Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Crankshaft Position (CKP)-Camshaft Position (CMP) Correlation Bank 1 Sensor A	P0016	Detects cam to crank misalignment by monitoring if cam sensor pulse for bank 1 sensor A occurs during the incorrect crank position	4 cam sensor pulses less than or greater than nominal position in one cam revolution.	-10.0 Crank Degrees 10.0 Crank Degrees	Crankshaft and camshaft position signals are synchronized Engine is Spinning No Active DTCs: Time since last execution of diagnostic	 CrankSensor_FA P0340, P0341 < 1.0 seconds	2 failures out of 3 tests. A failed test is 4 failures out of 5 samples. One sample per cam rotation	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Outside Air Temperature (OAT) Sensor Circuit Performance (OAT wired to ECM)	P0071	Detects an Outside Air Temperature (OAT) sensorthat is stuck in range. There are two components to the test: an engine off component, and an engine running component. If the engine has been off for a long enough period of time, and the coolant temperature and Intake Air Temperature (IAT) values are similar, then the air temperature values in the engine compartment of the vehicle are considered to have equalized. In this case, the engine off component of the diagnostic can be enabled. If the IAT and the OAT values are similar, then the OAT Performance Diagnostic passes. If the IAT and OAT values are not similar, the diagnostic will continue to monitor the IAT and the OAT as the vehicle starts to move. For applications that have ability to move without engaging the internal combustion	**Engine Off:**		Time between current ignition cycle and the last time the engine was running	>= 28,800.0 seconds	Executed every 100 msec until a pass or fail decision is made	Type B, 2 Trips
			If IAT >= OAT: IAT - OAT	> 20.0 deg C	Engine is not running			
			If IAT < OAT: OAT - IAT	> 20.0 deg C	Vehicle Speed	>= 12.4 MPH		
			If either of the following conditions are met, this diagnostic will pass:		Coolant Temperature - IAT	< 15.0 deg C		
					IAT - Coolant Temperature	< 15.0 deg C		
			If IAT >= OAT: IAT - OAT	<= 20.0 deg C	OAT-to-IAT engine off equilibrium counter	>= 300.0 counts		
			If IAT < OAT: OAT - IAT	<= 20.0 deg C	The "OAT-to-IAT engine off equilibrium counter" is a counter that is incremented or decremented based on vehicle speed when the engine is off. When this counter is high enough, the vehicle has reached an equilibrium where IAT and OAT can be compared. The value that is added or subtracted to the counter every 100 msec is contained in table **P0071: OAT Performance Drive Equilibrium Engine Off**			
					No Active DTCs:	VehicleSpeedSensor_FA IAT_SensorFA ECT_Sensor_Ckt_FA MAF_SensorFA EngineModeNotRunTimer Error		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		engine, the engine off test will continue. If the vehicle has been moving quickly enough for a long enough period of time, the IAT and OAT values should have reached an equilibrium. This period of time is defined by the "OAT-to-IAT engine off equilibrium counter". The "OAT-to-IAT engine off equilibrium counter" is a counter that is incremented or decremented based on vehicle speed when the engine is off. When this counter is high enough, the vehicle has reached an equilibrium where IAT and OAT can be compared. While the "OAT-to-IAT engine off equilibrium counter" is counting, IAT and OAT are monitored for similarity. If they are similar, the OAT Performance Diagnostic passes. If the counter reaches an equilibrium and the IAT and OAT values are not similar, the OAT Performance Diagnostic will fail.	**<u>Engine Running:</u>** If IAT >= OAT: IAT - OAT If IAT < OAT: OAT - IAT If either of the following conditions are met, this diagnostic will pass: If IAT >= OAT: IAT - OAT If IAT < OAT: OAT - IAT	 > 20.0 deg C > 20.0 deg C <= 20.0 deg C <= 20.0 deg C	Time between current ignition cycle and the last time the engine was running Engine is running Vehicle Speed Engine airflow OAT-to-IAT engine running equilibrium counter The "OAT-to-IAT engine running equilibrium counter" is a counter that is incremented or decremented based on vehicle speed and engine air flow when the engine is running. When this counter is high enough, the vehicle has reached an equilibrium where IAT and OAT can be compared. The value that is added or subtracted to the counter every 100 msec is contained in table **P0071: OAT Performance Drive Equilibrium Engine Running** No Active DTCs:	>= 28,800.0 seconds >= 12.4 MPH >= 10.0 grams/second >= 300.0 counts VehicleSpeedSensor_FA IAT_SensorFA ECT_Sensor_Ckt_FA MAF_SensorFA EngineModeNotRunTimer Error	Executed every 100 msec until a pass or fail decision is made	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		If the engine off component of the diagnostic was enabled, but did not make a pass or fail decision, the engine running component will begin executing when the internal combustion engine starts to run. If the vehicle has been moving quickly enough for a long enough period of time, the IAT and OAT values should have reached an equilibrium. This period of time is defined by the "OAT-to-IAT engine running equilibrium counter". The "OAT-to-IAT engine running equilibrium counter" is a counter that is incremented or decremented based on vehicle speed when the engine is running. When this counter is high enough, the vehicle has reached an equilibrium where IAT and OAT can be compared. While the "OAT-to-IAT engine running equilibrium counter" is counting, IAT and OAT are monitored for						

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		similarity. If they are similar, the OAT Performance Diagnostic passes. If the counter reaches an equilibrium and the IAT and OAT values are not similar, the OAT Performance Diagnostic will fail.						

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Outside Air Temperature (OAT) Sensor Circuit Low	P0072	Detects a continuous short to ground in the Outside Air Temperature (OAT) signal circuit by monitoring the OAT sensor output resistance and failing the diagnostic when the OAT resistance is too low. The OAT sensor is a thermistor in which the resistance across the sensor can be equated to a temperature. A lower resistance is equivalent to a higher temperature.	Raw OAT Input	<= 46 Ohms (-150 deg C)	Continuous		40 failures out of 50 samples 1 sample every 100 msec	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Outside Air Temperature (OAT) Sensor Circuit High	P0073	Detects a continuous open circuit in the Outside Air Temperature (OAT) signal circuit by monitoring the OAT sensor output resistance and failing the diagnostic when the OAT resistance is too high. The OAT sensor is a thermistor in which the resistance across the sensor can be equated to a temperature. A higher resistance is equivalent to a lower temperature.	Raw OAT Input	>= 427,757 Ohms (~-60 deg C)	Continuous		40 failures out of 50 samples 1 sample every 100 msec	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Outside Air Temperature (OAT) Sensor Intermittent In-Range	P0074	Detects a noisy or erratic signal in the Outside Air Temperature (OAT) circuit by monitoring the OAT sensor and failing the diagnostic when the OAT signal has a noisier output than is expected. When the value of the OAT signal in °C is determined, a delta is calculated between the current reading and the previous reading. The absolute value of these deltas is summed over a number of OAT readings. The result of this summation is called a “string length”. Since the OAT signal is anticipated to be relatively smooth, a string length of a particular magnitude indicates a noisy or erratic OAT signal. The diagnostic will fail if the string length is too high.	String Length Where: "String Length" = sum of "Diff" calculated over And where: "Diff" = ABS(current OAT reading - OAT reading from 100 milliseconds previous)	> 100 deg C 10 consecutive OAT readings		Continuous	4 failures out of 5 samples Each sample takes 1.0 seconds	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Fuel Rail Pressure (FRP) Too Low	P0087	Determine if rail pressure is below an absolute value.	Rail pressure	< 0 to 13 MPa (see table **P0087 Minimum rail pressure)**	Run crank voltage	> 11.0V	320 failures out of 457 samples 6.25 ms/sample	Type A, 1 Trips
					Engine running, cranking excluded, for a time	>= 30.00 s		
					No IFT running (refer to FUL_IFT_St)			
					No engine shut down request			
					LowFuelConditionDiagnostic	= FALSE		
					Fuel pressure estimated at high pressure pump inlet is valid			
					Fuel pressure estimated at high pressure pump inlet	>= 350.00 kPa		
					No DTC active:	FuelPumpRIyCktFA P0091 P2294 P2296		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Fuel Pressure Regulator 1 Performance	P0089	Determine when rail pressure is above maximum threshold when pressure is governed by Fuel Metering Unit valve.	Rail pressure	> 67 to 217 MPa (see table **P0089 Maximum rail pressure with MU)**	Run crank voltage Rail pressure is governed by Fuel Metering Unit (refer to *RailPresCntrl)*	> 11.0V	160 failures out of 229 samples OR 160 continuous failures out of 229 samples 6.25 ms/sample	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Fuel Pressure Regulator Solenoid 1 Control Circuit	P0090	Controller specific output driver circuit diagnoses the Fuel Metering Unit valve low sided driver for an open circuit failure when the output is powered off by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range during driver off state indicates open circuit failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for an open circuit: impedance between signal and controller ground	> 200 kQ	Powertrain relay voltage Rail pressure is governed by Fuel Metering Unit (refer to *RailPresCntrl)* No active DTC since key is on: Powertrain relay voltage Run crank voltage Engine not cranking Metering Unit valve calibrated as present	> 11.0V FHP_MU_DrvrCloseTFTK0 FHP_MU_DrvrOpenTFTK0	44 failures out of 88 samples 6.25 ms/sample	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Fuel Pressure Regulator Solenoid 1 Control Circuit Low Voltage	P0091	Controller specific output driver circuit diagnoses the Fuel Metering Unit valve low sided driver for a short to ground failure when the output is powered off by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range during driver off state indicates short to ground failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for a short to ground: impedance between signal and controller ground	< 0.5 Q	Powertrain relay voltage Rail pressure is governed by Fuel Metering Unit (refer to *RailPresCntrl)* No active DTC since key is on:	> 11.0V FHP_MU_DrvrCloseTFTKO FHP_MU_DrvrOpenTFTKO	44 failures out of 88 samples 6.25 ms/sample	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Fuel Pressure Regulator Solenoid 1 Control Circuit High Voltage	P0092	Controller specific output driver circuit diagnoses the Fuel Metering Unit valve low sided driver for a short to power failure when the output is powered on by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range during driver on state indicates short to power failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for a short to power: impedance between signal and controller power	< 0.5 Q	Powertrain relay voltage Rail pressure is governed by Fuel Metering Unit (refer to *RailPresCntrl)* No active DTC since key is on:	> 11.0V FHP_MU_DrvrCloseTFTK 0 FHP_MU_DrvrOpenTFTK 0	44 failures out of 88 samples 6.25 ms/sample	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Intake Air Temperature Sensor 2 Circuit Performance (applications with IAT, IAT2 and IAT3)	P0096	Detects an Intake Air Temperature 2 (IAT2) sensor value that is stuck in range by comparing the IAT2 sensor value against the IAT and IAT3 sensor values and failing the diagnostic if the IAT2 value is more different than the IAT and IAT3 values than is expected. If the engine has been off for a long enough period of time, the air temperature values in the engine compartment of the vehicle are considered to have equalized, and the diagnostic can be enabled. The diagnostic will fail if the IAT and IAT3 values are similar, and the IAT2 value is not similar to the IAT and IAT3 values. The diagnostic will also fail if none of the three sensor values are similar to each other, and the IAT2 value is furthest from the sensor value that is in the middle of the three sensor values. This diagnostic is executed once per	**<u>Good Correlation Between IAT and IAT3</u>** ABS(Power Up IAT - Power Up IAT2) AND ABS(Power Up IAT - Power Up IAT3) AND ABS(Power Up IAT2 - Power Up IAT3)	> 25 deg C <= 25 deg C > 25 deg C	Time between current ignition cycle and the last time the engine was running Powertrain Relay Voltage for a time No Active DTCs:	> 28,800 seconds >= 11.0 Volts >= 0.9 seconds PowertrainRelayFault ECT_Sensor_Ckt_FA IAT_SensorCircuitFA MnfdTempSensorCktFA HumTempSnsrCktFA EngineModeNotRunTimer Error	Executes once at the beginning of each ignition cycle if enable conditions are met	Type B, 2 Trips
			<u>Not Good Correlation, IAT in Middle</u> Power Up IAT is between Power Up IAT2 and Power Up IAT3 AND ABS(Power Up IAT2 - Power Up IAT3) AND ABS(Power Up IAT - Power Up IAT2) > ABS(Power Up IAT - Power Up IAT3)	> 25 deg C	Time between current ignition cycle and the last time the engine was running Powertrain Relay Voltage for a time No Active DTCs:	> 28,800 seconds >= 11.0 Volts >= 0.9 seconds PowertrainRelayFault ECT_Sensor_Ckt_FA IAT_SensorCircuitFA MnfdTempSensorCktFA HumTempSnsrCktFA EngineModeNotRunTimer Error	Executes once at the beginning of each ignition cycle if enable conditions are met	
			<u>Not Good Correlation, IAT3 in Middle</u> Power Up IAT3 is between Power Up IAT and Power Up IAT2		Time between current ignition cycle and the last time the engine was running Powertrain Relay Voltage for a time	> 28,800 seconds >= 11.0 Volts >= 0.9 seconds	Executes once at the beginning of each ignition cycle if enable conditions are met	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		ignition cycle if the enable conditions are met.	AND ABS(Power Up IAT - Power Up IAT2) AND ABS(Power Up IAT3 - Power Up IAT2) > ABS(Power Up IAT3 - Power Up IAT)	> 25 deg C	No Active DTCs:	PowertrainRelayFault ECT_Sensor_Ckt_FA IAT_SensorCircuitFA MnfdTempSensorCktFA HumTempSnsrCktFA EngineModeNotRunTimer Error		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Intake Air Temperature Sensor Circuit 2 Low	P0097	Detects a continuous short to ground in the Intake Air Temperature 2 (IAT2) signal circuit or an IAT2 sensorthat is outputting a frequency signal that is too low. The diagnostic monitors the IAT2 sensor output frequency and fails the diagnostic when the IAT2 frequency is too low. The IAT2 sensor is a thermistor in which the resistance across the sensor can be equated to a temperature. The temperature value is converted by the sensor to a frequency value in Hertz. A digital square wave signal is transmitted by the sensor to the ECM. The ECM calculates the frequency of the square wave signal and converts that frequency to a temperature value. A lower frequency is equivalent to a lower temperature. This diagnostic is enabled if the Powertrain Relay voltage is high enough.	Raw IAT 2 Input	< 13 Hertz (~-60 deg C)	Powertrain Relay Voltage for a time No Active DTCs:	>= 11.0 Volts >= 0.9 seconds PowertrainRelayFault	40 failures out of 50 samples 1 sample every 100 msec	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Intake Air Temperature Sensor Circuit 2 High	P0098	Detects an Intake Air Temperature 2 (IAT2) sensor that is outputting a frequency signal that is too high. The diagnostic monitors the IAT2 sensor output frequency and fails the diagnostic when the IAT2 frequency is too high. The IAT2 sensor is a thermistor in which the resistance across the sensor can be equated to a temperature. The temperature value is converted by the sensor to a frequency value in Hertz. A digital square wave signal is transmitted by the sensor to the ECM. The ECM calculates the frequency of the square wave signal and converts that frequency to a temperature value. A higher frequency is equivalent to a higher temperature. This diagnostic is enabled if the Powertrain Relay voltage is high enough.	Raw IAT 2 Input	> 390 Hertz (-150 deg C)	Powertrain Relay Voltage for a time No Active DTCs:	>= 11.0 Volts >= 0.9 seconds PowertrainRelayFault	40 failures out of 50 samples 1 sample every 100 msec	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Intake Air Temperature Sensor 2 Intermittent In-Range	P0099	Detects a noisy or erratic signal in the Intake Air Temperature 2 (IAT2) circuit by monitoring the IAT2 sensor and failing the diagnostic when the IAT2 signal has a noisier output than is expected. When the value of the IAT2 signal in °C is determined, a delta is calculated between the current reading and the previous reading. The absolute value of these deltas is summed over a number of IAT2 readings. The result of this summation is called a “string length”. Since the IAT2 signal is anticipated to be relatively smooth, a string length of a particular magnitude indicates a noisy or erratic IAT2 signal. The diagnostic will fail if the string length is too high. This diagnostic is enabled if the Powertrain Relay voltage is high enough.	String Length Where: "String Length" = sum of "Diff" calculated over And where: "Diff" = ABS(current IAT 2 reading - IAT 2 reading from 100 milliseconds previous)	> 80.00 deg C 10 consecutive IAT 2 readings	Powertrain Relay Voltage for a time No Active DTCs:	>= 11.0 Volts >= 0.9 seconds PowertrainRelayFault	4 failures out of 5 samples Each sample takes 1.0 seconds	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Multiple Pressure Sensor Correlation Performance (3 intake air pressure sensor configuration)	P00C7	This monitor is used to identify if BARO, MAP and TCIAP pressure values are irrational when compared to each other. The plausibility monitor compares the BARO, MAP and TCIAP pressures in two different conditions: - at idle (part of the test enabled when the engine is running) - between key off and when the engine starts running (part of the test enabled when the engine is not running). If the three sensors are not in agreement the monitor is not able to pinpoint the sensor(s) that is/are not working correctly and therefore indicates that there is a fault that impacts the three sensors.	Difference (absolute value) in measured pressure between BARO sensor and TCIAP sensor AND Difference (absolute value) in measured pressure between BARO sensor and MAP sensor AND Difference (absolute value) in measured pressure between TCIAP sensor and MAP sensor	> **P0106, P2227, P227B, P00C7: Maximum pressure difference** [kPa] > **P0106, P2227, P227B, P00C7: Maximum pressure difference** [kPa] > **P0106, P2227, P227B, P00C7: Maximum pressure difference** [kPa]	Correlation diagnostic enabled by calibration Engine is running Run Crankrelay supply voltage in range Engine speed Requested fuel Throttle measured position Engine Coolant Temperature No faults are present	==1.00 > 11.00 [V] < 950.00 [rpm] < 40.00 [mm^3] > 90.00 [%] > 70.00 [°C] CrankSensor_FA ==FALSE FUL_GenericInjSysFA ==FALSE TPS_PstnSnsrFA ==FALSE MAP_SensorCircuitFA ==FALSE AAP2_SnsrCktFA ==FALSE AAP_AAP5_SnsrCktFA ==FALSE AAP_AAP2_SnsrStabFA ==FALSE AAP_AAP5_SnsrStabFA ==FALSE ECT_Sensor_FA	640.00 fail counters over 800.00 sample counters sampling time is 12.5 ms	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
						==FALSE MAF_MAF SnsrFA ==FALSE		
			Difference (absolute value) in measured pressure between MAP sensor and BARO sensor AND Difference (absolute value) in measured pressure between TCIAP sensor and MAP sensor AND Difference (absolute value) in measured pressure between TCIAP sensor and BARO sensor OR Difference (absolute value) in measured pressure between MAP sensor and BARO sensor AND Difference (absolute value) in measured pressure between TCIAP sensor and MAP sensor AND Difference (absolute value) in measured pressure between TCIAP sensor and BARO sensor OR Difference (absolute value) in measured pressure between MAP sensor and BARO sensor	> 10.0 [kPa] <= 10.0 [kPa] <= 10.0 [kPa] <= 10.0 [kPa] > 10.0 [kPa] <= 10.0 [kPa] <= 10.0 [kPa]	Time between current ignition cycle and the last time the engine was running Engine is not rotating Manifold Pressure Manifold Pressure Baro Pressure Baro Pressure TCIAP Pressure TCIAP Pressure No Active DTCs: No Pending DTCs:	> 5.0 [s] >= 50.0 [kPa] <= 115.0 [kPa] >= 50.0 [kPa] <= 115.0 [kPa] >= 50.0 [kPa] <= 115.0 [kPa] EngineModeNotRunTimer Error MAP_SensorFA AAP_SnsrFA AAP2_SnsrFA MAP_SensorCircuitFP AAP_SnsrCktFP AAP2_SnsrCktFP	384 fail counters over 480 sample counters sampling time is 12.5 ms	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			AND Difference (absolute value) in measured pressure between TCIAP sensor and MAP sensor	<= 10.0 [kPa]				
			AND Difference (absolute value) in measured pressure between TCIAP sensor and BARO sensor	> 10.0 [kPa]				
			OR					
			Difference (absolute value) in measured pressure between MAP sensor and BARO sensor	> 10.0 [kPa]				
			AND Difference (absolute value) in measured pressure between TCIAP sensor and MAP sensor	> 10.0 [kPa]				
			AND Difference (absolute value) in measured pressure between TCIAP sensor and BARO sensor	> 10.0 [kPa]				

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Intake Air Temperature Sensor 3 Circuit Performance	P00E9	Detects an Intake Air Temperature 3 (IAT3) sensor value that is stuck in range by comparing the IAT3 sensor value against the IAT and IAT2 sensor values and failing the diagnostic if the IAT3 value is more different than the IAT and IAT2 values than is expected. If the engine has been off for a long enough period of time, the air temperature values in the engine compartment of the vehicle are considered to have equalized, and the diagnostic can be enabled. The diagnostic will fail if the IAT and IAT2 values are similar, and the IAT3 value is not similar to the IAT and IAT2 values. The diagnostic will also fail if none of the three sensor values are similar to each other, and the IAT3 value is furthest from the sensor value that is in the middle of the three sensor values. This diagnostic is executed once per	**<u>Good Correlation Between IAT and IAT2</u>** ABS(Power Up IAT - Power Up IAT2) AND ABS(Power Up IAT - Power Up IAT3) AND ABS(Power Up IAT2 - Power Up IAT3)	<= 25 deg C > 25 deg C > 25 deg C	Time between current ignition cycle and the last time the engine was running Powertrain Relay Voltage for a time No Active DTCs:	> 28,800 seconds >= 11.0 Volts >= 0.9 seconds PowertrainRelayFault ECT_Sensor_Ckt_FA IAT_SensorCircuitFA MnfdTempSensorCktFA HumTempSnsrCktFA EngineModeNotRunTimer Error	Executes once at the beginning of each ignition cycle if enable conditions are met	Type B, 2 Trips
			<u>Not Good Correlation, IAT in Middle</u> Power Up IAT is between Power Up IAT2 and Power Up IAT3 AND ABS(Power Up IAT2 - Power Up IAT3) AND ABS(Power Up IAT - Power Up IAT3) > ABS(Power Up IAT - Power Up IAT2)	> 25 deg C	Time between current ignition cycle and the last time the engine was running Powertrain Relay Voltage for a time No Active DTCs:	> 28,800 seconds >= 11.0 Volts >= 0.9 seconds PowertrainRelayFault ECT_Sensor_Ckt_FA IAT_SensorCircuitFA MnfdTempSensorCktFA HumTempSnsrCktFA EngineModeNotRunTimer Error	Executes once at the beginning of each ignition cycle if enable conditions are met	
			<u>Not Good Correlation, IAT2 in Middle</u> Power Up IAT2 is between Power Up IAT and Power Up IAT3		Time between current ignition cycle and the last time the engine was running Powertrain Relay Voltage for a time	> 28,800 seconds >= 11.0 Volts >= 0.9 seconds	Executes once at the beginning of each ignition cycle if enable conditions are met	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		ignition cycle if the enable conditions are met.	AND ABS(Power Up IAT - Power Up IAT3) AND ABS(Power Up IAT2 - Power Up IAT3) > ABS(Power Up IAT2 - Power Up IAT)	> 25 deg C	No Active DTCs:	PowertrainRelayFault ECT_Sensor_Ckt_FA IAT_SensorCircuitFA MnfdTempSensorCktFA HumTempSnsrCktFA EngineModeNotRunTimer Error		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Intake Air Temperature Sensor Circuit 3 Low	POOEA	Detects a continuous short to ground in the Intake Air Temperature 3 (IAT3) signal circuit by monitoring the IAT3 sensor output resistance and failing the diagnostic when the IAT3 resistance is too low. The IAT3 sensor is a thermistor in which the resistance across the sensor can be equated to a temperature. A lower resistance is equivalent to a higher temperature.	Raw IAT 3 Input	< 57.94 Ohms (-150 deg C)	Engine Run Time	> 0.00 seconds	40 failures out of 50 samples 1 sample every 100 msec	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Intake Air Temperature Sensor Circuit 3 High	POOEB	Detects a continuous open circuit in the Intake Air Temperature 3 (IAT3) signal circuit by monitoring the IAT3 sensor output resistance and failing the diagnostic when the IAT3 resistance is too high. The IAT3 sensor is a thermistor in which the resistance across the sensor can be equated to a temperature. A higher resistance is equivalent to a lower temperature.	Raw IAT 3 Input	> 153,665 Ohms (~-60 deg C)	Engine Run Time	> 0.00 seconds	40 failures out of 50 samples 1 sample every 100 msec	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Intake Air Temperature Sensor 3 Intermittent In-Range	POOEC	Detects a noisy or erratic signal in the Intake Air Temperature 3 (IAT3) circuit by monitoring the IAT3 sensor and failing the diagnostic when the IAT3 signal has a noisier output than is expected. When the value of the IAT3 signal in °C is determined, a delta is calculated between the current reading and the previous reading. The absolute value of these deltas is summed over a number of IAT3 readings. The result of this summation is called a “string length”. Since the IAT3 signal is anticipated to be relatively smooth, a string length of a particular magnitude indicates a noisy or erratic IAT3 signal. The diagnostic will fail if the string length is too high.	String Length Where: "String Length" = sum of "Diff" calculated over And where: "Diff" = ABS(current IAT 3 reading - IAT 3 reading from 100 milliseconds previous)	> 80.00 deg C 10 consecutive IAT 3 readings	Continuous		4 failures out of 5 samples Each sample takes 1.0 seconds	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Humidity Sensor Circuit Low	P00F4	Detects a continuous short to ground in the humidity signal circuit or a humidity sensor that is outputting a duty cycle that is too low. The diagnostic monitors the humidity sensor duty cycle output and fails the diagnostic when the humidity duty cycle is too low. The humidity sensor converts the capacitance across the sensor to a relative humidity. The relative humidity value is converted by the sensor to a duty cycle value in %. A digital square wave signal is transmitted by the sensor to the ECM. The ECM calculates the duty cycle of the square wave signal and converts that duty cycle to a relative humidity value in % through a transfer function. This diagnostic is enabled if the Powertrain Relay voltage is high enough.	Humidity Duty Cycle	<= 5.0 %	Powertrain Relay Voltage for a time No Active DTCs:	>= 11.0 Volts >= 0.9 seconds PowertrainRelayFault	40 failures out of 50 samples 1 sample every 100 msec	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Humidity Sensor Circuit High	P00F5	Detects a humidity sensor that is outputting a duty cycle signal that is too high. The diagnostic monitors the humidity sensor duty cycle output and fails the diagnostic when the humidity duty cycle is too high. The humidity sensor converts the capacitance across the sensor to a relative humidity. The relative humidity value is converted by the sensor to a duty cycle value in %. A digital square wave signal is transmitted by the sensor to the ECM. The ECM calculates the duty cycle of the square wave signal and converts that duty cycle to a relative humidity value in % through a transfer function. This diagnostic is enabled if the Powertrain Relay voltage is high enough.	Humidity Duty Cycle	>= 95.0 %	Powertrain Relay Voltage for a time No Active DTCs:	>= 11.0 Volts >= 0.9 seconds PowertrainRelayFault	40 failures out of 50 samples 1 sample every 100 msec	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Humidity Sensor Circuit Intermittent	P00F6	Detects a noisy or erratic signal in the humidity circuit by monitoring the humidity sensor and failing the diagnostic when the humidity signal has a noisier output than is expected. When the value of relative humidity in % is determined, a delta is calculated between the current reading and the previous reading. The absolute value of these deltas is summed over a number of humidity readings. The result of this summation is called a “string length”. Since the humidity signal is anticipated to be relatively smooth, a string length of a particular magnitude indicates a noisy or erratic humidity signal. The diagnostic will fail if the string length is too high. This diagnostic is enabled if the Powertrain Relay voltage is high enough.	String Length Where: "String Length" = sum of "Diff" calculated over And where: "Diff" = ABS(current Humidity reading - Humidity reading from 100 milliseconds previous)	> 80 % 10 consecutive Humidity readings	Powertrain Relay Voltage for a time No Active DTCs:	>= 11.0 Volts >= 0.9 seconds PowertrainRelayFault	4 failures out of 5 samples Each sample takes 1.0 seconds	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Manifold Absolute Pressure (MAP) Sensor Performance (3 intake air pressure sensor configuration)	P0106	This monitor is used to identify MAP sensor internal faults (measurement with an offset or a drift). The plausibility monitor compares the BARO, MAP and TCIAP pressures in two different conditions: - at idle (part of the test enabled when the engine is running) - between key off and when the engine starts running (part of the test enabled when the engine is not running). If MAP sensor is not in agreement with the other two the monitor is able to pinpoint MAP as the faulty sensor.	Difference (absolute value) in measured pressure between MAP sensor and TCIAP sensor AND Difference (absolute value) in measured pressure between MAP sensor and BARO sensor AND Difference (absolute value) in measured pressure between BARO sensor and TCIAP sensor	> **P0106, P2227, P227B, P00C7: Maximum pressure difference** [kPa] > **P0106, P2227, P227B, P00C7: Maximum pressure difference** [kPa] <= **P0106, P2227, P227B, P00C7: Maximum pressure difference** [kPa]	Correlation diagnostic enabled by calibration Engine is running Run Crankrelay supply voltage in range Engine speed Requested fuel Throttle measured position Engine Coolant Temperature No faults are present	==1.00 > 11.00 [V] < 950.00 [rpm] < 40.00 [mm^3] > 90.00 [%] > 70.00 [°C] CrankSensor_FA ==FALSE FUL_GenericInjSysFA ==FALSE TPS_PstnSnsrFA ==FALSE MAP_SensorCircuitFA ==FALSE AAP2_SnsrCktFA ==FALSE AAP_AAP5_SnsrCktFA ==FALSE AAP_AAP2_SnsrStabFA ==FALSE AAP_AAP5_SnsrStabFA ==FALSE ECT_Sensor_FA	320.00 fail counters over 400.00 sample counters sampling time is 12.5 ms	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
						==FALSE MAF_MAF SnsrFA ==FALSE		
			MAP sensor OR MAP sensor OR Difference (absolute value) in measured pressure between MAP sensor and TCIAP sensor AND Difference (absolute value) in measured pressure between MAP sensor and BARO sensor AND Difference (absolute value) in measured pressure between BARO sensor and TCIAP sensor	< 50.0 [kPa] > 115.0 [kPa] > 10.0 [kPa] > 10.0 [kPa] <= 10.0 [kPa]	Time between current ignition cycle and the last time the engine was running Engine is not rotating No Active DTCs: No Pending DTCs:	> 5.0 [s] EngineModeNotRunTimer Error MAP_SensorCircuitFA AAP_SnsrCktFA MAP_SensorCircuitFP AAP_SnsrCktFP	384 fail counters over 480 sample counters sampling time is 12.5 ms	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Manifold Absolute Pressure Sensor Circuit Low (with pull-up)	P0107	Detects a continuous short to ground in the Manifold Absolute Pressure (MAP) signal circuit by monitoring the MAP sensor output voltage and failing the diagnostic when the MAP voltage is too low. The MAP sensor is a pressure transducer which outputs a voltage proportional to the absolute pressure.	MAP Voltage	< 3.3 % of 5 Volt Range (This is equal to 7.5 kPa)	Continuous		320 failures out of 400 samples 1 sample every 12.5 msec	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Manifold Absolute Pressure Sensor Circuit High (with pull-up)	P0108	Detects a continuous short to power or open circuit in the Manifold Absolute Pressure (MAP) signal circuit by monitoring the MAP sensor output voltage and failing the diagnostic when the MAP voltage is too high. The MAP sensor is a pressure transducer which outputs a voltage proportional to the absolute pressure.	MAP Voltage	> 97.0 % of 5 Volt Range (This is equal to 421.5 kPa)	Continuous		320 failures out of 400 samples 1 sample every 12.5 msec	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Intake Air Temperature Sensor Circuit Performance (applications with IAT, IAT2 and IAT3)	P0111	Detects an Intake Air Temperature (IAT) sensor value that is stuck in range by comparing the IAT sensor value against the IAT2 and IAT3 sensor values and failing the diagnostic if the IAT value is more different than the IAT2 and IAT3 values than is expected. If the engine has been off for a long enough period of time, the air temperature values in the engine compartment of the vehicle are considered to have equalized, and the diagnostic can be enabled. The diagnostic will fail if the IAT2 and IAT3 values are similar, and the IAT value is not similar to the IAT2 and IAT3 values. The diagnostic will also fail if none of the three sensor values are similar to each other, and the IAT value is furthest from the sensor value that is in the middle of the three sensor values. This diagnostic is executed once per	**<u>Good Correlation Between IAT2 and IAT3</u>** ABS(Power Up IAT - Power Up IAT2) AND ABS(Power Up IAT - Power Up IAT3) AND ABS(Power Up IAT2 - Power Up IAT3)	 > 25 deg C > 25 deg C <= 25 deg C	Time between current ignition cycle and the last time the engine was running Powertrain Relay Voltage for a time No Active DTCs:	 > 28,800 seconds >= 11.0 Volts >= 0.9 seconds PowertrainRelayFault ECT_Sensor_Ckt_FA IAT_SensorCircuitFA MnfdTempSensorCktFA HumTempSnsrCktFA EngineModeNotRunTimer Error	Executes once at the beginning of each ignition cycle if enable conditions are met	Type B, 2 Trips
			<u>Not Good Correlation, IAT2 in Middle</u> Power Up IAT2 is between Power Up IAT and Power Up IAT3 AND ABS(Power Up IAT - Power Up IAT3) AND ABS(Power Up IAT2 - Power Up IAT) > ABS(Power Up IAT2 - Power Up IAT3)	 > 25 deg C	Time between current ignition cycle and the last time the engine was running Powertrain Relay Voltage for a time No Active DTCs:	 > 28,800 seconds >= 11.0 Volts >= 0.9 seconds PowertrainRelayFault ECT_Sensor_Ckt_FA IAT_SensorCircuitFA MnfdTempSensorCktFA HumTempSnsrCktFA EngineModeNotRunTimer Error	Executes once at the beginning of each ignition cycle if enable conditions are met	
			<u>Not Good Correlation, IAT3 in Middle</u> Power Up IAT3 is between Power Up IAT and Power Up IAT2		Time between current ignition cycle and the last time the engine was running Powertrain Relay Voltage for a time	 > 28,800 seconds >=11.0 Volts >= 0.9 seconds	Executes once at the beginning of each ignition cycle if enable conditions are met	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		ignition cycle if the enable conditions are met.	AND ABS(Power Up IAT - Power Up IAT2) AND ABS(Power Up IAT3 - Power Up IAT) > ABS(Power Up IAT3 - Power Up IAT2)	> 25 deg C	No Active DTCs:	PowertrainRelayFault ECT_Sensor_Ckt_FA IAT_SensorCircuitFA MnfdTempSensorCktFA HumTempSnsrCktFA EngineModeNotRunTimer Error		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Intake Air Temperature Sensor Circuit Low	P0112	Detects a continuous short to ground in the Intake Air Temperature (IAT) signal circuit by monitoring the IAT sensor output resistance and failing the diagnostic when the IAT resistance is too low. The IAT sensor is a thermistor in which the resistance across the sensor can be equated to a temperature. A lower resistance is equivalent to a higher temperature.	Raw IAT Input	< 58.00 Ohms (-150 deg C)	Engine Run Time	> 0.00 seconds	40 failures out of 50 samples 1 sample every 100 msec	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Intake Air Temperature Sensor Circuit High	P0113	Detects a continuous open circuit in the Intake Air Temperature (IAT) signal circuit by monitoring the IAT sensor output resistance and failing the diagnostic when the IAT resistance is too high. The IAT sensor is a thermistor in which the resistance across the sensor can be equated to a temperature. A higher resistance is equivalent to a lower temperature.	Raw IAT Input	> 142,438 Ohms (~-60 deg C)	Engine Run Time	> 0.00 seconds	40 failures out of 50 samples 1 sample every 100 msec	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Intake Air Temperature Sensor Intermittent In-Range	P0114	Detects a noisy or erratic signal in the Intake Air Temperature (IAT) circuit by monitoring the IAT sensor and failing the diagnostic when the IAT signal has a noisier output than is expected. When the value of the IAT signal in °C is determined, a delta is calculated between the current reading and the previous reading. The absolute value of these deltas is summed over a number of IAT readings. The result of this summation is called a “string length”. Since the IAT signal is anticipated to be relatively smooth, a string length of a particular magnitude indicates a noisy or erratic IAT signal. The diagnostic will fail if the string length is too high.	String Length Where: "String Length" = sum of "Diff" calculated over And where: "Diff" = ABS(current IAT reading - IAT reading from 100 milliseconds previous)	> 80.00 deg C 10 consecutive IAT readings	Continuous		4 failures out of 5 samples Each sample takes 1.0 seconds	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Engine Coolant Temperature (ECT) Sensor Performance (TSRD)	P0116	This DTC detects either a biased high or low ECT (Engine Coolant temperature) sensor. This is done by comparing the ECT sensor output to two other temperature sensor outputs after a soak condition.	**Sensor usage definitions:** **Sensori =** CeECTR_e_ECT_Snsr (Sensori is the temp sensor most impacted by the block heater (if equipped)) **Sensor2 =** CeECTR_e_IAT_Snsr **Sensor3 =** CeECTR_e_OAT_Snsr		No Active DTC's	VehicleSpeedSensor_FA IAT_SensorCircuitFA THMR_RCT_Sensor_Ckt_FA ECT_Sensor_Ckt_FA EngineModeNotRunTimerError EngineModeNotRunTimer_FA OAT_PtEstFiltFA OAT_PtEstRawFA PSAR_PropSysInactveCrs_FA DRER_DiagSystemDsbl	1 failure to set DTC 1 sec/ sample Once per valid cold start	Type A, 1 Trips
					Engine Off Soak Time Propulsion Off Soak Time Non-volatile memory initization	>28,800 seconds >25,200 seconds = Not occurred		
			A failure will be reported if any of the following occur: 1) Sensori power up absolute temp difference to Sensor2 and Sensor3 is (Sensori fast fail) .	> 100.0 °C	Test complete this trip Test aborted this trip Test disabled this trip Ambient LowFuelCondition Diag High sided coolant rationality	= False = False = False > -7 °C = False = Disabled		
			2) Sensori power up temp is greater than Sensor2 and Sensor3 in this range: (and a block heater has not been detected)	> 20.0 and < 100.0 °C	Block Heater detection is **enabled** when either of the following occurs:			
			3) Sensori power up temp is lower than Sensor2 and Sensor3 by this amount:	< 20.0 Deg °C	1) Sensori power up temp is greater than Sensor2 and Sensor3 in this range:	>20.0 °C and <100.0 °C		
			4) Sensori power up temp is > Sensor2 and		2) Cranking time	< 120.0 Seconds		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			Sensor3 by 20.0 °C and the time spent cranking the engine without starting is > 120.0 seconds with the LowFuelConditionDiag	= False	Block Heater is **detected** and diagnostic is aborted when 1) or 2) occurs.			
					1a) IAT monitoring is enabled after the following Vehicle drive constraints			
					1b) Drive time	> 400 Seconds with		
					lc) Vehicle speed	> 14.9 MPH and		
					ld) Additional Vehicle drive time is provided to 1b when Vehicle speed is below 1c as follows:	0.50 times the seconds with vehicle speed below 1b		
					le) IAT drops from power up IAT	> 5.0 °C		
					2a) ECT monitoring is enabled after engine start in the following engine run time window	1.0 <= seconds <= 40.0		
					2b) Sensori temp derivative during the test is:	< -0.10°C/sec		
					2c) Consecutive samples of 2b) being true are:	> 4 samples		
					Diagnostic is **aborted** when 3) or 4) occurs:			
					3) Engine run time with vehicle speed below 1b	> 1,800 Seconds		
					4) Engine off time (i.e. auto stop) during Block	>900.0 Seconds		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					heater detection			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Engine Coolant Temp Sensor Circuit Low	P0117	Circuit Continuity This DTC detects a short to ground in the ECT (Engine Coolant temperature) signal circuit or the ECT sensor. This is accomplished by monitoring the resistance of the circuit. If the resistance goes out of the expected range the DTC is set.	ECT Resistance (@ 150°C)	< 55 Ohms			5 failures out of 6 samples 1 sec/ sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Engine Coolant Temp Sensor Circuit High	P0118	Circuit Continuity This DTC detects a short to high or open in the ECT (Engine Coolant temperature) signal circuit or the ECT sensor. This is accomplished by monitoring the resistance of the circuit. If the resistance goes out of the expected range the DTC is set.	ECT Resistance (@ -60°C)	>133,561 Ohms	Engine run time OR IAT min	> 10.0 seconds > -6.7 °C	5 failures out of 6 samples 1 sec/ sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Engine Coolant Temperature (ECT) Sensor Circuit Intermittent	P0119	Circuit Erratic This DTC detects large step changes in the ECT (Engine Coolant temperature) signal circuit or the ECT sensor. Allowable high and low limits are calculated for the next sample based on the previous sample and sensor time constant. If the sensor responds faster than should be possible the DTC is set.	ECT temperature step change: 1) postive step change is greater than calculated high limit OR 2) negitive step change is lower than calculated low limit. The calculated high and low limits for the next reading use the following calibrations: 1) Sensor time constant 2) Sensor low limit 3) Sensor high limit *****Generic Example***** If the last ECT reading was 90 Deg C, the Time constant was calibrated at 10 seconds, the low limit was calibrated to -80 Deg C and the high limit was calibrated to 200 Deg C the calculated limits are 101 Deg C and 73 Deg C. The next reading (after the 90 Deg C reading) must be between 73 Deg C and 101 Deg C to be valid. ****************************	7.4 seconds -60.0 Deg C 200.0 Deg C	No Active DTC's	ECT_Sensor_Ckt_FP	3 failures out of 4 samples 1 sec/ sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Engine Coolant Temperature Below Stat Regulating Temperature	P0128	This DTC detects if the ECT (EngineCoolant temperature) does not achieve the required target temperature after an allowed energy accumulation by the engine. This can be caused by an ECT sensor biased low or a cooling system that is not warming up correctly because of a stuck open thermostat or other fault.	Energy is accumulated after the first conbustion event using Range #1 or #2 below: Thermostat type is divided into normal (non-heated) and electrically heated. For this application the "type" cal (KeTHMG_b_TMS_ElecThstEquipped) = 0 If the type cal is equal to one, the application has an electrically heated t-stat, if equal to zero the the application has an non heated t-stat. See appropiate section below. ***************************** Type cal above = 1 (Electrically heated t-stat) == == == == Range #1 (Primary) ECT reaches Commanded temperature minus 11 °C when Ambient min is < 52 °C and >10 °C. Note: Warm up target for range #1 will be at least 71 °C == == == == Range #2 (Alternate) ECT reaches Commanded temperature minus 11 °C when Ambient min is < 10 °C and >-7 °C. Note: Warm up target for range #2 will be at least	See the two tables named: **P0128_Maximum Accumulated Energy for Start-up ECT conditions - Primary** and **P0128_Maximum Accumulated Energy for Start-up ECT conditions - Alternate** in the Supporting tables section. This diagnostic models the net energy into and out of the cooling	No Active DTC's Engine not run time (soaking time before current trip) Engine run time Fuel Condition Distance traveled **************************** If Engine RPM is continuously greater than for this time period The diagnostic test for this key cycle will abort **************************** **************************** If T-Stat Heater commanded duty cycle for this time period	ECT_Sensor_Ckt_FA ECT_Sensor_Perf_FA VehicleSpeedSensor_FA OAT_PtEstFiltFA IAT_SensorCircuitFA MAF_SensorFA THMR_AWP_AuxPumpFA THMR_AHV_FA THMR_SWP_Control_FA THMR_SWP_NoFlow_FA THMR_SWP_FlowStuckOn_FA EngineTorqueEstInaccurate > 1,800 seconds 20 < Eng Run Tme < 2,100 seconds Ethanol < 15 % > 0.93 miles **************************** 9,999 rpm 5.0 seconds **************************** **************************** > 20.0 % duty cycle > 5.0 seconds	1 failure to set DTC 1 sec/ sample Once per ignition key cycle	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			71 °C ***************************** Type cal above = 0 (non - heated t-stat) == == == == Range #1 (Primary) ECT reaches 71 °C when Ambient min is < 52 °C and >10 °C. == == == == Range #2 (Alternate) ECT reaches 71 °C when Ambient min is < 10 °C and >-7 °C. *****************************	system during the warm-up process. The five energy terms are: heat from combustion (with AFM correction), heat from after-run, heat loss to enviroment, heat loss to cabin and heat loss to DFCO.	The diagnostic test for this key cycle will abort ************************** ECT at start run	*************************** -40 < ECT < 52 °C		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Fuel Temperature Sensor A Performance (FTS wired to FTZM)	P0181	Determine when fuel temperature sensor is not plausible, due to offset or drift.	Averaged for absolute difference between fuel temperature and reference temperature is IF fuel fired heater has been used ELSE (see **P0181 Fuel Temperature Sensor Reference**)	>= 20.00 °C >= 20.00 °C	FTZM Run crank voltage A time and is passed since engine movement is detected Engine soak time No error for Engine Not Running timer (Engine coolant temperature OR ECTJDBD-GlobalCoolTmpEnbl (refer to *"OBD Coolant Enable Criteria"* section)) Sensor Bus Relay commanded on No DTC active: At least one valid value received from serial communication	>8.0 >3s <4.00s > 28,800 s > -40 °C = TRUE FTS_FTS_CktFA FTS_PlausRefSnsrFlt SBR_RlyFA P1103	3 samples 100 ms/sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Fuel Temperature Sensor A Circuit Low (FTS wired to FTZM)	P0182	Determine when a short circuit to ground affects fuel temperature sensor.	Fuel temperature sensor output resistance	< 50 Q	Run crank voltage	> 6.0V	10 failures out of 20 samples 100 ms/samples	Type B, 2 Trips
					Run crank voltage	> 11.0V		
					Engine not cranking			
					FTZM Run crank voltage	> 8.00		
					Sensor Bus relay Commanded on			
					No DTC active	SBRRIyFA P1103		
					At least one valid value received from serial communication			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Fuel Temperature Sensor A Circuit High (FTS wired to FTZM)	P0183	Determine when a short circuit to ground affects fuel temperature sensor.	Fuel temperature sensor output resistance	> 121,865 Q	Run crank voltage	> 6.0V	10 failures out of 20 samples	Type B, 2 Trips
					Run crank voltage	> 11.0V		
					Engine not cranking		100 ms/samples	
					FTZM Run crank voltage	> 8.00		
					Sensor Bus relay Commanded on			
					No DTC active	SBRRIyFA P1103		
					At least one valid value received from serial communication			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Fuel Temperature Sensor A Circuit Intermittent (FTS wired to FTZM)	P0184	Determine when fuel temperature sensor changes quicker than expected, likely due to an intermittent fault.	Fuel temperature	>(1 - a) *156 °C + (Last good sample * a) with a = e^[- (amount of consecutive bad samples * 0.01)]	Run crank voltage Run crank voltage FTZM Run crank voltage Sensor Bus relay Commanded on No DTC active At least one valid value received from serial communication	> 6.0V > 11.0V > 8.00 FTS_FTS_CktFA FTS_PlausRefSnsrFlt SBRRlyFA P1103	10 failures out of 15 samples 100 ms/samples	Type B, 2 Trips
			Fuel temperature	< (1 -a)*-56°C + (Last good sample * a) with a = e^[- (amount of consecutive bad samples * 0.01)]	Run crank voltage Run crank voltage FTZM Run crank voltage Sensor Bus relay Commanded on No DTC active At least one valid value received from serial communication	> 6.0V > 11.0V > 8.00 FTS_FTS_CktFA FTS_PlausRefSnsrFlt SBR_RlyFA P1103	10 failures out of 15 samples 100 ms/samples	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Fuel Pressure Sensor "B" Circuit Range/ Performance	P018B	This DTC detects a fuel pressure sensor response stuck within the normal operating range using an intrusive test (as follows) a] Intrusive Test Trigger: 1] Fuel Pump Duty Cycle Clamped Time (min or max duty cycle) >= 5 sec Or 2] Fuel Pres Err Variance <= calibration value KeFDBR_cmp_FPSS_MinPres Variance ; Otherwise, Report status as Pass b] Intrusive test freq limit: 60 sec between intrusive tests that pass, c] Intrusive test Fuel Flow limit: Fuel Flow Actual < Max allowed Fuel Flow rate	Sensed fuel pressure change [absolute value, during intrusive test]	<= 30 kPa	a) Diagnostic enabled [FDBR b FPSS DiagEnbld] b) Timer Engine Running [FDBR_t_EngModeRunCoarse] c1) Fuel Flow Rate Valid c2) FDB_FuelPresSnsrCktFA c3) Reference Voltage Fault Status [DTC P0641] c4) FAB_FuelPmpCktFA c5) Fuel Control Enable Fault Active [DTC P12A6] c6) Fuel Pump Driver Module OverTemp Fault Active [DTC P1255] c7) Fuel Pump Speed Fault Active [DTC P129F] c8) CAN Sensor Bus message $0C3 Comm Fault [CFMR_b_FTZM_Info1_UcodeCmFADTC P165C] c9) CAN Sensor Bus Fuel Pmp Spd Command ARC and Checksum Comm Fault Code [CFMR_b_FTZM_Cmd1_UcodeCmFA DTC]	a) == TRUE b) >= 5.00 seconds c1)== TRUE c2) <> TRUE c3) <> TRUE c4] <> TRUE c5) <> TRUE c6) <> TRUE c7) <> TRUE c8) <> TRUE c9] <> TRUE	1 sample / 12.5 millisec Intrusive Test Duration: Fuel Flow - related (5 to 12 sec)	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					c10) Fuel Pump Duty Cycle Fault Active	c10) <>TRUE		
					d 1) Sensor Configuration [FDBR_e_FuelPresSnsrConfig]	c11) == CeFDBR_e_WiredTo_FTZM		
					c12) Sensor Bus Relay On	c12) == TRUE		
					d) Emissions Fuel Level Low [Message $3FB]	d)<> TRUE		
					e) Fuel Control Enable	e) == TRUE		
					f) Fuel Pump Control State	f) == Normal Control OR == Fuel Pres Sensor Stuck Control		
					g) Instantaneous Fuel Flow [FCBR_dm_InstFuelFlow]	g) >= 0.05 gm/sec		
					h) Diagnostic System Disabled [DRER_b_DiagSysDsb]	h)<> TRUE		
					j1) Fuel Pmp Speed Command Alive Rolling Count and Checksum Error [CAN Bus B $0CE] [CFMR_b_FTZM_Cmd1_ARC_ChkErr DTC]	j1)<> TRUE		
					j2) CAN Sensor Bus message $0C3_Available	j2) == TRUE		
					j3) Fuel Pres Sensor Ref Voltage Status Message Counter Incorrect Alive Rolling Count and	j3) <> TRUE		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Checksum Error [CAN Bus B $0C3] [CFMR_b_FTZM_Info1_ARC_ChkErr DTC]			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Fuel Pressure Sensor "B" Circuit Low	P018C	This DTC detects if the fuel pressure sensor circuit is shorted low Values are analyzed as percent of sensor reference voltage [[Abs [5.0V - SensorVoltsActual] / 5.0V] *100%]	Fuel Pressure Sensor output % [re. full range as percent of 5.0V reference]	< 4.00 % or [0 kPa gauge]	a) Diagnostic enabled [FDBR_b_FPSnsrCktLoDiagEnbl] b) Run_Crank Active [PMDR_b_RunCrankActive c) Diagnostic System Disabled [DRER_b_DiagSysDsbl] d) Pressure Sensor Configuration [FDBR_e_FuelPresSnsrConfig]	a) == TRUE b) == TRUE c) <> TRUE d1) IF calibration CeFDBR_e_WiredTo_FTZM == WiredTo ECM d2) IF NOT, then see Case2	64.00 failures / 80.00 samples 1 sample/12.5 ms	Type B, 2 Trips
			Fuel Pressure Sensor output % [re. full range as percent of 5.0V reference]	< 4.00 % or [0 kPa gauge]	a) Diagnostic enabled [FDBR_b_FPSnsrCktLoDiagEnbl] b) Run_Crank Active [PMDR_b_RunCrankActive c) Diagnostic System Disabled [DRER_b_DiagSysDsbl] d1) Pressure Sensor Configuration [FDBR_e_FuelPresSnsrConfig] d2) Sensor Bus Relay On d3) CAN Sensor Bus message $0C3_Available d4) Fuel Pres Sensor Ref	a) == TRUE b) == TRUE c) <> TRUE d1) IF calibration CeFDBR_e_WiredTo_FTZM == WiredTo FTZM d2) == TRUE d3) == TRUE d4) <> TRUE	64.00 failures / 80.00 samples 1 sample/12.5 ms	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Voltage Status Message Counter Incorrect Alive Rolling Count and Checksum Error [CAN Bus B $0C3] [CFMR_b_FTZM_Info1_ARC_ChkErr DTC]	d2) IF calibration CeFDBR_e_WiredTo_FTZM <> WiredTo FTZM, then see CaseI		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Fuel Pressure Sensor "B" Circuit High	P018D	This DTC detects if the fuel pressure sensor circuit is shorted High Values are analyzed as percent of sensor reference voltage [[Abs [5.0V - SensorVoltsActual] / 5.0V] *100%]	Fuel Pressure Sensor output % [re. full range as percent of 5.0V reference]	> 96.00 % or [743 kPa ga]	a) Diagnostic enabled [FDBR_b_FPSnsrCktLoDiagEnbl] b) Run_Crank Active [PMDR_b_RunCrankActive c) Diagnostic System Disabled [DRER_b_DiagSysDsbl] d) Pressure Sensor Configuration [FDBR_e_FuelPresSnsrConfig]	a) == TRUE b) == TRUE c) <> TRUE d1) IF calibration CeFDBR_e_WiredTo_FTZM == WiredTo ECM d2) IF NOT, then see Case2	64.00 failures / 80.00 samples 1 sample/12.5 ms	Type B, 2 Trips
			Fuel Pressure Sensor output % [re. full range as percent of 5.0V reference]	> 96.00 % or [743 kPa ga]	a) Diagnostic enabled [FDBR_b_FPSnsrCktLoDiagEnbl] b) Run_Crank Active [PMDR_b_RunCrankActive c) Diagnostic System Disabled [DRER_b_DiagSysDsbl] d1) Pressure Sensor Configuration [FDBR_e_FuelPresSnsrConfig] d2) Sensor Bus Relay On d3) CAN Sensor Bus message $0C3_Available d4) Fuel Pres Sensor Ref	a) == TRUE b) == TRUE c) <> TRUE d1) IF calibration CeFDBR_e_WiredTo_FTZM == WiredTo FTZM d2) == TRUE d3) == TRUE d4) <> TRUE	64.00 failures / 80.00 samples 1 sample/12.5 ms	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Voltage Status Message Counter Incorrect Alive Rolling Count and Checksum Error [CAN Bus B $0C3] [CFMR_b_FTZM_Info1_ARC_ChkErr DTC]	d2) IF calibration CeFDBR_e_WiredTo_FTZM <> WiredTo FTZM, then see CaseI		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Fuel Rail Pressure (FRP) Sensor A Performance	P0191	Determine when fuel rail pressure sensor is not plausible, due to offset or drift.	Rail pressure sensor output (as percentage of supply voltage) OR Rail pressure sensor output (as percentage of supply voltage)	>14.0% <6.5%	Engine off time No error for Engine Not Running timer No engine movement detected since begin of driving cycle (Engine coolant temperature OR ECT_OBD_GlobalCoolTmpEnbl (refer to *"OBD Coolant Enable Criteria"* section)) Run crank voltage Run crank voltage No active DTC:	£35s >-40 °C = TRUE > 6.0V > 11.0V ECT_Sensor_FA FHP_RPS_CktFA	42 failures out of 60 samples 6.25 ms/sample	Type A, 1 Trips
			Absolute difference between rail pressure #1 (first trace) and rail pressure #2 (second trace)	>21.0 MPa	**P0191 Rail Pressure Sensor Configuration** Starter motor is not engaged OR Starter motor has been engaged for a time OR Run crank voltage	= CeFHPG_e_RPS_DoubleTrack >15s > 8.4 V	33 failures out of 55 samples 6.25 ms/sample	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					No active DTC:	FHP_RPS_CktFA FHP_RPS2_CktFA P0194		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Fuel Rail Pressure (FRP) Sensor A Circuit Low Voltage	P0192	Determine when a short circuit to ground affects fuel rail pressure sensor.	Fuel rail pressure sensor output (as percentage of supply voltage)	< 4.3 %	Starter motor is not engaged OR Starter motor has been engaged for a time OR Run crank voltage	 > 15 s > 8.4 V	38 failures out of 76 samples OR 22 continuous failures out of 76 samples 6.25 ms/samples	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Fuel Rail Pressure (FRP) Sensor A Circuit High Voltage	P0193	Determine when a short circuit to voltage affects fuel rail pressure sensor.	Fuel rail pressure sensor output (as percentage of supply voltage)	> 94.8%	Starter motor is not engaged OR Starter motor has been engaged for a time OR Run crank voltage	 > 15 s > 8.4 V	38 failures out of 76 samples OR 22 continuous failures out of 76 samples 6.25 ms/samples	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Coolant Temperature Dropped Below Diagnostic Monitoring Temperature	P01F0	This DTC detects an unexplained cooling system cool down below the OBD monitoring threshold during normal operating conditions. This check is run throughout the key cycle.	For this application the "type" cal (KeTHMG_b_TMS_ElecThstEquipped) = 0 If the type cal is equal to one, the application has an electrically heated t-stat, if equal to zero the the application has an non heated t-stat. See appropiate section below. ***************************** Type cal above = 0 (non - heated t-stat) == == == == Engine coolant temperature ***************************** Type cal above = 1 (Electrically heated t-stat) == == == == Engine coolant temperature	 < 70.0 Deg C < 78.5 Deg C	No Active DTC's Engine Runtime Distance traveled this key cycle Ambient air pressure Ambient air temperature ************************** Engine coolant temperature At least once during the key cycle Type 0 (non-heated t-stat) Type 1 (Electrically heated T-stat) ************************** Heat to coolant DFCO time Thermostat duty cycle RPM Active Fuel Management is not in	ECT_Sensor_Ckt_FA VehicleSpeedSensor_FA OAT_PtEstFiltFA THMR_AWP_AuxPumpFA THMR_AHV_FA THMR_SWP_Control_FA EngineTorqueEstInaccurate ECT_Sensor_Perf_FA THMR_SWP_NoFlow_FA THMR_SWP_FlowStuckOn_FA >30.0 seconds >1.2 km > 55.0 kPa > -6.7 Deg C >71 Deg C >79.5 to 94.5 Deg C **Cool Down Diagnostic > Min Heat to Coolant** <10.0 seconds <100.0% <8,192 Half Cylinder Mode	30 seconds out of a 60 seconds window Continuous	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Injector 1 Open Circuit	P0201	This DTC checks the Injector 1 circuit for electrical integrity during operation.	Low current through the low side driver during operation indicates open circuit	Open circuit: circuit attached to the Controller external connections has an impedance >= 200 K Ohm	Test enabled by calibration; and Battery voltage and Key ON and Engine is not cranking and Engine Running and FUL_OutEnblCyl_CiEPSR_CylinderA and At least one injection pulse is requested by the application software (FUL_FuelInjectedCyl_CiEPSR_CylinderA	== 1 [Boolean] > 11.00 [V] - - >= 1.00 [s] == 0 [Boolean] == TRUE);	5 failures out of 10 samples 100 ms/sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Injector 2 Open Circuit	P0202	This DTC checks the Injector 2 circuit for electrical integrity during operation.	Low current through the low side driver during operation indicates open circuit	Open circuit: circuit attached to the Controller external connections has an impedance >= 200 K Ohm	Test enabled by calibration; and Battery voltage and Key ON and Engine is not cranking and Engine Running and FUL_OutEnblCyl_CiEPSR_CylinderB and At least one injection pulse is requested by the application software (FUL_FuelInjectedCyl_CiEPSR_CylinderB	== 1 [Boolean] > 11.00 [V] - - >= 1.00 [s] == 0 [Boolean] ==TRUE);	5 failures out of 10 samples 100 ms/sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Injector 3 Open Circuit	P0203	This DTC checks the Injector 3 circuit for electrical integrity during operation.	Low current through the low side driver during operation indicates open circuit	Open circuit: circuit attached to the Controller external connections has an impedance >= 200 K Ohm	Test enabled by calibration; and Battery voltage and Key ON and Engine is not cranking and Engine Running and FUL_OutEnblCyl_CiEPSRCylinderH and At least one injection pulse is requested by the application software (FUL_FuelInjectedCyl_CiEPSR_CylinderH	== 1 [Boolean] > 11.00 [V] - - >= 1.00 [s] == 0 [Boolean] ==TRUE);	5 failures out of 10 samples 100 ms/sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Injector 4 Open Circuit	P0204	This DTC checks the Injector 4 circuit for electrical integrity during operation.	Low current through the low side driver during operation indicates open circuit	Open circuit: circuit attached to the Controller external connections has an impedance >= 200 K Ohm	Test enabled by calibration; and Battery voltage and Key ON and Engine is not cranking and Engine Running and FUL_OutEnblCyl_CiEPSR_CylinderE and At least one injection pulse is requested by the application software (FUL_FuelInjectedCyl_CiEPSR_CylinderE	== 1 [Boolean] > 11.00 [V] - - >= 1.00 [s] == 0 [Boolean] == TRUE);	5 failures out of 10 samples 100 ms/sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Injector 5 Open Circuit	P0205	This DTC checks the Injector 5 circuit for electrical integrity during operation.	Low current through the low side driver during operation indicates open circuit	Open circuit: circuit attached to the Controller external connections has an impedance >= 200 K Ohm	Test enabled by calibration; and Battery voltage and Key ON and Engine is not cranking and Engine Running and FUL_OutEnblCyl_CiEPSR_CylinderF and At least one injection pulse is requested by the application software (FUL_FuelInjectedCyl_CiEPSR_CylinderF	== 1 [Boolean] > 11.00 [V] - - >= 1.00 [s] == 0 [Boolean] == TRUE);	5 failures out of 10 samples 100 ms/sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Injector 6 Open Circuit	P0206	This DTC checks the Injector 6 circuit for electrical integrity during operation.	Low current through the low side driver during operation indicates open circuit	Open circuit: circuit attached to the Controller external connections has an impedance >= 200 K Ohm	Test enabled by calibration; and Battery voltage and Key ON and Engine is not cranking and Engine Running and FUL_OutEnblCyl_CiEPSR_CylinderG and At least one injection pulse is requested by the application software (FUL_FuelInjectedCyl_CiEPSR_CylinderG	== 1 [Boolean] > 11.00 [V] - - >= 1.00 [s] == 0 [Boolean] == TRUE);	5 failures out of 10 samples 100 ms/sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Injector 7 Open Circuit	P0207	This DTC checks the Injector 7 circuit for electrical integrity during operation.	Low current through the low side driver during operation indicates open circuit	Open circuit: circuit attached to the Controller external connections has an impedance >= 200 K Ohm	Test enabled by calibration; and Battery voltage and Key ON and Engine is not cranking and Engine Running and FUL_OutEnblCyl_CiEPSR_CylinderC and At least one injection pulse is requested by the application software (FUL_FuelInjectedCyl_CiEPSR_CylinderC	== 1 [Boolean] > 11.00 [V] - - >= 1.00 [s] == 0 [Boolean] == TRUE);	5 failures out of 10 samples 100 ms/sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Injector 8 Open Circuit	P0208	This DTC checks the Injector 8 circuit for electrical integrity during operation.	Low current through the low side driver during operation indicates open circuit	Open circuit: circuit attached to the Controller external connections has an impedance >= 200 K Ohm	Test enabled by calibration; and Battery voltage and Key ON and Engine is not cranking and Engine Running and FUL_OutEnblCyl_CiEPSR_CylinderD and At least one injection pulse is requested by the application software (FUL_FuelInjectedCyl_CiEPSR_CylinderD	== 1 [Boolean] > 11.00 [V] - - >= 1.00 [s] == 0 [Boolean] == TRUE);	5 failures out of 10 samples 100 ms/sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Cylinder 1 Injection Timing	P020A	This DTC detects an Injector fault or ECU fault that causes pull In period of the current pulse out of range on injector 1 The pull in period is the time for the injection current to rise to the current level (20.00 [A]) at the beginning of the pulse	Measurement of the Pull In period of the current pulse of the injector 1 provided by HWIO	< 0.00 [us] OR > 105.00 [us]	Test enabled by calibration; and Battery voltage and Key ON and No active DTC's: and At least one injection pulse is requested by the application software; (FUL_FuelInjectedCyl_CiEPSR_CylinderA and No information of dropped pulse reported by HWIO	== 1 [Boolean] > 11.00 [V] - FULJnjCktTFTKO FUL_CntrlrStTFTKO FUL_BoostVoltTFTKO == TRUE); -	38 failures out of 55 samples 1 sample every engine cycle Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Cylinder 2 Injection Timing	P020B	This DTC detects an Injector fault or ECU fault that causes pull In period of the current pulse out of range on injector 2 The pull in period is the time for the injection current to rise to the current level (20.00 [A]) at the beginning of the pulse	Measurement of the Pull In period of the current pulse of the injector 2 provided by HWIO	< 0.00 [us] OR > 105.00 [us]	Test enabled by calibration; and Battery voltage and Key ON and No active DTC's: and At least one injection pulse is requested by the application software; (FUL_FuelInjectedCyl_CiEPSR_CylinderB and No information of dropped pulse reported by HWIO	== 1 [Boolean] > 11.00 [V] - FULJnjCktTFTKO FUL_CntrlrStTFTKO FUL_BoostVoltTFTKO == TRUE); -	38 failures out of 55 samples 1 sample every engine cycle Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Cylinder 3 Injection Timing	P020C	This DTC detects an Injector fault or ECU fault that causes pull In period of the current pulse out of range on injector 3 The pull in period is the time for the injection current to rise to the current level (20.00 [A]) at the beginning of the pulse	Measurement of the Pull In period of the current pulse of the injector 3 provided by HWIO	< 0.00 [us] OR > 105.00 [us]	Test enabled by calibration; and Battery voltage and Key ON and No active DTC's: and At least one injection pulse is requested by the application software; (FUL_FuelInjectedCyl_CiE PSR_CylinderH and No information of dropped pulse reported by HWIO	== 1 [Boolean] > 11.00 [V] - FULJnjCktTFTKO FUL_CntrlrStTFTKO FUL_BoostVoltTFTKO == TRUE); -	38 failures out of 55 samples 1 sample every engine cycle Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Cylinder 4 Injection Timing	P020D	This DTC detects an Injector fault or ECU fault that causes pull In period of the current pulse out of range on injector 4 The pull in period is the time for the injection current to rise to the current level (20.00 [A]) at the beginning of the pulse	Measurement of the Pull In period of the current pulse of the injector 4 provided by HWIO	< 0.00 [us] OR > 105.00 [us]	Test enabled by calibration; and Battery voltage and Key ON and No active DTC's: and At least one injection pulse is requested by the application software; (FUL_FuelInjectedCyl_CiE PSR_CylinderE and No information of dropped pulse reported by HWIO	== 1 [Boolean] > 11.00 [V] - FULJnjCktTFTKO FUL_CntrlrStTFTKO FUL_BoostVoltTFTKO == TRUE); -	38 failures out of 55 samples 1 sample every engine cycle Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Cylinder 5 Injection Timing	P020E	This DTC detects an Injector fault or ECU fault that causes pull In period of the current pulse out of range on injector 5 The pull in period is the time for the injection current to rise to the current level (20.00 [A]) at the beginning of the pulse	Measurement of the Pull In period of the current pulse of the injector 5 provided by HWIO	< 0.00 [us] OR > 105.00 [us]	Test enabled by calibration; and Battery voltage and Key ON and No active DTC's: and At least one injection pulse is requested by the application software; (FUL_FuelInjectedCyl_CiE PSR_CylinderF and No information of dropped pulse reported by HWIO	== 1 [Boolean] > 11.00 [V] - FULJnjCktTFTKO FUL_CntrlrStTFTKO FUL_BoostVoltTFTKO == TRUE); -	38 failures out of 55 samples 1 sample every engine cycle Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Cylinder 6 Injection Timing	P020F	This DTC detects an Injector fault or ECU fault that causes pull In period of the current pulse out of range on injector 6 The pull in period is the time for the injection current to rise to the current level (20.00 [A]) at the beginning of the pulse	Measurement of the Pull In period of the current pulse of the injector 6 provided by HWIO	< 0.00 [us] OR > 105.00 [us]	Test enabled by calibration; and Battery voltage and Key ON and No active DTC's: and At least one injection pulse is requested by the application software; (FUL_FuelInjectedCyl_CiEPSR_CylinderG and No information of dropped pulse reported by HWIO	== 1 [Boolean] > 11.00 [V] - FULJnjCktTFTKO FUL_CntrlrStTFTKO FUL_BoostVoltTFTKO == TRUE); -	38 failures out of 55 samples 1 sample every engine cycle Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.

Injection Timing Control Circuit	P0216	This DTC detects an ECU internal fault, by comparing the cumulative injection pulse width provided by HWIO and the cumulative injection pulse width calculated by Application SW.
		A calibration is used to define the pulses that have to be taken into account to calculate the cumulative injection pulse width, both by HWIO and by application SW.
		Two different thresholds are defined for detecting the fault.
		The high threshold depends on the number of injection pulses active, i.e. the injection pulses driven and monitored.
			The cumulative injection pulse width (both HWIO and Application SW) is calculated by considering only the pulses to be monitored, defined in the calibration **P0216_ET_CumulEnbl**
			
			if (Cumulative injection pulse width read by HWIO > Cumulative injection pulse width calculated by Application SW)
			{
			|Cumulative injection pulse width read by HWIO-
			Cumulative injection pulse width calculated by Application SW|
			}
			else
			{
			|Cumulative injection pulse width read by HWIO-
			Cumulative injection pulse width calculated by Application SW|
			}
			
			OR
			information of dropped pulse reported by HWIO
			
			Cumulative injection pulse width calculated bv
				> **P0216_PulsWidthErrHi** [us] depending on the number of injection pulses active
				
				> 80.00 [us]
					Test enabled by calibration;
					
					and
					Battery voltage
					
					and
					Key ON
					
					and
					No active DTC's:
					
					and
					At least one Injection Pulse is requested by the application software (FUL_FuelInjected
					
					and
						== 1.00 [Boolean]
						
						> 11.00 [V]
						
						-
						
						FULJnjCktTFTKO
						FUL_CntrlrStTFTKO
						FUL_BoostVoltTFTKO
						FUL_PullInErrTFTKO
						
						== TRUE);
							12 failures out of 24 samples
							
							or
							
							255 consecutive failures
							
							1 sample every cylinder firing
							
							Continuous
								Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			Application SW is equal to the sum of the programmed pulses width and the end of injection period measurement provided by HWIO.					

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Cylinder 7 Injection Timing	P021A	This DTC detects an Injector fault or ECU fault that causes pull In period of the current pulse out of range on injector 7 The pull in period is the time for the injection current to rise to the current level (20.00 [A]) at the beginning of the pulse	Measurement of the Pull In period of the current pulse of the injector 7 provided by HWIO	< 0.00 [us] OR > 105.00 [us]	Test enabled by calibration; and Battery voltage and Key ON and No active DTC's: and At least one injection pulse is requested by the application software; (FUL_FuelInjectedCyl_CiE PSR_CylinderC and No information of dropped pulse reported by HWIO	== 1 [Boolean] > 11.00 [V] - FULJnjCktTFTKO FUL_CntrlrStTFTKO FUL_BoostVoltTFTKO == TRUE); -	38 failures out of 55 samples 1 sample every engine cycle Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Cylinder 8 Injection Timing	P021B	This DTC detects an Injector fault or ECU fault that causes pull In period of the current pulse out of range on injector 8 The pull in period is the time for the injection current to rise to the current level (20.00 [A]) at the beginning of the pulse	Measurement of the Pull In period of the current pulse of the injector 8 provided by HWIO	< 0.00 [us] OR > 105.00 [us]	Test enabled by calibration; and Battery voltage and Key ON and No active DTC's: and At least one injection pulse is requested by the application software; (FUL_FuelInjectedCyl_CiEPSR_CylinderD and No information of dropped pulse reported by HWIO	== 1 [Boolean] > 11.00 [V] - FULJnjCktTFTKO FUL_CntrlrStTFTKO FUL_BoostVoltTFTKO == TRUE); -	38 failures out of 55 samples 1 sample every engine cycle Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Turbocharger/ Supercharger "A" Overboost Condition	P0234	This monitor detects failures in the charging air system such to not fulfill the request of boost pressure in the intake manifold. It works only in steady state closed loop pressure control zone. The DTC checks a permanent negative control deviation of the boost pressure indicating an overboost condition. This monitor is used to detect any malfunction in the boost pressure system causing the vehicle's emissions to exceed the limits. The aim of the overboost pressure monitor is to detect obstructions in the exhaust pipe. The boost pressure is usually controlled by the VGT vanes. The intake manifold pressure is also affected by the throttle valve and the HP EGR valve position changes. The aim of this procedure is to identify a limitation of the VGT vanes (equal to an obstruction) that leads to exceed the emission limits.	Boost pressure tracking error(difference between the desired boost pressure and the measured pressure at intake manifold by MAP sensor) lower than a threshold. If throttle control is active: The setpoint used for closed loop control is the conversion of the desired upstream throttle boost pressure (target) in desired intake boost pressure. The conversion of the setpoint is done calculating the pressure drop over the throttle valve that is strictly dependent on the valve position. If throttle control is NOT active: The setpoint used for closed loop control is the intake manifold pressure: in this situation the diagnostic monitors the boost pressure closed loop control tracking error.	If throttle control is active (Refer to "Other AICR DSL flags" Free Form): < (**P0234: Negative boost deviation threshold (throttle control active)** [kPa] X **P0234, P2263: Overboost barometric correction**) If throttle control is NOT active (Refer to "Other AICR DSL flags" Free Form): < (**P0234: Negative boost deviation threshold (throttle control not active)** [kPa] X **P0234, P2263: Overboost barometric correction**)	Calibration on diagnostic enabling Engine Running Cranking ignition in range PT Relay voltage in range Difficult launch NOT detected Boost Pressure Control Closed Loop active No active transition from a combustion mode to another one Outside Air Temperature in range Desired Boost Pressure steady state: BstDes-BstDes_Old	P0234, P0299: Boost pressure control deviation enabling==TRUE (see FreeFrorm) ==TRUE Battery voltage > 11.00 [V] Powertrain relay voltage > 11.00 [V] Refer to "LDT_DifficultLaunchActive" Free Form Refer to "Boost Control in Closed Loop" Free Form ==TRUE >-6.70 [°C] AND <55.00 [°C] >-5 [kPa/s] AND <4 [kPa/s]	400 fail counters over 500 sample counters sampling time is 25ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Engine speed in range	>700.00 [rpm] AND <3,000.00 [rpm]		
					Desired intake Boost pressure in range	> **P0234: Minimum boost pressure for overboost monitor enabling** [kPa] AND < **P0234: Maximum boost pressure for overboost monitor enabling** [kPa]		
					(Engine Coolant Temperature OR OBD Coolant Enable Criteria), AND Engine Coolant Temperature	>70 [°C] ==TRUE <130 [°C]		
					Ambient Air Pressure in range	>75 [kPa] AND <110 [kPa]		
					Throttle Valve position	>=85.00 [%] if throttle control is active (Refer to "Other AICR DSL flags" Free Form) >= 75.00 [%] if throttle control is NOT active (Refer to "Other AICR		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					No active DTCs All enabling conditions last for a time	DSL flags" Free Form) AIC_BstSysDiagDenomDsbl ==FALSE > **P0234: Overboost monitor delay timer** [s]		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Injector 1 Control Circuit Low Voltage	P0261	This DTC detects a short circuit to ground of the low side driver circuit of Injector 1.	Voltage low across low side drive during off state indicates short-to-ground	Short to ground: impedence between LS pin and controller ground <= 0.5 [Ohm]	Test enabled by calibration; and Battery voltage and Key ON and Engine is not cranking and Engine Running and FUL_OutEnblCyl_CiEPSR_CylinderA and At least one injection pulse is requested by the application software (FUL_FuelInjectedCyl_CiEPSR_CylinderA	== 1 [Boolean] > 11.00 [V] - - >= 1.00 [s] == 0 [Boolean] ==TRUE);	5 failures out of 10 samples 100 ms/sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Injector 1 Control Circuit High Voltage	P0262	This DTC detects a short circuit to power supply of the low side driver circuit of Injector 1.	Voltage high across low side driver during On state indicates short to power	Short to power: impedence between LS pin and controller power <= 0.5 [Ohm]	Test enabled by calibration;	== 1 [Boolean]	5 failures out of 10 samples 100 ms/sample Continuous	Type A, 1 Trips
					and Battery voltage	> 11.00 [V]		
					and Key ON	-		
					and Engine is not cranking	-		
					and Engine Running	>= 1.00 [s]		
					and FUL_OutEnblCyl_CiEPSR_CylinderA	== 0 [Boolean]		
					and At least one injection pulse is requested by the application software (FUL_FuelInjectedCyl_CiEPSR_CylinderA	==TRUE);		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Injector 2 Control Circuit Low Voltage	P0264	This DTC detects a short circuit to ground of the low side driver circuit of Injector 2.	Voltage low across low side drive during off state indicates short-to-ground	Short to ground: impedence between LS pin and controller ground <= 0.5 [Ohm]	Test enabled by calibration; and Battery voltage and Key ON and Engine is not cranking and Engine Running and FUL_OutEnblCyl_CiEPSR_CylinderB and At least one injection pulse is requested by the application software (FUL_FuelInjectedCyl_CiEPSR_CylinderB	== 1 [Boolean] > 11.00 [V] - - >= 1.00 [s] == 0 [Boolean] ==TRUE);	5 failures out of 10 samples 100 ms/sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Injector 2 Control Circuit High Voltage	P0265	This DTC detects a short circuit to power supply of the low side driver circuit of Injector 2.	Voltage high across low side driver during On state indicates short to power	Short to power: impedence between LS pin and controller power <= 0.5 [Ohm]	Test enabled by calibration; and Battery voltage and Key ON and Engine is not cranking and Engine Running and FUL_OutEnblCyl_CiEPSR_CylinderB and At least one injection pulse is requested by the application software (FUL_FuelInjectedCyl_CiEPSR_CylinderB	== 1 [Boolean] > 11.00 [V] - - >= 1.00 [s] == 0 [Boolean] ==TRUE);	5 failures out of 10 samples 100 ms/sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Injector 3 Control Circuit Low Voltage	P0267	This DTC detects a short circuit to ground of the low side driver circuit of Injector 3.	Voltage low across low side drive during off state indicates short-to-ground	Short to ground: impedence between LS pin and controller ground <= 0.5 [Ohm]	Test enabled by calibration; and Battery voltage and Key ON and Engine is not cranking and Engine Running and FUL_OutEnblCyl_CiEPSR_CylinderH and At least one injection pulse is requested by the application software (FUL_FuelInjectedCyl_CiEPSR_CylinderH	== 1 [Boolean] > 11.00 [V] - - >= 1.00 [s] == 0 [Boolean] ==TRUE);	5 failures out of 10 samples 100 ms/sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Injector 3 Control Circuit High Voltage	P0268	This DTC detects a short circuit to power supply of the low side driver circuit of Injector 3.	Voltage high across low side driver during On state indicates short to power	Short to power: impedence between LS pin and controller power <= 0.5 [Ohm]	Test enabled by calibration; and Battery voltage and Key ON and Engine is not cranking and Engine Running and FUL_OutEnblCyl_CiEPSRCylinderH and At least one injection pulse is requested by the application software (FUL_FuelInjectedCyl_CiEPSR_CylinderH	== 1 [Boolean] > 11.00 [V] - - >= 1.00 [s] == 0 [Boolean] ==TRUE);	5 failures out of 10 samples 100 ms/sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Injection Timing Performance	P026B	This DTC detects an injection timing only fault by comparison of the requested Start Of Injection by Application SW and the scheduled SOI by HWIO SW.	Comparison of the requested Start Of Injection by Application SW and the scheduled SOI by HWIO SW for all cylinders.	< -4.00 OR > 4.00	Test enabled by calibration AND Engine Speed in range AND At least one injection pulse is commanded by Application SW on all cylinders in the previous engine cycle FUL_FuelInjectedCyl_CiEPSR_CylinderA FUL_FuelInjectedCyl_CiEPSR_CylinderB FUL_FuelInjectedCyl_CiEPSR_CylinderC FUL_FuelInjectedCyl_CiEPSR_CylinderD FUL_FuelInjectedCyl_CiEPSR_CylinderE FUL_FuelInjectedCyl_CiEPSR_CylinderF FUL_FuelInjectedCyl_CiEPSR_CylinderG FUL_FuelInjectedCyl_CiEPSR_CylinderH AND At least one injection pulse is commanded by HWIO OR at least one post injection is commanded by Application SW, on all cylinders in the previous engine cycle	== 1.00 > 400 [rpm] AND < 3,000.00 == TRUE; - -	280.00 failures out of 400.00 samples 1 sample every engine revolution	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					AND No information of dropped pulse reported by HWIO AND No electrical fault on injectors are present AND No Injection Controller Fault AND No faults on crankshaft sensor for the entire driving cycle. AND Cold Start Strategy not Enabled	FUL_FuelInjCkt_FA FUL_CntrlrStFA CrankSensor_FA AND CrankSensor_TFTKO		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Injector 4 Control Circuit Low Voltage	P0270	This DTC detects a short circuit to ground of the low side driver circuit of Injector 4.	Voltage low across low side drive during off state indicates short-to-ground	Short to ground: impedence between LS pin and controller ground <= 0.5 [Ohm]	Test enabled by calibration;	== 1 [Boolean]	5 failures out of 10 samples 100 ms/sample Continuous	Type A, 1 Trips
					and Battery voltage	> 11.00 [V]		
					and Key ON	-		
					and Engine is not cranking	-		
					and Engine Running	>= 1.00 [s]		
					and FUL_OutEnblCyl_CiEPSR_CylinderE	== 0 [Boolean]		
					and At least one injection pulse is requested by the application software (FUL_FuelInjectedCyl_CiEPSR_CylinderE	==TRUE);		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Injector 4 Control Circuit High Voltage	P0271	This DTC detects a short circuit to power supply of the low side driver circuit of Injector 4.	Voltage high across low side driver during On state indicates short to power	Short to power: impedence between LS pin and controller power <= 0.5 [Ohm]	Test enabled by calibration; and Battery voltage and Key ON and Engine is not cranking and Engine Running and FUL_OutEnblCyl_CiEPSR_CylinderE and At least one injection pulse is requested by the application software (FUL_FuelInjectedCyl_CiEPSR_CylinderE	== 1 [Boolean] > 11.00 [V] - - >= 1.00 [s] == 0 [Boolean] ==TRUE);	5 failures out of 10 samples 100 ms/sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Injector 5 Control Circuit Low Voltage	P0273	This DTC detects a short circuit to ground of the low side driver circuit of Injector 5.	Voltage low across low side drive during off state indicates short-to-ground	Short to ground: impedence between LS pin and controller ground <= 0.5 [Ohm]	Test enabled by calibration; and Battery voltage and Key ON and Engine is not cranking and Engine Running and FUL_OutEnblCyl_CiEPSR_CylinderF and At least one injection pulse is requested by the application software (FUL_FuelInjectedCyl_CiEPSR_CylinderF	== 1 [Boolean] > 11.00 [V] - - >= 1.00 [s] == 0 [Boolean] ==TRUE);	5 failures out of 10 samples 100 ms/sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Injector 5 Control Circuit High Voltage	P0274	This DTC detects a short circuit to power supply of the low side driver circuit of Injector 5.	Voltage high across low side driver during On state indicates short to power	Short to power: impedence between LS pin and controller power <= 0.5 [Ohm]	Test enabled by calibration; and Battery voltage and Key ON and Engine is not cranking and Engine Running and FUL_OutEnblCyl_CiEPSR_CylinderF and At least one injection pulse is requested by the application software (FUL_FuelInjectedCyl_CiEPSR_CylinderF	== 1 [Boolean] > 11.00 [V] - - >= 1.00 [s] == 0 [Boolean] ==TRUE);	5 failures out of 10 samples 100 ms/sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Injector 6 Control Circuit Low Voltage	P0276	This DTC detects a short circuit to ground of the low side driver circuit of Injector 6.	Voltage low across low side drive during off state indicates short-to-ground	Short to ground: impedence between LS pin and controller ground <= 0.5 [Ohm]	Test enabled by calibration; and Battery voltage and Key ON and Engine is not cranking and Engine Running and FUL_OutEnblCyl_CiEPSR_CylinderG and At least one injection pulse is requested by the application software (FUL_FuelInjectedCyl_CiEPSR_CylinderG	== 1 [Boolean] > 11.00 [V] - - >= 1.00 [s] == 0 [Boolean] ==TRUE);	5 failures out of 10 samples 100 ms/sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Injector 6 Control Circuit High Voltage	P0277	This DTC detects a short circuit to power supply of the low side driver circuit of Injector 6.	Voltage high across low side driver during On state indicates short to power	Short to power: impedence between LS pin and controller power <= 0.5 [Ohm]	Test enabled by calibration; and Battery voltage and Key ON and Engine is not cranking and Engine Running and FUL_OutEnblCyl_CiEPSR_CylinderG and At least one injection pulse is requested by the application software (FUL_FuelInjectedCyl_CiEPSR_CylinderG	== 1 [Boolean] > 11.00 [V] - - >= 1.00 [s] == 0 [Boolean] ==TRUE);	5 failures out of 10 samples 100 ms/sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Injector 7 Control Circuit Low Voltage	P0279	This DTC detects a short circuit to ground of the low side driver circuit of Injector 7.	Voltage low across low side drive during off state indicates short-to-ground	Short to ground: impedence between LS pin and controller ground <= 0.5 [Ohm]	Test enabled by calibration; and Battery voltage and Key ON and Engine is not cranking and Engine Running and FUL_OutEnblCyl_CiEPSR_CylinderC and At least one injection pulse is requested by the application software (FUL_FuelInjectedCyl_CiEPSR_CylinderC	== 1 [Boolean] > 11.00 [V] - - >= 1.00 [s] == 0 [Boolean] == TRUE);	5 failures out of 10 samples 100 ms/sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Injector 7 Control Circuit High Voltage	P0280	This DTC detects a short circuit to power supply of the low side driver circuit of Injector 7.	Voltage high across low side driver during On state indicates short to power	Short to power: impedence between LS pin and controller power <= 0.5 [Ohm]	Test enabled by calibration; and Battery voltage and Key ON and Engine is not cranking and Engine Running and FUL_OutEnblCyl_CiEPSR_CylinderC and At least one injection pulse is requested by the application software (FUL_FuelInjectedCyl_CiEPSR_CylinderC	== 1 [Boolean] > 11.00 [V] - - >= 1.00 [s] == 0 [Boolean] ==TRUE);	5 failures out of 10 samples 100 ms/sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Injector 8 Control Circuit Low Voltage	P0282	This DTC detects a short circuit to ground of the low side driver circuit of Injector 8.	Voltage low across low side drive during off state indicates short-to-ground	Short to ground: impedence between LS pin and controller ground <= 0.5 [Ohm]	Test enabled by calibration;	== 1 [Boolean]	5 failures out of 10 samples 100 ms/sample Continuous	Type A, 1 Trips
					and Battery voltage	> 11.00 [V]		
					and Key ON	-		
					and Engine is not cranking	-		
					and Engine Running	>= 1.00 [s]		
					and FUL_OutEnblCyl_CiEPSR_CylinderD	== 0 [Boolean]		
					and At least one injection pulse is requested by the application software (FUL_FuelInjectedCyl_CiEPSR_CylinderD	==TRUE);		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Injector 8 Control Circuit High Voltage	P0283	This DTC detects a short circuit to power supply of the low side driver circuit of Injector 8.	Voltage high across low side driver during On state indicates short to power	Short to power: impedence between LS pin and controller power <= 0.5 [Ohm]	Test enabled by calibration; and Battery voltage and Key ON and Engine is not cranking and Engine Running and FUL_OutEnblCyl_CiEPSR_CylinderD and At least one injection pulse is requested by the application software (FUL_FuelInjectedCyl_CiEPSR_CylinderD	== 1 [Boolean] > 11.00 [V] - - >= 1.00 [s] == 0 [Boolean] ==TRUE);	5 failures out of 10 samples 100 ms/sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Turbocharger/ Supercharger "A" Underboost Condition	P0299	This monitor detects failures in the charging air system such to not fulfill the request of boost pressure in the intake manifold. It works only in steady state closed loop pressure control zone. The DTC checks a permanent positive control deviation of the boost pressure indicating an underboost condition. This monitor is used to detect any malfunction in the boost pressure system causing the vehicle's emissions to exceed the limits. The aim of the underboost pressure monitor is to detect leakages in the pipe after the compressor or in the intake/exhaust manifold. The boost pressure is usually controlled by the VGT vanes. The intake manifold pressure is also affected by the throttle valve and the HP EGR valve position changes. The aim of this procedure is to identify a limitation of the VGT vanes (equal to a leakage) that leads to exceed the emission	Boost pressure tracking error(difference between the desired boost pressure and the measured pressure at intake manifold by MAP sensor) higher than a threshold. If throttle control is active: The setpoint used for closed loop control is the conversion of the desired upstream throttle boost pressure (target) in desired intake boost pressure. The conversion of the setpoint is done calculating the pressure drop over the throttle valve that is strictly dependent on the valve position. If throttle control is NOT active: The setpoint used for closed loop control is the intake manifold pressure: in this situation the diagnostic monitors the boost pressure closed loop control tracking error.	If throttle control is active (Refer to "Other AICR DSL flags" Free Form): > (**P0299: Positive boost deviation threshold (throttle control active)** [kPa] X **P0299, P2263: Underboost barometric correction**) If throttle control is NOT active (Refer to "Other AICR DSL flags" Free Form): > (**P0299: Positive boost deviation threshold (throttle control not active)** [kPa] X **P0299, P2263: Underboost barometric correction**)	Calibration on diagnostic enabling Engine Running Cranking ignition in range PT Relay voltage in range Difficult launch NOT detected Boost Pressure Control Closed Loop active No active transition from a combustion mode to another one Outside Air Temperature in range Desired Boost Pressure steady state: BstDes-BstDes_Old	P0234, P0299: Boost pressure control deviation enabling==TRUE (see FreeFrorm) ==TRUE Battery voltage > 11.00 [V] Powertrain relay voltage > 11.00 [V] Refer to "LDT_DifficultLaunchActive" Free Form Refer to "Boost Control in Closed Loop" Free Form ==TRUE >-6.70 [°C] AND <55.00 [°C] >-5 [kPa/s] AND <4 [kPa/s]	400.00 fail counters over 500.00 sample counters sampling time is 25ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		limits.			Engine speed in range	> 700.00 [rpm] AND < 3,000.00 [rpm]		
					Desired intake Boost pressure in range	> **P0299: Minimum boost pressure for underboost monitor enabling** [kPa] AND < **P0299: Maximum boost pressure for underboost monitor enabling** [kPa]		
					(Engine Coolant Temperature OR OBD Coolant Enable Criteria), AND Engine Coolant Temperature	>70 [°C] ==TRUE <130 [°C]		
					Ambient Air Pressure in range	>75 [kPa] AND <110 [kPa]		
					Throttle Valve position	>= 85.00 [%] if throttle control is active (Refer to "Other AICR DSL flags" Free Form) >= 75.00 [%] if throttle control is NOT active (Refer to "Other AICR		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					No active DTCs All enabling conditions last for a time	DSL flags" Free Form) AIC_BstSysDiagDenomDsbl ==FALSE > **P0299: Underboost monitor delay timer** [s]		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Random Misfire Detected Cylinder 1 Misfire Detected Cylinder 2 Misfire Detected Cylinder 3 Misfire Detected Cylinder 4 Misfire Detected Cylinder 5 Misfire Detected Cylinder 6 Misfire Detected Cylinder 7 Misfire Detected Cylinder 8 Misfire Detected	P0300 P0301 P0302 P0303 P0304 P0305 P0306 P0307 P0308	These DTC's will determine if a random or a cylinder specific misfire is occurring by monitoring various terms derived from crankshaft velocity. The rate of misfire over an interval is compared to both emissions and catalyst damaging thresholds. The pattern of crankshaft acceleration after the misfire is checked to differentiate between real misfire and other sources of crank shaft noise. Emissions Neutral Default Action: If consumed Emissions Neutral Default DTCs from other subsystems are set: Ignore Rough Road, Traction, Stability, and Antilock brake signals. If default action not activated, Misfire Monitor could complete less frequently or inaccurately. Default Action Latched for duration of Trip Default Action: If Misfire P030x sets on some hybrid applications, the isolation clamper	Crankshaft Deceleration Value(s) vs. Engine Speed and Engine load The equation used to calculate deceleration value is tailored to specific vehicle operating conditions. The selection of the equation used is based on the 1st single cylinder continuous misfire threshold tables encountered that are not max of range. If all tables are max of range at a given speed/load, that speed load region is an ***Undetectable region*** see Algorithm Description Document for additional details. SINGLE CYLINDER CONTINUOUS MISFIRE((Medres_Decel Medres_Jerk OR (Medres_Decel Medres_Jerk OR (Lores_Decel Lores_Jerk OR (LoresJDecel Lores_Jerk OR RevBalanceTime)	 - see details of thresholds on Supporting Tables Tab > **RufSCD_Decel** AND > **RufSCD Jerk)** **>SCD_Decel** AND **> SCD_Jerk)** **> RufCyl_Decel** AND **> RufCyl_Jerk)** **> CylModeDecel** AND **> CylModeJerk)** **>RevMode_Decel**	Engine Run Time Engine Coolant Temp Or If ECT at startup Then System Voltage + Throttle delta - Throttle delta Early Termination option: (used on plug ins that may not have enough engine run time at end of trip for normal interval to complete.)	> 2 crankshaft revolution "ECT" If OBD Max Coolant Achieved = FALSE -7 °C < ECT Or if OBD Max Coolant Achieved = TRUE -7 °C < ECT < 131 °C < -9 °C If OBD Max Coolant Achieved = FALSE 21 °C < ECT If OBD Max Coolant Achieved = TRUE 21 °C < ECT < 131 °C 9.00 < volts < 32.00 < 100.00 % per 25 ms < 100.00 % per 25 ms Not Enabled	Emission Exceedence = any (5) failed 200 rev blocks out of (16) 200 rev block tests Failure reported for (4) Exceedence in 1st (16) 200 rev block tests, or (4) Exceedences thereafter. OR when Early Termination Reporting = Enabled and engine rev > 1,000 revs and < 3,200 revs at end of trip	Type B, 2 Trips (Mil Flashes with Catalyst damage level of Misfire)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		between engine and transmission can go into extreme resonance. Default action is to move rpm out of the resonance zone. If default action not activated, significant hardware damage could occur rendering vehicle inoperable.	****************************** **This Feature only used on Diesel engines** Combustion Modes that force selection of Idle Tables ****************************** Other patterns of misfire use adjustments to the single cylinder continuous misfire threshold tables: RANDOM MISFIRE Use random misfire thresholds If no misfire for (Medres_Decel AND Medres_Jerk) OR (Medres_Decel AND Medres_Jerk) OR (Lores_Decel AND Lores_Jerk)	************************* **This Feature only used on Diesel engines** **CombustModeIdleTbl** in Supporting Tables ************************* > 3 Engine Cycles **> RufSCD_Decel * Random_SCD_Decel** **>RufSCD_Jerk * Random_SCD_Jerk** **> SCD_Decel * Random_SCD_Decel** **>SCD_Jerk * Random_SCD_Jerk** **> RufCyl_Decel * RandomCylModDecel** **> RufCyl_Jerk * RandomCylModJerk**			any Catalyst Exceedence = (1) 200 rev block as data supports for catalyst damage. Catalyst Failure reported with (1 or 3) Exceedences in FTP, or (1) Exceedence outside FTP. Continuous	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			OR (Lores_Decel AND Lores_Jerk)	**> CylModeDecel * RandomCylModDecel** **> CylModeJerk * RandomCylModJerk**				
			OR RevBalanceTime	**> RevMode_Decel * RandomRevModDecl**				
			PAIRED CYLINDER MISFIRE If a cylinder & it's pair are above PAIR thresholds (Medres_Decel AND Medres_Jerk)	**> RufSCD_Decel * Pair_SCD_Decel** **> RufSCD_Jerk * Pair_SCD_Jerk**				
			OR (MedresJDecel AND Medres_Jerk)	**> SCD_Decel * Pair_SCD_Decel** **>SCD_Jerk * Pair_SCD_Jerk**				
			OR (Lores_Decel AND Lores_Jerk)	**> RufCyl_Decel * PairCylModeDecel** **> RufCyl_Jerk * PairCylModeJerk**				
			OR (LoresJDecel AND Lores_Jerk)	**> CylModeDecel * PairCylModeDecel** **> CylModeJerk * PairCylModeJerk**				

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			OR (Revmode Active AND (within one engine cycle: 2nd largest LoresJDecel) AND Above TRUE for))	**> CylModeDecel * PairCylModeDecel** > 35 engine cycles out of 100 engine cycles				
			BANK MISFIRE Cylinders above Bank Thresholds	>= 2 cylinders				
			(Medres_Decel AND Medres_Jerk)	**> RufSCDJDecel * Bank_SCD_Decel** **> RufSCD_Jerk * Bank_SCD_Jerk**				
			OR (Medres_Decel AND Medres_Jerk)	**> SCD_Decel * Bank_SCD_Decel** **> SCD_Jerk * Bank_SCD_Jerk**				
			OR (Lores_Decel AND Lores_Jerk)	**> RufCyl_Decel * BankCylModeDecel** **> RufCyl_Jerk * BankCylModeJerk**				
			OR (LoresJDecel AND Lores_Jerk)	**> CylModeDecel * BankCylModeDecel** **> CylModeJerk * BankCylModeJerk**				

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			CONSECUTIVE CYLINDER MISFIRE 1st cylinder uses single cyl continuous misfire thresholds; 2nd Cylinder uses: (Medres_Decel AND Medres_Jerk)	 **> RufSCD_Decel * ConsecSCD_Decel** **> RufSCD_Jerk * ConsecSCD_Jerk**				
			OR (Medres_Decel AND Medres_Jerk)	**> SCD_Decel * ConsecSCD_Decel** **>SCD_Jerk * ConsecSCD_Jerk**				
			OR (Lores_Decel AND Lores_Jerk)	**> RufCyl_Decel * ConsecCylModDecel** **> RufCyl_Jerk * ConsecCylModeJerk**				
			OR (Lores_Decel AND Lores_Jerk)	**> CylModeDecel * ConsecCylModDecel** **> CylModeJerk * ConsecCylModeJerk**				
			CYLINDER DEACTIVATION MODE (Active Fuel Manaament)					

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			AFM: SINGLE CYLINDER CONTINUOUS MISFIRE (CylAfterDeacCyl_Decel	**> CylModeDecel * ClyAfterAFM_Decel**				
			AND CylAfterDeacCyl_Jerk)	**> CylModeJerk * CylAfterAFM_Jerk**				
			OR (CylBeforeDeacCylDecel	**> CylModeDecel * CylBeforeAFM_Decel**				
			AND CylBeforeDeacCyl_Jerk)	**> CylModeJerk * ClyBeforeAFM_Jerk**				
			AFM: RANDOM MISFIRE Use random misfire thresholds If no misfire for	> 3 Engine Cycles				
			(CylAfterDeacCyl_Decel	**> CylModeDecel * ClyAfterAFM_Decel * RandomAFM_Decl**				
			AND CylAfterDeacCyl_Jerk)	**> CylModeJerk * CylAfterAFM_Jerk * RandomAFM_Jerk**				
			(CylBeforeDeacCylDecel AND CylBeforeDeacCyl_Jerk)	**> CylModeDecel * CylBeforeAFM_Decel * RandomAFM_Decl** **> CylModeJerk * ClyBeforeAFM_Jerk * RandomAFM_Jerk**				
				- see details on SuoDortino Tables Tab				

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			Misfire Percent Emission Failure Threshold	>3.88% P0300				
			Misfire Percent Catalyst Damage	> **Catalyst_Damage_Misfire_Percentage** in Supporting Tables whenever secondary conditions are met.				
			When engine speed and load are less than the FTP cals (3) catalyst damage exceedences are allowed.	< 0 FTP rpm AND < 0 FTP % load	(at low speed/loads, one cylinder may not cause cat damage) Engine Speed Engine Load Misfire counts	> 8,191 rpm AND > 199 % load AND < 180 counts on one cylinder		
					Engine Speed	510 < rpm < ((Engine Over Speed Limit) - 250) OR 3,200) Engine speed limit is a function of inputs like Gear and temoerature	4 cycle delay	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
						see **EngineOverSpeedLimit** in supporting tables		
					No active DTCs:	TPS_FA EnginePowerLimited MAF_SensorTFTKO MAP_SensorTFTKO IAT_SensorTFTKO ECT_Sensor_Ckt_TFTKO 5VoltReferenceB_FA CrankSensor_TFTKO CrankSensor_FA CamLctnIntFA CamLctnExhFA CamSensorAnyLctnTFTK 0 AnyCamPhaser_FA AnyCamPhaser_TFTKO AmbPresDfltdStatus	4 cycle delay	
					P0315 & engine speed	> 1,000 rpm	4 cycle delay	
					Fuel Level Low	LowFuelConditionDiagnos tic	500 cycle delay	
					Cam and Crank Sensors	in sync with each other	4 cycle delay	
					Misfire requests TCC unlock	Not honored because Transmission in hot mode or POPD intrusive diagnostic running	4 cycle delay	
					Fuel System Status	# Fuel Cut	4 cycle delay	
					Active FuelManagement	Transition in progress	0 cycle delay	
					Undetectable enaine	***Undetectable recrion***	4 cvcle delav	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					speed and engine load region	from Malfunction Criteria		
					Abusive Engine Over Speed	> 8,192 rpm	0 cycle delay	
					Below zero torque (except CARB approved 3000 rpm to redline triangle.)	**< ZeroTorqueEngLoad** or **<ZeroTorqueAFM** if AFM is active in Supporting Tables	4 cycle delay	
					Below zero torque: TPS Vehicle Speed	< 100.0% (< 100.0% in AFM) >318mph (>318mph AFM)	4 cycle delay	
					NEGATIVE TORQ AFM If deactivated cylinders appear to make power, torque is negative: DeactivatedCyl_Decel AND DeactivatedCyl_Jerk AND # of Deact Cyls Inverted	 **<DeacCylInversionDecel** **<DeacCylInversionJerk** > 4 cylinders	0 cycle delay	
					EGR Intrusive test	if Active	0 cycle delay	
					Manual Trans	Clutch shift	4 cycle delay	
					Accel Pedal Position AND Automatic transmission shift	> 97.00 %	4 cycle delay	
					After Fuel resumes on Automatic shift containing Fuel Cut		2 Cylinder delay	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Delay if PTO engaged	Enabled	4 cycle delay	
					******************************	******************************	*******************	
					This Feature only used on Diesel engines			
					Combustion Mode	**= InfrequentRegen** value in Supporting Tables	4 cycle delay	
					Driver cranks before Wait to Start lamp extinguishes	IF TRUE	**WaitToStart** cycle delay	
					Brake Torque	> 199.99 % Max Torque	4 cycle delay	
					******************************	******************************	*******************	
					DRIVELINE RING FILTER After a low level misfire, another misfire may not be detectable until driveline ringing ceases. If no ringing seen, stop filter early.			
					Filter Driveline ring:	**> "Ring Filter"** # of engine cycles after misfire in Supporting Tables		
					Stop filter early:	**> "Number of Normals"** # of engine cycles after misfire in Supporting Tables tab		
					ABNORMAL ENGINE SPEED OSCILLATION: (checks each "misfire" candidate in 100 engine			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Cycle test to see if it looks like some disturbance like rough road (abnormal).) Used Off Idle, and while not shifting, TPS Engine Speed Veh Speed Auto Transmission indivdual candidate deemed abnormal if number of consecutive decelerating cylinders after "misfire": (Number of decels can vary with misfire detection equation) Consecutive decels while in SCD Mode Cyl Mode Rev Mode At the end of 100 engine cycle test, the ratio of abnormal/candidate is checked to confirm if real misfire is present within the 100 engine cycles. abnormal candidates/ total candidates MISFIRE CRANKSHAFT	> 199 % > 1,000 rpm > 3 mph not shifting **> Abnormal SCD Mode** **> Abnormal Cyl Mode** **> Abnormal Rev Mode** in Supporting Tables >0.50 ratio	discard 100 engine cycle test	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					PATTERN RECOGNITION checks each "misfire" candidate in 100 engine Cycle test to see if overall crankshaft pattern looks like real misfire (recognized), or some disturbance like rough road (unrecognized). At the end of 100 engine cycle test, the ratio of unrecog/recognized is checked to confirm if real misfire is present within the 100 engine cycles. Typically used for checking a single misfire per engine cycle but can support some other patterns on some packages			
					Pattern Recog Enabled:	Enabled		
					Pattern Recog Enabled during Cylinder Deac	Not Enabled		
					Pattern Recog Enabled consecutive cyl pattrn	Enabled		
					Engine Speed	580 < rpm < 6,800		
					Veh Speed	> 0.0 mph		
					The 1st check for "recognized" is the 1st fired cylinder after the misfire candidate should both accelerate and jerk an amount based acceleration and jerk of Sinole Cylinder Misfire			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					thresholds in effect at that speed and load. (CylAfter_Accel AND CylAfter_Jerk)	> Misfire_ decel * **1st_FireAftrMisfr_Acel** > Misfire_Jerk * **1st_FireAftrMisfr_Jerk** Or if AFM mode is active: > Misfire_ decel * **IstFireAftrMisAcelAFM** > Misfire_Jerk * **1stFireAfterMisJerkAFM**		
					Addtionally, the crankhaft is checked again a small calibratible number of cylinders later to see if the distrubance is still large like rough road, or has calmed down like real misfire. The size of disturbance is compared to a multiplier times the ddtjerk value used to detect misfire at that speed and load. If there is repetitive misfire on consecutive engine cycles, the expected snap is adjusted due to the higher expected disturbance.			
					Num of Cylinders after misfire to start check of crankshaft snap	3 Cylinders		
					"misfire" recognized if: Crankshaft snap after: isolated "misfire"	< Misfire_Jerk *		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					repetative "misfire" At the end of 100 engine cycle test, the ratio of unrecog/recognized is checked to confirm if real misfire is present. Ratio of Unrecog/Recog ****************************** NON-CRANKSHAFT BASED ROUGH ROAD: Rough Road Source ****************************** IF Rough Road Source = WheelSpeedInECM ABS/TCS Wheel speed noise VSES AND No Emission Neutral Default Action DTCs ****************************** IF Rough Road Source = "FromABS" ABS/TCS	**SnapDecayAfterMisfire** < Misfire_Jerk * **SnapDecayAfterMisfire * RepetSnapDecayAdjst** in Supporting Tables >0.60 ****************************** Disabled CeRRDReNone ****************************** active **> WSSRoughRoadThres** active ABS Failed Vehicle Dynamics Control System Status Driven Wheel Rotation Status Non Driven Wheel Rotation Status ******************************	discard 100 engine cycle test ****************** ****************** discard 100 engine cycle test ****************** discard 100	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					RoughRoad VSES AND No Emission Neutral Default Action DTCs ****************************** IF Rough Road Source = "TOSS" TOSS dispersion AND No Active DTCs ****************************** Default Action Isolator Resonance Default Action Option ****************************** If Isolator Resonance Option Enabled AND Misfire P030x TFTKO	active detected active ABS Failed Vehicle Dynamics Control System Status ****************************** **>TOSSRoughRoadThres** in supporting tables Transmission Output Shaft Angular Velocity Validity TransmissionEngagedState_FA (Auto Trans only) ClutchPstnSnsr FA (Manual Trans only) ****************************** Not Enabled ****************************** Set engine speed limits: 0 < Eng RPM < 9,000	engine cycle test ******************* discard 100 engine cycle test 4 cycle delay ******************* *******************	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Crankshaft Position System Variation Not Learned	P0315	This DTC determines if the crankshaft sensor learn values that are stored in memory are valid. The angle between each tooth of the reluctor wheel is learned, and the sum of all angles together should sum to 360° (one revolution of the reluctor wheel). Default values, or corrupted values will not sum to 360°.	The Crankshaft target wheel should be 360 degrees around in circumferance. Loss or controller non-volitile memory or an error in memory will cause the values of individual teeth learn to be defaulted or incorrect. Set the DTC if the Difference between the sum of the reluctor wheel's teeth and 360 degrees is greater than:	> 0.001 degrees	OBD Manufacturer Enable Counter	MEC = 0	0.50 seconds Frequency Continuous100 msec	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Crankshaft Position (CKP) Sensor A Circuit	P0335	Determines if a fault exists with the crank position sensor signal	Time since last crankshaft position sensor pulse received	>= 4.0 seconds	Starter engaged AND (cam pulses being received OR (MAF_SensorFA AND Engine Air Flow	 = FALSE > 2.0 grams/second))	Continuous every 100 msec	Type A, 1 Trips
			No crankshaft pulses received	>= 0.3 seconds	Engine is Running Starter is not engaged		Continuous every 12.5 msec	
			No crankshaft pulses received		Engine is Running OR Starter is engaged No DTC Active:	 P0340 P0341	2 failures out of 10 samples One sample per engine revolution	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Crankshaft Position (CKP) Sensor A Performance	P0336	Determines if a performance fault exists with the crank position sensor signal	Time in which 10 or more crank re-synchronizations occur	< 10.0 seconds	Engine Air Flow Cam-based engine speed No DTC Active:	>= 2.0 grams/second > 450 RPM P0335	Continuous every 250 msec	Type A, 1 Trips
			No crankshaft synchronization gap found	>= 0.4 seconds	Engine is Running Starter is not engaged		Continuous every 12.5 msec	
			Time since starter engaged without detecting crankshaft synchronization gap	>= 1.5 seconds	Starter engaged AND (cam pulses being received OR (MAF_SensorFA AND Engine Air Flow	= FALSE > 2.0 grams/second))	Continuous every 100 msec	
			Crank pulses received in one engine revolution OR Crank pulses received in one engine revolution	< 51 > 65	Engine is Running OR Starter is engaged No DTC Active:	P0340 P0341	8 failures out of 10 samples One sample per engine revolution	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Camshaft Position (CMP) Sensor Circuit Bank 1 Sensor A	P0340	Determines if a fault exists with the cam position bank 1 sensor A signal	Time since last camshaft position sensor pulse received OR Time that starter has been engaged without a camshaft sensor pulse	>= 5.5 seconds >= 4.0 seconds	Starter engaged AND (crank pulses being received OR (MAF_SensorFA AND Engine Air Flow	= FALSE > 2.0 grams/second))	Continuous every 100 msec	Type A, 1 Trips
			Fewer than 4 camshaft pulses received in a time	> 3.0 seconds	Engine is running Starter is not engaged		Continuous every 100 msec	
			No camshaft pulses received during first 24 MEDRES events (There are 24 MEDRES events per engine cycle		Crankshaft is synchronized Starter must be engaged to enable the diagnostic, but the diagnostic will not disable when the starter is disengaged No DTC Active:	CrankSensor_FA	Continuous every MEDRES event	
			The number of camshaft pulses received during 100 engine cycles	= 0	Crankshaft is synchronized No DTC Active:	CrankSensor_FA	8 failures out of 10 samples Continuous every engine cycle	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Camshaft Position (CMP) Sensor Performance Bank 1 Sensor A	P0341	Determines if a performance fault exists with the cam position bank 1 sensor A signal	The number of camshaft pulses received during first 24 MEDRES events is OR (There are 24 MEDRES events per engine cycle)	< 4 > 6	Crankshaft is synchronized Starter must be engaged to enable the diagnostic, but the diagnostic will not disable when the starter is disengaged No DTC Active:	CrankSensor_FA	Continuous every MEDRES event	Type A, 1 Trips
			The number of camshaft pulses received during 100 engine cycles OR	< 398 > 402	Crankshaft is synchronized No DTC Active:	CrankSensor_FA	8 failures out of 10 samples Continuous every engine cycle	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Exhaust Gas Recirculation (EGR) Flow insufficient	P0401	This monitor detects failures in the air system such to not fulfill the request of mass airflow through the intake circuit. This monitor is used to detect any malfunction in the air system that leads to lower EGR rate causing the vehicle's emissions to exceed the OBD limits. The aim of the EGR flow monitor is to detect HP EGR obstructions (insufficient EGR flow). The EGR flow depends on several variables like the HP EGR valve position, intake manifold pressure, exhaust pressure, EGR cooler outlet temperature. The aim of this procedure is to identify a limitation of the HP EGR (equal to an obstruction) that leads to exceed the OBD limits. In particular environmental conditions where the provided EGR flow amount is not enough to have a robust monitoring, the EGR flow intrusive test can be enabled. When the intrusive test is	Air mass tracking error: difference between the fresh air requested (set point) and the fresh air measured by MAF sensor.	< (SeaBaro Constant X **P0401: Insufficient EGR flow barometric table B (sea level)** [mg]) + (MidBaro Constant X **P0401: Insufficient EGR flow barometric table B (mid level)** [mg]) + (LoBaro Constant X **P0401: Insufficient EGR flow barometric table B (low level)** [mg]) + (SeaBaro Constant X	Calibration on diagnostic enabling HP EGR control is in closed loop on airflow OR LP EGR (if present) control is in closed loop on air flow OR Diagnostic enabled by calibration when HP/LP EGR control is in closed loop on HP/LP EGR flow Engine Running Cranking ignition in range PT Relay voltage in range Air Control is Active (air control in closed loop) Desired EGR rate Engine speed is steady state: |RPM-RPM_old| for a minimum number of samples	P0401, P0402: EGR flow monitor enabling == TRUE (see FreeForm) Refer to "Other AICR DSL flags" Free Form 1.00==TRUE ==TRUE Battery voltage > 11.00 [V] Powertrain relay voltage > 11.00 [V] Refer to "Air Control Active" Free Form > 0 [%] <= 27 [rpm] > 8 [counts]	400.00 fail counters over 500.00 sample counters sampling time is 25 ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		enabled, a dedicated flow setpoint value is provided to air control.		**P0401: Insufficient EGR flow barometric table A (sea level)** [mg] X **P0401: Insufficient EGR flow barometric correction (sea level)**) + (MidBaro Constant X **P0401: Insufficient EGR flow barometric table A (mid level)** [mg] X **P0401: Insufficient EGR flow barometric correction (mid level)**) + (LoBaro Constant X **P0401: Insufficient EGR flow barometric table A (low level)** [mg] X **P0401: Insufficient EGR flow barometric correction (low level)**)	Fuel request is steady state: |FUEL-FUEL_old| for a minimum number of samples An air control transition has ended OR Such condition is disabled by calibration No active transition from a combustion mode to another one Throttle measured position Outside Air Temperature Ambient Pressure Engine Coolant Temperature OR OBD Coolant Enable Criteria Desired EGR flow	<=1.25 [mm^3] > 8 [counts] Refer to "Air Control TransitionTree Form OR 1.00==TRUE ==TRUE > 85.00 [%] > -6.70 [°C] > 75.00 [kPa] > 70.00 [°C] ==TRUE > **P0401: Minimum desired EGR flow** [mg]		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Desired fuel quantity	> **P0401: Insufficient EGR flow Min fuel enabling condition** [mm^3] AND < **P0401: Insufficient EGR flow Max fuel enabling condition** [mm^3]		
					Outside air temperature in range	Condition must be TRUE. Refer to "P0401, P0402: Outside air temperature" Free Form		
					No faults on proper temperature sensor	AIC_EGR_FlowDiagAirTempFA ==FALSE		
					All enabling conditions last for a time	> 0.50 [s]		
			Air mass tracking error: difference between the fresh air requested (set point) and the fresh air measured by MAF sensor.	< (SeaBaro Constant X **P0401: Insufficient EGR flow barometric table B (sea level)** [mg]) + (	Calibration on diagnostic enabling	**P0401, P0402: EGR intrusive test enabling** ==TRUE	400.00 fail counters over 500.00 sample counters	
					Difficult launch NOT detected	Refer to "LDT_DifficultLaunchActive" Free Form	sampling time is 25 ms	
					HP EGR control is in closed loop on air flow OR LP EGR (if present)	Refer to "Other AICR DSL flags" Free Form		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
				MidBaro Constant X **P0401: Insufficient EGR flow barometric table B (mid level)** [mg])	control is in closed loop on air flow OR Diagnostic enabled by calibration when HP/LP EGR control is in closed loop on HP/LP EGR flow	1.00==TRUE		
				+	Engine Running	==TRUE		
				(LoBaro Constant X **P0401: Insufficient EGR flow barometric table B (low level)** [mg])	Cranking ignition in range	Battery voltage > 11.00 [V]		
					PT Relay voltage in range	Powertrain relay voltage > 11.00 [V]		
				+	Air Control is Active (air control in closed loop)	Refer to "Air Control Active" Free Form		
				(SeaBaro Constant X	Desired EGR rate	> 0 [%]		
				P0401: Insufficient EGR flow barometric table A (sea level) [mg]	Engine speed is steady state: |RPM-RPM_old|	<= 27 [rpm]		
				X	for a minimum number of samples	> 8 [counts]		
				P0401: Insufficient EGR flow barometric correction (sea level))	Fuel request is steady state: |FUEL-FUEL_old|	<= 1.25 [mm^3]		
				+	for a minimum number of samples	> 8 [counts]		
				(MidBaro Constant X	An air control transition	Refer to "Air Control		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
				P0401: Insufficient EGR flow barometric table A (mid level) [mg] X **P0401: Insufficient EGR flow barometric correction (mid level)**) + (LoBaro Constant X **P0401: Insufficient EGR flow barometric table A (low level)** [mg] X **P0401: Insufficient EGR flow barometric correction (low level)**)	has ended OR Such condition is disabled by calibration	TransitionTree Form OR 1.00==TRUE		
					No active transition from a combustion mode to another one	==TRUE		
					Throttle measured position	> 85.00 [%]		
					Outside Air Temperature	> -6.70 [°C]		
					Ambient Pressure	> 75.00 [kPa]		
					Engine Coolant Temperature OR OBD Coolant Enable Criteria	> 70.00 [°C] ==TRUE		
					Outside air temperature in range	Condition must be FALSE. Refer to "P0401, P0402: Outside air temperature" Free Form		
					No faults on proper temperature sensor	AIC_EGR_FlowDiagAirTempFA ==FALSE		
					No faults on crank sensor or on fuel injection system	CrankSensor_FA ==FALSE FUL_GenericInjSysFA ==FALSE		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Time since last EGR flow insufficient monitoring (standard test or intrusive test) test completion	> 0.00 [s]		
					Desired fuel quantity	> **P0401: Insufficient EGR intrusive test Min fuel enabling condition** [mm^3] AND < **P0401: Insufficient EGR intrusive test Max fuel enabling condition** [mm^3]		
					All enabling conditions above last for a time	> 0.00 [s]		
					All enabling conditions (included the above timer) last for a time	> 0.50 [s]		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Exhaust Gas Recirculation (EGR) Flow excessive	P0402	This monitor detects failures in the air system such to not fulfil the request of mass air flow through the intake circuit. This monitor is used to detect any malfunction in the air system that leads to higher EGR rate causing the vehicle's emissions to exceed the OBD limits. The aim of the EGR flow monitor is to detect HP EGR valve leakages (excessive EGR flow). The EGR flow depends on several variables like the HP EGR valve position, intake manifold pressure, exhaust pressure, EGR cooler outlet temperature. The aim of this procedure is to identify a limitation of the HP EGR (equal to a leakage) that leads to exceed the OBD limits. In particular environmental conditions where the provided EGR flow amount is not enough to have a robust monitoring, the EGR flow intrusive test can be enabled. When the intrusive test is	Air mass tracking error: difference between the fresh air requested (set point) and the fresh air measured by MAF sensor.	> (SeaBaro Constant X **P0402: Excessive EGR flow barometric table B (sea level)** [mg]) + (MidBaro Constant X **P0402: Excessive EGR flow barometric table B (mid level)** [mg]) + (LoBaro Constant X **P0402: Excessive EGR flow barometric table B (low level)** [mg]) + (SeaBaro Constant X	Calibration on diagnostic enabling HP EGR control is in closed loop on airflow OR LP EGR (if present) control is in closed loop on air flow OR Diagnostic enabled by calibration when HP/LP EGR control is in closed loop on HP/LP EGR flow Engine Running Cranking ignition in range PT Relay voltage in range Air Control is Active (air control in closed loop) Desired EGR rate Engine speed is steady state: |RPM-RPM_old| for a minimum number of samples	P0401, P0402: EGR flow monitor enabling == TRUE (see FreeForm) Refer to "Other AICR DSL flags" Free Form 1.00==TRUE ==TRUE Battery voltage > 11.00 [V] Powertrain relay voltage > 11.00 [V] Refer to "Air Control Active" Free Form > 0 [%] <= 27 [rpm] > 8 [counts]	200.00 fail counters over 300.00 sample counters sampling time is 25 ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		enabled, a dedicated flow setpoint value is provided to air control.		**P0402: Excessive EGR flow barometric table A (sea level)** [mg] X **P0402: Excessive EGR flow barometric correction (sea level)**) + (MidBaro Constant X **P0402: Excessive EGR flow barometric table A (mid level)** [mg] X **P0402: Excessive EGR flow barometric correction (mid level)**) + (LoBaro Constant X **P0402: Excessive EGR flow barometric table A (low level)** [mg] X **P0402: Excessive EGR flow barometric correction (low level)**)	Fuel request is steady state: |FUEL-FUEL_old| for a minimum number of samples An air control transition has ended OR Such condition is disabled by calibration No active transition from a combustion mode to another one Throttle measured position Outside Air Temperature Ambient Pressure Engine Coolant Temperature OR OBD Coolant Enable Criteria Desired EGR flow	<=1.25 [mm^3] > 8 [counts] Refer to "Air Control Transition" Free Form OR 1.00==TRUE ==TRUE > 85.00 [%] > -6.70 [°C] > 75.00 [kPa] > 70.00 [°C] ==TRUE < **P0402: Maximum desired EGR flow** [mg]		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Desired fuel quantity	> **P0402: Excessive EGR flow Min fuel enabling condition** [mm^3] AND < **P0402: Excessive EGR flow Max fuel enabling condition** [mm^3]		
					Outside air temperature in range	Condition must be TRUE. Refer to "P0401, P0402: Outside air temperature" Free Form		
					No faults on proper temperature sensor	AIC_EGR_FlowDiagAirTempFA ==FALSE		
					All enabling conditions last for a time	> 0.10 [s]		
			Air mass tracking error: difference between the fresh air requested (set point) and the fresh air measured by MAF sensor.	> (SeaBaro Constant X **P0402: Excessive EGR flow barometric table B (sea level)** [mg]) + (	Calibration on diagnostic enabling	**P0401, P0402: EGR intrusive test enabling** ==TRUE	200.00 fail counters over 300.00 sample counters	
					Difficult launch NOT detected	Refer to "LDT_DifficultLaunchActive" Free Form	sampling time is 25 ms	
					HP EGR control is in closed loop on air flow OR LP EGR (if present)	Refer to "Other AICR DSL flags" Free Form		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
				MidBaro Constant X **P0402: Excessive EGR flow barometric table B (mid level)** [mg])	control is in closed loop on air flow OR Diagnostic enabled by calibration when HP/LP EGR control is in closed loop on HP/LP EGR flow	1.00==TRUE		
				+	Engine Running	==TRUE		
				(LoBaro Constant X **P0402: Excessive EGR flow barometric table B (low level)** [mg])	Cranking ignition in range	Battery voltage > 11.00 [V]		
					PT Relay voltage in range	Powertrain relay voltage > 11.00 [V]		
				+	Air Control is Active (air control in closed loop)	Refer to "Air Control Active" Free Form		
				(SeaBaro Constant X	Desired EGR rate	> 0 [%]		
				P0402: Excessive EGR flow barometric table A (sea level) [mg]	Engine speed is steady state: |RPM-RPM_old|	<= 27 [rpm]		
				X **P0402: Excessive EGR flow barometric correction (sea level)**	for a minimum number of samples	> 8 [counts]		
				)	Fuel request is steady state: |FUEL-FUEL_old|	<= 1.25 [mm^3]		
				+	for a minimum number of samples	> 8 [counts]		
				(MidBaro Constant X	An air control transition	Refer to "Air Control		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
				P0402: Excessive EGR flow barometric table A (mid level) [mg] X **P0402: Excessive EGR flow barometric correction (mid level)**) + (LoBaro Constant X **P0402: Excessive EGR flow barometric table A (low level)** [mg] X **P0402: Excessive EGR flow barometric correction (low level)**)	has ended OR Such condition is disabled by calibration No active transition from a combustion mode to another one Throttle measured position Outside Air Temperature Ambient Pressure Engine Coolant Temperature OR OBD Coolant Enable Criteria Outside air temperature in range No faults on proper temperature sensor No faults on crank sensor or on fuel injection system	Transition" Free Form OR 1.00==TRUE ==TRUE > 85.00 [%] > -6.70 [°C] > 75.00 [kPa] > 70.00 [°C] ==TRUE Condition must be FALSE. Refer to "P0401, P0402: Outside air temperature" Free Form AIC_EGR_FlowDiagAirTempFA ==FALSE CrankSensor_FA ==FALSE FUL_GenericInjSysFA ==FALSE		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Time since last EGR flow excessive monitoring (standard test or intrusive test) test completion Desired fuel quantity in range All enabling conditions above last for a time All enabling conditions (included the above timer) last for a time	> 0.00 [s] > **P0402: Excessive EGR intrusive test Min fuel enabling condition** [mm^3] AND < **P0402: Excessive EGR intrusive test Max fuel enabling condition** [mm^3] > 0.00 [s] > 0.10 [s]		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Warm Up Catalyst Efficiency Below Threshold Bank 1	P0421	The Catalyst (CC DOC) monitor only runs during DPF regeneration and compares the CC DOC released oxidation heat and the post-injected fuel quantity both evaluated inside a determined portion of the DPF regeneration itself. This comparison (ratio) produces an Aging Index that shall be greater than the efficiency threshold, in case of fresh (efficient) Catalyst. If, instead, the so calculated Aging Index is below the efficiency threshold, the diagnosis reports fail because the Catalyst is too much damaged to play well its role (conversion inefficiency detected) and shall be replaced. It is needed that post-injection is enabled during CC DOC monitor in order to produce enough exothermic heat across the Catalyst to evaluate the component conversion efficiency in a reliable way. EWMA Filtering functionality (including	Catalyst Aging Index < Threshold If - Catalyst EWMA filter enabling calibration = TRUE AND - Catalyst conversion inefficiency previously detected (Catalyst Fault Active = TRUE) Then: Catalyst Aging Index < Repass Threshold	Aging Index < **CatCrtdEffThrsh** [Curve] If EWMA Enbl Cal = 0.00 [Boolean] AND Catalyst FA = CAT_CatSysEffLoB1_FA Then: Aging Index < **CatCrtdEffRepEWMA** [Curve]	- Catalyst monitor in DPF regeneration enabled by calibrations AND No active DTCs: - Catalyst up temperature sensor not in fault (Fault Flag = FALSE) AND - Catalyst down temperature sensor not in fault (Fault Flag = FALSE); Temperature Learning concluded: - Number of elapsed samples (task time = 100 [ms]) equal to calibration; **Catalyst monitor status is DISABLED if:** - DPF regeneration disabled OR - Injection system in fault (Fault Flag = TRUE) OR - Ambient temperature	RegenMonitorEnabled = 1.00 [Boolean] AND DPF_RegenMonitorSelected = NOT(0.00 [Boolean]) AND ReportingEnabled= 1.00 [Boolean] AND Cat Up Temp Snsr Flt = NOT (EGT_SnsrCatUpFlt) AND Cat Dwn Temp Snsr Flt = NOT (EGT_SnsrCatDwnFlt); Samples nr. = 10.00 [Counter]; **Catalyst monitor status is DISABLED if:** DPF_DPF_St = SootLoading [Enumerative] OR Injection System Flt = FUL_GenericInjSysFlt OR Amb Temp FA = CAT_OutsideTempFA	Task Time = 100 [ms] If - Catalyst EWMA filter enabling cailibration = FALSE (EWMA Enbl Cal = 0.00 [Boolean]) Then: 2 trips (with malfunction) to set DTC (Type B) If - Catalyst EWMA filter enabling cailibration = TRUE (EWMA Enbl Cal = 0.00 [Boolean]) AND - EWMA status = EWMA Standard Then: 1 trip (with malfunction) to set DTC (Type A) If - Catalyst EWMA filter enabling cailibration = TRUE (EWMA Enbl Cal = 0.00 [Boolean])	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		Fast Initial Response (FIR), Rapid Response (RR) and EWMA Standard) is supported by the Catalyst (CC DOC) monitor.			information in fault (Fault Active = TRUE) OR - Catalyst up exhaust flow estimation in fault (Fault Flag = TRUE) OR -Ambient conditions not always satisfied while engine running: Ambient pressure lower than calibration OR Ambient temperature lower than calibration OR - Catalyst monitor already performed successfully in current driving cycle (Catalyst monitor shall run only once per driving cycle) OR HC unloading enabled; **Catalyst monitor status can move from DISABLED to TRIGGERED if:** - DPF regeneration enabled AND - Injection system not in fault (Fault Flag = FALSE) AND - Ambient temperature information not in fault	OR Cat Up Exh Flow Flt = EXF_TotExhCatUpFlt OR -Ambient conditions not always satisfied while engine running: Amb Press < 74.90 [KPa] OR Amb Temp < 266.45 [K] OR Catalyst monitor already performed successfully in current driving cycle (Catalyst monitor shall run only once per driving cycle) [Boolean] OR HCI_DeHC_ExhlnjDsbl = TRUE [Boolean]; **Catalyst monitor status can move from DISABLED to TRIGGERED if:** DPF_DPF_St # SootLoading [Enumerative] AND Injection System Flt = NOT (FUL_GenericlnjSysFlt) AND Amb Temp FA = NOT (CAT_OutsideTemoFA)	AND - EWMA status = Fast Initial Response (FIR) Then: - 1 trip (with malfunction) to set DTC (Type A) and return to EWMA status = EWMA Standard - 0.00 [Counter] elapsed trips (with no mulfunction) to report pass and return to EWMA status = EWMA Standard If - Catalyst EWMA filter enabling cailibration = TRUE (EWMA Enbl Cal = 0.00 [Boolean]) AND - EWMA status = Rapid Response (RR) Then: - 1 trip (with malfunction) to set DTC (Type A) and return to EWMA status = EWMA Standard - 1 trip (with no mulfunction) to report pass - 0.00 [Counter]	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					(Fault Active = FALSE) AND - Catalyst up exhaust flow estimation not in fault (Fault Flag = FALSE) AND -Ambient conditions always satisfied while engine running: Ambient pressure higher than calibration AND Ambient temperature higher than calibration AND - Catalyst monitor not yet performed successfully in current driving cycle (Catalyst monitor shall run only once per driving cycle) AND - If DPF regeneration has been interrupted in previous driving cycle or in current driving cycle Then: Engine coolant temperature lower than calibration AND - Catalyst up exhaust temperature (by sensor) lower than calibration AND HC unloading disabled; **Catalyst monitor status can move from TRIGGERED to**	AND Cat Up Exh Flow Fit = NOT (EXF_TotExhCatUpFlt) AND Ambient conditions always satisfied while engine running: Amb Press > 75.00 [KPa] AND Amb Temp > 266.45 [K] AND Catalyst monitor not yet performed successfully in current driving cycle (Catalyst monitor shall run only once per driving cycle) [Boolean] AND If Interrupted DPF regeneration counter > 0 [Counter] Then: Eng Cool Temp < 255.99 [°C] AND Cat Up Temp Snsr < 1,500.00 [K]; AND HCI_DeHC_ExhlnjDsbl = FALSE [Boolean]; **Catalyst monitor status can move from TRIGGERED to**	elapsed trips (with no mulfunction) to report pass and return to EWMA status = EWMA Standard	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					ENABLED (oxidation heat release integrator and post injected fuel integrator are both enabled) if: - DPF regeneration enabled AND - Injection system not in fault (Fault Flag = FALSE) AND - Ambient temperature information not in fault (Fault Active = FALSE) AND - Catalyst up exhaust flow estimation not in fault (Fault Flag = FALSE) AND -Ambient conditions always satisfied while engine running: Ambient pressure higher than calibration AND Ambient temperature higher than calibration AND - Catalyst monitor not yet performed successfully in current driving cycle (Catalyst monitor shall run only once per driving cycle) AND - Catalyst up exhaust temperature (by sensor) higher than calibration AND - Post injection enabled	**ENABLED (oxidation heat release integrator and post injected fuel integrator are both enabled) if:** DPF_DPF_St # SootLoading [Enumerative] AND Injection System Flt = NOT (FUL_GenericInjSysFlt) AND Amb Temp FA = NOT (CAT_OutsideTempFA) AND Cat Up Exh Flow Flt = NOT (EXF_TotExhCatUpFlt) AND -Ambient conditions always satisfied while engine running: Amb Press > 75.00 [KPa] AND Amb Temp > 266.45 [K] AND Catalyst monitor not yet performed successfully in current driving cycle (Catalyst monitor shall run only once per driving cycle) [Boolean] AND Cat Up Temp Snsr > 0.00 [K] AND FUL_PostEnbl = TRUE		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					AND - Catalyst up exhaust flow estimation in range AND - Catalyst up exhaust temperature (by sensor) in range AND - Post injection fuel rate in range AND - Consecutive time in which Post Injection Fuel rate is lower than a threshold is less than a calibration AND HC unloading disabled; **Oxidation heat release integrator and post injected fuel integrator are both frozen if:** - Engine not running OR - Catalyst up exhaust flow estimation out of range OR - Catalyst up exhaust temperature (by sensor) out of range OR - Post injection fuel rate	[Boolean] AND 0.00 < Cat Up Exh Flow <450.00 [g/s] AND 400.00 < Cat Up Temp Snsr [K] < 773.00 AND 0.01 < Post Inj Fuel Qnty [g/s] < 10.00 AND Post Inj Fuel Qnty [g/s] < 0.00 for less than 0.00 [s] AND HCI_DeHC_ExhInjDsbl = FALSE [Boolean]; **Oxidation heat release integrator and post injected fuel integrator are both frozen if:** - Engine not running OR Cat Up Exh Flow [g/s] < 0.00 OR Cat Up Exh Flow > 450.00 [g/s] OR Cat Up Temp Snsr [K] < 400.00 OR Cat Up Temp Snsr [K] > 773.00 OR Post Inj Fuel Qnty [g/s] < 0.01		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					out of range	OR Post Inj Fuel Qnty [g/s] > 10.00		
					OR - Consecutive time in which Post Injection Fuel rate is lower than a threshold is more than a calibration	OR Post Inj Fuel Qnty [g/s] < 0.00 for more than 0.00 [s]		
					Catalyst monitor status can move from ENABLED (oxidation heat release integrator and post injected fuel integrator are both enabled) to DONE (integrators are stopped and the ratio between the total integrated oxidation heat and the total integrated injected fuel is performed with the consequent creation of the Catalyst Aging Index to be compared with the Fault Threshold --> Diagnostic test evaluation trigger) if: - DPF regeneration enabled AND - Injection system not in fault (Fault Flag = FALSE) AND - Ambient temperature information not in fault	**Catalyst monitor status can move from ENABLED (oxidation heat release integrator and post injected fuel integrator are both enabled) to DONE (integrators are stopped and the ratio between the total integrated oxidation heat and the total integrated injected fuel is performed with the consequent creation of the Catalyst Aging Index to be compared with the Fault Threshold --> Diagnostic test evaluation trigger) if:** DPF_DPF_St # SootLoading [Enumerative] AND Injection System Flt = NOT (FUL_GenericInjSysFlt) AND Amb Temp FA = NOT (CAT_OutsideTempFA)		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					(Fault Active = FALSE) AND - Catalyst up exhaust flow estimation not in fault (Fault Flag = FALSE) AND -Ambient conditions always satisfied while engine running: Ambient pressure higher than calibration AND Ambient temperature higher than calibration AND - Catalyst monitor not yet performed successfully in current driving cycle (Catalyst monitor shall run only once per driving cycle) AND - Integrated post injected fuel quantity higher than curve AND HC unloading disabled;	AND Cat Up Exh Flow Fit = NOT (EXF_TotExhCatUpFlt) AND -Ambient conditions always satisfied while engine running: Amb Press > 75.00 [KPa] AND Amb Temp > 266.45 [K] AND Catalyst monitor not yet performed successfully in current driving cycle (Catalyst monitor shall run only once per driving cycle) [Boolean] AND Intgr Post Inj Fuel Qnty > **CatCrtdMaxFuel** [g] AND HCI_DeHC_ExhInjDsbl = FALSE [Boolean];		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Fuel Level Sensor 1 Performance (For use on vehicles with dual fuel tanks and electric transfer pump)	P0461	This DTC will detect a primary fuel tank level sensor stuck in-range.	1)****************************** Fuel Level in Primary and Secondary Tanks Remain in an Unreadable Range too Long****************************** 1a) If Deadband diagnostic subtest enabled 1b) If fuel volume in primary tank is 1c) and if fuel volume in secondary tank is 1d) and if 1b and 1c indications do not change while fuel volume consumed by engine is OR 2)****************************** Fuel consumed without a Primary Fuel Level Change****************************** 2a) If indicated fuel volume change is 2b) while fuel consumed by the engine is	1a) == Disabled status 1b) >1,024.0 liters 1c) < 0.0 liters 1d) > 18.0 liters 2a) < 3 liters 2b) > 27.3 liters	1) Diagnostic Enabled 2) Engine Operational State 3) Device control state for the electric transfer pump	1a) == True 1b) == Running 3) <> True	250 ms / sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Fuel Level Sensor 1 Circuit Low Voltage (For use on vehicles with a fuel float connected to an FTZM)	P0462	This DTC will detect a primary fuel tank sensor out-of-range low.	Fuel level Sender % of 5V range	< 10%	a) Diagnostic enabled status b) Fuel Level Sensor Initialized status c) Fuel Level Sensor Data Available Status d) Communication faults status	a) == True b) == True c) == True d) <> True	100 failures out of 125 samples 250 ms / sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Fuel Level Sensor 1 Circuit High Voltage (For use on vehicles with a fuel float connected to an FTZM)	P0463	This DTC will detect a primary fuel tank level sensor out-of-range high.	Fuel level Sender % of 5V range	> 60 %	a) Diagnostic enabled status b) Fuel Level Sensor Initialized status c) Fuel Level Sensor Data Available Status d) Communication faults status	a) == True b) == True c) == True d) <> True	100 failures out of 125 samples 250 ms / sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Cooling Fan 1 Relay Control Circuit Open (Output Driver Monitor) [Non- EREV]	P0480	Diagnoses the cooling fan 1 relay control low side driver circuit for circuit faults	Voltage low during driver off state (indicates open circuit)	Open Circuit: > 200 K Q impedance between signal and controller ground	Powertrain Relay Voltage	Voltage > 11.00 volts	50.00 failures out of 63.00 samples 100 ms / sample	Type B, 2 Trips Note: In certain controllers P0691 may also set (Fan 1 Short to Ground).

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Cooling Fan System Performance [Electro-Viscous Engine-Driven Fan Only]	P0483	Detects inability to control fan speed to desired RPM	Weighted filtered Cooling Fan Speed Differential [Measured - Commanded]	1. <= -500.00 RPM OR 2. >= 500.00 RPM	1. System Performance Test Triggered [FEAD b SysPerfTestTrig] 2. Commanded Cooling Fan Output Duty Cycle [FEAR_Pct_PWM_Output DutyCycle] 3a. Intake Air Temp Sensor Fault Active [DTCs P0112, P0113, P1111, P1112] 3b. Engine Coolant Temp Sensor FA [DTCs P0116, P0117, P0118, P0119, P1114, P1115] 3c. Cooling Fan Speed Sensor Circuit FA [DTC P0526] 3d. Cooling Fan FOD_OutputDriver_FA 3e. Ignition Sw Position Run_Crank Circuit voltage 3f. Induction Air Temp 4. System Performance Test enabled 5. Fan Speed Total Weighting Filtered Factor Calculation [See Supporting Calculation and Tables] P0483 Calculation - Total	1. == TRUE 2. >= 39.00 % 3a. <> TRUE 3b. <> TRUE 3c. <> TRUE 3d. <> TRUE 3e. >= 11.00 volts 3f. >= -6.70 degC 4. == TRUE 5. > 0.60 [dimensionless]	Fail condtion present >= 300.00 ; 100 ms / sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Weighting Factor			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Cooling Fan Speed High [Electro-Viscous Engine-Driven Fan Only]	P0495	Diagnoses the engine-driven cooling fan speed during OFF state against a rational speed accounting for inertia and ram-air flow effects	Measured Cooling Fan Speed	> Calculated Allowed Fan Drag Speed RPM	a) Diagnostic enabled b) Hydraulic Fan Clutch Pumped Out [FEAD_b_ClutchPumpedOut] c) Calculated Cooling Fan Speed [FEAD_n FanDriveSpeed]	a) == TRUE b) == TRUE c) > 1,600.00 RPM	800.00 failures / 1,000.00 samples 100 ms / sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Low Engine Speed Idle System	P0506	This DTC will determine if a low idle exists	Filtered Engine Speed Error	> 91.00 rpm	Baro	> 75 kPa	Diagnostic runs in every 12.5 ms loop	Type B, 2 Trips
			filter coefficient	0.00300	Coolant Temp	> KeSPDD_T_EnblECT_Min (60 °C) and < KfECTI_T_EngCoolHotHiThresh (129 °C) Must verify KfECTI_T_EngCoolHotLoThresh (126) is less than KfECTI_T_EngCoolHotHiThresh (129)	Diagnostic reports pass or fail in 10 seconds once all enable conditions are met	
					Engine run time	> 60 sec		
					Ignition voltage	32 > volts > 11		
					Time since gear change	> 3 sec		
					Time since a TCC mode change	> 3 sec		
					IAT	> -7 °C		
					Vehicle speed	< 1.24 mph		
					Commanded RPM delta	< 25 rpm		
					Idle time	> 5 sec		
					For manual transmissions: Clutch Pedal Position or Clutch Pedal Position	> 68.00 pct < 25.00 pct		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
						PTO not active Transfer Case not in 4WD LowState Off-vehicle device control (service bay control) must not be active. following conditions not TRUE: (VeTESR_e_EngSpdReqIntvType = CeTESR_e_EngSpdMinLimitAND VeTESR_e_EngSpdReqRespType = CeTESR_e_NoSuggestion) Clutch is not depressed		
					No active DTCs	TC_BoostPresSnsrFA ECT_Sensor_FA EnginePowerLimited EGRValveCircuit_FA EGRValvePerformance_FA IAT_SensorCircuitFA EvapFlowDuringNonPurge_FA FuelTrimSystemB1_FA FuelTrimSystemB2_FA FuelInjectorCircuit_FA MAF_SensorFA EngineMisfireDetected_FA IgnitionOutputDriver_FA		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
						TPS_FA TPS_Performance_FA VehicleSpeedSensor_FA FuelLevelDataFault LowFuelConditionDiagnostic Clutch Sensor FA AmbPresDfltdStatus P2771		
					All of the above met for Idle time	> 5 sec The diagnostic does not run during autostop as engine is shutdown during that time (occurs in a hybrid or 12v start stop vehicle)		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
High Engine Speed Idle System	P0507	This DTC will determine if a high idle exists	Filtered Engine Speed Error	< -182.00 rpm	Baro	> 75 kPa	Diagnostic runs in every 12.5 ms loop	Type B, 2 Trips
			filter coefficient	0.00300	Coolant Temp	> KeSPDD_T_EnblECT_Min(60°C) and < KfECTI_T_EngCoolHotHiThresh (129 °C) Must verify KfECTI_T_EngCoolHotLoThresh (126) is less than KfECTI_T_EngCoolHotHiThresh (129)	Diagnostic reports pass or fail in 10 seconds once all enable conditions are met	
					Engine run time	> 60 sec		
					Ignition voltage	32 > volts > 11		
					Time since gear change	> 3 sec		
					Time since a TCC mode change	> 3 sec		
					IAT	> -7 °C		
					Vehicle speed	< 1.24 mph		
					Commanded RPM delta	< 25 rpm		
					For manual transmissions: Clutch Pedal Position or Clutch Pedal Position	> 68.00 pct < 25.00 pct		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
						PTO not active Transfer Case not in 4WD LowState Off-vehicle device control (service bay control) must not be active. following conditions not TRUE: (VeTESR_e_EngSpdReqIntvType = CeTESR_e_EngSpdMinLimitAND VeTESR_e_EngSpdReqRespType = CeTESR_e_NoSuggestion) Clutch is not depressed		
					No active DTCs	TC_BoostPresSnsrFA ECT_Sensor_FA EnginePowerLimited EGRValveCircuit_FA EGRValvePerformance_FA IAT_SensorCircuitFA EvapFlowDuringNonPurge_FA FuelTrimSystemB1_FA FuelTrimSystemB2_FA FuelInjectorCircuit_FA MAF_SensorFA EngineMisfireDetected_FA IgnitionOutputDriver_FA TPS_FA TPS_Performance_FA VehicleSoeedSensor_FA		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
						FuelLevelDataFaultLow FuelConditionDiagnostic Clutch SensorFA AmbPresDfltdStatus P2771		
					All of the above met for Idle time	> 5 sec The diagnostic does not run during autostop as engine is shutdown during that time (occurs in a hybrid or 12v start stop vehicle)		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Cooling Fan Speed Sensor Circuit [Electro-Viscous Engine-Driven Fan Only]	P0526	Diagnoses the engine driven cooling fan speed sensor	Measured Cooling Fan Speed	< 4.00 RPM	a) Commanded Fan Output Duty Cycle [FEAR_Pct_PWM_Output DutyCycle] b) Diagnostic enabled c) Timer - Test Enable	a) >= 39.00 % b) == TRUE c) >= 2.00 seconds	250.00 failures / 300.00 samples 100 ms / sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.

Idle Control System - Fuel Quantity Lower Than Expected	P054E	This DTC detects if the fuel quantity of the torque forming pulses is lower than the expected fuel quantity request when the engine is idle. Depending on combustion mode and gear, different maps of fuel quantity thresholds can be used. Each map depends on engine speed and engine coolant temperature	Depending on Combustion Mode
			case **StrongExhGasWarmUp:**
			{
			transmission in Gear:
			Fuel quantity of the torque forming pulses
			transmission in Park/ Neutral:
			Fuel quantity of the torque forming pulses
			}
			case **SoftExhGasWarmUp:**
			{
			transmission in Gear:
			Fuel quantity of the torque forming pulses
				< 0.5* **P054E_IFM_MinFuelIdleV3_G** [mm^3] depending on engine speed and engine coolant temperature
				< 0.5* **P054E_IFM_MinFuelIdleV3_PN** [mm^3] depending on engine speed and engine coolant temperature
				< 0.5* **P054E_IFM_MinFuelIdleV2_G** [mm^3] depending on engine speed and engine coolant
					For enabling the monitor, all the following conditions must be satisfied continuously for more than
					Test enabled by calibration
					and
					current gear
					and
					depending on **Gear Selection Calibration =** CeFULR_e_InGearNeutralPark
					(
					CeFULR_e_InGear:
					transmission
					CeFULR_e_NeutralPark:
					transmission
					CeFULR_e_InGearNeutralPark:
					transmission
					)
					and
					engine speed
					and
					engine speed
						5.00 [s]
						1.00 [Boolean]
						unchanged
						in gear
						in park/neutral
						in gear and in park neutral
						> hysteresis(420.00 , 420.00 + 0.00)[rpm]
						<hysteresis(1,560.00 , 1,560.00 + 0.00)[rpml
							200.00 failures out of 255.00 samples
							1 sample every cylinder firing event
								Type B, 2 Trips

<table>
<tr><th>Component/ System</th><th>Fault Code</th><th>Monitor Strategy Description</th><th>Malfunction Criteria</th><th>Threshold Value</th><th>Secondary Parameters</th><th>Enable Conditions</th><th>Time Required</th><th>MIL Ilium.</th></tr>
<tr><td></td><td></td><td></td><td><u>transmission in Park/ Neutral:</u>
Fuel quantity of the torque forming pulses

}
case
HC unloading driving and park/neutral (HCS_DeHC_Drive || HCS DeHC Park):
{
<u>transmission in Gear:</u>
Fuel quantity of the torque forming pulses

<u>transmission in Park/ Neutral:</u>
Fuel quantity of the torque forming pulses

}</td><td>temperature

< 0.5* P054E_IFM_MinFuelIdleV2_PN [mm^3] depending on engine speed and engine coolant temperature

< 0.5* P054E_IFM_MinFuelIdleHC_G [mm^3] depending on engine speed and engine coolant temperature

< 0.5* P054E_IFM_MinFuelIdleHC_PN [mm^3] depending on engine speed and engine coolant temperature</td><td>and
(
OBD Coolant Enable Criteria
OR
engine coolant temperature
)
and
outside air temperature
and
vehicle speed
and
enabled in the combustion mode
and
Accelerator Pedal Position
and
Engine running
and
PTO_PTO_Active
and
Run Crank voltage
and
if the transmission is manual</td><td>

== TRUE

> hysteresis(-6.70 , -6.70) [°C]

> hysteresis(-6.70 , -6.70) [°C]

< 3.00 [kph]

P054E_IFM_CombModesEnbl

<=0.05 [%]

-

== 0 [Boolean]

>=11.00 [V]</td><td></td><td></td></tr>
</table>

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.

			default:
			{
			transmission in Gear:
			Fuel quantity of the torque forming pulses
			
			transmission in Park/ Neutral:
			Fuel quantity of the torque forming pulses
			
			}
				< 0.5* **P054E_IFM_MinFuelIdleC1_G** [mm^3] depending on engine speed and engine coolant temperature
				
				< 0.5* **P054E_IFM_MinFuelIdleC1_PN** [mm^3] depending on engine speed and engine coolant temperature
					(
					if the Gear is Neutral
					AND
					the clutch pedal position
					OR
					the clutch pedal position
					)
					NLT_Active
					
					and
					No active DTC's:
					
					Depending on the **OAT Source Calibration =**
					CeOATR_e_ECM_OAT_Sensor
					(
					CeOATR_e_NonOBD_NonECMNonVICM:
					
					default:
					)
						> 0.00
						
						< 0.00
						
						==0 [Boolean]
						
						OAT_OAT_SnsrNonEmissFA
						
						OAT_PtEstFiltFA
						
						CrankSensor_TFTKO
						
						ECT_Sensor_FA
						
						Transmission Estimated Gear Validity
						
						VehicleSpeedSensor_FA
						
						AcceleratorPedalFailure
						
						ClutchPedalPosSensor_FA
						
						NLT_ActvErr
						
						(FUL_GenericInjSysFA
						AND
						FUL GenericInjSysFlt
						)		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.

Idle Control System - Fuel Quantity Higher Than Expected	P054F	This DTC detects if the fuel quantity of the torque forming pulse is higher than the expected fuel quantity request when the engine is idle. Depending on combustion mode and gear, different maps of fuel quantity thresholds can be used. Each map depends on engine speed and engine coolant temperature	Depending on Combustion Mode
			
			case **StrongExhGasWarmUp:**
			{
			transmission in Gear:
			Fuel quantity of the torque forming pulses
			
			transmission in Park/ Neutral:
			Fuel quantity of the torque forming pulses
			
			}
			case **SoftExhGasWarmUp:**
			{
			transmission in Gear:
			Fuel quantity of the torque forming pulses
				
				> 1.5* **P054F_IFM_MaxFuelIdleV3_G** [mm^3] depending on engine speed and engine coolant temperature
				
				> 1.5* **P054F_IFM_MaxFuelIdleV3_PN** [mm^3] depending on engine speed and engine coolant temperature
				
				> 1.5* **P054F_IFM_MaxFuelIdleV2_G** [mm^3] depending on engine speed and engine coolant temperature
					For enabling the monitor, all the following conditions must be satisfied continuously for more than
					
					Test enabled by calibration
					
					and current gear
					
					and depending on **Gear Selection Calibration =** CeFULR_e_InGearNeutralPark
					{
					CeFULReInGear: transmission
					
					CeFULR_e_NeutralPark: transmission
					
					CeFULR_e_InGearNeutralPark: transmission
					}
					
					and engine speed
					
					and engine speed
					
					and
						5.00 [s]
						
						1.00 [Boolean]
						
						unchanged
						
						in gear
						
						in park/neutral
						
						in gear and in park neutral
						
						> hysteresis(420.00 , 420.00 + 0.00) [rpm]
						
						< hysteresis(1,560.00 , 1,560.00 + 0.00) [rpm]
							200.00 failures out of 255.00 samples
							
							1 sample every cylinder firing event
								Type B, 2 Trips

<table>
<tr><th>Component/ System</th><th>Fault Code</th><th>Monitor Strategy Description</th><th>Malfunction Criteria</th><th>Threshold Value</th><th>Secondary Parameters</th><th>Enable Conditions</th><th>Time Required</th><th>MIL Ilium.</th></tr>
<tr><td></td><td></td><td></td><td><u>transmission in Park/ Neutral:</u></td><td></td><td>{
OBD Coolant Enable Criteria</td><td>== TRUE</td><td></td><td></td></tr>
<tr><td></td><td></td><td></td><td>Fuel quantity of the torque forming pulses</td><td>> 1.5* P054F_IFM_MaxFuelIdleV2_PN [mm^3] depending on engine speed and engine coolant temperature</td><td>OR
engine coolant temperature
}</td><td>> hysteresis(-6.70 , -6.70)[°C]</td><td></td><td></td></tr>
<tr><td></td><td></td><td></td><td>}</td><td></td><td>and
outside air temperature</td><td>> hysteresis(-6.70 , -6.70) [°C]</td><td></td><td></td></tr>
<tr><td></td><td></td><td></td><td>case
HC unloading driving and park/neutral (HCS_DeHC_Drive || HCS_DeHC_Park):
{</td><td></td><td>and
vehicle speed</td><td>< 3.00 [kph]</td><td></td><td></td></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td>and
enabled in the combustion mode</td><td>P054F_IFM_CombModesEnbl</td><td></td><td></td></tr>
<tr><td></td><td></td><td></td><td><u>transmission in Gear:</u>
Fuel quantity of the torque forming pulses</td><td>> 1.5* P054F_IFM_MaxFuelIdleHC_G [mm^3] depending on engine speed and engine coolant temperature</td><td>and
Accelerator Pedal Position</td><td><=0.05 [%]</td><td></td><td></td></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td>and
Engine running</td><td>-</td><td></td><td></td></tr>
<tr><td></td><td></td><td></td><td><u>transmission in Park/ Neutral:</u></td><td></td><td>and
PTO_PTO_Active</td><td>== 0 [Boolean]</td><td></td><td></td></tr>
<tr><td></td><td></td><td></td><td>Fuel quantity of the torque forming pulses</td><td>> 1.5* P054F_IFM_MaxFuelIdleHC_PN [mm^3] depending on engine speed and engine coolant temperature</td><td>and
Run Crank voltage</td><td>>= 11.00 [V]</td><td></td><td></td></tr>
<tr><td></td><td></td><td></td><td>}</td><td></td><td>and
if the transmission is manual
(
if the Gear is Neutral
AND
the clutch pedal position</td><td>>0.00</td><td></td><td></td></tr>
<tr><td></td><td></td><td></td><td>default:</td><td></td><td></td><td></td><td></td><td></td></tr>
</table>

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.

			{
			transmission in Gear:
			Fuel quantity of the torque forming pulses
			
			transmission in Park/ Neutral:
			Fuel quantity of the torque forming pulses
			
			}
				> 1.5* **P054F_IFM_MaxFuelIdleC1_G** [mm^3] depending on engine speed and engine coolant temperature
				
				> 1.5* **P054F_IFM_MaxFuelIdleC1_PN** [mm^3] depending on engine speed and engine coolant temperature
					OR
					
					the clutch pedal position
					)
					
					NLT_Active
					
					and
					No active DTC's:
					
					Depending on the **OAT Source Calibration =** CeOATR_e_ECM_OAT_Sensor
					{
					CeOATR_e_NonOBD_NonECM_NonVICM:
					
					default:
					}
						<0.00
						
						==0 [Boolean]
						
						OAT_OAT_SnsrNonEmissFA
						
						OAT_PtEstFiltFA
						
						CrankSensor_TFTKO
						
						ECT_Sensor_FA
						
						Transmission Estimated Gear Validity
						
						VehicleSpeedSensor_FA
						
						AcceleratorPedalFailure
						
						ClutchPedalPosSensor_FA
						
						NLT_ActvErr
						
						(FUL_GenericInjSysFA AND FUL_GenericInjSysFlt
						)		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Brake Pedal Position Sensor Circuit Range/ Performance	P057B	This diagnostic monitors the Brake Pedal Position Sensor for a stuck in range failure	.Brake pedal position sensor movement diagnostic cal is enabled 1.00	True	Brake Pedal Position Sensor Circuit Range / Performance Diagnostic Enable	1.00 ignition voltage > 10.00		MIL: Type A, 1 Trips
			Calculated EWMA value must be greater than calibratable theshold after calibratable number of tests have completed to report a "test passed" for P057B	EWMA value looked up in supporting table **P057B KtBRKI_K_FastTestPointWeight** P057B as a function of calculated brake pedal position delta EWMA value is > 0.80	calculated brake pedal position delta sample counter > 250.00 for fast test OR calculated brake pedal position delta sample counter > 1,000.00 for slow test	calculated brake pedal position delta > 3.33 OR (for slow test) shift lever has been in park once this key cycle vehicle speed >= 8.00 accelerator pedal position < 5.00	total number of EWMA tests > 20.00	
			Calculated EWMA Value must be less than calibratable threshold after calibratable number of tests have completed to report a "test failed" for P057B. This test runs once per key cycle	EWMA value looked up in supporting table **P057B KtBRKI_K_CmpltTestPointweight** P057B as a function of calculated brake pedal position delta EWMA value is less thatn 0.40	no DTC's active (P057C, P057D)	shift lever has been in park once this key cycle vehicle speed >= 8.00 accelerator pedal position < 5.00	total number of EWMA tests > 2.00	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Brake Pedal Position Sensor Circuit Low	P057C	detects short to ground for brake pedal position sensor	If x of y samples are observed below failure threshold, default brake pedal position to zero percent.	5.00	Brake Pedal Position Sensore Low Voltage Diagnostic Enable	1.00	20 / 32.00 counts	MIL: Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Brake Pedal Position Sensor Circuit High	P057D	detects open circuit for brake pedal position sensor	If x of y samples are observed above failure threshold, default brake pedal position to zero percent and set DTC	95.00	Brake Pedal Position Sensore High Voltage Diagnostic Enable	1.00	20.00/ 32.00 counts	MIL: Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Brake Pedal Position Sensor Circuit Intermittent/ Erratic	P057E	detects noisy / erratic ouput for brake pedal position sensor	If x of y samples are observed above failure threshold, default brake pedal position to zero percent and set DTC	20.50	Brake Pedal Position Sensor Circuit Intermittent / Erratic Diagnostic Enable	1.00	5.00/ 20.00 counts	MIL: Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Cold Start Injection Timing Performance	P05EC	This DTC detects an injection timing only fault by comparison of the requested Start Of Injection by Application SW and the scheduled SOI by HWIO SW in cold start condition.	Comparison of the requested Start Of Injection by Application SW and the scheduled SOI by HWIO SW for all cylinders.	< -4.00 OR > 4.00	Test enabled by calibration AND Engine Speed in range AND At least one injection pulse is commanded by Application SW on all cylinders in the previous engine cycle FUL_FuelInjectedCyl_CiEPSR_CylinderA FUL_FuelInjectedCyl_CiEPSR_CylinderB FUL_FuelInjectedCyl_CiEPSR_CylinderC FUL_FuelInjectedCyl_CiEPSR_CylinderD FUL_FuelInjectedCyl_CiEPSR_CylinderE FUL_FuelInjectedCyl_CiEPSR_CylinderF FUL_FuelInjectedCyl_CiEPSR_CylinderG FUL_FuelInjectedCyl_CiEPSR_CylinderH AND At least one injection pulse is commanded by HWIO OR at least one post injection is commanded by Application SW, on all cylinders in the previous engine cycle	== 1.00 > 400 [rpm] AND < 3,000.00 == TRUE; - -	280.00 failures out of 400.00 samples 1 sample every engine revolution	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					AND No information of dropped pulse reported by HWIO AND No electrical fault on injectors are present AND No Injection Controller Fault AND No faults on crankshaft sensor for the entire driving cycle. AND Cold Start strategy enabled	FUL_FuelInjCkt_FA FUL_CntrlrStFA CrankSensor_FA AND CrankSensor_TFTKO		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Control Module Read Only Memory (ROM)	P0601	This DTC will be stored if the calibration check sum is incorrect or the flash memory detects an uncorrectable error via the Error Correcting Code.	The Primary Processor's calculated checksum does not match the stored checksum value. Covers all software and calibrations.	1 failure if the fault is detected during the first pass. 5.00 failures if the fault occurs after the first pass is complete.			Diagnostic runs continuously in the background.	Type A, 1 Trips
			The Primary Processor's Error Correcting Code hardware in the flash memory detects an error. Covers all software and calibrations.	254 failures detected via Error Correcting Code			Diagnostic runs continuously via the flash hardware.	
			The Primary Processor's calculated checksum does not match the stored checksum value for a selected subset of the calibrations.	2 consecutive failures detected or 5 total failures detected.			Diagnostic runs continuously. Will report a detected fault within 200 ms.	
			The Secondary Processor's calculated checksum does not match the stored checksum value. Covers all software and calibrations.	1 failure if the fault is detected during the first pass. 5 failures if the fault occurs after the first pass is complete.			Diagnostic runs continuously in the background.	
				In all cases, the failure count is cleared when controller shuts down				

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Control Module Not Programmed	P0602	This DTC will be stored if the ECU is a service part that has not been programmed.	Service (reflash) controller calibration present	= 1		none	Diagnostic runs at powerup and once per second continuously after that	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
ECM Long Term Memory Reset	P0603	This DTC detects an invalid NVM which includes a Static NVM, Perserved NVM, ECC ROM in NVM Flash Region, and Perserved NVM during shut down.	Static NVM region error detected during initialization				Diagnostic runs at controller power up.	Type A, 1 Trips
			Perserved NVM region error detected during initialization				Diagnostic runs at controller power up.	
			ECC ROM fault detected in NVM Flash region ECC ROM Error Count >	 3			Diagnostic runs at controller power up.	
			Perserved NVM region error detected during shut down.				Diagnostic runs at controller power down.	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
ECM RAM Failure	P0604	Indicates that the ECM has detected a RAM fault. This includes Primary Processor System RAM Fault, Primary Processor Cache RAM Fault, Primary Processor TPU RAM Fault, Primary Processor Update Dual Store RAM Fault, Primary Processor Write Protected RAM Fault, and Secondary Processor RAM Fault. This diagnostic runs continuously.	Indicates that the primary processor is unable to correctly read data from or write data to system RAM. Detects data read does not match data written >=	254 counts			Will finish first memory scan within 30 seconds at all engine conditions - diagnostic runs continuously (background loop)	Type A, 1 Trips
			Indicates that the primary processor is unable to correctly read data from or write data to cached RAM. Detects data read does not match data written >=	254 counts			Will finish first memory scan within 30 seconds at all engine conditions - diagnostic runs continuously (background loop)	
			Indicates that the primary processor is unable to correctly read data from or write data to TPU RAM. Detects data read does not match data written >=	5 counts			Will finish first memory scan within 30 seconds at all engine conditions - diagnostic runs continuously (background loop)	
			Indicates that the primary processor detects a mismatch between the data and dual data is found during RAM updates. Detects a mismatch in data and dual data updates >	0.47728 s			When dual store updates occur.	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			Indicates that the primary processor detects an illegal write attempt to protected RAM. Number of illegal writes are >	65,534 counts			Diagnostic runs continuously (background loop)	
			Indicates that the secondary processor is unable to correctly read data from or write data to system RAM. Detects data read does not match data written >=	5 counts			Will finish first memory scan within 30 seconds at all engine conditions - diagnostic runs continuously (background loop)	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Internal ECM Processor Integrity Fault	P0606	Indicates that the ECM has detected an internal processor integrity fault. These include diagnostics done on the SPI Communication as well as a host of diagnostics for both the primary and secondary processsors.	Loss or invalid message of SPI communication from the Secondary Processor at initialization detected by the Primary Processor or loss or invalid message of SPI communication from the Secondary Processor after a valid message was received by the Primary Processor	Loss or invalid message at initialization detected or loss or invalid message after a valid message was recieved	Run/Crank voltage Run/Crank voltage	>=6.41 Volts or >= 11.00 Volts, else the failure will be reported for all conditions	In the primary processor, 159/399 counts intermittent or 39 counts continuous; 39 counts continuous @ initialization. 12.5 ms /count in the ECM main processor	Type A, 1 Trips
			Loss or invalid message of SPI communication from the Primary Processor at initialization detected by the Secondary Processor or loss or invalid message of SPI communication from the Primary Processor after a valid message was received by the Secondary Processor	Loss or invalid message at initialization detected or loss or invalid message after a valid message was recieved			In the secondary processor, 20/200 counts intermittent or 0.1875 s continuous; 0.4750 s continuous @ initialization. 12.5 ms /count in the ECM secondary processor	
			Checks for stack over or underflow in secondary processor by looking for corruption of known pattern at stack boundaries. Checks number of stack over/ under flow since last powerup reset >=	5		Test is Enabled: 1 (If 0, this test is disabled)	variable, depends on length of time to corrupt stack	
			MAIN processor is verified by responding to a seed sent from the secondary with a key response to secondary. Checks number of incorrect keys	2 incorrect seeds within 8 messages, 0.2000 seconds		ignition in Run or Crank	150 ms for one seed continually failing	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			received > or Secondary processor has not received a new within time limit					
			Time new seed not received exceeded			always running	0.450 seconds	
			MAIN processor receives seed in wrong order			always running	3 / 17 counts intermittent. 50 ms/count in the ECM main processor	
			2 fails in a row in the Secondary processor's ALU check			Test is Enabled: 1 (If 0, this test is disabled)	25 ms	
			2 fails in a row in the Secondary processor's configuration register masks versus known good data			Test is Enabled: 1 (If 0, this test is disabled)	12.5 to 25 ms	
			Secondary processor detects an error in the toggling of a hardware discrete line controlled by the MAIN processor: number of discrete changes > = or < = over time window(50ms)	7 17		Test is Enabled: 0 . (If 0, this test is disabled) time from initialization >= 0.4875 seconds	50 ms	
			Software background task first pass time to complete exceeds			Run/Crank voltage > 6.41	360.000 seconds	
			2 fails in a row in the MAIN processor's ALU check			Test is Enabled: 1 (If 0, this test is disabled)	25 ms	
			2 fails in a row in the MAIN orocessor's			Test is Enabled: 1	12.5 to 25 ms	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			configuration register masks versus known good data			(If 0, this test is disabled)		
			Checks number of stack over/under flow since last powerup reset >=	3		Test is Enabled: 1 (If 0, this test is disabled)	variable, depends on length of time to corrupt stack	
			Voltage deviation >	0.4950		Test is Enabled: 1 (If 0, this test is disabled)	5 / 10 counts or 0.150 seconds continuous; 50 ms/count in the ECM main processor	
			Checks for ECC (error correcting code) circuit test errors reported by the hardware for flash memory. Increments counter during controller initialization if ECC error occured since last controller initialization. Counter >=	3 (results in MIL), 5 (results in MIL and remedial action)		Test is Enabled: 1 (If 0, this test is disabled)	variable, depends on length of time to access flash with corrupted memory	
			Checks for ECC (error correcting code) circuit test errors reported by the hardware for RAM memory circuit. Increments counter during controller initialization if ECC error occured since last controller initialization. Counter >=	3 (results in MIL), 5 (results in MIL and remedial action)		Test is Enabled: 1 (If 0, this test is disabled)	variable, depends on length of time to write flash to RAMvariable, depends on length of time to write flash to RAM	
			MAIN processor DMA transfer from Flash to RAM has 1 failure			Test is Enabled: 0 (If 0, this test is disabled)	variable, depends on length of time to write flash to	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
							RAM	
			Safety critical software is not executed in proper order.	>= 1 incorrect sequence.		Test is Enabled: 1 (If 0, this test is disabled)	Fail Table, f(Loop Time). See supporting tables: **P0606_PSW Sequence Fail f (Loop Time)** / Sample Table, f (Loop Time)See supporting tables: **P0606_PSW Sequence Sample f(Loop Time)** counts 50 ms/count in the ECM main processor	
			MAIN processor determines a seed has not changed within a specified time period within the 50ms task.	Previous seed value equals current seed value.		Test is Enabled: 1 (If 0, this test is disabled)	Table, f(Loop Time). See supporting tables: **P0606_Last Seed Timeout f (Loop Time)**	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Internal Control Module Redundant Memory Performance (Diesel)	P060C	Detect Processor Calculation faults due to RAM corruptions, ALU failures and ROM failures For all of the following cases: If the individual diagnostic threshold is equal to 2048 ms, this individual case is not applicable. If any of the following cases are X out of Y diagnostics and the fail (x) is greater than the sample (Y), this individual case is also not applicable.	Torque Learn offset is out of bounds given by threshold range	High Threshold 0.00 Nm Low Threshold 0.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multipier	Type A, 1 Trips
			Commanded Predicted Engine Torque and its dual store do not match	N/A	Ignition State	Accessory, run or crank	Up/down timer 2,048 ms continuous, 0.5 down time multipier	
			Zero pedal axle torque is out of bounds given by threshold range	High Threshold 3,269.36 Nm Low Threshold -65,535.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multipier	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			Creep Coast Axle Torque is out of bounds given by threshold range	High Threshold 3,269.36 Nm Low Threshold -65,535.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 2,048 ms continuous, 0.5 down time multipier	
			Rate limited vehicle speed and its dual store do not equal	N/A		Time since first CAN message with vehicle speed >= 0.500 sec	10/40 counts; 25.0msec/count	
			Commanded engine torque due to fast actuators and its dual store do not equal	N/A	Ignition State	Accessory, run or crank	Up/down timer 465 ms continuous, 0.5 down time multipier	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			Commanded engine torque due to slow actuators and its dual store do not equal	N/A	Ignition State	Accessory, run or crank	Up/down timer 465 ms continuous, 0.5 down time multipier	
			TOS to wheel speed conversion factor is out of bounds given by threshold range	High Threshold: 1.10 T/C Range Hi 0.10 T/C Range Lo Low Threshold: 1.10 T/C Range Hi 0.10 T/C Range Lo	Ignition State	Accessory, run or crank	255/6 counts; 25.0msec/count	
			TOS to wheel speed conversion factor is out of bounds given by threshold	N/A	Ignition State	Accessory, run or crank Transfer case range valid	7.00/ 10.00 counts; 25.0msec/count	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			range Transfer case neutral request from four wheel drive logic does not match with operating conditions			and not over-ridden FWD Apps only		
			Driver progression mode and its dual store do not equal	N/A	Ignition State	Accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	
			Predicted torque for uncorrected zero pedal determination is greater than calculated limit.	Minimum value **P060C_Speed Control External Load f(Oil Temp, (RPM)** , **P060C_Speed Control External Load Max f(Vehicle Speed, RPM) +** **P060C_Speed Control External Load Offset f(Vehicle Sped, Transmission Oil Temp)**) +	Ignition State	Accessory, run or crank	Up/down timer 2,048 ms continuous, 0.5 down time multipier	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
				190.00 Nm				
			Engine Predicted Request Without Motor is greater than its redundant calculation plus threshold	4,096.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 2,048 ms continuous, 0.5 down time multipier	
			Engine Immediate Request Without Motor is greater than its redundant calculation plus threshold	189.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 165 ms continuous, 0.5 down time multipier	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			Commanded Predicted Engine Request is greater than its redundant calculation plus threshold	4,096.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 2,048 ms continuous, down time multipier0.5	
			Commanded Hybrid Predicted Crankshaft Request is greater than its redundant calculation plus threshold	4,096.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 2,048 ms continuous, 0.5 down time multipier	
			Commanded Hybrid Immediate Crankshaft Request is less than its redundant calculation minus threshold	4,096.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 2,048 ms continuous, 0.5 down time multipier	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			Commanded Immediate Engine Request is greater than its redundant calculation plus threshold	190.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	
			Engine Speed Lores Intake Firing (event based) calculation not equal its redundant calculation	N/A		Engine speed greater than Orpm	Up/down timer 165 ms continuous, 0.5 down time multipier	
			Engine Speed Lores	N/A		Engine speed greater	Up/down timer	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			Intake Firing timing (event based) calculation not equal its redundant calculation			than Orpm	165 ms continuous, 0.5 down time multipier	
			Idle speed control calculated predicted minimum torque request exceeds calculated torque limit	Minimum value (**P060C_Speed Control External Load f(Oil Temp, RPM)** , **P060C_Speed Control External Load Max f(Vehicle Speed, RPM) + P060C_Speed Control External Load Offset f(Vehicle Sped, Transmission Oil Temp)**) + 190.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 2,048 ms continuous, 0.5 down time multipier	
			Idle speed control calculated predicted minimum torque without reserves exceeds calculated torque limit	Minimum value (**P060C_Speed Control External Load f(Oil Temp, RPM)** ,	Ignition State	Accessory, run or crank	Up/down timer 2,048 ms continuous, 0.5 down time multipier	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
				P060C_Speed Control External Load Max f(Vehicle Speed, RPM) + P060C_Speed Control External Load Offset f(Vehicle Sped, Transmission Oil Temp)) + 190.00 Nm				
			Difference between Driver Requested Immediate Torque primary path and its secondary exceeds threshold	3,269.36 Nm	Ignition State	Accessory, run or crank	Up/down timer 2,048 ms continuous, 0.5 down time multipier	
			Driver Immediate Request is less than its redundant calculation minus threshold	3,269.36 Nm	Ignition State	Accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	
			Commanded Immediate	3,269.36	Ignition State	Accessory, run or crank	Up/down timer	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			Request is greater than its redundant calculation plus threshold OR Commanded Immediate Request is less than its redundant calculation minus threshold	Nm			475 ms continuous, 0.5 down time multipier	
			Commanded Immediate Response Type is set to Inactive	N/A	Ignition State	Accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	
			Difference between Cruise Axle Torque Arbitrated Request and Cruise Axle Torque Request exceeds threshold	93.75 Nm		Cruise has been engaged for more than 4.00 seconds	Up/down timer 2,048 ms continuous, 0.5 down time multipier	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			Desired engine torque request greater than redundant calculation plus threshold	189.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 2,048 ms continuous, 0.5 down time multipier	
			Absolute difference of adjustment factor based on temperature and its dual store above threshold	550.50 m/s	Ignition State	Accessory, run or crank	Up/down timer 2,048 ms continuous, 0.5 down time multipier	
			1. Absolute difference of redundant calculated engine speed above threshold	500 RPM		Engine speed greater than 0 RPM	Up/down timer 165 ms continuous, 0.5 down time multipier	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			Speed Control's Preditcted Torque Request and its dual store do not match	N/A	Ignition State	Accessory, run or crank	Up/down timer 2,048 ms continuous, 0.5 down time multipier	
			Engine oil temperature and its dual store do not match	N/A	Ignition State	Accessory, run or crank	Up/down timer 192 ms continuous, 0.5 down time multipier	
			Difference of base friction torque and its redundant calculation is out of bounds given by threshold range	High Threshold 190.00 Nm Low Threshold -190.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			AC friction torque is greater than commanded by AC control software or less than threshold limit	High Threshold 35.00 Nm Low Threshold 0.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	
			Generator friction torque is out of bounds given by threshold range	High Threshold 190.00 Nm Low Threshold 0.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	
			Engine Torque Closed Loop Fuel Quantity Correction higher then threshold OR	8.07 mm3	Engine cranking or engine running		Up/down timer 2,048 ms continuous, 0.5 down time multipier	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			Engine Torque Closed Loop Fuel Quantity Correction lower then threshold	- 8.07 mm3				
			1. Difference of reserve torque value and its redundant calculation exceed threshold OR 2. Reserve request does not agree with operating conditions or Difference of final predicted torque and its redundant calculation exeed threshold OR 3. Rate of change of reserve torque exceeds threshold, increasing direction only OR 4. Reserve engine torque above allowable capacity threshold	1. 189.00 Nm 2. N/A 3. 189.00 Nm 4. 189.00 Nm	3. &4.: Ignition State	1. &2.: Torque reserve (condition when spark control greater than optimum to allow fast transitions for torque disturbances) > 190.00 Nm 3. &4.: Accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	
			Min. Axle Torque Capacity	0.00	Ignition State	Accessory, run or crank	Up/down timer	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			is greater than threshold	Nm			175 ms continuous, 0.5 down time multipier	
			Driver Predicted Request is greater than its redundant calculation plus threshold OR Driver Predicted Request is less than its redundant calculation minus threshold	3,269.36 Nm	Ignition State	Accessory, run or crank	Up/down timer 2,048 ms continuous, 0.5 down time multipier	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			Commanded Predicted Axle Torque and its dual store do not match	1 Nm	Ignition State	Accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	
			Rate limited cruise axle torque request and its dual store do not match within a threshold	93.75 Nm	Ignition State	Accessory, run or crank	Up/down timer 163 ms continuous, 0.5 down time multipier	
			1. Absolute difference of Calculated accelerator pedal position compensated for carpet learn and error conditions and its redundant calculation is out of bounds given by threshold range OR 2. Absolute difference of Calculated accelerator pedal position compensated for carpet learn and error conditions	1. 5.00 % 2. N/A 3. N/A	Ignition State	Accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			and its dual store do not equal OR 3. Absolute difference of Calculated accelerator pedal position and its dual store do not equal					
			Commanded axle torque is greater than its redundant calculation by threshold	3,269.36 Nm	Ignition State	Accessory, run or crank	Up/down timer 2,048 ms continuous, 0.5 down time multipier	
			Commanded axle torque is less than its redundant calculation by threshold	4,904.04 Nm	Ignition State	Accessory, run or crank	Up/down timer 2,048 ms continuous, 0.5 down time multipier	
			AC friction torque is greater than commanded	40.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 2,048	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			by AC control software				ms continuous, 0.5 down time multipier	
			Engine Speed Lores Intake Firing (time based) calculation does not equal its redundant calculation	N/A		Engine speed >0rpm	Up/down timer 175 ms continuous, 0.5 down time multipier	
			Transmission Torque Request cacluations do not equal their dual stores	N/A		Run or Crank = TRUE > 0.50 s	16/32 counts; 25.0msec/count	
			Pedal learns and their redundant calculation do not equal		Ignition State	Accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	
			Requested fuel mass is greater or equal to its redundant calculation plus threshold	13.67 mg	Engine running No rich combustion mode No cranking phase		Up/down timer 464.78 ms continuous, 0.5 down time	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					No fuel cut off request		multiplier	
			Engine friction torque is greater than its redundant calculation plus threshold OR Engine friction torque is lower than its redundant calculation minus threshold	190.00 Nm 190.00 Nm	Engine running		Up/down timer 475.00 ms continuous, 0.5 down time multiplier	
			High Pressure Pump Torque Load is greater than threshold OR High Pressure Pump Torque Load is lower than threshold	190.00 Nm 0.00 Nm	Engine running		Up/down timer 475.00 ms continuous, 0.5 down time multiplier	
			Limited Immediate Indicated Torque request is greater than its redundant calculation plus threshold	190.00 Nm	Engine running		Up/down timer 464.78 ms continuous, 0.5 down time multiplier	
			Active damping torque reduction greater than threshold OR Active damping torque reduction lower than threshold	190.00 Nm -190.00 Nm	Engine running		Up/down timer 164.78 ms continuous, 0.5 down time multiplier	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			Fuel volume request greater than its redundant calculation plus threshold	16.13 mm3	Engine running No rich combustion mode		Up/down timer 464.78 ms continuous, 0.5 down time multiplier	
			Absolute value of the sum of the Fuel Volumes in the pulse train minus Fuel Volume Request minus Main Correction greater than threshold	16.13 mm3	Engine Running No rich combustion mode Main pulse quantity already compensated with main correction is greater than or equal to zero		Up/down timer 164.78 ms continuous, 0.5 down time multiplier	
			Cumulative Programmed Energizing Time greater then its redundant calculation plus threshold (Note: when an emission test is performed OR CSERS test is performed the threshold is incremented by a further value)	174.90 us additional value for emission tests: 0.00 us additional value fro CSERS test 0.00 us	Engine running		Up/down timer 164.78 ms continuous, 0.5 down time multiplier	
			Cumulative Desired Energizing Time greater than its redundant calculation plus threshold (Note: when an emission test is performed OR CSERS test is performed the threshold is incremented by a further value)	174.90 us additional value for emission tests: 0.00 us additional value fro CSERS test 0.00 us	Engine Running		Up/down timer 164.78 ms continuous, 0.5 down time multiplier	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			Difference between Fuel Rail Pressure Event Based Signal and Fuel Rail Pressure Time Based signal higher than threshold OR Difference between Fuel Rail Pressure Event Based Signal and Fuel Rail Pressure Time Based signal lower than threshold	300.00 MPa -40.00 MPa	Engine running Delta Filtered Pressure value lower than AND Delta Filtered Pressure value greater than	 1,880.25 MPa/s -3,582.25 MPa/s	Up/down timer 464.78 ms continuous, 0.5 down time multiplier	
			Absolute difference between Main Correction and its redundant calculation greater than or equal to threshold	16.13 mm3	Engine running No rich combustion mode		Up/down timer 164.78 ms continuous, 0.5 down time multiplier	
			Cylinder Balancing Fuel Quantity Compensation converted in Energizing Time greater than its redundant calculation plus threshold OR (only if cylinder balancing detected a fault) Cylinder Balancing Fuel Quantity Compensation converted in Energizing Time greater than threshold	**P060C_CB safety deadband threshold f (Fuel Rail Pressure)** us **P060C_CB safety deadband threshold f (Fuel Rail Pressure)** us	Engine running		Up/down timer 164.78 ms continuous, 0.5 down time multiplier	
			Absolute value of the difference between the calculated EIA	**P060C_EIA safety deadband threshold f (Fuel Rail Pressure)**	Engine cranking or engine running		Up/down timer 164.78 ms continuous,	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			compensation and its redundant calculation greater than threshold	us			0.5 down time multiplier	
			Absolute value of the difference between the calculated EIA compensation and its redundant calculation greater than threshold	16.13 mm3	Engine cranking or engine running		Up/down timer 164.78 ms continuous, 0.5 down time multiplier	
			Absolute value of the weighted delta energizing time greater then threshold	**P060C_SQA safety deadband threshold f (Fuel Rail Pressure)** us	Ignition State	Accessory, run or crank	Up/down timer 464.78 ms continuous, 0.5 down time multiplier	
			Oil Pump Low Pressure Offset Friction greater then zero OR Oil Pump Low Pressure Offset Friction lower then threshold	 -3.00 Nm	Engine running		Up/down timer 475.00 ms continuous, 0.5 down time multiplier	
			Rate of change on fuel mass compensaton for coolant temperature greater than P2D2 threshold	68.35 mg/sec	Engine running No rich combustion mode No cranking phase No fuel cut off request		Up/down timer 464.78 ms continuous, 0.5 down time multiplier	
			Absolute value of fuel mass compensated for air temperature greater then threshold	6.84 mg	Engine running No rich combustion mode No cranking phase No fuel cut off request	Accessory, run or crank	Up/down timer 464.78 ms continuous, 0.5 down time multiplier	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			Absolute value of fuel mass compensated for vehicle speed greater than threshold	6.84 mg	Engine running No rich combustion mode No cranking phase No fuel cut off request	Accessory, run or crank	Up/down timer 164.78 ms continuous, 0.5 down time multiplier	
			Absolute value of Main correction compensation based on coolant temperature greater then threshold	8.07 mm3	Engine Running No rich combustion mode		Up/down timer 164.78 ms continuous, 0.5 down time multiplier	
			Rail Pressure Wave Compensation greater than threshold	**P060C_Rail Pressure Wave Compensation f(Fuel Rail Pressure, Fuel Quantity)** MPa	Engine cranking or running		Up/down timer 2,047.97 ms continuous, 0.5 down time multiplier	
			Injector Valve Closing Adjustment energizing time correction greater then threshold OR Injector Valve Closing Adjustment energizing time correction lower then threshold	**P060C_VCA safety max deadband threshold f(Fuel Rail Pressure)** us **P060C_VCA safety min deadband threshold f(Fuel Rail Pressure)** us	Engine Cranking or engine running		Up/down timer 464.78 ms continuous, 0.5 down time multiplier	
			Desired Immediate Indicated torque greater then its redundant calculation plus threshold	190.00 Nm	Engine running		Up/down timer 464.78 ms continuous, 0.5 down time multiplier	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			Fuel Temperature Energizing Time Compensation greater then its redundant calculation plus threshold	**P060C_FTD safety deadband threshold f (Fuel Rail Pressure)** us	(Engine running OR engine cranking occurred in current driving cycle) AND FULJnjLeakTempValid	 = TRUE	Up/down timer 78.41 ms continuous, 0.5 down time multiplier	
			Absolute value of the diffence between current and previous Fuel Injector Backflow Temperature greater then threshold	2,047.94 °C/100ms	Engine cranking or engine running ECT_Sensor_FA AND FTS_FTS_CktFA AND FTS_FTS_PIFA AND XOY_SecurityFlt_CeXOYR_e_FULR_FTD_RateLimFlt AND XOY_SecurityFlt_CeXOYR_e_ETMR_FTD_RedntCalcFlt	 = FALSE = FALSE = FALSE = FALSE = FALSE	Up/down timer 2,047.97 ms continuous, 0.5 down time multiplier	
			Increase of pumping losses due to exhaust brake actuation less then threshold	0.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 475.00 ms continuous, 0.5	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
							down time multiplier	
			Exhaust Brake Torque Capacity less then Threshold	0.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 475.00 ms continuous, 0.5 down time multiplier	
			Delta Engine Fuel Temperature less than zero		Engine Fuel Temperature below threshold Engine cranking or engine running	80.00° C	Up/down timer 462.50 ms continuous, 0.5 down time multiplier	
			Combustion Mode Arbitration Winner is higher than the maximum expected combustion mode OR Previous Combustion Mode Arbitration Winner is higher than the maximum expected combustion mode OR Combustion Mode Arbitration Winner is equal to Previous Combustion Mode Arbitration Winner and not equal to Normal combustion Mode		Engine cranking or engine running		Up/down timer 162.50 ms continuous, 0.5 down time multiplier	
			The sum of Low, Middle		Engine cranking or engine		Up/down timer	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			and High Barometric Correction Factors greater than 1		running		462.50 ms continuous, 0.5 down time multiplier	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Fuel Pump Relay Control Circuit Low Voltage	P0628	Controller specific output driver circuit diagnoses the Feed Fuel Pump Relay high sided driver for a short to ground failure when the output is powered on by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range during driver on state indicates short to ground failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for a short to ground.	<= 0.5 Ohms impedance between signal and controller ground	Run/Crank Voltage Engine Speed	Voltage 11.00 volts ORPM	8 failures out of 10 samples 250 ms / sample	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Fuel Pump Relay Control Circuit High Voltage	P0629	Controller specific output driver circuit diagnoses the Feed Fuel Pump Relay high sided driver for a short to power failure when the output is powered off by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range during driver off state indicates short to power failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for a short to power.	<= 0.5 Ohms impedance between signal and controller power	Run/Crank Voltage Engine Speed	Voltage 11.00 volts ORPM	8 failures out of 10 samples 250 ms / sample	Type A, 1 Trips Note: In certain controllers P0627 may also set (Fuel Pump Relay Control Open Circuit)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Internal Control Module Fuel Injector Control Performance	P062B	This DTC Diagnoses the internal fuel injector control module circuit for circuit faults. The following check are performed: - Chip initialization - Boost voltage - chip test - Code and Parameter - SPI error (SPI communication failed)	Driver Status OR (Driver Status for a number of samples)	== FAILED (chip test not passed OR Wrong download of microcode OR SPI error) == NOT INITIALIZED (chip not initialized OR Boost Voltage < 40.00) > 10 samples	Test enabled by calibration; and Battery voltage and Key ON and Engine is not cranking and Boost Voltage has achieved (at least one time)	== 1 [Boolean] > 11.00 [V] - - 40.00 [V]	4 failures out of 8 samples 12.5 ms / sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Fuel Injector Driver Circuit Performance Bank 1	P062D	This DTC detects if there is: open circuit of the power supply line of the injector or Boost voltage fault or ECU internal fault The monitoring determines if the boost voltage is above a threshold or below another threshlod with hysteresis	Internal ECU Boost Voltage	> 58.00 [V] OR < hysteresis(40.00 , 41.00) [V]	Test enabled by calibration; and Battery voltage and Key ON and Engine is not cranking	== 1 [Boolean] > 11.00 [V] - -	14 failures out of 20 samples 6.25 ms/sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Powertrain Internal Control Module EEPROM Error	P062F	This DTC detects a NVM long term performance. There are two types of diagnostics that run during controller power up. One for HWIO reports that writing to NVM (at shutdown) will not succeed, and the other HWIO reports the assembly calibration integrity check has failed.	HWIO reports that writing to NVM (at shutdown) will not succeed				Diagnostic runs at controller power up.	Type B, 2 Trips
			HWIO reports the assembly calibration integrity check has failed				Diagnostic runs at controller power up.	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
VIN Not Programmed or Mismatched - Engine Control Module (ECM)	P0630	This DTC checks that the VIN is correctly written	At least one of the programmed VIN digits	= 00 or FF	OBD Manufacturer Enable Counter	= 0	250 ms / test Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
5 Volt Reference #1 Circuit	P0641	Detects a continuous or intermittent short on the 5 volt reference circuit #1 by monitoring the reference percent Vrefl and failing the diagnostic when the percent Vrefl is too low or too high or if the delta between the filtered percent Vrefl and non-filtered percent Vrefl is too large. This diagnostic only runs when battery voltage is high enough.	ECM percent Vrefl < or ECM percent Vrefl > or the difference between ECM filtered percent Vrefl and percent Vrefl >	4.875 % Vrefl 5.125% Vrefl 0.0494 % Vrefl	Diagnostic enabled AND [(Run/Crank voltage for Time period AND Starter engaged) OR (Run/Crank voltage AND Starter engaged)]	= 1 >6.41 Volts = 0.02 Seconds = FALSE >8.41 Volts = TRUE	19/39 counts; or 0.1875 sec continuous; 12.5 ms/count in main processor	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Malfunction Indicator Lamp (MIL) Control Circuit (ODM) Open	P0650	Detects an inoperative malfunction indicator lamp control low side driver circuit. This diagnostic reports the DTC when an open circuit is detected.	Voltage low during driver off state (indicates open circuit)	Open circuit: > 200 K Q impedance between signal and controller ground	Run/Crank Voltage Remote Vehicle Start is not active	Voltage > 11.00 volts	1 failures out of 1 samples 50 ms / sample	Type B, No MIL NO MIL Note: In certain controlle rs P263A may also set (MIL Control Short to Ground)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
5 Volt Reference #2 Circuit	P0651	Detects a continuous or intermittent short on the 5 volt reference circuit #2 by monitoring the reference percent Vref2 and failing the diagnostic when the percent Vref2 is too low or too high or if the delta between the filtered percent Vref2 and non-filtered percent Vref2 is too large. This diagnostic only runs when battery voltage is high enough.	ECM percent Vref2 < or ECM percent Vref2 > or the difference between ECM filtered percent Vref2 and percent Vref2 >	4.875 % Vref2 5.125% Vref2 0.0494 % Vref2	Diagnostic enabled AND [(Run/Crank voltage for Time period AND Starter engaged) OR (Run/Crank voltage AND Starter engaged)]	= 1 >6.41 Volts = 0.02 Seconds = FALSE >8.41 Volts = TRUE	19/39 counts; or 0.1875 sec continuous; 12.5 ms/count in main processor	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Powertrain Relay Control (ODM) Open	P0685	Detects an open circuit in the Powertrain Relay driver. This diagnostic reports the DTC when an open circuit failure is present. Monitoring occurs when the output is powered off. A decision is made by comparing a voltage measurement to a controller specific voltage threshold.	Voltage measurement outside of controller specific acceptable range during driver off state indicates open circuit failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for an open circuit.	Open Circuit: > 200 K Q ohms impedance between output and controller ground	Run/Crank Voltage	Voltage > 11.00 volts	8 failures out of 10 samples 250 ms / sample	Type B, 2 Trips Note: In certain controllers P0686 may also set (Powertrain Relay Control Short to Ground).

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Powertrain Relay Control (ODM) Low	P0686	Detects a short to ground in the Powertrain Relay low side driver. This diagnostic reports the DTC when a short to ground failure is present. Monitoring occurs when the output is powered off. A decision is made by comparing a voltage measurement to a controller specific voltage threshold.	Voltage measurement outside of controller specific acceptable range during driver off state indicates short to ground failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for a short to ground.	Short to ground: < 0.5 Q impedance between output and controller ground	Run/Crank Voltage	Voltage > 11.00 volts	8 failures out of 10 samples 250 ms / sample	Type B, 2 Trips Note: In certain controllers P0685 may also set (Powertrain Relay Control Open Circuit).

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Powertrain Relay Control (ODM) High	P0687	Detects a short to power in the Powertrain Relay low side driver. This diagnostic reports the DTC when a short to power failure is present. Monitoring occurs when the output is powered off. A decision is made by comparing a voltage measurement to a controller specific voltage threshold.	Voltage measurement outside of controller specific acceptable range during driver on state indicates short to power failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for a short to power.	Short to power: < 0.5 Q impedance between output and controller power	Run/Crank Voltage	Voltage > 11.00 volts	8 failures out of 10 samples 250 ms / sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Control Module Power Relay Feedback Circuit Low Voltage	P0689	Detects low voltage in the control module relay feedback circuit. This diagnostic reports the DTC when low voltage is present. Monitoring occurs when run crank voltage is above a calibrated value.	Control module relay feedback circuit low voltage	Powertrain relay voltage <=5.00	Powertrain relay short low diagnostic enable Run Crank voltage Powertrain relay state	= 1.00 >9.00 = ON	5 failures out of 6 samples 1000 ms / sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Powertrain Relay Feedback Circuit High	P0690	Detects higher than expected voltage in the powertrain relay feedback circuit. This diagnostic reports the DTC when higher than expected voltage is present. For example, the powertrain relay could be stuck on. Monitoring occurs when the relay is commanded "off' for a calibrated duration.	Powertrain Relay Voltage	>= 4.00 volts will increment the fail counter	Powertrain relay commanded “OFF” No active DTCs:	>=2.00 seconds PowertrainRelayStateOn_FA	50 failures out of 63 samples 100ms / Sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Cooling Fan 1 Relay Control Circuit Low Voltage (ODM)	P0691	Diagnoses the cooling fan 1 relay control low side driver circuit for circuit faults	Voltage low during driver off state (indicates short-to-ground)	Short to ground: < 0.5 Ω impedance between signal and controller ground	Powertrain Relay Voltage	Voltage > 11.00 volts	50.00 failures out of 63.00 samples 100 ms / sample	Type B, 2 Trips Note: In certain controllers P0480 may also set (Fan 1 Open Circuit).

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Cooling Fan 1 Relay Control Circuit High Voltage (ODM)	P0692	Diagnoses the cooling fan 1 relay control low side driver circuit for circuit faults	Voltage high during driver on state (indicates short to power)	Short to power: < 0.5 Q impedance between signal and controller power	Powertrain Relay Voltage	Voltage > 11.00 volts	50.00 failures out of 63.00 samples 100 ms / sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
5 Volt Reference #3 Circuit	P0697	Detects a continuous or intermittent short on the 5 volt reference circuit #3 by monitoring the reference percent Vref3 and failing the diagnostic when the percent Vref3 is too low or too high or if the delta between the filtered percent Vref3 and non-filtered percent Vref3 is too large. This diagnostic only runs when battery voltage is high enough.	ECM percent Vref3 < or ECM percent Vref3 > or the difference between ECM filtered percent Vref3 and percent Vref3 >	4.875 % Vref3 5.125% Vref3 0.0494 % Vref3	Diagnostic enabled AND [(Run/Crank voltage for Time period AND Starter engaged) OR (Run/Crank voltage AND Starter engaged)]	= 1 >6.41 Volts = 0.02 Seconds = FALSE >8.41 Volts = TRUE	19/39 counts; or 0.1875 sec continuous; 12.5 ms/count in main processor	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
5 Volt Reference #4 Circuit	P06A3	Detects a continuous or intermittent short on the 5 volt reference circuit #4 by monitoring the reference percent Vref4 and failing the diagnostic when the percent Vref4 is too low or too high or if the delta between the filtered percent Vref4 and non-filtered percent Vref4 is too large. This diagnostic only runs when battery voltage is high enough.	ECM percent Vref4 < or ECM percent Vref4 > or the difference between ECM filtered percent Vref4 and percent Vref4 >	4.875 % Vref4 5.125% Vref4 0.0494 % Vref4	Diagnostic enabled AND [(Run/Crank voltage for Time period AND Starter engaged) OR (Run/Crank voltage AND Starter engaged)]	= 1 >6.41 Volts = 0.02 Seconds = FALSE >8.41 Volts = TRUE	19/39 counts; or 0.1875 sec continuous; 12.5 ms/count in main processor	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Transmission Control Module (TCM) Requested MIL Illumination	P0700	Monitors the TCM MIL request message to determine when the TCM has detected a MIL illuminating fault.	Transmission Control Module Emissions-Related DTC set and module is requesting MIL	Transmission Control Module Emissions-Related DTC set and module is requesting MIL		Time since power-up > 3 seconds	Continuous	Type A, No MIL

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Fuel Pump Driver Control Module Reset Signal Message Counter Incorrect	P1000	This DTC monitors for an error in communication with the Fuel Pump Driver Control Module Reset Signal	Communication of the Alive Rolling Count or Protection Value from the FPDCM over CAN bus is incorrect for out of total samples	 >= 8 counts >= 10 counts	Message frame All the following conditions are met for Power Mode Powertrain Relay Voltage Run/Crank Ignition Voltage And Sensor Bus Relay	= Is available >= 3,000.00 milliseconds = Run >=11.00 Volts >=11.00 Volts = On (if present)	Executes in 10ms loop.	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Fuel Pump Driver Control Module System Voltage Performance (Only on applications that use an FTZM)	P1002	Detects low system voltage performance of the fuel pump driver control module system. This diagnostic reports the DTC when the absolute value of the difference between the fuel pump driver battery voltage and the fuel pump driver run/crank voltage exceeds a calibrated value.	Fuel Pump Driver Control Module Run Crank voltage low and high	ABS (Fuel Pump Driver Control Module Battery voltage - Fuel Pump Driver Control Module Run Crank voltage) > 3.00	Fuel Tank Zone Module (FTZM) is present on vehicle Fuel Pump Driver Control Module System Voltage Performance diagnostic is enabled Fuel Tank Zone Module (FTZM) serial messages are available FTZM Run Crank Active is TRUE Starter motor not engaged Sensor Bus relay is commanded ON	 = 1	100 failures out of 125 samples 12.5 ms / sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Fuel Pump Driver Control Module Reset Error	P1005	This DTC monitors for a reset error in the Fuel Pump Driver Control Module	If the received value for the time since the last FPDCM reset has reset and the newly received value or previous value is	<=0.50 seconds	DTC is enabled	Enabled	Diagnostic runs in 50 ms loop.	Type A, 1 Trips
					Sensor bus relay	On		
					Battery voltage	> 11.00 Volts		
			for	>=2.00 counts	P1000	Not active		
			out of total samples	>=400.00 counts	U18A2	Not active		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Fuel Pump Driver Control Module Ignition Switch Run/ Start Position Circuit High (Only on applications that use an FTZM)	P1007	Detects high voltage of the fuel pump driver control module ignition switch circuit. This diagnostic reports the DTC when the fuel pump driver control module ignition switch circuit voltage exceeds a calibrated value.	Fuel Pump Driver Control Module Ignition switch Run/Start position circuit high	FTZM Run Crank Active is TRUE	Fuel Tank Zone Module (FTZM) is present on vehicle Fuel Pump Driver Control Module Ignition Switch Run/Start Position Circuit High diagnostic is enabled Fuel Tank Zone Module (FTZM) serial messages are available Run Crank Active Sensor Bus relay is commanded ON	 = 1 = FALSE	200 failures out of 250 samples 50 ms / sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Fuel Pump Driver Control Module Temperature (Fuel Tank Zone Module) Too High Signal Message Counter Incorrect	P1009	This DTC monitors for an error in communication with the Fuel Pump Driver Control Module (FTZM) Temperature Too High Signal Message	Communication of the Alive Rolling Count or Protection Value from the Fuel Pump Driver Control Module over CAN bus is incorrect for out of total samples	 >= 8 counts >= 10 counts	Message frame All the following conditions are met for Power Mode Powertrain Relay Voltage Run/Crank Ignition Voltage Sensor Bus Relay	= Is available >= 3,000.00 milliseconds = Run >=11.00 Volts >=11.00 Volts = On (if present)	Executes in 100ms loop.	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Turbocharger Boost Control Signal Message Counter Incorrect	P100A	This DTC monitors for an error in communication with the Turbocharger Boost Control Signal	Communication of the Turbo Actuator Error Alive Rolling Count or Protection Value from the VGTA over CAN bus is incorrect for out of total samples or Communication of the Turbo Actuator Status Alive Rolling Count or Protection Value from the VGTA over CAN bus is incorrect for out of total samples or Communication of the Turbo Actuator Learned Relative Position Alive Rolling Count or Protection Value from the VGTA over CAN bus is incorrect for out of total samples or Communication of the Turbo Actuator Actual Position Alive Rolling Count or Protection Value	>=8.00 counts >= 10.00 counts >= 8.00 counts >= 10.00 counts >= 8.00 counts >= 10.00 counts	Message frame All the following conditions are met for Power Mode Powertrain Relay Voltage Run/Crank Ignition Voltage And Sensor Bus Relay	= Is available >= 3,000.00 milliseconds = Run >=11.00 Volts >=11.00 Volts = On	Executes in 10ms loop.	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			from the VGTA over CAN bus is incorrect					
			for	>= 8.00 counts				
			out of total samples	>= 10.00 counts				
			or					
			Communication of the Turbo Actuator Supply Voltage Count or Protection Value from the VGTA over CAN bus is incorrect					
			for	>=8.00 counts				
			out of total samples	>= 10.00 counts				
			or					
			Communication of the Turbo Actuator Temperature Unprocessed Value Alive Rolling Count or Protection Value from the VGTA over CAN bus is incorrect					
			for	>= 8.00 counts				
			out of total samples	>= 10.00 counts				
			or					
			Communication of the Turbo Actuator Learned Absolute Position Alive Rolling Count or Protection Value from the VGTA over CAN bus is incorrect					
			for	>=8.00 counts				

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			out of total samples	>= 10.00 counts				

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Reductant Control Module Sensor/ Switch Communication Circuit A Low	P1015	This monitor checks if the Reductant Control Module SENT Sensor protocol is out of range low	The SENT Message Rolling Pulse Count is provided to the ECM by the DEF-C via CAN bus. This monitor detects a Low Circuit Fault in the SENT Communication Circuit.	SENT Message Rolling Pulse Count sample equals to the previous sample AND Sent Circuit Low Error Message equals to TRUE	Engine in Cranking Phase Run/Crank is Active Powertrain relay voltage No loss of CAN communication DEF-C Controller not in initialization condition	FALSE TRUE >11.00V CAN_LostComm_FltN_BusB_DEF_C == FALSE TRUE	Time counter: 50.00 fails out of 62.00 samples Task = 100ms	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Reductant Control Module Sensor/ Switch Communication Circuit A High	P1016	This monitor checks if the Reductant Control Module SENT Sensor protocol is out of range high	The SENT Message Rolling Pulse Count is provided to the ECM by the DEF-C via CAN bus. This monitor detects a High Circuit Fault in the SENT Communication Circuit.	SENT Message Rolling Pulse Count sample equals to the previous sample AND Sent Circuit High Error Message equals to TRUE	Engine in Cranking Phase Run/Crank is Active Powertrain relay voltage No loss of CAN communication DEF-C Controller not in initialization condition	FALSE TRUE >11.00V CAN_LostComm_FltN_BusB_DEF_C == FALSE TRUE	Time counter: 50.00 fails out of 62.00 samples Task = 100ms	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Reductant Control Module Sensor/ Switch Communication Circuit A Performance	P1017	This monitor checks if the Reductant Control Module SENT Sensor protocol has performance problems	The SENT Message Rolling Pulse Count and the Reductant Quality Sensor SENT Message Age are provided to the ECM by the DEF-C via CAN bus. This monitor checks if the DEF-C recognizes an error in the SENT trasmission and if the age time is coherent with the Rolling Pulse Count increment.	At least one of the following conditions to be verified: 1. SENT Message Rolling Pulse Count sample is different from the previous sample AND Reductant Quality Sensor SENT Message Age > 1.00 s 2. A SENT Fault is present	Engine in Cranking Phase Run/Crank is Active Powertrain relay voltage No loss of CAN communication DEF-C Controller not in initialization condition No electrical fault on DEF Quality Sensor SENT circuit	FALSE TRUE >11.00V CAN_LostComm_FltN_BusB_DEF_C == FALSE TRUE DQMR_DEFQS_SENT_ElecFlt == FALSE	Time counter: 50.00 fails out of 62.00 samples Task = 100ms	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
DEF Quality Sensor 5V Supply Circuit Short to Ground	P1018	This diagnosis verifies DEF Quality Sensor 5V Supply Circuit pin for Short to Ground	The DEF QS 5V Supply Circuit Short to Ground flag is provided to the ECM by the DEF-C via CAN bus. This monitor checks if there is a short circuit to ground on DEF Quality Sensor 5V Supply Circuit pin.	DEF QS 5V Supply Circuit Short to Ground flag status == TRUE	Engine in Cranking Phase Run/Crank is Active Powertrain relay voltage No loss of CAN communication DEF-C Controller not in initialization condition No electrical fault on DEF Quality Sensor SENT circuit No performance fault on DEF Quality Sensor SENT circuit	FALSE TRUE >11.00V CAN_LostComm_FltN_BusB_DEF_C == FALSE TRUE DQMR_DEFQS_SENT_ElecFA == FALSE DQMR_DEFQS_SENT_PerfFA == FALSE	Time counter: 40.00 fails out of 50.00 samples Task = 100ms	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
DEF Quality Sensor 5V Supply Circuit Short to Battery	P1019	This diagnosis verifies DEF Quality Sensor 5V Supply Circuit pin for Short to Battery	The DEF QS 5V Supply Circuit Short to Battery flag is provided to the ECM by the DEF-C via CAN bus. This monitor checks if there is a short circuit to battery on DEF Quality Sensor 5V Supply Circuit pin.	DEF QS 5V Supply Circuit Short to Battery flag status == TRUE	Engine in Cranking Phase Run/Crank is Active Powertrain relay voltage No loss of CAN communication DEF-C Controller not in initialization condition No electrical fault on DEF Quality Sensor SENT circuit No performance fault on DEF Quality Sensor SENT circuit	FALSE TRUE >11.00V CAN_LostComm_FltN_BusB_DEF_C == FALSE TRUE DQMR_DEFQS_SENT_ElecFA == FALSE DQMR_DEFQS_SENT_PerfFA == FALSE	Time counter: 40.00 fails out of 50.00 samples Task = 100ms	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
DEF Quality Sensor Return Circuit Short to Battery	P101A	This diagnosis verifies DEF Quality Sensor Return Circuit pin for Short to Battery	The DEF QS Ground Circuit Short to Battery flag is provided to the ECM by the DEF-C via CAN bus. This monitor checks if there is a short circuit to battery on DEF Quality Sensor Return Circuit pin.	DEF QS Ground Circuit Short to Battery flag status == TRUE	Engine in Cranking Phase Run/Crank is Active Powertrain relay voltage No loss of CAN communication DEF-C Controller not in initialization condition No electrical fault on DEF Quality Sensor SENT circuit No performance fault on DEF Quality Sensor SENT circuit	FALSE TRUE >11.00V CAN_LostComm_FltN_BusB_DEF_C == FALSE TRUE DQMR_DEFQS_SENT_ElecFA == FALSE DQMR_DEFQS_SENT_PerfFA == FALSE	Time counter: 40.00 fails out of 50.00 samples Task = 100ms	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Fuel Pump Phase U-V-W Circuit Open	P1029	This DTC detects if any of the 3phase fuel pump control circuits is Open [system configuration "Brushless"] The diagnostic can detect open circuit faults when the fuel pump is not rotating. In the "stopped" state, small currents are injected into each motor phase circuit pair by an internal fixed source and corresponding back-EMF voltage is monitored. A fault is reported when the monitored voltage falls into a specific range [adjusted for source voltage]. This process is completed in less than 1 millisecond. The FTZM ERFS control samples back-Electromotive Force [EMF] for zero voltage-level crossings as a detection method to enable closed loop control brushless commutation. Back EMF is an electrical characteristic of the inactive phase of the 3-phase signal wherein only 2 phases are	Phased-pair circuit voltage	3V <= V [back-EMF] <= 6V	a) Sensed fuel pump speed b) Device configuration FCBR_e_ChassisFuelPressSysType c) Diagnostic Enabled - KeFABR_b_OpenCktDiagEnbl d) CAN Sensor Bus message $3EC_Avail e) Sensor Bus Relay On f) Sensor Bus B Message $3EC Temp Signal Message Counter Incorrect [CFMR_b_FTZM_Info7_ARCChkErr]	a) == 0 RPM b) CeFCBR_e_DSL_ECM_FTZM_BLDC_Sys c) == TRUE d) == TRUE e) == TRUE f) <> TRUE	40.00 failures / 80.00 samples 1 sample / 12.5 ms	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		active at any moment. Brushless fuel pump speed is inferred using the rate of zero-crossings detection and number of motor pole-pairs. Speed is reported to the ECM as serial data every 10 milliseconds. This open circuit diagnostic follows "smart device" Component Technical Specifications.						

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Fuel Pump Phase U-V-W Circuit Low	P102A	This DTC detects if the fuel pump control circuit is shorted to low [Short to Ground] The diagnostic detects short-to-ground faults using 2 methods depending on whether the fuel pump is rotating. 1) In the "rotating" state, voltage drop across each phase-pair high-side drive is monitored, or 2) in the "stopped" state, small currents are injected into each motor phase circuit pair	Phased-pair circuit voltage Difference	Vdelta > 0.145 V	a) Device configuration FCBR_e_ChassisFuelPressSysType b) Diagnostic KeFABR_b_GshtCktDiagEnbl c) CAN Sensor Bus message $3EC_Avail d) Sensor Bus Relay On e) Sensor Bus Message $3EC Temp Signal Message Counter Incorrect [CFMR_b_FTZM_Info7_ARCChkErr]	a) == CeFCBR_e_DSL_ECM_FTZM_BLDC_Sys b) == TRUE c) == TRUE d) == TRUE e) <> TRUE	40.00 failures / 80.00 samples 1 sample / 12.5 ms	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		by an internal fixed source and corresponding back-EMF voltage is monitored. A fault is reported when the monitored voltage falls into a specific range [adjusted for source voltage]. The FTZM ERFS control samples back-Electromotive Force [EMF] for zero voltage-level crossings as a detection method to enable closed loop control brushless commutation. Back EMF is an electrical characteristic of the inactive phase of the 3-phase signal wherein only 2 phases are active at any moment. Brushless fuel pump speed is inferred using the rate of zero-crossings detection and number of motor pole-pairs. Speed is reported to the ECM as serial data every 10 milliseconds. This open circuit diagnostic follows "smart device" Component Technical Specifications.	Phased-pair circuit voltage	V [back-EMF] >= 6 V	a) Sensed fuel pump speed b) Device configuration FCBR_e_ChassisFuelPresSysType c) Diagnostic KeFABR_b_GshtCktDiagEnbl d) CAN Sensor Bus message $3EC_Avail e) Sensor Bus Relay On f) Sensor Bus Message $3EC Temp Signal Message Counter Incorrect [CFMR_b_FTZM_Info7_ARCChkErr]	a) == 0 RPM b) == CeFCBR_e_DSL_ECM_FTZM_BLDC_Sys c) == TRUE d) == TRUE e) == TRUE f) <> TRUE	40.00 failures / 80.00 samples 1 sample / 12.5 ms	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Fuel Pump Phase U-V-W Circuit High	P102B	This DTC detects if the fuel pump control circuit is shorted to high voltage [Short to Battery] The diagnostic detects short-to-battery faults using 2 methods depending on whether the fuel pump is rotating. 1) In the "rotating" state, voltage drop across each phase-pair low-side current shunt is monitored, or 2) in the "stopped" state, small currents are injected	Phased-pair circuit voltage Difference	Vdelta > 0.4 V	a) Device configuration FCBR_e_ChassisFuelPressSysType b) Diagnostic KeFABR_b_PshtCktDiagEnbl c) CAN Sensor Bus message $3EC_Avail d) Sensor Bus Relay On e) Sensor Bus Message $3EC Temp Signal Message Counter Incorrect [CFMR_b_FTZM_Info7_ARCChkErr]	a) == CeFCBR_e_DSL_ECM_FTZM_BLDC_Sys b) == TRUE c) == TRUE d) == TRUE e) <> TRUE	40.00 failures / 80.00 samples 1 sample / 12.5 ms	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		into each motor phase circuit pair by an internal fixed source and corresponding back-EMF voltage is monitored. A fault is reported when the monitored voltage falls into a specific range [adjusted for source voltage]. The FTZM ERFS control samples back-Electromotive Force [EMF] for zero voltage-level crossings as a detection method to enable closed loop control brushless commutation. Back EMF is an electrical characteristic of the inactive phase of the 3-phase signal wherein only 2 phases are active at any moment. Brushless fuel pump speed is inferred using the rate of zero-crossings detection and number of motor pole-pairs. Speed is reported to the ECM as serial data every 10 milliseconds. This open circuit diagnostic follows "smart device" Component Technical Specifications.	Phased-pair circuit voltage	V[backEMF] > 6 V	a) Sensed fuel pump speed b) Device configuration FCBR_e_ChassisFuelPressSysType b) Diagnostic KeFABR_b_PshtCktDiagEnbl c) CAN Sensor Bus message $3EC_Avail d) Sensor Bus Relay On e) Sensor Bus Message $3EC Temp Signal Message Counter Incorrect [CFMR_b_FTZM_Info7_ARCChkErr]	a) == 0 RPM b) == CeFCBR_e_DSL_ECM_FTZM_BLDC_Sys b) == TRUE c) == TRUE d) == TRUE e) <> TRUE	40.00 failures / 80.00 samples 1 sample / 12.5 ms	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Injection Quantity Monitoring	P1037	This monitor detects failures in the application of the correct coolant compensations to fuel injection system setpoint during cold start. The injection system diagnostic monitors that energizing time programmed by the SW for each injection pulse (that is the fuel quantity) is correctly driven by the ECU (ET width and sequence for each stroke and for each cylinder are checked). This monitor detects	In order to identify whether there is a fault on an injector, the following tests shall be performed: 1. At least one dropped pulse is present (i.e. at least one pulse programmed by the application software is not driven by the ECU) 2. |ETpulseX,programmed (cyl) - ET pulseX,HWIO (cyi)l where: ETpulseX,HWIO (cyl)) = energizing time feedback read by HWIO for pulseX and on cylinder cyl ETpulseX,programmed (cyl) = ETpulseX,SW (cyl) + EOlpulseX,HWIO (cyl) = energizing time programmed by SW for pulseX and on cylinder cyl (end of injection is not included) + end of injection feedback read by HWIO for pulseX and on cylinder cyl	 > 50.00	Test enabled by calibration Powertrain relay voltage in range Engine is running Catalyst Warm-Up Boolean from CSERS should be enabled (it takes into account the combustion mode, the minimum soaking time and ECT limit) CSE_CatalystWarmupEnabled No monitoring Shutoff conditions present (no FA on Boost Voltage monitoring, Injector Electrical monitorings, Pull In Period monitoring, and Controller Status monitoring) FUL_BoostVoltFA FUL_FuelInjCkt_FA FUL_PullInErrFA FUL_CntrlrStFA At least one injection	== 1.00 [Boolean] > 11.00 [V] == TRUE [Boolean] == TRUE [Boolean] == FALSE [Boolean] == FALSE [Boolean] == FALSE [Boolean] == FALSE [Boolean] == TRUE [Boolean]	50.00 failures of 100.00 samples Function task: angular based	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					pulse is requested by the application SW FUL_FuelInjected			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Reductant Pump Driver High Temperature	P103F	This diagnosis verifies that the Motor Mosfet Driver Temperature is too High	Motor Mosfet Driver Temperature too High Error status == FAULT	VeSCRR_e_PmpDrvrHiTemp == FAULT	Test enabled by calibration Key on (OR engine running) Engine is not cranking Battery voltage No loss of CAN communication Motor Mosfet Driver Temperature too High Error status provided by DEF control module different from INDETERMINATE	1.00 [Boolean] > 11.00 [V] U010E, Lost Communication With Reductant Control Module	40.00 failures out of 50.00 samples Time basis = 100ms/sample	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Reductant Pump A Control Circuit Shorted	P1040	This diagnosis verifies that the DEF pump phases are shorted	Motor Pump Phases Shorted Error status provided by DEF control module == FAULT	VeSCRR_e_PmpMtrShorted==FAULT	Test enabled by calibration	1.00	20.00 failures out of 25.00 samples Time basis = 100ms/sample	Type A, 1 Trips
					Key on (OR engine running)			
					Engine is not cranking			
					Battery voltage	> 11.00 [V]		
					No loss of CAN comunication	U010E, Lost Communication With Reductant Control Module (SCR)		
					Motor Pump Phases Shorted Error status provided by DEF control module different from indeterminate			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Reductant Injection Valve Supply Voltage Circuit Low Bank 1 Unit 1	P1048	This diagnosis verifies if a DEF dosing valve high side short to ground occurred	HWIO interface DEFMV_ENABLE_GROUND_SHORT = Fault	VeHWIO_e_DEFMV_EnblGsht == CeSCRR_e_Fault	Test enabled by calibration Key on (OR engine running) Engine is not cranking Battery voltage HWIO interface DEFMV_ENABLE_GROUND_SHORT different from INDETERMINATE	1.00 > 11.00 [V]	30.00 failures out of 60.00 samples Time basis = 100ms/sample	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Reductant Injection Valve Supply Voltage Circuit High Bank 1 Unit 1	P1049	This diagnosis verifies if a DEF dosing valve high side short to power occurred	HWIO interface DEFMV_ENABLE_POWE R-SHORT = Fault	VeHWIO_e_DEFMV_EnbIPsht == CeSCRR_e_Fault	Test enabled by calibration Key on (OR engine running) Engine is not cranking Battery voltage HWIO interface DEFMV_ENABLE_POWE R_SHORT different from INDETERMINATE	1.00 > 11.00 [V]	30.00 failures out of 60.00 samples Time basis = 100ms/sample	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Reductant Heater 1 Driver Over Temperature Fault	P1051	This diagnosis verifies if the driver of the DEF tank heater is affected by overtemperature	Tank Heater driver over temperature flag reports a fail	VeSCRR_e_HeatA_OverTemp == CeSCRR_e_fault	Test enabled by calibration	1.00	8.00 failures out of 10.00 samples Time basis = 500ms/sample	Type A, 1 Trips
					Temperature used by the heating strategy to switch on the heaters	< 60.00 [°C]		
					Battery voltage	>11.00 [V]		
					Key on (OR engine running)			
					Engine is not cranking			
					No loss of CAN communication	U010E, Lost Communication With Reductant Control Module (SCR) (GetCANR_b_LostComm_FltN= FALSE)		
					DEF Temperature sensor not in fault	SCR_DEFTS_FA == FALSE		
					Tank Heater driver over temperature flag different from INDETERMINATE			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Reductant Heater 2 Driver Over Temperature Fault	P1052	This diagnosis verifies if the driver of the DEF dosing line heater is affected by overtemperature	Line Heater driver over temperature flag reports a fail	VeSCRR_e_HeatB_OverTemp == CeSCRR_e_fault	Test enabled by calibration	1.00== TRUE	8.00 failures out of 10.00 samples Time basis = 500ms/sample	Type A, 1 Trips
					Temperature used by the heating strategy to switch on the heaters	< 60.00		
					Battery voltage	> 11.00 [V]		
					Key on (OR engine running)			
					Engine is not cranking			
					No loss of CAN communication	U010E, Lost Communication With Reductant Control Module (SCR)		
					Line Heater driver over temperature flag different from INDETERMINATE			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Reductant Pump A Speed Low	P105A	This diagnosis verifies that the DEF pump rotor is stalled	DEF pump commanded to move forward or reverse AND DEF Pump Motor speed within calibrated range	VeSCRR_n_PmpMtrSpd > -650.00 AND VeSCRR_n_PmpMtrSpd < 650.00	Test enabled by calibration	1.00	160.00 failures out of 200.00 samples Time basis = 25ms	Type A, 1 Trips
					Engine is not cranking			
					Battery voltage	> 11.00 [V]		
					Key on (OR engine running)			
					PWM_pump_command not in fault	SCR_DEF_PumpCmdFA == FALSE		
					DEF motor pump not in fault	SCR_DEFPM_FA == FALSE		
					No loss of CAN communication	U010E, Lost Communication With Reductant Control Module (SCR)		
					Tank Defrost phase completed			
					DEF pump commanded to move forward or reverse	pct duty cycle inside: (39.00 ; 81.00) [%] or (11.00; 31.00)[%]		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Reductant Injector Temperature - Exhaust Gas Temperature Not Plausible	P10D1	This monitor measures the temperature of DEF injector coil and compares to reference temperature after long soak.	Difference between coil temperature and reference temperature greater than calibratable value.	>55.00	Test enabled by calibration (TRUE->Enable False -> Disable)	1.00	Single decision criteria. Function Task: 25ms	Type B, 2 Trips
					DEF Injector Fault State (No fault on injector)	== FALSE		
					Powertrain relay in range	== TRUE		
					Long Engine off soak period has elapsed (sec)	>= 28,800.00		
					Service Test	== FALSE		
					Run/Crank is Active	== TRUE		
					Engine in Cranking Phase	== FALSE		
					Powertrain Relay in-Range	== TRUE		
					Diag System Disable	== FALSE		
					Coil Temp Rationality Diag Inhibited	== FALSE		
					Coil Temperature Estimation Available	== TRUE		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Fuel Level Sensor 2 Signal Message Counter Incorrect	P1100	This DTC monitors for an error in communication with the Fuel Pump Control Module (FTZM) Fuel Level Sensor 2 Signal Message Counter	Communication of the Fuel Level Sensor 2 Signal Message Counter from the Fuel Pump Control Module (FTZM) over CAN bus is incorrect for out of total samples	>= 8 counts >= 10 counts	Message frame All the following conditions are met for Power Mode Powertrain Relay Voltage Run/Crank Ignition Voltage Sensor Bus Relay	= Is available >= 3,000.00 milliseconds = Run >=11.00 Volts >=11.00 Volts = On (if present)	Executes in 10ms loop.	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
NOx Sensor 1 02 Reference Voltage Circuit	P115E	This diagnosis verifies Upstream NOx gen3 sensor 02 binary reference voltage pin for Open Load Circuit	Check if there is an open circuit on NOx Sensor 1 02 Binary reference voltage (P+ pin)	open circuit on P+ pin	NOx sensor is Gen3.0	TRUE	Time counter: 20 fails out of 40 samples Task=25ms	Type A, 1 Trips
					Powertrain relay voltage	>11.00V		
					NOx Sensor Bus relay is commanded ON	TRUE		
					CAN_LostComm_FltN_BusB_NOxSnsr_A	FALSE		
					Sensor supply in range	> 10.80 V		
					Sensor dewpoint is reached	TRUE		
					No DTC active:	P30B4		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
NOx Sensor 1 02 Reference Voltage Circuit Low Voltage	P115F	This diagnosis verifies Upstream NOx gen3 sensor binary reference voltage pin for Short to Ground	Check if there is a short circuit to ground on NOx Sensor 1 02 Binary reference voltage (P+ pin)	groundshort on P+ pin	NOx sensor is Gen3.0	TRUE	Time counter: 20 fails out of 40 samples Task=25ms	Type B, 2 Trips
					Powertrain relay voltage	>11.00V		
					NOx Sensor Bus relay is commanded ON	TRUE		
					CAN_LostComm_FltN_BusB_NOxSnsr_A	FALSE		
					Sensor supply in range	> 10.80 V		
					Sensor dewpoint is reached	TRUE		
					No DTC active:	P30B4		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
NOx Sensor 1 02 Reference Voltage Circuit High Voltage	P1160	This diagnosis verifies Upstream NOx gen3 sensor binary reference voltage pin for Short to Battery	Check if there is a short circuit to power supply on NOx Sensor 1 02 Binary reference voltage (P+ pin)	powershort on P+ pin	NOx sensor is Gen3.0	TRUE	Time counter: 20 fails out of 40 samples Task=25ms	Type B, 2 Trips
					Powertrain relay voltage	>11.00V		
					NOx Sensor Bus relay is commanded ON	TRUE		
					CAN_LostComm_FltN_BusB_NOxSnsr_A	FALSE		
					Sensor supply in range	> 10.80 V		
					Sensor dewpoint is reached	TRUE		
					No DTC active:	P30B4		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
NOx Sensor 1 02 Signal Circuit	P116A	This diagnosis verifies Upstream NOx gen3 sensor linear lambda circuit pin for Open Load Circuit	Check if there is an open circuit on NOx Sensor 1 02 Linear pin (P-)	open circuit on P- pin	NOx sensor is Gen3.0	TRUE	Time counter: 20 fails out of 40 samples Task=25ms	Type A, 1 Trips
					Powertrain relay voltage	>11.00V		
					NOx Sensor Bus relay is commanded ON	TRUE		
					CAN_LostComm_FltN_BusB_NOxSnsr_A	FALSE		
					Sensor supply in range	> 10.80 V		
					Sensor dewpoint is reached	TRUE		
					No DTC active:	P30B4		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
NOx Sensor 1 02 Signal Circuit Low Voltage	P116B	This diagnosis verifies Upstream NOx gen3 sensor linear lambda circuit pin for Short to Ground	Check if there is a short circuit to ground on NOx Sensor 1 02 Linear pin (P-)	groundshort on P- pin	NOx sensor is Gen3.0	TRUE	Time counter: 20 fails out of 40 samples	Type B, 2 Trips
					Powertrain relay voltage	>11.00V		
					NOx Sensor Bus relay is commanded ON	TRUE	Task=25ms	
					CAN_LostComm_FltN_BusB_NOxSnsr_A	FALSE		
					Sensor supply in range	> 10.80 V		
					Sensor dewpoint is reached	TRUE		
					No DTC active:	P30B4		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
NOx Sensor 1 02 Signal Circuit High Voltage	P116C	This diagnosis verifies Upstream NOx gen3 sensor linear lambda circuit pin for Short to Battery	Check if there is a short circuit to power supply on NOx Sensor 1 02 Linear pin (P-)	powershort on P- pin	NOx sensor is Gen3.0	TRUE	Time counter: 20 fails out of 40 samples Task=25ms	Type B, 2 Trips
					Powertrain relay voltage	>11.00V		
					NOx Sensor Bus relay is commanded ON	TRUE		
					CAN_LostComm_FltN_BusB_NOxSnsr_A	FALSE		
					Sensor supply in range	> 10.80 V		
					Sensor dewpoint is reached	TRUE		
					No DTC active:	P30B4		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
NOx Sensor 1 02 Pump Current Control Circuit	P116D	This diagnosis verifies Upstream NOx gen3 sensor 02 reference circuit pin for Open Load Circuit	Check if there is an open circuit on NOx Sensor 1 02 Reference pin(M1, auxiliary pumping current)	open circuit on M1 pin	NOx sensor is Gen3.0	TRUE	Time counter: 20 fails out of 40 samples Task=25ms	Type A, 1 Trips
					Powertrain relay voltage	>11.00V		
					NOx Sensor Bus relay is commanded ON	TRUE		
					CAN_LostComm_FltN_BusB_NOxSnsr_A	FALSE		
					Sensor supply in range	> 10.80 V		
					Sensor dewpoint is reached	TRUE		
					No DTC active:	P30B4		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
NOx Sensor 1 02 Pump Current Control Circuit Low Voltage	P116E	This diagnosis verifies Upstream NOx gen3 sensor 02 reference circuit pin for Short to Ground	Check if there is a short circuit to ground on NOx Sensor 1 02 Reference pin (M1, auxiliary pumping current)	groundshort on M1 pin	NOx sensor is Gen3.0	TRUE	Time counter: 20 fails out of 40 samples Task=25ms	Type B, 2 Trips
					Powertrain relay voltage	>11.00V		
					NOx Sensor Bus relay is commanded ON	TRUE		
					CAN_LostComm_FltN_BusB_NOxSnsr_A	FALSE		
					Sensor supply in range	> 10.80 V		
					Sensor dewpoint is reached	TRUE		
					No DTC active:	P30B4		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
NOx Sensor 1 02 Pump Current Control Circuit High Voltage	P116F	This diagnosis verifies Upstream NOx gen3 sensor 02 reference circuit pin for Short to Battery	Check if there is a short circuit to power supply on NOx Sensor 1 02 Reference pin (M1, auxiliary pumping current)	powershort on M1 pin	NOx sensor is Gen3.0 Powertrain relay voltage NOx Sensor Bus relay is commanded ON CAN_LostComm_FltN_BusB_NOxSnsr_A Sensor supply in range Sensor dewpoint is reached No DTC active:	TRUE >11.00V TRUE FALSE > 10.80 V TRUE P30B4	Time counter: 20 fails out of 40 samples Task=25ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Fuel Pump Driver Control Module Fuel Level Sensor 1 Internal Supply Circuit	P1178	This DTC monitors for an error in the Fuel Pump Driver Control Module Fuel Level Sensor 1 Internal Supply Circuit	Raw Fuel Pump Driver Control Module Fuel Level Sensor 1 Internal Supply Circuit is	> 92.25 Percent	Diagnostic is enabled	Enabled	Executes in 50.0ms loop.	Type B, 2 Trips
					Run/Crank Ignition Voltage	>=11.00 Volts		
			or		U0076	Is not active		
			Raw Fuel Pump Driver Control Module Fuel Level Sensor 1 Internal Supply Circuit is	<87.75 Percent	PT Sensor Bus Relay	Commanded on (if present)		
					Communication with the Fuel Tank Zone Module is not lost			
			or					
			Absolute difference of the filtered Fuel Pump Driver Control Module Fuel Level Sensor 1 Internal Supply Circuit and Raw Fuel Pump Driver Control Module Fuel Level Sensor 1 Internal Supply Circuit is	> 0.90 Percent				
			For a non-continuous failure of	40.00 counts				
			out of	80.00 counts				
			For a continuous failure of	0.20 seconds				

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Fuel Pump Driver Control Module Fuel Level Sensor 2 Internal Supply Circuit	P1179	This DTC monitors for an error in the Fuel Pump Driver Control Module Fuel Level Sensor 2 Internal Supply Circuit	Raw Fuel Pump Driver Control Module Fuel Level Sensor 2 Internal Supply Circuit is or Raw Fuel Pump Driver Control Module Fuel Level Sensor 2 Internal Supply Circuit is or Absolute difference of the filtered Fuel Pump Driver Control Module Fuel Level Sensor 2 Internal Supply Circuit and Raw Fuel Pump Driver Control Module Fuel Level Sensor 2 Internal Supply Circuit is For a non-continuous failure of out of For a continuous failure of	> 92.25 Percent <87.75 Percent > 0.90 Percent 40.00 counts 80.00 counts 0.20 seconds	Diagnostic is enabled Run/Crank Ignition Voltage U0076 PT Sensor Bus Relay Communication with the Fuel Tank Zone Module is not lost	Enabled >=11.00 Volts Is not active Commanded on	Executes in 50.0ms loop.	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
NOx Sensor 1 02 Low Reference Circuit	P1192	This diagnosis verifies Upstream NOx gen3 sensor Low Reference Circuit for Open Load Circuit	Check if there is an open circuit on NOx Sensor 1 Low Reference pin (Ref)	open circuit on Ref pin	NOx sensor is Gen3.0	TRUE	Time counter: 20 fails out of 40 samples Task=25ms	Type A, 1 Trips
					Powertrain relay voltage	>11.00V		
					NOx Sensor Bus relay is commanded ON	TRUE		
					CAN_LostComm_FltN_BusB_NOxSnsr_A	FALSE		
					Sensor supply in range	> 10.80 V		
					Sensor dewpoint is reached	TRUE		
					No DTC active:	P30B4		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
NOx Sensor 1 02 Low Reference Circuit Low Voltage	P1193	This diagnosis verifies Upstream NOx gen3 sensor Low Reference Circuit for Short to Ground	Check if there is an short circuit to ground on NOx Sensor 1 Low Reference pin (Ref)	groundshort on Ref pin	NOx sensor is Gen3.0	TRUE	Time counter: 20 fails out of 40 samples Task=25ms	Type B, 2 Trips
					Powertrain relay voltage	>11.00V		
					NOx Sensor Bus relay is commanded ON	TRUE		
					CAN_LostComm_FltN_BusB_NOxSnsr_A	FALSE		
					Sensor supply in range	> 10.80 V		
					Sensor dewpoint is reached	TRUE		
					No DTC active:	P30B4		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
NOx Sensor 1 02 Low Reference Circuit High Voltage	P1194	This diagnosis verifies Upstream NOx gen3 sensor Low Reference Circuit for Short to Battery	Check if there is an short circuit to power supply on NOx Sensor 1 Low Reference pin (Ref)	powershort on Ref pin	NOx sensor is Gen3.0	TRUE	Time counter: 20 fails out of 40 samples Task=25ms	Type B, 2 Trips
					Powertrain relay voltage	>11.00V		
					NOx Sensor Bus relay is commanded ON	TRUE		
					CAN_LostComm_FltN_BusB_NOxSnsr_A	FALSE		
					Sensor supply in range	> 10.80 V		
					Sensor dewpoint is reached	TRUE		
					No DTC active:	P30B4		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
NOx Sensor 1 Signal Circuit	P119A	This diagnosis verifies Upstream NOx gen3 sensor NOx Circuit for Open Load Circuit	Check if there is an open circuit on NOx Sensor 1 NOx-related measurement pin (M2)	open circuit on M2	NOx sensor is Gen3.0	TRUE	Time counter: 20 fails out of 40 samples	Type A, 1 Trips
					Powertrain relay voltage	>11.00V		
					NOx Sensor Bus relay is commanded ON	TRUE	Task=25ms	
					CAN_LostComm_FltN_BusB_NOxSnsr_A	FALSE		
					Sensor supply in range	> 10.80 V		
					Sensor dewpoint is reached	TRUE		
					No DTC active:	P30B4		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
NOx Sensor 1 Signal Circuit Low Voltage	P119B	This diagnosis verifies Upstream NOx gen3 sensor NOx Circuit for Short to Ground	Check if there is a short circuit to ground on NOx Sensor 1 NOx-related measurement pin (M2)	groundshort on M2 pin	NOx sensor is Gen3.0	TRUE	Time counter: 20 fails out of 40 samples Task=25ms	Type B, 2 Trips
					Powertrain relay voltage	>11.00V		
					NOx Sensor Bus relay is commanded ON	TRUE		
					CAN_LostComm_FltN_BusB_NOxSnsr_A	FALSE		
					Sensor supply in range	> 10.80 V		
					Sensor dewpoint is reached	TRUE		
					No DTC active:	P30B4		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
NOx Sensor 1 Signal Circuit High Voltage	P119C	This diagnosis verifies Upstream NOx gen3 sensor NOx Circuit for Short to Battery	Check if there is a short circuit to power supply on NOx Sensor 1 NOx-related measurement pin (M2)	powershort on M2 pin	NOx sensor is Gen3.0 Powertrain relay voltage NOx Sensor Bus relay is commanded ON CAN_LostComm_FltN_BusB_NOxSnsr_A Sensor supply in range Sensor dewpoint is reached No DTC active:	TRUE >11.00V TRUE FALSE > 10.80 V TRUE P30B4	Time counter: 20 fails out of 40 samples Task=25ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
NOx Sensor 2 Signal Circuit	P119D	This diagnosis verifies Downstream NOx gen3 sensor NOx Circuit for Open Load Circuit	Check if there is an open circuit on NOx Sensor 2 NOx-related measurement pin (M2)	open circuit on M2 pin	NOx sensor is Gen3.0	TRUE	Time counter: 20 fails out of 40 samples Task=25ms	Type A, 1 Trips
					Powertrain relay voltage	>11.00V		
					NOx Sensor Bus relay is commanded ON	TRUE		
					CAN_LostComm_FltN_BusB_NOxSnsr_B	FALSE		
					Sensor supply in range	> 10.80 V		
					Sensor dewpoint is reached	TRUE		
					No DTC active:	P30B5		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
NOx Sensor 2 Signal Circuit Low Voltage	P119E	This diagnosis verifies Downstream NOx gen3 sensor NOx Circuit for Short to Ground	Check if there is a short circuit to ground on NOx Sensor 2 NOx-related measurement pin (M2)	groundshort on M2 pin	NOx sensor is Gen3.0	TRUE	Time counter: 20 fails out of 40 samples Task=25ms	Type B, 2 Trips
					Powertrain relay voltage	>11.00V		
					NOx Sensor Bus relay is commanded ON	TRUE		
					CAN_LostComm_FltN_BusB_NOxSnsr_B	FALSE		
					Sensor supply in range	> 10.80 V		
					Sensor dewpoint is reached	TRUE		
					No DTC active:	P30B5		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
NOx Sensor 2 Signal Circuit High Voltage	P119F	This diagnosis verifies Downstream NOx gen3 sensor NOx Circuit for Short to Battery	Check if there is a short circuit to power supply on NOx Sensor 2 NOx-related measurement pin (M2)	powershort on M2 pin	NOx sensor is Gen3.0	TRUE	Time counter: 20 fails out of 40 samples Task=25ms	Type B, 2 Trips
					Powertrain relay voltage	>11.00V		
					NOx Sensor Bus relay is commanded ON	TRUE		
					CAN_LostComm_FltN_BusB_NOxSnsr_B	FALSE		
					Sensor supply in range	> 10.80 V		
					Sensor dewpoint is reached	TRUE		
					No DTC active:	P30B5		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
NOx Sensor 2 02 Reference Voltage Circuit	P11BE	This diagnosis verifies Dowstream NOx gen3 sensor binary reference voltage pin for Open Load Circuit	Check if there is an open circuit on NOx Sensor 2 02 Binary reference voltage (P+ pin)	open circuit on P+ pin	NOx sensor is Gen3.0	TRUE	Time counter: 20 fails out of 40 samples Task=25ms	Type A, 1 Trips
					Powertrain relay voltage	>11.00V		
					NOx Sensor Bus relay is commanded ON	TRUE		
					CAN_LostComm_FltN_BusB_NOxSnsr_B	FALSE		
					Sensor supply in range	> 10.80 V		
					Sensor dewpoint is reached	TRUE		
					No DTC active:P30B5	P30B5		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
NOx Sensor 2 02 Reference Voltage Circuit Low Voltage	P11BF	This diagnosis verifies Downstream NOx gen3 sensor binary reference voltage pin for Short to Ground	Check if there is a short circuit to ground on NOx Sensor 2 02 Binary reference voltage (P+ pin)	groundshort on P+ pin	NOx sensor is Gen3.0	TRUE	Time counter: 20 fails out of 40 samples Task=25ms	Type B, 2 Trips
					Powertrain relay voltage	>11.00V		
					NOx Sensor Bus relay is commanded ON	TRUE		
					CAN_LostComm_FltN_BusB_NOxSnsr_B	FALSE		
					Sensor supply in range	> 10.80 V		
					Sensor dewpoint is reached	TRUE		
					No DTC active:	P30B5		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
NOx Sensor 2 02 Reference Voltage Circuit High Voltage	P11C0	This diagnosis verifies Downstream NOx gen3 sensor binary reference voltage pin for Short to Battery	Check if there is an short circuit to power supply on NOx Sensor 2 02 Binary reference voltage (P+ pin)	powershort on P+ pin	NOx sensor is Gen3.0	TRUE	Time counter: 20 fails out of 40 samples Task=25ms	Type B, 2 Trips
					Powertrain relay voltage	>11.00V		
					NOx Sensor Bus relay is commanded ON	TRUE		
					CAN_LostComm_FltN_BusB_NOxSnsr_B	FALSE		
					Sensor supply in range	> 10.80 V		
					Sensor dewpoint is reached	TRUE		
					P30B5No DTC active:	P30B5		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
NOx Sensor 1 Heater Ground Circuit	P11C5	This diagnosis verifies Upstream NOx gen3 sensor heater ground circuit open	Check if there is an open circuit on NOx Sensor 1 heater reference pin (H-)	open circuit on H- pin	NOx sensor is Gen3.0 Powertrain relay voltage NOx Sensor Bus relay is commanded ON CAN_LostComm_FltN_BusB_NOxSnsr_A Sensor supply in range No DTC active:	TRUE >11.00V TRUE FALSE > 10.80 V P30B4	Time counter: 20 fails out of 40 samples Task=25ms	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
NOx Sensor 1 Heater Ground Circuit High Voltage	P11C6	This diagnosis verifies Upstream NOx gen3 sensor heater ground circuit Short to Battery	Check if there is short circuit to power supply on NOx Sensor 1 heater reference pin (H-)	powershort on H-	NOx sensor is Gen3.0	TRUE	Time counter: 20 fails out of 40 samples Task=25ms	Type B, 2 Trips
					Powertrain relay voltage	>11.00V		
					NOx Sensor Bus relay is commanded ON	TRUE		
					CAN_LostComm_FltN_BusB_NOxSnsr_A	FALSE		
					Sensor supply in range	> 10.80 V		
					Sensor dewpoint is reached	TRUE		
					No DTC active:	P30B4		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
NOx Sensor 2 Heater Ground Circuit	P11C7	This diagnosis verifies Downstream NOx gen3 sensor heater ground circuit open	Check if there is an open circuit on NOx Sensor 2 heater reference pin (H-)	open circuit on H- pin	NOx sensor is Gen3.0 Powertrain relay voltage NOx Sensor Bus relay is commanded ON CAN_LostComm_FltN_BusB_NOxSnsr_B Sensor supply in range No DTC active:	TRUE >11.00V TRUE FALSE > 10.80 V P30B5	Time counter: 20 fails out of 40 samples Task=25ms	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
NOx Sensor 2 Heater Ground Circuit High Voltage	P11C8	This diagnosis verifies Dowmstream NOx gen3 sensor heater ground circuit Short to Battery	Check if there is a short circuit to power on NOx Sensor 2 heater reference pin (H-)	powershort on H- pin	NOx sensor is Gen3.0	TRUE	Time counter: 20 fails out of 40 samples Task=25ms	Type B, 2 Trips
					Powertrain relay voltage	>11.00V		
					NOx Sensor Bus relay is commanded ON	TRUE		
					CAN_LostComm_FltN_BusB_NOxSnsr_B	FALSE		
					Sensor supply in range	> 10.80 V		
					Sensor dewpoint is reached	TRUE		
					No DTC active:	P30B5		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
NOx Sensor 2 02 Signal Circuit	P11D0	This diagnosis verifies Dowstream NOx gen3 sensor 02 reference circuit pin for Open Load Circuit	Check if there is an open circuit on NOx Sensor 2 02 Linear pin (P-)	open circuit on P-	NOx sensor is Gen3.0	TRUE	Time counter: 20 fails out of 40 samples Task=25ms	Type A, 1 Trips
					Powertrain relay voltage	>11.00V		
					NOx Sensor Bus relay is commanded ON	TRUE		
					CAN_LostComm_FltN_BusB_NOxSnsr_B	FALSE		
					Sensor supply in range	> 10.80 V		
					Sensor dewpoint is reached	TRUE		
					No DTC active:	P30B5		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
NOx Sensor 2 02 Signal Circuit Low Voltage	P11D1	This diagnosis verifies Downstream NOx gen3 sensor linear lambda circuit pin for Short to Ground	Check if there is a short circuit to ground on NOx Sensor 2 02 Linear pin (P-)	groundshort on P- pin	NOx sensor is Gen3.0	TRUE	Time counter: 20 fails out of 40 samples Task=25ms	Type B, 2 Trips
					Powertrain relay voltage	>11.00V		
					NOx Sensor Bus relay is commanded ON	TRUE		
					CAN_LostComm_FltN_BusB_NOxSnsr_B	FALSE		
					Sensor supply in range	> 10.80 V		
					Sensor dewpoint is reached	TRUE		
					No DTC active:	P30B5		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
NOx Sensor 2 02 Signal Circuit High Voltage	P11D2	This diagnosis verifies Downstream NOx gen3 sensor linear lambda circuit pin for Short to Battery	Check if there is a short circuit to power supply on NOx Sensor 2 02 Linear Pin (P-)	powershort on P- pin	NOx sensor is Gen3.0	TRUE	Time counter: 20 fails out of 40 samples Task=25ms	Type B, 2 Trips
					Powertrain relay voltage	>11.00V		
					NOx Sensor Bus relay is commanded ON	TRUE		
					CAN_LostComm_FltN_BusB_NOxSnsr_B	FALSE		
					Sensor supply in range	> 10.80 V		
					Sensor dewpoint is reached	TRUE		
					No DTC active:	P30B5		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
NOx Sensor Offset Learning At Min Limit - Bank 1 Sensor 1	P11D3	This diagnosis verifies if Upstream NOx sensor raw signal is affected by an offset	Check if NOx1 signal has an offset by learning the raw value in stable conditions during fuel cut off maneuver. A fault is detected if one of the following conditions is true: 1. Mean of all NOx sensor readings (where every reading is the mean value of a sampling window) OR 2. Mean of all NOx sensor readings (where every reading is the mean value of a sampling window)	< -40.00 ppm > 50.00 ppm	Combustion mode dependent enabling flag Engine is running Engine is not cranking Powertrain relay voltage NOx Sensor Bus relay is commanded ON Upstream NOx Sensor is present in the exhaust Sensor heater is in range: a) (Sensor heater raw resistance - sensor heater target resistance) / sensor heater target resistence b) condition a) is fulfilled for time Sensor supply in range Sensor dewpoint is reached Injection small quantity adjustment (SQA) learning is not active EGR measured position Exhaust mass flow is within a range DEF injection is within a range Engine speed is within a	**NOX_S1_OfstMntrEnblCmbMode** TRUE TRUE >11.00V TRUE TRUE < 0.03% > - 0.03 % > 10.00 sec > 10.80 V TRUE FAD_SQA_LrnET_Enbl ==FALSE < 100.00% < 200.00 g/s > 0.00 g/s < 700.00 mg/s > -1.00 mg/s < 2,700.00 rpm	The monitor runs after fuel cut off maneuver, when air mass integral exceeds 500.00 g and Upstream NOx signal is stable for at least 0.10s. The NOx value used for the monitor is calculated after sampling up to 1.00 sampling windows (each one made up of 1.00 samples), averaging the mean values of every window. Once computed this value, the diagnostic provides a result. Task=25ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					range	> 700.00 rpm		
					Upstream NOx sensor temperature is within a range	< 325.00 °C > -7.00 °C		
					Fuel request is steady state when all the following conditions are verified: a) Fuel request derivative b) Fuel request within a range c) conditions a) and b) are fulfilled for a time	 < 5.00mm^3/s < 0.00 mm^3 > -1.00 mm^3 > 2.00 s		
					Intake manifold absolute pressure	< 1,000.00 kPa		
					No failure on intake manifold absolute pressure sensor	MAP_SensorFA==FALSE NOX_Snsr1_FltSt ==FALSE		
					No electrical failure on NOx1 sensor	NOX_NOx1_StBitChkFlt ==FALSE		
					No current control failure on NOx1 sensor	NOX_NOx1_OutOfRngLo Fit ==FALSE		
					No out of range low failure on NOx1 sensor	NOX_NOx1_OutOfRngHi Fit ==FALSE		
					No out of range high failure on NOx1 sensor	NOX_NOx1_NOxPlausFlt ==FALSE		
					No failure on NOx1 sensor signal plausibility	NOX_NOx1_DynChkFlt ==FALSE		
					No failure on NOx1 CAN communication	CAN_LostComm_FltN_BusB_NOxSnsr_A		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
						==FALSE		
					No failure on EGR valve actuator	EGR_PstnShtOffReqFA ==FALSE		
					No failure on high pressure fuel rail system	FHPJnjLeakageFA ==FALSE		
					No failure on injectors	FUL_GenericInjSysFlt ==FALSE		
					No fault on any exhaust mass flow model input	EXM_TurbFlowNotValid ==FALSE		
					No failure on air control system	AIC_AirShtOffReq ==FALSE		
					No failure on NOx Sensor Bus relay circuit	SBR_RlyFA==FALSE		
					No failure on Upstream SCR temperature sensor	NOX_Snsr1_TempFlt ==FALSE		
					No DTC set:	P30B4		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
NOx Sensor Offset Learning At Min Limit - Bank 1 Sensor 2 - L5D only	P11D5	This diagnosis verifies if Downstream NOx sensor raw signal is affected by an offset	Check if NOx2 signal has an offset by learning the raw value in stable conditions during fuel cut off maneuver. A fault is detected if one of the following conditions is true: 1. Mean of all NOx sensor readings (where every reading is the mean value of a sampling window) OR 2. Mean of all NOx sensor readings (where every reading is the mean value of a sampling window)	< -15.00 ppm > 300.00 ppm	Combustion mode dependent enabling flag Engine is running Engine is not cranking Powertrain relay voltage NOx Sensor Bus relay is commanded ON Post Catalyst NOx Sensor is present in the exhaust Sensor heater is in range: a) (Sensor heater raw resistance - Sensor heater target resistance) / Sensor heater target resistence b) condition a) is fulfilled for time Sensor supply in range Sensor dewpoint is reached Injection small quantity adjustment (SQA) learning is not active EGR measured position Exhaust mass flow is within a range DEF injection is within a range	**NOX_S2_OfstMntrEnblCmbMode** TRUE TRUE >11.00V TRUE TRUE < 0.03% > - 0.03 % > 10.00 sec > 10.80 V TRUE FAD_SQA_LrnET_Enbl ==FALSE < 100.00% < 200.00 g/s > 0.00 g/s < 100.00 mg/s > -1.00 mg/s	The monitor runs after fuel cut off maneuver, when air mass integral exceeds 200.00 g and Post Catalyst NOx signal is stable for at least 0.10s. The NOx value used for the monitor is calculated after sampling up to 1.00 sampling windows (each one made up of 1.00 samples), averaging the mean values of every window. Once computed this value, the diagnostic provides a result. Task=25ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Engine speed is within a range	< 2,700.00 rpm > 700.00 rpm		
					Post Catalyst NOx Sensor temperature is within a range	< 300.00 °C > -7.00 °C		
					Time after DPF regen modes	> 600.00 s		
					Fuel request is steady state when all the following conditions are verified:			
					a) Fuel request derivative	< 5.00mm^3/s		
					b) Fuel request within a range	< 0.00 mm^3 > -1.00 mm^3		
					c) conditions a) and b) are fulfilled for a time	> 2.00 s		
					Intake manifold absolute pressure	< 1,000.00 kPa		
					No failure on intake manifold absolute pressure Sensor	MAP_SensorFA==FALSE		
					No electrical failure on NOx2 Sensor	NOX_Snsr2_FltSt ==FALSE		
					No current control failure on NOx2 Sensor	NOX_NOx2_StBitChkFlt ==FALSE		
					No out of range low failure on NOx2 Sensor	NOX_NOx2_OutOfRngLo Fit ==FALSE		
					No out of ranoe hioh	NOX_NOx2_OutOfRngHi Fit		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					failure on NOx2 Sensor	==FALSE		
					No failure on NOx2 CAN communication	CAN_LostComm_FltN_BusB_NOxSnsr_B ==FALSE		
					No failure on EGR valve actuator	EGR_PstnShtOffReqFA ==FALSE		
					No failure on high pressure fuel rail system	FHPJnj LeakageFA ==FALSE		
					No failure on injectors	FUL_GenericInjSysFlt ==FALSE		
					No fault on any exhaust mass flow model input	EXM_TurbFlowNotValid ==FALSE		
					No failure on air control system	AIC_AirShtOffReq ==FALSE		
					No failure on NOx Sensor Bus relay circuit	SBR_RlyFA==FALSE		
					Upstream SCR temperature is steady state:			
					a) Upstream SCR temperature derivative within a range	< 2.00 °C/s > -5.00 °C/s		
					b) conditions a) is fulfilled for a time	> 100.00 s		
					No failure on Downstream SCR temperature Sensor	NOX_Snsr2_TempFlt ==FALSE		
					No failure on upstream SCR temperature	EGT_TempSCR_UpFlt ==FALSE		
					No 02 plausibility in load	OXY NOx2ChkLoadFlt		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					fault on NOx2	==FALSE		
					No DTC set:	P30B5		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
NOx Sensor 2 02 Pump Current Control Circuit	P11D8	This diagnosis verifies Downstream NOx gen3 sensor 02 reference circuit pin for Open Load Circuit	Check if there is an open circuit on NOx Sensor 2 02 Reference pin (M1, auxiliary pumping current)	open circuit on M1 pin	NOx sensor is Gen3.0	TRUE	Time counter: 20 fails out of 40 samples Task=25ms	Type A, 1 Trips
					Powertrain relay voltage	>11.00V		
					NOx Sensor Bus relay is commanded ON	TRUE		
					CAN_LostComm_FltN_BusB_NOxSnsr_B	FALSE		
					Sensor supply in range	> 10.80 V		
					Sensor dewpoint is reached	TRUE		
					No DTC active:	P30B5		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
NOx Sensor 2 02 Pump Current Control Circuit Low Voltage	P11D9	This diagnosis verifies Downstream NOx gen3 sensor 02 reference circuit pin for Short to Ground	Check if there is a short circuit to ground on NOx Sensor 2 02 Reference pin (M1, auxiliary pumping current)	groundshort on M1 pin	NOx sensor is Gen3.0	TRUE	Time counter: 20 fails out of 40 samples Task=25ms	Type B, 2 Trips
					Powertrain relay voltage	>11.00V		
					NOx Sensor Bus relay is commanded ON	TRUE		
					CAN_LostComm_FltN_BusB_NOxSnsr_B	FALSE		
					Sensor supply in range	> 10.80 V		
					Sensor dewpoint is reached	TRUE		
					No DTC active:	P30B5		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
NOx Sensor 2 02 Pump Current Control Circuit High Voltage	P11DA	This diagnosis verifies Downstream NOx gen3 sensor 02 reference circuit pin for Short to Battery	Check if there is a short circuit to power supply on NOx Sensor 2 02 Reference pin (M1, auxiliary pumping current)	powershort on M1 pin	NOx sensor is Gen3.0	TRUE	Time counter: 20 fails out of 40 samples Task=25ms	Type B, 2 Trips
					Powertrain relay voltage	>11.00V		
					NOx Sensor Bus relay is commanded ON	TRUE		
					CAN_LostComm_FltN_BusB_NOxSnsr_B	FALSE		
					Sensor supply in range	> 10.80 V		
					Sensor dewpoint is reached	TRUE		
					No DTC active:	P30B5		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
NOx Sensor 2 02 Low Reference Circuit	P11FC	This diagnosis verifies Dowstream NOx gen3 sensor Low Reference Circuit for Open Load Circuit	Check if there is an open circuit on NOx Sensor 2 Low Reference pin (Ref)	open circuit on Ref pin	NOx sensor is Gen3.0	TRUE	Time counter: 20 fails out of 40 samples Task=25ms	Type A, 1 Trips
					Powertrain relay voltage	>11.00V		
					NOx Sensor Bus relay is commanded ON	TRUE		
					CAN_LostComm_FltN_BusB_NOxSnsr_B	FALSE		
					Sensor supply in range	> 10.80 V		
					Sensor dewpoint is reached	TRUE		
					No DTC active:	P30B5		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
NOx Sensor 2 02 Low Reference Circuit Low Voltage	P11FD	This diagnosis verifies Downstream NOx gen3 sensor Low Reference Circuit for Short to Ground	Check if there is a short circuit to ground on NOx Sensor 2 Low Reference pin (Ref)	groundshort on Ref pin	NOx sensor is Gen3.0	TRUE	Time counter: 20 fails out of 40 samples Task=25ms	Type B, 2 Trips
					Powertrain relay voltage	>11.00V		
					NOx Sensor Bus relay is commanded ON	TRUE		
					CAN_LostComm_FltN_BusB_NOxSnsr_B	FALSE		
					Sensor supply in range	> 10.80 V		
					Sensor dewpoint is reached	TRUE		
					No DTC active:	P30B5		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
NOx Sensor 2 02 Low Reference Circuit High Voltage	P11FE	This diagnosis verifies Downstream NOx gen3 sensor Low Reference Circuit for Short to Battery	Check if there is a short circuit to power supply on NOx Sensor 2 Low Reference pin (Ref)	powershort on Ref pin	NOx sensor is Gen3.0	TRUE	Time counter: 20 fails out of 40 samples Task=25ms	Type B, 2 Trips
					Powertrain relay voltage	>11.00V		
					NOx Sensor Bus relay is commanded ON	TRUE		
					CAN_LostComm_FltN_BusB_NOxSnsr_B	FALSE		
					Sensor supply in range	> 10.80 V		
					Sensor dewpoint is reached	TRUE		
					No DTC active:	P30B5		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Fuel Pump Command Signal Message Counter Incorrect	P11FF	This DTC monitors for an error in communication with the Fuel Pump Command Signals	Communication of the Alive Rolling Count or Protection Value from the Fuel Control System over CAN bus is incorrect for	>= 15 counts	Message frame	= Is available	Executes in 10ms loop.	Type B, 2 Trips
			out of total samples	>= 16 counts	All the following conditions are met for	>= 3,000.00 milliseconds		
					Power Mode	= Run		
					Powertrain Relay Voltage	>=11.00 Volts		
					Run/Crank Ignition Voltage	>=11.00 Volts		
					And			
					Sensor Bus Relay	= On (if present)		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Fuel Level Sensor 1 Signal Message Counter Incorrect	P1200	This DTC monitors for an error in communication with the Fuel Pump Control Module (FTZM) Fuel Level Sensor 1 Signal Message Counter	Communication of the Fuel Level Sensor 1 Signal Message Counter from the Fuel Pump Control Module (FTZM) over CAN bus is incorrect for out of total samples	>= 8 counts >= 10 counts	Message frame All the following conditions are met for Power Mode Powertrain Relay Voltage Run/Crank Ignition Voltage Sensor Bus Relay	= Is available >= 3,000.00 milliseconds = Run >=11.00 Volts >=11.00 Volts = On (if present)	Executes in 10ms loop.	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Injector 1 Positive Voltage Control Circuit Shorted to Control Circuit	P1248	This DTC detects a shorted load on Injector 1	Voltage high across low side and High side drivers during on state indicates low side shorted to high side	the time to reach the 2 A threshold of the injector current is shorter than 2 us	Test enabled by calibration; and Battery voltage and Key ON and Engine is not cranking and Engine Running and FUL_OutEnblCyl_CiEPSR_CylinderA and At least one injection pulse is requested by the application software (FUL_FuelInjectedCyl_CiEPSR_CylinderA	== 1 [Boolean] > 11.00 [V] - - >= 1.00 [s] == 0 [Boolean] ==TRUE);	5 failures out of 10 samples 100 ms/sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Injector 2 Positive Voltage Control Circuit Shorted to Control Circuit	P1249	This DTC detects a shorted load on Injector 2	Voltage high across low side and High side drivers during on state indicates low side shorted to high side	the time to reach the 2 A threshold of the injector current is shorter than 2 us	Test enabled by calibration; and Battery voltage and Key ON and Engine is not cranking and Engine Running and FUL_OutEnblCyl_CiEPSR_CylinderB and At least one injection pulse is requested by the application software (FUL_FuelInjectedCyl_CiEPSR_CylinderB	== 1 [Boolean] > 11.00 [V] - - >= 1.00 [s] == 0 [Boolean] ==TRUE);	5 failures out of 10 samples 100 ms/sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Injector 3 Positive Voltage Control Circuit Shorted to Control Circuit	P124A	This DTC detects a shorted load on Injector 3	Voltage high across low side and High side drivers during on state indicates low side shorted to high side	the time to reach the 2 A threshold of the injector current is shorter than 2 us	Test enabled by calibration; and Battery voltage and Key ON and Engine is not cranking and Engine Running and FUL_OutEnblCyl_CiEPSRCylinderH and At least one injection pulse is requested by the application software (FUL_FuelInjectedCyl_CiEPSR_CylinderH	== 1 [Boolean] > 11.00 [V] - - >= 1.00 [s] == 0 [Boolean] ==TRUE);	5 failures out of 10 samples 100 ms/sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Injector 4 Positive Voltage Control Circuit Shorted to Control Circuit	P124B	This DTC detects a shorted load on Injector 4	Voltage high across low side and High side drivers during on state indicates low side shorted to high side	the time to reach the 2 A threshold of the injector current is shorter than 2 us	Test enabled by calibration; and Battery voltage and Key ON and Engine is not cranking and Engine Running and FUL_OutEnblCyl_CiEPSR_CylinderE and At least one injection pulse is requested by the application software (FUL_FuelInjectedCyl_CiEPSR_CylinderE	== 1 [Boolean] > 11.00 [V] - - >= 1.00 [s] == 0 [Boolean] ==TRUE);	5 failures out of 10 samples 100 ms/sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Injector 5 Positive Voltage Control Circuit Shorted to Control Circuit	P124C	This DTC detects a shorted load on Injector 5	Voltage high across low side and High side drivers during on state indicates low side shorted to high side	the time to reach the 2 A threshold of the injector current is shorter than 2 us	Test enabled by calibration; and Battery voltage and Key ON and Engine is not cranking and Engine Running and FUL_OutEnblCyl_CiEPSR_CylinderF and At least one injection pulse is requested by the application software (FUL_FuelInjectedCyl_CiEPSR_CylinderF	== 1 [Boolean] > 11.00 [V] - - >= 1.00 [s] == 0 [Boolean] ==TRUE);	5 failures out of 10 samples 100 ms/sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Injector 6 Positive Voltage Control Circuit Shorted to Control Circuit	P124D	This DTC detects a shorted load on Injector 6	Voltage high across low side and High side drivers during on state indicates low side shorted to high side	the time to reach the 2 A threshold of the injector current is shorter than 2 us	Test enabled by calibration; and Battery voltage and Key ON and Engine is not cranking and Engine Running and FUL_OutEnblCyl_CiEPSR_CylinderG and At least one injection pulse is requested by the application software (FUL_FuelInjectedCyl_CiEPSR_CylinderG	== 1 [Boolean] > 11.00 [V] - - >= 1.00 [s] == 0 [Boolean] ==TRUE);	5 failures out of 10 samples 100 ms/sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Injector 7 Positive Voltage Control Circuit Shorted to Control Circuit	P124E	This DTC detects a shorted load on Injector 7	Voltage high across low side and High side drivers during on state indicates low side shorted to high side	the time to reach the 2 A threshold of the injector current is shorter than 2 us	Test enabled by calibration; and Battery voltage and Key ON and Engine is not cranking and Engine Running and FUL_OutEnblCyl_CiEPSR_CylinderC and At least one injection pulse is requested by the application software (FUL_FuelInjectedCyl_CiEPSR_CylinderC	== 1 [Boolean] > 11.00 [V] - - >= 1.00 [s] == 0 [Boolean] ==TRUE);	5 failures out of 10 samples 100 ms/sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Injector 8 Positive Voltage Control Circuit Shorted to Control Circuit	P124F	This DTC detects a shorted load on Injector 8	Voltage high across low side and High side drivers during on state indicates low side shorted to high side	the time to reach the 2 A threshold of the injector current is shorter than 2 us	Test enabled by calibration; and Battery voltage and Key ON and Engine is not cranking and Engine Running and FUL_OutEnblCyl_CiEPSR_CylinderD and At least one injection pulse is requested by the application software (FUL_FuelInjectedCyl_CiEPSR_CylinderD	== 1 [Boolean] > 11.00 [V] - - >= 1.00 [s] == 0 [Boolean] ==TRUE);	5 failures out of 10 samples 100 ms/sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Fuel Pump Driver Over Temperature	P1255	To detect if an internal fuel pump driver over-temperature condition exists under normal operating conditions. The FTZM ERFS control may adjust the PWM slew rate or frequency as a self-protection method, but may not reduce pump rotational speed or impact pumping performance in any way due to an over-temperature condition.	Fuel Pump Driver Temperature	T> 160degC	a) Diagnostic enabled [KeFABR b OvertempDiagEnbl] b) Sensor Bus Relay On c) CAN Sensor Bus message $3EC_Available d) Sensor Bus Message $3EC Temp Signal Message Counter Incorrect [CFMR_b_FTZM_Info7_ARCChkErr]	a) == TRUE b) == TRUE c) == TRUE d) <> TRUE	5.00 failures / 10.00 samples 1 sample / 100 millisec	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Fuel Rail Pressure (FRP) Sensor B Circuit Low Voltage	P127C	Determine when a short circuit to ground affects fuel rail pressure (secondary) sensor.	Fuel rail pressure sensor output (as percentage of supply voltage)	< 4.3 %	Starter motor is not engaged OR Starter motor has been engaged for a time OR Run crank voltage Rail PRessure Sensor configuration calibrated as *Double Track*	 > 15 s > 8.4 V	38 failures out of 55 samples OR 22 continuous failures out of 55 samples 6.25 ms/samples	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Fuel Rail Pressure (FRP) Sensor B Circuit High Voltage	P127D	Determine when a short circuit to voltage affects fuel rail pressure (secondary) sensor.	Fuel rail pressure sensor output (as percentage of supply voltage)	> 94.8%	Starter motor is not engaged OR Starter motor has been engaged for a time OR Run crank voltage Rail PRessure Sensor configuration calibrated as *Double Track*	 >15 s > 8.4 V	38 failures out of 76 samples OR 22 continuous failures out of 76 samples 6.25 ms/samples	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Fuel Pump Driver Control Module System Ignition Switch Run/ Start Position Circuit Low (Only on applications that use an FTZM)	P129D	Detects low voltage of the fuel pump driver control module ignition switch circuit. This diagnostic reports the DTC when the fuel pump driver control module ignition switch circuit voltage is below a calibrated value.	Fuel Pump Driver Control Module Ignition switch Run/Start position circuit low	FTZM Run Crank Active is FALSE	Fuel Tank Zone Module (FTZM) is present on vehicle Fuel Pump Driver Control Module Ignition Switch Run/Start Position Circuit High diagnostic is enabled Fuel Tank Zone Module (FTZM) serial messages are available Run Crank Active Sensor Bus relay is commanded ON	 = 1 = TRUE	40 failures out of 50 samples 50 ms / sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Fuel Pump Driver Control Module Fuel Pump Speed Signal Incorrect	P129F	FTZM ERFS control samples back-Electromotive Force [EMF] for zero voltage-level crossings as a detection method to enable closed loop control brushless commutation. Back EMF is an electrical characteristic of the inactive phase of the 3-phase signal wherein only 2 phases are active at any moment. Brushless pump speed is inferred using rate of zero-crossings detection and number of motor pole-pairs. Speed is reported to the ECM as serial data every 10 millisecs. Diagnostic software [FABR ring] calculates the error between the commanded, arbitrated fuel pump speed [FCBR ring] and the FTZM sensed fuel pump speed. The error is filtered and evaluated against calibratable threshold limits to determine pass/fail status. Any failure that exists on the fuel pump output circuit (3 phases) will be manifested in a Fuel Pump Speed	Sensed Filtered Fuel Pump Speed Error	> Speed Error Low Threshold [Supporting Table] **P129F Threshold Low** OR < Speed Error High Threshold [Supporting Table] **P129F Threshold High**	a) Diagnostic Enabled FABR Speed Rationality Diagnostic b) CAN Sensor Bus message $0CB_Available c) FABR Fuel Control Enable Fault Active d) Fuel Pmp Speed Command Alive Rolling Count and Checksum Error [CAN Bus B $0CE] [CFMR_b_FTZM_Cmd1_ARC_ChkErr] e) FABR Fuel Pump Ckt FA f) FABR Driver OverTemp FA g) Run_Crank input Voltage h) Sensor Bus Relay On j) CAN Sensor Bus message $0CB Data Fault [CFMR_b_FTZM_Info8_ARCChkErr] k) CAN Sensor Bus message $0CB Comm Fault [CFMR_b_FTZM_Info8_UcodeCmFA] l) Fuel Pmp Spd Command ARC and Checksum Comm Fault Code [CFMR_b_FTZM_Cmd1_UcodeCmFA] m) Timer - FABR Rising Edge Diagnostic Delay n) Timer - FABR Falling Edge Diagn Delay	a) == TRUE b) == TRUE c) <> TRUE d) <> TRUE e) <> TRUE f) <> TRUE g) > 11.00 volts h) == TRUE j) <> TRUE k) <> TRUE l) <> TRUE m) > 0.90 seconds n) > 0.90 seconds	1 sample / 12.5 msec	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		Rationality Diagnostic fault. Reported fuel pump speed data will only be consumed in this same diagnostic.						

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Fuel Pump Driver Control Module Enable Circuit Performance	P12A6	The purpose of the Fuel Pump Driver Control Module Enable Circuit Performance diagnostic is to detect if the state of the fuel control enable circuit is valid. This is done by comparing the fuel control enable circuit state [high or low] sensed by the Fuel Tank Zone Module device to the commanded state of the fuel control enable signal from the ECM [in serial data]. When the sensed state does not match the commanded state, the fail counter increments.	Sensed Fuel Control Enable circuit state [Fuel Tank Zone Module device]	<> Fuel Control Enable Active command [serial data]	a) Diagnostic enabled [KeFABR_b_FuelCntrlEnblDiagEnbl] b) Sensor Bus message $0CC Fuel Pump Command Message Signal Counter Incorrect [CFMR_b_FTZM_Info2_ARCChkErr] c) CAN Sensor Bus message $OCC_Available d) Sensor Bus Relay On e) Timer [FABR t RunCrankActive]	a) == TRUE b) <> TRUE c) == TRUE d) == TRUE e) >= 0.51 seconds	40.00 failures / 80.00 samples 1 sample / 12.5 millisec	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Fuel Pump Control Module (Fuel Tank Zone Module) Control Signal Message Counter Incorrect	P12A8	This DTC monitors for an error in communication with the Fuel Pump Control Module (FTZM) Control Signal Message	Communication of the Alive Rolling Count or Protection Value from the Fuel Pump Control Module (FTZM) over CAN bus is incorrect for out of total samples	>= 8 counts >= 10 counts	Message frame All the following conditions are met for Power Mode Powertrain Relay Voltage Run/Crank Ignition Voltage Sensor Bus Relay	= Is available >= 3,000.00 milliseconds = Run >=11.00 Volts >=11.00 Volts = On (if present)	Executes in 10ms loop.	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Ignition Run/ Start Voltage Signal Message Counter Incorrect	P130F	This DTC monitors for an error in the Ignition Run/Start Voltage Signal Message Counter	Communication of the Alive Rolling Count or Protection Value from the Fuel Pump Control Module (FTZM) over CAN bus is incorrect for out of total samples	>= 8 counts >= 10 counts	Message frame All the following conditions are met for Power Mode Powertrain Relay Voltage Run/Crank Ignition Voltage Sensor Bus Relay	= Is available >= 3,000.00 milliseconds = Run >=11.00 Volts >=11.00 Volts = On (if present)	Executes in 10ms loop.	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Glow Plug Control Module Diagnostic Status Signal 1 Message Counter Incorrect	P139A	This DTC monitors for an error in communication with the Glow Plug Control Module Diagnostic Status 1 Signal.	The signal value of the Alive Rolling Count (ARC),Protection Value (PV), or Checksum (CSUM) of the following signals received over serial data is incorrect for: Glow Plug Control Module Diagnostic Status 1 ARC	 >= 8.00 counts out of >= 10.00 counts	Message frame All the following conditions are met for Power Mode Powertrain Relay Voltage Run/Crank Ignition Voltage	= Is available >= 3,000.00 milliseconds = Run >=11.00 Volts >=11.00 Volts	Executes in 12.5ms loop.	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Glow Plug Control Module Diagnostic Status Signal 2 Message Counter Incorrect	P139B	This DTC monitors for an error in communication with the Glow Plug Control Module Diagnostic Status 2 Signal.	The signal value of the Alive Rolling Count (ARC),Protection Value (PV), or Checksum (CSUM) of the following signals received over serial data is incorrect for: Glow Plug Control Module Diagnostic Status 2 ARC	 >= 8.00 counts out of >= 10.00 counts	Message frame All the following conditions are met for Power Mode Powertrain Relay Voltage Run/Crank Ignition Voltage	= Is available >= 3,000.00 milliseconds = Run >=11.00 Volts >=11.00 Volts	Executes in 12.5ms loop.	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
EGR Slow Response - Increasing Flow (OBDII market only)	P140B	This monitor (in increasing flow direction) detects failures in the air system such to not fulfilll the request of EGR flow in the intake manifold during transient conditions. It works only in closed loop EGR control zone. This monitor is used to detect any malfunction in the EGR system that leads to slow down the air control causing the vehicle's emissions to exceed OBDII limits. The aim of the EGR flow slow response monitor is to detect small leakages in the pipe after the compressor or in the intake/exhaust manifold. This monitor could also detect slow responding EGR valves, or skewed MAF sensor. Slow responding throttle and VGT vanes could also affect the EGR flow response time.	Error difference (absolute value) between the desired EGR rate and the actual EGR rate during transient air control conditions. The error is averaged over a calibrate-able cumulative transient time.	> **P140B: Increasing EGR slow response threshold** **[%]**	Calibration on diagnostic enabling	P140B, P140C: EGR slow response enabling == TRUE (see FreeForm)	Test is evaluated after the enabling conditions are satisfied for a number of samples >=250.00 sampling time is 25ms	Type B, 2 Trips
					Engine Running	==TRUE		
					Cranking ignition in range	Battery voltage > 11.00 [V]		
					PT Relay voltage in range	Powertrain relay voltage > 11.00 [V]		
					Air Control is Active (air control in closed loop)	Refer to "Air Control Active" Free Form		
					Air control active condition lasts for a time	> 0.10 [s]		
					Desired EGR rate	> 0 [%]		
					No active transition from a combustion mode to another one	==TRUE		
					OBD Coolant Enable Criteria	==TRUE		
					Throttle measured position	> 85.00 [%]		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Outside air temperature	>-6.70 [°C]		
					Ambient air pressure	> 75.00 [kPa]		
					Engine speed in range	> 700.00 [rpm] AND <2,400.00 [rpm]		
					Desired fuel quantity in range	>15.00 [mm^3] AND < 110.00 [mm^3]		
					Exhaust manifold pressure in range	>75.00 [kPa] AND < 350.00 [kPa]		
					Desired air request is steady state: AirReq-AirReqOld	>-40.00 [mg/s] AND <-2.00 [mg/s]		
					Air control tracking error (air setpoint-MAF measure)	< 0 [mg]		
					EGR valve position OR it is above that threshold for a time	<= 75.00 [%] >= 0.10 [s]		
					Exhaust manifold pressure is valid	EXM_ExhMnfdPresNotVld ==FALSE		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Nominal EGR valve total flow is valid	EGR_VlvTotFlowNomNotVid ==FALSE		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
EGR Slow Response - Decreasing Flow (OBDII market only)	P140C	This monitor (in decreasing flow direction) detects failures in the air system such to not fulfill! the request of EGR flow in the intake manifold during transient conditions. It works only in closed loop EGR control zone. This monitor is used to detect any malfunction in the EGR system that lead to slow down the air control causing the vehicle's emissions to exceed OBDII limits. The aim of the EGR flow slow response monitor is to detect small obstructions in the exhaust pipe. This monitor could also detect slow responding EGR valves, or skewed MAF sensor. Slow responding throttle and VGT vanes could also affect the EGR flow response time.	Error difference (absolute value) between the desired EGR rate and the actual EGR rate during transient air control conditions. The error is averaged over a calibrate-able cumulative transient time.	> **P140C: Decreasing EGR slow response threshold** **[%]**	Calibration on diagnostic enabling	P140B, P140C: EGR slow response enabling == TRUE (see FreeForm)	Test is evaluated after the enabling conditions are satisfied for a number of samples >=500.00 sampling time is 25ms	Type B, 2 Trips
					Engine Running	==TRUE		
					Cranking ignition in range	Battery voltage > 11.00 [V]		
					PT Relay voltage in range	Powertrain relay voltage > 11.00 [V]		
					Air Control is Active (air control in closed loop)	Refer to "Air Control Active" Free Form		
					Air control active condition lasts for a time	> 0.10 [s]		
					Desired EGR rate	> 0 [%]		
					No active transition from a combustion mode to another one	==TRUE		
					OBD Coolant Enable Criteria	==TRUE		
					Throttle measured position	> 85.00 [%]		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Outside air temperature	>-6.70 [°C]		
					Ambient air pressure	>75.00 [kPa]		
					Engine speed in range	> 700.00 [rpm] AND <2,000.00 [rpm]		
					Desired fuel quantity in range	>15.00 [mm^3] AND < 110.00 [mm^3]		
					Exhaust manifold pressure in range	>75.00 [kPa] AND <350.00 [kPa]		
					Desired air request is steady state: AirReq-AirReqOld	>2.00 [mg/s] AND <20.00 [mg/s]		
					Air control tracking error (air setpoint-MAF measure)	> 0 [mg]		
					Exhaust manifold pressure is valid	EXM_ExhMnfdPresNotVld ==FALSE		
					Nominal valve total flow is valid	EGR_VlvTotFlowNomNotVld ==FALSE		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Fuel Level Sensor A Reference Feedback Range/ Performance [For use on vehicles with FTZM]	P1434	This DTC will detect a fault in Primary fuel tank level sensor 5V reference by comparing DEC ECU commanded signal period and pulse width values against measured period and pulse width reported by the smart device	Reference Voltage 0 Period Error Maximum [Measured Ref V Period - Commanded RefV Period]	> 25.00 millisec	a] CAN serial data available [$2D7] b] Calibration - Reference Voltage Command Source c] Timer - Reference Voltage Pulse Width Available Synchronization d] Timer - Reference Voltage Period Available Delay e] Diagnostic System Disabled f] FTZM Serial Data Info4 Rolling Counter Check Error g] Reference Voltage Performance 0 Diagnostic Enabled	a] == True b] == ECM c] > 1.25 sec d] > 0.75 sec e] <> True f] <> True g] == TRUE	250 ms / sample	Type B, 2 Trips
			Reference Voltage 0 Pulse Width Error Maximum [Measured Ref V PW - Commanded RefV PW]	> 1.50 millisec	a] CAN serial data available [$2D7] b] Calibration - Reference Voltage Command Source c] Timer - Reference Voltage Pulse Width Available Synchronization d] Timer - Reference Voltage Period Available Delay e] Diagnostic System Disabled	a] == True b] == ECM c] > 1.25 sec d] > 0.75 sec e] <> True	250 ms / sample 16 Failures / 20 Samples	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					f] FTZM Serial Data Info4 Rolling Counter Check Error g] Reference Voltage Performance 0 Diagnostic Enabled	f] <> True g] == TRUE		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Reductant Control System Diagnostic Signals Message Counter Incorrect	P143A	This DTC monitors for an error in communication with the Reductant Control System Diagnostic Signals	Communication of the Alive Rolling Count or Protection Value of the Diesel Exhaust Fluid Controller Diagnostic Information 1 over CAN bus is incorrect for	>= 8.00 counts	Message frame	= Is available	Executes in 10ms loop.	Type B, 2 Trips
					All the following conditions are met for	>= 3,000.00 milliseconds		
					Power Mode	= Run		
					Powertrain Relay Voltage	>=11.00 Volts		
			out of total samples	>= 10.00 counts	Run/Crank Ignition Voltage	>=11.00 Volts		
			Or					
			Communication of the Alive Rolling Count or Protection Value of the Diesel Exhaust Fluid Diagnostic Controller Information 2 over CAN bus is incorrect for	>= 8.00 counts				
			out of total samples	>= 10.00 counts				
			Or					
			Communication of the Alive Rolling Count or Protection Value of the Diesel Exhaust Fluid Controller Diagnostic Information 3 over CAN bus is incorrect for	>=8.00 counts				
			out of total samples	>= 10.00 counts				

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Reductant Control System Information Signals Message Counter Incorrect	P143B	This DTC monitors for an error in communication with the Reductant Control System Information Signals	Communication of the Alive Rolling Count or Protection Value of the Diesel Exhaust Fluid Controller Reductant Sensor Data over CAN bus is incorrect for out of total samples Or Communication of the Alive Rolling Count or Protection Value of the Diesel Exhaust Fluid Controller Information 1 over CAN bus is incorrect for out of total samples Or Communication of the Alive Rolling Count or Protection Value of the Diesel Exhaust Fluid Controller Information 2 over CAN bus is incorrect for out of total samples	>= 8.00 counts >= 10.00 counts >=8.00 counts >= 10.00 counts >= 8.00 counts >= 10.00 counts	Message frame All the following conditions are met for Power Mode Powertrain Relay Voltage Run/Crank Ignition Voltage	= Is available >= 3,000.00 milliseconds = Run >=11.00 Volts >=11.00 Volts	Executes in 10ms loop.	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Fuel Level Sensor B Reference Feedback Range/ Performance [For use on vehicles with FTZM and Secondary Fuel Tank]	P143E	This DTC will detect a fault in Secondary fuel tank level sensor 5V reference by comparing DEC ECU commanded signal period and pulse width values against measured period and pulse width reported by the smart device	Reference Voltage 1 Period Error Maximum [Measured Ref V Period - Commanded RefV Period]	> 25.00 millisec	a] CAN serial data available [$2D7] b] Calibration - Reference Voltage Command Source c] Timer - Reference Voltage Pulse Width Available Synchronization d] Timer - Reference Voltage Period Available Delay e] Diagnostic System Disabled f] FTZM Serial Data Info4 Rolling Counter Check Error g] Reference Voltage Performance 1 Diagnostic Enabled	a] == True b] == ECM c] > 1.25 sec d] > 0.75 sec e] <> True f] <> True g] == TRUE	250 ms / sample 16 Failures/ 20 Samples	Type B, 2 Trips
			Reference Voltage 1 Pulse Width Error Maximum [Measured Ref V PW - Commanded RefV PW]	> 1.50 millisec	a] CAN serial data available [$2D7] b] Calibration - Reference Voltage Command Source c] Timer - Reference Voltage Pulse Width Available Synchronization d] Timer - Reference Voltage Period Available Delay e] Diagnostic System Disabled	a] == True b] == ECM c] > 1.25 sec d] > 0.75 sec e] <> True	250 ms / sample 16 Failures / 20 Samples	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					f] FTZM Serial Data Info4 Rolling Counter Check Error g] Reference Voltage Performance 1 Diagnostic Enabled	f] <> True g] == TRUE		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Fuel Pump Driver Control Module Configuration Status Signal Message Counter Incorrect	PUCE	This DTC monitors for an error in communication with the Fuel Pump Driver Control Module Configuration Status Signal.	Communication of the Alive Rolling Count or Protection Value from the Fuel Control System over CAN bus is incorrect for out of total samples	>= 8.00 counts >= 10.00 counts	Message frame All the following conditions are met for Power Mode Powertrain Relay Voltage Run/Crank Ignition Voltage And Sensor Bus Relay	= Is available >= 3,000.00 milliseconds = Run >=11.00 Volts >=11.00 Volts = On (if present)	Executes in 10ms loop.	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Transmission Engine Speed Request Circuit	P150C	This DTC monitors for an error in communication with the Transmission Engine Speed Request signal in$19D	Communication of the Alive Rolling Count or Protection Value in the Transmission Engine Speed signal over CAN bus is incorrect for out of total samples	>= 8 counts >= 10 counts	Message frame All the following conditions are met for Power Mode Powertrain Relay Voltage Run/Crank Ignition Voltage	= Is available >= 3,000.00 milliseconds = Run >=11.00 Volts >=11.00 Volts	Executes in 25ms loop.	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Sensor Bus Relay Feedback Circuit High Voltage	P157A	Detects unexpected CAN activity on the sensor bus. This diagnostic reports the DTC when controller-specific CAN frames are received while the sensor bus relay is commanded "off."	Continued reception of sensor bus CAN frames during driver off state indicates a stuck on circuit failure. Controller specific received CAN frames are selected to determine continued CAN activity.		Sensor Bus Relay feedback circuit high voltage diagnostic enabled Sensor Bus Relay commanded “OFF” No Sensor Bus active DTCs:	= 1 P16D7, P16D8, P16D9	6 failures out of 10 samples 250ms / Sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Internal Control Module Pressure Regulator 1 Control Performance	P163A	Determine when commanded current for Fuel metering Unit valve is out of expected current range.	Current flowing through fuel metering unit valve OR Current flowing through fuel metering unit valve	>2.80A <0.05A	Powertrain relay voltage Rail pressure is governed by Fuel Metering Unit (refer to *RailPresCntrl)* No active DTC since key is on:	> 11.0V FHP_MU_DrvrCloseTFTK 0 FHP_MU_DrvrOpenTFTK 0	160 failures out of 250 samples 6.25 ms/sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Internal Control Module Pressure Regulator 2 Control Performance	P163B	Determine when commanded current for Rail Pressure Regulator valve is out of expected current range.	Current flowing through pressure regulator valve OR Current flowing through pressure regulator valve	>2.80A <0.05A	Powertrain relay voltage Rail pressure is governed by Pressure Regulator (refer to *RailPresCntrl)* No active DTC since key is on:	> 11.0V FHP_PR_DrvrCloseTFTK 0 FHP_PR_DrvrOpenTFTK 0	160 failures out of 250 samples 6.25 ms/sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Sensor Reference Voltage Status Message Counter Incorrect	P165C	This DTC monitors for an error in communication with the Sensor Reference Voltage Status Signals	Communication of the Alive Rolling Count or Protection Value from the Fuel Control System over CAN bus is incorrect for out of total samples	 >= 8 counts >= 10 counts	Message frame All the following conditions are met for Power Mode Powertrain Relay Voltage Run/Crank Ignition Voltage And Sensor Bus Relay	= Is available >= 3,000.00 milliseconds = Run >=11.00 Volts >=11.00 Volts = On (if present)	Executes in 10ms loop.	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Battery Voltage Signal Message Counter Incorrect	P167F	This DTC monitors for an error in the FTZM Battery Voltage Signal Message Counter	Communication of the Alive Rolling Count or Protection Value from the Fuel Pump Control Module (FTZM) over CAN bus is incorrect for out of total samples	 >= 8 counts >= 10 counts	Message frame All the following conditions are met for Power Mode Powertrain Relay Voltage Run/Crank Ignition Voltage Sensor Bus Relay	= Is available >= 3,000.00 milliseconds = Run >=11.00 Volts >=11.00 Volts = On (if present)	Executes in 10ms loop.	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Ignition Voltage Correlation	P1682	Detect a continuous or intermittent out of correlation between the Run/Crank Ignition Voltage and the Powertrain Relay Ignition Voltage. The diagnostic monitors the difference in voltage between Run/Crank Voltage and the Powertrain Relay Ignition Voltage and fails the diagnostic when the voltage difference is too high. This diagnostic only runs when the powertrain is commanded on and the Run/Crank Voltage is greater than a threshold based on IAT or the powertrain ignition voltage is high enough the Run/Crank voltage is high enough.	|Run/Crank - PT Relay Ignition) >	3.00 Volts		Powertrain commanded on AND (Run/Crank voltage > Table, f(IAT). See supporting tables: **P1682_PT Relay Pull-in Run/Crank Voltage f(IAT)** OR PT Relay Ignition voltage > 5.50 Volts) AND Run/Crank voltage > 5.50 Volts	240/480 counts; or 0.175 sec continuous; 12.5 ms/count in main processor	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Turbocharger Boost Control A Slow Response - Increasing Pressure (OBDII market only)	P168A	This monitor (in increasing pressure direction) detects failures in the charging air system such to not fulfill the request of boost pressure in the intake manifold. It works only in transient closed loop boost pressure control zone. This monitor is used to detect any malfunction in the boost pressure system that lead to slow down the boost pressure control causing the vehicle's emissions to exceed OBDII limits. The aim of the boost pressure slow response monitor is to detect small leakages in the pipe after the compressor or in the intake/exhaust manifold (increasing pressure). This monitor could also detect slow responding VGT vanes since the boost pressure is usually controlled by the turbocharger actuator. Slow responding throttle and HP EGR valves could also affect the boost pressure response time.	Error difference (absolute value) between the desired intake boost pressure and the actual intake manifold pressure measured by the MAP sensor. The error is averaged over a calibrate-able cumulative transient time. If throttle control is active: The setpoint used for closed loop control is the conversion of the desired upstream throttle boost pressure (target) in desired intake boost pressure. The conversion of the setpoint is done calculating the pressure drop over the throttle valve that is strictly dependent on the valve position. If throttle control is NOT active: The setpoint used for closed loop control is the intake manifold pressure: in this situation the diagnostic monitors the boost pressure closed loop control tracking error.	> **P168A: Positive boost slow response threshold** [kPa]	Calibration on diagnostic enabling Engine Running Cranking ignition in range PT Relay voltage in range Difficult launch NOT detected Boost control in closed loop Boost control in closed loop condition lasts for a time No active transition from a combustion mode to another one Engine Coolant Temperature OR OBD Coolant Enable Criteria	P168A, P168B: Boost pressure slow response enabling == TRUE (see FreeForm) ==TRUE Battery voltage > 11.00 [V] Powertrain relay voltage > 11.00 [V] Refer to "LDT_DifficultLaunchActive" Free Form Refer to "Boost Control in Closed Loop" Free Form > 1.00 [s] ==TRUE >20.00 [°C] ==TRUE	Test is evaluated after the enabling conditions are satisfied for a number of samples >=500.00 sampling time is 25ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Outside air temperature	>-6.70 [°C]		
					Ambient air pressure	> 75.00 [kPa]		
					Throttle Valve measured position	>= 85.00 [%] if throttle control is active (Refer to "Other AICR DSL flags" Free Form) >= 75.00 [%] if throttle control is NOT active (Refer to "Other AICR DSL flags" Free Form)		
					Engine speed in range	>1,800.00 [rpm] AND <2,800.00 [rpm]		
					Desired fuel quantity in range	>0.00 [mm^3] AND < 125.00 [mm^3]		
					Desired boost pressure derivative in range: (BstRespTgt - BstRespTgAirReqOld)/dt	> 5.00 [kPa/s] AND < 500.00 [kPa/s]		
					Boost pressure current tracking error (not averaged over the cumulative transient time)	> 0 [kPa]		
					No active DTCs			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
						AICJBstSysDiagDenomDsbl ==FALSE		
					All enabling conditions last for a time	> 0.02 [s]		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Turbocharger Boost Control A Slow Response - Decreasing Pressure (OBDII market only)	P168B	This monitor (in decreasing pressure direction) detects failures in the charging air system such to not fulfill the request of boost pressure in the intake manifold. It works only in transient closed loop boost pressure control zone. This monitor is used to detect any malfunction in the boost pressure system that lead to slow down the boost pressure control causing the vehicle's emissions to exceed OBDII limits. The aim of the boost pressure slow response monitor is to detect small obstructions in the exhaust pipe (decreasing pressure). This monitor could also detect slow responding VGT vanes since the boost pressure is usually controlled by the turbocharger actuator. Slow responding throttle and HP EGR valves could also affect the boost pressure response time.	Error difference (absolute value) between the desired intake boost pressure and the actual intake manifold pressure measured by the MAP sensor. The error is averaged over a calibrate-able cumulative transient time. If throttle control is active: The setpoint used for closed loop control is the conversion of the desired upstream throttle boost pressure (target) in desired intake boost pressure. The conversion of the setpoint is done calculating the pressure drop over the throttle valve that is strictly dependent on the valve position. If throttle control is NOT active: The setpoint used for closed loop control is the intake manifold pressure: in this situation the diagnostic monitors the boost pressure closed loop control tracking error.	> **P168B: Negative boost slow response threshold** [kPa]	Calibration on diagnostic enabling Engine Running Cranking ignition in range PT Relay voltage in range Difficult launch NOT detected Boost control in closed loop Boost control in closed loop condition lasts for a time No active transition from a combustion mode to another one Engine Coolant Temperature OR OBD Coolant Enable Criteria	P168A, P168B: Boost pressure slow response enabling == TRUE (see FreeForm) ==TRUE Battery voltage > 11.00 [V] Powertrain relay voltage > 11.00 [V] Refer to "LDT_DifficultLaunchActive" Free Form Refer to "Boost Control in Closed Loop" Free Form > 1.00 [s] ==TRUE >20.00 [°C] ==TRUE	Test is evaluated after the enabling conditions are satisfied for a number of samples >=500.00 sampling time is 25ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Outside air temperature	>-6.70 [°C]		
					Ambient air pressure	> 75.00 [kPa]		
					Throttle Valve measured position	>= 85.00 [%] if throttle control is active (Refer to "Other AICR DSL flags" Free Form) >= 75.00 [%] if throttle control is NOT active (Refer to "Other AICR DSL flags" Free Form)		
					Engine speed in range	>1,800.00 [rpm] AND <2,800.00 [rpm]		
					Desired fuel quantity in range	> 45.00 [mm^3] AND < 85.00 [mm^3]		
					Desired boost pressure derivative in range: (BstRespTgt - BstRespTgAirReqOld)/dt	>-200.00 [kPa/s] AND <-5.00 [kPa/s]		
					Boost pressure current tracking error (not averaged over the cumulative transient time)	< 0 [kPa]		
					No active DTCs			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
						AICJBstSysDiagDenomDsbl ==FALSE		
					All enabling conditions last for a time	> 0.02 [s]		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Ignition Voltage Correlation #3	P16BC	Detect a continuous or intermittent out of correlation between the Run/Crank Ignition Voltage & the Powertrain Relay Ignition Voltage #2	|Run/Crank - PT Relay Ignition) >	3.00 Volts		Powertrain commanded on AND (Run/Crank voltage > Table, f(IAT). See supporting tables: **P1682_PT Relay Pull-in Run/Crank Voltage f(IAT)** OR PT Relay Ignition voltage > 5.50 Volts) AND Run/Crank voltage > 5.50 Volts	240/480 counts; or 0.175 sec continuous; 12.5 ms/count in main processor	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Engine Controls Ignition Relay Feedback Circuit 3 High Voltage - (Diesel Controllers ONLY)	P16BF	Detects high voltage in the engine controls ignition relay feedback circuit 3. This diagnostic reports the DTC when high voltage is present. Monitoring occurs when the relay state is inactive.	Engine controls ignition relay feedback circuit 3 high voltage	Relay voltage >= 4.00	Powertrain relay high diag enable Powertrain relay state	= 1.00 = INACTIVE	50 failures out of 63 samples 100 ms / sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Sensor Bus Relay Control Circuit Open	P16D7	Detects an open circuit in the sensor bus relay circuit. This diagnostic reports the DTC when an open circuit is present. A decision is made by comparing a voltage measurement to a controller specific voltage threshold.	Voltage measurement outside of controller specific acceptable range during driver off state indicates open circuit failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for an open circuit.	Open Circuit: > 200 K Q ohms impedance between output and controller ground	Run/Crank Voltage	Voltage > 11.00 volts	8 failures out of 10 samples 250 ms / sample	Type A, 1 Trips Note: In certain controllers P16D8 may also set (Sensor Bus Relay Control Circuit Low).

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Sensor Bus Relay Control Circuit Low	P16D8	Detects a short to ground in the sensor bus relay circuit. This diagnostic reports the DTC when a short to ground is present. A decision is made by comparing a voltage measurement to a controller specific voltage threshold.	Voltage measurement outside of controller specific acceptable range during driver off state indicates short to ground failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for a short to ground.	Short to ground: < 0.5 Q impedance between output and controller ground	Run/Crank Voltage	Voltage > 11.00 volts	8 failures out of 10 samples 250 ms / sample	Type A, 1 Trips Note: In certain controllers P16D7 may also set (Sensor Bus Relay Control Circuit Open).

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Sensor Bus Relay Control Circuit High	P16D9	Detects a short to power in the sensor bus relay circuit. This diagnostic reports the DTC when a short to power is present. A decision is made by comparing a voltage measurement to a controller specific voltage threshold.	Voltage measurement outside of controller specific acceptable range during driver on state indicates short to power failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for a short to power.	Short to power: < 0.5 Q impedance between output and controller power	Run/Crank Voltage	Voltage > 11.00 volts	8 failures out of 10 samples 250 ms / sample	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Control Module Serial Peripheral Interface Bus 1	P16F0	This DTC detects intermitent and continuous invalid SPI messages. This is based on the detection of missing or invalid receive message within the main processor before receiving a valid message.	This function detects a serial communications fault based upon the detection of missing or invalid (receive) message within the main processor before receiving a valid message.		Run/Crank voltage	>6.41 Volts	39/ 399 counts continuous; 12.5 ms /count in the ECM main processor	Type A, 1 Trips
			This function detects a serial communications fault based upon the detection of missing or invalid (receive) message within the main processor after receiving a valid message.		Run/Crank voltage	> 6.41 Volts	159 / 399 counts continuous; 12.5 ms /count in the ECM main processor	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Transfer Case Control Module Transfer Case Command State Rationality - 4WD high or 4WD low command not 4wd high or 4WD low ratio	P17D4	The diagnostic monitor compares measured transfer case ratio to the transfer case control module commanded transfer case state. When the measured transfer case gear ratio is 4WD neutral ratio, while, the transfer case control module command state is 4WD high ratio or 4WD low ratio, the DTC is set. The 4WD neutral ratio regions are considered ratios outside the nominal 4WD high and nominal 4WD low ratios. The 4WD ratio is calculated as transmission output shaft speed divided by the transfer case output shaft speed, both speed are measured values based on speed sensors.	transfer case contol module transfer case command state AND measured transfer case ratio is NOT in 4WD low ratio window AND measured transfer case ratio is NOT in 4WD high window AND measured transfer case ratio is NOT in 4WD low ratio window AND measured transfer case ratio is NOT in 4WD high window OR vehicle is stopped: transfer case output shaft speed transmission output shaft speed vehicle stopped secondary parameter thresholds met (measured transfer case ratio = transmission output speed / transfer case output speed)	± 4WD neutral 4WD low ratio window < 3.30 > 2.70 4WD high ratio window <1.30 > 0.70 > 3.20 < 2.80 > 1.20 < 0.80 < 10.0 RPM > 500.0 RPM	vehicle stopped: transmission output shaft speed engine torque engine speed accelerator pedal position accelerator pedal position brake pedal position transmssion gear is forward gear: transmission output shaft speed engine torque engine speed accelerator pedal position accelerator pedal position brake pedal position transmssion gear is reverse gear: transmission output shaft speed engine torque engine speed accelerator pedal position accelerator pedal position brake pedal position diagnsotic monitor enable PTO active engine power limited DTCs not fault active	> 500.0 RPM > 100.0 Nm > 300.0 RPM > 5.0 % hysteresis high NOT < 3.0 % hysteresis low < 100.0 % > 500.0 RPM > -20.0 Nm > 0.0 RPM > 0.0 % hysteresis high NOT < 0.0 % hysteresis low < 100.0 % > 500.0 RPM > 90.0 Nm > 300.0 PRM > 6.0 % hysteresis high NOT < 3.0 % hysteresis low < 100.0 % = 1 Boolean = FALSE = FALSE CrankSensor_FA VehicleSpeedSensor_FA EngineTorqueEstInaccurate P057B, P057C, P057D,	fail time > 10.50 seconds out of sample time > 15.00 seconds update rate 12.5 milliseconds	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			update rate 12.5 milliseconds			P057E, P279A, P279B, P279C, P0502, P0503, P0722, P0723, P2160, P2161		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Reductant Level Sensor Circuit Range/ Performance	P203B	This monitor detects when a fault is causing this readiness signal being equal “Don’t use data’ for excessive times.	Ratio between amount of "Don't use data" readiness signal samples and total readiness signal samples for DEF level sensor	> 0.98	Sensor Bus Wake Up signal is active At least one message has been received by DEF device (Engine off timer AND Tank Temperature sampled at init AND UTLC Temperature sampled at init AND Tank Temperature AND UTLC Temperature) OR (Tank Temperature AND UTLC Temperature) Vehicle speed Absolute derivative of vehicle speed for a minimum time Estimated tank level volume No fault for: - serial communication with DEF device (SCRPM) - sensor bus wake up signal - level sensor out of range	 > 14,400 s > -6.0 °C > -6.0 °C > -9.0 °C > -9.0 °C > -4.0 °C > -2.0 °C > 0.0 km/h < 1.25m/s^2 > 0 s >1.01 U010E SCR_DEFLS_ElecFltSt	Travelled distance with Enable Conditions met > 5.0 km	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					- DEF tank temperature sensor - UTLC temperature sensor - vehicle speed	SCR_DEFTS_FA		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Reductant Level Sensor Circuit Low Voltage	P203C	This diagnosis verifies if an short to ground or open circuit occurred in the DEF level sensor	DEF level sensor raw signal is below a calibrated threshold	< 0.20	Test enabled by calibration Key on (OR engine running) Engine is not cranking Battery voltage No loss of CAN comunication	1.00 == TRUE > 11.00 [V] U010E, Lost Communication With Reductant Control Module (SCR)	40.00 failures out of 50.00 samples Time basis = 100ms	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Reductant Level Sensor Circuit High Voltage	P203D	This diagnosis verifies that the short to battery occurred in the DEF level sensor	DEF level sensor raw signal is above a calibrated threshold	> 99.80	Test enabled by calibration Key on (OR engine running) Engine is not cranking Battery voltage No loss of CAN comunication	1.00== TRUE > 11.00 [V] U010E, Lost Communication With Reductant Control Module (SCR)	80.00 failures out of 100.00 samples Time basis = 100ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Reductant Injector Circuit / Open Bank 1 Unit 1	P2047	This diagnosis verifies if a DEF dosing valve open circuit occurred	HWIO interface DEFMV_OPEN = Fault	VeHWIO_e_DEFMV_ Open == CeSCRR_e_Fault	Test enabled by calibration Key on (OR engine running) Engine is not cranking Battery voltage HWIO interface DEFMV_OPEN different from INDETERMINATE	1.00 > 11.00 [V]	30.00 failures out of 60.00 samples Time basis = 100ms	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Reductant Injector Circuit Low Bank 1 Unit 1	P2048	This diagnosis verifies if a DEF dosing valve low side short to ground occurred	HWIO interface DEFMV_GROUND_SHORT = Fault	VeHWIO_e_DEFMV_Gsht == CeSCRR_e_Fault	Test enabled by calibration Key on (OR engine running) Engine is not cranking Battery voltage HWIO interface DEFMV_GROUND_SHORT different from INDETERMINATE	1.00 > 11.00 [V]	30.00 failures out of 60.00 samples Time basis = 100ms	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Reductant Injector Circuit High Bank 1 Unit 1	P2049	This diagnosis verifies if a DEF dosing valve low side short to battery occurred	HWIO interface DEFMV_POWER_SHORT = Fault	VeHWIO_e_DEFMV_Psht == CeSCRR_e_Fault	Test enabled by calibration Key on (OR engine running) Engine is not cranking Battery voltage HWIO interface DEFMV_ENABLE_POWER_SHORT different from INDETERMINATE	1.00 > 11.00 [V]	30.00 failures out of 60.00 samples Time basis = 100ms	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Reductant Pressure Sensor Performance	P204B	This diagnosis verifies if the DEF tank Pressure sensor is affected by rationality fault (offset)	At the end of driving cycle, with DEF line empty and pressure compensation phase done, DEF pressure sensor signal is not equal (with tolerance) to the ambient pressure DEF Pressure signal outside the range:	(7.50;18.50) [KPa]	Test enabled by calibration DEF dosing valve not in fault No electrical fault on pressure sensor SCR System Stand-By recovery action not activated No DEF Pump Rotor Stall fault No DEF Pressure Governor Deviation High fault DEF temperature sensor higher than a calibrated threshold End of trip process executed SCR pressure compensation performed during afterrun DEF metering valve HWIO interface provides INDETERMINATE OR NO-FAULT during After-Run state	1.00 SCR_DEFMV_FA == FALSE SCR-DEFPS-FA == FALSE SCR_DEFPM_FA == FALSE SCR_PresGovDvtnHiFA == FALSE > -7.00	160.00 failures out of 200.00 samples Time basis = 25ms	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Powertrain Relay Voltage is in range At least one DEF pressure sample has been received from ECM			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Reductant Pressure Sensor Circuit Low Voltage	P204C	This diagnosis verifies that the DEF pressure sensor is affected by open circuit or short circuit to ground	The DEF pressure sensor raw signal is a voltage, expressed as percentage of the sensor's supply voltage. DEF pressure sensor raw signal is below a calibrated threshold	< 5.00 [%]	Test enabled by calibration Battery voltage > 11V Key on Engine is not cranking	1.00== TRUE > 11.00 [V]	100.00 failures out of 125.00 samples Time basis = 25ms	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Reductant Pressure Sensor Circuit High Voltage	P204D	This diagnosis verifies that the DEF pressure sensor is affected by short circuit to battery	The DEF pressure sensor raw signal is a voltage, expressed as percentage of the sensor's supply voltage. DEF pressure sensor raw signal is above a calibrated threshold	> 98.00 [%]	Test enabled by calibration Battery voltage > 11V Key on Engine is not cranking	1.00== TRUE > 11.00 [V]	100.00 failures out of 125.00 Time basis = 25ms	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Reductant Tank Temperature Sensor Performance	P205B	This diagnosis verifies that the DEF tank temperature sensor is affected by rationality fault (gain or offset)	Difference between temperature sensor signal and system average temperature (provided by the Exhaust Gas Temperature sensors) is greater than a calibrated threshold	> 35.00	Test enabled by calibration Battery voltage Key on (OR engine running) No loss of CAN comunication Average exhaust gas temperature available or not available for a time Engine speed = 0 rpm No electrical fault on DEF temperature sensor Time elapsed since last key off Tank Refill is not detected DEF temperature sensor signal is not outside the DEF freezing temperature range (with toilerance). Test not performed in this driving cycle No electrical malfunction detected:	1.00== TRUE > 11.00 [V] U010E, Lost Communication With Reductant Control Module (SCR) < 8 s SCR_DEFTS_FA == FALSE > 28,800.00 [(-90.00- 1.00) ; (-90.00 + 1.00)] [°C] SCR_DEFTS_ElecHiErr, SCR_DEFTS_ElecLoErr	8.00 failures out of 10.00 samples Time basis = 500ms	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Reductant Tank Temperature Sensor Circuit Low Voltage	P205C	This diagnosis verifies that the DEF tank temperature sensor is affected by open circuit or short circuit to ground	The DEF tank temperature sensor raw output is a resistance expressed in [ohm] DEF temperature sensor raw signal is below a calibrated threshold	< 200.00 [ohm]	Test enabled by calibration Battery voltage Key on (OR engine running) Engine is not cranking No loss of CAN comunication DEF Tank heater not in fault	1.00 > 11.00 [V] U010E, Lost Communication With Reductant Control Module (SCR) SCR_DEFTH_FA == FALSE	8.00 failures out of 10.00 samples Time basis = 500ms	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Reductant Tank Temperature Sensor Circuit High Voltage	P205D	This diagnosis verifies that the DEF tank temperature sensor is affected by short circuit to battery	The DEF tank temperature sensor raw output is a resistance expressed in [ohm] DEF temperature sensor raw signal is above a calibrated threshold	> 60,000.00	Test enabled by calibration Battery voltage Key on (OR engine running) Engine is not cranking No loss of CAN comunication DEF Tank heater not in fault Defrost phase is completed	1.00 > 11.00 [V] U010E, Lost Communication With Reductant Control Module (SCR) SCR_DEFTH_FA== FALSE	8.00 failures out of 10.00 samples Time basis = 500ms	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
DEF temperature sensor Self Correlated diagnostic	P205E	This diagnosis verifies that the DEF temperature sensor signal has not a plausible time evolution	DEF temperature sensor signal time evolution not plausible (intermittent signal)		Test enabled by calibration Run Crank active Run Crank in range No loss of CAN comunication No electrical fault on tank Temperature sensor	1.00 U010E, Lost Communication With Reductant Control Module (SCR) SCR_DEFTS_ElecFltSt == FALSE	8.00 failures out of 10.00 samples Time basis = 500ms	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Fuel Level Sensor 2 Performance (For use on vehicles with dual fuel tanks and electric transfer pump)	P2066	This DTC will detect a secondary fuel tank level sensor stuck in-range	1) ****************************** Fuel Level in Primary and Secondary Tanks Remain in an Unreadable Range too Long ****************************** 1a) If Deadband diagnostic subtest enabled 1b) If fuel volume in primary tank is 1c) and if fuel volume in secondary tank is 1d) and if 1b and 1c indications do not change while fuel volume consumed by engine is OR 2) ****************************** Fuel consumed without a Secondary Fuel Level Change ****************************** 2a) If engine is running, and the fuel consumed is 2b) then secondary tank volume change must be	1a) == Disabled status 1b) >1,024.0 liters 1c) < 0.0 liters 1d) > 18.0 liters 2a) > 30 liters 2b) > 5.00 liters	1a) Diagnostic Enabled 1b) Engine Operational Status	1a) ==True 1b) == Running	250 ms / sample	Type B, 2 Trips

Component/ System	**Fault Code**	**Monitor Strategy Description**	**Malfunction Criteria**	**Threshold Value**	**Secondary Parameters**	**Enable Conditions**	**Time Required**	**MIL Ilium.**
Fuel Level Sensor 2 Circuit Low Voltage (For use on vehicles with two fuel senders connected to an FTZM)	P2067	This DTC will detect a fuel sender out-of-range low in the secondary fuel tank.	Fuel level Sender % of 5V range	< 10%	a) Diagnostic enabled status b) Fuel Level Sensor Initialized status c) Fuel Level Sensor Data Available Status d) Communication faults status	a) == True b) == True c) == True d) <> True	100 failures out of 125 samples 250 ms / sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Fuel Level Sensor 2 Circuit High Voltage (For use on vehicles with two fuel senders connected to an FTZM)	P2068	This DTC will detect a fuel level sensor out-of-range high in the secondary fuel tank.	Fuel level Sender % of 5V range	> 60 %	a) Diagnostic enabled status b) Fuel Level Sensor Initialized status c) Fuel Level Sensor Data Available Status d) Communication faults status	a) == True b) == True c) == True d) <> True	100 failures out of 125 samples 250 ms / sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
DEF Quality Sensor Performance	P206B	This diagnosis checks if the DEF Quality Sensor has performance problems	The Quality sensor ready flag is provided to the ECM by the DEF-C via CAN bus. This monitor checks if the reflected sound waves are not heard by the sensor (for example, if the sensor is contaminated).	Quality sensor ready flag status equals to FALSE	Run/Crank is Active	TRUE	Time counter: 4,500.00 fails out of4,600.00 samples Task = 100ms	Type A, 1 Trips
					Powertrain relay voltage	>11.00V		
					Engine in Cranking Phase	FALSE		
					No loss of CAN communication	CAN_LostComm_FltN_BusB_DEF_C == FALSE		
					No fault messages from the DEF-C Controller	TRUE		
					DEF Level Estimation	> 5.001		
					DEF QS thermistor temperature	> 5.00 °C		
					No electrical fault on DEF QS is present	DQMR_DEFQS_ElecFlt == FALSE		
					No electrical low fault on DEF Quality Sensor SENT circuit	DQMR_DEFQS_SENT_ElecFA == FALSE		
					No performance fault on DEF Quality Sensor SENT circuit	DQMR_DEFQS_SENT_PerfFA == FALSE		
					No fault on DEF QS thermistor is present	DQMR_DEFQS_TempFlt == FALSE		
					No electrical fault on Quality sensor PZT is present	DQMR_DEFQS_PZT_ElecFlt == FALSE		
					Number of accelerations greater than 1.25 m/s2 in actual driving cycle	> 10.00m/s2		
					Number of accelerations			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					greater than 1.25m/s2 from last DEF refill Distance travelled in actual driving cycle Distance travelled from last DEF refill	> 40.00 m/s2 > 2.00 Km > 20.00 Km		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Reductant Quality Sensor Circuit Low	P206C	This diagnosis verifies if DEF Quality Sensor read out of range low	The Reductant Quality Sensor PZT Input Voltage Low error status is provided to the ECM by the DEF-C via CAN bus. This monitor checks if the DEF-C Sensor read out of range low.	Reductant Quality Sensor PZT Input Voltage < 0.15 V (Input to Speed of Sound Signal Conditioning)	Run/Crank is Active Engine in Cranking Phase Powertrain relay voltage No loss of CAN communication No fault messages from the DEF-C Controller DEF QS thermistor temperature	TRUE FALSE >11.00V CAN_LostComm_FltN_BusB_DEF_C == FALSE TRUE > -7.00	Time counter: 40.00 fails out of 50.00 samples Task = 100ms	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Reductant Quality Sensor Circuit High	P206D	This diagnosis verifies if DEF Quality Sensor sensor read out of range high	The Reductant Quality Sensor PZT Input Voltage High error status is provided to the ECM by the DEF-C via CAN bus. This monitor checks if the DEF-C Sensor read out of range high.	Reductant Quality Sensor PZT Input Voltage > 4.5 V (Input to Speed of Sound Signal Conditioning)	Run/Crank is Active Engine in Cranking Phase Powertrain relay voltage No loss of CAN communication No fault messages from the DEF-C Controller	TRUE FALSE >11.00V CAN_LostComm_FltN_BusB_DEF_C == FALSE TRUE	Time counter: 40.00 fails out of 50.00 samples Task = 100ms	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Reductant Pump Control Circuit	P208A	This diagnosis verifies that the DEF pump phases are open	Motor Pump Phase Open Error status provided by DEF control module == FAULT		Test enabled by calibration Battery voltage Key on (OR engine running) Engine is not cranking No loss of CAN comunication Motor Pump Phase Open Error status provided by DEF control module different from indeterminate	1.00 > 11.00 [V] U010E, Lost Communication With Reductant Control Module (SCR)	32.00 failures out of 40.00 samples Time basis = 100ms	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Reductant Pump Control Circuit Low Voltage	P208C	This diagnosis verifies that the DEF pump phases are shorted to ground	Motor Pump Phase Shorted To Ground Error status provided by DEF control module == FAULT	VeSCRR_e_PmpMtrShrtToGND==FAULT	Test enabled by calibration	1.00	20.00 failures out of 25.00 samples Time basis = 100ms	Type A, 1 Trips
					Battery voltage	> 11.00 [V] (VeLVTR_b_PT_RelaylnRange== TRUE)		
					Key on (OR engine running)	VePMDR_b_RunCrankActive==TRUE		
					Engine is not cranking	VeEMDR_b_EngModeCrank == FALSE		
					No loss of CAN comunication	U010E, Lost Communication With Reductant Control Module (SCR) (GetCANR_b_LostComm_FltN= FALSE)		
					Motor Pump Phase Shorted To Ground Error status provided by DEF control module different from indeterminate	VeSCRR_e_PmpMtrShrtToGND != Indeterminate		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Reductant Pump Control Circuit High Voltage	P208D	This diagnosis verifies that the DEF pump phases are shorted to battery	Motor Pump Phase Shorted To Battery Error status provided by DEF control module == FAULT		Test enabled by calibration Battery voltage Key on (OR engine running) Engine is not cranking No loss of CAN comunication Motor Pump Phase Shorted To Battery Error status provided by DEF control module different from indeterminate	1.00 > 11.00 [V] U010E, Lost Communication With Reductant Control Module (SCR)	20.00 failures out of 25.00 samples Time basis = 100ms	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Reductant Heater 1 Control Circuit	P20B9	This diagnosis verifies if the DEF tank heater is affected by open circuit	Tank Heater Open circuit status == FAULT		Test enabled by calibration	1.00	8.00 failures out of 10.00 samples Time basis = 500ms	Type A, 1 Trips
					Temperature used by the heating strategy to switch on the heaters < threshold	< 60.00		
					Battery voltage	> 11.00 [V]		
					Key on (OR engine running)			
					Engine is not cranking			
					No loss of CAN comunication	U010E, Lost Communication With Reductant Control Module (SCR)		
					DEF Temperature sensor not in fault	SCR_DEFTS_FA== FALSE		
					Open circuit status provided by DEF control module different from indeterminate			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
DEF tank heater plausibility check	P20BA	This diagnosis verifies that the DEF tank heater resistance value is not plausible	DEF tank heater resistance not plausible (too different from the nominal one) DEF tank heater resistance outside the range	 (1.08; 2.02) [ohm]	Test enabled by calibration Battery voltage Key on (OR engine running) Engine is not cranking No SCR Power Module CAN loss of communication No electrical faults affecting the tank heater Heating strategy is requesting the Heater to be activated Time passed since heater activation > threshold Tank heater supply under-voltage fault not present Tank heater supply over-voltage fault not present	1.00 > 11.00 [V] U010E, Lost Communication With Reductant Control Module (SCR) SCR_DEFTH_ElecFltSt == FALSE > 1.00[s] SCR_TankHeatSplyVoltFA == FALSE SCR_DEFTH_SplyVoltHiFA	16.00 failures out of 20.00 samples Time basis = 500ms	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Reductant Heater 1 Control Circuit Low Voltage	P20BB	This diagnosis verifies if the DEF tank heater is affected by short circuit to ground	Tank Heater Short to Ground Low Side / High Side status == FAULT		Test enabled by calibration Temperature used by the heating strategy to switch on the heaters < threshold Battery voltage Key on (OR engine running) Engine is not cranking No loss of CAN comunication DEF Temperature sensor not in fault Short to Ground Low Side / High Side status provided by DEF control module different from indeterminate	1.00 < 60.00 > 11.00 [V] U010E, Lost Communication With Reductant Control Module (SCR) SCR_DEFTS_FA== FALSE	8.00 failures out of 10.00 samples Time basis = 500ms	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Reductant Heater 1 Control Circuit High Voltage	P20BC	This diagnosis verifies if the DEF tank heater is affected by short circuit to battery	Tank Heater Short to Battery Low Side / High Side status == FAULT		Test enabled by calibration Temperature used by the heating strategy to switch on the heaters < threshold Battery voltage Key on (OR engine running) Engine is not cranking No loss of CAN comunication DEF Temperature sensor not in fault Short to Battery Low Side / High Side status provided by DEF control module different from indeterminate	1.00 < 60.00 > 11.00 [V] U010E, Lost Communication With Reductant Control Module (SCR) SCR_DEFTS_FA== FALSE	8.00 failures out of 10.00 samples Time basis = 500ms	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Reductant Heater 2 Control Circuit	P20BD	This diagnosis verifies if the DEF line heater is affected by open circuit	Line Heater Open circuit status == FAULT		Test enabled by calibration Temperature used by the heating strategy to switch on the heaters < threshold Battery voltage Key on (OR engine running) Engine is not cranking No loss of CAN comunication Open circuit status provided by DEF control module different from indeterminate	1.00 < 60.00 > 11.00 [V] U010E, Lost Communication With Reductant Control Module (SCR)	8.00 failures out of 10.00 samples Time basis = 500ms	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
DEF line heater plausibility check	P20BE	This diagnosis verifies that the DEF line heater resistance value is not plausible	DEF line heater resistance value not plausible (too different from the nominal one)	(Heater supply voltage/ Heater Current) > 17.66 OR (Heater supply voltage/ Heater Current) < 4.82	Test enabled by calibration	1.00	16.00 failures out of 20.00 samples Time basis = 500ms	Type A, 1 Trips
					Battery voltage	> 11.00 [V]		
					Key on (OR engine running)			
					Engine is not cranking			
					No loss of CAN comunication	U010E, Lost Communication With Reductant Control Module (SCR)		
					No electrical faults affecting the line heater	SCR_DEFLH_ElecFltSt ==FALSE		
					Heating strategy is requesting the Heater to be activated	VeSCRR_b_HeatB_On == TRUE		
					Time since heater activation > threshold	> 1.00		
					Line heater supply under-voltage fault not present	SCR_LineHeatSplyVoltFA == FALSE		
					Line heater supply under-voltage fault not present	SCR_DEFLH_SplyVoltHiFA		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Reductant Heater 2 Control Circuit Low Voltage	P20BF	This diagnosis verifies if the DEF line heater is affected by short circuit to ground	Line Heater Short to Ground Low Side / High Side status == FAULT		Test enabled by calibration Temperature used by the heating strategy to switch on the heaters < threshold Battery voltage Key on (OR engine running) Engine is not cranking No loss of CAN comunication Short to Ground Low Side / High Side status provided by DEF control module different from indeterminate	1.00 < 60.00 > 11.00 [V] U010E, Lost Communication With Reductant Control Module (SCR)	8.00 failures out of 10.00 samples Time basis = 500ms	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Reductant Heater 2 Control Circuit High Voltage	P20C0	This diagnosis verifies if the DEF line heater is affected by short circuit to battery	Line Heater Short to Battery Low Side / High Side status == FAULT		Test enabled by calibration Temperature used by the heating strategy to switch on the heaters < threshold Battery voltage Key on (OR engine running) Engine is not cranking No loss of CAN comunication Short to Battery Low Side / High Side status provided by DEF control module different from indeterminate	1.00 < 60.00 > 11.00 [V] U010E, Lost Communication With Reductant Control Module (SCR)	8.00 failures out of 10.00 samples Time basis = 500ms	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Reductant Pressure Too Low	P20E8	This diagnosis verifies that the DEF pressure is lower than the target value set by the control	(Test 1) Too attemps of pressure build up (Test 2) DEF pressure setpoint - DEF measured pressure > calibrateable threshold	(Test 1) > 2.00 (Test 2) > 166.00	Test enabled by calibration	1.00	40.00 failures out of 50.00 samples Time basis = 500ms	Type A, 1 Trips
					Battery voltage	> 11.00 [V]		
					Key on (OR engine running)			
					Defrost complete			
					Motor pump rotor stall fault not present	SCR_PmpRtrStlFA == FALSE		
					No fault on DEF pressure sensor	SCR_DEFPS_FA== FALSE		
					No fault on PWM command	SCR_DEF_PumpCmdFA == FALSE		
					No electrical fault on DEF pump	SCR_DEFPM_FA == FALSE		
					No electrical fault on DEF dosing valve	SCR_DEFMV_FA == FALSE		
					Motor pump is no more green (some build pressure attempts already performed since the beginning of vehicle life). Time elapsed from the first build up attempt	> 1,200.00 [s]		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					(Test 1) Pressure Build-Up state is released for the first time during the driving cycle AND Test-Pass OR Test-Fail has not been reported for this test (Test 2) DEF pressure control is in pressure closed loop			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Reductant Pressure Too High	P20E9	This diagnosis verifies that the DEF pressure in the dosing line is too high	Difference between "DEF line pressure" and "DEF line pressure set point" > Threshold AND Pump rotor speed < Threshold	> 150.00 < 3,200.00	Test enabled by calibration Battery voltage Key on (OR engine running) DEF pressure sensor not in fault PWM_pump_command not in fault DEF pressure control status equal to “Closed loop control” DEF motor pump not in fault Pump motor speed signal valid on CAN	1.00 > 11.00 [V] SCR_DEFPS_FA== FALSE SCR_DEF_PumpCmdFA == FALSE VeSCRC_e_SCR_PresState == CeSCRC_e_PresCntrlCLC SCR_DEFPM_FA	200.00 failures out of 250.00 samples Time basis = 25ms	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
SCR NOx Catalyst Efficiency Below Threshold Bank 1 - EWMA Enabled	P20EE	The diagnosis checks if there is a malfunction in the SCR NOx conversion system measuring its SCR NOx conversion efficiency. SCR NOx conversion efficiency is evaluated by two NOx sensors (upstream & downstream SCR). The monitoring is executed by comparing measured NOx conversion efficiency and reference efficiency: - Measured NOx conversion efficiency is calculated as q_Eff_Msrd = 1 - [J NOx_Dwn_Msrd / f NOx_Up_Msrd] - Reference efficiency is evaluated as q Eff R ef = 1 - [J NOx_Dwn_Ref / J NOx_Up_Msrd] NOx_Dwn_Ref is calsulated as	EWMA filtering is applied to the difference between measured SCR NOx conversion efficiency (q_Eff_Msrd)) and reference efficiency (q_Eff_Ref). For the calculation of r|_Eff_Ref, a fixed value of SCR_eff_estimated equal to 1 is used if 0.00 == 1 [Boolean], Otherwise, the estimated efficiency provided by model (SCR_eff_estimated) is used.	Fail threshold is = 0, Repass threshold is = 0	Test enabled by calibration; No active DTCs; Debounce time elapsed after SCR chemical model is healed; Debounce time elapsed after exiting from transient dosing forced by remedial action (conditions active only if Market # USA_CARB); Diagnostic system not disabled; Test not yet executed on current key cycle except the case where EWMA filtering is in Rapid Response (RR) or Fast Initial Response (FIR) state; Tests per trip up to calibratable value when EWMA filter is in Fast Initial Response (FIR)	CalOut = 1 [Boolean]; # NOX_Snsr1_NOx_Flt ≠ NOX_NOx_SnsrSCR_DwnFlt + EGT_TempSCR_UpFlt # EGP_PresSCR_UpFlt # EXM_TurbFlowNotValid # SCR_RDP_Flt # SCR_TipStuckFltSt # SCR_DEFMV_FA # SCR_ChemicalMdlFlt; Debounce = 120 [sec]; Debounce = 300 [sec]; NotDsbl = True [Boolean]; NotRun = True [Boolean]; FIR test trip < 4 ;	One failure to set the DTC.	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		NOx_Dwn_Ref = NOx_Up_Msrd * (1 - (SCReffestimated - offset)) SCR_eff_estimated comes from SCR chemical model and it takes into account the estimated amount of NOx at SCR outlet: SCReff_estimated = 1 - (NOx_Dwn_Est/ NOx_Up_Msrd) The offset **(K_EffOffset)** is calibrated in order to detect a malfunction. Test is performed when either NOx integral upstream SCR reaches 2,500.00 [mg] or NOx integral downstream SCR reaches 1,000,000.00 [mg] whatever condition occurs first. Use this section if EWMA filter is enabled (1.00 == 1 [Boolean]).			state; Total tests executed in Fast Initial Response (FIR) state up to calibratable value; Tests per trip up to calibratable value when EWMA filter is in Rapid Response (RR) state; Total tests executed in Rapid Response (RR) state up to calibratable value; DEF system ready to inject; Urea inside the tank not frozen; Debounce time elapsed after DEF defrost has been completed; Engine torque request higher than calibration; Rate of change of estimated efficiency (from SCR catalyst model) less than or equal to a calibratable value; Debounce time elapsed when estimated efficiency stable condition becomes true;	 FIR tot tests < 4 ; RR test trip < 3 ; RR tot tests < 3 ; DEF ready = True [Boolean]; DEF tank status = DEF_TankNotFrozen [Enumerative]; Debounce = 300 [sec]; Torque >= 0 [Nm]; |Rate of change of estimated efficiency! <= 0 [-] Debounce = 1 [sec];		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Upstream SCR NOx sensor measurement reliable;	Reliable = True [Boolean];		
					Downstream SCR NOx sensor measurement reliable;	Reliable = True [Boolean];		
					Slip detection reliable;	Slip reliable = True [Boolean];		
					Number of DPF regeneration events successfully completed after vehicle exits from assembly plant (SCR catalyst de-greened);	DPF Rgn Compt > 0 [-];		
					SCR service bay test not active;	Service Bay Test == ServNotRunning [Enumerative];		
					Debounce time elapsed after exiting from SCR service bay test;	Debounce = 300 [sec];		
					Outside ambient temperature higher than calibration with hysteresis;	OAT > -7 [°C]; -7 [°C] < hysteresis range < -7 [°C]		
					Ambient pressure higher than calibration with hysteresis;	Pressure > 75 [kPa]; 75 [kPa] < hysteresis range < 75 [kPa]		
					Urea dosing activation by SCR mean temperature condition;	SCR mean temperature > 180 [°C]; 170 [°C] < hysteresis range < 180 [°C]		
					Debounce time elapsed after urea dosing activation by SCR mean	Debounce = 3 [sec];		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					temperature becomes true;			
					Difference between SCR upstream and SCR downstream temperatures: - higher than first calibration curve (f[SCR mean temperature]) AND - lower than second calibration curve (f[SCR mean temperature]);	SCR up/down diff temperature > **T_MinTempGrad [°C]** Temperature < **T_MaxTempGrad** [°C];		
					Debounce time elapsed when difference between SCR upstream and SCR downstream temperature condition becomes in range;	Debounce = 2 [sec];		
					Exhaust mass flow and SCR average temperature within calibratable limits defined by 2 size table (f [exhaust mass flow, SCR average temperature]), enabled if table output is greater than calibration;	**K_EffExhFlowCond >** 1 [-];		
					Debounce time elapsed when exhaust mass flow and SCR average temperature conditions get within limits;	Debounce = 5 [sec];		
					SCR mean temperature time derivative within limits defined bv	-2 < Delta temperature < 1 [°C/sec];		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					maximum and minimum calibrations and debounce time elapsed based on following logic: - while SCR mean temperature time derivative is outside the limits, the system continuously evaluates the debounce time based on calibration curve (f[SCR mean temperature time derivative]) and records the maximum value; - instead when SCR mean temperature time derivative gets within the limits, countdown starts until debounce time has been reached;	Debounce = **t_DerTempDsblTmr** [sec];		
					Upstream SCR NOx flow measurement lower than calibration and debounce time elapsed based on following logic: - while SCR NOx flow measurement higher than calibration, the system continuously evaluates the NOx average flow; - instead when SCR NOx flow measurement gets lower than calibration, debounce time based on calibration curve (f[NOx average flow, time spent with NOx flow higher than calibration]) is evaluated and countdown starts until debounce time	NOx up flow < 145[mg/s]; Debounce = **t_NOxFlowIncDsblTmr** [sec]; Max debounce = 250 [sec];		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					has been elapsed. Limitation on the debouce time is always applied;			
					Upstream SCR NOx flow measurement higher than calibration;	NOx up flow > 2 [mg/s];		
					Upstream SCR NOx sensor measurement higher than calibration;	NOx up > 125 [ppm];		
					Upstream SCR NOx sensor measurement lower than calibration;	NOx up < 650 [ppm];		
					Downstream SCR NOx sensor measurement higher than calibration;	NOx dwn > -1 [ppm];		
					Upstream SCR absolute NOx flow derivative lower than calibration;	Delta NOx up flow < 500 [mg/sec^2];		
					NO2/NOX ratio: - higher than first calibratable value AND - lower than second calibratable value;	NO2/NOX > 0 [-] NO2/NOX < 1 [-];		
					Debounce time elapsed when all NOx conditions (except upstream SCR NOx flow measurement lower than calibration) become true;	Debounce = 0 [sec];		
					Slip conditions: - debounce time elapsed when no slip is detected any more,	Debounce = 275 [sec]		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					OR - when slip is active NOx upstream flow accumulated shall be greater than a calibration curve (f[SCR temperature]);	f NOxJJp > **m_SlipNOxIntglThrsh** [mg];		
					DPF / DeHC combustion modes not active;	Cmb # DPF_HiO2 | DPF_LoO2 | DPF_EngPrtct_HiO2 | DPF_EngPrtct_LoO2 | DPF PN | DPF_RichIdle | DeHC_Drive | DeHC_Park [Enumerative];		
					Debounce time elapsed after exiting from DPF / DeHC combustion modes;	Debounce = 500 [sec];		
					NH3 storage deviation error: - higher than first calibration curve (f[SCR average temperature]) AND - lower than second calibration curve (f[SCR average temperature]);	NH3 deviation > **m_NH3_StrgDevErrMinThrsh** [g] NH3 deviation < **m_NH3_StrgDevErrMaxThrsh** [g];		
					NH3 storage: - higher than first calibration curve (f[SCR average temperature]) AND - lower than second calibration curve (f[SCR average temperature]);	NH3 storage > **m NH3 StrgMinThrsh** [g] NH3 storage < **m_NH3_StrgMaxThrsh** [g];		
					Debounce time elapsed when NH3 storage	Debounce = 250 [seel:		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					deviation error or NH3 storage condition becomes in range; SCR dosing in NH3 storage control or in intrusive NH3 storage control; Debounce time elapsed when switching to NH3 storage control or intrusive NH3 storage control; Diesel Exhaust Fluid quality measurement (concentration read by DEF quality sensor) higher than calibration with hysteresis (condition active only if DEF quality sensor is available);	Dos = NH3_StrgCntrl | Intrsv_NH3_StrgCntrl [Enumerative]; Debounce = 180 [sec]; DEF concentration > 30 [Pct]; 30 [Pct] < hysteresis range < 30 [Pct] DEFQS present= 1 [Boolean];		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Accelerator Pedal Position (APP) Sensor 1 Lo	P2122	Detects a continuous or intermittent short low or open in the APP sensor #1 by monitoring the APP1 sensor percent Vref and failing the diagnostic when the APP1 percent Vref is too low. This diagnostic only runs when battery voltage is high enough. Detects a continuous or intermittent short low or open in the APP sensor #1 on the Main processor.	APP1 percent Vref	< 0.4625 % Vref	Run/Crank voltage No 5V reference error or fault for # 4 5V reference circuit	>6.41 Volts P06A3	19/39 counts; or 14 counts continuous; 12.5 ms/count in the main processor	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Accelerator Pedal Position (APP) Sensor 1 Hi	P2123	Detects a continuous or intermittent short high in the APP sensor #1 by monitoring the APP1 sensor percent Vref and failing the diagnostic when the APP1 percent Vref is too high. This diagnostic only runs when battery voltage is high enough. Detect a continuous or intermittent short high in the APP sensor #1 on the Main processor.	APP1 percent Vref >	4.7500 % Vref	Run/Crank voltage No 5V reference error or fault for # 4 5V reference circuit	>6.41 Volts P06A3	19/39 counts; or 14 counts continuous; 12.5 ms/count in the main processor	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Accelerator Pedal Position (APP) Sensor 2 Lo	P2127	Detects a continuous or intermittent short low or open in the APP sensor #2 by monitoring the APP2 sensor percent Vref and failing the diagnostic when the APP2 percent Vref is too low. This diagnostic only runs when battery voltage is high enough. Detects a continuous or intermittent short low or open in the APP sensor #2 on the Main processor.	APP2 percent Vref <	0.3250 % Vref	Run/Crank voltage No 5V reference error or fault for # 4 5V reference circuit	> 6.41 Volts P0697	19/39 counts; or 14 counts continuous; 12.5 ms/count in the main processor	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Accelerator Pedal Position (APP) Sensor 2 Hi	P2128	Detects a continuous or intermittent short high in the APP sensor #2 by monitoring the APP2 sensor percent Vref and failing the diagnostic when the APP2 percent Vref is too high. This diagnostic only runs when battery voltage is high enough. Detect a continuous or intermittent short high in the APP sensor #2 on the Main processor.	APP2 percent Vref >	2.6000 % Vref	Run/Crank voltage No 5V reference error or fault for # 4 5V reference circuit	> 6.41 Volts P0697	19/39 counts; or 14 counts continuous; 12.5 ms/count in the main processor	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Accelerator Pedal Position (APP) Sensor 1-2 Correlation	P2138	Detect a continuous or intermittent correlation fault between APP sensors #1 and #2 on Main processor. 1.) The diagnostic monitors the difference in position between APP1 and the APP2 and fails the diagnostic when the difference is too high. This diagnostic only runs when the battery voltage is high enough. 2.) The diagnostic also monitors the difference in reference voltage between normalized min APP1 and the normalized min APP2 and fails the diagnostic when the difference is too high. This diagnostic only runs when the battery voltage is high enough. Detects a continuous or intermittent correlation fault between APP sensors #1 and #2 on Main processor	Difference between APP1 displaced and APP2 displaced >	5.000 % offset at min. pedal position with a linear threshold to 10.001 % at max. pedal position	Run/Crank voltage No APP sensor faults No 5V reference errors or faulst for # 3 & # 4 5V reference circuits	> 6.41 Volts (P2122, P2123.P2127, P2128) (P06A3, P0697)	19/39 counts intermittent; or 15 counts continuous, 12.5 ms/count in the main processor	Type A, 1 Trips
			Difference between (normalized min APP1) and (normalized min APP2) >	5.000 % Vref	Run/Crank voltage No APP sensor faults No 5V reference errors or faulst for # 3 & # 4 5V reference circuits	> 6.41 Volts (P2122, P2123.P2127, P2128) (P06A3, P0697)	19/39 counts intermittent; or 15 counts continuous, 12.5 ms/count in the main processor	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Injector Positive Voltage Control Circuit Group 1 Low Voltage	P2147	This DTC detects a short circuit to ground of the high side driver circuit of the Bank 1 (injector 1 and 4)	Voltage high across High Side Driver of bank 1 (injector 1 and 4) during On state indicates short to ground	impedence between HS pin of injector 1 and controller ground <= 0.5 [Ohm] OR impedence between HS pin of injector 4 and controller ground <= 0.5 [Ohm]	Test enabled by calibration; and Battery voltage and Key ON and Engine is not cranking and Engine Running and (FUL_OutEnblCyl_CiEPSR_CylinderA OR FUL_OutEnblCyl_CiEPSR CylinderE) and (FUL_FuelInjectedCyl_CiEPSR CylinderA OR FUL_FuelInjectedCyl_CiEPSR CylinderE)	= 1 [Boolean] > 11.00 [V] - - >= 1.00 [s] == 0 [Boolean] == 0 [Boolean] == TRUE); == TRUE);	5 failures out of 10 samples 100 ms/sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Injector Positive Voltage Control Circuit Group 1 High Voltage	P2148	This DTC detects a short circuit to high voltage of high side driver circuit of the Bank 1 (injector 1 and 4)	Voltage low across High side drive of bank 1 (injector 1 and 4) during off state indicates short to power	impedence between HS pin of injector 1 and controller power <= 0.5 [Ohm] OR impedence between HS pin of injector 4 and controller power <= 0.5 [Ohm]	Test enabled by calibration; and Battery voltage and Key ON and Engine is not cranking and Engine Running and (FUL_OutEnblCyl_CiEPSR_CylinderA OR FUL_OutEnblCyl_CiEPSR CylinderE) and (FUL_FuelInjectedCyl_CiEPSR CylinderA OR FUL_FuelInjectedCyl_CiEPSR CylinderE)	= 1 [Boolean] > 11.00 [V] - - >= 1.00 [s] == 0 [Boolean] == 0 [Boolean] == TRUE); == TRUE);	5 failures out of 10 samples 100 ms/sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Reductant Pump A Current Too High	P214E	This diagnosis verifies that the DEF pump current flow is too high	Motor High Current Error status provided by DEF control module == FAULT OR Motor Current Limit Error status provided by DEF control module == FAULT		Test enabled by calibration Battery voltage Key on (OR engine running) Engine is not cranking No loss of CAN comunication Motor High Current Error status provided by DEF control module different from indeterminate	1.00 > 11.00 [V] U010E, Lost Communication With Reductant Control Module (SCR)	20.00 failures out of 25.00 samples OR 20.00 failures out of 25.00 samples Time basis = 100ms	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Injector Positive Voltage Control Circuit Group 2 Low Voltage	P2150	This DTC detects a short circuit to ground of the high side driver circuit of the Bank 2 (injector 2 and 5)	Voltage high across High Side Driver of bank 2 (injector 2 and 5) during On state indicates short to ground	impedence between HS pin of injector 2 and controller ground <= 0.5 [Ohm] OR impedence between HS pin of injector 5 and controller ground <= 0.5 [Ohm]	Test enabled by calibration; and Battery voltage and Key ON and Engine is not cranking and Engine Running and (FUL_OutEnblCyl_CiEPSR_CylinderB OR FUL_OutEnblCyl_CiEPSR CylinderF) and (FUL_FuelInjectedCyl_CiEPSR CylinderB OR FUL_FuelInjectedCyl_CiEPSR CylinderF)	= 1 [Boolean] > 11.00 [V] - - >= 1.00 [s] == 0 [Boolean] == 0 [Boolean] == TRUE); == TRUE);	5 failures out of 10 samples 100 ms/sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Injector Positive Voltage Control Circuit Group 2 High Voltage	P2151	This DTC detects a short circuit to high voltage of high side driver circuit of the Bank 2 (injector 2 and 5)	Voltage low across High side drive of bank 2 (injector 2 and 5) during off state indicates short to power	impedence between HS pin of injector 2 and controller power <= 0.5 [Ohm] OR impedence between HS pin of injector 5 and controller power <= 0.5 [Ohm]	Test enabled by calibration; and Battery voltage and Key ON and Engine is not cranking and Engine Running and (FUL_OutEnblCyl_CiEPSR_CylinderB OR FUL_OutEnblCyl_CiEPSR CylinderF) and (FUL_FuelInjectedCyl_CiEPSR CylinderB OR FUL_FuelInjectedCyl_CiEPSR CylinderF)	= 1 [Boolean] > 11.00 [V] - - >= 1.00 [s] == 0 [Boolean] == 0 [Boolean] == TRUE); == TRUE);	5 failures out of 10 samples 100 ms/sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Injector Positive Voltage Control Circuit Group 3 Low Voltage	P2153	This DTC detects a short circuit to ground of the high side driver circuit of the Bank 3 (injector 6 and 7)	Voltage high across High Side Driver of bank 3 (injector 6 and 7) during On state indicates short to ground	impedence between HS pin of injector 6 and controller ground <= 0.5 [Ohm] OR impedence between HS pin of injector 7 and controller ground <= 0.5 [Ohm]	Test enabled by calibration; and Battery voltage and Key ON and Engine is not cranking and Engine Running and (FUL_OutEnblCyl_CiEPSR_CylinderG OR FUL_OutEnblCyl_CiEPSR CylinderC) and (FUL_FuelInjectedCyl_CiEPSR CylinderG OR FUL_FuelInjectedCyl_CiEPSR CylinderC)	= 1 [Boolean] > 11.00 [V] - - >= 1.00 [s] == 0 [Boolean] == 0 [Boolean] == TRUE); == TRUE);	5 failures out of 10 samples 100 ms/sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Injector Positive Voltage Control Circuit Group 3 High Voltage	P2154	This DTC detects a short circuit to high voltage of high side driver circuit of the Bank 3 (injector 6 and 7)	Voltage low across High side drive of bank 3 (injector 6 and 7) during off state indicates short to power	impedence between HS pin of injector 6 and controller power <= 0.5 [Ohm] OR impedence between HS pin of injector 7 and controller power <= 0.5 [Ohm]	Test enabled by calibration; and Battery voltage and Key ON and Engine is not cranking and Engine Running and (FUL_OutEnblCyl_CiEPSR_CylinderG OR FUL_OutEnblCyl_CiEPSR CylinderC) and (FUL_FuelInjectedCyl_CiEPSR CylinderG OR FUL_FuelInjectedCyl_CiEPSR CylinderC)	= 1 [Boolean] > 11.00 [V] - - >= 1.00 [s] == 0 [Boolean] == 0 [Boolean] == TRUE); == TRUE);	5 failures out of 10 samples 100 ms/sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Injector Positive Voltage Control Circuit Group 4 Low Voltage	P2156	This DTC detects a short circuit to ground of the high side driver circuit of the Bank 4 (injector 3 and 8)	Voltage high across High Side Driver of bank 4 (injector 3 and 8) during On state indicates short to ground	impedence between HS pin of injector 3 and controller ground <= 0.5 [Ohm] OR impedence between HS pin of injector 8 and controller ground <= 0.5 [Ohm]	Test enabled by calibration; and Battery voltage and Key ON and Engine is not cranking and Engine Running and (FUL_OutEnblCyl_CiEPS RJDylinderH OR FUL_OutEnblCyl_CiEPS R CylinderD) and (FUL_FuelInjectedCyl_CiE PSR CylinderH OR FUL_FuelInjectedCyl_CiE PSR CylinderD)	= 1 [Boolean] > 11.00 [V] - - >= 1.00 [s] == 0 [Boolean] == 0 [Boolean] == TRUE); == TRUE);	5 failures out of 10 samples 100 ms/sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Injector Positive Voltage Control Circuit Group 4 High Voltage	P2157	This DTC detects a short circuit to high voltage of high side driver circuit of the Bank 4 (injector 3 and 8)	Voltage low across High side drive of bank 4 (injector 3 and 8) during off state indicates short to power	impedence between HS pin of injector 3 and controller power <= 0.5 [Ohm] OR impedence between HS pin of injector 8 and controller power <= 0.5 [Ohm]	Test enabled by calibration; and Battery voltage and Key ON and Engine is not cranking and Engine Running and (FUL_OutEnblCyl_CiEPS RJDylinderH OR FUL_OutEnblCyl_CiEPS R CylinderD) and (FUL_FuelInjectedCyl_CiE PSR CylinderH OR FUL_FuelInjectedCyl_CiE PSR CylinderD)	= 1 [Boolean] > 11.00 [V] - - >= 1.00 [s] == 0 [Boolean] == 0 [Boolean] == TRUE); == TRUE);	5 failures out of 10 samples 100 ms/sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Transfer Case Speed Sensor Output (TCSS)	P2160	The diagnostic monitor detects no activity in the TCSS circuit due to an electrical fault, wiring fault or sensor fault. The TCSS signal is rationalized against operating conditions of the vehicle. If the vehicle is in motion, accelerator pedal, engine torque, transmission in gear, and no vehicle braking, and the TCSS signal registers below a threshold, the DTC will set.	transfer case output shaft speed sesnor raw speed	< 25.0 RPM	diagnotic monitor enable calibration	= 1 Boolean	fail time > 4.50 seconds 25 millisecond update rate	Type B, 2 Trips
					transmission gear selector position AND	= PARK OR NEUTRAL		
					engine torque AND	> 8,191.75 Nm		
					engine torque NOT AND	< 8,191.75 Nm		
					accelerator pedal position AND	> 100.00 %		
					accelerator pedal position NOT	< 8.00 %		
					transmission gear selector position AND	# PARK AND # NEUTRAL		
					engine torque AND	> 80.00 Nm		
					engine torque NOT AND	< 35.00		
					accelerator pedal position AND	> 5.00 %		
					accelerator pedal position NOT	< 3.00 %		
					run/crank voltage	>6.0 volts for 25 milliseconds		
					run/crank voltage	>9.0 volts		
					engine power limited	= FALSE Boolean		
					PTO active	= FALSE Boolean		
					engine speed	> 300.0 RPM		
					transmission output shaft speed	> 181.0 RPM		
					update range change delay time when condition A or condition B or condition C (25 millisecond update rate):		range change delay time >	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					condition A: transmission range state transmission range state previous loop (25 millisecond) condition B: test when transmission range state is reverse enable calibration AND transmission range state transmission range state previous loop (25 millisecond) condition C: test when transmission range state is neutral enable calibration AND transmission range state transmission range state previous loop (25 millisecond) P2161 test fail this key on P2160 test fail this key on P2160 fault active DTCs not fault active	 = drive8 or less = drives or less = 0 Boolean = REVERSE = REVERSE = 0 Boolean = NEUTRAL = NEUTRAL = FALSE Boolean = FALSE Boolean = FALSE Boolean Transmission Output Shaft Angular Velocity Validity CrankSensor_FA EngineTorqueEstInaccurate	**P2160 range change delay time** seconds Refer to "Transmission Supporting Tables" for details	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Transfer Case Speed Sensor Output (TCSS)	P2161	The diagnostic monitor detects an unrealistic drop in the TCSS signal due to a sudden electrical fault, wiring fault or sensor fault. The TCSS signal is rationalized against operating conditions of the vehicle. If the vehicle is in motion, accelerator pedal, engine torque, transmission in gear, and no vehicle braking, and the TCSS signal drops above a delta threshold, a fail timer is enabled. When a TCSS drop occurs it is possible to enable the P2160 fail time as well as the PP2161 fail time. With both P2160 and P2161 fail timers active it is a race condition to either DTC.	transfer case speed sesnor raw speed delta, 25 millisecond update rate	> 650.0 RPM	diagnotic monitor enable calibration update range change delay time when condition A or condition B or condition C (25 millisecond update rate): condition A: transmission range state transmission range state previous loop (25 millisecond) condition B: test when transmission range state is reverse enable calibration AND transmission range state transmission range state previous loop (25 millisecond) condition C: test when transmission range state is neutral enable calibration AND transmission range state transmission range state previous loop (25 millisecond)	= 1 Boolean = drive8 or less = drives or less = 0 Boolean = REVERSE = REVERSE =0 Boolean = NEUTRAL = NEUTRAL	fail time > 3.00 seconds, 25 millisecond update rate, increment fail count fail count > 5 counts, 25 millisecond update rate range change delay time > **P2161 range change delay time** seconds Refer to "Transmission Supporting Tables" for details	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					run/crank voltage	>6.0 volts for 25 milliseconds		
					run/crank voltage	>9.0 volts		
					PTO active	= FALSE Boolean		
					transfer case mode	# transfer case mode previos loop (25 millisecond) update 4WD range change time		
						4WD range change time	> 5.00 seconds	
					engine speed	> 500.0 RPM		
					transmission output shaft speed loop to loop delta (25 millisecond) AND	< 4,095.0 RPM		
					transmission output shaft speed	> 350.0 RPM		
					update stability time stability time	> 0.00 seconds		
					transfer case raw output speed AND	> 150.0 RPM		
					transfer case raw output speed last loop (25 millisecond)	> 150.0 RPM		
					update stability time stability time	> 6.00 seconds		
					P2160 test fail this key on	= FALSE		
					P2160 fault active	= FALSE		
					DTCs not fault active	CrankSensor_FA TransmissionEngagedState_FA Transmission Output Shaft Angular Velocity Validity		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Intake Air Temperature Sensor 1 / 2 Correlation	P2199	Detects when the Intake Air Temperature (IAT) sensor and IAT2 sensor values do not correlate with each other. These two temperature sensors are both in the induction system, although they do have different sensor time constants and different positional relationships with components that produce heat. If these two temperature values differ by a large enough amount, the Intake Air Temperature 1 / 2 Correlation Diagnostic will fail. This diagnostic is enabled if the Powertrain Relay voltage is high enough.	ABS (IAT - IAT2)	> 55.0 deg C	Powertrain Relay Voltage for a time No Active DTCs:	>= 11.0 Volts >= 0.9 seconds PowertrainRelayFault	40 failures out of 50 samples 1 sample every 100 msec	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Reductant Level Sensor Stuck (continuous sensor)	P21C5	Continuous level sensor is able to measure small changes in height of DEF tank fluid so variation of level value is expected when fast accelerations or decelerations cause fluid sloshing. This monitor detects when a fault is causing measurements being constant during steep variations of vehicle speed.This diagnosis verifies that the DEF level sensor signal is stuck in range.	Difference between maximum and minimum DEF level values, sampled while vehicle is strongly accelerating	> 0.3 %	Sensor Bus Wake Up signal is active At least one message has been received by DEF device (Engine off timer AND Tank Temperature sampled at init AND UTLC Temperature sampled at init AND Tank Temperature greater AND UTLC Temperature) OR (Tank Temperature AND UTLC Temperature) Amount of valid level values since last test has run, sampled while vehicle is strongly accelerating, Absolute derivative of vehicle speed Estimated tank level volume No fault for: - serial communication with DEF device (SCRPM)	 > 14,400 s >-6.0 °C >-6.0 °C >-9.0 °C >-9.0 °C >-4.0 °C >-2.0 °C > 15 samples $<10.00 m/s^2$ 0.21< volume <99.01 U010E	14.00 failures out of 15.00 samples Time basis = 100ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					- sensor bus wake up signal - level sensor out of range - DEF tank temperature sensor - UTLC temperature sensor - vehicle speed	 SCR_DEFLS_ElecFltSt SCR_DEFTS_FA		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
SCRPM supply under-voltage monitoring	P21CB	This diagnosis verifies that the SCRPM supply voltage is under the threshold of correct functioning	SCRPM supply under-voltage (System Battery Voltage - SCRPM Supply Voltage value)	 > 3.00	Test enabled by calibration Powertrain relay in range Run Crank Active Cranking phase excluded No SCR Power Module CAN loss of communication	1.00 U010E, Lost Communication With Reductant Control Module (SCR)	40.00 failures out of 50.00 samples Time basis = 100ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
NOx Sensor Circuit Range/ Performance Bank 1 Sensor 1	P2201	This diagnosis verifies that Upstream NOx sensor embedded current control circuit status is healthy	Check if the NOx1 sensor embedded stability criteria of Nox/Lambda current control circuit are violated NOx stability flag: (OFF_Time/TOTAL_time) Lambda stability flag: (OFF_Time/TOTAL_time) Note: TOTAL_time= ON_time +OFF_Time	Stability flag for NOx signal is set to OFF if one of the following condition is not fulfilled: a) V2 within an interval of 40mV around its set point b) Delta Ip2 < 426nA/10msec c) Ip1 within the interval of -40 uA... 19 uA d) Delta Ip1 < 2.4 uA aorund its set point Stability flag for Lambda signal is set to OFF if one of the following condition is not fulfilled: a) Ip1 within the interval of -40uA... 19uA b) Delta IpO< 300 uA/10 msec c) Delta Ip1 z 2.4 uA around its set point > 0.50 % > 0.50 %	Powertrain relay voltage NOx Sensor Bus relay is commanded ON CAN_LostComm_FltN_BusB_NOxSnsr_A Sensor supply in range Engine is not cranking Sensor dewpoint is reached Sensor heater is in range: a) (Sensor heater raw resistance - sensor heater target resistance) / sensor heater target resistence b) condition a) is fulfilled for time Engine is running No electrical failure on NOx1 sensor Combustion mode dependent enabling flag Fuel request: a) fuel request derivative is within a range b) condition a) is fulfilled for time	>11.00V TRUE FALSE > 10.80 V TRUE TRUE < 0.03 % >- 0.03% > 10.00 sec TRUE NOX_Snsr1_FltSt ==FALSE **NOX_S1_StBitChkEnblCmbMode** <= 35.00 mm^3/s >= -50.00 mm^3/s >5.00 sec	NOx stability flag time counter: 2 fails out of 2 samples Lambda stability flag time counter: 2 fails out of 2 samples Task=12.5ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
NOx Sensor Circuit Low Bank 1 Sensor 1	P2202	This diagnosis verifies Upstream NOx sensor read out of range low	Check if the NOx1 sensor NOx concentration raw read is out of lower range: NOx raw read	 <-90 ppm	Fuel injection quantity request Powertrain relay voltage NOx Sensor Bus relay is commanded ON No failure on NOx1 CAN communication Sensor supply in range Sensor dewpoint is reached No current control failure on NOx1 sensor No electrical failure on NOx1 sensor Combustion mode dependent enabling flag	>-1 mm^3 >11.00V TRUE CAN_LostComm_FltN_BusB_NOxSnsr_A > 10.80 V TRUE NOX_NOx1_StBitChkFlt ==FALSE NOX_Snsr1_ElecFA ==FALSE **NOX_S1_OutRngMinCmbMode**	Time counter: 100 fails out of 200 samples Task=25ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
NOx Sensor Circuit High Bank 1 Sensor 1	P2203	This diagnosis verifies Upstream NOx sensor read out of range high	Check if the NOx1 sensor NOx concentration raw read is out of higher range:		Powertrain relay voltage	>11.00V	Time counter: 200 fails out of 250 samples	Type B, 2 Trips
					NOx Sensor Bus relay is commanded ON	TRUE		
			NOx raw read	>2,500 ppm	No failure on NOx1 CAN communication	CAN_LostComm_FltN_BusB_NOxSnsr_A	Task=25ms	
					Sensor supply in range	> 10.80 V		
					Sensor dewpoint is reached	TRUE		
					No current control failure on NOx1 sensor	NOX_NOx1_StBitChkFlt ==FALSE		
					No electrical failure on NOx1 sensor	NOX_Snsr1_ElecFA ==FALSE		
					Combustion mode dependent enabling flag	**NOX_S1_OutRngMaxCmbMode**		
					Engine running for a time longer than	0.00 s		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
NOx Sensor 1 Heater Control Circuit	P2205	This diagnosis verifies Upstream NOx gen3 sensor Heater Supply pin Open Load Circuit	Check if there is an open circuit on NOx Sensor 1 Heater Supply pin (H+)	open circuit on H+ pin	NOx sensor is Gen3.0 Powertrain relay voltage NOx Sensor Bus relay is commanded ON CAN_LostComm_FltN_BusB_NOxSnsr_A Sensor supply in range No DTC active:	TRUE >11.00V TRUE FALSE > 10.80 V P30B4	Time counter: 20 fails out of 40 samples Task=25ms	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
NOx Sensor 1 Heater Control Circuit Low Voltage	P2206	This diagnosis verifies Upstream NOx gen3 sensor Heater Supply pin for Short to Ground	Check if there is an short circuit to ground on NOx Sensor 1 Heater Supply pin (H+)	groundshort on H+ pin	NOx sensor is Gen3.0	TRUE	Time counter: 20 fails out of 40 samples Task=25ms	Type B, 2 Trips
					Powertrain relay voltage	>11.00V		
					NOx Sensor Bus relay is commanded ON	TRUE		
					CAN_LostComm_FltN_BusB_NOxSnsr_A	FALSE		
					Sensor supply in range	> 10.80 V		
					Sensor dewpoint is reached	TRUE		
					No DTC active:	P30B4		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
NOx Sensor 1 Heater Control Circuit High Voltage	P2207	This diagnosis verifies Upstream NOx gen3 sensor Heater Supply pin for Short to Battery	Check if there is an short circuit to power supply on NOx Sensor 1 Heater Supply pin (H+)	powershort on H+ pin	NOx sensor is Gen3.0	TRUE	Time counter: 20 fails out of 40 samples Task=25ms	Type B, 2 Trips
					Powertrain relay voltage	>11.00V		
					NOx Sensor Bus relay is commanded ON	TRUE		
					CAN_LostComm_FltN_BusB_NOxSnsr_A	FALSE		
					Sensor supply in range	> 10.80 V		
					Sensor dewpoint is reached	TRUE		
					No DTC active:	P30B4		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
NOx Sensor 1 Heater Sense Circuit	P2208	This diagnosis verifies Upstream NOx gen3 sensor Heater sense resistance measurement pin for Open Load Circuit	Check if there is an open circuit on NOx Sensor 1 Heater Sense pin (HTemp)	open circuit on HTemp pin	NOx sensor is Gen3.0 Powertrain relay voltage NOx Sensor Bus relay is commanded ON CAN_LostComm_FltN_BusB_NOxSnsr_A Sensor supply in range No DTC active:	TRUE >11.00V TRUE FALSE > 10.80 V P30B4	Time counter: 20 fails out of 40 samples Task=25ms	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
NOx Sensor Heater Sense Circuit Range/ Performance Bank 1 Sensor 1	P2209	This diagnosis verifies if the Upstream NOx sensor Heater raw resistance is in range	This diagnosis verifies if the Upstream NOx sensor Heater raw resistance is out of speficied range: (Sensor heater raw resistance - Sensor heater target resistance) / Sensor heater target resistence	 >0.03 <- 0.03	Powertrain relay voltage No loss of communcation with Engine Out Nox Sensor No plausibility failure on NOx signal from NOx Sensor No offset failure on NOx signal from NOx Sensor No increasing dynamic failure on NOx signal coming from NOx Sensor No decreasing dynamic failure on NOx signal coming from NOx Sensor No circuit failure on NOx Sensor No out of range high failulre on NOx Signal No out of range low failulre on NOx Signal No DTC set: No failure on NOx Sensor Bus relay circuit NOx Sensor Bus relay is commanded ON Delay timer once sensor	>11.00V CAN_LostComm_FltN_BusB_NOxSnsr_A ==FALSE NOX_NOx1_NOxPlausFlt ==FALSE NOX_NOx1_OfstMontrFlt ==FALSE NOX_NOx1JncrDynChkFlt ==FALSE NOX_NOx1_DecrDynChkFit ==FALSE NOX_NOx1_StBitChkFlt ==FALSE NOX_NOx1_OutOfRngHiFit ==FALSE NOXNOxIOutOfRngLoFit ==FALSE P30B4 SBR_RlyFA==FALSE TRUE >45sec	Time counter: 50 fails out of 100 samples Task=25ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					supply is in range (> 10.8 V)			
					Delay timer once sensor dewpoint is reached	> 180 sec		
					Delay timer once engine is overrun	> 5 sec		
					Delay timer once DPF combustion mode is not active	30 sec		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
NOx Sensor Supply Voltage Circuit Bank 1 Sensor 1	P220A	This diagnosis verifies if the supply voltage of the Upstream Nox sensor is out of range	Check if NOx Sensor 1 supply voltage status is out of range	Sensor supply voltage <10.80 V	NOx sensor is Gen3.0	TRUE	Time counter: 120 fails out of 240 samples Task=25ms	Type B, 2 Trips
					Powertrain relay voltage	>11.00V		
					NOx Sensor Bus relay is commanded ON	TRUE		
					a) NOx sensor Dewpoint is reached	TRUE		
					b) condition a) shall be fulfilled for time	>0sec		
					CAN_LostComm_FltN_BusB_NOxSnsr_A	FALSE		
					No DTC active:	P30B4		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
NOx Sensor Supply Voltage Circuit Bank 1 Sensor 2	P220B	This diagnosis verifies if the supply voltage of the Downstream Nox sensor is out of range	Check if NOxSensor 2 supply voltage status is out of range	Sensor supply voltage < 10.80 V	NOx sensor is Gen3.0	TRUE	Time counter: 120 fails out of 240 samples Task=25ms	Type B, 2 Trips
					Powertrain relay voltage	>11.00V		
					NOx Sensor Bus relay is commanded ON	TRUE		
					a) NOx sensor Dewpoint is reached	TRUE		
					b) condition a) shall be fulfilled for time	>0sec		
					CAN_LostComm_FltN_BusB_NOxSnsr_B	FALSE		
					No DTC active:	P30B5		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
NOx Sensor 1 Heater Sense Circuit Low Voltage	P2210	This diagnosis verifies Upstream NOx gen3 sensor Heater sense resistance measurement pin for Short to Ground	Check if there is a short circuit to ground on NOx Sensor 1 Heater Sense pin (HTemp)	groundshort on HTemp pin	NOx sensor is Gen3.0	TRUE	Time counter: 20 fails out of 40 samples Task=25ms	Type B, 2 Trips
					Powertrain relay voltage	>11.00V		
					NOx Sensor Bus relay is commanded ON	TRUE		
					CAN_LostComm_FltN_BusB_NOxSnsr_A	FALSE		
					Sensor supply in range	> 10.80 V		
					Sensor dewpoint is reached	TRUE		
					No DTC active:	P30B4		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
NOx Sensor 1 Heater Sense Circuit High Voltage	P2211	This diagnosis verifies Upstream NOx gen3 sensor Heater sense resistance measurement pin for Short to Battery	Check if there is a short circuit to power supply NOx Sensor 1 Heater Sense pin (HTemp)	powershort on HTemp pin	NOx sensor is Gen3.0	TRUE	Time counter: 20 fails out of 40 samples Task=25ms	Type B, 2 Trips
					Powertrain relay voltage	>11.00V		
					NOx Sensor Bus relay is commanded ON	TRUE		
					CAN_LostComm_FltN_BusB_NOxSnsr_A	FALSE		
					Sensor supply in range	> 10.80 V		
					Sensor dewpoint is reached	TRUE		
					No DTC active:	P30B4		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Barometric Pressure (BARO) Sensor Performance (3 intake air pressure sensor configuration)	P2227	This monitor is used to identify BARO sensor internal faults (measurement with an offset or a drift). The plausibility monitor compares the BARO, MAP and TCIAP pressures in two different conditions: - at idle (part of the test enabled when the engine is running) - between key off and when the engine starts running (part of the test enabled when the engine is not running). If BARO sensor is not in agreement with the other two the monitor is able to pinpoint BARO as the faulty sensor.	Difference (absolute value) in measured pressure between BARO sensor and TCIAP sensor AND Difference (absolute value) in measured pressure between BARO sensor and MAP sensor AND Difference (absolute value) in measured pressure between TCIAP sensor and MAP sensor	> **P0106, P2227, P227B, P00C7: Maximum pressure difference** [kPa] > **P0106, P2227, P227B, P00C7: Maximum pressure difference** [kPa] <= **P0106, P2227, P227B, P00C7: Maximum pressure difference** [kPa]	Correlation diagnostic enabled by calibration Engine is running Run Crankrelay supply voltage in range Engine speed Requested fuel Throttle measured position Engine Coolant Temperature No faults are present	==1.00 > 11.00 [V] < 950.00 [rpm] < 40.00 [mm^3] > 90.00 [%] > 70.00 [°C] CrankSensor_FA ==FALSE FUL_GenericInjSysFA ==FALSE TPS_PstnSnsrFA ==FALSE MAP_SensorCircuitFA ==FALSE AAP2_SnsrCktFA ==FALSE AAP_AAP5_SnsrCktFA ==FALSE AAP_AAP2_SnsrStabFA ==FALSE AAP_AAP5_SnsrStabFA ==FALSE ECT_Sensor_FA	640.00 fail counters over 800.00 sample counters sampling time is 12.5 ms	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
						==FALSE MAF_MAF SnsrFA ==FALSE		
			BARO Pressure OR BARO Pressure OR Difference (absolute value) in measured pressure between BARO sensor and TCIAP sensor AND Difference (absolute value) in measured pressure between BARO sensor and MAP sensor AND Difference (absolute value) in measured pressure between TCIAP sensor and MAP sensor	< 50.0 [kPa] > 115.0 [kPa] > 10.0 [kPa] > 10.0 [kPa] <= 10.0 [kPa]	Time between current ignition cycle and the last time the engine was running Engine is not rotating No Active DTCs: No Pending DTCs:	> 5.0 [s] EngineModeNotRunTimer Error MAP_SensorCircuitFA AAP_SnsrCktFA MAP_SensorCircuitFP AAP_SnsrCktFP	384 fail counters over 480 sample counters sampling time is 12.5 ms	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Barometric Pressure (BARO) Sensor Circuit Low (Diesel, pull-down)	P2228	Detects a continuous short to ground or open circuit in the Barometric Pressure (BARO) signal circuit by monitoring the BARO sensor output voltage and failing the diagnostic when the BARO voltage is too low. The BARO sensor is a pressure transducer which outputs a voltage proportional to the absolute pressure.	BARO Voltage	< 35.5 % of 5 Volt Range (This is equal to 50.0 kPa)			320 failures out of 400 samples 1 sample every 12.5 msec	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Barometric Pressure (BARO) Sensor Circuit High (Diesel, pull-down)	P2229	Detects a continuous short to power in the Barometric Pressure (BARO) signal circuit by monitoring the BARO sensor output voltage and failing the diagnostic when the BARO voltage is too high. The BARO sensor is a pressure transducer which outputs a voltage proportional to the absolute pressure.	BARO Voltage	> 94.0% of 5 Volt Range (This is equal to 115.0 kPa)			320 failures out of 400 samples 1 sample every 12.5 msec	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Barometric Pressure (BARO) Sensor Circuit Intermittent	P2230	Detects a noisy or erratic signal in the barometric pressure (BARO) circuit by monitoring the BARO sensor and failing the diagnostic when the BARO signal has a noisier output than is expected. When the value of BARO in kilopascals (kPa) is determined, a delta is calculated between the current reading and the previous reading. The absolute value of these deltas is summed over a number of BARO readings. The result of this summation is called a “string length”. Since the BARO signal is anticipated to be relatively smooth, a string length of a particular magnitude indicates a noisy or erratic BARO signal. The diagnostic will fail if the string length is too high.	String Length Where: "String Length" = sum of "Diff" calculated over And where: "Diff" = ABS(current BARO reading - BARO reading from 12.5 milliseconds previous)	> 100 kPa 80 consecutive BARO readings			4 failures out of 5 samples Each sample takes 1.0 seconds	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Turbocharger Inlet Pressure (TCIAP) Sensor Performance (3 intake air pressure sensor configuration)	P227B	This monitor is used to identify TCIAP sensor internal faults (measurement with an offset or a drift). The plausibility monitor compares the BARO, MAP and TCIAP pressures in two different conditions: - at idle (part of the test enabled when the engine is running) - between key off and when the engine starts running (part of the test enabled when the engine is not running) If TCIAP sensor is not in agreement with the other two the monitor is able to pinpoint TCIAP as the faulty sensor.	Difference (absolute value) in measured pressure between BARO sensor and TCIAP sensor AND Difference (absolute value) in measured pressure between TCIAP sensor and MAP sensor AND Difference (absolute value) in measured pressure between BARO sensor and MAP sensor	> **P0106, P2227, P227B, P00C7: Maximum pressure difference** [kPa] > **P0106, P2227, P227B, P00C7: Maximum pressure difference** [kPa] <= **P0106, P2227, P227B, P00C7: Maximum pressure difference** [kPa]	Correlation diagnostic enabled by calibration Engine is running Run Crank relay supply voltage in range Engine speed Requested fuel Throttle measured position Engine Coolant Temperature No faults are present	==1.00 > 11.00 [V] < 950.00 [rpm] < 40.00 [mm^3] > 90.00 [%] > 70.00 [°C] CrankSensor_FA ==FALSE FUL_GenericInjSysFA ==FALSE TPS_PstnSnsrFA ==FALSE MAP_SensorCircuitFA ==FALSE AAP2_SnsrCktFA ==FALSE AAP_AAP5_SnsrCktFA ==FALSE AAP_AAP2_SnsrStabFA ==FALSE AAP_AAP5_SnsrStabFA ==FALSE	640.00 fail counters over 800.00 sample counters sampling time is 12.5 ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
						ECT_Sensor_FA ==FALSE MAF_MAF_SnsrFA ==FALSE		
			TCIAP Pressure OR TCIAP Pressure OR Difference (absolute value) in measured pressure between BARO sensor and TCIAP sensor AND Difference (absolute value) in measured pressure between TCIAP sensor and MAP sensor AND Difference (absolute value) in measured pressure between BARO sensor and MAP sensor	< 50.0 [kPa] > 115.0[kPa] > 10.0 [kPa] >10.0 [kPa] <= 10.0 [kPa]	Time between current ignition cycle and the last time the engine was running Engine is not rotating No Active DTCs: No Pending DTCs:	> 5.0 [s] EngineModeNotRunTimer Error MAP_SensorCircuitFA AAP_SnsrCktFA AAP2_SnsrCktFA AAP3_SnsrCktFA MAP_SensorCircuitFP AAP_SnsrCktFP AAP2_SnsrCktFP AAP3_SnsrCktFP	384 fail counters over 480 sample counters sampling time is 12.5ms	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Barometric Pressure Sensor Circuit C Low (Diesel, pull-up)	P227C	Detects a continuous short to ground in the Barometric Pressure (BARO) C signal circuit by monitoring the BARO C sensor output voltage and failing the diagnostic when the BARO C voltage is too low. The BARO C sensor is a pressure transducer which outputs a voltage proportional to the absolute pressure.	BARO C Voltage	<39.3% of 5 Volt Range (This is equal to 50.0 kPa)			320 failures out of 400 samples 1 sample every 12.5 msec	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Barometric Pressure Sensor Circuit C High (Diesel, pull-up)	P227D	Detects a continuous short to power or open circuit in the Barometric Pressure (BARO) C signal circuit by monitoring the BARO C sensor output voltage and failing the diagnostic when the BARO C voltage is too high. The BARO C sensor is a pressure transducer which outputs a voltage proportional to the absolute pressure.	BARO C Voltage	> 90.0% of 5 Volt Range (This is equal to 115.0 kPa)			320 failures out of 400 samples 1 sample every 12.5 msec	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Barometric Pressure Sensor C Circuit Intermittent/ Erratic	P227E	Detects a noisy or erratic signal in the barometric pressure (BARO) C circuit by monitoring the BARO C sensor and failing the diagnostic when the BARO C signal has a noisier output than is expected. When the value of BARO C in kilopascals (kPa) is determined, a delta is calculated between the current reading and the previous reading. The absolute value of these deltas is summed over a number of BARO C readings. The result of this summation is called a “string length”. Since the BARO C signal is anticipated to be relatively smooth, a string length of a particular magnitude indicates a noisy or erratic BARO C signal. The diagnostic will fail if the string length is too high.	String Length Where: "String Length" = sum of "Diff" calculated over And where: "Diff" = ABS(current BARO C reading - BARO C reading from 12.5 milliseconds previous)	> 100 kPa 80 consecutive BARO C readings			4 failures out of 5 samples Each sample takes 1.0 seconds	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Fuel Pressure Regulator 1 - Forced Engine Shutdown	P228A	Determine when rail pressure is lower than desired setpoint and metering unit actuator has achieved its maximum authority.	Rail pressure setpoint - measured rail pressure Commanded fuel flow for metering unit	> 40 MPa ≥ Maximum flow deliverable by high pressure pump (refer to *RailPresCntrl* section)	Run crank voltage Engine running Rail pressure is governed by Fuel Metering Unit (refer to *RailPresCntrl)* No DTC active since key is on:	> 11.0V P000F	640 failures out of 800 samples 12.5 ms/sample	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Fuel Pressure Regulator 2 - Forced Engine Shutdown	P228B	Determine when rail pressure is lower than desired setpoint and rail pressure regulator has achieved its maximum authority.	Rail pressure setpoint - measured rail pressure Commanded pressure for pressure regulator valve	>40 MPa > 30 to 30 MPa (see table **P228B Pressure Regulator completely closed command**)	Run crank voltage Engine running Pressure Regulator controlled in closed loop (refer to *RailPresCntrl)*	> 11.0V	640 failures out of 800 samples 12.5 ms/sample	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Fuel Pressure Regulator 1 Exceeded Control Limits - Pressure Too Low	P228C	Determine when rail pressure is lower than desired setpoint.	Rail pressure setpoint - measured rail pressure	>12 to 12 MPa (see table **P228C Positive rail pressure deviation (MU)** **)**	Run crank voltage Engine running Fuel Metering Unit controlled in closed loop (refer to *RailPresCntrl)* Fuel injected quantity (Low fuel level calibrated as enabling condition OR LowFuelConditionDiagnostic (Air ambient pressure calibrated as enabling condition OR Air ambient pressure (Air ambient temperature calibrated as enabling condition OR Air ambient temperature No DTC active since key is on:	> 11.0V >20.0 mm^3/stroke == 1.00 == FALSE == 1.00 > 75.00 == 1.00 > -6.70 P000F	640 failures out of 800 samples 12.5 ms/sample	Type B, 2 Trips MIL is illuminated according to 'similar engine conditions' criteria.
			Rail pressure setpoint -		Run crank voltage	> 11.0V	640 failures out	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			measured rail pressure	>12to 12 MPa (see table **P229A Positive rail pressure deviation (PR))**	Engine running Pressure Regulator controlled in closed loop (refer to *RailPresCntrl)* Fuel injected quantity (Low fuel level calibrated as enabling condition OR LowFuelConditionDiagnostic (Air ambient pressure calibrated as enabling condition OR Air ambient pressure (Air ambient temperature calibrated as enabling condition OR Air ambient temperature	 >20.0 mm^3/stroke == 1.00 = FALSE) == 1.00 >75 kPa) == 1.00 >-7°C)	of 800 samples 12.5 ms/sample	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Fuel Pressure Regulator 1 Exceeded Control Limits - Pressure Too High	P228D	Determine when rail pressure is greater than desired setpoint.	Rail pressure setpoint - measured rail pressure	< -17to -17MPa (see table **P228D Negative rail pressure deviation (MU)**	Run crank voltage Engine running Fuel Metering Unit controlled in closed loop (refer to *RailPresCntrl)* Fuel injected quantity Fuel temperature (Low fuel level calibrated as enabling condition OR LowFuelConditionDiagnostic (Air ambient pressure calibrated as enabling condition OR Air ambient pressure (Air ambient temperature calibrated as enabling condition OR Air ambient temperature	> 11.0V >20.0 mm^3/stroke > -40 °C == 1.00 = FALSE) == 1.00 > 75.00 kPa) ==1.00 > -6.70 °C)	640 failures out of 800 samples 12.5 ms/sample	Type A, 1 Trips MIL is illuminated according to 'similar engine conditions' criteria.
			Rail pressure setpoint - measured rail pressure	<-17MPa	Run crank voltage Engine running	> 11.0V	640 failures out of 800 samples	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Pressure Regulator controlled in closed loop (refer to RailPresCntrl) Fuel injected quantity (Low fuel level calibrated as enabling condition OR LowFuelConditionDiagnostic (Air ambient pressure calibrated as enabling condition OR Air ambient pressure (Air ambient temperature calibrated as enabling condition OR Air ambient temperature	 >20.0 mm^3/stroke ==1.00 = FALSE) == 1.00 >75 kPa) == 1.00 >-7°C)	12.5 ms/sample	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Fuel Pressure Regulator 2 Performance	P2293	Determine when rail pressure is above maximum threshold when pressure is governed by Pressure Regulator valve.	Rail pressure	> 67 to 217 MPa (see table **P2293 Maximum rail pressure with PR)**	Run crank voltage Rail pressure is governed by Pressure Regulator (refer to *RailPresCntrl)*	> 11.0V	160 failures out of 229 samples OR 160 continuous failures out of 229 samples 6.25 ms/sample	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Fuel Pressure Regulator Solenoid 2 Control Circuit	P2294	Controller specific output driver circuit diagnoses the Rail Pressure Regulator valve low sided driver for an open circuit failure when the output is powered off by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range during driver off state indicates open circuit failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for an open circuit: impedance between signal and controller ground	> 200 kQ	Powertrain relay voltage Run crank voltage Engine not cranking Pressure Regulator calibrated as present	> 11.0V > 6.0V	44 failures out of 88 samples 6.25 ms/sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Fuel Pressure Regulator Solenoid 2 Control Circuit Low Voltage	P2295	Controller specific output driver circuit diagnoses the Rail Pressure Regulator valve low sided driver for a short to ground failure when the output is powered off by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range during driver off state indicates short to ground failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for a short to ground: impedance between signal and controller ground	< 0.5 Q	Powertrain relay voltage Run crank voltage Engine not cranking Pressure Regulator calibrated as present	> 11.0V > 6.0V	44 failures out of 88 samples 6.25 ms/sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Fuel Pressure Regulator Solenoid 2 Control Circuit High Voltage	P2296	Controller specific output driver circuit diagnoses the Rail Pressure Regulator valve low sided driver for a short to power failure when the output is powered on by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range during driver on state indicates short to power failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for a short to power: impedance between signal and controller power	< 0.5 Q	Powertrain relay voltage Run crank voltage Engine not cranking Pressure Regulator calibrated as present	> 11.0V > 6.0V	44 failures out of 88 samples 6.25 ms/sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
NOx Sensor Circuit Range/ Performance Bank 1 Sensor 2 - NOxS_CurrPerf_B1S2	P229F	This diagnosis verifies that Downstream NOx sensor embedded current control circuit status is healthy	Check if the NOx2 sensor embedded stability criteria of Nox/Lambda current control circuit are violated NOx stability flag: (OFF_Time/TOTAL_time) Lambda stability flag: (OFF_Time/TOTAL_time) Note:	Stability flag for NOx signal is set to OFF if one of the following condition is not fulfilled: a) V2 within an interval of 40mV around its set point b) Delta Ip2 < 426nA/10msec c) Ip1 within the interval of -40 uA... 19 uA d) Delta Ip1 < 2.4 uA aorund its set point Stability flag for Lambda signal is set to OFF if one of the following condition is not fulfilled: a) Ip1 within the interval of -40uA... 19uA b) Delta IpO< 300 uA/10 msec c) Delta Ip1 z 2.4 uA around its set point > 0.50 % > 0.50 %	Powertrain relay voltage NOx Sensor Bus relay is commanded ON CAN_LostComm_FltN_BusBNOxSnsrB Sensor supply in range Engine is not cranking Sensor dewpoint is reached Sensor heater is in range: a) (Sensor heater raw resistance - sensor heater target resistance) / sensor heater target resistence b) condition a) is fulfilled for time Engine is running No electrical failure on NOx2 sensor Combustion mode dependent enabling flag Fuel request: a) fuel request derivative is within a range b) condition a) is fulfilled for time	>11.00V TRUE FALSE > 10.80 V TRUE TRUE < 0.03 % >- 0.03 % > 10.00 sec TRUE NOX_Snsr2_FltSt ==FALSE **NOX_S2_StBitChkEnblCmbMode** <= 35.00 mm^3/s >= -50.00 mm^3/s >5.00 sec	NOx stability flag time counter: 2 fails out of 2 samples Lambda stability flag time counter: 2 fails out of 2 samples Task=12.5ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			TOTAL_time= ON_time +OFF_Time					

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
NOx Sensor Circuit Low Bank 1 Sensor 2	P22A0	This diagnosis verifies Downstream NOx sensor read out of range low	Check if the NOx2 sensor NOx concentration raw read is out of lower range: NOx raw read	 <-90 ppm	Fuel injection quantity request Powertrain relay voltage NOx Sensor Bus relay is commanded ON No failure on NOx2 CAN communication Sensor supply in range Sensor dewpoint is reached No current control failure on NOx2 sensor No electrical failure on NOx2 sensor Combustion mode dependent enabling flag No 02 plausibility in load fault on NOx2	>-1 mm^3 >11.00V TRUE CAN_LostComm_FltN_BusB_NOxSnsr_B > 10.80 V TRUE N0X_N0x2_StBitChkFlt ==FALSE NOX_Snsr2_ElecFA ==FALSE **NOX_S2_OutRngMinCmbMode** OXY_NOx2ChkLoadFlt ==FALSE	Time counter: 100 fails out of 200 samples Task=25ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
NOx Sensor Circuit High Bank 1 Sensor 2	P22A1	This diagnosis verifies Downstream NOx sensor read out of range high	Check if the NOx1 sensor NOx concentration raw read is out of higher range:		Powertrain relay voltage	>11.00V	Time counter: 400 fails out of 480 samples Task=25ms	Type B, 2 Trips
					NOx Sensor Bus relay is commanded ON	TRUE		
			NOx raw read	>2,500 ppm	No failure on NOx2 CAN communication	CAN_LostComm_FltN_BusB_NOxSnsr_B		
					Sensor supply in range	> 10.80 V		
					Sensor dewpoint is reached	TRUE		
					No current control failure on NOx2 sensor	N0X_N0x2_StBitChkFlt ==FALSE		
					No electrical failure on NOx2 sensor	NOX_Snsr2_ElecFA ==FALSE		
					Combustion mode dependent enabling flag	**NOX_S2_OutRngMaxCmbMode**		
					No 02 plausibility in load fault on NOx2	OXY_NOx2ChkLoadFlt ==FALSE		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
NOx Sensor 2 Heater Control Circuit	P22A3	This diagnosis verifies Downstream NOx gen3 sensor Heater Supply pin Open Load Circuit	Check if there is an open circuit on NOx Sensor 2 Heater Supply pin (H+)	open circuit on H+ pin	NOx sensor is Gen3.0	TRUE	Time counter: 20 fails out of 40 samples Task=25ms	Type A, 1 Trips
					Powertrain relay voltage	>11.00V		
					NOx Sensor Bus relay is commanded ON	TRUE		
					CAN_LostComm_FltN_BusB_NOxSnsr_B	FALSE		
					Sensor supply in range	> 10.80 V		
					No DTC active:	P30B5		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
NOx Sensor 2 Heater Control Circuit Low Voltage	P22A4	This diagnosis verifies Downstream NOx gen3 sensor Heater Supply pin for Short to Ground	Check if there is a short circuit to ground on NOx Sensor 2 Heater Supply pin (H+)	groundshort on H+ pin	NOx sensor is Gen3.0	TRUE	Time counter: 20 fails out of 40 samples Task=25ms	Type B, 2 Trips
					Powertrain relay voltage	>11.00V		
					NOx Sensor Bus relay is commanded ON	TRUE		
					CAN_LostComm_FltN_BusB_NOxSnsr_B	FALSE		
					Sensor supply in range	> 10.80 V		
					Sensor dewpoint is reached	TRUE		
					No DTC active:	P30B5		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
NOx Sensor 2 Heater Control Circuit High Voltage	P22A5	This diagnosis verifies Downstream NOx gen3 sensor Heater Supply pin for Short to Battery	Check if there is a short circuit to power supply on NOx Sensor 2 Heater Supply pin (H+)	powershort on H+ pin	NOx sensor is Gen3.0	TRUE	Time counter: 20 fails out of 40 samples Task=25ms	Type B, 2 Trips
					Powertrain relay voltage	>11.00V		
					NOx Sensor Bus relay is commanded ON	TRUE		
					CAN_LostComm_FltN_BusB_NOxSnsr_B	FALSE		
					Sensor supply in range	> 10.80 V		
					Sensor dewpoint is reached	TRUE		
					No DTC active:	P30B5		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
NOx Sensor 2 Heater Sense Circuit	P22A6	This diagnosis verifies Downstream NOx gen3 sensor Heater sense resistance measurement pin for Open Load Circuit	Check if there is an open circuit on NOx Sensor 2 Heater Sense pin (HTemp)	open circuit on HTemp pin	NOx sensor is Gen3.0	TRUE	Time counter: 20 fails out of 40 samples Task=25ms	Type A, 1 Trips
					Powertrain relay voltage	>11.00V		
					NOx Sensor Bus relay is commanded ON	TRUE		
					CAN_LostComm_FltN_BusB_NOxSnsr_B	FALSE		
					Sensor supply in range	> 10.80 V		
					No DTC active:	P30B5		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
NOx Sensor Heater Sense Circuit Range/ Performance Bank 1 Sensor 2	P22A7	This diagnosis verifies if the Downstream NOx sensor Heate raw resistance is in range	This diagnosis verifies if the Post Catalyst NOx Sensor Heater raw resistance is out of speficied range: (Sensor heater raw resistance - Sensor heater target resistance) / Sensor heater target resistence	 <0.03 >- 0.03	Powertrain relay voltage No loss of communcation with Nox2 Sensor No offset failure on NOx signal from NOx Sensor No circuit failure on NOx Sensor No out of range high failulre on NOx Signal No out of range low failulre on NOx Signal No DTC set: No failure on NOx Sensor Bus relay circuit NOx Sensor Bus relay is commanded ON Delay timer once Sensor supplyisin range (> 10.8 V) Delay timer once Sensor dewpoint is reached Delay timer once engine is overrun Delay timer once DPF combustion mode is not active	>11.00V CAN_LostComm_FltN_BusB_NOxSnsr_B ==FALSE NOX_NOx2_OfstMontrFlt ==FALSE NOX_NOx2_StBitChkFlt ==FALSE NOX_NOx2_OutOfRngHiFlt ==FALSE NOX_NOx2_OutOfRngLoFlt ==FALSE P30B5 SBR_RlyFA==FALSE TRUE > 45 sec > 180 sec > 5 sec 30 sec	Time counter: 50 fails out of 100 samples Task=25ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
NOx Sensor 2 Heater Sense Low Voltage	P22A8	This diagnosis verifies Downstream NOx gen3 sensor Heater sense resistance measurement pin for Short to Ground	Check if there is a short circuit to ground on NOx Sensor 2 Heater Sense pin (HTemp)	groundshort on HTemp	NOx sensor is Gen3.0	TRUE	Time counter: 20 fails out of 40 samples Task=25ms	Type B, 2 Trips
					Powertrain relay voltage	>11.00V		
					NOx Sensor Bus relay is commanded ON	TRUE		
					CAN_LostComm_FltN_BusB_NOxSnsr_B	FALSE		
					Sensor supply in range	> 10.80 V		
					Sensor dewpoint is reached	TRUE		
					No DTC active:	P30B5		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
NOx Sensor 2 Heater Sense High Voltage	P22A9	This diagnosis verifies Downstream NOx gen3 sensor Heater sense resistance measurement pin for Short to Battery	Check if there is a short circuit to power supply on NOx Sensor 2 Heater Sense (HTemp)	powershort on HTemp pin	NOx sensor is Gen3.0	TRUE	Time counter: 20 fails out of 40 samples Task=25ms	Type B, 2 Trips
					Powertrain relay voltage	>11.00V		
					NOx Sensor Bus relay is commanded ON	TRUE		
					CAN_LostComm_FltN_BusB_NOxSnsr_B	FALSE		
					Sensor supply in range	> 10.80 V		
					Sensor dewpoint is reached	TRUE		
					No DTC active:	P30B5		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
NOx Sensor Performance - Sensing Element Bank 1 Sensor 1	P22FB	This diagnosis verifies the plausibility of Upstream NOx sensor signal	Check if (Upstream NOx Sensor signal - NOx Model)/NOx Model with EWMA filter is above or below two calibratable thresholds	<-30% OR >70.00 %	Engine is running	TRUE	Test per trip: 1 If Fast Initial Response EWMA is active then 2 test per trip are allowed If Rapid Response EWMA is active then 2 test per trip are allowed The signal for the monitor check is calculated at first collecting and averaging 255.00 samples, than filtering the resulting mean value by means of a first-order filter. The filter gain calibration (1) can assume the following values: -0.49 if FIR is active - 0.35 if RR is active -0.17 if neither FIR and RR are active	Type A, 1 Trips
					Powertrain relay voltage	>11.00V		
					No failure on any NOx model inputs	EXM_NOxMdl_ExhMnfdNotVld ==FALSE		
					Injection small quantity adjustment (SQA) learning is not active	FAD_SQA_LrnET_Enbl ==FALSE		
					No failure on NOx1 CAN communication	CAN_LostComm_FltN_BusB_NOxSnsr_A ==FALSE		
					No electrical failure on NOx1 Sensor	NOX_Snsr1_FltSt ==FALSE		
					No out of range low failure on NOx1 Sensor	NOX_NOx1_OutOfRngLoFit ==FALSE		
					No out of range high failure on NOx1 Sensor	NOX_NOx1_OutOfRngHiFit ==FALSE		
					No current control failure on NOx1 Sensor	NOX_NOx1_StBitChkFlt ==FALSE		
					No offset failure on NOx1 Sensor	NOX_NOx1_OfstMontrFlt ==FALSE		
					No increasing dynamic failure on NOx1 Sensor	NOX_NOx1JncrDynChkFlt ==FALSE		
					No decreasing dynamic failure on NOx1 Sensor	NOX_NOx1_DecrDynChkFit ==FALSE		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					No DTC set:	P30B4	(1)The EWMA filter is active if the filter gain is calibrated with a value lower than 1, otherwise EWMA filter is cal-out.	
					No failure on outside air temperature Sensor	OAT_PtEstFiltFA ==FALSE		
					No failure on ambient air temperature Sensor	AmbPresDfltdStatus ==FALSE		
					no falut on upstream catalyst exhaust pressure model inputs	EGP_PresCatUpFlt ==FALSE		
					No failure on engine coolant temperature Sensor	ECT_Sensor_FA ==FALSE		
					No failure on injectors	FUL_GenericInjSysFlt ==FALSE		
					No failure on high pressure fuel rail system	FHPJnjLeakageFA ==FALSE		
					No failure on intake manifold absolute pressure Sensor	MAP_SensorFA==FALSE		
					Modeled Engine Out NOx concentration	> 100 ppm		
					Steady state detection: a) Modeled Engine Out NOx concentration step at 100 ms.	< 2 ppm		
					b) condition a) is fulfilled for time	>3.00 sec		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Ambient air pressure	>75 kPa <200 kPa		
					Outside air temperature	>-7 °C < 300 °C		
					Combustion mode dependent enabling flag	**NOX_S1_PlausChkEnblCmbMode**		
					Intake manifold absolute pressure	< 250 kPA		
					Injection fuel quantity requested	For normal combustion mode: > 20.00 mm^3 < 50.00 mm^3 For other combustion modes: > 15mm^3 <30mm^3		
					Engine speed	For normal combustion mode: > 1,200 rpm <2,300 rpm For other combustion modes: > 1,200 rpm <3,200 rpm		
					Engine coolant temperature	>70 °C <129 °C		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Sensor dewpoint is reached	TRUE		
					Diagnostic test results during EWMA FIR mode	< 2		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
NOx Sensor Performance - Sensing Element Bank 1 Sensor 2	P22FE	This diagnosis verifies the Downstream NOx sensor sensing cells integrity during afterrun	Check if there is any clogging in the Downstream NOx sensor measurement cavities that could result in reduced NOx-sensitivity. The sensor internal operating current set-points are changed such way, that the 02 concentration in 2nd sensor cavity is around WOOppm. One test result is measured in fresh sensor state (at supplier plant) and stored in the sensor E2prom as diagnosis reference value. The diagnosis result is the ratio of current diagnosis value/reference value. The diagnosis result is processed with EWMA logic.	>150% OR < 50 %	No electrical failure on NOx2 Sensor No out of range low failure on NOx2 Sensor No out of range high failure on NOx2 Sensor No failure on NOx2 CAN communication No offset failure on NOx2 Sensor No DTC active: No failure on NOx1 Sensor No failure on 02 from NOx1 plausibility diagnostics No failure on SCR system No failure on downstream SCR HC model inputs No failure on crank Sensor No failure on exhaust temperature Sensor (downstream SCR) No failure on HC injector	NOX_Snsr2_ElecFA ==FALSE NOX_NOx2_OutOfRngLo Fit ==FALSE N0X_N0x2_0ut0fRngHi Fit ==FALSE CAN_LostComm_FltN_BusB_NOxSnsr_B ==FALSE NOX_NOx2_OfstMontrFlt ==FALSE P30B5 N0X_Snsr1_N0x_Flt ==FALSE 0XY_N0x1_02_Flt ==FALSE EXF_TotExhSCR_UpFlt ==FALSE SCR_HC_SCR_DwnFlt ==FALSE CrankSensor_FA ==FALSE EGT_TempSCR_DwnFlt ==FALSE HCI GenericShtOffReq	Test per trip: 1 If Fast Initial Response EWMA is active then 2 test per trip are allowed If Rapid Response EWMA is active then 2 test per trip are allowed	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
						==FALSE		
					No failure on Vehicle Speed Sensor	VehicleSpeedSensor_FA ==FALSE		
					No failure on any input of SCR chemical model	SCR_ChemicalMdlFlt ==FALSE		
					No current control failure on NOx2 Sensor	N0X_N0x2_StBitChkFlt ==FALSE		
					No failure on 02 from N0x2 plausibility diagnostics	OXY_NOx2_O2_Flt ==FALSE		
					No failure on NOx Sensor Bus relay circuit	SBR_RlyFA==FALSE		
					Powertrain relay voltage	>11.00V		
					N0x2 sensor supply in range	> 10.80 V		
					N0x2 sensor dewpoint is reached	TRUE		
					(N0x2 Sensor heater raw resistance - N0x2 Sensor heater target resistance) / N0x2 Sensor heater target resistence	< 0.03 % >- 0.03%		
					a)combustion mode dependent enabling flag	**NOX_NOx2SelfTstEnblCmbMode**		
					b) condition a) is fulfilled for time	>0sec		
					c) engine speed	> 0 rpm < 1,500 rpm		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					d) condition c) is fulfilled for time	> 1 sec		
					e) After injection pulse is not used for time	> Osec		
					f) exhaust temperature Sensor (downstream SCR)	>-7 °C <265 °C		
					g) exhaust mass flow	< 40 g/s		
					h) NH3 concentration	<20 ppm		
					j) conditions f) g) h) are fulfilled for time	> 5 sec		
					k) 02 concentration from N0x1	>10%		
					i) NOx concentration from N0x1	< 300 ppm		
					l) conditions k) i) are fulfilled for time	>0sec		
					m) duty cycle applied to the HC injector driver	<1 %		
					n) condition m) is fulfilled for time	> 5 sec		
					o) time between key off and last overrun	> 15 sec		
					p) time between key off and last DPF regen	> 15 sec		
					q) engine speed in idle range	< 800 rpm		
					r) fuel reauest in idle	<20mm^3		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					range	< 1,800 sec		
					s) conditions q) r) is fulfillled for time			
					t) timer of condition s) is reset if one of the following condition is fulfilled (idle off recognition - t) conditions):	>200 °C		
					t.1) exhaust temperature (downstream SCR)	> 5 sec		
					t.2) condition t.1) is fulfilled for time (once idle has been detected)	> 5mph		
					t.3) vehicle speed	> 5 sec		
					t.4) condition t.3) is fulfilled for time (once idle has been detected)	> 40 g/sec		
					t.5) exhaust mass flow	> 5 sec		
					t.6) condition t.5) is fulfilled for time (once idle has been detected)	< 40g/s		
					u) HC mass flow (SCR downstream)			
					Once u) condition is fulfilled the following additional u.x) conditions shall be fulfilled to enable the monitor (AND logic)	>200g/s		
					u.1) exhaust temperature (downstream SCR)	>20 sec		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					u.2) condition u.1) is fulfilled for time (once condition u) has been detected) u.3) vehicle speed u.4) condition u.3) is fulfilled for time (once condition u) has been detected) u.5) exhaust mass flow u.6) condition u.5) is fulfilled for time (once condition u) has been detected) v) deceleration before keyoff. w) condition v) could be ignored if idle engine condition w.x) is fulfilled w.1) engine speed in idle range w.2) condition w.1) fulfilled for time Once all conditions above are fulfilled during the driving cycle, ECM requires diagnostic test execution at key off	>=5mph > 10 sec >20g/s > 5 sec < 5.00 m/s < 1.00 rpm < 10.00 rpm > 8.00 s		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
DEF tank heater supply undervoltage monitoring	P248A	This diagnosis verifies that the tank heater supply voltage is under the threshold of correct functioning	Tank heater supply under-voltage (System Battery voltage - Tank heater Supply Voltage value)	 > 3.00	Test enabled by calibration Powertrain relay in range Run Crank Active Cranking phase excluded No SCR Power Module CAN loss of communication Heating strategy is requesting the Heater to be activated	1.00 U010E, Lost Communication With Reductant Control Module (SCR) VeSCRR_b_HeatA_On == TRUE	16.00 failures out of 20.00 samples Time basis = 500ms	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
DEF tank heater supply overvoltage monitoring	P248B	This diagnosis verifues that the tank heater supply voltage is over the threshold of correct functioning	Tank heater supply voltage - PT relay voltage	> 2.0 V	Run Crank in range PT relay voltage (Run Crank voltage OR Engine running) Engine not cranking Tank heater commanded on None of following DTC present:	> 11.0V > 11.0V > 6.0V U010E	16 failures out of 20 samples 500 ms/sample	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
DEF line heater supply undervoltage monitoring	P248C	This diagnosis verifues that the line heater supply voltage is under the threshold of correct functioning	Line heater supply under-voltage (System Battery voltage - Line heater Supply Voltage value)	 > 3.00	Test enabled by calibration Powertrain relay in range Run Crank Active Cranking phase excluded No SCR Power Module CAN loss of communication Heating strategy is requesting the Heater to be activated	1.00 U010E, Lost Communication With Reductant Control Module (SCR)	16.00 failures out of 20.00 samples Time basis = 500ms	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
DEF line heater supply overvoltage monitoring	P248D	This diagnosis verifues that the line heater supply voltage is over the threshold of correct functioning	Line heater supply voltage - PT relay voltage	>2.0 V	Run Crank in range PT relay voltage (Run Crank voltage OR Engine running) Engine not cranking Tank heater commanded on None of following DTC present:	> 11.0V > 11.0V > 6.0V U010E	16 failures out of 20 samples 500 ms/sample	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Transmission Control Torque Request Circuit	P2544	Determines if the torque request from the TCM is valid	Protect error - Serial Communication message 2's complement not equal ($189/$199) OR Rolling count error - Serial Communication message ($189/$199) rolling count index value OR Range Error - Serial Communication message - ($189/$199) TCM Requested Torque Increase OR Multi-transition error - Trans torque intervention type request change	Message <> two's complement of message Message <> previous message rolling count value + one > 1,298 Nm Requested torque intervention type toggles from not increasing request to increasing request	Diagnostic Status Power Mode Ignition Voltage Engine Running Run/Crank Active No Serial communication loss to TCM (U0101)	Enabled = Run > 6.41 volts = True > 0.50 Sec No loss of communication	>=16 failures out of 20 samples. Performed on every received message >= 6 Rolling count errors out of 10 samples. Performed on every received message >=6 range errors out of 10 samples. Performed on every received message >=3 multi-transitions out of 5 samples. Performed every 200 msec	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Unmetered Fuel - Forced Engine Shutdown	P25BD	Determines if engine overspeed condition is occuring when no fuel is being delivered	Engine Speed exceeds a threshold for a period of time	Fail Condition: Engine Speed > 5,200 RPM		Engine Speed > 1,500 RPM	Fail threshold: Overspeed condition TRUE > 499.0 milliseconds	Type A, 1 Trips
			Engine Speed less than a threshold for a period of time	Pass Condition: Engine Speed < (5,200 - 300) RPM		Engine Speed > 1,500 RPM	Pass threshold: Overspeed condition FALSE > 499.0 milliseconds	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Control Module Power Off Timer Performance	P262B	This DTC determines if the hardware timer does not initialize or count properly. There are two tests to ensure proper functioning of the timer: Count Up Test (CUT) and Range Test (RaTe). Count Up Test (CUT): Verifies that the HWIO timer is counting up with the proper increment. Range Test (RaTe): When the run/crank is not active both the hardware and mirror timers are started. The timers are compared when module shutdown is initiated or run/crank becomes active.	Count Up Test: Time difference between the current read and the previous read of the timer Range Test: The variation of the HWIO timer and mirror timer is	> 1.50 seconds > 0.25%.			Count Up Test: 4 failures out of 20 samples 1 sec / sample Continuous while run/crank is not active and until controller shutdown is initiated. Range Test: Once per trip when controller shutdown is initiated or run/ crank becomes active.	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Fuel Pump "A" Low Flow / Performance	P2635	This DTC detects degradation in the performance of the electronically regulated fuel system by calculating the difference between the sensed, filtered system [line] pressure versus the ECM-commanded pressure [error calculation]. The calculated error is then compared to calibrated fault threshold tables for a fault decision.	Sensed Filtered Fuel System [line] pressure error	<= Low Threshold [Supporting Table] **P2635 Threshold Low** OR >= High Threshold [Supporting Table] **P2635 Threshold High**	a) Diagnostic enabled [FDBR_b_FSRD] b) Timer Engine Running [FDBR_t_EngModeRunCoarse] c1) Fuel Flow Rate Valid c2) Ambient Air Pressure Value Defaulted c3) FDB_FuelPresSnsrCktFA c4) Reference Voltage Fault Status [DTC P0641] c5) Exhaust AfterTreatment Fuel Injector A Control Circuit Short Low Fault [HCIR_b_GshtFA DTC P20CD] c6) Fuel Pres Sensor Performance Fault Active [DTC P018B] c7) Use Calculated Flow Performance Fault Thresholds [FDBR_b_UseCalcFSRD_FltThrshs] c8) Engine Speed Status Valid c9) FAB_FuelPmpCktFA c10) Fuel Control Enable	a) == TRUE b) >= 40.00 seconds c1)== TRUE c2) <>TRUE c3) <> TRUE c4) <> TRUE c5) <> TRUE c6) <> TRUE c7) <> TRUE c8] ==TRUE c9] <> TRUE c10) <> TRUE	1 sample / 12.5 millisec	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Fault Active [DTC P12A6]			
					c11) Fuel Pump Driver Module OverTemp Fault Active [DTC P1255]	c11)<> TRUE		
					c12) Fuel Pump Speed Fault Active [DTC P129F]	c12) <> TRUE		
					c13) CAN Sensor Bus message $0C3 Comm Fault [CFMR_b_FTZM_lnfo1_UcodeCmFADTC P165C]	c13) <> TRUE		
					c14) CAN Sensor Bus Fuel Pmp Spd Command ARC and Checksum Comm Fault Code [CFMR_b_FTZM_Cmd1_UcodeCmFA DTC]	c14] <> TRUE		
					c15) Sensor Configuration [FDBR_e_FuelPresSnsrConfig]	c15) == CeFDBR_e_WiredTo_FTZM		
					c16) Sensor Bus Relay On	c16) == TRUE		
					d) Emissions Fuel Level Low [Message $3FB]	d) <> TRUE		
					e) Fuel Control Enable	e) == TRUE		
					f) Fuel Pump Control State	f) == NORMAL		
					g) Run_Crank input circuit voltage	g) 11.00 volts <= Run_Crank_V <= 32.00 volts		
					h) Hioh Pres Fuel Pumo	h) <> TRUE		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Mode Management Enabled j) High Pres Fuel Pump Control Mode k) Instantaneous Fuel Flow [FCBR_dm_InstFuelFlow] m1) Fuel Pmp Speed Command Alive Rolling Count and Checksum Error [CAN Bus B $0CE] [CFMR_b_FTZM_Cmd1_ ARC_ChkErr DTC] m2) CAN Sensor Bus message $0C3_Available m3) Fuel Pres Sensor Ref Voltage Status Message Counter Incorrect Alive Rolling Count and Checksum Error [CAN Bus B $0C3] [CFMR_b_FTZM_Info1_A RC_ChkErr DTC] n) Timer - Diagnostic Enable	j) <> Disabled Mode AND a8b) <> ZeroFlow Mode k) 0.05 grams/sec <= InstFuelFlow <= Max Allowed Flow [Supporting Table] **P2635 Max Fuel Flow** m1)<> TRUE m2) == TRUE m3) <> TRUE n) > 2.00 seconds		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Malfunction Indicator Lamp (MIL) Control Circuit (ODM) Low	P263A	Detects an inoperative malfunction indicator lamp control circuit. This diagnostic reports the DTC when a short to ground is detected.	Voltage low during driver off state (indicates short-to-ground)	Short to ground: < 0.5 Q impedance between output and controller ground	Run/Crank Voltage Remote Vehicle Start is not active	Voltage > 11.00 volts	1 failures out of 1 samples 50 ms / sample	Type B, No MIL NO MIL Note: In certain controllers P0650 may also set (MIL Control Open Circuit)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Malfunction Indicator Lamp (MIL) Control Circuit (ODM) High	P263B	Detects an inoperative malfunction indicator lamp control circuit. This diagnostic reports the DTC when a short to power is detected.	Voltage high during driver on state (indicates short to power)	Short to power: < 0.5 Q impedance between output and controller power	Run/Crank Voltage Remote Vehicle Start is not active	Voltage > 11.00 volts	4 failures out of 5 samples 50 ms / sample	Type B, No MIL NO MIL

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Engine Serial Number Not Programmed or Incompatible	P264F	This DTC checks that the engine serial number is correctly written	At least one of the programmed engine serial number digits	=0xFF	OBD Manufacturer Enable Counter	= 0	250 ms / test Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Shared High Side Drive #2 Control Circuit Low (STG)- (GEN III Controllers ONLY)	P2670	Controller specific output driver circuit diagnoses the shared high sided driver # 2 for a short to ground failure when the output is powered on by comparing a voltage measurement to controller specific voltage thresholds.	- Voltage measurement outside of controller specific acceptable range during driver on state indicates short to ground failure. - Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for a short to ground.	< 0.5 Q impedance between output and controller ground	Shared high side drive #2 low diag enable Powertrain relay voltage Run Crank voltage Powertrain relay state	= 0 >=11.00 >6.00 = ON	5 failures out of 10 samples 100 ms / sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Shared High Side Drive #2 Control Circuit High (STP)- (GEN III Controllers ONLY)	P2671	Controller specific output driver circuit diagnoses the shared high sided driver # 2 for a short to power failure when the output is powered off by comparing a voltage measurement to controller specific voltage thresholds.	- Voltage measurement outside of controller specific acceptable range during driver off state indicates short to power failure. - Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for a short to power.	< 0.5 Q impedance between output and controller power	Shared high side drive #2 diag enable Powertrain relay voltage Run Crank voltage Powertrain relay state	= 1 >=11.00 >6.00 = ON	20 failures out of 25 samples 100 ms / sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Transfer Case Control Module Transfer Case Command State Rationality - 4WD high command not 4WD high ratio	P279A	Monitor measured transfer case gear ratio is 4WD low ratio or neutral while the transfer case control module command state is4WDhigh. The 4WD measured transfer case ratio is calculated as transmission output shaft speed divided by the transfer case output shaft speed, both speed are measured values based on speed sensors.	transfer case contol module transfer case command state AND measured transfer case ratio is in 4WD low ratio window OR measured transfer case ratio is in neutral window AND measured transfer case ratio is in 4WD low ratio window (measured transfer case ratio = transmission output speed / transfer case output speed) update rate 12.5 milliseconds	= 4WD high 4WD low ratio window < 3.30 > 2.70 neutral ratio window > 1.30 < 0.70 OR > 3.30 < 2.70 4WD low ratio window < 3.20 > 2.80	transmssion gear is forward gear: transmission output shaft speed engine torque engine speed accelerator pedal position brake pedal position transmssion gear is reverse gear: transmission output shaft speed engine torque engine speed accelerator pedal position brake pedal position diagnsotic monitor enable PTO active engine power limited DTCs not fault active	 > 500.0 RPM > 80.0 Nm > 300.0 RPM > 5.0 % <100.0 % > 500.0 RPM > 80.0 Nm > 300.0 PRM > 5.0 % < 100.0 % = 1 Boolean = FALSE = FALSE CrankSensor_FA VehicleSpeedSensor_FA EngineTorqueEstInaccurate P057B, P057C, P057D, P057E P17D4, P279B, P279C P0502, P0503, P0722, P0723, P2160, P2161	fail time > 7.00 seconds out of sample time > 10.00 seconds update rate 12.5 milliseconds	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Transfer Case Control Module Transfer Case Command State Rationality - 4WD low command not 4WD low ratio	P279B	Monitor measures transfer case gear ratio is 4WD high ratio or neutral while the transfer case control module command state is 4WD low. The 4WD measured transfer case ratio is calculated as transmission output shaft speed divided by the transfer case output shaft speed, both speed are measured values based on speed sensors.	transfer case contol module transfer case command state AND measured transfer case ratio is in 4WD high ratio window OR measured transfer case ratio is in neutral window AND measured transfer case ratio is in 4WD high ratio window (measured transfer case ratio = transmission output speed / transfer case output speed) update rate 12.5 milliseconds	= 4WD low 4WD high ratio window < 1.30 > 0.70 neutral ratio window > 1.30 < 0.70 OR > 3.30 < 2.70 4WD high ratio window < 1.20 > 0.80	transmssion gear is forward gear: transmission output shaft speed engine torque engine speed accelerator pedal position brake pedal position transmssion gear is reverse gear: transmission output shaft speed engine torque engine speed accelerator pedal position brake pedal position diagnsotic monitor enable PTO active engine power limited DTCs not fault active	 > 500.0 RPM > 80.0 Nm > 300.0 RPM > 5.0 % < 100.0 % > 500.0 RPM > 80.0 Nm > 300.0 PRM > 5.0 % < 100.0 % = 1 Boolean = FALSE = FALSE CrankSensor_FA VehicleSpeedSensor_FA EngineTorqueEstInaccurate P057B, P057C, P057D, P057E P17D4, P279A, P279C P0502, P0503, P0722, P0723, P2160, P2161	fail time > 7.00 seconds out of sample time > 10.00 seconds update rate 12.5 milliseconds	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Transfer Case Control Module Transfer Case Command State Rationality - 4WD neutral command not 4WD neutral ratio	P279C	Monitor measured transfer case gear ratio is 4WD high ratio or 4WD low ratio while the transfer case control module command state is 4WD neutral. The 4WD measured transfer case ratio is calculated as transmission output shaft speed divided by the transfer case output shaft speed, both speed are measured values based on speed sensors.	transfer case contol module transfer case command state AND measured transfer case ratio is in 4WD low ratio window OR measured transfer case ratio is in 4WD high window AND measured transfer case ratio is in 4WD low ratio window or in 4WD high ratio window (measured transfer case ratio = transmission output speed / transfer case output speed) update rate 12.5 milliseconds	= 4WD neutral 4WD low ratio window < 3.30 > 2.70 4WD high ratio window > 1.30 < 0.70 4WD neutral ratio window < 3.20 > 2.80 OR < 1.20 > 0.80	transmssion gear is forward gear: transmission output shaft speed engine torque engine speed accelerator pedal position brake pedal position transmssion gear is reverse gear: transmission output shaft speed engine torque engine speed accelerator pedal position brake pedal position diagnsotic monitor enable PTO active engine power limited DTCs not fault active	> 300.0 RPM > -20.0 Nm > 0.0 RPM > 0.0 % < 100.0 % > 500.0 RPM > 80.0 Nm > 300.0 PRM > 5.0 % < 100.0 % = 1 Boolean = FALSE = FALSE CrankSensor_FA VehicleSpeedSensor_FA EngineTorqueEstInaccurate P057B, P057C, P057D, P057E P17D4, P279A, P279B P0502, P0503, P0722, P0723, P2160, P2161	fail time > 10.50 seconds out of sample time > 15.00 seconds update rate 12.5 milliseconds	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
DEF Quality Sensor Temperature Offset Monitor	P2ADA	Determine when the DEF Quality Sensor Temperature Offset is not plausible	This monitor checks if the difference between Tref (the average temperature of all the temperature sensors in the exhaust) and the temperature meausured by the QS thermistor is bigger than a threshold.		Engine in Cranking Phase	FALSE	Time counter: 40.00 fails out of 50.00 samples Task = 100ms	Type A, 1 Trips
					Powertrain relay voltage	>11.00V		
					Run/Crank is Active	TRUE		
					Tref signal is available (usually calculated after 8 hours vehicle soak)	TRUE		
			|Tref- QS thermistor temperature]	> 35.00 °C	DEF QS thermistor temperature signal not equals the DEF freezing temperature (with tolerance)	> (-90.00 + 1.00)°C OR < (-90.00-1.00)°C		
					Time elapsed since last key off	> 28,800.00 s		
					No fault on engine mode-not-run timer	EngineModeNotRunTimer Error		
					Urea Refill is not detected	TRUE		
					No loss of CAN communication	CAN_LostComm_FltN_BusB_DEF_C == FALSE		
					DEF-C Controller not in initialization condition	TRUE		
					No electrical fault on DEF QS is present	DQMR_DEFQS_ElecFlt == FALSE		
					No electrical fault on DEF Quality Sensor SENT circuit	DQMR_DEFQS_SENT_ElecFA == FALSE		
					No performance fault on DEF Quality Sensor SENT circuit	DQMR_DEFQS_SENT_PerfFA == FALSE		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					No fault on DEF QS thermistor is present	DQMRJDEFQSTempFlt == FALSE		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
DEF Quality Sensor Temperature OOR Low	P2ADB	This diagnosis verifies if DEF Quality Temperature Sensor read out of range low	This monitor checks if the DEF Quality Temperature Sensor signal is out of lower range. DEF QS thermistor temperature value	 < -55.00 °C	Engine in Cranking Phase Powertrain relay voltage Run/Crank is Active No loss of CAN communication DEF-C Controller not in initialization condition No electrical fault on DEF QS is present No electrical fault on DEF Quality Sensor SENT circuit No performance fault on DEF Quality Sensor SENT circuit	FALSE >11.00V TRUE CAN_LostComm_FltN_BusB_DEF_C == FALSE TRUE DQMR_DEFQS_ElecFlt == FALSE DQMR_DEFQS_SENT_ElecFA == FALSE DQMR_DEFQS_SENT_PerfFA == FALSE	Time counter: 40.00 fails out of 50.00 samples Task = 100ms	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
DEF Quality Sensor Temperature OCR High	P2ADC	This diagnosis verifies if DEF Quality Temperature Sensor read out of range high	This monitor checks if the DEF Quality Temperature Sensor signal is out of higher range.		Engine in Cranking Phase	FALSE	Time counter: 40.00 fails out of 50.00 samples Task = 100ms	Type A, 1 Trips
					Powertrain relay voltage	>11.00V		
					Run/Crank is Active	TRUE		
			DEF QS thermistor temperature value	> 155.00 °C				
					No loss of CAN communication	CAN_LostComm_FltN_BusB_DEF_C == FALSE		
					DEF-C Controller not in initialization condition	TRUE		
					No electrical fault on DEF QS is present	DQMR_DEFQS_ElecFlt == FALSE		
					No electrical fault on DEF Quality Sensor SENT circuit	DQMR_DEFQS_SENT_ElecFA == FALSE		
					No performance fault on DEF Quality Sensor SENT circuit	DQMR_DEFQS_SENT_PerfFA == FALSE		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
DEF Quality Sensor Erratic Temperature	P2ADD	This diagnosis verifies if the DEF Quality Temperature Sensor signal dynamic is plausible.	This monitor checks if the dynamic behaviour of the DEF Quality Sensor signal is out of calibratable thresholds. QS thermistor raw value OR QS thermistor raw value	> (1-a)* 155.00 °C + (Last good sample * a) - measurement error < (1-a)* -55.00 °C + (Last good sample * a) with: a = e^[-(amount of consecutive bad samples * 0.08)] measurement error as per **P2ADD_Measure_Error** supporting table	Powertrain relay voltage Run/Crank is Active Engine in Cranking Phase No electrical fault on DEF QS thermistor is present No loss of CAN communication DEF-C Controller not in initialization condition No electrical fault on DEF QS is present No electrical fault on DEF Quality Sensor SENT circuit No performance fault on DEF Quality Sensor SENT circuit	>11.00V TRUE FALSE DQMR_DEFQS_PZT_ElecFlt == FALSE CAN_LostComm_FltN_Bus B_D E F_C == FALSE TRUE DQMR_DEFQS_ElecFlt == FALSE DQMR_DEFQS_SENT_ElecFA == FALSE DQMR_DEFQS_SENT_PerfFA == FALSE	Time counter: 100.00 fails out of 125.00 samples Task = 500ms	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Reductant Delivery Performance Maximum Authority	P2BAA	This monitor detects a failure that causes RDP factor being at maximum authority.This monitor determines when RDP compensation has achieved the maximum authority without being able to achieve the expected pressure drop that guarantees proper reductant delivery performance.	Reductant Delivery Perfomance compensation factor	> 1.35	Closed loop of Reductant Delivery Performance Compensation running		10 fails out of 20 samples (100 ms/sample)	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Cold Start Fuel Pressure Regulator A Exceeded Control Limits - Pressure Too Low	P2C1F	Determines when rail pressure is lower than desired setpoint during Cold Start	Rail pressure setpoint - measured rail pressure OR Rail pressure setpoint - measured rail pressure	> 12 to 12 MPa (see table **P228C Positive rail pressure deviation (MU))** > 12 to 12 MPa (see table **P229A Positive rail pressure deviation (PR))**	Cold Start strategy enabled Powertrain relay voltage Engine Mode Run Fuel Metering Unit OR Pressure Regulator controlled in closed loop (refer to RailPresCntrl) (Fuel injected quantity (Low fuel level calibrated as enabling condition OR LowFuelConditionDiagnostic (Air ambient pressure calibrated as enabling condition OR Air ambient pressure (Air ambient temperature calibrated as enabling condition OR Air ambient temperature OR (Fuel injected quantity (Low fuel level calibrated	== TRUE >= 11.0V == True == True >20.0 mm^3/stroke ==1.00 == False) ==1.00 >= 75 kPa) ==1.00 >=-7°C)) >20.0 mm^3/stroke	640 failures out of 800 samples 25 ms/sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					as enabling condition OR LowFuelConditionDiagnostic (Air ambient pressure calibrated as enabling condition OR Air ambient pressure (Air ambient temperature calibrated as enabling condition OR Air ambient temperature	==1.00 == False) ==1.00 >= 75 kPa) ==1.00 >=-7°C))		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Cold Start Fuel Pressure Regulator A Exceeded Control Limits - Pressure Too High	P2C20	Determines when rail pressure is greater than desired setpoint.	Rail pressure setpoint - measured rail pressure OR Rail pressure setpoint - measured rail pressure	< -17 to -17MPa (see table **P228D Negative rail pressure deviation (MU)** < -17MPa	Cold Start strategy enabled Powertrain relay voltage Engine Mode Run Fuel Metering Unit OR Pressure Regulator controlled in closed loop (refer to RailPresCntrl) (Fuel injected quantity Fuel temperature (Low fuel level calibrated as enabling condition OR LowFuelConditionDiagnostic (Air ambient pressure calibrated as enabling condition OR Air ambient pressure (Air ambient temperature calibrated as enabling condition OR Air ambient temperature OR	== TRUE >= 11.0V == True == True > 20.0 mm^3/stroke > -40 °C == 1.00 == False) == 1.00 >= 75 kPa) == 1.00 >=-7°C)	640 failures out of 800 samples 25 ms/sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					(Fuel injected quantity (Low fuel level calibrated as enabling condition OR LowFuelConditionDiagnostic (Air ambient pressure calibrated as enabling condition OR Air ambient pressure (Air ambient temperature calibrated as enabling condition OR Air ambient temperature	 > 20.00 mm^3/stroke ==1.00 == False) ==1.00 >= 75 kPa) ==1.00 >=-7°C)		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Reductant Temperature Too Low	P2D45	This monitoring detects when DEF tank heater is affected by a fault that causes low temperature increase rate.	Maximum difference between current tank temperature and tank temperature sampled at begin of driving	<0.5°C	Sensor Bus Wake Up signal is active No test status has been reported for this monitoring since begin of driving cycle No fault for serial communication with DEF device (SCRPM) (e.g. ARC/Checksum) No fault for sensor bus wake up signal No fault for DEF tank temperature sensor No electrical fault for tank heater Tank heater active DEF tank temperature at begin of driving cycle [(Tank heater has been continuously commanded active AND battery system voltage (RunCrank) is continuously greater than 11 V for a time)OR(Tank heater has been continuously commanded active AND battery	SCR_DEFTH_ElecFltSt SCR_DEFTH_SplyVoltHiFA <-15.0°C >600.00 s < 600.00 s	As enable conditions are met.	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					system voltage (RunCrank) is continuously greater than 11 V for a time since begin of driving cycle AND difference between current tank temperature and tank temperature sampled at begin of driving cycle)] Engine soak time Engine run time Difference between current ambient temperature and DEF tank temperature sampled at begin of driving cycle is within calibratable range	>0.5 °C >36,000.00 s < 610.00 > -8.00 < 8.00		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
NOx Sensor Signal Message Counter Incorrect Bank 1 Sensor 1	P30B4	This DTC monitors for an error in communication with the Bank 1 Sensor 1 NOx Sensor Signal Message.	Communication of the Alive Rolling Count or Protection Value of the NOx Sensor Oxygen Engine Out data over CAN bus is incorrect for	>= 8.00 counts	Message frame	= Is available	Executes in 10ms loop.	Type B, 2 Trips
					All the following conditions are met for	>= 3,000.00 milliseconds		
					Power Mode	= Run		
			out of total samples	>= 10.00 counts	Powertrain Relay Voltage	>=11.00 Volts		
			Or		Run/Crank Ignition Voltage	>=11.00 Volts		
			Communication of the Alive Rolling Count or Protection Value of the Engine Out NOx Sensor Data 1 data over CAN bus is incorrect for	>= 8.00 counts				
			out of total samples	>= 10.00 counts				
			Or					
			Communication of the Alive Rolling Count or Protection Value of the Engine Out NOx Sensor Data 2 data over CAN bus is incorrect for	>= 8.00 counts				
			out of total samples	>= 10.00 counts				
			Or					
			Communication of the Alive Rolling Count or Protection Value of the Engine Out NOx Sensor Data 3 data over CAN bus is incorrect for	>=8.00 counts				
			out of total samples	>= 10.00 counts				

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			Or Communication of the Alive Rolling Count or Protection Value of the NOx Sensor Error Engine Out data over CAN bus is incorrect for out of total samples Or Communication of the Alive Rolling Count or Protection Value of the Engine Out NOx Sensor Data 6 data over CAN bus is incorrect for out of total samples Or Communication of the Alive Rolling Count or Protection Value of the NOx Sensor Component Information Engine Out data over CAN bus is incorrect for out of total samples	>= 8.00 counts >= 10.00 counts >=8.00 counts >= 10.00 counts >= 8.00 counts >= 10.00 counts				

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
NOx Sensor Signal Message Counter Incorrect Bank 1 Sensor 2	P30B5	This DTC monitors for an error in communication with the Bank 1 Sensor 2 NOx Sensor Signal Message.	Communication of the Alive Rolling Count or Protection Value of the NOx Sensor Oxygen Post Catalyst data over CAN bus is incorrect for	>= 8.00 counts	Message frame	= Is available	Executes in 10ms loop.	Type B, 2 Trips
			out of total samples	>= 10.00 counts	All the following conditions are met for	>= 3,000.00 milliseconds		
			Or		Power Mode	= Run		
			Communication of the Alive Rolling Count or Protection Value of the Post Catalyst NOx Sensor Self Diagnostic Feedback Status 1 data over CAN bus is incorrect for	>= 8.00 counts	Powertrain Relay Voltage	>=11.00 Volts		
			out of total samples	>= 10.00 counts	Run/Crank Ignition Voltage	>=11.00 Volts		
			Or					
			Communication of the Alive Rolling Count or Protection Value of the Post Catalyst NOx Sensor Self Diagnostic Result data over CAN bus is incorrect for	>= 8.00 counts				
			out of total samples	>= 10.00 counts				
			Or					
			Communication of the Alive Rolling Count or Protection Value of the NOx Sensor Lambda Binary Voltage Post Catalyst data over CAN					

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			bus is incorrect for out of total samples Or Communication of the Alive Rolling Count or Protection Value of the NOx Sensor Error Post Catalyst data over CAN bus is incorrect for out of total samples Or Communication of the Alive Rolling Count or Protection Value of the Post Catalyst NOx Sensor Data 6 data over CAN bus is incorrect for out of total samples Or Communication of the Alive Rolling Count or Protection Value of the NOx Sensor Component Information Post Catalyst over CAN bus is incorrect for out of total samples	>= 8.00 counts >= 10.00 counts >=8.00 counts >= 10.00 counts >=8.00 counts >= 10.00 counts >=8.00 counts >= 10.00 counts				

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Particulate Matter Sensor Control Module Status Signal Message Counter Incorrect	P30BC	This DTC monitors for an error in communication with the Particulate Matter Sensor Control Module Status Signal Message.	Communication of the Alive Rolling Count or Protection Value of the Soot Sensor Electrode Current/Voltage and Soot Sensor Status data over CAN bus is incorrect for	>=8.00 counts	Message frame	= Is available	Executes in 10ms loop.	Type B, 2 Trips
			out of total samples	>= 10.00 counts	All the following conditions are met for	>= 3,000.00 milliseconds		
			Or		Power Mode	= Run		
			Communication of the Alive Rolling Count or Protection Value of the Soot Sensor Input/Output Error and Heater Duty Cycle data over CAN bus is incorrect for	>= 8.00 counts	Powertrain Relay Voltage	>=11.00 Volts		
			out of total samples	>= 10.00 counts	Run/Crank Ignition Voltage	>=11.00 Volts		
			Or					
			Communication of the Alive Rolling Count or Protection Value of the Soot Sensor Heater Resistance and Soot Sensor Regeneration Setpoint Temperature data over CAN bus is incorrect for	>= 8.00 counts				
			out of total samples	>= 10.00 counts				
			Or					
			Communication of the Alive Rolling Count or Protection Value of the					

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			Soot Sensor Control Unit Information data over CAN bus is incorrect for	>= 8.00 counts				
			out of total samples	>= 10.00 counts				
			Or					
			Communication of the Alive Rolling Count or Protection Value of the Soot Sensor Electrode Temperature/Soot Sensor Supply Voltage Extended Range data over CAN bus is incorrect for	>= 8.00 counts				
			out of total samples	>= 10.00 counts				
			Or					
			Communication of the Alive Rolling Count or Protection Value of the Soot Sensor Temperature Compensated Electrode Current data over CAN bus is incorrect for	>= 8.00 counts				
			out of total samples	>= 10.00 counts				
			Or					
			Communication of the Alive Rolling Count or Protection Value of the Soot Sensor Probe Current Sensitivity Factor data over CAN bus is incorrect for	>= 8.00 counts				

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			out of total samples	>= 10.00 counts				

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Control Module Communication Bus A Off	U0073	This DTC monitors for a BUS A off condition	Bus off failures equals or exceeds	5 counts (equivalent to 0.83 seconds)	General Enable Criteria:		Diagnostic runs in 12.5 ms loop	Type A, 1 Trips
					Starter motor engaged for Or	> 15.00 milliseconds		
					Run/Crank ignition voltage	> 8.41 Volts		
			before the sample time of is reached	0.83 seconds				
					All below criteria have been met for	>=5.00 seconds		
					Normal CAN transmission on Bus	Enabled		
					Controller not in programming mode			
					If bus type = Sensor Bus:			
					Sensor bus relay is on			
					Otherwise:			
					If power mode = Run/ Crank:			
					Power Mode	= Run		
					If calibratable low voltage disable mode is not Never Disabled			
					Low voltage disable mode: OBDII			
					If OBDII: Run/Crank ignition voltage	>=11.00 Volts		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					If EOBD: Run/Crank ignition voltage If Secure: Starter motor engaged for Or Run/Crank ignition voltage If Hybrid Secure: Run/Crank ignition voltage If power mode = Accessory Off key cycle diagnostics are enabled Or Controller is an OBD controller Controller shutdown impending Power Mode Battery voltage	>=9.00 Volts > 15.00 milliseconds > 8.41 Volts >= 6.41 Volts Enabled OBD Controller = False = Not crank >=11.00 Volts		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Control Module Communication Powertrain Sensor CAN Bus Off	U0076	This DTC monitors for a Powertrain Sensor Bus S off condition	Bus off failures equals or exceeds before the sample time of is reached	5 counts (equivalent to 0.83 seconds) 0.83 seconds	General Enable Criteria: Starter motor engaged for Or Run/Crank ignition voltage All below criteria have been met for Normal CAN transmission on Bus Controller not in programming mode If bus type = Sensor Bus: Sensor bus relay is on Otherwise: If power mode = Run/ Crank: Power Mode If calibratable low voltage disable mode is not Never Disabled Low voltage disable mode: OBDII If OBDII: Run/Crank ignition voltage	 > 15.00 milliseconds > 8.41 Volts >=5.00 seconds Enabled = Run >=11.00 Volts	Diagnostic runs in 12.5 ms loop	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					If EOBD: Run/Crank ignition voltage If Secure: Starter motor engaged for Or Run/Crank ignition voltage If Hybrid Secure: Run/Crank ignition voltage If power mode = Accessory Off key cycle diagnostics are enabled Or Controller is an OBD controller Controller shutdown impending Power Mode Battery voltage	 >=9.00 Volts > 15.00 milliseconds >8.41 Volts >= 6.41 Volts Enabled OBD Controller = False = Not crank >=11.00 Volts		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Lost Communication With TCM	U0101	This DTC monitors for a loss of communication with the Transmission Control Module.	Message is not received from controller for		General Enable Criteria:		Diagnostic runs in 12.5 ms loop	Type A, 1 Trips
					If message is on Bus A:			
			Message $0F9	>0.50 seconds	U0073	Not Active		
			Message $189	>0.50 seconds	If message is on Bus B: U0074	Not Active		
			Message $197	>0.50 seconds				
			Message $199	>0.50 seconds	If message is on Bus S: U0076	Not Active		
			Message $19D	>0.50 seconds	Starter motor engaged for	> 15.00 milliseconds		
					Or			
			Message $1AF	>0.50 seconds	Run/Crank ignition voltage	>8.41 Volts		
			Message $1F5	>0.50 seconds				
					Bus is enabled for	>=0.40 seconds		
			Message $4C9	> 10.00 seconds				
					The following criteria have been enabled for	>=5.00 seconds		
					Normal CAN transmission on Bus	Enabled		
					Transition from accessory mode to off is pending	= False		
					Controller not in programming mode			
					If bus type = Sensor Bus:			
					Battery voltage	>11.00 Volts		
					Sensor Bus Relay	= On		
					Otherwise:			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					If power mode = Run/ Crank:			
					Power Mode	= Run		
					If calibratable low voltage disable mode is not Never Disabled			
					Low voltage disable mode: OBDII			
					IfOBDII:			
					Run/Crank ignition voltage	>=11.00 Volts		
					If EOBD:			
					Run/Crank ignition voltage	>=9.00 Volts		
					If Secure:			
					Starter motor engaged for Or	> 15.00 milliseconds		
					Run/Crank ignition voltage	>8.41 Volts		
					If Hybrid Secure:			
					Run/Crank ignition voltage	>=6.41 Volts		
					If power mode = Accessory			
					Off key cycle diagnostics are enabled Or	Enabled		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Controller is an OBD controller	OBD Controller		
					Controller shutdown impending	= False		
					Power Mode	= Not crank		
					Battery voltage	>=11.00 Volts		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Lost Communication With Glow Plug Control Module	U0106	This DTC monitors for a loss of communication with the Glow Plug Control Module	Message is not received from controller for		General Enable Criteria:		Diagnostic runs in 12.5 ms loop	Type B, 2 Trips
			Message $3BD	> 10.00 seconds	If message is on Bus A: U0073	Not Active		
					If message is on Bus B: U0074	Not Active		
					If message is on Bus S: U0076	Not Active		
					Starter motor engaged for	> 15.00 milliseconds		
					Or			
					Run/Crank ignition voltage	>8.41 Volts		
					Bus is enabled for	>=0.40 seconds		
					The following criteria have been enabled for	>=5.00 seconds		
					Normal CAN transmission on Bus	Enabled		
					Transition from accessory mode to off is pending	= False		
					Controller not in programming mode			
					If bus type = Sensor Bus:			
					Battery voltage	>11.00 Volts		
					Sensor Bus Relay	= On		
					Otherwise: If power mode = Run/ Crank:			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Power Mode If calibratable low voltage disable mode is not Never Disabled Low voltage disable mode: OBDII IfOBDII: Run/Crank ignition voltage If EOBD: Run/Crank ignition voltage If Secure: Starter motor engaged for Or Run/Crank ignition voltage If Hybrid Secure: Run/Crank ignition voltage If power mode = Accessory Off key cycle diagnostics are enabled Or Controller is an OBD controller Controller shutdown impending Power Mode Batterv voltaoe	= Run >=11.00 Volts >=9.00 Volts > 15.00 milliseconds >8.41 Volts >=6.41 Volts Enabled OBD Controller = False = Not crank >=11.00 Volts		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Lost Communication with Turbocharger Boost Control Module	U010C	This DTC monitors for a loss of communication with the Turbocharger Boost Control Module	Message is not received from controller for		General Enable Criteria:		Diagnostic runs in 12.5 ms loop	Type B, 2 Trips
			Message $099	> 10.00 seconds	If message is on Bus A: U0073	Not Active		
			Message $499	> 10.00 seconds	If message is on Bus B: U0074	Not Active		
					If message is on Bus S: U0076	Not Active		
					Starter motor engaged for Or Run/Crank ignition voltage	> 15.00 milliseconds >8.41 Volts		
					Bus is enabled for	>=0.40 seconds		
					The following criteria have been enabled for	>=5.00 seconds		
					Normal CAN transmission on Bus	Enabled		
					Transition from accessory mode to off is pending	= False		
					Controller not in programming mode			
					If bus type = Sensor Bus:			
					Battery voltage	>11.00 Volts		
					Sensor Bus Relay	= On		
					Otherwise: If power mode = Run/ Crank:			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Power Mode	= Run		
					If calibratable low voltage disable mode is not Never Disabled			
					Low voltage disable mode: OBDII			
					IfOBDII: Run/Crank ignition voltage	>=11.00 Volts		
					If EOBD: Run/Crank ignition voltage	>=9.00 Volts		
					If Secure: Starter motor engaged for Or Run/Crank ignition voltage	> 15.00 milliseconds > 8.41 Volts		
					If Hybrid Secure: Run/Crank ignition voltage	>=6.41 Volts		
					If power mode = Accessory			
					Off key cycle diagnostics are enabled Or Controller is an OBD controller	Enabled OBD Controller		
					Controller shutdown impending	= False		
					Power Mode	= Not crank		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Battery voltage	>=11.00 Volts		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Lost Communication With Reductant Control Module (SCR)	U010E	This DTC monitors for a loss of communication with the Reductant Control Module (SCR)	Message is not received from controller for		General Enable Criteria:		Diagnostic runs in 12.5 ms loop	Type A, 1 Trips
			Message $092	> 10.00 seconds	If message is on Bus A: U0073	Not Active		
			Message $4CC	> 10.00 seconds	If message is on Bus B: U0074	Not Active		
			Message $4CD	> 10.00 seconds	If message is on Bus S: U0076	Not Active		
			Message $4E5	> 10.00 seconds	Starter motor engaged for Or	> 15.00 milliseconds		
			Message $4E6	> 10.00 seconds	Run/Crank ignition voltage	>8.41 Volts		
			Message $4E7	> 10.00 seconds	Bus is enabled for	>=0.40 seconds		
			Message $4E8	> 10.00 seconds	The following criteria have been enabled for	>=5.00 seconds		
			Message $4E9	> 10.00 seconds	Normal CAN transmission on Bus	Enabled		
			Message $4EA	> 10.00 seconds	Transition from accessory mode to off is pending	= False		
					Controller not in programming mode			
					If bus type = Sensor Bus:			
					Battery voltage	>11.00 Volts		
					Sensor Bus Relay	= On		
					Otherwise: If power mode = Run/ Crank:			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Power Mode	= Run		
					If calibratable low voltage disable mode is not Never Disabled			
					Low voltage disable mode: OBDII			
					IfOBDII: Run/Crank ignition voltage	>=11.00 Volts		
					If EOBD: Run/Crank ignition voltage	>=9.00 Volts		
					If Secure: Starter motor engaged for	> 15.00 milliseconds		
					Or Run/Crank ignition voltage	>8.41 Volts		
					If Hybrid Secure: Run/Crank ignition voltage	>=6.41 Volts		
					If power mode = Accessory			
					Off key cycle diagnostics are enabled	Enabled		
					Or Controller is an OBD controller	OBD Controller		
					Controller shutdown impending	= False		
					Power Mode	= Not crank		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Battery voltage	>=11.00 Volts		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Lost Communication With NOx Sensor A	U029D	This DTC monitors for a loss of communication with NOx Sensor A.	Message is not received from controller for		General Enable Criteria:		Diagnostic runs in 12.5 ms loop	Type A, 1 Trips
			Message $0B0	>0.50 seconds	If message is on Bus A: U0073	Not Active		
			Message $0B1	>0.50 seconds	If message is on Bus B: U0074	Not Active		
			Message $0B5	> 10.00 seconds				
			Message $0B7	> 10.00 seconds	If message is on Bus S: U0076	Not Active		
			Message $289	>0.50 seconds	Starter motor engaged for	> 15.00 milliseconds		
					Or			
			Message $296	>0.50 seconds	Run/Crank ignition voltage	>8.41 Volts		
			Message $591	> 10.00 seconds				
					Bus is enabled for	>=0.40 seconds		
					The following criteria have been enabled for	>=5.00 seconds		
					Normal CAN transmission on Bus	Enabled		
					Transition from accessory mode to off is pending	= False		
					Controller not in programming mode			
					If bus type = Sensor Bus:			
					Battery voltage	>11.00 Volts		
					Sensor Bus Relay	= On		
					Otherwise: If power mode = Run/ Crank:			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Power Mode	= Run		
					If calibratable low voltage disable mode is not Never Disabled			
					Low voltage disable mode: OBDII			
					IfOBDII: Run/Crank ignition voltage	>=11.00 Volts		
					If EOBD: Run/Crank ignition voltage	>=9.00 Volts		
					If Secure: Starter motor engaged for Or Run/Crank ignition voltage	> 15.00 milliseconds > 8.41 Volts		
					If Hybrid Secure: Run/Crank ignition voltage	>=6.41 Volts		
					If power mode = Accessory			
					Off key cycle diagnostics are enabled Or Controller is an OBD controller	Enabled OBD Controller		
					Controller shutdown impending	= False		
					Power Mode	= Not crank		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Battery voltage	>=11.00 Volts		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Lost Communication With NOx Sensor B (post catalyst NOx sensor)	U029E	This DTC monitors for a loss of communication with NOx Sensor B.	Message is not received from controller for		General Enable Criteria:		Diagnostic runs in 12.5 ms loop	Type A, 1 Trips
			Message $0A4	>0.50 seconds	If message is on Bus A: U0073	Not Active		
			Message $0B2	>0.50 seconds	If message is on Bus B: U0074	Not Active		
			Message $0B6	> 10.00 seconds				
			Message $0B8	> 10.00 seconds	If message is on Bus S: U0076	Not Active		
			Message $28B	>0.50 seconds	Starter motor engaged for Or	> 15.00 milliseconds		
			Message $297	>0.50 seconds	Run/Crank ignition voltage	>8.41 Volts		
			Message $592	> 10.00 seconds				
					Bus is enabled for	>=0.40 seconds		
					The following criteria have been enabled for	>=5.00 seconds		
					Normal CAN transmission on Bus	Enabled		
					Transition from accessory mode to off is pending	= False		
					Controller not in programming mode			
					If bus type = Sensor Bus:			
					Battery voltage	>11.00 Volts		
					Sensor Bus Relay	= On		
					Otherwise: If power mode = Run/ Crank:			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Power Mode	= Run		
					If calibratable low voltage disable mode is not Never Disabled			
					Low voltage disable mode: OBDII			
					IfOBDII: Run/Crank ignition voltage	>=11.00 Volts		
					If EOBD: Run/Crank ignition voltage	>=9.00 Volts		
					If Secure: Starter motor engaged for	> 15.00 milliseconds		
					Or Run/Crank ignition voltage	> 8.41 Volts		
					If Hybrid Secure: Run/Crank ignition voltage	>=6.41 Volts		
					If power mode = Accessory			
					Off key cycle diagnostics are enabled	Enabled		
					Or Controller is an OBD controller	OBD Controller		
					Controller shutdown impending	= False		
					Power Mode	= Not crank		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Battery voltage	>=11.00 Volts		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Lost Communication With PM Sensor (Diesel Particulate)	U02A3	This DTC monitors for a loss of communication with the PM Sensor (Diesel Particulate).	Message is not received from controller for		General Enable Criteria:		Diagnostic runs in 12.5 ms loop	Type B, 2 Trips
			Message $3A3	> 10.00 seconds	If message is on Bus A: U0073	Not Active		
			Message $3A5	> 10.00 seconds	If message is on Bus B: U0074	Not Active		
			Message $3A8	> 10.00 seconds				
			Message $3A9	> 10.00 seconds	If message is on Bus S: U0076	Not Active		
			Message $3AA	> 10.00 seconds	Starter motor engaged for Or	> 15.00 milliseconds		
			Message $497	> 10.00 seconds	Run/Crank ignition voltage	>8.41 Volts		
					Bus is enabled for	>=0.40 seconds		
					The following criteria have been enabled for	>=5.00 seconds		
					Normal CAN transmission on Bus	Enabled		
					Transition from accessory mode to off is pending	= False		
					Controller not in programming mode			
					If bus type = Sensor Bus:			
					Battery voltage	>11.00 Volts		
					Sensor Bus Relay	= On		
					Otherwise: If power mode = Run/ Crank:			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Power Mode	= Run		
					If calibratable low voltage disable mode is not Never Disabled			
					Low voltage disable mode: OBDII			
					IfOBDII: Run/Crank ignition voltage	>=11.00 Volts		
					If EOBD: Run/Crank ignition voltage	>=9.00 Volts		
					If Secure: Starter motor engaged for Or Run/Crank ignition voltage	> 15.00 milliseconds >8.41 Volts		
					If Hybrid Secure: Run/Crank ignition voltage	>=6.41 Volts		
					If power mode = Accessory			
					Off key cycle diagnostics are enabled Or Controller is an OBD controller	Enabled OBD Controller		
					Controller shutdown impending	= False		
					Power Mode	= Not crank		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Battery voltage	>=11.00 Volts		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Fuel Tank Zone Module Configuratio n Error	U101A	FTZM Pump Control Configuration Management provides a method for a Diagnostic and Emissions-Critical Electronic Control Unit (DEC ECU) to communicate configuration information to an OBD Smart Device (SD); in this case the FTZM. The FTZM contains pre-loaded sets of calibrations, each of which specifies proper tuning values for electronic commutation of corresponding fuel pump motor variants including a default value that denotes a non-operational [factory default] pump variant. This configuration management feature provides a method to reduce the number of FTZM end-item part numbers. The Configuration Error Diagnostic runs every 100ms to verify that a calibration index value is present that is not the factory default value. When the diagnostic identifies that the default index value is loaded, the	FTZM Fuel Pump Configuration Calibration Index Value	= Factory Default Index Value OR = Not Configured Index Value [device failed to accept calibration value on 1st wake-up]	a] Diagnostic enabled; b] Device feedback Faulted; c] Diagnostic system disabled; d] CAN serial data message $3C8 received	a] = 1.00 [1=TRUE; 0 <> True] b] <> True; c] <>True; d] = TRUE	6.00 failures of 8.00 samples ; 100 millisec/ sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		DTC is set.						

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Lost Communication With Fuel Pump Driver Control Module on Bus S	U18A2	This DTC monitors for a loss of communication with the Fuel Pump Driver Control Module on Bus S.	Message is not received from controller for		General Enable Criteria:		Diagnostic runs in 12.5 ms loop	Type B, 2 Trips
			Message $0C3	> 10.00 seconds	If message is on Bus A: U0073	Not Active		
			Message $0CB	> 10.00 seconds	If message is on Bus B: U0074	Not Active		
			Message $0CC	> 10.00 seconds	If message is on Bus S: U0076	Not Active		
			Message $2C1	> 1.13 seconds				
			Message $2D7	> 10.00 seconds	Starter motor engaged for Or	> 15.00 milliseconds		
			Message $2D9	> 10.00 seconds	Run/Crank ignition voltage	>8.41 Volts		
			Message $3C8	> 10.00 seconds	Bus is enabled for	>=0.40 seconds		
			Message $3EB	>0.50 seconds	The following criteria have been enabled for	>=5.00 seconds		
			Message $3EC	> 10.00 seconds				
			Message $3EE	> 10.00 seconds	Normal CAN transmission on Bus	Enabled		
					Transition from accessory mode to off is pending	= False		
					Controller not in programming mode			
					If bus type = Sensor Bus:			
					Battery voltage	>11.00 Volts		
					Sensor Bus Relay	= On		
					Otherwise: If power mode = Run/ Crank:			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Power Mode	= Run		
					If calibratable low voltage disable mode is not Never Disabled			
					Low voltage disable mode: OBDII			
					IfOBDII: Run/Crank ignition voltage	>=11.00 Volts		
					If EOBD: Run/Crank ignition voltage	>=9.00 Volts		
					If Secure: Starter motor engaged for Or Run/Crank ignition voltage	> 15.00 milliseconds > 8.41 Volts		
					If Hybrid Secure: Run/Crank ignition voltage	>=6.41 Volts		
					If power mode = Accessory			
					Off key cycle diagnostics are enabled Or Controller is an OBD controller	Enabled OBD Controller		
					Controller shutdown impending	= False		
					Power Mode	= Not crank		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Battery voltage	>=11.00 Volts		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Glow Plug Control Module Lost Communication with Engine Control Module	U18C8	This DTC monitors for a Glow Plug Control Module loss of communication with the Engine Control Module.	The GPCM Diagnostic Status Message signal in GMLAN frame $3BD from the GPCM has a value of : for the Diagnostic Status signal.	CeDFIR_e_GlowPlugCMLostCommECM	General Enable Criteria: Message $3BD U18C8 Glow Plug Control Module	 Is being received Not Active on Current Key Cycle is present on the bus	Diagnostic runs in 12.5 ms loop	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Turbocharge rVGTA Position Exceeded Learning Limit (VGT Smart)	P003A	This monitor checks if the VGT smart travel (from fully closed to fully open position) measured at key off during the learning procedure is plausibile	physical travel measured at key off < low threshold OR physical travel measured at key off > high threshold	<195.00 [counts] OR >308.00 [counts]	Test enabled by calibration Key signal is off Learning procedure at key off has been successfully completed: - ambient temperature greater than a threshold; - engine coolant temperature in range; - battery voltage in range; -learning time needed smaller than a time out threshold; - no faults present on coolant temperature sensor; - no faults present on ambient temperature sensor. End Of Trip event has elapsed No fault validated on smart VGT rolling counters	==1.00 >=-60.00 (°C) <=129.00 (°C) >=10.00 (°C) <=30.00 (V) >=9.00 (V) <=3.00 (s) ECT_Sensor_FA ==FALSE OAT_PtEstFiltFA ==FALSE CFM_VGT_CommFA ==FALSE	No debounce is present: DTC sets as soon as the error is present Function task: at key off	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Turbocharger VGT A Performance (VGT Smart)	P0046	This monitor detects an obstruction on the actuator (obstruction found during the vanes opening or closing) checking the setpoint position against the position measured by the VGT Position Sensor	Absolute value of position tracking error (setpoint position - measured position)	>16.00 [%]	Cold Start strategy NOT enabled Test enabled by calibration System out of the cranking phase PT relay supply voltage in range VGT position closed loop control active (no faults present on VGT position sensor, VGT vanes, VGT position control deviation) VGT position setpoint in steady state conditions for minimum time Engine coolant temperature higher or equal to minimum threshold OR Engine cooling system target temperature reached (thermostat opening) No faults present on	==TRUE ==1.00 > 11.00 [V] VGT_PstnSnsrOfstFA ==FALSE VGT_SmartActrFA ==FALSE CFM_VGT_CommFA ==FALSE <100.00 [%/s] >-100.00 [%/s] for 0.50 [s] >=50.00 [°C] ECT_Sensor_FA ==FALSE	420.00 fail count out of 520.00 sample counts Function task: 25 ms	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					engine coolant temperature sensor			
					Outside air temperature higher or equal to minimum threshold	>=-60.00 [°C]		
					No faults present on outside air temperature sensor	OAT_PtEstFiltFA ==FALSE		
					No mechanical stop soft approach in progress			
					No anti-sticking procedure in progress			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Charge Air Cooler Temperature Sensor Up Circuit Performance	P007B	This monitor checks if the CAC up air temperature sensor is irrational at key on when compared with two reference temperature sensors after a long soak time	Charge air cooler up air temperature is compared at power up with an average temperature calculated using the intake manifold air temperature sensor and the fuel temperature sensor over a calibratable number of samples	>20.00 [°C]	Test enabled by calibration	==1.00	Test executed after a counter of 10.00 samples Functional task: 100 ms	Type B, 2 Trips
					Key on and engine not running or engine running for less than a calibratable time	>=1.00 [s]		
					Runk Crank Relay voltage in range	>11.00 [V]		
					The engine has not run for a calibratable time since last key off	>= 28,800.00 [s]		
					No faults detected on engine off timer	EngineModeNotRunTimer Error ==FALSE		
					Absolute value of the difference between intake manifold air temperature and fuel temperature smaller than a calibratable threshold	<45.00 [°C]		
					No electrical or self-correlated faults detected on charge air cooler up air temperature sensors	CIT_CAC_UpCktFA ==FALSE CIT_CAC_UpSelfCorFA ==FALSE		
					No faults detected on intake manifold air temperature sensor	MnfdTempSensorFA ==FALSE		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					No faults detected on fuel temperature sensor	FTS_FTS_Flt==FALSE		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Charge Air Cooler Temperature Sensor Up Circuit Low	P007C	This monitor checks if the CAC up air temperature sensor is out of electrical range low	Charge air cooler up air temperature resistance value < low threshold	<7.11 [ohm]	Test enabled by calibration Engine not cranking Runk Crank Relay voltage in range	==1.00 >11.00 [V]	20.00 fail counter over 24.00 sample counter Functional task: 100 ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Charge Air Cooler Temperature Sensor Up Circuit High	P007D	This monitor checks if the CAC up air temperature sensor is out of electrical range high	Charge air cooler up air temperature resistance value > high threshold	>753,016.00 [ohm]	Test enabled by calibration	==1.00	20.00 fail counter over 24.00 sample counter	Type B, 2 Trips
					Engine not cranking			
					Runk Crank Relay voltage in range	> 11.00 [V]	Functional task: 100 ms	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Charge Air Cooler Temperature Sensor Up Circuit Intermittent/ Erratic	P007E	This monitor checks if the CAC up air temperature has an intermittent fault	Charge air cooler up air temperature value > T_MAX_threshold	>300.00 [°C]	Test enabled by calibration	==1.00	50.00 fail counter over 63.00 sample counter	Type B, 2 Trips
			Charge air cooler up air temperature value < T_MIN_threshold	<-40.00 [°C]	Engine not cranking		Functional task: 100 ms	
			where		Runk Crank Relay voltage in range	>11.00 [V]		
			- T_MAX_threshold = (1 - alpha)*T_MAX + alpha*T_last_good - T_MIN_threshold = (1 - alpha)*T_MIN + alpha*T_last_good - alpha = e^(#fails + 1)*(ts/ tau) - #fails = number of consecutive samples where the test failed - ts = sensor sampling time - tau = sensor filter response time - T_MAX = sensor maximum actual reading - T_MIN = sensor minimum actual reading - T_last_good = last good temperature measured by the sensor		No electrical faults detected on CAC up air temperature sensor	CIT_CAC_UpCktFA ==FALSE		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Turbocharger VGT A Module Performance (VGT Smart)	POOAF	This monitor checks if the smart VGT has an internal fault	Smart actuator internal fault: Pattern Error, Overcurrent Error, Checksum Error (error information provided by the actuator)		Test enabled by calibration System out of the cranking phase PT relay supply voltage in range No fault validated on smart VGT rolling counters HWIO error status different from INDETERMINATE status	==1.00 >11.00 [V] CFM_VGT_CommFA ==FALSE	8.00 fail counts out of 10.00 sample counts Function task: 500 ms	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Mass Air Flow (MAF) Sensor Performance	P0101	This monitor checks if the MAF sensor measure is coherent with MAF estimation when the HP EGR and LP EGR (if present) are closed. It is able to detect MAF sensor wiring harness poor contacts, MAF sensor internal fault (offset), leaks from the induction air circuit, leaks from the recirculation exhuast gas circuit. For OBDII market, it is used to detect a PCV disconnection. The standard test can be calibrated to run when engine conditions are recognised as IDLE, OVERRUN or HIGH LOAD. An intrusive test can be enabled, to force the HP EGR to close when particular conditions are encountered, to allow the monitoring to run in idle.	Drift high check: drift of the mass air flow Drift low check: drift of the mass air flow The drift of the mass air flow is calculated as the ratio between the MAF sensor reading and the estimated mass airflow. The ratio is averaged over a calibrate-able cumulative transient time. If, by calibration, CeMAFD_e_ArflAdj ==CeMAFD_e_ArflRaw, the MAF sensor reading is given by the raw MAF value multiplied by the **P0101: Pulsation Map**	>1.25 [ratio] < 0.80 [ratio]	Calibration on diagnostic enabling PT relay supply voltage in range Share High Side driver closed Estimated mass airflow is valid No Electrical or offset fault present on MAF sensor OBDII Market: Outside Ambient Temperature in range OR Fault present on Ouside Air temperature EOBD Market: Outside Ambient Temperature in range AND No Fault present on Ouside Air temperature	P0101: MAF performance enabling==TRUE (see FreeForm) >11.00 [V] ==TRUE MAF_AirFlowEstdSS_NotVid ==FALSE MAF_MAF_SnsrCktOffstFA ==FALSE MAF_MAF_SnsrCktOffstTFKO ==FALSE >-6.70 [°C] OAT_PtEstFiltFA==TRUE >-6.70 [°C] OAT_OAT_SnsrNonEmissFA ==FALSE	Test is evaluated after the enabling conditions are satisfied for a number of samples ==400.00 Sampling time is: 12.5 ms	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Induction air temperature	>-6.70 [°C]		
					No fault present on induction air temperature sensor	IAT_SensorFA ==FALSE IAT_SensorTFTKO ==FALSE		
					(Engine Coolant Temperature	>40.00 [°C]		
					OR OBD Coolant Enable Criteria),	==TRUE		
					AND Engine Coolant Temperature	<130.00 [°C]		
					No faults detected on engine coolant temperature sensor	ECT_Sensor_FA ==FALSE ECT_Sensor_TFTKO ==FALSE		
					Barometric pressure	> 74.80 [kPa] < 75.00 [kPa]		
					No faults detected on barometric pressure sensor	AAP_AmbientAirPresDfltd ==FALSE AAP_AmbPresSnsrTFTKO ==FALSE		
					Throttle valve position	> 85.00 [%]		
					No faults detected on Throttle valve position sensor	TPS_PstnSnsrFA ==FALSE		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					HP EGR valve position	<=1.00 [%]		
					No faults detected on HP EGR valve position sensor	EGR_PstnSnsrFA ==FALSE		
					LP EGR (if present) valve position	<=1.00 [%]		
					No faults detected on LP EGR (if present) valve position sensor	LPE_PstnSnsrFA ==FALSE		
					Engine works in IDLE, OVERRUN or HIGH LOAD condition	Refer to "Engine conditions" Free Form		
			Drift high check: drift of the mass air flow	> 1.25 [ratio]	Intrusive Test enabled by calibration	1.00==TRUE	Test is evaluated after the enabling conditions are satisfied for a number of samples	
			Drift low check: drift of the mass air flow	< 0.80 [ratio]	MAF rationality monitoring enabled by calibration	P0101: MAF performance enabling==TRUE (see FreeForm)	==400.00	
			The drift of the mass air flow is calculated as the ratio between the MAF sensor reading and the estimated mass airflow. The ratio is averaged over a calibrate-able cumulative transient time.	75.00	Diagnostic has not run in current driving cycle yet	==TRUE	Sampling time is: 12.5 ms	
			If, by calibration, CeMAFD_e_ArflAdj		Calibratable SCR dosing condition	IF1.00==TRUE: SCR dosing condition is NH3 storage control OR intrusive NH3 storage		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			==CeMAFD_e_ArflRaw, the MAF sensor reading is given by the raw MAF value multiplied by the **P0101: Pulsation Map**			control OR transient dosing control. IF1.00==FALSE: No restrictions on SCR dosing		
					SCR predicted NOx conversion efficiency	>0.60 [ratio]		
					Air control is working only in EGR control: Desired EGR rate	= 100%		
					Vehicle speed	<3.00 [kph]		
					No faults detected on vehicle speed sensor	VehicleSpeedSensor_FA ==FALSE		
					Desired fuel in range, with hysteresis OR	Enabled if < 0.00 [mm^3] AND > 0.00 [mm^3] Disabled if > 0.00 [mm^3] OR < 0.00 [mm^3]		
					(Speed Control Mode is Idle AND No faults detected on Speed Control) (OBDII market only)	==TRUE FULJFMJdleFuelQntyFA ==FALSE		
					PT relay supply voltage in range	>11.00 [V]		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Share High Side driver closed	==TRUE		
					Estimated mass airflow is valid	MAF_AirFlowEstdSS_NotVid ==FALSE		
					No Electrical or offset fault present on MAF sensor	MAF_MAF_SnsrCktOffstFA ==FALSE MAF_MAF_SnsrCktOffstTFKO ==FALSE		
					OBDII Market: Outside Ambient Temperature in range	>-6.70 [°C]		
					OR			
					Fault present on Ouside Air temperature	OR OAT_PtEstFiltFA==TRUE		
					EOBD Market: Outside Ambient Temperature in range	>-6.70 [°C]		
					AND			
					No Fault present on Ouside Air temperature	AND OAT_OAT_SnsrNonEmissFA ==FALSE		
					Induction air temperature	>-6.70 [°C]		
					No fault present on induction air temperature sensor	IAT_SensorFA ==FALSE IAT_SensorTFTKO ==FALSE		
					(Engine Coolant			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Temperature OR OBD Coolant Enable Criteria), AND Engine Coolant Temperature	>40.00 [°C] ==TRUE <130.00 [°C]		
					No faults detected on engine coolant temperature sensor	ECT_Sensor_FA ==FALSE ECT_Sensor_TFTKO ==FALSE		
					Barometric pressure	> 74.80 [kPa] < 75.00 [kPa]		
					No faults detected on barometric pressure sensor	AAP_AmbientAirPresDfltd ==FALSE AAP_AmbPresSnsrTFTKO ==FALSE		
					Throttle valve position	> 85.00 [%]		
					No faults detected on Throttle valve position sensor	TPS_PstnSnsrFA ==FALSE		
					LP EGR (if present) valve position	<=1.00 [%]		
					No faults detected on LP EGR (if present) valve position sensor	LPE_PstnSnsrFA ==FALSE		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Engine speed in range OR (Speed Control Mode is Idle AND No faults detected on Speed Control) (OBDII market only) for a time Intake manifold pressure in range Intake manifold pressure is in steady state (SS) Once all the conditions above are satisfied, additional conditions on HP EGR valve must be verified within a time limit HP EGR valve position No faults detected on HP EGR valve position sensor All conditions are verified for a time	> 600.00 [rpm] < 800.00 [rpm] ==TRUE IAC_SystemRPM_FA ==FALSE >= 10.00[s] > 75.00 [kPa] < 110.00 [kPa] when SS is OFF, the first value of Intake manifold pressure is taken as reference (p_ref); then, | Intake manifold pressure - p_ref| < 10.00 [kPa] for maintaining the SS ON < 0.25 [s] <=1.00 [%] EGR_PstnSnsrFA ==FALSE		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
						> 0.50 [s]		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Mass Air Flow (MAF) Sensor Circuit Low	P0102	This monitor checks if the MAF sensor is out of electrical range low. The MAF sensor is out of electrical range low in case of sensor internal fault or wiring harness faults.	MAF frequency value	<276.00 [Hz]	Test enabled by calibration	1.00==TRUE	300.00 fail counts out of 375.00 sample counts	Type A, 1 Trips
					Engine speed	>= 50.00 [rpm]		
					PT relay supply voltage in range	> 11.00 [V]	Function task: 100 ms	
					Share High Side Driver closed	==TRUE		
					All conditions are valid for a time	>=0.30 [s]		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Mass Air Flow (MAF) Sensor Circuit High	P0103	This monitor checks if the MAF sensor is out of electrical range high. The MAF sensor is out of electrical range high in case of sensor internal fault or wiring harness faults.	MAF frequency value	>14,400.00 [Hz]	Test enabled by calibration	1.00==TRUE	300.00 fail counts out of 375.00 sample counts	Type A, 1 Trips
					Engine speed	>= 50.00 [rpm]		
					PT relay supply voltage in range	> 11.00 [V]	Function task:100 ms	
					Share High Side Driver closed	==TRUE		
					All conditions arevalid for a time	>=0.30 [s]		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Fuel Trim System Lean Bank 1	P0171	This DTC monitors if FSA control system has reached its maximum authority and cannot achieve the target. An error shall be detected when the fuel adjustment value (mm3) released by FSA is saturatedat its minimum value.	Released FSA fuel correction value	< refer to supporting table (**KtFADC_V_FSA_Fuel Min**) [mm3]	System voltage in range FSA correction release enabled (FSA Learning is active OR DFSA Learning is active) for a time Ambient air pressure OBD Coolant Enable Criteria OR Engine coolant temperature Ambient air temperature No Low fuel tank level indication No pending or confirmed DTCs	> 11.00 [V] refer to "FSA Control Flag" Free Form FAD_FSA_NormRngCrtn Valid refer to "FSA Control Flag" Free Form (FAD_FSA_EnblLrn OR FAD_DFSA_EnblLrn) > 1.40[s] > 75.00 [kPa] = TRUE > 45.00 [°C] > -6.70 [°C] LowFuelConditionDiagnostic AmbPresDfltdStatus (ECT_Sensor_TFTKO AND ECT_Sensor_FA) OAT_PtEstFiltFA	Time counter: 280 failures out of 400 samples. Time task 25[ms]	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Fuel Trim System Rich Bank 1	P0172	This DTC monitors if FSA control system has reached its maximum authority and cannot achieve the target. An error shall be detected when the fuel adjustment value (mm3) released by FSA is saturatedat its maximum value.	Released FSA fuel correction value	> refer to supporting table (**KtFADC_V_FSA_Fuel Max**)[mm3]	System voltage in range FSA correction release enabled (FSA Learning is active OR DFSA Learning is active) for a time Ambient air pressure OBD Coolant Enable Criteria OR Engine coolant temperature Ambient air temperature No Low fuel tank level indication No pending or confirmed DTCs	> 11.00 [V] refer to "FSA Control Flag" Free Form FAD_FSA_NormRngCrtn Valid refer to "FSA Control Flag" Free Form (FAD_FSA_EnblLrn OR FAD_DFSA_EnblLrn) > 1.40[s] > 75.00 [kPa] = TRUE > 45.00 [°C] > -6.70 [°C] LowFuelConditionDiagnostic AmbPresDfltdStatus (ECT_Sensor_TFTKO AND ECT_Sensor_FA) OAT_PtEstFiltFA	Time counter: 280 failures out of 400 samples. Time task 25[ms]	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Cylinder 1 Injection Timing Perfomance - Over Retarded	P01CB	This diagnosis is able to detect an excessive negative drift on fuel injection quantity and timing affecting injector 1. During Diesel Fuel Cut-off conditions SQA command the injection of a known quantity on one injector (e.g. 1,5mm^3) and checks, by means of crank-wheel sensor, the angular acceleration produced during the combustion phase. By comparing the angular acceleration value produced during the combustion phase with the angular acceleration that would be produced during the combustion of a nominal fuel quantity (e.g. 1,5mm3), the SQA is able to calculate the drift, in term of energizing time, on injector 1. Several injections, with different injection quantities, are performed in order to define the correct DeltaET to reach the target crank wheel angular acceleration and obtain the injector behavior in the small	Suspicious confidence level of tested injector (To fail suspicious), function of Current Energizing time calculated with SSQAand delta Energizing time calculated in the previous test: **KtFADD_Pct_SSQA_InjSuspConfLvl** (Delta Enegizing Time, Delta Energizing Time old) In case the first test fails: Delta Energizing time calculated with VSQA (To fail Validation)	<50.00 [%] >105.00 [us]	SQA Diagnosis enabled SSQA and VSQA enabled via calibration Baro Pressure Ambient temp No Low Fuel level tank indication AND Boolean Flag used to enable low fuel level check is TRUE XSQA Learning conditions enabled Power Take Off status NAND Boolean Flag used to disable SQA in case of power take off active Cylinder 1 Injection Timing Perfomance - Over Advanced not set	1.00 1.00 >=75.00 [kPa] >=-6.70 [°C] LowFuelConditionDiagnostic 1.00 FAD_XSQA_LrnCondEnbl = 0.00	Inj_To_PassFail_SSQA Number of injections in case sospicious pass or (if sospicious fails) Inj_To PassFail_SSQA +Inj_To_PassFail_VSQA number of injections to pass or fail validation Once per Trip if suspicious and validations (in case of sospicious injectors detected) have been already completed in the previous driving cycle, otherwise the diagnosis starts from the interrupted status. Sample Rate: [1 Sample every cylinder firing event].	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		quantity area. This energizing time is then used for the diagnostic test that is performed in two different steps: The first is the suspicious (SSQA) in which all the injectors are classified as suspicious or not suspicious. During this phase several injections are performed on all the injectors in order to calculate the drift, in term of energizing time, of each injector. The drift found is then used together with the drift found in the previous test to enter a calibrate-able map in which a confidence level between 0 and 100% is given to each injector. The confidence levels depends on the delta energizing time between two consecutive tests. An injector is considered suspicious if the confidence level is lower than a calibrate-able threshold. The suspicious phase can only report test pass for not suspicious injectors while the injectors that fail the						

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		suspicious are tested by means of VSQA (Validation Small Quantity Adjustment) in order to validate or not the fault. The validation starts from the most suspicious injector (using the distance of current DeltaET from the VSQA calibrate-able thresholds) found during Suspicious phase and performs a calibrate-able number of injections, generally higher than the number of injection performed during suspicious, in order to find out a more accurate drift value for the tested injector. If the Delta Energizing time calculated during this phase is higher than a calibrate-able threshold a DTC is set. If an excessive negative drift is detected (this diagnosis failed), the diagnosis on the same cylinder of a possible excessive positive drift is disabled (Cylinder 1 Injection Timing Performance - Over Advanced is disabled) and viceversa.						

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Cylinder 1 Injection Timing Perfomance - Over Advanced	P01CC	This diagnosis is able to detect an excessive positive drift on fuel injection quantity and timing affecting injector 1. During Diesel Fuel Cut-off conditions SQA command the injection of a known quantity on one injector (e.g. 1,5mm^3) and checks, by means of crank-wheel sensor, the angular acceleration produced during the combustion phase. By comparing the angular acceleration value produced during the combustion phase with the angular acceleration that would be produced during the combustion of a nominal fuel quantity (e.g. 1,5mm3), the SQA is able to calculate the drift, in term of energizing time, on injector 1. Several injections, with different injection quantities, are performed in order to define the correct DeltaET to reach the target crank wheel angular acceleration and obtain the injector behavior in the small	Suspicious confidence level of tested injector (To fail suspicious), function of Current Energizing time calculated with SSQAand delta Energizing time calculated in the previous test: **KtFADD_Pct_SSQA_InjSuspConfLvl** (Delta Enegizing Time, Delta Energizing Time old) In case the first test fails: Delta Energizing time calculated with VSQA (To fail Validation)	<50.00 [%] < -105.00 [us]	SQA Diagnosis enabled SSQA and VSQA enabled via calibration Baro Pressure Ambient temp No Low Fuel level tank indication AND Boolean Flag used to enable low fuel level check is TRUE XSQA Learning conditions enabled Power Take Off status NAND Boolean Flag used to disable SQA in case of power take off active Cylinder 1 Injection Timing Perfomance - Over Retarded not set	1.00 1.00 >=75.00 [kPa] >=-6.70 [°C] LowFuelConditionDiagnostic 1.00 FAD_XSQA_LrnCondEnbl = 0.00	Inj_To_PassFail_SSQA Number of injections in case sospicious pass or (if sospicious fails) Inj_To PassFail_SSQA +Inj_To_PassFail_VSQA number of injections to pass or fail validation Once per Trip if suspicious and validations (in case of sospicious injectors detected) have been already completed in the previous driving cycle, otherwise the diagnosis starts from the interrupted status. Sample Rate: [1 Sample every cylinder firing event].	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		quantity area. This energizing time is then used for the diagnostic test that is performed in two different steps: The first is the suspicious (SSQA) in which all the injectors are classified as suspicious or not suspicious. During this phase several injections are performed on all the injectors in order to calculate the drift, in term of energizing time, of each injector. The drift found is then used together with the drift found in the previous test to enter a calibrate-able map in which a confidence level between 0 and 100% is given to each injector. The confidence levels depends on the delta energizing time between two consecutive tests. An injector is considered suspicious if the confidence level is lower than a calibrate-able threshold. The suspicious phase can only report test pass for not suspicious injectors while the injectors that fail the						

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		suspicious are tested by means of VSQA (Validation Small Quantity Adjustment) in order to validate or not the fault. The validation starts from the most suspicious injector (using the distance of current DeltaET from the VSQA calibrate-able thresholds) found during Suspicious phase and performs a calibrate-able number of injections, generally higher than the number of injection performed during suspicious, in order to find out a more accurate drift value for the tested injector. If the Delta Energizing time calculated during this phase is lower than a calibrate-able threshold a DTC is set. If an excessive positive drift is detected (this diagnosis failed), the diagnosis on the same cylinder of a possible excessive negative drift is disabled (Cylinder 1 Injection Timing Performance - Over Retarded is disabled) and viceversa.						

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Cylinder 2 Injection Timing Perfomance - Over Retarded	P01CD	This diagnosis is able to detect an excessive negative drift on fuel injection quantity and timing affecting injector 2. During Diesel Fuel Cut-off conditions SQA command the injection of a known quantity on one injector (e.g. 1,5mm^3) and checks, by means of crank-wheel sensor, the angular acceleration produced during the combustion phase. By comparing the angular acceleration value produced during the combustion phase with the angular acceleration that would be produced during the combustion of a nominal fuel quantity (e.g. 1,5mm3), the SQA is able to calculate the drift, in term of energizing time, on injector 2. Several injections, with different injection quantities, are performed in order to define the correct DeltaET to reach the target crank wheel angular acceleration and obtain the injector behavior in the small	Suspicious confidence level of tested injector (To fail suspicious), function of Current Energizing time calculated with SSQAand delta Energizing time calculated in the previous test: **KtFADD_Pct_SSQA_InjSuspConfLvl** (Delta Enegizing Time, Delta Energizing Time old) In case the first test fails: Delta Energizing time calculated with VSQA (To fail Validation)	<50.00 [%] >105.00 [us]	SQA Diagnosis enabled SSQA and VSQA enabled via calibration Baro Pressure Ambient temp No Low Fuel level tank indication AND Boolean Flag used to enable low fuel level check is TRUE XSQA Learning conditions enabled Power Take Off status NAND Boolean Flag used to disable SQA in case of power take off active Cylinder 2 Injection Timing Perfomance - Over Advanced not set	1.00 1.00 >=75.00 [kPa] >=-6.70 [°C] LowFuelConditionDiagnostic 1.00 FAD_XSQA_LrnCondEnbl = 0.00	Inj_To_PassFail_SSQA Number of injections in case sospicious pass or (if sospicious fails) Inj_To PassFail_SSQA +Inj_To_PassFail_VSQA number of injections to pass or fail validation Once per Trip if suspicious and validations (in case of sospicious injectors detected) have been already completed in the previous driving cycle, otherwise the diagnosis starts from the interrupted status. Sample Rate: [1 Sample every cylinder firing event].	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		quantity area. This energizing time is then used for the diagnostic test that is performed in two different steps: The first is the suspicious (SSQA) in which all the injectors are classified as suspicious or not suspicious. During this phase several injections are performed on all the injectors in order to calculate the drift, in term of energizing time, of each injector. The drift found is then used together with the drift found in the previous test to enter a calibrate-able map in which a confidence level between 0 and 100% is given to each injector. The confidence levels depends on the delta energizing time between two consecutive tests. An injector is considered suspicious if the confidence level is lower than a calibrate-able threshold. The suspicious phase can only report test pass for not suspicious injectors while the injectors that fail the						

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		suspicious are tested by means of VSQA (Validation Small Quantity Adjustment) in order to validate or not the fault. The validation starts from the most suspicious injector (using the distance of current DeltaET from the VSQA calibrate-able thresholds) found during Suspicious phase and performs a calibrate-able number of injections, generally higher than the number of injection performed during suspicious, in order to find out a more accurate drift value for the tested injector. If the Delta Energizing time calculated during this phase is higher than a calibrate-able threshold a DTC is set. If an excessive negative drift is detected (this diagnosis failed), the diagnosis on the same cylinder of a possible excessive positive drift is disabled (Cylinder 2 Injection Timing Performance - Over Advanced is disabled) and viceversa.						

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Cylinder 2 Injection Timing Perfomance - Over Advanced	P01CE	This diagnosis is able to detect an excessive positive drift on fuel injection quantity and timing affecting injector 2. During Diesel Fuel Cut-off conditions SQA command the injection of a known quantity on one injector (e.g. 1,5mm^3) and checks, by means of crank-wheel sensor, the angular acceleration produced during the combustion phase. By comparing the angular acceleration value produced during the combustion phase with the angular acceleration that would be produced during the combustion of a nominal fuel quantity (e.g. 1,5mm3), the SQA is able to calculate the drift, in term of energizing time, on injector 2. Several injections, with different injection quantities, are performed in order to define the correct DeltaET to reach the target crank wheel angular acceleration and obtain the injector behavior in the small	Suspicious confidence level of tested injector (To fail suspicious), function of Current Energizing time calculated with SSQAand delta Energizing time calculated in the previous test: **KtFADD_Pct_SSQA_InjSuspConfLvl** (Delta Enegizing Time, Delta Energizing Time old) In case the first test fails: Delta Energizing time calculated with VSQA (To fail Validation)	<50.00 [%] < -105.00 [us]	SQA Diagnosis enabled SSQA and VSQA enabled via calibration Baro Pressure Ambient temp No Low Fuel level tank indication AND Boolean Flag used to enable low fuel level check is TRUE XSQA Learning conditions enabled Power Take Off status NAND Boolean Flag used to disable SQA in case of power take off active Cylinder 2 Injection Timing Perfomance - Over Retarded not set	1.00 1.00 >= 75.00 [kPa] >=-6.70 [°C] LowFuelConditionDiagnostic 1.00 FAD_XSQA_LrnCondEnbl = 0.00	Inj_To_PassFail_SSQA Number of injections in case sospicious pass or (if sospicious fails) Inj_To PassFail_SSQA +Inj_To_PassFail_VSQA number of injections to pass or fail validation. Once per Trip if suspicious and validations (in case of sospicious injectors detected) have been already completed in the previous driving cycle, otherwise the diagnosis starts from the interrupted status. Sample Rate: [1 Sample every cylinder firing event].	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		quantity area. This energizing time is then used for the diagnostic test that is performed in two different steps: The first is the suspicious (SSQA) in which all the injectors are classified as suspicious or not suspicious. During this phase several injections are performed on all the injectors in order to calculate the drift, in term of energizing time, of each injector. The drift found is then used together with the drift found in the previous test to enter a calibrate-able map in which a confidence level between 0 and 100% is given to each injector. The confidence levels depends on the delta energizing time between two consecutive tests. An injector is considered suspicious if the confidence level is lower than a calibrate-able threshold. The suspicious phase can only report test pass for not suspicious injectors while the injectors that fail the						

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		suspicious are tested by means of VSQA (Validation Small Quantity Adjustment) in order to validate or not the fault. The validation starts from the most suspicious injector (using the distance of current DeltaET from the VSQA calibrate-able thresholds) found during Suspicious phase and performs a calibrate-able number of injections, generally higher than the number of injection performed during suspicious, in order to find out a more accurate drift value for the tested injector. If the Delta Energizing time calculated during this phase is lowerthan a calibrate-able threshold a DTC is set. If an excessive positive drift is detected (this diagnosis failed), the diagnosis on the same cylinder of a possible excessive negative drift is disabled (Cylinder 2 Injection Timing Performance - Over Retarded is disabled) and viceversa.						

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Cylinder 3 Injection Timing Perfomance - Over Retarded	P01CF	This diagnosis is able to detect an excessive negative drift on fuel injection quantity and timing affecting injector 3. During Diesel Fuel Cut-off conditions SQA command the injection of a known quantity on one injector (e.g. 1,5mm^3) and checks, by means of crank-wheel sensor, the angular acceleration produced during the combustion phase. By comparing the angular acceleration value produced during the combustion phase with the angular acceleration that would be produced during the combustion of a nominal fuel quantity (e.g. 1,5mm3), the SQA is able to calculate the drift, in term of energizing time, on injector 3. Several injections, with different injection quantities, are performed in order to define the correct DeltaET to reach the target crank wheel angular acceleration and obtain the injector behavior in the small	Suspicious confidence level of tested injector (To fail suspicious), function of Current Energizing time calculated with SSQAand delta Energizing time calculated in the previous test: **KtFADD_Pct_SSQA_InjSuspConfLvl** (Delta Enegizing Time, Delta Energizing Time old) In case the first test fails: Delta Energizing time calculated by VSQA(To fail Validation)	<50.00 [%] >105.00 [us]	SQA Diagnosis enabled SSQA and VSQA enabled via calibration Baro Pressure Ambient temp No Low Fuel level tank indication AND Boolean Flag used to enable low fuel level check is TRUE XSQA Learning conditions enabled Power Take Off status NAND Boolean Flag used to disable SQA in case of power take off active Cylinder 3 Injection Timing Perfomance - Over Advanced not set	1.00 1.00 >= 75.00 [kPa] >= -6.70 [°C] LowFuelConditionDiagnostic 1.00 FAD_XSQA_LrnCondEnbl = 0.00	Inj_To_PassFail_SSQA Number of injections in case sospicious pass or (if sospicious fails) Inj_To PassFail_SSQA +Inj_To_PassFail_VSQA number of injections to pass or fail validation Once per Trip if suspicious and validations (in case of sospicious injectors detected) have been already completed in the previous driving cycle, otherwise the diagnosis starts from the interrupted status. Sample Rate: [1 Sample every cylinder firing event].	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		quantity area. This energizing time is then used for the diagnostic test that is performed in two different steps: The first is the suspicious (SSQA) in which all the injectors are classified as suspicious or not suspicious. During this phase several injections are performed on all the injectors in order to calculate the drift, in term of energizing time, of each injector. The drift found is then used together with the drift found in the previous test to enter a calibrate-able map in which a confidence level between 0 and 100% is given to each injector. The confidence levels depends on the delta energizing time between two consecutive tests. An injector is considered suspicious if the confidence level is lower than a calibrate-able threshold. The suspicious phase can only report test pass for not suspicious injectors while the injectors that fail the						

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		suspicious are tested by means of VSQA (Validation Small Quantity Adjustment) in order to validate or not the fault. The validation starts from the most suspicious injector (using the distance of current DeltaET from the VSQA calibrate-able thresholds) found during Suspicious phase and performs a calibrate-able number of injections, generally higher than the number of injection performed during suspicious, in order to find out a more accurate drift value for the tested injector. If the Delta Energizing time calculated during this phase is higher than a calibrate-able threshold a DTC is set. If an excessive negative drift is detected (this diagnosis failed), the diagnosis on the same cylinder of a possible excessive positive drift is disabled (Cylinder 3 Injection Timing Performance - Over Advanced is disabled) and viceversa.						

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Cylinder 3 Injection Timing Perfomance - Over Advanced	P01D0	This diagnosis is able to detect an excessive positive drift on fuel injection quantity and timing affecting injector 3. During Diesel Fuel Cut-off conditions SQA command the injection of a known quantity on one injector (e.g. 1,5mm^3) and checks, by means of crank-wheel sensor, the angular acceleration produced during the combustion phase. By comparing the angular acceleration value produced during the combustion phase with the angular acceleration that would be produced during the combustion of a nominal fuel quantity (e.g. 1,5mm3), the SQA is able to calculate the drift, in term of energizing time, on injector 3. Several injections, with different injection quantities, are performed in order to define the correct DeltaET to reach the target crank wheel angular acceleration and obtain the injector behavior in the small	Suspicious confidence level of tested injector (To fail suspicious), function of Current Energizing time calculated with SSQAand delta Energizing time calculated in the previous test: **KtFADD_Pct_SSQA_InjSuspConfLvl** (Delta Enegizing Time, Delta Energizing Time old) In case the first test fails: Delta Energizing time calculated by VSQA(To fail Validation)	<50.00 [%] < -105.00 [us]	SQA Diagnosis enabled SSQA and VSQA enabled via calibration Baro Pressure Ambient temp No Low Fuel level tank indication AND Boolean Flag used to enable low fuel level check is TRUE XSQA Learning conditions enabled Power Take Off status NAND Boolean Flag used to disable SQA in case of power take off active Cylinder 3 Injection Timing Perfomance - Over Retarded not set	1.00 1.00 >= 75.00 [kPa] >=-6.70 [°C] LowFuelConditionDiagnostic 1.00 FAD_XSQA_LrnCondEnbl = 0.00	Inj_To_PassFail_SSQA Number of injections in case sospicious pass or (if sospicious fails) Inj_To PassFail_SSQA +Inj_To_PassFail_VSQA number of injections to pass or fail validation. Once per Trip if suspicious and validations (in case of sospicious injectors detected) have been already completed in the previous driving cycle, otherwise the diagnosis starts from the interrupted status. Sample Rate: [1 Sample every cylinder firing event].	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		quantity area. This energizing time is then used for the diagnostic test that is performed in two different steps: The first is the suspicious (SSQA) in which all the injectors are classified as suspicious or not suspicious. During this phase several injections are performed on all the injectors in order to calculate the drift, in term of energizing time, of each injector. The drift found is then used together with the drift found in the previous test to enter a calibrate-able map in which a confidence level between 0 and 100% is given to each injector. The confidence levels depends on the delta energizing time between two consecutive tests. An injector is considered suspicious if the confidence level is lower than a calibrate-able threshold. The suspicious phase can only report test pass for not suspicious injectors while the injectors that fail the						

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		suspicious are tested by means of VSQA (Validation Small Quantity Adjustment) in order to validate or not the fault. The validation starts from the most suspicious injector (using the distance of current DeltaET from the VSQA calibrate-able thresholds) found during Suspicious phase and performs a calibrate-able number of injections, generally higher than the number of injection performed during suspicious, in order to find out a more accurate drift value for the tested injector. If the Delta Energizing time calculated during this phase is lowerthan a calibrate-able threshold a DTC is set. If an excessive positive drift is detected (this diagnosis failed), the diagnosis on the same cylinder of a possible excessive negative drift is disabled (Cylinder 3 Injection Timing Performance - Over Retarded is disabled) and viceversa.						

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Cylinder 4 Injection Timing Perfomance - Over Retarded	P01D1	This diagnosis is able to detect an excessive negative drift on fuel injection quantity and timing affecting injector 4. During Diesel Fuel Cut-off conditions SQA command the injection of a known quantity on one injector (e.g. 1,5mm^3) and checks, by means of crank-wheel sensor, the angular acceleration produced during the combustion phase. By comparing the angular acceleration value produced during the combustion phase with the angular acceleration that would be produced during the combustion of a nominal fuel quantity (e.g. 1,5mm3), the SQA is able to calculate the drift, in term of energizing time, on injector 4. Several injections, with different injection quantities, are performed in order to define the correct DeltaET to reach the target crank wheel angular acceleration and obtain the injector behavior in the small	Suspicious confidence level of tested injector (To fail suspicious), function of Current Energizing time calculated with SSQAand delta Energizing time calculated in the previous test: **KtFADD_Pct_SSQA_InjSuspConfLvl** (Delta Enegizing Time, Delta Energizing Time old) In case the first test fails: Delta Energizing time calculated by VSQA(To fail Validation)	<50.00 [%] >105.00 [us]	SQA Diagnosis enabled SSQA and VSQA enabled via calibration Baro Pressure Ambient temp No Low Fuel level tank indication AND Boolean Flag used to enable low fuel level check is TRUE XSQA Learning conditions enabled Power Take Off status NAND Boolean Flag used to disable SQA in case of power take off active Cylinder 4 Injection Timing Perfomance - Over Advanced not set	1.00 1.00 >=75.00 [kPa] >=-6.70 [°C] LowFuelConditionDiagnostic 1.00 FAD_XSQA_LrnCondEnbl = 0.00	Inj_To_PassFail_SSQA Number of injections in case sospicious pass or (if sospicious fails) Inj_To PassFail_SSQA +Inj_To_PassFail_VSQA number of injections to pass or fail validation Once per Trip if suspicious and validations (in case of sospicious injectors detected) have been already completed in the previous driving cycle, otherwise the diagnosis starts from the interrupted status. Sample Rate: [1 Sample every cylinder firing event].	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		quantity area. This energizing time is then used for the diagnostic test that is performed in two different steps: The first is the suspicious (SSQA) in which all the injectors are classified as suspicious or not suspicious. During this phase several injections are performed on all the injectors in order to calculate the drift, in term of energizing time, of each injector. The drift found is then used together with the drift found in the previous test to enter a calibrate-able map in which a confidence level between 0 and 100% is given to each injector. The confidence levels depends on the delta energizing time between two consecutive tests. An injector is considered suspicious if the confidence level is lower than a calibrate-able threshold. The suspicious phase can only report test pass for not suspicious injectors while the injectors that fail the						

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		suspicious are tested by means of VSQA (Validation Small Quantity Adjustment) in order to validate or not the fault. The validation starts from the most suspicious injector (using the distance of current DeltaET from the VSQA calibrate-able thresholds) found during Suspicious phase and performs a calibrate-able number of injections, generally higher than the number of injection performed during suspicious, in order to find out a more accurate drift value for the tested injector. If the Delta Energizing time calculated during this phase is higher than a calibrate-able threshold a DTC is set. If an excessive negative drift is detected (this diagnosis failed), the diagnosis on the same cylinder of a possible excessive positive drift is disabled (Cylinder 4 Injection Timing Perfomance - Over Advanced is disabled) and viceversa.						

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Cylinder 4 Injection Timing Perfomance - Over Advanced	P01D2	This diagnosis is able to detect an excessive positive drift on fuel injection quantity and timing affecting injector 4. During Diesel Fuel Cut-off conditions SQA command the injection of a known quantity on one injector (e.g. 1,5mm^3) and checks, by means of crank-wheel sensor, the angular acceleration produced during the combustion phase. By comparing the angular acceleration value produced during the combustion phase with the angular acceleration that would be produced during the combustion of a nominal fuel quantity (e.g. 1,5mm3), the SQA is able to calculate the drift, in term of energizing time, on injector 4. Several injections, with different injection quantities, are performed in order to define the correct DeltaET to reach the target crank wheel angular acceleration and obtain the injector behavior in the small	Suspicious confidence level of tested injector (To fail suspicious), function of Current Energizing time calculated with SSQAand delta Energizing time calculated in the previous test: **KtFADD_Pct_SSQA_InjSuspConfLvl** (Delta Enegizing Time, Delta Energizing Time old) In case the first test fails: Delta Energizing time calculated by VSQA(To fail Validation)	<50.00 [%] < -105.00 [us]	SQA Diagnosis enabled SSQA and VSQA enabled via calibration Baro Pressure Ambient temp No Low Fuel level tank indication AND Boolean Flag used to enable low fuel level check is TRUE XSQA Learning conditions enabled Power Take Off status NAND Boolean Flag used to disable SQA in case of power take off active Cylinder 4 Injection Timing Perfomance - Over Retarded not set	1.00 1.00 >=75.00 [kPa] >=-6.70 [°C] LowFuelConditionDiagnostic 1.00 FAD_XSQA_LrnCondEnbl = 0.00	Inj_To_PassFail_SSQA Number of injections in case sospicious pass or (if sospicious fails) Inj_To PassFail_SSQA +Inj_To_PassFail_VSQA number of injections to pass or fail validation. Once per Trip if suspicious and validations (in case of sospicious injectors detected) have been already completed in the previous driving cycle, otherwise the diagnosis starts from the interrupted status. Sample Rate: [1 Sample every cylinder firing event].	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		quantity area. This energizing time is then used for the diagnostic test that is performed in two different steps: The first is the suspicious (SSQA) in which all the injectors are classified as suspicious or not suspicious. During this phase several injections are performed on all the injectors in order to calculate the drift, in term of energizing time, of each injector. The drift found is then used together with the drift found in the previous test to enter a calibrate-able map in which a confidence level between 0 and 100% is given to each injector. The confidence levels depends on the delta energizing time between two consecutive tests. An injector is considered suspicious if the confidence level is lower than a calibrate-able threshold. The suspicious phase can only report test pass for not suspicious injectors while the injectors that fail the						

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		suspicious are tested by means of VSQA (Validation Small Quantity Adjustment) in order to validate or not the fault. The validation starts from the most suspicious injector (using the distance of current DeltaET from the VSQA calibrate-able thresholds) found during Suspicious phase and performs a calibrate-able number of injections, generally higher than the number of injection performed during suspicious, in order to find out a more accurate drift value for the tested injector. If the Delta Energizing time calculated during this phase is lowerthan a calibrate-able threshold a DTC is set. If an excessive positive drift is detected (this diagnosis failed), the diagnosis on the same cylinder of a possible excessive negative drift is disabled (Cylinder 4 Injection Timing Perfomance - Over Retarded is disabled) and viceversa.						

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Cylinder 5 Injection Timing Perfomance - Over Retarded	P01D3	This diagnosis is able to detect an excessive negative drift on fuel injection quantity and timing affecting injector 5. During Diesel Fuel Cut-off conditions SQA command the injection of a known quantity on one injector (e.g. 1,5mm^3) and checks, by means of crank-wheel sensor, the angular acceleration produced during the combustion phase. By comparing the angular acceleration value produced during the combustion phase with the angular acceleration that would be produced during the combustion of a nominal fuel quantity (e.g. 1,5mm3), the SQA is able to calculate the drift, in term of energizing time, on injector 5. Several injections, with different injection quantities, are performed in order to define the correct DeltaET to reach the target crank wheel angular acceleration and obtain the injector behavior in the small	Suspicious confidence level of tested injector (To fail suspicious), function of Current Energizing time calculated with SSQAand delta Energizing time calculated in the previous test: **KtFADD_Pct_SSQA_InjSuspConfLvl** (Delta Enegizing Time, Delta Energizing Time old) In case the first test fails: Delta Energizing time calculated by VSQA(To fail Validation)	<50.00 [%] >105.00 [us]	SQA Diagnosis enabled SSQA and VSQA enabled via calibration Baro Pressure Ambient temp No Low Fuel level tank indication AND Boolean Flag used to enable low fuel level check is TRUE XSQA Learning conditions enabled Power Take Off not active NAND Boolean Flag used to disable SQA in case of power take off active Cylinder 5 Injection Timing Perfomance - Over Advanced not set	1.00 1.00 >=75.00 [kPa] >=-6.70 [°C] LowFuelConditionDiagnostic 1.00 FAD_XSQA_LrnCondEnbl = 0.00	Inj_To_PassFail_SSQA Number of injections in case sospicious pass or (if sospicious fails) Inj_To PassFail_SSQA +Inj_To_PassFail_VSQA number of injections to pass or fail validation Once per Trip if suspicious and validations (in case of sospicious injectors detected) have been already completed in the previous driving cycle, otherwise the diagnosis starts from the interrupted status. Sample Rate: [1 Sample every cylinder firing event].	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		quantity area. This energizing time is then used for the diagnostic test that is performed in two different steps: The first is the suspicious (SSQA) in which all the injectors are classified as suspicious or not suspicious. During this phase several injections are performed on all the injectors in order to calculate the drift, in term of energizing time, of each injector. The drift found is then used together with the drift found in the previous test to enter a calibrate-able map in which a confidence level between 0 and 100% is given to each injector. The confidence levels depends on the delta energizing time between two consecutive tests. An injector is considered suspicious if the confidence level is lower than a calibrate-able threshold. The suspicious phase can only report test pass for not suspicious injectors while the injectors that fail the						

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		suspicious are tested by means of VSQA (Validation Small Quantity Adjustment) in order to validate or not the fault. The validation starts from the most suspicious injector (using the distance of current DeltaET from the VSQA calibrate-able thresholds) found during Suspicious phase and performs a calibrate-able number of injections, generally higher than the number of injection performed during suspicious, in order to find out a more accurate drift value for the tested injector. If the Delta Energizing time calculated during this phase is higher than a calibrate-able threshold a DTC is set. If an excessive negative drift is detected (this diagnosis failed), the diagnosis on the same cylinder of a possible excessive positive drift is disabled (Cylinder 5 Injection Timing Performance - Over Advanced is disabled) and viceversa.						

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Cylinder 5 Injection Timing Perfomance - Over Advanced	P01D4	This diagnosis is able to detect an excessive positive drift on fuel injection quantity and timing affecting injector 5. During Diesel Fuel Cut-off conditions SQA command the injection of a known quantity on one injector (e.g. 1,5mm^3) and checks, by means of crank-wheel sensor, the angular acceleration produced during the combustion phase. By comparing the angular acceleration value produced during the combustion phase with the angular acceleration that would be produced during the combustion of a nominal fuel quantity (e.g. 1,5mm3), the SQA is able to calculate the drift, in term of energizing time, on injector 5. Several injections, with different injection quantities, are performed in order to define the correct DeltaET to reach the target crank wheel angular acceleration and obtain the injector behavior in the small	Suspicious confidence level of tested injector (To fail suspicious), function of Current Energizing time calculated with SSQAand delta Energizing time calculated in the previous test: **KtFADD_Pct_SSQA_InjSuspConfLvl** (Delta Enegizing Time, Delta Energizing Time old) In case the first test fails: Delta Energizing time calculated by VSQA(To fail Validation)	<50.00 [%] < -105.00 [us]	SQA Diagnosis enabled SSQA and VSQA enabled via calibration Baro Pressure Ambient temp No Low Fuel level tank indication AND Boolean Flag used to enable low fuel level check is TRUE XSQA Learning conditions enabled Power Take Off status NAND Boolean Flag used to disable SQA in case of power take off active Cylinder 5 Injection Timing Perfomance - Over Retarded not set	1.00 1.00 >=75.00 [kPa] >=-6.70 [°C] LowFuelConditionDiagnostic 1.00 FAD_XSQA_LrnCondEnbl = 0.00	Inj_To_PassFail_SSQA Number of injections in case sospicious pass or (if sospicious fails) Inj_To PassFail_SSQA +Inj_To_PassFail_VSQA number of injections to pass or fail validation. Once per Trip if suspicious and validations (in case of sospicious injectors detected) have been already completed in the previous driving cycle, otherwise the diagnosis starts from the interrupted status. Sample Rate: [1 Sample every cylinder firing event].	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		quantity area. This energizing time is then used for the diagnostic test that is performed in two different steps: The first is the suspicious (SSQA) in which all the injectors are classified as suspicious or not suspicious. During this phase several injections are performed on all the injectors in order to calculate the drift, in term of energizing time, of each injector. The drift found is then used together with the drift found in the previous test to enter a calibrate-able map in which a confidence level between 0 and 100% is given to each injector. The confidence levels depends on the delta energizing time between two consecutive tests. An injector is considered suspicious if the confidence level is lower than a calibrate-able threshold. The suspicious phase can only report test pass for not suspicious injectors while the injectors that fail the						

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		suspicious are tested by means of VSQA (Validation Small Quantity Adjustment) in order to validate or not the fault. The validation starts from the most suspicious injector (using the distance of current DeltaET from the VSQA calibrate-able thresholds) found during Suspicious phase and performs a calibrate-able number of injections, generally higher than the number of injection performed during suspicious, in order to find out a more accurate drift value for the tested injector. If the Delta Energizing time calculated during this phase is lowerthan a calibrate-able threshold a DTC is set. If an excessive positive drift is detected (this diagnosis failed), the diagnosis on the same cylinder of a possible excessive negative drift is disabled (Cylinder 5 Injection Timing Performance - Over Retarded is disabled) and viceversa.						

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Cylinder 6 Injection Timing Perfomance - Over Retarded	P01D5	This diagnosis is able to detect an excessive negative drift on fuel injection quantity and timing affecting injector 6. During Diesel Fuel Cut-off conditions SQA command the injection of a known quantity on one injector (e.g. 1,5mm^3) and checks, by means of crank-wheel sensor, the angular acceleration produced during the combustion phase. By comparing the angular acceleration value produced during the combustion phase with the angular acceleration that would be produced during the combustion of a nominal fuel quantity (e.g. 1,5mm3), the SQA is able to calculate the drift, in term of energizing time, on injector 6. Several injections, with different injection quantities, are performed in order to define the correct DeltaET to reach the target crank wheel angular acceleration and obtain the injector behavior in the small	Suspicious confidence level of tested injector (To fail suspicious), function of Current Energizing time calculated with SSQAand delta Energizing time calculated in the previous test: **KtFADD_Pct_SSQA_InjSuspConfLvl** (Delta Enegizing Time, Delta Energizing Time old) In case the first test fails: Delta Energizing time calculated by VSQA(To fail Validation)	<50.00 [%] >105.00 [us]	SQA Diagnosis enabled SSQA and VSQA enabled via calibration Baro Pressure Ambient temp No Low Fuel level tank indication AND Boolean Flag used to enable low fuel level check is TRUE XSQA Learning conditions enabled Power Take Off status NAND Boolean Flag used to disable SQA in case of power take off active Cylinder 6 Injection Timing Perfomance - Over Advanced not set	1.00 1.00 >=75.00 [kPa] >=-6.70 [°C] LowFuelConditionDiagnostic 1.00 FAD_XSQA_LrnCondEnbl = 0.00	Inj_To_PassFail_SSQA Number of injections in case sospicious pass or (if sospicious fails) Inj_To PassFail_SSQA +Inj_To_PassFail_VSQA number of injections to pass or fail validation Once per Trip if suspicious and validations (in case of sospicious injectors detected) have been already completed in the previous driving cycle, otherwise the diagnosis starts from the interrupted status. Sample Rate: [1 Sample every cylinder firing event].	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		quantity area. This energizing time is then used for the diagnostic test that is performed in two different steps: The first is the suspicious (SSQA) in which all the injectors are classified as suspicious or not suspicious. During this phase several injections are performed on all the injectors in order to calculate the drift, in term of energizing time, of each injector. The drift found is then used together with the drift found in the previous test to enter a calibrate-able map in which a confidence level between 0 and 100% is given to each injector. The confidence levels depends on the delta energizing time between two consecutive tests. An injector is considered suspicious if the confidence level is lower than a calibrate-able threshold. The suspicious phase can only report test pass for not suspicious injectors while the injectors that fail the						

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		suspicious are tested by means of VSQA (Validation Small Quantity Adjustment) in order to validate or not the fault. The validation starts from the most suspicious injector (using the distance of current DeltaET from the VSQA calibrate-able thresholds) found during Suspicious phase and performs a calibrate-able number of injections, generally higher than the number of injection performed during suspicious, in order to find out a more accurate drift value for the tested injector. If the Delta Energizing time calculated during this phase is higher than a calibrate-able threshold a DTC is set. If an excessive negative drift is detected (this diagnosis failed), the diagnosis on the same cylinder of a possible excessive positive drift is disabled (Cylinder 6 Injection Timing Performance - Over Advanced is disabled) and viceversa.						

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Cylinder 6 Injection Timing Perfomance - Over Advanced	P01D6	This diagnosis is able to detect an excessive positive drift on fuel injection quantity and timing affecting injector 6. During Diesel Fuel Cut-off conditions SQA command the injection of a known quantity on one injector (e.g. 1,5mm^3) and checks, by means of crank-wheel sensor, the angular acceleration produced during the combustion phase. By comparing the angular acceleration value produced during the combustion phase with the angular acceleration that would be produced during the combustion of a nominal fuel quantity (e.g. 1,5mm3), the SQA is able to calculate the drift, in term of energizing time, on injector 6. Several injections, with different injection quantities, are performed in order to define the correct DeltaET to reach the target crank wheel angular acceleration and obtain the injector behavior in the small	Suspicious confidence level of tested injector (To fail suspicious), function of Current Energizing time calculated with SSQAand delta Energizing time calculated in the previous test: **KtFADD_Pct_SSQA_InjSuspConfLvl** (Delta Enegizing Time, Delta Energizing Time old) In case the first test fails: Delta Energizing time calculated by VSQA(To fail Validation)	<50.00 [%] < -105.00 [us]	SQA Diagnosis enabled SSQA and VSQA enabled via calibration Baro Pressure Ambient temp No Low Fuel level tank indication AND Boolean Flag used to enable low fuel level check is TRUE XSQA Learning conditions enabled Power Take Off status NAND Boolean Flag used to disable SQA in case of power take off active Cylinder 6 Injection Timing Perfomance - Over Retarded not set	1.00 1.00 >=75.00 [kPa] >=-6.70 [°C] LowFuelConditionDiagnostic 1.00 FAD_XSQA_LrnCondEnbl = 0.00	Inj_To_PassFail_SSQA Number of injections in case sospicious pass or (if sospicious fails) Inj_To_PassFail_SSQA +Inj_To_PassFail_VSQA number of injections to pass or fail validation. Once per Trip if suspicious and validations (in case of sospicious injectors detected) have been already completed in the previous driving cycle, otherwise the diagnosis starts from the interrupted status. Sample Rate: [1 Sample every cylinder firing event].	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		quantity area. This energizing time is then used for the diagnostic test that is performed in two different steps: The first is the suspicious (SSQA) in which all the injectors are classified as suspicious or not suspicious. During this phase several injections are performed on all the injectors in order to calculate the drift, in term of energizing time, of each injector. The drift found is then used together with the drift found in the previous test to enter a calibrate-able map in which a confidence level between 0 and 100% is given to each injector. The confidence levels depends on the delta energizing time between two consecutive tests. An injector is considered suspicious if the confidence level is lower than a calibrate-able threshold. The suspicious phase can only report test pass for not suspicious injectors while the injectors that fail the						

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		suspicious are tested by means of VSQA (Validation Small Quantity Adjustment) in order to validate or not the fault. The validation starts from the most suspicious injector (using the distance of current DeltaET from the VSQA calibrate-able thresholds) found during Suspicious phase and performs a calibrate-able number of injections, generally higher than the number of injection performed during suspicious, in order to find out a more accurate drift value for the tested injector. If the Delta Energizing time calculated during this phase is lowerthan a calibrate-able threshold a DTC is set. If an excessive positive drift is detected (this diagnosis failed), the diagnosis on the same cylinder of a possible excessive negative drift is disabled (Cylinder 6 Injection Timing Performance - Over Retarded is disabled) and viceversa.						

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Cylinder 7 Injection Timing Perfomance - Over Retarded	P01D7	This diagnosis is able to detect an excessive negative drift on fuel injection quantity and timing affecting injector 7. During Diesel Fuel Cut-off conditions SQA command the injection of a known quantity on one injector (e.g. 1,5mm^3) and checks, by means of crank-wheel sensor, the angular acceleration produced during the combustion phase. By comparing the angular acceleration value produced during the combustion phase with the angular acceleration that would be produced during the combustion of a nominal fuel quantity (e.g. 1,5mm3), the SQA is able to calculate the drift, in term of energizing time, on injector 7. Several injections, with different injection quantities, are performed in order to define the correct DeltaET to reach the target crank wheel angular acceleration and obtain the injector behavior in the small	Suspicious confidence level of tested injector (To fail suspicious), function of Current Energizing time calculated with SSQAand delta Energizing time calculated in the previous test: **KtFADD_Pct_SSQA_InjSuspConfLvl** (Delta Enegizing Time, Delta Energizing Time old) In case the first test fails: Delta Energizing time calculated by VSQA(To fail Validation)	<50.00 [%] >105.00 [us]	SQA Diagnosis enabled SSQA and VSQA enabled via calibration Baro Pressure Ambient temp No Low Fuel level tank indication AND Boolean Flag used to enable low fuel level check is TRUE XSQA Learning conditions enabled Power Take Off status NAND Boolean Flag used to disable SQA in case of power take off active Cylinder 7 Injection Timing Perfomance - Over Advanced not set	1.00 1.00 >=75.00 [kPa] >=-6.70 [°C] LowFuelConditionDiagnostic 1.00 FAD_XSQA_LrnCondEnbl = 0.00	Inj_To_PassFail_SSQA Number of injections in case sospicious pass or (if sospicious fails) Inj_To PassFail_SSQA +Inj_To_PassFail_VSQA number of injections to pass or fail validation Once per Trip if suspicious and validations (in case of sospicious injectors detected) have been already completed in the previous driving cycle, otherwise the diagnosis starts from the interrupted status. Sample Rate: [1 Sample every cylinder firing event].	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		quantity area. This energizing time is then used for the diagnostic test that is performed in two different steps: The first is the suspicious (SSQA) in which all the injectors are classified as suspicious or not suspicious. During this phase several injections are performed on all the injectors in order to calculate the drift, in term of energizing time, of each injector. The drift found is then used together with the drift found in the previous test to enter a calibrate-able map in which a confidence level between 0 and 100% is given to each injector. The confidence levels depends on the delta energizing time between two consecutive tests. An injector is considered suspicious if the confidence level is lower than a calibrate-able threshold. The suspicious phase can only report test pass for not suspicious injectors while the injectors that fail the						

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		suspicious are tested by means of VSQA (Validation Small Quantity Adjustment) in order to validate or not the fault. The validation starts from the most suspicious injector (using the distance of current DeltaET from the VSQA calibrate-able thresholds) found during Suspicious phase and performs a calibrate-able number of injections, generally higher than the number of injection performed during suspicious, in order to find out a more accurate drift value for the tested injector. If the Delta Energizing time calculated during this phase is higher than a calibrate-able threshold a DTC is set. If an excessive negative drift is detected (this diagnosis failed), the diagnosis on the same cylinder of a possible excessive positive drift is disabled (Cylinder 7 Injection Timing Performance - Over Advanced is disabled) and viceversa.						

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Cylinder 7 Injection Timing Perfomance - Over Advanced	P01D8	This diagnosis is able to detect an excessive positive drift on fuel injection quantity and timing affecting injector 7. During Diesel Fuel Cut-off conditions SQA command the injection of a known quantity on one injector (e.g. 1,5mm^3) and checks, by means of crank-wheel sensor, the angular acceleration produced during the combustion phase. By comparing the angular acceleration value produced during the combustion phase with the angular acceleration that would be produced during the combustion of a nominal fuel quantity (e.g. 1,5mm3), the SQA is able to calculate the drift, in term of energizing time, on injector 7. Several injections, with different injection quantities, are performed in order to define the correct DeltaET to reach the target crank wheel angular acceleration and obtain the injector behavior in the small	Suspicious confidence level of tested injector (To fail suspicious), function of Current Energizing time calculated with SSQAand delta Energizing time calculated in the previous test: **KtFADD_Pct_SSQA_InjSuspConfLvl** (Delta Enegizing Time, Delta Energizing Time old) In case the first test fails: Delta Energizing time calculated by VSQA(To fail Validation)	<50.00 [%] < -105.00 [us]	SQA Diagnosis enabled SSQA and VSQA enabled via calibration Baro Pressure Ambient temp No Low Fuel level tank indication AND Boolean Flag used to enable low fuel level check is TRUE XSQA Learning conditions enabled Power Take Off status NAND Boolean Flag used to disable SQA in case of power take off active Cylinder 7 Injection Timing Perfomance - Over Retarded not set	1.00 1.00 >=75.00 [kPa] >=-6.70 [°C] LowFuelConditionDiagnostic 1.00 FAD_XSQA_LrnCondEnbl = 0.00	Inj_To_PassFail_SSQA Number of injections in case sospicious pass or (if sospicious fails) Inj_To PassFail_SSQA +Inj_To_PassFail_VSQA number of injections to pass or fail validation. Once per Trip if suspicious and validations (in case of sospicious injectors detected) have been already completed in the previous driving cycle, otherwise the diagnosis starts from the interrupted status. Sample Rate: [1 Sample every cylinder firing event].	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		quantity area. This energizing time is then used for the diagnostic test that is performed in two different steps: The first is the suspicious (SSQA) in which all the injectors are classified as suspicious or not suspicious. During this phase several injections are performed on all the injectors in order to calculate the drift, in term of energizing time, of each injector. The drift found is then used together with the drift found in the previous test to enter a calibrate-able map in which a confidence level between 0 and 100% is given to each injector. The confidence levels depends on the delta energizing time between two consecutive tests. An injector is considered suspicious if the confidence level is lower than a calibrate-able threshold. The suspicious phase can only report test pass for not suspicious injectors while the injectors that fail the						

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		suspicious are tested by means of VSQA (Validation Small Quantity Adjustment) in order to validate or not the fault. The validation starts from the most suspicious injector (using the distance of current DeltaET from the VSQA calibrate-able thresholds) found during Suspicious phase and performs a calibrate-able number of injections, generally higher than the number of injection performed during suspicious, in order to find out a more accurate drift value for the tested injector. If the Delta Energizing time calculated during this phase is lowerthan a calibrate-able threshold a DTC is set. If an excessive positive drift is detected (this diagnosis failed), the diagnosis on the same cylinder of a possible excessive negative drift is disabled (Cylinder 7 Injection Timing Performance - Over Retarded is disabled) and viceversa.						

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Cylinder 8 Injection Timing Perfomance - Over Retarded	P01D9	This diagnosis is able to detect an excessive negative drift on fuel injection quantity and timing affecting injector 8. During Diesel Fuel Cut-off conditions SQA command the injection of a known quantity on one injector (e.g. 1,5mm^3) and checks, by means of crank-wheel sensor, the angular acceleration produced during the combustion phase. By comparing the angular acceleration value produced during the combustion phase with the angular acceleration that would be produced during the combustion of a nominal fuel quantity (e.g. 1,5mm3), the SQA is able to calculate the drift, in term of energizing time, on injector 8. Several injections, with different injection quantities, are performed in order to define the correct DeltaET to reach the target crank wheel angular acceleration and obtain the injector behavior in the small	Suspicious confidence level of tested injector (To fail suspicious), function of Current Energizing time calculated with SSQAand delta Energizing time calculated in the previous test: **KtFADD_Pct_SSQA_InjSuspConfLvl** (Delta Enegizing Time, Delta Energizing Time old) In case the first test fails: Delta Energizing time calculated by VSQA(To fail Validation)	<50.00 [%] >105.00 [us]	SQA Diagnosis enabled SSQA and VSQA enabled via calibration Baro Pressure Ambient temp No Low Fuel level tank indication AND Boolean Flag used to enable low fuel level check is TRUE XSQA Learning conditions enabled Power Take Off status NAND Boolean Flag used to disable SQA in case of power take off active Cylinder 8 Injection Timing Perfomance - Over Advanced not set	1.00 1.00 >=75.00 [kPa] >=-6.70 [°C] LowFuelConditionDiagnostic 1.00 FAD_XSQA_LrnCondEnbl = 0.00	Inj_To_PassFail_SSQA Number of injections in case sospicious pass or (if sospicious fails) Inj_To PassFail_SSQA +Inj_To_PassFail_VSQA number of injections to pass or fail validation Once per Trip if suspicious and validations (in case of sospicious injectors detected) have been already completed in the previous driving cycle, otherwise the diagnosis starts from the interrupted status. Sample Rate: [1 Sample every cylinder firing event].	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		quantity area. This energizing time is then used for the diagnostic test that is performed in two different steps: The first is the suspicious (SSQA) in which all the injectors are classified as suspicious or not suspicious. During this phase several injections are performed on all the injectors in order to calculate the drift, in term of energizing time, of each injector. The drift found is then used together with the drift found in the previous test to enter a calibrate-able map in which a confidence level between 0 and 100% is given to each injector. The confidence levels depends on the delta energizing time between two consecutive tests. An injector is considered suspicious if the confidence level is lower than a calibrate-able threshold. The suspicious phase can only report test pass for not suspicious injectors while the injectors that fail the						

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		suspicious are tested by means of VSQA (Validation Small Quantity Adjustment) in order to validate or not the fault. The validation starts from the most suspicious injector (using the distance of current DeltaET from the VSQA calibrate-able thresholds) found during Suspicious phase and performs a calibrate-able number of injections, generally higher than the number of injection performed during suspicious, in order to find out a more accurate drift value for the tested injector. If the Delta Energizing time calculated during this phase is higher than a calibrate-able threshold a DTC is set. If an excessive negative drift is detected (this diagnosis failed), the diagnosis on the same cylinder of a possible excessive positive drift is disabled (Cylinder 8 Injection Timing Performance - Over Advanced is disabled) and viceversa.						

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Cylinder 8 Injection Timing Perfomance - Over Advanced	P01DA	This diagnosis is able to detect an excessive positive drift on fuel injection quantity and timing affecting injector 8. During Diesel Fuel Cut-off conditions SQA command the injection of a known quantity on one injector (e.g. 1,5mm^3) and checks, by means of crank-wheel sensor, the angular acceleration produced during the combustion phase. By comparing the angular acceleration value produced during the combustion phase with the angular acceleration that would be produced during the combustion of a nominal fuel quantity (e.g. 1,5mm3), the SQA is able to calculate the drift, in term of energizing time, on injector 8. Several injections, with different injection quantities, are performed in order to define the correct DeltaET to reach the target crank wheel angular acceleration and obtain the injector behavior in the small	Suspicious confidence level of tested injector (To fail suspicious), function of Current Energizing time calculated with SSQAand delta Energizing time calculated in the previous test: **KtFADD_Pct_SSQA_InjSuspConfLvl** (Delta Enegizing Time, Delta Energizing Time old) In case the first test fails: Delta Energizing time calculated by VSQA(To fail Validation)	<50.00 [%] < -105.00 [us]	SQA Diagnosis enabled SSQA and VSQA enabled via calibration Baro Pressure Ambient temp No Low Fuel level tank indication AND Boolean Flag used to enable low fuel level check is TRUE XSQA Learning conditions enabled Power Take Off status NAND Boolean Flag used to disable SQA in case of power take off active Cylinder 8 Injection Timing Perfomance - Over Retarded not set	1.00 1.00 >=75.00 [kPa] >=-6.70 [°C] LowFuelConditionDiagnostic 1.00 FAD_XSQA_LrnCondEnbl = 0.00	Inj_To_PassFail_SSQA Number of injections in case sospicious pass or (if sospicious fails) Inj_To PassFail_SSQA +Inj_To_PassFail_VSQA number of injections to pass or fail validation. Once per Trip if suspicious and validations (in case of sospicious injectors detected) have been already completed in the previous driving cycle, otherwise the diagnosis starts from the interrupted status. Sample Rate: [1 Sample every cylinder firing event].	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		quantity area. This energizing time is then used for the diagnostic test that is performed in two different steps: The first is the suspicious (SSQA) in which all the injectors are classified as suspicious or not suspicious. During this phase several injections are performed on all the injectors in order to calculate the drift, in term of energizing time, of each injector. The drift found is then used together with the drift found in the previous test to enter a calibrate-able map in which a confidence level between 0 and 100% is given to each injector. The confidence levels depends on the delta energizing time between two consecutive tests. An injector is considered suspicious if the confidence level is lower than a calibrate-able threshold. The suspicious phase can only report test pass for not suspicious injectors while the injectors that fail the						

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		suspicious are tested by means of VSQA (Validation Small Quantity Adjustment) in order to validate or not the fault. The validation starts from the most suspicious injector (using the distance of current DeltaET from the VSQA calibrate-able thresholds) found during Suspicious phase and performs a calibrate-able number of injections, generally higher than the number of injection performed during suspicious, in order to find out a more accurate drift value for the tested injector. If the Delta Energizing time calculated during this phase is lowerthan a calibrate-able threshold a DTC is set. If an excessive positive drift is detected (this diagnosis failed), the diagnosis on the same cylinder of a possible excessive negative drift is disabled (Cylinder 8 Injection Timing Performance - Over Retarded is disabled) and viceversa.						

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Charge Air Cooler Efficiency Below Threshold (OBDII market only)	P026A	This monitor checks the Charge Air Cooler efficiency deterioration, that would cause vehicle's emissions to exceed specific emission levels.	Charge Air Cooler Efficiency (averaged over a calibrate-able cumulative transient time) is compared with a threshold. Charge Air Cooler Efficiency is computed as the ratio between (CAC upstream temperature - CAC downstream temperature) and (CAC upstream temperature - Reference temperature). Reference temperature can be selected via calibration: if 1.00 ==TRUE, it is the induction air temperature, otherwise it is the outside air temperature.	<50.00 [%]	Calibration on diagnostic enabling	1.00==TRUE	Test executed after 500.00 samples are collected and their average is computed Function task: 100 ms	Type B, 2 Trips
					Diagnostic has not run in current driving cycle yet	==TRUE		
					Vehicle speed in range	>65.00 [kph]		
					Air mass flow in range	>90.00 [mg/s] <500.00 [mg/s]		
					Engine coolant temperature in range OR OBD Coolant Enable Criteria	>70.00 [°C] ==TRUE		
					Throttle valve position	>85.00 [%]		
					Pressure ratio through the compressor in range	> 1.23 [ratio]		
					Temperature difference between upstream charge air cooler and Reference temperature in range	> 33.00 [°C]		
					Environmental pressure in range	>75.00 [kPa]		
					Environmental temperature in range	>-6.70 [°C]		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					No fault on vehicle speed sensor	VehicleSpeedSensor_FA ==FALSE		
					No fault on engine coolant temperature sensor	ECT_Sensor_FA ==FALSE		
					No fault on throttle position sensor	TPS_PstnSnsrFA ==FALSE		
					No fault on ambient pressure sensor	AAP_AmbientAirPresDfltd ==FALSE		
					No fault on Reference temperature sensor	OAT_PtEstFiltFA ==FALSE OR IAT_SensorFA==FALSE		
					No fault on charge air cooler upstream and downstream temperature sensors	CIT_CAC_UpFA==FALSE CIT_CAC_DwnFA ==FALSE		
					No fault on MAF meter	MAF_MAF_SnsrFA ==FALSE		
					No fault on Intake Manifold Pressure sensor	MAP_SensorFA==FALSE		
					All the enabling conditions last for a time	>= 11.00 [s]		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Fuel Injection Quantity Lower Than Expected	P026C	An error shall be detected when the fuel adjustment value (mm3) released by FSA is below a calibrated threshold.	Released FSA fuel correction value lower than a threshold A selected based on active combustion mode (refer to supporting table **KaFADR_e_FSA_ECM_CombModeGrp)** multiplied per ambient air pressure correction factor B	<A*B A = (If Groupl is selected: refer to supporting table **KtFADD_V_FSA_ECM_LoThrshGrp1** If Group2 is selected: refer to supporting table **KtFADD_V_FSA_ECM_LoThrshGrp2** If Group3 is selected: refer to supporting table **KtFADD_V_FSA_ECM_LoThrshGrp3**) [mm^3] B = (refer to supporting table **KtFADD_K_FSA_ECM_PresAmbWghtLo)**	Following conditions are met for a calibrated time: a. System voltage in range b. FSA correction release enabled c. (FSA Learning is active) OR (DFSA Learning is active) AND (Boolean Flag used to enable DFSA learningactive check is TRUE)) for a time d. Ambient air pressure e. (Power Take-Off (PTO) is not active OR Boolean flag used to disable FSA in case of PTO active is FALSE) f. (OBD Coolant Enable Criteria OR Engine coolant temperature) g. Ambient air temperature h. Gear engaged	> 0.00 + 7.00 [s] > 11.00 [V] refer to "FSA Control Flag" Free Form FAD FSA NormRngCrtn Valid refer to "FSA Control Flag" Free Form (FAD_FSA_EnblLrn) OR ((FAD_DFSA_EnblLrn) AND 1 [boolean]) > 5.00 [s] > 75.00 [kPa] 0 [boolean] = TRUE > 70.00 [°C] > -6.70 [°C]	Time counter: 280 failures out of 400 samples. Time task 25[ms]	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
						different from Neutral or Parking		
					for a time (only in case of Automatic Transmission)	> 45.00 [s]		
					i. Engine speed in operating range	> 420 [rpm] < 780 [rpm]		
					j. Engine speed gradient for a time	< 20 [rpm/25ms] > 45.00 [s]		
					k. Injected fuel quantity in operating range	> 3 [mm^3] < 24 [mm^3]		
					l. Injected fuel quantity gradient for a time	< 0.70 [mm^3/25ms] > 10.00 [s]		
					m. Vehicle speed in operating range for a time	> -1 [kph] < 3 [kph] > 45.00 [s]		
					n. Difference between FSA estimated error and FSA correction quantity	< 1,000.00 [mm^3]		
					o. Active combustion mode in selected group	refer to supporting table **KaFADR_e_FSA_ECM_ (CombModeGrp)**		
					p. No Low fuel tank level indication	LowFuelConditionDiagnostic		
					q. No pending or confirmed DTCs	(ECT_Sensor_TFTKO AND ECT_Sensor_FA) OAT_PtEstFiltFA FAD_FSA_LrnShtOffReq		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
						OXY_eqr_TurbDwn_F SA _NotVld		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Fuel Injection Quantity Higher Than Expected	P026D	An error shall be detected when the fuel adjustment value (mm^3) released by FSAis above a calibrated threshold.	Released FSA fuel correction value higher than a threshold A selected based on active combustion mode (refer to supporting table **KaFADR_e_FSA_ECM_CombModeGrp)** multiplied per ambient air pressure correction factor B	>A*B A= (If Groupl is selected: refer to supporting table **KtFADD_V_FSA_ECM_HiThrshGrp1** If Group2 is selected: refer to supporting table **KtFADD_V_FSA_ECM_HiThrshGrp2** If Group3 is selected: refer to supporting table **KtFADD_V_FSA_ECM_HiThrshGrp3**) [mm^3] B = (refer to supporting table **KtFADD_K_FSA_ECM_PresAmbWghtHi)**	Following conditions are met for a calibrated time: a. System voltage in range b. FSA correction release enabled c. (FSA Learning is active) OR ((DFSA Learning is active) AND (Boolean Flag used to enable DFSA learningactive check is TRUE)) for a time d. Ambient air pressure e. (Power Take-Off (PTO) is not active OR Boolean flag used to disable FSA in case of PTO active is FALSE) f. (OBD Coolant Enable Criteria OR Engine coolant temperature) g. Ambient air temperature h. Gear engaged	> 0.00 + 7.00 [s] > 11.00 [V] refer to "FSA Control Flag" Free Form FAD FSA NormRngCrtn Valid refer to "FSA Control Flag" Free Form (FAD FSA EnblLrn) OR ((FAD_DFSA_EnblLrn) AND 1 [boolean])) > 5.00 [s] > 75.00 [kPa] 0 [boolean] = TRUE > 70.00 [°C] > -6.70 [°C] different from Neutral or	Time counter: 280 failures out of 400 samples. Time task 25[ms]	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
						Parking		
					for a time (only in case of Automatic Transmission)	> 45.00 [s]		
					i. Engine speed in operating range	> 420 [rpm] < 780 [rpm]		
					j. Engine speed gradient for a time	< 20 [rpm/25ms] > 45.00 [s]		
					k. Injected fuel quantity in operating range	> 3 [mm^3] < 24 [mm^3]		
					l. Injected fuel quantity gradient for a time	< 0.70 [mm^3/25ms] > 10.00 [s]		
					m. Vehicle speed in operating range for a time	> -1 [kph] < 3 [kph] > 45.00 [s]		
					n. Difference between FSA estimated error and FSA correction quantity	< 1,000.00 [mm^3]		
					o. Active combustion mode in selected group	refer to supporting table **KaFADR_e_FSA_ECM_(CombModeGrp)**		
					p. No Low fuel tank level indication	LowFuelConditionDiagnostic		
					q. No pending or confirmed DTCs	(ECT_Sensor_TFTKO AND ECT_Sensor_FA) OAT_PtEstFiltFA FAD_FSA_LrnShtOffReq		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
						OXY_eqr_TurbDwn_F SA _NotVld		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Diesel Intake Air Flow Control Circuit	P02E0	This monitor checks if the Throttle commands are in open circuit	Load resistance higher than a threshold (error information provided by HWIO)	>200 [kOhm]	Test enabled by calibration	==1.00	160.00 fail counts out of 200.00 sample counts Function task: 12.5 ms	Type A, 1 Trips
					System out of the cranking phase			
					PT relay supply voltage in range	>11.00 [V]		
					H-Bridge driver is OFF			
					Valve requested in a position different from wide open (default position)			
					Diagnostic system enabled (no clear code or EOT in progress)			
					HWIO error status different from INDETERMINATE status			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Diesel Intake Air Flow Performance	P02E1	This monitor detects an obstruction on the actuator (obstruction found during the Throttle valve opening or closing) checking the setpoint position against the position measured by the Throttle Position Sensor	[Throttle Position Tracking Error] (setpoint position - measured position) > maximum threshold	> 16.00 [%]	Cold Start strategy NOT enabled	==TRUE	1,280.00 fail counts out of 1,600.00 sample counts 1,280.00 fail counts to enable the open circuit check (P02E0) Function task: 6.25 ms	Type A, 1 Trips
					Test enabled by calibration	==1.00		
					Diagnostic system enabled (no clear code or EOT in progress)			
					System out of the cranking phase			
					PT relay supply voltage in range	>11.00 [V]		
					Engine coolant temperature higher or equal to minimum threshold OR Engine cooling system target temperature reached (thermostat opening)	>=50.00 [°C]		
					No faults present on engine coolant temperature sensor	ECT_Sensor_FA ==FALSE		
					Outside air temperature higher or equal to minimum threshold	>=-23.00 [°C]		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					No faults present on outside air temperature sensor	OAT_PtEstFiltFA ==FALSE		
					Throttle position setpoint in steady state conditions for minimum time	>-160.00 [%/s] <160.00 [%/s] for >= 0.40 [s]		
					Throttle position closed loop control active			
					No mechanical stop soft approach in progress			
					No anti-sticking procedure in progress			
					No faults present on Throttle position sensor, Throttle valve, Throttle position control deviation	TPS_PstnShtOffReq == FALSE		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Diesel Intake Air Flow Stuck Closed	P02E5	This monitor detects the Throttle valve mechanically stuck in a certain position different from its defaulted position (fully open) when the actuator is no longer driven (missing dafaulted position)	Measured Throttle position < minimum threshold	<75.00 [%]	P02E1 is already set		No debounce is present: DTC sets as soon as the error is present Function task: 6.25 ms	Type A, 1 Trips
					Waiting time after driver shut off > minimum threshold (needed for the spring to drive the valve in its defaulted position)	>1.00 [s]		
					Diagnostic system enabled (no clear code or EOT in progress)			
					No faults present on Throttle position sensor, Throttle valve, Throttle position control deviation	TPS_PstnShtOffReq == FALSE		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Diesel Intake Air Flow Position Sensor Circuit Low (SENT position sensor)	P02E8	This monitor checks if the Throttle SENT position sensor is out of electrical range low	SENT position raw voltage < low threshold	< 1.00 [%5V]	Test enabled by calibration System out of the cranking phase PT relay supply voltage in range No faults present on Throttle SENT out of range and SENT performance	==1.00 >11.00 [V] TPS_SENT_OOR_Flt == FALSE TPS_SENT_PerfFlt == FALSE	200.00 fail counts out of 250.00 sample counts Function task: 6.25 ms	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Diesel Intake Air Flow Position Sensor Circuit High (SENT position sensor)	P02E9	This monitor checks if the Throttle SENT position sensor is out of electrical range low	SENT position raw voltage > high threshold	> 99.00 [%5V]	Test enabled by calibration System out of the cranking phase PT relay supply voltage in range No faults present on Throttle SENT out of range and SENT performance	==1.00 >11.00 [V] TPS_SENT_OOR_Flt== FALSE TPS_SENT_PerfFlt== FALSE	200.00 fail counts out of 250.00 sample counts Function task: 6.25 ms	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Diesel Intake Air Flow Current Range/ Performance	P02EB	This monitor checks if an excessive current flows through the Throttle DC-Motor (e.g. shunt circuit between load, Throttle DC-Motor internal faults, etc).	Current flowing through the H-Bridge higher than a threshold (error information provided by HWIO)	> 5.5 [A]	Test enabled by calibration	==1.00	160.00 fail counts out of 200.00 sample counts Function task: 12.5 ms	Type A, 1 Trips
					System out of the cranking phase			
					PT relay supply voltage in range	>11.00 [V]		
					No faults present on Throttle DC Motor current range/performance	TPSJVItrCurrLimTFTKO == FALSE		
					H-Bridge driver is ON			
					Diagnostic system enabled (no clear code or EOT in progress)			
					HWIO error status different from INDETERMINATE status			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Cold Start Exhaust Gas Recirculation Current Performance	P034F	This monitor detects an obstruction on the actuator (obstruction found during the HP EGR Cooler Bypass valve opening or closing) checking the setpoint position against the position measured by the HP EGR Cooler Bypass Position Sensor	|HP EGR Position Tracking Error| (setpoint position - measured position) > maximum threshold	> 16.00 [%]	Cold Start strategy enabled Test enabled by calibration Diagnostic system enabled (no clear code or EOT in progress) System out of the cranking phase PT relay supply voltage in range HP EGR position closed loop control active (no faults present on HP EGR position sensor, HP EGR flap, HP EGR position control deviation) HP EGR position setpoint in steady state conditions for minimum time Engine coolant temperature higher or equal to minimum threshold (calculated with a table ECT/OAT) OR	==TRUE == 1.00 >11.00 [V] EGR_PstnSnsrFlt ==FALSE EGR_ActrFA==FALSE EGR_VlvStkOpenTFTKO ==FALSE <160.00 [%/s] >-160.00 [%/s] for >=0.40 [s] >=-40.00 [°C]	1,280.00 fail counts out of 1,600.00 sample counts Function task: 6.25 ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Engine cooling system target temperature reached (thermostat opening)			
					No faults present on engine coolant temperature sensor	ECT_Sensor_FA ==FALSE		
					Outside air temperature higher or equal to minimum threshold	>=-23.00 [°C]		
					No faults present on outside air temperature sensor	OAT_PtEstFiltFA ==FALSE		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Glow Plug/ Heater Indicator Control Circuit Low	P037A	This DTC checks the wait to start lamp circuit for electrical integrity during operation. Wait to start lamp pin shorted to ground.	Test performed by HWIO. Aground short condition shall be detected if the circuit attached to the controller external connection has an impedance R to a voltage source within the Vehicle Ground Voltage Range relative to PWRGND. The short to ground faults are not required to be detected when the Off state diagnostic leakage current source is Disabled.	R = 0.5 Q	Glow Lamp present Test enabled Run/Crank On Run/Crank voltage Engine cranking	== 1.00 [boolean] == 1.00 [boolean] == True >11.00 V == False	10.00 failures out of 15.00 samples (*) (*) Ground short monitoring is implemented in HWIO which means no further debouncing is needed in case of short to ground	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Glow Plug/ Heater Indicator Control Circuit High	P037B	This DTC checks the wait to start lamp circuit for electrical integrity during operation. Wait to start lamp pin shorted to high voltage.	Test performed by HWIO. A power short condition shall be detected if the circuit attached to the Controller external connection has an impedance R to a voltage source within the Normal Operating Voltage Range or the High Operating Voltage Range.	R = 0.5 Q	Glow Lamp present Test enabled Run/Crank On Run/Crank voltage Engine cranking	== 1.00 [boolean] == 1.00 [boolean] == True >11.00 V == False	5.00 failures out of 8.00 samples Sampling rate: 100 ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Glow Plug/ Heater Indicator Control Circuit/Open	P0381	This DTC checks the wait to start lamp circuit for electrical integrity during operation. Wait to start lamp pin open circuit.	Test performed by HWIO. An open circuit condition shall be detected if the circuit attached to the Controller external connection has an impedance Ropendet and shall not be detected if the circuit impedance is less than the Ropmin. The open circuit faults are not required to be detected when the Off state diagnostic leakage current source is Disabled.	Ropendet = 300 Q Ropmin = 10 0	Glow Lamp present Test enabled Run/Crank On Run/Crank voltage Engine cranking	== 1.00 [boolean] == 1.00 [boolean] == True >11.00 V == False	10.00 failures out of 15.00 samples (*) (*) Open load monitoring is implemented in HWIO which means no further debouncing is needed in case of open load	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Exhaust Gas Recirculation Control Circuit	P0403	This monitor checks if the HP EGR commands are in open circuit	Load resistance higher than a threshold (error information provided by HWIO)	> 200 [kOhm]	Test enabled by calibration	==1.00	160.00 fail counts out of 200.00 sample counts	Type A, 1 Trips
					System out of the cranking phase		Function task: 12.5 ms	
					PT relay supply voltage in range	>11.00 [V]		
					H-Bridge driver is OFF			
					Valve requested in a position different from fully closed (default position)			
					Diagnostic system enabled (no clear code or EOT in progress)			
					HWIO error status different from INDETERMINATE status			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Exhaust Gas Recirculation Position Performance	P0404	This monitor detects an obstruction on the actuator (obstruction found during the HP EGR valve opening or closing) checking the setpoint position against the position measured by the HP EGR Position Sensor	|HP EGR Position Tracking Error| (setpoint position - measured position) > maximum threshold	>16.00 [%]	Cold Start strategy NOT enabled Test enabled by calibration Diagnostic system enabled (no clear code or EOT in progress) System out of the cranking phase PT relay supply voltage in range Engine coolant temperature higher or equal to minimum threshold OR Engine cooling system target temperature reached (thermostat opening) No faults present on engine coolant temperature sensor Outside air temperature higher or equal to minimum threshold	==TRUE ==1.00 >11.00 [V] >=50.00 [°C] ECT_Sensor_FA ==FALSE >-23.00 [°C]	1,260.00 fail counts out of 1,600.00 sample counts 1,260.00 fail counts to enable the open circuit check (P0403) Function task: 6.25 ms	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					No faults present on outside air temperature sensor	OAT_PtEstFiltFA ==FALSE		
					HP EGR position setpoint in steady state conditions for minimum time	>-160.00 [%/s] <160.00 [%/s] for >=0.10 [s]		
					HP EGR position closed loop control active			
					No mechanical stop soft approach in progress			
					No anti-sticking procedure in progress			
					No faults present on HP EGR position sensor, HP EGR valve, HP EGR position control deviation	EGR_PstnShtOffReq== FALSE		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Exhaust Gas Recirculation Position Sensor Circuit Low Voltage	P0405	This monitor checks if the HP EGR position analog sensor is out of electrical range low	analog position raw voltage < low threshold	< 1.00 [%5V]	Test enabled by calibration System out of the cranking phase PT relay supply voltage in range	==1.00 >11.00 [V]	200.00 fail counts out of 250.00 sample counts Function task: 6.25 ms	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Exhaust Gas Recirculation Position Sensor Circuit High Voltage	P0406	This monitor checks if the HP EGRposition analog sensor is out of electrical range high	analog position raw voltage > high threshold	> 99.00 [%5V]	Test enabled by calibration System out of the cranking phase PT relay supply voltage in range	==1.00 >11.00 [V]	200.00 fail counts out of 250.00 sample counts Function task: 6.25 ms	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
EGR Temperature Sensor2 Ckt Range/ Performance	P040B	ECM determines that the EGR temperature Sensor 2 has not moved enought since start (Stuck)	ECM determines that after an allowed amount of amount of engine consumed following a long enough soak, the Down Stream Temperature sensor has not change enough.	ABS(Initial Down stream temperature - final down stream temperature)<= **Down Stream Stk Temp Vrtn** [C°]	System supply voltage Engine soak (not run) time No Active DTCs Engine is running	> 11.00 Volts >= 28,800.00 sec P262B	cumulative Time > 11.00 continuous	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
EGR Temperature Sensor2 Ckt Low	P040C	Diagnose the EGR Down Stream Temperature sensor circuit low	The ECM detects that the measured resistance of the temperature sensor is out of range low.	Measured Resistance of the Temperature sensor < 159.00 0 impedance	System supply voltage Output driver is commanded on Ignition switch is in crank or run position	> 11.00 Volts	10 failures out of 20 samples 100 ms /sample, continuous	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
EGR Temperature Sensor2 Ckt High	P040D	Diagnose the EGR Down Stream Temperature sensor circuit high	The ECM detects that the measured resistance of the temperature sensor is out of range high.	Measured Resistance of the Temperature sensor > 885.00 0 impedance	System supply voltage Output driver is commanded on Ignition switch is in crank or run position	> 11.00 Volts	10 failures out of 20 samples 100 ms /sample, continuous	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
EGR Temperature Sensor2 Ckt Intermittent/ Erratic	P040E	Detects a temperature sensorthat is showing erratic or intermittent temperature readings	The absoluted value of the loop to loop (100 ms / sample) resistance change of the temperature sensor is greater than the allowed rate of change.	Delta chage > 25.00 Q impedance	System supply voltage Output driver is commanded on Ignition switch is in crank or run position	> 11.00 Volts	20 failures out of 30 samples 100 ms /sample, continuous	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
EGR Temperature Sensori Ckt Range/ Performance	P041B	ECM determines that the EGR temperature Sensor 1 has not moved enought since start (Stuck)	ECM determines that after an allowed amount of engine consumed airflow following a long enough soak, the Up Stream Temperature sensor has not change enough.	ABS(Initial upstream temperature - final upstream temperature) <= **UP Stream Stk Temp Vrtn** [C°]	System supply voltage Engine soak (not run) time No Active DTCs Engine is running	> 11.00 Volts >= 28,800.00 sec P262B	cumulative Time > 4.00 continuous	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
EGR Temperature Sensori Ckt Low	P041C	Diagnose the EGR Up Stream Temperature sensor circuit low	The ECM detects that the measured resistance of the temperature sensor is out of range low.	Measured Resistance of the Temperature sensor < 164.00 0 impedance	System supply voltage Output driver is commanded on Ignition switch is in crank or run position	> 11.00 Volts	10 failures out of 20 samples 100 ms /sample, continuous	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
EGR Temperature Sensori Ckt High	P041D	Diagnose the EGR Up Stream Temperature sensor circuit high	The ECM detects that the measured resistance of the temperature sensor is out of range high.	Measured Resistance of the Temperature sensor > 860.00 0 impedance	System supply voltage Output driver is commanded on Ignition switch is in crank or run position	> 11.00 Volts	10 failures out of 20 samples 100 ms /sample, continuous	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
EGR Temperature Sensori Ckt Intermittent/ Erratic	P041E	Detects a temperature sensorthat is showing erratic or intermittent temperature readings	The absoluted value of the loop to loop (100 ms / sample) resistance change of the temperature sensor is greater than the allowed rate of change.	Delta chage > 25.00 Q impedance	System supply voltage Output driver is commanded on Ignition switch is in crank or run position	> 11.00 Volts	20 failures out of 30 samples 100 ms /sample, continuous	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Exhaust Gas Recirculation Control Stuck Open	P042E	This monitor detects the HP EGR valve mechanically stuck in a certain position different from its defaulted position (fully closed) when the actuator is no longer driven (missing dafaulted position)	Measured HP EGR position > maximum threshold	>6.00 [%]	P0404 is already set		No debounce is present: DTC sets as soon as the error is present Function task: 6.25 ms	Type A, 1 Trips
					Waiting time after driver shut off > minimum threshold (needed for the spring to drive the valve in its defaulted position)	>2.00 [s]		
					Diagnostic system enabled (no clear code or EOT in progress)			
					No faults present on HP EGR position sensor, HP EGR valve, HP EGR position control deviation	EGR_PstnShtOffReq == FALSE		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Exhaust Gas Recirculation Position Exceeded Learning Limit	P049D	This monitor checks if the HP EGR position analog sensor has an offset with respect to the nominal position where the valve does the learning procedure (fully closed)	analog position raw voltage when the valve is in fully closed position < low threshold OR analog position raw voltage when the valve is in fully closed position > high threshold	< 15.00 [%5V] OR > 26.00 [%5V]	Test enabled by calibration	==1.00	1.00 fail counts out of 1.00 sample counts Function task: at key off	Type A, 1 Trips
					Learning procedure at key off in fully closed position has been successfully completed:			
					- engine coolant temperature in range;	>= 70.00 [°C] <= 70.00 [°C]		
					- no faults present on engine coolant temperature sensor;	ECT_Sensor_FA == FALSE		
					- valve is in fully closed position (measured position smaller than a threshold);	< 100.00 [%]		
					- difference between max and min learned values is smaller than a threshold.	< 100.00 [%]		
					Position control in closed loop: battery voltage above a threshold.	> 5.00 [V]		
					No faults present on HP EGR position sensor, HP EGR valve, HP EGR position deviation	EGR_PstnShtOffReq == FALSE		
					End Of Trip event has elapsed			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
EGR “A” Control Temperature Too High	P04FA	This monitor checks if the temperature of the HP EGR DC-Motor increases too much (e.g. HP EGR DC-Motor internal faults, etc).	H-Bridge driver temperature higher than a threshold (error information provided by HWIO)	> 170 [°C]	Test enabled by calibration	==1.00	160.00 fail counts out of 200.00 sample counts Function task: 12.5 ms	Type A, 1 Trips
					System out of the cranking phase			
					PT relay supply voltage in range	>11.00 [V]		
					Diagnostic system enabled (no clear code or EOT in progress)			
					HWIO error status different from INDETERMINATE status			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Exhaust gas temperature sensor (EGT) 1 out of range monitoring Low	P0545	Controller specific output driver circuit diagnoses t the exhaust gas temperature 1 (EGT1) sensor signal high sided driver for a short to ground failure when the output is powered on by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range during driver on state indicates short to ground failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for a short to ground.	< 158 [Ohm]	Test enabled by calibration (TRUE-> enable FALSE -> disable) and with Engine cranking and with Battery voltage and with key on	1 [Boolean] == FALSE > 11.00 [V] == TRUE	10 fail samples over 20 samples Function task: 100ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Exhaust gas temperature sensor (EGT) 1 out of range monitoring High	P0546	Controller specific output driver circuit diagnoses the exhaust gas temperature 1 (EGT1) signal high sided driver for a short to power failure when the output is powered off by comparing a voltage measurement to controller specific voltage thresholds. Controller specific output driver circuit diagnoses the exhaust gas temperature 1 (EGT1) signal high sided driver for an open circuit failure when the output is powered on by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range during driver on state indicates short to power failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for a short to power. Voltage measurement outside of controller specific acceptable range during driver on state indicates open circuit failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for an open circuit.	> 900 [Ohm]	Test enabled by calibration (TRUE-> enable FALSE -> disable) and with Engine cranking and with Battery voltage and with key on	1 [Boolean] == FALSE > 11.00 [V] == TRUE	10 fail samples over 20 samples Function task: 100ms	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Turbocharge r VGT A Initial Position Exceeded Learning Limit (VGT Smart)	P100B	This monitor checks if the VGT smart travel (from fully closed to fully open position) measured at End Of Line during the learning procedure is plausibile	physical travel measured at End Of Line < low threshold OR physical travel measured at End Of Line > high threshold	<217.00 [counts] OR >285.00 [counts]	Test enabled by calibration End Of Line Learning procedure at key off has been successfully completed End Of Trip event has elapsed No fault validated on smart VGT rolling counters	==1.00 CFM_VGT_CommFA ==FALSE	No debounce is present: DTC sets as soon as the error is present Function task: at key off	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Rail Pressure deviation during cut off	P1089	This diagnosis is able to check if, during SQA learning, the pressure set-point requested by SQA is correctly reached and maintained (in rail pressure range defined for SQA), in order to allow SQA to perform the learning.	Fuel Rail pressure	> SQA Rail Pressure Set-point + **KaFADC_p_SQA_LrnDelt** OR < SQA Rail Pressure Set-point - **KaFADC_p_SQA_LrnDelt**	Test enabled by calibration All enabling conditions for SQA learning different from Rail Pressure in range are satified Calibrateable delay time since SQA started to request rail pressure set-point has expired.	1.00 FAD_SQA_LrnPresEnbl 3,500.00	800.00 Fail Samples over 1,143.00 samples. 1 Sample every 12,5ms.	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Charge Air Cooler Temperature Sensor Down Circuit Performance	P10D5	This monitor checks if the CAC down air temperature sensor is irrational at key on when compared with two reference temperature sensors after a long soak time	Charge air cooler down air temperature is compared at power up with an average temperature calculated using the intake manifold air temperature sensor and the fuel temperature sensor over a calibratable number of samples	>20.00 [°C]	Enablement calibration set to TRUE	==1.00	Test executed after a counter of 10.00 samples Functional task: 100 ms	Type B, 2 Trips
					Key on and engine not running or engine running for less than a calibratable time	>=1.00 [s]		
					Runk Crank Relay voltage in range	>11.00 [V]		
					The engine has not run for a calibratable time since last key off	>=28,800.00 [s]		
					No faults detected on engine off timer	EngineModeNotRunTimer Error ==FALSE		
					Absolute value of the difference between intake manifold air temperature and fuel temperature smaller than a calibratable threshold	<45.00 [°C]		
					No electrical or self-correlated faults detected on charge air cooler down air temperature sensors	CIT_CAC_DwnCktFA ==FALSE OR CIT_CAC_DwnSelfCorFA ==FALSE		
					No faults detected on intake manifold air	MnfdTempSensorFA ==FALSE		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					temperature sensor			
					No faults detected on fuel temperature sensor	FTS_FTS_Flt==FALSE		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Charge Air Cooler Temperature Sensor Down Circuit Low	P10D6	This monitor checks if the CAC down air temperature sensor is out of electrical range low	Charge air cooler down air temperature resistance value < low threshold	<7.11 [ohm]	Test enabled by calibration Engine not cranking Runk Crank Relay voltage in range	==1.00 > 11.00 [V]	20.00 fail counter over 24.00 sample counter Functional task: 100 ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Charge Air Cooler Temperature Sensor Down Circuit High	P10D7	This monitor checks if the CAC down air temperature sensoris out of electrical range high	Charge air cooler down air temperature resistance value > high threshold	>753,016.00 [ohm]	Test enabled by calibration Engine not cranking Runk Crank Relay voltage in range	==1.00 > 11.00 [V]	20.00 fail counter over 24.00 sample counter Functional task: 100 ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Charge Air Cooler Temperature Sensor Down Circuit Intermittent/ Erratic	P10D8	This monitor checks if the CAC down air temperature has an intermittent fault	Charge air cooler down air temperature value > T_MAX_threshold Charge air cooler down air temperature value < T_MIN_threshold where - T_MAX_threshold = (1 - alpha)*T_MAX + alpha*T_last_good - T_MIN_threshold = (1 - alpha)*T_MIN + alpha*T_last_good - alpha = e^(#fails + 1)*(ts/ tau) -#fails = number of consecutive samples where the test failed - ts = sensor sampling time - tau = sensor filter response time - T_MAX = sensor maximum actual reading - T_MIN = sensor minimum actual reading - T_last_good = last good temperature measured by the sensor	>300.00 [°C] <-40.00 [°C]	Test enabled by calibration Engine not cranking Runk Crank Relay voltage in range No electrical faults detected on CAC down air temperature sensor	==1.00 >11.00 [V] CIT_CAC_DwnCktFA ==FALSE	50.00 fail counter over 63.00 sample counter Functional task: 100 ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Exhaust gas temperature sensor (EGT) 1 plausibility at key on monitoring	P113B	This diagnosis verify if, at key on, the temperature value read by exhaust gas temperature 1 (EGT1) sensor is almost equal to the reference temperature. Reference temperature is calculated as average value among all the available system temperature sensors (exhaust temperature sensors, coolant temperature sensor, fuel temperature sensor, ambient temperature sensor, intake temperature sensor). The number of sensor used for the average calculation shall be at least 4 but which sensor to use is calibratable and the sensor should not be faulted. The reference temperature is calculated at the system start up after a calibratable engine stop when all the temperature are supposed to be similar. |Reference temperature at system cold start up (EGT_Avg) - EGT1 temperature] in case of parking heater present 0.00 the threshold	|Reference temperature at system cold start up (EGT_Avg) - EGT1 temperature] in case of parking heater present 0.00 the threshold	> 30 [°C] > 30.00	Test enabled by calibration and with Battery voltage and with No Active DTCs No elettic puntual error and with **Reference temperature calculation done:** - key on and with - minimum engine-off time and with - Minimum number of sensor available for calculation Ambient Temperature	1 [Boolean] > 11.00 [V] EGT_ExhGas1_CktTFTKO ==TRUE == TRUE > 28,800.00 [sec] >=4 >-10.00 2.00	2 fail samples out of 2 samples Function task: 100ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					with hysteresis			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Exhaust gas temperature sensor (EGT) 2 plausibility at key on monitoring	P113C	This diagnosis verify if, at key on, the temperature value read by exhaust gas temperature 2 (EGT2) sensor is almost equal to the reference temperature. Reference temperature is calculated as average value among all the available systemtemperature sensors(exhaust temperature sensors, coolant temperature sensor, fuel temperature sensor, ambient temperature sensor, intake temperature sensor). The number of sensor used for the average calculation shall be at least 4 but which sensor to use is calibratableand the sensor should not be faulted. The reference temperature is calculated at the system start up after a calibratable engine stop when all the temperature are supposed to be similar.	|Reference temperature at system cold start up (EGT_Avg) - EGT2 temperature] in case of the parking heater present the 0.00 threshold	> 25 [°C] >25.00 [°C]	Test enabled by calibration (TRUE-> enable FALSE -> disable) and with Battery voltage and with No Active DTCs No elettic puntual error and with **Reference temperature calculation done:** - key on and with - minimum engine-off time and with - Minimum number of sensor available for calculation	1 [Boolean] > 11.00 [V] EGT_ExhGas2_CktTFTKO ==TRUE ==TRUE > 28,800.00 [sec] >=4 >-15.00 2.00	2 fail samples out of 2 samples Function task: 100ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Ambient Temperature with hysteresis			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Exhaust gas temperature sensor (EGT) 3 plausibility at key on monitoring	P113D	This diagnosis verify if, at key on, the temperature value read by exhaust gas temperature 3 (EGT3) sensor is almost equal to the reference temperature. Reference temperature is calculated as average value among all the available systemtemperature sensors(exhaust temperature sensors, coolant temperature sensor, fuel temperature sensor, ambient temperature sensor, intake temperature sensor). The number of sensor used for the average calculation shall be at least 4 but which sensor to use is calibratableand the sensor should not be faulted. The reference temperature is calculated at the system start up after a calibratable engine stop when all the temperature are supposed to be similar.	|Reference temperature at system cold start up (EGT_Avg) - EGT3 temperature] in case of parking heater present 0.00 the threshold	> 20 [°C] > 20.00 [°]	Test enabled by calibration (TRUE-> enable FALSE -> disable) and with Battery voltage and with No Active DTC No eletrical puntual error and with **Reference temperature calculation done:** - key on and with - minimum engine-off time and with - Number of sensor available for calculation Ambient Temperature	1 [Boolean] > 11.00 [V] EGT_ExhGas3_CktTFTKO ==TRUE ==TRUE > 28,800.00 [sec] >=4 > -20.00 2.00	2 fail samples out of 2 samples Function task: 100ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					with hysteresis			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Exhaust gas temperature sensor (EGT) 4 plausibility at key on monitoring	P113E	This diagnosis verify if, at key on, the temperature value read by exhaust gas temperature 4 (EGT4) sensor is almost equal to the reference temperature. Reference temperature is calculated as average value among all the available systemtemperature sensors(exhaust temperature sensors, coolant temperature sensor, fuel temperature sensor, ambient temperature sensor, intake temperature sensor). The number of sensor used for the average calculation shall be at least 4 but which sensor to use is calibratableand the sensor should not be faulted. The reference temperature is calculated at the system start up after a calibratable engine stop when all the temperature are supposed to be similar.	|Reference temperature at system cold start up (EGT_Avg) - EGT4 temperature] in case of parking heater present 0.00 the threshold	> 20 [°C] > 20.00 [°]	Test enabled by calibration (TRUE-> enable FALSE -> disable) and with Battery voltage and with No Active DTCs and with No eletrical puntual error Reference temperature calculation done: - key on and with - minimum engine-off time and with - Number of sensor available for calculation Ambient Temperature	1 [Boolean] > 11.00 [V] EGT_ExhGas4_CktTFTKO ==TRUE ==TRUE > 28,800.00 [sec] >=4 > -20.00 2.00	2 fail samples out of 2 samples Function task: 100ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					with hysteresis			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Exhaust gas temperature sensor (EGT) 5 plausibility at key on monitoring	P113F	This diagnosis verify if, at key on, the temperature value read by exhaust gas temperature 5 (EGT5) sensor is almost equal to the reference temperature. Reference temperature is calculated as average value among all the available systemtemperature sensors(exhaust temperature sensors, coolant temperature sensor, fuel temperature sensor, ambient temperature sensor, intake temperature sensor). The number of sensor used for the average calculation shall be at least 4 but which sensor to use is calibratableand the sensor should not be faulted. The reference temperature is calculated at the system start up after a calibratable engine stop when all the temperature are supposed to be similar.	|Reference temperature at system cold start up (EGT_Avg) - EGT5 temperature] in case of parking heater present 0.00 the threshold	> 20 [°C] > 20.00 [°]	Test enabled by calibration (TRUE-> enable FALSE -> disable) and with Battery voltage and with No Active DTCs and with No eletrical puntual error and Reference temperature calculation done: - key on and with - minimum engine-off time and with - Number of sensor availablefor calculation Ambient Temperature with hysteresis	1 [Boolean] > 11.00 [V] EGT_ExhGas5_CktTFTKO ==TRUE ==TRUE > 28,800.00 [sec] >=4 > -20.00 2.00	2 fail samples out of 2 samples Function task: 100ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Particulate Matter Sensor Temperature Not Plausible	P118B	This diagnosis detects a soot sensor temperature sensor damaged or a possible parassitic resistance on the wiring harness between the soot sensor heater and the soot sensor control unit	The absolute value of the difference between the soot sensor electrode temperature at power-up and the average of temperature sensors (EGT_Avg)	> 30.00 °C	Key is turned on		No time debounce	Type B, 2 Trips
					Ignition voltage in range	> 11.00		
					Soot Sensor bus relay is commanded on	NOT(SBR_RlyFA)		
					No electrical fault active on Soot Sensor bus relay			
					No faults of CAN communication loss with Soot Sensor	NOT(U02A3)		
					No Soot Sensor supply undervoltage detected, i.e. supply sensor voltage for a time	> 9.00 V > 0.10s		
					No electrical fault detected on Soot Sensor	NOT(SOT_EleclFlt)		
					If enabled, the Soot Sensor temperature circuit low and high monitoring reported a test pass	TPTKO on SOT_SnsrTempCktHiErr TPTKO on SOT_SnsrTempCktLoErr		
					Ambient Air pressure	>75.00 KPa		
					Ambient air pressure sensor not faulty	AmbPresDfltdStatus = CeAAPR_e_AmbPresNotDfltd		
					Time since Soot Sensor heating off when the sensor temperature has	> 600.00 s		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					been stored is Timer since Soot Sensor heating off is not affected by error on module off timer Calculation of the reference temperature at system start up is valid: Minimum time from the previous key off to enable the reference temperature calculation Diagnostic has not yet reported a pass or failure Transmission fault with sensor control unit not present	NOT(ModuleOffTimeErr) EGT_TempAvgVld >28,800.00 NOT (TPTKO OR TFTKO) on P118B NOT(P30BC)		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Exhaust Gas Temperature Sensor Performance - During Engine Running Test Bank 1 Sensor 1	P118E	This diagnosis compares the measured EGT to a model EGT when entry conditions permit. The difference between the values is averaged over a time window. After this time window has elapsed, the average difference is compared to a threshold. The result is then input to an X out of Y counter.	(Measured EGT1 - Modeled EGT1)>	204.00 degC	Test Enabled by calibration	1.00	6.00 fail samples out of 8.00 Each sample is 5.00 seconds	Type B, 2 Trips
				OR	and			
			(Measured EGT1 - Modeled EGT1)<	-170.00 degC	Battery Voltage	> 11.00 Volts		
					and			
					EGT_EGT1_DiagMdlFlt	== FALSE		
					and			
					Engine Off Timer	> = 0.00 seconds		
					and			
					EGT1 Model Temperature	> -40.00 degC		
					and			
					EGT1 Model Temperature	< 900.00 degC		
					and			
					Dynamick check Valid	==TRUE		
					and			
					No faults on the consumed EGT sensors	EGT_ExhGas1_StkFA and EGT_ExhGas1_StkTFTKO and EGT_ExhGas1_CktFA and		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					and	EGT_ExhGas1_CktTFTK0 and EGT_ExhGas2_QckChgFA and EGTExhGas1_QckChgTFTKO		
					Time since last DPF regeneration	>=900.00 seconds		
					and			
					Time after warm up	>=90.00 seconds		
					and			
					Continues engine run time	>=210.00 seconds		
					and			
					Fuel Rate and Engine Speed within bounds, determined by calibration map	**EGT1 DynChk EngPtEnbl**		
					and			
					Model Temperature Rate of change limited to:	30.00 degC		
					over a time period of:	CeEGTR_e_IndexMax5000ms		
					Enabling delay time	4.00 seconds		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Exhaust Gas Temperature Sensor Performance - During Engine Running Test Bank 1 Sensor 2	P118F	This diagnosis compares the measured EGT to a model EGT when entry conditions permit. The difference between the values is averaged over a time window. After this time window has elapsed, the average difference is compared to a threshold. The result is then input to an X out of Y counter.	(Measured EGT2 - Modeled EGT2) > (Measured EGT2 - Modeled EGT2) <	100.00 degC OR -100.00 degC	Test Enabled by calibration and Battery Voltage and EGT_EGT2_DiagMdlFlt and Engine Off Timer and EGT2 Model Temperature and EGT2 Model Temperature and Dynamick check Valid and	1.00 > 11.00 Volts == FALSE > 3,600.00 seconds > -40.00 degC < 900.00 degC ==TRUE	6.00 fail samples out of 8.00 Each sample is 5.00 seconds	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					No faults on the consumed EGT sensors and	EGT_ExhGas2_CktFA and EGT_ExhGas2 CktTFTK 0 and EGT_ExhGas2_QckChgF A and EGT_ExhGas2_QckChgT FTKO and EGT_ExhGas2_QckChgF A		
					Time since last DPF regeneration	>= 900.00 seconds		
					and			
					Time afert warm up	>= 90.00 seconds		
					and			
					Continues engine run time	>= 210.00 seconds		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					and Fuel Rate and Engine Speed within bounds, determined by calibration map and Model Temperature Rate of change limited to: over a time period of: Enabling delay time	**EGT2 DynChk EngPtEnbl** <4.00 degC CeEGTR_e_IndexMax5000ms 4.00 seconds		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Exhaust Gas Temperature Sensor Performance - During Engine Running Test Bank 1 Sensor 3	P1196	This diagnosis compares the measured EGT to a model EGT when entry conditions permit. The difference between the values is averaged over a time window. After this time window has elapsed, the average difference is compared to a threshold. The result is then input to an X out of Y counter.	Measured EGT3 - Modeled EGT3) > Measured EGT3 - Modeled EGT3) <	100.00 degC OR -100.00 degC	Test Enabled by calibration and Battery Voltage and EGT_EGT3_DiagMdlFlt and Engine Off Timer and EGT3 Model Temperature and EGT3 Model Temperature and Dynamick check Valid and	1.00 > 11.00 Volts == FALSE > 0.00 seconds >-40.00 degC < 900.00 degC ==TRUE	6.00 fail samples out of8.00 Each sample is 5.00 seconds	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					No faults on the consumed EGT sensors and	EGT_ExhGas3_CktFA and EGT_ExhGas3_CktTFTK0 and EGT_ExhGas3_QckChgFA and EGT_ExhGas3_QckChgTFTKO and EGT_ExhGas3_StkFA and EGT_ExhGas3_StkTFTK0		
					Time since last DPF regeneration and	>=900.00 seconds		
					Time afert warm up and	>=90.00 seconds		
					Continues engine run time and	>= 210.00 seconds		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Fuel Rate and Engine Speed within bounds, determined by calibration map and Model Temperature Rate of change limited to: over a time period of: Enabling delay time	**EGT3 DynChk EngPtEnbl** <4.00 degC CeEGTR_e_IndexMax5000ms 4.00 seconds		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Exhaust Gas Temperature Sensor Performance - During Engine Running Test Bank 1 Sensor 4	P1197	This diagnosis compares the measured EGT to a model EGT when entry conditions permit. The difference between the values is averaged over a time window. After this time window has elapsed, the average difference is compared to a threshold. The result is then input to an X out of Y counter.	Measured EGT4 - Modeled EGT4) > Measured EGT4 - Modeled EGT4) <	100.00 degC OR -100.00 degC	Test Enabled by calibration and Battery Voltage and EGT_EGT4_DiagMdlFlt and Engine Off Timer and EGT4 Model Temperature and EGT4 Model Temperature and Dynamick check Valid and	1.00 > 11.00 Volts == FALSE > 0.00 seconds >-40.00 degC <900.00 degC ==TRUE	12.00 fail samples out of 16.00 Each sample is 5.00 seconds	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					No faults on the consumed EGT sensors and	EGT_ExhGas4_CktFA and EGT_ExhGas4_CktTFTK0 and EGT_ExhGas4_QckChgFA and EGT_ExhGas4_QckChgTFTKO and EGT_ExhGas4_StkFA and EGT_ExhGas4_StkTFTK0		
					Time since last DPF regeneration and	>=900.00 seconds		
					Time afert warm up and	>=90.00 seconds		
					Continues engine run time and	>=210.00 seconds		
					Fuel Rate and Engine Speed within bounds,	**EGT4 DynChk EngPtEnbl**		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					determined by calibration map and Model Temperature Rate of change limited to: over a time period of: Enabling delay time	 <4.00 degC CeEGTR_e_IndexMax5000ms 4.00 seconds		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Exhaust Gas Temperature Sensor Performance - During Engine Running Test Bank 1 Sensor 5	P1198	This diagnosis compares the measured EGT to a model EGT when entry conditions permit. The difference between the values is averaged over a time window. After this time window has elapsed, the average difference is compared to a threshold. The result is then input to an X out of Y counter.	Measured EGT5 - Modeled EGT5) > Measured EGT5 - Modeled EGT5) <	100.00 degC OR -100.00 degC	Test Enabled by calibration and Battery Voltage and EGT_EGT5_DiagMdlFlt and Engine Off Timer and EGT5 Model Temperature and EGT5 Model Temperature and Dynamick check Valid and	1.00 > 11.00 Volts == FALSE > 0.00 seconds >-40.00 degC <900.00 degC ==TRUE	24.00 fail samples out of 32.00 Each sample is 5.00 seconds	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					No faults on the consumed EGT sensors	EGT_ExhGas5_CktFA and EGT_ExhGas5_CktTFTK0 and EGT_ExhGas5_QckChgFA and EGT_ExhGas5_QckChgTFTKO and EGT_ExhGas5_StkFA and EGT_ExhGas5_StkTFTK0		
					and			
					Time since last DPF regeneration	>=900.00 seconds		
					and			
					Time afert warm up	>=90.00 seconds		
					and			
					Continues engine run time	>=210.00 seconds		
					and			
					Fuel Rate and Engine Speed within bounds, determined by calibration mao	**EGT5 DynChk EngPtEnbl**		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					and Model Temperature Rate of change limited to: over a time period of: Enabling delay time	<4.00 degC CeEGTR_e_IndexMax5000ms 4.00 seconds		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Diesel Intake Air Flow Supply Circuit	P122B	This monitor checks if the Throttle DC-Motor is correctly supplied	System voltage supply lower than a threshold (error information provided by HWIO)	< 6 [V]	Test enabled by calibration System out of the cranking phase PT relay supply voltage in range Diagnostic system enabled (no clear code or EOT in progress) HWIO error status different from INDETERMINATE status	==1.00 >11.00 [V]	160.00 fail counts out of 200.00 sample counts Function task: 12.5 ms	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Diesel Intake Air Flow Control Circuit Shorted	P122C	This monitor checks if the Throttle commands are shorted one other	Current flowing through the H-Bridge switches higher than a threshold (error information provided by HWIO)	> 9 [A]	Test enabled by calibration	==1.00	160.00 fail counts out of 200.00 sample counts Function task: 12.5 ms	Type A, 1 Trips
					System out of the cranking phase			
					PT relay supply voltage in range	>11.00 [V]		
					H-Bridge driver is ON			
					Diagnostic system enabled (no clear code or EOT in progress)			
					HWIO error status different from INDETERMINATE status			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Diesel Intake Air Flow Position Sensor Exceeded Learning Limit (SENT position sensor)	P122D	This monitor checks if the Throttle position SENT sensor has an offset with respect to the nominal position where the valve does the learning procedure (fully closed)	SENT position raw voltage when the valve is in fully closed position < low threshold OR SENT position raw voltage when the valve is in fully closed position > high threshold	< 85.00 [%5V] OR > 94.00 [%5V]	Test enabled by calibration Key signal is off Learning procedure enabled: - no faults present on engine coolant temperature sensor; - the engine coolant tempearture is in range. - outside air temperature above a threshold - no faults present on outside air temperature sensor Position control in closed loop: battery voltage above a threshold. No faults present on Throttle position sensor, Throttle valve, Throttle position deviation End Of Trip event has elapsed	==1.00 ECT_Sensor_FA == FALSE >= 70.00 [°C] <= 129.00 [°C] >=-10.00 [°C] OAT_PtEstFiltFA == FALSE > 5.00 [V] TPS_PstnShtOffReq== FALSE	1.00 fail counts out of 1.00 sample counts Function task: at key off	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Exhaust Gas Recirculation Supply Circuit	P1402	This monitor checks if the HP EGR DC-Motor is correctly supplied	System voltage supply lower than a threshold (error information provided by HWIO)	< 6 [V]	Test enabled by calibration	==1.00	160.00 fail counts out of 200.00 sample counts Function task: 12.5 ms	Type A, 1 Trips
					System out of the cranking phase			
					PT relay supply voltage in range	>11.00 [V]		
					Diagnostic system enabled (no clear code or EOT in progress)			
					HWIO error status different from INDETERMINATE status			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Exhaust Gas Recirculation Control Circuit Shorted	P1407	This monitor checks if the HP EGR commands are shorted one other	Current flowing through the H-Bridge switches higher than a threshold (error information provided by HWIO)	> 8 [A]	Test enabled by calibration System out of the cranking phase PT relay supply voltage in range H-Bridge driver is ON Diagnostic system enabled (no clear code or EOT in progress) HWIO error status different from INDETERMINATE status	==1.00 >11.00 [V]	160.00 fail counts out of 200.00 sample counts Function task: 12.5 ms	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Exhaust Gas Recirculation Current Range/ Performance	P140F	This monitor checks if an excessive current flows through the HP EGR DC-Motor (e.g. shunt circuit between load, HP EGR DC-Motor internal faults, etc).	Current flowing through the H-Bridge higher than a threshold (error information provided by HWIO)	> 6.3 [A]	Test enabled by calibration	==1.00	160.00 fail counts out of 200.00 sample counts Function task: 12.5 ms	Type A, 1 Trips
					System out of the cranking phase			
					PT relay supply voltage in range	>11.00 [V]		
					No faults present on HP EGR DC Motor current range/performance	EGR_MtrCurrLimTFTKO == FALSE		
					H-Bridge driver is ON			
					Diagnostic system enabled (no clear code or EOT in progress)			
					HWIO error status different from INDETERMINATE status			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Exhaust Gas Recirculation Cooler Bypass Valve Control Circuit Shorted (ECB DC Motor)	P1413	This monitor checks if the HP EGR cooler bypass valve commands are shorted one other	Current flowing through the H-Bridge switches higher than a threshold (error information provided by HWIO)	>8 [A]	Test enabled by calibration	==1.00	106.00 fail counts out of 200.00 sample counts Function task: 12.5 ms	Type B, 2 Trips
					System out of the cranking phase			
					PT relay supply voltage in range	> 11.00 [V]		
					H-Bridge driver is ON			
					Diagnostic system enabled (no clear code or EOT in progress)			
					HWIO error status different from INDETERMINATE status			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Exhaust Gas Recirculation Cooler Bypass Valve Current Range/ Performance (ECB DC Motor)	P1414	This monitor checks if an excessive current flows through the HP EGR cooler bypass DC-Motor (e.g. shunt circuit between load, HP EGR cooler bypass DC-Motor internal faults, etc).	Current flowing through the H-Bridge higher than a threshold (error information provided by HWIO)	> 6.3 [A]	Test enabled by calibration	==1.00	160.00 fail counts out of 200.00 sample counts Function task: 12.5 ms	Type B, 2 Trips
					System out of the cranking phase			
					PT relay supply voltage in range	> 11.00 [V]		
					No faults present on HP EGR Cooler Bypass DC Motor current range/ performance	CEB_MtrCurrLimTFTKO == FALSE		
					H-Bridge driver is ON			
					Diagnostic system enabled (no clear code or EOT in progress)			
					HWIO error status different from INDETERMINATE status			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Diesel Intake Air Flow Motor Overtempera tore	P1425	This monitor checks if the temperature of the Throttle DC-Motor increases too much (e.g. Throttle DC-Motor internal faults, etc).	H-Bridge driver temperature higher than a threshold (error information provided by HWIO)	> 170 [°C]	Test enabled by calibration System out of the cranking phase PT relay supply voltage in range Diagnostic system enabled (no clear code or EOT in progress) HWIO error status different from INDETERMINATE status	==1.00 >11.00 [V]	160.00 fail counts out of 200.00 sample counts Function task: 12.5 ms	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
EGR Temperature Sensed IAT Not Plausible	P1428	The power up temperatue varies too much from reference sensor after long soak	if the power up initial value of the temp sensor varies more than allowed from the reference temp sensor	Temperature Delta from MAT at powerup > 20 °C	Engine soak (not run) time No P codes Ambient Temperature with hysteresis	>= 28,800.00 Sec P262B P0111 P0114 P010B P00E9 P117D P017C P017D P017B P117B P117F P117E P117C P0116 P0117 P0118 P111E P0128 P0119 > -20.00 0.00	NA	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
EGR Temperature Sensor2 IAT Not Plausible	P142A	The power up temperatue varies too much from reference sensor after long soak	if the power up initial value of the temp sensor varies more than allowed from the reference temp sensor	Temperature Delta from MAT at powerup > 20 °C	Engine soak (not run) time No P codes Ambient Temperature with hysteresis	>= 28,800.00 Sec P262B P0111 P0114 P010B P00E9 P117D P017C P017D P017B P117B P117F P117E P117C P0116 P0117 P0118 P111E P0128 P0119 >-20.00 0.00	NA	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Exhaust Gas Recirculation Cooler Bypass Valve Supply Circuit (ECB DC Motor)	P1438	This monitor checks if the HP EGR cooler bypass DC-Motor is correctly supplied	System voltage supply lower than a threshold (error information provided by HWIO)	< 6 [V]	Test enabled by calibration	==1.00	160.00 fail counts out of 200.00 sample counts Function task: 12.5 ms	Type B, 2 Trips
					System out of the cranking phase			
					PT relay supply voltage in range	> 11.00 [V]		
					Diagnostic system enabled (no clear code or EOT in progress)			
					HWIO error status different from INDETERMINATE status			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Particulate Matter Sensor Electrode Supply Circuit Open	P1474	This diagnosis detects an open circuit on the soot sensor electrode supply line	Diagnosis executed in Soot Sensor Control Unit: Soot Sensor Electode supply voltage signal (i.e. measured ADC voltage for electrode current)	< 0.3 V	Soot Sensor Control Unit conditions: Battery Voltage Soot Sensor Electrode Supply Voltage ECU conditions: Ignition voltage in range Soot Sensor bus relay is commanded on No electrical fault active on Soot Sensor bus relay No faults of CAN communication loss with Soot Sensor Key is turned on Engine not in cranking mode Fault not active on undervoltage for Soot Sensor Control Unit supply	>9 V = 45,6V > 11.00 NOT(SBR_RlyFA) NOT(U02A3) NOT(P24DO)	Time counter: 21.00 consecutive failures OR 40.00 failures out of 80.00 samples 100 ms/sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Particulate Matter Sensor Electrode Supply Circuit Low	P1475	This diagnosis detects a short to ground on the soot sensor electrode supply line	Diagnosis executed in Soot Sensor Control Unit: Soot Sensor Electrode supply voltage	U < 41.55 V OR U > 49.72 V	Soot Sensor Control Unit conditions: Battery voltage Soot Sensor Electrode High Voltage Enabled ECU conditions: Ignition voltage in range Soot Sensor bus relay is commanded on No electrical fault active on Soot Sensor bus relay No faults of CAN communication loss with Soot Sensor Key is turned on Engine not in cranking mode Fault not active on undervoltage for Soot Sensor Control Unit supply	> 9 V > 11.00 NOT(SBR_RlyFA) NOT(U02A3) NOT(P24DO)	Time counter: 22.00 consecutive failures OR 42.00 failures out of 84.00 samples 100 ms/sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Particulate Matter Sensor Electrode Supply Circuit High	P1476	This diagnosis detects a short to power on the soot sensor electrode supply line	Diagnosis executed in Soot Sensor Control Unit:		Soot Sensor Control Unit conditions:		Time counter: 6.00 consecutive failures OR 15.00 failures out of 20.00 samples 100 ms/sample	Type B, 2 Trips
			Soot Sensor Electrode voltage signal (measured ADC voltage for electrode current)	>4.7 V	Soot Sensor Electrode Voltage Disabled			
					ECU conditions:			
					Soot Sensor bus relay is commanded on			
					No electrical fault active on Soot Sensor bus relay	NOT(SBR_RlyFA)		
					No faults of CAN communication loss with Soot Sensor	NOT(U02A3)		
					Fault not active on undervoltage for Soot Sensor Control Unit supply	NOT(P24DO)		
			Diagnosis executed in Soot Sensor Control Unit:		Soot Sensor Control Unit conditions:		Time counter: 6.00 consecutive failures OR 15.00 failures out of 20.00 samples 100 ms/sample	
			Soot Sensor Electrode supply voltage	>2 V	Soot Sensor Electrode Voltage Disabled			
					ECU conditions:			
					Soot Sensor bus relay is commanded on			
					No electrical fault active on Soot Sensor bus relay	NOT(SBR_RlyFA)		
					No faults of CAN communication loss with Soot Sensor	NOT(U02A3)		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Fault not active on undervoltage for Soot Sensor Control Unit supply	NOT(P24DO)		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Particulate Matter Sensor Shunt Circuit High Current	P147B	This diagnosis detects a no more efficient soot sensor	Soot Sensor Electrode raw current	> 6.70A	Key is turned on Ignition voltage in range Soot Sensor bus relay is commanded on No electrical fault active on Soot Sensor bus relay No faults of CAN communication loss with Soot Sensor No electrical fault detected on Soot Sensor Soot Sensor is in measurement phase Soot Sensor Electrode supply voltage Soot Sensor temperature Soot Sensor Electrode current measurement enabled Transmission fault with sensor control unit not present	 > 11.00 NOT(SBR_RlyFA) NOT(U02A3) NOT(SOT_ElecIFlt) 41.00 V < U < 50.00 V 200.00 °C < T < 425.00 °C NOT(P30BC)	No time debouce	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Diesel Particulate Filter Efficiency Below Threshold Bank 1 - (EWMA filter not used) - (SW 18.19 and beyond)	P2002	This diagnosis detects a cracked Diesel Particulate Filter	{The level of soot calculated by a prediction model is for certain time OR soot sensor current is for certain time} AND predicted soot sensor level averaged over a number of different diagnostic runs (>= 1 runs) is	>= 0.83 (0= no soot) > 0.10s >= 12.00 pA >=0.10s <0.82	Test enabled by calibration (TRUE-> enable FALSE -> disable) Ignition voltage in range for a time Engine running or engine cranking or in auto-stop phase No faults on soot sensor and faults which inhibit sensor to stay in measurement Engine out soot model realiable Note: the not reliability shall be verified for 1 s before to be declared No faults on downstream DPF temperature sensor or model No faults on downstream DPF mass airflow No faults on engine out soot model Ambient temperature During sensor measurement phase, Number of Autostop events During sensor	1.00 > 0.00 s NOT (SOT_SootSnsrFlt) NOT (EXM_PM_TurbFlowNotRI b) SOT_ExhTempSootSnsrV Id SOT_TotExhSootSnsrVld NOT (SOT_PM_DPF_UpFlt) > -6.70 °C < 20.00	The number of runs to perform the diagnostic test >= 1.00	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					measurement phase, Duration of Autostop phase	< 200.00 s		
					During sensor measurement phase, no heavy transient manoeuvers detected , i.e. the maximum fuel request during a transient manoeuver is	<=150.00		
					If EWMA filter is disabled (TRUE—> enable FALSE -> disable)	0.00 = 0 (false)		
					EGR rate signal is valid	NOT (INM_EGR_RateNotVld)		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Diesel Particulate Filter Over Temperature Bank (C_DPF_UI_ SCR_SCR2) (EGT3)	P200C	This diagnosis verify if the exahust gas temperature on DPF Upstream (EGT_DPF_Up) is above its maximum allowed temperature in applications with the following aftertreatment architecture: DOC - D P F - SCR - SCR2	**Excursion Event monitoring:** DPF Upstream Exhaust gas temperature	**In Regeneration mode:** > 800.00 [°C] **In Normal mode:** > 800.00 [°C]	Test enabled by calibration (TRUE-> enable FALSE -> disable) and with Battery voltage and with Engine running and with No fault on DPF Upstream Temperature sensor	1.00 [Boolean] > 11.00 [V] == TRUE [Boolean] EGT_SnsrDPF_UpFlt [Boolean]	In Normal mode: 300.00 fail samples out of 450.00 In Regeneration mode: 300.00 fail samples out of 450.00 Function task: 100ms	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			Extreme Event monitoring: DPF Upstream Exhaust gas temperature	> 900.00 [°C]	Test enabled by calibration (TRUE-> enable FALSE -> disable) and with Battery voltage and with Engine running and with No fault on DPF Upstream Temperature sensor	1.00 [Boolean] > 11.00 [V] == TRUE [Boolean] EGT_SnsrDPF_UpFlt [Boolean]	50.00 fail samples out of 70.00 samples Function task: 100ms	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Diesel Particulate Filter Over Temperature Bank (C_DPF_UI_ SCR_SCR2) (EGT4)	P200C	This diagnosis verify if the exahust gas temperature on DPF Downstream (EGT_DPF_Dwn) is above its maximum allowed temperature in applications with the following aftertreatment architecture: DOC - DPF - SCR - SCR2	**Excursion Event monitoring:** DPF Downstream Exhaust gas temperature	***In Regeneration mode:*** >800.00 [°C] **In Normal mode:** > 800.00 [°C]	Test enabled by calibration (TRUE-> enable FALSE -> disable) and with Battery voltage and with Engine running and with No fault on DPF Downstream Temperature sensor	1.00 [Boolean] > 11.00 [V] == TRUE [Boolean] EGT_SnsrDPF_DwnFit [Boolean]	**In Normal mode:** 300.00 fail samples out of 450.00 samples **In Regeneration mode:** 300.00 fail samples out of 450.00 samples Function task: 100ms	Type A, 1 Trips
			Extreme Event monitoring: DPF Downstream Exhaust gas temperature	> 900.00 [°C]	Test enabled by calibration (TRUE-> enable FALSE -> disable) and with Battery voltage and with Engine running and with	1.00 [Boolean] > 11.00 [V] == TRUE [Boolean] EGT_SnsrDPF_DwnFlt [Boolean]	50.00 fail samples out of 70.00 samples Function task: 100ms	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					No fault on DPF Downstream Temperature sensor			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Catalyst System Over Temperature Bank 1 (C_DPF_UI_SCR SCR2) (EGT2)	P200E	This diagnosis verifies if the exahust gas temperature on ccDOC Downstream (EGT_DOC1_Dwn) is above its maximum allowed temperature in applications with the following aftertreatment architecture: DOC-DPF-SCR-SCR2	**Excursion Event monitoring:** Exhaust gas temperature on ccDOC Downstream	**In Regeneration mode:** > 800.00 [°C] **In Normal mode:** > 800.00 [°C]	Test enabled by calibration (TRUE-> enable FALSE -> disable) and with Battery voltage and with Engine running and with No fault on ccDOC Downstream Temperature sensor (EGT2)	1.00 > 11.00 == TRUE EGT_SnsrCatDwnFlt	**In Normal mode:** 300.00 fail samples out of 450.00 samples **In Regeneration mode :** 300.00 fail samples out of 450.00 samples Function task: 100ms	Type A, 1 Trips
			Extreme Event monitoring: Exhaust gas temperature on ccDOC Downstream	> 900.00	Test enabled by calibration (TRUE-> enable FALSE -> disable) and with Battery voltage and with Engine running and with No fault on ccDOC Downstream	1.00 > 11.00 == TRUE EGT_SnsrCatDwnFlt	50.00 fail samples out of 70.00 samples Function task: 100ms	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Temperature sensor (EGT2)			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Exhaust gas temperature sensor (EGT) 2 out of range monitoring Low	P2032	Controller specific output driver circuit diagnoses t the exhaust gas temperature 2 (EGT2) sensor signal high sided driver for a short to ground failure when the output is powered on by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range during driver on state indicates short to ground failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for a short to ground.	< 158.00 [Ohm]	Test enabled by calibration (TRUE-> enable FALSE -> disable) and with Engine cranking and with Battery voltage and with key on	1 [Boolean] == FALSE > 11.00 [V] == TRUE	10 fail samples over 20 samples Function task: 100ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Exhaust gas temperature sensor (EGT) 2 out of range monitoring High	P2033	Controller specific output driver circuit diagnoses the exhaust gas temperature 2 (EGT2) signal high sided driver for a short to power failure when the output is powered off by comparing a voltage measurement to controller specific voltage thresholds. Controller specific output driver circuit diagnoses the exhaust gas temperature 2 (EGT2) signal high sided driver for an open circuit failure when the output is powered on by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range during driver on state indicates short to power failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for a short to power. Voltage measurement outside of controller specific acceptable range during driver on state indicates open circuit failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for an open circuit.	> 900.00 [Ohm]	Test enabled by calibration (TRUE-> enable FALSE -> disable) and with Engine cranking and with Battery voltage and with key on	1 [Boolean] == FALSE > 11.00 [V] ==TRUE	10 fail samples over 20 samples Function task: 100ms	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Exhaust gas temperature sensor (EGT) 1 quick change monitoring	P2081	This diagnosis verify if the EGT1 temperature sensor signal (difference between two consecutive signal samples) variation is too big	|EGT1 output reistance - EGT1 output resistance old|	> 10.00 [Ohm]	Test enabled by calibration and with Engine running and with Engine cranking and with Battery voltage and with key on and with No electrical faults on EGT1 sensor in and logic	1 [Boolean] == TRUE == FALSE > 11.00 [V] == TRUE EGT_ExhGas1_TFTKO and with EGT_ExhGas1_FA	15 fail samples out of 30 samples Function task: 100ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Exhaust gas temperature sensor (EGT) 2 quick change monitoring	P2085	This diagnosis verify if the EGT2 temperature sensor signal (difference between two consecutive signal samples) variation is too big	|EGT2 output reistance - EGT2 output resistance old|	>10.00 [Ohm]	Test enabled by calibration and with Engine running and with Engine cranking and with key on and with Battery voltage and with No electrical faults on EGT2 sensor in and logic	1 [Boolean] == TRUE == FALSE ==TRUE > 11.00 [V] EGT_ExhGas2_TFTKO and with EGT_ExhGas2_FA	15 fail samples out of 30 samples Function task: 100ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
02 Sensor Out of Range During Deceleration Bank 1 Sensor 1	P2297	This DTC aims to detect a drift of measured 02 value (A) from an estimated concentration (B) when the latter can be considered stable during overrun condition.	EWMA filtered error (A-B) in overrun condition is out of plausible range	> 2.00 [%] < -3.00 [%]	Engine running System voltage in range Sensor is fully operative No SQA learning is active Enabled in combustion mode No Exhaust Brake active i.e. intake manifold pressure No pending or confirmed DTCs	> 11.00 [V] OXY_NOx1_O2_RawNotRib == FALSE FAD_SQA_LrnET_Enbl == FALSE refer to supporting table (**KaOXYD_b_NOx1OvrnChkCmbModeEnbl**) < 1,000.00 [kPa] NOX_Snsr1_NotVld NOX_Snsr1_PresFlt OXY_O2_NOx1PlausMdlFit OXY_NOx1SignRngChkFlt FHPJnjLeakageFA EGR_PstnShtOffReqFA (MAF_MAF_SnsrFA AND MAF_MAF_SnsrTFTKO) (MAP_SensorFA AND	Once per trip Note: if EWMA Fast Initial Response is active OR EWMA Rapid Response is active than multiple tests per trip are allowed.	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
						MAP_SensorTFTKO)		
					Stable fuel cut-off condition has been reached i.e. following conditions are met for a calibrateable time:	> 3.50 [s]		
					a. Engine speed in operating range	> 700 [rpm] < 3,000 [rpm]		
					b. EGR position	< 5.00 [%]		
					c. No fuel injected			
					d. Air mass per cylinder in operating range	> 400.00 [mg] < 2,500.00 [mg]		
					Estimated 02 concentration stable i.e. difference between initial and actual value	< 0.50 [%]		
					Air mass flown since fuel cut-off condition	> 40.00 [g]		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
O2 Sensor Out of Range During Deceleration Bank 1 Sensor 2	P232F	This DTC aims to detect a drift of Sensor 2 O2 measured value (A) from Sensor 1 O2 measured value (B) when the latter can be considered stable during overrun condition.	EWMA filtered error (A - B) in overrun condition is out of plausible range	> 3.00 [%] < -3.00 [%]	Engine running		EWMA filtering: multiple tests per trip are allowed.	Type B, 2 Trips
					System voltage in range	> 11.00 [V]		
					Sensor is fully operative	OXY_O2_NOx2_PresCmpNotRIb ==FALSE		
					Sensor 1 is fully operative	OXY_O2_NOx1_PresCmpNotRIb == FALSE		
					No pending or confirmed DTCs	NOX_Snsr2_NotVld (MAF_SensorFA AND MAF_SensorTFTKO) OXY_NOx1_O2_Flt OXY_NOx2SignRngChkFlt NOX_Snsr2_PresFlt		
					DTC P2297 is running	(see P2297 Fault code)		
					Air mass flown since P2297	> 30.00 [g]		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Exhaust gas temperature sensor (EGT) 3 out of range monitoring Low	P242C	Controller specific output driver circuit diagnoses t the exhaust gas temperature 3 (EGT3) sensor signal high sided driver for a short to ground failure when the output is powered on by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range during driver on state indicates short to ground failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for a short to ground.	<158.00 [Ohm]	Test enabled by calibration and with Engine cranking and with Battery voltage and with key on	1 [Boolean] == FALSE > 11.00 [V] ==TRUE	10 fail samples over 20 samples Function task: 100ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Exhaust gas temperature sensor (EGT) 3 out of range monitoring High	P242D	Controller specific output driver circuit diagnoses the exhaust gas temperature 3 (EGT3) signal high sided driver for a short to power failure when the output is powered off by comparing a voltage measurement to controller specific voltage thresholds. Controller specific output driver circuit diagnoses the exhaust gas temperature 3 (EGT3) signal high sided driver for an open circuit failure when the output is powered on by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range during driver on state indicates short to power failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for a short to power. Voltage measurement outside of controller specific acceptable range during driver on state indicates open circuit failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for an open circuit.	> 900.00 [Ohm]	Test enabled by calibration and with Engine cranking and with Battery voltage and with key on	1 [Boolean] == FALSE > 11.00 [V] ==TRUE	10 fail samples over 20 samples Function task: 100ms	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Exhaust gas temperature sensor (EGT) 3 quick change monitoring	P242E	This diagnosis verify if the EGT3 temperature sensor signal (difference between two consecutive signal samples) variation is too big	|EGT3 output reistance - EGT3 output resistance old|	>10.00 [Ohm]	Test enabled by calibration	1 [Boolean]	15 fail samples out of 30 samples Function task: 100ms	Type B, 2 Trips
					and with			
					Engine running	== TRUE		
					and with			
					Engine cranking	== FALSE		
					and with			
					key on	==TRUE		
					and with			
					Battery voltage	> 11.00 [V]		
					and with			
					No electrical faults on EGT3 sensorin and logic	EGT_ExhGas3_TFTKO and with EGT_ExhGas3_FA		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Diesel Particulate Filter Differential Pressure Too Low - (SW 18.19 and beyond)	P244A	This diagnostic detects a DPF pressure sensor pipe disconnected or clogged or blocked or a removed Diesel Particulate Filter	measured DPF absolute pressure	< **Exhaust Gas Pressure Too Low Threshold**	Test enabled by calibration (TRUE-> enable FALSE -> disable)	1.00	60.00 failures over 120.00 samples function task: 100 ms	Type A, 1 Trips
					No error on relative to ambient pressure sensor (electrical, rationality and offset)	EGP_DiffPresSnsrRatFlt		
					No error on upstream DPF temperature sensor (electrical and rationality)	EGT_SnsrDPF_UpFlt		
					No error on air flow meter	MAF_MAF_SnsrFA OR MAF_MAF_SnsrTFTKO		
					No error on atmospheric pressure sensor	AmbPresDfltdStatus= CeAAPR_e_AmbPresNotDfltd		
					Exhaust gas volume flow	> 125.00 l/s		
					Engine speed	> 800.00 rpm		
					(Engine coolant temperature	> 40.00 °C		
					OR	OR		
					OBD Coolant Enable Criteria)	= TRUE)		
					Pipe Icing Risk Low	==TRUE		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Particulate filter pressure sensor offset monitoring - 18.21	P2452	This diagnosis verify if the pressure at the DPF inlet measured at the beginning of the driving cycle (when engine is not running), is too big (sensor offset too big)	|Average DPF pressure ©beginning of driving cycle|	2 [%]	Test enabled by calibration and with key on and with minimum engine-off time and with Minimum engine not No fault on engine off Timer and with Pipe Icing Risk Low No fault on exhaust gas pressure sensor (electrical, quick change and stuck in range in and logic)	1 [Boolean] ==TRUE >21,600.00 [sec] >0.02 [sec] **EMD_EngModeNotRunTmErr** ==TRUE Units: [-] EGP_DiffPresQckChgFlt and with EGP_DiffPresSnsrCktFlt and with EGP_DiffPresSnsrRatFlt	No debounce Function task: 12.5 ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Particulate filter pressure sensor plausibility monitoring - 18.21	P2453	Casel: This diagnosis verify if the current value of the flow resistace is almost equal to the average value of the flow resistance Case2: This diagnosis verify if the pressure at the DPF inlet doesn't change when it is supposed to change (when moving from one engine operating point to another)	|Flow resistance filtered - Average flow resistance|>	> 0.02 [KPa*s/m^3]	Test enabled by calibration and with Engine running and with Engine cranking and with key on and with Battery voltage and with No fault on exhaust gas pressure sensor (electrical, offset, quick change and stuck in range in and logic) and with No fault on air flow meter in and logic and with No fault on DPF Upstream temperature	0 [Boolean] == TRUE == FALSE ==TRUE > 11.00 [V] EGP_DiffPresOfstTFTKO and with EGP_DiffPresQckChgFlt and with EGP_DiffPresSnsrCktFlt and with EGP_DiffPresStkFltPresent MAF_SensorFA and with MAF_SensorTFTKO EGT_SnsrDPF_UpFA and with	40 fail samples out of 80 samples Function task: 12.5 ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					sensor (electrical, rationality, quick change and stuck in range in and logic) and with **System in stationary conditions:** - Fuel request and with - Engine speed and with -Air mass quantity per cylinder and with -Air mass quantity per cylinder and with - Deactivation of Flow resistance calculation	EGT_SnsrDPF_UpTFTK 0 <=1.00 [mm^3] <=10.00 [rpm] <= 10.00 [mg] >0.00 [mg] == FALSE		
			DPF pressure variation	<= 0.15[%]	Test enabled by calibration and with Engine running and with No fault on exhaust gas pressure sensor (electrical, plausibility,	1 == TRUE EGP_DiffPresOfstTFTKO and with EGP_DiffPresQckChgFlt	15 fail samples out of 20 samples Function task: 12.5 ms	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					offset and quick change in and logic)	and with EGP_DiffPresSnsrCktFlt and with EGP_DiffPresStkFltPresent		
					and with			
					Engine speed variation greater	>300.00 [rpm/s]		
					and with	==TRUE Units: [-]		
					Pipe Icing Risk low	>20.00 [l/s]		
					Fuel quantity variation greater			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Particulate filter pressure sensor out of range monitoring Low - 18.19	P2454	Controller specific output driver circuit diagnoses the relative to ambient pressure sensor signal s high sided driver for a short to ground failure when the output is powered on by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range during driver on state indicates short to ground failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for a short to ground.	<3.00 [%]	Test enabled by calibration and with Engine running and with Engine cranking and with key on and with Battery voltage	1 [Boolean] == TRUE == FALSE ==TRUE > 11.00 [V]	160 fail samples out of 250 samples Function task: 12.5 ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Particulate filter pressure sensor out of range monitoring High - 18.19	P2455	Controller specific output driver circuit diagnoses the relative to ambient pressure sensor signal high sided driver for a short to power failure when the output is powered off by comparing a voltage measurement to controller specific voltage thresholds. Controller specific output driver circuit diagnoses the relative to ambient pressure sensor signal high sided driver for an open circuit failure when the output is powered on by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range during driver on state indicates short to power failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for a short to power.	> 97.00 %	Test enabled by calibration and with Engine running and with Engine cranking and with key on and with Battery voltage	1 [Boolean] == TRUE == FALSE ==TRUE > 11.00 [V]	160 fail samples out of 250 samples Function task: 12.5 ms	Type A, 1 Trips
			Voltage measurement outside of controller specific acceptable range during driver on state indicates open circuit failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for an open circuit.	> 97.00 %	Test enabled by calibration and with Engine running and with Engine cranking and with key on and with Battery voltage	1 [Boolean] == TRUE == FALSE ==TRUE > 11.00 [V]	160 fail samples out of 250 samples Function task: 12.5 ms	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Particulate filter pressure sensor quick change monitoring - 18.19	P2456	This diagnosis verify if the signal (difference between two consecutive signal samples) variation is too big	|DPF pressure raw signal - DPFpressure raw signal old|	> 20.00 %	Test enabled by calibration and with Engine running and with Engine cranking and with key on and with Battery voltage and with No electrical fault on exhaust gas pressure sensor	1 [Boolean] == TRUE == FALSE == TRUE > 11.00 [V] EGP_DiffPresSnsrCktFlt	40 fail samples out of 170 samples Function task: 12.5 ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Exhaust Gas Recirculation Cooling System Performance (OBDII market only) (non-MDE applications)	P2457	This monitor checks the HP EGR Cooler efficiency deterioration, that would cause vehicle's emissions to exceed specific emission levels.	HP EGR Cooler Efficiency (averaged over a calibrate-able cumulative transient time) is compared with a threshold. HP EGR Cooler efficiency is computed as the ratio between (HP EGR cooler upstream temperature - HP EGR cooler downstream temperature) and (HP EGR cooler upstream temperature - Engine coolant temperature).	< 72.61 [%]	Calibration on diagnostic enabling	1.00==TRUE	Test executed after 1,000.00 samples are collected and their average is computed	Type B, 2 Trips
					Diagnostic has not run in current driving cycle yet	==TRUE		
					PT Relay voltage in range	Powertrain relay voltage > 11.00 [V]	functional task 100 ms	
					Engine is running or cranking	==TRUE		
					HP EGR cooler upstream temperature in range	>95.00 [°C] <760.00 [°C]		
					Ambient Temperature	>=-6.70 [°C]		
					Ambient pressure	>=75.00 [kPa]		
					Air Control is Active	Refer to "Air Control Active" Free Form		
					Engine Coolant Temperature (OR OBD Coolant Enable Criteria), AND Engine Coolant Temperature	>70.00 [°C] ==TRUE <130.00 [°C]		
					HP EGR Cooler bypass	>3.00 [s]		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					not active for a time			
					Time after combustion mode change	>0.00 [s]		
					HP EGR filtered flow in range	< **P2457: Maximum HP EGR filtered flow for HP EGR cooler efficiency monitor enabling** [g/s] > **P2457: Minimum HP EGR filtered flow for HP EGR cooler efficiency monitor enabling** [g/s]		
					for a time	>= **P2457: Minimum time for HP EGR cooler efficiency monitor enabling** [s]		
					HP EGR flow estimation is valid	EGR_VlvTotFlowNotValid ==FALSE		
					Engine speed in range	<3,000.00 [rpm] >1,000.00 [rpm]		
					No fault on HP EGR cooler upstream temperature sensor	CET_UPSS_FA==FALSE		
					No fault on HP EGR	CET_DNSS_FA==FALSE		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					cooler downstream temperature sensor			
					No fault on Ambient Temperature sensor	OAT_PtEstFiltFA ==FALSE		
					No fault on ambient pressure sensor	AAP_AmbientAirPresDfltd ==FALSE		
					No fault on engine coolant temperature sensor	ECT_Sensor_FA ==FALSE		
					No fault on engine speed	CrankSensor_FA ==FALSE		
					No fault on HP EGR Cooler Bypass	CEB_ActrCktLoFA ==FALSE		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Diesel Particulate Filter Regeneration Frequency - SW 18.21 w/o EWMA filter	P2459	This diagnostic detects a too high DPF regeneration frequency due to inefficient combustion, inefficient regeneration, soot overestimated by models or leaks in the exhaust or the intake line. When a new regeneration is started, the diagnostic computes a ratio between the soot level estimated by the model that has triggered the regeneration and the soot level estimated by the Nominal Engine Out soot model, which gives information about the expected soot level in the DPF. If the ratio is greater than a threshold, the diagnostic will report a fail. In case the regeneration is started based on miles travelled or time passed since last regeneration, the diagnostic will always report a pass.	When the regeneration is started by a soot model, the ratio between the soot level from that model and the soot level estimated by the Nominal Engine Out model is	> 6.70	Test enabled by calibration A new DPF regeneration is started At least one successful regeneration has already occurred The previous regeneration was completed successfully The regeneration is requested at service Just before the new regeneration is started, Delta Pressure (Ap) soot model was valid for a time (*) Delta Pressure (Ap) plus Configurable Correction Block (CCB) soot model was valid for a fraction of the soot loading time (*) The Nominal Engine Out soot model was valid for a fraction of the soot loading time (**)	1.00 == TRUE == TRUE == TRUE == FALSE >= 0.00 s >=0.20 >=0.20	No time required, the malfunction criteria are evaluated as soon as a new DPF regeneration is started. Function task: 100 ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Run/crank voltage Extreme transient engine operation was not detected, i.e. the delta fuel request during the soot loading time was *(*) Condition is ignored if the regeneration is not triggered by this model* *(**) Condition is ignored if the regeneration is started based on miles or time since last regeneration*	>11.00V < 255.00 mm3/s		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Exhaust Gas Recirculation Cooler Bypass Valve Control Circuit (ECB DC Motor)	P245A	This monitor checks if the HP EGR cooler bypass valve commands are in open circuit	Load resistance higher than a threshold (error information provided by HWIO)	> 200 [kOhm]	Test enabled by calibration	==1.00	160.00 fail counts out of 200.00 sample counts Function task: 12.5 ms	Type B, 2 Trips
					System out of the cranking phase			
					PT relay supply voltage in range	>11.00 [V]		
					H-Bridge driver is OFF			
					Valve requested in a position different from fully closed (default position)			
					Diagnostic system enabled (no clear code or EOT in progress)			
					HWIO error status different from INDETERMINATE status			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Exhaust Gas Recirculation Cooler Bypass Valve Performance (ECB DC Motor)	P245B	This monitor detects an obstruction on the actuator (obstruction found during the HP EGR Cooler Bypass valve opening or closing) checking the setpoint position against the position measured by the HP EGR Cooler Bypass Position Sensor	|HP EGR Cooler Bypass Position Tracking Error| (setpoint position - measured position) > maximum threshold	> 16.00 [%]	Cold Start strategy NOT enabled Test enabled by calibration Diagnostic system enabled (no clear code or EOT in progress) System out of the cranking phase PT relay supply voltage in range HP EGR Cooler Bypass position closed loop control active (no faults present on HP EGR Cooler Bypass position sensor, HP EGR Cooler Bypass flap, HP EGR Cooler Bypass position control deviation) HP EGR Cooler Bypass position setpoint in steady state conditions for minimum time Engine coolant temperature higher or	==TRUE ==1.00 >11.00 [V] CEB_PstnSnsrFlt ==FALSE CEB_ActrFlt==FALSE CEB_ObstructionTFTKO ==FALSE <160.00 [%/s] >-160.00 [%/s] for >=0.40 [s] >=50.00 [°C]	1,280.00 fail counts out of 1,600.00 sample counts 1,280.00 fail counts to enable the open circuit check (P245A) Function task: 6.25 ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					equal to minimum threshold OR Engine cooling system target temperature reached (thermostat opening)			
					No faults present on engine coolant temperature sensor	ECT_Sensor_FA ==FALSE		
					Outside air temperature higher or equal to minimum threshold	>=-23.00 [°C]		
					No faults present on outside air temperature sensor	OAT_PtEstFiltFA ==FALSE		
					No mechanical stop soft approach in progress			
					No anti-sticking procedure in progress			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Diesel Particulate Filter Soot Accumulation-(SW 18.19 and beyond)	P2463	This diagnostic detects a clogged DPF needing to be regeneration at service	Soot model based on Delta pressure measure plus configurable correction block (CCB)	> 160.00	Test enabled by calibration (TRUE-> enable FALSE -> disable)	1.00	120.00 failures over 150.00 samples function task: 100 ms	Type A, 1 Trips
					No fault on DPF pressure sensor (electrical, rationality and offset)	EGPJDiffPresSnsrFlt		
					No fault on upstream DPF temperature sensor (electrical and rationality)	EGT_SnsrDPF_UpFlt		
					No fault on air flow meter	MAF_MAF_SnsrFAOR MAF_MAF_SnsrTFTKO		
					No fault on atmospheric pressure sensor	AmbPresDfltdStatus = CeAAPR_e_AmbPresNotDfltd		
					DPF status insootloading phase (no regeneration ongoing)	DPF_DPF_St== CeDPFR_e_SootLoading		
					Engine speed	> 800.00 [rpm]		
					No fault on exhaust mass flow estimation	EXF_TotExhDPF_UpFA		
					Exhaust gas volume flow greater than a calibrateable threshold for more than a calibratable time	> 70.00 [l/s] for > 2.00 [s]		
					Exhaust gas temperature at DPF inlet is between two thresholds for a minimum calibrateable time	150.00 [DegC] < Temperature < 700.00 [DegC] for > 25.00 [s]		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Engine Coolant Temperature	> -40.00 [DegC]		
					Ambient Temperature	> -40.00 [DegC]		
					Soot model based on Delta Pressure plus configurable correction block (CCB) is valid for a time	> = 0.20 % of the soot loading		
					Soot model based on Delta Pressure is always valid for a time	>= 30.00 s		
					Distance since last completed regeneration	> -1.00 km		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Exhaust gas temperature sensor (EGT) 4 out of range monitoring Low	P2470	Controller specific output driver circuit diagnoses t the exhaust gas temperature 4 (EGT4) sensor signal high sided driver for a short to ground failure when the output is powered on by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range during driver on state indicates short to ground failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for a short to ground.	<158 [Ohm]	Test enabled by calibration and with Engine cranking and with Battery voltage and with key on	1 [Boolean] == FALSE >11.00 [V] == TRUE	10 fail samples over 20 samples Function task: 100ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Exhaust gas temperature sensor (EGT) 4 out of range monitoring High	P2471	Controller specific output driver circuit diagnoses the exhaust gas temperature 4 (EGT4) signal high sided driver for a short to power failure when the output is powered off by comparing a voltage measurement to controller specific voltage thresholds. Controller specific output driver circuit diagnoses the exhaust gas temperature 4 (EGT4) signal high sided driver for an open circuit failure when the output is powered on by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range during driver on state indicates short to power failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for a short to power.	> 900 [Ohm]	Test enabled by calibration and with Engine cranking and with Battery voltage and with key on	1 [Boolean] == FALSE > 11.00 [V] == TRUE	10 fail samples over 20 samples Function task: 100ms	Type A, 1 Trips
			Voltage measurement outside of controller specific acceptable range during driver on state indicates open circuit failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for an open circuit.	> 900 [Ohm]	Test enabled by calibration and with Engine cranking and with Battery voltage and with key on	1 [Boolean] == FALSE > 11.00 [V] == TRUE	10 fail samples over 20 samples Function task: 100ms	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Exhaust gas temperature sensor (EGT) 4 quick change monitoring	P2472	This diagnosis verify if the EGT4 temperature sensor signal (difference between two consecutive signal samples) variation is too big	|EGT4output reistance - EGT4 output resistance old|	>10.00 [Ohm]	Test enabled by calibration and with Engine running and with Engine cranking and with Battery voltage and with key on and with No electrical faults on EGT4 sensorin and logic	1 [Boolean] == TRUE == FALSE > 11.00 [V] == TRUE EGT_ExhGas4_TFTKO and with EGT_ExhGas4_FA	15 fail samples out of 30 samples Function task: 100ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Exhaust gas temperature sensor (EGT) 5 out of range monitoring Low	P2481	Controller specific output driver circuit diagnoses t the exhaust gas temperature 5 (EGT5) sensor signal high sided driver for a short to ground failure when the output is powered on by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range during driver on state indicates short to ground failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for a short to ground.	< 158 [Ohm]	Test enabled by calibration (TRUE-> enable FALSE -> disable) and with Engine cranking and with Battery voltage and with key on	1 [Boolean] == FALSE > 11.00 [V] == TRUE	10 fail samples over 20 samples Function task: 100ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Exhaust gas temperature sensor (EGT) 5 out of range monitoring High	P2482	Controller specific output driver circuit diagnoses the exhaust gas temperature 5 (EGT5) signal high sided driver for a short to power failure when the output is powered off by comparing a voltage measurement to controller specific voltage thresholds. Controller specific output driver circuit diagnoses the exhaust gas temperature 5 (EGT5) signal high sided driver for an open circuit failure when the output is powered on by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range during driver on state indicates short to power failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for a short to power.	> 900 [Ohm]	Test enabled by calibration and with Engine cranking and with Battery voltage and with key on	1 [Boolean] == FALSE > 11.00 [V] == TRUE	10 fail samples over 20 samples Function task: 100ms	Type A, 1 Trips
			Voltage measurement outside of controller specific acceptable range during driver on state indicates open circuit failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for an open circuit.	> 900 [Ohm]	Test enabled by calibration and with Engine cranking and with Battery voltage and with key on	1 [Boolean] == FALSE > 11.00 [V] == TRUE	10 fail samples over 20 samples Function task: 100ms	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Exhaust gas temperature sensor (EGT) 5 quick change monitoring	P2484	This diagnosis verify if the EGT5 temperature sensor signal (difference between two consecutive signal samples) variation is too big	|EGT5 output reistance - EGT5 output resistance old|	>10.00 [Ohm]	Test enabled by calibration and with Engine running and with Engine cranking and with Battery voltage and with key on and with No electrical faults on EGT1sensorin and logic	1 [Boolean] == TRUE == FALSE > 11.00 [V] == TRUE EGT_ExhGas5_TFTKO and with EGT_ExhGas5_FA	15 fail samples out of 30 samples Function task: 100ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Exhaust Gas Recirculation Cooler Bypass Valve Position Sensor Circuit Low (analog position sensor)	P2494	This monitor checks if the HP EGR cooler bypass position analog sensor is out of electrical range low	analog position raw voltage < low threshold	< 1.00 [%5V]	Test enabled by calibration System out of the cranking phase PT relay supply voltage in range	= 1.00 >11.00 [V]	200.00 fail counts out of 250.00 sample counts Function task: 6.25 ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Exhaust Gas Recirculation Cooler Bypass Valve Position Sensor Circuit High (analog position sensor)	P2495	This monitor checks if the HP EGR cooler bypass position analog sensor is out of electrical range high	analog position raw voltage > high threshold	> 99.00 [%5V]	Test enabled by calibration System out of the cranking phase PT relay supply voltage in range	= 1.00 >11.00 [V]	200.00 fail counts out of 250.00 sample counts Function task: 6.25 ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Closed Loop DPF Regeneration Control At Limit - Temperature Too Low (SW 18.22 and beyond)	P24A0	DPF Control Temperature Deviation diagnostic monitors diagnostic mthe exhaust gas temperature onitordsownstream the 1st ccDOC to determine whether the temperature deviation between the control setpoint and the temperature read by the sensor is within a prescribed deviation range. Temperature deviation diagnostic shall diagnose a too low temperature, that means a Positive temperature deviation temperature. The diagnosis runs during regeneration mode and when the temperature closed loop is active. The monitoring is divided into 2 logics, in particular the DPF warm up state logic and the DPF steady state logic.	**LowTemperature monitoring (Positive Deviation):** **(c1)** Temperature ccDOC Downstream control setpoint - ccDOC Downstream sensor reading (EGT2) **(c2)** Temperature DPF Upstream control setpoint - DPF Upstream sensor reading (EGT3)	 >100.00 degC	Test shall be enabled by calibratable flag Regeneration state in warm up DPF Mode DPF temperature closed loop control shall be enabled Battery voltage No fault on exhaust mass flow **(c1)** No Fault on ccDOC Downstream temperature sensor **(c2)** No Fault on DPF Upstream temperature sensor Combustion mode different from LNT Desox Lean and LNT Engine Protection Temperature deviation monitoring shall be enabled by a boolean flag. The boolean flag shall be the output of a map function of engine	1.00 [Boolean] DPF_DPF_St== WarmJJp EGT_DsblCL== Enable temperature Closed loop control [Boolean] > 11.00 [V] EXM_TurbFlowNotValid [Boolean] EGT_SnsrCatDwnFlt [Boolean] EGT_SnsrDPF_UpFlt [Boolean] **EnginePointEnable_DPF _TempDeviation** [Boolean]	1,500.00 fail samples out of 1,850.00 samples Function task: 100ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					speed and fuel request			
					Exhaust mass flow AND	< 250.00 [g/s]		
					Exhaust mass flow	> 8.00 [g/s]		
					Filtered Exhaust mass flow variation (absolute value)	< 150.00 [g/s]		
					The system shall not be in cut off for a calibratable timer.	< 30.00 [sec]		
					No fault on ambient temperature sensor (only SCR forward architecture)	OAT_PtEstFiltFA		
					No fault on ambietnt pressure sensor (only SCR forward architecture)	AAP_AmbientAirPresDfltd AND AAP_AmbPresSnsrTFTKO		
					All the above enabling conditions met for at least a calibratable timer	> 10.00 [sec]		
			Low Temperature monitoring (Positive Deviation):		Test shall be enabled by calibratable flag	1.00 [Boolean]	1,500.00 fail samples out of 1,850.00 samples Function task: 100ms	
			(c1) Temperature ccDOC Downstream control setpoint - ccDOC Downstream	>100.00 degC	Regeneration state in Steday state DPF Mode	DPF_DPF_St== Steady state		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			sensor reading (EGT2) **(c2)** Temperature DPF Upstream control setpoint - DPF Upstream sensor reading (EGT3)		DPF temperature closed loop control shall be enabled	EGTJDsblCL == Enable temperature Closed loop control [Boolean]		
					Battery voltage	> 11.00 [V]		
					No fault on exhaust mass flow	EXM_TurbFlowNotValid [Boolean]		
					(c1) No Fault on ccDOC Downstream temperature sensor	EGT_SnsrCatDwnFlt [Boolean]		
					(c2) No Fault on DPF Upstream temperature sensor	EGT_SnsrDPF_UpFlt [Boolean]		
					Combustion mode different from LNT Desox Lean and LNT Engine Protection			
					Temperature deviation monitoring shall be enabled by a boolean flag. The boolean flag shall be the output of a map function of engine speed and fuel request	**EnginePointEnable_DPF _TempDeviation** [Boolean]		
					Exhaust mass flow AND	< 250.00 [g/s]		
					Exhaust mass flow	> 8.00 [g/s]		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Filtered Exhaust mass flow variation (absolute value)	< 150.00 [g/s]		
					The system shall not be in cut off for a calibratable time	< 30.00 [sec]		
					No fault on ambient temperature sensor (only SCR forward architecture)	OAT_PtEstFiltFA		
					No fault on ambietnt pressure sensor (only SCR forward architecture)	AAP_AmbientAirPresDfltd AND AAP_AmbPresSnsrTFTKO		
					All the above enabling conditions met for at least a calibratable timer	> 3.00 [sec]		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Closed Loop DPF Regeneration Control At Limit - Temperature Too High (SW 18.22 and beyond)	P24A1	DPF Control Temperature Deviation diagnostic monitors the exhaust gas temperature downstream the 1st ccDOC to determine whether the temperature deviation between the control setpoint and the temperature read by the sensor is within a prescribed deviation range. Temperature deviation diagnostic shall diagnose a too high temperature, that means a Negative temperature deviation temperature. The diagnosis runs during regeneration mode and when the temperature closed loop is active. The monitoring runs only in DPF steady state logic.	**Hi Temperature monitoring (Negative Deviation):** **(c1)** Temperature ccDOC Downstream control setpoint - ccDOC Downstream sensor reading (EGT2) **(c2)** Temperature DPF Upstream control setpoint - DPF Upstream sensor reading (EGT3)	 < -100.00 degC	Test shall be enabled by calibratable flag Regeneration state in Steday state DPF Mode DPF temperature closed loop control shall be enabled Battery voltage No fault on exhaust mass flow **(c1)** No Fault on ccDOC Downstream temperature sensor **(c2)** No Fault on DPF Upstream temperature sensor Temperature deviation monitoring shall be enabled by a boolean flag. The boolean flag shall be the output of a map function of engine speed and fuel request Exhaust mass flow AND	1.00 [Boolean] DPF_DPF_St== Steady state EGT_DsblCL== Enable temperature Closed loop control [Boolean] > 11.00 [V] EXM_TurbFlowNotValid [Boolean] EGT_SnsrCatDwnFlt [Boolean] EGT_SnsrDPF_UpFlt [Boolean] **EnginePointEnable_DPF_TempDeviation** [Boolean] < 250.00 [g/s]	50.00 fail samples out of 60.00 samples Function task: 100ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Exhaust mass flow	> 8.00 [g/s]		
					Filtered Exhaust mass flow variation (absolute value)	< 150.00 [g/s]		
					The system shall not be in cut off for a calibratable timer.	< 30.00 [sec]		
					No fault on ambient temperature sensor (only SCR forward architecture)	OAT_PtEstFiltFA		
					No fault on ambietnt pressure sensor (only SCR forward architecture)	AAP_AmbientAirPresDfltd AND AAP_AmbPresSnsrTFTKO		
					All the above enabling conditions met for at least a calibratable timer	> 3.00 [sec]		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Exhaust Gas Recirculation Cooler Bypass Valve Control Stuck (ECB DC Motor)	P24A5	This monitor detects the HP EGR Cooler Bypass mechanically stuck in a certain position different from its defaulted position (fully closed, cooling mode) when the actuator is no longer driven (missing dafaulted position)	Measured HP EGR Cooler Bypass position > maximum threshold (not cooling position)	>15.00 [%]	P245B is already set		No debounce is present: DTC sets as soon as the error is present Function task: 6.25 ms	Type B, 2 Trips
					Waiting time after driver shut off > minimum threshold (needed for the spring to drive the vanes in their defaulted position)	>1.00 [s]		
					Diagnostic system enabled (no clear code or EOT in progress)			
					HP EGR Cooler Bypass position closed loop control active (no faults present on HP EGR Cooler Bypass position sensor, HP EGR Cooler Bypass flap, HP EGR Cooler Bypass position control deviation)	CEB_PstnSnsrFlt ==FALSE CEB_ActrFlt==FALSE CEB_ObstructionTFTKO ==FALSE		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Particulate Matter Sensor Circuit Range/ Performance	P24AF	This diagnosis detects a soot sensor memory corruption	Soot sensor sensitivity factor is	<-0.25 OR >0.25	Key is turned on Ignition voltage in range Soot Sensor bus relay is commanded on No electrical fault active on Soot Sensor bus relay No faults of CAN communication loss with Soot Sensor No electrical fault detected on Soot Sensor Transmission fault with sensor control unit not present	 > 11.00 NOT(SBR_RlyFA) NOT(U02A3) NOT(SOT_ElecIFlt) NOT(P30BC)	Time counter: 40.00 failures out of 80.00 samples 1000 ms/sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Particulate Matter Sensor Circuit Low	P24B0	This diagnosis detects an open circuit on the soot sensor electrode signal or a cracked electrode	Soot Sensor Electrode raw current 1 AND Soot Soot Electrode raw current measured at setpoint temperature 1 - Soot Soot Electrode raw current measured at setpoint temperature 2	< 2.00A < 0.09A	Ignition voltage in range Soot Sensor bus relay is commanded on No electrical fault active on Soot Sensor bus relay No faults of CAN communication loss with Soot Sensor Key is turned on No Electrical faults present on Soot Sensor Soot Sensor is in regeneration phase Soot Sensor temperature Soot Sensor Electrode current measurement enabled Transmission fault with sensor control unit not present	> 11.00 NOT(SBR_RlyFA) NOT(U02A3) NOT(SOT_EleclFlt) 560.00 < T < 800.00 °C NOT(P30BC)	No time debounce	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Particulate Matter Sensor Circuit High	P24B1	This diagnosis detects a short to power the soot sensor electrode signal	<u>Diagnosis executed in Soot Sensor Control Unit:</u> Soot Sensor Electrode supply voltage (measured ADC voltage for electrode current)	 >4.1 V	<u>Soot Sensor Control Unit conditions:</u> no conditions <u>ECU conditions:</u> Ignition voltage in range Soot Sensor bus relay is commanded on No electrical fault active on Soot Sensor bus relay No faults of CAN communication loss with Soot Sensor Key is turned on Engine not in cranking mode Fault not active on undervoltage for Soot Sensor Control Unit supply Soot sensor is not in regeneration status	> 11.00 NOT(SBR_RlyFA) NOT(U02A3) NOT(P24DO)	Time counter: 10.00 consecutive failures OR 18.00 failures out of 36.00 samples 100 ms/sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Particulate Matter Sensor Heater Control Circuit/Open	P24B3	This diagnosis detects an open circuit on the soot sensor heater line	<u>Diagnosis executed in Soot Sensor Control Unit:</u> Soot Sensor Heater current	1< 0.5AOR 1> 15A	<u>Soot Sensor Control Unit conditions:</u> Soot Sensor Heater Commanded on, i.e., heater duty cycle	>0%	Time counter: 20.00 consecutive failures OR 38.00 failures out of 76.00 samples 100 ms/sample	Type B, 2 Trips
					No Heater failures detected in the Sensor Control Unit			
					<u>ECU conditions:</u> Soot Sensor bus relay is commanded on			
					No electrical fault active on Soot Sensor bus relay	NOT(SBR_RlyFA)		
					No faults of CAN communication loss with Soot Sensor	NOT(U02A3)		
					Fault not active on undervoltage for Soot Sensor Control Unit supply	NOT(P24DO)		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Particulate Matter Sensor Heater Control Circuit Low	P24B5	This diagnosis detects a short to ground on the soot sensor heater line	Diagnosis executed in Sensor Control Unit: Soot Sensor Heater current	1< 0.5A OR 1> 15A	Soot Sensor Control Unit conditions: Soot Sensor Heater Commanded on, i.e., heater duty cycle	> 0 %	Time counter: 20.00 consecutive failures OR 38.00 failures out of 76.00 samples 100 ms/sample	Type B, 2 Trips
					No Soot Sensor Heater failures detected in the Sensor Control Unit			
					ECU conditions: Soot Sensor bus relay is commanded on			
					No electrical fault active on Soot Sensor bus relay	NOT(SBR_RlyFA)		
					No faults of CAN communication loss with Soot Sensor	NOT(U02A3)		
					Fault not active on undervoltage for Soot Sensor Control Unit supply	NOT(P24DO)		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Particulate Matter Sensor Heater Control Circuit High	P24B6	This diagnosis detects a short to power on the soot sensor heater line	Diagnosis executed in Soot Sensor Control Unit: Soot Sensor Heater current OR Soot Sensor Heater switch output (off state) OR Soot Sensor Heater switch input (off state)	> 0.2 A = 1 (for one of the last 5 measurements) = 1 (for one of the last 5 measurements)	Soot Sensor Control Unit conditions: Soot Sensor Heater Off ECU conditions: Ignition voltage in range Soot Sensor bus relay is commanded on No electrical fault active on Soot Sensor bus relay No faults of CAN communication loss with Soot Sensor Key is turned on Engine not in cranking mode Fault not active on undervoltage for Soot Sensor Control Unit supply	> 11.00 NOT(SBR_RlyFA) NOT(U02A3) NOT(P24DO)	Time counter: 10.00 consecutive failures OR 18.00 failures out of 36.00 samples 100 ms/sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Exhaust Gas Recirculation Cooler Bypass Valve Position Sensor Exceeded Learning Limit (analog position sensor)	P24C4	This monitor checks if the HP EGR cooler bypass position analog sensor has an offset with respect to the nominal position where the valve does the learning procedure (cooling position and bypass position)	analog position raw voltage when the valve is in cooling position < low threshold OR analog position raw voltage when the valve is in cooling position > high threshold OR analog position raw voltage when the valve is in bypass position < low threshold OR analog position raw voltage when the valve is in bypass position > high threshold	< 16.00 [%5V] OR > 24.00 [%5V] OR < 60.90 [%5V] OR > 91.40 [%5V]	Test enabled by calibration Learning procedure at key off in fully closed and fully open position has been successfully completed: - engine coolant in range; - no faults present on engine coolant temperature. No faults present on HP EGR cooler bypass position sensor, HP EGR cooler bypass valve, HP EGR cooler bypass position deviation End Of Trip event has elapsed	= 1.00 >= 70.00 [°C] <= 129.00 [°C] ECT_Sensor_FA == FALSE CEB_ActrFlt == FALSE CEB_PstnSnsrFlt == FALSE CEB_ObstructionTFTKO == FALSE	No debounce is present: DTC sets as soon as the error is present Function task: at key off	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Diesel Particulate Matter Sensor Temperature Circuit Performance	P24C7	This diagnosis detects a soot sensor removed from the exhaust line, a soot sensor temperature sensor damaged or a possible parassitic resistance on the wiring harness between the soot sensor heater and the soot sensor control unit.	The absolute value of the difference between the Soot Sensor Electrode and the electrode temperature model	>100.00 °C	Key is turned on Ignition voltage in range Soot Sensor bus relay is commanded on No electrical fault active on Soot Sensor bus relay No faults of CAN communication loss with Soot Sensor Engine in running mode No electrical fault detected on Soot Sensor Soot Sensor heater is not commanded Soot Sensor is in measurement operating status Exhaust gas temperature model is valid	> 11.00 NOT(SBR_RlyFA) NOT(U02A3) NOT(SOT_EleclFlt) SOT_ExhTempSootSnsrV ld AND SOT_TotExhSootSnsrVld AND NOT(OAT_PtEstFiltFA) AND AmbPresDfltdStatus = CeAAPR_e_AmbPresNot Dfltd AND NOT (VehicleSpeedSensor FA	Time counter: 250.00 failures out of 255.00 samples 100 ms/sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
						)		
					Exhaust gas temperature model is reliable, i.e.:	> 75.00 kPa		
					(Ambient air pressure	> -6.70 °C		
						> 50.00 mg/s		
					Ambient air temperature	>300.00 s		
						OR		
					Exhaust gas volumetric flow at soot sensor	> 100.00 °C		
					)	> 0.00 °C		
					Time after sensor regeneration	NOT(P30BC)		
					Temperature estimated by the sensor probe temperature model - Electrode temperature			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Temperature estimated by the sensor probe temperature model - Outside air temperature Transmission fault with sensor control unit not present			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Particulate Matter Sensor Temperature Circuit Low	P24C8	This diagnosis detects a short to ground on the soot sensor temperature signal	Diagnosis executed in Soot Sensor Control Unit: Voltage of Soot Sensor temperature meander (TM) signal	< 0.3 V	Soot Sensor Control Unit conditions: no conditions ECU conditions: Ignition voltage in range Soot Sensor bus relay is commanded on No electrical fault active on Soot Sensor bus relay No faults of CAN communication loss with Soot Sensor Key is turned on Engine not in cranking mode Fault not active on undervoltage for Soot Sensor Control Unit supply	> 11.00 NOT(SBR_RlyFA) NOT(U02A3) NOT(P24DO)	Time counter: 2.00 consecutive failures OR 2.00 failures out of 2.00 samples 100 ms/sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Particulate Matter Sensor Temperature Circuit High	P24C9	This diagnosis detects a short to power or an open circuit on the soot sensor temperature signal	Diagnosis executed in Soot Sensor Control Unit: Voltage of Soot Sensor temperature meander (TM) signal	> 3 V	Soot Sensor Control Unit conditions: no conditions ECU conditions: Ignition voltage in range Soot Sensor bus relay is commanded on No electrical fault active on Soot Sensor bus relay No faults of CAN communication loss with Soot Sensor Key is turned on Engine not in cranking mode Fault not active on undervoltage for Soot Sensor Control Unit supply	> 11.00 NOT(SBR_RlyFA) NOT(U02A3) NOT(P24DO)	Time counter: 2.00 consecutive failures OR 2.00 failures out of 2.00 samples 100 ms/sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Particulate Matter Sensor Supply Voltage Circuit Low	P24D0	This diagnosis detects a short to ground of the soot sensor voltage supply line	Soot Sensor Control Unit supply voltage	0.00V	Ignition voltage in range Soot Sensor bus relay is commanded on No electrical fault active on Soot Sensor bus relay No faults of CAN communication loss with Soot Sensor Key is turned on Engine not in cranking mode (The sensor is in regneration phase OR the time from a regeneration request)	> 11.00 NOT(SBR_RlyFA) NOT(U02A3) > 80.00	Time counter: 5.00 consecutive failures OR 8.00 failures out of 16.00 samples 100 ms/sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Particulate Matter Sensor Regeneration Incomplete	P24D1	This diagnosis detects a degradation of the soot sensor heater	the Soot Sensor Electrode Temperature is during the steady state soot sensor regeneration, for a consecutively time	<= (785.00-10.00)°C < 43.00 s	Key is turned on Ignition voltage in range Soot Sensor bus relay is commanded on No electrical fault active on Soot Sensor bus relay No faults of CAN communication loss with Soot Sensor No electrical fault detected on Soot Sensor Volumetric flow estimation is valid The power ratio timer the power ratio timer increments during the steady state of soot sensor regeneration, when the ratio between power demand and power available is (Soot sensor transitioned from regeneration to	> 11.00 NOT(SBR_RlyFA) NOT(U02A3) NOT(SOT_EleclFlt) SOT_TotExhSootSnsrVld AND SOT_ExhTempSootSnsrVld AND SOT_ExhPresSootSnsrVld < 5.00 s 0.00 <= r <= 1.00	no debouncing time	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					measurement status OR the time of soot sensor steady state regeneration is) Transmission fault with sensor control unit not present	>= 150.00 s NOT(P30BC)		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Particulate Matter Sensor Exhaust Sample Error Bank 1	P24DA	This diagnosis detects a soot sensor that has been removed from exhaust line or is clogged	Integrated derivative of corrected volumetric flow	> 5,000.00	Key is turned on		No debounce time	Type B, 2 Trips
			AND		Ignition voltage in range	> 11.00		
			Integrated derivative of effective soot sensor heater voltage (i,e, cumulated heater voltage change)	< 2.00V	Engine in running mode			
					Soot Sensor bus relay is commanded on			
					No electrical fault active on Soot Sensor bus relay	NOT(SBR_RlyFA)		
					No faults of CAN communication loss with Soot Sensor	(U02A3)		
					No Soot Sensor supply undervoltage detected	NOT(P24DO)		
					No electrical fault detected on Soot Sensor	NOT(SOT_EleclFlt)		
					No fault on exhaust gas pressure estimation at sensor location	SOT_ExhPresSootSnsrVld		
					No fault on exhaust gas temperature estimation at sensor location	SOT_ExhTempSootSnsrVld		
					No fault on gas mass flow estimation at sensor location	SOT_TotExhSootSnsrVld		
					Soot Sensor in protection heating operating state			
					Derivative in volumetric flow	3.00 < d2V < 100.00		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					for a time	> = 1.00 s		
					At InitCntrlr time since engine off	> 28,800.00 s		
					At InitCntrlr time since engine off is valid	NOT EngineModeNotRunTimer Error		
					The time from the Soot Sensor Heater is controlled in closed loop	> 22.00 s		
					As soon as Soot Sensor is supplied the time since PM sensor heating off (module off plus heating off)	> 0.00 s		
					Exhaust gas temperature at Soot Sensor	0.00 < T <200.00 °C		
					Environmental pressure	> 75.0 kPa		
					Diagnostic has not yet reported a pass or failure			
					The sign of derivative in volumetric flow does not change for a time	>= 0.00 s NOT(P30BC)		
					Transmission fault with sensor control unit not present			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Turbocharge r VGT A Stuck Closed (VGT Smart)	P2599	This monitor detects the VGT vanes mechanically stuck in a certain position different from their defaulted position (fully open) when the actuator is no longer driven (missing defaulted position)	Position after P0046 has set > threshold	>25.00 [%]	P0046 is already set Waiting time after driver shut off > minimum threshold (needed for the spring to drive the valve in its defaulted position) VGT position closed loop control active (no faults present on VGT position sensor, VGT vanes, VGT position control deviation)	 >2.00 [s] VGT_PstnSnsrOfstFA ==FALSE VGT_SmartActrFA ==FALSE CFM_VGT_CommFA == FALSE	No debounce is present: DTC sets as soon as the error is present Function task: 25 ms	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
02 Sensor Pumping Current Trim Circuit Low Bank 1 Sensor 1	P2627	This DTC detects if 02 signal is lower than physical minimum value.	02 signal lower than a minimum value	< -4.00 [%]	Engine running System voltage in range Sensor is fully operative Enabled in combustion mode No pending or confirmed DTC	 > 11.00 [V] OXY_NOx1_O2_RawNotRib == FALSE refer to supporting table **KaOXYD_b_NOx1SigRn(gEnblCmbMode**) NOX_Snsr1_NotVld	Time counter: 200 failures out of 250 samples. Time task 25[ms]	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
02 Sensor Pumping Current Trim Circuit High Bank 1 Sensor 1	P2628	This DTC detects if 02 signal is higher than physical maximum value.	02 signal higher than a maximum value	> 27.00 [%]	Engine running System voltage in range Sensor is fully operative Exhaust gas pressure No Exhaust Brake active i.e. intake manifold pressure No pending or confirmed DTCs	 > 11.00 [V] OXY_NOx1_O2_RawNot Rib == FALSE < 1,000.00 [kPa] < 1,000.00 [kPa] NOX_Snsr1_NotVld NOX_Snsr1_PresFlt (MAP_SensorFA AND MAP_SensorTFTKO)	Time counter: 100 failures out of 200 samples. Time task 25[ms]	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Cylinder 1 Injector Data Incompatible	P268C	This DTC detects if the EIA (End of line Injector Adjustment) code for cylinder 1 has not been programmed. The diagnostic shall report test pass if the EIA code has been succesfully programmed, otherwise only report test fail if the MEC (Manufacturing Enable Counter) is zero.	Cylinder 1 EIA code not written via DID (DID $60).	N/A	Ignition ON Diagnosis enabled via calibration Manufacturer Enable Counter (MEC) == 0	 1.00 [Boolean]	N/A	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Cylinder 2 Injector Data Incompatible	P268D	This DTC detects if the EIA (End of line Injector Adjustment) code for cylinder 2 has not been programmed. The diagnostic shall report test pass if the EIA code has been succesfully programmed, otherwise only report test fail if the MEC (Manufacturing Enable Counter) is zero.	Cylinder 2 EIA code not written via DID (DID $61).	N/A	Ignition ON Diagnosis enabled via calibration Manufacturer Enable Counter (MEC) == 0	 1.00 [Boolean]	N/A	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Cylinder 3 Injector Data Incompatible	P268E	This DTC detects if the EIA (End of line Injector Adjustment) code for cylinder 3 has not been programmed. The diagnostic shall report test pass if the EIA code has been succesfully programmed, otherwise only report test fail if the MEC (Manufacturing Enable Counter) is zero.	Cylinder 3 EIA code not written via DID (DID $62).	N/A	Ignition ON Diagnosis enabled via calibration Manufacturer Enable Counter (MEC) == 0	 1.00 [Boolean]	N/A	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Cylinder 4 Injector Data Incompatible	P268F	This DTC detects if the EIA (End of line Injector Adjustment) code for cylinder 4 has not been programmed. The diagnostic shall report test pass if the EIA code has been succesfully programmed, otherwise only report test fail if the MEC (Manufacturing Enable Counter) is zero.	Cylinder 4 EIA code not written via DID (DID $63).	N/A	Ignition ON Diagnosis enabled via calibration Manufacturer Enable Counter (MEC) == 0	 1.00 [Boolean]	N/A	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Cylinder 5 Injector Data Incompatible	P2690	This DTC detects if the EIA (End of line Injector Adjustment) code for cylinder 5 has not been programmed. The diagnostic shall report test pass if the EIA code has been succesfully programmed, otherwise only report test fail if the MEC (Manufacturing Enable Counter) is zero.	Cylinder 5 EIA code not written via DID (DID $64).	N/A	Ignition ON Diagnosis enabled via calibration Manufacturer Enable Counter (MEC) == 0	 1.00 [Boolean]	N/A	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Cylinder 6 Injector Data Incompatible	P2691	This DTC detects if the EIA (End of line Injector Adjustment) code for cylinder 6 has not been programmed. The diagnostic shall report test pass if the EIA code has been succesfully programmed, otherwise only report test fail if the MEC (Manufacturing Enable Counter) is zero.	Cylinder 6 EIA code not written via DID (DID $65).	N/A	Ignition ON Diagnosis enabled via calibration Manufacturer Enable Counter (MEC) == 0	 1.00 [Boolean]	N/A	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Cylinder 7 Injector Data Incompatible	P2692	This DTC detects if the EIA (End of line Injector Adjustment) code for cylinder 7 has not been programmed. The diagnostic shall report test pass if the EIA code has been succesfully programmed, otherwise only report test fail if the MEC (Manufacturing Enable Counter) is zero.	Cylinder 7 EIA code not written via DID (DID $66).	N/A	Ignition ON Diagnosis enabled via calibration Manufacturer Enable Counter (MEC) == 0	 1.00 [Boolean]	N/A	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Cylinder 8 Injector Data Incompatible	P2693	This DTC detects if the EIA (End of line Injector Adjustment) code for cylinder 8 has not been programmed. The diagnostic shall report test pass if the EIA code has been succesfully programmed, otherwise only report test fail if the MEC (Manufacturing Enable Counter) is zero.	Cylinder 8 EIA code not written via DID (DID $67).	N/A	Ignition ON Diagnosis enabled via calibration Manufacturer Enable Counter (MEC) == 0	 1.00 [Boolean]	N/A	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Cold Start Diesel Intake Air Flow A Control Performance	P2957	This monitor detects an obstruction on the actuator (obstruction found during the Throttle valve opening or closing) checking the setpoint position against the position measured by the Throttle Position Sensor	[Throttle Position Tracking Error] (setpoint position - measured position) > maximum threshold	> 16.00 [%]	Cold Start strategy enabled	==TRUE	1,280.00 fail counts out of 1,600.00 sample counts Function task: 6.25 ms	Type B, 2 Trips
					Test enabled by calibration	==1.00		
					Diagnostic system enabled (no clear code or EOT in progress)			
					System out of the cranking phase	>11.00 [V]		
					PT relay supply voltage in range	>=-40.00 [°C]		
					Engine coolant temperature higher or equal to minimum threshold OR Engine cooling system target temperature reached (thermostat opening)	ECT_Sensor_FA ==FALSE >=-23.00 [°C] >= -23.00 [°C]		
					No faults present on engine coolant temperature sensor	OATPtEstFiltFA ==FALSE		
					Outside air temperature			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					higher or equal to minimum threshold	>-160.00 [%/s] <160.00 [%/s] for >= 0.40 [s]		
					Outside air temperature breakpoint for minimum engine coolant temperature enable			
					No faults present on outside air temperature sensor			
					Throttle position setpoint in steady state conditions for minimum time			
					Throttle position closed loop control active			
					No mechanical stop soft approach in progress			
					No faults present on Throttle position sensor, Throttle valve, Throttle position control deviation			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Cold Start Turbocharge rVGTA Performance	P2958	This monitor detects an obstruction on the actuator (obstruction found during the vanes opening or closing) checking the setpoint position against the position measured by the VGT Position Sensor	Absolute value of position tracking error (setpoint position - measured position)	> 16.00	Cold Start strategy enabled Test enabled by calibration System out of the cranking phase PT relay supply voltage in range VGT position closed loop control active (no faults present on VGT position sensor, VGT vanes, VGT position control deviation) VGT position setpoint in steady state conditions for minimum time Engine coolant temperature higher or equal to minimum threshold OR Engine cooling system target temperature reached (thermostat opening) No faults present on	== TRUE == 1.00 > 11.00 [V] VGT_PstnSnsrFA ==FALSE VGT_ActCktFA ==FALSE VGT_PstnCntrlFA ==FALSE > -100.00 [%/s] < 100.00 [%/s] for >= 0.50 [s] >= 50.00 [°C] ECT_Sensor_FA ==FALSE	420.00 fail counts out of 520.00 sample counts Function task: 6.25 ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					engine coolant temperature sensor			
					Outside air temperature higher or equal to minimum threshold	>= -60.00 [°C]		
					No faults present on outside air temperature sensor	OAT_PtEstFiltFA ==FALSE		
					No mechanical stop soft approach in progress			
					No anti-sticking procedure in progress			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Cold Start Exhaust Gas Recirculation Cooler Bypass Valve Performance (ECB DC Motor)	P2959	This monitor detects an obstruction on the actuator (obstruction found during the HP EGR Cooler Bypass valve opening or closing) checking the setpoint position against the position measured by the HP EGR Cooler Bypass Position Sensor	|HP EGR Cooler Bypass Position Tracking Error| (setpoint position - measured position) > maximum threshold	> 16.00 [%]	Cold Start strategy enabled	==TRUE	1,280.00 fail counts out of 1,600.00 sample counts Function task: 6.25 ms	Type B, 2 Trips
					Test enabled by calibration	==1.00		
					Diagnostic system enabled (no clear code or EOT in progress)			
					System out of the cranking phase			
					PT relay supply voltage in range	>11.00 [V]		
					HP EGR Cooler Bypass position closed loop control active (no faults present on HP EGR Cooler Bypass position sensor, HP EGR Cooler Bypass flap, HP EGR Cooler Bypass position control deviation)	CEB_PstnSnsrFlt ==FALSE CEB_ActrFlt==FALSE CEB_ObstructionTFTKO ==FALSE		
					HP EGR Cooler Bypass position setpoint in steady state conditions for minimum time	<160.00 [%/s] >-160.00 [%/s] for >=0.40 [s]		
					Engine coolant temperature higher or	>=-40.00 [°C]		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					equal to minimum threshold (calculated with a table ECT/OAT) OR Engine cooling system target temperature reached (thermostat opening)			
					No faults present on engine coolant temperature sensor	ECT_Sensor_FA ==FALSE		
					Outside air temperature higher or equal to minimum threshold	>=-23.00 [°C]		
					No faults present on outside air temperature sensor	OAT_PtEstFiltFA ==FALSE		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
O2S Circuit Range/ Performance Bank 1 Sensor 1	P2A00	This DTC aims to detect a drift of measured 02 value (A) from an estimated concentration (B) when the latter can be considered stable during full load condition.	EWMA filtered error (A-B) in full load condition is out of plausible range	> 2.50 [%] < -4.60 [%]	Engine running System voltage in range Sensor is fully operative Enabled in combustion mode (No After injection release AND Boolean Flag used to enable After injection status is TRUE) No pending or confirmed DTCs Stable fuel cut-off condition has been reached i.e. following	> 11.00 [V] OXY_NOx1_O2_RawNotRib == FALSE refer to supporting table (**KaOXYD_b_NOx1LoadChkCmbModeEnbl**) 0 [boolean] NOX_Snsr1_NotVld NOX_Snsr1_PresFlt OXY_NOx1SignRngChkFlt OXY_O2_NOx1PlausMdlFlt FHPJnjLeakageFA (MAF_MAF_SnsrFA AND MAF_MAF_SnsrTFTKO) EGR_VlvTotFlowNotValid	Once per trip Note: if EWMA Fast Initial Response is active OR EWMA Rapid Response is active than multiple tests per trip are allowed.	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					conditions are met for a calibrateable time: a. Engine speed in operating range b. EGR mass flow c. Injected fuel quantity in operating range d. Air mass per cylinder in operating range Estimated 02 concentration stable i.e. difference between initial and actual value Air mass flown since fuel cut-off condition	> 1.00 [s] > 1,000 [rpm] < 2,200 [rpm] < 1,000.00 [mg] > 20.00 [mm^3] < 50.00 [mm^3] > 400.00 [mg] < 2,500.00 [mg] < 0.80 [%] > 40.00 [g]		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
O2S Circuit Range/ Performance Bank 1 Sensor 2	P2A01	This DTC aims to detect a drift of Sensor 2 02 measured value (A) from Sensor 1 02 measured value (B) when the latter can be considered stable during full load condition.	EWMA filtered error (A - B) in full load condition is out of plausible range	> 4.60 [%] < -3.50 [%]	Engine running		EWMA filtering: multiple tests per trip are allowed.	Type B, 2 Trips
					System voltage in range	> 11.00 [V]		
					Sensor is fully operative	OXY_O2_NOx2_PresCmpNotRIb == FALSE		
					Sensor 1 is fully operative	OXY_O2_NOx1_PresCmpNotRIb == FALSE		
					No pending or confirmed DTCs	NOX_Snsr2_NotVld NOX_Snsr2_PresFlt OXY_NOx2SignRngChkFlt OXY_NOx1_O2_Flt (MAF_SensorFA AND MAF_SensorTFTKO)		
					DTC P2A00 is running	(see P2A00 Fault code)		
					Air mass flown since P2A00 is enabled	> 30.00 [g]		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Exhaust Gas Recirculation Cooler Bypass Valve Motor Overtemperature (ECB DC Motor)	P2AA5	This monitor checks if the temperature of the HP EGR cooler bypass DC-Motor increases too much (e.g. HP EGR cooler bypass DC-Motor internal faults, etc).	H-Bridge driver temperature higher than a threshold (error information provided by HWIO)	> 170 [°C]	Test enabled by calibration	==1.00	160.00 fail counts out of 200.00 sample counts Function task: 12.5 ms	Type B, 2 Trips
					System out of the cranking phase			
					PT relay supply voltage in range	> 11.00 [V]		
					Diagnostic system enabled (no clear code or EOT in progress)			
					HWIO error status different from INDETERMINATE status			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Lost Communication With Diesel Intake Air Flow "A" Position Sensor	U0654	This monitor checks if the Throttle position sensor protocol is out of range low, out of range high or has performance problems	(		Test enabled by calibration	== 1.00	200.00 fail counts out of 250.00 sample counts Function task: 6.25 ms	Type A, 1 Trips
			HWIO counter of valid Throttle SENT position indications no longer updated > threshold (age error = TRUE)	> 6.25 [ms]	System out of the cranking phase	== TRUE		
			AND	AND	PT relay supply voltage in range	> 11.00 [V]		
			HWIO Throttle SENT position protocol status	== STEADY LOW	Diagnostic system enabled (no clear code or EOT in progress)	== TRUE		
			)					
			OR					
			(					
			HWIO time counter since last valid Throttle SENT position was transmitted > threshold (age error = TRUE)	> 6.25 [ms]				
			AND	AND				
			HWIO Throttle SENT position protocol status	== STEADY HIGH				
			)					
			OR					
			(					
			HWIO message fault on Throttle SENT position == TRUE	message error==TRUE				
			OR	OR				

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			(number of Throttle SENT position counters has been updated AND HWIO time counter since last valid Throttle SENT position was transmitted > threshold (age error = TRUE)))	 ------------- AND > 6.25 [ms]				

Initial Supporting table - KaFADC_b_SQC_CWA_EnblLink

Description: Engine speed ranges to be learned with CWA before give a positive report to Zero Torque Coordinator.

y/x	0	1	2	3	4	5
1	0	0	0	0	0	0

Initial Supporting table - KaFADC_n_DFSA_EngSpdThrsh

Description: Threshold to evaluate the engine speed steady state, as function of the engaged gear

Value Units: rpm

y/x	0	1	2	3	4	5	6	7	8	9	10	11	12
1	5	5	5	5	5	5	5	5	5	5	5	5	5

Initial Supporting table - KaFADC_n_FSA_EngSpdThrsh

Description: Threshold to evaluate the engine speed steady state, as function of the engaged gear

Value Units: rpm

y/x	0	1	2	3	4	5	6	7	8	9	10	11	12
1	1	1	1	1	1	1	1	1	1	1	1	1	1

Initial Supporting table - KaFADC_n_SQC_HiThrshDelt

Description: Engine speed high threshold [rpm] delta for SQC actuators enable function of driveline group

Value Units: rpm

KaFADC_n_SQC_HiThrshDelt - Part 1

y/x	CeFADR_e_CWA_DrvlnGrpNotAlwd	CeFADR_e_CWA_DrivelineGrp1	CeFADR_e_CWA_DrivelineGrp2	CeFADR_e_CWA_DrivelineGrp3
1	100	100	100	100

KaFADC_n_SQC_HiThrshDelt - Part 2

y/x	CeFADR_e_CWA_DrivelineGrp4	CeFADR_e_CWA_DrivelineGrp5	CeFADR_e_CWA_DrivelineGrp6	CeFADR_e_CWA_DrivelineGrp7
1	100	100	100	100

KaFADC_n_SQC_HiThrshDelt - Part 3

y/x	CeFADR_e_CWA_DrivelineGrp8	CeFADR_e_CWA_DrivelineGrp9	CeFADR_e_CWA_DrivelineGrp1 0	
1	100	100	100	

Initial Supporting table - KaFADC_p_SQA_LrnDelt

Description: Delta Rail Pressure allowed to enable SQA learning [MPa] function of nominal rail pressure setpoint defined for SQA.

Value Units: Mpa

y/x	0	1	2	3	4
1	3	3	3	3	3

Initial Supporting table - KaOXYD_b_NOx1LoadChkCmbModeEnbl

Description: This array indicates what are the combustion mode in which Plausibility Diagnosis in Full Load condition is enabled

KaOXYD_b_NOx1LoadChkCmbModeEnbl - Part 1

y/x	CeCMBR_e_Normal	CeCMBR_e_DPF_HiO2	CeCMBR_e_DPF_LoO2	CeCMBR_e_FullyWarmEmissions
1	1	0	0	0

KaOXYD_b_NOx1LoadChkCmbModeEnbl - Part 2

y/x	CeCMBR_e_LNT_DeNOx	CeCMBR_e_LNT_DeSOx_Lean	CeCMBR_e_LNT_DeSOx_Rich	CeCMBR_e_StrongExhGasWarmUp
1	0	0	0	0

KaOXYD_b_NOx1LoadChkCmbModeEnbl - Part 3

y/x	CeCMBR_e_SoftExhGasWarmUp	CeCMBR_e_DPF_PN	CeCMBR_e_DPF_RichIdle	CeCMBR_e_DPF_EngPrtct_HiO2
1	0	0	0	0

KaOXYD_b_NOx1LoadChkCmbModeEnbl - Part 4

y/x	CeCMBR_e_DPF_EngPrtct_LoO2	CeCMBR_e_LNT_EngPrtct	CeCMBR_e_FAD_IdleInjLrn	CeCMBR_e_HCS_DeHC_Drive
1	0	0	0	0

KaOXYD_b_NOx1LoadChkCmbModeEnbl - Part 5

y/x	CeCMBR_e_HCS_DeHC_Park	CeCMBR_e_SCR_ServWarmUp	CeCMBR_e_SCR_ServCheck	
1	0	0	0	

Initial Supporting table - KaOXYD_b_NOx1OvrnChkCmbModeEnbl

Description: This array indicates what are the combustion mode in which Plausibility Diagnosis in Overrun condition is enabled

KaOXYD_b_NOx1OvrnChkCmbModeEnbl - Part 1

y/x	CeCMBR_e_Normal	CeCMBR_e_DPF_HiO2	CeCMBR_e_DPF_LoO2	CeCMBR_e_FullyWarmEmissions
1	1	0	0	0

KaOXYD_b_NOx1OvrnChkCmbModeEnbl - Part 2

y/x	CeCMBR_e_LNT_DeNOx	CeCMBR_e_LNT_DeSOx_Lean	CeCMBR_e_LNT_DeSOx_Rich	CeCMBR_e_StrongExhGasWarmUp
1	0	0	0	1

KaOXYD_b_NOx1OvrnChkCmbModeEnbl - Part 3

y/x	CeCMBR_e_SoftExhGasWarmUp	CeCMBR_e_DPF_PN	CeCMBR_e_DPF_RichIdle	CeCMBR_e_DPF_EngPrtct_HiO2
1	1	0	0	0

KaOXYD_b_NOx1OvrnChkCmbModeEnbl - Part 4

y/x	CeCMBR_e_DPF_EngPrtct_LoO2	CeCMBR_e_LNT_EngPrtct	CeCMBR_e_FAD_IdleInjLrn	CeCMBR_e_HCS_DeHC_Drive
1	0	0	0	0

KaOXYD_b_NOx1OvrnChkCmbModeEnbl - Part 5

y/x	CeCMBR_e_HCS_DeHC_Park	CeCMBR_e_SCR_ServWarmUp	CeCMBR_e_SCR_ServCheck	
1	0	0	0	

Initial Supporting table - KaOXYD_b_NOx1SigRngEnblCmbMode

Description: This array indicates what are the combustion mode in which Signal Range Diagnosis is enabled

KaOXYD_b_NOx1SigRngEnblCmbMode - Part 1

y/x	CeCMBR_e_Normal	CeCMBR_e_DPF_HiO2	CeCMBR_e_DPF_LoO2	CeCMBReFullyWarmEmissions
1	1	1	0	0

KaOXYD_b_NOx1SigRngEnblCmbMode - Part 2

y/x	CeCMBR_e_LNT_DeNOx	CeCMBR_e_LNT_DeSOx_Lean	CeCMBR_e_LNT_DeSOx_Rich	CeCMBR_e_StrongExhGasWarmUp
1	0	0	0	1

KaOXYD_b_NOx1SigRngEnblCmbMode - Part 3

y/x	CeCMBR_e_SoftExhGasWarmllp	CeCMBR_e_DPF_PN	CeCMBR_e_DPF_RichIdle	CeCMBR_e_DPF_EngPrtct_HiO2
1	1	0	1	1

KaOXYD_b_NOx1SigRngEnblCmbMode - Part 4

y/x	CeCMBR_e_DPF_EngPrtct_LoO2	CeCMBR_e_LNT_EngPrtct	CeCMBR_e_FAD_IdleInjLrn	CeCMBR_e_HCS_DeHC_Drive
1	0	0	0	1

KaOXYD_b_NOx1SigRngEnblCmbMode - Part 5

y/x	CeCMBR_e_HCS_DeHC_Park	CeCMBR_e_SCR_ServWarmUp	CeCMBR_e_SCR_ServCheck	
1	1	1	1	

Initial Supporting table - KtFADC_p_SQA_MAP_HiThrsh

Description: Manifold Air Pressure High Threshold [kPa] to disable SQA Strategy function on Rail Pressure levels defined for SQA

Value Units: kPa

y/x	1,000	1,200	1,400	1,600	1,800
1	190	190	190	190	190

Initial Supporting table - KtFADC_V_FSA_FuelMax

Description: Map used to define FSA maximum authority

Value Units: mm^3

y/x	5	10	20	30	40	50	60	80	100	120
450	12	13	12	15	18	21	23	28	30	33
700	12	13	14	16	18	21	23	28	30	33
950	12	13	16	18	19	21	23	28	30	33
1,200	12	13	17	20	22	23	24	29	30	33
1,450	12	13	17	20	23	25	26	31	32	34
1,700	12	13	17	20	23	26	30	33	34	35
1,950	12	13	17	20	23	26	30	35	36	38
2,200	12	13	17	20	23	26	30	35	38	41
2,800	12	13	17	20	23	26	30	35	38	41
3,200	12	13	17	20	23	26	30	35	38	41

Initial Supporting table - KtFADC_V_FSA_FuelMin

Description: Map used to define FSA minimum authority

Value Units: mm^3

y/x	5	10	20	30	40	50	60	80	100	120
450	-12	-13	-12	-15	-18	-21	-23	-28	-30	-33
700	-12	-13	-14	-16	-18	-21	-23	-28	-30	-33
950	-12	-13	-16	-18	-19	-21	-23	-28	-30	-33
1,200	-12	-13	-17	-20	-22	-23	-24	-29	-30	-33
1,450	-12	-13	-17	-20	-23	-25	-26	-31	-32	-34
1,700	-12	-13	-17	-20	-23	-26	-30	-33	-34	-35
1,950	-12	-13	-17	-20	-23	-26	-30	-35	-36	-38
2,200	-12	-13	-17	-20	-23	-26	-30	-35	-38	-41
2,800	-12	-13	-17	-20	-23	-26	-30	-35	-38	-41
3,200	-12	-13	-17	-20	-23	-26	-30	-35	-38	-41

Initial Supporting table - KtFADC_V_FSA_MaxFuelFall

Description: Upper bound of fuel quantity range to enable the FSA learning phase depending on the engine speed

Value Units: mm^3

y/x	510	511	800	1,000	1,500	1,750	2,250	2,750	3,000	3,250
1	0	30	60	70	100	120	110	110	100	70

Initial Supporting table - KtFADD_p_XSQA_MAP_HiThrsh

Description: Manifold Air Pressure High Threshold [kPa] to disable SQA Emission Correlated Monitoring function on Rail Pressure levels defined for SQA

Value Units: kPa

y/x	1,000	1,200	1,400	1,600	1,800
1	190	190	190	190	190

Initial Supporting table - KtFADD_Pct_SSQA_InjSuspConfLvl

Description: Calibration table to define the suspicious confidence level [%] function of current last raw Delta Energizing Time [us] and previous one [us]

Value Units: %

y/x	-120	-80	-70	-69	-40	0	40	44	45	60	75
-120	0	0	0	0	0	0	0	0	0	0	0
-78	0	0	0	0	0	0	0	0	0	0	0
-77	0	0	0	100	100	100	100	100	0	0	0
-40	0	0	0	100	100	100	100	100	0	0	0
0	0	0	0	100	100	100	100	100	0	0	0
40	0	0	0	100	100	100	100	100	0	0	0
52	0	0	0	100	100	100	100	100	0	0	0
53	0	0	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0	0	0

Initial Supporting table - NOX_NOx2SelfTstEnblCmbMode

Description: Combustion mode dependent diag enable for Downstream NOx sensor selt-test monitoring

NOX_NOx2SelfTstEnblCmbMode - Part 1

y/x	CeCMBR_e_Normal	CeCMBR_e_DPF_HiO2	CeCMBR_e_DPF_LoO2	CeCMBReFullyWarmEmissions	CeCMBReLNTDeNOx
1	1	0	0	0	0

NOX_NOx2SelfTstEnblCmbMode - Part 2

y/x	CeCMBR_e_LNT_DeSOx_Lean	CeCMBR_e_LNT_DeSOx_Rich	CeCMBR_e_StrongExhGasWarmllp	CeCMBR_e_SoftExhGasWarmUp	CeCMBR_e_DPF_PN
1	0	0	1	1	0

NOX_NOx2SelfTstEnblCmbMode - Part 3

y/x	CeCMBR_e_DPF_RichIdle	CeCMBR e DPF EngPrtct HiO2	CeCMBR_e_DPF_EngPrtct_LoO2	CeCMBR_e_LNT_EngPrtct	CeCMBR_e_FAD_IdleInjLrn
1	0	0	0	0	0

NOX_NOx2SelfTstEnblCmbMode - Part 4

y/x	CeCMBR_e_HCS_DeHC_Drive	CeCMBR_e_HCS_DeHC_Park	CeCMBR_e_SCR_ServWarmUp	CeCMBR_e_SCR_ServCheck	
1	0	0	0	0	

Initial Supporting table - NOX_S1_OfstMntrEnblCmbMode

Description:

NOX_S1_OfstMntrEnblCmbMode - Part 1

y/x	CeCMBR_e_Normal	CeCMBR_e_DPF_HiO2	CeCMBR_e_DPF_LoO2	CeCMBReFullyWarmEmissions	CeCMBReLNTDeNOx
1	1	0	0	0	0

NOX_S1_OfstMntrEnblCmbMode - Part 2

y/x	CeCMBR_e_LNT_DeSOx_Lean	CeCMBR_e_LNT_DeSOx_Rich	CeCMBR_e_StrongExhGasWarmUp	CeCMBR_e_SoftExhGasWarmUp	CeCMBR_e_DPF_PN
1	0	0	1	1	0

NOX_S1_OfstMntrEnblCmbMode - Part 3

y/x	CeCMBR_e_DPF_RichIdle	CeCMBR_e_DPF_EngPrtct_HiO2	CeCMBR_e_DPF_EngPrtct_LoO2	CeCMBR_e_LNT_EngPrtct	CeCMBR_e_FAD_IdleInjLm
1	0	0	0	0	0

NOX_S1_OfstMntrEnblCmbMode - Part 4

y/x	CeCMBR_e_HCS_DeHC_Drive	CeCMBR_e_HCS_DeHC_Park	CeCMBR_e_SCR_ServWarmUp	CeCMBR_e_SCR_ServCheck	
1	0	0	0	0	

Initial Supporting table - NOX_.SIOutRngMaxCmbMode

Description: Combustion mode dependent diag enable for Upstream NOx sensor OCR high monitor

NOX_S1_OutRngMaxCmbMode - Part 1

y/x	CeCMBR_e_Normal	CeCMBR_e_DPF_HiO2	CeCMBR_e_DPF_LoO2	CeCMBR_e_FullyWarmEmissions	CeCMBR_e_LNT_DeNOx
1	1	1	0	0	0

NOX_S1_OutRngMaxCmbMode - Part 2

y/x	CeCMBR_e_LNT_DeSOx_Lean	CeCMBR_e_LNT_DeSOx_Rich	CeCMBR_e_StrongExhGasWarmUp	CeCMBR_e_SoftExhGasWarmUp	CeCMBR_e_DPF_PN
1	0	0	1	1	0

NOX_S1_OutRngMaxCmbMode - Part 3

y/x	CeCMBR_e_DPF_RichIdle	CeCMBR_e_DPF_EngPrtct_HiO2	CeCMBR_e_DPF_EngPrtct_LoO2	CeCMBR_e_LNT_EngPrtct	CeCMBR_e_FAD_IdleInjLrn
1	1	1	0	0	0

NOX_S1_OutRngMaxCmbMode - Part 4

y/x	CeCMBR_e_HCS_DeHC_Drive	CeCMBR_e_HCS_DeHC_Park	CeCMBR_e_SCR_ServWarmUp	CeCMBR_e_SCR_ServCheck	
1	1	1	1	1	

Initial Supporting table - NOX_,S1_OutRngMinCmbMode

Description: Combustion mode dependent diag enable for Upstream NOx sensor OCR low monitor

NOX_S1_OutRngMinCmbMode - Part 1

y/x	CeCMBR_e_Normal	CeCMBR_e_DPF_HiO2	CeCMBR_e_DPF_LoO2	CeCMBR_e_FullyWarmEmissions	CeCMBR_e_LNT_DeNOx
1	1	1	0	0	0

NOX_S1_OutRngMinCmbMode - Part 2

y/x	CeCMBR_e_LNT_DeSOx_Lean	CeCMBR_e_LNT_DeSOx_Rich	CeCMBR_e_StrongExhGasWarmUp	CeCMBR_e_SoftExhGasWarmUp	CeCMBR_e_DPF_PN
1	0	0	1	1	0

NOX_S1_OutRngMinCmbMode - Part 3

y/x	CeCMBR_e_DPF_RichIdle	CeCMBR_e_DPF_EngPrtct_HIO2	CeCMBR_e_DPF_EngPrtct_LoO2	CeCMBR_e_LNT_EngPrtct	CeCMBR_e_FAD_IdleInjLrn
1	1	1	0	0	0

NOX_S1_OutRngMinCmbMode - Part 4

y/x	CeCMBR_e_HCS_DeHC_Drive	CeCMBR_e_HCS_DeHC_Park	CeCMBR_e_SCR_ServWarmUp	CeCMBR_e_SCR_ServCheck	
1	1	1	1	1	

Initial Supporting table - NOX SlPlausChkEnblCmbMode

Description: Combustion mode dependent diag enable for Upstream NOx sensor plausibility

NOX_S1_PlausChkEnblCmbMode - Part 1

y/x	CeCMBR_e_Normal	CeCMBR_e_DPF_HiO2	CeCMBR_e_DPF_LoO2	CeCMBR_e_FullyWarmEmissions	CeCMBR_e_LNT_DeNOx
1	1	0	0	0	0

N0X_S1_PlausChkEnblCmbMode - Part 2

y/x	CeCMBR_e_LNT_DeSOx_Lean	CeCMBR_e_LNT_DeSOx_Rich	CeCMBR_e_StrongExhGasWarmUp	CeCMBR_e_SoftExhGasWarmUp	CeCMBR_e_DPF_PN
1	0	0	0	0	0

NOX_S1_PlausChkEnblCmbMode - Part 3

y/x	CeCMBR_e_DPF_RichIdle	CeCMBR e DPF EngPrtct HiO2	CeCMBR_e_DPF_EngPrtct_LoO2	CeCMBR_e_LNT_EngPrtct	CeCMBR_e_FAD_IdleInjLrn
1	0	0	0	0	0

NOX_S1_PlausChkEnblCmbMode - Part 4

y/x	CeCMBR_e_HCS_DeHC_Drive	CeCMBR_e_HCS_DeHC_Park	CeCMBR_e_SCR_ServWarmUp	CeCMBR_e_SCR_ServCheck	
1	0	0	0	0	

Initial Supporting table - NOX_S1_StBitChkEnblCmbMode

Description: Combustion mode dependent diag enable for Upstream NOx sensor stability monitor

NOX_S1_StBitChkEnblCmbMode - Part 1

y/x	CeCMBR_e_Normal	CeCMBR_e_DPF_HiO2	CeCMBR_e_DPF_LoO2	CeCMBReFullyWarmEmissions	CeCMBReLNTDeNOx
1	1	1	0	0	0

NOX_S1_StBitChkEnblCmbMode - Part 2

y/x	CeCMBR_e_LNT_DeSOx_Lean	CeCMBR_e_LNT_DeSOx_Rich	CeCMBR_e_StrongExhGasWarmUp	CeCMBR_e_SoftExhGasWarmUp	CeCMBR_e_DPF_PN
1	0	0	1	1	0

NOX_S1_StBitChkEnblCmbMode - Part 3

y/x	CeCMBR_e_DPF_RichIdle	CeCMBR_e_DPF_EngPrtct_HiO2	CeCMBR_e_DPF_EngPrtct_LoO2	CeCMBR_e_LNT_EngPrtct	CeCMBR_e_FAD_IdleInjLm
1	1	1	0	0	0

NOX_S1_StBitChkEnblCmbMode - Part 4

y/x	CeCMBR_e_HCS_DeHC_Drive	CeCMBR_e_HCS_DeHC_Park	CeCMBR_e_SCR_ServWarmUp	CeCMBR_e_SCR_ServCheck	
1	1	1	1	1	

Initial Supporting table - NOX_S2_OfstMntrEnblCmbMode

Description:

NOX_S2_OfstMntrEnblCmbMode - Part 1

y/x	CeCMBR_e_Normal	CeCMBR_e_DPF_HiO2	CeCMBR_e_DPF_LoO2	CeCMBReFullyWarmEmissions	CeCMBReLNTDeNOx
1	1	0	0	0	0

NOX_S2_OfstMntrEnblCmbMode - Part 2

y/x	CeCMBR_e_LNT_DeSOx_Lean	CeCMBR_e_LNT_DeSOx_Rich	CeCMBR_e_StrongExhGasWarmUp	CeCMBR_e_SoftExhGasWarmUp	CeCMBR_e_DPF_PN
1	0	0	1	1	0

NOX_S2_OfstMntrEnblCmbMode - Part 3

y/x	CeCMBR_e_DPF_RichIdle	CeCMBR_e_DPF_EngPrtct_HiO2	CeCMBR_e_DPF_EngPrtct_LoO2	CeCMBR_e_LNT_EngPrtct	CeCMBR_e_FAD_IdleInjLm
1	0	0	0	0	0

NOX_S2_OfstMntrEnblCmbMode - Part 4

y/x	CeCMBR_e_HCS_DeHC_Drive	CeCMBR_e_HCS_DeHC_Park	CeCMBR_e_SCR_ServWarmUp	CeCMBR_e_SCR_ServCheck	
1	0	0	0	0	

Initial Supporting table - NOX_.S2_OutRngMaxCmbMode

Description: Combustion mode dependent diag enable for Downstream NOx sensor OCR high monitor

NOX_S2_OutRngMaxCmbMode - Part 1

y/x	CeCMBR_e_Normal	CeCMBR_e_DPF_HiO2	CeCMBR_e_DPF_LoO2	CeCMBReFullyWarmEmissions	CeCMBReLNTDeNOx
1	1	0	0	0	0

NOX_S2_OutRngMaxCmbMode - Part 2

y/x	CeCMBR_e_LNT_DeSOx_Lean	CeCMBR_e_LNT_DeSOx_Rich	CeCMBR_e_StrongExhGasWarmllp	CeCMBR_e_SoftExhGasWarmUp	CeCMBR_e_DPF_PN
1	0	0	1	1	0

NOX_S2_OutRngMaxCmbMode - Part 3

y/x	CeCMBR_e_DPF_RichIdle	CeCMBR e DPF EngPrtct HiO2	CeCMBR_e_DPF_EngPrtct_LoO2	CeCMBR_e_LNT_EngPrtct	CeCMBR_e_FAD_IdleInjLrn
1	0	0	0	0	0

NOX_S2_OutRngMaxCmbMode - Part 4

y/x	CeCMBR_e_HCS_DeHC_Drive	CeCMBR_e_HCS_DeHC_Park	CeCMBR_e_SCR_ServWarmUp	CeCMBR_e_SCR_ServCheck	
1	0	0	1	1	

Initial Supporting table - NOX_S2_OutRngMinCmbMode

Description: Combustion mode dependent diag enable for Downstream NOx sensor OCR low monitor

NOX_S2_OutRngMinCmbMode - Part 1

y/x	CeCMBR_e_Normal	CeCMBR_e_DPF_HiO2	CeCMBR_e_DPF_LoO2	CeCMBReFullyWarmEmissions	CeCMBR_e_LNT_DeNOx
1	1	1	0	0	0

NOX_S2_OutRngMinCmbMode - Part 2

y/x	CeCMBR_e_LNT_DeSOx_Lean	CeCMBR_e_LNT_DeSOx_Rich	CeCMBR_e_StrongExhGasWarmIlp	CeCMBR_e_SoftExhGasWarmUp	CeCMBR_e_DPF_PN
1	0	0	1	1	0

NOX_S2_OutRngMinCmbMode - Part 3

y/x	CeCMBR_e_DPF_RichIdle	CeCMBR e DPF EngPrtct HiO2	CeCMBR_e_DPF_EngPrtct_LoO2	CeCMBR_e_LNT_EngPrtct	CeCMBR_e_FAD_IdleInjLm
1	1	1	0	0	0

NOX_S2_OutRngMinCmbMode - Part 4

y/x	CeCMBR_e_HCS_DeHC_Drive	CeCMBR_e_HCS_DeHC_Park	CeCMBR_e_SCR_ServWarmUp	CeCMBR_e_SCR_ServCheck	
1	1	1	1	1	

Initial Supporting table - NOX_S2_StBitChkEnblCmbMode

Description: Combustion mode dependent diag enable for Downstream NOx sensor stability monitor

NOX_S2_StBitChkEnblCmbMode - Part 1

y/x	CeCMBR_e_Normal	CeCMBR_e_DPF_HiO2	CeCMBR_e_DPF_LoO2	CeCMBReFullyWarmEmissions	CeCMBReLNTDeNOx
1	1	1	0	0	0

NOX_S2_StBitChkEnblCmbMode - Part 2

y/x	CeCMBR_e_LNT_DeSOx_Lean	CeCMBR_e_LNT_DeSOx_Rich	CeCMBR_e_StrongExhGasWarmllp	CeCMBR_e_SoftExhGasWarmUp	CeCMBR_e_DPF_PN
1	0	0	1	1	0

NOX_S2_StBitChkEnblCmbMode - Part 3

y/x	CeCMBR_e_DPF_RichIdle	CeCMBR_e_DPF_EngPrtct_HiO2	CeCMBR_e_DPF_EngPrtct_LoO2	CeCMBR_e_LNT_EngPrtct	CeCMBR_e_FAD_IdleInjLm
1	1	1	0	0	0

NOX_S2_StBitChkEnblCmbMode - Part 4

y/x	CeCMBR_e_HCS_DeHC_Drive	CeCMBR_e_HCS_DeHC_Park	CeCMBR_e_SCR_ServWarmUp	CeCMBR_e_SCR_ServCheck	
1	1	1	1	1	

Initial Supporting table - P0106, P2227, P227B, P00C7: Maximum pressure difference

Description: Maximum delta pressure allowed between the three pressure sensors without setting the fault. It is function of the measured airflow.

Value Units: kPa
X Unit: g/s

y/x	20	25	30	35	40	45	50	55
1	25	30	34	37	40	42	44	46

Initial Supporting table - AIC_AirCntrlShtOffActn: ECT Too Low Hysteresis High Threshold for DPF

Description: Hysteresis high threshold for engine coolant temperature too low shut off condition evaluation during DPF combustion modes and SCR service warm up combustion mode. It is function of outside air temperature.

Value Units: °C
X Unit: °C

y/x	-20	-10	0	10	20	30
1	50	50	42	29	16	16

Initial Supporting table - AIC_AirCntrlShtOffActn: ECT Too Low Hysteresis High Threshold for others

Description: Hysteresis high threshold for engine coolant temperature too low shut off condition evaluation. It is function of outside air temperature.

Value Units: °C
X Unit: °C

y/x	-20	-10	0	10	20	30
1	68	55	42	29	16	16

Initial Supporting table - AIC_AirCntrlShtOffActn: ECT Too Low Hysteresis Low Threshold for DPF

Description: Hysteresis low threshold for engine coolant temperature too low shut off condition evaluation during DPF combustion modes and SCR service warm up combustion mode. It is function of outside air temperature.

Value Units: °C
X Unit: °C

y/x	-20	-10	0	10	20	30
1	47	47	39	26	13	13

Initial Supporting table - AIC_AirCntrlShtOffActn: ECT Too Low Hysteresis Low Threshold for others

Description: Hysteresis low threshold for engine coolant temperature too low shut off condition evaluation. It is function of outside air temperature.

Value Units: °C
X Unit: °C

y/x	-20	-10	0	10	20	30
1	65	52	39	26	13	13

Initial Supporting table - AIC_AirCntrlShtOffActn: Fuel High Threshold for D1 and D3

Description: Hysteresis high threshold for large injected fuel shut off condition evaluation during DPF and HCS combustion modes. It is function of engine speed.

Value Units: mm^3
X Unit: rpm

y/x	600	1,000	1,400	1,800	2,200	2,600	3,000	3,400
1	60	60	60	60	60	60	60	60

Initial Supporting table - AIC_AirCntrlShtOffActn: Fuel High Threshold for D4

Description: Hysteresis high threshold for large injected fuel shut off condition evaluation during DPF rich idle combustion mode. It is function of engine speed.

Value Units: mm^3
X Unit: rpm

y/x	600	1,000	1,400	1,800	2,200	2,600	3,000	3,400
1	160	160	160	160	160	160	160	160

Initial Supporting table - AIC_AirCntrlShtOffActn: Fuel Low Threshold for D1 and D3

Description: Hysteresis low threshold for large injected fuel shut off condition evaluation during DPF and HCS combustion modes. It is function of engine speed.

Value Units: mm^3
X Unit: rpm

y/x	600	1,000	1,400	1,800	2,200	2,600	3,000	3,400
1	50	50	50	50	50	50	50	50

Initial Supporting table - AIC_AirCntrlShtOffActn: Fuel Low Threshold for D4

Description: Hysteresis low threshold for large injected fuel shut off condition evaluation during DPF rich idle combustion mode. It is function of engine speed.

Value Units: mm^3
X Unit: rpm

y/x	600	1,000	1,400	1,800	2,200	2,600	3,000	3,400
1	150	150	150	150	150	150	150	150

Initial Supporting table - AIC_BstCntrlCL: Fuel Request On Threshold for 02

Description: Fuel threshold above which the pressure closed loop control is enabled in C2 mode. It is function of engine speed.

Value Units: mm^3
X Unit: rpm

y/x	500	700	800	1,000	1,200	1,400	1,600	1,800	2,000	2,200	2,600	2,800	3,400
1	80	80	65	45	40	40	30	25	25	20	20	15	15

Initial Supporting table - AIC_BstCntrlCL: Fuel Request On Threshold for D1 and D3

Description: Fuel threshold above which the pressure closed loop control is enabled in DPF high 02, Rich idle and all HC modes and SCR service warm up. It is function of engine speed).

Value Units: mm^3
X Unit: rpm

y/x	500	700	800	1,000	1,200	1,400	1,600	1,800	2,000	2,200	2,600	2,800	3,400
1	50	50	45	30	26	24	23	22	21	20	20	20	20

Initial Supporting table - AIC_BstCntrlCL: Fuel Request On Threshold for D4

Description: Fuel threshold above which the pressure closed loop control is enabled in DPF low 02. It is function of engine speed.

Value Units: mm^3
X Unit: rpm

y/x	500	700	800	1,000	1,200	1,400	1,600	1,800	2,000	2,200	2,600	2,800	3,400
1	50	50	40	30	26	24	23	22	21	20	20	20	20

Initial Supporting table - AIC_BstCntrlCL: Fuel Request On Threshold for others

Description: Fuel threshold above which the pressure closed loop control is enabled. It is function of engine speed.

Value Units: mm^3
X Unit: rpm

y/x	500	700	800	1,000	1,200	1,400	1,600	1,800	2,000	2,200	2,600	2,800	3,400
1	50	50	40	30	26	24	23	22	21	20	20	20	20

Initial Supporting table - AIC_BstCntrlCL: Fuel Request On Threshold for V3

Description: Fuel threshold above which the pressure closed loop control is enabled in SCR temp 1 or DeSOx lean mode. It is function of engine speed.

Value Units: mm^3
X Unit: rpm

y/x	500	700	800	1,000	1,200	1,400	1,600	1,800	2,000	2,200	2,600	2,800	3,400
1	50	50	40	30	26	24	23	22	21	20	20	20	20

Initial Supporting table - AIC_BstCntrlCL: On Threshold for V1

Description: Threshold above which the pressure closed loop control is enabled in SCR temp 3 or DeNOx mode. It is function of engine speed.

Value Units: composite
X Unit: rpm

y/x	500	700	800	1,000	1,200	1,400	1,600	1,800	2,000	2,200	2,600	2,800	3,400
1	80	80	65	45	40	40	30	25	25	20	20	15	15

Initial Supporting table - AIC_BstCntrlCL: On Threshold for V2

Description: Threshold above which the pressure closed loop control is enabled in SCR temp 2 or DeSOx Rich mode. It is function of engine speed.

Value Units: composite
X Unit: rpm

y/x	500	700	800	1,000	1,200	1,400	1,600	1,800	2,000	2,200	2,600	2,800	3,400
1	80	80	65	35	20	20	20	20	20	20	20	15	15

Initial Supporting table - AirCntrlTrnstnEnd: Timer threshold

Description: Timer threshold after which an air control transition is considered as ended. It is function of engine speed.

Value Units: s
X Unit: rpm

y/x	600	900	1,200	1,500	1,800	2,100	2,400	2,700	3,000
1	1	0	0	0	0	0	0	0	0

Initial Supporting table - KaFADR_e_FSA_CombModeEnblGrp

Description: Enable FSA learning based on the combustion modes and select related maps based on calibrated groups

Value Units: -
X Unit: -

KaFADR_e_FSA_CombModeEnblGrp - Part 1

y/x	CeCMBR_e_Normal	CeCMBR_e_DPF_HiO2	CeCMBR_e_DPF_LoO2	CeCMBR_e_FullyWarmEmissions
1	CeFADR_e_FSA_Grp1	CeFADR_e_FSA_GrpNotAllwd	CeFADR_e_FSA_GrpNotAllwd	CeFADR_e_FSA_GrpNotAllwd

KaFADR_e_FSA_CombModeEnblGrp - Part 2

y/x	CeCMBR_e_LNT_DeNOx	CeCMBR_e_LNT_DeSOx_Lean	CeCMBR_e_LNT_DeSOx_Rich	CeCMBR_e_StrongExhGasWarmUp
1	CeFADR_e_FSA_GrpNotAllwd	CeFADR_e_FSA_GrpNotAllwd	CeFADR_e_FSA_GrpNotAllwd	CeFADR_e_FSA_Grp2

KaFADR_e_FSA_CombModeEnblGrp - Part 3

y/x	CeCMBR_e_SoftExhGasWarmUp	CeCMBR_e_DPF_PN	CeCMBR_e_DPF_RichIdle	CeCMBR_e_DPF_EngPrtct_HiO2
1	CeFADR_e_FSA_GrpNotAllwd	CeFADR_e_FSA_GrpNotAllwd	CeFADR_e_FSA_GrpNotAllwd	CeFADR_e_FSA_GrpNotAllwd

KaFADR_e_FSA_CombModeEnblGrp - Part 4

y/x	CeCMBR_e_DPF_EngPrtct_LoO2	CeCMBR_e_LNT_EngPrtct	CeCMBR_e_FAD_IdleInjLrn	CeCMBR_e_HCS_DeHC_Drive
1	CeFADR_e_FSA_GrpNotAllwd	CeFADR_e_FSA_GrpNotAllwd	CeFADR_e_FSA_GrpNotAllwd	CeFADR_e_FSA_GrpNotAllwd

KaFADR_e_FSA_CombModeEnblGrp - Part 5

y/x	CeCMBR_e_HCS_DeHC_Park	CeCMBR_e_SCR_ServWarmUp	CeCMBR_e_SCR_ServCheck	
1	CeFADR_e_FSA_GrpNotAllwd	CeFADR_e_FSA_GrpNotAllwd	CeFADR_e_FSA_GrpNotAllwd	

Initial Supporting table - KaFADR_e_FSA_CombModeRelGrp

Description: Enable FSA correction release based on the combustion modes and select related maps based on calibrated groups

Value Units: -
X Unit: -

KaFADR_e_FSA_CombModeRelGrp - Part 1

y/x	CeCMBR_e_Normal	CeCMBR_e_DPF_HiO2	CeCMBR_e_DPF_LoO2	CeCMBR_e_FullyWarmEmissions
1	CeFADR_e_FSA_Grp1	CeFADR_e_FSA_GrpNotAllwd	CeFADR_e_FSA_GrpNotAllwd	CeFADR_e_FSA_GrpNotAllwd

KaFADR_e_FSA_CombModeRelGrp - Part 2

y/x	CeCMBR_e_LNT_DeNOx	CeCMBR_e_LNT_DeSOx_Lean	CeCMBR_e_LNT_DeSOx_Rich	CeCMBR_e_StrongExhGasWarmUp
1	CeFADR_e_FSA_GrpNotAllwd	CeFADR_e_FSA_GrpNotAllwd	CeFADR_e_FSA_GrpNotAllwd	CeFADR_e_FSA_Grp2

KaFADR_e_FSA_CombModeRelGrp - Part 3

y/x	CeCMBR_e_SoftExhGasWarmUp	CeCMBR_e_DPF_PN	CeCMBR_e_DPF_RichIdle	CeCMBR_e_DPF_EngPrtct_HiO2
1	CeFADR_e_FSA_GrpNotAllwd	CeFADR_e_FSA_GrpNotAllwd	CeFADR_e_FSA_GrpNotAllwd	CeFADR_e_FSA_GrpNotAllwd

KaFADR_e_FSA_CombModeRelGrp - Part 4

y/x	CeCMBR_e_DPF_EngPrtct_LoO2	CeCMBR_e_LNT_EngPrtct	CeCMBR_e_FAD_IdleInjLrn	CeCMBR_e_HCS_DeHC_Drive
1	CeFADR_e_FSA_GrpNotAllwd	CeFADR_e_FSA_GrpNotAllwd	CeFADR_e_FSA_GrpNotAllwd	CeFADR_e_FSA_GrpNotAllwd

KaFADR_e_FSA_CombModeRelGrp - Part 5

y/x	CeCMBR_e_HCS_DeHC_Park	CeCMBR_e_SCR_ServWarmUp	CeCMBR_e_SCR_ServCheck	
1	CeFADR_e_FSA_GrpNotAllwd	CeFADR_e_FSA_GrpNotAllwd	CeFADR_e_FSA_GrpNotAllwd	

Initial Supporting table - KaFADR_e_FSA_ECM_CombModeGrp

Description: Enable P026C and P026D in specific combustion modes and select related threshold maps based on calibrated group

Value Units: -
X Unit: -

KaFADR_e_FSA_ECM_CombModeGrp - Part 1

y/x	CeCMBR_e_Normal	CeCMBR_e_DPF_HiO2	CeCMBR_e_DPF_LoO2	CeCMBR_e_FullyWarmEmissions
1	CeFADR_e_FSA_Grp1	CeFADR_e_FSA_GrpNotAllwd	CeFADR_e_FSA_GrpNotAllwd	CeFADR_e_FSA_GrpNotAllwd

KaFADR_e_FSA_ECM_CombModeGrp - Part 2

y/x	CeCMBR_e_LNT_DeNOx	CeCMBR_e_LNT_DeSOx_Lean	CeCMBR_e_LNT_DeSOx_Rich	CeCMBR_e_StrongExhGasWarmUp
1	CeFADR_e_FSA_GrpNotAllwd	CeFADR_e_FSA_GrpNotAllwd	CeFADR_e_FSA_GrpNotAllwd	CeFADR_e_FSA_GrpNotAllwd

KaFADR_e_FSA_ECM_CombModeGrp - Part 3

y/x	CeCMBR_e_SoftExhGasWarmUp	CeCMBR_e_DPF_PN	CeCMBR_e_DPF_RichIdle	CeCMBR_e_DPF_EngPrtct_Hi02
1	CeFADR_e_FSA_GrpNotAllwd	CeFADR_e_FSA_GrpNotAllwd	CeFADR_e_FSA_GrpNotAllwd	CeFADR_e_FSA_GrpNotAllwd

KaFADR_e_FSA_ECM_CombModeGrp - Part 4

y/x	CeCMBR_e_DPF_EngPrtct_LoO2	CeCMBR_e_LNT_EngPrtct	CeCMBR_e_FAD_IdleInjLrn	CeCMBR_e_HCS_DeHC_Drive
1	CeFADR_e_FSA_GrpNotAllwd	CeFADR_e_FSA_GrpNotAllwd	CeFADR_e_FSA_GrpNotAllwd	CeFADR_e_FSA_GrpNotAllwd

KaFADR_e_FSA_ECM_CombModeGrp - Part 5

y/x	CeCMBR_e_HCS_DeHC_Park	CeCMBR_e_SCR_ServWarmUp	CeCMBR_e_SCR_ServCheck	
1	CeFADR_e_FSA_GrpNotAllwd	CeFADR_e_FSA_GrpNotAllwd	CeFADR_e_FSA_GrpNotAllwd	

Initial Supporting table - KtFADC_V_FSA_FuelMax

Description: Map used to define FSA maximum authority

Value Units: mm^3
X Unit: mm^3
Y Units: rpm

y/x	5	10	20	30	40	50	60	80	100	120
450	12	13	12	15	18	21	23	28	30	33
700	12	13	14	16	18	21	23	28	30	33
950	12	13	16	18	19	21	23	28	30	33
1,200	12	13	17	20	22	23	24	29	30	33
1,450	12	13	17	20	23	25	26	31	32	34
1,700	12	13	17	20	23	26	30	33	34	35
1,950	12	13	17	20	23	26	30	35	36	38
2,200	12	13	17	20	23	26	30	35	38	41
2,800	12	13	17	20	23	26	30	35	38	41
3,200	12	13	17	20	23	26	30	35	38	41

Initial Supporting table - KtFADC_V_FSA_FuelMin

Description: Map used to define FSA minimum authority

Value Units: mm^3
X Unit: mm^3
Y Units: rpm

y/x	5	10	20	30	40	50	60	80	100	120
450	-12	-13	-12	-15	-18	-21	-23	-28	-30	-33
700	-12	-13	-14	-16	-18	-21	-23	-28	-30	-33
950	-12	-13	-16	-18	-19	-21	-23	-28	-30	-33
1,200	-12	-13	-17	-20	-22	-23	-24	-29	-30	-33
1,450	-12	-13	-17	-20	-23	-25	-26	-31	-32	-34
1,700	-12	-13	-17	-20	-23	-26	-30	-33	-34	-35
1,950	-12	-13	-17	-20	-23	-26	-30	-35	-36	-38
2,200	-12	-13	-17	-20	-23	-26	-30	-35	-38	-41
2,800	-12	-13	-17	-20	-23	-26	-30	-35	-38	-41
3,200	-12	-13	-17	-20	-23	-26	-30	-35	-38	-41

Initial Supporting table - KtFADD_K_FSA_ECM_PresAmbWghtHi

Description: Curve of the weighting factor dependent on ambient pressure for P026D

Value Units: -
X Unit: kPa

y/x	70	83	98
1	1	1	1

Initial Supporting table - KtFADD_K_FSA_ECM_PresAmbWghtLo

Description: Curve of the weighting factor dependent on ambient pressure for P026C

Value Units: -
X Unit: kPa

y/x	70	83	98
1	1	1	1

Initial Supporting table - KtFADD_V_FSA_ECM_HiThrshGrp1

Description: Map to define P026D threshold for combustion mode Group 1

Value Units: mm^3
X Unit: mm^3
Y Units: rpm

y/x	2	4	6	8	10	12	14	18	20	24
450	3	4	4	5	6	7	7	9	10	11
550	3	4	4	5	6	7	7	9	10	11
600	3	4	4	5	6	7	7	9	10	11
650	3	4	4	5	6	7	7	9	10	11
700	3	4	4	5	6	7	7	9	10	11
750	3	4	4	5	6	7	7	9	10	11
800	3	4	4	5	6	7	7	9	10	11
850	3	4	4	5	6	7	7	9	10	11

Initial Supporting table - KtFADD_V_FSA_ECM_HiThrshGrp2

Description: Map to define P026D threshold for combustion mode Group 2

Value Units: mm^3
X Unit: mm^3
Y Units: rpm

y/x	2	4	6	8	10	12	14	18	20	24
450	4	6	7	9	11	14	18	21	25	25
550	4	6	7	9	11	14	18	21	25	25
600	4	6	7	9	11	14	18	21	25	25
650	4	6	7	9	11	14	18	21	25	25
700	4	6	7	9	11	14	18	21	25	25
750	4	6	7	9	11	14	18	21	25	25
800	4	6	7	9	11	14	18	21	25	25
850	4	6	7	9	11	14	18	21	25	25

Initial Supporting table - KtFADD_V_FSA_ECM_HiThrshGrp3

Description: Map to define P026D threshold for combustion mode Group 3

Value Units: mm^3
X Unit: mm^3
Y Units: rpm

y/x	2	4	6	8	10	12	14	18	20	24
450	3	3	3	3	4	4	4	4	4	4
550	3	3	3	3	4	4	4	4	4	4
600	3	3	3	3	4	4	4	4	4	4
650	3	3	3	3	4	4	4	4	4	4
700	3	3	3	3	4	4	4	4	4	4
750	3	3	3	3	4	4	4	4	4	4
800	3	3	3	3	4	4	4	4	4	4
850	3	3	3	3	4	4	4	4	4	4

Initial Supporting table - KtFADD_V_FSA_ECM_LoThrshGrp1

Description: Map to define P026C threshold for combustion mode Group 1

Value Units: mm^3
X Unit: mm^3
Y Units: rpm

y/x	2	4	6	8	10	12	14	18	20	24
450	-2	-1	-1	0	0	1	1	2	2	3
550	-2	-1	-1	0	0	1	1	2	2	3
600	-2	-1	-1	0	0	1	1	2	2	3
650	-2	-1	-1	0	0	1	1	2	2	3
700	-2	-1	-1	0	0	1	1	2	2	3
750	-2	-1	-1	0	0	1	1	2	2	3
800	-2	-1	-1	0	0	1	1	2	2	3
850	-2	-1	-1	0	0	1	1	2	2	3

Initial Supporting table - KtFADD_V_FSA_ECM_LoThrshGrp2

Description: Map to define P026C threshold for combustion mode Group 2

Value Units: mm^3
X Unit: mm^3
Y Units: rpm

y/x	2	4	6	8	10	12	14	18	20	24
450	-5	-5	-5	-5	-5	-5	-5	-4	-3	-3
550	-5	-5	-5	-5	-5	-5	-5	-4	-3	-3
600	-5	-5	-5	-5	-5	-5	-5	-4	-3	-3
650	-5	-5	-5	-5	-5	-5	-5	-4	-3	-3
700	-5	-5	-5	-5	-5	-5	-5	-4	-3	-3
750	-5	-5	-5	-5	-5	-5	-5	-4	-3	-3
800	-5	-5	-5	-5	-5	-5	-5	-4	-3	-3
850	-5	-5	-5	-5	-5	-5	-5	-4	-3	-3

Initial Supporting table - KtFADD_V_FSA_ECM_LoThrshGrp3

Description: Map to define P026C threshold for combustion mode Group 3

Value Units: mm^3
X Unit: mm^3
Y Units: rpm

y/x	2	4	6	8	10	12	14	18	20	24
450	-4	-4	-4	-3	-3	-2	-2	-2	-2	-2
550	-4	-4	-4	-3	-3	-2	-2	-2	-2	-2
600	-4	-4	-4	-3	-3	-2	-2	-2	-2	-2
650	-4	-4	-4	-3	-3	-2	-2	-2	-2	-2
700	-4	-4	-4	-3	-3	-2	-2	-2	-2	-2
750	-4	-4	-4	-3	-3	-2	-2	-2	-2	-2
800	-4	-4	-4	-3	-3	-2	-2	-2	-2	-2
850	-4	-4	-4	-3	-3	-2	-2	-2	-2	-2

Initial Supporting table - P0234, P2263: Overboost barometric correction

Description: Ambient air pressure multiplicative correction to the base threshold for overboost monitoring. It is function of ambient air pressure (Y axis) and desired boost pressure (X axis).

Value Units: const [-8, 8]
X Unit: kPa
Y Units: kPa

y/x	100	110	120	130	140	150	160	170	180	190	200	210	220	230	240
70	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
80	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
90	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
100	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

Initial Supporting table - P0234: Maximum boost pressure for overboost monitor enabling

Description: Maximum desired boost pressure below which the overboost deviation monitoring is enabled. This map is function of ambient air pressure.

Value Units: kPa
X Unit: kPa

y/x	70	80	90	100
1	300	300	300	300

Initial Supporting table - P0234: Minimum boost pressure for overboost monitor enabling

Description: Minimum desired boost pressure above which the overboost deviation monitoring is enabled. This map is function of ambient air pressure.

Value Units: kPa
X Unit: kPa

y/x	70	80	90	100
1	150	150	150	150

Initial Supporting table - P0234: Negative boost deviation threshold (throttle control active)

Description: Boost pressure deviation threshold for the negative boost pressure control deviation monitor when the throttle control is active. It identifies an overboost faulty condition. It is function of engine speed (Y axis) and desired boost pressure (X axis).

Value Units: kPa
X Unit: kPa
Y Units: rpm

y/x	100	110	120	130	140	150	160	170	180	190	200	210	220	230	240
1,400	-11	-10	-10	-10	-10	-10	-10	-10	-10	-10	-12	-14	-16	-18	-20
1,500	-11	-10	-10	-10	-10	-10	-10	-10	-10	-10	-12	-14	-16	-18	-20
1,600	-11	-10	-10	-10	-10	-10	-10	-10	-10	-10	-12	-14	-16	-18	-20
1,700	-11	-10	-10	-10	-10	-10	-10	-10	-10	-10	-12	-14	-16	-18	-20
1,800	-11	-10	-10	-10	-10	-10	-10	-10	-10	-10	-12	-14	-16	-18	-20
1,900	-11	-10	-10	-10	-10	-10	-10	-10	-10	-10	-12	-14	-16	-18	-20
2,000	-11	-10	-10	-10	-10	-10	-10	-10	-10	-10	-12	-14	-16	-18	-20
2,100	-11	-11	-11	-11	-11	-11	-11	-11	-11	-11	-13	-14	-16	-18	-20
2,200	-11	-11	-12	-12	-12	-12	-12	-12	-12	-12	-13	-14	-16	-18	-20
2,300	-11	-12	-13	-13	-13	-13	-13	-13	-13	-13	-13	-14	-16	-18	-20

Initial Supporting table - P0234: Negative boost deviation threshold (throttle control not active)

Description: Boost pressure deviation threshold for the negative boost pressure control deviation monitor when the throttle control is not active. It identifies an overboost faulty condition. It is function of engine speed (Y axis) and desired boost pressure (X axis).

Value Units: kPa
X Unit: kPa
Y Units: rpm

y/x	100	110	120	130	140	150	160	170	180	190	200	210	220	230	240
1,400	-11	-10	-10	-10	-10	-10	-10	-10	-10	-10	-12	-14	-16	-18	-20
1,500	-11	-10	-10	-10	-10	-10	-10	-10	-10	-10	-12	-14	-16	-18	-20
1,600	-11	-10	-10	-10	-10	-10	-10	-10	-10	-10	-12	-14	-16	-18	-20
1,700	-11	-10	-10	-10	-10	-10	-10	-10	-10	-10	-12	-14	-16	-18	-20
1,800	-11	-10	-10	-10	-10	-10	-10	-10	-10	-10	-12	-14	-16	-18	-20
1,900	-11	-10	-10	-10	-10	-10	-10	-10	-10	-10	-12	-14	-16	-18	-20
2,000	-11	-10	-10	-10	-10	-10	-10	-10	-10	-10	-12	-14	-16	-18	-20
2,100	-11	-11	-11	-11	-11	-11	-11	-11	-11	-11	-13	-14	-16	-18	-20
2,200	-11	-11	-12	-12	-12	-12	-12	-12	-12	-12	-13	-14	-16	-18	-20
2,300	-11	-12	-13	-13	-13	-13	-13	-13	-13	-13	-13	-14	-16	-18	-20

Initial Supporting table - P0234: Overboost monitor delay timer

Description: Delay timer before enabling the overboost deviation monitoring once all entry conditions are fulfilled. This map is function of engine speed.

Value Units: s
X Unit: rpm

y/x	1,400	1,500	1,600	1,700	1,800	1,900	2,000	2,100	2,200	2,300
1	1	1	1	1	0	0	0	0	0	0

Initial Supporting table - P0299, P2263: Underboost barometric correction

Description: Ambient air pressure multiplicative correction to the base threshold for underboost monitoring. It is function of ambient air pressure (Y axis) and desired boost pressure (X axis).

Value Units: const [-8, 8]
X Unit: kPa
Y Units: kPa

y/x	100	110	120	130	140	150	160	170	180	190	200	210	220	230	240
70	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
80	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
90	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
100	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

Initial Supporting table - P0299: Maximum boost pressure for underboost monitor enabling

Description: Maximum desired boost pressure below which the underboost deviation monitoring is enabled. This map is function of ambient air pressure.

Value Units: kPa
X Unit: kPa

y/x	70	80	90	99
1	300	300	300	300

Initial Supporting table - P0299: Minimum boost pressure for underboost monitor enabling

Description: Minimum desired boost pressure above which the underboost deviation monitoring is enabled. This map is function of ambient air pressure.

Value Units: kPa
X Unit: kPa

y/x	70	80	90	99
1	150	150	150	150

Initial Supporting table - P0299: Positive boost deviation threshold (throttle control active)

Description: Boost pressure deviation threshold for the positive boost pressure control deviation monitor when the throttle control is active. It identifies an underboost faulty condition. It is function of engine speed (Y axis) and desired boost pressure (X axis).

Value Units: kPa
X Unit: kPa
Y Units: rpm

y/x	70	80	90	100	110	120	130	140	150	160	170	180	190	200	210
1,200	99	100	100	100	100	100	100	100	100	100	98	96	94	92	90
1,300	99	100	100	100	100	100	100	100	100	100	98	96	94	92	90
1,400	99	100	100	100	100	100	100	100	100	100	98	96	94	92	90
1,500	99	100	100	100	100	100	100	100	100	100	98	96	94	92	90
1,600	99	100	100	100	100	100	100	100	100	100	98	96	94	92	90
1,700	99	100	100	100	100	100	100	100	100	100	98	96	94	92	90
1,800	99	100	100	100	100	100	100	100	100	100	98	96	94	92	90
1,900	99	99	99	99	99	99	99	99	99	99	97	96	94	92	90
2,000	99	99	98	98	98	98	98	98	98	98	97	96	94	92	90
2,100	99	98	97	97	97	97	97	97	97	97	97	96	94	92	90

Initial Supporting table - P0299: Positive boost deviation threshold (throttle control not active)

Description: Boost pressure deviation threshold for the positive boost pressure control deviation monitor when the throttle control is not active. It identifies an underboost faulty condition. It is function of engine speed (Y axis) and desired boost pressure (X axis).

Value Units: kPa
X Unit: kPa
Y Units: rpm

y/x	70	80	90	100	110	120	130	140	150	160	170	180	190	200	210
1,200	17	17	17	17	17	17	17	17	17	17	17	17	18	24	49
1,300	15	15	15	15	15	15	15	15	15	15	16	17	18	24	49
1,400	15	12	12	12	13	13	13	13	13	13	13	13	18	24	49
1,500	15	12	12	12	13	13	13	13	13	13	13	13	18	24	49
1,600	15	12	12	12	12	13	13	13	13	13	13	12	18	24	49
1,700	15	12	12	12	12	12	13	13	13	13	13	12	18	23	48
1,800	15	12	12	12	12	12	12	13	13	13	13	12	18	22	46
1,900	13	12	12	12	12	12	12	12	13	13	13	13	17	21	45
2,000	12	11	11	11	11	11	11	11	12	12	12	12	16	19	44
2,100	11	10	10	10	10	10	10	10	11	11	11	11	15	18	43

Initial Supporting table - P0299: Underboost monitor delay timer

Description: Delay timer before enabling the underboost deviation monitoring once all entry conditions are fulfilled. This map is function of engine speed.

Value Units: s
X Unit: rpm

y/x	1,200	1,300	1,400	1,500	1,600	1,700	1,800	1,900	2,000	2,100
1	2	2	2	1	1	1	1	1	1	1

Initial Supporting table - P0401, P0402: EGR intrusive test enabling

Description: Calibration map to choose if the EGR intrusive test is enabled or not for each combustion mode.

Value Units: boolean
X Unit: enum

P0401, P0402: EGR intrusive test enabling - Part 1

y/x	CeCMBR_e_Normal	CeCMBR_e_DPF_HiO2	CeCMBR_e_DPF_LoO2	CeCMBR_e_FullyWarmEmissions	CeCMBR_e_LNT_DeNOx
1	0	0	0	0	0

P0401, P0402: EGR intrusive test enabling - Part 2

y/x	CeCMBR_e_LNT_DeSOx_Lean	CeCMBR_e_LNT_DeSOx_Rich	CeCMBR_e_StrongExhGasWarmUp	CeCMBR_e_SoftExhGasWarmUp	CeCMBR_e_DPF_PN
1	0	0	0	0	0

P0401, P0402: EGR intrusive test enabling - Part 3

y/x	CeCMBR_e_DPF_RichIdle	CeCMBR_e_DPF_EngPrtct_HiO2	CeCMBR_e_DPF_EngPrtct_LoO2	CeCMBR_e_LNT_EngPrtct	CeCMBR_e_FADJd leInjLrn
1	0	0	0	0	0

P0401, P0402: EGR intrusive test enabling - Part 4

y/x	CeCMBR_e_HCS_DeHC_Drive	CeCMBR_e_HCS_DeHC_Park	CeCMBR_e_SCR_ServWarmUp	CeCMBR_e_SCR_ServCheck	
1	0	0	0	0	

Initial Supporting table - P0401: Insufficient EGR flow barometric correction (low level)

Description: Air Temperature correction at low barometric level for OBDII insufficient EGR flow monitor. It is function of air temperature.

Value Units: const [-1,1]
X Unit: °C

y/x	-10	-5	0	5	10	20	30	35	40	50
1	2	2	1	1	0	0	0	1	1	2

Initial Supporting table - P0401: Insufficient EGR flow barometric correction (mid level)

Description: Air Temperature correction at mid barometric level for OBDII insufficient EGR flow monitor. It is function of air temperature.

Value Units: const [-1,1]
X Unit: °C

y/x	-10	-5	0	5	10	20	30	35	40	50
1	2	2	1	1	0	0	0	1	1	2

Initial Supporting table - P0401: Insufficient EGR flow barometric correction (sea level)

Description: Air Temperature correction at sea barometric level for OBDII insufficient EGR flow monitor. It is function of air temperature.

Value Units: const [-1,1]
X Unit: °C

y/x	-10	-5	0	5	10	20	30	35	40	50
1	2	2	1	1	0	0	0	1	1	2

Initial Supporting table - P0401: Insufficient EGR flow barometric table A (low level)

Description: Barometric (low level) calibration table for defining a OBDII threshold for insufficient EGR flow deviation monitoring. It is function of engine speed (X axis) and fuel request (Y axis).

Value Units: mg
X Unit: rpm
Y Units: mm^3

y/x	1,400	1,600	1,800	2,000	2,200	2,400	2,600	2,800
20	-40	-40	-40	-40	-40	-40	-40	-40
30	-40	-40	-40	-40	-40	-40	-40	-40
40	-40	-40	-40	-40	-40	-40	-40	-40
50	-40	-40	-40	-40	-40	-40	-40	-40
60	-40	-40	-40	-40	-40	-40	-40	-40
70	-40	-40	-40	-40	-40	-40	-40	-40
80	-40	-40	-40	-40	-40	-40	-40	-40
90	-40	-40	-40	-40	-40	-40	-40	-40
100	-40	-40	-40	-40	-40	-40	-40	-40

Initial Supporting table - P0401: Insufficient EGR flow barometric table A (mid level)

Description: Barometric (mid level) calibration table for defining a OBDII threshold for insufficient EGR flow deviation monitoring. It is function of engine speed (X axis) and fuel request (Y axis).

Value Units: mg
X Unit: rpm
Y Units: mm^3

y/x	1,400	1,600	1,800	2,000	2,200	2,400	2,600	2,800
20	-40	-40	-40	-40	-40	-40	-40	-40
30	-40	-40	-40	-40	-40	-40	-40	-40
40	-40	-40	-40	-40	-40	-40	-40	-40
50	-40	-40	-40	-40	-40	-40	-40	-40
60	-40	-40	-40	-40	-40	-40	-40	-40
70	-40	-40	-40	-40	-40	-40	-40	-40
80	-40	-40	-40	-40	-40	-40	-40	-40
90	-40	-40	-40	-40	-40	-40	-40	-40
100	-40	-40	-40	-40	-40	-40	-40	-40

Initial Supporting table - P0401: Insufficient EGR flow barometric table A (sea level)

Description: Barometric (sea level) calibration table for defining a OBDII threshold for insufficient EGR flow deviation monitoring. It is function of engine speed (X axis) and fuel request (Y axis).

Value Units: mg
X Unit: rpm
Y Units: mm^3

y/x	1,400	1,600	1,800	2,000	2,200	2,400	2,600	2,800
20	-40	-40	-40	-40	-40	-40	-40	-40
30	-40	-40	-40	-40	-40	-40	-40	-40
40	-40	-40	-40	-40	-40	-40	-40	-40
50	-40	-40	-40	-40	-40	-40	-40	-40
60	-40	-40	-40	-40	-40	-40	-40	-40
70	-40	-40	-40	-40	-40	-40	-40	-40
80	-40	-40	-40	-40	-40	-40	-40	-40
90	-40	-40	-40	-40	-40	-40	-40	-40
100	-40	-40	-40	-40	-40	-40	-40	-40

Initial Supporting table - P0401: Insufficient EGR flow barometric table B (low level)

Description: Barometric (low level) calibration table for defining a OBDII threshold for insufficient EGR flow deviation monitoring. It is function of engine speed (X axis) and fuel request (Y axis).

Value Units: mg
X Unit: rpm
Y Units: mm^3

y/x	1,400	1,600	1,800	2,000	2,200	2,400	2,600	2,800
20	-72	-88	-88	-96	-96	-96	-80	-72
30	-88	-104	-112	-112	-136	-144	-120	-80
40	-64	-104	-112	-120	-152	-168	-144	-88
50	-64	-104	-112	-136	-176	-192	-160	-104
60	-64	-104	-120	-144	-176	-192	-168	-104
70	-64	-104	-136	-152	-160	-176	-128	-72
80	-64	-104	-136	-152	-152	-144	-104	-72
90	-64	-104	-136	-152	-136	-104	-104	-72
100	-64	-104	-136	-152	-120	-72	-72	-72

Initial Supporting table - P0401: Insufficient EGR flow barometric table B (mid level)

Description: Barometric (mid level) calibration table for defining a OBDII threshold for insufficient EGR flow deviation monitoring. It is function of engine speed (X axis) and fuel request (Y axis).

Value Units: mg
X Unit: rpm
Y Units: mm^3

y/x	1,400	1,600	1,800	2,000	2,200	2,400	2,600	2,800
20	-88	-104	-112	-112	-112	-112	-96	-88
30	-104	-128	-136	-136	-160	-168	-144	-96
40	-72	-120	-136	-144	-184	-208	-176	-112
50	-72	-120	-136	-160	-208	-232	-192	-120
60	-72	-120	-144	-176	-208	-232	-208	-120
70	-72	-120	-160	-184	-192	-208	-152	-88
80	-72	-120	-160	-184	-184	-176	-128	-88
90	-72	-120	-160	-184	-160	-128	-128	-88
100	-72	-120	-160	-184	-144	-88	-88	-88

Initial Supporting table - P0401: Insufficient EGR flow barometric table B (sea level)

Description: Barometric (sea level) calibration table for defining a OBDII threshold for insufficient EGR flow deviation monitoring. It is function of engine speed (X axis) and fuel request (Y axis).

Value Units: mg
X Unit: rpm
Y Units: mm^3

y/x	1,400	1,600	1,800	2,000	2,200	2,400	2,600	2,800
20	-72	-88	-88	-96	-96	-96	-80	-72
30	-88	-104	-112	-112	-136	-144	-120	-80
40	-64	-104	-112	-120	-152	-168	-144	-88
50	-64	-104	-112	-136	-176	-192	-160	-104
60	-64	-104	-120	-144	-176	-192	-168	-104
70	-64	-104	-136	-152	-160	-176	-128	-72
80	-64	-104	-136	-152	-152	-144	-104	-72
90	-64	-104	-136	-152	-136	-104	-104	-72
100	-64	-104	-136	-152	-120	-72	-72	-72

Initial Supporting table - P0401: Insufficient EGR flow Max fuel enabling condition

Description: Maximum desired fuel below which the insufficient EGR flow is enabled. It is function of engine speed (X axis) and barometric pressure (Y axis).

Value Units: mm^3
X Unit: rpm
Y Units: kPa

y/x	600	800	1,000	1,400	1,800	2,200	2,600	3,000
50	120	120	120	120	120	120	120	120
55	120	120	120	120	120	120	120	120
60	120	120	120	120	120	120	120	120
65	120	120	120	120	120	120	120	120
70	120	120	120	120	120	120	120	120
75	120	120	120	120	120	120	120	120
80	120	120	120	120	120	120	120	120
85	120	120	120	120	120	120	120	120
90	120	120	120	120	120	120	120	120
100	120	120	120	120	120	120	120	120
110	120	120	120	120	120	120	120	120

Initial Supporting table - P0401: Insufficient EGR flow Max OAT threshold for C1

Description: Maximum desired OAT below which the insufficient EGR flow is enabled, for the Normal combustion mode. It is function of barometric pressure.

Value Units: °C
X Unit: kPa

y/x	50	55	60	65	70	75	80	85	90	100	110
1	90	90	90	90	90	90	90	90	90	90	90

Initial Supporting table - P0401: Insufficient EGR flow Max OAT threshold for 02

Description: Maximum desired OAT below which the insufficient EGR flow is enabled, for the Fully Warm Emissions combustion mode. It is function of barometric pressure.

Value Units: °C
X Unit: kPa

y/x	50	55	60	65	70	75	80	85	90	100	110
1	90	90	90	90	90	90	90	90	90	90	90

Initial Supporting table - P0401: Insufficient EGR flow Max OAT threshold for others

Description: Maximum desired OAT below which the insufficient EGR flow is enabled, for all other combustion modes. It is function of barometric pressure.

Value Units: °C
X Unit: kPa

y/x	50	55	60	65	70	75	80	85	90	100	110
1	90	90	90	90	90	90	90	90	90	90	90

Initial Supporting table - P0401: Insufficient EGR flow Max OAT threshold for V2

Description: Maximum desired OAT below which the insufficient EGR flow is enabled, for the Soft Warm Up combustion mode. It is function of barometric pressure.

Value Units: °C
X Unit: kPa

y/x	50	55	60	65	70	75	80	85	90	100	110
1	90	90	90	90	90	90	90	90	90	90	90

Initial Supporting table - P0401: Insufficient EGRflow Min fuel enabling condition

Description: Minimum desired fuel above which the insufficient EGRflow is enabled. It is function of engine speed (X axis) and barometric pressure (Y axis).

Value Units: mm^3
X Unit: rpm
Y Units: kPa

y/x	600	800	1,000	1,400	1,800	2,200	2,600	3,000
50	45	45	45	45	45	45	45	45
55	45	45	45	45	45	45	45	45
60	45	45	45	45	45	45	45	45
65	45	45	45	45	45	45	45	45
70	45	45	45	45	45	45	45	45
75	45	45	45	45	45	45	45	45
80	45	45	45	45	45	45	45	45
85	45	45	45	45	45	45	45	45
90	45	45	45	45	45	45	45	45
100	45	45	45	45	45	45	45	45
110	45	45	45	45	45	45	45	45

Initial Supporting table - P0401: Insufficient EGR flow Min OAT threshold for C1

Description: Minimum desired OAT above which the insufficient EGR flow is enabled, for the Normal combustion mode. It is function of barometric pressure.

Value Units: °C
X Unit: kPa

y/x	50	55	60	65	70	75	80	85	90	100	110
1	-7	-7	-7	-7	-7	-7	-7	-7	-7	-7	-7

Initial Supporting table - P0401: Insufficient EGR flow Min OAT threshold for 02

Description: Minimum desired OAT above which the insufficient EGR flow is enabled, for the Fully Warm Emissions combustion mode. It is function of barometric pressure.

Value Units: °C
X Unit: kPa

y/x	50	55	60	65	70	75	80	85	90	100	110
1	-7	-7	-7	-7	-7	-7	-7	-7	-7	-7	-7

Initial Supporting table - P0401: Insufficient EGR flow Min OAT threshold for others

Description: Minimum desired OAT above which the insufficient EGR flow is enabled, for all other combustion modes. It is function of barometric pressure.

Value Units: °C
X Unit: kPa

y/x	50	55	60	65	70	75	80	85	90	100	110
1	-7	-7	-7	-7	-7	-7	-7	-7	-7	-7	-7

Initial Supporting table - P0401: Insufficient EGR flow Min OAT threshold for V2

Description: Minimum desired OAT above which the insufficient EGR flow is enabled, for the Soft Warm Up combustion mode. It is function of barometric pressure.

Value Units: °C
X Unit: kPa

y/x	50	55	60	65	70	75	80	85	90	100	110
1	-7	-7	-7	-7	-7	-7	-7	-7	-7	-7	-7

Initial Supporting table - P0401: Insufficient EGR intrusive test Max fuel enabling condition

Description: Maximum desired fuel below which the insufficient EGR intrusive test is enabled. It is function of engine speed (X axis) and barometric pressure (Y axis).

Value Units: mm^3
X Unit: rpm
Y Units: kPa

y/x	1	2	3	4	5	6	7	8
1	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0

Initial Supporting table - P0401: Insufficient EGR intrusive test Min fuel enabling condition

Description: Minimum desired fuel above which the insufficient EGR intrusive test is enabled. It is function of engine speed (X axis) and barometric pressure (Y axis).

Value Units: mm^3
X Unit: rpm
Y Units: kPa

y/x	1	2	3	4	5	6	7	8
1	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0

Initial Supporting table - P0401: Minimum desired EGRflow

Description: Minimum desired EGR flow above which the insufficient EGR flow is enabled. It is function of engine speed (X axis) and barometric pressure (Y axis).

Value Units: mg
X Unit: rpm
Y Units: kPa

y/x	600	800	1,000	1,400	1,800	2,200	2,600	3,000
50	52	52	52	52	52	52	52	52
55	52	52	52	52	52	52	52	52
60	52	52	52	52	52	52	52	52
65	52	52	52	52	52	52	52	52
70	52	52	52	52	52	52	52	52
75	52	52	52	52	52	52	52	52
80	52	52	52	52	52	52	52	52
85	52	52	52	52	52	52	52	52
90	52	52	52	52	52	52	52	52
100	52	52	52	52	52	52	52	52
110	52	52	52	52	52	52	52	52

Initial Supporting table - P0402: Excessive EGR flow barometric correction (low level)

Description: Air Temperature correction at low barometric level for OBDII excessive EGR flow monitor. It is function of air temperature.

Value Units: const [-1,1]
X Unit: °C

y/x	-10	-5	0	5	10	20	30	35	40	50
1	2	1	1	0	0	0	0	1	1	2

Initial Supporting table - P0402: Excessive EGR flow barometric correction (mid level)

Description: Air Temperature correction at mid barometric level for OBDII excessive EGR flow monitor. It is function of air temperature.

Value Units: const [-1,1]
X Unit: °C

y/x	-10	-5	0	5	10	20	30	35	40	50
1	2	1	1	0	0	0	0	1	1	2

Initial Supporting table - P0402: Excessive EGR flow barometric correction (sea level)

Description: Air Temperature correction at sea barometric level for OBDII excessive EGR flow monitor. It is function of air temperature.

Value Units: const [-1,1]
X Unit: °C

y/x	-10	-5	0	5	10	20	30	35	40	50
1	2	1	1	0	0	0	0	1	1	2

Initial Supporting table - P0402: Excessive EGR flow barometric table A (low level)

Description: Barometric (low level) calibration table for defining a OBDII threshold for excessive EGR flow deviation monitoring. It is function of engine speed (X axis) and fuel request (Y axis).

Value Units: mg
X Unit: rpm
Y Units: mm^3

y/x	600	800	1,000	1,200	1,400	1,600	1,800	2,000
20	32	32	32	32	32	32	32	32
30	32	32	32	32	32	32	32	32
40	32	32	32	32	32	32	32	32
50	32	32	32	32	32	32	32	32
60	32	32	32	32	32	32	32	32
70	32	32	32	32	32	32	32	32
80	32	32	32	32	32	32	32	32
90	32	32	32	32	32	32	32	32
100	32	32	32	32	32	32	32	32

Initial Supporting table - P0402: Excessive EGR flow barometric table A (mid level)

Description: Barometric (mid level) calibration table for defining a OBDII threshold for excessive EGR flow deviation monitoring. It is function of engine speed (X axis) and fuel request (Y axis).

Value Units: mg
X Unit: rpm
Y Units: mm^3

y/x	600	800	1,000	1,200	1,400	1,600	1,800	2,000
20	32	32	32	32	32	32	32	32
30	32	32	32	32	32	32	32	32
40	32	32	32	32	32	32	32	32
50	32	32	32	32	32	32	32	32
60	32	32	32	32	32	32	32	32
70	32	32	32	32	32	32	32	32
80	32	32	32	32	32	32	32	32
90	32	32	32	32	32	32	32	32
100	32	32	32	32	32	32	32	32

Initial Supporting table - P0402: Excessive EGR flow barometric table A (sea level)

Description: Barometric (sea level) calibration table for defining a OBDII threshold for excessive EGR flow deviation monitoring. It is function of engine speed (X axis) and fuel request (Y axis).

Value Units: mg
X Unit: rpm
Y Units: mm^3

y/x	600	800	1,000	1,200	1,400	1,600	1,800	2,000
20	32	32	32	32	32	32	32	32
30	32	32	32	32	32	32	32	32
40	32	32	32	32	32	32	32	32
50	32	32	32	32	32	32	32	32
60	32	32	32	32	32	32	32	32
70	32	32	32	32	32	32	32	32
80	32	32	32	32	32	32	32	32
90	32	32	32	32	32	32	32	32
100	32	32	32	32	32	32	32	32

Initial Supporting table - P0402: Excessive EGR flow barometric table B (low level)

Description: Barometric (low level) calibration table for defining a OBDII threshold for excessive EGR flow deviation monitoring. It is function of engine speed (X axis) and fuel request (Y axis).

Value Units: mg
X Unit: rpm
Y Units: mm^3

y/x	600	800	1,000	1,200	1,400	1,600	1,800	2,000
20	248	248	248	248	248	248	248	248
30	248	248	248	248	248	248	248	248
40	248	248	248	248	248	248	248	248
50	248	248	248	248	248	248	248	248
60	248	248	248	248	248	248	248	248
70	248	248	248	248	248	248	248	248
80	248	248	248	248	248	248	248	248
90	248	248	248	248	248	248	248	248
100	248	248	248	248	248	248	248	248

Initial Supporting table - P0402: Excessive EGR flow barometric table B (mid level)

Description: Barometric (mid level) calibration table for defining a OBDII threshold for excessive EGR flow deviation monitoring. It is function of engine speed (X axis) and fuel request (Y axis).

Value Units: mg
X Unit: rpm
Y Units: mm^3

y/x	600	800	1,000	1,200	1,400	1,600	1,800	2,000
20	304	304	304	304	304	304	304	304
30	304	304	304	304	304	304	304	304
40	304	304	304	304	304	304	304	304
50	304	304	304	304	304	304	304	304
60	304	304	304	304	304	304	304	304
70	304	304	304	304	304	304	304	304
80	304	304	304	304	304	304	304	304
90	304	304	304	304	304	304	304	304
100	304	304	304	304	304	304	304	304

Initial Supporting table - P0402: Excessive EGR flow barometric table B (sea level)

Description: Barometric (sea level) calibration table for defining a OBDII threshold for excessive EGR flow deviation monitoring. It is function of engine speed (X axis) and fuel request (Y axis).

Value Units: mg
X Unit: rpm
Y Units: mm^3

y/x	600	800	1,000	1,200	1,400	1,600	1,800	2,000
20	248	248	248	248	224	200	176	152
30	248	248	248	248	224	200	176	152
40	248	248	248	248	224	200	176	152
50	248	248	248	248	224	200	176	152
60	248	248	248	248	224	200	176	152
70	248	248	248	248	224	200	176	152
80	248	248	248	248	224	200	176	152
90	248	248	248	248	224	200	176	152
100	248	248	248	248	224	200	176	152

Initial Supporting table - P0402: Excessive EGR flow Max fuel enabling condition

Description: Maximum desired fuel below which the excessive EGR flow is enabled. It is function of engine speed (X axis) and barometric pressure (Y axis).

Value Units: mm^3
X Unit: rpm
Y Units: kPa

y/x	600	800	1,000	1,400	1,800	2,200	2,600	3,000
50	90	90	90	90	90	90	90	90
55	90	90	90	90	90	90	90	90
60	90	90	90	90	90	90	90	90
65	90	90	90	90	90	90	90	90
70	90	90	90	90	90	90	90	90
75	90	90	90	90	90	90	90	90
80	90	90	90	90	90	90	90	90
85	90	90	90	90	90	90	90	90
90	90	90	90	90	90	90	90	90
100	90	90	90	90	90	90	90	90
110	90	90	90	90	90	90	90	90

Initial Supporting table - P0402: Excessive EGR flow Max OAT threshold for C1

Description: Maximum desired OAT below which the excessive EGR flow is enabled, for the Normal combustion mode. It is function of barometric pressure.

Value Units: °C
X Unit: kPa

y/x	50	55	60	65	70	75	80	85	90	100	110
1	90	90	90	90	90	90	90	90	90	90	90

Initial Supporting table - P0402: Excessive EGR flow Max OAT threshold for 02

Description: Maximum desired OAT below which the excessive EGR flow is enabled, for the Fully Warm Emissions combustion mode. It is function of barometric pressure.

Value Units: °C
X Unit: kPa

y/x	50	55	60	65	70	75	80	85	90	100	110
1	90	90	90	90	90	90	90	90	90	90	90

Initial Supporting table - P0402: Excessive EGR flow Max OAT threshold for others

Description: Maximum desired OAT below which the excessive EGR flow is enabled, for all others combustion modes. It is function of barometric pressure.

Value Units: °C
X Unit: kPa

y/x	50	55	60	65	70	75	80	85	90	100	110
1	90	90	90	90	90	90	90	90	90	90	90

Initial Supporting table - P0402: Excessive EGR flow Max OAT threshold for V2

Description: Maximum desired OAT below which the excessive EGR flow is enabled, for the Soft Warm Up combustion mode. It is function of barometric pressure.

Value Units: °C
X Unit: kPa

y/x	50	55	60	65	70	75	80	85	90	100	110
1	90	90	90	90	90	90	90	90	90	90	90

Initial Supporting table - P0402: Excessive EGR flow Min fuel enabling condition

Description: Minimum desired fuel above which the excessive EGR flow is enabled. It is function of engine speed (X axis) and barometric pressure (Y axis).

Value Units: mm^3
X Unit: rpm
Y Units: kPa

y/x	600	800	1,000	1,400	1,800	2,200	2,600	3,000
50	50	30	20	20	20	20	20	20
55	50	30	20	20	20	20	20	20
60	50	30	20	20	20	20	20	20
65	50	30	20	20	20	20	20	20
70	50	30	20	20	20	20	20	20
75	50	30	20	20	20	20	20	20
80	50	30	20	20	20	20	20	20
85	50	30	20	20	20	20	20	20
90	50	30	20	20	20	20	20	20
100	50	30	20	20	20	20	20	20
110	50	30	20	20	20	20	20	20

Initial Supporting table - P0402: Excessive EGR flow Min OAT threshold for C1

Description: Minimum desired OAT above which the excessive EGR flow is enabled, for the Normal combustion mode. It is function of barometric pressure.

Value Units: °C
X Unit: kPa

y/x	50	55	60	65	70	75	80	85	90	100	110
1	-7	-7	-7	-7	-7	-7	-7	-7	-7	-7	-7

Initial Supporting table - P0402: Excessive EGR flow Min OAT threshold for 02

Description: Minimum desired OAT above which the excessive EGR flow is enabled, for the Fully Warm Emissions combustion mode. It is function of barometric pressure.

Value Units: °C
X Unit: kPa

y/x	50	55	60	65	70	75	80	85	90	100	110
1	-7	-7	-7	-7	-7	-7	-7	-7	-7	-7	-7

Initial Supporting table - P0402: Excessive EGR flow Min OAT threshold for others

Description: Minimum desired OAT above which the excessive EGR flow is enabled, for all other combustion modes. It is function of barometric pressure.

Value Units: °C
X Unit: kPa

y/x	50	55	60	65	70	75	80	85	90	100	110
1	-7	-7	-7	-7	-7	-7	-7	-7	-7	-7	-7

Initial Supporting table - P0402: Excessive EGR flow Min OAT threshold for V2

Description: Minimum desired OAT above which the excessive EGR flow is enabled, for the Soft Warm Up combustion mode. It is function of barometric pressure.

Value Units: °C
X Unit: kPa

y/x	50	55	60	65	70	75	80	85	90	100	110
1	-7	-7	-7	-7	-7	-7	-7	-7	-7	-7	-7

Initial Supporting table - P0402: Excessive EGR intrusive test Max fuel enabling condition

Description: Maximum desired fuel below which the excessive EGR intrusive test is enabled. It is function of engine speed (X axis) and barometric pressure (Y axis).

Value Units: mm^3
X Unit: rpm
Y Units: kPa

y/x	1	2	3	4	5	6	7	8
1	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0

Initial Supporting table - P0402: Excessive EGR intrusive test Min fuel enabling condition

Description: Minimum desired fuel above which the excessive EGR intrusive test is enabled. It is function of engine speed (X axis) and barometric pressure (Y axis).

Value Units: mm^3
X Unit: rpm
Y Units: kPa

y/x	1	2	3	4	5	6	7	8
1	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0

Initial Supporting table - P0402: Maximum desired EGRflow

Description: Maximum desired EGR flow below which the excessive EGR flow is enabled. It is function of engine speed (X axis) and barometric pressure (Y axis).

Value Units: mg
X Unit: rpm
Y Units: kPa

y/x	600	800	1,000	1,400	1,800	2,200	2,600	3,000
50	360	336	320	280	260	256	256	208
55	360	336	320	280	260	256	256	208
60	360	336	320	280	260	256	256	208
65	360	336	320	280	260	256	256	208
70	360	336	320	280	260	256	256	208
75	384	356	340	296	276	272	272	220
80	404	380	360	316	292	288	288	236
85	428	400	380	332	308	304	304	248
90	452	420	400	352	324	320	320	260
100	452	420	400	352	324	320	320	260
110	452	420	400	352	324	320	320	260

Initial Supporting table - P140B: Increasing EGR slow response threshold

Description: Threshold for increasing EGR flow slow response monitoring. It is function of ambient air pressure.

Value Units: %
X Unit: kPa

y/x	70	83	96
1	10	10	10

Initial Supporting table - P140C: Decreasing EGR slow response threshold

Description: Threshold for decreasing EGR flow slow response monitoring. It is function of ambient air pressure.

Value Units: %
X Unit: kPa

y/x	70	83	96
1	20	20	20

Initial Supporting table - P168A: Positive boost slow response threshold

Description: Averaged cumulative boost pressure deviation threshold for the positive boost pressure slow response monitor. The map is function of ambient air pressure.

Value Units: kPa
X Unit: kPa

y/x	70	83	96
1	90	80	55

Initial Supporting table - P168B: Negative boost slow response threshold

Description: Averaged cumulative boost pressure deviation threshold for the negative boost pressure slow response monitor. The map is function of ambient air pressure.

Value Units: kPa
X Unit: kPa

y/x	70	83	96
1	55	43	30

Initial Supporting table - P0071: OAT Performance Drive Equilibrium Engine Off

Description: OAT Performance Diagnostic counter increment for determining OAT-IAT equilibrium for engine off (for hybrid applications)

Value Units: Counter Increment Value (Unitless)
X Unit: Vehicle Speed (KPH)

y/x	0.0	5.0	10.0	15.0	20.0	25.0	30.0	50.0	80.0
1.0	0.0	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0

Initial Supporting table - P0071: OAT Performance Drive Equilibrium Engine Running

Description: OAT Performance Diagnostic counter increment for determining OAT-IAT equilibhum for engine running

Value Units: Counter Increment Value (Unitless)
X Unit: Vehicle Speed (KPH)
Y Units: Engine Air Flow (Grams/Second)

y/x	0.0	5.0	10.0	15.0	20.0	25.0	30.0	50.0	80.0
1.0	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0
5.0	-5.0	-2.0	-1.0	0.0	1.0	2.0	3.0	4.0	5.0
10.0	-4.0	-1.0	0.0	0.0	1.0	2.0	3.0	4.0	5.0
20.0	-2.0	-1.0	0.0	0.0	1.0	2.0	3.0	4.0	5.0
30.0	-1.0	0.0	0.0	1.0	2.0	3.0	4.0	5.0	6.0
40.0	0.0	0.0	0.0	1.0	2.0	3.0	4.0	5.0	6.0
50.0	0.0	0.0	1.0	2.0	3.0	4.0	5.0	6.0	7.0
60.0	0.0	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0
70.0	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0

Initial Supporting table - 1st_FireAftrMisfr_Acel

Description: Used for P0300 - P0308, Multiplier for establishing the expected acceleration of the cylinder after the misfire

Value Units: multiplier
X Unit: RPM
Y Units: percent load of max indicated torque (%)

y/x	510	660	700	800	900	1,000	1,200	1,400	1,600	1,800	2,000	2,200	2,400	2,600	2,800	3,000	3,200
4	0.42	0.49	0.49	0.58	0.60	0.54	0.59	0.41	0.51	0.47	0.38	0.48	0.67	0.53	0.50	0.39	0.52
8	0.44	0.48	0.60	0.71	0.69	0.68	0.63	0.61	0.78	0.80	0.65	0.83	0.96	0.67	0.65	0.47	0.61
12	0.40	0.43	0.52	0.59	0.70	0.68	0.65	0.64	1.17	0.91	1.00	1.09	1.07	1.00	1.00	0.56	0.70
18	0.38	0.39	0.50	0.48	0.69	0.68	0.59	0.66	0.96	0.80	1.05	1.05	1.06	1.21	1.13	0.77	0.86
22	0.35	0.38	0.47	0.44	0.65	0.68	0.55	0.60	0.84	0.69	1.01	0.98	1.00	1.22	1.14	0.82	0.88
24	0.35	0.38	0.47	0.42	0.64	0.66	0.54	0.60	0.79	0.66	1.00	0.95	0.96	1.24	1.13	0.83	0.83
30	0.33	0.37	0.45	0.40	0.61	0.64	0.53	0.58	0.74	0.58	0.92	0.90	0.92	1.22	1.14	0.88	0.77
60	0.29	0.35	0.42	0.35	0.57	0.63	0.49	0.57	0.63	0.44	0.65	0.75	0.82	1.14	1.07	1.08	0.69
98	0.28	0.34	0.41	0.34	0.55	0.65	0.47	0.56	0.59	0.39	0.57	0.67	0.79	1.11	1.04	1.24	0.67

Initial Supporting table - 1st_FireAftrMisfr_Jerk

Description: Used for P0300 - P0308, Multiplier for establishing the expected Jerk of the cylinder after the misfire

Value Units: multiplier
X Unit: RPM
Y Units: percent load of max indicated torque (%)

y/x	510	660	700	800	900	1,000	1,200	1,400	1,600	1,800	2,000	2,200	2,400	2,600	2,800	3,000	3,200
4	-1.07	-0.65	-0.82	-0.80	-0.78	-0.71	-0.67	-0.66	-0.62	-0.53	-0.39	-0.53	-0.46	-0.37	-0.31	-0.36	-0.42
8	-1.21	-0.99	-0.92	-0.97	-0.82	-0.86	-0.76	-0.82	-0.74	-0.74	-0.43	-0.59	-0.53	-0.45	-0.42	-0.45	-0.47
12	-1.35	-0.93	-0.81	-0.89	-0.67	-0.66	-0.81	-0.72	-0.71	-0.76	-0.61	-0.72	-0.49	-0.45	-0.44	-0.42	-0.38
18	-1.40	-0.95	-0.71	-0.80	-0.66	-0.65	-0.94	-0.85	-0.74	-0.76	-0.79	-0.82	-0.70	-0.45	-0.50	-0.52	-0.58
22	-1.40	-0.96	-0.68	-0.77	-0.65	-0.66	-0.97	-0.87	-0.73	-0.66	-0.85	-0.90	-0.85	-0.55	-0.68	-0.69	-0.78
24	-1.37	-0.96	-0.68	-0.75	-0.64	-0.66	-0.85	-0.94	-0.80	-0.68	-0.85	-0.90	-0.86	-0.59	-0.70	-0.74	-0.91
30	-1.40	-0.96	-0.66	-0.73	-0.62	-0.68	-0.73	-0.95	-1.10	-0.76	-0.90	-0.97	-0.87	-0.71	-0.84	-0.92	-1.08
60	-1.36	-0.96	-0.64	-0.69	-0.56	-0.71	-0.70	-1.02	-0.98	-0.78	-0.99	-0.98	-0.99	-1.04	-1.04	-1.24	-1.64
98	-1.36	-0.96	-0.63	-0.68	-0.54	-0.74	-0.68	-1.04	-1.13	-0.74	-1.01	-0.96	-1.04	-1.23	-1.09	-1.28	-2.02

Initial Supporting table - IstFireAfterMisJerkAFM

Description: Used for P0300 - P0308, Multiplier for establishing the expected jerk of the cylinder after the misfire if Active Fuel Management cylinder deact mode is active

Value Units: multiplier
X Unit: RPM
Y Units: percent load of max indicated torque (%)

y/x	800	1,000	1,200	1,600	2,000	2,400	2,600	3,000	3,500
8	1	1	1	1	1	1	1	1	1
12	1	1	1	1	1	1	1	1	1
16	1	1	1	1	1	1	1	1	1
20	1	1	1	1	1	1	1	1	1
24	1	1	1	1	1	1	1	1	1
30	1	1	1	1	1	1	1	1	1
40	1	1	1	1	1	1	1	1	1
60	1	1	1	1	1	1	1	1	1
100	1	1	1	1	1	1	1	1	1

Initial Supporting table - IstFireAftrMisAcelAFM

Description: Used for P0300 - P0308, Multiplier for establishing the expected acceleration of the cylinder after the misfire if Active Fuel Management cylinder deact mode is active

Value Units: multiplier
X Unit: RPM
Y Units: percent load of max indicated torque (%)

y/x	800	1,000	1,200	1,600	2,000	2,400	2,600	3,000	3,500
8	1	1	1	1	1	1	1	1	1
12	1	1	1	1	1	1	1	1	1
16	1	1	1	1	1	1	1	1	1
20	1	1	1	1	1	1	1	1	1
24	1	1	1	1	1	1	1	1	1
30	1	1	1	1	1	1	1	1	1
40	1	1	1	1	1	1	1	1	1
60	1	1	1	1	1	1	1	1	1
100	1	1	1	1	1	1	1	1	1

Initial Supporting table - Abnormal Cyl Mode

Description: Used for P0300-P0308. Number of consecutive number of decelerating cylinders after the misfire that would be considered abnormal. (Cylinder Mode Equation)

Value Units: Number of consecutive number of decelerating cylinders (integer)
X Unit: thousands of RPM (rpm/1000)

y/x	0	1	2	3	4	5	6	7	8
1	3	4	4	3	3	3	3	3	3

Initial Supporting table - Abnormal Rev Mode

Description: Used for P0300-P0308. Abnormal Rev Mode   Number of consecutive number of decelerating cylinders after the misfire that would be considered abnormal.   (Rev Mode Equation)

Value Units: Number of consecutive number of decelerating cylinders (integer)
X Unit: thousands of RPM   (rpm/1000)

y/x	0	1	2	3	4	5	6	7	8
1	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00

Initial Supporting table - Abnormal SCD Mode

Description: Used for P0300-P0308. Number of consecutive number of decelerating cylinders after the misfire that would be considered abnormal. (SCD Mode Equation)

Value Units: Number of consecutive number of decelerating cylinders (integer)
X Unit: thousands of RPM (rpm/1000)

y/x	0	1	2	3	4	5	6	7	8
1	2	2	2	2	2	2	2	2	2

Initial Supporting table - Bank_SCD_Decel

Description: Used for P0300 - P0308, Mulitplier to SCD decel to account for different pattern of Paired cylinder misfire. Multipliers are a function of engine rpm and % engine Load.

Value Units: multiplier
X Unit: RPM
Y Units: percent load of max indicated torque (%)

y/x	400	550	700	800	900	1,000	1,200	1,400	1,600
6	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60
8	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60
12	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60
16	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60
20	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60
30	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60
40	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60
60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60
98	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60

Initial Supporting table - Bank_SCD_Jerk

Description: Used for P0300 - P0308, Mulitplier to Medres SCD jerk to account for different pattern of Paired cylinder misfire. Multipliers are a function of engine rpm and % engine Load.

Value Units: mulitplier
X Unit: RPM
Y Units: percent load of max indicated torque (%)

y/x	400	550	700	800	900	1,000	1,200	1,400	1,600
6	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
8	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
12	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
16	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
20	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
30	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
40	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
60	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
98	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Initial Supporting table - BankCylModeDecel

Description: Used for P0300 - P0308, Mulitplier to Lores Decel to account for different pattern of Paired cylinder misfire. Multipliers are a function of engine rpm and % engine Load.

Value Units: multiplier
X Unit: RPM
Y Units: percent load of max indicated torque (%)

y/x	510	660	700	800	900	1,000	1,200	1,400	1,600	1,800	2,000	2,200	2,400	2,600	2,800	3,000	3,200
6	0.79	0.93	1.01	0.95	0.89	0.90	0.74	0.77	0.77	0.58	0.40	1.09	1.03	1.33	1.72	1.31	1.84
8	0.57	0.68	0.84	0.81	0.76	0.78	0.63	0.78	0.70	0.63	0.44	1.22	1.12	1.37	1.81	1.31	1.83
12	0.33	0.39	0.46	0.48	0.45	0.51	0.51	0.54	0.46	0.57	0.55	1.03	0.93	1.33	2.05	1.44	1.95
16	0.24	0.28	0.34	0.33	0.35	0.35	0.42	0.56	0.44	0.58	0.57	0.54	0.70	1.08	1.59	1.62	2.10
20	0.24	0.28	0.34	0.31	0.40	0.36	0.37	0.54	0.35	0.51	0.56	0.33	0.30	0.67	1.12	1.59	1.87
30	0.19	0.26	0.31	0.33	0.50	0.36	0.32	0.39	0.35	0.43	0.47	0.38	0.42	0.44	0.66	1.38	1.21
40	0.17	0.25	0.30	0.34	0.54	0.37	0.30	0.41	0.36	0.42	0.43	0.45	0.43	0.30	0.50	1.27	0.95
60	0.14	0.24	0.29	0.38	0.58	0.38	0.29	0.41	0.36	0.40	0.34	0.48	0.36	0.44	0.48	1.17	0.71
98	0.17	0.29	0.35	0.42	0.62	0.38	0.30	0.38	0.36	0.38	0.31	0.46	0.32	0.52	0.46	1.11	0.56

Initial Supporting table - BankCylModeJerk

Description: Used for P0300 - P0308, Mulitplier to Lores Jerk to account for different pattern of Paired cylinder misfire. Multipliers are a function of engine rpm and % engine Load.

Value Units: multiplier
X Unit: RPM
Y Units: percent load of max indicated torque (%)

y/x	510	660	700	800	900	1,000	1,200	1,400	1,600	1,800	2,000	2,200	2,400	2,600	2,800	3,000	3,200
6	3.11	3.00	2.50	2.25	2.95	3.00	1.46	1.38	1.15	1.06	1.52	1.76	1.97	2.09	3.10	1.71	2.41
8	1.93	2.03	2.03	1.97	2.00	2.69	1.15	1.36	1.03	0.90	1.18	1.53	1.90	1.97	3.27	1.73	2.24
12	0.89	0.91	0.92	1.02	0.95	1.23	0.94	0.77	0.83	0.93	1.07	1.28	1.52	1.74	2.74	1.50	1.83
16	0.63	0.60	0.63	0.71	0.62	0.69	0.79	0.86	1.15	0.70	1.11	1.16	1.10	1.40	2.14	1.58	1.90
20	0.68	0.66	0.63	0.63	0.70	0.71	0.98	0.95	0.86	0.74	1.03	0.96	1.05	1.12	1.48	1.63	2.00
30	0.60	0.58	0.57	0.58	0.76	0.73	0.78	1.00	1.26	0.76	0.89	0.83	0.94	1.02	1.30	1.42	1.96
40	0.53	0.55	0.55	0.59	0.75	0.73	0.79	0.93	0.93	0.90	0.85	0.73	0.85	1.07	0.89	1.41	1.93
60	0.47	0.51	0.54	0.57	0.75	0.71	0.78	0.96	0.96	0.72	0.82	0.65	0.78	1.27	0.61	1.15	1.82
98	0.49	0.52	0.54	0.55	0.74	0.70	0.77	0.96	0.91	0.68	0.82	0.59	0.72	1.33	0.47	0.96	1.78

Initial Supporting table - Catalyst_Damage_Misfire_Percentage

Description: Catalyst Damaging Misfire Percentage" Table whenever secondary conditions are met.

Value Units: percent misfire over 200 revolutions (%)
X Unit: RPM
Y Units: percent load of max indicated torque (%)

y/x	0	1,000	2,000	3,000	4,000	5,000	6,000	7,000
0	512.0	512.0	512.0	512.0	512.0	512.0	512.0	512.0
10	512.0	512.0	512.0	512.0	512.0	512.0	512.0	512.0
20	512.0	512.0	512.0	512.0	512.0	512.0	512.0	512.0
30	512.0	512.0	512.0	512.0	512.0	512.0	512.0	512.0
40	512.0	512.0	512.0	512.0	512.0	512.0	512.0	512.0
50	512.0	512.0	512.0	512.0	512.0	512.0	512.0	512.0
60	512.0	512.0	512.0	512.0	512.0	512.0	512.0	512.0
70	512.0	512.0	512.0	512.0	512.0	512.0	512.0	512.0
80	512.0	512.0	512.0	512.0	512.0	512.0	512.0	512.0
90	512.0	512.0	512.0	512.0	512.0	512.0	512.0	512.0
100	512.0	512.0	512.0	512.0	512.0	512.0	512.0	512.0

Initial Supporting table - CatCrtdEffRepEWMA

Description: Minimum Catalyst (CC DOC) conversion efficiency threshold (repass fault threshold) as function of ambient temperature [K] in case of Catalyst EWMA filter enabled and Catalyst conversion inefficiency previously detected (Catalyst FA = TRUE)

y/x	250.00	266.00	282.00	298.00	314.00	330.00
1.00	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

Initial Supporting table - CatCrtdEffThrsh

Description: Minimum Catalyst (CC DOC) conversion efficiency threshold (fault threshold) as function of ambient temperature [K]

y/x	250.00	266.00	282.00	298.00	314.00	330.00
1.00	0.8500	0.8500	0.8500	0.8500	0.8500	0.8500

Initial Supporting table - CatCrtdMaxFuel

Description: Maximum integrated post injected fuel quantity threshold [g], as function of ambient temperature [K], needed to stop Catalyst integrators (heat and injected fuel) and calculate the Aging Index

y/x	250.00	266.00	282.00	298.00	314.00	330.00
1.00	150.0000	150.0000	150.0000	150.0000	150.0000	150.0000

Initial Supporting table - ClyAfterAFM_Decel

Description: Used for P0300 - P0308, Mulitplier to Lores decel to account for different pattern of misfire after a deactivated cylider.   Similar to the second cylinder of consecutive cylinder misfire. Multipliers are a function of engine rpm and % engine Load.

Value Units: multiplier
X Unit: RPM
Y Units: percent load of max indicated torque (%)

y/x	800	1,000	1,200	1,600	2,000	2,400	2,600	3,000	3,500
5	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
10	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
20	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
30	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
40	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
50	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
60	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
80	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
100	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Initial Supporting table - ClyBeforeAFM_Jerk

Description: Used for P0300 - P0308, Mulitplier to Lores decel to account for different pattern of misfire before a deactivated cylider, but after an active cylinder that follows an deactive cylinder on engine that supports cylinder deactivation in non even fire patterns.. Multipliers are a function of engine rpm and % engine Load.

Value Units: multiplier
X Unit: RPM
Y Units: percent load of max indicated torque (%)

y/x	800	1,000	1,200	1,600	2,000	2,400	2,600	3,000	3,500
5	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
10	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
20	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
30	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
40	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
50	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
60	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
80	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
100	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Initial Supporting table - CombustModeIdleTbl

Description: Used for P0300 - P0308, Only used on Diesel engines. Combustion modes that will force use of Idle table. A value of CeCMBR_i_CombModesMax means not selected.

Value Units: Enumerated value of different combustion modes (enumeration)
X Unit: Current Combustion Mode (enumeration)

CombustModeIdleTbl - Part 1

y/x	0	1	2	3	4	5
1	CeCMBR_i_CombModesMax	CeCMBR_i_CombModesMax	CeCMBR_i_CombModesMax	CeCMBR_i_CombModesMax	CeCMBR_i_CombModesMax	CeCMBR_i_CombModesMax

CombustModeIdleTbl - Part 2

y/x	6	7	8	9	10	11
1	CeCMBR_i_CombModesMax	CeCMBR_i_CombModesMax	CeCMBR_i_CombModesMax	CeCMBR_i_CombModesMax	CeCMBR_i_CombModesMax	CeCMBR_i_CombModesMax

CombustModeIdleTbl - Part 3

y/x	12	13	14	15	16	
1	CeCMBR_i_CombModesMax	CeCMBR_i_CombModesMax	CeCMBR_i_CombModesMax	CeCMBR_i_CombModesMax	CeCMBR_i_CombModesMax	

Initial Supporting table - ConsecCylModDecel

Description: Used for P0300 - P0308, Mulitplier to Lores decel to account for different pattern of the second cylinder of consecutive misfire. Multipliers are a function of engine rpm and % engine Load.

Value Units: multiplier
X Unit: RPM
Y Units: percent load of max indicated torque (%)

y/x	510	660	700	800	900	1,000	1,200	1,400	1,600	1,800	2,000	2,200	2,400	2,600	2,800	3,000	3,200
4	1.10	1.12	1.08	0.99	1.30	1.26	1.23	1.16	0.57	0.60	0.84	0.92	1.48	1.32	1.76	1.37	1.93
6	1.11	1.02	1.23	0.94	1.02	1.13	1.29	1.19	0.54	0.85	0.90	0.98	1.45	1.33	1.62	1.26	1.84
10	0.97	1.08	1.31	0.94	0.93	1.01	1.16	1.21	1.30	1.32	1.17	1.18	1.27	1.24	1.10	1.13	1.67
14	1.16	1.22	1.46	1.23	1.32	1.25	1.00	1.18	1.59	1.40	1.24	1.28	1.03	1.00	1.00	1.15	1.25
18	1.18	1.32	1.59	1.45	1.67	1.51	0.78	1.00	1.22	1.29	1.19	1.16	0.89	1.00	0.94	1.23	1.14
22	1.16	1.38	1.65	1.52	1.90	1.72	0.74	0.78	0.96	1.10	1.10	1.09	0.82	0.91	0.94	1.32	1.20
30	1.07	1.47	1.72	1.79	2.15	1.86	0.84	0.64	0.90	0.77	0.93	0.74	0.78	0.59	0.60	1.47	1.21
60	1.01	1.61	1.87	2.17	2.56	2.19	0.81	0.56	0.85	0.67	0.62	0.62	0.70	0.67	1.70	2.48	1.26
98	0.98	1.62	1.94	2.34	2.74	2.34	0.81	0.51	0.84	0.65	0.52	0.78	0.66	0.63	2.57	3.07	1.33

Initial Supporting table - ConsecCylModeJerk

Description: Used for P0300 - P0308, Mulitplier to Lores Jerk to account for different pattern of the second cylinder of consecutive misfire. Multipliers are a function of engine rpm and % engine Load.

Value Units: multiplier
X Unit: RPM
Y Units: percent load of max indicated torque (%)

y/x	510	660	700	800	900	1,000	1,200	1,400	1,600	1,800	2,000	2,200	2,400	2,600	2,800	3,000	3,200
4	-1	-1	-1	-1	-2	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	0	0
6	0	-1	-1	-1	-2	-1	-2	-2	-2	-1	-1	-1	-1	-1	-1	0	-1
10	0	0	0	-1	-1	-1	-2	-3	-3	-1	-1	-2	-1	-1	-1	0	-1
14	0	0	0	0	0	0	-2	-3	-4	-1	-1	-1	-1	-1	-1	0	0
18	0	0	0	0	0	0	-2	-3	-3	-1	-1	-1	-1	-1	-1	-1	0
22	0	0	0	0	0	0	-2	-3	-3	-1	-1	-1	-1	-2	-2	-1	-1
30	0	0	0	0	0	0	-2	-2	-3	-1	-1	-1	-1	-2	-2	-1	-1
60	1	0	0	0	0	0	-1	-2	-3	-1	-1	-1	-1	-2	-2	-3	-3
98	1	1	0	0	0	0	0	-1	-3	0	-1	-1	-1	-2	-1	-3	-3

Initial Supporting table - ConsecSCD_Decel

Description: Used for P0300 - P0308, Mulitplier to medres decel to account for different pattern of the second cylinder of consecutive misfire. Multipliers are a function of engine rpm and % engine Load.

Value Units: multiplier
X Unit: RPM
Y Units: percent load of max indicated torque (%)

y/x	400	550	700	800	900	1,000	1,200	1,400	1,600
4	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
6	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
10	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
14	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
18	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
22	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
30	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
60	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
98	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Initial Supporting table - ConsecSCD_Jerk

Description: Used for P0300 - P0308, Mulitplier to medres Jerk to account for different pattern of the second cylinder of consecutive misfire. Multipliers are a function of engine rpm and % engine Load.

Value Units: multiplier
X Unit: RPM
Y Units: percent load of max indicated torque (%)

y/x	400	550	700	800	900	1,000	1,200	1,400	1,600
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
98	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Initial Supporting table - CylAfterAFM_Jerk

Description: Used for P0300 - P0308, Mulitplier to Lores Jerk to account for different pattern of misfire after a deactivated cylider. Similar to the second cylinder of consecutive cylinder misfire. Multipliers are a function of engine rpm and % engine Load.

Value Units: multiplier
X Unit: RPM
Y Units: percent load of max indicated torque (%)

y/x	800	1,000	1,200	1,600	2,000	2,400	2,600	3,000	3,500
5	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0	0
60	0	0	0	0	0	0	0	0	0
80	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0

Initial Supporting table - CylBeforeAFM_Decel

Description: Used for P0300 - P0308, Mulitplier to Lores decel to account for different pattern of misfire before a deactivated cylider, but after an active cylinder that follows an deactive cylinder on engine that supports cylinder deactivation in non even fire patterns.. Multipliers are a function of engine rpm and % engine Load.

Value Units: multiplier
X Unit: RPM
Y Units: percent load of max indicated torque (%)

y/x	800	1,000	1,200	1,600	2,000	2,400	2,600	3,000	3,500
5	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
10	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
20	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
30	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
40	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
50	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
60	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
80	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
100	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Initial Supporting table - CylModeDecel

Description: Used for P0300-P0308. Crankshaft decel threshold. Thresholds are a function of rpm and % engine Load.

Value Units: Delta time per cylinder (usee)
X Unit: RPM
Y Units: percent load of max indicated torque (%)

CylModeDecel - Part 1

y/x	510	585	660	700	800	900	1,000	1,100	1,200	1,400	1,600	1,800	2,000
1	1,098	889	700	597	371	238	200	178	150	105	84	65	46
2	801	606	456	475	328	214	168	157	120	85	65	56	43
4	672	544	441	403	281	184	149	132	80	68	52	45	38
6	664	538	396	335	238	181	139	110	74	56	44	36	32
8	890	671	487	365	247	189	136	101	77	51	40	28	28
10	1,041	803	575	443	286	215	156	103	82	54	36	28	24
12	1,158	901	661	518	343	238	175	105	91	57	36	29	24
14	1,270	1,009	746	574	395	257	197	109	104	61	41	32	25
16	1,389	1,127	828	630	453	285	217	138	117	66	52	35	27
18	1,579	1,223	913	693	500	312	237	165	128	76	59	40	29
20	1,803	1,302	994	747	552	340	256	193	144	91	70	46	31
22	1,976	1,407	1,071	818	606	368	278	222	159	102	80	52	34
24	2,117	1,493	1,143	885	657	397	306	247	174	113	90	58	36
30	2,609	1,818	1,363	1,078	795	480	381	317	214	145	119	75	46
40	3,445	2,337	1,720	1,390	1,029	617	497	440	284	205	175	104	65
60	4,952	3,384	2,465	2,008	1,487	893	724	676	416	297	274	165	107
97	7,796	5,301	3,867	3,145	2,337	1,408	1,160	1,129	670	474	458	278	184

CylModeDecel - Part 2

y/x	2,200	2,400	2,600	2,800	3,000	3,200	3,400	3,600	3,800	4,000	4,200	4,600	5,000
1	36	24	22	26	22	17	32,766	32,768	32,768	32,768	32,768	32,768	32,768
2	32	19	20	21	21	15	32,766	32,768	32,768	32,768	32,768	32,768	32,768
4	27	17	17	17	19	14	32,766	32,768	32,768	32,768	32,768	32,768	32,768
6	22	15	15	15	18	13	32,766	32,768	32,768	32,768	32,768	32,768	32,768
8	18	13	14	13	16	12	32,766	32,768	32,768	32,768	32,768	32,768	32,768
10	17	13	13	11	15	11	32,766	32,768	32,768	32,768	32,768	32,768	32,768
12	17	14	12	10	14	10	32,766	32,768	32,768	32,768	32,768	32,768	32,768
14	18	15	13	10	13	10	32,766	32,768	32,768	32,768	32,768	32,768	32,768
16	20	17	13	11	13	10	32,766	32,768	32,768	32,768	32,768	32,768	32,768
18	22	18	14	12	13	11	32,766	32,768	32,768	32,768	32,768	32,768	32,768
20	24	20	15	13	14	12	32,766	32,768	32,768	32,768	32,768	32,768	32,768

Initial Supporting table - CylModeDecel

22	27	22	16	14	14	13	32,766	32,768	32,768	32,768	32,768	32,768	32,768
24	29	24	17	15	15	15	32,766	32,768	32,768	32,768	32,768	32,768	32,768
30	36	30	21	18	17	20	32,766	32,768	32,768	32,768	32,768	32,768	32,768
40	48	40	27	23	21	28	32,766	32,768	32,768	32,768	32,768	32,768	32,768
60	76	59	39	35	26	43	32,766	32,768	32,768	32,768	32,768	32,768	32,768
97	129	94	61	56	36	72	32,766	32,768	32,768	32,768	32,768	32,768	32,768

Initial Supporting table - CylModeJerk

Description: Crankshaft jerk threshold. Thresholds are a function of rpm and % engine Load.

Value Units: Change in Delta time per cylinder from last cylinder (usee)
Y Units: percent load of max indicated torque (%)

CylModeJerk - Part 1

y/x	510	585	660	700	800	900	1,000	1,100	1,200	1,400	1,600	1,800	2,000
1	909	712	564	498	332	224	181	161	138	134	54	66	29
2	693	583	469	426	265	183	142	128	117	94	44	51	25
4	543	480	369	318	219	149	124	89	89	59	36	39	21
6	481	360	313	307	202	136	108	84	70	51	34	32	17
8	672	548	416	345	213	159	107	87	80	46	33	29	19
10	827	662	528	450	272	220	144	93	87	49	37	28	21
12	930	766	645	580	369	277	187	106	94	60	40	27	22
14	1,072	936	781	698	463	336	231	113	104	68	40	33	24
16	1,171	1,022	892	814	553	393	273	126	120	62	45	40	27
18	1,303	1,149	1,012	933	646	450	315	156	126	77	55	41	31
20	1,467	1,280	1,129	1,045	750	494	352	182	122	83	66	54	35
22	1,572	1,409	1,242	1,160	855	560	389	209	152	89	74	61	40
24	1,713	1,526	1,350	1,270	959	630	426	237	189	97	84	70	45
30	2,105	1,962	1,702	1,591	1,280	822	528	306	277	135	82	92	58
40	2,720	2,454	2,233	2,114	1,758	1,159	699	406	384	200	163	116	79
60	4,081	3,843	3,379	3,152	2,781	1,809	1,026	634	608	290	240	214	118
97	6,573	6,010	5,449	5,101	4,669	3,035	1,615	1,087	1,025	476	403	379	193

CylModeJerk - Part 2

y/x	2,200	2,400	2,600	2,800	3,000	3,200	3,400	3,600	3,800	4,000	4,200	4,600	5,000
1	29	26	28	23	19	12	32,766	32,768	32,768	32,768	32,768	32,768	32,768
2	22	22	23	21	16	11	32,766	32,768	32,768	32,768	32,768	32,768	32,768
4	19	18	21	18	14	10	32,766	32,768	32,768	32,768	32,768	32,768	32,768
6	17	16	18	15	12	9	32,766	32,768	32,768	32,768	32,768	32,768	32,768
8	17	15	17	13	11	9	32,766	32,768	32,768	32,768	32,768	32,768	32,768
10	17	16	16	12	11	9	32,766	32,768	32,768	32,768	32,768	32,768	32,768
12	18	17	16	13	11	9	32,766	32,768	32,768	32,768	32,768	32,768	32,768
14	20	19	17	14	12	10	32,766	32,768	32,768	32,768	32,768	32,768	32,768
16	22	21	18	14	12	10	32,766	32,768	32,768	32,768	32,768	32,768	32,768
18	26	20	19	16	13	11	32,766	32,768	32,768	32,768	32,768	32,768	32,768
20	28	22	20	17	14	11	32,766	32,768	32,768	32,768	32,768	32,768	32,768

Initial Supporting table - CylModeJerk

22	31	23	21	16	15	12	32,766	32,768	32,768	32,768	32,768	32,768	32,768
24	34	26	22	17	16	12	32,766	32,768	32,768	32,768	32,768	32,768	32,768
30	43	35	26	19	18	13	32,766	32,768	32,768	32,768	32,768	32,768	32,768
40	61	48	31	28	21	15	32,766	32,768	32,768	32,768	32,768	32,768	32,768
60	92	72	39	43	31	20	32,766	32,768	32,768	32,768	32,768	32,768	32,768
97	153	118	57	72	50	27	32,766	32,768	32,768	32,768	32,768	32,768	32,768

Initial Supporting table - DeacCylInversionDecel

Description: Used for P0300 - P0308, Negative Torque can cause crank readings to invert (active cylinders appear weak & deactivated cylinders appear "strong" If deactivated cylinders don't decelerate at least this amount then the crank signal is inverting. Function of speed and load.

Value Units: Delta time per cylinder (usee)
X Unit: RPM
Y Units: percent load of max indicated torque (%)

y/x	800	1,000	1,200	1,600	2,000	2,400	2,600	3,000	3,500
5	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0	0
60	0	0	0	0	0	0	0	0	0
80	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0

Initial Supporting table - DeacCylInversionJerk

Description: Used for P0300 - P0308, Negative Torque can cause crank readings to invert (active cylinders appear weak & deactivated cylinders appear "strong" If deactivated cylinders don't jerk at least this amount then the crank signal is inverting. Function of speed and load.

Value Units: Change in Delta time per cylinder from last cylinder (usee)
X Unit: RPM
Y Units: percent load of max indicated torque (%)

y/x	800	1,000	1,200	1,600	2,000	2,400	2,600	3,000	3,500
5	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0	0
60	0	0	0	0	0	0	0	0	0
80	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0

Initial Supporting table - EngineOverSpeedLimit

Description: Engine OverSpeed Limit versus gear

Value Units: RPM
X Unit: Enumeration of transmission gear state (enumeration)

EngineOverSpeedLimit - Part 1

y/x	CeTGRR_e_TransGr1	CeTGRR_e_TransGr2	CeTGRR_e_TransGr3	CeTGRR_e_TransGr4	CeTGRR_e_TransGr5	CeTGRR_e_TransGr6	CeTGRR_e_TransGr9
1	5,200	5,200	5,200	5,200	5,200	5,200	5,200

EngineOverSpeedLimit - Part 2

y/x	CeTGRR_e_TransGr10	CeTGRR_e_TransGrNeut	CeTGRR_e_TransGrRvrs	CeTGRR_e_TransGrPark	CeTGRR_e_TransGr7	CeTGRR_e_TransGr8	
1	5,200	2,925	5,200	2,925	5,200	5,200	

Initial Supporting table - InfrequentRegen

Description: Used for P0300-P0308. Only used on Diesel engines. Initiates a misfire delay when the current combustion mode matchs a selection in the table. A value of CeCMBR_i_CombModesMax means not selected.

Value Units: Enumerated value of differant combustion modes (enumeration)
X Unit: Current Combustion Mode (enumeration)

InfrequentRegen - Part 1

y/x	0	1	2	3	4	5
1	CeCMBR_e_DPF_HiO2	CeCMBR_e_DPF_PN	CeCMBR_e_DPF_RichIdle	CeCMBR_i_CombModesMax	CeCMBR_i_CombModesMax	CeCMBR_i_CombModesMax

InfrequentRegen - Part 2

y/x	6	7	8	9	10	11
1	CeCMBR_i_CombModesMax	CeCMBR_i_CombModesMax	CeCMBR_i_CombModesMax	CeCMBR_i_CombModesMax	CeCMBR_i_CombModesMax	CeCMBR_i_CombModesMax

InfrequentRegen - Part 3

y/x	12	13	14	15	16	
1	CeCMBR_i_CombModesMax	CeCMBR_i_CombModesMax	CeCMBR_i_CombModesMax	CeCMBR_i_CombModesMax	CeCMBR_i_CombModesMax	

Initial Supporting table - K_EffExhFlowCond

Description: Enablement table, function of exhaust flow and SCR average temperature [boolean] for SCR NOx catalyst efficiency monitoring (P20EE)

Value Units: boolean
X Unit: °C
Y Units: g/sec

y/x	239	240	274	275	300	301	324	325	349	350	370	410	440	441	450
79	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
80	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0
94	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0
95	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0
124	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0
125	0	1	1	1	1	1	1	0	0	0	0	0	0	0	0
164	0	1	1	1	1	1	1	0	0	0	0	0	0	0	0
165	0	1	1	1	1	1	1	1	1	0	0	0	0	0	0
179	0	1	1	1	1	1	1	1	1	0	0	0	0	0	0
180	0	0	0	0	0	1	1	1	1	1	1	0	0	0	0
200	0	0	0	0	0	1	1	1	1	1	1	0	0	0	0
201	0	0	0	0	0	0	0	1	1	1	1	1	1	0	0
234	0	0	0	0	0	0	0	1	1	1	1	1	1	0	0
235	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0
254	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0
255	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Initial Supporting table - m_NH3_StrgDevErrMaxThrsh

Description: Upper boundary of NH3 storage deviation error [g] for SCR NOx catalyst efficiency monitoring (P20EE)

Value Units: g
X Unit: °C

y/x	200	230	275	299	300	325	350	400
1	3	3	2	2	1	1	1	1

Initial Supporting table - m_NH3_StrgDevErrMinThrsh

Description: Lower boundary of NH3 storage deviation error [g] for SCR NOx catalyst efficiency monitoring (P20EE)

Value Units: g
X Unit: °C

y/x	200	230	275	299	300	325	350	400
1	-3	-3	-2	-2	-1	-1	-1	-1

Initial Supporting table - m_NH3_StrgMaxThrsh

Description: Upper boundary of estimated NH3 storage [g] for SCR NOx catalyst efficiency monitoring (P20EE)

Value Units: g
X Unit: °C

y/x	200	250	275	300	325	350	400	450
1	7	7	7	7	7	7	7	7

Initial Supporting table - m_NH3_StrgMinThrsh

Description: Lower boundary of estimated NH3 storage [g] for SCR NOx catalyst efficiency monitoring (P20EE)

Value Units: g
X Unit: °C

y/x	200	250	275	300	325	350	400	450
1	0	0	0	0	0	0	0	0

Initial Supporting table - m SlipNOxintglThrsh

Description: NOx integral threshold to enable slip condition based on SCR average temperature [mg] for SCR NOx catalyst efficiency monitoring (P20EE)

Value Units: mg
X Unit: °C

y/x	240	275	300	325
1	3,500	5,000	6,000	8,192

Initial Supporting table - Number of Normals

Description: Used for P0300-P0308. Number of Normals for the Driveline Ring Filter
After a low level misfire, another misfire may not be detectable until driveline ringing ceases. If no ringing seen, stop filter early.

Value Units: Number of Engine cycles after isolated misfire (Engine cycles)
X Unit: thousands of RPM (rpm/1000)

y/x	0	1	2	3	4	5	6	7	8
1	3	3	3	3	3	3	3	3	3

Initial Supporting table - P0101: Manifold pressure High limit in Overrun

Description: Intake manifold pressure high limit in overrun condition, below which the MAF sensor performance monitoring is enabled. It is function of engine speed.

Value Units: kPa
X Unit: rpm

y/x	600	1,000	1,400	1,800	2,200	2,600	3,000	3,400
1	115	120	125	130	135	140	140	140

Initial Supporting table - P0101: Manifold pressure Low limit in Overrun

Description: Intake manifold pressure low limit in overrun condition, above which the MAF sensor performance monitoring is enabled. It is function of engine speed.

Value Units: kPa
X Unit: rpm

y/x	600	1,000	1,400	1,800	2,200	2,600	3,000	3,400
1	75	75	75	75	75	75	75	75

Initial Supporting table - P0101: Pulsation Map

Description: Adjustment of the air mass flow measured by the MAF sensor for flow distribution and pulsations. It is function of engine speed (X axis) and fuel request (Y axis)

Value Units: const
X Unit: rpm
Y Units: mm^3

y/x	600	800	1,000	1,200	1,400	1,600	1,800	2,000	2,200	2,400	2,600	2,800	3,020	3,200	3,400	3,600
0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
10	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
20	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
30	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
40	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
50	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
60	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
70	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
80	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
90	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
100	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
110	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
120	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
130	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
140	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

Initial Supporting table - P0101: VGT position High limit in Overrun

Description: VGT position high limit in overrun condition, below which the MAF sensor performance monitoring is enabled. It is function of engine speed.

Value Units: %
X Unit: rpm

y/x	600	1,000	1,400	1,800	2,200	2,600	3,000	3,400
1	86	86	86	86	86	86	86	86

Initial Supporting table - P0101: VGT position Low limit in Overrun

Description: VGT position low limit in overrun condition, above which the MAF sensor performance monitoring is enabled. It is function of engine speed.

Value Units: %
X Unit: rpm

y/x	600	1,000	1,400	1,800	2,200	2,600	3,000	3,400
1	10	10	10	10	10	10	10	10

Initial Supporting table - P2457: Maximum HP EGR filtered flow for HP EGR cooler efficiency monitor enabling

Description: Maximum allowed HP EGR filtered flow as a function of ambient air temperature to enable HP EGR cooler efficiency diagnostic.

Value Units: g/s
X Unit: deg C

y/x	1	2	3	4	5	6
1	60	60	60	60	60	60

Initial Supporting table - P2457: Minimum HP EGR filtered flow for HP EGR cooler efficiency monitor enabling

Description: Minimum allowed HP EGR filtered flow as a function of ambient air temperature to enable HP EGR cooler efficiency diagnostic.

Value Units: g/s
X Unit: deg C

y/x	1	2	3	4	5	6
1	8	8	8	8	8	8

Initial Supporting table - P2457: Minimum time for HP EGR cooler efficiency monitor enabling

Description: Minimum allowed time as a function of HP EGR filtered flow to run HP EGR cooler efficiency diagnostic once that all HP EGR flow enabling conditions are reached.

Value Units: s
X Unit: g/s

y/x	0	20	40	60	80	100
1	1	1	1	1	1	1

Initial Supporting table - Pair_SCD_Decel

Description: Used for P0300 - P0308, Mulitplier to SCD_Decel to account for different pattern of Paired cylinder misfire. Multipliers are a function of engine rpm and % engine Load.

Value Units: multiplier
X Unit: RPM
Y Units: percent load of max indicated torque (%)

y/x	400	550	700	800	900	1,000	1,200	1,400	1,600
4	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
6	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
10	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
14	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
18	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
22	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
30	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
60	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
98	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Initial Supporting table - Pair_SCD_Jerk

Description: Used for P0300 - P0308, Mulitplier to P0300_SCD_Jerk to account for different pattern of Paired cylinder misfire. Multipliers are a function of engine rpm and % engine Load.

Value Units: multiplier
X Unit: RPM
Y Units: percent load of max indicated torque (%)

y/x	400	550	700	800	900	1,000	1,200	1,400	1,600
4	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
6	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
10	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
14	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
18	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
22	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
30	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
60	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
98	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Initial Supporting table - PairCylModeDecel

Description: Used for P0300 - P0308, Mulitplier to Cyl Mode Deceleration to account for different pattern of Paired cylinder misfire. Multipliers are a function of engine rpm and % engine Load.

Value Units: mulitplier
X Unit: RPM
Y Units: percent load of max indicated torque (%)

y/x	510	660	700	800	900	1,000	1,200	1,400	1,600	1,800	2,000	2,200	2,400	2,600	2,800	3,000	3,200
4	1.02	0.88	0.86	1.04	1.01	1.01	1.04	0.99	1.29	0.85	0.56	1.19	1.73	0.76	1.03	1.29	1.41
6	1.04	0.90	0.83	1.04	0.91	0.91	0.94	0.88	0.85	0.86	0.56	1.18	1.62	0.73	1.03	1.26	1.40
10	0.85	0.79	0.71	1.02	0.91	1.00	0.88	0.93	0.65	0.77	0.56	0.85	0.93	0.80	0.95	1.10	1.38
14	0.93	0.83	0.99	1.09	1.11	1.07	0.90	0.98	1.01	0.89	0.76	0.75	0.74	0.88	0.90	0.88	1.20
18	1.01	0.84	1.05	1.11	1.22	1.12	1.30	1.14	0.94	0.99	1.09	0.91	0.83	0.93	0.79	0.69	0.90
22	0.96	0.86	1.07	1.10	1.28	1.15	1.45	1.41	1.14	1.08	1.22	1.04	0.91	0.94	0.82	0.86	0.76
30	0.95	0.91	1.09	1.14	1.36	1.13	1.69	1.73	1.42	1.19	1.32	1.18	1.00	1.07	1.00	1.06	0.67
60	0.95	0.98	1.17	1.19	1.50	1.17	2.05	2.30	1.62	1.17	1.23	1.27	1.17	1.19	1.14	1.52	0.71
98	0.95	1.06	1.22	1.22	1.56	1.17	2.14	2.46	1.68	1.19	1.18	1.28	1.19	1.25	1.19	1.81	0.71

Initial Supporting table - PairCylModeJerk

Description: Used for P0300 - P0308, Mulitplier to P0300_CylModeJerk to account for different pattern of Paired cylinder misfire. Multipliers are a function of engine rpm and % engine Load.

Value Units: multiplier
X Unit: RPM
Y Units: percent load of max indicated torque (%)

y/x	510	660	700	800	900	1,000	1,200	1,400	1,600	1,800	2,000	2,200	2,400	2,600	2,800	3,000	3,200
4	1.10	1.41	0.99	1.52	1.72	1.75	1.13	1.51	2.35	1.83	2.12	2.05	1.66	1.05	1.20	2.14	3.47
6	1.15	1.59	0.84	1.39	1.45	1.63	1.07	1.45	1.81	1.25	1.73	1.94	1.56	1.06	1.27	2.25	3.24
10	0.91	0.96	0.66	1.22	1.00	1.26	0.96	1.13	1.17	1.04	1.12	1.09	1.23	0.94	1.25	1.91	2.35
14	0.97	0.95	0.90	1.06	1.03	1.13	1.20	1.21	1.36	1.26	1.13	1.05	0.93	0.88	0.89	1.43	1.47
18	1.02	0.99	0.95	1.04	1.03	1.08	0.94	1.78	1.39	1.41	1.15	1.06	1.03	0.87	0.78	0.96	0.96
22	1.03	1.00	0.97	1.01	1.02	1.11	0.96	2.04	1.42	1.30	1.24	1.11	1.15	0.93	0.97	0.93	0.99
30	1.05	1.00	0.98	0.96	1.00	1.14	0.94	2.19	2.00	1.33	1.33	1.21	1.10	1.04	1.14	1.22	1.31
60	1.09	1.03	1.03	0.94	0.97	1.18	0.85	1.89	1.72	1.27	1.40	1.27	1.26	1.41	1.01	1.76	2.33
98	1.10	1.07	1.06	0.92	0.97	1.22	0.81	1.81	2.01	1.21	1.43	1.28	1.28	1.54	0.97	1.90	3.06

Initial Supporting table - IRandom_SCD_Decel

Description: Used for P0300 - P0308, Mulitplier to SCD_Decel to account for different pattern of light level misfire. Multipliers are a function of engine rpm and % engine Load.

Value Units: multiplier
X Unit: RPM
Y Units: percent load of max indicated torque (%)

y/x	400	550	700	800	900	1,000	1,200	1,400	1,600
4	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
8	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
12	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
18	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
22	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
24	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
30	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
60	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
98	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Initial Supporting table - Random_SCD_Jerk

Description: Used for P0300 - P0308, Mulitplier to Random_SCD_Jerk to account for different pattern of light level misfire. Multipliers are a function of engine rpm and % engine Load.

Value Units: multiplier
X Unit: RPM
Y Units: percent load of max indicated torque (%)

y/x	400	550	700	800	900	1,000	1,200	1,400	1,600
4	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
8	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
12	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
18	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
22	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
24	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
30	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
60	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
98	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Initial Supporting table - RandomAFM_Decl

Description: Used for P0300 - P0308, Mulitplierto Cylinder_Decel while in Cylnder Deactivation mode to account for different pattern of light level misfire. Multipliers are a function of engine rpm and % engine Load.

Value Units: multiplier
X Unit: RPM
Y Units: percent load of max indicated torque (%)

y/x	800	1,000	1,200	1,600	2,000	2,400	2,600	3,000	3,500
5	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
10	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
20	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
30	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
40	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
50	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
60	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
80	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
100	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Initial Supporting table - RandomAFM_Jerk

Description: Used for P0300 - P0308, Mulitplier to Cylinder_Jerk while in Cylnder Deactivation mode to account for different pattern of light level misfire. Multipliers are a function of engine rpm and % engine Load.

Value Units: multiplier
X Unit: RPM
Y Units: percent load of max indicated torque (%)

y/x	800	1,000	1,200	1,600	2,000	2,400	2,600	3,000	3,500
5	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
10	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
20	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
30	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
40	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
50	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
60	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
80	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
100	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Initial Supporting table - RandomCylModDecel

Description: Used for P0300 - P0308. Multiplier to CylMode_Decel. account for different pattern of light level misfire. Multipliers are a function of engine rpm and % engine Load.

Value Units: Multiplier
X Unit: RPM
Y Units: percent load of max indicated torque (%)

y/x	510	660	700	800	900	1,000	1,200	1,400	1,600	1,800	2,000	2,200	2,400	2,600	2,800	3,000	3,200
4	1.01	1.00	1.00	1.00	1.03	1.00	1.02	1.00	1.00	1.00	1.00	1.00	1.00	1.30	1.00	1.00	1.04
8	1.07	1.11	1.24	1.28	1.09	1.14	1.18	1.09	1.00	1.14	1.00	1.00	1.04	1.05	1.00	1.00	1.00
12	1.29	1.12	1.23	1.34	1.35	1.33	1.14	1.11	1.28	1.21	1.15	1.21	1.21	1.21	1.15	1.00	1.05
18	1.46	1.27	1.37	1.51	1.68	1.60	1.03	1.03	1.04	1.18	1.28	1.34	1.36	1.39	1.33	1.19	1.24
22	1.41	1.32	1.40	1.58	1.77	1.67	1.01	1.03	1.00	1.13	1.46	1.45	1.36	1.41	1.39	1.39	1.24
24	1.45	1.35	1.40	1.60	1.79	1.66	1.01	1.07	1.00	1.12	1.51	1.43	1.38	1.47	1.40	1.43	1.17
30	1.43	1.42	1.40	1.65	1.87	1.68	1.04	1.16	1.00	1.11	1.53	1.51	1.46	1.61	1.54	1.59	1.13
60	1.46	1.55	1.41	1.77	2.01	1.76	1.02	1.09	1.00	1.17	1.32	1.54	1.45	1.92	1.67	2.17	1.02
98	1.47	1.59	1.42	1.81	2.07	1.77	1.00	1.12	1.00	1.16	1.27	1.51	1.45	2.06	1.66	2.58	1.00

Initial Supporting table - RandomCylModJerk

Description: Used for P0300 - P0308, Multiplier to CylMode_Jerk to account for different pattern of light level misfire. Multipliers are a function of engine rpm and % engine Load.

Value Units: multiplier
X Unit: RPM
Y Units: percent load of max indicated torque (%)

y/x	510	660	700	800	900	1,000	1,200	1,400	1,600	1,800	2,000	2,200	2,400	2,600	2,800	3,000	3,200
4	1.04	1.01	1.08	1.08	1.13	1.06	1.00	1.00	1.11	1.00	1.61	1.29	1.26	1.22	1.06	1.46	1.58
8	1.21	1.11	1.05	1.19	1.04	1.15	1.00	1.00	1.00	1.00	1.03	1.06	1.17	1.00	1.04	1.45	1.47
12	1.30	1.10	1.04	1.15	1.11	1.17	1.00	1.00	1.00	1.05	1.05	1.03	1.00	1.03	1.00	1.15	1.11
18	1.64	1.09	1.03	1.00	1.10	1.11	1.04	1.05	1.00	1.05	1.00	1.02	1.03	1.00	1.00	1.02	1.00
22	1.74	1.09	1.01	1.00	1.11	1.12	1.07	1.17	1.00	1.00	1.00	1.00	1.02	1.00	1.00	1.10	1.09
24	1.82	1.10	1.01	1.00	1.09	1.12	1.00	1.18	1.00	1.01	1.00	1.00	1.00	1.00	1.00	1.13	1.22
30	1.82	1.08	1.00	1.00	1.06	1.15	1.00	1.09	1.12	1.00	1.01	1.02	1.01	1.00	1.14	1.25	1.46
60	1.82	1.10	1.00	1.00	1.00	1.23	1.10	1.00	1.03	1.00	1.03	1.07	1.07	1.59	1.21	1.55	2.03
98	1.80	1.11	1.00	1.00	1.00	1.28	1.07	1.00	1.00	1.00	1.05	1.04	1.06	1.84	1.15	1.55	2.39

Initial Supporting table - IRandomRevModDecl

Description: Used for P0300 - P0308, Mulitplier to RevModeJDecel to account for different pattern of light level misfire. Multipliers are a function of engine rpm and % engine Load.

Value Units: multiplier
X Unit: RPM
Y Units: percent load of max indicated torque (%)

y/x	3,001	3,500	4,000	4,500	5,000	5,500	6,000	7,000	8,000
4	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
8	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
12	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
18	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
22	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
24	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
30	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
60	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
98	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Initial Supporting table - RepetSnapDecayAdjst

Description: Used for P0300 - P0308, If misfire is present in consecutive engine cycles, this multiplier is applied to the misfire jerk threshold and compared to a crankshaft snap value after the misfire has taken place.. Table lookup as a function of engine rpm.

Value Units: multiplier
X Unit: RPM

y/x	600	900	1,000	1,200	1,400	1,800	2,000	2,800	3,200
1	1.00	1.00	1.00	2.42	1.00	2.09	1.14	1.14	1.00

Initial Supporting table - RevMode_Decel

Description: Used for P0300-P0308. Crankshaft decel threshold. Thresholds are a function of rpm and % engine Load.

Value Units: Delta time between revolutions (usee)
X Unit: RPM
Y Units: percent load of max indicated torque (%)

y/x	1,100	1,200	1,400	1,600	1,800	2,000	2,200	2,400	2,600	2,800	3,000	3,001	3,500	4,000	4,500	5,000	5,500	6,000	6,500
1	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768
2	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768
4	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768
6	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768
8	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768
10	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768
12	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768
14	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768
16	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768
18	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768
20	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768
22	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768
24	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768
30	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768
40	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768
60	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768
97	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768

Initial Supporting table - Ring Filter

Description: Used for P0300-P0308. Driveline Ring Filter
After a low level misfire, another misfire may not be detectable until driveline ringing ceases. If no ringing seen, stop filter early.

Value Units: Number of Engine cycles after isolated misfire (Engine cycles)
X Unit: thousands of RPM (rpm/1000)

y/x	0	1	2	3	4	5	6	7	8
1	4	4	4	4	4	4	4	4	4

Initial Supporting tatjle - SCD_Decel

Description: Used for P0300-P0308 Crankshaft decel threshold. SCD mode uses smaller windows near TDC. Thresholds are a function of rpm and % engine Load.

Value Units: Delta time per cylinder (usee)
X Unit: RPM
Y Units: percent load of max indicated torque (%)

y/x	450	520	600	700	800	900	1,000	1,100	1,200	1,400	1,600	1,800	2,000
1	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768
2	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768
4	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768
6	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768
8	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768
10	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768
12	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768
14	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768
16	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768
18	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768
20	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768
22	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768
24	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768
30	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768
40	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768
60	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768
97	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768

Initial Supporting table - SCD_Jerk

Description: Used for P0300-P0308. Crankshaft jerk threshold. SCD mode uses smaller windows nearTDC. Thresholds are a function of rpm and % engine Load.

Value Units: Change in Delta time per cylinder from last cylinder (usee)
X Unit: RPM
Y Units: percent load of max indicated torque (%)

y/x	450	520	600	700	800	900	1,000	1,100	1,200	1,400	1,600	1,800	2,000
1	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768
2	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768
4	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768
6	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768
8	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768
10	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768
12	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768
14	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768
16	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768
18	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768
20	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768
22	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768
24	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768
30	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768
40	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768
60	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768
97	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768	32,768

Initial Supporting table - SnapDecayAfterMisfire

Description: Used for P0300 - P0308, multiplier times the ddtjerk value used used to detect misfire at that speed and load to see if size of disturbance has died down as expected of real misfire. Table lookup as a function of engine rpm and trans gear ratio.

Value Units: multiplier
X Unit: RPM
Y Units: gear ratio

y/x	600	900	1,000	1,200	1,400	1,800	2,000	2,800	3,200
1	1.07	1.00	3.65	2.65	1.30	3.20	2.45	1.00	1.10
1	1.07	1.00	2.84	2.80	1.30	2.90	2.60	1.00	1.00
1	1.07	1.00	2.29	2.70	1.15	2.80	2.64	1.00	1.31
1	1.07	1.00	1.35	2.00	1.90	1.85	2.20	1.30	1.55
2	1.07	1.00	1.80	1.70	1.70	1.70	2.00	1.50	1.60
3	1.08	1.00	1.38	1.10	1.05	1.65	1.90	1.45	1.40
3	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
4	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
5	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Initial Supporting table - t_DerTempDsblTmr

Description: Disabling timer based on the time derivative of SCR average temperature [sec] for SCR NOx catalyst efficiency monitoring (P20EE)

Value Units: sec
X Unit: °C/sec

y/x	-2	-1	-1	0	1	1	1	1
1	60	60	60	60	60	60	60	60

Initial Supporting table - T_MaxTempGrad

Description: Upper boundary of SCR temperature gradient (difference between SCR upstream and SCR downstream) [°C] for SCR NOx catalyst efficiency monitoring (P20EE)

Value Units: °C
X Unit: °C

y/x	200	250	299	300	379	380	440	441
1	45	45	45	45	45	45	45	45

Initial Supporting table - T_MinTempGrad

Description: Lower boundary of SCR temperature gradient (difference between SCR upstream and SCR downstream) [°C] for SCR NOx catalyst efficiency monitoring (P20EE)

Value Units: °C
X Unit: °C

y/x	200	250	299	300	374	375	425	450
1	0	0	0	3	3	5	5	5

Initial Supporting table - t_NOxFlowIncDsblTmr

Description: Debounce time to wait after the NOx flow becomes in range [sec] for SCR NOx catalyst efficiency monitoring (P20EE)

Value Units: sec
X Unit: mg/sec
Y Units: sec

y/x	0	5	10	10	15	20	20
5	45	45	45	100	100	100	250
50	45	45	45	100	100	100	250
100	45	45	45	100	100	100	250
200	45	45	45	100	100	100	250
300	45	45	45	100	100	100	250
400	45	45	45	100	100	100	250
500	45	45	45	100	100	100	250
750	45	45	45	100	100	100	250

Initial Supporting table - T(□SSRoughRoadThres

Description: Used for P0300-P0308. Only used if Rough Road source = TOSS: dispersion Value on Transmission Output Speed Sensor above which rough road is indicated present

Value Units: change in rpm per sec (rpm)
X Unit: Engine Speed (RPM)
Y Units: Transmission Speed (RPM)

y/x	600	800	1,000	1,200	1,400	1,600	1,800	2,000	2,200	2,400	2,600	2,800	3,000	3,500	4,000	4,500	5,000	5,500	6,000
100	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
200	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
300	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
400	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
500	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
600	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
700	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
800	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
900	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
1,000	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
1,100	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
1,200	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
1,300	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
1,400	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

Initial Supporting table - WaitToStart

Description: Used for P0300-P0308. Number of engine cycles to delay if diesel engine is cranked before wait to start lamp is extinguished. This lookup table determines the delay length by taking into account the coolant temperature.

Value Units: Number of Engine Cycles (integer)
X Unit: Engine Coolant (deg C)

y/x	-20	-10	0	10	20	30	40	50	60
1	0	0	0	0	0	0	0	0	0

Initial Supporting table - WSSRoughRoadThres

Description: Used for P0300-P0308. Only used if Wheel speed from ABS is used. If difference between wheel speed readings is larger than this limit, rough road is present

Value Units: acceleration
X Unit: Vehicle Speed (KPH)

y/x	0	12	24	36	48	60	72	85	97	109	121	133	145	157	169	181	193
1	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000

Initial Supporting table - ZeroTorqueAFM

Description: Used for P0300-P0308. Zero torque engine load while in Active Fuel Management. %of Max Brake Torque along the Neutral rev line, as a function of RPM and Baro

Value Units: Percent of Maximum Brake torque (%)
X Unit: RPM
Y Units: Barometric Pressure (kPa)

ZeroTorqueAFM - Part 1

y/x	510	585	660	700	800	900	1,000	1,100	1,200	1,400	1,600	1,800	2,000
75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
95	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
105	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

ZeroTorqueAFM - Part 2

y/x	2,200	2,400	2,600	2,800	3,000	3,200	3,400	3,600	3,800	4,000	4,200	4,600	5,000
75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
95	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
105	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Initial Supporting table - ZeroTorqueEngLoad

Description: Used for P0300-P0308. %of Max Brake Torque that represents Zero Brake torque along the Neutral rev line, as a function of RPM and Baro

Value Units: Percent of Maximum Brake torque (%)
X Unit: RPM
Y Units: Barometric Pressure (kPa)

ZeroTorqueEngLoad - Part 1

y/x	510	585	660	700	800	900	1,000	1,100	1,200	1,400	1,600	1,800	2,000
75	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00
75	-0.03	-0.31	-0.49	-0.57	-0.95	-1.09	-1.53	-1.40	-1.51	-1.69	-1.98	-0.73	0.53
85	-0.01	-0.33	-0.57	-0.68	-1.04	-1.55	-1.87	-1.92	-2.11	-3.06	-3.10	-1.75	-0.40
95	-0.59	-0.70	-0.36	-0.37	-0.25	-0.51	-0.75	-0.66	-0.56	-0.22	0.18	1.57	2.96
105	-0.59	-0.70	-0.36	-0.37	-0.25	-0.51	-0.75	-0.66	-0.56	-0.22	0.18	1.57	2.96

ZeroTorqueEngLoad - Part 2

y/x	2,200	2,400	2,600	2,800	3,000	3,200	3,400	3,600	3,800	4,000	4,200	4,600	5,000
75	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00
75	1.79	3.05	4.30	5.56	6.81	8.07	9.33	10.58	11.84	13.10	14.36	16.87	19.38
85	0.95	2.31	3.66	5.01	6.36	7.71	9.06	10.41	11.77	13.12	14.47	17.18	19.87
95	4.35	5.73	7.12	8.51	9.89	11.28	12.66	14.06	15.44	16.83	18.21	20.99	23.76
105	4.35	5.73	7.12	8.51	9.89	11.28	12.66	14.06	15.44	16.83	18.21	20.99	23.76

Initial Supporting table - Down Stream Stk Temp Vrtn

Description: Minimum temperature movement to pass the stuck monitor

Value Units: minimum temperature movement (deg C)
X Unit: Downstream temperature sensor (deg C)

y/x	-40	0	20	40	60	80	100	120
1	2	4	5	5	5	4	3	2

Initial Supporting table - UP Stream Stk Temp Vrtn

Description: Minimum temperature movement to pass the stuck monitor

Value Units: minimum temperature movement (deg C)
X Unit: Upstream temperature sensor (deg C)

y/x	-40	0	20	40	60	80	100	120
1	3	4	5	5	5	4	3	2

Initial Supporting table - Cool Down Diagnostic Min Heat to Coolant

Description: KtECTR_P_CDD_HeatToCoolantMin

Value Units: Power (kW)
X Unit: Firing fraction (ratio)
Y Units: Ambient Air Temperature (Deg C)

y/x	0.00	0.25	0.50	0.67	1.00
-9.0	41.0	41.0	41.0	41.0	41.0
0.0	41.0	41.0	41.0	41.0	41.0
10.0	41.0	41.0	41.0	41.0	41.0
20.0	41.0	41.0	41.0	41.0	41.0
50.0	41.0	41.0	41.0	41.0	41.0

Initial Supporting table - P129F Threshold High

Description: P129F Filtered Fuel Pump Speed Error High Threshold [over-performing motor]
Instantaneously calculated filtered pump speed error measured is higher than commanded

Value Units: revs / min
X Unit: revs / min [commanded pump speed]
Y Units: kiloPascals [requested fuel pressure]

y/x	200.0	300.0	400.0	500.0	600.0
1,000.0	-1,125.0	-1,125.0	-1,125.0	-1,125.0	-1,125.0
2,000.0	-1,125.0	-1,125.0	-1,125.0	-1,125.0	-1,125.0
3,000.0	-1,125.0	-1,125.0	-1,125.0	-1,125.0	-1,125.0
4,000.0	-1,125.0	-1,125.0	-1,125.0	-1,125.0	-1,125.0
5,000.0	-1,125.0	-1,125.0	-1,125.0	-1,125.0	-1,125.0
6,000.0	-1,125.0	-1,125.0	-1,125.0	-1,125.0	-1,125.0
7,000.0	-1,125.0	-1,125.0	-1,125.0	-1,125.0	-1,125.0

Initial Supporting table - P129F Threshold Low

Description: P129F Filtered Fuel Pump Speed Error Low Threshold [under-performing motor]
Instantaneously calculated filtered pump speed error measured is lower than commanded

Value Units: revs / min
X Unit: revs / min [commanded pump speed]
Y Units: kiloPascals [requested fuel pressure]

y/x	200.0	300.0	400.0	500.0	600.0
1,000.0	1,125.0	1,125.0	1,125.0	1,125.0	1,125.0
2,000.0	1,125.0	1,125.0	1,125.0	1,125.0	1,125.0
3,000.0	1,125.0	1,125.0	1,125.0	1,125.0	1,125.0
4,000.0	1,125.0	1,125.0	1,125.0	1,125.0	1,125.0
5,000.0	1,125.0	1,125.0	1,125.0	1,125.0	1,125.0
6,000.0	1,750.0	1,750.0	1,750.0	1,750.0	1,750.0
7,000.0	2,750.0	2,750.0	2,750.0	2,750.0	2,750.0

Initial Supporting table - P2635 Max Fuel Flow

Description: P2635 Maximum Fuel Flow Disable Criteria
Maximum allowed fuel flow values above which the diagnostic is disabled

Value Units: grams / second
X Unit: kilopascals [commanded fuel pressure]
Y Units: volts [device supply]

y/x	200	250	300	350	400	450	500	550	600
5	512	512	512	512	512	512	512	512	512
6	512	512	512	512	512	512	512	512	512
8	512	512	512	512	512	512	512	512	512
9	512	512	512	512	512	512	512	512	512
11	512	512	512	512	512	512	512	512	512
12	512	512	512	512	512	512	512	512	512
14	512	512	512	512	512	512	512	512	512
15	512	512	512	512	512	512	512	512	512
17	512	512	512	512	512	512	512	512	512
18	512	512	512	512	512	512	512	512	512
20	512	512	512	512	512	512	512	512	512
21	512	512	512	512	512	512	512	512	512
23	512	512	512	512	512	512	512	512	512
24	512	512	512	512	512	512	512	512	512
26	512	512	512	512	512	512	512	512	512
27	512	512	512	512	512	512	512	512	512
29	512	512	512	512	512	512	512	512	512

Initial Supporting table - P2635 Threshold High

Description: P2635 Filtered Fuel Pressure Error High Threshold [under-performing pump]
Instantaneously calculated filtered fuel pressure error

Value Units: kilopascals
X Unit: kilopascals [commanded fuel pressure]
Y Units: grams / sec [fuel flow]

y/x	200	250	300	350	400	450	500	550	600
0	40	40	40	40	40	40	130	180	230
2	40	40	40	40	40	40	130	180	230
3	40	40	40	40	40	40	130	180	230
5	40	40	40	40	40	40	130	180	230
6	40	40	40	40	40	40	130	180	230
8	40	40	40	40	40	40	130	180	230
9	40	40	40	40	40	40	130	180	230
11	40	40	40	40	40	40	130	180	230
12	40	40	40	40	40	40	130	180	230
14	40	40	40	40	40	40	130	180	230
15	40	40	40	40	40	40	130	180	230
17	40	40	40	40	40	40	130	180	230
18	40	40	40	40	40	40	130	180	230
20	40	40	40	40	40	40	130	180	230
21	40	40	40	40	40	40	130	180	230
23	40	40	40	40	40	40	130	180	230
24	40	40	40	40	40	60	130	180	230
26	40	40	40	40	40	60	130	180	230
27	40	40	40	40	40	60	130	180	230
29	40	40	40	40	40	60	130	180	230
30	40	40	40	40	40	60	130	180	230
32	40	40	40	40	40	60	130	180	230
33	40	40	40	40	40	60	130	180	230
35	40	40	40	40	40	60	130	180	230
36	40	40	40	40	40	60	130	180	230
38	40	40	40	40	40	60	130	180	230
39	40	40	40	40	40	60	130	180	230
41	40	40	40	40	40	60	130	180	230
42	40	40	40	40	40	60	130	180	230
44	40	40	40	40	40	60	130	180	230
45	40	40	40	40	40	60	130	180	230

Initial Supporting table - P•2635 Threshold High

47	40	40	40	40	40	60	130	180	230
48	40	40	40	40	40	60	130	180	230

Initial Supporting table - P2635 Threshold Low

Description: P2635 Filtered Pressure Error Low Threshold [over-performing pump]
Instantaneously calculated filtered fuel pressure error

Value Units: kilopascals
X Unit: kilopascals [commanded fuel pressure]
Y Units: grams / second [fuel flow]

y/x	200	250	300	350	400	450	500	550	600
0	-190	-190	-190	-190	-190	-190	-190	-190	-190
2	-190	-190	-190	-190	-190	-190	-190	-190	-190
3	-190	-190	-190	-190	-190	-190	-190	-190	-190
5	-190	-190	-190	-190	-190	-190	-190	-190	-190
6	-190	-190	-190	-190	-190	-190	-190	-190	-190
8	-190	-190	-190	-190	-190	-190	-190	-190	-190
9	-190	-190	-190	-190	-190	-190	-190	-190	-190
11	-190	-190	-190	-190	-190	-190	-190	-190	-190
12	-190	-190	-190	-190	-190	-190	-190	-190	-190
14	-190	-190	-190	-190	-190	-190	-190	-190	-190
15	-190	-190	-190	-190	-190	-190	-190	-190	-190
17	-190	-190	-190	-190	-190	-190	-190	-190	-190
18	-190	-190	-190	-190	-190	-190	-190	-190	-190
20	-190	-190	-190	-190	-190	-190	-190	-190	-190
21	-190	-190	-190	-190	-190	-190	-190	-190	-190
23	-190	-190	-190	-190	-190	-190	-190	-190	-190
24	-190	-190	-190	-190	-190	-190	-190	-190	-190
26	-190	-190	-190	-190	-190	-190	-190	-190	-190
27	-190	-190	-190	-190	-190	-190	-190	-190	-190
29	-190	-190	-190	-190	-190	-190	-190	-190	-190
30	-190	-190	-190	-190	-190	-190	-190	-190	-190
32	-190	-190	-190	-190	-190	-190	-190	-190	-190
33	-190	-190	-190	-190	-190	-190	-190	-190	-190
35	-190	-190	-190	-190	-190	-190	-190	-190	-190
36	-190	-190	-190	-190	-190	-190	-190	-190	-190
38	-190	-190	-190	-190	-190	-190	-190	-190	-190
39	-190	-190	-190	-190	-190	-190	-190	-190	-190
41	-190	-190	-190	-190	-190	-190	-190	-190	-190
42	-190	-190	-190	-190	-190	-190	-190	-190	-190
44	-190	-190	-190	-190	-190	-190	-190	-190	-190
45	-190	-190	-190	-190	-190	-190	-190	-190	-190

Initial Supporting table - P2635 Threshold Low

47	-190	-190	-190	-190	-190	-190	-190	-190	-190
48	-190	-190	-190	-190	-190	-190	-190	-190	-190

Initial Supporting table - P0128_Maximum Accumulated Energy for Start-up ECT conditions - Alternate

Description: KtECTR_E_CTR_WrmUpEnrgyLimTest1

Value Units: Cooling system energy failure threshold (kJ)
X Unit: Minimum ECT for the key cycle (°C)

y/x	-20	-7	10	35	55	71	82
1	63,738	58,400	51,419	41,153	32,940	32,940	32,940

Initial Supporting table - P0128_Maximum Accumulated Energy for Start-up ECT conditions - Primary

Description: KtECTR_E_CTR_WrmUpEnrgyLimTestO

Value Units: Cooling system energy failure threshold (kJ)
X Unit: Minimum ECT for the key cycle (°C)

y/x	-20	-7	10	35	55	71	82
1	38,678	34,215	28,379	19,797	12,932	7,439	7,439

Initial Supporting table - P0606_Last Seed Timeout f(Loop Time)

Description: The max time for the Last Seed Timeout as a function of operating loop time sequence.

P0606_Last Seed Timeout f(Loop Time) - Part 1

y/x	CePISR_e_5msSeq	CePISR_e_6p25msSeq	CePISR_e_1 OmsSeq	CePISR_e_1 2p5msSeq	CePISR_e_20msSeq	CePISR_e_25msSeq	CePISR_e_40msSeq
1	200.000	200.000	200.000	200.000	200.000	200.000	200.000

P0606_Last Seed Timeout f(Loop Time) - Part 2

y/x	CePISR_e_50msSeq	CePISR_e_80msSeq	CePISR_e_1 OOmsSeq	CePISR_e_Eve ntA_Seq	CePISR_e_EventB_Seq	CePISR_e_Eve ntC_Seq	
1	200.000	200.000	500.000	8,191.875	8,191.875	8,191.875	

Initial Supporting table - P0606_PSW Sequence Fail f(Loop Time)

Description: Fail threshold for PSW per operating loop.

P0606_PSW Sequence Fail f(Loop Time) - Part 1

y/x	CePISR_e_5msSeq	CePISR_e_6p25msSeq	CePISR_e_1 OmsSeq	CePISR_e_1 2p5msSeq	CePISR_e_20msSeq	CePISR_e_25msSeq	CePISR_e_40msSeq
1	5	3	5	3	5	3	5

P0606_PSW Sequence Fail f(Loop Time) - Part 2

y/x	CePISR_e_50msSeq	CePISR_e_80msSeq	CePISR_e_1 OOmsSeq	CePISR_e_Eve ntA_Seq	CePISR_e_EventB_Seq	CePISR_e_Eve ntC_Seq	
1	5	5	3	3	3	5	

Initial Supporting table - P0606_PSW Sequence Sample f(Loop Time)

Description: Sample threshold for PSW per operating loop.

P0606_PSW Sequence Sample f(Loop Time) - Part 1

y/x	CePISR_e_5msSeq	CePISR_e_6p25msSeq	CePISR_e_1OmsSeq	CePISR_e_1 2p5msSeq	CePISR_e_20msSeq	CePISR_e_25msSeq	CePISR_e_40msSeq
1	4	4	4	4	4	4	4

P0606_PSW Sequence Sample f(Loop Time) - Part 2

y/x	CePISR_e_50msSeq	CePISR_e_80msSeq	CePISR_e_1OOmsSeq	CePISR_e_Eve ntA_Seq	CePISR_e_EventB_Seq	CePISR_e_Eve ntC_Seq	
1	4	4	4	4	4	4	

Initial Supporting table - Fuel Integral threshold

Description:

y/x	-40	-10	0	9	10
1	1,000	890	877	500	0

Initial Supporting table - P057B KtBRKI_K_CmpltTestPointWeight

Description:

y/x	0.000	0.025	0.028	0.033	0.070	0.100	0.150	0.500	1.000
1	0	0	0	1	1	1	1	1	1

Initial Supporting table - P057B KtBRKI_K_FastTestPointWeight

Description:

y/x	0.000	0.025	0.028	0.033	0.045	0.100	0.200	0.500	1.000
1	0	0	0	1	1	1	1	1	1

Initial Supporting table - Ambient correction on distance

Description: Ambient pressure correction for threshold on Distance covered since last regeneration

Value Units: [0; 2]
X Unit: kPa

y/x	70	72	80	90	92	100
1	1	1	1	1	1	1

Initial Supporting table - Ambient correction on time

Description: Ambient pressure correction for threshold on time spent since last regeneration

Value Units: [0; 2]
X Unit: kPa

y/x	70	72	80	90	92	100
1	1	1	1	1	1	1

Initial Supporting table - Distance since last regeneration

Description: Base value to trigger regeneration for distance covered since last regeneration, function of regeneration priority

Value Units: km
X Unit: enumerative (mission profiles)

Distance since last regeneration - Part 1

y/x	CeDPFC_e_RgnPriority_0	CeDPFC_e_RgnPriority_1	CeDPFC_e_RgnPriority_2	CeDPFC_e_RgnPriority_3	CeDPFC_e_RgnPriority_4	CeDPFC_e_RgnPriority_5
1	65,535	65,535	65,535	65,535	65,535	65,535

Distance since last regeneration - Part 2

y/x	CeDPFC_e_RgnPriority_6	CeDPFC_e_RgnPriority_7	CeDPFC_e_RgnPriority_8	CeDPFC_e_RgnPriority_9	CeDPFC_e_RgnPriority_10	CeDPFC_e_RgnPriority_11
1	65,535	65,535	65,535	65,535	65,535	65,535

Distance since last regeneration - Part 3

y/x	CeDPFC_e_RgnPriority_12	CeDPFC_e_RgnPriority_13	CeDPFC_e_RgnPriority_14	CeDPFC_e_RgnPriority_15	CeDPFC_e_RgnPriority_16	
1	65,535	65,535	65,535	65,535	65,535	

Initial Supporting table - DPF Load correction on distance

Description: Map of DPF Load correction for threshold on distance covered since last regeneration

Value Units: [0; 2]
X Unit: % DPF load

y/x	20	40	50	70	75	80	90	95
1	1	1	1	1	1	1	1	1

Initial Supporting table - DPF Load correction on time

Description: Map of DPF Load correction for threshold on time spent since last regeneration

Value Units: [0; 2]
X Unit: % DPF load

y/x	20	40	50	70	75	80	90	95
1	1	1	1	1	1	1	1	1

Initial Supporting table - EGT1 DynChk EngPtEnbl

Description: Contains the engine speed and fuel rate enablments for EGT1 Dynamic Check.

y/x	0.0	15.0	20.0	40.0	60.0	80.0	120.0
800.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1,199.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1,200.0	0.0	0.0	1.0	1.0	1.0	1.0	0.0
2,000.0	0.0	0.0	1.0	1.0	1.0	1.0	0.0
2,500.0	0.0	0.0	1.0	1.0	1.0	1.0	0.0
3,200.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Initial Supporting table - EGT2DynChk EngPtEnbl

Description: Contains the engine speed and fuel rate enablments for EGT2 Dynamic Check.

y/x	0.0	15.0	20.0	40.0	60.0	80.0	120.0
800.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1,000.0	0.0	0.0	1.0	1.0	1.0	1.0	0.0
1,500.0	0.0	0.0	1.0	1.0	1.0	1.0	0.0
2,000.0	0.0	0.0	1.0	1.0	1.0	1.0	0.0
2,500.0	0.0	0.0	1.0	1.0	1.0	1.0	0.0
3,200.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Initial Supporting table - EGT3DynChk EngPtEnbl

Description: Contains the engine speed and fuel rate enablments for EGT3 Dynamic Check.

y/x	0.0	15.0	20.0	40.0	60.0	80.0	120.0
800.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1,000.0	0.0	0.0	1.0	1.0	1.0	1.0	0.0
1,500.0	0.0	0.0	1.0	1.0	1.0	1.0	0.0
2,000.0	0.0	0.0	1.0	1.0	1.0	1.0	0.0
2,500.0	0.0	0.0	1.0	1.0	1.0	1.0	0.0
3,200.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Initial Supporting table - EGT4DynChk EngPtEnbl

Description: Contains the engine speed and fuel rate enablments for EGT4 Dynamic Check.

y/x	0.0	15.0	20.0	40.0	60.0	80.0	120.0
800.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1,000.0	0.0	0.0	1.0	1.0	1.0	1.0	0.0
1,500.0	0.0	0.0	1.0	1.0	1.0	1.0	0.0
2,000.0	0.0	0.0	1.0	1.0	1.0	1.0	0.0
2,500.0	0.0	0.0	1.0	1.0	1.0	1.0	0.0
3,200.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Initial Supporting table - EGT5 DynChk EngPtEnbl

Description: Contains the engine speed and fuel rate enablments for EGT5 Dynamic Check.

y/x	0.0	15.0	20.0	40.0	60.0	80.0	120.0
800.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1,000.0	0.0	0.0	1.0	1.0	1.0	1.0	0.0
1,500.0	0.0	0.0	1.0	1.0	1.0	1.0	0.0
2,000.0	0.0	0.0	1.0	1.0	1.0	1.0	0.0
2,500.0	0.0	0.0	1.0	1.0	1.0	1.0	0.0
3,200.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Initial Supporting table - EnginePointEnable DPF TempDeviation

Description:

y/x	950	1,000	1,200	1,400	1,600	2,400	3,600	5,000
0	0	0	0	0	0	0	0	0
1	0	0	0	0	1	1	1	1
12	0	0	0	0	1	1	1	1
14	0	0	1	1	1	1	1	1
16	0	1	1	1	1	1	1	1
18	0	1	1	1	1	1	1	1
20	0	1	1	1	1	1	1	1
30	0	1	1	1	1	1	1	1
60	0	1	1	1	1	1	1	1

Initial Supporting table - Exhaust Gas Pressure Too Low Threshold

Description: Diagnostic threshold for the exhaust gas pressure too low monitoring. This threshold is function of the exhaust gas flow and of the soot trapped in the DPF

Value Units: kPa
X Unit: l/s
Y Units: % DPF load

y/x	10	20	60	100	140	198	199	200
50	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0
150	0	0	0	0	0	0	0	0
300	0	0	0	0	0	0	0	0
450	0	0	0	0	0	0	0	0
600	0	0	0	0	0	0	0	0
750	0	0	0	0	0	0	0	0
900	0	0	0	0	0	0	0	0

Initial Supporting table - KaFADC_b_SQC_CWA_EnblLink

Description: Engine speed ranges to be learned with CWA before give a positive report to Zero Torque Coordinator.

y/x	0	1	2	3	4	5
1	0	0	0	0	0	0

Initial Supporting table - KaFADC_n_DFSA_EngSpdThrsh

Description: Threshold to evaluate the engine speed steady state, as function of the engaged gear

Value Units: rpm

y/x	0	1	2	3	4	5	6	7	8	9	10	11	12
1	5	5	5	5	5	5	5	5	5	5	5	5	5

Initial Supporting table - KaFADC_n_FSA_EngSpdThrsh

Description: Threshold to evaluate the engine speed steady state, as function of the engaged gear

Value Units: rpm

y/x	0	1	2	3	4	5	6	7	8	9	10	11	12
1	1	1	1	1	1	1	1	1	1	1	1	1	1

Initial Supporting table - KaFADC_n_SQC_HiThrshDelt

Description: Engine speed high threshold [rpm] delta for SQC actuators enable function of driveline group

Value Units: rpm

KaFADC_n_SQC_HiThrshDelt - Part 1

y/x	CeFADR_e_CWA_DrvlnGrpNotAlwd	CeFADR_e_CWA_DrivelineGrp1	CeFADR_e_CWA_DrivelineGrp2	CeFADR_e_CWA_DrivelineGrp3
1	100	100	100	100

KaFADC_n_SQC_HiThrshDelt - Part 2

y/x	CeFADR_e_CWA_DrivelineGrp4	CeFADR_e_CWA_DrivelineGrp5	CeFADR_e_CWA_DrivelineGrp6	CeFADR_e_CWA_DrivelineGrp7
1	100	100	100	100

KaFADC_n_SQC_HiThrshDelt - Part 3

y/x	CeFADR_e_CWA_DrivelineGrp8	CeFADR_e_CWA_DrivelineGrp9	CeFADR_e_CWA_DrivelineGrp1 0	
1	100	100	100	

Initial Supporting table - KaFADC_p_SQA_LrnDelt

Description: Delta Rail Pressure allowed to enable SQA learning [MPa] function of nominal rail pressure setpoint defined for SQA.

Value Units: MPa

y/x	0	1	2	3	4
1	3	3	3	3	3

Initial Supporting table - KtFADC_p_SQA_MAP_HiThrsh

Description: Manifold Air Pressure High Threshold [kPa] to disable SQA Strategy function on Rail Pressure levels defined for SQA

Value Units: MPa

y/x	1,000	1,200	1,400	1,600	1,800
1	190	190	190	190	190

Initial Supporting table - KtFADC_V_FSA_FuelMax

Description: Map used to define FSA maximum authority

Value Units: mm^3

y/x	5	10	20	30	40	50	60	80	100	120
450	12	13	12	15	18	21	23	28	30	33
700	12	13	14	16	18	21	23	28	30	33
950	12	13	16	18	19	21	23	28	30	33
1,200	12	13	17	20	22	23	24	29	30	33
1,450	12	13	17	20	23	25	26	31	32	34
1,700	12	13	17	20	23	26	30	33	34	35
1,950	12	13	17	20	23	26	30	35	36	38
2,200	12	13	17	20	23	26	30	35	38	41
2,800	12	13	17	20	23	26	30	35	38	41
3,200	12	13	17	20	23	26	30	35	38	41

Initial Supporting table - KtFADC_V_FSA_FuelMin

Description: Map used to define FSA minimum authority

Value Units: mm^3

y/x	5	10	20	30	40	50	60	80	100	120
450	-12	-13	-12	-15	-18	-21	-23	-28	-30	-33
700	-12	-13	-14	-16	-18	-21	-23	-28	-30	-33
950	-12	-13	-16	-18	-19	-21	-23	-28	-30	-33
1,200	-12	-13	-17	-20	-22	-23	-24	-29	-30	-33
1,450	-12	-13	-17	-20	-23	-25	-26	-31	-32	-34
1,700	-12	-13	-17	-20	-23	-26	-30	-33	-34	-35
1,950	-12	-13	-17	-20	-23	-26	-30	-35	-36	-38
2,200	-12	-13	-17	-20	-23	-26	-30	-35	-38	-41
2,800	-12	-13	-17	-20	-23	-26	-30	-35	-38	-41
3,200	-12	-13	-17	-20	-23	-26	-30	-35	-38	-41

Initial Supporting table - KtFADC_V_FSA_MaxFuelFall

Description: Upper bound of fuel quantity range to enable the FSA learning phase depending on the engine speed

Value Units: mm^3

y/x	510	511	800	1,000	1,500	1,750	2,250	2,750	3,000	3,250
1	0	30	60	70	100	120	110	110	100	70

Initial Supporting table - KtFADD_p_XSQA_MAP_HiThrsh

Description: Manifold Air Pressure High Threshold [kPa] to disable SQA Emission Correlated Monitoring function on Rail Pressure levels defined for SQA

Value Units: kPa

y/x	1,000	1,200	1,400	1,600	1,800
1	190	190	190	190	190

Initial Supporting table - KtFADD_Pct_SSQA_InjSuspConfLvl

Description: Calibration table to define the suspicious confidence level [%] function of current last raw Delta Energizing Time [us] and previous one [us]

Value Units: %

y/x	-120	-80	-70	-69	-40	0	40	44	45	60	75
-120	0	0	0	0	0	0	0	0	0	0	0
-78	0	0	0	0	0	0	0	0	0	0	0
-77	0	0	0	100	100	100	100	100	0	0	0
-40	0	0	0	100	100	100	100	100	0	0	0
0	0	0	0	100	100	100	100	100	0	0	0
40	0	0	0	100	100	100	100	100	0	0	0
52	0	0	0	100	100	100	100	100	0	0	0
53	0	0	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0	0	0

Initial Supporting table - Mission profile correction on distance

Description: Curve of Mission profile dependent correction for threshold on distance covered since last regeneration

Value Units: [0; 2]
X Unit: enumerative (mission profiles)

Mission profile correction on distance - Part 1

y/x	CeDPFR_e_MisProfO	CeDPFR_e_MisProf1	CeDPFR_e_MisProf2	CeDPFR_e_MisProf3	CeDPFR_e_MisProf4	CeDPFR_e_MisProf5	CeDPFR_e_MisProf6
1	1	1	1	1	1	1	1

Mission profile correction on distance - Part 2

y/x	CeDPFR_e_MisProf7	CeDPFR_e_MisProf8	CeDPFR_e_MisProf9	CeDPFR_e_MisProf10	CeDPFR_e_MisProf11	CeDPFR_e_MisProf12	CeDPFR_e_MisProf13
1	1	1	1	1	1	1	1

Mission profile correction on distance - Part 3

y/x	CeDPFR_e_MisProf14	CeDPFR_e_MisProf15	CeDPFR_e_MisProf16	CeDPFR_e_MisProf17 Srv	CeDPFR_e_MisProf18 Rec		
1	1	1	1	1	1		

Initial Supporting table - Mission profile correction on time

Description: Curve of Mission profile dependent correction for threshold on time spent since last regeneration

Value Units: [0; 2]
X Unit: enumerative (mission profiles)

Mission profile correction on time - Part 1

y/x	CeDPFR_e_MisProfO	CeDPFR_e_MisProf1	CeDPFR_e_MisProf2	CeDPFR_e_MisProf3	CeDPFR_e_MisProf4	CeDPFR_e_MisProf5	CeDPFR_e_MisProf6
1	1	1	1	1	1	1	1

Mission profile correction on time - Part 2

y/x	CeDPFR_e_MisProf7	CeDPFR_e_MisProf8	CeDPFR_e_MisProf9	CeDPFR_e_MisProf10	CeDPFR_e_MisProf11	CeDPFR_e_MisProf12	CeDPFR_e_MisProf13
1	1	1	1	1	1	1	1

Mission profile correction on time - Part 3

y/x	CeDPFR_e_MisProf14	CeDPFR_e_MisProf15	CeDPFR_e_MisProf16	CeDPFR_e_MisProf17 Srv	CeDPFR_e_MisProf18 Rec		
1	1	1	1	1	1		

Initial Supporting table - P0087 Minimum rail pressure

Description: Minimum rail pressure threshold (MPa) as function of engine speed (rpm).

Value Units: MPa
X Unit: rpm

y/x	0	419	590	600	800	1,000	1,200	1,600	2,000	2,400	2,800	3,200	3,600	4,200	4,400	4,800
1	0	0	0	13	13	13	13	13	13	13	13	13	13	13	13	13

Initial Supporting table - P0089 Maximum rail pressure with MU

Description: Maximum rail pressure threshold (MPa) when pressure is governed by Metering Unit as function of engine speed (rpm).

Value Units: MPa
X Unit: rpm

y/x	0	1,250	3,500	4,500
1	67	217	217	117

Initial Supporting table - P0181 Fuel Temperature Sensor Reference

Description: Define which sensor is used as reference for check plausibility of fuel temperature sensor.
(CeFTSR_e_ECT_Snsr = Engine coolant temperature, CeFTSR_e_IAT_Snsr = Intake air temperature, CeFTSR_e_IAT_2_Snsr = Manifold air temperature, CeFTSR_e_MainCatTempSnsr = Upstream DPF temperature)

Value Units: -

y/x	1
1	CeFTSReMainCatTempSnsr

Initial Supporting table - P0191 Rail Pressure Sensor Configuration

Description:

Value Units: -

y/x	1
1	CeFHPG_e_RPS_DoubleTrack

Initial Supporting table - P0606_Last Seed Timeout f(Loop Time)

Description: The max time for the Last Seed Timeout as a function of operating loop time sequence.

Value Units: Max Time for Last Seed Timeout (ms)
X Unit: Operating Loop Sequence (enum)

P0606_Last Seed Timeout f(Loop Time) - Part 1

y/x	CePISR_e_5msSeq	CePISR_e_6p25msSeq	CePISR_e_1OmsSeq	CePISR_e_1 2p5msSeq	CePISR_e_20msSeq	CePISR_e_25msSeq	CePISR_e_40msSeq
1	200.000	200.000	200.000	200.000	200.000	200.000	200.000

P0606_Last Seed Timeout f(Loop Time) - Part 2

y/x	CePISR_e_50msSeq	CePISR_e_80msSeq	CePISR_e_1OOmsSeq	CePISR_e_Eve ntA_Seq	CePISR_e_EventB_Seq	CePISR_e_Eve ntC_Seq	
1	200.000	200.000	500.000	8,191.875	8,191.875	8,191.875	

Initial Supporting table - P0606_PSW Sequence Fail f(Loop Time)

Description: Fail threshold for PSW per operating loop.

Value Units: Fail threshold for PSW (count)
X Unit: Operating Loop (enum)

P0606_PSW Sequence Fail f(Loop Time) - Part 1

y/x	CePISR_e_5msSeq	CePISR_e_6p25msSeq	CePISR_e_1 OmsSeq	CePISR_e_1 2p5msSeq	CePISR_e_20msSeq	CePISR_e_25msSeq	CePISR_e_40msSeq
1	5	3	5	3	5	3	5

P0606_PSW Sequence Fail f(Loop Time) - Part 2

y/x	CePISR_e_50msSeq	CePISR_e_80msSeq	CePISR_e_1 OOmsSeq	CePISR_e_Eve ntA_Seq	CePISR_e_EventB_Seq	CePISR_e_Eve ntC_Seq	
1	5	5	3	3	3	5	

Initial Supporting table - P0606_PSW Sequence Sample f(Loop Time)

Description: Sample threshold for PSW per operating loop.

Value Units: Sample threshold for PSW (count)
X Unit: Operating Loop (enum)

P0606_PSW Sequence Sample f(Loop Time) - Part 1

y/x	CePISR_e_5msSeq	CePISR_e_6p25msSeq	CePISR_e_1OmsSeq	CePISR_e_1 2p5msSeq	CePISR_e_20msSeq	CePISR_e_25msSeq	CePISR_e_40msSeq
1	4	4	4	4	4	4	4

P0606_PSW Sequence Sample f(Loop Time) - Part 2

y/x	CePISR_e_50msSeq	CePISR_e_80msSeq	CePISR_e_1OOmsSeq	CePISR_e_Eve ntA_Seq	CePISR_e_EventB_Seq	CePISR_e_Eve ntC_Seq	
1	4	4	4	4	4	4	

Initial Supporting table - P1682_PT Relay Pull-in Run/Crank Voltage f(IAT)

Description: The Run/Crank voltages required to pull in the PT relay as a function of induction air temperature.

Value Units: Run/Crank Voltages required to pull in PT Relay (V)
X Unit: Induction Air Temperature (deg C)

y/x	23.0	85.0	95.0	105.0	125.0
1	7.000	8.699	9.000	9.199	10.000

Initial Supporting table - P228A Fuel High Pressure Pump efficiency

Description: Efficiency percentage of high pressure pump as function of rail pressure (MPa) and engine speed (rpm).

Value Units: %
X Unit: MPa
Y Units: rpm

y/x	30	80	120	180	200
1,000	98	94	90	83	80
1,250	98	95	91	85	83
1,500	98	95	92	86	84
1,750	98	95	92	87	86
2,000	98	95	92	88	87
2,250	98	95	93	88	87
2,500	95	92	90	86	85
4,000	60	59	58	55	55

Initial Supporting table - P228A Fuel High Pressure Pump efficiency correction

Description: Correction of high pressure pump eficiency as function of fuel temperature (°C).

Value Units: -
X Unit: °C

y/x	-30	-20	20	40	80
1	1	1	1	1	1

Initial Supporting table - P228B Pressure Regulator completely closed command

Description: Command, in terms of pressure (MPa), to consider pressure regulator valve completely closed as function of rail pressure (MPa).

Value Units: MPa
X Unit: MPa

y/x	0	100	190	250
1	30	30	30	30

Initial Supporting table - P228C Positive rail pressure deviation (MU)

Description: Positive rail pressure deviation threshold (MPa) when metering unit is controlled in closed loop as function of engine speed (rpm).

Value Units: MPa
X Unit: rpm

y/x	199	200	630	800	1,000	1,200	1,400	1,600	2,000	2,400	2,800	3,200	3,600	4,200	4,800	5,400
1	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12

Initial Supporting table - P228D Negative rail pressure deviation (MU)

Description: Negative rail pressure deviation threshold (MPa) when metering unit is controlled in closed loop as function of engine speed (rpm).

Value Units: MPa
X Unit: rpm

y/x	199	200	630	800	1,000	1,200	1,400	1,600	2,000	2,400	2,800	3,200	3,600	4,200	4,800	5,400
1	-17	-17	-17	-17	-17	-17	-17	-17	-17	-17	-17	-17	-17	-17	-17	-17

Initial Supporting table - P2293 Maximum rail pressure with PR

Description: Maximum rail pressure threshold (MPa) when pressure is governed by Pressure Regulator as function of engine speed (rpm).

Value Units: MPa
X Unit: rpm

y/x	0	1,250	3,500	4,500
1	67	217	217	117

Initial Supporting table - P229A Positive rail pressure deviation (PR)

Description: Positive rail pressure deviation threshold (MPa) when pressure regulator is controlled in closed loop as function of engine speed (rpm).

Value Units: MPa
X Unit: rpm

y/x	199	200	630	800	1,000	1,200	1,400	1,600	2,000	2,400	2,800	3,200	3,600	4,200	4,800	5,400
1	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12

Initial Supporting table - Rail Pressure Control Configuration

Description: CeFHPG_e_MU_And_PR_ModeSel = pressure control can be governed by both metering unit and pressure regulator
CeFHPG_e_MU = pressure control can be governed by metering unit only
CeFHPG_e_PR = pressure control can be governed by pressure regulator only

Value Units: -

y/x	1
1	CeFHPG_e_MU_And_PR_ModeSel

Initial Supporting table - Time since last regeneration

Description: Base value to trigger regeneration for time spent since last regeneration, function of regeneration priority

Value Units: s
X Unit: enumerative (mission profiles)

Time since last regeneration - Part 1

y/x	CeDPFC_e_RgnPriority_0	CeDPFC_e_RgnPriority_1	CeDPFC_e_RgnPriority_2	CeDPFC_e_RgnPriority_3	CeDPFC_e_RgnPriority_4	CeDPFC_e_RgnPriority_5
1	86,400	86,400	86,400	86,400	86,400	86,400

Time since last regeneration - Part 2

y/x	CeDPFC_e_RgnPriority_6	CeDPFC_e_RgnPriority_7	CeDPFC_e_RgnPriority_8	CeDPFC_e_RgnPriority_9	CeDPFC_e_RgnPriority_10	CeDPFC_e_RgnPriority_11
1	86,400	86,400	86,400	86,400	86,400	86,400

Time since last regeneration - Part 3

y/x	CeDPFC_e_RgnPriority_12	CeDPFC_e_RgnPriority_13	CeDPFC_e_RgnPriority_14	CeDPFC_e_RgnPriority_15	CeDPFC_e_RgnPriority_16	
1	86,400	86,400	86,400	86,400	86,400	

Initial Supporting table - P0216_ET_CumulEnbl

Description: This calibration provides the capability to select which pulses of the injection pattern have to be monitored
1 -> pulse monitored
0 -> pulse NOT monitored

Value Units: Boolean
X Unit: Pulse ID

P0216_ET_CumulEnbl - Part 1

y/x	CeFULR_e_PulsPI	CeFULR_e_PulsR2	CeFULR_e_PulsR1	CeFULR_e_PulsM	CeFULR_e_PulsA1	CeFULR_e_PulsA2	CeFULR_e_PulsA3
1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00

P0216_ET_CumulEnbl - Part 2

y/x	CeFULR_e_PulsA4	CeFULR_e_PulsP1	CeFULR_e_PulsP2	CeFULR_e_PulsP3	CeFULR_e_PulsP4	CeFULR_e_PulsP5	
1.00	1.00	0.00	0.00	0.00	0.00	0.00	

Initial Supporting table - P0216_PulsWidthErrHi

Description: This error threshold map defines the maximum acceptable positive error [us] between cumulative ET HW and ET SW, depending on the number of pulses driven and monitored.

Value Units: us
X Unit: -
Y Units: Number of pulses

y/x	0.00	1.00	2.00	3.00	4.00	5.00
1.00	32,767.00	32,767.00	32,767.00	32,767.00	32,767.00	32,767.00

Initial Supporting table - P054E_IFM_CombModesEnbl

Description: This calibration provides the capability to select in which combustion mode the Idle Fuel Monitoring shall be enabled.
1 -> monitor enabled
0 -> monitor disabled

Value Units: Boolean
X Unit: Combustion Mode

P054E_IFM_CombModesEnbl - Part 1

y/x	CeCMBR_e_Normal	CeCMBR_e_DPF_HiO2	CeCMBR_e_DPF_LoO2	CeCMBR_e_FullyWarmEmissions	CeCMBR_e_LNT_DeNOx
1	1	0	0	0	0

P054E_IFM_CombModesEnbl - Part 2

y/x	CeCMBR_e_LNT_DeSOx_Lean	CeCMBR_e_LNT_DeSOx_Rich	CeCMBR_e_StrongExhGasWarmUp	CeCMBR_e_SoftExhGasWarmUp	CeCMBR_e_DPF_PN
1	0	0	1	1	0

P054E_IFM_CombModesEnbl - Part 3

y/x	CeCMBR_e_DPF_RichIdle	CeCMBR_e_DPF_EngPrtct_HiO2	CeCMBR_e_DPF_EngPrtct_LoO2	CeCMBR_e_LNT_EngPrtct	CeCMBR_e_FAD_IdleInjLrn
1	0	0	0	0	0

P054E_IFM_CombModesEnbl - Part 4

y/x	CeCMBR_e_HCS_DeHC_Drive	CeCMBR_e_HCS_DeHC_Park	CeCMBR_e_SCR_ServWarmUp	CeCMBR_e_SCR_ServCheck	
1	0	0	0	0	

Initial Supporting table - P054EJFM_MinFuelIdleC1_G

Description: During Normal combustion mode, this error threshold map indicates the minimum fuel requested [mm3] in nominal condition and with transmission in gear. It’s function of engine coolant temperature [°C] and engine speed [rpm]

Value Units: mm3
X Unit: rpm
Y Units: °C

y/x	450	660	900	1,200	1,600
-20	39	39	39	39	39
-10	23	23	23	23	23
0	18	18	18	18	18
20	14	14	14	14	14
50	9	9	9	9	9
70	6	6	6	6	6

Initial Supporting table - P054E EJFM_MinFuelIdleC1_PN

Description: During Normal combustion mode, this error threshold map indicates the minimum fuel requested [mm3] in nominal condition and with transmission in park and neutral. It’s function of engine coolant temperature [°C] and engine speed [rpm]

Value Units: mm3
X Unit: rpm
Y Units: °C

y/x	450	660	900	1,200	1,600
-20	39	39	39	39	39
-10	23	23	23	23	23
0	18	18	18	18	18
20	14	14	14	14	14
50	9	9	9	9	9
70	6	6	6	6	6

Initial Supporting table - P054EJFM_MinFuelIdleHC_G

Description: During HC Unloading combustion mode, this error threshold map indicates the minimum fuel requested [mm3] in nominal condition and with transmission in gear. It’s function of engine coolant temperature [°C] and engine speed [rpm]

Value Units: mm3
X Unit: rpm
Y Units: °C

y/x	450	660	900	1,200	1,600
-20	15	15	15	15	15
-10	15	15	15	15	15
0	15	15	15	15	15
20	15	15	15	15	15
50	15	15	15	15	15
70	12	12	12	12	12

Initial Supporting table - P054E: zJFM_MinFuelIdleHC_PN

Description: During HC Unloading combustion mode, this error threshold map indicates the minimum fuel requested [mm3] in nominal condition and with transmission in park and neutral. It’s function of engine coolant temperature [°C] and engine speed [rpm]

Value Units: mm3
X Unit: rpm
Y Units: °C

y/x	450	660	900	1,200	1,600
-20	11	11	11	11	11
-10	11	11	11	11	11
0	11	11	11	11	11
20	11	11	11	11	11
50	11	11	11	11	11
70	5	5	5	5	5

Initial Supporting table - P054EJFM_MinFuelIdleV2_G

Description: During Soft Warm Up combustion mode, this error threshold map indicates the minimum fuel requested [mm3] in nominal condition and with transmission in gear. It's function of engine coolant temperature [°C] and engine speed [rpm]

Value Units: mm3
X Unit: rpm
Y Units: °C

y/x	450	660	900	1,200	1,600
-20	39	39	39	39	39
-10	29	29	29	29	29
0	20	20	20	20	20
20	13	13	13	13	13
50	12	12	12	12	12
70	11	11	11	11	11

Initial Supporting table - P054E EJFM_MinFuelIdleV2_PN

Description: During Soft Warm Up combustion mode, this error threshold map indicates the minimum fuel requested [mm3] in nominal condition and with transmission in park and neutral. It’s function of engine coolant temperature [°C] and engine speed [rpm]

Value Units: mm3
X Unit: rpm
Y Units: °C

y/x	450	660	900	1,200	1,600
-20	13	13	13	13	13
-10	11	11	11	11	11
0	7	7	7	7	7
20	8	8	8	8	8
50	4	4	4	4	4
70	3	3	3	3	3

Initial Supporting table - P054EJFM_MinFuelIdleV3_G

Description: During Strong Warm Up combustion mode, this error threshold map indicates the minimum fuel requested [mm3] in nominal condition and with transmission in gear. It’s function of engine coolant temperature [°C] and engine speed [rpm]

Value Units: mm3
X Unit: rpm
Y Units: °C

y/x	450	660	900	1,200	1,600
-20	13	13	13	13	13
-10	11	11	11	11	11
0	7	7	7	7	7
20	8	8	8	8	8
50	4	4	4	4	4
70	3	3	3	3	3

Initial Supporting table - P054E EJFM_MinFuelIdleV3_PN

Description: During Strong Warm Up combustion mode, this error threshold map indicates the minimum fuel requested [mm3] in nominal condition and with transmission in park and neutral. It’s function of engine coolant temperature [°C] and engine speed [rpm]

Value Units: mm3
X Unit: rpm
Y Units: °C

y/x	450	660	900	1,200	1,600
-20	13	13	13	13	13
-10	11	11	11	11	11
0	7	7	7	7	7
20	8	8	8	8	8
50	4	4	4	4	4
70	3	3	3	3	3

Initial Supporting table - P054F_IFM_CombModesEnbl

Description: This calibration provides the capability to select in which combustion mode the Idle Fuel Monitoring shall be enabled.
1 -> monitor enabled
0 -> monitor disabled

Value Units: Boolean
X Unit: Combustion Mode

P054F_IFM_CombModesEnbl - Part 1

y/x	CeCMBR_e_Normal	CeCMBR_e_DPF_HiO2	CeCMBR_e_DPF_LoO2	CeCMBR_e_FullyWarmEmissions	CeCMBR_e_LNT_DeNOx
1	1	0	0	0	0

P054F_IFM_CombModesEnbl - Part 2

y/x	CeCMBR_e_LNT_DeSOx_Lean	CeCMBR_e_LNT_DeSOx_Rich	CeCMBR_e_StrongExhGasWarmUp	CeCMBR_e_SoftExhGasWarmUp	CeCMBR_e_DPF_PN
1	0	0	1	1	0

P054F_IFM_CombModesEnbl - Part 3

y/x	CeCMBR_e_DPF_RichIdle	CeCMBR_e_DPF_EngPrtct_HiO2	CeCMBR_e_DPF_EngPrtct_LoO2	CeCMBR_e_LNT_EngPrtct	CeCMBR_e_FAD_IdleInjLrn
1	0	0	0	0	0

P054F_IFM_CombModesEnbl - Part 4

y/x	CeCMBR_e_HCS_DeHC_Drive	CeCMBR_e_HCS_DeHC_Park	CeCMBR_e_SCR_ServWarmUp	CeCMBR_e_SCR_ServCheck	
1	0	0	0	0	

Initial Supporting table - P054FJFM_MaxFuelIdleC1_G

Description: During Normal combustion mode, this error threshold map indicates the maximum fuel requested [mm3] in nominal condition and with transmission in gear. It's function of engine coolant temperature [°C] and engine speed [rpm]

Value Units: mm3
X Unit: rpm
Y Units: °C

y/x	450	660	900	1,200	1,600
-20	51	51	51	51	51
-10	44	44	44	44	44
0	39	39	39	39	39
20	32	32	32	32	32
50	25	25	25	25	25
70	25	25	25	25	25

Initial Supporting table - P054F JFM_MaxFuelIdleC1_PN

Description: During Normal combustion mode, this error threshold map indicates the maximum fuel requested [mm3] in nominal condition and with transmission in park and neutral. It’s function of engine coolant temperature [°C] and engine speed [rpm]

Value Units: mm3
X Unit: rpm
Y Units: °C

y/x	450	660	900	1,200	1,600
-20	48	48	48	48	48
-10	33	33	33	33	33
0	28	28	28	28	28
20	24	24	24	24	24
50	19	19	19	19	19
70	17	17	17	17	17

Initial Supporting table - P054FJFM_MaxFuelIdleHC_G

Description: During HC Unloading combustion mode, this error threshold map indicates the maximum fuel requested [mm3] in nominal condition and with transmission in gear. It's function of engine coolant temperature [°C] and engine speed [rpm]

Value Units: mm3
X Unit: rpm
Y Units: °C

y/x	450	660	900	1,200	1,600
-20	26	26	26	26	26
-10	26	26	26	26	26
0	26	26	26	26	26
20	26	26	26	26	26
50	26	26	26	26	26
70	25	25	25	25	25

Initial Supporting table - P054F_JFM_MaxFuelIdleHC_PN

Description: During HC Unloading combustion mode, this error threshold map indicates the maximum fuel requested [mm3] in nominal condition and with transmission in park and neutral. It’s function of engine coolant temperature [°C] and engine speed [rpm]

Value Units: mm3
X Unit: rpm
Y Units: °C

y/x	450	660	900	1,200	1,600
-20	22	22	22	22	22
-10	22	22	22	22	22
0	22	22	22	22	22
20	22	22	22	22	22
50	22	22	22	22	22
70	19	19	19	19	19

Initial Supporting table - P054FJFM_MaxFuelIdleV2_G

Description: During Soft Warm Up combustion mode, this error threshold map indicates the maximum fuel requested [mm3] in nominal condition and with transmission in gear. It's function of engine coolant temperature [°C] and engine speed [rpm]

Value Units: mm3
X Unit: rpm
Y Units: °C

y/x	450	660	900	1,200	1,600
-20	46	46	46	46	46
-10	35	35	35	35	35
0	30	30	30	30	30
20	25	25	25	25	25
50	23	23	23	23	23
70	22	22	22	22	22

Initial Supporting table - P054F-JFM_MaxFuelIdleV2_PN

Description: During Soft Warm Up combustion mode, this error threshold map indicates the maximum fuel requested [mm3] in nominal condition and with transmission in park and neutral. It's function of engine coolant temperature [°C] and engine speed [rpm]

Value Units: mm3
X Unit: rpm
Y Units: °C

y/x	450	660	900	1,200	1,600
-20	24	24	24	24	24
-10	23	23	23	23	23
0	18	18	18	18	18
20	19	19	19	19	19
50	15	15	15	15	15
70	14	14	14	14	14

Initial Supporting table - P054FJFM_MaxFuelIdleV3_G

Description: During Strong Warm Up combustion mode, this error threshold map indicates the maximum fuel requested [mm3] in nominal condition and with transmission in gear. It's function of engine coolant temperature [°C] and engine speed [rpm]

Value Units: mm3
X Unit: rpm
Y Units: °C

y/x	450	660	900	1,200	1,600
-20	46	46	46	46	46
-10	35	35	35	35	35
0	30	30	30	30	30
20	25	25	25	25	25
50	23	23	23	23	23
70	22	22	22	22	22

Initial Supporting table - P054F-JFM_MaxFuelIdleV3_PN

Description: During Strong Warm Up combustion mode, this error threshold map indicates the maximum fuel requested [mm3] in nominal condition and with transmission in park and neutral. It’s function of engine coolant temperature [°C] and engine speed [rpm]

Value Units: mm3
X Unit: rpm
Y Units: °C

y/x	450	660	900	1,200	1,600
-20	43	43	43	43	43
-10	23	23	23	23	23
0	23	23	23	23	23
20	23	23	23	23	23
50	20	20	20	20	20
70	20	20	20	20	20

Initial Supporting table - P2160 range change delay time

Description: If the transmission range state changes, the transmission range state must be stable for this amount of time as part of the P2160 enable conditions.

X Unit: transmission fluid temperature DegC
Y Units: delay time seconds

y/x	-40.00	0.00	40.00
1	5.000	5.000	5.000

Initial Supporting table - P2161 range change delay time

Description: If the transmission range state changes, the transmission range state must be stable for this amount of time as part of the P2161 enable conditions.

X Unit: transmission fluid temperature DegC
Y Units: delay time seconds

y/x	-40.00	-20.00	40.00
1	5.000	5.000	5.000

Initial Supporting table - P0606_Last Seed Timeout f(Loop Time)

Description: The max time for the Last Seed Timeout as a function of operating loop time sequence.

Value Units: Max Time for Last Seed Timeout (ms)
X Unit: Operating Loop Sequence (enum)

P0606_Last Seed Timeout f(Loop Time) - Part 1

y/x	CePISR_e_5msSeq	CePISR_e_6p25msSeq	CePISR_e_1OmsSeq	CePISR_e_1 2p5msSeq	CePISR_e_20msSeq	CePISR_e_25msSeq	CePISR_e_40msSeq
1	200.000	200.000	200.000	200.000	200.000	200.000	200.000

P0606_Last Seed Timeout f(Loop Time) - Part 2

y/x	CePISR_e_50msSeq	CePISR_e_80msSeq	CePISR_e_1OOmsSeq	CePISR_e_Eve ntA_Seq	CePISR_e_EventB_Seq	CePISR_e_Eve ntC_Seq	
1	200.000	200.000	500.000	8,191.875	8,191.875	8,191.875	

Initial Supporting table - P0606_PSW Sequence Fail f(Loop Time)

Description: Fail threshold for PSW per operating loop.

Value Units: Fail threshold for PSW (count)
X Unit: Operating Loop (enum)

P0606_PSW Sequence Fail f(Loop Time) - Part 1

y/x	CePISR_e_5msSeq	CePISR_e_6p25msSeq	CePISR_e_1 OmsSeq	CePISR_e_1 2p5msSeq	CePISR_e_20msSeq	CePISR_e_25msSeq	CePISR_e_40msSeq
1	5	3	5	3	5	3	5

P0606_PSW Sequence Fail f(Loop Time) - Part 2

y/x	CePISR_e_50msSeq	CePISR_e_80msSeq	CePISR_e_1 OOmsSeq	CePISR_e_Eve ntA_Seq	CePISR_e_EventB_Seq	CePISR_e_Eve ntC_Seq	
1	5	5	3	3	3	5	

Initial Supporting table - P0606_PSW Sequence Sample f(Loop Time)

Description: Sample threshold for PSW per operating loop.

Value Units: Sample threshold for PSW (count)
X Unit: Operating Loop (enum)

P0606_PSW Sequence Sample f(Loop Time) - Part 1

y/x	CePISR_e_5msSeq	CePISR_e_6p25msSeq	CePISR_e_1OmsSeq	CePISR_e_1 2p5msSeq	CePISR_e_20msSeq	CePISR_e_25msSeq	CePISR_e_40msSeq
1	4	4	4	4	4	4	4

P0606_PSW Sequence Sample f(Loop Time) - Part 2

y/x	CePISR_e_50msSeq	CePISR_e_80msSeq	CePISR_e_1OOmsSeq	CePISR_e_Eve ntA_Seq	CePISR_e_EventB_Seq	CePISR_e_Eve ntC_Seq	
1	4	4	4	4	4	4	

Initial Supporting table - P060C CB safety deadband threshold f(Fuel Rail Pressure)

Description: Maximum allowable safety deadband on CB Energizing Time compensation (for each torque forming pulse) as a function of Fuel Rail Pressure.

y/x	12	24	36	47	59	71	83	94	106	118	130	141	153	165	177	188	200
1	1,440	940	667	522	433	373	331	300	275	255	238	225	212	201	192	183	175

Initial Supporting table - P060C_EIA safety deadband threshold f(Fuel Rail Pressure)

Description: Maximum allowable safety deadband on EIA Energizing Time compensation (for each torque forming pulse) as function of Fuel Rail Pressure.

y/x	12	24	36	47	59	71	83	94	106	118	130	141	153	165	177	188	200
1	1,440	940	667	522	433	373	331	300	275	255	238	225	212	201	192	183	175

Initial Supporting table - P060C_FTD safety deadband threshold f(Fuel Rail Pressure)

Description: Maximum allowable safety deadband on FTD Energizing Time compensation as function of Fuel Rail Pressure.

y/x	12	24	36	47	59	71	83	94	106	118	130	141	153	165	177	188	200
1	1,440	940	667	522	433	373	331	300	275	255	238	225	212	201	192	183	175

Initial Supporting table - P060C_Rail Pressure Wave Compensation f(Fuel Rail Pressure, Fuel Quantity)

Description: Safety treshold for the Rail Pressure Wave Compensation on each torque forming pulse as a function of Fuel Rail Pressure and Fuel Quantity

y/x	0	1	2	3	5	7	10	15	25	35	40	50	60
20	1	1	1	1	1	1	1	1	1	1	1	1	1
40	1	1	1	1	1	1	1	1	1	1	1	1	1
60	1	1	1	1	1	1	1	1	1	1	1	1	1
80	1	1	1	1	1	1	1	1	1	1	1	1	1
100	1	1	1	1	1	1	1	1	1	1	1	1	1
120	1	1	1	1	1	1	1	1	1	1	1	1	1
140	1	1	1	1	1	1	1	1	1	1	1	1	1
160	1	1	1	1	1	1	1	1	1	1	1	1	1
180	1	1	1	1	1	1	1	1	1	1	1	1	1
200	1	1	1	1	1	1	1	1	1	1	1	1	1

Initial Supporting table - P060C_Speed Control External Load f(Oil Temp, RPM)

Description: Specifies the external load table for SPDR torque security as a function of engine oil temperature and engine RPM.

y/x	-40	-20	-10	0	50	90
400	593	571	549	492	212	213
550	565	549	533	477	197	207
600	555	540	524	469	193	202
660	561	543	525	469	192	197
700	565	545	525	469	191	192
750	559	539	519	464	191	186
800	553	533	512	458	191	179
850	536	520	505	449	171	169
900	518	507	497	439	151	158
1,000	495	486	477	420	133	132
1,100	437	430	423	366	82	76
1,800	100	100	100	100	100	100
2,000	100	100	100	100	100	100
2,200	100	100	100	100	100	100
2,400	-210	-210	-210	-210	-210	-210
2,600	-213	-213	-213	-213	-213	-213
4,800	-250	-250	-250	-250	-250	-250

Initial Supporting table - P060C_Speed Control External Load Max f(Vehicle Speed, RPM)

Description: External load calibration table on the basis of engine speed and vehicle speed

y/x	0	5	10	15	30	50	70
500	200	200	200	200	200	200	200
800	200	200	200	200	200	100	50
1,000	200	200	200	100	100	50	0
1,500	200	200	200	100	-25	-50	-75
2,000	200	200	200	100	-25	-50	-75

Initial Supporting table - P060C_Speed Control External Load Offset f(Vehicle Sped, Transmission Oil Temp)

Description: The offset load to add to KtSPDC_M_ExtrenalLoadMaxLmt.

y/x	0	5	10	15	30	50	70
-40	200	200	150	100	75	25	0
-20	100	100	75	50	50	20	0
-10	75	75	50	30	25	15	0
0	50	50	30	20	20	10	0
50	25	25	20	15	10	5	0
90	0	0	0	0	0	0	0

Initial Supporting table - P060C_SQA safety deadband threshold f(Fuel Rail Pressure)

Description: Maximum allowable safety deadband on SQA Energizing Time compensation (for each torque forming pulse) as function of Fuel Rail Pressure.

y/x	12	29	46	63	80	97	115	132	149	166	183	200
1	1,624	927	649	518	438	387	344	314	289	269	253	237

Initial Supporting table - P060C_VCA safety max deadband threshold f(Fuel Rail Pressure)

Description: Maximum allowable safety deadband on VCA energizing time correction as function of Fuel Rail Pressure.

y/x	12	24	36	47	59	71	83	94	106	118	130	141	153	165	177	188	200
1	720	470	333	261	217	186	166	150	138	127	119	112	106	101	96	91	87

Initial Supporting table - P060C_VCA safety min deadband threshold f(Fuel Rail Pressure)

Description: Minimum allowable safety deadband on VCA energizing time correction as function of Fuel Rail Pressure.

y/x	12	24	36	47	59	71	83	94	106	118	130	141	153	165	177	188	200
1	-720	-470	-333	-261	-217	-186	-166	-150	-138	-127	-119	-112	-106	-101	-96	-91	-87

Initial Supporting table - KaF1ADC_b_SQA_EnblCMBR

Description: SQA combustion mode enable

KaFADC_b_SQA_EnblCMBR - Part 1

y/x	CeCMBR_e_Normal	CeCMBR_e_DPF_HiO2	CeCMBR_e_DPF_LoO2	CeCMBR_e_FullyWarmEmissions	CeCMBR_e_LNT_DeNOx
1	1	1	0	0	0

KaFADC_b_SQA_EnblCMBR - Part 2

y/x	CeCMBR_e_LNT_DeSOx_Lean	CeCMBR_e_LNT_DeSOx_Rich	CeCMBR_e_StrongExhGasWarmllp	CeCMBR_e_SoftExhGasWarmUp	CeCMBR_e_DPF_PN
1	0	0	1	1	0

KaFADC_b_SQA_EnblCMBR - Part 3

y/x	CeCMBR_e_DPF_RichIdle	CeCMBR e DPF EngPrtct HiO2	CeCMBR_e_DPF_EngPrtct_LoO2	CeCMBR_e_LNT_EngPrtct	CeCMBR_e_FAD_IdleInjLm
1	0	1	0	0	0

KaFADC_b_SQA_EnblCMBR - Part 4

y/x	CeCMBR_e_HCS_DeHC_Drive	CeCMBR_e_HCS_DeHC_Park	CeCMBR_e_SCR_ServWarmUp	CeCMBR_e_SCR_ServCheck	
1	0	0	0	0	

Initial Supporting table - KaFADC_n_SQC_HiThrsh

Description: Engine speed high threshold for SQC enable function of driveline group and SQA rail pressure level index.

Value Units: Rpm

KaFADC_n_SQC_HiThrsh - Part 1

y/x	CeFADR_e_CWA_DrvlnGrpNotAlwd	CeFADR_e_CWA_DrivelineGrp1	CeFADR_e_CWA_DrivelineGrp2	CeFADR_e_CWA_DrivelineGrp3
0	2,100	2,100	2,100	2,100
1	2,100	2,100	2,100	2,100
2	2,100	2,100	2,100	2,100
3	2,100	2,100	2,100	2,100
4	2,100	2,100	2,100	2,100

KaFADC_n_SQC_HiThrsh - Part 2

y/x	CeFADR_e_CWA_DrivelineGrp4	CeFAD R_e_C WA_D rive lineGrp5	CeFADR_e_CWA_DrivelineGrp6	CeFADR_e_CWA_DrivelineGrp7
0	2,100	1,750	1,750	2,100
1	2,100	1,750	1,750	2,100
2	2,100	1,750	1,750	2,100
3	2,100	1,750	1,750	2,100
4	2,100	1,750	1,750	2,100

KaFADC_n_SQC_HiThrsh - Part 3

y/x	CeFAD R_e_C WA_D rive lineGrp8	CeFADR_e_CWA_DrivelineGrp9	CeFADR_e_CWA_DrivelineGrp10	
0	2,100	1,750	1,750	
1	2,100	1,750	1,750	
2	2,100	1,750	1,750	
3	2,100	1,750	1,750	
4	2,100	1,750	1,750	

Initial Supporting table - KaFADC_n_SQC_LoThrsh

Description: Engine speed low threshold for SQC enable function of driveline group and SQA rail pressure level index.

Value Units: Rpm

KaFADC_n_SQC_LoThrsh - Part 1

y/x	CeFADR_e_CWA_DrvInGrpNotAlwd	CeFADR_e_CWA_DrivelineGrp1	CeFADR_e_CWA_DrivelineGrp2	CeFADR_e_CWA_DrivelineGrp3
0	1,200	1,200	1,200	1,200
1	1,200	1,200	1,200	1,200
2	1,200	1,200	1,200	1,200
3	1,200	1,200	1,200	1,200
4	1,200	1,200	1,200	1,200

KaFADC_n_SQC_LoThrsh - Part 2

y/x	CeFADR_e_CWA_DrivelineGrp4	CeFADR_e_CWA_DrivelineGrp5	CeFADR_e_CWA_DrivelineGrp6	CeFADR_e_CWA_DrivelineGrp7
0	1,200	1,300	1,300	1,200
1	1,200	1,300	1,300	1,200
2	1,200	1,300	1,300	1,200
3	1,200	1,300	1,300	1,200
4	1,200	1,300	1,300	1,200

KaFADC_n_SQC_LoThrsh - Part 3

y/x	CeFADR_e_CWA_DrivelineGrp8	CeFADR_e_CWA_DrivelineGrp9	CeFADR_e_CWA_DrivelineGrp10	
0	1,200	1,300	1,300	
1	1,200	1,300	1,300	
2	1,200	1,300	1,300	
3	1,200	1,300	1,300	
4	1,200	1,300	1,300	

Initial Supporting table - RufCyl Decel

Description: Used for P0300-P0308. Crankshaft decel threshold during Idle or GPF regen. Thresholds are a function of rpm and % engine Load.

Value Units: Delta time per cylinder (usee)
X Unit: rpm
Y Units: percent load of max indicated torque (%)

RufCyl_Decel - Part 1

y/x	510	585	660	700	800	900	1,000	1,100	1,200	1,400	1,600	1,800	2,000
1	1,098	889	700	597	371	238	200	178	150	105	84	65	46
2	801	606	456	475	328	214	168	157	120	85	65	56	43
4	672	544	441	403	281	184	149	132	80	68	52	45	38
6	664	538	396	335	238	181	139	110	74	56	44	36	32
8	890	671	487	365	247	189	136	101	77	51	40	28	28
10	1,041	803	575	443	286	215	156	103	82	54	36	28	24
12	1,158	901	661	518	343	238	175	105	91	57	36	29	24
14	1,270	1,009	746	574	395	257	197	109	104	61	41	32	25
16	1,389	1,127	828	630	453	285	217	138	117	66	52	35	27
18	1,579	1,223	913	693	500	312	237	165	128	76	59	40	29
20	1,803	1,302	994	747	552	340	256	193	144	91	70	46	31
22	1,976	1,407	1,071	818	606	368	278	222	159	102	80	52	34
24	2,117	1,493	1,143	885	657	397	306	247	174	113	90	58	36
30	2,609	1,818	1,363	1,078	795	480	381	317	214	145	119	75	46
40	3,445	2,337	1,720	1,390	1,029	617	497	440	284	205	175	104	65
60	4,952	3,384	2,465	2,008	1,487	893	724	676	416	297	274	165	107
97	7,796	5,301	3,867	3,145	2,337	1,408	1,160	1,129	670	474	458	278	184

RufCyl_Decel - Part 2

y/x	2,200	2,400	2,600	2,800	3,000	3,200	3,400	3,600	3,800	4,000	4,200	4,600	5,000
1	36	24	22	26	22	17	32,766	32,768	32,768	32,768	32,768	32,768	32,768
2	32	19	20	21	21	15	32,766	32,768	32,768	32,768	32,768	32,768	32,768
4	27	17	17	17	19	14	32,766	32,768	32,768	32,768	32,768	32,768	32,768
6	22	15	15	15	18	13	32,766	32,768	32,768	32,768	32,768	32,768	32,768
8	18	13	14	13	16	12	32,766	32,768	32,768	32,768	32,768	32,768	32,768
10	17	13	13	11	15	11	32,766	32,768	32,768	32,768	32,768	32,768	32,768
12	17	14	12	10	14	10	32,766	32,768	32,768	32,768	32,768	32,768	32,768
14	18	15	13	10	13	10	32,766	32,768	32,768	32,768	32,768	32,768	32,768
16	20	17	13	11	13	10	32,766	32,768	32,768	32,768	32,768	32,768	32,768
18	22	18	14	12	13	11	32,766	32,768	32,768	32,768	32,768	32,768	32,768
20	24	20	15	13	14	12	32,766	32,768	32,768	32,768	32,768	32,768	32,768

Initial Supporting table - RufCyl Decel

22	27	22	16	14	14	13	32,766	32,768	32,768	32,768	32,768	32,768	32,768
24	29	24	17	15	15	15	32,766	32,768	32,768	32,768	32,768	32,768	32,768
30	36	30	21	18	17	20	32,766	32,768	32,768	32,768	32,768	32,768	32,768
40	48	40	27	23	21	28	32,766	32,768	32,768	32,768	32,768	32,768	32,768
60	76	59	39	35	26	43	32,766	32,768	32,768	32,768	32,768	32,768	32,768
97	129	94	61	56	36	72	32,766	32,768	32,768	32,768	32,768	32,768	32,768

Initial Supporting table - RufCyl Jerk

Description: Crankshaft jerk threshold during Idle or GPF regen. Thresholds are a function of rpm and % engine Load.

Value Units: Delta time per cylinder (usee)
X Unit: rpm
Y Units: percent load of max indicated torque (%)

RufCyl_Jerk - Part 1

y/x	510	585	660	700	800	900	1,000	1,100	1,200	1,400	1,600	1,800	2,000
1	909	712	564	498	332	224	181	161	138	134	54	66	29
2	693	583	469	426	265	183	142	128	117	94	44	51	25
4	543	480	369	318	219	149	124	89	89	59	36	39	21
6	481	360	313	307	202	136	108	84	70	51	34	32	17
8	672	548	416	345	213	159	107	87	80	46	33	29	19
10	827	662	528	450	272	220	144	93	87	49	37	28	21
12	930	766	645	580	369	277	187	106	94	60	40	27	22
14	1,072	936	781	698	463	336	231	113	104	68	40	33	24
16	1,171	1,022	892	814	553	393	273	126	120	62	45	40	27
18	1,303	1,149	1,012	933	646	450	315	156	126	77	55	41	31
20	1,467	1,280	1,129	1,045	750	494	352	182	122	83	66	54	35
22	1,572	1,409	1,242	1,160	855	560	389	209	152	89	74	61	40
24	1,713	1,526	1,350	1,270	959	630	426	237	189	97	84	70	45
30	2,105	1,962	1,702	1,591	1,280	822	528	306	277	135	82	92	58
40	2,720	2,454	2,233	2,114	1,758	1,159	699	406	384	200	163	116	79
60	4,081	3,843	3,379	3,152	2,781	1,809	1,026	634	608	290	240	214	118
97	6,573	6,010	5,449	5,101	4,669	3,035	1,615	1,087	1,025	476	403	379	193

RufCyl_Jerk - Part 2

y/x	2,200	2,400	2,600	2,800	3,000	3,200	3,400	3,600	3,800	4,000	4,200	4,600	5,000
1	29	26	28	23	19	12	32,766	32,768	32,768	32,768	32,768	32,768	32,768
2	22	22	23	21	16	11	32,766	32,768	32,768	32,768	32,768	32,768	32,768
4	19	18	21	18	14	10	32,766	32,768	32,768	32,768	32,768	32,768	32,768
6	17	16	18	15	12	9	32,766	32,768	32,768	32,768	32,768	32,768	32,768
8	17	15	17	13	11	9	32,766	32,768	32,768	32,768	32,768	32,768	32,768
10	17	16	16	12	11	9	32,766	32,768	32,768	32,768	32,768	32,768	32,768
12	18	17	16	13	11	9	32,766	32,768	32,768	32,768	32,768	32,768	32,768
14	20	19	17	14	12	10	32,766	32,768	32,768	32,768	32,768	32,768	32,768
16	22	21	18	14	12	10	32,766	32,768	32,768	32,768	32,768	32,768	32,768
18	26	20	19	16	13	11	32,766	32,768	32,768	32,768	32,768	32,768	32,768
20	28	22	20	17	14	11	32,766	32,768	32,768	32,768	32,768	32,768	32,768

Initial Supporting table - RufCyl Jerk

22	31	23	21	16	15	12	32,766	32,768	32,768	32,768	32,768	32,768	32,768
24	34	26	22	17	16	12	32,766	32,768	32,768	32,768	32,768	32,768	32,768
30	43	35	26	19	18	13	32,766	32,768	32,768	32,768	32,768	32,768	32,768
40	61	48	31	28	21	15	32,766	32,768	32,768	32,768	32,768	32,768	32,768
60	92	72	39	43	31	20	32,766	32,768	32,768	32,768	32,768	32,768	32,768
97	153	118	57	72	50	27	32,766	32,768	32,768	32,768	32,768	32,768	32,768

Initial Supporting table 3 - RufSCD_Decel

Description: Used for P0300-P0308. Crankshaft decel threshold while in SCD mode during Idle or GPF regen. SCD mode uses smaller windows near TDC. Thresholds are a function of rpm and % engine Load. Note: Misfire's Load term is %, but not PID$04. PID $04 is not robust to temperature and alititude shifts, (especially decel and jerk thresholds since they track actual air trapped in cylinder)

Value Units: Delta time per cylinder (usee)
X Unit: rpm
Y Units: percent load of max indicated torque (%)

RufSCD_Decel - Part 1

y/x	510	585	660	700	800	900	1,000	1,100	1,200	1,400	1,600	1,800	2,000
1	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
2	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
4	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
6	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
8	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
10	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
12	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
14	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
16	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
18	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
20	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
22	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
24	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
30	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
40	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
60	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
97	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767

RufSCD_Decel - Part 2

y/x	2,200	2,400	2,600	2,800	3,000	3,200	3,400	3,600	3,800	4,000	4,200	4,600	5,000
1	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
2	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
4	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
6	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
8	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
10	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
12	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
14	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
16	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767

Initial Supporting table - RufSCD Decel

18	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
20	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
22	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
24	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
30	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
40	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
60	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
97	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767

Initial Supporting table - RufSCD Jerk

Description: Used for P0300-P0308. Crankshaft jerk threshold while in SCD mode during Idle or GPF regen. SCD mode uses smaller windows nearTDC. Thresholds are a function of rpm and % engine Load.

Value Units: Delta time per cylinder (usee)
X Unit: rpm
Y Units: percent load of max indicated torque (%)

RufSCD_Jerk - Part 1

y/x	510	585	660	700	800	900	1,000	1,100	1,200	1,400	1,600	1,800	2,000
1	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
2	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
4	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
6	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
8	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
10	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
12	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
14	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
16	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
18	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
20	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
22	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
24	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
30	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
40	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
60	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
97	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767

RufSCD_Jerk - Part 2

y/x	2,200	2,400	2,600	2,800	3,000	3,200	3,400	3,600	3,800	4,000	4,200	4,600	5,000
1	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
2	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
4	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
6	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
8	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
10	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
12	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
14	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
16	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
18	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767

Initial Supporting table - RufSCD Jerk

20	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
22	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
24	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
30	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
40	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
60	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
97	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767

Initial Supporting table - P2ADD_Measure_Error

Description: Maximum temperature measurement error as function of last good measured temperature

Value Units: °C
X Unit: °C

y/x	-40.0	-20.0	80.0	120.0
1.0	3.0	2.0	3.0	3.0