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GROUP: Fuel Systems

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SUBJECT:

Diesel Transfer Pump Diagnosis

MODELS:

1998 - 2002 (BR/BE) Ram Pickup

NOTE: THIS BULLETIN APPLIES TO VEHICLES EQUIPPED WITH A 5.9L 24 VALVE CUMMINS TURBO DIESEL ENGINE (SALES CODE ETC OR ETH).

EQUIPMENT REQUIRED:

6977	Kit, Diesel Fuel Pressure (Includes #6628 Gauge and #6976 Fitting)
6631	Adapter, Fuel Pressure

DISCUSSION:

Improved diagnostic procedures are available which will greatly improve identifying a faulty fuel transfer pump. The improved procedures test the "flow" capability of the transfer pump. If sufficient fuel reaches the injection pump from the low-pressure system, then the cause of engine performance problem(s) lies elsewhere.

DIAGNOSTIC PROCEDURE:

The following procedure is to aid in evaluating the low-pressure fuel system performance in the absence of fault codes.

1. Inspect all fuel lines (including chassis) for kinks and leaks. Repair prior to proceeding.
2. Battery voltage must be greater than 11.5 volts. If not, charge batteries as required.
3. Remove the rubber fuel hose from the outlet side of the fuel filter (Fig. 1).

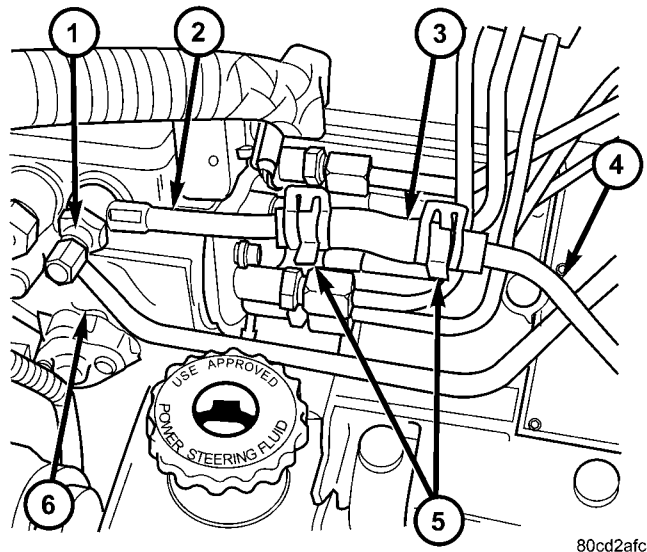


Fig. 1 FUEL HOSE AT FUEL FILTER

- 1 - TEST PORT FITTING
- 2 - VP-44 FUEL INLET LINE
- 3 - RUBBER FUEL HOSE
- 4 - FUEL FILTER OUTLET LINE
- 5 - HOSE CLAMPS (2)
- 6 - VP-44 INJECTION PUMP

4. Attach a 915 mm (36 in.) clear hose to the fuel filter outlet line (Fig. 1). Do not use the pressure test fitting.
5. Route the hose to a clean, empty 3.8 liter (1 gallon) approved diesel fuel container.
6. Purge all air from the lines by bumping the starter to activate the transfer pump (transfer pump should run for 25 seconds).

NOTE: THE TRANSFER PUMP WILL RUN LESS THAN 2 SECONDS (VARIES WITH ECM CALIBRATION) WHEN THE IGNITION KEY IS FIRST TURNED TO ON. WHEN THE STARTER IS BUMPED (DO NOT ALLOW THE ENGINE TO START), THE TRANSFER PUMP WILL RUN 25 SECONDS. IF THE ENGINE HAS BEEN RUNNING, THE IGNITION KEY MUST BE CYCLED TO ALLOW THE TRANSFER PUMP TO RUN.

7. If the transfer pump runs, proceed to step 8. If the transfer pump does not run, check electrical circuits as follows:
 - a. Verify 12 volts are present across the transfer pump connector. Use test light to verify current flow.
 - b. If 12 volts are present - Measure the resistance across the transfer pump. If greater than 200 ohms or less than 0.2 ohms, replace transfer pump.
8. Empty the container of fuel.
9. Bump the starter to activate the transfer pump. Look for air bubbles. If no air bubbles are present, proceed to step 10. If bubbles are present, check the lines/connectors between the fuel tank and the transfer pump for conditions allowing air to be drawn into the fuel system. Correct the condition and repeat steps 6, 8, and 9.

10. Measure the amount of fuel in the container after the pump shuts off. If the amount of fuel in the container is GREATER than 1.33 liters (45 fluid ounces) and the fuel is bubble free, then the low-pressure fuel system is OK, the cause of engine performance problem lies elsewhere. No further testing of the low pressure fuel system is required. If the amount of fuel in the container is LESS than 1.33 liters (45 fluid ounces), proceed to step 11.
11. Connect fuel pressure test gauge #6828, included in the #6977 Diesel Fuel Pressure kit, to the pressure fitting located on the fuel filter inlet. If the vehicle is a 2002 model, install test fitting #6976, included in the #6977 Diesel Fuel Pressure kit.
12. Purge all air from the lines by bumping the starter to activate the transfer pump. Empty the container of fuel.
13. Bump the starter to activate the transfer pump for 25 seconds. Observe the hose for air bubbles. Record filter inlet pressure.
 - a. If fuel filter inlet pressure is greater than 34.8 kPa (5 psi), replace the filter element, and repeat step 12 & 13.
 - b. If bubbles are present, check the lines/connectors between the fuel tank and the transfer pump for conditions allowing air to be drawn into the fuel system. Correct the condition and repeat step 12 & 13.
 - c. If fuel inlet pressure is less than 34.8 kPa (5 psi), proceed to step 14.
14. If the fuel quantity continues to be LESS than 1.33 liters (45 fluid ounces), connect a fuel vacuum test gauge #6828 using the fuel pressure test adapter #6631 between the transfer pump and the chassis mounted fuel lines.
15. Purge all air from the lines by bumping the starter to activate the transfer pump.
16. Empty the container of fuel.
17. Bump the starter to activate the transfer pump for 25 seconds. Observe the hose for air bubbles. Record transfer pump inlet vacuum.
 - a. If inlet vacuum is greater than 152.4 mm/Hg (6 in/Hg), excessive restriction exists between the tank and the transfer pump. Inspect/repair the chassis fuel lines and/or fuel tank module for kinks and/or restrictions. After correcting the restriction, repeat steps 15, 16, & 17.
 - b. If bubbles are present, check the lines/connectors between the fuel tank and the transfer pump for conditions allowing air to be drawn into the fuel system. Correct the condition and repeat step 15, 16, & 17.
 - c. If the fuel quantity continues to be LESS than 1.33 liters (45 fluid ounces) and no bubbles are present, replace the transfer pump.

POLICY:

Information Only.