Vehicle Diagnostic Information

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Diagnostic Information and Procedures

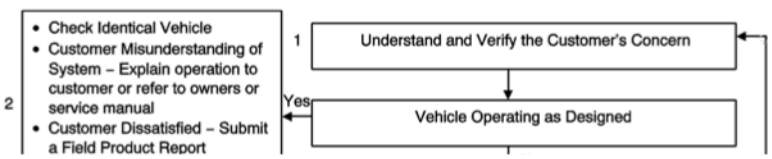
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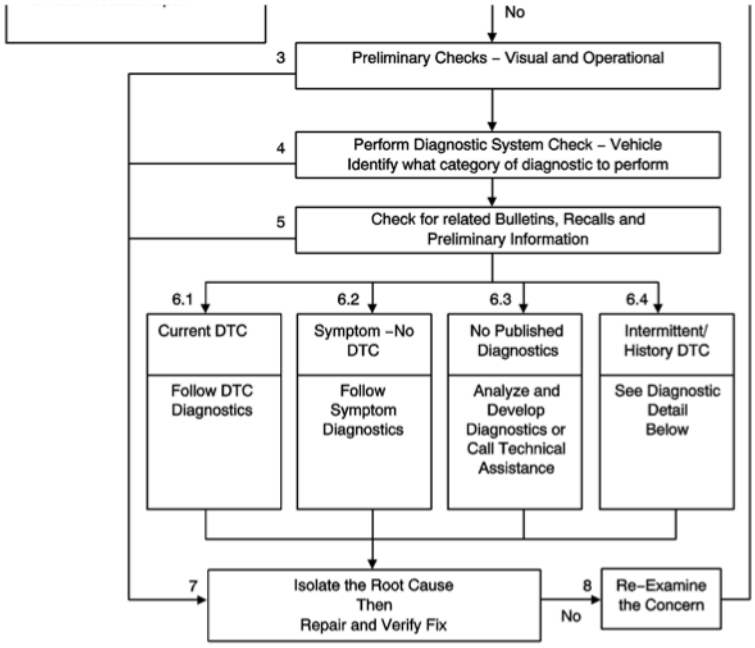
1. **DIAGNOSTIC OVERVIEW, STARTING POINT, AND PROGRAMMING**
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## Strategy Based Diagnosis

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 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.

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1. Understand and Verify the Customer Concernâ€"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 Designedâ€"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 Checksâ€"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 â€" Vehicleâ€"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:

7.

    1. Current DTCâ€"Follow the designated DTC diagnostic in order to make an effective repair. Refer to Diagnostic Trouble Code (DTC) List - Vehicle.

    2. Symptom â€" No DTCâ€"Select the appropriate symptom diagnostic. Follow the diagnostic steps or suggestions in order to complete the repair. Refer to Symptoms - Vehicle.

    3. No Published Diagnosticsâ€"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.

    4. Intermittent/History DTCâ€"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.

    5.

        - Combining technicians knowledge with the available service information.
        - Evaluate the symptoms and conditions described by the customer on the Customer Concern Verification Sheets 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* Vehicle Data Recorder with data capturing capabilities.

8. Isolate the Root Cause then Repair and Verify Fixâ€"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.

9. Re-examine the Concernâ€"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.

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## Diagnostic Procedure Instructions

The following is an overview of instructions for all 16â€‰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 | â€” | 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 â€“ PCM

| Circuit | Short to Ground | Open | Short to Voltage |
|---|---|---|---|
| **Operating Conditions:** Engine Running<br><br>**Parameter Normal Range:** 32 to +130Â°Câ€‰(26 to +275Â°F) | | | |
| ECT Signal | 140Â°Câ€‰(284Â°F) | 40Â°Câ€‰(40Â°F) | 40Â°Câ€‰(40Â°F) |
| Low Reference | â€” | 40Â°Câ€‰(40Â°F) | 40Â°Câ€‰(40Â°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.

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

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.

The technician should be able to identify if the fault is occurring on the input circuit â€“ signal or on the output circuit â€“ 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.

## 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.

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. If the result of a numbered test step is NOT achieved, the repair arrow bullet below that 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 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.

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 3â€‰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.

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.

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## Diagnostic System Check Instructions

The following is an overview of instructions for the general information and 14 step System Verification included in the Diagnostic System Check â€“ 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 14â€‰step System Verification included in the Diagnostic System Check â€“ 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 Master Electrical Component List 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.

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## Diagnostic System Check

1. VERIFY CUSTOMER CONCERNâ€"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.

2. 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.

3. 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.

4. BULLETIN SEARCHâ€"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.

5. MECHANICAL CONCERNSâ€"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.

6. Examples:

7. 
    - 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

8. CONTROL MODULE COMMUNICATION and DTC CHECKâ€"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.

9. 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.

10. To complete this step, the technician is asked to utilize the scan tool function called Vehicle DTC Information located in Vehicle Control Systems. 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. 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.

11. CONTROL MODULE INTERNAL PERFORMANCE FAULTSâ€"The technician is asked to review the DTCs recorded in step 4 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.

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12. Examples:
13.
    - 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
14. CONTROL MODULE COMMUNICATION VERIFICATIONâ€"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 ECU names 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.
15. COMMUNICATION and POWERMODE FAULTSâ€"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.
16. Examples:
17.
    - 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
18. POWER MODE VERIFICATIONâ€"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.
19. ENGINE CRANK and RUN VERIFICATIONâ€"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 Cranks But Does Not Run 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.

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20. REMAINING DTC REVIEWâ€"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 5â€‰V 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.

21.

    1. Voltage DTCs
    2.
        - B1325 Device Power 1â€‰Circuit
        - C0875 Device Voltage Reference Input 2â€‰Circuit
        - C1001 Adaptive Cruise Control Indicators Supply Voltage Circuit
        - P0641 5-Volt Reference Circuit
        - P0787 Downshift Timing Solenoid Control Circuit Low Voltage
    3. Programming, Setup, Configuration or Software Performance DTCs
    4.
        - 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 â€“ Powertrain Control Module (PCM)
    5. Component related DTCs
    6.
        - B0013 Driver Frontal Deployment Loop Stageâ€‰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
    7. System related DTCs
    8.
        - B1010 System Sensors Data Mismatch
        - C0176 System Thermal Error
        - C0561 System Disabled Information Stored
        - P1564 Vehicle Acceleration Too High â€“ Cruise Control Disabled
        - P1625 Transmission Control Module (TCM) System Reset

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9. Any other remaining DTCsâ€”The technician should diagnose and correct any other DTCs that are left that were not from the categories above.

22. EMISSION RELATED INSPECTION/MAINTENANCE TESTING CONCERNSâ€”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.

23. SYMPTOM DIAGNOSISâ€”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.

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## Diagnostic Starting Point - Vehicle

Begin the system diagnosis with Diagnostic System Check - Vehicle. The Diagnostic System Check â€“ Vehicle will provide the following information:

- The identification of the control modules which are not communicating through the serial data circuit.
- The identification of any stored diagnostic trouble codes (DTCs) and their status.

The use of the Diagnostic System Check â€“ Vehicle will identify the correct procedures to begin vehicle diagnosis. These must be performed before system DTC or symptom diagnosis.

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## 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 12â€‰V 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 Master Electrical Component List.
- There are no aftermarket devices that affect the operation of the system.
- The scan tool powers up. Refer to Scan Tool Does Not Power Up.

### Diagnostic System Check

1. Verify Customer Concernâ€”Understand and validate the customer concern. Inspect the visible system components for obvious damage or conditions that may cause the concern.
2. Bulletin Searchâ€”Check for related bulletins, recall/field actions and preliminary information.
3. Mechanical Concernsâ€”Verify the symptom is not exclusively a mechanical concern.
4.
    - If the symptom is exclusively a mechanical concern, refer to Symptoms - Vehicle.
5. 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.
6. Control Module Communication and DTC Checkâ€”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:
7.
    - Any control module that is not communicating.
    - Any DTC, including symptom byte, and the control module that has set the DTC.
8. Control Module Internal Performance Faultsâ€”Verify there are no current control module Internal Hardware Performance DTCs set.
9.
    - If any DTC of this type is set, refer to Diagnostic Trouble Code (DTC) List - Vehicle.
10. Control Module Communication Verificationâ€”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.
11.
    - If the scan tool does not communicate with one or more control modules refer to Data Link References.

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12. Communication and Power Mode Faultsâ€”Verify there are no current control module Power Mode or Communication DTCs set.
13. 
    - If any DTC of this type is set, refer to Diagnostic Trouble Code (DTC) List - Vehicle.
14. 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.
15. Power Mode Verificationâ€”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.
16. Engine Crank and Run Verificationâ€”Verify that the engine cranks and runs.
17. 
    - 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.
18. Remaining DTC Reviewâ€”Verify there are no other DTCs set.
19. 
    - If other DTCs are set, diagnose them in the order listed below. Refer to Diagnostic Trouble Code (DTC) List - Vehicle.
20. 
    1. Voltage DTCs
    2. Programming, Setup, Configuration or Software Performance DTCs
    3. Component related DTCs
    4. System related DTCs
    5. Any remaining DTCs
21. Emission Related Inspection/Maintenance Testing Concernsâ€”If inspection and maintenance checks are required in your region, verify the customer concern is not related to inspection/maintenance testing.
22. Symptom Diagnosisâ€”Diagnose any remaining customer concern. Refer to Symptoms - Vehicle.

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1. **DIAGNOSTIC OVERVIEW, STARTING POINT, AND PROGRAMMING**
2. VEHICLE DIAGNOSTIC INFORMATION
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4.

## Powertrain Diagnostic Trouble Code (DTC) Type Definitions

### Emissions Related DTCs

Action Taken When the DTC Sets â€“ 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 â€“ 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 2â€‰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 2â€‰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 20â€‰percent of the previous test that failed.
        - The engine speed is within 375â€‰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 2â€‰consecutive trips, the control module illuminates the MIL.
    - If the control module detects a fuel trim condition during 2â€‰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 20â€‰percent of the previous test that failed.
        - The engine speed is within 375â€‰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 â€“ Type A or Type B

- The control module turns OFF the MIL after 4â€‰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 40â€‰consecutive warm-up cycles, if no failures are reported by this or any other emission related diagnostic.

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- Clear the MIL and the DTC with a scan tool.

## Non-Emissions Related DTCs

Action Taken When the DTC Sets â€“ 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 â€“ Type C

- A current DTC Last Test Failed clears when the diagnostic runs and passes.
- A history DTC clears after 40â€‰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.

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1. DIAGNOSTIC OVERVIEW, STARTING POINT, AND PROGRAMMING
2. VEHICLE DIAGNOSTIC INFORMATION
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4.

## Diagnostic Trouble Code (DTC) List - Vehicle

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

| DTC | Diagnostic Procedure |
|---|---|
| B0012 | Supplemental Inflatable Restraints - DTC B0012 |
| 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 |
| 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 |
| B0082 | Seat Belts - DTC B0082 |
| B0082 | Supplemental Inflatable Restraints - DTC B0082 |
| B0085 | Supplemental Inflatable Restraints - DTC B0085 or B0086 |
| B0086 | Supplemental Inflatable Restraints - DTC B0085 or B0086 |
| B0091 | Supplemental Inflatable Restraints - DTC B0091 |
| B0098 | Supplemental Inflatable Restraints - DTC B0098 |
| B1001 | Supplemental Inflatable Restraints - DTC B1001 |
| B1019 | Supplemental Inflatable Restraints - DTC B1019 |
| B101D | Data Communications - DTC B101D |
| B101E | Data Communications - DTC B101E |
| B1512 | Displays and Gauges - DTC B1512-B1537 |
| B1513 | Displays and Gauges - DTC B1512-B1537 |
| B1514 | Displays and Gauges - DTC B1512-B1537 |
| B1515 | Displays and Gauges - DTC B1512-B1537 |
| B1516 | Displays and Gauges - DTC B1512-B1537 |
| B1517 | Displays and Gauges - DTC B1512-B1537 |
| B1518 | Displays and Gauges - DTC B1512-B1537 |
| B1519 | Displays and Gauges - DTC B1512-B1537 |
| B1520 | Displays and Gauges - DTC B1512-B1537 |
| B1521 | Displays and Gauges - DTC B1512-B1537 |
| B1522 | Displays and Gauges - DTC B1512-B1537 |
| B1523 | Displays and Gauges - DTC B1512-B1537 |
| B1524 | Displays and Gauges - DTC B1512-B1537 |
| B1525 | Displays and Gauges - DTC B1512-B1537 |
| B1526 | Displays and Gauges - DTC B1512-B1537 |
| B1527 | Displays and Gauges - DTC B1512-B1537 |
| B1528 | Displays and Gauges - DTC B1512-B1537 |
| B1529 | Displays and Gauges - DTC B1512-B1537 |
| B1530 | Displays and Gauges - DTC B1512-B1537 |
| B1531 | Displays and Gauges - DTC B1512-B1537 |
| B1532 | Displays and Gauges - DTC B1512-B1537 |
| B1533 | Displays and Gauges - DTC B1512-B1537 |
| B1534 | Displays and Gauges - DTC B1512-B1537 |
| B1535 | Displays and Gauges - DTC B1512-B1537 |
| B1536 | Displays and Gauges - DTC B1512-B1537 |
| B1537 | Displays and Gauges - DTC B1512-B1537 |

| DTC | Diagnostic Procedure |
|---|---|
| B2745 | Antilock Brake System - DTC B2745 |
| C0035 | Antilock Brake System - DTC C0035, C0040, C0045, or C0050 |
| C0040 | Antilock Brake System - DTC C0035, C0040, C0045, or C0050 |
| C0045 | Antilock Brake System - DTC C0035, C0040, C0045, or C0050 |
| C0050 | Antilock Brake System - DTC C0035, C0040, C0045, or C0050 |
| C0110 | Antilock Brake System - DTC C0110 |
| C0131 | Antilock Brake System - DTC C0131 |
| C0161 | Antilock Brake System - DTC C0161 |
| C0176 | Power Steering - DTC C0176 |
| C0179 | Antilock Brake System - DTC C0179 |
| C0186 | Antilock Brake System - DTC C0186 |
| C0196 | Antilock Brake System - DTC C0196 |
| C0201 | Antilock Brake System - DTC C0201 |
| C0292 | Antilock Brake System - DTC C0292 |
| C0460 | Power Steering - DTC C0460 |
| C0475 | Power Steering - DTC C0475 |
| C0545 | Power Steering - DTC C0545 |
| C056D | Antilock Brake System - DTC C056D |
| C056D | Power Steering - DTC C056D |
| C056E | Antilock Brake System - DTC C056E |
| C0710 | Antilock Brake System - DTC C0710 |
| C0800 | Antilock Brake System - DTC C0800 |
| P0016 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0016 or P0340 |
| P0030 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0030-P0032, P0036-P0038, P0053, P0054, P0135, or P0141 |
| P0031 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0030-P0032, P0036-P0038, P0053, P0054, P0135, or P0141 |
| P0031 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - LMT, LMU with FX3 - DTC P0031, P0032, P0037, P0038, P0053, P0054, P0135, or P0141 |
| P0032 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0030-P0032, P0036-P0038, P0053, P0054, P0135, or P0141 |
| P0032 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - LMT, LMU with FX3 - DTC P0031, P0032, P0037, P0038, P0053, P0054, P0135, or P0141 |
| P0036 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0030-P0032, P0036-P0038, P0053, P0054, P0135, or P0141 |
| P0037 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0030-P0032, P0036-P0038, P0053, P0054, P0135, or P0141 |
| P0037 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - LMT, LMU with FX3 - DTC P0031, P0032, P0037, P0038, P0053, P0054, P0135, or P0141 |
| P0038 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0030-P0032, P0036-P0038, P0053, P0054, P0135, or P0141 |
| P0038 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - LMT, LMU with FX3 - DTC P0031, P0032, P0037, P0038, P0053, P0054, P0135, or P0141 |
| P003A | Engine Controls and Fuel - 1.0L Diesel - DTC P003A |
| P0045 | Engine Controls and Fuel - 1.0L Diesel - DTC P0045-P0048 |
| P0046 | Engine Controls and Fuel - 1.0L Diesel - DTC P0045-P0048 |
| P0047 | Engine Controls and Fuel - 1.0L Diesel - DTC P0045-P0048 |
| P0048 | Engine Controls and Fuel - 1.0L Diesel - DTC P0045-P0048 |
| P0053 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0030-P0032, P0036-P0038, P0053, P0054, P0135, or P0141 |
| P0053 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - LMT, LMU with FX3 - DTC P0031, P0032, P0037, P0038, P0053, P0054, P0135, or P0141 |
| P0054 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0030-P0032, P0036-P0038, P0053, P0054, P0135, or P0141 |
| P0054 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - LMT, LMU with FX3 - DTC P0031, P0032, P0037, P0038, P0053, P0054, P0135, or P0141 |
| P0106 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0106 |
| P0107 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0107 or P0108 |
| P0108 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0107 or P0108 |
| P0112 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - LMT, LMU with FX3 - DTC P0112 or P0113 |
| P0113 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - LMT, LMU with FX3 - DTC P0112 or P0113 |
| P0116 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0116 |

| DTC | Diagnostic Procedure |
|---|---|
| P0117 | Engine Controls and Fuel - 1.0L Diesel - DTC P0117 or P0118 |
| P0117 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - LMT, LMU with FX3 - DTC P0117 or P0118 |
| P0117 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - LMT, LMU without FX3 - DTC P0117, P0118, or P0119 |
| P0118 | Engine Controls and Fuel - 1.0L Diesel - DTC P0117 or P0118 |
| P0118 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - LMT, LMU with FX3 - DTC P0117 or P0118 |
| P0118 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - LMT, LMU without FX3 - DTC P0117, P0118, or P0119 |
| P0119 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0117, P0118, or P0119 |
| P0121 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0121-P0123, P0221-P0223, or P2135 |
| P0122 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0121-P0123, P0221-P0223, or P2135<br>or<br>Engine Controls and Fuel - 1.0L Diesel - DTC P0122 or P0123 |
| P0122 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - LMT, LMU with FX3 - DTC P0122, P0123, P0222, P0223, or P2135 |
| P0123 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0121-P0123, P0221-P0223, or P2135<br>or<br>Engine Controls and Fuel - 1.0L Diesel - DTC P0122 or P0123 |
| P0123 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - LMT, LMU with FX3 - DTC P0122, P0123, P0222, P0223, or P2135 |
| P0130 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - LKY - DTC P0130-P0134, P0136-P0138, or P0140 |
| P0130 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0130-P0134, P0136-P0138, or P0140<br>or<br>Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0131, P0132, P0134, P0137, P0138, P0140, or P2A00 |
| P0131 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0130-P0134, P0136-P0138, or P0140<br>or<br>Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0131, P0132, P0134, P0137, P0138, P0140, or P2A00 |
| P0132 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0130-P0134, P0136-P0138, or P0140<br>or<br>Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0131, P0132, P0134, P0137, P0138, P0140, or P2A00 |
| P0133 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0130-P0134, P0136-P0138, or P0140<br>or<br>Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0131, P0132, P0134, P0137, P0138, P0140, or P2A00 |
| P0133 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0133, P013A, P013B, P013E, P013F, P015A, P015B, P2270, or P2271 |
| P0134 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0130-P0134, P0136-P0138, or P0140<br>or<br>Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0131, P0132, P0134, P0137, P0138, P0140, or P2A00 |
| P0135 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0030-P0032, P0036-P0038, P0053, P0054, P0135, or P0141 |
| P0135 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - LMT, LMU with FX3 - DTC P0031, P0032, P0037, P0038, P0053, P0054, P0135, or P0141 |
| P0136 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0130-P0134, P0136-P0138, or P0140 |
| P0137 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0130-P0134, P0136-P0138, or P0140<br>or<br>Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0131, P0132, P0134, P0137, P0138, P0140, or P2A00 |
| P0138 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0130-P0134, P0136-P0138, or P0140<br>or<br>Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0131, P0132, P0134, P0137, P0138, P0140, or P2A00 |

| DTC | Diagnostic Procedure |
|---|---|
| P013A | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0133, P013A, P013B, P013E, P013F, P015A, P015B, P2270, or P2271 |
| P013A | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0130-P0134, P0136-P0138, or P0140<br>or<br>Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0131, P0132, P0134, P0137, P0138, P0140, or P2A00 |
| P013B | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0133, P013A, P013B, P013E, P013F, P015A, P015B, P2270, or P2271 |
| P013B | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0130-P0134, P0136-P0138, or P0140<br>or<br>Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0131, P0132, P0134, P0137, P0138, P0140, or P2A00 |
| P013E | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0133, P013A, P013B, P013E, P013F, P015A, P015B, P2270, or P2271 |
| P013F | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0133, P013A, P013B, P013E, P013F, P015A, P015B, P2270, or P2271 |
| P0140 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0130-P0134, P0136-P0138, or P0140<br>or<br>Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0131, P0132, P0134, P0137, P0138, P0140, or P2A00 |
| P0141 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0030-P0032, P0036-P0038, P0053, P0054, P0135, or P0141 |
| P0141 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - LMT, LMU with FX3 - DTC P0031, P0032, P0037, P0038, P0053, P0054, P0135, or P0141 |
| P015A | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0133, P013A, P013B, P013E, P013F, P015A, P015B, P2270, or P2271 |
| P015B | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0133, P013A, P013B, P013E, P013F, P015A, P015B, P2270, or P2271 |
| P0171 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0171 or P0172 |
| P0172 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0171 or P0172 |
| P0182 | Engine Controls and Fuel - 1.0L Diesel - DTC P0182 or P0183 |
| P0183 | Engine Controls and Fuel - 1.0L Diesel - DTC P0182 or P0183 |
| P0192 | Engine Controls and Fuel - 1.0L Diesel - DTC P0192 or P0193 |
| P0193 | Engine Controls and Fuel - 1.0L Diesel - DTC P0192 or P0193 |
| P0201 | Engine Controls and Fuel - 1.0L Diesel - DTC P0201-P0203 |
| P0202 | Engine Controls and Fuel - 1.0L Diesel - DTC P0201-P0203 |
| P0203 | Engine Controls and Fuel - 1.0L Diesel - DTC P0201-P0203 |
| P0221 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0121-P0123, P0221-P0223, or P2135 |
| P0222 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - LKY - DTC P0121-P0123, P0221-P0223, or P2135 |
| P0222 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - LMT, LMU with FX3 - DTC P0122, P0123, P0222, P0223, or P2135 |
| P0223 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - LKY - DTC P0121-P0123, P0221-P0223, or P2135 |
| P0223 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - LMT, LMU with FX3 - DTC P0122, P0123, P0222, P0223, or P2135 |
| P0230 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0230 |
| P0234 | Engine Controls and Fuel - 1.0L Diesel - DTC P0234 or P0299 |
| P0251 | Engine Controls and Fuel - 1.0L Diesel - DTC P0251-P0254 |
| P0252 | Engine Controls and Fuel - 1.0L Diesel - DTC P0251-P0254 |
| P0253 | Engine Controls and Fuel - 1.0L Diesel - DTC P0251-P0254 |
| P0254 | Engine Controls and Fuel - 1.0L Diesel - DTC P0251-P0254 |
| P0261 | Engine Controls and Fuel - 1.0L Diesel - DTC P0261, P0262, P0264, P0265, P0267, or P0268 |
| P0261 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0261, P0262, P0264, P0265, P0267, P0268, P0270, or P0271 |
| P0262 | Engine Controls and Fuel - 1.0L Diesel - DTC P0261, P0262, P0264, P0265, P0267, or P0268 |
| P0262 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0261, P0262, P0264, P0265, P0267, P0268, P0270, or P0271 |
| P0264 | Engine Controls and Fuel - 1.0L Diesel - DTC P0261, P0262, P0264, P0265, P0267, or P0268 |
| P0264 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0261, P0262, P0264, P0265, P0267, P0268, P0270, or P0271 |
| P0265 | Engine Controls and Fuel - 1.0L Diesel - DTC P0261, P0262, P0264, P0265, P0267, or P0268 |

| DTC | Diagnostic Procedure |
|---|---|
| P0265 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0261, P0262, P0264, P0265, P0267, P0268, P0270, or P0271 |
| P0267 | Engine Controls and Fuel - 1.0L Diesel - DTC P0261, P0262, P0264, P0265, P0267, or P0268 |
| P0267 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0261, P0262, P0264, P0265, P0267, P0268, P0270, or P0271 |
| P0268 | Engine Controls and Fuel - 1.0L Diesel - DTC P0261, P0262, P0264, P0265, P0267, or P0268 |
| P0268 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0261, P0262, P0264, P0265, P0267, P0268, P0270, or P0271 |
| P0270 | Engine Controls and Fuel - 1.0L Diesel - DTC P0261, P0262, P0264, P0265, P0267, or P0268 |
| P0270 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0261, P0262, P0264, P0265, P0267, P0268, P0270, or P0271 |
| P0271 | Engine Controls and Fuel - 1.0L Diesel - DTC P0261, P0262, P0264, P0265, P0267, or P0268 |
| P0271 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0261, P0262, P0264, P0265, P0267, P0268, P0270, or P0271 |
| P0299 | Engine Controls and Fuel - 1.0L Diesel - DTC P0234 or P0299 |
| P0300 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - LMT, LMU without FX3, LKY, and LCP - DTC P0300-P0304 |
| P0300 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0300-P0304 |
| P0301 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - LMT, LMU without FX3, LKY, and LCP - DTC P0300-P0304 |
| P0301 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0300-P0304 |
| P0302 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - LMT, LMU without FX3, LKY, and LCP - DTC P0300-P0304 |
| P0302 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0300-P0304 |
| P0303 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - LMT, LMU without FX3, LKY, and LCP - DTC P0300-P0304 |
| P0303 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0300-P0304 |
| P0304 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - LMT, LMU without FX3, LKY, and LCP - DTC P0300-P0304 |
| P0304 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0300-P0304 |
| P0315 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0315 |
| P0325 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0325 or P0326 |
| P0326 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0325 or P0326 |
| P0335 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - LMT, LMU without FX3 - DTC P0335-P0337 |
| P0335 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - LMT, LMU with FX3 - DTC P0335 or P0336 |
| P0336 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - LMT, LMU without FX3 - DTC P0335-P0337 |
| P0336 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - LMT, LMU with FX3 - DTC P0335 or P0336 |
| P0337 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0335-P0337 |
| P0340 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0016 or P0340 |
| P0341 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0341 or P0342 |
| P0342 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0341 or P0342 |
| P0351 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0351-P0354 |
| P0352 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0351-P0354 |
| P0353 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0351-P0354 |
| P0354 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0351-P0354 |
| P0380 | Engine Controls and Fuel - 1.0L Diesel - DTC P0380, P0383, or P0384 |
| P0383 | Engine Controls and Fuel - 1.0L Diesel - DTC P0380, P0383, or P0384 |
| P0384 | Engine Controls and Fuel - 1.0L Diesel - DTC P0380, P0383, or P0384 |
| P0400 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0400-P0402 |
| P0401 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0400-P0402 |
| P0401 | Engine Controls and Fuel - 1.0L Diesel - DTC P0401 or P0402 |
| P0402 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0400-P0402 |
| P0402 | Engine Controls and Fuel - 1.0L Diesel - DTC P0401 or P0402 |
| P0403 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0403-P0406 or P042E |
| P0403 | Engine Controls and Fuel - 1.0L Diesel - DTC P0403, P0489, or P0490 |
| P0404 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0403-P0406 or P042E |
| P0404 | Engine Controls and Fuel - 1.0L Diesel - DTC P0404 |
| P0405 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0403-P0406 or P042E |
| P0405 | Engine Controls and Fuel - 1.0L Diesel - DTC P0405 or P0406 |
| P0406 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0403-P0406 or P042E |
| P0406 | Engine Controls and Fuel - 1.0L Diesel - DTC P0405 or P0406 |
| P0420 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0420 |
| P042E | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0403-P0406 or P042E |

| DTC | Diagnostic Procedure |
|---|---|
| P0443 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0443, P0458, or P0459 |
| P0458 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - LMT or LMU with FX3 - DTC P0443, P0458, or P0459 |
| P0458 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0443, P0458, or P0459 |
| P0459 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - LMT or LMU with FX3 - DTC P0443, P0458, or P0459 |
| P0459 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0443, P0458, or P0459 |
| P0461 | Displays and Gauges - DTC P0461-P0463 |
| P0462 | Displays and Gauges - DTC P0461-P0463 |
| P0463 | Displays and Gauges - DTC P0461-P0463 |
| P0480 | Engine Heating and Cooling - DTC P0480 or P0481 |
| P0481 | Engine Heating and Cooling - DTC P0480 or P0481 |
| P0489 | Engine Controls and Fuel - 1.0L Diesel - DTC P0403, P0489, or P0490 |
| P0490 | Engine Controls and Fuel - 1.0L Diesel - DTC P0403, P0489, or P0490 |
| P0501 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0501 or P0502 |
| P0502 | Manual Transmission - Y4A/Y4M - DTC P0502 or P0503 |
| P0502 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0501 or P0502 |
| P0503 | Manual Transmission - Y4A/Y4M - DTC P0502 or P0503 |
| P0506 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0506 or P0507 |
| P0507 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0506 or P0507 |
| P0511 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0511 |
| P0537 | HVAC - Manual - DTC P0537 or P0538 |
| P0538 | HVAC - Manual - DTC P0537 or P0538 |
| P0560 | 12 V Starting and Charging - LKY - DTC P0560, P0562, or P0563 |
| P0562 | 12 V Starting and Charging - DTC P0562 or P0563 |
| P0562 | 12 V Starting and Charging - LKY - DTC P0560, P0562, or P0563 |
| P0563 | 12 V Starting and Charging - DTC P0562 or P0563 |
| P0563 | 12 V Starting and Charging - LKY - DTC P0560, P0562, or P0563 |
| P0601 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - LMT, LMU with FX3 - DTC P0601, P0602, P0604-P0607, P060A-P060D, P061A, or P2610 |
| P0602 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0601, P0602, P0604-P0607, P060A-P060D, P061A, or P2610 |
| P0604 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - LMT, LMU with FX3 - DTC P0601, P0602, P0604-P0607, P060A-P060D, P061A, or P2610 |
| P0605 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - LMT, LMU with FX3 - DTC P0601, P0602, P0604-P0607, P060A-P060D, P061A, or P2610 |
| P0606 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0601, P0602, P0604-P0607, P060A-P060D, P061A, or P2610 |
| P0607 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0601, P0602, P0604-P0607, P060A-P060D, P061A, or P2610 |
| P060A | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0601, P0602, P0604-P0607, P060A-P060D, P061A, or P2610 |
| P060B | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0601, P0602, P0604-P0607, P060A-P060D, P061A, or P2610 |
| P060C | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0601, P0602, P0604-P0607, P060A-P060D, P061A, or P2610 |
| P060D | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0601, P0602, P0604-P0607, P060A-P060D, P061A, or P2610 |
| P061A | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0601, P0602, P0604-P0607, P060A-P060D, P061A, or P2610 |
| P0627 | Engine Controls and Fuel - 1.0L Diesel - DTC P0627-P0629 |
| P0627 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0627-P0629 |
| P0628 | Engine Controls and Fuel - 1.0L Diesel - DTC P0627-P0629 |
| P0628 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - LKY - DTC P0627-P0629 |
| P0628 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - LMT, LMU - DTC P0628 or P0629 |
| P0629 | Engine Controls and Fuel - 1.0L Diesel - DTC P0627-P0629 |
| P0629 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - LKY - DTC P0627-P0629 |
| P0629 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - LMT, LMU - DTC P0628 or P0629 |
| P062A | Engine Controls and Fuel - 1.0L Diesel - DTC P062A |
| P062D | Engine Controls and Fuel - 1.0L Diesel - DTC P062D or P062E |
| P062E | Engine Controls and Fuel - 1.0L Diesel - DTC P062D or P062E |
| P0641 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0641, P0651, or P0697 |
| P0642 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0642, P0643, P0652, or P0653 |

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| DTC | Diagnostic Procedure |
|---|---|
| P0643 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0642, P0643, P0652, or P0653 |
| P0646 | HVAC - Manual - DTC P0646 or P0647 |
| P0647 | HVAC - Manual - DTC P0646 or P0647 |
| P064C | Engine Controls and Fuel - 1.0L Diesel - DTC P064C |
| P0650 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - LMT, LMU - DTC P0650 |
| P0650 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - LKY - DTC P0650, P263A, or P263B |
| P0651 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0641, P0651, or P0697 |
| P0652 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0642, P0643, P0652, or P0653 |
| P0653 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0642, P0643, P0652, or P0653 |
| P0656 | Displays and Gauges - DTC P0656 |
| P066A | Engine Controls and Fuel - 1.0L Diesel - DTC P066A, P066C, or P066E |
| P066C | Engine Controls and Fuel - 1.0L Diesel - DTC P066A, P066C, or P066E |
| P066E | Engine Controls and Fuel - 1.0L Diesel - DTC P066A, P066C, or P066E |
| P0671 | Engine Controls and Fuel - 1.0L Diesel - DTC P0671-P0673 |
| P0672 | Engine Controls and Fuel - 1.0L Diesel - DTC P0671-P0673 |
| P0673 | Engine Controls and Fuel - 1.0L Diesel - DTC P0671-P0673 |
| P0674 | Engine Controls and Fuel - 1.0L Diesel - DTC P0671-P0673 |
| P067A | Engine Controls and Fuel - 1.0L Diesel - DTC P066A, P066C, or P066E |
| P0685 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0685, P0686, or P0687 |
| P0686 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0685, P0686, or P0687 |
| P0687 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - LL0 - DTC P0687, P0689, P0690, or P1682 |
| P0687 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - LKY - DTC P0685, P0686, or P0687 |
| P0689 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0687, P0689, P0690, or P1682 |
| P0690 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0687, P0689, P0690, or P1682 |
| P0697 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0641, P0651, or P0697 |
| P0700 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0700 |
| P0705 | Automatic Transmission - Jatco - DTC P0705 |
| P0710 | Automatic Transmission - Jatco - DTC P0710 |
| P0715 | Automatic Transmission - Jatco - DTC P0715 |
| P0720 | Automatic Transmission - Jatco - DTC P0720 |
| P0731 | Automatic Transmission - Jatco - DTC P0731-P0734 |
| P0732 | Automatic Transmission - Jatco - DTC P0731-P0734 |
| P0733 | Automatic Transmission - Jatco - DTC P0731-P0734 |
| P0734 | Automatic Transmission - Jatco - DTC P0731-P0734 |
| P0740 | Automatic Transmission - Jatco - DTC P0740 |
| P0748 | Automatic Transmission - Jatco - DTC P0748 |
| P0753 | Automatic Transmission - Jatco - DTC P0753 |
| P0758 | Automatic Transmission - Jatco - DTC P0758 |
| P1325 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P1325 |
| P1391 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P1391 |
| P1409 | Engine Controls and Fuel - 1.0L Diesel - DTC P1409 |
| P1648 | Immobilizer - DTC P1648 |
| P1668 | Engine Electrical - DTC P1668 |
| P1682 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0687, P0689, P0690, or P1682 |
| P174A | Automatic Transmission - Jatco - DTC P174A |
| P2009 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P2009 or P2010 |
| P2010 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P2009 or P2010 |
| P2101 | Engine Controls and Fuel - 1.0L Diesel - DTC P2101<br><br>Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P2101 or P2119 |
| P2104 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P2104-P2106 or P2110 |
| P2105 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P2104-P2106 or P2110 |
| P2106 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P2104-P2106 or P2110 |

| DTC | Diagnostic Procedure |
|---|---|
| P2110 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P2104-P2106 or P2110 |
| P2119 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P2101 or P2119 |
| P2122 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P2122, P2123, P2127, P2128, or P2138 |
| P2123 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P2122, P2123, P2127, P2128, or P2138 |
| P2127 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P2122, P2123, P2127, P2128, or P2138 |
| P2128 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P2122, P2123, P2127, P2128, or P2138 |
| P2135 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - LKY - DTC P0121-P0123, P0221-P0223, or P2135 |
| P2135 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - LMT, LMU with FX3 - DTC P0122, P0123, P0222, P0223, or P2135 |
| P2138 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P2122, P2123, P2127, P2128, or P2138 |
| P2184 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P2184 or P2185 |
| P2185 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P2184 or P2185 |
| P2263 | Engine Controls and Fuel - 1.0L Diesel - DTC P2263 |
| P2265 | Engine Controls and Fuel - 1.0L Diesel - DTC P2265 |
| P2270 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0133, P013A, P013B, P013E, P013F, P015A, P015B, P2270, or P2271 |
| P2271 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0133, P013A, P013B, P013E, P013F, P015A, P015B, P2270, or P2271 |
| P2300 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P2300, P2301, P2303, P2304, P2306, P2307, P2309, or P2310 |
| P2301 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P2300, P2301, P2303, P2304, P2306, P2307, P2309, or P2310 |
| P2303 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P2300, P2301, P2303, P2304, P2306, P2307, P2309, or P2310 |
| P2304 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P2300, P2301, P2303, P2304, P2306, P2307, P2309, or P2310 |
| P2306 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P2300, P2301, P2303, P2304, P2306, P2307, P2309, or P2310 |
| P2307 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P2300, P2301, P2303, P2304, P2306, P2307, P2309, or P2310 |
| P2309 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P2300, P2301, P2303, P2304, P2306, P2307, P2309, or P2310 |
| P2310 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P2300, P2301, P2303, P2304, P2306, P2307, P2309, or P2310 |
| P2413 | Engine Controls and Fuel - 1.0L Diesel - DTC P2413 |
| P245A | Engine Controls and Fuel - 1.0L Diesel - DTC P245A-P245D |
| P245B | Engine Controls and Fuel - 1.0L Diesel - DTC P245A-P245D |
| P245C | Engine Controls and Fuel - 1.0L Diesel - DTC P245A-P245D |
| P245D | Engine Controls and Fuel - 1.0L Diesel - DTC P245A-P245D |
| P2610 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0601, P0602, P0604-P0607, P060A-P060D, P061A, or P2610 |
| P263A | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0650, P263A, or P263B |
| P263B | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0650, P263A, or P263B |
| P2687 | Engine Controls and Fuel - 1.0L Diesel - DTC P2687-P2689 |
| P2688 | Engine Controls and Fuel - 1.0L Diesel - DTC P2687-P2689 |
| P2689 | Engine Controls and Fuel - 1.0L Diesel - DTC P2687-P2689 |
| P268C | Engine Controls and Fuel - 1.0L Diesel - DTC P268C-P268E |
| P268D | Engine Controls and Fuel - 1.0L Diesel - DTC P268C-P268E |
| P268E | Engine Controls and Fuel - 1.0L Diesel - DTC P268C-P268E |
| P2A00 | Engine Controls and Fuel - 1.0L, 1.19L, or 1.2L - DTC P0131, P0132, P0134, P0137, P0138, P0140, or P2A00 |
| U0001 | Data Communications - DTC U0001 |
| U0073 | Data Communications - DTC U0073 |
| U0100-U02FF | Data Communications - DTC U0100-U02FF |
| U1001-U1254 | Data Communications - DTC U1001-U1254 |

1. **DIAGNOSTIC OVERVIEW, STARTING POINT, AND PROGRAMMING**
2. VEHICLE DIAGNOSTIC INFORMATION
3. DIAGNOSTIC INFORMATION AND PROCEDURES
4.

## Symptom Byte List

| Symptom Byte | Symptom Byte Description | Symptom Byte Definition |
|---|---|---|
| **(00â€“0F) General Electrical Failures**<br><br>This category includes standard wiring failure modes (for example, shorts and opens), direct current (DC) quantities related by Ohmâ€™s Law and quantities related to amplitude, frequency or rate of change, and wave shape. | | |
| 00 | â€” | 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. |
| 08 | Performance â€“ 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. |
| **(10â€“1F) Additional General Electrical Failures**<br><br>This category includes the overflow from category 0. | | |
| 10 | â€” | 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 | Performance â€“ Signal Rising Time Failure | This sub type is used for failures where the signal rise time is outside a specified range. |
| 16 | Performance â€“ Signal Falling Time Failure | This sub type is used for failures where the signal fall time is outside a specified range. |
| 17 | Performance â€“ 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.) |

| Symptom Byte | Symptom Byte Description | Symptom Byte Definition |
|---|---|---|
| 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 â€“ 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 | â€” | Currently not used. |
| 1D | â€” | Currently not used. |
| 1E | â€” | 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. |
| **(20â€“2F) FM / PWM Failures**<br><br>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 | â€” | 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. |
| 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 | â€” | Currently not used. |
| 2D | â€” | Currently not used. |
| 2E | â€” | Currently not used. |
| 2F | â€” | Currently not used. |
| **(30â€“3F) Electronic Control Unit Internal Failures**<br><br>This category includes faults related to memory, software, and internal electrical circuitry; requiring component replacement. | | |
| 30 | â€” | 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. |

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| Symptom Byte | Symptom Byte Description | Symptom Byte Definition |
|---|---|---|
| 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. |
| 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 | â€” | Currently not used. |
| 3E | â€” | Currently not used. |
| 3F | â€” | Currently not used. |
| **(40â€“4F) Electronic Control Unit Programming Failures**<br><br>This category includes faults related to operational software, calibrations, and options; remedied by programming the Electronic Control Unit. | | |
| 40 | â€” | 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 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 | â€” | Currently not used. |
| 4F | â€” | Currently not used. |
| **(50â€“5F) Algorithm Based Failures**<br><br>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 | â€” | Currently not used. |
| 51 | â€” | Currently not used. |
| 52 | â€” | 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. |

| Symptom Byte | Symptom Byte Description | Symptom Byte Definition |
|---|---|---|
| | | |
| 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. |
| 57 | â€” | 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 | â€” | Currently not used. |
| 5C | â€” | Currently not used. |
| 5D | â€” | Currently not used. |
| 5E | â€” | Currently not used. |
| 5F | â€” | Currently not used. |
| **(60â€“6F) Mechanical Failures**<br><br>This category includes faults detected by inappropriate motion in response to an Electronic Control Unit controlled output. | | |
| 60 | â€” | 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. |
| 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 90Â°. |
| 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 | â€” | Currently not used. |
| 69 | â€” | Currently not used. |
| 6A | â€” | Currently not used. |
| 6B | â€” | Currently not used. |
| 6C | â€” | Currently not used. |
| 6D | â€” | Currently not used. |
| 6E | â€” | Currently not used. |
| 6F | â€” | Currently not used. |
| **(70â€“7F) Bus Signal / Message Failures**<br><br>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 | â€” | 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 | â€” | Currently not used. |
| 78 | â€” | Currently not used. |
| 79 | â€” | Currently not used. |
| 7A | â€” | Currently not used. |
| 7B | â€” | Currently not used. |
| 7C | â€” | Currently not used. |
| 7D | â€” | Currently not used. |
| 7E | â€” | 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. |
| **(80â€“FF) Reserved**<br>Unique System Specific â€“ See specific diagnostic procedures for symptom byte information if these symptom bytes are used. | | |

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## 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

### Driveline/Axle

Symptoms - Wheel Drive Shafts

### Driver Information and Entertainment

- Symptoms - Displays and Gauges
- Symptoms - Entertainment

### Engine

- Symptoms - Engine Controls.
- Symptoms - Engine Cooling
- Symptoms - Engine Electrical
- Symptoms - Engine Exhaust
- Symptoms - Engine Mechanical.

### General Information

Symptoms - Squeaks and Rattles

### HVAC

Symptoms - HVAC Systems - Manual

### Power and Signal Distribution

- Symptoms - Data Communications
- Symptoms - Power Outlets

### Safety and Security

- Symptoms - Keyless Entry
- Symptoms - Object Detection

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- Symptoms - Seat Belts
- Symptoms - SIR
- Symptoms - Theft Deterrent

### Steering

- Symptoms - Manual Steering Gear
- Symptoms - Power Steering System
- Symptoms - Steering Wheel and Column

### Suspension

Symptoms - Suspension General Diagnosis

### Transmission

- Symptoms - Automatic Transmission
- Symptoms - Clutch
- Symptoms - Manual Transmission

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## 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

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## Engine Cranks But Does Not Run

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

Engine Cranks But Does Not Run

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## Diagnostic Repair Verification

1. Install any components or connectors that have been removed or replaced during diagnosis.
2. Perform any adjustment, programming or setup procedures that are required when a component or module is removed or replaced.
3. Clear the DTCs.
4. Turn OFF the ignition for 60â€‰seconds.
5. 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 reset. If the DTC resets or another DTC is present, refer to the Diagnostic Trouble Code (DTC) List - Vehicle and perform the appropriate diagnostic procedure.
6. 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.

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Specifications

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## K17 Electronic Brake Control Module: Scan Tool Information

The electronic brake control module (EBCM) 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 Voltage | â€” | 0 V | The scan tool displays the pump motor voltage. |
| Antilock Braking System | â€” | OK | The scan tool displays OK or Malfunction. Malfunction is displayed when the ABS is defective. |
| Brake Fluid Level Sensor | â€” | Panic Brake Assist Status | The scan tool displays OK when the brake fluid is at correct level and Low when the brake fluid is low. |
| Brake Pedal Position Sensor | 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 | Brake pedal released | 0â€“1 V | The scan tool displays 0â€“5 V depending on the applied hydraulic brake pressure. |
| | Brake pedal applied | 1â€“5 V | |
| Dynamic Rear Proportioning Status | â€” | OK | The scan tool displays OK or Malfunction. Malfunction is displayed when the dynamic rear proportioning system is defective. |
| Left Front Inlet Solenoid Valve Feedback | â€” | 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 | â€” | 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 | â€” | 0 km/h | The scan tool displays km/h depending on the current speed of the left front wheel speed sensor. |
| Left Rear Inlet Solenoid Valve Feedback | â€” | Inactive | The scan tool displays Inactive or Active. Active is displayed when the left rear inlet solenoid valve is commanded ON. |
| Left Rear Outlet Solenoid Valve Feedback | â€” | 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 | â€” | 0 km/h | The scan tool displays km/h depending on the current speed of the left rear wheel speed sensor. |
| Panic Brake Assist Status | â€” | OK | The scan tool displays OK or Malfunction. Malfunction is displayed when the panic brake assist system is defective. |
| Pump Motor Relay Feedback | â€” | Inactive | The scan tool displays Inactive or Active. Active is displayed when the pump motor is commanded ON. |
| Primary Isolation Solenoid Valve Feedback | â€” | Inactive | The scan tool displays Inactive or Active. Active is displayed when the isolation solenoid valve is commanded ON. |
| Primary Prime Solenoid Valve Feedback | â€” | Inactive | The scan tool displays Inactive or Active. Active is displayed when the prime solenoid valve is commanded ON. |
| Right Front Inlet Solenoid Valve Feedback | â€” | 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 | â€” | 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 | â€” | 0 km/h | The scan tool displays km/h depending on the current speed of the right front wheel speed sensor. |
| Right Rear Inlet Solenoid Valve Feedback | â€” | 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 | â€” | Inactive | The scan tool displays Inactive or Active. Active is displayed when the right rear outlet solenoid valve is commanded ON. |

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| Parameter | System State | Expected Value | Description |
|---|---|---|---|
| Right Rear Wheel Speed Sensor | â€” | 0 km/h | The scan tool displays km/h depending on the current speed of the right rear wheel speed sensor. |
| Secondary Isolation Solenoid Valve Feedback | â€” | Inactive | The scan tool displays Inactive or Active. Active is displayed when the isolation solenoid valve is commanded ON. |
| Secondary Prime Solenoid Valve Feedback | â€” | Inactive | The scan tool displays Inactive or Active. Active is displayed when the prime solenoid valve is commanded ON. |
| Steering Wheel Angle | â€” | Varies | The scan tool displays Â°. This is the current position of the steering angle sensor. |
| System Voltage | â€” | 11â€“14 V | The scan tool displays V. This is the current battery voltage. |
| Traction Control System | â€” | OK | The scan tool displays OK or Malfunction. Malfunction is displayed when the traction control system is defective. |
| Vehicle Stability Enhancement System Relay Feedback | â€” | Inactive | The scan tool displays Inactive or Active depending on the state of the stability control. |
| Vehicle Stability Enhancement System Switch | Traction control switch released | Active | The scan tool displays Active or Inactive depending on the status of the TCS/ESC switch. |
| | Traction control switch pressed | Inactive | |
| Vehicle Stability System | â€” | OK | The scan tool displays OK or Malfunction. Malfunction is displayed when the vehicle stability enhancement system is defective. |

Electronic Brake Control Module Scan Tool Output Controls

| Output Control | Description |
|---|---|
| ABS Pump Motor | Commands the ABS pump motor Increase or Decrease. |
| Front Traction Control Isolation Valve | Commands the solenoid valve ON or OFF. |
| Front Traction Control Prime Valve | Commands the solenoid valve ON or OFF. |
| Left Front ABS Solenoid Valves | Commands the solenoid valves ON or OFF. |
| Left Rear ABS Solenoid Valves | Commands the solenoid valves ON or OFF. |
| Rear Traction Control Isolation Valve | Commands the solenoid valve ON or OFF. |
| Rear Traction Control Prime Valve | Commands the solenoid valve ON or OFF. |
| Right Front ABS Solenoid Valves | Commands the solenoid valves ON or OFF. |
| Right Rear ABS Solenoid Valves | Commands the solenoid valves ON or OFF. |

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## K20 Engine Control Module: Scan Tool Information

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.<br><br>**Base Operating Conditions:** Engine Idling/Radiator Hose Hot/Park or Neutral/Closed Loop | | | |
| 5â€‰V Reference 1, 2, 3, 4 or 5 | Engine Idling | 5â€‰Volts | This parameter displays the voltage sensed on the 5â€‰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. |
| 5â€‰V Reference 1, 2, 3, 4 or 5 Circuit Status | Engine Idling | OK | This parameter will display OK if the circuit is good or Malfunction if a short to ground, short to B+ is present. |
| A/C Compressor Clutch Inhibit Reason History 1 or 2 | Ignition ON | None | This parameter displays one of the following if an A/C Compressor Clutch Inhibit reasons is detected. High Side Fluid Pressure, Engine Speed, Battery Voltage, Engine Stall, Engine Speed Stabilization, Wide Open Throttle, Vehicle Launch Performance, High Coolant Temperature, AC Relay Fault, Hybrid Request, AutoStop Request, High Power Electronics Coolant Temperature, High Transmission Fluid Temperature, Full Pedal Power Limit Applied, Airbag deployed, Battery Power Limit Exceeded, Powertrain Diagnostics, AC Compressor Fault, Serial Communication Fault, or Low Brake Vacuum. |
| A/C Compressor Clutch Relay Command | Engine Idling | Off | This parameter displays when the A/C Compressor Clutch relay is commanded ON or OFF. |
| A/C Compressor Clutch Relay Control Circuit High Voltage Test Status | Engine Idling | OK | This parameter displays the status of the relay control circuit. It can display OK, Malfunction or Not Run. |
| A/C Compressor Clutch Relay Control Circuit Low Voltage Test Status | Engine Idling | OK | This parameter displays the status of the relay control circuit. It can display OK, Malfunction or Not Run. |
| A/C Compressor Clutch Relay Control Circuit Open Test Status | Engine Idling | OK | This parameter displays the status of the relay control circuit. It can display OK, Malfunction or Not Run. |
| A/C Disabled â€“ 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 1â€“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 | 0.75â€“1.5â€‰Volts* | This parameter displays the voltage signal from the A/C high side pressure sensor input to the control module.<br><br>* Varies with temperature, humidity, and altitude. |
| | A/C ON | 1.3â€“2.5â€‰Volts* | |
| A/C High Side Pressure Sensor | A/C OFF | 450â€“827â€‰kPa (65â€“120â€‰psi)* | This parameter displays the pressure from the A/C high side pressure sensor signal circuit to the control module.<br><br>* Varies with temperature, humidity, and altitude. |
| | A/C ON | 827â€“2,350â€‰kPa (120â€“341â€‰psi)* | |

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| Parameter | System State | Expected Value | Description |
|---|---|---|---|
| A/C OFF for WOT | A/C ON | No | This parameter displays whether the control module is commanding the A/C compressor clutch relay OFF for wide open throttle (WOT). |
| A/C Request Signal | A/C ON | No | This parameter displays the state of the A/C request input to the control module from the heating, ventilation, and air conditioning (HVAC) controls. |
| Accelerator Pedal Position | Engine Idling | 0â€“100â€‰% | 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. |
| Active Grille Air Shutter Ambient Air Temperature | Ignition ON | ÂºC (ÂºF) | This parameter displays the temperature detected and used by the Active Air Shutter system. |
| Active Grille Air Shutter Control | Ignition ON | Active / Inactive | This parameter indicates if the Active Grille Air Shutter Control is Active or Inactive. |
| Active Grille Air Shutter Control Status | Ignition ON | ON/OFF | This parameter displays the control status of the active air shutter. |
| Active Grille Air Shutter Desired Position Achieved | Ignition ON | Yes / No | This parameter indicates if the Active Grille Air Shutter Desired Position is Achieved. |
| Active Grille Air Shutter Diagnostic Control | Ignition ON | Active / Inactive | This parameter indicates if the control system is attempting to move the Active Grille Air Shutter for diagnostic purposes. Displays Active or Inactive. |
| Active Grille Air Shutter Ice Protection Mode | Ignition ON | Active / Inactive | This parameter indicates whether or not the Shutter control algorithm is in Ice Mode, which attempts to park the shutter and prohibit further operation. Displays Active or Inactive. |
| Active Grille Air Shutter Initialization Status | Ignition ON | Complete / Incomplete | This parameter displays the initialization status of the Active Grille Air Shutter. |
| Active Grille Air Shutter Position | Ignition ON | % | This parameter displays the position of the active grill air shutter. 0% = fully closed, 100% = fully open. |
| Active Grille Air Shutter Status | Ignition ON | Moving / Stationary | This parameter indicates if the Active Grille Air Shutter is Moving or Stationary. |
| Active Grille Air Shutter Supply Voltage | Ignition ON | Volts | This parameter indicates the Active Grille Air Shutter Supply Voltage. |
| Active Grille Air Shutter Torque Command | Ignition ON | Counts | This parameter displays the commanded torque level for the active air shutter. 0 = Nominal Torque. |
| Air/Fuel Equivalence Ratio Command | Engine Idling | Varies:1 | This parameter should display 1.0 when in Closed Loop fuel control. |
| Alternative Fuel Injector 1, 2, 3, 4, 5, 6, 7 or 8 Command | Ignition ON | On / Off | This parameter contains the commanded state of the alternative fuel injector 1 output (the output is considered to be commanded on if the injector is enabled while the engine is running or cranking). |
| Alternative Fuel Injector 1 Control Circuit High Voltage Test Status | Ignition ON | OK, Malfunction, Not Run | This parameter displays the state of the Alternative Fuel Injector 1 control circuit. The parameter displays Malfunction if the Alternative Fuel Injector 1 control circuit is shorted to voltage. |
| Alternative Fuel Injector 1 Control Circuit Low Voltage Test Status | Ignition ON | OK, Malfunction, Not Run | This parameter displays the state of the Alternative Fuel Injector 1 control circuit. The parameter displays Malfunction if the Alternative Fuel Injector 1 control circuit is shorted to ground. |
| Alternative Fuel Injector Pulse Width Bank 1 | Ignition ON | ms | This parameter displays the alternative fuel injector pulse width (on time) commanded to each cylinder on bank 1. |

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| Parameter | System State | Expected Value | Description |
|---|---|---|---|
| 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 â^' 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 â€˜undefaultedâ€™ 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 | Â°C (Â°F) | This parameter displays the undefaulted alternative fuel rail temperature measured by a sensor. Range is â^'40 to 215Â°C. |
| Alternative Fuel Shutoff Valve 1 or 2 Control Circuit Command | Ignition ON | On / Off | This parameter displays the commanded state of the alternative fuel shutoff valve 1 output (the output is considered to be commanded on if the shutoff valve is enabled while the engine is running or cranking). |
| Alternative Fuel Shutoff Valve 1 or 2 Control Circuit High Voltage Test Status | Ignition ON | OK, Malfunction, Not Run | This parameter displays the state of the Alternative Fuel Shutoff Valve 1 or 2 control circuit. The parameter displays Malfunction if the Alternative Fuel Shutoff Valve is shorted to voltage. |
| Alternative Fuel Tank Pressure | Ignition ON | Volts | This parameter displays the alternative fuel tank pressure sensor analog input as a percentage of its reference voltage. |
| Ambient Air Temperature | Engine Idling | Varies | This parameter displays temperature from the input of the Intake Air Temperature Sensor. |
| Ambient Air Temperature | Ignition ON | Â°C (Â°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 | â€” | Â°C (Â°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 Sensorâ€‰1 | Accelerator pedal not actuated | 0.98â€‰Volts | This parameter displays the actual voltage on the accelerator pedal position (APP) sensorâ€‰1 signal circuit as measured by the control module. |
| | Accelerator pedal fully actuated | 4.25â€‰Volts | |
| APP Sensorâ€‰1 and 2 | Ignition ON | Agree | This parameter displays Disagree if the control module detects the signal voltage from APP sensor 1 is not in correct relationship to APP sensor 2. The scan tool displays Agree under the normal operating conditions. |
| APP Sensor 1 Circuit Status | Engine Idling | OK | APP Sensor 1 Out of Range indicates that the sensed accelerator pedal positionâ€‰1 sensor value is currently out of range or that a Malfunction has been detected based upon the sensed accelerator pedal positionâ€‰1 sensor value being out of range |
| APP Sensorâ€‰1 Learned Applied Position | Ignition ON | 78â€‰% | 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 sensorâ€‰1. |

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| Parameter | System State | Expected Value | Description |
|---|---|---|---|
| APP Sensorâ€‰1 Learned Released Position | Ignition ON | 0.98â€‰Volts | This parameter indicates the accelerator pedal sensorâ€‰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 Sensorâ€‰1 Position | Pedal Released | 0â€‰% | This parameter contains the displacement determined from accelerator pedal position sensorâ€‰1 (corrected and normalized based upon its learned minimum and maximum positions). |
| | Pedal Fully Applied | 99â€‰% | |
| APP Sensorâ€‰2 | Ignition ON | Volts | This parameter contains the accelerator pedal position sensorâ€‰2 analog input as a percentage of its reference voltage |
| APP Sensorâ€‰2 | Accelerator pedal not actuated | 0.49â€‰Volts | This parameter displays the actual voltage on the accelerator pedal position (APP) sensorâ€‰2 signal circuit as measured by the control module. |
| | Accelerator pedal fully actuated | 2.14â€‰Volts | |
| APP Sensor 2 Circuit Status | Ignition ON | OK | APP Sensor 2 Out of Range indicates that the sensed accelerator pedal position 2 sensor value is currently out of range or that a malfunction has been detected (and latched) based upon the sensed accelerator pedal position 2 sensor value being out of range |
| APP Sensor 2 Learned Applied Position | Ignition ON | 78â€‰% | 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 | 0.49â€‰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 | 0â€‰% | This parameter contains the displacement determined from accelerator pedal position sensor 2 (corrected and normalized based upon its learned minimum and maximum positions). |
| | Pedal Fully Applied | 100â€‰% | |
| APP Sensors | Pedal Released | 0â€‰% | 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 | 99â€‰% | |
| Autostop/Autostart Disable Mode | â€” | Active | This parameter displays â€œActiveâ€ when all conditions for allowing the autostop/autostart mode are present (no inhibit conditions exist), this parameter displays "Inactive" when all conditions for allowing the autostop/autostart mode are not present. |
| Autostart Inhibit Reason Autostop/Autostart Malfunction | Engine Idling | No | This parameter displays that a immediate stop was commanded due to a Autostop/Autostart malfunction. |
| Autostart Inhibit Reason | Engine Idling | No | The scan tool displays Yes if one of the following Autostart Inhibit Reason is detected. Control Function Active, Crank Abort, Driver Exited Vehicle, ECM Malfunction, ECM Request, Engine Coolant Temperature Out of Range, Hood Ajar, Hybrid/EV Power Conditions, Hybrid/EV Battery Pack Contactor Open, Hybrid/EV Battery Pack Power Low, Hybrid/EV Battery Pack State of Charge Low, Hybrid/EV Battery Pack Voltage Low, Hybrid/EV Propulsion System Inactive, Not Commanded, Run/Crank Not Active, System Malfunction, Transmission Range. |

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| Parameter | System State | Expected Value | Description |
|---|---|---|---|
| Autostart Reason | Engine Idling | No | This parameter displays Yes if one of the following Autostart Reason is detected. A/C Request, Acceleration Request, Accelerator Pedal Pressed, Auxiliary Transmission Fluid Pump Not Available, Brake Booster Weak Vacuum, Brake Pedal Released, Clutch Pedal Applied, Control Function Active, Drive Motor Inverter Temperature High, Drive Motor Temperature High, Driver Exited Vehicle, ECM Request, Engine Coolant Temperature Out of Range, Hood Ajar, Hybrid/EV Battery Module Voltage Low, Hybrid/EV Battery Pack Power Low, Hybrid/EV Battery Pack State of Charge Low, Hybrid/EV Battery Pack Temperature, Hybrid/EV Battery Pack Voltage Low, Hybrid/EV Propulsion System Inactive, Ignition Switch Start, Inclination, Invalid Data Received, Low Voltage Battery Discharge Current High, Low Voltage Battery State of Function Low, Low Voltage Battery State of Health Low, Low Voltage Battery Voltage Low, Maximum Autostop Time Exceeded, Minimum Engine Run Time Not met, Reduced Engine Power Active, Remote Vehicle Start Request, Stop/Start Select Switch, System Malfunction, System Optimization, System Voltage Low, TCM Demand, Tow/Haul Mode Switch ON, Transmission Fluid Temperature Out of Range, Transmission In Reverse, Transmission Range, Vehicle Speed Too High. |
| Autostop Disable Reason | Engine Idling | No | The scan tool displays Yes if one of the following Autostop Disable Reason is detected. 12 V Start Counter Exceeded, A/C Request, Acceleration Request, Accelerator Pedal Pressed, Auxiliary Transmission Fluid Pump Not Available, Brake Booster Weak Vacuum, Brake Pedal Released, Clutch Pedal Applied, Control Function Active, Drive Motor Inverter Temperature High, Drive Motor Temperature High, ECM Request, Engine Coolant Temperature Out of range, Engine Speed High, Generator Load High, Hood Ajar Hybrid/EV Battery Module Voltage Low, Hybrid/EV Battery Pack Power Low, Hybrid/EV Battery Pack State of Charge Low, Hybrid/EV Battery Pack Temperature, Hybrid/EV Battery Pack Voltage Low, Hybrid/EV Propulsion System Inactive, Idle Boost Mode Active, Ignition 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. |
| Auxiliary Coolant Pump Relay Command | Ignition ON | On / Off | This parameter displays the command status of the Auxiliary Coolant Pump Relay. |
| Auxiliary Coolant Pump Relay Control Circuit High Voltage Test Status | Ignition ON | OK, Malfunction, Not Run | This parameter displays the status of the Auxiliary Coolant Pump Relay Control Circuit High Voltage Test. Can display OK, Malfunction, or Not Run. |

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| Parameter | System State | Expected Value | Description |
|---|---|---|---|
| Auxiliary Coolant Pump Relay Control Circuit Low Voltage Test Status | Ignition ON | OK, Malfunction, Not Run | This parameter displays the status of the Auxiliary Coolant Pump Relay Control Circuit Low Voltage Test. Can display OK, Malfunction, or Not Run. |
| Auxiliary Coolant Pump Relay Control Circuit Open Test Status | Ignition ON | OK, Malfunction, Not Run | This parameter displays the status of the Auxiliary Coolant Pump Relay Control Circuit Open Circuit Test. Can display OK, Malfunction, or Not Run. |
| Average Fuel Age | Ignition ON | Days | This parameter displays the average fuel age in days. |
| Axle Torque | Engine Idling | 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. |
| Axle Torque Command | Ignition ON | N-m (lb ft) | This parameter displays the commanded Axle Torque value. |
| BARO | Engine Idling | 65â€“104â€‰kPa (8â€“16â€‰psi) | This parameter displays the barometric pressure. The control module uses the barometric pressure sensor input for fuel control to compensate for altitude differences. |
| BARO Sensor | Engine Idling | 2.5â€“4.0â€‰Volts | This parameter displays the barometric pressure sensor voltage. |
| Barometric Pressure Sensor Bank 1 | Ignition ON | kPa (PSI) | This parameter displays the ambient air pressure. |
| Barometric Pressure Sensor Bank 2 | Ignition ON | Volts | This parameter displays the signal voltage of the barometric pressure sensor |
| Base Model Part Number | Ignition ON | # | This parameter displays information which is used during programming to identify unique combinations of hardware and software. |
| Battery Capacity | Ignition ON | Ah | This parameter displays the capacity of the battery in Amp-hours. |
| Battery Sensor Module Battery State Information | Ignition ON | Available / Not Available | This parameter indicates if Battery State Information is Available or Not Available. Battery State Information is Not Available when there is a battery drain such as a parasitic draw. |
| Battery Sensor Module Reset Occurred - Using Estimated State of Charge | Ignition ON | Yes / No | This parameter indicates if the current battery State of Charge is estimated. This occurs when the BSM has been reset. |
| Battery State of Charge | Ignition ON | % | This parameter displays the Battery State of Charge (SOC). SOC is a calculated value provided by an intelligent battery sensor (IBS). |
| Battery State of Health | Ignition ON | % | This parameter displays the Battery State of Health (SOH). SOH is a calculated value provided by an intelligent battery sensor (IBS). |
| Battery Type | Ignition ON | N/A | This parameter displays the battery type. |
| Battery Voltage | Ignition ON | Volts | This parameter displays the battery voltage. |
| Battery Voltage High Resolution | Ignition ON | Volts | This parameter displays the high resolution battery voltage value. |
| Boost Pressure | Engine Idling | kPa | This parameter shows the Turbocharger boost pressure in kPa. |
| Boost Pressure Sensor | Engine Idling | kPa | This parameter shows the Turbocharger boost pressure in kPa. |
| Boost Pressure Sensor | â€” | 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). |

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| Parameter | System State | Expected Value | Description |
|---|---|---|---|
| Brake Pedal Position Circuit Signal | â€” | 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. |
| 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<br><br>97.2â€‰kPa/14.1â€‰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<br><br>or<br><br>Calculated Catalyst Temperature Bankâ€‰1 or Bankâ€‰2 | Engine Idling | Approximately 552Â°C (1026Â°F) | This parameter contains the estimated catalyst temperature (as a function of engine speed, engine airflow, and fuel ethanol percentage) for use in the oxygen sensor and catalyst monitor diagnostic algorithms. |
| Calculated Engine Oil Pressure | Engine Idling | kPa (PSI) | This parameter displays the filtered value for the engine oil pressure. |
| Calculated Engine Oil Temperature | Engine Idling | 105Â°C (221Â°F) | This parameter displays the estimated engine oil temperature (as a function of engine coolant temperature and other parameters). |
| Calibration History Buffer | Ignition ON | Unlocked | This parameter displays locked when the buffer has been locked against further updates due to detection of a non-production calibration. |
| Calibration Verification Number Historyâ€‰1â€“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. |

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| Parameter | System State | Expected Value | Description |
|---|---|---|---|
| Camshaft Position Signal Output Circuit Open Test Status | Engine Idling | OK | This parameter displays the state of the Camshaft Position Signal Output Circuit. The parameter displays Malfunction if the Camshaft Position Signal Output Circuit is open. |
| Catalyst Monitor Complete | Engine Idling | Yes/No | This parameter indicates the status of the Catalyst. The scan tool displays YES when the diagnostic is complete. And NO if the diagnostic has not run, or a malfunction is detected in the catalyst. |
| Catalyst Monitor Complete This Ignition Cycle | Engine Idling | Yes/No | This parameter indicates the status of the catalyst monitor diagnostic. Catalyst Monitor Test Running indicates yes or no when the catalyst monitor diagnostic is actively running a test. |
| Catalyst Monitor Enabled | Engine Idling | Yes/No | The scan tool displays YES when the Catalyst Monitor is Enabled. If the scan tool displays NO this could indicate a malfunction in the Catalyst Monitor circuit. |
| Catalyst Monitor Enabled this Ignition Cycle | Engine Idling | Yes-No | This parameter displays the monitor enable status during the current driving/monitoring cycle. |
| Catalyst Monitor Not At Idle Test Conditions Met | Engine Idling | Yes/No | This parameter indicates the status of the catalyst monitor diagnostic. Catalyst Monitor Test Running indicates yes or no when the catalyst monitor diagnostic is actively running a test. |
| Catalyst Monitor Test Counter<br><br>or<br><br>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<br><br>or<br><br>Catalyst Monitor Test Result Bank 1 or 2 | Engine Idling | No Decision/Failed/Passed | This parameter indicates the status of the catalyst monitor diagnostic. Multiple tests may run before the diagnostic reports a â€œPassâ€ or â€œFailâ€ and will be tracked by Catalyst Monitor Diagnostic Test Counter. When this Parameter reports a â€œPassâ€ or â€œFailâ€, the diagnostic is complete for the current trip and will not attempt any further tests. |
| Catalyst Monitor Test State | Engine Idling | Active/Inactive | This parameter indicates the status of the catalyst monitor diagnostic by displaying active or inactive. This test will only run with the engine at idle. |
| Change Engine Oil Indicator Command | Ignition ON | Off | This parameter sends a signal through the serial communication to inform the driver to change the engine oil. It is based on a calibrated amount of time. |
| Charge Air Cooler Coolant Pump Relay Command | Ignition ON | Off | This parameter displays the commanded state of the intercooler pump relay command. |
| Charge Air Cooler Coolant Pump Relay Control Circuit High Voltage Test Status | Ignition ON | OK | This parameter displays the state of the charge air cooler coolant pump control circuit. The parameter displays Malfunction if the charge air cooler coolant pump control circuit is shorted to voltage. |
| Charge Air Cooler Coolant Pump Relay Control Circuit Low Voltage Test Status | Ignition ON | OK | This parameter displays the state of the charge air cooler coolant pump control circuit. The parameter displays Malfunction if the charge air cooler coolant pump control circuit is shorted to ground. |
| Charge Air Cooler Coolant Pump Relay Control Circuit Open Test Status | Ignition ON | OK | This parameter displays the state of the charge air cooler coolant pump control circuit. The parameter displays Malfunction if the charge air cooler coolant pump control circuit is open. |
| Clutch Pedal Starter Inhibit Switch (If Equipped) | Engine Idling | On | This parameter displays ON when the clutch pedal is released. |
| Clutch Pedal Switch (If Equipped) | Engine Idling | Released | This parameter displays the state of the clutch pedal as determined by the control module from the clutch pedal switch. |

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| Parameter | System State | Expected Value | Description |
|---|---|---|---|
| Cold Startup | Ignition ON | No | This parameter displays whether the engine meets the conditions for a cold startup during the present ignition cycle. The scan tool displays Yes when the conditions for a cold startup are met during the ignition cycle. The scan tool displays No when the conditions for a cold startup are not met during the present ignition cycle. Conditions for a cold startup require the coolant temperature and the intake air temperature to be below a predetermined temperature and within a certain range of each other. These conditions must occur after the engine was warmed up to a specific temperature during the previous ignition cycle. |
| Component Monitor Complete | Ignition ON | Yes/No | This parameter displays Yes when the Component Monitor is Complete. The engine control module looks at many input and output components to make this determination. If a malfunction is detected the scan tool will display No. |
| Component Monitor Enabled | Ignition ON | Yes/No | This parameter displays Yes when Component Monitor is Enabled. And No when it is not Enabled. |
| Component Monitor - This Ignition Cycle | Ignition ON | Disabled, Enabled, Complete | This parameter displays the status of the Component Monitor during this ignition cycle. Can display Disabled, Enabled, or Complete. |
| Cooling Fan Command | â€” | % | This parameter displays the amount of fan power commanded as a percentage of the total fan power available. |
| Cooling Fan Motor Command | â€” | % | This parameter displays the commanded duty cycle for the cooling fan. |
| Cooling Fan Control Circuit High Voltage Test Status | Ignition ON | OK, Malfunction, Not Run | This parameter displays the status of the Cooling Fan Control Circuit High Voltage Test. Can display OK, Malfunction, or Not Run. |
| Cooling Fan Control Circuit Low Voltage Test Status | Ignition ON | OK, Malfunction, Not Run | This parameter displays the status of the Cooling Fan Control Circuit Low Voltage Test. Can display OK, Malfunction, or Not Run. |
| Cooling Fan Control Circuit Open Test Status | Ignition ON | OK, Malfunction, Not Run | This parameter displays the status of the Cooling Fan Control Circuit Open Circuit Test. Can display OK, Malfunction, or Not Run. |
| Cooling Fan Relay 1 Command | Ignition ON | On | This parameter displays the commanded state of the fan relayâ€‰1 control circuit. The cooling fan relayâ€‰1 should be ON when the scan tool indicates the FC Relayâ€‰1 Command is ON. The cooling fan relayâ€‰1 should be OFF when the scan tool indicates the FC Relayâ€‰1` Command is OFF. |
| Cooling Fan Relays 2 and 3 Command | Ignition ON | On | This parameter displays the commanded state of the fan relay 2 output. |
| Cooling Fan Relay 1 Control Circuit Open Test Status | Ignition ON | OK | This parameter displays the state of the cooling fan relay control circuit. The parameter displays Malfunction if the cooling fan relay control circuit is open. |
| Cooling Fan Relay 1, or 2 and 3 Control Circuit High Voltage Test Status | Ignition ON | OK | This parameter displays the state of the cooling fan relay control circuit. The parameter displays Malfunction if the cooling fan relay control circuit is shorted to voltage. |
| Cooling Fan Relay 1, or 2 and 3 Control Circuit Low Voltage Test Status | Ignition ON | OK | This parameter displays the state of the cooling fan relay control circuit. The parameter displays Malfunction if the cooling fan relay control circuit is shorted to ground. |
| Cooling Fan Solenoid Valve Command | Ignition ON | % | This parameter displays the commanded duty cycle for the PWM fan system. |
| Cooling Fan Speed | Ignition ON | Varies | This parameter displays the current state of the cooling fan speed. (For example OFF, Low, Medium, or High) rather than rotational speed. |
| CPP Learn Status | Ignition ON | Learned | This parameter displays the status of the procedure used to learn the clutch pedal fully applied position. |

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| Parameter | System State | Expected Value | Description |
|---|---|---|---|
| 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 | 0â€“255â€‰Counts | This parameter displays an incrementing counter when the control module receives a signal from the crankshaft position sensor (CKP). |
| Crankshaft Position Learned Apply Position | Ignition ON | Volts | This parameter displays the position learned for the clutch pedal position (CPP) sensor when the clutch pedal is fully applied during the associated learn procedure. |
| Crankshaft Position Learned Release Position | Ignition ON | Volts | This parameter displays the position learned for the clutch pedal position sensor when the clutch pedal is released. |
| Crankshaft Position Resync Counter | Engine Idling | 0 Counts | This parameter displays the number of times the control module has to resynchronize with the CKP sensor. The parameter will begin to increment if the control module does not detect a CKP reference pulse. The parameter will reset to 0 after the ignition is switched OFF. |
| Crankshaft Position Sensor | Engine Idling | RPM | This parameter displays engine speed. |
| Crankshaft Position 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 displays Malfunction if the crankshaft position signal output circuit is shorted to ground. |
| Crankshaft Position Signal Output Circuit Open Test Status | Ignition ON | OK | This parameter displays the state of the crankshaft position signal output circuit. The parameter displays Malfunction if the crankshaft position signal output circuit is open. |
| Crankshaft Position Variation Learn | Ignition ON | Not Learned | This parameter displays if the crank angle learned this key cycle. |
| Crankshaft Position Variation Learn Attempts | Ignition ON | Counts | This parameter displays the number of attempts to learn the crank angle sensing error (CASE) during current key cycle. |
| Crankshaft Position Variation Learn Crank Pulse to Cylinder Count | Ignition ON | Counts | This parameter displays the number of attempts to learn the crank angle sensing error (CASE) during the current key cycle. |

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| Parameter | System State | Expected Value | Description |
|---|---|---|---|
| Crankshaft Position Variation Learn Crank Pulse to Cylinder Count | Ignition ON | Agree | This parameters displays the number of crank pulses observed over an engine cycle did not equal the number of cylinders for the engine at some point during the CASE learn cycle. |
| Crankshaft Position Variation Learn Cylinder Compensation Factors | Engine Running | In Range / Out Of Range | This parameter indicates if one or more compensation factors calculated for individual cylinders is out of range. |
| Crankshaft Position Variation Learn Data Collected | Ignition ON | Sufficient / Insufficient | This parameter indicates if the CASE learn algorighm has collected sufficient data. |
| Crankshaft Position Variation Learn Opposing Cylinder Compensation Factors | Ignition ON | In Range / Out Of Range | This parameter indicates if the difference in the compensation factors calculated for one or more pairs of opposing cylinders is out of range. |
| Crankshaft Position Variation Learn Reluctor Ring Tooth Spacing Factors | Ignition ON | In Range / Out Of Range | This parameter indicates if one or more of the compensation factors calculated for the individual tooth spacing is out of range. |
| Crankshaft Position Variation Learn Required Engine Speed | Ignition ON | In Range | This parameter displays that the engine speed required to complete the CASE learn process has not been achieved. |
| Crankshaft Position Variation Learn Status | Ignition ON | Complete | This parameter displays the status of the crank angle sensing error (CASE) learn algorithm. |
| Crankshaft Position Variation Learn Sum of Cylinder Compensation Factors | Ignition ON | In Range / Out Of Range | This parameter indicates if the sum of the compensation factors calculated for the individual cylinders is too large. |
| Cruise Control | Cruise ON | Active | This parameter displays the status of the cruise control system as determined by the control module. |
| Cruise Control Acceleration Switch | Ignition ON | Active, Inactive, Invalid | This parameter Indicates the state of the cruise control speed ACCEL switch. This signal is based upon the state of the cruise control speed ACCEL switch received over serial communication from the platform electronics. |
| Cruise Control Cancel Switch | Cruise ON | Inactive | This parameter displays the status of the cruise control cancel switch. |
| Cruise Control Switch 2 | Cruise ON | N/A | This parameter indicates the state of the secondary Cruise Control Switch. |
| Cruise Control Disengage 1-8 History | Cruise ON | Reason for Cruise Disengagement | The parameter displays the last 8 cruise control disengages in order from 1 to 8, with 8 being the most recent. There are approximately 30 possible causes for the cruise control to disengage. |
| Cruise Control Inhibit Reason | Cruise OFF | Off | The parameter displays the reason the cruise control system cannot engage. |
| | Cruise ON | Park/Neutral | |
| Cruise Control ON/OFF Switch | Cruise ON | On | The engine control module (ECM) monitors the signal circuit of the cruise control switch. A closed switch is displayed as ON. |
| Cruise Control Resume/Accelerator Switch | Cruise ON | On | The scan tool displays ON, when the cruise ON/OFF switch is ON and the resume/accel (+) button is pressed, the ECM detects a predetermined voltage value for the resume/accel. switch. |
| Cruise Control Set/Coast Switch | Cruise ON | On | The scan tool displays ON, when the cruise ON/OFF switch is ON and the ECM detects a predetermined voltage value for the set/coast (â^') 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. |

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| Parameter | System State | Expected Value | Description |
|---|---|---|---|
| Current Fuel Type | Ignition ON | Varies | This parameter displays the current fuel type such as Not available, Gasoline/petrol, Methanol, Ethanol, Diesel, Liquefied Petroleum Gas, Compressed Natural Gas, Propane, Battery/electric, Bi-fuel, or Hybrid. |
| Current Gear | Transmission in Park/Neutral | P/N | This parameter displays the transmission gear commanded by the transmission control module. |
| | Transmission not in Park/Neutral | Reverse/1st-5th | |
| Current Gear When Engine Overspeed Detected | Engine Idling | Varies | This parameter displays the transmission actual gear observed upon initial detection of an overspeed condition. |
| Cycles of Misfire Data | Engine Running | 0â€“3,000â€‰counts | This parameter displays the number of cylinder firing events recorded by the control module. |
| Cylinder Deactivation Disable History 1-8 | Engine Running | - | This parameter displays one of the last eight reasons for the reactivation of all engine cylinders. |
| Cylinder Deactivation Inhibit | Engine Running | Yes / No | A/C Compressor Clutch On, Acceleration Request, APP High, APP Rate High, Axle Torque Limiting, Brake Booster Pressure Sensor DTC, Brake Booster Weak Vacuum, Calculated Torque, Camshaft Position Actuator DTC, Camshaft Position Sensor DTC, Catalyst Overtemperature Protection, Catalyst Temperature Low, Crankshaft Position Sensor DTC, Cylinder Deactivation Solenoid Valve DTC, Cylinder Deactivation System DTC, Deceleration Fuel Cut-Off, ECT, ECT Sensor DTC, Engine Controls Ignition Relay DTC, Engine Oil Pressure, Engine Oil Pressure Control Solenoid Valve Stuck Off, Engine Oil Pressure Control Test Active, Engine Oil Pressure Sensor DTC, Engine Oil Temperature, Engine Overtemperature Protection, Engine Speed, Engine Stall Prevention, Exiting Deceleration Fuel Cut-Off, Fuel Trim Cylinder Balance DTC, Heater Performance, HO2S 2 Test, Hot Coolant Mode, IAT Sensor DTC, Ignition Voltage, Injector Stable Time, Insufficient Torque Capacity, Intake Manifold Weak Vacuum, MAP Sensor DTC, Maximum Deactivation Time Exceeded, Maximum Throttle Exceeded, Minimum Time After TAC DTC, Minimum Time On All Cylinders, Misfire DTC, Oil Aeration, Panic Brake Assist Active, Piston Protection, RPM Limit, Scan Tool Override, TAC System DTC, Torque Reduction, Transmission Gear, Transmission Range, Transmission Shifting, Vehicle Speed Too Low, VSS DTC |
| Cylinder Deactivation Performance Test | Engine Running | OK / Malfunction | This parameter indicates if one or more cylinders failed to deactivate when commanded. |
| Cylinder Deactivation System Command | Engine Running | All Cylinder / Cylinder Deactivation | This parameter indicates the status of the Cylinder Deactivation System Command. |
| Cylinder 1,2,3,4,5,6,7,8 Current Misfire Counter | Engine Idling | Counts | The scan tool displays a range of 0â€“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 0â€“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. |

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| Parameter | System State | Expected Value | Description |
|---|---|---|---|
| Cylinder 1, 2, 3, 4, 5, 6, 7 or 8 Injector Control Circuit High Voltage Test Status | Ignition ON | OK | This parameter displays the state of the injector control circuit. The parameter displays Malfunction if the injector control circuit is shorted to voltage. |
| Cylinder 1, 2, 3, 4, 5, 6, 7 or 8 Injector Control Circuit Low Voltage Test Status | Ignition ON | OK | This parameter displays the state of the injector control circuit. The parameter displays Malfunction if the injector control circuit is shorted to ground. |
| Cylinder 1, 2, 3, 4, 5, 6, 7 or 8 Injector Control Circuit Open Test Status | Ignition ON | OK | This parameter displays the state of the injector control circuit. The parameter displays Malfunction if the injector control circuit is open. |
| Cylinder 1, 2, 3, 4, 5, 6, 7 or 8 Injector Flow Identifier | Ignition ON | OK | This parameter displays the End of Line Injector Adjustment (EIA) for the fuel injector. This value shall be used by the ECM for adjustment to actual fuel injected quantity compared to nominal for the injector. |
| Cylinder 1-6 Injector Control Circuit Status | Engine Idling | OK | This parameter displays the state of the fuel injector control circuit. |
| Cylinder 1-6 Injector Disabledâ€‰Misfire Detected | Engine Idling | No | This parameter displays the injector that has been disabled by the misfire catalyst converter protection calibration. |
| Cylinder 1â€“6 Knock Detected | Engine Idling | No | This parameter displays yes if a knock has been detected in an individual cylinder. |
| DC/DC Converter Ignition 1 Signal | Engine Running | On / Off | This parameter indicates if the DC/DC Converter Ignition 1 Signal is On or Off. |
| DC/DC Converter Output Voltage 1 Variance - Engine Cranking | Engine Cranking | Volts | This parameter indicates the DC/DC Converter Output Voltage 1 Variance with the engine cranking. |
| DC/DC Converter Output Voltage 1 Variance - Engine Running / Off | Engine Running/Off | Volts | This parameter indicates the DC/DC Converter Output Voltage 1 Variance with the engine running or Off. |
| DC/DC Converter Output Voltage 2 Variance - Engine Cranking | Engine Cranking | Volts | This parameter indicates the DC/DC Converter Output Voltage 2 Variance with the engine cranking. |
| DC/DC Converter Output Voltage 2 Variance - Engine Running / Off | Engine Running/Off | Volts | This parameter indicates the DC/DC Converter Output Voltage 2 Variance with the engine running or Off. |
| DC/DC Converter Output Voltage Sensor Circuit 1 | Engine Running | Volts | This parameter measures voltage at the DC/DC Converter Output Voltage Sensor Circuit 1. |
| DC/DC Converter Output Voltage Sensor Circuit 2 | Engine Running | Volts | This parameter measures voltage at the DC/DC Converter Output Voltage Sensor Circuit 2. |
| Deceleration Fuel Cut-Off | Engine Running | Inactive | This parameter displays the status of the operating mode of the control module used to turn OFF the fuel injectors and the EVAP canister purge valve during certain deceleration conditions. |
| Desired Active Grille Air Shutter Position | Ignition ON | % | This parameter displays the commanded position for the active grille air shutter. 0%=fully closed, 100%=fully open. |
| Desired Boost Pressure | Engine Running | kPa | This parameter displays the desired turbocharger boost pressure. |
| Desired Cooling Fan Speed | Ignition ON | RPM | This parameter displays the desired fan speed. |
| Desired ECT | Ignition ON | Â°C (Â°F) | This parameter displays the desired engine coolant temperature in degrees. |

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| Parameter | System State | Expected Value | Description |
|---|---|---|---|
| Desired Exhaust Camshaft Position<br><br>or<br><br>Desired Exhaust Camshaft Position Bank 1 or 2 | Engine Idling | 0â€‰Degrees | This parameter displays the desired exhaust camshaft angle as commanded by the control module. |
| | Engine speed at 2000â€‰RPM | 10â€‰Degrees | |
| Desired Fuel Pressure | Ignition ON | kPa (PSI) | This parameter displays the desired fuel supply pressure. |
| Desired Fuel Rail Pressure | Engine Idling | Varies 3.4 mPa to 5.5â€‰mPa (500 to 800â€‰psi) | This parameter displays the desired Fuel Rail Pressure commanded by the control module. |
| Desired Idle Speed | Engine Idling | Approximately 650â€‰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<br><br>or<br><br>Desired Intake Camshaft Position Bank 1 or 2 | Engine Idling | 0â€‰Degrees | This parameter displays the desired intake camshaft angle as commanded by the control module. |
| | Engine speed at 2000â€‰RPM | 10â€‰Degrees | |
| Desired Throttle Position | Engine Idling | % | Commanded Throttle Actuator Control. |
| Distance Since DTC Cleared | Engine Idling | 0â€‰Km/mi | This parameter displays in kilometers or miles the distance traveled since a DTC was cleared. |
| Distance Since First Malfunction | Engine Idling | 0â€‰Km/mi | This parameter displays in kilometers or miles the distance traveled since a Malfunction occurred. |
| Distance Since Last Malfunction | Engine Idling | 0â€‰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 | 0â€‰Km/mi | This parameter displays in kilometers or miles the distance traveled since the last oil level warning Malfunction occurred. |
| Distance Since Last Oil Pressure Warning | Engine Idling | 0â€‰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 | 0â€‰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 90â€‰percent duty cycle while the Traction Control System Data Control Signal input is active. |
| ECM Authentication Status | Ignition ON | Valid | ECM Authentication Status indicates the result of the comparison between the last received immobilizer response and the expected response calculated into the ECM. |

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| Parameter | System State | Expected Value | Description |
|---|---|---|---|
| ECM Challenge Status | Ignition ON | Valid | This parameter displays the immobilizer system status of the ECM challenge. This indicates whether the currently calculated ECM challenge is valid. |
| ECM in Immobilizer Fail Enable Mode | Ignition ON | Yes / No | This parameter displays that a serial communication failure has been detected after the receipt of the correct VTD password. |
| ECM Odometer | Ignition ON | km (miles) | This parameter displays the odometer reading of the vehicle. |
| ECM Response Source | Ignition ON | Ignition Switch Start | ECM Response Source indicates the source used to calculate the ECM response. |
| Economy Mode Indicator Command | Ignition ON | Off | This parameter indicates the status of the serial data signal used to illuminate the economy mode indicator lamp. |
| ECT Sensor | Ignition ON | 88 to 105Â°C (190 to 221Â°F) | This parameter displays the temperature of the engine coolant based on input to the control module from the engine coolant temperature (ECT) sensor. |
| ECT vs. IAT Sensor Temperature at Last ECT vs. RCT Malfunction Detection | Ignition ON | Agree | This parameter displays that the temperature values of the ECT and IAT sensors did not agree at the time of the most recent failure of the ECT/RCT rationality diagnostic. |
| EGR/Camshaft Position Monitor Complete | Ignition ON | Yes/No | This parameter displays the status of the EGR/Camshaft Position Monitor. The parameter will display Yes when the EGR/Camshaft Position Monitor is complete. |
| EGR/Camshaft Position Monitor Complete This Ignition Cycle | Engine Idling | Yes/No | This parameter displays Yes or No of the completion status during the current driving/monitoring cycle of emission related monitors. |
| EGR/Camshaft Position Monitor Enabled | Ignition ON | Yes/No | This parameter displays the status of the EGR/Camshaft Position Monitor. The parameter will display Yes when the EGR/Camshaft Position Monitor is Enabled. |
| EGR/Camshaft Position Monitor Enabled This Ignition Cycle | Engine Idling | Yes/No | This parameter displays Yes or No of the completion status during the current driving/monitoring cycle of emission related monitors. |
| Electric Power Management Inhibit Reason | Engine Idling | None | This parameter displays the reason for the source of the Regulated Voltage Control (RVC) override command. RVC lowers system operating voltage to reduce system electrical load and improve fuel economy performance. The following is a list of possible reasons:<br>• None<br>• Control Function<br>• Active/Fuel System<br>• On-board Diagnostic System<br>• Air Flow Measurement System<br>• Cylinder Deactivation System<br>• System Transmission Control Module |
| End Model Part Number | â€” | # | This parameter identifies the part number that represents the combination of hardware, software, and calibrations present in the ECU. |
| Engine Autostopped | â€” | No | This parameter displays the status of the internal combustion engine (ICE) in vehicles incorporating ICE autostart/stop functionality. |
| Engine Calibration Part Number History 1-10 | Ignition ON | # | This parameter displays the engine calibration part number history. |
| Engine Calibration Part Number History 1-10 Counter | Ignition ON | # | This parameter displays the number of times the engine controller had been calibrated. |

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| Parameter | System State | Expected Value | Description |
|---|---|---|---|
| Engine Controls Ignition Relay Command | Ignition ON | Off | This parameter displays the state of the control circuit for control module power relay as commanded by the control module. |
| Engine Controls Ignition Relay Control Circuit High Voltage Test Status | Ignition ON | OK | This parameter displays the state of the Engine Controls Ignition Relay control circuit. The parameter displays Malfunction if the Engine Controls Ignition Relay control circuit is shorted to voltage. |
| Engine Controls Ignition Relay Controls Circuit Low Voltage Test Status | Ignition ON | OK | This parameter displays the state of the Engine Controls Ignition Relay control circuit. The parameter displays Malfunction if the Engine Controls Ignition Relay control circuit is shorted to ground. |
| Engine Controls Ignition Relay Controls Circuit Open Test Status | Ignition ON | OK | This parameter displays the state of the Engine Controls Ignition Relay control circuit. The parameter displays Malfunction if the Engine Controls Ignition Relay control circuit is open. |
| Engine Controls Ignition Relay Feedback 2 Signal | Ignition ON | Volts | This parameter indicates the signal voltage from the second input to the controller from the powertrain relay. |
| Engine Controls Ignition Relay Feedback 3 Signal | Ignition ON | Volts | This parameter indicates the signal voltage from the third input to the controller from the powertrain relay. |
| Engine Controls Ignition Relay Feedback Signal | Ignition ON | 12.0â€“14.9â€‰Volts | This parameter displays the voltage available at the engine controls ignition relay terminal of the engine control module. |
| Engine Coolant Pump Clutch Relay Command | Ignition ON | Flow / No Flow | This parameter displays the commanded state of the engine coolant pump clutch. |
| Engine Coolant Thermostat Heater Command | Ignition ON | % | This parameter displays the commanded duty cycle for the engine coolant thermostat. |
| Engine Coolant Thermostat Heater Control Circuit High Voltage Test Status | Ignition ON | OK | This parameter displays the state of the engine coolant thermostat heater control circuit. The parameter displays Malfunction if the engine coolant thermostat heater control circuit is shorted to voltage. |
| Engine Coolant Thermostat Heater Control Circuit Low Voltage Test Status | Ignition ON | OK | This parameter displays the state of the engine coolant thermostat heater control circuit. The parameter displays Malfunction if the engine coolant thermostat heater control circuit is shorted to ground. |
| Engine Coolant Thermostat Heater Control Circuit Open Test Status | Ignition ON | OK | This parameter displays the state of the engine coolant thermostat heater control circuit. The parameter displays Malfunction if the engine coolant thermostat heater control circuit is open. |
| Engine Crank Command | Ignition ON | Yes / No | This parameter indicates if the engine is being commanded to crank or not. |
| Engine Crank Time | Ignition ON | 0:00:00â€‰Seconds â€“ Varies | This parameter indicates the time between the start of engine cranking to when the engine reaches an operating RPM. |
| Engine Load | Engine Idling | 25â€“45â€‰% | This parameter displays the calculated engine load in percent based on inputs to the control module from various engine sensors. |
| | Engine speed at 2,500â€‰RPM | 40â€“60â€‰% | |
| Engine Load During Misfire Historyâ€‰1-10 | Ignition ON | % | This parameter displays the engine load during the last misfire event. |
| Engine Off | â€” | No | This parameter displays the status of the internal combustion engine (ICE) in vehicles incorporating ICE autostop/autostart functionality. |
| Engine OFF Time | Engine Idling | 0:00:00â€‰Seconds â€“ Varies | This parameter displays the amount of time that has elapsed since the engine was last cycled OFF. |
| Engine Oil Absolute Pressure Sensor | Engine Idling | kPa/PSI | This parameter displays the undefaulted, unfiltered measured engine oil pressure read by an oil absolute pressure sensor. |

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| Parameter | System State | Expected Value | Description |
|---|---|---|---|
| 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 | 0â€“100â€‰% | This parameter displays the percent of engine oil life remaining. The controller calculates the engine oil life by monitoring engine load, coolant temperature, and engine speed. |
| Engine Oil Pressure | Engine Idling | kPa/PSI | This parameter displays the actual engine oil pressure measured by a sensor. |
| Engine Oil Pressure Control Disable History 1 or 2 | Ignition ON | â€” | This parameter indicates one of the last two reasons that powertrain has disengaged oil control. |
| Engine Oil Pressure Control Solenoid Valve Command | Ignition ON | High Pressure/Low Pressure | This parameter displays the commanded state of the variable displacement oil pump output. |
| Engine Oil Pressure Control Solenoid Valve Control Circuit High Voltage Test Status | Ignition ON | OK | This parameter displays the state of the engine oil pressure control solenoid valve control circuit. The parameter displays Malfunction if the engine oil pressure control solenoid valve control circuit is shorted to voltage. |
| Engine Oil Pressure Control Solenoid Valve Control Circuit Low Voltage Test Status | Ignition ON | OK | This parameter displays the state of the engine oil pressure control solenoid valve control circuit. The parameter displays Malfunction if the c engine oil pressure control solenoid valve control circuit is shorted to ground. |
| Engine Oil Pressure Control Solenoid Valve Control Circuit Open Test Status | Ignition ON | OK | This parameter displays the state of the engine oil pressure control solenoid valve control circuit. The parameter displays Malfunction if the engine oil pressure control solenoid valve control circuit is open. |
| Engine Oil Pressure Control Test Counter | Ignition ON | Counts | This parameter displays the number of times that the Engine Oil Pressure Control test has been activated during the current key cycle. |
| Engine Oil Pressure Control Test Inhibit History 1 or 2 | Ignition ON | â€” | This parameter indicates one of the last two reasons that powertrain has inhibited oil pressure intrusive diagnostic test. |
| Engine Oil Pressure Sensor | Engine Idling | OK | This parameter displays the engine oil pressure as determined by engine oil pressure sensor. |
| Engine Oil Pressure Switch | Engine Idling | OK / Low | This parameter displays the status of the engine oil pressure sensor. |
| Engine Oil Temperature Sensor | Ignition ON | CÂ° (Â°F) | This parameter displays engine oil temperature as measured by a sensor connected to the ECM. |
| Engine Oil Temperature When Engine Overspeed Detected | Engine Idling | Temperature | This parameter displays the temperature of the engine oil as determined by the control module. |
| Engine Oil Type | Ignition ON | Conventional / Synthetic | This parameter indicates whether the engine oil type is conventional or synthetic oil. |
| Engine Overspeed | Engine Idling | Not Present | This parameter displays if an Engine Overspeed is Present or Not Present. |
| Engine Overspeed Counter | Ignition ON | Counts | This parameter displays the accumulated number of engine overspeed detection events. |
| Engine Run Time | Engine Idling | 0:00:00<br>Increments when the engine is operating | This parameter displays the time elapsed since the engine was started. |
| Engine Running | â€” | No | This parameter displays the status of the internal combustion engine (ICE) in vehicles incorporating ICE autostop/autostart functionality. |
| Engine Serial Number | Ignition ON | # | This parameter displays the engine serial number. |

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| Parameter | System State | Expected Value | Description |
|---|---|---|---|
| Engine Shutdown Counter â€“ Excessive Idle Time | Ignition ON | Counts | This parameter displays the count of engine shutdowns due to excessive idle time. |
| Engine Shutdown Counter â€“ High Coolant Temperature | Ignition ON | Counts | This parameter displays the count of engine shutdowns due to high coolant temperature. |
| Engine Shutdown Counter â€“ Low Coolant Level | Ignition ON | Counts | This parameter displays the count of engine shutdowns due to low coolant level. |
| Engine Shutdown Counter â€“ 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 60â€‰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 | 550â€“700â€‰RPM | |
| Engine Speed During Misfire Historyâ€‰1â€“5 | Ignition ON | RPM | This parameter displays the last 5â€‰engine speeds during misfire events. |
| Engine Speed When Engine Overspeed Detected | Engine Idling | RPM | This parameter displays the engine speed observed upon initial detection of an overspeed condition. This value will be updated after each overspeed condition. |
| Engine Stalled | Ignition ON | No | This parameter displays that the internal combustion engine has stopped running unintentionally. |
| Engine Starting | Ignition ON | No | This parameter displays that the internal combustion engine is being started (in transition from engine OFF to engine running). |
| Engine Stopping | Ignition ON | No | Engine Stopping indicates that the internal combustion engine is stopping (in transition from engine running to engine off, OR in transition from engine running to engine failed). |
| Engine Torque | Engine Running | % | This parameter indicates the current indicated torque as a percent of engine reference torque. |
| 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:<br>• None<br>• Excess Vacuum<br>• Purge Valve Leak<br>• Small Leak<br>• Weak Vacuum<br>• 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. |

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| Parameter | System State | Expected Value | Description |
|---|---|---|---|
| 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. |
| EVAP Purge Solenoid Valve Control Circuit High Voltage Test Status | Ignition ON | OK | This parameter displays the state of the evaporative emission (EVAP) purge solenoid control circuit. The parameter displays Malfunction if the EVAP purge solenoid control circuit is shorted to voltage. |
| EVAP Purge Solenoid Valve Control Circuit Low Voltage Test Status | Ignition ON | OK | This parameter displays the state of the evaporative emission (EVAP) purge solenoid control circuit. The parameter displays Malfunction if the EVAP purge solenoid control circuit is shorted to ground. |
| EVAP Purge Solenoid Valve Control Circuit Open Test Status | Ignition ON | OK | This parameter displays the state of the evaporative emission (EVAP) purge solenoid control circuit. The parameter displays Malfunction if the EVAP purge solenoid control circuit is open. |
| EVAP System Fuel Tank Pressure Sensor to Fuel Tank Restriction Detected | Ignition ON | Yes / No | This parameter indicates if the Fuel Tank Pressure Sensor detects a blockage in the fuel system. |
| EVAP Vent Solenoid Command | Engine Idling | Not Venting | This parameter displays the state of the control circuit for evaporative emission (EVAP) vent solenoid as commanded by the control module. |
| EVAP Vent Solenoid Valve Control Circuit High Voltage Test Status | Ignition ON | OK | This parameter displays the state of the EVAP vent solenoid control circuit. The parameter displays Malfunction if the EVAP vent solenoid control circuit is shorted to voltage. This parameter may not change if the scan tool is used to command the EVAP vent solenoid ON. |
| EVAP Vent Solenoid Valve Control Circuit Low Voltage Test Status | Ignition ON | OK | This parameter displays the state of the EVAP vent solenoid control circuit. The parameter displays Malfunction if the EVAP vent solenoid control circuit is shorted to ground. This parameter may not change if the scan tool is used to command the EVAP vent solenoid ON. |
| EVAP Vent Solenoid Valve Control Circuit Open Test Status | Ignition ON | OK | This parameter displays the state of the EVAP vent solenoid control circuit. The parameter displays Malfunction if the EVAP vent solenoid control circuit is open. This parameter may not change if the scan tool is used to command the EVAP vent solenoid ON. |
| Exhaust Camshaft Position | Engine Idling | Â° | 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<br><br>or<br><br>Exhaust Camshaft Position Active Counter Bankâ€‰1 or 2 | Engine Idling | 0â€“255 | This parameter displays an incrementing counter when the control module receives a signal from the exhaust camshaft position (CMP) sensor. |

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| Parameter | System State | Expected Value | Description |
|---|---|---|---|
| Exhaust Camshaft Position Actuator Solenoid Valve Control Circuit High Voltage Test Status<br><br>or<br><br>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<br><br>or<br><br>Exhaust Camshaft Position Actuator Solenoid Valve Control Circuit Low Voltage Test Status Bank 1 or 2 | Engine Idling | OK | This parameter displays the state of the exhaust camshaft actuator solenoid control circuit. The parameter displays Malfunction if the camshaft actuator solenoid control circuit is shorted to ground. |
| Exhaust Camshaft Position Actuator Solenoid Valve Control Circuit Open Test Status<br><br>or<br><br>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<br><br>or<br><br>Exhaust Camshaft Position Bank 1 or 2 | Engine Idling | 0â€‰Degrees | This parameter displays the actual exhaust camshaft position in degrees. |
| | Engine speed at 2000â€‰RPM | 10â€‰Degrees | |
| Exhaust Camshaft Position Command<br><br>or<br><br>Exhaust Camshaft Position Command Bank 1 or 2 | Engine Idling | 20â€‰% | This parameter displays the on-time or duty cycle of the exhaust camshaft position (CMP) actuator solenoid valve as commanded by the control module. |
| | Engine speed at 2000â€‰RPM | 50â€‰% | |
| Exhaust Camshaft Position Variance<br><br>or<br><br>Exhaust Camshaft Position Variance Bank 1 or 2 | Engine Idling | 0â€‰Degrees | This parameter displays in degrees, the difference between the desired exhaust camshaft position and the actual exhaust camshaft position. |
| | Engine speed at 2000â€‰RPM | 0â€‰Degrees | |

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| Parameter | System State | Expected Value | Description |
|---|---|---|---|
| Extended Travel Brake Pedal Position Signal | Engine Idling | Released | This parameter displays the status of the Extended Travel Brake Pedal Position sensor. |
| Extended Travel Brake Pedal Switch | Ignition ON | Released | This parameter displays the undebounced / undefaulted state of the extended travel brake switch input to the ECM |
| Filtered System Voltage | Ignition ON | Volts | This parameter indicates the filtered voltage of the system. |
| Filtered System Voltage Prior to Engine Crank | Ignition ON | Volts | This parameter displays the filtered system voltage just before an engine cranking event. |
| Freeze Frame DTC | Ignition ON | # | This parameter displays the diagnostic trouble code (DTC) that caused the freeze frame to be stored. |
| Fuel Alcohol Content | Engine Idling | % | This parameter displays the percentage of alcohol in the fuel. The value is calculated by the ECM using the fuel composition sensor input. |
| Fuel Alcohol Content When Recommended Maximum Fuel Alcohol Content Exceeded | Engine Idling | % | This parameter displays a percentage of Fuel Alcohol Content When Recommended Maximum Fuel Alcohol Content Exceeded. |
| Fuel Composition Learn | Engine Idling | Inactive | This parameter displays Active or Inactive. Active will be displayed if the ECM is learning the alcohol content of the fuel. |
| Fuel Composition Sensor | Engine Idling | Hz | This parameter displays the frequency of the fuel composition sensor input. This value can be used to determine fuel composition or sensor malfunction. |
| Fuel Consumed Since Recommended Maximum Fuel Alcohol Content Exceeded | Engine Idling | Liters | This parameter displays in Liters the Fuel Consumed Since Recommended Maximum Fuel Alcohol Content Exceeded. |
| Fuel Control Loop Status | Engine Idling | Closed | Fuel Closed Loop Active indicates that oxygen sensor 1 of each bank is being used as feedback to adjust the amount of fuel delivered to the engine. |
| Fuel Economy | Engine Idling | Liters per Hour | This parameter displays the instant fuel consumption rate of the engine in liters per hour. |
| Fuel Economy Mode | Ignition ON | Inactive | This parameter indicates if the economy mode algorithm has activated economy mode. |
| Fuel Economy Mode Request | Ignition ON | Off | This parameter indicates if the driver of the vehicle has requested economy mode by pressing the economy mode switch. |
| Fuel Economy Mode Switch | Ignition ON | OK | This parameter displays the state of the fuel economy mode switch circuit. The parameter displays Malfunction if the fuel economy mode switch circuit is shorted to voltage. |
| Fuel Economy Mode Switch | Ignition ON | OK | This parameter displays the state of the fuel economy mode switch circuit. The parameter displays Malfunction if the fuel economy mode switch circuit is shorted to ground. |
| Fuel Economy Mode Switch | Ignition ON | OK | This parameter displays the state of the fuel economy mode switch circuit. The parameter displays Malfunction if the fuel economy mode switch circuit is open. |
| Fuel Economy Mode Switch | Ignition ON | Volts | This parameter displays the economy mode switch reference voltage. |
| Fuel Enrichment-Hot Catalyst | Engine Running | Inactive | Fuel Enrichment Catalyst Protection Active indicates fuel is being added to cool the catalytic converter. |
| Fuel Enrichment-Hot Coolant | Engine Running | Inactive | Hot Coolant Enrichment Active indicates that the conditions to enable hot coolant enrichment are active and that a richer than stoichiometric air/fuel ratio is being commanded in order to help cool the engine when a system malfunction is causing the engine to run at extreme temperatures. |
| Fuel Injector Driver Supply Voltage | Ignition ON | Volts | This parameter displays the injector driver circuit boost supply voltage. |

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| Parameter | System State | Expected Value | Description |
|---|---|---|---|
| Fuel Level Sensor | Ignition ON | Volts | This parameter displays the unfiltered fuel level sensor analog input for the primary fuel tank as a percentage of its reference voltage. |
| Fuel Level Sensor Left Tank (If Equipped) | Ignition ON | 0â€“5â€‰Volts | This parameter displays the voltage signal received by the control module from the secondary fuel level sensor in the left side of the fuel tank. |
| Fuel Level Sensor Reference Command | Engine Idling | % | 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 | 0â€“5â€‰Volts | This parameter displays the voltage signal received by the control module from the primary fuel level sensor in the right side of the fuel tank. |
| Fuel Maintenance Mode | Ignition ON | Active / Inactive | This parameter displays if the Fuel Maintenance Mode is currently active. |
| Fuel Maintenance Mode Counter | Ignition ON | Counts | This parameter displays the cumulative number of fuel maintenance mode events over the life of the controller. |
| Fuel Mode Active | Ignition ON | Gaseous, Gasoline | This parameter displays if the fuel mode algorithm has activated the alternative fuel mode. |
| Fuel Mode Driver Request | Ignition ON | Gaseous, Gasoline | This parameter displays if the driver of the vehicle has selected one of the two specific fuel modes (alternative fuel, or petrol fuel) |
| Fuel Mode Indication On | Ignition ON | Gaseous, Gasoline | This parameter displays the status of the signal used to illuminate the fuel mode indicator lamp. |
| Fuel Mode Indicator Lamp Command | Ignition ON | On / Off | This parameter displays the commanded state of the fuel mode indicator lamp. |
| Fuel Mode Indicator Lamp Control Circuit High Voltage Test Status | Ignition ON | OK, Malfunction, Not Run | This parameter displays the state of the Fuel Mode Indicator Lamp control circuit. The parameter displays Malfunction if the Fuel Mode Indicator Lamp control circuit is shorted to voltage. |
| Fuel Mode Indicator Lamp Control Circuit Low Voltage Test Status | Ignition ON | OK, Malfunction, Not Run | This parameter displays the state of the Fuel Mode Indicator Lamp control circuit. The parameter displays Malfunction if the Fuel Mode Indicator Lamp control circuit is shorted to ground. |
| Fuel Mode Indicator Lamp Control Circuit Open Test Status | Ignition ON | OK, Malfunction, Not Run | This parameter displays the state of the Alternative Fuel Injector 1 control circuit. The parameter displays Malfunction if the Alternative Fuel Injector 1 control circuit is open. |
| Fuel Mode Switch | Ignition ON | mV | This parameter displays the Fuel Mode Switch circuit in voltage. |
| Fuel Mode Switch Both States Latched | Ignition ON | True, False | This parameter displays true once both the on and off switch states are observed and will remain latched for the current ignition cycle. |
| Fuel Mode Switch State | Ignition ON | Fault Low, On, Indeterminate, Off, Fault High | This parameter displays the raw fuel mode switch state information. |
| Fuel Pressure Drop - Cylinder 1-8 Injector | Engine Running | â€” | This parameter contains the result of the Fuel Injector Flow Device Control (Direct and Gaseous Fuel Injected Engines). The fuel or alternative fuel rail pressure sensor value after the injection event is subtracted from the fuel rail or alternative fuel pressure sensor value before the injection event and reported as the pressure drop for the appropriate injector. |
| Fuel Pressure Regulator Control Circuit Command | Engine Cranking or Running | On | This parameter displays the commanded state of the fuel pressure regulator 1 low side output (the output is considered to be commanded ON if the regulator is enabled while the engine is running or cranking). |
| Fuel Pressure Regulator Control Circuit High Voltage Test | Ignition ON | OK | This parameter displays the status of the output driver for the fuel pressure regulator control circuit. The scan tool will display OK if the circuit is operating correctly or Not Run if a diagnosis has not been made. The scan tool will display Malfunction if there is an short to voltage in the circuit. |

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| Parameter | System State | Expected Value | Description |
|---|---|---|---|
| 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 operating correctly or Not Run if a diagnosis has not been made. The scan tool will display Malfunction if there is an short to ground in the circuit. |
| Fuel Pressure Regulator High Control Circuit Open Test Status | Ignition ON | OK | This parameter displays the status of the output driver for the fuel pressure regulator high control circuit. The scan tool will display OK if the circuit is operating correctly or Not Run if a diagnosis has not been made. The scan tool will display Malfunction if there is an open in the circuit. |
| Fuel Pressure Sensor | Engine Idling | kPa/PSI | For Port Fuel Injected (PFI) systems, this Parameter displays fuel rail pressure at the engine. For high pressure fuel systems, this Parameter indicates the low side fuel pressure before the high pressure pump. |
| Fuel Pressure Sensor | Ignition ON | Volts | This parameter displays the fuel supply pressure sensor analog input as a percentage of its reference voltage. |
| Fuel Pump Enable Command | Ignition ON | On | This parameter displays the commanded state of the fuel pump output (the output is considered to be commanded ON if its duty cycle is not zero). |
| Fuel Pump Enable Circuit High Voltage Test Status | Ignition ON | OK | This parameter displays the status of the output driver for the fuel pump control circuit. The scan tool will display OK if the circuit is operating correctly or Not Run if a diagnosis has not been made. The scan tool will display Malfunction if there is an short to voltage in the circuit. |
| Fuel Pump Enable Circuit Low Voltage Test Status | Ignition ON | OK | This parameter displays the status of the output driver for the fuel pump control circuit. The scan tool will display OK if the circuit is operating correctly or Not Run if a diagnosis has not been made. The scan tool will display Malfunction if there is an short to ground in the circuit. |
| Fuel Pump Enable Circuit Open Test Status | Ignition ON | OK | This parameter displays the status of the output driver for the fuel pump control circuit. The scan tool will display OK if the circuit is operating correctly or Not Run if a diagnosis has not been made. The scan tool will display Malfunction if there is an open in the circuit. |
| Fuel Pump Relay Control Circuit High Voltage Test Status | Ignition ON | OK | This parameter displays the state of the fuel pump relay control circuit. The parameter displays Malfunction if the fuel pump relay control circuit is shorted to voltage. |
| Fuel Pump Relay Control Circuit Low Voltage Test Status | Ignition ON | OK | This parameter displays the state of the fuel pump relay control circuit. The parameter displays Malfunction if the fuel pump relay control circuit is shorted to ground. |

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| Parameter | System State | Expected Value | Description |
|---|---|---|---|
| Fuel Pump Relay Control Circuit Open Test Status | Ignition ON | OK | This parameter displays the state of the fuel pump relay control circuit. The parameter displays Malfunction if the fuel pump relay control circuit is open. |
| Fuel Pump Speed Output Circuit High Voltage Test Status | Engine Running | OK, Malfunction, Not Run | This parameter displays the Fuel Pump Speed Output Circuit High Voltage Test Status. Can display OK, Malfunction, or Not Run. |
| Fuel Pump Speed Output Circuit Low Voltage Test Status | Engine Running | OK, Malfunction, Not Run | This parameter displays the Fuel Pump Speed Output Circuit Low Voltage Test Status. Can display OK, Malfunction, or Not Run. |
| Fuel Pump Speed Output Circuit Open Test Status | Engine Running | OK, Malfunction, Not Run | This parameter displays the Fuel Pump Speed Output Circuit Open Circuit Test Status. Can display OK, Malfunction, or Not Run. |
| Fuel Rail Pressure Regulator Command (If Equipped) | Engine idling | 36â€‰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 | 1.9â€“5.0â€‰MPa/279â€“725â€‰PSI | This parameter displays the high side fuel pressure after the high pressure pump. |
| Fuel Rail Pressure Sensor | Engine Idling | 0 to 5â€‰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 | â€” | Complete | This parameter displays the if the Fuel Rail Pressure Sensor First Time Adaptation is Complete |
| Fuel Rail Pressure Sensor Learn | â€” | Active | This parameter displays the current state of the fuel rail pressure sensor learn condition. |
| Fuel Rail Pressure Sensor Learn Inhibit | â€” | No | This parameter displays the reason for the fuel rail pressure sensor learn to be inhibited. These include: Assembly Plant Mode Counter Not Programmed, Assembly Plant Suspension, Barometric Pressure Sensor DTC, Barometric Pressure Too Low, Clutch Pedal Applied, Clutch Pedal Position Sensor DTC, Desired Fuel Rail Pressure Too Low, DTC Present, Engine in Catalyst Warm-Up Mode, Engine Not Synchronized, Engine Stopped, Fuel Pressure Spike, Fuel Level Too Low, Fuel Pressure Regulator Control Circuit DTC, Fuel Pump Control Function Active, Fuel Pump is Off, Fuel Rail Pressure Control Function Active, Fuel Rail Pressure Sensor DTC, Fuel System in Open Loop Operation, Fuel Temperature Out of Range, Idle Test Failed, Injector Flow Test in Progress, Intake Air Temperature Too Low, Low Pressure Fuel System Malfunction, Low Pressure Fuel System Pressure Too Low, Minimum Engine Run Time Not Met, Minimum Normal Fuel Pressure Control Time Not Met, Minimum Run Time, Time After New Engine Mode Not Met, Minimum Time After Drive Not Met, Minimum Time for Released Accelerator Pedal Not Met, New Engine Mode, Not in Control of Idle Speed, Other Diagnostics Active, Sensor Reading Too High Test Failed, Some Cylinders Are Turned Off, Stuck Sensor Test Failed, Vehicle Speed Too High |
| Fuel Rail Pressure Sensor Learn Status | â€” | Complete | This parameter displays several signals associated with the status of the power mode and starter systems. |
| Fuel Rail Pressure Sensor Learned Value | â€” | kPa | This parameter displays the fuel rail pressure learned value at the fuel rail pressure sensor. |
| Fuel Rail Temperature Sensor 1 | Ignition ON | ÂºC (ÂºF) | This parameter indicates the fuel rail temperature measured by the first sensor on the rail. |
| Fuel Rail Temperature Sensor 2 | Ignition ON | ÂºC (ÂºF) | This parameter indicates the fuel rail temperature measured by the second sensor on the rail. |
| Fuel System Monitor Complete | Engine Idling | Yes/No | This parameter displays the enable and completion status during the current driving/monitoring cycle of each continuous legislated emission related monitor and noncontinuous legislated emission related monitor. |

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| Parameter | System State | Expected Value | Description |
|---|---|---|---|
| Fuel System Monitor Complete This Ignition Cycle | Ignition ON | No | This parameter displays the completion status of the fuel system monitor during the current driving / monitoring cycle. |
| Fuel System Monitor Enabled | Engine Idling | Yes/No | This parameter displays the enable and completion status during the current driving/monitoring cycle of each continuous legislated emission related monitor and noncontinuous legislated emission related monitor. |
| Fuel System Monitor Enabled This Ignition Cycle | Ignition ON | No | This parameter displays the enable status of the fuel system monitor during the current driving / monitoring cycle. |
| Fuel Tank Pressure Sensor | Ignition ON, engine OFF | kPa/psi | This parameter displays the pressure/vacuum inside the fuel tank. A negative value indicates a vacuum, while a positive value indicates a pressure. |
| Fuel Tank Pressure Sensor | â€” | 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 | 0â€“5â€‰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<br><br>or<br><br>Fuel Trim Cylinder Balance Test Bankâ€‰1â€“2 | Ignition ON | Inactive | This parameter indicates the current state of the fuel trim cylinder balance test. |
| Fuel Trim Cylinder Balance Test Counter<br><br>or<br><br>Fuel Trim Cylinder Balance Test Counter Bankâ€‰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 Bankâ€‰1-2 | Ignition ON | No Result | This parameter indicates the current state of the fuel trim cylinder balance test. |
| Fuel Trim Learn | Engine Idling | Enabled | This parameter displays Enabled when conditions are appropriate for enabling long term fuel trim corrections. This indicates that the long term fuel trim is adapting continuing amounts of short term fuel trim. If the scan tool displays Disabled, then long term fuel trim will not respond to changes in short term fuel trim. |
| Fuel Trim Learn | â€” | Enabled | This parameter displays if the fuel trim learn is enabled. |
| Fuel Trim Memory Cell | Engine Idling | Counts 0â€‰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 | â€” | # | 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 | â€” | Complete | This parameter displays the state of the fuel trim system test. |

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| Parameter | System State | Expected Value | Description |
|---|---|---|---|
| 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 Fâ€‰ Terminal Signal | Engine Idling | 0â€“100â€‰% | This parameter displays the amount of generator ON-time as commanded by the control module. The higher the percentage the greater the generator output. |
| Generator Indicator Command | Engine Idling | On | This parameter displays On or Off associated with the status of the generator. |
| Generator Lâ€‰ 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 Lâ€‰ 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 Lâ€‰ 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 | 0â€“100â€‰% | This parameter displays the control modules commanded state of the voltage regulator on the generator. |
| Generator L-Terminal Signal Command | Ignition ON | On / Off | This parameter displays the commanded state of the generator L-terminal output. |
| Heated Catalyst Monitor Complete | Engine Idling | Yes | This parameter indicates the status of the heated catalyst. The scan tool displays Yes when the diagnostic is complete. And No if the diagnostic has not ran or a malfunction is detected in the heated catalyst. |
| Heated Catalyst Monitor Enabled | Engine Idling | Yes | This parameter indicates the status of the heated catalyst monitor diagnostic. Catalyst Monitor Test Running indicates Yes or No when the heated catalyst monitor diagnostic is actively running a test. |
| Heater Coolant Pump Relay Command | Ignition ON | On / Off | This parameter indicates if the heater core pump relay is commanded On or Off. |
| Heater Coolant Pump Relay Control Circuit High Voltage Test Status | Ignition ON | OK, Malfunction, Not Run | This parameter displays the Heater Coolant Pump Relay Control Circuit High Voltage Test Status. Can display OK, Malfunction, or Not Run. |
| Heater Coolant Pump Relay Control Circuit Low Voltage Test Status | Ignition ON | OK, Malfunction, Not Run | This parameter displays the Heater Coolant Pump Relay Control Circuit Low Voltage Test Status. Can display OK, Malfunction, or Not Run. |
| Heater Coolant Pump Relay Control Circuit Open Test Status | Ignition ON | OK, Malfunction, Not Run | This parameter displays the Heater Coolant Pump Relay Control Circuit Open Circuit Test Status. Can display OK, Malfunction, or Not Run. |
| High Side Driver 1 Circuit High Voltage Test Status | Ignition ON | OK, Malfunction, Not Run | This parameter displays the High Side Driver 1 Circuit High Voltage Test Status. Can display OK, Malfunction, or Not Run. |
| High Side Driver 1 Circuit Low Voltage Test Status | Ignition ON | OK, Malfunction, Not Run | This parameter displays the High Side Driver 1 Circuit Low Voltage Test Status. Can display OK, Malfunction, or Not Run. |
| High Side Driver 1 Circuit Open Test Status | Ignition ON | OK, Malfunction, Not Run | This parameter displays the High Side Driver 1 Circuit Open Circuit Test Status. Can display OK, Malfunction, or Not Run. |
| High Side Driver 1 Command | Ignition ON | On / Off | This parameter indicates if the High Side Driver 1 is being commanded On or Off. |
| High Side Driver 2 Circuit High Voltage Test Status | Ignition ON | OK, Malfunction, Not Run | This parameter displays the High Side Driver 2 Circuit High Voltage Test Status. Can display OK, Malfunction, or Not Run. |

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| Parameter | System State | Expected Value | Description |
|---|---|---|---|
| High Side Driver 2 Circuit Low Voltage Test Status | Ignition ON | OK, Malfunction, Not Run | This parameter displays the High Side Driver 2 Circuit Low Voltage Test Status. Can display OK, Malfunction, or Not Run. |
| High Side Driver 2 Circuit Open Test Status | Ignition ON | OK, Malfunction, Not Run | This parameter displays the High Side Driver 2 Circuit Open Circuit Test Status. Can display OK, Malfunction, or Not Run. |
| High Side Driver 2 Command | Ignition ON | On / Off | This parameter indicates if the High Side Driver 2 is being commanded On or Off. |
| Hood Position | Ignition ON | Closed, Ajar, Open, Invalid | This parameter indicates the Position of the Hood. |
| Hood Position Switch | Ignition ON | Closed | This parameter displays the current position of the hood. |
| HO2S Sensor 1<br><br>or<br><br>HO2S Bank 1 Sensor 1 or Bank 2 Sensor 1 | Engine Idling | 0.00â€“1.00â€‰Volts | This parameter displays the voltage output from the HO2S to the control module. A lower voltage indicates a lean exhaust, while a higher voltage indicates a rich exhaust. |
| HO2S Sensor 1<br><br>or<br><br>HO2S Bank 1 Sensor 1 or Bank 2 Sensor 1 | Engine Idling | Lambda 0.8â€“1.1 | This parameter displays the voltage output as a lambda value. When the fuel system is lean, the oxygen level will be high and the lambda signal will be high or more than 1. When the fuel system is rich, the oxygen level will be low, and the lambda signal will be low or less than 1. The ECM uses this information to maintain the correct air/fuel ratio |
| HO2S Sensor 2<br><br>or<br><br>HO2S Bank 1 Sensor 2 or Bank 2 Sensor 2 | Engine Idling | 0.00â€“1.00â€‰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<br><br>or<br><br>HO2S Heater Bank 1 Sensor 1 or Bank 2 Sensor 1 | Engine Idling | Amps | This parameter display the current feedback for the oxygen sensor heater output for sensor 1. |
| HO2S Heater Sensor 2<br><br>or<br><br>HO2S Heater Bank 1 Sensor 2 or Bank 2 Sensor 2 | Engine Idling | Amps | This parameter display the current feedback for the oxygen sensor heater output for sensorâ€‰2. |
| HO2S Heater Command<br><br>or<br><br>HO2S Heater Command Bankâ€‰1 or 2 Sensorâ€‰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 Bankâ€‰1 or 2 Sensorâ€‰1 or 2 Heater Command | Engine Idling | 0â€“100â€‰% | This parameter displays the HO2S heater ON time in percentage, as commanded by the control module. |

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| Parameter | System State | Expected Value | Description |
|---|---|---|---|
| HO2S Heater Control Circuit High Voltage Test Status<br><br>or<br><br>HO2S Heater Control Circuit High Voltage Test Status Bank 1 Sensor 1 or Bank 2 Sensor 1 | Engine Idling | OK | This parameter displays the state of the oxygen sensor heater control circuit. The parameter displays Malfunction if the oxygen sensor heater control circuit is shorted to voltage. |
| HO2S Heater Control Circuit High Voltage Test Status<br><br>or<br><br>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<br><br>or<br><br>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<br><br>or<br><br>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<br><br>or<br><br>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<br><br>or<br><br>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. |

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| Parameter | System State | Expected Value | Description |
|---|---|---|---|
| HO2S/Heater Monitor Complete This Ignition Cycle | Engine Idling | Yes/No | This parameter displays the diagnostic monitor completion status during the current driving/monitoring cycle. |
| HO2S Heater Monitor Enabled | Ignition ON | No | This parameter displays the current state of the H02S heater monitor. |
| HO2S/Heater Monitor Enabled This Ignition Cycle | Engine Idling | Yes/No | This parameter displays the diagnostic monitor enable status during the current driving/monitoring cycle. |
| Humidity Sensor Intake Air Temperature Signal | Ignition ON | Hz | This parameter displays the frequency of the humidity sensorâ€™s intake air temperature (IAT) sensor input. |
| IAT Sensorâ€‰1 | Ignition ON | â^'39Â° to +140Â°C<br>(â^'38Â° to +284Â°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 Sensorâ€‰2 | Engine Idling | Hz | This parameter displays the frequency of the humidity sensorâ€™s intake air temperature (IAT) sensor input to the engine control module. |
| IAT Sensorâ€‰2 | â€" | Â°C (Â°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) sensorâ€‰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 Sensorâ€‰3 | â€" | Â°C (Â°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) sensorâ€‰3. The scan tool will display a low value when the air temperature is low, and a high value when the air temperature is high. |
| Idle Speed Correction | Ignition ON | RPM | This parameter displays the engine idle speed correction within a restricted range to address complaints of vehicle vibration. |
| Ignitionâ€‰1 Signal | Ignition ON | B+ | This parameter displays B+ when the control module detects a voltage at the ignitionâ€‰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<br>or<br>Ignition Coil Supply Voltage Bank 1 or 2 | Engine Idling | On | This parameter displays ON when voltage is supplied to the Ignition coil. |
| Ignition Cycles Since Recommended Maximum Fuel Alcohol Content Exceeded | Engine Idling | Counts | This parameter displays the number of Ignition Cycles since Recommended Maximum Fuel Alcohol Content Exceeded. |
| Ignition Cycles with Malfunction Since 1st Malfunction | Ignition ON | Counts | This parameter contains the number of ignition cycles with a failure reported since the first ignition cycle with a failure reported. |

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| Parameter | System State | Expected Value | Description |
|---|---|---|---|
| Ignition Cycles Without Completed Test Since 1st Malfunction | Engine Idling | Counts | This parameter displays the number of ignition cycles without a pass or a failure reported since the first ignition cycle with a failure reported. |
| Ignition Cycles Without Malfunction Since Last Malfunction | Engine Idling | Counts | This parameter displays the number of ignition cycles with a pass reported and no malfunctions reported since the first ignition cycle with a malfunction reported. |
| Ignition Cycles without Malfunction Since Last Malfunction | Ignition ON | Counts | This parameter contains the number of ignition cycles with a pass reported and no failures reported since the first ignition cycle with a failure reported. |
| Ignition Off Time | Ignition ON | hh:mm:ss | This parameter displays the time that the ignition has been OFF. |
| Ignition Timing | Engine Idling | Degrees | This parameter displays the final spark advance in terms of a crankshaft angle. |
| Immobilizer Auto Learn Counter | Ignition ON | Counts | This parameter displays the number of auto-learn cycles that have been successfully completed within the immobilizer system. |
| Immobilizer Automatic Learn Timer | Ignition ON | h/m/s | This parameter displays the time elapsed within the current auto-learn cycle within the immobilizer system. |
| Immobilizer ECM Identifier | Ignition ON | OK | This parameter displays that the immobilizer control module (ICM) has received the correct powertrain identifier. |
| Immobilizer Environment Deviceâ€‰1-4 | Ignition ON | OK | This parameter displays that the associated device is OK or unknown or its identification is pending to the immobilizer control module (ICM). |
| Immobilizer Fuel Disable | Ignition ON | Inactive | This parameter displays if the vehicle is immobilized by the ECM. |
| Immobilizer Module Environment Identification | Ignition ON | Inactive | This parameter displays that the ICM has not received the powertrain identifier or has received the wrong powertrain identifier. |
| Immobilizer Module Fuel Disable | Ignition ON | Inactive | This parameter displays if the vehicle is immobilized by the ICM. |
| Immobilizer Module Identification | Ignition ON | Complete | This parameter indicates that the ICM has not received the powertrain identifier or has received the wrong powertrain identifier. |
| Immobilizer Module Security Code Programmed | Ignition ON | Yes | This parameter indicates that the ICM security code has been programmed (i.e., the immobilizer device is locked). |
| Immobilizer Password Learn | Ignition ON | Active/Inactive | Learning Enabled indicates that learning of immobilizer code information is enabled. |
| Immobilizer Password Learn Scan Tool Delay | Engine Idling | Active/Inactive | Scan tool Learn Delay Active indicates that the security code has been accepted but the scan tool learn delay is active and will not allow learning enabled, programming security code, or resetting security code. |
| Immobilizer Password Programmed | Ignition ON | Yes | This parameter indicates that the ICM password has been programmed. |
| Immobilizer Post-Release Passive State | Ignition ON | Active / Inactive | This parameter displays that the immobilizer algorithm is in the post release passive state. |
| Immobilizer Post-Release State | Ignition ON | Active / Inactive | This parameter displays that the immobilizer algorithm is in the post release passive state. |
| Immobilizer Pre-Release State | Ignition ON | Active / Inactive | This parameter displays that the immobilizer algorithm is in the pre release active state. |
| Immobilizer Release State | Ignition ON | Active / Inactive | This parameter displays that the immobilizer algorithm is in the release active state. |
| Immobilizer Security Code Accepted | Engine Idling | Yes/No | Security Code Accepted displaying Yes indicates' that the received security code is correct. |
| Immobilizer Security Code Function | Engine Idling | Present/Not Present | This parameter indicates if the ECU supports the immobilizer security code strategy. |
| Immobilizer Security Code Lockout | Engine Idling | Yes/No | Security Code Lockout Active indicates that the security code has not passed and lockout is active. |

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| Parameter | System State | Expected Value | Description |
|---|---|---|---|
| Immobilizer Security Code Lockout Active Timer | Engine Idling | ms | This parameter displays the time elapsed since the immobilizer security code lockout has been activated either due to a battery disconnect or an incorrect immobilizer security code being entered. |
| Immobilizer Security Code Programmed | Ignition ON | Yes/No | Security Code Programmed indicates that the security code has been programmed. |
| Immobilizer Security Code Programming Counter | Ignition ON | Counts | This parameter displays the number of times a new immobilizer security code has been programmed through secure access. This counter can only be incremented. |
| Immobilizer Security Code Reset Counter | Ignition ON | Counts | This parameter displays the number of times the immobilizer security code has been reset to the default value through secure access. This counter can only be incremented. |
| Immobilizer Security Information Programmed | Ignition ON | Yes/No | This parameter displays the status of the immobilizer system. |
| Immobilizer Security Level | Ignition ON | # | This parameter displays the current immobilizer security level. If the correct security code is entered, the security level will remain at or be reset to a level of 10. If an incorrect security code is entered, the security level will be set to a level of 9. |
| Immobilizer Transponder Identification | Ignition ON | Active / Inactive | This parameter displays that the transponder identification process is active within the ICM. |
| Immobilizer Transponder Key | Ignition ON | OK | This parameter displays that the transponder key is correct for the ICM. |
| Immobilizer Transponder Key Identification | Ignition ON | OK | This parameter displays that the transponder key identification process is active within the ICM. |
| Immobilizer System Status | Ignition ON | Varies | This parameter displays the status of the immobilizer system, the following maybe displayed. Standby, Immobilized at Startup, Immobilized, No Response, Immobilized Negative Response, Immobilized, Incorrect Response, Post-Release State, Pre-Release State, Release State. |
| Immobilizer Valid Response Received Time | Ignition ON | ms | This parameter displays the actual time observed for a valid immobilizer response. |
| Initialized Fuel Alcohol Content | Ignition ON | % | This parameter displays the initialized fuel composition to be used as a starting point for the fuel composition algorithm. |
| Injector Duty Cycle<br><br>or<br><br>Injector Duty Cycle Bank 1 or 2 | Engine idling | 0.82â^'1.50â€‰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. |

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| Parameter | System State | Expected Value | Description |
|---|---|---|---|
| Inspection/Maintenance Drive Cycle Vehicle Speed Time Complete | Engine Idling | Yes/No | This parameter displays Yes when the Vehicle Speed Time Complete indicates that the vehicle has been above 25 mph for five minutes. |
| Inspection/Maintenance Drive Cycle Vehicle Speed Timer | Engine Idling | hh:mm:ss | This parameter displays the total accumulated time in which the vehicle speed has been greater than 25 mph after the 1st time the engine is started. |
| Intake Air Humidity Sensor | Engine Idling | % | 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 | Â° | This parameter displays the position of the intake camshaft for bankâ€‰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<br><br>or<br><br>Intake Camshaft Position Active Counter Bankâ€‰1 or 2 | Engine Idling | 0â€“255 | This parameter displays an incrementing counter when the control module receives a signal from the intake camshaft position (CMP) sensor. |
| Intake Camshaft Position Actuator Oil Pressure | Engine Idling | kPa | This parameter displays the oil pressure at the intake camshaft position actuator. |
| Intake Camshaft Position Actuator Oil Pressure Sensor | Engine Idling | Volts | This parameter displays the intake camshaft position actuator pressure sensor in voltage. |
| Intake Camshaft Position Actuator Park Lock Solenoid Valve Command Bank 1 | Ignition ON | Locked / Unlocked | This parameter indicates if the Intake Camshaft Position Actuator Park Lock Solenoid Valve for Bank 1 is Locked or Unlocked. |
| Intake Camshaft Position Actuator Park Lock Solenoid Valve Command Bank 2 | Ignition ON | Locked / Unlocked | This parameter indicates if the Intake Camshaft Position Actuator Park Lock Solenoid Valve for Bank 2 is Locked or Unlocked. |
| Intake Camshaft Position Actuator Park Lock Solenoid Valve Control Circuit High Voltage Test Status Bank 1 | Ignition ON | OK, Malfunction, Not Run | This parameter displays the Intake Camshaft Position Actuator Park Lock Solenoid Valve Control Circuit High Voltage Test Status Bank 1. Can display OK, Malfunction, or Not Run. |
| Intake Camshaft Position Actuator Park Lock Solenoid Valve Control Circuit High Voltage Test Status Bank 2 | Ignition ON | OK, Malfunction, Not Run | This parameter displays the Intake Camshaft Position Actuator Park Lock Solenoid Valve Control Circuit High Voltage Test Status Bank 2. Can display OK, Malfunction, or Not Run. |
| Intake Camshaft Position Actuator Park Lock Solenoid Valve Control Circuit Low Voltage Test Status Bank 1 | Ignition ON | OK, Malfunction, Not Run | This parameter displays the Intake Camshaft Position Actuator Park Lock Solenoid Valve Control Circuit Low Voltage Test Status Bank 1. Can display OK, Malfunction, or Not Run. |
| Intake Camshaft Position Actuator Park Lock Solenoid Valve Control Circuit Low Voltage Test Status Bank 2 | Ignition ON | OK, Malfunction, Not Run | This parameter displays the Intake Camshaft Position Actuator Park Lock Solenoid Valve Control Circuit Low Voltage Test Status Bank 2. Can display OK, Malfunction, or Not Run. |

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| Parameter | System State | Expected Value | Description |
|---|---|---|---|
| Intake Camshaft Position Actuator Park Lock Solenoid Valve Control Circuit Open Test Status Bank 1 | Ignition ON | OK, Malfunction, Not Run | This parameter displays the Intake Camshaft Position Actuator Park Lock Solenoid Valve Control Circuit Open Circuit Test Status Bank 1. Can display OK, Malfunction, or Not Run. |
| Intake Camshaft Position Actuator Park Lock Solenoid Valve Control Circuit Open Test Status Bank 2 | Ignition ON | OK, Malfunction, Not Run | This parameter displays the Intake Camshaft Position Actuator Park Lock Solenoid Valve Control Circuit Open Circuit Test Status Bank 2. Can display OK, Malfunction, or Not Run. |
| Intake Camshaft Position Actuator Park Lock Test Abort Reason Bank 1 | Ignition ON | N/A | This parameter indicates the reason why the Intake Camshaft Actuator Park Lock Pin Test for Bank 1 was aborted. |
| Intake Camshaft Position Actuator Park Lock Test Abort Reason Bank 2 | Ignition ON | N/A | This parameter indicates the reason why the Intake Camshaft Actuator Park Lock Pin Test for Bank 2 was aborted. |
| Intake Camshaft Position Actuator Park Lock Test Status Bank 1 | Ignition ON | N/A | This parameter indicates the status of the intake camshaft actuator park lock pin test for bank 1. |
| Intake Camshaft Position Actuator Park Lock Test Status Bank 2 | Ignition ON | N/A | This parameter indicates the status of the intake camshaft actuator park lock pin test for Bank 2. |
| Intake Camshaft Position Actuator Solenoid Valve Control Circuit High Voltage Test Status<br><br>or<br><br>Intake Camshaft Position Actuator Solenoid Valve Control Circuit High Voltage Test Status Bank 1 or 2 | Engine Idling | OK | This parameter displays the state of the intake camshaft actuator solenoid control circuit. The parameter displays Malfunction if the camshaft actuator solenoid control circuit is shorted to voltage. |
| Intake Camshaft Position Actuator Solenoid Valve Control Circuit Low Voltage Test Status<br><br>or<br><br>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. |

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| Parameter | System State | Expected Value | Description |
|---|---|---|---|
| Intake Camshaft Position Actuator Solenoid Valve Control Circuit Open Test Status<br><br>or<br><br>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<br><br>or<br><br>Intake Camshaft Position Bank 1 or 2 | Engine Idling | 0â€‰Degrees | This parameter displays the actual intake camshaft position in degrees. |
| | Engine speed at 2000â€‰RPM | 10â€‰Degrees | |
| Intake Camshaft Position Commanded<br><br>or<br><br>Intake Camshaft Position Commanded Bankâ€‰1 or 2 | Engine Idling | 20â€‰% | This parameter displays the ON-time or duty cycle of the intake camshaft position (CMP) actuator solenoid valve as commanded by the control module. |
| | Engine speed at 2000â€‰RPM | 50â€‰% | |
| Intake Camshaft Position Variance<br><br>or<br><br>Intake Camshaft Position Variance Bank 1 or 2 | Engine Idling | 0â€‰Degrees | This parameter displays in degrees, the difference between the desired intake camshaft position and the actual intake camshaft position. |
| | Engine speed at 2000â€‰RPM | 0â€‰Degrees | |
| Intake Manifold Pressure | Engine Idling | kPa/psi | This parameter displays the engine intake manifold vacuum pressure calculated as the difference between ambient air pressure (barometric pressure) and intake manifold absolute pressure (MAP). |
| Intake Manifold Tuning Control Valve Control Circuit Command | Ignition ON | On | This parameter displays the commanded state of the intake manifold tuning valve output. |
| Intake Manifold Tuning Control Valve Control Circuit High Voltage Test Status | Ignition ON | OK | This parameter displays the state of the intake manifold tuning control valve control circuit. The parameter displays Malfunction if the intake manifold tuning control valve control circuit is shorted to voltage. |
| Intake Manifold Tuning Control Valve Control Circuit Low Voltage Test Status | Ignition ON | OK | This parameter displays the state of the skip shift solenoid actuator control circuit. The parameter displays Malfunction if the skip shift solenoid actuator control circuit is shorted to ground. |
| Intake Manifold Tuning Control Valve Control Circuit Open Test Status | Ignition ON | OK | This parameter displays the state of the skip shift solenoid actuator control circuit. The parameter displays Malfunction if the skip shift solenoid actuator control circuit is open. |
| Intake Manifold Tuning Control Valve Feedback Signal | Ignition ON | % | 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. |

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| Parameter | System State | Expected Value | Description |
|---|---|---|---|
| Intake Manifold Tuning Control Valve Position | Ignition ON | Closed | This parameter displays whether the intake manifold tuning valve is in an open, closed, or intermediate position based upon the PWM feedback from the intake manifold tuning electronics. |
| Intake Rocker Arm Solenoid Valve 1â€“2 Command | Engine Idling | Off | This parameter displays the intake rocker arm solenoid valve command ON/OFF status. |
| Intake Rocker Arm Solenoid Valve 1â€“2 Command | Engine Idling | High Lift/Low Lift | This parameter displays the intake rocker arm solenoid valve command status. |
| Intake Rocker Arm Solenoid Valve 1â€“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 1â€“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 1â€“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 | 0â€‰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 | â€” | # | This parameter displays a numeric value. This is the long term (LT) fuel pump trim. |
| Long Term Fuel Trim<br>or<br>Long Term Fuel Trim Bank 1 or 2 | Engine Idling | 0â€‰% | 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<br>or<br>Long Term Fuel Trim Test Average Bank 1 or 2 | Engine Idling | 0â€‰% | 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<br>or<br>Long Term Fuel Trim Test Average without Purge Bank 1 or 2 | Engine Idling | 0â€‰% | 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. |
| Lost Communication with Active Grille Air Shutter Actuator Test Status | Ignition ON | OK, Malfunction, Not Run | This parameter indicates the status of the Active Grille Air Shutter actuator diagnostic test. |
| Low Engine Oil Level Indicator Command | Engine Idling | Off | The scan tool displays On or Off. This is the state of the low engine oil level indicator as monitored by the ECM. |

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| Parameter | System State | Expected Value | Description |
|---|---|---|---|
| Low Engine Oil Pressure Indicator Command | Engine Idling | Off | This parameter displays the commanded state of the low EOP lamp control circuit by the control module. |
| Low-Voltage Battery Current | Ignition ON | Amps | This parameter displays the battery current. |
| Low-Voltage Battery State of Charge | Ignition ON | Volts | This parameter indicates the percentage of the battery charge remaining. |
| Low-Voltage Battery State of Function | Ignition ON | Volts | This parameter displays the predicted minimum voltage of the next crank event. |
| Low-Voltage Battery State of Health | Ignition ON | Volts | This parameter indicates the available capacity of the battery if it were fully charged, relative to the capacity when the battery was new. |
| Low-Voltage Battery Temperature | Ignition ON | ÂºC (ÂºF) | This parameter indicates the temperature of the battery. |
| MAF Performance Test | Engine Idling | OK | This parameter displays the status of the MAF performance testâ€‰ by the engine control module. The scan tool will display OK if no malfunction is found. The scan tool will display malfunction if the engine control module detects a malfunction during the test. |
| MAF Sensor | Engine Idling | 3.0â€“8.3â€‰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 2,500â€‰RPM | 11.88â€‰g/s | |
| MAF Sensor | Engine Idling | 2,000â€“2,500â€‰Hz | The scan tool displays a range of 0-65,555 hertz. This parameter displays the frequency signal input to the control module, and represents measured quantity of air flowing into the engine during all operating conditions. |
| MAF Sensor Supply Voltage Command | Ignition ON | On / Off | This parameter indicates if the mass air flow sensor supply voltage is commanded On or Off. |
| MAF Sensor Supply Voltage Control Circuit High Voltage Test Status | Ignition ON | OK, Malfunction, Not Run | This parameter displays the mass air flow sensor supply voltage Control Circuit High Voltage Test Status. Can display OK, Malfunction, or Not Run. |
| MAF Sensor Supply Voltage Control Circuit Low Voltage Test Status | Ignition ON | OK, Malfunction, Not Run | This parameter displays the mass air flow sensor supply voltage Control Circuit Low Voltage Test Status. Can display OK, Malfunction, or Not Run. |
| MAF Sensor Supply Voltage Control Circuit Open Test Status | Ignition ON | OK, Malfunction, Not Run | This parameter displays the mass air flow sensor supply voltage Control Circuit Open Circuit Test Status. Can display OK, Malfunction, or Not Run. |
| MAF When Engine Overspeed Detected | Engine Idling | g/s | This parameter indicates the quantity calculated by the control module based on a signal from the MAF sensor at the time an overspeed was detected. |
| MAP Performance Test 1 | Engine Idling | OK | MAP Testâ€‰1 Residual Out of Tolerance indicates that the filtered MAP Testâ€‰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 Testâ€‰2 Residual Out of Tolerance indicates that the filtered MAP Testâ€‰2 residual (the difference between the measured intake manifold pressure and the intake manifold pressure predicted from the intake manifold model using the measured mass airflow) exceeds a failure threshold. |
| MAP Sensor | Engine Idling | kPa/psi | This parameter displays the actual engine intake manifold absolute pressure (MAP). |
| MAP Sensor | Engine Idling | 0.4â€“2.0â€‰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. |

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| Parameter | System State | Expected Value | Description |
|---|---|---|---|
| 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 anâ€‰A orâ€‰B type DTC. The scan tool will display No if the MIL is illuminated for another reason, such as transmission DTCs. |
| MIL Requested by DTC | Engine Idling | No | This parameter indicates the reason the control module illuminated the MIL. The scan tool will display YES when the MIL is requested as a result of an A or B type DTC. The scan tool will display NO if the MIL is illuminated for another reason, such as transmission DTCs. |
| Minimum DC/DC Converter Output Voltage on Circuit 1 - Last Engine Crank | Ignition ON | Volts | This parameter indicates the minimum DC/DC Converter Output Voltage on Circuit 1 on the last engine crank. |
| Minimum DC/DC Converter Output Voltage on Circuit 2 - Last Engine Crank | Ignition ON | Volts | This parameter indicates the minimum DC/DC Converter Output Voltage on Circuit 2 on the last engine crank. |
| Misfire Diagnostic Engine Load | Engine Idling | % | 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 1â€“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 1â€“5 | Engine Idling | RPM | This parameter displays the specific engine speed when the engine was operating for one of the last five misfire events . |
| Misfire Monitor Complete | Engine Idling | Yes/No | This parameter displays the status of the Misfire Monitor. The parameter will display Yes when the Misfire Monitor is Complete. |
| Misfire Monitor Complete This Ignition Cycle | Ignition ON | No | This parameter displays the completion status of the misfire monitor during the current driving / monitoring cycle. |
| Misfire Monitor Enabled | Engine Idling | Yes/No | This parameter displays the status of the Misfire Monitor. The parameter will display Yes when the Misfire Monitor is Enabled. |
| Misfire Monitor Enabled This Ignition Cycle | Ignition ON | No | This parameter displays the enable status of the misfire monitor during the current driving / monitoring cycle. |
| Neutral Position Sensor | â€” | % | This parameter displays the current state of the neutral position sensor in degrees. |

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| Parameter | System State | Expected Value | Description |
|---|---|---|---|
| Number of Calibration History Events Stored | Ignition ON | Counts | This parameter displays the history entries for the primary calibration in the controller. |
| Number of DTC(s) | Engine Idling | 0 | This parameter indicates the number of diagnostic trouble codes (DTCs). |
| O2S/HO2S Monitor Complete | Engine Idling | Yes/No | This parameter displays the enable and completion status during the current driving/monitoring cycle of each continuous legislated emission related monitor and non continuous legislated emission related monitor. |
| O2S/HO2S Monitor Complete This Ignition Cycle | Engine Idling | Yes/No | This parameter displays the enable and completion status during the current driving/monitoring cycle of each continuous legislated emission related monitor and non continuous legislated emission related monitor. |
| O2S/HO2S Monitor Enabled | Engine Idling | Yes/No | This parameter displays the enable and completion status during the current driving/monitoring cycle of each continuous legislated emission related monitor and non continuous legislated emission related monitor. |
| O2S/HO2S Monitor Enabled This Ignition Cycle | Engine Idling | Yes/No | This parameter displays the enable and completion status during the current driving/monitoring cycle of each continuous legislated emission related monitor and non continuous legislated emission related monitor. |
| Odometer at Engine Shutdown â€“ 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 â€“ 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 â€“ 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 â€“ Low Oil Level | Ignition ON | km / miles | This parameter displays the odometer reading at an engine shutdown due to low oil level. |
| Odometer When Engine Overspeed Detected | Engine Idling | km/miles | This parameter displays the kilometers or miles of the Odometer When Engine Overspeed Detected. |
| Oil Level Warning Counter City | Ignition ON | Counts | This parameter displays a rolling count of oil level debounce events for the city calibration. |
| Oil Level Warning Counter Country Road | Ignition ON | Counts | This parameter displays a rolling count of oil level debounce events for the country road calibration |
| Oil Level Warning Counter Highway | Ignition ON | Counts | This parameter displays a rolling count of oil level debounce events for the highway calibration. |
| Output Shaft Speed Sensor | Engine Idling | RPM | This parameter displays the transmission output speed. |
| Park/Neutral Position Switch (If Equipped) | Engine Idling | Park/Neutral | This parameter indicates the range selection of the automatic transmission as calculated by the control module based on input from the PNP switch. The scan tool will display, In Gear, Park, or Neutral depending on the PNP switch position. |
| Park/Neutral Position Switch (RPO=MO5) | Engine Idling | Active/Inactive | This parameter indicates the status of the Park/Neutral Positionâ€‰(PNP) Switch. When in Park, the PNP Switch is closed and the scan tool will display active. When in Reverse, Neutral, or Drive, the PNP Switch is open and the scan tool will display inactive. |
| Power Enrichment | Engine Idling | Inactive | This parameter indicates if the control module has detected conditions appropriate to operate in Power Enrichment mode. The scan tool will display Active if the mode is in operation, and Inactive if the mode is not in operation. The control module enters Open Loop operation and increases injector pulse width when in power enrichment mode. |

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| Parameter | System State | Expected Value | Description |
|---|---|---|---|
| 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 | â€” | Varies CÂ° (FÂ°) | This parameter displays the undefaulted radiator coolant temperature measured by a sensor located in the coolant outlet of the radiator. |
| RCT vs. IAT Sensor Temperature at Last ECT vs. RCT Malfunction Detection | Engine Idling | Agree | This parameter displays that the temperature values of the RCT and IAT sensors did not agree at the time of the most recent failure of the ECT/RCT rationality diagnostic. |
| Recommended Maximum Fuel Alcohol Content | Engine Idling | % | This parameter displays the percentage of the Recommended Maximum Fuel Alcohol Content. |
| Recommended Maximum Fuel Alcohol Content Exceeded | Engine Idling | No | This parameter displays Yes or No if the Recommended Maximum Fuel Alcohol Content Exceeded. |
| Recommended Maximum Fuel Alcohol Content When Recommended Maximum Fuel Alcohol Content Exceeded | Engine Idling | % | This parameter displays the percentage of the Recommended Maximum Fuel Alcohol Content When Recommended Maximum Fuel Alcohol Content Exceeded. |
| Reduced Engine Power | Engine Idling | Inactive | This parameter displays Active if the control module is commanding reduced engine power due to a throttle actuator control (TAC) system condition. |
| Reduced Engine Power History | Engine Idling | Throttle Malfunction, Cooling Fan Malfunction, Engine Over-temperature Protection Active, Engine Oil Temperature Too High, Remote Vehicle Speed Limiting, Engine Calibration Malfunction, Engine Oil Life, High Pressure Fuel System Malfunction | This parameter displays the last reason that Powertrain has illuminated the Reduced Engine Power (REP) indication. |
| Redundant Odometer Memory | Engine Idling | Present | ECU Odometer Programmed indicates if the ECU odometer value has been programmed. |
| Refueling Events Since Recommended Maximum Fuel Alcohol Content Exceeded | Engine Idling | Counts | This parameter displays the number Refueling Events Since Recommended Maximum Fuel Alcohol Content Exceeded. |
| Remaining Fuel in Tank | Engine Idling | % | 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 1â€“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. |

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| Parameter | System State | Expected Value | Description |
|---|---|---|---|
| Reverse Inhibit Solenoid Actuator Control Circuit Low Voltage Test Status | Ignition ON | OK | This parameter displays the state of the reverse inhibit solenoid actuator control circuit. The parameter displays Malfunction if the reverse inhibit solenoid actuator control circuit is shorted to ground. |
| Reverse Inhibit Solenoid Actuator Control Circuit Open Test Status | Ignition ON | OK | This parameter displays the state of the reverse inhibit solenoid actuator control circuit. The parameter displays Malfunction if the reverse inhibit solenoid actuator control circuit is open. |
| Reverse Position Switch | Engine Idling | Off | This parameter displays if the manual transmission shifter is in reverse. |
| Secondary Air Injection Monitor Enabled | Engine Idling | Yes | This parameter displays the status of the secondary air injection monitor. |
| Secondary Air Injection Pressure | Engine Idling | kPa | This parameter displays the normalized secondary air injection system pressure. |
| Secondary Air Injection Pressure Sensor | Engine Idling | kPa | This parameter displays the unfiltered secondary air injection system pressure. |
| Secondary Air Injection Pressure Sensor | Engine Idling | Volts | This parameter displays the secondary air injection system pressure analog input as a percentage of its reference voltage. |
| Secondary Air Injection Pressure Sensor Variance | Engine Idling | kPa | This parameter displays the weighted average pressure error (difference between the predicted and actual secondary air injection system pressure) during the secondary air injection on test (phase 1). |
| Secondary Air Injection Pump Relay Command | Engine Idling | Off | This parameter displays the commanded state of the secondary air injection pump output. |
| Secondary Air Injection Pump Relay Control Circuit High Voltage Test Status | Engine Idling | OK | This parameter displays the state of the secondary air injection pump relay control circuit. The parameter displays Malfunction if the secondary air injection pump relay control circuit is shorted to voltage. |
| Secondary Air Injection Pump Relay Control Circuit Low Voltage Test Status | Engine Idling | OK | This parameter displays the state of the secondary air injection pump relay control circuit. The parameter displays Malfunction if the secondary air injection pump relay control circuit is shorted to ground. |
| Secondary Air Injection Pump Relay Control Circuit Open Test Status | Engine Idling | OK | This parameter displays the state of the secondary air injection pump relay control circuit. The parameter displays Malfunction if the secondary air injection pump relay control circuit is open. |
| Secondary Air Injection Solenoid Valve Command | Engine Idling | Off | This parameter displays the commanded state of the secondary air injection valve output. |
| Secondary Air Injection Solenoid Valve Control Circuit High Voltage Test Status | Engine Idling | OK | This parameter displays the state of the secondary air injection solenoid valve control circuit. The parameter displays Malfunction if the secondary air injection solenoid valve control circuit is shorted to voltage. |
| Secondary Air Injection Solenoid Valve Control Circuit Low Voltage Test Status | Engine Idling | OK | This parameter displays the state of the secondary air injection solenoid valve control circuit. The parameter displays Malfunction if the secondary air injection solenoid valve control circuit is shorted to ground. |
| Secondary Air Injection Solenoid Valve Control Circuit Open Test Status | Engine Idling | OK | This parameter displays the state of the secondary air injection solenoid valve control circuit. The parameter displays Malfunction if the secondary air injection solenoid valve control circuit is open. |
| Short Term Fuel Pump Trim | â€” | # | This parameter displays a numeric value. This is the short term (ST) fuel pump trim. |

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| Parameter | System State | Expected Value | Description |
|---|---|---|---|
| Short Term Fuel Trim<br><br>or<br><br>Short Term Fuel Trim Bank 1 or Bank 2 | Engine Idling | â^'5â€‰% to +5â€‰% | 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<br><br>or<br><br>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 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. |
| Starter Pinion Solenoid Actuator Relay Command | Engine Cranking | On / Off | This parameter indicates the commanded state of the Starter Pinion Solenoid Actuator relay. |
| Starter Pinion Solenoid Actuator Relay Control Circuit High Voltage Test Status | Engine Cranking | OK, Malfunction, Not Run | This parameter displays the Starter Pinior Solenoid Actuator Relay Control Circuit High Voltage Test Status. Can display OK, Malfunction, or Not Run. |
| Starter Pinion Solenoid Actuator Relay Control Circuit Low Voltage Test Status | Engine Cranking | OK, Malfunction, Not Run | This parameter displays the Starter Pinior Solenoid Actuator Relay Control Circuit Low Voltage Test Status. Can display OK, Malfunction, or Not Run. |
| Starter Pinion Solenoid Actuator Relay Control Circuit Open Test Status | Engine Cranking | OK, Malfunction, Not Run | This parameter displays the Starter Pinior Solenoid Actuator Relay Control Circuit Open Circuit Test Status. Can display OK, Malfunction, or Not Run. |
| Starter Relay Command | Ignition switch not in the crank position | Off | This parameter indicates whether the control module is commanding the starter relay to go On or Off. |
| | Ignition switch in the crank position | On | |
| Starter Relay Control Circuit High Voltage Test Status | Ignition ON | OK | This parameter displays the state of the starter relay control circuit. The parameter displays Malfunction if the starter relay control circuit is shorted to voltage.<br><br>This parameter may not change if the scan tool is used to command the relay control circuit On. |

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| Parameter | System State | Expected Value | Description |
|---|---|---|---|
| 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.<br><br>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.<br><br>This parameter may not change if the scan tool is used to command the relay control circuit On. |
| Start-Up ECT | Ignition ON | â^'39Â° to +140Â°C (â^'38Â° to +284Â°F) | This parameter displays the temperature of the engine coolant on start-up based on input to the control module from the ECT sensor. |
| Start-Up Fuel Rail Temperature | Engine Idling | ÂºC (ÂºF) | This parameter indicates the fuel rail temperature when the engine was started from the first sensor located on the fuel rail. |
| Start-Up Fuel Rail Temperature 1 | Engine Idling | ÂºC (ÂºF) | This parameter indicates the fuel rail temperature when the engine was started from the first sensor located on the fuel rail. |
| Start-Up Fuel Rail Temperature 2 | Engine Idling | ÂºC (ÂºF) | This parameter indicates the fuel rail temperature when the engine was started from the second sensor located on the fuel rail. |
| Start-Up IAT Sensor or Start-Up IAT Sensor 1 or 2 | Ignition ON | â^'39Â° to +140Â°C (â^'38Â° to +284Â°F) | This parameter displays the temperature of the intake air at start in the air induction system based on input to the control module from the IAT sensor. |
| Start-Up IAT Sensor 3 | Engine Idling | ÂºC (ÂºF) | This parameter indicates the intake air temperature when the engine was started. |
| Stop/Start Disable Mode | Ignition ON | Active / Inactive / Not Available | This parameter indicates the status of the Stop/Start Disable Mode. |
| Supercharger Bypass Solenoid Valve Command | Ignition ON | % | This parameter displays the commanded duty cycle for the supercharger boost solenoid output. |
| Supercharger Bypass Solenoid Valve Control Circuit High Voltage Test Status | Ignition ON | OK | This parameter displays the state of the supercharger bypass solenoid valve control circuit. The parameter displays Malfunction if the supercharger bypass solenoid valve control circuit is shorted to voltage. |
| Supercharger Bypass Solenoid Valve Control Circuit Low Voltage Test Status | Ignition ON | OK | This parameter displays the state of the supercharger bypass solenoid valve control circuit. The parameter displays Malfunction if the supercharger bypass solenoid valve control circuit is shorted to ground. |
| Supercharger Bypass Solenoid Valve Control Circuit Open Test Status | Ignition ON | OK | This parameter displays the state of the supercharger bypass solenoid valve control circuit. The parameter displays Malfunction if the supercharger bypass solenoid valve control circuit is open. |
| Supercharger Inlet Pressure | Engine Idling | kPa | This parameter displays the supercharger inlet vacuum pressure calculated as the difference between ambient air pressure (barometric pressure) and supercharger inlet absolute pressure (SCIAP). |
| Supercharger Inlet Pressure Sensor | Engine Idling | kPa | This parameter displays the unfiltered supercharger inlet absolute pressure (SCIAP). |
| Supercharger Inlet Pressure Sensor | Engine Idling | Volts | This parameter displays the supercharger inlet absolute pressure (SCIAP) analog input as a percentage of its reference voltage. |
| SVS Indicator Command | Ignition ON | Off | This parameter displays that the Service Vehicle Soon lamp is being commanded on due to the failure of a non emission related diagnostic test. |
| System Off | Ignition ON | No | This parameter displays that the vehicle is waiting for a key crank to happen (key crank not done yet). |

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| Parameter | System State | Expected Value | Description |
|---|---|---|---|
| TAC Forced Engine Shutdown | Ignition ON | No | This parameter indicates the status of the TAC motor by the control module. The scan tool will display Yes if the engine has been shut down due to a throttle control fault. |
| TAC Motor | Ignition ON | Enabled | This parameter indicates the status of the throttle actuator control (TAC) motor driver in the control module. The scan tool will display Enabled if TAC motor operation is allowed. The scan tool will display Disabled if the control module detects a condition that affects TAC motor operation. |
| TAC Motor Command | Ignition ON | % | 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 | 0â€“100â€‰% | 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 Sensorâ€‰1 | Ignition ON | 3.7â€“4.3â€‰Volts | This parameter displays the actual voltage on the TP sensorâ€‰1 signal circuit as measured by the control module. |
| Throttle Position Sensorâ€‰1 Learned Minimum | Ignition ON | 0.51â€‰Volts | This parameter displays the learned minimum value of throttle position (TP) sensorâ€‰1 as recorded by the control module during the last learn procedure. |
| Throttle Position Sensorâ€‰1 or 2 Position | Ignition ON | % | This parameter displays the actual voltage on the TP sensorâ€‰2 signal circuit as measured by the control module. |
| Throttle Position Sensorâ€‰2 | Ignition ON | 0.5â€“0.8â€‰Volts | This parameter displays the voltage signal sent to the control module from TP sensorâ€‰2 of the throttle assembly. The TP sensorâ€‰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 Sensorâ€‰2 Learned Minimum | Ignition ON | 0.51â€‰Volts | This parameter displays the learned minimum value of TP sensorâ€‰2 as recorded by the control module during the last learn procedure. |
| Throttle Position Sensorsâ€‰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). |
| Torque Request Inhibit â€“ Fuel | Engine Idling | No | This parameter displays the existing condition in the ECM causing the transmission torque request to be limited. |
| Torque Request Inhibit â€“ Ignition Timing | Engine Idling | No | This parameter displays the existing condition in the ECM causing the transmission torque request to be limited. |

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| Parameter | System State | Expected Value | Description |
|---|---|---|---|
| Torque Request Inhibit â€“ 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 â€“ 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 â€“ 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 â€“ TAC | Engine Idling | No | This parameter displays the existing condition in the ECM causing the transmission torque request to be limited. |
| Torque Request Inhibit â€“ 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 Mass Air Flow | Engine Idling | g/s | This parameter indicates the engine mass airflow. |
| Total Engine Overspeed Time | Engine Idling | ms | This parameter displays the Total Engine Overspeed Time. |
| Total Knock Retard | Engine Idling | 0Â° | This parameter displays how much ignition spark timing is being retarded due to all control systems monitored by the control module. |
| Total Misfire | Engine Idling | 0 | This parameter displays the total number of cylinder firing events that the control module detected as misfires for the last 200 crankshaft revolution sample period. |
| Traction Control Axle Torque Request Signal | Vehicle Moving | N-m (lb ft) | This parameter indicates the axle torque requested by the traction control module. |
| Traction Control Status | Vehicle Moving | Inactive | This parameter displays Active if the electronic brake and traction control module (EBTCM) is commanding traction control. |
| Transmission Fluid Pressure Accumulator Solenoid Valve Command | Ignition ON | On/Off | This parameter displays the position of the Transmission Fluid Pressure Accumulator Solenoid Valve Control. |
| Transmission Fluid Pressure Accumulator Solenoid Valve Control Circuit High Voltage Test Status | Ignition ON | OK, Malfunction, Not Run | This parameter displays the state of the Transmission Fluid Pressure Accumulator Solenoid Valve Control Circuit. The parameter displays Malfunction if the Transmission Fluid Pressure Accumulator Solenoid Valve Control Circuit is shorted to voltage. |
| Transmission Fluid Pressure Accumulator Solenoid Valve Control Circuit Low Voltage Test Status | Ignition ON | OK, Malfunction, Not Run | This parameter displays the state of the Transmission Fluid Pressure Accumulator Solenoid Valve Control Circuit. The parameter displays Malfunction if the Transmission Fluid Pressure Accumulator Solenoid Valve Control Circuit is shorted to ground. |
| Transmission Fluid Pressure Accumulator Solenoid Valve Control Circuit Open Test Status | Ignition ON | OK, Malfunction, Not Run | This parameter displays the state of the Transmission Fluid Pressure Accumulator Solenoid Valve Control Circuit. The parameter displays Malfunction if the Transmission Fluid Pressure Accumulator Solenoid Valve Control Circuit is open. |
| Transmission Fluid Temperature Sensor | Ignition ON | Â°C (Â°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. |

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| Parameter | System State | Expected Value | Description |
|---|---|---|---|
| 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 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 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 1â€“8 | Engine Idling | Varies | This parameter displays the reason for the last 8 variable valve lift disable history reasons. |

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| Parameter | System State | Expected Value | Description |
|---|---|---|---|
| Variable Valve Lift Low Lift Inhibit â€“ Reason | Engine Idling | Varies | This parameter lists the reason the variable valve lift low lift may be inhibited. These include; 4WD Low State Invalid, A/C Compressor Clutch On, Acceleration Request, Brake Booster Pressure Sensor DTC, Brake Booster Weak Vacuum, Calculated Torque, Camshaft Position Sensor DTC, Control Function Active, Crankshaft Position Sensor DTC, ECT, ECT Sensor DTC, Engine Controls Ignition Relay DTC, Engine Not Synchronized, Engine Off, Engine Oil Pressure, Engine Oil Pressure Control Solenoid Valve Stuck Off, Engine Oil Pressure Control Test Active, Engine Oil Pressure Sensor DTC, Engine Oil Temperature, Engine Overtemperature Protection, Engine Power Not Requested, Engine Speed, Engine Torque Capacity, Fuel Alcohol Content Learn In Progress, Fuel Alcohol Content Too High, Fuel System Disabled, Green Engine Mode, HO2S 2 Test, Hot Coolant Mode, Hybrid/EV Powertrain Control Module Request, IAT Sensor DTC, Ignition Voltage, MAP Sensor DTC, Maximum Throttle Exceeded, Minimum Time After TAC DTC, Misfire DTC, Oil Aeration. On-Board Diagnostic System, Rocker Arm Solenoid Valve DTC, RPM Limit, TAC System DTC, Transmission Gear, Transmission Range, Transmission Shifting, Vehicle Speed Too Low, VSS DTC. |
| Variable Valve Lift System Command | â€” | Low Lift | This parameter displays the current state of the variable valve lift system command. |
| Vehicle Speed Sensor | Vehicle Moving | Km/h<br>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<br>mph | This parameter displays the Vehicle Speed When Engine Overspeed Detected. |
| VIN Programming Counter | Ignition ON | Counts | This parameter displays the number of times the VIN has been programmed. This counter can only be incremented. |
| Warm Ups Since DTC Cleared | Engine Idling | Counts | This parameter indicates the number of warm up cycles that have occurred Since DTCs were cleared. The scan tool will display a higher counts as more warm up cycles have occurred since the DTCs were cleared. |
| Warm Ups without Emission Malfunctions | Engine Idling | Counts | This parameter displays the number of OBD defined warm up cycles since the last emissions related (fault type A or B) fail report or MIL request. Emissions related DTCs are cleared from memory when this counter reaches 40. |
| Warm Ups without Non Emission Malfunctions | Engine Idling | Counts | This parameter displays the number of OBD defined warm up cycles since the last non emissions related (fault type C) fail report. Non emissions related DTCs are cleared from memory when this counter reaches 40. |
| Weight Percent Water in Air | Engine Idling | % | 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 100â€‰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

| Outputâ€‰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. |

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| Outputâ€‰Control | Description |
|---|---|
| Active Grill Air Shutter 1 or 2 Commanded Position | This device control is used to command the position of the active grill air shutter 1 or 2 output. 0% equals fully closed, 100% equals fully open. |
| Alternative Fuel High Pressure Shutoff Valve Control | This device control is used to override the state of the alternative fuel shutoff valve 1 output. |
| Alternative Fuel Injector Disable Control | This device control is used with the engine running to override the state of the alternative fuel injector outputs. This device control is used to disable alternative fuel injectors in order to cut off alternative fuel to the associated cylinders. |
| Alternative Fuel Injector Flow Control | This device control is used to trigger a single Alternative fuel injector to be commanded on for a calibrated number of pulses (e.g. 25) in order to test the flow of the Alternative fuel injector. |
| Alternative Fuel Low Pressure Shutoff Valve Control | This device control is used to verify functionality of the Alternative Fuel Low Pressure Fuel Shutoff Valve system by allowing the Alternative Fuel Low Pressure Fuel Shutoff Valve output to be commanded to a specific Alternative Fuel Rail Pressure. |
| Alternative Fuel System Leak Test â€“ Service Bay Test | This device control will signal the ECM to begin the Alternative Fuel System Leak Test. |
| Autostop/Autostart | This device control is used to override the internal combustion engine (ICE) running state. |
| BiFuel System â€“ Fuel Mode Selection | When this CPID is active, the fuel mode is commanded to the selection made in â€œFuel Mode Selection.â€ |
| 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 Relayâ€‰1 | This function activates the cooling fan relay â€‰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 Relayâ€‰ 1 Command. The control module allows cooling fan relay control when the following conditions are met:<br>• The Ignition is ON or the engine is running.<br>• A/C compressor operation is not requested.<br>• The engine coolant temperature is less than 106Â°C (224Â°F). |
| Cooling Fan Relayâ€‰1,2 and 3 | This function activates the cooling fan relay 1, 2 and 3. The normal commanded state of the fan relays is NONE. The relay command status can also be monitored on the scan tool data parameters Cooling Fan Relay 1 Command and Cooling Fan Relays 2 and 3 Command. The control module allows cooling fan relay control when the following conditions are met:<br>• The Ignition is ON or the engine is running.<br>• A/C compressor operation is not requested.<br>• The engine coolant temperature is less than 106Â°C (224Â°F). |
| Cooling Fanâ€‰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:<br>• The Ignition is ON or the engine is running.<br>• A/C compressor operation is not requested.<br>• The engine coolant temperature is less than 106Â°C (224Â°F). |

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| Outputâ€‰Control | Description |
|---|---|
| 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:<br><br>The Misfire Current and Misfire History parameters may not increment when using this function.<br><br>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:<br><br>• The engine is operating and the engine idle is stable.<br>• The vehicle speed is 0â€‰km/h (0â€‰mph).<br>• There are no DTCs set for the vehicle speed sensor.<br><br>If the fuel injector was disabled for 30â€‰seconds, fuel injector control is not allowed again on the same fuel injector for 60â€‰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 â€œFuel Pump Device Control with Engine Runningâ€ such that when the low pressure pump is commanded OFF the high pressure pump will be controlled to a low pressure value. This combination shall be held until either the FPMR device control is released, or the engine stalls. |
| Engine Controls Ignition Relay | This device control is used to override the state of the Powertrain Relay. |
| Engine Coolant Thermostat Heater | This device control is used to override the state of the Engine Coolant Thermostat Heater. |
| Engine Oil Life Reset | This DID contains the engine oil remaining life determined from an algorithm based upon the effective engine revolutions and the distance driven since the last oil change. This DID may be used to reset the engine oil remaining life to 100â€‰% 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 25â€‰RPM, 100â€‰RPM, and 500â€‰RPM increments, from the base idle speed to 1,400â€‰RPM. The scan tool initiates the test when the following conditions are met:<br><br>• The transmission is in park or neutral.<br>• The engine speed is less than 1,000â€‰RPM.<br><br>The engine speed will remain in the commanded state until cancelled by the scan tool. |
| EVAP Purge/Seal | Note:<br><br>The EVAP Purge and Vent Solenoid Command parameters may not change states when using this output control.<br><br>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 0â€‰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 â^’24â€‰mmâ€‰Hg (â^’12â€‰inchâ€‰H20). |
| EVAP Purge Solenoid Valve | Note:<br><br>The EVAP Purge Solenoid Command parameter may not change states when using this output control.<br><br>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 10â€‰percent increments within a range of 0â€“100â€‰percent. The system remains in the commanded state until cancelled by the scan tool or the fuel tank pressure (FTP) sensor exceeds â^’24â€‰mmâ€‰Hg (â^’12â€‰inchâ€‰H20). |
| EVAP Test | This device control is used to activate the evaporative emissions service bay test. |

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| Outputâ€‰Control | Description |
| --- | --- |
| EVAP Vent Solenoid Valve | Note:<br><br>The EVAP Vent Solenoid Command parameter may not change states when using this output control.<br><br>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:<br><br>• Cancelled by the scan tool<br><br>• The EVAP canister purge solenoid is more than 0â€‰percent, and the FTP sensor exceeds â^’24â€‰mmâ€‰Hg (â^’12â€‰inchâ€‰H20). |
| Excessive Clutch Slip Data Reset | This device control is used to reset all clutch slip detection values. |
| Exhaust Camshaft Position Actuator<br><br>or<br><br>Exhaust Camshaft Position Actuator Bank 1 | This device control is used to override the state of the exhaust cam phase output. The commanded camshaft position is expressed in terms of degrees of camshaft rotation (retard for exhaust camshaft) from the park position (a camshaft position of zero represents the park position). |
| Exhaust Camshaft Position Actuator<br><br>or<br><br>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<br><br>or<br><br>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<br><br>or<br><br>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:<br><br>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.<br><br>The system remains in the commanded state until cancelled by the scan tool. |

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| Outputâ€‰Control | Description |
|---|---|
| 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:<br>• All instruction on the scan tool is complete.<br>• A fuel injector is selected.<br>• The ignition is ON with the engine OFF.<br>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 1862â€“17,237â€‰kPa (270â€“2500â€‰psi). The scan tool initiates the test when the following conditions are met:<br>• The engine is operating<br>• The ignition voltage is 10â€“18â€‰V<br>• The vehicle speed is 0â€‰mph<br>• DTCâ€‰P0700 is not set<br>The system remains in the commanded state for about 30â€‰seconds or until cancelled by the scan tool or the ECM detects a vehicle speed. |
| Fuel Pressure Regulator | Note:<br>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.<br>This device control is intended for use on a Direct Injection (DI) high pressure fuel supply system to activate the fuel pressure regulator at ignition ON, engine OFF. Both the low side and high side of the regulator are controlled together. Commanding the regulator to ON will modulate the high side driver to a calibratible Maximum Duty Cycle. |
| Fuel Pump Enable | This function controls the fuel pump. The normal commanded state is NONE. The scan tool initiates the test when the following conditions are met:<br>• There are no vehicle speed sensor DTCs set.<br>• The vehicle speed is 0â€‰km/h (0â€‰mph).<br>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 2â€‰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 Injectionâ€‰(DI) high pressure fuel supply system to override the commanded fuel high pressure output from the powertrain controller. |
| Fuel Trim Enable | This function disables the control modules ability to learn new fuel trim parameters. The commanded states are NONE, ENABLED, DISABLED. The normal commanded state is NONE. The system remains in the commanded state until cancelled by the scan tool. |
| Fuel Trim Reset | This function is used to reset the learned fuel trim values to their initial values. |
| Generator L-Terminal | Commands the generator L terminal ON and OFF. |
| Heater Coolant Pump | This device control is used to override the state of the heater core pump relay output. |
| HO2S Heater Sensor 1<br>or<br>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 3.0â€‰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. |

| Outputâ€‰Control | Description |
|---|---|
| HO2S Heater Sensor 2<br><br>or<br><br>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 3.0â€‰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 3.0â€‰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 3.0â€‰seconds, after which the selected oxygen sensor heater must be disabled for a limited duration (typically 60 seconds) before it may be enabled again. With the engine running, this device control is used to operate the oxygen sensor heaters at the various duty cycles available to the engine controller. |
| HO2S Heater Learn | This device control is used to trigger the reset of the learned resistances for the oxygen sensor heaters following a replacement in service. The learned resistances are reset to a calibration used to prevent overheating of the sensors until more accurate resistances may be learned following an extended engine OFF time (typically 12 or more hours). |
| Idle Ignition Timing | Disables and enables idle spark advance with the engine running. |
| Idle Learn | This function allows the throttle position and the idle speed to be relearned by the ECM, once the following conditions have been met.<br>• The ignition is ON with the engine OFF.<br>• The ECT is between 5â€“85Â°C (41â€“185Â°F).<br>• 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<br><br>or<br><br>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<br><br>or<br><br>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<br><br>or<br><br>Intake Camshaft Position Actuator Solenoid Valve Bank 1 | This device control is used to override the state of the intake cam phase solenoid output. |

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| Outputâ€‰Control | Description |
|---|---|
| Intake Camshaft Position Actuator Solenoid Valve<br><br>or<br><br>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 1â€“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 Lampâ€‰(MIL) | This function controls the malfunction indicator lamp (MIL). The normal commanded state is NONE. When commanded ON/OFF, the ECM turns the MIL ON/OFF. The system remains in the commanded state until cancelled by the scan tool. |
| Mass Air Flow Sensor Supply Voltage | This device control is used to override the state of the mass air flow sensor supply voltage output. |
| Misfire Graphic | This function clears the misfire graphics from the scan tool. |
| Oil Life Reset | This output control is used to reset the engine oil life monitor from 0 to 100â€‰%. |
| 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 8â€‰attempts is cleared. |
| Secondary Air Injection Pump Relay | This device control is used to turn the AIR Pump ON or OFF. |
| Secondary Air Injection Solenoid Valve | This device control is used to turn the AIR Valve ON or OFF. |
| Secondary Air Injection Test | This device control is used to trigger the secondary air injection (SAI) diagnostic service bay test, which causes the on board SAI diagnostic to execute until it is completed or aborted. |
| Starter Relay (If Available) | Commands the starter relay ON and OFF. |
| Throttle Position | This device control is used to override the commanded throttle position. |
| Throttle Sweep | This function moves the Throttle plate slowly from a closed position to wide open position, aiding diagnosis of TAC motor. |
| Transmission Fluid Pressure Accumulator Solenoid Valve | This device control is used to override the state of the Transmission Fluid Pressure Accumulator Solenoid Valve. |
| Turbocharger Bypass Solenoid Valve | This device control is used to control the duty cycle for the turbocharger A compressor bypass. |
| Turbocharger Wastegate Solenoid Valve | This device control is used to control the duty cycle for the turbocharger A wastegate. |

## Related Part Information

| Part Name | Catalog Name | Part Code |
|---|---|---|
| Engine Control Module | MODULE PKG,ENG CONT | 0498A |
| Engine Control Module | MODULE KIT,ENG CONT | 0499Z |
| Engine Control Module | MODULE,ENG CONT | 0500A |
| Engine Control Module | MODULE,ENG CONT(W/O CALN) | 0500B |
| Engine Control Module | MODULE,ENG CONT | 0500C |
| Engine Control Module | MODULE,ENG CONT(W/O CALN & OPERG SYS) | 0500D |
| Engine Control Module | MODULE,ENG CONT(W/O BOOT PRGM) | 0500E |
| Engine Control Module | MODULE,ENG CONT(W/O BOOT PRGM & CALN) | 0500F |

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| Part Name | Catalog Name | Part Code |
|---|---|---|
| Engine Control Module | MODULE,ENG CONT(W/O BOOT PRGM & CALN & OPERG SYS) | 0500G |
| Engine Control Module | MODULE,ENG CONT (W/ 2ND MPU) | 0500H |
| Engine Control Module | MODULE,ENG CONT (W/ 2ND MPU) (W/O BOOT&CALN&OPERG SYS | 0500K |
| Engine Control Module | MODULE,ENG CONT (W/ BRKT) | 0500L |
| Engine Control Module | MODULE,ENG CONT | SJ056 |
| Engine Control Module | MODULE KIT,ENG CONT | SJ282 |
| Engine Control Module | MODULE,ENG CONT | SS070 |

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## K36 Inflatable Restraint Sensing and Diagnostic Module: Scan Tool Information

Note:

Some parameters and values in the table below may not apply to every vehicle.

Sensing and Diagnostic Module Scan Tool Data Parameters

| Parameter | Expected Value | Definition |
|---|---|---|
| **Operating Conditions:** Ignition ON | | |
| 2nd Row Left Seat Belt Reminder Sensor Pad Enable Status | Disabled/Enabled | The scan tool displays if the left rear seat belt reminder sensor pad is enabled to the SDM. |
| 2nd Row Left Seat Belt Reminder Sensor Pad Learn Status | Learned/Not Learned | The scan tool displays Learned or Not Learned. Learned is displayed if the left rear seat belt reminder sensor pad has been learned by the SDM. |
| 2nd Row Left Seat Belt Status | Buckled/Unbuckled | The scan tool displays Buckled or Unbuckled. This is the state of the left rear seat belt switch when the seat belt is buckled or unbuckled. |
| 2nd Row Middle Seat Belt Reminder Sensor Pad Enable Status | Disabled/Enabled | The scan tool displays if the rear middle seat belt reminder sensor pad is enabled to the SDM. |
| 2nd Row Middle Seat Belt Reminder Sensor Pad Learn Status | Learned/Not Learned | The scan tool displays Learned or Not Learned. Learned is displayed if the rear middle seat belt reminder sensor pad has been learned by the SDM. |
| 2nd Row Middle Seat Belt Status | Buckled/Unbuckled | The scan tool displays Buckled or Unbuckled. This is the state of the middle rear seat belt switch when the seat belt is buckled or unbuckled. |
| 2nd Row Middle Seat Belt Reminder Sensor Pad Enable Status | Disabled/Enabled | The scan tool displays if the rear right seat belt reminder sensor pad is enabled to the SDM. |
| 2nd Row Middle Seat Belt Reminder Sensor Pad Learn Status | Learned/Not Learned | The scan tool displays Learned or Not Learned. Learned is displayed if the rear right seat belt reminder sensor pad has been learned by the SDM. |
| 2nd Row Right Seat Belt Status | Buckled/Unbuckled | The scan tool displays Buckled or Unbuckled. This is the state of the right rear seat belt switch when the seat belt is buckled or unbuckled. |
| Air Bag Malfunction Indicator | On/Off/Flashes | The scan tool will display On or Flashes if there is a problem with the SIR system. Any problems within the SIR system will illuminate the air bag indicator. The indicator will either flash or stay on. |
| Base Model Part Number | Varies, 8 Digit Number | The scan tool displays the part number of the SDM which is stored in non volatile memory. |
| Calibration Part Number | Varies, 8 Digit Number | The scan tool displays the part number of the calibration file in the SDM. |
| Deployment Loop 1-18 Enable Status | Enabled/Disabled | The scan tool displays Enabled or Disabled. This is the status of the air bag or pretensioner. |
| Deployment Loop 1-18 Learn Status | Learned/Not Learned | The scan tool displays Learned or Not learned. Learned is displayed if the SDM has defined the number loop programmed from an air bag or pretensioner. |
| Deployment Loop 1-18 Resistance | 1.44â€“4.25 Ohms | The scan tool displays the resistance of the learned loop of the air bag or pretensioner when connected to the SDM. |
| Deployment Loop 1-18 Type | Varies | The scan tool displays the name of the air bag or pretensioner associated with the loop type 1â€“18. |
| Driver Seat Belt Reminder Indicator | On/Off | The scan tool displays On if this indicator is on. If the indicator is on it means the seat belt has not been buckled. |
| Driver Seat Belt Sensor Enable Status | Enabled/Disabled | The scan tool displays if the seat belt sensor in the seat belt buckle is enabled to the SDM. |
| Driver Seat Belt Sensor Learn Status | Learned/Not learned | The scan tool displays Learned or Not Learned. Learned is displayed if the driver seat belt sensor has been learned by the SDM. |
| Driver Seat Belt Status | Buckled/Unbuckled | The scan tool displays Buckled or Unbuckled. This is the state of the driver seat belt switch when the seat belt is buckled or unbuckled. |

| Parameter | Expected Value | Definition |
|---|---|---|
| Driver Seat Position Sensor | Rearward/Forward | The scan tool will display if the driver seat is forward or rearward of the sensor set position. |
| Driver Seat Position Sensor Enable Status | Enabled/Disabled | The scan tool displays if the seat position sensor is enabled to the SDM. |
| Driver Seat Position Sensor Learn Status | Learned/Not Learned | The scan tool displays Learned or Not Learned. Learned is displayed if the driver seat position sensor has been learned by the SDM. |
| End Model Part Number | Varies, 8 Digit Number | The scan tool displays the part number of the SDM in production. |
| Impact Sensor 1-8 Enable Status | Enabled/Disabled | The scan tool displays Enabled or Disabled This is the status of the impact sensor. |
| Impact Sensor 1-8 Learn Status | Learned/Not Learned | The scan tool displays Learned or Not learned. Learned is displayed if the SDM has learned and has assigned a number to that impact sensor. |
| Impact Sensor 1-8 Type | Equipped/Not Equipped | The scan tool displays the name of the impact sensor associated with the type 1â€“8. |
| Inflatable Restraint Sensing and Diagnostic Module Primary Key | Hex Value | The scan tool indicates the primary key Hex value. |
| Manufacturer's Traceability Number | Varies, 16 Digit Number | The scan tool displays the 16 digit traceability number in the SDM. |
| Module Setup | Incomplete/Complete | The scan tool indicates if the SDM is set up. |
| Passenger Air Bag Disabled Switch | On/Off | The scan tool displays Off when the customer manually turns the passenger airbag off with this switch. |
| Passenger Air Bag Off Indicator | On/Off | The scan tool displays Off when the passenger indicator is not illuminated. This indicator is off when the disable switch is in the off position or no one is sitting in the passenger seat. |
| Passenger Air Bag On Indicator | On/Off | The scan tool displays On when the passenger indicator is illuminated. This indicator is on when the disable switch is in the on position and someone is sitting in the passenger seat. |
| Passenger Air Bag Status | Enabled/Disabled | The scan tool displays if the passenger air bag is enabled to the SDM. |
| Passenger Air Bag Disable Indicator Enable Status | Enabled/Disabled | The scan tool displays if the passenger air bag disable indicator is enabled to the SDM. |
| Passenger Air Bag Disable Indicator Learn Status | Learned/Not Learned | The scan tool displays Learned or Not Learned. Learned is displayed if the SDM has learned the status of the passenger air bag disable indicator. |
| Passenger Air Bag Disable Switch Enable Status | Enabled/Disabled | The scan tool displays if the passenger air bag disable switch is enabled to the SDM. |
| Passenger Air Bag Disable Switch Learn Status | Learned/Not Learned | The scan tool displays Learned or Not Learned. Learned is displayed if the SDM has learned the status of the passenger air bag disable switch. |
| Passenger Air Bag Enable Indicator Enable Status | Enabled/Disabled | The scan tool displays if the passenger air bag enable indicator is enabled to the SDM. |
| Passenger Air Bag Enable Indicator Learn Status | Learned/Not Learned | The scan tool displays Learned or Not Learned. Learned is displayed if the SDM has learned the status of the passenger air bag enable indicator. |
| Passenger Classification | 00â€“07 | The scan tool will display what type of individual is sitting in the passenger seat. |
| Passenger Presence Detection System Enable Status | Enabled/Disabled | The scan tool displays if the passenger presence system is enabled to the SDM. |
| Passenger Presence Detection System Learn Status | Learned/Not Learned | The scan tool displays Learned or Not Learned. Learned is displayed if the SDM has learned the passenger presence system. |
| Passenger Presence Detection System Reporting DTC(s) | Yes/No | The SDM will report if there are DTCs set in the passenger presence module. |
| Passenger Seat Belt Reminder Indicator | On/Off | The scan tool displays On if this indicator is on. If the indicator is on it means the seat belt has not been buckled. |
| Passenger Seat Belt Reminder Indicator Enable Status | Disabled/Enabled | The scan tool displays if the passenger seat belt reminder indicator is enabled to the SDM. |
| Passenger Seat Belt Reminder Indicator Learn Status | Learned/Not Learned | The scan tool displays Learned or Not Learned. Learned is displayed if the passenger seat belt reminder indicator has been learned by the SDM. |
| Passenger Seat Belt Reminder Sensor Pad Enable Status | Disabled/Enabled | The scan tool displays if the passenger seat belt reminder sensor pad is enabled to the SDM. |
| Passenger Seat Belt Reminder Sensor Pad Learn Status | Learned/Not Learned | The scan tool displays Learned or Not Learned. Learned is displayed if the passenger seat belt reminder sensor pad has been learned by the SDM. |
| Passenger Seat Belt Sensor Enable Status | Enabled/Disabled | The scan tool displays if the seat position sensor is enabled to the SDM. |

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| Parameter | Expected Value | Definition |
|---|---|---|
| Passenger Seat Belt Sensor Learn Status | Learned/Not learned | The scan tool displays Learned or Not Learned. Learned is displayed if the passenger seat belt sensor has been learned by the SDM. |
| Passenger Seat Belt Status | Buckled/Unbuckled | The scan tool displays Buckled or Unbuckled. This is the state of the passenger seat belt switch when the seat belt is buckled or unbuckled. |
| Passenger Seat Occupancy Status | Empty Seat/Occupied | The scan tool displays Occupied if someone is sitting in the passenger seat. |
| Passenger Seat Position Sensor | Rearward/Forward | The scan tool will display if the passenger seat is forward or rearward of the sensor set position. |
| Passenger Seat Position Sensor Enable Status | Disabled/Enabled | The scan tool displays if the passenger seat position sensor pad is enabled to the SDM. |
| Passenger Seat Position Sensor Learn Status | Learned/Not Learned | The scan tool displays Learned or Not Learned. Learned is displayed if the passenger seat position sensor has been learned by the SDM. |
| Power Mode | Off/Accessory/Run/Crank Request | The scan tool will display the power mode of the vehicle. |
| Primary Key Status | Valid/Invalid | The scan tool displays Valid if the primary key matches what is stored to memory in the SDM. |
| Primary Key Status Last Ignition Cycle | Invalid/Valid | The SDM checks to see if the primary key data received is valid. |
| Received Primary Key | Hex Value | The scan tool displays a Hex value indicating the SDM received primary key data. |
| Rollover Sensor Enable Status | Disabled/Enabled | The scan tool displays if the rollover sensor is enabled to the SDM. |
| Rollover Sensor Learn Status | Learn/Unlearn | The scan tool displays Learned or Not Learned. Learned is displayed if the rollover sensor has been learned by the SDM. |
| Security Code Accepted | Yes/No | The SDM either accepts the security code or it does not. The scan tool displays Yes if the security code has been accepted by the SDM. |
| Security Code Lockout | Yes/No | The scan tool displays Yes if the SDM has been locked out because of the security code not being accepted. |
| Security Code Lockout Active Timer | Random Value | The SDM uses a timer before the security code is locked in the SDM. |
| Security Code Programmed | Yes/No | The scan tool displays Yes if the SDM has been programmed with the security code. |
| Security Code Programming Counter | Random Value | The SDM uses a counter for the value of the security code programming. |
| Security Code Reset Counter | Random Value | The SDM uses a counter to reset the value of the security code. |
| Software Part Number | Varies, 8 Digit Number | The scan tool displays the software part number in the SDM. |
| Vehicle Identification Number | Varies, 17 Digit Number | The VIN number of the vehicle programmed into the SDM. |
| VIN Programmed | Yes/No | The scan tool displays Yes if the VIN has been programmed into the SDM. |
| VIN Programming Counter | Random Value | The SDM uses this counter while programming the VIN. |

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## K43 Power Steering Control Module: Scan Tool Information

Power Steering Control Module Scan Tool Data Parameters

| Parameter | System State | Expected Value | Description |
|---|---|---|---|
| **Operating Conditions:** Ignition ON | | | |
| Ignition Cycle Counter | â€” | Varies | This displays the number of ignition cycles. |
| Calculated System Temperature | â€” | Varies | This displays Â°â€‰C. This is the current system temperature. |
| Steering Wheel Angle | â€” | Varies | This displays Degrees. This displays the current steering wheel angle in degrees. |
| Steering Wheel Input Torque | â€” | Varies | This displays N-m. This displays the current steering input torque in N-m. |
| Power Steering Motor Overload Protection Counter | â€” | Varies | This displays counts. This displays the Electric Power Steering Motor Overload Protection Incidents counter. |
| Power Steering Control Module SPS Calibration Status | â€” | True/False | Indicates the completion status of the Electric Power Steering calibration. |
| Power Steering Control Module Center Procedure | â€” | True/False | Indicates the completion status of the Electric Power Steering centering procedure. |
| Engine Speed | â€” | 0â€‰RPM | This displays RPM. This is the current engine speed from the ECM. |
| Vehicle Speed | â€” | 0â€‰Km/h (0â€‰MPH) | This displays km/h (mph). This is the current vehicle speed. |
| Motor Feedback Current | â€” | Varies | This displays amps (A). This displays the Electric Power Steering Motor Current Feedback. |
| Delivered Torque | â€” | Varies | This displays N-m. This displays the current value of the Output Torque of the Electric Power Steering. |
| Power Mode | â€” | OFF/Accessory/Run/Crank Request | This displays system power mode. |
| Battery Voltage | â€” | Varies | This displays Volts. This is the current battery voltage. |

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## Communication Interface Module Scan Tool Information

Telematics Communication Interface Control Module Scan Tool Data Parameters

| Parameter | System State | Expected Value | Description |
|---|---|---|---|
| **Operating Conditions:** Ignition ON | | | |
| **GPS Data** | | | |
| • Dead Reckoning Calibration Status | â€” | Calibrated or Not Calibrated | Indicates the dead reckoning calibration status. |
| • Position Calibration Method | â€” | Varies | Indicates the method used to determine current location. (0) GPS, (1) Wheel Speed Dead Reckoning only, (2) Combined Wheel Speed and GPS, (3) Gyro only, (4) Combined Gyro and GPS, (5) No Fix |
| • Month | â€” | MM | This displays the current month. |
| • Day | â€” | DD | This displays the current day of the month. |
| • Year | â€” | YY | This displays the current year. |
| • Hour | â€” | HH | This displays the GPS current hour (24 hour format â€“ GMT). |
| • Minute | â€” | MM | This displays the GPS current minute. |
| • Second | â€” | SS | This displays the GPS current second. |
| • GPS Signal | â€” | Varies | The scan tool displays Yes or No. Yes is displayed if there is a GPS signal received by the telematics communication interface control module. |
| **Signal Strength Data** | | | |
| • Current Transceiver Identifier | â€” | Varies | The scan tool displays a 2â€“5 digit value. This is the transceiver identification number. |
| • GSM Signal Strength | â€” | Varies | The scan tool displays 0â€“127. This is the telematics communication interface control module signal strength. |
| • Signal Type | â€” | Digital | This is the signal type received by the telematics communication interface control module. |
| **Bluetooth Data** | | | |
| • Bluetooth | â€” | Enabled | Indicates if the Bluetooth system is enabled or disabled. |
| • Bluetooth Link Status | â€” | Varies | Indicates the current link status. (0) Unconnected, (1) Connected / Idle, (2) Call active, (3) 3-way calling active |
| • Bluetooth Link Quality | â€” | Varies | The scan tool displays a decimal value between 0 and 255. |
| • Bluetooth Phone to Telematics Communication Interface Control Module Authentication Status | â€” | Active or Inactive | Displays the bluetooth phone to telematics communication interface control module authentication status. |
| • Bluetooth Phone to Telematics Communication Interface Control Module Communication Status | â€” | Active or Inactive | Displays the bluetooth phone to telematics communication interface control module status. |
| • Bluetooth Phone Voice Recognition Status | â€” | Active or Inactive | Displays the bluetooth phone to voice recognition status. |

Telematics Communication Interface Control Module Scan Tool Output Controls

| Output Control | Description |
|---|---|
| | |

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| Output Control | Description |
|---|---|
| B1000 Information | This shows the data recorded when DTC B1000 was set in the telematics communication interface control module. |
| Green Indicator | The telematics communication interface control module illuminates the green LED when ON is selected. |
| Phone Call Test | When ON is selected, telematics communication interface control module commands OnStar to connect to the OnStar Center. |
| Red Indicator | The telematics communication interface control module illuminates the red LED when ON is selected. |
| Preferred Roaming List Update | The telematics communication interface control module performs a preferred roaming list (PRL) update when this is selected. |
| Remote Vehicle Speed Limiting Reset | This function resets the speed limiting feature. |

## Related Part Information

| Part Name | Catalog Name | Part Code |
|---|---|---|
| Communication Interface Module | MODULE KIT,COMN INTERFACE (W/ M/TEL XCVR) | 8774Y |
| Communication Interface Module | MODULE PKG,COMN INTERFACE (W/M/TEL XCVR) | 8774Z |
| Communication Interface Module | MODULE,COMN INTERFACE (W/MOBILE TEL XCVR) | 8775A |
| Communication Interface Module | MODULE,COMN INTERFACE (W/MOBILE TEL XCVR) | 8775B |
| Communication Interface Module | MODULE,COMN INTERFACE | 8778A |
| Communication Interface Module | MODULE PKG,COMN INTERFACE (W/DIGITAL RDO RCVR) | 8804Z |
| Communication Interface Module | MODULE,COMN INTERFACE (W/DIGITAL RDO RCVR) | 8805A |

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## Electronic Brake Control Module Scan Tool Information

The electronic brake control module (EBCM) 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 Voltage | â€” | 0 V | The scan tool displays the pump motor voltage. |
| Antilock Braking System | â€” | OK | The scan tool displays OK or Malfunction. Malfunction is displayed when the ABS is defective. |
| Brake Fluid Level Sensor | â€” | Panic Brake Assist Status | The scan tool displays OK when the brake fluid is at correct level and Low when the brake fluid is low. |
| Brake Pedal Position Sensor | 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 | Brake pedal released | 0â€“1 V | The scan tool displays 0â€“5 V depending on the applied hydraulic brake pressure. |
| | Brake pedal applied | 1â€“5 V | |
| Dynamic Rear Proportioning Status | â€” | OK | The scan tool displays OK or Malfunction. Malfunction is displayed when the dynamic rear proportioning system is defective. |
| Left Front Inlet Solenoid Valve Feedback | â€” | 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 | â€” | 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 | â€” | 0 km/h | The scan tool displays km/h depending on the current speed of the left front wheel speed sensor. |
| Left Rear Inlet Solenoid Valve Feedback | â€” | Inactive | The scan tool displays Inactive or Active. Active is displayed when the left rear inlet solenoid valve is commanded ON. |
| Left Rear Outlet Solenoid Valve Feedback | â€” | 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 | â€” | 0 km/h | The scan tool displays km/h depending on the current speed of the left rear wheel speed sensor. |
| Panic Brake Assist Status | â€” | OK | The scan tool displays OK or Malfunction. Malfunction is displayed when the panic brake assist system is defective. |
| Pump Motor Relay Feedback | â€” | Inactive | The scan tool displays Inactive or Active. Active is displayed when the pump motor is commanded ON. |
| Primary Isolation Solenoid Valve Feedback | â€” | Inactive | The scan tool displays Inactive or Active. Active is displayed when the isolation solenoid valve is commanded ON. |
| Primary Prime Solenoid Valve Feedback | â€” | Inactive | The scan tool displays Inactive or Active. Active is displayed when the prime solenoid valve is commanded ON. |
| Right Front Inlet Solenoid Valve Feedback | â€” | 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 | â€” | 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 | â€” | 0 km/h | The scan tool displays km/h depending on the current speed of the right front wheel speed sensor. |
| Right Rear Inlet Solenoid Valve Feedback | â€” | 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 | â€” | Inactive | The scan tool displays Inactive or Active. Active is displayed when the right rear outlet solenoid valve is commanded ON. |

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| Parameter | System State | Expected Value | Description |
|---|---|---|---|
| Right Rear Wheel Speed Sensor | â€” | 0 km/h | The scan tool displays km/h depending on the current speed of the right rear wheel speed sensor. |
| Secondary Isolation Solenoid Valve Feedback | â€” | Inactive | The scan tool displays Inactive or Active. Active is displayed when the isolation solenoid valve is commanded ON. |
| Secondary Prime Solenoid Valve Feedback | â€” | Inactive | The scan tool displays Inactive or Active. Active is displayed when the prime solenoid valve is commanded ON. |
| Steering Wheel Angle | â€” | Varies | The scan tool displays Â°. This is the current position of the steering angle sensor. |
| System Voltage | â€” | 11â€“14 V | The scan tool displays V. This is the current battery voltage. |
| Traction Control System | â€” | OK | The scan tool displays OK or Malfunction. Malfunction is displayed when the traction control system is defective. |
| Vehicle Stability Enhancement System Relay Feedback | â€” | Inactive | The scan tool displays Inactive or Active depending on the state of the stability control. |
| Vehicle Stability Enhancement System Switch | Traction control switch released | Active | The scan tool displays Active or Inactive depending on the status of the TCS/ESC switch. |
| | Traction control switch pressed | Inactive | |
| Vehicle Stability System | â€” | OK | The scan tool displays OK or Malfunction. Malfunction is displayed when the vehicle stability enhancement system is defective. |

Electronic Brake Control Module Scan Tool Output Controls

| Output Control | Description |
|---|---|
| ABS Pump Motor | Commands the ABS pump motor Increase or Decrease. |
| Front Traction Control Isolation Valve | Commands the solenoid valve ON or OFF. |
| Front Traction Control Prime Valve | Commands the solenoid valve ON or OFF. |
| Left Front ABS Solenoid Valves | Commands the solenoid valves ON or OFF. |
| Left Rear ABS Solenoid Valves | Commands the solenoid valves ON or OFF. |
| Rear Traction Control Isolation Valve | Commands the solenoid valve ON or OFF. |
| Rear Traction Control Prime Valve | Commands the solenoid valve ON or OFF. |
| Right Front ABS Solenoid Valves | Commands the solenoid valves ON or OFF. |
| Right Rear ABS Solenoid Valves | Commands the solenoid valves ON or OFF. |

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## Fuel Injector Control Module Scan Tool Information

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.<br><br>**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 5â€‰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. |
| 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. |
| Air/Fuel Equivalence Ratio Command | â€” | 1.0 | This parameter contains the commanded equivalence ratio. The equivalence ratio should be reported as 1.0 when the vehicle is in closed loop. |
| 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 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 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 pressureâ€‰(FRP) sensor. |
| Alternative Fuel Rail Temperature | Engine Idling | Â°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 pressureâ€‰(FTP) sensor. |
| Ambient Air Temperature | Ignition On | Â°C (Â°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. |
| 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. |
| | | | |

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| Parameter | System State | Expected Value | Description |
|---|---|---|---|
| Camshaft Position Active Counter | â€” | Counts | This parameter displays a rolling count of the number of primary cam position sensor pulses. A change in the value of this parameter indicates primary camshaft position sensor activity |
| Camshaft Position Sensor | â€” | Engine Idle Speed | This parameter displays the engine speed as calculated by the control module using the signal from the CMP sensor. |
| Camshaft Position Signal Output Circuit High Voltage Test Status | â€” | OK | This parameter displays the state of the camshaft position signal output circuit. The parameter displays Malfunction if the camshaft position signal circuit is shorted to voltage. |
| Camshaft Position Signal Output Circuit Low Voltage Test Status | â€” | OK | This parameter displays the state of the camshaft position signal output circuit. The parameter displays Malfunction if the camshaft position signal circuit is shorted to ground. |
| Camshaft Position Signal Output Circuit Open Test Status | â€” | OK | This parameter displays the state of the camshaft position signal output circuit. The parameter displays Malfunction if the camshaft position signal circuit is open. |
| Crankshaft Position Active Counter | â€” | Incrementing | This parameter displays an incrementing counter when the control module receives a signal from the crankshaft position (CKP) sensor. |
| Crankshaft Position Signal Output Circuit High Voltage Test Status | â€” | 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 | â€” | OK | This parameter displays the state of the crankshaft position signal output circuit. The parameter displays Malfunction if the crankshaft position signal output circuit is shorted to ground. |
| Crankshaft Position Signal Output Circuit Open Test Status | â€” | 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 Resync Counter | â€” | Varies | This parameter displays the number of times the control module has to synchronize the CKP sensor. |
| Crankshaft Position Sensor | â€” | Engine Idle Speed | This parameter displays the engine speed as calculated by the control module using the signal from the CKP sensor. |
| 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 1â€“8 Injector 2 Control Circuit Status | â€” | OK | This parameter displays the status of the fuel injector's 1â€“8 output malfunction for Short circuit from injector high side to ground or system voltage, Short circuit from injector low side to injector low side, Short circuit from injector low side to ground or system voltage, Short circuit from injector high side to low side and Injector open circuit. |
| 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. |
| 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. |

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| Parameter | System State | Expected Value | Description |
|---|---|---|---|
| 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 throttleâ€‰(WOT) is commanded |
| Distance Since DTC Cleared | â€” | km / miles | This parameter displays the distance accumulated since an emission diagnostic trouble code was cleared. The scan tool will display increasing distance as the vehicle is driven. |
| Distance Since First Malfunction | â€” | Varies | This parameter displays the distance accumulated when the emission diagnostic trouble code first failed. |
| Distance Since Last Malfunction | â€” | km / miles | The parameter displays the distance driven since the last engine controls malfunction. |
| ECM Fuel Enable | Ignition On | Active / Inactive | This parameter displays the commanded state of the fuel pump output. |
| ECT Sensor | Ignition On | Â°C (Â°F) | This parameter displays the temperature of the engine coolant based on input to the control module from the engine coolant temperatureâ€‰(ECT) sensor. |
| Engine Controls Ignition Relay Feedback Signal | â€” | Battery Voltage | This parameter displays the voltage of the powertrain relay feedback to the controller. |
| Engine Controls Ignition Relay Feedback 2 Signal | â€” | Battery Voltage | This parameter displays the voltage of the powertrain relay feedback to the controller. |
| 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 crankshaftâ€‰(CKP) sensor. If there is a CKP sensor DTC, the ECM calculates the engine speed from one of the camshaft positionâ€‰(CMP) sensors. |
| Estimated LPG Tank Temperature at Startup | Ignition On | Â°C (Â°F) | 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 paramater displays the commanded state of the alternative fuel shutoff valveâ€‰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 Control Loop Status | â€” | Closed | This parameter displays the fuel system loop status. |
| 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 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 Command from ECM | â€” | On/Off | This parameter displays the commanded state of the secondary fuel injectors. |
| 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. |

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| Parameter | System State | Expected Value | Description |
|---|---|---|---|
| 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 | Â°C (Â°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 temperatureâ€‰(IAT) sensor. |
| Ignitionâ€‰1 Signal | Ignition On | On / Off | This parameter displays On when the control module detects a battery voltage. |
| Ignitionâ€‰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. |
| Injector Duty Cycle Bank 1 or 2 | â€” | ms | This parameter displays the fuel injector pulse width (onâ€‘time) commanded to each cylinder on bank 1 or 2. |
| 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 Valve Control Circuit Open 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 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 pressureâ€‰(MAP). |
| Mass Air Flow | Engine Idling | 3.0â€“8.3â€‰g/s | This parameter displays in grams per second, the measured quantity of air flowing into the engine during all operating conditions. |
| MIL Requested | â€” | Yes/No | This parameter displays the commanded state of the malfunction indicator lamp (MIL) output. |
| Number of DTC(s) | â€” | Counts | This parameter displays the number of DTCs set in the control module. |
| 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. If the serial data signal is not received, the arameter will display Off. |

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| Parameter | System State | Expected Value | Description |
|---|---|---|---|
| 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. |
| Secondary Fuel Disable Circuit Signal | â€” | Active | 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. |
| Secondary Fuel Disable Circuit Signal | â€” | Active | This parameter displays whether the secondary fuel injector circuit signal is active. |
| Secondary Fuel Disable Signal | â€” | Active | This parameter displays whether the secondary fuel injector circuit signal is active. |
| Secondary Injector Duty Cycle Bank 1 or 2 | â€” | ms | This parameter displays the fuel injector pulse width (onâ€˜time) commanded to each cylinder on bank 1 or 2. |
| 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 | Â°C (Â°F) | This parameter displays the undefaulted, 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 moduleâ€‰(TCM) from information received from the vehicle speed sensorâ€‰(VSS). |
| Warm-ups Since DTC Cleared | â€” | # | This parameter indicates the number of warm up cycles that have occurred Since DTCs were cleared. The scan tool will display a higher counts as more warm up cycles have occurred since the DTCs were cleared. |
| Warm-ups Without Emission Malfunctions | â€” | # | This parameter indicates the number of warm up cycles that have occurred without an emission Malfunction present. The scan tool will display a 0 if a Malfunction has occurred. The scan tool will display a higher count if a number of warm up cycles have occurred without an emission Malfunction. |
| Warm-ups Without Non-Emission Malfunctions | â€” | # | This parameter indicates the number of warm up cycles that have occurred without a non-emission Malfunction present. The scan tool will display a 0 if a Malfunction has occurred. The scan tool will display a higher count if a number of warm up cycles have occurred without a non-emission Malfunction. |

Fuel Injector Control Module Scan Tool Output Controls

| 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 valveâ€‰1 output. |
| Low Pressure Fuel Cut-Off Solenoid Valve | This device control is used to override the state of the alternative fuel shutoff valveâ€‰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. |

| Output Control | Description |
|---|---|
| Requested Torque | This device control is used to activate the requested torque control circuit from the FICM to the ECM. |

## Related Part Information

| Part Name | Catalog Name | Part Code |
|---|---|---|
| Fuel Injector Control Module | MODULE,F/INJR CONT | 8995A |

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## Fuel Pump Power Control Module Scan Tool Information

Refer to: K20 Engine Control Module: Scan Tool Information.

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## Inflatable Restraint Sensing and Diagnostic Module Scan Tool Information

Note:

Some parameters and values in the table below may not apply to every vehicle.

Sensing and Diagnostic Module Scan Tool Data Parameters

| Parameter | Expected Value | Definition |
|---|---|---|
| **Operating Conditions:** Ignition ON | | |
| 2nd Row Left Seat Belt Reminder Sensor Pad Enable Status | Disabled/Enabled | The scan tool displays if the left rear seat belt reminder sensor pad is enabled to the SDM. |
| 2nd Row Left Seat Belt Reminder Sensor Pad Learn Status | Learned/Not Learned | The scan tool displays Learned or Not Learned. Learned is displayed if the left rear seat belt reminder sensor pad has been learned by the SDM. |
| 2nd Row Left Seat Belt Status | Buckled/Unbuckled | The scan tool displays Buckled or Unbuckled. This is the state of the left rear seat belt switch when the seat belt is buckled or unbuckled. |
| 2nd Row Middle Seat Belt Reminder Sensor Pad Enable Status | Disabled/Enabled | The scan tool displays if the rear middle seat belt reminder sensor pad is enabled to the SDM. |
| 2nd Row Middle Seat Belt Reminder Sensor Pad Learn Status | Learned/Not Learned | The scan tool displays Learned or Not Learned. Learned is displayed if the rear middle seat belt reminder sensor pad has been learned by the SDM. |
| 2nd Row Middle Seat Belt Status | Buckled/Unbuckled | The scan tool displays Buckled or Unbuckled. This is the state of the middle rear seat belt switch when the seat belt is buckled or unbuckled. |
| 2nd Row Middle Seat Belt Reminder Sensor Pad Enable Status | Disabled/Enabled | The scan tool displays if the rear right seat belt reminder sensor pad is enabled to the SDM. |
| 2nd Row Middle Seat Belt Reminder Sensor Pad Learn Status | Learned/Not Learned | The scan tool displays Learned or Not Learned. Learned is displayed if the rear right seat belt reminder sensor pad has been learned by the SDM. |
| 2nd Row Right Seat Belt Status | Buckled/Unbuckled | The scan tool displays Buckled or Unbuckled. This is the state of the right rear seat belt switch when the seat belt is buckled or unbuckled. |
| Air Bag Malfunction Indicator | On/Off/Flashes | The scan tool will display On or Flashes if there is a problem with the SIR system. Any problems within the SIR system will illuminate the air bag indicator. The indicator will either flash or stay on. |
| Base Model Part Number | Varies, 8 Digit Number | The scan tool displays the part number of the SDM which is stored in non volatile memory. |
| Calibration Part Number | Varies, 8 Digit Number | The scan tool displays the part number of the calibration file in the SDM. |
| Deployment Loop 1-18 Enable Status | Enabled/Disabled | The scan tool displays Enabled or Disabled. This is the status of the air bag or pretensioner. |
| Deployment Loop 1-18 Learn Status | Learned/Not Learned | The scan tool displays Learned or Not learned. Learned is displayed if the SDM has defined the number loop programmed from an air bag or pretensioner. |
| Deployment Loop 1-18 Resistance | 1.44â€“4.25 Ohms | The scan tool displays the resistance of the learned loop of the air bag or pretensioner when connected to the SDM. |
| Deployment Loop 1-18 Type | Varies | The scan tool displays the name of the air bag or pretensioner associated with the loop type 1â€“18. |
| Driver Seat Belt Reminder Indicator | On/Off | The scan tool displays On if this indicator is on. If the indicator is on it means the seat belt has not been buckled. |
| Driver Seat Belt Sensor Enable Status | Enabled/Disabled | The scan tool displays if the seat belt sensor in the seat belt buckle is enabled to the SDM. |
| Driver Seat Belt Sensor Learn Status | Learned/Not learned | The scan tool displays Learned or Not Learned. Learned is displayed if the driver seat belt sensor has been learned by the SDM. |
| Driver Seat Belt Status | Buckled/Unbuckled | The scan tool displays Buckled or Unbuckled. This is the state of the driver seat belt switch when the seat belt is buckled or unbuckled. |

| Parameter | Expected Value | Definition |
|---|---|---|
| Driver Seat Position Sensor | Rearward/Forward | The scan tool will display if the driver seat is forward or rearward of the sensor set position. |
| Driver Seat Position Sensor Enable Status | Enabled/Disabled | The scan tool displays if the seat position sensor is enabled to the SDM. |
| Driver Seat Position Sensor Learn Status | Learned/Not Learned | The scan tool displays Learned or Not Learned. Learned is displayed if the driver seat position sensor has been learned by the SDM. |
| End Model Part Number | Varies, 8 Digit Number | The scan tool displays the part number of the SDM in production. |
| Impact Sensor 1-8 Enable Status | Enabled/Disabled | The scan tool displays Enabled or Disabled This is the status of the impact sensor. |
| Impact Sensor 1-8 Learn Status | Learned/Not Learned | The scan tool displays Learned or Not learned. Learned is displayed if the SDM has learned and has assigned a number to that impact sensor. |
| Impact Sensor 1-8 Type | Equipped/Not Equipped | The scan tool displays the name of the impact sensor associated with the type 1â€“8. |
| Inflatable Restraint Sensing and Diagnostic Module Primary Key | Hex Value | The scan tool indicates the primary key Hex value. |
| Manufacturer's Traceability Number | Varies, 16 Digit Number | The scan tool displays the 16 digit traceability number in the SDM. |
| Module Setup | Incomplete/Complete | The scan tool indicates if the SDM is set up. |
| Passenger Air Bag Disabled Switch | On/Off | The scan tool displays Off when the customer manually turns the passenger airbag off with this switch. |
| Passenger Air Bag Off Indicator | On/Off | The scan tool displays Off when the passenger indicator is not illuminated. This indicator is off when the disable switch is in the off position or no one is sitting in the passenger seat. |
| Passenger Air Bag On Indicator | On/Off | The scan tool displays On when the passenger indicator is illuminated. This indicator is on when the disable switch is in the on position and someone is sitting in the passenger seat. |
| Passenger Air Bag Status | Enabled/Disabled | The scan tool displays if the passenger air bag is enabled to the SDM. |
| Passenger Air Bag Disable Indicator Enable Status | Enabled/Disabled | The scan tool displays if the passenger air bag disable indicator is enabled to the SDM. |
| Passenger Air Bag Disable Indicator Learn Status | Learned/Not Learned | The scan tool displays Learned or Not Learned. Learned is displayed if the SDM has learned the status of the passenger air bag disable indicator. |
| Passenger Air Bag Disable Switch Enable Status | Enabled/Disabled | The scan tool displays if the passenger air bag disable switch is enabled to the SDM. |
| Passenger Air Bag Disable Switch Learn Status | Learned/Not Learned | The scan tool displays Learned or Not Learned. Learned is displayed if the SDM has learned the status of the passenger air bag disable switch. |
| Passenger Air Bag Enable Indicator Enable Status | Enabled/Disabled | The scan tool displays if the passenger air bag enable indicator is enabled to the SDM. |
| Passenger Air Bag Enable Indicator Learn Status | Learned/Not Learned | The scan tool displays Learned or Not Learned. Learned is displayed if the SDM has learned the status of the passenger air bag enable indicator. |
| Passenger Classification | 00â€“07 | The scan tool will display what type of individual is sitting in the passenger seat. |
| Passenger Presence Detection System Enable Status | Enabled/Disabled | The scan tool displays if the passenger presence system is enabled to the SDM. |
| Passenger Presence Detection System Learn Status | Learned/Not Learned | The scan tool displays Learned or Not Learned. Learned is displayed if the SDM has learned the passenger presence system. |
| Passenger Presence Detection System Reporting DTC(s) | Yes/No | The SDM will report if there are DTCs set in the passenger presence module. |
| Passenger Seat Belt Reminder Indicator | On/Off | The scan tool displays On if this indicator is on. If the indicator is on it means the seat belt has not been buckled. |
| Passenger Seat Belt Reminder Indicator Enable Status | Disabled/Enabled | The scan tool displays if the passenger seat belt reminder indicator is enabled to the SDM. |
| Passenger Seat Belt Reminder Indicator Learn Status | Learned/Not Learned | The scan tool displays Learned or Not Learned. Learned is displayed if the passenger seat belt reminder indicator has been learned by the SDM. |
| Passenger Seat Belt Reminder Sensor Pad Enable Status | Disabled/Enabled | The scan tool displays if the passenger seat belt reminder sensor pad is enabled to the SDM. |
| Passenger Seat Belt Reminder Sensor Pad Learn Status | Learned/Not Learned | The scan tool displays Learned or Not Learned. Learned is displayed if the passenger seat belt reminder sensor pad has been learned by the SDM. |
| Passenger Seat Belt Sensor Enable Status | Enabled/Disabled | The scan tool displays if the seat position sensor is enabled to the SDM. |

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| Parameter | Expected Value | Definition |
|---|---|---|
| Passenger Seat Belt Sensor Learn Status | Learned/Not learned | The scan tool displays Learned or Not Learned. Learned is displayed if the passenger seat belt sensor has been learned by the SDM. |
| Passenger Seat Belt Status | Buckled/Unbuckled | The scan tool displays Buckled or Unbuckled. This is the state of the passenger seat belt switch when the seat belt is buckled or unbuckled. |
| Passenger Seat Occupancy Status | Empty Seat/Occupied | The scan tool displays Occupied if someone is sitting in the passenger seat. |
| Passenger Seat Position Sensor | Rearward/Forward | The scan tool will display if the passenger seat is forward or rearward of the sensor set position. |
| Passenger Seat Position Sensor Enable Status | Disabled/Enabled | The scan tool displays if the passenger seat position sensor pad is enabled to the SDM. |
| Passenger Seat Position Sensor Learn Status | Learned/Not Learned | The scan tool displays Learned or Not Learned. Learned is displayed if the passenger seat position sensor has been learned by the SDM. |
| Power Mode | Off/Accessory/Run/Crank Request | The scan tool will display the power mode of the vehicle. |
| Primary Key Status | Valid/Invalid | The scan tool displays Valid if the primary key matches what is stored to memory in the SDM. |
| Primary Key Status Last Ignition Cycle | Invalid/Valid | The SDM checks to see if the primary key data received is valid. |
| Received Primary Key | Hex Value | The scan tool displays a Hex value indicating the SDM received primary key data. |
| Rollover Sensor Enable Status | Disabled/Enabled | The scan tool displays if the rollover sensor is enabled to the SDM. |
| Rollover Sensor Learn Status | Learn/Unlearn | The scan tool displays Learned or Not Learned. Learned is displayed if the rollover sensor has been learned by the SDM. |
| Security Code Accepted | Yes/No | The SDM either accepts the security code or it does not. The scan tool displays Yes if the security code has been accepted by the SDM. |
| Security Code Lockout | Yes/No | The scan tool displays Yes if the SDM has been locked out because of the security code not being accepted. |
| Security Code Lockout Active Timer | Random Value | The SDM uses a timer before the security code is locked in the SDM. |
| Security Code Programmed | Yes/No | The scan tool displays Yes if the SDM has been programmed with the security code. |
| Security Code Programming Counter | Random Value | The SDM uses a counter for the value of the security code programming. |
| Security Code Reset Counter | Random Value | The SDM uses a counter to reset the value of the security code. |
| Software Part Number | Varies, 8 Digit Number | The scan tool displays the software part number in the SDM. |
| Vehicle Identification Number | Varies, 17 Digit Number | The VIN number of the vehicle programmed into the SDM. |
| VIN Programmed | Yes/No | The scan tool displays Yes if the VIN has been programmed into the SDM. |
| VIN Programming Counter | Random Value | The SDM uses this counter while programming the VIN. |

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## Instrument Cluster Scan Tool Information

Instrument Cluster Scan Tool Data Parameters

| Parameter | Expected Value | Description |
|---|---|---|
| Operating Conditions: Ignition ON | | |
| Vehicle Speed | 0 Km/h (0 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). |
| Engine Speed | RPM | This parameter displays the rotational speed of the engine expressed as revolutions per minute. |
| Fuel Level Sensor | 0â€“100% Varies | This parameter displays the amount of fuel remaining in the fuel tank as measured in percentage. The control module determines the amount of fuel remaining in the tank by using information from the fuel level sensors.<br><br>The scan tool will display a higher value with a full fuel tank, and a lower value with an empty fuel tank. |
| Engine Coolant Temperature | Varies | The scan tool displays C (F). This is the current engine coolant temperature. |
| Odometer | Varies | This parameter displays the vehicle mileage. |
| Trip Odometer A | Varies | This parameter displays the vehicle mileage stored in the trip A. |
| Trip Odometer B | Varies | This parameter displays the vehicle mileage stored in the trip B. |
| Manufacturer Enable Counter | â€” | â€” |
| AIR BAG Indication On/BLN | Off | The scan tool displays if the airbag warning indicator is illuminated. |
| ABS Indication On/BLN | Off | The scan tool displays if the ABS warning indicator is illuminated. |
| SEATBELT Indication On/BLN | Off | The scan tool displays if the driver seatbelt warning indicator is illuminated. |
| Module Diagnostic Address | Varies | The scan tool displays the Module Diagnostic Address. |
| ManufacturerTraceability Number | â€” | â€” |
| Software Part Number | Varies | The scan tool displays the boot Software Part Number. |
| End Model Part Number | Varies | This parameter displays the End Model Part Number. |
| Base Model Part Number | Varies | The scan tool displays the Base Model Part Number. |

Instrument Cluster Scan Tool Output Controls

| Output Control | Description |
|---|---|
| All Indicators | This function is used to command all the indicators ON or OFF. |
| Speedometer Gauge | This function is used to command the speedometer gauge to increase or decrease in 2 km/h increments. |
| Tachometer Gauge | This function is used to command the tachometer gauge to increase or decrease in 50 RPM increments. |
| Fuel Gauge | This function is used to command the fuel gauge to increase or decrease in 4% increments. |
| Driver Information Center Segments | This function is used to command all the messages and indicators can be displayed in the cluster ON and OFF. |
| Odometer | This function is used to command the odometer to increase or decrease in 10 km increments. |
| Odometer A | This function is used to command the odometer stored in trip A to increase or decrease in 10 km increments. The distance is started from 0 km. |
| Odometer B | This function is used to command the odometer stored in trip B to increase or decrease in 10 km increments. The distance is started from stored distance in the trip. |

### Related Part Information

| Part Name | Catalog Name | Part Code |
|---|---|---|
| Instrument Cluster | CLUSTER,INST(W/PAD) | 0025A |
| Instrument Cluster | CLUSTER,INST (W/HSG) | 0030A |
| Instrument Cluster | CLUSTER KIT,INST | 0049Z |

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| Part Name | Catalog Name | Part Code |
|---|---|---|
| Instrument Cluster | CLUSTER,INST | 0050A |
| Instrument Cluster | CLUSTER,INST | 0050B |
| Instrument Cluster | CLUSTER PKG,INST | 0051A |
| Instrument Cluster | CLUSTER,INST | SJ490 |
| Instrument Cluster | CLUSTER PKG,INST | SJ533 |

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## Keyless Entry Control Module Scan Tool Information

| Parameter | Expected Value | Description |
|---|---|---|
| Operating Conditions: Ignition ON | | |
| Key in Ignition Lock Signal | Active/Inactive | The scan tool displays Active or Inactive. This is the state of the key in ignition switch. |
| Ignition 1 Signal | RPM | This parameter displays the rotational speed of the engine expressed as revolutions per minute. |
| Driver Door Key Unlock Switch Signal | Active/Inactive | This parameter indicates if the driver door is locked or unlocked. |
| Passenger Door Key Unlock Switch Signal | Active/Inactive | This parameter indicates if the passenger door is locked or unlocked. |
| Door Ajar Switch | Active/Inactive | This parameter indicates that the door is ajar; it is open, but the safety latch is engaged. |
| Hood Open Switch | Active/Inactive | This parameter indicates that the hood is ajar; it is open, but the safety latch is engaged. |
| Rear Closure Status | Varies | This switch indicates if the rear closure of the vehicle is ajar. |

Keyless Entry Control Module Scan Tool Output Controls

| Output Control | Description |
|---|---|
| Exterior Lamp Flash | This output control is used to turn ON or OFF the exterior lamp depending on this control when the door is unlocked by the key transmitter. |

### Related Part Information

| Part Name | Catalog Name | Part Code |
|---|---|---|
| Keyless Entry Control Module | MODULE,KEYLESS ENTRY CONT | 6922A |

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## Mobile Telephone Control Module Scan Tool Information

The mobile telephone control module scan tool data parameters list contains all mobile telephone control module 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.

Mobile Telephone Control Module Scan Tool Data Parameters

| Parameter | System State | Expected Value | Description |
|---|---|---|---|
| **Operating Conditions:** Ignition ON | | | |
| Battery Voltage | â€” | 11â€“14â€‰V | The scan tool displays V. This is the current battery voltage. |
| Bluetooth Signal Strength | â€” | 0â€–20â€‰dB | The scan tool displays the wireless devices (Bluetooth) reception field strength. |
| GSM Signal Strength | â€” | 113 to 51â€‰dBm | The scan tool displays the Global System for Mobile Communications (GSM) signal strength. |
| Microphone Signal | â€” | 1â€–16â€‰V | The scan tool displays the voltage level of the microphone power supply. |
| Phone Cradle to Vehicle Status | Cradle is connected | Connected | The scan tool displays the different aspects of the cradle status. |
| | Cradle is not connected | Disconnected | |
| Phone in Cradle | Phone in cradle | Yes | The scan tool displays the status if a phone is connected in the cradle. |
| | Phone not in cradle | No | |

Mobile Telephone Control Module Scan Tool Output Controls

| Output Control | Description |
|---|---|
| Audio Tone | This output control is used to command the Mobile Telephone Control Module audio tone enable or disable. |

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## Power Steering Control Module Scan Tool Information

Power Steering Control Module Scan Tool Data Parameters

| Parameter | System State | Expected Value | Description |
|---|---|---|---|
| **Operating Conditions:** Ignition ON | | | |
| Battery Voltage | â€” | Varies | This displays Volts. This is the current battery voltage. |
| Ignition Voltage | â€” | Varies | This displays Volts. This is the current ignition voltage. |
| Motor Voltageâ€‰+ | â€” | Varies | This displays Volts. |
| Motor Voltageâ€‰ | â€” | Varies | This displays Volts. |
| Steering Calibration | â€” | Varies | This displays a numeric value. |
| Steering Shaft Torque | â€” | Varies | This displays N-m. |
| Vehicle Speed | â€” | 0â€‰km/h (0â€‰mph) | This displays km/h (mph). This is the current vehicle speed. |

## Related Part Information

| Part Name | Catalog Name | Part Code |
|---|---|---|
| Power Steering Control Module | MODULE KIT,P/S CONT | 0024Y |
| Power Steering Control Module | MODULE KIT,P/S CONT | 0024Z |
| Power Steering Control Module | MODULE,P/S CONT | 0025A |
| Power Steering Control Module | MODULE,P/S CONT | 0025B |

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## Radio Scan Tool Information

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 | Not Present | The scan tool displays Present or Not Present. This parameter displays present 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. |
| Power Mode | Run | The scan tool displays Off, Accessory, Run or Crank Request. This is the current power mode of the radio. |
| Radio Signal Strength | Varies | This displays the signal strength in dB. This is the signal strength of the currently tuned radio station. |
| 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. Active indicates the radio is locked. Inactive indicates the theft lock system is armed and the radio is unlocked. |
| Test Bench Mode | Inactive | The scan tool displays Active or Inactive. This parameter indicates if the radio is in bench or user mode. |
| End Model Part Number | Varies | End Model Part Number is the part number for the hardware of the control module with software and calibrations. |
| Base Model Part Number | Varies | Base Model Part Number is the part number for the hardware without software and calibrations. |
| Boot Software Part Number | Varies | The scan tool displays the boot software ID number. |
| Calibration Part Numberâ€‰1 | Varies | The scan tool displays the software module IDâ€‰1. |
| Calibration Part Numberâ€‰2 | Varies | The scan tool displays the software module IDâ€‰2. |
| Calibration Part Numberâ€‰3 | Varies | The scan tool displays the software module IDâ€‰3. |
| Calibration Part Numberâ€‰4 | Varies | The scan tool displays the software module IDâ€‰4. |
| Calibration Part Numberâ€‰5 | Varies | The scan tool displays the software module IDâ€‰5. |
| Calibration Part Numberâ€‰6 | Varies | The scan tool displays the software module IDâ€‰6. |
| Calibration Part Numberâ€‰7 | Varies | The scan tool displays the software module IDâ€‰7. |
| Calibration Part Numberâ€‰8 | Varies | The scan tool displays the software module IDâ€‰8. |
| Calibration Part Numberâ€‰9 | Varies | The scan tool displays the software module IDâ€‰9. |
| Calibration Part Numberâ€‰10 | Varies | The scan tool displays the software module IDâ€‰10. |
| Digital Radio Receiver ID | Varies | The scan tool displays the Digital Audio Broadcast receiver ID. |
| Vin Digits 2-17 | Varies | The scan tool displays the learned VIN digits 2-17. |
| Subscriber ID | Varies | Identifies the alphanumeric dealer code or the tester's (Tech2, MDI etc.) serial number. This string is programmed into the ECU memory during the last programming event. |
| Module Diagnostic Address | 80 | Displays the 2 digit diagnostic address of the control module. |

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| Parameter | Expected Value | Definition |
|---|---|---|
| Date Programmed | Varies | Displays the date when the ECU was last programmed. |

Radio Scan Tool Output Controls

| Scan Tool Output Control | Description |
|---|---|
| Left Front Speaker | This output control is used to command the speaker ON and OFF. Commanding the speaker ON will generate a test tone to be generated through the selected loudspeaker. |
| Left Rear Speaker | This output control is used to command the speaker ON and OFF. Commanding the speaker ON will generate a test tone to be generated through the selected loudspeaker. |
| Right Front Speaker | This output control is used to command the speaker ON and OFF. Commanding the speaker ON will generate a test tone to be generated through the selected loudspeaker. |
| Right Rear Speaker | This output control is used to command the speaker ON and OFF. Commanding the speaker ON will generate a test tone to be generated through the selected loudspeaker. |
| Eject | This output is a command to eject the disc. |

## Related Part Information

| Part Name | Catalog Name | Part Code |
|---|---|---|
| Radio | RADIO, | 0009A |
| Radio | RADIO,AM | 0010A |
| Radio | RADIO,AM | 0011A |
| Radio | RADIO,AM & CLK | 0020A |
| Radio | RADIO,AM & T/PLYR | 0030A |
| Radio | RADIO,AM/FM | 0040A |
| Radio | RADIO,AM/FM | 0041A |
| Radio | RADIO,RECEIVER | 0045A |
| Radio | RADIO,RECEIVER & NAV | 0047A |
| Radio | RADIO,AM/FM & CLK | 0050A |
| Radio | RADIO,AM/FM STEREO | 0060A |
| Radio | RADIO PKG,AM/FM STEREO | 0061A |
| Radio | RADIO,AM/FM/LW STEREO | 0062A |
| Radio | RADIO PKG,AM/FM STEREO & NAVN | 0064Z |
| Radio | RADIO,AM/FM STEREO & NAVN | 0065A |
| Radio | RADIO PKG,AM/FM STEREO & CLK | 0069Y |
| Radio | RADIO,AM/FM STEREO & CLK | 0070A |
| Radio | RADIO,AM/FM STEREO & CLK | 0070B |
| Radio | RADIO,AM/FM STEREO & T/PLYR | 0080A |
| Radio | RADIO,AM/FM STEREO & T/PLYR | 0081A |
| Radio | RADIO,AM/FM STEREO & T/PLYR & MOBILE TEL | 0082A |
| Radio | RADIO,AM/FM STEREO & T/PLYR & TEL & VEH LOC | 0082B |
| Radio | RADIO,AM/FM/LW STEREO & T/PLYR | 0083A |
| Radio | RADIO,AM/FM/LW STEREO & T/PLYR & MOBILE TEL | 0083E |
| Radio | RADIO,AM/FM STEREO & CLK & T/PLYR | 0089Y |
| Radio | RADIO,AM/FM STEREO & CLK & T/PLYR | 0090A |
| Radio | RADIO,AM/FM STEREO & CLK & T/PLYR | 0090B |
| Radio | RADIO,AM/FM STEREO & CD PLYR | 0091Z |
| Radio | RADIO,AM/FM STEREO & AUDIO DISC PLYR | 0092A |
| Radio | RADIO,AM/FM STEREO & AUDIO DISC PLYR & M/TEL | 0092B |
| Radio | RADIO,AM/FM STEREO & AUDIO DISC PLYR & T/PLYR | 0092C |
| Radio | RADIO,AM/FM STEREO & CD PLYR & T/PLYR & MOBILE TEL | 0092D |
| Radio | RADIO,AM/FM STEREO & CD PLYR & T/PLYR | 0092E |
| Radio | RADIO,AM/FM STEREO & CD PLYR & T/PLYR & TEL & VEH LOC | 0092F |
| Radio | RADIO,AM/FM STEREO & CD PLYR & M/TEL & NAVN | 0092G |
| Radio | RADIO,AM/FM STRO & CD PLYR & TEL & NAVN & COMN CTR CALL | 0092H |

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| Part Name | Catalog Name | Part Code |
|---|---|---|
| Radio | RADIO,AM/FM STEREO & AUDIO DISC PLYR & NAVN | 0092J |
| Radio | RADIO PKG,AM/FM STEREO & AUDIO PLYR & NAVN | 0092K |
| Radio | RADIO,AM/FM STEREO & AUDIO DISC PLYR & MP3 PLYR | 0092L |
| Radio | RADIO,AM/FM STEREO & AUDIO DISC PLYR & MP3 PLYR&HARD DR | 0092M |
| Radio | RADIO,AM/FM STEREO & AUDIO DISC PLYR & MP3 PLYR & TP PL | 0092N |
| Radio | RADIO PKG,AM/FM STEREO & AUDIO PLYR & MP3 PLYR | 0092P |
| Radio | RADIO,AM/FM STEREO & AUDIO DISC PLYR & NAVN & MP3 | 0092Q |
| Radio | RADIO,AM/FM/LW STEREO & AUDIO DISC PLYR | 0093A |
| Radio | RADIO,AM/FM/LW STEREO & CD PLYR & T/PLYR | 0093E |
| Radio | RADIO,AM/FM/LW STEREO & CD PLYR & MOBILE TEL | 0093J |
| Radio | RADIO,AM/FM/LW STEREO & CD PLYR & NAVIGATION SYS | 0093L |
| Radio | RADIO,AM/FM/LW STEREO & CD PLYR & T/PLYR & MOBILE TEL | 0093N |
| Radio | RADIO PKG,AM/FM STEREO & CLK & AUDIO PLYR | 0094Y |
| Radio | RADIO PKG,AM/FM STEREO & CLK & AUDIO/VIDEO DISC PLYR | 0094Z |
| Radio | RADIO,AM/FM STEREO & CLK & AUDIO DISC PLYR | 0095A |
| Radio | RADIO,AM/FM STEREO & CLK & CD PLYR | 0095B |
| Radio | RADIO,AM/FM STEREO & CLK & AUDIO DISC PLYR & INFO SYS | 0095C |
| Radio | RADIO,AM/FM STEREO & CLK & AUDIO/VIDEO DISC PLYR | 0095D |
| Radio | RADIO,AM/FM STEREO & CLK & AUDIO/VIDEO DISC PLYR | 0095E |
| Radio | RADIO,AM/FM STEREO & CLK & AUD CD PLYR & INFO SYS | 0095F |
| Radio | RADIO,AM/FM STEREO & AUDIO DISC & MP3 PLYR & INFO SYS | 0095G |
| Radio | RADIO,AM/FM STEREO & CLK & MP3 PLYR & AUX IN & USB | 0095H |
| Radio | RADIO,AM/FM STEREO (W/ M/ FUNC)(W/O CALN & OPERG SYS) | 0095J |
| Radio | RADIO,STEREO & CLK & AUD DSC PLR (W/O CALN & OPG SYS) | 0095K |
| Radio | RADIO,AM/FM STEREO & CLK & CD PLYR & MP3 & TEL & AUX IN | 0095L |
| Radio | RADIO PKG,AM/FM STEREO & CLK & AUDIO PLYR & INFO SYS | 0095Y |
| Radio | RADIO PKG,CB | 0099A |
| Radio | RADIO,AM/FM/CB STEREO | 0100A |
| Radio | RADIO,AM/FM/CB STEREO & CLK & T/PLYR | 0110A |
| Radio | RADIO,AM/FM STEREO & CLK & CD PLYR & T/PLYR | 0110Y |
| Radio | RADIO,AM/FM STEREO & CLK & T/PLYR & CD PLYR | 0111A |
| Radio | RADIO,AM/FM STEREO & CLK & CD PLYR & T/PLYR | 0111B |
| Radio | RADIO,AM/FM STEREO & VIDEO DISC PLYR & NAVN | 0111C |
| Radio | RADIO,AM/FM STEREO & VIDEO DISC PLYR & NAVN | 0111D |
| Radio | RADIO,AM/FM STEREO & VIDEO DISC PLYR & NAVN&MP3&HARD DR | 0112A |
| Radio | RADIO,AM/FM STEREO & VIDEO DISC PLYR & MP3 PLR & HARD D | 0112B |
| Radio | RADIO,MOBILE | 7700T |
| Radio | RADIO, | SG070 |
| Radio | RADIO PKG,SATELLITE DIGITAL | SJ024 |
| Radio | RADIO PKG,CB 40 CHAN | SS031 |
| Radio | RADIO PKG,(DEALER RTN ONLY) | SS422 |
| Radio | RADIO PKG,SATELLITE DIGITAL | SJ070 |
| Radio | RADIO PKG,NAVIGATION | SJ074 |
| Radio | RADIO PKG, | SS039 |
| Radio | RADIO PKG,INSTL | SS076 |

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## Telematics Communication Interface Control Module Scan Tool Information

Telematics Communication Interface Control Module Scan Tool Data Parameters

| Parameter | System State | Expected Value | Description |
|---|---|---|---|
| **Operating Conditions:** Ignition ON | | | |
| **GPS Data** | | | |
| • Dead Reckoning Calibration Status | â€” | Calibrated or Not Calibrated | Indicates the dead reckoning calibration status. |
| • Position Calibration Method | â€” | Varies | Indicates the method used to determine current location. (0) GPS, (1) Wheel Speed Dead Reckoning only, (2) Combined Wheel Speed and GPS, (3) Gyro only, (4) Combined Gyro and GPS, (5) No Fix |
| • Month | â€” | MM | This displays the current month. |
| • Day | â€” | DD | This displays the current day of the month. |
| • Year | â€” | YY | This displays the current year. |
| • Hour | â€” | HH | This displays the GPS current hour (24 hour format â€“ GMT). |
| • Minute | â€” | MM | This displays the GPS current minute. |
| • Second | â€” | SS | This displays the GPS current second. |
| • Number of Satellites Tracked | â€” | Varies | The scan tool displays the number of satellites being tracked by the telematics communication interface control module. |
| **Signal Strength Data** | | | |
| • GSM Signal Strength | â€” | Varies | The scan tool displays 0â€“127. This is the telematics communication interface control module signal strength. |
| • Current Public Land Mobile Network | â€” | Varies | Identifies the cellular communications network currently in use by the telematics communication interface control module. Each network has a unique decimal number assigned to it for identification. |
| **Bluetooth Data** | | | |
| • Bluetooth | â€” | Enabled | Indicates if the Bluetooth system is enabled or disabled. |
| • Bluetooth Link Status | â€” | Varies | Indicates the current link status. (0) Unconnected, (1) Connected / Idle, (2) Call active, (3) 3-way calling active |
| • Bluetooth Link Quality | â€” | Varies | The scan tool displays a decimal value between 0 and 255. |
| • Bluetooth Phone to Telematics Communication Interface Control Module Authentication Status | â€” | Active or Inactive | Displays the bluetooth phone to telematics communication interface control module authentication status. |
| • Bluetooth Phone to Telematics Communication Interface Control Module Communication Status | â€” | Active or Inactive | Displays the bluetooth phone to telematics communication interface control module status. |
| • Bluetooth Phone Voice Recognition Status | â€” | Active or Inactive | Displays the bluetooth phone to voice recognition status. |
| **WLAN Device Data** | | | |
| Off-Board Navigation | â€” | Enabled or Disabled | Indicates if Off-Board Navigation is enabled or disabled |
| Wireless LAN | â€” | Enabled or Disabled | Indicates the capability of the wireless communication of the Telematics Communication Interface Control Module |

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| Parameter | System State | Expected Value | Description |
|---|---|---|---|
| Number of WLAN Devices | â€” | Varies | Indicates the number of Wireless devices present |
| Active WLAN 2.4GHz Chennel | â€” | Varies | Indicates the active Wireless channel being used on the 2.4 GHz frequency |
| WLAN Link Status | â€” | Radio System â€“ Never, Remembered but Not Associated or Associated | Indicates the link status of the Telematics Communication Interface Control Module and Infotainment system |
| GSM Signal Strength | â€” | Varies | State for Received Signal Strength Indicator |
| Mobile Communication Standard | â€” | 2G, 3G, 4G or 4G LTE | State for Cellular Data Connection. Indicates the currently used data rate speed |
| WLAN Password | â€” | Varies | Indicates the Telematics Communication Interface Control Module Wireless Password |
| WLAN SSID (Service Set Identifier) | â€” | Varies | Indicates the Telematics Communication Interface Control Module Wireless Service Name |
| WLAN Encryption â€“ WPA (Wiâ€“Fi Protected Access) | â€” | Active or Inactive | Indicates if the WLAN Encryption â€“ WPA (Wiâ€“Fi Protected Access) is Active or Inactive |
| WLAN Encryption â€“ WPA2 (Wiâ€“Fi Protected Access II) | â€” | Active or Inactive | Indicates if the WLAN Encryption â€“ WPA2 (Wiâ€“Fi Protected Access II) is Active or Inactive |
| WLAN Encryption â€“ AES (Advanced Encryption Standard) | â€” | Active or Inactive | Indicates if the WLAN Encryption â€“ AES (Advanced Encryption Standard) is Active or Inactive |
| WLAN Encryption â€“ TKIP (Temporal Key Intergrity Protocol) | â€” | Active or Inactive | Indicates if the WLAN Encryption â€“ TKIP (Temporal Key Integrity Protocol) is Active or Inactive |

Telematics Communication Interface Control Module Scan Tool Output Controls

| Output Control | Description |
|---|---|
| B1000 Information | This shows the data recorded when DTC B1000 was set in the telematics communication interface control module. |
| Green Indicator | The telematics communication interface control module illuminates the green LED when ON is selected. |
| Phone Call Test | When ON is selected, telematics communication interface control module commands OnStar to connect to the OnStar Center. |
| Red Indicator | The telematics communication interface control module illuminates the red LED when ON is selected. |
| Preferred Roaming List Update | The telematics communication interface control module performs a preferred roaming list (PRL) update when this is selected. |
| Remote Vehicle Speed Limiting Reset | This function resets the speed limiting feature. |

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## Theft Deterrent Module Scan Tool Information

Theft Deterrent Module Scan Tool Output Controls

| Output Control | Description |
|---|---|
| Key Learn | This output control is used to learn replaced key and should be performed when replacing all keys, immobilizer or both immobilizer and ECM. |
| Additional Key Learn | This output control is used to learn new key. |
| Neutral Mode | This output control is used to learn new ECM to immobilizer and should be performed when replacing only ECM. |

### Related Part Information

| Part Name | Catalog Name | Part Code |
|---|---|---|
| Theft Deterrent Module | MODULE,THEFT DTRNT | 3360A |

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