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1.0 INTRODUCTION

The procedures contained in this manual include all the specifications, instructions and graphics needed to diagnose 2004 body system problems. The diagnostics in this manual are based on the failure condition or symptom being present at the time of diagnosis.

Please follow the recommendations below when choosing your diagnostic path.

1. First make sure the DRBIII® is communicating with the appropriate modules; i.e., if the DRBIII® displays a "No Response" or "Bus +/- signal open" condition, you must diagnose that first.
2. Read DTC's (diagnostic trouble codes) with the DRBIII®.
3. If no DTC's are present, identify the customer complaint.
4. Once the DTC or customer complaint is identified, locate the matching test in the Table of Contents and begin to diagnose the symptom.

All component location views are in Section 8.0. All connector pinouts are in Section 9.0. All schematics are in Section 10.0.

An * placed before the symptom description indicates a customer complaint.

When repairs are required, refer to the appropriate service manual for the proper removal and repair procedure.

Diagnostic procedures change every year. New diagnostic systems may be added and carryover systems may be enhanced. READ THIS MANUAL BEFORE TRYING TO DIAGNOSE A VEHICLE DIAGNOSTIC TROUBLE CODE. It is recommended that you review the entire manual to become familiar with all the new and changed diagnostic procedures.

This book reflects many suggested changes from readers of past issues. After using this book, if you have any comments or suggestions, please fill out the comment form in the back of the book and mail it back to us.

1.1 SYSTEM COVERAGE

This diagnostic procedures manual covers all 2004 PL NEON vehicles.

1.2 SIX-STEP TROUBLESHOOTING PROCEDURE

Diagnosis of the body system is done in six basic steps:

- verification of complaint
- verification of any related symptoms
- symptom analysis
- problem isolation
- repair of isolated problem
- verification of proper operation

2.0 IDENTIFICATION OF SYSTEM

The vehicle systems that are part of the "body" system are:

- Airbag System
- Audio
- Compass/Temperature Mirror
- Instrument Cluster
- Interior Lighting
- Power Door Locks/Remote Keyless Entry
- Vehicle Communications
- Vehicle Theft Security System

3.0 SYSTEM DESCRIPTION AND FUNCTIONAL OPERATION

The body system on the 2004 PL consists of a combination of modules that communicate over the PCI bus (Programmable Communication Interface multiplex system). Through the PCI bus, information about the operation of vehicle components and circuits is relayed quickly to the appropriate module(s). All modules receive all the information transmitted on the bus even though a module may not require all information to perform it's function. It will only respond to messages "addressed" to it through a binary coding process. This method of data transmission significantly reduces the complexity of the wiring in the vehicle and the size of wiring harnesses. All of the information about the functioning of all the systems is organized, controlled, and communicated by the PCI bus, which is described in the Vehicle Communication Section of this general information.

3.1 AIRBAG SYSTEM

The Airbag Control Module (ACM) is bolted to the floor panel transmission tunnel rearward from the gear shift selector inside the vehicle. The ACM mounting bracket is welded to the tunnel and is not serviced with the ACM. The ACM contains a microprocessor, the impact sensor, and energy storage capacitor. The microprocessor contains the airbag system logic. The ACM system logic includes On-Board Diagnostics (OBD) capability, and communicates with the instrument cluster circuitry via the PCI data bus to control the airbag indicator lamp.

The microprocessor in the ACM monitors the impact sensor signal and the airbag system electrical circuits to determine the system readiness. If the ACM detects a monitored system fault, it sends messages to the instrument cluster on the PCI data bus to turn on the airbag indicator lamp. A preprogrammed decision algorithm in the ACM microprocessor determines when the deceleration rate as signaled by the sensor indicates an impact that is severe enough to require airbag system protection. When the programmed conditions are met, the ACM sends an electrical signal to deploy the airbag system components.

The impact sensor is an accelerometer that senses the rate of vehicle deceleration, which provides verification of the direction and severity of an impact. The impact sensor is calibrated for the specific vehicle, and is only serviced as a unit with the ACM.

The ACM also contains an energy-storage capacitor. The purpose of the capacitor is to provide airbag system protection in a severe secondary impact if the initial impact has damaged or disconnected the battery, but was not severe enough to deploy the airbags.

WARNING: THE AIRBAG SYSTEM IS A SENSITIVE, COMPLEX ELECTROMECHANICAL UNIT. BEFORE ATTEMPTING TO DIAGNOSE OR SERVICE ANY AIRBAG SYSTEM OR RELATED STEERING WHEEL, STEERING COLUMN, OR INSTRUMENT PANEL COMPONENTS YOU MUST FIRST DISCONNECT AND ISOLATE THE BATTERY NEGATIVE (GROUND) CABLE. WAIT TWO MINUTES FOR THE SYSTEM CAPACITOR TO DISCHARGE BEFORE FURTHER SYSTEM SERVICE. THIS IS THE ONLY SURE WAY TO DISABLE THE AIRBAG SYSTEM. FAILURE TO DO THIS COULD RESULT IN ACCIDENTAL AIRBAG DEPLOYMENT AND POSSIBLE PERSONAL INJURY OR DEATH.

WARNING: NEVER STRIKE OR KICK THE AIRBAG CONTROL MODULE, AS IT CAN DAMAGE THE IMPACT SENSOR OR AFFECT ITS CALIBRATION. IF AN AIRBAG CONTROL MODULE IS ACCIDENTALLY DROPPED DURING SERVICE, THE MODULE MUST BE SCRAPPED AND REPLACED WITH A NEW UNIT. FAILURE TO TAKE THE PROPER PRECAUTIONS COULD RESULT IN ACCIDENTAL AIRBAG DEPLOYMENT AND PERSONAL INJURY OR DEATH.

The airbag warning lamp is the only point at which the customer can observe "symptoms" of system malfunction. Whenever the ignition key is turned to the "run" or "start" position, the MIC performs a lamp check by turning the airbag warning lamp on for 6-8 seconds. If the lamp turns off, it means that the ACM has checked the system and found it to be free of discernible malfunctions. If the lamp remains on, there could be an active fault in the system or the MIC lamp circuit may be internally shorted to ground. If the lamp comes on and stays on for a period longer than 6-8 seconds then goes off, there is usually an intermittent problem in the system.

The ACM cannot be repaired or adjusted and, if damaged or faulty, it must be replaced.

3.1.1 DRIVER AIRBAG (DAB)

The airbag protective trim cover is the most visible part of the driver side airbag system. The module is mounted directly to the steering wheel. Located under the trim cover are the horn switch, the airbag cushion, and the airbag cushion supporting components. The airbag module includes a housing to which the cushion and inflator are attached and sealed. The airbag module cannot be repaired, and must be replaced if deployed or in any way damaged. The inflator assembly is mounted to the back of the airbag module. The inflator seals the hole in the airbag cushion so it can discharge the gas it produces directly into the cushion when supplied with the proper electrical signal. The protective trim cover is fitted to the front of the airbag module and forms a decorative cover in the center of the steering wheel. Upon airbag deployment, this cover will split at a predetermined breakout line.

WARNING: THE AIRBAG INFLATOR ASSEMBLY CONTAINS SODIUM AZIDE AND POTASSIUM NITRATE. THESE MATERIALS ARE POISONOUS AND EXTREMELY FLAMMABLE. CONTACT WITH ACID, WATER, OR HEAVY METALS MAY PRODUCE HARMFUL AND IRRITATING GASES (SODIUM HYDROXIDE IS FORMED IN THE PRESENCE OF MOISTURE) OR COMBUSTIBLE COMPOUNDS. IN ADDITION, THE PASSENGER AIRBAG MODULE CONTAINS ARGON GAS PRESSURIZED TO OVER 2500 PSI. DO NOT ATTEMPT TO DISMANTLE AN AIRBAG MODULE OR TAMPER WITH ITS INFLATOR. DO NOT PUNCTURE, INCINERATE, OR BRING INTO CONTACT WITH ELECTRICITY. DO NOT STORE AT TEMPERATURE EXCEEDING 93°C (200°F). FAILURE TO TAKE THE PROPER PRECAUTIONS COULD RESULT IN ACCIDENTAL AIRBAG DEPLOYMENT AND PERSONAL INJURY OR DEATH.

3.1.2 CLOCKSPRING

The clockspring is mounted on the steering column behind the steering wheel. This assembly consists of a plastic housing which contains a flat, ribbon-like, electrically conductive tape that winds and unwinds with the steering wheel rotation. The clockspring is used to maintain a continuous electrical circuit between the instrument panel wire harness and the driver side airbag module, the horn switch, and the vehicle speed control switches on vehicles that are so equipped. The clockspring must be properly centered when it is installed on the steering column following any service removal, or it will be damaged. The clockspring cannot be repaired it must be replaced.

3.1.3 PASSENGER AIRBAG (PAB)

The airbag door in the instrument panel top cover above the glove box is the most visible part of the passenger side airbag system. Located under the airbag door is the airbag cushion and its supporting components. The airbag module includes a housing to which the cushion and inflator are attached and sealed. The airbag module cannot be repaired, and must be replaced if deployed or in any way damaged. The inflator assembly is mounted to the back of the airbag module. The inflator includes a small canister of highly compressed argon gas. The inflator seals the hole in the airbag cushion so it can discharge the compressed gas it contains directly into the cushion when supplied with the proper electrical signal. The airbag door has a living hinge at the top, which is secured to the instrument panel top cover. The door also has predetermined breakout lines concealed beneath its decorative cover. Upon airbag deployment, the airbag door will split at the breakout lines and the door will pivot out of the way.

WARNING: THE AIRBAG INFLATOR ASSEMBLY CONTAINS SODIUM AZIDE AND POTASSIUM NITRATE. THESE MATERIALS ARE POISONOUS AND EXTREMELY FLAMMABLE. CONTACT WITH ACID, WATER, OR HEAVY METALS MAY PRODUCE HARMFUL AND IRRITATING GASES (SODIUM HYDROXIDE IS FORMED IN THE PRESENCE OF MOISTURE) OR COMBUSTIBLE COMPOUNDS. IN ADDITION, THE PASSENGER AIRBAG CONTAINS ARGON GAS PRESSURIZED TO OVER 2500 PSI. DO NOT ATTEMPT TO DISMANTLE AN AIRBAG MODULE OR TAMPER WITH ITS INFLATOR. DO NOT PUNCTURE, INCINERATE, OR BRING INTO CONTACT WITH ELECTRICITY. DO NOT STORE AT TEMPERATURE EXCEEDING 93°C (200°F). FAILURE TO TAKE THE PROPER PRECAUTIONS COULD RESULT IN ACCIDENTAL AIRBAG DEPLOYMENT AND PERSONAL INJURY OR DEATH.

WARNING: REPLACE AIRBAG SYSTEM COMPONENTS ONLY WITH PARTS SPECIFIED IN THE CHRYSLER MOPAR PARTS CATALOG. SUBSTITUTE PARTS MAY APPEAR INTERCHANGEABLE, BUT INTERNAL DIFFERENCES MAY RESULT IN INFERIOR OCCUPANT PROTECTION. THE FASTENERS, SCREWS, AND BOLTS ORIGINALLY USED FOR THE AIRBAG SYSTEM COMPONENTS HAVE SPECIAL COATINGS AND ARE SPECIFICALLY DESIGNED FOR THE AIRBAG SYSTEM. THEY MUST NEVER BE REPLACED WITH ANY SUBSTITUTES. ANY TIME A NEW FASTENER IS NEEDED, REPLACE IT WITH THE CORRECT FASTENERS PROVIDED IN THE SERVICE PACKAGE OR SPECIFIED IN THE MOPAR PARTS CATALOG. FAILURE TO TAKE THE PROPER PRECAUTIONS COULD RESULT IN ACCIDENTAL AIRBAG DEPLOYMENT AND PERSONAL INJURY OR DEATH.

3.1.4 SIDE IMPACT AIRBAG CONTROL MODULES (SIACM)

They are located on the left and right B-post. The SIACM perform self diagnostics and circuit tests to determine if the system is functioning properly. If the test finds a problem the SIACM will set both active and stored diagnostic trouble codes. If a DTC is active the SIACM will request that the airbag warning lamp be turned on. The results of the system test are transmitted on the PCI Bus to the ACM once each second or on change in lamp state. If the warning lamp status message from the either SIACM contains a lamp on request the ACM will set an active DTC. At the same time as the DTC is set the ACM sends a PCI Bus message to the mechanical instrument cluster (MIC) requesting the airbag warning lamp be turned on. Observe all ACM warning and caution statements when servicing or handling the SIACM. SIACM are not repairable and must be replaced if they are dropped.

NOTE: When the Airbag Warning Indicator is illuminated, interrogate the ACM.

3.1.5 SEAT AIRBAGS

The Left and Right seat airbag modules are located in the outboard end of the front seat backs. The airbag module contains a bag, an inflator (a small canister of highly compressed argon gas) and a mounting bracket. The seat airbag module cannot be repaired and must be replaced if deployed or in any way damaged. When supplied with the proper electrical signal the inflator seals the hole in the airbag cushion so it can discharge the compressed gas it contains directly into the cushion. Upon deployment, the seat back trim cover will tear open and allow the seat airbag to fully deploy between the seat and the door.

NOTE: It will be necessary to remove the seat back trim to gain access to the seat airbag module connector when diagnosing the seat airbag system.

WARNING: THE SEAT AIRBAG CONTAINS ARGON GAS PRESSURIZED TO OVER 2500 PSI. DO NOT ATTEMPT TO DISMANTLE AN AIRBAG MODULE OR TAMPER WITH ITS INFLATOR. DO NOT PUNCTURE, INCINERATE, OR BRING INTO CONTACT WITH ELECTRICITY. DO NOT STORE AT TEMPERATURE EXCEEDING 93°C (200°F). REPLACE AIRBAG SYSTEM COMPONENTS ONLY WITH PARTS SPECIFIED IN THE CHRYSLER MOPAR PARTS CATALOG. SUBSTITUTE PARTS MAY APPEAR INTERCHANGEABLE, BUT INTERNAL DIFFERENCES MAY RESULT IN INFERIOR OCCUPANT PROTECTION. THE FASTENERS, SCREWS, AND BOLTS ORIGINALLY USED FOR THE AIRBAG SYSTEM COMPONENTS HAVE SPECIAL COATINGS AND ARE SPECIFICALLY DESIGNED FOR THE AIRBAG SYSTEM. THEY MUST NEVER BE REPLACED WITH ANY SUBSTITUTES. ANY TIME A NEW FASTENER IS NEEDED, REPLACE IT WITH THE CORRECT FASTENERS PROVIDED IN THE SERVICE PACKAGE OR SPECIFIED IN THE CHRYSLER MOPAR PARTS CATALOG. FAILURE TO TAKE THE PROPER PRECAUTIONS COULD RESULT IN ACCIDENTAL AIRBAG DEPLOYMENT AND PERSONAL INJURY OR DEATH.

3.1.6 SPECIAL TOOLS

Some airbag diagnostic tests use special tools, 8310 and 8443 airbag load tool, for testing squib circuits. The load tools contain fixed resistive loads, jumpers and adapters. The fixed loads are connected to cables and mounted in a storage case. The cables can be directly connected to some airbag system connectors. Jumpers are used to convert the load tool cable connectors to the other airbag system connectors. The adapters are connected to the module harness connector to open shorting clips and protect the connector terminal during testing. When using the load tool follow all of the safety procedures in the service information for disconnecting airbag system components. Inspect the wiring, connector and terminals for damage or misalignment. Substitute the airbag load tool in place of a Driver or Passenger Airbag, curtain airbag, clockspring, or seat belt tensioner (use a jumper if needed). Then follow all of the safety procedures in the service information for connecting airbag system components. Read the module active DTC's. If the module reports NO ACTIVE DTC's the defective component has been removed from the system and should be replaced. If the DTC is still active, continue this process until all components in the circuit have been tested. Then disconnect the module connector and connect the matching adapter to the module connector. With all airbags disconnected and the adapter installed the squib wiring can be tested for open and shorted conditions.

3.1.7 DIAGNOSTIC TROUBLE CODES

Airbag diagnostic trouble codes consist of active and stored codes. If more than one code exists, diagnostic priority should be given to the active codes.

Each diagnostic trouble code is diagnosed by following a specific testing procedure. The diagnostic test procedures contain step-by-step instructions for determining the cause of the trouble codes. It is not necessary to perform all of the tests in this book to diagnose an individual code.

Active diagnostic trouble codes for the airbag system are not permanent and will change the moment the reason for the code is corrected. In certain test procedures within this manual, diagnostic trouble codes are used as a diagnostic tool.

3.1.7.1 ACTIVE CODES

The code becomes active as soon as the malfunction is detected or key-off, whichever occurs first. An active trouble code indicates an on-going malfunction. This means that the malfunction is currently there every time the control module checks that circuit/function. It is impossible to erase an active code; active codes automatically erase by themselves when the reason for the code has been corrected.

With the exception of the warning lamp trouble codes or malfunctions, when a malfunction is detected, the airbag lamp remains lit for a minimum of 12 seconds or as long as the malfunction is present.

An "Interrogate Right SIACM or Interrogate left SIACM" diagnostic trouble code indicates an active trouble code in the respective module.

3.1.7.2 STORED CODES

Airbag codes are automatically stored in the ACM's memory as soon as the malfunction is detected. A "stored" code indicates there was an active code present at some time. However, the code currently may not be present as an active code, although another active code could be.

When a trouble code occurs, the airbag warning lamp illuminates for 12 seconds minimum (even if the problem existed for less than 12 seconds). The code is stored, along with the time in minutes it was active, and the number of times the ignition has been cycled since the problem was last detected. The minimum time shown for any code will be one minute, even if the code was actually present for less than one minute, Thus, the time shown for a code that was present for two minutes 13 seconds, for example, would be three minutes.

When and if the malfunction ceases to exist, an ignition cycle count will be initiated for that code. If the ignition cycle count reaches 100 without a reoccurrence of the same malfunction, the diagnostic trouble code is erased and that ignition cycle counter is reset to zero. If the malfunction reoccurs before the count reaches 100, then the ignition cycle counter will be reset and the diagnostic trouble code will continue to be a stored code.

If a malfunction is not active while performing a diagnostic test procedure, the active code diagnostic test will not locate the source of the problem. In this case, the stored code can indicate an area to inspect.

WARNING: TO AVOID PERSONAL INJURY OR DEATH, MAINTAIN A SAFE DISTANCE FROM ALL AIRBAGS WHILE PERFORMING THE FOLLOWING INSPECTION:

If no obvious problems are found:

- Erase the stored codes
- Place the ignition in the Run position
- Wiggle the wire harness and connectors
- Rotate the steering wheel from stop to stop
- Recheck for active codes periodically as you work through the system.

3.2 AUDIO SYSTEM

The audio system on the 2004 PL consists of a radio that communicates over the PCI bus. The speakers are located in the instrument panel, the front doors and the rear "D" pillars. The instrument panel speakers are a tweeter type speaker for high frequency. The front door speakers are a woofer/midrange type speaker. The rear "D" pillar speakers are a full range type speaker. If one of the speaker circuits experiences a short, the other speakers on that output channel will also shut down until the circuit is repaired. The radio will also set a trouble code, which the DRBIII® can display.

The in-dash CD-changer is designed to fit into the existing cubby bin in the center stack. This new cartridge-less CD-changer is controlled by your radio, and allows you to individually load up to four discs at one time. However, due to its compact design, the CD-changer can only carry out one operation at a time. For example you can not load a new disc while playing another at the same time. Each operation happens sequentially.

The radio unit installed with your system provides control over all features of the CD-changer with the exception of the CD load and eject functions, which are controlled by buttons located on the front of the CD-changer. The radio also supplies the power, ground, PCI Bus, left and right speaker output through a single DIN cable. All features you would expect , such as Disc Up/Down, Track Up/Down, Random and Scan are controlled by the radio, which also displays all relevant CD-changer information on the radio display.

The CD-changer contains a Load/Eject button and an indicator light for each of the four disc positions. The individual light indicates whether a CD is currently loaded in that particular chamber of the CD-changer. Pressing the individual Load/Eject button for a particular chamber will eject a disc currently present in the chamber. If the chamber is currently empty, actuating the Load/Eject button will position that chamber to receive and load a new disc in that chamber.

3.3 COMPASS/TEMPERATURE MIRROR

DESCRIPTION

The optional Compass/Temperature Mirror has a vacuum fluorescent (VF) display that is integrated into the rear view mirror. The Compass/Temp Mirror includes the compass/temperature display and two map/reading lamps. This display provides the outside temperature and one of eight compass headings to indicate the direction the vehicle is facing. The Compass/Temp Mirror displays the compass heading and the outside temperature at the same time. The Ambient Temperature Sensor monitors the outside temperature and is hardwired to the PCM. The Compass/Temp Mirror also receives and transmits data on the PCI Bus.

OPERATION

The Compass/Temp Mirror incorporates 2 reading lamp buttons with the STEP button and the Zone/Calibration button features activated by holding a button for a specified time period. The STEP button provides the selections between English and

Metric. The Zone/Cal button provides the selection to change the compass zone or to calibrate the compass. The reading lamp buttons also cycle the reading lamps on or off.

The STEP button (right reading lamp button) operates a momentary contact switch which provides input to the Compass/Temp Mirror in one of the following four modes:

- To toggle the right reading lamp on and off upon release of the button.
- To select degrees in F (Fahrenheit) for the temperature display.
- To select degrees in C (Celsius) for the temperature display.
- To turn off the compass/temperature display.

ENGLISH / METRIC / OFF MODE

With the ignition in the ON position, pressing and holding the STEP button (right reading lamp button) for 5-10 seconds will toggle the display between English and Metric. The Compass/Temp Mirror stores the selected display mode in memory upon releasing the button during the 5-10 seconds.

Pressing and holding the STEP button for 10-15 seconds will turn the display OFF upon releasing the button during the 10-15 seconds.

Each time the temperature mode is changed to F° or C°, the Compass/Temp Mirror stores the new mode in memory. The selected English or Metric mode is recalled after the ignition is cycled. The display OFF mode is not recalled after the ignition is cycled. The Compass/Temp Mirror will power up and display the temperature mode (F° or C°) that was last selected.

CALIBRATION / ZONE MODE

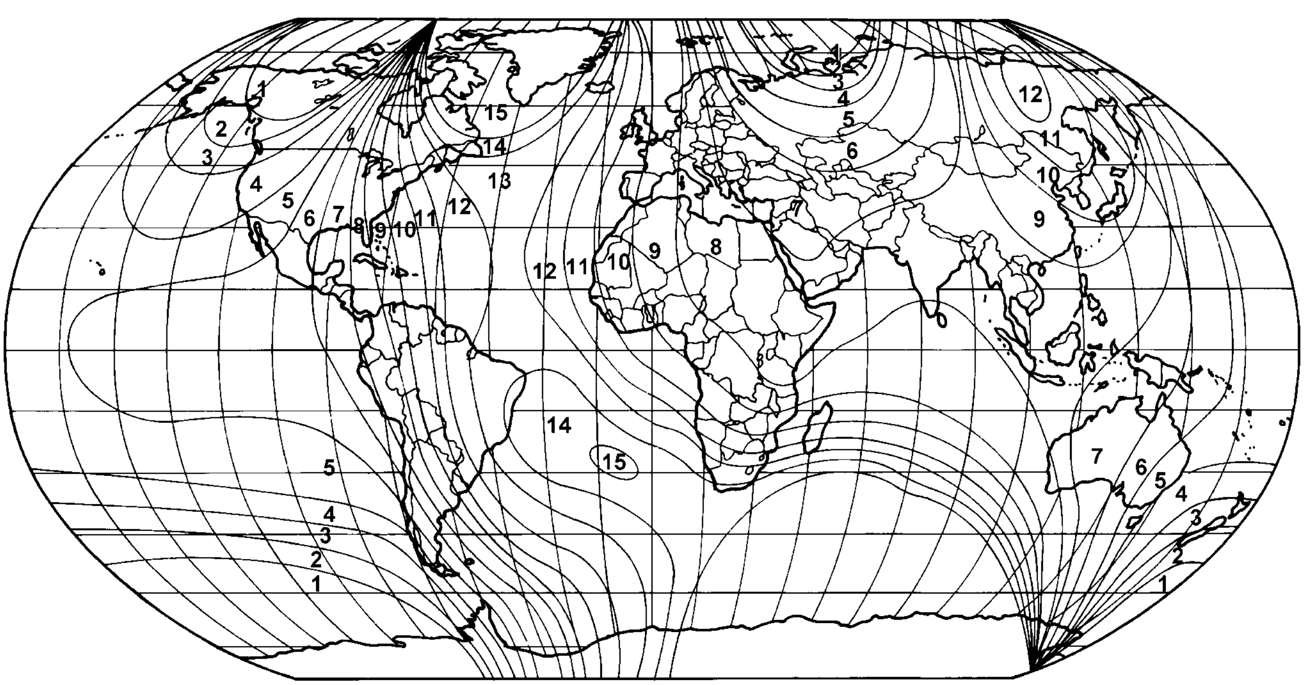
Refer to the Zone Variance Map. With the ignition in the ON position, pressing and holding the Zone/Cal button (left reading lamp button) for 5-10 seconds will illuminate ZONE in the display. Releasing the button while ZONE is illuminated will enter the compass into the Zone Setting mode. The Compass/Temp Mirror will illuminate the Zone Variance number 1 to 15 that is stored in memory. While ZONE is displayed; momentarily pressing the Zone/Cal button advances the zone to the next higher zone. When the desired zone number is displayed, do not press the Zone/Cal button again. After 5 seconds, the Zone Variance number will be stored in the module memory.

With the ignition in the ON position, pressing and holding the Zone/Cal button for 10-15 seconds will toggle the CAL (calibration) mode between on and off. Releasing the button while CAL is displayed enters the compass into the calibration mode. See "First Time Calibration", "Manual Calibration", and "Continuous Calibration."

Pressing and holding the Zone/Cal button for 15-20 seconds and then releasing will exit the CAL mode and toggle the display to the current state of compass/temperature mirror use; OFF, Compass/Temperature F°, or Compass/Temperature C°.

Pressing and holding the Zone/Cal button for 20-25 seconds will enter the CTM into the self-check diagnostic mode upon releasing the button.

Holding the Zone/Cal button for longer than 25 seconds will cause the display to return to its current state with no changes.



SETTING COMPASS ZONE

The compass has a default zone of 8. Refer to the Zone Variance Map to determine the correct zone number. The correct compass Zone selection is critical to proper compass operation. With the ignition in the ON position, pressing the Zone/Cal button (left reading lamp button) for 5-10 seconds and then releasing while ZONE is illuminated enters the compass into the Zone display mode. In the Zone display mode, ZONE will be illuminated instead of the temperature. The current Zone number, 1 through 15 will be displayed. While ZONE is illuminated; momentarily pressing the Zone/Cal button advances the zone to the next higher zone. When the desired zone number is displayed, do not press the Zone/Cal button again. After 5 seconds, the Zone Variance number will be stored in the module memory.

FIRST TIME CALIBRATION

A new Compass/Temp Mirror is shipped in a first time calibration mode. CAL is illuminated when the Compass/Temp Mirror is first powered up. The first time calibration mode can not be exited until the first time calibration process is completed. The CAL icon will remain illuminated to alert the driver that the Compass/Temp Mirror is operating in the CAL mode. Move the vehicle to an area away from large metallic objects or overhead power lines. While CAL is illuminated in the display the vehicle must be driven in 3 complete 360 degree circles at less than 5 MPH (8 KPH). The compass will calibrate; CAL will turn off, and then resume normal operation.

MANUAL CALIBRATION

With the ignition in the ON position, pressing and holding the Zone/Cal button (left reading lamp button) for 10-15 seconds will toggle the display to CAL. Releasing the button within the 10-15 second duration will enter the compass into the calibration mode. CAL will remain illuminated until the calibration is complete or is toggled off by pressing the Zone/Cal button. Move the vehicle to an area away from large metallic objects or overhead power lines. While CAL is illuminated in the display the vehicle must be driven in 3 complete 360 degree circles at less than 5 MPH (8 KPH). The compass will calibrate; CAL will turn off, and then resume normal operation.

CONTINUOUS CALIBRATION

During normal operation, the Compass/Temp Mirror will continuously update the compass calibration to adjust for gradual changes in the vehicle's magnetic remnant field. If the vehicle is subjected to high magnetic influences, the compass may appear to indicate false headings or appear unable to be calibrated. If this occurs the vehicle may need to be demagnetized. Refer to Demagnetizing Procedure in the Service Manual.

SELF- CHECK DIAGNOSTICS

With the ignition ON, the Compass/Temp Mirror can perform a diagnostic self- check by pressing and holding the Zone/Cal button (left reading lamp button) for 20-25 seconds. The internal diagnostics will sequence the following five tests:

1) VF segment display- Illuminates the segment patterns one at a time for 1 second each as follows: CAL; ZONE; N; NE; E; SE; S; SW; W; NW; 0 through 9; C°; F°
2) CTM memory- ROM Checksum
3) CTM memory- RAM
4) CTM memory- EEPROM
5) Compass Test

During the self- check, if any of the internal tests fail, the Compass/Temp Mirror will display an "F" and the number of the test that failed. If more than one test fails "FO" will be displayed. P- Pass or F- Fail will be displayed until the Zone/Cal button (left reading lamp button) is pressed and released or the ignition is cycled. If all of the tests pass, the Compass/Temp Mirror will display "P". A VF segment that fails to illuminate will not cause the Compass/Temp Mirror to display an "F". If any segment fails to illuminate or the Compass/Temp Mirror displays "F", the Compass/Temp Mirror must be replaced.

To exit self- check diagnostics, press and release the Zone/Cal button or cycle the ignition to return to normal compass/temp operation.

OUTSIDE TEMPERATURE

The Compass/Temp Mirror utilizes vehicle speed and engine temperature data received on the PCI Bus to accurately display the outside temperature to avoid "hot soak" condition readings. The displayed outside temperature information is stored within the memory of the compass/temp mirror. When the Compass/Temp Mirror is first powered up, it retrieves the temperature data from the module memory. The memory temperature is compared with the temperature received from the ambient temperature sensor. The colder of the two temperatures is displayed.

TEMPERATURE UPDATE - WARM

On power up, when the outside temperature sensed by the ambient temperature sensor is warmer than the temperature stored in the module memory, the Compass/Temp Mirror will update the displayed temperature in relation to vehicle speed and engine temperature data received on the PCI Bus.

TEMPERATURE UPDATE - COLD

On power up, when the outside air temperature sensed by the ambient temperature sensor is colder than the stored memory temperature, the Compass/Temp Mirror will update the displayed temperature to the outside temperature at a rate of -1°F every 2 seconds, regardless if the vehicle is moving or not.

EXTREME TEMPERATURE / OPEN OR SHORT CONDITION

If the measured outside temperature is more than 60°C (140°F) or the ambient temperature sensor sense circuit is shorted to ground, the temp display will be 60°C (140°F) to indicate a short circuit condition.

If the measured outside temperature is less than -45°C (-49°F) or the ambient temperature sensor sense circuit is open, the temp display will be -45°C (-49°F) to indicate an open circuit condition.

AMBIENT TEMPERATURE SENSOR

DESCRIPTION

The Ambient Temperature Sensor is hardwired to the PCM. The ambient air temperature is monitored and displayed by the Compass/Temp Mirror.

The ambient temperature sensor cannot be adjusted or repaired and, if faulty or damaged, it must be replaced.

OPERATION

The resistance in the ambient temperature sensor changes as the outside temperature rises or falls. The PCM senses the change in reference voltage through the ambient temperature sensor resistor. Based on the resistance of the ambient temperature sensor, the PCM is programmed to correspond to a specific temperature. The Compass/Temp Mirror then displays the proper ambient temperature.

AMBIENT TEMPERATURE SENSOR DIAGNOSTICS

The outside temperature function is supported by the ambient temperature sensor, a signal and ground circuit hardwired to the PCM and the Compass/Temp Mirror display.

If the Compass/Temp Mirror display indicates 60°C (140°F) or the ambient temperature sensor sense circuit is shorted to ground, the temp display will be 60°C (140°F) to indicate a SHORT circuit condition.

If the Compass/Temp Mirror display indicates -45°C (-49°F) or the ambient temperature sensor sense circuit is open, the temp display will be -45°C (-49°F) to indicate an OPEN circuit condition.

If there is an OPEN or SHORT circuit condition, it must be repaired before the Compass/Temp Mirror VF display can be tested.

The ambient temperature sensor can be diagnosed using the following Sensor Test. If there are no codes stored in the PCM and the ambient temperature sensor and the circuits are confirmed to be OK, but the temperature display is inoperative or incorrect, replace the Compass/Temp Mirror.

AMBIENT TEMPERATURE SENSOR TEST

(1) Turn the ignition OFF.

(2) Disconnect and isolate the battery negative cable.

(3) Disconnect the ambient temperature sensor harness connector.

(4) Measure the resistance of the ambient temperature sensor using the following values:

- 0° C (32° F) Sensor Resistance = 29.33 – 35.99 Kilohms
- 10° C (50° F) Sensor Resistance = 17.99 – 21.81 Kilohms
- 20° C (68° F) Sensor Resistance = 11.37 – 13.61 Kilohms
- 25° C (77° F) Sensor Resistance = 9.12 – 10.86 Kilohms
- 30° C (86° F) Sensor Resistance = 7.37 – 8.75 Kilohms
- 40° C (104° F) Sensor Resistance = 4.90 – 5.75 Kilohms

The sensor resistance should read between these min/max values. If the resistance value is OK, refer to the Wiring Diagrams to test the Signal and Ground circuits. If the resistance values are not OK, replace the Sensor.

3.4 EXTERIOR LIGHTING

The Headlamps are controlled by the Instrument Cluster. The Instrument Cluster is also referred to as a “Smart Cluster”. It receives and sends messages to other modules through the PCI BUS circuit. The Headlamps are wired through the cluster and then go to the Fuse Block to the lamps. Each Headlamp has an independent fuse located in the Fuse Block. For vehicles equipped with Daytime Running Lamps, the DRL Module is integrated with the Instrument Cluster.

3.5 ELECTRO/MECHANICAL INSTRUMENT CLUSTER (EMIC)

There are 4 (four) different types of Instrument Clusters. Base, Premium, Luxury, and AutoStick. The Premium cluster is equipped with a tachometer and a low fuel indicator. The Luxury has the same features as the Premium with an additional black overlay and chrome rings. The AutoStick is the

Luxury cluster with the AutoStick function. The PCM controls the vacuum fluorescent (VF) PRND or AutoStick display. The cluster will illuminate the appropriate PRND or gear position based on PCI Bus data received from the PCM.

The Instrument Cluster Speedometer, Tachometer, and Engine Coolant Temperature gauges are positioned using PCI Bus messages received from the PCM. The Fuel gauge is a hard wired input from the Fuel Level Sensor in the Fuel Pump Module.

The Cluster also contains warning indicators that are illuminated by hard wired inputs or by messages received from other modules on the PCI Bus.

The Trip/Total Odometer is a Vacuum Fluorescent (VF) display that is controlled by PCI Bus messages received from the PCM. The VF display also displays the “Door”, “Cruise”, and “Trac” messages. If the Instrument Cluster experiences a loss of PCI Bus communication with other modules on the Bus, the Cluster will display “nobuS” in the VF display.

The illumination lamps are hard wired in the Instrument Cluster. When the Park or Headlamps are turned on, the Cluster receives a hard wire input from the Multi-Function Switch. The Cluster sends a Panel Lamps Dimmer Signal to ground through the Multi-Function Switch. The varying voltage drop is sensed by the Instrument Panel Drivers to create a corresponding amount of illumination dimming. This dimming level is then sent out from the Cluster to other components.

The Cluster will communicate with the DRBIII® to display PCI Engine Info, PCI Bus info, and certain inputs/outputs. The Cluster is also capable of performing a diagnostic Self-Test that is actuated by depressing and holding the Odometer trip reset stalk while cycling the ignition from the off to the on position. The Cluster will position all of the gauges at specified calibration points and will illuminate all the PCI Bus controlled indicators. The Cluster will also illuminate each segment of the VF display.

If the Cluster does not detect voltage on the Courtesy Lamp circuit, the message “FUSE” will alternate with the odometer/trip odometer for 30 (thirty) seconds after the ignition is turned on and for 15 (fifteen) seconds after the vehicle is first moved.

3.6 INTERIOR LIGHTING

The Courtesy Lamps are controlled by the instrument cluster. Some of the features that it controls are the courtesy lamps, chime, and all instrument illumination. It receives and sends messages to other modules via the PCI bus circuit. The front turn signals are wired through the cluster and then go to the front lamps. For vehicles equipped with Daytime Running Lamps, the DRL module is built into the cluster.

3.7 REMOTE KEYLESS ENTRY MODULE

The Remote Keyless Entry module controls the Power Door Locks and the Vehicle Theft Security System (VTSS). It also wakes up the Instrument Cluster to turn on the illuminated entry when it senses a signal from the RKE transmitter. The module communicates with other modules via the PCI bus circuit.

The RKE module monitors the Occupant Restraint Controller messages for the purpose of monitoring the deployment of the airbag. Upon receiving that message along with the verification that the ignition is on and the vehicle speed is zero, it will provide the “enhanced accident response feature”. This feature will cause the module to unlock-all doors immediately and the instrument cluster to turn the courtesy lamps on when the vehicle reaches 0 MPH.

The RKE module communicates with the Powertrain Control Module to receive vehicle speed information to activate the rolling door lock feature, receive the “okay to lock” message, and receive body style information. Two transmitters are supplied with the vehicle but a total of 4 can be programmed to the module. The horn chirp on vehicle lock command is customer programmable.

To limit the amount of battery drain during storage, the IOD fuse may be removed.

3.7.1 VEHICLE THEFT SECURITY SYSTEM

When the VTSS is armed, it will monitor the ignition switch status, ajar switches for the vehicle doors and decklid. Also monitored is a decklid security switch (knockout) for the cylinder lock. If the alarm is tripped, it will sound the vehicles horn, flash the exterior lamps and the VTSS indicator located in the instrument cluster.

Arming the system is accomplished by locking the doors with the door lock switch following a normal exit sequence of opening the door pressing the power lock button and closing the door, by using the driver door cylinder lock switch or by pressing the RKE lock button. After all the doors are closed, the VTSS indicator will flash quickly for sixteen-seconds indicating the pre-arm process, after which it will flash at a slower rate indicating the system is armed. If during the pre-arm process a door is opened, the ignition is turned to the Run/Start position or if the RKE module receives an unlock request the system will automatically be disarmed. If the VTSS indicator stays on steady during pre-arm, it is an indication of an open decklid security switch sense circuit.

Disarming can be accomplished with a RKE unlock, turning the ignition on with a valid Sentry key or unlocking the vehicle with the driver door cylinder lock. All of the switches for the VTSS system can be monitored using the DRBIII®. The DRBIII® is also useful to determine the cause of a customer complaint of the alarm going off with no apparent reason.

3.7.2 VEHICLE THEFT SECURITY SYSTEM (EXPORT ONLY)

When the VTSS is armed, it will monitor the interior of the vehicle for movement via an intrusion sensor (if equipped), the ignition switch status, ajar switches for the vehicle doors, decklid and hood. Vehicles without an intrusion sensor will have a decklid security switch (knockout) which will also be monitored. If the alarm is tripped, it will sound the vehicles horn or a battery backed siren for vehicles equipped with the intrusion sensor, flash the exterior lamps and the VTSS indicator located in the instrument cluster.

Arming the system is accomplished by locking the doors with the door lock switch following a normal exit sequence of opening the door pressing the power lock button and closing the door, or by using either door cylinder lock switch or by pressing the RKE lock button. After all the doors are closed, the VTSS indicator will flash quickly for sixteen-seconds indicating the pre-arm process, after which it will flash at a slower rate indicating the system is armed. If during the pre-arm process a door is opened, the ignition is turned to the Run/Start position or if the RKE module receives an unlock request the system will automatically be disarmed. If the VTSS indicator stays on steady during pre-arm, it is an indication of the hood ajar circuit being shorted (hood opened) or the decklid security switch circuit being open (if equipped). Defeating the intrusion sensor feature for vehicles so equipped can be done by three additional lock request to the RKE module within 5 seconds.

Disarming is done by either a RKE unlock or turning the ignition on with a valid Sentry key. All of the switches for the VTSS system can be monitored using the DRBIII®. The DRBIII® is also useful to determine the cause of a customer complaint of the alarm going off with no apparent reason.

3.7.3 POWER DOOR LOCKS

3.7.3.1 CENTRAL LOCKING (W/VTSS ONLY)

This feature allows the customer to lock/unlock all vehicle doors with the key from the front door cylinder lock switch. The customer can choose to program this feature to unlock all doors with one turn of the key or open the driver door only with the first turn of the key and open the other doors with the second turn. Altering the operation of the unlock function via the key cylinder switch from one turn to two turns will also alter the operation of the RKE transmitter from one press to two presses.

3.7.3.2 ROLLING (AUTOMATIC) DOOR LOCKS

All vehicle doors are locked automatically once the vehicle reaches a speed of 15 mph and all doors are closed. This feature can be also be enabled/disabled by the customer.

3.7.3.3 DOOR LOCK INHIBIT

This feature disables the door lock command from the interior door lock switch whenever the driver door is open and the key is in the ignition. This prevents the driver from locking the keys in the ignition when using the power door locks. This feature is inoperable if the IOD fuse is not installed.

3.7.3.4 POWER DECKLID RELEASE

Electrically releases the decklid upon two presses of the RKE transmitter decklid release button. This feature is disabled once the speed of the vehicle is greater than 5 mph. The decklid can also be released from the switch in the glove box.

3.7.3.5 PANIC MODE (IF EQUIPPED)

Upon activation of the panic function, the headlamps and park lamps flash in an alternating manner, the horn pulses every second and the courtesy lamps are turned on. The panic mode allows normal nightime driving by allowing the headlamps and park lamps to be on steady when the headlamp switch is in the on position. Panic mode is activated immediately by pressing the panic button once. It does not disarm the VTSS or unlock the doors. It is canceled by pressing the button a second time, reaching a vehicle speed greater than 15 mph or after 3 minutes has elapsed in panic mode. Once panic mode has been activated there is a 2-second delay before it will turn off. Once it is cancelled there is a 2-second delay before it can be reactivated. This is to avoid the problem of deactivating and immediate reactivating due to multiple button presses.

3.8 VEHICLE COMMUNICATION

The Programmable Communication Interface or PCI Bus is a single wire multiplexed network capable of supporting binary encoded messages shared between multiple modules. The PCI bus circuit is identified as D25. The modules are wired in parallel. Connections are made in the harness using splices. The following modules are used on the PL:

- Airbag Control Module
- Left Side Impact Airbag Control Module
- Right Side Impact Airbag Control Module
- Controller Antilock Brake
- Powertrain Control Module
- Radio (If equipped)
- CD Changer (If equipped)
- Compass/Temperature Mirror (If equipped)
- Remote Keyless Entry Module (If equipped)
- Sentry Key Immobilizer Module (If equipped)
- Mechanical Instrument Cluster

Each module provides its own bias and termination in order to transmit and receive messages. The bus voltage is at zero volts when no modules are transmitting and is pulled up to about seven and a half volts when modules are transmitting.

The bus messages are transmitted at a rate averaging 10800 bits per second. Since there is only voltage present when the modules transmit and the message length is only about 500 milliseconds, it is ineffective to try and measure the bus activity with a conventional voltmeter. The preferred method is to use the DRBIII® lab scope. The 12v square wave selection on the 20-volt scale provides a good view of the bus activity. Voltage on the bus should pulse between zero and about seven and a half volts. Refer to the following figure for some typical displays.

The PCI Bus failure modes are broken down into two categories. Complete PCI Bus Communication Failure and individual module no response. Causes of a complete PCI Bus Communication Failure include a short to ground or battery on the PCI circuit. Individual module no response can be caused by an open circuit at the module, or an open battery or ground circuit to the affected module.

Symptoms of a complete PCI Bus Communication Failure would include but are not limited to:

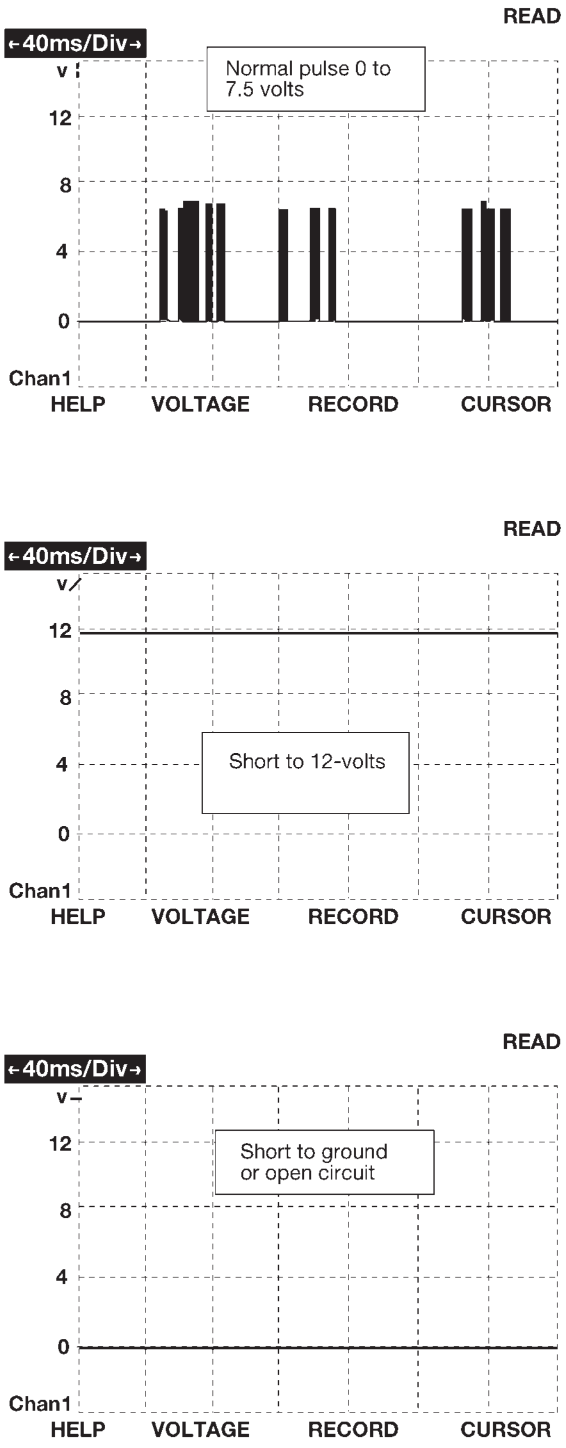
- All gauges on the EMIC stay at zero
- All telltales on EMIC illuminate
- EMIC backlighting at full intensity
- No response received from any module on the PCI bus (except PCM)
- No start (if equipped with Sentry Key Immobilizer)

Symptoms of Individual module failure could include any one or more of the above. The difference would be that at least one or more modules would respond to the DRBIII®.

Diagnosis starts with symptom identification. If a complete PCI Bus Communication Failure is suspected, begin by identifying which modules the vehicle is equipped with and then attempt to get a response from the modules with the DRBIII®. If any modules are responding, the failure is not related to the total bus, but can be caused by one or more modules PCI circuit or power supply and ground circuits. The DRBIII® may display “BUS +/- SIGNALS OPEN” OR “NO RESPONSE” to indicate a communication problem. These same messages will be displayed if the vehicle is not equipped with that particular module. The CCD error message is a default message used by the DRBIII® and in no way indicates whether or not the PCI bus is operational. The message is only an indication that a module is either not responding or the vehicle is not equipped.

NOTE: For 2004 model year, some vehicles will integrate the Transmission Control Module and Powertrain Control Module into a single control module. This new module is the Next Generation Controller for DaimlerChrysler and will be referred to as the Powertrain Control Module (PCM). The Transmission Control Module is part of the Powertrain Control Module.

Diagnostic procedures and DTC numbers are some of the changes you will see which reflect the new combined module technology. The PCM will have four color coded connectors C1 through C4, (C1-BLK, C2-ORANGE, C3-WHITE, C4-GREEN), each PCM connector will have 38 pins each. Two new tools are used for probing and repairing the New PCM connectors. A New tool to release the pins from the PCM connectors Miller #3638 is introduced, you must use the Miller tool #3638 to release the connector pins or harness and connector damage will occur. Also a New tool for probing connectors Miller #8815 is introduced, you must use the Miller tool #8815 to probe the PCM pins or harness and connector damage will occur. There is also a new Verification test and module replacment procedure for the PCM.



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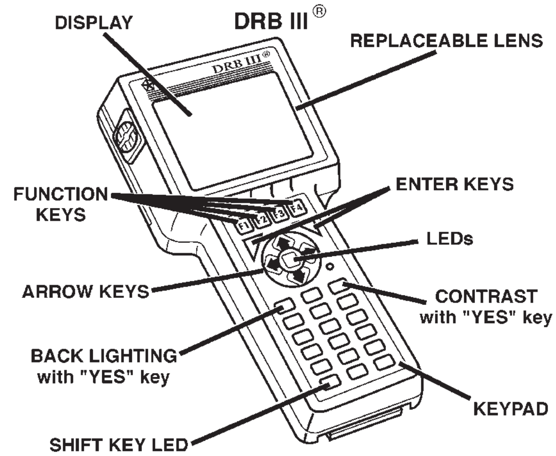
3.9 USING THE DRBIII®

Refer to the DRBIII® user's guide for instructions and assistance with reading trouble codes, erasing trouble codes and other DRBIII® functions.



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3.9.1 DRBIII® ERROR MESSAGES AND BLANK SCREEN

Under normal operation, the DRBIII® will display one of only two error messages:

– User-Requested WARM Boot or User-Requested COLD Boot

If the DRBIII® should display any other error message, record the entire display and call the Star Center for information and assistance. This is a sample of such an error message display:

```
ver: 2.14
date: 26 Jul93
file: key_itf.cc
date: Jul 26 1993
line: 548
err: 0x1
User-Requested COLD Boot

Press MORE to switch between this display
   and the application screen.
Press F4 when done noting information.
```

3.9.2 DRBIII® DOES NOT POWER UP

If the LED's do not light or no sound is emitted at start up, check for loose cable connections or a bad cable. Check the vehicle battery voltage (data link connector cavity 16). A minimum of 11 volts is required to adequately power the DRBIII®.

If all connections are proper between the DRBIII® and the vehicle or other devices, and the vehicle battery is fully charged, and inoperative DRBIII® may be the result of faulty cable or vehicle wiring.

3.9.3 DISPLAY IS NOT VISIBLE

Low temperatures will affect the visibility of the display. Adjust the contrast to compensate for this condition.

4.0 DISCLAIMERS, SAFETY, WARNINGS

4.1 DISCLAIMERS

All information, illustrations, and specifications contained in this manual are based on the latest information available at the time of publication. The right is reserved to make changes at any time without notice.

4.2 SAFETY

4.2.1 TECHNICIAN SAFETY INFORMATION

WARNING! WHEN OPERATING, ENGINES PRODUCE AN ODORLESS GAS CALLED CARBON MONOXIDE. INHALING CARBON MONOXIDE GAS CAN RESULT IN SLOWER REACTION TIMES AND CAN LEAD TO PERSONAL INJURY OR DEATH. WHEN THE ENGINE IS OPERATING, KEEP SERVICE AREAS WELL VENTILATED OR ATTACH THE VEHICLE EXHAUST SYSTEM TO THE SHOP EXHAUST REMOVAL SYSTEM.

Set the parking brake and block the wheels before testing or repairing the vehicle. It is especially important to block the wheels on front-wheel drive vehicles; the parking brake does not hold the drive wheels.

When servicing a vehicle, always wear eye protection, and remove any metal jewelry such as rings, watchbands or bracelets that might make an inadvertent electrical contact.

When diagnosing a body system problem, it is important to follow approved procedures where applicable. These procedures can be found in this General Information Section or in service manual procedures. Following these procedures is very important to the safety of individuals performing diagnostic tests.

4.2.2 VEHICLE PREPARATION FOR TESTING

Make sure the vehicle being tested has a fully charged battery. If it does not, false diagnostic codes or error messages may occur.

4.2.3 SERVICING SUB-ASSEMBLIES

Some components of the body system are intended to be serviced as an assembly only. Attempting to remove or repair certain system subcomponents may result in personal injury and/or improper system operation. Only those components with approved repair and installation procedures in the service manual should be serviced.

4.2.4 DRBIII® SAFETY INFORMATION

WARNING: EXCEEDING THE LIMITS OF THE DRBIII® MULTIMETER IS DANGEROUS. READ ALL DRBIII® INSTRUCTIONS BEFORE USING THE MULTIMETER. FAILURE TO FOLLOW THESE INSTRUCTIONS CAN RESULT IN PERSONAL INJURY OR DEATH.

- Follow the vehicle manufacturer's service specifications at all times.
- Do not use the DRBIII® if it has been damaged.
- Do not use the test leads if the insulation is damaged or if metal is exposed.
- To avoid electrical shock, do not touch the test leads, tips, or the circuit being tested.
- Choose the proper range and function for the measurement. Do not try voltage or current measurements that may exceed the rated capacity.
- Do not exceed the limits shown in the table below:

FUNCTION	INPUT LIMIT
Volts	0 - 500 peak volts AC 0 - 500 volts DC
Ohms (resistance)*	0 - 1.12 megohms
Frequency Measured Frequency Generated	0 - 10 kHz
Temperature	-58 - 1100°F -50 - 600°C

* Ohms cannot be measured if voltage is present. Ohms can be measured only in a non-powered circuit.

- Voltage between any terminal and ground must not exceed 500v DC or 500v peak AC.
- Use caution when measuring voltage above 25v DC or 25v AC.
- Use the low current shunt to measure circuits up to 10A. Use the high current clamp to measure circuits exceeding 10A.
- When testing for the presence of voltage or current, make sure the meter is functioning correctly. Take a reading of a known voltage or current before accepting a zero reading.
- When measuring current, connect the meter in series with test lead.
- Disconnect the live test lead before disconnecting the common test lead.

- When using the meter function, keep the DRBIII® away from spark plug or coil wires to avoid measuring error from outside interference.

4.3 WARNINGS

4.3.1 VEHICLE DAMAGE WARNINGS

Before disconnecting any control module, make sure the ignition is “off”. Failure to do so could damage the module.

When testing voltage or continuity at any control module, use the terminal side (not the wire end) of the connector. Do not probe a wire through the insulation, this will damage it and eventually cause it to fail because of corrosion. Be careful when performing electrical tests so as to prevent accidental shorting of terminals. Such mistakes can damage fuses or components. Also, a second code could be set, making diagnosis of the original problem more difficult.

4.3.2 ROAD TESTING A COMPLAINT VEHICLE

Some complaints will require a test drive as part of the repair verification procedure. The purpose of the test drive is to try to duplicate the diagnostic code or symptom condition.

WARNING: REASSEMBLE ALL COMPONENTS BEFORE ROAD TESTING A VEHICLE. DO NOT TRY TO READ THE DRBIII® SCREEN OR OTHER TEST EQUIPMENT DURING A TEST DRIVE. DO NOT HANG THE DRBIII® OR OTHER TEST EQUIPMENT FROM THE REARVIEW MIRROR DURING A TEST DRIVE. HAVE AN ASSISTANT AVAILABLE TO OPERATE THE DRBIII® OR OTHER TEST EQUIPMENT. FAILURE TO FOLLOW THESE INSTRUCTIONS CAN RESULT IN PERSONAL INJURY OR DEATH.

5.0 REQUIRED TOOLS AND EQUIPMENT

DRBIII® (diagnostic read-out box)
Jumper Wires
Ohmmeter
Voltmeter
Test Light
8310 Airbag Load Tool
8443 SRS Airbag System Load Tool

6.0 GLOSSARY OF ACRONYMS

ABS	antilock brake system
ACM	airbag control module
AECM	airbag electronic control module (ACM)
ASDM	airbag system diagnostic module (ACM)
BUX	built-up export
CAB	controller antilock brake
CTM	compass/temperature mirror
DAB	driver airbag
DLC	data link connector
DTC	diagnostic trouble code
EMIC	electro/mechanical instrument cluster
LSIACM	left SIACM
NGC	next generation controller
PAB	passenger airbag
PCI	Programmable Communication Interface (vehicle communication bus)
PCM	powertrain control module
PDC	power distribution center
PWM	pulse width modulated
RKE	remote keyless entry
RSIACM	right SIACM
SAB	side airbag
SIACM	side impact airbag control module
SKIM	sentry key immobilizer module
SKIS	sentry key immobilizer system
SQUIB	also called initiator (located in rear of airbag module)
TCM	transmission control module
VFD	vacuum fluorescent display
VTSS	vehicle theft security system

7.0

DIAGNOSTIC INFORMATION AND PROCEDURES

Symptom List:

- **ACCELEROMETER 1**
- **ACCELEROMETER 2**
- **INTERNAL 1**
- **OUTPUT DRIVER 1**
- **OUTPUT DRIVER 2**
- **SAFING SENSOR**
- **STORED ENERGY FIRING 1**
- **STORED ENERGY LOGIC**

Test Note: All symptoms listed above are diagnosed using the same tests. The title for the tests will be ACCELEROMETER 1.

When Monitored and Set Condition:

ACCELEROMETER 1

When Monitored: With the ignition on, the module on board diagnostics continuously performs internal circuit tests.

Set Condition: This DTC will set if the module identifies an out of range internal circuit.

ACCELEROMETER 2

When Monitored: With the ignition on, the module on board diagnostics continuously performs internal circuit tests.

Set Condition: This DTC will set if the module identifies an out of range internal circuit.

INTERNAL 1

When Monitored: With the ignition on, the module on board diagnostics continuously performs internal circuit tests.

Set Condition: This DTC will set if the module identifies an out of range internal circuit.

OUTPUT DRIVER 1

When Monitored: With the ignition on the module on board diagnostics continuously performs internal circuit tests.

Set Condition: This DTC will set if the module identifies an out of range internal circuit.

OUTPUT DRIVER 2

When Monitored: With the ignition on the module on board diagnostics continuously performs internal circuit tests.

Set Condition: This DTC will set if the module identifies an out of range internal circuit.

ACCELEROMETER 1 — Continued

SAFING SENSOR

When Monitored: When the ignition on, the module on board diagnostics continuously performs internal circuit tests.

Set Condition: This DTC will set if the module identifies an out of range safing sensor.

STORED ENERGY FIRING 1

When Monitored: With the ignition on the ACM on board diagnostics continuously performs internal circuit tests.

Set Condition: This DTC will set if the ACM identifies an out of range internal circuit.

STORED ENERGY LOGIC

When Monitored: With the ignition on the ACM on board diagnostics continuously performs internal circuit tests.

Set Condition: This DTC will set if the ACM identifies an out of range internal circuit.

POSSIBLE CAUSES
AIRBAG CONTROL MODULE - ACM
LEFT SIDE IMPACT AIRBAG CONTROL MODULE - LSIACM
RIGHT SIDE IMPACT AIRBAG CONTROL MODULE - RSIACM

ACCELEROMETER 1 — Continued

TEST	ACTION	APPLICABILITY
1	Turn the ignition on. Ensure the battery is fully charged. **WARNING: IF THE MODULE IS DROPPED AT ANY TIME, IT MUST BE REPLACED. FAILURE TO TAKE THE PROPER PRECAUTIONS COULD RESULT IN ACCIDENTAL AIRBAG DEPLOYMENT AND PERSONAL INJURY OR DEATH.** **NOTE: For the purpose of this test, the AECM and ORC modules will be referred to as an ACM.** From the list below, select the appropriate module reporting this diagnostic trouble code. SELECT ONE: ACM - ACTIVE or STORED DTC Replace the Airbag Control Module in accordance with Service Instructions. Perform AIRBAG VERIFICATION TEST - VER 1. LEFT SIACM - ACTIVE or STORED DTC WARNING: MAKE SURE THE BATTERY IS DISCONNECTED, THEN WAIT TWO MINUTES BEFORE PROCEEDING. Replace the Left Side Impact Airbag Control Module in accordance with Service Instructions. Perform AIRBAG VERIFICATION TEST - VER 1. RIGHT SIACM - ACTIVE or STORED DTC WARNING: MAKE SURE THE BATTERY IS DISCONNECTED, THEN WAIT TWO MINUTES BEFORE PROCEEDING. Replace the Right Side Impact Airbag Control Module in accordance with Service information. Perform AIRBAG VERIFICATION TEST - VER 1. **NOTE: When reconnecting Airbag system components, the ignition must be turned off and the battery must be disconnected.**	All

Symptom List:
AIRBAG WARNING INDICATOR OPEN
AIRBAG WARNING INDICATOR SHORT

Test Note: All symptoms listed above are diagnosed using the same tests. The title for the tests will be AIRBAG WARNING INDICATOR OPEN.

When Monitored and Set Condition:

AIRBAG WARNING INDICATOR OPEN

When Monitored: With ignition on the ACM monitors the PCI Bus for a message from the MIC containing the airbag warning indicator status. The MIC transmits the message one time at ignition on, upon lamp state change, or in response to the ACM lamp message.

Set Condition: This DTC will set if the indicator status is OPEN for 2 or 3 consecutive messages or 2 or 3 seconds.

AIRBAG WARNING INDICATOR SHORT

When Monitored: With ignition on the ACM monitors the PCI Bus for a message from the MIC containing the airbag warning indicator status. The MIC transmits the message one time at ignition on, upon lamp state change, or in response to the ACM lamp message.

Set Condition: This DTC will set if the indicator status is SHORT for 2 or 3 consecutive messages or 2 or 3 seconds.

POSSIBLE CAUSES
MIC, COMMUNICATION FAILURE
WARNING INDICATOR
ACM, WARNING INDICATOR
STORED CODE OR INTERMITTENT CONDITION
ACTIVE CODE PRESENT

TEST	ACTION	APPLICABILITY
1	Turn the ignition on. Ensure the battery is fully charged. **NOTE: For the purpose of this test, the AECM and ORC modules will be referred to as an ACM.** SELECT ACTIVE or STORED DTC: ACM - ACTIVE DTC Go To 2 ACM - STORED DTC Go To 5 **NOTE: When reconnecting Airbag system components, the ignition must be turned off and the battery must be disconnected.**	All

AIRBAG WARNING INDICATOR OPEN — Continued

TEST	ACTION	APPLICABILITY
2	With the DRBIII®, ensure PCI Bus communications with the Instrument Cluster. Is the Instrument Cluster communicating on the PCI Bus? Yes → Go To 3 No → Refer to category COMMUNICATION CATEGORY and select the related symptom INSTRUMENT CLUSTER BUS +/- SIGNAL OPEN.	All
3	With the DRBIII® select PASSIVE RESTRAINTS, AIRBAG and MONITOR DISPLAY. Using the DRBIII®, read the WARNING LAMP MONITOR screen. Select the LAMP STATUS displayed on the DRB monitors screen. Does the DRBIII® show the LAMP STATUS: OK? YES Go To 4 NO Replace Instrument Cluster. Perform BODY VERIFICATION TEST - VER 1.	All
4	**WARNING: TO AVOID PERSONAL INJURY OR DEATH, TURN THE IGNITION OFF, DISCONNECT THE BATTERY AND WAIT TWO MINUTES BEFORE PROCEEDING.** **WARNING: IF THE AIRBAG CONTROL MODULE IS DROPPED AT ANY TIME, IT MUST BE REPLACED. FAILURE TO TAKE THE PROPER PRECAUTIONS COULD RESULT IN ACCIDENTAL AIRBAG DEPLOYMENT AND PERSONAL INJURY OR DEATH.** If there are no possible causes remaining, view repair. Repair Replace the Airbag Control Module in accordance with Service Instructions. Perform AIRBAG VERIFICATION TEST - VER 1.	All
5	**NOTE: Ensure the battery is fully charged.** With the DRBIII®, record and erase all DTCs from all modules. All active codes must be resolved before diagnosing any stored codes. Maintain a safe distance from all airbags while performing the following steps. With the DRBIII® monitor active codes as you work through the system. **NOTE: If equipped with Passenger Airbag On-Off switch, read the DTC's in all switch positions.** Wiggle the wiring harness and connectors of the appropriate airbag system and rotate the steering wheel from stop to stop. **NOTE: Check connectors - Clean and repair as necessary.** You have just attempted to simulate the condition that initially set the trouble code message. The following additional checks may assist you in identifying a possible intermittent problem: - Visually inspect related wire harness connectors. Look for broken, bent, pushed out, spread, corroded, or contaminated terminals. - Visually inspect the related harnesses. Look for chafed, pierced, pinched or partially broken wire. - Refer to Wiring Diagrams and Technical Service Bulletins that may apply. Did the DTC become active ? Yes → Select appropriate symptom from Symptom List. No → No problem found at this time. Erase all codes before returning vehicle to customer.	All

Symptom:
CLUSTER MESSAGE MISMATCH

When Monitored and Set Condition:

CLUSTER MESSAGE MISMATCH

When Monitored: After the MIC bulb test is completed, the ACM compares the Lamp Request by ACM, On or Off, and the Lamp on by MIC, On or Off, PCI Bus messages. Each message is transmitted one time per second or when a change in the lamp state occur.

Set Condition: If the Lamp Request by ACM, On or Off, and the Lamp on by MIC, On or Off, messages do not match, the code will set.

POSSIBLE CAUSES
MIC DIAGNOSTIC CODES
CLUSTER MESSAGE MISMATCH
STORED CODE OR INTERMITTENT CONDITION
ACM, CLUSTER MESSAGE MISMATCH
ACTIVE CODE PRESENT

TEST	ACTION	APPLICABILITY
1	Turn the ignition on. Ensure the battery is fully charged. **NOTE: For the purpose of this test, the AECM and ORC modules will be referred to as an ACM.** SELECT ACTIVE or STORED DTC: ACM - ACTIVE DTC Go To 2 ACM - STORED DTC Go To 5 **NOTE: When reconnecting Airbag system components, the ignition must be turned off and the battery must be disconnected.**	All
2	Turn the ignition on. With the DRBIII®, read the MIC DTCs. Does the DRBIII® display any active Diagnostic Codes? Yes → Refer to symptom list for problems related to Instrument Cluster. No → Go To 3	All

CLUSTER MESSAGE MISMATCH — Continued

TEST	ACTION	APPLICABILITY
3	With the DRBIII® select PASSIVE RESTRAINTS, AIRBAG, MONITOR DISPLAY and WARNING LAMP STATUS. Cycle the ignition key and observe the LAMP ON BY MIC and LAMP REQ BY ACM monitors after the 6 to 8 second indicator test. Does the LAMP ON BY MIC and LAMP REQ BY ACM monitors match? YES Go To 4 NO Replace Mechanical Instrument Cluster. Perform BODY VERIFICATION TEST - VER 1.	All
4	**WARNING: TO AVOID PERSONAL INJURY OR DEATH, MAKE SURE THE BATTERY IS DISCONNECTED, THEN WAIT TWO MINUTES BEFORE PROCEEDING.** **WARNING: IF THE AIRBAG CONTROL MODULE IS DROPPED AT ANY TIME, IT MUST BE REPLACED. FAILURE TO TAKE THE PROPER PRECAUTIONS COULD RESULT IN ACCIDENTAL AIRBAG DEPLOYMENT AND PERSONAL INJURY OR DEATH.** If there are no possible causes remaining, view repair. Repair Replace the Airbag Control Module in accordance with Service Instructions. Perform AIRBAG VERIFICATION TEST - VER 1.	All
5	**NOTE: Ensure the battery is fully charged.** With the DRBIII®, record and erase all DTCs from all modules. All active codes must be resolved before diagnosing any stored codes. Maintain a safe distance from all airbags while performing the following steps. With the DRBIII® monitor active codes as you work through the system. **NOTE: If equipped with Passenger Airbag On-Off switch, read the DTC's in all switch positions.** Wiggle the wiring harness and connectors of the appropriate airbag system and rotate the steering wheel from stop to stop. **NOTE: Check connectors - Clean and repair as necessary.** You have just attempted to simulate the condition that initially set the trouble code message. The following additional checks may assist you in identifying a possible intermittent problem: - Visually inspect related wire harness connectors. Look for broken, bent, pushed out, spread, corroded, or contaminated terminals. - Visually inspect the related harnesses. Look for chafed, pierced, pinched or partially broken wire. - Refer to Wiring Diagrams and Technical Service Bulletins that may apply. Did the DTC become active ? Yes → Select appropriate symptom from Symptom List. No → No problem found at this time. Erase all codes before returning vehicle to customer.	All

Symptom:
CONFIGURATION ERROR

When Monitored and Set Condition:

CONFIGURATION ERROR

When Monitored: With ignition on the Side Impact Airbag Control Module monitors the unused squib terminals for the a valid squib circuit resistance.

Set Condition: When the SIACM detects a valid squib circuit resistance across the unused terminals.

POSSIBLE CAUSES
SELECT MODULE REPORTING DTC
MISS WIRED LEFT SIACM CONNECTOR
MISS WIRED RIGHT SIACM CONNECTOR
LEFT SIDE IMPACT AIRBAG CONTROL MODULE - LSIACM
RIGHT SIDE IMPACT AIRBAG CONTROL MODULE - LSIACM
STORED CODE OR INTERMITTENT CONDITION
ACTIVE CODE PRESENT

TEST	ACTION	APPLICABILITY
1	Turn the ignition on. **NOTE: Ensure that the battery is fully charged.** **NOTE: For the purpose of this test, the AECM and ORC modules will be referred to as an ACM.** SELECT ONE: LEFT SIACM - ACTIVE DTC Go To 2 LEFT SIACM - STORED DTC Go To 4 RIGHT SIACM - ACTIVE DTC Go To 3 RIGHT SIACM - STORED DTC Go To 4 **NOTE: When reconnecting Airbag system components, the ignition must be turned off and the battery must be disconnected.**	All

CONFIGURATION ERROR — Continued

TEST	ACTION	APPLICABILITY
2	**WARNING: TURN IGNITION OFF, DISCONNECT THE BATTERY AND WAIT TWO MINUTES BEFORE PROCEEDING.** Disconnect the Left SIACM connector. **NOTE: Check connectors - Clean and repair as necessary.** Using the wiring diagram/schematic as a guide, inspect the Left SIACM connector wiring. Is the connector correctly wired? Yes → Replace the Left Side Impact Airbag Control Module in accordance with Service Instructions. WARNING: IF THE SIDE IMPACT AIRBAG CONTROL MODULE IS DROPPED AT ANY TIME, IT MUST BE REPLACED. Perform AIRBAG VERIFICATION TEST - VER 1. No → Rewire the Left Side Impact Airbag Control Module connector. Perform AIRBAG VERIFICATION TEST - VER 1.	All
3	**WARNING: TURN IGNITION OFF, DISCONNECT THE BATTERY AND WAIT TWO MINUTES BEFORE PROCEEDING.** Disconnect the Right SIACM connector. **NOTE: Check connectors - Clean and repair as necessary.** Using the wiring diagram/schematic as a guide, inspect the Right SIACM connector wiring. Is the connector correctly wired? Yes → Replace the Right Side Impact Airbag Control Module in accordance with Service Instructions. WARNING: IF THE SIDE IMPACT AIRBAG CONTROL MODULE IS DROPPED AT ANY TIME, IT MUST BE REPLACED. Perform AIRBAG VERIFICATION TEST - VER 1. No → Rewire the Right Side Impact Airbag Control Module connector. Perform AIRBAG VERIFICATION TEST - VER 1.	All
4	**NOTE: Ensure the battery is fully charged.** With the DRBIII®, record and erase all DTCs from all modules. All active codes must be resolved before diagnosing any stored codes. Maintain a safe distance from all airbags while performing the following steps. With the DRBIII® monitor active codes as you work through the system. **NOTE: If equipped with Passenger Airbag On-Off switch, read the DTC's in all switch positions.** Wiggle the wiring harness and connectors of the appropriate airbag system and rotate the steering wheel from stop to stop. **NOTE: Check connectors - Clean and repair as necessary.** You have just attempted to simulate the condition that initially set the trouble code message. The following additional checks may assist you in identifying a possible intermittent problem: - Visually inspect related wire harness connectors. Look for broken, bent, pushed out, spread, corroded, or contaminated terminals. - Visually inspect the related harnesses. Look for chafed, pierced, pinched or partially broken wire. - Refer to Wiring Diagrams and Technical Service Bulletins that may apply. Did the DTC become active ? Yes → Select appropriate symptom from Symptom List. No → No problem found at this time. Erase all codes before returning vehicle to customer.	All

Symptom:
DRIVER SQUIB 1 CIRCUIT OPEN

When Monitored and Set Condition:

DRIVER SQUIB 1 CIRCUIT OPEN

When Monitored: With the ignition on the ACM monitors the resistance of the Driver Squib 1 circuits.

Set Condition: The ACM detects an open circuit or high resistance in the Driver Squib 1 circuits.

POSSIBLE CAUSES
DRIVER AIRBAG OPEN
CLOCKSPRING SQUIB CIRCUITS OPEN
DRIVER SQUIB 1 LINE 1 OR LINE 2 CIRCUIT OPEN
ACM, DRIVER SQUIB 1 CIRCUIT OPEN
STORED CODE OR INTERMITTENT CONDITION
ACTIVE CODE PRESENT

TEST	ACTION	APPLICABILITY
1	Turn the ignition on. **NOTE: Ensure that the battery is fully charged.** **NOTE: For the purpose of this test, the AECM and ORC modules will be referred to as an ACM.** SELECT ACTIVE or STORED DTC: ACM - ACTIVE DTC Go To 2 ACM - STORED DTC Go To 6 **NOTE: When reconnecting Airbag system components, the ignition must be turned off and the battery must be disconnected.**	All

DRIVER SQUIB 1 CIRCUIT OPEN — Continued

TEST	ACTION	APPLICABILITY
2	**WARNING: TO AVOID PERSONAL INJURY OR DEATH, TURN THE IGNITION OFF, DISCONNECT THE BATTERY AND WAIT TWO MINUTES BEFORE PROCEEDING.** **WARNING: DO NOT PLACE AN INTACT UNDEPLOYED AIRBAG FACE DOWN ON A HARD SURFACE, THE AIRBAG WILL PROPEL INTO THE AIR IF ACCIDENTALLY DEPLOYED. FAILURETO TAKE THE PROPER PRECAUTIONS COULD RESULT IN ACCIDENTAL AIRBAG DEPLOYMENT AND PERSONAL INJURY OR DEATH.** Disconnect the Driver Airbag. **NOTE: Check connectors - Clean and repair as necessary.** Connect the appropriate Load Tool to the Driver Airbag connectors. **WARNING: TO AVOID PERSONAL INJURY OR DEATH, TURN THE IGNITION ON, THEN RECONNECT THE BATTERY.** With the DRBIII®, read the active Airbag DTCs. Does the DRBIII® show DRIVER SQUIB 1 CIRCUIT OPEN? Yes → Go To 3 No → Replace the Driver Airbag in accordance with the Service Information. Perform AIRBAG VERIFICATION TEST - VER 1.	All
3	**WARNING: TO AVOID PERSONAL INJURY OR DEATH, TURN THE IGNITION OFF, DISCONNECT THE BATTERY AND WAIT TWO MINUTES BEFORE PROCEEDING.** Disconnect the Clockspring connector. **NOTE: Check connectors - Clean and repair as necessary.** Connect the appropriate Load Tool to the Clockspring connector. **WARNING: TO AVOID PERSONAL INJURY OR DEATH,TURN THE IGNITION ON, THEN RECONNECT THE BATTERY.** With the DRBIII®, read the active Airbag DTCs. Does the DRBIII® show DRIVER SQUIB 1 CIRCUIT OPEN? Yes → Go To 4 No → Replace the Clockspring in accordance with the Service Information. Perform AIRBAG VERIFICATION TEST - VER 1.	All
4	**WARNING: TO AVOID PERSONAL INJURY OR DEATH, TURN THE IGNITION OFF, DISCONNECT THE BATTERY AND WAIT TWO MINUTES BEFORE PROCEEDING.** Disconnect the Airbag Control Module connector. **NOTE: Check connectors - Clean and repair as necessary.** Connect the appropriate Load Tool adaptor to the Airbag Control Module connector. Disconnect the Load Tool from the Clockspring connector. Measure the resistance of the Driver Squib 1 Line 1 and Line 2 circuit between the ACM adaptor and the Clockspring connector. Is the resistance below 1.0 ohms on both circuits? Yes → Go To 5 No → Repair open or high resistance in the Driver Squib 1 Line 1 or Line 2 circuit. Perform AIRBAG VERIFICATION TEST - VER 1.	All

DRIVER SQUIB 1 CIRCUIT OPEN — Continued

TEST	ACTION	APPLICABILITY
5	**WARNING: TO AVOID PERSONAL INJURY OR DEATH, TURN THE IGNITION OFF, DISCONNECT THE BATTERY AND WAIT TWO MINUTES BEFORE PROCEEDING.** **WARNING: IF THE AIRBAG CONTROL MODULE IS DROPPED AT ANY TIME, IT MUST BE REPLACED. FAILURE TO TAKE THE PROPER PRECAUTIONS COULD RESULT IN ACCIDENTAL AIRBAG DEPLOYMENT AND PERSONAL INJURY OR DEATH.** If there are no possible causes remaining, view repair. Repair Replace the Airbag Control Module in accordance with Service Instructions. Perform AIRBAG VERIFICATION TEST - VER 1.	All
6	**NOTE: Ensure the battery is fully charged.** With the DRBIII®, record and erase all DTCs from all modules. All active codes must be resolved before diagnosing any stored codes. Maintain a safe distance from all airbags while performing the following steps. With the DRBIII® monitor active codes as you work through the system. **NOTE: If equipped with Passenger Airbag On-Off switch, read the DTC's in all switch positions.** Wiggle the wiring harness and connectors of the appropriate airbag system and rotate the steering wheel from stop to stop. **NOTE: Check connectors - Clean and repair as necessary.** You have just attempted to simulate the condition that initially set the trouble code message. The following additional checks may assist you in identifying a possible intermittent problem: - Visually inspect related wire harness connectors. Look for broken, bent, pushed out, spread, corroded, or contaminated terminals. - Visually inspect the related harnesses. Look for chafed, pierced, pinched or partially broken wire. - Refer to Wiring Diagrams and Technical Service Bulletins that may apply. Did the DTC become active ? Yes → Select appropriate symptom from Symptom List. No → No problem found at this time. Erase all codes before returning vehicle to customer.	All

Symptom:
DRIVER SQUIB 1 CIRCUIT SHORT

When Monitored and Set Condition:

DRIVER SQUIB 1 CIRCUIT SHORT

When Monitored: With the ignition on the ACM monitors the resistance of the Driver Squib 1 circuits.

Set Condition: The ACM has detected low resistance on the Driver Squib 1 circuits.

POSSIBLE CAUSES
DRIVER AIRBAG CIRCUIT SHORT
CLOCKSPRING, DRIVER SQUIB 1 CIRCUIT SHORT
DRIVER SQUIB 1 LINE 1 SHORT TO LINE 2
ACM, DRIVER SQUIB 1 CIRCUIT SHORT
STORED CODE OR INTERMITTENT CONDITION
ACTIVE CODE PRESENT

TEST	ACTION	APPLICABILITY
1	Turn the ignition on. **NOTE: Ensure that the battery is fully charged.** **NOTE: For the purpose of this test, the AECM and ORC modules will be referred to as an ACM.** SELECT ACTIVE or STORED DTC: ACM - ACTIVE DTC Go To 2 ACM - STORED DTC Go To 6 **NOTE: When reconnecting airbag system components the Ignition must be turned off and the Battery must be disconnected.**	All

DRIVER SQUIB 1 CIRCUIT SHORT — Continued

TEST	ACTION	APPLICABILITY
2	**WARNING: TO AVOID PERSONAL INJURY OR DEATH, TURN THE IGNITION OFF, DISCONNECT THE BATTERY AND WAIT TWO MINUTES BEFORE PROCEEDING.** Disconnect the Driver Airbag. **WARNING: DO NOT PLACE AN INTACT UNDEPLOYED AIRBAG FACE DOWN ON A HARD SURFACE, THE AIRBAG WILL PROPEL INTO THE AIR IF ACCIDENTALLY DEPLOYED. FAILURE TO TAKE THE PROPER PRECAUTIONS COULD RESULT IN ACCIDENTAL AIRBAG DEPLOYMENT AND PERSONAL INJURY OR DEATH.** **NOTE: Check connectors - Clean and repair as necessary.** Connect the appropriate Load Tool to the Driver Airbag connectors. **WARNING: TO AVOID PERSONAL INJURY OR DEATH,TURN THE IGNITION ON, THEN RECONNECT THE BATTERY.** With the DRBIII®, read the active Airbag DTCs. Does the DRBIII® show DRIVER SQUIB 1 CIRCUIT SHORT? Yes → Go To 3 No → Replace Driver Airbag. Perform AIRBAG VERIFICATION TEST - VER 1.	All
3	**WARNING: TO AVOID PERSONAL INJURY OR DEATH, TURN THE IGNITION OFF, DISCONNECT THE BATTERY AND WAIT TWO MINUTES BEFORE PROCEEDING.** Disconnect the Clockspring connector. **NOTE: Check connectors - Clean and repair as necessary.** Connect the appropriate Load Tool to the Clockspring connector. **WARNING: TO AVOID PERSONAL INJURY OR DEATH, TURN THE IGNITION ON, THEN RECONNECT THE BATTERY.** With the DRBIII®, read the active Airbag DTCs. Does the DRBIII® show DRIVER SQUIB 1 CIRCUIT SHORT? Yes → Go To 4 No → Replace Clockspring. Perform AIRBAG VERIFICATION TEST - VER 1.	All
4	**WARNING: TO AVOID PERSONAL INJURY OR DEATH, TURN THE IGNITION OFF, DISCONNECT THE BATTERY AND WAIT TWO MINUTES BEFORE PROCEEDING.** Disconnect the Airbag Control Module connector. **NOTE: Check connectors - Clean and repair as necessary.** Connect the appropriate Load Tool adaptor to the Airbag Control Module connector. Disconnect the Load Tool from the Clockspring connector. Measure the resistance between the Driver Squib 1 Line 1 and Line 2 at the Clockspring connector. Is the resistance below 10K ohms? Yes → Repair the Driver Squib 1 Line 1 circuit shorted to Driver Squib 1 Line 2 circuit. Perform AIRBAG VERIFICATION TEST - VER 1. No → Go To 5	All

DRIVER SQUIB 1 CIRCUIT SHORT — Continued

TEST	ACTION	APPLICABILITY
5	**WARNING: TO AVOID PERSONAL INJURY OR DEATH, TURN THE IGNITION OFF, DISCONNECT THE BATTERY AND WAIT TWO MINUTES BEFORE PROCEEDING.** **WARNING: IF THE AIRBAG CONTROL MODULE IS DROPPED AT ANY TIME, IT MUST BE REPLACED. FAILURE TO TAKE THE PROPER PRECAUTIONS COULD RESULT IN ACCIDENTAL AIRBAG DEPLOYMENT AND PERSONAL INJURY OR DEATH.** If there are no possible causes remaining, view repair. Repair Replace the Airbag Control Module in accordance with Service Instructions. Perform AIRBAG VERIFICATION TEST - VER 1.	All
6	**NOTE: Ensure the battery is fully charged.** With the DRBIII®, record and erase all DTCs from all modules. All active codes must be resolved before diagnosing any stored codes. Maintain a safe distance from all airbags while performing the following steps. With the DRBIII® monitor active codes as you work through the system. **NOTE: If equipped with Passenger Airbag On-Off switch, read the DTC's in all switch positions.** Wiggle the wiring harness and connectors of the appropriate airbag system and rotate the steering wheel from stop to stop. **NOTE: Check connectors - Clean and repair as necessary.** You have just attempted to simulate the condition that initially set the trouble code message. The following additional checks may assist you in identifying a possible intermittent problem: - Visually inspect related wire harness connectors. Look for broken, bent, pushed out, spread, corroded, or contaminated terminals. - Visually inspect the related harnesses. Look for chafed, pierced, pinched or partially broken wire. - Refer to Wiring Diagrams and Technical Service Bulletins that may apply. Did the DTC become active ? Yes → Select appropriate symptom from Symptom List. No → No problem found at this time. Erase all codes before returning vehicle to customer.	All

Symptom:
DRIVER SQUIB 1 SHORT TO BATTERY

When Monitored and Set Condition:

DRIVER SQUIB 1 SHORT TO BATTERY

When Monitored: With the ignition on the ACM monitors the voltage of the Driver Squib 1 circuits.

Set Condition: The ACM has detected high voltage on the Driver Squib 1 circuits.

POSSIBLE CAUSES
DRIVER AIRBAG CIRCUIT SHORT TO BATTERY
CLOCKSPRING, DRIVER SQUIB 1 CIRCUIT SHORT TO BATTERY
DRIVER SQUIB 1 LINE 1 OR LINE 2 SHORT TO BATTERY
ACM, DRIVER SQUIB 1 CIRCUITS SHORT TO BATTERY
STORED CODE OR INTERMITTENT CONDITION
ACTIVE CODE PRESENT

TEST	ACTION	APPLICABILITY
1	Turn the ignition on. **NOTE: Ensure that the battery is fully charged.** **NOTE: For the purpose of this test, the AECM and ORC modules will be referred to as an ACM.** SELECT ACTIVE or STORED ACM DTC: ACM - ACTIVE DTC Go To 2 ACM - STORED DTC Go To 6 **NOTE: When reconnecting Airbag system components, the ignition must be turned off and the battery must be disconnected.**	All

DRIVER SQUIB 1 SHORT TO BATTERY — Continued

TEST	ACTION	APPLICABILITY
2	**WARNING: TO AVOID PERSONAL INJURY OR DEATH, TURN THE IGNITION OFF, DISCONNECT THE BATTERY AND WAIT TWO MINUTES BEFORE PROCEEDING.** **WARNING: DO NOT PLACE AN INTACT UNDEPLOYED AIRBAG FACE DOWN ON A HARD SURFACE, THE AIRBAG WILL PROPEL INTO THE AIR IF ACCIDENTALLY DEPLOYED, AND COULD RESULT IN SERIOUS OR FATAL INJURY.** Disconnect the Driver Airbag. **NOTE: Check connectors - Clean and repair as necessary.** Connect the appropriate Load Tool to the Driver Airbag connectors. **WARNING: TO AVOID PERSONAL INJURY OR DEATH, TURN THE IGNITION ON, THEN RECONNECT THE BATTERY.** With the DRBIII®, read the active Airbag DTCS. Does the DRBIII® show DRIVER SQUIB 1 SHORT TO BATTERY? Yes → Go To 3 No → Replace the Driver Airbag in accordance with the Service Information. Perform AIRBAG VERIFICATION TEST - VER 1.	All
3	**WARNING: TO AVOID PERSONAL INJURY OR DEATH, TURN THE IGNITION OFF, DISCONNECT THE BATTERY AND WAIT TWO MINUTES BEFORE PROCEEDING.** Disconnect the Clockspring connector. **NOTE: Check connectors - Clean and repair as necessary.** Connect the appropriate Load Tool to the Clockspring connector. **WARNING: TO AVOID PERSONAL INJURY OR DEATH, TURN THE IGNITION ON, THEN RECONNECT THE BATTERY.** With the DRBIII®, read the active Airbag DTCs. Does the DRBIII® show DRIVER SQUIB 1 SHORT TO BATTERY ? Yes → Go To 4 No → Replace the Clockspring in accordance with the Service Information. Perform AIRBAG VERIFICATION TEST - VER 1.	All
4	**WARNING: TO AVOID PERSONAL INJURY OR DEATH, TURN THE IGNITION OFF, DISCONNECT THE BATTERY AND WAIT TWO MINUTES BEFORE PROCEEDING.** **WARNING: IF THE AIRBAG CONTROL MODULE IS DROPPED AT ANY TIME, IT MUST BE REPLACED. FAILURE TO TAKE THE PROPER PRECAUTIONS COULD RESULT IN ACCIDENTAL AIRBAG DEPLOYMENT AND PERSONAL INJURY OR DEATH.** Disconnect the Airbag Control Module connector. **NOTE: Check connectors - Clean and repair as necessary.** Connect the appropriate Load Tool adaptor to the Airbag Control Module connector. **WARNING: TO AVOID PERSONAL INJURY OR DEATH, TURN THE IGNITION ON, THEN RECONNECT THE BATTERY.** Disconnect the Load Tool from the Clockspring connector. Measure the voltage on the Driver Squib 1 Line 1 and Line 2 circuits between the Clockspring connector and ground. Is there any voltage present? Yes → Repair the Driver Squib 1 Line 1 or Line 2 circuits shorted to battery. Perform AIRBAG VERIFICATION TEST - VER 1. No → Go To 5	All

DRIVER SQUIB 1 SHORT TO BATTERY — Continued

TEST	ACTION	APPLICABILITY
5	**WARNING: TO AVOID PERSONAL INJURY OR DEATH, TURN THE IGNITION OFF, DISCONNECT THE BATTERY AND WAIT TWO MINUTES BEFORE PROCEEDING.** **WARNING: IF THE AIRBAG CONTROL MODULE IS DROPPED AT ANY TIME, IT MUST BE REPLACED. FAILURE TO TAKE THE PROPER PRECAUTIONS COULD RESULT IN ACCIDENTAL AIRBAG DEPLOYMENT AND PERSONAL INJURY OR DEATH.** If there are no possible causes remaining, view repair. Repair Replace the Airbag Control Module in accordance with Service Instructions. Perform AIRBAG VERIFICATION TEST - VER 1.	All
6	**NOTE: Ensure the battery is fully charged.** With the DRBIII®, record and erase all DTCs from all modules. All active codes must be resolved before diagnosing any stored codes. Maintain a safe distance from all airbags while performing the following steps. With the DRBIII® monitor active codes as you work through the system. **NOTE: If equipped with Passenger Airbag On-Off switch, read the DTC's in all switch positions.** Wiggle the wiring harness and connectors of the appropriate airbag system and rotate the steering wheel from stop to stop. **NOTE: Check connectors - Clean and repair as necessary.** You have just attempted to simulate the condition that initially set the trouble code message. The following additional checks may assist you in identifying a possible intermittent problem: - Visually inspect related wire harness connectors. Look for broken, bent, pushed out, spread, corroded, or contaminated terminals. - Visually inspect the related harnesses. Look for chafed, pierced, pinched or partially broken wire. - Refer to Wiring Diagrams and Technical Service Bulletins that may apply. Did the DTC become active ? Yes → Select appropriate symptom from Symptom List. No → No problem found at this time. Erase all codes before returning vehicle to customer.	All

Symptom:
DRIVER SQUIB 1 SHORT TO GROUND

When Monitored and Set Condition:

DRIVER SQUIB 1 SHORT TO GROUND

When Monitored: With the ignition on the ACM monitors the resistance of the Driver Squib 1 circuits.

Set Condition: The ACM has detected a short to ground in the Driver Squib 1 circuits.

POSSIBLE CAUSES
DRIVER AIRBAG CIRCUIT SHORT TO GROUND
CLOCKSPRING, DRIVER SQUIB 1 CIRCUIT SHORT TO GROUND
DRIVER SQUIB 1 LINE 1 OR LINE 2 SHORTED TO GROUND
ACM, DRIVER SQUIB 1 CIRCUITS SHORT TO GROUND
STORED CODE OR INTERMITTENT CONDITION
ACTIVE CODE PRESENT

TEST	ACTION	APPLICABILITY
1	Turn the ignition on. **NOTE: Ensure that the battery is fully charged.** **NOTE: For the purpose of this test, the AECM and ORC modules will be referred to as an ACM.** SELECT ACTIVE or STORED DTC: ACM - ACTIVE DTC Go To 2 ACM - STORED DTC Go To 5 **NOTE: When reconnecting Airbag system components, the ignition must be turned off and the battery must be disconnected.**	All

DRIVER SQUIB 1 SHORT TO GROUND — Continued

TEST	ACTION	APPLICABILITY
2	**WARNING: TO AVOID PERSONAL INJURY OR DEATH, TURN THE IGNITION OFF, DISCONNECT THE BATTERY AND WAIT TWO MINUTES BEFORE PROCEEDING.** **WARNING: DO NOT PLACE AN INTACT UNDEPLOYED AIRBAG FACE DOWN ON A HARD SURFACE, THE AIRBAG WILL PROPEL INTO THE AIR IF ACCIDENTALLY DEPLOYED. FAILURE TO TAKE THE PROPER PRECAUTIONS COULD RESULT IN ACCIDENTAL AIRBAG DEPLOYMENT AND PERSONAL INJURY OR DEATH.** Disconnect the Driver Airbag Module. **NOTE: Check connectors - Clean and repair as necessary.** Connect the appropriate Load Tool to the Driver Airbag connectors. **WARNING: TO AVOID PERSONAL INJURY OR DEATH, TURN THE IGNITION ON, THEN RECONNECT THE BATTERY.** With the DRBIII®, read the active Airbag DTCs. Does the DRBIII® show DRIVER SQUIB 1 SHORT TO GROUND? Yes → Go To 3 No → Replace the Driver Airbag in accordance with the Service Information. Perform AIRBAG VERIFICATION TEST - VER 1.	All
3	**WARNING: TO AVOID PERSONAL INJURY OR DEATH, TURN THE IGNITION OFF, DISCONNECT THE BATTERY AND WAIT TWO MINUTES BEFORE PROCEEDING.** Disconnect the Clockspring connector. **NOTE: Check connectors - Clean and repair as necessary.** Connect the appropriate Load Tool to the Clockspring connector. **WARNING: TO AVOID PERSONAL INJURY OR DEATH, TURN THE IGNITION ON, THEN RECONNECT THE BATTERY.** With the DRBIII®, read the active Airbag DTCs. Does the DRBIII® show DRIVER SQUIB 1 SHORT TO GROUND? Yes → Go To 4 No → Replace the Clockspring. Perform AIRBAG VERIFICATION TEST - VER 1.	All
4	**WARNING: TO AVOID PERSONAL INJURY OR DEATH, TURN THE IGNITION OFF, DISCONNECT THE BATTERY AND WAIT TWO MINUTES BEFORE PROCEEDING.** Disconnect the Airbag Control Module connector. **NOTE: Check connectors - Clean and repair as necessary.** Connect the appropriate Load Tool adaptor to the Airbag Control Module connector. Disconnect the Load Tool from the Clockspring connector. Measure the resistance of the Driver Squib 1 Line 1 and Line 2 circuits between Clockspring connector and ground. Is the resistance below 10K ohms on either circuit? Yes → Repair Driver Squib 1 Line 1 or Line 2 circuits shorted to ground. Perform AIRBAG VERIFICATION TEST - VER 1. No → Replace the Airbag Control Module in accordance with Service Instructions. Perform AIRBAG VERIFICATION TEST - VER 1.	All

DRIVER SQUIB 1 SHORT TO GROUND — Continued

TEST	ACTION	APPLICABILITY
5	**NOTE: Ensure the battery is fully charged.** With the DRBIII®, record and erase all DTCs from all modules. All active codes must be resolved before diagnosing any stored codes. Maintain a safe distance from all airbags while performing the following steps. With the DRBIII® monitor active codes as you work through the system. **NOTE: If equipped with Passenger Airbag On-Off switch, read the DTC's in all switch positions.** Wiggle the wiring harness and connectors of the appropriate airbag system and rotate the steering wheel from stop to stop. **NOTE: Check connectors - Clean and repair as necessary.** You have just attempted to simulate the condition that initially set the trouble code message. The following additional checks may assist you in identifying a possible intermittent problem: - Visually inspect related wire harness connectors. Look for broken, bent, pushed out, spread, corroded, or contaminated terminals. - Visually inspect the related harnesses. Look for chafed, pierced, pinched or partially broken wire. - Refer to Wiring Diagrams and Technical Service Bulletins that may apply. Did the DTC become active ? Yes → Select appropriate symptom from Symptom List. No → No problem found at this time. Erase all codes before returning vehicle to customer.	All

Symptom:
INTERROGATE LEFT SIACM

When Monitored and Set Condition:

INTERROGATE LEFT SIACM

When Monitored: With ignition on, the ACM monitors the PCI Bus for a Left SIACM status message containing the airbag warning lamp ″On or OFF″ request. The status message is sent to the ACM once each second or upon any change in the active DTCs.

Set Condition: The Code will set, if the ACM receives an Lamp On status message from the Left SIACM. NOTE: This indicates that there was an active diagnostic trouble code in the Left SIACM.

POSSIBLE CAUSES
INTERROGATE LEFT SIACM
ACM, NO ACTIVE LEFT SIACM DTCS
STORED CODE OR INTERMITTENT CONDITION
ACTIVE CODE PRESENT

TEST	ACTION	APPLICABILITY
1	**NOTE: Ensure that the battery is fully charged.** Ensure the battery is fully charged. **NOTE: For the purpose of this test, the AECM and ORC modules will be referred to as an ACM.** SELECT ACTIVE or STORED DTC: ACM - ACTIVE DTC Go To 2 ACM - STORED DTC Go To 4 **NOTE: When reconnecting Airbag system components, the ignition must be turned off and the battery must be disconnected.**	All
2	Turn the ignition on. With the DRBIII® read the Left SIACM active DTCs. Did the DRBIII® show any active DTCs? Yes → Refer to symptom list for problems related to Left SIACM. Perform AIRBAG VERIFICATION TEST - VER 1. No → Go To 3	All

INTERROGATE LEFT SIACM — Continued

TEST	ACTION	APPLICABILITY
3	**WARNING: TURN THE IGNITION OFF, DISCONNECT THE BATTERY AND WAIT TWO MINUTES BEFORE PROCEEDING.** If there are no possible causes remaining, view repair. Repair Replace the Airbag Control Module in accordance with Service Instructions. WARNING: IF THE AIRBAG CONTROL MODULE IS DROPPED AT ANY TIME, IT MUST BE REPLACED. Perform AIRBAG VERIFICATION TEST - VER 1.	All
4	**NOTE: Ensure the battery is fully charged.** With the DRBIII®, record and erase all DTCs from all modules. All active codes must be resolved before diagnosing any stored codes. Maintain a safe distance from all airbags while performing the following steps. With the DRBIII® monitor active codes as you work through the system. **NOTE: If equipped with Passenger Airbag On-Off switch, read the DTC's in all switch positions.** Wiggle the wiring harness and connectors of the appropriate airbag system and rotate the steering wheel from stop to stop. **NOTE: Check connectors - Clean and repair as necessary.** You have just attempted to simulate the condition that initially set the trouble code message. The following additional checks may assist you in identifying a possible intermittent problem: - Visually inspect related wire harness connectors. Look for broken, bent, pushed out, spread, corroded, or contaminated terminals. - Visually inspect the related harnesses. Look for chafed, pierced, pinched or partially broken wire. - Refer to Wiring Diagrams and Technical Service Bulletins that may apply. Did the DTC become active ? Yes → Select appropriate symptom from Symptom List. No → No problem found at this time. Erase all codes before returning vehicle to customer.	All

Symptom:
INTERROGATE RIGHT SIACM

When Monitored and Set Condition:

INTERROGATE RIGHT SIACM

When Monitored: With ignition on, the ACM monitors the PCI Bus for a Right SIACM status message containing the airbag warning indicator On - OFF request. The status message is sent to the ACM once each second or upon any change in the active DTCs.

Set Condition: The Code will set, if the ACM receives an Lamp On status message from the Right SIACM. NOTE: This indicates that there is an active diagnostic trouble code in the Right SIACM.

POSSIBLE CAUSES
INTERROGATE RIGHT SIACM
NO ACTIVE RIGHT SIACM DTCS
STORED CODE OR INTERMITTENT CONDITION
ACTIVE CODE PRESENT

TEST	ACTION	APPLICABILITY
1	**NOTE: Ensure that the battery is fully charged.** Ensure the battery is fully charged. **NOTE: For the purpose of this test, the AECM and ORC modules will be referred to as an ACM.** SELECT ACTIVE or STORED DTC: ACM - ACTIVE DTC Go To 2 ACM - STORED DTC Go To 4 **NOTE: When reconnecting Airbag system components, the ignition must be turned off and the battery must be disconnected.**	All
2	Turn the ignition on. With the DRBIII® read the Right SIACM active DTCs. Did the DRBIII® show any active DTCs? Yes → Refer to symptom list for problems related to Right SIACM. Perform AIRBAG VERIFICATION TEST - VER 1. No → Go To 3	All

INTERROGATE RIGHT SIACM — Continued

TEST	ACTION	APPLICABILITY
3	**WARNING: TURN THE IGNITION OFF, DISCONNECT THE BATTERY AND WAIT TWO MINUTES BEFORE PROCEEDING.** If there are no possible causes remaining, view repair. Repair Replace the Airbag Control Module in accordance with Service Instructions. WARNING: IF THE AIRBAG CONTROL MODULE IS DROPPED AT ANY TIME, IT MUST BE REPLACED. Perform AIRBAG VERIFICATION TEST - VER 1.	All
4	**NOTE: Ensure the battery is fully charged.** With the DRBIII®, record and erase all DTCs from all modules. All active codes must be resolved before diagnosing any stored codes. Maintain a safe distance from all airbags while performing the following steps. With the DRBIII® monitor active codes as you work through the system. **NOTE: If equipped with Passenger Airbag On-Off switch, read the DTC's in all switch positions.** Wiggle the wiring harness and connectors of the appropriate airbag system and rotate the steering wheel from stop to stop. **NOTE: Check connectors - Clean and repair as necessary.** You have just attempted to simulate the condition that initially set the trouble code message. The following additional checks may assist you in identifying a possible intermittent problem: - Visually inspect related wire harness connectors. Look for broken, bent, pushed out, spread, corroded, or contaminated terminals. - Visually inspect the related harnesses. Look for chafed, pierced, pinched or partially broken wire. - Refer to Wiring Diagrams and Technical Service Bulletins that may apply. Did the DTC become active ? Yes → Select appropriate symptom from Symptom List. No → No problem found at this time. Erase all codes before returning vehicle to customer.	All

Symptom:
LOSS OF IGNITION RUN - START

When Monitored and Set Condition:

LOSS OF IGNITION RUN - START

When Monitored: With the ignition in the Run or Start position the module monitors the Run - Start circuit for proper system voltage.

Set Condition: The code will set, if the voltage on the Run - Start circuit drops below approximately 4.5 volts for the ACM or 6.7 volts for the SIACM.

POSSIBLE CAUSES
AIRBAG SYSTEM COMPONENT SHORTED TO GROUND
IGNITION SWITCH RUN-START CIRCUIT OPEN
FUSED IGNITION SWITCH OUTPUT RUN-START CIRCUIT OPEN
ACM, FUSED IGNITION OUTPUT RUN-START CIRCUIT OPEN
MODULE RUN - START SHORTED TO GROUND
RSIACM, LOW IGNITION RUN - START VOLTAGE
LSIACM - LOW IGNITION RUN - START VOLTAGE
STORED CODE OR INTERMITTENT CONDITION
ACTIVE CODE PRESENT

TEST	ACTION	APPLICABILITY
1	Turn the ignition on. **NOTE: Ensure that the battery is fully charged.** **NOTE: For the purpose of this test, the AECM and ORC modules will be referred to as an ACM.** From the list below, select the appropriate module and DTC type for the this diagnostic trouble code. SELECT ONE: ACM - ACTIVE DTC Go To 2 ACM - STORED DTC Go To 7 LEFT SIACM - ACTIVE DTC Go To 8 RIGHT SIACM - ACTIVE DTC Go To 9 **NOTE: When reconnecting Airbag system components, the ignition must be turned off and the battery must be disconnected.**	All

LOSS OF IGNITION RUN - START — Continued

TEST	ACTION	APPLICABILITY
2	Turn ignition off. Remove and inspect the Airbag Run - Start Fuse. **NOTE: Check connectors - Clean and repair as necessary.** Is the Fuse open? Yes → Go To 3 No → Go To 4	All
3	**WARNING: TO AVOID PERSONAL INJURY OR DEATH, TURN IGNITION OFF, DISCONNECT THE BATTERY AND WAIT TWO MINUTES BEFORE PROCEEDING.** Measure the resistance of the Fused Ignition Switch Output Run-Start circuit between the Airbag Run-Start Fuse and ground. While monitoring the ohmmeter, disconnect each airbag system component on the Run - Start circuit one at a time. **NOTE: Refer to the service information and system schematics to identify component(s) on the run - start circuit.** Is the resistance above 10K ohms: Yes - after removing a component? Replace the shorted airbag system component in accordance with Service Instructions and replace the airbag Run - Start fuse. Perform AIRBAG VERIFICATION TEST - VER 1. No - after all components are removed? Repair the Fused Ignition Run - Start circuit shorted to ground and replace Airbag Run-Start Fuse. Perform AIRBAG VERIFICATION TEST - VER 1.	All
4	Turn the ignition on. Measure the voltage of the Ignition Switch Output circuit between the Airbag Run - Start Fuse and ground. Is the voltage above approximately 4.5 volts? Yes → Go To 5 No → Repair the open Ignition Switch Output Run-Start circuit. Perform AIRBAG VERIFICATION TEST - VER 1.	All
5	**WARNING: TO AVOID PERSONAL INJURY OR DEATH, TURN THE IGNITION OFF, DISCONNECT THE BATTERY AND WAIT TWO MINUTES BEFORE PROCEEDING.** Disconnect the Airbag Control Module connector. **NOTE: Check connectors - Clean and repair as necessary.** Reinstall the previously removed Airbag Run-Start Fuse. **WARNING: TO AVOID PERSONAL INJURY OR DEATH, TURN THE IGNITION ON, THEN RECONNECT THE BATTERY.** Measure the voltage of the Fused Ignition Switch Output Run-Start Circuit between the Airbag Control Module connector ground. Is the voltage above approximately 4.5 volts? Yes → Go To 6 No → Repair open Fused Ignition Switch Output Run-Start circuit. Perform AIRBAG VERIFICATION TEST - VER 1.	All

LOSS OF IGNITION RUN - START — Continued

TEST	ACTION	APPLICABILITY
6	**WARNING: TO AVOID PERSONAL INJURY OR DEATH, TURN IGNITION OFF, DISCONNECT THE BATTERY AND WAIT TWO MINUTES BEFORE PROCEEDING.** **WARNING: IF THE AIRBAG CONTROL MODULE IS DROPPED AT ANY TIME, IT MUST BE REPLACED. FAILURE TO TAKE THE PROPER PRECAUTIONS COULD RESULT IN ACCIDENTAL AIRBAG DEPLOYMENT AND PERSONAL INJURY OR DEATH.** If there are no possible causes remaining, view repair. Repair Replace the Airbag Control Module in accordance with Service Instructions. Perform AIRBAG VERIFICATION TEST - VER 1.	All
7	**NOTE: Ensure the battery is fully charged.** With the DRBIII®, record and erase all DTCs from all modules. All active codes must be resolved before diagnosing any stored codes. Maintain a safe distance from all airbags while performing the following steps. With the DRBIII® monitor active codes as you work through the system. **NOTE: If equipped with Passenger Airbag On-Off switch, read the DTC's in all switch positions.** Wiggle the wiring harness and connectors of the appropriate airbag system and rotate the steering wheel from stop to stop. **NOTE: Check connectors - Clean and repair as necessary.** You have just attempted to simulate the condition that initially set the trouble code message. The following additional checks may assist you in identifying a possible intermittent problem: - Visually inspect related wire harness connectors. Look for broken, bent, pushed out, spread, corroded, or contaminated terminals. - Visually inspect the related harnesses. Look for chafed, pierced, pinched or partially broken wire. - Refer to Wiring Diagrams and Technical Service Bulletins that may apply. Did the DTC become active ? Yes → Select appropriate symptom from Symptom List. No → No problem found at this time. Erase all codes before returning vehicle to customer.	All
8	**WARNING: TURN IGNITION OFF, DISCONNECT THE BATTERY AND WAIT TWO MINUTES BEFORE PROCEEDING.** If there are no possible causes remaining, view repair. Repair Replace the Left Side Impact Airbag Control Module in accordance with Service Instructions. WARNING: IF THE MODULE IS DROPPED AT ANY TIME, IT MUST BE REPLACED. Perform AIRBAG VERIFICATION TEST - VER 1.	All
9	**WARNING: TURN IGNITION OFF, DISCONNECT THE BATTERY AND WAIT TWO MINUTES BEFORE PROCEEDING.** If there are no possible causes remaining, view repair. Repair Replace the Right Side Impact Airbag Control Module in accordance with Service information. WARNING: IF THE MODULE IS DROPPED AT ANY TIME, IT MUST BE REPLACED. Perform AIRBAG VERIFICATION TEST - VER 1.	All

Symptom:
LOSS OF IGNITION RUN ONLY

When Monitored and Set Condition:

LOSS OF IGNITION RUN ONLY

When Monitored: With the ignition in the run position the module monitors the Run Only circuit for proper system voltage.

Set Condition: If the voltage on the Run Only circuit drops below 4.5 volts, the code will set.

POSSIBLE CAUSES
IGNITION SWITCH OUTPUT RUN CIRCUIT OPEN
FUSED IGNITION SWITCH OUTPUT RUN CIRCUIT OPEN
ACM, FUSED IGNITION OUTPUT RUN CIRCUIT OPEN
CHECKING FOR A SHORTED RUN CIRCUIT
FUSED IGNITION SWITCH OUTPUT RUN CIRCUIT SHORT TO GROUND
ACM, FUSED IGNITION RUN CIRCUIT SHORT TO GROUND

TEST	ACTION	APPLICABILITY
1	Turn the ignition on. Ensure the battery is fully charged. **NOTE: For the purpose of this test, the AECM and ORC modules will be referred to as an ACM.** SELECT ACTIVE : ACM - ACTIVE DTC Go To 2 **NOTE: When reconnecting Airbag system components, the ignition must be turned off and the battery must be disconnected.**	All
2	Turn the ignition off. Remove and inspect the Airbag Run circuit fuse. Is the Fuse open? Yes → Go To 3 No → Go To 6	All
3	Remove the Airbag Run fuse. **NOTE: Check connectors - Clean and repair as necessary.** Measure the resistance of the Fused Ignition Switch Output Run circuit between the Run Fuse and ground. Is the resistance below 10.0 ohms ? Yes → Go To 4 No → Replace the defective fuse. Perform AIRBAG VERIFICATION TEST - VER 1.	All

LOSS OF IGNITION RUN ONLY — Continued

TEST	ACTION	APPLICABILITY
4	**WARNING: TO AVOID PERSONAL INJURY OR DEATH, TURN THE IGNITION OFF, DISCONNECT THE BATTERY AND WAIT TWO MINUTES BEFORE PROCEEDING.** Disconnect the Airbag Control Module connector. **NOTE: Check connectors - Clean and repair as necessary.** Measure the resistance of the Fused Ignition Switch Output Run circuit between the ACM connector and ground. Is the resistance below 10K ohms ? Yes → Repair the Fused Ignition Switch Output Run circuit for a short to ground and replace Airbag Run Fuse. Perform AIRBAG VERIFICATION TEST - VER 1. No → Go To 5	All
5	**WARNING: TO AVOID PERSONAL INJURY OR DEATH, TURN IGNITION OFF, DISCONNECT THE BATTERY AND WAIT TWO MINUTES BEFORE PROCEEDING.** **WARNING: IF THE AIRBAG CONTROL MODULE IS DROPPED AT ANY TIME, IT MUST BE REPLACED. FAILURE TO TAKE THE PROPER PRECAUTIONS COULD RESULT IN ACCIDENTAL AIRBAG DEPLOYMENT AND PERSONAL INJURY OR DEATH.** If there are no possible causes remaining, view repair. Repai: Replace the Airbag Control Module in accordance with Service Instructions and replace the Run Only Fuse. Perform AIRBAG VERIFICATION TEST - VER 1. **NOTE: When reconnecting Airbag system components, the ignition must be turned off and the battery must be disconnected.**	All
6	Turn the ignition on. Measure the voltage of the Ignition Switch Output Run circuit between the Airbag Run circuit fuse and ground. Is the voltage above approximately 4.5 volts? Yes → Go To 7 No → Repair the open Ignition Switch Output Run circuit. Perform AIRBAG VERIFICATION TEST - VER 1.	All
7	**WARNING: TO AVOID PERSONAL INJURY OR DEATH, TURN THE IGNITION OFF, DISCONNECT THE BATTERY AND WAIT TWO MINUTES BEFORE PROCEEDING.** Disconnect the Airbag Control Module connector. **NOTE: Check connectors - Clean and repair as necessary.** Reinstall the airbag Run fuse. **WARNING: TO AVOID PERSONAL INJURY OR DEATH, TURN THE IGNITION ON, THEN RECONNECT THE BATTERY.** Measure the voltage of the Fused Ignition Switch Output Run circuit at the Airbag Control Module connector. Is the voltage above approximately 4.5 volts? Yes → Go To 8 No → Repair the an open or high resistance in the Fused Ignition Switch Output Run circuit. Perform AIRBAG VERIFICATION TEST - VER 1.	All

LOSS OF IGNITION RUN ONLY — Continued

TEST	ACTION	APPLICABILITY
8	**WARNING: TO AVOID PERSONAL INJURY OR DEATH, TURN THE IGNITION OFF, DISCONNECT THE BATTERY AND WAIT TWO MINUTES BEFORE PROCEEDING.** **WARNING: IF THE AIRBAG CONTROL MODULE IS DROPPED AT ANY TIME, IT MUST BE REPLACED. FAILURE TO TAKE THE PROPER PRECAUTIONS COULD RESULT IN ACCIDENTAL AIRBAG DEPLOYMENT AND PERSONAL INJURY OR DEATH.** If there are no possible causes remaining, view repair. Repair Replace the Airbag Control Module in accordance with Service Instructions. Perform AIRBAG VERIFICATION TEST - VER 1.	All

Symptom:
MODULE NOT CONFIGURED FOR SAB

When Monitored and Set Condition:

MODULE NOT CONFIGURED FOR SAB

When Monitored: With ignition on, the ACM monitors the PCI Bus for a message containing an ″A″ in the 4 th position of the VIN. This character identifies the type of safety equipment and should match the VIN. The PCM transmits the VIN every 13.76 seconds.

Set Condition: The code will set, if the ACM detects a Side Impact Airbag Module active on the PCI Bus and the 4 th character of the VIN message is not an ″A″.

POSSIBLE CAUSES
CHECK PCM VIN
PCM, PCI COMMUNICATION FAILURE
MODULE NOT CONFIGURED
ACM, NOT CONFIGURED FOR SIDE AIRBAGS
STORED CODE OR INTERMITTENT CONDITION
ACTIVE CODE PRESENT

TEST	ACTION	APPLICABILITY
1	Turn the ignition on. Ensure the battery is fully charged. **NOTE: For the purpose of this test, the AECM and ORC modules will be referred to as an ACM.** SELECT ACTIVE or STORED DTC: ACM - ACTIVE DTC Go To 2 ACM - STORED DTC Go To 6 **NOTE: When reconnecting Airbag system components, the ignition must be turned off and the battery must be disconnected.**	All
2	Turn the ignition on. Connect the DRB to the data link connector and select PCM, SYSTEM TEST. Does the DRB show PCM Active on the Bus:? Yes → Go To 3 No → Refer to category COMMUNICATION and select the related symptom. Perform AIRBAG VERIFICATION TEST - VER 1.	All

MODULE NOT CONFIGURED FOR SAB — Continued

TEST	ACTION	APPLICABILITY
3	With the DRB read the Vehicle Identification Number in the Powertrain Control Module. Compare the VIN displayed on the DRB screen and the Vehicle VIN plate. Does the VIN plate and the PCM VIN match? Yes → Go To 4 No → Replace the Powertrain Control Module and program with the correct vehicle identification number. Perform AIRBAG VERIFICATION TEST - VER 1.	All
4	Using the DRB select MISCELLANEOUS and then CONFIGURE FOR SIDE AIRBAGS. Then press the continue button to display the current side airbag status. Does the DRBIII® show current status as ACM WITHOUT SIDE AIRBAG? Yes → Using the DRB select ACM WITH SIDE AIRBAGS to configure the ACM for Side Airbags. Perform AIRBAG VERIFICATION TEST - VER 1. No → Go To 5	All
5	**WARNING: TURN THE IGNITION OFF, DISCONNECT THE BATTERY AND WAIT TWO MINUTES BEFORE PROCEEDING.** **WARNING: IF THE AIRBAG CONTROL MODULE IS DROPPED AT ANY TIME, IT MUST BE REPLACED.** If there are no possible causes remaining, view repair. Repair Replace the Airbag Control Module in accordance with Service Instructions. WARNING: IF THE AIRBAG CONTROL MODULE IS DROPPED AT ANY TIME, IT MUST BE REPLACED. Perform AIRBAG VERIFICATION TEST - VER 1.	All
6	**NOTE: Ensure the battery is fully charged.** With the DRBIII®, record and erase all DTCs from all modules. All active codes must be resolved before diagnosing any stored codes. Maintain a safe distance from all airbags while performing the following steps. With the DRBIII® monitor active codes as you work through the system. **NOTE: If equipped with Passenger Airbag On-Off switch, read the DTC's in all switch positions.** Wiggle the wiring harness and connectors of the appropriate airbag system and rotate the steering wheel from stop to stop. **NOTE: Check connectors - Clean and repair as necessary.** You have just attempted to simulate the condition that initially set the trouble code message. The following additional checks may assist you in identifying a possible intermittent problem: - Visually inspect related wire harness connectors. Look for broken, bent, pushed out, spread, corroded, or contaminated terminals. - Visually inspect the related harnesses. Look for chafed, pierced, pinched or partially broken wire. - Refer to Wiring Diagrams and Technical Service Bulletins that may apply. Did the DTC become active ? Yes → Select appropriate symptom from Symptom List. No → No problem found at this time. Erase all codes before returning vehicle to customer.	All

Symptom:
NO CLUSTER MESSAGE

When Monitored and Set Condition:

NO CLUSTER MESSAGE

When Monitored: With ignition on, the ACM monitors the PCI Bus for a message from the MIC containing the airbag warning indicator status. The MIC transmits the message one time at ignition on, lamp state change, or in response to the ACM message.

Set Condition: If the MIC message is not received for 10 consecutive seconds, the code will set.

POSSIBLE CAUSES
MIC, COMMUNICATION FAILURE
ACM, NO CLUSTER MESSAGES
STORED CODE OR INTERMITTENT CONDITION
ACTIVE CODE PRESENT

TEST	ACTION	APPLICABILITY
1	**NOTE: Ensure that the battery is fully charged.** **NOTE: For the purpose of this test, the AECM and ORC modules will be referred to as an ACM.** Turn the ignition on. SELECT ACTIVE or STORED DTC: ACM - ACTIVE DTC Go To 2 ACM - STORED DTC Go To 4 **NOTE: When reconnecting Airbag system components, the ignition must be turned off and the battery must be disconnected.**	All
2	Turn the ignition on. With the DRBIII®, ensure PCI Bus communications with the Instrument Cluster. Is the Instrument Cluster communicating on the PCI Bus? Yes → Go To 3 No → Refer to category COMMUNICATION CATEGORY and select the related symptom INSTRUMENT CLUSTER BUS +/- SIGNAL OPEN or NO RESPONSE.	All

NO CLUSTER MESSAGE — Continued

TEST	ACTION	APPLICABILITY
3	**WARNING: TO AVOID PERSONAL INJURY OR DEATH, TURN THE IGNITION OFF, DISCONNECT THE BATTERY AND WAIT TWO MINUTES BEFORE PROCEEDING.** **WARNING: IF THE AIRBAG CONTROL MODULE IS DROPPED AT ANY TIME, IT MUST BE REPLACED. FAILURE TO TAKE THE PROPER PRECAUTIONS COULD RESULT IN ACCIDENTAL AIRBAG DEPLOYMENT AND PERSONAL INJURY OR DEATH.** If there are no possible causes remaining, view repair. Repair Replace the Airbag Control Module in accordance with Service Instructions. Perform AIRBAG VERIFICATION TEST - VER 1. **NOTE: When reconnecting airbag system components the Ignition must be turned off and the Battery must be disconnected.**	All
4	**NOTE: Ensure the battery is fully charged.** With the DRBIII®, record and erase all DTCs from all modules. All active codes must be resolved before diagnosing any stored codes. Maintain a safe distance from all airbags while performing the following steps. With the DRBIII® monitor active codes as you work through the system. **NOTE: If equipped with Passenger Airbag On-Off switch, read the DTC's in all switch positions.** Wiggle the wiring harness and connectors of the appropriate airbag system and rotate the steering wheel from stop to stop. **NOTE: Check connectors - Clean and repair as necessary.** You have just attempted to simulate the condition that initially set the trouble code message. The following additional checks may assist you in identifying a possible intermittent problem: - Visually inspect related wire harness connectors. Look for broken, bent, pushed out, spread, corroded, or contaminated terminals. - Visually inspect the related harnesses. Look for chafed, pierced, pinched or partially broken wire. - Refer to Wiring Diagrams and Technical Service Bulletins that may apply. Did the DTC become active ? Yes → Select appropriate symptom from Symptom List. No → No problem found at this time. Erase all codes before returning vehicle to customer.	All

Symptom:
NO LEFT SIACM MESSAGE

When Monitored and Set Condition:

NO LEFT SIACM MESSAGE

When Monitored: With ignition on, the ACM monitors the PCI Bus for the Left Side Impact Airbag Control Module status message. The Left SIACM transmits the status message to the ACM at 1 - second intervals.

Set Condition: If the ACM fails to see the Left SIACM status message on the PCI Bus for 10 seconds the code will set.

POSSIBLE CAUSES
NO LEFT SIACM MESSAGE
ACM, NO LEFT SIACM MESSAGE
STORED CODE OR INTERMITTENT CONDITION
ACTIVE CODE PRESENT

TEST	ACTION	APPLICABILITY
1	**NOTE: Ensure the battery is fully charged.** Turn the ignition on. **NOTE: For the purpose of this test, the AECM and ORC modules will be referred to as an ACM.** SELECT ACTIVE or STORED DTC: ACM - ACTIVE DTC Go To 2 ACM - STORED DTC Go To 4	All
2	With the DRBIII® select PASSIVE RESTRAINTS, SIDE AIRBAG then LEFT SIDE from the DRB menu. Does the DRBIII® show NO RESPONSE or BUS +/- SIGNAL OPEN? Yes → Refer to the Communication category for the related symptom. Perform AIRBAG VERIFICATION TEST - VER 1. No → Go To 3	All
3	**WARNING: TURN THE IGNITION OFF, DISCONNECT THE BATTERY AND WAIT TWO MINUTES BEFORE PROCEEDING.** If there are no possible causes remaining, view repair. Repair Replace the Airbag Control Module in accordance with Service Instructions. WARNING: IF THE AIRBAG CONTROL MODULE IS DROPPED AT ANY TIME, IT MUST BE REPLACED. Perform AIRBAG VERIFICATION TEST - VER 1.	All

NO LEFT SIACM MESSAGE — Continued

TEST	ACTION	APPLICABILITY
4	**NOTE: Ensure the battery is fully charged.** With the DRBIII®, record and erase all DTCs from all modules. All active codes must be resolved before diagnosing any stored codes. Maintain a safe distance from all airbags while performing the following steps. With the DRBIII® monitor active codes as you work through the system. **NOTE: If equipped with Passenger Airbag On-Off switch, read the DTC's in all switch positions.** Wiggle the wiring harness and connectors of the appropriate airbag system and rotate the steering wheel from stop to stop. **NOTE: Check connectors - Clean and repair as necessary.** You have just attempted to simulate the condition that initially set the trouble code message. The following additional checks may assist you in identifying a possible intermittent problem: - Visually inspect related wire harness connectors. Look for broken, bent, pushed out, spread, corroded, or contaminated terminals. - Visually inspect the related harnesses. Look for chafed, pierced, pinched or partially broken wire. - Refer to Wiring Diagrams and Technical Service Bulletins that may apply. Did the DTC become active ? Yes → Select appropriate symptom from Symptom List. No → No problem found at this time. Erase all codes before returning vehicle to customer.	All

Symptom:
NO PCI TRANSMISSION

When Monitored and Set Condition:

NO PCI TRANSMISSION

When Monitored: With the ignition on and the module transmitting information on the PCI BUS.

Set Condition: The code will set if the onboard diagnostic cannot detect the module transmitting information on the PCI BUS for 4 consecutive seconds. NOTE: Any PCI Bus Failure will may cause a stored code to set.

POSSIBLE CAUSES
AIRBAG CONTROL MODULE - ACM
LEFT SIDE IMPACT AIRBAG CONTROL MODULE - LSIACM
RIGHT SIDE IMPACT AIRBAG CONTROL MODULE - RSIACM
STORED CODE OR INTERMITTENT CONDITION
ACTIVE CODE PRESENT

NO PCI TRANSMISSION — Continued

TEST	ACTION	APPLICABILITY
1	**NOTE: Ensure that the battery is fully charged.** IF THE MODULE IS DROPPED AT ANY TIME, IT MUST BE REPLACED. Turn the ignition on. From the list below, select the appropriate module and DTC type for the this diagnostic trouble code. **NOTE: For the purpose of this test, the AECM and ORC modules will be referred to as an ACM.** Select the appropriate module and type of DTC ACM - ACTIVE Replace the Airbag Control Module in accordance with Service Instructions. Perform AIRBAG VERIFICATION TEST - VER 1. ACM - STORED Go To 2 LEFT SIACM - ACTIVE WARNING: TURN THE IGNITION OFF, DISCONNECT THE BATTERY AND WAIT TWO MINUTES BEFORE PROCEEDING. Replace the Left Side Impact Airbag Control Module in accordance with Service Instructions. Perform AIRBAG VERIFICATION TEST - VER 1. LEFT SIACM - STORED Go To 2 RIGHT SIACM - ACTIVE WARNING: TURN THE IGNITION OFF, DISCONNECT THE BATTERY AND WAIT TWO MINUTES BEFORE PROCEEDING. Replace the Right Side Impact Airbag Control Module in accordance with Service information. Perform AIRBAG VERIFICATION TEST - VER 1. RIGHT SIACM - STORED Go To 2	All

NO PCI TRANSMISSION — Continued

TEST	ACTION	APPLICABILITY
2	**NOTE: Ensure the battery is fully charged.** With the DRBIII®, record and erase all DTCs from all modules. All active codes must be resolved before diagnosing any stored codes. Maintain a safe distance from all airbags while performing the following steps. With the DRBIII® monitor active codes as you work through the system. **NOTE: If equipped with Passenger Airbag On-Off switch, read the DTC's in all switch positions.** Wiggle the wiring harness and connectors of the appropriate airbag system and rotate the steering wheel from stop to stop. **NOTE: Check connectors - Clean and repair as necessary.** You have just attempted to simulate the condition that initially set the trouble code message. The following additional checks may assist you in identifying a possible intermittent problem: - Visually inspect related wire harness connectors. Look for broken, bent, pushed out, spread, corroded, or contaminated terminals. - Visually inspect the related harnesses. Look for chafed, pierced, pinched or partially broken wire. - Refer to Wiring Diagrams and Technical Service Bulletins that may apply. Did the DTC become active ? Yes → Select appropriate symptom from Symptom List. No → No problem found at this time. Erase all codes before returning vehicle to customer.	All

Symptom:
NO RIGHT SIACM MESSAGE

When Monitored and Set Condition:

NO RIGHT SIACM MESSAGE

When Monitored: With ignition on, the ACM monitors the PCI Bus for the Right Side Impact Airbag Control Module status message. The Right SIACM transmits the status message to the ACM at 1 - second intervals.

Set Condition: If the ACM fails to see the Right SIACM status message on the PCI Bus for 10 seconds the code will set.

POSSIBLE CAUSES
NO RIGHT SIACM MESSAGE
ACM, NO RIGHT SIACM MESSAGE
STORED CODE OR INTERMITTENT CONDITION
ACTIVE CODE PRESENT

TEST	ACTION	APPLICABILITY
1	**NOTE: Ensure the battery is fully charged.** Turn the ignition on. **NOTE: For the purpose of this test, the AECM and ORC modules will be referred to as an ACM.** SELECT ACTIVE or STORED DTC: ACM - ACTIVE DTC Go To 2 ACM - STORED DTC Go To 4 **NOTE: When reconnecting Airbag system components, the ignition must be turned off and the battery must be disconnected.**	All
2	With the DRBIII® select SIDE AIRBAG and the RIGHT SIDE AIRBAG from the DRBIII® menu. Does the DRBIII® show NO RESPONSE or BUS +/- SIGNAL OPEN? Yes → Refer to the COMMUNICATION category for the related symptom. Perform AIRBAG VERIFICATION TEST - VER 1. No → Go To 3	All

NO RIGHT SIACM MESSAGE — Continued

TEST	ACTION	APPLICABILITY
3	**WARNING: TURN THE IGNITION OFF, DISCONNECT THE BATTERY AND WAIT TWO MINUTES BEFORE PROCEEDING.** If there are no possible causes remaining, view repair. Repair Replace the Airbag Control Module in accordance with Service Instructions. WARNING: IF THE AIRBAG CONTROL MODULE IS DROPPED AT ANY TIME, IT MUST BE REPLACED. Perform AIRBAG VERIFICATION TEST - VER 1. **NOTE: When reconnecting airbag system components the Ignition must be turned off and the Battery must be disconnected.**	All
4	**NOTE: Ensure the battery is fully charged.** With the DRBIII®, record and erase all DTCs from all modules. All active codes must be resolved before diagnosing any stored codes. Maintain a safe distance from all airbags while performing the following steps. With the DRBIII® monitor active codes as you work through the system. **NOTE: If equipped with Passenger Airbag On-Off switch, read the DTC's in all switch positions.** Wiggle the wiring harness and connectors of the appropriate airbag system and rotate the steering wheel from stop to stop. **NOTE: Check connectors - Clean and repair as necessary.** You have just attempted to simulate the condition that initially set the trouble code message. The following additional checks may assist you in identifying a possible intermittent problem: - Visually inspect related wire harness connectors. Look for broken, bent, pushed out, spread, corroded, or contaminated terminals. - Visually inspect the related harnesses. Look for chafed, pierced, pinched or partially broken wire. - Refer to Wiring Diagrams and Technical Service Bulletins that may apply. Did the DTC become active ? Yes → Select appropriate symptom from Symptom List. No → No problem found at this time. Erase all codes before returning vehicle to customer.	All

Symptom:
PASSENGER SQUIB 1 CIRCUIT OPEN

When Monitored and Set Condition:

PASSENGER SQUIB 1 CIRCUIT OPEN

When Monitored: When the ignition is On, the ACM monitors the resistance of the Passenger Squib 1 circuits.

Set Condition: The ACM has detected an open circuit or high resistance on the Passenger Squib 1 circuits.

POSSIBLE CAUSES
PASSENGER AIRBAG OPEN
PASSENGER SQUIB 1 LINE 1 OR LINE 2 CIRCUIT OPEN
STORED CODE OR INTERMITTENT CONDITION
ACM, PASSENGER SQUIB 1 CIRCUIT OPEN
ACTIVE CODE PRESENT

TEST	ACTION	APPLICABILITY
1	**NOTE: Ensure the battery is fully charged.** Turn the ignition on. **NOTE: For the purpose of this test, the AECM and ORC modules will be referred to as an ACM.** SELECT ACTIVE or STORED DTC: ACM - ACTIVE DTC Go To 2 ACM - STORED DTC Go To 4 **NOTE: When reconnecting Airbag system components, the ignition must be turned off and the battery must be disconnected.**	All

PASSENGER SQUIB 1 CIRCUIT OPEN — Continued

TEST	ACTION	APPLICABILITY
2	**WARNING: TO AVOID PERSONAL INJURY OR DEATH, TURN THE IGNITION OFF, DISCONNECT THE BATTERY AND WAIT TWO MINUTES BEFORE PROCEEDING.** **WARNING: DO NOT PLACE AN INTACT UNDEPLOYED AIRBAG FACE DOWN ON A HARD SURFACE, THE AIRBAG WILL PROPEL INTO THE AIR IF ACCIDENTALLY DEPLOYED, AND COULD RESULT IN SERIOUS OR FATAL INJURY.** Disconnect the Passenger Airbag. **NOTE: Check connectors - Clean and repair as necessary.** Connect the appropriate Load Tool to the Passenger Airbag connector. **WARNING: TO AVOID PERSONAL INJURY OR DEATH, TURN IGNITION ON, THEN RECONNECT THE BATTERY.** With the DRBIII®, read the active Airbag DTCs. Does the DRBIII® show PASSENGER SQUIB 1 CIRCUIT OPEN? Yes → Go To 3 No → Replace the Passenger Airbag in accordance with the Service Information. Perform AIRBAG VERIFICATION TEST - VER 1.	All
3	**WARNING: TO AVOID PERSONAL INJURY OR DEATH, TURN THE IGNITION OFF, DISCONNECT THE BATTERY AND WAIT TWO MINUTES BEFORE PROCEEDING.** Disconnect the Airbag Control module connector. **NOTE: Check connectors - Clean and repair as necessary.** Connect the appropriate Load Tool adaptor to the Airbag Control Module connector. Disconnect the Load Tool from the Passenger Airbag connector. Measure the resistance of the Passenger Squib 1 Line 1 and Line 2 circuit between the ACM Adaptor and the Passenger Airbag connector. Is the resistance below 1.0 ohms on both circuits? Yes → Replace the Airbag Control Module in accordance with Service Instructions. Perform AIRBAG VERIFICATION TEST - VER 1. No → Repair open or high resistance in Passenger Squib 1 Line 1 or Line 2 circuits. Perform AIRBAG VERIFICATION TEST - VER 1.	All

PASSENGER SQUIB 1 CIRCUIT OPEN — Continued

TEST	ACTION	APPLICABILITY
4	**NOTE: Ensure the battery is fully charged.** With the DRBIII®, record and erase all DTCs from all modules. All active codes must be resolved before diagnosing any stored codes. Maintain a safe distance from all airbags while performing the following steps. With the DRBIII® monitor active codes as you work through the system. **NOTE: If equipped with Passenger Airbag On-Off switch, read the DTC's in all switch positions.** Wiggle the wiring harness and connectors of the appropriate airbag system and rotate the steering wheel from stop to stop. **NOTE: Check connectors - Clean and repair as necessary.** You have just attempted to simulate the condition that initially set the trouble code message. The following additional checks may assist you in identifying a possible intermittent problem: - Visually inspect related wire harness connectors. Look for broken, bent, pushed out, spread, corroded, or contaminated terminals. - Visually inspect the related harnesses. Look for chafed, pierced, pinched or partially broken wire. - Refer to Wiring Diagrams and Technical Service Bulletins that may apply. Did the DTC become active ? Yes → Select appropriate symptom from Symptom List. No → No problem found at this time. Erase all codes before returning vehicle to customer.	All

Symptom:
PASSENGER SQUIB 1 CIRCUIT SHORT

When Monitored and Set Condition:

PASSENGER SQUIB 1 CIRCUIT SHORT

When Monitored: When the ignition is on, the ACM monitors the resistance of the Passenger Squib 1 circuits.

Set Condition: The ACM has detected low resistance in the Passenger Squib 1 circuits.

POSSIBLE CAUSES
PASSENGER AIRBAG CIRCUIT SHORT
PASSENGER SQUIB 1 LINE 1 SHORT TO LINE 2
ACM, PASSENGER SQUIB 1 CIRCUIT SHORT
STORED CODE OR INTERMITTENT CONDITION
ACTIVE CODE PRESENT

TEST	ACTION	APPLICABILITY
1	**NOTE: Ensure that the battery is fully charged.** Turn the ignition on. **NOTE: For the purpose of this test, the AECM and ORC modules will be referred to as an ACM.** SELECT ACTIVE or STORED DTC: ACM - ACTIVE DTC Go To 2 ACM - STORED DTC Go To 4 **NOTE: When reconnecting Airbag system components, the ignition must be turned off and the battery must be disconnected.**	All

PASSENGER SQUIB 1 CIRCUIT SHORT — Continued

TEST	ACTION	APPLICABILITY
2	**WARNING: TO AVOID PERSONAL INJURY OR DEATH, TURN THE IGNITION OFF, DISCONNECT THE BATTERY AND WAIT TWO MINUTES BEFORE PROCEEDING.** **WARNING: DO NOT PLACE AN INTACT UNDEPLOYED AIRBAG FACE DOWN ON A HARD SURFACE, THE AIRBAG WILL PROPEL INTO THE AIR IF ACCIDENTALLY DEPLOYED, AND COULD RESULT IN SERIOUS OR FATAL INJURY.** Disconnect the Passenger Airbag. **NOTE: Check connectors - Clean and repair as necessary.** Connect the appropriate Load Tool to the Passenger Airbag connector. **WARNING: TO AVOID PERSONAL INJURY OR DEATH, TURN THE IGNITION ON, THEN RECONNECT THE BATTERY.** With the DRBIII®, read the active airbag DTCs. Does the DRBIII® show PASSENGER SQUIB 1 CIRCUIT SHORT? Yes → Go To 3 No → Replace Passenger Airbag in accordance with the Service Information. Perform AIRBAG VERIFICATION TEST - VER 1.	All
3	**WARNING: TO AVOID PERSONAL INJURY OR DEATH, TURN THE IGNITION OFF, DISCONNECT THE BATTERY AND WAIT TWO MINUTES BEFORE PROCEEDING.** Disconnect the Airbag Control Module connector **NOTE: Check connectors - Clean and repair as necessary.** Connect the appropriate Load Tool adapter to the Airbag Control Module connector. Disconnect the Load Tool from the Passenger airbag connector. Measure the resistance between Passenger Squib 1 Line 1 and Squib 1 Line 2 circuit at the Passenger Airbag connector. Is the resistance below 10K ohms? Yes → Repair Passenger Squib 1 Line 1 circuit short to Passenger Squib 1 Line 2 circuit. Perform AIRBAG VERIFICATION TEST - VER 1. No → Replace the Airbag Control Module in accordance with Service Instructions. Perform AIRBAG VERIFICATION TEST - VER 1. **NOTE: When reconnecting airbag system components the Ignition must be turned off and the Battery must be disconnected.**	All

PASSENGER SQUIB 1 CIRCUIT SHORT — Continued

TEST	ACTION	APPLICABILITY
4	**NOTE: Ensure the battery is fully charged.** With the DRBIII®, record and erase all DTCs from all modules. All active codes must be resolved before diagnosing any stored codes. Maintain a safe distance from all airbags while performing the following steps. With the DRBIII® monitor active codes as you work through the system. **NOTE: If equipped with Passenger Airbag On-Off switch, read the DTC's in all switch positions.** Wiggle the wiring harness and connectors of the appropriate airbag system and rotate the steering wheel from stop to stop. **NOTE: Check connectors - Clean and repair as necessary.** You have just attempted to simulate the condition that initially set the trouble code message. The following additional checks may assist you in identifying a possible intermittent problem: - Visually inspect related wire harness connectors. Look for broken, bent, pushed out, spread, corroded, or contaminated terminals. - Visually inspect the related harnesses. Look for chafed, pierced, pinched or partially broken wire. - Refer to Wiring Diagrams and Technical Service Bulletins that may apply. Did the DTC become active ? Yes → Select appropriate symptom from Symptom List. No → No problem found at this time. Erase all codes before returning vehicle to customer.	All

Symptom:
PASSENGER SQUIB 1 SHORT TO BATTERY

When Monitored and Set Condition:

PASSENGER SQUIB 1 SHORT TO BATTERY

When Monitored: When the ignition is on, the ACM monitors the voltage of the Passenger Squib 1 circuits.

Set Condition: The ACM has detected high voltage on the Passenger Squib 1 circuits.

POSSIBLE CAUSES
PASSENGER AIRBAG CIRCUIT SHORT TO BATTERY
PASSENGER SQUIB 1 LINE 1 OR LINE 2 SHORT TO BATTERY
ACM, PASSENGER SQUIB 1 CIRCUIT SHORT TO BATTERY
STORED CODE OR INTERMITTENT CONDITION
ACTIVE CODE PRESENT

TEST	ACTION	APPLICABILITY
1	**NOTE: Ensure that the battery is fully charged.** Turn the ignition on. **NOTE: For the purpose of this test, the AECM and ORC modules will be referred to as an ACM.** SELECT ACTIVE or STORED DTC: ACM - ACTIVE DTC Go To 2 ACM - STORED DTC Go To 4 **NOTE: When reconnecting Airbag system components, the ignition must be turned off and the battery must be disconnected.**	All

PASSENGER SQUIB 1 SHORT TO BATTERY — Continued

TEST	ACTION	APPLICABILITY
2	**WARNING: TO AVOID PERSONAL INJURY OR DEATH, TURN THE IGNITION OFF, DISCONNECT THE BATTERY AND WAIT TWO MINUTES BEFORE PROCEEDING.** **WARNING: DO NOT PLACE AN INTACT UNDEPLOYED AIRBAG FACE DOWN ON A HARD SURFACE, THE AIRBAG WILL PROPEL INTO THE AIR IF ACCIDENTALLY DEPLOYED. FAILURE TO TAKE THE PROPER PRECAUTIONS COULD RESULT IN ACCIDENTAL AIRBAG DEPLOYMENT AND PERSONAL INJURY OR DEATH.** Disconnect the Passenger Airbag connector. **NOTE: Check connectors - Clean and repair as necessary.** Connect the appropriate Load Tool to the Passenger Airbag connector. **WARNING: TO AVOID PERSONAL INJURY OR DEATH, TURN THE IGNITION ON, THEN RECONNECT THE BATTERY.** With the DRBIII®, read the active Airbag DTCs. Does the DRBIII® show PASSENGER SQUIB 1 CIRCUIT SHORT TO BATTERY? Yes → Go To 3 No → Replace Passenger Airbag in accordance with the Service Information. Perform AIRBAG VERIFICATION TEST - VER 1.	All
3	**WARNING: TO AVOID PERSONAL INJURY OR DEATH, TURN THE IGNITION OFF, DISCONNECT THE BATTERY AND WAIT TWO MINUTES BEFORE PROCEEDING.** Disconnect the Airbag Control Module connector. **NOTE: Check connectors - Clean and repair as necessary.** Connect the appropriate Load Tool adaptor to the Airbag Control Module connector. **WARNING: TO AVOID PERSONAL INJURY OR DEATH, TURN IGNITION ON, THEN RECONNECT THE BATTERY.** Disconnect the Load Tool from the Passenger Airbag connector. Measure the voltage on the Passenger Squib 1 Line 1 and Line 2 circuits between the Passenger Airbag connector and ground. Is there any voltage present? Yes → Repair Passenger Squib 1 Line 1 or Line 2 circuit short to battery. Perform AIRBAG VERIFICATION TEST - VER 1. No → Replace the Airbag Control Module in accordance with Service Instructions. Perform AIRBAG VERIFICATION TEST - VER 1.	All

PASSENGER SQUIB 1 SHORT TO BATTERY — Continued

TEST	ACTION	APPLICABILITY
4	**NOTE: Ensure the battery is fully charged.** With the DRBIII®, record and erase all DTCs from all modules. All active codes must be resolved before diagnosing any stored codes. Maintain a safe distance from all airbags while performing the following steps. With the DRBIII® monitor active codes as you work through the system. **NOTE: If equipped with Passenger Airbag On-Off switch, read the DTC's in all switch positions.** Wiggle the wiring harness and connectors of the appropriate airbag system and rotate the steering wheel from stop to stop. **NOTE: Check connectors - Clean and repair as necessary.** You have just attempted to simulate the condition that initially set the trouble code message. The following additional checks may assist you in identifying a possible intermittent problem: - Visually inspect related wire harness connectors. Look for broken, bent, pushed out, spread, corroded, or contaminated terminals. - Visually inspect the related harnesses. Look for chafed, pierced, pinched or partially broken wire. - Refer to Wiring Diagrams and Technical Service Bulletins that may apply. Did the DTC become active ? Yes → Select appropriate symptom from Symptom List. No → No problem found at this time. Erase all codes before returning vehicle to customer.	All

Symptom:
PASSENGER SQUIB 1 SHORT TO GROUND

When Monitored and Set Condition:

PASSENGER SQUIB 1 SHORT TO GROUND

When Monitored: When the ignition is on, the ACM monitors the resistance of the Passenger Squib 1 circuits for low resistance.

Set Condition: The ACM has detected a short to ground in the Passenger Squib 1 circuits.

POSSIBLE CAUSES
PASSENGER AIRBAG CIRCUIT SHORT TO GROUND
PASSENGER SQUIB 1 LINE 1 AND LINE 2 SHORT TO GROUND
STORED CODE OR INTERMITTENT CONDITION
ACM, PASSENGER SQUIB 1 CIRCUIT SHORT TO GROUND
ACTIVE CODE PRESENT

TEST	ACTION	APPLICABILITY
1	**NOTE: Ensure that the battery is fully charged.** Turn the ignition on. **NOTE: Connect the appropriate Load Tool to the Passenger Airbag connector.** SELECT ACTIVE or STORED DTC: ACM - ACTIVE DTC Go To 2 ACM - STORED DTC Go To 5 **NOTE: When reconnecting Airbag system components, the ignition must be turned off and the battery must be disconnected.**	All

PASSENGER SQUIB 1 SHORT TO GROUND — Continued

TEST	ACTION	APPLICABILITY
2	**WARNING: TO AVOID PERSONAL INJURY OR DEATH, TURN THE IGNITION OFF, DISCONNECT THE BATTERY AND WAIT TWO MINUTES BEFORE PROCEEDING.** **WARNING: DO NOT PLACE AN INTACT UNDEPLOYED AIRBAG FACE DOWN ON A HARD SURFACE, THE AIRBAG WILL PROPEL INTO THE AIR IF ACCIDENTALLY DEPLOYED, AND COULD RESULT IN SERIOUS OR FATAL INJURY.** Disconnect the Passenger Airbag connector. **NOTE: Check connectors - Clean and repair as necessary.** Connect the appropriate Load Tool to the Passenger Airbag connector. **WARNING: TO AVOID PERSONAL INJURY OR DEATH, TURN THE IGNITION ON, THEN RECONNECT THE BATTERY.** With the DRBIII®, read the active Airbag DTCs. Does the DRBIII® show PASSENGER SQUIB 1 CIRCUIT SHORT TO GROUND? Yes → Go To 3 No → Replace the Passenger Airbag in accordance with the Service Information. Perform AIRBAG VERIFICATION TEST - VER 1.	All
3	**WARNING: TO AVOID PERSONAL INJURY OR DEATH, TURN THE IGNITION OFF, DISCONNECT THE BATTERY AND WAIT TWO MINUTES BEFORE PROCEEDING.** Disconnect the Airbag Control Module connector **NOTE: Check connectors - Clean repair as necessary.** Connect the appropriate Load Tool adaptor to the Airbag Control Module connector. Disconnect the Load Tool from the Passenger Airbag connector. Measure the resistance of the Passenger Squib 1 Line 1 or Line 2 circuit between the Passenger Airbag Module Connector and ground. Is the resistance below 10K ohms on either circuit? Yes → Repair Passenger Squib 1 Line 1 and Line 2 circuits for a short to ground. Perform AIRBAG VERIFICATION TEST - VER 1. No → Go To 4	All
4	**WARNING: TO AVOID PERSONAL INJURY OR DEATH, TURN THE IGNITION OFF, DISCONNECT THE BATTERY AND WAIT TWO MINUTES BEFORE PROCEEDING.** **WARNING: IF THE AIRBAG CONTROL MODULE IS DROPPED AT ANY TIME, IT MUST BE REPLACED. FAILURE TO TAKE THE PROPER PRECAUTIONS COULD RESULT IN ACCIDENTAL AIRBAG DEPLOYMENT AND PERSONAL INJURY OR DEATH.** If there are no possible causes remaining, view repair. Repair Replace the Airbag Control Module in accordance with Service Instructions. Perform AIRBAG VERIFICATION TEST - VER 1.	All

PASSENGER SQUIB 1 SHORT TO GROUND — Continued

TEST	ACTION	APPLICABILITY
5	**NOTE: Ensure the battery is fully charged.** With the DRBIII®, record and erase all DTCs from all modules. All active codes must be resolved before diagnosing any stored codes. Maintain a safe distance from all airbags while performing the following steps. With the DRBIII® monitor active codes as you work through the system. **NOTE: If equipped with Passenger Airbag On-Off switch, read the DTC's in all switch positions.** Wiggle the wiring harness and connectors of the appropriate airbag system and rotate the steering wheel from stop to stop. **NOTE: Check connectors - Clean and repair as necessary.** You have just attempted to simulate the condition that initially set the trouble code message. The following additional checks may assist you in identifying a possible intermittent problem: - Visually inspect related wire harness connectors. Look for broken, bent, pushed out, spread, corroded, or contaminated terminals. - Visually inspect the related harnesses. Look for chafed, pierced, pinched or partially broken wire. - Refer to Wiring Diagrams and Technical Service Bulletins that may apply. Did the DTC become active ? Yes → Select appropriate symptom from Symptom List. No → No problem found at this time. Erase all codes before returning vehicle to customer.	All

Symptom:
SEAT SQUIB CIRCUIT OPEN

When Monitored and Set Condition:

SEAT SQUIB CIRCUIT OPEN

When Monitored: With the ignition is On, the SIACM monitors the resistance of the Seat Squib circuits.

Set Condition: When the SIACM detects an open circuit or high resistance on the Seat Squib circuits.

POSSIBLE CAUSES
SEAT AIRBAG OPEN
SEAT SQUIB LINE 1 OR LINE 2 CIRCUIT OPEN
SIACM, SEAT SQUIB CIRCUIT OPEN
STORED CODE OR INTERMITTENT CONDITION
ACTIVE CODE PRESENT

TEST	ACTION	APPLICABILITY
1	Ensure the battery is fully charged. Turn the ignition on. **NOTE: For the purpose of this test, the AECM and ORC modules will be referred to as an ACM.** SELECT ONE: LEFT SIACM - ACTIVE DTC Go To 2 LEFT SIACM - STORED DTC Go To 4 RIGHT SIACM - ACTIVE DTC Go To 2 RIGHT SIACM - STORED DTC Go To 4 **NOTE: When reconnecting Airbag system components, the ignition must be turned off and the battery must be disconnected.**	All

SEAT SQUIB CIRCUIT OPEN — Continued

TEST	ACTION	APPLICABILITY
2	**WARNING: TURN IGNITION OFF, DISCONNECT THE BATTERY AND WAIT TWO MINUTES BEFORE PROCEEDING.** **WARNING: DO NOT PLACE AN INTACT UNDEPLOYED SEAT BACK PADDED SIDE DOWN ON A HARD SURFACE, THE AIRBAG WILL PROPEL INTO THE AIR IF ACCIDENTALLY DEPLOYED, AND COULD RESULT IN SERIOUS OR FATAL INJURY.** Disconnect the Seat Airbag connector. **NOTE: Check connectors - Clean and repair as necessary.** Connect the appropriate Load Tool to the Seat Airbag connector. **WARNING: TURN IGNITION ON, THEN RECONNECT THE BATTERY.** With the DRBIII®, read the SIACM active DTC's. Does the DRB show SEAT SQUIB CIRCUIT OPEN? Yes → Go To 3 No → Replace Seat Airbag in accordance with the Service Information. Perform AIRBAG VERIFICATION TEST - VER 1.	All
3	**WARNING: TURN IGNITION OFF, DISCONNECT THE BATTERY AND WAIT TWO MINUTES BEFORE PROCEEDING.** **WARNING: DO NOT PLACE AN INTACT UNDEPLOYED SEAT BACK PADDED SIDE DOWN ON A HARD SURFACE, THE AIRBAG WILL PROPEL INTO THE AIR IF ACCIDENTALLY DEPLOYED, AND COULD RESULT IN SERIOUS OR FATAL INJURY.** Disconnect the Airbag Load Tool Jumper. Disconnect the Side Impact Airbag Control Module Connector. **NOTE: Check connectors - Clean and repair as necessary.** Connect the appropriate Load Tool adaptor to the Side Impact Airbag Control Module connector. Measure the resistance of the Seat Squib Line 1 and Line 2 circuits between the Load Tool SIACM adaptor and the Seat Airbag connector. Is the resistance below 1.0 ohms on both circuits? Yes → Replace the Side Impact Airbag Control Module in accordance with the Service information. WARNING: IF THE SIDE IMPACT AIRBAG CONTROL MODULE IS DROPPED AT ANY TIME, IT MUST BE REPLACED. Perform AIRBAG VERIFICATION TEST - VER 1. No → Repair open or high resistance in the Seat Squib Line 1 or Line 2 circuits. Perform AIRBAG VERIFICATION TEST - VER 1.	All

SEAT SQUIB CIRCUIT OPEN — Continued

TEST	ACTION	APPLICABILITY
4	**NOTE: Ensure the battery is fully charged.** With the DRBIII®, record and erase all DTCs from all modules. All active codes must be resolved before diagnosing any stored codes. Maintain a safe distance from all airbags while performing the following steps. With the DRBIII® monitor active codes as you work through the system. **NOTE: If equipped with Passenger Airbag On-Off switch, read the DTC's in all switch positions.** Wiggle the wiring harness and connectors of the appropriate airbag system and rotate the steering wheel from stop to stop. **NOTE: Check connectors - Clean and repair as necessary.** You have just attempted to simulate the condition that initially set the trouble code message. The following additional checks may assist you in identifying a possible intermittent problem: - Visually inspect related wire harness connectors. Look for broken, bent, pushed out, spread, corroded, or contaminated terminals. - Visually inspect the related harnesses. Look for chafed, pierced, pinched or partially broken wire. - Refer to Wiring Diagrams and Technical Service Bulletins that may apply. Did the DTC become active ? Yes → Select appropriate symptom from Symptom List. No → No problem found at this time. Erase all codes before returning vehicle to customer.	All

Symptom:
SEAT SQUIB CIRCUIT SHORT

When Monitored and Set Condition:

SEAT SQUIB CIRCUIT SHORT

When Monitored: When the ignition is on, the SIACM monitors the resistance between the Seat Squib circuits.

Set Condition: When the SIACM detects a low resistance between the Seat Squib circuits.

POSSIBLE CAUSES
SEAT AIRBAG SHORT
SEAT SQUIB LINE 1 SHORT TO LINE 2
SIACM, SEAT SQUIB CIRCUIT SHORT
STORED CODE OR INTERMITTENT CONDITION
ACTIVE CODE PRESENT

TEST	ACTION	APPLICABILITY
1	Ensure the battery is fully charged. Turn the ignition on. **NOTE: For the purpose of this test, the AECM and ORC modules will be referred to as an ACM.** SELECT ONE: LEFT SIACM - ACTIVE DTC Go To 2 LEFT SIACM - STORED DTC Go To 4 RIGHT SIACM - ACTIVE DTC Go To 2 RIGHT SIACM - STORED DTC Go To 4 **NOTE: When reconnecting Airbag system components, the ignition must be turned off and the battery must be disconnected.**	All

SEAT SQUIB CIRCUIT SHORT — Continued

TEST	ACTION	APPLICABILITY
2	**WARNING: TURN THE IGNITION OFF, DISCONNECT THE BATTERY AND WAIT TWO MINUTES BEFORE PROCEEDING.** **WARNING: DO NOT PLACE AN INTACT UNDEPLOYED SEAT BACK PADDED SIDE DOWN ON A HARD SURFACE, THE AIRBAG WILL PROPEL INTO THE AIR IF ACCIDENTALLY DEPLOYED, AND COULD RESULT IN SERIOUS OR FATAL INJURY.** Disconnect the Seat Airbag connector. **NOTE: Check connectors - Clean repair as necessary.** Connect the appropriate Load Tool to the Seat Airbag connector. **WARNING: TURN IGNITION ON, THEN RECONNECT THE BATTERY.** With the DRB, read the SIACM active DTC's. Does the DRB show SEAT SQUIB CIRCUIT SHORT? Yes → Go To 3 No → Replace Seat Airbag in accordance with the Service Information. Perform AIRBAG VERIFICATION TEST - VER 1.	All
3	**WARNING: TURN THE IGNITION OFF, DISCONNECT THE BATTERY AND WAIT TWO MINUTES BEFORE PROCEEDING.** **WARNING: DO NOT PLACE AN INTACT UNDEPLOYED SEAT BACK PADDED SIDE DOWN ON A HARD SURFACE, THE AIRBAG WILL PROPEL INTO THE AIR IF ACCIDENTALLY DEPLOYED, AND COULD RESULT IN SERIOUS OR FATAL INJURY.** **NOTE: Check connectors - Clean and repair as necessary.** Connect the appropriate Load Tool adaptor to the SIACM connector. Disconnect the Side Impact Airbag Control Module connector Measure the resistance between the Seat Squib Line 1 and Line 2 circuits at the Seat Airbag connector. Is the resistance below 10K ohms? Yes → Repair Seat Squib Line 1 shorted to Line 2 circuit. Perform AIRBAG VERIFICATION TEST - VER 1. No → Replace the Side Impact Airbag Control Module in accordance with Service Instructions. WARNING: IF THE SIDE IMPACT AIRBAG CONTROL MODULE IS DROPPED AT ANY TIME, IT MUST BE REPLACED. Perform AIRBAG VERIFICATION TEST - VER 1.	All

SEAT SQUIB CIRCUIT SHORT — Continued

TEST	ACTION	APPLICABILITY
4	**NOTE: Ensure the battery is fully charged.** With the DRBIII®, record and erase all DTCs from all modules. All active codes must be resolved before diagnosing any stored codes. Maintain a safe distance from all airbags while performing the following steps. With the DRBIII® monitor active codes as you work through the system. **NOTE: If equipped with Passenger Airbag On-Off switch, read the DTC's in all switch positions.** Wiggle the wiring harness and connectors of the appropriate airbag system and rotate the steering wheel from stop to stop. **NOTE: Check connectors - Clean and repair as necessary.** You have just attempted to simulate the condition that initially set the trouble code message. The following additional checks may assist you in identifying a possible intermittent problem: - Visually inspect related wire harness connectors. Look for broken, bent, pushed out, spread, corroded, or contaminated terminals. - Visually inspect the related harnesses. Look for chafed, pierced, pinched or partially broken wire. - Refer to Wiring Diagrams and Technical Service Bulletins that may apply. Did the DTC become active ? Yes → Select appropriate symptom from Symptom List. No → No problem found at this time. Erase all codes before returning vehicle to customer.	All

Symptom:
SEAT SQUIB SHORT TO BATTERY

When Monitored and Set Condition:

SEAT SQUIB SHORT TO BATTERY

When Monitored: When the ignition is on, the SIACM monitors the voltage of the Seat Squib circuits.

Set Condition: When the SIACM detects high voltage on the Seat Squib circuits.

POSSIBLE CAUSES
SEAT AIRBAG SHORT TO BATTERY
SEAT SQUIB LINE 1 OR LINE 2 SHORTED TO BATTERY
SIACM, SEAT SQUIB SHORT TO BATTERY
STORED CODE OR INTERMITTENT CONDITION
ACTIVE CODE PRESENT

TEST	ACTION	APPLICABILITY
1	Turn the ignition on. Ensure the battery is fully charged. **NOTE: For the purpose of this test, the AECM and ORC modules will be referred to as an ACM.** SELECT ONE: LEFT SIACM - ACTIVE DTC Go To 2 LEFT SIACM - STORED DTC Go To 4 RIGHT SIACM - ACTIVE DTC Go To 2 RIGHT SIACM - STORED DTC Go To 4 **NOTE: When reconnecting Airbag system components, the ignition must be turned off and the battery must be disconnected.**	All

SEAT SQUIB SHORT TO BATTERY — Continued

TEST	ACTION	APPLICABILITY
2	**WARNING: TURN IGNITION OFF, DISCONNECT THE BATTERY AND WAIT TWO MINUTES BEFORE PROCEEDING.** **WARNING: DO NOT PLACE AN INTACT UNDEPLOYED SEAT BACK PADDED SIDE DOWN ON A HARD SURFACE, THE AIRBAG WILL PROPEL INTO THE AIR IF ACCIDENTALLY DEPLOYED, AND COULD RESULT IN SERIOUS OR FATAL INJURY.** Disconnect the Seat Airbag connector. **NOTE: Check connectors - Clean and repair as necessary.** Connect the appropriate Load Tool to the Seat Airbag connector. **WARNING: TURN IGNITION ON, THEN RECONNECT THE BATTERY.** With the DRBIII®, read SIACM active DTC's. Does the DRBIII® display SEAT SQUIB SHORT TO BATTERY? Yes → Go To 3 No → Replace Seat Airbag in accordance with the Service Information. Perform AIRBAG VERIFICATION TEST - VER 1.	All
3	**WARNING: TURN IGNITION OFF, DISCONNECT THE BATTERY AND WAIT TWO MINUTES BEFORE PROCEEDING.** **WARNING: DO NOT PLACE AN INTACT UNDEPLOYED SEAT BACK PADDED SIDE DOWN ON A HARD SURFACE, THE AIRBAG WILL PROPEL INTO THE AIR IF ACCIDENTALLY DEPLOYED, AND COULD RESULT IN SERIOUS OR FATAL INJURY.** Disconnect the Airbag Load Tool Jumper. Disconnect the Side Impact Airbag Control Module connector. **NOTE: Check connectors - Clean and repair as necessary.** Connect the appropriate Load Tool SIACM adaptor to the SIACM connector. **WARNING: TURN IGNITION ON, THEN RECONNECT THE BATTERY.** Measure the voltage of the Seat Squib Line 1 and Line 2 circuits between the Seat Airbag connector and ground. Is any voltage present on either circuit? Yes → Repair Seat Squib Line 1 or Line 2 shorted to battery. Perform AIRBAG VERIFICATION TEST - VER 1. No → Replace the Side Impact Airbag Control Module in accordance with Service Instructions. WARNING: IF THE SIDE IMPACT AIRBAG CONTROL MODULE IS DROPPED AT ANY TIME, IT MUST BE REPLACED. Perform AIRBAG VERIFICATION TEST - VER 1.	All

SEAT SQUIB SHORT TO BATTERY — Continued

TEST	ACTION	APPLICABILITY
4	**NOTE: Ensure the battery is fully charged.** With the DRBIII®, record and erase all DTCs from all modules. All active codes must be resolved before diagnosing any stored codes. Maintain a safe distance from all airbags while performing the following steps. With the DRBIII® monitor active codes as you work through the system. **NOTE: If equipped with Passenger Airbag On-Off switch, read the DTC's in all switch positions.** Wiggle the wiring harness and connectors of the appropriate airbag system and rotate the steering wheel from stop to stop. **NOTE: Check connectors - Clean and repair as necessary.** You have just attempted to simulate the condition that initially set the trouble code message. The following additional checks may assist you in identifying a possible intermittent problem: - Visually inspect related wire harness connectors. Look for broken, bent, pushed out, spread, corroded, or contaminated terminals. - Visually inspect the related harnesses. Look for chafed, pierced, pinched or partially broken wire. - Refer to Wiring Diagrams and Technical Service Bulletins that may apply. Did the DTC become active ? Yes → Select appropriate symptom from Symptom List. No → No problem found at this time. Erase all codes before returning vehicle to customer.	All

Symptom:
SEAT SQUIB SHORT TO GROUND

When Monitored and Set Condition:

SEAT SQUIB SHORT TO GROUND

When Monitored: When the ignition is on, the SIACM monitors the resistance of the Seat Squib circuits.

Set Condition: When the SIACM detects a short to ground on the Seat Squib circuits.

POSSIBLE CAUSES
SEAT AIRBAG SHORT TO GROUND
SEAT SQUIB LINE 1 OR LINE 2 SHORTED TO GROUND
SIACM, SEAT SQUIB SHORT TO GROUND
STORED CODE OR INTERMITTENT CONDITION
ACTIVE CODE PRESENT

TEST	ACTION	APPLICABILITY
1	Ensure the battery is fully charged. Turn the ignition on. **NOTE: For the purpose of this test, the AECM and ORC modules will be referred to as an ACM.** SELECT ONE: LEFT SIACM - ACTIVE DTC Go To 2 LEFT SIACM - STORED DTC Go To 4 RIGHT SIACM - ACTIVE DTC Go To 2 RIGHT SI ACM - STORED DTC Go To 4 **NOTE: When reconnecting Airbag system components, the ignition must be turned off and the battery must be disconnected.**	All

SEAT SQUIB SHORT TO GROUND — Continued

TEST	ACTION	APPLICABILITY
2	**WARNING: TURN IGNITION OFF, DISCONNECT THE BATTERY AND WAIT TWO MINUTES BEFORE PROCEEDING.** **WARNING: DO NOT PLACE AN INTACT UNDEPLOYED SEAT BACK PADDED SIDE DOWN ON A HARD SURFACE, THE AIRBAG WILL PROPEL INTO THE AIR IF ACCIDENTALLY DEPLOYED, AND COULD RESULT IN SERIOUS OR FATAL INJURY.** Disconnect the Seat Airbag connector. **NOTE: Check connectors - Clean and repair as necessary.** Connect the appropriate Load Tool to the Seat Airbag connector. **WARNING: TURN IGNITION ON, THEN RECONNECT THE BATTERY.** With the DRBIII®, read SIACM active DTC's. Does the DRBIII® display SEAT SQUIB SHORT TO GROUND? Yes → Go To 3 No → Replace the Seat Airbag in accordance with Service Instructions. Perform AIRBAG VERIFICATION TEST - VER 1.	All
3	**WARNING: TURN IGNITION OFF, DISCONNECT THE BATTERY AND WAIT TWO MINUTES BEFORE PROCEEDING.** **WARNING: DO NOT PLACE AN INTACT UNDEPLOYED SEAT BACK PADDED SIDE DOWN ON A HARD SURFACE, THE AIRBAG WILL PROPEL INTO THE AIR IF ACCIDENTALLY DEPLOYED, AND COULD RESULT IN SERIOUS OR FATAL INJURY.** Disconnect the Airbag Load Tool Jumper. Disconnect the Side Impact Airbag Control Module connector. **NOTE: Check connectors - Clean and repair as necessary.** Connect the appropriate Load Tool SIACM adaptor to the SIACM connector. Measure the resistance of the Seat Squib Line 1 and Line 2 circuits between the Curtain Squib connector and ground. Is the resistance below 10K ohms on either circuit? Yes → Repair Seat Squib Line 1 or Line 2 shorted to ground. Perform AIRBAG VERIFICATION TEST - VER 1. No → Replace the Side Impact Airbag Control Module in accordance with Service Instructions. WARNING: IF THE SIDE IMPACT AIRBAG CONTROL MODULE IS DROPPED AT ANY TIME, IT MUST BE REPLACED. Perform AIRBAG VERIFICATION TEST - VER 1.	All

SEAT SQUIB SHORT TO GROUND — Continued

TEST	ACTION	APPLICABILITY
4	**NOTE: Ensure the battery is fully charged.** With the DRBIII®, record and erase all DTCs from all modules. All active codes must be resolved before diagnosing any stored codes. Maintain a safe distance from all airbags while performing the following steps. With the DRBIII® monitor active codes as you work through the system. **NOTE: If equipped with Passenger Airbag On-Off switch, read the DTC's in all switch positions.** Wiggle the wiring harness and connectors of the appropriate airbag system and rotate the steering wheel from stop to stop. **NOTE: Check connectors - Clean and repair as necessary.** You have just attempted to simulate the condition that initially set the trouble code message. The following additional checks may assist you in identifying a possible intermittent problem: - Visually inspect related wire harness connectors. Look for broken, bent, pushed out, spread, corroded, or contaminated terminals. - Visually inspect the related harnesses. Look for chafed, pierced, pinched or partially broken wire. - Refer to Wiring Diagrams and Technical Service Bulletins that may apply. Did the DTC become active ? Yes → Select appropriate symptom from Symptom List. No → No problem found at this time. Erase all codes before returning vehicle to customer.	All

Symptom:
*AIRBAG INDICATOR ON WITHOUT ACM TROUBLE CODES

POSSIBLE CAUSES
INSTRUMENT CLUSTER PROBLEMS
ACM, INDICATOR ON NO CODES

TEST	ACTION	APPLICABILITY
1	Turn the ignition on. Make sure that all active DTC's have been repaired before performing this procedure. **WARNING: TO AVOID PERSONAL INJURY OR DEATH, TURN IGNITION OFF, DISCONNECT THE BATTERY AND WAIT TWO MINUTES BEFORE PROCEEDING.** Does the DRBIII® show LAMP REQ BY ACM: ON? Yes → Go To 2 No → Refer to INSTRUMENT CLUSTER CATEGORY symptom list for problems related to Instrument Cluster. Perform AIRBAG VERIFICATION TEST - VER 1. **NOTE: When reconnecting Airbag system components, the ignition must be turned off and the battery must be disconnected.**	All
2	**WARNING: TO AVOID PERSONAL INJURY OR DEATH, TURN IGNITION OFF, DISCONNECT THE BATTERY AND WAIT TWO MINUTES BEFORE PROCEEDING.** **WARNING: IF THE AIRBAG CONTROL MODULE IS DROPPED AT ANY TIME, IT MUST BE REPLACED. FAILURE TO TAKE THE PROPER PRECAUTIONS COULD RESULT IN ACCIDENTAL AIRBAG DEPLOYMENT AND PERSONAL INJURY OR DEATH.** If there are no possible causes remaining, view repair. Repair Replace the Airbag Control Module in accordance with the Service information. Perform AIRBAG VERIFICATION TEST - VER 1.	All

Symptom:
ALL OUTPUTS SHORT

When Monitored and Set Condition:

ALL OUTPUTS SHORT

When Monitored: Ignition in RUN and IOD fuse installed.

Set Condition: The radio has sensed a short on the output for more than 10 seconds.

POSSIBLE CAUSES
DETERMINE FAULT
FRONT SHORTED SPEAKER
I/P SHORTED SPEAKER
REAR SHORTED SPEAKER
(+) CIRCUIT SHORTED TO GROUND
(-) CIRCUIT SHORTED TO GROUND
SPEAKER (+) & (-) CIRCUITS SHORTED TOGETHER
SPEAKER SECTION OF RADIO

TEST	ACTION	APPLICABILITY
1	Turn the ignition on. Turn the Radio on. With the DRBIII®, erase the audio DTC's. Cycle the ignition switch from off to on and wait 10 seconds. With the DRBIII®, read the audio DTC's. Does the DRBIII® display ALL OUTPUTS SHORT? Yes → Go To 2 No → Refer to the wiring diagrams located in the service information to help isolate a possible intermittent short. Perform BODY VERIFICATION TEST - VER 1.	All

ALL OUTPUTS SHORT — Continued

TEST	ACTION	APPLICABILITY
2	Turn the ignition off. **NOTE: Perform this procedure after disconnecting each front speaker connector.** Disconnect each front speaker harness connector one at a time. Turn the ignition on. Turn the radio on. With the DRBIII®, erase the audio DTCs. Cycle the ignition switch from off to on and wait 10 seconds. With the DRBIII®, read DTC's. Does the DRBIII® display ALL OUTPUTS SHORT with all the front speakers disconnected? Yes → Go To 3 No → Replace the Speaker that when disconnected the DTC did not reset. Perform BODY VERIFICATION TEST - VER 1.	All
3	Turn the ignition off. **NOTE: Perform this procedure after disconnecting each I/P speaker connector.** Disconnect each I/P speaker harness connector one at a time. Turn the ignition on. Turn the radio on. With the DRBIII®, erase the audio DTCs. Cycle the ignition switch from off to on and wait 10 seconds. With the DRBIII®, read DTC's. Does the DRBIII® display ALL OUTPUTS SHORT with all the I/P speakers disconnected? Yes → Go To 4 No → Replace the Speaker that when disconnected the DTC did not reset. Perform BODY VERIFICATION TEST - VER 1.	All
4	Turn the ignition off. **NOTE: Perform this procedure after disconnecting each rear speaker connector.** Disconnect each rear speaker harness connector one at a time. Turn the ignition on. Turn the radio on. With the DRBIII®, erase the audio DTCs. Cycle the ignition switch from off to on and wait 10 seconds. With the DRBIII®, read DTC's. Does the DRBIII® display ALL OUTPUTS SHORT with all the rear speakers disconnected? Yes → Go To 5 No → Replace the Speaker that when disconnected the DTC did not reset. Perform BODY VERIFICATION TEST - VER 1.	All

ALL OUTPUTS SHORT — Continued

TEST	ACTION	APPLICABILITY
5	Turn the ignition off. Disconnect each front, I/P and rear speaker harness connector. Disconnect the Radio C1 harness connector. Measure the resistance between ground and each speaker (+) circuit. Is the resistance below 1000.0 (1K) ohms? Yes → Repair the speaker (+) circuit for a short to ground. Perform BODY VERIFICATION TEST - VER 1. No → Go To 6	All
6	Turn the ignition off. Disconnect each front, I/P and rear speaker harness connector. Disconnect the Radio C1 harness connector. Measure the resistance between ground and each speaker (-) circuit. Is the resistance below 1000.0 (1K) ohms? Yes → Repair the speaker (-) circuit for a short to ground. Perform BODY VERIFICATION TEST - VER 1. No → Go To 7	All
7	Turn the ignition off. Disconnect each front, I/P and rear speaker harness connector. Disconnect the Radio C1 harness connector. Measure the resistance between each speaker (+) circuit and each speaker (-) circuit. Is the resistance below 1000.0 (1K) ohms for any of the measurements? Yes → Repair the speaker circuits shorted together. Perform BODY VERIFICATION TEST - VER 1. No → Go To 8	All
8	If there are no possible causes remaining, view repair. Repair Replace the Radio. Perform BODY VERIFICATION TEST - VER 1.	All

Symptom List:

CASSETTE PLAYER INOP
CD MECHANICAL FAILURE
NO PCI TRANSMISSION
***AM/FM SWITCH INOPERATIVE**
***ANY STATION PRESET SWITCH INOPERATIVE**
***BALANCE INOPERATIVE**
***CD EJECT SWITCH INOPERATIVE**
***EQUALIZER INOPERATIVE**
***FADER INOPERATIVE**
***FF/RW SWITCH INOPERATIVE**
***HOUR/MINUTE SWITCHES INOPERATIVE**
***PAUSE/PLAY SWITCH INOPERATIVE**
***PWR SWITCH INOPERATIVE**
***SCAN SWITCH INOPERATIVE**
***SEEK SWITCH INOPERATIVE**
***SET SWITCH INOPERATIVE**
***TAPE EJECT SWITCH INOPERATIVE**
***TIME SWITCH INOPERATIVE**
***TUNE SWITCH INOPERATIVE**

Test Note: All symptoms listed above are diagnosed using the same tests. The title for the tests will be CASSETTE PLAYER INOP.

When Monitored and Set Condition:

CASSETTE PLAYER INOP

When Monitored: Continuously with the ignition and radio turned on.

Set Condition: The code will set if the radio detects a internal cassette failure.

CD MECHANICAL FAILURE

When Monitored: Continuously with the ignition and CD player turned on.

Set Condition: The code will set if the radio detects a CD mechanical failure.

POSSIBLE CAUSES
INTERNAL FAILURE

CASSETTE PLAYER INOP — Continued

TEST	ACTION	APPLICABILITY
1	**NOTE: If a DTC is set, erase the DTC and attempt to reset the DTC. If DTC resets, follow this test.** This is an internal radio failure. View repair Repair Replace the Radio. Perform BODY VERIFICATION TEST - VER 1.	All

Symptom:
CD CHANGER MECHANICAL FAILURE

When Monitored and Set Condition:

CD CHANGER MECHANICAL FAILURE

When Monitored: Continuously with the ignition and CD Changer turned on.

Set Condition: The code will set if the CD Changer detects a mechanical failure.

POSSIBLE CAUSES
INTERNAL FAILURE

TEST	ACTION	APPLICABILITY
1	**NOTE: Erase DTC and attempt to reset. If DTC resets, follow this test.** This is an internal CD Changer failure. View repair Repair Replace the CD Changer. Perform BODY VERIFICATION TEST - VER 1.	All

Symptom:
CD CHANGER READ FAILURE

When Monitored and Set Condition:

CD CHANGER READ FAILURE

When Monitored: Continuously with the ignition and CD Changer turned on.

Set Condition: The code will set if a CD that is not formatted as a music CD is installed in the CD Changer.

POSSIBLE CAUSES
CD CHANGER READ FAILURE

TEST	ACTION	APPLICABILITY
1	Replace the problem CD with a good, clean, unscratched, music CD. Turn the radio on and select the good CD. With the DRBIII®, read DTC's. Does the DRBIII® display CD CHANGER READ FAILURE? Yes → Replace the CD Changer. Perform BODY VERIFICATION TEST - VER 1. No → Test Complete.	All

Symptom:
CD CHANGER TEMPERATURE HIGH

When Monitored and Set Condition:

CD CHANGER TEMPERATURE HIGH

When Monitored: Continuously with the ignition and CD Changer turned on.

Set Condition: The code will set if the temperature inside the CD Changer is above +65° C (+145° F).

POSSIBLE CAUSES
HIGH TEMPERATURE FAILURE

TEST	ACTION	APPLICABILITY
1	With the DRBIII®, erase the audio DTC's. Start the engine and allow the engine to reach normal operating temperature. If the vehicle has been in the hot sunlight or extreme cold move the vehicle indoors and open the doors to allow the inside temperature to stabilize. The CD Changer will operate between -23° C and 65° C (-10° F and +145° F). With the DRBIII®, read DTC's. Does the DRBIII® display CD CHANGER TEMPERATURE HIGH? Yes → Replace the CD Changer. Perform BODY VERIFICATION TEST - VER 1. No → Test Complete.	All

Symptom:
CD PLAY FAILURE

When Monitored and Set Condition:

CD PLAY FAILURE

When Monitored: Continuously with the ignition and the radio CD player turned on.

Set Condition: The code will set if a CD that is not formatted as a music CD or is scratched, dirty so the radio can not play the CD.

POSSIBLE CAUSES
CD PLAY FAILURE

TEST	ACTION	APPLICABILITY
1	Replace the problem CD with a good, clean, unscratched, music CD. Turn the radio CD player on. With the DRBIII®, read DTC's. Does the DRBIII® display CD PLAY FAILURE? Yes → Replace the Radio. Perform BODY VERIFICATION TEST - VER 1. No → Test Complete.	All

Symptom:
CD READ FAILURE

When Monitored and Set Condition:

CD READ FAILURE

When Monitored: Continuously with the ignition and the radio CD player turned on.

Set Condition: The code will set if a CD that is not formatted as a music CD is installed in the radio CD player.

POSSIBLE CAUSES
CD READ FAILURE

TEST	ACTION	APPLICABILITY
1	Replace the problem CD with a good, clean, unscratched, music CD. Turn the radio CD player on. With the DRBIII®, read DTC's. Does the DRBIII® display CD READ FAILURE? Yes → Replace the Radio. Perform BODY VERIFICATION TEST - VER 1. No → Test Complete.	All

Symptom:
CD TEMPERATURE HIGH

When Monitored and Set Condition:

CD TEMPERATURE HIGH

When Monitored: Continuously with the ignition and the radio CD player turned on.

Set Condition: The code will set if the temperature inside the radio CD player is above +85° C (+185° F).

POSSIBLE CAUSES
HIGH TEMPERATURE FAILURE

TEST	ACTION	APPLICABILITY
1	With the DRBIII®, erase the audio DTC's. Start the engine and allow the engine to reach normal operating temperature. If the vehicle has been in the hot sunlight or extreme cold move the vehicle indoors and open the doors to allow the inside temperature to stabilize. The radio CD player will operate between -30° C and 85° C (-22° F and +185° F). With the DRBIII®, read DTC's. Does the DRBIII® display CD TEMPERATURE HIGH? Yes → Replace the Radio. Perform BODY VERIFICATION TEST - VER 1. No → Test Complete.	All

Symptom:
LOW VOLTAGE LEVEL

When Monitored and Set Condition:

LOW VOLTAGE LEVEL

When Monitored:

Set Condition: The radio detects lower than normal voltage.

POSSIBLE CAUSES
CHECK CHARGING SYSTEM
CHECK VOLTAGE LEVEL AT RADIO
RADIO

TEST	ACTION	APPLICABILITY
1	Check the charging system in accordance with the service information. Is the charging system operating properly? Yes → Go To 2 No → Refer to the appropriate service information and repair as necessary. Perform BODY VERIFICATION TEST - VER 1.	All
2	Turn the ignition off. Disconnect the Radio harness connector. Start the engine. Measure the voltage of each Fused B+ circuit and the Fused Ignition Switch Output circuit. Is the voltage above or approximately 14 volts for each measurement? Yes → Go To 3 No → Repair the circuit for high resistance. Perform BODY VERIFICATION TEST - VER 1.	All
3	**Note: Reconnect all previously disconnected components.** Turn the ignition and Radio on. With the DRBIII®, erase the audio DTC's. Start the engine. With the DRBIII®, read the audio DTC's. Did this DTC reset? Yes → Replace the Radio. Perform BODY VERIFICATION TEST - VER 1. No → Test Complete.	All

Symptom:
NO ANTENNA CONNECTION

When Monitored and Set Condition:

NO ANTENNA CONNECTION

When Monitored: With the ignition on and the radio in seek up/down mode.

Set Condition: With the radio in seek or scan mode for two minutes and the radio does not detect an antenna connection or does not receive a radio station signal.

POSSIBLE CAUSES
BAD ANTENNA CONNECTION
TEST ANTENNA
RADIO

TEST	ACTION	APPLICABILITY
1	Turn the ignition off. Disconnect the Radio Antenna connector. Inspect the Radio Antenna connection. Was the Antenna connection clean and tight? Yes → Go To 2 No → Repair Antenna connection as needed. Perform BODY VERIFICATION TEST - VER 1.	All
2	Refer to the Audio System in the service information and test the Antenna in accordance with the service procedure. Is the Antenna ok? Yes → Go To 3 No → Repair or replace the Antenna assembly as necessary. Perform BODY VERIFICATION TEST - VER 1.	All
3	**NOTE: Reconnect all previously disconnected components.** Turn the ignition and Radio on. **NOTE: Move vehicle outside approximately 30ft from any structure.** With the DRBIII®, erase the audio DTC's, put the radio in seek up and seek down mode for approximately 2 minutes before proceeding. With the DRBIII®, read the audio DTC's. Did this DTC reset? Yes → Replace the Radio. Perform BODY VERIFICATION TEST - VER 1. No → Test Complete.	All

Symptom:
POWER AMP SHUTDOWN

When Monitored and Set Condition:

POWER AMP SHUTDOWN

When Monitored: Ignition in RUN and IOD fuse installed.

Set Condition: The radio has sensed a short on the output for more than 10 seconds.

POSSIBLE CAUSES
DETERMINE FAULT
FRONT SHORTED SPEAKER
I/P SHORTED SPEAKER
REAR SHORTED SPEAKER
(+) CIRCUIT SHORTED TO GROUND
(-) CIRCUIT SHORTED TO GROUND
SPEAKER (+) & (-) CIRCUITS SHORTED TOGETHER
SPEAKER SECTION OF RADIO

TEST	ACTION	APPLICABILITY
1	Turn the ignition on. Turn the Radio on. With the DRBIII®, erase the audio DTC's. Cycle the ignition switch from off to on and wait 10 seconds. With the DRBIII®, read the audio DTC's. Does the DRBIII® display POWER AMP SHUTDOWN? Yes → Go To 2 No → Refer to the wiring diagrams located in the service information to help isolate a possible intermittent short. Perform BODY VERIFICATION TEST - VER 1.	All

POWER AMP SHUTDOWN — Continued

TEST	ACTION	APPLICABILITY
2	Turn the ignition off. **NOTE: Perform this procedure after disconnecting each front speaker connector.** Disconnect each front speaker harness connector one at a time. Turn the ignition on. Turn the radio on. With the DRBIII®, erase the audio DTCs. Cycle the ignition switch from off to on and wait 10 seconds. With the DRBIII®, read DTC's. Does the DRBIII® display POWER AMP SHUTDOWN with all the front speakers disconnected? Yes → Go To 3 No → Replace the Speaker that when disconnected the DTC did not reset. Perform BODY VERIFICATION TEST - VER 1.	All
3	Turn the ignition off. **NOTE: Perform this procedure after disconnecting each I/P speaker connector.** Disconnect each I/P speaker harness connector one at a time. Turn the ignition on. Turn the radio on. With the DRBIII®, erase the audio DTCs. Cycle the ignition switch from off to on and wait 10 seconds. With the DRBIII®, read DTC's. Does the DRBIII® display POWER AMP SHUTDOWN with all the I/P speakers disconnected? Yes → Go To 4 No → Replace the Speaker that when disconnected the DTC did not reset. Perform BODY VERIFICATION TEST - VER 1.	All
4	Turn the ignition off. **NOTE: Perform this procedure after disconnecting each rear speaker connector.** Disconnect each rear speaker harness connector one at a time. Turn the ignition on. Turn the radio on. With the DRBIII®, erase the audio DTCs. Cycle the ignition switch from off to on and wait 10 seconds. With the DRBIII®, read DTC's. Does the DRBIII® display POWER AMP SHUTDOWN with all the rear speakers disconnected? Yes → Go To 5 No → Replace the Speaker that when disconnected the DTC did not reset. Perform BODY VERIFICATION TEST - VER 1.	All

POWER AMP SHUTDOWN — Continued

TEST	ACTION	APPLICABILITY
5	Turn the ignition off. Disconnect each front, I/P and rear speaker harness connector. Disconnect the Radio C1 harness connector. Measure the resistance between ground and each speaker (+) circuit. Is the resistance below 1000.0 (1K) ohms? Yes → Repair the speaker (+) circuit for a short to ground. Perform BODY VERIFICATION TEST - VER 1. No → Go To 6	All
6	Turn the ignition off. Disconnect each front, I/P and rear speaker harness connector. Disconnect the Radio C1 harness connector. Measure the resistance between ground and each speaker (-) circuit. Is the resistance below 1000.0 (1K) ohms? Yes → Repair the speaker (-) circuit for a short to ground. Perform BODY VERIFICATION TEST - VER 1. No → Go To 7	All
7	Turn the ignition off. Disconnect each front, I/P and rear speaker harness connector. Disconnect the Radio C1 harness connector. Measure the resistance between each speaker (+) circuit and each speaker (-) circuit. Is the resistance below 1000.0 (1K) ohms for any of the measurements? Yes → Repair the speaker circuits shorted together. Perform BODY VERIFICATION TEST - VER 1. No → Go To 8	All
8	If there are no possible causes remaining, view repair. Repair Replace the Radio. Perform BODY VERIFICATION TEST - VER 1.	All

Symptom:
*NO RESPONSE FROM ACM

POSSIBLE CAUSES
CHECKING FOR VOLTAGE AT ACM
GROUND CIRCUIT OPEN
PCI BUS CIRCUIT OPEN
AIRBAG CONTROL MODULE

TEST	ACTION	APPLICABILITY
1	Ensure that the battery is fully charged. **WARNING: TO AVOID PERSONAL INJURY OR DEATH, TURN THE IGNITION OFF, DISCONNECT THE BATTERY AND WAIT TWO MINUTES BEFORE PROCEEDING.** Disconnect the ACM harness connector. Connect the appropriate Load Tool ACM Adapter to the ACM connector. Turn the ignition on and then reconnect the Battery. Using a 12-volt test light connected to ground, probe the Fused Ignition Switch Output (Run) Circuit and the Fused Ignition Switch Output (Run/Start) Circuit at the ACM connector. NOTE: One open circuit will not cause a NO RESPONSE condition. Is the test light illuminated on both circuits? Yes → Go To 2 No → Repair the Fused Ignition Switch Output (Run) and Fused Ignition Switch Output (Run/Start) circuits for an open. Perform AIRBAG VERIFICATION TEST - VER 1. **NOTE: When reconnecting airbag system components, the ignition must be turned off and the battery must be disconnected.**	All
2	**Ensure that the battery is fully charged.** **WARNING: TO AVOID PERSONAL INJURY OR DEATH, TURN THE IGNITION OFF, DISCONNECT THE BATTERY AND WAIT TWO MINUTES BEFORE PROCEEDING.** Disconnect the ACM harness connector. Connect the appropriate Load Tool ACM Adapter to the ACM connector. Using a 12-volt test light connected to 12-volts, probe the ground circuit. **NOTE: Make sure test light is connected to the Battery positive terminal.** Is the test light illuminated? Yes → Go To 3 No → Repair the Ground circuit for an open. Perform AIRBAG VERIFICATION TEST - VER 1. **When reconnecting Airbag system components, the ignition must be turned off and the battery must be disconnected.**	All

*NO RESPONSE FROM ACM — Continued

TEST	ACTION	APPLICABILITY
3	**Note: Ensure there is PCI bus communication with other modules. If not, refer to the PCI Bus Communication Failure symptom and repair as necessary.** **WARNING: TO AVOID PERSONAL INJURY OR DEATH, TURN THE IGNITION OFF, DISCONNECT THE BATTERY AND WAIT TWO MINUTES BEFORE PROCEEDING.** Disconnect the ACM harness connector. Connect the appropriate Load Tool ACM Adapter to the ACM connector. Turn the ignition on and then reconnect the Battery. Use Scope input cable CH7058, Cable to Probe adapter CH7062, and the red and black test probes. Connect the scope input cable to the channel one connector on the DRB. Attach the red and black leads and the cable to probe adapter to the scope input cable. With the DRBIII® select Pep Module Tools. Select lab scope. Select Live Data. Select 12 volt square wave. Press F2 for Scope. Press F2 and use the down arrow to set voltage range to 20 volts. Press F2 again when complete. Connect the Black lead to the chassis ground. Connect the Red lead to the PCI Bus circuit in the ACM connector. Observe the voltage display on the DRB Lab Scope. Does the voltage pulse from 0 to approximately 7.5 volts? Yes → Go To 4 No → Repair the PCI Bus circuit for an open. Perform AIRBAG VERIFICATION TEST - VER 1.	All
4	If there are no possible causes remaining, view repair. Repair Replace the Airbag Control Module (ACM) in accordance with the Service lnformation. WARNING: To avoid personal injury or death, make sure the battery is disconnected and wait 2 minutes before proceeding. Perform AIRBAG VERIFICATION TEST - VER 1.	All

Symptom:
*NO RESPONSE FROM COMPASS/TEMPERATURE MIRROR

POSSIBLE CAUSES
OPEN GROUND CIRCUIT
OPEN FUSED B+ CIRCUIT
OPEN FUSED IGNITION SWITCH OUTPUT CIRCUIT
OPEN PCI BUS CIRCUIT
COMPASS/TEMPERATURE MIRROR

TEST	ACTION	APPLICABILITY
1	Turn the ignition off. Turn all lights off. Disconnect the Compass/Temperature Mirror harness connector. Using a 12-volt test light connected to 12-volts, probe each ground circuit. Is the test light illuminated for both circuits? Yes → Go To 2 No → Repair the ground circuit for an open. Perform BODY VERIFICATION TEST - VER 1.	All
2	Turn the ignition off. Disconnect the Compass/Temperature Mirror harness connector. Using a 12-volt test light connected to ground, probe the Fused B+ circuit. Is the test light illuminated? Yes → Go To 3 No → Repair the Fused B+ circuit for an open. Refer to the wiring diagrams in the service information. Perform BODY VERIFICATION TEST - VER 1.	All
3	Turn the ignition off. Disconnect the Compass/Temperature Mirror harness connector. Turn the ignition on. Using a 12-volt test light connected to ground, probe the Fused Ignition Switch Output circuit. Is the test light illuminated? Yes → Go To 4 No → Repair the Fused Ignition Switch Output circuit for an open. Refer to the wiring diagrams in the service information. Perform BODY VERIFICATION TEST - VER 1.	All

*NO RESPONSE FROM COMPASS/TEMPERATURE MIRROR — Continued

TEST	ACTION	APPLICABILITY
4	**Note: Ensure there is PCI Bus communication with other modules on the vehicle before proceeding. If not, refer to the symptom list from the menu and repair as necessary.** Disconnect the Compass/Temperature Mirror harness connector. Use Scope input cable CH7058, Cable to Probe adapter CH7062, and the red and black test probes. Connect the scope input cable to the channel one connector on the DRB. Attach the red and black leads and the cable to probe adapter to the scope input cable. With the DRBIII® select Pep Module Tools. Select lab scope. Select Live Data. Select 12 volt square wave. Press F2 for Scope. Press F2 and use the down arrow to set voltage range to 20 volts. Set Probe to x10. Press F2 again when complete. Connect the Black lead to the chassis ground. Connect the Red lead to the PCI Bus circuit in the Compass/Temperature Mirror connector. Turn the ignition on. Observe the voltage display on the DRB Lab Scope. Does the voltage pulse from 0 to approximately 7.5 volts? Yes → Replace the Compass/Temperature Mirror in accordance with the service information. Perform BODY VERIFICATION TEST - VER 1. No → Repair the PCI Bus circuit for an open. Perform BODY VERIFICATION TEST - VER 1.	All

Symptom:
*NO RESPONSE FROM CONTROLLER ANTILOCK BRAKE

POSSIBLE CAUSES
NO RESPONSE FROM CAB
GROUND CIRCUIT OPEN
OPEN FUSED IGNITION SWITCH OUTPUT CIRCUIT
OPEN PCI BUS CIRCUIT
CONTROLLER ANTILOCK BRAKE

TEST	ACTION	APPLICABILITY
1	Turn the ignition on. **Note: As soon as one or more module communicates with the DRB, answer the question.** With the DRB, attempt to communicate with the Airbag Control Module (ACM). With the DRB, attempt to communicate with the Instrument Cluster (MIC). Was the DRB able to I/D or establish communications with either of the modules? Yes → Go To 2 No → Refer to the Communications category and perform the symptom PCI Bus Communication Failure. Perform ABS VERIFICATION TEST - VER 1.	All
2	Turn the ignition off. Disconnect the CAB harness connector. Using a 12-volt test light connected to 12-volts, probe both ground circuits. Is the test light illuminated for both circuits? Yes → Go To 3 No → Repair the ground circuit(s) for an open. Perform ABS VERIFICATION TEST - VER 1.	All
3	Turn the ignition off. Disconnect the CAB harness connector. Turn the ignition on. Using a 12-volt test light connected to ground, probe the Fused Ignition Switch Output circuit. Is the test light illuminated? Yes → Go To 4 No → Repair the Fused Ignition Switch Output circuit for an open. Perform ABS VERIFICATION TEST - VER 1.	All

*NO RESPONSE FROM CONTROLLER ANTILOCK BRAKE — Continued

TEST	ACTION	APPLICABILITY
4	**Note: Ensure there is PCI Bus communication with other modules on the vehicle before proceeding. If not, refer to the symptom list from the menu and repair as necessary.** Disconnect the CAB harness connector. Use Scope input cable CH7058, Cable to Probe adapter CH7062, and the red and black test probes. Connect the scope input cable to the channel one connector on the DRB. Attach the red and black leads and the cable to probe adapter to the scope input cable. With the DRBIII® select Pep Module Tools. Select lab scope. Select Live Data. Select 12 volt square wave. Press F2 for Scope. Press F2 and use the down arrow to set voltage range to 20 volts. Press F2 again when complete. Connect the Black lead to the chassis ground. Connect the Red lead to the PCI Bus circuit in the CAB connector. Turn the ignition on. Observe the voltage display on the DRB Lab Scope. Does the voltage pulse from 0 to approximately 7.5 volts? Yes → Go To 5 No → Repair the PCI Bus circuit for an open. Perform ABS VERIFICATION TEST - VER 1.	All
5	If there are no possible causes remaining, view repair. Repair Replace the Controller Antilock Brake in accordance with the Service Information. Perform ABS VERIFICATION TEST - VER 1.	All

Symptom:
*NO RESPONSE FROM INSTRUMENT CLUSTER

POSSIBLE CAUSES
OPEN GROUND CIRCUIT
OPEN FUSED B+ CIRCUIT
OPEN FUSED IGNITION SWITCH OUTPUT CIRCUIT
OPEN PCI BUS CIRCUIT
INSTRUMENT CLUSTER

TEST	ACTION	APPLICABILITY
1	Turn the ignition off. Turn all lights off. Disconnect the Instrument Cluster harness connector. Using a 12-volt test light connected to 12-volts, probe the ground circuit. Is the test light illuminated? Yes → Go To 2 No → Repair the ground circuit for an open. Perform BODY VERIFICATION TEST - VER 1.	All
2	Turn the ignition off. Disconnect the Instrument Cluster harness connector. Using a 12-volt test light connected to ground, probe the Fused B+ circuit. Is the test light illuminated? Yes → Go To 3 No → Repair the Fused B+ circuit for an open. Refer to the wiring diagrams in the service information. Perform BODY VERIFICATION TEST - VER 1.	All
3	Turn the ignition off. Disconnect the Instrument Cluster harness connector. Turn the ignition on. Using a 12-volt test light connected to ground, probe the Fused Ignition Switch Output circuit. Is the test light illuminated? Yes → Go To 4 No → Repair the Fused Ignition Switch Output circuit for an open. Refer to the wiring diagrams in the service information. Perform BODY VERIFICATION TEST - VER 1.	All

*NO RESPONSE FROM INSTRUMENT CLUSTER — Continued

TEST	ACTION	APPLICABILITY
4	**Note: Ensure there is PCI Bus communication with other modules on the vehicle before proceeding. If not, refer to the symptom list from the menu and repair as necessary.** Disconnect the Instrument Cluster harness connector. Use Scope input cable CH7058, Cable to Probe adapter CH7062, and the red and black test probes. Connect the scope input cable to the channel one connector on the DRB. Attach the red and black leads and the cable to probe adapter to the scope input cable. With the DRBIII® select Pep Module Tools. Select lab scope. Select Live Data. Select 12 volt square wave. Press F2 for Scope. Press F2 and use the down arrow to set voltage range to 20 volts. Press F2 again when complete. Connect the Black lead to the chassis ground. Connect the Red lead to the PCI Bus circuit in the Instrument Cluster connector. Turn the ignition on. Observe the voltage display on the DRB Lab Scope. Does the voltage pulse from 0 to approximately 7.5 volts? Yes → Replace the Instrument Cluster in accordance with the service information. Perform BODY VERIFICATION TEST - VER 1. No → Repair the PCI Bus circuit for an open. Perform BODY VERIFICATION TEST - VER 1.	All

Symptom:
*NO RESPONSE FROM LEFT SIACM

POSSIBLE CAUSES
INTERROGATE ACM
GROUND CIRCUIT OPEN
FUSED IGNITION SWITCH OUTPUT CIRCUIT (RUN/START) OPEN
PCI BUS CIRCUIT OPEN
LEFT SIDE IMPACT AIRBAG CONTROL MODULE

TEST	ACTION	APPLICABILITY
1	Turn the ignition on. With the DRBIII® select Passive Restraints. With the DRBIII® select Airbag and read the active DTC's. Is the Loss Of Ignition Run/Start DTC set? Yes → Refer to the symptom list and perform the Loss Of Ignition Run/Start symptom. Perform AIRBAG VERIFICATION TEST - VER 1. No → Go To 2	All
2	**Ensure that the battery is fully charged.** **Warning: TURN IGNITION OFF, DISCONNECT THE BATTERY AND WAIT TWO MINUTES BEFORE PROCEEDING.** Disconnect the Left Side Impact Airbag Control Module harness connector. Connect the appropriate Load Tool SIACM Adapter to the SIACM connector. Using a 12-volt test light connected to 12-volts, probe the ground circuit. **NOTE: Make sure test light is connected to the Battery positive terminal.** Is the test light illuminated? Yes → Go To 3 No → Repair the Ground circuit for an open. Perform AIRBAG VERIFICATION TEST - VER 1. **Note: When reconnecting Airbag system components, the ignition must be turned off and the battery must be disconnected.**	All
3	**Warning: TURN IGNITION OFF, DISCONNECT THE BATTERY AND WAIT TWO MINUTES BEFORE PROCEEDING.** Disconnect the Left Side Impact Airbag Control Module harness connector. Connect the appropriate Load Tool SIACM Adapter to the SIACM connector. Turn the ignition on and then reconnect the Battery. Measure the voltage of the Fused Ignition Switch Output (Run/Start) circuit. Is the voltage above 6.0 volts? Yes → Go To 4 No → Repair the Fused Ignition Switch Output (Run/Start) circuit for an open. Perform AIRBAG VERIFICATION TEST - VER 1. **Note: When reconnecting Airbag system components, the ignition must be turned off and the battery must be disconnected.**	All

*NO RESPONSE FROM LEFT SIACM — Continued

TEST	ACTION	APPLICABILITY
4	**NOTE: Ensure there is PCI bus communication with other modules. If not, refer to the PCI Bus Communication Failure symptom and repair as necessary.** **WARNING: TURN THE IGNITION OFF, DISCONNECT THE BATTERY AND WAIT TWO MINUTES BEFORE PROCEEDING.** Disconnect the Left Side Impact Airbag Control Module harness connector. Connect the appropriate Load Tool SIACM Adapter to the SIACM connector. Turn the ignition on and then reconnect the Battery. Use Scope input cable CH7058, Cable to Probe adapter CH7062, and the red and black test probes. Connect the scope input cable to the channel one connector on the DRB. Attach the red and black leads and the cable to probe adapter to the scope input cable. With the DRBIII® select Pep Module Tools. Select lab scope. Select Live Data. Select 12 volt square wave. Press F2 for Scope. Press F2 and use the down arrow to set voltage range to 20 volts. Set Probe to x10. Press F2 again when complete. Connect the Black lead to the chassis ground. Connect the Red lead to the PCI Bus circuit in the Left Side Impact Airbag Control Module connector. Observe the voltage display on the DRB Lab Scope. Does the voltage pulse from 0 to approximately 7.5 volts? Yes → Go To 5 No → Repair the PCI Bus circuit for an open. Perform AIRBAG VERIFICATION TEST - VER 1.	All
5	If there are no possible causes remaining, view repair. Yes → Replace the Left Side Impact Airbag Control Module (LSIACM) in accordance with the Service Information. WARNING: Make sure the battery is disconnected and wait 2 minutes before proceeding. Perform AIRBAG VERIFICATION TEST - VER 1.	All

Symptom:
*NO RESPONSE FROM PCM (PCI BUS) - NGC

POSSIBLE CAUSES
PCM PCI NO RESPONSE
POWERTRAIN CONTROL MODULE
PCI BUS CIRCUIT OPEN

TEST	ACTION	APPLICABILITY
1	Turn the ignition on. **NOTE: As soon as one or more module communicates with the DRB, answer the question.** With the DRB, enter Anti-Lock Brakes. With the DRB, enter Electro/Mechanical Cluster (MIC). With the DRB, enter Passive Restraints then Airbag. Were you able to establish communications with any of the modules? Yes → Go To 2 No → Refer to symptom PCI Bus Communication Failure in the Communications category. Perform POWERTRAIN VERIFICATION TEST VER - 1.	All
2	With the DRB read the Powertrain DTC's. This is to ensure power and grounds to the PCM are operational. **NOTE: If the DRB will not read PCM DTC's, follow the NO RESPONSE TO PCM (PCM SCI only) symptom path.** Turn the ignition off. Disconnect the PCM harness connectors. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Use Scope input cable CH7058, Cable to Probe adapter CH7062, and the red and black test probes. Connect the scope input cable to the channel one connector on the DRB. Attach the red and black leads and the cable to probe adapter to the scope input cable. With the DRBIII® select Pep Module Tools. Select lab scope. Select Live Data. Select 12 volt square wave. Press F2 for Scope. Press F2 and use the down arrow to set voltage range to 20 volts. Press F2 again when complete. Connect the Black lead to the chassis ground. Connect the Red lead to the PCI Bus circuit in the appropriate terminal of special tool #8815. Turn the ignition on. Observe the voltage display on the DRB Lab Scope. Does the voltage pulse from 0 to approximately 7.5 volts? Yes → Replace and program the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 1. No → Repair the PCI Bus circuit for an open. Perform POWERTRAIN VERIFICATION TEST VER - 1.	All

Symptom:
*NO RESPONSE FROM PCM (PCM SCI ONLY) - NGC

POSSIBLE CAUSES
CHECK PCM POWERS AND GROUNDS
PCM SCI TRANSMIT CIRCUIT SHORTED TO VOLTAGE
PCM SCI RECEIVE CIRCUIT SHORTED TO VOLTAGE
PCM SCI CIRCUITS SHORTED TOGETHER
PCM SCI TRANSMIT CIRCUIT SHORTED TO GROUND
PCM SCI RECEIVE CIRCUIT SHORTED TO GROUND
PCM SCI RECEIVE CIRCUIT OPEN
PCM SCI TRANSMIT CIRCUIT OPEN
POWERTRAIN CONTROL MODULE

TEST	ACTION	APPLICABILITY
1	Perform the symptom Checking PCM Power and Ground Circuits in the Driveability category. **NOTE: With the DRBIII® in the generic scan tool mode, attempt to communicate with the PCM.** **NOTE: If the DRBIII® can communicate with the PCM in the generic scan tool mode, it may not be necessary to perform this step.** Did the vehicle pass this test? Yes → Go To 2 No → Repair as necessary. Perform POWERTRAIN VERIFICATION TEST VER - 1.	All
2	Turn the ignition off. Disconnect the DRBIII® from the DLC. Disconnect the PCM harness connectors. Turn the ignition on. Measure the voltage of the PCM SCI Transmit circuit at the Data Link harness connector (cav 7). Is the voltage above 1.0 volt? Yes → Repair the PCM SCI Transmit circuit for a short to voltage. Perform POWERTRAIN VERIFICATION TEST VER - 1. No → Go To 3	All
3	Turn the ignition off. Disconnect the DRBIII® from the DLC. Disconnect the PCM harness connectors. Turn the ignition on. Measure the voltage of the PCM SCI Receive circuit at the Data Link harness connector (cav 12). Is the voltage above 1.0 volt? Yes → Repair the PCM SCI Receive circuit for a short to voltage. Perform POWERTRAIN VERIFICATION TEST VER - 1. No → Go To 4	All

*NO RESPONSE FROM PCM (PCM SCI ONLY) - NGC — Continued

TEST	ACTION	APPLICABILITY
4	Turn the ignition off. Disconnect the DRBIII® from the DLC. Disconnect the PCM harness connectors. Measure the resistance between the PCM SCI Transmit circuit and the PCM SCI Receive circuit at the Data Link harness connector (cavs 7 and 12). Is the resistance below 5.0 ohms? Yes → Repair the short between the PCM SCI Transmit and the PCM SCI Receive circuits. Perform POWERTRAIN VERIFICATION TEST VER - 1. No → Go To 5	All
5	Turn the ignition off. Disconnect the PCM harness connectors. Disconnect the DRBIII® from the DLC. Measure the resistance between ground and the PCM SCI Transmit circuit at the Data Link harness connector (cav 7). Is the resistance below 5.0 ohms? Yes → Repair the PCM SCI Transmit circuit for a short to ground. Perform POWERTRAIN VERIFICATION TEST VER - 1. No → Go To 6	All
6	Turn the ignition off. Disconnect the PCM harness connector. Disconnect the DRBIII® from the DLC. Measure the resistance between ground and the PCM SCI Receive circuit in the Data Link harness connector (cav 12). Is the resistance below 5.0 ohms? Yes → Repair the PCM SCI Receive circuit for a short to ground. Perform POWERTRAIN VERIFICATION TEST VER - 1. No → Go To 7	All
7	Turn the ignition off. Disconnect the PCM harness connector. Disconnect the DRBIII® from the DLC. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the PCM SCI Receive circuit from the Data Link harness connector (cav 12) to the appropriate terminal of special tool #8815. Is the resistance below 5.0 ohms? Yes → Go To 8 No → Repair the PCM SCI Receive circuit for an open. Perform POWERTRAIN VERIFICATION TEST VER - 1.	All

*NO RESPONSE FROM PCM (PCM SCI ONLY) - NGC — Continued

TEST	ACTION	APPLICABILITY
8	Turn the ignition off. Disconnect the PCM harness connector. Disconnect the DRBIII® from the DLC. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the PCM SCI Transmit circuit from the Data Link harness connector (cav 7) to the appropriate terminal of special tool #8815. Is the resistance below 5.0 ohms? Yes → Go To 9 No → Repair the PCM SCI Transmit circuit for an open. Perform POWERTRAIN VERIFICATION TEST VER - 1.	All
9	If there are no possible causes remaining, view repair. Repair Replace and program the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 1.	All

Symptom:
*NO RESPONSE FROM RADIO

POSSIBLE CAUSES
NO RESPONSE FROM RADIO
OPEN FUSED IGNITION SWITCH OUTPUT CIRCUIT
OPEN FUSED B+ CIRCUIT
RADIO GROUND CIRCUIT OPEN
OPEN PCI BUS CIRCUIT
RADIO

TEST	ACTION	APPLICABILITY
1	Turn the ignition on. **Note: As soon as one or more module communicates with the DRB, answer the question.** With the DRB, attempt to communicate with the Airbag Control Module (ACM). With the DRB, attempt to communicate with the Instrument Cluster (MIC). Was the DRB able to I/D or establish communications with either of the modules? Yes → Go To 2 No → Refer to the Communications category and perform the symptom PCI Bus Communication Failure. Perform BODY VERIFICATION TEST - VER 1.	All
2	Turn the ignition off. Disconnect the Radio C1 harness connector. Turn the ignition on. Using a 12-volt test light connected to ground, probe the Fused Ignition Switch Output circuit. Is the test light illuminated? Yes → Go To 3 No → Check Fuse Block fuse for an open. If ok, repair the Fused Ignition Switch Output circuit for an open or short. Refer to the wiring diagrams located in the Service Information. Perform BODY VERIFICATION TEST - VER 1.	All
3	Turn the ignition off. Disconnect the Radio C1 harness connector. Using a 12-volt test light connected to ground, probe the Fused B+ circuit. Is the test light illuminated? Yes → Go To 4 No → Repair the Fused B+ circuit for an open or short. Refer to the wiring diagrams located in the Service Information. Perform BODY VERIFICATION TEST - VER 1.	All

*NO RESPONSE FROM RADIO — Continued

TEST	ACTION	APPLICABILITY
4	Turn the ignition off. Disconnect the Radio C1 harness connector. Using a 12-volt test light connected to 12-volts, probe the ground circuit. Is the test light illuminated? Yes → Go To 5 No → Repair the ground circuit for an open. Perform BODY VERIFICATION TEST - VER 1.	All
5	**Note: Ensure there is PCI Bus communication with other modules on the vehicle before proceeding. If not, refer to the symptom list from the menu and repair as necessary.** Disconnect the Radio C1 harness connector. Use Scope input cable CH7058, Cable to Probe adapter CH7062, and the red and black test probes. Connect the scope input cable to the channel one connector on the DRB. Attach the red and black leads and the cable to probe adapter to the scope input cable. With the DRBIII® select Pep Module Tools. Select lab scope. Select Live Data. Select 12 volt square wave. Press F2 for Scope. Press F2 and use the down arrow to set voltage range to 20 volts. Press F2 again when complete. Connect the Black lead to the chassis ground. Connect the Red lead to the PCI Bus circuit in the Radio connector. Turn the ignition on. Observe the voltage display on the DRB Lab Scope. Does the voltage pulse from 0 to approximately 7.5 volts? Yes → Go To 6 No → Repair the PCI Bus circuit for an open. Perform BODY VERIFICATION TEST - VER 1.	All
6	If there are no possible causes remaining, view repair. Repair Replace the Radio. Perform BODY VERIFICATION TEST - VER 1.	All

Symptom:
*NO RESPONSE FROM RIGHT SIACM

POSSIBLE CAUSES
INTERROGATE ACM
GROUND CIRCUIT OPEN
FUSED IGNITION SWITCH OUTPUT CIRCUIT (RUN/START) OPEN
PCI BUS CIRCUIT OPEN
RIGHT SIDE IMPACT AIRBAG CONTROL MODULE

TEST	ACTION	APPLICABILITY
1	Turn the ignition on. With the DRBIII® select Passive Restraints. With the DRBIII® select Airbag and read the active DTC's. Is the Loss Of Ignition Run/Start DTC set? Yes → Refer to the symptom list and perform the Loss Of Ignition Run/Start symptom. Perform AIRBAG VERIFICATION TEST - VER 1. No → Go To 2	All
2	**Ensure that the battery is fully charged.** **Warning: TURN IGNITION OFF, DISCONNECT THE BATTERY AND WAIT TWO MINUTES BEFORE PROCEEDING.** Disconnect the Right Side Impact Airbag Control Module harness connector. Connect the appropriate Load Tool SIACM Adapter to the SIACM connector. Using a 12-volt test light connected to 12-volts, probe the ground circuit. **NOTE: Make sure test light is connected to the Battery positive terminal.** Is the test light illuminated? Yes → Go To 3 No → Repair the Ground circuit for an open. Perform AIRBAG VERIFICATION TEST - VER 1. **Note: When reconnecting Airbag system components, the ignition must be turned off and the battery must be disconnected.**	All
3	**Warning: TURN IGNITION OFF, DISCONNECT THE BATTERY AND WAIT TWO MINUTES BEFORE PROCEEDING.** Disconnect the Right Side Impact Airbag Control Module harness connector. Connect the appropriate Load Tool SIACM Adapter to the SIACM connector. Turn the ignition on and then reconnect the Battery. Measure the voltage of the Fused Ignition Switch Output (Run/Start) circuit. Is the voltage above 6.0 volts? Yes → Go To 4 No → Repair the Fused Ignition Switch Output (Run/Start) circuit for an open. Perform AIRBAG VERIFICATION TEST - VER 1. **Note: When reconnecting Airbag system components, the ignition must be turned off and the battery must be disconnected.**	All

*NO RESPONSE FROM RIGHT SIACM — Continued

TEST	ACTION	APPLICABILITY
4	**NOTE: Ensure there is PCI bus communication with other modules. If not, refer to the PCI Bus Communication Failure symptom and repair as necessary.** **WARNING: TURN THE IGNITION OFF, DISCONNECT THE BATTERY AND WAIT TWO MINUTES BEFORE PROCEEDING.** Disconnect the Right Side Impact Airbag Control Module harness connector. Connect the appropriate Load Tool SIACM Adapter to the SIACM connector. Turn the ignition on and then reconnect the Battery. Use Scope input cable CH7058, Cable to Probe adapter CH7062, and the red and black test probes. Connect the scope input cable to the channel one connector on the DRB. Attach the red and black leads and the cable to probe adapter to the scope input cable. With the DRBIII® select Pep Module Tools. Select lab scope. Select Live Data. Select 12 volt square wave. Press F2 for Scope. Press F2 and use the down arrow to set voltage range to 20 volts. Set Probe to x10. Press F2 again when complete. Connect the Black lead to the chassis ground. Connect the Red lead to the PCI Bus circuit in the Right Side Impact Airbag Control Module connector. Observe the voltage display on the DRB Lab Scope. Does the voltage pulse from 0 to approximately 7.5 volts? Yes → Go To 5 No → Repair the PCI Bus circuit for an open. Perform AIRBAG VERIFICATION TEST - VER 1.	All
5	If there are no possible causes remaining, view repair. Yes → Replace the Right Side Impact Airbag Control Module (RSIACM) in accordance with the Service Information. WARNING: Make sure the battery is disconnected and wait 2 minutes before proceeding. Perform AIRBAG VERIFICATION TEST - VER 1.	All

Symptom:
*NO RESPONSE FROM RKE

POSSIBLE CAUSES
OPEN GROUND CIRCUIT
OPEN FUSED B+ CIRCUIT
OPEN FUSED IGNITION SWITCH OUTPUT CIRCUIT
OPEN PCI BUS CIRCUIT
REMOTE KEYLESS ENTRY MODULE

TEST	ACTION	APPLICABILITY
1	Turn the ignition off. Turn all lights off. Disconnect the RKE Module harness connector. Using a 12-volt test light connected to 12-volts, probe both ground circuits. Is the test light illuminated for both ground circuits? Yes → Go To 2 No → Repair the ground circuit for an open. Perform BODY VERIFICATION TEST - VER 1.	All
2	Turn the ignition off. Disconnect the RKE Module harness connector. Using a 12-volt test light connected to ground, probe each Fused B+ circuit. Is the test light illuminated for each Fused B+ circuit? Yes → Go To 3 No → Check the fuses that feed the Fused B+ circuits for an open. If ok, repair the Fused B+ circuit that did not illuminate the test light for an open. Refer to the wiring diagrams in the service information. Perform BODY VERIFICATION TEST - VER 1.	All
3	Turn the ignition off. Disconnect the RKE Module harness connector. Turn the ignition on. Using a 12-volt test light connected to ground, probe the Fused Ignition Switch Output circuit. Is the test light illuminated? Yes → Go To 4 No → Repair the Fused Ignition Switch Output circuit for an open. Perform BODY VERIFICATION TEST - VER 1.	All

*NO RESPONSE FROM RKE — Continued

TEST	ACTION	APPLICABILITY
4	**Note: Ensure there is PCI Bus communication with other modules on the vehicle before proceeding. If not, refer to the symptom list from the menu and repair as necessary.** Disconnect the RKE Module harness connector. Use Scope input cable CH7058, Cable to Probe adapter CH7062, and the red and black test probes. Connect the scope input cable to the channel one connector on the DRB. Attach the red and black leads and the cable to probe adapter to the scope input cable. With the DRBIII® select Pep Module Tools. Select lab scope. Select Live Data. Select 12 volt square wave. Press F2 for Scope. Press F2 and use the down arrow to set voltage range to 20 volts. Set probe to x10. Press F2 again when complete. Connect the Black lead to the chassis ground. Connect the Red lead to the PCI Bus circuit in the RKE Module connector. Turn the ignition on. Observe the voltage display on the DRB Lab Scope. Does the voltage pulse from 0 to approximately 7.5 volts? Yes → Replace the Remote Keyless Entry Module in accordance with the service information. Perform BODY VERIFICATION TEST - VER 1. No → Repair the PCI Bus circuit for an open. Perform BODY VERIFICATION TEST - VER 1.	All

Symptom:

*NO RESPONSE FROM SENTRY KEY IMMOBILIZER MODULE

POSSIBLE CAUSES
ATTEMPT TO COMMUNICATE WITH THE MIC
GROUND CIRCUIT OPEN
FUSED IGNITION SWITCH OUTPUT CIRCUIT OPEN
FUSED B(+) CIRCUIT OPEN
OPEN PCI BUS CIRCUIT
SENTRY KEY IMMOBILIZER MODULE

TEST	ACTION	APPLICABILITY
1	Turn the ignition on. With the DRB, enter Body then Electro/Mech Cluster (MIC). Was the DRB able to I/D or communicate with the MIC? Yes → Go To 2 No → Refer to the symptom list for problems related to no communication with the MIC. Perform SKIS VERIFICATION.	All
2	Turn the ignition off. Disconnect the SKIM harness connector. Measure the resistance between ground and the ground circuit. Is the resistance below 5.0 ohms? Yes → Go To 3 No → Repair the ground circuit for an open. Perform SKIS VERIFICATION.	All
3	Turn the ignition off. Disconnect the SKIM harness connector. Turn the ignition on. Using a 12-volt test light connected to ground, probe the Fused Ignition Switch Output circuit. Is the test light illuminated? Yes → Go To 4 No → Repair the Fused Ignition Switch Output circuit for an open. Perform SKIS VERIFICATION.	All
4	Turn the ignition off. Disconnect the SKIM harness connector. Using a 12-volt test light connected to ground, probe the Fused B(+) circuit. Is the test light illuminated? Yes → Go To 5 No → Repair the Fused B+ circuit for an open. Perform SKIS VERIFICATION.	All

*NO RESPONSE FROM SENTRY KEY IMMOBILIZER MODULE — Continued

TEST	ACTION	APPLICABILITY
5	**Note: Ensure there is PCI Bus communication with other modules on the vehicle before proceeding. If not, refer to the symptom list from the menu and repair as necessary.** Disconnect the SKIM harness connector. Use Scope input cable CH7058, Cable to Probe adapter CH7062, and the red and black test probes. Connect the scope input cable to the channel one connector on the DRB. Attach the red and black leads and the cable to probe adapter to the scope input cable. With the DRBIII® select Pep Module Tools. Select lab scope. Select Live Data. Select 12 volt square wave. Press F2 for Scope. Press F2 and use the down arrow to set voltage range to 20 volts. Press F2 again when complete. Connect the Black lead to the chassis ground. Connect the Red lead to the PCI Bus circuit in the SKIM connector. Turn the ignition on. Observe the voltage display on the DRB Lab Scope. Does the voltage pulse from 0 to approximately 7.5 volts? Yes → Go To 6 No → Repair the PCI Bus circuit for an open. Perform SKIS VERIFICATION.	All
6	If there are no possible causes remaining, view repair. Repair Replace and program the Sentry Key Immobilizer Module in accordance with the Service Information. Perform SKIS VERIFICATION.	All

Symptom:
*NO RESPONSE FROM TRANSMISSION CONTROL MODULE - NGC

POSSIBLE CAUSES
NO RESPONSE FROM TRANSMISSION CONTROL MODULE
FUSED IGNITION SWITCH OUTPUT CIRCUIT OPEN
FUSED B(+) CIRCUIT OPEN
GROUND CIRCUIT(S) OPEN
PCI BUS CIRCUIT OPEN
POWERTRAIN CONTROL MODULE

TEST	ACTION	APPLICABILITY
1	Turn the ignition on. **Note: As soon as one or more module communicates with the DRB, answer the question.** With the DRB, attempt to communicate with the Instrument Cluster. With the DRB, attempt to communicate with the Airbag Control Module. Was the DRB able to I/D or establish communications with both of the modules? Yes → Go To 2 No → Refer to the Communications category and perform the appropriate symptom. Perform 40/41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1.	All
2	Turn the ignition off. Disconnect the PCM harness connectors. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Turn the ignition on. Using a 12-volt test light connected to ground, probe both Fused Ignition Switch Output circuits (cavs 11 and 12) in the appropriate terminal of special tool #8815. **NOTE: The test light must illuminate brightly. Compare the brightness to that of a direct connection to the battery.** Is the test light illuminated for both circuits? Yes → Go To 3 No → Repair the Fused Ignition Switch Output circuit for an open. Refer to the wiring diagrams located in the Service Information. Perform 40/41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1.	All

*NO RESPONSE FROM TRANSMISSION CONTROL MODULE - NGC — Continued

TEST	ACTION	APPLICABILITY
3	Turn the ignition off. Disconnect the PCM harness connectors. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Using a 12-volt test light connected to ground, probe the Fused B(+) circuit in the appropriate terminal of special tool #8815. **NOTE: The test light must illuminate brightly. Compare the brightness to that of a direct connection to the battery.** Is the test light illuminated? Yes → Go To 4 No → Repair the Fused B(+) circuit for an open. Refer to the wiring diagrams located in the Service Information. Perform 40/41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1.	All
4	Turn the ignition off. Disconnect the PCM harness connectors. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Using a 12-volt test light connected to 12-volts, probe each ground circuit in the appropriate terminal of special tool #8815. **NOTE: The test light must illuminate brightly. Compare the brightness to that of a direct connection to the battery.** Is the light illuminated at all ground circuits? Yes → Go To 5 No → Repair the Ground circuit(s) for an open. Check the main ground connection to engine block and/or chassis. Refer to the wiring diagrams located in the Service Information. Perform 40/41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1.	All

*NO RESPONSE FROM TRANSMISSION CONTROL MODULE - NGC — Continued

TEST	ACTION	APPLICABILITY
5	**Note: Ensure there is PCI Bus communication with other modules on the vehicle before proceeding. If not, refer to the symptom list from the menu and repair as necessary.** Disconnect the PCM harness connectors. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Use Scope input cable CH7058, Cable to Probe adapter CH7062, and the red and black test probes. Connect the scope input cable to the channel one connector on the DRB. Attach the red and black leads and the cable to probe adapter to the scope input cable. With the DRBIII® select Pep Module Tools. Select lab scope. Select Live Data. Select 12 volt square wave. Press F2 for Scope. Press F2 and use the down arrow to set voltage range to 20 volts. Press F2 again when complete. Connect the Black lead to the chassis ground. Connect the Red lead to the PCI Bus circuit in the appropriate terminal of special tool #8815. Turn the ignition on. Observe the voltage display on the DRB Lab Scope. Does the voltage pulse from 0 to approximately 7.5 volts? Yes → Go To 6 No → Repair the PCI Bus circuit for an open. Perform 40/41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1.	All
6	Using the schematics as a guide, inspect the wiring and connectors. Repair as necessary. Pay particular attention to all power and ground circuits. If there are no possible causes remaining, view repair. Repair Replace and program the Powertrain Control Module in accordance with the service information. WITH THE DRBIII® PERFORM QUICK LEARN AND REPROGRAM PINION FACTOR. Perform 40/41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1.	All

Symptom:
*PCI BUS COMMUNICATION FAILURE

POSSIBLE CAUSES
WIRING HARNESS INTERMITTENT
OPEN PCI BUS CIRCUIT AT THE DATA LINK CONNECTOR (DLC)
PCI BUS CIRCUIT SHORTED TO VOLTAGE
MODULE SHORT TO VOLTAGE
PCI BUS CIRCUIT SHORTED TO GROUND
MODULE SHORT TO GROUND

TEST	ACTION	APPLICABILITY
1	**Note: Determine which modules this vehicle is equipped with before beginning.** **Note: When attempting to communicate with any of the modules on this vehicle, the DRB will display 1 of 2 different communication errors: a NO RESPONSE message or a BUS +/- SIGNALS OPEN message.** Turn the ignition on. Using the DRB, attempt to communicate with the following control modules: Airbag Control Module SKIM (SENTRY KEY IMMOBILIZER) MIC (INSTRUMENT CLUSTER) Was the DRBIII® able to communicate with one or more Module(s)? Yes → Go To 2 No → Go To 3	All
2	Turn the ignition off. **Note: Visually inspect the related wiring harness. Look for any chafed, pierced, pinched, or partially broken wires.** **Note: Visually inspect the related wire harness connectors. Look for broken, bent, pushed out, or corroded terminals.** **Note: If the DRB can not communicate with a single module, refer to the category list for the related symptom.** Were any problems found? Yes → Repair wiring harness/connectors as necessary. Perform BODY VERIFICATION TEST - VER 1. No → Test Complete.	All

*PCI BUS COMMUNICATION FAILURE — Continued

TEST	ACTION	APPLICABILITY
3	Turn the ignition off. Disconnect the PCM harness connector. Note: If equipped with NGC follow the caution below. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Disconnect the DRB from the Data Link Connector (DLC). Disconnect the negative battery cable. Measure the resistance of the PCI Bus circuit between the Data Link Connector (DLC) and the PCM harness connector. Is the resistance below 5.0 ohms? Yes → Go To 4 No → Repair the PCI Bus circuit for an open. Perform BODY VERIFICATION TEST - VER 1.	All
4	**NOTE: Reconnect the PCM harness connector and the negative battery cable.** Turn the ignition on. Measure the voltage of the PCI Bus circuit at the Data Link Connector (DLC). Is the voltage above 7.0 volts? Yes → Go To 5 No → Go To 6	All
5	Turn the ignition off. Using a voltmeter, connect one end to the PCI Bus circuit at the DLC, and the other end to ground. **Note: When performing the next step turn the ignition off (wait one minute) before disconnecting any module. When the module is disconnected turn the ignition on to check for a short to voltage.** Turn the ignition on. While monitoring the voltmeter, disconnect each module the vehicle is equipped with one at a time. Is the voltage steadily above 7.0 volts with all the modules disconnected? Yes → Repair the PCI Bus circuit for a short to voltage. Perform BODY VERIFICATION TEST - VER 1. No → Replace the module that when disconnected the short to voltage was eliminated. Perform BODY VERIFICATION TEST - VER 1.	All

*PCI BUS COMMUNICATION FAILURE — Continued

TEST	ACTION	APPLICABILITY
6	Turn the ignition off. Disconnect the negative battery cable. Using a ohmmeter, connect one end to the PCI Bus circuit at the DLC, and the other end to ground. While monitoring the ohmmeter, disconnect each module the vehicle is equipped with one at a time. **NOTE: Total bus resistance to ground thru all of the modules is typically between 350 to 1000 ohms. The more modules on the bus, the lower the total bus resistance will be.** Is the resistance below 150.0 ohms with all the modules disconnected? Yes → Repair the PCI Bus circuit for a short to ground. Perform BODY VERIFICATION TEST - VER 1. No → Replace the module that when disconnected the short to ground was eliminated. Perform BODY VERIFICATION TEST - VER 1.	All

Symptom:
COMPASS/TEMPERATURE MIRROR INTERNAL FAILURE

POSSIBLE CAUSES
COMPASS/TEMP MIRROR

TEST	ACTION	APPLICABILITY
1	Perform the Compass/Temp Mirror Self-Check. Turn the ignition on. Press and hold the left lamp button for 20-25 seconds. The display will illuminate each of the VF segments: CAL ZONE N, NE, E, SE, S, SW, W, NW The numerals 0 through 9 C° and F° The Compass/Temp Mirror will test the memory and the compass. Press the left lamp button or cycle the ignition to exit the Self-Check. The Compass/Temp Mirror will display a ″P″ for Pass or an ″F″ for Fail. Did the Compass/Temp Mirror display an ″F″ after the Self-Check? Yes → Replace the Compass/Temp Mirror in accordance with the Service Information. Perform BODY VERIFICATION TEST - VER 1. No → Test Complete.	All

Symptom:
*COMPASS/TEMPERATURE MIRROR DOES CALIBRATE

POSSIBLE CAUSES
CALIBRATION PROCEDURE
COMPASS/TEMPERATURE MIRROR

TEST	ACTION	APPLICABILITY
1	Perform the Compass/Temp Mirror Self-Check. Turn the ignition on. Depress and hold the Zone/Cal button (left reading lamp button) for 20 - 25 seconds. Turn the ignition on and then release the STEP button. **NOTE: The Compass/Temp Module will illuminate all of the VF segments and then display a ″P″ for Pass or an ″F″ for Fail.** Exit the self-check by depressing the Zone/Cal button or cycling the ignition. Did the Compass/Temp Mirror display an ″F″ during the self-check? Yes → Replace the Compass/Temp Mirror in accordance with the Service Information. NOTE: After replacing the CTM, it must be calibrated to operate properly. Refer to Overhead Console in the Service Information or ″CTM Does Not Calibrate″ in this section. Perform BODY VERIFICATION TEST - VER 1. No → Go To 2	All

*COMPASS/TEMPERATURE MIRROR DOES CALIBRATE — Continued

TEST	ACTION	APPLICABILITY
2	**NOTE: Ensure that the vehicle has been properly demagnetized before attempting to calibrate the compass. Refer to Overhead Console in the Service Manual.** **NOTE: The compass must be calibrated after any replacement or display ″lock-up″.** Calibrate the compass using the following steps: Drive the vehicle to an area away from any large metal objects or overhead power lines. Ensure that the proper magnetic variance zone is stored in the compass memory. Turn the ignition on and ensure that the compass display is not blank. Depress and hold the STEP button for 5-10 seconds until ″ZONE″ appears in the display, then release the STEP button. The number displayed is the variance zone stored in the compass memory. If necessary, refer to the Variance Map in Overhead Console in the Service Manual. To change the variance zone, depress the STEP button to scroll through the zone numbers 1-15 until the desired zone is displayed. After selecting the proper zone, wait approximately 15 seconds for the compass display to return to normal. With the engine running, depress and hold the STEP button for 5-10 seconds, ″ZONE″ will appear, then ″CAL″. Release the STEP button within 2 seconds of ″CAL″ illuminating. With ″CAL″ displayed, drive slowly, less than 5 MPH (8 kPH) in 3 complete 360 degree circles. ″CAL″ will turn off and the compass will be calibrated. Did the compass calibrate? Yes → Test Complete. No → Ensure that all calibration instructions have been followed carefully. Attempt to re-calibrate the compass, if unsuccessful, replace the Compass/Temp Mirror in accordance with the Service Instructions. Perform BODY VERIFICATION TEST - VER 1.	All

Symptom:
*COMPASS/TEMPERATURE MIRROR INOPERATIVE

POSSIBLE CAUSES
NO RESPONSE - PCI BUS - COMPASS
FUSED B(+) CIRCUIT SHORT TO GROUND
FUSED B(+) CIRCUIT OPEN
FUSED IGNITION SWITCH OUTPUT CIRCUIT SHORT TO GROUND
FUSED IGNITION SWITCH OUTPUT CIRCUIT OPEN
GROUND CIRCUIT OPEN
COMPASS/TEMPERATURE MIRROR

TEST	ACTION	APPLICABILITY
1	Turn the ignition on. With the DRBIII®, attempt to I/D or communicate with the Compass/Temperature Mirror. Was the DRBIII® able to communicate with the Compass/Temperature Mirror. Yes → Go To 2 No → Refer to Communications for the related symptom(s). Perform BODY VERIFICATION TEST - VER 1.	All
2	Turn the ignition off. Remove and inspect the #4 Fuse in the Fuse Block. If the fuse is open, replace with the proper rated fuse. Turn the ignition on for approximately 1 minute. Turn the ignition off. Remove and inspect the #4 Fuse in the Fuse Block. Is the #4 Fuse open? Yes → Check the Fused B(+) circuit for a short to ground and repair as necessary. If the Fused B(+) circuit is not shorted to ground, replace the Compass/Temperature Mirror. Perform BODY VERIFICATION TEST - VER 1. No → Go To 3	All
3	Turn the ignition off. Remove and inspect the #7 Fuse in the Fuse Block. If the fuse is open, replace with the proper rated fuse. Turn the ignition on for approximately 1 minute. Turn the ignition off. Remove and inspect the #7 Fuse in the Fuse Block. Is the #7 Fuse open? Yes → Check the Fused Ignition Switch Output circuit for a short to ground and repair as necessary. If the Fused Ignition Switch Output circuit is not shorted to ground, replace the Compass/Temperature Mirror. Perform BODY VERIFICATION TEST - VER 1. No → Go To 4	All

*COMPASS/TEMPERATURE MIRROR INOPERATIVE — Continued

TEST	ACTION	APPLICABILITY
4	Turn the ignition off. Disconnect the Compass/Temperature Mirror harness connector. Measure the voltage between the Fused B(+) circuit and ground. Is the voltage below 10.5 volts? Yes → Repair the Fused B(+) circuit for an open. Perform BODY VERIFICATION TEST - VER 1. No → Go To 5	All
5	Turn the ignition off. Disconnect the Compass/Temperature Mirror harness connector. Turn the ignition on. Measure the voltage between the Fused Ignition Switch Output circuit and ground. Is the voltage below 10.5 volts? Yes → Repair the Fused Ignition Switch Output circuit for an open. Perform BODY VERIFICATION TEST - VER 1. No → Go To 6	All
6	Turn the ignition off. Disconnect the Compass/Temperature Mirror harness connector. Measure the resistance between ground and the Compass/Temperature Mirror Ground circuit. Is the resistance above 5.0 ohms? Yes → Repair the Ground circuit for an open. Perform BODY VERIFICATION TEST - VER 1. No → Replace the Compass/Temperature Mirror in accordance with the Service Information. Perform BODY VERIFICATION TEST - VER 1.	All

Symptom:
*TEMPERATURE DISPLAY INOPERATIVE OR WRONG (2.0L ONLY)

POSSIBLE CAUSES
DTC PRESENT IN PCM
AMBIENT TEMPERATURE SENSOR
COMPASS/TEMPERATURE MIRROR

TEST	ACTION	APPLICABILITY
1	With the DRBIII®, read DTCs. Does the DRBIII® display any PCM Ambient Temp DTCs? Yes → Refer to DRIVEABILITY for the related symptom(s). Perform BODY VERIFICATION TEST - VER 1. No → Go To 2	All
2	Turn the ignition off. Disconnect the Ambient Temperature Sensor harness connector. Measure the Ambient Temperature Sensor using the following values: 10°C (50°F) Sensor Resistance = 17.99 - 21.81 Kilohms 20°C (68°F) Sensor Resistance = 11.37 - 13.61 Kilohms 25°C (77°F) Sensor Resistance = 9.12 - 10.88 Kilohms 30°C (86°F) Sensor Resistance = 7.37 - 8.75 Kilohms 40°C (104°F) Sensor Resistance = 4.90 - 5.75 Kilohms 50°C (122°F) Sensor Resistance = 3.33 - 3.88 Kilohms Does the Ambient Temperature Sensor resistance measure between the min/max specifications? Yes → Replace the Compass/Temp Mirror in accordance with the Service Information. Perform BODY VERIFICATION TEST - VER 1. No → Replace the Ambient Temperature Sensor in accordance with the Service Information. Perform BODY VERIFICATION TEST - VER 1.	All

Symptom:
*HIGH BEAM HEADLAMPS WILL NOT TRN ON

POSSIBLE CAUSES
OPEN FUSED B+
DIMMER SWITCH LOW BEAM OUTPUT CIRCUIT SHORT TO GROUND
DIMMER SWITCH HIGH BEAM OUTPUT CIRCUIT SHORT TO GROUND
OPEN FUSE
DIMMER SWITCH LOW BEAM OUTPUT CIRCUIT OPEN
INSTRUMENT CLUSTER
MULTIFUNCTION SWITCH

TEST	ACTION	APPLICABILITY
1	Remove Circuit Breaker 2 from the Fuse Block. Measure voltage of the Fused B+ circuit at the Circuit Breaker connector. Is the voltage above 10.0 volts? Yes → Go To 2 No → Repair the open Fused B+ circuit from Fuse Block fuse 15. Perform BODY VERIFICATION TEST - VER 1.	All
2	Check fuse 15 in the Fuse Block. Is fuse 15 open? Yes → Go To 3 No → Go To 5	All
3	Remove fuse 15 from the Fuse Block. Disconnect the Multifunction Switch connector. Measure resistance of the Dimmer Switch Low Beam Output Circuit to ground. Is the resistance below 5.0 ohms? Yes → Repair the Dimmer Switch Low Beam Output Circuit for a short to ground condition. Perform BODY VERIFICATION TEST - VER 1. No → Go To 4	All
4	Remove Circuit Breaker 2 from the Fuse Block. Disconnect the Multifunction Switch connector. Measure resistance of the Dimmer Switch High Beam Output Circuit and ground. Is the resistance below 5.0 ohms? Yes → Repair the Dimmer Switch High Beam Output Circuit for a short to ground condition. Perform BODY VERIFICATION TEST - VER 1. No → Go To 5	All

*HIGH BEAM HEADLAMPS WILL NOT TRN ON — Continued

TEST	ACTION	APPLICABILITY
5	Turn the ignition off. Check Circuit Breaker 2 Is Circuit Breaker 2 open? Yes → Replace the open Fuse. Perform BODY VERIFICATION TEST - VER 1. No → Go To 6	All
6	Disconnect the Multifunction Switch connector. Turn the headlamps on. Measure voltage of the Fused B+ Circuit in the Multifunction Switch connector. Is the voltage below 1.0 volt. Yes → Go To 7 No → Repair the Dimmer Switch Low Beam Output Circuit for an open condition. Perform BODY VERIFICATION TEST - VER 1.	All
7	Disconnect the Multifunction Switch connector. Turn the headlamps on. Connect a jumper wire between the Dimmer Switch Low Beam Output Circuit and the Dimmer Switch High Beam Output Circuit in the Multifunction Switch connector. Did the High Beam Headlamps come on? Yes → Replace the Instrument cluster. Perform BODY VERIFICATION TEST - VER 1. No → Replace the Multifunction Switch. Perform BODY VERIFICATION TEST - VER 1.	All

Symptom:
*HIGH BEAM HEADLAMPS WILL NOT TURN OFF

POSSIBLE CAUSES
DIMMER SWITCH HIGH BEAM OUTPUT CIRCUIT SHORT TO VOLTAGE
INSTRUMENT CLUSTER
MULTIFUNCTION SWITCH

TEST	ACTION	APPLICABILITY
1	Remove Circuit Breaker 2 from the Fuse Block. Do the High Beam Headlamps turn off? Yes → Go To 2 No → Repair the Dimmer Switch High Beam Output Circuit for a short to voltage condition. Perform BODY VERIFICATION TEST - VER 1.	All
2	Disconnect the Instrument Cluster connector. Disconnect the Multifunction Switch connector. Measure resistance of the Dimmer Switch High Beam Output Circuit to ground. Is the resistance below 5.0 ohms? Yes → Replace the Instrument Cluster. Perform BODY VERIFICATION TEST - VER 1. No → Replace the Multifunction Switch. Perform BODY VERIFICATION TEST - VER 1.	All

Symptom:
*LOW BEAM HEADLAMPS WILL NOT TURN OFF

POSSIBLE CAUSES
MULTIFUNCTION SWITCH
DIMMER SWITCH LOW BEAM OUTPUT CIRCUIT SHORT TO VOLTAGE
FUSE BLOCK
INSTRUMENT CLUSTER

TEST	ACTION	APPLICABILITY
1	Turn the headlamp switch to the off position. With the DRBIII®, read the Headlamp Switch Voltage. Does the DRBIII® display Headlamp Switch Voltage between 4.3 and 4.8 Volts? Yes → Go To 2 No → Replace the Multifunction Switch. Perform BODY VERIFICATION TEST - VER 1.	All
2	Turn the ignition off. Disconnect the Instrument Cluster. Turn the ignition on. Measure voltage of the Dimmer Switch Low Beam Output Circuit. Is the voltage below 1.0 volt? Yes → Go To 3 No → Repair the Dimmer Switch Low Beam Output Circuit for a short to voltage condition. Perform BODY VERIFICATION TEST - VER 1.	All
3	Turn the ignition off. Remove Circuit Breaker 2 from the Junction Block. Disconnect the Instrument Cluster harness connector. Measure resistance of the Dimmer Switch Low Beam Output Circuit and ground. Is the resistance below 100.0 ohms? Yes → Replace the Fuse Block. Perform BODY VERIFICATION TEST - VER 1. No → Replace the Instrument Cluster. Perform BODY VERIFICATION TEST - VER 1.	All

Symptom:
*LOW BEAM HEADLAMPS WILL NOT TRN ON

POSSIBLE CAUSES
MULTIFUNCTION SWITCH
FUSE BLOCK
DIMMER SWITCH LOW BEAM OUTPUT CIRCUIT OPEN
INSTRUMENT CLUSTER
OPEN FUSED B+ TO FUSE BLOCK
FUSED B+ CIRCUIT SHORT TO GROUND
B+ CIRCUIT BREAKER 2

TEST	ACTION	APPLICABILITY
1	Turn the Headlamps on. With the DRBIII® read the Headlamp Switch voltage. Does the DRBIII® display Headlamp Switch voltage below 5.0 volts? Yes → Go To 2 No → Replace the Multifunction Switch. Perform BODY VERIFICATION TEST - VER 1.	All
2	Remove Circuit Breaker 2 from the Fuse Block. Measure voltage of the Fused B+ circuit in the Circuit Breaker connector. Is the voltage above 10.0 volts? Yes → Go To 3 No → Replace the Fuse Block. Perform BODY VERIFICATION TEST - VER 1.	All
3	Remove Circuit Breaker 2 from the Fuse Block. Measure voltage of the Fused B+ Circuit in the Circuit Breaker connector. Is the voltage above 10.0 volts? Yes → Go To 4 No → Go To 5	All
4	Disconnect the Multifunction Switch harness connector. Connect a 12 volt test light between the Dimmer Switch Low Beam Output Circuit and the Fused B+ Circuit in the Multifunction Switch connector. Did the test light illuminate brightly? Yes → Repair the Dimmer Switch Low Beam Output Circuit for an open condition. Perform BODY VERIFICATION TEST - VER 1. No → Replace the Instrument Cluster. Perform BODY VERIFICATION TEST - VER 1.	All

*LOW BEAM HEADLAMPS WILL NOT TRN ON — Continued

TEST	ACTION	APPLICABILITY
5	Remove and test Fuse 15 from the Fuse Block. Is the Fuse open? Yes → Go To 6 No → Repair the open Fused B+ Circuit between the Multifunction Switch and the Fuse Block. Perform BODY VERIFICATION TEST - VER 1.	All
6	Remove Circuit Breaker 2 from the Fuse Block. Measure resistance of the Fused B+ circuit in the fuse connector to ground. Is the resistance below 5.0 ohms? Yes → Repair the Fused B+ Circuit for a short to ground condition. Perform BODY VERIFICATION TEST - VER 1. No → Replace the Circuit Breaker and retest the system. Perform BODY VERIFICATION TEST - VER 1.	All

Symptom List:
ABS INDICATOR CIRCUIT OPEN
AIRBAG INDICATOR CIRCUIT OPEN

Test Note: All symptoms listed above are diagnosed using the same tests. The title for the tests will be ABS INDICATOR CIRCUIT OPEN.

When Monitored and Set Condition:

ABS INDICATOR CIRCUIT OPEN

When Monitored: With the ignition on and requested to turn on by the ABS module.

Set Condition: The Instrument Cluster detects an open during the internal test on the indicator.

AIRBAG INDICATOR CIRCUIT OPEN

When Monitored: With the ignition on and requested to turn on by the ACM.

Set Condition: The Instrument Cluster detects an open during the internal test on the indicator.

POSSIBLE CAUSES
INSTRUMENT CLUSTER

TEST	ACTION	APPLICABILITY
1	**NOTE: The Instrument Cluster performs internal tests on the ABS and Airbag indicators each ignition cycle. These indicator LEDs are not replaceable.** With the DRBIII®, erase DTCs. Cycle the ignition and wait approximately 1 minute. Did the ABS or Airbag indicator DTC reset? Yes → Replace the Instrument Cluster in accordance with the Service Information. Perform BODY VERIFICATION TEST - VER 1. No → Test Complete.	All

Symptom List:

ABS MESSAGE NOT RECEIVED
ACM MESSAGE NOT RECEIVED
EATX MESSAGE NOT RECEIVED
SBEC MESSAGE NOT RECEIVED
SKIM MESSAGE NOT RECEIVED

Test Note: All symptoms listed above are diagnosed using the same tests. The title for the tests will be ABS MESSAGE NOT RECEIVED.

When Monitored and Set Condition:

ABS MESSAGE NOT RECEIVED

When Monitored: With the ignition in the Run/Start position.

Set Condition: The Instrument Cluster detects no PCI Bus message from the CAB module for 12 (twelve) seconds.

ACM MESSAGE NOT RECEIVED

When Monitored: With the ignition in the Run/Start position.

Set Condition: The Instrument Cluster detects no PCI Bus message from the AECM for 5 (five) seconds.

EATX MESSAGE NOT RECEIVED

When Monitored: With the ignition on.

Set Condition: The Instrument Cluster detects no PCI Bus message from the EATX for 5 (five) seconds.

SBEC MESSAGE NOT RECEIVED

When Monitored: With the ignition in the Run/Start position.

Set Condition: The Instrument Cluster detects no PCI Bus message from the SBEC for 20 (twenty) seconds.

SKIM MESSAGE NOT RECEIVED

When Monitored: With the ignition in the Run/Start position.

Set Condition: The Instrument Cluster detects no PCI Bus message from the SKIM Module for 20 (twenty) seconds.

POSSIBLE CAUSES
BUS MESSAGE NOT RECEIVED DTC PRESENT
INTERMITTENT CONDITION
INSTRUMENT CLUSTER

ABS MESSAGE NOT RECEIVED — Continued

TEST	ACTION	APPLICABILITY
1	With the DRBIII®, attempt to communicate with the ABS, ACM, EATX, SBEC, or SKIM module. Was the DRBIII® able to I/D or communicate with the Module in question? Yes → Go To 2 No → Refer to Communication category for the related symptom(s).	All
2	With the DRBIII®, erase DTCs. Cycle the ignition, wait approximately 1 minute. With the DRBIII®, read DTCs. Did the DTC reset? Yes → Replace the Instrument Cluster in accordance with the Service Information. Perform BODY VERIFICATION TEST - VER 1. No → The condition is not present at this time. Monitor DRBIII® parameters while wiggling the related wire harness. Refer to any Technical Service Buletins (TSB) that may apply. Visually inspect the related wiring harness and connector terminals.	All

Symptom:
BATTERY LOSS

When Monitored and Set Condition:

BATTERY LOSS

When Monitored: With the ignition on.

Set Condition: When the Instrument Cluster detects that the ignition has been turned on but detects no Fused B(+) circuit.

POSSIBLE CAUSES
PDC FUSE #13 DEFECTIVE
PDC FUSED B(+) CIRCUIT SHORT TO GROUND
FUSE BLOCK #4 FUSE DEFECTIVE
FUSE BLOCK FUSED B(+) CIRCUIT SHORT TO GROUND
B(+) TO PDC #13 FUSE OPEN
B(+) TO FUSE BLOCK #4 FUSE OPEN
FUSED B(+) CIRCUIT TO INSTRUMENT CLUSTER OPEN
INSTRUMENT CLUSTER

TEST	ACTION	APPLICABILITY
1	Turn the ignition off. Remove and inspect the #13 Fuse in the PDC. If the fuse is open, replace with the proper rated fuse. Turn the ignition on for approximately 1 minute. Turn the ignition off. Remove and inspect the #13 Fuse in the PDC. Is the #13 Fuse in the PDC open? Yes → Repair the PDC #13 Fused B(+) circuit for a short to ground. Perform BODY VERIFICATION TEST - VER 1. No → Go To 2	All
2	Turn the ignition off. Remove and inspect the Fuse Block #4 Fuse. If the fuse is open, replace with the proper rated fuse. Turn the ignition on for approximately 1 minute. Turn the ignition off. Remove and inspect the Fuse Block #4 Fuse. Is the Fuse Block #4 Fuse open? Yes → Repair the Fuse Block Fused B(+) circuit for a short to ground. Perform BODY VERIFICATION TEST - VER 1. No → Go To 3	All

BATTERY LOSS — Continued

TEST	ACTION	APPLICABILITY
3	Turn the ignition off. Measure the voltage between the PDC #13 Fuse and ground. Is the voltage above 10.5 volts? Yes → Go To 4 No → Repair the B(+) circuit to the PDC #13 Fuse for an open. Perform BODY VERIFICATION TEST - VER 1.	All
4	Turn the ignition off. Measure the voltage between the Fuse Block #4 Fuse and ground. Is the voltage above 10.5 volts? Yes → Go To 5 No → Repair the B(+) circuit to the Fuse Block #4 Fuse for an open. Perform BODY VERIFICATION TEST - VER 1.	All
5	Turn the ignition off. Disconnect the Instrument Cluster harness connector. Check connectors - Clean/repair as necessary. Measure the voltage between the Fused B(+) circuit and ground. Is the voltage above 10.5 volts? Yes → Replace the Instrument Cluster in accordance with the Service Information. Perform BODY VERIFICATION TEST - VER 1. No → Repair the Fused B(+) circuit for an open between the Fuse Block #4 Fuse and the Instrument Cluster. Perform BODY VERIFICATION TEST - VER 1.	All

Symptom List:
CLUSTER BUS TX SHUTDOWN
NO PCI BUS TRANSMISSION

Test Note: All symptoms listed above are diagnosed using the same tests. The title for the tests will be CLUSTER BUS TX SHUTDOWN.

When Monitored and Set Condition:

CLUSTER BUS TX SHUTDOWN

When Monitored: Continuous.

Set Condition: The Instrument Cluster fails the loop- back test on the PCI Bus.

NO PCI BUS TRANSMISSION

When Monitored: Continous.

Set Condition: The Instrument Cluster microprocessor fails the loop- back test on the PCI Bus.

POSSIBLE CAUSES
INSTRUMENT CLUSTER

TEST	ACTION	APPLICABILITY
1	With the DRBIII®, erase DTCs. Cycle the ignition and wait approximately 1 minute. With the DRBIII®, read DTCs. Did this DTC reset? Yes → Replace the Instrument Cluster in accordance with the Service Information. Perform BODY VERIFICATION TEST - VER 1. No → Test Complete.	All

Symptom:
EATX MISMATCH

When Monitored and Set Condition:

EATX MISMATCH

When Monitored: With the ignition on.

Set Condition: The Instrument Cluster detects that the configuration programmed by the plant does not equal the configuration of the cluster.

POSSIBLE CAUSES
EATX BUS MESSAGE DTC PRESENT
INSTRUMENT CLUSTER CONFIGURATION INCORRECT
INSTRUMENT CLUSTER

TEST	ACTION	APPLICABILITY
1	With the DRBIII®, read DTCs. Does the DRBIII® display ″EATX Bus Message Not Received″? Yes → Refer to Communication for the related symptom. No → Go To 2	All
2	With the DRBIII® in Cluster Type, ensure that the Instrument Cluster is correctly configured. Is the Instrument Cluster configured correctly? Yes → Replace the Instrument Cluster in accordance with the Service Information. Perform BODY VERIFICATION TEST - VER 1. No → With the DRBIII®, configure the Instrument Cluster. Perform BODY VERIFICATION TEST - VER 1.	All

Symptom:
FUEL LEVEL SENSOR OPEN

When Monitored and Set Condition:

FUEL LEVEL SENSOR OPEN

When Monitored: With the ignition on. (Customer Complaint: fuel gauge displays empty)

Set Condition: The Instrument Cluster monitors the Fuel Level Sensor Signal circuit resistance. If the Cluster detects a resistance greater than 1500 ohms or less than 25 ohms for 18 seconds, this code will set.

POSSIBLE CAUSES
INTERMITTENT CONDITION
FUEL LEVEL SENSOR SIGNAL CIRCUIT SHORT TO VOLTAGE
FUEL LEVEL SENSOR SIGNAL CIRCUIT OPEN
FUEL PUMP MODULE GROUND CIRCUIT OPEN
FUEL LEVEL SENSOR
INSTRUMENT CLUSTER

TEST	ACTION	APPLICABILITY
1	Turn the ignition on. With the DRBIII®, erase DTC's. Cycle the ignition off and then back on. With the DRBIII®, read DTC's. Does the DRBIII® display "Fuel Level Sensor Open"? No → Test complete. DTC is intermittent. Road test the vehicle and recheck for DTC's. If the code returns, rerun this test. Refer to any Technical Service Bulletins (TSB) that may aply. Inspect related harness and connectors. Perform BODY VERIFICATION TEST - VER 1. Yes → Go To 2	All
2	Turn the ignition off. Disconnect the Fuel Pump Module harness connector. Disconnect the Instrument Cluster harness connector. Check connectors - Clean/repair as necessary. Turn the ignition on. **NOTE: The ignition must be turned off for at least 10 minutes to allow the cluster to go to "sleep" before proceeding with this test.** Measure the voltage between the Fuel Level Sensor Signal circuit and ground. Is there any voltage present? Yes → Repair the Fuel Level Sensor Signal circuit for a short to voltage. Perform BODY VERIFICATION TEST - VER 1. No → Go To 3	All

FUEL LEVEL SENSOR OPEN — Continued

TEST	ACTION	APPLICABILITY
3	Turn the ignition off. Disconnect the Fuel Pump Module harness connector. Check connectors - Clean/repair as necessary. Connect a jumper wire between the Fuel Level Sensor Signal circuit and ground. Turn the ignition on. With the DRBIII® in Sensors, read the Fuel Sender Volts. Does the DRBIII® display 0 (zero) volts? Yes → Go To 4 No → Repair the Fuel Level Sensor Signal circuit for an open. Perform BODY VERIFICATION TEST - VER 1.	All
4	Turn the ignition off. Disconnect the Fuel Pump Module harness connector. Check connectors - Clean/repair as necessary. Measure the resistance between ground and the Fuel Level Sensor Ground circuit. Is the resistance below 5.0 ohms? Yes → Go To 5 No → Repair the Fuel Pump Module Ground circuit for an open. Perform BODY VERIFICATION TEST - VER 1.	All
5	Turn the ignition off. Disconnect the Fuel Pump Module harness connector. Check connectors - Clean/repair as necessary. Measure the resistance of the Fuel Level Sensor between the Sensor Signal circuit pin and the Sensor Ground circuit pin. Is the resistance above 1500 ohms? Yes → Replace the Fuel Level Sender in accordance with the Service Information. Perform BODY VERIFICATION TEST - VER 1. No → Replace the Instrument Cluster in accordance with the Service Information. Perform BODY VERIFICATION TEST - VER 1.	All

Symptom:
FUEL LEVEL SENSOR SHORT

When Monitored and Set Condition:

FUEL LEVEL SENSOR SHORT

When Monitored: When the ignition is on. (Customer Complaint: fuel gauge displays empty).

Set Condition: The Instrument Cluster monitors the fuel level sensor signal circuit for a resistance value between approximately 25 ohms to 1100 ohms. If the Cluster senses a resistance less than 25 ohms, this code will set.

POSSIBLE CAUSES
FUEL LEVEL SENSOR SHORT INTERMITTENT CONDITION
FUEL LEVEL SENSOR
FUEL LEVEL SENSOR SIGNAL CIRCUIT SHORT TO SENSOR GROUND CIRCUIT
INSTRUMENT CLUSTER

TEST	ACTION	APPLICABILITY
1	With the DRBIII®, erase DTC's. Turn the ignition on, wait for one minute. With the DRBIII®, read DTC's. Does the DRBIII® display Fuel Level Sensor Short? No → Test complete. DTC is intermittent. Road test the vehicle and recheck for DTC's. If the code returns, rerun this test. Refer to any Technical Service Bulletins (TSB) that may apply. Inspect related harness and connectors. Perform BODY VERIFICATION TEST - VER 1. Yes → Go To 2	All
2	Turn the ignition off. Disconnect the Fuel Pump Module harness connector. Check connectors - Clean/repair as necessary. Measure the resistance of the Fuel Level Sensor between the Sensor Signal circuit pin and the Sensor Ground circuit pin (sensor side). Is the resistance below 50.0 ohms? Yes → Replace the Fuel Level Sensor in accordance with the Service Information. Perform BODY VERIFICATION TEST - VER 1. No → Go To 3	All

FUEL LEVEL SENSOR SHORT — Continued

TEST	ACTION	APPLICABILITY
3	Turn the ignition off. Disconnect the Instrument Cluster harness connector. Disconnect the Fuel Pump Module harness connector. Check connectors - Clean/repair as necessary. Measure the resistance of the Fuel Level Sensor Signal circuit to ground. Is the resistance below 10,000 (10 K) ohms? NOTE: it should be infinite. Yes → Repair the Fuel Level Sensor Signal circuit for a short to the Sensor Ground circuit. Perform BODY VERIFICATION TEST - VER 1. No → Test Complete.	All

Symptom:
PANEL DIMMER OPEN

When Monitored and Set Condition:

PANEL DIMMER OPEN

When Monitored: When the ignition is on.

Set Condition: The Instrument Cluster monitors the panel lamps dimmer signal circuit for a resistance value between 0.0 ohms and approximately 3,650 ohms. When the cluster senses a value greater than 30,000 ohms for more than 5 seconds, this code will set. When this condition occurs, the cluster illumination will default to full brightness.

POSSIBLE CAUSES
INTERMITTENT CONDITION
PANEL LAMPS DIMMER SIGNAL CIRCUIT SHORT TO VOLTAGE
PANEL LAMPS DIMMER SIGNAL CIRCUIT OPEN
MULTI- FUNCTION SWITCH
MULTI- FUNCTION SWITCH GROUND CIRCUIT OPEN
INSTRUMENT CLUSTER

TEST	ACTION	APPLICABILITY
1	With the DRBIII®, erase DTC's. Turn the Park Lamps on. Wait 10 (ten) seconds. Rotate the Panel Lamps Dimmer Switch through the full range of adjustment. With the DRBIII®, read DTC's. Does the DRBIII® display Panel Dimmer Open? Yes → Go To 2 No → The condition is not present at this time. Monitor DRBIII® parameters while wiggling the related wire harness. Refer to any Technical Service Bulletins (TSB) that may apply. Visually inspect the related wiring harness and connector terminals. Perform BODY VERIFICATION TEST - VER 1.	All
2	Turn the ignition off. Disconnect the Instrument Cluster harness connector. Disconnect the Multi- function Switch harness connector. Check connectors - Clean/repair as necessary. Turn the ignition on. Measure the voltage between the Panel Lamps Dimmer Signal circuit and ground. Is there any voltage present? Yes → Repair the Panel Lamps Dimmer Signal circuit for a short to voltage. Perform BODY VERIFICATION TEST - VER 1. No → Go To 3	All

PANEL DIMMER OPEN — Continued

TEST	ACTION	APPLICABILITY
3	Turn the ignition off. Disconnect the Instrument Cluster harness connector. Disconnect the Multi-Function Switch harness connector. Check connectors - Clean/repair as necessary. Measure the resistance of the Panel Lamps Dimmer Signal circuit. Is the resistance below 5.0 ohms? Yes → Go To 4 No → Repair the open in the Panel Lamps Dimmer Signal circuit. Perform BODY VERIFICATION TEST - VER 1. **NOTE: Reconnect the Multi-Function Switch harness connector before proceeding.**	All
4	Turn the ignition off. Disconnect the Multi-Function Switch harness connector. Check connectors - Clean/repair as necessary. Measure the resistance of the Multi- Function Switch Ground circuit to a known good ground. Does the resistance measure less than 5.0 ohms? Yes → Go To 5 No → Repair the open in the Multi- Function Switch Ground circuit. Perform BODY VERIFICATION TEST - VER 1.	All
5	Turn the ignition off. Disconnect the Instrument Cluster harness connector. Ensure the Multi-Function Switch is connected before proceeding. Measure the resistance of the Panel Lamps Dimmer Signal circuit from the Instrument Cluster harness connector to ground. Move the Instrument Panel Dimmer Switch through the entire range of adjustment while observing the ohmmeter. Did the resistance increment smoothly between approximately 0.0 ohms to approximately 3,500 ohms? Yes → Replace the Instrument Cluster in accordance with the Service Information. Perform BODY VERIFICATION TEST - VER 1. No → Replace the Multi-Function Switch in accordance with the Service Information. Perform BODY VERIFICATION TEST - VER 1.	All

Symptom:
*ALL GAUGES INOPERATIVE

POSSIBLE CAUSES
NO RESPONSE - PCI BUS
NO RESPONSE - PCI BUS - POWERTRAIN CONTROL MODULE
NO RESPONSE - PCI BUS - INSTRUMENT CLUSTER
FUSED IGNITION SWITCH OUTPUT CIRCUIT SHORT TO GROUND
FUSED IGNITION SWITCH OUTPUT CIRCUIT OPEN
INSTRUMENT CLUSTER GROUND CIRCUIT OPEN
INSTRUMENT CLUSTER

TEST	ACTION	APPLICABILITY
1	Turn the ignition on. With the DRBIII®, select System Monitors, then J1850 Module Scan. Does the DRBIII® display MIC PRESENT on the BUS? Yes → Go To 2 No → Refer to the COMMUNICATION category and perform the appropriate symptom.	All
2	Turn the ignition on. With the DRBIII®, select Body, MIC, SYSTEM TESTS, PCM Monitor. Does the DRBIII® display PCM INACTIVE ON THE BUS? Yes → Refer to the symptom list for problems related to *NO RESPONSE FROM THE POWERTRAIN CONTROL MODULE. No → Go To 3	All
3	Turn the ignition on. With the DRBIII®, select Body, MIC, MODULE DISPLAY. Does the DRBIII® display NO RESPONSE from MIC? Yes → Refer to the symptom list for problems related to *NO RESPONSE FROM THE INSTRUMENT CLUSTER. No → Go To 4	All

*ALL GAUGES INOPERATIVE — Continued

TEST	ACTION	APPLICABILITY
4	Turn the ignition off. Inspect the #11 Fuse in the Fuse Block for LHD vehicles (#12 Fuse for LHD autostick equipped vehicles); #10 Fuse in the Fuse Block for RHD vehicles (#9 Fuse for RHD autostick equipped vehicles). If the fuse is open, replace with proper rated fuse. Turn the ignition on for one minute. Turn the ignition off. Inspect the #11 Fuse in the Fuse Block for LHD vehicles (#12 Fuse for LHD autostick equipped vehicles); #10 Fuse in the Fuse Block for RHD vehicles (#9 Fuse for RHD autostick equipped vehicles). Is the fuse open? Yes → Repair the Fused Ignition Switch Output circuit for a short to ground. Perform BODY VERIFICATION TEST - VER 1. No → Go To 5	All
5	Turn the ignition off. Disconnect the Instrument Cluster harness connector. Turn the ignition on. Measure the voltage between the Fused Ignition Switch Output circuit (pin 15) and ground. For autostick equipped vehicles, also measure the voltage between the Fused Ignition Switch Output circuit (pin 9) and ground. Is the voltage above 10.5 volts? Yes → Go To 6 No → Repair the Fused Ignition Switch Output circuit for an open. Perform BODY VERIFICATION TEST - VER 1.	All
6	Turn the ignition off. Disconnect the Instrument Cluster harness connector. Measure the resistance between ground and the Instrument Cluster Ground circuit. Is the resistance below 5.0 ohms? Yes → Replace the Instrument Cluster in accordance with the Service Information. Perform BODY VERIFICATION TEST - VER 1. No → Repair the Instrument Cluster Ground circuit for an open. Perform BODY VERIFICATION TEST - VER 1.	All

Symptom:
*ANY OR ALL GAUGE POINTER(S) ON WRONG SIDE OF STOP

POSSIBLE CAUSES
INSTRUMENT CLUSTER

TEST	ACTION	APPLICABILITY
1	To repair any or all gauges with the pointer on the wrong side of the stop, perform either of the following procedures: Procedure 1: Turn the ignition off. Remove the #4 Fuse from the Fuse Block. Turn the ignition on, then off. Reinstall the #4 Fuse to the Fuse Block. Procedure 2: Perform the Instrument Cluster self-test. Turn the ignition off. Press and hold the Trip Reset button. Turn the ignition on. Did the gauge pointer(s) in question return to the proper position? Yes → Test Complete. No → Replace the Instrument Cluster in accordance with the Service Information. Perform BODY VERIFICATION TEST - VER 1.	All

Symptom:
*ANY PCI BUS INDICATOR INOPERATIVE

POSSIBLE CAUSES
*LED DEFECTIVE
INSTRUMENT CLUSTER

TEST	ACTION	APPLICABILITY
1	**NOTE: Refer to the Service Information: Diagnosis and Testing - Instrument Cluster Lamps for complete list of Indicators that will illuminate during the Self Test.** **NOTE: Ensure that the Instrument Cluster communicates on the PCI Bus.** **NOTE: Diagnose and repair any PCM, ACM, ABS, RKE, or SKIM DTCs before proceeding with this test.** Turn the ignition off. Remove the Instrument Cluster. Remove the inoperative LED from the Instrument Cluster. Using a DVOM, select ″Diode Mode″, and connect the leads across the LED. **NOTE: Ensure that the RED lead is on the ″+″ of the LED.** Did the LED illuminate? Yes → Replace the Instrument Cluster in accordance with the Service Information. Perform BODY VERIFICATION TEST - VER 1. No → Replace the Indicator LED in accordance with the Service Information. Perform BODY VERIFICATION TEST - VER 1.	All

Symptom:
*BRAKE WARNING INDICATOR ALWAYS ON

POSSIBLE CAUSES
BRAKE WARNING INDICATOR CIRCUIT SHORT TO GROUND
RED BRAKE WARNING INDICATOR DRIVER CIRCUIT SHORT TO GROUND
PARK BRAKE SWITCH
BRAKE FLUID LEVEL SWITCH
INSTRUMENT CLUSTER
POWERTRAIN CONTROL MODULE

TEST	ACTION	APPLICABILITY
1	Turn the ignition on. Ensure that the Parking Brake is disengaged. With the DRBIII® in Inputs/Outputs, read the Parking Brake Switch state. Does the DRBIII® display ″Closed″ with the Parking Brake disengaged? Yes → Go To 2 No → Go To 4	All
2	Turn the ignition off. Disconnect the Park Brake Switch harness connector. Turn the ignition on. With the DRBIII® in Inputs/Outputs, read the Parking Brake Switch state. Does the DRBIII® display ″Open″? Yes → Replace the Park Brake Switch in accordance with the Service Information. Perform BODY VERIFICATION TEST - VER 1. No → Go To 3	All
3	Turn the ignition off. Disconnect the Park Brake Switch harness connector. Disconnect the Instrument Cluster harness connector. Measure the resistance between ground and the Brake Warning Indicator Driver circuit. Is the resistance below 10,000 ohms (should be infinite)? Yes → Repair the Brake Warning Indicator circuit for a short to ground (between the Park Brake Switch and the Instrument Cluster). Perform BODY VERIFICATION TEST - VER 1. No → Replace the Instrument Cluster in accordance with the Service Information. Perform BODY VERIFICATION TEST - VER 1.	All

*BRAKE WARNING INDICATOR ALWAYS ON — Continued

TEST	ACTION	APPLICABILITY
4	**NOTE: Ensure that the brake fluid is properly filled to the correct level, and the Base Brake system operates properly.** Turn the ignition on. With the DRBIII® in Inputs/Outputs, read the Brake Fluid Level Switch state. Disconnect the Brake Fluid Level Switch harness connector. With the DRBIII® in Inputs/Outputs, read the Brake Fluid Level Switch state. Did the DRBIII® Brake Fluid Level Switch input change states? Yes → Replace the Brake Fluid Level Switch in accordance with the Service Information. Perform BODY VERIFICATION TEST - VER 1. No → Go To 5	All
5	Turn the ignition off. Disconnect the Brake Fluid Level Switch harness connector. Disconnect the PCM (C2 connector for 2.0L vehicles) harness connector. Measure the resistance between ground and the Red Brake Warning Indicator Driver circuit. Is the resistance below 10,000 ohms (should be infinite)? Yes → Repair the Red Brake Warning Indicator Driver circuit for a short to ground (between the Brake Fluid Level Switch and the Instrument Cluster). Perform BODY VERIFICATION TEST - VER 1. No → Test Complete.	All

Symptom:
*BRAKE WARNING INDICATOR INOPERATIVE

POSSIBLE CAUSES
BRAKE WARNING INDICATOR CIRCUIT OPEN
INDICATOR LED
BRAKE FLUID LEVEL SWITCH
PARK BRAKE SWITCH
RED BRAKE WARNING INDICATOR DRIVER CIRCUIT OPEN
BRAKE FLUID LEVEL SWITCH GROUND CIRCUIT OPEN
INSTRUMENT CLUSTER
POWERTRAIN CONTROL MODULE

TEST	ACTION	APPLICABILITY
1	**NOTE: The Brake Warning Indicator should illuminate during the bulb check cycle, and will also illuminate using the Self Test.** Observe the Brake Warning Indicator during the bulb check or Instrument Cluster Self Test. Did the indicator illuminate? Yes → Go To 2 No → Go To 8	All
2	**NOTE: The Brake Warning Indicator illuminates with the Park Brake engaged or with low Brake Fluid.** Is the Brake Warning Indicator inoperative with the use of the Park brake? Yes → Go To 3 No → Go To 5	All
3	Turn the ignition off. Disconnect the Park Brake Switch harness connector. Connect a jumper wire between the Brake Warning Indicator circuit and ground. Turn the ignition on and observe the Brake Warning Indicator. Does the Indicator illuminate? Yes → Replace the Park Brake Switch in accordance with the Service Information. Perform BODY VERIFICATION TEST - VER 1. No → Go To 4	All

*BRAKE WARNING INDICATOR INOPERATIVE — Continued

TEST	ACTION	APPLICABILITY
4	Turn the ignition off. Disconnect the Instrument Cluster harness connector. Disconnect the Park Brake Switch harness connector. Measure the resistance of the Brake Warning Indicator circuit. Is the resistance below 5.0 ohms? Yes → Replace the Instrument Cluster in accordance with the Service Information. Perform BODY VERIFICATION TEST - VER 1. No → Repair the Brake Warning Indicator circuit for an open. Perform BODY VERIFICATION TEST - VER 1.	All
5	Turn the ignition on. With the DRBIII® in Inputs/Outputs, read the Brake Fluid Level Switch state. Disconnect the Brake Fluid Level Switch harness connector. Connect a jumper wire between cavity A and cavity B of the Brake Fluid Level Switch harness connector. With the DRBIII®, observe the Brake Fluid Level input. Did the Brake Fluid Level input change state? Yes → Replace the Brake Fluid Level Switch in accordance with the Service Information. Perform BODY VERIFICATION TEST - VER 1. No → Go To 6	All
6	Turn the ignition off. Disconnect the Brake Fluid Level Switch harness connector. Measure the resistance of the Brake Fluid Level Switch ground circuit. Is the resistance above 5.0 ohms? Yes → Repair the Brake Fluid Level Switch Ground circuit for an open. Perform BODY VERIFICATION TEST - VER 1. No → Go To 7	All
7	Turn the ignition off. Disconnect the PCM (C2 connector for 2.0L equipped vehicles) harness connector. Disconnect the Brake Fluid Level Switch harness connector. Measure the resistance of the Red Brake Warning Indicator Driver circuit. Is the resistance above 5.0 ohms? Yes → Repair the Red Brake Warning Indicator Driver circuit for an open. Perform BODY VERIFICATION TEST - VER 1. No → Replace the Powertrain Control Module in accordance with the Service Information. Perform BODY VERIFICATION TEST - VER 1.	All

*BRAKE WARNING INDICATOR INOPERATIVE — Continued

TEST	ACTION	APPLICABILITY
8	Turn the ignition off. Remove the Instrument Cluster. Remove the inoperative Indicator LED. Using a DVOM, select ″Diode Mode″, and attach the leads across the LED. **NOTE: Ensure that the RED lead is on the ″+″ of the LED.** Did the LED illuminate? Yes → Replace the Instrument Cluster in accordance with the Service Information. Perform BODY VERIFICATION TEST - VER 1. No → Replace the Brake Warning Indicator LED in accordance with the Service Information. Perform BODY VERIFICATION TEST - VER 1.	All

Symptom:
*FRONT FOG LAMP INDICATOR INOPERATIVE

POSSIBLE CAUSES
FRONT FOG LAMP INDICATOR CIRCUIT OPEN
INDICATOR LED
INSTRUMENT CLUSTER

TEST	ACTION	APPLICABILITY
1	**NOTE: Ensure that the Fog Lamps operate properly before proceeding with this test. If not, select ″Service Information″ from the menu and repair as necessary.** Disconnect the Instrument Cluster harness connector. Turn the Headlamps on. Turn the Fog Lamps on. **NOTE: Ensure that the battery is fully charged.** Measure the voltage between the Fog Lamp Switch Output circuit and ground. Is the voltage greater than 10.0 volts? Yes → Go To 2 No → Repair the open in the Front Fog Lamp Switch Output circuit. Perform BODY VERIFICATION TEST - VER 1.	All
2	Turn the ignition off. Remove the Instrument Cluster. Remove the inoperative LED. Using a DVOM, select ″Diode Mode″, and attach the leads across the LED. **NOTE: Ensure that the RED lead is on the ″+″ of the LED.** Did the indicator illuminate? Yes → Replace the Instrument Cluster in accordance with the Service Information. Perform BODY VERIFICATION TEST - VER 1. No → Replace the inoperative indicator LED in accordance with the Service Information. Perform BODY VERIFICATION TEST - VER 1.	All

Symptom:
*FUEL GAUGE INACCURATE

POSSIBLE CAUSES
DTC PRESENT
FUEL LEVEL SENSOR
INTERMITTENT CONDITION
INSTRUMENT CLUSTER

TEST	ACTION	APPLICABILITY
1	Turn the ignition on. With the DRBIII®, read DTCs. Does the DRBIII® display Fuel Level Sensor Open or Fuel Level Sensor Short? Yes → Refer to Fuel Level Sensor Open or Fuel Level Sensor Short for the related symptom(s). No → Go To 2	All
2	Perform the Instrument Cluster Self Test. Turn the ignition off. Press and hold the Trip Reset button. Turn the ignition on. Observe the Fuel Gauge during the Self Test. The Fuel Gauge pointer should pause at each of these following positions: E, 1/2, Full. Did the Fuel Gauge perform the Self Test properly? Yes → Go To 3 No → Replace the Instrument Cluster in accordance with the Service Information. Perform BODY VERIFICATION TEST - VER 1.	All

*FUEL GAUGE INACCURATE — Continued

TEST	ACTION	APPLICABILITY
3	Turn the ignition off. Remove the Fuel Pump Module from the Fuel Tank. **NOTE: Inspect for physical obstructions in the Fuel Tank. Inspect the Fuel Level Sensor for bent or damaged parts.** Measure the resistance of the Fuel Level Sensor while moving the float arm through the complete range of motion. The Fuel Level Sensor should measure the following resistances: E = 184 - 204 ohms 1/4 = 360 - 410 ohms 1/2 = 565 - 585 ohms 3/4 = 741 - 791 ohms Full = 947 - 967 ohms **NOTE: The Fuel Level Sensor should read resistance through the full range of float arm motion.** Does the Fuel Level Sensor read the proper resistance values through the full range of motion? Yes → The condition is not present at this time. Monitor DRBIII® parameters while wiggling the related wire harness. Refer to any Technical Service Bulletins (TSB) that may apply. Visually inspect the related wiring harness and connector terminals. No → Replace the Fuel Level Sensor in accordance with the Service Information. Perform BODY VERIFICATION TEST - VER 1.	All

Symptom:
*HIGH BEAM INDICATOR INOPERATIVE

POSSIBLE CAUSES
HIGH BEAM INDICATOR CIRCUIT OPEN
HIGH BEAM INDICATOR BULB
INSTRUMENT CLUSTER

TEST	ACTION	APPLICABILITY
1	**NOTE: Ensure that the High Beam headlamps operate properly before proceeding with this test.** Turn the ignition off. Disconnect the Instrument Cluster harness connector. Turn on the headlamps and actuate the High Beams. Using a 12-volt test light connected to ground, check the High Beam Indicator circuit. Does the test light illuminate brightly? Yes → Go To 2 No → Repair the High Beam Indicator circuit for an open. Perform BODY VERIFICATION TEST - VER 1.	All
2	Turn the ignition off. Disconnect the Instrument Cluster harness connector. Remove and inspect the High Beam Indicator bulb. Is the bulb open? Yes → Replace the High Beam Indicator bulb in accordance with the Service Information. Perform BODY VERIFICATION TEST - VER 1. No → Replace the Instrument Cluster in accordance with the Service Information. Perform BODY VERIFICATION TEST - VER 1.	All

Symptom:
*INSTRUMENT CLUSTER DIMMING INOPERATIVE

POSSIBLE CAUSES
DTC PRESENT
HEADLAMP SWITCH OUTPUT CIRCUIT OPEN
ILLUMINATION BULB
INSTRUMENT CLUSTER

TEST	ACTION	APPLICABILITY
1	Turn the ignition on. With the DRBIII®, read DTCs. Does the DRBIII® display Panel Dimmer Open? Yes → Refer to the Service Information to diagnose "Panel Dimmer Open". Perform BODY VERIFICATION TEST - VER 1. No → Go To 2	All
2	**NOTE: Ensure that the Park Lamps operate properly before proceeding with this test.** Turn the ignition off. Disconnect the Instrument Cluster harness connector. Turn the Park Lamps on. Using a 12-volt test light connected to ground, check the Headlamp Output circuit. Does the test light illuminate brightly? Yes → Go To 3 No → Repair the Headlamp Switch Output circuit for an open. Perform BODY VERIFICATION TEST - VER 1.	All
3	Turn the ignition off. Disconnect the Instrument Cluster harness connector. Inspect the Illumination Bulb in question. Is the Illumination Bulb filament open? Yes → Replace the Illumination Bulb in accordance with the Service Information. Perform BODY VERIFICATION TEST - VER 1. No → Replace the Instrument Cluster in accordance with the Service Information. Perform BODY VERIFICATION TEST - VER 1.	All

Symptom:
*LOW OIL PRESSURE INDICATOR ALWAYS ON

POSSIBLE CAUSES
ENGINE OIL PRESSURE SWITCH
ENGINE OIL PRESSURE SWITCH SENSE CIRCUIT SHORT TO GROUND
POWERTRAIN CONTROL MODULE
INSTRUMENT CLUSTER

TEST	ACTION	APPLICABILITY
1	**NOTE: Ensure that Engine oil pressure is within normal operating range. Refer to the Service Information for specifications.** Allow the engine to idle. With the DRBIII® in Sensors, read the Engine Oil Pressure Switch state. Does the Engine Oil Pressure Switch status read ″Closed″? Yes → Go To 2 No → Replace the Instrument Cluster in accordance with the Service Information. Perform BODY VERIFICATION TEST - VER 1.	All
2	Turn the ignition off. Disconnect the Engine Oil Pressure Switch harness connector. With the DRBIII® in Sensors, read the Engine Oil Pressure Switch status. Does the Engine Oil Pressure Switch status read ″Closed″? Yes → Go To 3 No → Replace the Engine Oil Pressure Switch in accordance with the Service Information. Perform BODY VERIFICATION TEST - VER 1.	All
3	Turn the ignition off. Disconnect the Engine Oil Pressure Switch harness connector. Disconnect the PCM (C1 connector on 2.0L equipped vehicles) harness connector. Measure the resistance between ground and the Engine Oil Pressure Switch Sense circuit. Is the resistance below 5.0 ohms? Yes → Repair the Engine Oil Pressure Switch Sense circuit for a short to ground. Perform BODY VERIFICATION TEST - VER 1. No → Replace the Powertrain Control Module in accordance with the Service Information.	All

Symptom:
*LOW OIL PRESSURE INDICATOR INOPERATIVE

POSSIBLE CAUSES
ENGINE OIL PRESSURE SWITCH
ENGINE OIL PRESSURE SWITCH SENSE CIRCUIT OPEN
INDICATOR LED
POWERTRAIN CONTROL MODULE
INSTRUMENT CLUSTER

TEST	ACTION	APPLICABILITY
1	Turn the ignition off. Perform the Instrument Cluster Self Test. Depress and hold the Trip Odometer reset button while turning the ignition on. Did the Low Oil Pressure Indicator illuminate? Yes → Go To 2 No → Go To 4	All
2	Turn the ignition on. With the DRBIII® in Sensors, read the Oil Pressure Switch state. Disconnect the Engine Oil Pressure Switch harness connector. With the DRBIII® in Sensors, read the Oil Pressure Switch state. Did the Engine Oil Pressure Switch change states? Yes → Replace the Engine Oil Pressure Switch in accordance with the Service Information. Perform BODY VERIFICATION TEST - VER 1. No → Go To 3	All
3	Turn the ignition off. Disconnect the Engine Oil Pressure Switch harness connector. Disconnect the PCM (C1 connector on 2.0L equipped vehicles) harness connector. Measure the resistance of the Engine Oil Pressure Switch Sense circuit. Is the resistance below 5.0 ohms? Yes → Replace the Powertrain Control Module in accordance with the Service Information. No → Repair the Engine Oil Pressure Switch Sense circuit for an open. Perform BODY VERIFICATION TEST - VER 1.	All

*LOW OIL PRESSURE INDICATOR INOPERATIVE — Continued

TEST	ACTION	APPLICABILITY
4	Turn the ignition off. Remove the Instrument Cluster. Remove the Low Oil Pressure indicator LED. Using a DVOM, select "Diode Mode", and attach the leads across the LED. **NOTE: Ensure that the RED lead is on the "+" of the LED.** Did the LED illuminate? Yes → Replace the Instrument Cluster in accordance with the Service Information. Perform BODY VERIFICATION TEST - VER 1. No → Replace the Low Oil Pressure Indicator LED in accordance with the Service Information. Perform BODY VERIFICATION TEST - VER 1.	All

Symptom:
*ONE GAUGE INOPERATIVE

POSSIBLE CAUSES
POWERTRAIN CONTROL MODULE DTCS
INSTRUMENT CLUSTER

TEST	ACTION	APPLICABILITY
1	Turn the ignition off. With the DRBIII®, read DTCs. **NOTE: The PCM will not store any DTCs regarding Oil Pressure concerns.** **NOTE: If Oil Pressure gauge readings are in question and the gauge tests good, a mechanical oil pressure gauge must be attached to the engine.** Does the DRBIII® display any PCM DTCs? Yes → Refer to the DRIVEABILITY category and perform the apropriate symptom. No → Go To 2	All
2	Perform the Instrument Cluster Self Test. Turn the ignition off. Press and hold the Trip Reset button. Turn the ignition on. Observe the gauge in question while the Instrument Cluster performs the Self Test. The gauges should position at the following calibration points: Speedometer: 30mph (51km/h BUX), 60mph (102km/h BUX), 90mph (153km/h BUX), 120mph Tachometer: 2000, 4000, 6000, 8000 Fuel: E, 1/2, Full Temperature: Lo, Mid Lo, High Did the gauge in question operate properly? Yes → Test Complete. No → Replace the Instrument Cluster in accordance with the Service Information. Perform BODY VERIFICATION TEST - VER 1.	All

Symptom:
*PRND OR AUTOSTICK INDICATOR DISPLAY INACCURATE OR INOPERATIVE

POSSIBLE CAUSES
DTC PRESENT
INTERMITTENT CONDITION
INSTRUMENT CLUSTER

TEST	ACTION	APPLICABILITY
1	**NOTE: Ensure that there is communication between the MIC, PCM, and the TCM before proceeding with this test.** **NOTE: Diagnose and repair any DTCs before proceeding with this test.** **NOTE: Ensure that the TCM passes the Shift Lever Test with the DRBIII® before proceeding with this test.** Turn the ignition on. With the DRBIII®, read DTCs. Does the DRBIII® display any MIC, PCM, or TCM DTCs? Yes → Refer to symptom list for problems related to DTC's. No → Go To 2	All
2	Perform the Instrument Cluster Self Test. Turn the ignition off. Press and hold the Trip Reset button. Turn the ignition on. Observe the PRND / AutoStick VF display during the Self Test. Did any part of the VF display fail to illuminate? Yes → Replace the Instrument Cluster in accordance with the Service Information. Perform BODY VERIFICATION TEST - VER 1. No → The condition is not present at this time. Monitor DRBIII® parameters while wiggling the related wire harness. Refer to any Technical Service Bulletins (TSB) that may apply. Visually inspect the related wiring harness and connector terminals.	All

Symptom:
*REAR FOG LAMP INDICATOR INOPERATIVE - BUX ONLY

POSSIBLE CAUSES
REAR FOG LAMP INDICATOR CIRCUIT OPEN
INDICATOR LED
INSTRUMENT CLUSTER

TEST	ACTION	APPLICABILITY
1	**NOTE: Ensure that the Rear Fog Lamps operate correctly before proceeding with this test.** Turn the ignition off. Disconnect the Instrument Cluster harness connector. Turn the Rear Fog Lamp switch on. Using a 12-volt test light connected to ground, check the Rear Fog Lamp Indicator circuit. Does the test light illuminate brightly? Yes → Go To 2 No → Repair the Rear Fog Lamp Indicator circuit for an open. Perform BODY VERIFICATION TEST - VER 1.	All
2	Turn the ignition off. Remove the Instrument Cluster. Remove the inoperative LED. Using a DVOM, select ″Diode Mode″, and attach the leads across the LED. **NOTE: Ensure that the RED lead is on the ″+″ of the LED.** Did the LED illuminate? Yes → Replace the Instrument Cluster in accordance with the Service Information. Perform BODY VERIFICATION TEST - VER 1. No → Replace the Rear Fog Lamp Indicator LED in accordance with the Service Information. Perform BODY VERIFICATION TEST - VER 1.	All

Symptom:
*SEATBELT INDICATOR INOPERATIVE

POSSIBLE CAUSES
INDICATOR LED
SEAT BELT INDICATOR CIRCUIT OPEN
SEAT BELT SWITCH GROUND OPEN
SEAT BELT SWITCH
INSTRUMENT CLUSTER

TEST	ACTION	APPLICABILITY
1	Turn the ignition off. Perform the Instrument Cluster Self Test. Did the Seat Belt Indicator illuminate? Yes → Go To 3 No → Go To 2	All
2	Turn the ignition off. Remove the Instrument Cluster. Remove the inoperative indicator. Using a DVOM, select ″Diode Mode″, and attach the leads across the LED. **NOTE: Ensure that the RED lead is on the ″+″ of the LED.** Did the LED illuminate? Yes → Go To 3 No → Replace the Seat Belt Indicator LED in accordance with the Service Information. Perform BODY VERIFICATION TEST - VER 1.	All
3	Turn the ignition off. Disconnect the Instrument Cluster harness connector. Disconnect the Seat Belt Switch harness connector. Measure the resistance of the Seat Belt Indicator circuit. Is the resistance below 5.0 ohms? Yes → Go To 4 No → Repair the Seat Belt Indicator circuit for an open. Perform BODY VERIFICATION TEST - VER 1.	All
4	Turn the ignition off. Disconnect the Seat Belt Switch harness connector. Measure the resistance between ground and the Seat Belt Switch Ground circuit. Is the resistance below 5.0 ohms? Yes → Go To 5 No → Repair the Seat Belt Switch Ground circuit for an open. Perform BODY VERIFICATION TEST - VER 1.	All

*SEATBELT INDICATOR INOPERATIVE — Continued

TEST	ACTION	APPLICABILITY
5	Turn the ignition off. Disconnect the Seat Belt Switch harness connector. Measure the resistance of the Seat Belt Switch between the Indicator circuit pin and the Ground circuit pin. Is the resistance below 5.0 ohms? Yes → Replace the Instrument Cluster in accordance with the Service Information. Perform BODY VERIFICATION TEST - VER 1. No → Replace the Seat Belt Switch in accordance with the Service Information. Perform BODY VERIFICATION TEST - VER 1.	All

Symptom:
*VF DISPLAY INOPERATIVE

POSSIBLE CAUSES
INSTRUMENT CLUSTER

TEST	ACTION	APPLICABILITY
1	Ensure that the Instrument Cluster communicates on the PCI Bus. **NOTE: The Instrument Cluster must be operational for the result of this test to be valid.** The Instrument Cluster Odometer vacuum fluorescent (VF) Display is not a repairable or replaceable item. If there are no possible causes remaining, view repair. Repair Replace the Instrument Cluster in accordance with the Service Information. Perform BODY VERIFICATION TEST - VER 1.	All

Symptom:
*COURTESY LAMPS INOPERATIVE - ALL LAMPS

POSSIBLE CAUSES
FUSED B+ CIRCUIT OPEN
INSTRUMENT CLUSTER - COURTESY LAMP OPEN
COURTESY LAMP DRIVER CIRCUIT OPEN
INTERMITTENT CONDITION

TEST	ACTION	APPLICABILITY
1	Remove the dome lamp lens. Remove and ensure the bulb is good. Using a 12-volt test light connected to ground, check the Fused B+ circuit. Does the test light illuminate brightly? Yes → Go To 2 No → Repair the open Fused B+ Circuit. Perform BODY VERIFICATION TEST - VER 1.	All
2	Disconnect the Instrument Cluster. Connect a jumper wire between the Courtesy Lamp Driver Circuit and ground. Observe the Dome Lamp. Does the test light illuminate brightly? Yes → Replace the Instrument Cluster. Perform BODY VERIFICATION TEST - VER 1. No → Go To 3	All
3	Remove the dome lamp bulb. Disconnect the Instrument Cluster. Connect a jumper wire between the Courtesy Lamp Driver Circuit in the Instrument Cluster connector and ground. Measure the resistance of the Courtesy Lamp Driver Circuit from the Dome Lamp to the Instrument Cluster connector. Is the resistance below 5.0 ohms? Yes → The condition that caused this symptom is currently not present. Inspect the related wiring for a possible intermittent condition. Look for any chafed, pierced, pinched or partially broken wires. Perform BODY VERIFICATION TEST - VER 1. No → Repair the open Courtesy Lamp Driver Circuit. Perform BODY VERIFICATION TEST - VER 1.	All

Symptom:
*COURTESY LAMPS ON AT ALL TIMES

POSSIBLE CAUSES
DRIVERS DOOR AJAR SWITCH
DRIVERS DOOR AJAR SWITCH SENSE WIRE SHORT TO GROUND
REMOTE KEYLESS ENTRY MODULE - IF EQUIPPED
INSTRUMENT CLUSTER
INSTRUMENT CLUSTER
PANEL LAMPS DIMMER SIGNAL WIRE SHORT TO GROUND
MULTIFUNCTION SWITCH
OPEN DOOR AJAR SWITCH
REMOTE KEYLESS ENTRY MODULE - IF EQUIPPED
PASSENGER DOOR AJAR/RKE SENSE WIRE SHORT TO GROUND
INSTRUMENT CLUSTER
COURTESY LAMP DRIVER CIRCUIT SHORT TO GROUND
INSTRUMENT CLUSTER

TEST	ACTION	APPLICABILITY
1	Close all the doors. Turn the Panel Lamps Dimmer Switch to the MID position. With the DRBIII®, read the Electro/Mech Cluster, I/O's. Observe the: Drv Door Ajar Sw, Dome Lamp, and the Pass Door Ajar Sw Output. Does the DRBIII® read as follows? Drv Door Ajar: CLOSED Go To 2 Dome Lamp Output: ON Go To 5 Pass Door Ajar Sw: CLOSED Go To 7 No → Go To 10	All
2	Open the Drivers door. Disconnect the Driver Door Ajar Switch connector. With the DRBIII® select: Body, Electro/Mech Cluster, Input/Output. Read the: Drv Door Ajar Sw - state. Does the DRBIII® show: Open? Yes → Replace the Drivers Door Ajar Switch. Perform BODY VERIFICATION TEST - VER 1. No → Go To 3	All

*COURTESY LAMPS ON AT ALL TIMES — Continued

TEST	ACTION	APPLICABILITY
3	Turn the ignition off. Disconnect the Driver Door Ajar Switch connector. Disconnect the Instrument Cluster connector. Disconnect the RKE Module connector - If Equipped. Measure the resistance of the Driver Door Ajar Switch Sense Circuit from the door ajar switch connector to ground. Is the resistance below 100.0 ohms? Yes → Repair the Drivers Door Ajar Switch Sense Wire for a short to ground. Perform BODY VERIFICATION TEST - VER 1. No → Go To 4	All
4	Ensure the Instrument Cluster is connected. Disconnect the RKE Module connector. With the DRBIII® select: Body, Electro/Mech Cluster, Input/Output. Read the: Drv Door Ajar Sw - state Does the DRBIII® show: Drv Door Ajar Sw:Open? Yes → Replace the Remote Keyless Entry Module. Perform BODY VERIFICATION TEST - VER 1. No → Replace the Instrument Cluster. Perform BODY VERIFICATION TEST - VER 1.	All
5	Turn the Panel Lamps Dimmer to the MID position. Remove the Instrument Cluster. Measure the resistance between ground and the Panel Lamps Dimmer Signal Circuit in the C2 connector. Is the resistance below 100.0 ohms? Yes → Go To 6 No → Replace the Instrument Cluster. Perform BODY VERIFICATION TEST - VER 1.	All
6	Disconnect the Instrument Cluster. Disconnect the Multifunction Switch connector. Measure the resistance of the Panel Lamps Dimmer Signal Circuit in the instrument cluster connector to ground. Is the resistance below 200.0 ohms? Yes → Repair the Panel Lamps Dimmer Signal Wire for a short to ground. Perform BODY VERIFICATION TEST - VER 1. No → Replace the Multifunction Switch. Perform BODY VERIFICATION TEST - VER 1.	All
7	Close all the passenger doors. With the DRBIII® select: Body, Electro/Mech Cluster, Input /Output. Read the, Pas Door Ajar Sw - state. Remove each passenger door ajar switch and observe the DRBIII®. Did the DRBIII® change states to read: Pas Door Ajar Sw: Open? Yes → Replace the applicable open Door Ajar Switch. Perform BODY VERIFICATION TEST - VER 1. No → Go To 8	All

*COURTESY LAMPS ON AT ALL TIMES — Continued

TEST	ACTION	APPLICABILITY
8	Remove all 3 passenger door ajar switches. With the DRBIII®,select: Body,Electro/Mech Cluster,Input/Output. Read the Pas Door Ajar Sw-state. Disconnect the RKE Module connector while observing the DRBIII®. Did the DRBIII® show, Pas Door Ajar Sw: Open? Yes → Replace the Remote Keyless Entry Module. Perform BODY VERIFICATION TEST - VER 1. No → Go To 9	All
9	Turn the ignition off. Disconnect all 3 passenger door ajar switches. Disconnect the RKE Module connector - If Equipped. Disconnect the Instrument Cluster connector. Measure the resistance of the Passenger Door Ajar Circuit in the Passenger Door Ajar Switch connector. Is the resistance below 100.0 ohms? Yes → Repair the Passenger Door Ajar/RKE Sense Wire for a short to ground. Perform BODY VERIFICATION TEST - VER 1. No → Replace the Instrument Cluster. Perform BODY VERIFICATION TEST - VER 1.	All
10	Turn the Panel Lamps Dimmer to the MID position. Disconnect the Instrument Cluster Connector. Measure the resistance between ground and the Courtesy Lamp Driver Circuit. Is the resistance below 100.0 ohms? Yes → Repair the Courtesy Lamp Driver Circuit for a short to ground. Perform BODY VERIFICATION TEST - VER 1. No → Replace the Instrument Cluster. Perform BODY VERIFICATION TEST - VER 1.	All

Symptom:
*ILLUMINATED ENTRY INOPERATIVE

POSSIBLE CAUSES
COURTESY LAMPS OPERATIONAL
INTERMITTENT CONDITION
ILLUMINATED ENTRY NOT ENABLED

TEST	ACTION	APPLICABILITY
1	Check the Courtesy Lamps for proper operation. Does the Courtesy Lamp operate properly from the Door Ajar Switches and the Dome Light Switch? Yes → Go To 2 No → Refer to Symptom list for problems related to COURTESY LAMPS INOPERATIVE. Perform BODY VERIFICATION TEST - VER 1.	All
2	With the DRBIII® select: THEFT ALARM - VTSS - MISCELLANEOUS - ENABLE ILLUMINATED ENTRY. With the DRBIII®, read the ILLUMINATED ENTRY status. Does the DRBIII® display ENABLED? Yes → The condition that caused this symptom is currently not present. Inspect the related wiring harness for a possible intermittent condition. Look for any chafed, pierced, pinched or partially broken wires. Perform BODY VERIFICATION TEST - VER 1. No → With the DRB, enable the Illuminated Entry. Perform BODY VERIFICATION TEST - VER 1.	All

Symptom:
BODY STYLE MISMATCH

When Monitored and Set Condition:

BODY STYLE MISMATCH

When Monitored: When the ignition is in the run position during Remote Keyless Entry Module configuration.

Set Condition: Once the body style configuration is complete, the RKE compares its configuration information with the PCI bus message transmitted by the Powertrain Control Module pertaining to body style. A miscomparison will result in setting the trouble code.

POSSIBLE CAUSES
BODY STYLE MISMATCH

Repair Instructions:

BODY STYLE MISMATCH

With the DRBIII select: "Theft Alarm", "Miscellaneous", "Configure Module" and follow instructions on the screen.

Perform BODY VERIFICATION TEST - VER 1.

Symptom:

DRIVER DOOR SWITCH SHORTED OR STUCK

When Monitored and Set Condition:

DRIVER DOOR SWITCH SHORTED OR STUCK

When Monitored: Whenever the RKE module is connected and battery voltage is above 10.0 volts.

Set Condition: When a lock or unlock input from the driver door switch to the RKE module is present for more than 8 seconds.

POSSIBLE CAUSES
DTC PRESENT
REMOTE KEYLESS ENTRY MODULE - SHORTED
DOOR LOCK SWITCH SHORTED
CYLINDER LOCK SWITCH SHORTED
DRIVER DOOR SWITCH MUX CIRCUIT SHORT TO GROUND.

TEST	ACTION	APPLICABILITY
1	Turn the ignition on. With the DRBIII®, erase DTCs. Operate the door locks several times from the driver door lock switch and the cylinder lock switch if VTSS equipped.. With the DRBIII®, read DTCs. Does the DRBIII® display: DRIVER DOOR SWITCH FAILURE? Yes → Go To 2 No → The causes for setting this code are not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Perform BODY VERIFICATION TEST - VER 1.	All
2	Disconnect the Remote Keyless Entry module connector. Turn the ignition off. Measure the resistance between ground and the driver Door Switch Mux circuit (cavity 10) in the RKE module connector Is the resistance below 8000.0 ohms? Yes → Go To 3 No → Replace the Remote Keyless Entry module. Perform BODY VERIFICATION TEST - VER 1.	All

DRIVER DOOR SWITCH SHORTED OR STUCK — Continued

TEST	ACTION	APPLICABILITY
3	**NOTE: This test is for vehicles with VTSS. If this vehicle is not equipped with VTSS, answer YES to the question and continue.** Turn the ignition off. Disconnect the Remote Keyless Entry module connector. Remove the driver door inner trim panel. Disconnect the Cylinder Lock Switch connector. Measure the resistance between ground and the driver Door Switch Mux circuit (cavity 10). Is the resistance below 8000.0 ohms? Yes → Go To 4 No → Replace the Cylinder Lock Switch. Perform BODY VERIFICATION TEST - VER 1.	All
4	Turn the ignition off. Disconnect the Door Lock Switch connector. Disconnect the Remote Keyless Entry module connector. Measure the resistance between ground and the driver Door Switch Mux circuit (cavity 10). Is the resistance below 8000.0 ohms? Yes → Repair the Driver Door Switch Mux circuit for a short to ground. Perform BODY VERIFICATION TEST - VER 1. No → Replace the Door Lock Switch. Perform BODY VERIFICATION TEST - VER 1.	All

Symptom:
INCORRECT MODULE TYPE CONFIGURATION FOR PART NUMBER

When Monitored and Set Condition:

INCORRECT MODULE TYPE CONFIGURATION FOR PART NUMBER

When Monitored: When the ignition is in the run position during Remote Keyless Entry Module configuration.

Set Condition: When the operator attempts to choose a configuration which is not compatible with the part number. Example: Selecting BUX RKE when the module is a Domestic part number, The RKE frequencies are not compatible.

POSSIBLE CAUSES
INCORRECT MODULE TYPE CONFIGURATION FOR PART NUMBER

TEST	ACTION	APPLICABILITY
1	Ensure the module type corresponds with the correct module part number. If the module type corresponds with the module part number the RKE module is defective. If there are no possible causes remaining, view repair. Repair Replace the Remote Keyless Entry Module. Perform BODY VERIFICATION TEST - VER 1.	All

Symptom:
INTERIOR DECKLID RELEASE SWITCH SHORTED OR STUCK

When Monitored and Set Condition:

INTERIOR DECKLID RELEASE SWITCH SHORTED OR STUCK

When Monitored: Whenever the RKE module is connected and the battery is above 10.0 volts..

Set Condition: When a decklid release input is present for more than 8 seconds.

POSSIBLE CAUSES
DTC PRESENT
DECKLID RELEASE SWITCH SHORT TO GROUND.
DECKLID RELEASE RELAY CONTROL CIRCUIT SHORT TO GROUND.
REMOTE KEYLESS ENTRY MODULE - SHORTED

TEST	ACTION	APPLICABILITY
1	With the DRBIII®, erase DTCs. Turn the ignition on. Operate the decklid release from the interior switch. With the DRBIII®, read DTCs. Does the DRBIII® display: INTERIOR DECKLID RELEASE SWITCH SHORTED OR STUCK? Yes → Go To 2 No → The causes for setting this code are not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Perform BODY VERIFICATION TEST - VER 1.	All
2	Disconnect the interior Decklid Release Switch connector. Turn the ignition on. Measure the voltage between ground and the Decklid Release Relay Control circuit in the switch connector Is the voltage above 10.0 volts? Yes → Replace the Decklid Release Switch. Perform BODY VERIFICATION TEST - VER 1. No → Go To 3	All

INTERIOR DECKLID RELEASE SWITCH SHORTED OR STUCK — Continued

TEST	ACTION	APPLICABILITY
3	Disconnect the RKE module connector. Disconnect the interior Decklid Release Switch connector. Measure the resistance between ground and the Decklid Release Relay Control circuit. Is the resistance below 1000.0 ohms? Yes → Repair the Decklid Release Relay Control circuit for a short to ground. Perform BODY VERIFICATION TEST - VER 1. No → Replace the Remote Keyless Entry module. Perform BODY VERIFICATION TEST - VER 1.	All

Symptom:
MODULE NOT CONFIGURED FOR RKE

When Monitored and Set Condition:

MODULE NOT CONFIGURED FOR RKE

When Monitored: When the ignition is in the run position during Remote Keyless Entry transmitter programming.

Set Condition: When the operator attempts to program a transmitter and the RKE module is not configured for RKE.

POSSIBLE CAUSES
MODULE NOT CONFIGURED FOR RKE

TEST	ACTION	APPLICABILITY
1	The RKE transmitter will not program because the module is not configured for RKE. View repair. Repair Using the DRBIII®, configure the module for Remote Keyless Entry. Perform BODY VERIFICATION TEST - VER 1.	All

Symptom:
NO AIRBAG MESSAGES RECEIVED

When Monitored and Set Condition:

NO AIRBAG MESSAGES RECEIVED

When Monitored: With the ignition on or in the run position.

Set Condition: The RKE Module does not receive any airbag messages for 12 seconds.

POSSIBLE CAUSES
ATTEMPT TO COMMUNICATE WITH THE ACM
RKE MODULE

TEST	ACTION	APPLICABILITY
1	Turn the ignition on. With the DRB, attempt to communicate with the ACM. Was the DRB able to I/D or communicate with the ACM? Yes → Go To 2 No → Refer to the Communication category for the related symptom(s). Perform BODY VERIFICATION TEST - VER 1.	All
2	With the DRB, erase DTC's. Turn the ignition on and wait approximately 1 minute. With the DRB, read DTC's. Did this DTC reset? Yes → Replace the Remote Keyless Entry Module. Perform BODY VERIFICATION TEST - VER 1. No → Test Complete.	All

Symptom:
NO PCM MESSAGES RECEIVED

When Monitored and Set Condition:

NO PCM MESSAGES RECEIVED

When Monitored: With the ignition on or in the run position.

Set Condition: The RKE Module does not receive any PCM messages for 12 seconds.

POSSIBLE CAUSES
NO PCM MESSAGES RECEIVED
ATTEMPT TO COMMUNICATE WITH THE PCM
PCI BUS CIRCUIT OPEN
POWERTRAIN CONTROL MODULE

TEST	ACTION	APPLICABILITY
1	Turn the ignition on. With the DRB, enter SYSTEM MONITORS then J1850 MODULE SCAN. Is the PCM present on the bus? Yes → With the DRB, erase DTCs. Cycle the ignition switch and check for DTCs. If DTC resets, replace the RKE Module. Perform BODY VERIFICATION TEST - VER 1. No → Go To 2	All
2	Turn the ignition on. With the DRB, attempt to communicate with the PCM. Was the DRB able to communicate with the PCM? Yes → Go To 3 No → Refer to the communication category and perform the appropriate symptom. Perform BODY VERIFICATION TEST - VER 1.	All
3	Turn the ignition off. Disconnect the PCM harness connectors. Disconnect the RKE Module harness connector. Measure the resistance of the PCI Bus circuit between the RKE Module connector and the PCM connector. Is the resistance below 5.0 ohms? Yes → Replace the Powertrain Control Module. Perform BODY VERIFICATION TEST - VER 1. No → Repair the PCI Bus circuit for an open. Perform BODY VERIFICATION TEST - VER 1.	All

Symptom:
NO SKIM MESSAGES RECEIVED

When Monitored and Set Condition:

NO SKIM MESSAGES RECEIVED

When Monitored: With the ignition on or in the run position.

Set Condition: The RKE Module does not receive any SKIM messages for 12 seconds.

POSSIBLE CAUSES
ATTEMPT TO COMMUNICATE WITH THE SKIM
RKE MODULE

TEST	ACTION	APPLICABILITY
1	Turn the ignition on. With the DRB, attempt to communicate with the SKIM. Was the DRB able to I/D or communicate with the SKIM? Yes → Go To 2 No → Refer to the Communication category for the related symptom(s). Perform BODY VERIFICATION TEST - VER 1.	All
2	With the DRB, erase DTC's. Turn the ignition on and wait approximately 1 minute. With the DRB, read DTC's. Did this DTC reset? Yes → Replace the Remote Keyless Entry Module. Perform BODY VERIFICATION TEST - VER 1. No → Test Complete.	All

Symptom:
PASSENGER DOOR SWITCH FAILURE

When Monitored and Set Condition:

PASSENGER DOOR SWITCH FAILURE

When Monitored: Whenever the RKE module is connected and battery voltage is above 10.0 volts.

Set Condition: When a lock or unlock input from the passenger door switch to the RKE module is present for more than 8 seconds.

POSSIBLE CAUSES
DTC PRESENT
REMOTE KEYLESS ENTRY MODULE - SHORTED
DOOR LOCK SWITCH SHORTED
CYLINDER LOCK SWITCH SHORTED - EXPORT ONLY
PASSENGER DOOR SWITCH MUX CIRCUIT SHORT TO GROUND.

TEST	ACTION	APPLICABILITY
1	Turn the ignition on. With the DRBIII®, erase DTCs. Operate the door locks several times from the passenger door lock switch and the cylinder lock switch if VTSS equipped.. With the DRBIII®, read DTCs. Does the DRBIII® display: PASS DOOR SWITCH FAILURE? Yes → Go To 2 No → The causes for setting this code are not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Perform BODY VERIFICATION TEST - VER 1.	All
2	Disconnect the Remote Keyless Entry module connector. Turn the ignition off. Measure the resistance between ground and the passenger Door Switch Mux circuit (cavity 11) in the RKE module connector Is the resistance below 8000.0 ohms? Yes → Go To 3 No → Replace the Remote Keyless Entry module. Perform BODY VERIFICATION TEST - VER 1.	All

PASSENGER DOOR SWITCH FAILURE — Continued

TEST	ACTION	APPLICABILITY
3	**NOTE: This test is for an EXPORT vehicle only. If this is a DOMESTIC vehicle, answer YES to the question and continue.** Turn the ignition off. Disconnect the Remote Keyless Entry module connector. Remove the passenger door inner trim panel. Disconnect the Cylinder Lock Switch connector. Measure the resistance between ground and the passenger Door Switch Mux circuit (cavity 11). Is the resistance below 8000.0 ohms? Yes → Go To 4 No → Replace the Cylinder Lock Switch. Perform BODY VERIFICATION TEST - VER 1.	All
4	Turn the ignition off. Disconnect the Door Lock Switch connector. Disconnect the Remote Keyless Entry module connector. Measure the resistance between ground and the passenger Door Switch Mux circuit (cavity 11). Is the resistance below 8000.0 ohms? Yes → Repair the passenger Door Switch Mux circuit for a short to ground. Perform BODY VERIFICATION TEST - VER 1. No → Replace the Door Lock Switch. Perform BODY VERIFICATION TEST - VER 1.	All

Symptom:
*ALL DOOR LOCKS INOPERATIVE

POSSIBLE CAUSES
DECKLID RELEASE RELAY OUTPUT WIRE SHORT TO GROUND
FUSED B(+) CIRCUIT OPEN
FUSED B(+) WIRE SHORT TO GROUND.
GROUND CIRCUIT OPEN
DOOR LOCK RELAY OUTPUT CIRCUIT OPEN
DRIVER DOOR UNLOCK RELAY OUTPUT SHORT TO DOOR LOCK RELAY OUTPUT
DRIVER DOOR UNLOCK RELAY OUTPUT WIRE SHORT TO GROUND
DOOR LOCK RELAY OUTPUT WIRE SHORT TO GROUND
DOOR UNLOCK RELAY OUTPUT SHORT TO DOOR LOCK RELAY OUTPUT
DECKLID RELEASE SOLENOID-SHORTED
DOOR UNLOCK RELAY OUTPUT WIRE SHORT TO GROUND
DEFECTIVE FUSE #14
RKE MODULE - B(+) SHORT TO GROUND
RKE MODULE - RELAYS OPEN
RKE MODULE - SHORTED

TEST	ACTION	APPLICABILITY
1	**Note: Ensure there is communication with the RKE module (with the DRB select ″Vehicle Theft″) before proceeding. If not, refer to the ″COMMUNICATION″ catagory.** Test Fuse #14 in the fuse block. Is the fuse open? Yes → Go To 2 No → Go To 13	All
2	Turn ignition off. Remove Fuse #14 in the Fuse Block. Measure the resistance of the fused B(+) circuit from the fuse output cavity to ground. Is the resistance below 100.0 ohms? Yes → Go To 3 No → Go To 4	All

*ALL DOOR LOCKS INOPERATIVE — Continued

TEST	ACTION	APPLICABILITY
3	Turn ignition off. Remove Fuse #14 in the Fuse Block. Disconnect the RKE Module connector. Measure the resistance of the fused B(+) circuit (cavity #3) in the RKE connector to ground. Is the resistance below 100.0 ohms? Yes → Repair fused B(+) wire for a short to ground and replace blown fuse. Perform BODY VERIFICATION TEST - VER 1. No → Replace the Remote Keyless Entry Module and replace the blown fuse. Perform BODY VERIFICATION TEST - VER 1.	All
4	Replace fuse #14. Operate all the door locks including the decklid release (if equipped). Did the system operate properly without blowing the fuse? Yes → Test complete. If Fuse #14 blows again, check with the customer as to when it blew and rerun this test. Perform BODY VERIFICATION TEST - VER 1. No → Go To 5	All
5	Disconnect the Remote Keyless Entry module connector. Measure the resistance of the Decklid Release Relay Output circuit to ground. Is the resistance below 0.5 ohms? Yes → Go To 6 No → Go To 7	All
6	Disconnect the Remote Keyless Entry module connector. Disconnect the Decklid Solenoid connector. Measure the resistance of the Decklid Release Relay Output circuit to ground. Is the resistance below 100.0 ohms? Yes → Repair the Decklid Release Relay Output wire for a short to ground. Perform BODY VERIFICATION TEST - VER 1. No → Replace the Decklid Release Solenoid. Perform BODY VERIFICATION TEST - VER 1.	All
7	Turn ignition off. Disconnect the Remote Keyless Entry module connector. Measure the resistance of the Driver Door Unlock Relay Output circuit in the RKE module connector to ground. Is the resistance below 1000.0 ohms? Yes → Repair the Driver Door Unlock Relay Output wire for a short to ground. Perform BODY VERIFICATION TEST - VER 1. No → Go To 8	All

*ALL DOOR LOCKS INOPERATIVE — Continued

TEST	ACTION	APPLICABILITY
8	Disconnect the Remote Keyless Entry module connector. Measure the resistance of the Door Lock Relay Output circuit in the RKE module connector to ground. Is the resistance below 1000.0 ohms? Yes → Repair the Door Lock Relay Output wire for a short to ground. Perform BODY VERIFICATION TEST - VER 1. No → Go To 9	All
9	Turn ignition off. Disconnect the Remote Keyless Entry module connector. Measure the resistance of the Door Unlock Relay Output circuit in the RKE module connector to ground. Is the resistance below 1000.0 ohms? Yes → Repair the Door Unlock Relay Output wire for a short to ground. Perform BODY VERIFICATION TEST - VER 1. No → Go To 10	All
10	Disconnect the Remote Keyless Entry module connector. Measure the resistance between the Driver Door Unlock Relay Output circuit and the Door Lock Relay Output circuit in the RKE module connector.. Is the resistance below 3.5 ohms? Yes → Repair the Driver Door Unlock Relay Output circuit for a short to the Door Lock Relay Output circuit. Perform BODY VERIFICATION TEST - VER 1. No → Go To 11	All
11	Disconnect the Remote Keyless Entry module connector. Measure the resistance between the Door Unlock Relay Output circuit and the Door Lock Driver Relay Output in the RKE module connector.. Is the resistance below 1.5 ohms? Yes → Repair the Door Unlock Relay Output circuit for a short to the Door Lock Relay Output circuit. Perform BODY VERIFICATION TEST - VER 1. No → Go To 12	All
12	If there are no possible causes remaining, view repair. Repair Replace the Remote Keyless Entry Module and replace the fuse. Perform BODY VERIFICATION TEST - VER 1.	All
13	Disconnect the RKE Module connector. Using a test light, test both sides of Fuse #14 to ensure the fuse is Okay and that the 12.0 volt supply is not open. Measure the Voltage of the Fused B(+) circuit (cavity #3) in the RKE Module connector. Is the voltage above 10.0 volts? Yes → Go To 14 No → Repair the open Fused B(+) wire from the RKE Module connector to the fuse. Perform BODY VERIFICATION TEST - VER 1.	All

*ALL DOOR LOCKS INOPERATIVE — Continued

TEST	ACTION	APPLICABILITY
14	Turn ignition off. Disconnect the RKE Module connector. Measure the resistance of the ground circuit (cavity #8) in the RKE Module connector. Is the resistance below 5.0 ohms? Yes → Go To 15 No → Repair the open ground circuit. Perform BODY VERIFICATION TEST - VER 1.	All
15	Disconnect the Remote Keyless Entry module connector. Measure the resistance between the Driver Door Unlock Relay Output circuit and the Door Lock Relay Output circuit in the RKE module connector.. Is the resistance LESS than 17.0 ohms? Yes → Go To 16 No → Repair the open Door Lock Relay Output circuit. Perform BODY VERIFICATION TEST - VER 1.	All
16	If there are no possible causes remaining, view repair. Repair Replace the Remote Keyless Entry Module (relays open). Perform BODY VERIFICATION TEST - VER 1.	All

Symptom:
*ALL DOORS EXCEPT DRIVER FAIL TO LOCK AND UNLOCK

POSSIBLE CAUSES
RKE MODULE - OPEN DOOR UNLOCK RELAY OUTPUT
DOOR UNLOCK RELAY OUTPUT WIRE OPEN
DOOR LOCK RELAY OUTPUT WIRE OPEN
OPEN MOTORS

TEST	ACTION	APPLICABILITY
1	Disconnect the Remote Keyless Entry module connector. Lower the passenger door window. Connect a jumper wire between the Door Lock Relay Output ckt and the Ground ckt in the RKE module connector. Connect a jumper wire to the Door Unlock Relay Output ckt and momentarily touch it to the Fused B(+) ckt and observe the passenger door locks. Reverse the jumper wires to drive the motors in the opposite direction. Did the passenger doors Lock and Unlock? Yes → Replace the Remote Keyless Entry Module. Perform BODY VERIFICATION TEST - VER 1. No → Go To 2	All
2	Turn the ignition off. Remove the passenger door inner trim panel to gain access to the door lock motor connector. Disconnect the Passenger Door Lock Motor/Ajar Switch connector. Disconnect the Remote Keyless Entry Module connector. Measure the resistance of the Door Unlock Relay Output circuit between the RKE module connector and the Door Lock Motor/Ajar Switch connector. Is the resistance below 5.0 ohms? Yes → Go To 3 No → Repair the Door Unlock Relay Output circuit for an open. Perform BODY VERIFICATION TEST - VER 1.	All
3	Turn the ignition off. Remove the passenger door inner trim panel to gain access to the door lock motor connector. Disconnect the Passenger Door Lock Motor/Ajar Switch connector. Disconnect the Remote Keyless Entry Module connector. Measure the resistance of the Door Lock Relay Output circuit between the RKE module connector and the Door Lock Motor/Ajar Switch connector. Is the resistance below 5.0 ohms? Yes → Go To 4 No → Repair the Door Lock Relay Output circuit for an open. Perform BODY VERIFICATION TEST - VER 1.	All
4	If there are no possible causes remaining, view repair. Repair Replace the Door Lock Motors as necessary. Perform BODY VERIFICATION TEST - VER 1.	All

Symptom:
*ALL DOORS EXCEPT DRIVER FAIL TO UNLOCK

POSSIBLE CAUSES
DOOR UNLOCK RELAY OUTPUT CIRCUIT SHORT TO GROUND
REMOTE KEYLESS ENTRY MODULE - UNLOCK RELAY

TEST	ACTION	APPLICABILITY
1	Turn the ignition off. Disconnect the Remote Keyless Entry module connector. Measure the resistance between ground and the Door Unlock Relay Output circuit. Is the resistance below 1000.0 ohms? Yes → Repair the Door Unlock Relay Output circuit for a short to ground. Perform BODY VERIFICATION TEST - VER 1. No → Replace the Remote Keyless Entry Module. Perform BODY VERIFICATION TEST - VER 1.	All

Symptom:
*ALL DOORS FAIL TO LOCK

POSSIBLE CAUSES
DOOR LOCK RELAY OUTPUT CIRCUIT SHORT TO GROUND
DECKLID RELEASE RELAY OUTPUT SHORT TO DOOR LOCK RELAY OUTPUT
DECKLID RELEASE RELAY OUTPUT SHORT TO DRIVER DOOR UNLOCK RELAY OUTPUT
DECKLID RELEASE RELAY OUTPUT SHORT TO DOOR UNLOCK RELAY OUTPUT
REMOTE KEYLESS ENTRY MODULE - UNLOCK GROUND OPEN

TEST	ACTION	APPLICABILITY
1	Disconnect the Remote Keyless Entry module connector. Measure the resistance of the Door Lock Relay Output circuit in the RKE module connector to ground. Is the resistance below 1000.0 ohms? Yes → Repair the Door Lock Relay Output circuit for a short to ground. Perform BODY VERIFICATION TEST - VER 1. No → Go To 2	All
2	Disconnect the Remote Keyless Entry module connector. Measure the resistance between the Decklid Release Relay Output terminal and the Door Lock Relay Output terminal in the RKE Module connector. Is the resistance below 100.0 ohms? Yes → Repair the Decklid Release Relay Output wire for a short to the Door lock Relay Output wire. Perform BODY VERIFICATION TEST - VER 1. No → Go To 3	All
3	Disconnect the Remote Keyless Entry module connector. Measure the resistance between the Decklid Release Relay Output terminal and the Driver Door Unlock Relay Output terminal in the RKE Module connector. Is the resistance below 100.0 ohms? Yes → Repair the Decklid Release Relay Output wire for a short to the Driver Door Unlock Relay Output wire. Perform BODY VERIFICATION TEST - VER 1. No → Go To 4	All
4	Disconnect the Remote Keyless Entry module connector. Measure the resistance between the Decklid Release Relay Output terminal and the Door Unlock Relay Output terminal in the RKE Module connector. Is the resistance below 100.0 ohms? Yes → Repair the Decklid Release Relay Output wire for a short to the Door Unlock Relay Output wire. Perform BODY VERIFICATION TEST - VER 1. No → Go To 5	All

*ALL DOORS FAIL TO LOCK — Continued

TEST	ACTION	APPLICABILITY
5	If there are no possible causes remaining, view repair. Repair Replace the Remote Keyless Entry Module. Perform BODY VERIFICATION TEST - VER 1.	All

Symptom:
*ALL LOCKS INOPERATIVE FROM A DOOR LOCK SWITCH

POSSIBLE CAUSES
DTC PRESENT
DOOR SWITCH GROUND WIRE OPEN
DOOR SWITCH MUX WIRE SHORT TO VOLTAGE
DOOR SWITCH MUX WIRE OPEN
DOOR LOCK SWITCH - OPEN
REMOTE KEYLESS ENTRY MODULE - HIGH VOLTAGE
REMOTE KEYLESS ENTRY MODULE - LOW VOLTAGE

TEST	ACTION	APPLICABILITY
1	With the DRBIII®, read DTCs. Are there any POWER DOOR LOCK related Trouble Codes? Yes → Refer to symptom list for problems related to POWER DOOR LOCKS. Perform BODY VERIFICATION TEST - VER 1. No → Go To 2	All
2	With the DRBIII® in Sensors, read the appropriate DOOR LOCK SW voltage.. Select the reading found: Between 0.0 and 3.7 volts. Replace the Remote Keyless Entry module. Perform BODY VERIFICATION TEST - VER 1. Between 4.9 and 5.5 volts. Go To 3 Above 5.6 volts. Go To 6	All
3	Turn the ignition off. Disconnect the Door Lock Switch connector. Measure the resistance between ground and the Ground circuit in the appropriate Door Lock Switch connector.. Is the resistance below 5.0 ohms? Yes → Go To 4 No → Repair the Ground circuit for an open. Perform BODY VERIFICATION TEST - VER 1.	All

*ALL LOCKS INOPERATIVE FROM A DOOR LOCK SWITCH — Continued

TEST	ACTION	APPLICABILITY
4	Turn the ignition off. Disconnect the Remote Keyless Entry Module connector. Disconnect the Door Lock Switch connector. Measure the resistance of the appropriate Door Switch Mux circuit between the RKE connector and the Door Lock Switch connector. Is the resistance below 5.0 ohms? Yes → Go To 5 No → Repair the Door Switch Mux wire for an open. Perform BODY VERIFICATION TEST - VER 1.	All
5	If there are no possible causes remaining, view repair. Repair Replace the Door Lock Switch - open resistor. Perform BODY VERIFICATION TEST - VER 1.	All
6	Turn the ignition off. Disconnect the Remote Keyless Entry Module connector. Disconnect the Door Lock Switch connector. Measure the voltage between the appropriate Door Switch Mux circuit and ground. Is there any voltage present? Yes → Repair the Door Switch Mux wire for a short to voltage. Perform BODY VERIFICATION TEST - VER 1. No → Replace the Remote Keyless Entry module. Perform BODY VERIFICATION TEST - VER 1.	All

Symptom:
*AUTOMATIC DOOR LOCKS INOPERATIVE

POSSIBLE CAUSES
AUTO DOOR LOCKS NOT ENABLED
DOOR AJAR STATUS
PCM DTC'S PRESENT
RKE MODULE DEFECTIVE - AUTO LOCKS INOPERABLE

TEST	ACTION	APPLICABILITY
1	With the DRBIII select: ″Theft Alarm″ ″VTSS″ ″Miscellaneous″ ″Auto Door Locks″ Does the DRB show ″Auto Door Locks: ENABLED″? Yes → Go To 2 No → With the DRBIII, enable the Auto Door Locks and retest the System. Perform BODY VERIFICATION TEST - VER 1.	All
2	Ensure all doors are closed. With the DRBIII read all DOOR AJAR states Do any door ajar states show CLOSED? Yes → Refer to symptom COURTESY LAMPS ON AT ALL TIMES in the INTERIOR LIGHTING category. Perform BODY VERIFICATION TEST - VER 1. No → Go To 3	All
3	With the DRBIII read ″Engine″ DTC's. Are there any TPS or Vehicle Speed DTC's present? Yes → Refer to symptom list for problems related to DRIVEABILITY.. Perform BODY VERIFICATION TEST - VER 1. No → Go To 4	All
4	If there are no possible causes remaining, view repair. Repair Replace the Remote Keyless Entry Module. Perform BODY VERIFICATION TEST - VER 1.	All

Symptom:
*DECKLID SOLENOID INOPERATIVE

POSSIBLE CAUSES
SOLENOID GROUND OPEN
DECKLID RELEASE SOLENOID OPEN
DECKLID RELEASE RELAY OUTPUT WIRE OPEN
RKE MODULE - DECKLID RELAY OPEN

TEST	ACTION	APPLICABILITY
1	Disconnect the Decklid Solenoid connector. Connect a test light between the Decklid Release Relay Output circuit and the Ground circuit in the Decklid Solenoid connector. With the DRBIII actuate the ″Decklid Solenoid″. Did the test light illuminate when the solenoid was actuated? Yes → Replace the Decklid Release Solenoid. Perform BODY VERIFICATION TEST - VER 1. No → Go To 2	All
2	Turn ignition off. Disconnect the Decklid Solenoid connector. Using a 12-volt test light connected to 12-volts, check the Ground circuit in the Decklid Release connector. Does the test light illuminate brightly? Yes → Go To 3 No → Repair the open ground wire. Perform BODY VERIFICATION TEST - VER 1.	All
3	Turn ignition off. Disconnect the Remote Keyless Entry module connector. Disconnect the Decklid Solenoid connector. Measure the resistance of the Decklid Release Relay Output wire from the RKE module connector to the Decklid Solenoid connector. Is the resistance below 5.0 ohms? Yes → Go To 4 No → Repair the open Decklid Release Relay Output wire. Perform BODY VERIFICATION TEST - VER 1.	All
4	If there are no possible causes remaining, view repair. Repair Replace the Remote Keyless Entry Module. Perform BODY VERIFICATION TEST - VER 1.	All

Symptom:

***DOORS LOCKABLE WITH KEY IN IGNITION & DRIVER DOOR OPEN**

POSSIBLE CAUSES
DRIVER DOOR AJAR SWITCH - OPEN
OPEN DRIVER DOOR AJAR SWITCH SENSE TO RKE MODULE
IGNITION SWITCH OPEN
KEY-IN IGNITION SWITCH SENSE WIRE OPEN
OPEN DRIVER DOOR AJAR SWITCH SENSE TO CLUSTER
INSTRUMENT CLUSTER - KEY-IN IGNITION OPEN
INSTRUMENT CLUSTER DEFECTIVE-DRIVER DOOR AJAR OPEN
RKE MODULE DEFECTIVE-OPEN DRIVER DOOR AJAR

TEST	ACTION	APPLICABILITY
1	Open the Drivers door. With the DRB III select: ″Body″ ″Electro/Mech Cluster″ ″Input/Output″ Read the ″Drv Door Ajar Sw″ state. Does the DRBIII Show: ″CLOSED″? No → Go To 2 Yes → Go To 5	All
2	Remove the driver door inner trim panel to gain access to the Door Lock Motor/Ajar Switch connector. Disconnect the Door Lock Motor/ Ajar Switch connector (Left Front or Right Front). Connect a jumper wire between Door Ajar Switch Sense circuit (driver door) and ground. With the DRB III select: ″Body″ ″Electro/Mech Cluster″ ″Input/Output″ Read the ″Drv Door Ajar Sw″ state. Does the DRBIII show: ″Closed″? Yes → Replace the Driver Door Ajar Switch. Perform BODY VERIFICATION TEST - VER 1. No → Go To 3	All
3	Turn ignition off. Disconnect the Door Lock Motor/Ajar Switch (driver door) connector. Disconnect the Instrument Cluster connector. Measure the resistance of the Door Ajar Switch Sense (driver door) circuit between the Door Lock Motor/Ajar Switch connector and the Instrument Cluster connector. Is the resistance below 5.0 ohms? Yes → Go To 4 No → Repair the Driver Door Ajar Switch Sense wire for an open. Perform BODY VERIFICATION TEST - VER 1.	All

*DOORS LOCKABLE WITH KEY IN IGNITION & DRIVER DOOR OPEN — Continued

TEST	ACTION	APPLICABILITY
4	If there are no possible causes remaining, view repair. Repair Replace the Instrument Cluster Perform BODY VERIFICATION TEST - VER 1.	All
5	**Note: Ensure that the Key is still in the Ignition Switch.** With the DRB, read the Key-In Ignition status. Does the DRB show KEY-IN IGN: CLOSED ? No → Go To 6 Yes → Go To 9	All
6	Ensure the Instrument Cluster is connected before proceeding. Disconnect the Ignition Switch connector. Connect a jumper wire from the Key-In Ignition Switch Sense circuit in the ignition switch connector to ground. With the DRB, read the Key-In Ignition status. Does the DRB show KEY-IN IGN: CLOSED ? Yes → Replace the Ignition Switch. Perform BODY VERIFICATION TEST - VER 1. No → Go To 7	All
7	Disconnect the Ignition Switch connector. Disconnect the Instrument Cluster connector. Measure the resistance of the Key-In Ignition Switch Sense circuit between the ignition switch connector and the instrument cluster connector. Is the resistance below 5.0 ohms? Yes → Go To 8 No → Repair the open Key-In Ignition Switch Sense wire. Perform BODY VERIFICATION TEST - VER 1.	All
8	If there are no possible causes remaining, view repair. Repair Replace the Instrument Cluster (key-in ign open). Perform BODY VERIFICATION TEST - VER 1.	All
9	Turn ignition off. Remove the driver door inner trim panel. Disconnect the Driver Door Lock Motor/Ajar Switch connector. Disconnect the RKE Module connector. Measure the resistance of the Driver Door Ajar Switch Sense circuit between the Driver Door Lock Motor/Ajar Switch connector and the RKE module connector. Is the resistance below 5.0 ohms? Yes → Go To 10 No → Repair the open Driver Door Ajar Switch Sense wire. Perform BODY VERIFICATION TEST - VER 1.	All
10	If there are no possible causes remaining, view repair. Repair Replace the Remote Keyless Entry Module. Perform BODY VERIFICATION TEST - VER 1.	All

Symptom:
*DRIVER DOOR FAILS TO LOCK & UNLOCK

POSSIBLE CAUSES
RKE MODULE - OPEN DRIVER UNLOCK CIRCUIT
DRIVER DOOR LOCK MOTOR - OPEN
DRIVER DOOR LOCK RELAY OUTPUT WIRE OPEN
DRIVER DOOR UNLOCK RELAY OUTPUT WIRE OPEN

TEST	ACTION	APPLICABILITY
1	Disconnect the Remote Keyless Entry module connector. Lower the driver door window. Connect a jumper wire between the Door Lock Relay Output ckt and the Ground ckt in the RKE module connector. Connect a jumper wire to the Driver Door Unlock Relay Output ckt and momentarily touch it to the Fused B(+) ckt and observe the door lock. Reverse the jumper wires to drive the motor in the opposite direction. Did the drivers door Lock and Unlock? Yes → Replace the Remote Keyless Entry Module. Perform BODY VERIFICATION TEST - VER 1. No → Go To 2	All
2	Ensure the RKE module is connected before proceeding. Remove the inner door trim panel to gain access to the Door Lock Motor connector. Disconnect the Door Lock Motor connector. Connect a test light between the Door Lock Relay Output and the Driver Door Unlock Relay Output circuits in the door lock motor connector. Press the door lock switch to the Lock and Unlock positions. Did the test light illuminate when the lock switch was pressed in both directions? Yes → Replace the Driver Door Lock Motor. Perform BODY VERIFICATION TEST - VER 1. No → Go To 3	All
3	Remove the inner door trim panel to gain access to the Door Lock Motor connector. Disconnect the Door Lock Motor connector. Disconnect the Remote Keyless Entry module connector. Measure the resistance of the Door Lock Relay Output wire between the RKE connector and the door lock motor connector. Is the resistance below 5.0 ohms? Yes → Go To 4 No → Repair the Driver Door Lock Relay Output Wire for an open. Perform BODY VERIFICATION TEST - VER 1.	All

*DRIVER DOOR FAILS TO LOCK & UNLOCK — Continued

TEST	ACTION	APPLICABILITY
4	Remove the inner door trim panel to gain access to the Door Lock Motor connector. Disconnect the Door Lock Motor connector. Disconnect the Remote Keyless Entry module connector. Measure the resistance of the Driver Door Unlock Relay Output wire between the RKE connector and the door lock motor connector. Is the resistance below 5.0 ohms? Yes → Test Complete. No → Repair the open Driver Door Unlock Relay Output wire. Perform BODY VERIFICATION TEST - VER 1.	All

Symptom:
*DRIVER DOOR FAILS TO UNLOCK

POSSIBLE CAUSES
DRIVER DOOR UNLOCK RELAY OUTPUT WIRE SHORT TO GROUND
RKE MODULE DEFECTIVE - DRIVER UNLOCK OPEN

TEST	ACTION	APPLICABILITY
1	Turn ignition off. Disconnect the Remote Keyless Entry module connector. Measure the resistance of the Driver Door Unlock Relay Output circuit in the RKE module connector to body ground. Is the resistance below 1000.0 ohms? Yes → Repair the Driver Door Unlock Relay Output wire for a short to ground. Perform BODY VERIFICATION TEST - VER 1. No → Replace the Remote Keyless Entry Module. Perform BODY VERIFICATION TEST - VER 1.	All

Symptom:
*ONE PASSENGER DOOR FAILS TO LOCK & UNLOCK

POSSIBLE CAUSES
DOOR LOCK MOTOR - OPEN
DOOR UNLOCK RELAY OUTPUT WIRE OPEN
DOOR LOCK RELAY OUTPUT WIRE OPEN
DOOR UNLOCK RELAY OUTPUT WIRE SHORT TO GROUND
DOOR UNLOCK RELAY OUTPUT SHORT TO DOOR LOCK RELAY OUTPUT
DOOR LOCK RELAY OUTPUT WIRE SHORT TO GROUND

TEST	ACTION	APPLICABILITY
1	Remove the inner door trim panel to gain access to the Door Lock Motor connector. Disconnect the appropriate Door Lock Motor connector. Connect a test light between the Door Lock Relay Output and the Door Unlock Relay Output circuits in the door lock motor connector. Press the door lock switch to the Lock and Unlock positions. Did the test light illuminate when the lock switch was pressed in both directions? Yes → Replace the Door Lock Motor. Perform BODY VERIFICATION TEST - VER 1. No → Go To 2	All
2	Turn ignition off. Remove the appropriate inner door trim panel to gain access to the Door Lock Motor connector. Disconnect the Door Lock Motor connector. Disconnect the Remote Keyless Entry module connector. Measure the resistance of the Door Lock Relay Output wire between the RKE module connector and the door lock motor connector. Is the resistance below 5.0 ohms? Yes → Go To 3 No → Repair the Door Lock Relay Output wire for an open. Perform BODY VERIFICATION TEST - VER 1.	All
3	Turn ignition off. Remove the appropriate inner door trim panel to gain access to the Door Lock Motor connector. Disconnect the Door Lock Motor connector. Disconnect the Remote Keyless Entry module connector. Measure the resistance of the Door Unlock Relay Output wire between the RKE module connector and the door lock motor connector. Is the resistance below 5.0 ohms? Yes → Go To 4 No → Repair the Door Unlock Relay Output wire for an open. Perform BODY VERIFICATION TEST - VER 1.	All

*ONE PASSENGER DOOR FAILS TO LOCK & UNLOCK — Continued

TEST	ACTION	APPLICABILITY
4	Turn ignition off. Remove the appropriate inner door trim panel to gain access to the Door Lock Motor connector. Disconnect the Door Lock Motor connector. Disconnect the Remote Keyless Entry module connector. Measure the resistance of the Door Unlock Relay Output wire to ground. Is the resistance below 1000.0 ohms? Yes → Repair the Door Unlock Relay Output wire for a short to ground. Perform BODY VERIFICATION TEST - VER 1. No → Go To 5	All
5	Turn ignition off. Remove the appropriate inner door trim panel to gain access to the Door Lock Motor connector. Disconnect the Door Lock Motor connector. Disconnect the Remote Keyless Entry module connector. Measure the resistance between the Door Unlock Relay Output circuit and the Door Lock Relay Output circuit Is the resistance below 1000.0 ohms? Yes → Repair the Door Unlock Relay Output wire for a short to the Door Lock Relay Output wire. Perform BODY VERIFICATION TEST - VER 1. No → Go To 6	All
6	Turn ignition off. Remove the appropriate inner door trim panel to gain access to the Door Lock Motor connector. Disconnect the Door Lock Motor connector. Disconnect the Remote Keyless Entry module connector. Measure the resistance of the Door Lock Relay Output wire to ground. Is the resistance below 1000.0 ohms? Yes → Repair the Door Lock Relay Output wire for a short to ground. Perform BODY VERIFICATION TEST - VER 1. No → Test Complete.	All

Symptom:
*RKE INOPERATIVE

POSSIBLE CAUSES
TEST TRANSMITTER WITH TESTER
RKE TRANSMITTER NOT PROGRAMMED
TEST RKE TRANSMITTER
RKE TRANSMITTER - INOPERATIVE
RKE MODULE
RKE MODULE - RECEIVER INOPERABLE

TEST	ACTION	APPLICABILITY
1	**NOTE: Ensure the RKE module is configured for RKE and the M1 (IOD) fuse is installed.** **Note: Ensure the voltage of each battery is greater than 3.0 volts before proceeding.** Do you have access to the Miller Tool ″9001 RF DETECTOR″? ? Yes → Go To 2 No → Go To 4	All
2	Using the 9001 RF Detector, follow the instructions on the back of the tester and test the transmitter several times. Does the signal strength measure ″STRONG″? Yes → Go To 3 No → Replace the transmitter. Perform BODY VERIFICATION TEST - VER 1.	All
3	Turn the ignition on Place transmission in the Park position. Ensure Vehicle Theft Security System (if equipped) is in Disarm Mode. With the DRBIII®, select Theft Alarm, VTSS, MISCELLANEOUS, then PROGRAM RKE. Follow the instructions on the screen. Exit PROGRAM RKE. Activate the Door Locks using the RKE Transmitter. Did the door locks respond properly to the RKE transmitter commands? Yes → Repair complete. Perform BODY VERIFICATION TEST - VER 1. No → Replace the Remote Keyless Entry Module and reprogram all transmitters used with this vehicle. Perform BODY VERIFICATION TEST - VER 1.	All

*RKE INOPERATIVE — Continued

TEST	ACTION	APPLICABILITY
4	Using the DRBIII select Theft Alarm, VTSS, MISCELLANEOUS then RKE FOB & Module Test. Follow the instructions on the DRBIII screen. Try the Door Locks using the original Transmitter. Did the Door Locks respond properly to the Transmitter commands ? Yes → Using the DRBIII, program the transmitter and recheck the system. If okay, program all Transmitters that will be used with this vehicle. Perform BODY VERIFICATION TEST - VER 1. No → Go To 5	All
5	Secure a known good Transmitter from another PL or PT vehicle. Using the DRBIII select BODY, Theft Alarm, VTSS, MISCELLANEOUS then RKE FOB & Module Test. Follow the instructions on the DRBIII screen. Try the Door Locks using the Transmitter. Did the Door Locks respond properly to the Transmitter commands ? Yes → Replace the original Transmitter. Program all Transmitters that will be used with this Vehicle. Perform BODY VERIFICATION TEST - VER 1. No → Replace the Remote Keyless Entry Module. Perform BODY VERIFICATION TEST - VER 1.	All

Symptom:
HOOD AJAR SWITCH MISSING (EXPORT ONLY)

When Monitored and Set Condition:

HOOD AJAR SWITCH MISSING (EXPORT ONLY)

When Monitored: With the ignition on during configuration of the Remote Keyless Entry Module.

Set Condition: If the Hood Ajar Switch RKE Module input is NOT grounded while the module is being configured for VTSS, this code will set.

POSSIBLE CAUSES
MODULE CONFIGURATION TEST
HOOD AJAR SWITCH OPERATIONAL TEST
OPEN GROUND CIRCUIT
HOOD AJAR SWITCH SENSE CIRCUIT OPEN
HOOD AJAR SWITCH
RKE MODULE - HOOD AJAR

TEST	ACTION	APPLICABILITY
1	Was the hood open during module configuration? Yes → Go To 2 No → Open the hood and attempt to reconfigure the RKE module.	All
2	Open the hood. With the DRBIII® select: VEHICLE THEFT, VTSS, INPUT/OUTPUT. Read the HOOD AJAR SW state. Does the DRBIII® show CLOSED? Yes → Replace the Remote Keyless Entry Module. Perform VTSS VERIFICATION TEST - 1A. No → Go To 3	All
3	Disconnect the Hood Ajar Switch connector. Measure the resistance of the Ground circuit in the Hood Ajar connector. Is the resistance below 5.0 ohms? Yes → Go To 4 No → Repair the Ground circuit for an open. Perform VTSS VERIFICATION TEST - 1A.	All

HOOD AJAR SWITCH MISSING (EXPORT ONLY) — Continued

TEST	ACTION	APPLICABILITY
4	Disconnect the Hood Ajar Switch connector. Disconnect the Remote Keyless Entry Module connector. Measure the resistance of the Hood Ajar Switch Sense circuit between the switch connector and the RKE module connector. Is the resistance below 5.0 ohms? Yes → Go To 5 No → Repair the Hood Ajar Switch Sense circuit for an open. Perform VTSS VERIFICATION TEST - 1A.	All
5	Disconnect the Hood Ajar Switch connector. Connect a jumper wire between the Hood Ajar Switch Sense circuit and ground. Does the DRBIII® show Hood Ajar Sw: Closed? Yes → Replace the Hood Ajar Switch. Perform VTSS VERIFICATION TEST - 1A. No → Replace the Remote Keyless Entry Module. Perform VTSS VERIFICATION TEST - 1A.	All

Symptom:
MODULE PREVIOUSLY CONFIGURED FOR VTSS

When Monitored and Set Condition:

MODULE PREVIOUSLY CONFIGURED FOR VTSS

When Monitored: With the ignition on during the configuration of the Remote Keyless Entry Module.

Set Condition: If the configuration of the module type has been previously set for VTSS, an attempt to set the module for non-VTSS will cause the new configuration to fail. This code should only appear if attempting to re-configure a used RKE module.

POSSIBLE CAUSES
REMOTE KEYLESS ENTRY MODULE

TEST	ACTION	APPLICABILITY
1	The RKE module attempting to be configured to non-VTSS, has originally been configured to be used on a VTSS equipped vehicle. If the vehicle is NOT VTSS equipped (does not have either a hood ajar or a decklid security switch (knockout)) the RKE module attempting to be configured should be replaced. If there are no possible causes remaining, view repair. Repair Replace the Remote Keyless Entry Module. Perform VTSS VERIFICATION TEST - 1A.	All

Symptom:
*ALARM TRIPS ON ITS OWN

POSSIBLE CAUSES
LAST VTSS CAUSE
ATTEMPT TO TRIP ALARM
INTERMITTENT CONDITION

TEST	ACTION	APPLICABILITY
1	With the DRBIII® in Theft Alarm Monitor Display, read the Alarm Tripped By state. Were there any causes displayed? Yes → Check for a possible intermittent condition with the circuit indicated by the DRBIII®. Perform VTSS VERIFICATION TEST - 1A. No → Go To 2	All
2	Is this an export vehicle equipped with a hood ajar switch? Yes → Go To 3 No → Go To 4	All
3	Remove the ignition key (but keep in hand). Lock the vehicle and close all the doors and hood. Allow the VTSS to arm. Lightly tap on hood near ajar switch to simulate wind and noise vibration. Did the VTSS trip to the alarming state? Yes → Replace the hood ajar switch. Perform VTSS VERIFICATION TEST - 1A. No → Go To 4	All
4	**NOTE: The condition that caused the alarm is not present at this time. The following list may help in indentifying the intermittent condition.** Refer to any Technical Service Bulletins (TSB) that may apply. Visually inspect related wiring harnesses. Look for chafed, pierced, pinched, or partially broken wires. Visually inspect the related wiring harness connectors. Look for loose connections, broken, bent, pushed out, or corroded terminals. Were any of the above conditions present? Yes → Repair as necessary Perform VTSS VERIFICATION TEST - 1A. No → Test Complete.	All

Symptom:
*HEADLAMPS FAIL TO FLASH DURING ALARM

POSSIBLE CAUSES
DIMMER SWITCH LOW BEAM OUTPUT CIRCUIT OPEN
REMOTE KEYLESS ENTRY MODULE

TEST	ACTION	APPLICABILITY
1	Ensure the Low Beam Headlamps are operational before proceeding. If the lamps are not working properly, refer to symptom LOW BEAM HEADLAMPS WILL NOT TURN ON in the EXTERIOR LIGHTING category. Disconnect the Remote Keyless Entry module connector. Connect a test light from the Dimmer Switch Low Beam Output circuit to ground. Turn the Low Beam Headlamps on. Does the test light illuminate when the low beam headlamps are on? Yes → Replace the Remote Keyless Entry Module. Perform VTSS VERIFICATION TEST - 1A. No → Repair the Dimmer Switch Low Beam Output circuit for an open. Perform VTSS VERIFICATION TEST - 1A.	All

Symptom:
*HORN FAILS TO SOUND DURING ALARM

POSSIBLE CAUSES
HORN RELAY CONTROL CIRCUIT OPEN
REMOTE KEYLESS ENTRY MODULE

TEST	ACTION	APPLICABILITY
1	Ensure the horn is operational from the horn switch before proceeding. If the horn does not work properly, refer to the appropriate Service Information and repair the Horn circuit as necessary. Disconnect the Remote Keyless Entry module connector. Connect one end of a jumper wire to the Horn Relay Control circuit in the RKE connector. Momentarily touch the other end of the jumper wire to ground. Did the horn sound when the jumper wire was attached? Yes → Replace the Remote Keyless Entry Module. Perform VTSS VERIFICATION TEST - 1A. No → Repair the Horn Relay Control circuit for an open. Perform VTSS VERIFICATION TEST - 1A.	All

Symptom:
*INTRUSION SENSOR CANNOT BE DISABLED (EXPORT ONLY)

POSSIBLE CAUSES
INTRUSION SENSOR
REMOTE KEYLESS ENTRY MODULE

TEST	ACTION	APPLICABILITY
1	Disconnect the Dome Lamp/Intrusion Sensor connector. Measure the voltage between the Intrusion Sensor Signal circuit and ground. Is the voltage above 10.0 volts? Yes → Replace the Intrusion Sensor. Perform VTSS VERIFICATION TEST - 1A. No → Replace the Remote Keyless Entry Module in accordance with the Service Information. Perform VTSS VERIFICATION TEST - 1A.	All

Symptom:
*INTRUSION SENSOR FAILS TO TRIP VTSS (EXPORT ONLY)

POSSIBLE CAUSES
INTRUSION SENSOR
OPEN FUSED B(+) CIRCUIT
OPEN GROUND CIRCUIT
INTRUSION SENSOR SIGNAL CIRCUIT OPEN
INTRUSION SENSOR SIGNAL CIRCUIT SHORTED TO GROUND
INTRUSION SENSOR
REMOTE KEYLESS ENTRY MODULE

TEST	ACTION	APPLICABILITY
1	Ensure the IOD fuse is installed. Using the DRBIII®, read the module configuration and ensure it is configured for PREMIUM VTA. With the DRBIII® select: THEFT ALARM, VTSS, SYSTEM TEST and INTRUSION SENSOR TEST. While waving your hand around the Intrusion Sensor, read the DRBIII®. Does the DRBIII® display INTRUSION DETECTED? Yes → Verify the system has not been armed with the intrusion sensor disabled. Replace the Intrusion Sensor if the problem remains intermittent. Perform VTSS VERIFICATION TEST - 1A. No → Go To 2	All
2	Disconnect the Dome Lamp/Intrusion Sensor connector. Measure the voltage between the Fused B(+) circuit and ground. Is the voltage above 10.0 volts? Yes → Go To 3 No → Repair the Fused B(+) circuit for an open between the IOD fuse and the Intrusion Sensor. Perform VTSS VERIFICATION TEST - 1A.	All
3	Disconnect the Dome Lamp/Intrusion Sensor connector. Turn the ignition and all the lights off. Measure the resistance between ground and the Ground circuit. Is the resistance below 5.0 ohms? Yes → Go To 4 No → Repair the Ground circuit for an open. Perform VTSS VERIFICATION TEST - 1A.	All

*INTRUSION SENSOR FAILS TO TRIP VTSS (EXPORT ONLY) — Continued

TEST	ACTION	APPLICABILITY
4	Disconnect the Dome Lamp/Intrusion Sensor connector. Disconnect the Remote Keyless Entry Module connector. Measure the resistance of the Intrusion Sensor Signal circuit between the sensor connector and the RKE module connector. Is the resistance below 5.0 ohms? Yes → Go To 5 No → Repair the Intrusion Sensor Signal circuit for an open. Perform VTSS VERIFICATION TEST - 1A.	All
5	Turn the ignition and all the lights off. Disconnect the Dome Lamp/Intrusion Sensor connector. Disconnect the Remote Keyless Entry Module Connector. Measure the resistance of the Intrusion Sensor Signal circuit to ground. Is the resistance below 1000.0 ohms? Yes → Repair the Intrusion Sensor Signal circuit for a short to ground. Perform VTSS VERIFICATION TEST - 1A. No → Go To 6	All
6	Disconnect the Dome Lamp/Intrusion Sensor connector. Backprobe a voltmeter lead to the Intrusion Sensor Signal circuit in the sensor connector and the other lead to ground. Reconnect the Intrusion Sensor Signal connector. Wave your hand around the Intrusion Sensor and observe the voltmeter. Is the voltage between 3.0 and 6.0 volts? Yes → Replace the Remote Keyless Entry Module in accordance with the Service Information. Perform VTSS VERIFICATION TEST - 1A. No → Replace the Intrusion Sensor in accordance with the Service Information. Perform VTSS VERIFICATION TEST - 1A.	All

Symptom:

***INTRUSION SENSOR REPEATEDLY TRIGGERS VTSS (EXPORT ONLY)**

POSSIBLE CAUSES
INTRUSION SENSOR
REMOTE KEYLESS ENTRY MODULE

TEST	ACTION	APPLICABILITY
1	**NOTE: Ensure there are no hanging objects or loose seat belts causing the false triggering. Also, ensure there is no dust or debris around the intrusion sensor causing the false triggering.** Disconnect the Dome Lamp/Intrusion Sensor connector. Close all the doors and arm the VTSS. Does the alarm inadvertently trigger due to intrusion sense even though the sensor is disconnected? Yes → Replace the Remote Keyless Entry Module in accordance with the Service Information. Perform VTSS VERIFICATION TEST - 1A. No → Replace the Intrusion Sensor in accordance with the Service Information. Perform VTSS VERIFICATION TEST - 1A.	All

Symptom:
*OPEN DRIVER DOOR FAILS TO TRIP ALARM

POSSIBLE CAUSES
DRIVER DOOR AJAR SWITCH
DRIVER DOOR AJAR SWITCH GROUND CIRCUIT OPEN
DRIVER DOOR AJAR SWITCH SENSE CIRCUIT OPEN
REMOTE KEYLESS ENTRY MODULE

TEST	ACTION	APPLICABILITY
1	Disconnect the Driver Door Ajar switch connector. Using a 12-volt Test Light connected to 12-volts, test the Ground circuit for continuity. Does the light illuminate? Yes → Go To 2 No → Repair the Driver Door Ajar Switch Ground circuit for an open. Perform BODY VERIFICATION TEST - VER 1.	All
2	Disconnect the Driver Door Lock Motor/Ajar Switch connector. Connect a jumper wire between the Door Ajar Switch Sense circuit and ground. With the DRBIII® select: THEFT ALARM, VTSS, INPUT/OUTPUT. With the DRBIII®, read the DRV DOOR AJAR SW state. Does the DRBIII® show: CLOSED? Yes → Replace the Driver Door Lock Motor/Ajar Switch. Perform VTSS VERIFICATION TEST - 1A. No → Go To 3	All
3	Turn the ignition off. Disconnect the Driver Door Lock Motor/Ajar Switch connector. Disconnect the RKE Module connector. Measure the resistance of the Door Ajar Switch Sense circuit between the door ajar switch connector and the RKE module connector. Is the resistance below 5.0 ohms? Yes → Replace the Remote Keyless Entry Module. Perform VTSS VERIFICATION TEST - 1A. No → Repair the Door Ajar Switch Sense circuit for an open. Perform VTSS VERIFICATION TEST - 1A.	All

Symptom:
*OPEN PASSENGER DOOR FAILS TO TRIP ALARM

POSSIBLE CAUSES
LEFT REAR DOOR AJAR SWITCH GROUND CIRCUIT OPEN
PASSENGER DOOR AJAR SWITCH
PASSENGER DOOR AJAR SWITCH GROUND CIRCUIT OPEN
RIGHT REAR DOOR AJAR SWITCH GROUND CIRCUIT OPEN
PASSENGER DOOR AJAR/RKE SENSE CIRCUIT OPEN
LEFT REAR DOOR AJAR SWITCH
PASSENGER DOOR AJAR/RKE SENSE CIRCUIT OPEN
RIGHT REAR DOOR AJAR SWITCH
PASSENGER DOOR AJAR/RKE CIRCUIT OPEN
PASSENGER DOOR AJAR/RKE SENSE CIRCUIT OPEN
REMOTE KEYLESS ENTRY MODULE
RKE MODULE - PASSENGER DOOR AJAR SENSE

TEST	ACTION	APPLICABILITY
1	Close all passenger doors. With the DRBIII® select: THEFT ALARM, VTSS, INPUT/OUTPUT. Read the PASS DOOR AJAR SW state and open and close each passenger door. Select the door(s) that did not show CLOSED when that door was opened. Passenger Go To 2 Left Rear Go To 4 Right Rear Go To 6 All Passenger Doors Go To 8 All Door States Read Correctly Retest the VTSS system. If the passenger doors will still not trip the alarm, replace the Remote Keyless Entry Module. Perform VTSS VERIFICATION TEST - 1A.	All
2	Disconnect the Passenger Door Ajar switch connector. Using a 12-volt Test Light connected to 12-volts, test the Ground circuit for continuity. Does the light illuminate? Yes → Go To 3 No → Repair the Passenger Door Ajar Switch Ground circuit for an open. Perform VTSS VERIFICATION TEST - 1A.	All

*OPEN PASSENGER DOOR FAILS TO TRIP ALARM — Continued

TEST	ACTION	APPLICABILITY
3	Open the Passenger Door. Disconnect the Passenger Door Lock Motor/Ajar Switch connector. Close all the other passenger doors. Connect a jumper wire from the Passenger Door Ajar/RKE Sense circuit to ground. With the DRBIII® select: THEFT ALARM, VTSS, INPUT/OUTPUT. With the DRBIII®, read the PASS DOOR AJAR SW state. Does the DRBIII® show: CLOSED? Yes → Replace the Passenger Door Lock Motor/Ajar Switch. Perform VTSS VERIFICATION TEST - 1A. No → Repair the Door Ajar Switch Sense circuit for an open between the door ajar switch and the splice. Perform VTSS VERIFICATION TEST - 1A.	All
4	Disconnect the Passenger Door Ajar switch connector. Using a 12-volt Test Light connected to 12-volts, test the Ground circuit for continuity. Does the light illuminate? Yes → Go To 5 No → Repair the Left Rear Door Ajar Switch Ground circuit for an open. Perform VTSS VERIFICATION TEST - 1A.	All
5	Open the Left Rear Door. Disconnect the Left Rear Door Ajar Switch connector. Close all the other Passenger Doors. Connect a jumper wire from the Passenger Door Ajar/RKE Sense circuit to ground. With the DRBIII® select: THEFT ALARM, VTSS, INPUT/OUTPUT. With the DRBIII®, read the PASS DOOR AJAR SW state. Does the DRBIII® show: CLOSED? Yes → Replace the Left Rear Door Ajar Switch. Perform VTSS VERIFICATION TEST - 1A. No → Repair the Door Ajar Switch Sense circuit for an open between the door ajar switch and the splice. Perform VTSS VERIFICATION TEST - 1A.	All
6	Disconnect the Driver Door Ajar switch connector. Using a 12-volt Test Light connected to 12-volts, test the Ground circuit for continuity. Does the light illuminate? Yes → Go To 7 No → Repair the Right Rear Door Ajar Switch Ground circuit for an open. Perform VTSS VERIFICATION TEST - 1A.	All

*OPEN PASSENGER DOOR FAILS TO TRIP ALARM — Continued

TEST	ACTION	APPLICABILITY
7	Open the Right Rear Door. Disconnect the Driver Door Ajar Switch connector. Close all the other Passenger Doors. Connect a jumper wire from the Passenger Door Ajar/RKE Sense circuit to ground. With the DRBIII® select: THEFT ALARM, VTSS, INPUT/OUTPUT. With the DRBIII®, read the PASS DOOR AJAR SW state. Does the DRBIII® show: CLOSED? Yes → Replace the Right Rear Door Ajar Switch. Perform VTSS VERIFICATION TEST - 1A. No → Repair the Door Ajar Switch Sense circuit for an open between the door ajar switch and the splice. Perform VTSS VERIFICATION TEST - 1A.	All
8	Turn the ignition off. Disconnect the Passenger Door Ajar Switch connector. Disconnect the RKE Module connector. Measure the resistance of the Passenger Door Ajar/RKE Sense circuit between the door ajar switch connector and the RKE module connector. Is the resistance below 5.0 ohms? Yes → Replace the Remote Keyless Entry Module. Perform VTSS VERIFICATION TEST - 1A. No → Repair the Passenger Door Ajar/RKE Sense circuit for an open. Perform VTSS VERIFICATION TEST - 1A.	All

Symptom:
*PARK LAMPS FAIL TO FLASH DURING ALARM

POSSIBLE CAUSES
PARK LAMP SWITCH OUTPUT CIRCUIT OPEN
REMOTE KEYLESS ENTRY MODULE

TEST	ACTION	APPLICABILITY
1	Ensure the park lamps are operational from the multifunction switch. If the park lamps are inoperative, refer to the appropriate Service Information and repair the Park Lamp circuit as necessary. Disconnect the Remote Keyless Entry Module connector. Connect a test light to the Park Lamp Switch Output circuit (cav 2) to ground. Turn the Park Lamps on. Does the test light illuminate when the Park Lamps are on? Yes → Replace the Remote Keyless Entry Module. Perform VTSS VERIFICATION TEST - 1A. No → Repair the Park Lamp Switch Output circuit for an open. Perform VTSS VERIFICATION TEST - 1A.	All

Symptom List:

***VTSS FAILS TO ARM FROM DRIVER DOOR CYLINDER LOCK SWITCH (EXPORT ONLY)**

***VTSS FAILS TO ARM/DISARM FROM DRIVER DOOR CYLINDER LOCK SWITCH**

Test Note: All symptoms listed above are diagnosed using the same tests. The title for the tests will be *VTSS FAILS TO ARM FROM DRIVER DOOR CYLINDER LOCK SWITCH (EXPORT ONLY).

POSSIBLE CAUSES
DOOR LOCK OPERATION TEST
GROUND CIRCUIT OPEN
DRIVER DOOR SWITCH MUX CIRCUIT OPEN
DRIVER CYLINDER LOCK SWITCH FAULTY

TEST	ACTION	APPLICABILITY
1	Open the driver door and operate the door locks from the door lock switch. Did the door locks operate properly? Yes → Go To 2 No → Refer to symptom: *ALL LOCKS INOPERATIVE FROM DRIVER DOOR LOCK SWITCH in the POWER DOOR LOCKS/RKE category.	All
2	Disconnect the Cylinder Lock Switch connector. Measure the resistance of the ground circuit to body ground. Is the resistance below 5.0 ohms? Yes → Go To 3 No → Repair the ground circuit for an open. Perform VTSS VERIFICATION TEST - 1A.	All
3	Disconnect the Cylinder Lock Switch connector. Measure the voltage between the Driver Door Switch Mux circuit and ground. Is the voltage approximately 5.0 volts? Yes → Replace the Driver Cylinder Lock Switch. Perform VTSS VERIFICATION TEST - 1A. No → Repair the Driver Door Switch Mux circuit for an open. Perform VTSS VERIFICATION TEST - 1A.	All

Symptom:

*VTSS FAILS TO ARM FROM PASSENGER DOOR CYLINDER LOCK SWITCH (EXPORT ONLY)

POSSIBLE CAUSES
DOOR LOCK OPERATION TEST
GROUND CIRCUIT OPEN
PASSENGER DOOR SWITCH MUX CIRCUIT OPEN
PASSENGER CYLINDER LOCK SWITCH FAULTY

TEST	ACTION	APPLICABILITY
1	Open the passenger door and operate the door locks from the door lock switch. Did the door locks operate properly? Yes → Go To 2 No → Refer to symptom: *ALL LOCKS INOPERATIVE FROM PASSENGER DOOR LOCK SWITCH in the POWER DOOR LOCKS/RKE category.	All
2	Disconnect the Cylinder Lock Switch connector. Measure the resistance of the ground circuit to body ground. Is the resistance below 5.0 ohms? Yes → Go To 3 No → Repair the ground circuit for an open. Perform VTSS VERIFICATION TEST - 1A.	All
3	Disconnect the Cylinder Lock Switch connector. Measure the voltage between the Passenger Door Switch Mux circuit and ground. Is the voltage approximately 5.0 volts? Yes → Replace the Passenger Cylinder Lock Switch. Perform VTSS VERIFICATION TEST - 1A. No → Repair the Passenger Door Switch Mux circuit for an open. Perform VTSS VERIFICATION TEST - 1A.	All

Symptom:
*VTSS INDICATOR FAILS TO FLASH

POSSIBLE CAUSES
REMOTE KEYLESS ENTRY MODULE
INSTRUMENT CLUSTER
VTSS INDICATOR DRIVER CIRCUIT OPEN
VTSS LED OPEN

TEST	ACTION	APPLICABILITY
1	**NOTE: The VTSS must be enabled for the Indicator Lamp to operate. To help ensure an accurate diagnosis, verify the system is enabled before proceeding.** Disconnect the Remote Keyless Entry Module connector. Connect a jumper wire between the VTSS Indicator Driver circuit and ground. Does the VTSS Indicator illuminate? Yes → Replace the Remote Keyless Entry Module. Perform VTSS VERIFICATION TEST - 1A. No → Go To 2	All
2	Disconnect the Remote Keyless Entry Module connector. Disconnect the Instrument Cluster connector. Measure the resistance of the VTSS Indicator Driver circuit between the RKE module connector and the Instrument Cluster connector. Is the resistance below 5.0 ohms? Yes → Go To 3 No → Repair the VTSS Indicator Driver circuit for an open. Perform VTSS VERIFICATION TEST - 1A.	All
3	Remove the VTSS Indicator LED from the Instrument Cluster. Test the VTSS Indicator LED for functionality. Does the VTSS Indicator LED light? Yes → Replace the Instrument Cluster. Perform VTSS VERIFICATION TEST - 1A. No → Replace the VTSS LED. Perform VTSS VERIFICATION TEST - 1A.	All

Symptom:
*VTSS INDICATOR STAYS ON STEADY DURING ARMING

POSSIBLE CAUSES
DECKLID SECURITY SWITCH SENSE CIRCUIT OPEN (IF EQUIPPED)
DECKLID SECURITY SWITCH GROUND CIRCUIT OPEN (IF EQUIPPED)
DECKLID SECURITY SWITCH (IF EQUIPPED)
HOOD AJAR SWITCH SENSE CIRCUIT SHORTED TO GROUND (IF EQUIPPED)
HOOD AJAR SWITCH (IF EQUIPPED)
RKE MODULE - VTSS INDICATOR
RKE MODULE - HOOD AJAR (IF EQUIPPED)
RKE MODULE - DECKLID SECURITY (IF EQUIPPED)

TEST	ACTION	APPLICABILITY
1	Is this vehicle equipped with a hood ajar switch? Yes → Go To 2 No → Go To 4	All
2	Ensure the hood is closed and aligned properly. With the DRBIII®, read the Hood Ajar status. Does the DRBIII® show OPEN? Yes → Go To 4 No → Go To 3	All
3	Disconnect the Hood Ajar switch connector. Disconnect the Remote Keyless Entry Module connector. Measure the resistance of the Hood Ajar Switch Sense circuit to ground. Is the resistance below 1000.0 (1k) ohms? Yes → Repair the Hood Ajar Switch Sense circuit for a short to ground. Perform VTSS VERIFICATION TEST - 1A. No → Replace the Hood Ajar Switch. Perform VTSS VERIFICATION TEST - 1A.	All
4	Is this vehicle equipped with a Decklid Security switch? Yes → Go To 5 No → Replace the Remote Keyless Entry Module. Perform VTSS VERIFICATION TEST - 1A.	All
5	With the DRBIII®, read the VTSS Decklid Security Switch state. Does the DRBIII® show PRESENT? Yes → Replace the Remote Keyless Entry Module. Perform VTSS VERIFICATION TEST - 1A. No → Go To 6	All

*VTSS INDICATOR STAYS ON STEADY DURING ARMING — Continued

TEST	ACTION	APPLICABILITY
6	Disconnect the Remote Keyless Entry Module connector. Measure the resistance of the Decklid Security Switch Sense circuit to ground. Is the resistance below 10.0 ohms? Yes → Replace the Remote Keyless Entry Module. Perform VTSS VERIFICATION TEST - 1A. No → Go To 7	All
7	Disconnect the Decklid Security Switch connector (behind decklid lock cylinder). Using a 12-volt Test Light connected to 12-volts, test the Ground circuit for continuity. Does the light illuminate? Yes → Go To 8 No → Repair the Decklid Security Switch Ground circuit for an open. Perform VTSS VERIFICATION TEST - 1A.	All
8	Turn the ignition off. Disconnect the Remote Keyless Entry Module connector. Disconnect the Decklid Security Switch connector (behind decklid lock cylinder). Connect a jumper wire between the Decklid Security Switch Sense circuit and ground. Measure the resistance of the Decklid Security Switch Sense circuit in the RKE module connector. Is the resistance below 5.0 ohms? Yes → Replace the Decklid Security Switch. Perform VTSS VERIFICATION TEST - 1A. No → Repair the Decklid Security Switch Sense circuit for an open. Perform VTSS VERIFICATION TEST - 1A.	All

Symptom:
*VTSS SIREN INOPERATIVE (EXPORT ONLY)

POSSIBLE CAUSES
SIREN FUNCTIONAL TEST
OPEN FUSED B(+) CIRCUIT
OPEN GROUND CIRCUIT
FAULTY SIREN
SIREN CONTROL CIRCUIT OPEN
SIREN CONTROL CIRCUIT SHORTED TO GROUND
REMOTE KEYLESS ENTRY MODULE

TEST	ACTION	APPLICABILITY
1	Ensure the IOD fuse is installed and the vehicle is in the Customer Usage Mode. Using the DRBIII®, read the module configuration and ensure it is configured for PREMIUM VTA. With the DRBIII®, actuate the SIREN. Does the Siren actuate and sound proper? Yes → The condition that caused this symptom is currently not present. Inspect the related wiring harness for a possible intermittent condition. Look for any chafed, pierced, pinched or partially broken wires. Perform VTSS VERIFICATION TEST - 1A. No → Go To 2	All
2	Disconnect the Siren connector. Measure the voltage of the Fused B(+) circuit in the Siren connector. Is the voltage above 10.0 volts? Yes → Go To 3 No → Repair the Fused B(+) circuit for an open between the IOD fuse and the Intrusion Sensor. Perform VTSS VERIFICATION TEST - 1A.	All
3	Turn the ignition off. Disconnect the Siren connector. Measure the resistance between ground and the Ground circuit in the Siren connector. Is the resistance below 5.0 ohms? Yes → Go To 4 No → Repair the Ground circuit for an open. Perform VTSS VERIFICATION TEST - 1A.	All

*VTSS SIREN INOPERATIVE (EXPORT ONLY) — Continued

TEST	ACTION	APPLICABILITY
4	Use the DRBIII® and set up as follows: Use the Scope input cable CH7058, Cable to Probe adapter CH7062, and the red and black test probes. Connect the scope input cable to the channel one connector on the DRBIII®. Attach the red and black leads and the cable to probe adapter to the scope input cable. Select DRBIII® Standalone. Select lab scope. Select Live. Select 12 volt square wave. Press F2 for Scope. Press F2 and use the down arrow to set voltage range to 20 volts. Press F2 again when complete. Disconnect the Siren connector. Connect the black lead to the chassis ground. Connect the red lead to the Siren Control circuits (cavities 1 & 2) in the Siren connector. Observe the voltage displayed on the DRBIII® Lab Scope. Is there a voltage square wave present in each cavity every 1 or 2 seconds? Yes → Replace the Siren in accordance with the Service Information. Perform VTSS VERIFICATION TEST - 1A. No → Go To 5	All
5	Turn the ignition off. Disconnect the Siren connector. Disconnect the Remote Keyless Entry Module connector. Measure the resistance of the Siren Control circuit between the Siren connector (cavities 1&2) and the RKE module connector (cavity 15). Is the resistance below 5.0 ohms at all cavities? Yes → Go To 6 No → Repair the Siren Control circuit for an open between the Siren and the RKE module connector. Perform VTSS VERIFICATION TEST - 1A.	All
6	Turn the ignition off. Disconnect the Siren connector. Disconnect the Remote Keyless Entry Module connector. Measure the resistance of the Siren Control circuit to ground. Is the resistance below 1000.0 ohms? Yes → Repair the Siren Control circuit for a short to ground. Perform VTSS VERIFICATION TEST - 1A. No → Replace the Remote Keyless Entry Module in accordance with the Service Information. Perform VTSS VERIFICATION TEST - 1A.	All

Verification Tests

40/41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1	APPLICABILITY
1. NOTE: After completion of the Transmission Verification Test, the Powertrain Verification Test must be performed. Refer to the Powertrain Category. 2. Connect the DRBIII® to the Data Link Connector (DLC). 3. Reconnect any disconnected components. 4. With the DRBIII®, erase all Transmission DTC's, also erase the PCM DTC's. 5. Perform *PRNDL FAULT CLEARING PROCEDURE after completion of repairs for P0706 CHECK SHIFTER SIGNAL. 6. With the DRBIII®, display Transmission Temperature. Start and run the engine until the Transmission Temperature is HOT, above 43° C or 110° F. 7. Check the transmission fluid and adjust if necessary. Refer to the Service Information for the Fluid Fill procedure. **8. NOTE: If the Transmission Control Module or Torque Converter has been replaced, or if the Transmission has been repaired or replaced, it is necessary to perform the DRBIII® Quick Learn Procedure and reset the "Pinion Factor".** 9. Road test the vehicle. With the DRBIII®, monitor the engine RPM. Make 15 to 20 1-2, 2-3, 3-4 upshifts. Perform these shifts from a standing start to 45 MPH with a constant throttle opening of 20 to 25 degrees. 10. Below 25 MPH, make 5 to 8 wide open throttle kickdowns to 1st gear. Allow at least 5 seconds each in 2nd and 3rd gear between each kickdown. 11. For a specific DTC, drive the vehicle to the Symptom's When Monitored/When Set conditions to verify the DTC is repaired. 12. If equipped with AutoStick®, upshift and downshift several times using the AutoStick® feature during the road test. **13. NOTE: Use the EATX OBDII task manager to run Good Trip time in each gear, this will confirm the repair and to ensure that the DTC has not re-matured.** 14. Check for Diagnostic Trouble Codes (DTC's) during the road test. If a DTC sets during the road test , return to the Symptom list and perform the appropriate symptom. **15. NOTE: Erase P0700 DTC in the PCM to turn the MIL light off after making transmission repairs.** Were there any Diagnostic Trouble Codes set during the road test? Yes → Repair is not complete, refer to the appropriate symptom. No → Repair is complete.	All

Verification Tests — Continued

ABS VERIFICATION TEST - VER 1	APPLICABILITY
1. Turn the ignition off. 2. Connect all previously disconnected components and connectors. 3. Ensure all accessories are turned off and the battery is fully charged. 4. Ensure that the Ignition is on, and with the DRBIII, erase all Diagnostic Trouble Codes from ALL modules. Start the engine and allow it to run for 2 minutes and fully operate the system that was malfunctioning. 5. Turn the ignition off and wait 5 seconds. Turn the ignition on and using the DRBIII, read DTC's from ALL modules. 6. If any Diagnostic Trouble Codes are present, return to Symptom list and troubleshoot new or recurring symptom. **7. NOTE: For Sensor Signal and Pump Motor faults, the CAB must sense all 4 wheels at 25 km/h (15 mph) before it will extinguish the ABS Indicator.** 8. If there are no DTC's present after turning ignition on, road test the vehicle for at least 5 minutes. Perform several antilock braking stops. **9. Caution: Ensure braking capability is available before road testing.** 10. Again, with the DRBIII® read DTC's. If any DTC's are present, return to Symptom list. 11. If there are no Diagnostic Trouble Codes (DTC's) present, and the customer's concern can no longer be duplicated, the repair is complete. Are any DTC's present or is the original concern still present? Yes → Repair is not complete, refer to appropriate symptom. No → Repair is complete.	All

AIRBAG VERIFICATION TEST - VER 1	APPLICABILITY
1. Remove any special tools or jumper wires and reconnect all previously disconnected components - except the Battery. **2. WARNING: TO AVOID PERSONAL INJURY OR DEATH, TURN THE IGNITION ON, THEN RECONNECT THE BATTERY.** 3. Connect the DRBIII® to the Data Link Connector - use the most current software available. 4. Use the DRBIII® and erase the stored codes in all airbag system modules. 5. Turn the Ignition Off, and wait 15 seconds before turning the Ignition On. 6. Wait one minute, and read active codes and if there are none present read the stored codes. 7. Note: If equipped with Airbag On-Off switch, read the DTC's in all switch positions. 8. Note: Read the DTC's in all airbag system related modules. 9. If the DRBIII® shows any active or stored codes, return to the Symptom list and follow path specified for that trouble code. If no active or stored codes are present, the repair is complete. Are any DTC's present or is the original condition still present? YES Repair is not complete, refer to appropriate symptom list. NO Repair is complete.	All

Verification Tests — Continued

BODY VERIFICATION TEST - VER 1	APPLICABILITY
1. Disconnect all jumper wires and reconnect all previously disconnected components and connectors. **2. NOTE: If the SKIM or PCM was replaced, refer to the service information for proper programming procedures.** 3. If the Remote Keyless Entry module was replaced, using the DRBIII® select ″Theft Alarm″ ″VTSS″ ″Miscellaneous″ and ″Configure Module″. If the vehicle is equipped with VTSS, use the DRBIII® and enable VTSS. 4. Program all RKE transmitters and other options as necessary. 5. Ensure all accessories are turned off and the battery is fully charged. 6. With the DRBIII®, record and erase all DTC's from ALL modules. Start and run the engine for 2 minutes. Operate all functions of the system that caused the original concern. 7. Turn the ignition off and wait 5 seconds. Turn the ignition on and using the DRBIII®, read DTC's from ALL modules. Are any DTC's present or is the original condition still present? Yes → Repair is not complete, refer to the appropriate symptom. No → Repair is complete.	All

POWERTRAIN VERIFICATION TEST VER - 1	APPLICABILITY
1. NOTE: After completing the Powertrain Verification Test the Transmission Verification Test must be performed. **2. NOTE: If the PCM has been replace and the vehicle is equipped with a 2.4L Turbo, Manual Transmission, the Pinion Factor MUST be programmed into the PCM. Failure to do so will cause the speedometer to become inoperative or inaccurate.** **3. NOTE: If the PCM has been replaced and the correct VIN and mileage have not been programmed, a DTC will be set in the ABS Module, Airbag Module and the SKIM.** **4. NOTE: If the vehicle is equipped with a Sentry Key Immobilizer System, Secret Key data must be updated. Refer to the Service Information for the PCM, SKIM and the Transponder (ignition key) for programming information.** 5. Inspect the vehicle to ensure that all components related to the repair are connected properly. 6. Inspect the engine oil for fuel contamination. Replace the oil and filter as necessary. 7. Attempt to start the engine. 8. If the No Start condition is still present, refer to the symptom list and perform the diagnostic testing as necessary. refer to and Technical Service Bulletins that may apply. 9. Run the engine for one warm-up cycle to verify operation. 10. With the DRBIII®, confirm that no DTCs or Secondary Indicators are present and that all components are functioning properly. 11. If a DTC is present, refer to the appropriate category and select the corresponding symptom. Are any DTCs present? Yes → Repair is not complete, refer to appropriate symptom. No → Repair is complete.	All

Verification Tests — Continued

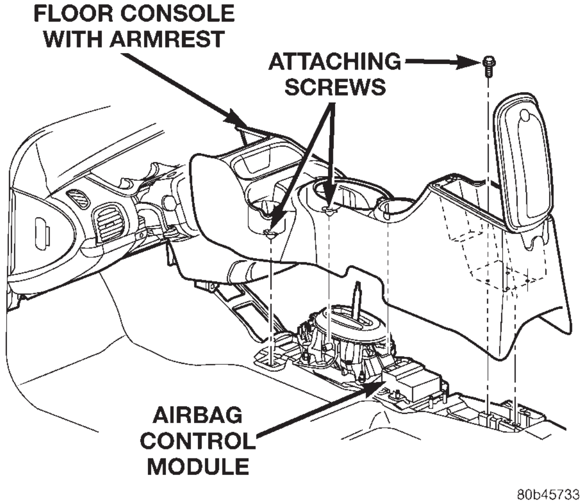
SKIS VERIFICATION	APPLICABILITY
1. Reconnect all previously disconnected components and connectors. 2. Obtain the vehicle's unique Personal Identification Number (PIN) assigned to it's original SKIM. This number can be obtained from the vehicle's invoice or Chrysler's Customer Center (1-800-992-1997). **3. NOTE: When entering the PIN, care should be taken because the SKIM will only allow 3 consecutive attempts to enter the correct PIN. If 3 consecutive incorrect PIN's are entered the SKIM will Lock Out the DRB III for 1 hour.** 4. To exit Lock Out mode, the ignition key must remain in the Run position continually for 1 hour. Turn off all accessories and connect a battery charger if necessary. 5. With the DRB III, select Theft Alarm, SKIM and Miscellaneous. Then select desired procedure and follow the steps that will be displayed. 6. If the SKIM has been replaced, ensure all of the vehicle ignition keys are programmed to the new SKIM. **7. NOTE: Prior to returning vehicle to the costumer, perform a module scan to be sure that all DTC's are erased. Erase any DTC's that are found.** 8. With the DRB III erase all DTC's. Perform 5 ignition key cycles leaving the key on for at least 90 seconds per cycle. 9. With the DRB III, read the SKIM DTC's. Are there any SKIM DTC's? Yes → Repair is not complete, refer to appropriate symptom. No → Repair is complete.	All

VTSS VERIFICATION TEST - 1A	APPLICABILITY
1. Ensure all doors and the decklid are closed. 2. Open the driver door. 3. Remove the ignition key (but keep in hand). 4. Lock the doors with RKE transmitter. 5. Close the driver door. 6. - If the VTSS indicator lamp flashes rapidly and after approximately 15 seconds changes to a slower flash, the system is operational. 7. - If the indicator fails to flash as described, there is a problem with the system. Select the Identifying VTSS symptom from the Symptom List to troubleshoot. Does the VTSS indicator lamp flash as specified? Yes → Repair is complete. No → Repair is not complete, refer to appropriate symptom.	All

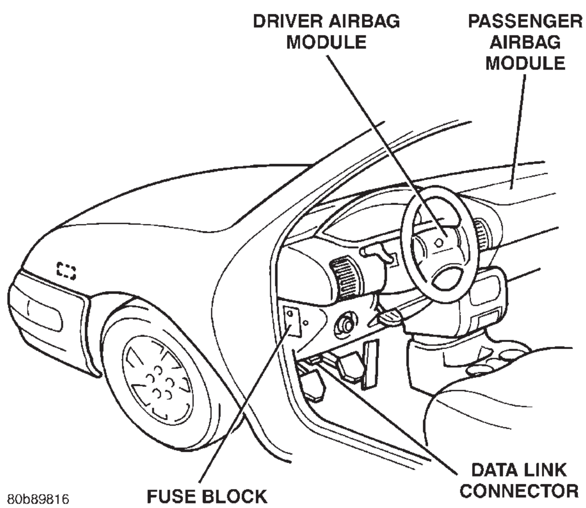
8.0 COMPONENT LOCATIONS

8.1 AIRBAG SYSTEM

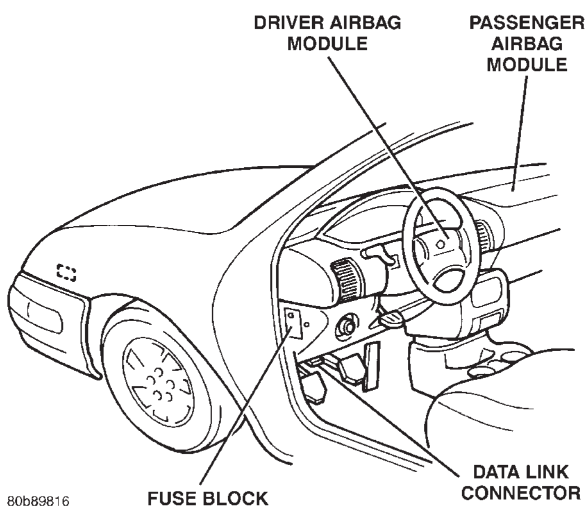
8.1.1 AIRBAG CONTROL MODULE (ACM)



8.1.2 AIRBAG MODULE (DRIVER)

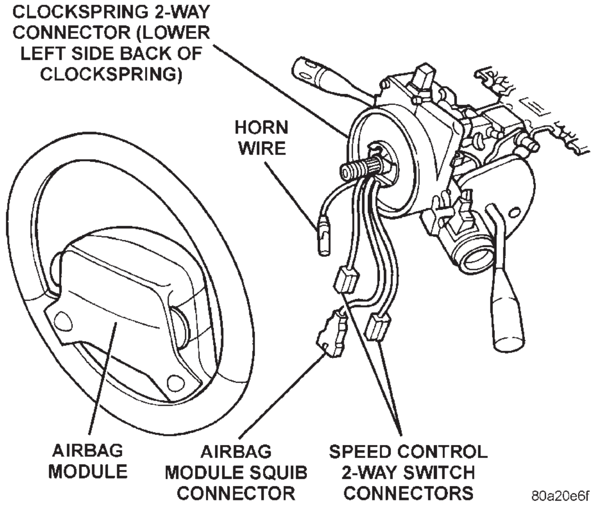


8.1.3 AIRBAG MODULE (PASSENGER)

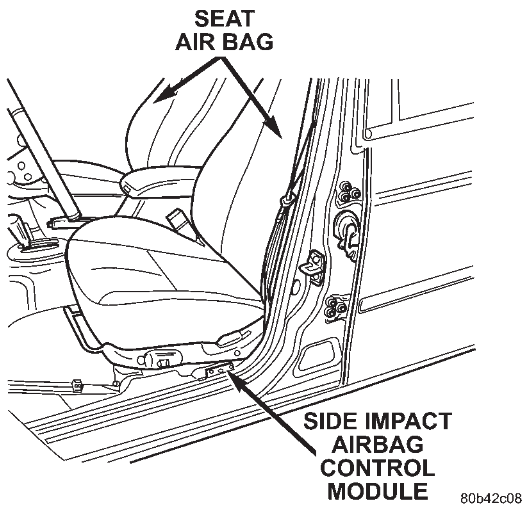


8.1 AIRBAG SYSTEM (Continued)

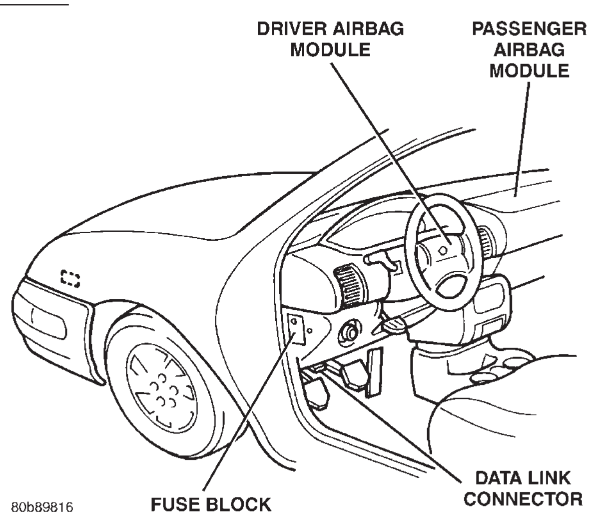
8.1.4 CLOCKSPRING



8.1.5 SIDE IMPACT AIRBAG CONTROL MODULE (SIACM)

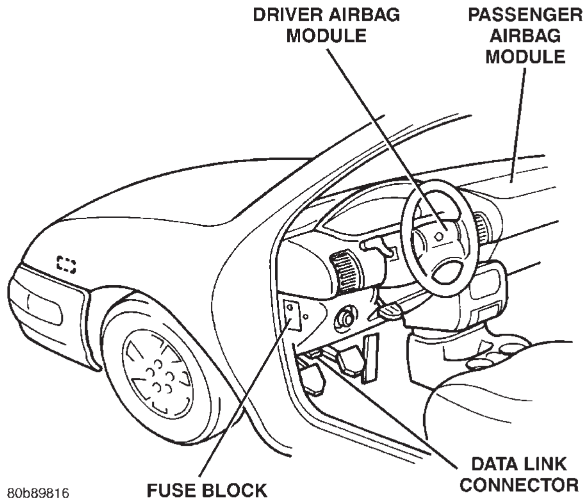


8.2 DATA LINK CONNECTOR



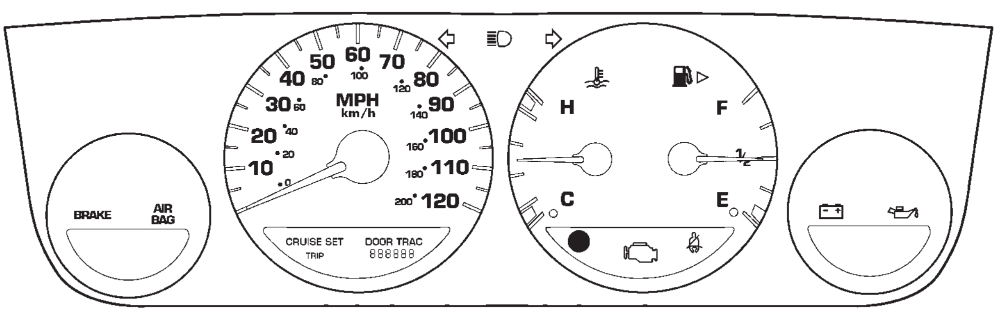
COMPONENT LOCATIONS

8.3 FUSE BLOCK



8.4 INSTRUMENT CLUSTER

8.4.1 BASE CLUSTER



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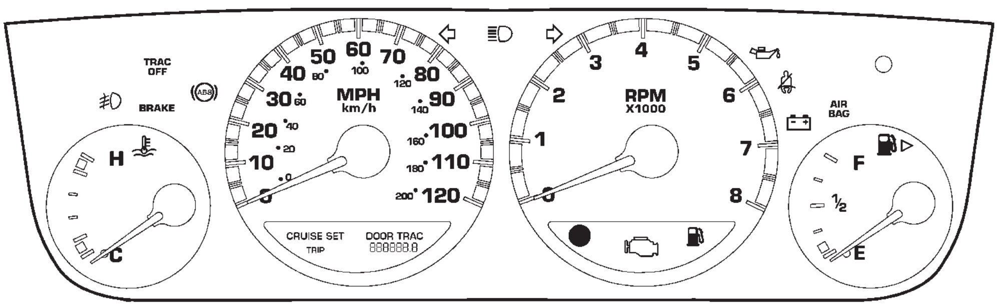
8.4.2 PREMIUM CLUSTER



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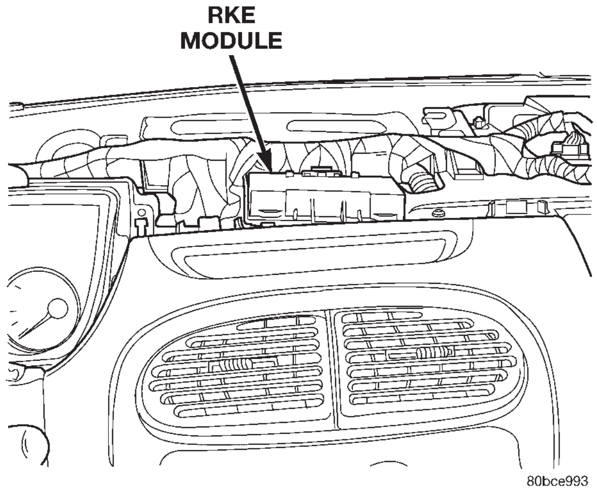
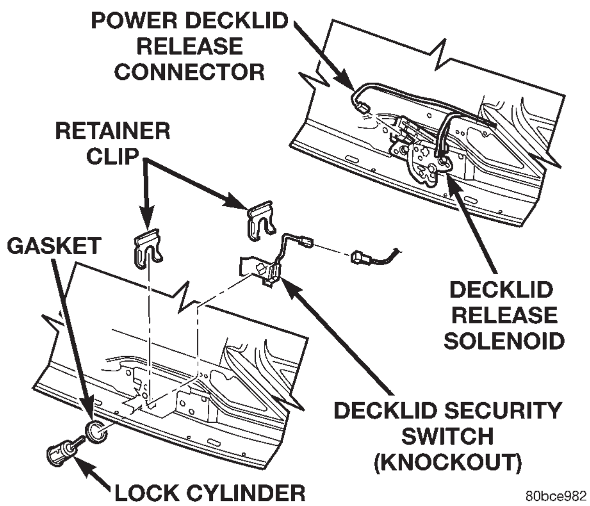
8.5 POWER DOOR LOCKS

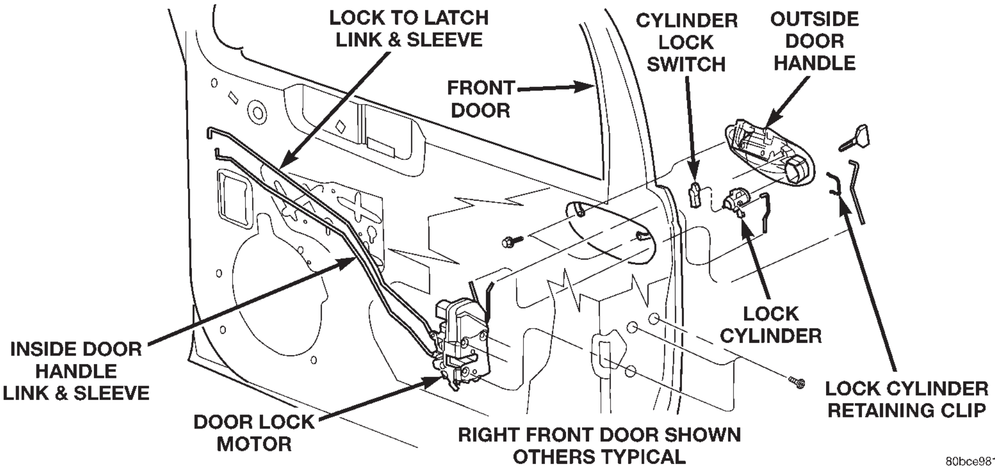
8.5.1 REMOTE KEYLESS ENTRY MODULE



8.5.2 DECKLID RELEASE SOLENOID

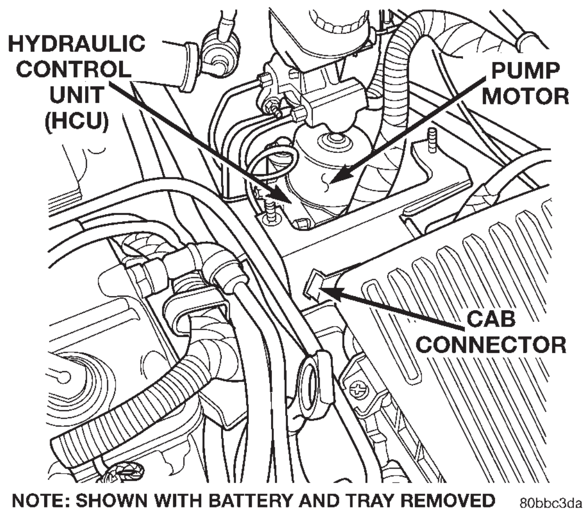


8.5.3 DOOR LOCK MOTOR

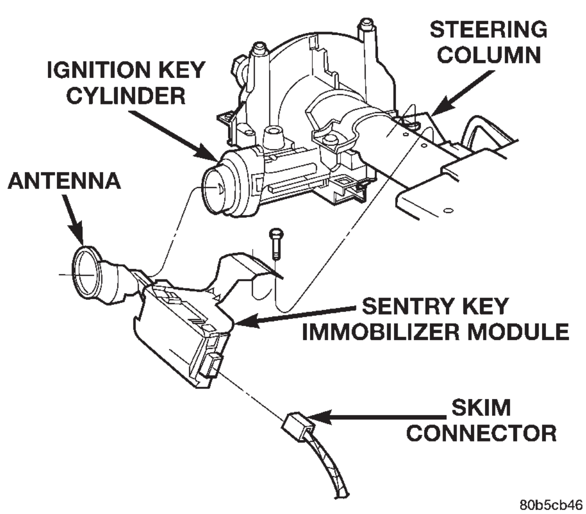


8.6 VEHICLE COMMUNICATION

8.6.1 CONTROLLER ANTILOCK BRAKE MODULE

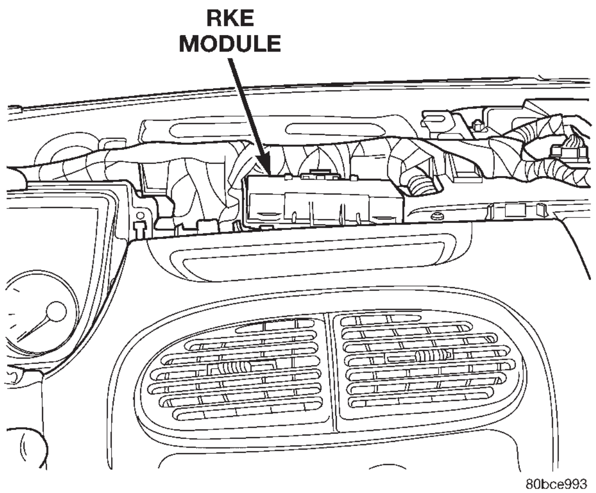


8.6.2 SENTRY KEY IMMOBILIZER MODULE (SKIM)

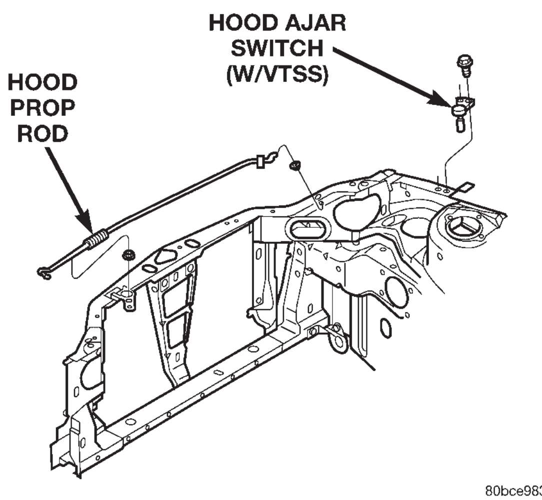


8.7 VEHICLE THEFT SECURITY

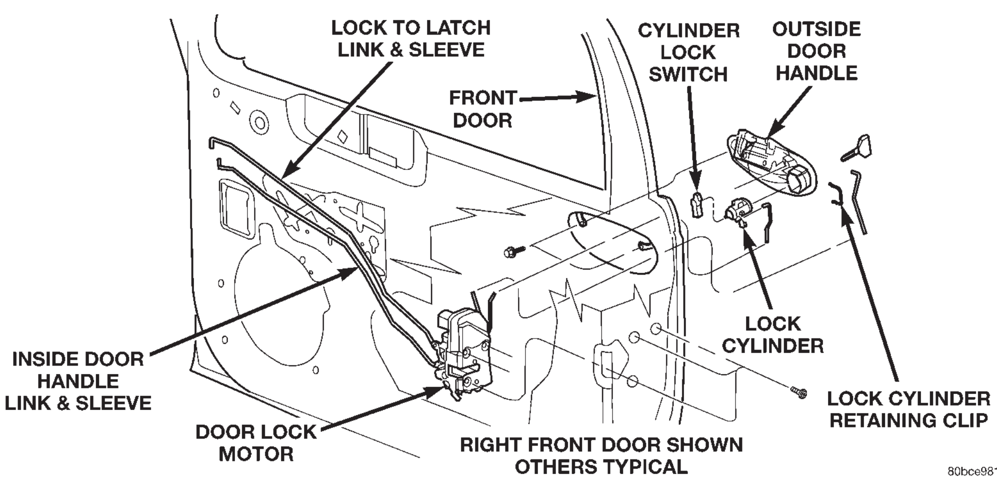
8.7.1 REMOTE KEYLESS ENTRY MODULE



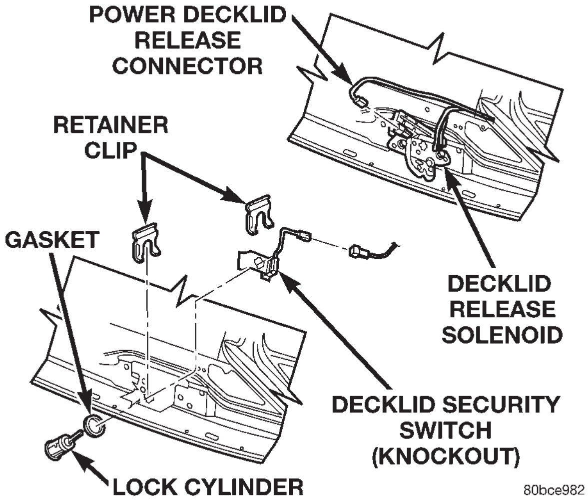
8.7.2 HOOD AJAR SWITCH (EXPORT)



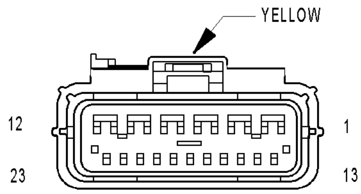
8.7.3 DOOR CYLINDER LOCK SWITCH (IF EQUIPPED)



8.7.4 DECKLID SECURITY SWITCH



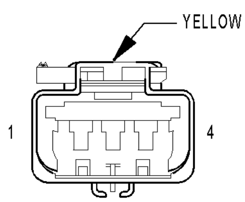
9.0 CONNECTOR PINOUTS



AIRBAG CONTROL MODULE

AIRBAG CONTROL MODULE - YELLOW 23 WAY

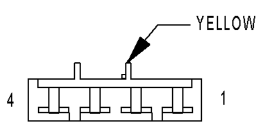
CAV	CIRCUIT	FUNCTION
1	-	-
2	-	-
3	-	-
4	Z6 20BK/PK	GROUND
5	R45 20DG/LB	DRIVER SQUIB 1 LINE 2
6	R43 20BK/LB	DRIVER SQUIB 1 LINE 1
7	R42 20BK/YL	PASSENGER SQUIB 1 LINE 1
8	R44 20DG/YL	PASSENGER SQUIB 1 LINE 2
9	-	-
10	-	-
11	-	-
12	-	-
13	-	-
14	F15 20DG/WT	FUSED IGNITION SWITCH OUTPUT (RUN-START)
15	F25 20TN/LG	FUSED IGNITION SWITCH OUTPUT (RUN)
16	-	-
17	-	-
18	-	-
19	-	-
20	-	-
21	D25 20VT/YL	PCI BUS
22	-	-
23	-	-



C208

C208 - YELLOW (SEAT SIDE)

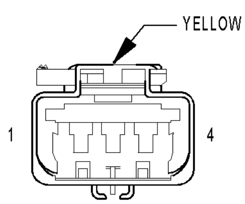
CAV	CIRCUIT
1	-
2	-
3	R32 18OR
4	R34 18WT



C208

C208 - YELLOW (SIDE IMPACT AIRBAG JUMPER SIDE)

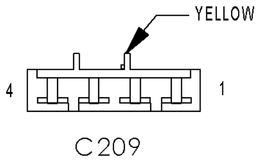
CAV	CIRCUIT
1	-
2	-
3	R32 20YL/OR
4	R34 20OR/YL



C209

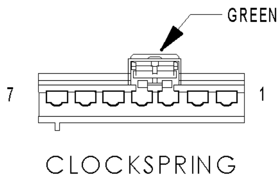
C209 - YELLOW (SEAT SIDE)

CAV	CIRCUIT
1	-
2	-
3	R31 18OR
4	R33 18WT



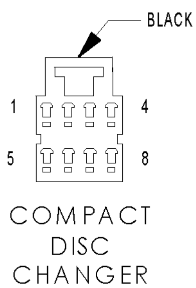
C209 - YELLOW (SIDE IMPACT AIRBAG JUMPER SIDE)

CAV	CIRCUIT
1	-
2	-
3	R31 20YL/OR
4	R33 20OR/YL



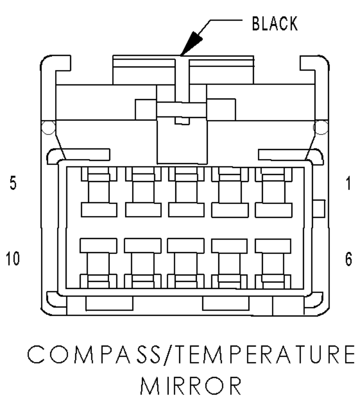
CLOCKSPRING - GREEN 7 WAY

CAV	CIRCUIT	FUNCTION
1	R45 20DG/LB	DRIVER SQUIB 1 LINE 2
2	R43 20BK/LB	DRIVER SQUIB 1 LINE 1
3	-	-
4	-	-
5	X3 22BK/RD	HORN RELAY CONTROL
6	V37 20RD/LG (2.0L SPEED CONTROL)	S/C SWITCH SIGNAL
7	K914 20BR/WT (2.0L SPEED CONTROL)	GROUND



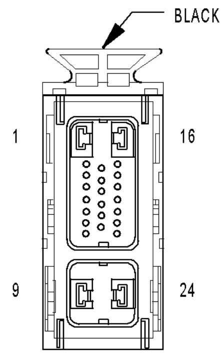
COMPACT DISC CHANGER - BLACK 8 WAY

CAV	CIRCUIT	FUNCTION
1	24GY/WT	AUDIO OUT RIGHT
2	24OR/YL	PANEL LAMPS DIMMER SIGNAL
3	24VT/YL	PCI BUS
4	24RD	FUSED IGNITION SWITCH OUTPUT
5	24DG/WT	AUDIO OUT LEFT
6	24BK/OR	GROUND
7	22BK/YL	GROUND
8	22GY/YL	B(+)



COMPASS/TEMPERATURE MIRROR - BLACK 10 WAY

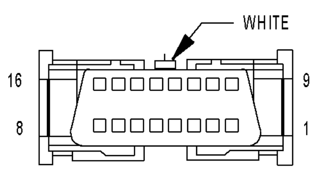
CAV	CIRCUIT	FUNCTION
1	F20 20BK/WT	FUSED IGNITION SWITCH OUTPUT (RUN)
2	M1 20BK/PK	FUSED B(+)
3	-	-
4	-	-
5	D25 20BK/VT	PCI BUS
6	Z3 20BK/OR	GROUND
7	M2 20BK/YL	COURTESY LAMP CONTROL
8	-	-
9	-	-
10	Z3 20BK/OR	GROUND



CONTROLLER ANTILOCK BRAKE

CONTROLLER ANTILOCK BRAKE - BLACK 24 WAY

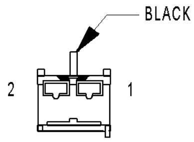
CAV	CIRCUIT	FUNCTION
1	Z1 12BK	GROUND
2	B1 18YL/DB	RIGHT REAR WHEEL SPEED SENSOR SIGNAL
3	B2 18YL	RIGHT REAR WHEEL SPEED SENSOR 12 VOLT SUPPLY
4	-	-
5	D25 18VT/YL	PCI BUS
6	B6 18WT/DB	RIGHT FRONT WHEEL SPEED SENSOR SIGNAL
7	B7 18WT	RIGHT FRONT WHEEL SPEED SENSOR 12 VOLT SUPPLY
8	-	-
9	A20 12RD/DB	FUSED B(+)
10	F12 18DB/WT (2.0L)	FUSED IGNITION SWITCH OUTPUT (RUN-START)
10	F12 18DB/RD (2.4L TURBO)	FUSED IGNITION SWITCH OUTPUT (RUN-START)
11	-	-
12	-	-
13	-	-
14	-	-
15	-	-
16	Z1 12BK	GROUND
17	-	-
18	L50 18WT/TN	BRAKE LAMP SWITCH OUTPUT
19	B3 18LG/DB	LEFT REAR WHEEL SPEED SENSOR SIGNAL
20	B4 18LG	LEFT REAR WHEEL SPEED SENSOR 12 VOLT SUPPLY
21	-	-
22	B8 18RD/DB	LEFT FRONT WHEEL SPEED SENSOR SIGNAL
23	B9 18RD	LEFT FRONT WHEEL SPEED SENSOR 12 VOLT SUPPLY
24	A10 12RD/DG	FUSED B(+)



DATA LINK CONNECTOR

DATA LINK CONNECTOR - WHITE 16 WAY

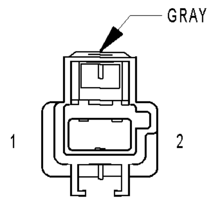
CAV	CIRCUIT	FUNCTION
1	-	-
2	D25 20VT/YL	PCI BUS (PCM)
3	-	-
4	Z12 20BK/TN	GROUND
5	Z12 20BK/TN	GROUND
6	-	-
7	D21 20PK	SCI TRANSMIT (PCM)
8	-	-
9	D6 20PK/LB (2.0L)	SCI RECEIVE (TCM)
10	-	-
11	-	-
12	D20 20LG	SCI RECEIVE (PCM)
13	-	-
14	-	-
15	D15 20WT/DG (2.0L)	SCI TRANSMIT (TCM)
16	A14 18RD/WT	FUSED B(+)



DECKLID RELEASE SWITCH (POWER RELEASE)

DECKLID RELEASE SWITCH (POWER RELEASE) - BLACK 2 WAY

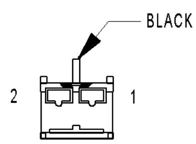
CAV	CIRCUIT	FUNCTION
1	Q33 20BR/LB	DECKLID RELEASE RELAY CONTROL
2	Z1 20BK	GROUND



DECKLID SECURITY SWITCH (KNOCK OUT)

DECKLID SECURITY SWITCH (KNOCK OUT) - GRAY 2 WAY

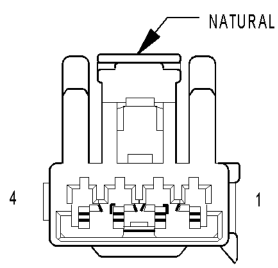
CAV	CIRCUIT	FUNCTION
1	Z1 20BK	GROUND
2	G71 20VT/YL	DECKLID SECURITY SWITCH SENSE



DECKLID SOLENOID

DECKLID SOLENOID - BLACK 2 WAY

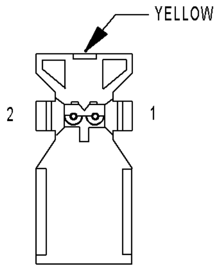
CAV	CIRCUIT	FUNCTION
1	Q2 14LG/BK	DECKLID RELEASE RELAY OUTPUT
2	Z1 14BK	GROUND



DOME LAMP/INTRUSION SENSOR (EXPORT)

DOME LAMP/INTRUSION SENSOR (EXPORT) - NATURAL 4 WAY

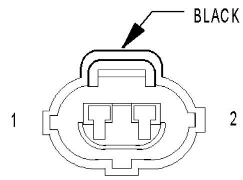
CAV	CIRCUIT	FUNCTION
1	M2 20YL	COURTESY LAMP CONTROL
2	M1 18PK	FUSED B(+)
3	Z1 18BK	GROUND
4	G120 18WT/DB	INTRUSION SENSOR SIGNAL



DRIVER
AIRBAG
SQUIB 1

DRIVER AIRBAG SQUIB 1 - YELLOW 2 WAY

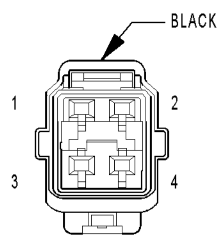
CAV	CIRCUIT	FUNCTION
1	R43 18BK/LB	DRIVER SQUIB 1 LINE 1
2	R45 18DG/LB	DRIVER SQUIB 1 LINE 2



DRIVER DOOR
AJAR SWITCH

DRIVER DOOR AJAR SWITCH - BLACK 2 WAY

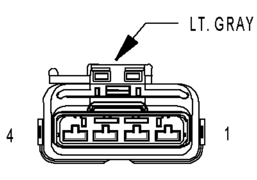
CAV	CIRCUIT	FUNCTION
1	G75 20TN	LEFT FRONT DOOR AJAR SWITCH SENSE
2	Z14 20BK/YL	GROUND



DRIVER
DOOR LOCK
MOTOR/AJAR
SWITCH

DRIVER DOOR LOCK MOTOR/AJAR SWITCH - BLACK 4 WAY

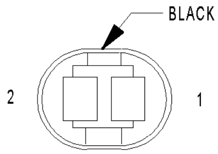
CAV	CIRCUIT	FUNCTION
1	G75 20TN (LHD)	LEFT FRONT DOOR AJAR SWITCH SENSE
1	G74 20TN/RD (RHD)	RIGHT FRONT DOOR AJAR SWITCH SENSE
2	Z14 20BK/YL	GROUND
3	P34 18PK/BK	DRIVER DOOR UNLOCK RELAY OUTPUT
4	P33 18OR/BK	DOOR LOCK RELAY OUTPUT



FUEL PUMP
MODULE

FUEL PUMP MODULE - LT. GRAY 4 WAY

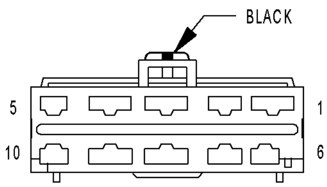
CAV	CIRCUIT	FUNCTION
1	Z1 18BK	GROUND
2	Z2 20BK/LG	GROUND
3	G4 20DB	FUEL LEVEL SENSOR SIGNAL
4	A141 18DG/WT	FUEL PUMP RELAY OUTPUT



HOOD AJAR SWITCH (EXPORT)

HOOD AJAR SWITCH (EXPORT) - BLACK 2 WAY

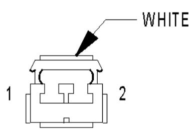
CAV	CIRCUIT	FUNCTION
1	G70 20BR/TN	HOOD AJAR SWITCH SENSE
2	Z1 20BK	GROUND



IGNITION SWITCH C1

IGNITION SWITCH C1 - BLACK 10 WAY

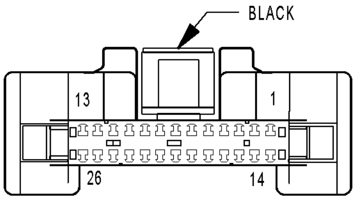
CAV	CIRCUIT	FUNCTION
1	A1 14RD	FUSED B(+)
2	A21 14DB	IGNITION SWITCH OUTPUT (RUN-START)
3	F30 16RD/BK	IGNITION SWITCH OUTPUT (RUN-ACC)
4	F1 16DB/BK	FUSED B(+)
5	G26 22LB	KEY-IN IGNITION SWITCH SENSE
6	A41 14YL	IGNITION SWITCH OUTPUT (START)
7	A31 14BK/WT	IGNITION SWITCH OUTPUT (RUN-ACC)
8	A22 12BK/OR	IGNITION SWITCH OUTPUT (RUN)
9	A2 12PK/BK	FUSED B(+)
10	-	-



IGNITION SWITCH C2

IGNITION SWITCH C2 - WHITE 2 WAY

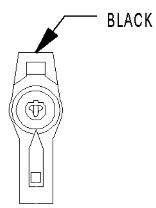
CAV	CIRCUIT	FUNCTION
1	A81 20DG/RD	FUSED B(+)
2	F11 20RD/WT (AUTO-STICK)	IGNITION SWITCH OUTPUT (OFF-RUN-START)



INSTRUMENT CLUSTER

INSTRUMENT CLUSTER - BLACK 26 WAY

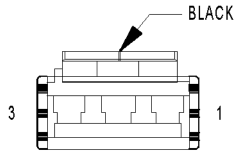
CAV	CIRCUIT	FUNCTION
1	L38 16BR/WT (EXPORT)	REAR FOG LAMP FEED
2	D25 20VT/YL	PCI BUS
3	M2 20YL	COURTESY LAMP CONTROL
4	L27 16WT/TN (DAYTIME RUNNING LAMPS)	FOG LAMP SWITCH SENSE
4	L39 20LB (EXCEPT EXPORT/EXCEPT DAYTIME RUNNING LAMPS)	FRONT FOG LAMP SWITCH OUTPUT
4	L39 16LB (EXPORT)	FRONT FOG LAMP SWITCH OUTPUT
5	G69 20BK/OR	VTSS INDICATOR DRIVER
6	E19 22RD	PANEL LAMPS DIMMER SIGNAL
7	G4 20DB	FUEL LEVEL SENSOR SIGNAL
8	-	-
9	G5 20DB/WT (AUTOSTICK)	FUSED IGNITION SWITCH OUTPUT (RUN-START)
10	Z3 16BK/OR	GROUND
11	-	-
12	E2 22OR	PANEL LAMPS DRIVER
13	M9 20LB/OR	PASSENGER DOOR AJAR/RKE SENSE
14	L7 18BK/YL	HEADLAMP SWITCH OUTPUT
15	F11 20RD/WT (AUTO-STICK)	IGNITION SWITCH OUTPUT (OFF-RUN-START)
15	G5 20DB/WT (EXCEPT AU-TOSTICK)	FUSED IGNITION SWITCH OUTPUT (RUN-START)
16	L161 18LG/OR (EXCEPT EXPORT)	LEFT TURN SIGNAL
17	L160 18TN/RD (EXCEPT EXPORT)	RIGHT TURN SIGNAL
18	L61 18LG	LEFT TURN SIGNAL
19	L60 18TN	RIGHT TURN SIGNAL
20	L4 16VT/WT (EXCEPT EX-PORT)	DIMMER SWITCH LOW BEAM OUTPUT
21	M1 18PK	FUSED B(+)
22	G11 20WT/BK	RED BRAKE WARNING INDICATOR DRIVER
23	G26 22LB	KEY-IN IGNITION SWITCH SENSE
24	G75 20TN/BK (EXCEPT EXPORT)	LEFT FRONT DOOR AJAR SWITCH SENSE
24	G74 20TN/RD (EXPORT)	RIGHT FRONT DOOR AJAR SWITCH SENSE
25	G10 20LG/RD	SEAT BELT SWITCH SENSE
26	L3 16RD/OR	DIMMER SWITCH HIGH BEAM OUTPUT



LEFT CYLINDER LOCK SWITCH (PREMIUM)

LEFT CYLINDER LOCK SWITCH (PREMIUM) - BLACK 2 WAY

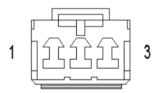
CAV	CIRCUIT	FUNCTION
1	P97 18LG	LEFT DOOR SWITCH MUX
2	Z14 18BK	GROUND



LEFT DOOR LOCK SWITCH

LEFT DOOR LOCK SWITCH - BLACK 3 WAY

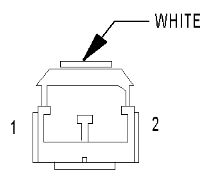
CAV	CIRCUIT	FUNCTION
1	-	-
2	P97 20LG	LEFT DOOR SWITCH MUX
2	P97 18LG (PREMIUM)	LEFT DOOR SWITCH MUX
3	Z14 20BK/YL	GROUND
3	Z14 18BK (PREMIUM)	GROUND



LEFT FRONT DOOR SPEAKER

LEFT FRONT DOOR SPEAKER - 3 WAY

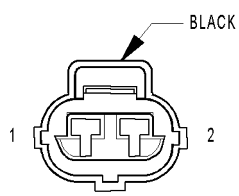
CAV	CIRCUIT	FUNCTION
1	X55 20BR/RD	LEFT FRONT SPEAKER (-)
2	-	-
3	X53 20DG	LEFT FRONT SPEAKER (+)



LEFT INSTRUMENT PANEL SPEAKER

LEFT INSTRUMENT PANEL SPEAKER - WHITE 2 WAY

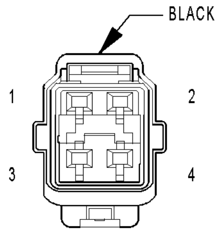
CAV	CIRCUIT	FUNCTION
1	X53 20DG	LEFT FRONT SPEAKER (+)
2	X55 20BR/RD	LEFT FRONT SPEAKER (-)



LEFT REAR DOOR AJAR SWITCH

LEFT REAR DOOR AJAR SWITCH - BLACK 2 WAY

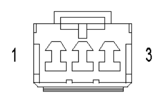
CAV	CIRCUIT	FUNCTION
1	G76 20TN/YL	PASSENGER DOOR AJAR/RKE SENSE
2	Z1 20BK	GROUND



LEFT REAR
DOOR LOCK
MOTOR/AJAR
SWITCH

LEFT REAR DOOR LOCK MOTOR/AJAR SWITCH - BLACK 4 WAY

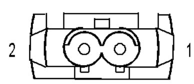
CAV	CIRCUIT	FUNCTION
1	G77 20TN/OR	PASSENGER DOOR AJAR/RKE SENSE
2	Z1 20BK	GROUND
3	P36 18PK/VT	DOOR UNLOCK RELAY OUTPUT
4	P33 18OR/BK	DOOR LOCK RELAY OUTPUT



LEFT
REAR
SPEAKER

LEFT REAR SPEAKER - 3 WAY

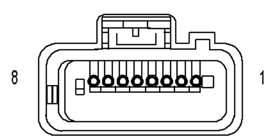
CAV	CIRCUIT	FUNCTION
1	X51 20BR/YL	LEFT REAR SPEAKER (+)
2	-	-
3	X57 20BR/LB	LEFT REAR SPEAKER (-)



LEFT SEAT
AIRBAG
SQUIB

LEFT SEAT AIRBAG SQUIB - 2 WAY

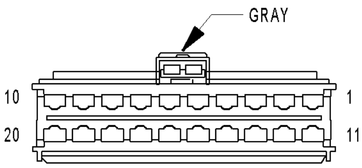
CAV	CIRCUIT	FUNCTION
1	R31 18OR	LEFT SEAT SQUIB LINE 2
2	R33 18WT	LEFT SEAT SQUIB LINE 1



LEFT SIDE IMPACT
AIRBAG CONTROL MODULE

LEFT SIDE IMPACT AIRBAG CONTROL MODULE - 8 WAY

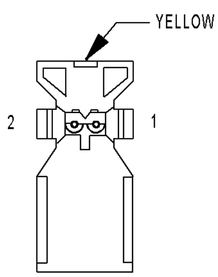
CAV	CIRCUIT	FUNCTION
1	F15 20DG/WT	FUSED IGNITION SWITCH OUTPUT (RUN-START)
2	-	-
3	R33 20OR/YL	LEFT SEAT SQUIB LINE 1
4	R31 20YL/OR	LEFT SEAT SQUIB LINE 2
5	Z6 20BK/PK	GROUND
6	-	-
7	-	-
8	D25 20VT/YL	PCI BUS



MULTI-FUNCTION SWITCH

MULTI-FUNCTION SWITCH - GRAY 20 WAY

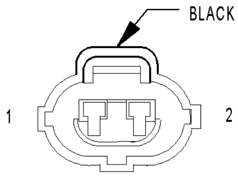
CAV	CIRCUIT	FUNCTION
1	L50 18WT/TN (EXCEPT EXPORT)	BRAKE LAMP SWITCH OUTPUT
2	L61 18LG	LEFT TURN SIGNAL
2	L61 18LG (EXPORT)	LEFT TURN SIGNAL
3	L6 20RD/WT	FUSED IGNITION SWITCH OUTPUT (RUN-ACC)
4	L63 18DG/RD	LEFT TURN SIGNAL
4	L63 18DG/RD (EXPORT)	LEFT TURN SIGNAL
5	L62 18BR/RD	RIGHT TURN SIGNAL
5	L62 18BR/RD (EXPORT)	RIGHT TURN SIGNAL
6	L60 18TN	RIGHT TURN SIGNAL
6	L60 18TN (EXPORT)	RIGHT TURN SIGNAL
7	Z3 20BK/OR	GROUND
8	E19 22RD	PANEL LAMPS DIMMER SIGNAL
9	L7 18BK/YL	HEADLAMP SWITCH OUTPUT
10	-	-
11	A15 18WT	FUSED B(+)
12	L38 16BR/WT (EXPORT)	REAR FOG LAMP FEED
12	L38 16BR/WT (EXPORT)	REAR FOG LAMP FEED
13	L4 14VT/WT (EXCEPT EX-PORT)	DIMMER SWITCH LOW BEAM OUTPUT
13	F61 16WT/OR (EXPORT)	FUSED B(+)
14	F39 14PK/LG (EXCEPT EX-PORT)	FRONT FOG LAMP SWITCH OUTPUT
14	L39 16LB (EXPORT)	FRONT FOG LAMP SWITCH OUTPUT
14	L39 16LB (EXPORT)	FRONT FOG LAMP SWITCH OUTPUT
15	-	-
16	L4 12VT/WT	DIMMER SWITCH LOW BEAM OUTPUT
17	L33 14LG/BR	DIMMER SWITCH HIGH BEAM OUTPUT
18	F3 12LB/OR	FUSED B(+)
19	F3 12LB/OR	FUSED B(+)
20	F33 18PK/RD	FUSED B(+)



PASSENGER AIRBAG SQUIB 1

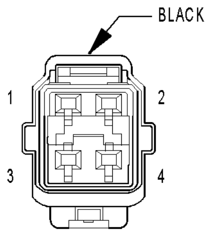
PASSENGER AIRBAG SQUIB 1 - YELLOW 2 WAY

CAV	CIRCUIT	FUNCTION
1	R42 20BK/YL	PASSENGER SQUIB 1 LINE 1
2	R44 20DG/YL	PASSENGER SQUIB 1 LINE 2



PASSENGER DOOR AJAR SWITCH - BLACK 2 WAY

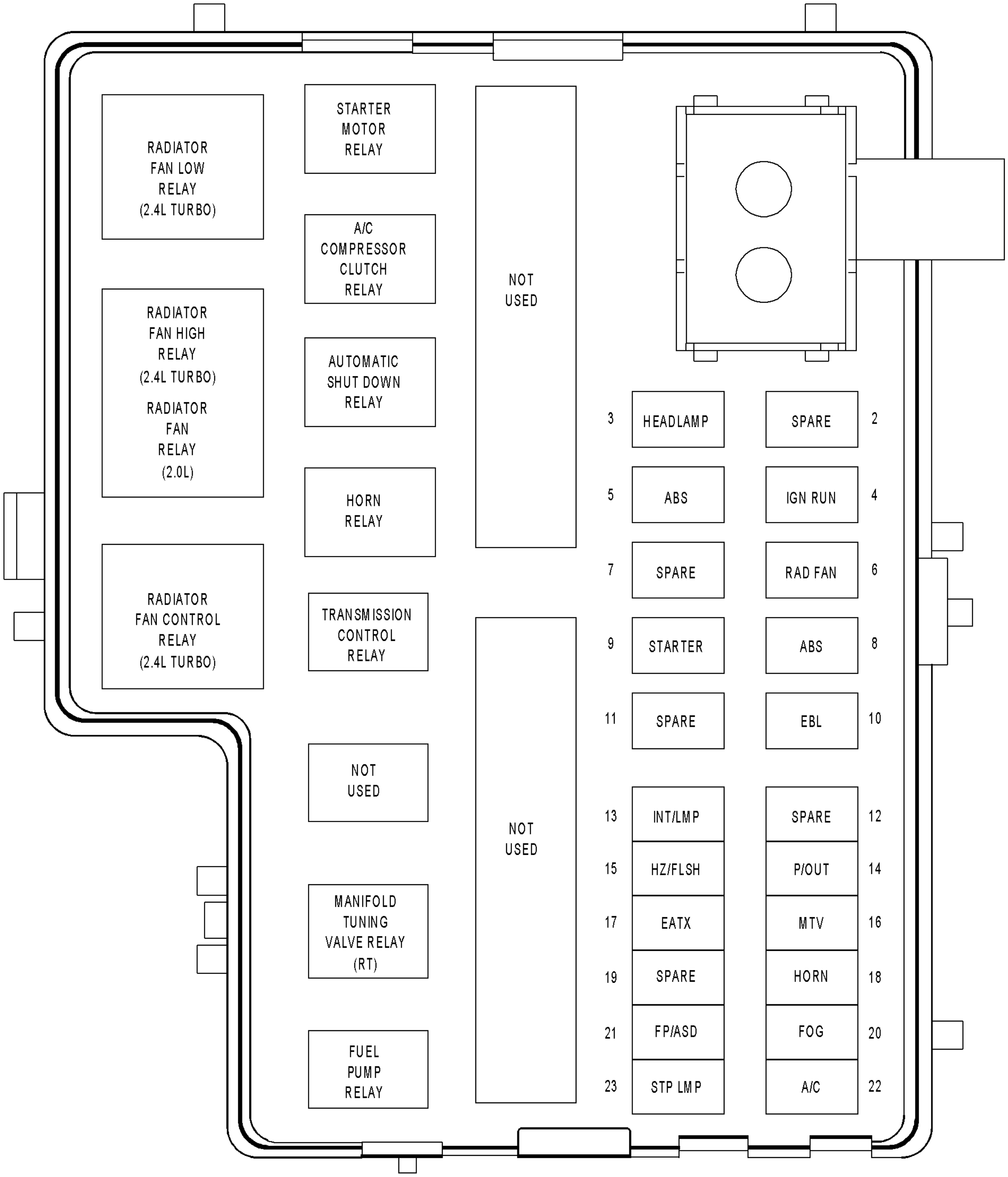
CAV	CIRCUIT	FUNCTION
1	G74 20TN	RIGHT FRONT DOOR AJAR SWITCH SENSE
2	Z14 20BK/YL	GROUND



PASSENGER DOOR LOCK MOTOR/AJAR SWITCH - BLACK 4 WAY

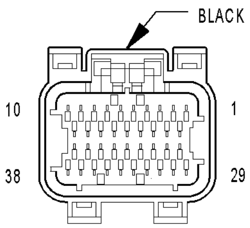
CAV	CIRCUIT	FUNCTION
1	G74 20TN/RD (LHD)	RIGHT FRONT DOOR AJAR SWITCH SENSE
1	G75 20TN (RHD)	LEFT FRONT DOOR AJAR SWITCH SENSE
2	Z14 20BK/YL	GROUND
3	P36 18PK/VT	DOOR UNLOCK RELAY OUTPUT
4	P33 18OR/BK	DOOR LOCK RELAY OUTPUT

POWER DISTRIBUTION CENTER



HORN RELAY

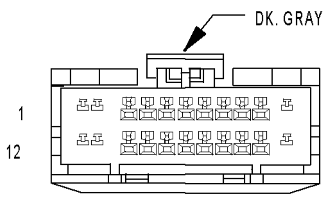
CAV	CIRCUIT	FUNCTION
39	F62 20RD (2.0L)	FUSED B(+)
39	F62 18RD (2.4L TURBO)	FUSED B(+)
40	F62 20RD (2.0L)	FUSED B(+)
40	F62 18RD (2.4L TURBO)	FUSED B(+)
41	X2 20DG/RD (2.0L)	HORN RELAY OUTPUT
41	X2 18DG/RD (2.4L TURBO)	HORN RELAY OUTPUT
42	-	-
43	X3 20BK/RD	HORN RELAY CONTROL



POWERTRAIN CONTROL MODULE C1

POWERTRAIN CONTROL MODULE C1 - BLACK 38 WAY

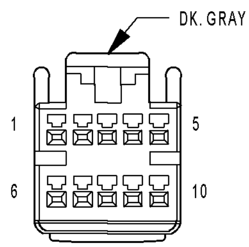
CAV	CIRCUIT	FUNCTION
1	-	-
2	-	-
3	-	-
4	-	-
5	-	-
6	-	-
7	-	-
8	-	-
9	Z11 18BK/WT	GROUND
10	-	-
11	F12 18DB/WT (2.0L)	FUSED IGNITION SWITCH OUTPUT (RUN-START)
11	F12 18DB/RD (2.4L TURBO)	FUSED IGNITION SWITCH OUTPUT (RUN-START)
12	F11 20RD/WT (2.0L AUTO-STICK)	IGNITION SWITCH OUTPUT (OFF-RUN-START)
12	F11 20RD/WT (2.0L EX-CEPT AUTOSTICK)	FUSED IGNITION SWITCH OUTPUT (RUN-START)
13	G7 20WT/OR	VEHICLE SPEED SIGNAL
14	G9 20GY/BK	BRAKE FLUID LEVEL SWITCH SENSE
15	K55 18LB (2.4L TURBO)	TIP SOL CONTROL
16	-	-
17	K150 18DB/YL (2.4L TURBO)	SURGE SOL CONTROL
18	Z12 18BK/TN	GROUND
19	-	-
20	G6 20GY	OIL PRESSURE SIGNAL
21	-	-
22	K145 20BR/OR	AAT SIGNAL
23	K153 18LB (2.4L TURBO)	TIP SIGNAL
24	-	-
25	D20 20LG	SCI RECEIVE (PCM)
26	D6 20PK/LB (2.0L)	SCI RECEIVE (TCM)
27	K6 20VT/WT (2.0L)	5 VOLT SUPPLY
27	K6 18VT/WT (2.4L TURBO)	5 VOLT SUPPLY
28	K137 18DB/GY (2.4L TURBO)	WASTEGATE SOL CONTROL
29	A14 18RD/WT	FUSED B(+)
30	A41 16YL	FUSED IGNITION SWITCH OUTPUT (START)
31	-	-
32	-	-
33	-	-
34	-	-
35	-	-
36	D21 20PK	SCI TRANSMIT (PCM)
37	D15 20WT/DG (2.0L)	SCI TRANSMIT (TCM)
38	D25 20VT/YL	PCI BUS (PCM)



RADIO C1

RADIO C1 - DK. GRAY 22 WAY

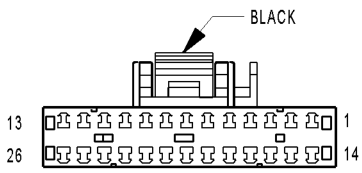
CAV	CIRCUIT	FUNCTION
1	M11 16PK/LB	FUSED B(+)
2	X12 18RD/WT	FUSED IGNITION SWITCH OUTPUT (RUN-ACC)
3	E2 20OR	PANEL LAMPS DRIVER
4	-	-
5	-	-
6	-	-
7	X54 20VT	RIGHT FRONT SPEAKER (+)
8	X56 20DB/RD	RIGHT FRONT SPEAKER (-)
9	X55 20BR/RD	LEFT FRONT SPEAKER (-)
10	X53 20DG	LEFT FRONT SPEAKER (+)
11	Z9 16BK	GROUND
12	-	-
13	-	-
14	D25 20VT/YL	PCI BUS
15	-	-
16	-	-
17	-	-
18	X51 20BR/YL	LEFT REAR SPEAKER (+)
19	X57 20BR/LB	LEFT REAR SPEAKER (-)
20	X58 20DB/OR	RIGHT REAR SPEAKER (-)
21	X52 20DB/WT	RIGHT REAR SPEAKER (+)
22	-	-



RADIO C2
(COMPACT DISC CHANGER)

RADIO C2 (COMPACT DISC CHANGER) - DK. GRAY 10 WAY

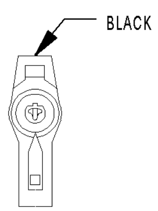
CAV	CIRCUIT	FUNCTION
1	24GY/WT	AUDIO OUT RIGHT
2	24BK/OR	GROUND
3	22BK	SHIELD GROUND
4	24VT/YL	PCI BUS
5	24RD	FUSED IGNITION SWITCH OUTPUT
6	24DG/WT	AUDIO OUT LEFT
7	22BK/YL	GROUND
8	-	-
9	24OR/YL	PANEL LAMPS DIMMER SIGNAL
10	22GY/YL	B(+)



REMOTE KEYLESS
ENTRY MODULE

REMOTE KEYLESS ENTRY MODULE - BLACK 26 WAY

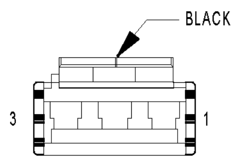
CAV	CIRCUIT	FUNCTION
1	L4 16VT/WT (EXCEPT EX-PORT)	DIMMER SWITCH LOW BEAM OUTPUT
1	L63 18DG/RD (EXPORT)	LEFT TURN SIGNAL
2	L7 18BK/YL (EXCEPT EX-PORT)	PARK LAMP SWITCH OUTPUT
2	L62 18BR/RD (EXPORT)	RIGHT TURN SIGNAL
3	F35 18RD	FUSED B(+)
4	P33 18OR/BK	DOOR LOCK RELAY OUTPUT
5	P34 18PK/BK	DRIVER DOOR UNLOCK RELAY OUTPUT
6	P36 18PK/VT	DOOR UNLOCK RELAY OUTPUT
7	M9 20LB/OR	PASSENGER DOOR AJAR/RKE SENSE
8	Z2 18BK/LG	GROUND
9	M1 18PK	FUSED B(+)
10	P97 20LG (LHD)	LEFT DOOR SWITCH MUX
10	P96 20LG/BK (RHD)	RIGHT DOOR SWITCH MUX
11	P96 20LG/BK (LHD)	RIGHT DOOR SWITCH MUX
11	P97 20LG (RHD)	LEFT DOOR SWITCH MUX
12	Z1 20BK	GROUND
13	-	-
14	Q33 20BR/LB	DECKLID RELEASE RELAY CONTROL
15	X5 22WT/RD (EXPORT)	SIREN CONTROL
16	Q2 16LG/BK	DECKLID RELEASE RELAY OUTPUT
17	G69 20BK/OR	VTSS INDICATOR DRIVER
18	X3 22BK/RD	HORN RELAY CONTROL
19	D25 20VT/YL	PCI BUS
20	G120 18WT/DB (EXPORT)	INTRUSION SENSOR SIGNAL
21	-	-
22	G5 20DB/WT	FUSED IGNITION SWITCH OUTPUT (RUN-START)
23	G70 20BR/TN (EXPORT)	HOOD AJAR SWITCH SENSE
24	G71 20VT/BK	DECKLID SECURITY SWITCH SENSE
25	G75 20TN/BK (LHD)	LEFT FRONT DOOR AJAR SWITCH SENSE
25	G74 20TN/RD (RHD)	RIGHT FRONT DOOR AJAR SWITCH SENSE
26	-	-



RIGHT CYLINDER
LOCK SWITCH
(EXPORT)

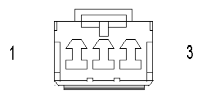
RIGHT CYLINDER LOCK SWITCH (EXPORT) - BLACK 2 WAY

CAV	CIRCUIT	FUNCTION
1	P96 18LG	RIGHT DOOR SWITCH MUX
2	Z14 18BK	GROUND



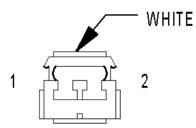
RIGHT DOOR LOCK SWITCH - BLACK 3 WAY

CAV	CIRCUIT	FUNCTION
1	-	-
2	P96 20LG/BK	RIGHT DOOR SWITCH MUX
2	P96 18LG (ALARM)	RIGHT DOOR SWITCH MUX
3	Z14 20BK/YL	GROUND
3	Z14 18BK (ALARM)	GROUND
3	Z14 20BK/YL (EXCEPT ALARM)	GROUND



RIGHT FRONT DOOR SPEAKER - 3 WAY

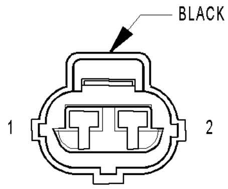
CAV	CIRCUIT	FUNCTION
1	X56 20DB/RD	RIGHT FRONT SPEAKER (-)
2	-	-
3	X54 20VT	RIGHT FRONT SPEAKER (+)



RIGHT INSTRUMENT PANEL SPEAKER - WHITE 2 WAY

CAV	CIRCUIT	FUNCTION
1	X54 20VT	RIGHT FRONT SPEAKER (+)
2	X56 20DB/RD	RIGHT FRONT SPEAKER (-)

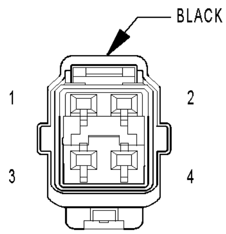
CONNECTOR PINOUTS



RIGHT REAR DOOR AJAR SWITCH

RIGHT REAR DOOR AJAR SWITCH - BLACK 2 WAY

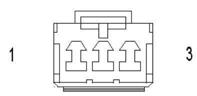
CAV	CIRCUIT	FUNCTION
1	G76 20TN/YL	PASSENGER DOOR AJAR/RKE SENSE
2	Z1 20BK	GROUND



RIGHT REAR DOOR LOCK MOTOR/AJAR SWITCH

RIGHT REAR DOOR LOCK MOTOR/AJAR SWITCH - BLACK 4 WAY

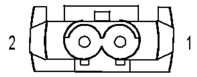
CAV	CIRCUIT	FUNCTION
1	G77 20TN/OR	PASSENGER DOOR AJAR/RKE SENSE
2	Z1 20BK	GROUND
3	P36 18PK/VT	DOOR UNLOCK RELAY OUTPUT
4	P33 18OR/BK	DOOR LOCK RELAY OUTPUT



RIGHT REAR SPEAKER

RIGHT REAR SPEAKER - 3 WAY

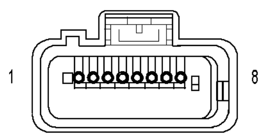
CAV	CIRCUIT	FUNCTION
1	X52 20DB/WT	RIGHT REAR SPEAKER (+)
2	-	-
3	X58 20DB/OR	RIGHT REAR SPEAKER (-)



RIGHT SEAT AIRBAG SQUIB

RIGHT SEAT AIRBAG SQUIB - 2 WAY

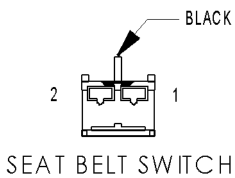
CAV	CIRCUIT	FUNCTION
1	R32 18OR	RIGHT SEAT SQUIB LINE 2
2	R34 18WT	RIGHT SEAT SQUIB LINE 1



RIGHT SIDE IMPACT AIRBAG CONTROL MODULE

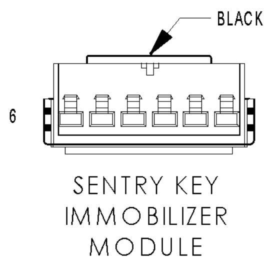
RIGHT SIDE IMPACT AIRBAG CONTROL MODULE - 8 WAY

CAV	CIRCUIT	FUNCTION
1	F15 20DG/WT	FUSED IGNITION SWITCH OUTPUT (RUN-START)
2	-	-
3	R34 20OR/YL	RIGHT SEAT SQUIB LINE 1
4	R32 20YL/OR	RIGHT SEAT SQUIB LINE 2
5	Z6 20BK/PK	GROUND
6	-	-
7	-	-
8	D25 20VT/YL	PCI BUS



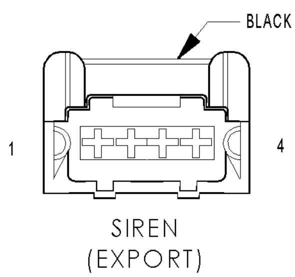
SEAT BELT SWITCH - BLACK 2 WAY

CAV	CIRCUIT	FUNCTION
1	G10 20LG/RD	SEAT BELT SWITCH SENSE
2	Z1 20BK	GROUND



SENTRY KEY IMMOBILIZER MODULE - BLACK 6 WAY

CAV	CIRCUIT	FUNCTION
1	-	-
2	D25 22VT/YL	PCI BUS
3	-	-
4	G5 20DB/WT	FUSED IGNITION SWITCH OUTPUT (RUN-START)
5	Z2 20BK/LG	GROUND
6	M1 20PK	FUSED B(+)

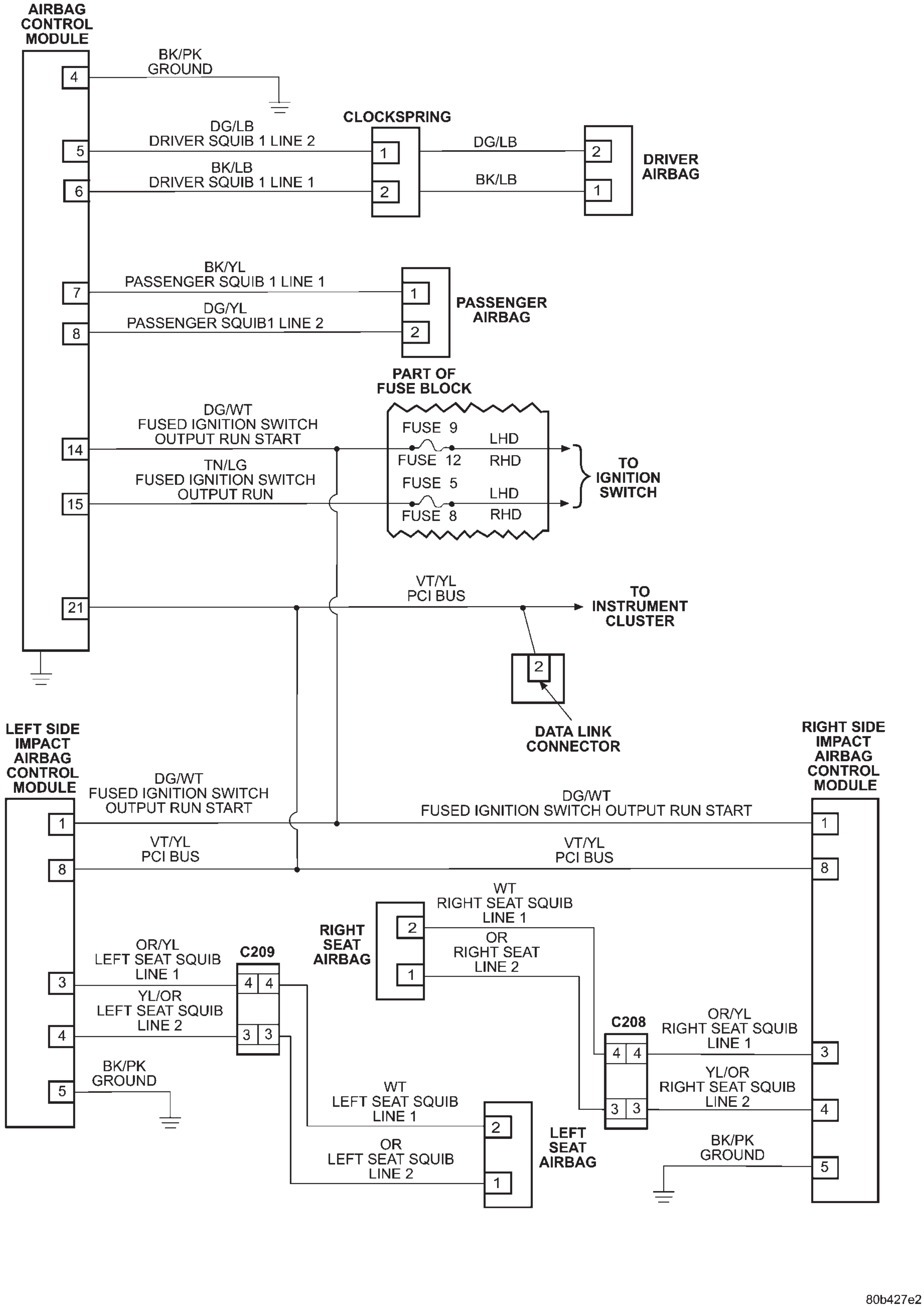


SIREN (EXPORT) - BLACK 4 WAY

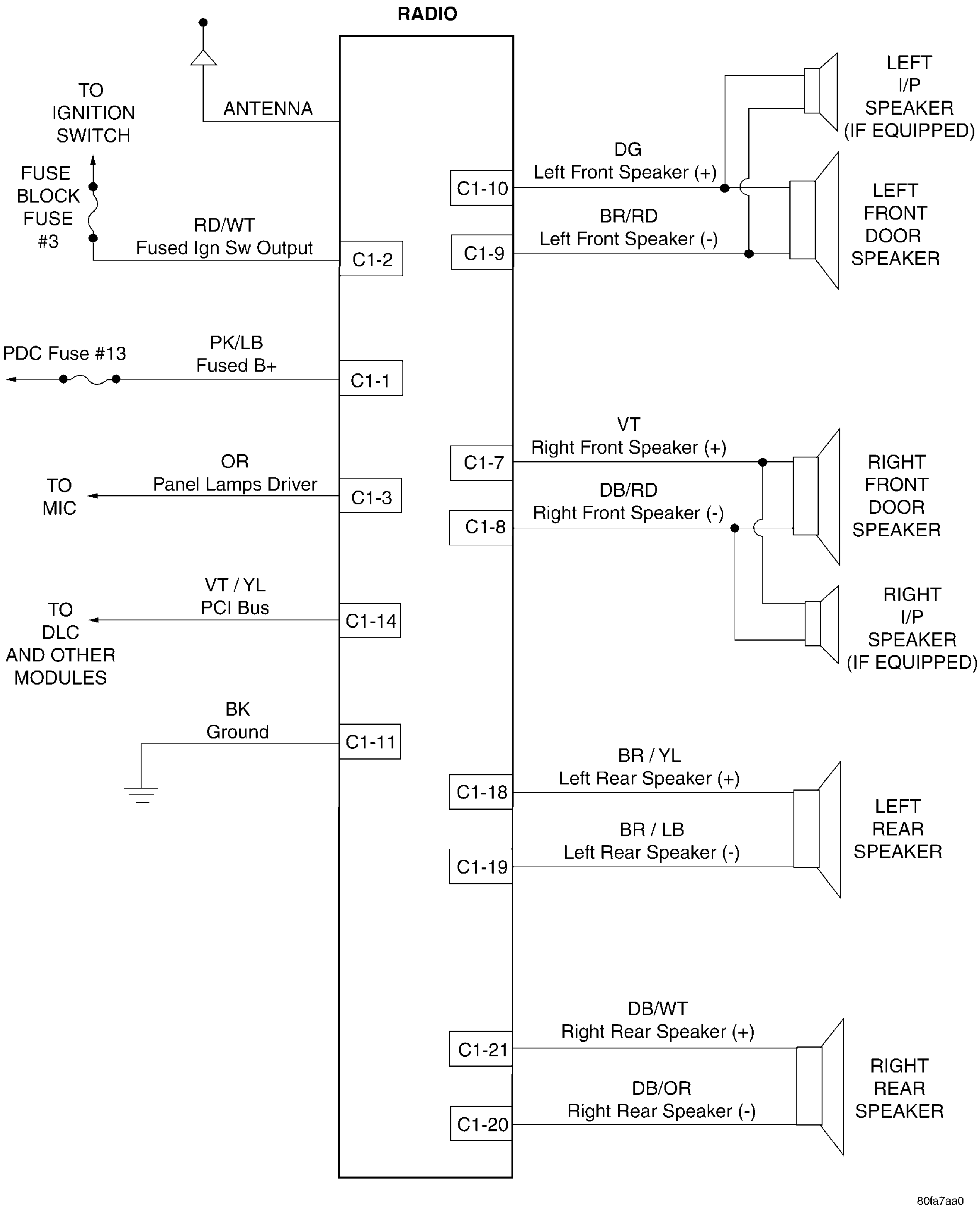
CAV	CIRCUIT	FUNCTION
1	X5 20WT/RD	SIREN CONTROL
2	X5 20WT/RD	SIREN CONTROL
3	Z1 18BK	GROUND
4	M1 18PK	FUSED B(+)

10.0 SCHEMATIC DIAGRAMS

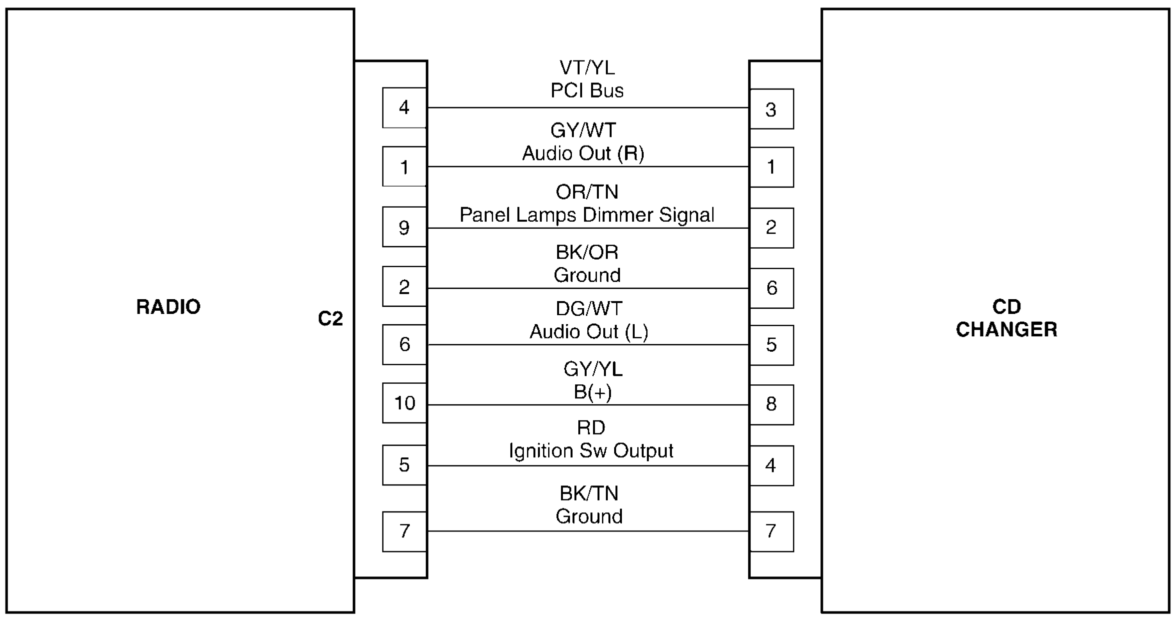
10.1 AIRBAG SYSTEM



10.2 AUDIO SYSTEM



10.2.1 CD CHANGER



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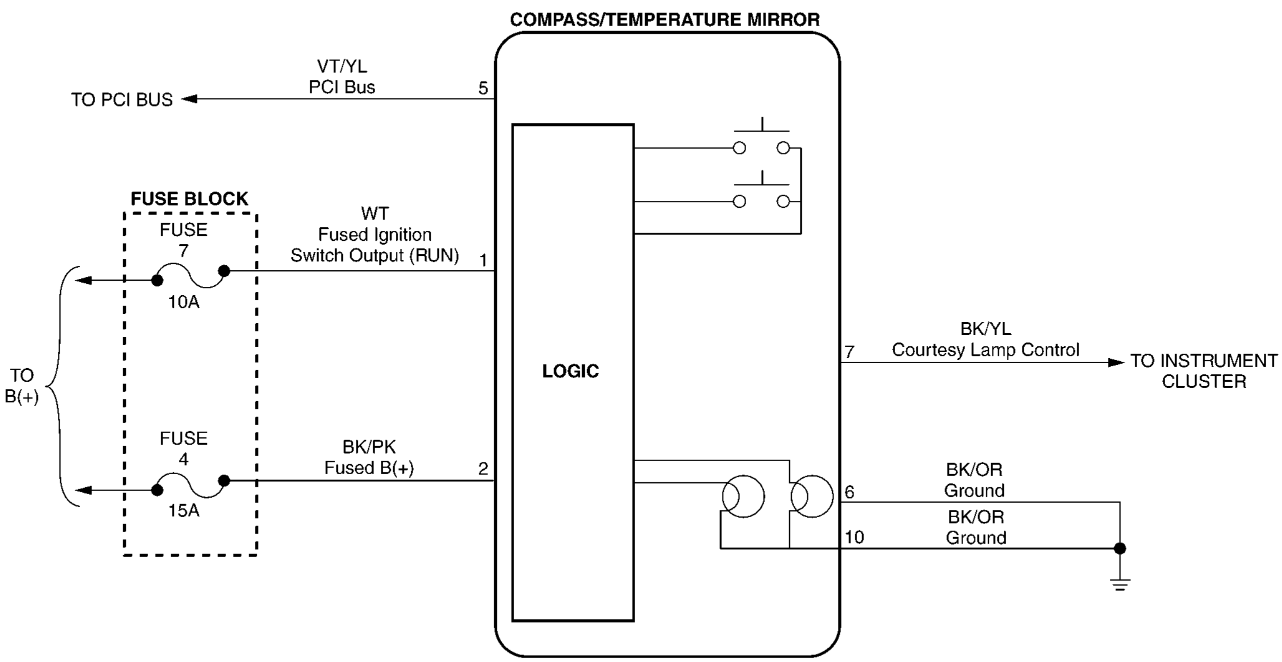
10.3 COMPASS/TEMPERATURE MIRROR



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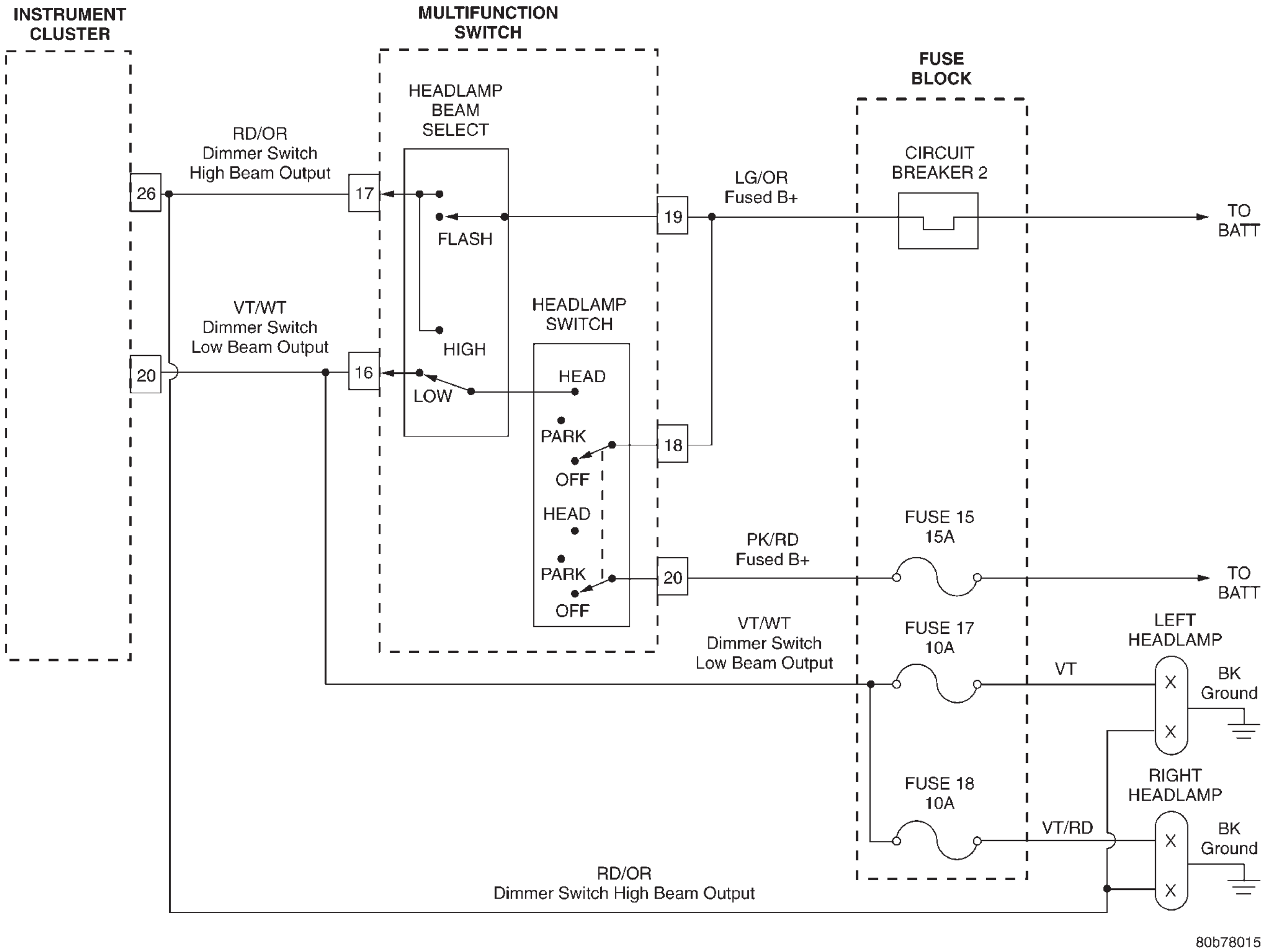
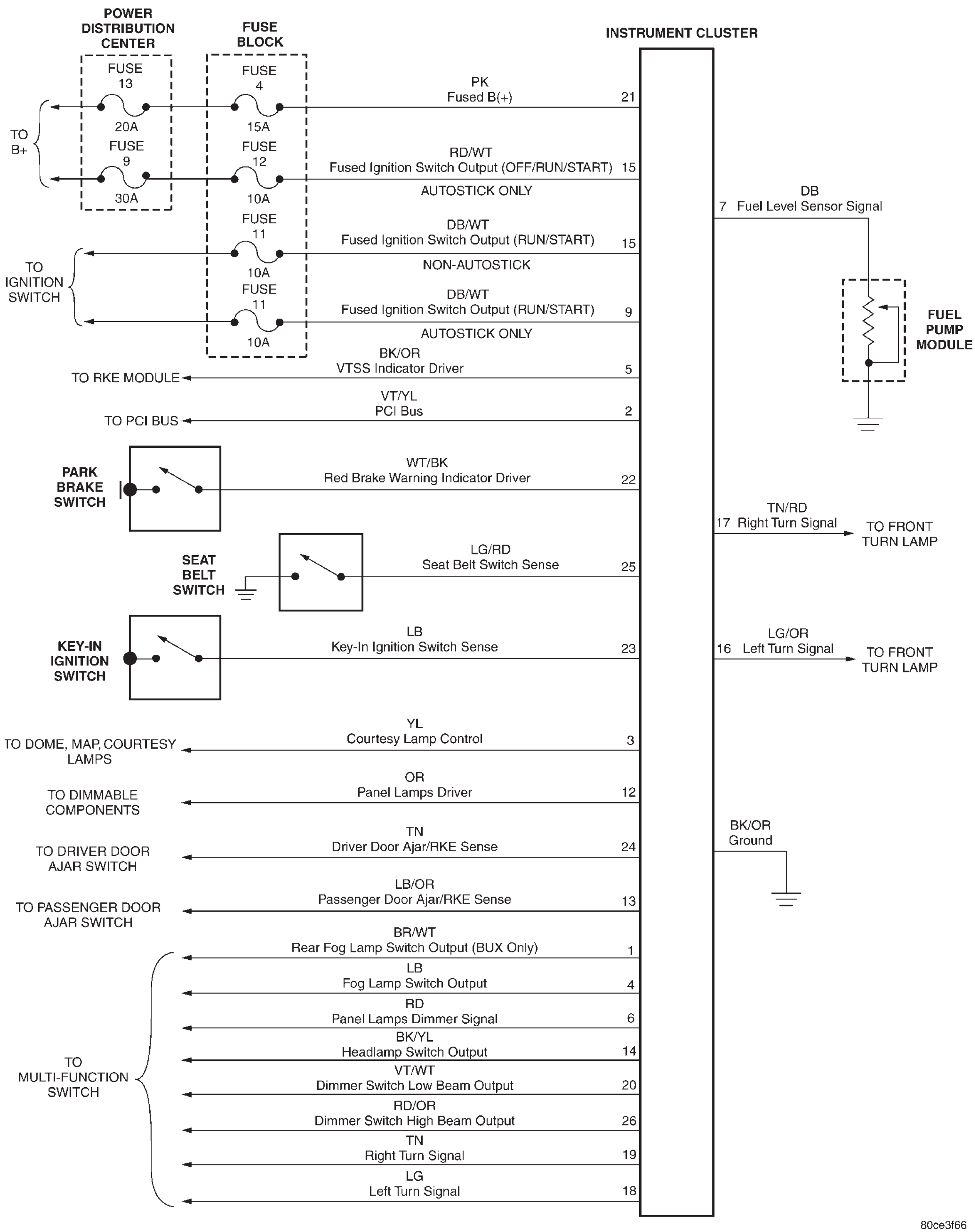
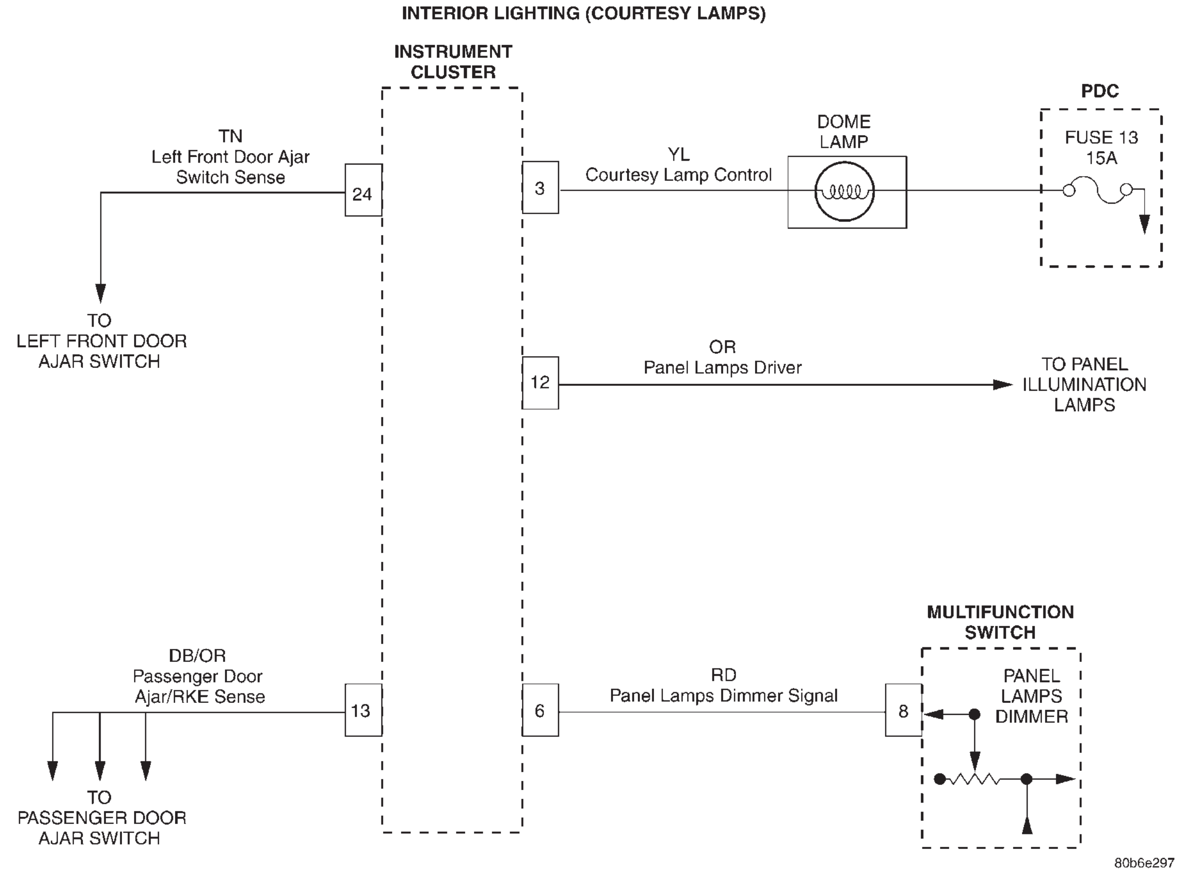
10.4 EXTERIOR LIGHTING



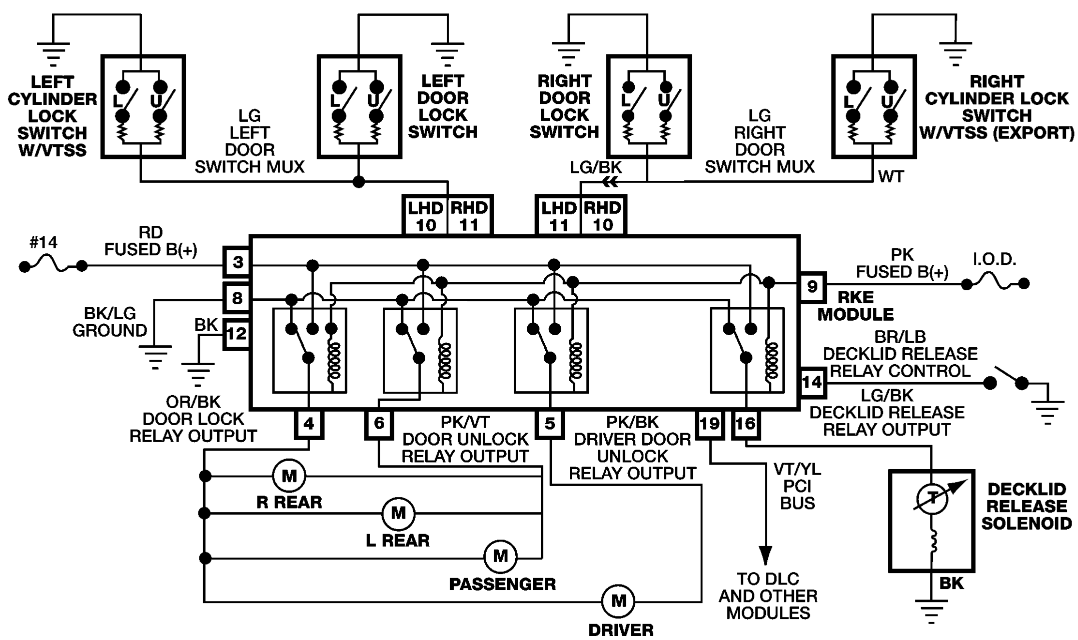
10.5 INSTRUMENT CLUSTER



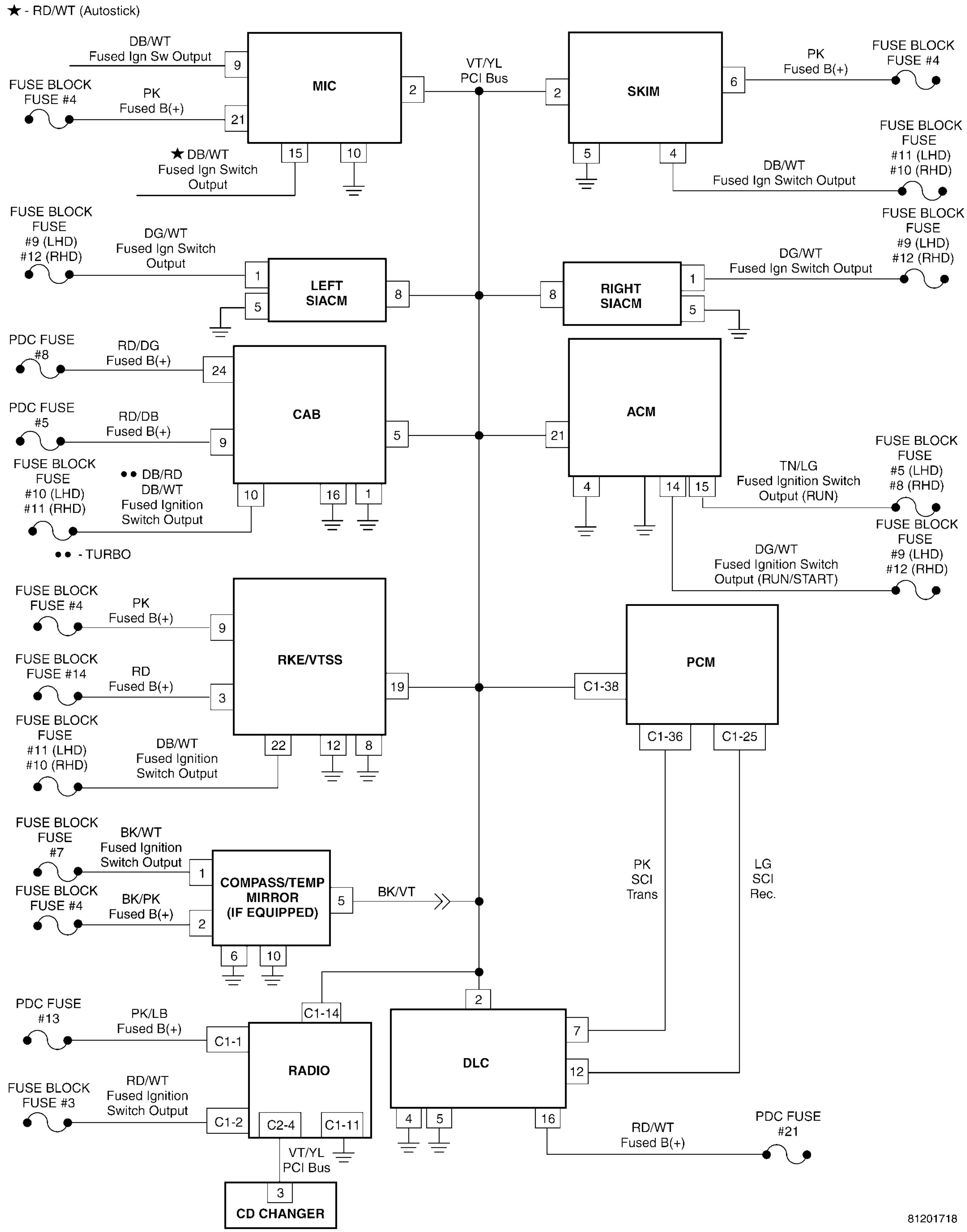
10.6 INTERIOR LIGHTING



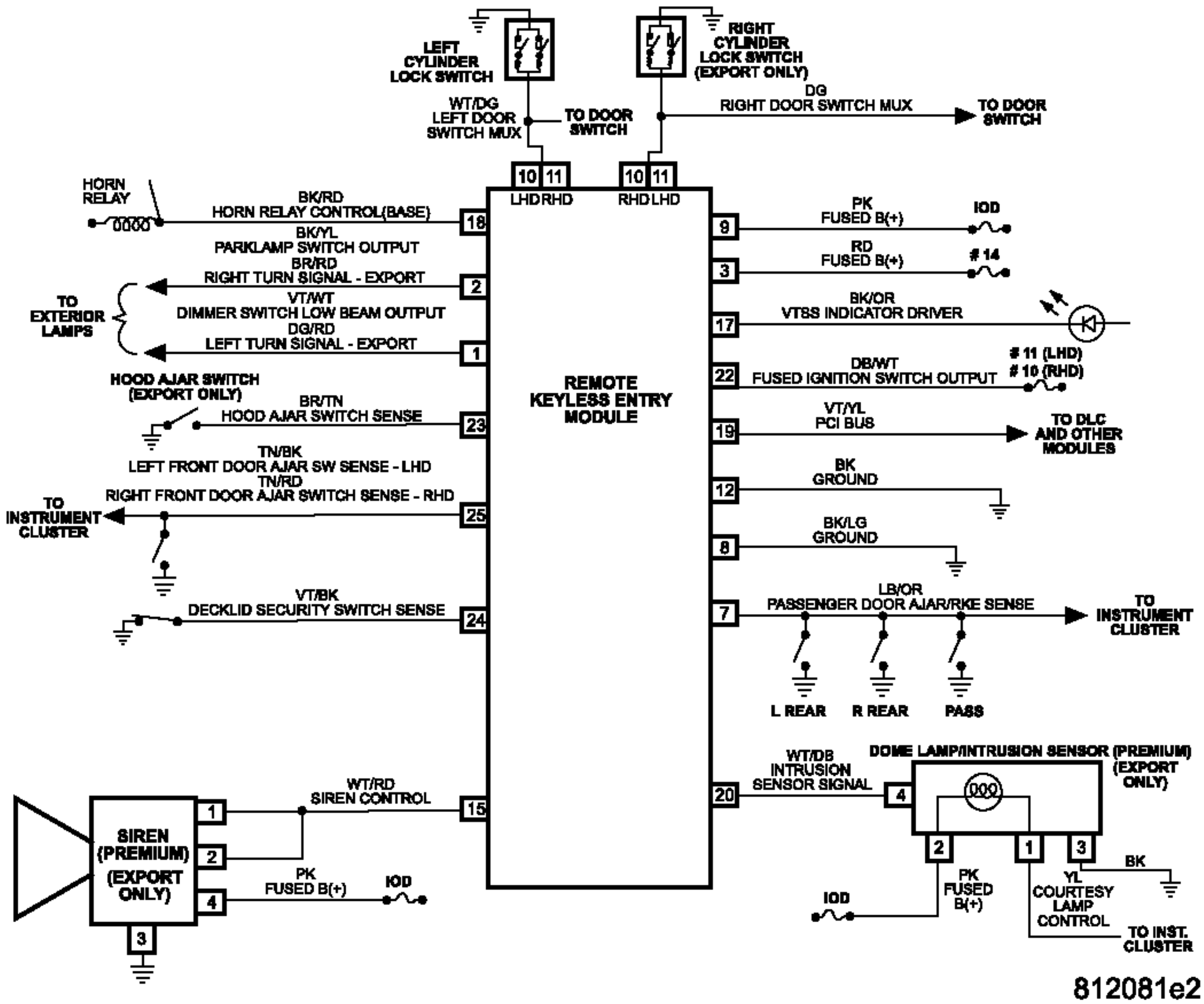
10.7 POWER DOOR LOCKS/RKE



10.8 VEHICLE COMMUNICATION



10.9 VEHICLE THEFT SECURITY SYSTEM



DIAGNOSTIC TEST PROCEDURES — TELL US!

DaimlerChrysler Corporation is constantly working to provide the technician the best diagnostic manuals possible. Your comments and recommendations regarding the diagnostic manuals and procedures are appreciated.

To best understand your suggestion, please complete the form giving us as much detail as possible.

Model ____________ **Year** ________ **Body Type** ____________ **Engine** ________

Transmission ________________ **Vehicle Mileage** ____________ **MDH** ________

Diagnostic Procedure ________________ **Book No.** ____________ **Page** ______

Comments/recommendations (if necessary, draw sketch)

Name ____

____

Submitted by: ____

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All comments become property of DaimlerChrysler Corporation and may be used without compensation.

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TABLE OF CONTENTS

TABLE OF CONTENTS - Continued

1.0 INTRODUCTION

The procedures contained in this manual include all the specifications, instructions, and graphics needed to diagnose 2004 Chrysler and Dodge Neon Mark 20e Antilock Braking System (ABS) problems. The diagnostics in this manual are based on the failure condition or symptom being present at time of diagnosis.

Follow the recommendations below when choosing your diagnostic path.

1. First make sure the DRBIII® is communicating with the CAB. If the DRBIII® displays a “No Response” condition, you must diagnose that first.
2. Read and record DTC’s (diagnostic trouble codes) and Freeze Frame information with the DRBIII®.
3. If no DTC’s are present, identify the customer complaint.
4. Once the DTC or customer complaint is identified, locate the matching test in the Table of Contents and begin to diagnose the symptom.

All component location views are in Section 8.0. All connector pinouts are in Section 9.0. All schematics are in Section 10.0.

An * placed before the symptom description indicated a customer complaint.

When repairs are required, refer to the appropriate service manual for the proper removal and repair procedure.

Diagnostic procedures change every year. New diagnostic systems may be added; carry over systems may be enhanced. READ THIS MANUAL BEFORE TRYING TO DIAGNOSE A VEHICLE CODE. It is recommended that you review the entire manual to become familiar with all new and changed diagnostic procedures.

After using this book, if you have any comments or recommendations, please fill out the form at the back of the book and mail it back to us.

1.1 SYSTEM COVERAGE

This diagnostic procedure manual covers the Teves Mark 20e Antilock Braking System (ABS) on the Neon.

1.2 SIX-STEP TROUBLESHOOTING PROCEDURE

Diagnosis of the antilock brake system is done in six basic steps:

- verification of complaint
- verification of any related symptoms
- symptom analysis
- problem isolation
- repair of isolated problem
- verification of proper operation

2.0 IDENTIFICATION OF SYSTEM

Vehicles equipped with the Teves Mark 20e antilock brake system can be identified by the presence of the hydraulic control unit located with the controller antilock brake (CAB) under the hood near the air cleaner housing, or by observing the ABS lamp illumination during the bulb check.

3.0 SYSTEM DESCRIPTION AND FUNCTIONAL OPERATION

3.1 TEVES MARK 20e SYSTEM DESCRIPTION

This section covers the physical and operational descriptions, and the diagnostic service procedures for the Teves Mark 20e Antilock Brake System. It is the only antilock brake system (ABS) available on this vehicle.

The purpose of the antilock brake system is to prevent wheel lockup under braking conditions on virtually any type of road surface. Antilock braking is desirable because a vehicle that is stopped without locking the wheels retains directional stability and some steering capability. This allows the driver to retain greater control of the vehicle during braking.

All vehicles equipped with ABS use Electronic Variable Brake Proportioning (EVBP) to balance front-to-rear braking when the brakes are applied in the partial braking range.

A Controller Antilock Brake (CAB) module is used to monitor wheel speeds and to modulate (control) hydraulic pressure in each brake channel when ABS is actuated. The CAB also provides a vehicle speed signal (VSS) to the powertrain control module via PCI BUS.

During a non-ABS stop, the system functions as a standard diagonally split configuration. The primary hydraulic system supplies brake fluid pressure to the right front and left rear brakes, and the secondary hydraulic system supplies the right rear and left front brakes. A conventional proportioning valve is not used. This system uses the existing ABS solenoids to replace and perform the same functions that the proportioning valves do. The CAB has a special software program that monitors the wheel speeds and when certain criteria are met the software will enable the solenoids to perform the same brake fluid management control as the proportioning valves.

During an ABS stop, the system still uses the diagonal hydraulic split; however, the brake system pressure is further split into four control channels. During ABS operation, all wheels are controlled independently and are on four separate control channels.

During an antilock stop, “wheel lock-up” does not necessarily mean that the wheel has locked, it means only that the wheel is turning slower than the vehicle speed. This is called “wheel slip” and is indicated as a percentage. 0% slip means that the wheel is rolling free and 100% slip means that the wheel is locked. The antilock system maintains an average of approximately 20% wheel slip.

It is important to remember that the antilock brake system does not shorten the vehicle stopping distance under all driving conditions, but provides improved control of the vehicle while stopping. Vehicle stopping distance is still dependent on vehicle speed, weight, tires, road surface, and other factors.

3.1.1 PEDAL FEEL/VEHICLES CHARACTERISTICS

There are several pedal feel/vehicle characteristics that are considered normal for antilock braking that may require further explanation.

When stopping conditions activate the antilock brakes, the driver may feel some vibrations/pulsations in the brake pedal and may hear the solenoid valves clicking and the pump motor running. The vibrations/pulsations are caused by the isolating, building and decaying of brake fluid pressure within the brake lines. The ABS system prevents complete wheel lock-up, but some wheel slip is required for the best braking performance. This slip may result in some tire chirping, depending on the road surface. This chirping should not be interpreted as total wheel lock-up. Total wheel lock-up leaves black tire marks on dry pavement. Antilock braking may leave some light marks.

At the end of an ABS stop, the ABS may function all the way down to near 0 km/h (0 mph). There may be a slight brake pedal drop anytime the ABS is deactivated.

In case of braking on a bumpy surface, the ABS system may detect wheel locking tendencies due to wheel hop and cycle the ABS. In that event the brake pedal may pulsate with a perceived loss of deceleration. ABS braking may also be activated at times while on dry pavement with sand, gravel, or other loose debris on the road.

It should be noted that the pulsating pedal feel characteristic will not illuminate the brake warning lamps or set a trouble code that is stored in the Controller Antilock Brake (CAB). When investigating a hard pedal feel, inspect the sensor and tone wheel teeth for chips/broken teeth, damaged sensor pole tips, excessive runout of the tone wheel, or excessive air gap.

3.1.2 SYSTEM COMPONENTS

ANTILOCK BRAKE SYSTEM

- controller antilock brake (CAB)
- vacuum booster
- master cylinder (w/center valves)
- hydraulic control unit (HCU)
- valve block assembly: 8 valve solenoids (4 inlet valves, 4 outlet valves)
- pump/motor assembly:
  1 motor
  2 pumps
- 4 wheel speed sensor/tone wheel assemblies
- ABS warning indicator
- fuses and wiring harness
- fluid reservoir (integral part of master cylinder assembly)

3.1.3 ABS AND RED BRAKE WARNING INDICATOR

The amber ABS warning indicator is located in the instrument cluster. It is used to inform the driver that the antilock function has been turned off due to a system malfunction. The CAB controls the lamp indirectly. The CAB monitors its own functions. If the CAB determines that the ABS warning indicator should be on, the CAB sends a message via the PCI BUS to the instrument cluster and the cluster turns on the indicator. The indicator will remain lit during every key cycle until the circuit or component fault is repaired and the CAB no longer detects the fault. After repair of a sensor signal fault or a pump motor fault, the CAB must sense all four wheels at 25 km/h (15 mph) before it will extinguish the ABS and Indicators.

The Instrument Cluster will illuminate the ABS Warning Indicator if it loses communication with the CAB.

The red brake warning indicator is located in the instrument cluster. It can be activated by application of the parking brake, a leak in the front or rear wheel brake hydraulic circuit which causes the master cylinder reservoir to be low on fluid, or by turning the ignition switch to the start position. The red brake warning indicator can also be turned on if the CAB indicates an Electronic Brake Distribution (EBD) failure.

3.1.4 CONTROLLER ANTILOCK BRAKE (CAB)

The antilock brake controller (CAB) is a microprocessor-based device that monitors wheel speeds and controls the antilock functions.

The primary functions of the CAB are:

- monitor wheel speeds
- detect wheel locking tendencies
- detect wheel slip
- control fluid pressure modulation to the brakes during antilock stop and traction control operation
- monitor the system for proper operation
- provide communication to the DRBIII® while in diagnostic mode
- store diagnostic information in non-volatile memory

The CAB continously monitors the speed of each wheel. When a wheel locking tendency is detected, the CAB will command the appropriate valve to modulate brake fluid pressure in its hydraulic unit. Brake pedal position is maintained during an antilock stop by being a closed system with the use of 3 accumulators. The CAB continues to control pressure in individual hydraulic circuits until a wheel locking tendency is no longer present. The CAB turns on the pump/motor during an antilock stop.

The antilock brake system is constantly monitored by the CAB for proper operation. If the CAB detects a system malfunction, it can disable the antilock system and turn on the antilock warning lamp. If the antilock function is disabled, the system will revert to standard base brake system operation.

The CAB inputs include the following:

- four wheel speed sensors
- brake lamp switch
- ignition switch
- battery voltage
- diagnostic communication (PCI BUS)

The CAB outputs include the following:

- eight valve/solenoid drivers
- pump/motor actuation
- ABS warning indicator actuation (PCI BUS)
- red brake warning indicator actuation (PCI BUS)
- diagnostic communication (PCI BUS)

3.1.5 HYDRAULIC CONTROL UNIT

The hydraulic control unit (HCU) contains the valve block assembly and the pump/motor assembly.

Valve Block Assembly: The valve block assembly contains inlet valves, outlet valves, and shuttle valves. The inlet valves are spring-loaded in the open position and the outlet valves are spring loaded in the closed position. During an antilock stop, these valves are cycled to maintain the proper slip ratio for each channel. If a wheel locks, the inlet valve is closed to prevent any further pressure increase. Then the outlet valve is opened to release the pressure to the accumulators until the wheel is no longer slipping. Once the wheel is no longer slipping, the outlet valve is closed and the inlet valve is opened to reapply pressure. If the wheel is decelerating within its predetermined limits (proper slip ratio), both valves will close to hold the pressure constant.

Pump Motor Assembly: The pump motor assembly provides the extra amount of fluid needed during antilock braking. The pump is supplied fluid that is released to the accumulators when the outlet valve is opened during an antilock stop. The pump is also used to drain the accumulator circuits after the antilock stop is complete. The pump is operated by an integral electric motor. This motor is controlled by the CAB. The CAB may turn on the motor when an antilock stop is detected. The pump continues to run during the antilock stop and is turned off approximately 3-5 seconds after the stop is complete. The CAB monitors the pump motor operation internally.

3.1.6 SENSORS

Wheel Speed Sensors and Tone Wheels: One wheel speed sensor (WSS) is located at each wheel. The sensor has internal circuitry powered by 12 volts from the controller antilock brake (CAB). The sensor generates and sends a DC voltage signal back to the CAB. The signal is toggled in proportion to the speed of the toothed tone wheel as it passes the sensor pole. The CAB uses the signal to activate ABS functions as required.

Because of the internal circuitry, correct sensor function cannot be determined by a resistance check across the pins of the sensor.

The front wheel sensors are attached to a boss in the steering knuckle. The tone wheels are an integral part of the front axle shaft. The rear speed sensors are mounted in the caliper adapter plate and the rear tone wheels are an integral part of the rear rotor hubs. **The wheel speed sensor air gap is NOT adjustable.**

Correct antilock system operation is dependent on wheel speed signals from the wheel speed sensors. The vehicle's wheels and tires should all be the same size and type to generate accurate signals. In addition, the tires should be inflated to the recommended pressures for optimum system operation. Variations in wheel and tire size or significant variations in inflation pressure can produce inaccurate wheel speed signals; however, the system will continue to function when using the correct factory mini-spare.

3.2 ABS DIAGNOSTIC TROUBLE CODES

The Teves Mark 20e Antilock Brake System (ABS) module may report any of the following diagnostic trouble codes:

- BUS System Communication Failure
- CAB Internal Failure
- Cluster Lamp Failure
- Left Front Sensor Circuit Failure
- Left Front Wheel Speed Signal Failure
- Left Rear Sensor Circuit Failure
- Left Rear Wheel Speed Signal Failure
- Pump Circuit Failure
- Right Front Sensor Circuit Failure
- Right Front Wheel Speed Signal Failure
- Right Rear Sensor Circuit Failure
- Right Rear Wheel Speed Signal Failure
- System Over Voltage
- System Under Voltage
- Valve Power Feed Failure

Diagnostic trouble codes are retained in memory until erased using the DRBIII®, or automatically erased after 255 key cycles or 3500 miles.

3.2.1 SYSTEM INITIALIZATION

System initialization starts when the key is turned to “run”. At this point, the CAB performs a complete self-check of all electrical components in the antilock brake systems. The ABS and brake warning lamps will illuminate for 4 seconds with ignition on.

At 20 km/h (12 mph) a dynamic test is performed. This will momentarily run the pump/motor. If during the dynamic test, the brake pedal is depressed, the driver may feel the test through brake pedal pulsations. This is a normal condition.

If any component sets a trouble code during system initialization or dynamic check, the CAB will illuminate the ABS warning lamp.

3.2.2 DIAGNOSTIC MODE

For a Mark 20e system to enter diagnostic mode, vehicle speed must be below 10 km/h (6 mph) and no ABS condition present. If vehicle speed is not below 10 km/h (6 mph), a “no response” message could be displayed by the DRBIII®. The following are characteristics of diagnostic mode:

- The amber ABS and red brake warning indicator will blink rapidly. If a hard trouble code is present, such as a CAB Power Feed Circuit diagnostic trouble code, the indicator will be illuminated without blinking until the diagnostic trouble condition is corrected.
- Antilock operation is disabled.

3.2.3 INTERMITTENT DIAGNOSTIC TROUBLE CODES

If the malfunction is not present while performing a test procedure, the diagnostic procedures will not locate the problem. In this case, the code can only suggest an area to inspect. Check for the following:

- loose or corroded conditions
- damaged components (sensors, tone wheels)
- damaged wiring
- excessive axle shaft runout
- hydraulic system leaks
- foundation (non-ABS) brake system problems

If no obvious problems are found, erase diagnostic trouble codes and, with the key on, wiggle the wire harness and connectors. Recheck for codes periodically while working through the system. This procedure may uncover a difficult to locate malfunction.

3.3 FREEZE FRAME

Freeze Frame takes a “snapshot” of specific vehicle information the instant an ABS failure is recognized and stores this information into the CAB memory. This information can be accessed using the DRBIII® to help diagnose the fault. Freeze Frame will capture the first time failure or only a new failure that occurs during the current ignition cycle.

3.4 USING THE DRBIII®

Refer to the DRBIII® user’s guide for instructions and assistance with reading diagnostic trouble codes, erasing diagnostic trouble codes and other DRBIII® functions.

3.5 DRBIII® ERROR MESSAGES

Under normal operation, the DRBIII® will display one of only two error messages:

– User-Requested WARM Boot or User-Requested COLD Boot

If the DRBIII® should display any other error message, record the entire display and call the Star Center. This is a sample of such an error message display:

```
ver: 2.14
date: 26 Jul93
file: key_itf.cc
date: Jul 26 1993
line: 548
err. 0x1
User-Requested COLD boot

Press MORE to switch between this display
   and the application screen.
Press F4 when done noting information.
```

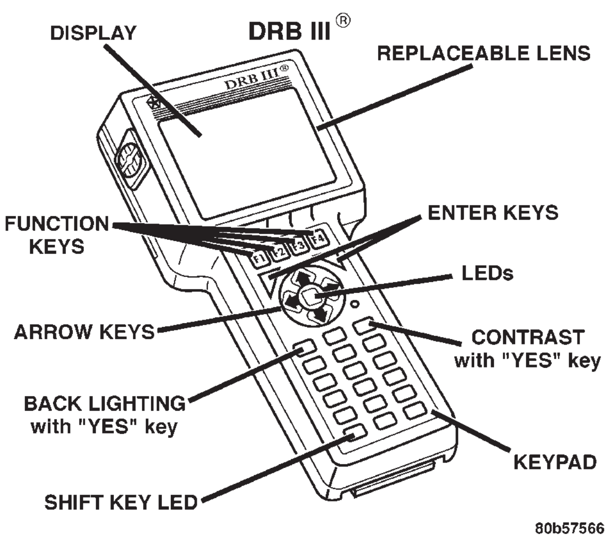
3.5.1 DRBIII® DOES NOT POWER UP (BLANK SCREEN)

If the LED's do not light or no sound is emitted at start up, check for loose cable connections or a bad cable. Check the vehicle battery voltage (data link 16-way connector cavity 16). A minimum of 11 volts is required to adequately power the DRBIII®. Also check for a good ground at the DLC.

If all connections are proper between the DRBIII® and the vehicle or other devices, and the vehicle battery is fully charged, an inoperative DRBIII® may be the result of faulty cable or vehicle wiring.

3.5.2 DISPLAY IS NOT VISIBLE

Low temperatures will affect the visibility of the display. Adjust the contrast to compensate for this condition.



4.0 DISCLAIMERS, SAFETY, WARNINGS

4.1 DISCLAIMERS

All information, illustrations, and specifications contained in this manual are based on the latest information available at the time of publication. The right is reserved to make changes at any time without notice.

4.2 SAFETY

4.2.1 TECHNICIAN SAFETY INFORMATION

WARNING: ENGINES PRODUCE CARBON MONOXIDE THAT IS ODORLESS, CAUSES SLOWER REACTION TIME, AND CAN LEAD TO SERIOUS INJURY. WHEN THE ENGINE IS OPERATING, KEEP SERVICE AREAS WELL VENTILATED, OR ATTACH THE VEHICLE EXHAUST SYSTEM TO THE SHOP EXHAUST REMOVAL SYSTEM.

Set the parking brake and block the wheels before testing or repairing the vehicle. It is especially important to block the wheels on the vehicle; the parking brake does not hold the front drive wheels.

When servicing a vehicle, always wear eye protection, and remove any metal jewelry such as watchbands or bracelets that might make an inadvertent electrical contact.

When diagnosing an antilock brake or speed proportional steering system problem, it is important to follow approved procedures where applicable. These procedures can be found in the service manual. Following these procedures is very important to safety of individuals performing diagnostic tests.

4.2.2 VEHICLE PREPARATION FOR TESTING

Make sure the vehicle being tested has a fully charged battery. If it does not, false diagnostic codes or error messages may occur.

4.2.3 SERVICING SUB—ASSEMBLIES

Some components of the antilock brake or speed proportional steering system are intended to be serviced in assembly only. Attempting to remove or repair certain sub-components may result in personal injury and/or improper system operation. Only those components with approved repair and installation procedures in the service manual should be serviced.

4.2.4 DRBIII® SAFETY INFORMATION

WARNING: EXCEEDING THE LIMITS OF THE DRBIII® MULTIMETER IS DANGEROUS. IT CAN EXPOSE YOU TO SERIOUS OR POSSIBLY FATAL INJURY. CAREFULLY READ AND UNDERSTAND THE CAUTIONS AND THE SPECIFICATION LIMITS.

- Follow the vehicle manufacturer's service specifications at all times.
- Do not use the DRBIII® if it has been damaged.
- Do not use the test leads if the insulation is damaged or if metal is exposed.
- To avoid electrical shock, do not touch the test leads, tips, or the circuit being tested.
- Choose the proper range and function for the measurement. Do not try voltage or current measurements that may exceed the rated capacity.
- Do not exceed the limits shown in the table below:

FUNCTION	INPUT LIMIT
Volts	0 — 500 peak volts AC 0 — 500 volts DC
Ohms (resistance)*	0 — 1.12 megohms
Frequency Measured Frequency Generated	0 — 10 kHz
Temperature	-58 — 1100° F -50 — 600° C

* Ohms cannot be measured if voltage is present. Ohm can be measured only in a non—powered circuit.

- Voltage between any terminal and ground must not exceed 500v DC or 500v peak AC.
- Use caution when measuring voltage above 25v DC or 25v AC.
- Use the low current shunt to measure circuits up to 10A. Use the high current clamp to measure circuits exceeding 10A.
- When testing for the presence of voltage or current, make sure the meter is functioning correctly. Take a reading of a known voltage or current before accepting a zero reading.
- When measuring current, connect the meter in series with the lead.
- When using the meter function, keep the DRBIII® away from spark plug or coil wires to avoid measuring error from outside interference.

4.3 WARNING

4.3.1 VEHICLE DAMAGE WARNINGS

Before disconnecting any control module, make sure the ignition is "off". Failure to do so could damage the module.

When testing voltage or continuity at any control module, use the terminal side (not the wire end) of the connector. Do not probe a wire through the insulation, this will damage it and eventually cause it to fail because of corrosion.

Use care when performing electrical tests so as to prevent accidental shorting of terminals. Such mistakes can damage fuses or components. Also, a second code could be set, making diagnosis of the original problem more difficult.

4.3.2 ROAD TESTING A COMPLAINT VEHICLE

Some complaints will require a test drive as part of the repair verification procedure. The purpose of the test drive is to try to duplicate the diagnostic code or symptom condition.

CAUTION: Before road testing a vehicle, be sure that all components are reassembled. During the test drive, do not try to read the DRBIII® screen while in motion. Do not hang the DRBIII® from the rear view mirror or operate it yourself. Have an assistant available to operate the DRBIII®.

4.4 DIAGNOSIS

1. Your diagnostic test procedure must begin with a thorough visual inspection of the ABS system for damaged components or disconnected connectors. The brake lamps must be operational, and if they are not, repair them prior to continuing.
2. Connect the DRBIII® to the data link connector located under the dash to the left of the steering column. If the DRBIII® does not power up, check the power and ground supplies to the connector.
3. Select "Antilock Brakes". Turn the ignition on. If the DRBIII® displays "No Response", perform the proper test.
4. Read and record all ABS diagnostic trouble codes and Freeze Frame information. If the "Valve Power Feed Circuit" diagnostic trouble code is present, it must be repaired prior to addressing any other DTC's. If any additional codes are present, proceed to the appropriate test.
5. If there are no diagnostic trouble codes present, select "Inputs/Outputs" and read the brake switch input as you press and release the brake

pedal. If the display does not match the state of the pedal, perform the proper test. If a problem with the amber "ABS" warning indicator exists, refer to the proper test.

6. If no other problems are found, it will be necessary to road test the vehicle. **THE DRBIII® MUST NOT BE CONNECTED TO THE DATA LINK CONNECTOR WHEN ROAD TESTING FOR PROPER ANTILOCK OPERATION. THE SYSTEM IS DISABLED WHILE IN DIAGNOSTIC MODE.** Perform several antilock stops from above 50 Km/h (30 mph) and then repeat steps 2, 3, and 4. If any diagnostic trouble codes are present, proceed to the appropriate test.
7. The following conditions should be considered "NORMAL" operation, and no repairs should be attempted to correct them.
   – Brake pedal feedback during an ABS stop (clicking, vibrating)
   – Clicking, groaning or buzzing at 10 Km/h (6 mph) (drive off self test)
   – Groaning noise during an ABS stop
   – Slight brake pedal drop and pop noise when ignition is initially turned on
   – Brake pedal ratcheting down at the end of an ABS stop
8. If the complaint is ABS "cycling" at the end of a stop at low speeds, it may caused by a marginal wheel speed sensor signal. The sensor air gap, tone wheel condition, and/or brakes hanging up are possible causes of this condition.
9. After a road test in which no problems were found, refer to any Technical Service Bulletins that may apply.

5.0 REQUIRED TOOLS AND EQUIPMENT

DRBIII® (diagnostic read-out box)
jumper wires
ohmmeter
voltmeter
test lamp

6.0 GLOSSARY OF TERMS

ABS	antilock brake system
CAB	controller antilock brake
DC	direct current
DLC	data link connector
DRB	diagnostic read–out box
EVBP	electronic variable brake proportioning
HCU	hydraulic control unit
HZ	Hertz
LF	left front
LR	left rear
PCI	Programmable Communication Interference
PCM	Powertrain Control Module
PDC	power distribution center
P/M	pump motor
RF	right front
RR	right rear
SOL	solenoid
WSS	wheel speed sensor

NOTES

7.0

DIAGNOSTIC INFORMATION AND PROCEDURES

Symptom:
BUS SYSTEM COMMUNICATION FAILURE

When Monitored and Set Condition:

BUS SYSTEM COMMUNICATION FAILURE

When Monitored: Ignition ON, continuously.

Set Condition: When the CAB does not receive a message from the instrument cluster for 10 seconds.

POSSIBLE CAUSES
INTERMITTENT CONDITION
ELECTRO-MECHANICAL INSTRUMENT CLUSTER DTC PRESENT
BUS CIRCUIT OPEN
CAB - INTERNAL FAILURE

TEST	ACTION	APPLICABILITY
1	Turn the ignition on. With the DRBIII®, read DTCs. With the DRBIII®, read Freeze Frame information. With the DRBIII®, erase DTCs. Turn the ignition off. Turn the ignition on. With the DRBIII®, read DTCs. Does the DRBIII® display BUS SYSTEM COMMUNICATION FAILURE? Yes → Go To 2 No → Go To 4	All
2	Turn the ignition on. With the DRBIII®, read EMIC DTCs. Does the DRBIII® display ABS MESSAGE NOT RECEIVED? Yes → Refer to symptom ABS MESSAGE NOT RECEIVED in the BODY/INSTRUMENT CLUSTER category. Perform ABS VERIFICATION TEST - VER 1. No → Go To 3	All

BUS SYSTEM COMMUNICATION FAILURE — Continued

TEST	ACTION	APPLICABILITY
3	Turn the ignition off. Disconnect the negative (-) battery cable. Disconnect the CAB harness connector. **NOTE: check connector - Clean/repair as necessary.** Measure the resistance of the Bus circuit between the CAB connector and the Data Link Connector (DLC). Is the resistance below 5.0 ohms? Yes → Replace the Controller Antilock Brake in accordance with the Service Information. Perform ABS VERIFICATION TEST - VER 1. No → Repair the Bus circuit for an open. Perform ABS VERIFICATION TEST - VER 1.	All
4	Turn the ignition off. Visually inspect the related wiring harness. Look for any chafed, pierced, pinched, or partially broken wires. Visually inspect the related wire harness connectors. Look for broken, bent, pushed out, or corroded terminals. Were any problems found? Yes → Repair as necessary. Perform ABS VERIFICATION TEST - VER 1. No → Test Complete.	All

Symptom:
CAB INTERNAL FAILURE

When Monitored and Set Condition:

CAB INTERNAL FAILURE

When Monitored: Ignition on. The CAB monitors the Fused B(+) circuit at all times for proper system voltage.

Set Condition: If the Fused B(+) voltage is missing when the CAB detects that an internal main driver is not ″on″, the Diagnostic Trouble Code (DTC) is set.

POSSIBLE CAUSES
INTERMITTENT DTC
DAMAGED CAB/CAB HARNESS CONNECTOR
CAB - GROUND CIRCUIT OPEN
ABS VALVE FUSED B(+) CIRCUIT OPEN
ABS PUMP FUSED B(+) CIRCUIT OPEN
CAB - INTERNAL FAULT

TEST	ACTION	APPLICABILITY
1	Turn the ignition on. With the DRBIII®, read DTCs. With the DRBIII®, erase DTCs. Turn the ignition off. Turn the ignition on. With the DRBIII®, read DTCs. Does the DRBIII® display CAB INTERNAL FAILURE? Yes → Go To 2 No → Go To 6	All
2	Turn the ignition off. Disconnect the CAB harness connector. Inspect the CAB/CAB harness connector for damage. Is there any broken, bent, pushed out, corroded or spread terminals? Yes → Repair as necessary. Perform ABS VERIFICATION TEST - VER 1. No → Go To 3	All

CAB INTERNAL FAILURE — Continued

TEST	ACTION	APPLICABILITY
3	Turn the ignition off. Disconnect the CAB harness connector. Using a 12-volt test light connected to 12-volts, probe the CAB harness connector ground circuits. Did the test light illuminate? Yes → Go To 4 No → Repair the CAB Ground circuit for an open. Perform ABS VERIFICATION TEST - VER 1.	All
4	Turn the ignition off. Disconnect the CAB harness connector. Using a 12-volt test light connected to ground, probe the ABS Valve Fused B(+) circuit at the CAB harness connector. Did the test light illuminate? Yes → Go To 5 No → Repair the ABS Valve Fused B(+) circuit for an open. Perform ABS VERIFICATION TEST - VER 1.	All
5	Turn the ignition off. Disconnect the CAB harness connector. Using a 12-volt test light connected to ground, probe the ABS Pump Fused B(+) circuit at the CAB harness connector. Did the test light illuminate? Yes → Replace the Controller Antilock Brake in accordance with the Service Information. Perform ABS VERIFICATION TEST - VER 1. No → Repair the ABS Pump Fused B(+) circuit for an open. Perform ABS VERIFICATION TEST - VER 1.	All
6	Turn the ignition off. Visually inspect the related wiring harness. Look for any chafed, pierced, pinched, or partially broken wires. Visually inspect the related wire harness connectors. Look for broken, bent, pushed out, or corroded terminals. Refer to any Hotline letters or Technical Service Bulletins that may apply. Were any problems found? Yes → Repair as necessary. Perform ABS VERIFICATION TEST - VER 1. No → Test Complete.	All

Symptom:
CLUSTER LAMP FAILURE

When Monitored and Set Condition:

CLUSTER LAMP FAILURE

When Monitored: Key ON. After Key-ON bulb check

Set Condition: When the instrument cluster informs the CAB that the cluster cannot turn on the ABS Lamp.

POSSIBLE CAUSES
INSTRUMENT CLUSTER OR ABS DTC PRESENT
INSTRUMENT CLUSTER
CAB - NO DTC SIGNAL TO THE INSTRUMENT CLUSTER
CAB - NO KEY-ON BULB CHECK SIGNAL
CAB - PERMANENT FAULT SIGNAL

TEST	ACTION	APPLICABILITY
1	Turn the ignition on. With the DRBIII®, read DTCs. Are there any Instrument Cluster or ABS DTCs present? Yes → Refer to the appropriate category for the related symptom(s). Perform ABS VERIFICATION TEST - VER 1. No → Go To 2	All
2	Turn the ignition off. Perform the Key-on Bulb Check. Does the ABS Warning Indicator light and then go out after a few seconds? Yes → Go To 3 No. Light remains after bulb check. Replace the Controller Antilock Brake in accordance with the Service Information. Perform ABS VERIFICATION TEST - VER 1. No. Indicator never comes on. Go To 4	All

CLUSTER LAMP FAILURE — Continued

TEST	ACTION	APPLICABILITY
3	**NOTE: The DRBIII® communication with the CAB must be operational for the result of this test to be valid.** Turn the ignition off. Remove ABS Valve fuse. Perform the Key-on Bulb Check. Does the ABS Indicator remain on after the bulb check? Yes → Test Complete. No → Replace the Controller Antilock Brake in accordance with the Service Information. Perform ABS VERIFICATION TEST - VER 1.	All
4	**NOTE: The following steps will initiate the Instrument Cluster self test.** Turn the ignition off. Press and hold the odometer reset button. Turn the ignition to RUN. Observe the Instrument Cluster indicators. Release the odometer reset button. Did the ABS Indicator illuminate during the Instrument Cluster self test? Yes → Replace the Controller Antilock Brake in accordance with the Service Information. Perform ABS VERIFICATION TEST - VER 1. No → Replace the Instrument Cluster in accordance with the Service Information. Perform ABS VERIFICATION TEST - VER 1.	All

Symptom List:

LEFT FRONT SENSOR CIRCUIT FAILURE
LEFT REAR SENSOR CIRCUIT FAILURE
RIGHT FRONT SENSOR CIRCUIT FAILURE
RIGHT REAR SENSOR CIRCUIT FAILURE

Test Note: All symptoms listed above are diagnosed using the same tests. The title for the tests will be LEFT FRONT SENSOR CIRCUIT FAILURE.

When Monitored and Set Condition:

LEFT FRONT SENSOR CIRCUIT FAILURE

When Monitored: Ignition on. The CAB monitors the wheel speed circuit continuously.

Set Condition: If the CAB detects an open or shorted wheel speed sensor circuit, the Diagnostic Trouble Code (DTC) will set.

LEFT REAR SENSOR CIRCUIT FAILURE

When Monitored: Ignition on. The CAB monitors the wheel speed circuit continuously.

Set Condition: If the CAB detects an open or shorted wheel speed sensor circuit, the Diagnostic Trouble Code (DTC) will set.

RIGHT FRONT SENSOR CIRCUIT FAILURE

When Monitored: Ignition on. The CAB monitors the wheel speed circuit continuously.

Set Condition: If the CAB detects an open or shorted wheel speed sensor circuit, the Diagnostic Trouble Code (DTC) will set.

RIGHT REAR SENSOR CIRCUIT FAILURE

When Monitored: Ignition on. The CAB monitors the wheel speed circuit continuously.

Set Condition: If the CAB detects an open or shorted wheel speed sensor circuit, the Diagnostic Trouble Code (DTC) will set.

POSSIBLE CAUSES
INTERMITTENT CONDITION
WHEEL SPEED SENSOR OR CONNECTOR DAMAGE
WHEEL SPEED SENSOR SIGNAL CIRCUIT FAULT
WHEEL SPEED SENSOR 12 VOLT SUPPLY CIRCUIT SHORT TO GROUND
WHEEL SPEED SENSOR 12 VOLT SUPPLY CIRCUIT OPEN
WHEEL SPEED SENSOR SIGNAL CIRCUIT SHORT TO GROUND
WHEEL SPEED SENSOR SIGNAL CIRCUIT OPEN

LEFT FRONT SENSOR CIRCUIT FAILURE — Continued

POSSIBLE CAUSES
CAB - 12 VOLT SUPPLY CIRCUIT FAULT
CAB - SIGNAL CIRCUIT FAULT
WHEEL SPEED SENSOR 12 VOLT SUPPLY SHORT TO GROUND
WHEEL SPEED SENSOR SIGNAL CIRCUIT INOPERATIVE

TEST	ACTION	APPLICABILITY
1	Turn the ignition on. With the DRBIII®, read DTCs. With the DRBIII®, read the Freeze Frame information. With the DRBIII®, erase DTCs. Turn the ignition off. Turn the ignition on. With the DRBIII®, read DTCs. **NOTE: The CAB must sense all four wheels at 25km/h (15 mph) before it will extinguish the ABS indicators.** Does the DRBIII® display SENSOR CIRCUIT FAILURE? Yes → Go To 2 No → Go To 13	All
2	Turn the ignition off. Inspect the CAB connector, affected Wheel Speed Sensor, and affected Wheel Speed Sensor connector. Is the affected Wheel Speed Sensor or any of the connectors damaged? Yes → Repair as necessary. Perform ABS VERIFICATION TEST - VER 1. No → Go To 3	All
3	Turn the ignition off. Disconnect the affected Wheel Speed Sensor connector. **Note: Check connector - Clean/repair as necessary.** Turn the ignition on. Measure the voltage between affected Wheel Speed Sensor 12 Volt Supply circuit and ground. Is the voltage above 10 volts? Yes → Go To 6 No → Go To 4	All
4	Turn the ignition off. Disconnect the CAB harness connector. Disconnect the affected Wheel Speed Sensor connector. Using a 12-volt test light connected to 12-volts, probe the affected Wheel Speed Sensor 12 Volt Supply circuit. Does the test light illuminate? Yes → Repair the affected Wheel Speed Sensor 12 Volt Supply circuit for a short to ground. Perform ABS VERIFICATION TEST - VER 1. No → Go To 5	All

LEFT FRONT SENSOR CIRCUIT FAILURE — Continued

TEST	ACTION	APPLICABILITY
5	Turn the ignition off. Disconnect the CAB harness connector. Disconnect the affected Wheel Speed Sensor connector. Connect a jumper wire between affected Wheel Speed Sensor 12 Volt Supply circuit and ground. Using a 12-volt test light connected to 12-volts, probe the affected Wheel Speed Sensor 12 Volt Supply circuit. Does the test light illuminate? Yes → Go To 6 No → Repair the affected Wheel Speed Sensor 12 Volt Supply circuit for an open. Perform ABS VERIFICATION TEST - VER 1.	All
6	Turn the ignition off. Disconnect the affected Wheel Speed Sensor connector. **NOTE: Check connector - Clean/repair as necessary.** Turn the ignition on. Measure the voltage between affected Wheel Speed Sensor Signal circuit and ground. Is the voltage above 1 volt? Yes → Repair the affected Wheel Speed Sensor Signal circuit for a short to voltage. Perform ABS VERIFICATION TEST - VER 1. No → Go To 7	All
7	Turn the ignition off. Disconnect the CAB harness connector. Disconnect the affected Wheel Speed Sensor connector. Using a 12-volt test light connected to 12-volts, probe the affected Wheel Speed Sensor Signal circuit. Does the test light illuminate? Yes → Repair the affected Wheel Speed Sensor Signal circuit for a short to ground. Perform ABS VERIFICATION TEST - VER 1. No → Go To 8	All
8	Turn the ignition off. Disconnect the CAB harness connector. Disconnect the affected Wheel Speed Sensor connector. Connect a jumper wire between affected Wheel Speed Sensor Signal circuit and ground. Using a 12-volt test light connected to 12-volts, probe the affected Wheel Speed Sensor Signal circuit. Does the test light illuminate? Yes → Go To 9 No → Repair the affected Wheel Speed Sensor Signal circuit for an open. Perform ABS VERIFICATION TEST - VER 1.	All

LEFT FRONT SENSOR CIRCUIT FAILURE — Continued

TEST	ACTION	APPLICABILITY
9	Turn the ignition off. Remove the CAB harness strain relief to access wires. Reconnect the CAB harness connector. Turn the ignition on. Measure the voltage between affected Wheel Speed Sensor 12 Volt Supply circuit and ground. Is the voltage above 10 volts? Yes → Go To 10 No → Replace the Controller Antilock Brake in accordance with the Service Information. Perform ABS VERIFICATION TEST - VER 1.	All
10	Turn the ignition off. Remove the CAB harness strain relief to access wires. Reconnect the CAB harness connector. Turn the ignition on. Measure the voltage between affected Wheel Speed Sensor 12 Volt Supply circuit and affected Wheel Speed Sensor Signal circuit. Is the voltage above 10 volts? Yes → Go To 11 No → Replace the Controller Antilock Brake in accordance with the Service Information. Perform ABS VERIFICATION TEST - VER 1.	All
11	Turn the ignition off. Reconnect ALL affected Wheel Speed Sensor circuit connectors. Disconnect the affected Wheel Speed Sensor connector. Turn the ignition on. Measure the voltage of the affected Wheel Speed Sensor 12 Volt Supply circuit in the affected Wheel Speed Sensor connector while reconnecting the sensor connector. Did the affected Wheel Speed Sensor 12 Volt Supply circuit drop voltage to 0 DC volts? Yes → Replace the affected Wheel Speed Sensor in accordance with the Service Information. Perform ABS VERIFICATION TEST - VER 1. No → Go To 12	All
12	Turn the ignition off. Reconnect ALL affected Wheel Speed Sensor circuit connectors. Turn the ignition on. Measure the DC voltage of the Wheel Speed Sensor Signal circuit in the affected Wheel Speed Sensor connector. Slowly rotate the wheel. Does the DC voltage toggle between 1.6 volts to .8 volts? Yes → Go To 13 No → Replace the affected Wheel Speed Sensor in accordance with the Service Information. Perform ABS VERIFICATION TEST - VER 1.	All

LEFT FRONT SENSOR CIRCUIT FAILURE — Continued

TEST	ACTION	APPLICABILITY
13	Turn the ignition off. Visually inspect the related wiring harness. Look for any chafed, pierced, pinched, or partially broken wires. Visually inspect the related wire harness connectors. Look for broken, bent, pushed out, or corroded terminals. Refer to any Hotline letters or Technical Service Bulletins that may apply. Were any problems found? Yes → Repair as necessary. Perform ABS VERIFICATION TEST - VER 1. No → Test Complete.	All

Symptom List:

LEFT FRONT WHEEL SPEED SIGNAL FAILURE
LEFT REAR WHEEL SPEED SIGNAL FAILURE
RIGHT FRONT WHEEL SPEED SIGNAL FAILURE
RIGHT REAR WHEEL SPEED SIGNAL FAILURE

Test Note: All symptoms listed above are diagnosed using the same tests. The title for the tests will be LEFT FRONT WHEEL SPEED SIGNAL FAILURE.

When Monitored and Set Condition:

LEFT FRONT WHEEL SPEED SIGNAL FAILURE

When Monitored: Wheel speed comparison is checked and verified at drive off and continuously thereafter.

Set Condition: If, during an ABS stop, the CAB commands any valve solenoid on for an extended length of time, and does not see a corresponding wheel speed change, the Diagnostic Trouble Code (DTC) is set. The DTC can also set if the signal is missing or erratic.

LEFT REAR WHEEL SPEED SIGNAL FAILURE

When Monitored: Wheel speed comparison is checked and verified at drive off and continuously thereafter.

Set Condition: If, during an ABS stop, the CAB commands any valve solenoid on for an extended length of time, and does not see a corresponding wheel speed change, the Diagnostic Trouble Code (DTC) is set. The DTC can also set if the signal is missing or erratic.

RIGHT FRONT WHEEL SPEED SIGNAL FAILURE

When Monitored: Wheel speed comparison is checked and verified at drive off and continuously thereafter.

Set Condition: If, during an ABS stop, the CAB commands any valve solenoid on for an extended length of time, and does not see a corresponding wheel speed change, the Diagnostic Trouble Code (DTC) is set. The DTC can also set if the signal is missing or erratic.

RIGHT REAR WHEEL SPEED SIGNAL FAILURE

When Monitored: Wheel speed comparison is checked and verified at drive off and continuously thereafter.

Set Condition: If, during an ABS stop, the CAB commands any valve solenoid on for an extended length of time, and does not see a corresponding wheel speed change, the Diagnostic Trouble Code (DTC) is set. The DTC can also set if the signal is missing or erratic.

LEFT FRONT WHEEL SPEED SIGNAL FAILURE — Continued

POSSIBLE CAUSES
WHEEL SPEED SIGNAL FAILURE DTC PRESENT
AFFECTED WHEEL SPEED SENSOR SIGNAL INOPERATIVE
AFFECTED WHEEL SPEED SENSOR CONNECTOR DAMAGED
AFFECTED WHEEL SPEED SENSOR TONE WHEEL DAMAGED
AFFECTED WHEEL SPEED SENSOR AIR GAP FAULT
WHEEL BEARING FAULT
BRAKE LINING FAULT
AFFECTED WHEEL SPEED SENSOR CIRCUIT ELECTRICAL FAULT

TEST	ACTION	APPLICABILITY
1	Turn the ignition on. With the DRBIII®, read DTCs. With the DRBIII®, read Freeze Frame information. **NOTE: The CAB must sense ALL 4 wheels at 25 km/h (15 mph) before it will extinguish the ABS indicators.** Does the DRBIII® display WHEEL SPEED SIGNAL FAILURE and SENSOR CIRCUIT FAILURE? Yes → Refer to the affected Wheel Speed SENSOR CIRCUIT FAILURE for the related symptom(s). Perform ABS VERIFICATION TEST - VER 1. No → Go To 2	All
2	Turn the ignition on. With the DRBIII® in Sensors, monitor ALL the Wheel Speed Sensor Signals while an assistant drives the vehicle. Slowly accelerate as straight as possible from a stop to 24 km/h (15 mph). Is the affected Wheel Speed Signal showing 0 km/h (0 mph)? Yes → Go To 3 No → The condition is not present at this time. Monitor DRBIII® parameters while wiggling the related wiring harness. Refer to any Technical Service Bulletins(TSB) that may apply. Visually inspect the related wiring harness and connector terminals. Perform ABS VERIFICATION TEST - VER 1.	All
3	Turn the ignition off. Inspect the CAB connector, affected Wheel Speed Sensor, and affected Wheel Speed Sensor connector. Is the Wheel Speed Sensor or any connector damaged? Yes → Repair as necessary. Perform ABS VERIFICATION TEST - VER 1. No → Go To 4	All

LEFT FRONT WHEEL SPEED SIGNAL FAILURE — Continued

TEST	ACTION	APPLICABILITY
4	Turn ignition off. Inspect the affected Tone Wheel for damaged, missing teeth, cracks, or looseness. **NOTE: The Tone Wheel teeth should be perfectly square, not bent, or nicked.** Is the affected Tone Wheel OK? Yes → Go To 5 No → Replace the Tone Wheel in accordance with the Service Information. Perform ABS VERIFICATION TEST - VER 1.	All
5	Turn the ignition off. Using a Feeler Gauge, measure the affected Wheel Speed Sensor Air Gap. **NOTE: Refer to the appropriate service information, if necessary, for procedures or specifications.** Is the Air Gap OK? Yes → Go To 6 No → Repair as necessary. Perform ABS VERIFICATION TEST - VER 1.	All
6	Turn the ignition off. Inspect the wheel bearings for excessive runout or clearance. **NOTE: Refer to the appropriate service information, if necessary, for procedures or specifications.** Is the bearing clearance OK ? Yes → Go To 7 No → Repair as necessary. Perform ABS VERIFICATION TEST - VER 1.	All
7	Turn the ignition off. Visually inspect brakes for locking up due to lining contamination or overheating. Inspect all components for defects which may cause a Signal DTC to set. Is any component damaged? Yes → Repair as necessary. Perform ABS VERIFICATION TEST - VER 1. No → Refer to symptom SENSOR CIRCUIT FAILURE for further diagnostics. Perform ABS VERIFICATION TEST - VER 1.	All

Symptom:
PUMP CIRCUIT FAILURE

When Monitored and Set Condition:

PUMP CIRCUIT FAILURE

When Monitored: Ignition on. The CAB commands the pump on at 20 km/h (12 mph) to check its operation, if the brake switch is not applied. If the brake is applied, the test will run at 40 km/h (25 mph).

Set Condition: The DTC is stored when the CAB detects: 1) Improper voltage decay after the pump was turned off. 2) Pump not energized by the CAB, but voltage is present for 3.5 seconds. 3) Pump is turned on by the CAB, but without sufficient voltage to operate it.

POSSIBLE CAUSES
CAB - PUMP MOTOR RUNNING CONTINUOUSLY
ABS PUMP FUSE
ABS PUMP MOTOR INTERMITTENT DTC
DAMAGED CAB/CAB HARNESS CONNECTOR
ABS PUMP FUSED B(+) CIRCUIT INTERMITTENT SHORT TO GROUND
ABS PUMP FUSED B(+) CIRCUIT SHORT TO GROUND
CAB - INTERNAL FAULT
ABS PUMP MOTOR INOPERATIVE
ABS PUMP MOTOR OPEN
ABS PUMP MOTOR B(+) CIRCUIT OPEN
ABS PUMP MOTOR GROUND CIRCUIT OPEN
CAB - INTERNAL FAULT

TEST	ACTION	APPLICABILITY
1	Turn the ignition off. Turn the ignition on. Monitor the ABS Pump Motor for continuous operation. **NOTE: The CAB must sense ALL wheels at 25 km/h (15 mph) before it will extinguish the ABS indicators.** Is the ABS Pump Motor running continuously? Yes → Replace the Controller Antilock Brake in accordance with the Service Information. Perform ABS VERIFICATION TEST - VER 1. No → Go To 2	All

PUMP CIRCUIT FAILURE — Continued

TEST	ACTION	APPLICABILITY
2	Turn the ignition off. Turn the ignition on. With the DRBIII®, read DTCs. With the DRBIII®, erase DTCs. Turn the ignition off. Turn the ignition on. With the DRBIII®, actuate the ABS Pump Motor. Did the ABS Pump Motor operate? Yes → Go To 3 No → Go To 4	All
3	Turn the ignition off. Visually inspect the related wiring harness. Look for any chafed, pierced, pinched, or partially broken wires. Make sure the Pump Motor connecter is secure. Visually inspect the related wire harness connectors. Look for broken, bent, pushed out, or corroded terminals. Refer to any Hotline letters or Technical Service Bulletins that may apply. Were any problems found? Yes → Repair as necessary. Perform ABS VERIFICATION TEST - VER 1. No → Test Complete.	All
4	Turn the ignition off. Remove and inspect the ABS Pump fuse. Is the ABS Pump fuse open? Yes → Go To 5 No → Go To 8	All
5	Turn the ignition off. Visually inspect the ABS Pump Fused B(+) circuit in the wiring harness. Look for any sign of an intermittent short to ground. Is the wiring harness OK? Yes → Go To 6 No → Repair the ABS Pump Fused B(+) circuit for a short to ground. Perform ABS VERIFICATION TEST - VER 1.	All
6	Turn the ignition off. Disconnect the CAB harness connector. Check connectors - Clean/repair as necessary. Using a 12-volt test light connected to 12-volts, probe the ABS Pump Fused B(+) circuit fuse terminal. Does the test light illuminate? Yes → Repair the ABS Pump Fused B(+) circuit for a short to ground. Perform ABS VERIFICATION TEST - VER 1. No → Go To 7	All

PUMP CIRCUIT FAILURE — Continued

TEST	ACTION	APPLICABILITY
7	Turn the ignition off. Reconnect the CAB harness connector. Using a 12-volt test light connected to 12-volts, probe the ABS Pump Fused B(+) circuit fuse terminal. Does the test light illuminate? Yes → Replace the Controller Antilock Brake in accordance with the Service Information. Perform ABS VERIFICATION TEST - VER 1. No → Replace the ABS Pump fuse. If the fuse is open make sure to check for a short to ground. Perform ABS VERIFICATION TEST - VER 1.	All
8	Turn the ignition off. Disconnect the CAB harness connector. Inspect the CAB and CAB harness connector for damage. Is there any broken, bent, pushed out, corroded, or spread terminals? Yes → Repair as necessary. Perform ABS VERIFICATION TEST - VER 1. No → Go To 9	All
9	Turn the ignition off. Reinstall the ABS Pump fuse. Disconnect the ABS Pump Motor connector. Check connectors - Clean/repair as necessary. Connect a 10 gauge 40 amp fused jumper wire between the ABS Pump Fused B(+) terminal in the CAB harness connector to the ABS Pump Motor connector RED wired terminal. Connect a 10 gauge jumper wire between the Ground circuit terminal in the CAB harness connector to the ABS Pump Motor connector BLACK wired terminal. Did the ABS Pump Motor operate? Yes → Replace the Controller Antilock Brake in accordance with the Service Information. Perform ABS VERIFICATION TEST - VER 1. No → Go To 10	All
10	Turn the ignition off. Disconnect the ABS Pump Motor connector. Check connectors - Clean/repair as necessary. Connect a 10 gauge 40 amp fused jumper wire between the ABS Pump Motor connector RED wired terminal and an alternate 40 amp capable B(+) source. Connect a 10 gauge jumper wire between the ABS Pump Motor connector BLACK wired terminal and ground Did the ABS Pump Motor operate? Yes → Go To 11 No → Replace the Hydraulic Control Unit in accordance with the Service Information. Perform ABS VERIFICATION TEST - VER 1.	All

PUMP CIRCUIT FAILURE — Continued

TEST	ACTION	APPLICABILITY
11	Turn the ignition off. Disconnect the ABS Pump Motor connector. Check connectors - Clean/repair as necessary. Connect a 10 gauge 40 amp fused jumper wire between the ABS Pump Fused B(+) terminal in the CAB harness connector to the ABS Pump Motor connector RED wired terminal. Connect a 10 gauge jumper wire between the ABS Pump Motor connector BLACK wired terminal and ground. Did the ABS Pump Motor operate? Yes → Repair the ABS Pump Motor Fused B(+) circuit for an open. Perform ABS VERIFICATION TEST - VER 1. No → Repair the ABS Pump Motor Ground circuit for an open. Perform ABS VERIFICATION TEST - VER 1.	All

Symptom:
SYSTEM OVER VOLTAGE

When Monitored and Set Condition:

SYSTEM OVER VOLTAGE

When Monitored: Ignition on. The CAB monitors the Fused B(+) circuit at all times for proper system voltage.

Set Condition: If the voltage is above 16.5 volts, the Diagnostic Trouble Code (DTC) is set.

POSSIBLE CAUSES
INTERMITTENT DTC
BATTERY CHARGER CONNECTED
FUSED IGNITION SWITCH OUTPUT (RUN) CIRCUIT HIGH
DAMAGED CAB/CAB HARNESS CONNECTOR
CAB - GROUND CIRCUIT OPEN
CAB - INTERNAL FAULT

TEST	ACTION	APPLICABILITY
1	Turn the ignition on. With the DRBIII®, read DTC's. With the DRBIII®, erase DTC's. Turn the ignition off. Turn the ignition on. Start the engine. With the DRBIII®, read DTC's. Does the DRBIII® display SYSTEM OVER VOLTAGE? Yes → Go To 2 No → Go To 7	All
2	Is a battery charger connected to the vehicle? Yes → Ensure the battery is fully charged. Perform ABS VERIFICATION TEST - VER 1. No → Go To 3	All

SYSTEM OVER VOLTAGE — Continued

TEST	ACTION	APPLICABILITY
3	Turn the ignition off. Disconnect the CAB connector. **Note: Check connector - Clean/repair as necessary.** Start the engine. Raise engine speed above 1,800 RPM's Measure the voltage between Fused Ignition Switch Output (RUN) circuit and ground. Is the voltage above 16.5 volts ? Yes → Refer to appropriate service information for Charging System testing and repair. Perform ABS VERIFICATION TEST - VER 1. No → Go To 4	All
4	Turn the ignition off. Disconnect the CAB connector. **Note: Check connector - Clean/repair as necessary.** Inspect the CAB and CAB harness connector for damage. Is there any broken, bent, pushed out, corroded, or spread terminals? Yes → Repair as necessary. Perform ABS VERIFICATION TEST - VER 1. No → Go To 5	All
5	Turn the ignition off. Disconnect the CAB connector. **Note: Check connector - Clean/repair as necessary.** Using a 12-volt test light connected to 12-volts, probe the Ground circuits. Does the test light illuminate? Yes → Go To 6 No → Repair the Ground circuit for an open. Perform ABS VERIFICATION TEST - VER 1.	All
6	Turn the ignition off. Reconnect the CAB harness connector. Turn the ignition on. With the DRBIII® in Sensors, read the ignition voltage. Does the DRBIII® display ignition voltage above 16 volts? Yes → Replace the Controller Antilock Brake in accordance with the Service Information. Perform ABS VERIFICATION TEST - VER 1. No → Go To 7	All

SYSTEM OVER VOLTAGE — Continued

TEST	ACTION	APPLICABILITY
7	Turn the ignition off. Visually inspect the related wiring harness. Look for any chafed, pierced, pinched, or partially broken wires. Visually inspect the related wire harness connectors. Look for broken, bent, pushed out, or corroded terminals. Refer to any Hotline letters or Technical Service Bulletins that may apply. Ensure the battery is fully charged. Inspect the vehicle for aftermarket accessories that may exceed the Generator System output. Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Were any problems found? Yes → Repair as necessary. Perform ABS VERIFICATION TEST - VER 1. No → Test Complete.	All

Symptom:
SYSTEM UNDER VOLTAGE

When Monitored and Set Condition:

SYSTEM UNDER VOLTAGE

When Monitored: Ignition on. The CAB monitors the Fused Ignition Switch Output circuit voltage above 10 km/h (6 mph) for proper system voltage.

Set Condition: If the voltage is below 9.5 volts, the Diagnostic Trouble Code (DTC) is set.

POSSIBLE CAUSES
INTERMITTENT DTC
DAMAGED CAB/CAB HARNESS CONNECTOR
RUNNING BATTERY VOLTAGE LOW
CAB - GROUND CIRCUIT OPEN
FUSED IGNITION SWITCH OUTPUT (RUN) CIRCUIT OPEN
CAB - INTERNAL FAULT

TEST	ACTION	APPLICABILITY
1	Turn the ignition on. With the DRBIII®, read DTC's. With the DRBIII®, erase DTC's. Turn the ignition off. Turn the ignition on. Start the engine. Drive the vehicle above 16 km/h (10 mph) for at least 20 seconds. Stop the vehicle With the DRBIII®, read DTC's. Does the DRBIII® display SYSTEM UNDER VOLTAGE ? Yes → Go To 2 No → Go To 6	All
2	Engine Running. Measure the battery voltage. Is the battery voltage below 10 volts? Yes → Refer to appropriate service information for charging system testing and repair. Perform ABS VERIFICATION TEST - VER 1. No → Go To 3	All

SYSTEM UNDER VOLTAGE — Continued

TEST	ACTION	APPLICABILITY
3	Turn the ignition off. Disconnect the CAB harness connector. Inspect the CAB and CAB harness connector for damage. Is there any broken, bent, pushed out, corroded, or spread terminals? Yes → Repair as necessary. Perform ABS VERIFICATION TEST - VER 1. No → Go To 4	All
4	Turn the ignition off. Disconnect the CAB harness connector. Using a 12-volt test light connected to 12-volts, probe the Ground circuits. Does the test light illuminate? Yes → Go To 5 No → Repair the Ground circuit for an open. Perform ABS VERIFICATION TEST - VER 1.	All
5	Turn the ignition on. Using a 12-volt test light connected to ground, probe the Fused Ignition Switch Output (RUN) circuit. Does the test light illuminate? Yes → Replace the Controller Antilock Brake in accordance with the Service Information. Perform ABS VERIFICATION TEST - VER 1. No → Repair the Fused Ignition Switch Output (RUN) circuit for an open. Perform ABS VERIFICATION TEST - VER 1.	All
6	Turn the ignition off. Visually inspect the related wiring harness. Look for any chafed, pierced, pinched, or partially broken wires. Visually inspect the related wire harness connectors. Look for broken, bent, pushed out, or corroded terminals. Refer to any Hotline letters or Technical Service Bulletins that may apply. Ensure the battery is fully charged. Inspect the vehicle for aftermarket accessories that may exceed the Generator System output. Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Were any problems found? Yes → Repair as necessary. Perform ABS VERIFICATION TEST - VER 1. No → Test Complete.	All

Symptom:
VALVE POWER FEED FAILURE

When Monitored and Set Condition:

VALVE POWER FEED FAILURE

When Monitored: Ignition on. The CAB monitors its internal microprocessors for correct operation.

Set Condition: If the CAB detects an internal fault, the DTC is set.

POSSIBLE CAUSES
INTERMITTENT DTC
ABS VALVE FUSE
ABS VALVE FUSED B(+) SUPPLY CIRCUIT OPEN
ABS VALVE FUSED B(+) CIRCUIT OPEN
ABS VALVE FUSED B(+) CIRCUIT INTERMITTENT SHORT TO GROUND
ABS VALVE FUSED B(+) CIRCUIT SHORT TO GROUND
DAMAGED CAB/CAB HARNESS CONNECTOR
CAB - GROUND CIRCUIT OPEN
CAB - INTERNAL FAULT

TEST	ACTION	APPLICABILITY
1	Turn the ignition on. With the DRBIII®, read DTC's. With the DRBIII®, erase DTC's. Turn the ignition off. Turn the ignition on. With the DRBIII®, read DTC's. Does the DRBIII® display VALVE POWER FEED FAILURE? Yes → Go To 2 No → Go To 10	All
2	Turn the ignition off. Remove and Inspect the ABS Valve fuse. Is the ABS Valve fuse open? Yes → Go To 3 No → Go To 6	All

VALVE POWER FEED FAILURE — Continued

TEST	ACTION	APPLICABILITY
3	Turn the ignition off. Visually inspect the ABS Valve Fused B(+) circuit in the wiring harness. Look for any sign of an intermittent short to ground. Is the wiring harness OK? Yes → Go To 4 No → Repair the ABS Valve Fused B(+) circuit for a short to ground. Perform ABS VERIFICATION TEST - VER 1.	All
4	Turn the ignition off. Disconnect the CAB harness connector. **Note: Check connector - Clean/repair as necessary.** Using a test light connected to 12 volts, probe the ABS Valve Fused B(+) circuit fuse terminal. Did the test light illuminate? Yes → Repair the ABS Valve Fused B(+) circuit for a short to ground. Perform ABS VERIFICATION TEST - VER 1. No → Go To 5	All
5	Turn the ignition off. Reconnect the CAB harness connector. **NOTE: The CAB harness connector must be reconnected for the results of this test to be valid.** Using a test light connected to 12 volts, probe the ABS Valve Fused B(+) circuit fuse terminal. Did the test light illuminate? Yes → Replace the Controller Antilock Brake in accordance with the Service Information. Perform ABS VERIFICATION TEST - VER 1. No → Replace the ABS Valve Fused B(+) fuse. If the fuse is open make sure to check for a short to ground. Perform ABS VERIFICATION TEST - VER 1.	All
6	Turn the ignition off. Disconnect the CAB harness connector. Inspect the CAB and CAB harness connector for damage. Is there any broken, bent, pushed out, corroded or spread terminals? Yes → Repair as necessary. Perform ABS VERIFICATION TEST - VER 1. No → Go To 7	All
7	Turn the ignition off. Using a 12-volt test light connected to ground, probe the B(+) supply at the ABS Valve fuse terminal. Did the test light illuminate? Yes → Go To 8 No → Repair the ABS Valve Fused B(+) supply circuit for an open. Perform ABS VERIFICATION TEST - VER 1.	All

VALVE POWER FEED FAILURE — Continued

TEST	ACTION	APPLICABILITY
8	Reinstall the ABS Valve fuse. Disconnect the CAB harness connector. Using a 12-volt test light connected to ground, probe the ABS Valve Fused B(+) circuit at the CAB harness connector. Did the test light illuminate? Yes → Go To 9 No → Repair the ABS Valve Fused B(+) circuit for an open. Perform ABS VERIFICATION TEST - VER 1.	All
9	Turn the ignition off. Using a 12-volt test light connected to 12-volts, probe the ground circuits at the CAB harness connector. Did the test light illuminate? Yes → Replace the Controller Antilock Brake in accordance with the Service Information. Perform ABS VERIFICATION TEST - VER 1. No → Repair the CAB Ground circuit for an open. Perform ABS VERIFICATION TEST - VER 1.	All
10	Turn the ignition off. Visually inspect the related wiring harness. Look for any chafed, pierced, pinched, or partially broken wires. Visually inspect the related wire harness connectors. Look for broken, bent, pushed out, or corroded terminals. Refer to any Hotline letters or Technical Service Bulletins that may apply. Were any problems found? Yes → Repair as necessary. Perform ABS VERIFICATION TEST - VER 1. No → Test Complete.	All

Symptom:
*NO RESPONSE FROM CONTROLLER ANTILOCK BRAKE

POSSIBLE CAUSES
NO RESPONSE FROM CAB
GROUND CIRCUIT OPEN
OPEN FUSED IGNITION SWITCH OUTPUT CIRCUIT
OPEN PCI BUS CIRCUIT
CONTROLLER ANTILOCK BRAKE

TEST	ACTION	APPLICABILITY
1	Turn the ignition on. **Note: As soon as one or more module communicates with the DRB, answer the question.** With the DRB, attempt to communicate with the Airbag Control Module (ACM). With the DRB, attempt to communicate with the Instrument Cluster (MIC). Was the DRB able to I/D or establish communications with either of the modules? Yes → Go To 2 No → Refer to the Communications category and perform the symptom PCI Bus Communication Failure. Perform ABS VERIFICATION TEST - VER 1.	All
2	Turn the ignition off. Disconnect the CAB harness connector. Using a 12-volt test light connected to 12-volts, probe both ground circuits. Is the test light illuminated for both circuits? Yes → Go To 3 No → Repair the ground circuit(s) for an open. Perform ABS VERIFICATION TEST - VER 1.	All
3	Turn the ignition off. Disconnect the CAB harness connector. Turn the ignition on. Using a 12-volt test light connected to ground, probe the Fused Ignition Switch Output circuit. Is the test light illuminated? Yes → Go To 4 No → Repair the Fused Ignition Switch Output circuit for an open. Perform ABS VERIFICATION TEST - VER 1.	All

*NO RESPONSE FROM CONTROLLER ANTILOCK BRAKE — Continued

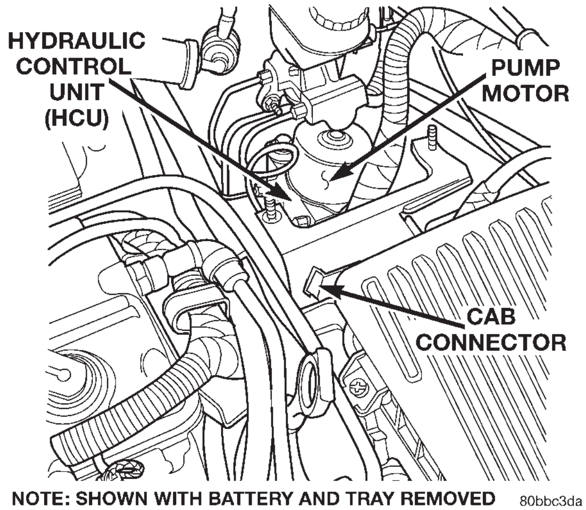
TEST	ACTION	APPLICABILITY
4	**Note: Ensure there is PCI Bus communication with other modules on the vehicle before proceeding. If not, refer to the symptom list from the menu and repair as necessary.** Disconnect the CAB harness connector. Use Scope input cable CH7058, Cable to Probe adapter CH7062, and the red and black test probes. Connect the scope input cable to the channel one connector on the DRB. Attach the red and black leads and the cable to probe adapter to the scope input cable. With the DRBIII® select Pep Module Tools. Select lab scope. Select Live Data. Select 12 volt square wave. Press F2 for Scope. Press F2 and use the down arrow to set voltage range to 20 volts. Press F2 again when complete. Connect the Black lead to the chassis ground. Connect the Red lead to the PCI Bus circuit in the CAB connector. Turn the ignition on. Observe the voltage display on the DRB Lab Scope. Does the voltage pulse from 0 to approximately 7.5 volts? Yes → Go To 5 No → Repair the PCI Bus circuit for an open. Perform ABS VERIFICATION TEST - VER 1.	All
5	If there are no possible causes remaining, view repair. Repair Replace the Controller Antilock Brake in accordance with the Service Information. Perform ABS VERIFICATION TEST - VER 1.	All

Verification Tests

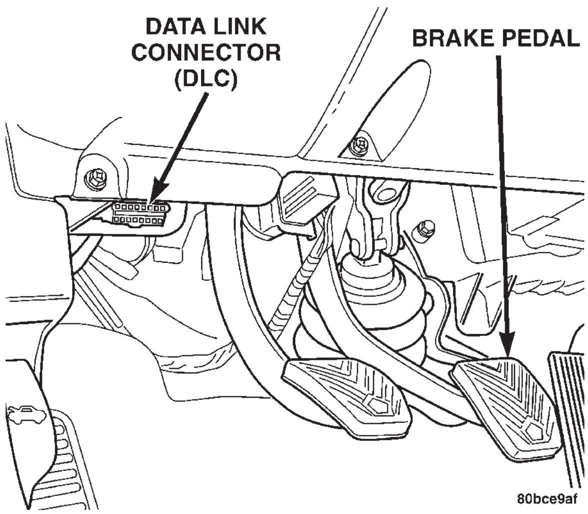
ABS VERIFICATION TEST - VER 1	APPLICABILITY
1. Turn the ignition off. 2. Connect all previously disconnected components and connectors. 3. Ensure all accessories are turned off and the battery is fully charged. 4. Ensure that the Ignition is on, and with the DRBIII, erase all Diagnostic Trouble Codes from ALL modules. Start the engine and allow it to run for 2 minutes and fully operate the system that was malfunctioning. 5. Turn the ignition off and wait 5 seconds. Turn the ignition on and using the DRBIII, read DTC's from ALL modules. 6. If any Diagnostic Trouble Codes are present, return to Symptom list and troubleshoot new or recurring symptom. **7. NOTE: For Sensor Signal and Pump Motor faults, the CAB must sense all 4 wheels at 25 km/h (15 mph) before it will extinguish the ABS Indicator.** 8. If there are no DTC's present after turning ignition on, road test the vehicle for at least 5 minutes. Perform several antilock braking stops. **9. Caution: Ensure braking capability is available before road testing.** 10. Again, with the DRBIII® read DTC's. If any DTC's are present, return to Symptom list. 11. If there are no Diagnostic Trouble Codes (DTC's) present, and the customer's concern can no longer be duplicated, the repair is complete. Are any DTC's present or is the original concern still present? Yes → Repair is not complete, refer to appropriate symptom. No → Repair is complete.	All

8.0 COMPONENT LOCATIONS

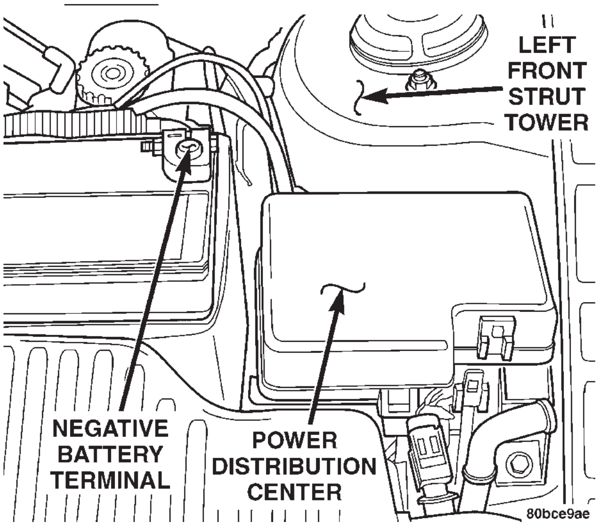
8.1 CONTROLLER ANTILOCK BRAKE

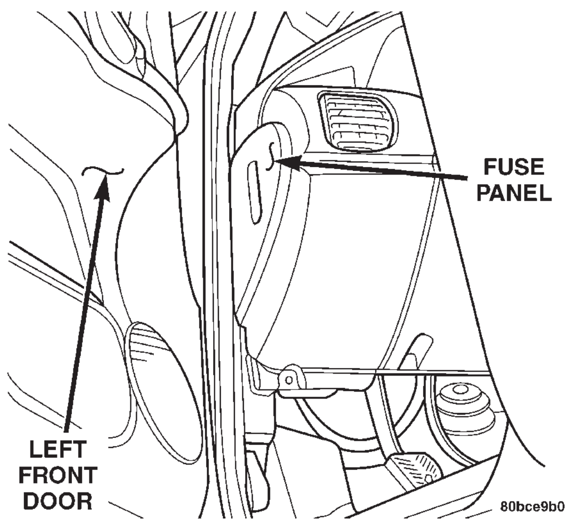


8.2 DATA LINK CONNECTOR

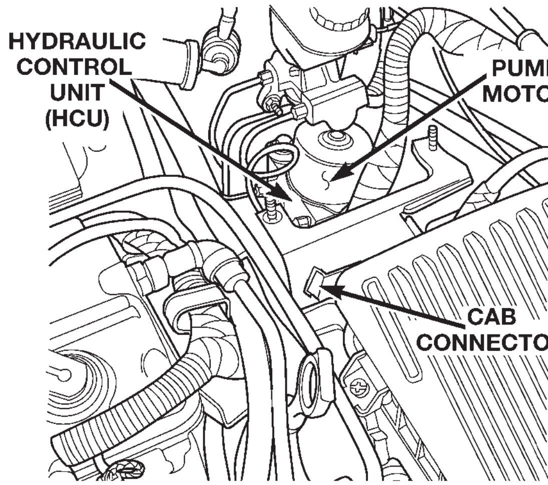


8.3 FUSES



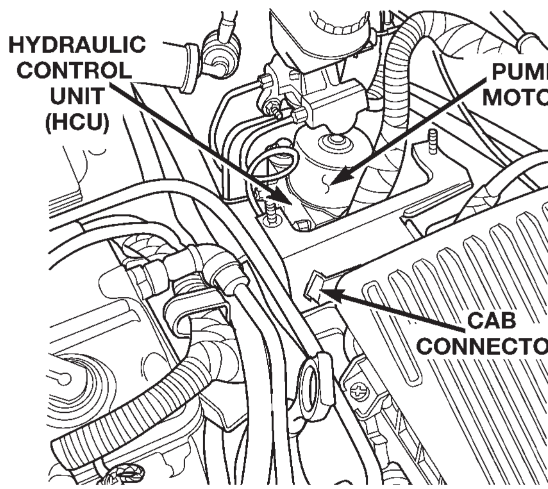


8.4 HYDRAULIC CONTROL UNIT



NOTE: SHOWN WITH BATTERY AND TRAY REMOVED 80bbc3da

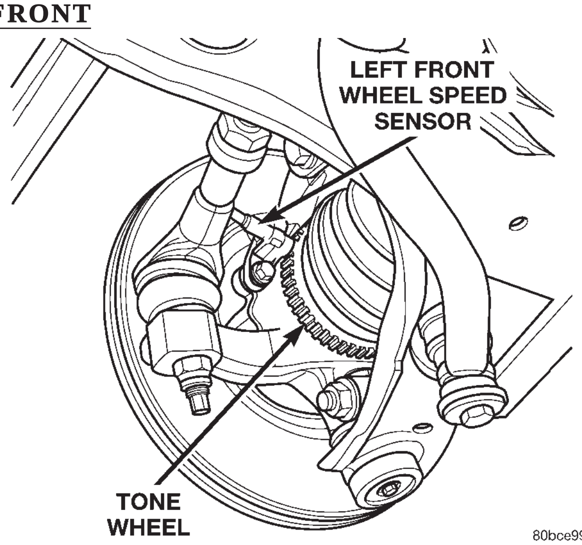
8.5 PUMP MOTOR



NOTE: SHOWN WITH BATTERY AND TRAY REMOVED 80bbc3da

8.6 TONE WHEELS

FRONT



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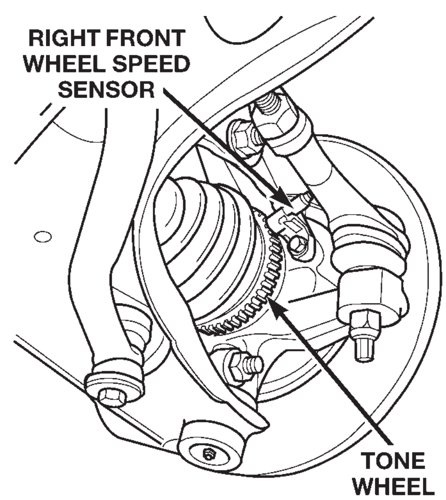

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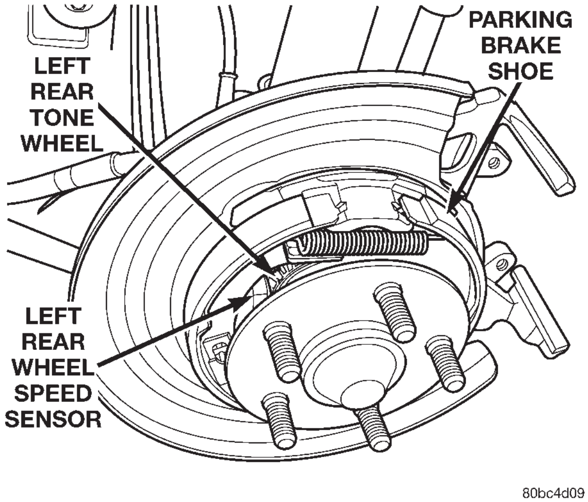
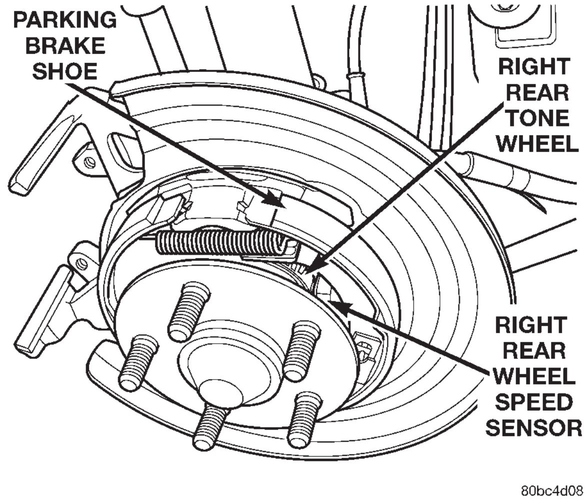
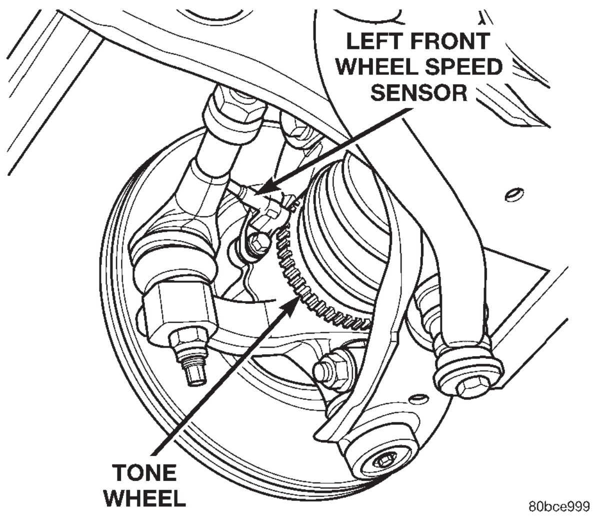
REAR

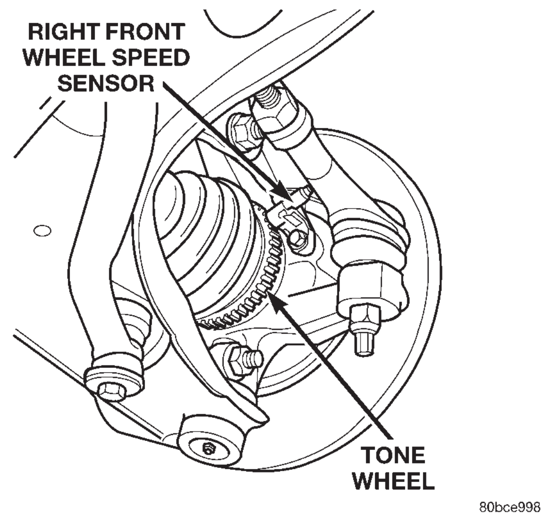




8.7 WHEEL SPEED SENSORS

FRONT





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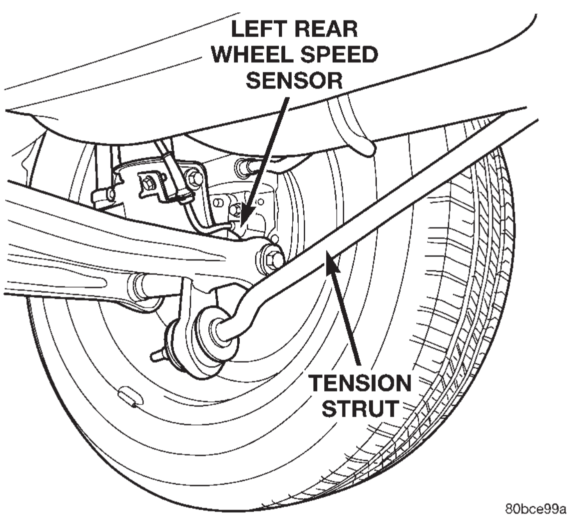
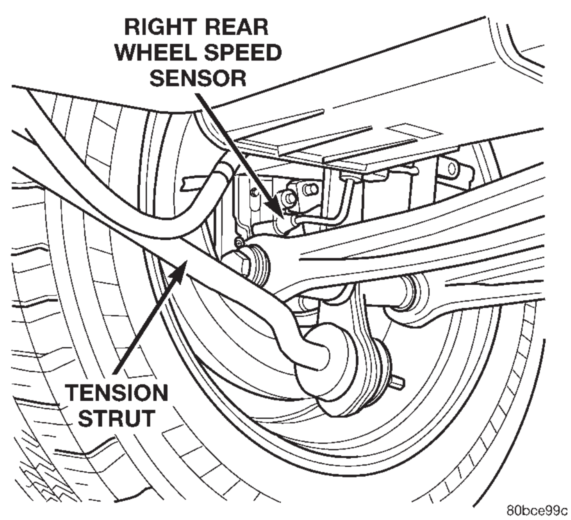
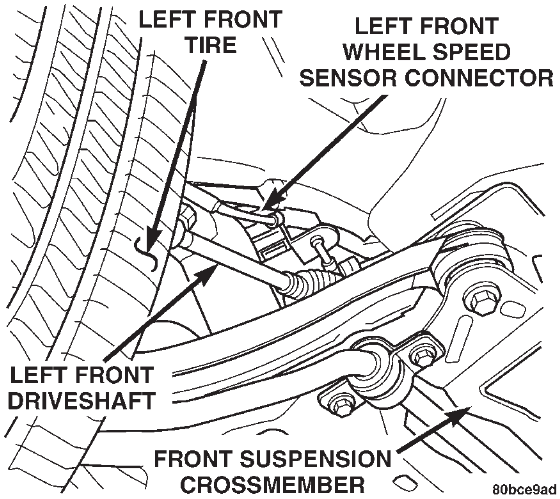
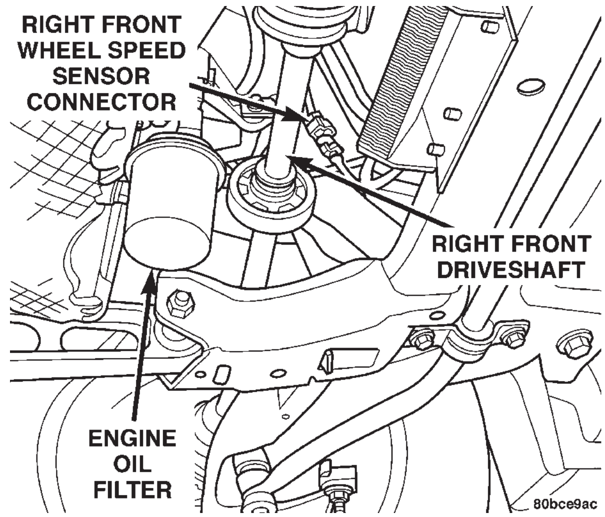




8.8 WHEEL SPEED SENSOR CONNECTORS

FRONT





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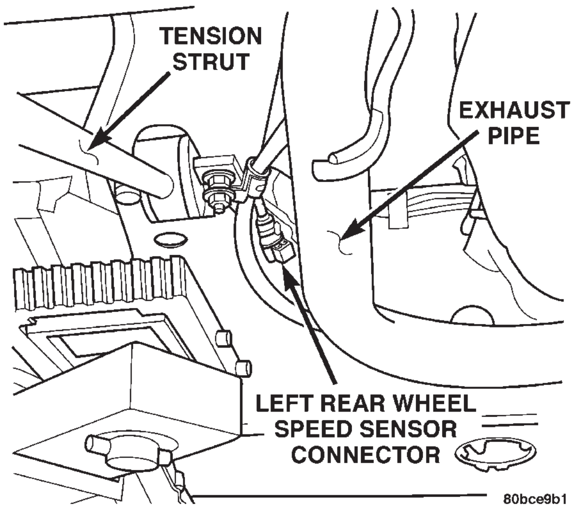
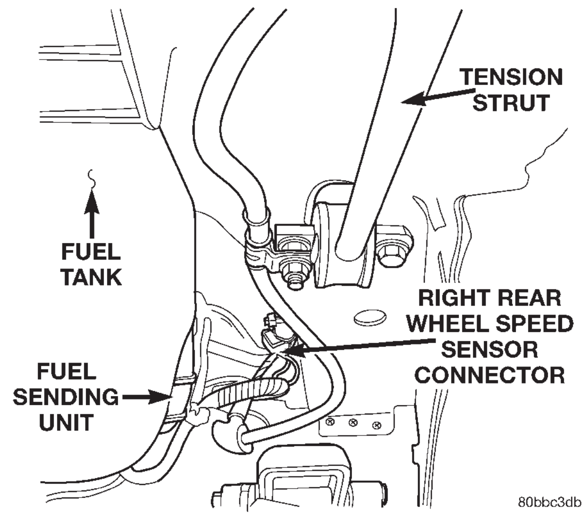
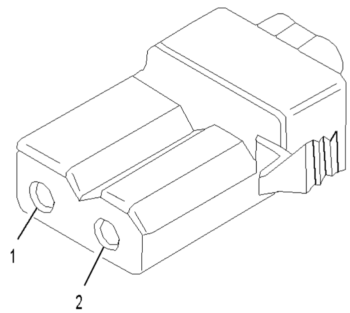




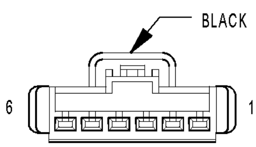
9.0 CONNECTOR PINOUTS



ABS PUMP MOTOR

ABS PUMP MOTOR - 2 WAY

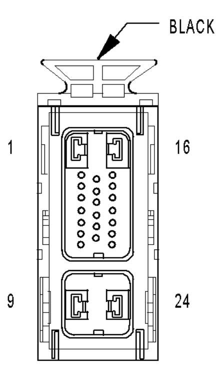
CAV	CIRCUIT	FUNCTION
1	TN	GROUND
2	RD	PUMP MOTOR RELAY OUTPUT



BRAKE LAMP SWITCH

BRAKE LAMP SWITCH - BLACK 6 WAY

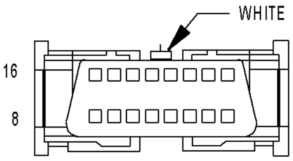
CAV	CIRCUIT	FUNCTION
1	F32 18PK/DB	FUSED B(+)
2	L50 18WT/TN	BRAKE LAMP SWITCH OUTPUT
2	L50 18WT/TN	BRAKE LAMP SWITCH OUTPUT
3	V30 20DB/RD (2.0L)	SPEED CONTROL BRAKE LAMP SWITCH OUTPUT
4	V32 20YL/RD (2.0L)	S/C SUPPLY
5	Z1 20BK (2.0L)	GROUND
5	Z1 18BK (2.4L TURBO)	GROUND
6	K29 20WT/PK	BRAKE SWITCH SIGNAL
6	K29 20WT/PK (2.0L)	BRAKE SWITCH SIGNAL



CONTROLLER ANTILOCK BRAKE

CONTROLLER ANTILOCK BRAKE - BLACK 24 WAY

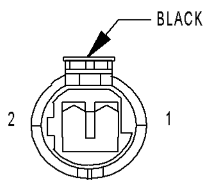
CAV	CIRCUIT	FUNCTION
1	Z1 12BK	GROUND
2	B1 18YL/DB	RIGHT REAR WHEEL SPEED SENSOR SIGNAL
3	B2 18YL	RIGHT REAR WHEEL SPEED SENSOR 12 VOLT SUPPLY
4	-	-
5	D25 18VT/YL	PCI BUS
6	B6 18WT/DB	RIGHT FRONT WHEEL SPEED SENSOR SIGNAL
7	B7 18WT	RIGHT FRONT WHEEL SPEED SENSOR 12 VOLT SUPPLY
8	-	-
9	A20 12RD/DB	FUSED B(+)
10	F12 18DB/WT (2.0L)	FUSED IGNITION SWITCH OUTPUT (RUN-START)
10	F12 18DB/RD (2.4L TURBO)	FUSED IGNITION SWITCH OUTPUT (RUN-START)
11	-	-
12	-	-
13	-	-
14	-	-
15	-	-
16	Z1 12BK	GROUND
17	-	-
18	L50 18WT/TN	BRAKE LAMP SWITCH OUTPUT
19	B3 18LG/DB	LEFT REAR WHEEL SPEED SENSOR SIGNAL
20	B4 18LG	LEFT REAR WHEEL SPEED SENSOR 12 VOLT SUPPLY
21	-	-
22	B8 18RD/DB	LEFT FRONT WHEEL SPEED SENSOR SIGNAL
23	B9 18RD	LEFT FRONT WHEEL SPEED SENSOR 12 VOLT SUPPLY
24	A10 12RD/DG	FUSED B(+)



DATA
LINK
CONNECTOR

DATA LINK CONNECTOR - WHITE 16 WAY

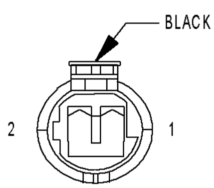
CAV	CIRCUIT	FUNCTION
1	-	-
2	D25 20VT/YL	PCI BUS (PCM)
3	-	-
4	Z12 20BK/TN	GROUND
5	Z12 20BK/TN	GROUND
6	-	-
7	D21 20PK	SCI TRANSMIT (PCM)
8	-	-
9	D6 20PK/LB (2.0L)	SCI RECEIVE (TCM)
10	-	-
11	-	-
12	D20 20LG	SCI RECEIVE (PCM)
13	-	-
14	-	-
15	D15 20WT/DG (2.0L)	SCI TRANSMIT (TCM)
16	A14 18RD/WT	FUSED B(+)



LEFT FRONT
WHEEL SPEED
SENSOR

LEFT FRONT WHEEL SPEED SENSOR - BLACK 2 WAY

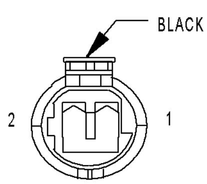
CAV	CIRCUIT	FUNCTION
1	B9 18RD	LEFT FRONT WHEEL SPEED SENSOR 12 VOLT SUPPLY
2	B8 18RD/DB	LEFT FRONT WHEEL SPEED SENSOR SIGNAL



LEFT REAR
WHEEL SPEED
SENSOR

LEFT REAR WHEEL SPEED SENSOR - BLACK 2 WAY

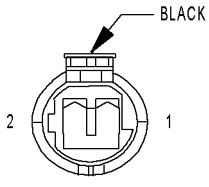
CAV	CIRCUIT	FUNCTION
1	B4 20LG	LEFT REAR WHEEL SPEED SENSOR 12 VOLT SUPPLY
2	B3 20LG/DB	LEFT REAR WHEEL SPEED SENSOR SIGNAL



RIGHT FRONT
WHEEL SPEED
SENSOR

RIGHT FRONT WHEEL SPEED SENSOR - BLACK 2 WAY

CAV	CIRCUIT	FUNCTION
1	B7 18WT	RIGHT FRONT WHEEL SPEED SENSOR 12 VOLT SUPPLY
2	B6 18WT/DB	RIGHT FRONT WHEEL SPEED SENSOR SIGNAL



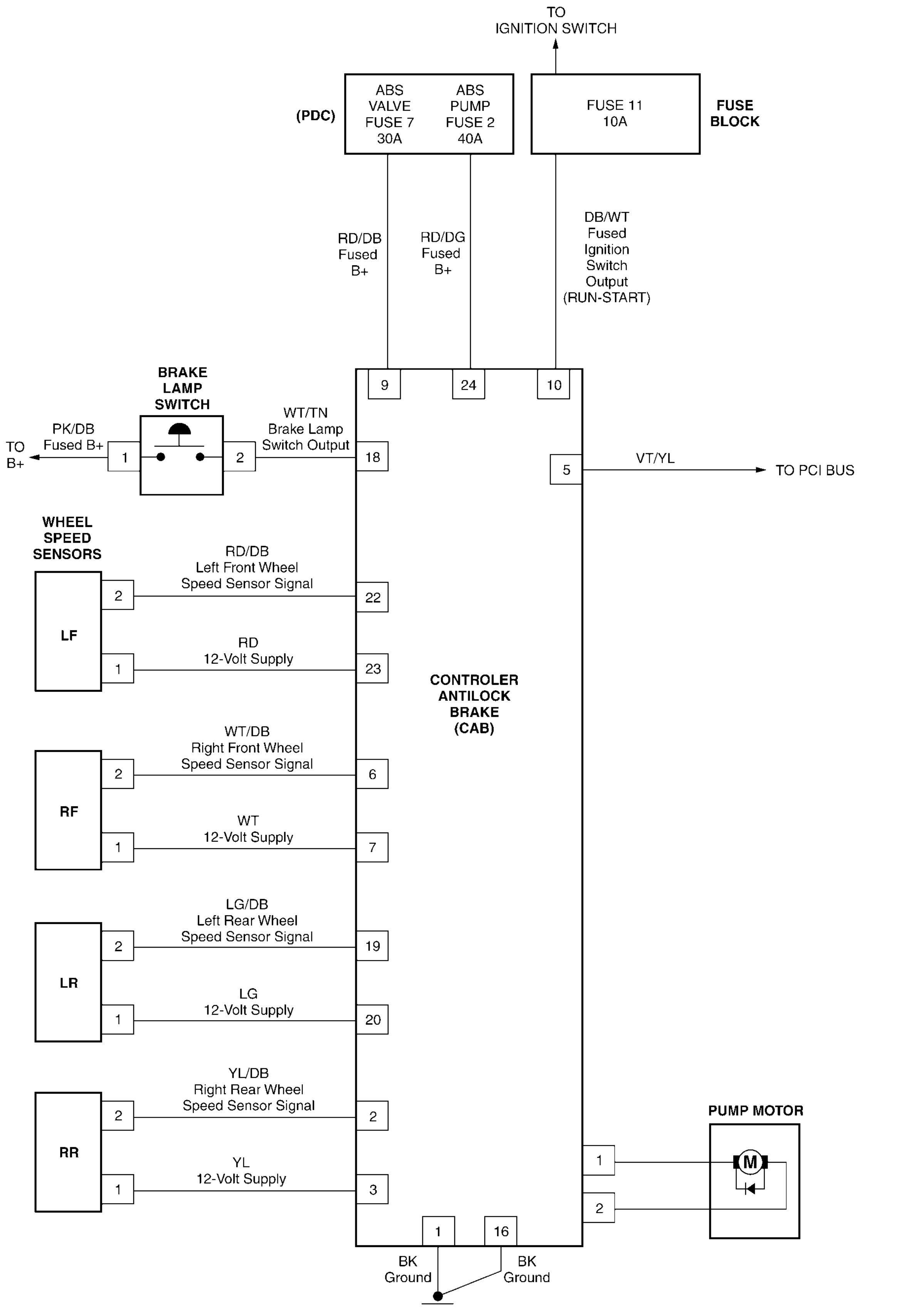
RIGHT REAR WHEEL SPEED SENSOR

RIGHT REAR WHEEL SPEED SENSOR - BLACK 2 WAY

CAV	CIRCUIT	FUNCTION
1	B2 20YL	RIGHT REAR WHEEL SPEED SENSOR 12 VOLT SUPPLY
2	B1 20YL/DB	RIGHT REAR WHEEL SPEED SENSOR SIGNAL

10.0 SCHEMATIC DIAGRAMS

10.1 TEVES MARK 20e CONTROLLER ANTILOCK BRAKE – ABS



DIAGNOSTIC TEST PROCEDURES — TELL US!

DaimlerChrysler Corporation is constantly working to provide the technician the best diagnostic manuals possible. Your comments and recommendations regarding the diagnostic manuals and procedures are appreciated.

To best understand your suggestion, please complete the form giving us as much detail as possible.

Model ____________ **Year** ______ **Body Type** __________ **Engine** _______

Transmission ______________ **Vehicle Mileage** __________ **MDH** ________

Diagnostic Procedure ______________ **Book No.** ____________ **Page** ____

Comments/recommendations (if necessary, draw sketch)

Name ____

Submitted by: ___________________________________

Address _______________________________________

City/State/Zip ___________________________________

Business Phone # ________________________________

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NOTE (NGC)

The 2004 PL is equipped with the Powertrain Control Module and Transmission Control Module combined in a single control module. This module is the Next Generation Controller (NGC) for DaimlerChrysler and will be referred to as the Powertrain Control Module (PCM).
The PCM has four color coded connectors C1 through C4, (C1 - BLK, C2 - ORANGE, C3 - WHITE, C4 - GREEN), with each connector containing 38 pins.
Two tools are required to diagnose and repair the PCM terminals and harness connectors:

1. **Miller #3638 Terminal Removal Pick must be used to release the connector terminals or harness and connector damage will occur.**

2. **Miller #8815 Pinout Box must be used to probe the PCM terminals or terminal damage will occur.**

1.0 INTRODUCTION

The procedures contained in this manual include specifications, instructions, and graphics needed to diagnose the PCM Powertrain System. The diagnostics in this manual are based on the failure condition or symptom being present at time of diagnosis.

Please follow the recommendations below when choosing your diagnostic path.

1. First make sure the DRBIII® is communicating with the appropriate modules; ie., if the DRBIII® displays a No Response condition, you must diagnose this first before proceeding.
2. Read DTC's (diagnostic trouble codes) with the DRBIII®.
3. If no DTC's are present, identify the customer complaint.
4. Once the DTC or customer complaint is identified, locate the matching test in the Table of Contents and begin to diagnose the symptom.

All component location views are in Section 8.0. All connector pinouts are in Section 9.0. All system schematics are in Section 10.0.

An * placed before the symptom description indicates a customer complaint.

When repairs are required, refer to the appropriate service information for the proper removal and repair procedure.

Diagnostic procedures change every year. New diagnostic systems may be added; carryover systems may be enhanced. READ THIS DIAGNOSTIC INFORMATION BEFORE TRYING TO DIAGNOSE A VEHICLE CODE. It is recommended that you review the entire diagnostic information to become familiar with all new and changed diagnostic procedures.

If you have any comments or recommendations after reviewing the diagnostic information, please fill out the form at the back of the book and mail it back to us.

1.1 SYSTEM COVERAGE

This diagnostic procedures manual covers the 2003 PL vehicle equipped with the 2.0L and 2.4L Turbo Engines.

1.2 SIX-STEP TROUBLESHOOTING PROCEDURE

Diagnosis of the powertrain control module (PCM) is done in six basic steps:

- verification of complaint
- verification of any related symptoms
- symptom analysis
- problem isolation
- repair of isolated problem
- verification of proper operation

2.0 IDENTIFICATION OF SYSTEM

The Powertrain Control Module (PCM) monitors and controls:

- Fuel System
- Idle Air Control System
- Ignition System
- Charging System
- Speed Control System
- Cooling system

3.0 SYSTEM DESCRIPTION AND FUNCTIONAL OPERATION

3.1 GENERAL DESCRIPTION

These Sequential Fuel Injection (SFI) engine systems have the latest in technical advances. The OBDII/Euro Stage III OBD diagnostics incorporated with the Powertrain Control Module (PCM) are intended to assist the field technician in repairing vehicle problems by the quickest means.

3.2 FUNCTIONAL OPERATION

3.2.1 FUEL CONTROL

The PCM controls the air/fuel ratio of the engine by varying fuel injector on time. Air flow is calculated using the speed density method using enigne speed, manifold absolute pressure, and air temperature change.

Different fuel calculation strategies are used depending on the operational state of the engine. During crank mode, a longer pulse width fuel pulse is delivered followed by fuel pulses determined by a crank time strategy. Cold engine operation is determined via an open loop strategy until the O2 sensors have reached operating temperature. At this point, the strategy enters a closed loop mode where fuel requirements are based upon the state of the O2 sensors, engine speed, MAP, throttle position, air temperature, battery voltage, and coolant temperature.

3.2.2 ON-BOARD DIAGNOSTICS

The PCM has been programmed to monitor many different circuits of the fuel injection system. This monitoring is called on-board diagnosis.

Certain criteria, or arming conditions, must be met for a trouble code to be entered into the PCM memory. The criteria may be a range of: engine rpm, engine temperature, and/or input voltage to the PCM. If a problem is sensed with a monitored circuit, and all of the criteria or arming conditions are met, then a trouble code will be stored in the PCM.

It is possible that a trouble code for a monitored circuit may not be entered into the PCM memory even though a malfunction has occurred. This may happen because one of the trouble code criteria have not been met.

The PCM compares input signal voltages from each input device with specifications (the established high and low limits of the range) that are programmed into it for that device. If the input voltage is not within specifications and other trouble code criteria are met, a trouble code will be stored in the PCM memory.

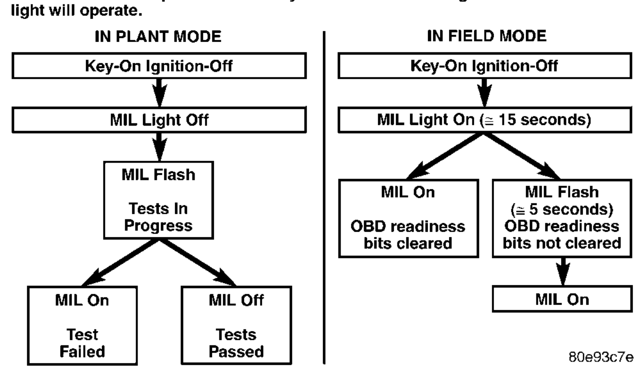
The On Board Diagnostics have evolved to the second Generation of Diagnostics referred to as OBDII/Euro Stage III OBD. These OBDII/Euro Stage III OBD Diagnostics control the functions necessary to meet the requirements of California OBDII, Federal OBD regulation and European regulation. These requirements specify the inclusion of a Malfunction Indicator Light (MIL) located on the instrument panel. The purpose of the MIL is to inform the vehicle operator in the event of a malfunction of any emission system or component failure.

MIL Lamp Strategy

I/M Readiness OK to test = **Key On Engine OFF** – MIL Lamp will remain on until the engine is started or Ignition is turned off.

I/M not ready for testing **= Key On Engine OFF** – MIL Lamp on solid for (15) seconds then MIL Lamp will flash on/off for (5) seconds then it will remain on until the vehicle is started or the Ignition is turned off.

In order to meet mandated regulations, a new feature has been added to engine control modules for 2002 to provide an OBDII I/M (In-Field Inspection & Maintenance) readiness indicator. When the engine controller is in in-field mode, turning the key on with the engine off will activate the MIL light for approximately 15 seconds. After this time, if the vehicle is ready for I/M testing the MIL light will remain fully illuminated. If the vehicle is not ready, the MIL light will blink for approximately 5 seconds and then remain on until the first engine crank or the key is turned off. This differs from the previous behavior of the MIL light, which was only activated with a failure in the system. For in-plant mode, the MIL light will function as in previous model years. Below are diagrams of how the MIL light will operate.



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OBD II/EURO STAGE III OBD MONITOR INFORMATION

Comprehensive Components Monitor	Major Monitors Non Fuel Control & Non Misfire	Major Monitors Fuel Control & Misfire
Run constantly	Run Once Per Trip	Run Constantly
Includes All Engine Hardware - Sensors, Switches, Solenoids, etc.	Monitors Entire Emission System	Monitors Entire System
One Trip Faults - Turns On The MIL and Sets DTC After One Failure	Two Trip Faults - Turns On The MIL and Sets DTC After Two Consecutive Failures	Two Trip Faults - Turns On The MIL and Sets DTC After Two Consecutive Failures
Priority 3	**Priority 1 or 3**	**Priority 2 or 4**
All Checked For Continuity Open Short To Ground Short To Voltage	Done Stop Testing = Yes Oxygen Sensor Heater Oxygen Sensor Response	**Fuel Control Monitor** Monitors Fuel Control System For: Fuel System Lean Fuel System Rich Requires 3 Consecutive *Fuel System Good Trips* To Extinguish The MIL
Inputs Checked For Rationality Outputs Checked For Functionality	Catalytic Converter Efficiency Except EWMA - up to 6 tests per trip and a one trip fault	
	Evaporative Emission System	**Misfire Monitor** Monitors For Engine Misfire at: 1000 RPM Counter (Type B) **200 RPM Counter (Type A)
Requires 3 Consecutive *Global/Alternate Good Trips* to Extinguish the MIL*	Requires 3 Consecutive *Global Good Trips* to Extinguish the MIL*	Requires 3 Consecutive *Misfire Good Trips* To Extinguish the MIL **Type A misfire is a two trip failure. The MIL will illuminate and blink at the first failure.

***40 Warm Up Cycles** are required to erase DTC's *after* the MIL has been extinguished.

OBDII Monitor Run Process NGC Vehicle

The following procedure has been established to assist Technicians in the field with enabling and running OBDII Monitors. The order listed in the following procedure is intended to allow the technician to effectively complete each monitor and to set the CARB Readiness Status in the least time possible.

NOTE

A. Once the monitor run process has begun, do not turn off the ignition. By turning the ignition key off, monitor enabling conditions will be lost. Only the 02 Heater Monitor runs after key off.
B. By performing a Battery Disconnect, or Selecting Erase DTCs, the CARB Readiness and all additional OBD information will be cleared.

Monitor Preliminary Checks:

1. Plug a DRBIII into the vehicle's DLC.
2. Turn the ignition, KEY ON–ENGINE OFF. Watch for MIL lamp illumination during the bulb check. MIL lamp must have illuminated, if not, repair MIL lamp.
3. On the DRB III Select #1 DRB III Standalone.
4. Select #1 1998-2004 Diagnostics
5. Select #1 Engine
6. Select #2 DTCs and Related Functions
7. Select #1 Read DTCs
   *Verify that No Emissions Related DTCs are Present.
   *If an Emissions DTC is Present, the OBD II Monitors may not run and the CARB Readiness will not update.
   *The Emissions related DTC, will need to be repaired, then cleared. By clearing DTCs, the OBD Monitors will need to be run and completed to set the CARB Readiness Status.
8. Return to Engine Select Function Menu and Select #9, OBD II Monitors.
9. Select #2 CARB Readiness Status.

Do all the CARB Readiness Status Locations read YES?

*YES, then all monitors have been completed and this vehicle is ready to be I/M or Emission Tested.
*NO, then the following procedure needs to be followed to run/complete all available monitors.

NOTE

A. Only the monitors, which are **not** YES in the CARB Readiness Status, need to be completed.
B. Specific criteria need to be met for each monitor. Each monitor has a Pre-Test screen to assist in running the monitor. For additional information, refer to the Chrysler Corporation Technical Training Workbook title On Board Diagnostics, part number 81-699-97094.

The most efficient order to run the monitors has been outlined below, including suggestions to aid the process.

A. NATURAL VACUUM LEAK DETECTION WITH PURGE MONITOR

This monitor requires a cool down cycle, usually an overnight soak for at least 8 hours without the engine running. The ambient temperature must decrease overnight – parking the vehicle outside is advised. To run this test the fuel level must be between 15-85% full. For the monitor run conditions select the EVAP MON PRE-TEST in the DRB III®, OBD II Monitors Menu. The Purge monitor will run if the small leak test reports a pass. Criteria for NVLD monitor.

1. Engine off time greater than one hour
2. Fuel Level between 15% and 85%
3. Start Up ECT and IAT within 10°C (18°F).
4. Vehicle started and run until Purge Monitor reports a result.

NOTE: If the vehicle does not report a result and the conditions were correct, it may take up to two weeks to fail the small leak monitor. DO NOT use this test to attempt to determine a fault. Use the appropriate service information procedure for finding a small leak. If there are no faults and the conditions are correct this test will run and report a pass. Note the Small leak test can find leaks less than 10 thousandths of an inch. If a small leak is present it takes approximately one week of normal driving to report a failure.

B. CATALYST/O2 MONITOR

With NGC, Catalyst and O2 Monitor information are acquired and processed at the same time. Most vehicles will need to be driven at highway speed (<50 mph) for a few minutes. Some trucks run the monitor at idle in drive. If the vehicle is equipped with a manual transmission, using 4th gear may assist in meeting the monitor running criteria. For the monitor run conditions, select the BANK 1 CAT MON PRE-TEST in the DRB III®, OBD II Monitors Menu.

C. EGR MONITOR

The EGR monitor now runs in a closed throttle decel or at idle on a warm vehicle. However, it is necessary to maintain the TPS, Map and RPM ranges to allow the monitor to complete itself. For the monitor run conditions, select the EGR PRE-TEST in the DRB III®, OBD II Monitors Menu.

D. 02 SENSOR HEATER MONITOR

This monitor is now continuously running once the heaters are energized. Pass information will be processed at power down. For the monitor run conditions, select the O2S HEATER MON PRE-TEST in the DRB III®, OBD II Monitors Menu.

3.2.3 OTHER CONTROLS

CHARGING SYSTEM (NGC)

The charging system is turned on when the engine is started. The Generator field is controlled by the PCM using a 12-volt high-side driver and a body ground circuit. The Generator output voltage is determined by the PCM. When more system voltage is needed, the PCM will applies a longer duty cycle using the 12-volt high-side drive and shortens duty cycle or none at all when less voltage is needed.

O2 SENSOR (NGC)

The O2 system with ignition on and engine off has a normalized O2 voltage of around 5 volts as displayed on the DRBIII or measured with a high impedance voltmeter. As the O2 sensor starts generating a signal the voltage will move towards 2.5 volts. The voltage will typically vary between 2.5 volts and 3.5 volts on a normal running engine. The goal voltage is also typically between 2.5 and 3.5 volts. This implies that the 0-volt through 1-volt range that you are used to is still valid, only it is shifted up by a 2.5 volt offset. This 2.5 volt supply is being delivered through the sensor return line.

SPEED CONTROL SYSTEM

The PCM controls vehicle speed by operation of the speed control servo vacuum and vent solenoids. Energizing the vacuum solenoid applies vacuum to the servo to increase throttle position. Operation of the vent solenoid slowly releases the vacuum allowing throttle position to decrease. A special vacuum dump solenoid allows immediate release of the throttle during speed control operation.

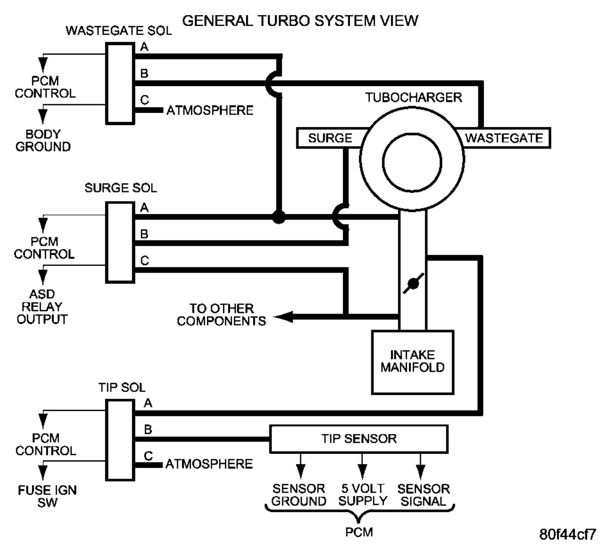
Speed control may be cancelled by braking, driver input using the speed control switches, shifting into neutral, excessive engine speed (wheels spinning), or turning the ignition off.

NOTE: If two speed control switches are selected simultaneously, the PCM will detect an illegal switch operation and turn the speed control off.

TURBOCHARGER SYSTEM 2.4L (NCG)

The turbocharger is a performance part and must not be tampered with. The wastegate bracket is an integral part of the turbocharger. Tampering with the wastegate components can reduce durability by increasing cylinder pressure and thermal loading due to incorrect inlet and exhaust manifold pressure. Poor fuel economy and failure to meet regulatory emissions laws may also result. Increasing the turbocharger boost WILL NOT increase engine power. The turbocharger is an exhaust-driven supercharger, which increases the pressure and density of the air entering the engine. With the increase of air entering the engine, more fuel can be injected into the cylinders, which creates more power during combustion. Refer to the Service Manual information for description and operation of the Turbo system. The Turbo system consists of the following components.

- Turbocharger with Surge Valve and Wastegate Actuators
- Surge Valve Solenoid
- Throttle Inlet Pressure (TIP) Solenoid
- Wastegate Solenoid
- Throttle Inlet Pressure (TIP) Sensor



NATURAL VACUUM LEAK DETECTION (NVLD) (NGC)

The Natural Vacuum Leak Detection (NVLD) system is the next generation evaporative leak detection system that will first be used on vehicles equipped with the Next Generation Controller (NGC) starting in 2002 M.Y. This new system replaces the leak detection pump as the method of evaporative system leak detection. The current CARB requirement is to detect a leak equivalent to a 0.020″ (0.5 mm) hole. This system has the capability to detect holes of this size very dependably.

The basic leak detection theory employed with NVLD is the ″Gas Law″. This is to say that the pressure in a sealed vessel will change if the temperature of the gas in the vessel changes. The vessel will only see this effect if it is indeed sealed. Even small leaks will allow the pressure in the vessel to come to equilibrium with the ambient pressure.

In addition to the detection of very small leaks, this system has the capability of detecting medium as well as large evaporative system leaks.

THE NVLD UTILIZES THE GAS LAW PRINCIPLES

A vent valve seals the canister vent during engine off conditions. If the vapor system has a leak of less than the failure threshold, the evaporative system will be pulled into a vacuum, either due to the cool down from operating temperature or diurnal ambient temperature cycling. The diurnal effect is considered one of the primary contributors to the leak determination by this diagnostic. When the vacuum in the system exceeds about 1″ H2O (0.25 KPA), a vacuum switch closes. The switch closure sends a signal to the PCM. The PCM, via appropriate logic strategies (described below), utilizes the switch signal, or lack thereof, to make a determination of whether a leak is present.

THE NVLD DEVICE AND HOW IT FUNCTIONS

The NVLD Assembly is designed with a normally open vacuum switch, a normally closed solenoid, and a seal, which is actuated by both the solenoid and a diaphragm. The NVLD is located on the atmospheric vent side of the canister.

The normally open vacuum switch will close with about 1″ H2O (0.25 KPA) vacuum in the evaporative system. The diaphragm actuates the switch. This is above the opening point of the fuel inlet check valve in the fill tube so cap off leaks can be detected. Submerged fill systems must have recirculation lines that do not have the in-line normally closed check valve that protects the system from failed nozzle liquid ingestion, in order to detect cap off conditions.

The normally closed valve in the NVLD is intended to maintain the seal on the evaporative system during the engine off condition. If vacuum in the evaporative system exceeds 3″ to 6″ H2O (0.75 to 1.5 KPA), the valve will be pulled off the seat, opening the seal. This will protect the system from excessive vacuum as well as allowing sufficient purge flow in the event that the solenoid was to become inoperative. The solenoid actuates the valve to unseal the canister vent while the engine is running. It also will be used to close the vent during the medium and large leak tests and during the purge flow check. This solenoid requires initial 1.5 amps of current to pull the valve open but after 100 ms. will be duty cycled down to an average of about 150 mA for the remainder of the drive cycle.

Another feature in the NVLD Assembly is a diaphragm that will open the seal with pressure in the evaporative system. The seal will be opened at about 0.5″ H2O (0.12 KPA) pressure to permit the venting of vapors during refueling. An added benefit to this is that it will also allow the tank to ″breathe″ during increasing temperatures, thus limiting the pressure in the tank to this low level. This is beneficial because the induced vacuum during a subsequent declining temperature will achieve the switch closed (pass threshold) sooner than if the tank had to decay from a built up pressure.

The NVLD Assembly itself has 3 wires: Switch sense, solenoid driver and ground. It also includes a resistor to protect the switch from a short to battery or a short to ground. The PCM utilizes a high-side driver to energize and duty-cycle the solenoid.

THE PCM'S ROLE IN NVLD DIAGNOSIS:

The integral part of the diagnostic system that makes engine-off leak detection possible is a special circuit in the PCM controller. After the vehicle is turned off, a special part of the controller stays alive and monitors for an NVLD switch closure. This circuit within the PCM is very specific in its function and consumes very little power. If a switch closure is detected, it will log the event and time from key-off, and then power down. This information will be processed at the next key cycle.

NVLD LEAK DETECTION

Small Leak Test (Passive)

If, after a specified delay after key off (perhaps 5 minutes), the switch closes or is closed, the test will be passed, indicating that there is no leak. The PCM records the switch closure. The NVLD circuit in the PCM will shut down for the remainder of that particular engine off (soak) period. When the engine is started, the switch closure is recorded as a ″Pass,″ and the timers that are recording accumulated time are reset.

This diagnostic test can take at least a week to mature a leak fault. A week has been chosen for this because the vehicle will have been exposed to the largest possible drive scenarios before a decision is made (most vehicles should see both daily work and weekend driving cycles). This also satisfies CARB's stated goal of getting 3 MIL illuminations within a month for 0.020″ (0.5 mm) leak detection diagnostic.

The diagnostics will log engine run time and engine off time to determine when a week has elapsed. There is a limit on the total amount of run time that is applied to the one-week timer. There is also a limit on the total soak time that will be allowed to be applied to the one-week timer. There will be a limit on the amount of accrued run time during one specific drive that can be applied to the one-week timer.

The enabling criteria to run this monitor are:

- Fuel level less than 85%
- Ambient temperature greater than 40 °F (4.4 °C)

Rationality Tests

1. The rationality check of the switch, solenoid and seal will be performed as follows:

- At key-on, the NVLD solenoid will be energized to vent any vacuum that may be trapped in the evaporative system from the previous soak. This should result in an open switch condition.
- The solenoid will be de-energized (to seal the system) at the point where purge begins. The system / NVLD component rationality passes for that drive cycle if the switch closes after purge begins.
- The solenoid is then re-energized for the remainder of the drive cycle.
- If the switch events are not seen in a certain period of time, the rationality check will have failed (2 trip rule).

2. Purge Flow:

The above rationality check is considered sufficient to confirm purge solenoid function and conformance with the purge flow test requirement. The Purge Flow Monitor is passed based on switch activity when purge is turned on or based on a rich fuel control shift when purge is turned on.

Medium and Large Leak Test (Intrusive)

NOTE: This intrusive test will only be run if the Small Leak (passive) test fails, or is inconclusive (the switch does not close)

Enabling Conditions:

- 40 °F to 90 °F
- Engine temperature at startup within 10 °F of the ambient temperature
- Fuel level less than 85%

The intrusive Medium and Large leak are conducted as follows:

- De-energize the NVLD solenoid to seal the canister vent.
- Activate purge shortly after closed loop. Pull the tank vacuum past the vacuum switch point (1″ H_2O vacuum) of the NVLD for a specific time while tracking the standard purge flow rate.
- Turn purge off and determine how long it takes to decay the tank vacuum and reopen the switch. Determine the leak size from the time it took to reopen the switch. Note: Fuel level is an important determining factor.
- If the switch does not close, a more aggressive purge flow will be applied to determine if it is a very large leak, missing fuel cap, problem with the NVLD device, purge flow problem, etc...

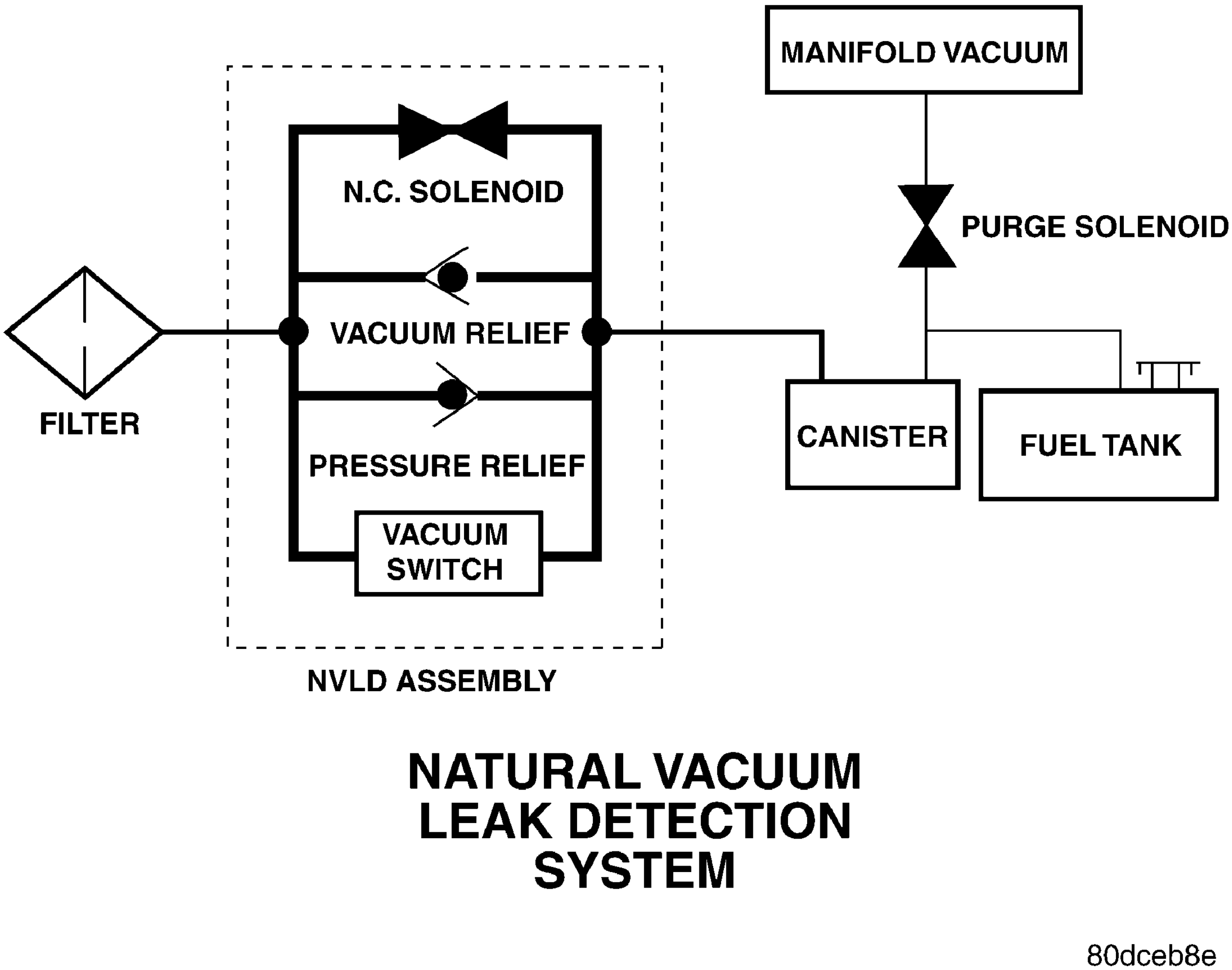
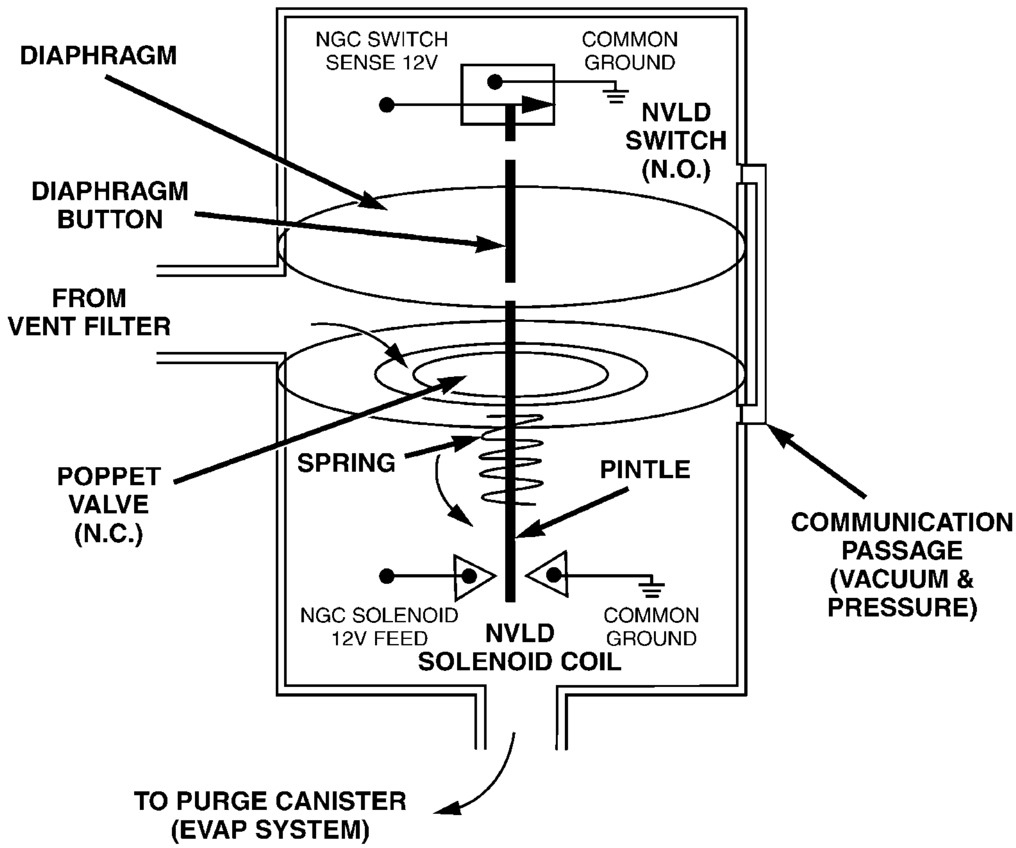

MANIFOLD VACUUM
N.C. SOLENOID
PURGE SOLENOID
VACUUM RELIEF
FILTER
CANISTER
FUEL TANK
PRESSURE RELIEF
VACUUM
SWITCH
NVLD ASSEMBLY
NATURAL VACUUM
LEAK DETECTION
SYSTEM
80dceb8e

FIGURE 1

NVLD ASSEMBLY INTERNAL SCHEMATIC



NVLD Switch Closure happens at 1" H2O (Water) Vacuum (+ - 12% when new). Vacuum draws the Diaphragm up closing the Switch.

- **PRESSURE RELIEF:** The Poppet Valve is spring loaded closed (up). It opens at 1" H2O Pressure. Pressure from the Purge Canister (EVAP System) enters the top of the diaphragm chamber via an internal communication passage. Pressure then pushes the Diaphragm down unseating the Poppet Valve allow the EVAP pressure to exit to the Vent Filter.
- **VACUUM RELIEF:** The Poppet Valve is spring loaded closed (up). The Poppet Valve begins to open at 3" - 4" H2O Vacuum, and is completely open at 6" H2O (flows 70 Liters per Minute). Vacuum acts on the bottom of the Poppet Valve & draws it down to open the Purge Canister (EVAP System) to the Vent Filter.

NVLD Solenoid has a Resistance of 8 Ohms (+ - 0.5 Ohm) at 68 Degrees F. When Energized, it pulls the Pintle down thus opening the Poppet Valve and connects the Purge Canister with the Vent Filter (Atmosphere).

80dceb68

FIGURE 2

3.2.4 PCM OPERATING MODES

As input signals to the PCM change, the PCM adjusts its response to output devices. For example, the PCM must calculate a different injector pulse width and ignition timing for idle than it does for wide open throttle. There are several different modes of operation that determine how the PCM responds to the various input signals.

There are two types of engine control operation: **open loop** and **closed loop.**

In **open loop** operation, the PCM receives input signals and responds according to preset programming. Inputs from the heated oxygen sensors are not monitored.

In **closed loop** operation, the PCM monitors the inputs from the heated oxygen sensors. This input indicates to the PCM whether or not the calculated injector pulse width results in the ideal air-fuel ratio of 14.7 parts air to 1 part fuel. By monitoring the exhaust oxygen content through the oxygen sensor, the PCM can fine tune injector pulse width. Fine tuning injector pulse width allows the PCM to achieve the lowest emission levels while maintaining optimum fuel economy.

The engine start-up (crank), engine warm-up, and wide open throttle modes are open loop modes. Under most operating conditions, closed loop modes occur with the engine at operating temperature.

3.2.5 NON-MONITORED CIRCUITS

The PCM does not monitor the following circuits, systems, and conditions even though they could have malfunctions that result in driveability problems. A diagnostic code may not be displayed for the following conditions. However, problems with these systems may cause a diagnostic code to be displayed for other systems. For example, a fuel pressure problem will not register a diagnostic code directly, but could cause a rich or lean condition. This could cause an oxygen sensor, fuel system, or misfire monitor trouble code to be stored in the PCM.

Engine Timing − The PCM cannot detect an incorrectly indexed timing chain, camshaft sprocket, or crankshaft sprocket. The PCM also cannot detect an incorrectly indexed distributor.(*)

Fuel Pressure − Fuel pressure is controlled by the fuel pressure regulator. The PCM cannot detect a clogged fuel pump inlet filter, clogged in-line filter, or a pinched fuel supply.(*)

Fuel Injectors − The PCM cannot detect if a fuel injector is clogged, the pintle is sticking, or the wrong injectors are installed.(*)

Fuel Requirements − Poor quality gasoline can cause problems such as hard starting, stalling, and stumble. Use of methanol-gasoline blends may result in starting and driveability problems. See individual symptoms and their definitions in Section 6.0 (Glossary of Terms).

PCM Grounds − The PCM cannot detect a poor system ground. However, a diagnostic trouble code may be stored in the PCM as a result of this condition.

Throttle Body Air Flow − The PCM cannot detect a clogged or restricted air cleaner inlet or filter element.(*)

Exhaust System − The PCM cannot detect a plugged, restricted, or leaking exhaust system.(*)

Cylinder Compression − The PCM cannot detect uneven, low, or high engine cylinder compression.(*)

Excessive Oil Consumption − Although the PCM monitors the exhaust stream oxygen content through the oxygen sensor when the system is in a closed loop, it cannot determine excessive oil consumption.

NOTE: Any of these conditions could result in a rich or lean condition causing an oxygen sensor TROUBLE CODE to be stored in the PCM, or the vehicle may exhibit one or more of the driveability symptoms listed in the Table of Contents.

3.2.6 SKIS OVERVIEW

The Sentry Key Immobilizer System (SKIS) is designed to prevent unauthorized vehicle operation. The system consists of a Sentry Key Immobilizer Module (SKIM), ignition key(s) equipped with a transponder chip and PCM. When the ignition switch is turned on, the SKIM interrogates the ignition key. If the ignition key is Valid or Invalid, the SKIM sends a PCI Bus message to the PCM indicating ignition key status. Upon receiving this message the PCM will terminate engine operation, or allow the engine to continue to operate.

3.2.7 SKIM ON-BOARD DIAGNOSTICS

The SKIM has been programmed to transmit and monitor many different coded messages as well as PCI Bus messages. This monitoring is called On Board Diagnosis.

Certain criteria must be met for a diagnostic trouble code to be entered into the SKIM memory. The criteria may be a range of; Input voltage, PCI Bus message, or coded messages to the SKIM. If all of the criteria for monitoring a circuit or function are met and a fault is sensed, a diagnostic trouble code will be stored in the SKIM memory.

3.2.8 SKIS OPERATION

When ignition power is supplied to the SKIM, the SKIM performs an internal self-test. After the self-test is completed, the SKIM energizes the antenna (this activates the transponder chip) and sends a challenge to the transponder chip. The transponder chip responds to the challenge by generating an encrypted response message using the following:

Secret Key - This is an electronically stored value (identification number) that is unique to each SKIS. The secret key is stored in the SKIM, PCM and all ignition key transponders.

Challenge - This is a random number that is generated by the SKIM at each ignition key cycle.

The secret key and challenge are the two variables used in the algorithm that produces the encrypted response message. The transponder uses the crypto algorithm to receive, decode and respond to the message sent by the SKIM. After responding to the coded message, the transponder sends a transponder I.D. message to the SKIM. The SKIM compares the transponder I.D. to the available valid key codes in the SKIM memory (8 key maximum at any one time). After validating the key ignition the SKIM sends a PCI Bus message called a Seed Request to the engine controller then waits for a PCM response. If the PCM does not respond, the SKIM will send the seed request again. After three failed attempts the SKIM will stop sending the seed request and store a trouble code. If the PCM sends a seed response, the SKIM sends a valid/invalid key message to the PCM. This is an encrypted message that is generated using the following:

VIN - Vehicle Identification Number

Seed - This is a random number that is generated by the PCM at each ignition key cycle.

The VIN and seed are the two variables used in the rolling code algorithm that encrypts the valid/invalid key message. The PCM uses the rolling code algorithm to receive, decode and respond to the valid/invalid key message sent by the SKIM. After sending the valid/invalid key message the SKIM waits 3.5 seconds for a PCM status message from the PCM. If the PCM does not respond with a valid key message to the SKIM, a fault is detected and a trouble code is stored.

The SKIS incorporates a VTSS LED located on the instrument panel upper cover. The LED receives switched ignition voltage and is hardwired to the body control module. The LED is actuated when the SKIM sends a PCI Bus message to the body controller requesting the LED on. The body controller then provides the ground for the LED. The SKIM will request VTSS LED operation for the following:

– bulb checks at ignition on
– to alert the vehicle operator to a SKIS malfunction
– customer key programming mode

For all faults except transponder faults and VTSS LED remains on steady. In the event of a transponder fault the LED flashes at a rate of 1 Hz (once per second). If a fault is present the LED will remain on or flashing for the complete ignition cycle. If a fault is stored in SKIM memory which prevents the system from operating properly, the PCM will allow the engine to start and run (for 2 seconds) up to six times. After the sixth attempt, the PCM disables the starter relay until the fault is corrected.

3.2.9 PROGRAMMING THE POWERTRAIN CONTROL MODULE

Important Note: Before replacing the PCM for a failed driver, control circuit or ground circuit, be sure to check the related component/circuit integrity for failures not detected due to a double fault in the circuit. Most PCM driver/control circuit failures are caused by internal failure to components (i.e. 12-volt pull-ups, drivers and ground sensors). These failures are difficult to detect when a double fault has occurred and only one DTC has set.

NOTE: If the PCM and the SKIM are replaced at the same time, program the VIN into the PCM first. All vehicle keys will then need to be replaced and programmed to the new SKIM.

The SKIS Secret Key is an I.D. code that is unique to each SKIS. This code is programmed and stored in the SKIM, engine controller and transponder chip (ignition key). When replacing the PCM it is necessary to program the secret key into the PCM.

NOTE: After replacing the PCM, you must program pinion factor.

NOTE: 2.4L Turbo Manual Transmission. After replacing the PCM, you must program pinion factor.

1. Turn the ignition on (transmission in park/neutral).
2. Use the DRBIII® and select THEFT ALARM, SKIM then MISCELLANEOUS.
3. Select PCM REPLACED.
4. Enter secured access mode by entering the vehicle four-digit PIN.

NOTE: If three attempts are made to enter the secure access mode using an incorrect PIN, secured access mode will be locked out for one hour. To exit this lockout mode, turn the ignition to the run position for one hour then enter the correct PIN. (Ensure all accessories are turned off. Also monitor the battery state and connect a battery charger if necessary).

5. Press ENTER to transfer the secret key (the SKIM will send the secret key to the PCM).

3.2.10 PROGRAMMING THE SENTRY KEY IMMOBILIZER MODULE

NOTE: If the PCM and the SKIM are replaced at the same time, program the VIN into the PCM first. All vehicle keys will then need to be replaced and programmed to the new SKIM.

1. Turn the ignition on (transmission in park/neutral).
2. Use the DRBIII® and select THEFT ALARM, SKIM then MISCELLANEOUS.
3. Select SKIM MODULE REPLACEMENT (GASOLINE).
4. Program the vehicle four-digit PIN into the SKIM.
5. Select COUNTRY CODE and enter the correct country.

NOTE: Be sure to enter the correct country code. If the incorrect country code is programmed into SKIM, the SKIM must be replaced.

6. Select UPDATE VIN (the SKIM will learn the VIN from the PCM).
7. Press ENTER to transfer the VIN (the PCM will send the VIN to the SKIM).
8. The DRBIII® will ask if you want to transfer the secret key. Select ENTER to transfer secret key from the PCM. This will ensure the current vehicle ignition keys will still operate the SKIS system.

3.2.11 PROGRAMMING THE IGNITION KEYS TO THE SENTRY KEY IMMOBILIZER MODULE

1. Turn the ignition on (transmission in park/neutral).
2. Use the DRBIII® and select THEFT ALARM, SKIM, then MISCELLANEOUS.
3. Select PROGRAM IGNITION KEYS.
4. Enter secured access mode by entering the vehicle four-digit PIN.

NOTE: A maximum of eight keys can be learned to each SKIM AT ONE TIME. Once a key is learned to a SKIM it (the key) cannot be transferred to another vehicle.

If ignition key programming is unsuccessful, the DRBIII® will display one of the following messages:

Programming Not Attempted - The DRBIII® attempts to read the programmed key status and there are no keys programmed in the SKIM memory.

Programming Key Failed - (Possible Used Key From Wrong Vehicle) - SKIM is unable to program key due to one of the following:

– faulty ignition key transponder

– ignition key is programmed to another vehicle.

8 Keys Already Learned, Programming Not Done - SKIM transponder ID memory is full.

1. Obtain ignition keys to be programmed from customer (8 keys maximum)
2. Using the DRBIII®, erase all ignition keys by selecting MISCELLANEOUS and ERASE ALL CURRENT IGN. KEYS
3. Program all ignition keys.

Learned Key In Ignition - Ignition key transponder ID is currently programmed in SKIM memory.

3.3 DIAGNOSTIC TROUBLE CODES

Each diagnostic trouble code is diagnosed by following a specific testing procedure. The diagnostic test procedures contain step-by-step instructions for determining the cause of trouble codes as well as no trouble code problems. It is not necessary to perform all of the tests in this book to diagnose an individual code.

Always begin by reading the diagnostic trouble codes using the DRBIII®.

3.3.1 HARD CODE

A diagnostic trouble code that comes back within one cycle of the ignition key is a hard code. This means that the defect is there every time the powertrain control module checks that circuit or function. Procedures in this manual verify if the DTC is a hard code at the beginning of each test. When it is not a hard code, an intermittent test must be performed.

DTC's that are for OBDII/Euro Stage III OBD monitors will not set with just the ignition key on. Comparing these to non-emission DTC's, they will seem like an intermittent. These DTC's require a set of parameters to be performed (The DRBIII® pre-test screens will help with this for MONITOR DTC's), this is called a TRIP. All OBDII/Euro Stage III OBD DTCs will be set after one or in some cases two trip failures, and the MIL will be turned on. These DTC's require three successful, no failures, TRIPS to extinguish the MIL, followed by 40 warm-up cycles to erase the DTC. For further explanation of TRIPS, Pre-test screens, Warm-up cycles, and the use of the DRBIII®, refer to the On Board Diagnostic training booklet #81-699-97094.

3.3.2 INTERMITTENT CODE

A diagnostic trouble code that is not there every time the PCM checks the circuit is an intermittent DTC. Most intermittent DTC's are caused by wiring or connector problems. Defects that come and go like this are the most difficult to diagnose; they must be looked for under specific conditions that cause them. The following checks may assist you in identifying a possible intermittent problem:

- Visually inspect related wire harness connectors. Look for broken, spread, bent, pushed out, or corroded terminals.
- Visually inspect the related harnesses. Look for chafed, pierced, or partially broken wire.
- Refer to any technical service bulletins that may apply.
- Use the DRBIII® data recorder or co-pilot.

3.3.3 STARTS SINCE SET COUNTER

The start since set counter counts the number of times the vehicle has been started since codes were last set, erased, or the battery was disconnected. The reset counter will count up to 255 start counts.

The number of starts helps determine when the trouble code actually happened. This is recorded by the PCM and can be viewed on the DRBIII® as STARTS since set.

When there are no trouble codes stored in memory, the DRBIII® will display NO DTC's Detected and the reset counter will show STARTS since clear = XXX.

3.3.4 DISTANCE SINCE MI SET

The Euro Stage III OBD directive requires that the distance traveled by the vehicle while the MI is activated must be available at any instant through the serial port on the standard data link connector. This feature works as follows:

1. If the MI is illuminated due to a fault, the distance count is updated (i.e. it is counting).
2. If there is a stale MI fault (i.e. the fault is still frozen in memory but the MI has been extinguished due to 3 good trips), the distance count is held (i.e. frozen).
3. If the distance count is being held due to (Item 2.) and the fault is cleared, the distance is cleared (set to zero).
4. If the distance count is being held due to (Item 2.) and another MI occurs, the distance count is reset (to) and begins updating anew.
5. If a fault occurs while the MI is already illuminated due to a previous fault (the distance count is updating), then the distance count continues to update w/out interruption.
6. If the MI is flashing due to active misfire and there is an active fault (i.e. matured fault for which 3 good trips have not occurred), the distance count behaves as the MI in ON.
7. If the MI is flashing due to active misfire and there is no active fault (i.e. the MI is flashing for a 1 malf.), the distance count behaves as if the MI is off (because it is not yet a matured fault).
8. The distance count is cleared whenever the fault is cleared. (Via 40 warm up cycles, or via scan tool).

3.4 USING THE DRBIII®

Refer to the DRBIII® user's guide for instructions and assistance with reading DTC's, erasing DTC's, and other DRBIII® functions.

3.5 DRBIII® ERROR MESSAGES AND BLANK SCREEN

Under normal operation, the DRBIII® will display one of only two error messages:

– User-Requested WARM Boot or User-Requested COLD Boot

If the DRBIII® should display any other error message, record the entire display and call the Star Center for information and assistance. This is a sample of such an error message display:

```
ver: 2.14
date: 26 Jul93
file: key_itf.cc
date: Jul 26 1993
line: 548
err: 0x1
User-Requested COLD Boot

Press MORE to switch between this display
   and the application screen.
Press F4 when done noting information.
```

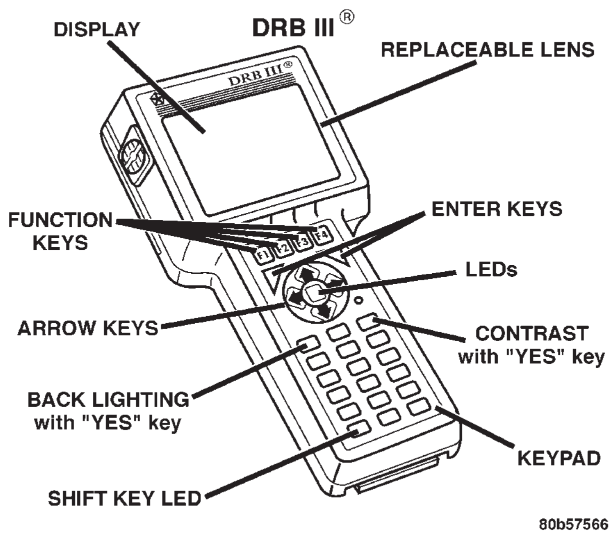
3.5.1 DRBIII® DOES NOT POWER UP

If the LED's do not light or no sound is emitted at start up, check for loose cable connections or a bad cable. Check the vehicle battery voltage (data link connector cavity 16). A minimum of 11 volts is required to adequately power the DRBIII®.

If all connections are proper between the DRBIII® and the vehicle or other devices, and the vehicle battery is fully charged, and inoperative DRBIII® may be the result of faulty cable or vehicle wiring.

3.5.2 DISPLAY IS NOT VISIBLE

Low temperatures will affect the visibility of the display. Adjust the contrast to compensate for this condition



4.0 DISCLAIMERS, SAFETY, WARNINGS

4.1 DISCLAIMERS

All information, illustrations, and specifications contained in this manual are based on the latest information available at the time of publication. The right is reserved to make changes at any time without notice.

4.2 SAFETY

4.2.1 TECHNICIAN SAFETY INFORMATION

WARNING: ENGINES PRODUCE CARBON MONOXIDE THAT IS ODORLESS, CAUSES SLOWER REACTION TIME, AND CAN LEAD TO SERIOUS INJURY. WHEN THE ENGINE IS OPERATING, KEEP SERVICE AREAS WELL VENTILATED OR ATTACH THE VEHICLE EXHAUST SYSTEM TO THE SHOP EXHAUST REMOVAL SYSTEM.

Set the parking brake and block the wheels before testing or repairing the vehicle. It is especially important to block the wheels on front-wheel drive vehicles; the parking brake does not hold the drive wheels.

When servicing a vehicle, always wear eye protection, and remove any metal jewelry such as watchbands or bracelets that might make an inadvertent electrical contact.

When diagnosing a powertrain system problem, it is important to follow approved procedures where applicable. These procedures can be found in service manual procedures. Following these procedures is very important to the safety of individuals performing diagnostic tests.

4.2.2 VEHICLE PREPARATION FOR TESTING

Make sure the vehicle being tested has a fully charged battery. If it does not, false diagnostic codes or error messages may occur.

4.2.3 SERVICING SUB ASSEMBLIES

Some components of the powertrain system are intended to be serviced in assembly only. Attempting to remove or repair certain system subcomponents may result in personal injury and/or improper system operation. Only those components with approved repair and installation procedures in the service manual should be serviced.

4.2.4 DRBIII® SAFETY INFORMATION

WARNING: EXCEEDING THE LIMITS OF THE DRBIII® MULTIMETER IS DANGEROUS. IT CAN EXPOSE YOU TO SERIOUS INJURY. CAREFULLY READ AND UNDERSTAND THE CAUTIONS AND THE SPECIFICATION LIMITS.

Follow the vehicle manufacturer's service specifications at all times.

- Do not use the DRBIII® if it has been damaged.

- Do not use the test leads if the insulation is damaged or if metal is exposed.
- To avoid electrical shock, do not touch the test leads, tips, or the circuit being tested.
- Choose the proper range and function for the measurement. Do not try voltage or current measurements that may exceed the rated capacity.
- Do not exceed the limits shown in the table below:

FUNCTION	INPUT LIMIT
Volts	0 - 500 peak volts AC 0 - 500 volts DC
Ohms (resistance)*	0 - 1.12 megohms
Frequency Measured Frequency Generated	0 - 10 kHz
Temperature	-58 - 1100°F -50 - 600°C

* Ohms cannot be measured if voltage is present. Ohms can be measured only in a non-powered circuit.

- Voltage between any terminal and ground must not exceed 500v DC or 500v peak AC.
- Use caution when measuring voltage above 25v DC or 25v AC.
- The circuit being tested must be protected by a 10A fuse or circuit breaker.
- Use the low current shunt to measure circuits up to 10A. Use the high current clamp to measure circuits exceeding 10A.
- When testing for the presence of voltage or current, make sure the meter is functioning correctly. Take a reading of a known voltage or current before accepting a zero reading.
- When measuring current, connect the meter in series with the load.
- Disconnect the live test lead before disconnecting the common test lead.
- When using the meter function, keep the DRBIII® away from spark plug or coil wires to avoid measuring error from outside interference.

4.3 WARNINGS AND CAUTIONS

4.3.1 ROAD TEST WARNINGS

Some complaints will require a test drive as part of the repair verification procedure. The purpose of the test drive is to try to duplicate the diagnostic code or symptom condition.

CAUTION: Before road testing a vehicle, be sure that all components are reassembled. During the test drive, do not try to read the DRBIII® screen while in motion. Do not hang the DRBIII® from the rear view mirror or operate it yourself. Have an assistant available to operate the DRBIII®.

4.3.2 VEHICLE DAMAGE CAUTIONS

Before disconnecting any control module, make sure the ignition is off. Failure to do so could damage the module.

When testing voltage or continuity at any control module, use the terminal side (not the wire end) of the connector. Do not probe a wire through the insulation; this will damage it and eventually cause it to fail because of corrosion.

Be careful when performing electrical tests so as to prevent accidental shorting of terminals. Such mistakes can damage fuses or components. Also, a second DTC could be set, making diagnosis of the original problem more difficult.

5.0 REQUIRED TOOLS AND EQUIPMENT

DRBIII® (diagnostic read-out box) scan tool
Evaporative System Diagnostic Kit #6917
fuel filler adapter #8382
fuel pressure adapter (C-6631) or #6539
fuel pressure kit (C-4799-B) or #5069
fuel release hose (C-4799-1)
Min Air flow fitting #6714
Pinout Box (Miller #8815)
jumper wires
ohmmeter
oscilloscope
vacuum gauge
voltmeter
12 volt test light minimum 25 ohms resistance with probe #6801

CAUTION: A 12 volt test light should not be used for the following circuits, damage to the powertrain controller will occur.

- 5 Volt Supply
- J1850 PCI Bus
- CKP Sensor Signal
- CMP Sensor Signal
- Vehicle Speed Sensor Signal
- O2 Sensor Signal

6.0 GLOSSARY OF TERMS

ABS	anti-lock brake system
backfire, popback	fuel ignites in either the intake or the exhaust system
CKP	crank position sensor
CMP	camshaft position sensor
cuts out, misses	a steady pulsation or the inability of the engine to maintain a consistent rpm
DLC	data link connector (previously called engine diagnostic connector)
detonation, spark knock	a mild to severe ping, especially under loaded engine conditions
ECT	engine coolant temperature sensor
EGR	exhaust gas recirculation valve and system
generator	previously called alternator
hard start	The engine takes longer than usual to start, even though it is able to crank normally.
hesitation, sag, stumble	There is a momentary lack of response when the throttle is opened. This can occur at all vehicle speeds. If it is severe enough, the engine may stall.
IAT	intake/inlet air temperature sensor
IAC	idle air control motor
JTEC	Combined engine and transmission control module
lack of power, sluggish	The engine has less than expected power, with little or no increase in vehicle speed when the throttle is opened.
LDP	leak detection pump
MAP	manifold absolute pressure sensor
MIL	malfunction indicator lamp
MTV	manifold tuning valve
NGC	next generation controller
O2S	oxygen sensor
PCI	programmable communication interface
PCM	powertrain control module
PCV	positive crankcase ventilation
PEP	peripheral expansion port
poor fuel economy	There is significantly less fuel mileage than other vehicles of the same design ad configuration
rough, unstable, or erratic idle stalling	The engine runs unevenly at idle and causes the engine to shake if it is severe enough. The engine idle rpm may vary (called hunting). This condition may cause stalling if it is severe enough.
SBEC	single board engine controller
SKIM	sentry key immobilizer module
SKIS	sentry key immobilizer system
start & stall	The engine starts but immediately dies.
surge	engine rpm fluctuation without corresponding change in throttle position sensor
TIP	throttle inlet pressure
TPS	throttle position sensor
TRS	transmission range sensor
VSS	vehicle speed sensor/signal

7.0

DIAGNOSTIC INFORMATION AND PROCEDURES

Symptom:
*NO RESPONSE FROM PCM (PCI BUS) - NGC

POSSIBLE CAUSES
PCM PCI NO RESPONSE
POWERTRAIN CONTROL MODULE
PCI BUS CIRCUIT OPEN

TEST	ACTION	APPLICABILITY
1	Turn the ignition on. **NOTE: As soon as one or more module communicates with the DRB, answer the question.** With the DRB, enter Anti-Lock Brakes. With the DRB, enter Electro/Mechanical Cluster (MIC). With the DRB, enter Passive Restraints then Airbag. Were you able to establish communications with any of the modules? Yes → Go To 2 No → Refer to symptom PCI Bus Communication Failure in the Communications category. Perform POWERTRAIN VERIFICATION TEST VER - 1.	All
2	With the DRB read the Powertrain DTC's. This is to ensure power and grounds to the PCM are operational. **NOTE: If the DRB will not read PCM DTC's, follow the NO RESPONSE TO PCM (PCM SCI only) symptom path.** Turn the ignition off. Disconnect the PCM harness connectors. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Use Scope input cable CH7058, Cable to Probe adapter CH7062, and the red and black test probes. Connect the scope input cable to the channel one connector on the DRB. Attach the red and black leads and the cable to probe adapter to the scope input cable. With the DRBIII® select Pep Module Tools. Select lab scope. Select Live Data. Select 12 volt square wave. Press F2 for Scope. Press F2 and use the down arrow to set voltage range to 20 volts. Press F2 again when complete. Connect the Black lead to the chassis ground. Connect the Red lead to the PCI Bus circuit in the appropriate terminal of special tool #8815. Turn the ignition on. Observe the voltage display on the DRB Lab Scope. Does the voltage pulse from 0 to approximately 7.5 volts? Yes → Replace and program the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 1. No → Repair the PCI Bus circuit for an open. Perform POWERTRAIN VERIFICATION TEST VER - 1.	All

Symptom:
*NO RESPONSE FROM PCM (PCM SCI ONLY) - NGC

POSSIBLE CAUSES
CHECK PCM POWERS AND GROUNDS
PCM SCI TRANSMIT CIRCUIT SHORTED TO VOLTAGE
PCM SCI RECEIVE CIRCUIT SHORTED TO VOLTAGE
PCM SCI CIRCUITS SHORTED TOGETHER
PCM SCI TRANSMIT CIRCUIT SHORTED TO GROUND
PCM SCI RECEIVE CIRCUIT SHORTED TO GROUND
PCM SCI RECEIVE CIRCUIT OPEN
PCM SCI TRANSMIT CIRCUIT OPEN
POWERTRAIN CONTROL MODULE

TEST	ACTION	APPLICABILITY
1	Perform the symptom Checking PCM Power and Ground Circuits in the Driveability category. **NOTE: With the DRBIII® in the generic scan tool mode, attempt to communicate with the PCM.** **NOTE: If the DRBIII® can communicate with the PCM in the generic scan tool mode, it may not be necessary to perform this step.** Did the vehicle pass this test? Yes → Go To 2 No → Repair as necessary. Perform POWERTRAIN VERIFICATION TEST VER - 1.	All
2	Turn the ignition off. Disconnect the DRBIII® from the DLC. Disconnect the PCM harness connectors. Turn the ignition on. Measure the voltage of the PCM SCI Transmit circuit at the Data Link harness connector (cav 7). Is the voltage above 1.0 volt? Yes → Repair the PCM SCI Transmit circuit for a short to voltage. Perform POWERTRAIN VERIFICATION TEST VER - 1. No → Go To 3	All
3	Turn the ignition off. Disconnect the DRBIII® from the DLC. Disconnect the PCM harness connectors. Turn the ignition on. Measure the voltage of the PCM SCI Receive circuit at the Data Link harness connector (cav 12). Is the voltage above 1.0 volt? Yes → Repair the PCM SCI Receive circuit for a short to voltage. Perform POWERTRAIN VERIFICATION TEST VER - 1. No → Go To 4	All

*NO RESPONSE FROM PCM (PCM SCI ONLY) - NGC — Continued

TEST	ACTION	APPLICABILITY
4	Turn the ignition off. Disconnect the DRBIII® from the DLC. Disconnect the PCM harness connectors. Measure the resistance between the PCM SCI Transmit circuit and the PCM SCI Receive circuit at the Data Link harness connector (cavs 7 and 12). Is the resistance below 5.0 ohms? Yes → Repair the short between the PCM SCI Transmit and the PCM SCI Receive circuits. Perform POWERTRAIN VERIFICATION TEST VER - 1. No → Go To 5	All
5	Turn the ignition off. Disconnect the PCM harness connectors. Disconnect the DRBIII® from the DLC. Measure the resistance between ground and the PCM SCI Transmit circuit at the Data Link harness connector (cav 7). Is the resistance below 5.0 ohms? Yes → Repair the PCM SCI Transmit circuit for a short to ground. Perform POWERTRAIN VERIFICATION TEST VER - 1. No → Go To 6	All
6	Turn the ignition off. Disconnect the PCM harness connector. Disconnect the DRBIII® from the DLC. Measure the resistance between ground and the PCM SCI Receive circuit in the Data Link harness connector (cav 12). Is the resistance below 5.0 ohms? Yes → Repair the PCM SCI Receive circuit for a short to ground. Perform POWERTRAIN VERIFICATION TEST VER - 1. No → Go To 7	All
7	Turn the ignition off. Disconnect the PCM harness connector. Disconnect the DRBIII® from the DLC. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the PCM SCI Receive circuit from the Data Link harness connector (cav 12) to the appropriate terminal of special tool #8815. Is the resistance below 5.0 ohms? Yes → Go To 8 No → Repair the PCM SCI Receive circuit for an open. Perform POWERTRAIN VERIFICATION TEST VER - 1.	All

*NO RESPONSE FROM PCM (PCM SCI ONLY) - NGC — Continued

TEST	ACTION	APPLICABILITY
8	Turn the ignition off. Disconnect the PCM harness connector. Disconnect the DRBIII® from the DLC. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the PCM SCI Transmit circuit from the Data Link harness connector (cav 7) to the appropriate terminal of special tool #8815. Is the resistance below 5.0 ohms? Yes → Go To 9 No → Repair the PCM SCI Transmit circuit for an open. Perform POWERTRAIN VERIFICATION TEST VER - 1.	All
9	If there are no possible causes remaining, view repair. Repair Replace and program the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 1.	All

Symptom:
*NO RESPONSE FROM SENTRY KEY IMMOBILIZER MODULE

POSSIBLE CAUSES
ATTEMPT TO COMMUNICATE WITH THE MIC
GROUND CIRCUIT OPEN
FUSED IGNITION SWITCH OUTPUT CIRCUIT OPEN
FUSED B(+) CIRCUIT OPEN
OPEN PCI BUS CIRCUIT
SENTRY KEY IMMOBILIZER MODULE

TEST	ACTION	APPLICABILITY
1	Turn the ignition on. With the DRB, enter Body then Electro/Mech Cluster (MIC). Was the DRB able to I/D or communicate with the MIC? Yes → Go To 2 No → Refer to the symptom list for problems related to no communication with the MIC. Perform SKIS VERIFICATION.	All
2	Turn the ignition off. Disconnect the SKIM harness connector. Measure the resistance between ground and the ground circuit. Is the resistance below 5.0 ohms? Yes → Go To 3 No → Repair the ground circuit for an open. Perform SKIS VERIFICATION.	All
3	Turn the ignition off. Disconnect the SKIM harness connector. Turn the ignition on. Using a 12-volt test light connected to ground, probe the Fused Ignition Switch Output circuit. Is the test light illuminated? Yes → Go To 4 No → Repair the Fused Ignition Switch Output circuit for an open. Perform SKIS VERIFICATION.	All
4	Turn the ignition off. Disconnect the SKIM harness connector. Using a 12-volt test light connected to ground, probe the Fused B(+) circuit. Is the test light illuminated? Yes → Go To 5 No → Repair the Fused B+ circuit for an open. Perform SKIS VERIFICATION.	All

*NO RESPONSE FROM SENTRY KEY IMMOBILIZER MODULE — Continued

TEST	ACTION	APPLICABILITY
5	**Note: Ensure there is PCI Bus communication with other modules on the vehicle before proceeding. If not, refer to the symptom list from the menu and repair as necessary.** Disconnect the SKIM harness connector. Use Scope input cable CH7058, Cable to Probe adapter CH7062, and the red and black test probes. Connect the scope input cable to the channel one connector on the DRB. Attach the red and black leads and the cable to probe adapter to the scope input cable. With the DRBIII® select Pep Module Tools. Select lab scope. Select Live Data. Select 12 volt square wave. Press F2 for Scope. Press F2 and use the down arrow to set voltage range to 20 volts. Press F2 again when complete. Connect the Black lead to the chassis ground. Connect the Red lead to the PCI Bus circuit in the SKIM connector. Turn the ignition on. Observe the voltage display on the DRB Lab Scope. Does the voltage pulse from 0 to approximately 7.5 volts? Yes → Go To 6 No → Repair the PCI Bus circuit for an open. Perform SKIS VERIFICATION.	All
6	If there are no possible causes remaining, view repair. Repair Replace and program the Sentry Key Immobilizer Module in accordance with the Service Information. Perform SKIS VERIFICATION.	All

Symptom:
*NO RESPONSE FROM TRANSMISSION CONTROL MODULE - NGC

POSSIBLE CAUSES
NO RESPONSE FROM TRANSMISSION CONTROL MODULE
FUSED IGNITION SWITCH OUTPUT CIRCUIT OPEN
FUSED B(+) CIRCUIT OPEN
GROUND CIRCUIT(S) OPEN
PCI BUS CIRCUIT OPEN
POWERTRAIN CONTROL MODULE

TEST	ACTION	APPLICABILITY
1	Turn the ignition on. **Note: As soon as one or more module communicates with the DRB, answer the question.** With the DRB, attempt to communicate with the Instrument Cluster. With the DRB, attempt to communicate with the Airbag Control Module. Was the DRB able to I/D or establish communications with both of the modules? Yes → Go To 2 No → Refer to the Communications category and perform the appropriate symptom. Perform 40/41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1.	All
2	Turn the ignition off. Disconnect the PCM harness connectors. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Turn the ignition on. Using a 12-volt test light connected to ground, probe both Fused Ignition Switch Output circuits (cavs 11 and 12) in the appropriate terminal of special tool #8815. **NOTE: The test light must illuminate brightly. Compare the brightness to that of a direct connection to the battery.** Is the test light illuminated for both circuits? Yes → Go To 3 No → Repair the Fused Ignition Switch Output circuit for an open. Refer to the wiring diagrams located in the Service Information. Perform 40/41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1.	All

*NO RESPONSE FROM TRANSMISSION CONTROL MODULE - NGC — Continued

TEST	ACTION	APPLICABILITY
3	Turn the ignition off. Disconnect the PCM harness connectors. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Using a 12-volt test light connected to ground, probe the Fused B(+) circuit in the appropriate terminal of special tool #8815. **NOTE: The test light must illuminate brightly. Compare the brightness to that of a direct connection to the battery.** Is the test light illuminated? Yes → Go To 4 No → Repair the Fused B(+) circuit for an open. Refer to the wiring diagrams located in the Service Information. Perform 40/41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1.	All
4	Turn the ignition off. Disconnect the PCM harness connectors. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Using a 12-volt test light connected to 12-volts, probe each ground circuit in the appropriate terminal of special tool #8815. **NOTE: The test light must illuminate brightly. Compare the brightness to that of a direct connection to the battery.** Is the light illuminated at all ground circuits? Yes → Go To 5 No → Repair the Ground circuit(s) for an open. Check the main ground connection to engine block and/or chassis. Refer to the wiring diagrams located in the Service Information. Perform 40/41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1.	All

*NO RESPONSE FROM TRANSMISSION CONTROL MODULE - NGC — Continued

TEST	ACTION	APPLICABILITY
5	**Note: Ensure there is PCI Bus communication with other modules on the vehicle before proceeding. If not, refer to the symptom list from the menu and repair as necessary.** Disconnect the PCM harness connectors. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Use Scope input cable CH7058, Cable to Probe adapter CH7062, and the red and black test probes. Connect the scope input cable to the channel one connector on the DRB. Attach the red and black leads and the cable to probe adapter to the scope input cable. With the DRBIII® select Pep Module Tools. Select lab scope. Select Live Data. Select 12 volt square wave. Press F2 for Scope. Press F2 and use the down arrow to set voltage range to 20 volts. Press F2 again when complete. Connect the Black lead to the chassis ground. Connect the Red lead to the PCI Bus circuit in the appropriate terminal of special tool #8815. Turn the ignition on. Observe the voltage display on the DRB Lab Scope. Does the voltage pulse from 0 to approximately 7.5 volts? Yes → Go To 6 No → Repair the PCI Bus circuit for an open. Perform 40/41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1.	All
6	Using the schematics as a guide, inspect the wiring and connectors. Repair as necessary. Pay particular attention to all power and ground circuits. If there are no possible causes remaining, view repair. Repair Replace and program the Powertrain Control Module in accordance with the service information. WITH THE DRBIII® PERFORM QUICK LEARN AND REPROGRAM PINION FACTOR. Perform 40/41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1.	All

Symptom:
*PCI BUS COMMUNICATION FAILURE

POSSIBLE CAUSES
WIRING HARNESS INTERMITTENT
OPEN PCI BUS CIRCUIT AT THE DATA LINK CONNECTOR (DLC)
PCI BUS CIRCUIT SHORTED TO VOLTAGE
MODULE SHORT TO VOLTAGE
PCI BUS CIRCUIT SHORTED TO GROUND
MODULE SHORT TO GROUND

TEST	ACTION	APPLICABILITY
1	**Note: Determine which modules this vehicle is equipped with before beginning.** **Note: When attempting to communicate with any of the modules on this vehicle, the DRB will display 1 of 2 different communication errors: a NO RESPONSE message or a BUS +/- SIGNALS OPEN message.** Turn the ignition on. Using the DRB, attempt to communicate with the following control modules: Airbag Control Module SKIM (SENTRY KEY IMMOBILIZER) MIC (INSTRUMENT CLUSTER) Was the DRBIII® able to communicate with one or more Module(s)? Yes → Go To 2 No → Go To 3	All
2	Turn the ignition off. **Note: Visually inspect the related wiring harness. Look for any chafed, pierced, pinched, or partially broken wires.** **Note: Visually inspect the related wire harness connectors. Look for broken, bent, pushed out, or corroded terminals.** **Note: If the DRB can not communicate with a single module, refer to the category list for the related symptom.** Were any problems found? Yes → Repair wiring harness/connectors as necessary. Perform BODY VERIFICATION TEST - VER 1. No → Test Complete.	All

*PCI BUS COMMUNICATION FAILURE — Continued

TEST	ACTION	APPLICABILITY
3	Turn the ignition off. Disconnect the PCM harness connector. Note: If equipped with NGC follow the caution below. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Disconnect the DRB from the Data Link Connector (DLC). Disconnect the negative battery cable. Measure the resistance of the PCI Bus circuit between the Data Link Connector (DLC) and the PCM harness connector. Is the resistance below 5.0 ohms? Yes → Go To 4 No → Repair the PCI Bus circuit for an open. Perform BODY VERIFICATION TEST - VER 1.	All
4	**NOTE: Reconnect the PCM harness connector and the negative battery cable.** Turn the ignition on. Measure the voltage of the PCI Bus circuit at the Data Link Connector (DLC). Is the voltage above 7.0 volts? Yes → Go To 5 No → Go To 6	All
5	Turn the ignition off. Using a voltmeter, connect one end to the PCI Bus circuit at the DLC, and the other end to ground. **Note: When performing the next step turn the ignition off (wait one minute) before disconnecting any module. When the module is disconnected turn the ignition on to check for a short to voltage.** Turn the ignition on. While monitoring the voltmeter, disconnect each module the vehicle is equipped with one at a time. Is the voltage steadily above 7.0 volts with all the modules disconnected? Yes → Repair the PCI Bus circuit for a short to voltage. Perform BODY VERIFICATION TEST - VER 1. No → Replace the module that when disconnected the short to voltage was eliminated. Perform BODY VERIFICATION TEST - VER 1.	All

*PCI BUS COMMUNICATION FAILURE — Continued

TEST	ACTION	APPLICABILITY
6	Turn the ignition off. Disconnect the negative battery cable. Using a ohmmeter, connect one end to the PCI Bus circuit at the DLC, and the other end to ground. While monitoring the ohmmeter, disconnect each module the vehicle is equipped with one at a time. **NOTE: Total bus resistance to ground thru all of the modules is typically between 350 to 1000 ohms. The more modules on the bus, the lower the total bus resistance will be.** Is the resistance below 150.0 ohms with all the modules disconnected? Yes → Repair the PCI Bus circuit for a short to ground. Perform BODY VERIFICATION TEST - VER 1. No → Replace the module that when disconnected the short to ground was eliminated. Perform BODY VERIFICATION TEST - VER 1.	All

Symptom:
INTERMITTENT CONDITION

POSSIBLE CAUSES
INTERMITTENT CONDITION

TEST	ACTION	APPLICABILITY
1	**NOTE: The conditions that set the DTC are not present at this time. The following list may help in identifying the intermittent condition.** **WARNING: WHEN THE ENGINE IS OPERATING, DO NOT STAND IN A DIRECT LINE WITH THE FAN. DO NOT PUT YOUR HANDS NEAR THE PULLEYS, BELTS OR FAN. DO NOT WEAR LOOSE CLOTHING.** Refer to any Technical Service Bulletins (TSBs) that may apply. Review the DRB Freeze Frame information. If possible, try to duplicate the conditions under which the DTC set. With the engine running at normal operating temperature, monitor the DRB parameters related to the DTC while wiggling the wire harness. Look for parameter values to change and/or a DTC to set. Visually inspect the related wire harness. Look for any chafed, pierced, pinched, partially broken wires and broken, bent, pushed out, or corroded terminals. **CAUTION: NEVER PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Inspect and clean all PCM, engine, and chassis grounds. If numerous trouble codes were set, use a wire schematic to help you find any common ground or supply circuits. For any Relay DTCs, actuate the Relay with the DRBIII® and wiggle the related wire harness to try to interrupt the actuation. For intermittent Evaporative Emission trouble codes perform a visual and physical inspection of the related parts including hoses and the Fuel cap. A co-pilot, data recording, and/or lab scope should be used to help diagnose intermittent conditions. Use the DRBIII® to perform a System Test if one applies to failing component. Were any problems found during the above inspections? Yes → Repair as necessary No → Test Complete.	All

Symptom:
P0016-CRANKSHAFT/CAMSHAFT TIMING MISALIGNMENT

When Monitored and Set Condition:

P0016-CRANKSHAFT/CAMSHAFT TIMING MISALIGNMENT

When Monitored: Engine cranking and Engine running

Set Condition: Powertrain Control Module detects an error when the camshaft position is out of phase with the crankshaft position. One trip fault.

POSSIBLE CAUSES
INTERMITTENT CONDITION
CHECKING INTERMITTENT CMP SIGNAL WITH LAB
CMP WIRE HARNESS INSPECTION
TONE WHEEL/PULSE RING INSPECTION
CKP WIRE HARNESS INSPECTION
TONE WHEEL/PULSE RING INSPECTION
INTERMITTENT CKP SIGNAL
CAMSHAFT POSITION SENSOR
CRANKSHAFT POSITION SENSOR

TEST	ACTION	APPLICABILITY
1	**WARNING: WHEN THE ENGINE IS OPERATING, DO NOT STAND IN A DIRECT LINE WITH THE FAN. DO NOT PUT YOUR HANDS NEAR THE PULLEYS, BELTS OR FAN. DO NOT WEAR LOOSE CLOTHING.** Ignition on, engine not running. With the DRBIII®, read DTCs and record the related Freeze Frame data. With the DRBIII®, erase DTCs. Start the engine and run until operating temp is reached. (Closed Loop) If the DTC does not reset it may be necessary to take the vehicle on a test drive. Does the DTC reset? Yes → Go To 2 No → Refer to the INTERMITTENT CONDITION symptom in the Driveability category. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

P0016-CRANKSHAFT/CAMSHAFT TIMING MISALIGNMENT — Continued

TEST	ACTION	APPLICABILITY
2	Turn the ignition off. With the DRBIII® lab scope probe and the Miller special tool #6801, backprobe the (K44) CMP Signal circuit at the CMP harness connector. **WARNING: WHEN THE ENGINE IS OPERATING, DO NOT STAND IN A DIRECT LINE WITH THE FAN. DO NOT PUT YOUR HANDS NEAR THE PULLEYS, BELTS OR FAN. DO NOT WEAR LOOSE CLOTHING.** Start the engine. Observe the lab scope screen. Are there any irregular or missing signals? Yes → Go To 3 No → Go To 6	All
3	Visually inspect the related wire harness. Look for any chafed, pierced, pinched, or partially broken wires. Visually inspect the related wire harness connectors. Look for broken, bent, pushed out, or corroded terminals. Ensure the Crankshaft Position Sensor and the Camshaft Position Sensor are properly installed and the mounting bolt(s) tight. Refer to any TSBs that may apply. Were any of the above conditions present? Yes → Repair as necessary Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 4	All
4	Turn the ignition off. Remove the Camshaft Position Sensor. Inspect the Tone Wheel/Pulse Ring for damage, foreign material, or excessive movement. Were any problems found? Yes → Repair or replace the Tone Wheel/Pulse Ring as necessary. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 5	All
5	If there are no possible causes remaining, view repair. Repair Replace the Camshaft Position Sensor. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
6	**WARNING: WHEN THE ENGINE IS OPERATING, DO NOT STAND IN A DIRECT LINE WITH THE FAN. DO NOT PUT YOUR HANDS NEAR THE PULLEYS, BELTS OR FAN. DO NOT WEAR LOOSE CLOTHING.** Start the engine. Gently tap on the Cam Position Sensor and wiggle the Sensor. Ignition on, engine not running. Inspect the Sensor harness connector, PCM harness connector, Sensor connector, and PCM connector for loose, bent, corroded, or pushed out pins/terminals. Inspect the related wire harness and the splices in the (K44) CMP circuits. Did the DTC reset? Yes → Repair the wiring/connector concerns as needed or replace the Camshaft Position Sensor. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 7	All

P0016-CRANKSHAFT/CAMSHAFT TIMING MISALIGNMENT — Continued

TEST	ACTION	APPLICABILITY
7	Turn the ignition off. With the DRBIII® lab scope probe and the Miller special tool #6801, backprobe the (K24) CKP Signal circuit at the CKP harness connector. **WARNING: WHEN THE ENGINE IS OPERATING, DO NOT STAND IN A DIRECT LINE WITH THE FAN. DO NOT PUT YOUR HANDS NEAR THE PULLEYS, BELTS OR FAN. DO NOT WEAR LOOSE CLOTHING.** Start the engine. Observe the lab scope screen. Are there any irregular or missing signals? Yes → Go To 8 No → Go To 11	All
8	Visually inspect the related wire harness. Look for any chafed, pierced, pinched, or partially broken wires. Visually inspect the related wire harness connectors. Look for broken, bent, pushed out, or corroded terminals. Ensure the Crankshaft Position Sensor and the Camshaft Position Sensor are properly installed and the mounting bolt(s) tight. Refer to any TSBs that may apply. Were any of the above conditions present? Yes → Repair as necessary Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 9	All
9	Turn the ignition off. Remove the Crankshaft Position Sensor. Inspect the Tone Wheel/Flex Plate slots for damage, foreign material, or excessive movement. Were any problems found? Yes → Repair or replace the Tone Wheel/Flex Plate as necessary. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 10	All
10	If there are no possible causes remaining, view repair. Repair Replace the Crankshaft Position Sensor. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

P0016-CRANKSHAFT/CAMSHAFT TIMING MISALIGNMENT — Continued

TEST	ACTION	APPLICABILITY
11	**NOTE: The conditions that set this DTC are not present at this time. The following test may help in identifying the intermittent condition.** **WARNING: WHEN THE ENGINE IS OPERATING, DO NOT STAND IN A DIRECT LINE WITH THE FAN. DO NOT PUT YOUR HANDS NEAR THE PULLEYS, BELTS OR FAN. DO NOT WEAR LOOSE CLOTHING.** Start the engine. Gently tap on the Crank Position Sensor and wiggle the CKP Sensor. Turn the ignition off. Inspect the Sensor harness connector, PCM harness connector, Sensor connector, and PCM connector for loose, bent, corroded, or pushed out pins/terminals. Inspect the related wire harness and the splices in the (K24) CKP circuits. Were any problems found? Yes → Repair the wiring/connector concerns as needed or replace the Crankshaft Position Sensor. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Test Complete.	All

Symptom List:
P0031-O2 SENSOR 1/1 HEATER CIRCUIT LOW
P0037-O2 SENSOR 1/2 HEATER CIRCUIT LOW

Test Note: All symptoms listed above are diagnosed using the same tests. The title for the tests will be P0031-O2 SENSOR 1/1 HEATER CIRCUIT LOW.

When Monitored and Set Condition:

P0031-O2 SENSOR 1/1 HEATER CIRCUIT LOW

When Monitored: Battery voltage above 10.6 volts, ASD is powered up, and O2 heater is on.

Set Condition: Desired state does not match Actual state.

P0037-O2 SENSOR 1/2 HEATER CIRCUIT LOW

When Monitored: Battery voltage above 10.6 volts, ASD is powered up, and O2 heater is on.

Set Condition: Desired state does not match Actual state.

POSSIBLE CAUSES
O2 SENSOR HEATER OPERATION
O2 HEATER ELEMENT
O2 HEATER CONTROL CIRCUIT
O2 HEATER CONTROL SHORTED TO GROUND
PCM

TEST	ACTION	APPLICABILITY
1	Ignition on, engine not running. With the DRBIII®, read DTCs and record the related Freeze Frame data. Is the Good Trip Counter displayed and equal to zero? Yes → Go To 3 No → Go To 2	All

P0031-O2 SENSOR 1/1 HEATER CIRCUIT LOW — Continued

TEST	ACTION	APPLICABILITY
2	Turn the ignition off. **NOTE: Allow the O2 Sensor to cool down before continuing the test. The O2 Sensor voltage should stabilize at 5.0 volts. Raising the hood may help in reducing under hood temps quicker.** Ignition on, engine not running. With the DRBIII®, actuate the O2 Heater Test. With the DRBIII®, monitor O2 Sensor voltage for at least 2 minutes. Does the O2 Sensor voltage stay above 4.5 volts? Yes → Go To 3 No → Refer to the INTERMITTENT CONDITION symptom in the Driveability category. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
3	Turn the ignition off. **NOTE: Allow the O2 sensor to cool down to room temperature.** Disconnect the O2 Sensor harness connector. Measure the resistance across the O2 Sensor Heater element component side. **NOTE: Heater Resistance Specification: 1/1 and 2/1 = 3.0 to 4.0 ohms or 1/2 and 2/2 = 4.0 to 5.0 ohms.** Is the O2 Sensor Heater element within specification? Yes → Go To 4 No → Replace the O2 Sensor. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
4	Turn the ignition off. Disconnect the O2 Sensor harness connector. Ignition on, engine not running. With the DRBIII®, actuate the O2 Heater Test. Using a 12-volt test light connected to ground, probe the O2 Heater Control circuit in the O2 Sensor harness connector. Does the test illuminate brightly and flash on and off? Yes → Replace the O2 Sensor. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 5	All
5	Turn the ignition off. Disconnect the O2 Sensor harness connector. Disconnect the PCM harness connector. Measure the resistance between ground and the O2 Heater Control circuit in the O2 Sensor harness connector. Is the resistance below 5.0 ohms? Yes → Repair the short to ground in the O2 Sensor Heater Control circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → NOTE: Before continuing, check the PCM harness connector terminals for corrosion, damage, or terminal push out. Repair as necessary. Replace and program the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

Symptom List:
P0032-O2 SENSOR 1/1 HEATER CIRCUIT HIGH
P0038-O2 SENSOR 1/2 HEATER CIRCUIT HIGH

Test Note: All symptoms listed above are diagnosed using the same tests. The title for the tests will be P0032-O2 SENSOR 1/1 HEATER CIRCUIT HIGH.

When Monitored and Set Condition:

P0032-O2 SENSOR 1/1 HEATER CIRCUIT HIGH

When Monitored: Battery voltage above 10.6 volts, ASD is powered up, and O2 heater is off.

Set Condition: The O2 heater voltage is out of range high. One trip fault.

P0038-O2 SENSOR 1/2 HEATER CIRCUIT HIGH

When Monitored: Battery voltage above 10.6 volts, ASD is powered up, and O2 heater is off.

Set Condition: The O2 heater voltage is out of range high. One trip fault.

POSSIBLE CAUSES
O2 SENSOR HEATER OPERATION
O2 HEATER ELEMENT
O2 HEATER GROUND CIRCUIT OPEN
O2 SENSOR
O2 HEATER CONTROL SHORTED TO VOLTAGE
O2 HEATER CONTROL CIRCUIT OPEN
PCM

TEST	ACTION	APPLICABILITY
1	Ignition on, engine not running. With the DRBIII®, read DTCs and record the related Freeze Frame data. Is the Good Trip Counter displayed and equal to zero? Yes → Go To 3 No → Go To 2	All

P0032-O2 SENSOR 1/1 HEATER CIRCUIT HIGH — Continued

TEST	ACTION	APPLICABILITY
2	Turn the ignition off. **NOTE: Allow the O2 Sensor to cool down before continuing the test. The O2 Sensor voltage should stabilize at 5.0 volts. Raising the hood may help in reducing under hood temps quicker.** Ignition on, engine not running. With the DRBIII®, actuate the O2 Heater Test. With the DRBIII®, monitor O2 Sensor voltage for at least 2 minutes. Does the O2 Sensor voltage stay above 4.5 volts? Yes → Go To 3 No → Refer to the INTERMITTENT CONDITION symptom in the Driveability category. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
3	Turn the ignition off. **NOTE: Allow the O2 sensor to cool down to room temperature.** Disconnect the O2 Sensor harness connector. Measure the resistance across the O2 Sensor Heater element component side. **NOTE: Heater Resistance Specification: 1/1 and 2/1 = 3.0 to 4.0 ohms or 1/2 and 2/2 = 4.0 to 5.0 ohms.** Is the O2 Sensor Heater element within specification? Yes → Go To 4 No → Replace the O2 Sensor. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
4	Turn the ignition off. Disconnect the O2 Sensor harness connector. Ignition on, engine not running. With the DRBIII®, actuate the O2 Heater Test. Using a 12-volt test light connected to ground, probe the O2 Heater Control circuit in the O2 Sensor harness connector. Does the test illuminate brightly and flash on and off? Yes → Go To 5 No → Go To 6	All
5	Turn the ignition off. Disconnect the O2 Sensor harness connector. Measure the resistance between engine ground and the O2 Heater ground circuit in the O2 Sensor harness connector. Is the resistance below 5.0 ohms? Yes → Replace the O2 Sensor. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Repair the open in the O2 Heater ground circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

P0032-O2 SENSOR 1/1 HEATER CIRCUIT HIGH — Continued

TEST	ACTION	APPLICABILITY
6	Turn the ignition off. Disconnect the O2 Sensor harness connector. Disconnect the PCM harness connector. Ignition on, engine not running. Measure the voltage on the O2 Heater Control circuit at the O2 Sensor harness connector. Does the voltmeter indicate any voltage present? Yes → Repair the short to voltage in the O2 Heater Control circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 7	All
7	Turn the ignition off. Disconnect the O2 Sensor harness connector. Disconnect the PCM harness connector. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the O2 Heater Control circuit from the O2 Sensor harness connector to the appropriate terminal of special tool #8815 Is the resistance below 5.0 ohms? Yes → NOTE: Before continuing, check the PCM harness connector terminals for corrosion, damage, or terminal push out. Repair as necessary. Replace and program the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Repair the open in the O2 Heater Control circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

Symptom:
P0033-SURGE VALVE SOLENOID CIRCUIT

When Monitored and Set Condition:

P0033-SURGE VALVE SOLENOID CIRCUIT

When Monitored: Ignition on or engine running. Battery voltage greater than 10 volts.

Set Condition: The PCM will set the DTC if the actual state of the solenoid does not match the intended state.

POSSIBLE CAUSES
GOOD TRIP EQUAL TO ZERO
SURGE VALVE SOLENOID OPERATION
(A142) ASD RELAY OUTPUT CIRCUIT
(K150) SURGE SOL CONTROL CIRCUIT SHORTED TO BATTERY VOLTAGE
(K150) SURGE SOL CONTROL CIRCUIT OPEN
(K150) SURGE SOL CONTROL CIRCUIT SHORTED TO GROUND
PCM

TEST	ACTION	APPLICABILITY
1	Ignition on, engine not running. With the DRBIII®, read PCM DTCs and record the related Freeze Frame data. Is the Good Trip displayed and equal to zero? Yes → Go To 2 No → Refer to the INTERMITTENT CONDITION symptom in the Driveability category. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
2	Turn the ignition off. Disconnect the Surge Valve Solenoid harness connector. Using a 12-volt test light, jumper across the Surge Valve harness connector. **NOTE: While actuating the solenoid wiggle the related wiring harness.** Turn the ignition on. With the DRBIII®, actuate the Surge Valve Solenoid. Does the test light illuminate brightly and flash on and off? Yes → Replace the Surge Valve Solenoid. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 3	All

P0033-SURGE VALVE SOLENOID CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
3	Turn the ignition off. Disconnect the Surge Valve Solenoid harness connector. Using a 12-volt test light connected to ground, probe the (A142) ASD Relay Output circuit in the harness connector. Turn the ignition on. With the DRBIII®, actuate the ASD Relay. Does the test light illuminate brightly and flash on and off? Yes → Go To 4 No → Repair the (A142) ASD Relay Output circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
4	Turn the ignition off. Disconnect the Surge Valve Solenoid harness connector. Disconnect the PCM harness connectors. Turn the ignition on. Measure the voltage of the (K150) Surge Sol Control circuit in the Surge Valve Solenoid harness connector. Does the voltmeter indicate any voltage present? Yes → Repair the short to voltage in the (K150) Surge Sol Control circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 5	All
5	Turn the ignition off. Disconnect the Surge Valve Solenoid harness connector. Disconnect the PCM harness connectors. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the (K150) Surge Sol Control circuit from the Surge Valve Solenoid harness connector to the appropriate terminal of special tool #8815. Is the resistance below 5.0 ohms? Yes → Go To 6 No → Repair the open in the (K150) Surge Sol Control circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
6	Turn the ignition off. Disconnect the Surge Valve Solenoid harness connector. Disconnect the PCM harness connectors. Measure the resistance between ground and the (K150) Surge Sol Control circuit at the Surge Valve Solenoid harness connector. Is the resistance below 100 ohms? Yes → Repair the short to ground in the (K150) Surge Sol Control circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 7	All
7	**NOTE: Before continuing, check the PCM harness connector terminals for corrosion, damage, or terminal push out. Repair as necessary.** If there are no possible causes remaining, view repair. Repair Replace and program the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

Symptom:
P0068-MANIFOLD PRESSURE/THROTTLE POSITION CORRELATION

When Monitored and Set Condition:

P0068-MANIFOLD PRESSURE/THROTTLE POSITION CORRELATION

When Monitored: With the engine running and no MAP Sensor or TP Sensor DTC's set.

Set Condition: The PCM determines a valid range in which the TP Sensor should be, at a given RPM/Load. The actual TP Sensor voltage is then compared to this value. If the TP Sensor voltage does not fall within the expected range within a predetermined time an error will be detected. Two Trip Fault.

POSSIBLE CAUSES
GOOD TRIP EQUAL TO ZERO
HIGH RESISTANCE IN MAP (K7) 5 VOLT SUPPLY CIRCUIT
RESISTANCE TO GROUND IN MAP (K7) 5 VOLT SUPPLY CIRCUIT
MAP SENSOR
HIGH RESISTANCE IN (K1) MAP SIGNAL CIRCUIT
RESISTANCE TO GROUND IN (K1) MAP SIGNAL CIRCUIT
HIGH RESISTANCE IN (K4) MAP GROUND CIRCUIT
PCM
TP SENSOR OPERATION
HIGH RESISTANCE IN TP SENSOR (K6) 5 VOLT SUPPLY CIRCUIT
RESISTANCE TO GROUND IN TP SENSOR (K6) 5 VOLT SUPPLY CIRCUIT
TP SENSOR
HIGH RESISTANCE IN (K22) TP SIGNAL CIRCUIT
RESISTANCE TO GROUND IN (K22) TP SENSOR SIGNAL CIRCUIT
HIGH RESISTANCE IN TP (K167) SENSOR GROUND CIRCUIT
PCM

P0068-MANIFOLD PRESSURE/THROTTLE POSITION CORRELATION — Continued

TEST	ACTION	APPLICABILITY
1	**NOTE: Diagnose any TP Sensor or MAP Sensor component DTCs before continuing.** **NOTE: The throttle plate and linkage must be free from binding and carbon build up, ensure the throttle plate is at the idle position.** Ignition on, engine not running. With the DRBIII®, read DTCs and record the related Freeze Frame data. Is the Good Trip Counter displayed and equal to zero? Yes → Go To 2 No → Refer to the INTERMITTENT CONDITION symptom in the Driveability category. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
2	Start the engine. With the DRBIII®, monitor the MAP Sensor voltage. Snap the throttle. Does the MAP Sensor voltage vary from below 2.0 volts at idle to above 3.5 volts at WOT? Yes → Go To 3 No → Go To 11	All
3	Ignition on, engine not running. With the DRBIII®, monitor the TP Sensor voltage while slowly depressing the throttle pedal from the idle position to the wide open throttle position. Does the voltage start approximately at 0.8 volts and go above 3.5 volts with a smooth transition? Yes → Refer to the INTERMITTENT CONDITION symptom in the Driveability category. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 4	All
4	Turn the ignition off. Disconnect the TP Sensor harness connector. Disconnect the PCM harness connector. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the (K6) 5 Volt Supply circuit from the TP Sensor harness connector to the appropriate terminal of special tool #8815. Is the resistance below 5.0 ohms? Yes → Go To 5 No → Repair the TP Sensor (K6) 5 Volt Supply circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

P0068-MANIFOLD PRESSURE/THROTTLE POSITION CORRELATION — Continued

TEST	ACTION	APPLICABILITY
5	Turn the ignition off. Disconnect the TP Sensor harness connector. Disconnect the PCM harness connector. Measure the resistance between ground and the (K6) 5 Volt Supply circuit at the TP Sensor harness connector. Is the resistance above 100k ohms? Yes → Go To 6 No → Repair the (K6) 5 Volt Supply circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
6	Turn the ignition off. Disconnect the TP Sensor harness connector. With the DRBIII®, monitor the TP Sensor voltage. Ignition on, engine not running. Connect a jumper wire between the (K22) TP Signal circuit and the (K4) Sensor ground circuit . Does the TP Sensor voltage change from approximately 4.9 volts to below 0.5 of a volt? Yes → Replace the Throttle Position Sensor. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 7	All
7	Turn the ignition off. Disconnect the TP Sensor harness connector. Disconnect the PCM harness connector. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the (K22) TP Signal circuit from the TP Sensor harness connector to the appropriate terminal of special tool #8815. Is the resistance below 5.0 ohms? Yes → Go To 8 No → Repair the (K22) TP Signal circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
8	Turn the ignition off. Disconnect the TP Sensor harness connector. Disconnect the PCM harness connector. Measure the resistance between ground and the (K22) TP Signal circuit in the TP Sensor harness connector. Is the resistance above 100k ohms? Yes → Go To 9 No → Repair the (K22) TP Sensor Signal circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

P0068-MANIFOLD PRESSURE/THROTTLE POSITION CORRELATION — Continued

TEST	ACTION	APPLICABILITY
9	Turn the ignition off. Disconnect the TP Sensor harness connector. Disconnect the PCM harness connector. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the (K4) Sensor ground circuit from the TP Sensor harness connector to the appropriate terminal of special tool #8815. Is the resistance below 5.0 ohms? Yes → Go To 10 No → Repair the (K167) Sensor Ground circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
10	**NOTE: Before continuing, check the PCM harness connector terminals for corrosion, damage, or terminal push out. Repair as necessary.** If there are no possible causes remaining, view repair. Repair Replace and program the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
11	Turn the ignition off. Disconnect the MAP Sensor harness connector. Disconnect the PCM harness connector. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the (K7) 5 Volt Supply circuit from the MAP Sensor harness connector to the appropriate terminal of special tool #8815. Is the resistance below 5.0 ohms? Yes → Go To 12 No → Repair the MAP (K7) 5 Volt Supply circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
12	Turn the ignition off. Disconnect the MAP Sensor harness connector. Disconnect the PCM harness connector. Measure the resistance between ground and the (K7) 5 Volt Supply circuit at the MAP Sensor harness connector. Is the resistance above 100k ohms? Yes → Go To 13 No → Repair the short to ground in the (K7) 5 Volt Supply circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

P0068-MANIFOLD PRESSURE/THROTTLE POSITION CORRELATION — Continued

TEST	ACTION	APPLICABILITY
13	Turn the ignition off. Disconnect the MAP Sensor harness connector. With the DRBIII®, monitor the MAP Sensor voltage. Ignition on, engine not running. Connect a jumper wire between the (K1) MAP Sensor Signal circuit and the (K4) Sensor ground circuit . Cycle the ignition switch from off to on. With the DRBIII®, monitor the MAP Sensor voltage. Does the DRBIII® display MAP voltage from approximately 4.9 volts to below 0.5 volt? Yes → Replace the MAP Sensor. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 14	All
14	Turn the ignition off. Disconnect the MAP Sensor harness connector. Disconnect the PCM harness connector. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the (K1) MAP Signal circuit from the MAP Sensor harness connector to the appropriate terminal of special tool #8815. Is the resistance below 5.0 ohms? Yes → Go To 15 No → Repair the (K1) MAP Signal circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
15	Turn the ignition off. Disconnect the MAP Sensor harness connector. Disconnect the PCM harness connector. Measure the resistance between ground and the (K1) MAP Signal circuit at the MAP Sensor harness connector. Is the resistance above 100k ohms? Yes → Go To 16 No → Repair the (K1) MAP Signal circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
16	Turn the ignition off. Disconnect the MAP Sensor harness connector. Disconnect the PCM harness connector. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the (K4) Sensor ground circuit from the MAP Sensor harness connector to the appropriate terminal of special tool #8815. Is the resistance below 5.0 ohms? Yes → Go To 17 No → Repair the (K4) Sensor Ground circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

P0068-MANIFOLD PRESSURE/THROTTLE POSITION CORRELATION — Continued

TEST	ACTION	APPLICABILITY
17	**NOTE: Before continuing, check the PCM harness connector terminals for corrosion, damage, or terminal push out. Repair as necessary.** If there are no possible causes remaining, view repair. Repair Replace and program the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

Symptom:
P0071-AMBIENT TEMP SENSOR PERFORMANCE

When Monitored and Set Condition:

P0071-AMBIENT TEMP SENSOR PERFORMANCE

When Monitored: Engine off time is greater than 480 minutes. Ambient temperature is greater than -23°C (-9°F).

Set Condition: After a calibrated amount of cool down time, the PCM compares the ECT Sensor, IAT Sensor and the Ambient Air Temperature Sensor values. If the Ambient Air Temperature Sensor value is not within 10°C (53°F) of the other two temperartue sensors an error is detected. Two Trip Fault.

POSSIBLE CAUSES
GOOD TRIP EQUAL TO ZERO
(K145) AAT SIGNAL CIRCUIT SHORTED TO BATTERY VOLTAGE
AMBIENT AIR TEMPERATURE SENSOR VOLTAGE BELOW 0.1 VOLT
(K145) AAT SIGNAL CIRCUIT OPEN
(K4) SENSOR GROUND CIRCUIT OPEN
(K145) AAT SIGNAL CIRCUIT SHORTED TO GROUND
(K145) AAT SIGNAL CIRCUIT SHORTED TO (K4) SENSOR GROUND
PCM LOW
PCM HIGH

TEST	ACTION	APPLICABILITY
1	**NOTE: After repairing this DTC, the AAT sensor value will not refresh until either the ignition is OFF for more than 5 hours or the vehicle has been driven at a speed greater than 20 MPH for more than 2 minutes.** Ignition on, engine not running. With the DRBIII®, read DTCs and record the related Freeze Frame data. Is the Good Trip Counter displayed and equal to zero? Yes → Go To 2 No → Refer to the INTERMITTENT CONDITION symptom in the Driveability category. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

P0071-AMBIENT TEMP SENSOR PERFORMANCE — Continued

TEST	ACTION	APPLICABILITY
2	**NOTE: Visually inspect both the component and the PCM connectors. Look for damage, partially broken wires and backed out or corroded terminals** Turn the ignition off. Disconnect the Ambient Air Temp Sensor harness connector. Ignition on, engine not running. Measure the voltage of the (K145) AAT Signal circuit in the Ambient Air Temperature Sensor harness connector. Is the voltage above 5.2 volts? Yes → Repair the short to battery voltage in the (K145) AAT Signal circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 3	All
3	Turn the ignition off. Disconnect the Ambient Air Temperature Sensor harness connector. Ignition on, engine not running. With the DRBIII®, read the Ambient Air Temperature Sensor voltage. Is the voltage above 4.9 volts? Yes → Go To 4 No → Go To 7	All
4	Turn the ignition off. Disconnect the Ambient Air Temperature Sensor harness connector. Using a jumper wire, jumper across the Ambient Air Temperature Sensor harness connector. Ignition on, engine not running. With the DRBIII®, read the Ambient Air Temperature voltage. Is the voltage below 0.1 volt? Yes → Replace the Ambient Air Temperature Sensor. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 5	All
5	Turn the ignition off. Disconnect the Ambient Air Temperature Sensor harness connector. Disconnect the PCM harness connector. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the (K145) AAT Signal circuit from the Ambient Air Temperature Sensor harness connector to the appropriate terminal of special tool #8815. Is the resistance below 5.0 ohms? Yes → Go To 6 No → Repair the open in the (K145) AAT Signal circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

P0071-AMBIENT TEMP SENSOR PERFORMANCE — Continued

TEST	ACTION	APPLICABILITY
6	Turn the ignition off. Disconnect the Ambient Air Temperature Sensor harness connector. Disconnect the PCM harness connector. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the (K167) Sensor ground circuit from the Ambient Air Temperature Sensor harness connector to the appropriate terminal of special tool #8815. Is the resistance below 5.0 ohms? Yes → NOTE: Before continuing, check the PCM harness connector terminals for corrosion, damage, or terminal push out. Repair as necessary. Replace and program the Powertrain Contorl Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Repair the open in the (K4) Sensor ground circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
7	Turn the ignition off. Disconnect the Ambient Air Temperature Sensor harness connector. Disconnect the PCM harness connector. Measure the resistance between ground and the (K145) AAT Signal circuit. Is the resistance below 100 ohms? Yes → Repair the short to ground in the (K145) AAT Signal circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 8	All
8	Turn the ignition off. Disconnect the Ambient Air Temperature Sensor harness connector. Disconnect the PCM harness connector. Measure the resistance between the (K145) AAT Signal circuit and the (K167) Sensor ground circuit in the Ambient Air Temperature Sensor harness connector. Is the resistance below 100 ohms? Yes → Repair the (K4) Sensor ground shorted to the (K145) AAT Signal circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → NOTE: Before continuing, check the PCM harness connector terminals for corrosion, damage or terminal push out. Repair as necessary. Replace and program the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

Symptom:
P0072-AMBIENT TEMP SENSOR LOW

When Monitored and Set Condition:

P0072-AMBIENT TEMP SENSOR LOW

When Monitored: The ignition key on.

Set Condition: Ambient Temperature Sensor is less than .04 of a volt at the PCM. One Trip Fault.

POSSIBLE CAUSES
AMBIENT AIR TEMPERATURE SENSOR VOLTAGE BELOW .04 VOLTS
AMBIENT AIR TEMPERATURE SENSOR INTERNAL FAILURE
(K145) AAT SIGNAL CIRCUIT SHORTED TO GROUND
(K145) AAT SIGNAL CIRCUIT SHORTED TO (K4) SENSOR GROUND CIRCUIT
PCM

TEST	ACTION	APPLICABILITY
1	**NOTE: After repairing this DTC, the AAT sensor value will not refresh until either the ignition is OFF for more than 5 hours or the vehicle has been driven at a speed greater than 20 MPH for more than 2 minutes.** Ignition on, engine not running. With the DRBIII®, read the Ambient Air Temperature Sensor voltage. Is the voltage below .04 of a volt? Yes → Go To 2 No → Refer to the INTERMITTENT CONDITION symptom in the Driveability category. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
2	Turn the ignition off. Disconnect the Ambient Air Temperature Sensor harness connector. Ignition on, engine not running. With the DRBIII®, read Ambient Air Temperature Sensor voltage. Is the voltage between 4.8 and 5.2 volts? Yes → Replace the Ambient Air Temperature Sensor. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 3	All

P0072-AMBIENT TEMP SENSOR LOW — Continued

TEST	ACTION	APPLICABILITY
3	Turn the ignition off. Disconnect the Ambient Air Temperature Sensor harness connector. Disconnect the PCM harness connector. Measure the resistance between ground and the (K145) AAT Signal circuit in the Ambient Air Temperature Sensor harness connector. Is the resistance below 100 ohms? Yes → Repair the short to ground in the (K145) AAT Signal circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 4	All
4	Turn the ignition off. Disconnect the Ambient Air Temperature Sensor harness connector. Disconnect the PCM harness connector. Measure the resistance between the (K145) AAT Signal circuit and the (K167) Sensor ground circuit in the Ambient Air Temperature Sensor harness connector. Is the resistance below 100 ohms? Yes → Repair the (K4) Sensor ground shorted to the (K145) AAT Signal circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 5	All
5	**NOTE: Before continuing, check the PCM harness connector terminals for corrosion, damage, or terminal push out. Repair as necessary.** If there are no possible causes remaining, view repair. Repair Replace and program the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

Symptom:
P0073-AMBIENT TEMP SENSOR HIGH

When Monitored and Set Condition:

P0073-AMBIENT TEMP SENSOR HIGH

When Monitored: The ignition key on.

Set Condition: The Ambient Temperature Sensor voltage is greater than 4.9 volts. One Trip Fault.

POSSIBLE CAUSES
AMBIENT AIR TEMPERATURE SENSOR VOLTAGE ABOVE 4.9 VOLTS
(K145) AAT SIGNAL CIRCUIT SHORTED TO BATTERY VOLTAGE
AMBIENT AIR TEMPERATURE SENSOR INTERNAL FAILURE
(K145) AAT SIGNAL CIRCUIT OPEN
(K4) SENSOR GROUND CIRCUIT OPEN
PCM

TEST	ACTION	APPLICABILITY
1	**NOTE: After repairing this DTC, the AAT sensor value will not refresh until either the ignition is OFF for more than 5 hours or the vehicle has been driven at a speed greater than 20 MPH for more than 2 minutes.** Ignition on, engine not running. With the DRBIII®, read the Ambient Air Temperature Sensor voltage. Is the voltage above 4.9 volts? Yes → Go To 2 No → Refer to the INTERMITTENT CONDITION symptom in the Driveability category. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
2	Turn the ignition off. Disconnect the Ambient Air Temperature Sensor harness connector. Ignition on, engine not running. Measure the voltage of the (K145) AAT Signal circuit in the Ambient Air Temperature Sensor harness connector. Is the voltage above 5.2 volts? Yes → Repair the short to battery voltage in the (K145) AAT Signal circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 3	All

P0073-AMBIENT TEMP SENSOR HIGH — Continued

TEST	ACTION	APPLICABILITY
3	Turn the ignition off. Disconnect the Ambient Air Temperature Sensor harness connector. Connect a jumper wire between the (K145) AAT Signal circuit and the (K167) Sensor ground circuit in the Ambient Air Temperature Sensor harness connector. Ignition on, engine not running. With the DRBIII®, read Ambient Air Temperature Sensor voltage. Is the voltage below 1.0 volt? Yes → Replace the Ambient Air Temperature Sensor. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 4	All
4	Turn the ignition off. Disconnect the Ambient Air Temperature Sensor harness connector. Disconnect the PCM harness connector. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the (K145) AAT Signal circuit from the Ambient Air Temperature Sensor harness connector to the appropriate terminal of special tool #8815. Is the resistance below 5.0 ohms? Yes → Go To 5 No → Repair the open in the (K145) AAT Signal circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
5	Turn the ignition off. Disconnect the Ambient Air Temperature Sensor harness connector. Disconnect the PCM harness connector. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the (K167) Sensor ground circuit from the Ambient Air Temperature Sensor harness connector to the appropriate terminal of special tool #8815. Is the resistance below 5.0 ohms? Yes → Go To 6 No → Repair the open in the (K4) Sensor ground circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
6	**NOTE: Before continuing, check the PCM harness connector terminals for corrosion, damage, or terminal push out. Repair as necessary.** If there are no possible causes remaining, view repair. Repair Replace and program the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

Symptom:
P0107-MAP SENSOR LOW

When Monitored and Set Condition:

P0107-MAP SENSOR LOW

When Monitored: Ignition on. TPS voltage less than 1.2 volts. Battery voltage greater than 10 volts.

Set Condition: The MAP sensor signal voltage is less than 0.782 of a volt for 1.7 seconds. One trip Fault.

POSSIBLE CAUSES
MAP SENSOR VOLTAGE BELOW .078 VOLTS
(K7) 5 VOLT SUPPLY CIRCUIT SHORTED TO GROUND
(K7) 5 VOLT SUPPLY CIRCUIT OPEN
MAP SENSOR INTERNAL FAILURE
(K1) MAP SIGNAL CIRCUIT SHORTED TO GROUND
(K1) MAP SIGNAL CIRCUIT SHORTED TO (K4) SENSOR GROUND CIRCUIT
PCM (K7) 5 VOLT SUPPLY CIRCUIT
PCM (K1) MAP SENSOR SIGNAL CIRCUIT

TEST	ACTION	APPLICABILITY
1	Turn the ignition on. With the DRBIII®, read the MAP Sensor voltage. Is the voltage below .078 of a volt? Yes → Go To 2 No → Refer to the INTERMITTENT CONDITION symptom in the Driveability category. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
2	Turn the ignition off. Disconnect the MAP Sensor harness connector. Ignition on, engine not running. Measure the voltage of the (K7) 5 volt Supply circuit in the MAP Sensor harness connector. Is the voltage between 4.75 to 5.2 volts? Yes → Go To 3 No → Go To 7	All

P0107-MAP SENSOR LOW — Continued

TEST	ACTION	APPLICABILITY
3	Turn the ignition off. Disconnect the MAP Sensor harness connector. Ignition on, engine not running. With the DRBIII®, monitor the MAP Sensor voltage. Is the voltage between 4.5 and 5.2 volts? Yes → Replace the MAP Sensor. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 4	All
4	Turn the ignition off. Disconnect the MAP Sensor harness connector. Disconnect the PCM harness connector. Measure the resistance between ground and the (K1) MAP Signal circuit at the MAP Sensor harness connector. Is the resistance below 100 ohms? Yes → Repair the short to ground in the (K1) MAP Signal circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 5	All
5	Turn the ignition off. Disconnect the MAP Sensor harness connector. Disconnect the PCM harness connector. Measure the resistance between the (K1) MAP Signal circuit and the (K4) Sensor ground circuit in the MAP Sensor harness connector. Is the resistance below 100 ohms? Yes → Repair the (K4) Sensor ground shorted to the (K1) MAP Signal circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 6	All
6	**NOTE: Before continuing, check the PCM harness connector terminals for corrosion, damage, or terminal push out. Repair as necessary.** If there are no possible causes remaining, view repair. Repair Replace and program the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
7	Turn the ignition off. Disconnect the MAP Sensor harness connector. Disconnect the PCM harness connector. Measure the resistance of the (K7) 5 volt Supply circuit in the MAP Sensor harness connector to ground. Is the resistance below 100 ohms? Yes → Repair the short to ground in the (K7) 5 volt Supply circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 8	All

P0107-MAP SENSOR LOW — Continued

TEST	ACTION	APPLICABILITY
8	Turn the ignition off. Disconnect the MAP Sensor harness connector. Disconnect the PCM harness connector. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the (K7) 5 volt Supply circuit from the MAP Sensor harness connector to the appropriate terminal of special tool #8815. Is the resistance below 5.0 ohms? Yes → Go To 9 No → Repair the open in the (K7) 5 volt Supply circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
9	**NOTE: Before continuing, check the PCM harness connector terminals for corrosion, damage, or terminal push out. Repair as necessary.** If there are no possible causes remaining, view repair. Repair Replace and program the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

Symptom:
P0108-MAP SENSOR HIGH

When Monitored and Set Condition:

P0108-MAP SENSOR HIGH

When Monitored: Ignition on. TP sensor voltage less than 1.2 volts for greater than 1.7 seconds. Battery voltage greater than 10 volts

Set Condition: The MAP sensor signal voltage is greater than 4.92 volts for 1.7 seconds. One trip Fault.

POSSIBLE CAUSES
MAP SENSOR VOLTAGE ABOVE 4.9 VOLTS
(K1) MAP SIGNAL CIRCUIT SHORTED TO (K7) 5 VOLT SUPPLY CIRCUIT
(K1) MAP SIGNAL CIRCUIT SHORTED TO BATTERY VOLTAGE
MAP SENSOR INTERNAL FAILURE
(K1) MAP SIGNAL CIRCUIT OPEN
(K4) SENSOR GROUND CIRCUIT OPEN
PCM

TEST	ACTION	APPLICABILITY
1	Turn the ignition on. With the DRBIII®, read the MAP Sensor voltage. Is the voltage above 4.9 volts? Yes → Go To 2 No → Refer to the INTERMITTENT CONDITION symptom in the Driveability category. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
2	Turn the ignition off. Disconnect the MAP Sensor harness connector. Disconnect the PCM harness connector. Measure the resistance between the (K1) MAP Signal circuit and the (K7) 5-Volt Supply circuit in the MAP Sensor harness connector. Is the resistance below 100 ohms? Yes → Repair the (K1) MAP Signal circuit for a short to the (K7) 5 volt Supply circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 3	All

P0108-MAP SENSOR HIGH — Continued

TEST	ACTION	APPLICABILITY
3	Turn the ignition off. Disconnect the MAP Sensor harness connector. Ignition on, engine not running. Measure the voltage of the (K1) MAP Signal circuit in the MAP Sensor harness connector. Is the voltage above 5.2 volts? Yes → Repair the short to battery voltage in the (K1) MAP Signal circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 4	All
4	Turn the ignition off. Disconnect the MAP Sensor harness connector. Connect a jumper wire between the (K1) MAP Sensor Signal circuit and the (K4) Sensor ground circuit. With the DRBIII®, monitor the MAP Sensor voltage. Ignition on, engine not running. Is the voltage below 1.0 volt? Yes → Replace the MAP Sensor. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 5	All
5	Turn the ignition off. Disconnect the MAP Sensor harness connector. Disconnect the PCM harness connector. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the (K1) MAP Signal circuit from the MAP Sensor harness connector to the appropriate terminal of special tool #8815. Is the resistance below 5.0 ohms? Yes → Go To 6 No → Repair the open in the (K1) MAP Signal circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
6	Turn the ignition off. Disconnect the MAP Sensor harness connector. Disconnect the PCM harness connector. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the (K4) Sensor ground circuit from the MAP Sensor harness connector to the appropriate terminal of special tool #8815. Is the resistance below 5.0 ohms? Yes → Go To 7 No → Repair the open in the (K4) Sensor ground circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

P0108-MAP SENSOR HIGH — Continued

TEST	ACTION	APPLICABILITY
7	**NOTE: Before continuing, check the PCM harness connector terminals for corrosion, damage, or terminal push out. Repair as necessary.** If there are no possible causes remaining, view repair. Repair Replace and program the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

Symptom:
P0111-INTAKE AIR TEMPERATURE SENSOR PERFORMANCE

When Monitored and Set Condition:

P0111-INTAKE AIR TEMPERATURE SENSOR PERFORMANCE

When Monitored: Engine off time is greater than 480 minutes. Ambient temperature is greater than -23°C (-9°F).

Set Condition: After a calibrated amount of cool down time, the PCM compares the ECT Sensor, IAT Sensor and the Ambient Air Temperature Sensor values. If the IAT Sensor value is not within calibrated temperature amount of the other two temperature sensors an error is detected. Two Trip Fault.

POSSIBLE CAUSES
GOOD TRIP EQUAL TO ZERO
(K21) IAT SIGNAL CIRCUIT SHORTED TO BATTERY VOLTAGE
IAT SENSOR VOLTAGE BELOW 0.1 VOLTS
(K21) IAT SIGNAL CIRCUIT OPEN
(K167) SENSOR GROUND CIRCUIT OPEN
(K21) IAT SIGNAL SHORTED TO GROUND
(K21) IAT SIGNAL CIRCUIT SHORTED TO (K167) SENSOR GROUND
PCM HIGH
PCM LOW

TEST	ACTION	APPLICABILITY
1	Ignition on, engine not running. With the DRBIII®, read DTCs and record the related Freeze Frame data. Is the Good Trip Counter displayed and equal to zero? Yes → Go To 2 No → Refer to the INTERMITTENT CONDITION symptom in the Driveability category. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
2	Turn the ignition off. Disconnect the IAT Sensor harness connector. **NOTE: Visually inspect both the component and the PCM connectors. Look for damaged, partially broken wires, and backed out or corroded terminals.** Ignition on, engine not running. Measure the voltage on the (K21) IAT Signal circuit in the IAT Sensor harness connector. Is the voltage above 5.2 volts? Yes → Repair the short to battery voltage in the (K21) IAT Signal circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 3	All

P0111-INTAKE AIR TEMPERATURE SENSOR PERFORMANCE — Continued

TEST	ACTION	APPLICABILITY
3	Turn the ignition off. Disconnect the IAT Sensor harness connector. Ignition on, engine not running. With the DRBIII®, read the IAT Sensor voltage. Is the voltage above 4.9 volts? Yes → Go To 4 No → Go To 7	All
4	Turn the ignition off. Disconnect the IAT Sensor harness connector. Using a jumper wire, jumper across the IAT Sensor harness connector. Ignition on, engine not running. With the DRBIII®, read the IAT Sensor voltage. Is the voltage below 0.1 volt? Yes → Replace the IAT Sensor. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 5	All
5	Turn the ignition off. Disconnect the IAT Sensor harness connector. Disconnect the PCM harness connector. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the (K21) IAT Signal circuit from the IAT Sensor harness connector to the appropriate terminal of special tool #8815. Is the resistance below 5.0 ohms? Yes → Go To 6 No → Repair the open in the (K21) IAT Signal circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
6	Turn the ignition off. Disconnect the IAT Sensor harness connector. Disconnect the PCM harness connector. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the (K167) Sensor ground circuit from the IAT Sensor harness connector to the appropriate terminal of special tool #8815. Is the resistance below 5.0 ohms? Yes → NOTE: Before continuing, check the PCM harness connector terminals for corrosion, damage, or terminal push out. Repair as necessary. Replace and program the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Repair the open in the (K167) Sensor ground circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

P0111-INTAKE AIR TEMPERATURE SENSOR PERFORMANCE — Continued

TEST	ACTION	APPLICABILITY
7	Turn the ignition off. Disconnect the IAT Sensor harness connector. Disconnect the PCM harness connector. Measure the resistance between ground and the (K21) IAT Signal circuit in the IAT Sensor harness connector. Is the resistance below 100 ohms? Yes → Repair the short to ground in the (K21) IAT Signal circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 8	All
8	Turn the ignition off. Disconnect the IAT Sensor harness connector. Disconnect the PCM harness connector. Measure the resistance between the (K4) Sensor ground circuit and the (K21) IAT Sensor Signal circuit at the IAT Sensor harness connector. Is the resistance below 5.0 ohms? Yes → Repair the (K167) Sensor ground circuit shorted to the (K21) IAT Signal circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → NOTE: Before continuing, check the PCM harness connector terminals for corrosion, damage, or terminal push out. Repair as necessary. Replace and program the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

Symptom:
P0112-INTAKE AIR TEMPERATURE SENSOR LOW

When Monitored and Set Condition:

P0112-INTAKE AIR TEMPERATURE SENSOR LOW

When Monitored: With the ignition on.

Set Condition: The Intake Air Temperature (IAT) sensor voltage is less than 0.1 of a volt. One trip Fault.

POSSIBLE CAUSES
IAT SENSOR VOLTAGE BELOW 0.1 VOLT
IAT SENSOR INTERNAL FAILURE
(K21) IAT SIGNAL SHORTED TO GROUND
(K21) IAT SIGNAL SHORTED TO (K167) SENSOR GROUND CIRCUIT
PCM

TEST	ACTION	APPLICABILITY
1	Ignition on, engine not running. With the DRBIII®, read the IAT Sensor voltage. Is the voltage below 0.1 volt? Yes → Go To 2 No → Refer to the INTERMITTENT CONDITION symptom in the Driveability category. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
2	Turn the ignition off. Disconnect the IAT harness connector. Ignition on, engine not running. With the DRBIII®, read IAT Sensor voltage. Is the voltage between 4.8 and 5.2 volts? Yes → Replace the IAT Sensor. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 3	All
3	Turn the ignition off. Disconnect the IAT Sensor harness connector. Disconnect the PCM harness connector. Measure the resistance between ground and the (K21) IAT Signal circuit at the IAT Sensor harness connector. Is the resistance below 100 ohms? Yes → Repair the short to ground in the (K21) IAT Signal circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 4	All

P0112-INTAKE AIR TEMPERATURE SENSOR LOW — Continued

TEST	ACTION	APPLICABILITY
4	Turn the ignition off. Disconnect the IAT Sensor harness connector. Disconnect the PCM harness connector. Measure the resistance between the (K21) IAT Sensor Signal circuit and the (K4) Sensor ground circuit in the IAT Sensor harness connector. Is the resistance below 100 ohms? Yes → Repair the (K167) Sensor ground shorted to the (K21) IAT Signal circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 5	All
5	**NOTE: Before continuing, check the PCM harness connector terminals for corrosion, damage, or terminal push out. Repair as necessary.** If there are no possible causes remaining, view repair. Repair Replace and program the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

Symptom:
P0113-INTAKE AIR TEMPERATURE SENSOR HIGH

When Monitored and Set Condition:

P0113-INTAKE AIR TEMPERATURE SENSOR HIGH

When Monitored: With the ignition on.

Set Condition: The Intake Air Temperature (IAT) sensor voltage at the PCM is greater than 4.9 volts. One trip Fault.

POSSIBLE CAUSES
IAT SENSOR VOLTAGE ABOVE 4.9 VOLTS
(K21) IAT SIGNAL CIRCUIT SHORTED TO BATTERY VOLTAGE
IAT SENSOR INTERNAL FAILURE
(K21) IAT SIGNAL CIRCUIT OPEN
(K167) SENSOR GROUND CIRCUIT OPEN
PCM

TEST	ACTION	APPLICABILITY
1	Ignition on, engine not running. With the DRBIII®, read the IAT Sensor voltage. Is the voltage above 4.9 volts? Yes → Go To 2 No → Refer to the INTERMITTENT CONDITION symptom in the Driveability category. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
2	Turn the ignition off. Disconnect the IAT Sensor harness connector. Ignition on, engine not running. Measure the voltage of the (K21) IAT Signal circuit in the IAT Sensor harness connector. Is the voltage above 5.2 volts? Yes → Repair the short to battery voltage in the (K21) IAT Signal circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 3	All

P0113-INTAKE AIR TEMPERATURE SENSOR HIGH — Continued

TEST	ACTION	APPLICABILITY
3	Turn the ignition off. Disconnect the IAT harness connector. Connect a jumper wire between the (K21) IAT Signal circuit and the (K4) Sensor ground circuit in the IAT harness connector. Ignition on, engine not running. With the DRBIII®, read IAT voltage. Is the voltage below 1.0 volt? Yes → Replace the IAT Sensor. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 4	All
4	Turn the ignition off. Disconnect the IAT Sensor harness connector. Disconnect the PCM harness connector. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the (K21) IAT Signal circuit from the IAT Sensor harness connector to the appropriate terminal of special tool #8815. Is the resistance below 5.0 ohms? Yes → Go To 5 No → Repair the open in the (K21) IAT Signal circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
5	Turn the ignition off. Disconnect the IAT Sensor harness connector. Disconnect the PCM harness connector. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the (K4) Sensor ground circuit from the IAT Sensor harness connector to the appropriate terminal of special tool #8815. Is the resistance below 5.0 ohms? Yes → Go To 6 No → Repair the open in the (K167) Sensor ground circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
6	**NOTE: Before continuing, check the PCM harness connector terminals for corrosion, damage, or terminal push out. Repair as necessary.** If there are no possible causes remaining, view repair. Repair Replace and program the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

Symptom:
P0116-ENGINE COOLANT TEMPERATURE PERFORMANCE

When Monitored and Set Condition:

P0116-ENGINE COOLANT TEMPERATURE PERFORMANCE

When Monitored: Engine off time is greater than 480 minutes. Ambient temperature is greater than -23°C (-9°F).

Set Condition: After a calibrated amount of cool down time, the PCM compares the ECT Sensor, IAT Sensor and the Ambient Air Temperature Sensor values. If the ECT Sensor value is not within calibrated temperature amount of the other two temperature sensors an error is detected. Two Trip Fault.

POSSIBLE CAUSES
GOOD TRIP EQUAL TO ZERO
(K2) ECT SIGNAL CIRCUIT SHORTED TO BATTERY VOLTAGE
ECT SENSOR VOLTAGE BELOW 0.1 VOLT
(K2) ECT SIGNAL CIRCUIT OPEN
(K167) SENSOR GROUND CIRCUIT OPEN
(K2) ECT SIGNAL CIRCUIT SHORTED TO GROUND
(K2) ECT SIGNAL SHORTED TO (K167) SENSOR GROUND
PCM HIGH
PCM LOW

TEST	ACTION	APPLICABILITY
1	**NOTE: The PCM compares IAT, AAT and ECT to determine if they are within a calibrated temp of one another. Using a block heater that does not meet OEM specifications or that is not installed at the proper location can defeat the algorithm in the PCM.** Ignition on, engine not running. **NOTE: Check with the customer to determine if such a block heater is installed on the vehicle.** With the DRBIII®, read DTCs and record the related Freeze Frame data. Is the Good Trip Counter displayed and equal to zero? Yes → Go To 2 No → Refer to the INTERMITTENT CONDITION symptom in the Driveability category. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

P0116-ENGINE COOLANT TEMPERATURE PERFORMANCE — Continued

TEST	ACTION	APPLICABILITY
2	Turn the ignition off. Disconnect the ECT Sensor harness connector. **NOTE: Visually inspect both the component and the PCM connectors. Look for damaged, partially broken wires, and backed out or corroded terminals.** Ignition on, engine not running. Measure the voltage on the (K2) ECT Signal circuit in the ECT Sensor harness connector. Is the voltage above 5.2 volts? Yes → Repair the short to battery voltage in the (K2) ECT Signal circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 3	All
3	Turn the ignition off. Disconnect the ECT Sensor harness connector. Ignition on, engine not running. With the DRBIII®, read the ECT Sensor voltage. Is the voltage above 4.9 volts? Yes → Go To 4 No → Go To 7	All
4	Turn the ignition off. Disconnect the ECT Sensor harness connector. Using a jumper wire, jumper across the ECT Sensor harness connector. Ignition on, engine not running. With the DRBIII®, read the ECT Sensor voltage. Is the voltage below 0.1 volt? Yes → Replace the ECT Sensor. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 5	All
5	Turn the ignition off. Disconnect the ECT Sensor harness connector. Disconnect the PCM harness connector. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the (K2) ECT Signal circuit from the ECT Sensor harness connector to the appropriate terminal of special tool #8815. Is the resistance below 5.0 ohms? Yes → Go To 6 No → Repair the open in the (K2) ECT Signal circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

P0116-ENGINE COOLANT TEMPERATURE PERFORMANCE — Continued

TEST	ACTION	APPLICABILITY
6	Turn the ignition off. Disconnect the ECT harness connector. Disconnect the PCM harness connector. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the (K167) Sensor ground circuit from the ECT Sensor harness connector to the appropriate terminal of special tool # 8815. Is the resistance below 5.0 ohms? Yes → NOTE: Before continuing, check the PCM harness connector terminals for corrosion, damage, or terminal push out. Repair as necessary. Replace and program the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Repair the open in the (K167) Sensor ground circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
7	Disconnect the ECT Sensor harness connector. Turn the ignition off. Disconnect the PCM harness connector. Measure the resistance between ground and the (K2) ECT Signal circuit in the ECT Sensor harness connector. Is the resistance below 100 ohms? Yes → Repair the short to ground in the (K2) ECT Signal circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 8	All
8	Turn the ignition off. Disconnect the ECT Sensor harness connector. Disconnect the PCM harness connector. Measure the resistance between the (K2) ECT Sensor Signal circuit and the (K167) Sensor ground circuit at the ECT Sensor harness connector. Is the resistance below 5.0 ohms? Yes → Repair the (K167) Sensor ground shorted to the (K2) ECT Sensor Signal circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → NOTE: Before continuing, check the PCM harness connector terminals for corrosion, damage, or terminal push out. Repair as necessary. Replace and program the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

Symptom:
P0117-ENGINE COOLANT TEMPERATURE SENSOR LOW

When Monitored and Set Condition:

P0117-ENGINE COOLANT TEMPERATURE SENSOR LOW

When Monitored: With the ignition on.

Set Condition: The Engine Coolant Temperature (ECT) sensor circuit voltage at the PCM is less than 0.1 of a volt. One Trip Fault.

POSSIBLE CAUSES
ECT SENSOR VOLTAGE BELOW 0.1 VOLTS
ECT SENSOR INTERNAL FAILURE
(K2) ECT SIGNAL SHORTED TO GROUND
(K2) ECT SIGNAL SHORTED TO (K167) SENSOR GROUND CIRCUIT
PCM

TEST	ACTION	APPLICABILITY
1	Ignition on, engine not running. With the DRBIII®, read the ECT Sensor voltage. Is the voltage below 0.1 volt? Yes → Go To 2 No → Refer to the INTERMITTENT CONDITION symptom in the Driveability category. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
2	Turn the ignition off. Disconnect the ECT harness connector. Ignition on, engine not running. With the DRBIII®, read ECT Sensor voltage. Is the voltage between 4.8 and 5.2 volts? Yes → Replace the ECT Sensor. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 3	All
3	Turn the ignition off. Disconnect the ECT Sensor harness connector. Disconnect the PCM harness connector. Measure the resistance between ground and the (K2) ECT Signal circuit in the ECT Sensor harness connector. Is the resistance below 100 ohms? Yes → Repair the ground shorted to the (K2) ECT Signal circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 4	All

P0117-ENGINE COOLANT TEMPERATURE SENSOR LOW — Continued

TEST	ACTION	APPLICABILITY
4	Turn the ignition off. Disconnect the ECT Sensor harness connector. Disconnect the PCM harness connector. Measure the resistance between the (K2) ECT Sensor Signal circuit and the (K167) Sensor ground circuit in the ECT Sensor harness connector. Is the resistance below 100 ohms? Yes → Repair the (K167) Sensor ground shorted to the (K2) ECT Sensor Signal circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 5	All
5	**NOTE: Before continuing, check the PCM harness connector terminals for corrosion, damage, or terminal push out. Repair as necessary.** If there are no possible causes remaining, view repair. Repair Replace and program the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

Symptom:
P0118-ENGINE COOLANT TEMPERATURE SENSOR HIGH

When Monitored and Set Condition:

P0118-ENGINE COOLANT TEMPERATURE SENSOR HIGH

When Monitored: With the ignition on.

Set Condition: The Engine Coolant Temperature (ECT) sensor voltage at the PCM is greater than 4.9 volts. One trip Fault.

POSSIBLE CAUSES
ECT SENSOR VOLTAGE ABOVE 4.9 VOLTS
(K2) ECT SIGNAL CIRCUIT SHORTED TO BATTERY VOLTAGE
ECT SENSOR INTERNAL FAILURE
(K2) ECT SIGNAL CIRCUIT OPEN
(K167) SENSOR GROUND CIRCUIT OPEN
PCM

TEST	ACTION	APPLICABILITY
1	Ignition on, engine not running. With the DRBIII®, read the ECT Sensor voltage. Is the voltage above 4.9 volts? Yes → Go To 2 No → Refer to the INTERMITTENT CONDITION symptom in the Driveability category. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
2	Turn the ignition off. Disconnect the ECT Sensor harness connector. Ignition on, engine not running. Measure the voltage of the (K2) ECT Signal circuit in the ECT Sensor harness connector. Is the voltage above 5.2 volts? Yes → Repair the short to battery voltage in the (K2) ECT Signal circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 3	All

P0118-ENGINE COOLANT TEMPERATURE SENSOR HIGH — Continued

TEST	ACTION	APPLICABILITY
3	Turn the ignition off. Disconnect the ECT harness connector. Connect a jumper wire between the (K2) ECT Signal circuit and the (K4) Sensor ground circuit in the ECT harness connector. Ignition on, engine not running. With the DRBIII®, read ECT Sensor voltage. Is the voltage below 1.0 volt? Yes → Replace the ECT Sensor. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 4	All
4	Turn the ignition off. Disconnect the ECT Sensor harness connector. Disconnect the PCM harness connector. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the (K2) ECT Signal circuit from the ECT Sensor harness connector to the appropriate terminal of special tool #8815. Is the resistance below 5.0 ohms? Yes → Go To 5 No → Repair the open in the (K2) ECT Signal circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
5	Turn the ignition off. Disconnect the ECT Sensor harness connector. Disconnect the PCM harness connector. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the (K167) Sensor ground circuit from the ECT Sensor harness connector to the appropriate terminal of special tool #8815. Is the resistance below 5.0 ohms? Yes → Go To 6 No → Repair the open in the (K167) Sensor ground circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
6	**NOTE: Before continuing, check the PCM harness connector terminals for corrosion, damage, or terminal push out. Repair as necessary.** If there are no possible causes remaining, view repair. Repair Replace and program the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

Symptom:
P0122-THROTTLE POSITION SENSOR #1 LOW

When Monitored and Set Condition:

P0122-THROTTLE POSITION SENSOR #1 LOW

When Monitored: With the ignition on. Battery voltage greater than 10 volts.

Set Condition: Throttle Position Sensor voltage at the PCM is less than 0.0978 of a volt. One Trip Fault.

POSSIBLE CAUSES
THROTTLE POSITION SENSOR SWEEP
INTERMITTENT CONDITION
(K6) 5 VOLT SUPPLY CIRCUIT SHORTED TO GROUND
(K6) 5 VOLT SUPPLY CIRCUIT OPEN
TP SENSOR INTERNAL FAILURE
(K22) TP SIGNAL CIRCUIT SHORTED TO GROUND
(K22) TP SIGNAL CIRCUIT SHORTED TO (K167) SENSOR GROUND CIRCUIT
PCM (K6) 5 VOLT SUPPLY CIRCUIT
PCM (K22) TP SENSOR SIGNAL

TEST	ACTION	APPLICABILITY
1	Ignition on, engine not running. With the DRBIII®, read the Throttle Position Sensor voltage. Is the voltage below 0.2 of a volt? Yes → Go To 2 No → Go To 10	All
2	Turn the ignition off. Disconnect the TP Sensor harness connector. Ignition on, engine not running. Measure the voltage of the (K7) 5 volt Supply circuit in the TP Sensor harness connector. Is the voltage between 4.5 to 5.2 volts? Yes → Go To 3 No → Go To 7	All

P0122-THROTTLE POSITION SENSOR #1 LOW — Continued

TEST	ACTION	APPLICABILITY
3	Turn the ignition off. Disconnect the TP Sensor harness connector. With the DRBIII®, monitor the TP Sensor voltage. Ignition on, engine not running. Is the voltage above 4.5 volts? Yes → Replace the Throttle Position Sensor. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 4	All
4	Turn the ignition off. Disconnect the TP harness connector. Disconnect the PCM harness connector. Measure the resistance between ground and the (K22) TP Signal circuit at the TP Sensor harness connector. Is the resistance below 100 ohms? Yes → Repair the short to ground in the (K22) TP Signal circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 5	All
5	Turn the ignition off. Disconnect the TP Sensor harness connector. Disconnect the PCM harness connector. Measure the resistance between the (K22) TPS Signal circuit and the (K167) Sensor ground circuit in the TPS harness connector. Is the resistance below 100 ohms? Yes → Repair the short to (K4) Sensor ground in the (K22) TP Signal circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 6	All
6	**NOTE: Before continuing, check the PCM harness connector terminals for corrosion, damage, or terminal push out. Repair as necessary.** If there are no possible causes remaining, view repair. Repair Replace and program the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
7	Turn the ignition off. Disconnect the TP Sensor harness connector. Disconnect the PCM harness connector. Measure the resistance between ground and the (K6) 5 volt Supply circuit in the TP Sensor harness connector. Is the resistance below 100 ohms? Yes → Repair the short to ground in the (K6) 5 volt Supply circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 8	All

P0122-THROTTLE POSITION SENSOR #1 LOW — Continued

TEST	ACTION	APPLICABILITY
8	Turn the ignition off. Disconnect the TP Sensor harness connector. Disconnect the PCM harness connector. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the (K6) 5 volt Supply circuit from the TP Sensor harness connector to the appropriate terminal of special tool #8815. Is the resistance below 5.0 ohms? Yes → Go To 9 No → Repair the open in the (K6) 5 volt Supply circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
9	**NOTE: Before continuing, check the PCM harness connector terminals for corrosion, damage, or terminal push out. Repair as necessary.** If there are no possible causes remaining, view repair. Repair Replace and program the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
10	Ignition on, engine not running. With the DRBIII®, monitor the Throttle Position Sensor voltage. Slowly open the throttle from the idle position to the wide open throttle position. Does voltage start at approximately 0.7 of a volt and go above 3.5 volts with a smooth transition? Yes → Refer to the INTERMITTENT CONDITION symptom in the Driveability category. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Replace the Throttle Position Sensor. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

Symptom:
P0123-THROTTLE POSITION SENSOR #1 HIGH

When Monitored and Set Condition:

P0123-THROTTLE POSITION SENSOR #1 HIGH

When Monitored: With the ignition on. Battery voltage greater than 10 volts.

Set Condition: Throttle Position Sensor voltage at the PCM is greater than 4.4721 volts. One Trip Fault.

POSSIBLE CAUSES
THROTTLE POSITION SENSOR SWEEP
INTERMITTENT CONDITION
(K22) TP SIGNAL CIRCUIT SHORTED TO (K7) 5 VOLT SUPPLY CIRCUIT
(K22) TP SIGNAL CIRCUIT SHORTED TO BATTERY VOLTAGE
TP SENSOR INTERNAL FAILURE
(K167) SENSOR GROUND CIRCUIT OPEN
(K22) TP SIGNAL CIRCUIT OPEN
PCM

TEST	ACTION	APPLICABILITY
1	**NOTE: Ensure the throttle is fully closed and free from binding or carbon build up.** Start the engine. With the DRBIII®, read the TP Sensor voltage. Is the voltage above 4.5 volts? Yes → Go To 2 No → Go To 8	All
2	Turn the ignition off. Disconnect the TP Sensor harness connector. Disconnect the PCM harness connector. Measure the resistance between the (K22) TP Signal circuit and the (K7) 5 Volt Supply circuit in the TP Sensor harness connector. Is the resistance below 100 ohms? Yes → Repair the short to the (K7) 5 volt Supply circuit in the (K22) TP Signal circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 3	All

P0123-THROTTLE POSITION SENSOR #1 HIGH — Continued

TEST	ACTION	APPLICABILITY
3	Turn the ignition off. Disconnect the TP Sensor harness connector. Ignition on, engine not running. Measure the voltage of the (K22) TP Signal circuit in the TP Sensor harness connector. Is the voltage above 5.2 volts? Yes → Repair the short to battery voltage in the (K22) TP Signal circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 4	All
4	Turn the ignition off. Disconnect the TP Sensor harness connector. Connect a jumper wire between the (K22) TP Signal circuit and the (K4) Sensor ground circuit. With the DRBIII®, monitor the TP Sensor voltage. Ignition on, engine not running. Is the voltage below 0.5 of a volt? Yes → Replace the Throttle Position Sensor. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 5	All
5	Turn the ignition off. Disconnect the TP Sensor harness connector. Disconnect the PCM harness connector. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the (K167) Sensor ground circuit from the TP Sensor harness connector to the appropriate terminal of special tool #8815. Is the resistance below 5.0 ohms? Yes → Go To 6 No → Repair the open in the (K167) Sensor ground circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
6	Turn the ignition off. Disconnect the TP harness connector. Disconnect the PCM harness connector. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the (K22) TP Signal circuit from the TP harness connector to the appropriate terminal of special tool #8815. Is the resistance below 5.0 ohms? Yes → Go To 7 No → Repair the open in the (K22) TP Signal circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

P0123-THROTTLE POSITION SENSOR #1 HIGH — Continued

TEST	ACTION	APPLICABILITY
7	**NOTE: Before continuing, check the PCM harness connector terminals for corrosion, damage, or terminal push out. Repair as necessary.** If there are no possible causes remaining, view repair. Repair Replace and program the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
8	Ignition on, engine not running. With the DRBIII®, monitor the TP Sensor voltage. Slowly open the throttle from the idle position to the wide open throttle position. Does voltage start at approximately 0.7 of a volt and go above 3.5 volts with a smooth transition? Yes → Refer to the INTERMITTENT CONDITION symptom in the Driveability category. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Replace the Throttle Position Sensor. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

Symptom:

P0125-INSUFFICIENT COOLANT TEMP FOR CLOSED-LOOP FUEL CONTROL

When Monitored and Set Condition:

P0125-INSUFFICIENT COOLANT TEMP FOR CLOSED-LOOP FUEL CONTROL

When Monitored: With battery voltage greater than 10.4 volts, after engine is started.

Set Condition: The engine temperature does not go above a calibrated value. Failure time depends on start-up coolant temperature and ambient temperature. (i.e. 2 minutes for a start temp of 10°C (50°F) or up to 5 minutes for a vehicle with a start-up temp of -7°C (20°F). Two Trip Fault.

POSSIBLE CAUSES
LOW COOLANT LEVEL
THERMOSTAT OPERATION
ENGINE COOLANT TEMPERATURE SENSOR

TEST	ACTION	APPLICABILITY
1	**NOTE: If a Engine Coolant Temperature (ECT) DTC is set along with this code, diagnose the ECT DTC first.** **NOTE: Inspect the ECT terminals and related PCM terminals. Ensure the terminals are free from corrosion and damage.** **NOTE: The best way to diagnose this DTC is to allow the vehicle to sit overnight outside in order to have a totally cold soaked engine.** **Note: Extremely cold outside ambient temperatures may have caused this DTC to set.** **WARNING: Never open the cooling system when the engine is hot. The system is under pressure. Extreme burns or scalding may result. Allow the engine to cool before opening the cooling system.** Check the coolant system to make sure that the coolant is in good condition and at the proper level. Is the coolant level and condition OK? Yes → Go To 2 No → Inspect the vehicle for a coolant leak and add the necessary amount of coolant. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

P0125-INSUFFICIENT COOLANT TEMP FOR CLOSED-LOOP FUEL CONTROL — Continued

TEST	ACTION	APPLICABILITY
2	**NOTE: This test works best if performed on a cold engine (cold soak).** Ignition on, engine not running. With the DRBIII®, read the ECT Deg value. If the engine was allowed to sit overnight (cold soak), the temperature value should be a sensible value that is somewhere close to the ambient temperature. **Note: If engine coolant temperature is above 82°C (180°F), allow the engine to cool until 65°C (150°F) is reached.** Start the Engine. During engine warm-up, monitor the ECT Deg value. The temp deg value change should be a smooth transition from start up to normal operating temp 82°C (180°F) . Also monitor the actual coolant temperature with a thermometer. **NOTE: As the engine warms up to operating temperature, the actual coolant temperature (thermometer reading) and the ECT Deg in the DRB sensor should stay relatively close to each other.** Using the appropriate service information, determine the proper opening temperature of the thermostat. Did the thermostat open at the proper temperature? Yes → Go To 3 No → Replace the thermostat. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
3	Ignition on, engine not running. With the DRBIII®, read the ECT Sensor temperature value. If the engine was allowed to sit overnight (cold soak), the temperature value should be a sensible value that is somewhere close to the ambient temperature. **Note: If engine coolant temperature is above 82°C (180°F), allow the engine to cool until 65°C (150°F) is reached.** Start the Engine. During engine warm-up, monitor the ECT Deg value. The temp deg value change should be a smooth transition from start up to normal operating temp 82°C (180°F) . Also monitor the actual coolant temperature with a thermometer. **NOTE: As the engine warms up to operating temperature, the actual coolant temperature (thermometer reading) and the ECT Sensor Temperature in the DRBIII® sensors should stay relatively close to each other.** Is the thermometer reading relatively close to the DRBIII® ECT Sensor reading? Yes → Test Complete. No → Replace the Engine Coolant Temperature Sensor. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

Symptom:
P0128-THERMOSTAT RATIONALITY

When Monitored and Set Condition:

P0128-THERMOSTAT RATIONALITY

When Monitored: The engine running. During cold start.

Set Condition: The PCM predicts a coolant temperature value that it will compare to the actual coolant temperature. If the two coolant temperature values are not within 10°C (18°F) of each other an error is detected. Two Trip Fault.

POSSIBLE CAUSES
GOOD TRIP EQUAL TO ZERO
LOW COOLANT LEVEL
OTHER POSSIBLE CAUSES
SIGNAL CIRCUIT SHORTED TO BATTERY VOLTAGE
MONITOR ENGINE COOLANT TEMPERATURE
TEMPERATURE SENSOR VOLTAGE BELOW 0.1 VOLT
SIGNAL CIRCUIT OPEN
SENSOR GROUND CIRCUIT OPEN
SIGNAL CIRCUIT SHORTED TO GROUND
SIGNAL CIRCUIT SHORTED TO SENSOR GROUND
PCM LOW
PCM HIGH

TEST	ACTION	APPLICABILITY
1	**NOTE: If any ECT, AAT, CMP or CKP sensor DTCs have set along with P0128, diagnose them first before continuing.** **NOTE: Ensure that Pinion Factor has been programmed correctly into the PCM.** Ignition on, engine not running. With the DRBIII®, read DTCs and record the related Freeze Frame data. Is the Good Trip displayed and equal to zero? Yes → Go To 2 No → Refer to the INTERMITTENT CONDITION symptom in the Driveability category. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

P0128-THERMOSTAT RATIONALITY — Continued

TEST	ACTION	APPLICABILITY
2	**NOTE: If a Engine Coolant Temperature (ECT) DTC is set along with this code, diagnose the ECT DTC first.** **NOTE: Inspect the ECT terminals and related PCM terminals. Ensure the terminals are free from corrosion and damage.** **NOTE: The best way to diagnose this DTC is to allow the vehicle to sit overnight outside in order to have a totally cold soaked engine.** **Note: Extremely cold outside ambient temperatures may have caused this DTC to set.** **WARNING: Never open the cooling system when the engine is hot. The system is under pressure. Extreme burns or scalding may result. Allow the engine to cool before opening the cooling system.** Check the coolant system to make sure that the coolant is in good condition and at the proper level. Is the coolant level and condition OK? Yes → Go To 3 No → Inspect the vehicle for a coolant leak and add the necessary amount of coolant. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
3	Using the appropriate service information, determine the proper opening temperature of the thermostat. **NOTE: It is important that the thermostat meets all OEM specifications. An incorrect thermostat or an improperly installed thermostat will cause this DTC to set.** **NOTE: This test works best if performed on a cold engine (cold soak).** Ignition on, engine not running. With the DRBIII®, monitor the Engine Coolant temperature. If the engine was allowed to sit overnight (cold soak), the temperature value should be a sensible value that is somewhere close to the ambient temperature. **NOTE: If engine coolant temperature is above 82°C (180°F), allow the engine to cool until 65°C (150°F) is reached.** Start the Engine. During engine warm-up, monitor the ECT Deg value on the DRBIII®. The temperature change should be a smooth transition from start up to normal operating temp 82°C (180°F) . Also monitor the actual coolant temperature with a thermometer. **NOTE: As the engine warms up to operating temperature, the actual coolant temperature (thermometer reading) and the ECT Deg on the DRBIII® should stay within 10° (18°F) of each other.** If the thermostat does not open at the proper temperature, replace the thermostat. If the monitored Engine Coolant Temperature transition from cold to hot was not smooth or if the temperature value on the DRBIII® was not within 10°C (18°F) of the thermometer reading during warm-up, replace the ECT Sensor. Were any problems found? Yes → Repair as necessary. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 4	All
4	Turn the ignition on. With the DRBIII®, read and record the AAT Sensor Temperature value Using the DRB Temperature Probe #CH7050, measure the ambient air temperature near the AAT sensor. Is the AAT Sensor value with 5°C (9°F) of the temperature probe reading? Yes → Go To 5 No → Go To 7	All

P0128-THERMOSTAT RATIONALITY — Continued

TEST	ACTION	APPLICABILITY
5	**WARNING: MAKE SURE THE ENGINE COOLING SYSTEM IS COOL BEFORE REMOVING THE PRESSURE CAP OR ANY HOSE. SEVERE PERSONAL INJURY MAY RESULT FROM ESCAPING HOT COOLANT. THE COOLING SYSTEM IS PRESSURIZED WHEN HOT.** Turn the ignition on. With the DRBIII®, read and record the ECT Sensor Temperature value Using the DRB Temperature Probe #CH7050, measure the engine coolant temperature. Is the ECT Sensor value with 5°C (9°F) of the temperature probe reading? Yes → Go To 6 No → Go To 7	All
6	Inspect the Temperature sensors for any physical damage. Inspect the engine coolant. Ensure the coolant is at the proper level. Refer to the Service Information COOLING. Ensure the Temperature sensors are properly mounted. Ensure the CMP and CKP sensors are mounted properly. Check the connectors for any signs of damage. **WARNING: WHEN THE ENGINE IS OPERATING, DO NOT STAND IN A DIRECT LINE WITH THE FAN. DO NOT PUT YOUR HANDS NEAR THE PULLEYS, BELTS OR FAN. DO NOT WEAR LOOSE CLOTHING.** Refer to any Technical Service Bulletins (TSBs) that may apply. With the engine running at normal operating temperature, monitor the Temperature sensor parameters while wiggling the wire harness. Look for parameter values to change. Visually inspect the related wire harness. Look for any chafed, pierced, pinched, partially broken wires and broken, bent, pushed out, or corroded terminals. **CAUTION: NEVER PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Inspect and clean all PCM, engine, and chassis grounds. Were any problems found during the above inspections? Yes → Repair as necessary Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Test Complete.	All
7	**NOTE: Visually inspect both the component and the PCM connectors. Look for damage, partially broken wires and backed out or corroded terminals** Turn the ignition off. Disconnect the applicable Temperature Sensor harness connector. Ignition on, engine not running. Measure the voltage of the Signal circuit in the applicable Temperature Sensor harness connector. Is the voltage above 5.2 volts? Yes → Repair the short to battery voltage in the Signal circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 8	All

P0128-THERMOSTAT RATIONALITY — Continued

TEST	ACTION	APPLICABILITY
8	Turn the ignition off. Disconnect the applicable Temperature Sensor harness connector. Ignition on, engine not running. With the DRBIII®, read the Temperature Sensor voltage. Is the voltage above 4.9 volts? Yes → Go To 9 No → Go To 12	All
9	Turn the ignition off. Disconnect the applicable Temperature Sensor harness connector. Using a jumper wire, jumper across the Temperature Sensor harness connector. Ignition on, engine not running. With the DRBIII®, read the Temperature voltage. Is the voltage below 0.1 volt? Yes → Replace the applicable Temperature Sensor. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 10	All
10	Turn the ignition off. Disconnect the applicable Temperature Sensor harness connector. Disconnect the PCM harness connector. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the Signal circuit from the Temperature Sensor harness connector to the appropriate terminal of special tool #8815. Is the resistance below 5.0 ohms? Yes → Go To 11 No → Repair the open in the Signal circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
11	Turn the ignition off. Disconnect the applicable Temperature Sensor harness connector. Disconnect the PCM harness connector. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the Sensor ground circuit from the Ambient Air Temperature Sensor harness connector to the appropriate terminal of special tool #8815. Is the resistance below 5.0 ohms? Yes → NOTE: Before continuing, check the PCM harness connector terminals for corrosion, damage, or terminal push out. Repair as necessary. Replace and program the Powertrain Contorl Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Repair the open in the Sensor ground circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

P0128-THERMOSTAT RATIONALITY — Continued

TEST	ACTION	APPLICABILITY
12	Turn the ignition off. Disconnect the applicable Temperature Sensor harness connector. Disconnect the PCM harness connector. Measure the resistance between ground and the Signal circuit in the Temperature harness connector. Is the resistance below 100 ohms? Yes → Repair the short to ground in the Signal circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 13	All
13	Turn the ignition off. Disconnect the applicable Temperature Sensor harness connector. Disconnect the PCM harness connector. Measure the resistance between the Signal circuit and the Sensor ground circuit in the Temperature Sensor harness connector. Is the resistance below 100 ohms? Yes → Repair the Sensor ground shorted to the Signal circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → NOTE: Before continuing, check the PCM harness connector terminals for corrosion, damage or terminal push out. Repair as necessary. Replace and program the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

Symptom:
P0129-BAROMETRIC PRESSURE OUT-OF-RANGE

When Monitored and Set Condition:

P0129-BAROMETRIC PRESSURE OUT-OF-RANGE

When Monitored: With the ignition key on. No Cam or Crank signal within 75 ms. Engine speed at less than 250 RPM.

Set Condition: The PCM senses the voltage from the MAP sensor to be greater than 4.9 volts (2.4 volts Turbo) but below 2.28 volts (1.2 Turbo) of a volt for 300 milliseconds. One Trip Fault.

POSSIBLE CAUSES
IAC SIGNAL CIRCUIT LOW
IAC SIGNAL CIRCUIT HIGH
INTERMITTENT CONDITION
(K7) 5 VOLT SUPPLY CIRCUIT SHORTED TO VOLTAGE
(K7) 5 VOLT SUPPLY CIRCUIT SHORTED TO GROUND
(K7) 5 VOLT SUPPLY CIRCUIT OPEN
MAP SENSOR INTERNAL FAILURE
(K1) MAP SIGNAL CIRCUIT OPEN
(K1) MAP SIGNAL CIRCUIT SHORTED TO GROUND
PCM (K7) 5 VOLT SUPPLY CIRCUIT
PCM (K1) MAP SIGNAL

TEST	ACTION	APPLICABILITY
1	**NOTE: Refer to any TSBs that may apply to this DTC before proceeding.** Ignition on, engine not running. With the DRBIII®, read the MAP Sensor voltage. Is the voltage greater than 4.9 volts (2.4 volts turbo). Yes → Go To 3 No → Go To 2	All
2	Ignition on, engine not running. With the DRBIII®, read the MAP Sensor voltage. Is the voltage below 2.28 volts (1.2 volts Turbo). Yes → Go To 3 No → Go To 12	All

P0129-BAROMETRIC PRESSURE OUT-OF-RANGE — Continued

TEST	ACTION	APPLICABILITY
3	Turn the ignition off. Disconnect the MAP Sensor harness connector. Ignition on, engine not running. Measure the voltage of the (K7) 5 Volt Supply circuit in the MAP Sensor harness connector. Is the voltage between 4.5 to 5.2 volts? Yes → Go To 4 No → Go To 8	All
4	Turn the ignition off. Disconnect the MAP Sensor harness connector. Ignition on, engine not running. With the DRBIII®, monitor the MAP Sensor voltage. Is the voltage above 2.2 volts? Yes → Replace the MAP Sensor. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 5	All
5	Turn the ignition off. Disconnect the MAP Sensor harness connector. Disconnect the PCM harness connector. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the (K1) MAP Signal circuit from the MAP Sensor harness connector to the appropriate terminal of special tool #8815. Is the resistance below 5.0 ohms? Yes → Go To 6 No → Repair the open in the (K1) MAP Signal circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
6	Turn the ignition off. Disconnect the MAP Sensor harness connector. Disconnect the PCM harness connector. Measure the resistance between ground and the (K1) MAP Signal circuit at the MAP Sensor harness connector. Is the resistance below 100 ohms? Yes → Repair the short to ground in the (K1) MAP Signal circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 7	All
7	**NOTE: Before continuing, check the PCM harness connector terminals for corrosion, damage, or terminal push out. Repair as necessary.** If there are no possible causes remaining, view repair. Repair Replace and program the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

P0129-BAROMETRIC PRESSURE OUT-OF-RANGE — Continued

TEST	ACTION	APPLICABILITY
8	Turn the ignition off. Disconnect the MAP Sensor harness connector. Ignition on, engine not running. Measure the voltage of the (K7) 5 Volt Supply circuit in the MAP Sensor harness connector. Is the voltage above 5.2 volts? Yes → Repair the short to battery voltage in the (K7) 5 Volt Supply circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 9	All
9	Turn the ignition off. Disconnect the MAP Sensor harness connector. Disconnect the PCM harness connector. Measure the resistance between ground and the (K7) 5 Volt Supply circuit at the MAP Sensor harness connector. Is the resistance below 100 ohms? Yes → Repair the short to ground in the (K7) 5 Volt Supply circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 10	All
10	Turn the ignition off. Disconnect the MAP Sensor harness connector. Disconnect the PCM harness connector. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the (K7) 5 Volt Supply circuit from the MAP Sensor harness connector to the appropriate terminal of special tool #8815. Is the resistance below 5.0 ohms? Yes → Go To 11 No → Repair the open in the (K7) 5 Volt Supply circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
11	**NOTE: Before continuing, check the PCM harness connector terminals for corrosion, damage, or terminal push out. Repair as necessary.** If there are no possible causes remaining, view repair. Repair Replace and program the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
12	Start the engine. **NOTE: If the engine will not idle, maintain an engine speed between 800 and 1500 RPM.** Allow the engine to idle. With the DRBIII®, read the IAC Current. Is the IAC Current below 146 mA? Yes → Refer to P0508 - IAC Valve Sense Low Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 13	All

P0129-BAROMETRIC PRESSURE OUT-OF-RANGE — Continued

TEST	ACTION	APPLICABILITY
13	Start the engine. **NOTE: If the engine will not idle, maintain an engine speed between 800 and 1500 RPM.** Allow the engine to idle. With the DRBIII®, read the IAC Current. Is the IAC Current above 999 mA? Yes → Refer to P0509 - IAC Valve Sense Circuit High Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Refer to the INTERMITTENT CONDITION symptom in the Driveability category. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

Symptom List:
P0131-O2 SENSOR 1/1 VOLTAGE LOW
P0137-O2 SENSOR 1/2 VOLTAGE LOW

Test Note: All symptoms listed above are diagnosed using the same tests. The title for the tests will be P0131-O2 SENSOR 1/1 VOLTAGE LOW.

When Monitored and Set Condition:

P0131-O2 SENSOR 1/1 VOLTAGE LOW

When Monitored: Engine Running.

Set Condition: The oxygen sensor signal voltage is below 2.402 volts for 9 seconds. Two trip Fault.

P0137-O2 SENSOR 1/2 VOLTAGE LOW

When Monitored: Engine Running.

Set Condition: The oxygen sensor signal voltage is below 2.402 volts for 9 seconds. Two trip Fault.

POSSIBLE CAUSES
O2 SENSOR BELOW 2.52 VOLTS
O2 SENSOR
O2 RETURN CIRCUIT SHORTED TO GROUND
O2 SIGNAL CIRCUIT SHORTED TO GROUND
O2 SIGNAL CIRCUIT SHORTED TO O2 RETURN CIRCUIT
O2 SIGNAL SHORTED TO HEATER GROUND CIRCUIT
PCM RETURN CIRCUIT
PCM SIGNAL CIRCUIT

P0131-O2 SENSOR 1/1 VOLTAGE LOW — Continued

TEST	ACTION	APPLICABILITY
1	**NOTE: If one of the O2 Sensors Signal or Return circuits are shorted to ground, the DRBIII® will display all O2 Sensor voltage readings low. The O2 Sensor that is shorted to ground will display a voltage reading near or at 0 volts.** **NOTE: It is important to perform the diagnostics on the O2 Sensor that set the DTC.** **NOTE: After the repairs have been made, verify proper O2 Sensor operation. If all the O2 Sensor voltage readings have not returned to normal, follow the diagnostic procedure for the remaining O2 Sensors.** Start the engine. Allow the engine to reach normal operating temperature. With the DRBIII®, read the O2 Sensor voltage. Is the voltage below 2.52 volts? Yes → Go To 2 No → Refer to the INTERMITTENT CONDITION symptom in the Driveability category. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
2	Turn the ignition off. Disconnect the O2 Sensor harness connector. Ignition on, engine not running. With the DRBIII®, monitor the O2 Sensor voltage. Is the O2 Sensor voltage above 4.8 volts? Yes → Go To 3 No → Go To 5	All
3	Turn the ignition off. Disconnect the O2 Sensor harness connector. Ignition on, engine not running. Measure the voltage on the O2 Return circuit in the O2 Sensor harness connector. Is the voltage at 2.5 volts? Yes → Replace the O2 Sensor. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 4	All
4	Turn the ignition off. Disconnect the O2 Sensor harness connector. Disconnect the PCM harness connector. Measure the resistance between ground and the O2 Return circuit in the O2 Sensor harness connector. Is the resistance below 100 ohms? Yes → Repair the short to ground in the O2 Return circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → NOTE: Before continuing, check the PCM harness connector terminals for corrosion, damage, or terminal push out. Repair as necessary. Replace and program the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

P0131-O2 SENSOR 1/1 VOLTAGE LOW — Continued

TEST	ACTION	APPLICABILITY
5	Turn the ignition off. Disconnect the O2 Sensor harness connector. Disconnect the PCM harness connector. Measure the resistance between ground and the O2 Signal circuit in the O2 Sensor harness connector. Is the resistance below 100 ohms? Yes → Repair the short to ground in the O2 Signal circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 6	All
6	Turn the ignition off. Disconnect the O2 Sensor harness connector. Disconnect the PCM harness connector. Measure the resistance between the O2 Signal circuit and the O2 Return circuit in the O2 Sensor harness connector. Is the resistance below 100 ohms? Yes → Repair the O2 Return circuit shorted to the O2 Signal circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 7	All
7	Turn the ignition off. Disconnect the O2 Sensor harness connector. Disconnect the PCM harness connector. Measure the resistance between the O2 Signal circuit and the Heater ground circuit in the O2 Sensor harness connector. Is the resistance below 100 ohms? Yes → Repair the Heater Ground circuit shorted to the O2 Signal circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 8	All
8	**NOTE: Before continuing, check the PCM harness connector terminals for corrosion, damage, or terminal push out. Repair as necessary.** If there are no possible causes remaining, view repair. Repair Replace and program the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

Symptom List:
P0132-O2 SENSOR 1/1 VOLTAGE HIGH
P0138-O2 SENSOR 1/2 VOLTAGE HIGH

Test Note: All symptoms listed above are diagnosed using the same tests. The title for the tests will be P0132-O2 SENSOR 1/1 VOLTAGE HIGH.

When Monitored and Set Condition:

P0132-O2 SENSOR 1/1 VOLTAGE HIGH

When Monitored: The engine running for 119 seconds. O2 Sensor Heater Temperature is greater than 350°C (662°F). Battery voltage greater than 10.99 volts.

Set Condition: The Oxygen Sensor voltage is above 3.9902 volts. Two trip fault.

P0138-O2 SENSOR 1/2 VOLTAGE HIGH

When Monitored: The engine running for 119 seconds. O2 Sensor Heater Temperature is greater than 350°C (662°F). Battery voltage greater than 10.99 volts.

Set Condition: The Oxygen Sensor voltage is above 3.9902 volts. Two trip fault.

POSSIBLE CAUSES
O2 SENSOR VOLTAGE ABOVE 3.7 VOLTS
O2 SENSOR SIGNAL CIRCUIT SHORTED TO VOLTAGE
O2 SENSOR RETURN CIRCUIT SHORTED TO VOLTAGE
O2 SENSOR
O2 SENSOR SIGNAL CIRCUIT OPEN
O2 SENSOR RETURN CIRCUIT OPEN
PCM

P0132-O2 SENSOR 1/1 VOLTAGE HIGH — Continued

TEST	ACTION	APPLICABILITY
1	**NOTE: If one of the O2 Sensors Signal or Return circuits are shorted to voltage, the DRBIII® will display all O2 Sensor voltage readings high.** **NOTE: It is important to perform the diagnostics on the O2 Sensor that set the DTC.** **NOTE: After the repairs have been made, verify proper O2 Sensor operation. If all the O2 Sensor voltage readings have not returned to normal, follow the diagnostic procedure for the remaining O2 Sensors.** Start the engine. Allow the engine to reach normal operating temperature. With the DRBIII®, read the O2 Sensor voltage. Is the voltage above 3.7 volts? Yes → Go To 2 No → Refer to the INTERMITTENT CONDITION symptom in the Driveability category. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
2	Turn the ignition off. Disconnect the O2 Sensor harness connector **WARNING: WHEN THE ENGINE IS OPERATING, DO NOT STAND IN A DIRECT LINE WITH THE FAN. DO NOT PUT YOUR HANDS NEAR THE PULLEYS, BELTS OR FAN. DO NOT WEAR LOOSE CLOTHING.** Start the engine and allow the engine to idle. Measure the voltage on the O2 Sensor Signal circuit in the O2 Sensor harness connector. **NOTE: Measure the voltage in reference to ground, not the O2 Sensor Return circuit.** Is the voltage above 5.2 volts? Yes → Repair the short to voltage in the O2 Sensor Signal circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 3	All
3	Turn the ignition off. Disconnect the O2 Sensor harness connector Disconnect the PCM harness connectors. Turn the ignition on. Measure the voltage on the O2 Sensor Return circuit in the O2 Sensor harness connector. Is there any voltage present? Yes → Repair the short to voltage in the O2 Sensor Return circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 4	All
4	Turn the ignition off. Disconnect the O2 Sensor harness connector. Connect a jumper wire between the O2 Sensor Signal circuit and the O2 Sensor Return circuit in the O2 Sensor harness connector. Ignition on, engine not running. With the DRBIII®, monitor the O2 Sensor voltage. Is the voltage between 2.3 and 2.7 volts with the jumper wire in place? Yes → Replace the O2 Sensor. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 5	All

P0132-O2 SENSOR 1/1 VOLTAGE HIGH — Continued

TEST	ACTION	APPLICABILITY
5	Turn the ignition off. Disconnect the O2 Sensor harness connector Disconnect the PCM harness connector. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the O2 Sensor Signal circuit from the O2 Sensor harness connector to the appropriate terminal of special tool #8815. Is the resistance below 5.0 ohms? Yes → Go To 6 No → Repair the open O2 Sensor Signal circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
6	Turn the ignition off. Disconnect the O2 Sensor harness connector Disconnect the PCM harness connector. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the O2 Sensor Return circuit from the O2 Sensor harness connector to the appropriate terminal of special tool #8815. Is the resistance below 5.0 ohms? Yes → NOTE: Before continuing, check the PCM harness connector terminals for corrosion, damage, or terminal push out. Repair as necessary. Replace and program the Powertrain Control Module in accorance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Repair the open O2 Sensor Return circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

Symptom List:

P0133-O2 SENSOR 1/1 SLOW RESPONSE
P0139-O2 SENSOR 1/2 SLOW RESPONSE

Test Note: All symptoms listed above are diagnosed using the same tests. The title for the tests will be P0133-O2 SENSOR 1/1 SLOW RESPONSE.

When Monitored and Set Condition:

P0133-O2 SENSOR 1/1 SLOW RESPONSE

When Monitored: Start and drive vehicle greater than 20 MPH and less than 55 MPH. Throttle open for a minimum 120 seconds. Coolant Temp greater than 70°C (158°F) Catalytic Converter Temperature greater than 600°C (1112°F) EVAP Purge active.

Set Condition: The PCM monitors the state of change of the front O2 sensor and the rear 02 sensor. The PCM will then compare the differences between both readings, if the differences are greater than a calibrated amount the PCM will record a fault. Two trip failure.

P0139-O2 SENSOR 1/2 SLOW RESPONSE

When Monitored: Start and drive vehicle greater than 20 MPH and less than 55 MPH. Throttle open for a minimum 120 seconds. Coolant Temp greater than 70°C (158°F) Catalytic Converter Temperature greater than 600°C

Set Condition: The O2 sensor voltage doess not switch properly from lean to rich during monitoring. Two Trip Fault.

POSSIBLE CAUSES
GOOD TRIP EQUAL TO ZERO
EXHAUST LEAK
O2 SIGNAL CIRCUIT
O2 RETURN CIRCUIT
O2 SENSOR

P0133-O2 SENSOR 1/1 SLOW RESPONSE — Continued

TEST	ACTION	APPLICABILITY
1	**NOTE: If one of the O2 Sensors Signal or Return circuits are shorted to ground or voltage, all the other O2 Sensor voltage readings will be affected.** **NOTE: It is important to perform the diagnostics on the O2 Sensor that set the DTC.** **NOTE: After the repairs have been made, verify proper O2 Sensor operation. If all the O2 Sensor voltage readings have not returned to normal, follow the diagnostic procedure for the remaining O2 Sensors.** **NOTE: Check for contaminants that may have damaged the O2 Sensor: contaminated fuel, unapproved silicone, oil and coolant.** Ignition on, engine not running. With the DRBIII®, read DTCs and record the related Freeze Frame data. Is the Good Trip Counter displayed and equal to zero? Yes → Go To 2 No → Refer to the INTERMITTENT CONDITION symptom in the Driveability category. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
2	Start the engine. Inspect the exhaust system for leaks between the engine and the O2 Sensors. Are there any exhaust leaks? Yes → Repair or replace the leaking exhaust parts as necessary. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 3	All
3	Turn the ignition off Disconnect the O2 Sensor harness connector. Ignition on, engine not running. Measure the voltage on the O2 Signal circuit in the O2 Sensor harness connector. Is the voltage between 4.5 and 5.2 volts? Yes → Go To 4 No → Check the O2 Signal circuit for damage, short to ground, open, or short to voltage. If OK, replace and program the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
4	Turn the ignition off. Disconnect the O2 Sensor harness connector. Ignition on, engine not running. Measure the voltage on the O2 Return circuit in the O2 Sensor harness connector. Is the voltage at 2.5 volts? Yes → Check the O2 Return circuit for damage, short to ground, open, or short to voltage. If OK, replace and program the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 5	All
5	If there are no possible causes remaining, view repair. Repair Replace the O2 Sensor Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

Symptom List:
P0135-O2 SENSOR 1/1 HEATER PERFORMANCE
P0141-O2 SENSOR 1/2 HEATER PERFORMANCE

Test Note: All symptoms listed above are diagnosed using the same tests. The title for the tests will be P0135-O2 SENSOR 1/1 HEATER PERFORMANCE.

When Monitored and Set Condition:

P0135-O2 SENSOR 1/1 HEATER PERFORMANCE

When Monitored: Engine Running and Heater duty cycle greater than 0%

Set Condition: O2 Heater Temperature does not reach 350°C (662°F) within 90 second during monitoring conditions. Two Trip Fault.

P0141-O2 SENSOR 1/2 HEATER PERFORMANCE

When Monitored: Engine Running and Heater duty cycle greater than 0%.

Set Condition: O2 Heater Temperature does not reach 350°C (662°FL) within 90 second during monitoring conditions. Two Trip Fault.

POSSIBLE CAUSES
O2 SENSOR HEATER OPERATION
O2 HEATER ELEMENT
O2 HEATER GROUND CIRCUIT OPEN
O2 HEATER CONTROL CIRCUIT OPEN
PCM

TEST	ACTION	APPLICABILITY
1	Ignition on, engine not running. With the DRBIII®, read DTCs and record the related Freeze Frame data. Is the Good Trip Counter display and equal to zero? Yes → Go To 3 No → Go To 2	All

P0135-O2 SENSOR 1/1 HEATER PERFORMANCE — Continued

TEST	ACTION	APPLICABILITY
2	Turn the ignition off. **NOTE: Allow the O2 Sensor to cool down before continuing the test. The O2 voltage should stabilize at 5.0 volts. Raising the hood may help in reducing under hood temps.** Ignition on, engine not running. With the DRBIII®, actuate the O2 Heater Test. With the DRBIII®, monitor O2 Sensor voltage for at least 2 minutes. Does the voltage stay above 4.5 volts? Yes → Go To 3 No → Refer to the INTERMITTENT CONDITION symptom in the Driveability category. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
3	**NOTE: Allow the O2 sensor to cool down to room temperature.** Turn the ignition off. Disconnect the O2 Sensor harness connector. Measure the resistance across the O2 Sensor Heater element component side. **NOTE: Heater Resistance Specification: 3 to 20 ohms for Upstream and Downstream O2 Sensors.** Is the resistance within the specifications? Yes → Go To 4 No → Replace the O2 Sensor. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
4	Turn the ignition off. Disconnect the O2 Sensor harness connector. Measure the resistance between an engine ground and the O2 Heater Ground circuit in the O2 Sensor harness connector. Is the resistance below 0.5 of an ohm? Yes → Go To 5 No → Repair the open/high resistance in the O2 Heater Ground circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
5	Turn the ignition off. Disconnect the O2 Sensor harness connector. Disconnect the PCM harness connector. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the O2 Heater Control circuit from the O2 Sensor harness connector to the appropriate terminal of special tool #8815. Is the resistance below 0.5 of an ohm? Yes → Go To 6 No → Repair the open/high resistance in the O2 Heater Control circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

P0135-O2 SENSOR 1/1 HEATER PERFORMANCE — Continued

TEST	ACTION	APPLICABILITY
6	**NOTE: Before continuing, check the PCM harness connector terminals for corrosion, damage, terminal push out. Repair as necessary.** If there are no possible causes remaining, view repair. Repair Replace and program the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

Symptom:
P0171-FUEL SYSTEM 1/1 LEAN

When Monitored and Set Condition:

P0171-FUEL SYSTEM 1/1 LEAN

When Monitored: With the engine running in closed loop mode, the ambient/battery temperature above (-7°C)20°F, altitude below 8500 ft and fuel level greater than 15%.

Set Condition: If the PCM multiplies short term compensation by long term adaptive and a certain percentage is exceeded for two trips, a freeze frame is stored, the MIL illuminates and a trouble code is stored.

POSSIBLE CAUSES
GOOD TRIP EQUAL TO ZERO
RESTRICTED FUEL SUPPLY LINE
FUEL PUMP INLET STRAINER PLUGGED
FUEL PUMP MODULE
O2 SENSOR
O2 SIGNAL CIRCUIT
O2 RETURN CIRCUIT
O2 SENSOR HEATER OPERATION
THROTTLE POSITION SENSOR SWEEP
MAP SENSOR OPERATION
ECT SENSOR OPERATION
ENGINE MECHANICAL PROBLEM
FUEL CONTAMINATION/EXHAUST LEAK

TEST	ACTION	APPLICABILITY
1	**NOTE: Check for contaminants that may have damaged the O2 Sensor: contaminated fuel, unapproved silicone, oil and coolant.** **NOTE: Diagnose any Misfire DTC(s) first, if set along with the fuel system DTC.** Ignition on, engine not running. With the DRBIII®, read DTCs and record the related Freeze Frame data. Is the Good Trip Counter displayed and equal to zero? Yes → Go To 2 No → Refer to the INTERMITTENT CONDITION symptom in the Driveability category. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

P0171-FUEL SYSTEM 1/1 LEAN — Continued

TEST	ACTION	APPLICABILITY
2	**Warning: The fuel system is under a constant pressure (even with the engine off). Before testing or servicing any fuel system hose, fitting or line, the fuel system pressure must be released.** Install a fuel pressure gauge. Ignition on, engine not running. With the DRBIII®, actuate the ASD Fuel System test and observe the fuel pressure gauge. **NOTE: Fuel pressure specification is 400 KPa +/- 34 KPa (58 psi +/- 5 psi).** Turn the ignition off. Choose a conclusion that best matches your fuel pressure reading. Within Specification Go To 3 Below Specification Go To 12 **Caution: Stop All Actuations.**	All
3	**NOTE: If one of the O2 Sensors Signal or Return circuits are shorted to ground or voltage, all the other O2 Sensor voltage readings will be affected.** **NOTE: After the repairs have been made, verify proper O2 Sensor operation. If all the O2 Sensor voltage readings have not returned to normal, follow the diagnostic procedure for the remaining O2 Sensors.** Start the engine. Allow the engine to reach normal operating temperature. With the DRBIII®, read the O2 Sensor voltage. Is the voltage switching between 2.5 and 3.4 volts? Yes → Go To 4 No → Go To 9	All
4	Turn the ignition off. **NOTE: Allow the O2 Sensor to cool down before continuing the test. The O2 voltage should stabilize at 5.0 volts. Raising the hood may help in reducing under hood temps.** Ignition on, engine not running. With the DRBIII®, actuate the O2 Heater Test. With the DRBIII®, monitor O2 Sensor voltage for at least 2 minutes. Does the voltage stay above 4.5 volts? Yes → Replace the O2 Sensor. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 5	All
5	Ignition on, engine not running. With the DRBIII®, read the TP Sensor voltage. While monitoring the DRBIII®, slowly open and close the throttle. Does the voltage increase and decease smoothly? Yes → Go To 6 No → Replace the Throttle Position Sensor. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

P0171-FUEL SYSTEM 1/1 LEAN — Continued

TEST	ACTION	APPLICABILITY
6	Turn the ignition off. Connect a Vacuum Gauge to a Manifold Vacuum source. Start the engine. Allow the engine to idle. **Note: If engine will not idle, maintain a constant RPM above idle.** With the DRBIII® in Sensors, read the MAP Sensor vacuum value. Is the DRBIII® reading within 1″ of the Vacuum Gauge reading? Yes → Go To 7 No → Replace the MAP Sensor. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
7	**Note: For this test to be valid, the thermostat must be operating correctly.** **Note: This test works best if performed on a cold engine (cold soak)** Ignition on, engine not running. With the DRBIII®, read the Engine Coolant Temperature (ECT) Sensor value. If the engine was allowed to sit overnight (cold soak), the temperature value should be a sensible value that is somewhere close to the ambient temperature. **Note: If engine coolant temperature is above 82°C (180°F), allow the engine to cool until 65°C (150°F) is reached.** Start the Engine. During engine warm-up, monitor the ECT Sensor value. The temperature value change should be a smooth transition from start up to normal operating temperature 82°C (180°F). The value should reach at least 82°C (180°F). Did the ECT value increase with a smooth transition and did it reach at least 82°C? Yes → Go To 8 No → Replace the Engine Coolant Temperature Sensor. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
8	Check for any of the following conditions/mechanical problems. AIR INDUCTION SYSTEM - must be free from leaks. ENGINE VACUUM - must be at least 13 inches in neutral ENGINE VALVE TIMING - must be within specifications ENGINE COMPRESSION - must be within specifications ENGINE EXHAUST SYSTEM - must be free of any restrictions or leaks. ENGINE PCV SYSTEM - must flow freely TORQUE CONVERTER STALL SPEED - must be within specifications POWER BRAKE BOOSTER - no internal vacuum leaks FUEL - must be free of contamination FUEL INJECTOR - plugged or restricted injector; control wire not connected to correct injector Are there any engine mechanical problems? Yes → Repair as necessary. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Test Complete.	All

P0171-FUEL SYSTEM 1/1 LEAN — Continued

TEST	ACTION	APPLICABILITY
9	Ignition on, engine not running. Disconnect the O2 Sensor harness connector. With the DRBIII®, monitor the O2 Sensor voltage. The O2 Sensor voltage should read 5.0 volts on the DRBIII® with the connector disconnected. Using a jumper wire, jump the O2 Signal circuit to the O2 Return circuit at the O2 Sensor harness connector. **NOTE: The voltage should drop from 5.0 volts to 2.5 volts with the jumper wire in place.** Did the O2 Sensor volts change from 5.0 volts to 2.5 volts? Yes → Replace the O2 Sensor Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 10	All
10	Turn the ignition off. Disconnect the O2 Sensor harness connector. Ignition on, engine not running. With the DRBIII®, monitor the O2 Sensor voltage. Is the voltage above 4.8 volts? Yes → Go To 11 No → Check the O2 Signal circuit for a short to ground, open, or short to voltage. Inspect the O2 Sensor connector and the PCM harness connector. If OK, replace and program the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
11	Turn the ignition off. Disconnect the O2 Sensor harness connector. Ignition on, engine not running. Measure the voltage on the O2 Return circuit in the O2 Sensor harness connector. Is the voltage at 2.5 volts? Yes → Check the fuel system for contaminants. Also, check the exhaust system for any leaks. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Check the O2 Return circuit for a short to ground, open, or short to voltage. Inspect the O2 Sensor connector and the PCM harness connector. If OK, replace and program the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

P0171-FUEL SYSTEM 1/1 LEAN — Continued

TEST	ACTION	APPLICABILITY
12	Turn the ignition off. **Warning: The fuel system is under a constant pressure (even with the engine off). Before testing or servicing any fuel system hose, fitting or line, the fuel system pressure must be released.** Raise vehicle on hoist, and disconnect the fuel pressure line at the fuel pump module. Install special 5/16 fuel line adapter tool #6539 between the disconnected fuel line and the fuel pump module. Attach a fuel pressure test gauge to the T fitting on the tool #6539 Turn the ignition on. With the DRBIII®, actuate the ASD Fuel System test and observe the fuel pressure gauge. **NOTE: Fuel pressure specification is 400 KPa +/- 34 KPa (58 psi +/- 5 psi).** Is the fuel pressure within specification? Yes → Repair or replace fuel supply line as necessary. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 13 **Caution: Stop All Actuations.**	All
13	Turn the ignition off. **Warning: The fuel system is under a constant pressure (even with the engine off). Before testing or servicing any fuel system hose,fitting or line, the fuel system pressure must be released.** Remove the Fuel Pump Module and inspect the Fuel Inlet Strainer. Is the Fuel Inlet Strainer plugged? Yes → Replace the Fuel Pump Inlet Strainer. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 14	All
14	If there are no possible causes remaining, view repair. Repair Replace the Fuel Pump Module. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

Symptom:
P0172-FUEL SYSTEM 1/1 RICH

When Monitored and Set Condition:

P0172-FUEL SYSTEM 1/1 RICH

When Monitored: With the engine running in closed loop mode, the ambient/battery temperature above (-7°C)20°F and altitude below 8500 ft.

Set Condition: If the PCM multiplies short term compensation by long term adaptive as well as a purge fuel multiplier and the result is below a certain value for 30 seconds over two trips, a freeze frame is stored, the MIL illuminates and a trouble code is stored.

POSSIBLE CAUSES
GOOD TRIP EQUAL TO ZERO
O2 SENSOR HEATER OPERATION
O2 SENSOR
EVAP PURGE SOLENOID OPERATION
O2 SIGNAL CIRCUIT
O2 RETURN CIRCUIT
MAP SENSOR OPERATION
ECT SENSOR OPERATION
ENGINE MECHANICAL PROBLEM
FUEL FILTER/PRESSURE REGULATOR
PCM

TEST	ACTION	APPLICABILITY
1	**NOTE: Check for contaminants that may have damaged the O2 Sensor: contaminated fuel, unapproved silicone, oil and coolant.** Ignition on, engine not running. With the DRBIII®, read DTCs and record the related Freeze Frame data. Is the Good Trip Counter displayed and equal to zero? Yes → Go To 2 No → Refer to the INTERMITTENT CONDITION symptom in the Driveability category. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

P0172-FUEL SYSTEM 1/1 RICH — Continued

TEST	ACTION	APPLICABILITY
2	**Warning: The fuel system is under a constant pressure (even with the engine off). Before testing or servicing any fuel system hose, fitting or line, the fuel system pressure must be released.** Install a fuel pressure gauge. Ignition on, engine not running. With the DRBIII®, actuate the ASD Fuel System test and observe the fuel pressure gauge. **NOTE: Fuel pressure specification is 400 KPa +/- 34 KPa (58 psi +/- 5 psi).** Turn the ignition off. Choose a conclusion that best matches your fuel pressure reading. Within Specification Go To 3 Above Specification Replace the fuel filter/pressure regulator. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. **Caution: Stop All Actuations.**	All
3	**NOTE: If one of the O2 Sensors Signal or Return circuits are shorted to ground or voltage, all the other O2 Sensor voltage readings will be affected.** **NOTE: After the repairs have been made, verify proper O2 Sensor operation. If all the O2 Sensor voltage readings have not returned to normal, follow the diagnostic procedure for the remaining O2 Sensors.** Start the engine. Allow the engine to reach normal operating temperature. With the DRBIII®, read the O2 Sensor voltage. Is the voltage switching between 2.5 and 3.4 volts? Yes → Go To 4 No → Go To 9	All
4	Turn the ignition off. **NOTE: Allow the O2 Sensor to cool down before continuing the test. The O2 voltage should stabilize at 5.0 volts. Raising the hood may help in reducing under hood temps.** Ignition on, engine not running. With the DRBIII®, actuate the O2 Heater Test. With the DRBIII®, monitor O2 Sensor voltage for at least 2 minutes. Does the voltage stay above 4.5 volts? Yes → Replace the O2 Sensor. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 5	All
5	Turn the ignition off. Disconnect the hoses at the Evap Purge Solenoid. Using a hand vacuum pump, apply 10 inches of vacuum to the Evap Purge Solenoid vacuum source port on the component side. Did the Evap Purge Solenoid hold vacuum? Yes → Go To 6 No → Replace the EVAP Purge Solenoid. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

P0172-FUEL SYSTEM 1/1 RICH — Continued

TEST	ACTION	APPLICABILITY
6	Turn the ignition off. Connect a Vacuum Gauge to a Manifold Vacuum source. Start the engine. Allow the engine to idle. **Note: If engine will not idle, maintain a constant RPM above idle.** With the DRBIII® in Sensors, read the MAP Sensor vacuum value. Is the DRB reading within 1″ of the Vacuum Gauge reading? Yes → Go To 7 No → Replace the MAP Sensor. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
7	**Note: For this test to be valid, the thermostat must be operating correctly.** **Note: This test works best if performed on a cold engine (cold soak)** Ignition on, engine not running. With the DRBIII®, read the Engine Coolant Temperature Sensor value. If the engine was allowed to sit overnight (cold soak), the temperature value should be a sensible value that is somewhere close to the ambient temperature. **Note: If engine coolant temperature is above 82°C (180°F), allow the engine to cool until 65°C (150°F) is reached.** Start the Engine. During engine warm-up, monitor the Engine Coolant Temperature value. The temp value change should be a smooth transition from start up to normal operating temp 82°C (180°F). The value should reach at least 82°C (180°F). Did the Engine Coolant Temperature value increase a smooth transition and did it reach at least 82°C Yes → Go To 8 No → Replace the Engine Coolant Temperature Sensor. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
8	Check for any of the following conditions/mechanical problems. AIR INDUCTION SYSTEM - must be free from restrictions. ENGINE VACUUM - must be at least 13 inches in neutral ENGINE VALVE TIMING - must be within specifications ENGINE COMPRESSION - must be within specifications ENGINE EXHAUST SYSTEM - must be free of any restrictions or leaks. ENGINE PCV SYSTEM - must flow freely TORQUE CONVERTER STALL SPEED - must be within specifications POWER BRAKE BOOSTER - no internal vacuum leaks FUEL - must be free of contamination FUEL INJECTOR - plugged or restricted injector; control wire not connected to correct injector Are there any engine mechanical problems? Yes → Repair as necessary. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Test Complete.	All

P0172-FUEL SYSTEM 1/1 RICH — Continued

TEST	ACTION	APPLICABILITY
9	Ignition on, engine not running. Disconnect the O2 Sensor harness connector. With the DRBIII®, monitor the O2 Sensor voltage. The O2 Sensor voltage should read 5.0 volts on the DRBIII® with the connector disconnected. Using a jumper wire, jump from the O2 Signal circuit to the O2 Return circuit in the O2 Sensor harness connector. **NOTE: The voltage should drop from 5.0 volts down to 2.5 volts with the jumper wire connected.** Did the O2 Sensor voltage drop from 5 volts to 2.5 volts? Yes → Replace the O2 Sensor Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 10	All
10	Turn the ignition off. Disconnect the O2 Sensor harness connector. Turn the ignition on. Measure the voltage of the O2 Signal circuit in the O2 Sensor harness connector. Is the voltage above 4.8 volts? Yes → Check the O2 Signal circuit for damage, short to ground, open, or short to voltage. Inspect the O2 Sensor connector and the PCM harness connector. If OK, replace the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 11	All
11	Turn the ignition off. Disconnect the O2 Sensor harness connector. Turn the ignition on. Measure the voltage on the O2 Return circuit in the O2 Sensor harness connector. Is the voltage at 2.5 volts? Yes → NOTE: Before continuing, check the PCM harness connector terminals for corrosion, damage, or terminal push out. Repair as necessary. Replace and program the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Check the O2 Return circuit for damage, short to ground, open, or short to voltage. Inspect the O2 Sensor connector and the PCM harness connector. If OK, replace the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

Symptom List:

P0201-FUEL INJECTOR #1
P0202-FUEL INJECTOR #2
P0203-FUEL INJECTOR #3
P0204-FUEL INJECTOR #4

Test Note: All symptoms listed above are diagnosed using the same tests. The title for the tests will be P0201-FUEL INJECTOR #1.

When Monitored and Set Condition:

P0201-FUEL INJECTOR #1

When Monitored: With battery voltage greater than 10 volts. Auto Shutdown Relay energized. Engine speed less than 3000 rpm.

Set Condition: No inductive spike is detected after injector turn off. One Trip Fault.

P0202-FUEL INJECTOR #2

When Monitored: With battery voltage greater than 10 volts. Auto Shutdown Relay energized. Engine speed less than 3000 rpm.

Set Condition: No inductive spike is detected after injector turn off. One Trip Fault.

P0203-FUEL INJECTOR #3

When Monitored: With battery voltage greater than 10 volts. Auto Shutdown Relay energized. Engine speed less than 3000 rpm.

Set Condition: No inductive spike is detected after injector turn off. One Trip Fault.

P0204-FUEL INJECTOR #4

When Monitored: With battery voltage greater than 10 volts. Auto Shutdown Relay energized. Engine speed less than 3000 rpm.

Set Condition: No inductive spike is detected after injector turn off. One Trip Fault.

POSSIBLE CAUSES
GOOD TRIP EQUAL TO ZERO
ASD RELAY OUTPUT CIRCUIT
FUEL INJECTOR
INJECTOR CONTROL CIRCUIT OPEN
INJECTOR CONTROL CIRCUIT SHORTED TO GROUND
PCM

P0201-FUEL INJECTOR #1 — Continued

TEST	ACTION	APPLICABILITY
1	Ignition on, engine not running. With the DRBIII®, read DTCs and record the related Freeze Frame data. Is the Good Trip Counter displayed and equal to zero? Yes → Go To 2 No → Refer to the INTERMITTENT CONDITION symptom in the Driveability category. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
2	Turn the ignition off. Disconnect the Fuel Injector harness connector. Ignition on, engine not running. With the DRBIII®, actuate the ASD Relay. Using a 12-volt test light connected to ground, backprobe the ASD Relay Output circuit at the Fuel Injector harness connector. Does the test light illuminate brightly? Yes → Go To 3 No → Repair the open or high resistance in the ASD Relay Output circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
3	Turn the ignition off. Disconnect the Fuel Injector harness connector. Ignition on, engine not running. Using a 12-volt test light connected to 12-volts, backprobe the Injector Control circuit. With the DRBIII®, actuate the Fuel Injector. Does the test light blink/flicker? Yes → Replace the Fuel Injector. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 4	All
4	Turn the ignition off. Disconnect the Fuel Injector harness connector. Disconnect the PCM harness connectors. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the Injector Control circuit from the Fuel Injector harness connector to the appropriate terminal of special tool #8815. Is the resistance below 5.0 ohms? Yes → Go To 5 No → Repair the open in the Injector Control circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

P0201-FUEL INJECTOR #1 — Continued

TEST	ACTION	APPLICABILITY
5	Turn the ignition off. Disconnect the Fuel Injector harness connector. Disconnect the PCM harness connectors. Measure the resistance between ground and the Injector Control circuit at the Fuel Injector harness connector. Is the resistance below 100 ohms? Yes → Repair the short to ground in the Injector Control circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 6	All
6	**NOTE: Before continuing, check the PCM harness connector terminals for corrosion, damage, or terminal push out. Repair as necessary.** If there are no possible causes remaining, view repair. Repair Replace and program the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

Symptom List:

P0234-OVERBOOST PERFORMANCE
P1106-BARO SOLENOID PERFORMANCE
P1188 TIP SENSOR PERFORMANCE

Test Note: All symptoms listed above are diagnosed using the same tests. The title for the tests will be P0234-OVERBOOST PERFORMANCE.

When Monitored and Set Condition:

P0234-OVERBOOST PERFORMANCE

When Monitored: With the engine running.

Set Condition: The TIP Sensor signal indicates excessive boost pressure.

P1106-BARO SOLENOID PERFORMANCE

When Monitored: With the engine in turbocharger boost mode.

Set Condition: The PCM does not detect sufficient difference between TIP Sensor signal and BARO Pressure signal during turbocharger boost mode.

P1188 TIP SENSOR PERFORMANCE

When Monitored: During the engine turbocharger boost and non-boost modes.

Set Condition: Non-boost Mode: PCM detects a significant difference between TIP Sensor signal and BARO Pressure signal. Boost Mode: The TIP Sensor is unable to read correct boost level.

POSSIBLE CAUSES
CHECKING FOR OTHER DTCS
CHECKING THE HOSES AND TUBING
CHECKING THE VACUUM SUPPLY TO SURGE SOLENOID
CONFIRM ALL SOLENOID TEST
GOOD TRIP EQUAL TO ZERO
SOLENOID #3 TEST
SOLENOID TEST #1
SOLENOID TEST #2
SOLENOID TEST #4
TURBOCHARGER
WASTEGATE ACTUATOR

P0234-OVERBOOST PERFORMANCE — Continued

TEST	ACTION	APPLICABILITY
1	Ignition on, engine not running. With the DRBIII®, read PCM DTCs and record the related Freeze Frame data. Is the Good Trip displayed and equal to zero? Yes → Go To 2 No → Refer to the INTERMITTENT CONDITION symptom in the Driveability category.	All
2	Turn the ignition on. With the DRBIII®, read the PCM DTCs. **NOTE: If there are any other MAP Sensor or Throttle Inlet Pressure Sensor DTCs present, repair the other MAP Sensor or Throttle Inlet Pressure Sensors before continuing.** Does the DRB display any other DTCs? Yes → Refer to symptom list for problems related to MAP Sensor or Throttle Inlet Pressure Sensor. No → Go To 3	All
3	**NOTE: The exhaust system must be free from any restriction to perform this test.** Check all of the tubes and hoses between the air cleaner and the intake manifold for loose connection, damage or restriction. Check all of the tubes connected to the intercooler for loose connection, damage or restriction. Check all of the tubes and hoses connected to the turbocharger, TIP Solenoid, Surge Solenoid and Wastegate Solenoid for loose connection, damage or restriction. **NOTE: Solenoid design and hose connections are identical for all three solenoids. It is possible to connect the hoses to the incorrect solenoid. Verify that hoses are connected to the correct solenoid.** Are any of these conditions evident? Yes → Repair or replace as necessary. No → Go To 4	All
4	Turn the ignition off. Disconnect the hoses from the Surge Solenoid. Connect a vacuum gauge to Surge Solenoid hose C. Allow the engine to reach normal operating temperature. Observe and note the vacuum gauge reading. Is the vacuum at idle above 15 inches? Yes → Go To 5 No → Repair or replace as necessary.	All
5	Turn the ignition off. Using regulated air pressure slowly apply from 0 psi to 10 psi to the wastegate actuator while observing the wastegate actuator arm. **NOTE: The wastegate actuator arm should extend approximately 1/2 to 3/4 inches as air pressure is applied.** Does the wastegate actuator arm extend 1/2 to 3/4 inch when 10 psi air pressure is applied? Yes → Go To 6 No → Replace the Turbocharger assembly in accordance with the Service Information.	All

P0234-OVERBOOST PERFORMANCE — Continued

TEST	ACTION	APPLICABILITY
6	**NOTE: This engine system utilizes three solenoids to control turbocharger operation. Perform the following four Solenoid Tests on each of the three solenoids one at a time.** Turn the ignition off. Disconnect the hoses from the appropriate Solenoid. Install a plug on the Solenoid hose B connection point. Connect a vacuum pump to the Solenoid hose A connection point. With vacuum pump apply 20 inches of vacuum to the Solenoid hose A connection point. **NOTE: Vacuum reading should not drop below 10 inches within 5 seconds.** Does vacuum read above 10 inches for at least 5 seconds? Yes → Go To 7 No → Replace the appropriate Solenoid.	All
7	Turn the ignition off. Disconnect the hoses from the appropriate Solenoid. Install a plug on the Solenoid hose C connection point. Connect a vacuum pump to the Solenoid hose A connection point. Attempt to apply 20 inches of vacuum to the Solenoid hose A connection point. **NOTE: Vacuum should escape through the Solenoid hose B connection point.** Does vacuum escape through the Solenoid hose B connection point? Yes → Go To 8 No → Replace the appropriate Solenoid.	All
8	Turn the ignition off. Disconnect the hoses from the appropriate Solenoid. Install a plug on Solenoid hose C connection point. Connect a vacuum pump to the Solenoid hose B connection point. **NOTE: For the result of this test to be accurate the solenoid must be turned on. Apply 12 volts and Ground to the appropriate solenoid terminals to turn the solenoid on.** With vacuum pump apply 20 inches of vacuum to the Solenoid hose B connection point. **NOTE: Vacuum reading should not drop below 10 inches within 5 seconds.** Does vacuum read above 10 inches for at least 5 seconds? Yes → Go To 9 No → Replace the appropriate Solenoid.	All
9	Turn the ignition off. Disconnect the hoses from the appropriate Solenoid. Install a plug on the Solenoid hose A connection point. Connect a vacuum pump to the Solenoid hose B connection point. **NOTE: For the result of this test to be accurate the solenoid must be turned on. Apply 12 volts and Ground to the appropriate solenoid terminals to turn the solenoid on.** Attempt to apply 20 inches of vacuum to the Solenoid hose B connection point. **NOTE: Vacuum should escape through the Solenoid hose C connection point.** Does vacuum escape through the Solenoid hose C connection point? Yes → Go To 10 No → Replace the appropriate Solenoid.	All

P0234-OVERBOOST PERFORMANCE — Continued

TEST	ACTION	APPLICABILITY
10	Did all the solenoids function correctly? Yes → Replace the Turbocharger assembly in accordance with the Service Information. No → Replace Solenoid(s) as necessary.	All

Symptom:
P0243-WASTEGATE SOLENOID CIRCUIT

When Monitored and Set Condition:

P0243-WASTEGATE SOLENOID CIRCUIT

When Monitored: The ignition on or engine running. Battery voltage greater than 10 volts.

Set Condition: The PCM will set the DTC if the actual state of the solenoid does not match the intended state.

POSSIBLE CAUSES
GOOD TRIP EQUAL TO ZERO
WASTEGATE SOLENOID OPERATION
(Z1) WASTEGATE SOLENOID GROUND CIRCUIT
(K137) WASTE SOL CONTROL CIRCUIT SHORTED TO BATTERY VOLTAGE
(K137) WASTEGATE SOL CONTROL CIRCUIT OPEN
(K137) WASTEGATE SOL CONTROL CIRCUIT SHORTED TO GROUND
PCM

TEST	ACTION	APPLICABILITY
1	Ignition on, engine not running. With the DRBIII®, read PCM DTCs and record the related Freeze Frame data. Is the Good Trip displayed and equal to zero? Yes → Go To 2 No → Refer to the INTERMITTENT CONDITION symptom in the Driveability category. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
2	Turn the ignition off. Disconnect the Wastegate Solenoid harness connector. Using a 12-volt test light, jumper across the Wastegate Solenoid harness connector. **NOTE: While actuating the solenoid wiggle the related wiring harness.** With the DRBIII®, actuate the Wastegate Solenoid. Does the test light illuminate brightly and flash on and off? Yes → Replace the Wastegate Solenoid. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 3	All

P0243-WASTEGATE SOLENOID CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
3	Turn the ignition off. Disconnect the Wastegate Solenoid harness connector. Using a 12-volt test light connected to battery voltage, probe the (Z1) Ground circuit in the Wastegate harness connector. Does the test light illuminate brightly? Yes → Go To 4 No → Repair the (Z1) Ground circuit for an open. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
4	**NOTE: The Wastegate Sol Control circuit is a high side control circuit. When the circuit is operating normally voltage will be present.** Turn the ignition off. Disconnect the Wastegate Solenoid harness connector. Disconnect the PCM harness connectors. Turn the ignition on Measure the voltage of the (K137) Wastegate Sol Control circuit in the Wastegate Solenoid harness connector. Does the voltmeter indicate any voltage present? Yes → Repair the short to voltage in the (K137) Wastegate Sol Control circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 5	All
5	Turn the ignition off. Disconnect the Wastegate Solenoid harness connector. Disconnect the PCM harness connectors. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the (K137) Wastegate Sol Control circuit from the Wastegate Solenoid harness connector to the appropriate terminal of special tool #8815. Is the resistance below 5.0 ohms? Yes → Go To 6 No → Repair the open in the (K137) Wastegate Sol Control circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
6	Turn the ignition off. Disconnect the Wastegate Solenoid harness connector. Disconnect the PCM harness connectors. Measure the resistance between ground and the (K137) Wastegate Sol Control circuit at the Wastegate Solenoid harness connector. Is the resistance below 100 ohms? Yes → Repair the short to ground in the (K137) Wastegate Sol Control circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 7	All

P0243-WASTEGATE SOLENOID CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
7	**NOTE: Before continuing, check the PCM harness connector terminals for corrosion, damage, or terminal push out. Repair as necessary.** If there are no possible causes remaining, view repair. Repair Replace and program the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

Symptom List:

P0300-MULTIPLE CYLINDER MISFIRE
P0301-CYLINDER #1 MISFIRE
P0302-CYLINDER #2 MISFIRE
P0303-CYLINDER #3 MISFIRE
P0304-CYLINDER #4 MISFIRE

Test Note: All symptoms listed above are diagnosed using the same tests. The title for the tests will be P0300-MULTIPLE CYLINDER MISFIRE.

When Monitored and Set Condition:

P0300-MULTIPLE CYLINDER MISFIRE

When Monitored: Any time the engine is running, and the Target Learning Coefficient has been successfully updated.

Set Condition: When more than a 1.0% misfire rate is measured during two trips.

P0301-CYLINDER #1 MISFIRE

When Monitored: Any time the engine is running, and the Target Learning Coefficient has been successfully updated.

Set Condition: When more than a 1.0% misfire rate is measured during two trips.

P0302-CYLINDER #2 MISFIRE

When Monitored: Any time the engine is running, and the Target Learning Coefficient has been successfully updated.

Set Condition: When more than a 1.0% misfire rate is measured during two trips.

P0303-CYLINDER #3 MISFIRE

When Monitored: Any time the engine is running, and the Target Learning Coefficient has been successfully updated.

Set Condition: When more than a 1.0% misfire rate is measured during two trips.

P0304-CYLINDER #4 MISFIRE

When Monitored: Any time the engine is running, and the Target Learning Coefficient has been successfully updated.

Set Condition: When more than a 1.0% misfire rate is measured during two trips.

POSSIBLE CAUSES
INTERMITTENT MISFIRE
VISUAL AND PHYSICAL INSPECTION

P0300-MULTIPLE CYLINDER MISFIRE — Continued

POSSIBLE CAUSES
IGNITION WIRE
ASD RELAY OUPUT CIRCUIT (COIL)
ENGINE MECHANICAL PROBLEM
IGNITION COIL
COIL CONTROL CIRCUIT
SPARK PLUG
CHECKING FUEL PRESSURE
FUEL PUMP INLET STRAINER PLUGGED
RESTRICTED FUEL SUPPLY LINE
FUEL PUMP MODULE
CHECKING FUEL LEAK DOWN
FUEL INJECTOR OPERATION
ASD RELAY OUTPUT CIRCUIT (INJECTOR)
FUEL INJECTOR
INJECTOR CONTROL CIRCUIT
PCM (IGNITION SYSTEM)
PCM

TEST	ACTION	APPLICABILITY
1	Read and record the FREEZE FRAME DATA. Select OBD II MONITORS. Read and record the MIS-FIRE SIMILAR CONDITIONS WINDOW DATA. With these screens, attempt to duplicate the condition(s) that has set this DTC. When the vehicle is operating in the SIMILAR CONDITIONS WINDOW, refer to the WHICH CYLINDER IS MISFIRING screen. Observe the WHICH CYLINDER IS MISFIRING screen for at least one minute. Is there a misfire present? Yes → Go To 2 No → Go To 18	All

P0300-MULTIPLE CYLINDER MISFIRE — Continued

TEST	ACTION	APPLICABILITY
2	**NOTE: Reviewing the vehicle repair history may aid in the repair of the misfire condition.** Visually and physically inspect the engine for any of the following conditions. - Worn serpentine belt - Binding Engine-Driven accessories. - Misaligned water pump, P/S pump and A/C compressor pulleys - Improper CKP sensor mounting - Poor connector/terminal to component connection. i.e., CKP sensor, Fuel Injector, Ign coil, etc. - Vacuum leaks - Restricted Air Induction system **NOTE: Verify the integrity of the powers and grounds for the PCM.** Were any of the above conditions present? Yes → Repair as necessary. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 3	All
3	Turn the ignition off. Disconnect the Ignition wire from the spark plug. **NOTE: Before continuing, inspect the ignition wire for damage or carbon tracking. Replace as necessary.** Install a spark tester to the ignition wire. While cranking the engine, observe the spark coming from the spark tester. **NOTE: A crisp blue spark should be generated that is able to jump the gap of the spark tester.** Is good spark present? Yes → Go To 4 No → Go To 14	All
4	Turn the ignition off. Remove the Spark Plug. Inspect the Spark Plug for the following conditions. - Cracks - Carbon Tracking - Foreign Material - Gap size out of specifications - Loose or broke electrode **NOTE: Lightly tap the bottom of the spark plug on a solid surface. The electrode in the spark plug should not move.** Were any of the above condition present? Yes → Replace the Spark Plug. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 5	All

P0300-MULTIPLE CYLINDER MISFIRE — Continued

TEST	ACTION	APPLICABILITY
5	**Warning: The fuel system is under a constant pressure (even with the engine off). Before testing or servicing any fuel system hose, fitting or line, the fuel system pressure must be released.** Install a fuel pressure gauge. Start the engine and observe the fuel pressure reading. **NOTE: Fuel pressure specification is 400 KPa +/- 34 KPa (58 psi +/- 5 psi).** Choose a conclusion that best matches your fuel pressure reading. Within Specification Go To 6 Below Specification Go To 12 Above Specification Replace the fuel filter/pressure regulator. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
6	**NOTE: Before continuing visually and physically inspect the fuel delivery system for external leaks or damage. Repair /replace as necessary.** Turn the ignition off. **WARNING: The fuel system is under a constant pressure even with the engine off. Before testing or servicing any fuel system hose, fitting or line, the fuel system pressure must be released.** Install special 5/16 fuel line adapter tool #6539. Attach a fuel pressure test gauge to the T fitting on the tool #6539 Start the engine and allow the fuel system to reach maximum pressure. Turn the ignition off. **NOTE: Fuel specification is 400 KPa +/- 34 KPa (58 psi +/- 5 psi).** Using special tool #C4390, Hose Clamp Pliers, slowly clamp off the rubber hose on the Fuel Pressure adapter between the fuel pressure gauge and the fuel pump module. Monitor the fuel pressure gauge for a minimum of 5 minutes. **NOTE: The pressure should not fall below 241 KPa (35 psi)** Does the fuel pressure gauge fall below the above specification? Yes → Replace the leaking Injector(s). Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 7	All
7	**Warning: The fuel system is under a constant pressure (even with the engine off). Before testing or servicing any fuel system hose, fitting or line, the fuel system pressure must be released.** **CAUTION: After each actuation of the Fuel Injector, start the engine to clear the cylinder of fuel. Failure to do so could cause engine damage.** Install a Fuel Pressure Gauge to the fuel rail. Start the engine and allow the fuel pressure to reach maximum pressure. Turn the engine off, leaving the ignition on. Using the DRBIII®, actuate the Fuel Injector for the cylinder that indicated the misfire. Monitor the fuel pressure gauge. Does the fuel pressure gauge indicate a drop in fuel pressure? Yes → Go To 8 No → Go To 9	All

P0300-MULTIPLE CYLINDER MISFIRE — Continued

TEST	ACTION	APPLICABILITY
8	Check for any of the following conditions/mechanical problems. ENGINE VACUUM - must be at least 13 inches in neutral ENGINE VALVE TIMING - must be within specifications ENGINE COMPRESSION - must be within specifications ENGINE EXHAUST SYSTEM - must be free of any restrictions or leaks. ENGINE PCV SYSTEM - must flow freely TORQUE CONVERTER STALL SPEED - must be within specifications POWER BRAKE BOOSTER - no internal vacuum leaks FUEL - must be free of contamination Are there any engine mechanical problems? Yes → Repair as necessary. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 18	All
9	Turn the ignition off. Disconnect the Fuel Injector harness connector. Ignition on, engine not running. With the DRBIII®, actuate the ASD Relay. Using a 12-volt test light connected to ground, probe the ASD Relay Output circuit at the Fuel Injector harness connector. Does the test light illuminate brightly? Yes → Go To 10 No → Repair the ASD Relay Output circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
10	Turn the ignition off. Disconnect the Fuel Injector harness connector. Ignition on, engine not running. Using a 12-volt test light connected to 12-volts, probe the Injector Control circuit. With the DRBIII®, actuate the Fuel Injector. Does the test light blink/flicker? Yes → Replace the Fuel Injector. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 11	All
11	Turn the ignition off. Disconnect the Fuel Injector harness connector. Disconnect the PCM harness connectors. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Check the Injector Control circuit. Was a problem found with the Injector Control circuit? Yes → Repair the Injector Control circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → NOTE: Before continuing, check the PCM harness connector terminals for corrosion, damage, or terminal push out. Repair as necessary. Replace and program the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

P0300-MULTIPLE CYLINDER MISFIRE — Continued

TEST	ACTION	APPLICABILITY
12	Turn the ignition off. **Warning: The fuel system is under a constant pressure (even with the engine off). Before testing or servicing any fuel system hose, fitting or line, the fuel system pressure must be released.** Raise vehicle on hoist, and disconnect the fuel pressure line at the fuel pump module. Install special 5/16 fuel line adapter tool #6539 between the disconnected fuel line and the fuel pump module. Attach a fuel pressure test gauge to the T fitting on the tool #6539 Ignition on, engine not running. With the DRBIII®, actuate the ASD Fuel System test and observe the fuel pressure gauge. **NOTE: Fuel pressure specification is 400 KPa +/- 34 KPa (58 psi +/- 5 psi).** Is the fuel pressure within specification? Yes → Repair or replace fuel supply line as necessary. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 13	All
13	Turn the ignition off. **Warning: The fuel system is under a constant pressure (even with the engine off). Before testing or servicing any fuel system hose,fitting or line, the fuel system pressure must be released.** Remove the Fuel Pump Module and inspect the Fuel Inlet Strainer. Is the Fuel Inlet Strainer plugged? Yes → Replace the Fuel Pump Inlet Strainer. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → NOTE: Before continuing, check the Fuel Pump Module harness connector terminals for corrosion, damage, or terminal push out. Ensure the ground circuit is operating properly. Repair as necessary. Replace the Fuel Pump Module. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
14	Turn the ignition off. Remove the ignition wire. Measure the resistance of the ignition wire. Is the resistance below 10K ohms? Yes → Go To 15 No → Replace the Ignition Wire. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
15	Turn the ignition off. Disconnect the Ignition Coil harness connector. Ignition on, engine not running. With the DRBIII®, actuate the ASD Relay. Using a 12-volt test light connected to ground, probe the ASD Relay Output circuit at the Ignition Coil harness connector. Does the test light illuminate brightly? Yes → Go To 16 No → Repair the ASD Relay Output circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

P0300-MULTIPLE CYLINDER MISFIRE — Continued

TEST	ACTION	APPLICABILITY
16	Turn the ignition off. Disconnect the Ignition Coil harness connector. Using a 12-volt test light connected to 12-volts, probe the Ignition Coil Control circuit. Crank the engine for 5 second while observing the test light. Does the test light blink/flicker? Yes → Replace the Ignition Coil. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 17	All
17	Turn the ignition off. Disconnect the Ignition Coil harness connector. Disconnect the PCM harness connector. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Check the Coil Control circuit. Was a problem found with the Coil Control circuit? Yes → Repair the Coil Control circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → NOTE: Before continuing, check the PCM harness connector terminals for corrosion, damage, or terminal push out. Repair as necessary. Replace and program the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

P0300-MULTIPLE CYLINDER MISFIRE — Continued

TEST	ACTION	APPLICABILITY
18	**NOTE: The conditions that set the DTC are not present at this time.** **WARNING: WHEN THE ENGINE IS OPERATING, DO NOT STAND IN A DIRECT LINE WITH THE FAN. DO NOT PUT YOUR HANDS NEAR THE PULLEYS, BELTS OR FAN. DO NOT WEAR LOOSE CLOTHING.** Refer to any Technical Service Bulletins (TSBs) that may apply. Review the DRB Freeze Frame information. If possible, try to duplicate the conditions under which the DTC set. With the engine running at normal operating temperature, monitor the DRB parameters related to the DTC while wiggling the wire harness. Look for parameter values to change and/or a DTC to set. Visually inspect the related wire harness. Look for any chafed, pierced, pinched, partially broken wires and broken, bent, pushed out, or corroded terminals. **CAUTION: NEVER PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Inspect and clean all PCM, engine, and chassis grounds. **NOTE: Reviewing the vehicle repair history may aid in the repair of the misfire condition.** Visually and physically inspect the engine for any of the following conditions. - Worn serpentine belt - Binding Engine-Driven accessories. - Misaligned water pump, P/S pump and A/C compressor pulleys - Improper CKP sensor mounting - Poor connector/terminal to component connection. i.e., CKP sensor, Fuel Injector, Ign coil, etc. - Vacuum leaks - Restricted Air Induction system Were any of the above conditions present? Yes → Repair as necessary. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Test Complete.	All

Symptom:
P0315-NO CRANK SENSOR LEARNED

When Monitored and Set Condition:

P0315-NO CRANK SENSOR LEARNED

When Monitored: Under closed throttle decel and A/C off. ECT above 75°C (167°F). Engine start time is greater than 50 seconds.

Set Condition: One of the CKP sensor target windows has more than 2.86% variance from the reference. One Trip Fault.

POSSIBLE CAUSES
DTC VERIFICATION
TONE WHEEL/PULSE RING INSPECTION
WIRING HARNESS INSPECTION
CRANKSHAFT POSITION SENSOR

TEST	ACTION	APPLICABILITY
1	**NOTE: Check for any TSBs that may apply to this symptom.** Ignition on, engine not running. With the DRBIII®, clear DTCs, and perform the PCM battery disconnect to reset the PCM. Start the engine. If the MIL has not yet illuminated, test drive the vehicle to try to get the code to reset. Does the code reset while cranking or during the test drive? Yes → Go To 2 No → Refer to the INTERMITTENT CONDITION symptom in the Driveability category. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
2	Visually inspect the CKP wire harness. Look for any chafed, pierced, pinched, or partially broken wires. Visually inspect the CKP wire harness connectors. Look for broken, bent, pushed out, or corroded terminals. Ensure the Crankshaft Position Sensor is properly installed and the mounting bolt tight. Refer to any TSB that may apply. Were any of the above conditions present? Yes → Repair as necessary Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 3	All

P0315-NO CRANK SENSOR LEARNED — Continued

TEST	ACTION	APPLICABILITY
3	Turn the ignition off. Remove the Crankshaft Position Sensor. Inspect the Tone Wheel/Flex Plate slots for damage, foreign material, or excessive movement. Were any problems found? Yes → Repair or replace the Tone Wheel/Flex Plate as necessary. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 4	All
4	If there are no possible causes remaining, view repair. Repair Replace the Crankshaft Position Sensor. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

Symptom:
P0325-KNOCK SENSOR #1 CIRCUIT

When Monitored and Set Condition:

P0325-KNOCK SENSOR #1 CIRCUIT

When Monitored: With the ignition on and the engine running.

Set Condition: The Knock Sensor circuit voltage falls below a minimum value. The minimum value is from a look-up table internal to the PCM and is based on engine rpm. DTC also sets if sensor output is approx 5.0 volts and the engine is running within idle range. One Trip Fault.

POSSIBLE CAUSES
GOOD TRIP EQUAL TO ZERO
KNOCK SENSOR CIRCUIT SHORTED TO VOLTAGE
KNOCK SENSOR CIRCUIT SHORTED TO GROUND
(K42) KS SIGNAL CIRCUIT OPEN
(K42) KS SIGNAL CIRCUIT SHORTED TO (K45) KS RETURN CIRCUIT
(K45) KS RETURN CIRCUIT OPEN
KNOCK SENSOR

TEST	ACTION	APPLICABILITY
1	Ignition on, engine not running. With the DRBIII®, read DTCs and record the related Freeze Frame data. Is the Good Trip displayed and equal to zero? Yes → Go To 2 No → Refer to the INTERMITTENT CONDITION symptom in the Driveability category. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
2	Turn the ignition off. Disconnect the Knock Sensor harness connector. Measure the voltage of the (K42) Knock Sensor Signal circuit and the (K45) Knock Sensor Return circuit in the Knock Sensor harness connector. Is the voltage above 2.0 volts on either circuit? Yes → Repair the short to voltage in the Knock Sensor circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 3	All

P0325-KNOCK SENSOR #1 CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
3	Turn the ignition off. Disconnect the Knock Sensor harness connector. Disconnect the PCM harness connector. Measure the resistance between ground and the (K42) and (K45) circuits at the Knock Sensor harness connector. Is the resistance to ground below 100 ohms on either circuit? Yes → Repair the short to ground in the Knock Sensor circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 4	All
4	Turn the ignition off. Disconnect the Knock Sensor harness connector. Disconnect the PCM harness connector. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the (K42) KS Signal circuit from the Knock Sensor harness connector to the appropriate terminal of special tool #8815. Is the resistance below 5.0 ohms? Yes → Go To 5 No → Repair the open in the (K42) KS Signal circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
5	Turn the ignition off. Disconnect the Knock Sensor harness connector. Measure the resistance between the (K42) KS Signal circuit and the (K45) KS Return circuit in the Knock Sensor harness connector. Is the resistance below 100 ohms? Yes → Repair the (K42) KS Signal circuit for a short to (K45) KS Return circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 6	All
6	Turn the ignition off. Disconnect the Knock Sensor harness connector. Disconnect the PCM harness connector. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the (K45) KS Return circuit from the Knock Sensor harness connector to the appropriate terminal of special tool #8815. Is the resistance below 5.0 ohms? Yes → Go To 7 No → Repair the open in the (K45) KS Return circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

P0325-KNOCK SENSOR #1 CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
7	Turn the ignition off. Replace the Knock Sensor. Ignition on, engine not running. With the DRBIII®, erase DTC. Attempt to operate the vehicle using the information noted in the Freeze Frame. With the DRBIII®, read DTC's. Does the DRBIII® display the DTC that was previously erased? Yes → NOTE: Before continuing, check the PCM harness connector terminals for corrosion, damage, or terminal push out. Repair as necessary. Replace and program the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Test Complete.	All

Symptom:
P0335-CRANKSHAFT POSITION SENSOR CIRCUIT

When Monitored and Set Condition:

P0335-CRANKSHAFT POSITION SENSOR CIRCUIT

When Monitored: Engine cranking.

Set Condition: No CKP signal is present during engine cranking, and at least 8 camshaft position sensor signals have occurred. One trip fault.

POSSIBLE CAUSES
CHECKING INTERMITTENT CMP SIGNAL WITH LAB
INTERMITTENT CKP SIGNAL
(K7) 5 VOLT SUPPLY CIRCUIT SHORTED TO GROUND
(K7) 5 VOLT SUPPLY CIRCUIT OPEN
(K7) 5 VOLT SUPPLY CIRCUIT SHORTED TO VOLTAGE
(K24) CKP SIGNAL CIRCUIT SHORTED GROUND
(K24) CKP SIGNAL CIRCUIT OPEN
(K24) CKP SIGNAL CIRCUIT SHORTED TO VOLTAGE
(K24) CKP SIGNAL SHORTED TO (K7) 5 VOLT SUPPLY CIRCUIT
(K4) SENSOR GROUND CIRCUIT OPEN
PCM - (K7) 5 VOLT SUPPLY
PCM - (K24) CKP SIGNAL
CRANKSHAFT POSITION SENSOR

TEST	ACTION	APPLICABILITY
1	Start the engine. With the DRBIII®, read the CKP SYNC State. Does the DRBIII® display CKP SYNC state IN SYNC? Yes → Go To 2 No → Go To 4	All

P0335-CRANKSHAFT POSITION SENSOR CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
2	Turn the ignition off. With the DRBIII® lab scope probe and the Miller special tool #6801, back probe the (K44) Camshaft Position (CMP) Sensor Signal circuit in the CMP harness connector. **WARNING: WHEN THE ENGINE IS OPERATING, DO NOT STAND IN A DIRECT LINE WITH THE FAN. DO NOT PUT YOUR HANDS NEAR THE PULLEYS, BELTS OR FAN. DO NOT WEAR LOOSE CLOTHING.** Ignition on, engine not running. Wiggle the related wire harness and lightly tap on the Cam Position Sensor. Observe the lab scope screen. Look for any pulses generated by the CMP Sensor. Start the engine. Allow the engine to idle. Observe the lab scope screen. Did the CMP Sensor generate any erratic pulses? Yes → Repair as necessary. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 3	All
3	Turn the ignition off. With the DRBIII® lab scope probe and the Miller special tool #6801, backprobe the (K24) CKP Signal circuit in the CKP harness connector. **WARNING: WHEN THE ENGINE IS OPERATING, DO NOT STAND IN A DIRECT LINE WITH THE FAN. DO NOT PUT YOUR HANDS NEAR THE PULLEYS, BELTS OR FAN. DO NOT WEAR LOOSE CLOTHING.** Ignition on, engine not running. Wiggle the related wire harness and lightly tap on the Crank Position Sensor. Observe the lab scope screen. Look for any pulses generated by the CKP Sensor. Start the engine. Allow the engine to idle. Observe the lab scope screen. Did the CKP Sensor generate any pulses? Yes → Repair as necessary. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Test Complete.	All
4	Turn the ignition off. Disconnect the CKP Sensor harness connector. Ignition on, engine not running. Measure the voltage of the (K7) 5 Volt Supply circuit in the CKP Sensor harness connector. Is the voltage between 4.5 and 5.5 volts? Yes → Go To 5 No → Go To 13	All
5	Turn the ignition off. Disconnect the CKP Sensor harness connector. Ignition on, engine not running. Measure the voltage of the (24) CKP Signal circuit in the CKP Sensor harness connector. Is the voltage between 4.5 and 5.0 volts? Yes → Go To 6 No → Go To 8	All

P0335-CRANKSHAFT POSITION SENSOR CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
6	Turn the ignition off. Disconnect the CKP Sensor harness connector. Disconnect the PCM harness connector. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the (K4) Sensor Ground circuit from the CKP Sensor harness connector to the appropriate terminal of special tool #8815. Is the resistance below 5.0 ohms? Yes → Go To 7 No → Repair the open in the (K4) Sensor Ground circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
7	**NOTE: Inspect the slots on the flywheel for damage. If a problem is found repair as necessary.** If there are no possible causes remaining, view repair. Repair Replace the Crankshaft Position Sensor. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
8	Turn the ignition off. Disconnect the CKP Sensor harness connector. Disconnect the PCM harness connector. Measure the resistance between ground and the (K24) CKP Signal circuit in the CKP Sensor harness connector. Is the resistance below 5.0 ohms? Yes → Repair the short to ground in the (K24) CKP Signal circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 9	All
9	Turn the ignition off. Disconnect the CKP Sensor harness connector. Disconnect the PCM harness connector. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the (K24) CKP Signal circuit from the CKP Sensor harness connector to the appropriate terminal of special tool #8815. Is the resistance below 5.0 ohms? Yes → Go To 10 No → Repair the open in the (K24) CKP Signal circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

P0335-CRANKSHAFT POSITION SENSOR CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
10	Turn the ignition off. Disconnect the CKP Sensor harness connector. Ignition on, engine not running. Measure the voltage of the (K24) CKP Signal circuit in the CKP Sensor harness connector. Is the voltage above 5.5 volts? Yes → Repair the short to battery voltage in the (K24) CKP Signal circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 11	All
11	Turn the ignition off. Disconnect the CKP Sensor harness connector. Disconnect the PCM harness connector. Measure the resistance between the (K24) CKP Signal circuit and the (K7) 5 Volt Supply circuit in the CKP Sensor harness connector. Is the resistance below 5.0 ohms? Yes → Repair the (K24) CKP Signal circuit shorted to the (K7) 5 Volt Supply circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 12	All
12	**NOTE: Before continuing, check the PCM harness connector terminals for corrosion, damage, or terminal push out. Repair as necessary.** If there are no possible causes remaining, view repair. Repair Replace and program the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
13	Turn the ignition off. Disconnect the CKP Sensor harness connector. Disconnect the PCM harness connector. Measure the resistance between ground and the (K7) 5 Volt Supply circuit in the CKP Sensor harness connector. Is the resistance below 100 ohms? Yes → Repair the short to ground in the (K7) 5 Volt Supply circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 14	All
14	Turn the ignition off. Disconnect the CKP Sensor harness connector. Disconnect the PCM harness connector. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the (K7) 5 Volt Supply circuit from the CKP Sensor harness connector to the appropriate terminal of special tool #8815. Is the resistance below 5.0 ohms? Yes → Go To 15 No → Repair the open in the (K7) 5 Volt Supply circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

P0335-CRANKSHAFT POSITION SENSOR CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
15	Turn the ignition off. Disconnect the CKP Sensor harness connector. Ignition on, engine not running. Measure the voltage on the (K7) 5 Volt Supply circuit in the CKP Sensor harness connector. Is the voltage above 5.5 volts? Yes → Repair the short to battery voltage in the (K7) 5 Volt Supply circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 16	All
16	**NOTE: Before continuing, check the PCM harness connector terminals for corrosion, damage, or terminal push out. Repair as necessary.** If there are no possible causes remaining, view repair. Repair Replace and program the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

Symptom:
P0339-CRANKSHAFT POSITION SENSOR INTERMITTENT

When Monitored and Set Condition:

P0339-CRANKSHAFT POSITION SENSOR INTERMITTENT

When Monitored: Engine running or Cranking.

Set Condition: When the failure counter reaches 20. One Trip Fault.

POSSIBLE CAUSES
GOOD TRIP EQUAL TO ZERO
WIRING HARNESS INSPECTION
(K7) 5 VOLT SUPPLY CIRCUIT OPEN OR SHORTED TO GROUND
TONE WHEEL/PULSE RING INSPECTION
CHECKING CAMSHAFT POSITION SENSOR SIGNAL WITH THE DRBIII® LAB
CRANKSHAFT POSITION SENSOR
(K24) CKP SIGNAL CIRCUIT OPEN
(K24) CKP SIGNAL CIRCUIT SHORT TO GROUND
(K24) CKP SIGNAL CIRCUIT SHORTED TO B+
(K24) CKP SIGNAL CIRCUIT SHORT TO (K7) 5 VOLTS
PCM

TEST	ACTION	APPLICABILITY
1	Ignition on, engine not running. With the DRBIII®, read DTCs and record the related Freeze Frame data. Is the Good Trip Counter displayed and equal to zero? Yes → Go To 2 No → Refer to the INTERMITTENT CONDITION symptom in the Driveability category. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

P0339-CRANKSHAFT POSITION SENSOR INTERMITTENT — Continued

TEST	ACTION	APPLICABILITY
2	With the DRBIII®, read and record Freeze Frame Data specific to the CKP signal, ECT, RPM, Sync state, vehicle speed, etc. Turn the ignition off. With the DRBIII® lab scope probe and the Miller special tool #6801, backprobe the (K24) CKP Signal circuit at the Sensor harness connector. **WARNING: WHEN THE ENGINE IS OPERATING, DO NOT STAND IN A DIRECT LINE WITH THE FAN. DO NOT PUT YOUR HANDS NEAR THE PULLEYS, BELTS OR FAN. DO NOT WEAR LOOSE CLOTHING.** Ignition on, engine not running. Observe the lab scope screen at least 1 minute and then start the vehicle. Continue observing the lab scope screen for an additional minute. Were there any irregular or missing signals? Yes → Go To 3 No → Go To 8	All
3	Visually inspect the related wire harness including the ground circuit. Look for any chafed, pierced, pinched, or partially broken wires. Visually inspect the related wire harness connectors. Look for broken, bent, pushed out, or corroded terminals. Ensure the Crankshaft Position Sensor and the Camshaft Position Sensor are properly installed and the mounting bolt(s) are tight. Refer to any TSBs that may apply. Were any of the above conditions present? Yes → Repair as necessary Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 4	All
4	Turn the ignition off. Disconnect the CKP Sensor connector. Ignition on, engine not running. Measure the voltage on the (K7) 5 Volt Supply circuit. Is the voltage between 4.5 and 5.5 volts? Yes → Go To 5 No → Repair the open or short to ground in the (K7) 5 Volt Supply circuit. Use Miller special tool #8815 when checking for an open circuit to prevent PCM harness connector terminal damage. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
5	Turn the ignition off. Carefully disconnect the Battery (-) Ground cable. Remove the Crankshaft Position Sensor. Inspect the Tone Wheel/Flex Plate slots for damage, foreign material, or excessive movement. Were any problems found? Yes → Repair or replace the Tone Wheel/Flex Plate as necessary. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 6	All

P0339-CRANKSHAFT POSITION SENSOR INTERMITTENT — Continued

TEST	ACTION	APPLICABILITY
6	**NOTE: An intermittent glitch in the Camshaft Position Sensor can cause the P0339 to set.** Turn the ignition off. With the DRBIII® lab scope probe and the Miller special tool #6801, backprobe the (K44) CMP Signal circuit at the Sensor harness connector. **WARNING: WHEN THE ENGINE IS OPERATING, DO NOT STAND IN A DIRECT LINE WITH THE FAN. DO NOT PUT YOUR HANDS NEAR THE PULLEYS, BELTS OR FAN. DO NOT WEAR LOOSE CLOTHING.** Ignition on, engine not running. Wiggle the related wire harness and lightly tap on the Camshaft Position Sensor. While observing the lab scope screen. Start the engine. Observe the lab scope screen. Are there any irregular or missing signals? Yes → Repair as necessary. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 7	All
7	If there are no possible causes remaining, view repair. Repair Replace the Crankshaft Position Sensor. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
8	Turn the ignition off. Disconnect the CKP Sensor connector. Disconnect the PCM connector. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance in the (K24) CKP Signal circuit between the CKP harness connector and the appropriate terminal of special tool #8815. Wiggle the wire harness while taking this measurement. Is the resistance below 1.0 ohm? Yes → Go To 9 No → Repair the open/high resistance in the (K24) CKP Signal circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
9	Turn the ignition off. Disconnect the PCM connector. Disconnect the CKP Sensor connector. Measure the resistance between ground and the (K24) CKP Signal circuit at the CKP Sensor harness connector. Wiggle the related wire harness while monitoring the resistance value. Does the resistance stay below 100 ohms? Yes → Repair the short to ground in the (K24) CKP Signal circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 10	All

P0339-CRANKSHAFT POSITION SENSOR INTERMITTENT — Continued

TEST	ACTION	APPLICABILITY
10	Turn the ignition off. Disconnect the CKP Sensor connector. Ignition on, engine not running. Measure the voltage on the (K24) CKP Signal circuit. Wiggle the related wire harness while taking this measurement. Does the voltage ever increase above 5.5 volts? Yes → Repair the short to B+ voltage in the (K24) CKP Signal circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 11	All
11	Turn the ignition off. Disconnect the PCM harness connector. Disconnect the CKP Sensor harness connector. Measure the resistance between the (K7) 5 Volt Supply circuit and the (K24) CKP signal circuit at the CKP Sensor harness connector. Wiggle the related wire harness while taking this measurement. Is the resistance below 5.0 ohms? Yes → Repair the short to the (K7) 5 Volt Supply circuit in the (K24) CKP Signal circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 12	All
12	**NOTE: Before continuing, check the PCM harness connector terminals for corrosion, damage, or terminal push out. Repair as necessary.** If there are no possible causes remaining, review repair. Repair Replace and program the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

Symptom:
P0340-CAMSHAFT POSITION SENSOR CIRCUIT

When Monitored and Set Condition:

P0340-CAMSHAFT POSITION SENSOR CIRCUIT

When Monitored: Engine cranking/running. Battery voltage greater than 10 volts.

Set Condition: At least 5 seconds or 2.5 engine revolutions have elapsed with crankshaft position sensor signals present but no camshaft position sensor signal. One Trip Fault.

POSSIBLE CAUSES
INTERMITTENT CRANKSHAFT POSITION SENSOR SIGNAL
INTERMITTENT CAMSHAFT POSITION SENSOR SIGNAL
(K7) 5 VOLT SUPPLY CIRCUIT SHORTED TO GROUND
(K7) 5 VOLT SUPPLY CIRCUIT OPEN
(K7) 5 VOLT SUPPLY CIRCUIT SHORTED TO VOLTAGE
(K44) CMP SIGNAL CIRCUIT SHORTED GROUND
(K44) CMP SIGNAL CIRCUIT OPEN
(K44) CMP SIGNAL CIRCUIT SHORTED TO VOLTAGE
(K44) CMP SIGNAL SHORTED TO (K7) 5 VOLT SUPPLY CIRCUIT
(K4) SENSOR GROUND CIRCUIT OPEN
PCM - (K7) 5 VOLT SUPPLY
PCM - (K44) CMP SIGNAL
CAMSHAFT POSITION SENSOR

TEST	ACTION	APPLICABILITY
1	Start the engine. With the DRBIII®, read the CMP SYNC State. Does the DRBIII® display the CMP SYNC State IN SYNC? Yes → Go To 2 No → Go To 4	All

P0340-CAMSHAFT POSITION SENSOR CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
2	Turn the ignition off. With the DRBIII® lab scope probe and the Miller special tool #6801, back probe the (K24) CKP signal circuit in the CKP harness connector. **WARNING: WHEN THE ENGINE IS OPERATING, DO NOT STAND IN A DIRECT LINE WITH THE FAN. DO NOT PUT YOUR HANDS NEAR THE PULLEYS, BELTS OR FAN. DO NOT WEAR LOOSE CLOTHING.** Ignition on, engine not running. Wiggle the related wire harness and lightly tap the Crankshaft Position Sensor. Observe the lab scope screen. Start the engine. Allow the engine to idle. Observe the lab scope screen. Did the CKP Sensor generate any erratic pulses? Yes → Repair as necessary. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 3	All
3	Turn the ignition off. With the DRBIII® lab scope probe and the Miller special tool #6801, backprobe the (K44) CMP Signal circuit in the CMP harness connector. **WARNING: WHEN THE ENGINE IS OPERATING, DO NOT STAND IN A DIRECT LINE WITH THE FAN. DO NOT PUT YOUR HANDS NEAR THE PULLEYS, BELTS OR FAN. DO NOT WEAR LOOSE CLOTHING.** Ignition on, engine not running. Wiggle the related wire harness and lightly tap on the Camshaft Position Sensor. Observe the lab scope screen. Start the engine. Allow the engine to idle. Observe the lab scope screen. Did the CMP Sensor generate any erratic pulses? Yes → Repair as necessary. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Test Complete.	All
4	Turn the ignition off. Disconnect the CMP Sensor harness connector. Ignition on, engine not running. Measure the voltage of the (K7) 5 Volt Supply circuit in the CMP Sensor harness connector. Is the voltage between 4.5 and 5.5 volts? Yes → Go To 5 No → Go To 13	All
5	Turn the ignition off. Disconnect the CMP Sensor harness connector. Ignition on, engine not running. Measure the voltage of the (K44) CMP Signal circuit in the CMP Sensor harness connector. Is the voltage between 4.5 and 5.0 volts? Yes → Go To 6 No → Go To 8	All

P0340-CAMSHAFT POSITION SENSOR CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
6	Turn the ignition off. Disconnect the CMP Sensor harness connector. Disconnect the PCM harness connector. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the (K4) Sensor Ground circuit from the CMP Sensor harness connector to the appropriate terminal of special tool #8815. Is the resistance below 5.0 ohms? Yes → Go To 7 No → Repair the open in the (K4) Sensor Ground circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
7	**NOTE: Inspect the Camshaft sprocket for damage per the Service Information. If a problem is found repair as necessary.** If there are no possible causes remaining, view repair. Repair Replace the Camshaft Position Sensor. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
8	Turn the ignition off. Disconnect the CMP Sensor harness connector. Disconnect the PCM harness connector. Measure the resistance between ground and the (K44) CMP Signal circuit in the CMP Sensor harness connector. Is the resistance below 100 ohms? Yes → Repair the short to ground in the (K44) CMP Signal circuit Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 9	All
9	Turn the ignition off. Disconnect the CMP Sensor harness connector. Disconnect the PCM harness connector. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the (K44) CMP Signal circuit from the CMP Sensor harness connector to the appropriate terminal of special tool #8815. Is the resistance below 5.0 ohms? Yes → Go To 10 No → Repair the open in the (K44) CMP Signal circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

P0340-CAMSHAFT POSITION SENSOR CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
10	Turn the ignition off. Disconnect the CMP Sensor harness connector. Ignition on, engine not running. Measure the voltage of the (K44) CMP Signal circuit in the CMP Sensor harness connector. Is the voltage above 5.2 volts? Yes → Repair the short to battery voltage in the (K44) CMP Signal circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 11	All
11	Turn the ignition off. Disconnect the CMP Sensor harness connector. Measure the resistance between the (K44) CMP Signal circuit and the (K7) 5 Volt Supply circuit in the CMP Sensor harness connector. Is the resistance below 5.0 ohms? Yes → Repair the (K44) CMP Signal circuit shorted to the (K7) 5 Volt Supply circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 12	All
12	**NOTE: Before continuing, check the PCM harness connector terminals for corrosion, damage, or terminal push out. Repair as necessary.** If there are no possible causes remaining, view repair. Repair Replace and program the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
13	Turn the ignition off. Disconnect the CMP Sensor harness connector. Disconnect the PCM harness connector. Measure the resistance between ground and the (K7) 5 Volt Supply circuit in the CMP Sensor harness connector. Is the resistance below 100 ohms? Yes → Repair the short to ground in the (K7) 5 Volt Supply circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 14	All
14	Turn the ignition off. Disconnect the CMP Sensor harness connector. Disconnect the PCM harness connector. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the (K7) 5 Volt Supply circuit between the CMP Sensor harness connector and the special tool #8815 terminal. Is the resistance below 5.0 ohms? Yes → Go To 15 No → Repair the open in the (K7) 5 Volt Supply circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

P0340-CAMSHAFT POSITION SENSOR CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
15	Turn the ignition off. Disconnect the CMP Sensor harness connector. Ignition on, engine not running. Measure the voltage of the (K7) 5 Volt Supply circuit in the CMP Sensor harness connector. Is the voltage above 5.5 volts? Yes → Repair the short to battery voltage in the (K7) 5 Volt Supply circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 16	All
16	**NOTE: Before continuing, check the PCM harness connector terminals for corrosion, damage, or terminal push out. Repair as necessary.** If there are no possible causes remaining, view repair. Repair Replace and program the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

Symptom:
P0344-CAMSHAFT POSITION SENSOR INTERMITTENT

When Monitored and Set Condition:

P0344-CAMSHAFT POSITION SENSOR INTERMITTENT

When Monitored: Engine running or Cranking.

Set Condition: When the failure counter reaches 20. One Trip Fault.

POSSIBLE CAUSES
GOOD TRIP EQUAL TO ZERO
WIRING HARNESS INSPECTION
(K7) 5 VOLT SUPPLY CIRCUIT OPEN OR SHORTED TO GROUND
TONE WHEEL/PULSE RING INSPECTION
CHECKING CKP SIGNAL WITH THE DRBIII® LAB
CAMSHAFT POSITION SENSOR
(K44) CMP SIGNAL CIRCUIT OPEN
(K44) CMP SIGNAL CIRCUIT SHORT TO GROUND
(K44) CMP SIGNAL CIRCUIT SHORTED TO B+
(K44) CMP SIGNAL CIRCUIT SHORT TO (K7) 5 VOLTS
PCM

TEST	ACTION	APPLICABILITY
1	Ignition on, engine not running. With the DRBIII®, read DTCs and record the related Freeze Frame data. Is the Good Trip Counter displayed and equal to zero? Yes → Go To 2 No → Refer to the INTERMITTENT CONDITION symptom in the Driveability category. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
2	Turn the ignition off. With the DRBIII® lab scope probe and the Miller special tool #6801, backprobe the (K44) CMP Signal circuit in the CMP harness connector. **WARNING: WHEN THE ENGINE IS OPERATING, DO NOT STAND IN A DIRECT LINE WITH THE FAN. DO NOT PUT YOUR HANDS NEAR THE PULLEYS, BELTS OR FAN. DO NOT WEAR LOOSE CLOTHING.** Ignition on, engine not running. Observe the lab scope screen. Start the engine. Observe the lab scope screen. Are there any irregular or missing signals? Yes → Go To 3 No → Go To 8	All

P0344-CAMSHAFT POSITION SENSOR INTERMITTENT — Continued

TEST	ACTION	APPLICABILITY
3	Visually inspect the related wire harness including the ground circuit. Look for any chafed, pierced, pinched, or partially broken wires. Visually inspect the related wire harness connectors. Look for broken, bent, pushed out, or corroded terminals. Ensure the Crankshaft Position Sensor and the Camshaft Position Sensor are properly installed and the mounting bolt(s) are tight. Refer to any TSBs that may apply. Were any of the above conditions present? Yes → Repair as necessary. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 4	All
4	Turn the ignition off. Disconnect the CMP Sensor connector. Ignition on, engine not running. Measure the voltage on the (K7) 5 Volt Supply circuit. Is the voltage between 4.5 and 5.5 volts? Yes → Go To 5 No → Repair the open or short to ground in the (K7) 5 Volt Supply circuit. Use Miller special tool #8815 when checking for an open circuit to prevent PCM harness connector terminal damage. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
5	Turn the ignition off. Carefully disconnect the Battery (-) Ground cable. Remove the Camshaft Position Sensor. Inspect the Tone Wheel/Pulse Ring for damage, foreign material, or excessive movement. Were any problems found? Yes → Repair or replace the Tone Wheel/Pulse Ring as necessary. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 6	All
6	**NOTE: An intermittent glitch in the Crankshaft Position Sensor can cause the P0344 to set.** Turn the ignition off. With the DRBIII® lab scope probe and the Miller special tool #6801, backprobe the (K24) CKP Signal circuit in the CKP Sensor harness connector. **WARNING: WHEN THE ENGINE IS OPERATING, DO NOT STAND IN A DIRECT LINE WITH THE FAN. DO NOT PUT YOUR HANDS NEAR THE PULLEYS, BELTS OR FAN. DO NOT WEAR LOOSE CLOTHING.** Ignition on, engine not running. Wiggle the related wire harness and lightly tap on the Crank Position Sensor. Observe the lab scope screen. Start the engine. Observe the lab scope screen. Are there any irregular or missing signals? Yes → Repair as necessary. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 7	All

P0344-CAMSHAFT POSITION SENSOR INTERMITTENT — Continued

TEST	ACTION	APPLICABILITY
7	If there are no possible causes remaining, view repair. Repair Replace the Camshaft Position Sensor. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
8	Turn the ignition off. Disconnect the CMP Sensor connector. Disconnect the PCM connector. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance in the (K44) CMP Signal circuit from the CMP harness connector to the appropriate terminal of special tool #8815. Wiggle the related wire harness while taking this measurement. Is the resistance below 5.0 ohms? Yes → Go To 9 No → Repair the open/high resistance in the (K44) CMP Signal circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
9	Turn the ignition off. Disconnect the PCM connector. Disconnect the CMP Sensor connector. Measure the resistance between ground and the (K44) CMP Signal circuit in the CMP Sensor harness connector. Wiggle the related wire harness while monitoring the resistance value. Does the resistance stay below 100 ohms? Yes → Repair the short to ground in the (K44) CMP Signal circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 10	All
10	Turn the ignition off. Disconnect the CMP Sensor connector. Ignition on, engine not running. Measure the voltage on the (K44) CMP Signal circuit. Wiggle the related wire harness while taking this measurement. Does the voltage ever increase above 5.5 volts? Yes → Repair the short to B+ voltage in the (K44) CMP Signal circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 11	All
11	Turn the ignition off. Disconnect the PCM harness connector. Disconnect the CMP harness connector. Measure the resistance between the (K7) 5 Volt Supply circuit and the (K44) CMP signal circuit in the CMP harness connector. Wiggle the related wire harness while taking this measurement. Is the resistance below 5.0 ohms? Yes → Repair the short to the (K7) 5 Volt Supply circuit in the (K44) CMP Signal circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 12	All

P0344-CAMSHAFT POSITION SENSOR INTERMITTENT — Continued

TEST	ACTION	APPLICABILITY
12	**NOTE: Before continuing, check the PCM harness connector terminals for corrosion, damage, or terminal push out. Repair as necessary.** If there are no possible causes remaining, view repair. Repair Replace and program the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

Symptom:
P0420-CATALYTIC 1/1 EFFICIENCY

When Monitored and Set Condition:

P0420-CATALYTIC 1/1 EFFICIENCY

When Monitored: Engine Run time greater than 90 seconds. Engine Coolant greater than 70°C (158°F) Vehicle speed greater than 20 MPH and less than 55 MPH. Engine Speed greater than 1216 RPM and less than 1952 RPM.

Set Condition: As catalyst efficiency deteriorates, the switch rate of the downstream O2 sensor approaches that of the upstream O2 sensor. If at any point during the test the switch ratio reaches a predetermined value a counter is incremented by one. One Trip Fault.

Symptom:
P0440-GENERAL EVAP SYSTEM FAILURE

When Monitored and Set Condition:

P0440-GENERAL EVAP SYSTEM FAILURE

When Monitored: Engine Running. Fuel Level greater than 12%. Ambient Temperature between 4°C and 32°C (39°F and 89°F)

Set Condition: The PCM does not see the NVLD switch close during the medium/large leak test. The PCM will then increase the vacuum supply to the EVAP system by increasing flow through the EVAP Purge valve. If the switch does not close with an increase in vacuum, an error is detected. Two Trip Fault.

POSSIBLE CAUSES
GOOD TRIP EQUAL TO ZERO
VISUAL AND PHYSICAL INSPECTION
EVAP PURGE SOLENOID VACUUM SUPPLY INSPECTION
EVAP PURGE SOLENOID STUCK CLOSED
NVLD SWITCH OPERATION
(Z1) GROUND CIRCUIT OPEN
NVLD ASSEMBLY
(K107) NVLD SWITCH SIGNAL CIRCUIT OPEN
EVAPORATIVE EMISSION LEAK DETECTION
PCM
PCM

TEST	ACTION	APPLICABILITY
1	**NOTE: If any of the following DTCs are set (P0443, P0452, P0453, P0498 or P0499) diagnose them first before continuing with P0440.** Ignition on, engine not running. With the DRBIII®, read DTCs and record the related Freeze Frame data. Is the Good Trip Counter displayed and equal to zero? Yes → Go To 2 No → Refer to the INTERMITTENT CONDITION symptom in the Driveability category. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

P0440-GENERAL EVAP SYSTEM FAILURE — Continued

TEST	ACTION	APPLICABILITY
2	Perform a visual and physical inspection of the entire Evaporative Emission system. Check for the following conditions: - Hoses disconnected or left off - Holes or cracks - Loose seal points - Evidence of damaged components - Incorrect routing of hoses and tubes - Fuel Cap left off or bad gasket seal Were any of the above conditions found? Yes → Repair as necessary. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 3	All
3	Turn the ignition off. Carefully inspect the Evap Purge Solenoid vacuum supply hose for proper routing. Check for a pinched or plugged hose from the throttle body to the Purge Solenoid. Ensure the vacuum port at the throttle body is free from any blockage. Were any problems found? Yes → Repair the vacuum supply, hose/tube as necessary. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 4	All
4	Disconnect the vacuum supply hoses form the EVAP Purge Solenoid. Using a hand vacuum pump, apply 10 in Hg to the ″CAN″ side of the EVAP Purge Solenoid. Ignition on, engine not running. Observe the vacuum gauge. With the DRBIII®, actuate the EVAP Purge Solenoid . Does the vacuum drop when the solenoid is actuated? Yes → Go To 5 No → Replace the Evap Purge Solenoid. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
5	Reconnect all vacuum hoses. Start the engine and allow it to idle. Using the DRBIII®, perform the NVLD FORCED MONITOR TEST. Monitor the NVLD Switch state. **NOTE: As the test runs, the NVLD Switch should go from an OPEN state to CLOSED. After the vacuum is released from the EVAP system the Switch state will return to OPEN.** Did the NVLD Switch operate as described above? Yes → Refer to the INTERMITTENT CONDITION symptom in the Driveability category. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 6	All

P0440-GENERAL EVAP SYSTEM FAILURE — Continued

TEST	ACTION	APPLICABILITY
6	To continue testing you will need Miller Tool #8404 Evaporative Emission Leak Detector (EELD). **WARNING: Keep lit cigarettes, sparks, flames, and other ignition sources away from the test area to prevent the ignition of explosive gases. Keep the test area well ventilated.** **NOTE: The fuel tank should have between 20% and 80% of fuel tank capacity to properly test the Evap system.** Connect the red power lead of EELD to the battery positive terminal and the black ground lead to battery negative terminal. **NOTE: See Charts and Graph support material EELD Calibration Setup for an example.** Block the vent hose of the EVAP Canister. Connect shop air to the EELD. Set the smoke/air control switch to AIR. Insert the tester's AIR supply tip (clear hose) into the .040 orifice on the tester's control panel. Press the remote smoke/air start button. Position the red flag on the air flow meter so it is aligned with the indicator ball. When the calibration is complete, release the remote button. The EELD is now calibrated the flow meter in liters per minute. Install the service port adapter #8404-14 on the vehicle's service port (if equipped) or install the #8404-ADP service adapter in the NVLD filter line. Connect the Air supply hose from the EELD to the service port. Press the remote button to activate AIR flow. **NOTE: Larger volume fuel tanks, lower fuel levels or if the vehicle is equipped with a Flow Management Valve, this may indicate high flow and will require 4 to 5 minutes to fill.** Compare the flow meter indicator ball reading to the red flag. ABOVE the red flag indicates a leak present. BELOW the red flag indicates a sealed system. Is the indicator ball above the red flag? Yes → Go To 7 No → Go To 8	All

P0440-GENERAL EVAP SYSTEM FAILURE — Continued

TEST	ACTION	APPLICABILITY
7	**NOTE: A thorough visual inspection of the Evap system hoses, tubes, and connections may save time in your diagnosis. Look for any physical damage or signs of wetness at connections. The strong smell of fuel vapors may aid diagnosis also.** To continue testing, you will need Miller Tool #8404 Evaporative Emissions Leak Detector (EELD). Remove the Air supply hose from the service port. Connect the SMOKE supply tip (black hose) to the service port. Set the smoke/air control switch to SMOKE. **NOTE: The flow meter indicator ball will not move at this point.** Press the remote smoke/air start button. **NOTE: Ensure that smoke has filled the EVAP system by continuing to press the remote smoke/air start button, remove the vehicle fuel cap, and wait for the smoke to exit. Once smoke is indicated reinstall the fuel cap.** **NOTE: For optimal performance, introduce smoke into the system for an additional 60 seconds; continue introducing smoke at 15 second intervals, as necessary.** While still holding the remote smoke/air start button, use the white light (#8404-CLL) to follow the EVAP system path, and look for the source of the leak indicated by exiting smoke. If a leak is concealed from view (i.e., top of fuel tank), release the remote smoke/air start button, and use the ultraviolet (UV) black light #8404-UVL and the yellow goggles 8404-20 to look for residual traces of dye that are left behind by the smoke. The exiting smoke deposits a residual fluid that is either bright green or bright yellow in color when viewed with a UV light. **NOTE: Carefully inspect the vent side of the EVAP Canister. Due to the filtering system in the canister the smoke or dye may or may not be visual. Introducing smoke into the filtered side of the canister may assist in locating the leak.** Was a leak found? Yes → Repair or replace the leaking component as necessary. Perform POWERTRAIN VERIFICATION TEST VER - 6 - NGC. No → NOTE: Before continuing, check the PCM harness connector terminals for corrosion, damage or terminal push out. Repair as necessary. Replace and program the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
8	Turn the ignition off. Disconnect the NVLD electrical harness connector. Check connectors - Clean/repair as necessary. Using a jumper wire, jumper across the (K107) NVLD Switch Sense circuit and the (Z1) Ground circuit in the NVLD electrical harness connector. Monitor the NVLD Switch state on the DRBIII®. Does the Switch change from OPEN to CLOSED. Yes → Replace the NVLD Assembly. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 9	All

P0440-GENERAL EVAP SYSTEM FAILURE — Continued

TEST	ACTION	APPLICABILITY
9	Turn the ignition off. Disconnect the NVLD electrical harness connector. Measure the resistance between the (Z1) Ground circuit and ground. Is the resistance below 5.0 ohms? Yes → Go To 10 No → Repair the open in the (Z1) Ground circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
10	Turn the ignition off. Disconnect the NVLD electrical harness connector. Disconnect the PCM harness connector. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the (K107) NVLD Switch Signal circuit from the NVLD electrical harness connector to the appropriate terminal of the special tool #8815. Is the resistance below 5.0 ohms? Yes → NOTE: Before continuing, check the PCM harness connector terminals for corrosion, damage or terminal push out. Repair as necessary. Replace and program the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Repair the open in the (K107) NVLD Switch Signal Circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

Symptom:
P0441-EVAP PURGE SYSTEM PERFORMANCE

When Monitored and Set Condition:

P0441-EVAP PURGE SYSTEM PERFORMANCE

When Monitored: Cold start test. Engine Running. Small Leak Test Passed.

Set Condition: The PCM activates the EVAP Purge solenoid gradually increases to maximum flow. During flow, the PCM looks for the NVLD switch to close. If the PCM does not see the NVLD switch close at maximum flow an error is detected. Two Trip Fault.

POSSIBLE CAUSES
GOOD TRIP EQUAL TO ZERO
INTERMITTENT CONDITION
CHECKING EVAP PURGE SOLENOID FUNCTIONALITY
EVAP PURGE SOLENOID VACUUM SUPPLY

TEST	ACTION	APPLICABILITY
1	**NOTE: If any of the following DTCs are set (P0443, P0452, P0453, P0498 or P0499) diagnose them first before continuing with P0441.** Ignition on, engine not running. With the DRBIII®, read DTCs and record the related Freeze Frame data. Is the Good Trip Counter displayed and equal to zero? Yes → Go To 2 No → Refer to the INTERMITTENT CONDITION symptom in the Driveability category. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
2	**NOTE: After disconnecting the Evap Purge vacuum connections, inspect the lines and solenoid for any signs of contamination or foreign materials.** Using a hand vacuum pump, apply 10 in Hg to ″CAN″ side of the EVAP Purge Solenoid. Ignition on, engine not running. Observe the vacuum gauge. With the DRBIII®, actuate the EVAP Purge Solenoid . Does the vacuum drop when the solenoid is actuated? Yes → Go To 3 No → Replace the Evap Purge Solenoid. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

P0441-EVAP PURGE SYSTEM PERFORMANCE — Continued

TEST	ACTION	APPLICABILITY
3	Turn the ignition off. Carefully inspect the Evap Purge Solenoid vacuum supply hose for proper routing. Check for a pinched or plugged hose from the throttle body to the Purge Solenoid. Inspect the vacuum port at the throttle body for any damage or plugging. Were any problems found? Yes → Repair the vacuum supply hose/tube as necessary. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Refer to the INTERMITTENT CONDITION symptom in the Driveability category. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

Symptom List:
P0442-EVAP SYSTEM MEDIUM LEAK
P0455-EVAP SYSTEM LARGE LEAK

Test Note: All symptoms listed above are diagnosed using the same tests. The title for the tests will be P0442-EVAP SYSTEM MEDIUM LEAK.

When Monitored and Set Condition:

P0442-EVAP SYSTEM MEDIUM LEAK

When Monitored: Engine Running. Cold start test. Fuel Level greater than 12%. Ambient Temperature between 4°C and 32°C (39°F and 89°F) Close Loop fuel system. Test runs when small leak test is maturing.

Set Condition: The PCM activates the EVAP Purge Solenoid to pull the EVAP system into a vacuum to close the NVLD swtich. Once the NVLD swtich is closed, the PCM turns the EVAP Pugre solenoid off to seal the EVAP system. If the NVLD switch reopens before the calibrated amount of time for a Medium leak an error is detected. Two Trip Fault.

P0455-EVAP SYSTEM LARGE LEAK

When Monitored: Engine Running. Cold start test. Fuel Level greater than 12%. Ambient Temperature between 4°C and 32°C (39°F and 89°F) Close Loop fuel system. Test runs when small leak test is maturing.

Set Condition: The PCM activates the EVAP Purge Solenoid to pull the EVAP system into a vacuum to close the NVLD swtich. Once the NVLD switch is closed, the PCM turns the EVAP Purge solenoid off to seal the EVAP system. If the NVLD switch reopens before the calibrated amount of time for a Large leak an error is detected. Two Trip Fault.

POSSIBLE CAUSES
INTERMITTENT CONDITION
VISUAL AND PHYSICAL INSPECTION
EVAPORATIVE EMISSION LEAK DETECTION
EVAP PURGE SOLENOID OPERATION
NVLD SWITCH OPERATION

P0442-EVAP SYSTEM MEDIUM LEAK — Continued

TEST	ACTION	APPLICABILITY
1	**NOTE: Since a hot vehicle can conceal a leak, it is best to perform this test at room temperature.** **NOTE: A loose gas cap could have caused this DTC to set. Make sure gas cap is tight and in good condition. Ensure the gas cap meets OEM specifications.** Ignition on, engine not running. With the DRBIII®, read DTCs and record the related Freeze Frame data. Is the Good Trip Counter displayed and equal to zero? Yes → Go To 2 No → Go To 7	All
2	Perform a visual and physical inspection of the entire Evaporative Emission system. Check for the follow conditions: - Holes or cracks - Loose seal points - Evidence of damaged components - Incorrect routing of hoses and tubes - Fuel Cap gasket seal Were any of the above conditions found? Yes → Repair as necessary. Perform POWERTRAIN VERIFICATION TEST VER - 6 - NGC. No → Go To 3	All

P0442-EVAP SYSTEM MEDIUM LEAK — Continued

TEST	ACTION	APPLICABILITY
3	To continue testing you will need Miller Tool #8404 Evaporative Emission Leak Detector (EELD). **WARNING: Keep lighted cigarettes, sparks, flames, and other ignition sources away from the test area to prevent the ignition of explosive gases. Keep the test area well ventilated.** **NOTE: The fuel tank should have between 20% and 80% of fuel tank capacity to properly test the Evap system.** Connect the red power lead of the EELD to the battery positive terminal and the black ground lead to battery negative terminal. **NOTE: See Charts and Graph support material EELD Calibration Setup for an example.** Block the vent hose of the EVAP Canister. Connect shop air to the EELD. Set the smoke/air control switch to AIR. Insert the tester's AIR supply tip (clear hose) into the appropriate calibration orifice on the tester's control panel (based on DTC leak size). Press the remote smoke/air start button. Position the red flag on the air flow meter so it is aligned with the indicator ball. When the calibration is complete, release the remote button. The EELD is now calibrated the flow meter in liters per minute to the size leak indicated by the DTC set in the PCM. Install the service port adapter #8404-14 on the vehicle's service port (if equipped) or install the #8404-ADP service adapter in the NVLD filter line. Connect the Air supply hose from the EELD to the service port. Press the remote button to activate AIR flow. **NOTE: Larger volume fuel tanks, lower fuel levels or if the vehicle is equipped with a Flow Management Valve may indicate high flow and will require 4 to 5 minutes to fill** Compare the flow meter indicator ball reading to the red flag. ABOVE the red flag indicates a leak present. BELOW the red flag indicates a sealed system. Is the indicator ball above the red flag? Yes → Go To 4 No → Go To 7	All

P0442-EVAP SYSTEM MEDIUM LEAK — Continued

TEST	ACTION	APPLICABILITY
4	**NOTE: A thorough visual inspection of the Evap system hoses, tubes, and connections may save time in your diagnosis. Look for any physical damage or signs of wetness at connections. The strong smell of fuel vapors may aid diagnosis also.** To continue testing, you will need Miller Tool #8404 Evaporative Emissions Leak Detector (EELD). Remove the Air supply hose from the service port. Connect the SMOKE supply tip (black hose) to the service port. Set the smoke/air control switch to SMOKE. **NOTE: The flow meter indicator ball will not move in the smoke mode.** Press the remote smoke/air start button. **NOTE: Ensure that smoke has filled the EVAP system by continuing to press the remote smoke/air start button, remove the vehicle fuel cap, and wait for the smoke to exit. Once smoke is indicated reinstall the fuel cap.** **NOTE: For optimal performance, introduce smoke into the system for an additional 60 seconds; continue introducing smoke at 15 second intervals, as necessary.** While still holding the remote smoke/air start button, use the white light (#8404-CLL) to follow the EVAP system path, and look for the source of the leak indicated by exiting smoke. If a leak is concealed from view (i.e., top of fuel tank), release the remote smoke/air start button, and use the ultraviolet (UV) black light #8404-UVL and the yellow goggles 8404-20 to look for residual traces of dye that is left behind by the smoke. The exiting smoke deposits a residual fluid that is either bright green or bright yellow in color when viewed with a UV light. **NOTE: Carefully inspect the vent side of the EVAP Canister. Due to the filtering system in the canister the smoke may not be as thick. Introducing smoke into the filtered side of the canister may assist in locating the leak.** Was a leak found? Yes → Repair or replace the leaking component as necessary. Perform POWERTRAIN VERIFICATION TEST VER - 6 - NGC. No → Go To 5	All
5	**NOTE: After disconnecting the Evap Purge Solenoid vacuum connections, inspect the lines and solenoid for any signs of contamination from the EVAP Canister. This may indicate a faulty rollover valve. Replace/repair as necessary.** Turn the ignition off. Disconnect the vacuum hoses at the Evap Purge Solenoid. Using a hand vacuum pump, apply 10 in Hg to the ″CAN″ of the EVAP Purge Solenoid. **NOTE: Monitor the vacuum gauge for at least 15 seconds.** Does the EVAP Purge Solenoid hold vacuum? Yes → Go To 6 No → Replace the Evap Purge Solenoid. Perform POWERTRAIN VERIFICATION TEST VER - 6 - NGC.	All

P0442-EVAP SYSTEM MEDIUM LEAK — Continued

TEST	ACTION	APPLICABILITY
6	Reconnect all vacuum hoses. Start the engine. Allow the engine to idle. Using the DRBIII®, perform the NVLD FORCED MONITOR TEST. Monitor the NVLD Switch. **As the test runs, the NVLD Switch should go from an OPEN state to CLOSED. After the vacuum is released form the EVAP system the Switch state will return to OPEN.** Did the NVLD Switch operate as described above? Yes → Go To 7 No → Replace the NVLD Assembly. Perform POWERTRAIN VERIFICATION TEST VER - 6 - NGC.	All
7	**WARNING: WHEN THE ENGINE IS OPERATING, DO NOT STAND IN A DIRECT LINE WITH THE FAN. DO NOT PUT YOUR HANDS NEAR THE PULLEYS, BELTS OR FAN. DO NOT WEAR LOOSE CLOTHING.** Review the DRBIII® Freeze Frame information. If possible, try to duplicate the conditions under which the DTC was set. Refer to any Technical Service Bulletins (TSB) that may apply. **NOTE: A loose gas cap could have caused this DTC to set. Make sure gas cap is tight and in good condition. Ensure the gas cap meets OEM specifications.** Perform a visual and physical inspection of the entire Evaporative Emission system. Check for the following conditions: - Holes or cracks - Loose seal points - Evidence of damaged components - Incorrect routing of hoses and tubes - Fuel Cap gasket seal Were any of the above conditions found? Yes → Repair as necessary. Perform POWERTRAIN VERIFICATION TEST VER - 6 - NGC. No → Test Complete.	All

Symptom:
P0443-EVAP PURGE SOLENOID CIRCUIT

When Monitored and Set Condition:

P0443-EVAP PURGE SOLENOID CIRCUIT

When Monitored: The ignition on or engine running. Battery voltage greater than 10 volts.

Set Condition: The PCM will set a trouble code if the actual state of the solenoid does not match the intended state.

POSSIBLE CAUSES
GOOD TRIP EQUAL TO ZERO
EVAP PURGE SOLENOID OPERATION
(K52) EVAP PURGE SOL CONTROL CIRCUIT OPEN
(K52) EVAP PURGE SOLENOID CONTROL CIRCUIT SHORTED TO GROUND
(K108) EVAP PURGE SOL RETURN CIRCUIT OPEN
(K108) EVAP PURGE SOL RETURN CIRCUIT SHORTED TO GROUND
POWERTRAIN CONTROL MODULE

TEST	ACTION	APPLICABILITY
1	Ignition on, engine not running. With the DRBIII®, read DTCs and record the related Freeze Frame data. Is the Good Trip Counter displayed and equal to zero? Yes → Go To 2 No → Refer to the INTERMITTENT CONDITION symptom in the Driveability category. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
2	Turn the ignition off. Disconnect the EVAP Purge Solenoid harness connector. Ignition on, engine not running. Using a 12-volt test light, jumper across the EVAP Purge Solenoid harness connector. With the DRBIII®, actuate the EVAP Purge Solenoid. Does the test light flash on and off? Yes → Replace the EVAP Purge Solenoid. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 3	All

P0443-EVAP PURGE SOLENOID CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
3	Turn the ignition off. Disconnect the Evap Purge Solenoid harness connector. Disconnect the PCM harness connectors. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the (K52) Evap Purge Solenoid Control circuit from the Evap Purge Solenoid harness connector to the appropriate terminal of special tool #8815. Is the resistance below 5.0 ohms? Yes → Go To 4 No → Repair the open in the (K52) Evap Purge Sol Control circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
4	Turn the ignition off. Disconnect the Evap Purge Solenoid harness connector. Disconnect the PCM harness connectors. Measure the resistance between ground and the (K52) Evap Purge Sol Control circuit at the Evap Purge Solenoid harness connector. Is the resistance below 5.0 ohms? Yes → Repair the short to ground in the (K52) Evap Purge Solenoid Control circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 5	All
5	Turn the ignition off. Disconnect the Evap Purge Solenoid harness connector. Disconnect the PCM harness connectors. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the (K108) Evap Purge Sol Return circuit from the Evap Purge Solenoid harness connector to the appropriate terminal of special tool #8815. Is the resistance below 5.0 ohms? Yes → Go To 6 No → Repair the open in the (K108) Evap Purge Sol Return circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
6	Turn the ignition off. Disconnect the Evap Purge Solenoid harness connector. Disconnect the PCM harness connectors. Measure the resistance between ground and the (K108) Evap Purge Sol Return circuit at the Evap Purge Solenoid harness connector. Is the resistance below 5.0 ohms? Yes → Repair the short to ground in the (K108) Evap Purge Solenoid Return circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 7	All

P0443-EVAP PURGE SOLENOID CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
7	**NOTE: Before continuing, check the PCM harness connector terminals for corrosion, damage, or terminal push out. Repair as necessary.** If there are no possible causes remaining, view repair. Repair Replace and program the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

Symptom:
P0452-NVLD PRESSURE SWITCH SENSE CIRCUIT LOW

When Monitored and Set Condition:

P0452-NVLD PRESSURE SWITCH SENSE CIRCUIT LOW

When Monitored: Immediately after engine start up.

Set Condition: The PCM activates the NLVD Solenoid. If the PCM does not see the NVLD switch open, an error is detected. One Trip Fault.

POSSIBLE CAUSES
GOOD TRIP EQUAL TO ZERO
NVLD SWITCH OPERATION
NVLD ASSEMBLY
(K52) EVAP PURGE SOL CONTROL CIRCUIT SHORTED TO GROUND
(K107) NVLD SWITCH SIGNAL CIRCUIT SHORTED TO GROUND
EVAP PURGE SOLENOID LEAKS/STUCK OPEN
PCM

TEST	ACTION	APPLICABILITY
1	Ignition on, engine not running. With the DRBIII®, read DTCs and record the related Freeze Frame data. Is the Good Trip Counter displayed and equal to zero? Yes → Go To 2 No → Refer to the INTERMITTENT CONDITION symptom in the Driveability category. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
2	Turn the ignition off. Disconnect the EVAP Purge Solenoid harness connector. Ignition on, engine not running. Using a 12-volt test light, jumper across the EVAP Purge Solenoid harness connector. With the DRBIII®, actuate the EVAP Purge Solenoid. Does the test light flash on and off? Yes → Go To 3 No → Go To 7	All

P0452-NVLD PRESSURE SWITCH SENSE CIRCUIT LOW — Continued

TEST	ACTION	APPLICABILITY
3	**NOTE: After disconnecting the Evap Purge Solenoid vacuum connections, inspect the lines and solenoid for any signs of contamination from the EVAP Canister. This may indicate a faulty rollover valve. Replace/repair as necessary.** Turn the ignition off. Disconnect the vacuum hoses at the Evap Purge Solenoid. Using a hand vacuum pump, apply 10 in Hg to the "CAN" of the EVAP Purge Solenoid. **NOTE: Monitor the vacuum gauge for at least 15 seconds.** Does the EVAP Purge Solenoid hold vacuum? Yes → Go To 4 No → Replace the Evap Purge Solenoid. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
4	Ignition on, engine not running. Using the DRBIII®, monitor the NVLD Switch State. Does the DRBIII® display the NVLD state OPEN? Yes → Refer to the INTERMITTENT CONDITION symptom in the Driveability category. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 5	All
5	Turn the ignition on. Using the DRBIII®, monitor the NVLD Switch State. Disconnect the NVLD electrical connector. Does the Switch change from CLOSED to OPEN? Yes → Replace the NVLD Assembly. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 6	All
6	Turn the ignition off. Disconnect the NVLD electrical harness connector. Disconnect the PCM harness connector. Measure the resistance between ground and the (K107) NVLD Switch Signal circuit in the NVLD Assembly harness connector. Is the resistance below 5.0 ohms? Yes → Repair the short to ground in the (K107) NVLD Switch Signal circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → NOTE: Before continuing, check the PCM harness connector terminals for corrosion, damage or terminal push out. Repair as necessary. Replace and program the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

P0452-NVLD PRESSURE SWITCH SENSE CIRCUIT LOW — Continued

TEST	ACTION	APPLICABILITY
7	Turn the ignition off. Disconnect the EVAP Purge Solenoid harness connector. Disconnect the Powertrain Control Module harness connectors. Measure the resistance between ground and the (K52) EVAP Purge Sol Control circuit at the EVAP Purge Solenoid harness connector. Is the resistance below 5.0 ohms? Yes → Repair the short to ground in the (K52) EVAP Purge Sol Control circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → NOTE: Before continuing, check the PCM harness connector terminals for corrosion, damage or terminal push out. Repair as necessary. Replace and program the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

Symptom:
P0453-NVLD PRESSURE SWITCH SENSE CIRCUIT HIGH

When Monitored and Set Condition:

P0453-NVLD PRESSURE SWITCH SENSE CIRCUIT HIGH

When Monitored: Engine Running.

Set Condition: If the PCM does not see the NVLD swtich close during test, an error is detected. One Trip Fault.

POSSIBLE CAUSES
NVLD SWITCH OPERATION
(K107) NVLD SWITCH SIGNAL CIRCUIT SHORTED TO BATTERY VOLTAGE
(K107) NVLD SWITCH SIGNAL CIRCUIT SHORTED TO (K106) NVLD SOL CONTROL CIRCUIT
NVLD ASSEMBLY
(Z1) GROUND CIRCUIT OPEN
(K107) NVLD SWITCH SIGNAL CIRCUIT OPEN
PCM

TEST	ACTION	APPLICABILITY
1	Start the engine. Allow the engine to idle. Using the DRBIII®, perform the NVLD FORCED MONITOR TEST. Monitor the NVLD Switch state. **NOTE: As the test runs, the NVLD Switch should go from an OPEN state to a CLOSED state and then return to OPEN when the test is complete.** Did the NVLD Switch operate as described above? Yes → Refer to the INTERMITTENT CONDITION symptom in the Driveability category. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 2	All
2	Turn the ignition off. Disconnect the NVLD electrical harness connector. Ignition on, engine not running. Measure the voltage on the (K107) NVLD Switch Signal circuit in the NVLD electrical harness connector. Is the voltage above 5.5 volts? Yes → Repair short to battery voltage in the (K107) NVLD Switch Signal circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 3	All

P0453-NVLD PRESSURE SWITCH SENSE CIRCUIT HIGH — Continued

TEST	ACTION	APPLICABILITY
3	Turn the ignition off. Disconnect the NVLD electrical harness connector. Measure the resistance between the (K107) NVLD Switch Signal circuit and (K106) NVLD Sol Control circuit in the NVLD electrical harness connector. Is the resistance below 5.0 ohms? Yes → Repair the (K107) NVLD Switch Signal circuit shorted to the (K106) NVLD Sol Control circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 4	All
4	Turn the ignition off. Disconnect the NVLD electrical harness connector. Using a jumper wire, jumper across the NVLD Switch Signal circuit and the Ground circuit. Monitor the NVLD Switch state on the DRBIII®. Does the Switch change from OPEN to CLOSED? Yes → Replace the NVLD Assembly. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 5	All
5	Turn the ignition off. Disconnect the NVLD electrical harness connector. Measure the resistance between the (Z1) Ground circuit and ground. Is the resistance below 5.0 ohms? Yes → Go To 6 No → Repair the open in the (Z1) Ground circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
6	Turn the ignition off. Disconnect the NVLD electrical harness connector. Disconnect the PCM harness connector. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the (K107) NVLD Switch Signal circuit from the NVLD electrical harness connector to the appropriate terminal of special tool # 8815. Is the resistance below 5.0 ohms? Yes → NOTE: Before continuing, check the PCM harness connector terminals for corrosion, damage or terminal push out. Repair as necessary. Replace and program the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Repair the open in the (K107) NVLD Switch Signal circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

Symptom:
P0456-EVAP SYSTEM SMALL LEAK

When Monitored and Set Condition:

P0456-EVAP SYSTEM SMALL LEAK

When Monitored: Ignition off. Fuel Level less than 88%. Ambient Temperature between 4°C to 43°C (39°F to 109°F)

Set Condition: Due to temperature changes a vacuum is created in the fuel tank and EVAP system. With the EVAP system sealed, the PCM monitors the NVLD switch. If the NVLD switch does not close within a calibrated amount of time an error is detected.

POSSIBLE CAUSES
INTERMITTENT CONDITION
VISUAL AND PHYSICAL INSPECTION
EVAPORATIVE EMISSION LEAK DETECTION

TEST	ACTION	APPLICABILITY
1	**NOTE: The difference in ambient temperature, outside temp VS shop temp, may conceal a leak, it is best to perform this test after the vehicle's temperature has stabilized in the work area.** Ignition on, engine not running. With the DRBIII®, read DTCs and record the related Freeze Frame data. Is the Good Trip Counter displayed and equal to zero? Yes → Go To 2 No → Go To 4	All
2	Perform a visual and physical inspection of the entire Evaporative Emission system. Check for the following conditions: - Holes or cracks - Loose seal points - Evidence of damaged components - Incorrect routing of hoses and tubes - Fuel Cap gasket seal Were any of the above conditions found? Yes → Repair as necessary. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 3	All

P0456-EVAP SYSTEM SMALL LEAK — Continued

TEST	ACTION	APPLICABILITY
3	**NOTE: A thorough visual inspection of the Evap system hoses, tubes, and connections may save time in your diagnosis. Look for any physical damage or signs of wetness at connections. The strong smell of fuel vapors may aid diagnosis also.** Use the Miller Tool #8404 Evaporative Emissions Leak Detector (EELD). Connect the SMOKE supply tip (black hose) to the service port, (if equipped) or install the #8404-ADP service adapter in the NVLD filter line.. Set the smoke/air control switch to SMOKE. Block the vent hose of the EVAP Canister. **NOTE: The flow meter indicator ball will not move at this point.** Press the remote smoke/air start button. **NOTE: Ensure that smoke has filled the EVAP system by continuing to press the remote smoke/air start button, remove the vehicle fuel cap, and wait for the smoke to exit. Once smoke is indicated reinstall the fuel cap.** **NOTE: For optimal performance, introduce smoke into the system for an additional 60 seconds; continue introducing smoke at 15 second intervals, as necessary.** While still holding the remote smoke/air start button, use the white light (#8404-CLL) to follow the EVAP system path, and look for the source of the leak indicated by exiting smoke. If a leak is concealed from view (i.e., top of fuel tank), release the remote smoke/air start button, and use the ultraviolet (UV) black light #8404-UVL and the yellow goggles 8404-20 to look for residual traces of dye that are left behind by the smoke. The exiting smoke deposits a residual fluid that is either bright green or bright yellow in color when viewed with a UV light. **NOTE: Carefully inspect the vent side of the EVAP Canister. Due to the filtering system in the canister the smoke or dye may or may not be visual. Introducing smoke into the filtered side of the canister may assist in locating the leak.** Was a leak found? Yes → Repair or replace the leaking component as necessary. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 4	All
4	**WARNING: WHEN THE ENGINE IS OPERATING, DO NOT STAND IN A DIRECT LINE WITH THE FAN. DO NOT PUT YOUR HANDS NEAR THE PULLEYS, BELTS OR FAN. DO NOT WEAR LOOSE CLOTHING.** Review the DRBIII® Freeze Frame information. If possible, try to duplicate the conditions under which the DTC was set. Refer to any Technical Service Bulletins (TSB) that may apply. **NOTE: A loose gas cap could have caused this DTC to set. Make sure gas cap is tight and in good condition. Ensure the gas cap meets OEM specifications.** Perform a visual and physical inspection of the entire Evaporative Emission system. Check for the following conditions: - Holes or cracks - Loose seal points - Evidence of damaged components - Incorrect routing of hoses and tubes - Fuel Cap gasket seal Were any of the above conditions found? Yes → Repair as necessary. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Test Complete.	All

Symptom:
P0461-FUEL LEVEL SENSOR #1 PERFORMANCE

When Monitored and Set Condition:

P0461-FUEL LEVEL SENSOR #1 PERFORMANCE

When Monitored: TEST #1: With the ignition on, the fuel level is compared to the previous key down after a 20 second delay. TEST #2: The PCM monitor the fuel level at ignition on.

Set Condition: TEST #1: If the PCM does not see a difference in fuel level of greater than 0.1 volt the test will fail. TEST #2: If the PCM does not see a change in the fuel level of .1765 over a set amount of miles the test will fail. Two Trip Fault.

POSSIBLE CAUSES
GOOD TRIP EQUAL TO ZERO
VISUALLY INSPECT FUEL TANK
(G4) FUEL LEVEL SIGNAL CIRCUIT SHORTED TO GROUND
(G4) FUEL LEVEL SIGNAL CIRCUIT OPEN
(Z2) GROUND CIRCUIT OPEN
INTERNAL INSPECTION OF THE FUEL TANK
FUEL LEVEL SENSOR

TEST	ACTION	APPLICABILITY
1	**NOTE: Diagnose P0462 or P0463 first, if set along with P0461.** **NOTE: Inspect the Fuel Pump Module harness connector for any corrosion or damage.** Ignition on, engine not running. With the DRBIII®, read DTCs and record the related Freeze Frame data. Is the Good Trip Counter displayed and equal to zero? Yes → Go To 2 No → Refer to the INTERMITTENT CONDITION symptom in the Driveability category. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
2	Visually inspect the Fuel Tank for damage that may restrict the Fuel Sending Unit float from moving. Is the Fuel Tank OK? Yes → Go To 3 No → Replace the Fuel Tank as necessary. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

P0461-FUEL LEVEL SENSOR #1 PERFORMANCE — Continued

TEST	ACTION	APPLICABILITY
3	Turn the ignition off. Disconnect the Fuel Pump Module harness connector. Measure the resistance between ground and the (G4) Fuel Level Signal circuit at the Fuel Pump Module harness connector. Is the resistance below 100 ohms? Yes → Repair the short to ground in the (G4) Fuel Level Signal circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 4	All
4	Turn the ignition off. Disconnect the Fuel Pump Module harness connector. Disconnect the Instrument Cluster harness connector. Measure the resistance of the (G4) Fuel Level Signal circuit from the Fuel Pump Module harness connector to the BCM harness connector. Is the resistance below 5.0 ohms? Yes → Go To 5 No → Repair the open in the (G4) Fuel Level Signal circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
5	Turn the ignition off. Disconnect the Fuel Pump Module harness connector. Measure the resistance of the (Z2) Ground circuit from the Fuel Pump Module harness connector to ground. Is the resistance below 5.0 ohms? Yes → Go To 6 No → Repair the open in the (Z2) Ground circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
6	**WARNING: The fuel system is under a constant pressure even with the engine off. Before opening the fuel system the fuel pressure must be release. Relieve the fuel pressure in accordance with the service information.** Remove the Fuel Tank in accordance with the Service Information. Remove the Fuel Pump Module. Visually inspect the inside of the Fuel Tank for any obstructions or deformities. Inspect the Fuel Pump Module Float arm for damage. Were any problems found? Yes → Repair or replace as necessary. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 7	All
7	If there are no possible causes remaining, view repair. Repair Replace the Fuel Level Sensor. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

Symptom List:

P0462-FUEL LEVEL SENSOR #1 LOW
P0463-FUEL LEVEL SENSOR #1 HIGH

Test Note: All symptoms listed above are diagnosed using the same tests. The title for the tests will be P0462-FUEL LEVEL SENSOR #1 LOW.

When Monitored and Set Condition:

P0462-FUEL LEVEL SENSOR #1 LOW

When Monitored: Ignition on and battery voltage above 10.4 volts.

Set Condition: The fuel level sensor signal voltage goes below 0.1961 volts for more than 5 seconds. One Trip Fault.

P0463-FUEL LEVEL SENSOR #1 HIGH

When Monitored: Ignition on and battery voltage above 10.4 volts.

Set Condition: The fuel level sensor signal voltage at the PCM goes above 4.7 volts for more than 5 seconds. One Trip Fault.

POSSIBLE CAUSES
GOOD TRIP EQUAL TO ZERO
INTERMITTENT CONDITION

TEST	ACTION	APPLICABILITY
1	Turn the ignition on. With the DRBIII®, read DTC's. Is the Good Trip displayed and equal to zero? Yes → Refer to the Instrument Cluster Category and perform the Fuel Sensor Open or Short symptoms. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Refer to the INTERMITTENT CONDITION symptom in the Driveability category. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

Symptom:
P0480-COOLING FAN 1 CONTROL CIRCUIT
P0481-COOLING FAN 2 CONTROL CIRCUIT (NON-TURBO)

When Monitored and Set Condition:

P0480/P0481-COOLING FAN 1/2 CONTROL CIRCUIT

When Monitored: With the ignition on. Battery voltage greater than 10 volts.

Set Condition: An open or shorted circuit is detected in the radiator fan relay control circuit. One Trip Fault.

POSSIBLE CAUSES
LOW SPEED RADIATOR FAN RELAY OPERATION
FUSED B+ FEED CIRCUITS
LOW SPEED RADIATOR FAN RELAY RESISTANCE
LOW SPEED RAD FAN RELAY CONTROL CIRCUIT OPEN
LOW SPEED RAD FAN RELAY CONTROL CIRCUIT SHORT TO GROUND
PCM

TEST	ACTION	APPLICABILITY
1	Ignition on, engine not running. With the DRBIII®, actuate the Radiator Fan Relay. Is the Radiator Fan Relay operating? Yes → Refer to the INTERMITTENT CONDITION symptom in the Driveability category. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 2	All
2	Turn the ignition off. Remove the Radiator Fan Relay from the PDC. Ignition on, engine not running. Measure the voltage of the Fused B+ Feed circuit in the PDC. Is the voltage above 11.0 volts? Yes → Go To 3 No → Repair the (A16) Fused B+ Output circuit. Inspect the related fuse and repair as necessary. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

P0480-COOLING FAN 1 CONTROL CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
3	Turn the ignition off. Remove the Radiator Fan Relay from the PDC. Measure the resistance of the Radiator Fan Relay between the Fused Ignition Switch Output terminal and the Rad Fan Relay Control terminal. Is the resistance between 60 to 85 ohms? Yes → Go To 4 No → Replace the Radiator Fan Relay. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
4	Turn the ignition off. Remove the Radiator Fan Relay from the PDC. Disconnect the PCM harness connector. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the (C24) Rad Fan Relay Control circuit from the PDC to the appropriate terminal of special tool #8815. Is the resistance below 5.0 ohms? Yes → Go To 5 No → Repair the open in the (C24) Rad Fan Relay Control circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
5	Turn the ignition off. Remove the Radiator Fan Relay from the PDC. Disconnect the PCM harness connector. Measure the resistance between ground and the Low Speed Rad Fan Control circuit at the PDC. Is the resistance below 100 ohms? Yes → Repair the short to ground in the Rad Fan Relay Control circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 6	All
6	**NOTE: Before continuing, check the PCM harness connector terminals for corrosion, damage, or terminal push out. Repair as necessary.** If there are no possible causes remaining, view repair. Repair Replace and program the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

Symptom:
P0481-COOLING FAN 2 CONTROL CIRCUIT (TURBO)

When Monitored and Set Condition:

P0481-COOLING FAN 2 CONTROL CIRCUIT

When Monitored: With the ignition on. Battery voltage greater than 10 volts.

Set Condition: An open or shorted circuit is detected in the radiator fan relay control circuits. One Trip Fault.

POSSIBLE CAUSES
RADIATOR FAN RELAYS 2 AND 3 OPERATION
FUSED IGNITION SWITCH OUTPUT CIRCUIT
RADIATOR FAN RELAY #2 CONTROL CIRCUIT OPEN BEFORE THE SPLICE
RADIATOR FAN RELAY #3 CONTROL CIRCUIT OPEN BEFORE SPLICE
RADIATOR FAN RELAY CONTROL CIRCUITS SHORT TO GROUND
RADIATOR FAN RELAY CONTROL CIRCUIT OPEN AFTER THE SPLICE
RADIATOR FAN RELAY #2 OR #3
PCM

TEST	ACTION	APPLICABILITY
1	Turn the ignition on. With the DRBIII®, actuate the High Speed Radiator Fan Relay. Are both Radiator Fan operating at high speed? Yes → Refer to the INTERMITTENT CONDITION symptom in the Driveability category. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 2	All
2	Turn the ignition off. Remove both of the Radiator Fan Relays (#2 and #3) from the PDC. Turn the ignition on. **NOTE: A voltage measurement must be taken at both Radiator Fan Relay Fused Ignition Switch Output circuits in the PDC.** Measure the voltage of the Fused Ignition Switch Output circuit at the radiator Fan Relay connector in the PDC. Is the voltage above 11.0 volts at both relay connectors? Yes → Go To 3 No → Repair the Fused Ignition Switch Output circuit. Check and replace any open fuses. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

P0481-COOLING FAN 2 CONTROL CIRCUIT (TURBO) — Continued

TEST	ACTION	APPLICABILITY
3	**NOTE: Both Radiator Fan Relays must be removed from the PDC during the following steps.** Turn the ignition on. Using the DRBIII®, actuate the High Speed Radiator Fan Relay. Using a test light connected to battery voltage, probe both of the Radiator Fan Relay Control circuits (relays #2 and #3). **NOTE: The test light should flash at both control circuits.** Choose a conclusion that best matches the result of the above test. Does NOT flash for Relay #2 (ONLY). Repair the open in the Radiator Fan Relay #2 Control circuit between the PDC and the splice. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. Does NOT flash for Relay #3 (ONLY). Repair the open in the Radiator Fan Relay #3 Control circuit between the PDC and the splice. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. Does NOT flash for both #2 and #3 Relays Go To 4 Flashes at both Relays. Install a substitute relay in place of the Radiator Fan Relays #2 and #3 to determine the faulty relay. Replace the appropriate Radiator Fan Relay. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
4	**NOTE: Both Radiator Fan Relays must be removed from the PDC during the following steps.** Turn the ignition off. Disconnect the PCM harness connector. Measure the resistance between ground and the Radiator Fan Relay #2 Control circuit in the PDC. Is the resistance below 100 ohms? Yes → Repair the short to ground in the Radiator Fan Relay Control circuits. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 5	All

P0481-COOLING FAN 2 CONTROL CIRCUIT (TURBO) — Continued

TEST	ACTION	APPLICABILITY
5	**NOTE: Both Radiator Fan Relays must be removed from the PDC during the following steps.** Turn the ignition off. Disconnect the PCM harness connector. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the Radiator Fan Relay #3 Control circuit from the PDC to the appropriate terminal of special tool #8815. Is the resistance below 5.0 ohms? Yes → NOTE: Before continuing, check the PCM harness connector terminals for corrosion, damage or terminal push out. Repair as necessary. Replace and program the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Repair the open in the Radiator Fan Relay Control circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

Symptom:
P0498-NVLD CANISTER VENT VALVE SOLENOID CIRCUIT LOW

When Monitored and Set Condition:

P0498-NVLD CANISTER VENT VALVE SOLENOID CIRCUIT LOW

When Monitored: Engine Running.

Set Condition: The PCM detects a short in the NVLD Canister vent solenoid circuits. One trip Fault.

POSSIBLE CAUSES
GOOD TRIP EQUAL TO ZERO
NVLD SOLENOID
(K106) NVLD SOLENOID CONTROL CIRCUIT SHORT TO GROUND
PCM

TEST	ACTION	APPLICABILITY
1	Ignition on, engine not running. With the DRBIII®, read DTCs and record the related Freeze Frame data. Is the Good Trip Counter displayed and equal to zero? Yes → Go To 2 No → Refer to the INTERMITTENT CONDITION symptom in the Driveability category. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
2	Turn the ignition off. Disconnect the NVLD electrical harness connector. Measure the resistance of the NVLD Solenoid coil. Is the resistance between 7.5 to 8.5 ohms? Yes → Go To 3 No → Replace the NVLD Assembly. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
3	Turn the ignition off. Disconnect the NVLD electrical harness connector. Disconnect the PCM harness connector. Measure the resistance between ground and the (K106) NVLD Sol Control circuit at the NVLD electrical harness connector. Is the resistance below 5.0 ohms? Yes → Repair the short to ground in the (K106) NVLD Solenoid Control circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → NOTE: Before continuing, check the PCM harness connector terminals for corrosion, damage or terminal push out. Repair as necessary. Replace and program the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

Symptom:

P0499-NVLD CANISTER VENT VALVE SOLENOID CIRCUIT HIGH

When Monitored and Set Condition:

P0499-NVLD CANISTER VENT VALVE SOLENOID CIRCUIT HIGH

When Monitored: Engine Running.

Set Condition: The PCM detects an open in the NVLD Canister vent solenoid circuits. One trip Fault.

POSSIBLE CAUSES
GOOD TRIP EQUAL TO ZERO
NVLD SOLENOID
(K106) NVLD SOL CONTROL CIRCUIT SHORT TO BATTERY VOLTAGE
(K106) NVLD SOL CONTROL CIRCUIT OPEN
(Z1) GROUND CIRCUIT OPEN
PCM

TEST	ACTION	APPLICABILITY
1	Ignition on, engine not running. With the DRBIII®, read DTCs and record the related Freeze Frame data. Is the Good Trip Counter displayed and equal to zero? Yes → Go To 2 No → Refer to the INTERMITTENT CONDITION symptom in the Driveability category. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
2	Turn the ignition off. Disconnect the NVLD Assembly harness connector. Measure the resistance of the NVLD Solenoid coil. Is the resistance between 7.5 to 8.5 ohms? Yes → Go To 3 No → Replace the NVLD Assembly. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

P0499-NVLD CANISTER VENT VALVE SOLENOID CIRCUIT HIGH — Continued

TEST	ACTION	APPLICABILITY
3	Turn the ignition off. Disconnect the NVLD Assembly harness connector. Disconnect the PCM harness connector. Turn the ignition on. Measure the voltage on the (K106) NVLD Sol Control circuit in the NVLD Assembly harness connector. Is the voltage above 1.0 volt? Yes → Repair the short to battery voltage in the (K106) NVLD Sol Control circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 4	All
4	Turn the ignition off. Disconnect the NVLD Assembly harness connector. Disconnect the PCM harness connector. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the (K106) NVLD Sol Control circuit from the NVLD Assembly harness connector to the appropriate terminal of special tool #8815. Is the resistance below 5.0 ohms? Yes → Go To 5 No → Repair the open in the (K106) NVLD Sol Control circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
5	Turn the ignition off. Disconnect the NVLD Assembly harness connector. Measure the resistance between the (Z1) Ground circuit and ground. Is the resistance below 5.0 ohms? Yes → Go To 6 No → Repair the open in the (Z1) Ground circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
6	**NOTE: Before continuing, check the PCM harness connector terminals for corrosion, damage, or terminal push out. Repair as necessary.** If there are no possible causes remaining, view repair. Repair Replace and program the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

Symptom:
P0501-VEHICLE SPEED SENSOR #1 PERFORMANCE (AUTO TRANS)

When Monitored and Set Condition:

P0501-VEHICLE SPEED SENSOR #1 PERFORMANCE (AUTO TRANS)

When Monitored: Engine running. Transmission not in park or neutral. Brakes not applied. Engine run time greater than 10 seconds.

Set Condition: The PCM does not see vehicle speed signal from the transmission control side of the PCM. Two Trip Fault.

POSSIBLE CAUSES
GOOD TRIP EQUAL TO ZERO
TRANSMISSION DTC(S)
PCM

TEST	ACTION	APPLICABILITY
1	**NOTE: Ensure that the Pinion Factor has been programmed and the correct tire size has been programmed in before continuing.** Ignition on, engine not running. With the DRBIII®, read PCM DTCs and record the related Freeze Frame data. Is the Good Trip displayed and equal to zero? Yes → Go To 2 No → Refer to the INTERMITTENT CONDITION symptom in the Driveability category. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
2	Turn the ignition on. With the DRBIII®, check the Transmission DTCs. Are there any Transmission DTCs present? Yes → Refer to the appropriate Transmission DTC in the Transmission category. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → NOTE: Before continuing, check the PCM harness connector terminals for corrosion, damage, or terminal push out. Repair as necessary. Replace and program the Powertrain Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

Symptom:
P0501-VEHICLE SPEED SENSOR #1 PERFORMANCE (MANUAL TRANS)

When Monitored and Set Condition:

P0501-VEHICLE SPEED SENSOR #1 PERFORMANCE (MANUAL TRANS)

When Monitored: With the engine running. Transmission not in park or neutral. Engine rpm greater than 1500.

Set Condition: The PCM does not receive a vehicle speed sensor signal for more than 11 seconds. 2 consecutive trips.

POSSIBLE CAUSES
VEHICLE SPEED SENSOR OPERATION
(K7) 5 VOLT SUPPLY CIRCUIT OPEN
(G7) VSS SIGNAL CIRCUIT SHORTED TO GROUND
(G7) VSS SIGNAL CIRCUIT OPEN
PCM VSS SIGNAL
(K4) SENSOR GROUND CIRCUIT OPEN
VEHICLE SPEED SENSOR

TEST	ACTION	APPLICABILITY
1	Raise the drive wheels off the ground. **WARNING: BE SURE TO KEEP HANDS AND FEET CLEAR OF ROTATING WHEELS.** Start the engine. With the DRBIII®, monitor the Vehicle Speed Sensor Place the transmission in any forward gear. Allow the wheels to rotate. Does the DRBIII® display vehicle speed above 0 MPH/KMH? Yes → Refer to the INTERMITTENT CONDITION symptom in the Driveability category. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 2	All
2	Turn the ignition off. Disconnect the Vehicle Speed Sensor harness connector. Turn the ignition on. Measure the voltage of the (K7) 5 Volt Supply circuit in the VSS harness connector. Is the voltage above 4.6 volts? Yes → Go To 3 No → Repair the (K7) 5 Volt Supply circuit for an open. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

P0501-VEHICLE SPEED SENSOR #1 PERFORMANCE (MANUAL TRANS)

— Continued

TEST	ACTION	APPLICABILITY
3	Turn the ignition off. Disconnect the Vehicle Speed Sensor harness connector. Turn the ignition on. Measure the voltage of the (G7) VSS Signal circuit in the VSS harness connector. Is the voltage between 4.5 to 5.0 volts? Yes → Go To 4 No → Go To 5	All
4	Turn the ignition off. Disconnect the Vehicle Speed Sensor harness connector. Measure the resistance of the (K4) Sensor ground circuit between the VSS harness connector and ground. Is the resistance below 5.0 ohms? Yes → Remove and inspect the Pinion Gear. If OK, replace the Vehicle Speed Sensor. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Repair the (K4) Sensor ground circuit for an open. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
5	Turn the ignition off. Disconnect the Vehicle Speed Sensor harness connector. Disconnect the PCM harness connector. Measure the resistance of the (G7) Vehicle Speed Sensor Signal circuit in the VSS harness connector to ground. Is the resistance below 100 ohms? Yes → Repair the (G7) VSS Signal circuit for a short to ground. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 6	All
6	Turn the ignition off. Disconnect the Vehicle Speed Sensor harness connector. Disconnect the PCM harness connector. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the (G7) VSS Signal circuit between the VSS harness connector and to the appropriate terminal of special tool #8815. Is the resistance below 5 ohms? Yes → Go To 7 No → Repair the (G7) VSS Signal circuit for an open. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
7	**NOTE: Before continuing, check the PCM harness connector terminals for corrosion, damage, or terminal push out. Repair as necessary.** If there are no possible causes remaining, view repair, Repair Replace and program the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

Symptom List:

P0506-IDLE SPEED LOW PERFORMANCE
P0507-IDLE SPEED HIGH PERFORMANCE
P0519-IDLE SPEED PERFORMANCE

Test Note: All symptoms listed above are diagnosed using the same tests. The title for the tests will be P0506-IDLE SPEED LOW PERFORMANCE.

When Monitored and Set Condition:

P0506-IDLE SPEED LOW PERFORMANCE

When Monitored: Engine Running. During an idle condition.

Set Condition: If the engine RPM does not come within a calibratable low limit of the target idle speed, a failure timer will increment. When the appropriate failure timer reaches its maximum threshold without sign of RPM trending towards control, a soft fail is generated. When a calibratable number of the soft fails is reached, a 1 trip fault is set. When two 1 trip faults occur in a row, the DTC is set and the MIL illuminates.

P0507-IDLE SPEED HIGH PERFORMANCE

When Monitored: Engine Running. During an idle condition.

Set Condition: If the engine RPM does not come within a calibratable high limit of the target idle speed, a failure timer will increment. When the appropriate failure timer reaches its maximum threshold without sign of RPM trending towards control, a soft fail is generated. When a calibratable number of the soft fails is reached, a 1 trip fault is set. When two 1 trip faults occur in a row, the DTC is set and the MIL illuminates.

P0519-IDLE SPEED PERFORMANCE

When Monitored: With the engine idling and the transmission in drive, if automatic. There must not be a MAP sensor trouble code or a Throttle Position Sensor trouble code.

Set Condition: The engine idle is not within 200 rpm above or 100 rpm below the target idle for 50 seconds. Two trip fault.

POSSIBLE CAUSES
GOOD TRIP EQUAL TO ZERO
PCV SYSTEM
IAC MOTOR PASSAGES
VACUUM LEAKS
AIR INDUCTION SYSTEM
THROTTLE BODY AND THROTTLE LINKAGE

P0506-IDLE SPEED LOW PERFORMANCE — Continued

TEST	ACTION	APPLICABILITY
1	Ignition on, engine not running. With the DRBIII®, read DTCs and record the related Freeze Frame data. Is the Good Trip Counter displayed and equal to zero? Yes → Go To 2 No → Refer to the INTERMITTENT CONDITION symptom in the Driveability category. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
2	Visually and Physically inspect the PCV system. Check for the PCV valve disconnected. Check for an incorrect PCV valve. The PCV valve must meet OEM specifications. Damage vacuum hose. Were any of the above condition found? Yes → Repair as necessary. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 3	All
3	Turn the ignition off. Remove the IAC Motor. Inspect the IAC Motor and passages for any obstructions or damage to motor. Were any problems found? Yes → Repair as necessary. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 4	All
4	Start the engine. Inspect the vehicle for external vacuum leaks. Inspect the engine for internal vacuum leaks. Were any vacuum leaks found? Yes → Repair the vacuum leak as necessary. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 5	All
5	Inspect the Air Induction System for the following problems. Restrictions: Dirty Air Cleaner, Foreign material trapped in the air intake tube, etc. Leaks: Air Intake tube connection, Air Cleaner housing, etc. Were any problems found? Yes → Repair or replace as necessary. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 6	All
6	Inspect the throttle body plate carbon build up or other restrictions. Inspect the throttle linkage for binding and smooth operation. Ensure the throttle plate is resting on the stop at idle. Were any problems found? Yes → Repair or replace as necessary. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Test Complete.	All

Symptom:
P0508-IAC VALVE SENSE CIRCUIT LOW

When Monitored and Set Condition:

P0508-IAC VALVE SENSE CIRCUIT LOW

When Monitored: Engine running. Battery voltage greater than 10 volts.

Set Condition: The IAC sense circuit is less than 175 mA. One Trip Fault.

POSSIBLE CAUSES
IAC MOTOR OPERATION
IAC MOTOR
(K610) IAC MOTOR CONTROL CIRCUIT SHORTED TO GROUND
(K961) IAC RETURN CIRCUIT OPEN
(K961) IAC RETURN CIRCUIT SHORTED TO GROUND
(K610) IAC MOTOR CONTROL CIRCUIT OPEN
PCM

TEST	ACTION	APPLICABILITY
1	**NOTE: If the engine will not idle, maintain an engine speed between 800 and 1500 RPM.** Start the engine. Allow the engine to idle. With the DRBIII®, read the IAC Current. Is the IAC Current below 146 mA? Yes → Go To 2 No → Refer to the INTERMITTENT CONDITION symptom in the Driveability category. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
2	Turn the ignition off. Disconnect the IAC Motor harness connector. Remove the IAC Motor. **NOTE: Inspect the IAC air passages for restriction and damage to the IAC valve.** Measure the resistance across the IAC Motor pin terminals (component). Is the resistance 9.7 +/- 1.0 ohms? Yes → Go To 3 No → Replace the IAC Motor. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

P0508-IAC VALVE SENSE CIRCUIT LOW — Continued

TEST	ACTION	APPLICABILITY
3	Turn the ignition off. Disconnect the IAC Motor harness connector. Disconnect the PCM harness connectors. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the (K961) IAC Signal circuit from the IAC Motor harness connector to the appropriate terminal of special tool #8815. Is the resistance below 5.0 ohms? Yes → Go To 4 No → Repair the open in the (K961) IAC Return circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
4	Turn the ignition off. Disconnect the IAC Motor harness connector. Disconnect the PCM harness connectors. Measure the resistance between ground and the (K961) IAC Signal in the IAC Motor harness connector. Is the resistance below 100 ohms? Yes → Repair the short to ground in the (K961) IAC Return circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 5	All
5	Turn the ignition off. Disconnect the IAC Motor harness connector. Disconnect the PCM harness connectors. Measure the resistance between ground and the (K610) IAC Motor Control circuit in the IAC Motor harness connector. Is the resistance below 100 ohms? Yes → Repair the short to ground in the (K610) IAC Motor Control circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 6	All
6	Turn the ignition off. Disconnect the IAC Motor harness connector. Disconnect the PCM harness connectors. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the (K610) IAC Return circuit from the IAC Motor harness connector to the appropriate terminal of special tool #8815. Is the resistance below 5.0 ohms? Yes → Go To 7 No → Repair the open in the (K610) IAC Motor Control circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

P0508-IAC VALVE SENSE CIRCUIT LOW — Continued

TEST	ACTION	APPLICABILITY
7	**NOTE: Before continuing, check the PCM harness connector terminals for corrosion, damage, or terminal push out. Repair as necessary.** If there are no possible causes remaining, view repair. Repair Replace and program the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

Symptom:
P0509-IAC VALVE SENSE CIRCUIT HIGH

When Monitored and Set Condition:

P0509-IAC VALVE SENSE CIRCUIT HIGH

When Monitored: Engine running. Battery voltage greater than 10 volts.

Set Condition: The IAC sense circuit is greater than 980 mA. One Trip Fault.

POSSIBLE CAUSES
IAC MOTOR OPERATION
IAC MOTOR
(K961) IAC RETURN CIRCUIT SHORTED TO VOLTAGE
(K610) IAC MOTOR CONTROL CIRCUIT SHORTED TO VOLTAGE
(K961) IAC RETURN CIRCUIT SHORTED TO (K610) IAC MOTOR CONTROL CIRCUIT
PCM

TEST	ACTION	APPLICABILITY
1	**NOTE: If the engine will not idle, maintain an engine speed between 800 and 1500 RPM.** Start the engine. Allow the engine to idle. With the DRBIII®, read the IAC Current. Is the IAC Current above 999 mA? Yes → Go To 2 No → Refer to the INTERMITTENT CONDITION symptom in the Driveability category. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
2	Turn the ignition off. Disconnect the IAC Motor harness connector. With the DRBIII®, monitor the IAC Current. Turn the ignition on. Does the DRBIII® display IAC Current at 0mA? Yes → Replace the IAC Motor. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 3	All

P0509-IAC VALVE SENSE CIRCUIT HIGH — Continued

TEST	ACTION	APPLICABILITY
3	Turn the ignition off. Disconnect the IAC Motor harness connector. Turn the ignition on. With the DRBIII®, actuate the ASD Relay. Measure the voltage of the (K961) IAC Return circuit in the IAC Motor harness connector. Is the voltage above 0.5 of a volt? Yes → Repair the short to voltage in the (K961) IAC Return circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 4	All
4	Turn the ignition off. Disconnect the IAC Motor harness connector. Turn the ignition on. With the DRBIII®, actuate the ASD Relay. Measure the voltage of the (K610) IAC Motor Driver circuit in the IAC Motor harness connector. Is the voltage above 0.5 of a volt? Yes → Repair the short to voltage in the (K610) IAC Motor Control circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 5	All
5	Turn the ignition off. Disconnect the IAC Motor harness connector. Measure the resistance across the IAC Motor harness connector. Is the resistance below 5.0 ohms? Yes → Repair the (K961) IAC Motor Return circuit short to the (K610) IAC Motor Control circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 6	All
6	**NOTE: Before continuing, check the PCM harness connector terminals for corrosion, damage, or terminal push out. Repair as necessary.** If there are no possible causes remaining, view repair. Repair Replace and program the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

Symptom:
P0513-INVALID SKIM KEY

When Monitored and Set Condition:

P0513-INVALID SKIM KEY

When Monitored: Ignition on.

Set Condition: The PCM detects an invalid SKIM key.

POSSIBLE CAUSES
INCORRECT VIN IN PCM
INVALID SKIM KEY NOT PRESENT
NO COMMUNICATION WITH SKIM
NO VIN PROGRAMMED IN THE PCM
PCM
SKIM TROUBLE CODES SET

TEST	ACTION	APPLICABILITY
1	Turn the ignition on. With the DRBIII®, read the PCM DTCs. Is the Good Trip Counter displayed and equal to zero? Yes → Go To 2 No → Go To 7	All
2	With the DRBIII®, attempt to communicate with the SKIM. Turn the ignition on. Can the DRBIII® communicate with the SKIM? Yes → Go To 3 No → Refer to the No Communication category. Perform SKIS VERIFICATION.	All
3	Turn the ignition on. With the DRBIII®, check for SKIM DTCs. Are any DTCs present in the SKIM? Yes → Refer to SKIM category for the related symptom(s). Perform SKIS VERIFICATION. No → Go To 4	All
4	Turn the ignition on. With the DRBIII®, display the VIN that is programmed in the PCM. Has a VIN been programmed into the PCM? Yes → Go To 5 No → Program the correct VIN into the PCM and retest. Perform SKIS VERIFICATION.	All

P0513-INVALID SKIM KEY — Continued

TEST	ACTION	APPLICABILITY
5	Turn the ignition on. With the DRBIII®, display the VIN that is programmed in the PCM. Was the correct VIN programmed into the PCM? Yes → Go To 6 No → Replace and program the Powertrain Control Module in accordance with the Service Information. Perform SKIS VERIFICATION.	All
6	Turn the ignition off. Replace and program the Sentry Key Immobilizer Module in accordance with the Service Information. Turn the ignition on. With the DRBIII®, erase all SKIM and PCM DTCs. Attempt to start and idle the engine. With the DRBIII®, read the PCM DTCs. Does the DRBIII® display this code? Yes → NOTE: Before continuing, check the PCM harness connector termnals for corrosion, damage, or terminal push out. Repair as necessary. Replace and program the Powertrain Control Module in accordance with the Service Information. Perform SKIS VERIFICATION. No → Test Complete.	All
7	**NOTE: You must obtain the SKIM pin number.** **NOTE: This DTC could have been set if the SKIM harness connector was disconnected, or if the SKIM was replaced recently.** **NOTE: All keys that the customer uses for this vehicle must be tested to verify they are operating properly.** Turn the ignition on. Verify the correct VIN is programmed into the PCM and SKIM. Turn the ignition off. With the next customer key turn the ignition key on and crank the engine to start. With the DRBIII®, read the PCM DTCs. Look for P0513. Is the Good Trip Counter for DTC P0513 displayed and equal to 0? Yes → Replace the Ignition Key. Perform SKIS VERIFICATION. No → Test Complete. **NOTE: If this DTC cannot be reset, it could have been an actual theft attempt.**	All

Symptom:
P0516-BATTERY TEMPERATURE SENSOR LOW

When Monitored and Set Condition:

P0516-BATTERY TEMPERATURE SENSOR LOW

When Monitored: Ignition on.

Set Condition: Battery temperature sensor voltage below 0.1 of a volt.

POSSIBLE CAUSES
BATTERY TEMP SENSOR VOLTAGE BELOW 0.1 VOLTS
BATTERY TEMP SENSOR INTERNAL FAILURE
(K118) BATTERY TEMP SIGNAL SHORTED TO GROUND
(K118) BATTERY TEMP SIGNAL SHORTED TO (K167) SENSOR GROUND CIRCUIT
PCM

TEST	ACTION	APPLICABILITY
1	**NOTE: After repairing a Battery Temp DTC, the Battery Temp value will not be refreshed until either the ignition is OFF for more than 3 hours or the vehicle is driven above 10 MPH for more than 10 minutes.** Ignition on, engine not running. With the DRBIII®, read the Battery Temp Sensor voltage. Is the voltage below 0.1 volt? Yes → Go To 2 No → Refer to the INTERMITTENT CONDITION symptom in the Driveability category. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
2	Turn the ignition off. Disconnect the Battery Temp Sensor harness connector. Ignition on, engine not running. With the DRBIII®, read Battery Temp Sensor voltage. Does the Battery Temp Sensor voltage read approximately 5.0 volts? Yes → Replace the Battery Temperature Sensor. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 3	All

P0516-BATTERY TEMPERATURE SENSOR LOW — Continued

TEST	ACTION	APPLICABILITY
3	Turn the ignition off. Disconnect the Battery Temp Sensor harness connector. Disconnect the PCM harness connector. Measure the resistance between ground and the (K118) Battery Temp Signal circuit in the Battery Temp Sensor harness connector. Is the resistance below 100 ohms? Yes → Repair the short to ground in the (K118) Battery Temp Signal circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 4	All
4	Turn the ignition off. Disconnect the Battery Temp Sensor harness connector. Disconnect the PCM harness connector. Measure the resistance between the (K118) Battery Temp Signal circuit and the (K167) Sensor ground circuit in the Battery Temp Sensor harness connector. Is the resistance below 100 ohms? Yes → Repair the (K167) Sensor ground shorted to the (K118) Battery Temp Sensor Signal circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 5	All
5	**NOTE: Before continuing, check the PCM harness connector terminals for corrosion, damage, or terminal push out. Repair as necessary.** If there are no possible causes remaining, view repair. Repair Replace and program the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

Symptom:
P0517-BATTERY TEMPERATURE SENSOR HIGH

When Monitored and Set Condition:

P0517-BATTERY TEMPERATURE SENSOR HIGH

When Monitored: Ignition on.

Set Condition: Battery temperature voltage above 4.9 volts.

POSSIBLE CAUSES
BATTERY TEMP VOLTAGE ABOVE 4.9 VOLTS
(K118) BATTERY TEMP SIGNAL CIRCUIT SHORTED TO BATTERY VOLTAGE
BATTERY TEMP SENSOR INTERNAL FAILURE
(K118) BATTERY TEMP SIGNAL CIRCUIT OPEN
(K167) SENSOR GROUND CIRCUIT OPEN
PCM

TEST	ACTION	APPLICABILITY
1	**NOTE: After repairing a Battery Temp DTC, the Battery Temp value will not be refreshed until either the ignition is OFF for more than 3 hours or the vehicle is driven above 10 MPH for more than 10 minutes.** Ignition on, engine not running. With the DRBIII®, read the Battery Temp Sensor voltage. Is the voltage above 4.9 volts? Yes → Go To 2 No → Refer to the INTERMITTENT CONDITION symptom in the Driveability category. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
2	Turn the ignition off. Disconnect the Battery Temp Sensor harness connector. Ignition on, engine not running. Measure the voltage of the (K118) Battery Temp Signal circuit in the Battery Temp Sensor harness connector. Is the voltage above 5.2 volts? Yes → Repair the short to battery voltage in the (K118) Battery Temp Signal circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 3	All

P0517-BATTERY TEMPERATURE SENSOR HIGH — Continued

TEST	ACTION	APPLICABILITY
3	Turn the ignition off. Disconnect the Battery Temp harness connector. Connect a jumper wire between the Battery Temp Signal circuit and the Sensor ground circuit in the Battery Temp harness connector. Ignition on, engine not running. With the DRBIII®, read the Battery Temp Sensor voltage. Is the voltage below 1.0 volt? Yes → Replace the Battery Temp Sensor. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 4	All
4	Turn the ignition off. Disconnect the Battery Temp Sensor harness connector. Disconnect the PCM harness connector. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the (K118) Battery Temp Signal circuit from the Battery Temp Sensor harness connector to the appropriate terminal of special tool #8815. Is the resistance below 5.0 ohms? Yes → Go To 5 No → Repair the open in the (K118) Battery Temp Signal circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
5	Turn the ignition off. Disconnect the Battery Sensor harness connector. Disconnect the PCM harness connector. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the (K167) Sensor ground circuit from the Battery Temp Sensor harness connector to the appropriate terminal of special tool #8815. Is the resistance below 5.0 ohms? Yes → Go To 6 No → Repair the open in the (K167) Sensor ground circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
6	**NOTE: Before continuing, check the PCM harness connector terminals for corrosion, damage, or terminal push out. Repair as necessary.** If there are no possible causes remaining, view repair. Repair Replace and program the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

Symptom:
P0522-OIL PRESSURE SENSOR LOW

When Monitored and Set Condition:

P0522-OIL PRESSURE SENSOR LOW

When Monitored: With the ignition key on and battery voltage above 10.4 volts.

Set Condition: The oil pressure sensor voltage at PCM goes below 0.1 volts for 0.5 of a second.

POSSIBLE CAUSES
GOOD TRIP EQUAL TO ZERO
OIL PRESSURE SENSOR INTERNAL FAILURE
(G6) OPS SIGNAL CIRCUIT OPEN
(G6) OPS SIGNAL CIRCUIT SHORTED TO VOLTAGE
PCM

TEST	ACTION	APPLICABILITY
1	**NOTE: Diagnose and repair any other Sensor Voltage High DTCs before performing this test.** Turn the ignition on, with the engine not running, for a minimum of 90 seconds. With the DRBIII®, read PCM DTCs and record the related Freeze Frame data. Is the Good Trip counter displayed and equal to zero? Yes → Go To 2 No → Refer to the INTERMITTENT CONDITION symptom in the Driveability category. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
2	Turn the ignition off. Disconnect the Oil Pressure Sensor harness connector. **NOTE: When there is no oil pressure present, the Oil Pressure Sensor contacts are normally closed.** **NOTE: Engine must be off for a minimum of 90 seconds to allow for the oil pressure to bleed down.** Measure the resistance between the Oil Pressure Sensor signal circuit terminal in the Oil Pressure Sensor and ground. Is the resistance above 5 ohms? Yes → Replace the Oil Pressure Sensor. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 3	All

P0522-OIL PRESSURE SENSOR LOW — Continued

TEST	ACTION	APPLICABILITY
3	Turn the ignition off. Disconnect the Oil Pressure Sensor harness connector. Turn the ignition on. Measure the voltage of the Oil Pressure Sensor signal circuit at the Oil Pressure Sensor harness connector. Is the voltage above 11.0 volts? Yes → Go To 4 No → Go To 5	All
4	Turn the ignition off. Disconnect the Oil Pressure Sensor harness connector. Disconnect the PCM harness connector. Measure the voltage of the Oil Pressure Sensor signal circuit at the Oil Pressure Sensor harness connector. Is there any voltage present? Yes → Repair the (G6) Oil Pressure Sensor signal circuit for a short to voltage. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Replace and program the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
5	Turn the ignition off. Disconnect the Oil Pressure Sensor harness connector. Disconnect the PCM harness connector. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the (G6) Oil Pressure Sensor signal circuit from the Oil Pressure Sensor harness connector to the appropriate terminal of special tool #8815. Is the resistance below 100 ohms? Yes → Repair the open (G6) Oil Pressure Sensor signal circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Replace and program the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

Symptom:
P0551-POWER STEERING SWITCH PERFORMANCE

When Monitored and Set Condition:

P0551-POWER STEERING SWITCH PERFORMANCE

When Monitored: Engine running. Vehicle speed at 50 MPH (80.5 KMh) or greater. Coolant temperature above 20°C (68°F).

Set Condition: The power steering pressure switch remains open for 40 seconds or greater while both the vehicle speed is at 50 MPH (80.5 KMh) and the engine coolant temperature above 20°C (68°F). Two trip fault.

POSSIBLE CAUSES
GOOD TRIP COUNTER = 0
POWER STEERING PRESSURE SWITCH (Z12) GROUND CIRCUIT OPEN
(K10) PSP SWITCH SIGNAL CIRCUIT SHORTED TO GROUND
(K10) PSP SWITCH SIGNAL CIRCUIT OPEN
POWER STEERING PRESSURE SWITCH
PCM

TEST	ACTION	APPLICABILITY
1	Ignition on, engine not running. With the DRBIII®, read DTCs and record the related Freeze Frame data. Is the Good Trip Counter displayed and equal to zero? Yes → Go To 2 No → Refer to the INTERMITTENT CONDITION symptom in the Driveability category. Perform POWERTRAIN VERIFICATION TEST VER - 2 - NGC.	All
2	Turn the ignition off. Disconnect the Power Steering Pressure Switch harness connector. Measure the resistance between Ground and the PSP Switch (Z12) ground circuit at the Power Steering Pressure Switch connector. Is the resistance below 5.0 ohms? Yes → Go To 3 No → Repair the open in the PSP Switch (Z1) ground circuit. Perform POWERTRAIN VERIFICATION TEST VER - 2 - NGC.	All

P0551-POWER STEERING SWITCH PERFORMANCE — Continued

TEST	ACTION	APPLICABILITY
3	Turn the ignition off. Disconnect the Power Steering Pressure Switch harness connector. Disconnect the PCM harness connector(s). Measure the resistance between ground and the (K10) PSP Switch Signal circuit at the Switch connector. Is the resistance below 100 ohms? Yes → Repair the short to ground in the (K10) PSP Switch Signal circuit. Perform POWERTRAIN VERIFICATION TEST VER - 2 - NGC. No → Go To 4	All
4	Turn the ignition off. Disconnect the Power Steering Pressure Switch harness connector. Disconnect the PCM harness connector(s). **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure resistance of Power Steering (K10) PSP Switch Signal circuit from the Power Steering Pressure Sensor harness connector to the appropriate terminal of special tool #8815. Is the resistance below 5.0 ohms? Yes → Go To 5 No → Repair the open in the (K10) PSP Switch Signal circuit. Perform POWERTRAIN VERIFICATION TEST VER - 2 - NGC.	All
5	Turn the ignition off. Disconnect the Power Steering Pressure Switch harness connector. Ignition on, engine not running. Connect a Jumper Wire to the (K10) PSP Switch Signal circuit at harness connector. Using the DRBIII®, while monitoring the Power Steering Pressure Switch. Touch the Jumper Wire to the Ground circuit at the Power Steering Pressure Switch harness connector several times. Did the Power Steering Pressure Switch status change from Hi to Low? Yes → Replace the Power Steering Pressure Switch. Perform POWERTRAIN VERIFICATION TEST VER - 2 - NGC. No → Go To 6	All
6	**NOTE: Before continuing, check the PCM harness connector terminals for corrosion, damage, or terminal push out. Repair as necessary.** If there are no possible causes remaining, view repair. Repair Replace and program the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 2 - NGC.	All

Symptom:
P0562-BATTERY VOLTAGE LOW

When Monitored and Set Condition:

P0562-BATTERY VOLTAGE LOW

When Monitored: The engine running. The engine speed greater than 380 RPM.

Set Condition: Battery voltage is less than 11.5 volts for 10 seconds. Battery Lamp will illuminate. The Battery Lamp will turn off if the battery voltage recovers to 12.04 volts or greater, due to reduction of load, increased RPM or an intermittent condition.

POSSIBLE CAUSES
GOOD TRIP EQUAL TO ZERO
B+ CIRCUIT HIGH RESISTANCE
GENERATOR GROUND HIGH RESISTANCE
GENERATOR OPERATION
(Z1) GENERATOR FIELD GROUND CIRCUIT OPEN
(K20) GEN FIELD CONTROL CIRCUIT SHORTED TO GROUND
(K20) GEN FIELD CONTROL CIRCUIT OPEN
PCM

TEST	ACTION	APPLICABILITY
1	**NOTE: Ensure the Battery is in good condition. Using the Midtronics Battery Tester, test the Battery before continuing.** **NOTE: Inspect the vehicle for aftermarket accessories that may exceed the Generator System output.** Turn the ignition off. **NOTE: Ensure the generator drive belt is in good operating condition.** **NOTE: Inspect the fuses in the PDC. If a fuse is found to be open use the wiring diagram/schematic as a guide, inspect the wiring and connectors for damage.** Ignition on, engine not running. With the DRBIII®, read DTCs and record the related Freeze Frame data. Is the Good Trip Counter displayed and equal to zero? Yes → Go To 2 No → Refer to the INTERMITTENT CONDITION symptom in the Driveability category. Perform POWERTRAIN VERIFICATION TEST VER - 3 - NGC.	All

P0562-BATTERY VOLTAGE LOW — Continued

TEST	ACTION	APPLICABILITY
2	**WARNING: WHEN THE ENGINE IS OPERATING, DO NOT STAND IN A DIRECT LINE WITH THE FAN. DO NOT PUT YOUR HANDS NEAR THE PULLEYS, BELTS OR FAN. DO NOT WEAR LOOSE CLOTHING.** Ignition on, engine not running. **NOTE: Ensure all wires are clear of the engine's moving parts.** Measure the voltage between the Generator B+ Terminal and the Battery+ Post. Start the engine. Is the voltage above 0.4 of a volt? Yes → Repair the B+ circuit for high resistance between the Generator and Battery. Perform POWERTRAIN VERIFICATION TEST VER - 3 - NGC. No → Go To 3	All
3	**WARNING: WHEN THE ENGINE IS OPERATING, DO NOT STAND IN A DIRECT LINE WITH THE FAN. DO NOT PUT YOUR HANDS NEAR THE PULLEYS, BELTS OR FAN. DO NOT WEAR LOOSE CLOTHING.** Start the engine. Allow the engine to reach normal operating temperature. **NOTE: Ensure all wires are clear of the engine's moving parts.** Measure the voltage between the Generator case and Battery ground post. Is the voltage above 0.1 of a volt? Yes → Repair Generator Ground for high resistance, Generator Case to Battery ground side. Perform POWERTRAIN VERIFICATION TEST VER - 3 - NGC. No → Go To 4	All
4	Turn the ignition off. Disconnect the Generator Field harness connector. Using a 12-volt test light, jumper it across the Generator Field harness connector. Ignition on, engine not running. With the DRBIII®, actuate the Generator Field Driver circuit. Does the test light illuminate brightly and flash on and off? Yes → Replace the Generator. Perform POWERTRAIN VERIFICATION TEST VER - 3 - NGC. No → Go To 5	All
5	Turn the ignition off. Disconnect the Generator Field harness connector. Using a 12-volt test connected to battery voltage, probe the Generator (Z1) Ground circuit in the Generator Field harness connector. Does the test light illuminate brightly? Yes → Go To 6 No → Repair the open in the (Z1) Generator Field Ground circuit. Perform POWERTRAIN VERIFICATION TEST VER - 3 - NGC.	All

P0562-BATTERY VOLTAGE LOW — Continued

TEST	ACTION	APPLICABILITY
6	Ignition on, engine not running. Disconnect the Generator Field harness connector. Disconnect the PCM harness connector. Measure the resistance between ground and the (K20) Gen Field Control circuit in the Generator Field harness connector. Is the resistance below 100 ohms? Yes → Repair the (K20) Gen Field Control circuit for a short to ground. Perform POWERTRAIN VERIFICATION TEST VER - 3 - NGC. No → Go To 7	All
7	Turn the ignition off. Disconnect the Generator Field harness connector. Disconnect the PCM harness connector. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the (K20) Gen Field Control circuit from the Generator Field harness connector to the appropriate terminal of the special tool #8815. Is the resistance below 5.0 ohms? Yes → Go To 8 No → Repair the open in the (K20) Gen Field Control circuit. Perform POWERTRAIN VERIFICATION TEST VER - 3 - NGC.	All
8	**NOTE: Before continuing, check the PCM harness connector terminals for corrosion, damage or terminal push out. Repair as necessary.** If there are no possible causes remaining, view repair. Repair Replace and program the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 3 - NGC.	All

Symptom:
P0563-BATTERY VOLTAGE HIGH

When Monitored and Set Condition:

P0563-BATTERY VOLTAGE HIGH

When Monitored: With the ignition on. Engine RPM greater than 380 RPM.

Set Condition: The battery voltage is 1 volt greater than desired system voltage

POSSIBLE CAUSES
GOOD TRIP EQUAL TO ZERO
GENERATOR OPERATION
(K20) GEN FIELD CONTROL CIRCUIT SHORTED TO BATTERY VOLTAGE
PCM

TEST	ACTION	APPLICABILITY
1	**NOTE: Ensure the Battery is in good condition. Using the Midtronics Battery Tester, test the Battery before continuing.** **NOTE: Inspect the vehicle for aftermarket accessories that may exceed the Generator System output.** Turn the ignition off. **NOTE: Ensure the generator drive belt is in good operating condition.** **NOTE: Inspect the fuses in the PDC. If a fuse is found to be open use the wiring diagram/schematic as a guide, inspect the wiring and connectors for damage.** Ignition on, engine not running. With the DRBIII®, read DTCs and record the related Freeze Frame data. Is the Good Trip Counter displayed and equal to zero? Yes → Go To 2 No → Refer to the INTERMITTENT CONDITION symptom in the Driveability category. Perform POWERTRAIN VERIFICATION TEST VER - 3 - NGC.	All
2	Turn the ignition off. Disconnect the Generator Field harness connector. Using a 12-volt test light, jumper it across the Generator Field harness connector. Ignition on, engine not running. With the DRBIII®, actuate the Generator Field Driver circuit. Does the test light illuminate brightly and flash on and off? Yes → Go To 4 No → Go To 3	All

P0563-BATTERY VOLTAGE HIGH — Continued

TEST	ACTION	APPLICABILITY
3	Turn the ignition off. Disconnect the Generator Field harness connector. Disconnect the PCM harness connector. Measure the voltage on the (K20) Gen Field Control circuit at the Generator Field harness connector. Is the voltage above 1.0 volt? Yes → Repair the short to voltage in the (K20) Gen Field Control circuit. Perform POWERTRAIN VERIFICATION TEST VER - 3 - NGC. No → Go To 4	All
4	**NOTE: Before continuing, check the PCM harness connector terminals for corrosion, damage or terminal push out. Repair as necessary.** If there are no possible causes remaining, view repair. Repair Replace and program the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 3 - NGC.	All

Symptom:
P0572-BRAKE SWITCH #1 CIRCUIT LOW

When Monitored and Set Condition:

P0572-BRAKE SWITCH #1 CIRCUIT LOW

When Monitored: Ignition on.

Set Condition: When the PCM recognizes Brake Switch is mechanically stuck in the low/on position. One Trip Fault.

POSSIBLE CAUSES
GOOD TRIP EQUAL TO ZERO
BRAKE LAMP SWITCH OPERATION
(K29) BRAKE SWITCH SIGNAL CIRCUIT SHORTED TO GROUND
PCM

TEST	ACTION	APPLICABILITY
1	**NOTE: Verify battery voltage is greater than 10 volts.** Record Freeze Frame Data that was set by the related DTC before continuing. With the DRBIII®, read DTCs and record the related Freeze Frame data. Is the Good Trip Counter displayed and equal to zero? Yes → Go To 2 No → Refer to the INTERMITTENT CONDITION symptom in the Diagnostic category. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
2	Turn the ignition off. Remove the Brake Lamp Switch and disconnect the harness connector. Measure the resistance between the (Z1) Ground circuit terminal and the (K29) Brake Switch Signal terminal at the Brake Lamp Switch. Apply and release the brake pedal plunger while monitoring the ohmmeter. Does the resistance change from below 5.0 ohms to an open circuit? Yes → Go To 3 No → Replace the Brake Lamp Switch. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
3	Turn the ignition off. Disconnect the PCM harness connectors. Measure the resistance between ground and the (K29) Brake Switch Signal circuit in the Brake Lamp Switch harness connector. Is the resistance below 100 ohms? Yes → Repair the short to ground in the (K29) Brake Switch Signal circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 4	All

P0572-BRAKE SWITCH #1 CIRCUIT LOW — Continued

TEST	ACTION	APPLICABILITY
4	**NOTE: Before continuing, check the PCM harness connector terminals for corrosion, damage, or terminal push out. Repair as necessary.** Using the schematics as a guide, inspect the wire harness and connectors. Pay particular attention to all Power and Ground circuits. If there are no possible causes remaining, view repair. Repair Replace and program the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

Symptom:
P0573-BRAKE SWITCH #1 CIRCUIT HIGH

When Monitored and Set Condition:

P0573-BRAKE SWITCH #1 CIRCUIT HIGH

When Monitored: Ignition on.

Set Condition: When the PCM recognizes Brake Switch is stuck in the high/off position. One Trip Fault.

POSSIBLE CAUSES
GOOD TRIP EQUAL TO ZERO
BRAKE LAMP SWITCH OPERATION
(K29) BRAKE SWITCH SIGNAL CIRCUIT OPEN
(Z1) GROUND CIRCUIT OPEN
PCM

TEST	ACTION	APPLICABILITY
1	Ignition on, engine not running. With the DRBIII®, read DTCs and record the related Freeze Frame data. Is the Good Trip Counter displayed and equal to zero? Yes → Go To 2 No → Refer to the INTERMITTENT CONDITION in the symptom Diagnostic category. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
2	Turn the ignition off. Disconnect the Brake Lamp Switch harness connector. Measure the resistance between the (Z1) Ground circuit terminal and the (K29) Brake Switch Signal circuit terminal in the Brake Lamp Switch. Apply and release the brake pedal while monitoring the ohmmeter. Does the resistance change from below 5.0 ohms to an open circuit? Yes → Go To 3 No → Replace the Brake Lamp Switch. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

P0573-BRAKE SWITCH #1 CIRCUIT HIGH — Continued

TEST	ACTION	APPLICABILITY
3	Turn the ignition off. Disconnect the PCM harness connectors. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the (K29) Brake Switch Signal circuit from the Brake Lamp Switch harness connector to the appropriate terminal of special tool #8815. Is the resistance below 5.0 ohms? Yes → Go To 4 No → Repair the open in the (K29) Brake Switch Signal circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
4	Measure the resistance between the (Z2) Ground circuit and ground at the Brake Lamp Switch harness connector. Is the resistance below 5.0 ohms? Yes → Go To 5 No → Repair the open in the (Z1) Ground circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
5	**NOTE: Before continuing, check the PCM harness connector terminals for corrosion, damage, or terminal push out. Repair as necessary.** Using the schematics as a guide, inspect the wire harness and connectors. Pay particular attention to all Power and Ground circuits. If there are no possible causes remaining, view repair. Repair Replace and program the Powertrain Control Module in accordance Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

Symptom:
P0581-SPEED CONTROL SWITCH #1 HIGH

When Monitored and Set Condition:

P0581-SPEED CONTROL SWITCH #1 HIGH

When Monitored: With the ignition key on. Battery voltage above 10 volts.

Set Condition: The PCM detects an open or short to voltage in the Speed Control Switch Signal circuit. One Trip Fault.

POSSIBLE CAUSES
SPEED CONTROL SWITCH VOLTAGE HIGH
SPEED CONTROL SWITCHES
(V37) S/C SWITCH SIGNAL CIRCUIT SHORTED TO BATTERY VOLTAGE
(K4) SENSOR GROUND OPEN
PCM

TEST	ACTION	APPLICABILITY
1	**NOTE: Do not press any of the Speed Control Switch buttons.** Ignition on, engine not running. With the DRBIII®, read the Speed Control voltage. Is the Speed Control voltage above 4.8 volt? Yes → Go To 2 No → Refer to the INTERMITTENT CONDITION symptom in the Driveability category. Perform POWERTRAIN VERIFICATION TEST VER - 4 - NGC.	All
2	Turn the ignition off. Remove the Speed Control Switches from the steering wheel. Measure the resistance across each Speed Control Switch. Monitor the ohmmeter while pressing each function button on each switch. Resume/Accel - 15,400 ohms Cancel - 909 +/- 9 ohms Decel (Coast) - 2940 +/- 30 ohms On/Off - 0 ohms Set - 6650 +/- 66 ohms Does the function on the Speed Control Switches have the correct ohm value? Yes → Go To 3 No → Replace the Speed Control Switch that had the incorrect resistance value. Perform POWERTRAIN VERIFICATION TEST VER - 4 - NGC.	All

P0581-SPEED CONTROL SWITCH #1 HIGH — Continued

TEST	ACTION	APPLICABILITY
3	Turn the ignition off. Disconnect the Speed Control On/Off Switch harness connector. Disconnect the Speed Control Resume/Accel Switch harness connector. Disconnect the PCM harness connector. Measure the voltage of the (V37) S/C Switch Signal circuit at the Speed Control harness connector. Is the is the voltage above 5.0 volts? Yes → Repair the (V37) S/C Switch Signal circuit shorted to the battery voltage. Perform POWERTRAIN VERIFICATION TEST VER - 4 - NGC. No → Go To 4	All
4	**NOTE: The measurement must be taken from both Speed Control Switch harness connector.** Turn the ignition off. Disconnect the Speed Control On/Off Switch harness connector. Disconnect the Speed Control Resume/Accel Switch harness connector. Disconnect the PCM harness connector. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the (K4) Sensor Ground circuit from the Speed Control harness connector to the appropriate terminal of special tool #8815. Is the resistance below 5.0 ohms for both measurement? Yes → NOTE: Before continuing, check the PCM harness connector terminals for corrosion, damage or terminal push out. Repair as necessary. Replace and program the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 4 - NGC. No → Repair the (K4) Sensor Ground circuit for an open. Perform POWERTRAIN VERIFICATION TEST VER - 4 - NGC.	All

Symptom:
P0582-SPEED CONTROL VACUUM SOLENOID CIRCUIT

When Monitored and Set Condition:

P0582-SPEED CONTROL VACUUM SOLENOID CIRCUIT

When Monitored: Ignition on. Speed Control active.

Set Condition: The PCM detects an open or short to voltage in the Speed Control Vacuum Control circuit. One Trip Fault.

POSSIBLE CAUSES
SPEED CONTROL SOLENOID OPERATION
SPEED CONTROL VACUUM SOLENOID
(V36) S/C VACUUM SOL CONTROL CIRCUIT SHORTED TO GROUND
(V36) S/C VACUUM SOL CONTROL CIRCUIT OPEN
PCM (VACUUM SOLENOID)

TEST	ACTION	APPLICABILITY
1	Ignition on, engine not running. With the DRBIII®, read DTCs and record the related Freeze Frame data. With the DRBIII®, actuate the Speed Control Vacuum Solenoid and note operation. Does the Speed Control Vacuum Solenoid actuate properly? Yes → Refer to the INTERMITTENT CONDITION symptom in the Driveability category. Perform POWERTRAIN VERIFICATION TEST VER - 4 - NGC. No → Go To 2	All
2	Turn the ignition off. Disconnect the Speed Control Servo harness connector. Ignition on, engine not running. With the DRBIII®, actuate the Speed Control Vacuum Solenoid. Using a 12-volt test light connected to ground, probe the S/C Vacuum Control circuit. Does the test light illuminate brightly and flash? Yes → Replace the Speed Control Servo. Perform POWERTRAIN VERIFICATION TEST VER - 4 - NGC. No → Go To 3	All

P0582-SPEED CONTROL VACUUM SOLENOID CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
3	Turn the ignition off. Disconnect the S/C Servo harness connector. Disconnect the PCM harness connector. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the (V36) S/C Vacuum Sol Control circuit from the Speed Control Servo harness connector to the appropriate terminal of special tool # 8815. Is the resistance below 5.0 ohms? Yes → Go To 4 No → Repair the open/high resistance in the (V36) S/C Vacuum Sol Control circuit. Perform POWERTRAIN VERIFICATION TEST VER - 4 - NGC.	All
4	Turn the ignition off. Disconnect the S/C Servo harness connector. Disconnect the PCM harness connector. Measure the resistance between ground and the (V36) S/C Vacuum Solenoid Control circuit at the Speed Control Servo harness connector. Is the resistance below 100 ohms? Yes → Repair the short to ground in the (V36) S/C Vacuum Sol Control circuit. Perform POWERTRAIN VERIFICATION TEST VER - 4 - NGC. No → Go To 5	All
5	**NOTE: Before continuing, check the PCM harness connector terminals for corrosion, damage, or terminal push out. Repair as necessary.** If the there are no possible causes remaining, view repair. Repair Replace and program the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 4 - NGC.	All

Symptom:
P0586-SPEED CONTROL VENT SOLENOID CIRCUIT

When Monitored and Set Condition:

P0586-SPEED CONTROL VENT SOLENOID CIRCUIT

When Monitored: Ignition on. Speed Control active.

Set Condition: The PCM detects an open or short to voltage in the Speed Control Vent Control circuit. One Trip Fault.

POSSIBLE CAUSES
SPEED CONTROL SOLENOID OPERATION
SPEED CONTROL VENT SOLENOID
(V35) S/C VENT SOL CONTROL CIRCUIT OPEN
(V35) S/C VENT SOL CONTROL CIRCUIT SHORTED TO GROUND
PCM (VENT SOLENOID)

TEST	ACTION	APPLICABILITY
1	Ignition on, engine not running. With the DRBIII®, read DTCs and record the related Freeze Frame data. With the DRBIII®, actuate the Speed Control Vent Solenoid and note operation. Does the Speed Control Vent Solenoid acutate properly? Yes → Refer to the INTERMITTENT CONDITION symptom in the Driveability category. Perform POWERTRAIN VERIFICATION TEST VER - 4 - NGC. No → Go To 2	All
2	Turn the ignition off. Disconnect the Speed Control Servo harness connector. Ignition on, engine not running. With the DRBIII®, actuate the Speed Control Vent Solenoid. Using a 12-volt test light connected to ground, probe the (V35) Speed Control Vent Solenoid Control circuit in the Speed Control Servo harness connector. Does the test light illuminate brightly and flash? Yes → Replace the Speed Control Servo. Perform POWERTRAIN VERIFICATION TEST VER - 4 - NGC. No → Go To 3	All

P0586-SPEED CONTROL VENT SOLENOID CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
3	Turn the ignition off. Disconnect the S/C Servo harness connector. Disconnect the PCM harness connector. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the (V35) S/C Vent Sol Control circuit from the Speed Control Servo harness connector to the appropriate terminal of special tool #8815. Is the resistance below 5.0 ohms? Yes → Go To 4 No → Repair the open/high resistance in the (V35) S/C Vent Sol Control circuit. Perform POWERTRAIN VERIFICATION TEST VER - 4 - NGC.	All
4	Turn the ignition off. Disconnect the S/C Servo harness connector. Disconnect the PCM harness connector. Measure the resistance between ground and the (V35) S/C Vent Sol Control circuit at the Speed Control Servo harness connector. Is the resistance below 100 ohms? Yes → Repair the short to ground in the (V35) Speed Control Vent Solenoid Control circuit. Perform POWERTRAIN VERIFICATION TEST VER - 4 - NGC. No → Go To 5	All
5	**NOTE: Before continuing, check the PCM harness connector terminals for corrosion, damage, or terminal push out. Repair as necessary.** If the there are no possible causes remaining, view repair. Repair Replace and program the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 4 - NGC.	All

Symptom:
P0594-SPEED CONTROL SERVO POWER CIRCUIT

When Monitored and Set Condition:

P0594-SPEED CONTROL SERVO POWER CIRCUIT

When Monitored: With the ignition key on. The speed control switched on.

Set Condition: The PCM detects a open or short in the Speed Control Power Supply circuit. One Trip Fault.

POSSIBLE CAUSES
(V40) S/C BRAKE SWITCH OUTPUT CIRCUIT
(V32) S/C POWER SUPPLY CIRCUIT
(V32) S/C POWER SUPPLY CIRCUIT SHORTED TO GROUND
(V40) S/C BRAKE SWITCH OUTPUT CIRCUIT SHORTEDTO GROUND
(V40) S/C BRAKE SWITCH OUTPUT CIRCUIT OPEN
BRAKE LAMP SWITCH
PCM (S/C SOURCE CIRCUIT)

TEST	ACTION	APPLICABILITY
1	Turn the ignition off. Disconnect the Speed Control Servo harness connector. Ignition on, engine not running. **NOTE: It is necessary to PRESS and HOLD the Speed Control Switch in the ON position while checking for voltage.** Using a 12-volt test light connected to ground, probe the (V40) S/C Brake Switch Output terminal in the Servo Harness connector. Does the test light illuminate brightly? Yes → Refer to the INTERMITTENT CONDITION symptom in the Driveability category. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 2	All

P0594-SPEED CONTROL SERVO POWER CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
2	Turn the ignition off. Disconnect the PCM harness connector. Disconnect the Brake Lamp Switch harness connector. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the (V32) S/C Power Supply circuit from the Brake Lamp Switch harness connector to the appropriate terminal of special tool #8815. Is the resistance below 5.0 ohms? Yes → Go To 3 No → Repair the open/high resistance in the (V32) S/C Power Supply circuit between the PCM and Brake Switch. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
3	Turn the ignition off. Disconnect the PCM harness connector. Disconnect the Brake Switch harness connector. Measure the resistance between ground and the (V32) S/C Power Supply circuit in the Brake Switch harness connector. Is the resistance below 100 ohms? Yes → Go To 4 No → Repair the short to ground in the (V32) S/C Power Supply circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
4	Turn the ignition off. Disconnect the S/C Servo harness connector. Disconnect the Brake Switch harness connector. Measure the resistance of the (V40) S/C Brake Switch Output circuit from the Brake Switch harness connector to the S/C Servo harness connector. Is the resistance below 5.0 ohms? Yes → Go To 5 No → Repair the open/high resistance in the (V40) S/C Brake Switch Output circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
5	Turn the ignition off. Disconnect the Speed Control Servo harness connector. Disconnect the Brake Switch harness connector. Measure the resistance between ground and the (V40) S/C Brake Switch Output circuit at the Speed Control Servo harness connector. Is the resistance below 100 ohms? Yes → Repair the short to ground in the (V40) S/C Brake Switch Output circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 6	All

P0594-SPEED CONTROL SERVO POWER CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
6	Disconnect the Brake Lamp Switch harness connector. Ignition on, engine not running. Using a 12-volt test light connected to ground, probe the (V32) Speed Control Power Supply circuit in the Brake Lamp Switch harness connector. **NOTE: It is necessary to HOLD the Cruise Control Switch in the ON position to get an accurate reading.** Does the test light illuminate brightly? Yes → Replace the Brake Lamp Switch. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 7	All
7	**NOTE: Before continuing, check the PCM harness connector terminals for corrosion, damage, or terminal push out. Repair as necessary.** If there are no possible causes remaining, view repair. Repair Replace and program the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

Symptom List:
P0600-SERIAL COMMUNICATION LINK
P0601-INTERNAL MEMORY CHECKSUM INVALID

Test Note: All symptoms listed above are diagnosed using the same tests. The title for the tests will be P0600-SERIAL COMMUNICATION LINK.

When Monitored and Set Condition:

P0600-SERIAL COMMUNICATION LINK

When Monitored: With the ignition on.

Set Condition: Internal Bus communication failure between the Engine and Transmission processors.

P0601-INTERNAL MEMORY CHECKSUM INVALID

When Monitored: With the ignition on.

Set Condition: Internal checksum for software failed, does not match calculated value.

POSSIBLE CAUSES
PCM INTERNAL OR SPI

TEST	ACTION	APPLICABILITY
1	The Powertrain Control Module is reporting internal errors, view repair to continue. Repair Replace and program the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 1.	All

Symptom:
P0622-GENERATOR FIELD CONTROL CIRCUIT

When Monitored and Set Condition:

P0622-GENERATOR FIELD CONTROL CIRCUIT

When Monitored: With the ignition on. Engine running.

Set Condition: When the PCM tries to regulate the generator field with no result during monitoring. One Trip Fault.

POSSIBLE CAUSES
GOOD TRIP EQUAL TO ZERO
GENERATOR OPERATION
(Z1) GEN FIELD GROUND CIRCUIT OPEN
(K20) GEN FIELD CONTROL CIRCUIT SHORTED TO BATTERY VOLTAGE
(K20) GEN FIELD CONTROL CIRCUIT SHORTED TO GROUND
(K20) GEN FIELD CONTROL CIRCUIT OPEN
PCM

TEST	ACTION	APPLICABILITY
1	Ignition on, engine not running. With the DRBIII®, read DTCs and record the related Freeze Frame data. Is the Good Trip Counter displayed and equal to zero? Yes → Refer to the INTERMITTENT CONDITION symptom in the Driveability category. Perform POWERTRAIN VERIFICATION TEST VER - 3 - NGC. No → Go To 2	All
2	Turn the ignition off. Disconnect the Generator Field harness connector. Using a 12-volt test light, jumper it across the Generator Field harness connector. Ignition on, engine not running. With the DRBIII®, actuate the Generator Field Driver circuit. Does the test light illuminate brightly and flash on and off? Yes → Replace the Generator. Perform POWERTRAIN VERIFICATION TEST VER - 3 - NGC. No → Go To 3	All

P0622-GENERATOR FIELD CONTROL CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
3	Turn the ignition off. Disconnect the Generator Field harness connector. Using a 12-volt test connected to battery voltage, probe the (Z1) Gen Ground circuit in the Generator Field harness connector. Does the test light illuminate brightly? Yes → Go To 4 No → Repair the open in the (Z1) Gen Field Ground circuit. Perform POWERTRAIN VERIFICATION TEST VER - 3 - NGC.	All
4	Turn the ignition off. Disconnect the Generator Field harness connector. Disconnect the PCM harness connector. Measure the voltage on the (K20) Gen Field Control circuit in the Generator Field harness connector. Is the voltage above 1.0 volts? Yes → Repair the short to voltage in the (K20) Gen Field Control circuit. Perform POWERTRAIN VERIFICATION TEST VER - 3 - NGC. No → Go To 5	All
5	Turn the ignition on. Disconnect the Generator Field harness connector. Disconnect the PCM harness connector. Measure the resistance between ground and the (K20) Gen Field Control circuit in the Generator Field harness connector. Is the resistance below 100 ohms? Yes → Repair the (K20) Gen Field Control circuit for a short to ground. Perform POWERTRAIN VERIFICATION TEST VER - 3 - NGC. No → Go To 6	All
6	Turn the ignition off. Disconnect the Generator Field harness connector. Disconnect the PCM harness connector. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the (K20) Gen Field Control circuit from the Generator Field harness connector to the appropriate terminal of the special tool #8815. Is the resistance below 5.0 ohms? Yes → Go To 7 No → Repair the open in the (K20) Gen Field Control circuit. Perform POWERTRAIN VERIFICATION TEST VER - 3 - NGC.	All
7	**NOTE: Before continuing, check the PCM connector terminals for corrosion, damage, or terminal push out. Repair as necessary.** If there are no possible causes remaining, view repair. Repair Replace and program the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 3 - NGC.	All

Symptom:
P0627-FUEL PUMP RELAY CIRCUIT

When Monitored and Set Condition:

P0627-FUEL PUMP RELAY CIRCUIT

When Monitored: With the ignition on. Battery voltage greater than 10.4 volts.

Set Condition: An open or shorted condition is detected in the fuel pump relay control circuit. One Trip Fault.

POSSIBLE CAUSES
FUEL PUMP RELAY OPERATION
(A14) FUSED IGNITION SWITCH OUTPUT CIRCUIT
FUEL PUMP RELAY RESISTANCE
(K31) FUEL PUMP RELAY CONTROL CIRCUIT OPEN
(K31) FUEL PUMP RELAY CONTROL CIRCUIT SHORT TO GROUND
PCM

TEST	ACTION	APPLICABILITY
1	Ignition on, engine not running. With the DRBIII®, actuate the Fuel Pump Relay. Is the Fuel Pump Relay operating? Yes → Refer to the INTERMITTENT CONDITION symptom in the Driveability category. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 2	All
2	Turn the ignition off. Remove the Fuel Pump Relay from the PDC. Ignition on, engine not running. Measure the voltage of the (A14) Fused Ignition Switch Output circuit in the PDC. Is the voltage above 11.0 volts? Yes → Go To 3 No → Repair the (A14) Fused Ignition Switch Output circuit. Check and replace any open fuses. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
3	Turn the ignition off. Remove the Fuel Pump Relay from the PDC. Measure the resistance of the Fuel Pump Relay between the Fused Ignition Switch Output terminal and the Fuel Pump Relay Control terminal. Is the resistance between 70 to 90 ohms at 70°F (21°C)? Yes → Go To 4 No → Replace the Fuel Pump Relay. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

P0627-FUEL PUMP RELAY CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
4	Turn the ignition off. Remove the Fuel Pump Relay from the PDC. Disconnect the PCM harness connector. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the (K31) Fuel Pump Relay Control circuit from the PDC to the appropriate terminal of special tool #8815. Is the resistance below 5.0 ohms? Yes → Go To 5 No → Repair the open in the (K31) Fuel Pump Relay Control circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
5	Turn the ignition off. Remove the Fuel Pump Relay from the PDC. Measure the resistance between ground and the (K31) Fuel Pump Relay Control circuit in the PDC. Is the resistance below 5.0 ohms? Yes → Repair the short to ground in the (K31) Fuel Pump Relay Control circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 6	All
6	**NOTE: Before continuing, check the PCM harness connector terminals for corrosion, damage, or terminal push out. Repair as necessary.** If there are no possible causes remaining, view repair. Repair Replace and program the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

Symptom:
P0630-VIN NOT PROGRAMMED IN PCM

When Monitored and Set Condition:

P0630-VIN NOT PROGRAMMED IN PCM

When Monitored: Ignition on.

Set Condition: The VIN has not been programmed into the PCM.

POSSIBLE CAUSES
PROGRAMMING VIN INTO PCM
VERIFY PCM PROGRAMMING
PCM

TEST	ACTION	APPLICABILITY
1	Ignition on, engine not running. With the DRBIII®, erase DTCs. Using the DRBIII®, program VIN into the PCM. Start the engine. **NOTE: If the engine will not start, crank the engine over for 15 seconds. Crank at least 2 times with the ignition switch returning to the off position each time.** Allow the engine to reach normal operating temperature. With the DRBIII®, read DTCs. Does the DTC reset? Yes → Go To 2 No → The VIN has been successfully programmed into the PCM. Test is complete. Perform POWERTRAIN VERIFICATION TEST VER - 1.	All
2	**NOTE: The ignition switch must be left in the off position for a minimum of 10 seconds.** Cycle the ignition switch to the off position and then back to run. Attempt to program the PCM with the applicable information. Start the vehicle and allow it to reach normal operating temperatures. With the DRBIII®, read DTCs. Does the DTC reset? Yes → Replace and program the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 1. No → The VIN has been successfully programmed into the PCM. Test is complete. Perform POWERTRAIN VERIFICATION TEST VER - 1.	All

Symptom:
P0632-ODOMETER NOT PROGRAMMED IN PCM

When Monitored and Set Condition:

P0632-ODOMETER NOT PROGRAMMED IN PCM

When Monitored: Ignition on.

Set Condition: The mileage has not been programmed into the PCM.

POSSIBLE CAUSES
PROGRAMMING MILEAGE INTO PCM
VERIFY PCM PROGRAMMING
PCM

TEST	ACTION	APPLICABILITY
1	Ignition on, engine not running. With the DRBIII®, erase DTCs. Using the DRBIII®, program the mileage into the PCM. Start the engine. Allow the engine to reach normal operating temperature. With the DRBIII®, read DTCs. Does the DTC reset? Yes → Go To 2 No → The mileage has been succcessfully programmed into the PCM. Test is complete. Perform POWERTRAIN VERIFICATION TEST VER - 1.	All
2	**NOTE: The ignition switch must be left in the off position for a minimum of 10 seconds.** Cycle the ignition switch to the off position and then back to run. Attempt to program the PCM with the applicable information. Start the vehicle and allow it to reach normal operating temperatures. With the DRBIII®, read DTCs. Does the DTC reset? Yes → Replace and program the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 1. No → The mileage has been successfully programmed into the PCM. Test is complete. Perform POWERTRAIN VERIFICATION TEST VER - 1.	All

Symptom:
P0633-SKIM KEY NOT PROGRAMMED IN PCM

When Monitored and Set Condition:

P0633-SKIM KEY NOT PROGRAMMED IN PCM

When Monitored: Ignition on.

Set Condition: The SKIM Key information has not been programmed into the PCM.

POSSIBLE CAUSES
PROGRAMMING SKIM KEY INTO PCM
VERIFY PCM PROGRAMMING
PCM

TEST	ACTION	APPLICABILITY
1	Ignition on, engine not running. With the DRBIII®, erase DTCs. Using the DRBIII®, program the SKIM Key information into the PCM. Start the engine. **NOTE: If the engine will not start, crank the engine over for 15 seconds. Crank at least 2 times with the ignition switch returning to the off position each time.** Allow the engine to reach normal operating temperature. With the DRBIII®, read DTCs. Does the DTC reset? Yes → Go To 2 No → The SKIM KEY information has been succcessfully programmed into the PCM. Test is complete. Perform SKIS VERIFICATION.	All
2	**NOTE: The ignition switch must be left in the off position for a minimum of 10 seconds.** Cycle the ignition switch to the off position and then back to run. Attempt to program the PCM with the applicable information. Start the vehicle and allow it to reach normal operating temperatures. With the DRBIII®, read DTCs. Does the DTC reset? Yes → Replace and program the Powertrain Control Module in accordance with the Service Information. Perform SKIS VERIFICATION. No → The SKIM Key Information has been successfully programmed into the PCM. Test is complete. Perform SKIS VERIFICATION.	All

Symptom:
P0645-A/C CLUTCH RELAY CIRCUIT

When Monitored and Set Condition:

P0645-A/C CLUTCH RELAY CIRCUIT

When Monitored: With the ignition on. Battery voltage greater than 10 volts. A/C Switch on.

Set Condition: An open or shorted condition is detected in the A/C clutch relay control circuit. One Trip Fault.

POSSIBLE CAUSES
A/C CLUTCH RELAY OPERATION
(A17) FUSED IGNITION SWITCH OUTPUT CIRCUIT
A/C CLUTCH RELAY RESISTANCE
(C28) A/C CLUTCH RELAY CONTROL CIRCUIT OPEN
(C28) A/C CLUTCH RELAY CONTROL CIRCUIT SHORT TO GROUND
PCM

TEST	ACTION	APPLICABILITY
1	Ignition on, engine not running. With the DRBIII®, actuate the A/C Clutch Relay. Is the A/C Clutch Relay operating? Yes → Refer to the INTERMITTENT CONDITION symptom in the Driveability category. Perform POWERTRAIN VERIFICATION TEST VER - 2 - NGC. No → Go To 2	All
2	Turn the ignition off. Remove the A/C Clutch Relay from the PDC. Ignition on, engine not running. Measure the voltage on the (A14) Fused Ignition Switch Output circuit in the PDC. Is the voltage above 11.0 volts? Yes → Go To 3 No → Repair the open or short to ground in the (A17) Fused Ignition Switch Output circuit. Check and replace any open fuses. Perform POWERTRAIN VERIFICATION TEST VER - 2 - NGC.	All

P0645-A/C CLUTCH RELAY CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
3	Turn the ignition off. Remove the A/C Clutch Relay from the PDC. Measure the resistance of the A/C Clutch Relay between the Fused Ignition Switch Output terminal and the A/C Clutch Relay Control terminal. Is the resistance between 60 to 95 ohms? Yes → Go To 4 No → Replace the A/C Clutch Relay. Perform POWERTRAIN VERIFICATION TEST VER - 2 - NGC.	All
4	Turn the ignition off. Remove the A/C Clutch Relay from the PDC. Disconnect the PCM harness connector. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the (C28) A/C Clutch Relay Control circuit from the PDC to the appropriate terminal of special tool #8815. Is the resistance below 5.0 ohms? Yes → Go To 5 No → Repair the open in the (C28) A/C Clutch Relay Control circuit. Perform POWERTRAIN VERIFICATION TEST VER - 2 - NGC.	All
5	Turn the ignition off. Remove the A/C Clutch Relay from the PDC. Measure the resistance between ground and the (C28) A/C Clutch Control circuit in the PDC. Is the resistance below 5.0 ohms? Yes → Repair the short to ground in the (C28) A/C Clutch Relay Control circuit. Perform POWERTRAIN VERIFICATION TEST VER - 2 - NGC. No → Go To 6	All
6	**NOTE: Before continuing, check the PCM harness connector terminals for corrosion, damage, or terminal push out. Repair as necessary.** If there are no possible causes remaining, view repair. Repair Replace and program the Powertrain Control Module Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 2 - NGC.	All

Symptom:
P0660-MANIFOLD TUNE VALVE SOLENOID CIRCUIT

When Monitored and Set Condition:

P0660-MANIFOLD TUNE VALVE SOLENOID CIRCUIT

When Monitored: With the ignition on. ASD Relay energized. Battery voltage greater than 10 volts.

Set Condition: The PCM senses the MTV is not at the desired state.

POSSIBLE CAUSES
GOOD TRIP EQUAL TO ZERO
GROUND CIRCUIT OPEN
MTV RELAY OUTPUT CIRCUIT OPEN
FUSED B+ CIRCUIT
ASD RELAY OUTPUT CIRCUIT
MTV RELAY CONTROL CIRCUIT SHORTED TO GROUND
MTV RELAY
MTV RELAY CONTROL CIRCUIT OPEN
MANIFOLD TUNING VALVE SLOENOID
PCM

TEST	ACTION	APPLICABILITY
1	Turn the ignition on. With the DRBIII®, read DTC's. Is the Good Trip displayed and equal to zero? Yes → Go To 2 No → Refer to the INTERMITTENT CONDITION symptom in the Driveability category.	All
2	Turn the ignition off. Disconnect the Manifold Tune Valve Solenoid harness connector. Turn the ignition on. Using a 12-volt test light connected to ground, probe the MTV Relay Output circuit in the MTV Solenoid harness connector. With the DRBIII®, actuate the MTV Relay. Does the 12-volt test light illuminate brightly? No → Go To 3 Yes → Go To 10	All

P0660-MANIFOLD TUNE VALVE SOLENOID CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
3	Turn the ignition off. Disconnect the MTV Solenoid harness connector. Remove the MTV Relay from the PDC. Measure the resistance of the MTV Relay Output circuit between the PDC and the MTV Solenoid harness connector. Is the resistance below 5.0 ohms? Yes → Go To 4 No → Repair the MTV Relay Output circuit for an open.	All
4	Turn the ignition off. Disconnect the MTV Relay from the PDC. Using a 12-volt test light connected to ground, probe the Fused B+ circuit in the PDC. Does the test light illuminate brightly? Yes → Go To 5 No → Repair the Fused B+ circuit.	All
5	Turn the ignition off. Disconnect the MTV Relay from the PDC. Using a 12-volt test light connected to ground, probe the ASD Relay Output circuit in the PDC. Turn the ignition on. With the DRBIII®, actuate the MTV Relay. Does the test light illuminate brightly? Yes → Go To 6 No → Repair the ASD Relay Output circuit.	All
6	Turn the ignition off. Disconnect the MTV Relay from the PDC. Turn the ignition on. Using a 12-volt test light connected to battery voltage, probe the MTV Relay Control circuit in the PDC. With the DRBIII®, actuate the MTV Relay. Does the 12-volt test light flash on and off? No → Go To 7 Yes → Replace the MTV Relay.	All
7	Turn the ignition off. Disconnect the PCM harness connector. Disconnect the MTV Relay from the PDC. Measure the resistance of the MTV Relay Control circuit to ground. Is the resistance below 5.0 ohms? Yes → Repair the MTV Relay Control circuit for a short to ground. No → Go To 8	All

P0660-MANIFOLD TUNE VALVE SOLENOID CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
8	Turn the ignition off. Disconnect the PCM harness connector. Disconnect the MTV Relay from the PDC. Measure the resistance of the MTV Relay Control circuit between the PCM harness connector and the PDC. Is the resistance below 5.0 ohms? Yes → Go To 9 No → Repair the MTV Relay Control circuit for an open.	All
9	IF there are no possible causes remaining, view repair. Repair Replace and program the Powertrain Control Module in accordance with the Service Information.	All
10	Turn the ignition off. Disconnect the MTV Solenoid harness connector. Using a 12-volt test light connected to battery voltage, probe the ground circuit in the MTV Solenoid harness connector. Does the test light illuminate brightly? Yes → Replace the Manifold Tuning Valve Solenoid. No → Repair the ground circuit for an open.	All

Symptom:
P0685-ASD RELAY CONTROL CIRCUIT

When Monitored and Set Condition:

P0685-ASD RELAY CONTROL CIRCUIT

When Monitored: With ignition on. Battery voltage above 10 volts.

Set Condition: An open or shorted condition is detected in the ASD relay control circuit. One trip Fault.

POSSIBLE CAUSES
ASD OPERATION
(A14) FUSED B+ CIRCUIT
ASD RELAY RESISTANCE
(K51) ASD RELAY CONTROL CIRCUIT OPEN
(K51) ASD RELAY CONTROL CIRCUIT SHORT TO GROUND
PCM

TEST	ACTION	APPLICABILITY
1	Ignition on, engine not running. With the DRBIII®, actuate the ASD Relay. Is the ASD Relay operating? Yes → Refer to the INTERMITTENT CONDITION symptom in the Driveability category. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 2	All
2	Turn the ignition off. Remove the ASD Relay from the PDC. Ignition on, engine not running. Measure the voltage of the (A14) Fused B+ circuits in the PDC. Is the voltage above 11.0 volts? Yes → Go To 3 No → Repair the (A14) Fused B+ circuit. Check and replace any open fuses. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
3	Turn the ignition off. Remove the ASD Relay from the PDC. Measure the resistance of the ASD Relay between the Fused B+ terminal and the ASD Relay Control terminal. Is the resistance between 60 to 85 ohms? Yes → Go To 4 No → Replace the ASD Relay. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

P0685-ASD RELAY CONTROL CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
4	Turn the ignition off. Remove the ASD Relay from the PDC. Disconnect the PCM harness connector. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the (K51) ASD Control circuit from the PDC to the appropriate terminal of special tool #8815. Is the resistance below 5.0 ohms? Yes → Go To 5 No → Repair the open in the (K51) ASD Relay Control circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
5	Turn the ignition off. Remove the ASD Relay from the PDC. Measure the resistance between ground and the (K51) ASD Relay Control circuit in the PDC. Is the resistance below 5.0 ohms? Yes → Repair the short to ground in the (K51) ASD Relay Control circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 6	All
6	**NOTE: Before continuing, check the PCM harness connector terminals for corrosion, damage, or terminal push out. Repair as necessary.** If there are no possible causes remaining, view repair. Repair Replace and program the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

Symptom:
P0688-ASD RELAY SENSE CIRCUIT LOW

When Monitored and Set Condition:

P0688-ASD RELAY SENSE CIRCUIT LOW

When Monitored: With ignition key on. Battery voltage greater than 10 volts.

Set Condition: No voltage sensed at the PCM when the ASD relay is energized. One Trip Fault.

POSSIBLE CAUSES
VERIFY ASD DTC
ASD RELAY
(A14) FUSED B+ CIRCUIT
(A142) ASD RELAY OUTPUT CIRCUIT OPEN
(A142) ASD RELAY OUTPUT CIRCUIT OPEN
PCM NO START
PCM START

TEST	ACTION	APPLICABILITY
1	**NOTE: Diagnose P0685 - Auto Shutdown Relay Control Circuit first if set along with this DTC.** With the DRBIII®, erase the DTC. Attempt to start the engine. If the engine will not start, crank the engine for at least 15 seconds. It may be necessary to repeat several times. Does the DTC reset? Yes → Go To 2 No → Refer to the INTERMITTENT CONDITION symptom in the Driveability category. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
2	Attempt to start the engine. Does the engine start. Yes → Go To 3 No → Go To 5	All

P0688-ASD RELAY SENSE CIRCUIT LOW — Continued

TEST	ACTION	APPLICABILITY
3	Turn the ignition off. Remove the ASD Relay from the PDC. Disconnect the PCM harness connector. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the (A142) ASD Output circuit from the PDC to the appropriate terminal of special tool #8815. Is the resistance below 5.0 ohms? Yes → Go To 4 No → Repair the open in the (A142) ASD Relay Output circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
4	**NOTE: Before continuing, check the PCM harness connector terminals for corrosion, damage, or terminal push out. Repair as necessary.** If there are no possible causes remaining, view repair. Repair Replace and program the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
5	Turn the ignition off. Install a substitute relay in place of the ASD Relay. Ignition on, engine not running. With the DRBIII®, erase DTCs. Attempt to start the engine. With the DRBIII®, read DTCs. Does the DTC reset? Yes → Go To 6 No → Replace the ASD Relay. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
6	Turn the ignition off. Remove the ASD Relay from the PDC. Measure the voltage of the (A14) Fused B+ circuit in the PDC. Is the voltage above 11.0 volts? Yes → Go To 7 No → Repair the (A14) Fused B+ circuit. Inspect the related fuse and repair as necessary. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

P0688-ASD RELAY SENSE CIRCUIT LOW — Continued

TEST	ACTION	APPLICABILITY
7	Turn the ignition off. Remove the ASD Relay from the PDC. Disconnect the PCM harness connector. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the (A142) ASD Output circuit from the PDC to the appropriate terminal of special tool #8815. Is the resistance below 5.0 ohms? Yes → Go To 8 No → Repair the open in the (A142) ASD Relay Output circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
8	**NOTE: Before continuing, check the PCM harness connector terminals for corrosion, damage, or terminal push out. Repair as necessary.** If there are no possible causes remaining, view repair. Repair Replace and program the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

Symptom:

P0700-TRANSMISSION CONTROL SYSTEM/READ TRANSMISSION DTCS ON THE DRBIII®

TEST	ACTION	APPLICABILITY
1	This is an informational DTC letting you know that a DTC(s) is stored in the Transmission Control Module. Erase this DTC from the PCM after all Transmission DTC(s) have been repaired. Using the DRBIII®, read the Transmission Controller DTC and refer to the Transmission Category and perform the appropriate symptom. PCM Diagnostic Information complete. Continue Test Complete.	All

Symptom:
P0833-CLUTCH RELEASED SWITCH CIRCUIT

When Monitored and Set Condition:

P0833-CLUTCH RELEASED SWITCH CIRCUIT

When Monitored: During crank or when engine speed is between 1500-2880 RPM and vehicle speed is greater than 25 MPH.

Set Condition: A short to ground is detected during startup. An open circuit is detected when engine Speed is between 1500-2880 RPM, vehicle speed is >25 MPH, and delta throttle is >1.1 volts for 4 seconds. This cycle must repeat 5 times per trip for 2 trips.

POSSIBLE CAUSES
CLUTCH PEDAL POSITION SWITCH OPERATION
CLUTCH PEDAL POSITION SWITCH
CLUTCH UPSTOP SIGNAL CIRCUIT OPEN
CLUTCH UPSTOP SIGNAL CIRCUIT SHORTED TO GROUND
(Z12) GROUND CIRCUIT
PCM

TEST	ACTION	APPLICABILITY
1	With the DRBIII®, monitor the Clutch Upstop Switch. Depress the Clutch Pedal completely to the floor and release all the way up several times. Did the Clutch Upstop Switch state change open to closed? Yes → Refer to the INTERMITTENT CONDITION symptom in the Driveability category. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 2	All
2	Disconnect the Clutch Pedal Position Switch harness connector. Connect a jumper wire between the Ground circuit and the Clutch Upstop Switch Signal circuit in the Clutch Pedal Position Switch harness connector. With the DRBIII®, monitor the Clutch Upstop Switch status. Did the Clutch Upstop Switch status change from Open to Closed? Yes → Replace the Clutch Pedal Position Switch. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 3	All

P0833-CLUTCH RELEASED SWITCH CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
3	Turn the ignition off. Disconnect the Clutch Pedal Position Switch harness connector. Disconnect the PCM harness connector. Measure the resistance of the Clutch Upstop Signal circuit in the Clutch Pedal Position Switch harness connector to ground. Is the resistance below 100 ohms? Yes → Repair the Clutch Upstop circuit for a short to ground. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 4	All
4	Turn the ignition off. Disconnect the Clutch Pedal Position Switch harness connector. Disconnect the PCM harness connector. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the Clutch Upstop Signal circuit between the Clutch Pedal Position Switch harness connector and the appropriate terminal of special tool #8815. Is the resistance below 5.0 ohms? Yes → Go To 5 No → Repair the Clutch Upstop Signal circuit for an open. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
5	Turn the ignition off. Disconnect Clutch Pedal Position Switch harness connector. Using a 12-volt test light connected to 12-volts, probe the (Z12) ground circuit in the Clutch Pedal Position Switch harness connector. Does the test light illuminate brightly? Yes → Go To 6 No → Repair the (Z12) ground circuit for an open. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
6	If there are no possible causes remaining, view repair. Repair Replace and program the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

Symptom:
P0850-PARK/NEUTRAL SWITCH PERFORMANCE

When Monitored and Set Condition:

P0850-PARK/NEUTRAL SWITCH PERFORMANCE

When Monitored: Continuously with the transmission in Park, Neutral, or Drive and NOT in Limp-in mode.

Set Condition: The PCM detects an incorrect Park/Neutral switch state for a given mode of vehicle operation. Two Trip Fault.

POSSIBLE CAUSES
GOOD TRIP EQUAL TO ZERO
TRANSMISSION DTC(S)
PCM

TEST	ACTION	APPLICABILITY
1	**NOTE: Check the TCM for DTCs. Diagnose any DTCs related to the TRS that may have set in the TCM.** Ignition on, engine not running. **NOTE: Before continuing, ensure that communication can be established with the TCM. If the DRBIII® can not communicate with the TCM refer to the Communication Category and preform the appropriate symptom.** With the DRBIII®, read PCM DTCs and record the related Freeze Frame data. Is the Good Trip displayed and equal to zero? Yes → Go To 2 No → Refer to the INTERMITTENT CONDITION symptom in the Driveability category. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
2	Turn the ignition on. With the DRBIII®, check the Transmission DTCs. Are there any Transmission DTCs present? Yes → Refer to the appropriate Transmission DTC in the Transmission category. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → NOTE: Before continuing, check the PCM harness connector terminals for corrosion, damage, or terminal push out. Repair as necessary. Replace and program the Powertrain Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

Symptom:
P1105-TIP SENSOR SOLENOID CIRCUIT

When Monitored and Set Condition:

P1105-TIP SENSOR SOLENOID CIRCUIT

When Monitored: The ignition on or the engine running. Battery voltage greater than 10.4 volts or in turbo boost mode.

Set Condition: The PCM will set the DTC if the actual state of the solenoid does not match the intended state.

POSSIBLE CAUSES
GOOD TRIP EQUAL TO ZERO
TIP SOLENOID OPERATION
(F12) FUSED IGNITION SWITCH OUTPUT CIRCUIT
(K55) TIP SOL CONTROL CIRCUIT SHORTED TO BATTERY VOLTAGE
(K55) TIP SOL CONTROL CIRCUIT OPEN
(K55) TIP SOL CONTROL CIRCUIT SHORTED TO GROUND
PCM

TEST	ACTION	APPLICABILITY
1	Ignition on, engine not running. With the DRBIII®, read PCM DTCs and record the related Freeze Frame data. Is the Good Trip displayed and equal to zero? Yes → Go To 2 No → Refer to the INTERMITTENT CONDITION symptom in the Driveability category. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
2	Turn the ignition off. Disconnect the TIP Solenoid harness connector. Using a 12-volt test light, jumper across the TIP Solenoid harness connector. **NOTE: While actuating the solenoid wiggle the related wiring harness.** With the DRBIII®, actuate the TIP Solenoid. Does the test light illuminate brightly and flash on and off? Yes → Replace the TIP Solenoid. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 3	All

P1105-TIP SENSOR SOLENOID CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
3	Disconnect the TIP Solenoid harness connector. Turn the ignition on. Using a 12-volt test light connected to ground, probe the (F12) Fused Ignition Switch Output circuit. Does the test light illuminate brightly? Yes → Go To 4 No → Repair the (F12) Fused Ignition Switch Output circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
4	Turn the ignition off. Disconnect the TIP Solenoid harness connector. Disconnect the PCM harness connectors. Turn the ignition on Measure the voltage of the (K55) TIP Sol Control circuit in the TIP Solenoid harness connector. Does the voltmeter indicate any voltage present? Yes → Repair the short to voltage in the (K55) TIP Sol Control circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 5	All
5	Turn the ignition off. Disconnect the TIP Solenoid harness connector. Disconnect the PCM harness connectors. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the (K55) TIP Sol Control circuit from the TIP Solenoid harness connector to the appropriate terminal of special tool #8815. Is the resistance below 5.0 ohms? Yes → Go To 6 No → Repair the open in the (K55) TIP Sol Control circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
6	Turn the ignition off. Disconnect the TIP Solenoid harness connector. Disconnect the PCM harness connectors. Measure the resistance between ground and the (K55) TIP Sol Control circuit at the TIP Solenoid harness connector. Is the resistance below 100 ohms? Yes → Repair the short to ground in the (K55) TIP Sol Control circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 7	All
7	**NOTE: Before continuing, check the PCM harness connector terminals for corrosion, damage, or terminal push out. Repair as necessary.** If there are no possible causes remaining, view repair. Repair Replace and program the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

Symptom:
P1115-GENERAL TEMP SENSOR PERFORMANCE

When Monitored and Set Condition:

P1115-GENERAL TEMP SENSOR PERFORMANCE

When Monitored: Engine off time is greater than 480 minutes. Ambient temperature is greater than -23°C (-9°F).

Set Condition: After a calibrated amount of cool down time, the PCM compares the ECT Sensor, IAT Sensor and the Ambient Air Temperature Sensor values. If the difference between (AAT and IAT), (AATand ECT) and (ECT and IAT) are all greater than a calibrated value, this DTC will set.

POSSIBLE CAUSES
GOOD TRIP EQUAL TO ZERO
OTHER POSSIBLE CAUSES
SIGNAL CIRCUIT SHORTED TO BATTERY VOLTAGE
TEMPERATURE SENSOR VOLTAGE BELOW 1.0 VOLT
SIGNAL CIRCUIT OPEN
SENSOR GROUND CIRCUIT OPEN
SIGNAL CIRCUIT SHORTED TO GROUND
SIGNAL CIRCUIT SHORTED TO SENSOR GROUND
PCM LOW
PCM HIGH

TEST	ACTION	APPLICABILITY
1	**NOTE: The PCM compares IAT, AAT and ECT to determine if they are within a calibrated temp of one another. Using a block heater that does not meet OEM specifications or that is not installed at the proper location can defeat the algorithm in the PCM.** Ignition on, engine not running. **NOTE: It requires more then one temperature sensor input for this DTC to set. After a repair has been made, all temperature sensors must be checked again using the DRBIII® temperature probe.** With the DRBIII®, read DTCs and record the related Freeze Frame data. Is the Good Trip displayed and equal to zero? Yes → Go To 2 No → Refer to the INTERMITTENT CONDITION symptom in the Driveability category. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

P1115-GENERAL TEMP SENSOR PERFORMANCE — Continued

TEST	ACTION	APPLICABILITY
2	Turn the ignition on. With the DRBIII®, read and record the AAT Sensor Temperature value Using the DRB Temperature Probe #CH7050, measure the ambient air temperature near the AAT sensor. Is the AAT Sensor value within 5°C (9°F) of the temperature probe reading? Yes → Go To 3 No → Go To 6	All
3	Turn the ignition on. With the DRBIII®, read and record the IAT Sensor Temperature value Remove the IAT sensor. Using the DRB Temperature Probe #CH7050, measure the temperature inside the IAT sensor opening. Is the IAT Sensor value within 5°C (9°F) of the temperature probe reading? Yes → Go To 4 No → Go To 6	All
4	**WARNING: MAKE SURE THE ENGINE COOLING SYSTEM IS COOL BEFORE REMOVING THE PRESSURE CAP OR ANY HOSE. SEVERE PERSONAL INJURY MAY RESULT FROM ESCAPING HOT COOLANT. THE COOLING SYSTEM IS PRESSURIZED WHEN HOT.** Turn the ignition on. With the DRBIII®, read and record the ECT Sensor Temperature value Using the DRB Temperature Probe #CH7050, measure the engine coolant temperature. Is the ECT Sensor value with 5°C (9°F) of the temperature probe reading? Yes → Go To 5 No → Go To 6	All
5	Inspect the Temperature sensors for any physical damage. Inspect the engine coolant. Ensure the coolant is at the proper level. Refer to the Service Information COOLING. Ensure the Temperature sensors are properly mounted. **WARNING: WHEN THE ENGINE IS OPERATING, DO NOT STAND IN A DIRECT LINE WITH THE FAN. DO NOT PUT YOUR HANDS NEAR THE PULLEYS, BELTS OR FAN. DO NOT WEAR LOOSE CLOTHING.** Refer to any Technical Service Bulletins (TSBs) that may apply. With the engine running at normal operating temperature, monitor the Temperature sensor parameters while wiggling the wire harness. Look for parameter values to change. Visually inspect the related wire harness. Look for any chafed, pierced, pinched, partially broken wires and broken, bent, pushed out, or corroded terminals. **CAUTION: NEVER PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Inspect and clean all PCM, engine, and chassis grounds. Were any problems found during the above inspections? Yes → Repair as necessary Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Test Complete.	All

P1115-GENERAL TEMP SENSOR PERFORMANCE — Continued

TEST	ACTION	APPLICABILITY
6	**NOTE: Visually inspect both the component and the PCM connectors. Look for damage, partially broken wires and backed out or corroded terminals** Turn the ignition off. Disconnect the applicable Temperature Sensor harness connector. Ignition on, engine not running. Measure the voltage of the Signal circuit in the applicable Temperature Sensor harness connector. Is the voltage above 5.2 volts? Yes → Repair the short to battery voltage in the Signal circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 7	All
7	Turn the ignition off. Disconnect the applicable Temperature Sensor harness connector. Ignition on, engine not running. With the DRBIII®, read the Temperature Sensor voltage. Is the voltage above 4.9 volts? Yes → Go To 8 No → Go To 11	All
8	Turn the ignition off. Disconnect the applicable Temperature Sensor harness connector. Using a jumper wire, jumper across the Temperature Sensor harness connector. Ignition on, engine not running. With the DRBIII®, read the Temperature voltage. Is the voltage below 1.0 volt? Yes → Replace the applicable Temperature Sensor. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 9	All
9	Turn the ignition off. Disconnect the applicable Temperature Sensor harness connector. Disconnect the PCM harness connector. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the Signal circuit from the Temperature Sensor harness connector to the appropriate terminal of special tool #8815. Is the resistance below 5.0 ohms? Yes → Go To 10 No → Repair the open in the Signal circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

P1115-GENERAL TEMP SENSOR PERFORMANCE — Continued

TEST	ACTION	APPLICABILITY
10	Turn the ignition off. Disconnect the applicable Temperature Sensor harness connector. Disconnect the PCM harness connector. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the Sensor ground circuit from the Ambient Air Temperature Sensor harness connector to the appropriate terminal of special tool #8815. Is the resistance below 5.0 ohms? Yes → NOTE: Before continuing, check the PCM harness connector terminals for corrosion, damage, or terminal push out. Repair as necessary. Replace and program the Powertrain Contorl Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Repair the open in the Sensor ground circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
11	Turn the ignition off. Disconnect the applicable Temperature Sensor harness connector. Disconnect the PCM harness connector. Measure the resistance between ground and the Signal circuit in the Temperature harness connector. Is the resistance below 100 ohms? Yes → Repair the short to ground in the Signal circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 12	All
12	Turn the ignition off. Disconnect the applicable Temperature Sensor harness connector. Disconnect the PCM harness connector. Measure the resistance between the Signal circuit and the Sensor ground circuit in the Temperature Sensor harness connector. Is the resistance below 100 ohms? Yes → Repair the Sensor ground shorted to the Signal circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → NOTE: Before continuing, check the PCM harness connector terminals for corrosion, damage or terminal push out. Repair as necessary. Replace and program the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

Symptom:
P1189-TIP SENSOR CIRCUIT LOW

When Monitored and Set Condition:

P1189-TIP SENSOR CIRCUIT LOW

When Monitored: Ignition on. Throttle Position Sensor voltage less than 1.2 volts. Battery voltage greater than 10 volts.

Set Condition: The TIP Sensor signal voltage is less than 0.0782 volts for 1.7 seconds. One trip Fault.

POSSIBLE CAUSES
TIP SENSOR VOLTAGE BELOW .078 VOLTS
(K6) 5 VOLT SUPPLY CIRCUIT SHORT TO GROUND
(K6) 5 VOLT SUPPLY CIRCUIT SHORT TO SENSOR GROUND
(K6) 5 VOLT SUPPLY OPEN
TIP SENSOR INTERNAL FAILURE
(A23) TIP SIGNAL CIRCUIT SHORTED TO GROUND
(A23) TIP SIGNAL CIRCUIT SHORTED TO (K167) SENSOR GROUND CIRCUIT
PCM

TEST	ACTION	APPLICABILITY
1	Start the engine. With the DRBIII®, read the TIP Sensor voltage. Is the voltage below .078 of a volt? Yes → Go To 2 No → Refer to the INTERMITTENT CONDITION symptom in the Driveability category. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
2	Turn the ignition off. Disconnect the TIP Sensor harness connector. Ignition on, engine not running. Measure the voltage of the (K6) 5 Volt Supply circuit in the TIP Sensor harness connector. Is the voltage between 4.5 to 5.2 volts? Yes → Go To 3 No → Go To 6	All

P1189-TIP SENSOR CIRCUIT LOW — Continued

TEST	ACTION	APPLICABILITY
3	Turn the ignition off. Disconnect the TIP Sensor harness connector. Ignition on, engine not running. With the DRBIII®, monitor the TIP Sensor voltage. Is the voltage between 4.5 and 5.2 volts? Yes → Replace the TIP Sensor. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 4	All
4	Turn the ignition off. Disconnect the TIP Sensor harness connector. Disconnect the PCM harness connector. Measure the resistance between the (A23) TIP Sensor signal circuit at the TIP Sensor harness connector and ground. Is the resistance below 100 ohms? Yes → Repair the short to ground in the (A23) TIP Sensor signal circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 5	All
5	Turn the ignition off. Disconnect the TIP Sensor harness connector. Disconnect the PCM harness connector. Measure the resistance between the (A23) TIP Sensor signal circuit and the (K167) Sensor ground circuit in the TIP Sensor harness connector. Is the resistance below 100 ohms? Yes → Repair the (A23) TIP Sensor signal circuit for a short to the (K167) Sensor ground circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 9	All
6	Turn the ignition off. Disconnect the TIP Sensor harness connector. Disconnect the PCM harness connector. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the (K6) 5 Volt Supply circuit from the TIP Sensor harness connector to the appropriate terminal of special tool #8815. Is the resistance below 100 ohms? Yes → Go To 7 No → Repair the open (K6) 5 Volt Supply circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

P1189-TIP SENSOR CIRCUIT LOW — Continued

TEST	ACTION	APPLICABILITY
7	Turn the ignition off. Disconnect the TIP Sensor harness connector. Disconnect the PCM Harness connector. Measure the resistance between the (K6) 5 Volt Supply circuit in the TIP Sensor harness connector and ground. Is the resistance below 5.0 ohms? Yes → Repair the (K6) 5 Volt Supply circuit for a short to ground. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 8	All
8	Turn the ignition off. Disconnect the TIP Sensor harness connector. Measure the resistance between the (K6) 5 Volt Supply circuit and the (K167) Sensor Ground circuit in the TIP Sensor harness connector. Is the resistance below 5.0 ohms? Yes → Repair the (K6) 5 Volt Supply circuit for a short to the (K167) Sensor Ground circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 9	All
9	**NOTE: Before continuing, check the PCM harness connector terminals for corrosion, damage, or terminal push out. Repair as necessary.** If there are no possible causes remaining, view repair. Repair Replace and program the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

Symptom:
P1190-TIP SENSOR CIRCUIT HIGH

When Monitored and Set Condition:

P1190-TIP SENSOR CIRCUIT HIGH

When Monitored: Ignition on. TP sensor voltage less than 1.2 volts. Battery voltage greater than 10 volts.

Set Condition: The TIP signal voltage is greater than 4.92 volts for 1.7 seconds. One trip Fault.

POSSIBLE CAUSES
TIP SENSOR VOLTAGE ABOVE 4.9 VOLTS
(A23) TIP SIGNAL CIRCUIT SHORTED TO (K6) 5 VOLT SUPPLY CIRCUIT
(A23) TIP SIGNAL CIRCUIT SHORTED TO BATTERY VOLTAGE
TIP SENSOR INTERNAL FAILURE
(K153) TIP SIGNAL CIRCUIT OPEN
(K167) SENSOR GROUND CIRCUIT OPEN
PCM

TEST	ACTION	APPLICABILITY
1	Start the engine. With the DRBIII®, read the TIP Sensor voltage. Is the voltage above 4.9 volts? Yes → Go To 2 No → Refer to the INTERMITTENT CONDITION symptom in the Driveability category. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
2	Turn the ignition off. Disconnect the TIP Sensor harness connector. Disconnect the PCM harness connector. Measure the resistance between the (A23) TIP Signal circuit and the (K6) 5 Volt Supply circuit in the TIP Sensor harness connector. Is the resistance below 100 ohms? Yes → Repair the (A23) TIP Signal circuit for a short to the (K6) 5 Volt Supply circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 3	All

P1190-TIP SENSOR CIRCUIT HIGH — Continued

TEST	ACTION	APPLICABILITY
3	Turn the ignition off. Disconnect the TIP Sensor harness connector. Ignition on, engine not running. Measure the voltage of the (K153) TIP Signal circuit in the TIP Sensor harness connector. Is the voltage above 5.2 volts? Yes → Repair the short to battery voltage in the (A23) TIP Signal circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 4	All
4	Turn the ignition off. Disconnect the TIP Sensor harness connector. Connect a jumper wire between the (A23) TIP Sensor Signal circuit and the (K167) Sensor ground circuit. With the DRBIII®, monitor the TIP Sensor voltage. Ignition on, engine not running. Is the voltage below 1.0 volt? Yes → Replace the TIP Sensor. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 5	All
5	Turn the ignition off. Disconnect the TIP Sensor harness connector. Disconnect the PCM harness connector. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the (K153) TIP Signal circuit from the TIP Sensor harness connector to the appropriate terminal of special tool #8815. Is the resistance below 5.0 ohms? Yes → Go To 6 No → Repair the open in the (K153) TIP Signal circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
6	Turn the ignition off. Disconnect the TIP Sensor harness connector. Disconnect the PCM harness connector. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the (K167) Sensor ground circuit from the TIP Sensor harness connector to the appropriate terminal of special tool #8815. Is the resistance below 5.0 ohms? Yes → Go To 7 No → Repair the open in the (K167) Sensor ground circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

P1190-TIP SENSOR CIRCUIT HIGH — Continued

TEST	ACTION	APPLICABILITY
7	**NOTE: Before continuing, check the PCM harness connector terminals for corrosion, damage, or terminal push out. Repair as necessary.** If there are no possible causes remaining, view repair. Repair Replace and program the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

Symptom:
P1593-SPEED CONTROL SWITCH STUCK

When Monitored and Set Condition:

P1593-SPEED CONTROL SWITCH STUCK

When Monitored: Ignition on.

Set Condition: S/C Switch is mechanically stuck in the On/Off, Resume/Accel, or Set position for too long. One trip fault.

POSSIBLE CAUSES
SPEED CONTROL SWITCH STATUS
SPEED CONTROL SWITCHES
(V37) S/C SIGNAL CIRCUIT SHORTED TO BATTERY VOLTAGE
(V37) S/C SIGNAL CIRCUIT OPEN
(K4) SENSOR GROUND OPEN
PCM

TEST	ACTION	APPLICABILITY
1	Start the engine. With the DRBIII®, monitor each switch function for the Speed Control Switches. Press and release each Speed Control Button. - Resume/Accel - Cancel - Decel (Coast) - On/Off - Set Does each switch function change status when pressing and then depressing each switch? Yes → Refer to the INTERMITTENT CONDITION Symptom in the Diagnostic category. Perform POWERTRAIN VERIFICATION TEST VER - 4 - NGC. No → Go To 2	All

P1593-SPEED CONTROL SWITCH STUCK — Continued

TEST	ACTION	APPLICABILITY
2	Turn the ignition off. Remove the Speed Control Switches from the steering wheel. Measure the resistance across each Switch Control Switch. Monitor the ohmmeter while pressing each function button on each switch. Resume/Accel - 15,400 ohms Cancel - 909 +/- 9 ohms Decel (Coast) - 2940 +/- 30 ohms On/Off - 0 ohms Set - 6650 +/- 66 ohms Does the function on the Speed Control Switches have the correct resistance value? Yes → Go To 3 No → Replace the Speed Control Switch that had the incorrect resistance value. Perform POWERTRAIN VERIFICATION TEST VER - 4 - NGC.	All
3	Measure the voltage on the (V37) S/C Signal circuit at the Speed Control harness connector. Is the is the voltage above 5.0 volts? Yes → Repair the short to battery voltage in the (V37) S/C Signal circuit. Perform POWERTRAIN VERIFICATION TEST VER - 4 - NGC. No → Go To 4	All
4	**NOTE: The measurement must be taken from both Speed Control Switch harness connector.** **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the (V37) S/C Signal circuit from the Speed Control harness connector to the appropriate terminal of special tool #8815. Is the resistance below 5.0 ohms for both measurement? Yes → Go To 5 No → Repair the open in the (V37) S/C Signal circuit. Perform POWERTRAIN VERIFICATION TEST VER - 4 - NGC.	All
5	**NOTE: The measurement must be taken from both Speed Control Switch harness connectors.** **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the (K4) Sensor ground circuit from the Speed Control harness connector to the appropriate terminal of special tool #8815. Is the resistance below 5.0 ohms for both measurements? Yes → Go To 6 No → Repair the open in the (K4) Sensor ground circuit. Perform POWERTRAIN VERIFICATION TEST VER - 4 - NGC.	All

P1593-SPEED CONTROL SWITCH STUCK — Continued

TEST	ACTION	APPLICABILITY
6	**NOTE: Before continuing, check the PCM harness connector terminals for corrosion, damage or terminal push out. Repair as necessary.** Using the schematics as a guide, inspect the wire harness and connectors. Pay particular attention to all Power and Ground circuits. If there are no possible causes remaining, view repair. Repair Replace and program the Powertrain Control Module per Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 4 - NGC.	All

Symptom:
P1602-PCM NOT PROGRAMMED

When Monitored and Set Condition:

P1602-PCM NOT PROGRAMMED

When Monitored: Ignition on.

Set Condition: The PCM has not been programmed.

POSSIBLE CAUSES
PCM NOT PROGRAMMED
VERIFY PCM PROGRAMMING
PCM

TEST	ACTION	APPLICABILITY
1	Ignition on, engine not running. With the DRBIII®, erase DTCs. With the DRBIII® program the PCM. Start the engine. Allow the engine to reach normal operating temperature. With the DRBIII®, read DTCs. Does the DTC reset? Yes → Go To 2 No → The PCM has been successfully programmed. Test is complete. Perform POWERTRAIN VERIFICATION TEST VER - 1.	All
2	**NOTE: The ignition switch must be left in the off position for a minimum of 10 seconds.** Cycle the ignition switch to the off position and then back to run. Attempt to program the PCM. Start the vehicle and allow it to reach normal operating temperatures. With the DRBIII®, read DTCs. Does the DTC reset? Yes → Replace and program the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 1. No → The PCM has been successfully programmed into the PCM. Test is complete. Perform POWERTRAIN VERIFICATION TEST VER - 1.	All

Symptom List:

P1603-PCM INTERNAL DUAL-PORT RAM COMMUNICATION
P1604-PCM INTERNAL DUAL-PORT RAM READ/WRITE INTEGRITY FAILURE
P1607-PCM INTERNAL SHUTDOWN TIMER RATIONALITY

Test Note: All symptoms listed above are diagnosed using the same tests. The title for the tests will be P1603-PCM INTERNAL DUAL-PORT RAM COMMUNICATION.

When Monitored and Set Condition:

P1607-PCM INTERNAL SHUTDOWN TIMER RATIONALITY

When Monitored: During cold start.

Set Condition: Compares shut down time to coolant temperature.

POSSIBLE CAUSES
FUSED IGNITION SWITCH OUTPUT (OFF-RUN-START)
PCM INTERNAL FAULURE

TEST	ACTION	APPLICABILITY
1	Turn the ignition off. Disconnect the PCM harness connector. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Turn the ignition to run. Using a 12-volt test light connected to ground, probe the Fused Ignition Switch Output (Off-Run-Start) cavity C1-12 circuit at the appropriate terminal of the special tool #8815. **NOTE: If the test light illuminates, wiggle the wiring harness to ensure that the problem is not an intermittent wiring problem.** Does the test light illuminate brightly? Yes → Replace the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 1. No → Check all related fuses. Repair the Fused Ignition Switch Output circuit. Perform POWERTRAIN VERIFICATION TEST VER - 1.	All

Symptom List:

P1696-EEPROM MEMORY WRITE DENIED/INVALID
P1697-EMR (SRI) MILEAGE NOT STORED

Test Note: All symptoms listed above are diagnosed using the same tests. The title for the tests will be P1696-EEPROM MEMORY WRITE DENIED/INVALID.

When Monitored and Set Condition:

P1696-EEPROM MEMORY WRITE DENIED/INVALID

When Monitored: With the ignition on continuous.

Set Condition: An attempt to program/write to the internal EEPROM failed. Also checks at power down.

P1697-EMR (SRI) MILEAGE NOT STORED

When Monitored: With the ignition on continuous.

Set Condition: An attempt to program/write to the internal EEPROM failed, Also checks at power down.

POSSIBLE CAUSES
DRB DISPLAYS WRITE FAILURE
DRB DISPLAYS WRITE REFUSED 2ND TIME
DRB DISPLAYS SRI MILEAGE INVALID
COMPARE SRI MILEAGE WITH ODOMETER

TEST	ACTION	APPLICABILITY
1	With the DRBIII®, perform the SRI Memory Test. Does the DRBIII® display Write Failure? Yes → Replace and program the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 1. No → Go To 2	All
2	With the DRBIII®, perform the SRI Memory Test. Does the DRBIII® display Write Refused? Yes → Go To 3 No → Go To 4	All

P1696-EEPROM MEMORY WRITE DENIED/INVALID — Continued

TEST	ACTION	APPLICABILITY
3	With the DRBIII®, perform the SRI Memory Test a second time. **NOTE: Retest the SRI Memory two more times.** Does the DRBIII® display Write Refused again? Yes → Replace and program the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 1. No → Test Complete.	All
4	With the DRBIII®, perform the SRI Memory Test. Does the DRBIII® display SRI Mileage Invalid? Yes → Update the mileage and retest the SRI Memory. Perform POWERTRAIN VERIFICATION TEST VER - 1. No → Go To 5	All
5	Compare the SRI Mileage stored with the Instrument Panel Odometer. Is the mileage within the specified range displayed on the DRBIII®? Yes → Test Complete. No → Update the mileage and retest the SRI Memory. Perform POWERTRAIN VERIFICATION TEST VER - 1.	All

Symptom:
P1854-TIP BARO OUT OF RANGE

When Monitored and Set Condition:

P1854-TIP BARO OUT OF RANGE

When Monitored: With the ignition on and engine speed less than 250 rpm.

Set Condition: The PCM senses the voltage from the MAP sensor to be greater than 4.9 volts (2.4 volts for Turbo) or below 2.28 volts (1.2 volts for Turbo) for 400 milliseconds. Two Trip Fault.

POSSIBLE CAUSES
CHECKING FOR OTHER DTCS
CHECKING THE HOSES AND TUBING
GOOD TRIP EQUAL TO ZERO
SOLENOID TEST #1
SOLENOID TEST #2
SOLENOID TEST #3
SOLENOID TEST #4
THROTTLE INLET PRESSURE SENSOR
(A23) TIP SIGNAL CIRCUIT OPEN
(K167) SENSOR GROUND CIRCUIT OPEN

TEST	ACTION	APPLICABILITY
1	Ignition on, engine not running. With the DRBIII®, read PCM DTCs and record the related Freeze Frame data. Is the Good Trip displayed and equal to zero? Yes → Go To 2 No → Refer to the INTERMITTENT CONDITION symptom in the Driveability category. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
2	Turn the ignition on. With the DRBIII®, read the PCM DTCs. **NOTE: If there are any other MAP Sensor or Throttle Inlet Pressure Sensor DTCs present, repair the other MAP Sensor or Throttle Inlet Pressure Sensors before continuing.** Does the DRB display any other DTCs? Yes → Refer to the symptom list and perform the appropriate diagnostic procedure. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 3	All

P1854-TIP BARO OUT OF RANGE — Continued

TEST	ACTION	APPLICABILITY
3	**NOTE: The exhaust system must be free from any restriction to perform this test.** Check all of the tubes and hoses between the air cleaner and the intake manifold for loose connection, damage or restriction. Check all of the tubes connected to the intercooler for loose connection, damage or restriction. Check all of the tubes and hoses connected to the turbocharger, TIP Solenoid, Surge Solenoid and Wastegate Solenoid for loose connection, damage or restriction. **NOTE: Solenoid design and hose connections are identical for all three solenoids. It is possible to connect the hoses to the incorrect solenoid. Verify that hoses are connected to the correct solenoid.** Are any of these conditions evident? Yes → Repair or replace as necessary. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 4	All
4	Turn the ignition off. Disconnect the TIP Sensor harness connector. Disconnect the PCM harness connector. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the (A23) TIP Signal circuit from the TIP Sensor harness connector to the appropriate terminal of special tool #8815. Is the resistance below 10.0 ohms? Yes → Go To 5 No → Repair the open in the (A23) TIP Signal circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
5	Turn the ignition off. Disconnect the TIP Sensor harness connector. Disconnect the PCM harness connector. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the (K167) Sensor ground circuit from the TIP Sensor harness connector to the appropriate terminal of special tool #8815. Is the resistance below 10.0 ohms? Yes → Go To 6 No → Repair the open in the (K167) Sensor ground circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

P1854-TIP BARO OUT OF RANGE — Continued

TEST	ACTION	APPLICABILITY
6	Turn the ignition off. Disconnect the hoses from the TIP Solenoid. Install a plug on the TIP Solenoid hose B connection point. Connect a vacuum pump to the TIP Solenoid hose A connection point. With vacuum pump apply 20 inches of vacuum to the TIP Solenoid hose A connection point. **NOTE: Vacuum reading should not drop below 10 inches within 5 seconds.** Does vacuum read above 10 inches for at least 5 seconds? Yes → Go To 7 No → Replace the TIP Solenoid. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
7	Turn the ignition off. Disconnect the hoses from the TIP Solenoid. Install a plug on the TIP Solenoid hose C connection point. Connect a vacuum pump to the TIP Solenoid hose A connection point. Attempt to apply 20 inches of vacuum to the TIP Solenoid hose A connection point. **NOTE: Vacuum should escape through the Solenoid hose B connection point.** Does vacuum escape through the Solenoid hose B connection point? Yes → Go To 8 No → Replace the TIP Solenoid. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
8	Turn the ignition off. Disconnect the hoses from the TIP Solenoid. Install a plug on TIP Solenoid hose C connection point. Connect a vacuum pump to the TIP Solenoid hose B connection point. **NOTE: For the result of this test to be accurate the solenoid must be turned on. Apply 12 volts and Ground to the appropriate solenoid terminals to turn the solenoid on.** With vacuum pump apply 20 inches of vacuum to the TIP Solenoid hose B connection point. **NOTE: Vacuum reading should not drop below 10 inches within 5 seconds.** Does vacuum read above 10 inches for at least 5 seconds? Yes → Go To 9 No → Replace the TIP Solenoid. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

P1854-TIP BARO OUT OF RANGE — Continued

TEST	ACTION	APPLICABILITY
9	Turn the ignition off. Disconnect the hoses from the TIP Solenoid. Install a plug on the TIP Solenoid hose A connection point. Connect a vacuum pump to the TIP Solenoid hose B connection point. **NOTE: For the result of this test to be accurate the solenoid must be turned on. Apply 12 volts and Ground to the appropriate solenoid terminals to turn the solenoid on.** Attempt to apply 20 inches of vacuum to the TIP Solenoid hose B connection point. **NOTE: Vacuum should escape through the Solenoid hose C connection point.** Does vacuum escape through the Solenoid hose C connection point? Yes → Replace the Throttle Inlet Pressure Sensor. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Replace the TIP Solenoid. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

Symptom:

P2074-MANIFOLD PRESSURE/THROTTLE POSITION CORRELATION - HIGH FLOW/VACUUM LEAK

When Monitored and Set Condition:

P2074-MANIFOLD PRESSURE/THROTTLE POSITION CORRELATION - HIGH FLOW/VACUUM LEAK

When Monitored: Engine Running, during all drive modes.

Set Condition: If vacuum drops below 1.5 Hg with engine RPM greater than 2000 RPM at closed throttle.

POSSIBLE CAUSES
GOOD TRIP EQUAL TO ZERO
VACUUM LEAK
HIGH RESISTANCE IN MAP (K7) 5 VOLT SUPPLY CIRCUIT
RESISTANCE TO GROUND IN MAP (K7) 5 VOLT SUPPLY CIRCUIT
MAP SENSOR
HIGH RESISTANCE IN (K1) MAP SIGNAL CIRCUIT
RESISTANCE TO GROUND IN (K1) MAP SIGNAL CIRCUIT
HIGH RESISTANCE IN (K4) MAP GROUND CIRCUIT
PCM
TP SENSOR OPERATION
HIGH RESISTANCE IN (K6) TP SENSOR 5 VOLT SUPPLY CIRCUIT
RESISTANCE TO GROUND IN (K6) TP SENSOR 5 VOLT SUPPLY CIRCUIT
TP SENSOR
HIGH RESISTANCE IN (K22) TP SIGNAL CIRCUIT
RESISTANCE TO GROUND IN (K22) TP SENSOR SIGNAL CIRCUIT
HIGH RESISTANCE IN TP (K4) SENSOR GROUND CIRCUIT
PCM

P2074-MANIFOLD PRESSURE/THROTTLE POSITION CORRELATION - HIGH FLOW/VACUUM LEAK — Continued

TEST	ACTION	APPLICABILITY
1	**NOTE: Diagnose any TP Sensor or MAP Sensor component DTCs before continuing.** **NOTE: If the P0501 - No Vehicle Speed Signal is set along with this DTC, refer to the P0501 diagnostics before continuing.** **NOTE: The throttle plate and linkage must be free from binding and carbon build up, ensure the throttle plate is at the idle position, ensure the throttle plate is at the idle position.** Ignition on, engine not running. With the DRBIII®, read DTCs and record the related Freeze Frame data. Is the Good Trip Counter displayed and equal to zero? Yes → Go To 2 No → Refer to the INTERMITTENT CONDITION symptom in the Driveability category. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
2	**NOTE: This code is intended to shut down the engine if a large crack occurs in the intake manifold.** **NOTE: A large vacuum leak is most likely the cause of this DTC.** Inspect the Intake Manifold for leaks and cracks. Inspect the Power Brake Booster for any vacuum leaks. Inspect the PCV system for proper operation or any vacuum leaks. Were any vacuum leaks found? Yes → Repair the vacuum leak as necessary. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 3	All
3	Start the engine. With the DRBIII®, monitor the MAP Sensor voltage. Snap the throttle from wide open throttle to idle several times. Does the MAP Sensor voltage vary from below 2.0 volts at idle to above 3.5 volts? Yes → Go To 4 No → Go To 12	All
4	Ignition on, engine not running. With the DRBIII®, monitor the TP Sensor voltage while slowly depressing the throttle pedal from the idle position to the wide open throttle position. Does the voltage start approximately at 0.8 volts and go above 3.5 volts with a smooth transition? Yes → Refer to the INTERMITTENT CONDITION symptom in the Driveability category. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 5	All

P2074-MANIFOLD PRESSURE/THROTTLE POSITION CORRELATION - HIGH FLOW/VACUUM LEAK — Continued

TEST	ACTION	APPLICABILITY
5	Turn the ignition off. Disconnect the TP Sensor harness connector. Disconnect the PCM harness connector. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the (K6) 5 volt Supply circuit from the TP Sensor harness connector to the appropriate terminal of special tool #8815. Is the resistance below 5.0 ohms? Yes → Go To 6 No → Repair the (K6) TP Sensor 5 volt Supply circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
6	Turn the ignition off. Disconnect the TP Sensor harness connector. Disconnect the PCM harness connector. Measure the resistance between ground and the (K6) 5 volt Supply circuit at the TP Sensor harness connector. Is the resistance above 100k ohms? Yes → Go To 7 No → Repair the (K6) 5 volt Supply circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
7	Turn the ignition off. Disconnect the TP Sensor harness connector. With the DRBIII®, monitor the TP Sensor voltage. Ignition on, engine not running. Connect a jumper wire between the (K22) TP Signal circuit and the (K4) Sensor ground circuit . Does the TP Sensor voltage change from approximately 4.9 volts to below 0.5 of a volt? Yes → Replace the Throttle Position Sensor. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 8	All
8	Turn the ignition off. Disconnect the TP Sensor harness connector. Disconnect the PCM harness connector. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the (K22) TP Signal circuit from the TP Sensor harness connector to the appropriate terminal of special tool #8815. Is the resistance below 5.0 ohms? Yes → Go To 9 No → Repair the (K22) TP Signal circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

P2074-MANIFOLD PRESSURE/THROTTLE POSITION CORRELATION - HIGH FLOW/VACUUM LEAK — Continued

TEST	ACTION	APPLICABILITY
9	Turn the ignition off. Disconnect the TP Sensor harness connector. Disconnect the PCM harness connector. Measure the resistance between ground and the (K22) TP Signal circuit in the TP Sensor harness connector. Is the resistance above 100k ohms? Yes → Go To 10 No → Repair the (K22) TP Sensor Signal circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
10	Turn the ignition off. Disconnect the TP Sensor harness connector. Disconnect the PCM harness connector. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the (K4) Sensor ground circuit from the TP Sensor harness connector to the appropriate terminal of special tool #8815. Is the resistance below 5.0 ohms? Yes → Go To 11 No → Repair the (K4) Sensor Ground circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
11	**NOTE: Before continuing, check the PCM harness connector terminals for corrosion, damage, or terminal push out. Repair as necessary.** If there are no possible causes remaining, view repair. Repair Replace and program the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
12	Turn the ignition off. Disconnect the MAP Sensor harness connector. Disconnect the PCM harness connector. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the (K7) 5 volt Supply circuit from the MAP Sensor harness connector to the appropriate terminal of special tool #8815. Is the resistance below 5.0 ohms? Yes → Go To 13 No → Repair the MAP (K7) 5 volt Supply circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

P2074-MANIFOLD PRESSURE/THROTTLE POSITION CORRELATION - HIGH FLOW/VACUUM LEAK — Continued

TEST	ACTION	APPLICABILITY
13	Turn the ignition off. Disconnect the MAP Sensor harness connector. Disconnect the PCM harness connector. Measure the resistance between ground and the (K7) 5 volt Supply circuit at the MAP Sensor harness connector. Is the resistance above 100k ohms? Yes → Go To 14 No → Repair the short to ground in the (K7) 5 volt Supply circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
14	Turn the ignition off. Disconnect the MAP Sensor harness connector. With the DRBIII®, monitor the MAP Sensor voltage. Ignition on, engine not running. Connect a jumper wire between the (K1) MAP Sensor Signal circuit and the (K4) Sensor ground circuit . Cycle the ignition switch from off to on. With the DRBIII®, monitor the MAP Sensor voltage. Does the DRBIII® display MAP voltage from approximately 4.9 volts to below 0.5 volt? Yes → Replace the MAP Sensor. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 15	All
15	Turn the ignition off. Disconnect the MAP Sensor harness connector. Disconnect the PCM harness connector. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the (K1) MAP Signal circuit from the MAP Sensor harness connector to the appropriate terminal of special tool #8815. Is the resistance below 5.0 ohms? Yes → Go To 16 No → Repair the (K1) MAP Signal circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
16	Turn the ignition off. Disconnect the MAP Sensor harness connector. Disconnect the PCM harness connector. Measure the resistance between ground and the (K1) MAP Signal circuit at the MAP Sensor harness connector. Is the resistance above 100k ohms? Yes → Go To 17 No → Repair the (K1) MAP Signal circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

P2074-MANIFOLD PRESSURE/THROTTLE POSITION CORRELATION - HIGH FLOW/VACUUM LEAK — Continued

TEST	ACTION	APPLICABILITY
17	Turn the ignition off. Disconnect the MAP Sensor harness connector. Disconnect the PCM harness connector. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the (K4) Sensor ground circuit from the MAP Sensor harness connector to the appropriate terminal of special tool #8815. Is the resistance below 5.0 ohms? Yes → Go To 18 No → Repair the (K4) Sensor Ground circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
18	**NOTE: Before continuing, check the PCM harness connector terminals for corrosion, damage, or terminal push out. Repair as necessary.** If there are no possible causes remaining, view repair. Repair Replace and program the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

Symptom List:
P2096-DOWN STREAM FUEL SYSTEM 1/2 LEAN
P2097-DOWN STREAM FUEL SYSTEM 1/2 RICH

Test Note: All symptoms listed above are diagnosed using the same tests. The title for the tests will be P2096-DOWN STREAM FUEL SYSTEM 1/2 LEAN.

When Monitored and Set Condition:

P2096-DOWN STREAM FUEL SYSTEM 1/2 LEAN

When Monitored: With the engine running in closed loop mode, the ambient/battery temperature above (-7°C)20°F, altitude below 8500 ft and fuel level greater than 15%.

Set Condition: If the PCM adds downstream short term compensation to long term adaptive and a certain percentage is exceeded for two trips, a freeze frame is stored, the MIL illuminates and a trouble code is stored.

P2097-DOWN STREAM FUEL SYSTEM 1/2 RICH

When Monitored: With the engine running in closed loop mode, the ambient/battery temperature above (-7°C)20°F and altitude below 8500 ft.

Set Condition: If the PCM adds downstream short term compensation to long term adaptive and a certain percentage is exceeded for two trips, a freeze frame is stored, the MIL illuminates and a trouble code is stored.

POSSIBLE CAUSES
GOOD TRIP EQUAL TO ZERO
EXHAUST LEAK
ENGINE MECHANICAL PROBLEM
O2 SENSOR
O2 SIGNAL CIRCUIT
O2 RETURN CIRCUIT
FUEL CONTAMINATION

P2096-DOWN STREAM FUEL SYSTEM 1/2 LEAN — Continued

TEST	ACTION	APPLICABILITY
1	**NOTE: Check the vehicle repair history. If the O2 has been replace ensure that the O2 sensor was properly installed and meets OEM specification.** **NOTE: Check for contaminants that may have damaged the O2 Sensor: contaminated fuel, unapproved silicone, oil and coolant.** Ignition on, engine not running. With the DRBIII®, read DTCs and record the related Freeze Frame data. Is the Good Trip Counter displayed and equal to zero? Yes → Go To 2 No → Refer to the INTERMITTENT CONDITION symptom in the Driveability category. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
2	Turn the ignition off. **WARNING: To avoid personal injury from the exhaust system being hot, allow the exhaust to cool down to a safe temperature before performing a physical inspection.** Visually and Physically inspect the for holes, cracks and blockage in the exhaust system. Is the exhaust system is good condition? Yes → Go To 3 No → Repair or Replace as necessary. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
3	Check for any of the following conditions/mechanical problems. AIR INDUCTION SYSTEM - must be free from leaks. ENGINE VACUUM - must be at least 13 inches in neutral ENGINE VALVE TIMING - must be within specifications ENGINE COMPRESSION - must be within specifications ENGINE EXHAUST SYSTEM - must be free of any restrictions or leaks. ENGINE PCV SYSTEM - must flow freely TORQUE CONVERTER STALL SPEED - must be within specifications POWER BRAKE BOOSTER - no internal vacuum leaks FUEL - must be free of contamination FUEL INJECTOR - plugged or restricted injector; control wire not connected to correct injector Are there any engine mechanical problems? Yes → Repair as necessary. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 4	All
4	Ignition on, engine not running. Disconnect the O2 Sensor harness connector. With the DRBIII®, monitor the O2 Sensor voltage. The O2 Sensor voltage should read 5.0 volts on the DRBIII® with the connector disconnected. Using a jumper wire, jump the O2 Signal circuit to the O2 Return circuit at the O2 Sensor harness connector. **NOTE: The voltage should drop from 5.0 volts to 2.5 volts with the jumper wire in place.** Did the O2 Sensor volts change from 5.0 volts to 2.5 volts? Yes → Replace the O2 Sensor Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 5	All

P2096-DOWN STREAM FUEL SYSTEM 1/2 LEAN — Continued

TEST	ACTION	APPLICABILITY
5	Turn the ignition off. Disconnect the O2 Sensor harness connector. Ignition on, engine not running. With the DRBIII®, monitor the O2 Sensor voltage. Is the voltage above 4.8 volts? Yes → Go To 6 No → Check the O2 Signal circuit for a short to ground, open, or short to voltage. Inspect the O2 Sensor connector and the PCM harness connector. If OK, replace and program the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
6	Turn the ignition off. Disconnect the O2 Sensor harness connector. Ignition on, engine not running. Measure the voltage on the O2 Return circuit in the O2 Sensor harness connector. Is the voltage at 2.5 volts? Yes → Check the fuel system for contaminants. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Check the O2 Return circuit for a short to ground, open, or short to voltage. Inspect the O2 Sensor connector and the PCM harness connector. If OK, replace and program the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

Symptom List:

P2302-IGNITION COIL #1 SECONDARY CIRCUIT-INSUFFICIENT IONIZATION
P2305-IGNITION COIL #2 SECONDARY CIRCUIT-INSUFFICIENT IONIZATION

Test Note: All symptoms listed above are diagnosed using the same tests. The title for the tests will be P2302-IGNITION COIL #1 SECONDARY CIRCUIT-INSUFFICIENT IONIZATION.

When Monitored and Set Condition:

P2302-IGNITION COIL #1 SECONDARY CIRCUIT-INSUFFICIENT IONIZATION

When Monitored: Engine Running.

Set Condition: If PCM detects that the secondary ignition burn time is incorrect or not present an error is detected. One Trip Fault.

P2305-IGNITION COIL #2 SECONDARY CIRCUIT-INSUFFICIENT IONIZATION

When Monitored: Engine Running.

Set Condition: If PCM detects that the secondary ignition burn time is incorrect or not present an error is detected. One Trip Fault

POSSIBLE CAUSES
INTERMITTENT CONDITION
SPARK PLUG
IGNITION WIRE
IGNITION COIL OPERATION
IGNITION COIL DRIVER CIRCUIT OPEN
COIL CONTROL CIRCUIT SHORTED TO GROUND
PCM
(A142) ASD RELAY OUTPUT CIRCUIT
IGNITION COIL

TEST	ACTION	APPLICABILITY
1	Ignition on, engine not running. With the DRBIII®, read DTCs and record the related Freeze Frame data. Is the Good Trip Counter displayed and equal to zero? Yes → Go To 2 No → Go To 9	All

P2302-IGNITION COIL #1 SECONDARY CIRCUIT-INSUFFICIENT IONIZATION — Continued

TEST	ACTION	APPLICABILITY
2	**NOTE: This test must be repeated for the adjacent ignition wire.** Turn the ignition off. Disconnect the ignition wire from the spark plug. **NOTE: Before continuing inspect the ignition wire for damage or carbon tracking coil or the spark plug insulator boot. If a problem is found, replace the ignition wire.** Install a spark tester to the ignition wire. While cranking the engine observe the spark coming from the spark tester. **NOTE: A crisp blue spark that is able to jumper the gap of the spark tester should be generated.** Is a good spark generated? Yes → Ensure the cylinder is operationg properly. If OK, replace the Spark Plug. Perform POWERTRAIN VERIFICATION TEST VER - 2 - NGC. No → Go To 3	All
3	**NOTE: This test must be repeated for the adjacent ignition wire.** Turn the ignition off. Remove the ignition wire. Measure the resistance of the ignition wire. Is the resistance below 10K ohms? Yes → Go To 4 No → Replace the Ignition Wire. Perform POWERTRAIN VERIFICATION TEST VER - 2 - NGC.	All
4	Turn the ignition off. Disconnect the Ignition Coil harness connector. Turn the ignition on. With the DRBIII®, actuate the ASD Relay. Using a 12-volt test light connected to ground, probe the (A142) ASD Relay Output circuit in the Ignition Coil harness connector. Does the test light illuminate brightly? Yes → Go To 5 No → Repair the (A142) ASD Relay Output circuit. Perform POWERTRAIN VERIFICATION TEST VER - 2 - NGC.	All
5	Turn the ignition off. Disconnect the Ignition Coil harness connector. Using a 12-volt test light connected to 12-volts, probe the Ignition Coil Driver circuit. Crank the engine for 5 second while observing the test light. Does the test light blink/flicker? Yes → Replace the Ignition Coil. Perform POWERTRAIN VERIFICATION TEST VER - 2 - NGC. No → Go To 6	All

P2302-IGNITION COIL #1 SECONDARY CIRCUIT-INSUFFICIENT IONIZATION — Continued

TEST	ACTION	APPLICABILITY
6	Turn the ignition off. Disconnect the Ignition Coil harness connector. Disconnect the PCM harness connector. Measure the resistance of the Coil Control circuit between the Ignition Coil harness connector and the special tool #8815 terminal. Is the resistance below 5.0 ohms? Yes → Go To 7 No → Repair the Coil Control circuit for an open. Perform POWERTRAIN VERIFICATION TEST VER - 2 - NGC.	All
7	Turn the ignition off. Disconnect the Ignition Coil harness connector. Disconnect the PCM harness connector. Measure the resistance between ground and the Coil Control circuit in the Ignition Coil harness connector. Is the resistance below 100k ohms? Yes → Repair the Coil Control circuit for a short to ground. Perform POWERTRAIN VERIFICATION TEST VER - 2 - NGC. No → Go To 8	All
8	NOTE: Before continuing, check the PCM harness connector terminals for corrosion, damage, or terminal push out. Repair as necessary. If there are no possible causes remaining, view repair. Repair Replace and program the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 2 - NGC.	All
9	Turn the ignition off. Remove the Spark Plug. Inspect the Spark Plug for the following conditions. - Cracks - Carbon Tracking - Foreign Material - Gap size out of specifications - Loose or broke electrode **NOTE: Lightly tap the bottom of the spark plug on a solid surface. The electrode in the spark plug should not move.** Were any of the above condition present? Yes → Replace the Spark Plug. Perform POWERTRAIN VERIFICATION TEST VER - 2 - NGC. No → Refer to the INTERMITTENT CONDITION symptom in the Driveability category. Perform POWERTRAIN VERIFICATION TEST VER - 2 - NGC.	All

Symptom:
P2503-CHARGING SYSTEM VOLTAGE LOW

When Monitored and Set Condition:

P2503-CHARGING SYSTEM VOLTAGE LOW

When Monitored: The engine running. The engine speed greater than 1157 RPM.

Set Condition: The battery sensed voltage is 1 volt below the charging goal for 13.47 seconds. The PCM senses the battery voltage, turns off the field driver and senses the battery voltage again. If the voltages are the same, the code is set.

POSSIBLE CAUSES
CHARGING VOLTAGE BELOW 15.1 VOLTS
(A11) B+ CIRCUIT HIGH RESISTANCE
GENERATOR GROUND HIGH RESISTANCE
GENERATOR OPERATION
(Z1) GEN FIELD GROUND CIRCUIT OPEN
(K20) GEN FIELD CONTROL CIRCUIT SHORTED TO BATTERY VOLTAGE
(K20) GEN FIELD CONTROL CIRCUIT SHORTED TO GROUND
(K20) GEN FIELD CONTROL CIRCUIT OPEN
PCM

TEST	ACTION	APPLICABILITY
1	**NOTE: Inspect the vehicle for aftermarket accessories that may exceed the Generator System output.** Turn the ignition off. **NOTE: The battery must be fully charged.** **NOTE: The Generator belt tension and condition must be checked before continuing.** Start the engine. Allow the idle to stabilize. With the DRBIII®, read the Target Charging Voltage. Is the Target Charging Voltage above 15.1 volts? Yes → Refer to the INTERMITTENT CONDITION symptom in the Driveability category. Perform POWERTRAIN VERIFICATION TEST VER - 3 - NGC. No → Go To 2	All

P2503-CHARGING SYSTEM VOLTAGE LOW — Continued

TEST	ACTION	APPLICABILITY
2	**WARNING: WHEN THE ENGINE IS OPERATING, DO NOT STAND IN A DIRECT LINE WITH THE FAN. DO NOT PUT YOUR HANDS NEAR THE PULLEYS, BELTS OR FAN. DO NOT WEAR LOOSE CLOTHING.** Ignition on, engine not running. **NOTE: Ensure all wires are clear of the engine's moving parts.** Start the engine. Measure the voltage between the (A11) Generator B+ Terminal and the Battery+ Post. Is the voltage above 0.4 of a volt? Yes → Repair the (A11) B+ circuit for high resistance between the Generator and Battery. Perform POWERTRAIN VERIFICATION TEST VER - 3 - NGC. No → Go To 3	All
3	**WARNING: WHEN THE ENGINE IS OPERATING, DO NOT STAND IN A DIRECT LINE WITH THE FAN. DO NOT PUT YOUR HANDS NEAR THE PULLEYS, BELTS OR FAN. DO NOT WEAR LOOSE CLOTHING.** Start the engine. Warm the engine to operating temperature. **NOTE: Ensure all wires are clear of the engine's moving parts.** Measure the voltage between the Generator case and Battery ground post. Is the voltage above 0.1 of a volt? Yes → Repair Generator Ground for high resistance, Generator Case to Battery ground side. Perform POWERTRAIN VERIFICATION TEST VER - 3 - NGC. No → Go To 4	All
4	Turn the ignition off. Disconnect the Generator Field harness connector. Using a 12-volt test light, jumper it across the Generator Field harness connector. Ignition on, engine not running. With the DRBIII®, actuate the Gen Field Control circuit. Does the test light illuminate brightly and flash on and off? Yes → Replace the Generator. Perform POWERTRAIN VERIFICATION TEST VER - 3 - NGC. No → Go To 5	All
5	Turn the ignition off. Disconnect the Generator Field harness connector. Using a 12-volt test connected to battery voltage, probe the (Z1) Gen Field Ground circuit in the Generator Field harness connector. Does the test light illuminate brightly? Yes → Go To 6 No → Repair the open in the (Z1) Gen Field Ground circuit. Perform POWERTRAIN VERIFICATION TEST VER - 3 - NGC.	All

P2503-CHARGING SYSTEM VOLTAGE LOW — Continued

TEST	ACTION	APPLICABILITY
6	Turn the ignition off. Disconnect the Generator Field harness connector. Disconnect the PCM harness connector. Measure the voltage on the (K20) Gen Field Control circuit at the Generator Field harness connector. Is the voltage above 1.0 volt? Yes → Repair the short to voltage in the (K20) Gen Field Control circuit. Perform POWERTRAIN VERIFICATION TEST VER - 3 - NGC. No → Go To 7	All
7	Turn the ignition on. Disconnect the Generator Field harness connector. Disconnect the PCM harness connector. Measure the resistance between ground and the (K20) Gen Field Control circuit in the Generator Field harness connector. Is the resistance below 100 ohms? Yes → Repair the (K20) Gen Field Control circuit for a short to ground. Perform POWERTRAIN VERIFICATION TEST VER - 3 - NGC. No → Go To 8	All
8	Turn the ignition off. Disconnect the Generator Field harness connector. Disconnect the PCM harness connector. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the (K20) Gen Field Control circuit from the Generator Field harness connector to the appropriate terminal of the special tool #8815. Is the resistance below 5.0 ohms? Yes → Go To 9 No → Repair the open in the (K20) Generator Field Control circuit. Perform POWERTRAIN VERIFICATION TEST VER - 3 - NGC.	All
9	If there are no possible causes remaining, view repair. Repair Replace and program the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 3 - NGC.	All

Symptom:
U0101-NO TRANSMISSION BUS MESSAGE

When Monitored and Set Condition:

U0101-NO TRANSMISSION BUS MESSAGE

When Monitored: Equipped with automatic transmission. Engine Running Battery voltage greater than 10 volts.

Set Condition: No bus messages are received from the TCM for 20 seconds, two trips required.

POSSIBLE CAUSES
PCI BUS UNABLE TO COMMUNICATE WITH DRBIII®
(F12) FUSED IGNITION SWITCH OUTPUT (OFF-RUN-START)
INTERMITTENT CONDITION
PCM

TEST	ACTION	APPLICABILITY
1	**NOTE: If P1603 or P1604 are set along with this DTC, diagnose them first before continuing with U0101.** **NOTE: Before continuing, inspect all fuses and ensure that all power and ground circuits are operating properly.** **NOTE: Check all powers and grounds to the PCM before continuing.** Turn the ignition on. With the DRBIII®, erase DTCs. Start the engine, allow the engine to run for at least 20 seconds with the gear selector in Drive. Repeat at least 2 times. With the DRBIII®, read DTC's. Does the DTC reset? Yes → Go To 2 No → Refer to the INTERMITTENT CONDITION symptom in the Driveability category. Perform POWERTRAIN VERIFICATION TEST VER - 1.	All

U0101-NO TRANSMISSION BUS MESSAGE — Continued

TEST	ACTION	APPLICABILITY
2	Turn the ignition off. Disconnect the PCM harness connector. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Turn the ignition to run. Using a 12-volt test light connected to ground, probe the (F12) Fused Ignition Switch Output (Off-Run-Start) cavity C1-12 circuit at the appropriate terminal of the special tool #8815. **NOTE: If the test light illuminates, wiggle the wiring harness to ensure that the problem is not an intermittent wiring problem.** Does the test light illuminate brightly? Yes → Go To 3 No → Check all related fuses. Repair the (F12) Fused Ignition Switch Output circuit for an open. Perform POWERTRAIN VERIFICATION TEST VER - 1.	All
3	**Note: Determine which modules this vehicle is equipped with before beginning.** **Note: When attempting to communicate with any of the modules on this vehicle, the DRB will display 1 of 2 different communication errors: a NO RESPONSE message or a BUS +/- SIGNALS OPEN message.** Turn the ignition on. Using the DRB, attempt to communicate with the following control modules: Instrument Cluster (MIC) Controller Antilock Brake (CAB) Was the DRB able to communicate with one or more Module(s)? Yes → Replace and program the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 1. No → Refer to the Communication category and perform the PCI BUS COMMUNICATION FAILURE symptom. Perform POWERTRAIN VERIFICATION TEST VER - 1.	All

Symptom:
U0155-NO CLUSTER BUS MESSAGE

When Monitored and Set Condition:

U0155-NO CLUSTER BUS MESSAGE

When Monitored: Engine Running.

Set Condition: No BUS messages received from the MIC (Instrument Cluster) for 20 seconds.

POSSIBLE CAUSES
DTC RESET
COMMUNICATE WITH CLUSTER
INSTRUMENT CLUSTER OPERATION
PCM

TEST	ACTION	APPLICABILITY
1	Turn the ignition on. With the DRBIII®, erase DTCs. Start the engine on and off several times. Leave the engine running for at least 20 second each time. With the DRBIII®, read DTCs. Does the DTC reset? Yes → Go To 2 No → Refer to the INTERMITTENT CONDITION symptom in the Driveability category. Perform POWERTRAIN VERIFICATION TEST VER - 1.	All
2	Ignition on, engine not running. With the DRBIII®, attempt to communicate with the Instrument cluster. Can communication be established with the Instrument Cluster? Yes → Go To 3 No → Refer to the Communication Category and perform the appropriate symptom related to no communication with cluster. Perform POWERTRAIN VERIFICATION TEST VER - 1.	All
3	Start the engine Allow the engine to idle. Is the correct engine speed display (Tachometer) in the instrument cluster? Yes → Replace and program the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 1. No → Refer to the Instrument Category and perform the appropriate symptom. Perform POWERTRAIN VERIFICATION TEST VER - 1.	All

Symptom:
U0168-NO SKIM BUS MESSAGES

When Monitored and Set Condition:

U0168-NO SKIM BUS MESSAGES

When Monitored: Ignition on or Engine Running.

Set Condition: No BUS messages are received from the SKIM for 20 seconds.

POSSIBLE CAUSES
INTERMITTENT CONDITION
PCI BUS CIRCUIT OPEN FROM PCM TO SKIM
LOSS OF SKIM COMMUNICATION
SKIM/PCM

TEST	ACTION	APPLICABILITY
1	Turn the ignition on. With the DRBIII®, read the DTCs and record the related Freeze Frame data. Is the Good Trip Counter displayed and equal to zero? Yes → Go To 2 No → Go To 5	All
2	Turn the ignition on. With the DRB III, attempt to communicate with the SKIM. **NOTE: This test will indicate if the Bus is operational from the DLC to the SKIM.** Was the DRB III able to communicate with the SKIM? Yes → Go To 3 No → Refer to symptom BUS +/- SIGNAL OPEN FROM SKIM in the COMMUNICATION category. Perform SKIS VERIFICATION.	All
3	Turn the ignition off. Disconnect the PCM harness connectors. Disconnect the SKIM harness connector. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the PCI Bus circuit from the SKIM harness connector to the appropriate terminal of special tool #8815. Is the resistance below 5.0 ohms? Yes → Go To 4 No → Repair the PCI Bus circuit between the PCM and the SKIM for an open. Perform SKIS VERIFICATION.	All

U0168-NO SKIM BUS MESSAGES — Continued

TEST	ACTION	APPLICABILITY
4	Turn the ignition off. Replace the Sentry Key Immobilizer Module in accordance with the Service Information. Turn the ignition on. Display and erase all PCM and SKIM DTCs. Perform 5 ignition key cycles leaving the ignition key on for 90 seconds per cycle. With the DRB, display PCM DTCs. Does the DRB display the same DTC? Yes → Replace and program the PCM in accordance with the Service Information. Perform SKIS VERIFICATION. No → Test Complete.	All
5	**WARNING: WHEN THE ENGINE IS OPERATING, DO NOT STAND IN A DIRECT LINE WITH THE FAN. DO NOT PUT YOUR HANDS NEAR THE PULLEYS, BELTS OR FAN. DO NOT WEAR LOOSE CLOTHING.** **NOTE: The conditions that set the DTC are not present at this time. The following list may help in identifying the intermittent condition.** With the engine running and at normal operating temperature, monitor the DRB parameters related to the DTC while wiggling the wire harness. Look for parameter values to change and/or a DTC to set. Review the DTC When Monitored and Set Conditions. If possible, try to duplicate the conditions under which the DTC was set. Refer to any Technical Service Bulletins (TSB) that may apply. Visually inspect the related wire harness. Look for any chafed, pierced, pinched, or partially broken wires. Visually inspect the related wire harness connectors. Look for broken, bent, pushed out, or corroded terminals. Were any of the above conditions present? Yes → Repair as necessary. Perform SKIS VERIFICATION. No → Test Complete.	All

Symptom:
U110C-NO FUEL LEVEL BUS MESSAGE

When Monitored and Set Condition:

U110C-NO FUEL LEVEL BUS MESSAGE

When Monitored: Ignition on.

Set Condition: No fuel level BUS messages received by the PCM for 20 seconds.

POSSIBLE CAUSES
DTC RESET
COMMUNICATE WITH CLUSTER
FUEL LEVEL BUS MESSAGE
PCI BUS CIRCUIT OPEN FROM PCM TO INSTRUMENT CLUSTER
INSTRUMENT CLUSTER

TEST	ACTION	APPLICABILITY
1	**NOTE: If a fuel level circuit or performance DTC is set along with U110C, diagnose the circuit/performance DTC before continuing.** Turn the ignition on. With the DRBIII®, erase DTCs. Start the engine on and off several times. Leave the engine running for at least 20 second each time. With the DRBIII®, read DTCs. Does the DTC reset? Yes → Go To 2 No → Refer to the INTERMITTENT CONDITION symptom in the Driveability category. Perform POWERTRAIN VERIFICATION TEST VER - 1.	All
2	Ignition on, engine not running. With the DRBIII®, attempt to communicate with the Instrument cluster. Can communication be established with the Instrument Cluster? Yes → Go To 3 No → Refer to the Communication Category and perform the appropriate symptom related to no communication with cluster. Perform POWERTRAIN VERIFICATION TEST VER - 1.	All
3	Turn the ignition on. Using the DRBIII®, read the Fuel Level parameter in the PCM. Does the DRBIII® display a fuel level value? Yes → Replace and program the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 1. No → Go To 4	All

U110C-NO FUEL LEVEL BUS MESSAGE — Continued

TEST	ACTION	APPLICABILITY
4	Turn the ignition off. Disconnect the PCM harness connectors. Disconnect the Instrument Cluster harness connector. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the PCI Bus circuit from the Instrument Cluster harness connector to the appropriate terminal of special tool #8815. Is the resistance below 5.0 ohms? Yes → Replace Instrument Cluster in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 1. No → Repair the PCI Bus circuit between the PCM and the Instrument Cluster for an open. Perform POWERTRAIN VERIFICATION TEST VER - 1.	All

Symptom:
*CHECKING PCM POWER AND GROUND CIRCUITS

POSSIBLE CAUSES
(A14) PCM FUSED B+ CIRCUIT
(A41) PCM FUSED IGNITION SWITCH OUTPUT CIRCUIT
(Z12) PCM GROUND CIRCUITS

TEST	ACTION	APPLICABILITY
1	**NOTE: The battery must be fully charged before continuing.** Turn the ignition off. Disconnect the PCM harness connector. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Using a 12-volt test light connected to ground, probe the (A14) PCM Fused B+ circuit in the Pinout Box. Does the test light illuminate brightly? Yes → Go To 2 No → Repair the (A14) Fused B+ circuit. Perform POWERTRAIN VERIFICATION TEST VER - 1.	All
2	Turn the ignition off. Disconnect the PCM harness connector. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Turn the ignition on. Using a 12-volt test light connected to ground, probe the (A41) PCM Fused Ignition Switch Output circuit in the Pinout Box. Does the test light illuminate brightly? Yes → Go To 3 No → Repair the (A41) Ignition Switch Output circuit Perform POWERTRAIN VERIFICATION TEST VER - 1.	All
3	Turn the ignition off. Disconnect the PCM harness connector. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Using a 12-volt test light connected to battery voltage, probe the (Z12) PCM ground circuits in the Pinout Box. Does the test light illuminate brightly? Yes → Test Complete. No → Repair the (Z12) PCM ground circuits. Perform POWERTRAIN VERIFICATION TEST VER - 1.	All

Symptom:
*CHECKING RAD FAN HIGH SPEED OPERATION (TURBO)

POSSIBLE CAUSES
GROUND CIRCUIT OPEN
RADIATOR FAN MOTOR
FUSED B+ CIRCUIT
RADIATOR FAN RELAY OUTPUT CIRCUIT
RAD FAN RELAY #1 OPERATION
RADIATOR FAN RELAY
RELAY #3 GROUND CIRCUIT OPEN (Z1)

TEST	ACTION	APPLICABILITY
1	**WARNING: The Checking Low Speed Fans Operation chart must be performed first before continuing.** Turn the ignition on. With the DRBIII®, actuate the High Speed Rad Fan Relay. Is the Rad Fan #1 operating Yes → Go To 2 No → Go To 3	All
2	**NOTE: The High Speed Relay #2 must still being actuating.** Turn the ignition on. With the DRBIII®, actuate the Low Speed Rad Fan Relay #1. **NOTE: Both Fans should be operating at high speed.** Is the Rad Fan #2 operation at high speed? Yes → The High Speed Fans are operating normal at this time. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → At the Rad Fan Control Relay #3 connector in the PDC check the ground circuit (Z1) for an open. If OK, replace the Rad Fan Control Relay #3. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
3	Turn the ignition off. Disconnect the Rad Fan #1 harness connector. Measure the resistance between the Ground circuit in the Radiator Fan harness connector to ground. Is the resistance below 5.0 ohms? Yes → Go To 4 No → Repair the Ground circuit for an open. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

*CHECKING RAD FAN HIGH SPEED OPERATION (TURBO) — Continued

TEST	ACTION	APPLICABILITY
4	Disconnect the Rad Fan #1 harness connector. Turn the ignition on. With the DRBIII®, actuate the High Speed Rad Fan Relay #2. Measure the voltage of the Radiator Fan Relay Output circuit in the Radiator Fan harness connector. Is the voltage above 11.0 volts? Yes → Replace the Radiator Fan Assembly. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 5	All
5	Turn the ignition off. Remove the High Speed Rad Fan Relay #2 from the PDC. Using a 12-volt test light connected to ground, probe the Fused B+ circuit in the PDC. Does the test light illuminate brightly? Yes → Go To 6 No → Repair the Fused B+ circuit. Inspect fuses and replace as necessary. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
6	Turn the ignition off. Remove the High Speed Rad Fan Relay from the PDC. Disconnect the Rad Fan #1 harness connector. Measure the resistance of the High Speed Rad Fan Relay Output circuit between the PDC and the Radiator Fan harness connector. Is the resistance below 5.0 ohms? Yes → Replace the Radiator Fan Relay. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Repair the Hgih Speed Rad Fan Relay Output circuit for an open. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

Symptom:
*CHECKING RAD FAN LOW SPEED OPERATION (TURBO)

POSSIBLE CAUSES
FUSED B+ CIRCUIT OPEN
LOW SPEED FANS OPERATION
RADIATOR FAN RELAY #3
LOW SPEED RAD FAN OUTPUT SHORTED TO GROUND BETWEEN RELAY #2 AND FAN #2
LOW SPEED RAD FAN OUTPUT SHORTED TO GROUND FAN#2 AND RELAY #3
RAD FAN #1 SHORTED INTERNALLY
RADIATOR FAN RELAY 1 OR 3
LOW SPEED RAD OUTPUT CIRCUIT SHORTED TO GROUND BETWEEN RELAY #3 AND FAN#1
GROUND CIRCUIT OPEN
RAD FAN #1 OPEN
RAD FAN #2 OPEN

TEST	ACTION	APPLICABILITY
1	Turn the ignition on. With the DRBIII®, actuate the Low Speed Rad Relay. Observe the Radiator Fans. Choose a conclusion that best match the Radiator Fans operation. Both Fans operation at at low speed Low Speed Radiator Fans are operation normally at this time. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. Fan #2 operating only Go To 2 Fans not Operating Go To 6	All
2	Using the DRBIII®, actuate the Low Speed Fan Relay #1. Turn the ignition on. Remove the Rad Fan Relay Control #3 from the PDC. Did the Fan #2 stop operating? Yes → Replace the Rad Fan Relay Control #3. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 3	All

*CHECKING RAD FAN LOW SPEED OPERATION (TURBO) — Continued

TEST	ACTION	APPLICABILITY
3	Turn the ignition off. Remove the Low Speed Rad Fan Relay #1 from the PDC. Disconnect the Rad Fan #2 harness connector. Measure the resistance between ground and the Low Speed Rad Fan Relay Output circuit at the Low Speed Rad Fan Relay #1 connector in the PDC. Is the resistance below 5.0 ohms? Yes → Repair the short to ground in the Low Speed Rad Fan Output circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 4	All
4	Turn the ignition off. Remove the Rad Fan Control Relay #3 from the PDC. Disconnect the Rad Fan #2 harness connector. Measure the resistance between ground and the Low Speed Rad Fan Relay Output circuit at the Rad Fan Control Relay #3 connector in the PDC terminal Is the resistance below 5.0 ohms? Yes → Repair the short to ground in the Low Speed Rad Fan Output circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 5	All
5	**NOTE: All relays and connectors reconnected.** Turn the ignition on. With the DRBIII®, actuate the Low Speed Rad Relay. **WARNING: Keep hands away from the Rad Fan when it is operating.** Disconnect the Rad Fan #1 harness connector. Is the Fan #2 still operating? Yes → Repair the Low Speed Rad Fan Output circuit for a short to ground. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Replace the Rad Fan Assembly. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
6	Remove the Low Speed Relay #1 from the PDC. Using a 12-volt test light connected to ground, probe the Fused B+ circuit in the PDC. Does the test light illuminate brightly? Yes → Go To 7 No → Repair the open in the Fused B+ circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
7	Turn the ignition off. Install a substitute relay in place of Radiator Fan Relay No. 1. Turn the ignition on. With the DRB, actuate the Low Speed Rad Fan Relay. **NOTE: Repeat the test above if the Rad Fans did not operate.** Did the Rad Fan operate normally when the relay(s) were substituted? Yes → Replace the Radiator Fan Relay that allowed the Fans to operate normally. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Go To 8	All

*CHECKING RAD FAN LOW SPEED OPERATION (TURBO) — Continued

TEST	ACTION	APPLICABILITY
8	Turn the ignition off. Disconnect the Rad Fan #1 harness connector. Measure the resistance of the ground circuit in the Rad Fan #1 harness connector to ground. Is the resistance below 5.0 ohms? Yes → Go To 9 No → Repair the open in the Ground circuit. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
9	Remove the Rad Fan Relay #3 from the PDC. Turn the ignition on. With the DRBIII®, actuate the Low Speed Rad Fan Relay#1. Using a fused jumper wire connected to ground, probe the Low Speed Rad Relay Output in the Rad Fan Control Relay #3. Does the Rad Fan #2 operate? Yes → Check for an open between the Relay #3 and the Rad Fan #1 in the Relay Output circuit. If OK, replace the Rad Fan Assembly. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Check for an open between the Relay #2 and Relay #3 in the Relay Output circuit. If OK, replace the Rad Fan Assembly. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All

Symptom:
*CHECKING RADIATOR FAN RELAY OUTPUT

POSSIBLE CAUSES
RADIATOR FAN RELAY OPERATION
GROUND CIRCUIT OPEN
RADIATOR FAN MOTOR
FUSED B+ CIRCUIT
RADIATOR FAN RELAY OUTPUT CIRCUIT
RADIATOR FAN RELAY

TEST	ACTION	APPLICABILITY
1	Turn the ignition on. With the DRBIII®, actuate the Radiator Fan Relay. Is the Radiator Fan actuating? Yes → The Radiator Fan System operating properly at this time. Perform POWERTRAIN VERIFICATION TEST VER - 2 - NGC. No → Go To 2	All
2	Turn the ignition off. Disconnect the Radiator Fan harness connector. Measure the resistance between the Ground circuit in the Radiator Fan harness connector to ground. Is the resistance below 5.0 ohms? Yes → Go To 3 No → Repair the Ground circuit for an open. Perform POWERTRAIN VERIFICATION TEST VER - 2 - NGC.	All
3	Disconnect the Radiator Fan harness connector. Turn the ignition on. With the DRBIII®, actuate the Radiator Fan Relay. Measure the voltage of the Radiator Fan Relay Output circuit in the Radiator Fan harness connector. Is the voltage above 11.0 volts? Yes → Replace the Radiator Fan Motor. Perform POWERTRAIN VERIFICATION TEST VER - 2 - NGC. No → Go To 4	All
4	Turn the ignition off. Remove the Radiator Fan Relay from the PDC. Using a 12-volt test light connected to ground, probe the Fused B+ circuit in the PDC. Does the test light illuminate brightly? Yes → Go To 5 No → Repair the Fused B+ circuit. Inspect fuses and replace as necessary. Perform POWERTRAIN VERIFICATION TEST VER - 2 - NGC.	All

*CHECKING RADIATOR FAN RELAY OUTPUT — Continued

TEST	ACTION	APPLICABILITY
5	Turn the ignition off. Remove the Radiator Fan Relay from the PDC. Disconnect the Radiator Fan harness connector. Measure the resistance of the Radiator Fan Relay Output circuit between the PDC and the Radiator Fan harness connector. Is the resistance below 5.0 ohms? Yes → Replace the Radiator Fan Relay. Perform POWERTRAIN VERIFICATION TEST VER - 2 - NGC. No → Repair the Radiator Fan Relay Output circuit for an open. Perform POWERTRAIN VERIFICATION TEST VER - 2 - NGC.	All

Symptom:
*CHECKING THE A/C RELAY OUTPUT

POSSIBLE CAUSES
A/C CLUTCH RELAY OPERATION
(Z1) GROUND CIRCUIT OPEN
A/C CLUTCH
(A17) FUSED B+ CIRCUIT
(C3) A/C CLUTCH OUTPUT CIRCUIT
A/C CLUTCH RELAY

TEST	ACTION	APPLICABILITY
1	**NOTE: Ensure that the refrigerant system is properly charged. Refer to the appropriate Service Information.** Turn the ignition on. With the DRBIII®, actuate the A/C Clutch Relay. Is the A/C Clutch actuating? Yes → The A/C Clutch System operating properly at this time. Perform POWERTRAIN VERIFICATION TEST VER - 2 - NGC. No → Go To 2	All
2	Turn the ignition off. Disconnect the A/C Clutch harness connector. Measure the (Z1) Ground circuit in the A/C Clutch harness connector to ground. Is the resistance below 5.0 ohms? Yes → Go To 3 No → Repair the (Z1) Ground circuit for an open. Perform POWERTRAIN VERIFICATION TEST VER - 2 - NGC.	All
3	Disconnect the A/C Clutch harness connector. Turn the ignition on. With the DRBIII®, actuate the A/C Clutch Relay. Measure the voltage of the A/C Clutch Relay Output circuit in the (C3) A/C Clutch harness connector. Is the voltage above 11.0 volts? Yes → Replace the A/C Clutch. Perform POWERTRAIN VERIFICATION TEST VER - 2 - NGC. No → Go To 4	All
4	Turn the ignition off. Remove the A/C Clutch Relay from the PDC. Using a 12-volt test light connected to ground, probe the (A17) Fused B+ circuit in the PDC. Does the test light illuminate brightly? Yes → Go To 5 No → Repair the (A17) Fused B+ circuit. Inspect fuses and replace as necessary. Perform POWERTRAIN VERIFICATION TEST VER - 2 - NGC.	All

*CHECKING THE A/C RELAY OUTPUT — Continued

TEST	ACTION	APPLICABILITY
5	Turn the ignition off. Disconnect the A/C Clutch Relay from the PDC. Disconnect the A/C Clutch harness connector. Measure the resistance of the (C3) A/C Clutch Relay Output circuit between the PDC and the A/C Clutch harness connector. Is the resistance below 5.0 ohms? Yes → Replace the A/C Clutch Relay. Perform POWERTRAIN VERIFICATION TEST VER - 2 - NGC. No → Repair the (C3) A/C Clutch Relay Output circuit for an open. Perform POWERTRAIN VERIFICATION TEST VER - 2 - NGC.	All

Symptom List:

ANTENNA FAILURE
COP FAILURE
EEPROM FAILURE
INTERNAL FAULT
RAM FAILURE
SERIAL LINK INTERNAL FAULT
STACK OVERFLOW FAILURE

Test Note: All symptoms listed above are diagnosed using the same tests. The title for the tests will be ANTENNA FAILURE.

When Monitored and Set Condition:

ANTENNA FAILURE

When Monitored: Every 250 milliseconds with the ignition on.

Set Condition: The SKIM's microcontroller determines that an antenna circuit fault has occurred for 2.0 consecutive seconds.

COP FAILURE

When Monitored: With the ignition on.

Set Condition: The COP timer is not reset by the micro controller every 65.5 milliseconds.

EEPROM FAILURE

When Monitored: With the ignition on.

Set Condition: When the value written to EEPROM memory does not equal the value read back after the write operation.

INTERNAL FAULT

When Monitored: With the ignition on.

Set Condition: The SKIM has detected a fault during an internal self test.

RAM FAILURE

When Monitored: With the ignition on.

Set Condition: The RAM fails a test that checks the RAM's ability to retain memory.

SERIAL LINK INTERNAL FAULT

When Monitored: With the ignition on.

Set Condition: The SKIM fails an internal J1850 communication self test.

STACK OVERFLOW FAILURE

When Monitored: With the ignition on.

Set Condition: The micro controller has exceeded its stack space limit.

ANTENNA FAILURE — Continued

POSSIBLE CAUSES
SKIM INTERNAL DTC FAILURE

TEST	ACTION	APPLICABILITY
1	**Note: This trouble code indicates an internal SKIM fault.** With the DRBIII®, read and record the SKIM DTCs and then erase the SKIM DTCs Perform 5 ignition key cycles, leaving the ignition key on for a minimum of 90 seconds per cycle. With the DRBIII® , read the SKIM DTCs. Did the same SKIM DTC return? Yes → Replace and program the Sentry Key Immobilizer Module in accordance with the Service Information. Perform SKIS VERIFICATION. No → Test Complete.	All

Symptom List:
PCM STATUS FAILURE
SERIAL LINK EXTERNAL FAULT

Test Note: All symptoms listed above are diagnosed using the same tests. The title for the tests will be PCM STATUS FAILURE.

When Monitored and Set Condition:

PCM STATUS FAILURE

When Monitored: With the ignition on.

Set Condition: This DTC exists when a PCM STATUS message was not received from the PCM for at least 20.0 consecutive seconds.

SERIAL LINK EXTERNAL FAULT

When Monitored: At ignition on, after ignition on during any rolling code handshake that occurs with the PCM due to a SKIM reset, or during SECRET KEY transfers to the PCM.

Set Condition: When the SKIM does not receive an expected PCI BUS message transmission acknowledgement from the PCM after 3 transmit attempts.

POSSIBLE CAUSES
INTERMITTENT WIRING HARNESS PROBLEM
WIRING HARNESS INSPECTION
SKIM/PCM

TEST	ACTION	APPLICABILITY
1	**NOTE: Ensure the PCM has proper power and ground connections before continuing.** With the DRBIII®, read and record the SKIM DTCs then erase the SKIM DTCs. Turn the ignition off. Wait 2 minutes. Turn the ignition on. With the DRBIII®, read the SKIM DTCs. Does the DRBIII® display the DTC that was previously erased? Yes → Go To 2 No → Go To 4	All

PCM STATUS FAILURE — Continued

TEST	ACTION	APPLICABILITY
2	Turn the ignition off. **NOTE: Visually inspect the related wiring harness and CCD/PCI Bus (whichever applicable) circuits. Look for any chafed, pierced, pinched, or partially broken wires.** **NOTE: Visually inspect the related wiring harness connectors. Look for broken, bent, pushed out, or corroded terminals.** **Note: Refer to any Technical Service Bulletins (TSB) that may apply.** Were any problems found? Yes → Repair as necessary. Perform SKIS VERIFICATION. No → Go To 3	All
3	**NOTE: Before proceeding it will be necessary to obtain the SKIM PIN.** Turn the ignition on. With the DRBIII®, display and erase all PCM and SKIM DTC's. Perform 5 ignition key cycles, leaving the ignition key on for a minimum of 90 seconds per cycle. With the DRBIII®, read the SKIM DTCs. Does the code appear? Yes → Replace and program the Powertrain Control Module in accordance with the Service Information. Perform SKIS VERIFICATION. No → Test Complete.	All
4	Turn the ignition off. **Note: Visually inspect the related wiring harness. Look for any chafed, pierced, pinched, or partially broken wires.** **NOTE: Visually inspect the related wiring harness connectors. Look for broken, bent, pushed out, or corroded terminals.** **Note: Refer to any Technical Service Bulletins (TSB) that may apply.** Were any problems found? Yes → Repair wiring harness/connectors as necessary. Perform SKIS VERIFICATION. No → Test Complete.	All

Symptom List:
ROLLING CODE FAILURE
VIN MISMATCH

Test Note: All symptoms listed above are diagnosed using the same tests. The title for the tests will be ROLLING CODE FAILURE.

When Monitored and Set Condition:

ROLLING CODE FAILURE

When Monitored: At ignition on, after ignition on during any rolling code handshake that occurs with the PCM due to a SKIM or PCM reset.

Set Condition: When a PCM STATUS message with a Valid Key status is not received by the SKIM within 3.5 seconds of transmitting the last Valid Key Code message to the PCM.

VIN MISMATCH

When Monitored: With the ignition on.

Set Condition: When the VIN received from the PCM does not match the VIN stored in the SKIM's EEPROM.

POSSIBLE CAUSES
VERIFYING PCM VIN
REPLACE SKIM AND CHECK DTC'S
INTERMITTENT WIRING HARNESS PROBLEM
PCM

TEST	ACTION	APPLICABILITY
1	With the DRBIII®, erase the SKIM DTCs. Turn the ignition off. Wait 10 seconds. Turn the ignition on and wait 2 minutes. With the DRBIII®, read the SKIM DTCs. Does the DRBIII® display the DTC that was previously erased? Yes → Go To 2 No → Go To 4	All

ROLLING CODE FAILURE — Continued

TEST	ACTION	APPLICABILITY
2	Turn the ignition on. With the DRBIII®, select Engine system from the main menu. Display and record the Vehicle Identification Number. **NOTE: Ensure that a VIN has been programmed into the PCM. If a VIN is not displayed, attempt to program the PCM with the correct vehicle VIN before continuing.** Does the VIN recorded from the PCM match the VIN of the vehicle? Yes → Go To 3 No → Perform the PCM replaced to update the VIN in the PCM. Perform SKIS VERIFICATION.	All
3	Turn the ignition off. Replace and program the Sentry Key Immobilizer Module in accordance with the Service Information. Turn the ignition on. With the DRBIII®, display and clear all PCM and SKIM DTC's. Perform 5 ignition key cycles leaving the ignition key on for 90 seconds per cycle. With the DRBIII®, check for SKIM DTCs. Does the DRBIII® display the same DTC? Yes → Replace and program the Powertrain Control Module in accordance with the Service Information. Perform SKIS VERIFICATION. No → The repair is complete. Perform SKIS VERIFICATION.	All
4	Turn the ignition off. **Note: Visually inspect the related wiring harness. Look for any chafed, pierced, pinched, or partially broken wires.** **NOTE: Visually inspect the related wiring harness connectors. Look for broken, bent, pushed out, or corroded terminals.** **Note: Refer to any Technical Service Bulletins (TSB) that may apply.** Were any problems found? Yes → Repair wiring harness/connectors as necessary. Perform SKIS VERIFICATION. No → Test Complete.	All

Symptom List:

TRANSPONDER COMMUNICATION FAILURE
TRANSPONDER CYCLIC REDUNDANCY CHECK (CRC) FAILURE
TRANSPONDER ID MISMATCH
TRANSPONDER RESPONSE MISMATCH

Test Note: All symptoms listed above are diagnosed using the same tests. The title for the tests will be TRANSPONDER COMMUNICATION FAILURE.

When Monitored and Set Condition:

TRANSPONDER COMMUNICATION FAILURE

When Monitored: At ignition on and during Key Programming Mode.

Set Condition: When the SKIM does not receive a transponder response after 8 consecutive transponder read attempts within 2.0 seconds.

TRANSPONDER CYCLIC REDUNDANCY CHECK (CRC) FAILURE

When Monitored: At ignition on and during Key Programming Mode.

Set Condition: When 5 consecutive transponder signal transmissions are sent to the SKIM with the correct message format but with invalid data.

TRANSPONDER ID MISMATCH

When Monitored: At ignition on and during Key Programming Mode.

Set Condition: When the transponder ID read by the SKIM does not match any of the transponder ID's stored in the SKIM's memory.

TRANSPONDER RESPONSE MISMATCH

When Monitored: At ignition on and during Key Programming Mode.

Set Condition: When the transponder's crypto algorithm result fails to match the SKIM's result.

POSSIBLE CAUSES
CHECKING MULTIPLE KEY OPERATION
SKIM
INTERMITTENT WIRING HARNESS PROBLEM
REPLACE IGNITION KEY

TRANSPONDER COMMUNICATION FAILURE — Continued

TEST	ACTION	APPLICABILITY
1	With the DRBIII®, read and record the SKIM DTCs. With the DRBIII®, erase the SKIM DTCs. **NOTE: Perform the following test several times to ensure the DTC is current.** Turn the ignition off. Wait 10 seconds. Turn the ignition on. With the DRBIII®, read the SKIM DTCs. Does the DRBIII® display the DTC that was previously erased? Yes → Go To 2 No → Go To 7	All
2	Are there multiple vehicle ignition keys available? Yes → Go To 3 No → Go To 4	All
3	**NOTE: Perform the following steps using one of the vehicle ignition keys. When finished, repeat the procedure using each of the other vehicle keys one at a time.** With the DRBIII®, erase the SKIM DTCs. Turn the ignition off. Wait 10 seconds. Turn the ignition on. With the DRBIII®, read the SKIM DTCs. Is the DTC present for all ignition keys? Yes → Replace and program the Sentry Key Immobilizer Module in accordance with the Service Information. Perform SKIS VERIFICATION. No → Replace the ignition key(s) that cause the SKIM DTC. Perform SKIS VERIFICATION.	All
4	With the DRBIII®, attempt to reprogram the ignition keys to the SKIM. With the DRBIII®, erase the SKIM DTCs. Wait 10 seconds. Turn the ignition on. With the DRBIII®, read the SKIM DTCs. Does the DTC set again? Yes → Go To 5 No → Test Complete.	All
5	Replace the ignition key with a new key. With the DRBIII®, program the new ignition key to the SKIM. With the DRBIII®, erase the SKIM DTCs. Turn the ignition off. Wait 10 seconds. Turn the ignition on. With the DRBIII®, read the SKIM DTCs. Does the DTC set again? Yes → Go To 6 No → Test Complete.	All

TRANSPONDER COMMUNICATION FAILURE — Continued

TEST	ACTION	APPLICABILITY
6	If there are no possible causes remaining, view repair. Repair Replace and program the Sentry Key Immobilizer Module in accordance with the Service Information. Perform SKIS VERIFICATION.	All
7	Turn the ignition off. **Note: Visually inspect the related wiring harness. Look for any chafed, pierced, pinched, or partially broken wires.** **NOTE: Visually inspect the related wiring harness connectors. Look for broken, bent, pushed out, or corroded terminals.** **Note: Refer to any Technical Service Bulletins (TSB) that may apply.** Were any problems found? Yes → Repair wiring harness/connectors as necessary. Perform SKIS VERIFICATION. No → Test Complete.	All

Symptom:
*CHECKING FUEL DELIVERY

POSSIBLE CAUSES
FUEL PUMP RELAY
FUEL PRESSURE OUT OF SPECS
RESTRICTED FUEL SUPPLY LINE
FUEL PUMP INLET STRAINER PLUGGED
FUEL PUMP MODULE
FUEL DELIVERY SYSTEM OPERATION
FUEL PUMP RELAY FUSED B+ CIRCUIT
(A141) FUEL PUMP RELAY OUTPUT CIRCUIT OPEN
(Z1) FUEL PUMP GROUND CIRCUIT OPEN/HIGH RESISTANCE
FUEL PUMP MODULE

TEST	ACTION	APPLICABILITY
1	Turn the ignition on. With the DRBIII®, actuate the ASD Fuel System test. **Note: It may be necessary to use a mechanics stethoscope in the next step.** Listen for fuel pump operation at the fuel tank. Does the Fuel Pump operate? Yes → Go To 2 No → Go To 5 **Caution: Stop All Actuations.**	All
2	Turn the ignition off. **WARNING: The fuel system is under a constant pressure even with the engine off. Before testing or servicing any fuel system hose, fitting or line, the fuel system pressure must be released.** Install a fuel gauge. Turn the ignition on. With the DRBIII®, actuate the ASD Fuel System test and observe the fuel pressure gauge. **NOTE: Fuel pressure specification is 400 KPa +/- 34 KPa (58 psi +/- 5 psi).** Choose a conclusion that best matches your fuel pressure reading. Below Specification Go To 3 Within Specification The Fuel Delivery System is operating normally. Perform POWERTRAIN VERIFICATION TEST VER - 1. Above Specification Replace the fuel filter/fuel pressure regulator. Perform POWERTRAIN VERIFICATION TEST VER - 1. **Caution: Stop All Actuations.**	All

*CHECKING FUEL DELIVERY — Continued

TEST	ACTION	APPLICABILITY
3	Turn the ignition off. **WARNING: The fuel system is under a constant pressure even with the engine off. Before testing or servicing any fuel system hose, fitting or line, the fuel system pressure must be released.** Raise vehicle on hoist, and disconnect the fuel pressure line at the fuel pump module. Install special 5/16 fuel line adapter tool #6539 between the disconnected fuel line and the fuel pump module. Attach a fuel pressure test gauge to the T fitting on the tool #6539 Turn the ignition on. With the DRBIII®, actuate the ASD Fuel System test and observe the fuel pressure gauge. **NOTE: Fuel pressure specification is 400 KPa +/- 34 KPa (58 psi +/- 5 psi).** Is the fuel pressure within specification now? Yes → Repair/replace fuel supply line as necessary. Perform POWERTRAIN VERIFICATION TEST VER - 1. No → Go To 4 **Caution: Stop All Actuations.**	All
4	Turn the ignition off. **WARNING: The fuel system is under a constant pressure even with the engine off. Before testing or servicing any fuel system hose,fitting or line, the fuel system pressure must be released.** Remove the Fuel Pump Module and inspect the Fuel Inlet Strainer. Is the Fuel Inlet Strainer plugged? Yes → Replace the Fuel Pump Inlet Strainer. Perform POWERTRAIN VERIFICATION TEST VER - 1. No → Replace the Fuel Pump Module. Perform POWERTRAIN VERIFICATION TEST VER - 1.	All
5	Turn the ignition off. Disconnect the fuel pump module harness connector. Turn the ignition on. With the DRBIII®, actuate the ASD Fuel System test. Using a 12 volt test light connected to ground, probe the (A141) Fuel Pump Relay Output circuit at the Fuel Pump Module harness connector. Does the test light illuminate brightly? Yes → Go To 6 No → Go To 8 **Caution: Stop All Actuations.**	All
6	Turn the ignition off. Disconnect the Fuel Pump Module harness connector. **Note: Check connectors - It is critical that the connector is free from any signs of corrosion or deformities - Clean/repair as necessary.** Using a test light connected to battery voltage, probe the (Z1) Fuel Pump ground circuit at the Fuel Pump Module harness connector. Does the test light illuminate brightly? Yes → Go To 7 No → Repair the open/high resistance in the (Z1) fuel pump ground circuit. Perform POWERTRAIN VERIFICATION TEST VER - 1.	All

*CHECKING FUEL DELIVERY — Continued

TEST	ACTION	APPLICABILITY
7	If there are no possible causes remaining, view repair. Repair Replace the Fuel Pump Module. Perform POWERTRAIN VERIFICATION TEST VER - 1.	All
8	Turn the ignition off. Remove the Fuel Pump Relay from the PDC. With a 12 volt test light connected to ground, probe the Fuel Pump Relay Fused B+ circuit at the PDC. Does the test light illuminate? Yes → Go To 9 No → Repair the Fuel Pump Realy Fused B+ circuit. Check for open fuse in the PDC. Perform POWERTRAIN VERIFICATION TEST VER - 1.	All
9	Turn the ignition off. Remove the Fuel Pump Relay from the PDC. Disconnect the Fuel Pump Module harness connector. **NOTE: Check connectors - It is critical that the connector is free from any signs of corrosion or deformities** Measure the resistance of the (A141) Fuel Pump Relay Output circuit from the relay connector to the fuel pump module connector. Is the resistance below 5.0 ohms? Yes → Replace the Fuel Pump Relay. Perform POWERTRAIN VERIFICATION TEST VER - 1. No → Repair the (A141) Fuel Pump Relay Output circuit for an open. Perform POWERTRAIN VERIFICATION TEST VER - 1.	All

Symptom:
*CHECKING FUEL PRESSURE LEAK DOWN

POSSIBLE CAUSES
CHECKING FUEL PRESSURE
FUEL PUMP MODULE
CHECKING FUEL LEAK DOWN

TEST	ACTION	APPLICABILITY
1	**Warning: The fuel system is under a constant pressure (even with the engine off). Before testing or servicing any fuel system hose, fitting or line, the fuel system pressure must be released.** Install a fuel pressure gauge. Start the engine and observe the fuel pressure reading. **NOTE: Fuel pressure specification is 400 KPa +/- 34 KPa (58 psi +/- 5 psi).** Turn the ignition off. Monitor the fuel pressure gauge for a minimum of 5 minutes. **NOTE: The pressure should not fall below 241 KPa (35 psi)** Does the fuel pressure gauge fall below the above specification? Yes → Go To 2 No → Fuel System is operating normally. Perform POWERTRAIN VERIFICATION TEST VER - 2 - NGC.	All
2	**NOTE: Before continuing visually and physically inspect the fuel delivery system for external leaks or damage. Repair /replace as necessary.** Turn the ignition off. **WARNING: The fuel system is under a constant pressure even with the engine off. Before testing or servicing any fuel system hose, fitting or line, the fuel system pressure must be released.** Install special 5/16 fuel line adapter tool #6539. Attach a fuel pressure test gauge to the T fitting on the tool #6539 Start the engine and allow the fuel system to reach maximum pressure. Turn the ignition off. **NOTE: Fuel specification is 400 KPa +/- 34 KPa (58 psi +/- 5 psi).** Using special tool #C4390, Hose Clamp Pliers, slowly clamp off the rubber hose on the Fuel Pressure adapter between the fuel pressure gauge and the engine. Monitor the fuel pressure gauge for a minimum of 5 minutes. **NOTE: The pressure should not fall below 241 KPa (35 psi)** Does the fuel pressure gauge fall below the above specification? Yes → Check the Fuel Delivery System between the fuel gauge and the fuel pump module. Inspect the seal points and the fuel lines for signs of fuel leakage. Repair/Replace as necessary. If OK, replace the Fuel Pump Module. Perform POWERTRAIN VERIFICATION TEST VER - 2 - NGC. No → Check the Fuel Delivery System between the fuel gauge and the fuel pump module. Inspect the seal points and the fuel lines for signs of fuel leakage. Repair/Replace as necessary. If OK, replace the Fuel Pump Module. Perform POWERTRAIN VERIFICATION TEST VER - 2 - NGC.	All

Symptom:

*ENGINE CRANKS DOES NOT START

POSSIBLE CAUSES
NO START PRE-TEST
POWERTRAIN FUSES OPEN
FUEL PRESSURE OUT OF SPECS
RESTRICTED FUEL SUPPLY LINE
FUEL PUMP INLET STRAINER PLUGGED
FUEL PUMP MODULE
FUEL PUMP RELAY FUSED B+ CIRCUIT
FUEL PUMP RELAY OUTPUT CIRCUIT OPEN
FUEL PUMP RELAY
FUEL PUMP GROUND CIRCUIT OPEN/HIGH RESISTANCE
FUEL PUMP MODULE
5 VOLT SUPPLY CIRCUIT
CKP SENSOR SIGNAL CIRCUIT OPEN
CKP SENSOR SIGNAL CIRCUIT SHORTED GROUND
CKP SENSOR SIGNAL CIRCUIT SHORTED TO VOLTAGE
CKP SENSOR SIGNAL SHORTED TO 5 VOLT SUPPLY CIRCUIT
SENSOR GROUND CIRCUIT OPEN
ASD RELAY OUTPUT CIRCUIT
CRANKSHAFT POSITION SENSOR
IGNITION COIL
IGNITION COIL DRIVER CIRCUIT OPEN
IGNITION COIL DRIVER CIRCUIT SHORTED TO GROUND
PCM - COIL
PCM - CKP SENSOR SIGNAL
OTHER POSSIBLE CAUSES FOR NO START

*ENGINE CRANKS DOES NOT START — Continued

TEST	ACTION	APPLICABILITY
1	**Note: The following list of items must be checked before continuing with any no start tests.** The battery must be fully charged and in good condition. A low charged battery may produce invalid test results. If the battery is low, charge the battery and then attempt to start the vehicle by cranking the engine for 15 seconds, 3 consecutive times. This will allow any DTC's to set that may have been erased due to a dead battery. Ensure the Powers and Ground to the PCM are ok. Make sure the PCM communicates with the DRBIII® and that there are no DTC's stored in the PCM memory. If the PCM reports a No Response condition, refer to the Communication category for the proper tests. Read the PCM DTC's with the DRBIII®. If any DTC's are present, they must be repaired before continuing with any other No Start diagnostic tests. Refer to the Symptom list for the related P-code that is reported by the PCM. Ensure that the PCI bus is functional. Attempt to communicate with the Instrument Cluster and SKIM, If you are unable to establish communicate refer to the Communication category for the proper symptoms. The Sentry Key Immobilizer System must be operating properly. Check for proper communication with the DRBIII® and check for DTC's that may be stored in the Sentry Key Immobilizer Module (SKIM). repair the DTC(s) before continuing. If no DTC's are found, using the DRBIII® select Clear PCM (Batt Disconnect). Crank the engine several times. Using the DRBIII®, read DTC's. If a DTC is present perform the DTC diagnostics before continuing. Were any problems found? Yes → Repair as necessary. Perform POWERTRAIN VERIFICATION TEST VER - 1. No → Go To 2	All
2	Check for any open fuses in the PDC or Fuse Block that may be related to the No Start condition. Are any of the fuses open? Yes → Using the wiring diagram/schematic as a guide, inspect the wiring and connectors, repair as necessary. Replace the Fuse. Perform POWERTRAIN VERIFICATION TEST VER - 1. No → Go To 3	All
3	Turn the ignition on. With the DRBIII®, actuate the ASD Fuel System test. **Note: It may be necessary to use a mechanics stethoscope in the next step.** Listen for fuel pump operation at the fuel tank. Does the Fuel Pump operate? Yes → Go To 4 No → Go To 24 **Caution: Stop All Actuations.**	All

*ENGINE CRANKS DOES NOT START — Continued

TEST	ACTION	APPLICABILITY
4	**NOTE: Repeat the following test at each Ignition wire. If spark is not present or is weak on only one or two Ignition wires, the problem may be the Ignition wire. Inspect all Ignition wires for proper operation.** Turn the ignition off. Disconnect the #1 Ignition wire. Connect a spark plug tester to the end of the Ignition wire. While cranking the engine, observe the spark tester. Is spark present? Yes → Go To 5 No → Go To 9	All
5	Turn the ignition off. **WARNING: The fuel system is under a constant pressure even with the engine off. Before testing or servicing any fuel system hose, fitting or line, the fuel system pressure must be released.** Install a fuel pressure gauge. Turn the ignition on. With the DRBIII®, actuate the ASD Fuel System test and observe the fuel pressure gauge. **NOTE: Fuel pressure specification is 400 kPa +/- 34 kPa (58 psi +/- 5 psi).** Choose a conclusion that best matches your fuel pressure reading. Below Specification Go To 6 Within Specification Go To 8 Above Specification Replace the fuel filter/fuel pressure regulator. Perform POWERTRAIN VERIFICATION TEST VER - 1. **Caution: Stop All Actuations.**	All
6	Turn the ignition off. **WARNING: The fuel system is under a constant pressure even with the engine off. Before testing or servicing any fuel system hose, fitting or line, the fuel system pressure must be released.** Raise vehicle on hoist, and disconnect the fuel pressure line at the fuel pump module. Install special 5/16 fuel line adapter tool #6539 between the disconnected fuel line and the fuel pump module. Attach a fuel pressure test gauge to the T fitting on the tool #6539 Turn the ignition on. With the DRBIII®, actuate the ASD Fuel System test and observe the fuel pressure gauge. **NOTE: Fuel pressure specification is 400 KPa +/- 34 KPa (58 psi +/- 5 psi).** Is the fuel pressure within specification now? Yes → Repair/replace fuel supply line as necessary. Perform POWERTRAIN VERIFICATION TEST VER - 1. No → Go To 7 **Caution: Stop All Actuations.**	All

*ENGINE CRANKS DOES NOT START — Continued

TEST	ACTION	APPLICABILITY
7	Turn the ignition off. **WARNING: The fuel system is under a constant pressure even with the engine off. Before testing or servicing any fuel system hose,fitting or line, the fuel system pressure must be released.** Remove the Fuel Pump Module and inspect the Fuel Inlet Strainer. Is the Fuel Inlet Strainer plugged? Yes → Replace the Fuel Pump Inlet Strainer. Perform POWERTRAIN VERIFICATION TEST VER - 1. No → Replace the Fuel Pump Module. Perform POWERTRAIN VERIFICATION TEST VER - 1.	All
8	The following items need to be checked as a possible cause for a no start condition. Refer to any Technical Service Bulletins that may apply to the symptom. The spark plugs must be free from fuel, oil, coolant and/or any foreign material or deposits. The fuel must be free from contamination. The exhaust may be free from restrictions. The engine compression must be within specifications. The engine valve timing must be within specifications. The engine must be free from vacuum leaks. Were any of the above conditions found? Yes → Repair as necessary. Perform POWERTRAIN VERIFICATION TEST VER - 1. No → Test Complete.	All
9	Turn the ignition on. With the DRBIII® in Sensors, select the RPM parameter. While cranking the engine monitor the RPM parameter. Does the DRBIII® display a RPM reading greater than 50 RPM and steady? Yes → Go To 10 No → Go To 15	All
10	Turn the ignition off. Disconnect the Ignition Coil harness connector. Turn the ignition on. With the DRBIII®, actuate the ASD Relay. Using a 12-volt test light connected to ground, probe the ASD Relay Output circuit in the Ignition Coil harness connector. Does the test light illuminate brightly? Yes → Go To 11 No → Repair the ASD Relay Output circuit. Perform POWERTRAIN VERIFICATION TEST VER - 1.	All
11	Turn the ignition off. Disconnect the Ignition Coil harness connector. Using a 12-volt test light connected to 12-volts, probe the Ignition Coil Driver circuit. Crank the engine for 5 second while observing the test light. Does the test light blink/flicker? Yes → Replace the Ignition Coil. Perform POWERTRAIN VERIFICATION TEST VER - 1. No → Go To 12	All

*ENGINE CRANKS DOES NOT START — Continued

TEST	ACTION	APPLICABILITY
12	Turn the ignition off. Disconnect the Ignition Coil harness connector. Disconnect the PCM harness connector. Measure the resistance of the Ignition Coil driver circuit between the Ignition Coil harness connector and the PCM harness connector. Is the resistance below 5.0 ohms? Yes → Go To 13 No → Repair the Ignition Coil driver circuit for an open. Perform POWERTRAIN VERIFICATION TEST VER - 1.	All
13	Turn the ignition off. Disconnect the Ignition Coil harness connector. Disconnect the PCM harness connector. Measure the resistance between ground and the Ignition Coil driver circuit in the Ignition Coil harness connector. Is the resistance below 100k ohms? Yes → Repair the Ignition Coil driver circuit for a short to ground. Perform POWERTRAIN VERIFICATION TEST VER - 1. No → Go To 14	All
14	If there are no possible causes remaining, view repair. Repair Replace and program the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 1.	All
15	Turn the ignition off. Disconnect the CKP Sensor harness connector. Turn the ignition on. Measure the voltage of the 5 Volt Supply circuit in the CKP Sensor harness connector. Is the voltage between 4.8 and 5.2 volts? Yes → Go To 16 No → Repair the 5 Volt Supply circuit. Perform POWERTRAIN VERIFICATION TEST VER - 1.	All
16	Turn the ignition off. Disconnect the CKP Sensor harness connector. Turn the ignition on. Measure the voltage of the CKP Sensor Signal circuit in the CKP Sensor harness connector. Is the voltage between 4.5 and 5.0 volts? Yes → Go To 17 No → Go To 19	All
17	Turn the ignition off. Disconnect the CKP Sensor harness connector. Measure the resistance between ground and the Sensor Ground circuit at the CKP Sensor harness connector. Is the resistance below 100 ohms? Yes → Go To 18 No → Repair the Sensor Ground circuit for an open. Perform POWERTRAIN VERIFICATION TEST VER - 1.	All

*ENGINE CRANKS DOES NOT START — Continued

TEST	ACTION	APPLICABILITY
18	**NOTE: Inspect the slots on the crank, tone wheel, for damage. If a problem is found repair as necessary.** If there are no possible causes remaining, view repair. Repair Replace the Crankshaft Position Sensor. Perform POWERTRAIN VERIFICATION TEST VER - 1.	All
19	Turn the ignition off. Disconnect the CKP Sensor harness connector. Disconnect the PCM harness connectors. Measure the resistance of the CKP Sensor Signal circuit from the CKP Sensor harness connector to the PCM harness connector. Is the resistance below 5.0 ohms? Yes → Go To 20 No → Repair the CKP Sensor Signal circuit for an open. Perform POWERTRAIN VERIFICATION TEST VER - 1.	All
20	Turn the ignition off. Disconnect the CKP Sensor harness connector. Measure the resistance between ground and the CKP Sensor Signal circuit at the CKP Sensor harness connector. Is the resistance below 100 ohms? Yes → Repair the CKP Sensor Signal circuit for a short to ground. Perform POWERTRAIN VERIFICATION TEST VER - 1. No → Go To 21	All
21	Turn the ignition off. Disconnect the CKP Sensor harness connector. Turn the ignition on. Measure the voltage of the CKP Sensor Signal circuit in the CKP Sensor harness connector. Is the voltage above 4.7 volts? Yes → Repair the CKP Sensor Signal circuit for a short to battery voltage. Perform POWERTRAIN VERIFICATION TEST VER - 1. No → Go To 22	All
22	Turn the ignition off. Disconnect the CKP Sensor harness connector. Disconnect the PCM harness connector(s). Measure the resistance between the CKP Sensor Signal circuit and the 5 Volt Supply circuit in the CKP Sensor harness connector. Is the resistance below 5.0 ohms? Yes → Repair the CKP Sensor Signal circuit shorted to the 5 Volt Supply circuit. Perform POWERTRAIN VERIFICATION TEST VER - 1. No → Go To 23	All

*ENGINE CRANKS DOES NOT START — Continued

TEST	ACTION	APPLICABILITY
23	If there are no possible causes remaining, view repair. Repair Replace and program the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 1.	All
24	Turn the ignition off. Disconnect the fuel pump module harness connector. Turn the ignition on. With the DRBIII®, actuate the ASD Fuel System test. Using a 12 volt test light connected to ground, probe the Fuel Pump Relay Output circuit at the Fuel Pump Module harness connector. Does the test light illuminate brightly? Yes → Go To 25 No → Go To 27 **Caution: Stop All Actuations.**	All
25	Turn the ignition off. Disconnect the Fuel Pump Module harness connector. **Note: Check connectors - It is critical that the connector is free from any signs of corrosion or deformities - Clean/repair as necessary.** Using a test light connected to battery voltage, probe the Fuel Pump ground circuit at the Fuel Pump Module harness connector. Does the test light illuminate brightly? Yes → Go To 26 No → Repair the open/high resistance in the fuel pump ground circuit. Perform POWERTRAIN VERIFICATION TEST VER - 1.	All
26	If there are no possible causes remaining, view repair. Repair Replace the Fuel Pump Module. Perform POWERTRAIN VERIFICATION TEST VER - 1.	All
27	Turn the ignition off. Remove the Fuel Pump Relay from the PDC. With a 12 volt test light connected to ground, probe the Fuel Pump Relay Fused B+ circuit at the PDC. Does the test light illuminate? Yes → Go To 28 No → Repair the Fuel Pump Relay Fused B+ circuit. Check for open fuse in the PDC. Perform POWERTRAIN VERIFICATION TEST VER - 1.	All

*ENGINE CRANKS DOES NOT START — Continued

TEST	ACTION	APPLICABILITY
28	Turn the ignition off. Remove the Fuel Pump Relay from the PDC. Disconnect the Fuel Pump Module harness connector. **NOTE: Check connectors - It is critical that the connector is free from any signs of corrosion or deformities** Measure the resistance of the Fuel Pump Relay Output circuit from the relay connector to the fuel pump module connector. Is the resistance below 5.0 ohms? Yes → Replace the Fuel Pump Relay. Perform POWERTRAIN VERIFICATION TEST VER - 1. No → Repair the open fuel pump relay output circuit. Perform POWERTRAIN VERIFICATION TEST VER - 1.	All

Symptom:

*ENGINE CRANKS DOES NOT START - 1.6L

POSSIBLE CAUSES
FUEL PUMP RELAY
NO START PRE-TEST
OTHER POSSIBLE CAUSES FOR NO START
POWERTRAIN FUSES OPEN
FUEL PRESSURE OUT OF SPECS
RESTRICTED FUEL SUPPLY LINE
FUEL PUMP INLET STRAINER PLUGGED
FUEL PUMP MODULE
FUEL PUMP RELAY FUSED B+ CIRCUIT
FUEL PUMP RELAY OUTPUT CIRCUIT OPEN
FUEL PUMP GROUND CIRCUIT OPEN/HIGH RESISTANCE
FUEL PUMP MODULE
5 VOLT SUPPLY CIRCUIT
CKP SENSOR SIGNAL CIRCUIT SHORTED GROUND
CKP SENSOR SIGNAL CIRCUIT OPEN
CKP SENSOR SIGNAL CIRCUIT SHORTED TO VOLTAGE
CKP SENSOR SIGNAL SHORTED TO 5 VOLT SUPPLY CIRCUIT
SENSOR GROUND CIRCUIT OPEN
CRANKSHAFT POSITION SENSOR
PCM - CKP SENSOR SIGNAL

*ENGINE CRANKS DOES NOT START - 1.6L — Continued

TEST	ACTION	APPLICABILITY
1	**Note: The following list of items must be checked before continuing with any no start tests.** The battery must be fully charged and in good condition. A low charged battery may produce invalid test results. If the battery is low, charge the battery and then attempt to start the vehicle by cranking the engine for 15 seconds, 3 consecutive times. This will allow any DTC's to set that may have been erased due to a dead battery. Ensure the Powers and Ground to the PCM are ok. Make sure the PCM communicates with the DRBIII® and that there are no DTC's stored in the PCM memory. If the PCM reports a No Response condition, refer to the Communication category for the proper tests. Read the PCM DTC's with the DRBIII®. If any DTC's are present, they must be repaired before continuing with any other No Start diagnostic tests. Refer to the Symptom list for the related P-code that is reported by the PCM. Ensure that the PCI bus is functional. Attempt to communicate with the Instrument Cluster and SKIM, If you are unable to establish communicate refer to the Communication category for the proper symptoms. The Sentry Key Immobilizer System must be operating properly. Check for proper communication with the DRBIII® and check for DTC's that may be stored in the Sentry Key Immobilizer Module (SKIM). repair the DTC(s) before continuing. If no DTC's are found, using the DRBIII® select Clear PCM (Batt Disconnect). Crank the engine several times. Using the DRBIII®, read DTC's. If a DTC is present perform the DTC diagnostics before continuing. Were any problems found? Yes → Repair as necessary. Perform POWERTRAIN VERIFICATION TEST VER-1 - 1.6L. No → Go To 2	All
2	Check for any open fuses in the PDC or Fuse Block that may be related to the No Start condition. Are any of the fuses open? Yes → Using the wiring diagram/schematic as a guide, inspect the wiring and connectors, repair as necessary. Replace the Fuse. Perform POWERTRAIN VERIFICATION TEST VER-1 - 1.6L. No → Go To 3	All
3	Turn the ignition on. With the DRBIII®, actuate the ASD Fuel System test. **Note: It may be necessary to use a mechanics stethoscope in the next step.** Listen for fuel pump operation at the fuel tank. Does the Fuel Pump operate? Yes → Go To 4 No → Go To 18 **Caution: Stop All Actuations.**	All

*ENGINE CRANKS DOES NOT START - 1.6L — Continued

TEST	ACTION	APPLICABILITY
4	Turn the ignition off. **WARNING: The fuel system is under a constant pressure even with the engine off. Before testing or servicing any fuel system hose, fitting or line, the fuel system pressure must be released.** Install a fuel pressure gauge. Turn the ignition on. With the DRBIII®, actuate the ASD Fuel System test and observe the fuel pressure gauge. **NOTE: Fuel pressure specification is 400 kPa +/- 34 kPa (58 psi +/- 5 psi).** Choose a conclusion that best matches your fuel pressure reading. Below Specification Go To 5 Within Specification Go To 7 Above Specification Replace the fuel filter/fuel pressure regulator. Perform POWERTRAIN VERIFICATION TEST VER-1 - 1.6L. **Caution: Stop All Actuations.**	All
5	Turn the ignition off. **WARNING: The fuel system is under a constant pressure even with the engine off. Before testing or servicing any fuel system hose, fitting or line, the fuel system pressure must be released.** Raise vehicle on hoist, and disconnect the fuel pressure line at the fuel pump module. Install special 5/16 fuel line adapter tool #6539 between the disconnected fuel line and the fuel pump module. Attach a fuel pressure test gauge to the T fitting on the tool #6539 Turn the ignition on. With the DRBIII®, actuate the ASD Fuel System test and observe the fuel pressure gauge. **NOTE: Fuel pressure specification is 400 KPa +/- 34 KPa (58 psi +/- 5 psi).** Is the fuel pressure within specification now? Yes → Repair/replace fuel supply line as necessary. Perform POWERTRAIN VERIFICATION TEST VER-1 - 1.6L. No → Go To 6 **Caution: Stop All Actuations.**	All
6	Turn the ignition off. **WARNING: The fuel system is under a constant pressure even with the engine off. Before testing or servicing any fuel system hose,fitting or line, the fuel system pressure must be released.** Remove the Fuel Pump Module and inspect the Fuel Inlet Strainer. Is the Fuel Inlet Strainer plugged? Yes → Replace the Fuel Pump Inlet Strainer. Perform POWERTRAIN VERIFICATION TEST VER-1 - 1.6L. No → Replace the Fuel Pump Module. Perform POWERTRAIN VERIFICATION TEST VER-1 - 1.6L.	All

*ENGINE CRANKS DOES NOT START - 1.6L — Continued

TEST	ACTION	APPLICABILITY
7	Turn the ignition on. With the DRBIII® in Sensors, select the RPM parameter. While cranking the engine monitor the RPM parameter. Does the DRBIII® display a RPM reading greater than zero? Yes → Go To 8 No → Go To 9	All
8	The following items need to be checked as a possible cause for a no start condition. Refer to any Technical Service Bulletins that may apply to the symptom. The spark plugs must be free from fuel, oil, coolant and/or any foreign material or deposits. The fuel must be free from contamination. The exhaust may be free from restrictions. The engine compression must be within specifications. The engine valve timing must be within specifications. The engine must be free from vacuum leaks. Were any of the above conditions found? Yes → Repair as necessary. Perform POWERTRAIN VERIFICATION TEST VER-1 - 1.6L. No → Test Complete.	All
9	Turn the ignition off. Disconnect the CKP Sensor harness connector. Turn the ignition on. Measure the voltage of the 5 Volt Supply circuit in the CKP Sensor harness connector. Is the voltage between 4.8 and 5.2 volts? Yes → Go To 10 No → Repair the 5 Volt Supply circuit. Perform POWERTRAIN VERIFICATION TEST VER-1 - 1.6L.	All
10	Turn the ignition off. Disconnect the CKP Sensor harness connector. Turn the ignition on. Measure the voltage of the CKP Sensor Signal circuit in the CKP Sensor harness connector. Is the voltage between 4.5 and 5.0 volts? Yes → Go To 11 No → Go To 13	All
11	Turn the ignition off. Disconnect the CKP Sensor harness connector. Measure the resistance between ground and the Sensor Ground circuit at the CKP Sensor harness connector. Is the resistance below 100 ohms? Yes → Go To 12 No → Repair the Sensor Ground circuit for an open. Perform POWERTRAIN VERIFICATION TEST VER-1 - 1.6L.	All

*ENGINE CRANKS DOES NOT START - 1.6L — Continued

TEST	ACTION	APPLICABILITY
12	**NOTE: Inspect the slots on the crank, tone wheel, for damage. If a problem is found repair as necessary.** If there are no possible causes remaining, view repair. Repair Replace the Crankshaft Position Sensor. Perform POWERTRAIN VERIFICATION TEST VER-1 - 1.6L.	All
13	Turn the ignition off. Disconnect the CKP Sensor harness connector. Measure the resistance between ground and the CKP Sensor Signal circuit at the CKP Sensor harness connector. Is the resistance below 100 ohms? Yes → Repair the CKP Sensor Signal circuit for a short to ground. Perform POWERTRAIN VERIFICATION TEST VER-1 - 1.6L. No → Go To 14	All
14	Turn the ignition off. Disconnect the CKP Sensor harness connector. Disconnect the PCM harness connectors. Measure the resistance of the CKP Sensor Signal circuit from the CKP Sensor harness connector to the PCM harness connector. Is the resistance below 5.0 ohms? Yes → Go To 15 No → Repair the CKP Sensor Signal circuit for an open. Perform POWERTRAIN VERIFICATION TEST VER-1 - 1.6L.	All
15	Turn the ignition off. Disconnect the CKP Sensor harness connector. Turn the ignition on. Measure the voltage of the CKP Sensor Signal circuit in the CKP Sensor harness connector. Is the voltage above 4.7 volts? Yes → Repair the CKP Sensor Signal circuit for a short to battery voltage. Perform POWERTRAIN VERIFICATION TEST VER-1 - 1.6L. No → Go To 16	All
16	Turn the ignition off. Disconnect the CKP Sensor harness connector. Disconnect the PCM harness connector(s). Measure the resistance between the CKP Sensor Signal circuit and the 5 Volt Supply circuit in the CKP Sensor harness connector. Is the resistance below 5.0 ohms? Yes → Repair the CKP Sensor Signal circuit shorted to the 5 Volt Supply circuit. Perform POWERTRAIN VERIFICATION TEST VER-1 - 1.6L. No → Go To 17	All

*ENGINE CRANKS DOES NOT START - 1.6L — Continued

TEST	ACTION	APPLICABILITY
17	If there are no possible causes remaining, view repair. Repair Replace and program the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER-1 - 1.6L.	All
18	Turn the ignition off. Disconnect the fuel pump module harness connector. Turn the ignition on. With the DRBIII®, actuate the ASD Fuel System test. Using a 12 volt test light connected to ground, probe the Fuel Pump Relay Output circuit at the Fuel Pump Module harness connector. Does the test light illuminate brightly? Yes → Go To 19 No → Go To 21 **Caution: Stop All Actuations.**	All
19	Turn the ignition off. Disconnect the Fuel Pump Module harness connector. **Note: Check connectors - It is critical that the connector is free from any signs of corrosion or deformities - Clean/repair as necessary.** Using a test light connected to battery voltage, probe the Fuel Pump ground circuit at the Fuel Pump Module harness connector. Does the test light illuminate brightly? Yes → Go To 20 No → Repair the open/high resistance in the fuel pump ground circuit. Perform POWERTRAIN VERIFICATION TEST VER-1 - 1.6L.	All
20	If there are no possible causes remaining, view repair. Repair Replace the Fuel Pump Module. Perform POWERTRAIN VERIFICATION TEST VER-1 - 1.6L.	All
21	Turn the ignition off. Remove the Fuel Pump Relay from the PDC. With a 12 volt test light connected to ground, probe the Fuel Pump Relay Fused B+ circuit at the PDC. Does the test light illuminate? Yes → Go To 22 No → Repair the Fuel Pump Relay Fused B+ circuit. Check for open fuse in the PDC. Perform POWERTRAIN VERIFICATION TEST VER-1 - 1.6L.	All

*ENGINE CRANKS DOES NOT START - 1.6L — Continued

TEST	ACTION	APPLICABILITY
22	Turn the ignition off. Remove the Fuel Pump Relay from the PDC. Disconnect the Fuel Pump Module harness connector. **NOTE: Check connectors - It is critical that the connector is free from any signs of corrosion or deformities** Measure the resistance of the Fuel Pump Relay Output circuit from the relay connector to the fuel pump module connector. Is the resistance below 5.0 ohms? Yes → Replace the Fuel Pump Relay. Perform POWERTRAIN VERIFICATION TEST VER-1 - 1.6L. No → Repair the open fuel pump relay output circuit. Perform POWERTRAIN VERIFICATION TEST VER-1 - 1.6L.	All

Symptom:
*NO CRANK CONDITION

POSSIBLE CAUSES
REPAIR MECHANICAL CONDITION
TRANSMISSION RANGE SENSOR
BATTERY CIRCUIT RESISTANCE TOO HIGH
IGNITION SWITCH OUTPUT CIRCUIT OPEN
STARTER RELAY CONTROL CIRCUIT OPEN
STARTER RELAY OUTPUT CIRCUIT OPEN
FUSED B(+) CIRCUIT OPEN
FUSED IGNITION SWITCH OUTPUT (START) CIRCUIT OPEN
STARTER
STARTER MOTOR RELAY
STARTER RELAY

TEST	ACTION	APPLICABILITY
1	**NOTE: Check all PCM powers and grounds before continuing.** **NOTE: Ensure that SKIS is operating properly. Check the SKIM for DTC. If a SKIM DTC(s) is present diagnose them first before continuing.** **WARNING: MAKE SURE THE BATTERY IS DISCONNECTED, THEN WAIT TWO MINUTES BEFORE PROCEEDING.** Turn the engine over by hand to ensure the engine is not seized. Is the engine able to turn over? Yes → Go To 2 No → Repair the mechanical condition preventing the starter motor from cranking. Perform POWERTRAIN VERIFICATION TEST VER - 1.	All
2	Turn the ignition off. Disconnect the PCM harness connectors. Move the Gear selector through all gear positions, from Park to 1st and back. While moving the gear selector through each gear, measure the resistance between ground and the P/N Position Switch Sense circuit. Did the resistance change from above 10.0 ohms to below 10.0 ohms? Yes → Go To 3 No → Replace the Transmission Range Sensor. Perform POWERTRAIN VERIFICATION TEST VER - 1.	All
3	Turn the ignition off. Check the Battery Cables for high resistance using the service information procedure. Did either Battery Cable have a voltage drop greater than 0.2 volt? Yes → Repair the Battery circuit for high resistance. Perform POWERTRAIN VERIFICATION TEST VER - 1. No → Go To 4	All

*NO CRANK CONDITION — Continued

TEST	ACTION	APPLICABILITY
4	Turn the ignition off. Disconnect the PCM harness connector. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Turn the ignition to the Start position. Using a 12-volt test light connected to ground, probe the Fused Ignition Switch Output (Start) circuit in the appropriate terminal of special tool #8815. Does the test light illuminate brightly? Yes → Go To 5 No → Repair the Fused Ignition Switch (Start) circuit for an open or high resistance. Perform POWERTRAIN VERIFICATION TEST VER - 1.	All
5	Turn ignition off. Remove the Starter Relay from PDC. **WARNING: The Parking Brake must be on and the Transmission must be in park for a vehicle equipped with an automatic transmission, manual Transmission must be in neutral.** **Warning: The engine may be cranked in the next step. Keep away from moving engine parts.** Briefly connect a jumper wire between Starter Relay B+ circuit and the Starter Relay Output Circuits. Did the Starter Motor crank the engine? Yes → Go To 6 No → Go To 9	All
6	Turn the ignition off. Remove the Starter Relay from the PDC. Turn the ignition on. Using a 12-volt test light, probe the Ignition Switch Output circuit in the Starter Relay connector. While observing 12-volt test light, hold ignition key in the start position. Does the test light illuminate brightly? Yes → Go To 7 No → Repair the Ignition Switch Output circuit for an open or high resistance. Perform POWERTRAIN VERIFICATION TEST VER - 1.	All
7	Turn the ignition off. Remove the Starter Relay from the PDC. Disconnect the PCM harness connector. Measure the Starter Relay Control circuit between the Relay terminal and the PCM harness connector. Is the resistance below 5.0 ohms? Yes → Go To 8 No → Repair the Starter Relay Control circuit for an open. Perform POWERTRAIN VERIFICATION TEST VER - 1.	All

*NO CRANK CONDITION — Continued

TEST	ACTION	APPLICABILITY
8	Turn the ignition off. Install a substitute a Relay in the of the Starter Motor Relay. Attempt to start the vehicle. Does the engine crank over? Yes → Replace the Starter Motor Relay. Perform POWERTRAIN VERIFICATION TEST VER - 1. No → Replace and program the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 1.	All
9	Turn ignition off. Remove the Starter Relay from the PDC. Disconnect the Starter Relay Output connector from the Starter Solenoid. Measure the resistance of the Starter Relay Output circuit between the Relay and the Solenoid harness connector. Is the resistance below 5.0 ohms? Yes → Go To 10 No → Repair Starter Relay Output circuit for an open. Perform POWERTRAIN VERIFICATION TEST VER - 1.	All
10	Turn the ignition off. Remove the Starter Relay from the PDC. Using a 12-volt test light connected to ground, probe the Fused B+ circuit at the Starter Relay terminal. Does the test light illuminate brightly? Yes → Go To 11 No → Repair the Fused B(+) Circuit for an open or high resistance. Perform POWERTRAIN VERIFICATION TEST VER - 1.	All
11	If there are no other possible causes remaining, review repair. Repair Replace the Starter. Perform POWERTRAIN VERIFICATION TEST VER - 1.	All

Symptom:
*NO RESPONSE FROM PCM WITH A NO START CONDITION

POSSIBLE CAUSES
PCM FUSED B+ CIRCUIT
PCM FUSED IGNITION SWITCH OUTPUT CIRCUIT
PCM GROUND CIRCUITS
PCM

TEST	ACTION	APPLICABILITY
1	**NOTE: The DRBIII® and cable must be operating properly for the results of this test to be valid.** **NOTE: Ensure the ignition switch was on when trying to communicate with the PCM.** Turn the ignition off. Disconnect the PCM harness connector. Using a 12-volt test light connected to ground, probe the PCM Fused B+ circuit in the PCM harness connector. Does the test light illuminate brightly? Yes → Go To 2 No → Repair the Fused B+ circuit. Perform POWERTRAIN VERIFICATION TEST VER - 1.	All
2	Turn the ignition off. Disconnect the PCM harness connector. Turn the ignition on. Using a 12-volt test light connected to ground, probe the PCM Fused Ignition Switch Output circuit in the PCM harness connector. Does the test light illuminate brightly? Yes → Go To 3 No → Repair the Ignition Switch Output circuit Perform POWERTRAIN VERIFICATION TEST VER - 1.	All
3	Turn the ignition off. Disconnect the PCM harness connector. Using a 12-volt test light connected to battery voltage, probe all the PCM ground circuits in the PCM harness connector. Does the test light illuminate brightly? Yes → Go To 4 No → Repair the PCM ground circuits. Perform POWERTRAIN VERIFICATION TEST VER - 1.	All
4	If there is no possible causes remaining, view repair. Repair Replace and program the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 1.	All

Symptom:
*START AND STALL CONDITION

POSSIBLE CAUSES
CHECKING DTCS
CHECKING SKIM DTCS
FUEL PRESSURE OUT OF SPECS
TP SENSOR SWEEP
TP SENSOR VOLTAGE GREATER THAN 0.92 VOLTS WITH THROTTLE CLOSED
ECT SENSOR OPERATION
OTHER POSSIBLE CAUSES FOR START & STALL
RESTRICTED FUEL SUPPLY LINE
FUEL PUMP INLET STRAINER PLUGGED
FUEL PUMP MODULE

TEST	ACTION	APPLICABILITY
1	Turn the ignition on. With the DRBIII®, read DTC's. Are any DTCs present? Yes → Refer to the Driveability Category and perform the appropriate symptom. Perform POWERTRAIN VERIFICATION TEST VER - 1. No → Go To 2	All
2	Turn the ignition on. **NOTE: If you are unable to communicate with the SKIM, refer to the Communication Category and perform the appropriate symptom.** With the DRBIII®, read the SKIM codes. Are there any SKIM DTCs? Yes → Refer to the Vehicle Theft category and perform the appropriate symptom. Perform POWERTRAIN VERIFICATION TEST VER - 1. No → Go To 3	All

*START AND STALL CONDITION — Continued

TEST	ACTION	APPLICABILITY
3	Turn the ignition off. **WARNING: The fuel system is under a constant pressure even with the engine off. Before testing or servicing any fuel system hose, fitting or line, the fuel system pressure must be released.** Install a fuel pressure gauge. Turn the ignition on. With the DRBIII®, actuate the ASD Fuel System test and observe the fuel pressure gauge. **NOTE: Fuel pressure specification is 400 KPa +/- 34 KPa (58 psi +/- 5 psi).** Choose a conclusion that best matches your fuel pressure reading. Below Specification Go To 4 Within Specification Go To 6 Above Specification Replace the fuel filter/fuel pressure regulator. Perform POWERTRAIN VERIFICATION TEST VER - 1. **Caution: Stop All Actuations.**	All
4	Turn the ignition off. **WARNING: The fuel system is under a constant pressure even with the engine off. Before testing or servicing any fuel system hose, fitting or line, the fuel system pressure must be released.** Raise vehicle on hoist, and disconnect the fuel pressure line at the fuel pump module. Install special 5/16 fuel line adapter tool #6539 between the disconnected fuel line and the fuel pump module. Attach a fuel pressure test gauge to the ″T″ fitting on tool #6539. Turn the ignition on. With the DRBIII®, actuate the ASD Fuel System test and observe the fuel pressure gauge. **NOTE: Fuel pressure specification is 400 KPa +/- 34 KPa (58 psi +/- 5 psi).** Is the fuel pressure within specification now? Yes → Repair/replace fuel supply line as necessary. Perform POWERTRAIN VERIFICATION TEST VER - 1. No → Go To 5 **Caution: Stop All Actuations.**	All
5	Turn the ignition off. **WARNING: The fuel system is under a constant pressure even with the engine off. Before testing or servicing any fuel system hose,fitting or line, the fuel system pressure must be released.** Remove the Fuel Pump Module and inspect the Fuel Inlet Strainer. Is the Fuel Inlet Strainer plugged? Yes → Replace the Fuel Pump Inlet Strainer. Perform POWERTRAIN VERIFICATION TEST VER - 1. No → Replace the Fuel Pump Module. Perform POWERTRAIN VERIFICATION TEST VER - 1.	All

*START AND STALL CONDITION — Continued

TEST	ACTION	APPLICABILITY
6	Turn the ignition on. With the DRBIII®, read TPS VOLTS. While monitoring the DRBIII®, slowly open and close the Throttle. Is the voltage change smooth? Yes → Go To 7 No → Replace the Throttle Position Sensor. Perform POWERTRAIN VERIFICATION TEST VER - 1.	All
7	Turn the ignition on. With the DRBIII®, read Throttle Position voltage. Throttle must be against stop. Is the voltage 0.92 or less with the Throttle closed? Yes → Go To 8 No → Check for a binding throttle condition. If OK, replace the Throttle Position Sensor. Perform POWERTRAIN VERIFICATION TEST VER - 1.	All
8	**Note: For this test to be valid, the thermostat must be operating correctly.** **Note: This test works best if performed on a cold engine (cold soaked).** **NOTE: If the vehicle was allow to sit over night with no engine start, coolant temperature should be near ambient temperatures.** Turn the ignition on. With the DRBIII®, read the Engine Coolant Temperature value. **Note: If engine coolant temperature is above 82° C (180° F), allow the engine to cool until 65° C (150° F) is reached.** Start the engine. During engine warm-up, monitor the Engine Coolant Temperature value. The temperature value change should be a smooth transition from start up to normal operating temp 82° C (180° F). The value should reach at least 82° C (180° F). Did the Engine Temperature value increase smoothly and did it reach at least 82° C (180° F)? Yes → Go To 9 No → Replace the Engine Coolant Temperature Sensor. Perform POWERTRAIN VERIFICATION TEST VER - 1.	All
9	The following additional items should be checked as a possible cause for a start and stall condition. Refer to any Technical Service Bulletins (TSB's) that may apply to the symptom. Fuel must be free of contamination. The exhaust system must be free of any restrictions. The engine compression must be within specifications. The engine valve timing must be within specifications. The engine must be free from vacuum leaks. The throttle body must be free of carbon buildup and dirt. Do any of the above conditions exist? Yes → Repair as necessary. Perform POWERTRAIN VERIFICATION TEST VER - 1. No → Test Complete.	All

Verification Tests

40/41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1	APPLICABILITY
1. NOTE: After completion of the Transmission Verification Test, the Powertrain Verification Test must be performed. Refer to the Powertrain Category. 2. Connect the DRBIII® to the Data Link Connector (DLC). 3. Reconnect any disconnected components. 4. With the DRBIII®, erase all Transmission DTC's, also erase the PCM DTC's. 5. Perform *PRNDL FAULT CLEARING PROCEDURE after completion of repairs for P0706 CHECK SHIFTER SIGNAL. 6. With the DRBIII®, display Transmission Temperature. Start and run the engine until the Transmission Temperature is HOT, above 43° C or 110° F. 7. Check the transmission fluid and adjust if necessary. Refer to the Service Information for the Fluid Fill procedure. **8. NOTE: If the Transmission Control Module or Torque Converter has been replaced, or if the Transmission has been repaired or replaced, it is necessary to perform the DRBIII® Quick Learn Procedure and reset the "Pinion Factor".** 9. Road test the vehicle. With the DRBIII®, monitor the engine RPM. Make 15 to 20 1-2, 2-3, 3-4 upshifts. Perform these shifts from a standing start to 45 MPH with a constant throttle opening of 20 to 25 degrees. 10. Below 25 MPH, make 5 to 8 wide open throttle kickdowns to 1st gear. Allow at least 5 seconds each in 2nd and 3rd gear between each kickdown. 11. For a specific DTC, drive the vehicle to the Symptom's When Monitored/When Set conditions to verify the DTC is repaired. 12. If equipped with AutoStick®, upshift and downshift several times using the AutoStick® feature during the road test. **13. NOTE: Use the EATX OBDII task manager to run Good Trip time in each gear, this will confirm the repair and to ensure that the DTC has not re-matured.** 14. Check for Diagnostic Trouble Codes (DTC's) during the road test. If a DTC sets during the road test , return to the Symptom list and perform the appropriate symptom. **15. NOTE: Erase P0700 DTC in the PCM to turn the MIL light off after making transmission repairs.** Were there any Diagnostic Trouble Codes set during the road test? Yes → Repair is not complete, refer to the appropriate symptom. No → Repair is complete.	All

BODY VERIFICATION TEST - VER 1	APPLICABILITY
1. Disconnect all jumper wires and reconnect all previously disconnected components and connectors. **2. NOTE: If the SKIM or PCM was replaced, refer to the service information for proper programming procedures.** 3. If the Remote Keyless Entry module was replaced, using the DRBIII® select "Theft Alarm" "VTSS" "Miscellaneous" and "Configure Module". If the vehicle is equipped with VTSS, use the DRBIII® and enable VTSS. 4. Program all RKE transmitters and other options as necessary. 5. Ensure all accessories are turned off and the battery is fully charged. 6. With the DRBIII®, record and erase all DTC's from ALL modules. Start and run the engine for 2 minutes. Operate all functions of the system that caused the original concern. 7. Turn the ignition off and wait 5 seconds. Turn the ignition on and using the DRBIII®, read DTC's from ALL modules. Are any DTC's present or is the original condition still present? Yes → Repair is not complete, refer to the appropriate symptom. No → Repair is complete.	All

Verification Tests — Continued

POWERTRAIN VERIFICATION TEST VER - 1	APPLICABILITY
1. NOTE: After completing the Powertrain Verification Test the Transmission Verification Test must be performed. **2. NOTE: If the PCM has been replace and the vehicle is equipped with a 2.4L Turbo, Manual Transmission, the Pinion Factor MUST be programmed into the PCM. Failure to do so will cause the speedometer to become inoperative or inaccurate.** **3. NOTE: If the PCM has been replaced and the correct VIN and mileage have not been programmed, a DTC will be set in the ABS Module, Airbag Module and the SKIM.** **4. NOTE: If the vehicle is equipped with a Sentry Key Immobilizer System, Secret Key data must be updated. Refer to the Service Information for the PCM, SKIM and the Transponder (ignition key) for programming information.** 5. Inspect the vehicle to ensure that all components related to the repair are connected properly. 6. Inspect the engine oil for fuel contamination. Replace the oil and filter as necessary. 7. Attempt to start the engine. 8. If the No Start condition is still present, refer to the symptom list and perform the diagnostic testing as necessary. refer to and Technical Service Bulletins that may apply. 9. Run the engine for one warm-up cycle to verify operation. 10. With the DRBIII®, confirm that no DTCs or Secondary Indicators are present and that all components are functioning properly. 11. If a DTC is present, refer to the appropriate category and select the corresponding symptom. Are any DTCs present? Yes → Repair is not complete, refer to appropriate symptom. No → Repair is complete.	All

POWERTRAIN VERIFICATION TEST VER - 2 - NGC	APPLICABILITY
1. NOTE: After completing the Powertrain Verification Test the Transmission Verification Test must be performed. **2. NOTE: If the PCM has been replace and the vehicle is equipped with a 2.4L Turbo, Manual Transmission, the Pinion Factor MUST be programmed into the PCM. Failure to do so will cause the speedometer to become inoperative or inaccurate.** **3. NOTE: If the PCM has been replaced and the correct VIN and mileage have not been programmed, a DTC will be set in the ABS Module, Airbag Module and the SKIM.** **4. NOTE: If the vehicle is equipped with a Sentry Key Immobilizer System, Secret Key data must be updated. Refer to the Service Information for the PCM, SKIM and the Transponder (ignition key) for programming information.** 5. Inspect the vehicle to ensure that all components related to the repair are connected properly. 6. With the DRBIII®, clear DTCs and Reset Memory all engine values. 7. Run the engine for one warm-up cycle to verify proper operation. 8. Road test the vehicle. Use all accessories that may be related to this repair. 9. With the DRBIII®, confirm that no DTC's or Secondary Indicators are present and that all components are functioning properly. 10. If this test is being performed after a No Trouble Code test, verify the symptom is no longer present. 11. If the symptom is still present, or any other symptom or DTC is present refer to the appropriate category and perform the corresponding symptom. 12. Refer to any Technical Service Bulletins that may apply. 13. If there are no DTCs present and all components are functional properly, the repair is complete. Are any DTCs present? Yes → Repair is not complete, refer to appropriate symptom. No → Repair is complete.	All

Verification Tests — Continued

POWERTRAIN VERIFICATION TEST VER - 3 - NGC	APPLICABILITY
1. NOTE: After completing the Powertrain Verification Test the Transmission Verification Test must be performed. **2. NOTE: If the PCM has been replace and the vehicle is equipped with a 2.4L Turbo, Manual Transmission, the Pinion Factor MUST be programmed into the PCM. Failure to do so will cause the speedometer to become inoperative or inaccurate.** **3. NOTE: If the PCM has been replaced and the correct VIN and mileage have not been programmed, a DTC will be set in the ABS Module, Airbag Module and the SKIM.** **4. NOTE: If the vehicle is equipped with a Sentry Key Immobilizer System, Secret Key data must be updated. Refer to the Service Information for the PCM, SKIM and the Transponder (ignition key) for programming information.** 5. Inspect the vehicle to ensure that all components related to the repair are connected properly. 6. With the DRBIII®, clear DTCs. 7. Perform generator output test. Refer to the appropriate service information as necessary. 8. Start the engine and set engine speed to 2000 RPM for at least thirty seconds. 9. Cycle the ignition key off and on. 10. With the DRBIII®, read the DTCs. If the DTC returns, or any other symptom or DTC is present, refer to the appropriate category and perform the corresponding symptom. 11. If there are no DTCs present and all components are functioning properly, the repair is complete. Are any DTCs present? Yes → Repair is not complete, refer to appropriate symptom. No → Repair is complete.	All

Verification Tests — Continued

<table>
<tr><th>POWERTRAIN VERIFICATION TEST VER - 4 - NGC</th><th>APPLICABILITY</th></tr>
<tr><td>
1. NOTE: After completing the Powertrain Verification Test the Transmission Verification Test must be performed.
2. NOTE: If the PCM has been replace and the vehicle is equipped with a 2.4L Turbo, Manual Transmission, the Pinion Factor MUST be programmed into the PCM. Failure to do so will cause the speedometer to become inoperative or inaccurate.
3. NOTE: If the PCM has been replaced and the correct VIN and mileage have not been programmed, a DTC will be set in the ABS Module, Airbag Module and the SKIM.
4. NOTE: If the vehicle is equipped with a Sentry Key Immobilizer System, Secret Key data must be updated. Refer to the Service Information for the PCM, SKIM and the Transponder (ignition key) for programming information.
5. Inspect the vehicle to ensure that all engine components are properly installed and connected.
6. Connect the DRBIII® to the data link connector and erase all codes.
7. Turn the speed control ON (if equipped, cruise light will be on).
8. Press and release the SET Switch. If the speed control did not engage, the repair is not complete. Check for TSBs that pertain to speed control problem and then, if necessary, return to Symptom List.
9. Press and hold the RESUME/ACCEL Switch. If the vehicle speed did not increase by at least 2 mph, the repair is not complete. Check for TSBs that pertain to speed control problem and then, if necessary, return to Symptom List.
10. Press and hold the COAST switch. The vehicle speed should decrease. If it did not decrease, the repair is not complete. Check for TSBs that pertain to speed control problem and then, if necessary, return to Symptom List.
11. Using caution, press and release the brake pedal. If the speed control did not disengage, the repair is not complete. Check for TSBs that pertain to speed control problem and then, if necessary, return to Symptom List.
12. Bring the vehicle speed back up to 35 MPH.
13. Press the RESUME/ACCEL switch. If the speed control did not resume the previously set speed, the repair is not complete. Check for TSBs that pertain to speed control problem and then, if necessary, return to Symptom List.
14. Hold down the SET switch. If the vehicle did not decelerate, the repair is not complete. Check for TSBs that pertain to speed control problem and then, if necessary, return to Symptom List.
15. Ensure vehicle speed is greater than 35 mph and release the SET Switch. If vehicle did not adjust and set a new vehicle speed, the repair is not complete. Check for TSBs that pertain to speed control problem and then, if necessary, return to Symptom List.
16. Press and release the CANCEL switch. If the speed control did not disengage, the repair is not complete. Check for TSBs that pertain to speed control problem and then, if necessary, return to Symptom List.
17. Bring the vehicle speed back up above 35 mph and engage speed control.
18. Turn the Speed Control Off. (Cruise light will be off). If the speed control did not disengage, the repair is not complete. Check for TSBs that pertain to speed control problem and then, if necessary, return to Symptom List.
19. If the vehicle successfully passed all of the previous tests, the speed control system is now functioning as designed. The repair is now complete.
Did the Speed Control pass the above test?
Yes → Repair is complete.
No → Repair is not complete, refer to appropriate symptom.
</td><td>All</td></tr>
</table>

Verification Tests — Continued

POWERTRAIN VERIFICATION TEST VER - 5 - NGC	APPLICABILITY
1. NOTE: After completing the Powertrain Verification Test the Transmission Verification Test must be performed. **2. NOTE: If the PCM has been replace and the vehicle is equipped with a 2.4L Turbo, Manual Transmission, the Pinion Factor MUST be programmed into the PCM. Failure to do so will cause the speedometer to become inoperative or inaccurate.** **3. NOTE: If the PCM has been replaced and the correct VIN and mileage have not been programmed, a DTC will be set in the ABS Module, Airbag Module and the SKIM.** **4. NOTE: If the vehicle is equipped with a Sentry Key Immobilizer System, Secret Key data must be updated. Refer to the Service Information for the PCM, SKIM and the Transponder (ignition key) for programming information.** **5. NOTE: When replacing an O2 Sensor, the PCM RAM memory must be cleared, either by disconnecting the PCM C-1 connector or momentarily disconnecting the battery negative terminal.** 6. The NGC (PCM) learns the characteristics of each O2 heater element and these old values should be cleared when installing a new O2 sensor. The customer may experience driveability issues if this is not performed. 7. Inspect the vehicle to ensure that all engine components are properly installed and connected. Reassemble and reconnect components as necessary. 8. Connect the DRBIII® to the data link connector. 9. Ensure the fuel tank has at least a quarter tank of fuel. Turn off all accessories. 10. If a Comprehensive Component DTC was repaired, perform steps 5 - 8. If a Major OBDII Monitor DTC was repaired skip those steps and continue verification. 11. After the ignition has been off for at least 10 seconds, restart the vehicle and run 2 minutes. 12. If the Good Trip counter changed to one or more and there are no new DTC's, the repair was successful and is now complete. Erase DTC's and disconnect the DRBIII®. 13. If the repaired DTC has reset, the repair is not complete. Check for any related TSB's or flash updates and return to the Symptom list. 14. If another DTC has set, return to the Symptom List and follow the path specified for that DTC. 15. With the DRBIII®, monitor the appropriate pre-test enabling conditions until all conditions have been met. Once the conditions have been met, switch screen to the appropriate OBDII monitor, (Audible beeps when the monitor is running). 16. If the monitor ran, and the Good Trip counter changed to one or more, the repair was successful and is now complete. Erase DTC's and disconnect the DRBIII®. 17. If the repaired OBDII trouble code has reset or was seen in the monitor while on the road test, the repair is not complete. Check for any related technical service bulletins or flash updates and return to Symptom List. 18. If another DTC has set, return to the Symptom List and follow the path specified for that DTC. Are any DTCs present? Yes → Repair is not complete, refer to appropriate symptom. No → Repair is complete.	All

Verification Tests — Continued

POWERTRAIN VERIFICATION TEST VER - 6 - NGC	APPLICABILITY
1. Install the Miller Tool #8404 Evaporative Emission Leak Detector (EELD). according to the instructions in the pervious DTC table. 2. Set the smoke/air control switch to AIR. 3. Insert the tester's AIR supply tip (clear hose) into the appropriate calibration orifice on the tester's control panel (based on DTC leak size). 4. Press the remote smoke/air start button. 5. Position the red flag on the air flow meter so it is aligned with the indicator ball. 6. When the calibration is complete, release the remote button. The EELD is now calibrated the flow meter in liters per minute to the size leak indicated by the DTC set in the PCM. 7. Install the service port adapter #8404-14 on the vehicle's service port. 8. Connect the Air supply hose from the EELD to the service port. 9. Press the remote button to activate AIR flow. **10. NOTE: Larger volume fuel tanks, lower fuel levels or if the vehicle is equipped with a Flow Management Valve may indicate high flow and will require 4 to 5 minutes to fill.** 11. Compare the flow meter indicator ball reading to the red flag. 12. ABOVE the red flag indicates a leak present. 13. BELOW the red flag indicates a sealed system. 14. If the indicator ball shows a leak present, perform the smoke test indicated in the previous test and identify the leak and repair. Perform this verification test when the repair is complete. Did the indicator ball indicate the a leak is present?? Yes → Repeat the DTC test to identify the leak and repair. No → Repair is complete.	All

POWERTRAIN VERIFICATION TEST VER-1 - 1.6L	APPLICABILITY
1. NOTE: If the PCM has been replaced, it must be programmed with the latest calibration before continuing. **2. NOTE: If the PCM has been replaced and the correct VIN and mileage have not been programmed, a DTC will be set in the ABS Module, Airbag Module and the SKIM.** **3. NOTE: If the vehicle is equipped with a Sentry Key Immobilizer System, Secret Key data must be updated. Refer to the Service Information for the PCM, SKIM and the Transponder (ignition key) for programming information.** 4. Inspect the vehicle to ensure that all components related to the repair are connected properly. 5. Inspect the engine oil for fuel contamination. Replace the oil and filter as necessary. 6. Attempt to start the engine. 7. If the No Start condition is still present, refer to the symptom list and perform the diagnostic testing as necessary. refer to any Technical Service Bulletins that may apply. 8. Run the engine for one warm-up cycle to verify operation. 9. With the DRBIII®, confirm that no DTCs or Secondary Indicators are present and that all components are functioning properly. 10. If a DTC is present, refer to the appropriate category and select the corresponding symptom. Are any DTCs present? Yes → Repair is not complete, refer to appropriate symptom. No → Repair is complete.	All

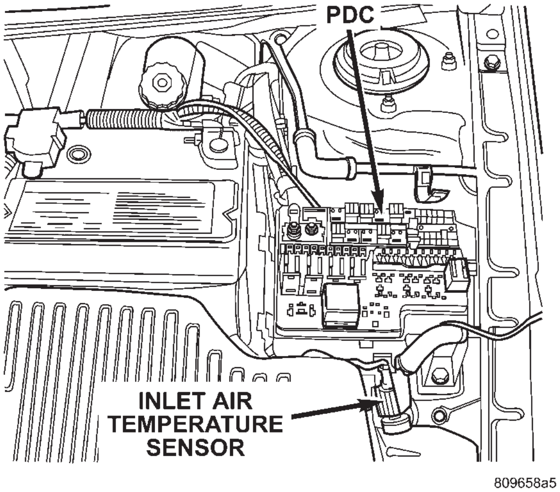
Verification Tests — Continued

SKIS VERIFICATION	APPLICABILITY
1. Reconnect all previously disconnected components and connectors. 2. Obtain the vehicle's unique Personal Identification Number (PIN) assigned to it's original SKIM. This number can be obtained from the vehicle's invoice or Chrysler's Customer Center (1-800-992-1997). **3. NOTE: When entering the PIN, care should be taken because the SKIM will only allow 3 consecutive attempts to enter the correct PIN. If 3 consecutive incorrect PIN's are entered the SKIM will Lock Out the DRB III for 1 hour.** 4. To exit Lock Out mode, the ignition key must remain in the Run position continually for 1 hour. Turn off all accessories and connect a battery charger if necessary. 5. With the DRB III, select Theft Alarm, SKIM and Miscellaneous. Then select desired procedure and follow the steps that will be displayed. 6. If the SKIM has been replaced, ensure all of the vehicle ignition keys are programmed to the new SKIM. **7. NOTE: Prior to returning vehicle to the costumer, perform a module scan to be sure that all DTC's are erased. Erase any DTC's that are found.** 8. With the DRB III erase all DTC's. Perform 5 ignition key cycles leaving the key on for at least 90 seconds per cycle. 9. With the DRB III, read the SKIM DTC's. Are there any SKIM DTC's? Yes → Repair is not complete, refer to appropriate symptom. No → Repair is complete.	All

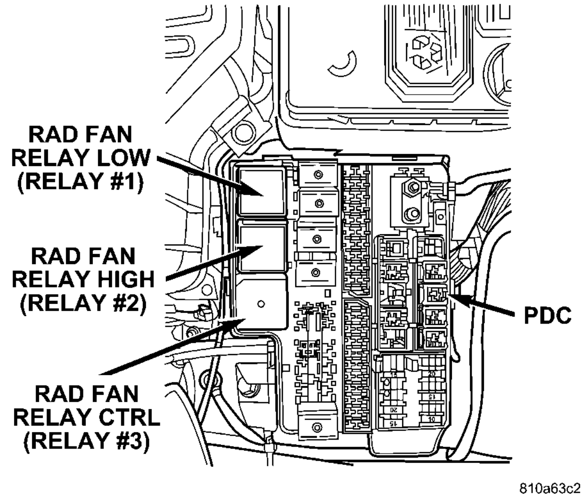
8.0 COMPONENT LOCATIONS

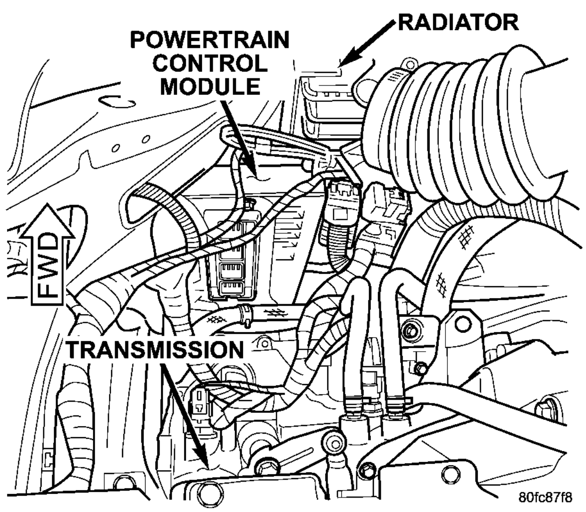
8.1 CONTROL MODULES AND PDC

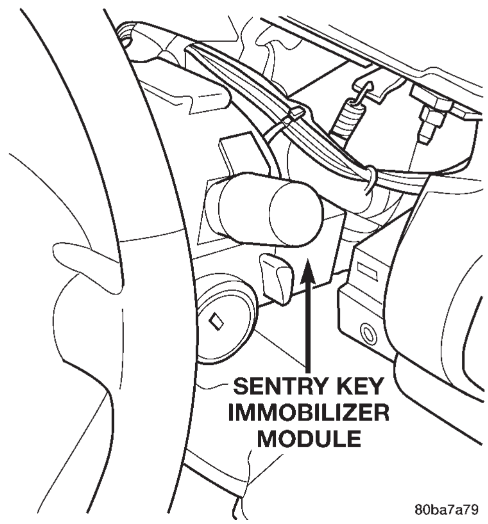
2.0L



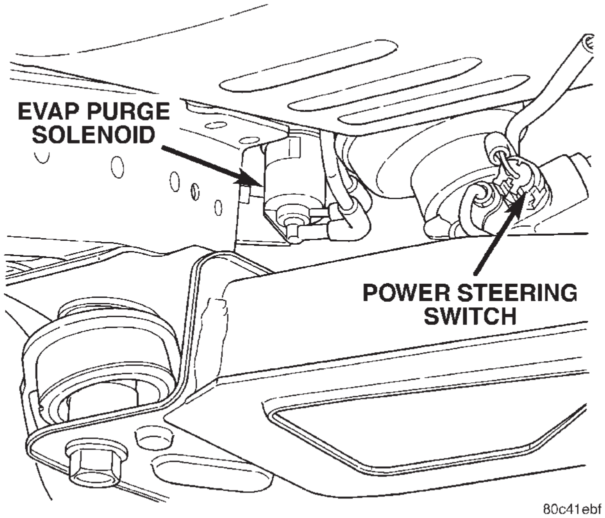
SRT-4







8.2 CONTROLS AND SOLENOIDS



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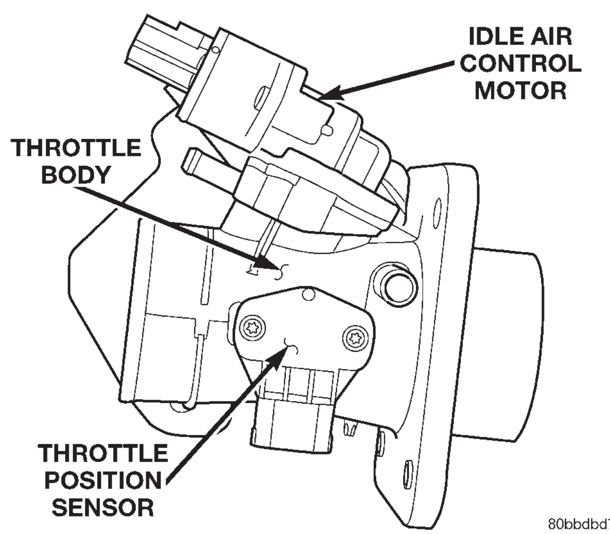

8.2 CONTROLS AND SOLENOIDS (Continued)

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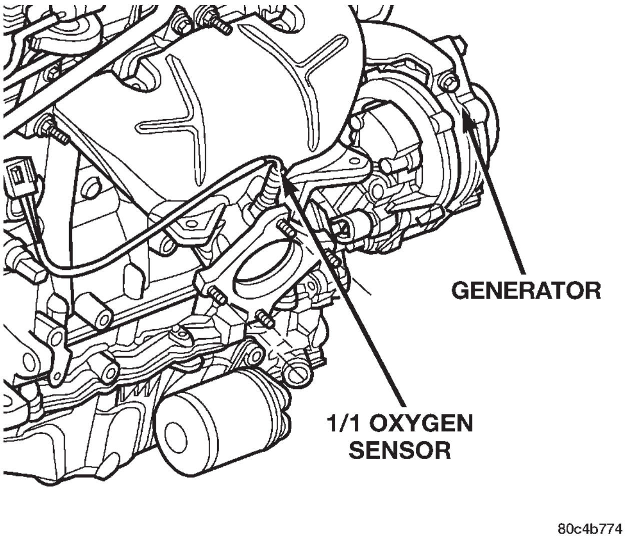

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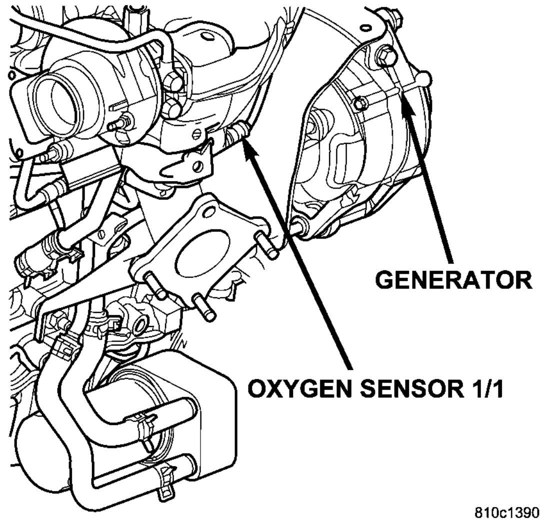

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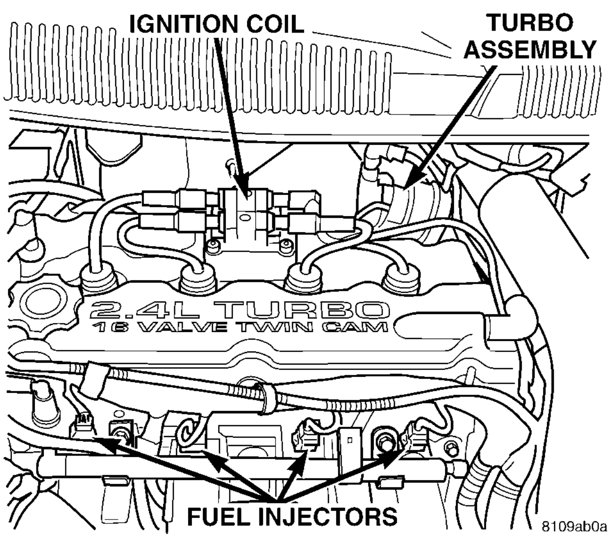

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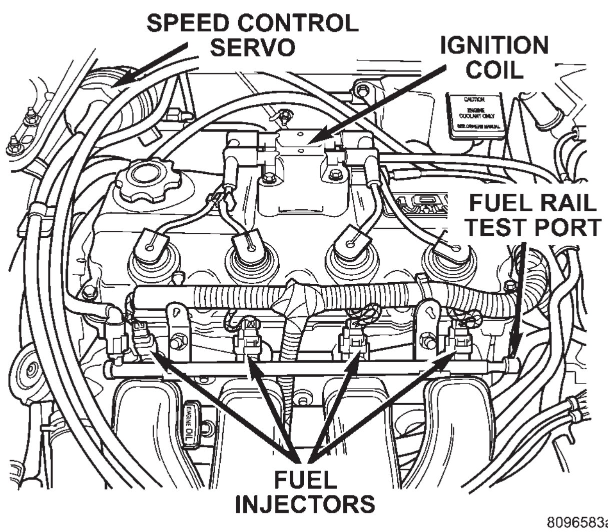

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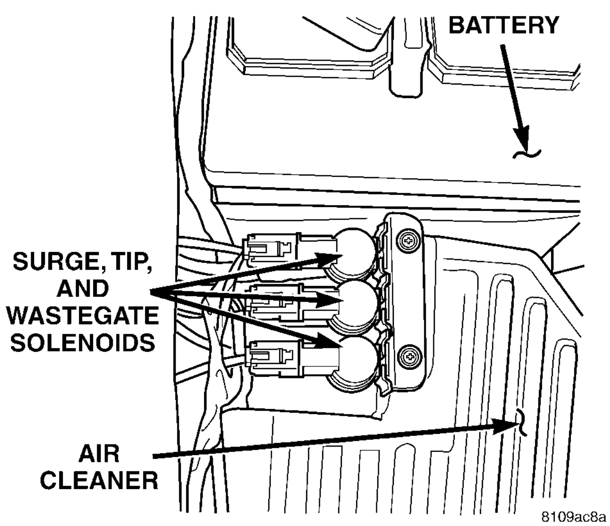

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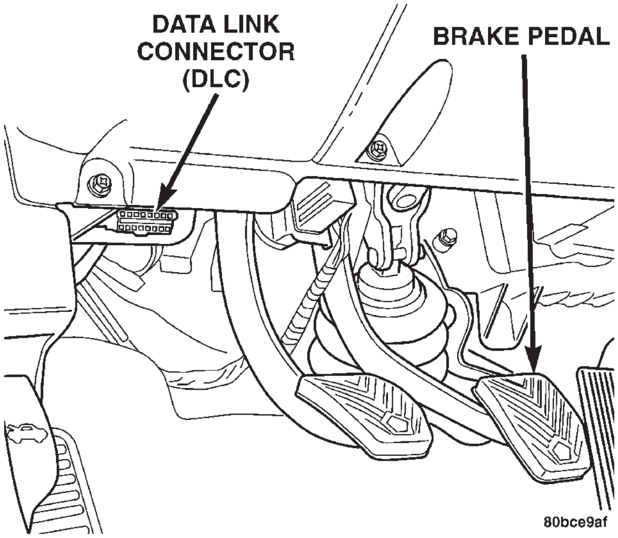

8.4 SENSORS

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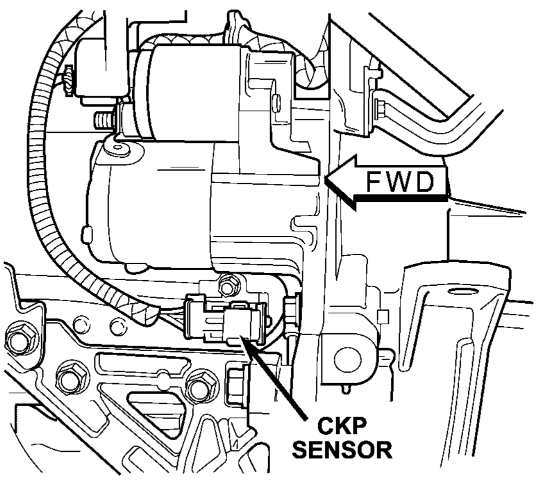

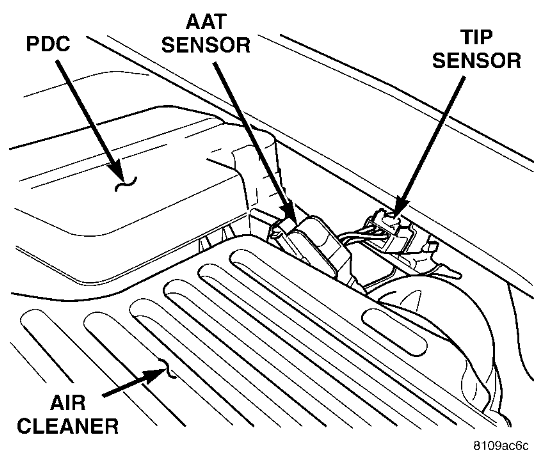

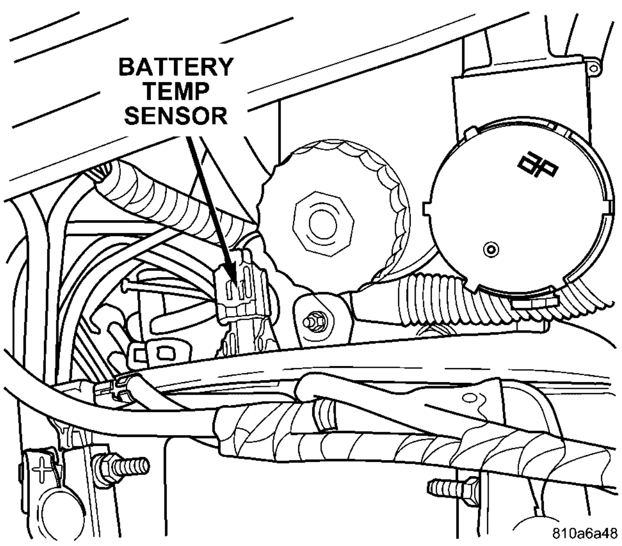

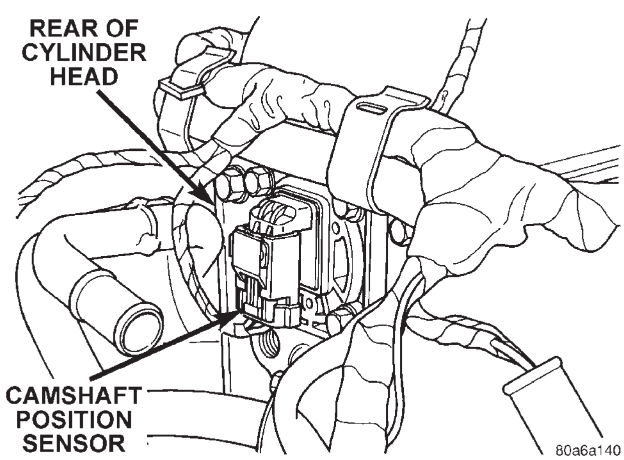

8.4 SENSORS (Continued)

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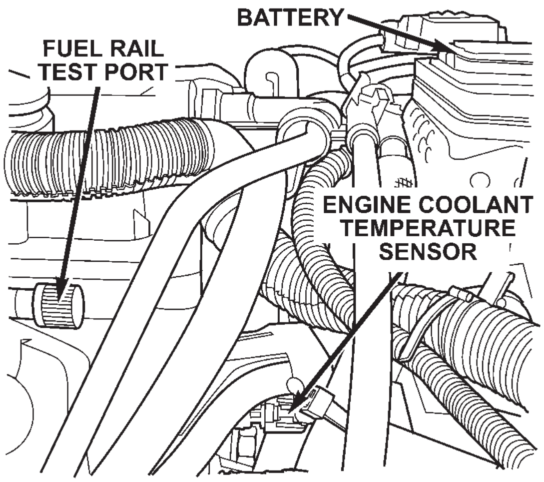

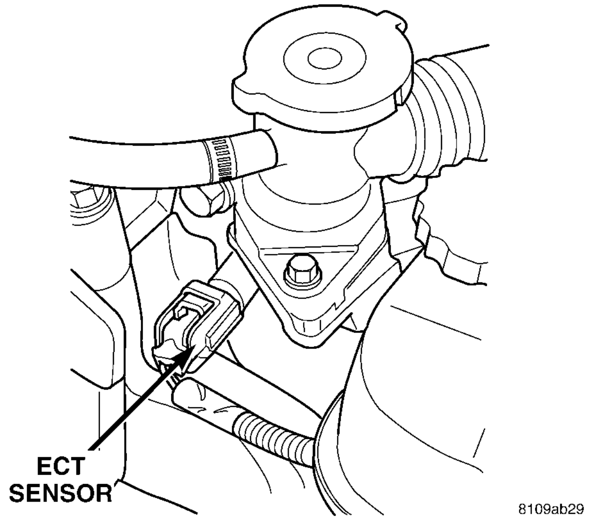

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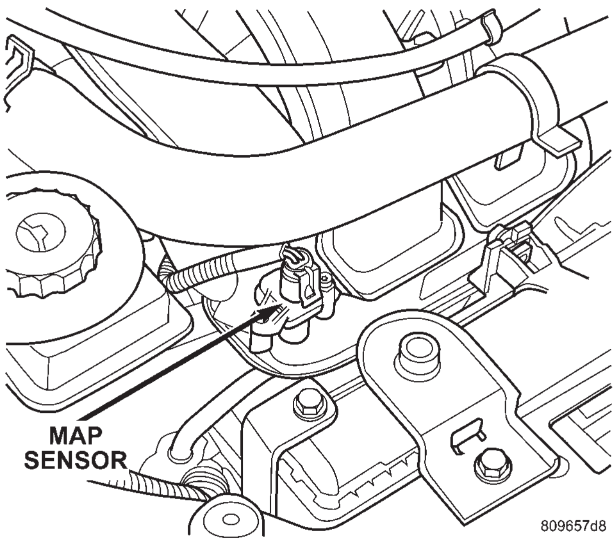

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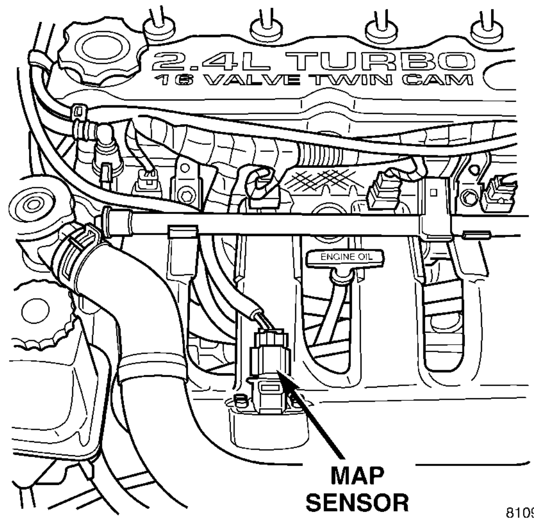

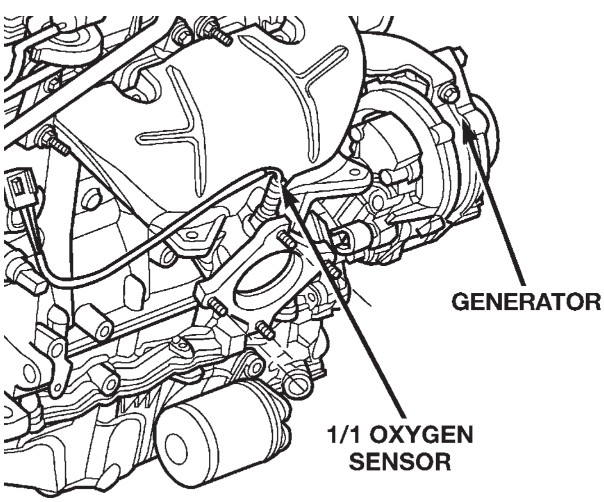

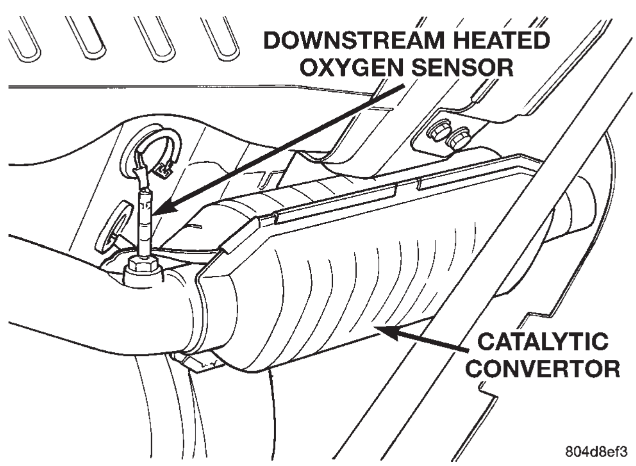

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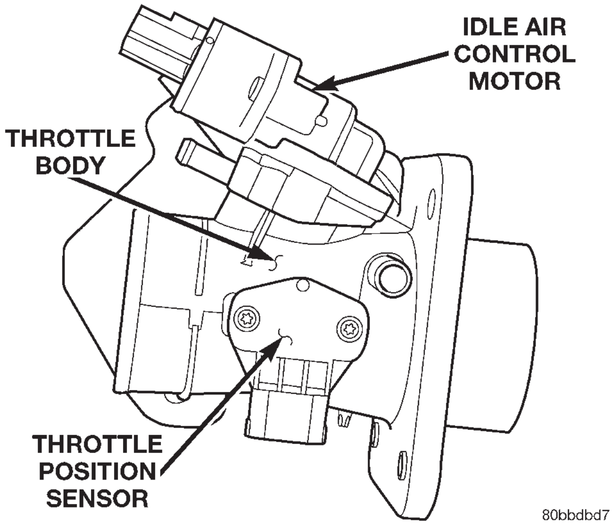

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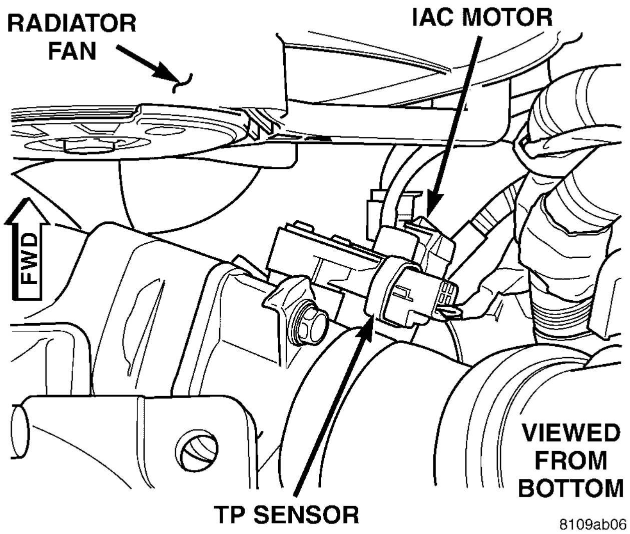

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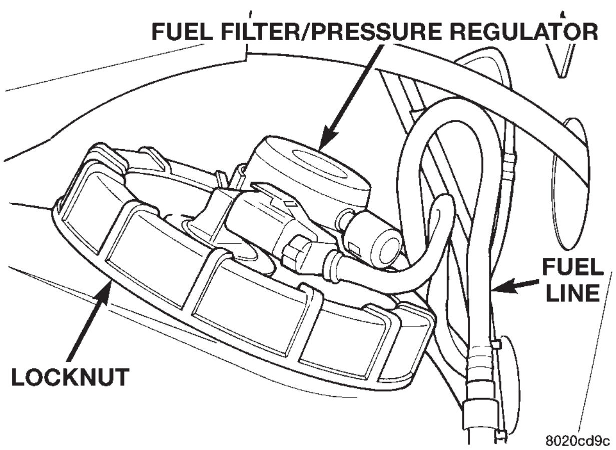
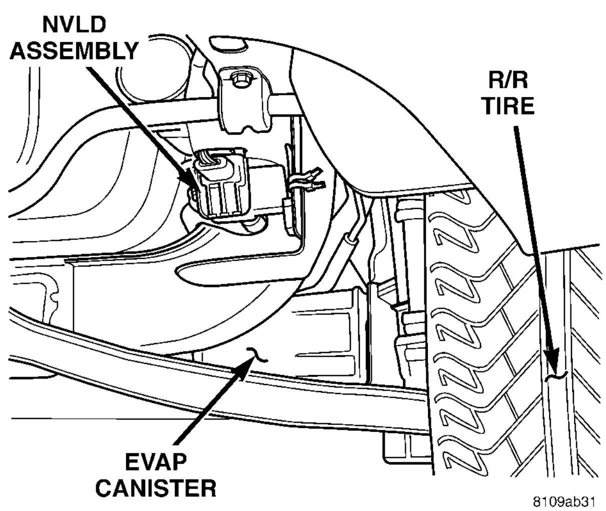
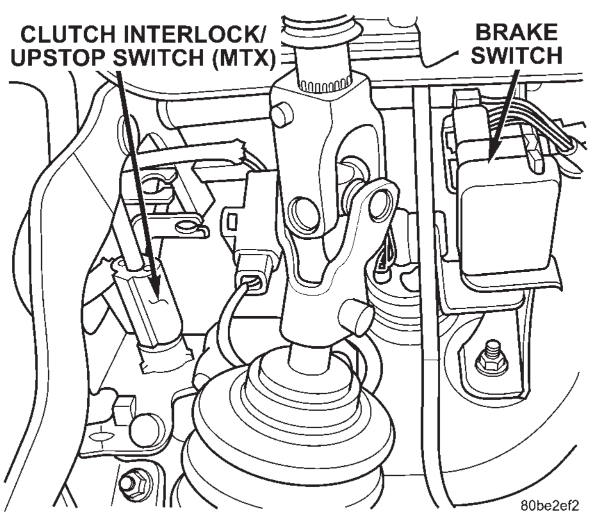
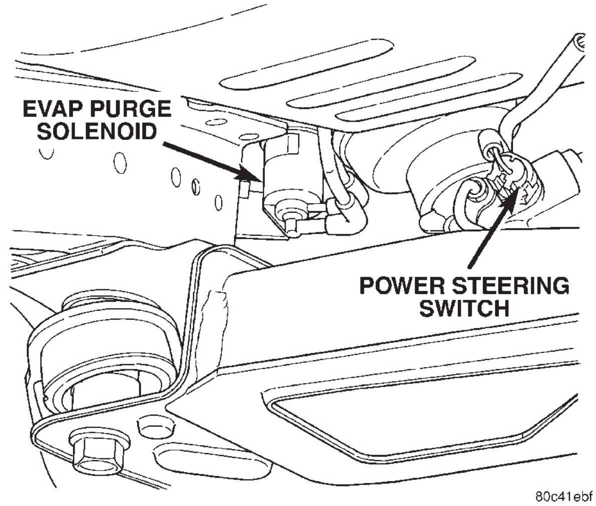


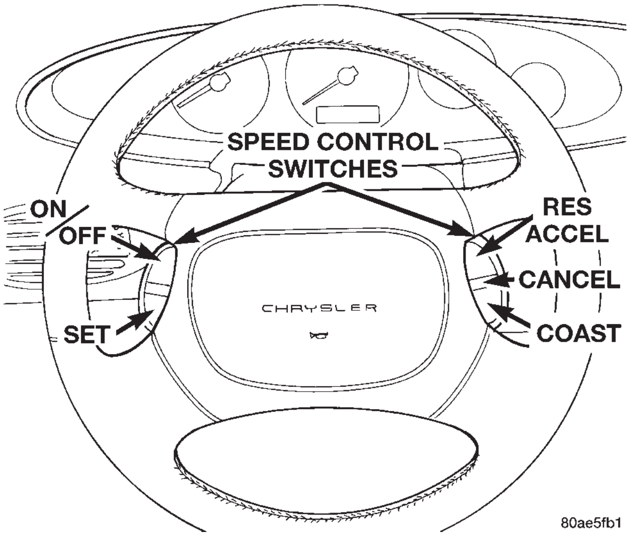


8.6 SWITCHES/GAUGES





8.6 SWITCHES/GAUGES (Continued)



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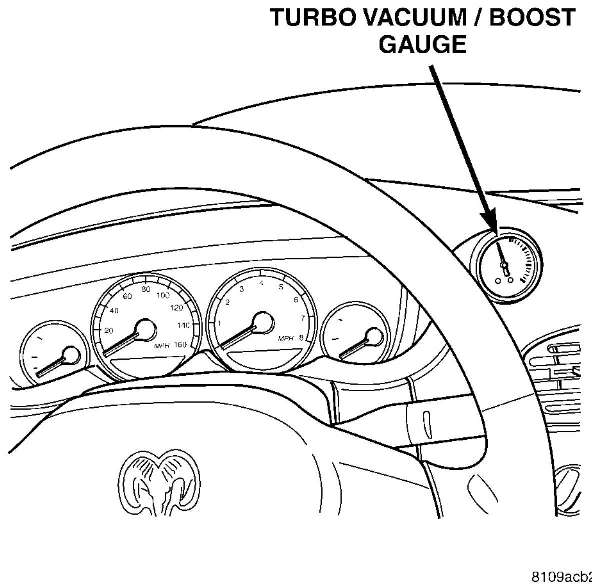
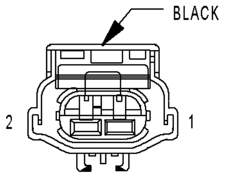
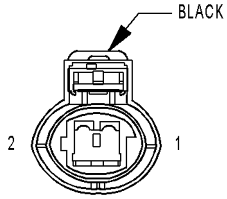


9.0 CONNECTOR PINOUTS



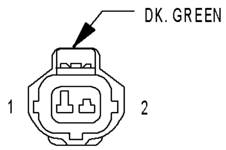
A/C COMPRESSOR CLUTCH - BLACK 2 WAY

CAV	CIRCUIT	FUNCTION
1	C3 20DB/BK	A/C CLUTCH RELAY OUTPUT
2	Z1 20BK	GROUND



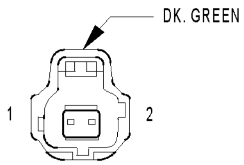
A/C HIGH PRESSURE SWITCH - BLACK 2 WAY

CAV	CIRCUIT	FUNCTION
1	C20 20BR/OR (2.0L)	A/C SWITCH SENSE
1	C20 20BR (2.4L TURBO)	A/C SWITCH SENSE
2	C22 20DB/WT	PRESSURE SWITCH OUTPUT



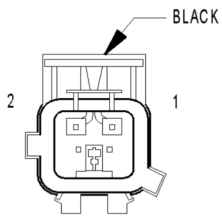
A/C LOW PRESSURE SWITCH (2.0L LHD) - DK. GREEN 2 WAY

CAV	CIRCUIT	FUNCTION
1	C22 20DB/WT	PRESSURE SWITCH OUTPUT
2	C21 20DB/OR	A/C SWITCH SENSE



A/C LOW PRESSURE SWITCH (2.4L TURBO) - DK. GREEN 2 WAY

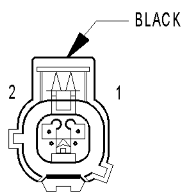
CAV	CIRCUIT	FUNCTION
1	C22 20DB/WT	PRESSURE SWITCH OUTPUT
2	C21 20DB/OR	A/C SWITCH SENSE



A/C LOW
PRESSURE SWITCH
(RHD)

A/C LOW PRESSURE SWITCH (RHD) - BLACK 2 WAY

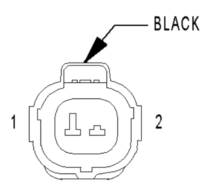
CAV	CIRCUIT	FUNCTION
1	C22 20DB/WT	PRESSURE SWITCH OUTPUT
2	C21 20DB/OR	A/C SWITCH SENSE



AMBIENT
TEMPERATURE
SENSOR

AMBIENT TEMPERATURE SENSOR - BLACK 2 WAY

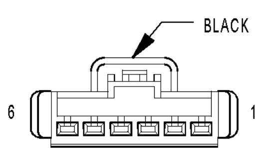
CAV	CIRCUIT	FUNCTION
1	K145 20BR/OR	AAT SIGNAL
2	K167 20BK/YL (2.0L LHD EXPORT)	SENSOR GROUND 2
2	K167 20BR/YL (2.0L RHD/ EXCEPT EXPORT)	SENSOR GROUND 2
2	K167 20BR/YL (2.4L TURBO)	SENSOR GROUND 2



BATTERY
TEMPERATURE
SENSOR

BATTERY TEMPERATURE SENSOR - BLACK 2 WAY

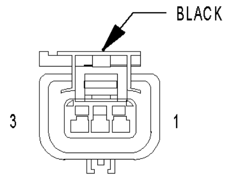
CAV	CIRCUIT	FUNCTION
1	K118 20PK/YL	BATTERY TEMP SIGNAL
2	K167 20BR/YL (2.0L)	SENSOR GROUND 2
2	K167 20BR/YL (2.4L TURBO)	SENSOR GROUND 2



BRAKE
LAMP
SWITCH

BRAKE LAMP SWITCH - BLACK 6 WAY

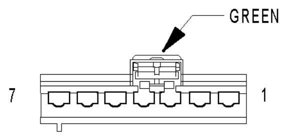
CAV	CIRCUIT	FUNCTION
1	F32 18PK/DB	FUSED B(+)
2	L50 18WT/TN	BRAKE LAMP SWITCH OUTPUT
2	L50 18WT/TN	BRAKE LAMP SWITCH OUTPUT
3	V30 20DB/RD (2.0L)	SPEED CONTROL BRAKE LAMP SWITCH OUTPUT
4	V32 20YL/RD (2.0L)	S/C SUPPLY
5	Z1 20BK (2.0L)	GROUND
5	Z1 18BK (2.4L TURBO)	GROUND
6	K29 20WT/PK	BRAKE SWITCH SIGNAL
6	K29 20WT/PK (2.0L)	BRAKE SWITCH SIGNAL



CAMSHAFT POSITION SENSOR

CAMSHAFT POSITION SENSOR - BLACK 3 WAY

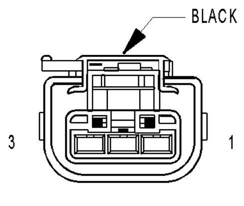
CAV	CIRCUIT	FUNCTION
1	K7 20OR (2.0L)	5 VOLT SUPPLY
1	K6 20VT/WT (2.4L TURBO)	5 VOLT SUPPLY
2	K4 20BK/LB (2.0L)	SENSOR GROUND
2	K167 20BR/YL (2.4L TURBO)	SENSOR GROUND 2
3	K44 20TN/YL	CMP SIGNAL



CLOCKSPRING

CLOCKSPRING - GREEN 7 WAY

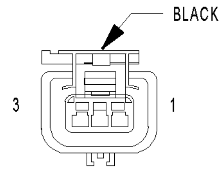
CAV	CIRCUIT	FUNCTION
1	R45 20DG/LB	DRIVER SQUIB 1 LINE 2
2	R43 20BK/LB	DRIVER SQUIB 1 LINE 1
3	-	-
4	-	-
5	X3 22BK/RD	HORN RELAY CONTROL
6	V37 20RD/LG (2.0L SPEED CONTROL)	S/C SWITCH SIGNAL
7	K914 20BR/WT (2.0L SPEED CONTROL)	GROUND



CLUTCH INTERLOCK/UPSTOP SWITCH (MTX)

CLUTCH INTERLOCK/UPSTOP SWITCH (MTX) - BLACK 3 WAY

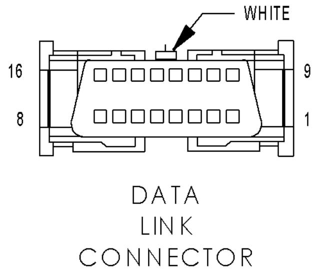
CAV	CIRCUIT	FUNCTION
1	K119 20LG/BK	CLUTCH UP SWITCH SIGNAL
2	Z1 20BK	GROUND
3	T141 20YL/RD	CLUTCH INTERLOCK SWITCH SIGNAL



CRANKSHAFT POSITION SENSOR

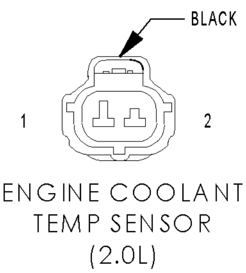
CRANKSHAFT POSITION SENSOR - BLACK 3 WAY

CAV	CIRCUIT	FUNCTION
1	K7 20OR	5 VOLT SUPPLY
2	K4 20BK/LB	SENSOR GROUND
3	K24 20GY/BK	CKP SIGNAL



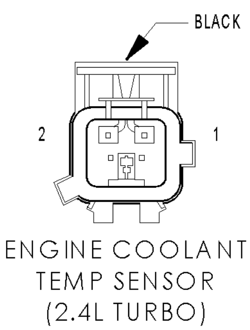
DATA LINK CONNECTOR - WHITE 16 WAY

CAV	CIRCUIT	FUNCTION
1	-	-
2	D25 20VT/YL	PCI BUS (PCM)
3	-	-
4	Z12 20BK/TN	GROUND
5	Z12 20BK/TN	GROUND
6	-	-
7	D21 20PK	SCI TRANSMIT (PCM)
8	-	-
9	D6 20PK/LB (2.0L)	SCI RECEIVE (TCM)
10	-	-
11	-	-
12	D20 20LG	SCI RECEIVE (PCM)
13	-	-
14	-	-
15	D15 20WT/DG (2.0L)	SCI TRANSMIT (TCM)
16	A14 18RD/WT	FUSED B(+)



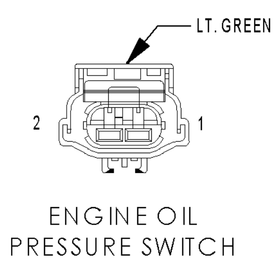
ENGINE COOLANT TEMP SENSOR (2.0L) - BLACK 2 WAY

CAV	CIRCUIT	FUNCTION
1	K4 20BK/LB	SENSOR GROUND
2	K2 20VT/LG	ECT SIGNAL



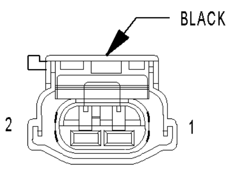
ENGINE COOLANT TEMP SENSOR (2.4L TURBO) - BLACK 2 WAY

CAV	CIRCUIT	FUNCTION
1	K4 20BK/LB	SENSOR GROUND
2	K2 20TN/BK	ECT SIGNAL



ENGINE OIL PRESSURE SWITCH - LT. GREEN 2 WAY

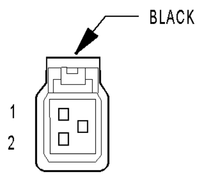
CAV	CIRCUIT	FUNCTION
1	G6 20GY	OIL PRESSURE SIGNAL
2	-	-



EVAP/PURGE SOLENOID

EVAP/PURGE SOLENOID - BLACK 2 WAY

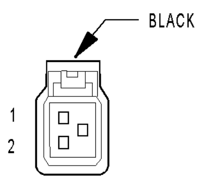
CAV	CIRCUIT	FUNCTION
1	K108 20WT/TN	EVAP/PURGE RETURN
2	K52 20PK/BK	EVAP/PURGE CONTROL



FUEL INJECTOR NO. 1

FUEL INJECTOR NO. 1 - BLACK 2 WAY

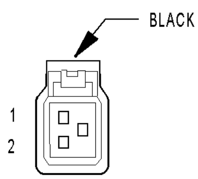
CAV	CIRCUIT	FUNCTION
1	K11 18WT/DB	INJECTOR CONTROL NO. 1
2	A142 18DG/OR	AUTOMATIC SHUT DOWN RELAY OUTPUT



FUEL INJECTOR NO. 2

FUEL INJECTOR NO. 2 - BLACK 2 WAY

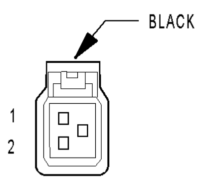
CAV	CIRCUIT	FUNCTION
1	K12 18TN	INJECTOR CONTROL NO. 2
2	A142 18DG/OR	AUTOMATIC SHUT DOWN RELAY OUTPUT



FUEL INJECTOR NO. 3

FUEL INJECTOR NO. 3 - BLACK 2 WAY

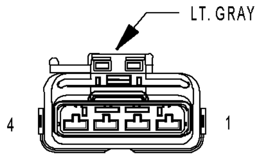
CAV	CIRCUIT	FUNCTION
1	K13 18YL/WT	INJECTOR CONTROL NO. 3
2	A142 18DG/OR	AUTOMATIC SHUT DOWN RELAY OUTPUT



FUEL INJECTOR NO. 4

FUEL INJECTOR NO. 4 - BLACK 2 WAY

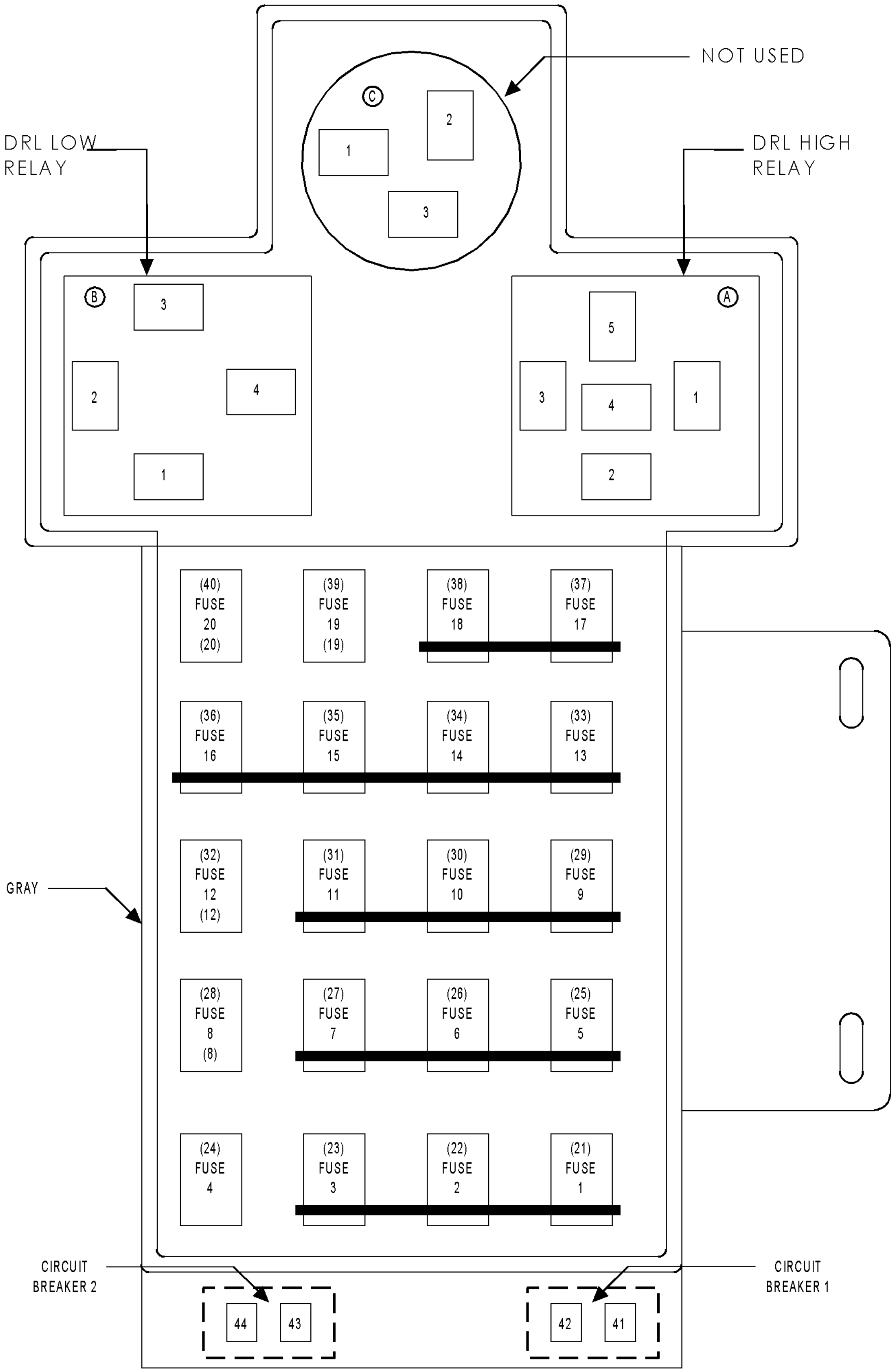
CAV	CIRCUIT	FUNCTION
1	K14 18LB/BR	INJECTOR CONTROL NO. 4
2	A142 18DG/OR	AUTOMATIC SHUT DOWN RELAY OUTPUT



FUEL PUMP MODULE - LT. GRAY 4 WAY

CAV	CIRCUIT	FUNCTION
1	Z1 18BK	GROUND
2	Z2 20BK/LG	GROUND
3	G4 20DB	FUEL LEVEL SENSOR SIGNAL
4	A141 18DG/WT	FUEL PUMP RELAY OUTPUT

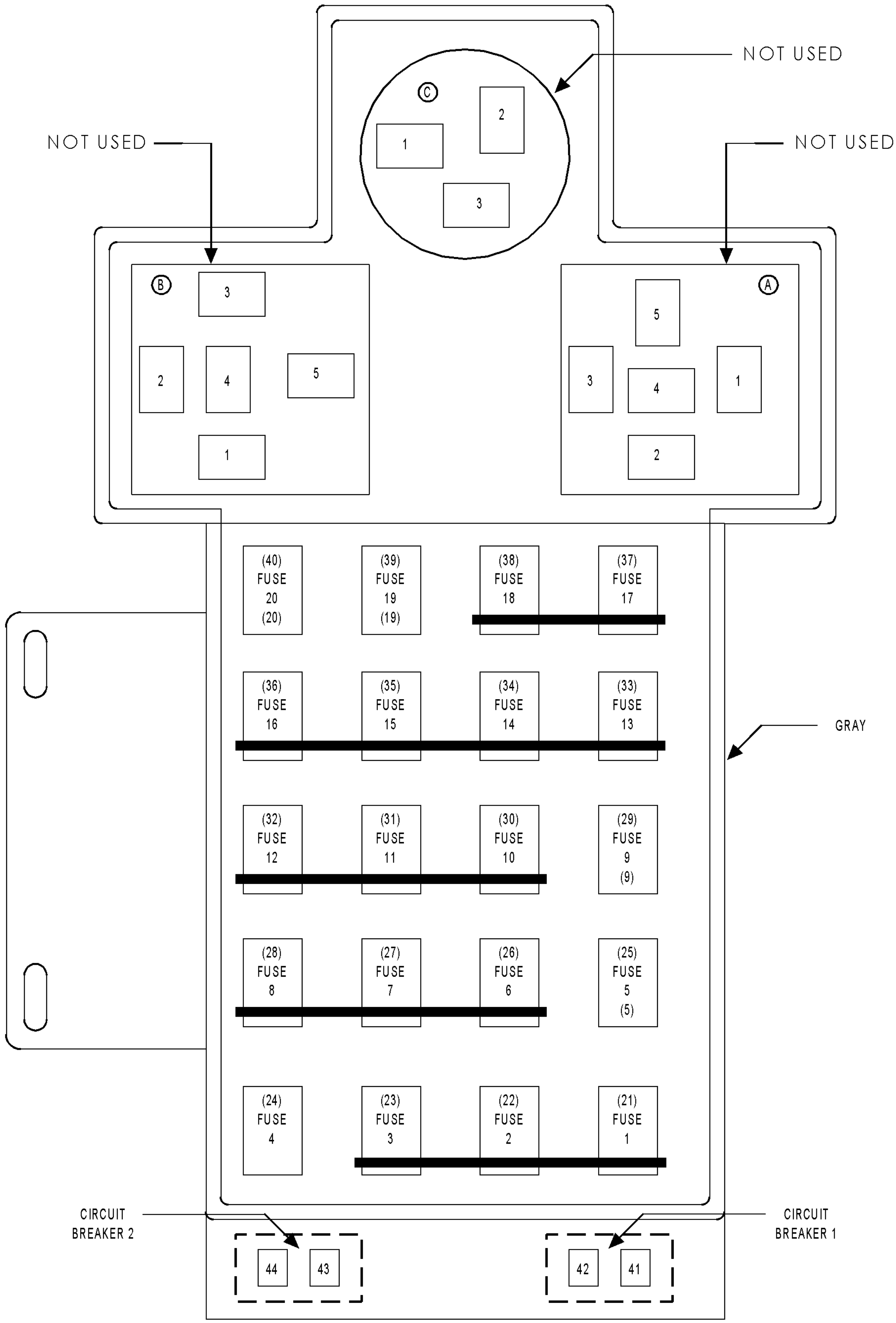
FUSE BLOCK


NOT USED
DRL LOW RELAY
DRL HIGH RELAY
C
1
2
3
B
3
2
4
1
A
5
3
4
1
2
(40) FUSE 20 (20)
(39) FUSE 19 (19)
(38) FUSE 18
(37) FUSE 17
(36) FUSE 16
(35) FUSE 15
(34) FUSE 14
(33) FUSE 13
(32) FUSE 12 (12)
(31) FUSE 11
(30) FUSE 10
(29) FUSE 9
(28) FUSE 8 (8)
(27) FUSE 7
(26) FUSE 6
(25) FUSE 5
(24) FUSE 4
(23) FUSE 3
(22) FUSE 2
(21) FUSE 1
GRAY
CIRCUIT BREAKER 2
CIRCUIT BREAKER 1
44
43
42
41

FUSES (FB LHD)

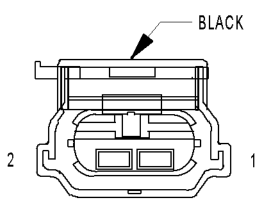
FUSE NO.	AMPS	FUSED CIRCUIT	FUNCTION
1	10A	L6 20RD/WT	FUSED IGNITION SWITCH OUTPUT (RUN-ACC)
1	10A	L6 20RD/WT	FUSED IGNITION SWITCH OUTPUT (RUN-ACC)
2	20A	V6 16DB	FUSED IGNITION SWITCH OUTPUT (RUN-ACC)
2	20A	V6 16DB	FUSED IGNITION SWITCH OUTPUT (RUN-ACC)
3	20A	X12 18RD/WT	FUSED IGNITION SWITCH OUTPUT (RUN-ACC)
3	20A	F10 18YL/RD	FUSED IGNITION SWITCH OUTPUT (RUN-ACC)
4	15A	M1 18PK	FUSED B(+)
5	10A	F25 20TN/LG	FUSED IGNITION SWITCH OUTPUT (RUN)
6	20A	C1 14DG	FUSED IGNITION SWITCH OUTPUT (RUN)
7	10A	F20 20WT	FUSED IGNITION SWITCH OUTPUT (RUN)
7	10A	F20 20WT (DAYTIME RUNNING LAMPS)	FUSED IGNITION SWITCH OUTPUT (RUN)
8	15A	L3 14RD/OR	DIMMER SWITCH HIGH BEAM OUTPUT
9	10A	F15 20DG/WT	FUSED IGNITION SWITCH OUTPUT (RUN-START)
10	15A	F12 18DB/PK	FUSED IGNITION SWITCH OUTPUT (RUN-START)
11	10A	G5 20DB/WT	FUSED IGNITION SWITCH OUTPUT (RUN-START)
12	10A	A81 20DG/RD (AUTOSTICK)	FUSED B(+)
13	-	-	-
14	20A	F35 18RD	FUSED B(+)
15	15A	F33 18PK/RD	FUSED B(+)
16	25A	F3 12LB/OR	FUSED B(+)
17	10A	L43 14VT	FUSED LEFT LOW BEAM OUTPUT
18	10A	L44 14VT/RD	FUSED RIGHT LOW BEAM OUTPUT
19	10A	L39 20LB	FRONT FOG LAMP SWITCH OUTPUT
19	10A	L39 20LB	FRONT FOG LAMP SWITCH OUTPUT
20	-	-	-

FUSE BLOCK


NOT USED
C
1
2
3
NOT USED
NOT USED
B
3
2
4
5
1
A
5
3
4
1
2
(40) FUSE 20 (20)
(39) FUSE 19 (19)
(38) FUSE 18
(37) FUSE 17
(36) FUSE 16
(35) FUSE 15
(34) FUSE 14
(33) FUSE 13
GRAY
(32) FUSE 12
(31) FUSE 11
(30) FUSE 10
(29) FUSE 9 (9)
(28) FUSE 8
(27) FUSE 7
(26) FUSE 6
(25) FUSE 5 (5)
(24) FUSE 4
(23) FUSE 3
(22) FUSE 2
(21) FUSE 1
CIRCUIT BREAKER 2
44
43
42
41
CIRCUIT BREAKER 1

FUSES (FB RHD)

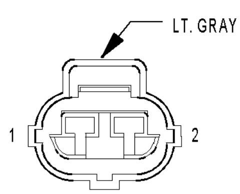
FUSE NO.	AMPS	FUSED CIRCUIT	FUNCTION
1	10A	L6 20RD/WT	FUSED IGNITION SWITCH OUTPUT (RUN-ACC)
1	10A	L6 20RD/WT	FUSED IGNITION SWITCH OUTPUT (RUN-ACC)
2	20A	V6 16DB	FUSED IGNITION SWITCH OUTPUT (RUN-ACC)
2	20A	V6 16DB	FUSED IGNITION SWITCH OUTPUT (RUN-ACC)
3	20A	F10 18YL/RD	FUSED IGNITION SWITCH OUTPUT (RUN-ACC)
3	20A	X12 18RD/WT	FUSED IGNITION SWITCH OUTPUT (RUN-ACC)
4	15A	M1 18PK	FUSED B(+)
5	15A	L3 14RD/OR	DIMMER SWITCH HIGH BEAM OUTPUT
6	10A	F20 20WT	FUSED IGNITION SWITCH OUTPUT (RUN)
7	20A	C1 14DG	FUSED IGNITION SWITCH OUTPUT (RUN)
8	10A	F25 20TN/LG	FUSED IGNITION SWITCH OUTPUT (RUN)
9	10A	A81 20DG/RD (AUTOSTICK)	FUSED B(+)
10	10A	G5 20DB/WT	FUSED IGNITION SWITCH OUTPUT (RUN-START)
11	15A	F12 18DB/PK	FUSED IGNITION SWITCH OUTPUT (RUN-START)
12	10A	F15 20DG/WT	FUSED IGNITION SWITCH OUTPUT (RUN-START)
13	20A	A120 16RD/LG	FUSED B(+)
14	20A	F35 18RD	FUSED B(+)
15	15A	F33 18PK/RD	FUSED B(+)
16	25A	F3 12LB/OR	FUSED B(+)
17	10A	L43 14VT	FUSED LEFT LOW BEAM OUTPUT
18	10A	L44 14VT/RD	FUSED RIGHT LOW BEAM OUTPUT
19	-	-	-
20	10A	C16 20LB/YL	FUSED REAR WINDOW DEFOGGER SWITCH OUTPUT
20	10A	C16 20LB/YL	FUSED REAR WINDOW DEFOGGER SWITCH OUTPUT



GENERATOR (2.0L)

GENERATOR (2.0L) - BLACK 2 WAY

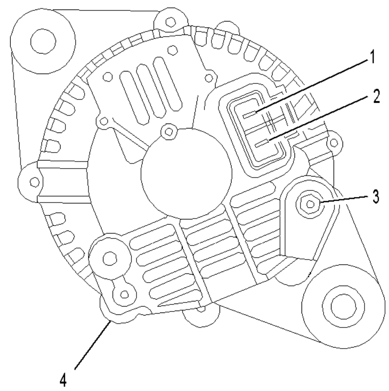
CAV	CIRCUIT	FUNCTION
1	Z1 20BK	GROUND
2	K20 20DG	GEN FIELD CONTROL



GENERATOR (2.4L TURBO)

GENERATOR (2.4L TURBO) - LT. GRAY 2 WAY

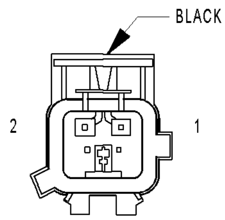
CAV	CIRCUIT	FUNCTION
1	Z1 18BK	GROUND
2	K20 18DG	GEN FIELD CONTROL



GENERATOR
(GENERATOR SIDE)

GENERATOR (GENERATOR SIDE)

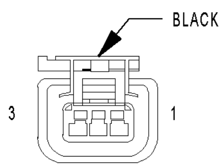
CAV	CIRCUIT	FUNCTION
1	-	GROUND
2	-	GEN FIELD CONTROL
3	-	B(+) TERMINAL
4	-	CASE GROUND



IDLE AIR
CONTROL
MOTOR
(2.0L/2.4L TURBO)

IDLE AIR CONTROL MOTOR (2.0L/2.4L TURBO) - BLACK 2 WAY

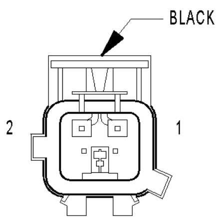
CAV	CIRCUIT	FUNCTION
1	K610 20VT/GY (2.0L)	IAC MOTOR CONTROL
1	K610 18VT/GY (2.4L TURBO)	IAC MOTOR CONTROL
2	K961 20BR/WT (2.0L)	IAC RETURN
2	K961 18BR/VT (2.4L TURBO)	IAC RETURN



IGNITION COIL

IGNITION COIL - BLACK 3 WAY

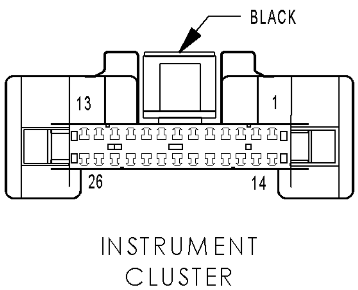
CAV	CIRCUIT	FUNCTION
1	K17 18DB/TN (2.0L)	COIL CONTROL NO. 2
1	K17 16DB/TN (2.4L TURBO)	COIL CONTROL NO. 2
2	A142 18DG/OR	AUTOMATIC SHUT DOWN RELAY OUTPUT
3	K19 18BK/GY (2.0L)	COIL CONTROL NO. 1
3	K19 16BK/GY (2.4L TURBO)	COIL CONTROL NO. 1



INLET AIR
TEMPERATURE
SENSOR

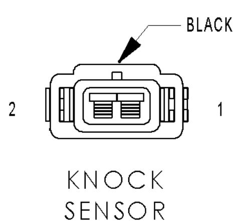
INLET AIR TEMPERATURE SENSOR - BLACK 2 WAY

CAV	CIRCUIT	FUNCTION
1	K21 20BK/RD	IAT SIGNAL
2	K167 20BR/YL (2.0L)	SENSOR GROUND 2
2	K4 20BK/LB (2.4L TURBO)	SENSOR GROUND



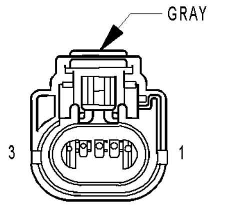
INSTRUMENT CLUSTER - BLACK 26 WAY

CAV	CIRCUIT	FUNCTION
1	L38 16BR/WT (EXPORT)	REAR FOG LAMP FEED
2	D25 20VT/YL	PCI BUS
3	M2 20YL	COURTESY LAMP CONTROL
4	L27 16WT/TN (DAYTIME RUNNING LAMPS)	FOG LAMP SWITCH SENSE
4	L39 20LB (EXCEPT EXPORT/EXCEPT DAYTIME RUNNING LAMPS)	FRONT FOG LAMP SWITCH OUTPUT
4	L39 16LB (EXPORT)	FRONT FOG LAMP SWITCH OUTPUT
5	G69 20BK/OR	VTSS INDICATOR DRIVER
6	E19 22RD	PANEL LAMPS DIMMER SIGNAL
7	G4 20DB	FUEL LEVEL SENSOR SIGNAL
8	-	-
9	G5 20DB/WT (AUTOSTICK)	FUSED IGNITION SWITCH OUTPUT (RUN-START)
10	Z3 16BK/OR	GROUND
11	-	-
12	E2 22OR	PANEL LAMPS DRIVER
13	M9 20LB/OR	PASSENGER DOOR AJAR/RKE SENSE
14	L7 18BK/YL	HEADLAMP SWITCH OUTPUT
15	F11 20RD/WT (AUTO-STICK)	IGNITION SWITCH OUTPUT (OFF-RUN-START)
15	G5 20DB/WT (EXCEPT AU-TOSTICK)	FUSED IGNITION SWITCH OUTPUT (RUN-START)
16	L161 18LG/OR (EXCEPT EXPORT)	LEFT TURN SIGNAL
17	L160 18TN/RD (EXCEPT EXPORT)	RIGHT TURN SIGNAL
18	L61 18LG	LEFT TURN SIGNAL
19	L60 18TN	RIGHT TURN SIGNAL
20	L4 16VT/WT (EXCEPT EX-PORT)	DIMMER SWITCH LOW BEAM OUTPUT
21	M1 18PK	FUSED B(+)
22	G11 20WT/BK	RED BRAKE WARNING INDICATOR DRIVER
23	G26 22LB	KEY-IN IGNITION SWITCH SENSE
24	G75 20TN/BK (EXCEPT EXPORT)	LEFT FRONT DOOR AJAR SWITCH SENSE
24	G74 20TN/RD (EXPORT)	RIGHT FRONT DOOR AJAR SWITCH SENSE
25	G10 20LG/RD	SEAT BELT SWITCH SENSE
26	L3 16RD/OR	DIMMER SWITCH HIGH BEAM OUTPUT



KNOCK SENSOR - BLACK 2 WAY

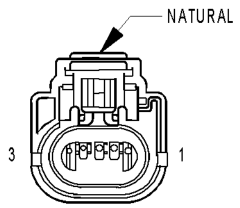
CAV	CIRCUIT	FUNCTION
1	K42 20DB/LG	KS SIGNAL
2	K45 20BK/VT	KS RETURN



MANIFOLD ABSOLUTE PRESSURE SENSOR (2.0L)

MANIFOLD ABSOLUTE PRESSURE SENSOR (2.0L) - GRAY 3 WAY

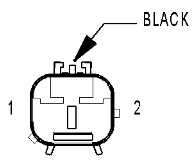
CAV	CIRCUIT	FUNCTION
1	K1 20DG/RD	MAP SIGNAL
2	K4 20BK/LB	SENSOR GROUND
3	K7 20OR	5 VOLT SUPPLY



MANIFOLD ABSOLUTE PRESSURE SENSOR (2.4L TURBO)

MANIFOLD ABSOLUTE PRESSURE SENSOR (2.4L TURBO) - NATURAL 3 WAY

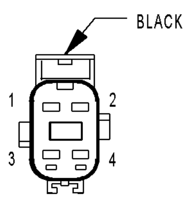
CAV	CIRCUIT	FUNCTION
1	K1 20DG/RD	MAP SIGNAL
2	K4 20BK/LB	SENSOR GROUND
3	K7 20OR	5 VOLT SUPPLY



MANIFOLD TUNING VALVE SOLENOID (RT)

MANIFOLD TUNING VALVE SOLENOID (RT) - BLACK 2 WAY

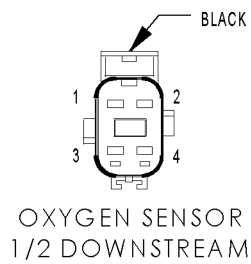
CAV	CIRCUIT	FUNCTION
1	K201 20BR/YL	MTV RELAY OUTPUT
2	Z1 18BK	GROUND



OXYGEN SENSOR 1/1 UPSTREAM

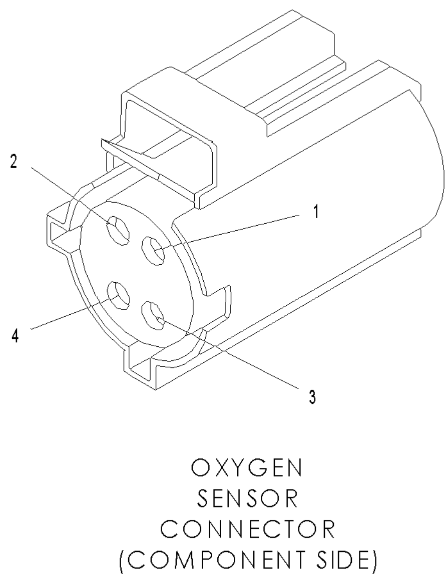
OXYGEN SENSOR 1/1 UPSTREAM - BLACK 4 WAY

CAV	CIRCUIT	FUNCTION
1	Z1 18BK	GROUND
2	K99 18BR/OR	O2 1/1 HEATER CONTROL
3	K904 20DB/DG	O2 RETURN
4	K41 20BK/DG	O2 1/1 SIGNAL



OXYGEN SENSOR 1/2 DOWNSTREAM - BLACK 4 WAY

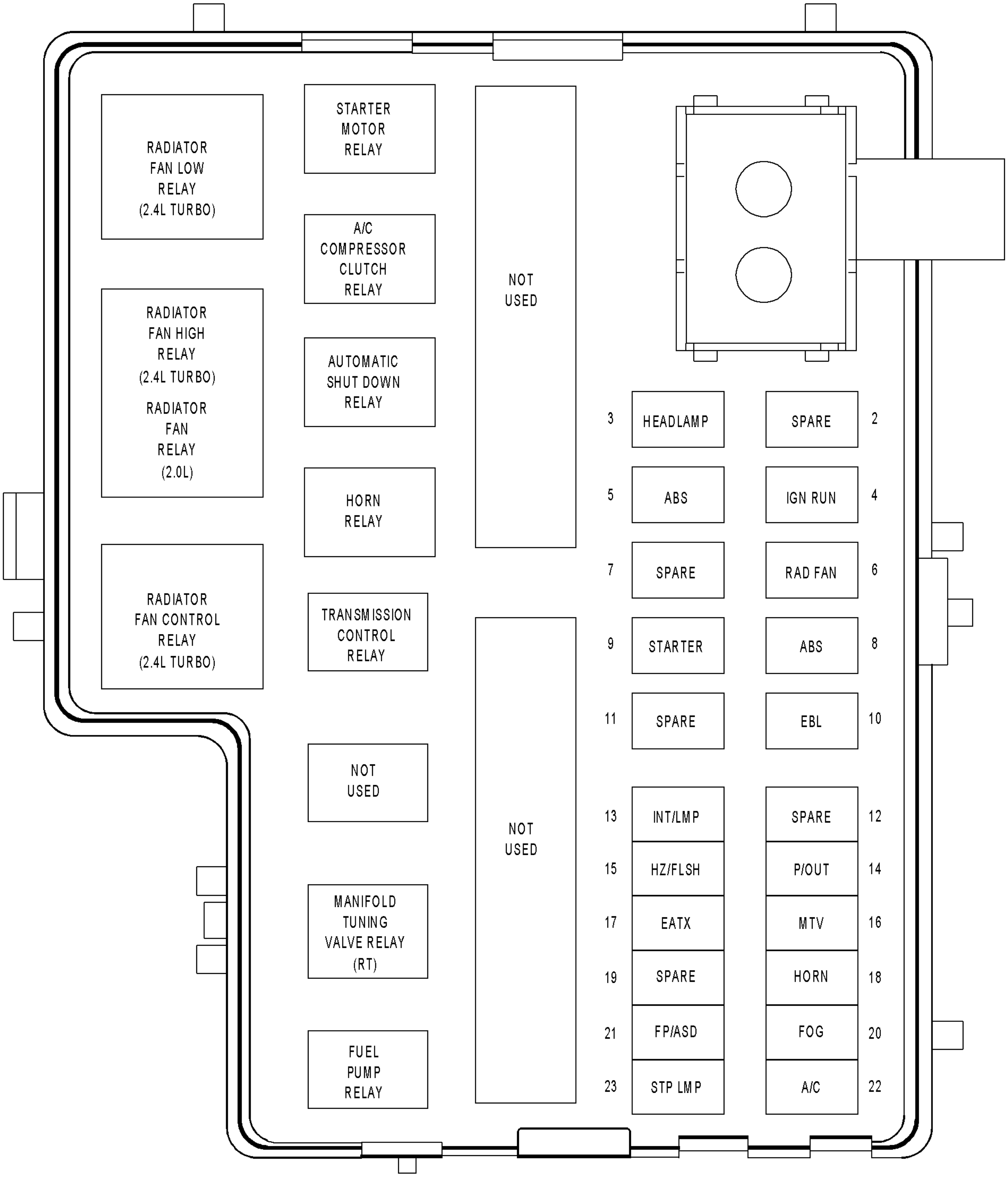
CAV	CIRCUIT	FUNCTION
1	Z1 18BK (2.0L)	GROUND
1	Z1 20BK (2.4L TURBO)	GROUND
2	K199 18BR/VT	O2 1/2 HEATER CONTROL
3	K904 20DB/DG	O2 RETURN
4	K141 20TN/WT	O2 1/2 SIGNAL



OXYGEN SENSOR CONNECTOR (COMPONENT SIDE) - 4 WAY

CAV	CIRCUIT	FUNCTION
1	-	GROUND
2	-	O2 HEATER CONTROL
3	-	O2 RETURN
4	-	O2 SIGNAL

POWER DISTRIBUTION CENTER



FUSES (PDC)

FUSE NO.	AMPS	FUSED CIRCUIT	FUNCTION
1	-	-	-
2	-	-	-
3	40A	A3 12RD/WT	FUSED B(+)
4	40A	A2 12PK/BK	FUSED B(+)
5	30A	A20 12RD/DB (ABS)	FUSED B(+)
6	30A	A16 14GY (2.0L)	FUSED B(+)
6	30A	A16 12GY (2.4L TURBO)	FUSED B(+)
7	-	-	-
8	40A	A10 12RD/DG (ABS)	FUSED B(+)
9	30A	A1 14RD	FUSED B(+)
10	40A	A4 10BK/RD (2.0L)	FUSED B(+)
10	40A	A4 10BK/PK (2.4L TURBO)	FUSED B(+)
11	-	-	-
12	-	-	-
13	20A	M11 16PK/LB	FUSED B(+)
14	20A	F1 16DB	FUSED B(+)
15	15A	A15 18WT (2.0L)	FUSED B(+)
15	15A	A15 18RD/PK (2.4L TURBO)	FUSED B(+)
16	15A	A200 18RD/BR (2.0L RT)	FUSED B(+)
17	20A	A30 16RD/WT (2.0L EATX)	FUSED B(+)
18	10A	F62 20RD (2.0L)	FUSED B(+)
18	10A	F62 20RD (2.0L)	FUSED B(+)
18	15A	F62 18RD (2.4L TURBO)	FUSED B(+)
18	15A	F62 18RD (2.4L TURBO)	FUSED B(+)
19	-	-	-
20	25A	F61 16WT/OR (EXPORT)	FUSED B(+)
21	20A	A14 16RD/WT	FUSED B(+)
22	10A	A17 20RD/BK	FUSED B(+)
23	15A	F32 18PK/DB	FUSED B(+)

A/C COMPRESSOR CLUTCH RELAY

CAV	CIRCUIT	FUNCTION
29	C28 20DB/OR (2.0L)	A/C CLUTCH RELAY CONTROL
29	C28 18DB/OR (2.4L TURBO)	A/C CLUTCH RELAY CONTROL
30	A17 20RD/BK	FUSED B(+)
31	C3 20DB/BK	A/C CLUTCH RELAY OUTPUT
32	-	-
33	F12 18DB/WT (2.0L)	FUSED IGNITION SWITCH OUTPUT (RUN-START)
33	F12 18DB/RD (2.4L TURBO)	FUSED IGNITION SWITCH OUTPUT (RUN-START)

AUTOMATIC SHUT DOWN RELAY

CAV	CIRCUIT	FUNCTION
34	A14 18RD/WT	FUSED B(+)
35	A14 18RD/WT	FUSED B(+)
36	A142 18DG/OR	AUTOMATIC SHUT DOWN RELAY OUTPUT
36	A142 18DG/OR (2.0L)	AUTOMATIC SHUT DOWN RELAY OUTPUT
37	-	-
38	K51 20DB/YL (2.0L)	AUTOMATIC SHUT DOWN RELAY CONTROL
38	K51 18DB/YL (2.4L TURBO)	AUTOMATIC SHUT DOWN RELAY CONTROL

FUEL PUMP RELAY

CAV	CIRCUIT	FUNCTION
59	F12 18DB/WT (2.0L)	FUSED IGNITION SWITCH OUTPUT (RUN-START)
59	F12 18DB/RD (2.4L TURBO)	FUSED IGNITION SWITCH OUTPUT (RUN-START)
60	A14 18RD/WT	FUSED B(+)
61	A141 18DG/WT	FUEL PUMP RELAY OUTPUT
62	-	-
63	K31 20BR (2.0L)	FUEL PUMP RELAY CONTROL
63	K31 18BR (2.4L TURBO)	FUEL PUMP RELAY CONTROL

MANIFOLD TUNING VALVE RELAY (RT)

CAV	CIRCUIT	FUNCTION
54	Z1 20BK	GROUND
55	A200 18RD/BR	FUSED B(+)
56	K201 20BR/YL	MTV RELAY OUTPUT
57	-	-
58	K200 20VT/OR	MTV CONTROL

RADIATOR FAN CONTROL RELAY (2.4L TURBO)

CAV	CIRCUIT	FUNCTION
74	C27 18DB/PK	RAD FAN RELAY CONTROL
75	F12 18DB/RD	FUSED IGNITION SWITCH OUTPUT (RUN-START)
76	C116 12LG/WT	RAD FAN HIGH/LOW FEED
77	C23 12DG	RAD FAN CONTROL/HIGH RELAY OUTPUT
78	Z1 12BK	GROUND

RADIATOR FAN HIGH RELAY (2.4L TURBO)

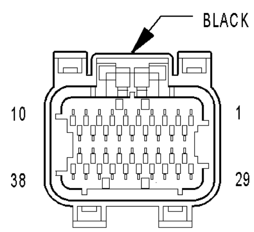
CAV	CIRCUIT	FUNCTION
69	C27 18DB/PK	HIGH SPEED RAD FAN RELAY CONTROL
69	C27 18DB/PK	HIGH SPEED RAD FAN RELAY CONTROL
70	F12 18DB/RD	FUSED IGNITION SWITCH OUTPUT (RUN-START)
71	A16 12GY	FUSED B(+)
72	-	-
73	C23 12DG	RAD FAN CONTROL/HIGH RELAY OUTPUT

RADIATOR FAN RELAY (2.0L)

CAV	CIRCUIT	FUNCTION
69	F12 18DB/WT	FUSED IGNITION SWITCH OUTPUT (RUN-START)
70	C27 20DB/PK	RAD FAN RELAY CONTROL
71	C25 12YL	RAD FAN RELAY OUTPUT
72	-	-
73	A16 14GY	FUSED B(+)

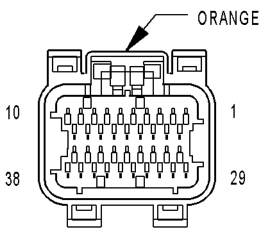
STARTER MOTOR RELAY

CAV	CIRCUIT	FUNCTION
24	A41 14YL	IGNITION SWITCH OUTPUT (START)
25	A1 14RD	FUSED B(+)
26	T40 14BR	ENGINE STARTER MOTOR RELAY OUTPUT
27	-	-
28	K90 20TN	STARTER RELAY CONTROL



POWERTRAIN CONTROL MODULE C1 - BLACK 38 WAY

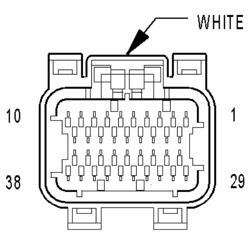
CAV	CIRCUIT	FUNCTION
1	-	-
2	-	-
3	-	-
4	-	-
5	-	-
6	-	-
7	-	-
8	-	-
9	Z11 18BK/WT	GROUND
10	-	-
11	F12 18DB/WT (2.0L)	FUSED IGNITION SWITCH OUTPUT (RUN-START)
11	F12 18DB/RD (2.4L TURBO)	FUSED IGNITION SWITCH OUTPUT (RUN-START)
12	F11 20RD/WT (2.0L AUTO-STICK)	IGNITION SWITCH OUTPUT (OFF-RUN-START)
12	F11 20RD/WT (2.0L EX-CEPT AUTOSTICK)	FUSED IGNITION SWITCH OUTPUT (RUN-START)
13	G7 20WT/OR	VEHICLE SPEED SIGNAL
14	G9 20GY/BK	BRAKE FLUID LEVEL SWITCH SENSE
15	K55 18LB (2.4L TURBO)	TIP SOL CONTROL
16	-	-
17	K150 18DB/YL (2.4L TURBO)	SURGE SOL CONTROL
18	Z12 18BK/TN	GROUND
19	-	-
20	G6 20GY	OIL PRESSURE SIGNAL
21	-	-
22	K145 20BR/OR	AAT SIGNAL
23	K153 18LB (2.4L TURBO)	TIP SIGNAL
24	-	-
25	D20 20LG	SCI RECEIVE (PCM)
26	D6 20PK/LB (2.0L)	SCI RECEIVE (TCM)
27	K6 20VT/WT (2.0L)	5 VOLT SUPPLY
27	K6 18VT/WT (2.4L TURBO)	5 VOLT SUPPLY
28	K137 18DB/GY (2.4L TURBO)	WASTEGATE SOL CONTROL
29	A14 18RD/WT	FUSED B(+)
30	A41 16YL	FUSED IGNITION SWITCH OUTPUT (START)
31	-	-
32	-	-
33	-	-
34	-	-
35	-	-
36	D21 20PK	SCI TRANSMIT (PCM)
37	D15 20WT/DG (2.0L)	SCI TRANSMIT (TCM)
38	D25 20VT/YL	PCI BUS (PCM)



POWERTRAIN CONTROL MODULE C2 (2.0L)

POWERTRAIN CONTROL MODULE C2 (2.0L) - ORANGE 38 WAY

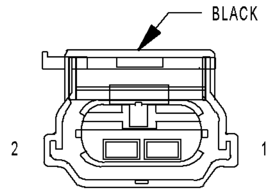
CAV	CIRCUIT	FUNCTION
1	-	-
2	-	-
3	-	-
4	-	-
5	-	-
6	-	-
7	-	-
8	-	-
9	K17 18DB/TN	COIL CONTROL NO. 2
10	K19 18BK/GY	COIL CONTROL NO. 1
11	K14 18LB/BR	INJECTOR CONTROL NO. 4
12	K13 18YL/WT	INJECTOR CONTROL NO. 3
13	K12 18TN	INJECTOR CONTROL NO. 2
14	K11 18WT/DB	INJECTOR CONTROL NO. 1
15	-	-
16	K200 20VT/OR (RT)	MTV CONTROL
17	K199 18BR/VT	O2 1/2 HEATER CONTROL
18	K99 18BR/OR	O2 1/1 HEATER CONTROL
19	K20 20DG	GEN FIELD CONTROL
20	K2 20VT/LG	ECT SIGNAL
21	K22 20OR/DB	TP SIGNAL
22	-	-
23	K1 20DG/RD	MAP SIGNAL
24	K45 20BK/VT	KS RETURN
25	K42 20DB/LG	KS SIGNAL
26	-	-
27	K4 20BK/LB	SENSOR GROUND
28	K961 20BR/WT	IAC RETURN
29	K7 20OR	5 VOLT SUPPLY
30	K21 20BK/RD	IAT SIGNAL
31	K41 20BK/DG	O2 1/1 SIGNAL
32	K904 20DB/DG	O2 RETURN
33	K141 20TN/WT	O2 1/2 SIGNAL
34	K44 20TN/YL	CMP SIGNAL
35	K24 20GY/BK	CKP SIGNAL
36	-	-
37	-	-
38	K610 20VT/GY	IAC MOTOR CONTROL



POWERTRAIN CONTROL MODULE C3

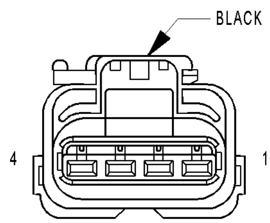
POWERTRAIN CONTROL MODULE C3 - WHITE 38 WAY

CAV	CIRCUIT	FUNCTION
1	-	-
2	-	-
3	K51 20DB/YL (2.0L)	AUTOMATIC SHUT DOWN RELAY CONTROL
3	K51 18DB/YL (2.4L TURBO)	AUTOMATIC SHUT DOWN RELAY CONTROL
4	C27 18DB/PK (2.4L TURBO)	HIGH SPEED RAD FAN RELAY CONTROL
5	V35 20LG/RD (2.0L)	S/C VENT CONTROL
6	C27 20DB/PK (2.0L)	RAD FAN RELAY CONTROL
6	C24 18DB/RD (2.4L TURBO)	RAD FAN LOW RELAY CONTROL
7	V32 20YL/RD (2.0L)	S/C SUPPLY
8	K106 20WT/DG (2.0L)	NVLD SOLENOID CONTROL
8	K106 18WT/DG (2.4L TURBO)	NVLD SOLENOID CONTROL
9	-	-
10	-	-
11	C28 20DB/OR (2.0L)	A/C CLUTCH RELAY CONTROL
11	C28 18DB/OR (2.4L TURBO)	A/C CLUTCH RELAY CONTROL
12	V36 20TN/RD (2.0L)	S/C VACUUM CONTROL
13	-	-
14	-	-
15	-	-
16	-	-
17	K167 20BR/YL (2.0L)	SENSOR GROUND 2
17	K167 18BR/YL (2.4L TURBO)	SENSOR GROUND 2
18	-	-
19	A142 18DG/OR	AUTOMATIC SHUT DOWN RELAY OUTPUT
20	K52 20PK/BK	EVAP/PURGE CONTROL
21	T141 20YL/RD	CLUTCH INTERLOCK SWITCH SIGNAL
22	-	-
23	K29 20WT/PK	BRAKE SWITCH SIGNAL
24	C20 20BR/OR (2.0L)	A/C SWITCH SENSE
24	C20 20BR (2.4L TURBO)	A/C SWITCH SENSE
25	-	-
26	T44 20YL/LB (2.0L EATX)	AUTOSTICK DOWNSHIFT SWITCH SIGNAL
26	K119 20LG/BK (2.0L MTX/ 2.4L TURBO)	CLUTCH UP SWITCH SIGNAL
27	T5 20LG/LB (2.0L)	AUTOSTICK UPSHIFT SWITCH SIGNAL
28	A142 18DG/OR	AUTOMATIC SHUT DOWN RELAY OUTPUT
29	K108 20WT/TN	EVAP/PURGE RETURN
30	K10 20DB/OR	PSP SWITCH SIGNAL
31	-	-
32	K118 20PK/YL	BATTERY TEMP SIGNAL
33	-	-
34	V37 20RD/LG (2.0L)	S/C SWITCH SIGNAL
35	K107 20OR (2.0L)	NVLD SWITCH SIGNAL
35	K107 18OR (2.4L TURBO)	NVLD SWITCH SIGNAL
36	-	-
37	K31 20BR (2.0L)	FUEL PUMP RELAY CONTROL
37	K31 18BR (2.4L TURBO)	FUEL PUMP RELAY CONTROL
38	K90 20TN	STARTER RELAY CONTROL



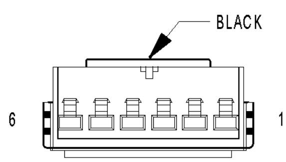
RADIATOR FAN MOTOR (2.0L) - BLACK 2 WAY

CAV	CIRCUIT	FUNCTION
1	C25 12YL	RAD FAN HIGH RELAY OUTPUT
2	Z1 14BK	GROUND



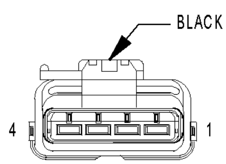
RADIATOR FAN MOTOR (2.4L TURBO) - BLACK 4 WAY

CAV	CIRCUIT	FUNCTION
1	Z1 12BK	GROUND
2	C23 12DG	RAD FAN CONTROL/HIGH RELAY OUTPUT
3	C116 12LG/WT	RAD FAN HIGH/LOW FEED
4	C25 12YL	RAD FAN LOW RELAY OUTPUT



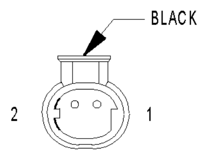
SENTRY KEY IMMOBILIZER MODULE - BLACK 6 WAY

CAV	CIRCUIT	FUNCTION
1	-	-
2	D25 22VT/YL	PCI BUS
3	-	-
4	G5 20DB/WT	FUSED IGNITION SWITCH OUTPUT (RUN-START)
5	Z2 20BK/LG	GROUND
6	M1 20PK	FUSED B(+)



SPEED CONTROL SERVO - BLACK 4 WAY

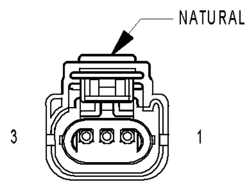
CAV	CIRCUIT	FUNCTION
1	V36 20TN/RD	S/C VACUUM CONTROL
2	V35 20LG/RD	S/C VENT CONTROL
3	V30 20DB/RD	SPEED CONTROL BRAKE LAMP SWITCH OUTPUT
4	Z1 20BK	GROUND



SURGE SOLENOID (2.4L TURBO)

SURGE SOLENOID (2.4L TURBO) - BLACK 2 WAY

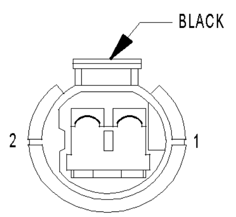
CAV	CIRCUIT	FUNCTION
1	K150 18DB/YL	SURGE SOL CONTROL
2	A142 16DG/OR	AUTOMATIC SHUT DOWN RELAY OUTPUT



THROTTLE INLET PRESSURE SENSOR (2.4L TURBO)

THROTTLE INLET PRESSURE SENSOR (2.4L TURBO) - NATURAL 3 WAY

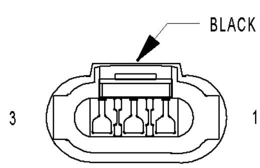
CAV	CIRCUIT	FUNCTION
1	K153 18LB	TIP SIGNAL
2	K167 20BR/YL	SENSOR GROUND 2
3	K6 18VT/WT	5 VOLT SUPPLY



THROTTLE INLET PRESSURE SOLENOID (2.4L TURBO)

THROTTLE INLET PRESSURE SOLENOID (2.4L TURBO) - BLACK 2 WAY

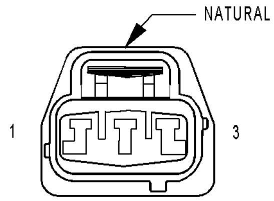
CAV	CIRCUIT	FUNCTION
1	K55 18LB	TIP SOL CONTROL
2	F12 20DB/RD	FUSED IGNITION SWITCH OUTPUT (RUN-START)



THROTTLE POSITION SENSOR (2.0L)

THROTTLE POSITION SENSOR (2.0L) - BLACK 3 WAY

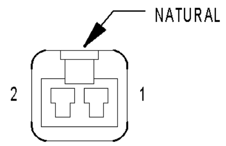
CAV	CIRCUIT	FUNCTION
1	K167 20BR/YL	SENSOR GROUND 2
2	K22 20OR/DB	TP SIGNAL
3	K6 20VT/WT	5 VOLT SUPPLY



THROTTLE POSITION SENSOR (2.4L TURBO)

THROTTLE POSITION SENSOR (2.4L TURBO) - NATURAL 3 WAY

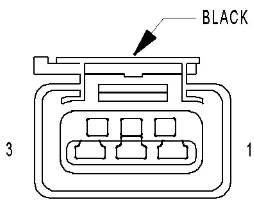
CAV	CIRCUIT	FUNCTION
1	K4 20BK/LB	SENSOR GROUND
2	K22 20OR/DB	TP SIGNAL
3	K7 20OR	5 VOLT SUPPLY



TURBO BOOST GAUGE LAMP (2.4L TURBO)

TURBO BOOST GAUGE LAMP (2.4L TURBO) - NATURAL 2 WAY

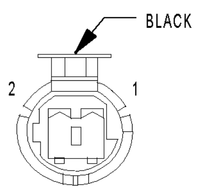
CAV	CIRCUIT	FUNCTION
1	E2 20OR	PANEL LAMPS DRIVER
2	Z3 20BK/OR	GROUND



VEHICLE SPEED SENSOR

VEHICLE SPEED SENSOR - BLACK 3 WAY

CAV	CIRCUIT	FUNCTION
1	K7 20OR	5 VOLT SUPPLY
2	K4 20BK/LB	SENSOR GROUND
3	G7 20WT/OR	VEHICLE SPEED SIGNAL



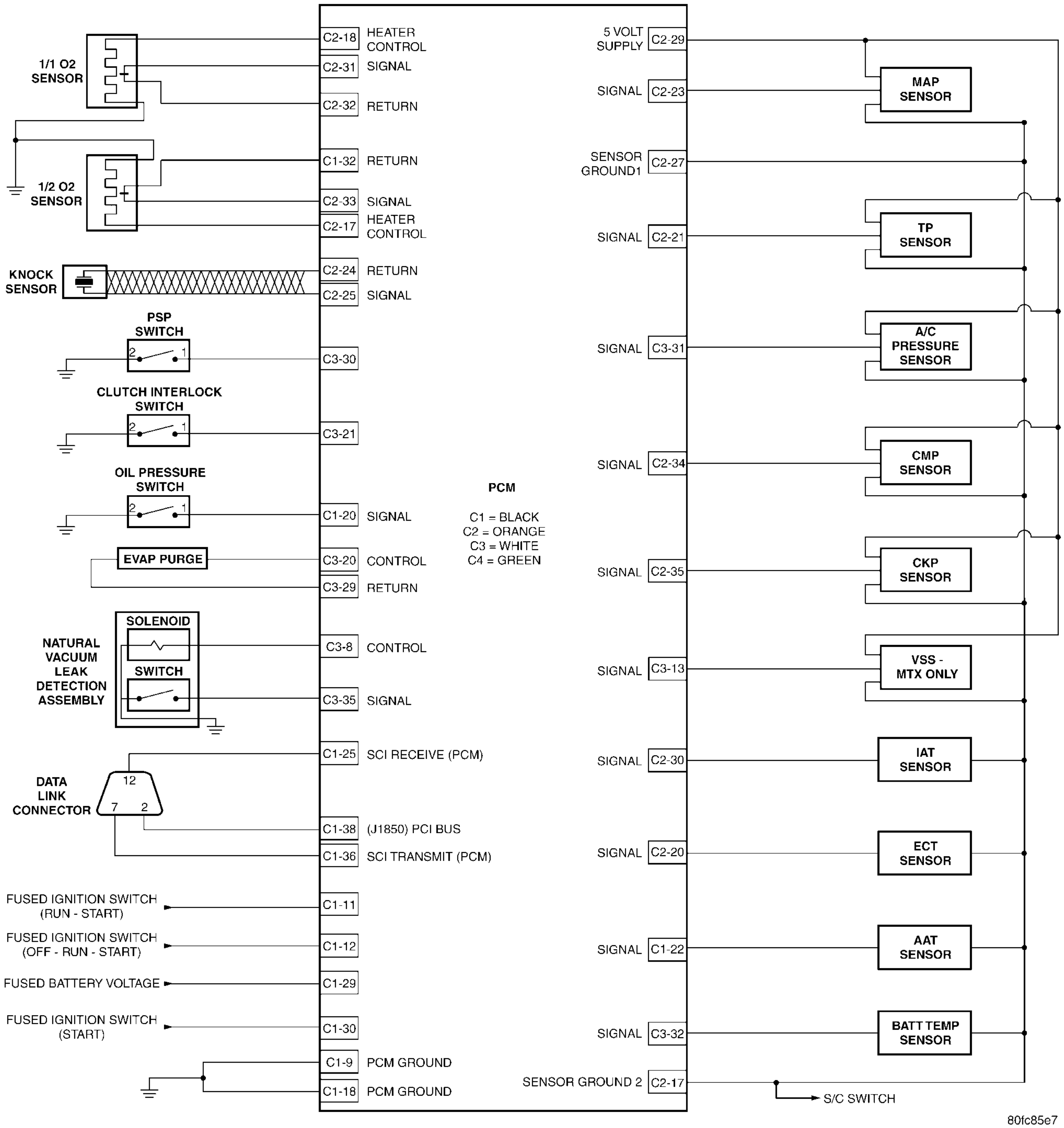
WASTEGATE SOLENOID (2.4L TURBO)

WASTEGATE SOLENOID (2.4L TURBO) - BLACK 2 WAY

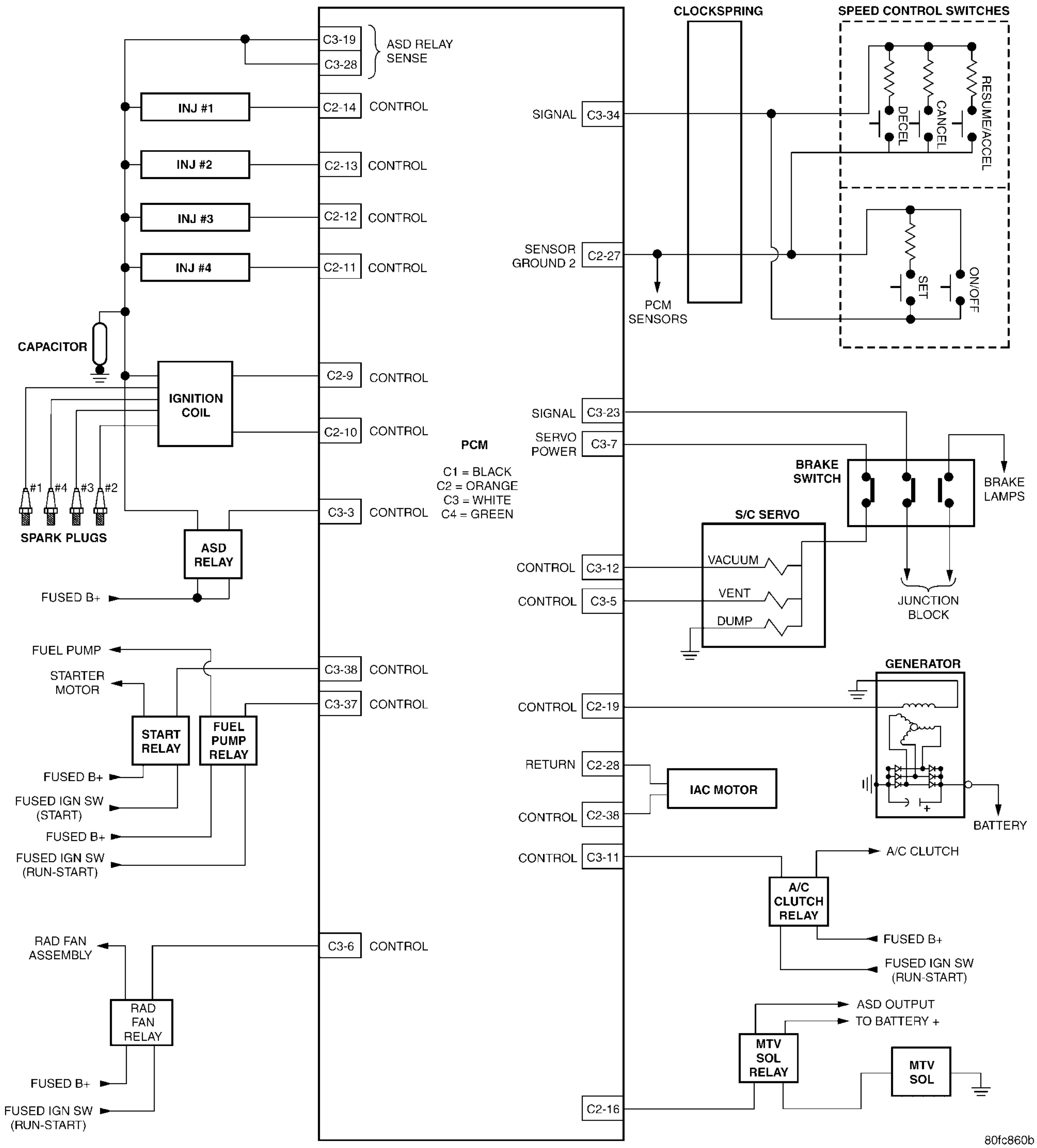
CAV	CIRCUIT	FUNCTION
1	K137 18DB/GY	WASTEGATE SOL CONTROL
2	Z1 20BK	GROUND

10.0 SCHEMATIC DIAGRAMS

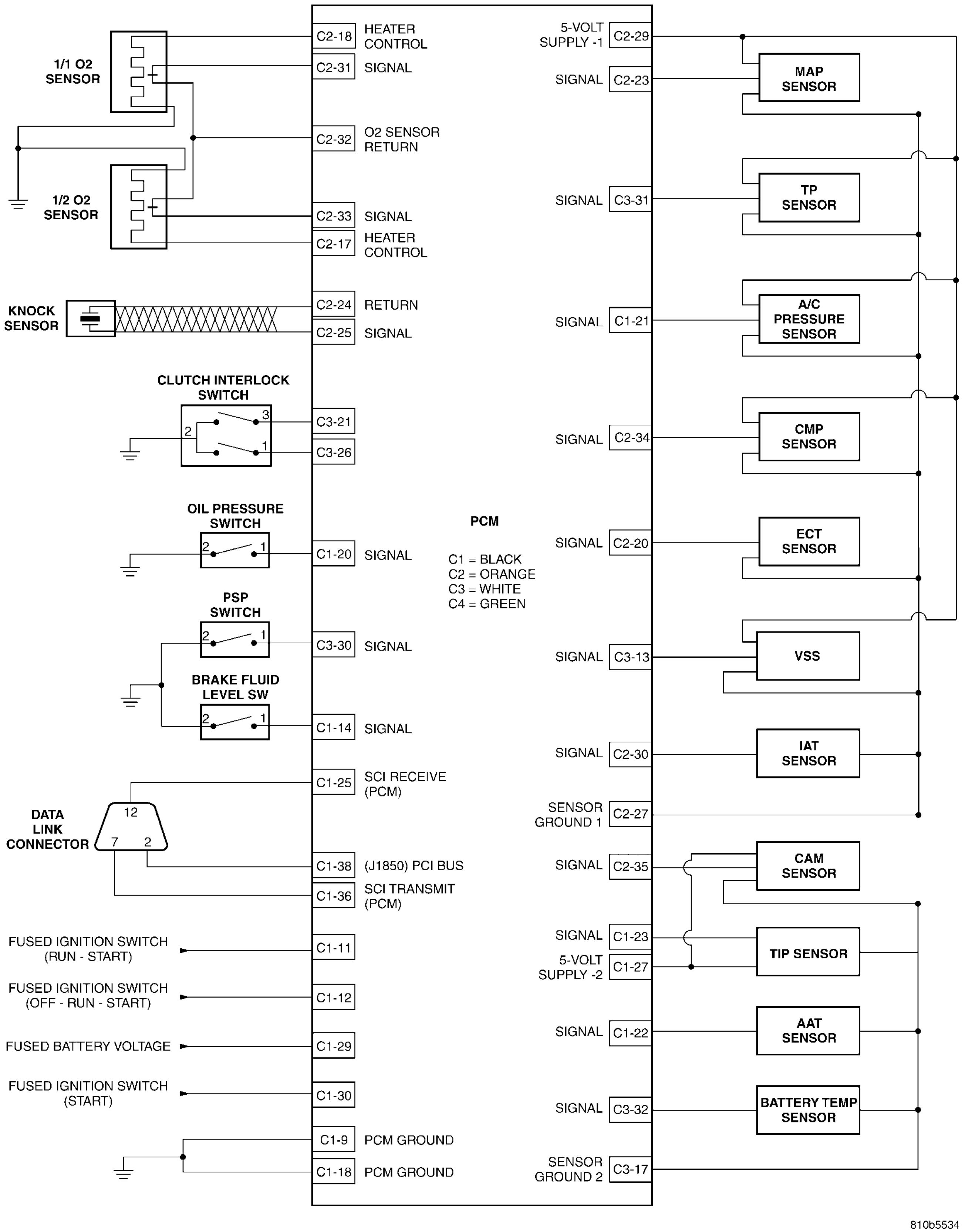
10.1 2004 PL 2.0L ENGINE



10.1 2004 PL 2.0L ENGINE (Continued)

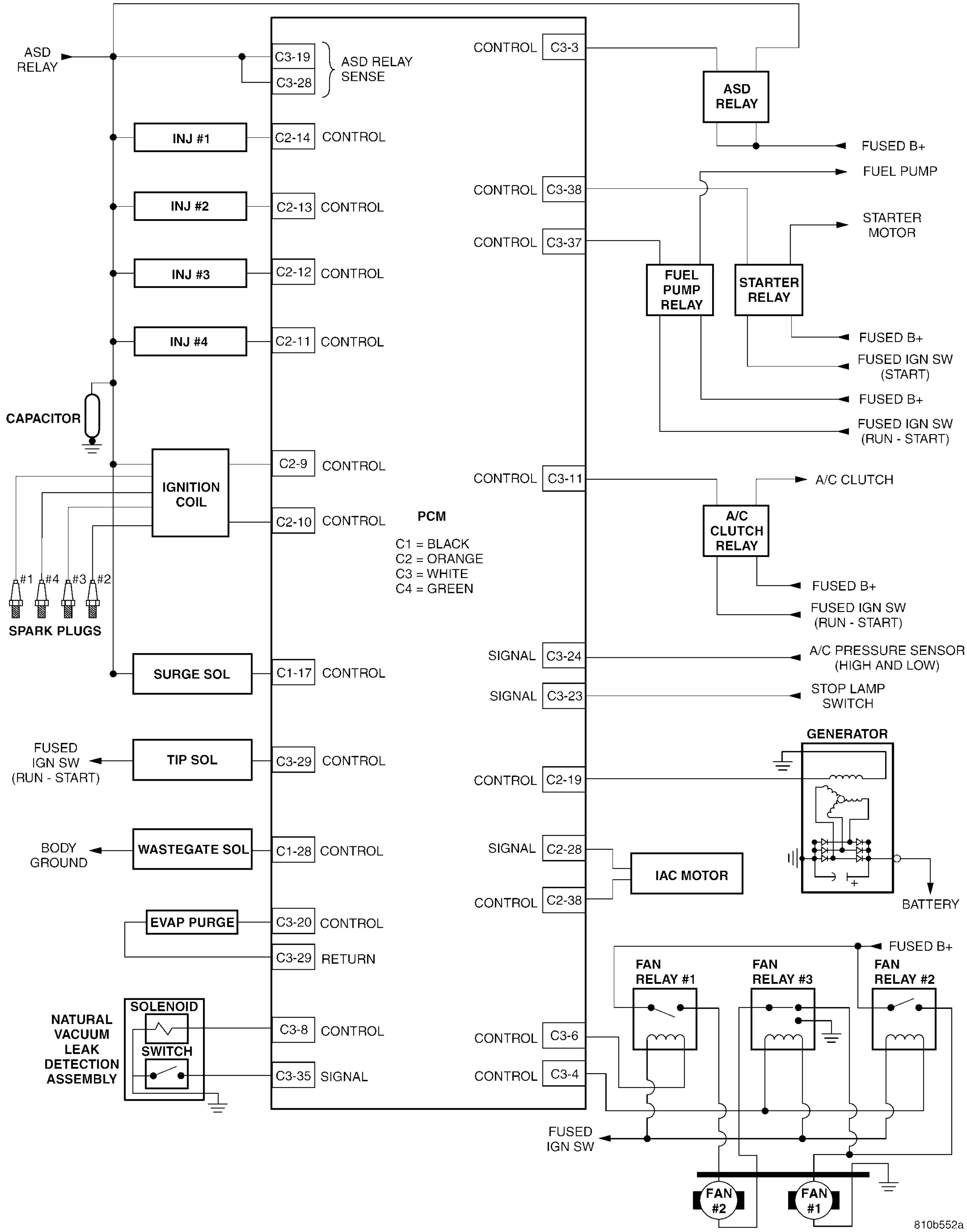


10.2 2004 SRT-4 2.4L ENGINE

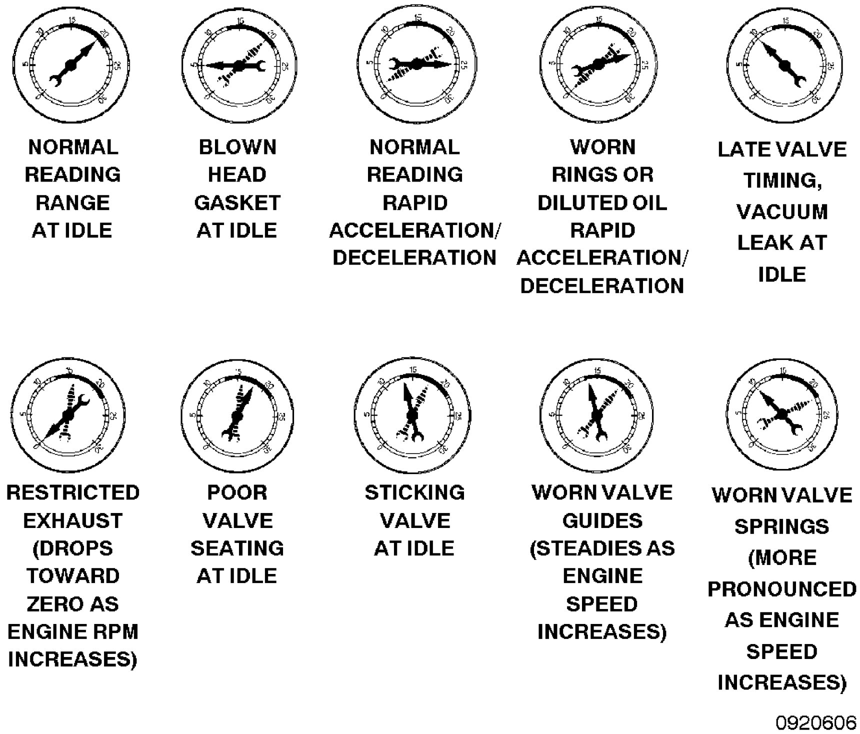


SCHEMATIC DIAGRAMS

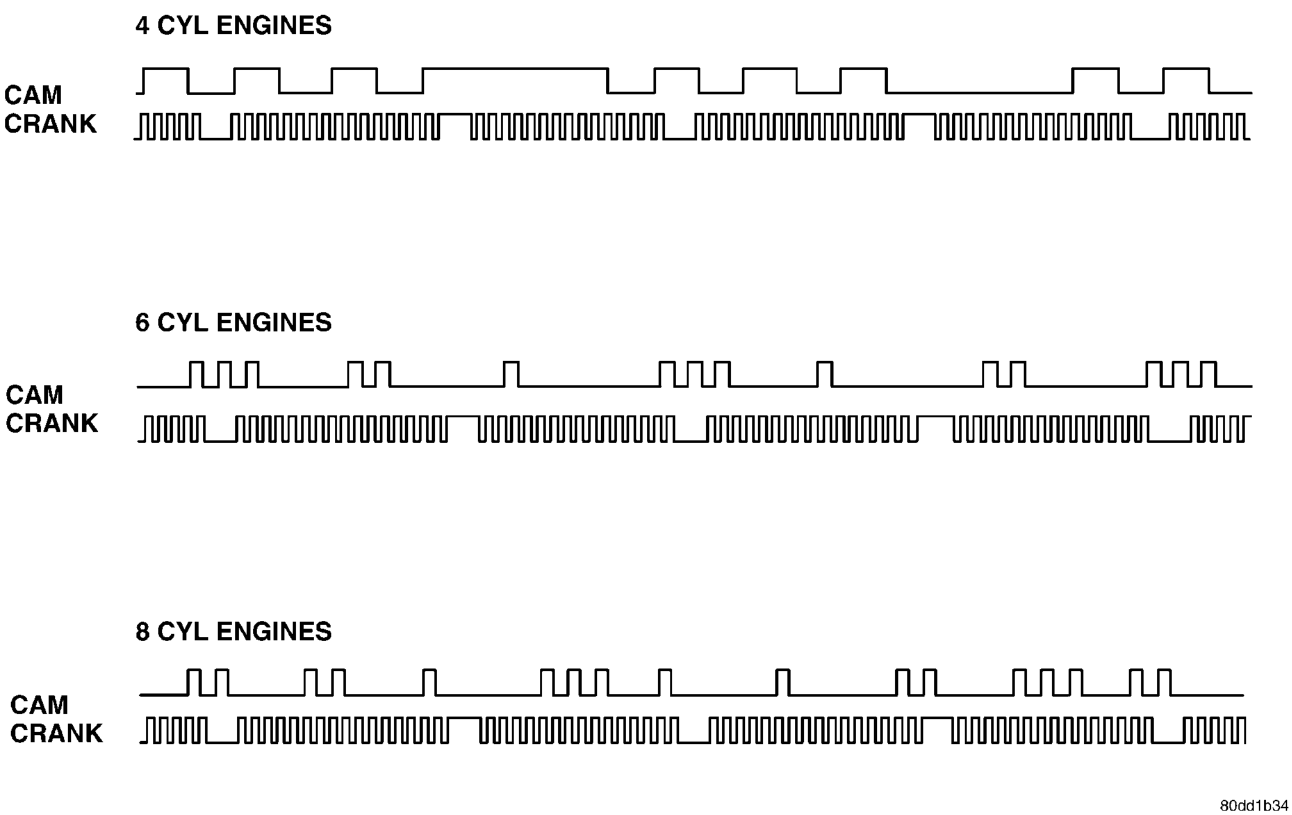
10.2 2004 SRT-4 2.4L ENGINE (Continued)

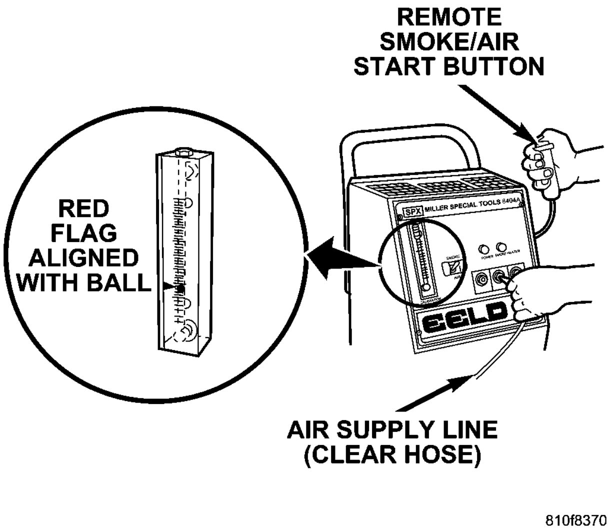


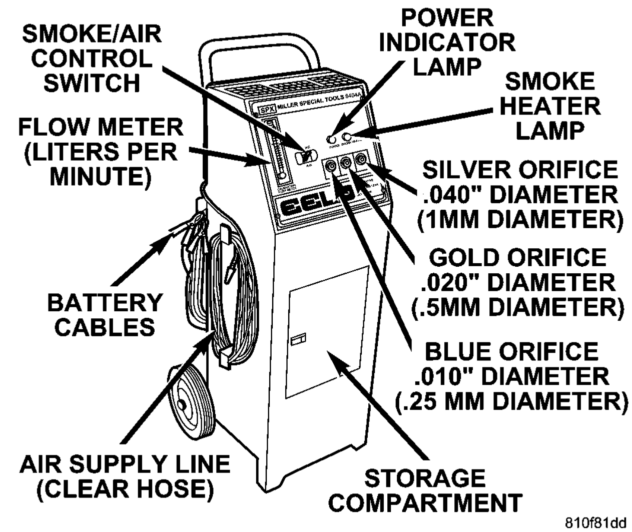
11.0 CHARTS AND GRAPHS

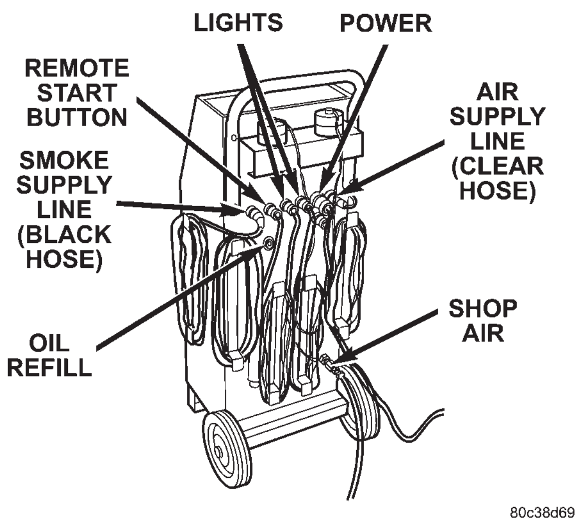


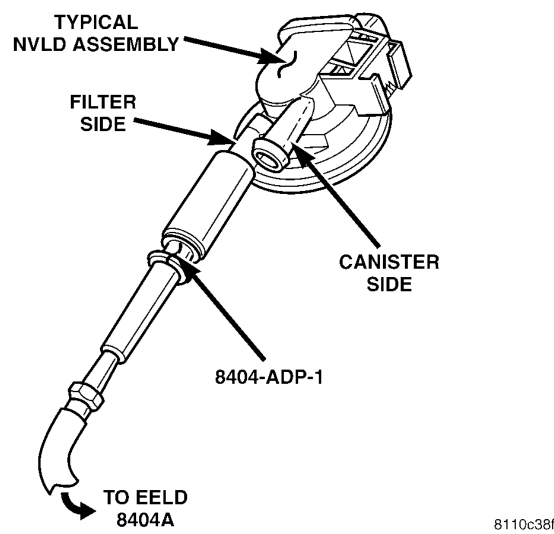
NGC TYPICAL SCOPE PATTERNS
CAMSHAFT AND CRANKSHAFT SENSOR




REMOTE SMOKE/AIR START BUTTON
RED FLAG ALIGNED WITH BALL
AIR SUPPLY LINE (CLEAR HOSE)
810f8370


SMOKE/AIR CONTROL SWITCH
POWER INDICATOR LAMP
SMOKE HEATER LAMP
FLOW METER (LITERS PER MINUTE)
SILVER ORIFICE .040" DIAMETER (1MM DIAMETER)
GOLD ORIFICE .020" DIAMETER (.5MM DIAMETER)
BATTERY CABLES
BLUE ORIFICE .010" DIAMETER (.25 MM DIAMETER)
AIR SUPPLY LINE (CLEAR HOSE)
STORAGE COMPARTMENT
810f81dd

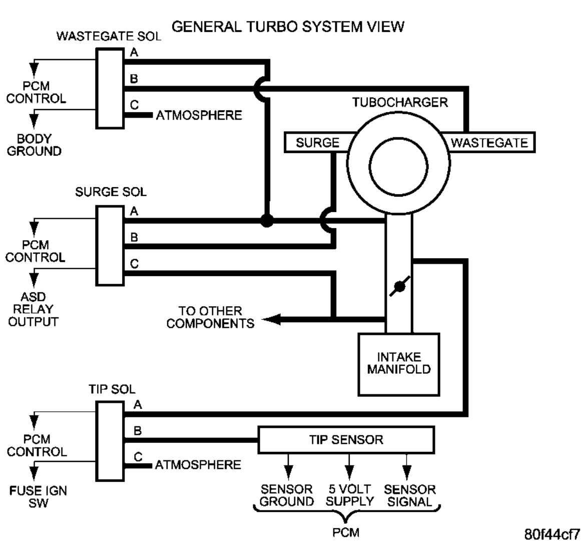

LIGHTS
POWER
REMOTE START BUTTON
AIR SUPPLY LINE (CLEAR HOSE)
SMOKE SUPPLY LINE (BLACK HOSE)
OIL REFILL
SHOP AIR
80c38d69


TYPICAL NVLD ASSEMBLY
FILTER SIDE
CANISTER SIDE
8404-ADP-1
TO EELD 8404A
8110c38f

O2 SENSOR CONFIGURATION

JR	4 CYLINDER	1/1	UPSTREAM
JR	4 CYLINDER	1/2	DOWNSTREAM
JR	2.7L V-6	1/1	REAR BANK UP
JR	2.7L V-6	1/2	REAR BANK DOWN
JR	2.7L V-6	2/1	FRONT BANK UP
JR	2.7L V-6	2/2	FRONT BANK DOWN
LH	V-6 ALL	1/1	RIGHT BANK UP
LH	V-6 ALL	1/2	RIGHT BANK DOWN
LH	V-6 ALL	2/1	LEFT BANK UP
LH	V-6 ALL	2/2	LEFT BANK DOWN
RS/RG	ALL	1/1	UPSTREAM
RS/RG	ALL	1/2	DOWNSTREAM
PL	ALL	1/1	UPSTREAM
PL	ALL	1/2	DOWNSTREAM
PR	3.5L	1/1	RIGHT BANK UP
PR	3.5L	1/2	RIGHT BANK DOWN
PR	3.5L	2/1	LEFT BANK UP
PR	3.5L	2/2	LEFT BANK DOWN
PT	ALL	1/1	UPSTREAM
PT	ALL	1/2	DOWNSTREAM

80aa3148



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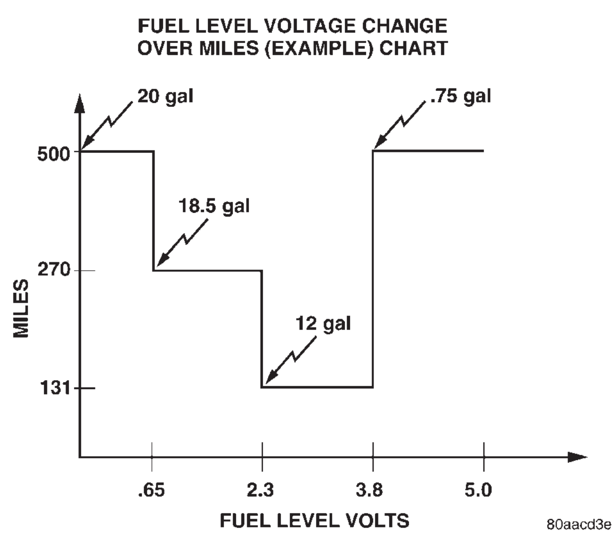

80aacd3e

DIAGNOSTIC TEST PROCEDURES — TELL US!

DaimlerChrysler Corporation is constantly working to provide the technician the best diagnostic manuals possible. Your comments and recommendations regarding the diagnostic manuals and procedures are appreciated.

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Model ______________________ **Year** ___________ **Body Type** _________________ **Engine** ____________

Transmission ___________________________ **Vehicle Mileage** _________________ **MDH** _______________

Diagnostic Procedure ____________________________ **Book No.** ______________________ **Page** _______

Comments/recommendations (if necessary, draw sketch)

Name ____

____

Submitted by: ____

Address ____

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Business Phone # ____

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1.0 INTRODUCTION

IMPORTANT

The 2004 model year, PL vehicles will integrate the Transmission Control Module and Powertrain Control Module into a single control module. This new module is called the Next Generation Controller (NGC) for DaimlerChrysler and will be referred to as the Powertrain Control Module (PCM). The Transmission Control System is part of the Powertrain Control Module.

The PCM will have four color coded connectors, C1 through C4, (C1-BLK, C2-GRAY, C3-WHITE, C4-GREEN), each PCM connector will have 38 pins each. Two tools are used for probing and repairing the PCM connectors. A tool to release the pins from the PCM connectors Miller Tool #3638, you must use the Miller Tool #3638 tool to release the connector pins or harness and connector damage will occur. Also a tool for probing connectors Miller Tool #8815, you must use the Miller tool #8815 tool to probe the PCM pins or harness and connector damage will occur.

The procedures contained in this manual include all the specifications, instructions, and graphics needed to diagnose 40/41TE Electronic Automatic Transaxle (EATX) problems. The diagnostics in this manual are based on the failure condition or symptom being present at time of diagnosis.

When repairs are required, refer to the appropriate volume of the service manual for the proper removal and repair procedure.

Diagnostic procedures change every year. New diagnostic systems may be added and/or carryover systems may be enhanced. READ THIS MANUAL BEFORE TRYING TO DIAGNOSE A VEHICLE TROUBLE CODE. It is recommended that you review the entire manual to become familiar with all new and changed diagnostic procedures.

This book reflects many suggested changes from readers of past issues. After using this book, if you have any comments or recommendations, please fill out the form at the back of the book and mail it back to us.

1.1 SYSTEM COVERAGE

This diagnostic procedures manual covers the 2004 PL vehicles equipped with a 40/41TE transaxle.

1.2 SIX-STEP TROUBLESHOOTING PROCEDURE

Diagnosis of the 40/41TE electronic transaxle is done in six basic steps:

- verification of complaint
- verification of any related symptoms
- symptom analysis
- problem isolation
- repair of isolated problem
- verification of proper operation

2.0 IDENTIFICATION OF SYSTEM

PL vehicles with a 4 speed automatic transmission can be visually identified. Notice that the 40/41TE transmission has all connectors for the Transmission Solenoid/Pressure Switch Assembly, Transmission Range Sensor, Input Speed Sensor and Output Speed Sensor are located on the same side of the transmission case. If the transmission part number is required, refer to the Service Information for transmission ID tag descriptions.

3.0 SYSTEM DESCRIPTION AND FUNCTIONAL OPERATION

3.1 GENERAL DESCRIPTION

The 40/41TE electronic transaxle is a conventional transaxle in that it uses hydraulically applied clutches to shift a planetary gear train. However, the electronic control system replaces many of the mechanical and hydraulic components used in conventional transmission valve bodies.

3.2 FUNCTIONAL OPERATION

The 40/41TE electronic transaxle has a fully adaptive control system. The system performs it's functions based on continuous real-time sensor feedback information. The control system automatically adapts to changes in engine performance and friction element variations to provide consistent shift quality. The control system ensures that clutch operation during upshifting and downshifting is more responsive without increased harshness.

The PCM continuously checks for electrical problems, mechanical problems, and some hydraulic problems. When a problem is sensed, the PCM stores a diagnostic trouble code. Some of these codes cause the transaxle to go into Limp-in or default mode. While in this mode, electrical power is taken away from the transaxle via the PCM, de-energizing the transmission control relay, and taking power from the solenoid pack. When this happens, the only transaxle mechanical functions are:

Park and Neutral

Reverse
Second Gear
No upshifts or downshifts are possible. The position of the manual valve alone allows the three ranges that are available. Although vehicle performance is seriously degraded while in this mode, it allows the owner to drive the vehicle in for service.

Once the DRBIII® is in the Transmission portion of the diagnostic program, it constantly monitors the PCM to see if the system is in Limp-in mode. If the transaxle is in Limp-in mode, the DRBIII® will flash the red LED.

3.2.1 AUTOSTICK FEATURE (IF EQUIPPED)

This feature allows the driver to manually shift the transaxle when the shift lever is pulled into the AutoStick position. When in AutoStick mode, the instrument cluster displays the current gear.

3.2.2 TRANSMISSION OPERATION AND SHIFT SCHEDULING AT VARIOUS OIL TEMPERATURES

The transmission covered in this manual has unique shift schedules depending on the temperature of the transmission oil. The shift schedule is modified to extend the life of the transmission while operating under extreme conditions.

The oil temperature is measured with a Temperature Sensor on the transmission. The Temperature Sensor is an integral component of the Transmission Range Sensor (TRS). If the Temperature Sensor is faulty, the transmission will default to a calculated oil temperature. Oil temperature will then be calculated through a complex heat transfer equation using engine coolant temperature, battery/ambient temperature, and engine off time from the Body Control Module (BCM). These inputs are received from the PCI bus periodically and used to initialize the oil temperature at start up. Once the engine is started, the PCM updates the transmission oil temperature based on torque converter slip speed, vehicle speed, gear, and engine coolant temperature to determine an estimated oil temperature during vehicle operation. Vehicles using calculated oil temperature track oil temperature reasonably accurate during normal operation. However, if a transmission is overfilled, a transmission oil cooler becomes restricted, or if a customer drives aggressively in low gear, the calculated oil temperature will be inaccurate. Consequently the shift schedule selected may be inappropriate for the current conditions. The key highlights of the various shift schedules are as folows:

Extreme Cold: Oil temperature at start up below -26.6°C (-16°F)

> Goes to Cold schedule above -24°C (-12°F) oil temperature

> Park, Reverse, Neutral and 2nd gear only (prevents shifting which may fail a clutch with frequent shifts)

Cold: Oil temperature at start up above -24°C (-12°F) and below 2.2°C (36°F)

> Goes to Warm schedule above 4.4°C (40°F) oil temperature

> Delayed 2-3 upshift approximately 35-50 Km/h (22 - 31 MPH)

> Delayed 3-4 upshift 72-85 Km/h (45-53 MPH)

> Early 4-3 coastdown shift approximately 48 Km/h (30 MPH)

> Early 3-2 coastdown shift approximately 27 Km/h (17 MPH)

> High speed 4-2, 3-2, 2-1 kickdown shifts are prevented

> No EMCC

Warm: Oil temperature at start up above 2.2° (36°F) and below 27°C (36°F)

> Goes to a Hot schedule above 27°C (80°F) oil temperature

> Normal operation (upshifts, kickdowns, and coastdowns)

> No EMCC

Hot: Oil temperature at start up above 27°C (80°F)

> Goes to a Overheat schedule above 115°C (240°F) oil temperature

> Normal operation (upshifts, kickdowns, and coastdowns)

> Full EMCC, No PEMCC except to engage FEMCC, except at closed throttle at speeds above 113-133 Km/h (70-83 MPH)

Overheat: Oil temperature above 115°C (240°F) or engine coolant temperature above 115C° (240°F)

> Goes to a Hot below 110°C (230°F) oil temperature or a Super Overheat above 135°C (275°F) oil temperature

> Delayed 2-3 upshift 40-51 Km/h (25-32 MPH)

> Delayed 3-4 upshift 66-77 Km/h (41-48 MPH)

> 2nd gear PEMCC above 35 KM/h (22 MPH)

> Above 35 Km/h (22 MPH) the torque converter will not unlock unless the throttle is closed (i.e. at 80 Km/h (50 MPH) a 4th FEMCC to 3rd FEMCC shift will be made during a part throttle kickdown or a 4th FEMCC to 2nd PEMCC shift will be made at wide open throttle) or if a wide open throttle 2nd PEMCC to 1 kickdown is made.

> 3rd gear FEMCC from 48-77 Km/h (30-48 MPH)

> 3rd gear PEMCC from 43-50 Km/h (27-31 MPH)

> DTC P0218 is set

Super Overheat: Oil temperature above 135°C (275°F) or Engine coolant temperature above 124°C (255°F)

> Goes back to Overheat below 124°C (255°F) oil temperature

> AutoStick feature is disabled

> DTC P1797 is set

Causes for operation in the wrong temperature shift schedule: Extreme Cold or Cold shift schedule at start up:

> Temperature Sensor circuit.

> Overheat or Super Overheat shift schedule after extended operation:

> Operation in city traffic or stop and go traffic

> Engine idle speed too high

> Aggressive driving in low gear

> Trailer towing in OD gear position (use 3 position (or A/S 3rd) if frequent shifting occurs)

> Cooling system failure causing engine to operate over 110°C (230°F)

> Engine coolant temperature stays low too long - If engine coolant temperature drops below 65°C (150°F), the transmission will disengage EMCC. Extended operation with the EMCC disengaged will cause the transmission to overheat.

> Brake switch issue will cause the EMCC to disengage. Extended oepration with the EMCC disengaged will cause the transmission to overheat.

> Tranmission fluid overfilled

> Transmission cooler or cooler lines restricted

> Transmission Temperature Sensor circuit

3.3 DIAGNOSTIC TROUBLE CODES

Diagnostic trouble codes (DTC's) are codes stored by the Powertrain Control Module (PCM) that help us diagnose Transmission problems. They are viewed using the DRBIII® scan tool.

Always begin by performing a visual inspection of the wiring, connectors, cooler lines and the transmission. Any obvious wiring problems or leaks should be repaired prior to performing any diagnostic test procedures. Some engine driveability problems can be misinterpreted as a transmission problem. Ensure that the engine is running properly and no engine DTC's are present that could cause a transmission complaint.

If there is a communication bus problem, trouble codes will not be accessible until the problem is fixed. The DRBIII® will display an appropriate message. The following is a possible list of causes for a bus problem:

– open or short to ground/battery in PCI bus circuit.

– internal failure of any module or component on the bus

Each diagnostic trouble code is diagnosed by following a specific testing sequence. The diagnostic test procedures contain step-by-step instructions for determining the cause of a transmission diagnostic trouble code. Possible sources of the code are checked and eliminated one by one. It is not necessary to perform all of the tests in this book to diagnose an individual code. These tests are based on the problem being present at the time that the test is run.

All testing should be done with a fully charged battery.

If the PCM records a DTC that will adversely affect vehicle emissions, it will request (via the communication bus) that the PCM illuminate the Malfunction Indicator Lamp (MIL). Although these DTC's will be stored in the PCM immediately as a 1 trip failure, it may take up to five minutes of accumulated trouble confirmation to set the DTC and illuminate the MIL. Three consecutive successful OBDII (EURO STAGE III OBD) trips or clearing the DTC's with a diagnostic tool (DRBIII® or equivalent) is required to extinguish the MIL. When the Transmission Control system requests that the PCM illuminate the MIL, the PCM sets a DTC P0700 ($89) to alert the technician that there are DTC's in the Transmission Control System. This must also be erased in the PCM in order to extinguish the MIL.

3.3.1 HARD CODE

Any Diagnostic Trouble Code (DTC) that is set whenever the system or component is monitored is a HARD code. This means that the problem is there every time the Transmission Control System checks that system or component. Some codes will set immediately at start up and others will require a road test under specific conditions. It must be determined if a code is repeatable (Hard) or intermittent before attempting diagnosis.

3.3.2 ONE TRIP FAILURES

A One Trip Failure, when read from the Transmission Control System, is a hard OBDII (EURO STAGE III OBD) code that has not matured for the full 5 minutes to a hard fault. This applies to codes that will only set after 5 minutes of substituted gear operation.

3.3.3 INTERMITTENT CODE

A diagnostic trouble code that is not there every time the Transmission Control System checks the circuit or function is an a intermittent code. Some intermittent codes, such as codes P1684(12), P0891(14), P0888(15), P0725(18), P1694(19), P0871(21), P0846(22), P0841(24), P0706(28), P0120(29), P0750(41), P0755(42), P0760(43), P0765(44), P0715(56), P0720(57), P1794(58), P0951(70), P1799(74), P0884(76), P1687(77), and P1652(78) are caused by wiring or connector problems. However intermittent codes 50 - 54 are usually caused by intermittent hydraulic seal leakage in the clutch and/or accumulator circuits. Problems that come and go like this are the most difficult to diagnose, they must be looked for under the specific conditions that cause them.

3.3.4 STARTS SINCE SET COUNTER

For the most recent code, the Starts Since Set counter counts the number of times the vehicle has started since it was last set. The counter will count up to 255 starts. Note that this code only applies to the last or most recent code set.

When there are no diagnostic trouble codes stored in memory, the DRBIII® will display NO DTC'S PRESENT and the reset counter will show "STARTS SINCE CLEAR =XXX

The number of starts helps determine if the diagnostic trouble code is hard or intermittent.

- If the count is less that 3, the code is usually a hard code.
- If the count is greater than 3, it is considered an intermittent code. This means that the engine has been started most of the time without the code recurring.

3.3.5 TROUBLE CODE ERASURE

A Diagnostic trouble code will be cleared from Transmission Control System memory if it has not reset for 40 warm-up cycles.

A warm-up cycle is defined as sufficient vehicle operation such that the coolant temperature has risen by at least 22°C (40°F) from engine starting and reaches a minumum temperature of 71°C (160°F).

The Malfunction Indicator Lamp (MIL) will turn off after 3 good trips or when the DTC's are cleared from the Transmission Control System.

3.3.6 EATX DTC EVENT DATA

EATX DTC EVENT DATA can be used as a diagnostic aid when experiencing Electronic Transmissions with intermittent problems. When a Diagnostic Trouble Code (DTC) is set, the vehicles EATX inputs are stored in the controller memory and are retrievable with the DRBIII®. This information can be helpful when a DTC can not be duplicated.

The EATX DTC EVENT DATA is located in the DRBIII®, under the Transmission system menu, in the sub-screen Miscellaneous. It is a good practice to document the EATX DTC EVENT DATA before beginning any diagnostic or service procedure.

A thorough understanding of how the transmission works is beneficial in order to interpret the data correctly. These skills are necessary in order to avoid an incorrect diagnosis.

A MASTERTECH video and reference book was produced in January 2002 that explains many of the features of the EATX DTC EVENT DATA with several examples on how to interpret the information and suggested training material to help understand all the specifics.

EATX DTC EVENT DATA can only be erased by:

1. Disconnecting the battery.
2. Performing a DRBIII® QUICK LEARN procedure.
3. Reprogramming the EATX/NGC controller.

Erasing Transmission DTCs does **not** clear the EATX DTC EVENT DATA.

3.3.7 LIST OF DIAGNOSTIC TROUBLE CODES (DETAILED DESCRIPTIONS FOLLOW LIST)

The Transmission Control System may report any of the following DTC's.

The Transmission Control System may report any of the following DTC's.

DTC	P-Code	Name of Code	Limp-in	MIL
11	P0613	Internal TCM	Yes	Yes
12	P1684	Battery was disconnected	No	No
13	P0613	Internal TCM	Yes	Yes
14	P0891	Transmission Relay always on	Yes	Yes
15	P0888	Relay output always off	Yes	Yes
16	P0605	Internal TCM	Yes	Yes
17	P0604	Internal TCM	Yes	Yes
18	P0725	Engine speed sensor circuit	Yes	Yes
19	P1694	Bus communication with engine module	No	No[-2]
20	P0890	Switched battery	Yes	Yes
21	P0871	OD pressure switch sense circuit	Yes	Yes[-1]
22	P0846	2/4 pressure switch sense circuit	Yes	Yes
24	P0841	LR pressure switch sense circuit	Yes	Yes
28	P0706	Check shifter signal	No	No
29	P0124	Throttle Position Sensor/APPS intermittent	No	Yes[-3]
2A	P0122	Throttle Position Sensor/APPS low	No	Yes[-3]
2B	P0123	Throttle Position Sensor/APPS high	No	Yes[-3]
31	P0870	OD hydraulic pressure test failure	Yes	Yes
32	P0845	2/4 hydraulic pressure test failure	Yes	Yes
33	P0992	2-4/OD hydraulic pressure test failure	Yes	Yes
35	P0944	Loss of prime	No	No
36	P1790	Fault immediately after shift	No	No
37	P1775	Solenoid switch valve latched in TCC position	No	Yes
38	P0740	Torque converter clutch control circuit	No	Yes
41	P0750	LR Solenoid circuit	Yes	Yes
42	P0755	2/4 Solenoid circuit	Yes	Yes
43	P0760	OD Solenoid circuit	Yes	Yes
44	P0765	UD Solenoid circuit	Yes	Yes
45	P0613	Internal TCM	No	No
47	P1776	Solenoid switch valve latched in LR position	Yes	Yes
50	P0736	Gear ratio error in reverse	Yes	Yes
51	P0731	Gear ratio error in 1st	Yes	Yes
52	P0732	Gear ratio error in 2nd	Yes	Yes
53	P0733	Gear ratio error in 3rd	Yes	Yes
54	P0734	Gear ratio error in 4th	Yes	Yes
56	P0715	Input speed sensor error	Yes	Yes
57	P0720	Output speed sensor error	Yes	Yes
58	P1794	Speed sensor ground error	Yes	Yes
69	P0952	AutoStick input circuit low	No	No
70	P0953	AutoStick input circuit high	No	No
71	P1797	Manual shift overheat	No	No
73	P0897	Worn out/burnt transaxle fluid	No	No
7A	P0711	Transmission temperature sensor performance	No	No
7B	P0712	Transmission temperature sensor low	No	No
7C	P0713	Transmission temperature sensor high	No	No
7D	P0714	Transmission temperature sensor intermittent	No	No
75	P0218	High temperature operation activated	No	No
76	P0884	Power up at speed	No	No
77	P1687	No communication with the MIC	No	No

The Transmission Control System may report any of the following DTC's.				
DTC	**P-Code**	**Name of Code**	**Limp-in**	**MIL**
78	P1652	Serial communication link malfunction	No	No-2
79	P0562	Low battery voltage	Yes	Yes
94	P0613	Internal TCM	Yes	Yes

Notes:
P1xxx DTC's will set the MIL only after 10 seconds of vehicle operation.
1 - The MIL will be lit only if DTC P0706 is also present
2 - The MIL will be lit by the engine controller
3 - The MIL will be lit only if the engine controller is not calibrated for throttle substitution.
Yes (underlined) indicates that this DTC can take up to five minutes of problem identification before illuminating the MIL.

3.3.8 DTC DESCRIPTIONS

Name of code: P0613(11, 13, 45, 94) - Internal TCM
When monitored: Whenever the key is in the Run or Run/Start position.
Set condition: This code is set whenever Transmission Control System senses an internal error.
Theory of operation: The PCM is constantly monitoring its internal processor. If an internal problem is detected, this DTC will be set. This DTC can also be set by a bad ground to the PCM and/or Trans Control Relay.
Transmission Effects: The MIL will illuminate (this DTC can take up to five minutes of problem identification before illuminating the MIL) and the transmission system will default to the Immediate Shutdown routine.
Possible causes:

> PCM ground circuit.
> Relay ground circuit
> PCM

Name of code: P1684(12) - Battery was Disconnected (Informational code Only)
When monitored: Whenever the key is in the Run/Start position.
Set condition: This code is set whenever the PCM is disconnected from battery power (B+) or ground. It will also be set during the DRBIII® Battery Disconnect procedure.
Theory of operation: A battery backed RAM (Random Access Memory) is used to maintain some learned values. When the battery B(+) is disconnected, the memory is lost. When the B(+) is restored, this memory loss is detected by the PCM. The code is set and the learned values are initialized to known constants or previously learned values from EEPROM (Electronic Erasable Programmable Read Only Memory). This results in the reinitialization of some parameters.
Transmission Effects: Loss of trouble code data. Immediate Limp-in mode if power is lost while operating the vehicle. Normal operation is resumed if the power is restored during the same key start.
Possible causes:

> Battery voltage removed from PCM
> PCM disconnected
> Dead Battery
> Low battery voltage during cranking
> Battery Disconnect by DRBIII® or MDS2
> PCM ground circuit missing.

Name of code: P0891(14) - Transmission Relay Always On
When monitored: Ignition key is turned from off position to run position and/or ignition key is turned from crank position to run position.
Set condition: This code is set if the PCM senses greater than 3 volts at the Trans Relay Output (switched battery) terminal of the PCM prior to the PCM energizing the relay.
Theory of operation: The transmission control relay is used to supply power to the solenoid pack when the transmission is in normal operating mode. When the relay is off, no power is supplied to the solenoid pack and the transmission is in Limp-in mode. The relay output is fed back to the PCM. It is referred to as the Transmission Control Relay Output circuit or switched battery.
Transmission Effects: The MIL will illuminate and the transmission system defaults to Logical Limp-in mode. Logical Limp-in mode results in the same modes of operation as Limp-in. Since the relay is stuck "on", the PCM can not open the relay, and the PCM shifts to 2nd gear.
Possible causes:

> Relay failure (welded contacts)
> Short to battery in 12-volt supply and/or Transmission Control Relay Output circuit(s)
> Short to voltage
> PCM connector problems
> PCM

Name of code: P0888(15) - Relay Output Always Off

When monitored: Continuously

Set condition: This code is set when less than 3 volts are present at the Transmission Control Relay Output (switched battery) terminals at the PCM, when the PCM is energizing the relay.

Theory of operation: The transmission control relay is used to supply power to the solenoid pack when the transmission is in normal operating mode. When the relay is off, no power is supplied to the solenoid pack and the transmission is in Limp-in mode. The relay output is fed back to the PCM. It is referred to as the Transmission Control Relay Output circuit or switched battery.

After a controller reset (ignition key turned to the run position or after cranking engine), the controller energizes the relay. Prior to this the PCM verifies that the contacts are open by checking for no voltage at the switched battery terminals. After the relay is energized, the PCM monitors the terminals to verify that the voltage is greater than 3 volts.

Transmission Effects: The MIL illuminates and the transmission system defaults to Limp-in mode.

Possible causes:

> Relay failure (intermittent relay function caused by oxidized or contaminated relay contacts)

> Short to ground or open circuit in the Transmission Control Relay circuit(s)

> PCM connector problem

> PCM

Name of code: P0725(18) - Engine Speed Sensor Circuit

NOTE: This code is not a Transmission Input Speed Sensor DTC

When monitored: Whenever the engine is running.

Set condition: This code is set when the engine speed sensed by the PCM is less than 390 RPM or greater than 8000 RPM for more than 2.0 seconds.

Theory of operation: The PCM uses a new dual port RAM internal to the controller to send the Crank Sensor signal to the Transmission Control System. If the PCM interprets this signal to be out of range when the engine is running the code is set.

Transmission Effects: The MIL illuminates and the transmission system defaults to Limp-in mode.

Possible causes:

> Engine DTC (engine rpm related) present

> PCM

Name of code: P1694(19) - Bus Communication with Engine Module

When monitored: Continuously with key on.

Set condition: If no PCI bus messages are received from the Powertrain Control Module (PCM) for 10 seconds.

Theory of operation: The PCM uses a new dual port RAM internal to the controller to communicate with the Transmission Control System. The Transmission Control System relies on certain engine information to function properly. The Transmission Control System continuously monitors the internal engine bus to check for messages broadcast from the PCM.

Transmission Effects: Delayed 3-4 shifts. No EMCC and early 3-4 shifts for a few minutes after engine is started.

Possible causes:

> PCM

Name of code: P0890(20) - Switched Battery

When monitored: Ignition key is turned from off position to run position and/or ignition key is turned from crank position to run position.

Set condition: This code is set if the PCM senses voltage on any of the pressure switch inputs prior to the PCM energizing the relay.

Theory of operation: The transmission control relay is used to supply power to the solenoid pack when the transmission is in normal operating mode. When the relay is off, no power is supplied to the solenoid pack and the transmission is in Limp-in mode. The relay output is fed back to the PCM. It is referred to as the Transmission Control Relay Output circuit or switched battery.

Immediately after a controller reset (ignition key turned to the run position or after cranking engine), the PCM verifies that the relay contacts are open by checking for no voltage at the switched battery terminals. After this is verified, the voltage at the pressure switches is checked. There should be no voltage on the pressure switches at this time. The PCM will then activate the relay.

Transmission Effects: The MIL illuminates and the transmission system defaults to Limp-in mode.

Possible causes:

> Short to battery on one or more pressure switch sense circuits

> PCM connector problems

> PCM

Name of code: P0871(21) - OD Pressure Switch Sense Circuit

When monitored: Whenever the engine is running.

Set condition: This code is set if the OD pressure switch is open or closed at the wrong time in a given gear.

Theory of operation: The PCM uses three pressure switches to monitor the fluid pressure in the LR, 2/4, and OD clutch circuits. The pressure switches are continuously monitored for the correct states in each gear as shown below.

PRESSURE SWITCH STATES

SWITCHES	R	N	1ST	2ND	3RD	4TH
L/R	OPEN	CLOSED	CLOSED	OPEN	OPEN	OPEN
2/4	OPEN	OPEN	OPEN	CLOSED	OPEN	CLOSED
O/D	OPEN	OPEN	OPEN	OPEN	CLOSED	CLOSED

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Transmission Effects: Normal operation will be experienced if no other codes are present. Transmission Control System will ignore the code. Limp-in condition will only occur if code P0871(21) is present with a code P0706(28).

Possible causes:

> If code P0944(35) is present, ignore code P0871(21) and perform code P0944 diagnostic procedures

> OD pressure switch sense circuit open or shorted to ground between PCM and solenoid pack

> OD pressure switch sense circuit shorted to battery

> Solenoid/Pressure Switch assembly

> Loose valve body bolts

> Plugged filter - internal transmission or torque converter failure

> PCM

Name of code: P0846(22) - 2/4 Pressure Switch Sense Circuit

When monitored: Whenever the engine is running.

Set condition: This code is set if the 2/4 pressure switch is open or closed at the wrong time in a given gear.

Theory of operation: The Transmission system uses three pressure switches to monitor the fluid pressure in the LR, 2/4, and OD elements. The pressure switches are continuously monitored for the correct states in each gear as shown below.

Transmission Effects: If the 2/4 pressure switch is identified as closed in P or N, the code will immediately be set and normal operation will be allowed for that given key start. If the problem is identified for 3 successive key starts, the transmission will go into Limp-in mode.

PRESSURE SWITCH STATES

SWITCHES	R	N	1ST	2ND	3RD	4TH
L/R	OPEN	CLOSED	CLOSED	OPEN	OPEN	OPEN
2/4	OPEN	OPEN	OPEN	CLOSED	OPEN	CLOSED
O/D	OPEN	OPEN	OPEN	OPEN	CLOSED	CLOSED

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If the 2/4 pressure switch is identified as being closed in 1st or 3rd gear and was not identified as being closed in P or N, then 2nd gear or 4th gear will be substituted for 1st or 3rd gear depending on throttle angle and vehicle speed. A short period of time after the gear substitution, the transmission will return to normal operating mode. If the transmission is shifted back into 1st or 3rd gear through normal operation, and the 2/4 pressure switch remains closed, 2nd or 4th gear will be substituted briefly and then resume normal operation. If four gear substitutions occur in a given key start, the transmission will go into Limp-in mode.

If the 2/4 pressure switch is open (indicating no 2/4 clutch pressure) in 2nd or 4th gear, the Transmission Control System sets code P0846(22) and continues with normal operation. The transmission will only go into Limp-in mode if a code P0706(28) is also present. If no 2/4 clutch pressure is present a gear ratio code P0732(52) or P0734(54) will be set and cause the limp-in condition.

Possible causes:

> If code P0944(35) is present, ignore code P0846(22) and perform code P0944 diagnostic procedures

> 2/4 pressure switch sense circuit open or shorted to ground between PCM and solenoid pack

> 2/4 pressure switch sense circuit shorted to battery

> Solenoid/Pressure Switch assembly

> Transmission overheated - Excessive regulator valve leakage in valve body causing high line pressure which results in 2/4 solenoid blow-off in 1st or 3rd gear. May require new valve body if it happens only when hot.

> Loose valve body bolts

> Plugged filter - internal transmission or torque converter failure

> PCM

Name of code: P0841(24) - LR Pressure Switch Sense Circuit

When monitored: Whenever the engine is running.

Set condition: This code is set if the LR pressure switch is either open or closed at the wrong time in a given gear.

Theory of operation: The Transmission system uses three pressure switches to monitor the fluid pressure in the LR, 2/4, and OD elements. The pressure switches are continuously monitored for the correct states in each gear.

PRESSURE SWITCH STATES

SWITCHES	R	N	1ST	2ND	3RD	4TH
L/R	OPEN	CLOSED	CLOSED	OPEN	OPEN	OPEN
2/4	OPEN	OPEN	OPEN	CLOSED	OPEN	CLOSED
O/D	OPEN	OPEN	OPEN	OPEN	CLOSED	CLOSED

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Transmission Effects: If a set condition is identified, 1st gear and torque converter lock-up (EMCC) will be inhibited. The vehicle will launch in 2nd gear and shift normally through the gears without allowing EMCC. If during the same key start, the set condition is no longer valid, the transmission will return to normal operation (1st and EMCC available). Limp-in will not occur unless code P0841(24) is accompanied by a code P0706(28) and the MIL will illuminate after 5 minutes of substituted operation.

Possible causes:

> If code P0944(35) is present, ignore code P0841(24) and perform code P0944(35) diagnostic procedures

> LR pressure switch sense circuit, open or shorted to ground between PCM and solenoid pack

> LR pressure switch sense circuit shorted to battery

> Solenoid/Pressure Switch assembly

> Valve body - solenoid switch valve stuck in LU position. May be accompanied by a code P1775(37)

> Loose valve body bolts

> Plugged filter - internal transmission or torque converter failure

> PCM

Name of code: P0706(28) - Check Shifter Signal

When monitored: Continuously with the key on.

Set condition: 3 occurrences in one key start of an invalid PRNDL code which lasts for more than 0.1 second.

Theory of operation: The C1 through C4 (T1, T3, T41, and T42) sense circuits communicate the shift lever position to the PCM. Each circuit is terminated at the transmission with a switch. Each switch can be either open or closed, depending on the shift lever position. The PCM can decode this information and determine the shift lever position. Each shift lever position has a certain combination of switches which will be open and closed, this is called a PRNDL code. There are 4 switches, therefore: there are many possible combinations of open and closed switches (codes). However, there are only 9 valid codes (8 for AutoStick), one for each gear position and three recognized between gear codes. The remainder of the codes should **never occur**, these are called invalid codes. The following chart shows the normal switch states for each shift lever position.

41TE TRANSMISSION RANGE SENSOR STATES

TRS	PARK	T1	REVERSE	T2	NEUTRAL	T2	OD	T3	D3/AS	T3	L
T1 (C4)	OPEN	OPEN	OPEN	CLOSED	CLOSED	CLOSED	CLOSED	CLOSED	OPEN	CLOSED	CLOSED
T3 (C3)	CLOSED	CLOSED	OPEN	OPEN	OPEN	OPEN	OPEN	CLOSED	CLOSED	CLOSED	CLOSED
T41 (C1)	CLOSED	OPEN	OPEN	OPEN	CLOSED	OPEN	OPEN	OPEN	OPEN	OPEN	OPEN
T42 (C2)	CLOSED	CLOSED	CLOSED	CLOSED	CLOSED	CLOSED	OPEN	OPEN	OPEN	OPEN	CLOSED

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The following are DRBIII® reported Shift Lever Error codes (chart)

SHIFT LEVER ERROR CODES REPORTED BY THE DRBIII®

ERROR CODE	SWITCH STUCK	POSITION
1	T1/C4 STUCK	OPEN
2	T1/C4 STUCK	CLOSED
3	T3/C3 STUCK	OPEN
4	T3/C3 STUCK	CLOSED
5	T42/C2 STUCK	OPEN
6	T24/C2 STUCK	CLOSED
7	T41/C1 STUCK	OPEN
8	T41/C1 STUCK	CLOSED

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Transmission Effects and possible causes:

Scenario 1) - All PRNDL lights stay illuminated indefinitely in Park following a Key start.

> Wrong Part Number PCM for application

> TRS connector not plugged in

> C1 through C4 (T1, T3, T41, or T42) circuits are open, shorted to ground, or shorted to 12 volts.

> PCI bus failure (Open or shorted resulting in no communication to BCM or Cluster)

> TRS

> PCM

> BCM

Scenario 2) - "P" is indicated following a key start but all PRNDL lights illuminate in "N" following a shift from "R" to "N". If PRNDL lights illuminate in "N" and shifter is moved directly into "3" or "L" position without pausing in "OD", then the "OD" position shift schedule and electronic display will indicate "OD" until the shifter is shifted into the "OD" position and held for at least 3 seconds.

> Worn Manual Lever (Rooster Comb). Check for heavy wearing by TRS switch contacts

> Intermittent C1 through C4 (T1, T3, T41 or T42) circuits. Check for corrosion, terminal push-outs or spread terminals at PCM and/or TRS connector

> TRS

> PCM

> BCM

Scenario 3) - If an invalid code happens while operating in the "3" or "L" position, the "3" or "L" shift schedule and electronic display will be frozen (regardless of whether "OD"', "3" or "L" is selected). The display will be frozen until the shifter is moved to the "N" position (all PRNDL lights will illuminate) and then back to the "OD" position. The "N" and "OD" position must be held there for at least 3 seconds in order to resume the normal "OD" shift schedule and electronic display.

> Intermittent C1 through C4 (T1, T3, T41 or T42) circuits. Check for corrosion, terminal push-outs or spread terminals at PCM and/or TRS connector

> TRS

> PCM

> BCM

These same symptoms may occur without the code P0706(28) setting. It is possible that the invalid code that was sensed by the PCM only occurred once or twice during the given ignition key start and/or did not last for longer than 0.1 second.

Name of code: P0124(29) - Throttle Position Sensor/APPS Intermittent

Name of code: P0122(2A) - Throttle Position Sensor/APPS Low

Name of code: P0123(2B) - Throttle Position Sensor/APPS High

When monitored: Whenever the key is on or the engine is running. Engine speed > 500 rpm

Set condition:

P0124 - Throttle angle change > 5° in 7 milliseconds the Fault set time milliseconds 0.448 seconds

P0122 - Throttle angle < 6° the Fault Set Time: 0.448 seconds

P0123 - Throttle angle > 120.6° the Fault Set Time: 0.448 seconds

Theory of operation: The transmission controller receives the throttle position signal and its ground from the Throttle Position Sensor (TPS). The TPS has a 5 volt pull up supplied by the engine controller. The throttle signal is checked for out-of-range as well as intermittency (excessive signal changes). The engine controller transmits the throttle value via the Dual Port RAM. Most engine controllers can synthesize the throttle value if the throttle position sensor signal is lost. If a throttle error is detected by the transmission controller and the throttle value is available via the Dual Port RAM, the Dual Port RAM throttle value will be used and normal operation will continue, however a throttle fault code will be set. If a throttle error is detected and the throttle value is not available via the Dual Port RAM, normal operation will be discontinued, a throttle fault code will be set, and the MIL will be turned on after 5 min. of substituted operation.

Transmission Effects:

- If throttle value available via the Dual Port RAM - No effect.
- If throttle value not available via the Dual Port RAM
  A default throttle value is used.
  Torque converter lock-up inhibited.
  4th gear inhibited.
  Limited shift schedule.
  MIL on after 5 min. of substituted operation.

Possible causes:

> Wiring problem.

> TPS

> PCM

Name of code: P0870(31) - OD Hydraulic Pressure Test Failure
P0845(32) - 2-4 Hydraulic Pressure Test Failure
P0992(33) - 2-4/OD Hydraulic Pressure Test Failure

When monitored: In 1st, 2nd, or 3rd gear with engine speed above 1000 RPM shortly after a shift and every minute thereafter.

Set condition: Immediately after a shift into 1st, 2nd, or 3rd gear, with engine speed above 1000 RPM, the PCM momentarily turns on element pressure to the 2/4 and/or OD clutch circuits to identify that the appropriate pressure switch closes. If the pressure switch does not close it is tested again. If the switch does not close the second time, the appropriate code is set.

Theory of operation: The PCM tests the OD and 2/4 pressure switches when they are off (OD and 2/4 are tested in 1st gear, OD in 2nd gear, and 2/4 in 3rd gear). The test verifies that the switches are operational. The PCM verifies that the switch closes when the corresponding element is applied. If a switch fails to close, it is retested, If it fails the second test, the code is set.

Transmission Effects: The MIL illuminates and the transmission system defaults to Limp-in mode.

Possible causes:

> Pressure switch sense circuit shorted to battery between PCM and solenoid pack.

> Low line pressure

> Solenoid/Pressure Switch assembly

PRESSURE SWITCH STATES

SWITCHES	R	N	1ST	2ND	3RD	4TH
L/R	OPEN	CLOSED	CLOSED	OPEN	OPEN	OPEN
2/4	OPEN	OPEN	OPEN	CLOSED	OPEN	CLOSED
O/D	OPEN	OPEN	OPEN	OPEN	CLOSED	CLOSED

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Name of code: P0944(35) - Loss Of Prime
When monitored: If the transmission is slipping in any forward gear and the pressure switches are not indicating pressure, a loss of prime test is run.
Set condition: If the transmission begins to slip in any forward gear, and the pressure switch or switches that should be closed for a given gear are open, a loss of prime test begins. All available elements (in 1st gear LR, 2/4 and OD, in 2nd, 3rd, and 4th gear 2/4 and OD) are turned on by the PCM to see if pump prime exists. The code is set if none of the pressure switches respond. The PCM will continue to run the loss of prime test until pump pressure returns.
Theory of operation: The loss of prime test is used to prevent transmission faults, which can be caused by a lack of pump prime.
Transmission Effects: Vehicle will not move or transmission slips. Normal operation will continue if pump prime returns.
Possible causes:

> Low transmission fluid level

> PRNDL indicates a valid OD code in the hydraulic reverse position

> Transmission fluid filter clogged or damaged

> Transmission fluid filter improperly installed (Bolts loose or O-ring missing)

> Oil pump - If a customer has a problem when the transmission is cold. Where someone shifts to reverse, reverse is engaged, and then shifts to OD and does not get OD (gets a neutral condition), and then can not get reverse or OD for 3-20 seconds, replace the oil pump. High side clearance in the oil pump will set a code 35. The pump will prime upon start-up, but as the torque converter purges air (drain down) the air will leak across the inner rotor into the pump suction port and cause a loss of prime right after the shift into OD. After 3 - 20 seconds, pump prime will return and normal operation will continue. The pump should be replaced only after all other possible causes above have been checked and verified.

Name of code: P1790(36) - Fault Immediately After Shift
When monitored: After a gear ratio error is stored.
Set condition: This code is set if the associated gear ratio code is stored within 1.3 seconds after a shift.
Theory of operation: This code will only be stored along with a 50 series code. If this code is set, it indicates the problem is mechanical in nature. When this code exists, diagnosing the transmission should be based on the associated gear ratio code and primarily mechanical causes should be considered.
Transmission Effects: None
Possible causes:

> Mechanical causes as listed under associated gear ratio code.

Name of code: P1775(37) - Solenoid Switch Valve Latched in TCC Position
When monitored: During an attempted shift into 1st gear.
Set condition: This code is set if three unsuccessful attempts are made to get into 1st gear in one given key start.
Theory of operation: The solenoid switch valve (SSV) controls the direction of the transmission fluid when the LR/TCC solenoid is energized. The SSV will be in the downshifted position in 1st gear, thus directing the fluid to the L-R clutch circuit. In 2nd, 3rd, and 4th, it will be in the upshifted position and directs the fluid into the torque converter clutch (TCC).

When shifting into 1st gear, a special hydraulic sequence is performed to ensure SSV movement into the downshifted position. The LR pressure switch is monitored to confirm SSV movement. If movement is not confirmed (the LR pressure switch does not close), 2nd gear is substituted for 1st.
Transmission Effects: Transmission will have no 1st gear (2nd gear will be substituted), and no EMCC operation and the MIL will illuminate after 5 minutes of substituted operation.
Possible causes:

> PRNDL indicates a valid OD code in the hydraulic reverse position

> Valve body - Solenoid valve stuck in TCC position

> High idle speed

> Solenoid malfunction - LR pressure switch will not close

> LR Pressure Switch Sense circuit shorted to battery

Name of code: P0740(38) - Torque Converter Clutch Control Circuit
When monitored: During Electronically Modulated Converter Clutch (EMCC)
Set condition:
(a) The transmission must be in EMCC, with the input speed greater than 1750 RPM. The TCC/LR solenoid must achieve it's maximum duty cycle and still not be able to pull the engine speed within 60 RPM of input speed.
b) If the transmission is in FEMCC and the engine can slip the TCC by more than 100 RPM (Engine speed - Input speed) for 10 seconds.

The code will be set if one of these event happens three times at a throttle angle less than 30 degrees.
Theory of operation: When in 2nd, 3rd, or 4th gear, the torque converter clutch (TCC) can be locked when certain conditions are met. The TCC piston is electronically modulated by increasing the duty cycle of the LR/TCC solenoid until the torque converter slip difference (difference between engine and turbine speed) is within 60 RPM. Then the LR/TCC solenoid is fully energized (FEMCC / 100% duty cycle). Torque converter slip is monitored in FEMCC to ensure adequate clutch capacity.
Transmission Effects: EMCC will still be available after code is set. MIL will illuminate after 5 minutes of accumulated slip in FEMCC. The transmission will attempt normal operation (not in Limp-in) even after the MIL is illuminated.
Possible causes:

> Worn pump bushing and/or failed torque converter - both should be replaced during a rebuild with code P0740(38) present

> Solenoid/Pressure Switch assembly.

Name of code: P0750(41) - LR Solenoid Circuit
P0755(42) - 2/4 Solenoid Circuit
P0760(43) - OD Solenoid Circuit
P0765(44) - UD Solenoid Circuit
When monitored: Ignition key is turned from off position to run position and/or ignition key is turned from crank position to run position, then every 10 seconds thereafter, or when a gear ratio or pressure switch error DTC is detected.
Set condition: All four solenoids are tested for continuity continuously immediately upon start up and during vehicle operation. For solenoids that are currently energized, power is momentarily interrupted, then reenergized. For solenoids that are not currently energized, the solenoid is momentarily energized, then de-energized. Under both situations, if an inductive spike is not sensed by the PCM during the continuity check, it is re-tested twice. If it fails the test the third time, the appropriate code is set.

SOLENOID APPLICATION CHART

GEAR	UD	OD	REV	2/4	LR
PARK					X
REVERSE			X		X
NEUTRAL					X
1ST	X				X
2ND	X			X	
3RD	X	X			
4TH		X		X	

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Theory of operation: Four solenoids are used to control the friction elements (clutches). The continuity of the solenoids circuits are periodically tested. Each solenoid is turned on or off depending on its current state. An inductive spike should be detected by the PCM during this test. If no spike is detected, the circuit is tested again to verify the failure. In addition to the periodic testing, the solenoid circuits are tested if a gear ratio or pressure switch error occurs. In this case, one failure will result in the appropriate code being set.
Transmission Effects: The MIL will illuminate and the transmission goes into neutral if code is set above 35 Km/h (22 MPH), Limp-in mode when vehicle speed is below 35 Km/h (22 MPH).
Possible causes:

> Open or shorted solenoid circuit(s) between PCM and Transmission Solenoid/Pressure Switch assembly

> Open ground circuit

> PCM connector problems.

> Solenoid/Pressure Switch connector problem.

> Solenoid/Pressure Switch assembly.

> PCM

Name of code: P1776(47) - Solenoid Switch Valve Latched in LR Position
When monitored: Continuously when doing partial or full EMCC (PEMCC or FEMCC)
Set condition: If the transmission senses the LR pressure switch closing while performing PEMCC or FEMCC. This code will be set after two unsuccessful attempts to perform PEMCC or FEMCC.
Theory of operation: The solenoid switch valve (SSV) controls the direction of the transmission fluid when the LR/TCC solenoid is energized. SSV will be in the downshifted position in 1st gear, thus directing the fluid to the LR clutch circuits. In 2nd,

3rd, and 4th, the SSV will be in the upshifted position and directs the fluid into the torque converter clutch (TCC).

When doing PEMCC or FEMCC, the LR pressure switch should indicate no pressure if the SSV is in the TCC position. If the LR pressure switch indicates pressure while in PEMCC or FEMCC, EMCC operation is aborted and inhibited to avoid inadvertent application of the LR clutch. Partial EMCC will be attempted if the LR pressure switch does not indicate pressure. A second detection of LR pressure results in setting the code.

Transmission Effects: At speeds above 72 Km/h (45 MPH), EMCC is inhibited. Once speed falls below 72 Km/h (45 MPH), the transmission will go into Limp-in mode and the MIL will illuminate after 5 minutes of substituted operation.

Possible causes:

> Valve body - Solenoid valve stuck in LR position

> Intermittent short to ground or open circuit in LR Pressure Switch Sense circuit (with code 24 only)

> Solenoid/Pressure Switch (with code P0841(24) only)

> PCM (with code P0841(24) only)

Name of code: P0736(50) - Gear Ratio Error in Reverse
P0731(51) - Gear Ratio Error in 1st
P0732(52) - Gear Ratio Error in 2nd
P0733(53) - Gear Ratio Error in 3rd
P0734(54) - Gear Ratio Error in 4th
P0715(56) - Input Speed Sensor Error
P0720(57) - Output Speed Sensor Error
P1794(58) - Speed Sensor Ground Error

When monitored: The transmission gear ratio is monitored continuously while the transmission is in gear.

Set condition: This code is set if the gear ratio is not correct for a period of time.

– Codes 50 through 54 sets if the ratio of the input RPM (Nt) to the output RPM (No) does not match the given gear ratio.
– Code 56 sets if there is an excessive change in input RPM in any gear
– Code 57 sets if there is an excessive change in output RPM in any gear
– Code 58 sets after a PCM reset in neutral and Nt/No equals a ratio of input to output of 2.50

A hard code sets within 3 seconds, an intermittent code sets within 15 seconds.

Theory of operation: The transmission system uses two speed sensors, one to measure input RPM and one to measure output RPM. These inputs are essential for proper transmission operation. Therefore, the integrity of this data is verified through the following checks:

1. When in gear, if the gear ratio does not compare to a known gear ratio, the corresponding in-gear trouble code is set (codes 50 through 54).
2. An excessive change in input or output speeds indicating signal intermittent will result in codes 56 and/or 57 being set.
3. After a PCM reset in neutral, observing erratic output and input speed sensor signals indicates a loss of the common speed sensors ground. This sets a code 58.

Transmission Effects: The transmission will not go into Limp-in mode until three gear ratio error events occur in a given key start also the MIL will illuminate after 5 minutes of substituted operation. This allows for intermittent problems to correct themselves without opening the relay. However, if a gear ratio error develops, a code is always set, but if the condition corrects itself the transmission will continue without requiring the ignition key to be cycled on and off. Many different events could occur given the range of failures possible for codes 50 through 58. The following are a few examples:

– Codes 51, 52, 53, 54, 56, and 57 at speeds above 72 Km/h (45 MPH) - The appropriate code is set, EMCC is aborted and current gear is maintained. If while still traveling above 72 Km/h (45 MPH), the gear ratio becomes valid again, EMCC will reengage and normal operation will resume. If the gear ratio becomes intermittent and recovers three times in a given key start, the current gear will be maintained and EMCC inhibited. Then the transmission will go into Limp-in mode if throttle is applied below 72 Km/h (45 MPH) or at 35 Km/h (22 MPH) with closed throttle.
– Codes 51, 52, 53, 54, 56, and 57 at speeds between 35 and 72 Km/h (22 and 45 MPH) - If one of these codes is set between 35 and 72 Km/h (22 and 45 MPH), the current gear will be maintained until the gear ratio problem corrects itself. If throttle is applied, the transmission will go to 2nd gear. If this happens and the gear ratio problem goes away, normal operation will resume. If three gear ratio problems are identified in a given key start, the current gear will be frozen until throttle is applied. The transmission will then go into Limp-in mode with throttle applied at speeds between 35 and 72 Km/h (22 and 45 MPH)
– Codes 51, 52, 53, 54, 56, and 57 at speeds below 35 Km/h (22 MPH) - If a gear ratio problem is identified below 35 Km/h (22

MPH), the transmission will immediately substitute second gear for the current gear. If the gear ratio problem goes away, normal operation will resume. If three gear ratio problems are identified in a given key start, the transmission will go into Limp-in mode.

Possible causes:

Code P0736(50) - Excludes geartrain failures which should be obvious upon disassembly

> If code P0944(35) is also set, follow diagnostic procedure for code P0944(35) first

> Valve body - #1 ball check or LR switch valve sticking - may also set code P0731(51)

> Speed sensor or associated wiring - may also set codes P0731(51), P0715(56), or P0720(57)

> Failed or slipping LR clutch - may also set code P0731(51)

– LR seal leakage (Intermittent no drive or reverse)

– Sticky LR accumulator seals (Intermittent no drive or reverse)

> Failed reverse clutch (hard code)

– OD/Rev lip seal leakage

– Worn reaction shaft support seal rings

– Snap ring out of position

Code P0731(51) - Excludes geartrain failures which should be obvious upon disassembly

> If code P0944(35) is also set, follow diagnostic procedure for code P0944(35) first

> Valve body - #1 ball check or LR switch valve sticking - may also set code P-0736(56) or have no Reverse

> Speed sensor or associated wiring - may also set codes P0736(50), P0715(56), or P0720(57)

> Failed or intermittent slipping UD clutch - may also set P0732(52), or P0733(53)

– UD seal leakage (intermittent)

– Worn input clutch hub bushing (hard code at heavy throttle)

– Sticky UD accumulator seals (intermittent)

– Worn reaction shaft support seal rings (hard code at heavy throttle)

– Solenoid pack (UD pressure in 4th gear)

> Failed or slipping LR clutch - may also set code P0736(56) or have no Reverse

– LR seal leakage (Intermittent)

– Sticky LR accumulator seals (Intermittent)

Code P0732(52) - Excludes geartrain failures which should be obvious upon disassembly

> If code P0944(35) is also set, follow diagnostic procedure for code P0944(35) first

> Failed or slipping 2/4 clutch - may also set code P0734(54)

– 2/4 seat leakage (intermittent)

– Sticky accumulator seals (intermittent)

> Failed or intermittent slipping UD clutch - may also set code P0731(51) and/or P0733(53)

– UD seal leakage (intermittent)

– Worn input clutch hub bushing (hard code at heavy throttle)

– Sticky UD accumulator seals (intermittent)

– Worn reaction shaft support seal rings (hard code at heavy throttle)

– Solenoid pack (UD pressure in 4th gear)

Code P0733(53) - Excludes geartrain failures which should be obvious upon disassembly

> If code P0944(35) is also set, follow diagnostic procedure for code P0944(35) first

> Failed or slipping OD clutch - may also set code P0734(54)

– OD and Reverse inner and outer lip seal leakage (usually hard code)

– Sticky OD accumulator seals (intermittent)

– Worn reaction shaft support seal rings (hard code at heavy throttle)

– Broken OD/UD tapered snap ring - (hard code at heavy throttle)

> Failed or intermittent slipping UD clutch - may also set code P0731(51) and/or P0732(52)

– UD seal leakage (intermittent)

– Worn input clutch hub bushing (hard code at heavy throttle)

– Sticky UD accumulator seals (intermittent)

– Worn reaction shaft support seal rings (hard code at heavy throttle)

– Solenoid pack (UD pressure in 4th gear)

Code P0734(54) - Excludes geartrain failures which should be obvious upon disassembly

> If code P0944(35) is also set, follow diagnostic procedure for code P0944(35) first

> Failed or slipping OD clutch - may also set code P0733(53)

– OD and Reverse inner and outer lip seal leakage (usually hard code)

– Sticky OD accumulator seals (intermittent)

– Worn reaction shaft support seal rings (hard code at heavy throttle)

– Broken OD/UD tapered snap ring - (hard code at heavy throttle)

> Failed or slipping 2/4 clutch - may also set code P0732(52)

– 2/4 seal leakage (intermittent)

– Sticky accumulator seals (intermittent)

Codes P0715(56) and P0720(57)

> Failed input or output speed sensor (intermittent or hard code)

> Shorted or open wiring between PCM and speed sensor(s) (intermittent)

> PCM Connector problems and/or Speed Sensor connector

Code P1794(58)

> Open or shorted speed sensor ground (speed sensor ground is different from chassis ground)

> Open or shorted Temperature Sensor wiring to TRS

> TRS - Will also set code P1799(74)

> PCM

Name of code: P0952(69) - AutoStick Sensor Circuit Low (If equipped)
When monitored: Whenever the engine is running.
Set condition:
1) The transmission shift lever is not in AutoStick and either the upshift or downshift switch is closed.
2) Upshift and downshift switches closed at the same time.
Theory of operation: In the AutoStick Mode (manual shift mode), upshifts and downshifts are actuated manually. Shift requests are detected by monitoring the upshift and downshift switches. The PCM monitors the above set conditions. A set condition will be tolerated for up to 15 seconds before setting a code.
Transmission Effects: The OD position shift schedule is substituted while operating in the AutoStick gear selector position. No Limp-in mode occurs.
Possible causes:

> Wiring or connector problems

> AutoStick switch failure

> PCM

Name of code: P1797(71) - Manual Shift Overheat
When monitored: Whenever the engine is running.
Set condition:

1. If the engine temperature exceeds 124°C (255°F) while operating in AutoStick mode.
2. If the transmission temperature exceeds 135°C (275°F) while in AutoStick mode

Theory of operation: Transmission and engine temperatures are monitored during vehicle operation. If conditions occur causing the engine or transmission to overheat, the AutoStick mode will be canceled, and a code will be set.
Transmission Effects: The 3 position shift schedule that is used in non-AutoStick applications is substituted while operating in the AutoStick gear selector position. No Limp-in mode occurs.
Possible causes:

> Engine overheat - refer to service manual for diagnosis and repair

> Transmission Overheat

– Restricted transmission cooling system

– Transmission fluid overfilled

– Radiator fan not functioning properly

– Extended driving in low gear

NOTE: Strenuous driving conditions may cause the vehicle to overheat. If the driver operates in or initiates AutoStick with an overheated vehicle, the code will be set.

Name of code: P0897(73) - Worn Out/Burnt Transaxle Fluid
When monitored: At every Fully Electronically Modulated Converter Clutch (FEMCC) to Partial Electronically Modulated Converter Clutch (PEMCC) transition miles when A/C compressor clutch is being cycled.
Set condition: The code will be set if vehicle shudder is detected 20 times when the A/C clutch is cycled.
Theory of operation: While in 3rd or 4th FEMCC and just before the A/C clutch engages, the Powertrain Control Module (PCM) requests the Transmission Control System to momentarily establish PEMCC operation. If vehicle shudder is detected during the FEMCC to PEMCC transition, a counter is incremented. If the count reaches 20, the trouble code is set. The driver may then notice harsh bumps when the A/C clutch is being cycled, but vehicle shudder will be eliminated. After 35 OBDII (EURO STAGE III OBD) warm-up cycles or if the code is cleared, PEMCC will be reactivated to see if shudder is still present. If one shudder event occurs, the code will be reset. Clearing the code and running battery disconnect with the DRBIII® is the only way to reset the shudder counter from 20 back to zero.
Transmission Effects: This code does not cause the transmission to go into Limp-in mode. However, once the code is set, FEMCC to PEMCC operation before the A/C clutch engagement will be disabled for 35 OBDII (EURO STAGE III OBD) warm up starts.
Possible causes:

> Degraded transmission fluid

> Wheels severely out of alignment

> Internal torque converter problem

Name of code: P0218(75) - High Temperature Operation Activated.

NOTE: This DTC is an informational DTC designed to aid the technician in diagnosing shift quality concerns.

When monitored: Whenever the engine is running.

Set condition: Immediately once the Overheat Shift Schedule is activated.

Theory of operation: If the transmission oil temperature rises above 115°C (240°F), the overheat shift schedule is activated refer to Transmission Operation as a function of Transmission Oil Temperature and the code is set. The DTC is an information code only and is being set to aid the technician in determining root cause of a customer driveability issue. The code is also intended to alert the technician to determine if a cooling system malfunction has occurred or if an additional transmission air to oil cooler should be added to the vehicle if the customer regularly drives in a manner that overheats the transmission. Extended operation above 115°C (240°F) will reduce the durability of the transmission and should be avoided. Correcting the cooling system malfunction or installing an additional transmission oil cooler will improve transmission durability especially for customers who operate in city/construction stop and go traffic, tow trailers regularly, drive aggressively in low gear or drive regularly in mountainous areas.

Transmission effects: Information only code. - Overheat shift schedule was activated, no Limp-in condition occurs. 2nd gear partial EMCC above 40 Km/h (25 MPH), 3rd gear EMCC from 45-69 Km/h (28-43 MPH), delayed 3-4 upshift at 69 Km/h (43 MPH), early 4-3 coastdown at 66 Km/h (41 MPH), EMCC operation under all conditions above 40 Km/h (25 MPH) except at closed throttle or 1st gear.

Possible causes:

- Transmission Overfilled with Oil
- Engine cooling fan failure
- Engine thermostat stuck closed
- Radiator corroded or packed with dirt
- Transmission Oil Cooler Plugged
- Customer driving pattern requires additional transmission cooling

Name of code: P0884(76) - Power-Up at Speed

When monitored: When PCM (transmission control module) initially powers-up.

Set condition: If the PCM powers up while in the "Drive" position and the vehicle is going above 32 Km/h (20 MPH), the code is set.

Theory of operation: If a vehicle loses power to the PCM, the vehicle will go to the 2nd gear mode since there is no power available to control the transmission solenoids. However if power is restored, the PCM will power-up and normal operation will be restored. This DTC identifies that power to the PCM was restored when the gear selector was in a "Drive" position while the vehicle was moving at speeds above 32 Km/h (20 MPH). If someone shifts to Neutral and cycles the ignition key and quickly shifts to "Drive" while moving before the PCM comes out of its START ROUTINE, the DTC can be set. Therefore it is critical that this DTC diagnosis repair procedure should only be used if the vehicle is experiencing intermittent 2nd gear operation and subsequently a return to normal operation during normal driving.

Transmission effects: No Limp-in condition. The DTC is for information only when trying to diagnosis intermittent 2nd gear operation and subsequently a return to normal operation.

Possible causes:

- No Problem if vehicle is started in "neutral" at speeds above 32 Km/H (20 MPH) and shifted quickly to "Drive" before PCM comes out of the START ROUTINE.

FOR INTERMITTENT 2ND GEAR OPERATION AND THEN A SUBSEQUENT RETURN TO NORMAL OPERATION WITHOUT CYCLING THE IGNITION KEY

- Intermittent Direct Battery connection between PCM and battery.
- Intermittent Fused Ignition Switch Output between PCM and ignition switch.
- Intermittent Ground to PCM.

Name of code: P1687(77) - No Communication with the MIC

When monitored: Continuously with key on.

Set condition: If no PCI bus messages are received from the Mechanical Instrument Cluster (MIC) for 25 seconds.

Theory of operation: The PCM communicates with the MIC using the PCI bus. It relies on certain information to function properly. The PCM continuously monitors the PCI bus to check for messages broadcast from the PCM.

Transmission effects: Possible improper PCM AutoStick configuration.

Possible causes:

> Open or shorted PCI bus circuit from MIC

> MIC

> PCM

Name of code: P1652(78) - Serial Communication Link Malfunction

When monitored: Continuously with key on.

Set condition: If no PCI bus messages are received by the Transmission Control System for 10 seconds.
Theory of operation: The PCM communicates with the other modules in the vehicle using the PCI bus. It relies on certain information to function properly. The PCM continuously monitors the PCI bus to check for messages broadcast from the certain modules.
Transmission Effects: Possible improper PCM AutoStick configuration and delayed 3-4 shifts. No EMCC and early 3-4 shifts for a few minutes after engine is started.
Possible causes:

> Open or shorted PCI bus circuit from BCM

> PCM

Name of code: P0562(79) Low Battery Voltage
When monitored: Continuously with engine running and Transmission Relay energized.
Set condition: If the voltage sensed at the Transmission Control Relay Output Sense circuit(s) to the PCM is less than 10.0 volts for the period of 15 seconds. The DTC will also set if the direct battery voltage sensed in the PCM is less than 6.5v for 200ms or where Transmission Control Relay Output Sense circuit (switched battery) is less than 7.2v for 200ms.

NOTE: P0562 generally indicates a gradually falling battery voltage or a resistive connection(s) to the PCM.

Theory of operation: The Transmission system requires sufficient battery voltage in order to energize the transmission solenoids. The PCM continuously monitors the voltage available to the solenoids.
Transmission effects: At speeds above 72 Km/h (45 MPH) the transmission system will default to neutral. Below 72 Km/h (45 MPH) the transmission system will default to Limp-in mode and the MIL will illuminate after 5 minutes of substituted operation. Manual gear selection of Park, Reverse, Neutral and Second will be available.
Possible causes:

> Charging system problem

> Poor/High resistance connection between PCM and Battery/Alternator

> PCM high resistance or poor connection

> PCM ground high resistance or poor connection

> High resistance in Transmission Control Relay contacts

> PCM

Name of code: P0711(7A) - Transmission temperature sensor performance
When monitored: Every 7 milliseconds with the engine running and no loss of prime DTC set.
Set condition: A temperature reading of 80°F is not reached in the specified period of time.
Theory of operation: The temperature sensor (thermistor) is used to sense the temperature of the transmission fluid. Transmission fluid temperature can affect shift quality, torque converter lock-up, and when and if some diagnostics are run. A failed temperature sensor could affect the OBDII diagnostics, therefore when a fault is detected in the temperature sensor circuit, transmission temperature will be based on a calculated temperature value.
Transmission effects: When the fault is set, calculated temperature is substituted for measured temperature, however the fault code is stored only after three consecutive occurrences of the fault.
Possible causes:

> Temperature sensor

> Temperature sensor wiring circuit.

> Internal controller

Name of code: P0712(7B) - Transmission temperature sensor low
When monitored: Every 7 milliseconds with the engine running and no loss of prime DTC set.
Set condition: Sensor output voltage less than 0.078v.
Theory of operation: The temperature sensor (thermistor) is used to sense the temperature of the transmission fluid. Transmission fluid temperature can affect shift quality, torque converter lock-up, and when and if some diagnostics are run. A failed temperature sensor could affect the OBDII diagnostics, therefore when a fault is detected in the temperature sensor circuit, transmission temperature will be based on a calculated temperature value.
Transmission effects: When the fault is set, calculated temperature is substituted for measured temperature, however the fault code is stored only after three consecutive occurrences of the fault.
Possible causes:

> Temperature sensor

> Temperature sensor wiring circuit.

> Internal controller

Name of code: P0713(7C) - Transmission temperature sensor high
When monitored: Every 7 milliseconds with the engine running and no loss of prime DTC set.
Set condition: Sensor output voltage greater than 4.94v.
Theory of operation: The temperature sensor (thermistor) is used to sense the temperature of the transmission fluid. Transmission fluid tempera-

ture can affect shift quality, torque converter lock-up, and when and if some diagnostics are run. A failed temperature sensor could affect the OBDII diagnostics, therefore when a fault is detected in the temperature sensor circuit, transmission temperature will be based on a calculated temperature value.
Transmission effects: When the fault is set, calculated temperature is substituted for measured temperature, however the fault code is stored only after three consecutive occurrences of the fault.
Possible causes:

> Temperature sensor

> Temperature sensor wiring circuit.

> Internal controller

Name of code: P0714(7D) - Transmission temperature sensor intermittent
When monitored: Every 7 milliseconds with the engine running and no loss of prime DTC set.
Set condition: Temperature reading change greater than maximum change allowed per loop.
Theory of operation: The temperature sensor (thermistor) is used to sense the temperature of the transmission fluid. Transmission fluid temperature can affect shift quality, torque converter lock-up, and when and if some diagnostics are run. A failed temperature sensor could affect the OBDII diagnostics, therefore when a fault is detected in the temperature sensor circuit, transmission temperature will be based on a calculated temperature value.
Transmission effects: When the fault is set, calculated temperature is substituted for measured temperature, however the fault code is stored only after three consecutive occurrences of the fault.
Possible causes:

> Temperature sensor

> Temperature sensor wiring circuit.

> Internal controller

3.3.9 QUICK LEARN

The Quick Learn function customizes adaptive parameters of the PCM to the transmission characteristics of a vehicle. This gives the customer improved “as received” shift quality compared to the initial parameters stored in the PCM.

Notes about Quick Learn Features

The nature of the Quick Learn function requires that certain features must be taken into consideration.

> Quick Learn should generally not be used as a repair procedure unless directed by a repair or diagnostic procedure. If the transmission system is exhibiting a problem that you think is caused by an invalid CVI, you should try to relearn the value by performing the appropriate driving maneuvers. In most cases, if a quick learn makes a vehicle shift better, the vehicle will return with the same problem.

> Before performing Quick Learn, it is imperative that the vehicle be shifted into OD with the engine running and the oil level set to the correct level. This step will purge air from the clutch circuits to prevent erroneous clutch volume values which could cause poor initial shift quality.

> If an unused PCM is installed on a vehicle with a HOT engine, Quick Learn will cause the PCM to report a cold calculated oil temperature. This requires monitoring the calculated oil temperature using the DRBIII®. If the temperature is below 15°C (60°F), the transmission must be run at idle or driven in gear until it goes above 15°C (60°F). If the temperature is above 93°C (200°F), the transmission must cool to below 93°C (200°F).

> First gear is engaged in overdrive after Quick Learn is completed. Place the vehicle in park after performing Quick Learn.

The Quick Learn function should be performed:

– Upon installation of a new service PCM
– After replacement or rebuild of internal transmission components or the torque converter
– If one or more of the clutch volumes indexes (CVI’s) contain skewed readings because of abnormal conditions.

To perform the Quick Learn procedure, the following conditions must be met.

– It is imperative that the vehicle be shifted into OD with the engine running and the oil level set to the correct level. This step will purge the air in the clutch circuits to prevent erroneous clutch volume values, which could cause poor initial shift quality.
– Place the selector lever in neutral.
– The brakes must be applied.
– The engine must be idling.
– The throttle angle (TP sensor) must be less than 3 degrees.
– The shift lever position must stay in neutral until prompted to shift into OD.
– The shift lever must stay in OD after the “Shift to Overdrive” prompt until the DRBIII® indicates the procedure is complete.

– The oil temperature must be between 15°C (60°F) and 93°C (200°F).

NOTE: The above conditions must be maintained during the procedure to keep the procedure from being aborted.

The Quick Learn procedure is performed with the DRBIII® by selecting "Transmission" system then "Miscellaneous" functions, then "Quick Learn". Follow the procedure instructions displayed on the DRBIII®.

3.3.10 CLUTCH VOLUMES

Theory of Operation: The volumes of the transmission fluid needed to apply the friction elements are continuously monitored and learned for adaptive controls. As the clutch friction material wears, the volume of fluid needed to apply the clutch increases. The following are typical clutch volumes, the clutches may be damaged if the volumes are greater or less than the specified below:

The LR clutch volume is updated when doing a 2-1 or 3-1 coast down shift. The transmission temperature must be between 21-49°C (70-120°F). The clutch volume should be between 35 and 83.
The 2/4 clutch volume is updated when doing a 1-2 shift. The transmission temperature must be above 43°C (110°F). The clutch volume should be between 20 and 77.
The OD clutch volume is updated when doing a 2-3 shift. The transmission temperature must be above 43°C (110°F). The clutch volume should be between 40 and 150.

The UD clutch volume is updated when doing a 4-3 or 4-2 shift. The transmission temperature must be above 43°C (110°F). The clutch volume should be between 24 and 70.

Transmission effects: These codes usually set with other DTC's, which indicates an internal transmission problem.
Possible causes:

> Clutch pack clearance out of spec
> Snap ring out of position or broken
> Broken return spring
> Hydraulic leak into clutch circuit with near-zero volume

3.3.11 ELECTRONIC PINION FACTOR (IF APPLICABLE)

Using the following steps, the pinion factor can be checked and/or reset using the DRBIII®:

1. Select Transmission system, then Miscellaneous functions, then Pinion Factor. The DRBIII® will display the current tire size.
2. If the tire size is incorrect, press the Enter key and then select the correct size.
3. Press the Page Back key to exit the reset procedure.

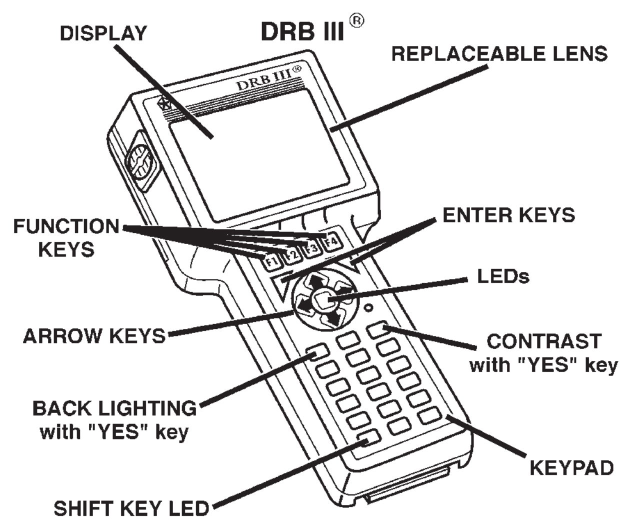
Notes About Electronic Pinion Factor Features
The nature of the electronic pinion factor requires that certain features must be taken into consideration.

> If no pinion factor is stored in an installed PCM, the vehicle speedometer will not operate, engine speed will be limited to 2300 RPM, and catalyst damage may occur.
> Selecting a wrong tire size will cause the speedometer to be inaccurate and will also cause any speed related features to operate improperly.

NOTE: After replacing the PCM, you must reprogram pinion factor

3.4 USING THE DRBIII®

Refer to the DRBIII® user's guide for instructions and assistance with reading trouble codes, erasing trouble codes, and other DRBIII® functions.



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3.5 DRBIII® ERROR MESSAGES

Under normal operation, the DRBIII® will display one of only two error messages:

– User−Requested WARM Boot
– User−Requested COLD Boot

If the DRBIII® should display any other error message, record the entire display and call the S.T.A.R. Center.

3.5.1 DRBIII® DOES NOT POWER UP (BLANK SCREEN)

If the LED's do not light or no sound is emitted at start up, check for loose cable connections or a bad cable. Check the vehicle battery voltage. A minimum of 11 volts is required to adequately power the DRBIII®.

If all connections are proper between the DRBIII® and the vehicle or other devices, and the vehicle battery is fully charged, an inoperative DRBIII® may be the result of faulty cable or vehicle wiring. For a blank screen, refer to the appropriate Body Diagnostic manual.

3.5.2 DISPLAY IS NOT VISIBLE

Low temperatures will affect the visibility of the display. Adjust the contrast to compensate for this condition.

3.5.3 SOME DISPLAY ITEMS READ "---"

This is caused by the scrolling the DRBIII® display a single line up or down. The line which was scrolled onto the screen might read "---". Use the page down or page up function to display the information.

3.6 TRANSMISSION SIMULATOR (MILLER TOOL #8333) AND ELECTRONIC TRANSMISSION ADAPTER KIT (MILLER TOOL #8333-1A)

NOTE: Remove the starter Relay when using the transmission simulator

- **Failure to remove the Starter Relay can cause a PCM - No Response condition.**
- **The removal of the Starter Relay will also prevent the engine from starting in gear.**
- **The Transmission Simulator will not accurately diagnose intermittent faults.**

The transmission simulator, simply put, is an electronic device that simulates the electronic functions of any EATX or NGC controlled transmission. The transmission Simulators basic function is to aid the technician in determining if an internal transmission problem exists or if the problem resides in the vehicle wiring or control module. It is only useful for electrical problems. It will not aid in the diagnosis of a failed mechanical component, but it can tell you that the control module and wiring are working properly and that the problem is internal.

The ignition switch should be in the lock position before attempting to install the simulator. Follow all instructions included with the simulator. If the feedback from the simulator is in doubt, you can verify it's operation by installing it on a known good vehicle. A "known good vehicle" would be defined as a vehicle that does not set any DTC's and drives and shifts as expected.

One important point to remember is that the Simulator receives it's power from the Trans Relay Output circuit. If the transmission system is in Limp−in (Relay open), the simulator will not operate. This is not really an indication of a problem, but an additional symptom. If the simulator does not power up ("P" led lit), this is an indication that the problem is still present with the simulator hooked up. This indicates that the problem is in the wiring or control module and not the transmission.

Miller Tool # 8333-1A consists of the adapter cables and overlay necessary to adapt the 8333 simulator to TE/AE/LE/RLE transmissions.

4.0 DISCLAIMERS, SAFETY, AND WARNINGS

4.1 DISCLAIMERS

All information, illustrations and specifications contained in this manual are based on the latest information available at the time of publication. The right is reserved to make changes at any time without notice.

4.2 SAFETY

4.2.1 TECHNICIAN SAFETY INFORMATION

WARNING: ENGINES PRODUCE CARBON MONOXIDE THAT IS ODORLESS, CAUSES SLOWER REACTION TIME, AND CAN LEAD TO SERIOUS INJURY. WHEN THE ENGINE IS OPERATING, KEEP SERVICE AREAS WELL VENTILATED OR ATTACH THE VEHICLE EXHAUST SYSTEM TO THE SHOP EXHAUST REMOVAL SYSTEM.

Set the parking brake and block the wheels before testing or repairing the vehicle. It is especially important to block the wheels on front-wheel drive vehicles: the parking brake does not hold the drive wheels.

Some operations in this manual require that hydraulic tubes, hoses, and fittings, disconnected for inspection or testing purposes. These systems, when fully charged contain fluid at high pressure.

Before disconnecting any hydraulic tubes, hoses or fittings, be sure that the system is fully depressurized.

When servicing a vehicle, always wear eye protection and remove any metal jewelry such as watchbands or bracelets that might make an inadvertent electrical contact.

When diagnosing a Transmission system problem, it is important to follow approved procedures where applicable. These procedures can be found in the service information. Following these procedures is very important to the safety of individuals performing diagnostic tests.

4.2.2 VEHICLE PREPARATION FOR TESTING

Make sure the vehicle being tested has a fully charged battery. If it does not, false diagnostic DTC's or error messages may occur. It is extremely important that accurate shift lever position data be available to the PCM. The accuracy of any DTC found in memory is doubtful unless the Shift Lever Test, performed on the DRBIII® Scan Tool, passes without failure.

4.2.3 SERVICING SUB-ASSEMBLIES

Some components of the Transmission system are intended to be serviced in assembly only. Attempting to remove or repair certain system subcomponents may result in personal injury and/or improper system operation. Only those components with approved repair and installation procedures in the service information should be serviced.

4.2.4 DRBIII® SAFETY INFORMATION

WARNING: EXCEEDING THE LIMITS OF THE DRBIII® MULTIMETER IS DANGEROUS. IT CAN EXPOSE YOU TO SERIOUS OR POSSIBLY FATAL INJURY. CAREFULLY READ AND UNDERSTAND THE CAUTIONS AND THE SPECIFICATION LIMITS.

- Follow the vehicle manufacturer's service specifications at all times.
- Do not use the DRBIII® if it has been damaged.
- Do not use the test leads if the insulation is damaged or if metal is exposed.
- To avoid electrical shock, do not touch the test leads, tips, or the circuit being tested.
- Choose the proper range and function for the measurement. Do not try voltage or current measurements that may exceed the rated capacity.
- Do not exceed the limits shown in the table.

FUNCTION	INPUT LIMIT
Volts	0 - 500 volts peak AC 0 - 500 volts DC
Ohms (resistance)*	0 - 1.12 megohms
Frequency Measured Frequency Generated	0 - 10 kHz
Temperature	-58 - 1100°F -50 - 600°C

*Ohms cannot be measured if voltage is present. Ohms can be measured only in a non-powered circuit.

- Voltage between any terminal and ground must not exceed 500v DC or 500v peak AC.
- Use caution when measuring voltage above 25v DC or 25v AC.
- The circuit being tested must be protected by a 10A fuse or circuit breaker.
- Use the low current shunt to measure circuits up to 10A. Use the high current clamp to measure circuits exceeds 10A.
- When testing for the presence of voltage or current, make sure the meter is functioning correctly. Take a reading of a known voltage or current before accepting a zero reading.
- When measuring current, connect the meter in series with the load.
- Disconnect the live test lead before disconnecting the common test lead.
- When using the meter function, keep the DRBIII® away from spark plug or coil wires to avoid measuring error from outside interference.

4.3 WARNINGS

4.3.1 VEHICLE DAMAGE WARNINGS

Before disconnecting any control module, make sure the ignition is "lock" position. Failure to do so could damage the module.

When testing voltage or continuity at any control module, use the terminal side (not the wire end) of the connector. Do not probe a wire through the insulation; this will damage it and eventually cause it to fail because of corrosion.

Be careful when performing electrical tests so as to prevent accidental shorting of terminals. Such mistakes can damage fuses or components. Also, a second DTC could be set, making diagnosis of the original problem more difficult.

When replacing a blown fuse, it is important to use only a fuse having the correct amperage rating. The use of a fuse with a rating other than indicated may result in a dangerous electrical system overload. If a properly rated fuse continues to blow, it indicates a problem in the circuit that must be corrected.

4.3.2 ROAD TEST COMPLAINT VEHICLE

Some complaints will require a test drive as part of the repair verification procedure. The purpose of the test drive is to try to duplicate the diagnostic DTC or symptom condition.

CAUTION: Before road testing a vehicle, be sure that all components are reassembled. During the test drive, do not try to read the DRBIII® screen while in motion. Do not hang the DRBIII® from the rear view mirror or operate it yourself. Have an assistant available to operate the DRBIII®.

Road testing is an essential step in the diagnostic process that must not be overlooked. Along with diagnostic information obtained from the DRBIII® Scan Tool and the original customer concern, the road test helps to verify the problem was current and any repairs performed, fixed the vehicle correctly. Always operate and observe the vehicle under actual driving conditions.

Just as important as the road test is, there are preliminary inspections that should be performed prior to the road test. Always check the fluid level and condition before taking the vehicle on a road test. Determine if an incorrect fluid type is being used, improper fluid will result in erratic transmission operation. Some of the conditions of incorrect fluid level are as follows:

- Delayed engagement
- Poor shifting or erratic shifting
- Excessive noise
- Overheating

The next step is to verify that the shifter is correctly adjusted. If the shifter is incorrectly adjusted, a number of complaints can result.

The PCM monitors the Shift Lever Position (SLP) Sensor continuously. If the shifter is incorrectly adjusted, the PCM will sense a shift lever position that is not correct for the gear chosen by the driver. This may cause a DTC to be set.

The following complaints may also be the result of an incorrectly adjusted or worn linkage:

- Delayed clutch engagement
- Erratic shifts
- Vehicle will drive in neutral
- Engine will not crank in park or neutral
- Shifter will be able to be moved without the key in the ignition
- Not able to remove the ignition key in park
- Parking pawl will not engage properly

The shifter should also be adjusted when replacing the Transmission, repairing the valve body, or when repairing any component between the shift lever and the Transmission.

Some questions to ask yourself when performing the road test are as follows:

- Is the complaint or concern what you think the problem is, based on the driver's description of the problem?
- Is the Transmission operating normally, or is there a real problem?
- When does the problem occur?
- Is the problem only in one gear range?
- What temperature does the problem occur?
- Does the vehicle have to sit over night for the problem to occur?
- Does the transmission go into Limp-in mode?

4.3.3 ELECTRONIC PINION FACTOR WARNINGS (IF APPLICABLE)

The pinion factor must be set when replacing the PCM. **Note: The pinion factor is a fixed number and cannot be changed or updated in some vehicle applications.** If the pinion factor is not set or incorrectly set, any speed related functions will not operate correctly i.e. speedometer, speed control, rolling door locks, and other control modules will be affected that depend on speed information.

4.3.4 BULLETINS AND RECALLS

Always perform all Safety Recalls and Technical Service Bulletins that are applicable to the problem.

5.0 REQUIRED TOOLS AND EQUIPMENT

> DRBIII® (diagnostic read−out box) − Must be at latest release level.

> Transmission Simulator (Miller #8333)

> Electronic Transmission Adapter kit (Miller #8333-1A)

> Jumper wires

> Test Light (minimum of 25 ohms of resistance)

> Ohmmeter

> Voltmeter
> Pressure gauge 0−2068 kPa (0−300 PSI)
> Diagnostic Pinout Box (Miller #8815)
> Terminal remover (Miller #3638)

6.0 GLOSSARY OF TERMS

6.1 ACRONYMS

APPS	- Accelerator Pedal Position Sensor
BCM	- Body Control Module
CKT	- Circuit
CVI	- Clutch Volume Index
DLC	- Data Link Connector
DRBIII®	- Diagnostic Readout Box
DTC	- Diagnostic Trouble Code
EATX	- Electronic Automatic Transaxle
EMCC	- Electronically Modulated Converter Clutch
FCM	- Front Control Module (part of the IPM system)
FEMCC	- Full Electronically Modulated Converter Clutch
IOD	- Ignition off−draw
IPM	- Integrated Power Module
IRT	- Intelligent Recovery Timer
ISS	- Input Speed Sensor
LED	- Light Emitting Diode
LR	- Low/reverse Clutch or Pressure Switch
LU	- Lockup
MIC	- Mechanical Instrument Cluster
MIL	- Malfunction Indicator Lamp
NGC	- Next Generation Controller
OBDII	- On Board Diagnostics
OD	- Overdrive Clutch or Pressure Switch
OSS	- Output Speed Sensor
PCM	- Powertrain Control Module
PEMCC	- Partial Electronically Modulated Converter Clutch
PLU	- Partial Lockup
REV	- Reverse Clutch
SLPK	- Solenoid Pack
SSV	- Solenoid Switch Valve
SW	- Switch
TCC	- Torque Converter Clutch
PCM	- Combined PCM and Transmission Control Module
TPS	- Throttle Position Sensor
TRD	- Torque Reduction
TRS	- Transmission Range Sensor
UD	- Underdrive Clutch
2/4	- 2nd and 4th gear Clutch or Pressure Switch

6.2 DEFINITIONS

OBDII (EURO STAGE III OBD) Trip - A vehicle start and drive cycle such that all once per trip diagnostic monitors have run.
Key Start - A vehicle start and run cycle of at least 20 seconds.
Warm-up Cycle - A vehicle start and run cycle such that the engine coolant must rise to at least 71°C (160°F) and must rise by at least 4.4°C (40°F) from initial start up. To count as a warm-up cycle, no DTC may occur during the cycle.

NOTES

7.0

DIAGNOSTIC INFORMATION AND PROCEDURES

Symptom:
*NO RESPONSE FROM TRANSMISSION CONTROL MODULE

POSSIBLE CAUSES
NO RESPONSE FROM TRANSMISSION CONTROL MODULE
FUSED IGNITION SWITCH OUTPUT CIRCUIT OPEN
FUSED B(+) CIRCUIT OPEN
GROUND CIRCUIT(S) OPEN
POWERTRAIN CONTROL MODULE
PCI BUS CIRCUIT OPEN
BODY CONTROL MODULE

TEST	ACTION	APPLICABILITY
1	Turn the ignition on. **Note: As soon as one or more module communicates with the DRB, answer the question.** With the DRB, attempt to communicate with the Instrument Cluster. With the DRB, attempt to communicate with the Body Control Module (BCM). Was the DRB able to I/D or establish communications with both of the modules? Yes → Go To 2 No → Refer to the Communications category and perform the appropriate symptom. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1.	All
2	Turn the ignition off. Disconnect the PCM harness connectors. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Turn the ignition on. Using a 12-volt test light connected to ground, probe both Fused Ignition Switch Output circuits (cavs 11 and 12) in the appropriate terminal of special tool #8815. **NOTE: The test light must illuminate brightly. Compare the brightness to that of a direct connection to the battery.** Is the test light illuminated for both circuits? Yes → Go To 3 No → Repair the Fused Ignition Switch Output circuit for an open. Refer to the wiring diagrams located in the Service Information. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1.	All

*NO RESPONSE FROM TRANSMISSION CONTROL MODULE — Continued

TEST	ACTION	APPLICABILITY
3	Turn the ignition off. Disconnect the PCM harness connectors. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Using a 12-volt test light connected to ground, probe the Fused B(+) circuit in the appropriate terminal of special tool #8815. **NOTE: The test light must illuminate brightly. Compare the brightness to that of a direct connection to the battery.** Is the test light illuminated? Yes → Go To 4 No → Repair the Fused B(+) circuit for an open. Refer to the wiring diagrams located in the Service Information. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1.	All
4	Turn the ignition off. Disconnect the PCM harness connectors. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Using a 12-volt test light connected to 12-volts, probe each ground circuit in the appropriate terminal of special tool #8815. **NOTE: The test light must illuminate brightly. Compare the brightness to that of a direct connection to the battery.** Is the light illuminated at all ground circuits? Yes → Go To 5 No → Repair the Ground circuit(s) for an open. Check the main ground connection to engine block and/or chassis. Refer to the wiring diagrams located in the Service Information. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1.	All

*NO RESPONSE FROM TRANSMISSION CONTROL MODULE — Continued

TEST	ACTION	APPLICABILITY
5	**Note: Ensure there is PCI Bus communication with other modules on the vehicle before proceeding. If not, refer to the symptom list from the menu and repair as necessary.** Disconnect the PCM harness connectors. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Use Scope input cable CH7058, Cable to Probe adapter CH7062, and the red and black test probes. Connect the scope input cable to the channel one connector on the DRB. Attach the red and black leads and the cable to probe adapter to the scope input cable. With the DRBIII® select Pep Module Tools. Select lab scope. Select Live Data. Select 12 volt square wave. Press F2 for Scope. Press F2 and use the down arrow to set voltage range to 20 volts. Set Probe to x10. Press F2 again when complete. Connect the Black lead to the chassis ground. Connect the Red lead to the PCI Bus circuit in the appropriate terminal of special tool #8815. Turn the ignition on. Observe the voltage display on the DRB Lab Scope. Does the voltage pulse from 0 to approximately 7.5 volts? Yes → Replace and program the Powertrain Control Module in accordance with the service information. WITH THE DRBIII® PERFORM QUICK LEARN AND REPROGRAM PINION FACTOR. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 6	All
6	Turn the ignition off. Disconnect the PCM harness connectors. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Disconnect the BCM C3 harness connector. Measure the resistance of the PCI Bus circuit from the BCM C3 harness connector to the appropriate terminal of special tool #8815. Is the resistance below 5.0 ohms? Yes → Replace the Body Control Module in accordance with the service information. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Repair the PCI Bus circuit for an open. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1.	All

Symptom:
P0122-THROTTLE POSITION SENSOR/APPS LOW

When Monitored and Set Condition:

P0122-THROTTLE POSITION SENSOR/APPS LOW

When Monitored: Continuously with the ignition on and engine running.

Set Condition: This DTC will set if the monitored TPS voltage drops below .078 volts for the period of 0.48 seconds.

POSSIBLE CAUSES
RELATED TPS ENGINE DTC'S PRESENT
POWERTRAIN CONTROL MODULE
INTERMITTENT WIRING AND CONNECTORS

TEST	ACTION	APPLICABILITY
1	**NOTE: Low fluid level can be the cause of many transmission problems. If the fluid level is low locate and repair the leak then check and adjust the fluid level per the Service Information.** **NOTE: Always perform diagnostics with a fully charged battery to avoid false symptoms.** With the DRBIII®, read Engine DTC's. Check and repair all Engine DTC's prior to performing any transmission symptom diagnostics. With the DRBIII®, read Transmission DTC's. Record all DTC's and 1 Trip Failures. **NOTE: Diagnose 1 Trip Failures as a fully matured DTC.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Perform the Shift Lever Position Test. If the test does not pass, refer to Symptom test for P0706 Check Shifter Signal. For Gear Ratio DTC's, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle such that all diagnostic monitors have run. **NOTE: Verify flash level of Powertrain Control Module. Some problems are corrected by software upgrades to the Transmission and Engine software.** **NOTE: Check for applicable TSB's related to the problem.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All
2	With the DRBIII®, check Engine DTC's, this includes all one trip failures. Are there any Engine TPS DTCs present? Yes → Refer to the Powertrain category and perform the appropriate symptom. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 3	All

P0122-THROTTLE POSITION SENSOR/APPS LOW — Continued

TEST	ACTION	APPLICABILITY
3	With the DRBIII®, record the EATX EVENT DATA to help identify the conditions in which the DTC was set. With the DRBIII®, erase Transmission DTCs. **NOTE: To erase EATX EVENT DATA information, a BATTERY DISCONNECT must be performed. Performing a BATTERY DISCONNECT will reset all learned Transmission values to controller defaults which may lead to erratic shift schedules.** Drive the vehicle and try to duplicate the conditions in which the DTC was reported by the EATX EVENT DATA. With the DRBIII®, read Transmission DTCs. Did the DTC P0122 THROTTLE POSITION SENSOR LOW, reset? Yes → Go To 4 No → Go To 5	All
4	**NOTE: Due to the integration of the Powertrain and Transmission Control Modules, bus communication between the modules is internal.** Using the schematics as a guide, inspect the wiring and connectors. Repair as necessary. Pay particular attention to all power and ground circuits. If there are no possible causes remaining, view repair. Repair Replace the Powertrain Control Module per the Service Information. WITH THE DRBIII® PERFORM QUICK LEARN. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1.	All
5	The conditions necessary to set this DTC are not present at this time. Using the schematics as a guide, inspect the wiring and connectors specific to this circuit. Wiggle the wires while checking for shorted and open circuits. Pay particular attention to the TPS signal and sensor ground circuits. With the DRBIII®, check the EATX EVENT DATA to help identify the conditions in which the DTC was set. Were there any problems found? Yes → Repair as necessary. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete.	All

Symptom:
P0123-THROTTLE POSITION SENSOR/APPS HIGH

When Monitored and Set Condition:

P0123-THROTTLE POSITION SENSOR/APPS HIGH

When Monitored: Continuously with the ignition on and engine running.

Set Condition: This DTC will set if the monitored TPS voltage rises above 4.94 volts for the period of 0.48 seconds.

POSSIBLE CAUSES
RELATED TPS ENGINE DTC'S PRESENT
POWERTRAIN CONTROL MODULE
INTERMITTENT WIRING AND CONNECTORS

TEST	ACTION	APPLICABILITY
1	**NOTE: Low fluid level can be the cause of many transmission problems. If the fluid level is low locate and repair the leak then check and adjust the fluid level per the Service Information.** **NOTE: Always perform diagnostics with a fully charged battery to avoid false symptoms.** With the DRBIII®, read Engine DTC's. Check and repair all Engine DTC's prior to performing any transmission symptom diagnostics. With the DRBIII®, read Transmission DTC's. Record all DTC's and 1 Trip Failures. **NOTE: Diagnose 1 Trip Failures as a fully matured DTC.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Perform the Shift Lever Position Test. If the test does not pass, refer to Symptom test for P0706 Check Shifter Signal. For Gear Ratio DTC's, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle such that all diagnostic monitors have run. **NOTE: Verify flash level of Powertrain Control Module. Some problems are corrected by software upgrades to the Transmission and Engine software.** **NOTE: Check for applicable TSB's related to the problem.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All
2	With the DRBIII®, check Engine DTC's, this includes all one trip failures. Are there any Engine TPS DTCs present? Yes → Refer to the Powertrain category and perform the appropriate symptom. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 3	All

P0123-THROTTLE POSITION SENSOR/APPS HIGH — Continued

TEST	ACTION	APPLICABILITY
3	With the DRBIII®, record the EATX EVENT DATA to help identify the conditions in which the DTC was set. With the DRBIII®, erase Transmission DTCs. **NOTE: To erase EATX EVENT DATA information, a BATTERY DISCONNECT must be performed. Performing a BATTERY DISCONNECT will reset all learned Transmission values to controller defaults which may lead to erratic shift schedules.** Drive the vehicle and try to duplicate the conditions in which the DTC was reported by the EATX EVENT DATA. With the DRBIII®, read Transmission DTCs. Did the DTC P0123 THROTTLE POSITION SENSOR HIGH, reset? Yes → Go To 4 No → Go To 5	All
4	**NOTE: Due to the integration of the Powertrain and Transmission Control Modules, communication between the modules is internal.** Using the schematics as a guide, inspect the wiring and connectors. Repair as necessary. Pay particular attention to all power and ground circuits. If there are no possible causes remaining, view repair. Repair Replace the Powertrain Control Module per the Service Information. WITH THE DRBIII® PERFORM QUICK LEARN. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1.	All
5	The conditions necessary to set this DTC are not present at this time. Using the schematics as a guide, inspect the wiring and connectors specific to this circuit. Wiggle the wires while checking for shorted and open circuits. Pay particular attention to the TPS signal and sensor ground circuits. With the DRBIII®, check the EATX EVENT DATA to help identify the conditions in which the DTC was set. Were there any problems found? Yes → Repair as necessary. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete.	All

Symptom:
P0124-THROTTLE POSITION SENSOR/APPS INTERMITTENT

When Monitored and Set Condition:

P0124-THROTTLE POSITION SENSOR/APPS INTERMITTENT

When Monitored: Continuously with the ignition on and engine running.

Set Condition: This DTC will set if the monitored TPS throttle angle between the angles of 6° and 120° and the degree change is greater than 5° within a period of less than 7.0 ms.

POSSIBLE CAUSES
RELATED TPS ENGINE DTC'S PRESENT
THROTTLE POSITION SENSOR
POWERTRAIN CONTROL MODULE
INTERMITTENT WIRING AND CONNECTORS

TEST	ACTION	APPLICABILITY
1	**NOTE: Low fluid level can be the cause of many transmission problems. If the fluid level is low locate and repair the leak then check and adjust the fluid level per the Service Information.** **NOTE: Always perform diagnostics with a fully charged battery to avoid false symptoms.** With the DRBIII®, read Engine DTC's. Check and repair all Engine DTC's prior to performing any transmission symptom diagnostics. With the DRBIII®, read Transmission DTC's. Record all DTC's and 1 Trip Failures. **NOTE: Diagnose 1 Trip Failures as a fully matured DTC.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Perform the Shift Lever Position Test. If the test does not pass, refer to Symptom test for P0706 Check Shifter Signal. For Gear Ratio DTC's, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle such that all diagnostic monitors have run. **NOTE: Verify flash level of Powertrain Control Module. Some problems are corrected by software upgrades to the Transmission and Engine software.** **NOTE: Check for applicable TSB's related to the problem.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All
2	With the DRBIII®, check Engine DTC's, this includes all one trip failures. Are there any Engine TPS DTCs present? Yes → Refer to the Powertrain category and perform the appropriate symptom. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 3	All

P0124-THROTTLE POSITION SENSOR/APPS INTERMITTENT — Continued

TEST	ACTION	APPLICABILITY
3	With the DRBIII®, record the EATX EVENT DATA to help identify the conditions in which the DTC was set. With the DRBIII®, erase Transmission DTCs. **NOTE: To erase EATX EVENT DATA information, a BATTERY DISCONNECT must be performed. Performing a BATTERY DISCONNECT will reset all learned Transmission values to controller defaults which may lead to erratic shift schedules.** Drive the vehicle and try to duplicate the conditions in which the DTC was reported by the EATX EVENT DATA. With the DRBIII®, read Transmission DTCs. Did the DTC P0124 THROTTLE POSITION SENSOR INTERMITTENT, reset? Yes → Go To 4 No → Go To 6	All
4	Ignition On, Engine Not Running. With the DRBIII®, under Transmission Sensors, monitor the TPS voltage in the following step. Slowly open and close the throttle while checking for erratic voltage changes. Did the TPS voltage change smooth and consistent? Yes → Go To 5 No → Replace the Throttle Position Sensor per the Service Information. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1.	All
5	**NOTE: Due to the integration of the Powertrain and Transmission Control Modules, communication between the modules is internal.** Using the schematics as a guide, inspect the wiring and connectors. Repair as necessary. Pay particular attention to all power and ground circuits. If there are no possible causes remaining, view repair. Repair Replace the Powertrain Control Module per the Service Information. WITH THE DRBIII® PERFORM QUICK LEARN. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1.	All
6	The conditions necessary to set this DTC are not present at this time. Using the schematics as a guide, inspect the wiring and connectors specific to this circuit. Wiggle the wires while checking for shorted and open circuits. Pay particular attention to the TPS signal and sensor ground circuits. With the DRBIII®, check the EATX EVENT DATA to help identify the conditions in which the DTC was set. Were there any problems found? Yes → Repair as necessary. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete.	All

Symptom:
P0218-HIGH TEMPERATURE OPERATION ACTIVATED

When Monitored and Set Condition:

P0218-HIGH TEMPERATURE OPERATION ACTIVATED

When Monitored: Whenever the engine is running. NOTE: This is an informational DTC designed to aid the technician in diagnosing shift quality complaints.

Set Condition: Immediately when a Overheat shift schedule is activated when the Transmission Oil Temperature reaches 155° C or 240° F.

POSSIBLE CAUSES
ENGINE COOLING SYSTEM MALFUNCTION
TRANSMISSION OIL COOLER PLUGGED
HIGH TEMPERATURE OPERATIONS ACTIVATED

TEST	ACTION	APPLICABILITY
1	**NOTE: Low fluid level can be the cause of many transmission problems. If the fluid level is low locate and repair the leak then check and adjust the fluid level per the Service Information.** **NOTE: Always perform diagnostics with a fully charged battery to avoid false symptoms.** With the DRBIII®, read Engine DTC's. Check and repair all Engine DTC's prior to performing any transmission symptom diagnostics. With the DRBIII®, read Transmission DTC's. Record all DTC's and 1 Trip Failures. **NOTE: Diagnose 1 Trip Failures as a fully matured DTC.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Perform the Shift Lever Position Test. If the test does not pass, refer to Symptom test for P0706 Check Shifter Signal. For Gear Ratio DTC's, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle such that all diagnostic monitors have run. **NOTE: Verify flash level of Powertrain Control Module. Some problems are corrected by software upgrades to the Transmission and Engine software.** **NOTE: Check for applicable TSB's related to the problem.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All
2	Perform Engine Cooling System diagnostics per the Service Information. Is the Engine Cooling System functioning properly? Yes → Go To 3 No → Repair the cause of the engine overheating. Refer to the Service Information for the related symptoms or repair procedures. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1.	All

P0218-HIGH TEMPERATURE OPERATION ACTIVATED — Continued

TEST	ACTION	APPLICABILITY
3	Perform Transmission Cooler Flow Check per the Service Information. Did the Transmission Cooler Flow Check test pass? Yes → Go To 4 No → Repair or replace the plugged Transmission Oil Cooler per the Service Information. Repair the cause of the plugged Transmission Oil Cooler as necessary. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1.	All
4	This DTC is an informational DTC designed to aid the Technician in diagnosing shift quality complaints. This DTC indicates that the transmission has been operating in the ″Overheat″ shift schedule which may generate a customer complaint. The customer driving patterns may indicate the need for an additional transmission oil cooler. With the DRBIII®, check the EATX EVENT DATA to help identify the conditions in which the DTC was set. View repair options. Repair Repair the cause of transmission overheating per the Service Information. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1.	All

Symptom:
P0562-LOW BATTERY VOLTAGE

When Monitored and Set Condition:

P0562-LOW BATTERY VOLTAGE

When Monitored: With the engine running and the PCM has closed the Transmission Control Relay.

Set Condition: If the battery voltage of the Transmission Control Relay Output Sense circuit(s) to the PCM is less than 10.0 volts for the period of 15 seconds. Note: P0562 generally indicates a gradually falling battery voltage or a resistive connection(s) to the PCM. The DTC will also set if the battery voltage sensed at the PCM is less than 6.5v for 200ms or where Transmission Control Relay Output circuits is less than 7.2v for 200ms.

POSSIBLE CAUSES
RELATED CHARGING SYSTEM DTC'S
GROUND CIRCUIT OPEN OR HIGH RESISTANCE
FUSED B+ CIRCUIT TO PCM HIGH RESISTANCE
TRANSMISSION CONTROL RELAY OUTPUT TO TCM OPEN OR HIGH RESISTANCE
TRANSMISSION CONTROL RELAY
POWERTRAIN CONTROL MODULE
INTERMITTENT WIRING AND CONNECTORS

TEST	ACTION	APPLICABILITY
1	**NOTE: Low fluid level can be the cause of many transmission problems. If the fluid level is low locate and repair the leak then check and adjust the fluid level per the Service Information.** **NOTE: Always perform diagnostics with a fully charged battery to avoid false symptoms.** With the DRBIII®, read Engine DTC's. Check and repair all Engine DTC's prior to performing any transmission symptom diagnostics. With the DRBIII®, read Transmission DTC's. Record all DTC's and 1 Trip Failures. **NOTE: Diagnose 1 Trip Failures as a fully matured DTC.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Perform the Shift Lever Position Test. If the test does not pass, refer to Symptom test for P0706 Check Shifter Signal. For Gear Ratio DTC's, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle such that all diagnostic monitors have run. **NOTE: Verify flash level of Powertrain Control Module. Some problems are corrected by software upgrades to the Transmission and Engine software.** **NOTE: Check for applicable TSB's related to the problem.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All

P0562-LOW BATTERY VOLTAGE — Continued

TEST	ACTION	APPLICABILITY
2	With the DRBIII®, read the Engine DTC's. Are there any Charging System related DTC's present also? Yes → Refer to the Charging System category and repair any PCM Charging System DTC's, before testing DTC P0562. NOTE: After repairing the PCM Charging System DTC's, perform the Transmission Verification test to verify the transmission was not damaged. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 3	All
3	**NOTE: Generator, battery, and charging system must be fully functional before performing this test.** With the DRBIII®, read Transmission DTC's. With the DRBIII®, Check the STARTS SINCE SET counter for P0562. **Note: This counter only applies to the last DTC set.** Is the STARTS SINCE SET counter set at 0? Yes → Go To 4 No → Go To 9	All
4	Turn the ignition off to the lock position. Disconnect the PCM harness connector. **Note: Check connectors - Clean/repair as necessary.** **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Using a 12-volt test light connected to 12-volts, check the Ground circuits in the appropriate terminal of special tool #8815. **NOTE: The test light must illuminate brightly. Compare the brightness to that of a direct connection to the battery.** Does the test light illuminate brightly for all the Ground circuits? Yes → Go To 5 No → Repair the Ground circuit and/or circuits for an open or high resistance. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1.	All

P0562-LOW BATTERY VOLTAGE — Continued

TEST	ACTION	APPLICABILITY
5	Turn the ignition off to the lock position. Disconnect the PCM harness connector. Remove the Transmission Control Relay. **Note: Check connectors - Clean/repair as necessary.** Connect a jumper wire between Fused B+ circuit and Transmission Control Relay Output circuit in the Transmission Relay connector. Ignition on, engine not running. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Using a 12-volt test light connected to ground, check the Fused B+ circuit in the appropriate terminal of special tool #8815. **NOTE: The Test light must illuminate brightly. Compare the brightness to that of a direct connection to the battery.** Does the test light illuminate brightly? Yes → Go To 6 No → Repair the Fused B+ Circuit circuit for an open or high resistance. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1.	All
6	Turn the ignition off to the lock position. Disconnect the PCM harness connector. Remove the Transmission Control Relay. **Note: Check connectors - Clean/repair as necessary.** **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Connect a jumper wire between Fused B+ circuit and the Transmission Control Relay Output circuit. Ignition on, engine not running. Using a 12-volt test light connected to ground, check both Transmission Control Relay Output circuits in the appropriate terminal of special tool #8815. **NOTE: The test light must illuminate brightly. Compare the brightness to that of a direct connection to the battery.** Does the test light illuminate brightly? Yes → Go To 7 No → Repair the Transmission Control Relay Output circuit for an open or high resistance. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1.	All

P0562-LOW BATTERY VOLTAGE — Continued

TEST	ACTION	APPLICABILITY
7	Turn the ignition off to the lock position. Install a substitute Relay in place of the Transmission Control Relay. Start the engine. Using a voltmeter, measure the battery voltage. With the DRBIII®, monitor the Transmission Switched Battery Voltage. Compare the DRBIII® Transmission Switched Battery voltage to the actual battery voltage. Is the DRBIII® voltage within 2.0 volts of the battery voltage? Yes → Replace the Transmission Control Relay. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 8	All
8	Using the schematics as a guide, inspect the wiring and connectors. Repair as necessary. Pay particular attention to all power and ground circuits. If there are no possible causes remaining, view repair. Repair Replace the Powertrain Control Module per the Service Information. WITH THE DRBIII® PERFORM QUICK LEARN AND REPROGRAM PINION FACTOR. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1.	All
9	The conditions necessary to set the DTC are not present at this time. Using the schematics as a guide, inspect the wiring and connectors specific to this circuit. Wiggle the wiring and connectors while checking for shorts and open circuits. With the DRBIII®, check the EATX EVENT DATA to help identify the conditions in which the DTC was set. Were there any problems found? Yes → Repair as necessary. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete.	All

Symptom List:
P0604-INTERNAL TCM
P0605-INTERNAL TCM
P0613-INTERNAL TCM

Test Note: All symptoms listed above are diagnosed using the same tests. The title for the tests will be P0604-INTERNAL TCM.

POSSIBLE CAUSES
PCM - INTERNAL ERROR

TEST	ACTION	APPLICABILITY
1	Using the schematics as a guide, inspect the wiring and connectors. Repair as necessary. Pay particular attention to all power and ground circuits. If there are no possible causes remaining, view repair. Repair Replace the Powertrain Control Module. WITH THE DRBIII® PERFORM QUICK LEARN AND REPROGRAM PINION FACTOR. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1.	All

Symptom:
P0706-CHECK SHIFTER SIGNAL

When Monitored and Set Condition:

P0706-CHECK SHIFTER SIGNAL

When Monitored: Continuously with the ignition on.

Set Condition: After 3 occurrences in one ignition cycle of an invalid PRNDL DTC which lasts for more than 0.1 second. Note: All indicator lights on the instrument cluster will illuminate boxed when the vehicle engine is not running, ignition on or engine running in park or neutral if a problem exists.

POSSIBLE CAUSES
SHIFTER OUT OF ADJUSTMENT
TRS T1 SENSE CIRCUIT OPEN
TRS T3 SENSE CIRCUIT OPEN
TRS T41 SENSE CIRCUIT OPEN
TRS T42 SENSE CIRCUIT OPEN
TRS T1 SENSE CIRCUIT SHORT TO GROUND
TRS T3 SENSE CIRCUIT SHORT TO GROUND
TRS T41 SENSE CIRCUIT SHORT TO GROUND
TRS T42 SENSE CIRCUIT SHORT TO GROUND
TRS T1 SENSE CIRCUIT SHORT TO VOLTAGE
TRS T3 SENSE CIRCUIT SHORT TO VOLTAGE
TRS T41 SENSE CIRCUIT SHORT TO VOLTAGE
TRS T42 SENSE CIRCUIT SHORT TO VOLTAGE
TRANSMISSION RANGE SENSOR
POWERTRAIN CONTROL MODULE
INTERMITTENT WIRING AND CONNECTORS

P0706-CHECK SHIFTER SIGNAL — Continued

TEST	ACTION	APPLICABILITY
1	**NOTE: Low fluid level can be the cause of many transmission problems. If the fluid level is low locate and repair the leak then check and adjust the fluid level per the Service Information.** **NOTE: Always perform diagnostics with a fully charged battery to avoid false symptoms.** With the DRBIII®, read Engine DTC's. Check and repair all Engine DTC's prior to performing any transmission symptom diagnostics. With the DRBIII®, read Transmission DTC's. Record all DTC's and 1 Trip Failures. **NOTE: Diagnose 1 Trip Failures as a fully matured DTC.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Perform the Shift Lever Position Test. If the test does not pass, refer to Symptom test for P0706 Check Shifter Signal. For Gear Ratio DTC's, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle such that all diagnostic monitors have run. **NOTE: Verify flash level of Powertrain Control Module. Some problems are corrected by software upgrades to the Transmission and Engine software.** **NOTE: Check for applicable TSB's related to the problem.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All
2	With the DRBIII®, erase Transmission DTCs. Cycle the ignition off, then start the vehicle. Firmly apply the brakes and shift into Overdrive. **NOTE: Vehicle must remain in Overdrive for at least 3.0 seconds.** With the brakes firmly applied, shift slowly through all gears (PRNDL) as least three times, pausing momentarily in each gear. **NOTE: If all the PRNDL lights box individually then the error was cleared.** Shift into park and turn the ignition off to the lock position. Ignition on, engine not running. With the DRBIII®, read Transmission DTCs. Does the DTC P0706 reset, or do all the PRNDL indicators remain boxed in park or neutral? Yes → Go To 3 No → Go To 21	All
3	With the DRBIII®, perform the Shift Lever Position Test. Select the test outcome from the following: Test passes Go To 21 Test fails with DTC Go To 4 Test fails without DTC Go To 20	All

P0706-CHECK SHIFTER SIGNAL — Continued

TEST	ACTION	APPLICABILITY
4	Turn the ignition off to the lock position. Remove the Starter Relay. **CAUTION: Removal of the Starter Relay is to prevent a Transmission, NO RESPONSE, condition and disable the starter.** Install the Transmission Simulator, Miller tool #8333 and the Electronic Transmission Adapter kit 8333-1A. Ignition on, engine not running. With the DRBIII®, perform the Shift Lever Position Test. When the DRBIII ® instructs you to put the Gear Selector in a particular position, you must do so using the Transmission Simulator. The LED for the gear position in question must be illuminated on the Transmission Simulator, prior to pressing the ENTER key on the DRBIII®. Did the Shift Lever Position Test pass? Yes → Go To 5 No → Go To 6 **NOTE: After completion of this procedure, make sure to disconnect the Transmission Simulator, Miller tool #8333 and FWD adaptor cable kit, Miller tool #8333-1A and reconnect all connectors.**	All
5	If there are no possible causes remaining, view repair. Repair Replace the Transmission Range Sensor per the Service Information. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1.	All
6	Ignition on, engine not running. With the DRBIII®, monitor the TRS Sense circuits on the Input/Output screen - C1 thru C4. Move the shift lever through all gear positions, pausing momentarily in each gear position and watch for one of the circuits to not change state. Pick the one that did not change state. TRS T1 sense (C4) Go To 7 TRS T3 sense (C3) Go To 10 TRS T41 sense (C1) Go To 13 TRS T42 sense (C2) Go To 16	All

P0706-CHECK SHIFTER SIGNAL — Continued

TEST	ACTION	APPLICABILITY
7	Turn the ignition off to the lock position. Disconnect the TRS harness connector. Disconnect the PCM harness connector. **Note: Check connectors - Clean/repair as necessary.** **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the TRS T1 Sense circuit from the appropriate terminal of special tool #8815 to the TRS harness connector. Is the resistance above 5.0 ohms? Yes → Repair the TRS T1 Sense circuit for an open. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 8	All
8	Turn the ignition off to the lock position. Disconnect the TRS harness connector. Disconnect the PCM harness connector. **Note: Check connectors - Clean/repair as necessary.** **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance between ground and the TRS T1 Sense circuit. Is the resistance below 5.0 ohms? Yes → Repair the TRS T1 Sense circuit for a short to ground. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 9	All
9	Turn the ignition off to the lock position. Disconnect the TRS harness connector. Disconnect the PCM harness connector. Remove the Transmission Control Relay from the PDC. **Note: Check connectors - Clean/repair as necessary.** **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Connect a jumper wire between the Fused B+ circuit and the Transmission Control Relay Output circuit in the Transmission Control Relay connector. Ignition on, engine not running. Measure the voltage of the TRS T1 Sense circuit at the appropriate terminal of special tool #8815. Is the voltage above 0.5 volt? Yes → Repair the TRS T1 Sense circuit for a short to voltage. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 19	All

P0706-CHECK SHIFTER SIGNAL — Continued

TEST	ACTION	APPLICABILITY
10	Turn the ignition off to the lock position. Disconnect the TRS harness connector. Disconnect the PCM harness connector. **Note: Check connectors - Clean/repair as necessary.** **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the TRS T3 Sense circuit from the appropriate terminal of special tool #8815 to the TRS harness connector. Is the resistance above 5.0 ohms? Yes → Repair the TRS T3 Sense circuit for an open. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 11	All
11	Turn the ignition off to the lock position. Disconnect the TRS harness connector. Disconnect the PCM harness connector. **Note: Check connectors - Clean/repair as necessary.** **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance between ground and the TRS T3 Sense circuit. Is the resistance below 5.0 ohms? Yes → Repair the TRS T3 Sense circuit for a short to ground. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 12	All
12	Turn the ignition off to the lock position. Disconnect the TRS harness connector. Disconnect the PCM harness connector. Remove the Transmission Control Relay. **Note: Check connectors - Clean/repair as necessary.** **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Connect a jumper wire between the Fused B+ circuit and the Transmission Control Relay Output circuit in the Transmission Control Relay connector. Ignition on, engine not running. Measure the voltage of the TRS T3 Sense circuit. Is the voltage above 0.5 volt? Yes → Repair the TRS T3 Sense circuit for a short to voltage. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 19	All

P0706-CHECK SHIFTER SIGNAL — Continued

TEST	ACTION	APPLICABILITY
13	Turn the ignition off to the lock position. Disconnect the TRS harness connector. Disconnect the PCM harness connector. **Note: Check connectors - Clean/repair as necessary.** **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the TRS T41 Sense circuit from the appropriate terminal of special tool #8815 to the TRS harness connector. Is the resistance above 5.0 ohms? Yes → Repair the TRS T41 Sense circuit for an open. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 14	All
14	Turn the ignition off to the lock position. Disconnect the TRS harness connector. Disconnect the PCM harness connector. **Note: Check connectors - Clean/repair as necessary.** **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance between ground and the TRS T41 Sense circuit Is the resistance below 5.0 ohms? Yes → Repair the TRS T41 Sense circuit for a short to ground. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 15	All
15	Turn the ignition off to the lock position. Disconnect the TRS harness connector. Disconnect the PCM harness connector. Remove the Transmission Control Relay. **Note: Check connectors - Clean/repair as necessary.** **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Connect a jumper wire between the Fused B+ circuit and the Transmission Control Relay Output circuit in the Transmission Control Relay connector. Ignition on, engine not running. Measure the voltage of the TRS T41 Sense circuit. Is the voltage above 0.5 volt? Yes → Repair the TRS T1 Sense circuit for a short to voltage. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 19	All

P0706-CHECK SHIFTER SIGNAL — Continued

TEST	ACTION	APPLICABILITY
16	Turn the ignition off to the lock position. Disconnect the TRS harness connector. Disconnect the PCM harness connector. **Note: Check connectors - Clean/repair as necessary.** **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the TRS T42 Sense circuit from the appropriate terminal of special tool #8815 to the TRS harness connector. Is the resistance above 5.0 ohms? Yes → Repair the TRS T42 Sense circuit for an open. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 17	All
17	Turn the ignition off to the lock position. Disconnect the TRS harness connector. Disconnect the PCM harness connector. **Note: Check connectors - Clean/repair as necessary.** **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance between ground and the TRS T42 Sense circuit. Is the resistance below 5.0 ohms? Yes → Repair the TRS T42 Sense circuit for a short to ground. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 18	All
18	Turn the ignition off to the lock position. Disconnect the TRS harness connector. Disconnect the PCM harness connector. Remove the Transmission Control Relay. **Note: Check connectors - Clean/repair as necessary.** Connect a jumper wire between the Fused B+ circuit and the Transmission Control Relay Output circuit in the Transmission Control Relay connector. Ignition on, engine not running. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the voltage of the TRS T42 Sense circuit. Is the voltage above 0.5 volt? Yes → Repair the TRS T42 Sense circuit for a short to voltage. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 19	All

P0706-CHECK SHIFTER SIGNAL — Continued

TEST	ACTION	APPLICABILITY
19	Using the schematics as a guide, inspect the wiring and connectors. Repair as necessary. Pay particular attention to all power and ground circuits. If there are no possible causes remaining, view repair. Repair Replace the Powertrain Control Module per the Service Information. WITH THE DRBIII® PERFORM QUICK LEARN AND REPROGRAM PINION FACTOR. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1.	All
20	If there are no possible causes remaining, view repair. Repair Adjust the Shift Linkage and/or cable per the Service Information. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1.	All
21	The conditions necessary to set the DTC are not present at this time. Using the schematics as a guide, inspect the wiring and connectors specific to this circuit. Wiggle the wiring and connectors while checking for shorted and open circuits. Check the Shift Linkage and cable for proper operation per the Service Information. With the DRBIII®, check the EATX EVENT DATA to help identify the conditions in which the DTC was set. Perform *PRNDL FAULT CLEARING PROCEDURE after completion of any repairs. Were there any problems found? Yes → Repair as necessary. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete.	All

Symptom:
P0711-TRANSMISSION TEMPERATURE SENSOR PERFORMANCE

When Monitored and Set Condition:

P0711-TRANSMISSION TEMPERATURE SENSOR PERFORMANCE

When Monitored: Continuously with the ignition on and engine running.

Set Condition: This DTC will set when the desired transmission temperature does not reach a normal operating temperature within a given time frame. Time is variable due to ambient temperature. Approximate times are starting temperature to warm up time: (-40° F / -40° C - 35 min) (-20° F / -28° C - 25 min) (20° F / -6.6° C - 20 min) (60° F / 15.5 ° C - 10 min)

POSSIBLE CAUSES
RELATED DTC'S PRESENT
TRANSMISSION TEMPERATURE SENSOR
POWERTRAIN CONTROL MODULE
INTERMITTENT WIRING AND CONNECTORS

TEST	ACTION	APPLICABILITY
1	**NOTE: Low fluid level can be the cause of many transmission problems. If the fluid level is low locate and repair the leak then check and adjust the fluid level per the Service Information.** **NOTE: Always perform diagnostics with a fully charged battery to avoid false symptoms.** With the DRBIII®, read Engine DTC's. Check and repair all Engine DTC's prior to performing any transmission symptom diagnostics. With the DRBIII®, read Transmission DTC's. Record all DTC's and 1 Trip Failures. **NOTE: Diagnose 1 Trip Failures as a fully matured DTC.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Perform the Shift Lever Position Test. If the test does not pass, refer to Symptom test for P0706 Check Shifter Signal. For Gear Ratio DTC's, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle such that all diagnostic monitors have run. **NOTE: Verify flash level of Powertrain Control Module. Some problems are corrected by software upgrades to the Transmission and Engine software.** **NOTE: Check for applicable TSB's related to the problem.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All

P0711-TRANSMISSION TEMPERATURE SENSOR PERFORMANCE — Continued

TEST	ACTION	APPLICABILITY
2	With the DRBIII®, check Transmission DTC's. Are there any other Transmission Temperature Sensor related DTCs present? Yes → Refer to the Transmission category and perform the appropriate symptom. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 3	All
3	With the DRBIII®, Check the STARTS SINCE SET counter for P0711. **NOTE: This counter only applies to the last DTC set.** Is the STARTS SINCE SET counter 2 or less? Yes → Go To 4 No → Go To 7	All
4	Turn the ignition off to the lock position. Remove the Starter Relay. **CAUTION: Removal of the Starter Relay is to prevent a Transmission, NO RESPONSE, condition and disable the starter.** Install the Transmission Simulator, Miller tool #8333 and the Electronic Transmission Adapter kit 8333-1A. **Note: Check connectors - Clean/repair as necessary.** Ignition on, engine not running. With the Transmission Simulator, turn the Input/Output switch to OFF. With the DRBIII®, monitor the TRANS TEMP VOLTS while turning the Thermistor Voltage switch to all three positions on the Transmission Simulator. Compare the DRBIII® readings with the numbers listed on the Transmission Simulator. Do the readings on the Transmission Simulator match the DRBIII® readings ± 0.2 volts? Yes → Go To 5 No → Go To 6	All
5	If there are no possible causes remaining, view repair. Repair Replace Transmission Solenoid/TRS assembly per the Service Information. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1.	All
6	Using the schematics as a guide, inspect the wiring and connectors. Repair as necessary. Pay particular attention to all power and ground circuits. If there are no possible causes remaining, view repair. Repair Replace the Powertrain Control Module per the Service Information. WITH THE DRBIII® PERFORM QUICK LEARN Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1.	All

P0711-TRANSMISSION TEMPERATURE SENSOR PERFORMANCE — Continued

TEST	ACTION	APPLICABILITY
7	The conditions necessary to set this DTC are not present at this time. Using the schematics as a guide, inspect the wiring and connectors specific to this circuit. Wiggle the wires while checking for shorted and open circuits. With the DRBIII®, check the EATX EVENT DATA to help identify the conditions in which the DTC was set. Were there any problems found? Yes → Repair as necessary. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete.	All

Symptom:
P0712-TRANSMISSION TEMPERATURE SENSOR LOW

When Monitored and Set Condition:

P0712-TRANSMISSION TEMPERATURE SENSOR LOW

When Monitored: Continuously with the ignition on and engine running.

Set Condition: The DTC will set when the monitored Temperature Sensor voltage drops below 0.078 volts for the period of 0.45 seconds.

POSSIBLE CAUSES
RELATED DTC'S PRESENT
TRANSMISSION TEMPERATURE SENSOR SIGNAL CIRCUIT SHORT TO GROUND
TRANSMISSION TEMPERATURE SENSOR
POWERTRAIN CONTROL MODULE
INTERMITTENT WIRING AND CONNECTORS

TEST	ACTION	APPLICABILITY
1	**NOTE: Low fluid level can be the cause of many transmission problems. If the fluid level is low locate and repair the leak then check and adjust the fluid level per the Service Information.** **NOTE: Always perform diagnostics with a fully charged battery to avoid false symptoms.** With the DRBIII®, read Engine DTC's. Check and repair all Engine DTC's prior to performing any transmission symptom diagnostics. With the DRBIII®, read Transmission DTC's. Record all DTC's and 1 Trip Failures. **NOTE: Diagnose 1 Trip Failures as a fully matured DTC.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Perform the Shift Lever Position Test. If the test does not pass, refer to Symptom test for P0706 Check Shifter Signal. For Gear Ratio DTC's, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle such that all diagnostic monitors have run. **NOTE: Verify flash level of Powertrain Control Module. Some problems are corrected by software upgrades to the Transmission and Engine software.** **NOTE: Check for applicable TSB's related to the problem.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All
2	With the DRBIII®, check Transmission DTC's. Are there any Speed Sensor DTCs present? Yes → Refer to the Transmission category and perform the appropriate symptom. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 3	All

P0712-TRANSMISSION TEMPERATURE SENSOR LOW — Continued

TEST	ACTION	APPLICABILITY
3	With the DRBIII®, Check the STARTS SINCE SET counter for P0712. **NOTE: This counter only applies to the last DTC set.** Is the STARTS SINCE SET counter 2 or less? Yes → Go To 4 No → Go To 8	All
4	Turn the ignition off to the lock position. Remove the Starter Relay. **CAUTION: Removal of the Starter Relay is to prevent a Transmission, NO RESPONSE, condition and disable the starter.** Install the Transmission Simulator, Miller tool #8333 and the Electronic Transmission Adapter kit 8333-1A. **Note: Check connectors - Clean/repair as necessary.** Ignition on, engine not running. With the Transmission Simulator, turn the Input/Output switch to OFF. With the DRBIII®, monitor the TRANS TEMP VOLTS while turning the Thermistor Voltage switch to all three positions on the Transmission Simulator. Compare the DRBIII® readings with the numbers listed on the Transmission Simulator. Do the readings on the Transmission Simulator match the DRBIII® readings ± 0.2 volts? Yes → Go To 5 No → Go To 6	All
5	If there are no possible causes remaining, view repair. Repair Replace Transmission Solenoid/TRS assembly per the Service Information. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1.	All
6	Turn the ignition off to the lock position. Disconnect the PCM C4 harness connector. Disconnect the Transmission Solenoid/TRS Assembly harness connector. **Note: Check connectors - Clean/repair as necessary.** **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance between ground and the Transmission Temperature Sensor Signal circuit. Is the resistance below 5.0 ohms? Yes → Repair the Transmission Temperature Sensor Signal circuit for a short to ground. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 7	All

P0712-TRANSMISSION TEMPERATURE SENSOR LOW — Continued

TEST	ACTION	APPLICABILITY
7	Using the schematics as a guide, inspect the wiring and connectors. Repair as necessary. Pay particular attention to all power and ground circuits. If there are no possible causes remaining, view repair. Repair Replace the Powertrain Control Module per the Service Information. WITH THE DRBIII® PERFORM QUICK LEARN Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1.	All
8	The conditions necessary to set this DTC are not present at this time. Using the schematics as a guide, inspect the wiring and connectors specific to this circuit. Wiggle the wires while checking for shorted and open circuits. With the DRBIII®, check the EATX EVENT DATA to help identify the conditions in which the DTC was set. Were there any problems found? Yes → Repair as necessary. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete.	All

Symptom:
P0713-TRANSMISSION TEMPERATURE SENSOR HIGH

When Monitored and Set Condition:

P0713-TRANSMISSION TEMPERATURE SENSOR HIGH

When Monitored: Continuously with the ignition on and engine running.

Set Condition: The DTC will set when the monitored Temperature Sensor voltage rises above 4.94 volts for the period of 0.45 seconds.

POSSIBLE CAUSES
RELATED DTC'S PRESENT
TRANSMISSION TEMPERATURE SENSOR SIGNAL CIRCUIT OPEN
TRANSMISSION TEMPERATURE SENSOR SIGNAL CIRCUIT SHORT TO VOLTAGE
TRANSMISSION TEMPERATURE SENSOR
POWERTRAIN CONTROL MODULE
INTERMITTENT WIRING AND CONNECTORS

TEST	ACTION	APPLICABILITY
1	**NOTE: Low fluid level can be the cause of many transmission problems. If the fluid level is low locate and repair the leak then check and adjust the fluid level per the Service Information.** **NOTE: Always perform diagnostics with a fully charged battery to avoid false symptoms.** With the DRBIII®, read Engine DTC's. Check and repair all Engine DTC's prior to performing any transmission symptom diagnostics. With the DRBIII®, read Transmission DTC's. Record all DTC's and 1 Trip Failures. **NOTE: Diagnose 1 Trip Failures as a fully matured DTC.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Perform the Shift Lever Position Test. If the test does not pass, refer to Symptom test for P0706 Check Shifter Signal. For Gear Ratio DTC's, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle such that all diagnostic monitors have run. **NOTE: Verify flash level of Powertrain Control Module. Some problems are corrected by software upgrades to the Transmission and Engine software.** **NOTE: Check for applicable TSB's related to the problem.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All

P0713-TRANSMISSION TEMPERATURE SENSOR HIGH — Continued

TEST	ACTION	APPLICABILITY
2	With the DRBIII®, check Transmission DTC's. Are there any Speed Sensor DTCs present? Yes → Refer to the Transmission category and perform the appropriate symptom. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 3	All
3	With the DRBIII®, Check the STARTS SINCE SET counter for P0713. **NOTE: This counter only applies to the last DTC set.** Is the STARTS SINCE SET counter 2 or less? Yes → Go To 4 No → Go To 9	All
4	Turn the ignition off to the lock position. Remove the Starter Relay. **CAUTION: Removal of the Starter Relay is to prevent a Transmission, NO RESPONSE, condition and disable the starter.** Install the Transmission Simulator, Miller tool #8333 and the Electronic Transmission Adapter kit 8333-1A. **Note: Check connectors - Clean/repair as necessary.** Ignition on, engine not running. With the Transmission Simulator, turn the Input/Output switch to OFF. With the DRBIII®, monitor the TRANS TEMP VOLTS while turning the Thermistor Voltage switch to all three positions on the Transmission Simulator. Compare the DRBIII® readings with the numbers listed on the Transmission Simulator. Do the readings on the Transmission Simulator match the DRBIII® readings ± 0.2 volts? Yes → Go To 5 No → Go To 6	All
5	If there are no possible causes remaining, view repair. Repair Replace Transmission Solenoid/TRS assembly per the Service Information. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1.	All

P0713-TRANSMISSION TEMPERATURE SENSOR HIGH — Continued

TEST	ACTION	APPLICABILITY
6	Turn the ignition off to the lock position. Disconnect the PCM C4 harness connector.. Disconnect the Transmission Solenoid /TRS Assembly harness connector **Note: Check connectors - Clean/repair as necessary.** **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the Transmission Temperature Sensor Signal circuit from the appropriate terminal of special tool #8815 to the Transmission Solenoid/TRS Assembly harness connector. Is the resistance above 5.0 ohms? Yes → Repair the Transmission Temperature Sensor Signal circuit for an open. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 7	All
7	Turn the ignition off to the lock position. Disconnect the PCM C4 harness connector. Remove the Transmission Control Relay. **Note: Check connectors - Clean/repair as necessary.** **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Connect a jumper wire between the Fused B+ circuit and the Transmission Control Relay Output circuit in the Transmission Control Relay connector. Ignition on, engine not running. Measure the voltage of the Transmission Temperature Sensor Signal circuit in the appropriate terminal of special tool #8815. Is the voltage above 0.5 volts? Yes → Repair the Transmission Temperature Sensor Signal circuit for a short to voltage. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 8	All
8	Using the schematics as a guide, inspect the wiring and connectors. Repair as necessary. Pay particular attention to all power and ground circuits. If there are no possible causes remaining, view repair. Repair Replace the Powertrain Control Module per the Service Information. WITH THE DRBIII® PERFORM QUICK LEARN Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1.	All

P0713-TRANSMISSION TEMPERATURE SENSOR HIGH — Continued

TEST	ACTION	APPLICABILITY
9	The conditions necessary to set this DTC are not present at this time. Using the schematics as a guide, inspect the wiring and connectors specific to this circuit. Wiggle the wires while checking for shorted and open circuits. With the DRBIII®, check the EATX EVENT DATA to help identify the conditions in which the DTC was set. Were there any problems found? Yes → Repair as necessary. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete.	All

Symptom:
P0714-TRANSMISSION TEMPERATURE SENSOR INTERMITTENT

When Monitored and Set Condition:

P0714-TRANSMISSION TEMPERATURE SENSOR INTERMITTENT

When Monitored: Continuously with the ignition on and engine running.

Set Condition: The DTC will set when the monitored Temperature Sensor voltage fluctuates or changes abruptly within a predetermined period of time.

POSSIBLE CAUSES
RELATED DTC'S PRESENT
TRANSMISSION TEMPERATURE SENSOR
POWERTRAIN CONTROL MODULE
INTERMITTENT WIRING AND CONNECTORS

TEST	ACTION	APPLICABILITY
1	**NOTE: Low fluid level can be the cause of many transmission problems. If the fluid level is low locate and repair the leak then check and adjust the fluid level per the Service Information.** **NOTE: Always perform diagnostics with a fully charged battery to avoid false symptoms.** With the DRBIII®, read Engine DTC's. Check and repair all Engine DTC's prior to performing any transmission symptom diagnostics. With the DRBIII®, read Transmission DTC's. Record all DTC's and 1 Trip Failures. **NOTE: Diagnose 1 Trip Failures as a fully matured DTC.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Perform the Shift Lever Position Test. If the test does not pass, refer to Symptom test for P0706 Check Shifter Signal. For Gear Ratio DTC's, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle such that all diagnostic monitors have run. **NOTE: Verify flash level of Powertrain Control Module. Some problems are corrected by software upgrades to the Transmission and Engine software.** **NOTE: Check for applicable TSB's related to the problem.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All
2	With the DRBIII®, check Transmission DTC's. Are there any Speed Sensor and/or other Temperature Sensor DTCs present? Yes → Refer to the Transmission category and perform the appropriate symptom. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 3	All

P0714-TRANSMISSION TEMPERATURE SENSOR INTERMITTENT — Continued

TEST	ACTION	APPLICABILITY
3	With the DRBIII®, Check the STARTS SINCE SET counter for P0714. **NOTE: This counter only applies to the last DTC set.** Is the STARTS SINCE SET counter 2 or less? Yes → Go To 4 No → Go To 7	All
4	Turn the ignition off to the lock position. Remove the Starter Relay. **CAUTION: Removal of the Starter Relay is to prevent a Transmission, NO RESPONSE, condition and disable the starter.** Install the Transmission Simulator, Miller tool #8333 and the Electronic Transmission Adapter kit 8333-1A. **Note: Check connectors - Clean/repair as necessary.** Ignition on, engine not running. With the Transmission Simulator, turn the Input/Output switch to OFF. With the DRBIII®, monitor the TRANS TEMP VOLTS while turning the Thermistor Voltage switch to all three positions on the Transmission Simulator. Compare the DRBIII® readings with the numbers listed on the Transmission Simulator. Do the readings on the Transmission Simulator match a non-fluctuating DRBIII® reading ± 0.2 volts? Yes → Go To 5 No → Go To 6	All
5	If there are no possible causes remaining, view repair. Repair Replace Transmission Solenoid/TRS assembly per the Service Information. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1.	All
6	Using the schematics as a guide, inspect the wiring and connectors. Repair as necessary. Pay particular attention to all power and ground circuits. If there are no possible causes remaining, view repair. Repair Replace the Powertrain Control Module per the Service Information. WITH THE DRBIII® PERFORM QUICK LEARN Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1.	All
7	The conditions necessary to set this DTC are not present at this time. Using the schematics as a guide, inspect the wiring and connectors specific to this circuit. Wiggle the wires while checking for shorted and open circuits. With the DRBIII®, check the EATX EVENT DATA to help identify the conditions in which the DTC was set. Were there any problems found? Yes → Repair as necessary. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete.	All

Symptom:
P0715-INPUT SPEED SENSOR ERROR

When Monitored and Set Condition:

P0715-INPUT SPEED SENSOR ERROR

When Monitored: The transmission gear ratio is monitored continuously while the transmission is in gear.

Set Condition: If there is an excessive change in the Input RPM in any gear.

POSSIBLE CAUSES
INPUT SPEED SENSOR SIGNAL CIRCUIT OPEN
SPEED SENSOR GROUND CIRCUIT OPEN
INPUT SPEED SENSOR SIGNAL CIRCUIT SHORT TO GROUND
INPUT SPEED SENSOR SIGNAL CIRCUIT SHORT TO VOLTAGE
SPEED SENSOR GROUND CIRCUIT SHORT TO VOLTAGE
INPUT SPEED SENSOR
POWERTRAIN CONTROL MODULE
INTERMITTENT WIRING AND CONNECTORS

TEST	ACTION	APPLICABILITY
1	**NOTE: Low fluid level can be the cause of many transmission problems. If the fluid level is low locate and repair the leak then check and adjust the fluid level per the Service Information.** **NOTE: Always perform diagnostics with a fully charged battery to avoid false symptoms.** With the DRBIII®, read Engine DTC's. Check and repair all Engine DTC's prior to performing any transmission symptom diagnostics. With the DRBIII®, read Transmission DTC's. Record all DTC's and 1 Trip Failures. **NOTE: Diagnose 1 Trip Failures as a fully matured DTC.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Perform the Shift Lever Position Test. If the test does not pass, refer to Symptom test for P0706 Check Shifter Signal. For Gear Ratio DTC's, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle such that all diagnostic monitors have run. **NOTE: Verify flash level of Powertrain Control Module. Some problems are corrected by software upgrades to the Transmission and Engine software.** **NOTE: Check for applicable TSB's related to the problem.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All

P0715-INPUT SPEED SENSOR ERROR — Continued

TEST	ACTION	APPLICABILITY
2	Start the engine. Place the shifter in park. With the DRBIII®, read the Input Speed Sensor RPM. Is the Input Speed Sensor reading below 400 RPM? Yes → Go To 3 No → Go To 11	All
3	Turn the ignition off to the lock position. Remove the Starter Relay. **CAUTION: Removal of the Starter Relay is to prevent a Transmission, NO RESPONSE, condition and disable the starter.** Install the Transmission Simulator, Miller tool #8333 and the Electronic Transmission Adapter kit 8333-1A. Ignition on, engine not running. With the Transmission Simulator, set the ″Input/Output Speed″ switch to ″ON″ and the rotary switch to the ″3000/1250″ position. With the DRBIII®, read the Input and Output RPM. Does the Input speed read 3000 RPM and the Output speed read 1250 RPM ± 50 RPM? Yes → Go To 4 No → Go To 5	All
4	If there are no possible causes remaining, view repair. Repair Replace the Input Speed Sensor per the Service Information. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1.	All
5	Turn the ignition off to the lock position. Disconnect the PCM harness connector. Disconnect the Input Speed Sensor harness connector. **Note: Check connectors - Clean/repair as necessary.** **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the Input Speed Sensor Signal circuit from the appropriate terminal of special tool #8815 to the Input Speed Sensor connector. Is the resistance above 5.0 ohms? Yes → Repair the Input Speed Sensor Signal circuit for an open. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 6	All

P0715-INPUT SPEED SENSOR ERROR — Continued

TEST	ACTION	APPLICABILITY
6	Turn the ignition off to the lock position. Disconnect the PCM harness connector. Disconnect the Input Speed Sensor harness connector. **Note: Check connectors - Clean/repair as necessary.** **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the Speed Sensor Ground circuit from the Pinout Box to the Input Speed Sensor harness connector. Is the resistance above 5.0 ohms? Yes → Repair the Speed Sensor Ground circuit for an open. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 7	All
7	Turn the ignition off to the lock position. Disconnect the PCM harness connector. Disconnect the Input Speed Sensor harness connector. **Note: Check connectors - Clean/repair as necessary.** **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance between ground and the Input Speed Sensor Signal circuit. Is the resistance Below 5.0 ohms? Yes → Repair the Input Speed Sensor Signal circuit for a short to ground. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 8	All
8	Turn the ignition off to the lock position. Disconnect the Input Speed Sensor harness connector. Disconnect the PCM harness connector. Remove the Transmission Control Relay. **Note: Check connectors - Clean/repair as necessary.** **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Connect a jumper wire between the Fused B+ circuit and the Transmission Control Relay Output circuit in the Transmission Control Relay connector. Ignition on, engine not running. Measure the voltage of the Input Speed Sensor Signal circuit. Is the voltage above 0.5 volts? Yes → Repair the Input Speed Sensor Signal circuit for a short to voltage. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 9	All

P0715-INPUT SPEED SENSOR ERROR — Continued

TEST	ACTION	APPLICABILITY
9	Turn the ignition off to the lock position. Disconnect the PCM harness connector. Disconnect the TRS harness connector. Remove the Transmission Control Relay. **Note: Check connectors - Clean/repair as necessary.** Connect a jumper wire between the Fused B+ and the Transmission Control Relay Output circuit in the Transmission Control Relay connector. Ignition on, engine not running. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the voltage of the Speed Sensor Ground circuit in the Pinout Box. Is the voltage above 0.5 volt? Yes → Repair the Speed Sensor Ground circuit for a short to voltage. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 10	All
10	Using the schematics as a guide, inspect the wiring and connectors. Repair as necessary. Pay particular attention to all power and ground circuits. If there are no possible causes remaining, view repair. Repair Replace the Powertrain Control Module per the Service Information. WITH THE DRBIII® PERFORM QUICK LEARN AND REPROGRAM PINION FACTOR. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1.	All
11	The conditions necessary to set the DTC are not present at this time. Using the schematics as a guide, inspect the wiring and connectors specific to this circuit. Wiggle the wiring and connectors while checking for shorted and open circuits. With the DRBIII®, check the EATX EVENT DATA to help identify the conditions in which the DTC was set. Were there any problems found? Yes → Repair as necessary. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete.	All

Symptom:
P0720-OUTPUT SPEED SENSOR ERROR

When Monitored and Set Condition:

P0720-OUTPUT SPEED SENSOR ERROR

When Monitored: The transmission gear ratio is monitored continuously while the transmission is in gear.

Set Condition: If there is an excessive change in the Output RPM in any gear.

POSSIBLE CAUSES
OUTPUT SPEED SENSOR SIGNAL CIRCUIT OPEN
SPEED SENSOR GROUND CIRCUIT OPEN
OUTPUT SPEED SENSOR SIGNAL CIRCUIT SHORT TO GROUND
OUTPUT SPEED SENSOR SIGNAL CIRCUIT SHORT TO VOLTAGE
SPEED SENSOR GROUND CIRCUIT SHORT TO VOLTAGE
OUTPUT SPEED SENSOR
POWERTRAIN CONTROL MODULE
INTERMITTENT WIRING AND CONNECTORS

TEST	ACTION	APPLICABILITY
1	**NOTE: Low fluid level can be the cause of many transmission problems. If the fluid level is low locate and repair the leak then check and adjust the fluid level per the Service Information.** **NOTE: Always perform diagnostics with a fully charged battery to avoid false symptoms.** With the DRBIII®, read Engine DTC's. Check and repair all Engine DTC's prior to performing any transmission symptom diagnostics. With the DRBIII®, read Transmission DTC's. Record all DTC's and 1 Trip Failures. **NOTE: Diagnose 1 Trip Failures as a fully matured DTC.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Perform the Shift Lever Position Test. If the test does not pass, refer to Symptom test for P0706 Check Shifter Signal. For Gear Ratio DTC's, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle such that all diagnostic monitors have run. **NOTE: Verify flash level of Powertrain Control Module. Some problems are corrected by software upgrades to the Transmission and Engine software.** **NOTE: Check for applicable TSB's related to the problem.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All

P0720-OUTPUT SPEED SENSOR ERROR — Continued

TEST	ACTION	APPLICABILITY
2	Start the engine in park. Raise the drive wheels off of the ground. **WARNING: PROPERLY SUPPORT THE VEHICLE.** Firmly apply the brakes and place the transmission selector in drive. **WARNING: BE SURE TO KEEP HANDS AND FEET CLEAR OF ROTATING WHEELS.** Release the brakes and allow the drive wheels to spin freely. **Note: The drive wheels must be turning at this point.** With the DRBIII®, read the Output RPM Is the Output RPM below 100? Yes → Go To 3 No → Go To 11	All
3	Turn the ignition off to the lock position. Remove the Starter Relay. **CAUTION: Removal of the Starter Relay is to prevent a Transmission, NO RESPONSE, condition and disable the starter.** Install the Transmission Simulator, Miller tool #8333 and the Electronic Transmission Adapter kit 8333-1A. Ignition on, engine not running. With the Transmission Simulator, set the ″Input/Output Speed″ switch to ″ON″ and the rotary switch to the ″3000/1250″ position. With the DRBIII®, read the Input and Output RPM. Does the Input RPM read 3000 and the Output RPM read 1250 (within 50 RPM)? Yes → Go To 4 No → Go To 5	All
4	If there are no possible causes remaining, view repair. Repair Replace the Output Speed Sensor per the Service Information. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1.	All
5	Turn the ignition off to the lock position. Disconnect the PCM harness connector. Disconnect the Output Speed Sensor harness connector. **Note: Check connectors - Clean/repair as necessary.** **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the Output Speed Sensor Signal circuit from appropriate terminal of special tool #8815 to the Output Speed Sensor harness connector. Is the resistance above 5.0 ohms? Yes → Repair the Output Speed Sensor Signal circuit for an open. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 6	All

P0720-OUTPUT SPEED SENSOR ERROR — Continued

TEST	ACTION	APPLICABILITY
6	Turn the ignition off to the lock position. Disconnect the PCM harness connector. Disconnect the Output Speed Sensor harness connector. **Note: Check connectors - Clean/repair as necessary.** **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the Speed Sensor Ground circuit from the appropriate terminal of special tool #8815 to the Output Speed Sensor harness connector. Is the resistance above 5.0 ohms? Yes → Repair the Speed Sensor Ground circuit for an open. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 7	All
7	Turn the ignition off to the lock position. Disconnect the PCM harness connector. Disconnect the Output Speed Sensor harness connector. **Note: Check connectors - Clean/repair as necessary.** **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance between ground and the Output Speed Sensor Signal circuit. Is the resistance below 5.0 ohms? Yes → Repair the Output Speed Sensor Signal circuit for a short to ground. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 8	All
8	Turn the ignition off to the lock position. Disconnect the PCM harness connector. Disconnect the Output Speed Sensor harness connector. Remove the Transmission Control Relay. **Note: Check connectors - Clean/repair as necessary.** Connect a jumper wire between the Fused B+ circuit and Transmission Control Relay Output circuit in the Transmission Control Relay connector. Ignition on, engine not running. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the voltage of the Output Speed Sensor Signal circuit. Is the voltage above 0.5 volt? Yes → Repair the Output Speed Sensor Signal circuit for a short to voltage. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 9	All

P0720-OUTPUT SPEED SENSOR ERROR — Continued

TEST	ACTION	APPLICABILITY
9	Turn the ignition off to the lock position. Disconnect the PCM harness connector. Disconnect the TRS harness connector. Remove the Transmission Control Relay. **Note: Check connectors - Clean/repair as necessary.** Connect a jumper wire between the Fused B+ and Transmission Control Relay Output circuits in the Transmission Control Relay connector. Ignition on, engine not running. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the voltage of the Speed Sensor Ground circuit. Is the voltage above 0.5 volts? Yes → Repair the Speed Sensor Ground circuit for a short to voltage. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 10	All
10	Using the schematics as a guide, inspect the wiring and connectors. Repair as necessary. Pay particular attention to all power and ground circuits. If there are no possible causes remaining, view repair. Repair Replace the Powertrain Control Module per the Service Information. WITH THE DRBIII® PERFORM QUICK LEARN AND REPROGRAM PINION FACTOR. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1.	All
11	The conditions necessary to set the DTC are not present at this time. Using the schematics as a guide, inspect the wiring and connectors specific to this circuit. Wiggle the wiring and connectors while checking for shorted and open circuits. With the DRBIII®, check the EATX EVENT DATA to help identify the conditions in which the DTC was set. Were there any problems found? Yes → Repair as necessary. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete.	All

Symptom:
P0725-ENGINE SPEED SENSOR CIRCUIT

When Monitored and Set Condition:

P0725-ENGINE SPEED SENSOR CIRCUIT

When Monitored: Whenever the engine is running.

Set Condition: The Engine RPM is less than 390 or greater than 8000 for more than 2 seconds while the engine is running.

POSSIBLE CAUSES
ENGINE DTCS PRESENT
POWERTRAIN CONTROL MODULE
INTERMITTENT WIRING AND CONNECTORS

TEST	ACTION	APPLICABILITY
1	**NOTE: Low fluid level can be the cause of many transmission problems. If the fluid level is low locate and repair the leak then check and adjust the fluid level per the Service Information.** **NOTE: Always perform diagnostics with a fully charged battery to avoid false symptoms.** With the DRBIII®, read Engine DTC's. Check and repair all Engine DTC's prior to performing any transmission symptom diagnostics. With the DRBIII®, read Transmission DTC's. Record all DTC's and 1 Trip Failures. **NOTE: Diagnose 1 Trip Failures as a fully matured DTC.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Perform the Shift Lever Position Test. If the test does not pass, refer to Symptom test for P0706 Check Shifter Signal. For Gear Ratio DTC's, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle such that all diagnostic monitors have run. **NOTE: Verify flash level of Powertrain Control Module. Some problems are corrected by software upgrades to the Transmission and Engine software.** **NOTE: Check for applicable TSB's related to the problem.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All
2	Start the engine. **NOTE: This DTC is not a Transmission Input Speed Sensor DTC.** With the DRBIII®, Check the STARTS SINCE SET counter for P0725. **NOTE: This counter only applies to the last DTC set.** Is the STARTS SINCE SET counter for P0725 set at 0? Yes → Go To 3 No → Go To 5	All

P0725-ENGINE SPEED SENSOR CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
3	With the DRBIII®, read Engine DTCs. Are there any Engine DTC's present? Yes → Refer to the Powertrain category and perform the appropriate symptom. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 4	All
4	Using the schematics as a guide, inspect the wiring and connectors. Repair as necessary. Pay particular attention to all power and ground circuits. If there are no possible causes remaining, view repair. Repair Replace the Powertrain Control Module per the Service Information. WITH THE DRBIII® PERFORM QUICK LEARN AND REPROGRAM PINION FACTOR. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1.	All
5	The conditions necessary to set the DTC are not present at this time. Using the schematics as a guide, inspect the wiring and connectors specific to this circuit. Wiggle the wiring and connectors while checking for shorted and open circuits. With the DRBIII®, check the EATX EVENT DATA to help identify the conditions in which the DTC was set. Were there any problems found? Yes → Repair as necessary. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete.	All

Symptom:
P0731-GEAR RATIO ERROR IN 1ST

When Monitored and Set Condition:

P0731-GEAR RATIO ERROR IN 1ST

When Monitored: The Transmission gear ratio is monitored continuously while the transmission is in gear.

Set Condition: If the ratio of the Input RPM to the Output RPM does not match the current gear ratio.

POSSIBLE CAUSES
RELATED DTC’S PRESENT
INTERNAL TRANSMISSION
INTERMITTENT GEAR RATIO ERRORS

TEST	ACTION	APPLICABILITY
1	**NOTE: Low fluid level can be the cause of many transmission problems. If the fluid level is low locate and repair the leak then check and adjust the fluid level per the Service Information.** **NOTE: Always perform diagnostics with a fully charged battery to avoid false symptoms.** With the DRBIII®, read Engine DTC’s. Check and repair all Engine DTC’s prior to performing any transmission symptom diagnostics. With the DRBIII®, read Transmission DTC’s. Record all DTC’s and 1 Trip Failures. **NOTE: Diagnose 1 Trip Failures as a fully matured DTC.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Perform the Shift Lever Position Test. If the test does not pass, refer to Symptom test for P0706 Check Shifter Signal. For Gear Ratio DTC’s, check and record all CVI’s. Most DTC’s set on start up but some must be set by driving the vehicle such that all diagnostic monitors have run. **NOTE: Verify flash level of Powertrain Control Module. Some problems are corrected by software upgrades to the Transmission and Engine software.** **NOTE: Check for applicable TSB’s related to the problem.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All

P0731-GEAR RATIO ERROR IN 1ST — Continued

TEST	ACTION	APPLICABILITY
2	With the DRBIII®, read Transmission DTC's. If any of these DTC's are present, perform their respective tests first. Are there any Loss of Prime, Line Pressure Sensor and/or Speed Sensor DTCs present? Yes → Refer to appropriate symptom in the Transmission category. If any of these DTC's are present, they will cause a gear ratio error. Perform the test for Loss of Prime first if it is present. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 3	All
3	With the DRBIII®, perform the 1st gear clutch test. Follow the instructions on the DRBIII®. Increase the throttle angle or TPS Degree to 30° for no more than a few seconds. **CAUTION: Do not overheat the transmission.** Did the Clutch Test pass, Input Speed remain at zero? Yes → Go To 4 No → Go To 5	All
4	The conditions to set this DTC are not current at this time. Check the gearshift linkage adjustment. Gear ratio DTC's can be set by problems in the Input and Output Speed Sensor circuits. If the vehicle passes the Clutch Test and still sets Gear Ratio DTC, check the Speed Sensors for proper operation. Remove the Starter Relay. **CAUTION: Removal of the Starter Relay is to prevent a Transmission, NO RESPONSE, condition and disable the starter.** Check the wiring and connectors for the Speed Sensors for a good connection, then perform a wiggle test using the Transmission Simulator, Miller tool #8333 and the Electronic Transmission Adapter kit 8333-1A. This DTC can also be set under extreme temperature conditions, this is usually caused by an internal problem. Verify if the problem is only experienced under extreme hot or cold conditions. With the DRBIII®, check the EATX EVENT DATA to help identify the conditions in which the DTC was set. Were there any problems found? Yes → Repair as necessary. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete.	All
5	If there are no possible causes remaining, view repair. Repair Repair internal Transmission per the Service Information. Check all of the components related to the UD and LR clutches. Inspect the Oil Pump and repair or replace per the Service Information. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1.	All

Symptom:
P0732-GEAR RATIO ERROR IN 2ND

When Monitored and Set Condition:

P0732-GEAR RATIO ERROR IN 2ND

When Monitored: The Transmission gear ratio is monitored continuously while the Transmission is in gear.

Set Condition: If the ratio of the Input RPM to the Output RPM does not match the current gear ratio.

POSSIBLE CAUSES
RELATED DTC'S PRESENT
TRANSMISSION SOLENOID/PRESSURE SWITCH ASSEMBLY
INTERNAL TRANSMISSION
INTERMITTENT GEAR RATIO ERRORS

TEST	ACTION	APPLICABILITY
1	**NOTE: Low fluid level can be the cause of many transmission problems. If the fluid level is low locate and repair the leak then check and adjust the fluid level per the Service Information.** **NOTE: Always perform diagnostics with a fully charged battery to avoid false symptoms.** With the DRBIII®, read Engine DTC's. Check and repair all Engine DTC's prior to performing any transmission symptom diagnostics. With the DRBIII®, read Transmission DTC's. Record all DTC's and 1 Trip Failures. **NOTE: Diagnose 1 Trip Failures as a fully matured DTC.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Perform the Shift Lever Position Test. If the test does not pass, refer to Symptom test for P0706 Check Shifter Signal. For Gear Ratio DTC's, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle such that all diagnostic monitors have run. **NOTE: Verify flash level of Powertrain Control Module. Some problems are corrected by software upgrades to the Transmission and Engine software.** **NOTE: Check for applicable TSB's related to the problem.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All

P0732-GEAR RATIO ERROR IN 2ND — Continued

TEST	ACTION	APPLICABILITY
2	With the DRBIII®, read Transmission DTC's. If any of these DTC's are present, perform their respective tests first. Are there any Loss of Prime, Line Pressure Sensor and/or Speed Sensor DTCs present? Yes → Refer to the Transmission category and perform the appropriate symptom. If any of these DTC's are present, they will cause a gear ratio error. Perform the test for Loss of Prime first if it is present. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 3	All
3	With the DRBIII®, perform the 2nd gear clutch test. Follow the instructions on the DRBIII®. Increase the throttle angle or TPS Degree to 30° for no more than a few seconds. **CAUTION: Do not overheat the transmission.** Did the Clutch Test pass - Input Speed remain at zero? Yes → Go To 4 No → Go To 5	All
4	The conditions to set this DTC are not current at this time. Check the Gearshift Linkage adjustment. Gear ratio DTC's can be set by problems in the Input and Output Speed Sensor circuits. If the vehicle passes the Clutch Test and still sets Gear Ratio DTC's, check the Speed Sensors for proper operation. Remove the Starter Relay. **CAUTION: Removal of the Starter Relay is to prevent a Transmission, NO RESPONSE, condition and disable the starter.** Check the Speed Sensor wiring and connectors for good connection, then perform a wiggle test using the Transmission Simulator, Miller tool #8333 and the Electronic Transmission Adapter kit 8333-1A. This DTC can also be set under extreme temperature conditions, this is usually caused by an internal problem. Verify if the problem is only experienced under extreme hot or cold conditions. Check for any Technical Service Bulletins (TSBs) that may apply. With the DRBIII®, check the EATX EVENT DATA to help identify the conditions in which the DTC was set. Were there any problems found? Yes → Repair as necessary. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete.	All
5	With the DRBIII®, read Transmission DTC's. Are the DTC's P0845 and/or P0846 present also? Yes → Replace the Transmission Solenoid/Pressure Switch Assembly per the Service Information. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 6	All

P0732-GEAR RATIO ERROR IN 2ND — Continued

TEST	ACTION	APPLICABILITY
6	If there are no possible causes remaining, view repair. Repair Repair internal transmission per the Service Information. Check all of the components related to the UD and 2/4 clutches. Inspect the Oil Pump and repair or replace per the Service Information. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1.	All

Symptom:
P0733-GEAR RATIO ERROR IN 3RD

When Monitored and Set Condition:

P0733-GEAR RATIO ERROR IN 3RD

When Monitored: The Transmission gear ratio is monitored continuously while the Transmission is in gear.

Set Condition: If the ratio of the Input RPM to the Output RPM does not match the current gear ratio.

POSSIBLE CAUSES
RELATED DTC'S PRESENT
TRANSMISSION SOLENOID/PRESSURE SWITCH ASSEMBLY
INTERNAL TRANSMISSION
INTERMITTENT GEAR RATIO ERRORS

TEST	ACTION	APPLICABILITY
1	**NOTE: Low fluid level can be the cause of many transmission problems. If the fluid level is low locate and repair the leak then check and adjust the fluid level per the Service Information.** **NOTE: Always perform diagnostics with a fully charged battery to avoid false symptoms.** With the DRBIII®, read Engine DTC's. Check and repair all Engine DTC's prior to performing any transmission symptom diagnostics. With the DRBIII®, read Transmission DTC's. Record all DTC's and 1 Trip Failures. **NOTE: Diagnose 1 Trip Failures as a fully matured DTC.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Perform the Shift Lever Position Test. If the test does not pass, refer to Symptom test for P0706 Check Shifter Signal. For Gear Ratio DTC's, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle such that all diagnostic monitors have run. **NOTE: Verify flash level of Powertrain Control Module. Some problems are corrected by software upgrades to the Transmission and Engine software.** **NOTE: Check for applicable TSB's related to the problem.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All

P0733-GEAR RATIO ERROR IN 3RD — Continued

TEST	ACTION	APPLICABILITY
2	With the DRBIII®, read Transmission DTC's. If any of these DTC's are present, perform their respective tests first. Are there any Loss of Prime, Line Pressure Sensor and/or Speed Sensor DTCs present? Yes → Refer to appropriate symptom in the Transmission category. If any of these DTC's are present, they will cause a gear ratio error. Perform the test for Loss of Prime DTC first if it is present. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 3	All
3	With the DRBIII®, perform the 3rd Gear Clutch test. Follow the instructions on the DRBIII®. Increase the throttle angle or TPS Degree to 30° for no more than a few seconds. **CAUTION: Do not overheat the transmission.** Did the clutch test pass, Input Speed remain at zero? Yes → Go To 4 No → Go To 5	All
4	The conditions to set this DTC are not current at this time. Check the gearshift linkage adjustment. Gear ratio DTC's can be set by problems in the input and output speed sensor circuits. If the vehicle passes the clutch test and still sets gear ratio DTC's, check the Speed Sensors for proper operation. Remove the Starter Relay. **CAUTION: Removal of the Starter Relay is to prevent a Transmission, NO RESPONSE, condition and disable the starter.** Check the speed sensor wiring and connectors for good connection, then perform a wiggle test using the Transmission Simulator, Miller tool #8333 and the Electronic Transmission Adapter kit 8333-1A. This DTC can also be set under extreme temperature conditions, this is usually caused by an internal problem. Verify if the problem is only experienced under extreme hot or cold conditions. With the DRBIII®, check the EATX EVENT DATA to help identify the conditions in which the DTC was set. Were there any problems found? Yes → Repair as necessary. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete.	All
5	With the DRBIII®, read Transmission DTC's. Are the DTC's P0870 and/or P0871 present also? Yes → Replace the Transmission Solenoid/Pressure Switch Assembly per the Service Information. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 6	All

P0733-GEAR RATIO ERROR IN 3RD — Continued

TEST	ACTION	APPLICABILITY
6	If there are no possible causes remaining, view repair. Repair Repair internal transmission per the Service Information. Check all of the components related to the UD and OD clutches. Inspect the Oil Pump and repair or replace per the Service Information. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1.	All

Symptom:
P0734-GEAR RATIO ERROR IN 4TH

When Monitored and Set Condition:

P0734-GEAR RATIO ERROR IN 4TH

When Monitored: The Transmission gear ratio is monitored continuously while the Transmission is in gear.

Set Condition: If the ratio of the Input RPM to the Output RPM does not match the current gear ratio.

POSSIBLE CAUSES
RELATED DTC'S PRESENT
TRANSMISSION SOLENOID/PRESSURE SWITCH ASSEMBLY
INTERNAL TRANSMISSION
INTERMITTENT GEAR RATIO ERRORS

TEST	ACTION	APPLICABILITY
1	**NOTE: Low fluid level can be the cause of many transmission problems. If the fluid level is low locate and repair the leak then check and adjust the fluid level per the Service Information.** **NOTE: Always perform diagnostics with a fully charged battery to avoid false symptoms.** With the DRBIII®, read Engine DTC's. Check and repair all Engine DTC's prior to performing any transmission symptom diagnostics. With the DRBIII®, read Transmission DTC's. Record all DTC's and 1 Trip Failures. **NOTE: Diagnose 1 Trip Failures as a fully matured DTC.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Perform the Shift Lever Position Test. If the test does not pass, refer to Symptom test for P0706 Check Shifter Signal. For Gear Ratio DTC's, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle such that all diagnostic monitors have run. **NOTE: Verify flash level of Powertrain Control Module. Some problems are corrected by software upgrades to the Transmission and Engine software.** **NOTE: Check for applicable TSB's related to the problem.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All

P0734-GEAR RATIO ERROR IN 4TH — Continued

TEST	ACTION	APPLICABILITY
2	With the DRBIII®, read Transmission DTC's. If any of these DTC's are present, perform their respective tests first. Are there any Loss of Prime, Line Pressure Sensor and/or Speed Sensor DTCs present? Yes → Refer to the Transmission category and perform the appropriate symptom. If any of these DTC's are present, they will cause a gear ratio error. Perform the test for Loss of Prime first if it is present. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 3	All
3	With the DRBIII®, perform the 4th gear clutch test. Follow the instructions on the DRBIII®. Increase the throttle angle or TPS Degree to 30° for no more than a few seconds. **CAUTION: Do not overheat the transmission.** Did the clutch test pass - Input Speed remain at zero? Yes → Go To 4 No → Go To 5	All
4	The conditions to set this DTC are not current at this time. Check the gearshift linkage adjustment. Gear ratio DTC's can be set by problems in the Input and Output Speed Sensor circuits. If the vehicle passes the clutch test and still sets gear ratio DTC's, check the Speed Sensors for proper operation. Remove the Starter Relay. **CAUTION: Removal of the Starter Relay is to prevent a Transmission, NO RESPONSE, condition and disable the starter.** Check the Speed Sensor wiring and connectors for good connection, then perform a wiggle test using the Transmission Simulator, Miller tool #8333 and the Electronic Transmission Adapter kit 8333-1A. This DTC can also be set under extreme temperature conditions, this is usually caused by an internal problem. Verify if the problem is only experienced under extreme hot or cold conditions. With the DRBIII®, check the EATX EVENT DATA to help identify the conditions in which the DTC was set. Were there any problems found? Yes → Repair as necessary. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete.	All
5	With the DRBIII®, read Transmission DTC's. Are the DTC's P0870 and/or P0871 present also? Yes → Replace the Solenoid/Pressure Switch Assembly per the Service Information. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 6	All

P0734-GEAR RATIO ERROR IN 4TH — Continued

TEST	ACTION	APPLICABILITY
6	If there are no possible causes remaining, view repair. Repair Repair internal transmission per the Service Information. Check all of the components related to the OD and 2/4 clutches. Inspect the Oil Pump and repair or replace per the Service Information. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1.	All

Symptom:
P0736-GEAR RATIO ERROR IN REVERSE

When Monitored and Set Condition:

P0736-GEAR RATIO ERROR IN REVERSE

When Monitored: The Transmission gear ratio is monitored continuously while the Transmission is in gear.

Set Condition: If the ratio of the Input RPM to the Output RPM does not match the current gear ratio.

POSSIBLE CAUSES
RELATED DTC'S PRESENT
INTERNAL TRANSMISSION
INTERMITTENT GEAR RATIO ERRORS

TEST	ACTION	APPLICABILITY
1	**NOTE: Low fluid level can be the cause of many transmission problems. If the fluid level is low locate and repair the leak then check and adjust the fluid level per the Service Information.** **NOTE: Always perform diagnostics with a fully charged battery to avoid false symptoms.** With the DRBIII®, read Engine DTC's. Check and repair all Engine DTC's prior to performing any transmission symptom diagnostics. With the DRBIII®, read Transmission DTC's. Record all DTC's and 1 Trip Failures. **NOTE: Diagnose 1 Trip Failures as a fully matured DTC.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Perform the Shift Lever Position Test. If the test does not pass, refer to Symptom test for P0706 Check Shifter Signal. For Gear Ratio DTC's, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle such that all diagnostic monitors have run. **NOTE: Verify flash level of Powertrain Control Module. Some problems are corrected by software upgrades to the Transmission and Engine software.** **NOTE: Check for applicable TSB's related to the problem.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All

P0736-GEAR RATIO ERROR IN REVERSE — Continued

TEST	ACTION	APPLICABILITY
2	With the DRBIII®, read Transmission DTC's. If any of these DTC's are present, perform their respective tests first. Are there any Loss of Prime, Line Pressure Sensor and/or Speed Sensor DTCs present? Yes → Refer to the Transmission category and perform the appropriate symptom. If any of these DTC's are present, they will cause a gear ratio error. Perform the test for Loss of Prime first if it is present. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 3	All
3	With the DRBIII®, perform the Reverse Gear Clutch test. Follow the instructions on the DRBIII®. Increase the throttle angle or TPS Degree to 30° for no more than a few seconds. **CAUTION: Do not overheat the transmission.** Did the clutch test pass - Input Speed remain at zero? Yes → Go To 4 No → Go To 5	All
4	The conditions to set this DTC are not current at this time. Check the gearshift linkage adjustment. Gear ratio DTC's can be set by problems in the Input and Output Speed Sensor circuits. If the vehicle passes the clutch test and still sets gear ratio DTC's, check the Speed Sensors for proper operation. Remove the Starter Relay. With the DRBIII®, check the EATX EVENT DATA to help identify the conditions in which the DTC was set. Check the Speed Sensor wiring and connectors for good connection, then perform a wiggle test using the Transmission Simulator, Miller tool #8333 and Electronic Transmission Adapter kit, Miller tool #8333-1. This DTC can also be set under extreme temperature conditions, this is usually caused by an internal problem. Verify if the problem is only experienced under extreme hot or cold conditions. With the DRBIII®, check the EATX EVENT DATA to help identify the conditions in which the DTC was set. Were there any problems found? Yes → Repair as necessary. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete.	All
5	If there are no possible causes remaining, view repair. Repair Repair internal transmission per the Service Information. Check all of the components related to the Reverse and LR clutches. Inspect the Oil Pump and repair or replace per the Service Information. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1.	All

Symptom:
P0740-TORQUE CONVERTER CLUTCH CONTROL CIRCUIT

When Monitored and Set Condition:

P0740-TORQUE CONVERTER CLUTCH CONTROL CIRCUIT

When Monitored: The Torque Converter Clutch (TCC) is in FEMCC or PEMCC, Transmission temperature is hot, Engine temperature is greater than 38° C or 100° F, Transmission Input Speed greater than 1750 RPM, TPS less than 30°.

Set Condition: The TCC is modulated by controlling the duty cycle of the L/R Solenoid until the difference between the Engine and the Transmission Input Speed RPM or duty cycle is within a desired range. The DTC is set after the period of 10 seconds and 3 occurrences of either: FEMCC - with slip greater than 100 RPM or PEMCC - duty cycle greater than 85%.

POSSIBLE CAUSES
RELATED DTC'S PRESENT
INTERNAL TRANSMISSION
INTERMITTENT WIRING AND CONNECTORS

TEST	ACTION	APPLICABILITY
1	**NOTE: Low fluid level can be the cause of many transmission problems. If the fluid level is low locate and repair the leak then check and adjust the fluid level per the Service Information.** **NOTE: Always perform diagnostics with a fully charged battery to avoid false symptoms.** With the DRBIII®, read Engine DTC's. Check and repair all Engine DTC's prior to performing any transmission symptom diagnostics. With the DRBIII®, read Transmission DTC's. Record all DTC's and 1 Trip Failures. **NOTE: Diagnose 1 Trip Failures as a fully matured DTC.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Perform the Shift Lever Position Test. If the test does not pass, refer to Symptom test for P0706 Check Shifter Signal. For Gear Ratio DTC's, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle such that all diagnostic monitors have run. **NOTE: Verify flash level of Powertrain Control Module. Some problems are corrected by software upgrades to the Transmission and Engine software.** **NOTE: Check for applicable TSB's related to the problem.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All

P0740-TORQUE CONVERTER CLUTCH CONTROL CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
2	With the DRBIII®, read Transmission DTC's Are the DTC's P0750 and/or P0841 present also? Yes → Refer to the Transmission category and perform the appropriate symptom. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 3	All
3	Ignition on, engine not running. With the DRBIII®, record and erase DTC's. Drive the vehicle until it is fully warmed up. At least 110 degrees. Perform the following step 3 times. Drive the vehicle at 50 MPH and allow 4th gear to engage for at least 10 seconds. Close the throttle, then tip back in until the throttle angle is between 25 and 29 degrees. Note that if you go over 30 degrees, you must back off of the throttle and retry. Did the TCC engage during any of the attempts? Yes → Go To 4 No → Go To 5	All
4	The conditions necessary to set the DTC are not present at this time. Using the schematics as a guide, inspect the wiring and connectors specific to this circuit. Wiggle the wiring and connectors while checking for shorted and open circuits. This DTC can also be set under extreme temperature conditions, this is usually caused by an internal problem. Verify if the problem is only experienced under extreme hot or cold conditions. With the DRBIII®, check the EATX EVENT DATA to help identify the conditions in which the DTC was set. Were there any problems found? Yes → Repair as necessary. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete.	All
5	If there are no possible causes remaining, view repair. Repair Perform the Hydraulic Pressure test per the Service Information and repair the internal transmission components and Torque convertor as necessary. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1.	All

Symptom:
P0750-LR SOLENOID CIRCUIT

When Monitored and Set Condition:

P0750-LR SOLENOID CIRCUIT

When Monitored: Initially at power-up, then every 10 seconds thereafter. The solenoids will also be tested immediately after a gear ratio or pressure switch error is detected.

Set Condition: Three consecutive solenoid continuity test failures, or one failure if test is run in response to a gear ratio or pressure switch error.

POSSIBLE CAUSES
RELATED RELAY DTC'S PRESENT
TRANSMISSION CONTROL RELAY OUTPUT CIRCUIT OPEN
LR SOLENOID CONTROL CIRCUIT OPEN
LR SOLENOID CONTROL CIRCUIT SHORT TO GROUND
LR SOLENOID CONTROL CIRCUIT SHORT TO VOLTAGE
LR SOLENOID/PRESSURE SWITCH ASSEMBLY
POWERTRAIN CONTROL MODULE
INTERMITTENT WIRING AND CONNECTORS

TEST	ACTION	APPLICABILITY
1	**NOTE: Low fluid level can be the cause of many transmission problems. If the fluid level is low locate and repair the leak then check and adjust the fluid level per the Service Information.** **NOTE: Always perform diagnostics with a fully charged battery to avoid false symptoms.** With the DRBIII®, read Engine DTC's. Check and repair all Engine DTC's prior to performing any transmission symptom diagnostics. With the DRBIII®, read Transmission DTC's. Record all DTC's and 1 Trip Failures. **NOTE: Diagnose 1 Trip Failures as a fully matured DTC.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Perform the Shift Lever Position Test. If the test does not pass, refer to Symptom test for P0706 Check Shifter Signal. For Gear Ratio DTC's, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle such that all diagnostic monitors have run. **NOTE: Verify flash level of Powertrain Control Module. Some problems are corrected by software upgrades to the Transmission and Engine software.** **NOTE: Check for applicable TSB's related to the problem.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All

P0750-LR SOLENOID CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
2	With the DRBIII®, read Transmission DTC's Are there any Transmission Control Relay DTC's present also? Yes → Refer to the Transmission category and perform the appropriate symptom. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 3	All
3	With the DRBIII®, Check the STARTS SINCE SET counter. **NOTE: This counter only applies to the last DTC set.** Is the STARTS SINCE SET counter for P0750 set at 0? Yes → Go To 4 No → Go To 11	All
4	Turn the ignition off to the lock position. Remove the Starter Relay. **CAUTION: Removal of the Starter Relay is to prevent a Transmission, NO RESPONSE, condition and disable the starter.** Install the Transmission Simulator, Miller tool #8333 and the Electronic Transmission Adapter kit 8333-1A. Ignition on, engine not running. With the DRBIII®, actuate the L/R Solenoid. Monitor the L/R Solenoid LED on the Transmission Simulator. Did the L/R Solenoid LED on the Transmission Simulator blink on and off during actuation? Yes → Go To 5 No → Go To 6	All
5	If there are no possible causes remaining, view repair. Repair Replace the Transmission Solenoid/Pressure Switch Assembly per the Service Information. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1.	All
6	Turn the ignition off to the lock position. Disconnect the PCM harness connector. Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the LR Solenoid Control circuit from the appropriate terminal of special tool #8815 to the Solenoid/Pressure Switch Assembly harness connector. Is the resistance above 5.0 ohms? Yes → Repair the LR Solenoid Control circuit for an open. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 7	All

P0750-LR SOLENOID CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
7	Turn the ignition off to the lock position. Disconnect the PCM harness connector. Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance between ground and the LR Solenoid Control circuit. Is the resistance below 5.0 ohms? Yes → Repair the LR Solenoid Control circuit for a short to ground. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 8	All
8	Turn the ignition off to the lock position. Disconnect the PCM harness connector. Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector. Remove the Transmission Control Relay. **Note: Check connectors - Clean/repair as necessary.** Connect a jumper wire between the Fused B+ circuit and the Transmission Control Relay Output circuit in the Transmission Control Relay connector. Ignition on, engine not running. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the voltage of the LR Solenoid Control circuit. Is the voltage above 0.5 volts? Yes → Repair the LR Solenoid Control circuit for a short to voltage. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 9	All
9	Turn the ignition off to the lock position. Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector. Remove the Transmission Control Relay. **Note: Check connectors - Clean/repair as necessary.** Connect a jumper wire between the Fused B+ circuit and Transmission Control Relay Output circuit in the Transmission Control Relay connector. Using a 12-volt test light connected to ground, check the Transmission Relay Output circuit in the Transmission Solenoid/Pressure Switch harness connector. **NOTE: The test light must illuminate brightly. Compare the brightness to that of a direct connection to the battery.** Does the test light illuminate brightly? Yes → Go To 10 No → Repair the Transmission Control Relay Output circuit for an open. If the fuse is open make sure to check for a short to ground. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1.	All

P0750-LR SOLENOID CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
10	Using the schematics as a guide, inspect the wiring and connectors. Repair as necessary. Pay particular attention to all power and ground circuits. If there are no possible causes remaining, view repair. Repair Replace the Powertrain Control Module per the Service Information. WITH THE DRBIII® PERFORM QUICK LEARN AND REPROGRAM PINION FACTOR. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1.	All
11	The conditions necessary to set the DTC are not present at this time. Using the schematics as a guide, inspect the wiring and connectors specific to this circuit. Wiggle the wires while checking for shorted and open circuits. With the DRBIII®, check the EATX EVENT DATA to help identify the conditions in which the DTC was set. Were there any problems found? Yes → Repair as necessary. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete.	All

Symptom:
P0755-2/4 SOLENOID CIRCUIT

When Monitored and Set Condition:

P0755-2/4 SOLENOID CIRCUIT

When Monitored: Initially at power-up, then every 10 seconds thereafter. They will also be tested immediately after a gear ratio or pressure switch error is detected.

Set Condition: Three consecutive solenoid continuity test failures, or one failure if test is run in response to a gear ratio or pressure switch error.

POSSIBLE CAUSES
RELATED RELAY DTC'S PRESENT
TRANSMISSION CONTROL RELAY OUTPUT CIRCUIT OPEN
2/4 SOLENOID CONTROL CIRCUIT OPEN
2/4 SOLENOID CONTROL CIRCUIT SHORT TO GROUND
2/4 SOLENOID CONTROL CIRCUIT SHORT TO VOLTAGE
2/4 SOLENOID
POWERTRAIN CONTROL MODULE
INTERMITTENT WIRING AND CONNECTORS

TEST	ACTION	APPLICABILITY
1	**NOTE: Low fluid level can be the cause of many transmission problems. If the fluid level is low locate and repair the leak then check and adjust the fluid level per the Service Information.** **NOTE: Always perform diagnostics with a fully charged battery to avoid false symptoms.** With the DRBIII®, read Engine DTC's. Check and repair all Engine DTC's prior to performing any transmission symptom diagnostics. With the DRBIII®, read Transmission DTC's. Record all DTC's and 1 Trip Failures. **NOTE: Diagnose 1 Trip Failures as a fully matured DTC.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Perform the Shift Lever Position Test. If the test does not pass, refer to Symptom test for P0706 Check Shifter Signal. For Gear Ratio DTC's, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle such that all diagnostic monitors have run. **NOTE: Verify flash level of Powertrain Control Module. Some problems are corrected by software upgrades to the Transmission and Engine software.** **NOTE: Check for applicable TSB's related to the problem.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All

P0755-2/4 SOLENOID CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
2	With the DRBIII®, read Transmission DTC's Are there any Transmission Control Relay DTC's present also? Yes → Refer to the Transmission category and perform the appropriate symptom. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 3	All
3	With the DRBIII®, Check the STARTS SINCE SET counter for P0755. **NOTE: This counter only applies to the last DTC set.** Is the STARTS SINCE SET counter set at 0? Yes → Go To 4 No → Go To 11	All
4	Turn the ignition off to the lock position. Remove the Starter Relay. **CAUTION: Removal of the Starter Relay is to prevent a Transmission, NO RESPONSE, condition and disable the starter.** Install the Transmission Simulator, Miller tool #8333 and the Electronic Transmission Adapter kit 8333-1A. Ignition on, engine not running. With the DRBIII®, actuate the 2/4 Solenoid. With the Transmission Simulator, monitor the 2/4 Solenoid LED. Did the 2/4 Solenoid LED on the Transmission Simulator blink on and off during actuation? Yes → Go To 5 No → Go To 6	All
5	If there are no possible causes remaining, view repair. Repair Replace the Transmission Solenoid/Pressure Switch Assembly per the Service Information. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1.	All
6	Turn the ignition off to the lock position. Disconnect the PCM harness connector. Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector. **Note: Check connectors - Clean/repair as necessary.** **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the 2/4 Solenoid Control circuit from the appropriate terminal of special tool #8815 to the Solenoid/Pressure Switch Assembly harness connector. Is the resistance above 5.0 ohms? Yes → Repair the 2-4 Solenoid Control circuit for an open. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 7	All

P0755-2/4 SOLENOID CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
7	Turn the ignition off to the lock position. Disconnect the PCM harness connector. Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector. **Note: Check connectors - Clean/repair as necessary.** **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance between ground and the 2/4 Solenoid Control circuit. Is the resistance below 5.0 ohms? Yes → Repair the 2/4 Solenoid Control circuit for a short to ground. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 8	All
8	Turn the ignition off to the lock position. Disconnect the PCM harness connector. Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector. Remove the Transmission Control Relay. **Note: Check connectors - Clean/repair as necessary.** Connect a jumper wire between the Fused B+ circuit and Transmission Control Relay Output circuit in the Transmission Control Relay connector. Ignition on, engine not running. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the voltage of the 2/4 Solenoid Control circuit. Is the voltage above 0.5 volts? Yes → Repair the 2/4 Solenoid Control circuit for a short to voltage. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 9	All
9	Turn the ignition off to the lock position. Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector. Remove the Transmission Control Relay. **Note: Check connectors - Clean/repair as necessary.** Connect a jumper wire between the Fused B+ circuit and Transmission Control Relay Output circuit in the Transmission Control Relay connector. Using a 12-volt test light connected to ground, check the Transmission Control Relay Output circuit in the Solenoid/Pressure Switch Assembly harness connector. **NOTE: The test light must illuminate brightly. Compare the brightness to that of a direct connection to the battery.** Does the test light illuminate brightly? Yes → Go To 10 No → Repair the Transmission Control Relay Output circuit for an open. If the fuse is open make sure to check for a short to ground. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1.	All

P0755-2/4 SOLENOID CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
10	Using the schematics as a guide, inspect the wiring and connectors. Repair as necessary. Pay particular attention to all power and ground circuits. If there are no possible causes remaining, view repair. Repair Replace the Powertrain Control Module per the Service Information. WITH THE DRBIII® PERFORM QUICK LEARN AND REPROGRAM PINION FACTOR. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1.	All
11	The conditions necessary to set the DTC are not present at this time. Using the schematics as a guide, inspect the wiring and connectors specific to this circuit. Wiggle the wiring and connectors while checking for shorted and open circuits. With the DRBIII®, check the EATX EVENT DATA to help identify the conditions in which the DTC was set. Were there any problems found? Yes → Repair as necessary. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete.	All

Symptom:
P0760-OD SOLENOID CIRCUIT

When Monitored and Set Condition:

P0760-OD SOLENOID CIRCUIT

When Monitored: Initially at power-up, then every 10 seconds thereafter. Also tested immediately after a gear ratio or pressure switch error is detected.

Set Condition: Three consecutive solenoid continuity test failures, or one failure if test is run in response to a gear ratio or pressure switch error.

POSSIBLE CAUSES
RELATED RELAY DTC'S PRESENT
TRANSMISSION CONTROL RELAY OUTPUT CIRCUIT OPEN
OD SOLENOID CONTROL CIRCUIT OPEN
OD SOLENOID CONTROL CIRCUIT SHORT TO GROUND
OD SOLENOID CONTROL CIRCUIT SHORT TO VOLTAGE
OD SOLENOID
POWERTRAIN CONTROL MODULE
INTERMITTENT WIRING AND CONNECTORS

TEST	ACTION	APPLICABILITY
1	**NOTE: Low fluid level can be the cause of many transmission problems. If the fluid level is low locate and repair the leak then check and adjust the fluid level per the Service Information.** **NOTE: Always perform diagnostics with a fully charged battery to avoid false symptoms.** With the DRBIII®, read Engine DTC's. Check and repair all Engine DTC's prior to performing any transmission symptom diagnostics. With the DRBIII®, read Transmission DTC's. Record all DTC's and 1 Trip Failures. **NOTE: Diagnose 1 Trip Failures as a fully matured DTC.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Perform the Shift Lever Position Test. If the test does not pass, refer to Symptom test for P0706 Check Shifter Signal. For Gear Ratio DTC's, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle such that all diagnostic monitors have run. **NOTE: Verify flash level of Powertrain Control Module. Some problems are corrected by software upgrades to the Transmission and Engine software.** **NOTE: Check for applicable TSB's related to the problem.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All

P0760-OD SOLENOID CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
2	With the DRBIII®, read Transmission DTC's Are there any Transmission Control Relay DTC's present also? Yes → Refer to the Transmission category and perform the appropriate symptom. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 3	All
3	With the DRBIII®, Check the STARTS SINCE SET counter for P0760. **NOTE: This counter only applies to the last DTC set.** Is the STARTS SINCE SET counter set at 0? Yes → Go To 4 No → Go To 11	All
4	Turn the ignition off to the lock position. Remove the Starter Relay. **CAUTION: Removal of the Starter Relay is to prevent a Transmission, NO RESPONSE, condition and disable the starter.** Install the Transmission Simulator, Miller tool #8333 and the Electronic Transmission Adapter kit 8333-1A. Ignition on, engine not running. With the Transmission Simulator, monitor the OD Solenoid LED. With the DRBIII®, actuate the OD Solenoid. Did the OD Solenoid LED on the Transmission Simulator blink on and off during actuation? Yes → Go To 5 No → Go To 6	All
5	If there are no possible causes remaining, view repair. Repair Replace the Transmission Solenoid/Pressure Switch Assembly per the Service Information. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1.	All
6	Turn the ignition off to the lock position. Disconnect the PCM harness connector. Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector. **Note: Check connectors - Clean/repair as necessary.** **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the OD Solenoid Control circuit from the appropriate terminal of special tool #8815 to the Transmission Solenoid/Pressure Switch Assembly harness connector. Is the resistance above 5.0 ohms? Yes → Repair the OD Solenoid Control circuit for an open. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 7	All

P0760-OD SOLENOID CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
7	Turn the ignition off to the lock position. Disconnect the PCM harness connector. Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector. **Note: Check connectors - Clean/repair as necessary.** **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance between ground and the OD Solenoid Control circuit. Is the resistance below 5.0 ohms? Yes → Repair the OD Solenoid Control circuit for a short to ground. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 8	All
8	Turn the ignition off to the lock position. Disconnect the PCM harness connector. Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector. Remove the Transmission Control Relay. **Note: Check connectors - Clean/repair as necessary.** Connect a jumper wire between the Fused B+ circuit and Transmission Control Relay Output circuit in the Transmission Control Relay connector. Ignition on, engine not running. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the voltage of the OD Solenoid Control circuit. Is the voltage above 0.5 volts? Yes → Repair the OD Solenoid Control circuit for a short to voltage. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 9	All
9	Turn the ignition off to the lock position. Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector. Remove the Transmission Control Relay. **Note: Check connectors - Clean/repair as necessary.** Connect a jumper wire between the Fused B+ circuit and Transmission Control Relay Output circuit in the Transmission Control Relay connector. Using a 12-volt test light connected to ground, check the Transmission Control Relay Output circuit in the Solenoid/Pressure Switch Assembly harness connector. **NOTE: The test light must illuminate brightly. Compare the brightness to that of a direct connection to the battery.** Does the test light illuminate brightly? Yes → Go To 10 No → Repair the Transmission Control Relay Output circuit for an open. If the fuse is open make sure to check for a short to ground. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1.	All

P0760-OD SOLENOID CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
10	Using the schematics as a guide, inspect the wiring and connectors. Repair as necessary. Pay particular attention to all power and ground circuits. If there are no possible causes remaining, view repair. Repair Replace the Powertrain Control Module per the Service Information. WITH THE DRBIII® PERFORM QUICK LEARN AND REPROGRAM PINION FACTOR. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1.	All
11	The conditions necessary to set the DTC are not present at this time. Using the schematics as a guide, inspect the wiring and connectors specific to this circuit. Wiggle the wiring and connectors while checking for shorted and open circuits. With the DRBIII®, check the EATX EVENT DATA to help identify the conditions in which the DTC was set. Were there any problems found? Yes → Repair as necessary. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete.	All

Symptom:
P0765-UD SOLENOID CIRCUIT

When Monitored and Set Condition:

P0765-UD SOLENOID CIRCUIT

When Monitored: Initially at power-up, then every 10 seconds thereafter. They will also be tested immediately after a gear ratio or pressure switch error is detected.

Set Condition: Three consecutive solenoid continuity test failures, or one failure if test is run in response to a gear ratio or pressure switch error.

POSSIBLE CAUSES
RELATED RELAY DTC'S PRESENT
UD SOLENOID CONTROL CIRCUIT OPEN
UD SOLENOID CONTROL CIRCUIT SHORT TO GROUND
UD SOLENOID CONTROL CIRCUIT SHORT TO VOLTAGE
UD SOLENOID
INTERMITTENT WIRING AND CONNECTORS

TEST	ACTION	APPLICABILITY
1	**NOTE: Low fluid level can be the cause of many transmission problems. If the fluid level is low locate and repair the leak then check and adjust the fluid level per the Service Information.** **NOTE: Always perform diagnostics with a fully charged battery to avoid false symptoms.** With the DRBIII®, read Engine DTC's. Check and repair all Engine DTC's prior to performing any transmission symptom diagnostics. With the DRBIII®, read Transmission DTC's. Record all DTC's and 1 Trip Failures. **NOTE: Diagnose 1 Trip Failures as a fully matured DTC.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Perform the Shift Lever Position Test. If the test does not pass, refer to Symptom test for P0706 Check Shifter Signal. For Gear Ratio DTC's, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle such that all diagnostic monitors have run. **NOTE: Verify flash level of Powertrain Control Module. Some problems are corrected by software upgrades to the Transmission and Engine software.** **NOTE: Check for applicable TSB's related to the problem.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All

P0765-UD SOLENOID CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
2	With the DRBIII®, read Transmission DTC's Are there any Transmission Control Relay DTC's present also? Yes → Refer to the Transmission category and perform the appropriate symptom. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 3	All
3	With the DRBIII®, Check the STARTS SINCE SET counter for P0765. **NOTE: This counter only applies to the last DTC set.** Is the STARTS SINCE SET counter set at 0? Yes → Go To 4 No → Go To 9	All
4	Turn the ignition off to the lock position. Remove the Starter Relay. **CAUTION: Removal of the Starter Relay is to prevent a Transmission, NO RESPONSE, condition and disable the starter.** Install the Transmission Simulator, Miller tool #8333 and the Electronic Transmission Adapter kit 8333-1A. Ignition on, engine not running. Monitor the UD Solenoid LED on the Transmission Simulator. With the DRBIII®, actuate the UD Solenoid. Did the UD Solenoid LED on the Transmission Simulator blink on and off? Yes → Go To 5 No → Go To 6	All
5	If there are no possible causes remaining, view repair. Repair Replace the Transmission Solenoid/Pressure Switch Assembly per the Service Information. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1.	All
6	Turn the ignition off to the lock position. Disconnect the PCM harness connector. Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector. **Note: Check connectors - Clean/repair as necessary.** **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the UD Solenoid Control circuit from the appropriate terminal of special tool #8815 to the Transmission Solenoid/Pressure Switch Assembly harness connector. Is the resistance above 5.0 ohms? Yes → Repair the UD Solenoid Control circuit for an open. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 7	All

P0765-UD SOLENOID CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
7	Turn the ignition off to the lock position. Disconnect the PCM harness connector. Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector. **Note: Check connectors - Clean/repair as necessary.** **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance between ground and the UD Solenoid Control circuit. Is the resistance below 5.0 ohms? Yes → Repair the UD Solenoid Control circuit for a short to ground. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 8	All
8	Turn the ignition off to the lock position. Disconnect the PCM harness connector. Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector. Remove the Transmission Control Relay. **Note: Check connectors - Clean/repair as necessary.** Connect a jumper wire between the Fused B+ circuit and Transmission Control Relay Output circuit in the Transmission Control Relay connector. Ignition on, engine not running. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the voltage of the UD Solenoid Control circuit. Is the voltage above 0.5 volts? Yes → Repair the UD Solenoid Control circuit for a short to voltage. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete.	All
9	The conditions necessary to set the DTC are not present at this time. Using the schematics as a guide, inspect the wiring and connectors specific to this circuit. Wiggle the wiring and connectors while checking for shorted and open circuits. With the DRBIII®, check the EATX EVENT DATA to help identify the conditions in which the DTC was set. Were there any problems found? Yes → Repair as necessary. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete.	All

Symptom:
P0841-LR PRESSURE SWITCH SENSE CIRCUIT

When Monitored and Set Condition:

P0841-LR PRESSURE SWITCH SENSE CIRCUIT

When Monitored: Whenever the engine is running.

Set Condition: The DTC is set if one of the pressure switches are open or closed at the wrong time in a given gear.

POSSIBLE CAUSES
RELATED RELAY DTC'S PRESENT
LOSS OF PRIME P0944 PRESENT
L/R PRESSURE SWITCH SENSE CIRCUIT OPEN
TRANSMISSION CONTROL RELAY OUTPUT CIRCUIT OPEN
L/R PRESSURE SWITCH SENSE CIRCUIT SHORT TO GROUND
L/R PRESSURE SWITCH SENSE CIRCUIT SHORT TO VOLTAGE
L/R PRESSURE SWITCH
POWERTRAIN CONTROL MODULE
INTERMITTENT WIRING AND CONNECTORS

TEST	ACTION	APPLICABILITY
1	**NOTE: Low fluid level can be the cause of many transmission problems. If the fluid level is low locate and repair the leak then check and adjust the fluid level per the Service Information.** **NOTE: Always perform diagnostics with a fully charged battery to avoid false symptoms.** With the DRBIII®, read Engine DTC's. Check and repair all Engine DTC's prior to performing any transmission symptom diagnostics. With the DRBIII®, read Transmission DTC's. Record all DTC's and 1 Trip Failures. **NOTE: Diagnose 1 Trip Failures as a fully matured DTC.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Perform the Shift Lever Position Test. If the test does not pass, refer to Symptom test for P0706 Check Shifter Signal. For Gear Ratio DTC's, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle such that all diagnostic monitors have run. **NOTE: Verify flash level of Powertrain Control Module. Some problems are corrected by software upgrades to the Transmission and Engine software.** **NOTE: Check for applicable TSB's related to the problem.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All

P0841-LR PRESSURE SWITCH SENSE CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
2	With the DRBIII®, read Transmission DTC's Are there any Transmission Control Relay DTC's present also? Yes → Refer to the Transmission category and perform the appropriate symptom. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 3	All
3	With the DRBIII®, check for other Transmission DTC's. Is the DTC P0944 present also? Yes → Refer to the Transmission category and perform the appropriate symptom. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 4	All
4	With the DRBIII®, Check the STARTS SINCE SET counter for P0841. **NOTE: This counter only applies to the last DTC set.** Is the STARTS SINCE SET counter 2 or less? Yes → Go To 5 No → Go To 12	All
5	Turn the ignition off to the lock position. Remove the Starter Relay. **CAUTION: Removal of the Starter Relay is to prevent a Transmission, NO RESPONSE, condition and disable the starter.** Install the Transmission Simulator, Miller tool #8333 and the Electronic Transmission Adapter kit 8333-1A. **Note: Check connectors - Clean/repair as necessary.** Ignition on, engine not running. With the Transmission Simulator, turn the Pressure Switch selector to L/R. With the DRBIII®, monitor the L/R Pressure Switch state while pressing the Pressure Switch Test button on the Transmission Simulator. Did the L/R Pressure Switch state change? Yes → Go To 6 No → Go To 7	All
6	If there are no possible causes remaining, view repair. Repair Replace the Transmission Solenoid/Pressure Switch Assembly per the Service Information. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1.	All

P0841-LR PRESSURE SWITCH SENSE CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
7	Turn the ignition off to the lock position. Disconnect the PCM harness connector. Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector. **Note: Check connectors - Clean/repair as necessary.** **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the L/R Pressure Switch Sense circuit from the appropriate terminal of special tool #8815 to the Transmission Solenoid/Pressure Switch Assembly harness connector. Is the resistance above 5.0 ohms? Yes → Repair the L/R Pressure Switch Sense circuit for an open. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 8	All
8	Turn the ignition off to the lock position. Disconnect the PCM harness connector. Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector. **Note: Check connectors - Clean/repair as necessary.** **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance between ground and the L/R Pressure Switch Sense circuit. Is the resistance below 5.0 ohms? Yes → Repair the L/R Pressure Switch Sense circuit for a short to ground. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 9	All
9	Turn the ignition off to the lock position. Disconnect the PCM harness connector. Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector. Remove the Transmission Control Relay. **Note: Check connectors - Clean/repair as necessary.** Connect a jumper wire between the Fused B+ circuit and Transmission Control Relay Output circuit. Ignition on, engine not running. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the voltage of the L/R Pressure Switch Sense circuit. Is the voltage above 0.5 volts? Yes → Repair the L/R Pressure Switch Sense circuit for a short to voltage. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 10	All

P0841-LR PRESSURE SWITCH SENSE CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
10	Turn the ignition off to the lock position. Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector. Remove the Transmission Control Relay. **Note: Check connectors - Clean/repair as necessary.** Connect a jumper wire between the Fused B+ circuit and the Transmission Control Relay Output circuit in the Transmission Control Relay connector. Using a 12-volt test light connected to ground, check the Transmission Control Relay Output circuit in the Transmission Solenoid/Pressure Switch Assembly harness connector. **NOTE: The test light must illuminate brightly. Compare the brightness to that of a direct connection to the battery.** Does the test light illuminate brightly? Yes → Go To 11 No → Repair the Transmission Control Relay Output circuit for an open. If the fuse is open make sure to check for a short to ground. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1.	All
11	Using the schematics as a guide, inspect the wiring and connectors. Repair as necessary. Pay particular attention to all power and ground circuits. If there are no possible causes remaining, view repair. Repair Replace the Powertrain Control Module per the Service Information. WITH THE DRBIII® PERFORM QUICK LEARN AND REPROGRAM PINION FACTOR. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1.	All
12	The conditions necessary to set the DTC are not present at this time. Using the schematics as a guide, inspect the wiring and connectors specific to this circuit. Wiggle the wires while checking for shorted and open circuits. With the DRBIII®, check the EATX EVENT DATA to help identify the conditions in which the DTC was set. Were there any problems found? Yes → Repair as necessary. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete.	All

Symptom:
P0845-2/4 HYDRAULIC PRESSURE TEST FAILURE

When Monitored and Set Condition:

P0845-2/4 HYDRAULIC PRESSURE TEST FAILURE

When Monitored: In any forward gear with engine speed above 1000 RPM, shortly after a shift and every minute thereafter.

Set Condition: After a shift into a forward gear, with engine speed greater than 1000 RPM, the PCM momentarily turns on element pressure to the clutch circuits that don't have pressure to identify the correct pressure switch closes. If the pressure switch does not close 2 times the DTC sets.

POSSIBLE CAUSES
LOSS OF PRIME P0944 PRESENT
TRANSMISSION CONTROL RELAY OUTPUT CIRCUIT OPEN
2/4 PRESSURE SWITCH SENSE CIRCUIT OPEN
2/4 PRESSURE SWITCH CIRCUIT SHORT TO GROUND
INTERNAL TRANSMISSION
2/4 PRESSURE SWITCH SENSE CIRCUIT SHORT TO VOLTAGE
TRANSMISSION SOLENOID/TRS ASSEMBLY
POWERTRAIN CONTROL MODULE
INTERMITTENT WIRING AND CONNECTORS

P0845-2/4 HYDRAULIC PRESSURE TEST FAILURE — Continued

TEST	ACTION	APPLICABILITY
1	**NOTE: Low fluid level can be the cause of many transmission problems. If the fluid level is low locate and repair the leak then check and adjust the fluid level per the Service Information.** **NOTE: Always perform diagnostics with a fully charged battery to avoid false symptoms.** With the DRBIII®, read Engine DTC's. Check and repair all Engine DTC's prior to performing any transmission symptom diagnostics. With the DRBIII®, read Transmission DTC's. Record all DTC's and 1 Trip Failures. **NOTE: Diagnose 1 Trip Failures as a fully matured DTC.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Perform the Shift Lever Position Test. If the test does not pass, refer to Symptom test for P0706 Check Shifter Signal. For Gear Ratio DTC's, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle such that all diagnostic monitors have run. **NOTE: Verify flash level of Powertrain Control Module. Some problems are corrected by software upgrades to the Transmission and Engine software.** **NOTE: Check for applicable TSB's related to the problem.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All
2	With the DRBIII®, check for other Transmission DTC's. Is the DTC P0944 present also? Yes → Refer to the Transmission category and perform the appropriate symptom. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 3	All
3	With the DRBIII®, read Transmission DTC's. Are any of the DTCs P0732, P0734 and/or P0846 present also? Yes → Replace the Transmission Solenoid/Pressure Switch Assembly per the Service Information. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 4	All
4	With the DRBIII®, Check the STARTS SINCE SET counter for P0845. **NOTE: This counter only applies to the last DTC set.** Is the STARTS SINCE SET counter 2 or less? Yes → Go To 5 No → Go To 12	All

P0845-2/4 HYDRAULIC PRESSURE TEST FAILURE — Continued

TEST	ACTION	APPLICABILITY
5	Turn the ignition off to the lock position. Remove the Starter Relay. **CAUTION: Removal of the Starter Relay is to prevent a Transmission, NO RESPONSE, condition and disable the starter.** Install the Transmission Simulator, Miller tool #8333 and the Electronic Transmission Adapter kit 8333-1A. **Note: Check connectors - Clean/repair as necessary.** Ignition on, engine not running. With the Transmission Simulator, turn the Pressure Switch selector switch to 2/4. With the DRBIII®, monitor the UD Pressure Switch state while pressing the Pressure Switch Test button on the Transmission Simulator. Wiggle the wires leading to the PCM while pressing and holding the Pressure Switch Test button. Did the 2/4 Pressure Switch state change to closed and remain closed while wiggling the wires? Yes → Go To 6 No → Go To 7	All
6	If there are no possible causes remaining, view repair. Repair Disassemble and inspect the Valve Body per the Service Information and repair or replace as necessary. If no problems are found in the Valve Body, replace the Transmission Solenoid/Pressure Switch Assembly. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1.	All
7	Turn the ignition off to the lock position. Disconnect the PCM harness connector. Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector. **NOTE: Check connectors - Clean/repair as necessary.** **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the 2/4 Pressure Switch Sense circuit from the appropriate terminal of special tool #8815 to the Transmission Solenoid/Pressure Switch Assembly harness connector. Is the resistance above 5.0 ohms? Yes → Repair the 2-4 Pressure Switch Sense circuit for an open. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 8	All

P0845-2/4 HYDRAULIC PRESSURE TEST FAILURE — Continued

TEST	ACTION	APPLICABILITY
8	Turn the ignition off to the lock position. Disconnect the PCM harness connector. Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector. **Note: Check connectors - Clean/repair as necessary.** **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance between ground and the 2/4 Pressure Switch Sense circuit. Is the resistance below 5.0 ohms? Yes → Repair the 2-4 Pressure Switch Sense circuit for a short to ground. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 9	All
9	Turn the ignition off to the lock position. Disconnect the PCM harness connector. Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector. Remove the Transmission Control Relay. **Note: Check connectors - Clean/repair as necessary.** Connect a jumper wire between the Fused B+ circuit and the Transmission Control Relay Output circuit. Ignition on, engine not running. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the voltage of the 2/4 Pressure Switch Sense circuit. Is the voltage above 0.5 volts? Yes → Repair the 2-4 Pressure Switch Sense circuit for a short to voltage. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 10	All
10	Turn the ignition off to the lock position. Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector. Remove the Transmission Control Relay. **Note: Check connectors - Clean/repair as necessary.** Connect a jumper wire between the Fused B+ circuit and the Transmission Control Relay Output circuit in the Transmission Control Relay connector. Ignition on, engine not running. Using a 12-volt test light connected to ground, check Transmission Control Relay Output circuit in the Transmission Solenoid/Pressure Switch Assembly harness connector. **NOTE: The test light must illuminate brightly. Compare the brightness to that of a direct connection to the battery.** Does the test light illuminate brightly? Yes → Go To 11 No → Repair the Transmission Control Relay Output circuit for an open. If the fuse is open make sure to check for a short to ground. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1.	All

P0845-2/4 HYDRAULIC PRESSURE TEST FAILURE — Continued

TEST	ACTION	APPLICABILITY
11	Using the schematics as a guide, inspect the wiring and connectors. Repair as necessary. Pay particular attention to all power and ground circuits. If there are no possible causes remaining, view repair. Repair Replace the Powertrain Control Module per the Service Information. WITH THE DRBIII® PERFORM QUICK LEARN AND REPROGRAM PINION FACTOR. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1.	All
12	The conditions necessary to set the DTC are not present at this time. Using the schematics as a guide, inspect the wiring and connectors specific to this circuit. Wiggle the wires while checking for shorted and open circuits. With the DRBIII®, check the EATX EVENT DATA to help identify the conditions in which the DTC was set. Were there any problems found? Yes → Repair as necessary. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete.	All

Symptom:
P0846-2/4 PRESSURE SWITCH SENSE CIRCUIT

When Monitored and Set Condition:

P0846-2/4 PRESSURE SWITCH SENSE CIRCUIT

When Monitored: Whenever the engine is running.

Set Condition: The DTC is set if one of the pressure switches are open or closed at the wrong time in a given gear .

POSSIBLE CAUSES
RELATED RELAY DTC'S PRESENT
2/4 PRESSURE SWITCH SENSE CIRCUIT OPEN
TRANSMISSION CONTROL RELAY OUTPUT CIRCUIT OPEN
2/4 PRESSURE SWITCH SENSE CIRCUIT SHORT TO GROUND
2/4 PRESSURE SWITCH SENSE CIRCUIT SHORT TO VOLTAGE
2/4 PRESSURE SWITCH
POWERTRAIN CONTROL MODULE
INTERMITTENT WIRING AND CONNECTORS

TEST	ACTION	APPLICABILITY
1	**NOTE: Low fluid level can be the cause of many transmission problems. If the fluid level is low locate and repair the leak then check and adjust the fluid level per the Service Information.** **NOTE: Always perform diagnostics with a fully charged battery to avoid false symptoms.** With the DRBIII®, read Engine DTC's. Check and repair all Engine DTC's prior to performing any transmission symptom diagnostics. With the DRBIII®, read Transmission DTC's. Record all DTC's and 1 Trip Failures. **NOTE: Diagnose 1 Trip Failures as a fully matured DTC.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Perform the Shift Lever Position Test. If the test does not pass, refer to Symptom test for P0706 Check Shifter Signal. For Gear Ratio DTC's, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle such that all diagnostic monitors have run. **NOTE: Verify flash level of Powertrain Control Module. Some problems are corrected by software upgrades to the Transmission and Engine software.** **NOTE: Check for applicable TSB's related to the problem.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All

P0846-2/4 PRESSURE SWITCH SENSE CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
2	With the DRBIII®, read Transmission DTC's Are there any Transmission Control Relay DTC's present also? Yes → Refer to the Transmission category and perform the appropriate symptom. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 3	All
3	With the DRBIII®, Check the STARTS SINCE SET counter for P0846. **NOTE: This counter only applies to the last DTC set.** Is the STARTS SINCE SET counter 2 or less? Yes → Go To 4 No → Go To 11	All
4	Turn the ignition off to the lock position. Remove the Starter Relay. **CAUTION: Removal of the Starter Relay is to prevent a Transmission, NO RESPONSE, condition and disable the starter.** Install the Transmission Simulator, Miller tool #8333 and the Electronic Transmission Adapter kit 8333-1A. **Note: Check connectors - Clean/repair as necessary.** Ignition on, engine not running. With the Transmission Simulator turn the Pressure Switch selector to 2/4. With the DRBIII®, monitor the 2/4 Pressure Switch state while pressing the Pressure Switch Test button on the Transmission Simulator. Did the state of the 2/4 Pressure Switch change while pressing the Pressure Switch Test button? Yes → Go To 5 No → Go To 6	All
5	If there are no possible causes remaining, view repair. Repair Replace the Transmission Solenoid/Pressure Switch Assembly per the Service Information. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1.	All
6	Turn the ignition off to the lock position. Disconnect the PCM harness connector. Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector. **Note: Check connectors - Clean/repair as necessary.** **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the 2/4 Pressure Switch Sense circuit from the appropriate terminal of special tool #8815 to the Transmission Solenoid/Pressure Switch Assembly harness connector. Is the resistance above 5.0 ohms? Yes → Repair the 2/4 Pressure Switch Sense circuit for an open. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 7	All

P0846-2/4 PRESSURE SWITCH SENSE CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
7	Turn the ignition off to the lock position. Disconnect the PCM harness connector. Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector. **Note: Check connectors - Clean/repair as necessary.** **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance between ground and the 2/4 Pressure Switch Sense circuit. Is the resistance below 5.0 ohms? Yes → Repair the 2/4 Pressure Switch Sense circuit for a short to ground. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 8	All
8	Turn the ignition off to the lock position. Disconnect the PCM harness connector Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector. Remove the Transmission Control Relay. **Note: Check connectors - Clean/repair as necessary.** Connect a jumper wire between the Fused B+ circuit and the Transmission Control Relay Output circuit. Ignition on, engine not running. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the voltage of the 2/4 Pressure Switch Sense circuit. Is the voltage above 0.5 volts? Yes → Repair the 2/4 Pressure Switch Sense circuit for a short to voltage. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 9	All
9	Turn the ignition off to the lock position. Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector. Remove the Transmission Control Relay. **Note: Check connectors - Clean/repair as necessary.** Connect a jumper wire between the Fused B+ circuit and the Transmission Control Relay Output circuit. Using a 12-volt test light connected to ground, check the Transmission Control Relay Output circuit in the Transmission Solenoid/Pressure Switch Assembly harness connector. **NOTE: The test light must illuminate brightly. Compare the brightness to that of a direct connection to the battery.** Does the test light illuminate brightly? Yes → Go To 10 No → Repair the Transmission Control Relay Output circuit for an open. If the fuse is open make sure to check for a short to ground. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1.	All

P0846-2/4 PRESSURE SWITCH SENSE CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
10	Using the schematics as a guide, inspect the wiring and connectors. Repair as necessary. Pay particular attention to all power and ground circuits. If there are no possible causes remaining, view repair. Repair Replace the Powertrain Control Module per the Service Information. WITH THE DRBIII® PERFORM QUICK LEARN AND REPROGRAM PINION FACTOR. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1.	All
11	The conditions necessary to set the DTC are not present at this time. Using the schematics as a guide, inspect the wiring and connectors specific to this circuit. Wiggle the wires while checking for shorted and open circuits. With the DRBIII®, check the EATX EVENT DATA to help identify the conditions in which the DTC was set. Were any problems found? Yes → Repair as necessary. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete.	All

Symptom:
P0870-OD HYDRAULIC PRESSURE TEST FAILURE

When Monitored and Set Condition:

P0870-OD HYDRAULIC PRESSURE TEST FAILURE

When Monitored: In any forward gear with engine speed above 1000 RPM shortly after a shift and every minute thereafter.

Set Condition: After a shift into a forward gear, with engine speed greater than 1000 RPM, the TCM momentarily turns on element pressure to the clutch circuits that don't have pressure to identify the correct pressure switch closes. If the pressure switch does not close 2 times the DTC sets

POSSIBLE CAUSES
LOSS OF PRIME - P0944 PRESENT
TRANSMISSION CONTROL RELAY OUTPUT CIRCUIT OPEN
OD PRESSURE SWITCH SENSE CIRCUIT SHORT TO GROUND
OD PRESSURE SWITCH SENSE CIRCUIT OPEN
OD PRESSURE SWITCH SENSE CIRCUIT SHORT TO VOLTAGE
TRANSMISSION SOLENOID/PRESSURE SWITCH ASSEMBLY
INTERNAL TRANSMISSION
POWERTRAIN CONTROL MODULE
INTERMITTENT WIRING AND CONNECTORS

P0870-OD HYDRAULIC PRESSURE TEST FAILURE — Continued

TEST	ACTION	APPLICABILITY
1	**NOTE: Low fluid level can be the cause of many transmission problems. If the fluid level is low locate and repair the leak then check and adjust the fluid level per the Service Information.** **NOTE: Always perform diagnostics with a fully charged battery to avoid false symptoms.** With the DRBIII®, read Engine DTC's. Check and repair all Engine DTC's prior to performing any transmission symptom diagnostics. With the DRBIII®, read Transmission DTC's. Record all DTC's and 1 Trip Failures. **NOTE: Diagnose 1 Trip Failures as a fully matured DTC.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Perform the Shift Lever Position Test. If the test does not pass, refer to Symptom test for P0706 Check Shifter Signal. For Gear Ratio DTC's, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle such that all diagnostic monitors have run. **NOTE: Verify flash level of Powertrain Control Module. Some problems are corrected by software upgrades to the Transmission and Engine software.** **NOTE: Check for applicable TSB's related to the problem.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All
2	With the DRBIII®, check for other Transmission DTC's. Is the DTC P0944 present also? Yes → Refer to the Transmission category and perform the appropriate symptom. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 3	All
3	With the DRBIII®, read Transmission DTC's. Is the DTC P0733 and/or P0871 present also? Yes → Replace the Transmission Solenoid/Pressure Switch Assembly per the Service Information. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 4	All
4	With the DRBIII®, Check the STARTS SINCE SET counter for P0870. **NOTE: This counter only applies to the last DTC set.** Is the STARTS SINCE SET counter 2 or less? Yes → Go To 5 No → Go To 12	All

P0870-OD HYDRAULIC PRESSURE TEST FAILURE — Continued

TEST	ACTION	APPLICABILITY
5	Turn the ignition off to the lock position. Remove the Starter Relay. **CAUTION: Removal of the Starter Relay is to prevent a Transmission, NO RESPONSE, condition and disable the starter.** Install the Transmission Simulator, Miller tool #8333 and the Electronic Transmission Adapter kit 8333-1A. **Note: Check connectors - Clean/repair as necessary.** With the Transmission Simulator select the OD Pressure Switch. With the DRBIII®, monitor the OD Pressure Switch state in the following step: Wiggle the wiring and connectors pertaining to this circuit while pressing the Pressure Switch Test button on the Transmission Simulator. Did the OD Pressure Switch state change to closed and remain closed while wiggling the wires? Yes → Go To 6 No → Go To 7	All
6	If there are no possible causes remaining, view repair. Repair Disassemble and inspect the Valve Body per the Service Information and repair or replace as necessary. If no problems are found in the Valve Body, replace the Transmission Solenoid/Pressure Switch Assembly per the Service Information. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1.	All
7	Turn the ignition off to the lock position. Disconnect the PCM harness connector. Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector. **Note: Check connectors - Clean/repair as necessary.** **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the OD Pressure Switch Sense circuit from the appropriate terminal of special tool #8815 to the Transmission Solenoid/Pressure Switch Assembly harness connector. Is the resistance above 5.0 ohms? Yes → Repair the OD Pressure Switch Sense circuit for an open. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 8	All

P0870-OD HYDRAULIC PRESSURE TEST FAILURE — Continued

TEST	ACTION	APPLICABILITY
8	Turn the ignition off to the lock position. Disconnect the PCM harness connector. Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector. **Note: Check connectors - Clean/repair as necessary.** **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance between ground and the OD Pressure Switch Sense circuit. Is the resistance below 5.0 ohms? Yes → Repair the OD Pressure Switch Sense circuit for a short to ground. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 9	All
9	Turn the ignition off to the lock position. Disconnect the PCM harness connector. Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector. Remove the Transmission Control Relay. **Note: Check connectors - Clean/repair as necessary.** Connect a jumper wire between the Fused B+ circuit and Transmission Control Relay Output circuit. Ignition on, engine not running. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the voltage of the OD Pressure Switch Sense circuit. Is the voltage above 0.5 volts? Yes → Repair the OD Pressure Switch Sense circuit for a short to voltage. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 10	All
10	Turn the ignition off to the lock position. Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector. Remove the Transmission Control Relay. **Note: Check connectors - Clean/repair as necessary.** Connect a jumper wire between the Fused B+ circuit and Transmission Control Relay Output circuit in the Transmission Control Relay connector. Using a 12-volt test light connected to ground, check the Transmission Control Relay Output circuit in the Solenoid/Pressure Switch Assembly harness connector. **NOTE: The test light must illuminate brightly. Compare the brightness to that of a direct connection to the battery..** Does the test light illuminate brightly? Yes → Go To 11 No → Repair the Transmission Control Relay Output circuit for an open. If the fuse is open make sure to check for a short to ground. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1.	All

P0870-OD HYDRAULIC PRESSURE TEST FAILURE — Continued

TEST	ACTION	APPLICABILITY
11	Using the schematics as a guide, inspect the wiring and connectors. Repair as necessary. Pay particular attention to all power and ground circuits. If there are no possible causes remaining, view repair. Repair Replace the Powertrain Control Module per the Service Information. WITH THE DRBIII® PERFORM QUICK LEARN AND REPROGRAM PINION FACTOR. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1.	All
12	The conditions necessary to set the DTC are not present at this time. Using the schematics as a guide, inspect the wiring and connectors specific to this circuit. Wiggle the wires while checking for shorted and open circuits. With the DRBIII®, check the EATX EVENT DATA to help identify the conditions in which the DTC was set. Were there any problems found? Yes → Repair as necessary. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete.	All

Symptom:
P0871-OD PRESSURE SWITCH SENSE CIRCUIT

When Monitored and Set Condition:

P0871-OD PRESSURE SWITCH SENSE CIRCUIT

When Monitored: Whenever the engine is running.

Set Condition: The DTC is set if one of the pressure switches are open or closed at the wrong time in a given gear.

POSSIBLE CAUSES
RELATED RELAY DTC'S PRESENT
OD PRESSURE SWITCH SENSE CIRCUIT OPEN
OD PRESSURE SWITCH SENSE CIRCUIT SHORT TO GROUND
TRANSMISSION RELAY OUTPUT CIRCUIT OPEN
OD PRESSURE SWITCH SENSE CIRCUIT SHORT TO VOLTAGE
OD PRESSURE SWITCH
POWERTRAIN CONTROL MODULE
INTERMITTENT WIRING AND CONNECTORS

TEST	ACTION	APPLICABILITY
1	**NOTE: Low fluid level can be the cause of many transmission problems. If the fluid level is low locate and repair the leak then check and adjust the fluid level per the Service Information.** **NOTE: Always perform diagnostics with a fully charged battery to avoid false symptoms.** With the DRBIII®, read Engine DTC's. Check and repair all Engine DTC's prior to performing any transmission symptom diagnostics. With the DRBIII®, read Transmission DTC's. Record all DTC's and 1 Trip Failures. **NOTE: Diagnose 1 Trip Failures as a fully matured DTC.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Perform the Shift Lever Position Test. If the test does not pass, refer to Symptom test for P0706 Check Shifter Signal. For Gear Ratio DTC's, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle such that all diagnostic monitors have run. **NOTE: Verify flash level of Powertrain Control Module. Some problems are corrected by software upgrades to the Transmission and Engine software.** **NOTE: Check for applicable TSB's related to the problem.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All

P0871-OD PRESSURE SWITCH SENSE CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
2	With the DRBIII®, read Transmission DTC's Are there any Transmission Control Relay DTC's present also? Yes → Refer to the Transmission category and perform the appropriate symptom. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 3	All
3	With the DRBIII®, Check the STARTS SINCE SET counter for P0871. **NOTE: This counter only applies to the last DTC set.** Is the STARTS SINCE SET counter 2 or less? Yes → Go To 4 No → Go To 11	All
4	Turn the ignition off to the lock position. Remove the Starter Relay. **CAUTION: Removal of the Starter Relay is to prevent a Transmission, NO RESPONSE, condition and disable the starter.** Install the Transmission Simulator, Miller tool #8333 and the Electronic Transmission Adapter kit 8333-1A. **Note: Check connectors - Clean/repair as necessary.** Ignition on, engine not running. With the Transmission Simulator turn the Pressure Switch selector to OD. With the DRBIII®, monitor the OD Pressure Switch state while pressing Pressure Switch test button. Did the OD Pressure Switch state change while pressing the Pressure Switch test button? Yes → Go To 5 No → Go To 6	All
5	If there are no possible causes remaining, view repair. Repair Replace the Solenoid/Pressure Switch Assembly per the Service Information. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1.	All
6	Turn the ignition off to the lock position. Disconnect the PCM harness connector. Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector. **Note: Check connectors - Clean/repair as necessary.** **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the OD Pressure Switch Sense circuit from the appropriate terminal of special tool #8815 and the Transmission Solenoid/Pressure Switch Assembly harness connector. Is the resistance above 5.0 ohms? Yes → Repair the OD Pressure Switch Sense circuit for an open. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 7	All

P0871-OD PRESSURE SWITCH SENSE CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
7	Turn the ignition off to the lock position. Disconnect the PCM harness connector. Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector. **Note: Check connectors - Clean/repair as necessary.** **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance between ground and the OD Pressure Switch Sense circuit. Is the resistance below 5.0 ohms? Yes → Repair the OD Pressure Switch Sense circuit for a short to ground. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 8	All
8	Turn the ignition off to the lock position. Disconnect the PCM harness connector. Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector. Remove the Transmission Control Relay. **Note: Check connectors - Clean/repair as necessary.** Connect a jumper wire between the Fused B+ circuit and Transmission Control Relay Output circuit. Ignition on, engine not running. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the voltage of the OD Pressure Switch Sense circuit. Is the voltage above 0.5 volts? Yes → Repair the OD Pressure Switch Sense circuit for a short to voltage. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 9	All
9	Turn the ignition off to the lock position. Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector. Remove the Transmission Control Relay. **Note: Check connectors - Clean/repair as necessary.** Connect a jumper wire between the Fused B+ circuit and Transmission Control Relay Output circuit. Using a 12-volt test light connected to ground, check the Transmission Control Relay Output circuit. **NOTE: The Test light must illuminate brightly. Compare the brightness to that of a direct connection to the battery.** Does the test light illuminate brightly? Yes → Go To 10 No → Repair the Transmission Control Relay Output circuit for an open. If the fuse is open make sure to check for a short to ground. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1.	All

P0871-OD PRESSURE SWITCH SENSE CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
10	Using the schematics as a guide, inspect the wiring and connectors. Repair as necessary. Pay particular attention to all power and ground circuits. If there are no possible causes remaining, view repair. Repair Replace the Powertrain Control Module per the Service Information. WITH THE DRBIII® PERFORM QUICK LEARN AND REPROGRAM PINION FACTOR. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1.	All
11	The conditions necessary to set the DTC are not present at this time. Using the schematics as a guide, inspect the wiring and connectors specific to this circuit. Wiggle the wiring and connectors while checking for shorted and open circuits. With the DRBIII®, check the EATX EVENT DATA to help identify the conditions in which the DTC was set. Were there any problems found? Yes → Repair as necessary. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete.	All

Symptom:
P0884-POWER UP AT SPEED

When Monitored and Set Condition:

P0884-POWER UP AT SPEED

When Monitored: When the Transmission Control Module initially powers up. Note: the Transmission Control Module is integrated with Powertrain Control Module. The Transmission Control Module has separate powers and grounds specifically to its portion of the PCM.

Set Condition: This DTC will set if the TCM powers up and senses the vehicle in a valid forward gear (no PRNDL DTCs) with a output speed above 800 RPM (approximately 32Km/h or 20 MPH).

POSSIBLE CAUSES
P0884 POWER UP AT SPEED

TEST	ACTION	APPLICABILITY
1	This DTC is set when the PCM is initialized while the vehicle is moving down the road in a valid forward gear. This is usually a momentarily loss of power to the Transmission portion of the PCM. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** **NOTE: Due to the integration of the Powertrain and Transmission Control Modules, the transmission part of the PCM has its own specific power and ground circuits.** Check all of the Fused B+, Fused Ignition Switch Output, and Ground circuits related to the PCM for an intermittent open or short to ground. Perform a wiggle test on all wiring and connectors pertaining to the PCM while looking for shorts and open circuits. With the DRBIII®, check the EATX EVENT DATA to help identify the conditions in which the DTC was set. If there are no possible causes remaining, view repair. Repair Repair as necessary. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1.	All

Symptom:
P0888-RELAY OUTPUT ALWAYS OFF

When Monitored and Set Condition:

P0888-RELAY OUTPUT ALWAYS OFF

When Monitored: Continuously

Set Condition: This DTC is set when less than 3 volts are present at the Transmission Control Relay output circuits at the Transmission Control Module (TCM) when the TCM is energizing the relay. Note: Due to the integration of the Powertrain and Transmission Control Modules, the transmission part of the PCM has its own specific power and ground circuits.

POSSIBLE CAUSES
FUSED B+ CIRCUIT OPEN
TRANSMISSION CONTROL RELAY OUTPUT CIRCUIT OPEN
TRANSMISSION CONTROL RELAY CONTROL CIRCUIT OPEN
TRANSMISSION CONTROL RELAY GROUND CIRCUIT OPEN
TRANSMISSION CONTROL RELAY STUCK OPEN
TRANSMISSION CONTROL RELAY CONTROL CIRCUIT SHORT TO GROUND
TRANSMISSION CONTROL RELAY OUTPUT CIRCUIT SHORT TO GROUND
POWERTRAIN CONTROL MODULE
INTERMITTENT WIRING AND CONNECTORS

P0888-RELAY OUTPUT ALWAYS OFF — Continued

TEST	ACTION	APPLICABILITY
1	**NOTE: Low fluid level can be the cause of many transmission problems. If the fluid level is low locate and repair the leak then check and adjust the fluid level per the Service Information.** **NOTE: Always perform diagnostics with a fully charged battery to avoid false symptoms.** With the DRBIII®, read Engine DTC's. Check and repair all Engine DTC's prior to performing any transmission symptom diagnostics. With the DRBIII®, read Transmission DTC's. Record all DTC's and 1 Trip Failures. **NOTE: Diagnose 1 Trip Failures as a fully matured DTC.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Perform the Shift Lever Position Test. If the test does not pass, refer to Symptom test for P0706 Check Shifter Signal. For Gear Ratio DTC's, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle such that all diagnostic monitors have run. **NOTE: Verify flash level of Powertrain Control Module. Some problems are corrected by software upgrades to the Transmission and Engine software.** **NOTE: Check for applicable TSB's related to the problem.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All
2	With the DRBIII®, Check the STARTS SINCE SET counter for P0888. **Note: This counter only applies to the last DTC set.** Is the STARTS SINCE SET counter equal to 0? Yes → Go To 3 No → Go To 11	All
3	Turn the ignition off to the lock position. Remove the Transmission Control Relay. **Note: Check connectors - Clean/repair as necessary.** Using a 12-volt test light connected to ground, check the Fused B+ circuit in the Transmission Control Relay connector. **NOTE: The test light must illuminate brightly. Compare the brightness to that of a direct connection to the battery.** Does the test light illuminate brightly? Yes → Go To 4 No → Repair the Fused B+ circuit for an open. If the fuse is open make sure to check for a short to ground. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1.	All
4	Turn the ignition off to the lock position. Remove the Transmission Control Relay. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance between ground and the Transmission Control Relay ground circuit. Is the resistance above 5.0 ohms? Yes → Repair the Transmission Control Relay Ground circuit for an open. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 5	All

P0888-RELAY OUTPUT ALWAYS OFF — Continued

TEST	ACTION	APPLICABILITY
5	Turn the ignition off to the lock position. Disconnect the PCM harness connector. Remove the Transmission Control Relay. **Note: Check connectors - Clean/repair as necessary.** **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of all the Transmission Control Relay Output circuits between the Transmission Control Relay connector and the appropriate terminals of special tool #8815. Is the resistance above 5.0 ohms on either circuit? Yes → Repair the Transmission Control Relay Output circuit for an open. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 6	All
6	Turn the ignition off to the lock position. Remove the Transmission Control Relay. Disconnect the PCM harness connector. **Note: Check connectors - Clean/repair as necessary.** **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the Transmission Control Relay Control circuit between the Transmission Control Relay connector and the appropriate terminal of special tool #8815. Is the resistance above 5.0 ohms? Yes → Repair the Transmission Control Relay Control circuit for an open. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 7	All
7	Turn the ignition off to the lock position. Disconnect the PCM harness connector. Remove the Transmission Control Relay. **Note: Check connectors - Clean/repair as necessary.** **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance between ground and the Transmission Control Relay Output circuit. Is the resistance below 5.0 ohms? Yes → Repair the Transmission Control Relay Output circuit for a short to ground. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 8	All

P0888-RELAY OUTPUT ALWAYS OFF — Continued

TEST	ACTION	APPLICABILITY
8	Turn the ignition off to the lock position. Disconnect the PCM harness connector. Remove the Transmission Control Relay. **Note: Check connectors - Clean/repair as necessary.** **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance between ground and the Transmission Control Relay Control circuit. Is the resistance below 5.0 ohms? Yes → Repair the Transmission Control Relay Control circuit for a short to ground. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 9	All
9	Turn the ignition off to the lock position. Disconnect the PCM harness connector. Remove the Transmission Control Relay. **Note: Check connectors - Clean/repair as necessary.** **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Connect a jumper wire between the Fused B+ circuit and the Transmission Control Relay Output circuit in the Transmission Control Relay connector. Using a 12-volt test light connected to ground, check the Transmission Control Relay Output circuit in the appropriate terminal of special tool #8815. **NOTE: The test light must illuminate brightly. Compare the brightness to that of a direct connection to the battery.** Does the test light illuminate brightly? Yes → Go To 10 No → Replace the Transmission Control Relay. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1.	All
10	Using the schematics as a guide, inspect the wiring and connectors. Repair as necessary. Pay particular attention to all power and ground circuits. If there are no possible causes remaining, view repair. Repair Replace the Powertrain Control Module per the Service Information. WITH THE DRBIII® PERFORM QUICK LEARN AND REPROGRAM PINION FACTOR. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1.	All

P0888-RELAY OUTPUT ALWAYS OFF — Continued

TEST	ACTION	APPLICABILITY
11	The conditions necessary to set the DTC are not present at this time. Using the schematics as a guide, inspect the wiring and connectors specific to this circuit. Wiggle the wiring and connectors while checking for shorted and open circuits. With the DRBIII®, check the EATX EVENT DATA to help identify the conditions in which the DTC was set. Were there any problems found? Yes → Repair as necessary. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete.	All

Symptom:
P0890-SWITCHED BATTERY

When Monitored and Set Condition:

P0890-SWITCHED BATTERY

When Monitored: When the ignition is turned from the ″off″ position to the ″run″ position and/or the ignition is turned from the ″crank″ position to the ″run″ position.

Set Condition: This DTC is set if the Transmission Control Module (TCM) senses voltage on any of the pressure switch inputs prior to the TCM energizing the relay. Note: Due to the integration of the Powertrain and Transmission Control Modules, the transmission part of the PCM has its own specific power and ground circuits.

POSSIBLE CAUSES
2/4 PRESSURE SWITCH SENSE CIRCUIT SHORT TO VOLTAGE
L/R PRESSURE SWITCH SENSE CIRCUIT SHORT TO VOLTAGE
OD PRESSURE SWITCH SENSE CIRCUIT SHORT TO VOLTAGE
POWERTRAIN CONTROL MODULE
INTERMITTENT WIRING AND CONNECTORS

TEST	ACTION	APPLICABILITY
1	**NOTE: Low fluid level can be the cause of many transmission problems. If the fluid level is low locate and repair the leak then check and adjust the fluid level per the Service Information.** **NOTE: Always perform diagnostics with a fully charged battery to avoid false symptoms.** With the DRBIII®, read Engine DTC's. Check and repair all Engine DTC's prior to performing any transmission symptom diagnostics. With the DRBIII®, read Transmission DTC's. Record all DTC's and 1 Trip Failures. **NOTE: Diagnose 1 Trip Failures as a fully matured DTC.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Perform the Shift Lever Position Test. If the test does not pass, refer to Symptom test for P0706 Check Shifter Signal. For Gear Ratio DTC's, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle such that all diagnostic monitors have run. **NOTE: Verify flash level of Powertrain Control Module. Some problems are corrected by software upgrades to the Transmission and Engine software.** **NOTE: Check for applicable TSB's related to the problem.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All

P0890-SWITCHED BATTERY — Continued

TEST	ACTION	APPLICABILITY
2	With the DRBIII®, Check the STARTS SINCE SET counter for P0890. **Note: This counter only applies to the last DTC set.** Is the ″STARTS SINCE SET″ counter set at 0? Yes → Go To 3 No → Go To 7	All
3	Turn the ignition off to the lock position. Disconnect the PCM harness connector. Disconnect the Solenoid/Pressure Switch Assembly harness connector. Remove the Transmission Control Relay. **Note: Check connectors - Clean/repair as necessary.** Connect a jumper wire between the Fused B+ circuit and Transmission Control Relay Output circuit in the Transmission Control Relay connector. Ignition on, engine not running. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the voltage of the OD Pressure Switch Sense circuit. Is the voltage above 0.5 volt? Yes → Repair the OD Pressure Switch Sense circuit for a short to voltage. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 4	All
4	Turn the ignition off to the lock position. Disconnect the PCM harness connector. Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector. Remove the Transmission Control Relay. **Note: Check connectors - Clean/repair as necessary.** Connect a jumper wire between the Fused B+ circuit and Transmission Control Relay Output circuit in the Transmission Control Relay connector. Ignition on, engine not running. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the voltage of the 2/4 Pressure Switch Sense circuit. Is the voltage above 0.5 volt? Yes → Repair the 2/4 Pressure Switch Sense circuit for a short to voltage. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 5	All

P0890-SWITCHED BATTERY — Continued

TEST	ACTION	APPLICABILITY
5	Turn the ignition off to the lock position. Disconnect the PCM harness connector. Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector. Remove the Transmission Control Relay. **Note: Check connectors - Clean/repair as necessary.** Connect a jumper wire between the Fused B+ circuit and Transmission Control Relay Output circuit in the Transmission Control Relay connector. Ignition on, engine not running. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the voltage of the L/R Pressure Switch Sense circuit. Is the voltage above 0.5 volts? Yes → Repair the L/R Pressure Switch Sense circuit for a short to voltage. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 6	All
6	Using the schematics as a guide, inspect the wiring and connectors. Repair as necessary. Pay particular attention to all power and ground circuits. If there are no possible causes remaining, view repair. Repair Replace the Powertrain Control Module per the Service Information. WITH THE DRBIII® PERFORM QUICK LEARN AND REPROGRAM PINION FACTOR. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1.	All
7	The conditions necessary to set the DTC are not present at this time. Using the schematics as a guide, inspect the wiring and connectors specific to this circuit. Wiggle the wiring and connectors while checking for shorted and open circuits. With the DRBIII®, check the EATX EVENT DATA to help identify the conditions in which the DTC was set. Were there any problems found? Yes → Repair as necessary. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete.	All

Symptom:
P0891-TRANSMISSION RLY ALWAYS ON

When Monitored and Set Condition:

P0891-TRANSMISSION RLY ALWAYS ON

When Monitored: When the ignition is turned from the ″off″ position to the ″run″ position and/or the ignition is turned from the ″crank″ position to the ″run″ position.

Set Condition: This DTC set if the Transmission Control Module (TCM) senses greater than 3 volts at the Transmission Control Relay Output circuits at the TCM prior to the TCM energizing the relay. Note: Due to the integration of the Powertrain and Transmission Control Modules, the transmission part of the PCM has its own specific power and ground circuits.

POSSIBLE CAUSES
TRANSMISSION CONTROL RELAY STUCK CLOSED
TRANSMISSION CONTROL RELAY CONTROL CIRCUIT SHORT TO VOLTAGE
TRANSMISSION CONTROL RELAY OUTPUT CIRCUIT SHORT TO VOLTAGE
POWERTRAIN CONTROL MODULE
INTERMITTENT WIRING AND CONNECTORS

TEST	ACTION	APPLICABILITY
1	**NOTE: Low fluid level can be the cause of many transmission problems. If the fluid level is low locate and repair the leak then check and adjust the fluid level per the Service Information.** **NOTE: Always perform diagnostics with a fully charged battery to avoid false symptoms.** With the DRBIII®, read Engine DTC's. Check and repair all Engine DTC's prior to performing any transmission symptom diagnostics. With the DRBIII®, read Transmission DTC's. Record all DTC's and 1 Trip Failures. **NOTE: Diagnose 1 Trip Failures as a fully matured DTC.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Perform the Shift Lever Position Test. If the test does not pass, refer to Symptom test for P0706 Check Shifter Signal. For Gear Ratio DTC's, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle such that all diagnostic monitors have run. **NOTE: Verify flash level of Powertrain Control Module. Some problems are corrected by software upgrades to the Transmission and Engine software.** **NOTE: Check for applicable TSB's related to the problem.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All

P0891-TRANSMISSION RLY ALWAYS ON — Continued

TEST	ACTION	APPLICABILITY
2	With the DRBIII®, Check the STARTS SINCE SET counter for P0891. **Note: This counter only applies to the last DTC set.** Is the STARTS SINCE SET counter equal to 0? Yes → Go To 3 No → Go To 7	All
3	Turn the ignition off to the lock position. Remove the Transmission Control Relay. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance between the Fused B+ circuit and the Transmission Control Relay Output Circuit in the Transmission Control Relay. Is the resistance above 5.0 ohms? Yes → Go To 4 No → Replace the Transmission Control Relay. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1.	All
4	Turn the ignition off to the lock position. Remove the Transmission Control Relay. Disconnect the PCM harness connector. **Note: Check connectors - Clean/repair as necessary.** Ignition on, engine not running. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the voltage at the Transmission Control Relay Output circuit in the Transmission Control Relay connector. Is the voltage above 0.5 volts? Yes → Repair the Transmission Control Relay Output circuit for a short to voltage. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 5	All
5	Turn the ignition off to the lock position. Remove the Transmission Control Relay. Ignition on, engine not running. **Note: Check connectors - Clean/repair as necessary.** Measure the voltage at the Transmission Control Relay Control circuit. Is the voltage above 0.5 volts? Yes → Repair the Transmission Control Relay Control circuit for a short to voltage. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 6	All

P0891-TRANSMISSION RLY ALWAYS ON — Continued

TEST	ACTION	APPLICABILITY
6	Using the schematics as a guide, inspect the wiring and connectors. Repair as necessary. Pay particular attention to all power and ground circuits. If there are no possible causes remaining, view repair. Repair Replace the Transmission Control Module per the Service Information. WITH THE DRBIII® PERFORM QUICK LEARN AND REPROGRAM PINION FACTOR. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1.	All
7	The conditions necessary to set the DTC are not present at this time. Using the schematics as a guide, inspect the wiring and connectors specific to this circuit. Wiggle the wiring and connectors while checking for shorted and open circuits. With the DRBIII®, check the EATX EVENT DATA to help identify the conditions in which the DTC was set. Were there any problems found? Yes → Repair as necessary. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete.	All

Symptom:
P0897-WORN OUT/BURNT TRANSAXLE FLUID

When Monitored and Set Condition:

P0897-WORN OUT/BURNT TRANSAXLE FLUID

When Monitored: With each transition from full Torque Convertor to partial Torque Convertor engagement for A/C bump prevention.

Set Condition: When vehicle shudder is detected during partial engagement (PEMCC).

POSSIBLE CAUSES
WORN OUT/ BURNT TRANSAXLE FLUID

TEST	ACTION	APPLICABILITY
1	**NOTE: Low fluid level can be the cause of many transmission problems. If the fluid level is low locate and repair the leak then check and adjust the fluid level per the Service Information.** **NOTE: Always perform diagnostics with a fully charged battery to avoid false symptoms.** With the DRBIII®, read Engine DTC's. Check and repair all Engine DTC's prior to performing any transmission symptom diagnostics. With the DRBIII®, read Transmission DTC's. Record all DTC's and 1 Trip Failures. **NOTE: Diagnose 1 Trip Failures as a fully matured DTC.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Perform the Shift Lever Position Test. If the test does not pass, refer to Symptom test for P0706 Check Shifter Signal. For Gear Ratio DTC's, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle such that all diagnostic monitors have run. **NOTE: Verify flash level of Powertrain Control Module. Some problems are corrected by software upgrades to the Transmission and Engine software.** **NOTE: Check for applicable TSB's related to the problem.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All

P0897-WORN OUT/BURNT TRANSAXLE FLUID — Continued

TEST	ACTION	APPLICABILITY
2	Turn the ignition off to the lock position. Flush the Transmission Oil Cooler and lines, replace the Transmission Oil Filter, refill with new Transmission Fluid, start the engine, and adjust the fluid per the Service Information. **Note: The Transmission Cooler must be flushed before prodceeding.** Allow the engine to idle for 10 minutes, in Park. Turn the ignition off to the lock position. Again, flush the Transmission Oil Cooler and lines, replace the Transmission Oil Filter, refill with new Transmission Fluid, start the engine, and adjust the fluid per the Service Information. With the DRBIII®, perform a Battery Disconnect. **NOTE: The Battery Disconnect must be done to re-enable EMCC during an A/C Clutch engagement.** **NOTE: The vehicle may exhibit intermittent shudder during the first few hundred miles. The new Transmission Fluid will gradually penetrate the Torque Convertor Clutch friction material and the shudder should disappear.** Erase the DTC and return the vehicle to the customer. Did the DTC reset and/or does the vehicle still shudder after a few thousand miles? Yes → Replace the Torque Converter per the Service Information. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete.	All

Symptom:
P0944-LOSS OF PRIME

When Monitored and Set Condition:

P0944-LOSS OF PRIME

When Monitored: If the transmission is slipping in any forward gear and the pressure switches are not indicating pressure, a loss of prime test is run.

Set Condition: If the Transmission begins to slip in a forward gear and the pressure switch(s) that should be closed are open, a loss of prime test begins. Available elements are turned on by the PCM to see if pump prime exists. The DTC sets if no pressure switches respond.

POSSIBLE CAUSES
SHIFT LEVER POSITION
PLUGGED TRANSMISSION OIL FILTER
TRANSMISSION OIL PUMP
INTERMITTENT WIRING AND CONNECTORS

TEST	ACTION	APPLICABILITY
1	**NOTE: Low fluid level can be the cause of many transmission problems. If the fluid level is low locate and repair the leak then check and adjust the fluid level per the Service Information.** **NOTE: Always perform diagnostics with a fully charged battery to avoid false symptoms.** With the DRBIII®, read Engine DTC's. Check and repair all Engine DTC's prior to performing any transmission symptom diagnostics. With the DRBIII®, read Transmission DTC's. Record all DTC's and 1 Trip Failures. **NOTE: Diagnose 1 Trip Failures as a fully matured DTC.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Perform the Shift Lever Position Test. If the test does not pass, refer to Symptom test for P0706 Check Shifter Signal. For Gear Ratio DTC's, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle such that all diagnostic monitors have run. **NOTE: Verify flash level of Powertrain Control Module. Some problems are corrected by software upgrades to the Transmission and Engine software.** **NOTE: Check for applicable TSB's related to the problem.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All

P0944-LOSS OF PRIME — Continued

TEST	ACTION	APPLICABILITY
2	Place the gear selector in park. Start the engine. **NOTE: The TRANS TEMP DEG must be at least 43° C or 110° F before performing the following steps.** The Transmission must be at operating temperature prior to checking pressure. A cold Transmission will give higher readings. Place the Transmission in Reverse. With the DRBIII®, observe the Transmission Pressure Switch states. Are any of the Pressure Switches closed? Yes → Go To 3 No → Go To 5	All
3	The conditions necessary to set this DTC are not present at this time. Test drive the vehicle. Allow the Transmission to shift through all gears and ranges. Did you experience a delayed engagement and/or a no drive condition? Yes → Go To 5 No → Go To 4	All
4	The conditions necessary to set this DTC are not present at this time. Using the schematics as a guide, inspect the wiring and connectors specific to this circuit. Wiggle the wiring while checking for shorted and open circuits. With the DRBIII®, check the EATX EVENT DATA to help identify the conditions in which the DTC was set. Were there any problems found? Yes → Repair as necessary. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete.	All
5	With the DRBIII®, perform a Shift Lever Position test. Follow the instructions on the DRBIII®. Did the Shift Lever Position Test pass? Yes → Go To 6 No → Refer to symptom list and perform test for DTC P0706. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1.	All
6	Remove and inspect the Transmission Oil Pan and Transmission Oil Filter per the Service Information. Does the Transmission Oil Pan contain excessive debris and/or is the Oil Filter plugged? Yes → Repair the cause of the plugged Transmission Oil Filter. Refer to the Service Information for the proper repair procedure. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 7	All

P0944-LOSS OF PRIME — Continued

TEST	ACTION	APPLICABILITY
7	If there are no possible causes remaining, view repair. Repair Replace the Transmission Oil Pump per the Service Information. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1.	All

Symptom:
P0952-AUTOSTICK INPUT CIRCUIT LOW

When Monitored and Set Condition:

P0952-AUTOSTICK INPUT CIRCUIT LOW

When Monitored: Whenever the engine is running.

Set Condition: The transmission is not in the Autostick position and the upshift or downshift is reporting closed - below 0.3 volts or if both switches are reported closed at the same time.

POSSIBLE CAUSES
AUTOSTICK® SWITCH
AUTOSTICK® DOWNSHIFT SENSE CIRCUIT SHORT TO GROUND
AUTOSTICK® UPSHIFT SENSE CIRCUIT SHORT TO GROUND
POWERTRAIN CONTROL MODULE
INTERMITTENT WIRING AND CONNECTORS

TEST	ACTION	APPLICABILITY
1	With the DRBIII®, Check the STARTS SINCE SET counter for P0951. **Note: This counter only applies to the last DTC set.** Is the Starts Since Set counter set at 0? Yes → Go To 2 No → Go To 6	All
2	Turn the ignition off to the lock position. Disconnect the AutoStick® Switch harness connector. **Note: Check connectors - Clean/repair as necessary.** Ignition on, engine not running. Measure the voltage of both the AutoStick® Upshift and Downshift sense circuits. Is the voltage above 5.0 volts on both circuits? Yes → Replace the AutoStick® Switch per the Service Information. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 3	All

P0952-AUTOSTICK INPUT CIRCUIT LOW — Continued

TEST	ACTION	APPLICABILITY
3	Turn the ignition off to the lock position. Disconnect the PCM harness connector. Disconnect the AutoStick® Switch harness connector. **Note: Check connectors - Clean/repair as necessary.** **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance between ground and the AutoStick® Downshift Sense circuit. Is the resistance below 5.0 ohms? Yes → Repair the AutoStick® Downshift Sense circuit for a short to ground. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 4	All
4	Turn the ignition off to the lock position. Disconnect the PCM harness connector. Disconnect the AutoStick® Switch harness connector. **Note: Check connectors - Clean/repair as necessary.** **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance between ground and the AutoStick® Upshift Sense circuit. Is the resistance below 5.0 ohms? Yes → Repair the AutoStick® Upshift Sense circuit for a short to ground. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 5	All
5	Ignition on, engine not running. With the DRBIII® display the AutoStick® Switch status. Shift into AutoStick®. Push the shift lever to the right several times to actuate the AutoStick® Upshift Switch and then to the left several times to actuate the AutoStick® Downshift Switch. Do both AutoStick® Upshift and Downshift Switch states toggle? Yes → Test Complete. No → Replace the Powertrain Control Module per the Service Information. WITH THE DRBIII® PERFORM QUICK LEARN AND REPROGRAM PINION FACTOR. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1.	All

P0952-AUTOSTICK INPUT CIRCUIT LOW — Continued

TEST	ACTION	APPLICABILITY
6	The conditions necessary to set this DTC are not present at this time. Using the schematics as a guide, inspect the wiring and connectors specific to this circuit. Wiggle the wires while checking for shorts and open circuits. With the DRBIII®, check the EATX EVENT DATA to help identify the conditions in which the DTC was set. Were there any problems found? Yes → Repair as necessary. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete.	All

Symptom:
P0992-2-4/OD HYDRAULIC PRESSURE TEST FAILURE

When Monitored and Set Condition:

P0992-2-4/OD HYDRAULIC PRESSURE TEST FAILURE

When Monitored: In any forward gear with engine speed above 1000 RPM shortly after a shift and every minute thereafter.

Set Condition: After a shift into a forward gear, with engine speed >1000 RPM, the PCM momentarily turns on element pressure to the clutch circuits that don't have pressure to identify the correct pressure switch closes. If the pressure switch does not close 2 times, the DTC sets.

POSSIBLE CAUSES
CONDITION P0992 PRESENT

TEST	ACTION	APPLICABILITY
1	**NOTE: Low fluid level can be the cause of many transmission problems. If the fluid level is low locate and repair the leak then check and adjust the fluid level per the Service Information.** **NOTE: Always perform diagnostics with a fully charged battery to avoid false symptoms.** With the DRBIII®, read Engine DTC's. Check and repair all Engine DTC's prior to performing any transmission symptom diagnostics. With the DRBIII®, read Transmission DTC's. Record all DTC's and 1 Trip Failures. **NOTE: Diagnose 1 Trip Failures as a fully matured DTC.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Perform the Shift Lever Position Test. If the test does not pass, refer to Symptom test for P0706 Check Shifter Signal. For Gear Ratio DTC's, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle such that all diagnostic monitors have run. **NOTE: Verify flash level of Powertrain Control Module. Some problems are corrected by software upgrades to the Transmission and Engine software.** **NOTE: Check for applicable TSB's related to the problem.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All

P0992-2-4/OD HYDRAULIC PRESSURE TEST FAILURE — Continued

TEST	ACTION	APPLICABILITY
2	**NOTE: The vehicle must be driven to set this DTC. The transmission must be warm or hot with the Engine RPM above 1000 RPM.** This DTC is an indication of both the 2/4 and the O/D Hydraulic Pressure Switch DTCs present. Perform diagnostics for both P0870 and P0845 to determine which switch is failing. With the DRBIII®, check the EATX EVENT DATA to help identify the conditions in which the DTC was set. If there are no possible causes remaining, view repair. Repair Refer to the Transmission category and perform the symptoms for P0845 and P0870. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1.	All

Symptom:
P1652-SERIAL COMMUNICATION LINK MALFUNCTION

When Monitored and Set Condition:

P1652-SERIAL COMMUNICATION LINK MALFUNCTION

When Monitored: Continuously with engine running.

Set Condition: The DTC sets in approximately 20 seconds if no BUS messages are received by the TCM. Note: Due to the integration of the Powertrain and Transmission Control Modules, bus communication between the modules is internal.

POSSIBLE CAUSES
ENGINE COMMUNICATION DTCS PRESENT
POWERTRAIN CONTROL MODULE
INTERMITTENT WIRING AND CONNECTORS

TEST	ACTION	APPLICABILITY
1	Ignition on, engine not running. With the DRBIII®, read Engine DTC's. Are there any Engine Communication DTC's present? Yes → Refer to the Powertrain category and perform the appropriate symptom. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 2	All
2	With the DRBIII®, erase Transmission DTC's. Start the Engine in Park. With the DRBIII®, read Transmission DTCs. **NOTE: The Engine must run for at least 20 seconds to reset this DTC.** Did the DTC reset after the engine was started? Yes → Go To 3 No → Go To 4	All
3	Using the schematics as a guide, inspect the wiring and connectors. Repair as necessary. Pay particular attention to all power and ground circuits. If there are no possible causes remaining, view repair. Repair Replace the Powertrain Control Module. WITH THE DRBIII® PERFORM QUICK LEARN AND REPROGRAM PINION FACTOR. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1.	All

P1652-SERIAL COMMUNICATION LINK MALFUNCTION — Continued

TEST	ACTION	APPLICABILITY
4	The conditions necessary to set the DTC are not present at this time. Make sure to check for any Communication DTCs or customer concerns of possible bus problems. This includes any other controllers on the bus on this vehicle. If there is a bus problem refer to the Communication Category for diagnosis. With the DRBIII®, check the EATX EVENT DATA to help identify the conditions in which the DTC was set. Were there any problems found? Yes → Repair as necessary. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete.	All

Symptom:
P1684-BATTERY WAS DISCONNECTED

When Monitored and Set Condition:

P1684-BATTERY WAS DISCONNECTED

When Monitored: Whenever the ignition is in the Run/Start position.

Set Condition: This DTC is set whenever the Transmission Control Module (TCM) is disconnected from battery power (B+) or ground. It will also be set during the DRBIII® Quick Battery Disconnect procedure. Note: Due to the integration of the Powertrain and Transmission Control Modules, the transmission part of the PCM has its own specific power and ground circuits.

POSSIBLE CAUSES
BATTERY WAS DISCONNECTED
PCM WAS REPLACED OR DISCONNECTED
QUICK LEARN WAS PERFORMED
FUSED B+ CIRCUIT TO TCM OPEN
GROUND CIRCUIT OPEN
INTERMITTENT WIRING AND CONNECTORS

TEST	ACTION	APPLICABILITY
1	**NOTE: Low fluid level can be the cause of many transmission problems. If the fluid level is low locate and repair the leak then check and adjust the fluid level per the Service Information.** **NOTE: Always perform diagnostics with a fully charged battery to avoid false symptoms.** With the DRBIII®, read Engine DTC's. Check and repair all Engine DTC's prior to performing any transmission symptom diagnostics. With the DRBIII®, read Transmission DTC's. Record all DTC's and 1 Trip Failures. **NOTE: Diagnose 1 Trip Failures as a fully matured DTC.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Perform the Shift Lever Position Test. If the test does not pass, refer to Symptom test for P0706 Check Shifter Signal. For Gear Ratio DTC's, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle such that all diagnostic monitors have run. **NOTE: Verify flash level of Powertrain Control Module. Some problems are corrected by software upgrades to the Transmission and Engine software.** **NOTE: Check for applicable TSB's related to the problem.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All

P1684-BATTERY WAS DISCONNECTED — Continued

TEST	ACTION	APPLICABILITY
2	Has the battery been disconnected, lost it's charge, or been replaced recently? Yes → Disconnecting or replacing the battery will set this DTC. Erase the DTC. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 3	All
3	Has a Quick Learn procedure been performed? Yes → Performing Quick Learn will set this DTC. Erase the DTC. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 4	All
4	Has the PCM been replaced or disconnected? Yes → Replacing or disconnecting the PCM will set this DTC. Erase the DTC. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 5	All
5	Turn the ignition off to the lock position. Disconnect the PCM harness connector. **Note: Check connectors - Clean/repair as necessary.** **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Using a 12-volt test light connected to ground, check the Fused B+ circuit. **NOTE: The test light must illuminate brightly. Compare the brightness to that of a direct connection to the battery.** Does the test light illuminate brightly? Yes → Go To 6 No → Repair the Fused B+ circuit for an open. If the fuse is open make sure to check for a short to ground. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1.	All

P1684-BATTERY WAS DISCONNECTED — Continued

TEST	ACTION	APPLICABILITY
6	Turn the ignition off to the lock position. Disconnect the PCM harness connector. **Note: Check connectors - Clean/repair as necessary.** **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Using a 12-volt test light connected to 12-volts, check the Ground circuits in the appropriate terminal of special tool #8815. **NOTE: The test light must illuminate brightly. Compare the brightness to that of a direct connection to the battery.** Does the test light illuminate brightly for all the ground circuits? Yes → Go To 7 No → Repair the Ground circuits for an open. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1.	All
7	The conditions necessary to set the DTC are not present at this time. Using the schematics as a guide, inspect the wiring and connectors specific to this circuit. Wiggle the wires while checking for shorted and open circuits. With the DRBIII®, check the EATX EVENT DATA to help identify the conditions in which the DTC was set. Were there any problems found? Yes → Repair as necessary. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete.	All

Symptom:
P1687-NO COMMUNICATION WITH THE MIC

When Monitored and Set Condition:

P1687-NO COMMUNICATION WITH THE MIC

When Monitored: Continuously with engine running.

Set Condition: The DTC sets in approximately 25 seconds if no BUS messages are received form the MIC.

POSSIBLE CAUSES
OTHER BUS PROBLEMS PRESENT
MIC - NO COMMUNICATION
POWERTRAIN CONTROL MODULE
INTERMITTENT WIRING AND CONNECTORS

TEST	ACTION	APPLICABILITY
1	**NOTE: Low fluid level can be the cause of many transmission problems. If the fluid level is low locate and repair the leak then check and adjust the fluid level per the Service Information.** **NOTE: Always perform diagnostics with a fully charged battery to avoid false symptoms.** With the DRBIII®, read Engine DTC's. Check and repair all Engine DTC's prior to performing any transmission symptom diagnostics. With the DRBIII®, read Transmission DTC's. Record all DTC's and 1 Trip Failures. **NOTE: Diagnose 1 Trip Failures as a fully matured DTC.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Perform the Shift Lever Position Test. If the test does not pass, refer to Symptom test for P0706 Check Shifter Signal. For Gear Ratio DTC's, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle such that all diagnostic monitors have run. **NOTE: Verify flash level of Powertrain Control Module. Some problems are corrected by software upgrades to the Transmission and Engine software.** **NOTE: Check for applicable TSB's related to the problem.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All
2	With the DRBIII®, Check the STARTS SINCE SET counter for P1687. **Note: This counter only applies to the last DTC set.** Is the STARTS SINCE SET counter set to zero? Yes → Go To 3 No → Go To 6	All

P1687-NO COMMUNICATION WITH THE MIC — Continued

TEST	ACTION	APPLICABILITY
3	With the DRBIII®, check all of the other modules on the vehicle for evidence of a vehicle bus problem. Bus related DTC's in other modules point to an overall vehicle bus problem. Other symptoms such as a customer complaint of intermittent operation of bus controlled features also indicate a bus problem. Does the PRNDL display indicate "No Bus" or is there any evidence of an overall vehicle bus problem? Yes → Refer to the Communications category and perform the appropriate symptom. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 4	All
4	Ignition on, engine not running. With the DRBIII®, clear all DTC's. Start the engine in park. **NOTE: May take up to 30 seconds of a consistent fault to set this DTC.** With the DRBIII®, read the BCM DTC's. Does the Body Control Module have a "MIC MESSAGES NOT RECEIVED" DTC? Yes → Refer to the Communications category and perform test for "MIC MESSAGES NOT RECEIVED". Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 5	All
5	Ignition on, engine not running. With the DRBIII®, erase Transmission DTC's. Start the engine in park. With the DRBIII®, read Transmission DTC's. Is the DTC "P1687 NO COMMUNICATION WITH THE MIC" present? Yes → Replace the Powertrain Control Module. WITH THE DRBIII® PERFORM QUICK LEARN AND REPROGRAM PINION FACTOR. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete.	All
6	The conditions necessary to set the DTC are not present at this time. Using the schematics as a guide, inspect the wiring and connectors specific to this circuit. Wiggle the wiring and connectors while checking for shorts and open circuits. With the DRBIII®, check the EATX EVENT DATA to help identify the conditions in which the DTC was set. Were there any problems found? Yes → Repair as necessary. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete.	All

Symptom:
P1694-BUS COMMUNICATION WITH ENGINE MODULE

When Monitored and Set Condition:

P1694-BUS COMMUNICATION WITH ENGINE MODULE

When Monitored: Continuously with ignition key on.

Set Condition: If no bus messages are received from the Powertrain Control Module (PCM) for 10 seconds. Note: Due to the integration of the Powertrain and Transmission Control Modules, bus communication between the modules is internal.

POSSIBLE CAUSES
POWERTRAIN CONTROL MODULE
INTERMITTENT WIRING AND CONNECTORS

TEST	ACTION	APPLICABILITY
1	With the DRBIII®, erase Transmission DTC's. Start the Engine in Park. With the DRBIII®, read Transmission DTCs. **NOTE: The Engine must run for at least 20 seconds to reset this DTC.** Did the DTC reset after the engine was started? Yes → Go To 2 No → Go To 3	All
2	Using the schematics as a guide, inspect the wiring and connectors. Repair as necessary. Pay particular attention to all power and ground circuits. If there are no possible causes remaining, view repair. Repair Replace the Powertrain Control Module per the Service Information. WITH THE DRBIII® PERFORM QUICK LEARN AND REPROGRAM PINION FACTOR. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1.	All
3	The conditions necessary to set the DTC are not present at this time. Make sure to check for any Communication DTCs or customer concerns of possible bus problems. This includes any other controllers on the bus on this vehicle. If there is a bus problem refer to the Communication Category for diagnosis. With the DRBIII®, check the EATX EVENT DATA to help identify the conditions in which the DTC was set. Were there any problems found? Yes → Repair as necessary. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete.	All

Symptom:
P1775-SOLENOID SWITCH VALVE LATCHED IN TCC POSITION

When Monitored and Set Condition:

P1775-SOLENOID SWITCH VALVE LATCHED IN TCC POSITION

When Monitored: During an attempted shift into 1st gear.

Set Condition: This DTC is set if three unsuccessful attempts are made to get into 1st gear in one given ignition start.

POSSIBLE CAUSES
RELATED DTC P0841 PRESENT
INTERMITTENT WIRING AND CONNECTORS
L/R PRESSURE SWITCH SENSE CIRCUIT OPEN
TRANSMISSION CONTROL RELAY OUTPUT CIRCUIT OPEN
L/R PRESSURE SWITCH SENSE CIRCUIT SHORT TO GROUND
L/R PRESSURE SWITCH SENSE CIRCUIT SHORT TO VOLTAGE
INTERNAL TRANSMISSION
POWERTRAIN CONTROL MODULE

TEST	ACTION	APPLICABILITY
1	**NOTE: Low fluid level can be the cause of many transmission problems. If the fluid level is low locate and repair the leak then check and adjust the fluid level per the Service Information.** **NOTE: Always perform diagnostics with a fully charged battery to avoid false symptoms.** With the DRBIII®, read Engine DTC's. Check and repair all Engine DTC's prior to performing any transmission symptom diagnostics. With the DRBIII®, read Transmission DTC's. Record all DTC's and 1 Trip Failures. **NOTE: Diagnose 1 Trip Failures as a fully matured DTC.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Perform the Shift Lever Position Test. If the test does not pass, refer to Symptom test for P0706 Check Shifter Signal. For Gear Ratio DTC's, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle such that all diagnostic monitors have run. **NOTE: Verify flash level of Powertrain Control Module. Some problems are corrected by software upgrades to the Transmission and Engine software.** **NOTE: Check for applicable TSB's related to the problem.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All

P1775-SOLENOID SWITCH VALVE LATCHED IN TCC POSITION — Continued

TEST	ACTION	APPLICABILITY
2	With the DRBIII®, check for other Transmission DTC's Is the DTC P0841 present also? Yes → Refer to the Transmission category and perform the appropriate symptom. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 3	All
3	With the DRBIII®, Check the STARTS SINCE SET counter for P1775. **NOTE: This counter only applies to the last DTC set.** Is the STARTS SINCE SET counter 2 or less? Yes → Go To 4 No → Go To 11	All
4	Turn the ignition off to the lock position. Remove the Starter Relay. **CAUTION: Removal of the Starter Relay is to prevent a Transmission, NO RESPONSE, condition and disable the starter.** Install the Transmission Simulator, Miller tool #8333 and the Electronic Transmission Adapter kit 8333-1A. Ignition on, engine not running. With the Transmission Simulator, turn the Pressure Switch selector switch to L/R. With the DRBIII®, monitor the L/R Pressure Switch State while pressing the Pressure Switch Test button. Did the Pressure Switch state change from open to closed when the test button was pressed? Yes → Go To 5 No → Go To 6	All
5	If there are no possible causes remaining, view repair. Repair Repair internal transmission as necessary per the Service Information. Inspect the Solenoid Switch Valve per the Service Information and repair or replace as necessary. If no problems are found, replace the Transmission Solenoid/Pressure Switch Assembly. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1.	All

P1775-SOLENOID SWITCH VALVE LATCHED IN TCC POSITION — Continued

TEST	ACTION	APPLICABILITY
6	Turn the ignition off to the lock position. Disconnect the PCM harness connector. Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector. **Note: Check connectors - Clean/repair as necessary.** **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the L/R Pressure Switch Sense circuit from the appropriate terminal of special tool #8815 to the Transmission Solenoid/Pressure Switch Assembly harness connector. Is the resistance above 5.0 ohms? Yes → Repair the L/R Pressure Switch Sense circuit for an open. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 7	All
7	Turn the ignition off to the lock position. Disconnect the PCM harness connector. Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector. **Note: Check connectors - Clean/repair as necessary.** **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance between ground and the L/R Pressure Switch Sense circuit. Is the resistance below 5.0 ohms? Yes → Repair the L/R Pressure Switch Sense circuit for a short to ground. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 8	All
8	Turn the ignition off to the lock position. Disconnect the PCM harness connector. Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector. Remove the Transmission Control Relay. **Note: Check connectors - Clean/repair as necessary.** Connect a jumper wire between the Fused B+ circuit and Transmission Control Relay Output circuit in the Transmission Control Relay connector. Ignition on, engine not running. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the voltage of the L/R Pressure Switch Sense circuit. Is the voltage above 0.5 volts? Yes → Repair the L/R Pressure Switch Sense circuit for a short to voltage. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 9	All

P1775-SOLENOID SWITCH VALVE LATCHED IN TCC POSITION — Continued

TEST	ACTION	APPLICABILITY
9	Turn the ignition off to the lock position. Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector. Remove the Transmission Control Relay. Connect a jumper wire between the Fused B+ circuit and the Transmission Control Relay Output circuit. **Note: Check connectors - Clean/repair as necessary.** **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Disconnect the PCM C4 harness connector. Remove the Starter Relay. Using a 12-volt test light connected to ground, check all three Transmission Control Relay Output circuits in the appropriate terminals of special tool #8815. **NOTE: The test light must illuminate brightly. Compare the brightness to that of a direct connection to the battery.** Does the test light illuminate brightly on all three output circuits? Yes → Repair the Transmission Control Relay Output circuit for an open. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 10	All
10	Using the schematics as a guide, inspect the wiring and connectors. Repair as necessary. Pay particular attention to all power and ground circuits. If there are no possible causes remaining, view repair. Repair Replace the Powertrain Control Module per the Service Information. WITH THE DRBIII® PERFORM QUICK LEARN AND REPROGRAM PINION FACTOR. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1.	All
11	The conditions necessary to set this DTC are not present at this time. Test drive and verify if the transmission is launching in 2nd gear and/or no TCC engagement. With the DRBIII®, check the EATX EVENT DATA to help identify the conditions in which the DTC was set. Are there 2nd gear launches and/or no TCC engagement? Yes → Disassemble and inspect the Valve Body per the Service Information and repair or replace as necessary. If no problems are found in the Valve Body, replace the Transmission Solenoid Pressure Switch Assembly. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete.	All

Symptom:
P1776-SOLENOID SWITCH VALVE LATCHED IN LR POSITION

When Monitored and Set Condition:

P1776-SOLENOID SWITCH VALVE LATCHED IN LR POSITION

When Monitored: Continuously when doing partial or full EMCC (PEMCC or FEMCC).

Set Condition: If the PCM senses the L/R Pressure Switch closing while performing PEMCC or FEMCC. This DTC will be set after two unsuccessful attempts to perform PEMCC or FEMCC.

POSSIBLE CAUSES
RELATED DTC P0841 PRESENT
TRANSMISSION CONTROL RELAY OUTPUT CIRCUIT OPEN
L/R PRESSURE SWITCH SENSE CIRCUIT OPEN
L/R PRESSURE SWITCH SENSE CIRCUIT SHORT TO GROUND
L/R PRESSURE SWITCH SENSE CIRCUIT SHORT TO VOLTAGE
INTERNAL TRANSMISSION
POWERTRAIN CONTROL MODULE
INTERMITTENT WIRING AND CONNECTORS

TEST	ACTION	APPLICABILITY
1	**NOTE: Low fluid level can be the cause of many transmission problems. If the fluid level is low locate and repair the leak then check and adjust the fluid level per the Service Information.** **NOTE: Always perform diagnostics with a fully charged battery to avoid false symptoms.** With the DRBIII®, read Engine DTC's. Check and repair all Engine DTC's prior to performing any transmission symptom diagnostics. With the DRBIII®, read Transmission DTC's. Record all DTC's and 1 Trip Failures. **NOTE: Diagnose 1 Trip Failures as a fully matured DTC.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Perform the Shift Lever Position Test. If the test does not pass, refer to Symptom test for P0706 Check Shifter Signal. For Gear Ratio DTC's, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle such that all diagnostic monitors have run. **NOTE: Verify flash level of Powertrain Control Module. Some problems are corrected by software upgrades to the Transmission and Engine software.** **NOTE: Check for applicable TSB's related to the problem.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All

P1776-SOLENOID SWITCH VALVE LATCHED IN LR POSITION — Continued

TEST	ACTION	APPLICABILITY
2	With the DRBIII®, check for other transmission DTC's Is the DTC P0841 present also? Yes → Refer to the Transmission category and perform the appropriate symptom. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 3	All
3	With the DRBIII®, Check the STARTS SINCE SET counter for P1776. **NOTE: This counter only applies to the last DTC set.** Is the STARTS SINCE SET counter 2 or less? Yes → Go To 4 No → Go To 11	All
4	Turn the ignition off to the lock position. **CAUTION: Removal of the Starter Relay is to prevent a Transmission, NO RESPONSE, condition and disable the starter.** Install the Transmission Simulator, Miller tool #8333 and the Electronic Transmission Adapter kit 8333-1A. Ignition on, engine not running. With the Transmission Simulator, turn the Pressure Switch selector switch to L/R. With the DRBIII® monitor the L/R Pressure Switch State while pressing the Pressure Switch Test button on the Transmission Simulator. Did the Pressure Switch state change from open to closed when test button was pressed? Yes → Go To 5 No → Go To 6	All
5	If there are no possible causes remaining, view repair. Repair Repair Internal Transmission as necessary. Inspect the Solenoid Switch Valve per the Service Information and repair or replace as necessary. If no problems are found, replace the Transmission Solenoid/Pressure Switch Assembly. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1.	All
6	Turn the ignition off to the lock position. Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector. Remove the Transmission Control Relay. **Note: Check connectors - Clean/repair as necessary.** Connect a jumper wire between the Fused B+ circuit and the Transmission Control Relay Output circuit in the Transmission Control Relay connector. Using a 12-volt test light connected to ground, check the Transmission Control Relay Output circuit in the Solenoid/Pressure Switch Assembly harness connector. **NOTE: The Test light must illuminate brightly. Compare the brightness to that of a direct connection to the battery.** Does the test light illuminate brightly? Yes → Go To 7 No → Repair the Transmission Control Relay Output circuit for an open. If the fuse is open make sure to check for a short to ground. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1.	All

P1776-SOLENOID SWITCH VALVE LATCHED IN LR POSITION — Continued

TEST	ACTION	APPLICABILITY
7	Turn the ignition off to the lock position. Disconnect the PCM harness connector. Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector. **Note: Check connectors - Clean/repair as necessary.** **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the L/R Pressure Switch Sense circuit from the Pinout Box to the Transmission Solenoid/Pressure Switch Assembly harness connector. Is the resistance above 5.0 ohms? Yes → Repair the L/R Pressure Switch Sense circuit for an open. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 8	All
8	Turn the ignition off to the lock position. Disconnect the PCM harness connector. Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector. **Note: Check connectors - Clean/repair as necessary.** **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance between ground and the L/R Pressure Switch Sense circuit. Is the resistance below 5.0 ohms? Yes → Repair the L/R Pressure Switch Sense circuit for a short to ground. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 9	All
9	Turn the ignition off to the lock position. Disconnect the PCM harness connector. Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector. Remove the Transmission Control Relay. **Note: Check connectors - Clean/repair as necessary.** **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Connect a jumper wire between the Fused B+ circuit and Transmission Control Relay Output circuit. Ignition on, engine not running. Measure the voltage of the L/R Pressure Switch Sense circuit. Is the voltage above 0.5 volt? Yes → Repair the L/R Pressure Switch Sense circuit for a short to voltage. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 10	All

P1776-SOLENOID SWITCH VALVE LATCHED IN LR POSITION — Continued

TEST	ACTION	APPLICABILITY
10	Using the schematics as a guide, inspect the wiring and connectors. Repair as necessary. Pay particular attention to all power and ground circuits. If there are no possible causes remaining, view repair. Repair Replace the Powertrain Control Module per the Service Information. WITH THE DRBIII® PERFORM QUICK LEARN AND REPROGRAM PINION FACTOR. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1.	All
11	The conditions necessary to set this DTC are not present at this time. Test Drive and verify if the transmission is launching in 2nd gear and/or no TCC engagement. With the DRBIII®, check the EATX EVENT DATA to help identify the conditions in which the DTC was set. Are there 2nd gear launches and/or no TCC engagement? Yes → Disassemble and inspect the Valve Body per the Service Information and repair or replace as necessary. If no problems are found in the Valve Body, replace the Transmission Solenoid Pressure Switch Assembly. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete.	All

Symptom:
P1790-FAULT IMMEDIATELY AFTER SHIFT

When Monitored and Set Condition:

P1790-FAULT IMMEDIATELY AFTER SHIFT

When Monitored: After a speed ratio error is stored.

Set Condition: This DTC is set if the associated speed ratio DTC is stored within 1.3 seconds after a shift.

POSSIBLE CAUSES
FAULT AFTER SHIFT

TEST	ACTION	APPLICABILITY
1	**NOTE: Low fluid level can be the cause of many transmission problems. If the fluid level is low locate and repair the leak then check and adjust the fluid level per the Service Information.** **NOTE: Always perform diagnostics with a fully charged battery to avoid false symptoms.** With the DRBIII®, read Engine DTC's. Check and repair all Engine DTC's prior to performing any transmission symptom diagnostics. With the DRBIII®, read Transmission DTC's. Record all DTC's and 1 Trip Failures. **NOTE: Diagnose 1 Trip Failures as a fully matured DTC.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Perform the Shift Lever Position Test. If the test does not pass, refer to Symptom test for P0706 Check Shifter Signal. For Gear Ratio DTC's, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle such that all diagnostic monitors have run. **NOTE: Verify flash level of Powertrain Control Module. Some problems are corrected by software upgrades to the Transmission and Engine software.** **NOTE: Check for applicable TSB's related to the problem.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All
2	This test is set along with a gear ratio DTC. Perform the appropriate test for the Gear Ratio DTC stored. **NOTE: Check 1 trip failures if there are no gear ratio DTCs current.** If there are no possible causes remaining, view repair. Repair Refer to the Transmission category and perform the appropriate symptom. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1.	All

Symptom:
P1793-TRD LINK COMMUNICATION ERROR

When Monitored and Set Condition:

P1793-TRD LINK COMMUNICATION ERROR

When Monitored: The Transmission Control Module (TCM) pulses the 12 volt TRD signal from the Powertrain Control Module (PCM) to ground, during torque managed shifts with the throttle angle above 54 degrees. The TRD system is also tested whenever the vehicle is stopped and the engine speed is at idle.

Set Condition: This DTC is set when the Transmission Control Module (TCM) sends two subsequent torque reduction messages to the Powertrain Control Module (PCM) and does not receive a confirmation from the PCM. Note: Due to the integration of the Powertrain and Transmission Control Modules, bus communication between the modules is internal.

POSSIBLE CAUSES
POWERTRAIN CONTROL MODULE

TEST	ACTION	APPLICABILITY
1	**NOTE: Due to the integration of the Engine and Transmission controllers into one module, the TRD bus messages are sent over a internal bus circuit.** View repair. Repair Replace the Powertrain Control Module per the Service Information. WITH THE DRBIII® PERFORM QUICK LEARN AND REPROGRAM PINION FACTOR. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1.	All

Symptom:
P1794-SPEED SENSOR GROUND ERROR

When Monitored and Set Condition:

P1794-SPEED SENSOR GROUND ERROR

When Monitored: The transmission gear ratio is monitored continuously while the transmission is in gear.

Set Condition: After a PCM reset in neutral and Input/Output Ratio equals a ratio of 2.50 to 1.0 ± 50.0 RPM.

POSSIBLE CAUSES
SPEED SENSOR GROUND CIRCUIT OPEN
POWERTRAIN CONTROL MODULE
INTERMITTENT WIRING AND CONNECTORS

TEST	ACTION	APPLICABILITY
1	**NOTE: Low fluid level can be the cause of many transmission problems. If the fluid level is low locate and repair the leak then check and adjust the fluid level per the Service Information.** **NOTE: Always perform diagnostics with a fully charged battery to avoid false symptoms.** With the DRBIII®, read Engine DTC's. Check and repair all Engine DTC's prior to performing any transmission symptom diagnostics. With the DRBIII®, read Transmission DTC's. Record all DTC's and 1 Trip Failures. **NOTE: Diagnose 1 Trip Failures as a fully matured DTC.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Perform the Shift Lever Position Test. If the test does not pass, refer to Symptom test for P0706 Check Shifter Signal. For Gear Ratio DTC's, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle such that all diagnostic monitors have run. **NOTE: Verify flash level of Powertrain Control Module. Some problems are corrected by software upgrades to the Transmission and Engine software.** **NOTE: Check for applicable TSB's related to the problem.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All

P1794-SPEED SENSOR GROUND ERROR — Continued

TEST	ACTION	APPLICABILITY
2	Turn the ignition off to the lock position. Remove the Starter Relay. **CAUTION: Removal of the Starter Relay is to prevent a Transmission, NO RESPONSE, condition and disable the starter.** Install the Transmission Simulator, Miller tool #8333 and the Electronic Transmission Adapter kit 8333-1A. Ignition on, engine not running. With the Transmission Simulator, set the ″Input/Output Speed″ switch to ″ON″ and the rotary switch to the ″3000/1250″ position. With the DRBIII®, monitor the Input and Output Speed Sensor readings. Does the Input Speed read 3000 RPM and the Output Speed read 1250 RPM, ± 50 RPM? Yes → Go To 3 No → Go To 4	All
3	The conditions necessary to set the DTC are not present at this time. Using the schematics as a guide, inspect the wiring and connectors specific to this circuit. Wiggle the wires while checking for shorted and open circuits. With the DRBIII®, check the EATX EVENT DATA to help identify the conditions in which the DTC was set. Were there any problems found? Yes → Repair as necessary. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete.	All
4	Turn the ignition off to the lock position. Disconnect the PCM harness connector. Disconnect the Input and Output Speed Sensor harness connectors. **Note: Check connectors - Clean/repair as necessary.** **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the Speed Sensor Ground circuit from the appropriate terminal of special tool #8815 to the Input and Output Speed Sensor harness connectors. Is the resistance above 5.0 ohms on either circuit? Yes → Repair the Speed Sensor Ground circuit for an open. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 5	All
5	Using the schematics as a guide, inspect the wiring and connectors. Repair as necessary. Pay particular attention to all power and ground circuits. If there are no possible causes remaining, view repair. Repair Replace and program the Powertrain Control Module per the Service Information. WITH THE DRBIII® PERFORM QUICK LEARN AND REPROGRAM PINION FACTOR. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1.	All

Symptom:
P1797-MANUAL SHIFT OVERHEAT

When Monitored and Set Condition:

P1797-MANUAL SHIFT OVERHEAT

When Monitored: Whenever the engine is running and transmission is in the AutoStick® mode.

Set Condition: If the Engine Temperature exceeds 123° C or 255° F, or the Transmission Temperature exceeds 135° C or 275° F while in AutoStick® mode. Note: Aggressive driving or driving in low for extended periods of time in AutoStick® mode will set this DTC.

POSSIBLE CAUSES
MANUAL SHIFT OVERHEAT

TEST	ACTION	APPLICABILITY
1	**NOTE: Low fluid level can be the cause of many transmission problems. If the fluid level is low locate and repair the leak then check and adjust the fluid level per the Service Information.** **NOTE: Always perform diagnostics with a fully charged battery to avoid false symptoms.** With the DRBIII®, read Engine DTC's. Check and repair all Engine DTC's prior to performing any transmission symptom diagnostics. With the DRBIII®, read Transmission DTC's. Record all DTC's and 1 Trip Failures. **NOTE: Diagnose 1 Trip Failures as a fully matured DTC.** Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary. Perform the Shift Lever Position Test. If the test does not pass, refer to Symptom test for P0706 Check Shifter Signal. For Gear Ratio DTC's, check and record all CVI's. Most DTC's set on start up but some must be set by driving the vehicle such that all diagnostic monitors have run. **NOTE: Verify flash level of Powertrain Control Module. Some problems are corrected by software upgrades to the Transmission and Engine software.** **NOTE: Check for applicable TSB's related to the problem.** Perform this procedure prior to Symptom diagnosis. Continue Go To 2	All

P1797-MANUAL SHIFT OVERHEAT — Continued

TEST	ACTION	APPLICABILITY
2	This is an informational DTC only. With the DRBIII®, check the EATX EVENT DATA to help identify the conditions in which the DTC was set. Check the engine and transmission cooling system for proper operation. Check the Radiator Cooling Fan operation. Check the Transmission Cooling Fan operation if equipped. Check the Transmission Fluid Level per the Service Information. Make sure it is not overfilled. **NOTE: Aggressive driving or driving in low for extended periods of time in AutoStick mode will set this DTC.** If there are no possible causes remaining, view repair. Repair If the Transmission Fluid is low, repair any Transmission Fluid leak as necessary and adjust the Transmission Fluid Level per the Service Information. Refer to Service Information for the related symptoms and repair as necessary. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1.	All

Symptom:
*BACKUP LAMPS COME ON WHILE SHIFTER IS NOT IN REVERSE POSITION

POSSIBLE CAUSES
INTERMITTENT WIRING AND CONNECTORS
BACKUP SUPPLY CIRCUIT SHORT TO VOLTAGE
TRANSMISSION RANGE SENSOR

TEST	ACTION	APPLICABILITY
1	Ignition on, engine not running. Firmly apply brakes. Place the Shift Lever in the position which causes the Backup Lamps to come on at the wrong time. Do the Backup Lamps come on while the shifter is not in Reverse? Yes → Go To 2 No → Go To 5	All
2	Ignition on, engine not running. Place the shift lever in a position that causes the Backup Lamps to come on when they should not. Disconnect the TRS harness connector. **NOTE: This will cause a DTC P0706 and possibly other DTC's to be stored in the PCM. They must be erased before returning the vehicle to the customer.** Did the Backup Lamps go out when the TRS harness connector was disconnected? Yes → Go To 3 No → Go To 4	All
3	If there are no possible causes remaining, view repair. Repair Replace Transmission Range Sensor per the Service Information.	All
4	Turn the ignition off to the lock position. Disconnect the TRS harness connector. Ignition on, engine not running. Measure the voltage of the Backup Light Supply circuit in the TRS harness connector. Is the voltage above 0.5 volt? Yes → Repair the Backup Lights Supply circuit for a short to voltage. No → Test Complete.	All
5	The conditions necessary to set this DTC are not present at this time. Using the schematics as a guide, inspect the wiring and connectors specific to this circuit. Wiggle the wires while checking for shorts and open circuits. Were there any problems found? Yes → Repair as necessary. No → Test Complete.	All

Symptom:
*BACKUP LAMPS INOPERATIVE

POSSIBLE CAUSES
OPEN BACKUP LAMP BULB(S)
BACKUP LAMP GROUND CIRCUIT OPEN
BACKUP LAMP SUPPLY CIRCUIT OPEN
FUSED IGNITION SWITCH OUTPUT CIRCUIT OPEN
TRANSMISSION RANGE SENSOR
INTERMITTENT BACKUP LAMPS

TEST	ACTION	APPLICABILITY
1	Ignition on, engine not running. Place foot firmly on brake pedal. Place the shift lever in the reverse position. Do either of the back-up lamps work? Yes → Go To 2 No → Go To 3	All
2	If one backup lamp works, the problem must be in the bulb or the wiring to the one that doesn't work. Check the bulb, Backup Lamp Supply circuit and the Ground circuit to the one that does not work. Using the schematics as a guide, inspect the wiring and connectors specific to this circuit. Wiggle the wires while checking for shorted and open circuits. View repair options. Repair Repair as necessary.	All
3	Turn the ignition off to the lock position. Remove the Starter Relay. **CAUTION: Removal of the Starter Relay is to prevent a Transmission, NO RESPONSE, condition and disable the starter.** Install the Transmission Simulator, Miller tool #8333 and the Electronic Transmission Adapter kit 8333-1A. Ignition on, engine not running. Press the "Reverse Light Test" button on the Transmission Simulator while observing the Back-up Lamps. Do either of the Back-up Lamps come on? Yes → Replace the Transmission Range Sensor per the Service Information. No → Go To 4	All
4	Remove both Backup Lamp bulbs. **NOTE: Check the Backup Lamp Sockets and Clean/repair as necessary.** Measure the resistance of the Backup Lamp bulbs. Is the resistance above 5.0 ohms on either bulb? Yes → Replace the Backup Lamp bulb(s). Verify the bulbs illuminate with the Transmission Simulator. No → Go To 5	All

*BACKUP LAMPS INOPERATIVE — Continued

TEST	ACTION	APPLICABILITY
5	Turn the ignition off to the lock position. Disconnect the TRS harness connector. Ignition on, engine not running. Using a 12-volt test light connected to ground, check the Fused Ignition Switch Output circuit in the TRS harness connector. **NOTE: The test light must illuminate brightly. Compare the brightness to that of a direct connection to the battery.** Does the test light illuminate brightly? Yes → Go To 6 No → Repair the Fused Ignition Switch Output circuit for an open. If the fuse is open make sure to check for a short to ground.	All
6	Turn the ignition off to the lock position. Install the Transmission Simulator, Miller tool #8333 and the Electronic Transmission Adapter kit 8333-1A. Remove the Backup Lamp bulb(s). Ignition on, engine not running. **Note: Check connectors - Clean/repair as necessary.** Using a 12-volt test light connected to ground, check the Backup Lamp Supply circuit in both Backup Lamp sockets while pressing the Reverse Light Test button on the Transmission Simulator. Does the test light illuminate brightly on either Backup Lamb Bulb socket? Yes → Repair the Backup Lamp Ground circuit for an open. No → Repair the Backup Lamp Supply circuit for an open.	All

Symptom:
*CHECKING PARK/NEUTRAL SWITCH OPERATION

POSSIBLE CAUSES
P/N POSITION SWITCH SENSE CIRCUIT OPEN
P/N POSITION SWITCH SENSE CIRCUIT SHORT TO GROUND
TRANSMISSION RANGE SENSOR
POWERTRAIN CONTROL MODULE

TEST	ACTION	APPLICABILITY
1	Ignition on, engine not running. With the DRBIII®, monitor the Park/Neutral Position Switch input state. Move the gear selector through all gear positions, Park to 1 and back to Park. Did the DRBIII® display show P/N and D/R in the correct gear positions? Yes → Test Complete. No → Go To 2	All
2	Turn the ignition off to the lock position. Disconnect the PCM harness connectors. Disconnect the TRS harness connector. **Note: Check connectors - Clean/repair as necessary.** **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the P/N Position Switch Sense circuit from the appropriate terminal of special tool #8815 to the Transmission Range Sensor harness connector. Is the resistance below 5.0 ohms? Yes → Go To 3 No → Repair the P/N Position Switch Sense circuit for an open.	All
3	Turn the ignition off to the lock position. Disconnect the PCM harness connectors. Disconnect the TRS harness connector. **Note: Check connectors - Clean/repair as necessary.** **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance between ground and the P/N Position Switch Sense circuit. Is the resistance above 100 kohms? Yes → Go To 4 No → Repair the P/N Position Switch Sense circuit for a short to ground.	All

*CHECKING PARK/NEUTRAL SWITCH OPERATION — Continued

TEST	ACTION	APPLICABILITY
4	Turn the ignition off to the lock position. Disconnect the PCM harness connectors. Move the Gear selector through all gear positions, from Park to 1st and back. While moving the gear selector through each gear, measure the resistance between ground and the P/N Position Switch Sense circuit in the appropriate terminal of special tool #8815. **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Did the resistance change from above 10.0 ohms to below 10.0 ohms? Yes → Go To 5 No → Replace the Transmission Range Sensor per the Service Information.	All
5	Using the schematics as a guide, inspect the wiring and connectors. Repair as necessary. Pay particular attention to all power and ground circuits. If there are no possible causes remaining, view repair. Repair Replace the Powertrain Control Module per the Service Information.	All

Symptom:
*NO MANUAL AUTOSTICK OPERATION

POSSIBLE CAUSES
AUTOSTICK® DOWNSHIFT SENSE CIRCUIT OPEN
AUTOSTICK® GROUND CIRCUIT OPEN
AUTOSTICK® UPSHIFT SENSE CIRCUIT OPEN
FUSED IGNITION SWITCH OUTPUT CIRCUIT OPEN
PCM - AUTOSTICK®

TEST	ACTION	APPLICABILITY
1	Turn the ignition off to the lock position. Disconnect the AutoStick® Switch harness connector. **Note: Check connectors - Clean/repair as necessary.** Ignition on, engine not running. Measure the voltage of the Fused Ignition Switch Output circuit in the AutoStick® Switch harness connector. Is the voltage above 10.0 volts? Yes → Go To 2 No → Repair the Fused Ignition Switch Output circuit for an open.	All
2	Turn the ignition off to the lock position. Disconnect the AutoStick® Switch harness connector. **Note: Check connectors - Clean/repair as necessary.** Measure the resistance between ground and the AutoStick® Ground circuit at the AutoStick® harness connector. Is the resistance above 5.0 ohms? Yes → Repair the AutoStick® Ground circuit for an open. No → Go To 3	All
3	Turn the ignition off to the lock position. Disconnect the PCM harness connector. Disconnect the AutoStick® Switch harness connector. **Note: Check connectors - Clean/repair as necessary.** **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the Upshift Sense circuit between the Pinout Box and the AutoStick® Switch harness connector. Is the resistance above 5.0 ohms? Yes → Repair the AutoStick® Upshift Sense circuit for an open. No → Go To 4	All

*NO MANUAL AUTOSTICK OPERATION — Continued

TEST	ACTION	APPLICABILITY
4	Turn the ignition off to the lock position. Disconnect the PCM harness connector. Disconnect the AutoStick® Switch harness connector. **Note: Check connectors - Clean/repair as necessary.** **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the Downshift Sense circuit between the Pinout Box and the AutoStick® Switch harness connector. Is the resistance above 5.0 ohms? Yes → Repair the AutoStick® Downshift Sense circuit for an open. No → Go To 5	All
5	Ignition on, engine not running. With the DRBIII® monitor the AutoStick® Switch status. Firmly apply the brake and shift into AutoStick®. Push the shift lever to the right several times to actuate the AutoStick® Upshift Switch and then to the left several times to actuate the AutoStick® Downshift Switch. Do both AutoStick® Upshift and Downshift Switch states toggle? Yes → Test Complete. No → Replace the Powertrain Control Module per the Service Information. WITH THE DRBIII® PERFORM QUICK LEARN AND REPROGRAM PINION FACTOR.	All

Symptom:
*PRNDL FAULT CLEARING PROCEDURE

POSSIBLE CAUSES
PRNDL FAULT CLEARING PROCEDURE

TEST	ACTION	APPLICABILITY
1	With the DRBIII®, erase Transmission DTCs. Cycle the ignition off, then start the vehicle. Firmly apply the brakes and shift into Overdrive. **NOTE: Vehicle must remain in Overdrive for at least 3.0 seconds.** With the brakes firmly applied, shift slowly through all gears (PRNDL) as least three times, pausing momentarily in each gear. **NOTE: If all the PRNDL lights box individually then the error was cleared.** Shift into park and turn the ignition off to the lock position. Ignition on, engine not running. With the DRBIII®, read Transmission DTCs. Does the DTC P0706 reset, or do all the PRNDL indicators remain boxed in park or neutral? Yes → Return to the symptom list and perform diagnostics for P0706 CHECK SHIFTER SIGNAL. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Test Complete. Perform 41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1.	All

Symptom:
*TRANSMISSION NOISY WITH NO DTC'S PRESENT

POSSIBLE CAUSES
INTERNAL TRANSMISSION PROBLEM - NOISY
INTERNAL TRANSMISSION PROBLEM - NOISY WHILE STANDING STILL

TEST	ACTION	APPLICABILITY
1	Check and adjust the oil level per the Service Information before continuing. Place vehicle on hoist. Run vehicle on hoist under conditions necessary to duplicate the noise. **CAUTION: BE SURE TO KEEP HANDS AND FEET CLEAR OF ROTATING WHEELS.** Using Chassis Ears or other suitable device, verify that the noise is coming from the transmission. Is the noise coming from the transmission? Yes → Go To 2 No → Test Complete.	All
2	With the shift lever in neutral, raise the engine speed and listen to the noise. **NOTE: THE RADIO MUST BE TURNED OFF. Alternator noise can come through the speakers and be misinterpreted as Transmission Pump Whine. This can happen even with the volume turned down.** Does the noise get louder or change pitch while the engine speed is changing? Yes → Go To 3 No → Go To 4	All
3	If there are no possible causes remaining, view repair. Repair Repair internal transmission problem as necessary. Inspect all of the transmission components for signs of wear. If no problems found, replace the Transmission Oil pump.	All
4	If there are no possible causes remaining, view repair. Repair Repair internal transmission problem as necessary. Inspect all of the transmission components for signs of wear. Pay particular attention to bearings, pinion gears, etc. Repair or replace as necessary.	All

Symptom:
*TRANSMISSION SHIFTS EARLY WITH NO DTC'S

POSSIBLE CAUSES
VEHICLE BUS PROBLEMS
CHECK FOR INTERMITTENT WIRING & CONNECTORS
COLD TRANSMISSION

TEST	ACTION	APPLICABILITY
1	Using the DRBIII®, check all other Modules for signs of a PCI bus problem such as bus related DTC's and/or communication problems. Check and diagnose all 1 trip failures as a hard code. Although it takes two occurences of a missed TRD link message to set the DTC P1793, one missed message will cause the transmission to short shift until the next start up. If the vehicle has any indications of a bus problem, the bus must be repaired first Do any of the other modules show signs of a bus problem? Yes → Refer to the Communication category and perform the appropriate diagnostics. No → Go To 2	All
2	The conditions necessary to set the DTC are not present at this time. Using the schematics as a guide, inspect the wiring and connectors specific to this circuit. Wiggle the wires while checking for shorts and open circuits. Although it takes two occurences of a missed TRD link message to set the DTC P1793, one missed message will cause the transmission to short shift until the next start up. If the vehicle has any indications of a bus problem, the bus must be repaired first Were there any problems found? Yes → Repair as necessary. No → Go To 3	All
3	If the transmission shifts too early when the transmission is cold, this is a normal condition. The software is designed to protect the transmission from high torque and/or high RPM shifts during cold operation. Did the problem occur when the transmission temperature was cold? Yes → This is a normal condition. The software is designed to protect the transmission from high torque and/or high RPM shifts during cold operation. No → Test Complete.	All

Symptom:
*TRANSMISSION SIMULATOR 8333 WILL NOT POWER UP

POSSIBLE CAUSES
TRANSMISSION SIMULATOR WILL NOT POWER UP

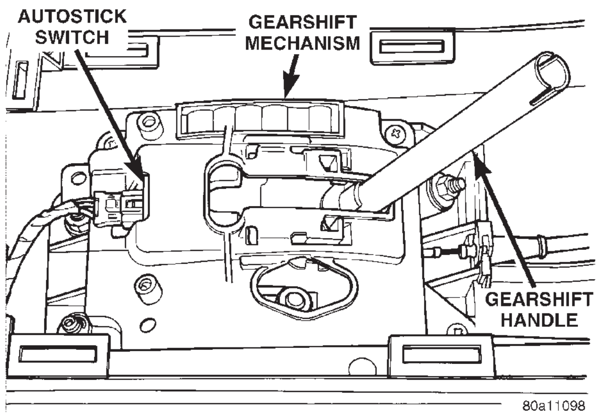
TEST	ACTION	APPLICABILITY
1	**NOTE: Make sure to check for any Transmission Control Relay DTCs. or conditions. A stuck open Transmission Control Relay can cause the Transmission Simulator to not Power up.** **NOTE: If the Transmission Simulator, Miller tool #8333 and the Electronic Transmission Adapter kit 8333-1A will not power up make sure to check all connectors and the ground cable for proper installation.** If there are no possible causes remaining, view repair. Repair Check and repair these symptoms before having the Transmission Simulator repaired.	All

Verification Tests

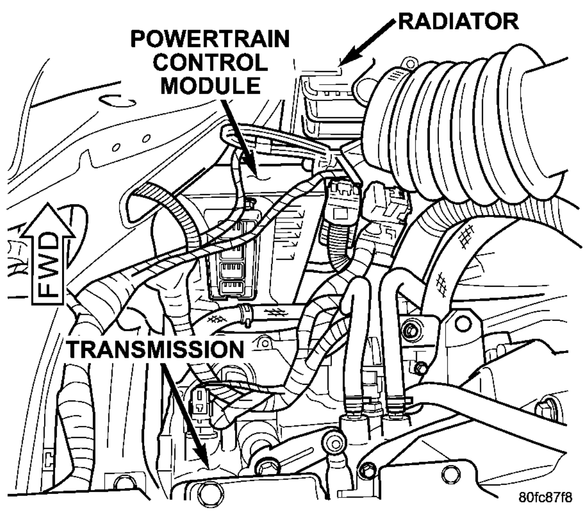
41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1	APPLICABILITY
1. NOTE: After completion of the Transmission Verification Test, the Powertrain Verification Test must be performed. Refer to the Powertrain Category. 2. Connect the DRBIII® to the Data Link Connector (DLC). 3. Reconnect any disconnected components. 4. With the DRBIII®, erase all Transmission DTC's, also erase the PCM DTC's. 5. Perform *PRNDL FAULT CLEARING PROCEDURE after completion of repairs for P0706 CHECK SHIFTER SIGNAL. 6. With the DRBIII®, display Transmission Temperature. Start and run the engine until the Transmission Temperature is HOT, above 43° C or 110° F. 7. Check the transmission fluid and adjust if necessary. Refer to the Service Information for the Fluid Fill procedure. **8. NOTE: If the Transmission Control Module or Torque Converter has been replaced or if the Transmission has been repaired or replaced it is necessary to perform the DRBIII® Quick Learn Procedure and reset the "Pinion Factor"** 9. Road test the vehicle. With the DRBIII®, monitor the engine RPM. Make 15 to 20 1-2, 2-3, 3-4 upshifts. Perform these shifts from a standing start to 45 MPH with a constant throttle opening of 20 to 25 degrees. 10. Below 25 MPH, make 5 to 8 wide open throttle kickdowns to 1st gear. Allow at least 5 seconds each in 2nd and 3rd gear between each kickdown. 11. For a specific DTC, drive the vehicle to the Symptom's When Monitored/When Set conditions to verify the DTC is repaired. 12. If equipped with AutoStick®, upshift and downshift several times using the AutoStick® feature during the road test. **13. NOTE: Use the EATX OBDII task manager to run Good Trip time in each gear, this will confirm the repair and to ensure that the DTC has not re-matured.** 14. Check for Diagnostic Trouble Codes (DTC's) during the road test. If a DTC sets during the road test , return to the Symptom list and perform the appropriate symptom. **15. NOTE: Erase P0700 DTC in the PCM to turn the MIL light off after making transmission repairs.** Were there any Diagnostic Trouble Codes set during the road test? Yes → Repair is not complete, refer to the appropriate symptom. No → Repair is complete.	All

8.0 COMPONENT LOCATIONS

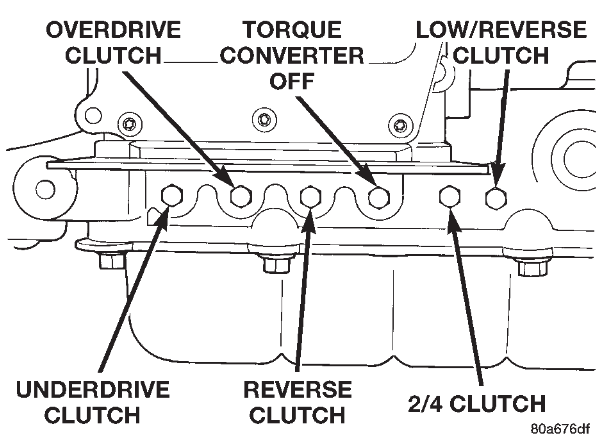
8.1 AUTOSTICK - IF EQUIPPED



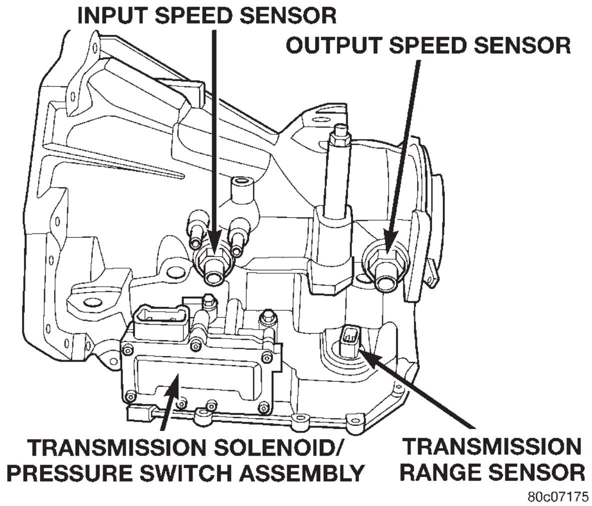
8.2 POWERTRAIN CONTROL MODULE



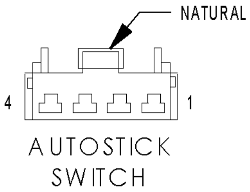
8.3 PRESSURE PORT



8.4 TRANSMISSION COMPONENT LOCATIONS

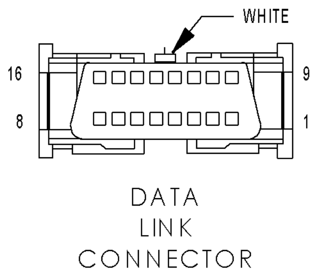


9.0 CONNECTOR PINOUTS



AUTOSTICK SWITCH - NATURAL 4 WAY

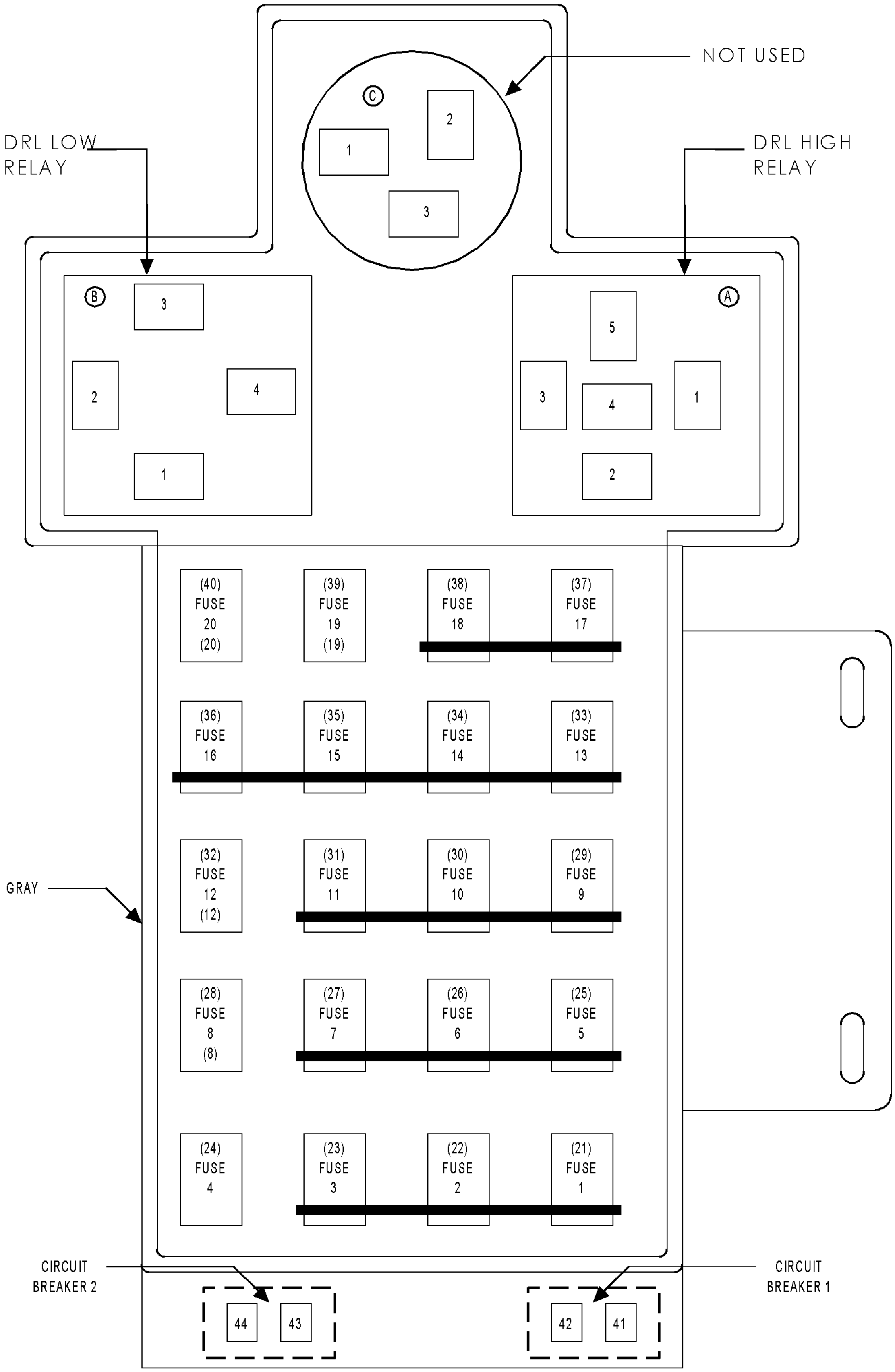
CAV	CIRCUIT	FUNCTION
1	T44 20YL/LB	AUTOSTICK DOWNSHIFT SWITCH SIGNAL
2	T5 20LG/LB	AUTOSTICK UPSHIFT SWITCH SIGNAL
3	Z1 20BK	GROUND
4	F11 20RD/WT	IGNITION SWITCH OUTPUT (OFF-RUN-START)



DATA LINK CONNECTOR - WHITE 16 WAY

CAV	CIRCUIT	FUNCTION
1	-	-
2	D25 20VT/YL	PCI BUS (PCM)
3	-	-
4	Z12 20BK/TN	GROUND
5	Z12 20BK/TN	GROUND
6	-	-
7	D21 20PK	SCI TRANSMIT (PCM)
8	-	-
9	D6 20PK/LB (2.0L)	SCI RECEIVE (TCM)
10	-	-
11	-	-
12	D20 20LG	SCI RECEIVE (PCM)
13	-	-
14	-	-
15	D15 20WT/DG (2.0L)	SCI TRANSMIT (TCM)
16	A14 18RD/WT	FUSED B(+)

FUSE BLOCK


NOT USED
C
1
2
3
DRL LOW
RELAY
DRL HIGH
RELAY
B
3
2
4
1
A
5
3
4
1
2
(40)
FUSE
20
(20)
(39)
FUSE
19
(19)
(38)
FUSE
18
(37)
FUSE
17
(36)
FUSE
16
(35)
FUSE
15
(34)
FUSE
14
(33)
FUSE
13
GRAY
(32)
FUSE
12
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FUSE
11
(30)
FUSE
10
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FUSE
9
(28)
FUSE
8
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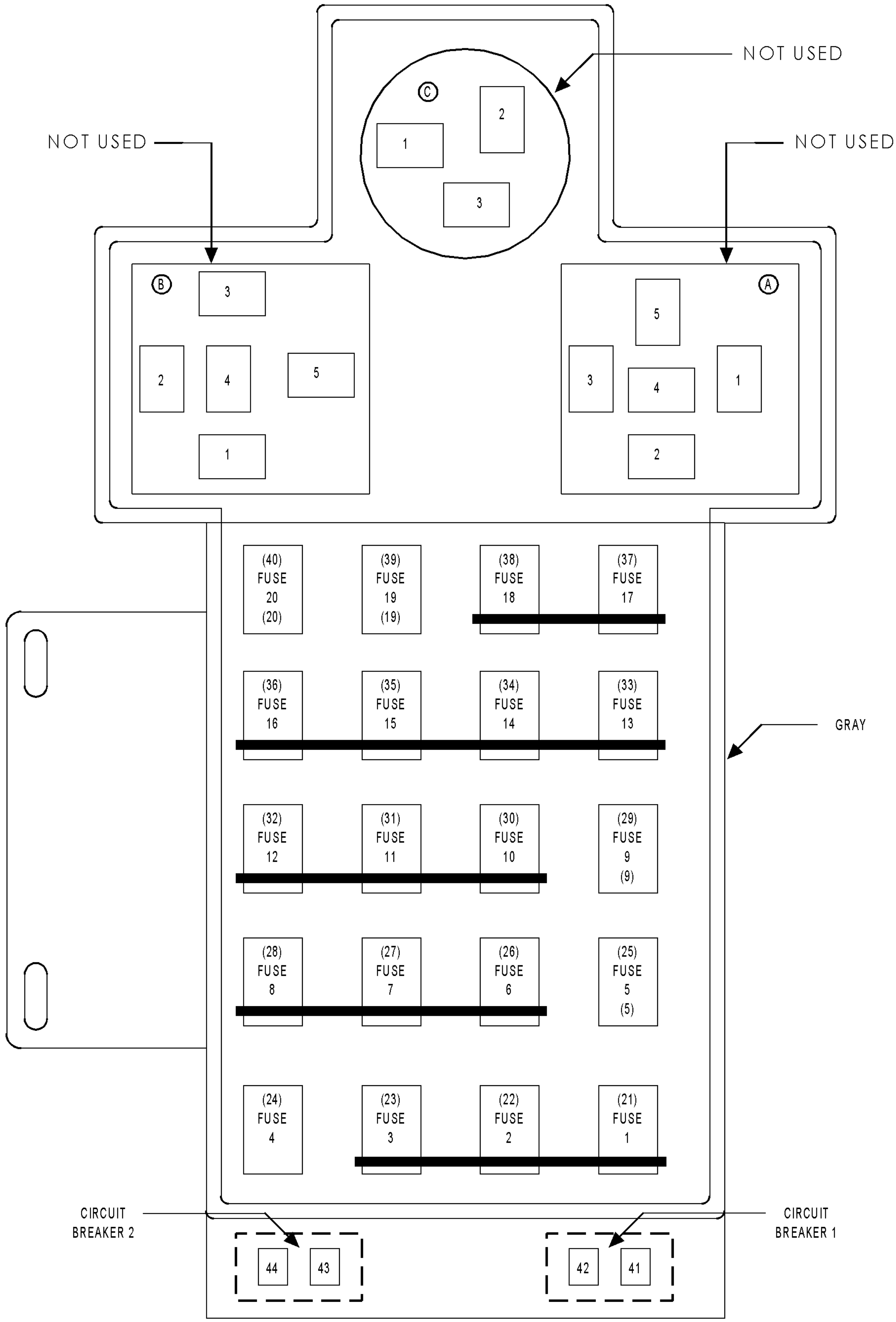
FUSE
7
(26)
FUSE
6
(25)
FUSE
5
(24)
FUSE
4
(23)
FUSE
3
(22)
FUSE
2
(21)
FUSE
1
CIRCUIT
BREAKER 2
44
43
CIRCUIT
BREAKER 1
42
41

FUSES (FB LHD)

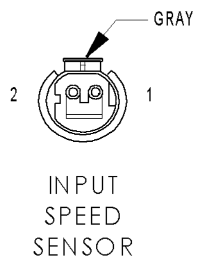
FUSE NO.	AMPS	FUSED CIRCUIT	FUNCTION
1	10A	L6 20RD/WT	FUSED IGNITION SWITCH OUTPUT (RUN-ACC)
1	10A	L6 20RD/WT	FUSED IGNITION SWITCH OUTPUT (RUN-ACC)
2	20A	V6 16DB	FUSED IGNITION SWITCH OUTPUT (RUN-ACC)
2	20A	V6 16DB	FUSED IGNITION SWITCH OUTPUT (RUN-ACC)
3	20A	X12 18RD/WT	FUSED IGNITION SWITCH OUTPUT (RUN-ACC)
3	20A	F10 18YL/RD	FUSED IGNITION SWITCH OUTPUT (RUN-ACC)
4	15A	M1 18PK	FUSED B(+)
5	10A	F25 20TN/LG	FUSED IGNITION SWITCH OUTPUT (RUN)
6	20A	C1 14DG	FUSED IGNITION SWITCH OUTPUT (RUN)
7	10A	F20 20WT	FUSED IGNITION SWITCH OUTPUT (RUN)
7	10A	F20 20WT (DAYTIME RUNNING LAMPS)	FUSED IGNITION SWITCH OUTPUT (RUN)
8	15A	L3 14RD/OR	DIMMER SWITCH HIGH BEAM OUTPUT
9	10A	F15 20DG/WT	FUSED IGNITION SWITCH OUTPUT (RUN-START)
10	15A	F12 18DB/PK	FUSED IGNITION SWITCH OUTPUT (RUN-START)
11	10A	G5 20DB/WT	FUSED IGNITION SWITCH OUTPUT (RUN-START)
12	10A	A81 20DG/RD (AUTOSTICK)	FUSED B(+)
13	-	-	-
14	20A	F35 18RD	FUSED B(+)
15	15A	F33 18PK/RD	FUSED B(+)
16	25A	F3 12LB/OR	FUSED B(+)
17	10A	L43 14VT	FUSED LEFT LOW BEAM OUTPUT
18	10A	L44 14VT/RD	FUSED RIGHT LOW BEAM OUTPUT
19	10A	L39 20LB	FRONT FOG LAMP SWITCH OUTPUT
19	10A	L39 20LB	FRONT FOG LAMP SWITCH OUTPUT
20	-	-	-

FUSE BLOCK


NOT USED
C
1
2
3
NOT USED
NOT USED
B
3
2
4
5
1
A
5
3
4
1
2
(40) FUSE 20 (20)
(39) FUSE 19 (19)
(38) FUSE 18
(37) FUSE 17
(36) FUSE 16
(35) FUSE 15
(34) FUSE 14
(33) FUSE 13
GRAY
(32) FUSE 12
(31) FUSE 11
(30) FUSE 10
(29) FUSE 9 (9)
(28) FUSE 8
(27) FUSE 7
(26) FUSE 6
(25) FUSE 5 (5)
(24) FUSE 4
(23) FUSE 3
(22) FUSE 2
(21) FUSE 1
CIRCUIT BREAKER 2
CIRCUIT BREAKER 1
44
43
42
41

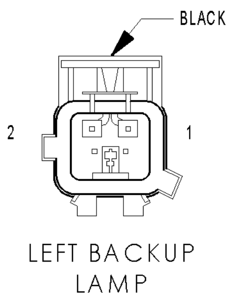
FUSES (FB RHD)

FUSE NO.	AMPS	FUSED CIRCUIT	FUNCTION
1	10A	L6 20RD/WT	FUSED IGNITION SWITCH OUTPUT (RUN-ACC)
1	10A	L6 20RD/WT	FUSED IGNITION SWITCH OUTPUT (RUN-ACC)
2	20A	V6 16DB	FUSED IGNITION SWITCH OUTPUT (RUN-ACC)
2	20A	V6 16DB	FUSED IGNITION SWITCH OUTPUT (RUN-ACC)
3	20A	F10 18YL/RD	FUSED IGNITION SWITCH OUTPUT (RUN-ACC)
3	20A	X12 18RD/WT	FUSED IGNITION SWITCH OUTPUT (RUN-ACC)
4	15A	M1 18PK	FUSED B(+)
5	15A	L3 14RD/OR	DIMMER SWITCH HIGH BEAM OUTPUT
6	10A	F20 20WT	FUSED IGNITION SWITCH OUTPUT (RUN)
7	20A	C1 14DG	FUSED IGNITION SWITCH OUTPUT (RUN)
8	10A	F25 20TN/LG	FUSED IGNITION SWITCH OUTPUT (RUN)
9	10A	A81 20DG/RD (AUTOSTICK)	FUSED B(+)
10	10A	G5 20DB/WT	FUSED IGNITION SWITCH OUTPUT (RUN-START)
11	15A	F12 18DB/PK	FUSED IGNITION SWITCH OUTPUT (RUN-START)
12	10A	F15 20DG/WT	FUSED IGNITION SWITCH OUTPUT (RUN-START)
13	20A	A120 16RD/LG	FUSED B(+)
14	20A	F35 18RD	FUSED B(+)
15	15A	F33 18PK/RD	FUSED B(+)
16	25A	F3 12LB/OR	FUSED B(+)
17	10A	L43 14VT	FUSED LEFT LOW BEAM OUTPUT
18	10A	L44 14VT/RD	FUSED RIGHT LOW BEAM OUTPUT
19	-	-	-
20	10A	C16 20LB/YL	FUSED REAR WINDOW DEFOGGER SWITCH OUTPUT
20	10A	C16 20LB/YL	FUSED REAR WINDOW DEFOGGER SWITCH OUTPUT



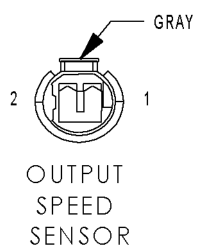
INPUT SPEED SENSOR - GRAY 2 WAY

CAV	CIRCUIT	FUNCTION
1	T13 20DB/BK	SPEED SENSOR GROUND
2	T52 20RD/BK	INPUT SPEED SENSOR SIGNAL



LEFT BACKUP LAMP - BLACK 2 WAY

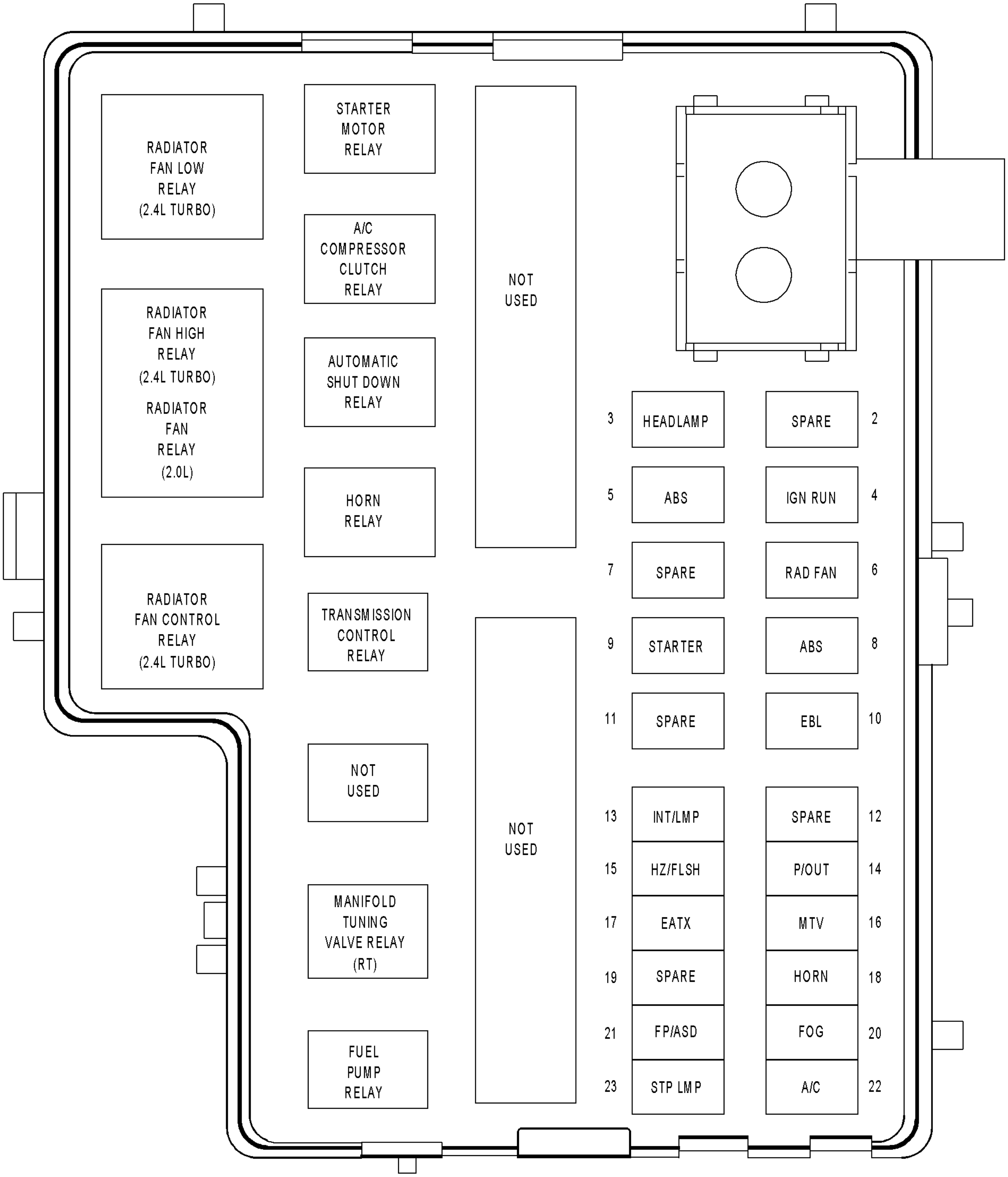
CAV	CIRCUIT	FUNCTION
1	Z1 20BK	GROUND
2	L1 20VT/BK	BACKUP LAMP FEED



OUTPUT SPEED SENSOR - GRAY 2 WAY

CAV	CIRCUIT	FUNCTION
1	T13 20DB/BK	SPEED SENSOR GROUND
2	T14 20LG/WT	OUTPUT SPEED SENSOR SIGNAL

POWER DISTRIBUTION CENTER

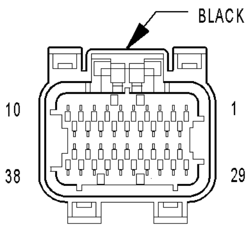


FUSES (PDC)

FUSE NO.	AMPS	FUSED CIRCUIT	FUNCTION
1	-	-	-
2	-	-	-
3	40A	A3 12RD/WT	FUSED B(+)
4	40A	A2 12PK/BK	FUSED B(+)
5	30A	A20 12RD/DB (ABS)	FUSED B(+)
6	30A	A16 14GY (2.0L)	FUSED B(+)
6	30A	A16 12GY (2.4L TURBO)	FUSED B(+)
7	-	-	-
8	40A	A10 12RD/DG (ABS)	FUSED B(+)
9	30A	A1 14RD	FUSED B(+)
10	40A	A4 10BK/RD (2.0L)	FUSED B(+)
10	40A	A4 10BK/PK (2.4L TURBO)	FUSED B(+)
11	-	-	-
12	-	-	-
13	20A	M11 16PK/LB	FUSED B(+)
14	20A	F1 16DB	FUSED B(+)
15	15A	A15 18WT (2.0L)	FUSED B(+)
15	15A	A15 18RD/PK (2.4L TURBO)	FUSED B(+)
16	15A	A200 18RD/BR (2.0L RT)	FUSED B(+)
17	20A	A30 16RD/WT (2.0L EATX)	FUSED B(+)
18	10A	F62 20RD (2.0L)	FUSED B(+)
18	10A	F62 20RD (2.0L)	FUSED B(+)
18	15A	F62 18RD (2.4L TURBO)	FUSED B(+)
18	15A	F62 18RD (2.4L TURBO)	FUSED B(+)
19	-	-	-
20	25A	F61 16WT/OR (EXPORT)	FUSED B(+)
21	20A	A14 16RD/WT	FUSED B(+)
22	10A	A17 20RD/BK	FUSED B(+)
23	15A	F32 18PK/DB	FUSED B(+)

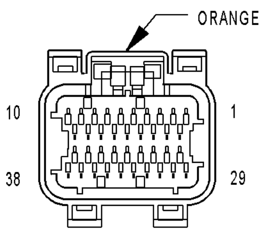
TRANSMISSION CONTROL RELAY

CAV	CIRCUIT	FUNCTION
44	Z1 20BK	GROUND
45	A30 16RD/WT	FUSED B(+)
46	T16 16RD	TRANSMISSION CONTROL RELAY OUTPUT
47	-	-
48	T15 20LG	TRANSMISSION CONTROL RELAY CONTROL



POWERTRAIN CONTROL MODULE C1 - BLACK 38 WAY

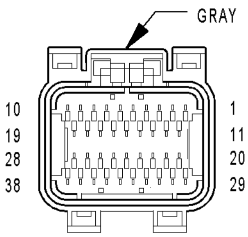
CAV	CIRCUIT	FUNCTION
1	-	-
2	-	-
3	-	-
4	-	-
5	-	-
6	-	-
7	-	-
8	-	-
9	Z11 18BK/WT	GROUND
10	-	-
11	F12 18DB/WT (2.0L)	FUSED IGNITION SWITCH OUTPUT (RUN-START)
11	F12 18DB/RD (2.4L TURBO)	FUSED IGNITION SWITCH OUTPUT (RUN-START)
12	F11 20RD/WT (2.0L AUTO-STICK)	IGNITION SWITCH OUTPUT (OFF-RUN-START)
12	F11 20RD/WT (2.0L EX-CEPT AUTOSTICK)	FUSED IGNITION SWITCH OUTPUT (RUN-START)
13	G7 20WT/OR	VEHICLE SPEED SIGNAL
14	G9 20GY/BK	BRAKE FLUID LEVEL SWITCH SENSE
15	K55 18LB (2.4L TURBO)	TIP SOL CONTROL
16	-	-
17	K150 18DB/YL (2.4L TURBO)	SURGE SOL CONTROL
18	Z12 18BK/TN	GROUND
19	-	-
20	G6 20GY	OIL PRESSURE SIGNAL
21	-	-
22	K145 20BR/OR	AAT SIGNAL
23	K153 18LB (2.4L TURBO)	TIP SIGNAL
24	-	-
25	D20 20LG	SCI RECEIVE (PCM)
26	D6 20PK/LB (2.0L)	SCI RECEIVE (TCM)
27	K6 20VT/WT (2.0L)	5 VOLT SUPPLY
27	K6 18VT/WT (2.4L TURBO)	5 VOLT SUPPLY
28	K137 18DB/GY (2.4L TURBO)	WASTEGATE SOL CONTROL
29	A14 18RD/WT	FUSED B(+)
30	A41 16YL	FUSED IGNITION SWITCH OUTPUT (START)
31	-	-
32	-	-
33	-	-
34	-	-
35	-	-
36	D21 20PK	SCI TRANSMIT (PCM)
37	D15 20WT/DG (2.0L)	SCI TRANSMIT (TCM)
38	D25 20VT/YL	PCI BUS (PCM)



POWERTRAIN CONTROL MODULE C2 (2.0L)

POWERTRAIN CONTROL MODULE C2 (2.0L) - ORANGE 38 WAY

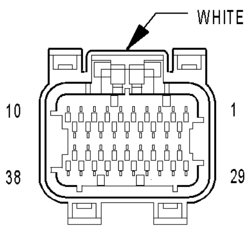
CAV	CIRCUIT	FUNCTION
1	-	-
2	-	-
3	-	-
4	-	-
5	-	-
6	-	-
7	-	-
8	-	-
9	K17 18DB/TN	COIL CONTROL NO. 2
10	K19 18BK/GY	COIL CONTROL NO. 1
11	K14 18LB/BR	INJECTOR CONTROL NO. 4
12	K13 18YL/WT	INJECTOR CONTROL NO. 3
13	K12 18TN	INJECTOR CONTROL NO. 2
14	K11 18WT/DB	INJECTOR CONTROL NO. 1
15	-	-
16	K200 20VT/OR (RT)	MTV CONTROL
17	K199 18BR/VT	O2 1/2 HEATER CONTROL
18	K99 18BR/OR	O2 1/1 HEATER CONTROL
19	K20 20DG	GEN FIELD CONTROL
20	K2 20VT/LG	ECT SIGNAL
21	K22 20OR/DB	TP SIGNAL
22	-	-
23	K1 20DG/RD	MAP SIGNAL
24	K45 20BK/VT	KS RETURN
25	K42 20DB/LG	KS SIGNAL
26	-	-
27	K4 20BK/LB	SENSOR GROUND
28	K961 20BR/WT	IAC RETURN
29	K7 20OR	5 VOLT SUPPLY
30	K21 20BK/RD	IAT SIGNAL
31	K41 20BK/DG	O2 1/1 SIGNAL
32	K904 20DB/DG	O2 RETURN
33	K141 20TN/WT	O2 1/2 SIGNAL
34	K44 20TN/YL	CMP SIGNAL
35	K24 20GY/BK	CKP SIGNAL
36	-	-
37	-	-
38	K610 20VT/GY	IAC MOTOR CONTROL



POWERTRAIN CONTROL MODULE C2 (2.4L TURBO)

POWERTRAIN CONTROL MODULE C2 (2.4L TURBO) - GRAY 38 WAY

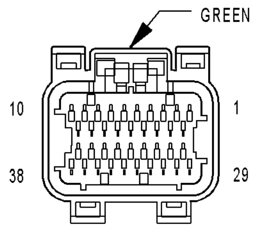
CAV	CIRCUIT	FUNCTION
1	-	-
2	-	-
3	-	-
4	-	-
5	-	-
6	-	-
7	-	-
8	-	-
9	K17 16DB/TN	COIL CONTROL NO. 2
10	K19 16BK/GY	COIL CONTROL NO. 1
11	K14 18LB/BR	INJECTOR CONTROL NO. 4
12	K13 18YL/WT	INJECTOR CONTROL NO. 3
13	K12 18TN	INJECTOR CONTROL NO. 2
14	K11 18WT/DB	INJECTOR CONTROL NO. 1
15	-	-
16	-	-
17	K199 18BR/VT	O2 1/2 HEATER CONTROL
18	K99 18BR/OR	O2 1/1 HEATER CONTROL
19	K20 18DG	GEN FIELD CONTROL
20	K2 20TN/BK	ECT SIGNAL
21	K22 20OR/DB	TP SIGNAL
22	-	-
23	K1 20DG/RD	MAP SIGNAL
24	K45 20BK/VT	KS RETURN
25	K42 20DB/LG	KS SIGNAL
26	-	-
27	K4 18BK/LB	SENSOR GROUND
28	K961 18BR/VT	IAC RETURN
29	K7 18OR	5 VOLT SUPPLY
30	K21 20BK/RD	IAT SIGNAL
31	K41 20BK/DG	O2 1/1 SIGNAL
32	K904 18DB/DG	O2 RETURN
33	K141 20TN/WT	O2 1/2 SIGNAL
34	K44 20TN/YL	CMP SIGNAL
35	K24 20GY/BK	CKP SIGNAL
36	-	-
37	-	-
38	K610 18VT/GY	IAC MOTOR CONTROL



POWERTRAIN CONTROL MODULE C3

POWERTRAIN CONTROL MODULE C3 - WHITE 38 WAY

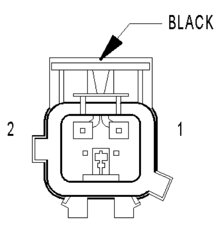
CAV	CIRCUIT	FUNCTION
1	-	-
2	-	-
3	K51 20DB/YL (2.0L)	AUTOMATIC SHUT DOWN RELAY CONTROL
3	K51 18DB/YL (2.4L TURBO)	AUTOMATIC SHUT DOWN RELAY CONTROL
4	C27 18DB/PK (2.4L TURBO)	HIGH SPEED RAD FAN RELAY CONTROL
5	V35 20LG/RD (2.0L)	S/C VENT CONTROL
6	C27 20DB/PK (2.0L)	RAD FAN RELAY CONTROL
6	C24 18DB/RD (2.4L TURBO)	RAD FAN LOW RELAY CONTROL
7	V32 20YL/RD (2.0L)	S/C SUPPLY
8	K106 20WT/DG (2.0L)	NVLD SOLENOID CONTROL
8	K106 18WT/DG (2.4L TURBO)	NVLD SOLENOID CONTROL
9	-	-
10	-	-
11	C28 20DB/OR (2.0L)	A/C CLUTCH RELAY CONTROL
11	C28 18DB/OR (2.4L TURBO)	A/C CLUTCH RELAY CONTROL
12	V36 20TN/RD (2.0L)	S/C VACUUM CONTROL
13	-	-
14	-	-
15	-	-
16	-	-
17	K167 20BR/YL (2.0L)	SENSOR GROUND 2
17	K167 18BR/YL (2.4L TURBO)	SENSOR GROUND 2
18	-	-
19	A142 18DG/OR	AUTOMATIC SHUT DOWN RELAY OUTPUT
20	K52 20PK/BK	EVAP/PURGE CONTROL
21	T141 20YL/RD	CLUTCH INTERLOCK SWITCH SIGNAL
22	-	-
23	K29 20WT/PK	BRAKE SWITCH SIGNAL
24	C20 20BR/OR (2.0L)	A/C SWITCH SENSE
24	C20 20BR (2.4L TURBO)	A/C SWITCH SENSE
25	-	-
26	T44 20YL/LB (2.0L EATX)	AUTOSTICK DOWNSHIFT SWITCH SIGNAL
26	K119 20LG/BK (2.0L MTX/ 2.4L TURBO)	CLUTCH UP SWITCH SIGNAL
27	T5 20LG/LB (2.0L)	AUTOSTICK UPSHIFT SWITCH SIGNAL
28	A142 18DG/OR	AUTOMATIC SHUT DOWN RELAY OUTPUT
29	K108 20WT/TN	EVAP/PURGE RETURN
30	K10 20DB/OR	PSP SWITCH SIGNAL
31	-	-
32	K118 20PK/YL	BATTERY TEMP SIGNAL
33	-	-
34	V37 20RD/LG (2.0L)	S/C SWITCH SIGNAL
35	K107 20OR (2.0L)	NVLD SWITCH SIGNAL
35	K107 18OR (2.4L TURBO)	NVLD SWITCH SIGNAL
36	-	-
37	K31 20BR (2.0L)	FUEL PUMP RELAY CONTROL
37	K31 18BR (2.4L TURBO)	FUEL PUMP RELAY CONTROL
38	K90 20TN	STARTER RELAY CONTROL



POWERTRAIN CONTROL MODULE C4

POWERTRAIN CONTROL MODULE C4 - GREEN 38 WAY

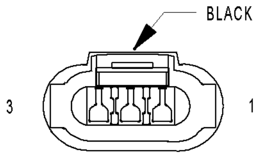
CAV	CIRCUIT	FUNCTION
1	T60 18BR	OVERDRIVE SOLENOID CONTROL
2	T59 18PK/BK	UNDERDRIVE SOLENOID CONTROL
3	-	-
4	-	-
5	-	-
6	T19 18WT	2-4 SOLENOID CONTROL
7	-	-
8	-	-
9	-	-
10	T20 18LB	LOW/REVERSE SOLENOID CONTROL
11	-	-
12	Z13 16BK/RD	GROUND
13	-	-
14	Z13 16BK/RD	GROUND
15	T1 20LG/BK	TRS T1 SENSE
16	T3 20VT	TRS T3 SENSE
17	-	-
18	T15 20LG	TRANSMISSION CONTROL RELAY CONTROL
19	T16 16RD	TRANSMISSION CONTROL RELAY OUTPUT
20	-	-
21	-	-
22	T9 18OR/BK	OVERDRIVE PRESSURE SWITCH SENSE
23	-	-
24	-	-
25	-	-
26	-	-
27	T41 20BK/WT	TRS T41 SENSE
28	T16 16RD	TRANSMISSION CONTROL RELAY OUTPUT
29	T50 18DG	LOW/REVERSE PRESSURE SWITCH SENSE
30	T47 18YL/BK	2-4 PRESSURE SWITCH SENSE
31	-	-
32	T14 20LG/WT	OUTPUT SPEED SENSOR SIGNAL
33	T52 20RD/BK	INPUT SPEED SENSOR SIGNAL
34	T13 20DB/BK	SPEED SENSOR GROUND
35	T54 20VT/PK	TRANSMISSION TEMPERATURE SENSOR SIGNAL
36	-	-
37	T42 20VT/WT	TRS T42 SENSE
38	-	-



RIGHT BACKUP LAMP

RIGHT BACKUP LAMP - BLACK 2 WAY

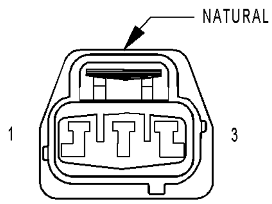
CAV	CIRCUIT	FUNCTION
1	Z1 20BK	GROUND
2	L1 20VT/BK	BACKUP LAMP FEED



THROTTLE POSITION SENSOR (2.0L)

THROTTLE POSITION SENSOR (2.0L) - BLACK 3 WAY

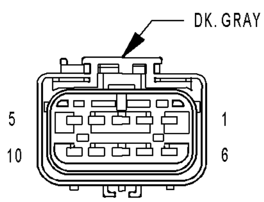
CAV	CIRCUIT	FUNCTION
1	K167 20BR/YL	SENSOR GROUND 2
2	K22 20OR/DB	TP SIGNAL
3	K6 20VT/WT	5 VOLT SUPPLY



THROTTLE POSITION SENSOR (2.4L TURBO)

THROTTLE POSITION SENSOR (2.4L TURBO) - NATURAL 3 WAY

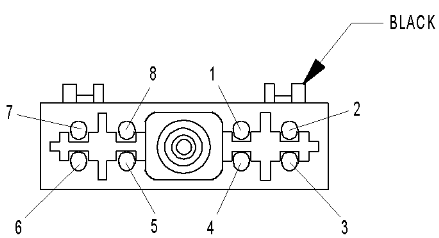
CAV	CIRCUIT	FUNCTION
1	K4 20BK/LB	SENSOR GROUND
2	K22 20OR/DB	TP SIGNAL
3	K7 20OR	5 VOLT SUPPLY



TRANSMISSION RANGE SENSOR

TRANSMISSION RANGE SENSOR - DK. GRAY 10 WAY

CAV	CIRCUIT	FUNCTION
1	F20 20WT	FUSED IGNITION SWITCH OUTPUT (RUN)
2	-	-
3	T13 20DB/BK	SPEED SENSOR GROUND
4	T54 20VT/PK	TRANSMISSION TEMPERATURE SENSOR SIGNAL
5	-	-
6	L1 20VT/BK	BACKUP LAMP FEED
7	T1 20LG/BK	TRS T1 SENSE
8	T3 20VT	TRS T3 SENSE
9	T42 20VT/WT	TRS T42 SENSE
10	T41 20BK/WT	TRS T41 SENSE



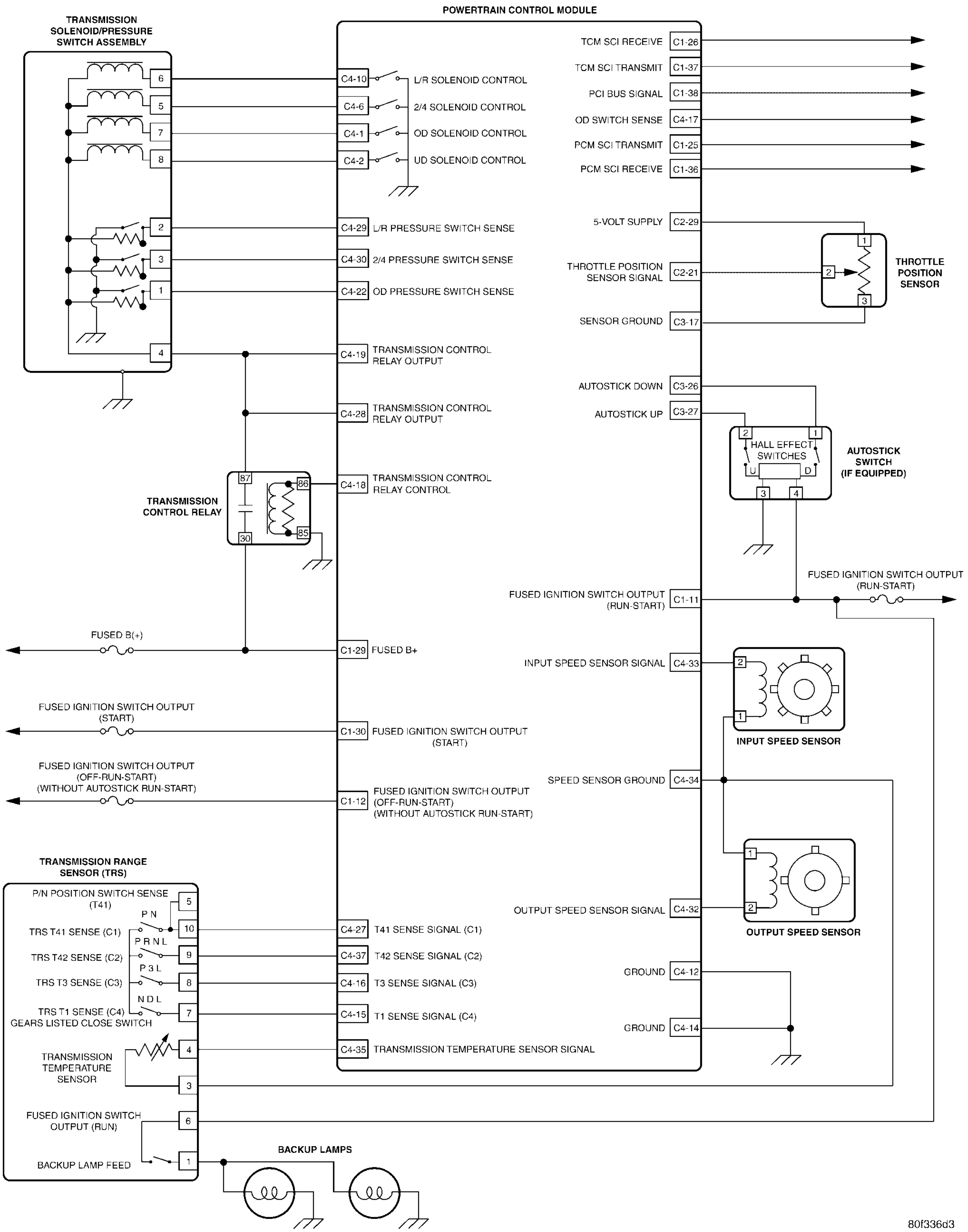
TRANSMISSION SOLENOID/PRESSURE SWITCH ASSEMBLY

TRANSMISSION SOLENOID/PRESSURE SWITCH ASSEMBLY - BLACK 8 WAY

CAV	CIRCUIT	FUNCTION
1	T47 18YL/BK	2-4 PRESSURE SWITCH SENSE
2	T50 18DG	LOW/REVERSE PRESSURE SWITCH SENSE
3	T9 18OR/BK	OVERDRIVE PRESSURE SWITCH SENSE
4	T16 16RD	TRANSMISSION CONTROL RELAY OUTPUT
5	T59 18PK/BK	UNDERDRIVE SOLENOID CONTROL
6	T60 18BR	OVERDRIVE SOLENOID CONTROL
7	T20 18LB	LOW/REVERSE SOLENOID CONTROL
8	T19 18WT	2-4 SOLENOID CONTROL

10.0 SCHEMATIC DIAGRAMS

FWD TRANSMISSION (NGC)



SCHEMATIC DIAGRAMS

11.0 CHARTS AND GRAPHS

11.1 TRANSMISSION RANGE SENSOR STATES

41TE TRANSMISSION RANGE SENSOR STATES

TRS	PARK	T1	REVERSE	T2	NEUTRAL	T2	OD	T3	D3/AS	T3	L
T1 (C4)	OPEN	OPEN	OPEN	CLOSED	CLOSED	CLOSED	CLOSED	CLOSED	OPEN	CLOSED	CLOSED
T3 (C3)	CLOSED	CLOSED	OPEN	OPEN	OPEN	OPEN	OPEN	CLOSED	CLOSED	CLOSED	CLOSED
T41 (C1)	CLOSED	OPEN	OPEN	OPEN	CLOSED	OPEN	OPEN	OPEN	OPEN	OPEN	OPEN
T42 (C2)	CLOSED	CLOSED	CLOSED	CLOSED	CLOSED	CLOSED	OPEN	OPEN	OPEN	OPEN	CLOSED

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11.2 PRESSURE SWITCH STATES

PRESSURE SWITCH STATES

SWITCHES	R	N	1ST	2ND	3RD	4TH
L/R	OPEN	CLOSED	CLOSED	OPEN	OPEN	OPEN
2/4	OPEN	OPEN	OPEN	CLOSED	OPEN	CLOSED
O/D	OPEN	OPEN	OPEN	OPEN	CLOSED	CLOSED

80d9d3b5

11.3 SOLENOID APPLICATION CHART

SOLENOID APPLICATION CHART

GEAR	UD	OD	REV	2/4	LR
PARK					X
REVERSE			X		X
NEUTRAL					X
1ST	X				X
2ND	X			X	
3RD	X	X			
4TH		X		X	

80ccf4c0

11.4 SHIFT LEVER ERROR CODES

SHIFT LEVER ERROR CODES
REPORTED BY THE DRBIII®

ERROR CODE	SWITCH STUCK	POSITION
1	T1/C4 STUCK	OPEN
2	T1/C4 STUCK	CLOSED
3	T3/C3 STUCK	OPEN
4	T3/C3 STUCK	CLOSED
5	T42/C2 STUCK	OPEN
6	T24/C2 STUCK	CLOSED
7	T41/C1 STUCK	OPEN
8	T41/C1 STUCK	CLOSED

80ccf2de

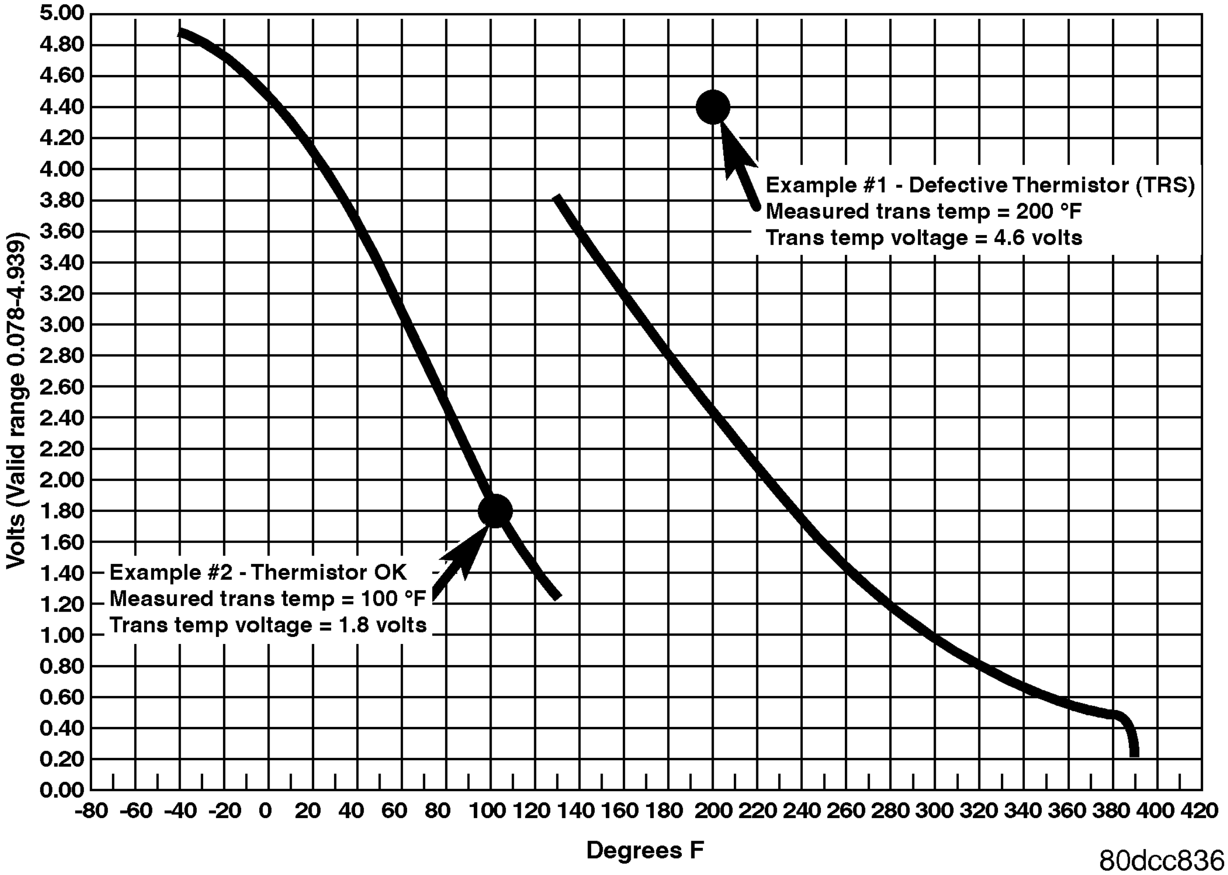
11.5 TRANSMISSION TEMPERATURE SENSOR

TRANSMISSION TEMPERATURE SENSOR (DUAL RANGE)

START ENGINE. WITH DRB, MONITOR AND RECORD TRANSMISSION TEMPERATURE VOLTAGE.

COMPARE THE MEASURED TEMPERATURE AND VOLTAGE WITH THE GRAPH SHOWN BELOW.

THE MEASURED VALUE SHOULD FALL ON ONE OF THE LINES ON THE GRAPH.



DIAGNOSTIC TEST PROCEDURES — TELL US!

DaimlerChrysler Corporation is constantly working to provide the technician the best diagnostic manuals possible. Your comments and recommendations regarding the diagnostic manuals and procedures are appreciated.

To best understand your suggestion, please complete the form giving us as much detail as possible.

Model ______________ **Year** ________ **Body Type** ____________ **Engine** ________

Transmission __________________ **Vehicle Mileage** ____________ **MDH** __________

Diagnostic Procedure ___________________ **Book No.** _______________ **Page** _____

Comments/recommendations (if necessary, draw sketch)

Name ____

____

Submitted by: ____

Address ____

City/State/Zip ____

Business Phone # ____

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