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SOLENOID VALVE CONTROLLER SHORT CIRCUIT
 TEMPERATURE OF ENGINE COOLANT SRC HIGH EXCEEDED
 TEMPERATURE OF ENGINE COOLANT SRC LOW EXCEEDED
 TERMINAL 15 PLAUSIBILITY AFTER START-UP
 TIMING GOVERNING NEGATIVE GOVERNOR DEVIATION
 TIMING GOVERNING POSITIVE GOVERNOR DEVIATION
 TURBOCHARGER BOOST SENSOR PLAUSIBILITY
 TURBOCHARGER BOOST SENSOR SIGNAL HIGH EXCEEDED
 TURBOCHARGER BOOST SENSOR SIGNAL LOW EXCEEDED
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 TURBOCHARGER BOOST SENSOR SUPPLY LOW EXCEEDED
 U_REF (2.5V)
 VEHICLE SPEED GOV ANALOG CTRL CONTROL CONTACT ALONE
 VEHICLE SPEED SENSOR PEC FREQUENCY TOO HIGH
 VEHICLE SPEED SENSOR SRC HIGH EXCEEDED
 VEHICLE SPEED SENSOR PLAUSIBILITY
 VEHICLE THEFT ALARM IMMOBILIZER SIGNAL LOST
 VEHICLE THEFT ALARM INVALID SKIM MESSAGE

3.3.5 HANDLING NO TROUBLE CODE PROBLEMS

After reading Section 3.0 (System Description and Functional Operation), you should have a better understanding of the theory and operation of the on-board diagnostics, and how this relates to the diagnosis of a vehicle that may have a driveability-related symptom or complaint.

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.

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

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.
    
```

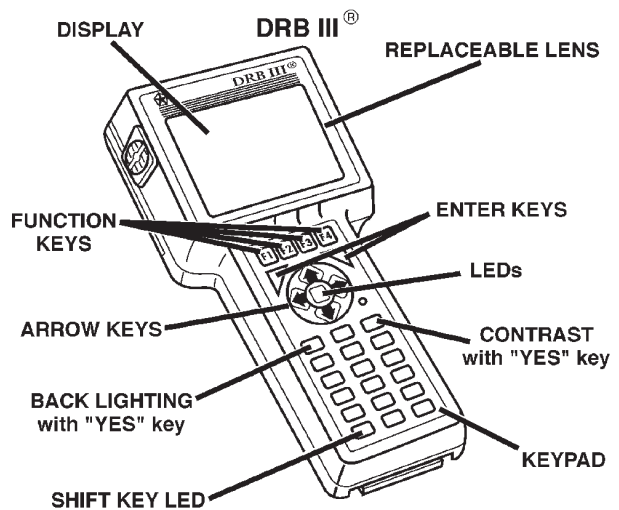
3.5.1 DRBIII® DOES NOT POWER UP

If the LEDs 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 at DLC cavity 16 is required to adequately power the DRBIII. Check for proper ground connection at DLC cavities 4 and 5.

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 a faulty cable or vehicle wiring. For a blank screen, refer to the appropriate body diagnostics 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.



80b57566

Symptom:

P1493-AMBIENT/BATT TEMP SEN VOLTS TOO LOW - DIESEL

When Monitored and Set Condition:

P1493-AMBIENT/BATT TEMP SEN VOLTS TOO LOW - DIESEL

When Monitored: With the ignition on.

Set Condition: The PCM detects voltage on the ambient/battery temperature sensor signal circuit below 0.08 volt for more than 3 seconds.

POSSIBLE CAUSES

INTERMITTENT CONDITION
 AMBIENT/BATTERY TEMPERATURE SENSOR
 AMBIENT/BATTERY TEMPERATURE SENSOR SIGNAL CIRCUIT SHORTED TO GROUND
 AMB/BATT TEMP SENSOR SIGNAL AND SENSOR GROUND CIRCUITS SHORTED TOGETHER
 POWERTRAIN CONTROL MODULE (SHORT TO GROUND INTERNALLY)

TEST	ACTION	APPLICABILITY
1	Turn the ignition on. With the DRB, read the voltage of the Ambient/Battery Temperature Sensor. Is the voltage below 0.4 volt? Yes → Go To 2 No → Go To 6	All
2	Turn the ignition off. Disconnect the Ambient/Battery Temperature Sensor harness connector. Turn the ignition on. With the DRB, read the voltage of the Ambient/Battery Temperature Sensor. Is the voltage above 4.0 volts? Yes → Replace the Ambient/Battery Temperature Sensor. Perform CHARGING VERIFICATION - VER-3. No → Go To 3	All
3	Turn the ignition off. Disconnect the Ambient/Battery Temperature Sensor harness connector. Disconnect the PCM harness connectors. Measure the resistance between ground and the Amb/Batt Temp Sensor Signal circuit. Is the resistance above 100 kohms? Yes → Go To 4 No → Repair the Ambient/Battery Temperature Sensor Signal circuit for a short to ground. Perform CHARGING VERIFICATION - VER-3.	All

Symptom:

P-1685 INVALID SKIM KEY

When Monitored and Set Condition:

P-1685 INVALID SKIM KEY

When Monitored: With the ignition on.

Set Condition: The PCM does not receive a valid key message from the SKIM.

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	With the DRB III, read the PCM DTCs. Look for P1685. Turn the ignition on. Is the Starts Since Set counter for DTC P1685 displayed and equal to 0? Yes → Go To 2 No → Go To 7	All
2	Turn the ignition on. With the DRB III, attempt to communicate with the SKIM. Can you communicate with the SKIM? Yes → Go To 3 No → Refer to symptom BUS +/- SIGNAL OPEN FROM SKIM in the COMMUNICATION category. Perform ROAD TEST VERIFICATION - VER-2.	All
3	Turn the ignition on. With the DRB III, check for SKIM DTC's. Are there any trouble codes set in the SKIM? Yes → Repair all SKIM DTC's. Perform ROAD TEST VERIFICATION - VER-2. No → Go To 4	All

Symptom:

***NO RESPONSE FROM POWERTRAIN CONTROL MODULE (DIESEL ONLY)**

POSSIBLE CAUSES
ATTEMPT TO COMMUNICATE WITH THE ECM CHECK PCM POWERS AND GROUNDS SCI RECEIVE CIRCUIT SHORTED TO GROUND SCI RECEIVE CIRCUIT OPEN SCI TRANSMIT CIRCUIT OPEN POWERTRAIN CONTROL MODULE

TEST	ACTION	APPLICABILITY
1	Turn the ignition on. With the DRB attempt to communicate with the ECM. Was the DRB able to communicate with the ECM? Yes → Go To 2 No → Refer to symptom list for problems related to No Response From ECM and PCM. Perform POWERTRAIN VERIFICATION TEST VER - 1.	All
2	Perform the symptom Checking ECM and PCM Power and Ground Circuits in the Driveability category. Did the vehicle pass this test? Yes → Go To 3 No → Repair as necessary. Perform POWERTRAIN VERIFICATION TEST VER - 1.	All
3	Turn the ignition off. Disconnect the PCM C3 harness connector. Disconnect the DRB from the DLC. Measure the resistance between ground and the SCI Receive circuit. Is the resistance below 5.0 ohms? Yes → Repair the SCI Receive circuit for a short to ground. Perform POWERTRAIN VERIFICATION TEST VER - 1. No → Go To 4	All
4	Turn the ignition off. Disconnect the PCM C3 harness connector. Measure the resistance of the SCI Receive circuit between the PCM C3 connector and the DLC. Is the resistance below 5.0 ohms? Yes → Go To 5 No → Repair the SCI Receive circuit for an open. Perform POWERTRAIN VERIFICATION TEST VER - 1.	All

Symptom:

P0180-FUEL TEMPERATURE SENSOR SRC HIGH EXCEEDED

When Monitored and Set Condition:

P0180-FUEL TEMPERATURE SENSOR SRC HIGH EXCEEDED

When Monitored: With the ignition on.

Set Condition: The fuel temperature sensor signal voltage is above 4.7 volts.

POSSIBLE CAUSES

INTERMITTENT CONDITION
 FUEL TEMPERATURE SENSOR (FUEL INJECTION PUMP) OPEN INTERNALLY
 FUEL TEMPERATURE SENSOR GROUND CIRCUIT OPEN
 FUEL TEMPERATURE SENSOR SIGNAL CIRCUIT OPEN
 INTERNAL FUEL INJECTION PUMP TEST
 FUEL TEMPERATURE SENSOR SIGNAL CIRCUIT SHORTED TO VOLTAGE
 ENGINE CONTROL MODULE

TEST	ACTION	APPLICABILITY
1	Turn the ignition on. With the DRB, erase ECM DTCs. Turn the ignition off, wait 10 seconds, then turn the ignition on. With the DRB, read ECM DTCs. Did this DTC reset? Yes → Go To 2 No → Go To 7	All
2	Turn the ignition off. Disconnect the Fuel Injection Pump harness connector. Connect a jumper wire between the Fuel Temperature Sensor Signal circuit and the Sensor Ground circuit in the Fuel Injection Pump harness connector (vehicle side). Turn the ignition on. With the DRB, erase ECM DTCs and then read ECM DTCs. Did DTC P0180-FUEL TEMPERATURE SENSOR SRC LOW EXCEEDED set? Yes → Replace the Fuel Injection Pump in accordance with the Service Information. Perform ROAD TEST VERIFICATION - VER-2. No → Go To 3	All

P0235-TURBOCHARGER BOOST SENSOR SIGNAL HIGH EXCEEDED — Continued

TEST	ACTION	APPLICABILITY
7	Turn the ignition off. NOTE: Ensure all harness connectors are connected. Turn the ignition on. Measure the voltage of the Boost Pressure Sensor Signal circuit by backprobing ECM harness connector C1, cavity 40. Is the voltage above 4.5 volts? Yes → Replace the Turbocharger Boost Pressure/Intake Air Temperature Sensor. Perform ROAD TEST VERIFICATION - VER-2. No → Go To 8	All
8	Turn the ignition on. With the DRB, read ECM DTCs. Did this DTC reset? Yes → Replace and program the Engine Control Module in accordance with the Service Information. Perform ROAD TEST VERIFICATION - VER-2. No → Ensure good terminal contact between the Turbocharger Boost Pressure/IAT Sensor harness connector and the sensor. The repair is complete. Perform ROAD TEST VERIFICATION - VER-2.	All
9	WARNING: KEEP CLEAR OF THE ENGINE'S MOVING PARTS. 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 at normal operating temperature, monitor the DRB parameters related to the DTC while wiggling the wiring 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 wiring harness. Look for any chafed, pierced, pinched, or partially broken wires. Visually inspect the related wiring harness connectors. Look for broken, bent, pushed out, or corroded terminals. Were any of the above conditions present? Yes → Repair as necessary Perform ROAD TEST VERIFICATION - VER-2. No → Test Complete.	All

Symptom:
P0400-EGR SHORT CIRCUIT

When Monitored and Set Condition:

P0400-EGR SHORT CIRCUIT

When Monitored: With the ignition on.

Set Condition: The ECM detects excessive current draw on the electric vacuum modulator control circuit.

POSSIBLE CAUSES
INTERMITTENT CONDITION EGR SOLENOID EGR SOLENOID CONTROL SHORTED TO VOLTAGE ENGINE CONTROL MODULE (INTERNAL) ENGINE CONTROL MODULE (INTERNAL SHORT TO VOLTAGE)

TEST	ACTION	APPLICABILITY
1	Turn the ignition on. With the DRB, erase ECM DTCs. Test drive the vehicle and monitor the DRB for ECM DTCs. Did this DTC reset? Yes → Go To 2 No → Go To 5	All
2	Turn the ignition off. Disconnect the EGR Solenoid harness connector. Turn the ignition on. With the DRB, erase ECM DTCs. Monitor the DRB for ECM DTCs. Does the DRB display P0400 EGR OPEN CIRCUIT? Yes → Replace the EGR Solenoid. Perform ROAD TEST VERIFICATION - VER-2. No → Go To 3	All
3	Turn the ignition off. Disconnect the EGR Solenoid harness connector. Turn the ignition on. Measure the voltage of the EGR Solenoid Control circuit. Is the voltage below 0.5 volt? Yes → Replace and program the Engine Control Module in accordance with the Service Information. Perform ROAD TEST VERIFICATION - VER-2. No → Go To 4	All

P0500-VEH. SPEED SENSOR PEC FREQUENCY TOO HIGH — Continued

TEST	ACTION	APPLICABILITY
5	Turn the ignition off. Disconnect the PCM harness connectors. Disconnect the Vehicle Speed Sensor harness connector. Note: Check connectors - Clean/repair as necessary. Turn the ignition on. Measure the voltage of the Vehicle Speed Sensor Signal circuit. Is the voltage above 5.5 volts? Yes → Go To 6 No → Replace and program the Powertrain Control Module in accordance with the Service Information. Perform ROAD TEST VERIFICATION - VER-2.	All
6	Turn the ignition off. Disconnect the ECM harness connectors. Disconnect the Vehicle Speed Sensor harness connector. Note: Check connectors - Clean/repair as necessary. Remove the ASD/Diesel Power Relay from the PDC. Connect a jumper wire between ASD/Diesel Power Relay cavities 30 and 87 (in PDC). Turn the ignition on. Measure the voltage of the Vehicle Speed Sensor Signal circuit. Is the voltage above 5.5 volts? Yes → Go To 7 No → Replace and program the Engine Control Module in accordance with the Service Information. Perform ROAD TEST VERIFICATION - VER-2.	All
7	If there are no possible causes remaining, view repair. Repair Repair the Vehicle Speed Sensor Signal circuit for a short to voltage. Perform ROAD TEST VERIFICATION - VER-2.	All
8	Turn the ignition off. Disconnect the Vehicle Speed Sensor harness connector. Disconnect the PCM C1 and C2 harness connectors. Check connectors - Clean/repair as necessary Measure the resistance between the Vehicle Speed Sensor Signal circuit and the 5-volt Supply circuit. Is the resistance above 100 kohms? Yes → Go To 9 No → Repair the Vehicle Speed Sensor Signal circuit for a short to the 5-volt Supply circuit. Perform ROAD TEST VERIFICATION - VER-2.	All
9	Turn the ignition off. Disconnect the ECM harness connectors. Disconnect the Vehicle Speed Sensor harness connector. Note: Check connectors - Clean/repair as necessary. Measure the resistance of the Vehicle Speed Sensor Signal circuit. Is the resistance below 5.0 ohms? Yes → Go To 10 No → Repair the Vehicle Speed Sensor Signal circuit for an open. Perform ROAD TEST VERIFICATION - VER-2.	All

P0725-ENGINE SPEED SENSOR DYN. PLAUSIBILITY — Continued

TEST	ACTION	APPLICABILITY
2	<p>WARNING: KEEP CLEAR OF THE ENGINE'S MOVING PARTS.</p> <p>NOTE: The conditions that set the DTC are not present at this time. The following list may help in identifying the intermittent condition.</p> <p>With the engine running at normal operating temperature, monitor the DRB parameters related to the DTC while wiggling the wiring harness. Look for parameter values to change and/or a DTC to set.</p> <p>Review the DTC When Monitored and Set Conditions. If possible, try to duplicate the conditions under which the DTC was set.</p> <p>Refer to any Technical Service Bulletins (TSB) that may apply.</p> <p>Visually inspect the related wiring harness. Look for any chafed, pierced, pinched, or partially broken wires.</p> <p>Visually inspect the related wiring harness connectors. Look for broken, bent, pushed out, or corroded terminals.</p> <p>Were any of the above conditions present?</p> <p style="padding-left: 40px;">Yes → Repair as necessary Perform ROAD TEST VERIFICATION - VER-2.</p> <p style="padding-left: 40px;">No → Test Complete.</p>	All
3	<p>Turn the ignition off.</p> <p>Disconnect the Engine Speed Sensor harness connector.</p> <p>Disconnect the ECM harness connectors.</p> <p>Measure the resistance between ground and the Engine Speed Sensor Signal circuit.</p> <p>Is the resistance above 100 kohms?</p> <p style="padding-left: 40px;">Yes → Go To 4</p> <p style="padding-left: 40px;">No → Repair the Engine Speed Sensor Signal circuit for a short to ground. Perform ROAD TEST VERIFICATION - VER-2.</p>	All
4	<p>Turn the ignition off.</p> <p>Disconnect the Engine Speed Sensor harness connector.</p> <p>Disconnect the ECM harness connectors.</p> <p>Measure the resistance between the Engine Speed Sensor Signal and Sensor Ground circuits.</p> <p>Is the resistance above 100 kohms?</p> <p style="padding-left: 40px;">Yes → Go To 5</p> <p style="padding-left: 40px;">No → Repair the Engine Speed Sensor Signal and Sensor Ground circuits for a short together. Perform ROAD TEST VERIFICATION - VER-2.</p>	All
5	<p>Turn the ignition off.</p> <p>Disconnect the Engine Speed Sensor harness connector.</p> <p>Disconnect the ECM harness connectors.</p> <p>Measure the resistance of the Engine Speed Sensor Signal circuit.</p> <p>Is the resistance below 5.0 ohms?</p> <p style="padding-left: 40px;">Yes → Go To 6</p> <p style="padding-left: 40px;">No → Repair the Engine Speed Sensor Signal circuit for an open. Perform ROAD TEST VERIFICATION - VER-2.</p>	All

Symptom:

P1201-NEEDLE MOVEMENT SENSOR SRC HIGH EXCEEDED

When Monitored and Set Condition:

P1201-NEEDLE MOVEMENT SENSOR SRC HIGH EXCEEDED

When Monitored: With the ignition on.

Set Condition: The ECM detects high voltage on the needle movement sensor signal circuit.

POSSIBLE CAUSES

INTERMITTENT CONDITION
 NEEDLE MOVEMENT SENSOR GROUND CIRCUIT OPEN
 NEEDLE MOVEMENT SENSOR SIGNAL CIRCUIT SHORTED TO VOLTAGE
 NEEDLE MOVEMENT SENSOR
 NEEDLE MOVEMENT SENSOR SIGNAL CIRCUIT OPEN
 ENGINE CONTROL MODULE

TEST	ACTION	APPLICABILITY
1	Turn the ignition on. With the DRB, erase ECM DTCs. Turn the ignition off, wait 30 seconds, then turn the ignition on. With the DRB, read ECM DTCs. Did this DTC reset? Yes → Go To 2 No → Go To 7	All
2	Turn the ignition off. Disconnect the ECM harness connectors. Disconnect the Needle Movement Sensor harness connector. Remove the ASD/Diesel Power Relay from the PDC. Connect a jumper wire between cavity 30 and cavity 87 of the ASD/Diesel Power Relay connector. Turn the ignition on. Measure the voltage on the Needle Movement Sensor Signal circuit. Is the voltage below 0.5 volt? Yes → Go To 3 No → Repair the Needle Movement Sensor Signal circuit for a short to voltage. Perform ROAD TEST VERIFICATION - VER-2. NOTE: Remove the jumper wire.	All

P1220-FUEL QUANTITY ACTUATOR POS GOV DEVIATION COLD — Continued

TEST	ACTION	APPLICABILITY
3	Turn the ignition off. Inspect the fuel system for restrictions in the delivery lines, filter and/or at the fuel level sensor module. Was a restriction found? Yes → Repair as necessary. Perform ROAD TEST VERIFICATION - VER-2. No → Go To 4	All
4	Turn the ignition off. Replace the Fuel Injection Pump in accordance with the Service Information. Turn the ignition on. With the DRB, erase ECM DTCs. Start the engine and vary the engine speed from idle to 3500 RPM several times. With the DRB, read ECM DTCs. Did this DTC reset? Yes → Replace and program the Engine Control Module in accordance with the Service Information. Perform ROAD TEST VERIFICATION - VER-2. No → The repair is complete. Perform ROAD TEST VERIFICATION - VER-2.	All
5	WARNING: KEEP CLEAR OF THE ENGINE'S MOVING PARTS. 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 at normal operating temperature, monitor the DRB parameters related to the DTC while wiggling the wiring 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 wiring harness. Look for any chafed, pierced, pinched, or partially broken wires. Visually inspect the related wiring harness connectors. Look for broken, bent, pushed out, or corroded terminals. Were any of the above conditions present? Yes → Repair as necessary Perform ROAD TEST VERIFICATION - VER-2. No → Test Complete.	All

Symptom List:**P1515-ACCEL. PEDAL SENSOR PLAUSIBILITY****P1515-ACCEL. PEDAL SENSOR PWG PLAUS WITH POTENTIOMETER****P1515-ACCEL. PEDAL SENSOR SIGNAL HIGH EXCEEDED****P1515-ACCEL. PEDAL SENSOR SUPPLY HIGH EXCEEDED****P1515-ACCEL. PEDAL SENSOR SUPPLY LOW EXCEEDED**

Test Note: All symptoms listed above are diagnosed using the same tests. The title for the tests will be P1515-ACCEL. PEDAL SENSOR PLAUSIBILITY.

When Monitored and Set Condition:**P1515-ACCEL. PEDAL SENSOR PLAUSIBILITY**

When Monitored: With the ignition on.

Set Condition: The accelerator pedal position sensor signal is below 0.2 volt (4%) or above 4.5 volts (90%) and the idle switch is not in the correct state. NOTE: The idle switch is designed to transition when the accel position is approximately 16% (1.00 volt). This code sets the ECM to Limp-in Mode, which includes a fixed engine speed of 1100 RPM.

P1515-ACCEL. PEDAL SENSOR PWG PLAUS WITH POTENTIOMETER

When Monitored: With the ignition on.

Set Condition: The accelerator pedal position sensor signal is below 0.20 volts, the idle switch transitions at too high a percentage intermittently or the idle switch is not in the correct state intermittently. NOTE: The idle switch is designed to transition when the accel position is approximately 16% (1.00 volt). This code sets the ECM to Limp-in Mode, which includes a fixed engine speed of 1100 RPM.

P1515-ACCEL. PEDAL SENSOR SIGNAL HIGH EXCEEDED

When Monitored: With the ignition on.

Set Condition: The accelerator pedal position sensor signal voltage is above 4.5 volts. NOTE: This code sets the ECM to Limp-in Mode, which includes a fixed engine speed of 1100 RPM.

P1515-ACCEL. PEDAL SENSOR SUPPLY HIGH EXCEEDED

When Monitored: With the ignition on.

Set Condition: The ECM detects voltage on the accelerator pedal position sensor 5-volt supply circuit above 5.2 volts.

P1515-ACCEL. PEDAL SENSOR SUPPLY LOW EXCEEDED

When Monitored: With the ignition on.

Set Condition: The ECM detects voltage the accelerator pedal position sensor 5-volt supply circuit below 4.75 volts.

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P1605-TERMINAL 15 PLAUSIBILITY AFTER START UP — Continued

TEST	ACTION	APPLICABILITY
3	Turn the ignition off. Disconnect the ECM harness connectors. Measure the voltage of ECM harness connector C1, cavities 2 and 28. Is voltage present on ECM harness connector C1, cavities 2 and 28? Yes → Go To 4 No → Repair the ECM circuit that measured above 2.0 volts for a short to voltage. Perform ROAD TEST VERIFICATION - VER-2.	All
4	Turn the ignition off. Disconnect the ECM harness connectors. Remove the ASD/Diesel Power Relay from the PDC. Measure the voltage on ECM harness connector C1 cavity 2. Is the voltage below 2.0 volts? Yes → Go To 5 No → Repair the ASD Relay Output circuit for a short to voltage. Perform ROAD TEST VERIFICATION - VER-2.	All
5	Turn the ignition off. Disconnect the ECM harness connectors. Remove the ASD/Diesel Power Relay from the PDC. Measure the resistance between ground and the ASD Relay Control circuit. Is the resistance above 100 kohms? Yes → Replace the ASD/Diesel Power Relay. Perform ROAD TEST VERIFICATION - VER-2. No → Repair the ASD Relay Control circuit for a short to ground. Perform ROAD TEST VERIFICATION - VER-2.	All
6	WARNING: KEEP CLEAR OF THE ENGINE'S MOVING PARTS. 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 at normal operating temperature, monitor the DRB parameters related to the DTC while wiggling the wiring 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 wiring harness. Look for any chafed, pierced, pinched, or partially broken wires. Visually inspect the related wiring harness connectors. Look for broken, bent, pushed out, or corroded terminals. Were any of the above conditions present? Yes → Repair as necessary Perform ROAD TEST VERIFICATION - VER-2. No → Test Complete.	All

P1630-SOLENOID VALVE CONTROLLER SHORT CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
3	Turn the ignition off. Disconnect the ECM harness connectors. Disconnect the Fuel Injection Pump harness connector. Remove the ASD/Diesel Power Relay from the PDC. Connect a jumper wire between cavity 30 and cavity 87 of the ASD/Diesel Power Relay connector. Turn the ignition on. Measure the voltage of the Fuel Timing Solenoid Control circuit. Is the voltage below 0.5 volt? Yes → Go To 4 No → Repair the Fuel Timing Solenoid Control circuit for a short to voltage. Perform ROAD TEST VERIFICATION - VER-2.	All
4	Disconnect the Fuel Injection Pump harness connector. Measure the resistance between the following cavities in the Fuel Injection Pump connector (fuel pump side): Cavity 1 to cavities 4, 5, 6, 7, 8, 9, and 10. Cavity 4 to cavities 5, 6, 7, 8, 9, and 10. Cavity 5 to cavities 6, 7, 8, and 9. Cavity 7 to cavities 6, 8, 9, and 10. Cavity 8 to cavities 6 and 10. NOTE: The resistance should be above 100 ohms for all measurements. Is the resistance above 100 ohms for each of the measurements? Yes → Replace and program the Engine Control Module in accordance with the Service Information. Perform ROAD TEST VERIFICATION - VER-2. No → Replace the Fuel Injection Pump in accordance with the Service Information. Perform ROAD TEST VERIFICATION - VER-2.	All
5	WARNING: KEEP CLEAR OF THE ENGINE'S MOVING PARTS. 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 at normal operating temperature, monitor the DRB parameters related to the DTC while wiggling the wiring 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 wiring harness. Look for any chafed, pierced, pinched, or partially broken wires. Visually inspect the related wiring harness connectors. Look for broken, bent, pushed out, or corroded terminals. Were any of the above conditions present? Yes → Repair as necessary Perform ROAD TEST VERIFICATION - VER-2. No → Test Complete.	All

P1645-GLOW DISPLAY SHORT CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
7	Turn the ignition off. Remove and check the Glow Plug Lamp bulb from the Instrument Cluster. Is the bulb OK? Yes → Replace the Message Center. Perform ROAD TEST VERIFICATION - VER-2. No → Replace the Glow Plug Lamp bulb. Perform ROAD TEST VERIFICATION - VER-2.	All

P1690-FAN CONTROL OPEN CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
3	Turn the ignition off. Remove the Radiator Fan Relay from the PDC. Turn the ignition on. Using a 12-volt test light connected to ground, check the ASD/Diesel Power Relay Output circuit. Did the test light illuminate brightly? Yes → Go To 4 No → Repair the ASD/Diesel Power Relay Output circuit for an open. Perform ROAD TEST VERIFICATION - VER-2.	All
4	Turn the ignition off. Install a substitute relay in place of the Radiator Fan Relay. Turn the ignition on. With the DRB, actuate the Radiator Fan Relay. Does the Radiator Fan cycle on and off? Yes → Replace the Radiator Fan Relay. Perform ROAD TEST VERIFICATION - VER-2. No → Go To 5	All
5	Turn the ignition off. Remove the Radiator Fan Relay from the PDC. Disconnect the ECM harness connectors. Measure the resistance between ground and the Radiator Fan Relay Control circuit. Is the resistance below 100 kohms? Yes → Repair the Radiator Fan Relay Control circuit for a short to ground. Perform ROAD TEST VERIFICATION - VER-2. No → Go To 6	All
6	Turn the ignition off. Remove the Radiator Fan Relay from the PDC. Disconnect the ECM harness connectors. Measure the resistance of the Radiator Fan Relay Control circuit. Is the resistance below 5.0 ohms? Yes → Go To 7 No → Repair the Radiator Fan Relay Control circuit for an open. Perform ROAD TEST VERIFICATION - VER-2.	All
7	If there are no possible causes remaining, view repair. Repair Replace and program the Engine Control Module in accordance with the Service Information. Perform ROAD TEST VERIFICATION - VER-2.	All

Symptom:

***CHECKING THE A/C SYSTEM**

POSSIBLE CAUSES
A/C COMPRESSOR CLUTCH
A/C COMPRESSOR CLUTCH GROUND CIRCUIT OPEN
A/C COMPRESSOR CLUTCH RELAY OUTPUT CIRCUIT OPEN
A/C HIGH PRESSURE SWITCH OPEN
A/C LOW PRESSURE SWITCH OPEN
A/C PRESSURE SENSE CIRCUIT OPEN
A/C SELECT SWITCH SENSE CIRCUIT OPEN
A/C SELECT SWITCH SENSE CIRCUIT SHORT TO GROUND
A/C SELECT SWITCH SENSE CIRCUIT SHORT TO VOLTAGE
A/C SWITCH INPUT TO THE PCM
A/C SWITCH SIGNAL OPEN
A/C SWITCH SIGNAL SHORTED TO GROUND
ACTUATOR TEST
ECM
ECM - PRESSURE SIGNAL OPEN
FUSED B+ CIRCUIT OPEN
GROUND CIRCUIT OPEN
HI PRESSURE SIGNAL CIRCUIT OPEN
PCM - A/C SELECT SWITCH SENSE CIRCUIT OPEN
PCM - A/C SWITCH INPUT
PCM - INTERNAL A/C SELECT SWITCH CIRCUIT

TEST	ACTION	APPLICABILITY
1	<p>NOTE: Prior to diagnosing the A/C electrical system, check for proper A/C system pressure. Improper refrigerant charge can cause incorrect system diagnosis and unnecessary component replacement.</p> <p>NOTE: Refer to the Service Information to check the A/C mechanical system before continuing.</p> <p>With the DRB, select Engine, JTEC then Inputs/Outputs. Start the engine and set the blower to Panel. Turn the A/C on. With the DRB, read the A/C Select Switch. Does the DRB display A/C Select Switch YES?</p> <p style="padding-left: 40px;">Yes → Go To 2</p> <p style="padding-left: 40px;">No → Go To 16</p>	All

***CHECKING THE ECM AND PCM POWER AND GROUND CIRCUITS —**
Continued

TEST	ACTION	APPLICABILITY
4	Turn the ignition off. Disconnect the ECM harness connectors. Remove the ASD/Diesel Power Relay from the PDC. Connect a jumper wire between cavity 30 and cavity 87 in the ASD/Diesel Power Relay connector. Using a 12-volt test light connected to ground, check the ASD Relay Output circuit in ECM harness connector C1 cavities 2 and 28. Did the test light illuminate for both circuits? Yes → Go To 5 No → Repair the ASD Relay Output circuit(s) for an open. Perform ROAD TEST VERIFICATION - VER-2.	All
5	Disconnect the PCM harness connectors. Using a 12-volt test light connected to ground, check the PCM Battery Supply circuit in PCM harness connector C1 cavity 22. Is the test light on? Yes → Go To 6 No → Repair the PCM Battery Supply circuit(s) for an open. Perform ROAD TEST VERIFICATION - VER-2.	All
6	Disconnect the PCM harness connectors. Using a 12-volt test light connected to 12-volts, check both PCM Ground circuits in PCM harness connector C1 cavities 31 and 32. Did the test light illuminate for both cavities? Yes → Go To 7 No → Repair the PCM Ground circuit(s) for an open. Perform ROAD TEST VERIFICATION - VER-2.	All
7	Turn the ignition off. Remove the ASD/Diesel Power Relay from the PDC. Disconnect the PCM harness connectors. Connect a jumper wire between cavity 30 and cavity 87 of the ASD/Diesel Power Relay connector. Using a 12-volt test light connected to ground, check the ASD Relay Output circuit in PCM harness connectors C1 cavity 2 and C3 cavity 12. Did the test light illuminate for both circuits? Yes → Test Complete. No → Repair the ASD Relay Output circuit(s) for an open. Perform ROAD TEST VERIFICATION - VER-2.	All

Symptom:

***CHECKING THE FUEL INJECTION PUMP**

POSSIBLE CAUSES

CHECKING THE FUEL INJECTION PUMP

TEST	ACTION	APPLICABILITY
1	<p>NOTE: This test should be performed before replacing the ECM during fault code diagnostics.</p> <p>NOTE: This test checks for shorted circuits internal to the Fuel Injection Pump assembly.</p> <p>Turn the ignition off.</p> <p>Disconnect the Fuel Injection Pump 10-way harness connector.</p> <p>NOTE: The following resistance measurements are performed on the Fuel Injection Pump 10-way harness connector (pump side). Resistance on these measurements should be greater than 100.0 ohms each.</p> <p>Measure the resistance between cavity 1 and cavities 4, 5, 6, 7, 8, 9, 10 and case ground.</p> <p>Measure the resistance between cavity 4 and cavities 5, 6, 8, 9, 10 and case ground.</p> <p>Measure the resistance between cavity 5 and cavities 6, 7, 8 and case ground.</p> <p>Measure the resistance between cavity 6 and cavities 7, 8, 9 and 10.</p> <p>Measure the resistance between cavity 7 and cavities 8, 9, 10 and case ground.</p> <p>Is the resistance below 100.0 ohms for any of the measurements?</p> <p>Yes → Replace the Fuel Injection Pump Assembly in accordance with the Service Information. Perform ROAD TEST VERIFICATION - VER-2.</p> <p>No → Test Complete.</p>	All

***CHECKING THE LOW COOLANT LAMP OPERATION — Continued**

TEST	ACTION	APPLICABILITY
13	Turn the ignition off. Disconnect the PCM harness connectors. Connect a jumper wire between the Low Coolant Lamp Control circuit and ground. Turn the ignition on. Is the Low Coolant Lamp illuminated? Yes → Replace and program the Powertrain Control Module in accordance with the Service Information. Perform ROAD TEST VERIFICATION - VER-2. No → Go To 14	All
14	Turn the ignition off. Disconnect the PCM harness connectors. Disconnect the Message Center harness connector. Measure the resistance of the Low Coolant Lamp Control circuit. Is the resistance below 5.0 ohms? Yes → Go To 15 No → Repair the Low Coolant Lamp Control circuit for an open. Perform ROAD TEST VERIFICATION - VER-2.	All
15	Turn the ignition off. Remove the Message Center. Remove and inspect the Low Coolant Lamp bulb. Is the bulb OK? Yes → Go To 16 No → Replace the Low Coolant Lamp bulb. Perform ROAD TEST VERIFICATION - VER-2.	All
16	If there are no possible causes remaining, view repair. Repair Replace the Message Center. Perform ROAD TEST VERIFICATION - VER-2.	All

Symptom:

***CHECKING THE TURBOCHARGER OPERATION**

POSSIBLE CAUSES
CHECKING THE TURBOCHARGER HOSES
CHECKING THE WASTEGATE HOSE
TURBOCHARGER
WASTEGATE ACTUATOR ARM OPERATION
WASTEGATE RESTRICTION

TEST	ACTION	APPLICABILITY
1	<p>NOTE: The exhaust system must be free from any restriction to perform this test.</p> <p>Check the turbocharger outlet hose between the turbocharger and the intake manifold and the turbocharger inlet hose between the turbocharger and the air cleaner for loose connection, damage or restriction.</p> <p>Are any of these conditions evident?</p> <p style="padding-left: 40px;">Yes → Repair or replace as necessary. Perform ROAD TEST VERIFICATION - VER-2.</p> <p style="padding-left: 40px;">No → Go To 2</p>	All
2	<p>Check the wastegate actuator supply hose for loose connection, damage or restriction.</p> <p>Are any of these conditions evident?</p> <p style="padding-left: 40px;">Yes → Repair or replace as necessary. Perform ROAD TEST VERIFICATION - VER-2.</p> <p style="padding-left: 40px;">No → Go To 3</p>	All
3	<p>Disconnect the Wastegate Actuator Supply Hose from the intake manifold.</p> <p>Using an air pressure regulator, connect an air hose to the disconnected end of the Wastegate Actuator Supply Hose.</p> <p>Start at 0 kPa (0 PSI) and slowly increase air pressure to 310 kPa (45 PSI) while monitoring the Wastegate Actuator Arm.</p> <p>NOTE: The Wastegate Actuator Arm should remain closed until air pressure reaches 117-138 kPa (17-20 PSI) and fully open when the air pressure reaches 234-276 kPa (34-40 PSI).</p> <p>Did the Wastegate Actuator unseat and fully open as described?</p> <p style="padding-left: 40px;">Yes → Go To 4</p> <p style="padding-left: 40px;">No → Go To 5</p>	All

P1655-AC CONTROL OPEN CIRCUIT - DIESEL — Continued

TEST	ACTION	APPLICABILITY
3	Turn the ignition off. Remove the A/C Compressor Clutch Relay from the PDC. Turn the ignition on. Using a 12-volt Test Light connected to ground, check the ASD/Diesel Power Relay Output circuit. Did the test light illuminate brightly? Yes → Go To 4 No → Repair the ASD/Diesel Power Relay Output circuit for an open. Perform ROAD TEST VERIFICATION - VER-2.	All
4	Turn the ignition off. Install a substitute relay in place of the A/C Compressor Clutch Relay. Turn the ignition on. With the DRB, actuate the A/C Compressor Clutch Relay. Is the A/C Compressor Clutch clicking? Yes → Replace the A/C Compressor Clutch Relay. Perform ROAD TEST VERIFICATION - VER-2. No → Go To 5	All
5	Turn the ignition off. Disconnect the ECM harness connector(s). Remove the A/C Compressor Clutch Relay from the PDC. Measure the resistance between ground and the A/C Compressor Clutch Relay Control circuit. Is the resistance above 100 kohms? Yes → Go To 6 No → Repair the A/C Compressor Clutch Relay Control circuit for a short to ground. Perform ROAD TEST VERIFICATION - VER-2.	All
6	Turn the ignition off. Disconnect the ECM harness connector(s). Remove the A/C Compressor Clutch Relay from the PDC. Measure the resistance of the A/C Compressor Clutch Relay Control circuit. Is the resistance below 5.0 ohms? Yes → Go To 7 No → Repair the A/C Compressor Clutch Relay Control circuit for an open. Perform ROAD TEST VERIFICATION - VER-2.	All
7	If there are no possible causes remaining, view repair. Repair Replace and program the Engine Control Module in accordance with the Service Information. Perform ROAD TEST VERIFICATION - VER-2.	All

***CHECKING THE SPEED CONTROL OPERATION — Continued**

TEST	ACTION	APPLICABILITY
12	<p>Refer to any Technical Service Bulletins (TSB) that may apply to this condition. Visually inspect the related wiring harness. Look for any chafed, pierced, pinched, or partially broken wires.</p> <p>Visually inspect the related wiring harness connectors. Look for broken, bent, pushed out, or corroded terminals.</p> <p>Were any of the above conditions present?</p> <p>Yes → Repair as necessary Perform SPEED CONTROL VERIFICATION - VER-4.</p> <p>No → Go To 13</p>	All
13	<p>Check the brake lamp switch for proper adjustment.</p> <p>Is the brake lamp switch adjusted properly?</p> <p>Yes → Replace and program the Engine Control Module in accordance with the Service Information. Perform SPEED CONTROL VERIFICATION - VER-4.</p> <p>No → Adjust or replace the brake lamp switch as necessary. Perform SPEED CONTROL VERIFICATION - VER-4.</p>	All
14	<p>Turn the ignition off.</p> <p>Disconnect the Brake Lamp Switch harness connector.</p> <p>Turn the ignition on.</p> <p>Measure the voltage of the Secondary Brake Switch Signal circuit.</p> <p>Is the voltage above 9.0 volts?</p> <p>Yes → Go To 15</p> <p>No → Go To 17</p>	All
15	<p>Turn the ignition off.</p> <p>Disconnect the Brake Switch harness connector.</p> <p>With the DRB, monitor the brake switch input.</p> <p>Connect a jumper wire between the Brake Lamp Switch harness connector cavities 1 and 2.</p> <p>Did the DRB display change from Pressed to Released?</p> <p>Yes → Adjust or replace the Brake Lamp Switch. Perform SPEED CONTROL VERIFICATION - VER-4.</p> <p>No → Go To 16</p>	All
16	<p>Disconnect the Brake Lamp Switch harness connector.</p> <p>Measure the resistance between ground and the Brake Lamp Switch harness connector cavity 2.</p> <p>Is the resistance below 5.0 ohms?</p> <p>Yes → Replace and program the ECM in accordance with the Service Information. Perform SPEED CONTROL VERIFICATION - VER-4.</p> <p>No → Repair the Ground circuit for an open. Perform SPEED CONTROL VERIFICATION - VER-4.</p>	All

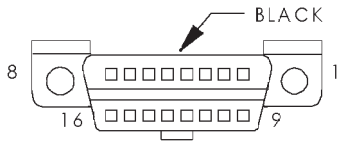
ANTENNA FAILURE — Continued

POSSIBLE CAUSES
SKIM INTERNAL DTC FAILURE

TEST	ACTION	APPLICABILITY
1	<p>Note: This trouble code indicates an internal SKIM fault.</p> <p>With the DRB III, read and record the SKIM DTC's and then erase the SKIM DTC's Perform 10 ignition key cycles, leaving the ignition key on for a minimum of 90 seconds per cycle. With the DRB III, read the SKIM DTC's. Did the same SKIM DTC return?</p> <p style="padding-left: 40px;">Yes → Replace and program the Sentry Key Immobilizer Module in accordance with the Service Information. Perform SKIS VERIFICATION.</p> <p style="padding-left: 40px;">No → Test Complete.</p>	All

Verification Tests — Continued

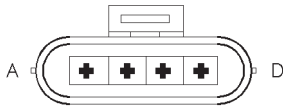
SKIS VERIFICATION	APPLICABILITY
<p>1. Reconnect all previously disconnected components and connectors.</p> <p>2. Obtain the vehicle's unique Personal Identification Number (PIN) assigned to it's original SKIM. This number can be obtained from the vehicle's invoice or Chrysler's Customer Center (1-800-992-1997).</p> <p>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.</p> <p>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.</p> <p>5. With the DRB III, select Theft Alarm, SKIM and Miscellaneous. Then select desired procedure and follow the steps that will be displayed.</p> <p>6. If the SKIM has been replaced, ensure all of the vehicle ignition keys are programmed to the new SKIM.</p> <p>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.</p> <p>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.</p> <p>9. With the DRB III, read the SKIM DTC's.</p> <p>Are there any SKIM DTC's?</p> <p style="padding-left: 40px;">Yes → Repair is not complete, refer to appropriate symptom.</p> <p style="padding-left: 40px;">No → Repair is complete.</p>	<p style="text-align: center;">All</p>



DATA LINK CONNECTOR

DATA LINK CONNECTOR - BLACK 16 WAY

CAV	CIRCUIT	FUNCTION
1	-	-
2	-	-
3	D1 18VT/BR	CCD BUS (+)
4	Z1 18BK	GROUND
5	Z12 18BK/TN	GROUND
6	D20 20LG/BK	SCI RECEIVE
7	D21 20PK	SCI TRANSMIT
8	-	-
9	-	-
10	-	-
11	D2 18WT/BK	CCD BUS (-)
12	-	-
13	-	-
14	-	-
15	-	-
16	F34 18TN/BK	FUSED B(+)



EGR SOLENOID (DIESEL)

EGR SOLENOID (DIESEL) - 4 WAY

CAV	CIRCUIT	FUNCTION
A	F142 18DG/OR	FUSED AUTOMATIC SHUT DOWN RELAY OUTPUT
B	K35 18GY/YL	EGR SOLENOID CONTROL
C	-	-
D	Z1 18BK	GROUND

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