Component Procedures: Engine Control Module

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Parts and Labor (itype_189)

Parts

Qualifier	Part #	Name	Price	Note
ECM	12651994	Ecm	825.74	

Labor

Operation	Qualifier Path	Skill	Std Hrs	Wty Hrs
Remove & Replace	Powertrain Control > ECM, R&R	B	0.6	0.5
Reprogram	Powertrain Control > ECM, Reprogram	B	0.5	0.0

Engine Control Module Description (Article 11086)

The Engine Control Module (ECM) interacts with and monitors many emission related components and systems for deterioration. OBD II diagnostics monitor the system performance and a diagnostic trouble code (DTC) sets if the system performance degrades. The ECM is part of a network and communicates with various other vehicle control module s.

Malfunction indicator lamp (MIL) operation and DTC storage are dictated by the DTC type. A DTC is ranked as a Type A or Type B if the DTC is emissions related. Type C is a non-emissions related DTC.

The ECM is the control center of the engine controls system. Review the components and wiring diagrams in order to determine which systems are controlled by the ECM.

The ECM constantly monitors the information from various sensors and other inputs, and controls the systems that affect engine performance and emissions. The ECM also performs diagnostic tests on various parts of the system and can turn on the MIL when it recognizes an operational problem that affects emissions. When the ECM detects a malfunction, the ECM stores a DTC. The condition area is identified by the particular DTC that is set. This aids the technician in making repairs.

ECM Function

The ECM can supply 5 V or 12 V to various sensors or switches. This is done through pull-up resistors to regulated power supplies within the ECM. In some cases, even an ordinary shop voltmeter will not give an accurate reading due to low input resistance. Therefore, a digital multimeter (DMM) with at least 10 megaohms input impedance is required in order to ensure accurate voltage readings.

The ECM controls the output circuits by controlling the ground or the power feed circuit through transistors or a device called an output driver module.

EEPROM

The electronically erasable programmable read only memory (EEPROM) is an integral part of the ECM. The EEPROM contains program and calibration information that the ECM needs in order to control engine operation.

Special equipment, as well as the correct program and calibration for the vehicle, are required in order to reprogram the ECM.

Data Link Connector (DLC)

The data link connector (DLC) provides serial data communication for ECM diagnosis. This connector allows the technician to use a scan tool in order to monitor various serial data parameters, and display DTC information.

The DLC is located inside the driver's compartment, underneath the instrument panel.

Malfunction Indicator Lamp (MIL)

The malfunction indicator lamp (MIL) is inside the instrument panel cluster (IPC). The MIL is controlled by the ECM and illuminates when the ECM detects a condition that affects vehicle emissions.

ECM Service Precautions

The ECM, by design, can withstand normal current draws that are associated with vehicle operations. However, care must be used in order to avoid overloading any of these circuits. When testing for opens or shorts, do not ground or apply voltage to any of the ECM circuits unless the diagnostic procedure instructs you to do so. These circuits should only be tested with a DMM unless the diagnostic procedure instructs otherwise.

Emissions Diagnosis For State I/M Programs

This OBD II equipped vehicle is designed to diagnose any conditions that could lead to excessive levels of the following emissions:

- Hydrocarbons (HC)
- Carbon monoxide (CO)
- Oxides of nitrogen (NOx)
- Evaporative emission (EVAP) system losses

The ECM turns ON the MIL and stores a DTC when the on-board diagnostic system detects a condition that could result in excessive emissions.

Aftermarket (Add-On) Electrical And Vacuum Equipment

Aftermarket, add-on, electrical and vacuum equipment is defined as any equipment installed on a vehicle after leaving the factory that connects to the vehicle's electrical or vacuum systems. No allowances have been made in the vehicle design for this type of equipment.

Add-on electrical equipment, even when installed to these strict guidelines, may still cause the powertrain system to malfunction. This may also include equipment not connected to the vehicle electrical system, such as portable telephones and radios. Therefore, the first step in diagnosing any powertrain condition is to eliminate all of the aftermarket electrical equipment from the vehicle. After this is done, if the problem still exists, the problem may be diagnosed in the normal manner.

Electrostatic Discharge (ESD) Damage

The electronic components that are used in the control systems are often designed to carry very low voltage. These electronic components are susceptible to damage caused by electrostatic discharge. Less than 100 V of static electricity can cause damage to some electronic components. By comparison, it takes as much as 4,000 V for a person to even feel a static discharge.

There are several ways for a person to become statically charged. The most common methods of charging are by friction and induction. An example of charging by friction is a person sliding across a car seat.

Charging by induction occurs when a person with well insulated shoes stands near a highly charged object and momentarily touches ground. Charges of the same polarity are drained off leaving the person highly charged with the opposite polarity. Static charges can cause damage, therefore, it is important to use care when handling and testing electronic components.

Emissions Control Information Label

The underhood Vehicle Emissions Control Information Label contains important emission specifications. This identifies the year, the displacement of the engine in liters, and the class of the vehicle.

This label is located in the engine compartment of every General Motors vehicle. If the label has been removed, it can be ordered from GM service parts operations (GMSPO).

Engine Control Module Replacement (Article 11413)

Callout Component Name

Preliminary Procedure Disconnect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection .

Preliminary Procedure

Disconnect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection .

1 Electronic Control Module Warning: Refer to Safety Glasses Warning . Caution: Turn the ignition OFF when installing or removing the control module connectors and disconnecting or reconnecting the power to the control module (battery cable, powertrain control module (PCM)/ engine control module (ECM)/ transaxle control module (TCM) pigtail, control module fuse, jumper cables, etc .) in order to prevent internal control module damage. Control module damage may result when the metal case contacts battery voltage. DO NOT contact the control module metal case with battery voltage when servicing a control module, using battery booster cables, or when charging the vehicle battery. In order to prevent any possible electrostatic discharge damage to the control module, do no touch the connector pins or the soldered components on the circuit board. Remove any debris from around the control module connector surfaces before servicing the control module. Inspect the control module connector gaskets when diagnosing or replacing the control module. Ensure that the gaskets are installed correctly. The gaskets prevent contaminant intrusion into the control module. The replacement control module must be programmed. Procedure Disconnect the electrical connectors. Release the retaining tabs. If replacing, program the ECM. Refer to Control Module References . Note: Before removing the engine control module (ECM), record the Engine Oil Life percentage remaining. Use the scan tool to reset the Engine Oil Life remaining back to the original percentage recorded.

- Turn the ignition OFF when installing or removing the control module connectors and disconnecting or reconnecting the power to the control module (battery cable, powertrain control module (PCM)/ engine control module (ECM)/ transaxle control module (TCM) pigtail, control module fuse, jumper cables, etc .) in order to prevent internal control module damage.
- Control module damage may result when the metal case contacts battery voltage. DO NOT contact the control module metal case with battery voltage when servicing a control module, using battery booster cables, or when charging the vehicle battery.
- In order to prevent any possible electrostatic discharge damage to the control module, do no touch the connector pins or the soldered components on the circuit board.
- Remove any debris from around the control module connector surfaces before servicing the control module. Inspect the control module connector gaskets when diagnosing or replacing the control module. Ensure that the

gaskets are installed correctly. The gaskets prevent contaminant intrusion into the control module.
- The replacement control module must be programmed.
Procedure
- Disconnect the electrical connectors.
- Release the retaining tabs.
- If replacing, program the ECM. Refer to Control Module References .

All New Technical Service Bulletins (itype_432)

Tsbs
- Identifying Non-GM (Aftermarket) Engine Calibrations for Gasoline Engines Using Tech 2® or GDS 2 (U.S., Canada, Australia, and New Zealand) (09-06-04-026Z, 2025/01/09)

All Technical Service Bulletins (itype_100)

Tsbs
- Engine Controls - Vehicle Stalls When Turning, No DTC's (15-06-04-003, 2015/07/31)
- Engine Controls - MIL ON, DTC's P0300/P0303 Set (PI1122B, 2014/02/10)
- Identifying Non-GM (Aftermarket) Engine Calibrations for Gasoline Engines Using Tech 2® or GDS 2 (U.S. and Canada) (09-06-04-026X, 2023/07/31)
- Engine - THIS BULLETIN HAS BEEN CANCELED (04-06-04-054E, 2012/08/06)
- Engine Controls - P00C6, P228C Diagnostic Assistance (PIP5209A, 2014/08/18)
- Identifying Non-GM (Aftermarket) Engine Calibrations for Gasoline Engines Using Tech 2® or GDS 2 (U.S., Canada, Australia, and New Zealand) (09-06-04-026Z, 2025/01/09)
- Engine Controls - Single Cylinder Misfire Diagnostics (PIP5062C, 2014/05/02)

Customer Interest Bulletins (itype_109)

Tsbs
- Engine Controls - Vehicle Stalls When Turning, No DTC's (15-06-04-003, 2015/07/31)

Repair Tips (itype_110)

Tsbs
- Engine Controls - MIL ON, DTC's P0300/P0303 Set (PI1122B, 2014/02/10)
- Engine Controls - P00C6, P228C Diagnostic Assistance (PIP5209A, 2014/08/18)
- Engine Controls - Single Cylinder Misfire Diagnostics (PIP5062C, 2014/05/02)

K20 Engine Control Module Programming and Setup (Article 10744)

Special Tools
EL-49642 - SPS Programming Support Tool
For equivalent regional tools, refer to Special Tools .
- DO NOT program a control module unless directed to by a service procedure or a service bulletin. If the control module is not properly configured with the correct calibration software, the control module will not control all of the vehicle features properly.
- Ensure the programming tool is equipped with the latest software and is securely connected to the data link connector (DLC). If there is an interruption during programming, programming failure or control module damage may occur.
- Stable battery voltage is critical during programming. Any fluctuation, spiking, over voltage or loss of voltage will interrupt programming. When required install the EL-49642 - SPS Programming Support Tool to maintain system voltage. If not available, connect a fully charged 12 V jumper or booster pack disconnected from the AC voltage supply. DO NOT connect a battery charger.
- Turn OFF or disable systems that may put a load on the vehicles battery such as; interior lights, exterior lights (including daytime running lights), HVAC, radio, etc .
- During the programming procedure, follow the SPS prompts for the correct ignition switch position.
- Clear DTCs after programming is complete. Clearing powertrain DTCs will set the Inspection/Maintenance (I/M) system status indicators to NO.
- Note the engine oil life remaining percentage.
- If over 14k GVW, program the engine serial number with the scan tool.
- If unable to complete programming or have questions contact Techlline 1–800–828–6860
Replace and Program Control Module
- The Prepare Control Module for Removal function can only be performed when communication with the old control module is still possible.

- Instances may occur where data is not transferred during the Prepare Control Module for Removal Function
- Ignition » On / Vehicle » In Service Mode
- Perform the scan tool function: Create Report
- Engine Oil Life Remaining
- Fuel Filter Life Remaining — If applicable
- Fuel Injector Flow Characteristic Identification — If applicable
- Install EL-49642 - SPS programming support tool .
- Access the Service Programming System and follow the on-screen instructions for the control module: K20 Engine Control Module
- Select — Prepare Control Module for Removal — If applicable
- Ignition/Vehicle & All vehicle systems » Off
- Replace the component: K20 Engine Control Module
- If both controller options below are listed, select K20 Engine and K71 Transmission Control Module s.
- Refer to: Control Module References — K71 Control Module Programing
- Perform the SPS function:
- K20 Engine and K71 Transmission Control Modules — Follow the on-screen instructions.
- K20 Engine Control Module — Follow the on-screen instructions.
- Clear DTCs after programming is complete. Clearing powertrain DTCs will set the Inspection/Maintenance (I/M) system status indicators to No.
- Perform the SPS function: Immobilizer Learn — If equipped. Refer to: Immobilizer System Component Programming
- Perform the SPS function: K20 Engine Control Module Setup — Configuration Perform any adjustment, programming or setup procedures that are required when a component or module is removed or replaced. Follow the on-screen instructions.
- Perform the scan tool learn/reset function:
- Fuel Injector Flow Characteristic Identification — If equipped
- Fuel Pressure Regulator Learn — If equipped
- Throttle Body Idle Air Flow Compensation Reset
- Turbocharger Wastegate Learn — If equipped
- Perform the scan tool function: Clear DTCs

Reprogram Control Module

To reprogram an existing K20 Engine Control Module, perform the following procedure:

- If both controller options below are listed, select K20 Engine and K71 Transmission Control Modules.

Unsuccessful Programming Recovery

If programming a control module is not successful, perform the following procedure:

- Verify the control module, data link connector and programming tool connections are secure and the tool software is up to date.
- Perform one of the following SPS Programming functions:
- K20/K71 Engine and Transmission Control Modules and follow the on-screen instructions.
- K20 Engine Control Module and follow on-screen instructions.
- Verify the control module programming is successful.
- If the programming is not successful
- Ignition/Vehicle » Off — For greater than 1 min
- If the programming is not successful Replace the appropriate component: K20 Engine Control Module or K71 Transmission Control Module
- If the programming is successful
- All OK.
- All OK..

Repair Instructions

Perform the Diagnostic Repair Verification after completing the repair.

Control Module References for control module replacement, programming and setup.

K20 Engine Control Module: Scan Tool Information (LFX) (Article 10785)

Parameter System State Expected Value Description

This is a comprehensive list. Not all parameters listed are available for all applications. Base Operating Conditions: Engine Idling/Radiator Hose Hot/Park or Neutral/Closed Loop

5 V Reference 1, 2, 3, 4 or 5 Engine Idling 5 Volts This parameter displays the voltage sensed on the 5 V reference circuits at the control module . The scan tool will display a higher value at higher voltage. The scan tool will display a lower value at lower voltage.

5 V Reference 1, 2, 3, 4 or 5 Circuit Status Engine Idling OK This parameter will display OK if the circuit is

good or Malfunction if a short to ground, short to B+ is present.
A/C Compressor Clutch Inhibit Reason History 1 or 2 Ignition ON None This parameter displays one of the following if an A/C Compressor Clutch Inhibit reasons is detected. High Side Fluid Pressure, Engine Speed, Battery Voltage, Engine Stall, Engine Speed Stabilization, Wide Open Throttle, Vehicle Launch Performance, High Coolant Temperature, AC Relay Fault, Hybrid Request, AutoStop Request, High Power Electronics Coolant Temperature, High Transmission Fluid Temperature, Full Pedal Power Limit Applied, Airbag deployed, Battery Power Limit Exceeded, Powertrain Diagnostics, AC Compressor Fault, Serial Communication Fault, or Low Brake Vacuum.
A/C Compressor Clutch Relay Command Engine Idling Off This parameter displays when the A/C Compressor Clutch relay is commanded ON or OFF.
A/C Compressor Clutch Relay Control Circuit High Voltage Test Status Engine Idling OK This parameter displays the status of the relay control circuit. It can display OK, Malfunction or Not Run.
A/C Compressor Clutch Relay Control Circuit Low Voltage Test Status Engine Idling OK This parameter displays the status of the relay control circuit. It can display OK, Malfunction or Not Run.
A/C Compressor Clutch Relay Control Circuit Open Test Status Engine Idling OK This parameter displays the status of the relay control circuit. It can display OK, Malfunction or Not Run.
A/C Disabled – A/C Pressure Out of Range A/C ON No This parameter displays whether the A/C pressure is out of range for normal operation as determined by the control module.
A/C Disengage 1–8 History A/C ON Reason for A/C Disengagement The parameter displays reason for the last 8 air conditioning (A/C) compressor disengagements in order from 1 to 8 with 8 being the most recent. There are 8 possible causes for the A/C compressor to disengage.
A/C High Side Pressure Sensor A/C OFF 0.75–1.5 Volts* This parameter displays the voltage signal from the A/C high side pressure sensor input to the control module. * Varies with temperature, humidity, and altitude.
A/C ON 1.3–2.5 Volts*
A/C High Side Pressure Sensor A/C OFF 450–827 kPa (65–120 psi)* This parameter displays the pressure from the A/C high side pressure sensor signal circuit to the control module. * Varies with temperature, humidity, and altitude.
A/C ON 827–2,350 kPa (120–341 psi)*
A/C OFF for WOT A/C ON No This parameter displays whether the control module is commanding the A/C compressor clutch relay OFF for wide open throttle (WOT).
A/C Request Signal A/C ON No This parameter displays the state of the A/C request input to the control module from the heating, ventilation, and air conditioning (HVAC) controls.
Accelerator Pedal Position Engine Idling 0–100 % This parameter displays the angle of the accelerator pedal position (APP) as calculated by the control module using the signals from the APP sensor s.
Accelerator Pedal Position When Engine Overspeed Detected Engine Idling 0–100 % This parameter displays the accelerator pedal position (APP) observed upon initial detection of an overspeed condition. This value will be updated upon each overspeed condition.
Active Grille Air Shutter Ambient Air Temperature Ignition ON ºC (ºF) This parameter displays the temperature detected and used by the Active Air Shutter system.
Active Grille Air Shutter Control Ignition ON Active / Inactive This parameter indicates if the Active Grille Air Shutter Control is Active or Inactive.
Active Grille Air Shutter Control Status Ignition ON ON/OFF This parameter displays the control status of the active air shutter.
Active Grille Air Shutter Desired Position Achieved Ignition ON Yes / No This parameter indicates if the Active Grille Air Shutter Desired Position is Achieved.
Active Grille Air Shutter Diagnostic Control Ignition ON Active / Inactive This parameter indicates if the control system is attempting to move the Active Grille Air Shutter for diagnostic purposes. Displays Active or Inactive.
Active Grille Air Shutter Ice Protection Mode Ignition ON Active / Inactive This parameter indicates whether or not the Shutter control algorithm is in Ice Mode, which attempts to park the shutter and prohibit further operation. Displays Active or Inactive.
Active Grille Air Shutter Initialization Status Ignition ON Complete / Incomplete This parameter displays the initialization status of the Active Grille Air Shutter.
Active Grille Air Shutter Position Ignition ON 0–100 % This parameter displays the position of the active grill air shutter. 0% = fully closed, 100% = fully open.
Active Grille Air Shutter Status Ignition ON Moving / Stationary This parameter indicates if the Active Grille Air Shutter is Moving or Stationary.
Active Grille Air Shutter Supply Voltage Ignition ON Volts This parameter indicates the Active Grille Air Shutter Supply Voltage.
Active Grille Air Shutter Torque Command Ignition ON Counts This parameter displays the commanded torque level

for the active air shutter. 0 = Nominal Torque.
Air/Fuel Equivalence Ratio Command Engine Idling Varies:1 This parameter should display 1.0 when in Closed Loop fuel control.
Alternative Fuel Injector 1, 2, 3, 4, 5, 6, 7 or 8 Command Ignition ON On / Off This parameter contains the commanded state of the alternative fuel injector 1 output (the output is considered to be commanded on if the injector is enabled while the engine is running or cranking).
Alternative Fuel Injector 1 Control Circuit High Voltage Test Status Ignition ON OK, Malfunction, Not Run This parameter displays the state of the Alternative Fuel Injector 1 control circuit. The parameter displays Malfunction if the Alternative Fuel Injector 1 control circuit is shorted to voltage.
Alternative Fuel Injector 1 Control Circuit Low Voltage Test Status Ignition ON OK, Malfunction, Not Run This parameter displays the state of the Alternative Fuel Injector 1 control circuit. The parameter displays Malfunction if the Alternative Fuel Injector 1 control circuit is shorted to ground.
Alternative Fuel Injector Pulse Width Bank 1 Ignition ON ms This parameter displays the alternative fuel injector pulse width (on time) commanded to each cylinder on bank 1.
Alternative Fuel Injector Pulse Width Bank 2 Ignition ON ms This parameter displays the alternative fuel injector pulse width (on time) commanded to each cylinder on bank 2.
Alternative Fuel Rail Pressure Ignition ON kPa / PSI This parameter displays the fuel rail pressure calculated as the difference between alternative fuel rail absolute pressure and ambient air pressure (barometric pressure). This measurement is a "gauge pressure." (Gauge = Absolute – Ambient) Range 0 to 2048 kPa.
Alternative Fuel Rail Pressure Ignition ON Volts This parameter displays the alternative fuel rail pressure sensor analog input as a percentage of its reference voltage.
Alternative Fuel Rail Pressure Sensor Ignition ON kPa This parameter displays an ‘undefaulted’ fuel rail pressure relative to manifold vacuum. This is intended for gaseous fuel injection alternative fuel applications (CNG/LPG Mono-Fuel and Bi-Fuel).
Alternative Fuel Rail Temperature Ignition ON °C (°F) This parameter displays the undefaulted alternative fuel rail temperature measured by a sensor. Range is –40 to 215°C.
Alternative Fuel Shutoff Valve 1 or 2 Control Circuit Command Ignition ON On / Off This parameter displays the commanded state of the alternative fuel shutoff valve 1 output (the output is considered to be commanded on if the shutoff valve is enabled while the engine is running or cranking).
Alternative Fuel Shutoff Valve 1 or 2 Control Circuit High Voltage Test Status Ignition ON OK, Malfunction, Not Run This parameter displays the state of the Alternative Fuel Shutoff Valve 1 or 2 control circuit. The parameter displays Malfunction if the Alternative Fuel Shutoff Valve is shorted to voltage.
Alternative Fuel Tank Pressure Ignition ON Volts This parameter displays the alternative fuel tank pressure sensor analog input as a percentage of its reference voltage.
Ambient Air Temperature Engine Idling Varies This parameter displays temperature from the input of the Intake Air Temperature Sensor .
Ambient Air Temperature Ignition ON °C (°F) Varies This parameter displays the outside air temperature as calculated by the control module.
Ambient Air Temperature When Recommended Maximum Fuel Alcohol Content Exceeded — °C (°F) This parameter displays the ambient air temperature when the recommended maximum fuel alcohol content was exceeded.
Ambient Humidity Ignition ON 0–100 % This parameter displays the current ambient humidity level.
APP Sensor 1 Accelerator pedal not actuated 0.98 Volts This parameter displays the actual voltage on the accelerator pedal position (APP) sensor 1 signal circuit as measured by the control module.
Accelerator pedal fully actuated 4.25 Volts
APP Sensor 1 and 2 Ignition ON Agree This parameter displays Disagree if the control module detects the signal voltage from APP sensor 1 is not in correct relationship to APP sensor 2. The scan tool displays Agree under the normal operating conditions.
APP Sensor 1 Circuit Status Engine Idling OK APP Sensor 1 Out of Range indicates that the sensed accelerator pedal position 1 sensor value is currently out of range or that a Malfunction has been detected based upon the sensed accelerator pedal position 1 sensor value being out of range
APP Sensor 1 Learned Applied Position Ignition ON 78 % This parameter contains the learned maximum (fully applied) accelerator pedal position relating to absolute accelerator pedal position (no correction or normalization based upon learned minimum or maximum positions) from accelerator pedal position sensor 1.
APP Sensor 1 Learned Released Position Ignition ON 0.98 Volts This parameter indicates the accelerator pedal sensor 1 signal at its minimum learned position (pedal released) as a percentage of its reference voltage. (The minimum learned position is automatically updated periodically as determined by the calibration.
APP Sensor 1 Position Pedal Released 0 % This parameter contains the displacement determined from accelerator pedal position sensor 1 (corrected and normalized based upon its learned minimum and maximum positions).
Pedal Fully Applied 99 %
APP Sensor 2 Ignition ON Volts This parameter contains the accelerator pedal position sensor 2 analog input as

a percentage of its reference voltage
APP Sensor 2 Accelerator pedal not actuated 0.49 Volts This parameter displays the actual voltage on the accelerator pedal position (APP) sensor 2 signal circuit as measured by the control module.
Accelerator pedal fully actuated 2.14 Volts
APP Sensor 2 Circuit Status Ignition ON OK APP Sensor 2 Out of Range indicates that the sensed accelerator pedal position 2 sensor value is currently out of range or that a malfunction has been detected (and latched) based upon the sensed accelerator pedal position 2 sensor value being out of range
APP Sensor 2 Learned Applied Position Ignition ON 78 % This parameter contains the learned maximum (fully applied) accelerator pedal position relating to absolute accelerator pedal position (no correction or normalization based upon learned minimum or maximum positions) from accelerator pedal position sensor 2.
APP Sensor 2 Learned Released Position Ignition ON 0.49 Volts This parameter indicates the accelerator pedal sensor 2 signal at its minimum learned position (pedal released) as a percentage of its reference voltage. (The minimum learned position is automatically updated periodically as determined by the engine control module.
APP Sensor 2 Position Pedal Released 0 % This parameter contains the displacement determined from accelerator pedal position sensor 2 (corrected and normalized based upon its learned minimum and maximum positions).
Pedal Fully Applied 100 %
APP Sensors Pedal Released 0 % This parameter contains the accelerator pedal position resulting directly from the settling of differences of the accelerator pedal position sensors (prior to any compensation to determine driver intent).
Autostop/Autostart Disable Mode — Active This parameter displays “Active” when all conditions for allowing the autostop/autostart mode are present (no inhibit conditions exist), this parameter displays "Inactive" when all conditions for allowing the autostop/autostart mode are not present.
Autostart Inhibit Reason Autostop/Autostart Malfunction Engine Idling No This parameter displays that a immediate stop was commanded due to a Autostop/Autostart malfunction.
Autostart Inhibit Reason Engine Idling No The scan tool displays Yes if one of the following Autostart Inhibit Reason is detected. Control Function Active, Crank Abort, Driver Exited Vehicle, ECM Malfunction, ECM Request, Engine Coolant Temperature Out of Range, Hood Ajar, Hybrid/EV Power Conditions, Hybrid/EV Battery Pack Contactor Open, Hybrid/EV Battery Pack Power Low, Hybrid/EV Battery Pack State of Charge Low, Hybrid/EV Battery Pack Voltage Low, Hybrid/EV Propulsion System Inactive, Not Commanded, Run/Crank Not Active, System Malfunction, Transmission Range .
Autostart Reason Engine Idling No This parameter displays Yes if one of the following Autostart Reason is detected. A/C Request, Acceleration Request, Accelerator Pedal Pressed, Auxiliary Transmission Fluid Pump Not Available, Brake Booster Weak Vacuum, Brake Pedal Released, Clutch Pedal Applied, Control Function Active, Drive Motor Inverter Temperature High, Drive Motor Temperature High, Driver Exited Vehicle, ECM Request, Engine Coolant Temperature Out of Range, Hood Ajar, Hybrid/EV Battery Module Voltage Low, Hybrid/EV Battery Pack Power Low, Hybrid/EV Battery Pack State of Charge Low, Hybrid/EV Battery Pack Temperature, Hybrid/EV Battery Pack Voltage Low, Hybrid/EV Propulsion System Inactive, Ignition Switch Start, Inclination, Invalid Data Received, Low Voltage Battery Discharge Current High, Low Voltage Battery State of Function Low, Low Voltage Battery State of Health Low, Low Voltage Battery Voltage Low, Maximum Autostop Time Exceeded, Minimum Engine Run Time Not met, Reduced Engine Power Active, Remote Vehicle Start Request, Stop/Start Select Switch, System Malfunction, System Optimization, System Voltage Low, TCM Demand, Tow/Haul Mode Switch ON, Transmission Fluid Temperature Out of Range, Transmission In Reverse, Transmission Range, Vehicle Speed Too High.
Autostop Disable Reason Engine Idling No The scan tool displays Yes if one of the following Autostop Disable Reason is detected. 12 V Start Counter Exceeded, A/C Request, Acceleration Request, Accelerator Pedal Pressed, Auxiliary Transmission Fluid Pump Not Available, Brake Booster Weak Vacuum, Brake Pedal Released, Clutch Pedal Applied, Control Function Active, Drive Motor Inverter Temperature High, Drive Motor Temperature High, ECM Request, Engine Coolant Temperature Out of range, Engine Speed High, Generator Load High, Hood Ajar Hybrid/EV Battery Module Voltage Low, Hybrid/EV Battery Pack Power Low, Hybrid/EV Battery Pack State of Charge Low, Hybrid/EV Battery Pack Temperature, Hybrid/EV Battery Pack Voltage Low, Hybrid/EV Propulsion System Inactive, Idle Boost Mode Active, Ignition Sw itch Start, Intake Manifold Weak Vacuum, Invalid Data Received, Low Voltage Battery Discharge Current High, Low Voltage Battery State of Charge Low, Low Voltage Battery State of Function Low, Low Voltage Battery State of Health Low, Low Voltage Battery Temperature Out of Range, Low Voltage Battery Voltage Low, Maximum Vehicle Stop Time Exceeded, Minimum Engine Run Time Not Met, Reduced Engine Power Active, Remote Vehicle Start Request, Run/Crank Not Active, Stop/Start Select Switch, System Optimization, System Voltage Low, TCM Request, Tow/Haul Mode Switch ON, Transmission Fluid Temperature Out of Range, Transmission in Reverse, Transmission Range, Vehicle Inclination, Vehicle Speed Threshold Not Reached, Vehicle Speed Too High, Wheel Slip Detected.
Auxiliary Coolant Pump Relay Command Ignition ON On / Off This parameter displays the command status of the Auxiliary Coolant Pump Relay.

Auxiliary Coolant Pump Relay Control Circuit High Voltage Test Status Ignition ON OK, Malfunction, Not Run This parameter displays the status of the Auxiliary Coolant Pump Relay Control Circuit High Voltage Test. Can display OK, Malfunction, or Not Run.
Auxiliary Coolant Pump Relay Control Circuit Low Voltage Test Status Ignition ON OK, Malfunction, Not Run This parameter displays the status of the Auxiliary Coolant Pump Relay Control Circuit Low Voltage Test. Can display OK, Malfunction, or Not Run.
Auxiliary Coolant Pump Relay Control Circuit Open Test Status Ignition ON OK, Malfunction, Not Run This parameter displays the status of the Auxiliary Coolant Pump Relay Control Circuit Open Circuit Test. Can display OK, Malfunction, or Not Run.
Average Fuel Age Ignition ON Days This parameter displays the average fuel age in days.
Axle Torque Engine Idling Nm This parameter displays the Axle Torque value sent from the hybrid control processor (HCP) to the ECM and anti-lock brake system (ABS) module.
Axle Torque Command Ignition ON Nm (lb ft) This parameter displays the commanded Axle Torque value.
BARO Engine Idling 65–104 kPa (8–16 psi) This parameter displays the barometric pressure. The control module uses the barometric pressure sensor input for fuel control to compensate for altitude differences.
BARO Sensor Engine Idling 2.5–4.0 Volts This parameter displays the barometric pressure sensor voltage.
Barometric Pressure Sensor Bank 1 Ignition ON kPa (PSI) This parameter displays the ambient air pressure.
Barometric Pressure Sensor Bank 2 Ignition ON Volts This parameter displays the signal voltage of the barometric pressure sensor
Base Model Part Number Ignition ON # This parameter displays information which is used during programming to identify unique combinations of hardware and software.
Battery Capacity Ignition ON Ah This parameter displays the capacity of the battery in Amp-hours.
Battery Sensor Module Battery State Information Ignition ON Available / Not Available This parameter indicates if Battery State Information is Available or Not Available. Battery State Information is Not Available when there is a battery drain such as a parasitic draw.
Battery Sensor Module Reset Occurred - Using Estimated State of Charge Ignition ON Yes / No This parameter indicates if the current battery State of Charge is estimated. This occurs when the BSM has been reset.
Battery State of Charge Ignition ON 0–100 % This parameter displays the Battery State of Charge (SOC). SOC is a calculated value provided by an intelligent battery sensor (IBS).
Battery State of Health Ignition ON 0–100 % This parameter displays the Battery State of Health (SOH). SOH is a calculated value provided by an intelligent battery sensor (IBS).
Battery Type Ignition ON N/A This parameter displays the battery type.
Battery Voltage Ignition ON Volts This parameter displays the battery voltage.
Battery Voltage High Resolution Ignition ON Volts This parameter displays the high resolution battery voltage value.
Boost Pressure Engine Idling kPa This parameter shows the Turbocharger boost pressure in kPa.
Boost Pressure Sensor Engine Idling kPa This parameter shows the Turbocharger boost pressure in kPa.
Boost Pressure Sensor — Volts This parameter displays the turbocharger boost pressure sensor in voltage.
Brake Booster Pressure Sensor Engine Idling Volts This parameter displays the brake booster vacuum pressure analog input as a percentage of its reference voltage.
Brake Booster Pressure Sensor Engine Idling kPa This parameter displays the undefaulted, unfiltered brake booster vacuum pressure measured by a sensor.
Brake Pedal Position Circuit Signal Ignition ON Closed This parameter displays the serial data message of the brake signal from the electronic brake and traction control module (EBTCM).
Brake Pedal Position Circuit Signal — Released This parameter displays the displacement of the brake pedal.
Brake Pedal Position Sensor Ignition ON 0–100 % This parameter displays the displacement of the brake pedal, where 0% corresponds to the brake pedal being released and 100% corresponds to the brake pedal being fully applied.
Brake Pedal Position Sensor Ignition ON Volts This parameter displays the brake pedal position as indicated by the analog sensor as a percentage of its reference voltage.
Brake Pedal Position Sensor Fully Released Learn Status Ignition ON Complete This parameter displays the brake pedal fully released learn position status.
Brake Pedal Position Sensor Learned Released Position Ignition ON Volts This parameter displays the position learned for the brake pedal position sensor when the brake pedal is fully released.
Brake Pedal Position Sensor Signal Ignition ON Released This parameter displays the serial data message of the brake position sensor signal from the electronic brake and traction control module (EBTCM).
Calculated Air Flow Engine Idling G/S This parameter contains the mass airflow determined from the speed density (MAP based) calculation of air mass per cylinder.
Calculated BARO Engine Idling kPa/psi 97.2 kPa/14.1 psi at idle This parameter contains an estimate of barometric pressure, used to correlate with sensed ambient air pressure in the Barometric Pressure Correlation

Diagnostic.
Calculated Catalyst Temperature or Calculated Catalyst Temperature Bank 1 or Bank 2 Engine Idling Approximately 552°C (1,026°F) This parameter contains the estimated catalyst temperature (as a function of engine speed, engine airflow, and fuel ethanol percentage) for use in the oxygen sensor and catalyst monitor diagnostic algorithms.
Calculated Engine Oil Pressure Engine Idling kPa (PSI) This parameter displays the filtered value for the engine oil pressure.
Calculated Engine Oil Temperature Engine Idling 105°C (221°F) This parameter displays the estimated engine oil temperature (as a function of engine coolant temperature and other parameters).
Calibration History Buffer Ignition ON Unlocked This parameter displays locked when the buffer has been locked against further updates due to detection of a non-production calibration.
Calibration Verification Number History 1–10 Ignition ON # This parameter displays the history entries for the primary calibration part in the controller.
Camshaft Position Active Counter Ignition ON Counts This parameter displays a rolling count of the number of primary cam position sensor pulses.
Camshaft Position Sensor Engine Idling 0 RPM This parameter displays the speed of the engine as calculated by the signal from a camshaft position (CMP) sensor. This parameter will always display 0 unless a condition with the CKP sensor or CKP reluctor exists. If a CKP condition exists the control module will use a valid CMP sensor signal to determine engine speed and crank/camshaft position.
Camshaft Position Signal Output Circuit High Voltage Test Status Engine Idling OK This parameter displays the state of the Camshaft Position Signal Output Circuit. The parameter displays Malfunction if the Camshaft Position Signal Output Circuit is shorted to voltage.
Camshaft Position Signal Output Circuit Low Voltage Test Status Engine Idling OK This parameter displays the state of the Camshaft Position Signal Output Circuit. The parameter displays Malfunction if the Camshaft Position Signal Output Circuit is shorted to ground.
Camshaft Position Signal Output Circuit Open Test Status Engine Idling OK This parameter displays the state of the Camshaft Position Signal Output Circuit. The parameter displays Malfunction if the Camshaft Position Signal Output Circuit is open.
Catalyst Monitor Complete Engine Idling Yes/No This parameter indicates the status of the Catalyst. The scan tool displays YES when the diagnostic is complete. And NO if the diagnostic has not run, or a malfunction is detected in the catalyst.
Catalyst Monitor Complete This Ignition Cycle Engine Idling Yes/No This parameter indicates the status of the catalyst monitor diagnostic. Catalyst Monitor Test Running indicates yes or no when the catalyst monitor diagnostic is actively running a test.
Catalyst Monitor Enabled Engine Idling Yes/No The scan tool displays YES when the Catalyst Monitor is Enabled. If the scan tool displays NO this could indicate a malfunction in the Catalyst Monitor circuit.
Catalyst Monitor Enabled this Ignition Cycle Engine Idling Yes/No This parameter displays the monitor enable status during the current driving/monitoring cycle.
Catalyst Monitor Not At Idle Test Conditions Met Engine Idling Yes/No This parameter indicates the status of the catalyst monitor diagnostic. Catalyst Monitor Test Running indicates yes or no when the catalyst monitor diagnostic is actively running a test.
Catalyst Monitor Test Counter or Catalyst Monitor Test Counter Bank 1 or 2 Engine Idling Counts This parameter contains the number of repeated results of the catalyst monitor diagnostic test that have been performed since a code clear (used to determine if a sufficient number of tests have run to report a passing condition).
Catalyst Monitor Test Result or Catalyst Monitor Test Result Bank 1 or 2 Engine Idling No Decision/Failed/Passed This parameter indicates the status of the catalyst monitor diagnostic. Multiple tests may run before the diagnostic reports a “Pass” or “Fail” and will be tracked by Catalyst Monitor Diagnostic Test Counter. When this Parameter reports a “Pass” or “Fail”, the diagnostic is complete for the current trip and will not attempt any further tests.
Catalyst Monitor Test State Engine Idling Active/Inactive This parameter indicates the status of the catalyst monitor diagnostic by displaying active or inactive. This test will only run with the engine at idle.
Change Engine Oil Indicator Command Ignition ON Off This parameter sends a signal through the serial communication to inform the driver to change the engine oil. It is based on a calibrated amount of time.
Charge Air Cooler Coolant Pump Relay Command Ignition ON Off This parameter displays the commanded state of the intercooler pump relay command.
Charge Air Cooler Coolant Pump Relay Control Circuit High Voltage Test Status Ignition ON OK This parameter displays the state of the charge air cooler coolant pump control circuit. The parameter displays Malfunction if the charge air cooler coolant pump control circuit is shorted to voltage.
Charge Air Cooler Coolant Pump Relay Control Circuit Low Voltage Test Status Ignition ON OK This parameter displays the state of the charge air cooler coolant pump control circuit. The parameter displays Malfunction

if the charge air cooler coolant pump control circuit is shorted to ground.
Charge Air Cooler Coolant Pump Relay Control Circuit Open Test Status Ignition ON OK This parameter displays the state of the charge air cooler coolant pump control circuit. The parameter displays Malfunction if the charge air cooler coolant pump control circuit is open.
Clutch Pedal Starter Inhibit Switch (If Equipped) Engine Idling On This parameter displays ON when the clutch pedal is released.
Clutch Pedal Switch (If Equipped) Engine Idling Released This parameter displays the state of the clutch pedal as determined by the control module from the clutch pedal switch.
Cold Startup Ignition ON No This parameter displays whether the engine meets the conditions for a cold startup during the present ignition cycle. The scan tool displays Yes when the conditions for a cold startup are met during the ignition cycle. The scan tool displays No when the conditions for a cold startup are not met during the present ignition cycle. Conditions for a cold startup require the coolant temperature and the intake air temperature to be below a predetermined temperature and within a certain range of each other. These conditions must occur after the engine was warmed up to a specific temperature during the previous ignition cycle.
Component Monitor Complete Ignition ON Yes/No This parameter displays Yes when the Component Monitor is Complete. The engine control module looks at many input and output components to make this determination. If a malfunction is detected the scan tool will display No.
Component Monitor Enabled Ignition ON Yes/No This parameter displays Yes when Component Monitor is Enabled. And No when it is not Enabled.
Component Monitor - This Ignition Cycle Ignition ON Disabled, Enabled, Complete This parameter displays the status of the Component Monitor during this ignition cycle. Can display Disabled, Enabled, or Complete.
Cooling Fan Command — 0–100 % This parameter displays the amount of fan power commanded as a percentage of the total fan power available.
Cooling Fan Motor Command — 0–100 % This parameter displays the commanded duty cycle for the cooling fan.
Cooling Fan Control Circuit High Voltage Test Status Ignition ON OK, Malfunction, Not Run This parameter displays the status of the Cooling Fan Control Circuit High Voltage Test. Can display OK, Malfunction, or Not Run.
Cooling Fan Control Circuit Low Voltage Test Status Ignition ON OK, Malfunction, Not Run This parameter displays the status of the Cooling Fan Control Circuit Low Voltage Test. Can display OK, Malfunction, or Not Run.
Cooling Fan Control Circuit Open Test Status Ignition ON OK, Malfunction, Not Run This parameter displays the status of the Cooling Fan Control Circuit Open Circuit Test. Can display OK, Malfunction, or Not Run.
Cooling Fan Relay 1 Command Ignition ON On This parameter displays the commanded state of the fan relay 1 control circuit. The cooling fan relay 1 should be ON when the scan tool indicates the FC Relay 1 Command is ON. The cooling fan relay 1 should be OFF when the scan tool indicates the FC Relay 1` Command is OFF.
Cooling Fan Relays 2 and 3 Command Ignition ON On This parameter displays the commanded state of the fan relay 2 output.
Cooling Fan Relay 1 Control Circuit Open Test Status Ignition ON OK This parameter displays the state of the cooling fan relay control circuit. The parameter displays Malfunction if the cooling fan relay control circuit is open.
Cooling Fan Relay 1, or 2 and 3 Control Circuit High Voltage Test Status Ignition ON OK This parameter displays the state of the cooling fan relay control circuit. The parameter displays Malfunction if the cooling fan relay control circuit is shorted to voltage.
Cooling Fan Relay 1, or 2 and 3 Control Circuit Low Voltage Test Status Ignition ON OK This parameter displays the state of the cooling fan relay control circuit. The parameter displays Malfunction if the cooling fan relay control circuit is shorted to ground.
Cooling Fan Solenoid Valve Command Ignition ON 0–100 % This parameter displays the commanded duty cycle for the PWM fan system.
Cooling Fan Speed Ignition ON Varies This parameter displays the current state of the cooling fan speed. (For example OFF, Low, Medium, or High) rather than rotational speed.
CPP Learn Status Ignition ON Learned This parameter displays the status of the procedure used to learn the clutch pedal fully applied position.
CPP Learned Apply Position Ignition ON Volts This parameter displays the position learned for the clutch pedal position sensor when the clutch pedal is fully applied during the associated learn procedure.
CPP Learned Release Position Ignition ON Volts This parameter displays the position learned for the clutch pedal position sensor when the clutch pedal is released.
CPP Sensor Ignition ON Volts This parameter displays the clutch pedal position sensor analog input as a voltage.
CPP Sensor Ignition ON 0–100 % This parameter displays the displacement of the clutch pedal (corrected and normalized based upon its learned released and fully applied positions), where 0% corresponds to the clutch

pedal being released and 100% corresponds to the clutch pedal being fully applied.
Crank Request Signal Ignition switch not in the crank position No This parameter displays whether the ignition switch has been cycled to the crank position requesting the control module to activate the starter relay .
Ignition switch in the crank position Yes
Crankshaft Position Active Counter Engine Idling 0–255 Counts This parameter displays an incrementing counter when the control module receives a signal from the crankshaft position sensor (CKP).
Crankshaft Position Learned Apply Position Ignition ON Volts This parameter displays the position learned for the clutch pedal position (CPP) sensor when the clutch pedal is fully applied during the associated learn procedure.
Crankshaft Position Learned Release Position Ignition ON Volts This parameter displays the position learned for the clutch pedal position sensor when the clutch pedal is released.
Crankshaft Position Resync Counter Engine Idling 0 Counts This parameter displays the number of times the control module has to resynchronize with the CKP sensor. The parameter will begin to increment if the control module does not detect a CKP reference pulse. The parameter will reset to 0 after the ignition is switched OFF.
Crankshaft Position Sensor Engine Idling RPM This parameter displays engine speed.
Crankshaft Position Signal Output Circuit High Voltage Test Status Ignition ON OK This parameter displays the state of the crankshaft position signal output circuit. The parameter displays Malfunction if the crankshaft position signal output circuit is shorted to voltage.
Crankshaft Position Signal Output Circuit Low Voltage Test Status Ignition ON OK This parameter displays the state of the crankshaft position signal output circuit. The parameter displays Malfunction if the crankshaft position signal output circuit is shorted to ground.
Crankshaft Position Signal Output Circuit Open Test Status Ignition ON OK This parameter displays the state of the crankshaft position signal output circuit. The parameter displays Malfunction if the crankshaft position signal output circuit is open.
Crankshaft Position Variation Learn Ignition ON Not Learned This parameter displays if the crank angle learned this key cycle.
Crankshaft Position Variation Learn Attempts Ignition ON Counts This parameter displays the number of attempts to learn the crank angle sensing error (CASE) during current key cycle.
Crankshaft Position Variation Learn Crank Pulse to Cylinder Count Ignition ON Counts This parameter displays the number of attempts to learn the crank angle sensing error (CASE) during the current key cycle.
Crankshaft Position Variation Learn Crank Pulse to Cylinder Count Ignition ON Agree This parameters displays the number of crank pulses observed over an engine cycle did not equal the number of cylinders for the engine at some point during the CASE learn cycle.
Crankshaft Position Variation Learn Cylinder Compensation Factors Engine Running In Range / Out Of Range This parameter indicates if one or more compensation factors calculated for individual cylinders is out of range.
Crankshaft Position Variation Learn Data Collected Ignition ON Sufficient / Insufficient This parameter indicates if the CASE learn algorighm has collected sufficient data.
Crankshaft Position Variation Learn Opposing Cylinder Compensation Factors Ignition ON In Range / Out Of Range This parameter indicates if the difference in the compensation factors calculated for one or more pairs of opposing cylinders is out of range.
Crankshaft Position Variation Learn Reluctor Ring Tooth Spacing Factors Ignition ON In Range / Out Of Range This parameter indicates if one or more of the compensation factors calculated for the individual tooth spacing is out of range.
Crankshaft Position Variation Learn Required Engine Speed Ignition ON In Range This parameter displays that the engine speed required to complete the CASE learn process has not been achieved.
Crankshaft Position Variation Learn Status Ignition ON Complete This parameter displays the status of the crank angle sensing error (CASE) learn algorithm.
Crankshaft Position Variation Learn Sum of Cylinder Compensation Factors Ignition ON In Range / Out Of Range This parameter indicates if the sum of the compensation factors calculated for the individual cylinders is too large.
Cruise Control Cruise ON Active This parameter displays the status of the cruise control system as determined by the control module.
Cruise Control Acceleration Switch Ignition ON Active, Inactive, Invalid This parameter Indicates the state of the cruise control speed ACCEL switch. This signal is based upon the state of the cruise control speed ACCEL switch received over serial communication from the platform electronics.
Cruise Control Cancel Switch Cruise ON Inactive This parameter displays the status of the cruise control cancel switch.
Cruise Control Switch 2 Cruise ON N/A This parameter indicates the state of the secondary Cruise Control Switch.

Cruise Control Disengage 1-8 History Cruise ON Reason for Cruise Disengagement The parameter displays the last 8 cruise control disengages in order from 1 to 8, with 8 being the most recent. There are approximately 30 possible causes for the cruise control to disengage.
Cruise Control Inhibit Reason Cruise OFF Off The parameter displays the reason the cruise control system cannot engage.
Cruise ON Park/Neutral
Cruise Control ON/OFF Switch Cruise ON On The engine control module (ECM) monitors the signal circuit of the cruise control switch. A closed switch is displayed as ON.
Cruise Control Resume/Accelerator Switch Cruise ON On The scan tool displays ON, when the cruise ON/OFF switch is ON and the resume/accel (+) button is pressed, the ECM detects a predetermined voltage value for the resume/accel. switch.
Cruise Control Set/Coast Switch Cruise ON On The scan tool displays ON, when the cruise ON/OFF switch is ON and the ECM detects a predetermined voltage value for the set/coast (–) switch.
Cruise Control Switch Cruise ON Inactive The engine control module (ECM) monitors the signal circuit of the cruise control switch. A closed switch is displayed as Active.
Current Fuel Type Ignition ON Varies This parameter displays the current fuel type such as Not available, Gasoline/petrol, Methanol, Ethanol, Diesel, Liquefied Petroleum Gas, Compressed Natural Gas, Propane, Battery/electric, Bi-fuel, or Hybrid.
Current Gear Transmission in Park/Neutral P/N This parameter displays the transmission gear commanded by the transmission control module .
Transmission not in Park/Neutral Reverse/1st-5th
Current Gear When Engine Overspeed Detected Engine Idling Varies This parameter displays the transmission actual gear observed upon initial detection of an overspeed condition.
Cycles of Misfire Data Engine Running 0–3,000 counts This parameter displays the number of cylinder firing events recorded by the control module.
Cylinder Deactivation Disable History 1-8 Engine Running — This parameter displays one of the last eight reasons for the reactivation of all engine cylinders.
Cylinder Deactivation Inhibit Engine Running Yes / No A/C Compressor Clutch On, Acceleration Request, APP High, APP Rate High, Axle Torque Limiting, Brake Booster Pressure Sensor DTC, Brake Booster Weak Vacuum, Calculated Torque, Camshaft Position Actuator DTC, Camshaft Position Sensor DTC, Catalyst Overtemperature Protection, Catalyst Temperature Low, Crankshaft Position Sensor DTC, Cylinder Deactivation Solenoid Valve DTC, Cylinder Deactivation System DTC, Deceleration Fuel Cut-Off, ECT , ECT Sensor DTC, Engine Controls Ignition Relay DTC, Engine Oil Pressure, Engine Oil Pressure Control Solenoid Valve Stuck Off, Engine Oil Pressure Control Test Active, Engine Oil Pressure Sensor DTC, Engine Oil Temperature, Engine Overtemperature Protection, Engine Speed, Engine Stall Prevention, Exiting Deceleration Fuel Cut-Off, Fuel Trim Cylinder Balance DTC, Heater Performance, HO2S 2 Test, Hot Coolant Mode, IAT Sensor DTC, Ignition Voltage, Injector Stable Time, Insufficient Torque Capacity, Intake Manifold Weak Vacuum, MAP Sensor DTC, Maximum Deactivation Time Exceeded, Maximum Throttle Exceeded, Minimum Time After TAC DTC, Minimum Time On All Cylinders, Misfire DTC, Oil Aeration, Panic Brake Assist Active, Piston Protection, RPM Limit, Scan Tool Override, TAC System DTC, Torque Reduction, Transmission Gear, Transmission Range, Transmission Shifting, Vehicle Speed Too Low, VSS DTC
Cylinder Deactivation Performance Test Engine Running OK / Malfunction This parameter indicates if one or more cylinders failed to deactivate when commanded.
Cylinder Deactivation System Command Engine Running All Cylinder / Cylinder Deactivation This parameter indicates the status of the Cylinder Deactivation System Command.
Cylinder 1,2,3,4,5,6,7,8 Current Misfire Counter Engine Idling Counts The scan tool displays a range of 0–255 counts. This parameter displays the number of misfires that have been detected during the last 255 cylinder firing events. The counters may normally display some activity, but the activity should be nearly equal for all of the cylinders, and in low numbers.
Cylinder 1–4 Exhaust Camshaft Profile Sleeve Position Engine Running Fixed Lift / Low Lift / High Lift / Cylinder Deactivation / Undetermined The scan tool displays the position of the Exhaust Camshaft Profile Sleeve as commanded by the control module.
Cylinder 1,2,3,4,5,6,7, or 8 History Misfire Counter Engine Running Counts The scan tool displays a range of 0–65,535 counts. The misfire history counters display the total level of misfire that has been detected on each cylinder. The misfire history counters will not update or show any activity until a misfire DTC P0300 has become active. The misfire history counters will update every 255 cylinder firing events.
Cylinder 1, 2, 3, 4, 5, 6, 7 or 8 Injector Control Circuit High Voltage Test Status Ignition ON OK This parameter displays the state of the injector control circuit. The parameter displays Malfunction if the injector control circuit is shorted to voltage.
Cylinder 1, 2, 3, 4, 5, 6, 7 or 8 Injector Control Circuit Low Voltage Test Status Ignition ON OK This

parameter displays the state of the injector control circuit. The parameter displays Malfunction if the injector control circuit is shorted to ground.
Cylinder 1, 2, 3, 4, 5, 6, 7 or 8 Injector Control Circuit Open Test Status Ignition ON OK This parameter displays the state of the injector control circuit. The parameter displays Malfunction if the injector control circuit is open.
Cylinder 1, 2, 3, 4, 5, 6, 7 or 8 Injector Flow Identifier Ignition ON OK This parameter displays the End of Line Injector Adjustment (EIA) for the fuel injector. This value shall be used by the ECM for adjustment to actual fuel injected quantity compared to nominal for the injector.
Cylinder 1-6 Injector Control Circuit Status Engine Idling OK This parameter displays the state of the fuel injector control circuit.
Cylinder 1-6 Injector Disabled Misfire Detected Engine Idling No This parameter displays the injector that has been disabled by the misfire catalyst converter protection calibration.
Cylinder 1–4 Intake Camshaft Profile Sleeve Position Engine Running Fixed Lift / Low Lift / High Lift / Cylinder Deactivation / Undetermined The scan tool displays the position of the IntakeCamshaft Profile Sleeve as commanded by the control module.
Cylinder 1–6 Knock Detected Engine Idling No This parameter displays yes if a knock has been detected in an individual cylinder.
DC/DC Converter Ignition 1 Signal Engine Running On / Off This parameter indicates if the DC/DC Converter Ignition 1 Signal is On or Off.
DC/DC Converter Output Voltage 1 Variance - Engine Cranking Engine Cranking Volts This parameter indicates the DC/DC Converter Output Voltage 1 Variance with the engine cranking.
DC/DC Converter Output Voltage 1 Variance - Engine Running / Off Engine Running/Off Volts This parameter indicates the DC/DC Converter Output Voltage 1 Variance with the engine running or Off.
DC/DC Converter Output Voltage 2 Variance - Engine Cranking Engine Cranking Volts This parameter indicates the DC/DC Converter Output Voltage 2 Variance with the engine cranking.
DC/DC Converter Output Voltage 2 Variance - Engine Running / Off Engine Running/Off Volts This parameter indicates the DC/DC Converter Output Voltage 2 Variance with the engine running or Off.
DC/DC Converter Output Voltage Sensor Circuit 1 Engine Running Volts This parameter measures voltage at the DC/DC Converter Output Voltage Sensor Circuit 1.
DC/DC Converter Output Voltage Sensor Circuit 2 Engine Running Volts This parameter measures voltage at the DC/DC Converter Output Voltage Sensor Circuit 2.
Deceleration Fuel Cut-Off Engine Running Inactive This parameter displays the status of the operating mode of the control module used to turn OFF the fuel injectors and the EVAP canister purge valve during certain deceleration conditions.
Desired Active Grille Air Shutter Position Ignition ON 0–100 % This parameter displays the commanded position for the active grille air shutter. 0%=fully closed, 100%=fully open.
Desired Boost Pressure Engine Running kPa This parameter displays the desired turbocharger boost pressure.
Desired Cooling Fan Speed Ignition ON RPM This parameter displays the desired fan speed.
Desired ECT Ignition ON °C (°F) This parameter displays the desired engine coolant temperature in degrees.
Desired Exhaust Camshaft Position or Desired Exhaust Camshaft Position Bank 1 or 2 Engine Idling 0 Degrees This parameter displays the desired exhaust camshaft angle as commanded by the control module.
Engine speed at 2000 RPM 10 Degrees
Desired Fuel Pressure Ignition ON kPa (PSI) This parameter displays the desired fuel supply pressure.
Desired Fuel Rail Pressure Engine Idling Varies 3.4 mPa to 5.5 mPa (500 to 800 psi) This parameter displays the desired Fuel Rail Pressure commanded by the control module.
Desired Idle Speed Engine Idling Approximately 650 RPM This parameter displays the desired engine idle speed as commanded by the control module. The desired idle speed varies depending on engine load.
Desired Intake Camshaft Position or Desired Intake Camshaft Position Bank 1 or 2 Engine Idling 0 Degrees This parameter displays the desired intake camshaft angle as commanded by the control module.
Desired Throttle Position Engine Idling 0–100 % Commanded Throttle Actuator Control .
Distance Since DTC Cleared Engine Idling 0 Km/mi This parameter displays in kilometers or miles the distance traveled since a DTC was cleared.
Distance Since First Malfunction Engine Idling 0 Km/mi This parameter displays in kilometers or miles the distance traveled since a Malfunction occurred.
Distance Since Last Malfunction Engine Idling 0 Km/mi This parameter displays the distance accumulated since last malfunction was captured. This parameter is only meaningful within the context of a failure record or freeze frame.
Distance Since Last Oil Level Warning Engine Idling 0 Km/mi This parameter displays in kilometers or miles the distance traveled since the last oil level warning Malfunction occurred.
Distance Since Last Oil Pressure Warning Engine Idling 0 Km/mi This parameter displays in kilometers or miles

the distance traveled since the last oil pressure warning Malfunction occurred.
Distance Since Recommended Maximum Fuel Alcohol Content Exceeded Engine Idling 0 Km/mi This parameter displays in kilometers or miles the distance Since Recommended Maximum Fuel Alcohol Content Exceeded.
Distance This Driving Cycle Ignition ON km / miles This parameter displays the distance a vehicle has traveled in the current driving cycle.
Distance with MIL On Ignition ON km / miles This parameter displays the accumulated distance driven with the malfunction indicator lamp (MIL) on.
Drag Control Status Vehicle Moving Active/Inactive EDC Active (Drag Active) control mode is indicated when the requested torque signal is above the driver requested value while the traction control system signal input is active.
Driver Requested Axle Torque Engine Idling Nm This parameter displays a (desired) output value after comparing engine load as an input to the hybrid control processor and engine control module.
Drop-Throttle Detected while Traction Control Active Engine Idling No This parameter displays if the Drop Throttle Control Mode is active while the Traction Control System Data Control Signal input is active.
Drop-Throttle Status Engine Idling Inactive This parameter displays the Drop Throttle Control Mode is active when the Requested Torque Signal indicates greater than 90 percent duty cycle while the Traction Control System Data Control Signal input is active.
ECM Authentication Status Ignition ON Valid ECM Authentication Status indicates the result of the comparison between the last received immobilizer response and the expected response calculated into the ECM.
ECM Challenge Status Ignition ON Valid This parameter displays the immobilizer system status of the ECM challenge. This indicates whether the currently calculated ECM challenge is valid.
ECM in Immobilizer Fail Enable Mode Ignition ON Yes / No This parameter displays that a serial communication failure has been detected after the receipt of the correct VTD password.
ECM Odometer Ignition ON km (miles) This parameter displays the odometer reading of the vehicle.
ECM Response Source Ignition ON Ignition Switch Start ECM Response Source indicates the source used to calculate the ECM response.
Economy Mode Indicator Command Ignition ON Off This parameter indicates the status of the serial data signal used to illuminate the economy mode indicator lamp.
ECT Sensor Ignition ON 88 to 105°C (190 to 221°F) This parameter displays the temperature of the engine coolant based on input to the control module from the engine coolant temperature (ECT) sensor.
ECT vs. IAT Sensor Temperature at Last ECT vs. RCT Malfunction Detection Ignition ON Agree This parameter displays that the temperature values of the ECT and IAT sensors did not agree at the time of the most recent failure of the ECT/RCT rationality diagnostic.
EGR/Camshaft Position Monitor Complete Ignition ON Yes/No This parameter displays the status of the EGR/Camshaft Position Monitor. The parameter will display Yes when the EGR/Camshaft Position Monitor is complete.
EGR/Camshaft Position Monitor Complete This Ignition Cycle Engine Idling Yes/No This parameter displays Yes or No of the completion status during the current driving/monitoring cycle of emission related monitors.
EGR/Camshaft Position Monitor Enabled Ignition ON Yes/No This parameter displays the status of the EGR/Camshaft Position Monitor. The parameter will display Yes when the EGR/Camshaft Position Monitor is Enabled.
EGR/Camshaft Position Monitor Enabled This Ignition Cycle Engine Idling Yes/No This parameter displays Yes or No of the completion status during the current driving/monitoring cycle of emission related monitors.
Electric Power Management Inhibit Reason Engine Idling None This parameter displays the reason for the source of the Regulated Voltage Control (RVC) override command. RVC lowers system operating voltage to reduce system electrical load and improve fuel economy performance. The following is a list of possible reasons: None Control Function Active/ Fuel System On-board Diagnostic System Air Flow Measurement System Cylinder Deactivation System System Transmission Control Module

- None
- Control Function
- Active/ Fuel System
- On-board Diagnostic System
- Air Flow Measurement System
- Cylinder Deactivation System
- System Transmission Control Module

End Model Part Number — # This parameter identifies the part number that represents the combination of hardware, software, and calibrations present in the ECU .
Engine Autostopped — No This parameter displays the status of the internal combustion engine (ICE) in vehicles incorporating ICE autostart/stop functionality.
Engine Calibration Part Number History 1-10 Ignition ON # This parameter displays the engine calibration part

number history.
Engine Calibration Part Number History 1-10 Counter Ignition ON # This parameter displays the number of times the engine controller had been calibrated.
Engine Controls Ignition Relay Command Ignition ON Off This parameter displays the state of the control circuit for control module power relay as commanded by the control module.
Engine Controls Ignition Relay Control Circuit High Voltage Test Status Ignition ON OK This parameter displays the state of the Engine Controls Ignition Relay control circuit. The parameter displays Malfunction if the Engine Controls Ignition Relay control circuit is shorted to voltage.
Engine Controls Ignition Relay Controls Circuit Low Voltage Test Status Ignition ON OK This parameter displays the state of the Engine Controls Ignition Relay control circuit. The parameter displays Malfunction if the Engine Controls Ignition Relay control circuit is shorted to ground.
Engine Controls Ignition Relay Controls Circuit Open Test Status Ignition ON OK This parameter displays the state of the Engine Controls Ignition Relay control circuit. The parameter displays Malfunction if the Engine Controls Ignition Relay control circuit is open.
Engine Controls Ignition Relay Feedback 2 Signal Ignition ON Volts This parameter indicates the signal voltage from the second input to the controller from the powertrain relay.
Engine Controls Ignition Relay Feedback 3 Signal Ignition ON Volts This parameter indicates the signal voltage from the third input to the controller from the powertrain relay.
Engine Controls Ignition Relay Feedback Signal Ignition ON 12.0–14.9 Volts This parameter displays the voltage available at the engine controls ignition relay terminal of the engine control module.
Engine Coolant Pump Clutch Relay Command Ignition ON Flow / No Flow This parameter displays the commanded state of the engine coolant pump clutch.
Engine Coolant Thermostat Heater Command Ignition ON 0–100 % This parameter displays the commanded duty cycle for the engine coolant thermostat.
Engine Coolant Thermostat Heater Control Circuit High Voltage Test Status Ignition ON OK This parameter displays the state of the engine coolant thermostat heater control circuit. The parameter displays Malfunction if the engine coolant thermostat heater control circuit is shorted to voltage.
Engine Coolant Thermostat Heater Control Circuit Low Voltage Test Status Ignition ON OK This parameter displays the state of the engine coolant thermostat heater control circuit. The parameter displays Malfunction if the engine coolant thermostat heater control circuit is shorted to ground.
Engine Coolant Thermostat Heater Control Circuit Open Test Status Ignition ON OK This parameter displays the state of the engine coolant thermostat heater control circuit. The parameter displays Malfunction if the engine coolant thermostat heater control circuit is open.
Engine Crank Command Ignition ON Yes / No This parameter indicates if the engine is being commanded to crank or not.
Engine Crank Time Ignition ON 0:00:00 Seconds – Varies This parameter indicates the time between the start of engine cranking to when the engine reaches an operating RPM.
Engine Load Engine Idling 25–45 % This parameter displays the calculated engine load in percent based on inputs to the control module from various engine sensors.
Engine speed at 2,500 RPM 40–60 %
Engine Load During Misfire History 1-10 Ignition ON 0–100 % This parameter displays the engine load during the last misfire event.
Engine Off — No This parameter displays the status of the internal combustion engine (ICE) in vehicles incorporating ICE autostop/autostart functionality.
Engine OFF Time Engine Idling 0:00:00 Seconds – Varies This parameter displays the amount of time that has elapsed since the engine was last cycled OFF.
Engine Oil Absolute Pressure Sensor Engine Idling kPa/PSI This parameter displays the undefaulted, unfiltered measured engine oil pressure read by an oil absolute pressure sensor.
Engine Oil Level Switch Engine Idling OK This parameter displays the status of the engine oil level switch as determined by the control module. The control module uses this information to turn on the low engine oil lamp if the engine oil level remains approximately 1 quart low for a sufficient amount of time. The scan tool will display Low when the engine oil level is low. The scan tool will display OK when the engine oil level is correct.
Engine Oil Life Remaining Engine Idling 0–100 % This parameter displays the percent of engine oil life remaining. The controller calculates the engine oil life by monitoring engine load, coolant temperature, and engine speed.
Engine Oil Pressure Engine Idling kPa/PSI This parameter displays the actual engine oil pressure measured by a sensor.
Engine Oil Pressure Control Disable History 1 or 2 Ignition ON — This parameter indicates one of the last two reasons that powertrain has disengaged oil control.

Engine Oil Pressure Control Solenoid Valve Command Ignition ON High Pressure/Low Pressure This parameter displays the commanded state of the variable displacement oil pump output.
Engine Oil Pressure Control Solenoid Valve Control Circuit High Voltage Test Status Ignition ON OK This parameter displays the state of the engine oil pressure control solenoid valve control circuit. The parameter displays Malfunction if the engine oil pressure control solenoid valve control circuit is shorted to voltage.
Engine Oil Pressure Control Solenoid Valve Control Circuit Low Voltage Test Status Ignition ON OK This parameter displays the state of the engine oil pressure control solenoid valve control circuit. The parameter displays Malfunction if the c engine oil pressure control solenoid valve control circuit is shorted to ground.
Engine Oil Pressure Control Solenoid Valve Control Circuit Open Test Status Ignition ON OK This parameter displays the state of the engine oil pressure control solenoid valve control circuit. The parameter displays Malfunction if the engine oil pressure control solenoid valve control circuit is open.
Engine Oil Pressure Control Test Counter Ignition ON Counts This parameter displays the number of times that the Engine Oil Pressure Control test has been activated during the current key cycle.
Engine Oil Pressure Control Test Inhibit History 1 or 2 Ignition ON — This parameter indicates one of the last two reasons that powertrain has inhibited oil pressure intrusive diagnostic test.
Engine Oil Pressure Sensor Engine Idling OK This parameter displays the engine oil pressure as determined by engine oil pressure sensor.
Engine Oil Pressure Switch Engine Idling OK / Low This parameter displays the status of the engine oil pressure sensor.
Engine Oil Temperature Sensor Ignition ON C° (°F) This parameter displays engine oil temperature as measured by a sensor connected to the ECM.
Engine Oil Temperature When Engine Overspeed Detected Engine Idling Temperature This parameter displays the temperature of the engine oil as determined by the control module.
Engine Oil Type Ignition ON Conventional / Synthetic This parameter indicates whether the engine oil type is conventional or synthetic oil.
Engine Overspeed Engine Idling Not Present This parameter displays if an Engine Overspeed is Present or Not Present.
Engine Overspeed Counter Ignition ON Counts This parameter displays the accumulated number of engine overspeed detection events.
Engine Run Time Engine Idling 0:00:00 Increments when the engine is operating This parameter displays the time elapsed since the engine was started.
Engine Running — No This parameter displays the status of the internal combustion engine (ICE) in vehicles incorporating ICE autostop/autostart functionality.
Engine Serial Number Ignition ON # This parameter displays the engine serial number.
Engine Shutdown Counter – Excessive Idle Time Ignition ON Counts This parameter displays the count of engine shutdowns due to excessive idle time.
Engine Shutdown Counter – High Coolant Temperature Ignition ON Counts This parameter displays the count of engine shutdowns due to high coolant temperature.
Engine Shutdown Counter – Low Coolant Level Ignition ON Counts This parameter displays the count of engine shutdowns due to low coolant level.
Engine Shutdown Counter – Low Oil Level Ignition ON Counts This parameter displays the count of engine shutdowns due to low oil level.
Engine Speed Engine Cranking Greater than 60 RPM This parameter displays the speed of the engine crankshaft rotation from information received from the crankshaft position (CKP) sensor. If there is a CKP sensor DTC, the ECM calculates the engine speed from one of the camshaft position (CMP) sensors.
Engine Idling 550–700 RPM
Engine Speed During Misfire History 1–5 Ignition ON RPM This parameter displays the last 5 engine speeds during misfire events.
Engine Speed When Engine Overspeed Detected Engine Idling RPM This parameter displays the engine speed observed upon initial detection of an overspeed condition. This value will be updated after each overspeed condition.
Engine Stalled Ignition ON No This parameter displays that the internal combustion engine has stopped running unintentionally.
Engine Starting Ignition ON No This parameter displays that the internal combustion engine is being started (in transition from engine OFF to engine running).
Engine Stopping Ignition ON No Engine Stopping indicates that the internal combustion engine is stopping (in transition from engine running to engine off, OR in transition from engine running to engine failed).
Engine Torque Engine Running 0–100 % This parameter indicates the current indicated torque as a percent of engine reference torque.
Engine Torque Command Engine Idling Nm This parameter displays the commanded predicted engine torque value,

which is the torque request for the slow response air path (control of the throttle).
EVAP Malfunction History Engine Running None This parameter displays the result of the evaporative emission (EVAP) system as determined by the control module. The scan tool will display the following: None Excess Vacuum Purge Valve Leak Small Leak Weak Vacuum No Test Result
- Excess Vacuum
- Purge Valve Leak
- Small Leak
- Weak Vacuum
- No Test Result

EVAP Monitor Complete Engine Running Yes/No This parameter displays if the most recent evaporative emissions diagnostic test is complete.
EVAP Monitor Complete This Ignition Cycle Engine Running Yes/No This parameter displays the diagnostic monitor completion status during the current driving/monitoring cycle.
EVAP Monitor Enabled Engine Running Yes/No This parameter displays if the evaporative emissions diagnostic test is enabled.
EVAP Monitor Enabled This Ignition Cycle Engine Running Yes/No This parameter displays the diagnostic monitor enable status during the current driving/monitoring cycle.
EVAP Purge Solenoid Valve Command Engine Idling 0–100 % This parameter displays the commanded duty cycle for the canister purge output.
EVAP Purge Solenoid Valve Control Circuit High Voltage Test Status Ignition ON OK This parameter displays the state of the evaporative emission (EVAP) purge solenoid control circuit. The parameter displays Malfunction if the EVAP purge solenoid control circuit is shorted to voltage.
EVAP Purge Solenoid Valve Control Circuit Low Voltage Test Status Ignition ON OK This parameter displays the state of the evaporative emission (EVAP) purge solenoid control circuit. The parameter displays Malfunction if the EVAP purge solenoid control circuit is shorted to ground.
EVAP Purge Solenoid Valve Control Circuit Open Test Status Ignition ON OK This parameter displays the state of the evaporative emission (EVAP) purge solenoid control circuit. The parameter displays Malfunction if the EVAP purge solenoid control circuit is open.
EVAP System Fuel Tank Pressure Sensor to Fuel Tank Restriction Detected Ignition ON Yes / No This parameter indicates if the Fuel Tank Pressure Sensor detects a blockage in the fuel system.
EVAP Vent Solenoid Command Engine Idling Not Venting This parameter displays the state of the control circuit for evaporative emission (EVAP) vent solenoid as commanded by the control module.
EVAP Vent Solenoid Valve Control Circuit High Voltage Test Status Ignition ON OK This parameter displays the state of the EVAP vent solenoid control circuit. The parameter displays Malfunction if the EVAP vent solenoid control circuit is shorted to voltage. This parameter may not change if the scan tool is used to command the EVAP vent solenoid ON.
EVAP Vent Solenoid Valve Control Circuit Low Voltage Test Status Ignition ON OK This parameter displays the state of the EVAP vent solenoid control circuit. The parameter displays Malfunction if the EVAP vent solenoid control circuit is shorted to ground. This parameter may not change if the scan tool is used to command the EVAP vent solenoid ON.
EVAP Vent Solenoid Valve Control Circuit Open Test Status Ignition ON OK This parameter displays the state of the EVAP vent solenoid control circuit. The parameter displays Malfunction if the EVAP vent solenoid control circuit is open. This parameter may not change if the scan tool is used to command the EVAP vent solenoid ON.
Exhaust Camshaft Position Engine Idling ° This parameter displays the position of the exhaust camshaft in terms of degrees of camshaft rotation (retard) from the park position (a value of zero represents the park position).
Exhaust Camshaft Position Active Counter or Exhaust Camshaft Position Active Counter Bank 1 or 2 Engine Idling 0–255 This parameter displays an incrementing counter when the control module receives a signal from the exhaust camshaft position (CMP) sensor.
Exhaust Camshaft Position Actuator Solenoid Valve Control Circuit High Voltage Test Status or Exhaust Camshaft Position Actuator Solenoid Valve Control Circuit High Voltage Test Status Bank 1 or 2 Engine Idling OK This parameter displays the state of the exhaust camshaft actuator solenoid control circuit. The parameter displays Malfunction if the camshaft actuator solenoid control circuit is shorted to voltage.
Exhaust Camshaft Position Actuator Solenoid Valve Control Circuit Low Voltage Test Status or Exhaust Camshaft Position Actuator Solenoid Valve Control Circuit Low Voltage Test Status Bank 1 or 2 Engine Idling OK This parameter displays the state of the exhaust camshaft actuator solenoid control circuit. The parameter displays Malfunction if the camshaft actuator solenoid control circuit is shorted to ground.
Exhaust Camshaft Position Actuator Solenoid Valve Control Circuit Open Test Status or Exhaust Camshaft Position Actuator Solenoid Valve Control Circuit Open Test Status Bank 1 or 2 Engine Idling OK This parameter displays the state of the exhaust camshaft actuator solenoid control circuit. The parameter displays

Malfunction if the camshaft actuator solenoid control circuit is open.
Exhaust Camshaft Position or Exhaust Camshaft Position Bank 1 or 2 Engine Idling 0 Degrees This parameter displays the actual exhaust camshaft position in degrees.
Exhaust Camshaft Position Command or Exhaust Camshaft Position Command Bank 1 or 2 Engine Idling 20 % This parameter displays the on-time or duty cycle of the exhaust camshaft position (CMP) actuator solenoid valve as commanded by the control module.
Engine speed at 2000 RPM 50 %
Exhaust Camshaft Position Variance or Exhaust Camshaft Position Variance Bank 1 or 2 Engine Idling 0 Degrees This parameter displays in degrees, the difference between the desired exhaust camshaft position and the actual exhaust camshaft position.
Engine speed at 2000 RPM 0 Degrees
Exhaust Camshaft Profile Actuator 1–4 Command Ignition ON On / Off This parameter displays the commanded state of the Exhaust Camshaft Profile Actuator output.
Exhaust Camshaft Profile Actuator 1–4 Control Circuit High Voltage Test Status Ignition ON OK, Malfunction, Not Run This parameter displays the state of the Exhaust Camshaft Profile Actuator control circuit per cylinder. The parameter displays Malfunction if the Exhaust Camshaft Profile Actuator control circuit is shorted to voltage.
Exhaust Camshaft Profile Actuator 1–4 Control Circuit Low Voltage Test Status Ignition ON OK, Malfunction, Not Run This parameter displays the state of the Exhaust Camshaft Profile Actuator control circuit per cylinder. The parameter displays Malfunction if the Exhaust Camshaft Profile Actuator control circuit is shorted to ground.
Exhaust Camshaft Profile Actuator 1–4 Control Circuit Open Test Status Ignition ON OK, Malfunction, Not Run This parameter displays the state of the Exhaust Camshaft Profile Actuator control circuit per cylinder. The parameter displays Malfunction if the Exhaust Camshaft Profile Actuator control circuit is open.
Exhaust Camshaft Profile Actuator Position Sensor 1–4 Ignition ON 0–100 % This parameter displays the commanded duty cycle for the Exhaust Camshaft Profile Actuator.
Exhaust Camshaft Profile Actuator Position Sensor 1–4 Ignition ON mm This parameter displays the commanded duty cycle for the Exhaust Camshaft Profile Actuator.
Exhaust Camshaft Profile Sleeve Position Sensor 1, 2 Engine Idling Counts This parameter displays the number of times that the Exhaust Camshaft Profile Sleeve test has been activated during the current key cycle.
Extended Travel Brake Pedal Position Signal Engine Idling Released This parameter displays the status of the Extended Travel Brake Pedal Position sensor.
Extended Travel Brake Pedal Switch Ignition ON Released This parameter displays the undebounced / undefaulted state of the extended travel brake switch input to the ECM
Filtered System Voltage Ignition ON Volts This parameter indicates the filtered voltage of the system.
Filtered System Voltage Prior to Engine Crank Ignition ON Volts This parameter displays the filtered system voltage just before an engine cranking event.
Freeze Frame DTC Ignition ON # This parameter displays the diagnostic trouble code (DTC) that caused the freeze frame to be stored.
Fuel Alcohol Content Engine Idling 0–100 % This parameter displays the percentage of alcohol in the fuel. The value is calculated by the ECM using the fuel composition sensor input.
Fuel Alcohol Content When Recommended Maximum Fuel Alcohol Content Exceeded Engine Idling 0–100 % This parameter displays a percentage of Fuel Alcohol Content When Recommended Maximum Fuel Alcohol Content Exceeded.
Fuel Composition Learn Engine Idling Inactive This parameter displays Active or Inactive. Active will be displayed if the ECM is learning the alcohol content of the fuel.
Fuel Composition Sensor Engine Idling Hz This parameter displays the frequency of the fuel composition sensor input. This value can be used to determine fuel composition or sensor malfunction.
Fuel Consumed Since Recommended Maximum Fuel Alcohol Content Exceeded Engine Idling Liters This parameter displays in Liters the Fuel Consumed Since Recommended Maximum Fuel Alcohol Content Exceeded.
Fuel Control Loop Status Engine Idling Closed Fuel Closed Loop Active indicates that oxygen sensor 1 of each bank is being used as feedback to adjust the amount of fuel delivered to the engine.
Fuel Economy Engine Idling Liters per Hour This parameter displays the instant fuel consumption rate of the engine in liters per hour.
Fuel Economy Mode Ignition ON Inactive This parameter indicates if the economy mode algorithm has activated economy mode.
Fuel Economy Mode Request Ignition ON Off This parameter indicates if the driver of the vehicle has requested economy mode by pressing the economy mode switch.
Fuel Economy Mode Switch Ignition ON OK This parameter displays the state of the fuel economy mode switch circuit. The parameter displays Malfunction if the fuel economy mode switch circuit is shorted to voltage.

Fuel Economy Mode Switch Ignition ON OK This parameter displays the state of the fuel economy mode switch circuit. The parameter displays Malfunction if the fuel economy mode switch circuit is shorted to ground.
Fuel Economy Mode Switch Ignition ON OK This parameter displays the state of the fuel economy mode switch circuit. The parameter displays Malfunction if the fuel economy mode switch circuit is open.
Fuel Economy Mode Switch Ignition ON Volts This parameter displays the economy mode switch reference voltage.
Fuel Enrichment-Hot Catalyst Engine Running Inactive Fuel Enrichment Catalyst Protection Active indicates fuel is being added to cool the catalytic converter .
Fuel Enrichment-Hot Coolant Engine Running Inactive Hot Coolant Enrichment Active indicates that the conditions to enable hot coolant enrichment are active and that a richer than stoichiometric air/fuel ratio is being commanded in order to help cool the engine when a system malfunction is causing the engine to run at extreme temperatures.
Fuel Injector Driver Supply Voltage Ignition ON Volts This parameter displays the injector driver circuit boost supply voltage.
Fuel Level Sensor Ignition ON Volts This parameter displays the unfiltered fuel level sensor analog input for the primary fuel tank as a percentage of its reference voltage.
Fuel Level Sensor Left Tank (If Equipped) Ignition ON 0–5 Volts This parameter displays the voltage signal received by the control module from the secondary fuel level sensor in the left side of the fuel tank.
Fuel Level Sensor Reference Command Engine Idling 0–100 % This parameter displays the percentage of time that the power supply for the fuel level sensor is on. This percentage is minimized when the fuel has high ethanol content and is maximized when the fuel has low ethanol content.
Fuel Level Sensor Right Tank (If Equipped) Ignition ON 0–5 Volts This parameter displays the voltage signal received by the control module from the primary fuel level sensor in the right side of the fuel tank.
Fuel Maintenance Mode Ignition ON Active / Inactive This parameter displays if the Fuel Maintenance Mode is currently active.
Fuel Maintenance Mode Counter Ignition ON Counts This parameter displays the cumulative number of fuel maintenance mode events over the life of the controller.
Fuel Mode Active Ignition ON Gaseous, Gasoline This parameter displays if the fuel mode algorithm has activated the alternative fuel mode.
Fuel Mode Driver Request Ignition ON Gaseous, Gasoline This parameter displays if the driver of the vehicle has selected one of the two specific fuel modes (alternative fuel, or petrol fuel)
Fuel Mode Indication On Ignition ON Gaseous, Gasoline This parameter displays the status of the signal used to illuminate the fuel mode indicator lamp.
Fuel Mode Indicator Lamp Command Ignition ON On / Off This parameter displays the commanded state of the fuel mode indicator lamp.
Fuel Mode Indicator Lamp Control Circuit High Voltage Test Status Ignition ON OK, Malfunction, Not Run This parameter displays the state of the Fuel Mode Indicator Lamp control circuit. The parameter displays Malfunction if the Fuel Mode Indicator Lamp control circuit is shorted to voltage.
Fuel Mode Indicator Lamp Control Circuit Low Voltage Test Status Ignition ON OK, Malfunction, Not Run This parameter displays the state of the Fuel Mode Indicator Lamp control circuit. The parameter displays Malfunction if the Fuel Mode Indicator Lamp control circuit is shorted to ground.
Fuel Mode Indicator Lamp Control Circuit Open Test Status Ignition ON OK, Malfunction, Not Run This parameter displays the state of the Alternative Fuel Injector 1 control circuit. The parameter displays Malfunction if the Alternative Fuel Injector 1 control circuit is open.
Fuel Mode Switch Ignition ON mV This parameter displays the Fuel Mode Switch circuit in voltage.
Fuel Mode Switch Both States Latched Ignition ON True, False This parameter displays true once both the on and off switch states are observed and will remain latched for the current ignition cycle.
Fuel Mode Switch State Ignition ON Fault Low, On, Indeterminate, Off, Fault High This parameter displays the raw fuel mode switch state information.
Fuel Pressure Drop - Cylinder 1-8 Injector Engine Running — This parameter contains the result of the Fuel Injector Flow Device Control (Direct and Gaseous Fuel Injected Engines). The fuel or alternative fuel rail pressure sensor value after the injection event is subtracted from the fuel rail or alternative fuel pressure sensor value before the injection event and reported as the pressure drop for the appropriate injector.
Fuel Pressure Regulator Control Circuit Command Engine Cranking or Running On This parameter displays the commanded state of the fuel pressure regulator 1 low side output (the output is considered to be commanded ON if the regulator is enabled while the engine is running or cranking).
Fuel Pressure Regulator Control Circuit Command Engine Cranking or Running 0–100 % This parameter displays the commanded state of the fuel pressure regulator 1 low side output (the output is considered to be commanded ON if the regulator is enabled while the engine is running or cranking).
Fuel Pressure Regulator Control Circuit High Voltage Test Ignition ON OK This parameter displays the status of the output driver for the fuel pressure regulator control circuit. The scan tool will display OK if the

circuit is operating correctly or Not Run if a diagnosis has not been made. The scan tool will display Malfunction if there is an short to voltage in the circuit.
Fuel Pressure Regulator Control Circuit Low Voltage Test Ignition ON OK This parameter displays the status of the output driver for the fuel pressure regulator control circuit. The scan tool will display OK if the circuit is operating correctly or Not Run if a diagnosis has not been made. The scan tool will display Malfunction if there is an short to ground in the circuit.
Fuel Pressure Regulator Control Circuit Open Test Status Ignition ON OK This parameter displays the status of the output driver for the fuel pressure regulator control circuit. The scan tool will display OK if the circuit is operating correctly or Not Run if a diagnosis has not been made. The scan tool will display Malfunction if there is an open in the circuit.
Fuel Pressure Regulator High Control Circuit Command Engine Idling On / Off This parameter displays the commanded duty cycle for the fuel pressure regulator 1 solenoid output.
Fuel Pressure Regulator High Control Circuit High Voltage Test Status Ignition ON OK This parameter displays the status of the output driver for the fuel pressure regulator high control circuit. The scan tool will display OK if the circuit is operating correctly or Not Run if a diagnosis has not been made. The scan tool will display Malfunction if there is an short to voltage in the circuit.
Fuel Pressure Regulator High Control Circuit Low Voltage Test Status Ignition ON OK This parameter displays the status of the output driver for the fuel pressure regulator high control circuit. The scan tool will display OK if the circuit is operating correctly or Not Run if a diagnosis has not been made. The scan tool will display Malfunction if there is an short to ground in the circuit.
Fuel Pressure Regulator High Control Circuit Open Test Status Ignition ON OK This parameter displays the status of the output driver for the fuel pressure regulator high control circuit. The scan tool will display OK if the circuit is operating correctly or Not Run if a diagnosis has not been made. The scan tool will display Malfunction if there is an open in the circuit.
Fuel Pressure Sensor Engine Idling kPa/PSI For Port Fuel Injected (PFI) systems, this Parameter displays fuel rail pressure at the engine. For high pressure fuel systems, this Parameter indicates the low side fuel pressure before the high pressure pump.
Fuel Pressure Sensor Ignition ON Volts This parameter displays the fuel supply pressure sensor analog input as a percentage of its reference voltage.
Fuel Pump Enable Command Ignition ON On This parameter displays the commanded state of the fuel pump output (the output is considered to be commanded ON if its duty cycle is not zero).
Fuel Pump Enable Circuit High Voltage Test Status Ignition ON OK This parameter displays the status of the output driver for the fuel pump control circuit. The scan tool will display OK if the circuit is operating correctly or Not Run if a diagnosis has not been made. The scan tool will display Malfunction if there is an short to voltage in the circuit.
Fuel Pump Enable Circuit Low Voltage Test Status Ignition ON OK This parameter displays the status of the output driver for the fuel pump control circuit. The scan tool will display OK if the circuit is operating correctly or Not Run if a diagnosis has not been made. The scan tool will display Malfunction if there is an short to ground in the circuit.
Fuel Pump Enable Circuit Open Test Status Ignition ON OK This parameter displays the status of the output driver for the fuel pump control circuit. The scan tool will display OK if the circuit is operating correctly or Not Run if a diagnosis has not been made. The scan tool will display Malfunction if there is an open in the circuit.
Fuel Pump Relay Control Circuit High Voltage Test Status Ignition ON OK This parameter displays the state of the fuel pump relay control circuit. The parameter displays Malfunction if the fuel pump relay control circuit is shorted to voltage.
Fuel Pump Relay Control Circuit Low Voltage Test Status Ignition ON OK This parameter displays the state of the fuel pump relay control circuit. The parameter displays Malfunction if the fuel pump relay control circuit is shorted to ground.
Fuel Pump Relay Control Circuit Open Test Status Ignition ON OK This parameter displays the state of the fuel pump relay control circuit. The parameter displays Malfunction if the fuel pump relay control circuit is open.
Fuel Pump Speed Output Circuit High Voltage Test Status Engine Running OK, Malfunction, Not Run This parameter displays the Fuel Pump Speed Output Circuit High Voltage Test Status. Can display OK, Malfunction, or Not Run.
Fuel Pump Speed Output Circuit Low Voltage Test Status Engine Running OK, Malfunction, Not Run This parameter displays the Fuel Pump Speed Output Circuit Low Voltage Test Status. Can display OK, Malfunction, or Not Run.
Fuel Pump Speed Output Circuit Open Test Status Engine Running OK, Malfunction, Not Run This parameter displays the Fuel Pump Speed Output Circuit Open Circuit Test Status. Can display OK, Malfunction, or Not Run.
Fuel Pump Trim Engine Running 0–4 % This parameter displays the adjustments for the fuel pump duty cycle control. This is calculated by comparing the estimated fuel rail pressure to the desired fuel rail pressure. If the short term fuel pump trim consistently deviates from 0, the long term fuel pump trim is adjusted

accordingly.
Fuel Rail Pressure Regulator Command (If Equipped) Engine idling 36 Degrees The scan tool displays in degrees, the Fuel Rail Pressure Regulator ON time as commanded by the control module.
Fuel Rail Pressure Sensor Engine Idling 1.9–5.0 MPa/279–725 PSI This parameter displays the high side fuel pressure after the high pressure pump.
Fuel Rail Pressure Sensor Engine Idling 0 to 5 Volts This parameter displays the voltage signal received by the control module from the fuel rail pressure (FRP) sensor.
Fuel Rail Pressure Sensor Initial Learn — Complete This parameter displays the if the Fuel Rail Pressure Sensor First Time Adaptation is Complete
Fuel Rail Pressure Sensor Learn — Active This parameter displays the current state of the fuel rail pressure sensor learn condition.
Fuel Rail Pressure Sensor Learn Inhibit — No This parameter displays the reason for the fuel rail pressure sensor learn to be inhibited. These include: Assembly Plant Mode Counter Not Programmed, Assembly Plant Suspension, Barometric Pressure Sensor DTC, Barometric Pressure Too Low, Clutch Pedal Applied, Clutch Pedal Position Sensor DTC, Desired Fuel Rail Pressure Too Low, DTC Present, Engine in Catalyst Warm-Up Mode, Engine Not Synchronized, Engine Stopped, Fuel Pressure Spike, Fuel Level Too Low, Fuel Pressure Regulator Control Circuit DTC, Fuel Pump Control Function Active, Fuel Pump is Off, Fuel Rail Pressure Control Function Active, Fuel Rail Pressure Sensor DTC, Fuel System in Open Loop Operation, Fuel Temperature Out of Range, Idle Test Failed, Injector Flow Test in Progress, Intake Air Temperature Too Low, Low Pressure Fuel System Malfunction, Low Pressure Fuel System Pressure Too Low, Minimum Engine Run Time Not Met, Minimum Normal Fuel Pressure Control Time Not Met, Minimum Run Time, Time After New Engine Mode Not Met, Minimum Time After Drive Not Met, Minimum Time for Released Accelerator Pedal Not Met, New Engine Mode, Not in Control of Idle Speed, Other Diagnostics Active, Sensor Reading Too High Test Failed, Some Cylinders Are Turned Off, Stuck Sensor Test Failed, Vehicle Speed Too High
Fuel Rail Pressure Sensor Learn Status — Complete This parameter displays several signals associated with the status of the power mode and starter systems.
Fuel Rail Pressure Sensor Learned Value — kPa This parameter displays the fuel rail pressure learned value at the fuel rail pressure sensor.
Fuel Rail Temperature Sensor 1 Ignition ON ºC (ºF) This parameter indicates the fuel rail temperature measured by the first sensor on the rail.
Fuel Rail Temperature Sensor 2 Ignition ON ºC (ºF) This parameter indicates the fuel rail temperature measured by the second sensor on the rail.
Fuel System Monitor Complete Engine Idling Yes/No This parameter displays the enable and completion status during the current driving/monitoring cycle of each continuous legislated emission related monitor and noncontinuous legislated emission related monitor.
Fuel System Monitor Complete This Ignition Cycle Ignition ON No This parameter displays the completion status of the fuel system monitor during the current driving / monitoring cycle.
Fuel System Monitor Enabled Engine Idling Yes/No This parameter displays the enable and completion status during the current driving/monitoring cycle of each continuous legislated emission related monitor and noncontinuous legislated emission related monitor.
Fuel System Monitor Enabled This Ignition Cycle Ignition ON No This parameter displays the enable status of the fuel system monitor during the current driving / monitoring cycle.
Fuel Tank Pressure Sensor Ignition ON, engine OFF kPa/psi This parameter displays the pressure/vacuum inside the fuel tank. A negative value indicates a vacuum, while a positive value indicates a pressure.
Fuel Tank Pressure Sensor — mmHg / in H2O This parameter displays the fuel tank pressure in mmHg/in H2O at the fuel tank pressure sensor.
Fuel Tank Pressure Sensor Ignition ON, engine OFF 0–5 Volts This parameter displays the voltage signal received by the control module from the fuel tank pressure (FTP) sensor.
Fuel Tank Rated Capacity Ignition ON Varies This parameter displays the capacity of the fuel tank in liters or gallons. The rated capacity displayed by the scan tool will varies with vehicle type.
Fuel Trim Cylinder Balance Test or Fuel Trim Cylinder Balance Test Bank 1–2 Ignition ON Inactive This parameter indicates the current state of the fuel trim cylinder balance test.
Fuel Trim Cylinder Balance Test Counter or Fuel Trim Cylinder Balance Test Counter Bank 1-2 Ignition ON Counts This parameter displays the number of Air Fuel Imbalance Monitor tests that have been performed since a code clear or non volatile memory (NVM) reset.
Fuel Trim Cylinder Balance Test Status Bank 1-2 Ignition ON No Result This parameter indicates the current state of the fuel trim cylinder balance test.
Fuel Trim Learn Engine Idling Enabled This parameter displays Enabled when conditions are appropriate for enabling long term fuel trim corrections. This indicates that the long term fuel trim is adapting continuing amounts of short term fuel trim. If the scan tool displays Disabled, then long term fuel trim will not respond

to changes in short term fuel trim.
Fuel Trim Learn — Enabled This parameter displays if the fuel trim learn is enabled.
Fuel Trim Memory Cell Engine Idling Counts 0–250 This parameter displays long term fuel corrections that is active based upon the current operating conditions (MAP, engine speed, purge duty cycle, A/C compressor state, and transmission range).
Fuel Trim Memory Cell — # This parameter displays the intake air temperature (measured by a sensor located near the throttle body) recorded at power-up (Run/Crank transition from low to high).
Fuel Trim System Test State Engine Idling Complete This parameter displays the current state of the fuel adjustment system diagnostic.
Fuel Trim System Test State — Complete This parameter displays the state of the fuel trim system test.
Fuel Volatility Engine Idling Varies This parameter indicates the rate the fuel can be vaporized in the cylinder as calculated by the control module. The scan tool will display HIGH when the fuel volatility is high. The scan tool will display LOW when the fuel volatility is low.
Generator F Terminal Signal Engine Idling 0–100 % This parameter displays the amount of generator ON-time as commanded by the control module. The higher the percentage the greater the generator output.
Generator Indicator Command Engine Idling On This parameter displays On or Off associated with the status of the generator.
Generator L Terminal Circuit High Voltage Test Status Engine Idling OK This parameter displays the state of the generator L circuit terminal. The parameter displays Malfunction if the generator L circuit is shorted to voltage.
Generator L Terminal Circuit Low Voltage Test Status Engine Idling OK This parameter displays the state of the generator L circuit terminal. The parameter displays Malfunction if the generator L circuit is shorted to ground.
Generator L Terminal Circuit Open Test Status Engine Idling OK This parameter displays the state of the generator L circuit terminal. The parameter displays Malfunction if the generator L circuit is open.
Generator L-Terminal Command Engine Idling 0–100 % This parameter displays the control modules commanded state of the voltage regulator on the generator.
Generator L-Terminal Signal Command Ignition ON On / Off This parameter displays the commanded state of the generator L-terminal output.
Heated Catalyst Monitor Complete Engine Idling Yes This parameter indicates the status of the heated catalyst. The scan tool displays Yes when the diagnostic is complete. And No if the diagnostic has not ran or a malfunction is detected in the heated catalyst.
Heated Catalyst Monitor Enabled Engine Idling Yes This parameter indicates the status of the heated catalyst monitor diagnostic. Catalyst Monitor Test Running indicates Yes or No when the heated catalyst monitor diagnostic is actively running a test.
Heater Coolant Pump Relay Command Ignition ON On / Off This parameter indicates if the heater core pump relay is commanded On or Off.
Heater Coolant Pump Relay Control Circuit High Voltage Test Status Ignition ON OK, Malfunction, Not Run This parameter displays the Heater Coolant Pump Relay Control Circuit High Voltage Test Status. Can display OK, Malfunction, or Not Run.
Heater Coolant Pump Relay Control Circuit Low Voltage Test Status Ignition ON OK, Malfunction, Not Run This parameter displays the Heater Coolant Pump Relay Control Circuit Low Voltage Test Status. Can display OK, Malfunction, or Not Run.
Heater Coolant Pump Relay Control Circuit Open Test Status Ignition ON OK, Malfunction, Not Run This parameter displays the Heater Coolant Pump Relay Control Circuit Open Circuit Test Status. Can display OK, Malfunction, or Not Run.
High Side Driver 1 Circuit High Voltage Test Status Ignition ON OK, Malfunction, Not Run This parameter displays the High Side Driver 1 Circuit High Voltage Test Status. Can display OK, Malfunction, or Not Run.
High Side Driver 1 Circuit Low Voltage Test Status Ignition ON OK, Malfunction, Not Run This parameter displays the High Side Driver 1 Circuit Low Voltage Test Status. Can display OK, Malfunction, or Not Run.
High Side Driver 1 Circuit Open Test Status Ignition ON OK, Malfunction, Not Run This parameter displays the High Side Driver 1 Circuit Open Circuit Test Status. Can display OK, Malfunction, or Not Run.
High Side Driver 1 Command Ignition ON On / Off This parameter indicates if the High Side Driver 1 is being commanded On or Off.
High Side Driver 2 Circuit High Voltage Test Status Ignition ON OK, Malfunction, Not Run This parameter displays the High Side Driver 2 Circuit High Voltage Test Status. Can display OK, Malfunction, or Not Run.
High Side Driver 2 Circuit Low Voltage Test Status Ignition ON OK, Malfunction, Not Run This parameter displays the High Side Driver 2 Circuit Low Voltage Test Status. Can display OK, Malfunction, or Not Run.
High Side Driver 2 Circuit Open Test Status Ignition ON OK, Malfunction, Not Run This parameter displays the High Side Driver 2 Circuit Open Circuit Test Status. Can display OK, Malfunction, or Not Run.

High Side Driver 2 Command Ignition ON On / Off This parameter indicates if the High Side Driver 2 is being commanded On or Off.
Hood Position Ignition ON Closed, Ajar, Open, Invalid This parameter indicates the Position of the Hood.
Hood Position Switch Ignition ON Closed This parameter displays the current position of the hood.
HO2S Sensor 1 or HO2S Bank 1 Sensor 1 or Bank 2 Sensor 1 Engine Idling 0.00–1.00 Volts This parameter displays the voltage output from the HO2S to the control module. A lower voltage indicates a lean exhaust, while a higher voltage indicates a rich exhaust.
HO2S Sensor 1 or HO2S Bank 1 Sensor 1 or Bank 2 Sensor 1 Engine Idling Lambda 0.8–1.1 This parameter displays the voltage output as a lambda value. When the fuel system is lean, the oxygen level will be high and the lambda signal will be high or more than 1. When the fuel system is rich, the oxygen level will be low, and the lambda signal will be low or less than 1. The ECM uses this information to maintain the correct air/fuel ratio
HO2S Sensor 2 or HO2S Bank 1 Sensor 2 or Bank 2 Sensor 2 Engine Idling 0.00–1.00 Volts This parameter displays the voltage output from the HO2S to the control module. A lower voltage indicates a lean exhaust, while a higher voltage indicates a rich exhaust.
HO2S Heater Sensor 1 or HO2S Heater Bank 1 Sensor 1 or Bank 2 Sensor 1 Engine Idling Amps This parameter display the current feedback for the oxygen sensor heater output for sensor 1.
HO2S Heater Sensor 2 or HO2S Heater Bank 1 Sensor 2 or Bank 2 Sensor 2 Engine Idling Amps This parameter display the current feedback for the oxygen sensor heater output for sensor 2.
HO2S Heater Command or HO2S Heater Command Bank 1 or 2 Sensor 1 or 2 Engine Idling Off This parameter display the state of the HO2S heater control circuit as commanded by the control module.
HO2S Heater Command Bank 1 or 2 Sensor 1 or 2 Heater Command Engine Idling 0–100 % This parameter displays the HO2S heater ON time in percentage, as commanded by the control module.
HO2S Heater Control Circuit High Voltage Test Status or HO2S Heater Control Circuit High Voltage Test Status Bank 1 Sensor 1 or Bank 2 Sensor 1 Engine Idling OK This parameter displays the state of the oxygen sensor heater control circuit. The parameter displays Malfunction if the oxygen sensor heater control circuit is shorted to voltage.
HO2S Heater Control Circuit High Voltage Test Status or HO2S Heater Control Circuit High Voltage Test Status Bank 1 Sensor 2 or Bank 2 Sensor 2 Engine Idling OK This parameter displays the state of the oxygen sensor heater control circuit. The parameter displays Malfunction if the oxygen sensor heater control circuit is shorted to voltage.
HO2S Heater Control Circuit Low Voltage Test Status or HO2S Heater Control Circuit Low Voltage Test Status Bank 1 Sensor 1 or Bank 2 Sensor 1 Engine Idling OK This parameter displays the state of the oxygen sensor heater control circuit. The parameter displays Malfunction if the oxygen sensor heater control circuit is shorted to ground.
HO2S Heater Control Circuit Low Voltage Test Status or HO2S Heater Control Circuit Low Voltage Test Status Bank 1 Sensor 2 or Bank 2 Sensor 2 Engine Idling OK This parameter displays the state of the oxygen sensor heater control circuit. The parameter displays Malfunction if the oxygen sensor heater control circuit is shorted to ground.
HO2S Heater Control Circuit Open Test Status or HO2S Heater Control Circuit Open Test Status Bank 1 Sensor 1 or Bank 2 Sensor 1 Engine Idling OK This parameter displays the state of the oxygen sensor heater control circuit. The parameter displays Malfunction if the oxygen sensor heater control circuit is open.
HO2S Heater Control Circuit Open Test Status or HO2S Heater Control Circuit Open Test Status Bank 1 Sensor 2 or Bank 2 Sensor 2 Engine Idling OK This parameter displays the state of the oxygen sensor heater control circuit. The parameter displays Malfunction if the oxygen sensor heater control circuit is open.
HO2S/Heater Monitor Complete This Ignition Cycle Engine Idling Yes/No This parameter displays the diagnostic monitor completion status during the current driving/monitoring cycle.
HO2S Heater Monitor Enabled Ignition ON No This parameter displays the current state of the H02S heater monitor.
HO2S/Heater Monitor Enabled This Ignition Cycle Engine Idling Yes/No This parameter displays the diagnostic monitor enable status during the current driving/monitoring cycle.
Humidity Sensor Intake Air Temperature Signal Ignition ON Hz This parameter displays the frequency of the humidity sensor’s intake air temperature (IAT) sensor input.
IAT Sensor 1 Ignition ON –39° to 140°C (–38° to 284°F) This parameter displays the temperature of the air entering the air induction system based on input to the control module from the intake air temperature (IAT) sensor.
IAT Sensor 2 Engine Idling Hz This parameter displays the frequency of the humidity sensor’s intake air temperature (IAT) sensor input to the engine control module.
IAT Sensor 2 — °C (°F) This parameter displays the temperature of the air entering the engine as calculated by the control module based on the input from the intake air temperature (IAT) sensor 2. The scan tool will display a low value when the air temperature is low, and a high value when the air temperature is high.

IAT Sensor 3 — °C (°F) This parameter displays the temperature of the air entering the engine as calculated by the control module based on the input from the intake air temperature (IAT) sensor 3. The scan tool will display a low value when the air temperature is low, and a high value when the air temperature is high.
Idle Speed Correction Ignition ON RPM This parameter displays the engine idle speed correction within a restricted range to address complaints of vehicle vibration.
Ignition 1 Signal Ignition ON B+ This parameter displays B+ when the control module detects a voltage at the ignition 1 input terminal.
Ignition Accessory Signal Ignition ON On This parameter displays On when the control module detects a voltage at the ignition accessory input terminal.
Ignition Coil 1,2,3,4,5,6,7, or 8 Control Circuit High Voltage Test Status Engine Running OK This parameter displays the state of the Ignition control circuit. The parameter displays Malfunction if the Ignition control circuit is shorted to voltage.
Ignition Coil 1,2,3,4,5,6,7, or 8 Control Circuit Low Voltage Test Status Engine Idling OK This parameter displays the state of the Ignition control circuit. The parameter display Malfunctions if the Ignition control circuit is shorted to ground.
Ignition Coil 1,2,3,4,5,6,7, or 8 Control Circuit Open Test Status Engine Idling OK This parameter displays the state of the Ignition control circuit. The parameter displays if Malfunction the Ignition control circuit is open.
Ignition Coil Supply Voltage or Ignition Coil Supply Voltage Bank 1 or 2 Engine Idling On This parameter displays ON when voltage is supplied to the Ignition coil.
Ignition Cycles Since Recommended Maximum Fuel Alcohol Content Exceeded Engine Idling Counts This parameter displays the number of Ignition Cycles since Recommended Maximum Fuel Alcohol Content Exceeded.
Ignition Cycles with Malfunction Since 1st Malfunction Ignition ON Counts This parameter contains the number of ignition cycles with a failure reported since the first ignition cycle with a failure reported.
Ignition Cycles Without Completed Test Since 1st Malfunction Engine Idling Counts This parameter displays the number of ignition cycles without a pass or a failure reported since the first ignition cycle with a failure reported.
Ignition Cycles Without Malfunction Since Last Malfunction Engine Idling Counts This parameter displays the number of ignition cycles with a pass reported and no malfunctions reported since the first ignition cycle with a malfunction reported.
Ignition Cycles without Malfunction Since Last Malfunction Ignition ON Counts This parameter contains the number of ignition cycles with a pass reported and no failures reported since the first ignition cycle with a failure reported.
Ignition Off Time Ignition ON hh:mm:ss This parameter displays the time that the ignition has been OFF.
Ignition Timing Engine Idling Degrees This parameter displays the final spark advance in terms of a crankshaft angle.
Immobilizer Auto Learn Counter Ignition ON Counts This parameter displays the number of auto-learn cycles that have been successfully completed within the immobilizer system.
Immobilizer Automatic Learn Timer Ignition ON h/m/s This parameter displays the time elapsed within the current auto-learn cycle within the immobilizer system.
Immobilizer ECM Identifier Ignition ON OK This parameter displays that the immobilizer control module (ICM) has received the correct powertrain identifier.
Immobilizer Environment Device 1-4 Ignition ON OK This parameter displays that the associated device is OK or unknown or its identification is pending to the immobilizer control module (ICM).
Immobilizer Fuel Disable Ignition ON Inactive This parameter displays if the vehicle is immobilized by the ECM.
Immobilizer Module Environment Identification Ignition ON Inactive This parameter displays that the ICM has not received the powertrain identifier or has received the wrong powertrain identifier.
Immobilizer Module Fuel Disable Ignition ON Inactive This parameter displays if the vehicle is immobilized by the ICM.
Immobilizer Module Identification Ignition ON Complete This parameter indicates that the ICM has not received the powertrain identifier or has received the wrong powertrain identifier.
Immobilizer Module Security Code Programmed Ignition ON Yes This parameter indicates that the ICM security code has been programmed (i.e., the immobilizer device is locked).
Immobilizer Password Learn Ignition ON Active/Inactive Learning Enabled indicates that learning of immobilizer code information is enabled.
Immobilizer Password Learn Scan Tool Delay Engine Idling Active/Inactive Scan tool Learn Delay Active indicates that the security code has been accepted but the scan tool learn delay is active and will not allow learning enabled, programming security code, or resetting security code.
Immobilizer Password Programmed Ignition ON Yes This parameter indicates that the ICM password has been

programmed.
Immobilizer Post-Release Passive State Ignition ON Active / Inactive This parameter displays that the immobilizer algorithm is in the post release passive state.
Immobilizer Post-Release State Ignition ON Active / Inactive This parameter displays that the immobilizer algorithm is in the post release passive state.
Immobilizer Pre-Release State Ignition ON Active / Inactive This parameter displays that the immobilizer algorithm is in the pre release active state.
Immobilizer Release State Ignition ON Active / Inactive This parameter displays that the immobilizer algorithm is in the release active state.
Immobilizer Security Code Accepted Engine Idling Yes/No Security Code Accepted displaying Yes indicates' that the received security code is correct.
Immobilizer Security Code Function Engine Idling Present/Not Present This parameter indicates if the ECU supports the immobilizer security code strategy.
Immobilizer Security Code Lockout Engine Idling Yes/No Security Code Lockout Active indicates that the security code has not passed and lockout is active.
Immobilizer Security Code Lockout Active Timer Engine Idling ms This parameter displays the time elapsed since the immobilizer security code lockout has been activated either due to a battery disconnect or an incorrect immobilizer security code being entered.
Immobilizer Security Code Programmed Ignition ON Yes/No Security Code Programmed indicates that the security code has been programmed.
Immobilizer Security Code Programming Counter Ignition ON Counts This parameter displays the number of times a new immobilizer security code has been programmed through secure access. This counter can only be incremented.
Immobilizer Security Code Reset Counter Ignition ON Counts This parameter displays the number of times the immobilizer security code has been reset to the default value through secure access. This counter can only be incremented.
Immobilizer Security Information Programmed Ignition ON Yes/No This parameter displays the status of the immobilizer system.
Immobilizer Security Level Ignition ON # This parameter displays the current immobilizer security level. If the correct security code is entered, the security level will remain at or be reset to a level of 10. If an incorrect security code is entered, the security level will be set to a level of 9.
Immobilizer Transponder Identification Ignition ON Active / Inactive This parameter displays that the transponder identification process is active within the ICM.
Immobilizer Transponder Key Ignition ON OK This parameter displays that the transponder key is correct for the ICM.
Immobilizer Transponder Key Identification Ignition ON OK This parameter displays that the transponder key identification process is active within the ICM.
Immobilizer System Status Ignition ON Varies This parameter displays the status of the immobilizer system, the following maybe displayed. Standby, Immobilized at Startup, Immobilized, No Response, Immobilized Negative Response, Immobilized, Incorrect Response, Post-Release State, Pre-Release State, Release State.
Immobilizer Valid Response Received Time Ignition ON ms This parameter displays the actual time observed for a valid immobilizer response.
Initialized Fuel Alcohol Content Ignition ON 0–100 % This parameter displays the initialized fuel composition to be used as a starting point for the fuel composition algorithm.
Injector Duty Cycle or Injector Duty Cycle Bank 1 or 2 Engine idling 0.82–1.50 ms This parameter displays the amount of fuel injector ON time or pulse width as commanded by the control module.
Inspection/Maintenance Drive Cycle Complete Engine Idling Yes/No Inspection/Maintenance Drive Cycle Complete means that all required components of the standard drive cycle have completed.
Inspection/Maintenance Drive Cycle Idle Time Complete Engine Idling Yes/No Inspection/Maintenance Drive Cycle Idle Time Complete indicates that the engine idle time requirement is complete.
Inspection/Maintenance Drive Cycle Idle Timer Engine Idling hh:mm:ss This parameter displays the Inspection/Maintenance Drive Cycle Idle Timer.
Inspection/Maintenance Drive Cycle Propulsion System Active Time Complete Engine Idling Yes/No This parameter displays the Inspection/Maintenance Drive Cycle Propulsion System Active Time Complete. The parameter displays Yes when the Inspection/Maintenance Drive Cycle Propulsion System Active Time is Complete.
Inspection/Maintenance Drive Cycle Propulsion System Active Timer Engine Idling hh:mm:ss This parameter displays the total accumulated time in which the propulsion system has been active after the 1st time the engine is started.
Inspection/Maintenance Drive Cycle Vehicle Speed Time Complete Engine Idling Yes/No This parameter displays Yes when the Vehicle Speed Time Complete indicates that the vehicle has been above 25 mph for five minutes.
Inspection/Maintenance Drive Cycle Vehicle Speed Timer Engine Idling hh:mm:ss This parameter displays the

total accumulated time in which the vehicle speed has been greater than 25 mph after the 1st time the engine is started.
Intake Air Humidity Sensor Engine Idling 0–100 % This parameter displays the raw duty cycle signal from the relative humidity sensor electronics, which represents the relative humidity of the intake air.
Intake Camshaft Position Engine Idling ° This parameter displays the position of the intake camshaft for bank 1 in terms of degrees of camshaft rotation (advance) from the park position (a value of zero represents the park position).
Intake Camshaft Position Active Counter or Intake Camshaft Position Active Counter Bank 1 or 2 Engine Idling 0–255 This parameter displays an incrementing counter when the control module receives a signal from the intake camshaft position (CMP) sensor.
Intake Camshaft Position Actuator Oil Pressure Engine Idling kPa This parameter displays the oil pressure at the intake camshaft position actuator.
Intake Camshaft Position Actuator Oil Pressure Sensor Engine Idling Volts This parameter displays the intake camshaft position actuator pressure sensor in voltage.
Intake Camshaft Position Actuator Park Lock Solenoid Valve Command Bank 1 Ignition ON Locked / Unlocked This parameter indicates if the Intake Camshaft Position Actuator Park Lock Solenoid Valve for Bank 1 is Locked or Unlocked.
Intake Camshaft Position Actuator Park Lock Solenoid Valve Command Bank 2 Ignition ON Locked / Unlocked This parameter indicates if the Intake Camshaft Position Actuator Park Lock Solenoid Valve for Bank 2 is Locked or Unlocked.
Intake Camshaft Position Actuator Park Lock Solenoid Valve Control Circuit High Voltage Test Status Bank 1 Ignition ON OK, Malfunction, Not Run This parameter displays the Intake Camshaft Position Actuator Park Lock Solenoid Valve Control Circuit High Voltage Test Status Bank 1. Can display OK, Malfunction, or Not Run.
Intake Camshaft Position Actuator Park Lock Solenoid Valve Control Circuit High Voltage Test Status Bank 2 Ignition ON OK, Malfunction, Not Run This parameter displays the Intake Camshaft Position Actuator Park Lock Solenoid Valve Control Circuit High Voltage Test Status Bank 2. Can display OK, Malfunction, or Not Run.
Intake Camshaft Position Actuator Park Lock Solenoid Valve Control Circuit Low Voltage Test Status Bank 1 Ignition ON OK, Malfunction, Not Run This parameter displays the Intake Camshaft Position Actuator Park Lock Solenoid Valve Control Circuit Low Voltage Test Status Bank 1. Can display OK, Malfunction, or Not Run.
Intake Camshaft Position Actuator Park Lock Solenoid Valve Control Circuit Low Voltage Test Status Bank 2 Ignition ON OK, Malfunction, Not Run This parameter displays the Intake Camshaft Position Actuator Park Lock Solenoid Valve Control Circuit Low Voltage Test Status Bank 2. Can display OK, Malfunction, or Not Run.
Intake Camshaft Position Actuator Park Lock Solenoid Valve Control Circuit Open Test Status Bank 1 Ignition ON OK, Malfunction, Not Run This parameter displays the Intake Camshaft Position Actuator Park Lock Solenoid Valve Control Circuit Open Circuit Test Status Bank 1. Can display OK, Malfunction, or Not Run.
Intake Camshaft Position Actuator Park Lock Solenoid Valve Control Circuit Open Test Status Bank 2 Ignition ON OK, Malfunction, Not Run This parameter displays the Intake Camshaft Position Actuator Park Lock Solenoid Valve Control Circuit Open Circuit Test Status Bank 2. Can display OK, Malfunction, or Not Run.
Intake Camshaft Position Actuator Park Lock Test Abort Reason Bank 1 Ignition ON N/A This parameter indicates the reason why the Intake Camshaft Actuator Park Lock Pin Test for Bank 1 was aborted.
Intake Camshaft Position Actuator Park Lock Test Abort Reason Bank 2 Ignition ON N/A This parameter indicates the reason why the Intake Camshaft Actuator Park Lock Pin Test for Bank 2 was aborted.
Intake Camshaft Position Actuator Park Lock Test Status Bank 1 Ignition ON N/A This parameter indicates the status of the intake camshaft actuator park lock pin test for bank 1.
Intake Camshaft Position Actuator Park Lock Test Status Bank 2 Ignition ON N/A This parameter indicates the status of the intake camshaft actuator park lock pin test for Bank 2.
Intake Camshaft Position Actuator Solenoid Valve Control Circuit High Voltage Test Status or Intake Camshaft Position Actuator Solenoid Valve Control Circuit High Voltage Test Status Bank 1 or 2 Engine Idling OK This parameter displays the state of the intake camshaft actuator solenoid control circuit. The parameter displays Malfunction if the camshaft actuator solenoid control circuit is shorted to voltage.
Intake Camshaft Position Actuator Solenoid Valve Control Circuit Low Voltage Test Status or Intake Camshaft Position Actuator Solenoid Valve Control Circuit Low Voltage Test Status Bank 1 or 2 Engine Idling OK This parameter displays the state of the intake camshaft actuator solenoid control circuit. The parameter displays Malfunction if the camshaft actuator solenoid control circuit is shorted to ground.
Intake Camshaft Position Actuator Solenoid Valve Control Circuit Open Test Status or Intake Camshaft Position Actuator Solenoid Valve Control Circuit Open Test Status Bank 1 or 2 Engine Idling OK This parameter displays the state of the intake camshaft actuator solenoid control circuit. The parameter displays Malfunction if the camshaft actuator solenoid control circuit is open.
Intake Camshaft Position or Intake Camshaft Position Bank 1 or 2 Engine Idling 0 Degrees This parameter displays the actual intake camshaft position in degrees.

Intake Camshaft Position Commanded or Intake Camshaft Position Commanded Bank 1 or 2 Engine Idling 20 % This parameter displays the ON-time or duty cycle of the intake camshaft position (CMP) actuator solenoid valve as commanded by the control module.
Intake Camshaft Position Variance or Intake Camshaft Position Variance Bank 1 or 2 Engine Idling 0 Degrees This parameter displays in degrees, the difference between the desired intake camshaft position and the actual intake camshaft position.
Intake Camshaft Profile Actuator 1–8 Command Ignition ON On / Off This parameter displays the commanded state of the Intake Camshaft Profile Actuator output.
Intake Camshaft Profile Actuator 1–8 Control Circuit High Voltage Test Status Ignition ON OK, Malfunction, Not Run This parameter displays the state of the Intake Camshaft Profile Actuator control circuit per cylinder. The parameter displays Malfunction if the Intake Camshaft Profile Actuator control circuit is shorted to voltage.
Intake Camshaft Profile Actuator 1–8 Control Circuit Low Voltage Test Status Ignition ON OK, Malfunction, Not Run This parameter displays the state of the Intake Camshaft Profile Actuator control circuit per cylinder. The parameter displays Malfunction if the Intake Camshaft Profile Actuator control circuit is shorted to ground.
Intake Camshaft Profile Actuator 1–8 Control Circuit Open Test Status Ignition ON OK, Malfunction, Not Run This parameter displays the state of the Intake Camshaft Profile Actuator control circuit per cylinder. The parameter displays Malfunction if the Intake Camshaft Profile Actuator control circuit is open.
Intake Camshaft Profile Actuator Position Sensor 1–4 Ignition ON 0–100 % This parameter displays the commanded duty cycle for the Intake Camshaft Profile Actuator.
Intake Camshaft Profile Actuator Position Sensor 1–4 Ignition ON mm This parameter displays the commanded duty cycle for the Intake Camshaft Profile Actuator.
Intake Camshaft Profile Sleeve Position Sensor 1, 2 Engine Idling Counts This parameter displays the number of times that the Intake Camshaft Profile Sleeve test has been activated during the current key cycle.
Intake Manifold Pressure Engine Idling kPa/psi This parameter displays the engine intake manifold vacuum pressure calculated as the difference between ambient air pressure (barometric pressure) and intake manifold absolute pressure (MAP).
Intake Manifold Tuning Control Valve Control Circuit Command Ignition ON On This parameter displays the commanded state of the intake manifold tuning valve output.
Intake Manifold Tuning Control Valve Control Circuit High Voltage Test Status Ignition ON OK This parameter displays the state of the intake manifold tuning control valve control circuit. The parameter displays Malfunction if the intake manifold tuning control valve control circuit is shorted to voltage.
Intake Manifold Tuning Control Valve Control Circuit Low Voltage Test Status Ignition ON OK This parameter displays the state of the skip shift solenoid actuator control circuit. The parameter displays Malfunction if the skip shift solenoid actuator control circuit is shorted to ground.
Intake Manifold Tuning Control Valve Control Circuit Open Test Status Ignition ON OK This parameter displays the state of the skip shift solenoid actuator control circuit. The parameter displays Malfunction if the skip shift solenoid actuator control circuit is open.
Intake Manifold Tuning Control Valve Feedback Signal Ignition ON 0–100 % This parameter displays the duty cycle of the PWM feedback from the intake manifold tuning electronics, which represents the position of the intake manifold tuning valve.
Intake Manifold Tuning Control Valve Learn Ignition ON Inactive This parameter displays that the intake manifold tuning electronics are currently learning the hard stop position for the intake manifold tuning valve.
Intake Manifold Tuning Control Valve Position Ignition ON Closed This parameter displays whether the intake manifold tuning valve is in an open, closed, or intermediate position based upon the PWM feedback from the intake manifold tuning electronics.
Intake Rocker Arm Solenoid Valve 1–2 Command Engine Idling Off This parameter displays the intake rocker arm solenoid valve command ON/OFF status.
Intake Rocker Arm Solenoid Valve 1–2 Command Engine Idling High Lift/Low Lift This parameter displays the intake rocker arm solenoid valve command status.
Intake Rocker Arm Solenoid Valve 1–2 Control Circuit High Voltage Test Status Engine Idling OK This parameter displays the state of the intake rocker arm solenoid valve control circuit. The parameter displays Malfunction if the intake rocker arm solenoid valve circuit is shorted to voltage.
Intake Rocker Arm Solenoid Valve 1–2 Control Circuit Low Voltage Test Status Engine Idling OK This parameter displays the state of the intake rocker arm solenoid valve control circuit. The parameter displays Malfunction if the intake rocker arm solenoid valve control circuit is shorted to ground.
Intake Rocker Arm Solenoid Valve 1–2 Control Circuit Open Test Status Engine Idling OK This parameter displays the state of the intake rocker arm solenoid valve control circuit. The parameter displays Malfunction if the

intake rocker arm solenoid valve control circuit is open.
ISS /OSS Supply Voltage Engine Idling OK This parameter displays the state of the ISS/OSS Supply Voltage circuit.
Knock Retard Engine Idling 0 Degrees This parameter indicates the amount of spark advance the control module removes from the ignition control (IC) spark advance in response to the signal from the knock sensors .
Long Term Fuel Pump Trim — # This parameter displays a numeric value. This is the long term (LT) fuel pump trim.
Long Term Fuel Trim or Long Term Fuel Trim Bank 1 or 2 Engine Idling 0 % This parameter displays the commanded Long Term Fuel Trim correction by the control module for cruise and acceleration conditions.
Long Term Fuel Trim Test Average or Long Term Fuel Trim Test Average Bank 1 or 2 Engine Idling 0 % This parameter displays the filtered long term closed loop fuel correction. This value is compared to thresholds to determine if the fuel adjustment system diagnostic is passing or failing or if an excess purge vapor test should be executed.
Long Term Fuel Trim Test Average without Purge or Long Term Fuel Trim Test Average without Purge Bank 1 or 2 Engine Idling 0 % This parameter displays the filtered non purge long term closed loop fuel correction. This value is compared to thresholds to determine if the fuel adjustment system diagnostic is passing, failing, or indeterminate during normal purge-OFF operation as well as during the intrusive excess purge vapor test.
Long Term Secondary O2 Sensor Fuel Trim Bank 1 or 2 Ignition ON 0–100 % This parameter displays the Long Term Secondary O2 Sensor Fuel Trim for Bank 1 or 2.
Lost Communication with Active Grille Air Shutter Actuator Test Status Ignition ON OK, Malfunction, Not Run This parameter indicates the status of the Active Grille Air Shutter actuator diagnostic test.
Low Engine Oil Level Indicator Command Engine Idling Off The scan tool displays On or Off. This is the state of the low engine oil level indicator as monitored by the ECM.
Low Engine Oil Pressure Indicator Command Engine Idling Off This parameter displays the commanded state of the low EOP lamp control circuit by the control module.
Low-Voltage Battery Current Ignition ON Amps This parameter displays the battery current.
Low-Voltage Battery State of Charge Ignition ON Volts This parameter indicates the percentage of the battery charge remaining.
Low-Voltage Battery State of Function Ignition ON Volts This parameter displays the predicted minimum voltage of the next crank event.
Low-Voltage Battery State of Health Ignition ON Volts This parameter indicates the available capacity of the battery if it were fully charged, relative to the capacity when the battery was new.
Low-Voltage Battery Temperature Ignition ON ºC (ºF) This parameter indicates the temperature of the battery.
MAF Performance Test Engine Idling OK This parameter displays the status of the MAF performance test by the engine control module. The scan tool will display OK if no malfunction is found. The scan tool will display malfunction if the engine control module detects a malfunction during the test.
MAF Sensor Engine Idling 3.0–8.3 g/s This parameter displays in grams per second, the measured quantity of air flowing into the engine during all operating conditions.
Engine speed at 2,500 RPM 11.88 g/s
MAF Sensor Engine Idling 2,000–2,500 Hz The scan tool displays a range of 0-65,555 hertz. This parameter displays the frequency signal input to the control module, and represents measured quantity of air flowing into the engine during all operating conditions.
MAF Sensor Supply Voltage Command Ignition ON On / Off This parameter indicates if the mass air flow sensor supply voltage is commanded On or Off.
MAF Sensor Supply Voltage Control Circuit High Voltage Test Status Ignition ON OK, Malfunction, Not Run This parameter displays the mass air flow sensor supply voltage Control Circuit High Voltage Test Status. Can display OK, Malfunction, or Not Run.
MAF Sensor Supply Voltage Control Circuit Low Voltage Test Status Ignition ON OK, Malfunction, Not Run This parameter displays the mass air flow sensor supply voltage Control Circuit Low Voltage Test Status. Can display OK, Malfunction, or Not Run.
MAF Sensor Supply Voltage Control Circuit Open Test Status Ignition ON OK, Malfunction, Not Run This parameter displays the mass air flow sensor supply voltage Control Circuit Open Circuit Test Status. Can display OK, Malfunction, or Not Run.
MAF When Engine Overspeed Detected Engine Idling g/s This parameter indicates the quantity calculated by the control module based on a signal from the MAF sensor at the time an overspeed was detected.
MAP Performance Test 1 Engine Idling OK MAP Test 1 Residual Out of Tolerance indicates that the filtered MAP Test 1 residual (the difference between the measured intake manifold pressure and the intake manifold pressure predicted from the intake manifold model using the mass airflow predicted from the throttle model) exceeds a failure threshold.
MAP Performance Test 2 Engine Idling OK MAP Test 2 Residual Out of Tolerance indicates that the filtered MAP

Test 2 residual (the difference between the measured intake manifold pressure and the intake manifold pressure predicted from the intake manifold model using the measured mass airflow) exceeds a failure threshold.
MAP Sensor Engine Idling kPa/psi This parameter displays the actual engine intake manifold absolute pressure (MAP).
MAP Sensor Engine Idling 0.4–2.0 Volts The parameter displays The MAP sensor voltage as it measures the change in the intake manifold pressure which results from engine load and speed changes. As the intake manifold pressure increases, the air density in the intake also increases and additional fuel is required.
Maximum Engine Speed When Engine Overspeed Detected Engine Idling RPM This parameter displays the Maximum Engine Speed When Engine Overspeed Detected.
MIL Command Engine Idling Off This parameter displays the commanded state of the malfunction indicator lamp (MIL) control circuit by the control module.
MIL Control Circuit High Voltage Test Status Ignition ON OK This parameter displays the state of the MIL control circuit. The parameter displays Malfunction if the MIL control circuit is shorted to voltage.
MIL Control Circuit Low Voltage Test Status Ignition ON OK This parameter displays the state of the MIL control circuit. The parameter displays Malfunction if the MIL control circuit is shorted to ground.
MIL Control Circuit Open Test Status Ignition ON OK This parameter displays the state of the MIL control circuit. The parameter displays Malfunction if the MIL control circuit is open.
MIL Requested Engine Idling No This parameter displays the reason the engine control module illuminated the MIL. The scan tool will display Yes when the MIL is requested as a result of an A or B type DTC. The scan tool will display No if the MIL is illuminated for another reason, such as transmission DTCs.
MIL Requested by DTC Engine Idling No This parameter indicates the reason the control module illuminated the MIL. The scan tool will display YES when the MIL is requested as a result of an A or B type DTC. The scan tool will display NO if the MIL is illuminated for another reason, such as transmission DTCs.
Minimum DC/DC Converter Output Voltage on Circuit 1 - Last Engine Crank Ignition ON Volts This parameter indicates the minimum DC/DC Converter Output Voltage on Circuit 1 on the last engine crank.
Minimum DC/DC Converter Output Voltage on Circuit 2 - Last Engine Crank Ignition ON Volts This parameter indicates the minimum DC/DC Converter Output Voltage on Circuit 2 on the last engine crank.
Misfire Diagnostic Engine Load Engine Idling 0–100 % This parameter displays the engine load used within the misfire diagnostic (calculated as the ratio of the mass of air predicted to be in the cylinder two firing events into the future to the maximum possible mass of air in the cylinder based on the current ambient air pressure and charge temperature).
Misfire Diagnostic Engine Speed Engine Idling RPM This parameter displays the engine speed used within the misfire diagnostic. This engine speed is the maximum engine speed observed over the previous engine cycle.
Misfire Engine Load History 1–5 Engine Idling 0–100 % This parameter displays the specific engine load when the engine was operating for one of the last five misfire events .
Misfire Engine Speed History 1–5 Engine Idling RPM This parameter displays the specific engine speed when the engine was operating for one of the last five misfire events .
Misfire Monitor Complete Engine Idling Yes/No This parameter displays the status of the Misfire Monitor. The parameter will display Yes when the Misfire Monitor is Complete.
Misfire Monitor Complete This Ignition Cycle Ignition ON No This parameter displays the completion status of the misfire monitor during the current driving / monitoring cycle.
Misfire Monitor Enabled Engine Idling Yes/No This parameter displays the status of the Misfire Monitor. The parameter will display Yes when the Misfire Monitor is Enabled.
Misfire Monitor Enabled This Ignition Cycle Ignition ON No This parameter displays the enable status of the misfire monitor during the current driving / monitoring cycle.
Neutral Position Sensor — ° This parameter displays the current state of the neutral position sensor in degrees.
Number of Calibration History Events Stored Ignition ON Counts This parameter displays the history entries for the primary calibration in the controller.
Number of DTC(s) Engine Idling 0 This parameter indicates the number of diagnostic trouble codes (DTCs).
O2S /HO2S Monitor Complete Engine Idling Yes/No This parameter displays the enable and completion status during the current driving/monitoring cycle of each continuous legislated emission related monitor and non continuous legislated emission related monitor.
O2S/HO2S Monitor Complete This Ignition Cycle Engine Idling Yes/No This parameter displays the enable and completion status during the current driving/monitoring cycle of each continuous legislated emission related monitor and non continuous legislated emission related monitor.
O2S/HO2S Monitor Enabled Engine Idling Yes/No This parameter displays the enable and completion status during the current driving/monitoring cycle of each continuous legislated emission related monitor and non continuous legislated emission related monitor.
O2S/HO2S Monitor Enabled This Ignition Cycle Engine Idling Yes/No This parameter displays the enable and

completion status during the current driving/monitoring cycle of each continuous legislated emission related monitor and non continuous legislated emission related monitor.
Odometer at Engine Shutdown – Excessive Idle Time Ignition ON km / miles This parameter displays the odometer reading at an engine shutdown due to excessive idle time.
Odometer at Engine Shutdown – High Coolant Temperature Ignition ON km / miles This parameter displays the odometer reading at an engine shutdown due to high coolant temperature.
Odometer at Engine Shutdown – Low Coolant Level Ignition ON km / miles This parameter displays the odometer reading at an engine shutdown due to low coolant level.
Odometer at Engine Shutdown – Low Oil Level Ignition ON km / miles This parameter displays the odometer reading at an engine shutdown due to low oil level.
Odometer When Engine Overspeed Detected Engine Idling km/miles This parameter displays the kilometers or miles of the Odometer When Engine Overspeed Detected.
Oil Level Warning Counter City Ignition ON Counts This parameter displays a rolling count of oil level debounce events for the city calibration.
Oil Level Warning Counter Country Road Ignition ON Counts This parameter displays a rolling count of oil level debounce events for the country road calibration
Oil Level Warning Counter Highway Ignition ON Counts This parameter displays a rolling count of oil level debounce events for the highway calibration.
Output Shaft Speed Sensor Engine Idling RPM This parameter displays the transmission output speed.
Park/ Neutral Position Switch (If Equipped) Engine Idling Park/Neutral This parameter indicates the range selection of the automatic transmission as calculated by the control module based on input from the PNP switch . The scan tool will display, In Gear, Park, or Neutral depending on the PNP switch position.
Park/Neutral Position Switch (RPO=MO5) Engine Idling Active/Inactive This parameter indicates the status of the Park/Neutral Position (PNP) Switch. When in Park, the PNP Switch is closed and the scan tool will display active. When in Reverse, Neutral, or Drive, the PNP Switch is open and the scan tool will display inactive.
Power Enrichment Engine Idling Inactive This parameter indicates if the control module has detected conditions appropriate to operate in Power Enrichment mode. The scan tool will display Active if the mode is in operation, and Inactive if the mode is not in operation. The control module enters Open Loop operation and increases injector pulse width when in power enrichment mode.
Power Mode Engine Idling Run This parameter displays the state of the System Power Mode. This signal is based upon the state of the system power mode received over serial communication from the vehicle electronics. If the serial data signal not received, the Parameter will display Off.
Radiator Coolant Temperature Sensor — Varies C° (F°) This parameter displays the undefaulted radiator coolant temperature measured by a sensor located in the coolant outlet of the radiator.
RCT vs. IAT Sensor Temperature at Last ECT vs. RCT Malfunction Detection Engine Idling Agree This parameter displays that the temperature values of the RCT and IAT sensors did not agree at the time of the most recent failure of the ECT/RCT rationality diagnostic.
Recommended Maximum Fuel Alcohol Content Engine Idling 0–100 % This parameter displays the percentage of the Recommended Maximum Fuel Alcohol Content.
Recommended Maximum Fuel Alcohol Content Exceeded Engine Idling No This parameter displays Yes or No if the Recommended Maximum Fuel Alcohol Content Exceeded.
Recommended Maximum Fuel Alcohol Content When Recommended Maximum Fuel Alcohol Content Exceeded Engine Idling % This parameter displays the percentage of the Recommended Maximum Fuel Alcohol Content When Recommended Maximum Fuel Alcohol Content Exceeded.
Reduced Engine Power Engine Idling Inactive This parameter displays Active if the control module is commanding reduced engine power due to a throttle actuator control (TAC) system condition.
Reduced Engine Power History Engine Idling Throttle Malfunction, Cooling Fan Malfunction, Engine Over-temperature Protection Active, Engine Oil Temperature Too High, Remote Vehicle Speed Limiting, Engine Calibration Malfunction, Engine Oil Life, High Pressure Fuel System Malfunction This parameter displays the last reason that Powertrain has illuminated the Reduced Engine Power (REP) indication.
Redundant Odometer Memory Engine Idling Present ECU Odometer Programmed indicates if the ECU odometer value has been programmed.
Refueling Events Since Recommended Maximum Fuel Alcohol Content Exceeded Engine Idling Counts This parameter displays the number Refueling Events Since Recommended Maximum Fuel Alcohol Content Exceeded.
Remaining Fuel in Tank Engine Idling 0–100 % This parameter displays the total fuel level as a percentage of the rated capacity of the fuel tank.
Remaining Fuel in Tank Engine Idling Liters/Gallons This parameter displays the actual total fuel volume contained in the fuel tank.
Remote Vehicle Start Disable History 1–8 Engine Cranking Reason for RVS Disable These parameters displays the last eight reasons the control module disabled remote vehicle start (RVS).

Remote Vehicle Start Request Signal Ignition ON Off Remote Vehicle Start Request indicates the state of the request received over serial communication from the remote vehicle start (RVS) system to start the vehicle in remote mode.
Replicated Transmission OSS Signal Ignition ON RPM This parameter displays the Replicated Transmission Output Speed (Replicated TOS) received from the Transmission Control Module.
Reverse Inhibit Solenoid Actuator Command Ignition ON Allowed This parameter displays that the driver is inhibited from shifting into reverse.
Reverse Inhibit Solenoid Actuator Control Circuit High Voltage Test Status Ignition ON OK This parameter displays the state of the reverse inhibit solenoid actuator control circuit. The parameter displays Malfunction if the reverse inhibit solenoid actuator control circuit is shorted to voltage.
Reverse Inhibit Solenoid Actuator Control Circuit Low Voltage Test Status Ignition ON OK This parameter displays the state of the reverse inhibit solenoid actuator control circuit. The parameter displays Malfunction if the reverse inhibit solenoid actuator control circuit is shorted to ground.
Reverse Inhibit Solenoid Actuator Control Circuit Open Test Status Ignition ON OK This parameter displays the state of the reverse inhibit solenoid actuator control circuit. The parameter displays Malfunction if the reverse inhibit solenoid actuator control circuit is open.
Reverse Position Switch Engine Idling Off This parameter displays if the manual transmission shifter is in reverse.
Secondary Air Injection Monitor Enabled Engine Idling Yes This parameter displays the status of the secondary air injection monitor.
Secondary Air Injection Pressure Engine Idling kPa This parameter displays the normalized secondary air injection system pressure.
Secondary Air Injection Pressure Sensor Engine Idling kPa This parameter displays the unfiltered secondary air injection system pressure.
Secondary Air Injection Pressure Sensor Engine Idling Volts This parameter displays the secondary air injection system pressure analog input as a percentage of its reference voltage.
Secondary Air Injection Pressure Sensor Variance Engine Idling kPa This parameter displays the weighted average pressure error (difference between the predicted and actual secondary air injection system pressure) during the secondary air injection on test (phase 1).
Secondary Air Injection Pump Relay Command Engine Idling Off This parameter displays the commanded state of the secondary air injection pump output.
Secondary Air Injection Pump Relay Control Circuit High Voltage Test Status Engine Idling OK This parameter displays the state of the secondary air injection pump relay control circuit. The parameter displays Malfunction if the secondary air injection pump relay control circuit is shorted to voltage.
Secondary Air Injection Pump Relay Control Circuit Low Voltage Test Status Engine Idling OK This parameter displays the state of the secondary air injection pump relay control circuit. The parameter displays Malfunction if the secondary air injection pump relay control circuit is shorted to ground.
Secondary Air Injection Pump Relay Control Circuit Open Test Status Engine Idling OK This parameter displays the state of the secondary air injection pump relay control circuit. The parameter displays Malfunction if the secondary air injection pump relay control circuit is open.
Secondary Air Injection Solenoid Valve Command Engine Idling Off This parameter displays the commanded state of the secondary air injection valve output.
Secondary Air Injection Solenoid Valve Control Circuit High Voltage Test Status Engine Idling OK This parameter displays the state of the secondary air injection solenoid valve control circuit. The parameter displays Malfunction if the secondary air injection solenoid valve control circuit is shorted to voltage.
Secondary Air Injection Solenoid Valve Control Circuit Low Voltage Test Status Engine Idling OK This parameter displays the state of the secondary air injection solenoid valve control circuit. The parameter displays Malfunction if the secondary air injection solenoid valve control circuit is shorted to ground.
Secondary Air Injection Solenoid Valve Control Circuit Open Test Status Engine Idling OK This parameter displays the state of the secondary air injection solenoid valve control circuit. The parameter displays Malfunction if the secondary air injection solenoid valve control circuit is open.
Short Term Fuel Pump Trim — # This parameter displays a numeric value. This is the short term (ST) fuel pump trim.
Short Term Fuel Trim or Short Term Fuel Trim Bank 1 or Bank 2 Engine Idling –5 % to +5 % This parameter displays the short-term correction to the fuel delivery by the control module in response to oxygen sensor 1 or 2. If the oxygen sensor indicates a lean air/fuel mixture, the control module will add fuel increasing the short term fuel trim above 0. If the oxygen sensor indicates a rich air/fuel mixture, the control module will reduce fuel decreasing the short term fuel trim below 0.
Short Term Fuel Trim Test Average or Short Term Fuel Trim Test Average Bank 1 or Bank 2 Engine Idling 0–100 % This parameter display's the filtered short term closed loop fuel correction. This value is compared to

thresholds to determine if the fuel adjustment system diagnostic is passing or failing or if an excess purge vapor test should be executed.
Short Term Secondary O2 Sensor Fuel Trim Bank 1 or 2 Ignition ON 0–100 % This parameter displays the Short Term Secondary O2 Sensor Fuel Trim for Bank 1 or 2.
Skip Shift Solenoid Actuator Command Ignition ON No Skip This parameter indicates that the skip shift solenoid is commanded on, inhibiting the driver from shifting up to one of the next highest gears.
Skip Shift Solenoid Actuator Control Circuit High Voltage Test Status Ignition ON OK This parameter displays the state of the skip shift solenoid actuator control circuit. The parameter displays Malfunction if the skip shift solenoid actuator control circuit is shorted to voltage.
Skip Shift Solenoid Actuator Control Circuit Low Voltage Test Status Ignition ON OK This parameter displays the state of the skip shift solenoid actuator control circuit. The parameter displays Malfunction if the skip shift solenoid actuator control circuit is shorted to ground.
Skip Shift Solenoid Actuator Control Circuit Open Test Status Ignition ON OK This parameter displays the state of the skip shift solenoid actuator control circuit. The parameter displays Malfunction if the skip shift solenoid actuator control circuit is open.
Specific Humidity Ignition ON 0–100 % This parameter shows the current specific humidity level.
Starter Pinion Solenoid Actuator Relay Command Engine Cranking On / Off This parameter indicates the commanded state of the Starter Pinion Solenoid Actuator relay.
Starter Pinion Solenoid Actuator Relay Control Circuit High Voltage Test Status Engine Cranking OK, Malfunction, Not Run This parameter displays the Starter Pinior Solenoid Actuator Relay Control Circuit High Voltage Test Status. Can display OK, Malfunction, or Not Run.
Starter Pinion Solenoid Actuator Relay Control Circuit Low Voltage Test Status Engine Cranking OK, Malfunction, Not Run This parameter displays the Starter Pinior Solenoid Actuator Relay Control Circuit Low Voltage Test Status. Can display OK, Malfunction, or Not Run.
Starter Pinion Solenoid Actuator Relay Control Circuit Open Test Status Engine Cranking OK, Malfunction, Not Run This parameter displays the Starter Pinior Solenoid Actuator Relay Control Circuit Open Circuit Test Status. Can display OK, Malfunction, or Not Run.
Starter Relay Command Ignition switch not in the crank position Off This parameter indicates whether the control module is commanding the starter relay to go On or Off.
Ignition switch in the crank position On
Starter Relay Control Circuit High Voltage Test Status Ignition ON OK This parameter displays the state of the starter relay control circuit. The parameter displays Malfunction if the starter relay control circuit is shorted to voltage. This parameter may not change if the scan tool is used to command the relay control circuit On.
Starter Relay Control Circuit Low Voltage Test Status Ignition ON OK This parameter displays the state of the starter relay control circuit. The parameter displays Malfunction if the starter relay control circuit is shorted to ground. This parameter may not change if the scan tool is used to command the relay control circuit On.
Starter Relay Control Circuit Open Test Status Ignition ON OK This parameter displays the state of the starter relay control circuit. The parameter displays Malfunction if the starter relay control circuit is open. This parameter may not change if the scan tool is used to command the relay control circuit On.
Start-Up ECT Ignition ON –39° to 140°C (–38° to 284°F) This parameter displays the temperature of the engine coolant on start-up based on input to the control module from the ECT sensor.
Start-Up Fuel Rail Temperature Engine Idling ºC (ºF) This parameter indicates the fuel rail temperature when the engine was started from the first sensor located on the fuel rail.
Start-Up Fuel Rail Temperature 1 Engine Idling ºC (ºF) This parameter indicates the fuel rail temperature when the engine was started from the first sensor located on the fuel rail.
Start-Up Fuel Rail Temperature 2 Engine Idling ºC (ºF) This parameter indicates the fuel rail temperature when the engine was started from the second sensor located on the fuel rail.
Start-Up IAT Sensor or Start-Up IAT Sensor 1 or 2 Ignition ON –39° to 140°C (–38° to 284°F) This parameter displays the temperature of the intake air at start in the air induction system based on input to the control module from the IAT sensor.
Start-Up IAT Sensor 3 Engine Idling ºC (ºF) This parameter indicates the intake air temperature when the engine was started.
Stop/Start Disable Mode Ignition ON Active / Inactive / Not Available This parameter indicates the status of the Stop/Start Disable Mode.
Supercharger Bypass Solenoid Valve Command Ignition ON 0–100 % This parameter displays the commanded duty cycle for the supercharger boost solenoid output.
Supercharger Bypass Solenoid Valve Control Circuit High Voltage Test Status Ignition ON OK This parameter displays the state of the supercharger bypass solenoid valve control circuit. The parameter displays

Malfunction if the supercharger bypass solenoid valve control circuit is shorted to voltage.
Supercharger Bypass Solenoid Valve Control Circuit Low Voltage Test Status Ignition ON OK This parameter displays the state of the supercharger bypass solenoid valve control circuit. The parameter displays Malfunction if the supercharger bypass solenoid valve control circuit is shorted to ground.
Supercharger Bypass Solenoid Valve Control Circuit Open Test Status Ignition ON OK This parameter displays the state of the supercharger bypass solenoid valve control circuit. The parameter displays Malfunction if the supercharger bypass solenoid valve control circuit is open.
Supercharger Inlet Pressure Engine Idling kPa This parameter displays the supercharger inlet vacuum pressure calculated as the difference between ambient air pressure (barometric pressure) and supercharger inlet absolute pressure (SCIAP).
Supercharger Inlet Pressure Sensor Engine Idling kPa This parameter displays the unfiltered supercharger inlet absolute pressure (SCIAP).
Supercharger Inlet Pressure Sensor Engine Idling Volts This parameter displays the supercharger inlet absolute pressure (SCIAP) analog input as a percentage of its reference voltage.
SVS Indicator Command Ignition ON Off This parameter displays that the Service Vehicle Soon lamp is being commanded on due to the failure of a non emission related diagnostic test.
System Off Ignition ON No This parameter displays that the vehicle is waiting for a key crank to happen (key crank not done yet).
TAC Forced Engine Shutdown Ignition ON No This parameter indicates the status of the TAC motor by the control module. The scan tool will display Yes if the engine has been shut down due to a throttle control fault.
TAC Motor Ignition ON Enabled This parameter indicates the status of the throttle actuator control (TAC) motor driver in the control module. The scan tool will display Enabled if TAC motor operation is allowed. The scan tool will display Disabled if the control module detects a condition that affects TAC motor operation.
TAC Motor Command Ignition ON 0–100 % This parameter displays the commanded duty cycle for the throttle actuator output.
TCC/Cruise Control Brake Pedal Switch Ignition ON Applied / Released This parameter indicates the state of the TCC/Cruise Control Brake Pedal Switch.
Throttle Body Idle Air Flow Compensation Engine Idling 0–100 % This parameter displays the percent compensation of the Learned Airflow Variation Calibration. This value indicates the current amount of airflow compensation in response to engine intake airflow restrictions. It can also be used as feedback for the Learned Airflow Adapts Reset Trigger Device Control.
Throttle Position Ignition ON 0–100 % This parameter displays the desired throttle position angle commanded by the control module.
Throttle Position Performance Test Engine Idling OK Throttle Position Residual Out of Tolerance indicates that the filtered throttle position residual (the product of the MAF residual and the MAP Test 1 residual) exceeds a failure threshold.
Throttle Position Sensor 1 Ignition ON 3.7–4.3 Volts This parameter displays the actual voltage on the TP sensor 1 signal circuit as measured by the control module.
Throttle Position Sensor 1 Learned Minimum Ignition ON 0.51 Volts This parameter displays the learned minimum value of throttle position (TP) sensor 1 as recorded by the control module during the last learn procedure.
Throttle Position Sensor 1 or 2 Position Ignition ON 0–100 % This parameter displays the actual voltage on the TP sensor 2 signal circuit as measured by the control module.
Throttle Position Sensor 2 Ignition ON 0.5–0.8 Volts This parameter displays the voltage signal sent to the control module from TP sensor 2 of the throttle assembly. The TP sensor 2 is a range of values indicating a low voltage when the throttle is closed to a high voltage when the throttle plate is fully open.
Throttle Position Sensor 2 Learned Minimum Ignition ON 0.51 Volts This parameter displays the learned minimum value of TP sensor 2 as recorded by the control module during the last learn procedure.
Throttle Position Sensors 1 and 2 Ignition ON Agree This parameter displays Disagree when the control module detects that TP sensor 1 voltage signal is not within the correct relationship to TP sensor 2. The scan tool displays Agree under the normal operating conditions.
Tire Size Ignition ON Rev/km This parameter displays the vehicle tire circumference in centimeters.
Torque Delivered Signal Vehicle Moving Nm/Lb/Ft This parameter displays the engine torque based upon the airflow through the engine and the torque losses due to spark retard and fuel shutoff. Since this is a steady state engine torque, it does not include the inertial component of engine torque.
Torque Management Ignition Timing Retard Engine Idling Degrees This parameter displays the total spark retard (in terms of a crankshaft angle).
Torque Request Inhibit – Fuel Engine Idling No This parameter displays the existing condition in the ECM causing the transmission torque request to be limited.
Torque Request Inhibit – Ignition Timing Engine Idling No This parameter displays the existing condition in the ECM causing the transmission torque request to be limited.

Torque Request Inhibit – Ignition Timing Advance Engine Idling No This parameter displays the existing condition in the ECM causing the transmission torque request to be limited.
Torque Request Inhibit – Minimum Idle Engine Idling No This parameter displays the existing condition in the ECM causing the transmission torque request to be limited.
Torque Request Inhibit – Minimum Torque Engine Idling No This parameter displays the existing condition in the ECM causing the transmission torque request to be limited.
Torque Request Inhibit – TAC Engine Idling No This parameter displays the existing condition in the ECM causing the transmission torque request to be limited.
Torque Request Inhibit – TAC Limit Engine Idling No This parameter displays the existing condition in the ECM causing the transmission torque request to be limited.
Total Alternative Fuel Level Percentage Ignition ON 0–100 % This parameter displays the undefaulted, total alternative fuel level as a percentage of the rated (advertised) capacity of the alternative fuel tank(s).
Total Engine Mass Air Flow Engine Idling g/s This parameter indicates the engine mass airflow.
Total Engine Overspeed Time Engine Idling ms This parameter displays the Total Engine Overspeed Time.
Total Knock Retard Engine Idling 0° This parameter displays how much ignition spark timing is being retarded due to all control systems monitored by the control module.
Total Misfire Engine Idling 0 This parameter displays the total number of cylinder firing events that the control module detected as misfires for the last 200 crankshaft revolution sample period.
Traction Control Axle Torque Request Signal Vehicle Moving Nm (lb ft) This parameter indicates the axle torque requested by the traction control module.
Traction Control Status Vehicle Moving Inactive This parameter displays Active if the electronic brake and traction control module (EBTCM) is commanding traction control.
Transmission Fluid Pressure Accumulator Solenoid Valve Command Ignition ON On/Off This parameter displays the position of the Transmission Fluid Pressure Accumulator Solenoid Valve Control.
Transmission Fluid Pressure Accumulator Solenoid Valve Control Circuit High Voltage Test Status Ignition ON OK, Malfunction, Not Run This parameter displays the state of the Transmission Fluid Pressure Accumulator Solenoid Valve Control Circuit. The parameter displays Malfunction if the Transmission Fluid Pressure Accumulator Solenoid Valve Control Circuit is shorted to voltage.
Transmission Fluid Pressure Accumulator Solenoid Valve Control Circuit Low Voltage Test Status Ignition ON OK, Malfunction, Not Run This parameter displays the state of the Transmission Fluid Pressure Accumulator Solenoid Valve Control Circuit. The parameter displays Malfunction if the Transmission Fluid Pressure Accumulator Solenoid Valve Control Circuit is shorted to ground.
Transmission Fluid Pressure Accumulator Solenoid Valve Control Circuit Open Test Status Ignition ON OK, Malfunction, Not Run This parameter displays the state of the Transmission Fluid Pressure Accumulator Solenoid Valve Control Circuit. The parameter displays Malfunction if the Transmission Fluid Pressure Accumulator Solenoid Valve Control Circuit is open.
Transmission Fluid Temperature Sensor Ignition ON °C (°F) This parameter displays the undefaulted, unfiltered transmission oil / fluid temperature measured by a sensor.
Turbocharger 1 Turbine Inlet Valve Control Circuit High Voltage Test Status Ignition ON OK This parameter displays the state of the turbocharger 1 turbine inlet valve control circuit. The parameter displays Malfunction if the turbocharger 1 turbine inlet valve control circuit is shorted to voltage.
Turbocharger 1 Turbine Inlet Valve Control Circuit Open Test Status Ignition ON OK This parameter displays the state of the turbocharger 1 turbine inlet valve control circuit. The parameter displays Malfunction if the turbocharger 1 turbine inlet valve control circuit is open.
Turbocharger 1 Turbine Inlet Valve Duty Cycle Ignition ON 0–100 % This parameter displays the commanded duty cycle for the turbocharger 1 turbine inlet valve in a percentage.
Turbocharger Bypass Solenoid Valve Command Ignition ON 0–100 % This parameter displays the commanded duty cycle for the turbocharger bypass solenoid valve in a percentage.
Turbocharger Bypass Solenoid Valve Control Circuit High Voltage Test Status Ignition ON OK This parameter displays the state of the turbocharger bypass solenoid valve control circuit. The parameter displays Malfunction if the turbocharger bypass solenoid valve control circuit is shorted to voltage.
Turbocharger Bypass Solenoid Valve Control Circuit Low Voltage Test Status Ignition ON OK This parameter displays the state of the turbocharger bypass solenoid valve control circuit. The parameter displays Malfunction if the turbocharger bypass solenoid valve control circuit is shorted to ground.
Turbocharger Bypass Solenoid Valve Control Circuit Open Test Status Ignition ON OK This parameter displays the state of the turbocharger bypass solenoid valve control circuit. The parameter displays Malfunction if the turbocharger bypass solenoid valve control circuit is open.
Turbocharger Wastegate Solenoid Valve Command Ignition ON 0–100 % This parameter displays the commanded duty cycle for the turbocharger wastegate solenoid valve in a percentage.
Turbocharger Wastegate Solenoid Valve Control Circuit High Voltage Test Status Ignition ON OK This parameter

displays the state of the turbocharger wastegate solenoid valve control circuit. The parameter displays Malfunction if the turbocharger wastegate solenoid valve control circuit is shorted to voltage.
Turbocharger Wastegate Solenoid Valve Control Circuit Low Voltage Test Status Ignition ON OK This parameter displays the state of the turbocharger wastegate solenoid valve control circuit. The parameter displays Malfunction if the turbocharger wastegate solenoid valve control circuit is shorted to ground.
Turbocharger Wastegate Solenoid Valve Control Circuit Open Test Status Ignition ON OK This parameter displays the state of the turbocharger wastegate solenoid valve control circuit. The parameter displays Malfunction if the turbocharger wastegate solenoid valve control circuit is open.
Upshift Indicator Command Vehicle Moving Off This parameter displays On when commanded by the engine control module.
Variable Valve Lift Low Lift Disable History 1–8 Engine Idling Varies This parameter displays the reason for the last 8 variable valve lift disable history reasons.
Variable Valve Lift Low Lift Inhibit – Reason Engine Idling Varies This parameter lists the reason the variable valve lift low lift may be inhibited. These include; 4WD Low State Invalid, A/C Compressor Clutch On, Acceleration Request, Brake Booster Pressure Sensor DTC, Brake Booster Weak Vacuum, Calculated Torque, Camshaft Position Sensor DTC, Control Function Active, Crankshaft Position Sensor DTC, ECT, ECT Sensor DTC, Engine Controls Ignition Relay DTC, Engine Not Synchronized, Engine Off, Engine Oil Pressure, Engine Oil Pressure Control Solenoid Valve Stuck Off, Engine Oil Pressure Control Test Active, Engine Oil Pressure Sensor DTC, Engine Oil Temperature, Engine Overtemperature Protection, Engine Power Not Requested, Engine Speed, Engine Torque Capacity, Fuel Alcohol Content Learn In Progress, Fuel Alcohol Content Too High, Fuel System Disabled, Green Engine Mode, HO2S 2 Test, Hot Coolant Mode, Hybrid/EV Powertrain Control Module Request, IAT Sensor DTC, Ignition Voltage, MAP Sensor DTC, Maximum Throttle Exceeded, Minimum Time After TAC DTC, Misfire DTC, Oil Aeration. On-Board Diagnostic System, Rocker Arm Solenoid Valve DTC, RPM Limit, TAC System DTC, Transmission Gear, Transmission Range, Transmission Shifting, Vehicle Speed Too Low, VSS DTC.
Variable Valve Lift System Command — Low Lift This parameter displays the current state of the variable valve lift system command.
Vehicle Speed Sensor Vehicle Moving Km/h mph This parameter displays the speed of the vehicle as calculated by the transmission control module (TCM) from information received from the vehicle speed sensor (VSS).
Vehicle Speed When Engine Overspeed Detected Engine Idling Km/h mph This parameter displays the Vehicle Speed When Engine Overspeed Detected.
VIN Programming Counter Ignition ON Counts This parameter displays the number of times the VIN has been programmed. This counter can only be incremented.
Warm Ups Since DTC Cleared Engine Idling Counts This parameter indicates the number of warm up cycles that have occurred Since DTCs were cleared. The scan tool will display a higher counts as more warm up cycles have occurred since the DTCs were cleared.
Warm Ups without Emission Malfunctions Engine Idling Counts This parameter displays the number of OBD defined warm up cycles since the last emissions related (fault type A or B) fail report or MIL request. Emissions related DTCs are cleared from memory when this counter reaches 40.
Warm Ups without Non Emission Malfunctions Engine Idling Counts This parameter displays the number of OBD defined warm up cycles since the last non emissions related (fault type C) fail report. Non emissions related DTCs are cleared from memory when this counter reaches 40.
Weight Percent Water in Air Engine Idling 0–100 % This parameter displays the calculated value of weight per cent water (specific humidity) in the intake air.
Wide Open Throttle Engine Idling No This parameter displays the throttle status commanded by the control module. The scan tool will display Yes if the vehicle throttle is commanded to 100 percent.
Wide Open Throttle Ignition ON No This parameter displays the desired throttle position exceeds a WOT threshold (selected specifically for service).
Output Control Description
This is a comprehensive list. Not all output controls listed are available for all applications.
A/C Compressor Clutch Relay This device control is used to override the state of the air conditioning compressor output.
Active Grill Air Shutter 1 or 2 Commanded Position This device control is used to command the position of the active grill air shutter 1 or 2 output. 0% equals fully closed, 100% equals fully open.
Alternative Fuel High Pressure Shutoff Valve Control This device control is used to override the state of the alternative fuel shutoff valve 1 output.
Alternative Fuel Injector Disable Control This device control is used with the engine running to override the state of the alternative fuel injector outputs. This device control is used to disable alternative fuel injectors in order to cut off alternative fuel to the associated cylinders.
Alternative Fuel Injector Flow Control This device control is used to trigger a single Alternative fuel injector to be commanded on for a calibrated number of pulses (e.g. 25) in order to test the flow of the

Alternative fuel injector.
Alternative Fuel Low Pressure Shutoff Valve Control This device control is used to verify functionality of the Alternative Fuel Low Pressure Fuel Shutoff Valve system by allowing the Alternative Fuel Low Pressure Fuel Shutoff Valve output to be commanded to a specific Alternative Fuel Rail Pressure.
Alternative Fuel System Leak Test – Service Bay Test This device control will signal the ECM to begin the Alternative Fuel System Leak Test.
Autostop/Autostart This device control is used to override the internal combustion engine (ICE) running state.
BiFuel System – Fuel Mode Selection When this CPID is active, the fuel mode is commanded to the selection made in “Fuel Mode Selection.”
Brake Pedal Position Learn This device control is used to reset the brake pedal fully released learned position to its initialized value after a brake system repair.
Camshaft Profile Actuator Stuck On Reset This device control is used to reset a latched default action when the camshaft profile actuator control is stuck on. The device control will work in conjunction with the vehicle diagnostics to ensure a proper system check before allowing normal vehicle operation.
Camshaft Profile Actuator System This device control is used to override the state
Compression Test This device control is used to set up the internal combustion engine for a compression test. The fuel pump, fuel injectors, and spark are all disabled. The throttle is opened to a Wide Open Throttle (WOT) position. For conventional engine vehicles, the extended crank feature is not active, and for strong hybrid vehicles, the Hybrid Powertrain Control Module is configured to crank at the speed specified in the device control command. Engine cranking is completely controlled by the technician either through the ignition key or through a remote starter switch as applicable. The device control limits and rejects will apply normally upon entry to the device control. Once the device control is active, the limits will be monitored (to prevent unwanted starter operation, for example), but in the case of a limit exceeded or a tester disconnect, device control of the fuel and spark will not be released until the Power Mode switches to Accessory or OFF. This will prevent unexpected fuel and spark operation in the case of a device control abort.
Coolant Fill This device control is used to start an automatic coolant fill service routine that will ensure proper fill and de-aeration of the cooling system.
Cooling Fan Relay 1 This function activates the cooling fan relay 1. The normal commanded state of the fan relay is NONE. The relay command status can also be monitored on the scan tool data parameter Cooling Fan Relay 1 Command. The control module allows cooling fan relay control when the following conditions are met: The Ignition is ON or the engine is running. A/C compressor operation is not requested. The engine coolant temperature is less than 106°C (224°F).
- The Ignition is ON or the engine is running.
- A/C compressor operation is not requested.
- The engine coolant temperature is less than 106°C (224°F).

Cooling Fan Relay 1,2 and 3 This function activates the cooling fan relay 1, 2 and 3. The normal commanded state of the fan relays is NONE. The relay command status can also be monitored on the scan tool data parameters Cooling Fan Relay 1 Command and Cooling Fan Relays 2 and 3 Command. The control module allows cooling fan relay control when the following conditions are met: The Ignition is ON or the engine is running. A/C compressor operation is not requested. The engine coolant temperature is less than 106°C (224°F).
Cooling Fan 2 and 3 This function activates the cooling fan relay 2 and relay 3. The normal commanded state of the fan relays is NONE. The relay command status can also be monitored on the scan tool data parameter 2 and 3 Command. The control module allows cooling fan relay control when the following conditions are met: The Ignition is ON or the engine is running. A/C compressor operation is not requested. The engine coolant temperature is less than 106°C (224°F).
Crankshaft Position Variation Learn This device control is used to activate the crankshaft position variation learn algorithm which calculates the reference pulse correction factors for the misfire diagnostic.
Cylinder Power Balance Note: The Misfire Current and Misfire History parameters may not increment when using this function. This function disables the selected fuel injector. The normal commanded state is None. The scan tool initiates the test when the following conditions are met: The engine is operating and the engine idle is stable. The vehicle speed is 0 km/h (0 mph). There are no DTCs set for the vehicle speed sensor. If the fuel injector was disabled for 30 seconds, fuel injector control is not allowed again on the same fuel injector for 60 seconds.
- The engine is operating and the engine idle is stable.
- The vehicle speed is 0 km/h (0 mph).
- There are no DTCs set for the vehicle speed sensor.

Cylinder 1–4 Exhaust Camshaft Profile Sleeve This device control is used to override the state. In order to command Deactivate on the B camshaft, the A camshaft profile for the same cylinder must be commanded to Deactivate.
Cylinder 1–4 Intake Camshaft Profile Sleeve This device control is used to override the state. Upon return to

normal control, the system shall actuate the camshaft profile control sleeve as necessary to the system desired position.

Depressurize Fuel System When the low pressure fuel pump is used in conjunction with a separate high pressure fuel pump for Direct Injection (DI) engines, this device control can be used to reduce the high fuel pressure to a low working level. The high fuel pressure control shall monitor the low pressure “Fuel Pump Device Control with Engine Running” such that when the low pressure pump is commanded OFF the high pressure pump will be controlled to a low pressure value. This combination shall be held until either the FPMR device control is released, or the engine stalls.

Engine Controls Ignition Relay This device control is used to override the state of the Powertrain Relay.

Engine Coolant Thermostat Heater This device control is used to override the state of the Engine Coolant Thermostat Heater.

Engine Oil Life Reset This DID contains the engine oil remaining life determined from an algorithm based upon the effective engine revolutions and the distance driven since the last oil change. This DID may be used to reset the engine oil remaining life to 100 % after an oil change or to any other value when replacing a control module.

Engine Oil Pressure Control Solenoid Valve This device control is used to override the state of the variable displacement oil pump. When the variable displacement oil pump is turned on, the oil pump will be commanded to a low pressure state.

Engine Speed This function controls the idle speed override in 25 RPM, 100 RPM, and 500 RPM increments, from the base idle speed to 1,400 RPM. The scan tool initiates the test when the following conditions are met: The transmission is in park or neutral. The engine speed is less than 1,000 RPM. The engine speed will remain in the commanded state until cancelled by the scan tool.

- The transmission is in park or neutral.
- The engine speed is less than 1,000 RPM.

EVAP Purge/Seal Note: The EVAP Purge and Vent Solenoid Command parameters may not change states when using this output control. This function activates both the EVAP purge solenoid valve and EVAP vent solenoid to seal the EVAP system. When activated, the purge valve is commanded to 0 percent and the vent valve is commanded ON, Not-venting. The normal commanded state for both solenoids is None. Both of the solenoids remain in the commanded state until cancelled by the scan tool or the FTP sensor exceeds –24 mm Hg (–12 inch H20).

EVAP Purge Solenoid Valve Note: The EVAP Purge Solenoid Command parameter may not change states when using this output control. This function controls the evaporative emission (EVAP) purge solenoid valve. The normal commanded state is NONE. The system will increase or decrease the amount of purge by changing the duty cycle of the purge valve in 10 percent increments within a range of 0–100 percent. The system remains in the commanded state until cancelled by the scan tool or the fuel tank pressure (FTP) sensor exceeds –24 mm Hg (–12 inch H20).

EVAP Test This device control is used to activate the evaporative emissions service bay test.

EVAP Vent Solenoid Valve Note: The EVAP Vent Solenoid Command parameter may not change states when using this output control. This function controls the EVAP vent solenoid. The normal commanded state is NONE. When commanded ON, the vent valve switches to Not-venting. The system remains in the commanded state unless one of the following conditions occur: Cancelled by the scan tool The EVAP canister purge solenoid is more than 0 percent, and the FTP sensor exceeds –24 mm Hg (–12 inch H20).

- Cancelled by the scan tool
- The EVAP canister purge solenoid is more than 0 percent, and the FTP sensor exceeds –24 mm Hg (–12 inch H20).

Excessive Clutch Slip Data Reset This device control is used to reset all clutch slip detection values.

Exhaust Camshaft Position Actuator or Exhaust Camshaft Position Actuator Bank 1 This device control is used to override the state of the exhaust cam phase output. The commanded camshaft position is expressed in terms of degrees of camshaft rotation (retard for exhaust camshaft) from the park position (a camshaft position of zero represents the park position).

Exhaust Camshaft Position Actuator or Exhaust Camshaft Position Actuator Bank 2 This device control is used to override the state of the exhaust cam phase output. The commanded camshaft position is expressed in terms of degrees of camshaft rotation (retard for exhaust camshaft) from the park position (a camshaft position of zero represents the park position).

Exhaust Camshaft Position Actuator Solenoid Valve or Exhaust Camshaft Position Actuator Solenoid Valve Bank 1 This device control is used to override the state of the exhaust cam phase solenoid output.

Exhaust Camshaft Position Actuator Solenoid Valve or Exhaust Camshaft Position Actuator Solenoid Valve Bank 2 This device control is used to override the state of the exhaust cam phase solenoid output.

Exhaust Camshaft Profile Actuator This device control is used to override the state of the B camshaft profile actuator control outputs. The device control is intended as an electrical test and is only allowed with the actuator connector disconnected. This is confirmed by having the open circuit fault active for the camshaft

profile actuator position sensor and at least one of the two camshaft profile actuator control outputs on the actuator assembly the device control is being requested for.
Fuel Composition Reset Note: Do not use this output control unless the actual alcohol content of the fuel in the tank is 10 percent or less. This will reset the learned alcohol composition to 0 percent in the engine control module (ECM).
Fuel Control Loop Status This function controls the heated oxygen sensor (HO2S) loop status. The commanded states include NONE, OPEN, and CLOSED. The normal commanded state is NONE. The loop status changes as commanded, OPEN or CLOSED. The system remains in the commanded state until cancelled by the scan tool.
Fuel Injector Balance Test (If Available) This function enables the fuel injector in order to verify the correct fuel injector flow. The ECM will pulse the selected fuel injector when the following conditions are met: All instruction on the scan tool is complete. A fuel injector is selected. The ignition is ON with the engine OFF. The selected fuel injector can only be flowed/pulsed once per ignition cycle.
- All instruction on the scan tool is complete.
- A fuel injector is selected.
- The ignition is ON with the engine OFF.

Fuel Mode Indicator Lamp System This device control is used to verify the functionality of the Fuel Mode Indicator Lamp.
Fuel Pressure This function allows control of the fuel rail pressure (FRP) regulator which is integral to the high pressure fuel pump. The system will Increase or Decrease the fuel rail pressure in increments, as commanded within an approximate range of 1862–17,237 kPa (270–2500 psi). The scan tool initiates the test when the following conditions are met: The engine is operating The ignition voltage is 10–18 V The vehicle speed is 0 mph DTC P0700 is not set The system remains in the commanded state for about 30 seconds or until cancelled by the scan tool or the ECM detects a vehicle speed.
- The engine is operating
- The ignition voltage is 10–18 V
- The vehicle speed is 0 mph
- DTC P0700 is not set

Fuel Pressure Regulator Note: As this is an electrical circuit test, a regulator solenoid commanded to ON does not necessarily equate to the regulator state at maximum fuel pressure. This device control is intended for use on a Direct Injection (DI) high pressure fuel supply system to activate the fuel pressure regulator at ignition ON, engine OFF. Both the low side and high side of the regulator are controlled together. Commanding the regulator to ON will modulate the high side driver to a calibratible Maximum Duty Cycle.
Fuel Pump Enable This function controls the fuel pump. The normal commanded state is NONE. The scan tool initiates the test when the following conditions are met: There are no vehicle speed sensor DTCs set. The vehicle speed is 0 km/h (0 mph). When commanded ON/OFF, the engine control module (ECM) turns the fuel pump ON/OFF. If the engine is running and the fuel pump is commanded OFF, the engine will stall. The system remains in the commanded state for about 2 seconds or until cancelled by the scan tool or the ECM detects a vehicle speed.
- There are no vehicle speed sensor DTCs set.

Fuel Pump Speed This device control is used to override the normal control of the fuel pump output. The device control is a service diagnostic aid that is used to determine if the fuel pump system is functioning properly. Different limit checks are used when the engine is and is not running for the operation of the fuel pump.
Fuel Rail Pressure This device control is intended for use on a Direct Injection (DI) high pressure fuel supply system to override the commanded fuel high pressure output from the powertrain controller.
Fuel Trim Enable This function disables the control modules ability to learn new fuel trim parameters. The commanded states are NONE, ENABLED, DISABLED. The normal commanded state is NONE. The system remains in the commanded state until cancelled by the scan tool.
Fuel Trim Reset This function is used to reset the learned fuel trim values to their initial values.
Generator L-Terminal Commands the generator L terminal ON and OFF.
Heater Coolant Pump This device control is used to override the state of the heater core pump relay output.
HO2S Heater Sensor 1 or HO2S Heater Bank 1 Sensor 1 This device control is used to override the duty cycle of the oxygen sensor heaters. With the engine OFF, this device control is intended to be used as a discrete control for circuit diagnosis. With the engine OFF, none of the oxygen sensor heaters can be commanded ON for more than 3.0 seconds, after which the selected oxygen sensor heater must be disabled for a limited duration (typically 60 seconds) before it may be enabled again. With the engine running, this device control is used to operate the oxygen sensor heaters at the various duty cycles available to the engine controller.
HO2S Heater Sensor 2 or HO2S Heater Bank 1 Sensor 2 This device control is used to override the duty cycle of the oxygen sensor heaters. With the engine OFF, this device control is intended to be used as a discrete control for circuit diagnosis. With the engine OFF, none of the oxygen sensor heaters can be commanded ON for more than 3.0 seconds, after which the selected oxygen sensor heater must be disabled for a limited duration

(typically 60 seconds) before it may be enabled again. With the engine running, this device control is used to operate the oxygen sensor heaters at the various duty cycles available to the engine controller.
HO2S Heater Bank 2 Sensor 1 This device control is used to override the duty cycle of the oxygen sensor heaters. With the engine OFF, this device control is intended to be used as a discrete control for circuit diagnosis. With the engine OFF, none of the oxygen sensor heaters can be commanded ON for more than 3.0 seconds, after which the selected oxygen sensor heater must be disabled for a limited duration (typically 60 seconds) before it may be enabled again. With the engine running, this device control is used to operate the oxygen sensor heaters at the various duty cycles available to the engine controller.
HO2S Heater Bank 2 Sensor 2 This device control is used to override the duty cycle of the oxygen sensor heaters. With the engine OFF, this device control is intended to be used as a discrete control for circuit diagnosis. With the engine OFF, none of the oxygen sensor heaters can be commanded ON for more than 3.0 seconds, after which the selected oxygen sensor heater must be disabled for a limited duration (typically 60 seconds) before it may be enabled again. With the engine running, this device control is used to operate the oxygen sensor heaters at the various duty cycles available to the engine controller.
HO2S Heater Learn This device control is used to trigger the reset of the learned resistances for the oxygen sensor heaters following a replacement in service. The learned resistances are reset to a calibration used to prevent overheating of the sensors until more accurate resistances may be learned following an extended engine OFF time (typically 12 or more hours).
Idle Ignition Timing Disables and enables idle spark advance with the engine running.
Idle Learn This function allows the throttle position and the idle speed to be relearned by the ECM, once the following conditions have been met. The ignition is ON with the engine OFF. The ECT is between 5–85°C (41–185°F). No throttle actuator control (TAC) system DTCs are set.
- The ECT is between 5–85°C (41–185°F).
- No throttle actuator control (TAC) system DTCs are set.
Ignition Timing Retard This device control is used to retard the spark angle from the software calculated spark angle. For example, if the software calculated spark angle was 15 degrees advanced and this device control requested a 3 degree retard, the commanded spark angle that would be delivered would be 12 degrees advanced.
Intake Air Heater This device control is used to override the state of the intake air heater.
Intake Camshaft Position Actuator or Intake Camshaft Position Actuator Bank 1 This device control is used to override the state of the intake cam phase output. The commanded camshaft position is expressed in terms of degrees of camshaft rotation (advance for intake camshafts) from the park position (a camshaft position of zero represents the park position).
Intake Camshaft Position Actuator or Intake Camshaft Position Actuator Bank 2 This device control is used to override the state of the intake cam phase output. The commanded camshaft position is expressed in terms of degrees of camshaft rotation (advance for intake camshafts) from the park position (a camshaft position of zero represents the park position).
Intake Camshaft Position Actuator Solenoid Valve or Intake Camshaft Position Actuator Solenoid Valve Bank 1 This device control is used to override the state of the intake cam phase solenoid output.
Intake Camshaft Position Actuator Solenoid Valve or Intake Camshaft Position Actuator Solenoid Valve Bank 2 This device control is used to override the state of the intake cam phase solenoid output.
Intake Camshaft Profile Actuator This device control is used to override the state of the A camshaft profile actuator control outputs. The device control is intended as an electrical test and is only allowed with the actuator connector disconnected. This is confirmed by having the open circuit fault active for the camshaft profile actuator position sensor and at least one of the two camshaft profile actuator control outputs on the actuator assembly the device control is being requested for.
Intake Rocker Arm Solenoid Valve 1–2 or 1 and 2 When the engine is running, this device control may be used to command intake valve opening to low or high (high being default when the solenoid is not energized) valve lift mode either in cylinder pairs or as a system.
Malfunction Indicator Lamp (MIL) This function controls the malfunction indicator lamp (MIL). The normal commanded state is NONE. When commanded ON/OFF, the ECM turns the MIL ON/OFF. The system remains in the commanded state until cancelled by the scan tool.
Mass Air Flow Sensor Supply Voltage This device control is used to override the state of the mass air flow sensor supply voltage output.
Misfire Graphic This function clears the misfire graphics from the scan tool.
Oil Life Reset This output control is used to reset the engine oil life monitor from 0 to 100 %.
Remote Vehicle Start Disable History Reset This function clears the remote vehicle start (RVS) disable history. When RESET is selected the reason the control module did not allow RVS in the last 8 attempts is cleared.
Secondary Air Injection Pump Relay This device control is used to turn the AIR Pump ON or OFF.

Secondary Air Injection Solenoid Valve This device control is used to turn the AIR Valve ON or OFF.
Secondary Air Injection Test This device control is used to trigger the secondary air injection (SAI) diagnostic service bay test, which causes the on board SAI diagnostic to execute until it is completed or aborted.
Starter Relay (If Available) Commands the starter relay ON and OFF.
Throttle Position This device control is used to override the commanded throttle position.
Throttle Sweep This function moves the Throttle plate slowly from a closed position to wide open position, aiding diagnosis of TAC motor.
Transmission Fluid Pressure Accumulator Solenoid Valve This device control is used to override the state of the Transmission Fluid Pressure Accumulator Solenoid Valve.
Turbocharger Bypass Solenoid Valve This device control is used to control the duty cycle for the turbocharger A compressor bypass.
Turbocharger Wastegate Solenoid Valve This device control is used to control the duty cycle for the turbocharger A wastegate.

New / Updated Parts (itype_117)

Tsbs
- Engine - THIS BULLETIN HAS BEEN CANCELED (04-06-04-054E, 2012/08/06)