



TECHNICAL BULLETIN APTB-02/08 R2

6.0L Injector Failure Analysis and Preventive Maintenance

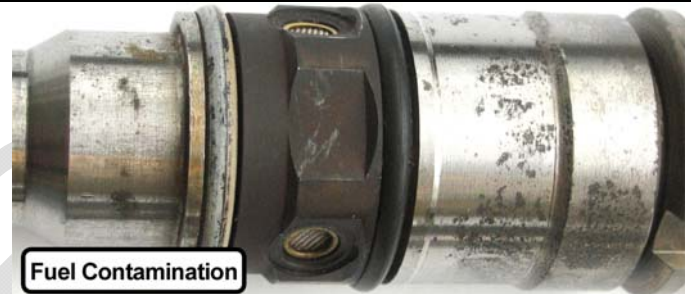
To assist the installer in avoiding premature failures and cold start driveability issues, we've developed two installer guides which will be included with each AP60900 or AP60901 6.0L injector. The first, shown below, covers failure analysis, and the second, shown on page two, advises installers to follow the procedures listed in TSB 08-26-3 to test the FICM, in addition to performing the FICM calibration (program module installation) to incorporate cold injector inductive heat calibration.

ATTENTION INSTALLER: Be sure the injector chamber gasket sealing surface of the cylinder head injector sleeve is clean (see combustion blow by below). Clean fuel and lubricating oil are the keys to longer injector life – when installing injectors, change both fuel filters (pre-filter and final filter), and change lube oil and filter (not only is this a good general practice, but an oil change will eliminate the diluted oil that results when injectors are removed and fuel drains out of the fuel passages in the cylinder head).

Before installing reman Alliant Power injectors in your engine; a visual check of the injectors you've removed will help avoid repeated, or premature, failures. Three common failures, and an oil rail installation caution, are noted below.

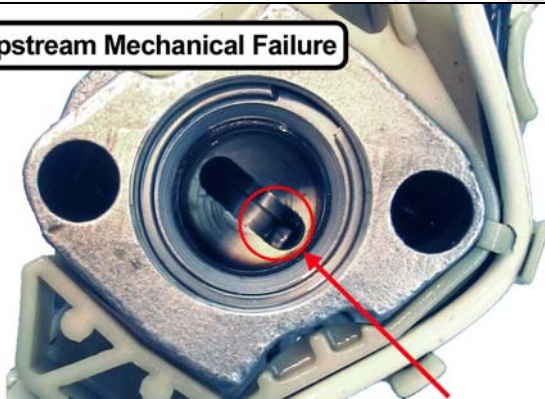


An injector nut that's black with carbon from the chamber gasket to the bottom o-ring, indicates that the sealing surface of the injector sleeve needs to be cleaned. We recommend using solvent and a stiff brush (e.g., Rotunda / Owatonna Tool part number 303-D112) to loosen and remove carbon materials, paying particular attention to the chamber gasket and injector o-ring sealing areas, then use shop towels to clean and dry the sleeve.



Discoloration, or other visible signs of fuel contamination, in the area between the two injector nut o-rings indicates that the injector has been subjected to water, or other contaminants in the fuel. The fuel should be analyzed to determine if contaminants are currently present (the contaminated fuel that left the evidence may already have flowed through the system). If contaminants are present, a complete flushing of the fuel system is required.

Upstream Mechanical Failure



Metallic pieces in the high pressure oil inlet bore of the injector (note the chunk restricting movement of the spool valve) is a sign of a parts failure upstream from the injector, most likely the high pressure pump. Replacement of the high pressure pump and oil reservoir screen, plus flushing the high pressure oil system will be necessary.

Oil Rail Installation Failure



Misalignment of the oil rail inlet fittings can result in a failure such as shown above. The seal itself can be damaged by misalignment, even without evidence of hard part failures. To avoid this type of failure, be certain that all injector inlet fittings are properly aligned during oil rail installation.

RECOMMENDED LUBE OIL AND FUEL FILTER CHANGE SCHEDULE:

INJECTOR HOLD DOWN SCREW TORQUE:

- Change Oil (15 Quarts) and Filter**
- Severe Duty – 5,000 Miles
 - Normal Duty – 7,500 Miles

- Change Fuel Filters**
- Severe Duty – 10,000 Miles
 - Normal Duty – 15,000 Miles

- 24 ft-lb (33 Nm); *Note:* Super Duty vehicles built 1/16/2006 and later, and Econoline vehicles built 1/23/2006 and later, torque is 26 ft-lb (35 Nm)

Alliant Power Technical Support

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TSB 08-26-3 SERVICE PROCEDURES – DRIVEABILITY

No start, hard start, runs rough, and Fuel Injection Control Module (FICM) diagnosis

Attention Installer: If this vehicle exhibits no start, hard start, or rough running symptoms when cold, we recommend you perform the procedures listed in TSB 08-26-3 (the TSB is available at alliantpower.com under the 6.0L Technical Information tab or from your Alliant Power reseller).

Some vehicles with 6.0L engines may experience no start, hard start, or rough running when cold and may be accompanied with DTCs P0611, P1378, and/or all eight injector circuit codes. These symptoms may lessen or disappear when the engine is warm. These conditions may be caused by a failed FICM or injector spool valve(s) sticking internally during cold engine operation (also known as stiction – refer to alliantpower.com under the 6.0L Technical Information tab APTB-09-01R1 – 6.0L Injector Stiction Discussion and Recommendations).

Note: If the vehicle runs rough when the engine is at operating temperature, diagnose those concerns before proceeding with this TSB.

1. A failed FICM can cause DTCs related to injectors even when the injectors or injector wiring are not at fault. TSB 08-26-3 lists the steps to check the FICM for proper operation before evaluating injector operation or wiring issues.

NOTE: BE SURE THE CHARGING SYSTEM AND VEHICLE BATTERIES ARE UP TO SPECIFICATION BEFORE TESTING FICM FOR PROPER OPERATION. AN IMPROPERLY OPERATING CHARGING SYSTEM OR LOW OUTPUT BATTERIES CAN CAUSE ADDITIONAL OPERATING LOADS TO THE INTERNAL COMPONENTS OF THE FICM, LEADING TO SHORTENED FICM LIFE.

2. After checking for proper FICM operation, the TSB calls for reprogramming the FICM to install an inductive heat calibration strategy to reduce injector spool valve sticking during cold engine operation.

After FICM reprogramming:

- ✓ Do not use a click test or power balance to identify cold injector performance issues because the inductive heating strategy is not active during these tests; injectors which do not respond in click test or power balance will respond in normal run mode with the inductive heat calibration
- ✓ If your customer previously had the post cycle calibration, notify them they will no longer hear the injectors cycling after engine shutdown

R1: Referenced TSB 08-26-3, which supersedes TSB 07-5-4; the new TSB includes procedures to test the FICM, in addition to performing the FICM calibration (program module installation) to incorporate cold injector inductive heat calibration.

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