

2012 GENERAL INFORMATION

Circuit Testing Procedures - Non-DTC-Based Diagnostics - Fiat 500

WARNING

WARNING

WARNINGS provide information to prevent personal injury and vehicle damage. Below is a list of general warnings that should be followed any time a vehicle is being serviced.

WARNING: Always wear safety glasses for eye protection.

WARNING: Use safety stands anytime a procedure requires being under a vehicle.

WARNING: Be sure that the ignition switch always is in the off position, unless the procedure requires it to be on.

WARNING: Set the parking brake when working on any vehicle. An automatic transmission should be in park. A manual transmission should be in neutral.

WARNING: Operate the engine only in a well-ventilated area.

WARNING: Keep away from moving parts when the engine is running, especially the fan and belts.

WARNING: To prevent serious burns, avoid contact with hot parts such as the radiator, exhaust manifold(s), tail pipe, catalytic converter and muffler.

WARNING: Do not allow flame or sparks near the battery. Gases are always present in and around the battery.

WARNING: Always remove rings, watches, loose hanging jewelry and avoid loose clothing.

DESCRIPTION

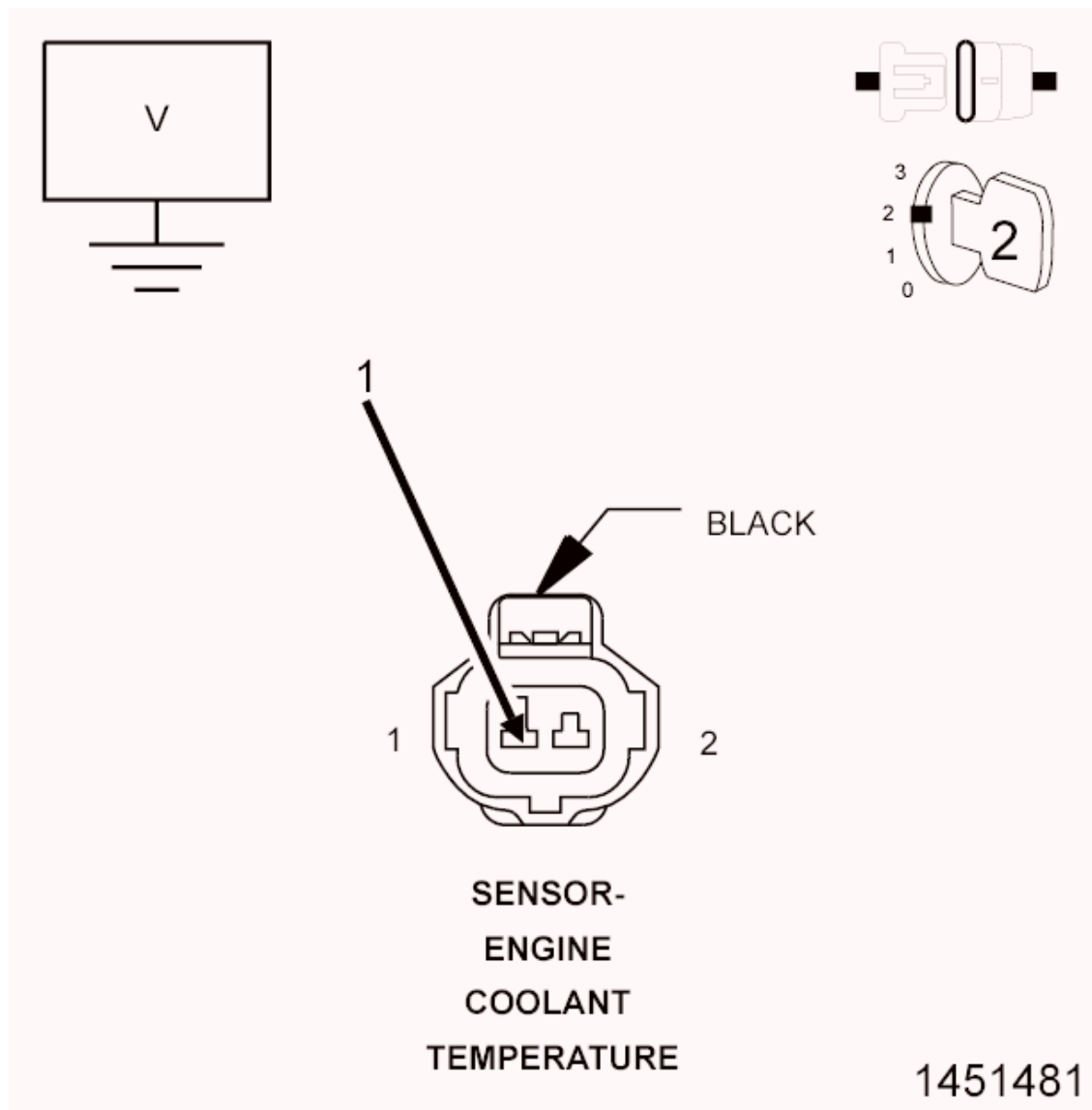


Fig. 5: Measuring Voltage On ECT Sensor Signal Circuit Harness Connector
 Courtesy of CHRYSLER GROUP, LLC

NOTE: The connector displayed in the graphics are only an example.

1. Turn the ignition off.
2. Disconnect the wire harness connector of the component that is being tested.

NOTE: Check connectors - Clean/repair as necessary.

3. At this time leave all in-line connectors connected.
4. Use a multimeter set to measure DC voltage.
5. Connect the ground lead of the meter to a known good ground circuit.
6. Use the positive lead of the multimeter and probe the circuit you are checking for voltage.

Yes

- Go To 3.

No

- Replace the Amplifier in accordance with the Service Information. Refer to **AMPLIFIER, REMOVAL** .
- Perform the BODY VERIFICATION TEST. Refer to **BODY VERIFICATION TEST** .

3. CHECK THE (X54) RIGHT FRONT AUDIO (+) CIRCUIT FOR AN OPEN

1. Turn the ignition off.
2. Disconnect the Radio harness connector.
3. Measure the resistance of the (X54) Right Front Audio (+) circuit between the Radio harness connector and the Amplifier harness connector.

Is the resistance below 5.0 Ohms?

Yes

- Go To 4.

No

- Repair the (X54) Right Front Audio (+) circuit for an open.
- Perform the BODY VERIFICATION TEST. Refer to **BODY VERIFICATION TEST** .

4. CHECK THE (X56) RIGHT FRONT AUDIO (-) CIRCUIT FOR AN OPEN

1. Measure the resistance of the (X56) Right Front Audio (-) circuit between the Radio harness connector and the Amplifier harness connector.

Is the resistance below 5.0 Ohms?

Yes

- Replace the Radio in accordance with the Service Information. Refer to **RADIO, REMOVAL** .
- Perform the BODY VERIFICATION TEST. Refer to **BODY VERIFICATION TEST** .

No

- Repair the (X56) Right Front Audio (-) circuit for an open.
- Perform the BODY VERIFICATION TEST. Refer to **BODY VERIFICATION TEST** .

B2002-92-FRONT RIGHT AUDIO SPEAKER OUTPUT - PERFORMANCE OR INCORRECT OPERATION

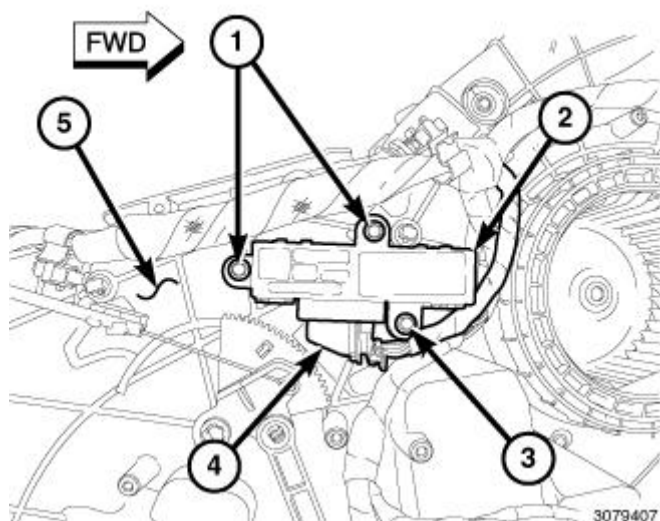


Fig. 4: Wire Harness Connector, A/C Heater Module, HVAC Housing, Lower Module Retaining Screw
 Courtesy of CHRYSLER GROUP, LLC

1. Position the A/C heater module (2) to the right side of the HVAC housing (5).

NOTE: Use a flexible drive socket to remove the lower module retaining screw (3).

2. Install the three retaining screws (1 and 3) that secure the module to the housing. Tighten the screws to 0.8 N.m (7 in. lbs.).
3. Connect the wire harness connector (4) to the A/C heater module.
4. Install the glove box. Refer to **GLOVE BOX, INSTRUMENT PANEL, INSTALLATION** .
5. Reconnect the negative battery cable.

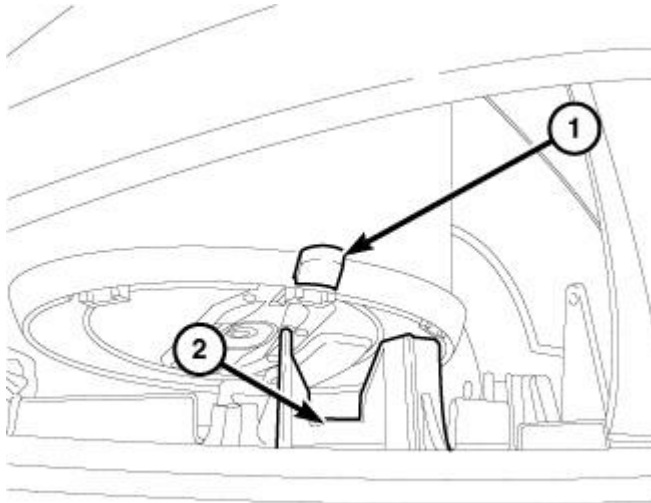
MODULE, ANTI-LOCK BRAKE SYSTEM

DESCRIPTION

DESCRIPTION

CAUTION: Make sure wires are not caught between the glass case and the motor.

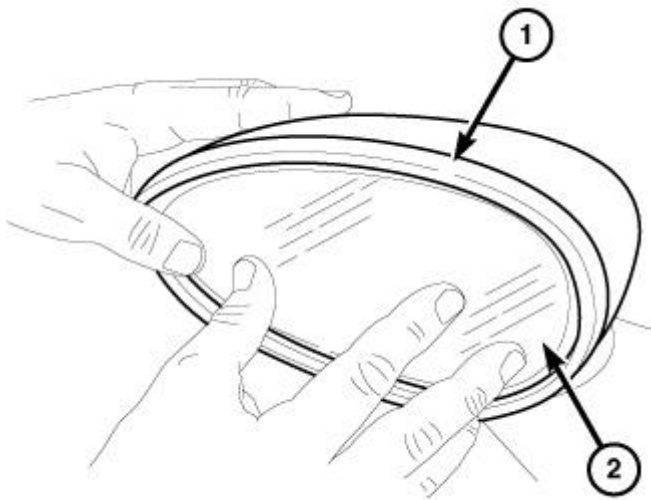
2. If equipped, connect the heater wires (1) by pushing on the thumb tabs.



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Fig. 114: Mirror Glass Case Slots & Retaining Tabs
 Courtesy of CHRYSLER GROUP, LLC

3. Align the mirror glass case slots (2) to the retaining tabs (1) located on the mirror motor assembly.



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Fig. 115: Glass Case & Mirror Assembly
 Courtesy of CHRYSLER GROUP, LLC

4. Once aligned, push the glass case (2) into the mirror assembly (1) to engage the retainers. Make sure all retainers are fully seated.

(W7) FRONT WIPER PARK SWITCH SENSE CIRCUIT SHORTED TO GROUND
 FRONT WIPER MOTOR
 BODY CONTROL MODULE (BCM)

DIAGNOSTIC TEST

1. INTERMITTENT CONDITION

NOTE: Prior to diagnosing this DTC, verify the Front Wiper Arm and Linkage is free of obstructions and correctly attached to the Front Wiper Motor output shaft. Repair as necessary.

1. Turn the ignition on.
2. With the scan tool, clear all DTCs.
3. Turn the Front Wiper on.
4. Wait 10 seconds.
5. With the scan tool, read DTCs.

Does the scan tool display this DTC as active?

Yes

- Go To 2.

No

- Test complete, the condition or conditions that originally set this DTC are not present at this time. Using the wiring diagrams as a guide, check all related splices and connectors for signs of water intrusion, corrosion, pushed out or bent terminals, and correct pin tension.
- Refer to **STANDARD PROCEDURE** and perform the BODY VERIFICATION TEST.

2. CHECK THE (W7) FRONT WIPER PARK SWITCH SENSE CIRCUIT FOR AN OPEN

1. Turn the ignition off.
2. Disconnect the Front Wiper Motor harness connector.
3. Disconnect the BCM C1 harness connector.
4. Measure the resistance of the (W7) Front Wiper Park Switch Sense circuit between the Front Wiper Motor harness connector and the BCM C1 harness connector.

Is the resistance below 5.0 Ohms?

Yes

- Go To 3.

No

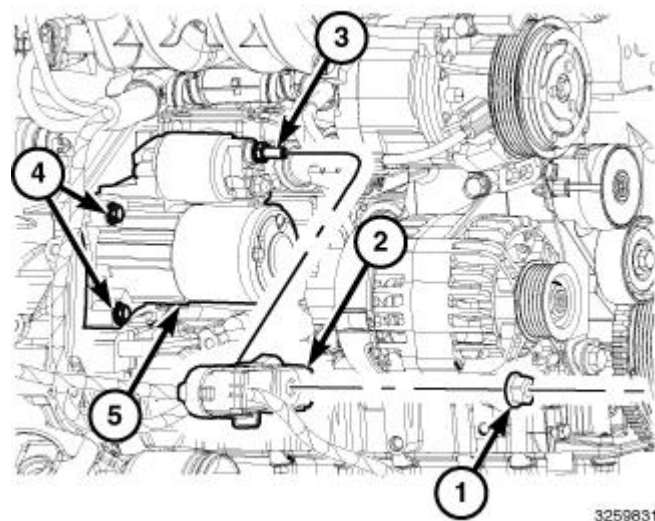


Fig. 115: Starter Assembly, Connector & Fasteners
 Courtesy of CHRYSLER GROUP, LLC

20. Install the starter assembly (5) and connect the electrical wiring (2). Refer to **STARTER, INSTALLATION** .

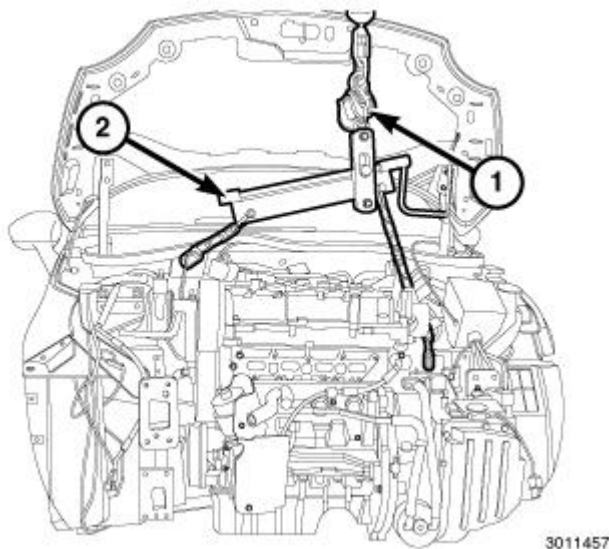
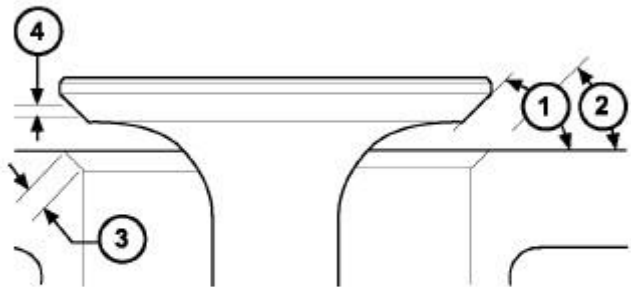


Fig. 116: Engine Hoist & Load-Leveling Lifting Sling
 Courtesy of CHRYSLER GROUP, LLC

21. Position the engine and transmission in the vehicle.



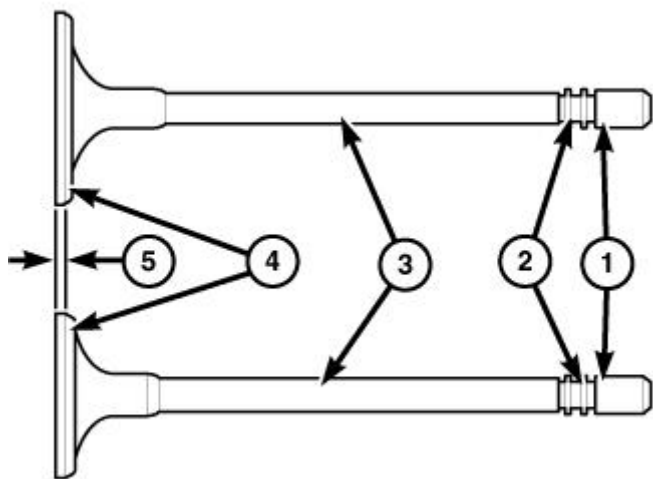
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Fig. 390: Valve Face & Seat

Courtesy of CHRYSLER GROUP, LLC

1 - SEAT WIDTH
2 - FACE ANGLE
3 - SEAT ANGLE
4 - SEAT CONTACT AREA

The intake and exhaust valves have a 44.5 to 45 degree face angle (1). The valve seats (2) have a 45 to 45.5 degree face angle.

VALVES

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Fig. 391: Inspecting Valve Margin

Courtesy of CHRYSLER GROUP, LLC

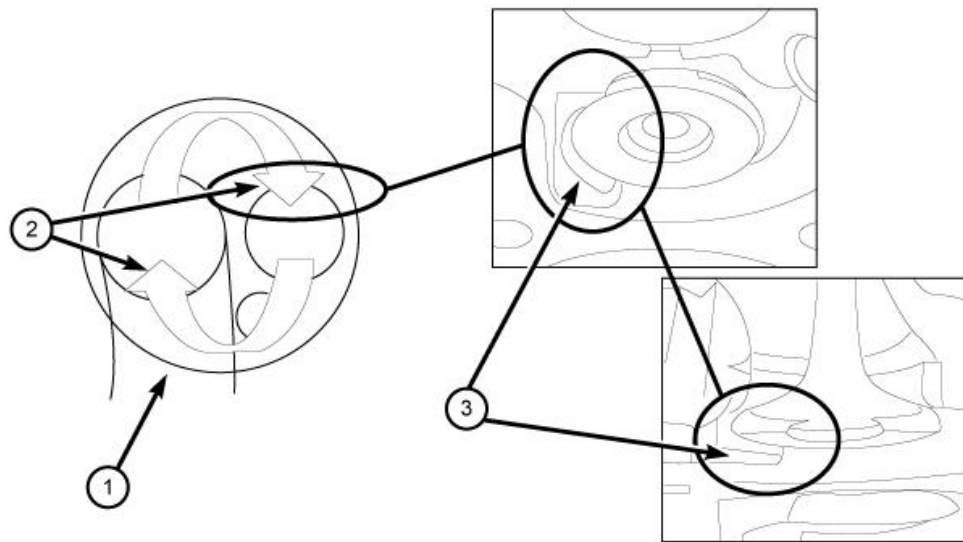
onto the three ball stud mounts (3).

2. Install the oil vapor hose and tighten the clamp (2).
3. Install the fresh air intake (4) to the air cleaner body (1) and tighten the bolt (5) to 5 N.m (45 in. lbs.).

CYLINDER HEAD

DESCRIPTION

DESCRIPTION



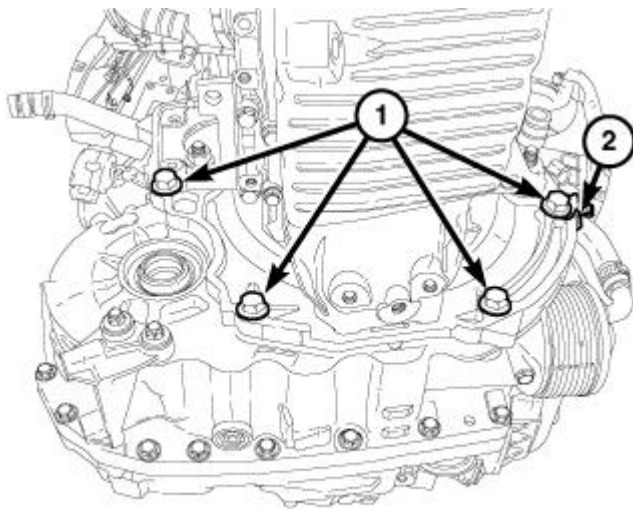
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Fig. 79: Variable Turbulence Combustion Chamber Cylinder Head
 Courtesy of CHRYSLER GROUP, LLC

The one-piece 1.4L 8V aluminum alloy cylinder head features two valves per cylinder with pressed in metal valve guides. The valves are actuated directly by the camshaft through bucket style mechanical tappets using selectable shims to adjust valve clearance. The head gasket is made of an aramidic fiber and the head does not require retightening throughout the life of the engine.

The "variable turbulence" combustion chamber design offers maximum performance and efficiency with reduced emissions. The variable turbulence is achieved through the inclusion of a calibrated deflector near the exhaust valve head (3) and special curvature of the intake manifold (1). This allows a consistent amount of the exhaust gases (about 25%) to be recirculated in the combustion chamber (2) reducing fuel consumption and exhaust emissions when driving in partial load conditions.

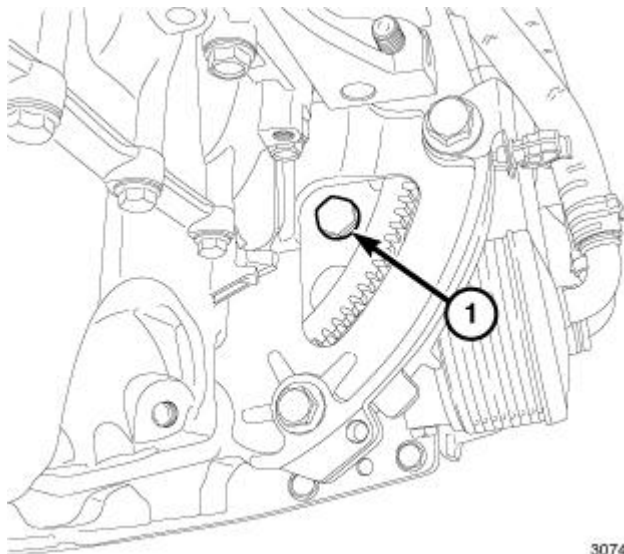
DIAGNOSIS AND TESTING



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Fig. 172: Lower Transmission Mounting Bolts & Oxygen Sensor Harness Bracket
 Courtesy of CHRYSLER GROUP, LLC

17. Install the four lower transmission mounting bolts (1) and the oxygen sensor harness bracket (2). Tighten bolts (1) to 40 N.m (30 ft. lbs.).



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Fig. 173: Torque Converter Bolts
 Courtesy of CHRYSLER GROUP, LLC

18. Install the six torque converter bolts (1). Tighten the six bolts in two steps as follows:
- Step 1: All to 20 N.m (15 ft. lbs.).
 - Step 2: All to 60 N.m (44 ft. lbs.).

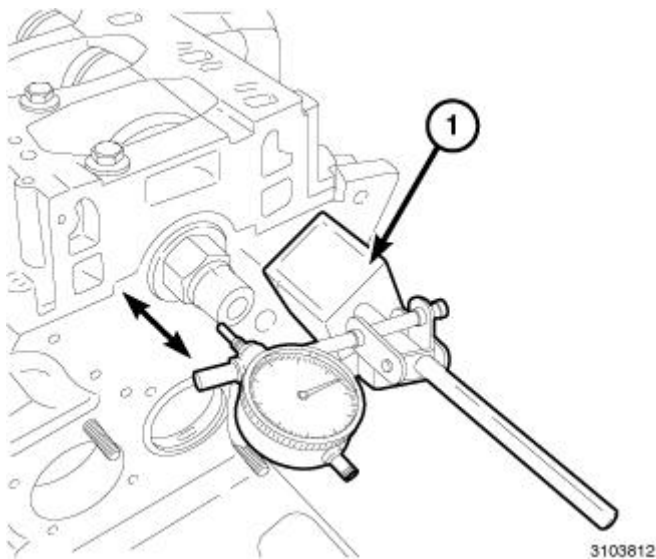


Fig. 433: Measuring Crankshaft End Play
 Courtesy of CHRYSLER GROUP, LLC

1. Mount Dial Indicator Set (special tool #C-3339A, Set, Dial Indicator) (1) to a stationary point at the front of the engine. Locate the probe perpendicular against the nose of the crankshaft.
2. Move the crankshaft all the way to the rear of its travel.
3. Zero the dial indicator.
4. Move the crankshaft forward to the limit of travel and read the dial indicator. Compare the measured end play to the specification. Refer to **Engine - Specifications**.

NOTE: Crankshaft thrust washers are not selectable and are only available in a single thickness.

REMOVAL

REMOVAL

No

- Repair the open in the O2 Return Downstream circuit.
- Refer to **STANDARD PROCEDURE** and perform the POWERTRAIN VERIFICATION TEST .

7. POWERTRAIN CONTROL MODULE (PCM)

1. Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Oxygen Sensor 1/2 and the Powertrain Control Module (PCM).
2. Look for any chafed, pierced, pinched or partially broken wires.
3. Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the O2 Sensor and Powertrain Control Module harness connectors.
4. Perform any Technical Service Bulletins that may apply.

Were there any problems found?

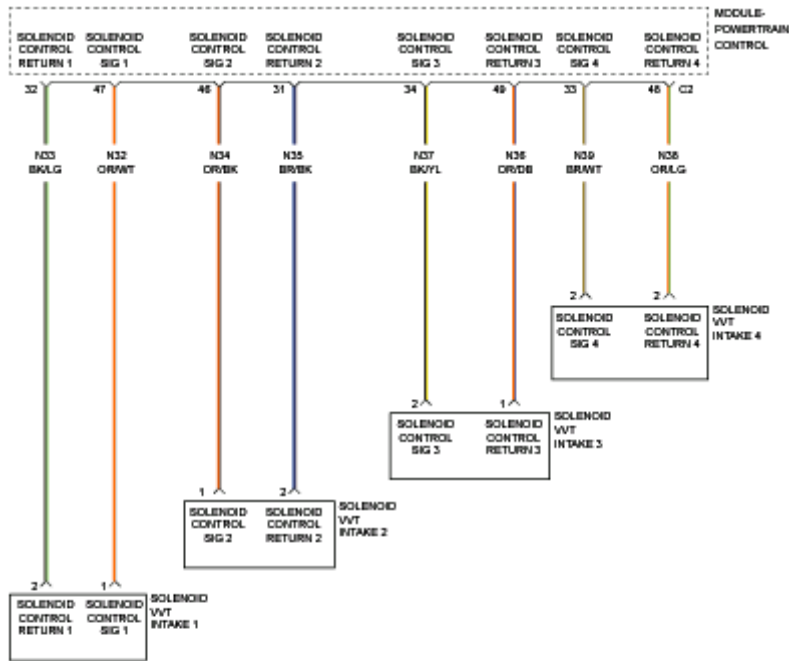
Yes

- Repair as necessary.
- Refer to **STANDARD PROCEDURE** and perform the POWERTRAIN VERIFICATION TEST .

No

- Replace and program the Powertrain Control Module in accordance with the Service Information. Refer to **MODULE, POWERTRAIN CONTROL [EAB], REMOVAL and STANDARD PROCEDURE** .
- Refer to **STANDARD PROCEDURE** and perform the POWERTRAIN VERIFICATION TEST .

P0139-O2 SENSOR 1/2 SLOW RESPONSE



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Fig. 11: VVT Solenoid Wiring Diagram
 Courtesy of CHRYSLER

For a complete wiring diagram, refer to appropriate **SYSTEM WIRING DIAGRAMS** article .

THEORY OF OPERATION

The Powertrain Control Module (PCM) performs various internal tests to verify proper controller operation. This DTC indicates that the controller's microprocessor internal watchdog has detected an error. If the PCM microprocessor detects an internal circuit error.

WHEN MONITORED:

Continuously with the ignition on.

SET CONDITION:

If the PCM microprocessor internal watchdog detects an error.

Yes

NOTE: Visually and physically inspect the wiring harness between the Speed Control Switch harness connector and the BCM harness connector. Repair any damaged wires, connectors, and open/spread terminals. If harness is OK, proceed with test.

-
- Replace the Speed Control Switch in accordance with the Service Information. Refer to **SWITCH, SPEED CONTROL, REMOVAL** .
- Perform the POWERTRAIN VERIFICATION TEST. Refer to **STANDARD PROCEDURE** .

No

- Perform the INTERMITTENT CONDITION diagnostic procedure. Refer to **STANDARD PROCEDURE** .

P1607-PCM INTERNAL SHUTDOWN TIMER RATIONALITY TOO SLOW

For a complete wiring diagram, refer to appropriate **SYSTEM WIRING DIAGRAMS** article .

THEORY OF OPERATION

The Powertrain Control Module (PCM) compares actual shutdown time to a calculated shutdown time value. The calculated shut down time value is based on the amount the Engine Coolant Temperature (ECT) should drop after a completely warmed up engine is shut down for a minimum of 8 hours. If the difference between actual shutdown time and the calculated shut down time is greater than a maximum value, a one trip failure will set. The shutdown time is measured again after 1 hour of ignition off time following the next engine warm up cycle. The PCM compares the shutdown time to a calculated value. If the difference is greater than a maximum value, the MIL is illuminated and a DTC will set.

WHEN MONITORED:

With the engine running after a cycle when a complete engine warm up was achieved, the difference between engine coolant temperature and ambient air temperature less than or equal to 10° C (50° F) and battery voltage greater than 10 Volts.

SET CONDITION:

This DTC sets if the engine coolant temp does not drop enough or drops too much during engine off time. This DTC may also set if the controller timer is inaccurate. Two Trip Fault. Three good trips to turn off the MIL.

POSSIBLE CAUSES

Possible Causes
ENGINE COOLING CONDITIONS THAT MAY SET THIS DTC

3. Install the Fuel Pressure Decay Tester (special tool #8978A, Decay Tool, Fuel) between the fuel supply line and the fuel pump module.
4. Ignition on, engine not running.
5. With the scan tool, actuate the ASD Fuel System test and observe the fuel pressure gauge.

NOTE: Fuel pressure specification: 400 kPa +/- 14 kPa (58 psi +/- 2 psi).

Is the fuel pressure within specification?

Yes

- Repair or replace fuel supply line as necessary.
- Perform the POWERTRAIN VERIFICATION TEST. Refer to **STANDARD PROCEDURE** .

No

- Go To 12.

12. FUEL PUMP INLET STRAINER

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. Failure to follow these instructions can result in possible serious or fatal injury.

1. Turn the ignition off.
2. 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 the POWERTRAIN VERIFICATION TEST. Refer to **STANDARD PROCEDURE** .

No

- Before continuing, check the Fuel Pump Module harness connector terminals for corrosion, damage or terminal push out. Make sure the ground circuit is functional. Repair as necessary. Replace the Fuel Pump Module.
- Perform the POWERTRAIN VERIFICATION TEST. Refer to **STANDARD PROCEDURE** .

13. IGNITION COIL