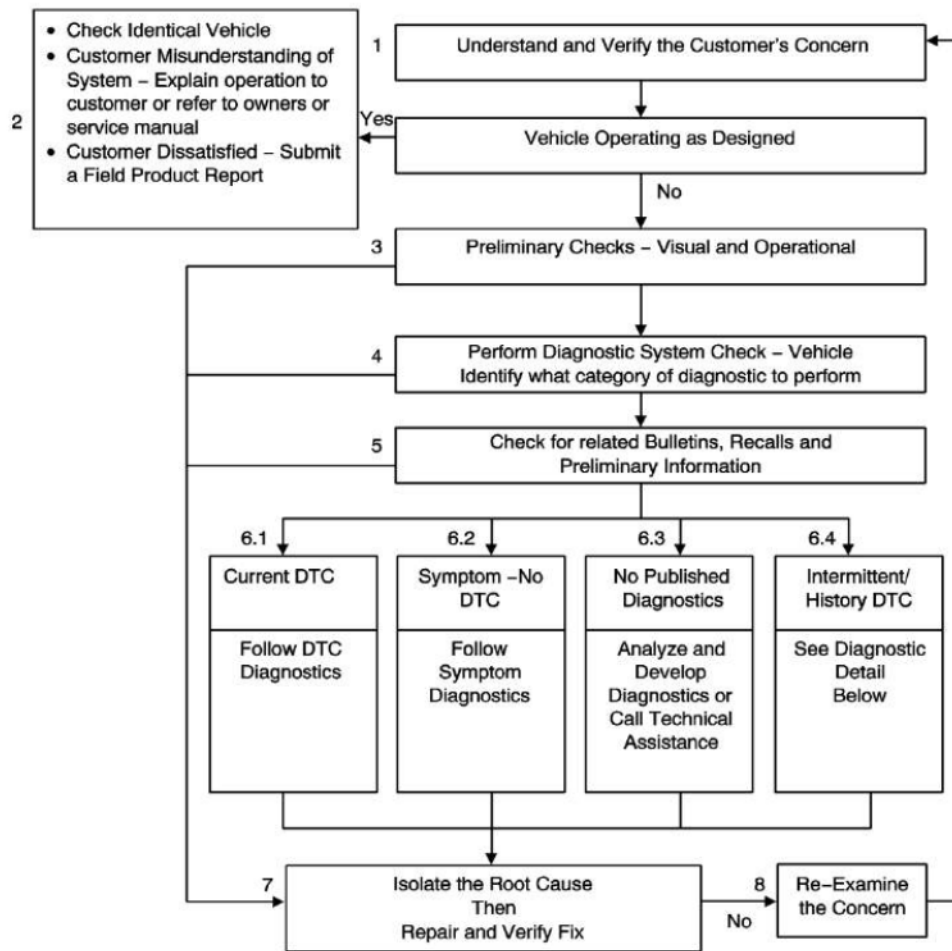


Strategy Based Diagnosis

The goal of Strategy Based Diagnosis is to provide guidance when you create a plan of action for each specific diagnostic situation. Following a similar plan for each diagnostic situation, you will achieve maximum efficiency when you diagnose and repair vehicles. Although each of the Strategy Based Diagnosis boxes is numbered, you are not required to complete every box in order to successfully diagnose a customer concern. The first step of your diagnostic process should always be Understand and Verify the Customer's Concern. The final step of your diagnostic process should be Repair and verify the Fix. Refer to the following chart for the correct Strategy Based Diagnosis.



- 1. Understand and Verify the Customer's Concern:** The first part of this step is to obtain as much information as possible from the customer. Are there aftermarket accessories on the vehicle? When does the condition occur? Where does the condition occur? How long does the condition last? How often does the condition occur? In order to verify the concern, the technician should be familiar with the normal operation of the system and refer to the owner or service manual for any information needed.
- 2. Vehicle Operating as Designed:** This condition exists when the vehicle is found to operate normally. The condition described by the customer may be normal. Compare with another like vehicle that is operating normally under the same conditions described by the customer. Explain your findings and the operation of the system to the customer. If the customer is dissatisfied submit a Field Product Report.
- 3. Preliminary Checks:** Conduct a thorough visual inspection. Review the service history. Detect unusual sounds or odors. Gather diagnostic trouble code (DTC) information in order to achieve an effective repair.

4. Perform Published Diagnostic System Check- Vehicle: The [Diagnostic System Check - Vehicle](#) verifies the proper operation of the system. This will lead the technician in an organized approach to diagnostics and identify what category of diagnostic to perform.
5. Check for related Bulletins, Recalls and Preliminary Information (PI).
6. Diagnostic categories:
 - 6.1. Current DTC: Follow the designated DTC diagnostic in order to make an effective repair. Refer to [Diagnostic Trouble Code \(DTC\) List - Vehicle](#).
 - 6.2. Symptom - No DTC: Select the appropriate symptom diagnostic. Follow the diagnostic steps or suggestions in order to complete the repair. Refer to [Symptoms - Vehicle](#).
 - 6.3. No Published Diagnostics: Analyze the Concern. Develop a plan for the diagnostics. The service manual schematics will help you to see system power, ground, input, and output circuits. You can also identify splices and other areas where multiple circuits are tied together. Look at component locations to see if components, connectors or harnesses may be exposed to extreme temperature, moisture, or corrosives (road salt, battery acid, oil or other fluids). Utilize the wiring diagrams, system description and operation, and system circuit description.
 - 6.4. Intermittent/History DTC: An intermittent condition is one that does not occur continuously, may be difficult to duplicate, and will only occur when certain conditions are met. Generally, an intermittent is caused by faulty electrical connections and wiring, malfunctioning components, electromagnetic/radio frequency interference, driving conditions, or aftermarket equipment. The following approaches/tools may prove to be beneficial in locating and repairing an intermittent condition or history DTC.
 - Combining technicians knowledge with the available service information.
 - Evaluate the symptoms and conditions described by the customer on the [Customer Concern Verification Sheets](#).
 - Follow the suggestions on [Testing for Intermittent Conditions and Poor Connections](#).
 - Use the available scan tool, digital multi-meter, or J-42598-B vehicle data recorder with data capturing capabilities.
7. Isolate the Root Cause then Repair and Verify Fix: After isolating the root cause, make the repairs and validate for the correct operation by performing the [Diagnostic Repair Verification](#). Verifying that the DTC or symptom has been corrected may involve road testing the vehicle.
8. Re-examine the Concern: If a technician cannot successfully find or isolate the concern, a re-evaluation is necessary. Re-verify the concern. The concern could be an intermittent or normal condition.

Diagnostic Procedure Instructions

The following is an overview of instructions for all 16 categories which may be included in a diagnostic procedure.

Diagnostic Instructions

A link to the [Diagnostic System Check - Vehicle](#) is provided here. This procedure should be performed prior to performing other diagnostic procedures, as this prevents misdiagnosis where there are integrated system dependencies.

A link to the [Strategy Based Diagnosis](#) is provided here. This provides an overview on how a technician should diagnose a vehicle.

A link to the [Diagnostic Procedure Instructions](#) is provided here. This information is an overview of instructions for all 16 categories which may be included in a diagnostic procedure.

DTC Descriptor

Describes what DTCs are diagnosed in this procedure. The DTC number, with Symptom Description when applicable, and descriptor are written out.

Diagnostic Fault Information

The diagnostic Fault Information table identifies each circuit that makes up an electrical subsystem and the associated circuit faults. DTCs and symptoms are listed in the table for all circuit fault modes. This information can be used to diagnose an electrical fault, or as a quick visual aid showing how the different symptoms and DTCs apply for the subsystem being diagnosed.

Even though all the DTCs and symptoms are shown in this table it does not mean they will all be diagnosed in the same procedure.

An example table from an engine coolant temperature (ECT) procedure:

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
ECT Sensor Signal	P0117	P0118	P0118	P0125, P0128
ECT Low Reference	—	P0118	P0118	P0125, P0128

Typical Scan Tool Data

The Typical Scan Tool Data table identifies a scan tool data parameter and its value in reference to potential circuit faults.

An example table from an ECT procedure:

ECT Sensor Temperature – PCM			
Circuit	Short to Ground	Open	Short to Voltage
Operating Conditions: Engine Running Parameter Normal Range: –32 to +130°C (–26 to +275°F)			
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Circuit	Short to Ground	Open	Short to Voltage
ECT Signal	140°C (284°F)	-40°C (-40°F)	-40°C (-40°F)
Low Reference	—	-40°C (-40°F)	-40°C (-40°F) *
* Internal ECM damage may occur if shorted to B+			

Circuit/System Description

Circuit/System Description identifies how a circuit/system normally functions.

Conditions for Running the DTC

Conditions for Running the DTC, identifies what conditions must be present to allow the diagnostic to run.

Conditions for Setting the DTC

Conditions for Setting the DTC, identifies the condition(s) that must be present in order to fail the diagnostic and when to set the DTC.

Action Taken When the DTC Sets

Actions Taken When the DTC sets, identifies the default actions taken when a control module sets a DTC.

Conditions for Clearing the DTC

Conditions for Clearing the DTC, identifies the conditions that must be met in order to clear the DTC.

Diagnostic Aids

Diagnostic Aids are suggestions which explain other methods to diagnose the condition. It also provides unique information about the system used to assist the technician in finding and repairing a vehicle condition.

Reference Information

Reference Information includes links providing additional information for the diagnostic procedure.

For example:

- Schematic Reference
- Connector End View Reference
- Description and Operation
- Electrical Information Reference
- DTC Type Reference
- Scan Tool Reference
- Special Tools Required

Circuit/System Verification

The diagnostic format does not force a technician to any of the 3 diagnostic categories (Circuit/System Verification, Circuit/System Testing and Component Testing). However, performing the Circuit/System Verification category first, aids in determining if a vehicle condition is current. Some diagnostic categories may state that another category must be performed first when there are testing dependencies.

This category also serves to route the technician to other diagnostic procedures which should be performed first; for example, a DTC with a higher priority.

Note: Any diagnostic step that asks if a DTC is set is referring to a Set, Current, Present, Active DTC status. This does not include any other DTC status. For example History, Not Run, Passed and Failed.

Circuit/System Verification is a non-intrusive procedure outlining how to verify that a system or a portion of a system is functioning correctly. During the verification process, the vehicle is kept intact and tested as a complete system. This verification is used to assist the technician in determining whether a condition is current or intermittent. When a condition is determined to be intermittent, a technician can use the link in Electrical Information Reference: [Testing for Intermittent Conditions and Poor Connections](#) for additional testing information.

The technician should be able to identify if the fault is occurring on the input circuit - signal or on the output circuit - control when applicable. The technician will need to decide from the verification results if the system is working correctly or if further diagnosis needs to be performed in either Circuit/System Testing and/or Component Testing.

To assist the technician in identifying a common part a component code is used. These codes are not translated so they will always be the same even though the part name may have slight variance. The component codes will always be the same once assigned to a unique part name and will be found on the schematics and in the diagnostic procedure categories Circuit/System Verification, Circuit/System Testing, and Component Testing categories.

Component Codes

The component codes used on the schematics will have the base code with an extension to identify location or quantity. For example the ABS wheel speed sensors are identified on the schematic with a base code (B5) and a location extension (LF, RF, LR, and RR) as seen below:

- B5LF Wheel Speed Sensor (WSS)-Left Front
- B5RF Wheel Speed Sensor (WSS)-Right Front
- B5LR Wheel Speed Sensor (WSS)-Left Rear
- B5RR Wheel Speed Sensor (WSS)-Right Rear

B5 is the base code for the wheel speed sensor and the LF, RF, LR, and RR indicate the on vehicle location.

The diagnostic procedures will use the base code (B5) for a wheel speed sensor but may or may not use the extension identifying location (LF, RF, LR, and RR). Example: Ignition OFF, disconnect the harness connector at the appropriate B5 wheel speed sensor. This is done so the diagnostic procedure can be common for all four wheel speed sensors and not have to take into account part location or quantity.

Where the diagnostic states "the appropriate" it is up to the technician to identify which component is being diagnosed by the symptom stated on the RO (drivers door lock is inoperative) or by the DTC descriptor (DTC C0585 04: Left Rear Actuator Circuit Open).

Circuit/System Testing

The diagnostic format does not force a technician to any of the 3 diagnostic categories (Circuit/System Verification, Circuit/System Testing and Component Testing). However, beginning with the Circuit/System Verification category aids in determining if a vehicle condition is current. Some diagnostic categories may state that another category must be performed first when there are testing dependencies.

Circuit/System Testing is a step by step, positive-flow, testing sequence which allows the technician to perform each test step, in sequence, until a fault is detected. If the result of a numbered test step is achieved, the normal flow is to proceed to the next numbered test step (indicated by the down pass arrow). If the result of a numbered test step is NOT achieved, the right repair arrow bullet below the failed test will identify what actions need to take place.

Intrusive diagnostics are performed to locate the system fault. System harness connections are disconnected from the module or component to test individual circuit functions. The module or component will be used to assist in verifying the circuit function. When a test does not pass, the repair steps (right arrow) will indicate what circuit faults to test for example, short to voltage, short to ground or open/high resistance.

When testing for individual circuit faults, the technician is expected to include terminal inspections such as connection surfaces and terminal tension at both the harness and component/module. Additionally, a technician can use the links in Electrical Information Reference: [Testing for Intermittent Conditions and Poor Connections](#) or [Circuit Testing](#) for additional information.

The control modules and components will also be diagnosed during these test steps. A retest of a control module or component should always be performed before replacement. For example, re-connect all components and modules and retest the system to verify the condition still exists before replacing modules or components.

Component Testing

The diagnostic format does not force a technician to any of the 3 diagnostic categories (Circuit/System Verification, Circuit/System Testing and Component Testing). However, beginning with the Circuit/System Verification category aids in determining if a vehicle condition is current. Some diagnostic categories may state that another category must be performed first when there are testing dependencies.

Component Testing can offer static and/or dynamic component tests. These tests can be used to verify if a component is operating correctly to avoid unnecessary replacement.

Testing modules in this category will not be offered. In most cases, the module is used to verify the harness circuits in the Circuit/System Testing category and a retest of the module should always be performed before replacement.

Repair Instructions

Repair Instructions provides a link to [Diagnostic Repair Verification](#). This link describes how to verify the vehicle is repaired.

All links to Repair or Replacement procedures are located here.

Repair Verification

Repair Verification describes how to verify the vehicle is repaired when additional instructions are needed beyond what is in Diagnostic Repair Verification.

Diagnostic System Check Instructions

The following is an overview of instructions for the general information and 13 step System Verification included in the Diagnostic System Check - Vehicle procedure.

Diagnostic Instructions

A link to [Strategy Based Diagnosis](#) is provided as an overview on how a technician should diagnose a vehicle.

A link to the Diagnostic System Check Instructions is provided. This provides an overview of instructions and examples for the general information and 13 step System Verification included in the Diagnostic System Check - Vehicle procedure. The examples in this document are intended to give the technician a general idea of what the test step is referring to. They are not intended to list every possible condition or situation.

Diagnostic Systems Check steps are listed by priority to guide the technician to the appropriate diagnostic procedure to correct the customer concern. There are many ways to determine the priority of diagnosing a vehicle concern. Some faults can cause customer perceived symptoms in areas unrelated to the fault. Using an example from the System Check, after reading DTCs, the technician is asked to verify there are no Electronic Control Unit Internal Performance Faults present. It is important that any internal performance issues are addressed prior to continuing through the System Check. There is no benefit addressing other DTCs that could be set due to an internal fault to a control module. If the fault is present, performing the diagnostic procedure for that fault will likely correct the customer perceived concern and possibly eliminate other DTCs that may be set.

Not all steps of the Diagnostic System Check have to be performed. The Diagnostic System Check tries to prioritize the test steps with the highest priority faults first. The technician is then lead to another document to do the actual diagnosis or repair. The strategy is to repair higher level faults that may be the cause of other system or component level symptoms. Additionally, the Diagnostic System Check can only be used for a single fault at a time. If additional faults are present, the technician must perform the diagnostic system check for each concern until all customer concerns are corrected.

Once a repair has been completed, General Motors diagnostic strategy is to always have the technician verify that the customer concern has been corrected. This is to prevent comebacks and to ensure customer satisfaction with their dealership experience. Therefore a link has been provided to [Diagnostic Repair Verification](#) procedure for the technician to verify the customer concern has been corrected.

There are some assumptions made when General Motors prepares service information. They include the following areas which are presumed to function as designed:

- The 12-volt battery is fully charged. General Motors assumes the majority of vehicles brought in for repair will be able to start and be driven into the service stall. If the vehicle has a dead battery, it is slow cranking or for any other reason the technician feels the customer concern may be battery related, a link is provided to [Battery Inspection/Test](#). This procedure will guide the technician through inspecting and verifying the battery functions properly.
- Fuses should not be open. General Motors does not call out in diagnostic procedures to verify a fuse. The technician is expected to find an open fuse when the diagnostic test step states to check for an open circuit condition. Therefore a link has been provided to [Power Distribution Schematics](#) and [Electrical Center Identification Views](#) for technicians to reference power sources and fuse locations if they feel there may be loss of power due to an open fuse condition.
- Ground circuits are clean, tight, and in the correct location. General Motors assumes that the original ground circuits have not been compromised. The technician is expected to find a poor ground connection when the diagnostic test step states to test the ground circuit for an

open/high resistance. Therefore a link has been provided to [Ground Distribution Schematics](#) and [Harness Routing Views](#) for technicians to reference ground locations and which ground circuits may be related to the customer concern.

- All connections/connectors are fully seated. General Motors assumes that all connections are properly installed. The technician is expected to find an open or poor connection when the diagnostic test step asks to test the circuit for an open/high resistance. Therefore a link has been provided to [Component Connector End Views](#) for technicians to reference which connections may be related to the customer concern.
- There are no aftermarket devices that affect the operation of the system. General Motors can only author diagnostic and repair information for vehicle systems and components that are original equipment or genuine GM Accessories. Aftermarket equipment can negatively affect original equipment operation and lead a technician's diagnosis of a concern in the wrong direction. Therefore a link has been provided to [Checking Aftermarket Accessories](#) that guides a technician through the possible causes of vehicle problems related to aftermarket accessories.
- The scan tool powers up. General Motors assumes that power is available at the Data Link Connector and the scan tool will power on. Therefore a link has been provided to [Scan Tool Does Not Power Up](#) if the technician finds that the scan tool does not power on.

Diagnostic System Check

1. **VERIFY CUSTOMER CONCERN**—This step is to obtain as much information as possible from the customer. Are there aftermarket accessories on the vehicle? When does the condition occur? Where does the condition occur? How long does the condition last? How often does the condition occur? Review the service history of the vehicle for previous repairs that could help diagnose the current concern.

Now that the technician understands the customer concern, they should validate the concern on the vehicle. In order to verify the concern, the technician should be familiar with the normal operation of the system and refer to the owner or service manual for any information needed. Inspect the visible system components for obvious damage or conditions that could cause the concern. Conduct a thorough visual inspection. Detect unusual sounds or odors.

The condition described by the customer may be normal. If the technician finds the vehicle to operate normally, compare with another like vehicle that is operating normally, under the same conditions described by the customer. If this is the case, explain your findings and the operation of the system to the customer. If the customer is dissatisfied, submit a Field Product Report.

2. **BULLETIN SEARCH**—By searching for related bulletins, recall/field actions and preliminary information documents, a procedure for a known field issue may resolve the customer concern with little or no diagnosis necessary saving the technician diagnostic time.
3. **MECHANICAL CONCERNS**—This step is designed to take the technician directly to a list of symptom diagnostic procedures. The technician is asked to verify the symptoms exhibited by the system are mechanical in nature and not related to an electrical system, see some examples below. If the technician feels the concern could be related to an electrical system, they should continue through the Diagnostic System Check to verify the electrical functionality of vehicle. If the technician feels the concern is exclusively related to a mechanical system, a link to [Symptoms - Vehicle](#) is provided to select the appropriate symptom diagnostic procedure for the customer concern.

Examples:

- Brake noise or diagnosing irregular pad wear
 - Water leak diagnosis
 - Engine or transmission fluid leak diagnosis
 - Manual window or door lock diagnosis
 - Vehicle vibration diagnosis
 - Exhaust noise or leak diagnosis
4. **VEHICLE POWER UP VERIFICATION**—The technician is asked in this step to turn the ignition key ON and verify that the vehicle powers up. The technician should look for clues that multiple vehicle systems are receiving vehicle powermode messages, such as the

cluster waking up, the radio powers on, the HVAC blower is operational, windshield wipers turn on, etc, with the key ON. This would be a rare condition as both the powermode master and back-up powermode master would have to be inoperable, however, if the vehicle does not power up, a link to [Power Mode Mismatch](#) is provided.

5. CONTROL MODULE COMMUNICATION and DTC CHECK—The technician is asked in this step to record the following three pieces of data on the Repair Order; any control module that the scan tool determined is not communicating, any DTC and symptom byte set current or history, and the control module that has set the DTC.

This is considered a setup step for the rest of the Diagnostic System Check. The technician is not expected to do anything other than record the three pieces of data provided by the scan tool on the Repair Order. This provides the information needed to complete the rest of the diagnostic system check.

To complete this step, the technician is asked to utilize the scan tool Vehicle DTC Information function. This function will query every possible control module on the vehicle requesting all DTCs. During the DTC query, the scan tool will try to establish communication with each control module. If the scan tool can communicate with the control module during the DTC request, it will display PRESENT and provide the number of DTCs set in the control module. If the scan tool cannot communicate with a control module, it will only display NOT COMMUNICATING. Since the scan tool cannot determine if a given control module should be present or not, the technician is asked in a future step to verify that the vehicle was not built with control modules listed as NOT COMMUNICATING.

If the scan tool cannot establish communications with ALL of the vehicles control modules, a link to [Data Link References](#) is provided. A faulty control module or fault with the serial data circuit can cause no communication with all of the control modules on the vehicle. If any control module communicates on the serial data circuit, continue through the Diagnostic System check, as a future step will address any specific non communicating or group of non communicating control modules.

Once the scan tool has completed the routine, the technician should review each control module that has set a DTC and document them on the Repair Order. When reviewing the DTCs, the technician should take notice if any DTCs are powertrain related, and if so, navigate in the scan tool to the Powertrain area and utilize the Capture Info function. This will upload any Freeze Frame/Failure Records stored in the control module to the scan tool in case the data is lost from the control module. As an example, if the technician commands a Clear DTCs function on a powertrain controller, all diagnostic information stored in the controller is erased. This includes Freeze Frame/Failure Records and Inspection/Maintenance System Status indicators, if required for your region.

6. CONTROL MODULE INTERNAL PERFORMANCE FAULTS—The technician is asked to review the DTCs recorded in step 5 and verify there are no control module internal performance faults set current. This type of fault may be the cause of other symptoms or DTCs displayed by the vehicle. By addressing this fault first, the technician may find the other concerns are resolved. The technician should always follow the diagnostic procedure for these types of faults prior to replacing any control module. If the technician finds a control module has an internal performance fault, a link is provided to [Diagnostic Trouble Code \(DTC\) List - Vehicle](#) to select the appropriate DTC diagnostic procedure.

Examples:

- B1000 Electronic Control Unit Performance
- B101D ECU Hardware Performance
- C0550 Electronic Control Unit Performance
- C056D ECU Hardware Performance
- C0570 Auxiliary Electronic Control Unit Performance
- P0606 Control Module Internal Performance
- P0607 Control Module Performance

7. CONTROL MODULE COMMUNICATION VERIFICATION—This step is used to ensure the control modules that are NOT COMMUNICATING were not built on the vehicle. To understand if the vehicle was built with that option, we provide a link to the [Data Link References](#) document where Regular Production Options (RPOs) are listed next to the names of optional ECU's and can be compared to those the vehicle was built with. If the

technician determines that a control that is NOT COMMUNICATING should be present, the technician is asked to follow the appropriate diagnostic procedure listed in the [Data Link References](#) document.

8. COMMUNICATION and POWERMODE FAULTS—This step is asking the technician to look for communication DTCs or DTCs related to control modules powering up based on power mode, communication enable or wake-up circuits. See in the below table some examples of the DTCs the technician should diagnose prior to continuing through the Diagnostic System Check. The technician should review the list of DTCs recorded in step 4 and verify that none of these type of DTCs are present. If so, the technician is referred to the [Diagnostic Trouble Code \(DTC\) List - Vehicle](#) to select the appropriate DTC diagnostic procedure.

Examples:

- U0140 Lost Communication With Body Control Module
- U0164 Lost Communication With HVAC Control Module
- U0170 Lost Communication With Passenger Presence Detection Module
- U0402 Invalid Data Received From Transmission Control Module
- U0452 Invalid Data Received From Inflatable Restraint Sensing and Diagnostic Module
- U1814 Powertrain High Speed Communication Enable Circuit
- B1428 Ignition Switched Power Run/Crank Relay Circuit
- B137B Accessory Power Module Wake Up Circuit
- C0897 Control Module Power Moding
- P2536 Ignition Accessory Switch Circuit

9. POWER MODE VERIFICATION—This step verifies the Power Mode Master is receiving the proper output state of the ignition switch. The technician should use the main power mode input, this being either the ignition key or, on vehicles equipped with Passive Entry Passive Start, the push button switch. The test should not be performed using a key fob, if the MIL is illuminated the powertrain controller may disable this input. The technician is asked to perform the test with the driver door open. This ensures the retained accessory power mode is inactive during this test which could result in different scan tool readings. The technician is only asked to verify the current Power Mode parameter in the power mode data display list. If the parameter does not match the actual ignition switch position, a link is provided to perform the [Power Mode Mismatch](#) diagnostic procedure.

10. ENGINE CRANK and RUN VERIFICATION—Here the technician is asked to verify that the engine cranks and runs. The technician should use the main power mode input, this being either the ignition key or, on vehicles equipped with Passive Entry Passive Start, the push button switch, to complete this step. The test should not be performed using a key fob, if the MIL is illuminated the powertrain controller may disable this input. The technician should know at this point whether the engine cranks and runs without having to actually performing this test step. One of the follow has probably already occurred and this step can be skipped: The technician drove the vehicle into the stall or verified when checking the Crank and Run parameter in step 8. If the technician has not already somehow verified the engine cranks in previous steps, the technician should perform this test step. Regardless of how this step was performed, if the engine does not crank, a link is provided to [Engine Does Not Crank](#) or if the engine cranks but does not run, a link is provided to [Engine Cranks But Does Not Run](#) for the technician to choose the correct diagnostic procedure for the actual engine application being used.

11. REMAINING DTC REVIEW—Here the technician is asked to review any remaining DTCs that were not addressed in previous steps. The technician is asked first to verify there are no control module supply voltage, system voltage or 5V circuit DTCs present. Control modules, systems or components with insufficient or zero voltage can cause one or multiple symptoms to exist on the vehicle. Control module voltage issues could also be the cause of failures during a programming event. The technician should correct voltage issues prior to addressing any programming or configuration DTCs. The technician should then check for any ECU programming, setup or configuration DTCs. By programming software or configuring a control module, the technician could correct the customer concern unobtrusively. The remaining DTCs, which are usually specific system or component faults,

are diagnosed last. They can include ECU input and output circuit DTCs or individual circuit faults that usually cause single symptoms or failure modes on the vehicle and can be fixed following the proper DTC diagnostic procedure. In general, the technician should think about what DTCs or faults could be caused by another DTC or fault. A failed sensor may set a component DTC and then the system may set a DTC indicating the system cannot operate properly. By correcting the sensor fault, the system may now operate properly and the system level DTC will transition to history. Refer to the examples within each category below to understand the differences between these DTCs. If DTCs of these type are current, the technician is referred to [Diagnostic Trouble Code \(DTC\) List - Vehicle](#) to choose the correct DTC diagnostic procedure.

11.1. Voltage DTCs

- B1325 Device Power 1 Circuit
- C0875 Device Voltage Reference Input 2 Circuit
- C1001 Adaptive Cruise Control Indicators Supply Voltage Circuit
- P0641 5-Volt Reference Circuit
- P0787 Downshift Timing Solenoid Control Circuit Low Voltage

11.2. Programming, Setup, Configuration or Software Performance DTCs

- B3943 Steering Column Lock has Not Learned Column Integration Module
- B101E ECU Software Performance
- B1019 System Configuration Error
- C0558 Calibration Data Not Programmed
- P0630 VIN Not Programmed or Mismatched - Powertrain Control Module (PCM)

11.3. Component related DTCs

- B0013 Driver Frontal Deployment Loop Stage 2
- B0163 Passenger Compartment Temp Sensor Circuit
- C0045 Left Rear Wheel Speed Sensor Circuit
- P0565 Cruise Control Switch Circuit
- P0751 1-2 Shift Solenoid (SS) Valve Performance

11.4. System related DTCs

- B1010 System Sensors Data Mismatch
- C0176 System Thermal Error
- C0561 System Disabled Information Stored
- P1564 Vehicle Acceleration Too High – Cruise Control Disabled
- P1625 Transmission Control Module (TCM) System Reset

11.5. Any other remaining DTCs—The technician should diagnose and correct any other DTCs that are left that were not from the categories above.

12. EMISSION RELATED INSPECTION/MAINTENANCE TESTING CONCERNS—Several regions require that a vehicle pass on-board diagnostic system tests and the inspection/maintenance emission tests in order to renew license plates or vehicle registration. This is accomplished by viewing the Inspection/Maintenance System Status display on a scan tool. Using a scan tool, the technician can observe the Inspection/Maintenance System Status in order to verify that the vehicle meets the criteria that comply with the local area requirements. If inspection and maintenance checks are required in your region, and the customer concern is related to not passing an Inspection/Maintenance test, a link is provided to [Inspection/Maintenance System Check](#) where the technician can choose the appropriate Inspection/Maintenance System Check for the actual engine application being used.
13. SYMPTOM DIAGNOSIS—At this step, the diagnostics are assuming that the only information the technician has available to diagnose the customer concern are symptoms of a problem. There are no DTCs set current or history. There may be a Driver Information Center display message or a system indicator to aid in identifying the root cause. The

technician should evaluate the symptoms and conditions described by the customer and perform the symptoms diagnostics for the area of customer concern. A link is provided to [Symptoms - Vehicle](#) which contains a list of all symptoms related to this service manual publication.

Diagnostic Starting Point - Vehicle

Begin the system diagnosis with [Diagnostic System Check - Vehicle](#). The Diagnostic System Check - Vehicle will provide a complete strategy to locate and repair a mechanical or electrical vehicle fault. Not following this strategy may cause additional diagnostic time and/or misdiagnosis.

The Diagnostic System Check - Vehicle will provide the following strategy:

- When to verify the customer concern and identify related bulletins, recalls and preliminary information
- When to identify a control module that is not communicating, a control module that has set a DTC, and the DTC diagnostic priority
- When to address power mode concerns
- When to verify the engine cranks and runs
- When to diagnose symptom related concerns

Diagnostic System Check - Vehicle

Diagnostic Instructions

- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- [Diagnostic System Check Instructions](#) provides an overview of each diagnostic step.
- Continue through the Diagnostic System Check until you are directed to follow a particular diagnostic or repair procedure. Once a repair has been completed, perform the [Diagnostic Repair Verification](#) and verify the customer concern has been corrected.

The diagnostic procedures within this manual are developed on the assumption that the following areas function as designed:

- The 12V battery is fully charged and cables are clean and tight. Refer to [Battery Inspection/Test](#).
- Fuses are not open. Refer to [Power Distribution Schematics](#) and [Electrical Center Identification Views](#).
- Ground circuits for the area of customer concern are clean, tight, and in the correct location. Refer to [Ground Distribution Schematics](#) and [Harness Routing Views](#).
- All connections/connectors for the area of concern are fully seated. Refer to [Component Connector End Views](#).
- There are no aftermarket devices that affect the operation of the system. Refer to [Checking Aftermarket Accessories](#).
- The scan tool powers up. Refer to [Scan Tool Does Not Power Up](#).

Diagnostic System Check

1. VERIFY CUSTOMER CONCERN—Understand and validate the customer concern. Inspect the visible system components for obvious damage or conditions that may cause the concern.
 2. BULLETIN SEARCH—Check for related bulletins, recall/field actions and preliminary information.
 3. MECHANICAL CONCERNS—Verify the symptom is not exclusively a mechanical concern.
⇒ If the symptom is exclusively a mechanical concern, refer to [Symptoms - Vehicle](#).
 4. VEHICLE POWER UP VERIFICATION—Ignition ON, verify the vehicle powers up.
⇒ If the vehicle does not power up, refer to [Power Mode Mismatch](#).
- Note:** Do not clear any DTCs unless instructed to do so by a diagnostic procedure. If any DTC is Powertrain related, select Capture Info to store DTC and Freeze Frame/Failure Records to the Scan Tool.
5. CONTROL MODULE COMMUNICATION and DTC CHECK—Using a scan tool, perform the Vehicle DTC Information function and verify at least one control module communicates with the scan tool. Record on the Repair Order the following information:
 - Any control module that is not communicating.
 - Any DTC, including symptom byte, and the control module that has set the DTC.⇒ If the scan tool does not communicate with any control module on the vehicle, refer to [Data Link References](#).
 6. CONTROL MODULE INTERNAL PERFORMANCE FAULTS—Verify there are no current control module Internal Hardware Performance DTCs set.
⇒ If any DTC of this type is set, refer to [Diagnostic Trouble Code \(DTC\) List - Vehicle](#).
 7. CONTROL MODULE COMMUNICATION VERIFICATION—Verify the vehicle is built with any control module listed as not communicating, refer to [Data Link References](#). All control modules should be communicating as equipped.

- ⇒ If the scan tool does not communicate with one or more control modules refer to [Data Link References](#).
8. COMMUNICATION and POWERMODE FAULTS—Verify there are no current control module Power Mode or Communication DTCs set.
- ⇒ If any DTC of this type is set, refer to [Diagnostic Trouble Code \(DTC\) List - Vehicle](#).
- Note:** The engine may start during this test. Ensure the vehicle is out of gear and the parking brake is applied. Turn the engine OFF as soon as the crank power mode parameter has been observed.
9. POWER MODE VERIFICATION—Driver door open, observe the scan tool Power Mode parameter while cycling the ignition switch through all the power modes. Verify the current Power Mode parameter matches the actual ignition switch positions.
- ⇒ If the Power Mode parameter does not match the actual ignition switch positions, refer to [Power Mode Mismatch](#).
10. ENGINE CRANK and RUN VERIFICATION—Verify that the engine cranks and runs.
- ⇒ If the engine does not crank, refer to [Engine Does Not Crank](#).
- ⇒ If the engine does not run, refer to [Engine Cranks But Does Not Run](#).
11. REMAINING DTC REVIEW—Verify there are no other DTCs set.
- ⇒ If other DTCs are set, diagnose them in the order listed below. Refer to [Diagnostic Trouble Code \(DTC\) List - Vehicle](#).
- 11.1. Voltage DTCs
- 11.2. Programming, Setup, Configuration or Software Performance DTCs
- 11.3. Component related DTCs
- 11.4. System related DTCs
- 11.5. Any remaining DTCs
12. EMISSION RELATED INSPECTION/MAINTENANCE TESTING CONCERNS—If inspection and maintenance checks are required in your region, verify the customer concern is not related to inspection/maintenance testing.
- ⇒ If the customer concern is related to inspection/maintenance testing, refer to [Inspection/Maintenance System Check](#).
13. SYMPTOM DIAGNOSIS—Diagnose any remaining customer concern. Refer to [Symptoms - Vehicle](#).

Powertrain Diagnostic Trouble Code (DTC) Type Definitions

Emissions Related DTCs

Action Taken When the DTC Sets – Type A

- The control module illuminates the malfunction indicator lamp (MIL) when the diagnostic runs and fails.
- The control module records the operating conditions at the time the diagnostic fails. The control module stores this information in the Freeze Frame/Failure Records.

Action Taken When the DTC Sets – Type B

- The control module illuminates the MIL on the second consecutive ignition cycle that the diagnostic runs and fails.
- The control module records the operating conditions at the time the diagnostic fails. The first time the diagnostic fails, the control module stores this information in the Failure Records. If the diagnostic reports a failure on the second consecutive ignition cycle, the control module records the operating conditions at the time of the failure. The control module writes the operating conditions to the Freeze Frame and updates the Failure Records.
- The following applies to misfire DTCs:
 - If the control module detects a low level or an emission level misfire condition during 2 consecutive trips, the control module illuminates the MIL.
 - If the control module detects a high level or catalyst damaging misfire, the control module flashes the MIL at a rate of once per second.
 - If the control module detects a misfire during 2 non-consecutive trips, the stored conditions are compared with the current conditions. The control module illuminates the MIL when the following conditions occur:
 - The engine load is within 20 percent of the previous test that failed.
 - The engine speed is within 375 RPM of the previous test that failed.
 - The engine coolant temperature is in the same range of the previous test that failed.
- The following applies to fuel trim DTCs:
 - If the control module detects a fuel trim condition during 2 consecutive trips, the control module illuminates the MIL.
 - If the control module detects a fuel trim condition during 2 non-consecutive trips, the stored conditions are compared with the current conditions. The control module illuminates the MIL when the following conditions occur:
 - The engine load is within 20 percent of the previous test that failed.
 - The engine speed is within 375 RPM of the previous test that failed.
 - The engine coolant temperature is in the same range of the previous test that failed.

Conditions for Clearing the MIL/DTC – Type A or Type B

- The control module turns OFF the MIL after 4 consecutive ignition cycles that the diagnostic runs and does not fail.
- A current DTC, Last Test Failed, clears when the diagnostic runs and passes.

- A history DTC clears after 40 consecutive warm-up cycles, if no failures are reported by this or any other emission related diagnostic.
- Clear the MIL and the DTC with a scan tool.

Non-Emissions Related DTCs

Action Taken When the DTC Sets – Type C

- The control module stores the DTC information into memory when the diagnostic runs and fails.
- The MIL will not illuminate.
- The control module records the operating conditions at the time the diagnostic fails. The control module stores this information in the Failure Records.
- The driver information center, if equipped, may display a message.

Conditions for Clearing the DTC – Type C

- A current DTC Last Test Failed clears when the diagnostic runs and passes.
- A history DTC clears after 40 consecutive warm-up cycles, if no failures are reported by this or any other non-emission related diagnostic.
- Clear the DTC with a scan tool.

Diagnostic Trouble Code (DTC) List - Vehicle

This master DTC list includes all applicable DTCs in alphanumeric order.

Diagnostic Trouble Code (DTC) List - Vehicle

DTC	Diagnostic Procedure
B0000	Antilock Brake System - DTC B0000
B0012	Supplemental Inflatable Restraints - DTC B0012 or B0013
B0013	Supplemental Inflatable Restraints - DTC B0012 or B0013
B0014	Supplemental Inflatable Restraints - DTC B0014, B0021, B0031, or B0038
B0015	Supplemental Inflatable Restraints - DTC B0015, B001A, B001B, or B0022
B0016	Supplemental Inflatable Restraints - DTC B0016, B0018, B0023, or B0025
B0019	Supplemental Inflatable Restraints - DTC B0019 or B0020
B001A	Supplemental Inflatable Restraints - DTC B0015, B001A, B001B, or B0022
B001B	Supplemental Inflatable Restraints - DTC B0015, B001A, B001B, or B0022
B0020	Supplemental Inflatable Restraints - DTC B0019 or B0020
B0021	Supplemental Inflatable Restraints - DTC B0014, B0021, B0031, or B0038
B0022	Supplemental Inflatable Restraints - DTC B0015, B001A, B001B, or B0022
B0023	Supplemental Inflatable Restraints - DTC B0016, B0018, B0023, or B0025
B0052	Supplemental Inflatable Restraints - DTC B0052
B0079	Supplemental Inflatable Restraints - DTC B0079 or B0080
B0081	Supplemental Inflatable Restraints - DTC B0081
B0083	Supplemental Inflatable Restraints - DTC B0083-B0088
B0084	Supplemental Inflatable Restraints - DTC B0083-B0088
B0085	Supplemental Inflatable Restraints - DTC B0083-B0088
B0086	Supplemental Inflatable Restraints - DTC B0083-B0088
B0158	Displays and Gauges - DTC B0158

DTC	Diagnostic Procedure
B0163	HVAC - Automatic - DTC B0163, B0183, or B1405
B0173	HVAC - Automatic - DTC B0173, B0178, B0509, B0514 or B3933
B0178	HVAC - Automatic - DTC B0173, B0178, B0509, B0514 or B3933
B0183	HVAC - Automatic - DTC B0163, B0183, or B1405
B0193	HVAC - Automatic - DTC B0193
B0228	HVAC - Automatic - DTC B0228, B0413, B0423, B1395, or B374A
B0283	Fixed and Moveable Windows - DTC B0283
B0413	HVAC - Automatic - DTC B0228, B0413, B0423, B1395, or B374A
B0423	HVAC - Automatic - DTC B0228, B0413, B0423, B1395, or B374A
B0509	HVAC - Automatic - DTC B0173, B0178, B0509, B0514 or B3933
B0514	HVAC - Automatic - DTC B0173, B0178, B0509, B0514 or B3933
B0550	Displays and Gauges - DTC B0550
B071F	Displays and Gauges - DTC B071F
B0946	Electronic Suspension Control - DTC B0946 or B0947
B0947	Electronic Suspension Control - DTC B0946 or B0947
B094B	Object Detection and Pedestrian Protection - DTC B094B or B094C
B094C	Object Detection and Pedestrian Protection - DTC B094B or B094C
B094D	Object Detection and Pedestrian Protection - DTC B094D or B094E
B094E	Object Detection and Pedestrian Protection - DTC B094D or B094E
B0954	Object Detection and Pedestrian Protection - DTC B0954, B0955, B0956, or B0957
B0955	Object Detection and Pedestrian Protection - DTC B0954, B0955, B0956, or B0957
B0956	Object Detection and Pedestrian Protection - DTC B0954, B0955, B0956, or B0957
B0957	Object Detection and Pedestrian Protection - DTC B0954, B0955, B0956, or B0957
B0958	Object Detection and Pedestrian Protection - DTC B0958, B0959, B0960, or B0961

DTC	Diagnostic Procedure
B0959	Object Detection and Pedestrian Protection - DTC B0958, B0959, B0960, or B0961
B0960	Object Detection and Pedestrian Protection - DTC B0958, B0959, B0960, or B0961
B0961	Object Detection and Pedestrian Protection - DTC B0958, B0959, B0960, or B0961
B0967	Object Detection and Pedestrian Protection - DTC B0967 or B0968
B0968	Object Detection and Pedestrian Protection - DTC B0967 or B0968
B096B	Object Detection and Pedestrian Protection - DTC B096B
B096C	Object Detection and Pedestrian Protection - DTC B096C or B096D
B096D	Object Detection and Pedestrian Protection - DTC B096C or B096D
B097B	Wiring Systems and Power Management - DTC B097B
B097C	Wiring Systems and Power Management - DTC B097C
B0987	Object Detection and Pedestrian Protection - DTC B0987
B0997	Cellular, Entertainment, and Navigation - DTC B0997
B1000	Data Communications - DTC B1000
B1001	Data Communications - DTC B1001
B1001	Supplemental Inflatable Restraints - DTC B1001
B1011	Object Detection and Pedestrian Protection - DTC B1011
B1015	Object Detection and Pedestrian Protection - DTC B1015
B1019	Supplemental Inflatable Restraints - DTC B1019
B101D	Data Communications - DTC B101D
B101E	Data Communications - DTC B101E
B1020	Cellular, Entertainment, and Navigation - DTC B1020
B1023	Steering Wheel and Column - DTC B1023
B1025	Cellular, Entertainment, and Navigation - DTC B1025, B1035, B1045, or B1055
B1035	Cellular, Entertainment, and Navigation - DTC B1025, B1035, B1045, or B1055
B1045	Cellular, Entertainment, and Navigation - DTC B1025, B1035, B1045, or B1055

DTC	Diagnostic Procedure
B1055	Cellular, Entertainment, and Navigation - DTC B1025, B1035, B1045, or B1055
B125A	Cellular, Entertainment, and Navigation - DTC B125A
B1265	Cellular, Entertainment, and Navigation - DTC B1265
B1271	Cellular, Entertainment, and Navigation - DTC B1271
B1287	Cellular, Entertainment, and Navigation - DTC B1287
B1325	12 V Starting and Charging - DTC B1325, B1330, B1420, B1424, B1517, C0800, C0895, C0899, C0900, P0560, P0562, or P0563
B1330	12 V Starting and Charging - DTC B1325, B1330, B1420, B1424, B1517, C0800, C0895, C0899, C0900, P0560, P0562, or P0563
B1370	Wiring Systems and Power Management - DTC B1370-B1379, B1380-B1389, or B1440-B1443
B1370	Displays and Gauges - DTC B1370
B1370	Wiring Systems and Power Management - Instrument Cluster - DTC B1370
B1380	Wiring Systems and Power Management - DTC B1370-B1379, B1380-B1389, or B1440-B1443
B1395	Power Seats - DTC B1395
B1395	HVAC - Automatic - DTC B0228, B0413, B0423, B1395, or B374A
B1405	Secondary and Configurable Customer Controls - DTC B1405
B1405	Object Detection and Pedestrian Protection - DTC B1405
B1405	Power Seats - DTC B1405, B1825, B2355, B2365, or B2375
B1405	HVAC - Automatic - DTC B0163, B0183, or B1405
B1420	12 V Starting and Charging - DTC B1325, B1330, B1420, B1424, B1517, C0800, C0895, C0899, C0900, P0560, P0562, or P0563
B1424	12 V Starting and Charging - DTC B1325, B1330, B1420, B1424, B1517, C0800, C0895, C0899, C0900, P0560, P0562, or P0563
B1441	Wiring Systems and Power Management - DTC B1370-B1379, B1380-B1389, or B1440-B1443
B1445	Wiring Systems and Power Management - DTC B1445
B144B	Wiring Systems and Power Management - DTC B144B
B144C	Steering Wheel and Column - DTC B144C

DTC	Diagnostic Procedure
B1451	Wiring Systems and Power Management - DTC B1451
B1461	Lighting - DTC B1461 or B1462
B1462	Lighting - DTC B1461 or B1462
B1474	Vehicle Access - DTC B1474 or B3849
B147E	Wiring Systems and Power Management - DTC B147E or B147F
B147F	Wiring Systems and Power Management - DTC B147E or B147F
B1480	Lighting - DTC B1480
B1516	12 V Starting and Charging - DTC B1516
B1517	12 V Starting and Charging - DTC B1325, B1330, B1420, B1424, B1517, C0800, C0895, C0899, C0900, P0560, P0562, or P0563
B151A	12 V Starting and Charging - DTC B151A
B1527	12 V Starting and Charging - DTC B1527
B1529	Secondary and Configurable Customer Controls - DTC B1529
B1534	Vehicle Access - DTC B1534 or B1535
B1535	Vehicle Access - DTC B1534 or B1535
B153A	Vehicle Access - DTC B153A
B154A	Mirrors - DTC B154A or B154B
B154B	Mirrors - DTC B154A or B154B
B1735	Power Seats - DTC B1735, B1740, B1745, B1750, B1755, B1760, B1815, B1820, B1830, B1835, B1840, or B1845
B1740	Power Seats - DTC B1735, B1740, B1745, B1750, B1755, B1760, B1815, B1820, B1830, B1835, B1840, or B1845
B1745	Power Seats - DTC B1735, B1740, B1745, B1750, B1755, B1760, B1815, B1820, B1830, B1835, B1840, or B1845
B1750	Power Seats - DTC B1735, B1740, B1745, B1750, B1755, B1760, B1815, B1820, B1830, B1835, B1840, or B1845
B1755	Power Seats - DTC B1735, B1740, B1745, B1750, B1755, B1760, B1815, B1820, B1830, B1835, B1840, or B1845
B1760	Power Seats - DTC B1735, B1740, B1745, B1750, B1755, B1760, B1815, B1820, B1830, B1835, B1840, or B1845

DTC	Diagnostic Procedure
B1815	Power Seats - DTC B1735, B1740, B1745, B1750, B1755, B1760, B1815, B1820, B1830, B1835, B1840, or B1845
B1820	Power Seats - DTC B1735, B1740, B1745, B1750, B1755, B1760, B1815, B1820, B1830, B1835, B1840, or B1845
B1825	Power Seats - DTC B1405, B1825, B2355, B2365, or B2375
B1830	Power Seats - DTC B1735, B1740, B1745, B1750, B1755, B1760, B1815, B1820, B1830, B1835, B1840, or B1845
B1835	Power Seats - DTC B1735, B1740, B1745, B1750, B1755, B1760, B1815, B1820, B1830, B1835, B1840, or B1845
B1840	Power Seats - DTC B1735, B1740, B1745, B1750, B1755, B1760, B1815, B1820, B1830, B1835, B1840, or B1845
B1845	Power Seats - DTC B1735, B1740, B1745, B1750, B1755, B1760, B1815, B1820, B1830, B1835, B1840, or B1845
B191A	Seat Heating and Cooling - DTC B191A
B2355	Power Seats - DTC B1405, B1825, B2355, B2365, or B2375
B2365	Power Seats - DTC B1405, B1825, B2355, B2365, or B2375
B2375	Power Seats - DTC B1405, B1825, B2355, B2365, or B2375
B2462	Cellular, Entertainment, and Navigation - DTC B2462
B2494	Vehicle Access - DTC B2494
B2495	Vehicle Access - DTC B2495
B2500	Vehicle Access - DTC B2500
B2515	Steering Wheel and Column - DTC B2515
B2530	Lighting - DTC B2530
B2540	Lighting - DTC B2540
B2545	Lighting - DTC B2545
B256A	Lighting - DTC B256A
B2570	Lighting - DTC B2570
B2575	Lighting - DTC B2575 or B2699
B257A	Lighting - DTC B257A

DTC	Diagnostic Procedure
B257B	Lighting - DTC B257B
B2580	Lighting - DTC B2580
B2585	Lighting - DTC B2585 or B3867
B258A	Lighting - DTC B258A
B2600	Lighting - DTC B2600 or B2605
B2605	Lighting - DTC B2600 or B2605
B2610	Lighting - DTC B2610
B2615	Lighting - DTC B2615
B2625	Lighting - DTC B2625
B263A	Lighting - DTC B263A
B2645	Lighting - DTC B2645
B2652	Lighting - DTC B2652
B2699	Lighting - DTC B2575 or B2699
B270A	Shift Lock Control - DTC B270A
B2730	Vehicle Access - DTC B2730
B2745	Antilock Brake System - DTC B2745
B274A	Antilock Brake System - DTC B274A
B2750	Horns - DTC B2750
B2755	Power Seats - DTC B2755 or B2765
B2765	Power Seats - DTC B2755 or B2765
B2897	Steering Wheel and Column - DTC B2897
B2910	Steering Wheel and Column - DTC B2910
B2955	Immobilizer - DTC B2955
B297B	Vehicle Access - DTC B297B or B297C
B297C	Vehicle Access - DTC B297B or B297C
B3006	Bolted Exterior Body Panels and Closures - DTC B3006

DTC	Diagnostic Procedure
B3031	Immobilizer - DTC B3031
B3055	Immobilizer - DTC B3055
B305A	Steering Wheel and Column - DTC B305A
B305C	Immobilizer - DTC B305C
B3060	Immobilizer - DTC B3060
B3101	Remote Functions - DTC B3101
B3105	Remote Functions - DTC B3105
B3106	Remote Functions - DTC B3106
B3109	Remote Functions - DTC B3109-B3113
B310D	Remote Functions - DTC B310D-B310F
B310E	Remote Functions - DTC B310D-B310F
B310F	Remote Functions - DTC B310D-B310F
B3110	Remote Functions - DTC B3109-B3113
B3111	Remote Functions - DTC B3109-B3113
B3112	Remote Functions - DTC B3109-B3113
B3113	Remote Functions - DTC B3109-B3113
B3119	Remote Functions - DTC B3119
B3120	Remote Functions - DTC B3120
B3121	Remote Functions - DTC B3121
B3122	Remote Functions - DTC B3122
B3123	Remote Functions - DTC B3123
B3124	Remote Functions - DTC B3124
B3125	Vehicle Access - DTC B3125, B3130, or B3135
B3130	Vehicle Access - DTC B3125, B3130, or B3135
B3135	Vehicle Access - DTC B3125, B3130, or B3135
B3140	Vehicle Access - DTC B3140, B3145, B3150, or B3155

DTC	Diagnostic Procedure
B3145	Vehicle Access - DTC B3140, B3145, B3150, or B3155
B3150	Vehicle Access - DTC B3140, B3145, B3150, or B3155
B3155	Vehicle Access - DTC B3140, B3145, B3150, or B3155
B316B	Fixed and Moveable Windows - DTC B316B, B317A, B318A, or B319A
B317A	Fixed and Moveable Windows - DTC B316B, B317A, B318A, or B319A
B318A	Fixed and Moveable Windows - DTC B316B, B317A, B318A, or B319A
B319A	Fixed and Moveable Windows - DTC B316B, B317A, B318A, or B319A
B3205	Fixed and Moveable Windows - DTC B3205 or B3210
B3210	Fixed and Moveable Windows - DTC B3205 or B3210
B3265	Vehicle Access - DTC B3265
B3410	Lighting - DTC B3410 or B3420
B3415	Lighting - DTC B3415
B3420	Lighting - DTC B3410 or B3420
B3435	Lighting - DTC B3435 or B3440
B3440	Lighting - DTC B3435 or B3440
B3567	Displays and Gauges - DTC B3567
B356A	Object Detection and Pedestrian Protection - DTC B356A
B3596	Lighting - DTC B3596
B3619	Displays and Gauges - DTC B3619
B361A	Displays and Gauges - DTC B361A
B3622	Secondary and Configurable Customer Controls - DTC B3622
B3634	Displays and Gauges - DTC B3634
B3650	Lighting - DTC B3650
B370A	Wipers and Washers - DTC B370A
B370B	Wipers and Washers - DTC B370B
B3715	Wipers and Washers - DTC B3715 or B3875

DTC	Diagnostic Procedure
B371A	Wipers and Washers - DTC B371A
B374A	HVAC - Automatic - DTC B0228, B0413, B0423, B1395, or B374A
B3794	Cruise Control - Cruise Control Malfunction - DTC B3794, P0564, P0565, P0567, P0568, P056C, P0580, P0581, P155A-P155C, or P162C
B3806	Lighting - DTC B3806
B3810	Wipers and Washers - DTC B3810
B3811	Wipers and Washers - DTC B3811
B3849	Vehicle Access - DTC B1474 or B3849
B3867	Lighting - DTC B2585 or B3867
B3873	Wipers and Washers - DTC B3873
B3875	Wipers and Washers - DTC B3715 or B3875
B3881	Lighting - DTC B3881 or B3882
B3882	Lighting - DTC B3881 or B3882
B3883	Lighting - DTC B3883
B3884	Lighting - DTC B3884
B389A	Immobilizer - DTC B389A
B3902	Immobilizer - DTC B3902
B3916	Theft Deterrent - DTC B3916
B3920	Power Seats - DTC B3920
B3924	Immobilizer - DTC B3924-B3928
B3925	Immobilizer - DTC B3924-B3928
B3926	Immobilizer - DTC B3924-B3928
B3927	Immobilizer - DTC B3924-B3928
B3928	Immobilizer - DTC B3924-B3928
B3933	HVAC - Automatic - DTC B0173, B0178, B0509, B0514 or B3933
B3935	Immobilizer - DTC B3935
B393B	HVAC - Automatic - DTC B393B

DTC	Diagnostic Procedure
B3948	Lighting - DTC B3948 or B3949
B3949	Lighting - DTC B3948 or B3949
B3950	Lighting - DTC B3950 or B3951
B3951	Lighting - DTC B3950 or B3951
B3976	Immobilizer - DTC B3976
B3978	Immobilizer - DTC B3978-B3982
B3979	Immobilizer - DTC B3978-B3982
B3980	Immobilizer - DTC B3978-B3982
B3981	Immobilizer - DTC B3978-B3982
B3982	Immobilizer - DTC B3978-B3982
B3984	Immobilizer - DTC B3984
C0035	Antilock Brake System - DTC C003A, C003B, C0035, C0040, C0045, C0050, or C0055
C003A	Antilock Brake System - DTC C003A, C003B, C0035, C0040, C0045, C0050, or C0055
C003B	Antilock Brake System - DTC C003A, C003B, C0035, C0040, C0045, C0050, or C0055
C0040	Antilock Brake System - DTC C003A, C003B, C0035, C0040, C0045, C0050, or C0055
C0045	Antilock Brake System - DTC C003A, C003B, C0035, C0040, C0045, C0050, or C0055
C0050	Antilock Brake System - DTC C003A, C003B, C0035, C0040, C0045, C0050, or C0055
C0055	Antilock Brake System - DTC C003A, C003B, C0035, C0040, C0045, C0050, or C0055
C0060	Antilock Brake System - DTC C0060-C0095, C0121, C0141, C0146, C0151, or C0156
C0061	Antilock Brake System - DTC C0060-C0095, C0121, C0141, C0146, C0151, or C0156
C0062	Antilock Brake System - DTC C0060-C0095, C0121, C0141, C0146, C0151, or C0156

DTC	Diagnostic Procedure
C0063	Antilock Brake System - DTC C0060-C0095, C0121, C0141, C0146, C0151, or C0156
C0064	Antilock Brake System - DTC C0060-C0095, C0121, C0141, C0146, C0151, or C0156
C0065	Antilock Brake System - DTC C0060-C0095, C0121, C0141, C0146, C0151, or C0156
C0066	Antilock Brake System - DTC C0060-C0095, C0121, C0141, C0146, C0151, or C0156
C0067	Antilock Brake System - DTC C0060-C0095, C0121, C0141, C0146, C0151, or C0156
C0068	Antilock Brake System - DTC C0060-C0095, C0121, C0141, C0146, C0151, or C0156
C0069	Antilock Brake System - DTC C0060-C0095, C0121, C0141, C0146, C0151, or C0156
C0070	Antilock Brake System - DTC C0060-C0095, C0121, C0141, C0146, C0151, or C0156
C0071	Antilock Brake System - DTC C0060-C0095, C0121, C0141, C0146, C0151, or C0156
C0072	Antilock Brake System - DTC C0060-C0095, C0121, C0141, C0146, C0151, or C0156
C0073	Antilock Brake System - DTC C0060-C0095, C0121, C0141, C0146, C0151, or C0156
C0074	Antilock Brake System - DTC C0060-C0095, C0121, C0141, C0146, C0151, or C0156
C0075	Antilock Brake System - DTC C0060-C0095, C0121, C0141, C0146, C0151, or C0156
C0076	Antilock Brake System - DTC C0060-C0095, C0121, C0141, C0146, C0151, or C0156
C0077	Antilock Brake System - DTC C0060-C0095, C0121, C0141, C0146, C0151, or C0156
C0078	Antilock Brake System - DTC C0060-C0095, C0121, C0141, C0146, C0151, or C0156
C0079	Antilock Brake System - DTC C0060-C0095, C0121, C0141, C0146, C0151, or C0156
C0080	Antilock Brake System - DTC C0060-C0095, C0121, C0141, C0146, C0151, or C0156

DTC	Diagnostic Procedure
C0081	Antilock Brake System - DTC C0060-C0095, C0121, C0141, C0146, C0151, or C0156
C0082	Antilock Brake System - DTC C0060-C0095, C0121, C0141, C0146, C0151, or C0156
C0083	Antilock Brake System - DTC C0060-C0095, C0121, C0141, C0146, C0151, or C0156
C0084	Antilock Brake System - DTC C0060-C0095, C0121, C0141, C0146, C0151, or C0156
C0085	Antilock Brake System - DTC C0060-C0095, C0121, C0141, C0146, C0151, or C0156
C0086	Antilock Brake System - DTC C0060-C0095, C0121, C0141, C0146, C0151, or C0156
C0087	Antilock Brake System - DTC C0060-C0095, C0121, C0141, C0146, C0151, or C0156
C0088	Antilock Brake System - DTC C0060-C0095, C0121, C0141, C0146, C0151, or C0156
C0089	Antilock Brake System - DTC C0060-C0095, C0121, C0141, C0146, C0151, or C0156
C0090	Antilock Brake System - DTC C0060-C0095, C0121, C0141, C0146, C0151, or C0156
C0091	Antilock Brake System - DTC C0060-C0095, C0121, C0141, C0146, C0151, or C0156
C0092	Antilock Brake System - DTC C0060-C0095, C0121, C0141, C0146, C0151, or C0156
C0093	Antilock Brake System - DTC C0060-C0095, C0121, C0141, C0146, C0151, or C0156
C0094	Antilock Brake System - DTC C0060-C0095, C0121, C0141, C0146, C0151, or C0156
C0095	Antilock Brake System - DTC C0060-C0095, C0121, C0141, C0146, C0151, or C0156
C0110	Antilock Brake System - DTC C0110
C0115	Antilock Brake System - DTC C0115
C0121	Antilock Brake System - DTC C0060-C0095, C0121, C0141, C0146, C0151, or C0156
C0126	Hydraulic Brakes - DTC C0126

DTC	Diagnostic Procedure
C0131	Antilock Brake System - DTC C0131
C0141	Antilock Brake System - DTC C0060-C0095, C0121, C0141, C0146, C0151, or C0156
C0146	Antilock Brake System - DTC C0060-C0095, C0121, C0141, C0146, C0151, or C0156
C0151	Antilock Brake System - DTC C0060-C0095, C0121, C0141, C0146, C0151, or C0156
C0156	Antilock Brake System - DTC C0060-C0095, C0121, C0141, C0146, C0151, or C0156
C0161	Antilock Brake System - DTC C0161
C0176	Power Steering - DTC C0176
C0186	Antilock Brake System - DTC C0186, C0196, or C0287
C0196	Antilock Brake System - DTC C0186, C0196, or C0287
C0242	Antilock Brake System - DTC C0242 or P0856
C0245	Antilock Brake System - DTC C0245
C025E	Hydraulic Brakes - DTC C025E
C0277	Lighting - DTC C0277 or C0890
C027B	Hydraulic Brakes - DTC C027B
C027D	Park Brake - DTC C027D
C0280	Antilock Brake System - DTC C0280
C0287	Antilock Brake System - DTC C0186, C0196, or C0287
C028A	Park Brake - DTC C028A, C028B, or C028F
C028B	Park Brake - DTC C028A, C028B, or C028F
C028E	Park Brake - DTC C028E
C028F	Park Brake - DTC C028A, C028B, or C028F
C0293	Park Brake - DTC C0293
C0297	Lighting - DTC C0297
C0298	Park Brake - DTC C0298

DTC	Diagnostic Procedure
C0475	Power Steering - DTC C0475
C047A	Power Steering - DTC C047A
C0545	Power Steering - DTC C0545
C0558	Park Brake - DTC C0558
C0561	Park Brake - DTC C0561
C0569	Power Steering - DTC C0569
C0569	Tire Pressure Monitoring - DTC C0569
C056D	Park Brake - DTC C056D
C056D	Data Communications - DTC C056D
C056D	Electronic Suspension Control - DTC C056D
C056E	Park Brake - DTC C056E
C056E	Data Communications - DTC C056E
C0574	Park Brake - DTC C0574
C0574	Electronic Suspension Control - DTC C0574
C0575	Electronic Suspension Control - DTC C0575, C0580, C0585, or C0590
C0580	Electronic Suspension Control - DTC C0575, C0580, C0585, or C0590
C0585	Electronic Suspension Control - DTC C0575, C0580, C0585, or C0590
C0590	Electronic Suspension Control - DTC C0575, C0580, C0585, or C0590
C0615	Electronic Suspension Control - DTC C0615, C0620, C0625, or C0630
C0620	Electronic Suspension Control - DTC C0615, C0620, C0625, or C0630
C0625	Electronic Suspension Control - DTC C0615, C0620, C0625, or C0630
C0630	Electronic Suspension Control - DTC C0615, C0620, C0625, or C0630
C0696	Electronic Suspension Control - DTC C0696
C0710	Antilock Brake System - DTC C0710
C0750	Tire Pressure Monitoring - DTC C0750, C0755, C0760, or C0765
C0755	Tire Pressure Monitoring - DTC C0750, C0755, C0760, or C0765

DTC	Diagnostic Procedure
C0760	Tire Pressure Monitoring - DTC C0750, C0755, C0760, or C0765
C0765	Tire Pressure Monitoring - DTC C0750, C0755, C0760, or C0765
C0775	Tire Pressure Monitoring - DTC C0775
C0800	Electronic Suspension Control - DTC C0800
C0800	12 V Starting and Charging - DTC B1325, B1330, B1420, B1424, B1517, C0800, C0895, C0899, C0900, P0560, P0562, or P0563
C0890	Lighting - DTC C0277 or C0890
C0895	12 V Starting and Charging - DTC B1325, B1330, B1420, B1424, B1517, C0800, C0895, C0899, C0900, P0560, P0562, or P0563
C0899	12 V Starting and Charging - DTC B1325, B1330, B1420, B1424, B1517, C0800, C0895, C0899, C0900, P0560, P0562, or P0563
C0900	12 V Starting and Charging - DTC B1325, B1330, B1420, B1424, B1517, C0800, C0895, C0899, C0900, P0560, P0562, or P0563
C0914	Antilock Brake System - DTC C0914
C124F	Antilock Brake System - DTC C124F or C1250-C1254
C1250	Antilock Brake System - DTC C124F or C1250-C1254
C1251	Antilock Brake System - DTC C124F or C1250-C1254
C1252	Antilock Brake System - DTC C124F or C1250-C1254
C1253	Antilock Brake System - DTC C124F or C1250-C1254
C1254	Antilock Brake System - DTC C124F or C1250-C1254
P0005	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0005
P0010	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0010, P0013, P0020, P0023, P2088, P2089, P2090, P2091, P2092, P2093, P2094, or P2095
P0011	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0011, P0014, P0021, or P0024
P0013	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0010, P0013, P0020, P0023, P2088, P2089, P2090, P2091, P2092, P2093, P2094, or P2095
P0014	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0011, P0014, P0021, or P0024
P0016	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0016, P0017, P0018, or P0019

DTC	Diagnostic Procedure
P0016	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0016
P0017	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0016, P0017, P0018, or P0019
P0018	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0016, P0017, P0018, or P0019
P0019	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0016, P0017, P0018, or P0019
P0020	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0010, P0013, P0020, P0023, P2088, P2089, P2090, P2091, P2092, P2093, P2094, or P2095
P0021	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0011, P0014, P0021, or P0024
P0023	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0010, P0013, P0020, P0023, P2088, P2089, P2090, P2091, P2092, P2093, P2094, or P2095
P0024	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0011, P0014, P0021, or P0024
P0030	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0030-P0032, P0036-P0038, P0050-P0054, P0056-P0060, P0135, P0141, P0155, or P0161
P0030	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0030, P0036, P0050, P0053, P0054, P0056, P0059, P0060, P0135, P0141, P0155, or P0161
P0031	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0030-P0032, P0036-P0038, P0050-P0054, P0056-P0060, P0135, P0141, P0155, or P0161
P0032	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0030-P0032, P0036-P0038, P0050-P0054, P0056-P0060, P0135, P0141, P0155, or P0161
P0033	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0033
P0036	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0030-P0032, P0036-P0038, P0050-P0054, P0056-P0060, P0135, P0141, P0155, or P0161
P0036	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0030, P0036, P0050, P0053, P0054, P0056, P0059, P0060, P0135, P0141, P0155, or P0161
P0037	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0030-P0032, P0036-P0038, P0050-P0054, P0056-P0060, P0135, P0141, P0155, or P0161
P0038	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0030-P0032, P0036-P0038, P0050-P0054, P0056-P0060, P0135, P0141, P0155, or P0161
P0050	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0030-P0032, P0036-P0038, P0050-P0054, P0056-P0060, P0135, P0141, P0155, or P0161
P0050	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0030, P0036, P0050, P0053, P0054, P0056, P0059, P0060, P0135, P0141, P0155, or P0161

DTC	Diagnostic Procedure
P0051	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0030-P0032, P0036-P0038, P0050-P0054, P0056-P0060, P0135, P0141, P0155, or P0161
P0052	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0030-P0032, P0036-P0038, P0050-P0054, P0056-P0060, P0135, P0141, P0155, or P0161
P0053	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0030-P0032, P0036-P0038, P0050-P0054, P0056-P0060, P0135, P0141, P0155, or P0161
P0053	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0030, P0036, P0050, P0053, P0054, P0056, P0059, P0060, P0135, P0141, P0155, or P0161
P0054	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0030-P0032, P0036-P0038, P0050-P0054, P0056-P0060, P0135, P0141, P0155, or P0161
P0054	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0030, P0036, P0050, P0053, P0054, P0056, P0059, P0060, P0135, P0141, P0155, or P0161
P0056	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0030-P0032, P0036-P0038, P0050-P0054, P0056-P0060, P0135, P0141, P0155, or P0161
P0056	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0030, P0036, P0050, P0053, P0054, P0056, P0059, P0060, P0135, P0141, P0155, or P0161
P0057	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0030-P0032, P0036-P0038, P0050-P0054, P0056-P0060, P0135, P0141, P0155, or P0161
P0058	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0030-P0032, P0036-P0038, P0050-P0054, P0056-P0060, P0135, P0141, P0155, or P0161
P0059	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0030-P0032, P0036-P0038, P0050-P0054, P0056-P0060, P0135, P0141, P0155, or P0161
P0059	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0030, P0036, P0050, P0053, P0054, P0056, P0059, P0060, P0135, P0141, P0155, or P0161
P0060	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0030-P0032, P0036-P0038, P0050-P0054, P0056-P0060, P0135, P0141, P0155, or P0161
P0060	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0030, P0036, P0050, P0053, P0054, P0056, P0059, P0060, P0135, P0141, P0155, or P0161
P0068	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0068 or P1101
P0068	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0068 or P1101
P006D	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P006D
P0089	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0089, P00C6, P228C, or P228D
P0090	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0090-P0092, P00C8, P00C9, or P00CA

DTC	Diagnostic Procedure
P0091	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0090-P0092, P00C8, P00C9, or P00CA
P0092	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0090-P0092, P00C8, P00C9, or P00CA
P0096	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0096 or P0111
P0096	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0096
P0097	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0097, P0098, or P0099
P0097	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0097 or P0098
P0098	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0097, P0098, or P0099
P0098	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0097 or P0098
P0099	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0097, P0098, or P0099
P00C6	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0089, P00C6, P228C, or P228D
P00C8	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0090-P0092, P00C8, P00C9, or P00CA
P00C9	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0090-P0092, P00C8, P00C9, or P00CA
P00CA	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0090-P0092, P00C8, P00C9, or P00CA
P00F4	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P00F4-P00F6
P00F5	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P00F4-P00F6
P00F6	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P00F4-P00F6
P0101	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0101
P0101	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0101
P0102	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0102 or P0103
P0102	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0102 or P0103
P0103	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0102 or P0103
P0103	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0102 or P0103

DTC	Diagnostic Procedure
P0106	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0106
P0106	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0106
P0107	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0107 or P0108
P0107	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0107 or P0108
P0108	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0107 or P0108
P0108	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0107 or P0108
P0111	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0111
P0111	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0096 or P0111
P0112	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0112, P0113, or P0114
P0112	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0112 or P0113
P0113	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0112, P0113, or P0114
P0113	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0112 or P0113
P0114	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0112, P0113, or P0114
P0116	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0116
P0117	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0117, P0118, or P0119
P0117	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0117 or P0118
P0118	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0117, P0118, or P0119
P0118	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0117 or P0118
P0119	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0117, P0118, or P0119
P0120	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0120-P0123, P0220, P0222, P0223, or P2135
P0121	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0121-P0123, P0222, P0223, P16A0-P16A2, or P2135
P0121	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0120-P0123, P0220, P0222, P0223, or P2135

DTC	Diagnostic Procedure
P0122	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0121-P0123, P0222, P0223, P16A0-P16A2, or P2135
P0122	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0120-P0123, P0220, P0222, P0223, or P2135
P0123	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0121-P0123, P0222, P0223, P16A0-P16A2, or P2135
P0123	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0120-P0123, P0220, P0222, P0223, or P2135
P0128	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0128
P0128	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0128
P012B	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P012B
P012C	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P012C or P012D
P012D	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P012C or P012D
P0131	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0131, P0132, P0134, P0137, P0138, P0140, P0151, P0152, P0154, P0157, P0158, or P0160
P0131	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0131, P0132, P0134, P0137, P0138, P0140, P0151, P0152, P0154, P0157, P0158, or P0160
P0132	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0131, P0132, P0134, P0137, P0138, P0140, P0151, P0152, P0154, P0157, P0158, or P0160
P0132	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0131, P0132, P0134, P0137, P0138, P0140, P0151, P0152, P0154, P0157, P0158, or P0160
P0133	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0133, P013A-P013F, P014A, P014B, P0153, P1133, P1153, or P2270-P2273
P0133	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - LSA - DTC P0133, P0153, P015A-P015D, or P2270-P2273
P0133	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - L77, LS3 - DTC P0133, P0153, P1133, P1153, or P2270-P2273
P0134	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0131, P0132, P0134, P0137, P0138, P0140, P0151, P0152, P0154, P0157, P0158, or P0160
P0134	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0131, P0132, P0134, P0137, P0138, P0140, P0151, P0152, P0154, P0157, P0158, or P0160
P0135	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0030-P0032, P0036-P0038, P0050-P0054, P0056-P0060, P0135, P0141, P0155, or P0161
P0135	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0030, P0036, P0050, P0053, P0054, P0056, P0059, P0060, P0135, P0141, P0155, or P0161

DTC	Diagnostic Procedure
P0137	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0131, P0132, P0134, P0137, P0138, P0140, P0151, P0152, P0154, P0157, P0158, or P0160
P0137	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0131, P0132, P0134, P0137, P0138, P0140, P0151, P0152, P0154, P0157, P0158, or P0160
P0138	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0131, P0132, P0134, P0137, P0138, P0140, P0151, P0152, P0154, P0157, P0158, or P0160
P0138	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0131, P0132, P0134, P0137, P0138, P0140, P0151, P0152, P0154, P0157, P0158, or P0160
P013A	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0133, P013A-P013F, P014A, P014B, P0153, P1133, P1153, or P2270-P2273
P013B	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0133, P013A-P013F, P014A, P014B, P0153, P1133, P1153, or P2270-P2273
P013C	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0133, P013A-P013F, P014A, P014B, P0153, P1133, P1153, or P2270-P2273
P013D	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0133, P013A-P013F, P014A, P014B, P0153, P1133, P1153, or P2270-P2273
P013E	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0133, P013A-P013F, P014A, P014B, P0153, P1133, P1153, or P2270-P2273
P013F	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0133, P013A-P013F, P014A, P014B, P0153, P1133, P1153, or P2270-P2273
P0140	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0131, P0132, P0134, P0137, P0138, P0140, P0151, P0152, P0154, P0157, P0158, or P0160
P0140	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0131, P0132, P0134, P0137, P0138, P0140, P0151, P0152, P0154, P0157, P0158, or P0160
P0141	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0030-P0032, P0036-P0038, P0050-P0054, P0056-P0060, P0135, P0141, P0155, or P0161
P0141	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0030, P0036, P0050, P0053, P0054, P0056, P0059, P0060, P0135, P0141, P0155, or P0161
P014A	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0133, P013A-P013F, P014A, P014B, P0153, P1133, P1153, or P2270-P2273
P014B	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0133, P013A-P013F, P014A, P014B, P0153, P1133, P1153, or P2270-P2273
P0151	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0131, P0132, P0134, P0137, P0138, P0140, P0151, P0152, P0154, P0157, P0158, or P0160
P0151	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0131, P0132, P0134, P0137, P0138, P0140, P0151, P0152, P0154, P0157, P0158, or P0160

DTC	Diagnostic Procedure
P0152	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0131, P0132, P0134, P0137, P0138, P0140, P0151, P0152, P0154, P0157, P0158, or P0160
P0152	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0131, P0132, P0134, P0137, P0138, P0140, P0151, P0152, P0154, P0157, P0158, or P0160
P0153	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - LSA - DTC P0133, P0153, P015A-P015D, or P2270-P2273
P0153	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - L77, LS3 - DTC P0133, P0153, P1133, P1153, or P2270-P2273
P0153	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0133, P013A-P013F, P014A, P014B, P0153, P1133, P1153, or P2270-P2273
P0154	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0131, P0132, P0134, P0137, P0138, P0140, P0151, P0152, P0154, P0157, P0158, or P0160
P0154	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0131, P0132, P0134, P0137, P0138, P0140, P0151, P0152, P0154, P0157, P0158, or P0160
P0155	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0030-P0032, P0036-P0038, P0050-P0054, P0056-P0060, P0135, P0141, P0155, or P0161
P0155	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0030, P0036, P0050, P0053, P0054, P0056, P0059, P0060, P0135, P0141, P0155, or P0161
P0157	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0131, P0132, P0134, P0137, P0138, P0140, P0151, P0152, P0154, P0157, P0158, or P0160
P0157	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0131, P0132, P0134, P0137, P0138, P0140, P0151, P0152, P0154, P0157, P0158, or P0160
P0158	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0131, P0132, P0134, P0137, P0138, P0140, P0151, P0152, P0154, P0157, P0158, or P0160
P0158	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0131, P0132, P0134, P0137, P0138, P0140, P0151, P0152, P0154, P0157, P0158, or P0160
P015A	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0133, P0153, P015A-P015D, or P2270-P2273
P015B	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0133, P0153, P015A-P015D, or P2270-P2273
P015C	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0133, P0153, P015A-P015D, or P2270-P2273
P015D	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0133, P0153, P015A-P015D, or P2270-P2273
P0160	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0131, P0132, P0134, P0137, P0138, P0140, P0151, P0152, P0154, P0157, P0158, or P0160

DTC	Diagnostic Procedure
P0160	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0131, P0132, P0134, P0137, P0138, P0140, P0151, P0152, P0154, P0157, P0158, or P0160
P0161	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0030-P0032, P0036-P0038, P0050-P0054, P0056-P0060, P0135, P0141, P0155, or P0161
P0161	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0030, P0036, P0050, P0053, P0054, P0056, P0059, P0060, P0135, P0141, P0155, or P0161
P0171	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0171, P0172, P0174, or P0175
P0171	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0171, P0172, P0174, or P0175
P0172	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0171, P0172, P0174, or P0175
P0172	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0171, P0172, P0174, or P0175
P0174	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0171, P0172, P0174, or P0175
P0174	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0171, P0172, P0174, or P0175
P0175	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0171, P0172, P0174, or P0175
P0175	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0171, P0172, P0174, or P0175
P0178	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0178
P0178	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0178
P0179	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0179
P0179	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0179
P018B	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P018B-P018D
P018B	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P018B-P018D
P018C	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - LFW, LFX - DTC P018B-P018D
P018C	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P018B-P018D
P018C	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - LWR - DTC P018C or P018D

DTC	Diagnostic Procedure
P018D	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - LFW, LFX - DTC P018B-P018D
P018D	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P018B-P018D
P018D	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - LWR - DTC P018C or P018D
P0192	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0192 or P0193
P0193	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0192 or P0193
P0196	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0196, P0197, or P0198
P0197	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0196, P0197, or P0198
P0198	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0196, P0197, or P0198
P0201	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0201, P0202, P0203, P0204, P0205, P0206, P0261, P0262, P0264, P0265, P0267, P0268, P0270, P0271, P0273, P0274, P0276, or P0277
P0201	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0201, P0202, P0203, P0204, P0205, P0206, P0207, or P0208
P0202	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0201, P0202, P0203, P0204, P0205, P0206, P0261, P0262, P0264, P0265, P0267, P0268, P0270, P0271, P0273, P0274, P0276, or P0277
P0202	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0201, P0202, P0203, P0204, P0205, P0206, P0207, or P0208
P0203	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0201, P0202, P0203, P0204, P0205, P0206, P0261, P0262, P0264, P0265, P0267, P0268, P0270, P0271, P0273, P0274, P0276, or P0277
P0203	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0201, P0202, P0203, P0204, P0205, P0206, P0207, or P0208
P0204	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0201, P0202, P0203, P0204, P0205, P0206, P0261, P0262, P0264, P0265, P0267, P0268, P0270, P0271, P0273, P0274, P0276, or P0277
P0204	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0201, P0202, P0203, P0204, P0205, P0206, P0207, or P0208
P0205	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0201, P0202, P0203, P0204, P0205, P0206, P0261, P0262, P0264, P0265, P0267, P0268, P0270, P0271, P0273, P0274, P0276, or P0277
P0205	

DTC	Diagnostic Procedure
	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0201, P0202, P0203, P0204, P0205, P0206, P0207, or P0208
P0206	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0201, P0202, P0203, P0204, P0205, P0206, P0261, P0262, P0264, P0265, P0267, P0268, P0270, P0271, P0273, P0274, P0276, or P0277
P0206	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0201, P0202, P0203, P0204, P0205, P0206, P0207, or P0208
P0207	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0201, P0202, P0203, P0204, P0205, P0206, P0207, or P0208
P0208	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0201, P0202, P0203, P0204, P0205, P0206, P0207, or P0208
P0218	Manual Transmission - Tremec 6-Speed (MG9 MER) - DTC P0218
P0220	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0120-P0123, P0220, P0222, P0223, or P2135
P0222	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0121-P0123, P0222, P0223, P16A0-P16A2, or P2135
P0222	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0120-P0123, P0220, P0222, P0223, or P2135
P0223	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0121-P0123, P0222, P0223, P16A0-P16A2, or P2135
P0223	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0120-P0123, P0220, P0222, P0223, or P2135
P0230	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0230
P0231	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - LWR - DTC P0231 or P0232
P0231	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0231, P0232, or P023F
P0231	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0231, P0232, or P023F
P0232	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - LWR - DTC P0231 or P0232
P0232	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0231, P0232, or P023F
P0232	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0231, P0232, or P023F
P023A	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P023A

DTC	Diagnostic Procedure
P023F	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0231, P0232, or P023F
P023F	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0231, P0232, or P023F
P025A	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P025A
P0261	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0201, P0202, P0203, P0204, P0205, P0206, P0261, P0262, P0264, P0265, P0267, P0268, P0270, P0271, P0273, P0274, P0276, or P0277
P0262	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0201, P0202, P0203, P0204, P0205, P0206, P0261, P0262, P0264, P0265, P0267, P0268, P0270, P0271, P0273, P0274, P0276, or P0277
P0264	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0201, P0202, P0203, P0204, P0205, P0206, P0261, P0262, P0264, P0265, P0267, P0268, P0270, P0271, P0273, P0274, P0276, or P0277
P0265	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0201, P0202, P0203, P0204, P0205, P0206, P0261, P0262, P0264, P0265, P0267, P0268, P0270, P0271, P0273, P0274, P0276, or P0277
P0267	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0201, P0202, P0203, P0204, P0205, P0206, P0261, P0262, P0264, P0265, P0267, P0268, P0270, P0271, P0273, P0274, P0276, or P0277
P0268	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0201, P0202, P0203, P0204, P0205, P0206, P0261, P0262, P0264, P0265, P0267, P0268, P0270, P0271, P0273, P0274, P0276, or P0277
P0270	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0201, P0202, P0203, P0204, P0205, P0206, P0261, P0262, P0264, P0265, P0267, P0268, P0270, P0271, P0273, P0274, P0276, or P0277
P0271	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0201, P0202, P0203, P0204, P0205, P0206, P0261, P0262, P0264, P0265, P0267, P0268, P0270, P0271, P0273, P0274, P0276, or P0277
P0273	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0201, P0202, P0203, P0204, P0205, P0206, P0261, P0262, P0264, P0265, P0267, P0268, P0270, P0271, P0273, P0274, P0276, or P0277
P0274	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0201, P0202, P0203, P0204, P0205, P0206, P0261, P0262, P0264, P0265, P0267, P0268, P0270, P0271, P0273, P0274, P0276, or P0277
P0276	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0201, P0202, P0203, P0204, P0205, P0206, P0261, P0262, P0264, P0265, P0267, P0268, P0270, P0271, P0273, P0274, P0276, or P0277
P0277	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0201, P0202, P0203, P0204, P0205, P0206, P0261, P0262, P0264, P0265, P0267, P0268, P0270, P0271, P0273, P0274, P0276, or P0277

DTC	Diagnostic Procedure
P0300	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0300-P0306
P0300	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0300-P0308
P0301	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0300-P0306
P0301	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0300-P0308
P0302	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0300-P0306
P0302	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0300-P0308
P0303	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0300-P0306
P0303	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0300-P0308
P0304	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0300-P0306
P0304	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0300-P0308
P0305	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0300-P0306
P0305	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0300-P0308
P0306	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0300-P0306
P0306	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0300-P0308
P0307	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0300-P0308
P0308	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0300-P0308
P0315	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0315
P0315	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0315
P0324	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0324, P0326, P0331, P06B6, or P06B7
P0324	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0324, P0325, P0326, P0327, P0328, P0330, P0332, or P0333
P0325	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0325, P0327, P0328, P0330, P0332, or P0333
P0325	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0324, P0325, P0326, P0327, P0328, P0330, P0332, or P0333
P0326	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0324, P0326, P0331, P06B6, or P06B7

DTC	Diagnostic Procedure
P0326	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0324, P0325, P0326, P0327, P0328, P0330, P0332, or P0333
P0327	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0325, P0327, P0328, P0330, P0332, or P0333
P0327	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0324, P0325, P0326, P0327, P0328, P0330, P0332, or P0333
P0328	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0325, P0327, P0328, P0330, P0332, or P0333
P0328	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0324, P0325, P0326, P0327, P0328, P0330, P0332, or P0333
P0330	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0325, P0327, P0328, P0330, P0332, or P0333
P0330	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0324, P0325, P0326, P0327, P0328, P0330, P0332, or P0333
P0331	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0324, P0326, P0331, P06B6, or P06B7
P0332	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0325, P0327, P0328, P0330, P0332, or P0333
P0332	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0324, P0325, P0326, P0327, P0328, P0330, P0332, or P0333
P0333	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0325, P0327, P0328, P0330, P0332, or P0333
P0333	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0324, P0325, P0326, P0327, P0328, P0330, P0332, or P0333
P0335	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0335 or P0336
P0335	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0335 or P0336
P0336	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0335 or P0336
P0336	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0335 or P0336
P0340	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0340, P0341, P0345, P0346, P0365, P0366, P0390, or P0391
P0340	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0340 or P0341
P0341	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0340, P0341, P0345, P0346, P0365, P0366, P0390, or P0391
P0341	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0340 or P0341

DTC	Diagnostic Procedure
P0345	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0340, P0341, P0345, P0346, P0365, P0366, P0390, or P0391
P0346	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0340, P0341, P0345, P0346, P0365, P0366, P0390, or P0391
P0351	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0351-P0356, P2300, P2301, P2303, P2304, P2306, P2307, P2309, P2310, P2312, P2313, P2315, or P2316
P0351	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0351-P0358
P0352	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0351-P0356, P2300, P2301, P2303, P2304, P2306, P2307, P2309, P2310, P2312, P2313, P2315, or P2316
P0352	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0351-P0358
P0353	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0351-P0356, P2300, P2301, P2303, P2304, P2306, P2307, P2309, P2310, P2312, P2313, P2315, or P2316
P0353	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0351-P0358
P0354	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0351-P0356, P2300, P2301, P2303, P2304, P2306, P2307, P2309, P2310, P2312, P2313, P2315, or P2316
P0354	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0351-P0358
P0355	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0351-P0356, P2300, P2301, P2303, P2304, P2306, P2307, P2309, P2310, P2312, P2313, P2315, or P2316
P0355	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0351-P0358
P0356	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0351-P0356, P2300, P2301, P2303, P2304, P2306, P2307, P2309, P2310, P2312, P2313, P2315, or P2316
P0356	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0351-P0358
P0357	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0351-P0358
P0358	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0351-P0358
P0365	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0340, P0341, P0345, P0346, P0365, P0366, P0390, or P0391
P0366	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0340, P0341, P0345, P0346, P0365, P0366, P0390, or P0391
P0390	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0340, P0341, P0345, P0346, P0365, P0366, P0390, or P0391

DTC	Diagnostic Procedure
P0391	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0340, P0341, P0345, P0346, P0365, P0366, P0390, or P0391
P0420	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0420 or P0430
P0420	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0420 or P0430
P0430	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0420 or P0430
P0430	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0420 or P0430
P0443	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0443, P0458, or P0459
P0443	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0443
P0458	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0443, P0458, or P0459
P0459	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0443, P0458, or P0459
P0461	Displays and Gauges - DTC P0461-P0464, P2066, P2067, or P2068
P0462	Displays and Gauges - DTC P0461-P0464, P2066, P2067, or P2068
P0463	Displays and Gauges - DTC P0461-P0464, P2066, P2067, or P2068
P0464	Displays and Gauges - DTC P0461-P0464, P2066, P2067, or P2068
P0480	Engine Heating and Cooling - DTC P0480, P0691, or P0692
P0502	Manual Transmission - Aisin AY6 (MV5) - DTC P0502 or P0503
P0502	Manual Transmission - Tremec 6-Speed (MG9 MER) - DTC P0502 or P0503
P0503	Manual Transmission - Aisin AY6 (MV5) - DTC P0502 or P0503
P0503	Manual Transmission - Tremec 6-Speed (MG9 MER) - DTC P0502 or P0503
P0506	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0506 or P0507
P0506	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0506 or P0507
P0507	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0506 or P0507
P0507	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0506 or P0507
P0513	Immobilizer - DTC P0513
P0520	Displays and Gauges - DTC P0520

DTC	Diagnostic Procedure
P0521	Displays and Gauges - DTC P0521, P0522, or P0523
P0522	Displays and Gauges - DTC P0521, P0522, or P0523
P0523	Displays and Gauges - DTC P0521, P0522, or P0523
P0532	HVAC - Automatic - DTC P0532 or P0533
P0533	HVAC - Automatic - DTC P0532 or P0533
P0556	Hydraulic Brakes - DTC P0556, P0557, or P0558
P0557	Hydraulic Brakes - DTC P0556, P0557, or P0558
P0558	Hydraulic Brakes - DTC P0556, P0557, or P0558
P0560	12 V Starting and Charging - DTC B1325, B1330, B1420, B1424, B1517, C0800, C0895, C0899, C0900, P0560, P0562, or P0563
P0562	12 V Starting and Charging - DTC B1325, B1330, B1420, B1424, B1517, C0800, C0895, C0899, C0900, P0560, P0562, or P0563
P0563	12 V Starting and Charging - DTC B1325, B1330, B1420, B1424, B1517, C0800, C0895, C0899, C0900, P0560, P0562, or P0563
P0564	Cruise Control - Cruise Control Malfunction - DTC B3794, P0564, P0565, P0567, P0568, P056C, P0580, P0581, P155A-P155C, or P162C
P0565	Cruise Control - Cruise Control Malfunction - DTC B3794, P0564, P0565, P0567, P0568, P056C, P0580, P0581, P155A-P155C, or P162C
P0567	Cruise Control - Cruise Control Malfunction - DTC B3794, P0564, P0565, P0567, P0568, P056C, P0580, P0581, P155A-P155C, or P162C
P0568	Cruise Control - Cruise Control Malfunction - DTC B3794, P0564, P0565, P0567, P0568, P056C, P0580, P0581, P155A-P155C, or P162C
P056C	Cruise Control - Cruise Control Malfunction - DTC B3794, P0564, P0565, P0567, P0568, P056C, P0580, P0581, P155A-P155C, or P162C
P0572	Cruise Control - DTC P0572 or P0573
P0573	Cruise Control - DTC P0572 or P0573
P0575	Cruise Control - DTC P0575
P057B	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P057B-P057D
P057C	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P057B-P057D
P057C	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P057C or P057D
P057D	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P057B-P057D

DTC	Diagnostic Procedure
P057D	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P057C or P057D
P0580	Cruise Control - Cruise Control Malfunction - DTC B3794, P0564, P0565, P0567, P0568, P056C, P0580, P0581, P155A-P155C, or P162C
P0581	Cruise Control - Cruise Control Malfunction - DTC B3794, P0564, P0565, P0567, P0568, P056C, P0580, P0581, P155A-P155C, or P162C
P0601	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - Fuel Pump Control Module, LWR - DTC P0601-P0604, P0606, P062F, or P064A
P0601	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - ECM - DTC P0601-P0604, P0606, P062B, P062F, P0630, P161C, P16F3, or P262B
P0601	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - Chassis Control Module - DTC P0601-P0606, P060A, P062F, or P262B
P0601	Data Communications - DTC P0601-P0606, P060A, P062F, or P262B
P0601	Automatic Transmission - 6L45 (MYA), 6L80 (MYC), or 6L90 (MYD) - DTC P0601-P0604 or P062F
P0601	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - ECM - DTC P0601, P0602, P0603, P0604, P0606, P0607, P060D, P062F, or P2610
P0602	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - Fuel Pump Control Module, LWR - DTC P0601-P0604, P0606, P062F, or P064A
P0602	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - ECM - DTC P0601-P0604, P0606, P062B, P062F, P0630, P161C, P16F3, or P262B
P0602	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - Chassis Control Module - DTC P0601-P0606, P060A, P062F, or P262B
P0602	Data Communications - DTC P0601-P0606, P060A, P062F, or P262B
P0602	Automatic Transmission - 6L45 (MYA), 6L80 (MYC), or 6L90 (MYD) - DTC P0601-P0604 or P062F
P0602	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - ECM - DTC P0601, P0602, P0603, P0604, P0606, P0607, P060D, P062F, or P2610
P0603	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - Fuel Pump Control Module, LWR - DTC P0601-P0604, P0606, P062F, or P064A
P0603	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - ECM - DTC P0601-P0604, P0606, P062B, P062F, P0630, P161C, P16F3, or P262B
P0603	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - Chassis Control Module - DTC P0601-P0606, P060A, P062F, or P262B
P0603	Data Communications - DTC P0601-P0606, P060A, P062F, or P262B

DTC	Diagnostic Procedure
P0603	Automatic Transmission - 6L45 (MYA), 6L80 (MYC), or 6L90 (MYD) - DTC P0601-P0604 or P062F
P0603	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - ECM - DTC P0601, P0602, P0603, P0604, P0606, P0607, P060D, P062F, or P2610
P0604	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - Fuel Pump Control Module, LWR - DTC P0601-P0604, P0606, P062F, or P064A
P0604	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - ECM - DTC P0601-P0604, P0606, P062B, P062F, P0630, P161C, P16F3, or P262B
P0604	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - Chassis Control Module - DTC P0601-P0606, P060A, P062F, or P262B
P0604	Data Communications - DTC P0601-P0606, P060A, P062F, or P262B
P0604	Automatic Transmission - 6L45 (MYA), 6L80 (MYC), or 6L90 (MYD) - DTC P0601-P0604 or P062F
P0604	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - ECM - DTC P0601, P0602, P0603, P0604, P0606, P0607, P060D, P062F, or P2610
P0605	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0601-P0606, P060A, P062F, or P262B
P0605	Data Communications - DTC P0601-P0606, P060A, P062F, or P262B
P0606	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - Chassis Control Module - DTC P0601-P0606, P060A, P062F, or P262B
P0606	Data Communications - DTC P0601-P0606, P060A, P062F, or P262B
P0606	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - Fuel Pump Control Module, LWR - DTC P0601-P0604, P0606, P062F, or P064A
P0606	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - ECM - DTC P0601-P0604, P0606, P062B, P062F, P0630, P161C, P16F3, or P262B
P0606	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - ECM - DTC P0601, P0602, P0603, P0604, P0606, P0607, P060D, P062F, or P2610
P0607	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0601, P0602, P0603, P0604, P0606, P0607, P060D, P062F, or P2610
P060A	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0601-P0606, P060A, P062F, or P262B
P060A	Data Communications - DTC P0601-P0606, P060A, P062F, or P262B
P060D	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0601, P0602, P0603, P0604, P0606, P0607, P060D, P062F, or P2610
P0615	12 V Starting and Charging - DTC P0615, P0616, or P0617

DTC	Diagnostic Procedure
P0616	12 V Starting and Charging - DTC P0615, P0616, or P0617
P0617	12 V Starting and Charging - DTC P0615, P0616, or P0617
P0621	12 V Starting and Charging - DTC P0621
P0622	12 V Starting and Charging - DTC P0622
P0628	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0628
P062B	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0601-P0604, P0606, P062B, P062F, P0630, P161C, P16F3, or P262B
P062F	Automatic Transmission - 6L45 (MYA), 6L80 (MYC), or 6L90 (MYD) - DTC P0601-P0604 or P062F
P062F	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - Fuel Pump Control Module, LWR - DTC P0601-P0604, P0606, P062F, or P064A
P062F	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - Chassis Control Module - DTC P0601-P0606, P060A, P062F, or P262B
P062F	Data Communications - DTC P0601-P0606, P060A, P062F, or P262B
P062F	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - ECM - DTC P0601-P0604, P0606, P062B, P062F, P0630, P161C, P16F3, or P262B
P062F	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - ECM - DTC P0601, P0602, P0603, P0604, P0606, P0607, P060D, P062F, or P2610
P0630	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0601-P0604, P0606, P062B, P062F, P0630, P161C, P16F3, or P262B
P0633	Immobilizer - DTC P0633
P0634	Automatic Transmission - 6L45 (MYA), 6L80 (MYC), or 6L90 (MYD) - DTC P0634
P0641	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0641, P0651, P0697, or P06A3
P0641	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - Chassis Control Module - DTC P0641 or P06A6
P0641	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - ECM, without Supercharger - DTC P0641 or P0651
P0645	HVAC - Automatic - DTC P0645, P0646, or P0647
P0646	HVAC - Automatic - DTC P0645, P0646, or P0647
P0647	HVAC - Automatic - DTC P0645, P0646, or P0647

DTC	Diagnostic Procedure
P064A	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P1255 or P064A
P064A	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0601-P0604, P0606, P062F, or P064A
P0650	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0650, P263A, or P263B
P0650	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0650
P0651	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0641, P0651, P0697, or P06A3
P0651	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0641 or P0651
P0658	Automatic Transmission - 6L45 (MYA), 6L80 (MYC), or 6L90 (MYD) - DTC P0658 or P0659
P0659	Automatic Transmission - 6L45 (MYA), 6L80 (MYC), or 6L90 (MYD) - DTC P0658 or P0659
P0667	Automatic Transmission - 6L45 (MYA), 6L80 (MYC), or 6L90 (MYD) - DTC P0667, P0668, or P0669
P0668	Automatic Transmission - 6L45 (MYA), 6L80 (MYC), or 6L90 (MYD) - DTC P0667, P0668, or P0669
P0669	Automatic Transmission - 6L45 (MYA), 6L80 (MYC), or 6L90 (MYD) - DTC P0667, P0668, or P0669
P0685	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0685-P0687, P0689, P0690, or P1682
P0685	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0685, P0689, P0690, or P1682
P0686	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0685-P0687, P0689, P0690, or P1682
P0687	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0685-P0687, P0689, P0690, or P1682
P0689	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0685-P0687, P0689, P0690, or P1682
P0689	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0685, P0689, P0690, or P1682
P0690	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0685-P0687, P0689, P0690, or P1682
P0690	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0685, P0689, P0690, or P1682

DTC	Diagnostic Procedure
P0691	Engine Heating and Cooling - DTC P0480, P0691, or P0692
P0692	Engine Heating and Cooling - DTC P0480, P0691, or P0692
P0697	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0641, P0651, P0697, or P06A3
P069E	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P069E
P069E	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P069E
P06A3	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0641, P0651, P0697, or P06A3
P06A6	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0641 or P06A6
P06AC	Automatic Transmission - 6L45 (MYA), 6L80 (MYC), or 6L90 (MYD) - DTC P06AC, P06AD, or P06AE
P06AD	Automatic Transmission - 6L45 (MYA), 6L80 (MYC), or 6L90 (MYD) - DTC P06AC, P06AD, or P06AE
P06AE	Automatic Transmission - 6L45 (MYA), 6L80 (MYC), or 6L90 (MYD) - DTC P06AC, P06AD, or P06AE
P06B6	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0324, P0326, P0331, P06B6, or P06B7
P06B7	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0324, P0326, P0331, P06B6, or P06B7
P0700	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0700
P0700	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0700
P0703	Cruise Control - DTC P0703
P0711	Automatic Transmission - 6L45 (MYA), 6L80 (MYC), or 6L90 (MYD) - DTC P0711-P0713
P0712	Automatic Transmission - 6L45 (MYA), 6L80 (MYC), or 6L90 (MYD) - DTC P0711-P0713
P0712	Manual Transmission - Tremec 6-Speed (MG9 MER) - DTC P0712 or P0713
P0713	Automatic Transmission - 6L45 (MYA), 6L80 (MYC), or 6L90 (MYD) - DTC P0711-P0713
P0713	Manual Transmission - Tremec 6-Speed (MG9 MER) - DTC P0712 or P0713
P0716	Automatic Transmission - 6L45 (MYA), 6L80 (MYC), or 6L90 (MYD) - DTC P0716 or P0717

DTC	Diagnostic Procedure
P0717	Automatic Transmission - 6L45 (MYA), 6L80 (MYC), or 6L90 (MYD) - DTC P0716 or P0717
P071D	Automatic Transmission - 6L45 (MYA), 6L80 (MYC), or 6L90 (MYD) - DTC P071D
P0722	Automatic Transmission - 6L45 (MYA), 6L80 (MYC), or 6L90 (MYD) - DTC P0722 or P0723
P0723	Automatic Transmission - 6L45 (MYA), 6L80 (MYC), or 6L90 (MYD) - DTC P0722 or P0723
P0741	Automatic Transmission - 6L45 (MYA), 6L80 (MYC), or 6L90 (MYD) - DTC P0741 or P0742
P0742	Automatic Transmission - 6L45 (MYA), 6L80 (MYC), or 6L90 (MYD) - DTC P0741 or P0742
P0751	Automatic Transmission - 6L45 (MYA), 6L80 (MYC), or 6L90 (MYD) - DTC P0751 or P0752
P0752	Automatic Transmission - 6L45 (MYA), 6L80 (MYC), or 6L90 (MYD) - DTC P0751 or P0752
P0756	Automatic Transmission - 6L45 (MYA), 6L80 (MYC), or 6L90 (MYD) - DTC P0756
P0776	Automatic Transmission - 6L45 (MYA), 6L80 (MYC), or 6L90 (MYD) - DTC P0776 or P0777
P0777	Automatic Transmission - 6L45 (MYA), 6L80 (MYC), or 6L90 (MYD) - DTC P0776 or P0777
P0796	Automatic Transmission - 6L45 (MYA), 6L80 (MYC), or 6L90 (MYD) - DTC P0796 or P0797
P0797	Automatic Transmission - 6L45 (MYA), 6L80 (MYC), or 6L90 (MYD) - DTC P0796 or P0797
P0801	Manual Transmission - Tremec 6-Speed (MG9 MER) - DTC P0801
P0803	Manual Transmission - Tremec 6-Speed (MG9 MER) - DTC P0803
P0806	Manual Transmission - Aisin AY6 (MV5) - DTC P0806-P0808
P0806	Manual Transmission - Tremec 6-Speed (MG9 MER) - DTC P0806
P0807	Manual Transmission - Aisin AY6 (MV5) - DTC P0806-P0808
P0807	Manual Transmission - Tremec 6-Speed (MG9 MER) - DTC P0807 or P0808
P0808	Manual Transmission - Aisin AY6 (MV5) - DTC P0806-P0808
P0808	Manual Transmission - Tremec 6-Speed (MG9 MER) - DTC P0807 or P0808

DTC	Diagnostic Procedure
P080A	Manual Transmission - Aisin AY6 (MV5) - DTC P080A
P080A	Manual Transmission - Tremec 6-Speed (MG9 MER) - DTC P080A
P0815	Automatic Transmission - 6L45 (MYA), 6L80 (MYC), or 6L90 (MYD) - DTC P0815 , P0816 , P0826 , or P1876
P0816	Automatic Transmission - 6L45 (MYA), 6L80 (MYC), or 6L90 (MYD) - DTC P0815 , P0816 , P0826 , or P1876
P0826	Automatic Transmission - 6L45 (MYA), 6L80 (MYC), or 6L90 (MYD) - DTC P0815 , P0816 , P0826 , or P1876
P0842	Automatic Transmission - 6L45 (MYA), 6L80 (MYC), or 6L90 (MYD) - DTC P0842 or P0843
P0843	Automatic Transmission - 6L45 (MYA), 6L80 (MYC), or 6L90 (MYD) - DTC P0842 or P0843
P0850	Automatic Transmission - 6L45 (MYA), 6L80 (MYC), or 6L90 (MYD) - DTC P0850-P0852
P0851	Automatic Transmission - 6L45 (MYA), 6L80 (MYC), or 6L90 (MYD) - DTC P0850-P0852
P0852	Automatic Transmission - 6L45 (MYA), 6L80 (MYC), or 6L90 (MYD) - DTC P0850-P0852
P0856	Antilock Brake System - DTC C0242 or P0856
P0872	Automatic Transmission - 6L45 (MYA), 6L80 (MYC), or 6L90 (MYD) - DTC P0872 or P0873
P0873	Automatic Transmission - 6L45 (MYA), 6L80 (MYC), or 6L90 (MYD) - DTC P0872 or P0873
P0877	Automatic Transmission - 6L45 (MYA), 6L80 (MYC), or 6L90 (MYD) - DTC P0877 or P0878
P0878	Automatic Transmission - 6L45 (MYA), 6L80 (MYC), or 6L90 (MYD) - DTC P0877 or P0878
P0961	Automatic Transmission - 6L45 (MYA), 6L80 (MYC), or 6L90 (MYD) - DTC P0961-P0963
P0962	Automatic Transmission - 6L45 (MYA), 6L80 (MYC), or 6L90 (MYD) - DTC P0961-P0963
P0963	Automatic Transmission - 6L45 (MYA), 6L80 (MYC), or 6L90 (MYD) - DTC P0961-P0963
P0965	Automatic Transmission - 6L45 (MYA), 6L80 (MYC), or 6L90 (MYD) - DTC P0965-P0967

DTC	Diagnostic Procedure
P0966	Automatic Transmission - 6L45 (MYA), 6L80 (MYC), or 6L90 (MYD) - DTC P0965-P0967
P0967	Automatic Transmission - 6L45 (MYA), 6L80 (MYC), or 6L90 (MYD) - DTC P0965-P0967
P0969	Automatic Transmission - 6L45 (MYA), 6L80 (MYC), or 6L90 (MYD) - DTC P0969-P0971
P0970	Automatic Transmission - 6L45 (MYA), 6L80 (MYC), or 6L90 (MYD) - DTC P0969-P0971
P0971	Automatic Transmission - 6L45 (MYA), 6L80 (MYC), or 6L90 (MYD) - DTC P0969-P0971
P0973	Automatic Transmission - 6L45 (MYA), 6L80 (MYC), or 6L90 (MYD) - DTC P0973 or P0974
P0974	Automatic Transmission - 6L45 (MYA), 6L80 (MYC), or 6L90 (MYD) - DTC P0973 or P0974
P0976	Automatic Transmission - 6L45 (MYA), 6L80 (MYC), or 6L90 (MYD) - DTC P0976 or P0977
P0977	Automatic Transmission - 6L45 (MYA), 6L80 (MYC), or 6L90 (MYD) - DTC P0976 or P0977
P0989	Automatic Transmission - 6L45 (MYA), 6L80 (MYC), or 6L90 (MYD) - DTC P0989 or P0990
P0990	Automatic Transmission - 6L45 (MYA), 6L80 (MYC), or 6L90 (MYD) - DTC P0989 or P0990
P1101	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0068 or P1101
P1101	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0068 or P1101
P1133	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0133, P0153, P1133, P1153, or P2270-P2273
P1133	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0133, P013A-P013F, P014A, P014B, P0153, P1133, P1153, or P2270-P2273
P1153	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0133, P0153, P1133, P1153, or P2270-P2273
P1153	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0133, P013A-P013F, P014A, P014B, P0153, P1133, P1153, or P2270-P2273
P121D	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P121D, P121E, or P2687
P121E	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P121D, P121E, or P2687

DTC	Diagnostic Procedure
P1248	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P1248-P124D
P1249	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P1248-P124D
P124A	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P1248-P124D
P124B	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P1248-P124D
P124C	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P1248-P124D
P124D	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P1248-P124D
P1255	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P1255
P1255	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P1255 or P064A
P1258	Engine Heating and Cooling - DTC P1258
P129B	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P129B or P129C
P129C	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P129B or P129C
P129D	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P129D
P129E	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P129E or P12A8
P12A6	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P12A6
P12A8	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P129E or P12A8
P135A	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P135A or P135B
P135B	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P135A or P135B
P1380	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P1380 or P1381
P1380	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P1380 or P1381
P1381	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P1380 or P1381
P1381	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P1380 or P1381
P1400	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P1400
P1400	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P1400
P150B	Automatic Transmission - 6L45 (MYA), 6L80 (MYC), or 6L90 (MYD) - DTC P150B
P150C	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P150C
P150C	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P150C

DTC	Diagnostic Procedure
P150C	Automatic Transmission - 6L45 (MYA), 6L80 (MYC), or 6L90 (MYD) - DTC P150C
P1516	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P1516, P2101, P2119, or P2176
P1516	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P1516, P2101, P2119, or P2176
P155A	Cruise Control - Cruise Control Malfunction - DTC B3794, P0564, P0565, P0567, P0568, P056C, P0580, P0581, P155A-P155C, or P162C
P155B	Cruise Control - Cruise Control Malfunction - DTC B3794, P0564, P0565, P0567, P0568, P056C, P0580, P0581, P155A-P155C, or P162C
P155C	Cruise Control - Cruise Control Malfunction - DTC B3794, P0564, P0565, P0567, P0568, P056C, P0580, P0581, P155A-P155C, or P162C
P15AE	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P15AE or P15AF
P15AF	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P15AE or P15AF
P161C	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0601-P0604, P0606, P062B, P062F, P0630, P161C, P16F3, or P262B
P162C	Cruise Control - Cruise Control Malfunction - DTC B3794, P0564, P0565, P0567, P0568, P056C, P0580, P0581, P155A-P155C, or P162C
P1630	Immobilizer - DTC P1630
P1631	Immobilizer - DTC P1631
P163A	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P163A
P1649	Immobilizer - DTC P1649
P1682	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0685-P0687, P0689, P0690, or P1682
P1682	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0685, P0689, P0690, or P1682
P168E	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P168E, P168F, P16B5, or P16B6
P168F	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P168E, P168F, P16B5, or P16B6
P16A0	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0121-P0123, P0222, P0223, P16A0-P16A2, or P2135
P16A1	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0121-P0123, P0222, P0223, P16A0-P16A2, or P2135

DTC	Diagnostic Procedure
P16A2	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0121-P0123, P0222, P0223, P16A0-P16A2, or P2135
P16B5	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P168E, P168F, P16B5, or P16B6
P16B6	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P168E, P168F, P16B5, or P16B6
P16F3	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0601-P0604, P0606, P062B, P062F, P0630, P161C, P16F3, or P262B
P1761	Automatic Transmission - 6L45 (MYA), 6L80 (MYC), or 6L90 (MYD) - DTC P1761
P1762	Automatic Transmission - 6L45 (MYA), 6L80 (MYC), or 6L90 (MYD) - DTC P1762
P182E	Automatic Transmission - 6L45 (MYA), 6L80 (MYC), or 6L90 (MYD) - DTC P182E or P1915
P1876	Automatic Transmission - 6L45 (MYA), 6L80 (MYC), or 6L90 (MYD) - DTC P0815, P0816, P0826, or P1876
P1915	Automatic Transmission - 6L45 (MYA), 6L80 (MYC), or 6L90 (MYD) - DTC P182E or P1915
P2066	Displays and Gauges - DTC P0461-P0464, P2066, P2067, or P2068
P2067	Displays and Gauges - DTC P0461-P0464, P2066, P2067, or P2068
P2068	Displays and Gauges - DTC P0461-P0464, P2066, P2067, or P2068
P2088	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0010, P0013, P0020, P0023, P2088, P2089, P2090, P2091, P2092, P2093, P2094, or P2095
P2089	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0010, P0013, P0020, P0023, P2088, P2089, P2090, P2091, P2092, P2093, P2094, or P2095
P2090	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0010, P0013, P0020, P0023, P2088, P2089, P2090, P2091, P2092, P2093, P2094, or P2095
P2091	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0010, P0013, P0020, P0023, P2088, P2089, P2090, P2091, P2092, P2093, P2094, or P2095
P2092	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0010, P0013, P0020, P0023, P2088, P2089, P2090, P2091, P2092, P2093, P2094, or P2095
P2093	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0010, P0013, P0020, P0023, P2088, P2089, P2090, P2091, P2092, P2093, P2094, or P2095
P2094	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0010, P0013, P0020, P0023, P2088, P2089, P2090, P2091, P2092, P2093, P2094, or P2095
P2095	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0010, P0013, P0020, P0023, P2088, P2089, P2090, P2091, P2092, P2093, P2094, or P2095

DTC	Diagnostic Procedure
P2101	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P1516, P2101, P2119, or P2176
P2101	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P1516, P2101, P2119, or P2176
P2119	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P1516, P2101, P2119, or P2176
P2119	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P1516, P2101, P2119, or P2176
P2120	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P2120, P2122, P2123, P2125, P2127, P2128, or P2138
P2122	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P2122, P2123, P2127, P2128, or P2138
P2122	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P2120, P2122, P2123, P2125, P2127, P2128, or P2138
P2123	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P2122, P2123, P2127, P2128, or P2138
P2123	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P2120, P2122, P2123, P2125, P2127, P2128, or P2138
P2125	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P2120, P2122, P2123, P2125, P2127, P2128, or P2138
P2127	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P2122, P2123, P2127, P2128, or P2138
P2127	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P2120, P2122, P2123, P2125, P2127, P2128, or P2138
P2128	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P2122, P2123, P2127, P2128, or P2138
P2128	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P2120, P2122, P2123, P2125, P2127, P2128, or P2138
P2135	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0121-P0123, P0222, P0223, P16A0-P16A2, or P2135
P2135	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0120-P0123, P0220, P0222, P0223, or P2135
P2138	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P2122, P2123, P2127, P2128, or P2138
P2138	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P2120, P2122, P2123, P2125, P2127, P2128, or P2138

DTC	Diagnostic Procedure
P2147	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P2147, P2148, P2150, P2151, P2153, P2154, P2156, P2157, P216B, P216C, P216E, or P216F
P2148	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P2147, P2148, P2150, P2151, P2153, P2154, P2156, P2157, P216B, P216C, P216E, or P216F
P2150	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P2147, P2148, P2150, P2151, P2153, P2154, P2156, P2157, P216B, P216C, P216E, or P216F
P2151	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P2147, P2148, P2150, P2151, P2153, P2154, P2156, P2157, P216B, P216C, P216E, or P216F
P2153	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P2147, P2148, P2150, P2151, P2153, P2154, P2156, P2157, P216B, P216C, P216E, or P216F
P2154	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P2147, P2148, P2150, P2151, P2153, P2154, P2156, P2157, P216B, P216C, P216E, or P216F
P2156	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P2147, P2148, P2150, P2151, P2153, P2154, P2156, P2157, P216B, P216C, P216E, or P216F
P2157	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P2147, P2148, P2150, P2151, P2153, P2154, P2156, P2157, P216B, P216C, P216E, or P216F
P216B	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P2147, P2148, P2150, P2151, P2153, P2154, P2156, P2157, P216B, P216C, P216E, or P216F
P216C	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P2147, P2148, P2150, P2151, P2153, P2154, P2156, P2157, P216B, P216C, P216E, or P216F
P216E	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P2147, P2148, P2150, P2151, P2153, P2154, P2156, P2157, P216B, P216C, P216E, or P216F
P216F	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P2147, P2148, P2150, P2151, P2153, P2154, P2156, P2157, P216B, P216C, P216E, or P216F
P2176	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P1516, P2101, P2119, or P2176
P2176	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P1516, P2101, P2119, or P2176
P2199	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P2199
P2227	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P2227-P2230
P2227	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P2227
P2228	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P2227-P2230
P2228	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P2228 or P2229
P2229	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P2227-P2230

DTC	Diagnostic Procedure
P2229	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P2228 or P2229
P2230	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P2227-P2230
P2269	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P2269
P2269	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P2269
P2270	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - LSA - DTC P0133, P0153, P015A-P015D, or P2270-P2273
P2270	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - L77, LS3 - DTC P0133, P0153, P1133, P1153, or P2270-P2273
P2270	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0133, P013A-P013F, P014A, P014B, P0153, P1133, P1153, or P2270-P2273
P2271	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - LSA - DTC P0133, P0153, P015A-P015D, or P2270-P2273
P2271	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - L77, LS3 - DTC P0133, P0153, P1133, P1153, or P2270-P2273
P2271	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0133, P013A-P013F, P014A, P014B, P0153, P1133, P1153, or P2270-P2273
P2272	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - LSA - DTC P0133, P0153, P015A-P015D, or P2270-P2273
P2272	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - L77, LS3 - DTC P0133, P0153, P1133, P1153, or P2270-P2273
P2272	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0133, P013A-P013F, P014A, P014B, P0153, P1133, P1153, or P2270-P2273
P2273	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - LSA - DTC P0133, P0153, P015A-P015D, or P2270-P2273
P2273	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - L77, LS3 - DTC P0133, P0153, P1133, P1153, or P2270-P2273
P2273	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0133, P013A-P013F, P014A, P014B, P0153, P1133, P1153, or P2270-P2273
P228C	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0089, P00C6, P228C, or P228D
P228D	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0089, P00C6, P228C, or P228D
P2300	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0351-P0356, P2300, P2301, P2303, P2304, P2306, P2307, P2309, P2310, P2312, P2313, P2315, or P2316

DTC	Diagnostic Procedure
P2301	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0351-P0356, P2300, P2301, P2303, P2304, P2306, P2307, P2309, P2310, P2312, P2313, P2315, or P2316
P2303	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0351-P0356, P2300, P2301, P2303, P2304, P2306, P2307, P2309, P2310, P2312, P2313, P2315, or P2316
P2304	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0351-P0356, P2300, P2301, P2303, P2304, P2306, P2307, P2309, P2310, P2312, P2313, P2315, or P2316
P2306	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0351-P0356, P2300, P2301, P2303, P2304, P2306, P2307, P2309, P2310, P2312, P2313, P2315, or P2316
P2307	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0351-P0356, P2300, P2301, P2303, P2304, P2306, P2307, P2309, P2310, P2312, P2313, P2315, or P2316
P2309	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0351-P0356, P2300, P2301, P2303, P2304, P2306, P2307, P2309, P2310, P2312, P2313, P2315, or P2316
P2310	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0351-P0356, P2300, P2301, P2303, P2304, P2306, P2307, P2309, P2310, P2312, P2313, P2315, or P2316
P2312	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0351-P0356, P2300, P2301, P2303, P2304, P2306, P2307, P2309, P2310, P2312, P2313, P2315, or P2316
P2313	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0351-P0356, P2300, P2301, P2303, P2304, P2306, P2307, P2309, P2310, P2312, P2313, P2315, or P2316
P2315	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0351-P0356, P2300, P2301, P2303, P2304, P2306, P2307, P2309, P2310, P2312, P2313, P2315, or P2316
P2316	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0351-P0356, P2300, P2301, P2303, P2304, P2306, P2307, P2309, P2310, P2312, P2313, P2315, or P2316
P2534	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P2534 or P2535
P2534	Wiring Systems and Power Management - DTC P2534 or P2535
P2535	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P2534 or P2535
P2535	Wiring Systems and Power Management - DTC P2534 or P2535
P2537	Wiring Systems and Power Management - DTC P2537
P2544	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P2544

DTC	Diagnostic Procedure
P2544	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P2544
P2548	Antilock Brake System - DTC P2548
P2548	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P2548
P2610	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0601, P0602, P0603, P0604, P0606, P0607, P060D, P062F, or P2610
P262B	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P0601-P0606, P060A, P062F, or P262B
P262B	Data Communications - DTC P0601-P0606, P060A, P062F, or P262B
P262B	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0601-P0604, P0606, P062B, P062F, P0630, P161C, P16F3, or P262B
P2635	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P2635
P2635	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P2635
P263A	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0650, P263A, or P263B
P263B	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P0650, P263A, or P263B
P2687	Engine Controls and Fuel - 3.0L (LFW) or 3.6L (LFX LWR) - DTC P121D, P121E, or P2687
P2714	Automatic Transmission - 6L45 (MYA), 6L80 (MYC), or 6L90 (MYD) - DTC P2714 or P2715
P2715	Automatic Transmission - 6L45 (MYA), 6L80 (MYC), or 6L90 (MYD) - DTC P2714 or P2715
P2719	Automatic Transmission - 6L45 (MYA), 6L80 (MYC), or 6L90 (MYD) - DTC P2719-P2721
P2720	Automatic Transmission - 6L45 (MYA), 6L80 (MYC), or 6L90 (MYD) - DTC P2719-P2721
P2721	Automatic Transmission - 6L45 (MYA), 6L80 (MYC), or 6L90 (MYD) - DTC P2719-P2721
P2723	Automatic Transmission - 6L45 (MYA), 6L80 (MYC), or 6L90 (MYD) - DTC P2723 or P2724
P2724	Automatic Transmission - 6L45 (MYA), 6L80 (MYC), or 6L90 (MYD) - DTC P2723 or P2724
P2728	Automatic Transmission - 6L45 (MYA), 6L80 (MYC), or 6L90 (MYD) - DTC P2728-P2730

DTC	Diagnostic Procedure
P2729	Automatic Transmission - 6L45 (MYA), 6L80 (MYC), or 6L90 (MYD) - DTC P2728-P2730
P2730	Automatic Transmission - 6L45 (MYA), 6L80 (MYC), or 6L90 (MYD) - DTC P2728-P2730
P2762	Automatic Transmission - 6L45 (MYA), 6L80 (MYC), or 6L90 (MYD) - DTC P2762, P2763, or P2764
P2763	Automatic Transmission - 6L45 (MYA), 6L80 (MYC), or 6L90 (MYD) - DTC P2762, P2763, or P2764
P2764	Automatic Transmission - 6L45 (MYA), 6L80 (MYC), or 6L90 (MYD) - DTC P2762, P2763, or P2764
P3400	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P3400
P3401	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P3401, P3425, P3441, or P3449
P3425	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P3401, P3425, P3441, or P3449
P3441	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P3401, P3425, P3441, or P3449
P3449	Engine Controls and Fuel - 6.0L (L77) or 6.2L (LS3 LSA) - DTC P3401, P3425, P3441, or P3449
U0020	Data Communications - DTC U0020
U0073	Data Communications - DTC U0073 or U2100
U0074	Data Communications - DTC U0074
U0077	Data Communications - DTC U0077
U0078	Data Communications - DTC U0078
U0100-U02FF	Data Communications - DTC U0100-U02FF
U0255-U0257	Cellular, Entertainment, and Navigation - DTC U0255-U0257
U0300-U0336	Data Communications - DTC U0300-U0336
U0400-U05FF	Data Communications - DTC U0400-U05FF
U1500-U15FF	Data Communications - DTC U1500-U15FF

DTC	Diagnostic Procedure
U1814	Data Communications - DTC U1814
U185D	Data Communications - DTC U185D
U185E	Data Communications - DTC U185E
U18A2	Data Communications - DTC U18A2
U18B9- U18BF	Data Communications - DTC U18B9-U18BF
U2099	Data Communications - DTC U2099
U2100	Data Communications - DTC U0073 or U2100
U2616	Data Communications - DTC U2616

Symptom Byte List

Symptom Byte List

Symptom Byte	Symptom Byte Description	Symptom Byte Definition
(00–0F) General Electrical Failures This category includes standard wiring failure modes (for example, shorts and opens), direct current (DC) quantities related by Ohm's Law and quantities related to amplitude, frequency or rate of change, and wave shape.		
00	—	This sub type is used for failures that cannot be assigned to a specific sub type. No additional information is available.
01	Short to Battery	This sub type is used for failures where the Electronic Control Unit measures vehicle system (battery positive) potential for greater than a specified time period or when some other value is expected.
02	Short to Ground	This sub type is used for failures where the Electronic Control Unit measures ground (battery negative) potential for greater than a specified time period or when some other value is expected.
03	Low Voltage	This sub type is used for failures where the Electronic Control Unit measures a voltage below a specified range but not necessarily a short to ground.
04	Open	This sub type is used for failures where the Electronic Control Unit determines an open circuit via lack of bias voltage, low current flow, no change in state of an input in response to an output, etc.
05	High Voltage/Open	This sub type is used for failures where the condition detected by the Electronic Control Unit is the same for either indicated failure mode.
06	Low Voltage/Open	This sub type is used for failures where the condition detected by the Electronic Control Unit is the same for either indicated failure mode.
07	High Voltage	This sub type is used for failures where the Electronic Control Unit measures a voltage above a specified range but not necessarily a short to battery.
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Symptom Byte	Symptom Byte Description	Symptom Byte Definition
08	Performance – Signal Invalid	This sub type is used for failures where the value of the signal is not plausible given the operating conditions.
09	Too Fast Transitions	This sub type is used for failures where the signal transitions more quickly than is reasonably allowed.
0A	Too Slow Transitions	This sub type is used for failures where the signal transitions more slowly than is reasonably allowed.
0B	High Current	This sub type is used for failures where the Electronic Control Unit measures current flow above a specified range.
0C	Low Current	This sub type is used for failures where the Electronic Control Unit measures current flow below a specified range.
0D	High Resistance	This sub type is used for failures where the Electronic Control Unit infers a circuit resistance above a specified range.
0E	Low Resistance	This sub type is used for failures where the Electronic Control Unit infers a circuit resistance below a specified range.
0F	Signal Erratic	This sub type is used for failures where the signal is momentarily implausible (not long enough for Signal Invalid) or discontinuous.
(10–1F) Additional General Electrical Failures This category includes the overflow from category 0.		
10	—	Currently not used.
11	High Input	This sub type is used for failures where some circuit quantity is above a specified range.
12	Low Input	This sub type is used for failures where some circuit quantity is below a specified range.
13	Low Voltage/High Temperature	This sub type is used for failures where a temperature sensor with a negative temperature coefficient detects a voltage below a specified range.
14	High Voltage/Low Temperature	This sub type is used for failures where a temperature sensor with a negative temperature coefficient detects a voltage above a specified range.
15		

Symptom Byte	Symptom Byte Description	Symptom Byte Definition
	Performance – Signal Rising Time Failure	This sub type is used for failures where the signal rise time is outside a specified range.
16	Performance – Signal Falling Time Failure	This sub type is used for failures where the signal fall time is outside a specified range.
17	Performance – Signal Shape/Waveform Failure	This sub type is used for failures where the shape of the signal (plot of the amplitude with respect to time) is not correct (for example, improper circuit impedance.)
18	Low Signal Amplitude	This sub type is used for failures where the Electronic Control Unit measures a signal voltage below a specified range but not necessarily a short to ground (for example, gain too low).
19	High Signal Amplitude	This sub type is used for failures where the Electronic Control Unit measures a signal voltage above a specified range but not necessarily a short to battery (for example, gain too high).
1A	Performance – Bias Level Out of Range	This sub type is used for failures where the Electronic Control Unit applies a bias voltage to a circuit upon which is superimposed a signal voltage (for example, Oxygen Sensor Circuit.)
1B	Signal Cross Coupled	This sub type is used for failures where the Electronic Control Unit detects a circuit shorted to another circuit when both circuits are controlled by the Electronic Control Unit.
1C	—	Currently not used.
1D	—	Currently not used.
1E	—	Currently not used.
1F	Erratic	This sub type is used for failures where the Electronic Control Unit momentarily detects one of the conditions defined above but not long enough to set a specific sub type.
(20–2F) FM / PWM Failures This category includes faults related to Frequency Modulated (FM) and Pulse Width Modulated (PWM) inputs and outputs of the Electronic Control Unit and faults where position is determined by counts.		
20	—	Currently not used.
21	Incorrect Period	This sub type is used for failures where the Electronic Control Unit measures an incorrect duration for one cycle of the output.

Symptom Byte	Symptom Byte Description	Symptom Byte Definition
22	Too Short Low-Time	This sub type is used for failures where the Electronic Control Unit detects the low pulse is too narrow with respect to time.
23	Too Long Low-Time	This sub type is used for failures where the Electronic Control Unit detects the low pulse is too wide with respect to time.
24	Too Short High-Time	This sub type is used for failures where the Electronic Control Unit detects the high pulse is too narrow with respect to time.
25	Too Long High-Time	This sub type is used for failures where the Electronic Control Unit detects the high pulse is too wide with respect to time.
26	Low Frequency	This sub type is used for failures where the Electronic Control Unit detects too few cycles in a given time period.
27	High Frequency	This sub type is used for failures where the Electronic Control Unit detects too many cycles in a given time period.
28	Incorrect Frequency	This sub type is used for failures where the Electronic Control Unit measures an incorrect number of cycles in a given time period.
29	Too Few Pulses	This sub type is used for failures where the Electronic Control Unit measures too few pulses (for example, position is calibrated in counts from one extreme to the other).
2A	Too Many Pulses	This sub type is used for failures where the Electronic Control Unit measures too many pulses (for example, position is calibrated in counts from one extreme to the other).
2B	Missing Reference	This sub type is used for failures where the Electronic Control Unit does not detect a reference for a signal circuit or a group of signal circuits.
2C	—	Currently not used.
2D	—	Currently not used.
2E	—	Currently not used.
2F	—	Currently not used.
(30–3F) Electronic Control Unit Internal Failures		

Symptom Byte	Symptom Byte Description	Symptom Byte Definition
This category includes faults related to memory, software, and internal electrical circuitry; requiring component replacement.		
30	—	Currently not used.
31	Internal Checksum Error	This sub type is used by the Electronic Control Unit to indicate an incorrect checksum calculation where memory type is not specified.
32	General Memory Malfunction	This sub type is used by the Electronic Control Unit to indicate a memory failure where memory type is not specified.
33	Special Memory Malfunction	This sub type is used by the Electronic Control Unit to indicate a memory failure where the specific memory type is not defined in this category.
34	RAM Malfunction	This sub type is used by the Electronic Control Unit to indicate a Random Access Memory (RAM) failure.
35	ROM Malfunction	This sub type is used by the Electronic Control Unit to indicate a Read Only Memory (ROM) failure.
36	EEPROM Performance/Malfunction	This sub type is used by the Electronic Control Unit to indicate an Electrically Erasable Programmable Read Only Memory (EEPROM) failure.
37	Software Malfunction	This sub type is used by the Electronic Control Unit to indicate a failure in the execution of operational software
38	Supervision Software Malfunction	This sub type is used by the Electronic Control Unit to indicate a loop time error in the execution of the operational software.
39	Internal Malfunction	This sub type is used by the Electronic Control Unit to indicate the detection of an internal circuit failure.
3A	Incorrect Component Installed	This sub type is used by the Electronic Control Unit to indicate a mismatch between the hardware connected to the Electronic Control Unit and the hardware expected by the Electronic Control Unit.
3B	Self-Test Malfunction	This sub type is used by the Electronic Control Unit to indicate a sensor self-test failure launched by an Electronic Control Unit command.

Symptom Byte	Symptom Byte Description	Symptom Byte Definition
3C	Internal Communication Malfunction	This sub type is used by the Electronic Control Unit to indicate loss of an internal communication line, for example, between microprocessors in a dual microprocessor configuration.
3D	—	Currently not used.
3E	—	Currently not used.
3F	—	Currently not used.
(40–4F) Electronic Control Unit Programming Failures This category includes faults related to operational software, calibrations, and options; remedied by programming the Electronic Control Unit.		
40	—	Currently not used.
41	Not Programmed	This sub type is used to indicate that only boot software is present in the Electronic Control Unit.
42	Calibration Not Programmed	This sub type is used to indicate that operational software is present but calibration data is not.
43	EEPROM Incorrect Programming	This sub type is used to indicate an EEPROM error that may be remedied by reprogramming the module.
44	Security Access Not Activated	This sub type is used to indicate that programming was attempted without unlocking the Electronic Control Unit.
45	Variant Not Programmed	This sub type is used to indicate the need to enter (program) the sub system option content.
46	Configuration Not Programmed	This sub type is used to indicate the need to enter (program) the vehicle option content.
47	VIN Not Programmed	This sub type is used to indicate the need to enter (program) the vehicle identification number (VIN).
48	Security Code Not Programmed	This sub type is used to indicate the need to enter (program) the theft / security code.
49	RAM Incorrect Programming	This sub type is used by the Electronic Control Unit to indicate a Random Access Memory (RAM) error remedied by reprogramming.
4A	Programming Checksum Error	This sub type is used by the Electronic Control Unit to indicate an incorrect checksum

Symptom Byte	Symptom Byte Description	Symptom Byte Definition
		calculation where memory type is not specified.
4B	Calibration Not Learned	This sub type is used by the Electronic Control Unit to indicate that a password, operational range, etc. for a sensor or actuator must be learned by the Electronic Control Unit.
4C	DTC Memory Full	This sub type is used by the Electronic Control Unit to indicate that more DTCs have been detected than can be accommodated by the memory allocated for DTC storage.
4D	Stack Overflow	This subtype is used by the Electronic Control Unit to indicate that more memory has been used in a stack than is allocated to a program.
4E	—	Currently not used.
4F	—	Currently not used.
(50–5F) Algorithm Based Failures This category includes faults based on comparing two or more input parameters for plausibility or comparing a single parameter to itself with respect to time.		
50	—	Currently not used.
51	—	Currently not used.
52	—	Currently not used.
53	Low Temperature	This sub type is used for failures where the Electronic Control Unit calculates a low temperature condition based upon the duration of certain operating parameters.
54	High Temperature	This sub type is used for failures where the Electronic Control Unit calculates a high temperature condition based upon the duration of certain operating parameters.
55	Too Few Transitions	This sub type is used for failures where the Electronic Control Unit monitors a parameter over time within specified limits and detects fewer than the expected number of transitions.
56	Too Many Transitions	This sub type is used for failures where the Electronic Control Unit monitors a parameter over time within specified limits and detects more than the expected number of transitions.

Symptom Byte	Symptom Byte Description	Symptom Byte Definition
57	—	Currently not used.
58	Performance	This sub type is used for failures where the Electronic Control Unit does not see the expected change to a parameter or group of parameters in response to a particular event.
59	Protection Time-Out	This sub type is used for failures where the Electronic Control Unit detects a function is active for greater than a specified time period.
5A	Not Plausible	This sub type is used for failures where the Electronic Control Unit compares two or more input parameters for plausibility.
5B	—	Currently not used.
5C	—	Currently not used.
5D	—	Currently not used.
5E	—	Currently not used.
5F	—	Currently not used.
(60–6F) Mechanical Failures This category includes faults detected by inappropriate motion in response to an Electronic Control Unit controlled output.		
60	—	Currently not used.
61	Stuck	This sub type is used for failures where the Electronic Control Unit does not detect any motion in response to energizing a motor, solenoid, relay, etc.
62	Stuck Open	This sub type is used for failures where the Electronic Control Unit does not detect any motion upon commanding the operation of a motor, solenoid, relay, etc., to close some piece of equipment.
63	Stuck Closed	This sub type is used for failures where the Electronic Control Unit does not detect any motion upon commanding the operation of a motor, solenoid, relay, etc., to open some piece of equipment.
64	Slip Detected	This sub type is used for failures where the Electronic Control Unit detects excessive duration to command a motor, solenoid, relay, etc., to move a piece of equipment to a desired position.

Symptom Byte	Symptom Byte Description	Symptom Byte Definition
65	Emergency Position Not Achievable	This sub type is used for failures where the Electronic Control Unit is unable to command a motor, solenoid, relay, etc., to move a piece of equipment to the emergency position.
66	Incorrect Mounting	This sub type is used for failures where the server detects incorrectly mounted components, for example, acceleration sensor showing a position error of 90°.
67	Incorrect Assembly	This sub type is used for failures where the control module has detected that the component has been incorrectly installed (for example, hydraulic pipes crossed over, circuits cross wired) or polarity errors.
68	—	Currently not used.
69	—	Currently not used.
6A	—	Currently not used.
6B	—	Currently not used.
6C	—	Currently not used.
6D	—	Currently not used.
6E	—	Currently not used.
6F	—	Currently not used.
(70–7F) Bus Signal / Message Failures This category includes faults related to bus hardware and signal integrity. This category is also used when the physical input for a signal is located in one Electronic Control Unit and another Electronic Control Unit diagnoses the circuit.		
70	—	Currently not used.
71	Invalid Data	This sub type is used by the Electronic Control Unit to indicate a signal was received with the corresponding validity bit equal to Invalid or post processing of the signal determines it is invalid.
72	Message Counter Incorrect	This sub type is used by the Electronic Control Unit to indicate a signal was received without the corresponding rolling count value being properly updated.
73	Parity Error	This sub type is used by the Electronic Control Unit to indicate a message was processed with an incorrect parity calculation.

Symptom Byte	Symptom Byte Description	Symptom Byte Definition
74	Bus Signal Checksum Error	This sub type is used by the Electronic Control Unit to indicate a message was processed with an incorrect protection (checksum) calculation.
75	Serial Data Link High Input	This sub type is used for failures where some circuit quantity, reported via serial data, is above a specified range.
76	Serial Data Link Low Input	This sub type is used for failures where some circuit quantity, reported via serial data, is below a specified range.
77	—	Currently not used.
78	—	Currently not used.
79	—	Currently not used.
7A	—	Currently not used.
7B	—	Currently not used.
7C	—	Currently not used.
7D	—	Currently not used.
7E	—	Currently not used.
7F	Bus Signal Erratic	This sub type is used for failures where the signal, reported via serial data, is momentarily implausible or discontinuous.
(80–FF) Reserved Unique System Specific – See specific diagnostic procedures for symptom byte information if these symptom bytes are used.		

Symptoms - Vehicle

Body Systems

- [Symptoms - Fixed and Moveable Windows](#)
- [Symptoms - Horns](#)
- [Symptoms - Lighting](#)
- [Symptoms - Mirrors](#)
- [Symptoms - Vehicle Access](#)
- [Symptoms - Wiper/Washer Systems](#)

Brakes

- [Symptoms - Antilock Brake System](#)
- [Symptoms - Hydraulic Brakes](#)
- [Symptoms - Park Brake](#)

Driveline/Axle

- [Symptoms - Propeller Shaft](#)
- [Symptoms - Rear Drive Axle](#)
- [Symptoms - Wheel Drive Shafts](#)

Driver Information and Entertainment

- [Symptoms - Entertainment](#)
- [Symptoms - Displays and Gauges](#)
- [Symptoms - Secondary and Configurable Customer Controls](#)

Engine

- [Symptoms - Engine Electrical](#)
- [Symptoms - Cruise Control](#)
- [Symptoms - Engine Controls](#) - 2.8L, 3.0L, 3.2L, or 3.6L engine
- [Symptoms - Engine Controls](#) - 4.8L, 5.3L, 6.0L, 6.2L, or 7.0L engine
- [Symptoms - Engine Cooling](#)
- [Symptoms - Engine Mechanical](#) - 2.8L, 3.0L, 3.2L, or 3.6L engine
- [Symptoms - Engine Mechanical](#) - 4.8L, 5.3L, 6.0L, 6.2L, or 7.0L engine
- [Symptoms - Engine Exhaust](#)

General Information

[Symptoms - Vibration Diagnosis and Correction](#)

HVAC

- [Symptoms - Heating, Ventilation, and Air Conditioning](#)
- [Symptoms - HVAC Systems - Automatic](#)

Power and Signal Distribution

- [Symptoms - Data Communications](#)

- [Symptoms - Power Outlets](#)
- [Symptoms - Wiring Systems](#)

Roof

[Symptoms - Roof](#)

Safety and Security

- [Symptoms - Object Detection](#)
- [Symptoms - Remote Functions](#)
- [Symptoms - Seat Belts](#)
- [Symptoms - SIR](#)
- [Symptoms - Theft Deterrent](#)

Seats

- [Symptoms - Power Seats](#)
- [Symptoms - Seat Heating and Cooling](#)

Steering

- [Symptoms - Power Steering System](#)
- [Symptoms - Steering Wheel and Column](#)

Suspension

- [Symptoms - Suspension General Diagnosis](#)
- [Symptoms - Tire Pressure Monitoring](#)

Transmission

- [Symptoms - Automatic Transmission](#) - 6L45/6L50/6L80/6L90 automatic transmission
- [Symptoms - Clutch](#)
- [Symptoms - Manual Transmission](#) - Aisin AY6 manual transmission
- [Symptoms - Manual Transmission](#) - Tremec 6-Speed manual transmission
- [Symptoms - Automatic Transmission Shift Lock Control](#)

Engine Does Not Crank

Refer to the appropriate diagnostic procedure below for the symptom observed.

- [Starter Solenoid Does Not Click](#)
- [Starter Solenoid Clicks, Engine Does Not Crank](#)
- [Engine Cranks Slowly](#)

Engine Cranks But Does Not Run

Refer to the appropriate diagnostic procedure below for the vehicle being serviced.

- [Engine Cranks But Does Not Run](#) for the 2.8L, 3.0L, 3.2L, or 3.6L engine
- [Engine Cranks But Does Not Run](#) for the 4.8L, 5.3L, 6.0L, 6.2L, or 7.0L engine

[2014 Holden VF Sedan](#) | [VF/WN - Sedan, Ute, Sportwagon, Caprice, Lumina, HSV Service Manual 5617662](#) |
[Diagnostic Overview, Starting Point, and Programming](#) | [Vehicle Diagnostic Information](#) |
[Diagnostic Information and Procedures](#) | **Document ID: 2174665**

Inspection/Maintenance System Check

There are no Inspection/Maintenance System Check testing requirements for this vehicle.

Diagnostic Repair Verification

Note: After a repair has been made, some DTCs require the ignition to be turned OFF then back ON before the scan tool function will clear the DTC.

1. Ignition OFF.
2. Install any components or connectors that have been removed or replaced during diagnosis.
3. Perform any adjustment, programming or setup procedures that are required when a component or module is removed or replaced.
4. Ignition ON.
5. Clear the DTCs.
6. Turn the ignition OFF for 60 seconds.
7. If the repair was related to a DTC, duplicate the Conditions for Running the DTC and use the Freeze Frame/Failure Records, if applicable, in order to verify the DTC does not set. If the DTC sets or another DTC is present, refer to the [Diagnostic Trouble Code \(DTC\) List - Vehicle](#) and perform the appropriate diagnostic procedure.

Or

If the repair was symptom related, duplicate the conditions under which the customer concern occurred to verify the repair. If the customer concern reoccurs or another symptom is present, return to [Symptoms - Vehicle](#) and perform the appropriate symptom diagnostic.

Body Control Module Scan Tool Information

Table 1: [Body Control Module Scan Tool Data Parameters](#)

Table 2: [Body Control Module Scan Tool Output Controls](#)

Body Control Module Scan Tool Data Parameters

Parameter	System State	Expected Value	Definition
Operating Conditions: Ignition ON, Vehicle in Park, All Doors Closed			
5 V Ignition Switch	—	Accessory / Key Out	The scan tool displays Off, Accessory, Run, or Crank. This parameter displays the ignition switch mode.
Accent Lighting 1 Command	—	Varies	This parameter displays the interior lighting ambient 1 command as a percentage.
Accent Lighting 2 Command	—	Varies	This parameter displays the interior lighting ambient 2 command as a percentage.
Accessory	—	Active	The scan tool displays Active or Inactive.
Accessory Power Mode Indicator Command	—	Varies	This parameter displays ignition switch accessory LED PWM command as a percentage.
Accessory Relay Command	—	Active	The scan tool displays Active or Inactive.
Accessory/Retained Accessory Power Relay Command	—	Active	The scan tool displays Active or Inactive. This parameter displays the retained accessory power relay status.
All Doors Lock Command	—	Inactive	The scan tool displays Active or Inactive. This parameter displays the door lock status.
Ambient Light Sensor	—	Varies	The scan tool displays volts. This parameter displays the ambient light sensor signal voltage.
Ambient Light Status	—	Night	The scan tool displays Unknown, Night, or Day. This parameter displays the ambient light level status.
Automatic Headlamps Disable Switch	—	Inactive	The scan tool displays Active or Inactive. This parameter displays the headlamp disable switch status.

Parameter	System State	Expected Value	Definition
Automatic Transmission Manual Shift Switch	—	Off	The scan tool displays Off or On. This parameter displays the transmission tap up tap down switch status.
Backup Lamps Relay Command	—	Inactive	The scan tool displays Active or Inactive. This parameter displays the backup lamps relay status.
Battery Current Sensor	—	Varies	The scan tool displays the battery current in amperes.
Battery Low at Start	—	Inactive	The scan tool displays Active or Inactive. This parameter displays Active when the battery level is low when the vehicle starts.
Battery Reconnect Detected	—	No	The scan tool displays No or Yes when a battery disconnect/reconnect event has been detected.
Battery Voltage	—	Varies	The scan tool displays the current battery voltage.
BCM-Controlled Charging Voltage	—	Active	The scan tool displays Active or Inactive.
BCM-Requested Charging Voltage Reduction	—	Inactive	The scan tool displays Active or Inactive. This parameter displays Active when the BCM has detected a low battery voltage condition.
Boot Software Part Number	—	Varies	The scan tool displays the boot software part number.
Brake Lamp Command	—	Inactive	The scan tool displays Active or Inactive. This parameter displays the brake lamp command status.
Brake Pedal Applied	—	Inactive	The scan tool displays Active or Inactive.
Brake Pedal Initial Travel Position Achieved	—	No	The scan tool displays No or Yes.
Brake Pedal Position Sensor	—	Varies	This displays Counts. This numeric value is the current brake pedal position.
Brake Pedal Position Sensor High Voltage During Learn	—	No	The scan tool displays No or Yes.
Brake Pedal Position Sensor Learn	—	No	The scan tool displays No or Yes. This parameter displays Yes when the

Parameter	System State	Expected Value	Definition
			brake pedal position sensor has learned.
Brake Pedal Position Sensor Learned Home Position	—	Yes	The scan tool displays No or Yes. This parameter displays Yes when the brake pedal position sensor has learned the home position.
Brake Pedal Position Sensor Learned Released Position	—	Yes	The scan tool displays No or Yes. This parameter displays Yes when the brake pedal position sensor has learned the released position.
Brake Pedal Position Sensor Learned Released Position	—	Varies	The scan tool displays volts.
Brake Pedal Position Sensor Learned Released Position	—	Varies	The scan tool displays percentage.
Brake Pedal Position Sensor Low Voltage During Learn	—	No	The scan tool displays No or Yes.
Brake Pedal Position Sensor Move During Learn	—	No	The scan tool displays No or Yes. This parameter displays the brake pedal sensor learn status.
Brake Pedal Position Sensor Pulled Up from Home Position	—	No	The scan tool displays No or Yes.
Brake Pedal Position Sensor Reference	—	Varies	The scan tool displays the brake pedal position as voltage value. This parameter displays the current brake pedal position sensor reference.
Brake Pedal Pulled Up from Home Position	—	No	The scan tool displays No or Yes.
Brake Pedal Pulled Up from Released Position	—	No	The scan tool displays No or Yes.
Brake Transmission Shift Interlock Solenoid Actuator	—	Inactive	The scan tool displays Active or Inactive. This parameter displays the remote start diagnostic status history.
Brake Transmission Shift Interlock Solenoid Actuator Command	—	Inactive	The scan tool displays Active or Inactive. This parameter displays the last remote start diagnostic status history.
Calculated Brake Pedal Position	—	Varies	The scan tool displays volts.

Parameter	System State	Expected Value	Definition
Calculated Brake Pedal Position	—	Varies	The scan tool displays percentage.
Calibration Part Number 1-20	—	Varies	The scan tool displays the software module calibration part number.
Center Brake Lamp Command	—	Inactive	The scan tool displays Active or Inactive. This parameter displays the center brake lamp status.
Center Stop Lamp Command	—	Inactive	The scan tool displays Active or Inactive. This parameter displays the center stop lamp status.
Central Door Lock Switch on Center Console/Passenger Door Lock Switch	—	Inactive	The scan tool displays Active or Inactive. This parameter displays the driver door lock switch status.
Child Security Lock Indicator Command	—	Inactive	The scan tool displays Active or Inactive. This parameter displays the child security lock indicator command status.
Child Security Lock Motors Command	—	Inactive	The scan tool displays Active or Inactive.
Child Security Lock/Window Lockout Switch	—	Inactive	The scan tool displays Active or Inactive.
Child Security Lock/Window Lockout Switch Indicator Command	—	Inactive	The scan tool displays Active or Inactive.
Content Theft Deterrent Alarm Status	—	Disarmed	The scan tool displays Off, Armed, or Disarmed. This parameter displays the content theft alarm status.
Content Theft Deterrent Disarmed Until Vehicle Closed	—	No	The scan tool displays No or Yes. This parameter displays the content theft deterrent system status.
Content Theft Deterrent Mode	—	Inactive	The scan tool displays Active or Inactive. This parameter displays the remote start diagnostic status history or the last remote start diagnostic status history.
Content Theft Deterrent Trigger History 1-3	—	None	The scan tool displays None, Driver door, Passenger door, Left rear door, Right rear door, Rear closure, Midgate, Tonneau Cover, Hood, Ignition

Parameter	System State	Expected Value	Definition
			Voltage, Intrusion, Inclination, Telematics enhanced service alarm, Battery reconnect detected, Unauthorized PWM change, Security Indicates Tamper, or Glass Breakage. This parameter displays the content theft deterrent trigger history status.
Courtesy Lamps Duty Cycle Command	—	Varies	This parameter displays the interior lights dimming command as a percentage.
Crank Abort	—	Inactive	This parameter displays the remote start diagnostic status history or the last remote start diagnostic status history.
Cruise Charging Set Level	—	Varies	This parameter displays cruise charging set level.
Cruise Control Switch Status	—	OFF	The scan tool displays CANCEL, OFF, ON, RESUME, SET or ERROR. This parameter displays the cruise control switch status.
Current Content Theft Deterrent Trigger	—	None	The scan tool displays None, Driver door, Passenger door, Left rear door, Right rear door, Rear closure, Midgate, Tonneau Cover, Hood, Ignition Voltage, Intrusion, Inclination, Telematics enhanced service alarm, Battery reconnect detected, Unauthorized PWM change, Security Indicates Tamper, Glass Breakage. This parameter displays the content theft deterrent current alarm trigger.
Current Driver	—	1-8	This parameter displays the current driver in vehicle.
Disable Battery Saver Relay Command	—	Inactive	The scan tool displays Active or Inactive.
Dome Lamp Switch	—	Inactive	The scan tool displays Active or Inactive. This parameter displays the dome lamp switch status.
Door Lock Switch	—	Inactive	The scan tool displays Active or Inactive.
Driver Door Ajar Switch	—	Inactive	The scan tool displays Active or Inactive. This parameter displays the driver door Ajar switch status.
Driver Door Key Unlock Switch	—	Inactive	The scan tool displays Active or Inactive.

Parameter	System State	Expected Value	Definition
Driver Door Lock Switch	—	Inactive	The scan tool displays Active or Inactive.
Driver Door Unlatch Command	—	Inactive	The scan tool displays Active or Inactive.
Driver Door Unlock Command	—	Inactive	The scan tool displays Active or Inactive. This parameter displays the driver door unlock command status.
Driver Seat Heating Switch	—	Inactive	The scan tool displays Active or Inactive.
Driver Seat Heating/Venting/Cooling Mode	—	Off	The scan tool displays On or Off.
Driver Seat Ventilation Switch	—	Inactive	The scan tool displays Active or Inactive.
Driver Window Learned	—	Yes	The scan tool displays No or Yes.
Driver Window Main Control Down Switch	—	Inactive	The scan tool displays Active or Inactive. This parameter displays the driver window main control down switch input status.
Driver Window Main Control Express Switch	—	Inactive	The scan tool displays Active or Inactive. This parameter displays the driver window switch express input status.
Driver Window Main Control Up Switch	—	Inactive	The scan tool displays Active or Inactive. This parameter displays the driver window switch UP input status.
Driver Window Motor Mode	—	Local Switch Overridden	The scan tool displays Down, Express Down, Express, Up, Error, Inhibit, or Local Switch Overridden. This parameter displays the driver window motor mode status.
Driver Window Motor Reversing Status	—	No	The scan tool displays No or Yes.
Driver Window Motor Sensing System Fault Status	—	No	The scan tool displays No or Yes.
Driver Window Motor Undervoltage Status	—	No	The scan tool displays No or Yes.
Enable Battery Saver Relay Command	—	Inactive	The scan tool displays Active or Inactive.

Parameter	System State	Expected Value	Definition
End Model Part Number	—	Varies	This parameter displays the end model part number.
Engine Stalled	—	Inactive	This parameter displays the remote start diagnostic status history or the last remote start diagnostic status history.
Environment Identification	—	Unknown	The parameter displays the vehicle environment identification successful status.
Front Fog Lamps Relay Command	—	Inactive	The scan tool displays Active or Inactive. This parameter displays the front fog lamp relay status.
Front Fog Lamps Switch	—	Inactive	The scan tool displays Active or Inactive. This parameter displays the front fog lamp switch status.
Front Passenger Window Main Control Down Switch	—	Inactive	The scan tool displays Active or Inactive. This parameter displays the front passenger window down switch status.
Front Passenger Window Main Control Express Switch	—	Inactive	The scan tool displays Active or Inactive. This parameter displays the passenger window switch express input status.
Front Passenger Window Main Control Up Switch	—	Inactive	The scan tool displays Active or Inactive. This parameter displays the passenger window switch UP input status.
Front Tire Pressure on Placard	—	Varies	The scan tool displays kPa or PSI. This parameter displays the specified tire pressure placard information programmed in the BCM for tire pressure monitoring.
Fuel Economy Mode Inhibited - Low Charging Voltage	—	Inactive	The scan tool displays Active or Inactive. This parameter displays the fuel economy mode status.
Generator Regulator Setpoint	—	Varies	The scan tool displays percentage.
Glove Box Unlatch Switch	—	Inactive	The scan tool displays Active or Inactive. This parameter displays the instrument panel compartment release switch status.
Hazard Lamps Switch	—	Inactive	

Parameter	System State	Expected Value	Definition
			The scan tool displays Active or Inactive. This parameter displays the hazard lamps switch status.
Hazard Lamps Switch Backlight Command	—	Varies	The scan tool displays percentage. This parameter displays hazard switch backlight level PWM command status.
Headlamps On Switch	—	Inactive	The scan tool displays Active or Inactive. This parameter displays the headlamp on switch status.
Headlamps Flash Switch	—	Inactive	The scan tool displays Active or Inactive. This parameter displays the headlamps flash to pass switch status.
Headlamp Washer Relay Command	—	Inactive	The scan tool displays Active or Inactive.
High Beam Select Switch	—	Inactive	The scan tool displays Active or Inactive. This parameter displays the high beam switch status.
High Beam Command	—	Inactive	The scan tool displays Active or Inactive. This parameter displays the high beam command status.
Hood Ajar Switch	—	Inactive	This parameter display the remote start diagnostic status history or the last remote start diagnostic status history.
Hood Ajar Switch Signal 1	—	Inactive	This parameter display the remote start diagnostic status history or the last remote start diagnostic status history.
Hood Position	—	CLOSED	The scan tool displays CLOSED, AJAR, or OPENED. This parameter displays the hood position.
Horn Relay Command	—	Inactive	The scan tool displays Active or Inactive.
Horn Switch	—	Inactive	The scan tool displays Active or Inactive.
Idle Boost Level 2-3 Counter	—	Varies	This parameter displays the state of the idle boost level as counts.
Idle Charging Set Level	—	Varies	This parameter displays idle charging set level.
	—	Varies	The scan tool displays percentage.

Parameter	System State	Expected Value	Definition
Ignition Mode Switch Dimming Command			
Ignition Switch Reference	—	Varies	This parameter displays the ignition switch voltage reference.
Ignition Switch Signal Voltage	—	Varies	This parameter displays the ignition switch signal voltage.
Ignition Switch Status	—	Inactive	This parameter displays the ignition switch status.
Immobilizer Allows Engine To Start	—	Unknown	The scan tool displays Unknown, Incorrect, Not Allowed, or Valid. This parameter displays the immobilizer status.
Immobilizer Automatic Learn Timer	—	Inactive	The scan tool displays Active or Inactive. This parameter displays the automatic learn timer status.
Immobilizer Environment Device 1-4	—	Unknown	The scan tool displays Incorrect, Correct, Not Received, Not Programmed or Unknown. This parameter displays the immobilizer source status.
Immobilizer Password Learn	—	Inactive	The scan tool displays Active or Inactive. This parameter displays the password learn status.
Immobilizer Password Learn Scan Tool Delay	—	Varies	This parameter displays the auto learn timer status.
Immobilizer Security Code Accepted	—	No	The scan tool displays No or Yes.
Immobilizer Security Code Lockout	—	No	The scan tool displays No or Yes.
Immobilizer Security Code Programmed	—	Yes	The scan tool displays No or Yes.
In Park Switch Status	—	On	The scan tool displays On or Off. This parameter displays the park switch status.
Inadvertent Load Command	—	Active	The scan tool displays Active or Inactive.
Indicator Dimming Duty Cycle Command	—	Varies	The scan tool displays percentage. This parameter displays indicator lighting PWM command status.

Parameter	System State	Expected Value	Definition
Interior/Courtesy Lighting Master Switch	—	Door	The scan tool displays Door or other lighting switch status.
Interior Trunk Lid/Liftgate Window Unlatch Switch	—	Inactive	The scan tool displays Active or Inactive.
Key Capture Solenoid Actuator	—	Active	The scan tool display Active or Inactive. This parameter displays column lock input status.
Key Fob 1-4 Battery Status	—	OK	The scan tool displays OK or other key fob battery status. This parameter displays the key fob battery status.
Key Fob 1-4 Function	—	Undefined	The scan tool displays Inactive, Lock, Unlock Driver Door, All Door Unlock, Release Rear Closure, Actuate Left Sliding Door, Actuate Right Sliding door, Panic Alarm, Release Fuel door, Actuate Power Windows, Actuate Folding Top, Start Engine, Stop Engine, Programmed, Locator Alarm, Close Liftgate, Open Liftgate, Stop Liftgate While Closing, Stop Liftgate While opening, Deadlock All Doors, Stop Liftgate Motion, Start Liftgate Motion, Stop Left Sliding Door Motion, Stop Right Sliding Door Motion, Comfort open, or Comfort close. This parameter displays the key fob function status.
Key Fob in Vehicle	—	Inactive	This parameter displays the current key fob in the vehicle.
Key In Cylinder Switch	—	Active	The scan tool displays Active or Inactive.
Key In Cylinder Switch/Key Fob in Vehicle	—	Yes	The scan tool displays No or Yes.
Key in Ignition Status	—	Inactive	The scan tool displays Key Out or Key In. This parameter displays the key in ignition status.
Key Part Number	—	Varies	This parameter displays the key part number.
Key Type	—	Master Key	The scan tool displays Unknown, Master Key, Valet Key, Fleet Key, or Unconfigured. This parameter displays the key type.
Last Door Lock Function	—		

Parameter	System State	Expected Value	Definition
		All Doors Lock	The scan tool displays NO Action, PC UNDB Lock, PC Unlock, Unlock, Unlock Driver, Unlock Passenger, Unlock Left Rear, Unlock Right Rear, Unlock Cargo Liftgate, Unlock Driver Side, Unlock Passenger Side, Unlock Non Driver, Unlock All, Lock All, DBL Lock, or UNDBL Lock.
LED Backlight Dimming Command	—	Varies	The scan tool displays as a percentage. This parameter displays LED backlight dimming PWM command status.
Left Brake Lamp Command	—	Varies	The scan tool displays percentage. This parameter displays left brake lamp command status.
Left Dedicated Daytime Running Lamp Command	—	Varies	The scan tool displays percentage. This parameter displays left dedicated daytime running lamp command status.
Left Front Tire Pressure	—	Varies	This parameter displays left front tire pressure in PSI.
Left Front Tire Pressure Sensor Identification	—	Varies	This parameter displays left front tire pressure sensor ID.
Left Front Tire Pressure Sensor Location Learned	—	Yes	The scan tool displays No or Yes. This parameter display tire pressure monitor system learned status.
Left Front Tire Pressure Sensor Mode	—	Learn Mode — Pressure Triggered	The scan tool parameter displays Learn Mode, Undefined, Remeasure Data Mode, Rolling Mode, Enter Off Mode, Exit Off Mode, or Learn Mode Pressure Triggered.
Left Front Tire Pressure Status	—	Normal	The scan tool displays Unknown, Normal, Very Low Pressure, Low, Weak Signal, or High.
Left Front Turn Signal Bulb Out Feedback	—	Inactive	The scan tool displays Active or Inactive.
Left Front Turn Signal/Hazard Lamp Command	—	Inactive	The scan tool displays Active or Inactive.
Left Low Beam/Daytime Running Lamp Command	—	Varies	The scan tool displays percentage. This parameter displays left low beam/daytime running lamp status.
	—	Varies	

Parameter	System State	Expected Value	Definition
Left Park Lamps Command			The scan tool displays percentage. This parameter displays rear exterior lighting status.
Left Rear Child Security Lock Switch	—	Inactive	This parameter displays Active or Inactive.
Left Rear Door Ajar Switch	—	Inactive	This parameter displays Active or Inactive. This parameter displays the left rear door ajar switch status.
Left Rear Tire Pressure	—	Varies	This parameter displays left rear tire pressure in PSI.
Left Rear Tire Pressure Sensor Identification	—	Varies	This parameter displays left rear tire pressure sensor ID.
Left Rear Tire Pressure Sensor Location Learned	—	Yes	The scan tool displays No or Yes. This parameter displays tire pressure monitor system learned status.
Left Rear Tire Pressure Sensor Mode	—	Stationary	The scan tool displays Learn Mode, Undefined, Remeasure Data Mode, Rolling Mode, Enter Off Mode, Exit Off Mode, or Learn Mode Pressure Triggered.
Left Rear Tire Pressure Status	—	Normal	The scan tool displays Unknown, Normal, Very Low Pressure, Low, Weak Signal, or High.
Left Rear Turn Signal Bulb Out Feedback	—	Inactive	The scan tool displays Active or Inactive. The parameter displays turn lamp outage status.
Left Rear Turn Signal/Hazard Lamp Command	—	Inactive	The scan tool displays Active or Inactive.
Left Rear Window Learned	—	Yes	The scan tool displays No or Yes.
Left Rear Window Main Control Down Switch	—	Inactive	The scan tool display Active or Inactive. This parameter displays driver window switch inputs.
Left Rear Window Main Control Express Switch	—	Inactive	The scan tool display Active or Inactive. This parameter displays driver window switch inputs.
Left Rear Window Main Control Up Switch	—	Inactive	The scan tool displays Active or Inactive. This parameter displays driver window switch inputs.

Parameter	System State	Expected Value	Definition
Left Rear Window Motor Mode	—	Local Switch Overridden	The scan tool displays Down, Express, Up, Inhibit, or Local Switch Overridden.
Left Rear Window Switch at Door	—	Inactive	The scan tool displays Active or Inactive.
Left Stop Lamp Command	—	Varies	The scan tool display percentage.
Left Turn Signal Switch	—	Inactive	The scan tool displays Active or Inactive. This parameter displays the left turn signal switch status.
License Plate Lamps Command	—	Inactive	The scan tool displays Active or Inactive.
Load Reduction Level 2-3 Counter	—	Varies	The scan tool display as counts.
Low Beam Relay Command	—	Inactive	The scan tool displays Active or Inactive. This parameter displays the headlamp low beam relay status.
Manufacturers Enable Counter	—	Varies	This parameter tool displays various counter values.
Master Keys Learned	—	Varies	This parameter displays the total number of master keys learned.
Module Diagnostic Address	—	Varies	This parameter displays module diagnostic address.
Number of Key Fobs In Vehicle	—	1	This parameter displays the number of fobs located in the vehicle.
Odometer	—	Varies	This parameter displays the vehicle mileage.
Outside Rear View Mirror Courtesy Lamp Command	—	Inactive	The scan tool displays Active or Inactive. This parameter displays front exterior lighting status.
Park Brake Switch	—	Active	The scan tool displays Active or Inactive. This parameter displays front exterior lighting status.
Park Lamps Switch	—	Inactive	The scan tool displays Active or Inactive. This parameter displays Active when the parklamp switch is activated.
Passenger Door Ajar Switch	—	Inactive	

Parameter	System State	Expected Value	Definition
			The scan tool displays Active or Inactive. This parameter displays the passenger door ajar switch status.
Passenger Door Lock Switch	—	Inactive	The scan tool displays Active or Inactive. This parameter displays the passenger door lock switch status.
Passenger Door Unlock Switch	—	Inactive	The scan tool displays Active or Inactive. This parameter displays the passenger door unlock switch status.
Passenger Door(s) Unlatch Command	—	Inactive	The scan tool displays Active or Inactive.
Passenger Door(s) Unlock Command	—	Inactive	The scan tool displays Active or Inactive. This parameter displays the passenger door unlock status.
Passenger Seat Heating Switch	—	Inactive	The scan tool displays Active or Inactive.
Passenger Seat Heating/Venting/Cooling Mode	—	Off	The scan tool displays On or Off.
Passenger Seat Ventilation Switch	—	Inactive	The scan tool displays Active or Inactive.
Passenger Window Learned	—	Yes	The scan tool displays No or Yes. This parameter displays the passenger window learned status.
Passenger Window Motor Mode	—	Local Switch Overridden	The scan tool displays Down, Express, Up, Inhibit, or Local Switch Overridden.
Passenger Window Switch at Door	—	Inactive	The scan tool displays Active or Inactive. This parameter displays the passenger window switch status.
Pickup Bed Cargo Lamp Command	—	Varies	The scan tool displays percentage. This parameter displays pickup bed cargo lamp command status.
Previous Key Type	—	Unknown	This parameter displays previous driver identification device type.
Primary Key Status	—	Yes	The scan tool displays No or Yes.
Push Button Ignition Switch	—	Inactive	The scan tool displays Active or Inactive.
	—	Varies	

Parameter	System State	Expected Value	Definition
Push Button Ignition Switch Voltage			This parameter displays the push button ignition switch voltage.
Rain Sensor	—	Inactive	The scan tool displays Active or Inactive.
Rear Closure Ajar Switch	—	Active	The scan tool displays Active or Inactive.
Rear Closure Cylinder Lock Switch	—	Inactive	The scan tool displays Active or Inactive.
Rear Closure Cylinder Unlock Switch	—	Inactive	The scan tool displays Active or Inactive.
Rear Tire Pressure on Placard	—	Varies	This parameter displays the rear tire pressure in kPa or PSI. This parameter displays the specified tire pressure placard information programmed in the BCM for tire pressure monitoring.
Regulated Voltage Control Mode	—	Voltage	The scan tool displays voltage.
Remote Vehicle Start Attempts Exhausted	—	Varies	This parameter displays the remote start diagnostic status history or the last remote start diagnostic status history or remaining start attempts.
Remote Vehicle Start Crank Time	—	Inactive	This parameter displays the remote start diagnostic status history or the last remote start diagnostic status history.
Remote Vehicle Start Disabled by Driver	—	Inactive	This parameter displays the remote start diagnostic status history or the last remote start diagnostic status history.
Remote Vehicle Start Source	—	Ignition Switch Start	The scan tool displays Ignition Switch Start or Remote Vehicle Start.
Remote Vehicle Starts Exhausted	—	Varies	This parameter displays the remote start diagnostic status history or the last remote start diagnostic status history or remaining remote starts.
Right Brake Lamp Command	—	Varies	The scan tool display percentage. This parameter displays right brake lamp PWM command status.
Right Dedicated Daytime Running Lamp Command	—	Varies	The scan tool display percentage. This parameter displays right dedicated DRL PWM command status.

Parameter	System State	Expected Value	Definition
Right Front Tire Pressure	—	Varies	This parameter displays right front tire pressure in PSI.
Right Front Tire Pressure Sensor Identification	—	Varies	This parameter displays right front tire pressure sensor ID.
Right Front Tire Pressure Sensor Location Learned	—	Yes	The scan tool displays No or Yes.
Right Front Tire Pressure Sensor Mode	—	Stationary	The scan tool displays Learn Mode, Undefined, Remeasure Data Mode, Rolling Mode, Enter Off Mode, Exit Off Mode or Learn Mode Pressure Triggered.
Right Front Tire Pressure Status	—	Normal	The scan tool displays Unknown, Normal, Very Low Pressure, Low, Weak Signal, or High.
Right Front Turn Signal Bulb Out Feedback	—	Inactive	The scan tool displays Active or Inactive.
Right Front Turn Signal/Hazard Lamp Command	—	Inactive	The scan tool displays Active or Inactive.
Right Low Beam/Daytime Running Lamp Command	—	Varies	The scan tool displays percentage. This parameter displays right low beam/daytime running lamp status.
Right Park Lamps Command	—	Varies	The scan tool displays percentage. This parameter displays rear exterior lighting status.
Right Rear Child Security Lock Switch	—	Inactive	The scan tool displays Active or Inactive.
Right Rear Door Ajar Switch	—	Inactive	The scan tool displays Active or Inactive.
Right Rear Tire Pressure	—	Varies	This parameter displays right rear tire pressure in PSI.
Right Rear Tire Pressure Sensor Identification	—	Varies	This parameter displays right rear tire pressure sensor ID.
Right Rear Tire Pressure Sensor Location Learned	—	Yes	The scan tool displays No or Yes.
Right Rear Tire Pressure Sensor Mode	—		The scan tool displays Learn Mode, Undefined, Remeasure Data Mode,

Parameter	System State	Expected Value	Definition
		Learn Mode — Pressure Triggered	Rolling Mode, Enter Off Mode, Exit Off Mode, or Learn Mode Pressure Triggered. This parameter displays the pressure sensor mode status.
Right Rear Tire Pressure Status	—	Normal	The scan tool displays Unknown, Normal, Very Low Pressure, Low, Weak Signal or High. This parameter displays the right rear tire pressure status.
Right Rear Turn Signal Bulb Out Feedback	—	Inactive	The scan tool displays Active or Inactive.
Right Rear Turn Signal/Hazard Lamp Command	—	Inactive	The scan tool displays Active or Inactive.
Right Rear Window Main Control Down Switch	—	Inactive	The scan tool displays Active or Inactive.
Right Rear Window Main Control Express Switch	—	Inactive	The scan tool displays Active or Inactive.
Right Rear Window Main Control Up Switch	—	Inactive	The scan tool displays Active or Inactive.
Right Rear Window Motor Mode	—	Local Switch Overridden	The scan tool displays Down, Express, Up, Inhibit, or Local Switch Overridden.
Right Rear Window Switch at Door	—	Inactive	The scan tool displays Active or Inactive.
Right Stop Lamp Command	—	Varies	The scan tool displays percentage.
Right Turn Signal Switch	—	Inactive	The scan tool displays Active or Inactive. This parameter displays the right turn signal switch status.
Run Abort	—	Inactive	This parameter displays the remote start diagnostic status history or the last remote start diagnostic status history.
Run Relay Command	—	Active	The scan tool displays Active or Inactive.
Run/Crank	—	Inactive	The scan tool displays Active or Inactive.
Run/Crank Relay Command	—	Active	The scan tool displays Active or Inactive.

Parameter	System State	Expected Value	Definition
Run/Crank Power Mode Indicator Command	—	Varies	The scan tool displays percentage. This parameter displays ignition switch run LED PWM command status.
Secondary Key Status	—	No	The scan tool displays No or Yes.
Security Indicator Command	—	Varies	The scan tool displays percentage. This parameter displays security LED PWM command status.
Selected Front Tire Type	—	Standard Load	The scan tool displays No Tire Type, Metric Standard Load, Metric Extra Load, Load Range C, Load Range D, or Load Range E. This parameter displays the front tire type.
Selected Rear Tire Type	—	Standard Load	The scan tool displays No Tire Type, Metric Standard Load, Metric Extra Load, Load Range C, Load Range D, or Load Range E. This parameter displays the rear tire type.
Start-Up State of Charge	—	Varies	The scan tool displays percentage. This parameter displays startup state of charge status.
State of Charge	—	Varies	The scan tool displays percentage. This parameter displays state of charge status.
Sunroof Enabled	—	Active	The scan tool displays Active or Inactive.
Sunroof Motor Overtemperature	—	Inactive	The scan tool displays Active or Inactive.
Sunroof Not Learned	—	Inactive	The scan tool displays Active or Inactive.
Sunroof Position	—	Closed	The scan tool displays Closed, Open, Venting, Comfort Open, Closing, Opening. This parameter displays the current sunroof position.
Sunroof Remote Command	—	Inactive	The scan tool displays Sunroof Secure Close, Venting, Close, or Open. This parameter displays the last sunroof remote command.
Sunroof Slide Switch	—	Inactive	The scan tool displays Inactive, Express Open, Open, Express Close, Close, Short to Ground, Short to Battery, or Stuck. This parameter displays the sunroof slide switch status.

Parameter	System State	Expected Value	Definition
Sunroof Tilt Switch	—	Inactive	The scan tool displays Inactive, Open, Close, Short to Ground, Short to Battery or Stuck. This parameter displays the sunroof tilt switch status. When the switch experiences a malfunction Short to Ground, Short to Battery or Stuck will be displayed.
Sunroof/Sunshade Motor Overtemperature	—	Inactive	The scan tool displays Active or Inactive.
Sunroof/Sunshade Switch	—	Inactive	The scan tool displays Inactive, Express Open, Open, Express Close, Close, Short to Ground, Short to Battery, or Stuck. This parameter displays the sunroof or sunshade switch status.
Sunshade Enabled	—	Active	The scan tool displays Active or Inactive.
Sunshade Not Learned	—	Inactive	The scan tool displays Active or Inactive.
Sunshade Position	—	Closed	The scan tool displays Ajar, Closed, Opened, Closing, or Opening. This parameter displays the sunshade position status.
Sunshade Remote Command	—	Inactive	The scan tool displays Close or Open. This parameter displays the last sunshade remote command.
Tamper Status	—	No	The scan tool displays No or Yes.
Telematics Enhanced Service Override Active	—	No	The scan tool displays No or Yes. This parameter displays vehicle theft deterrent system status.
Total Keys Learned	—	Varies	This parameter displays the number of keys learned.
Traction Control Switch	—	Inactive	The scan tool displays Active or Inactive. This parameter displays Active when the traction control switch is active.
Transponder Authentication	—	Initializing	The scan tool displays Inactive, Initializing, ID Received, Password Received, Data Reception Complete, or Data Transmission Complete. This parameter displays the transponder key communication status.

Parameter	System State	Expected Value	Definition
Transponder Key Status	—	OK	The scan tool displays OK, LIN Bus Initialization Malfunction, Antenna Initialization Malfunction, Password Error, No Valid Key Detected, LIN Bus Communication Malfunction, or Antenna Malfunction. This parameter displays the transponder key communication error status.
Trunk Lamp Command	—	Varies	The scan tool displays as percentage.
Trunk Lid/Liftgate Window Exterior Unlatch Switch	—	Inactive	The scan tool displays Active or Inactive.
Trunk Lid/Liftgate Window Unlatch Command	—	Inactive	The scan tool displays Active or Inactive.
Valet Keys Learned	—	Varies	This parameter displays the number of valet keys learned.
Valet Mode Status	—	Inactive	This parameter displays the remote start diagnostic status history or the last remote start diagnostic status history.
Valet switch	—	Inactive	The scan tool displays Active or Inactive. This parameter displays Active when the valet switch is on.
Vehicle Identification Number (VIN)	—	Varies	This parameter displays the vehicle identification number.
Window Lockout Switch	—	Inactive	The scan tool displays Active or Inactive.
Window Lockout Switch Indicator Command	—	Inactive	The scan tool displays Active or Inactive.
Windshield Washer Relay Command	—	Inactive	The scan tool displays Active or Inactive. This parameter displays the windshield washer relay status.
Windshield Washer Switch	—	Inactive	The scan tool displays Active or Inactive. This parameter displays the windshield washer switch status.
Windshield Wiper Park Switch	—	Active	The scan tool displays Active or Inactive.
Windshield Wiper High Speed Relay Command	—	Inactive	The scan tool displays Active or Inactive.

Parameter	System State	Expected Value	Definition
Windshield Wiper High Speed Switch	—	Inactive	The scan tool displays Active or Inactive.
Windshield Wiper Motor Relay Command	—	Inactive	The scan tool displays Active or Inactive. This parameter displays the windshield wiper relay status.
Windshield Wiper Stalled During Sweep	—	Inactive	The scan tool displays Active or Inactive.
Windshield Wiper Stalled in Park Position	—	Inactive	The scan tool displays Active or Inactive. This parameter displays the windshield wiper stalled status.
Windshield Wiper Switch	—	Off	The scan tool displays Off, Delay 1, Delay 2, Delay 3, Delay 4, Delay 5, or Low. This parameter displays the windshield wiper switch status.

Body Control Module Scan Tool Output Controls

Scan Tool Output Control	Description
Accent Lighting 1	The BCM activates the accent lighting when you select On. The value should be 100%. All accent lighting should illuminate until commanded Off.
Accent Lighting 2	The BCM activates the accent lighting when you select On. The value should be 100%. All accent lighting should illuminate until commanded Off.
Accessory Power Mode Indicator	The BCM activates the accessory indicator when you select On. The value should be 100%. The yellow LED accessory indicator on start button should illuminate until commanded Off.
Accessory Power Relay	The BCM actuates the accessory power relay when you select On. The accessory power relay should turn on allowing specific vehicle functions to operate.
Accessory/Retained Accessory Power Relay	The BCM actuates the retained accessory power relay when you select On. The retained accessory power relay should turn on allowing specific vehicle functions to operate.
All Doors Lock	The BCM activates all doors lock when you select Lock. All doors should lock.
All Doors Lock/Unlock	The BCM activates all doors lock/unlock when you select Lock/Unlock.
Auxiliary Ignition Run Relay	The BCM controls the Ignition Run Coil Control circuit to turn it On and Off.
Backup Lamps	

Scan Tool Output Control	Description
	The BCM actuates the backup lamps relay when you select On. The backup lamps should illuminate until commanded Off. Engine must be running.
Battery Saver Relay	The BCM activates the battery saver relay when you select Enable. This command sets the low power mode relay in the state in which it does not supply power to the non-essential parts of the vehicle. This is used to prevent the battery from being depleted when the vehicle is not used for a long period of time.
Brake Pedal Position Sensor Learn	The BCM activates the brake pedal position sensor learn when you select Learn. The brake pedal position sensor learn procedure should start.
Brake Transmission Shift Interlock Solenoid Actuator	The BCM activates the transmission shift interlock solenoid actuator when you select On.
Brake Transmission Shift Interlock Indicator	The BCM activates the transmission range indicator when you select On. The transmission range indicator at the shifter should illuminate until commanded Off.
Center Brake Lamp	The BCM activates the center brake lamp when you select On. The center brake lamp should illuminate until commanded Off.
Center Stop Lamp	The BCM activates the center stop lamp when you select On. The center stop lamp should illuminate until commanded Off.
Child Security Lock Indicator	The BCM activates the child security lock indicator when you select On. The child security lock indicator should illuminate until commanded Off.
Child Security Lock Motors	The BCM actuates the child security door motor when you select Lock. The child security doors should lock.
Child Security Lock/Window Lockout Switch Indicator	The BCM activates the child security lock/window lockout switch indicator when you select On. The child security lock/window lockout switch indicator should illuminate until commanded Off.
Clear Driver Window Learned Values	When you select Clear the clear driver window learn procedure should start.
Clear Passenger Window Learned Values	When you select Clear the clear left rear window learn procedure should start.
Courtesy Lamps	The BCM activates the courtesy lamps when you select On. The value should be 100%. The courtesy lamps should illuminate until commanded Off.
Driver Door Unlatch	The BCM activates the output circuit to unlatch the driver door with a passive entry passive start when you select Unlatch. There is NO door handle on this type of vehicle to open the door. Instead, there is a pad that you press to unlatch the door.

Scan Tool Output Control	Description
Driver Door Unlock	The BCM pulses the driver door unlock motor when you select Unlock. The driver door should unlock.
Driver Window Motor	The BCM activates the driver window motor when you select Up/Down/Stop/Express Up/Express Down. The driver window should follow the appropriate command.
Driver Window Motor Mode	The BCM activates the driver window motor when you select Up/Down/Stop/Express Up/Express Down. The driver window should follow the appropriate command.
Front Fog Lamps	The BCM actuates the front fog lamps relay when you select On. The front fog lamps relay should turn on.
Generator Regulator Setpoint	The BCM changes the output of the generator.
Hazard Lamps Switch Backlight	The BCM activates the hazard lamps switch when you select On. The value should be 100%. The hazard lamps switch backlight should illuminate until commanded Off.
High Beams	The BCM activates the high beam command when you select On. The high beam lights should illuminate. The headlamps have to be on.
Horn Relay	The BCM activates the horn when you select On. The horn should sound.
Inadvertent Load	The BCM activates the inadvertent load command when you select On. (It is an electronic request to shut down an electrical or electronic device that is drawing power from the battery at a time when there should be no activity, usually after the key has been removed from the ignition for a period of time.)
Incandescent Dimming	The BCM activates the incandescent light dimming when you select On. The values should be 100%. The incandescent light dimming should illuminate until commanded Off.
Indicator Dimming	The BCM activates the indicator dimming when you select On. The values should be 100%. The indicator should illuminate until commanded Off.
LED Backlight Dimming	The BCM activates the LED backlight dimming when you select On. The values should be 100%. The LED backlight dimming for control switches should illuminate until commanded Off.
Left Brake Lamp	The BCM activates the left brake lamp when you select On. The values should be 100%. The left brake lamp should illuminate until commanded Off.
Left Dedicated Daytime Running Lamp	The BCM activates the left dedicated daytime running lamp when you select ON. The value changes to 100%. The left daytime running lamp should illuminate.

Scan Tool Output Control	Description
Left Front Park Lamp	The BCM activates the left front park lamp when you select ON with a value of 100%. The left front park lamp should illuminate.
Left Front Park Lamp/Daytime Running Lamp	The BCM activates the left front park lamp/daytime running lamp when you select ON with a value of 100%. The left front park lamp/daytime running lamp should illuminate.
Left Front Turn Signal Lamp	The BCM activates the left front turn signal lamp when you select On. The left front turn signal lamp should illuminate until commanded Off.
Left Headlamp Lamp Low Beam	The BCM activates the left headlamp low beam when you select On. The values should be 100%. The left headlamp low beam should illuminate until commanded Off.
Left Park Lamps	The BCM activates the left park lamps when you select ON with a value of 100%. The left park lamps should illuminate.
Left Rear Park Lamp	The BCM activates the left rear park lamp when you select ON with a value of 100%. The left rear park lamp should illuminate.
Left Rear Stop/Park Lamp	The BCM activates the left rear stop/park lamp when you select ON with a value of 100%. The left rear stop/park lamp should illuminate.
Left Rear Turn Signal Lamp	The BCM activates the left rear turn signal lamp when you select On. The left rear turn signal lamp should illuminate until commanded Off.
Left Rear Turn Signal/Stop Lamp	The BCM activates the left rear turn signal/stop lamp when you select On. The left rear turn signal/stop lamp should illuminate until commanded Off.
Left Rear Window Motor	The BCM activates the left rear window motor when you select Up/Down/Stop/Express Down. The left rear window should follow the appropriate command.
Left Stop Lamp	The BCM activates the left stop lamp when you select ON with a value of 100%. The left stop lamp should illuminate.
Left Trailer Turn Signal Lamp	The BCM activates the left trailer turn signal lamp when you select ON with a value of 100%. The left trailer turn signal lamp should illuminate.
License Plate Lamps	The BCM activates the license plate lamps when you select On. The license plate lights should turn on until commanded Off.
Liftgate Unlatch	The BCM actuates the rear compartment lid release actuator when you select Unlatch. The trunk or liftgate should open.
LIN Bus Device Identification Data	When you select Update the LIN Bus Device part number and calibration part number should be updated.
Low Beam Lamps	The BCM activates the low beam lamps when you select On. The low beam lamps should turn on.
Low Beam Relay	

Scan Tool Output Control	Description
	The BCM activates the low beams when you select On. The low beam lights should turn on.
Outside Rear View Mirror Courtesy Lamp	The BCM activates the outside rear view mirror courtesy lamp when you select On. The outside rear view mirror courtesy lamp (at the bottom) should illuminate.
Passenger Door(s) Unlatch	The BCM activates the output circuit to unlatch the passenger door with a passive entry passive start when you select Unlatch. There is NO door handle on this type of vehicle to open the door. Instead, there is a pad that you press to unlatch the door.
Passenger Door(s) Unlock	The BCM pulses the passenger door unlock motor when you select Unlock. The passenger door should unlock.
Passenger Window Motor	The BCM activates the passenger window motor when you select Up/Down/Stop/Express Up/Express Down. The passenger window should follow the appropriate command.
Pickup Bed Cargo Lamp	The BCM activates the pickup bed cargo lamp when you select On. The values should be 100%. The pickup bed cargo lamp should illuminate until commanded Off.
Rear Fog Lamp(s) Relay	The BCM activates the rear fog lamps when you select On. The rear fog lamps should turn on.
Right Brake Lamp	The BCM activates the right brake lamp when you select On. The value should be 100%. The right brake lamp should illuminate until commanded Off.
Right Dedicated Daytime Running Lamp	The BCM activates the right dedicated daytime running lamp when you select On. The value should be 100%. The right daytime running lamp should illuminate.
Right Front Park Lamp	The BCM activates the right front park lamp when you select ON with a value of 100%. The right front park lamp should illuminate.
Right Front Park Lamp/Daytime Running Lamp	The BCM activates the right front park lamp/daytime running lamp when you select ON with a value of 100%. The right front park lamp/daytime running lamp should illuminate.
Right Front Turn Signal Lamp	The BCM activates the right front turn signal lamp when you select On. The right front turn signal/hazard lamp should illuminate.
Right Headlamp Low Beam	The BCM activates the right headlamp low beam when you select On. The right headlamp low beam should illuminate.
Right Park Lamps	The BCM activates the right park lamps when you select ON with a value of 100%. The right park lamps should illuminate.
Right Rear Park Lamp	The BCM activates the right rear park lamp when you select ON with a value of 100%. The right rear park lamp should illuminate.

Scan Tool Output Control	Description
Right Rear Stop/Park Lamp	The BCM activates the right rear stop/park lamp when you select ON with a value of 100%. The right rear stop/park lamp should illuminate.
Right Rear Turn Signal Lamp	The BCM activates the right rear turn signal/hazard lamp when you select On. The right rear turn signal lamp should illuminate until commanded Off.
Right Rear Turn Signal/Stop Lamp	The BCM activates the right rear turn signal/stop lamp when you select On. The right rear turn signal/stop lamp should illuminate until commanded Off.
Right Rear Window Motor	The BCM activates the right rear window motor when you select Up/Down/Stop/Express Down. The right rear window should follow the appropriate command.
Right Stop Lamp	The BCM activates the right stop lamp when you select ON with a value of 100%. The right stop lamp should illuminate.
Right Trailer Turn Signal Lamp	The BCM activates the right trailer turn signal lamp when you select ON with a value of 100%. The right trailer turn signal lamp should illuminate.
Run Relay	The BCM actuates the run relay when you select On. The run relay should turn on.
Run/Crank Relay	The BCM actuates the run/crank relay when you select On. The run/crank relay should turn on.
Run/Start Power Mode Indicator	The BCM activates the run/start lamp when you select On. The value should be 100%. The green LED on engine start/stop button should illuminate until commanded Off.
Security Indicator	The BCM activates the security indicator command when you select On. The security indicator at center of dash (or at DRL sensor) should illuminate until commanded Off.
Stop Lamps	The BCM activates the stop lamps when you select ON with a value of 100%. The stop lamps should illuminate.
Tire Pressure Sensors Learn	The BCM activates the tire pressure sensor learn procedure when you select Learn.
Tire Type/Pressure Selection	When you select OK, you can change tire type and load range.
Trailer Backup Lamps	The BCM activates the trailer backup lamps when you select ON with a value of 100%. The trailer backup lamps should illuminate.
Trailer Park Lamps	The BCM activates the trailer park lamps when you select ON with a value of 100%. The trailer park lamps should illuminate.
Transmission Range Indicator	The BCM activates the transmission range indicator when you select On. The transmission range indicator at the shifter should illuminate until commanded Off.

Scan Tool Output Control	Description
Trunk Lamp	The BCM activates the trunk lamp when you select On. The value should be 100%. The trunk lamp should illuminate until commanded Off.
Trunk Lid Unlatch	The BCM activates the trunk lid unlatch when you select On. The trunk lid should unlatch.
Window Lockout Switch Indicator	The BCM activates the window lockout switch indicator when you select On. The window lockout switch indicator should illuminate until commanded Off.
Windshield Washer Relay	The BCM actuates the windshield washer relay when you select On. The windshield washer relay should turn on.
Windshield Wiper High Speed Relay	The BCM actuates the windshield wiper high speed relay when you select On. The windshield wiper high speed relay should turn on.
Windshield Wiper Motor Relay	The BCM actuates the windshield wiper motor relay when you select On. The windshield wiper motor relay should turn on.

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Chassis Control Module Scan Tool Information

Table 1: [Chassis Control Module \(CCM\) Scan Tool Data Parameters for Fuel System](#)

Table 2: [Chassis Control Module \(CCM\) Scan Tool Output Controls for Fuel System](#)

Table 3: [CCM Scan Tool Parameters for Active Grille Air Shutters \(If Equipped\)](#)

Table 4: [CCM Scan Tool Output Controls for Active Grille Air Shutters \(If Equipped\)](#)

Table 5: [CCM Scan Tool Parameters for Active Engine Mounts \(If Equipped\)](#)

Table 6: [CCM Scan Tool Output Controls for Active Engine Mounts \(If Equipped\)](#)

Table 7: [CCM Scan Tool Parameters for Exhaust Flow Control Valves \(If Equipped\)](#)

Table 8: [CCM Scan Tool Output Controls for Exhaust Flow Control Actuators \(If Equipped\)](#)

Table 9: [CCM Scan Tool Parameters for Trailer Brake Control System \(If Equipped\)](#)

Table 10: [Chassis Control Module \(CCM\) Scan Tool Output Controls for Trailer Brake Control System \(If Equipped\)](#)

Table 11: [CCM Scan Tool Parameters for Vehicle Level Control \(If Equipped\)](#)

Table 12: [CCM Scan Tool Output Controls for Vehicle Level Control \(If Equipped\)](#)

Table 13: [CCM Scan Tool Parameters for Transmission Cooling Fan \(If Equipped\)](#)

Table 14: [CCM Scan Tool Output Controls for Transmission Cooling Fan \(If Equipped\)](#)

Chassis Control Module (CCM) Scan Tool Data Parameters for Fuel System

Parameter	System State	Expected Value	Description
Operating Conditions: Ignition ON/Engine Idling at Normal Operating Temperature/Vehicle is in Park or Neutral			
Desired Fuel Pressure	—	306.8 kPa (44.5 psi)	This displays kPa (psi). This is the desired fuel pressure.
Fuel Pump Command	—	On	The scan tool displays On or Off. This is the current state of the fuel pump command.
Fuel Pump Signal Command	—	Varies	This displays %. This is the commanded fuel pump signal measured in percentage.
Fuel Pressure Sensor	—	296.4–310.3 kPa (43–45 psi)	This displays kPa (psi). This is the current pressure at the fuel pressure sensor.
Fuel Pressure Sensor	—	4.90–5.01 Volts	

Parameter	System State	Expected Value	Description
			This displays Volts. This is the fuel pressure sensor voltage.
Ignition 1 Signal	—	Varies	This displays Volts. This is the current ignition 1 signal.
LT Fuel Pump Trim	—	Varies	This displays a numeric value. This is the long term (LT) fuel pump trim.
ST Fuel Pump Trim	—	Varies	This displays a numeric value. This is the short term (ST) fuel pump trim.

Chassis Control Module (CCM) Scan Tool Output Controls for Fuel System

Output Control	Description
Fuel Pressure Control	This output control is used to control the fuel pressure.
Fuel Pump	This output control is used to command the fuel pump ON and OFF.
Fuel Pump Trim Reset	This output control is used to reset the fuel pump trim.

CCM Scan Tool Parameters for Active Grille Air Shutters (If Equipped)

Parameter	System State	Expected Value	Description
Operating Conditions: Ignition ON/Engine Idling at Normal Operating Temperature / Vehicle is in Park or Neutral			
Active Grille Air Shutter Position Command (Single Shutter System)	—	Varies	This displays %. This is the commanded active grille air shutter position.
Active Grille Air Shutter Position (Single Shutter System)	—	Varies	This displays %. This is the actual active grille air shutter position.
Active Grille Air Shutter 1 Position Command (Dual Shutter System)	—	Varies	This displays %. This is the commanded active grille air shutter position.
Active Grille Air Shutter 1 Position (Dual Shutter System)	—	Varies	This displays %. This is the actual active grille air shutter position.

Parameter	System State	Expected Value	Description
Active Grille Air Shutter 2 Position Command (Dual Shutter System)	—	Varies	This displays %. This is the commanded active grille air shutter position.
Active Grille Air Shutter 2 Position (Dual Shutter System)	—	Varies	This displays %. This is the actual active grille air shutter position.

CCM Scan Tool Output Controls for Active Grille Air Shutters (If Equipped)

Output Control	Description
Active Grille Air Shutter System (Single Shutter System)	This output control is used to perform the Active Grille Air Shutter Actuator test. It is used to cycle the active grille air shutter open and closed. The test result will display pass or fail based on the ability of the louvers to cycle open and closed.
Active Grille Air Shutter 1 (Dual Shutter System)	This output control is used to perform the Active Grille Air Shutter Actuator test. It is used to cycle the active grille air shutter open and closed. The test result will display pass or fail based on the ability of the louvers to cycle open and closed.
Active Grille Air Shutter 2 (Dual Shutter System)	This output control is used to perform the Active Grille Air Shutter Actuator test. It is used to cycle the active grille air shutter open and closed. The test result will display pass or fail based on the ability of the louvers to cycle open and closed.

CCM Scan Tool Parameters for Active Engine Mounts (If Equipped)

Parameter	System State	Expected Value	Description
Operating Conditions: Ignition ON/Engine Idling at Normal Operating Temperature / Vehicle is in Park or Neutral			
Engine Mount Actuator Output 1	—	On/Off	The scan tool will display On/Off. This is the engine mount actuator commanded state.
Engine Mount Actuator Output 2	—	On/Off	The scan tool will display On/Off. This is the engine mount actuator commanded state.
Engine Mount Actuator Control Circuit 1 Status (2014 model year only)	—	Passed	The scan tool displays Passed/Short to Battery/Short to Ground/Open This is the engine mount actuator control circuit 1 condition.

Parameter	System State	Expected Value	Description
Engine Mount Actuator Control Circuit 2 Status (2014 model year only)	—	Passed	The scan tool displays Passed/Short to Battery/Short to Ground/Open This is the engine mount actuator control circuit 2 condition.

CCM Scan Tool Output Controls for Active Engine Mounts (If Equipped)

Output Control	Description
Engine Mount Actuator Output 1	This output control is used to turn the engine mount actuator 1 On and Off.
Engine Mount Actuator Output 2	This output control is used to turn the engine mount actuator 2 On and Off.

CCM Scan Tool Parameters for Exhaust Flow Control Valves (If Equipped)

Parameter	System State	Expected Value	Description
Operating Conditions: Ignition ON/Engine Idling at Normal Operating Temperature / Vehicle is in Park or Neutral			
Exhaust Flow Control Valve Command	—	Open/Closed	Exhaust Flow Valve Commanded State
Exhaust Flow Control Valve Command	—	%	Exhaust Flow Valve Commanded Duty Cycle (0%-100%)
Exhaust Flow Control Valve Performance Mode	—	Active/Inactive	Exhaust Flow Valve Control Status
Exhaust Flow Control Valve Rumble Mode	—	Active/Inactive	Exhaust Flow Valve Control Status
Exhaust Flow Control Valve	—	Active/Inactive	Exhaust Flow Valve Control Status
Cylinder Deactivation Exhaust Flow Valve Command	—	Open/Closed/Disabled	Exhaust Flow Valve Commanded State
Cylinder Deactivation Exhaust Flow Control Valve	—	Active/Inactive	Exhaust Flow Valve Control Status
Cylinder Deactivation Exhaust Flow Control Valve 1 Position	—	Open range is 4 - 28 degrees	Cylinder Deactivation Exhaust Flow Control Valve 1 actual position in degrees

Parameter	System State	Expected Value	Description
		Closed range is 64 - 93 degrees	
Cylinder Deactivation Exhaust Flow Control Valve 2 Position	—	Open range is 4 - 28 degrees Closed range is 64 - 93 degrees	Cylinder Deactivation Exhaust Flow Control Valve 2 actual position in degrees

CCM Scan Tool Output Controls for Exhaust Flow Control Actuators (If Equipped)

Output Control	Description
Exhaust Flow Control Valve Command	This output control is used to cycle the exhaust flow control valve open and closed.
Cylinder Deactivation Exhaust Flow Valve Command	This output control is used to cycle the cylinder deactivation exhaust flow control valve open and closed.

CCM Scan Tool Parameters for Trailer Brake Control System (If Equipped)

Parameter	System State	Expected Value	Description
Operating Conditions: Ignition ON/Engine Idling at Normal Operating Temperature / Vehicle is in Park or Neutral			
ABS Active Signal	—	OK	The scan tool displays Ok/Not Ok. The scan tool displays Ok when no problems are found with the ABS Active Signal serial data message from the electronic brake control module to the chassis control module.
Antilock Braking System	—	Inactive	The scan tool displays Active/Inactive. The scan tool displays Inactive when the ABS system is not functioning.
Automatic Brake Control Gain Request From EBCM	—	0-100%	The scan tool displays a number between 0-100%.
Automatic Brake Request From EBCM	—	No	The scan tool displays Yes/No. This is a request from the EBCM to apply the trailer brakes.
Automatic-Brake Torque	—	Nm	The scan tool displays a numerical value.

Parameter	System State	Expected Value	Description
Automatic-Brake Torque Signal	—	Ok	The scan tool displays Ok/Not Ok. The scan tool displays Ok when no problems are found with the Automatic Brake Torque Signal serial data message to the chassis control module.
Automatic Braking Active Signal	—	Ok	The scan tool displays Ok/Not OK. The scan tool displays OK when no problems are found with the Automatic Braking Active Signal serial data message to the chassis control module.
Automatic Braking Event	—	Not Detected	The scan tool displays Detected/Not Detected. This parameter represents a command to apply the trailer brakes from the adaptive cruise control system.
Brake Master Cylinder Pressure Sensor	—	Varies	The scan tool will display brake fluid pressure in the master cylinder. The scan tool will display a kPa or psi signal received from the chassis control module.
Brake Pressure Signal	—	OK	The scan tool will display Ok/Not Ok. The scan tool will display a serial data message received from the chassis control module.
Brake Request from EBCM	—	Ok	The scan tool displays Ok/Not Ok. The scan tool displays Ok when no problems are found with the Brake Request signal serial data message from the electronic brake control module to the chassis control module.
Desired Trailer Brake Control Duty Cycle	—	0–100%	The scan tool displays a number between 0–100%. This number represents a duty cycle request signal from the chassis control module to the trailer brake power module.

Parameter	System State	Expected Value	Description
Deviation Between Manual Trailer Brake Apply Request Signal 1 and 2	—	Varies	The scan tool displays a percentage difference between the Apply Request Signal 2 and Redundant Request Signal 1.
Driver Initiated Brake Event	—	Not Detected	The scan tool displays Detected/Not Detected. The scan tool detects when the driver has applied the trailer brakes.
Induced Voltage by Trailer Brake Coil	—	0–20 V	The scan tool displays a voltage. This number represents the actual voltage supplied by the trailer brake power module to the trailer brakes.
Manual Trailer Brake Apply Request Signal 1	—	Varies	The scan tool displays a percentage. This represents a brake apply signal between the chassis control module and the trailer brake power module.
Manual Trailer Brake Apply Request Signal 2	—	Varies	The scan tool displays a percentage. This represents a brake apply signal between the chassis control module and the trailer brake power module.
Stop Lamp Signal	—	Not Requested	The scan tool displays Requested/Not Requested. This is the brake pedal position sensor signal from the BCM to the chassis control module.
Trailer Brake Automatic Control State	—	Normal	The scan tool displays Normal/Active/Temporarily Inhibited/Temporarily Limited/Permanently Failed/Communication Failed/Disabled by Calibration. This represents the operational state of the chassis control module.
Trailer Brake Control Duty Cycle	—	0–100%	The scan tool displays a percentage. This is the pulse width modulated

Parameter	System State	Expected Value	Description
			output signal from the trailer brake power module to the trailer brakes.
Trailer Brake Control Output Circuit	—	Okay	The scan tool displays Unknown/Short to Battery/Short to Ground/Okay. This represents the state of health of the output circuit from the trailer brake power module to the trailer brakes.
Trailer Brake Control Output Circuit	—	0–20 V	The scan tool displays a voltage. This represents the voltage supplied by the trailer brake power module to the trailer brakes.
Trailer Brake Power Control Module	—	De-Energized	The scan tool displays Energized/De-Energized. This represents the state of the trailer brake power module.
Trailer Brake Power Control Module Battery Voltage	—	Varies	The scan tool displays a voltage. This represents the battery voltage supplied to the trailer brake power module.
Trailer Brake Type	—	Undefined	The scan tool displays Undefined when a trailer is not connected to the vehicle. The scan tool displays Electromagnetic Brakes or Electrohydraulic Brakes when a trailer is connected to the vehicle. The type displayed is based on what is detected by the chassis control module.
Trailer Brake User Gain	—	Varies	The scan tool displays percent of full gain setting. The scan tool displays 0–100%. Each full gain setting represents an increment of approximately 10 percent of full gain setting. Approximately 40% will be indicated with a gain setting of 4.0, 65% will be

Parameter	System State	Expected Value	Description
			indicated with a gain setting of 6.5, etc.
Trailer Brake User Gain Switch	—	Varies	The scan tool displays percent of full gain setting. The scan tool displays 0–100%. Each full gain setting represents an increment of approximately 10 percent of full gain setting. Approximately 40% will be indicated with a gain setting of 4.0, 65% will be indicated with a gain setting of 6.5, etc.
Vehicle Speed	—	Varies	The scan tool displays 0–327 km/h (0–204 mph). The scan tool displays 0 km/h (0 mph) when the vehicle is not moving. This is the vehicle speed serial data message from the ECM.
Vehicle Stability Enhancement System Signal	—	Ok	The scan tool displays Ok/Not Ok. The scan tool displays Ok when no problems are found with the Vehicle Stability Enhancement System signal to the chassis control module.
Wheel Speed Signal	—	Ok	The scan tool displays Ok/Not Ok. The scan tool displays Ok when no problems are found with the Wheel Speed signal from the EBCM to the chassis control module.

Chassis Control Module (CCM) Scan Tool Output Controls for Trailer Brake Control System (If Equipped)

Output Control	Description
Trailer Brake Control Signal	This output control is used to turn the trailer brake power control module on and off.
Trailer Brake Duty Cycle	This output control is used to control the trailer brake apply signal from trailer brake power control module.

CCM Scan Tool Parameters for Vehicle Level Control (If Equipped)

Parameter	System State	Expected Value	Description

Parameter	System State	Expected Value	Description
Operating Conditions: Ignition ON			
Left Rear Vehicle Level Position Sensor	—	.25–4.75 Volts	This displays Volts. This is the level position sensor voltage.
Right Rear Vehicle Level Position Sensor	—	.25–4.75 Volts	This displays Volts. This is the level position sensor voltage.
Vehicle Level Control Compressor Over Temperature	—	No	This displays Yes or No. This will display Yes if the compressor is overheated.
Excessive Compressor Activity	—	No	This displays Yes or No. This will display Yes if the compressor activity is excessive.
Vehicle Level Control Status	—	Normal	This displays Normal/Uneven Surface or Hoisted/Overloaded/Failed.
Vehicle Level Control Compressor	—	Varies	This displays On or Off. This will display if the compressor is on or off.
Vehicle Level Control Exhaust Valve	—	Varies	This displays Open or Closed. This will display if the exhaust valve is open or closed.
Vehicle Level Control Pressure Sensor	—	.4–4.8 Volts	This displays Volts. This is the level control pressure sensor voltage.
Vehicle Leveling Sensors Supply Voltage	—	4.9–5.1 Volts	This displays Volts. This is the leveling sensors supply voltage.
Vehicle Level Control Pressure Sensor Supply Voltage	—	4.9–5.1 Volts	This displays Volts. This is the level control pressure sensor supply voltage.
Vehicle Level Trim Height Status	—	Learned/Not Learned	This displays if the level trim height status

CCM Scan Tool Output Controls for Vehicle Level Control (If Equipped)

Output Control	Description
Suspension Position Sensor Trim Height	This output control is used to learn the trim height.

Output Control	Description
Vehicle Level Control Compressor Relay	This output control is used to command the compressor ON and OFF.
Vehicle Level Control Exhaust Valve	This output control is used to command the exhaust valve ON and OFF.

CCM Scan Tool Parameters for Transmission Cooling Fan (If Equipped)

Parameter	System State	Expected Value	Description
Operating Conditions: Ignition ON/Engine Idling at Normal Operating Temperature / Vehicle is in Park or Neutral			
Transmission Cooling Fan Circuit High Voltage Test Status	—	OK	Malfunction/Not Run/OK
Transmission Cooling Fan Circuit Open Test Status	—	OK	Malfunction/Not Run/OK
Transmission Cooling Fan Circuit Low Voltage Status	—	OK	Malfunction/Not Run/OK
Transmission Cooling Fan Command	—	Yes/No	The scan tool displays Yes/No. This shows if the transmission cooling fan is being commanded ON.
Transmission Cooling Fan Duty Cycle	—	0 – 100%	The scan tool displays a percentage. This is the transmission cooling fan ON duty cycle.

CCM Scan Tool Output Controls for Transmission Cooling Fan (If Equipped)

Output Control	Description
Transmission Cooling Fan Duty Cycle	This output control is used to control the transmission cooling fan.

Seat Memory Control Module Scan Tool Information

Table 1: [Seat Position Scan Tool Data Parameters](#)

Table 2: [Seat Memory Control Module Scan Tool Output Controls](#)

Seat Position Scan Tool Data Parameters

Parameter	Expected Value	Definition
Operating Conditions: Ignition ON		
Driver Seat Back Switch	Inactive	The scan tool displays Inactive, Forward, or Rearward. When the seat recline switch is pressed, the scan tool displays the state of the seat recline switch.
Driver Seat Back Direction Command	Inactive	The scan tool displays Inactive, Forward, or Rearward. When the seat recline switch is pressed or when a memory recall occurs, the scan tool displays the direction the memory control module is commanding the seat recline motor.
Driver Seat Back Position	Varies	The scan tool displays 0–65,535 counts. The hall effect sensor provides a determined number of pulse signals with each rotation of the motor that the scan tool displays as counts. High count values indicate that the seat back is in the forward position, while low count values indicate that the seat back is in the rearward position.
Driver Seat Cushion Front Vertical Direction Command	Inactive	The scan tool displays Inactive, Up or Down. When the seat front vertical switch is pressed or when a memory recall occurs, the scan tool displays the direction the memory control module is commanding the seat front vertical motor.
Driver Seat Cushion Front Vertical Position	Varies	The scan tool displays 0–65,535 counts. The hall effect sensor provides a determined number of pulse signals with each rotation of the motor that the scan tool displays as counts. High count values indicate that the seat front vertical is in the up position, while low count values indicate that the seat front vertical is in the down position.
Driver Seat Cushion Front Vertical Switch	Inactive	The scan tool displays Inactive, Up or Down. This is the state of the seat front vertical switch.
Driver Seat Cushion Rear Vertical Direction Command	Inactive	The scan tool displays Inactive, Up or Down. When the seat rear vertical switch is pressed or when a memory recall occurs, the scan tool displays the direction the memory control

Parameter	Expected Value	Definition
		module is commanding the seat rear vertical motor.
Driver Seat Cushion Rear Vertical Position	Varies	The scan tool displays 0–65,535 counts. The hall effect sensor provides a determined number of pulse signals with each rotation of the motor that the scan tool displays as counts. High count values indicate that the seat rear vertical is in the up position, while low count values indicate that the seat rear vertical is in the down position.
Driver Seat Cushion Rear Vertical Switch	Inactive	The scan tool displays Inactive, Up or Down. This is the state of the rear vertical downward switch.
Driver Seat Horizontal Direction Command	Inactive	The scan tool displays Inactive, Forward, or Rearward. When the seat horizontal switch is pressed or when a memory recall occurs, the scan tool displays the direction the memory control module is commanding the seat horizontal motor.
Driver Seat Horizontal Position	Varies	The scan tool displays 0–65,535 counts. The hall effect sensor provides a determined number of pulse signals with each rotation of the motor that the scan tool displays as counts. High count values indicate that the seat horizontal position is forward, while low count values indicate that the seat horizontal position is rearward.
Driver Seat Horizontal Switch	Inactive	The scan tool displays Inactive, Forward, or Rearward. This is the state of the seat horizontal switch.
Memory Recall Switches	Idle	The scan tool displays Idle, Memory 1, Memory 2, or Memory 3. When a memory function switch is pressed, the scan tool will momentarily display the function selected.

Seat Memory Control Module Scan Tool Output Controls

Control Functions	Description
Driver Seat Back Movement	This output control is used to command the driver seat back Forward and Rearward.
Driver Seat Cushion Front Vertical Movement	This output control is used to command the driver seat cushion front vertical motor Up and Down.
Driver Seat Cushion Rear	This output control is used to command the driver seat cushion rear vertical motor Up and Down.

Control Functions	Description
Vertical Movement	
Driver Seat Horizontal Movement	This output control is used to command the driver seat Forward and Rearward.

Electronic Brake Control Module Scan Tool Information

Table 1: [Electronic Brake Control Module Scan Tool Data Parameter](#)

Table 2: [Electronic Brake Control Module Scan Tool Output Controls](#)

The electronic brake control module scan tool data parameters list contains all ABS related parameters that are available on the scan tool. The list is arranged in alphabetical order. A given parameter may appear in any one of the data lists.

Electronic Brake Control Module Scan Tool Data Parameter

Parameter	System State	Expected Value	Description
Operating Conditions: Ignition ON			
ABS Pump Motor	Pump motor inactive	Inactive	The scan tool displays Inactive or Active depending on the status of the pump motor.
	Pump motor active	Active	
Brake Pedal Switch Status	Brake pedal released	Inactive	The scan tool displays Inactive or Active depending on the state of the brake pedal.
	Brake pedal applied	Active	
Brake Pressure Sensor	—	Varies	The scan tool displays the current hydraulic brake pressure.
Lateral Acceleration	—	Varies	The scan tool displays the current lateral acceleration in m/s ² .
Left Front Inlet Solenoid Valve Feedback	—	Inactive	The scan tool displays Inactive or Active. Active is displayed when the left front inlet solenoid valve is commanded ON.
Left Front Outlet Solenoid Valve Feedback	—	Inactive	The scan tool displays Inactive or Active. Active is displayed when the left front outlet solenoid valve is commanded ON.
Left Front Wheel Speed Sensor	—	0 km/h (0 MPH)	The scan tool displays km/h (MPH) depending on the current speed of the left front wheel speed sensor.
Left Rear Inlet Solenoid Valve Feedback	—	Inactive	The scan tool displays Inactive or Active. Active is displayed when the left rear inlet solenoid valve is commanded ON.
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Parameter	System State	Expected Value	Description
Left Rear Outlet Solenoid Valve Feedback	—	Inactive	The scan tool displays Inactive or Active. Active is displayed when the left rear outlet solenoid valve is commanded ON.
Left Rear Wheel Speed Sensor	—	0 km/h (0 MPH)	The scan tool displays km/h (MPH) depending on the current speed of the left rear wheel speed sensor.
Longitudinal Acceleration	—	Varies	The scan tool displays the current longitudinal acceleration in m/s ² .
Primary Isolation Solenoid Valve Feedback	—	Inactive	The scan tool displays Inactive or Active. Active is displayed when the primary isolation solenoid valve is commanded ON.
Primary Prime Solenoid Valve Feedback	—	Inactive	The scan tool displays Inactive or Active. Active is displayed when the primary prime solenoid valve is commanded ON.
Pump Motor Relay Feedback	—	Inactive	The scan tool displays Inactive or Active. Active is displayed when the pump motor is commanded ON.
Right Front Inlet Solenoid Valve Feedback	—	Inactive	The scan tool displays Inactive or Active. Active is displayed when the right front inlet solenoid valve is commanded ON.
Right Front Outlet Solenoid Valve Feedback	—	Inactive	The scan tool displays Inactive or Active. Active is displayed when the right front outlet solenoid valve is commanded ON.
Right Front Wheel Speed Sensor	—	0 km/h (0 MPH)	The scan tool displays km/h (MPH) depending on the current speed of the right front wheel speed sensor.
Right Rear Inlet Solenoid Valve Feedback	—	Inactive	The scan tool displays Inactive or Active. Active is displayed when the right rear inlet solenoid valve is commanded ON.
Right Rear Outlet Solenoid Valve Feedback	—	Inactive	The scan tool displays Inactive or Active. Active is displayed when the right rear outlet solenoid valve is commanded ON.
Right Rear Wheel Speed Sensor	—	0 km/h (0 MPH)	The scan tool displays km/h (MPH) depending on the current speed of the right rear wheel speed sensor.
	—	Inactive	

Parameter	System State	Expected Value	Description
Secondary Isolation Solenoid Valve Feedback			The scan tool displays Inactive or Active. Active is displayed when the secondary isolation solenoid valve is commanded ON.
Secondary Prime Solenoid Valve Feedback	—	Inactive	The scan tool displays Inactive or Active. Active is displayed when the secondary prime solenoid valve is commanded ON.
Steering Wheel Angle Sensor	—	Varies	The scan tool displays the current steering wheel angle position in °.
System Voltage	—	11–14 V	The scan tool displays V. This is the current battery voltage.
Yaw Rate Signal	—	Varies	The scan tool displays the current yaw rate in °/s.

Electronic Brake Control Module Scan Tool Output Controls

Output Control	Description
ABS Pump Motor	Commands the ABS pump motor ON or OFF.
Automated Brake Bleed	This is used in order to bleed the ABS hydraulics.
Left Front Inlet Solenoid Valve	Commands the solenoid valve ON or OFF.
Left Front Outlet Solenoid Valve	Commands the solenoid valve ON or OFF.
Left Rear Inlet Solenoid Valve	Commands the solenoid valve ON or OFF.
Left Rear Outlet Solenoid Valve	Commands the solenoid valve ON or OFF.
Longitudinal Acceleration Sensor Learn	This function activates the longitudinal acceleration sensor learn procedure.
Right Front Inlet Solenoid Valve	Commands the solenoid valve ON or OFF.
Right Front Outlet Solenoid Valve	Commands the solenoid valve ON or OFF.
Right Rear Inlet Solenoid Valve	Commands the solenoid valve ON or OFF.
Right Rear Outlet Solenoid Valve	Commands the solenoid valve ON or OFF.
Steering Wheel Angle Sensor Learn	This function activates the steering wheel angle sensor learn procedure.
Traction Control Left Front/Right Rear Isolation Solenoid Valve	Commands the solenoid valves ON or OFF.

Output Control	Description
Traction Control Left Front/Right Rear Prime Solenoid Valve	Commands the solenoid valves ON or OFF.
Traction Control Right Front/Left Rear Isolation Solenoid Valve	Commands the solenoid valves ON or OFF.
Traction Control Right Front/Left Rear Prime Solenoid Valve	Commands the solenoid valves ON or OFF.

Electronic Parking Brake Control Module Scan Tool Information

Table 1: [Parking Brake Control Module Scan Tool Data Parameters](#)

Table 2: [Parking Brake Control Module Scan Tool Output Controls](#)

Parking Brake Control Module Scan Tool Data Parameters

Parameter	Expected Value	Description
Operating Conditions: Ignition ON, Parking Brake Off		
Base Hardware	Varies	The scan tool displays the base hardware number.
BCM Brake Pedal Signal	Valid	The scan tool displays Valid or Invalid. This parameter displays the signal status received by the body control module brake pedal as valid or invalid. If the signal received is invalid the parking brake control module will deactivate.
Calculated System Temperature	Varies	The scan tool displays the parking brake control module temperature in degrees Celsius.
Calibrations	Varies	The scan tool displays the calibration number.
EBCM Emergency Park Brake Enable Signal	Valid	The scan tool displays Valid or Invalid. This parameter displays the signal status received by the electronic brake control module emergency park brake enable signal as valid or invalid. If the signal received is invalid the parking brake control module will deactivate.
ECM Accelerator Pedal Position Signal	Valid	The scan tool displays Valid or Invalid. This parameter displays the signal status received by the engine control module accelerator pedal position signal as valid or invalid. If the signal received is invalid the parking brake control module will deactivate.
ECM Clutch Pedal Position Signal	Valid	The scan tool displays Valid or Invalid. This parameter displays the signal status received by the engine control module clutch pedal position signal as valid or invalid. If the signal received is invalid the parking brake control module will deactivate.
ECM Vehicle Speed Signal	Valid	The scan tool displays Valid or Invalid. This parameter displays the signal status received by the engine control module vehicle speed signal as valid or invalid. If the signal received is invalid the parking brake control module will deactivate.
End Model	Varies	The scan tool displays the end model number.
OS/Software	Varies	The scan tool displays the software number.

Parameter	Expected Value	Description
Park Brake Calibration Status	Passed	The scan tool displays Passed or Failed. This parameter displays if the park brake calibration is properly programmed into the parking brake control module.
Park Brake Cable Position	Varies	The scan tool displays the current park brake position in counts. When the park brake is fully released the value will be 0 counts which will allow cable disassembly. The park brake cable position counts will display in range of 0-700 counts when released and 701-1300 counts when applied.
Park Brake Motor Command	Off	The scan tool displays On or Off. This parameter displays the status of the park brake motor.
Park Brake Motor Direction	Inactive	The scan tool displays Apply, Release or Inactive. This parameter displays the status of the park brake motor direction.
Park Brake Motor Duty Cycle Command	Varies	The scan tool displays the pulse width modulated cycle as a percentage.
Park Brake Release Reason	None	The scan tool displays None, Ign. Cycled, Spd. Threshold, or Brake Applied. This parameter displays the reason the parking brake was released.
Park Brake Status	Released	The scan tool displays Applied, Released, Malfunction or Invalid. This parameter displays the current status of the parking brake.
Park Brake Switch	Inactive	The scan tool displays Applied, Released, Inactive, or Invalid. This parameter displays the current status of the parking brake switch.
TCM Current Gear Signal	Valid	The scan tool displays Valid or Invalid. This parameter displays the signal status received by the transmission control module current gear signal as valid or invalid. If the signal received is invalid the parking brake control module will deactivate.
VIN	Varies	The scan tool displays the vehicle identification number.

Parking Brake Control Module Scan Tool Output Controls

Output Control	Description
Parking Brake Shoe Service Reset	The electric parking brake module will reset the dynamic brake counter. When selected the EPB counter will be set to zero.
Parking Brake Calibration	The electric parking brake module will activate the park brake calibration learn procedure when selected. During the learn procedure the rear brakes will cycle several times.
Parking Brake Cable Apply	The electric parking brake module will apply the parking brake cable tension to diagnose a possible EPB switch failure.

Output Control	Description
Parking Brake Cable Release	The electric parking brake module will release the parking brake cable to diagnose a possible EPB switch failure.
Parking Brake Cable Replacement	The electric parking brake module will unwind the parking brake cable for replacement or service when selected.
Parking Brake Actuator DTC Reset	The electric parking brake module will reset the park brake actuator when commanded.
Parking Brake Switch Procedure	The electric parking brake module will test the parking brake switch signals to verify they are working properly or if there is an open circuit.

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[Diagnostic Overview, Starting Point, and Programming](#) | [Vehicle Diagnostic Information](#) | [Specifications](#) |

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K20 Engine Control Module: Scan Tool Information (LFW, LFX, LSA, LS3, LWR or L77)

Table 1: [Engine Control Module Scan Tool Data](#)

Table 2: [Engine Control Module \(ECM\) Scan Tool Output Controls](#)

Engine Control Module Scan Tool Data

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.
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Parameter	System State	Expected Value	Description
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

Parameter	System State	Expected Value	Description
			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 sensors.
Accelerator Pedal Position When Engine Overspeed Detected	Engine Idling	%	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.
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

Parameter	System State	Expected Value	Description
			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

Parameter	System State	Expected Value	Description
			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	%	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

Parameter	System State	Expected Value	Description
			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.
		2.14 Volts	

Parameter	System State	Expected Value	Description
	Accelerator pedal fully actuated		
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). 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).
	Pedal Fully Applied	100 %	
APP Sensors	Pedal Released	0 %	
	Pedal Fully Applied	99 %	

Parameter	System State	Expected Value	Description
Autostart/Autostop Disable Mode	—	Active	This parameter displays "Active" when all conditions for allowing the autostart/autostop mode are present (no inhibit conditions exist), this parameter displays "Inactive" when all conditions for allowing the autostart/autostop mode are not present.
Autostart Inhibit Reason Autostart/Autostop Malfunction	Engine Idling	No	This parameter displays that a immediate stop was commanded due to a Autostart/Autostop 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

Parameter	System State	Expected Value	Description
			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,

Parameter	System State	Expected Value	Description
			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 Switch 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.
Axle Torque	Engine Idling	N•m	This parameter displays the Axle Torque value sent from the hybrid control processor (HCP) to the ECM and anti-lock brake system (ABS) module.
BARO	Engine Idling	65–104 kPa (8–16 psi)	

Parameter	System State	Expected Value	Description
			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.
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	%	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.

Parameter	System State	Expected Value	Description
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 (1026°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 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).
	Ignition ON	Unlocked	

Parameter	System State	Expected Value	Description
Calibration History Buffer			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

Parameter	System State	Expected Value	Description
			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	Engine Idling	No Decision/Failed/Passed	This parameter indicates the status of the catalyst monitor diagnostic.

Parameter	System State	Expected Value	Description
Catalyst Monitor Test Result Bank 1 or 2			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

Parameter	System State	Expected Value	Description
			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.

Parameter	System State	Expected Value	Description
Cooling Fan Command	—	%	This parameter displays the amount of fan power commanded as a percentage of the total fan power available.
Cooling Fan Motor Command	—	%	This parameter displays the commanded duty cycle for the cooling fan.
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 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.

Parameter	System State	Expected Value	Description
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 percentage of its reference voltage.
CPP Sensor	Ignition ON	%	This parameter displays the position learned for the clutch pedal position sensor when the clutch pedal is fully applied during the associated learn procedure.
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

Parameter	System State	Expected Value	Description
			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 Sensor	Ignition ON	Volts	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.
Crankshaft Position Sensor	Ignition ON	%	This parameter displays the clutch pedal position sensor analog input as a percentage of its reference voltage.
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

Parameter	System State	Expected Value	Description
			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 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 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.
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

Parameter	System State	Expected Value	Description
			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 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 Cruise ON	Off Park/Neutral	The parameter displays the reason the cruise control system cannot engage.
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,

Parameter	System State	Expected Value	Description
			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 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 1,2,3,4,5,6,7, 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

Parameter	System State	Expected Value	Description
			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 1-6 Knock Detected	Engine Idling	No	This parameter displays yes if a knock has been detected in an individual cylinder.
Deceleration Fuel Cut-Off	Engine Idling	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 Boost Pressure	—	kPa	This parameter displays the desired turbocharger boost pressure.

Parameter	System State	Expected Value	Description
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 Engine speed at 2000 RPM	0 Degrees 10 Degrees	This parameter displays the desired exhaust camshaft angle as commanded by the control module.
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 Engine speed at 2000 RPM	0 Degrees 10 Degrees	This parameter displays the desired intake camshaft angle as commanded by the control module.
Desired Throttle Position	Engine Idling	%	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.

Parameter	System State	Expected Value	Description
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	N•m	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.

Parameter	System State	Expected Value	Description
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 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

Parameter	System State	Expected Value	Description
			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
Engine Autostopped	—	No	This parameter displays the status of the internal combustion engine (ICE) in vehicles incorporating

Parameter	System State	Expected Value	Description
			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 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 Thermostat Heater Command	Ignition ON	%	This parameter displays the commanded duty cycle

Parameter	System State	Expected Value	Description
			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 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	%	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 autostart/stop 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 Idling	kPa/PSI	

Parameter	System State	Expected Value	Description
Engine Oil Absolute Pressure Sensor			This parameter displays the defaulted, 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 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	System State	Expected Value	Description
			parameter displays Malfunction if the 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 Sensor	Engine Idling	OK	This parameter displays the engine oil pressure as determined by 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 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 autostart/stop functionality.
Engine Serial Number	Ignition ON	#	This parameter displays the engine serial number.
	Ignition ON	Counts	

Parameter	System State	Expected Value	Description
Engine Shutdown Counter – Excessive Idle Time			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

Parameter	System State	Expected Value	Description
			from engine running to engine off, OR in transition from engine running to engine failed).
Engine Torque Command	Engine Idling	N•m	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
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	%	This parameter displays the commanded duty cycle for the canister purge output.

Parameter	System State	Expected Value	Description
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 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

Parameter	System State	Expected Value	Description
			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	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.

Parameter	System State	Expected Value	Description
Circuit Low Voltage Test Status Bank 1 or 2			
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 Engine speed at 2000 RPM	0 Degrees 10 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 Engine speed at 2000 RPM	20 % 50 %	This parameter displays the on-time or duty cycle of the exhaust camshaft position (CMP) actuator solenoid valve as commanded by the control module.
Exhaust Camshaft Position Variance or Exhaust Camshaft Position Variance Bank 1 or 2	Engine Idling Engine speed at 2000 RPM	0 Degrees 0 Degrees	This parameter displays in degrees, the difference between the desired exhaust camshaft position and the actual exhaust camshaft position.
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
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	%	This parameter displays the percentage of alcohol in the fuel. The value is calculated by the ECM

Parameter	System State	Expected Value	Description
			using the fuel composition sensor input.
Fuel Alcohol Content When Recommended Maximum Fuel Alcohol Content Exceeded	Engine Idling	%	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

Parameter	System State	Expected Value	Description
			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.
	Ignition ON	0-5 Volts	

Parameter	System State	Expected Value	Description
Fuel Level Sensor Left Tank (If Equipped)			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	%	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.

Parameter	System State	Expected Value	Description
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 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 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

Parameter	System State	Expected Value	Description
			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	%	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

Parameter	System State	Expected Value	Description
			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	—	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.
	Ignition ON	OK	

Parameter	System State	Expected Value	Description
Fuel Pump Enable Circuit Low Voltage Test Status			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 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

Parameter	System State	Expected Value	Description
			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

Parameter	System State	Expected Value	Description
			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 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.
	Ignition ON	No	This parameter displays the enable status of the

Parameter	System State	Expected Value	Description
Fuel System Monitor Enabled This Ignition Cycle			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

Parameter	System State	Expected Value	Description
			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.

Parameter	System State	Expected Value	Description
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

Parameter	System State	Expected Value	Description
			monitor diagnostic is actively running a test.
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 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	mA	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	mA	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	Engine Idling	OK	This parameter displays the state of the oxygen sensor heater control circuit. The parameter displays Malfunction if the oxygen sensor heater

Parameter	System State	Expected Value	Description
Sensor 1 or Bank 2 Sensor 1			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

Parameter	System State	Expected Value	Description
			the current driving/monitoring cycle.
HO2S Heater Monitor Enabled	Ignition ON	No	This parameter displays the current state of the HO2S 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,

Parameter	System State	Expected Value	Description
			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

Parameter	System State	Expected Value	Description
			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.

Parameter	System State	Expected Value	Description
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.

Parameter	System State	Expected Value	Description
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.
	Ignition ON	Counts	This parameter displays the number of times a new

Parameter	System State	Expected Value	Description
Immobilizer Security Code Programming Counter			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.

Parameter	System State	Expected Value	Description
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	%	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

Parameter	System State	Expected Value	Description
			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	%	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 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.

Parameter	System State	Expected Value	Description
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 Engine speed at 2000 RPM	0 Degrees 10 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 Engine speed at 2000 RPM	20 % 50 %	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 Engine speed at 2000 RPM	0 Degrees 0 Degrees	This parameter displays in degrees, the difference between the desired intake camshaft position and the actual intake camshaft position.
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).
	Ignition ON	On	

Parameter	System State	Expected Value	Description
Intake Manifold Tuning Control Valve Control Circuit Command			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	%	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.

Parameter	System State	Expected Value	Description
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 Fuel Pump Trim	—	#	This parameter displays a numeric value. This is the long term (LT) fuel pump trim.

Parameter	System State	Expected Value	Description
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	%	This parameter displays the Long Term Secondary O2 Sensor Fuel Trim for Bank 1 or 2.
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.
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

Parameter	System State	Expected Value	Description
			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 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

Parameter	System State	Expected Value	Description
			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

Parameter	System State	Expected Value	Description
			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.
Misfire Diagnostic Engine Load	Engine Idling	%	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	%	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

Parameter	System State	Expected Value	Description
			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.
	Engine Idling	Yes/No	

Parameter	System State	Expected Value	Description
O2S/HO2S Monitor Enabled			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

Parameter	System State	Expected Value	Description
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.
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 defaulted radiator coolant temperature measured by a sensor located in the coolant outlet of the radiator.
RCT vs. IAT Sensor Temperature at Last	Engine Idling	Agree	This parameter displays that the temperature

Parameter	System State	Expected Value	Description
ECT vs. RCT Malfunction Detection			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	%	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	Engine Idling	Counts	This parameter displays the number Refueling Events Since

Parameter	System State	Expected Value	Description
Maximum Fuel Alcohol Content Exceeded			Recommended Maximum Fuel Alcohol Content Exceeded.
Remaining Fuel in Tank	Engine Idling	%	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

Parameter	System State	Expected Value	Description
			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	Engine Idling	OK	This parameter displays the state of the secondary air injection pump relay

Parameter	System State	Expected Value	Description
Circuit High Voltage Test Status			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	Engine Idling	OK	This parameter displays the state of the secondary air injection solenoid valve

Parameter	System State	Expected Value	Description
Circuit Open Test Status			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	%	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	%	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

Parameter	System State	Expected Value	Description
			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	%	This parameter shows the current specific humidity level.
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 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.
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.

Parameter	System State	Expected Value	Description
			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.
Supercharger Bypass Solenoid Valve Command	Ignition ON	%	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.
	Ignition ON	OK	

Parameter	System State	Expected Value	Description
Supercharger Bypass Solenoid Valve Control Circuit Open Test Status			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

Parameter	System State	Expected Value	Description
			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	%	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	%	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

Parameter	System State	Expected Value	Description
			during the last learn procedure.
Throttle Position Sensor 1 or 2 Position	Ignition ON	%	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	N•m/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).

Parameter	System State	Expected Value	Description
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	%	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 Overspeed Time	Engine Idling	ms	This parameter displays the Total Engine Overspeed Time.
Total Knock Retard	Engine Idling	0°	

Parameter	System State	Expected Value	Description
			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 Status	Ignition ON	Inactive	This parameter displays Active if the electronic brake and traction control module (EBTCM) is commanding traction control.
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	%	This parameter displays the commanded duty cycle for the turbocharger 1 turbine inlet valve in a percentage.
Turbocharger Bypass Solenoid Valve Command	Ignition ON	%	This parameter displays the commanded duty cycle for the turbocharger

Parameter	System State	Expected Value	Description
			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	%	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

Parameter	System State	Expected Value	Description
			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,

Parameter	System State	Expected Value	Description
			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.

Parameter	System State	Expected Value	Description
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	%	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).

Engine Control Module (ECM) Scan Tool Output Controls

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.
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

Output Control	Description
	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.
Autostart/Autostop	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.
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.
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).
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

Output Control	Description
	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.
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

Output Control	Description
	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.
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 H2O).
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 H2O).
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 H2O).
Exhaust Camshaft Position Actuator or	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

Output Control	Description
Exhaust Camshaft Position Actuator Bank 1	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.
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.
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–

Output Control	Description
	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.
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 calibratable 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.
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	

Output Control	Description
	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	

Output Control	Description
	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.
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 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.

Output Control	Description
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.
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.

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Document ID: 2210651

Front and Rear Parking Assist Control Module Scan Tool Information

Table 1: [Parking Assist Control Module Scan Tool Data Parameters](#)

Table 2: [Parking Assist Control Module Scan Tool Output Controls](#)

Parking Assist Control Module Scan Tool Data Parameters

Parameter	System State	Expected Value	Description
Operating Conditions: Ignition ON/Engine OFF/Parking Assist ON			
Battery Voltage	—	11–14 V	The scan tool displays V. This is the current battery voltage.
Calculated Transmission Range	Transmission in reverse	Reverse	The scan tool displays Park, Reverse, Neutral, Drive or Unknown depending on the state of the commanded gear.
Obstacle Detected	—	No	The scan tool displays Yes or No. Yes is displayed if there is an object within the measuring range of the object sensors.
Park Assist Chime	—	Varies	The scan tool displays On or Off. On is displayed if there is an object within the measuring range of the object sensors.
Park Assist Disable History 1	—	Varies	The scan tool displays None, Manual Disable, Park Brake Applied, Trailer or Other Attached Object, Excessive Speed in Reverse, No or Invalid Sensor Signals, Sensor Disturbance, Sensors Dirty, Sound Signal Return Time Not Plausible. This is the state of the park assist disable history.
Park Assist Disable History 2	—	Varies	The scan tool displays None, Manual Disable, Park Brake Applied, Trailer or Other Attached Object, Excessive Speed in Reverse, No or Invalid Sensor Signals, Sensor Disturbance, Sensors Dirty, Sound Signal Return Time Not Plausible. This is the state of the park assist disable history.
Park Assist Disable History 3	—	Varies	The scan tool displays None, Manual Disable, Park Brake Applied, Trailer or Other Attached Object, Excessive Speed in Reverse, No or Invalid Sensor Signals, Sensor Disturbance, Sensors Dirty, Sound Signal Return Time Not

Parameter	System State	Expected Value	Description
			Plausible. This is the state of the park assist disable history.
Park Assist Disable History 4	—	Varies	The scan tool displays None, Manual Disable, Park Brake Applied, Trailer or Other Attached Object, Excessive Speed in Reverse, No or Invalid Sensor Signals, Sensor Disturbance, Sensors Dirty, Sound Signal Return Time Not Plausible. This is the state of the park assist disable history.
Park Assist Disable History 5	—	Varies	The scan tool displays None, Manual Disable, Park Brake Applied, Trailer or Other Attached Object, Excessive Speed in Reverse, No or Invalid Sensor Signals, Sensor Disturbance, Sensors Dirty, Sound Signal Return Time Not Plausible. This is the state of the park assist disable history.
Park Assist Disable History 6	—	Varies	The scan tool displays None, Manual Disable, Park Brake Applied, Trailer or Other Attached Object, Excessive Speed in Reverse, No or Invalid Sensor Signals, Sensor Disturbance, Sensors Dirty, Sound Signal Return Time Not Plausible. This is the state of the park assist disable history.
Park Assist Disable History 7	—	Varies	The scan tool displays None, Manual Disable, Park Brake Applied, Trailer or Other Attached Object, Excessive Speed in Reverse, No or Invalid Sensor Signals, Sensor Disturbance, Sensors Dirty, Sound Signal Return Time Not Plausible. This is the state of the park assist disable history.
Park Assist Sensor	—	On	The scan tool displays On or Off.
Park Assist Sensor Reference Voltage	—	7.3–9.1 V	The scan tool displays V. This is the amount of voltage being sent to the object sensors.
Park Assist System Status	—	Enable	The scan tool displays Disable, Enable, Inhibited or Failed. This is the state of the parking assist system.
Power Mode	—	Run	The scan tool displays Off, Accessory, Run or Crank. This is the state of the ignition switch.
Rear Red LED	Parking assist Active, No	Off	The scan tool displays On and Off.

Parameter	System State	Expected Value	Description
	object behind the vehicle		
	Parking assist Active, Object between 0.3 – 0.6 m (1– 1.9 ft) behind the vehicle	On	
Rear Yellow 1 LED	Parking assist Active, No object behind the vehicle	Off	The scan tool displays On and Off.
	Parking assist Active, Object between 1– 2.5 m (3.3– 8.2 ft) behind the vehicle	On	
Rear Yellow 2 LED	Parking assist Active, No object behind the vehicle	Off	The scan tool displays On and Off.
	Parking assist Active, Object between 0.6 – 1 m (1.9– 3.3 ft) behind the vehicle	On	

Parking Assist Control Module Scan Tool Output Controls

Output Control	Description
Rear Red LED	The parking assist control module illuminates the red LED of the parking assist indicator when commanded from the scan tool.
Rear Yellow 1 LED	

Output Control	Description
	The parking assist control module illuminates the 1st yellow LED of the parking assist indicator when commanded from the scan tool.
Rear Yellow 2 LED	The parking assist control module illuminates the 2nd yellow LED of the parking assist indicator when commanded from the scan tool.

Front View Camera Module Scan Tool Information

Table 1: [Front View Camera Module Scan Tool Data Parameters](#)

Table 2: [Front View Camera Module Scan Tool Output Controls](#)

Front View Camera Module Scan Tool Data Parameters

Parameter	System State	Expected Value	Description
Operating Conditions: Ignition ON/Engine OFF/Lane Departure Warning ON			
System Voltage	—	Varies	The scan tool displays the system voltage depending of the current battery voltage.
System Power Mode	—	Varies	The scan tool displays Off, Accessory, Running, Cranking or Undefined. This is the state of the ignition switch.
Power Mode Controlled by Backup Device	—	Varies	The scan tool displays Off, Accessory, Running or Cranking depending of the current power mode.
Frontview Camera System Status	—	Varies	The scan tool displays Normal, Malfunction or Undefined depending on the state of the lane departure warning system.
Frontview Camera Calibration Status	—	Varies	The scan tool displays Not Calibrated, Calibrated, Dynamically Calibrated or Undefined. This is the current state of the calibration.
Frontview Camera Learn Mode Status	—	Varies %	The scan tool displays varies percentage between 0–100% depending on the state of the frontview camera learn mode.
Lane Departure Warning Status	—	Varies	The scan tool displays Off, Disabled, Not Ready to Assist, Ready to Assist, Malfunction, Unknown or Undefined depending on the state of the lane departure warning system.
Lane Departure Warning Switch Status	—	On	The scan tool displays On or Off depending on the state of the lane departure warning switch.
Lane Departure Warning Indicator Status	—	Varies	The scan tool displays Off, On, Malfunction, Unknown or Undefined depending on the state of the lane departure warning system.
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Parameter	System State	Expected Value	Description
Forward Collision Alert Function Status			The scan tool displays Off, On, Malfunction, Unknown or Undefined depending on the state of the lane departure warning system.
Intelligent Light Ranging Status	—	Varies	The scan tool displays Off, Disabled, Malfunction, Enabled, Unknown or Undefined depending on the state of the intelligent light ranging system.
Automatic High Beam Activation Status	—	Varies	The scan tool displays Disabled, Enabled or Undefined depending on the state of the automatic high beam assist system.
Following Distance Indicator Status	—	Varies	The scan tool displays Off, Disabled, Not Ready to Assist, Ready to Assist or Undefined depending on the state of the following distance indicator status.
Frontview Camera Disable History 1–4	—	Varies	The scan tool displays Empty, Lane Departure Warning Indicator Malfunction, Lane Departure Warning Switch Malfunction, Sensors Obstructed, Accelerator Pedal Position Out of Range, Driven Wheel Speed Signal Invalid, Non-Driven Wheel Speed Invalid, Brake Pedal Moderate Travel Signal Invalid, Brake Pedal Initial Travel Position Achieved, Lost Communication with Steering Wheel Angle Sensor Module, Invalid Data Received From Steering Wheel Angle Sensor Module, Forward Collision Alert Switch Malfunction, Clutch Pedal Position (CPP) Sensor Performance, Transmission Gear Engaged, Acceleration Sensor Longitudinal Signal, Invalid Data Received From Yaw Rate Sensor Module, Power Mode Controlled by Backup Device, System Power Mode, Overvoltage, Undervoltage or Undefined depending on the history data of the frontview camera disable history.

Front View Camera Module Scan Tool Output Controls

Output Control	Description
Clear Disable History Data	The frontview camera control module clears all disable history buffers when commanded from the scan tool.
Forward Collision Alert Switch	The frontview camera control module switches the forward collision alert system to Near, Medium or Far when commanded from the scan tool.

Output Control	Description
High Beams	The frontview camera control module switches the high beams On or Off when commanded from the scan tool.
Lane Departure Warning Indicator	The frontview camera control module switches the lane departure warning indicator On or Off when commanded from the scan tool.
Lane Departure Warning Switch	The frontview camera control module switches the lane departure warning system On or Off when commanded from the scan tool.
Vehicle Direction Camera Learn	The frontview camera control module initializes the service point calibration of the frontview camera and switches into the learn mode when commanded from the scan tool.

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Fuel Injector Control Module Scan Tool Information

Table 1: [Fuel Injector Control Module Scan Tool Data Parameters](#)

Table 2: [Fuel Injector Control Module Scan Tool Output Controls](#)

Fuel Injector Control Module Scan Tool Data Parameters

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			
5V Reference 1 or 2	Ignition On	V	This parameter displays the voltage sensed on the 5V 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.
5V Reference 1, 2, 3, 4, 5 or 6 Circuit Status	Ignition On	OK / Malfunction	This parameter will display OK if the circuit is good or Malfunction if a short to ground, short to B+ is present.
Alternative Fuel Injector Driver Supply Voltage Circuit 1 or 2	Ignition On	Active / Inactive	This parameter displays the state of the alternative fuel injector driver supply voltage.
Alternative Fuel Level	Ignition On	%	This parameter displays the percentage of fuel remaining as recorded by the alternative fuel level sensor.
Alternative Fuel Level Sensor	Ignition On	V	This parameter displays the voltage signal received by the control module from the alternative fuel level sensor.
Alternative Fuel Pump Command	Ignition On	On / Off	This parameter displays the

Parameter	System State	Expected Value	Description
			commanded state of the alternative fuel pump output (the output is considered to be commanded ON if its duty cycle is not zero).
Power Mode	Ignition On	OK, Malfunction, Not Run	This parameter displays the status of the output driver for the alternative 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.
Alternative Fuel Pump Control Circuit Low Voltage Test Status	Ignition On	OK, Malfunction, Not Run	This parameter displays the status of the output driver for the alternative 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.
Alternative Fuel Pump Control Circuit Open Test Status	Ignition On	OK, Malfunction, Not Run	This parameter displays the status of the output driver for the alternative 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

Parameter	System State	Expected Value	Description
			if there is an open in the circuit.
Alternative Fuel Rail Pressure	Engine Idling	V	This parameter displays the voltage signal received by the control module from the alternative fuel rail pressure sensor.
Alternative Fuel Rail Pressure	Engine Idling	Kpa	This parameter displays the high side fuel pressure after the high pressure pump.
Alternative Fuel Rail Pressure Sensor	Engine Idling	V	This parameter displays the voltage signal received by the control module from the fuel rail pressure (FRP) sensor.
Alternative Fuel Rail Temperature	Engine Idling	°C	This parameter displays the temperature at the alternative fuel rail.
Alternative Fuel Tank Pressure	Engine Idling	KPa	This parameter displays fuel pressure at the alternative fuel tank.
Alternative Fuel Tank Pressure Sensor	Ignition On	V	This parameter displays the voltage signal received by the control module from the fuel tank pressure (FTP) sensor.
Ambient Air Temperature	Ignition On	°C (°F)	This parameter displays the outside air temperature as calculated by the control module.
Average Alternative Fuel Injector Duty Cycle	Engine Idling	ms	This parameter displays the average amount of alternative fuel injector ON time or pulse width as commanded by the control module.

Parameter	System State	Expected Value	Description
BARO	Engine Idling	kPa	This parameter displays the barometric pressure. The control module uses the barometric pressure sensor input for fuel control to compensate for altitude differences.
Control Module Voltage Signal	Ignition On	V	This parameter displays the voltage available at the fuel injector control module.
Current Fuel Type	Ignition On	Gasoline/Bi-Fuel LPG	This parameter displays the type of fuel currently being utilized by the vehicle
Cylinder 1, 2, 3 or 4 Alternative Fuel Injector Command	Ignition On	On / Off	This parameter displays the commanded state of the alternative fuel injector.
Cylinder 1, 2, 3 or 4 Alternative Fuel Injector Control Circuit High Voltage Test Status	Ignition On	OK, Malfunction, Not Run	This parameter displays the state of the fuel injector control circuit. The parameter displays Malfunction if the injector control circuit is shorted to voltage.
Cylinder 1, 2, 3 or 4 Alternative Fuel Injector Control Circuit Low Voltage Test Status	Ignition On	OK, Malfunction, Not Run	This parameter displays the state of the injector control circuit. The parameter display Malfunction if the injector control circuit is shorted to ground.
Cylinder 1, 2, 3 or 4 Alternative Fuel Injector Control Circuit Open Test Status	Ignition On	OK, Malfunction, Not Run	This parameter displays the state of the injector control circuit. The parameter displays Malfunction if the injector control circuit is open.

Parameter	System State	Expected Value	Description
Cylinder 1, 2, 3 or 4 Alternative Fuel Injector Duty Cycle	Ignition On	ms	This parameter displays the amount of fuel injector ON time or pulse width as commanded by the control module.
Desired Throttle Position	Ignition On	%	This parameter displays the commanded throttle position used to control the throttle motor. A value of 0% indicates that closed throttle is commanded, and a value of 100% indicates that wide open throttle (WOT) is commanded
ECM Fuel Enable	Ignition On	Active / Inactive	This parameter displays the commanded state of the fuel pump output.
Engine Coolant Temperature	Ignition On	°C (°F)	This parameter displays the temperature of the engine coolant based on input to the control module from the engine coolant temperature (ECT) sensor.
Engine Run Time	Engine Idling	hh:mm:ss	This parameter displays the time elapsed since the engine was started.
Engine Speed	Engine Idling	RPM	This parameter displays the speed of the engine crankshaft rotation from information received from the crankshaft (CKP) sensor. If there is a CKP sensor DTC, the ECM calculates the engine speed from one of the camshaft position (CMP) sensors.
	Ignition On	°C (°F)	

Parameter	System State	Expected Value	Description
Estimated LPG Tank Temperature at Startup			This parameter displays the estimated temperature of the LPG tank at engine startup.
Front LPG Cut-Off Solenoid Valve Command	Ignition On	Active / Inactive	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) along with the status of its associated short to ground, open circuit, and short to power tests.
Fuel Heater Relay 1, 2 or 3 Command	Ignition On	On / Off	This parameter displays the state of the control circuit for the fuel heater power relay as commanded by the control module.
Fuel Heater Relay 1, 2 or 3 Control Circuit High Voltage Test Status	Ignition On	OK, Malfunction, Not Run	This parameter displays the state of the fuel heater relay control circuit. The parameter displays Malfunction if the fuel heater relay control circuit is shorted to voltage.
Fuel Heater Relay 1, 2 or 3 Control Circuit Low Voltage Test Status	Ignition On	OK, Malfunction, Not Run	This parameter displays the state of the fuel heater relay control circuit. The parameter displays Malfunction if the fuel heater relay control circuit is shorted to ground.
Fuel Heater Relay 1, 2 or 3 Control Circuit Open Test Status	Ignition On	OK, Malfunction, Not Run	This parameter displays the state of the fuel heater relay control circuit. The parameter displays Malfunction if the

Parameter	System State	Expected Value	Description
			fuel heater relay control circuit is open.
Fuel Injector Control Module Engine Controls Ignition Relay Circuit	Ignition On	Active / Inactive	This parameter displays the state of the control circuit for the fuel injector control module relay as commanded by the control module.
Fuel Mode Select Switch	Ignition On	Gasoline/Bi-Fuel LPG	This parameter displays the status of the fuel mode select switch.
High Pressure Fuel Cut-Off Solenoid Valve Command	Ignition On	On / Off	This parameter displays the commanded state for the high pressure fuel cut-off solenoid.
High Pressure Fuel Cut-Off Solenoid Valve Control Circuit High Voltage Test Status	Ignition On	OK, Malfunction, Not Run	This parameter displays the state of the high pressure fuel cut-off solenoid control circuit. The parameter displays Malfunction if the control circuit is shorted to voltage.
High Pressure Fuel Cut-Off Solenoid Valve Control Circuit Low Voltage Test Status	Ignition On	OK, Malfunction, Not Run	This parameter displays the state of the high pressure fuel cut-off solenoid control circuit. The parameter displays Malfunction if the control circuit is shorted to ground.
High Pressure Fuel Cut-Off Solenoid Valve Control Circuit Open Test Status	Ignition On	OK, Malfunction, Not Run	This parameter displays the state of the high pressure fuel cut-off solenoid control circuit. The parameter displays Malfunction if the control circuit is open.
IAT Sensor	Ignition On	°C (°F)	This parameter displays the temperature of the

Parameter	System State	Expected Value	Description
			air entering the air induction system based on input to the control module from the intake air temperature (IAT) sensor.
Ignition 1 Signal	Ignition On	On / Off	This parameter displays On when the control module detects a battery voltage.
Ignition 1 Signal	Ignition On	Active / Inactive	This parameter displays Active when the control module detects a battery voltage.
Ignition Accessory Signal	Ignition On	On / Off	This parameter displays ON when the control module detects a voltage at the ignition accessory input terminal.
Low Pressure Fuel Cut-Off Solenoid Valve Command	Ignition On	On / Off	This parameter displays the commanded state for the low pressure fuel cut-off solenoid.
Low Pressure Fuel Cut-Off Solenoid Valve Control Circuit High Voltage Test Status	Ignition On	OK, Malfunction, Not Run	This parameter displays the state of the low pressure fuel cut-off solenoid control circuit. The parameter displays Malfunction if the control circuit is shorted to voltage.
Low Pressure Fuel Cut-Off Solenoid Valve Control Circuit Low Voltage Test Status	Ignition On	OK, Malfunction, Not Run	This parameter displays the state of the low pressure fuel cut-off solenoid control circuit. The parameter displays Malfunction if the control circuit is shorted to ground.
Low Pressure Fuel Cut-Off Solenoid	Ignition On	OK, Malfunction, Not Run	This parameter displays the state of the low pressure

Parameter	System State	Expected Value	Description
Valve Control Circuit Open Test Status			fuel cut-off solenoid control circuit. The parameter displays Malfunction if the control circuit is open.
Low Pressure Fuel Cut-Off Solenoid Valve Duty Cycle	Ignition On		This parameter displays the commanded duty cycle for the low pressure fuel cut-off solenoid.
LPG Cut-Off Solenoid Valves	Ignition On	Off / On	This parameter displays the current command of the LPG cut-off solenoid valves.
LPG Tank Pressure at Startup	Ignition On	kPa	This parameter displays fuel pressure at the LPG fuel tank.
LPG Vaporizer Relay 1, 2 or 3	Ignition On	Off / On	This parameter displays the current command of the LPG vaporizer relay.
LPG Warm-Up Mode Indicator	Ignition On	Off / On	This parameter displays the current state of the LPG warm-up mode indicator.
MAP Sensor	Ignition On	kPa	This parameter displays the actual engine intake manifold absolute pressure (MAP).
Mass Air Flow	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.
Power Mode	Engine Idling	Off/Accessory/Run/Crank Request	This parameter displays the state of the system power mode. This signal is based upon the state of the system

Parameter	System State	Expected Value	Description
			power mode received over serial communication from the vehicle electronics. If the serial data signal is not received, the parameter will display Off.
Rear LPG Cut-Off Solenoid Valve Command	Ignition On	Active / Inactive	This parameter displays the current command of the rear LPG cut-off solenoid valve.
Requested Torque	Engine Idling	Hz	This parameter displays the requested torque output of the engine by the driver.
System Power Mode	Engine Idling	Off / Accessory / Run / Crank Request	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.
Transmission Fluid Temperature	Ignition On	°C (°F)	This parameter displays the defaulted, unfiltered transmission oil / fluid temperature measured by a sensor.
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).

Fuel Injector Control Module Scan Tool Output Controls

Output Control	Description

Output Control	Description
This is a comprehensive list. Not all Output Controls listed are available for all applications.	
Alternative Fuel Pump	This device control is used to override the state of the alternative fuel pump output.
Front LPG Fuel Cut-Off Solenoid Valve	This device control is used to open the front LPG fuel cut-off solenoid valve.
Fuel Heater Relay 1, 2 or 3	This device control is used to override the state of the alternative fuel heater 1, 2 or 3 output.
Fuel Mode Select Switch Indicator	This device control is used to override the state of the fuel mode selector switch indicator.
Fuel Mode Selection Override	This device control is used to override the state of the fuel mode selection.
High Pressure Fuel Cut-Off Solenoid Valve	This device control is used to override the state of the alternative fuel shutoff valve 1 output.
Low Pressure Fuel Cut-Off Solenoid Valve	This device control is used to override the state of the alternative fuel shutoff valve 2 output.
LPG Cut-Off Solenoid Valves	This device control is used to activate the fuel cut-off solenoid valve relay. When this output is active the solenoid valves will be OFF (Closed). When this output is inactive the solenoid valves will be ON (Open).
LPG Vaporizer Relay 1, 2 or 3	This device control is used to activate LPG Vaporizer Relay 1, 2 or 3 while monitoring the BCM Battery current draw. An increase in current draw confirms the vaporizer heater is operating.
LPG Warm-Up Mode Indicator	This device control is used to activate LPG Warm Up Mode Warning in the IPC.
Rear LPG Fuel Cut-Off Solenoid Valve	This device control is used to open the rear LPG fuel cut-off solenoid valve.
Requested Torque	This device control is used to activate the requested torque control circuit from the FICM to the ECM.

Headlamp Control Module Scan Tool Information

Table 1: [Headlamp Control Module Scan Tool Data Parameters](#)

Table 2: [Headlamp Control Module Scan Tool Output Controls](#)

The headlamp control module scan tool data parameters list contains all headlamp related parameters that are available on the scan tool. The list is arranged in alphabetical order. A given parameter may appear in any one of the data lists.

Headlamp Control Module Scan Tool Data Parameters

Parameter	System State	Expected Value	Description
Operating Conditions: Ignition ON			
Accelerator Pedal Position	—	—	The scan tool displays the position of the accelerator pedal in %.
Battery Voltage	—	9.0–14.0 V	The scan tool displays the current battery voltage.
Front Levelling Position Sensor	—	—	The scan tool displays the position of the front levelling sensor in mm.
Front Levelling Position Sensor Signal	—	—	The scan tool displays the position of the front levelling sensor in %.
Headlamp Light Distribution	—	Inactive	The scan tool displays the current light distribution mode.
	—	Country Road	
	—	City Street	
	—	Expressway	
	—	Bad Weather	
	—	High Beam	
Left Headlamp Horizontal Motor	—	—	The scan tool displays the position of the left headlamp horizontal motor in °.
Left Headlamp Vertical Motor	—	—	The scan tool displays the position of the left headlamp vertical motor in %.
Low Beam Illumination Area	—	Left Hand Traffic	The scan tool displays the current traffic mode.
	—	Right Hand Traffic	

Parameter	System State	Expected Value	Description
	—	Right Hand Traffic	
Rear Levelling Position Sensor	—	—	The scan tool displays the position of the rear levelling sensor in mm.
Rear Levelling Position Sensor Signal	—	—	The scan tool displays the position of the rear levelling sensor in %.
Right Headlamp Horizontal Motor	—	—	The scan tool displays the position of the right headlamp horizontal motor in °.
Right Headlamp Vertical Motor	—	—	The scan tool displays the position of the right headlamp vertical motor in %.
Steering Wheel Angle Sensor Signal	—	—	The scan tool displays the current position of the steering wheel angle sensor in °.
Vehicle Levelling Sensors Supply Voltage	—	9.0–13.0 V	The scan tool displays the current levelling sensor supply voltage.
Vehicle Speed	—	—	The scan tool displays the vehicle speed in km/h (MPH).

Headlamp Control Module Scan Tool Output Controls

Output Control	Description
Automatic Headlamp Leveling Sensor Learn	Commands the automatic headlamp leveling sensor learn process.
Headlamp Leveling Motors	Commands the headlamp leveling motors Increase or Decrease.
Headlamp Motor	Commands the headlamp motor Left or Right.
Headlamps High Intensity Discharge Power Increase	Commands the discharge power On or Off.
Left Cornering Lamp	Commands the cornering lamp On or Off.
Left Headlamp Horizontal Motor	Commands the horizontal motor Left or Right.
Left Headlamp Vertical Motor	Commands the vertical motor Increase or Decrease.
Right Cornering Lamp	Commands the cornering lamp On or Off.
Right Headlamp Horizontal Motor	Commands the horizontal motor Left or Right.

Output Control	Description
Right Headlamp Vertical Motor	Commands the vertical motor Increase or Decrease.

Heating, Ventilation and Air Conditioning Control Module Scan Tool Information

Table 1: [Heating Ventilation and Air Conditioning Control Module Scan Tool Data Parameters](#)

Table 2: [Heating Ventilation and Air Conditioning Control Module Scan Tool Output Controls](#)

Heating Ventilation and Air Conditioning Control Module Scan Tool Data Parameters

Parameter	System State	Expected Value	Description
Operating Conditions: Ignition ON			
A/C Compressor Clutch Inhibit Reason	—	Varies	The scan tool displays the reason why the activation of the A/C compressor is inhibit.
A/C Compressor Clutch Status	A/C Off	Disengaged	The scan tool displays Engaged or Disengaged depending on the state of the A/C compressor clutch.
	A/C On	Engaged	
A/C Evaporator Temperature Sensor	—	−40 to +80° C (−40 to +176°F)	The scan tool displays °C (°F). This is the current temperature at the A/C evaporator temperature sensor.
A/C High Side Pressure Sensor	—	Varies	The scan tool displays kPa. This is the current pressure of the A/C refrigerant.
A/C Indicator	A/C Off	Off	The scan tool displays On or Off depending on the state of the A/C mode.
	A/C On	On	
A/C Request Signal	A/C Off	Inactive	The scan tool displays Active or Inactive depending on the state of the A/C mode.
	A/C On	Active	
A/C Switch	A/C Switch released	Inactive	The scan tool displays Active or Inactive depending on the state of the A/C switch.
	A/C Switch pressed	Active	
Air Inlet Door Motor Calibration Status	—	Varies	The scan tool displays Not Running, In Progress, Complete or Failed depending the calibration status.
Air Recirculation LED	Air recirculation mode is deactivated	Off	The scan tool displays On or Off depending on the state of the Recirculation mode.

Parameter	System State	Expected Value	Description
	Air recirculation mode is activated	On	
Air Recirculation Mode Switch	Air recirculation switch released	Inactive	The scan tool displays Active or Inactive depending on the state of the air recirculation mode switch.
	Air recirculation switch pressed	Active	
Battery Voltage	—	11–14 V	The scan tool displays V. This is the current battery voltage.
Bi-level Indicator	—	Varies	The scan tool displays On or Off depending on the state of the Bi-level switch.
Bi-level Switch	—	Varies	The scan tool displays Active or Inactive depending on the state of the Bi-level switch.
Blower Motor Switch	—	Varies	Only with C68 The scan tool displays OFF, 1–8 depending on the state of the selected blower motor speed. Only with CJ2 The scan tool displays Up, Down or Inactive depending on the state of the blower motor switches.
Desired Left Temperature	—	Varies	The scan tool displays °C (°F). This is the selected temperature at the temperature switch.
Desired Left Temperature Motor Door Position	—	Varies	The scan tool displays Counts. This is the desired position of the left temperature actuator.
Engine Coolant Temperature	—	–40 to +215°C (–40 to +419°F)	The scan tool displays °C (°F). This is the current engine coolant temperature.
Enhanced Defrost Indicator	Enhanced defrost mode is deactivated	Off	The scan tool displays On or Off depending on the state of the enhanced defrost mode.
	Enhanced defrost	On	

Parameter	System State	Expected Value	Description
	mode is activated		
Enhanced Defrost Switch	Enhanced defrost switch released	Off	The scan tool displays On or Off depending on the state of the enhanced defrost switch.
	Enhanced defrost switch pressed	On	
Floor Mode Indicator	Floor mode is deactivated	Off	The scan tool displays On or Off depending on the state of the floor mode.
	Floor mode is activated	On	
Floor Mode Switch	Floor mode switch released	Off	The scan tool displays On or Off depending on the state of the floor mode switch.
	Floor mode switch pressed	On	
Front Defrost Indicator	Front defrost mode is deactivated	Off	The scan tool displays On or Off depending on the state of the front defrost mode.
	Front defrost mode is activated	On	
Front Defrost Switch	Front defrost switch released	Off	The scan tool displays On or Off depending on the state of the front defrost switch.
	Front defrost switch pressed	On	
HVAC Actuators Supply Voltage	—	Active	The scan tool displays Active or Inactive. Inactive is displayed if there is a malfunction at the actuators supply voltage circuit.
Instrument Panel Vents Indicator	Instrument panel vents	Off	

Parameter	System State	Expected Value	Description
	mode is deactivated	On	The scan tool displays On or Off depending on the state of the instrument panel vents mode.
	Instrument panel vents mode is activated		
Instrument Panel Vents switch	Instrument panel vents switch released	Inactive	The scan tool displays Active or Inactive depending on the state of the instrument panel vents switch.
	Instrument panel vents switch pressed	Active	
Left Mode Door Motor Direction	—	Varies	The scan tool displays Stop, Increase or Decrease. During the movement of the door, the scan tool shows Increase or Decrease depending the movement direction. When the position of the door is reached, the scan tool displays Stop.
Left Temperature Door Motor Calibration Status	—	Varies	The scan tool displays Not Running, In Progress, Complete or Failed depending the calibration status.
Left Temperature Door Motor Direction	—	—	The scan tool displays Stop, Increase or Decrease. During the movement of the door, the scan tool shows Increase or Decrease depending the movement direction. When the position of the door is reached, the scan tool displays Stop.
Left Temperature Door Position	—	Varies	The scan tool displays Counts. This is the current position of the temperature actuator.
Left Temperature Knob Position	—	Varies	The scan tool displays Counts. The value varies between –5 to +5 depending the selected temperature knob position. At the cold end position is the value 18 and at the hot end position –18.
Mode Door Motor Calibration Status	—	Varies	The scan tool displays Not Running, In Progress, Complete or Failed depending the calibration status.
Rear Defogger Indicator	Rear defogger is deactivated	Off	The scan tool displays On or Off depending on the state of the rear defogger.

Parameter	System State	Expected Value	Description
	Rear defogger is activated	On	
Rear Defogger Switch	Rear defogger switch released	Inactive	The scan tool displays Active or Inactive depending on the state of the rear defogger switch.
	Rear defogger switch pressed	Active	
Recirculation Door Motor Direction	Air recirculation mode is deactivated	Outside Air	The scan tool displays Stop, Outside Air, Increase, Recirculation, Decrease or Not Used depending on the state of the recirculation door. During the movement of the door, the scan tool shows Increase or Decrease depending the movement direction.
	Air recirculation mode is activated	Recirculation	

Heating Ventilation and Air Conditioning Control Module Scan Tool Output Controls

Output Control	Description
A/C Indicator	The HVAC control module illuminates the A/C indicator when commanded from the scan tool.
A/C Switch	This control function simulates the state of the A/C switch.
Air Recirculation Door Motor Direction	The HVAC control module commands the air recirculation actuator from venting to recirculation and back again.
Air Recirculation LED	The HVAC control module illuminates the Air Recirculation indicator when commanded from the scan tool.
Air Recirculation Mode Switch	When On is selected, the HVAC control module commands the air recirculation door from outside air to recirculation. When Off is selected, the HVAC control module commands the air recirculation door from recirculation to outside air.
Blower Speed Indicator 1-6	The HVAC control module illuminates the appropriate blower speed indicator when commanded from the scan tool.
Blower Motor Switch	This control function simulates the state of the blower motor switch.
Front Defrost Indicator	The HVAC control module illuminates the front defrost indicator when commanded from the scan tool.
HVAC Actuators	

Output Control	Description
	The HVAC control module executes the Motor Learn Routine when commanded from the scan tool.
HVAC Afterblow Configuration	This control function disables and enables the afterblow configuration.
Left Temperature Door Motor Direction	When Increase is selected, the left temperature door position increases stepwise. When Decrease is selected, the left temperature door position decreases stepwise.
Left Temperature Door Position	This commands the left temperature door position from Cold to Hot.
Mode Door Motor Command	The HVAC control module commands the mode actuator stepwise from defrost to floor and back again.
Mode Door Position	When Floor is selected, the HVAC control module commands the mode actuator to the floor position. When Defrost is selected, the HVAC control module commands the actuator to the defrost position.
Rear Defog	The HVAC control module commands the rear defogger On and Off.
Rear Defog Indicator	The HVAC control module commands the rear defogger indicator On and Off.
Recirculation Door	The HVAC control module commands the recirculation actuator stepwise from outside air to recirculation and back again.

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Heating, Ventilation, and Air Conditioning Controls Scan Tool Information

HVAC Controls Scan Tool Data Parameters

Parameter	Expected Value	Definition
Operating Conditions: Ignition ON		
Battery Voltage	Varies	The scan tool displays volts. This is the voltage at the input to the radio controls.
Power Mode	Run	The scan tool displays Off, Accessory, Run or Crank Request. This is the vehicle power mode status as received by the radio controls via serial data.
Key Stuck	No	The scan tool indicates Yes or No. This indicates if one of the secondary steering wheel controls buttons has been detected in a stuck/ always on state or held too long.
Infotainment Controls	No Button Pressed	The scan tool displays No button Pressed, Button Pressed, or Multiple Buttons Pressed. The scan tool indicates if controls buttons are currently pressed.
Blower Speed Knob	Varies	The scan tools displays the number setting of the speed control knob for the blower motor.
Left Temperature Knob Position	Varies	The scan tools displays in degrees the requested temperature setting.
Right Temperature Knob Position	Varies	The scan tools displays in degrees the requested temperature setting.

Inflatable Restraint Sensing and Diagnostic Module Scan Tool Information

The inflatable restraint sensing and diagnostic module (SDM) scan tool data list contains all the restraint system related parameters that are available on the scan tool. The parameters in the list are arranged in alphabetical order.

Use the SDM scan tool data list as directed by a diagnostic table or in order to supplement the diagnostic procedures. Begin all of the diagnostic procedures with the Diagnostic System Check – SIR. Use the SDM scan tool data list after the following is determined:

- There is no published diagnostic trouble code (DTC) procedure nor published symptom procedure for the customer concern
- The DTC or symptom diagnostic procedure indicated by the diagnostic system check does not resolve the customer concern

The typical data values are obtained from a properly operating vehicle under the conditions specified in the second row of the scan tool data list table. Comparison of the parameter values from the suspect vehicle with the typical data values may reveal the source of the customer concern.

Sensing and Diagnostic Module Scan Tool Data Parameters

Parameter	Operating Conditions	Expected Value	Definition
Operating Conditions: Ignition is ON, engine OFF, and vehicle is stationary			
Backup System Power Mode	Backup system power mode activated	Enable	This parameter displays the status of the Backup System Power Mode
	Backup system power mode deactivated	Disable	
Driver Air Bag Stage 1 Squib	—	2.6–3.3 Ohms	The scan tool displays 2.6–3.3 Ohms. This is the resistance of the driver air bag stage 1 squib circuit as interpreted by the Sensing and Diagnostic Module.
Driver Air Bag Stage 2 Squib	—	2.6–3.3 Ohms	The scan tool displays 2.6–3.3 Ohms. This is the resistance of the driver air bag stage 2 squib circuit as interpreted by the Sensing and Diagnostic Module.
Driver EFS Status	—	Okay	The scan tool displays Okay or Not Okay. This

Parameter	Operating Conditions	Expected Value	Definition
	—	Not Okay	is the current status of the Driver EFS.
Driver Seat Position Sensor Status	—	Okay	The scan tool displays Okay or Not Okay. This is the current status of the Driver Seat Position Sensor.
	—	Not Okay	
Driver Curtain Air Bag Squib	—	1.9–2.6 Ohms	The scan tool displays 1.9–2.6 Ohms. This is the resistance of the driver curtain air bag squib circuit as interpreted by the Sensing and Diagnostic Module.
Driver Pretensioner Circuit	—	2.6–3.3 Ohms	The scan tool displays 2.6–3.3 Ohms. This is the resistance of the driver pretensioner circuit as interpreted by the Sensing and Diagnostic Module.
Driver Seat Belt Status	Seat belt buckled	Buckled	The scan tool displays whether the driver seat belt is Buckled or Not Buckled.
	Seat belt unbuckled	Not Buckled	
Driver Side Air Bag Squib	—	2.6–3.3 Ohms	The scan tool displays 2.6–3.3 Ohms. This is the resistance of the driver side air bag squib circuit as interpreted by the Sensing and Diagnostic Module.
Driver SIS Status	—	Okay	The scan tool displays Okay or Not Okay. This is the current status of the Driver SIS.
	—	Not Okay	
Passenger Air Bag Stage 1 Squib	—	1.9–2.6 Ohms	The scan tool displays 1.9–2.6 Ohms. This is the resistance of the passenger air bag stage 1 squib circuit as interpreted by the Sensing and Diagnostic Module.
Passenger Air Bag Stage 2 Squib	—	1.9–2.6 Ohms	The scan tool displays 1.9–2.6 Ohms. This is the resistance of the passenger air bag stage

Parameter	Operating Conditions	Expected Value	Definition
			2 squib circuit as interpreted by the Sensing and Diagnostic Module.
Passenger Curtain Air Bag Squib	—	2.6–3.3 Ohms	The scan tool displays 2.6–3.3 Ohms. This is the resistance of the passenger curtain air bag squib circuit as interpreted by the Sensing and Diagnostic Module.
Passenger EFS Status	—	Okay	The scan tool displays Okay or Not Okay. This is the current status of the Passenger EFS.
	—	Not Okay	
Passenger Pretensioner Circuit	—	1.9–2.6 Ohms	The scan tool displays 1.9–2.6 Ohms. This is the resistance of the passenger pretensioner circuit as interpreted by the Sensing and Diagnostic Module.
Passenger Side Air Bag Squib	—	1.9–2.6 Ohms	The scan tool displays 1.9–2.6 Ohms. This is the resistance of the passenger side air bag squib circuit as interpreted by the Sensing and Diagnostic Module.
Passenger SIS Status	—	Okay	The scan tool displays Okay or Not Okay. This is the current status of the Passenger SIS.
	—	Not Okay	
Primary Key Status	—	Valid	The scan tool displays if there is a passenger airbag suppression device used on this vehicle and if so, whether it is has an automatic, manual key switch or both.
	—	Invalid	
Received Primary Key	—	4711	The scan tool displays what the BCM is sending out as the primary key. The SDM then compares it to what it has stored. This should match the SDM Primary Key.
Run/Crank Signal		Active	

Parameter	Operating Conditions	Expected Value	Definition
	Ignition is in RUN/CRANK position		The scan tool displays the current power mode of the SDM.
	Ignition is in OFF/ACC position	Inactive	
Seat Position Driver	Seat positioned toward the rear of the cabin	Rearward	The scan tool displays Rearward or Forward. This is the positional state of the drive seat.
	Seat positioned close to the steering wheel	Forward	
Secondary Key Status	—	Valid	The scan tool displays whether the Secondary Key is valid or invalid. This determines if the VIN stored in SDM memory matches what is stored in the BCM.
	—	Invalid	
System Power Mode	Ignition is in OFF position	Off	This scan tool displays the current position of the ignition cycle.
	Ignition is in ACC position	Accessory	
	Ignition is in RUN position	Run	
	Ignition is in CRANK position	Crank	
VIN Digit 2–5	—	Vehicle Dependant	The scan tool displays the Secondary Key which includes digits 2 though 5 of the VIN that the BCM sends to the SDM.
VIN Digit 6–8	—	Vehicle Dependant	The scan tool displays the Secondary Key which includes digits 6 through 8 of the VIN that the BCM sends to the SDM.
VIN Digit 9–12	—	Vehicle Dependant	The scan tool displays the Secondary Key which includes digits 9 through 12 of the VIN that the BCM sends to the SDM.
VIN Digit 13–15	—	Vehicle Dependant	The scan tool displays the Secondary Key which includes digits 13 through 15 of the VIN

Parameter	Operating Conditions	Expected Value	Definition
			that the BCM sends to the SDM.
VIN Digit 16-17	—	Vehicle Dependant	The scan tool displays the Secondary Key which includes digits 16 and 17 of the VIN that the BCM sends to the SDM.
Warning Indicator	SRS warning indicator activated	On	The scan tool displays whether the SRS warning indicator has been requested ON or OFF
	SRS warning indicator deactivated	Off	

Head-Up Display Scan Tool Information

Table 1: [Head Up Display Scan Tool Data Parameters](#)

Table 2: [Head Up Display Scan Tool Output Controls](#)

Head Up Display Scan Tool Data Parameters

Parameter	System State	Expected Value	Description
Operating Conditions: Ignition ON			
Adjust Display Down Switch	—	Inactive	The scan tool displays Active or Inactive. This is the state of the adjust display down switch.
Adjust Display Up Switch	—	Inactive	The scan tool displays Active or Inactive. This is the state of the adjust display up switch.
Ambient Light Sensor	—	Varies	This displays %. This is the amount of light hitting the sensor.
Battery Voltage	—	Varies	This displays Volts. This is the current battery voltage signal.
Display Dimming	—	Varies	This displays %. This is the current dimming percentage level.
Dim Select Switch	—	Varies	The scan tool displays Active or Inactive. This is the state of the dim select switch.
Display Units	—	Varies	The scan tool displays English or Metric. English should be displayed for vehicles in the United States.
English/Metric Status	—	English	The scan tool displays English or Metric. English should be displayed for vehicles in the United States.
Language	—	English	The scan tool displays English, French, German, Italian, Spanish or Japanese.
Mirror Vertical Position	—	Varies	The scan tool displays the mirror position.
Page Switch	—	Inactive	The scan tool displays Active or Inactive. This is the state of the page switch.
Tachometer Gauge	—	Varies	The scan tool displays engine RPM.
Vehicle Speed	—	Varies	The scan tool displays the vehicle speed.

Head Up Display Scan Tool Output Controls

Scan Tool Output Control	Description
Backlight Dimming	The scan tool commands the HUD to increase or decrease the brightness of the display when selected.
Info Display Pattern 1 Check	The scan tool commands the HUD to perform a Grid test when selected.

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Instrument Cluster Scan Tool Information

Table 1: [Instrument Cluster Scan Tool Data Parameters](#)

Table 2: [Instrument Cluster Scan Tool Output Controls](#)

Instrument Cluster Scan Tool Data Parameters

Parameter	Expected Value	Description
Operating Conditions: Ignition ON		
Battery Voltage	12–14 V	The scan tool displays Volts. This is the current battery voltage signal.
Key in Ignition Status	Active/Inactive	The scan tool displays Active or Inactive. This is the state of the key in ignition switch.
Driver Information Center Switch	Varies	The scan tool displays Volts. This is the current driver information center switch input voltage.
Driver Information Center Switch	Inactive	The scan tool displays either Inactive, Up, Down, or Menu. This is the state of the driver information center switch.
Reset Switch	Active/Inactive	The scan tool displays Active or Inactive. This is the state of the reset switch.
Ambient Air Temperature	15°C	The scan tool displays outside temperature in °C.
Washer Fluid Level Switch	Open	The scan tool displays either Open, Closed, or Not Available.
Odometer Lock Status	Active/Inactive	The scan tool displays Active or Inactive depending on the state of the odometer.
Engine Speed	0 RPM	The scan tool displays the filtered value of engine speed.
Vehicle Speed	0 km/h	The scan tool displays the filtered vehicle speed value.
Fuel Level Sensor	—	The scan tool displays the filtered value of the fuel level.
Engine Coolant Temperature	—	The scan tool displays the filtered value of the engine coolant temperature.
Engine Oil Pressure	—	The scan tool displays the filtered value of the engine oil pressure.
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Parameter	Expected Value	Description
Steering Wheel Control Switches	Left, Select, Right , Volume UP, Volume Down	The scan tool displays the current steering wheel controls button being pushed.

Instrument Cluster Scan Tool Output Controls

Output Control	Description
Instrument Cluster Gauge Sweep	This function is used to command the gauges to sweep from minimum to maximum.
Driver Information Center Dimming	This function is used to command the dimming of the driver information display to Increase or Decrease by 10%.
Instrument Panel Dimmer Switch	This function is used to command the dimming of the instrument cluster to Increase or Decrease by 10%.
Driver Information Center Segments	This function is used to command the driver information center segments ON and OFF.
All Indicators	This function is used to command all the indicators ON or OFF.
Driver Information Center Options	This function is used to command the driver information center buttons using the scan tool.
CAN Bus Configuration Learn	This function is used to Reset the source ID for low speed CAN Bus communications.

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Keyless Entry Control Module Scan Tool Information

Keyless Entry Control Module Scan Tool Data Parameters

Parameter	Expected Value	Definition
Operating Conditions: Ignition ON		
Battery Voltage	V	This parameter indicates the battery voltage as measured at the module
Driver Door Ajar Switch	Active/Inactive	This parameter indicates that the driver door is ajar; it is open, but the safety latch is engaged.
Driver Door Open Switch	Active/Inactive	This parameter indicates that the driver door is more than just ajar, it is open.
Driver Door Unlock Switch	Active/Inactive	This parameter indicates if the driver door is locked or unlocked.
Exterior Driver Door Handle Switch	Active/Inactive	This switch begins the challenge and response to determine if the door should be unlocked. If the vehicle responds correctly to the challenge, the door will be unlocked or unlatched.
Exterior Driver Door Handle Proximity Sensor	Active, Inactive, Fault	This is a capacitive proximity sensor on the exterior of the driver door handle. It allows the user to lock the door by pressing a small rectangle on the outside of the door handle if a key is detected leaving the vehicle.
Passenger Door Open Switch	Active/Inactive	This parameter indicates that the passenger door is more than just ajar, it is open.
Passenger Door Ajar Switch	Active/Inactive	This parameter indicates that the passenger door is ajar; it is open, but the safety latch is engaged.
Exterior Passenger Door Handle Switch	Active/Inactive	This switch begins the challenge and response to determine if the door should be unlocked. If the vehicle responds correctly to the challenge, the door will be unlocked or unlatched.
Exterior Passenger Door Handle Proximity Sensor	Active, Inactive, Fault	This is a capacitive proximity sensor on the exterior of the driver door handle. It allows the user to lock the door by pressing a small rectangle on the outside of the door handle if a key is detected leaving the vehicle.
Left Rear Door Ajar Switch	Active/Inactive	This parameter indicates that the driver's side rear door is ajar; it is open, yet the safety latch is engaged.
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Parameter	Expected Value	Definition
Exterior Left Rear Door Handle Switch	Active/Inactive	This switch begins the challenge and response to determine if the door should be unlocked. If the vehicle responds correctly to the challenge, the door will be unlocked or unlatched.
Right Rear Door Ajar Switch	Active/Inactive	This parameter indicates that the passenger's side rear door is ajar; it is open, yet the safety latch is engaged.
Exterior Right Rear Door Handle Switch	Active/Inactive	This switch begins the challenge and response to determine if the door should be unlocked. If the vehicle responds correctly to the challenge, the door will be unlocked or unlatched.
Liftgate Ajar Switch	Active/Not Active	This switch indicates if the rear closure of the vehicle is ajar.
Liftgate Handle Switch	Active/Inactive	This switch begins the challenge and response to determine if the rear closure should be unlatched. If the vehicle responds correctly to the challenge, the rear liftgate will be unlatched.

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Document ID: 2832931

Liftgate Close Actuator Motor Control Module Scan Tool Information

Liftgate Module Scan Tool Data Parameters

Parameter	System State	Expected Value	Definition
Operating Conditions: Ignition ON			
Battery Voltage Signal 1	—	Varies	This displays volts. This is the voltage input supplied to the liftgate module.
Battery Voltage Signal 2	—	Varies	This displays volts. This is the voltage input supplied to the liftgate module.
Liftgate Latch Pawl Switch	—	Inactive	This displays Active or Inactive. This is the state of the latch pawl switch.
Liftgate Latch Ratchet Switch	—	Inactive	This displays Active or Inactive. This is the state of the latch ratchet switch.
Liftgate Latch Sector Switch	—	Inactive	This displays Active or Inactive. This is the state of the latch sector switch.
Liftgate Ajar Switch	—	Inactive	The scan tool displays Active or Inactive. This is the state of the liftgate ajar switch.
Liftgate Handle Switch	—	Inactive	The scan tool displays Active or Inactive. This is the state of the liftgate handle switch.

Power Steering Control Module Scan Tool Information

Table 1: [Power Steering Control Module Scan Tool Data Parameters](#)

Table 2: [Power Steering Control Module Scan Tool Output Controls](#)

The power steering control module scan tool data parameters list contains all power steering related parameters that are available on the scan tool. The list is arranged in alphabetical order. A given parameter may appear in any one of the data lists.

Power Steering Control Module Scan Tool Data Parameters

Parameter	System State	Expected Value	Description
Operating Conditions: Ignition ON			
Battery Voltage	—	9–16 V	The scan tool displays the current battery voltage.

Power Steering Control Module Scan Tool Output Controls

Output Control	Description
Pressure Control Solenoid Valve	Commands the solenoid valve Increase or Decrease.

Radio Scan Tool Information

Table 1: [Radio Scan Tool Data Parameters](#)

Table 2: [Radio Scan Tool Output Controls](#)

Radio Scan Tool Data Parameters

Parameter	Expected Value	Definition
Operating Conditions: Ignition ON		
Antenna Module	Enabled	The scan tool displays Enabled or Disabled. This indicates if the system uses an antenna module and the output status between the radio and the antenna module.
Auxiliary Audio Input	Present	The scan tool displays Present or Not Present. This parameter displays active when an auxiliary input is connected.
Battery Voltage	Varies	The scan tool displays volts. This is the voltage at the input to the radio.
Digital Radio Receiver	Present	The scan tool displays Present or Not Present. This is the state of the Digital Audio Broadcast.
Phone Signal	Present	The scan tool displays Present or Not Present. This parameter will display whether this system uses discrete a phone arbitration or not.
Power Mode	Run	The scan tool displays Off, Accessory, Run or Crank Request. This is the power mode radio.
Radio Signal Strength	Varies	This displays the signal strength in dB. This is the signal strength of the radio signal.
Radio Theft Lock Armed	Learned VIN	The scan tool displays Learned VIN or No VIN. This is the state of the VIN programming in the radio.
Radio Theft Lock Status	Inactive	The scan tool displays Active or Inactive. This is the state of the theft lock system.
Rear Seat Audio	Not Present	The scan tool displays Present or Not Present. This parameter displays Present if the system detects a rear seat audio module.
Valet Mode Status	Inactive	The scan tool displays Active or Inactive. This is the state of the valet mode.
Video Display 1	Inactive	The scan tool displays Active or Inactive. When the rear video display 1 is ON, the scan tool will display Active.

Parameter	Expected Value	Definition
Video Display 2	Inactive	The scan tool displays Active or Inactive. When the rear video display 2 is ON, the scan tool will display Active.
End Model Part Number	Varies	The scan tool displays the end model part number.
Boot Software Part Number	Varies	The scan tool displays the boot software ID number.
Calibration Part Number 1	Varies	The scan tool displays the software module ID 1.
Calibration Part Number 2	Varies	The scan tool displays the software module ID 2.
Calibration Part Number 3	Varies	The scan tool displays the software module ID 3.
Calibration Part Number 4	Varies	The scan tool displays the software module ID 4.
Calibration Part Number 5	Varies	The scan tool displays the software module ID 5.
Calibration Part Number 6	Varies	The scan tool displays the software module ID 6.
Calibration Part Number 7	Varies	The scan tool displays the software module ID 7.
Calibration Part Number 8	Varies	The scan tool displays the software module ID 8.
Calibration Part Number 9	Varies	The scan tool displays the software module ID 9.
Calibration Part Number 10	Varies	The scan tool displays the software module ID 10.
Calibration Part Number 11	Varies	The scan tool displays the software module ID 11.
Calibration Part Number 12	Varies	The scan tool displays the software module ID 12.
Calibration Part Number 13	Varies	The scan tool displays the software module ID 13.
Calibration Part Number 14	Varies	The scan tool displays the software module ID 14.
	Varies	The scan tool displays the software module ID 15.

Parameter	Expected Value	Definition
Calibration Part Number 15		
Calibration Part Number 16	Varies	The scan tool displays the software module ID 16.
VIN Digits 2-17	Varies	The scan tool displays the learned VIN digits 2-17.
Digital Radio Receiver ID	Varies	The scan tool displays the Digital Audio Broadcast receiver ID.
DVD Region Code	Varies	The scan tool displays the DVD region code.
DVD Region Code Changes Remaining	Varies	The scan tool displays the number DVD region code changes remaining.

Radio Scan Tool Output Controls

Scan Tool Output Control	Description
Eject	This output is a reset command to eject the disc.
Info Display/Infotainment Faceplate Reset	This output is a reset command to reset the radio display.
Info Display/Infotainment Faceplate Wakeup	This output commands a wakeup at the display and the faceplate controls.

Radio Controls Scan Tool Information

Table 1: [Radio Controls Scan Tool Data Parameters](#)

Table 2: [Radio Controls Scan Tool Output Controls](#)

Table 3: [Radio Controls Configuration/Reset Options](#)

Radio Controls Scan Tool Data Parameters

Parameter	Expected Value	Definition
Operating Conditions: Ignition ON		
Battery Voltage	Varies	The scan tool displays volts. This is the voltage at the input to the radio controls.
Power Mode	Run	The scan tool displays Off, Accessory, Run or Crank Request. This is the vehicle power mode status as received by the radio controls via serial data.
Driver Seat Heating/Venting/Cooling Level	Varies	The scan tool displays No LED Activated, 1 LED Activated, Seat Back and Cushion Heating, Seat Back Heating, 2 LEDs Activated, Seat Venting/Cooling, or 3 LEDs Activated. The scan tool displays the level at which the LEDs are illuminated on the driver heated seat indicator.
Passenger Seat Heating/Venting/Cooling Level	Varies	The scan tool displays No LED Activated, 1 LED Activated, Seat Back and Cushion Heating, Seat Back Heating, 2 LEDs Activated, Seat Venting/Cooling, or 3 LEDs Activated. The scan tool displays the level at which the LEDs are illuminated on the passenger heated seat indicator.
Driver Seat Heating/Venting/Cooling Mode	Varies	The scan tool displays Seat Back and Cushion Heating, Seat Back Heating, or Seat Venting/Cooling. The scan tool displays the driver seat heating or cooling mode that is currently active.
Passenger Seat Heating/Venting/Cooling Mode	Varies	The scan tool displays Seat Back and Cushion Heating, Seat Back Heating, or Seat Venting/Cooling. The scan tool displays the passenger seat heating or cooling mode that is currently active.
Key Stuck	No	The scan tool indicates Yes or No. This indicates if one of the secondary steering wheel controls buttons has been detected in a stuck/ always on state or held too long..
Infotainment Controls	No Button Pressed	The scan tool displays No button Pressed, Button Pressed, or Multiple Buttons Pressed. The scan

Parameter	Expected Value	Definition
		tool indicates if controls buttons are currently pressed.
Info Display/Infotainment Faceplate Wake-Up Command	Inactive	The scan tool displays Active or Inactive. This indicates if the wakeup input for the display/controls is active.
End Model Part Number	Varies	The scan tool displays the end model part number.
Boot Software Part Number	Varies	The scan tool displays the boot software ID number.
Manufacturer Enable Counter	0	The scan tool displays the counter value. This counter is used for manufacturing purposes only.
Calibration Part Number 1	Varies	The scan tool displays the software module ID 1.
Calibration Part Number 2	Varies	The scan tool displays the software module ID 2.
Calibration Part Number 3	Varies	The scan tool displays the software module ID 3.
Calibration Part Number 4	Varies	The scan tool displays the software module ID 4.
Calibration Part Number 5	Varies	The scan tool displays the software module ID 5.
Calibration Part Number 6	Varies	The scan tool displays the software module ID 6.
Calibration Part Number 7	Varies	The scan tool displays the software module ID 7.
Calibration Part Number 8	Varies	The scan tool displays the software module ID 8.
Calibration Part Number 9	Varies	The scan tool displays the software module ID 9.
Calibration Part Number 10	Varies	The scan tool displays the software module ID 10.
Calibration Part Number 11	Varies	The scan tool displays the software module ID 11.
Calibration Part Number 12	Varies	The scan tool displays the software module ID 12.

Parameter	Expected Value	Definition
Calibration Part Number 13	Varies	The scan tool displays the software module ID 13.
Calibration Part Number 14	Varies	The scan tool displays the software module ID 14.
Calibration Part Number 15	Varies	The scan tool displays the software module ID 15.
Calibration Part Number 16	Varies	The scan tool displays the software module ID 16.
Diagnostic Data Identifier	Varies	Identifies a supplier and system specific data stream used by diagnostic testers to interpret a diagnostic data stream.

Radio Controls Scan Tool Output Controls

Scan Tool Output Control	Description
Info Display/Infotainment Faceplate Reset	This output is a reset command to reset the display/controls assembly.
Backlight Dimming	This control function is used to increase or decrease the backlighting dimming level of the controls, expressed in percent.
Seat Heating/Venting/Cooling Indicator	This control function is used to turn the seat heating/venting/cooling indicator on or off.

Radio Controls Configuration/Reset Options

Scan Tool Output Control	Description
Info Display/Infotainment Faceplate Reset	This output is a reset command to reset the display/controls assembly.
CAN Bus Configuration Learn	Implementation of this device control allows the user to force the module to relearn all previously learned source IDs.

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Side Object Sensing Alert Module Scan Tool Information

Table 1: [Side Object Detection Scan Tool Parameters](#)

Table 2: [Side Object Detection Module Output Controls](#)

Side Object Detection Scan Tool Parameters

Parameter	System State	Expected Value	Definition
Operating Conditions: Ignition ON			
Manufacturer's Traceability Number	–	Varies	The scan tool displays the Manufacturer's Traceability Number
Software Module 1 Identifier	–	Varies	The scan tool displays the Software Module 1 Identifier
Software Module 2 Identifier	–	Varies	The scan tool displays the Software Module 2 Identifier
End Model Part Number	–	Varies	The scan tool displays the End Model Part Number
Base Model Part Number	–	Varies	The scan tool displays the Base Model Part Number
Manufacturer Enable Counter	–	Varies	The scan tool displays the Manufacturer Enable Counter
Module Diagnostic Address	–	Varies	The scan tool displays the Software Module 1 Identifier
Software Release Level	–	Varies	The scan tool displays the Software Release Level
Software Module 1 Identifier Alpha Code	–	Varies	The scan tool displays the Software Module 1 Identifier Alpha Code
Software Module 2 Identifier Alpha Code	–	Varies	The scan tool displays the Software Module 2 Identifier Alpha Code
End Model Part Number Alpha Code	–	Varies	The scan tool displays the End Model Part Number Alpha Code
Base Model Part Number Alpha Code	–	Varies	The scan tool displays the Base Model Part Number Alpha Code

Side Object Detection Module Output Controls

Scan Tool Output Control	Description

Scan Tool Output Control	Description
Object Detection Alert Indicators	When commanded by the scan tool, the module will provide power to illuminate the side blind zone indicators in appropriate outside rear view mirror. The outside rear view mirror indicator will illuminate.
Rear Cross Traffic Audible Alert	When commanded by the scan tool, the module will send a signal to the audio system to turn on the rear cross traffic audible alert signal. The audio system will beep.
Rear Cross Traffic Haptic Alert	When commanded by the scan tool, the module will send a signal to the memory seat module to turn on the rear cross traffic haptic alert. The driver's seat will vibrate (if equipped).
Rear Cross Traffic Visual Alert	When commanded by the scan tool, the module will turn on the rear cross traffic alert indicators on infotainment display. The infotainment display will illuminate with the appropriate rear cross traffic alert.

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Steering Column Lock Control Module Scan Tool Information

Scan Tool Data Parameters

Parameter	Expected Value	Description
Operating Conditions: Ignition ON		
Column Lock Status	Varies	The scan tool displays Failed, Unknown, Locked and Unlocked. The scan tool displays the current state of the column lock.
Turn Steering Wheel, Start Vehicle Again Display Message	On/Off	The scan tool displays On/Off. If the wheels are against a curb, the lock pin may not be able to pull out. A message for the driver that is displayed on the Driver Information Center. The scan tool displays the need to turn the steering wheel, turn off the vehicle and then restart the vehicle.
Steering Column Lock Indicator	On/Off	The scan tool displays On/Off. The scan tool displays the current state of the column lock.
Steering Column Lock Pin Position	counts	The scan tool displays the current counts of the column lock pin position.

Transmission Control Module Scan Tool Information (6L45/6L50/6L80/6L90)

Table 1: [Scan Tool Data Parameters](#)

Table 2: [Scan Tool Output Controls](#)

The Transmission Control Module Scan Tool Data List contains all transmission related parameters that are available on the scan tool. The list is arranged in alphabetical order. A given parameter may appear in any one of the data lists, and in some cases may appear more than once, or in more than one data list in order to group certain related parameters together.

The values below represent a typical display recorded from a properly functioning system.

Only the parameters listed below are used/referenced in this manual for diagnosis. If a scan tool displays other parameters, those values are not recommended by General Motors for use in diagnosis.

If all values are within the expected value described below, refer to [Symptoms - Automatic Transmission](#) for diagnosis.

The scan tool values from a properly functioning transmission may be used for comparison with the transmission you are diagnosing. The values below represent a typical display recorded from a properly functioning system.

Scan Tool Data Parameters

Parameter	System State	Expected Value	Description
Operating Conditions: Engine at idle with the upper radiator hose hot and in closed loop operation, closed throttle, transmission in Park, accessories OFF, brake pedal not applied.			
1-2 Shift Time	Varies	Seconds	This parameter displays the actual time of the last adaptable 1-2 shift. The shift time is based on the gear ratio change after the commanded 1-2 shift.
2-3 Shift Time	Varies	Seconds	This parameter displays the actual time of the last adaptable 2-3 shift. The shift time is based on the gear ratio change after the commanded 2-3 shift.
3-4 Shift Time	Varies	Seconds	This parameter displays the actual time of the last adaptable 3-4 shift. The shift time is based on the gear ratio change after the commanded 3-4 shift.
4-5 Shift Time	Varies	Seconds	This parameter displays the actual time of the last adaptable 4-5 shift. The actual shift time is obtained by measuring the time required for the input shaft to decelerate from the previous ratio to the current ratio.

Parameter	System State	Expected Value	Description
5-6 Shift Time	Varies	Seconds	This parameter displays the actual time of the last 5-6 shift. The shift time is base on the gear ratio change after the commanded 5-6 shift.
Brake Switch	Released	Applied/Released	This parameter displays the status of the brake switch circuit input. Applied indicates a zero voltage input, brake pedal applied. Released indicates a voltage input, brake pedal released. The scan tool displays Applied or Released.
Calc. Throttle Position	Varies	%	This parameter displays a calculated value, which is determined by the accelerator pedal position and the actual throttle position, used to optimize transmission controls. It represents the driver's intended request for torque or acceleration. The range is 0-100 percent, where 0 percent represents an idle or coast request and 100 percent represents a request for wide open throttle (WOT).
Commanded Gear	1	1, 2, 3, 4 or 1, 2, 3, 4, 5 or Park/Neutral, Reverse, 1, 2, 3, 4, 5	This parameter displays the current commanded state of the shift solenoid valves. The scan tool displays 1, 2, 3, 4 or 5
Driver Shift Control	Inactive	Active/Inactive	This parameter displays Active or Inactive. The scan tool displays Active when the gear selector is in the sport (S) position, which enables TAP shift. The scan tool displays Inactive when the gear selector is not in the S position, TAP shift disabled.
Driver Shift Request	None	Upshift/ Downshift/ None/ Invalid	This parameter displays the current request from the TAP Shift System. This parameter will display up shift, downshift or invalid depending on the amount of voltage measured at the remote shift selector input and also will display none when there is no request.
ECT	Varies	°C (°F)	This parameter displays the input signal from the engine

Parameter	System State	Expected Value	Description
			coolant temperature (ECT) sensor. ECT is high at 151°C (304°F) when the signal voltage is low (0 V). ECT is low at -40°C (-40°F) when the signal voltage is high (5 V).
Engine Speed	Varies	RPM	This parameter displays the rotational speed of the engine expressed as revolutions per minute.
Engine Torque	Varies	N•m (lb ft)	This parameter displays a calculated value based on engine load, throttle position, mass air flow, and other engine inputs. This parameter is accurate to within 20 N•m 15 lb ft of actual measured engine torque.
Gear Ratio	Varies	Ratio	This parameter displays the actual transmission gear ratio. The scan tool displays the gear ratio calculated from the automatic transmission input shaft speed sensor (AT ISS) and the automatic transmission output shaft speed sensor (AT OSS) inputs.
High Side Driver 1	Enabled	Enabled/Disabled	This parameter displays the High Side Driver 1 status on the scan tool. When the High Side Driver 1 is commanded OFF this displays Disabled, when the High Side Driver 1 is commanded ON this displays Enabled.
High Side Driver 1 CKT Status	OK or Indeterminate	OK, Open/Short to Volts, Short to GND, Indeterminate	This parameter displays the High Side Driver 1 circuit status on the scan tool. If the voltage is low when the solenoid is commanded OFF, the scan tool will display Open/Short to GND. If the voltage is high when the solenoid is commanded ON, the scan tool will display Short to Volts. If no circuit fault is present the scan tool will display OK.
Ignition Voltage	12 to 14 volts	Volts	This parameter displays the system voltage measured at the ignition feed.
IMS	Park	Park-Drive 1, Open, Invalid	This parameter displays PARK, PARK/REVERSE, REVERSE, REVERSE/NEUTRAL, NEUTRAL,

Parameter	System State	Expected Value	Description
			NEUTRAL/DRIVE 4, DRIVE 4, DRIVE 4/DRIVE 3, DRIVE 3, DRIVE 3/DRIVE 2, DRIVE 2, DRIVE 2/DRIVE 1, DRIVE 1 or INVALID. The IMS Range display represents a decoded status of the four inputs from the IMS. The combination of IMS inputs are used to determine what position the manual valve is in at any time.
IMS A/B/C/P	LOW/HI/HI/LOW	HI or LOW	This parameter displays the status of the four A/B/C/P inputs from the automatic transmission internal mode switch. HI indicates an ignition voltage signal and LOW indicates a 0 voltage signal. The scan tool will display HI/LOW, HI/LOW, HI/LOW, HI/LOW.
ISS/OSS Supply Voltage	OK	OK, Out of Range	This parameter displays OK, Out of Range.
Last Shift Time	Varies	Seconds	This parameter displays the actual time of the last up shift. This value is only accurate if the shift was adaptable.
PC Sol. 2 CKT Status	OK or Indeterminate	OK, Open/Short to GND, Short to Volts, Indeterminate	This parameter displays OK, Open/Short to GND, Short to Volts.
PC Sol. 2 Pressure Comm	No	Yes/No	This parameter displays Yes or No. Yes, solenoid pressure is commanded. No, solenoid pressure is not commanded.
PC Sol. 3 CKT Status	OK or Indeterminate	OK, Open/Short to GND, Short to Volts, Indeterminate	This parameter displays OK, Open/Short to GND, Short to Volts.
PC Sol. 3 Pressure Comm	Yes	Yes/No	This parameter displays Yes or No. Yes, solenoid pressure is commanded. No, solenoid pressure is not commanded.
PC Sol. 4 CKT Status	OK or Indeterminate	OK, Open/Short to GND, Short to Volts, Indeterminate	This parameter displays OK, Open/Short to GND, Short to Volts.
PC Sol. 4 Pressure Comm	No	Yes/No	This parameter displays Yes or No. Yes, solenoid pressure is

Parameter	System State	Expected Value	Description
			commanded. No, solenoid pressure is not commanded.
PC Sol. 5 CKT Status	OK or Indeterminate	OK, Open/Short to GND, Short to Volts, Indeterminate	This parameter displays OK, Open/Short to GND, Short to Volts.
PC Sol. 5 Pressure Comm	No	Yes/No	This parameter displays Yes or No. Yes, solenoid pressure is commanded. No, solenoid pressure is not commanded.
Shift Sol. 1 CKT Status	OK or Indeterminate	OK, Open/Short to GND, Short to Volts, Indeterminate	This parameter displays OK, Open/Short to GND, Short to Volts, or Indeterminate.
Shift Solenoid 1	ON	On/Off	This parameter displays the commanded state of the reverse, 1st shift solenoid valve (S1). The scan tool displays On/Off.
Shift Sol. 2 CKT Status	OK or Indeterminate	OK, Open/Short to GND, Short to Volts, Indeterminate	This parameter displays OK, Open/Short to GND, Short to Volts, or Indeterminate.
Shift Solenoid 2	ON	On/Off	This parameter displays the commanded state of the 2-3, 3-4 shift solenoid valve (S2). The scan tool displays On/Off.
TCC PC Sol. Pressure Comm	No	Yes/No	This parameter displays Yes or No. Yes, solenoid pressure is commanded. No, solenoid pressure is not commanded.
TCC Slip Speed	Varies	RPM	This parameter displays the difference between transmission input speed and engine speed. A negative value indicates that the engine speed is less than the input speed, deceleration. A positive value indicates that the engine speed is greater than the input speed, acceleration. A value of zero indicates that the engine speed is equal to the input speed, TCC applied.
TCM Temperature	Varies	°C (°F)	This parameter displays results in °C (°F).
TFP Switch 1	HI	HI/LOW	This parameter displays the state of the first clutch oil

Parameter	System State	Expected Value	Description
			pressure switch. The scan tool displays HI/LOW.
TFP Switch 3	LOW	HI/LOW	This parameter displays state of the 3rd clutch oil pressure switch. The scan tool displays HI/LOW.
TFP Switch 4	LOW	HI/LOW	This parameter displays state of the 4th clutch oil pressure switch. The scan tool displays HI/LOW.
TFP Switch 5	LOW	HI/LOW	This parameter displays state of the fifth clutch oil pressure switch. The scan tool displays HI/LOW.
Tow/Haul Mode (If equipped)	Inactive	Active/Inactive	This parameter displays ACTIVE when the transmission is operating in the tow/haul mode. In this mode the transmission control module (TCM) extends the length of time between upshifts and elevates transmission line pressure. Shift quality and TCC scheduling are also affected during tow/haul mode operation. The scan tool displays ACTIVE or INACTIVE.
Trans. Fluid Temp.	Varies	°C (°F)	This parameter displays the input signal of the transmission fluid temperature sensor. Transmission fluid temperature is high 151°C (304°F) when signal voltage is low, 0 V, and transmission fluid temperature is low -40°C (-40°F) when signal voltage is high, 5 V.
Transmission ISS	Varies	RPM	This parameter displays the rotational speed of the transmission input shaft. The scan tool displays input shaft speed is revolutions per minute.
Transmission OSS	0	RPM	This parameter displays the rotational speed of the transmission output shaft expressed as revolutions per minute.

Scan Tool Output Controls

Output Control	Description
High Side Driver 1	

Output Control	Description
	• The TCM commands the driver for the solenoid voltage supply ON and OFF. • When the ignition is ON, and the engine is OFF, there are no limits to this control. • High side drivers may not be commanded ON and OFF with the scan tool if the engine is running.
Line PC Solenoid	• The scan tool is used to request pressure in increments of 200 kPa (30 psi) from 200–2000 kPa (30–290 psi). The TCM will then command the line PC solenoid to achieve the requested increment. • When the ignition is ON, and the engine is OFF, the pressure request may be controlled within calibrated limits. There is a limit to the output control of 200 kPa (290 psi) when the engine is OFF. If the request is above specified amount, the message "Request override current out of range" will display. • When the engine is running, the following control limits apply: – When the transmission range is Park or Neutral, the pressure request may be controlled within calibrated limits. The engine speed must be less than 1,500 RPM. If the engine speed is greater than 1,500 RPM, the message "TR in park/neutral and engine speed over 1,500 RPM" appears on the scan tool display. – When the transmission range is not Park or Neutral, the requested pressure can only be controlled equal to or greater than the pressure determined by the TCM. The TCM does not allow a pressure to be selected that may cause damage to the transmission. If the requested pressure is less than allowed by the TCM, the message "Requested pressure for the Line PC Solenoid is too low" appears on the scan tool display. – Transmission range DTCs must not be active. If a transmission range DTC is active, the message "Engine running with transmission DTC present" appears on the scan tool display.
PC Solenoid 2 Command	• The TCM commands the pressure control solenoid in order to apply or release the clutches. • When the ignition is ON, and the engine is OFF, there are no limits to this control. The solenoid remains ON until commanded OFF, and vice versa. When the output control is exited, the solenoid state is determined by the TCM. • When the engine is running, the following control limits apply: – The transmission range must be in Park or Neutral. If the transmission range is not Park or Neutral, the message "Engine running and transmission range is not Park/Neutral" appears on the scan tool display. – The solenoid remains ON until commanded OFF, and vice versa. When the output control is exited, the solenoid state is determined by the TCM.
PC Solenoid 3 Command	
PC Solenoid 4 Command	
PC Solenoid 5 Command	

Output Control	Description
	- Transmission range DTCs must not be active. If a transmission range DTC is active, the message "Engine running with transmission DTC present" appears on the scan tool display.
Service Clean Procedure	• The scan tool is used to start and stop the transmission cleaning procedure algorithm. • The following control limits apply: - The engine must be running. The message "Engine not Running" will appear on the scan tool if this control is attempted without the engine running. - There cannot be active transmission DTCs. The message "Transmission Fault present" will appear on the scan tool if this control is attempted with transmission DTCs active. - The transmission range must be Park or Neutral. The message "Transmission not in PARK or NEUTRAL" will appear on the scan tool if this control is attempted with the transmission in any range other than Park or Neutral. - The vehicle speed cannot exceed 8 km/h (5 mph). The message "Vehicle Speed too high" will appear on the scan tool if this control is attempted with a vehicle speed greater than 8 km/h (5 mph). - The engine speed cannot exceed 2500 RPM. The message "Engine Speed too high" will appear on the scan tool if this control is attempted with an engine speed greater than 2500 RPM. - The transmission oil temperature must be at a normal operating temperature. The message "Transmission oil temperature out of range" will appear on the scan tool if this control is attempted without a transmission oil temperature between 70–110°C (158–230°F).
Reset Transmission Adapts	• The scan tool is used to start and stop the transmission Fast Learn Adapt algorithm. • The following control limits apply: - The engine must be running. The message "Engine not Running" will appear on the scan tool if this control is attempted without the engine running. - There cannot be active transmission DTCs. The message "Transmission Fault present" will appear on the scan tool if this control is attempted with transmission DTCs active.
Shift Solenoid 1	• The TCM commands Shift Solenoid 1 and Shift Solenoid 2 ON and OFF. • When the ignition is ON, and the engine is OFF, there are no limits to this control. The solenoid remains ON until commanded OFF, and vice versa. When the output control is exited, the solenoid state is determined by the TCM. • When the engine is running, the following control limits apply:
Shift Solenoid 2	

Output Control	Description
	- The transmission range must be in Park or Neutral. If the transmission range is not Park or Neutral, the message "Engine running and transmission range is not Park/Neutral" appears on the scan tool display. - The solenoid remains ON until commanded OFF, and vice versa. When the output control is exited, the solenoid state is determined by the TCM. - Transmission range DTCs must not be active. If a transmission range DTC is active, the message "Engine running with transmission DTC present" appears on the scan tool display.
TCC PC Solenoid Command	• The transmission control module (TCM) commands the torque converter clutch pressure control (TCC PC) solenoid pressure in order to apply and release the TCC. • When the ignition is ON, and the engine is OFF, there are no limits to this control. The solenoid remains ON until commanded OFF and vice versa. • When the engine is running, the following control limits apply: - If the transmission range is Park, and the transmission is in hot mode, the TCC PC solenoid may not be commanded OFF. If the solenoid is requested OFF, the message "TCC OFF command disabled in Hot Mode" appears on the scan tool display. - The TCC PC solenoid may not be commanded OFF for more than a calibrated amount of time. If the solenoid is commanded OFF, for a certain amount of time, the message "TCC OFF time has been exceeded" appears on the scan tool display.