


Fuel Injectors — Late Build

 [Printable View \(481 KB\)](#)

Special Tool(s)

| | |
|---|--|
|  ST2862-A | Release Tool, Injector Connector 303-1115 |
|---|--|

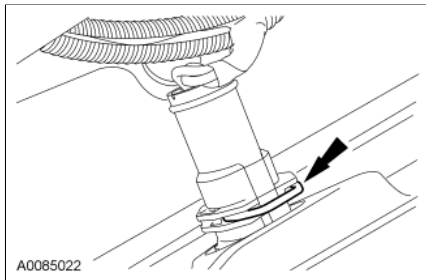
Material

| Item | Specification |
|---|---------------|
| SAE 15W-40 Super Duty Motor Oil XO-15W40-QSD or equivalent | WSS-M2C171-B |
| Metal Brake Parts Cleaner PM-4 (Canada CPM-4) | — |

Removal

All vehicles

1. Remove the valve cover. For additional information, refer to [Section 303-01C](#).
2. Disconnect the fuel injector electrical connector.

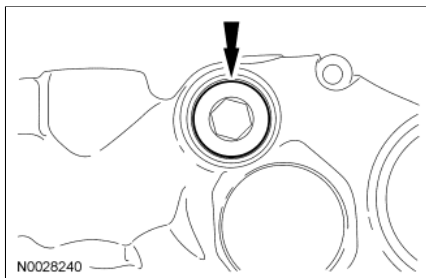


Two-piece head tube

3. **NOTE:** Some engines may have been updated with a new two-piece crankcase-to-head tube. If the crankcase-to-head tube has been updated it will have a hex head.

If the high-pressure oil rail has a hex head, remove the crankcase-to-head tube assembly.

- Remove and discard the O-ring seals.

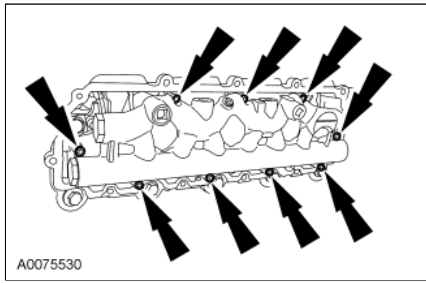


All vehicles

4. **NOTE:** Do not remove the oil rail end plugs or acoustic wave attenuator port fitting. Service parts are not available to support the components.

NOTE: Use a tool like the KD Tool #58965 or Lisle T30 to avoid interference with the evaporator case.

Remove the bolts and the high-pressure oil rail.

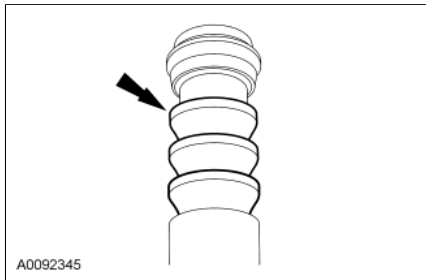


One-piece head tube

5. **NOTE:** The rings on the crankcase-to-head tube are to be used to pry the tube assembly from the branch tube assembly or the oil rail assembly.

Remove the crankcase-to-head tube.

- Remove and discard the O-ring seal.

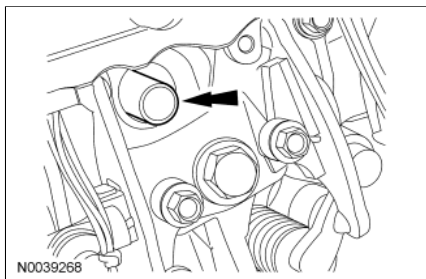


Two-piece head tube

6. **CAUTION:** Use care not to deform the lower crankcase-to-head tube during removal. If the tube is damaged, a new tube must be installed.

NOTE: Use a shop towel and metal brake parts cleaner to remove the oil residue prior to removing.

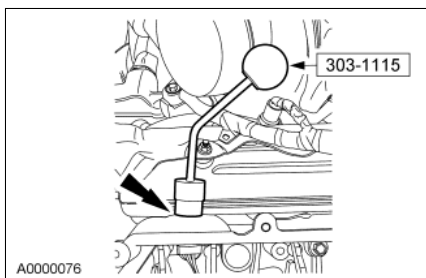
If the updated crankcase-to-head tube separated, using a pair of soft jawed pliers, remove the lower crankcase-to-head tube.



All vehicles

7. **CAUTION:** Do not attempt to apply battery voltage to the fuel injector or damage to the fuel injector will occur.

Using the special tool, push the fuel injector electrical connector out of the rocker arm carrier.



8. Prior to removing the injector assembly, insert clean shop towels in the oil drain holes adjacent to each glow plug.

9. **CAUTION:** Failure to account for all snap rings or pieces prior to placing the vehicle back in service can cause engine damage. A missing snap

ring can be ingested into the lube oil system, causing severe engine damage.

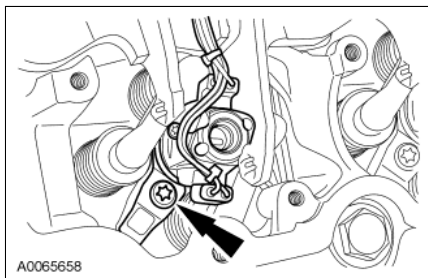
⚠ CAUTION: To prevent engine damage, do not use air tools to remove the fuel injectors. The snap ring that extracts the injector can dislodge and fall into the oil drain hole.

NOTE: There is no need to drain the fuel rail.

NOTE: If engine coolant is found in the combustion chambers, it may be necessary to install a new injector sleeve. For additional information, refer to [Fuel Injector Sleeve](#) in this section.

NOTE: Use a tool like Snap-On SDMT440 torx to avoid damaging the fuel injector plastic and to avoid interference with the evaporator case.

Remove the bolt, fuel injector hold-down clamp and fuel injector.

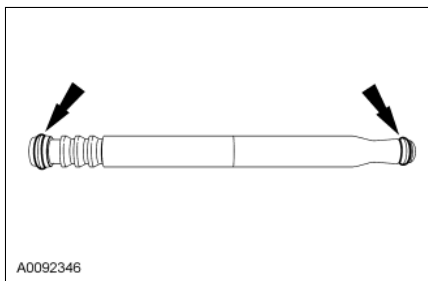


Installation

One-piece head tube

- ⚠ CAUTION:** Install new D-ring seals on the crankcase-to-head tube. It requires several hours after installation for the D-ring seals to relax back to their original size. If the tube assembly is installed before the D-ring seals have relaxed, damage to the D-ring seals can occur.

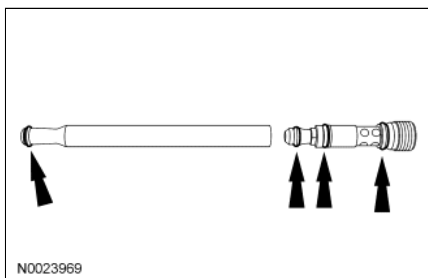
Install new D-ring seals on each end of the crankcase-to-head tube assemblies.



Two-piece head tube

- ⚠ CAUTION:** Install new D-ring seals on the crankcase-to-head tube. It requires several hours after installation for the D-ring seals to relax back to their original size. If the tube assembly is installed before the D-rings have relaxed, damage to the D-ring seals can occur.

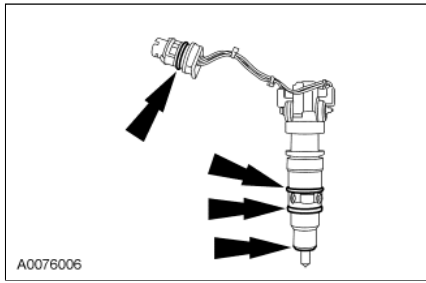
Install new D-ring seals on the crankcase-to-head tube.



All vehicles

- ⚠ CAUTION:** If the fuel injector oil inlet D-shaped O-ring is damaged, a new fuel injector must be installed.

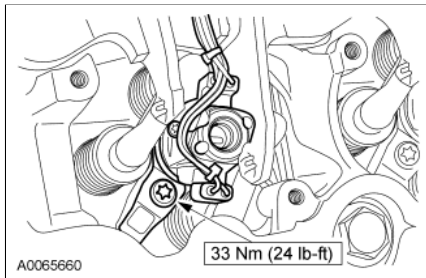
Install new O-ring seals and copper washer on the fuel injector. Lubricate the fuel injector and O-ring seals liberally with clean engine oil.



4. **CAUTION:** Failure to tighten the injector properly can lead to engine damage.

CAUTION: To prevent engine damage, do not use air tools to install the fuel injectors. The snap ring that extracts the injector can dislodge and fall into the oil drain hole.

Install the fuel injector, fuel injector hold-down clamp and bolt.

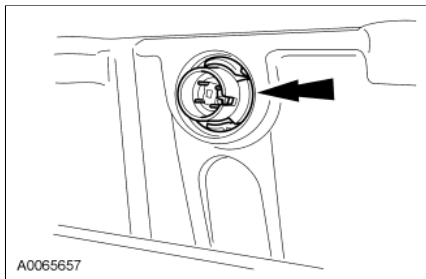


5. **NOTE:** If a snap ring or piece of a snap ring is missing from the injector hold-down assembly, it must be located prior to removing the shop towels.

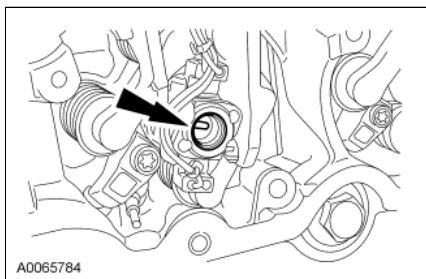
Remove the shop towels.

6. **CAUTION:** Make sure the injector wiring is clear of all moving parts or engine damage can occur.

Install the fuel injector electrical connector into the rocker carrier.



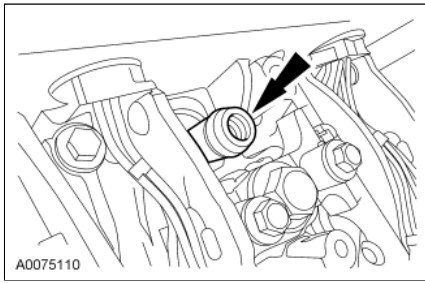
7. Apply engine oil to the top fuel injector O-ring seals.



One-piece head tube

8. **CAUTION:** To prevent engine damage, check that the crankcase-to-head tube assemblies bottom out in the branch tube assembly. The oil rail, crankcase-to-head tube and the fuel injectors will not function correctly if the tubes are not bottomed out.

Apply clean engine oil on the crankcase-to-head tube O-ring seals and install the tubes.

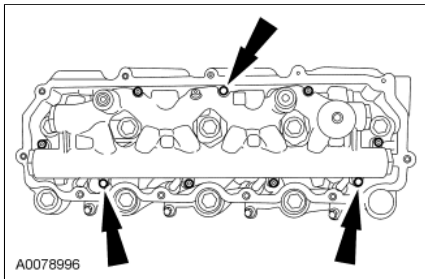


All vehicles

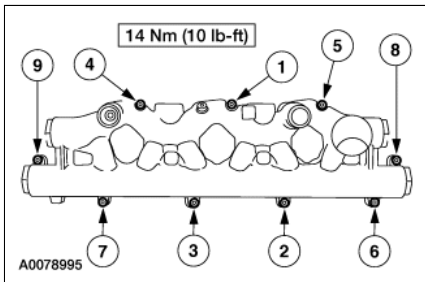
9. **NOTE:** Apply clean engine oil on the tubes prior to installing the oil manifold.

Position the oil rail on the fuel injectors.

- Place the oil rail on top of the carrier so that the four single ball tubes are engaging the injector lead angle.
- Insert three bolts, two on the ends of the straight side of the oil rail and one in the middle of the wavy side of the rail. Install the guide studs six to seven turns.
- Press the oil rail into the fuel injectors.
- Make sure that the oil rail mounting feet are flat against the mounting surface.
- Loosely install the six bolts.



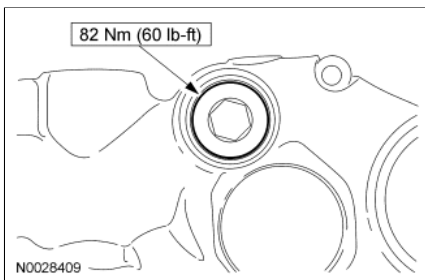
10. Install the oil rail retaining bolts.
- Remove the three guide bolts.
 - Loosely install three remaining bolts.
 - Tighten the nine bolts in the sequence shown.



Two-piece head tube

11. **NOTE:** Apply clean engine oil to the crankcase-to-head tube prior to installation.

If equipped with a updated crankcase-to-head tube, install the crankcase-to-head tube assembly.



All vehicles

12. Connect the fuel injector electrical connector.

