COMBUSTION BLOW-BY TROUBLESHOOTING + DIAGNOSTIC TIPS FOR FORD 6.0L INJECTORS

A common problem on the 6.0L Power Stroke is air in the low-pressure fuel supply to the injectors. The majority of the time the cause is one or more injectors that are not properly sealing in the cylinder head. This allows combustion pressure in the cylinder to blow past the injector sealing washer and lower injector o-ring into the low-pressure fuel supply rail in the cylinder head.

Just one injector with combustion blow-by (see Figure A) will cause multiple misfires, usually on one bank and inaccurate power balance test results that can lead to unnecessary replacement of multiple injectors.

Figure A

COMMON CAUSES OF COMUSTION Figure A BLOW-BY

- Not cleaning carbon deposits from the bottom of the each injector sleeve bore.
- Missing or multiple injector sealing washer(s).
- Reuse of the injector sealing washer. Once a washer is crushed during the injector installation, it will not provide another proper seal if the injector clamp is loosened or removed.
- Either low or high torque of the injector clamp retaining bolt. Torque a retaining bolt requiring a T40 Torx bit to 24 lb. ft. (33 Nm) and a bolt requiring a T45 Torx bit to 26 lb. ft. (35 Nm).

- Oil in the retaining bolt hole in the cylinder head or a stretched retaining bolt will allow the proper bolt torque to be made, however the injector will not be adequately retained in the cylinder head.

CAUTION Low fuel supply pressure and air in the fuel supply system may affect the return stroke of the injector's intensifier piston leading to internal injector damage. Damage may occur to the injector with combustion blow-by and other multiple injectors on either cylinder bank. Prior to replacing multiple injectors, replace the injector(s) with combustion blow-by and reevaluate the engine operation.

DIAGNOSTICS

Most people use the "balloon test" in Ford TSB 08-16-09 to check for combustion blow-by, however, it is easy to miss small leaks using this method. Another test is to remove the secondary fuel filter, top up the housing with clean fuel to just below the standpipe. With the ignition switch in the off position, use a remote starter to crank the engine and watch for air bubbles coming from the standpipe. If bubbles are present, a previously completed power balance test may indicate what cylinder bank to look at first. Remove the glow plug from one cylinder at a time and repeat the bubble test. When the bubbles stop you have located the problem cylinder. Be aware there may be more than one cylinder with combustion blow-by. If you find a cylinder causing air in the fuel supply rail and there is no evidence of combustion blow-by, the injector's nozzle is leaking allowing compression to blow into the injector and on to the fuel rail.

SOURCE:

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