1998-2002 DODGE 24 VALVE

DEAD PEDAL:

- This is the most common of all complaints on the 1998.5-2002 Dodge Cummins with the Bosch VP44 injection pump. Being more descriptive about the specific complaint will improve diagnostics. The complaint may also be described as “loss of throttle”, “no throttle response”, or “intermittent low power”, “engine only idles” or “poor throttle response”. This complaint may show up hot or cold. In our experience it is often when the engine is cold, and the customer complains of losing throttle response when pulling out into traffic.
- There a few causes for this complaint but the vast majority are internal VP44 failures. The others are as follows: faulty throttle position sensor (APPS), defective MAP sensor (not sending a boost signal to the ECM for reference), a defective aftermarket performance box that ties in with the MAP and/or APPS sensor, OR least commonly a faulty ECM.
- The problem will most likely be an internal VP44 fault caused by low or no fuel supply pump pressure. This causes the advance piston to stick in the advance housing bore due to cavitation damage. Another cause could be from faulty lead free soldered connections that fail over time in the pump PSG.
- In order to properly diagnose this complaint all of the other possibilities must be eliminated because there are often no codes stored in the ECM in conjunction with the complaint. There are cases where a P0216 code (pump timing failure – advance operation) will be stored in the ECM in conjunction with the complaint which makes diagnostics somewhat easier, but it is still important to do thorough diagnostics.

FUEL SUPPLY PUMP PRESSURE:

- The supply pump is critical for the longevity of the VP44 injection pump. The supply pump should maintain at least 4psi at the inlet to the injection pump on a wide open throttle (WOT) 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 the fuel is under a vacuum, can cause cavitation, which will damage the injection pump.

- In order to maintain good fuel flow, especially with performance modifications, you may need to add an aftermarket supply pump. If the vehicle is equipped with an aftermarket supply pump system, be aware that there may be an inline fuel filter in the fuel supply line prior to the supply pump. This filter should be changed at the same interval as the other fuel filter.

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:

- Low or no fuel supply pressure, restricted fuel filter(s).
- Dirty air filter or inlet restriction.
- Exhaust leak before the turbo.
- MAP sensor can go bad and not set a code, check reading with scan tool versus actual. This can be erratic and sometimes be confused with a "dead pedal" complaint that can be caused by a sticky advance piston, which usually sets a P0216 code. MAP sensor displays on scan tool as absolute not gauge pressure.
- Injectors bad, see injectors heading

NO START:

- Low or no supply pressure.
- No fuel – sending unit in tank defective.
- If the supply pump recently failed, it could damage the injection pump and cause a no start.
- Check for DTC, follow Powertrain Diagnostic Procedures Manual.
- Injectors bad; 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.
- CMP or CKP sensor bad should set a code

- Injection Pump

HARD START: HOT OR COLD

- Follow the same guidelines as no start.
- Internal leaks at injector feed tubes, internal or external?
- If supply pump recently failed, it could cause injection pump problems due to cavitation damage.
- If the vehicle is a 98-00 there may be a re-flash for hard start, refer to TSB 18-015-00. This problem can show up at any time or mile range, but usually after the supply pump is replaced.
- Faulty Overflow Valve, injection pump return.

MISS:

- Check for DTC
- Check Injectors
- Leaking injector tubes (internally) may also cause a miss. If they leak externally, they are also leaking at the injector connection.

SURGE WHILE DRIVING:

- No or low fuel supply pump pressure, restricted fuel filter.
- 98 & early 99 automatic transmission, see TSB 18-02-99 on erratic torque converter clutch operation - needs re-flash
- Erratic APPS signal can sometimes be resolved (instead of a re-flash) with the BD 1300030 noise isolator. Monitor the scan tool for TCC lock/unlock, if it is erratic install noise isolator. This problem normally will not set an APPS code; if you have an APPS code you may have a faulty sensor or wiring issue.

SURGE AT IDLE or RUNS ERRATIC AT IDLE

- No or low fuel supply pressure, restricted fuel filter
- DTC present? Look at solving the codes first.
- If you have black smoke and no DTC, possible bad injectors.
- Possible speed sensor issue inside injection pump, which may not set a code.
- Faulty overflow valve, injection pump return

DTC 215 – Fuel Injection Pump Control Circuit

- Swap injection pump relay with horn relay and retest.

DTC 216 – Fuel Injection Pump Timing Failure

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

DTC230 – Transfer Pump Circuit Out of Range

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

DTC251 – Fuel Injection Pump Mechanical Failure, fuel valve feedback circuit

- If the engine still runs, check for fry grease, too thick of fuel can cause this code to set when the fuel is cold.

DTC252 – Fuel Valve Signal Missing

- If the engine is still running this code can set with improper fuel (bio-fuel) when fuel is cold and viscosity is too thick.

DTC253 – Fuel Injection Pump Fuel Valve Open

- Check fuel injection pump ground or low voltage.
- Swap horn relay with injection pump relay.
- Wiring issue at injection pump connector
- Performance box issue, remove and recheck.
- Injection pump has failed

DTC336 – Crankshaft Position Sensor (CKP) Signal

- Indicates no engine speed or position signal to ECM.
- Can cause other codes, solve DTC336 first.
- Reads out on scan tool as ECM speed however, some scan tools don't identify which rpm signal it is, there are
- Bad CKP 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

- If no other DTC, pump is likely faulty.

DTC602 – ECM Fueling Calibration

- Could be caused by a performance box.
- Can also be caused by a DTC336.

DTC1688 – Internal Fuel Injection Pump Failure

- This code can be caused by a bad crank sensor (DTC336)
- 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

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

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

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

DTC1691 –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.

- Look in the other module for trouble codes, the vehicle has both a PCM and ECM. Some scan tools will not read codes in both modules at the same time. P1693 means – LOOK IN THE OTHER MODULE TO GET THE OTHER CODE!