REPLACING UPPER ENGINE GASKETS ON THE FORD 4.0L OHV

Ford 4.0L (OHV) Upper Intake Manifold Assembly Removal & Installation

Removal

1. Disconnect the battery ground cable.

2. I highly recommend taking the hood off. Mark where the bolts connect on the hood to ensure proper alignment upon re-installation. My trick was to use “white-out” to do this, comes with a nice little brush.

3. Remove the air cleaner outlet tube by loosening the clamp next to the MAF and the clamp next to the Throttle Body.

4. Disconnect the accelerator cable from the throttle body arm, and then unclip the accelerator cable from the speed control actuator cable. Move them out of the way.

5. Disconnect the vacuum hoses from the brake vacuum booster, EGR valve and crankcase ventilation hose.

6. Disconnect the wiring harness connectors from the EGR valve, the DPFE sensor, and the idle air control (IAC) valve.

7. Disconnect the DPFE sensor hoses.

8. Disconnect the throttle position sensor (TPS) harness connector.

9. Disconnect the throttle body vapor management hose. This is the small coolant hose that runs directly to a port on the bottom of the TB.

10. Disconnect the spark plug wires from the ignition coil.

11. Disconnect the harness connector from the ignition coil and the radio ignition interference capacitor.

12. Slide the engine sensor control connector off the bracket. This is the large black connector that is located up near the firewall on the driver’s side of the engine bay.

13. Remove all 6 nuts (13mm) holding down the upper intake manifold, and the small attached bracket.

(*‘98 Ranger 4.0L Upper Intake Assembly*)

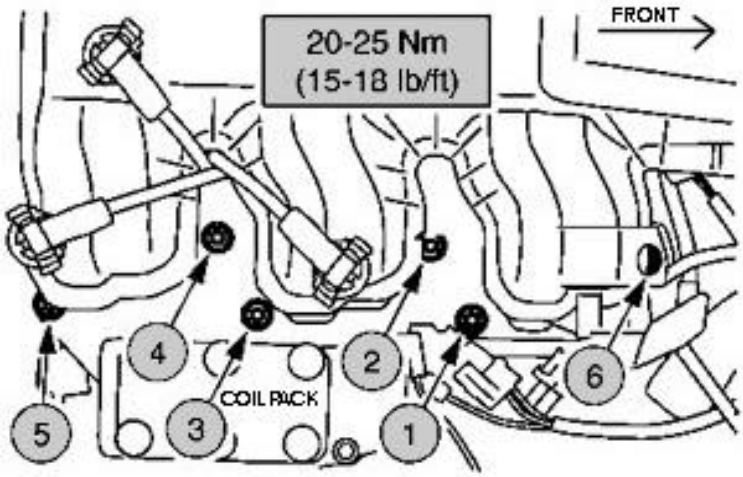
14. Remove the upper intake manifold assembly by pulling straight up.

15. Remove the upper intake manifold gaskets from the upper intake.

Installation

1. Installation of the Upper Intake Manifold Assembly is the reverse of removal.

Tighten the nuts in the sequence shown:



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Ford 4.0L (OHV) Valve Covers & Gaskets - Removal & Installation

Removal

1. Remove the upper intake manifold as described above.

2. Disconnect the vacuum line that goes into the top of the EGR valve.

3. Remove the bolts (10 mm) securing the EGR valve to the Tube that goes into the upper intake.

4. Remove the oil level indicator tube.

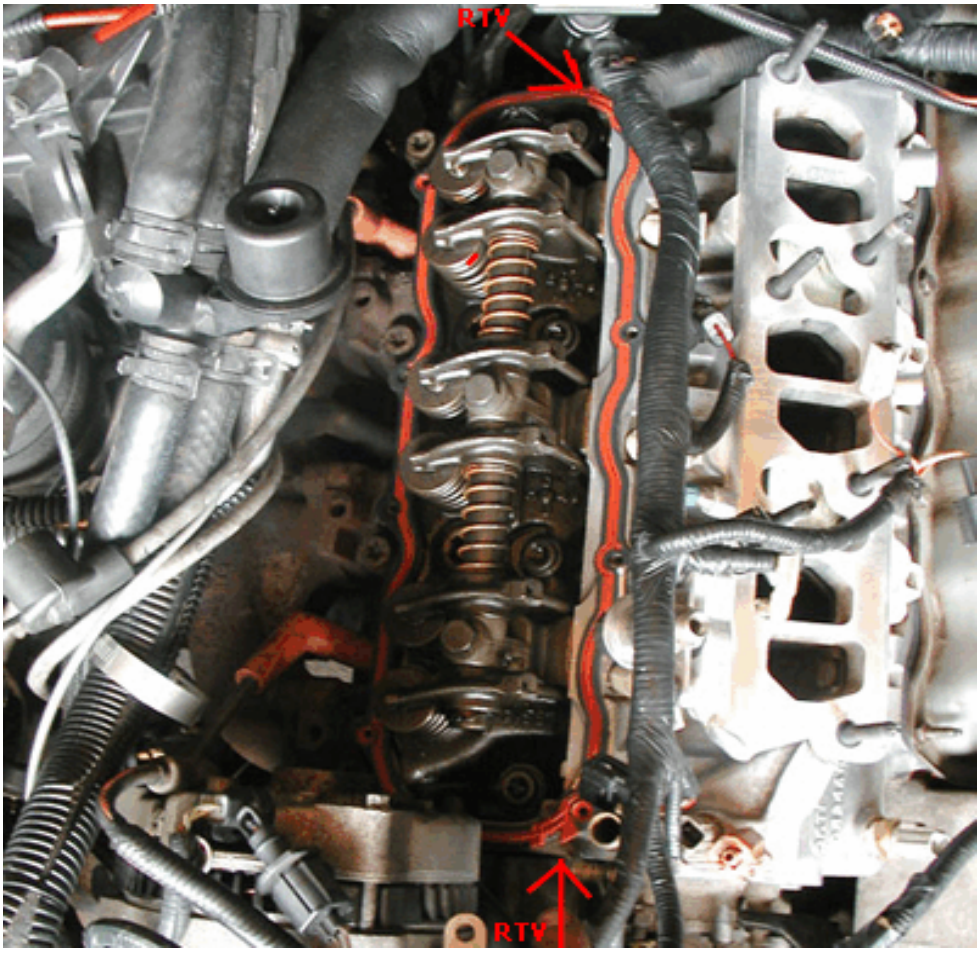
5. Remove the EGR Tube and the bracket (Be careful not to let the metal gasket fall and get lost).

6. Remove the valve cover bolts (10 mm).

7. Remove the valve covers (requires some lifting and twisting) and the valve cover gaskets.

Installation

1. Clean and inspect the gasket sealing surfaces.

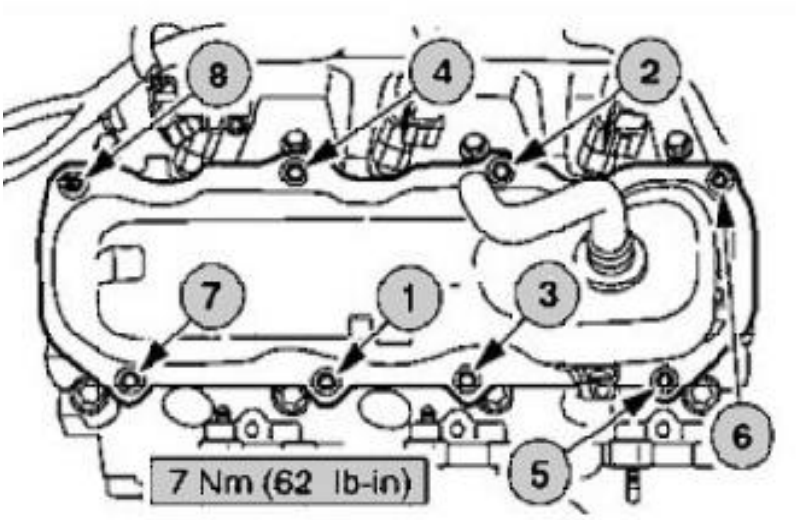


NOTE: It is necessary to apply a dab of good RTV (I used Permatex Ultra Black) in 2 places on each valve cover gasket sealing surface before installing the gaskets. You will see that there is a little "step" where the intake manifold and cylinder heads join together. The OEM valve cover gaskets, as well as the Fel-Pro Perma-Dry Plus gaskets that I used, have a special "hinged-carrier" design which helps the gasket seal those joint areas. These are the areas that require the RTV support.

(*Valve Cover Gasket - passenger side)*

2. Install the valve cover gaskets, valve covers and the bolts.

Tighten the bolts in the sequence shown:



3. Install the EGR Tube and the bracket.

4. Install the oil level indicator tube.

5. Install the gasket and the EGR valve. Torque the two bolts to 25 Nm (18 lb-ft).

6. Connect the EGR valve vacuum line.

7. Install the upper intake manifold as described above.

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Ford 4.0L (OHV) Lower Intake Manifold & Gasket Removal & Installation

Removal

1. Remove the upper intake manifold and valve covers as described above.

2. Relieve the fuel line pressure.

3. Disconnect the fuel line from the Fuel Supply Intake Manifold (see comments below).

4. Disconnect the harness connectors to the fuel injectors, the engine coolant temperature sensor (ECT), the water temperature indicator sending unit, and the oil pressure sensor.

5. Remove both the valve covers and the valve cover gaskets as described above.

6. Remove the upper radiator hose, the thermostat housing (10 mm bolts), and the thermostat.

7, Remove all 8 lower intake manifold bolts (10 mm).

8. Remove the lower intake manifold.

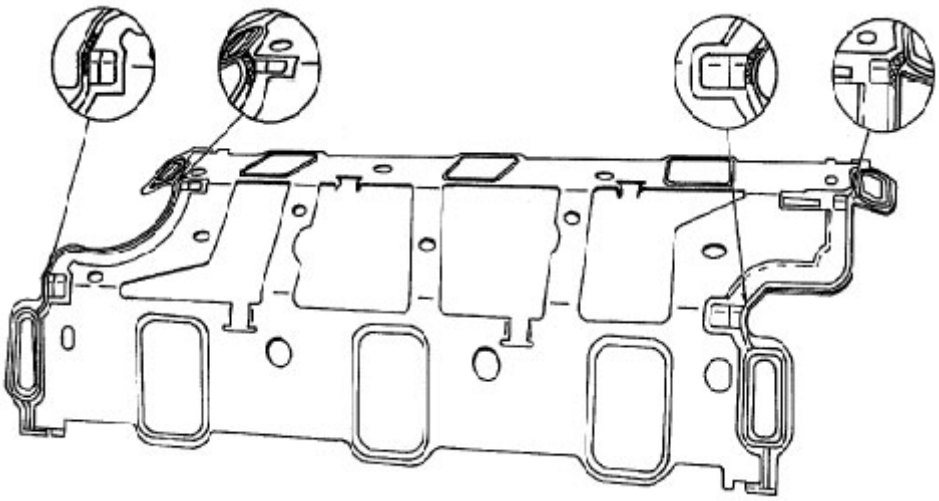
(*4.0L Lower Intake Manifold - bottom view*)

9. Remove the lower intake manifold gasket.

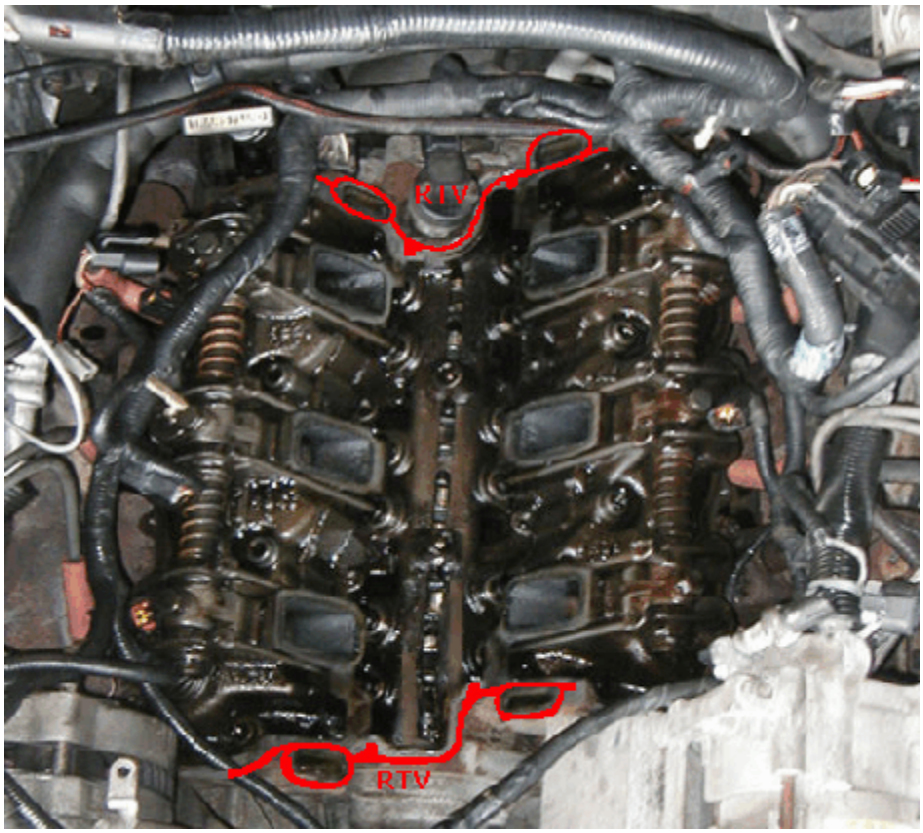
Installation

1. Clean the gasket sealing surfaces.

2. Install the lower intake manifold gasket.



NOTE: It is necessary to apply RTV to a few specific areas on the gasket sealing surface before installing the intake manifold gasket. Ford says you only need to apply some RTV to the 4 corners (both sides of gasket) where the intake meets the engine...



...but I went a little further with the RTV (although not quite as far as Haynes Manual advises). I put a tiny bead of Ultra Black around each coolant port (there are 4 in all, two in front, two in back) and also ran a small bead between the front corners, and then the back corners, for a complete seal. Essentially, I put RTV down wherever the rubber ends of the OEM gasket meet the engine. After positioning the gasket, I added a dab of RTV to the 4 corners, per Ford.

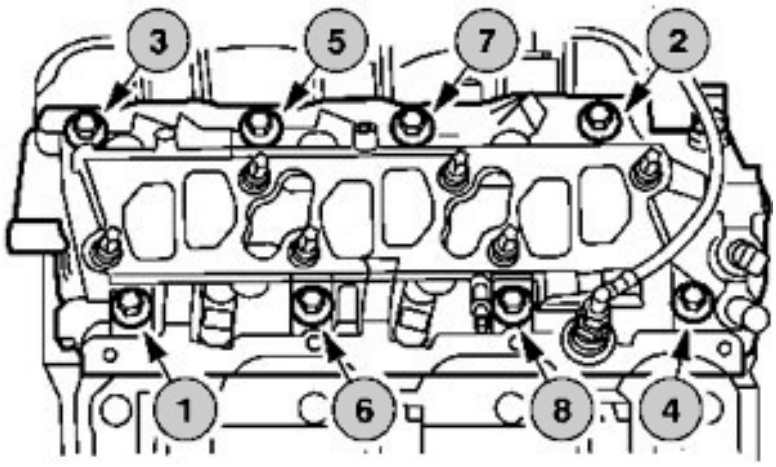
3. Using the guide pins, install the intake manifold. Tighten the bolts in sequence in four steps:

Step 1: Tighten to 2.5 Nm (22 lb-in).

Step 2: Tighten to 10 Nm (88 lb-in).

Step 3: Tighten to 13 Nm (115 lb-in).

Step 4: Tighten to 14-18 Nm (11-13 lb-ft).



4. Install the upper radiator hose, the thermostat, and the thermostat housing. Torque the thermostat housing bolts to 9-12 Nm (80-106 lb/in.). I used Permatex Water Pump/T-Stat Housing RTV to help seal the housing to the lower intake.

5. Install the valve cover gaskets and valve covers as described above.

6. Connect the harness connectors for the fuel injectors, the ECT, the water temperature indicator sending unit, and the oil pressure sensor.

7. Connect the fuel line.

8. Install the upper intake manifold as described above.

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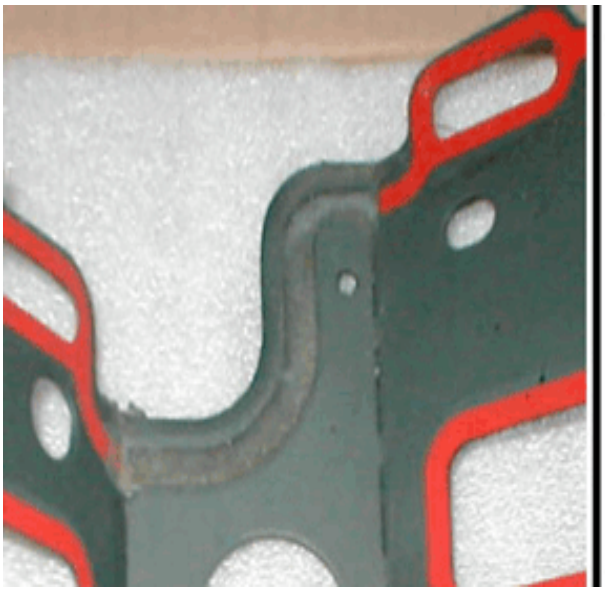
Miscellaneous

Choosing Gaskets

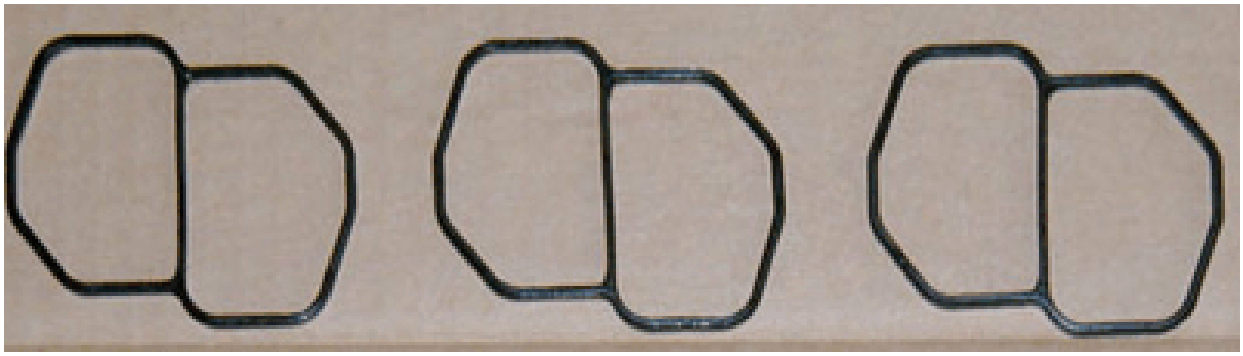
1. Use OEM Intake Gaskets. The Fel-Pros are good, but the Ford Gaskets are better, according to most 4.0L gurus. Apparently the Fel-Pro lower intake gasket uses cork on the ends, as opposed the rubber that Ford uses: (Ford Part # F7TZ-9E439-AA)



(Fel-Pro Lower Intake Gasket - Cork Ends)

(OEM Lower Intake Gasket - Rubber Ends)

2. For 1995+, the "Upper Intake Gasket" on the 4.0L is actually a set of three gaskets: (Ford Part # F57Z-9E436-AA)



3. Fel-Pro does make high quality Valve Cover Gaskets for the 4.0L, not the cork ones, but their "Perma-Dry Plus" rubber composite gaskets, which I used. (Part # VS50368T at Advance Auto).

A Few More Comments

1. I chose not to detach the Fuel Supply Manifold (a/k/a the "fuel rail") from the Lower Intake Manifold. I pulled the whole assembly together, fuel injectors and all. I figured that I was not getting any lean codes, which is what a bad Fuel Supply Manifold Gasket would cause, so no need to disturb anything there. However, if you have a 1997 4.0L, I would not advise skipping this gasket like I did. For some reason, for that year only, the gasket located between the Fuel Supply Manifold and Lower Intake Manifold can lose its compressive loading and get drawn into the intake manifold runners, resulting in a vacuum leak/lean condition and associated codes. A redesigned gasket has been used ever since (TSB 98-6-8). So if you are doing this kind of repair, replacement of the Fuel Supply Manifold Gasket is probably advisable on the 1997 models. ***See attached TSB 98-6-8**

2. Make it a point to thoroughly clean all the gasket surfaces, and put a wire wheel to all the nuts and bolts, so as to ensure proper sealing and torquing. And now is as good a time as any to clean up the intakes, inside and out. I used solvent, a rag, and a small, fine-wire brass brush on the metal parts.

3. I was working alone, so before dropping in the new Lower Intake & Gasket, I used long zip ties to secure the wiring harness(es) out of the way. This was also helpful when installing the Valve Covers, which require a decent amount of negotiation to get back on.

4. There is an EGR Tube which connects to the Upper Intake and is bolted to the EGR Valve. It is curved at the intake end, and protrudes several inches inside of it, which makes removing and installing the Upper Intake Assembly more difficult than it looks to be at first glance. Keep this in mind.

5. Replacing your Upper Engine Gaskets is not a difficult project, but with things like the wiring harness and A/C lines snug against the engine and in the way, normally simple things become more time-consuming tasks in their own right. Pulling the Valve Covers is a tight squeeze, for example, not like the old days when you could rip 'em off in less than 5 minutes. But everything is quite doable if you follow the steps outlined above, even for a hacker like myself. :)

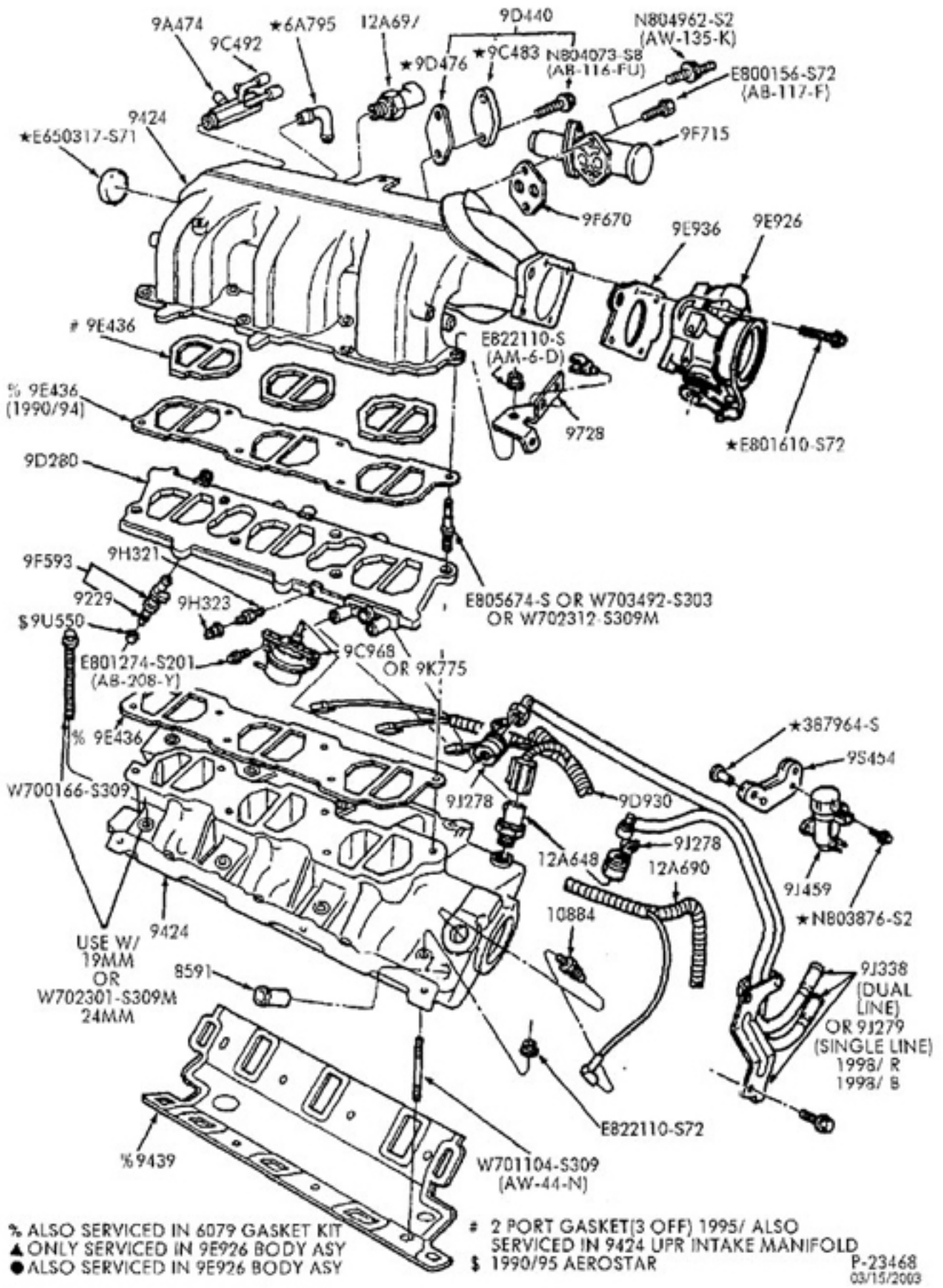
6. Finally, when I was at the dealership ordering the gaskets, I was able to coax a nice printout of the 4.0L OHV Upper & Lower Intake Assembly from the parts counter guy, so I'll include it here for reference:

1998 R (Ranger)

90 - Emission System, Fuel System, Manifold

6 CYL. 4.0L - OHV

Fuel injection manifold, injectors, valves and wiring supply and return fuel system



- **ROUGH IDLE—MALFUNCTION INDICATOR LAMP (MIL) ILLUMINATED—DIAGNOSTIC TROUBLE CODES (DTCS) P0171, P0174, P1131 AND/OR P1151 STORED IN MEMORY—4.0L ENGINES ONLY**
- **STALL—DURING IDLE—MALFUNCTION INDICATOR LAMP (MIL) ILLUMINATED—DIAGNOSTIC TROUBLE CODES (DTCS) P0171, P0174, P1131 AND/OR P1151 STORED IN MEMORY—4.0L ENGINES ONLY**
- **LAMP—MALFUNCTION INDICATOR LAMP (MIL) ILLUMINATED—DIAGNOSTIC TROUBLE CODES (DTCS) P0171, P0174, P1131 AND/OR P1151 STORED IN MEMORY—4.0L ENGINES ONLY**

Article No. 98-6-8

FORD: 1997 AEROSTAR, RANGER

This TSB article is being republished in its entirety to correct the part number listed, revise the Service Procedure, and add Aerostar.

ISSUE

A rough idle, stalling at an idle and/or Diagnostic Trouble Codes (DTCs) P0171, P0174, P1131, and/or P1151 may be stored in memory on some vehicles with a 4.0L engine. This may be caused by the gasket located between the fuel rail and lower intake manifold losing its compressive loading and becoming drawn into the intake manifold runners resulting in a vacuum leak.

ACTION

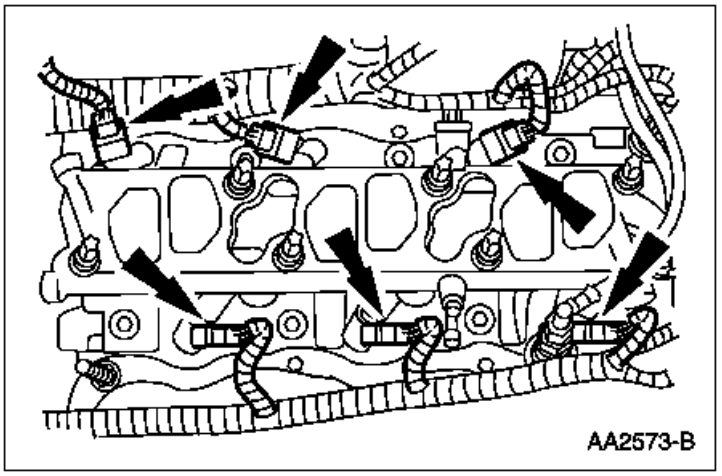
Replace the fuel rail-to-intake manifold paper gasket with a revised gasket. Refer to the following Service Procedure and the 1997 Ranger or Aerostar Service Manual for removal and replacement procedures.

SERVICE PROCEDURE

1. Remove the upper intake manifold and inspect the O-ring style gaskets on the mounting surface of the upper intake manifold. If the gasket bead is above the intake surface and is not torn, do not disturb the gasket. If any of the O-ring gaskets are torn or do not protrude beyond the mounting surface of the upper intake manifold, the gasket should be replaced.
2. Remove six (6) studs and lift off fuel rail manifold and paper gasket.
3. Inspect all holes in the lower intake manifold to make sure there is no debris.
4. Replace the Gasket (F8PZ-9E436-AA) (bright green paper and blue bead) and set the fuel rail manifold on the gasket. No paper gasket is needed on the top side of the fuel rail manifold.
5. Lubricate the lower portion of the stud bolts with a light grade oil such as 5W30 and torque the bolts to 14 ±2 N•m (10 ±1.5 lb-ft) using the torque sequence shown in Figure 1.
6. The upper intake manifold should be installed and the nuts torqued to 25 N•m (18.5 lb-ft) using the torque sequence shown in Figure 1.
7. Start and warm the engine.
8. Allow the engine to cool and retorque all of the nuts to 25 N•m (18.5 lb-ft) using the sequence shown in Figure 1.

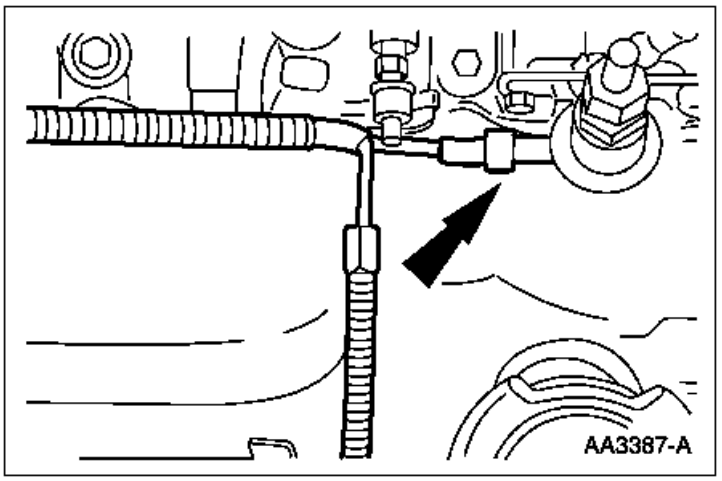
PART NUMBER	PART NAME
F8PZ-9E436-AA	Fuel Rail-To-Intake Manifold Gasket

1. **Disconnect the fuel injector harness connectors**

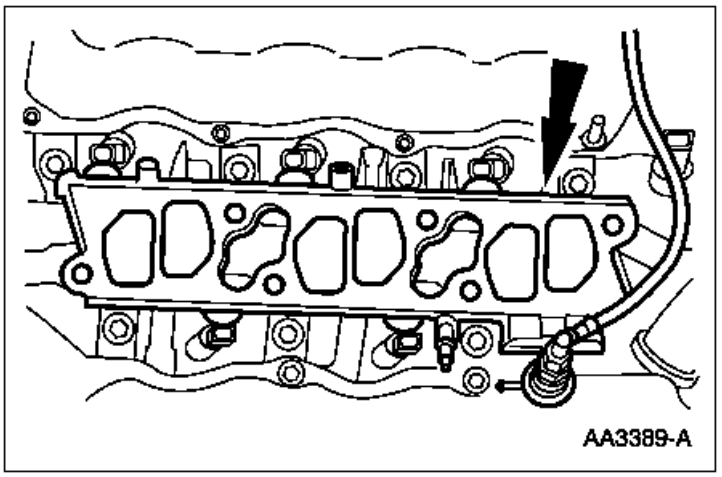


NOTE: You need a size E7 "reverse torx" socket for the studs that secure the fuel supply manifold to the lower intake.

2. Disconnect the fuel pressure regulator vacuum hose.



3. Remove the fuel supply manifold and the fuel injectors as an assembly. Install protective tape and caps to the engine openings.



4. Disconnect the fuel supply line from the fuel supply manifold and install a protective cap.

CAUTION: Do not use metal scrapers, wire brushes, power abrasive discs, or other abrasive means to clean the sealing surfaces.

NOTE: It is important that the gasket surfaces are free from all dirt, oil and debris. Remove and discard the gaskets. Clean the gasket surfaces. Clean the gasket sealing surfaces with Metal Surface Cleaner F4AZ-19A536-RA or equivalent meeting Ford specification WSE-M5B392-A. Allow the surfaces to dry until there is no sign of wetness.

5. Remove the gaskets and clean the gasket surfaces.

Installation

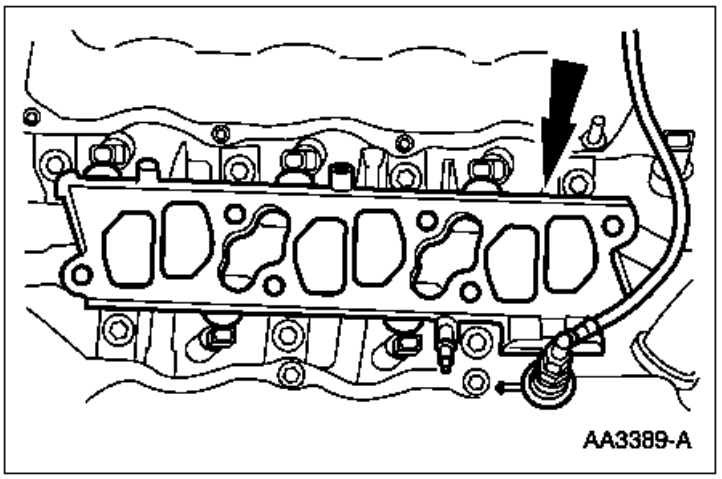
1. **WARNING: DO NOT CARRY AN OPEN FLAME OF ANY TYPE WHEN WORKING ON OR NEAR AN OPEN FUEL SYSTEM. OVER A PERIOD OF TIME, THE FUEL SYSTEM MAY BUILD PRESSURE. USE CAUTION WHEN REMOVING THE PROTECTIVE CAPS. INSPECT THE FUEL LINE O -RING SEALS FOR DAMAGE, PRIOR TO ASSEMBLY. REPLACE THE O-RINGS ONLY WITH APPROPRIATE REPLACEMENT PARTS. LUBRICATE THE O -RINGS WITH CLEAN ENGINE OIL PRIOR TO ASSEMBLY.**

   Remove the protective cap. Connect the fuel supply line to the fuel supply manifold. Securely tighten the retaining bolts.

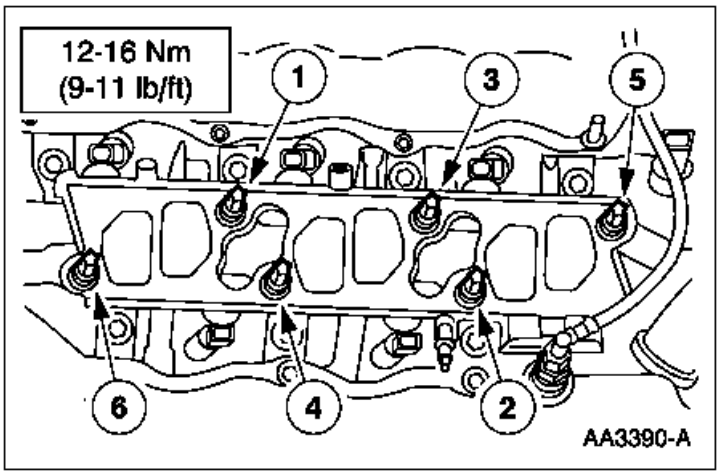
2. **CAUTION: Do not use silicone grease to lubricate the O -rings. Silicone grease can plug fuel injectors.**

   NOTE: Inspect the fuel injector O -ring seals for damage prior to assembly. Replace the O -rings only with appropriate replacement parts. Lubricate the O -rings with clean engine oil prior to assembly. Make sure the fuel injector end caps are clean and free of contamination.

   Remove the protective caps and tape from the engine openings. Install a new fuel supply manifold gasket. Install the fuel injectors and supply manifold as an assembly.



3. Tighten the retaining studs in sequence to 14 Nm (10 lb -ft).



4. Connect the engine harness connectors to the fuel injectors.