



## Fuel Injector Concerns

Correct installation of a diesel fuel injector is critical to proper engine operation. Improper installation can cause serious engine damage and unnecessary warranty claims. It has been determined, based on analysis of injectors returned as warranty defects, that many injector failures are the result of improper installation procedures or defects in the engine's fuel delivery system.

**These types of injector failures are NOT covered under the limited warranty.**



Figure 1: Lack of Copper Washer or Inadequate Torque Injector

### Missing Copper Washer or Incorrect Torque

A missing copper washer or poorly torqued injector can allow hot combustion gases into the injector cavity. This will result in the failure of the low fuel o-ring on the injector causing fuel to leak into the combustion chamber when the engine is shut down and hot combustion gases into the fuel system when the engine is running.

Fuel leaks into the combustion chamber can result in hydro-static engine lock up and engine failure. This will occur when the engine is off and the fuel drains past the injectors, tapping into the combustion chamber.

Combustion gases leaked into the fuel system will result in the seizure of the internal components of the fuel injector and failure of manifold injection. Since all injectors share a common fuel rail within the cylinder head a leak in the fuel combustion system will contaminate all injectors.

**Black soot on the bottom of the injector is a clear indicator that the injector was improperly torqued or the copper washer was missing.**



### **Fuel Contamination – Split Injector Tip**

Fuel contaminated with water, air, or debris can cause injector tip failure resulting in severe engine damage. Fuel is used to cushion the needle in the nozzle. Lack of fuel at the nozzle, caused by air in the system, low fuel pressure or no fuel pressure can result in this type of failure. Water lacks the characteristics of diesel fuel for lubricity, viscosity and specific gravity. Water present in the fuel can result in fracture of the nozzle tip



### **Fuel Injector Replacement Tips**

- Copper washer is present on the injector being replaced
- Copper washer is present on replacement injector
- Ball tubes are free of gouging, nicks, or burrs (6.0L Powerstroke)
- Oil rail ball tubes are aligned correctly
- Injector is correctly torqued – refer to service manual
- Engine oil is clean and at proper level
- Fuel supply is free of water, air, or debris
- Fuel pressure is within specifications
- Injector sleeve is clean & free of damage
- Engine coolant shows no signs of engine oil (sleeve failure)