



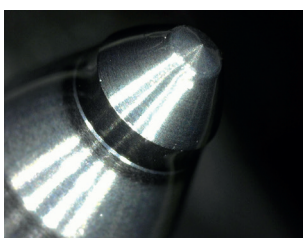
Technical bulletin

PRODUCT:	Common rail injector
OEM:	Bosch, Delphi, Denso, Schaeffler (Continental, Siemens, VDO), Stanadyne
FITS:	Various
JOB:	How to troubleshoot a common rail injector failure

With multiple injections during a single combustion cycle, sub-micron tolerances and operating pressures upwards of 2,000 bar, today's common rail injectors are more susceptible to wear and tear. So it's important to know what to look out for, and how to troubleshoot potential failures.

Why do common rail injectors fail?

- » particle contamination may erode key components, affecting the injector's ability to correctly meter the fuel



particles on nozzle needle

- » excess water can corrode surfaces, block filters and reduce the fuel's lubricating properties, shortening component life
- » any fuel left in the injector after engine shut down, will be 'baked' on - over time these deposits can impact injection timing and quantity
- » poor installation leading to unnecessary wear
- » a short circuit from a faulty ECU, damaged wiring loom or water ingress can damage the solenoid
- » fuel and oil residue from engine blow-by can clog the injectors
- » a cracked nozzle, capnut or o-ring will cause a leak, hampering delivery of the fuel-air mixture
- » a faulty ECU may not be able to tell the fuel injectors how to properly mix and deliver the air and fuel
- » on some applications the injector drive circuit inside the ECU can fail and cause a short to ground, damaging the injector solenoid

What are the signs of a faulty common rail injector?

- » engine management light on
- » engine knock indicating that the timing of the combustion process is off
- » rough idle, engine misfire and/or sluggish acceleration if the vehicle is not getting enough/uneven fuel supply

- » engine surge if the engine is getting too much fuel - revs will change continuously under constant load
- » leaked fuel on either the injector or fuel rail due to physical damage
- » smell of diesel fuel from a leak or an injector stuck open and/or rotten eggs due to a microbial infestation
- » engine running rich resulting in poor fuel economy
- » increased emissions and visible exhaust smoke due to an uneven or incomplete fuel burn

How to diagnose a common rail injector fault:

- » plug in an diagnostic scan tool to confirm the fault code



- » if it brings up a fuel injection system fault code, check the injectors back leak flow to confirm which injector(s) is at fault
- » test the pressure of the common rail pump using an EOBD tool or dedicated sealed rail diagnostic test kit during engine cranking - if the pressure differs from what it should be for that vehicle, then the pump could be at fault - further diagnostics will be required to confirm if this is a mechanical or electrical issue
- » test the injectors electrical functionality:
 - » for a typical DC wound coil, use a multimeter to test the resistance of the injector's electrical integrity - a ground to earth check with a more comprehensive tool can test for coil breakdown
 - » for piezoelectric, specialist hardware will be required to electrically diagnose the solenoid

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