

## **1998-2002 DODGE 24 VALVE DIAGNOSTICS**

### **CHECKING FUEL SUPPLY PUMP PRESSURE:**

The fuel supply pump pressure is critical for the longevity of the VP44 injection pump. The fuel supply pump should maintain at least 4psi at the inlet to the injection pump on a W.O.T. test drive. Failure to maintain a pressurized flow of un-aerated fuel will cause injection pump damage.

4psi at the inlet to the injection pump with a clean fuel filter allows for a pressure drop across the fuel filter when it is dirty. According to Chrysler, pressure doesn't matter, only volume. The problem with their volume test with an unrestricted flow is their specifications for volume aren't high enough. Some vehicles with the updated in-tank supply pump won't maintain a positive pressure during a test drive. When the supply pump in the injection pump is pulling more fuel than the supply pump in the tank is pushing, then pressure becomes a vacuum because volume isn't high enough. Continued driving, when fuel is under a vacuum, can cause cavitations, which will damage the injection pump.

In order to maintain good fuel flow, especially with performance modifications, you may need to add an additional supply pump.

**NOTE:** The following information is not a substitute for the proper diagnostic manuals, but to share some of the common problems we have run across.

### **PERFORMANCE BOXES**

Performance boxes that tap into, or connect into, vehicle wiring should be removed to make certain that they are not causing any of the following complaints.

### **INJECTORS:**

"Normal" life seems to be about 150,000 miles. When injectors are going bad, they can cause many different intermittent problems, such as: no start, hard start, black smoke, low power, white smoke and rough running.

### **LOW POWER:**

1. Low or no fuel supply pressure.
2. Dirty air filter or inlet restriction.
3. Exhaust leak before the turbo.
4. MAP sensor can go bad and not set a code, check reading with scan tool versus actual.
5. Injectors bad

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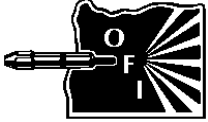


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**NO START:**

1. Low or no supply pressure.
2. No fuel – sending unit in tank defective.
3. If the supply pump recently failed, it could damage the injection pump and cause a no start.
4. Check for DTC, follow Powertrain Diagnostic Procedures Manual.

**INJECTORS BAD:**

1. Check injectors, remove injection lines and crank engine. Do any of the injector feed tubes pump compression back out while cranking? Replace injector, if needed.
2. CMP sensor defective.
3. Injection pump

**HARD START: HOT OR COLD**

1. Follow the same guidelines as no start.
2. Fuel leaks at injector feed tubes, internal or external?
3. If supply pump recently failed, it could cause injection pump problems due to cavitation damage.

**MISS:**

1. Check for DTC.
2. Check injectors.
3. Leaking fuel injector tubes may also cause a miss. If they leak externally, they are also leaking at the injector connection.

**SURGE WHILE DRIVING:**

1. No or low fuel supply pump pressure.
2. 98 & early 99 automatic transmission, see TSB on erratic torque converter clutch operation - needs reflash

**SURGE AT IDLE: OR RUNS ERRATIC AT IDLE**

1. No or low fuel supply pressure.
2. DTC present? Look at solving the codes first.
3. With black smoke and no DTC, possible bad injectors.

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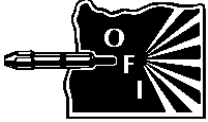
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In addition to the information in the Diagnostic Procedure Manuals, consider the following checks and information.

**DTC 215 – Fuel Injection Pump Control Circuit**

1. Swap injection pump relay with horn relay and retest.

**DTC 216 – Fuel Injection Pump Timing Failure**

1. If supply pump previously failed (within the last 2-3 months) it could cause advance component and housing damage in the injection pump.
2. Low or no fuel supply pump pressure.
3. Improper installation of replacement injection pump. Key not aligned with gear and gear pulled onto shaft with driveshaft nut.
4. Injection pump drive gear installed one tooth off.

**DTC230 – Transfer Pump Circuit Out of Range**

1. Bad fuel Supply pump will normally cause this code.
2. Could also cause a DTC216.
3. Could set due to excessive cranking, see hard start diagnostics.

**DTC336 – Engine Crankshaft Position Sensor (CKP) Signal**

1. Indicates no engine speed or position signal to ECM.
2. Can cause other codes, solve DTC336 first.
3. Reads out on scan tool as ECM engine speed.
4. Will cause multiple problems, such as surge, miss erratic run, hard start, no start, stalls, etc.

**DTC370 – Fuel Injection Pump Speed / Position Sensor Signal Lost**

1. If no other DTC, pump is likely faulty.

**DTC602 – ECM Fueling Calibration**

1. Could be caused by a performance box.
2. Can also be caused by a DTC336.

**DTC1688 – Internal Fuel Injection Pump Failure**

1. This code can be caused by a bad crank sensor (DTC336)
2. If no other DTC, most likely injection pump needs to be replaced due to an electronic failure.

**DTC1689 – No Communication Between ECM and Injection Pump Module**

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1. Can be caused due to excessive cranking – See hard start & no start diagnostics.
2. Wires chaffed at pump connection.
3. Performance box problem.
4. Fuel pump relay bad (swap with horn relay and retest).
5. Possible defective pump.

### DTC1690 – Fuel Injection Pump CKP Sensor Does Not Agree With ECM CKP

1. Monitor RPM reading of the following: ECM engine speed (crank position sensor See DTC336) vs. engine speed CMP (cam position sensor) vs. injection pump engine RPM (from injection pump).
2. Can be caused by a DTC336 – repair DTC336 **FIRST**

### DTC1691 – Fuel Injection Pump Controller Calibration Error (PSG)

Likely an injection pump problem.

### DTC1693 – DTC Detected in PCM

The JTEC controller is reporting that there is a DTC stored in the PCM.

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