
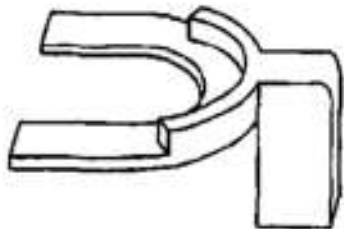



# DISASSEMBLY AND ASSEMBLY OF SUBASSEMBLIES

## CYLINDER HEAD

### Special Tool(s)

	<p>Compressor, Valve Spring 303-567 (T97P-6565-AH)</p>
	<p>Compressor Spacer, Valve Spring 303-382 (T91P-6565-AH)</p>
	<p>Installer, Valve Stem Oil Seal 303-383 (T91P-6571-A)</p>

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**Fig. 530: Identifying Special Tools**  
Courtesy of FORD MOTOR CO.

### Material(s)

Item	Specification
Silicone Gasket Remover ZC-30	—
Metal Surface Prep ZC-31	—

G01548695

**Fig. 531: Identifying Materials (1 Of 2)**  
Courtesy of FORD MOTOR CO.

Item	Specification
SAE 5W-20 Premium Synthetic Blend Engine Oil XO-5W20-QSP or equivalent	WSS-M2C153-H

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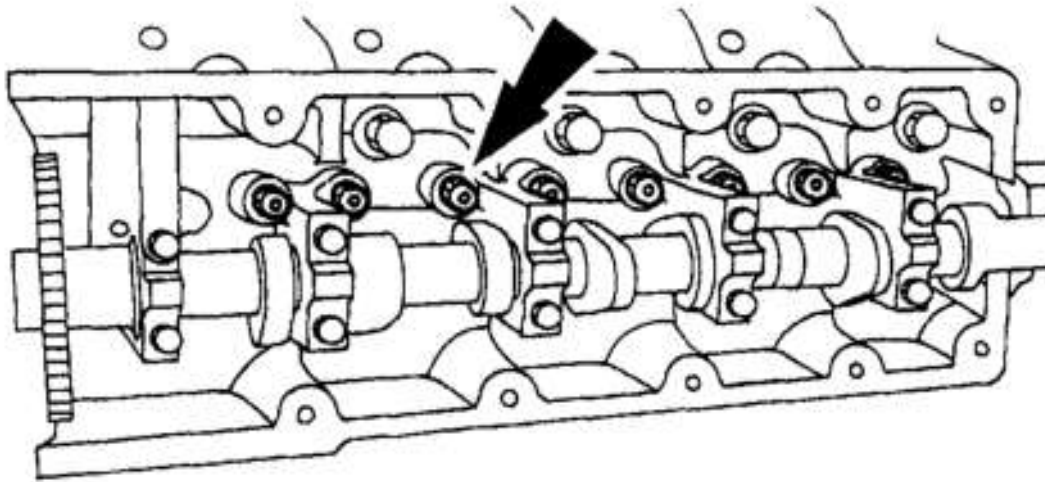
**Fig. 532: Identifying Materials (2 Of 2)**  
Courtesy of FORD MOTOR CO.

#### Disassembly

**CAUTION:** Cylinder head machining or milling is not authorized by the Ford Motor Company. Cylinder head flatness must be within 0.0254 mm (0.001 in) across a 38.1 mm (1.5 in) square area.

**CAUTION:** Place the cylinder head on a cardboard or wood surface to prevent damage to the joint face.

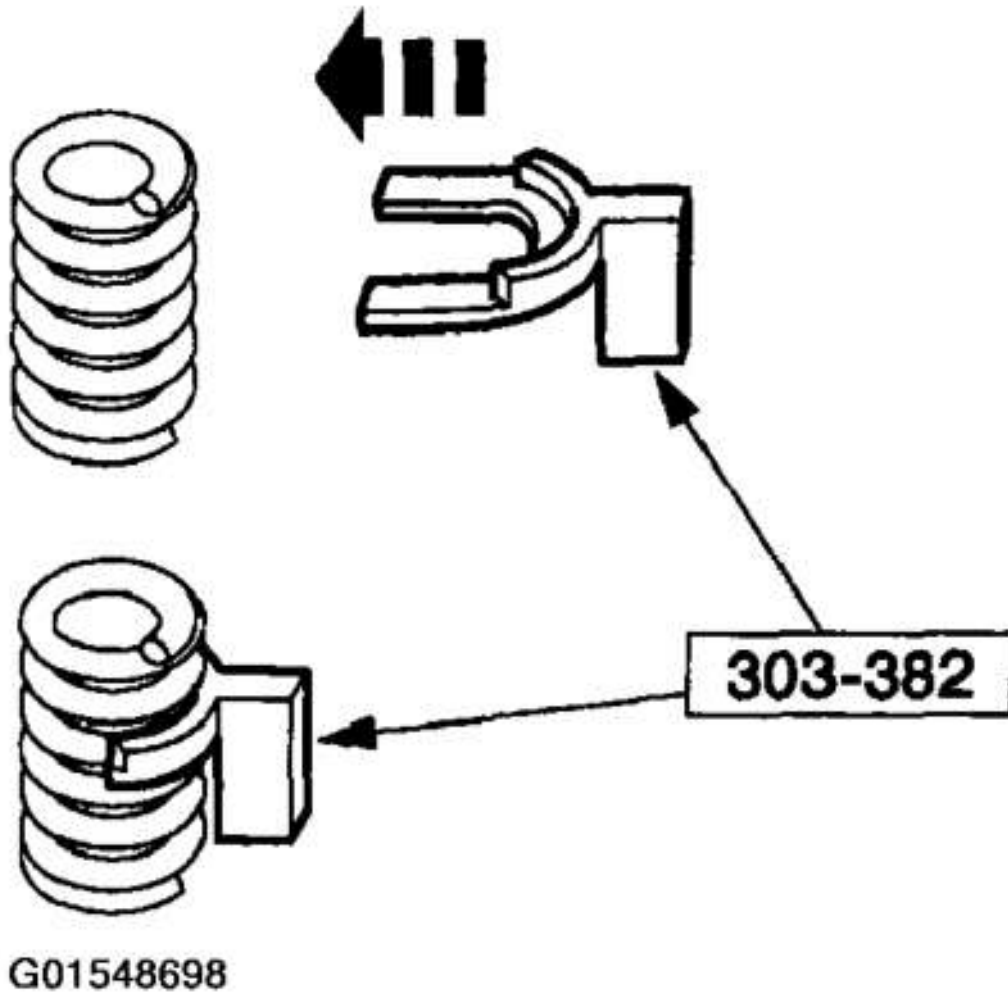
**NOTE:** The hydraulic lash adjusters must be reinstalled in their original locations. Record the hydraulic lash adjuster locations.



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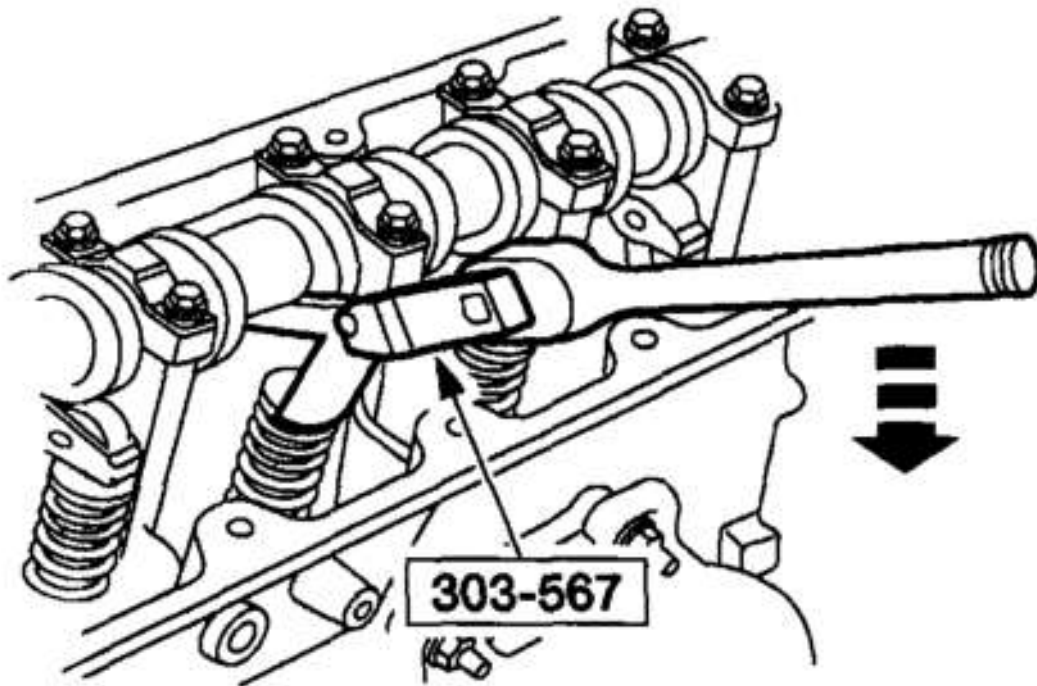
**Fig. 533: Removing Hydraulic Lash Adjusters**  
**Courtesy of FORD MOTOR CO.**

1. Remove the hydraulic lash adjusters.
2. Install the special tool between the valve spring coils to prevent valve stem seal damage.



**Fig. 534: Installing Special Tool Between Valve Spring Coils**  
Courtesy of FORD MOTOR CO.

3. Use the special tool to compress the valve springs.

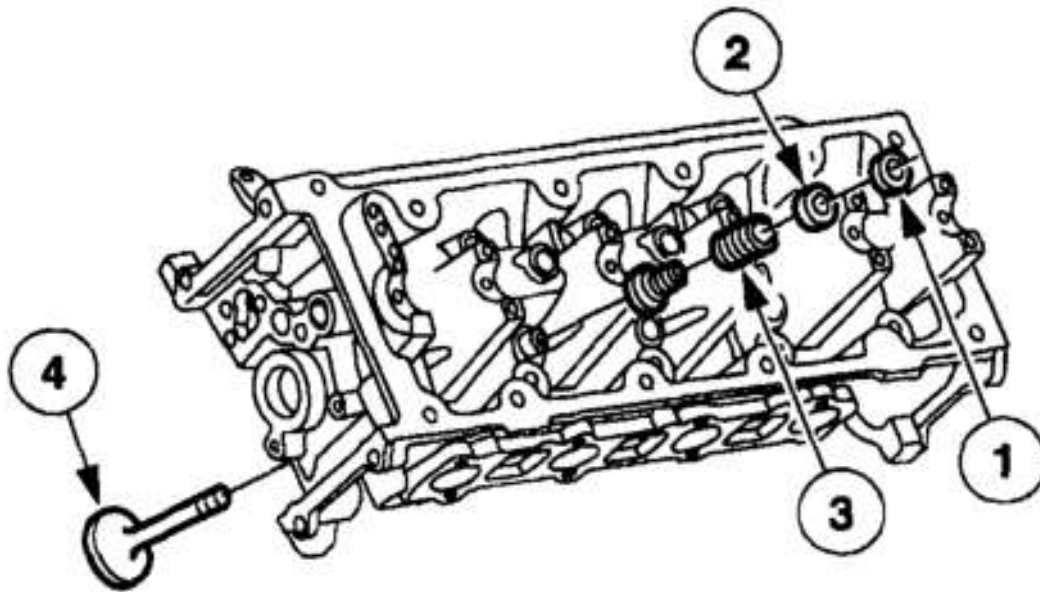


G01548699

**Fig. 535: Compressing Valve Springs Using Special Tool**  
Courtesy of FORD MOTOR CO.

**CAUTION:** Keep the valves and valve spring retainer keys in order so they can be reinstalled in their original locations.

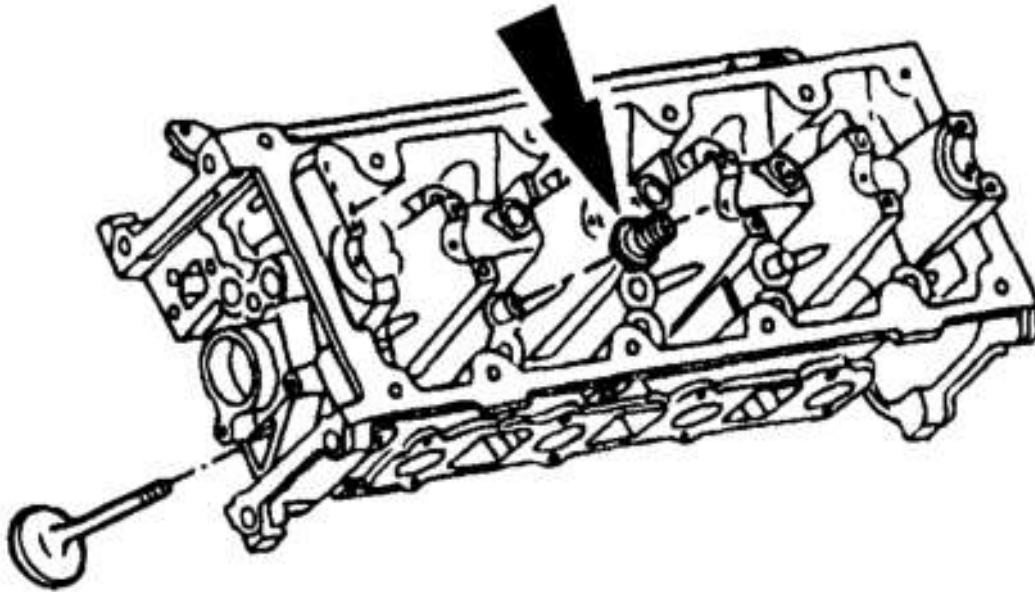
**NOTE:** Shown without camshaft for clarity.



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**Fig. 536: Removing Valves**  
**Courtesy of FORD MOTOR CO.**

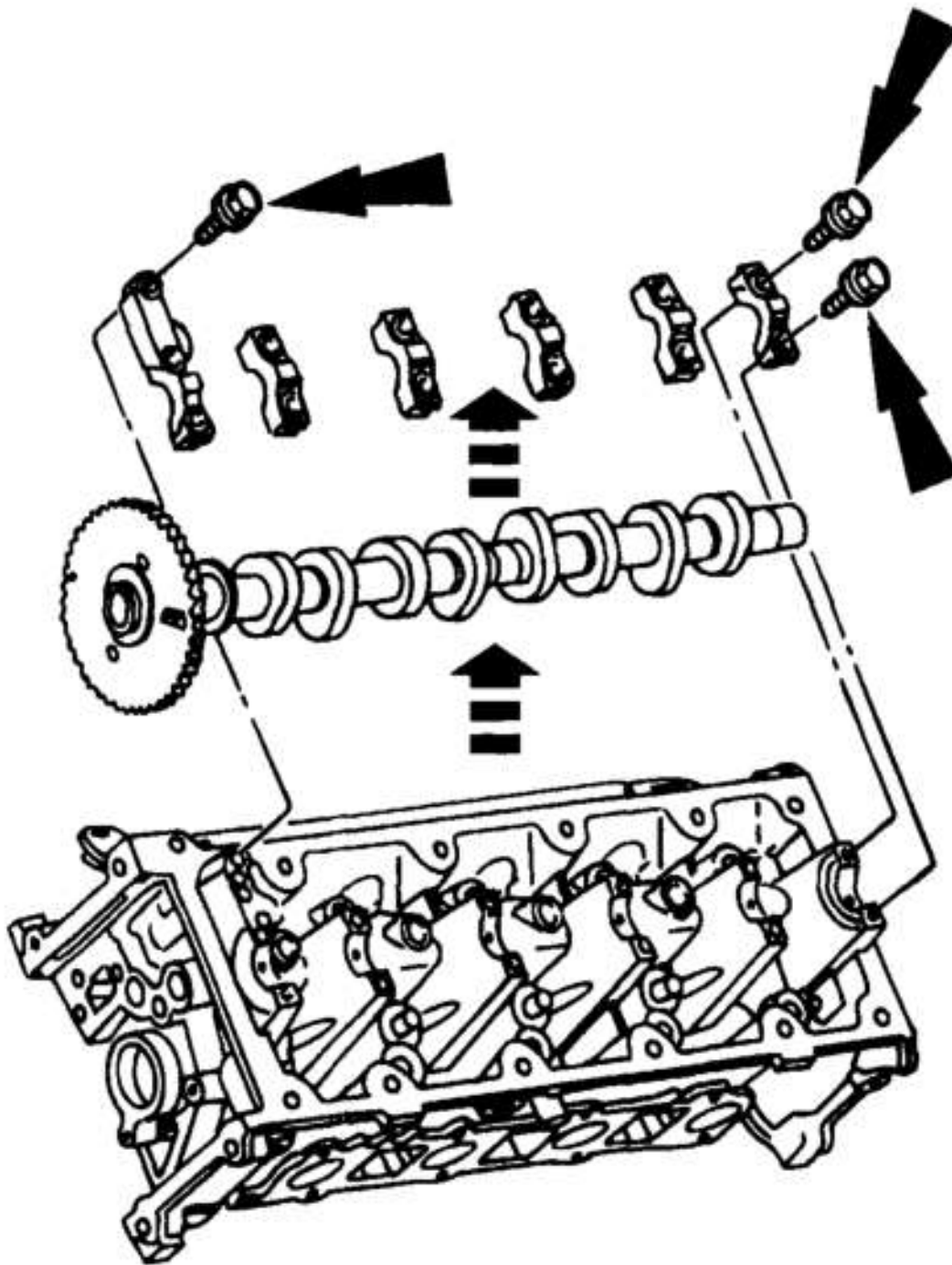
4. Remove the valves.
  1. Remove the valve spring retainer keys.
  2. Remove the valve spring retainers.
  3. Remove the valve springs.
  4. Remove the valves.
5. Remove the valve stem seals.



G01548701

**Fig. 537: Removing Valve Stem Seals**  
Courtesy of FORD MOTOR CO.

**NOTE:** The camshaft bearing caps must be reinstalled in their original locations. Record the camshaft bearing cap locations.



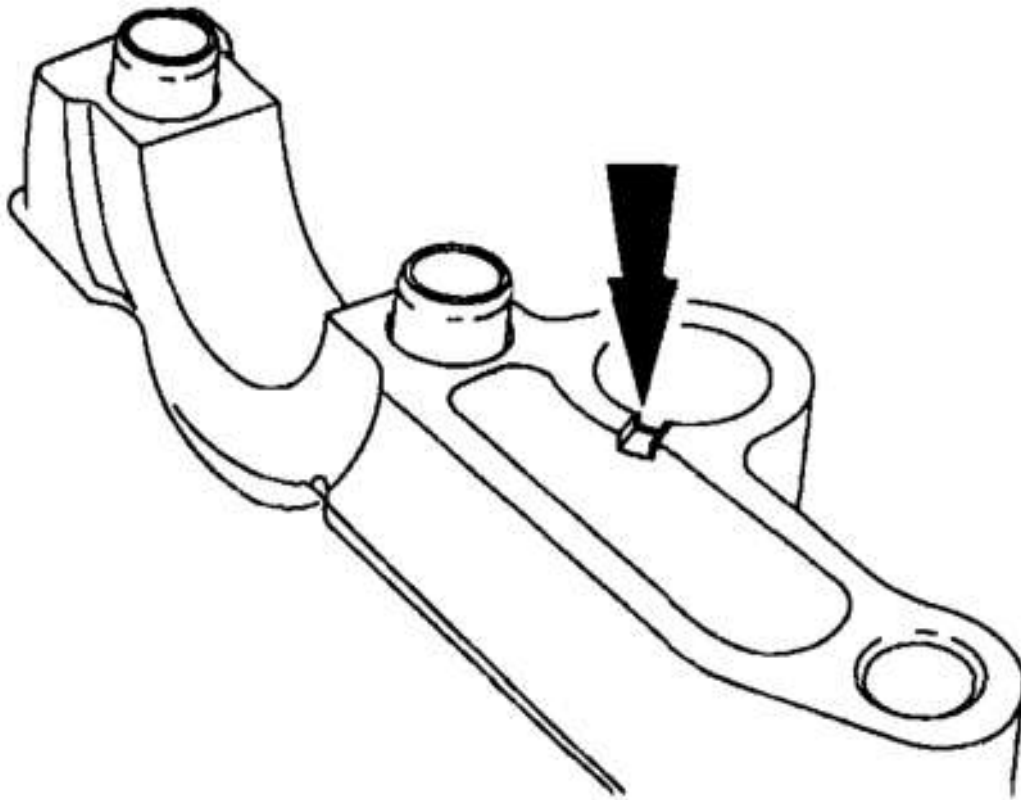
G01548702

**Fig. 538: Removing Bolts, Bearing Caps And Camshaft**  
Courtesy of FORD MOTOR CO.

6. Remove the bolts, the bearing caps and the camshaft.
7. Clean and inspect the camshaft bearing caps.
  - One of the bearing caps contains an oil flow restriction groove. Make sure the groove is free of



foreign material.



G01548703

**Fig. 539: Inspecting Camshaft Bearing Caps**  
Courtesy of FORD MOTOR CO.

**CAUTION:** Do not use metal scrapers, wire brushes, power abrasive discs or other abrasive means to clean the sealing surfaces. These tools cause scratches and gouges that make leak paths. Use a plastic scraping tool to remove all traces of the head gasket.

**CAUTION:** Observe all warnings or cautions and follow all application directions contained on the packaging of the silicone gasket remover and the metal surface prep.

**NOTE:** If there is no residual gasket material present, metal surface prep can be used to clean and prepare the surfaces.

8. Clean the cylinder head-to-cylinder block mating surfaces of both the cylinder head and the cylinder block.
  1. Remove any large deposits of silicone or gasket material with a plastic scraper.

2. Apply silicone gasket remover, following package directions, and allow to set for several minutes.
3. Remove the silicone gasket remover with a plastic scraper. A second application of silicone gasket remover may be required if residual traces of silicone or gasket material remain.
4. Apply metal surface prep, following package directions, to remove any remaining traces of oil or coolant, and to prepare the surfaces to bond with the new gasket. Do not attempt to make the metal shiny. Some staining of the metal surfaces is normal.

## Assembly

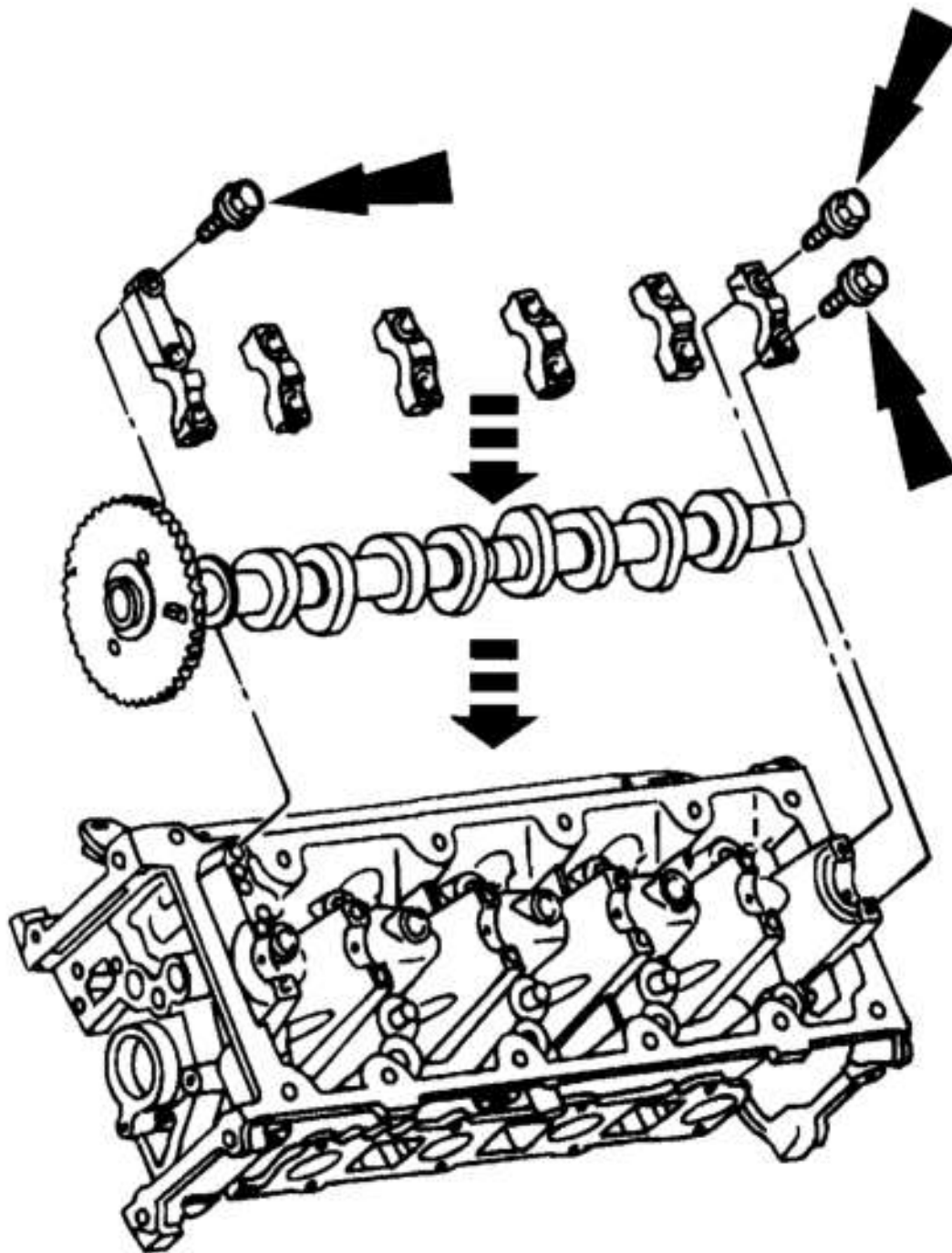
1. Lubricate the camshaft journals with clean engine oil.



G01548704

**Fig. 540: Lubricating Camshaft Journals With Clean Engine Oil**  
Courtesy of FORD MOTOR CO.

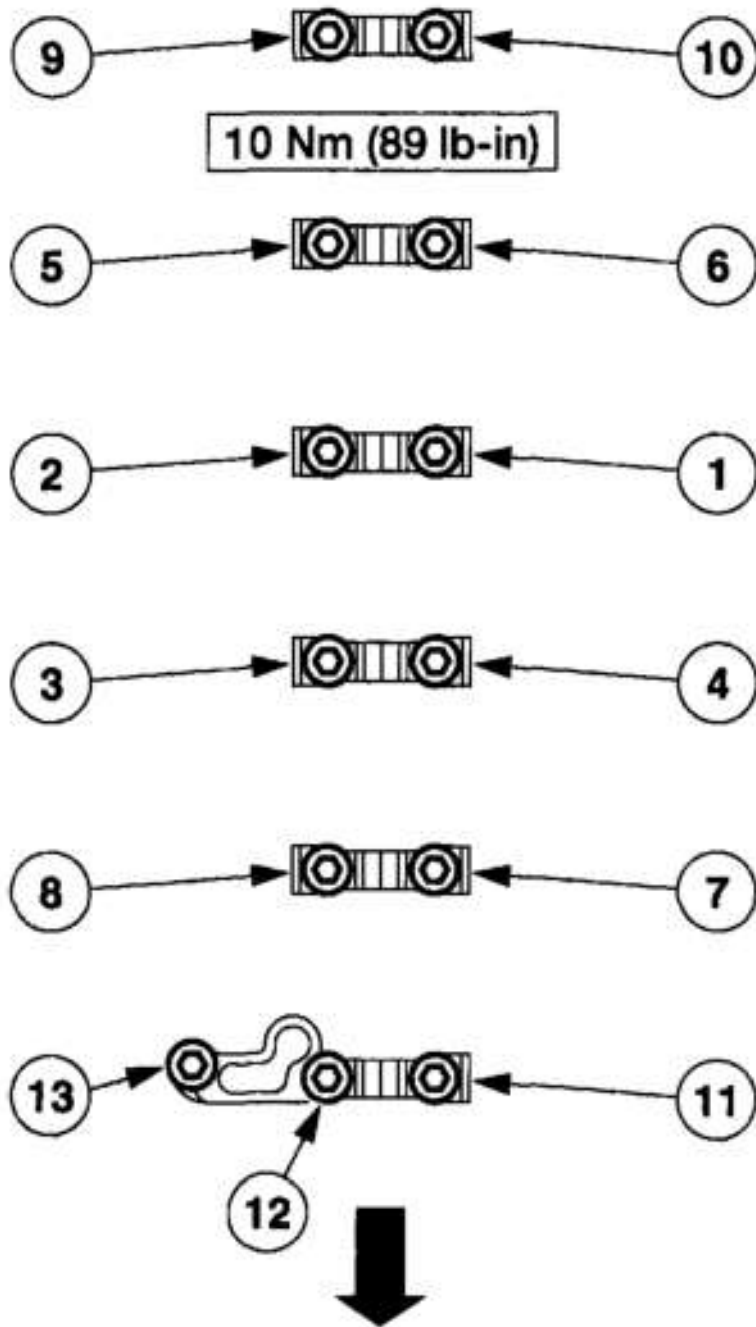
2. Install the camshaft and the camshaft bearing caps in their original locations.
  - Lubricate the camshaft bearing caps with clean engine oil.
  - Position the camshaft bearing caps.
  - Install the bolts loosely.



G01548705

**Fig. 541: Installing Camshaft And Camshaft Bearing Caps In Original Locations**  
Courtesy of FORD MOTOR CO.

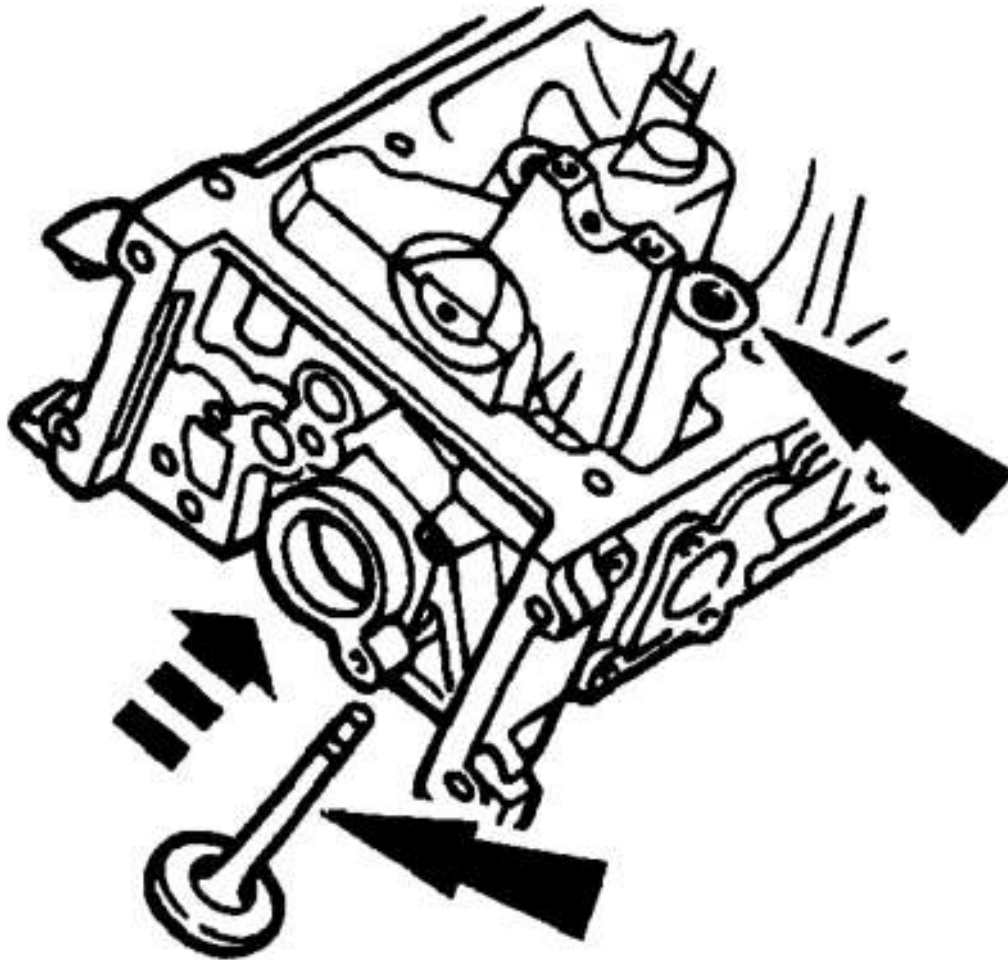
3. Tighten the bolts in the sequence shown.



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**Fig. 542: Identifying Bolts Tightening Sequence**  
 Courtesy of FORD MOTOR CO.

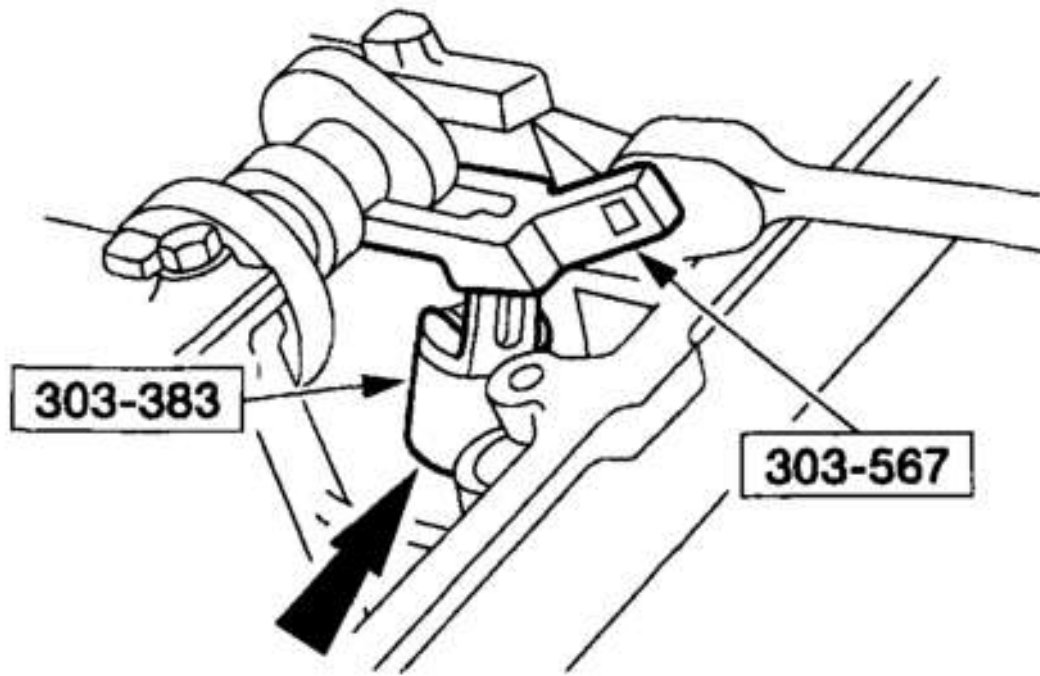
**NOTE:** Lubricate the valve stems with clean engine oil.



G01548707

**Fig. 543: Installing Valves In Valve Guides**  
Courtesy of FORD MOTOR CO.

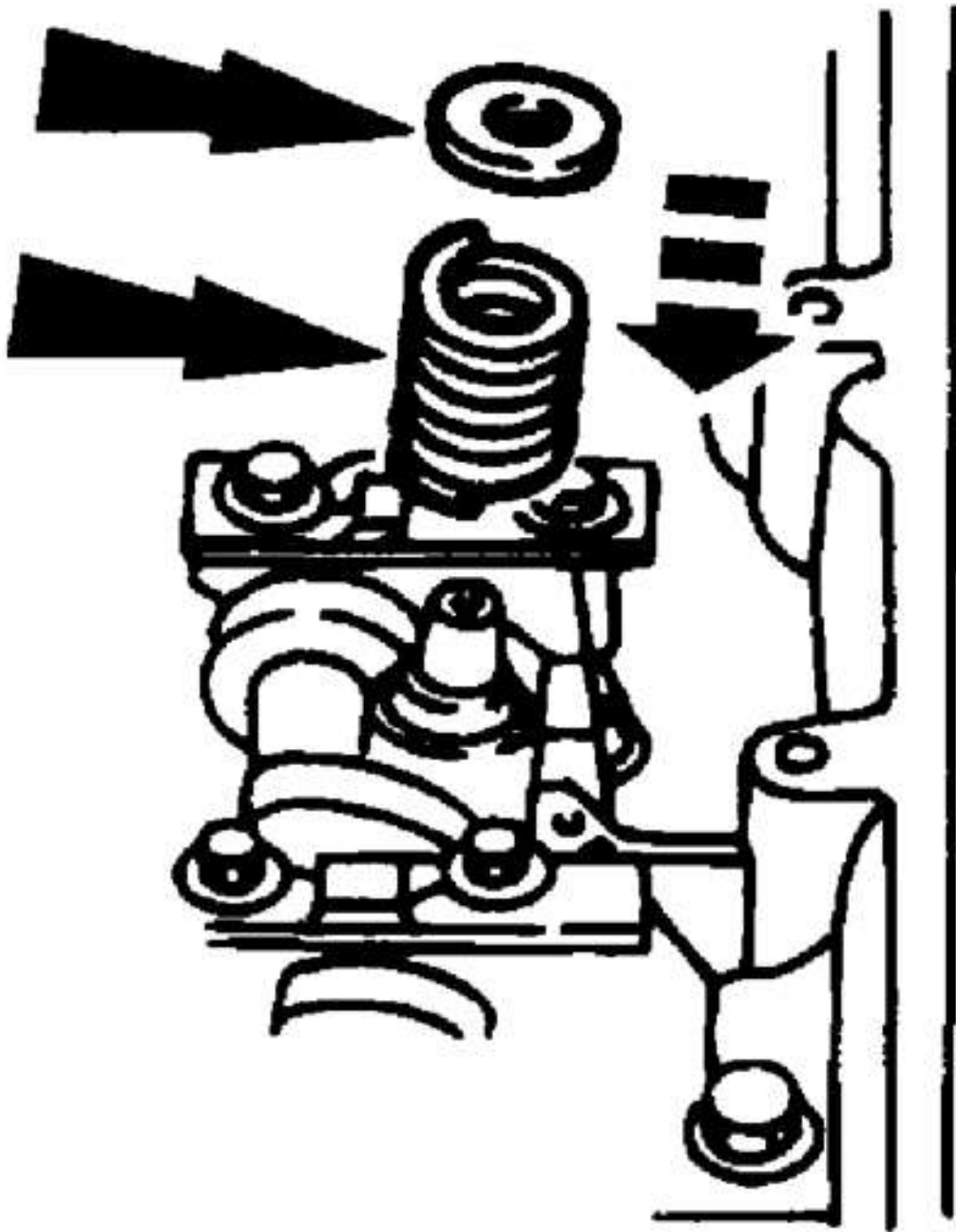
4. Install the valves in the valve guides located in the cylinder head.
5. Use the special tools to install the valve stem seals.



G01548708

**Fig. 544: Installing Valve Stem Seals Using Special Tool**  
Courtesy of FORD MOTOR CO.

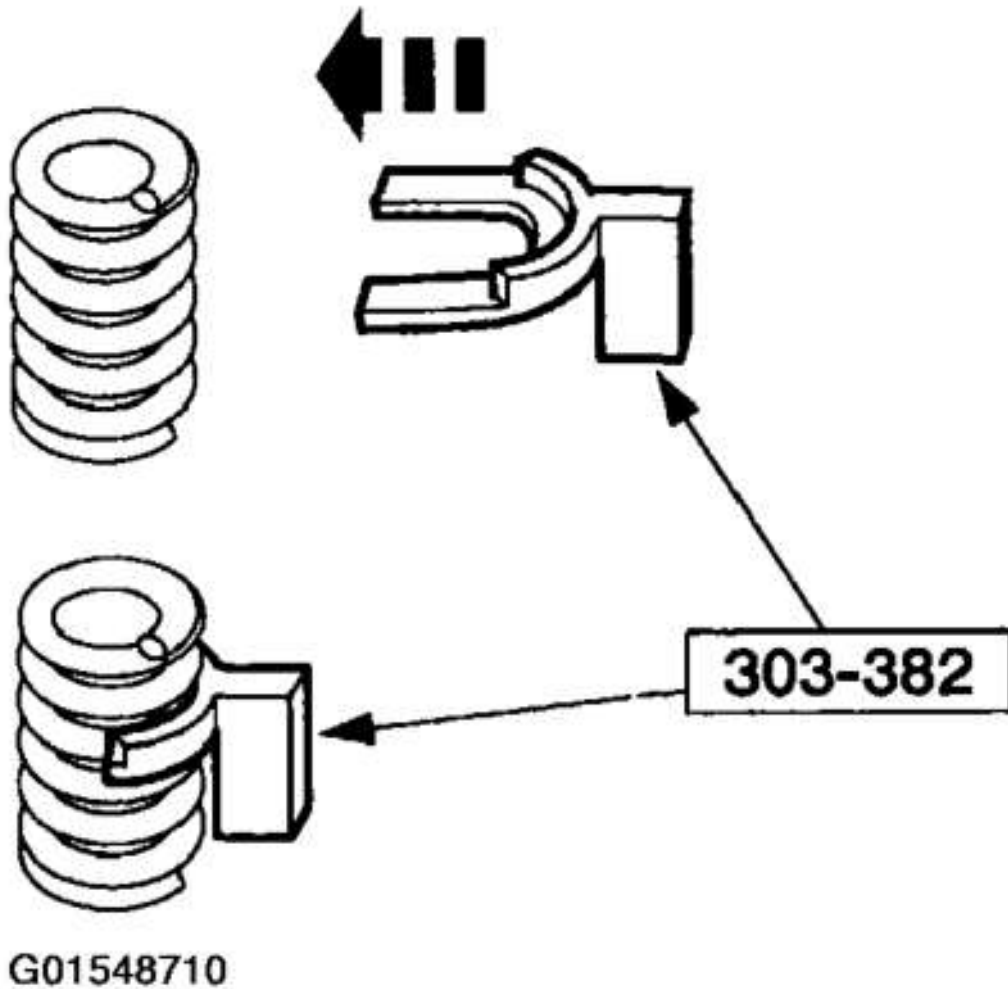
6. Install the valve springs and the valve spring retainers onto the valves.



G01548709

**Fig. 545: Installing Valve Springs And Valve Spring Retainers Onto Valves**  
Courtesy of FORD MOTOR CO.

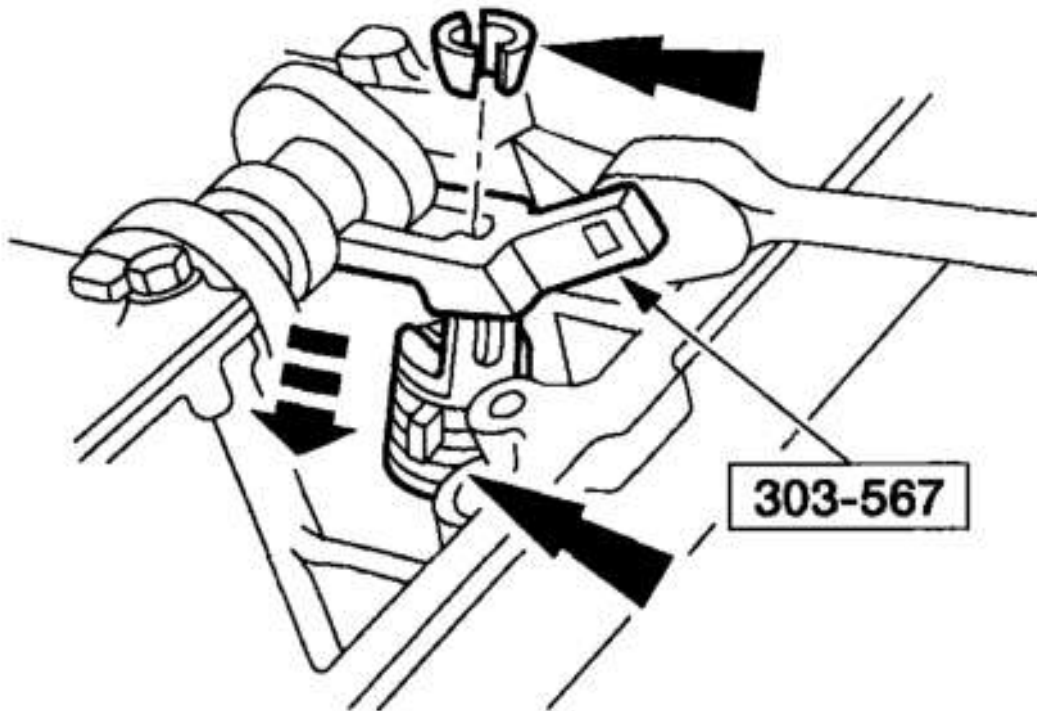
7. Install the special tool between the valve spring coils to prevent valve stem seal damage.



**Fig. 546: Installing Special Tool Between Valve Spring Coils**  
Courtesy of FORD MOTOR CO.

8. Use the special tool to compress the valve springs. Install the valve spring retainer keys.

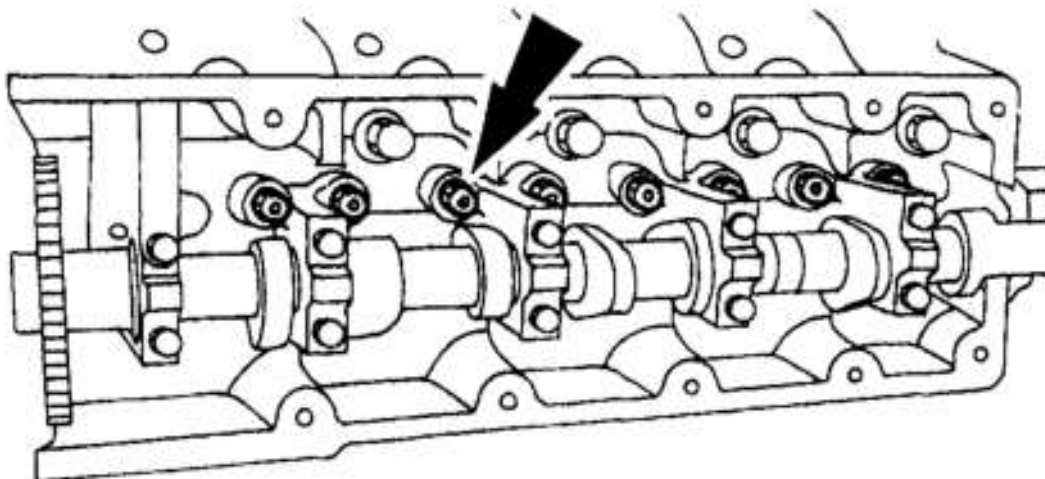




G01548711

**Fig. 547: Compressing Valve Springs Using Special Tool**  
Courtesy of FORD MOTOR CO.

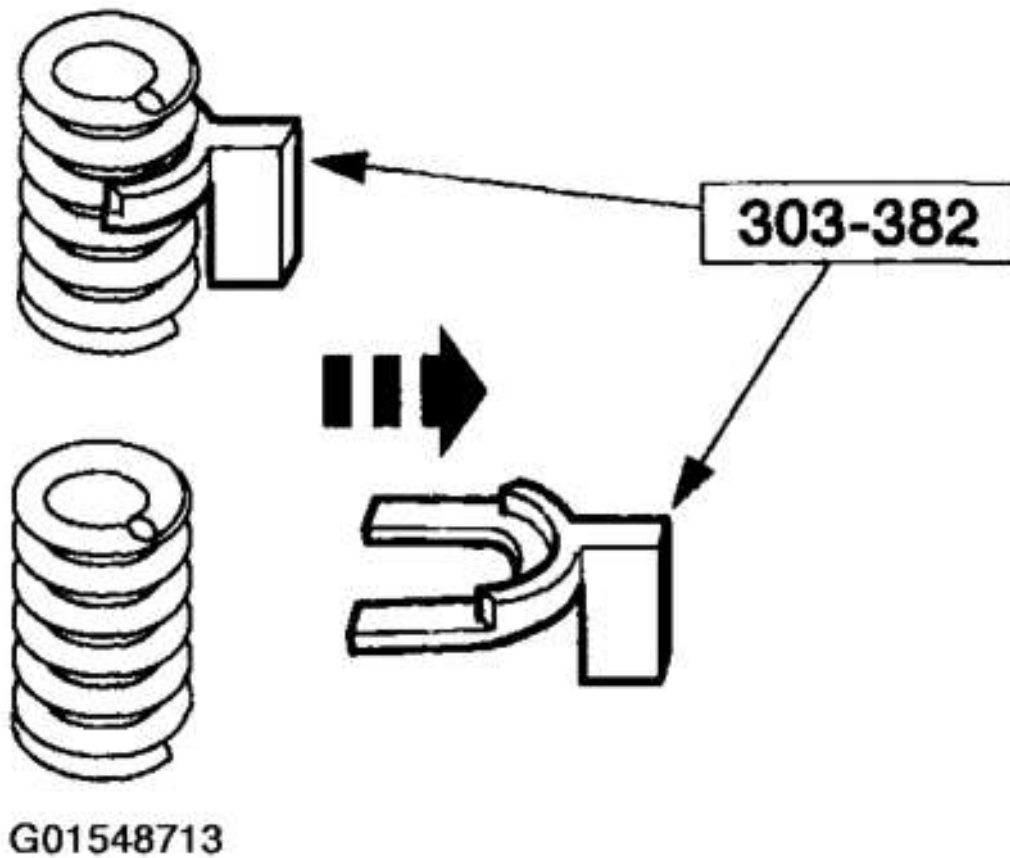
**NOTE:** Lubricate the hydraulic lash adjusters with clean engine oil.



G01548712

**Fig. 548: Installing Hydraulic Lash Adjusters In Original Locations**  
Courtesy of FORD MOTOR CO.

9. Install the hydraulic lash adjusters in their original locations.
10. Remove the special tool.



**Fig. 549: Removing Special Tool**  
Courtesy of FORD MOTOR CO.

**PISTON - PIN CONNECTING ROD, FLOATING PIN**

**Material(s)**

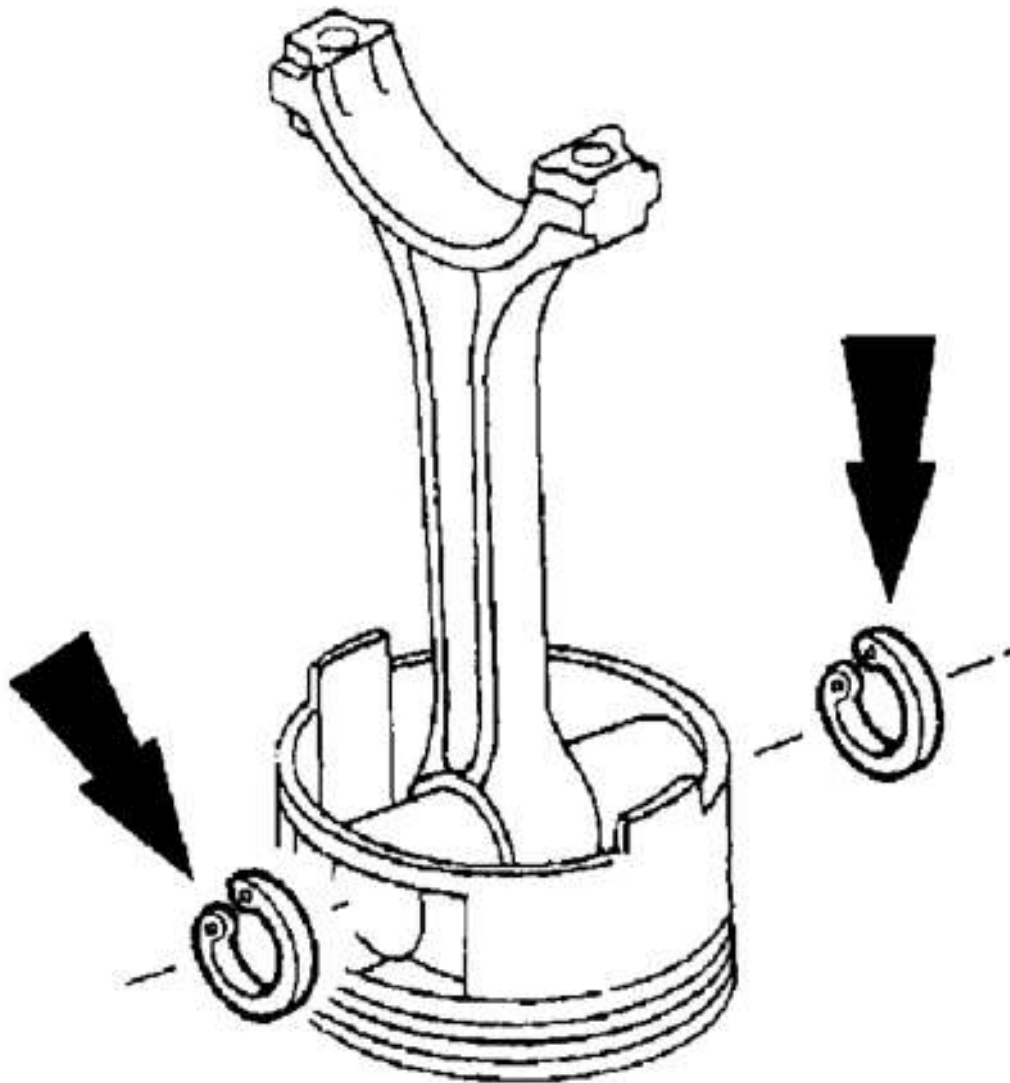
Item	Specification
SAE 5W-20 Premium Synthetic Blend Engine Oil XO-5W20-QSP	WSS-M2C153-H

G01548714

**Fig. 550: Identifying Materials**  
Courtesy of FORD MOTOR CO.

**Disassembly**

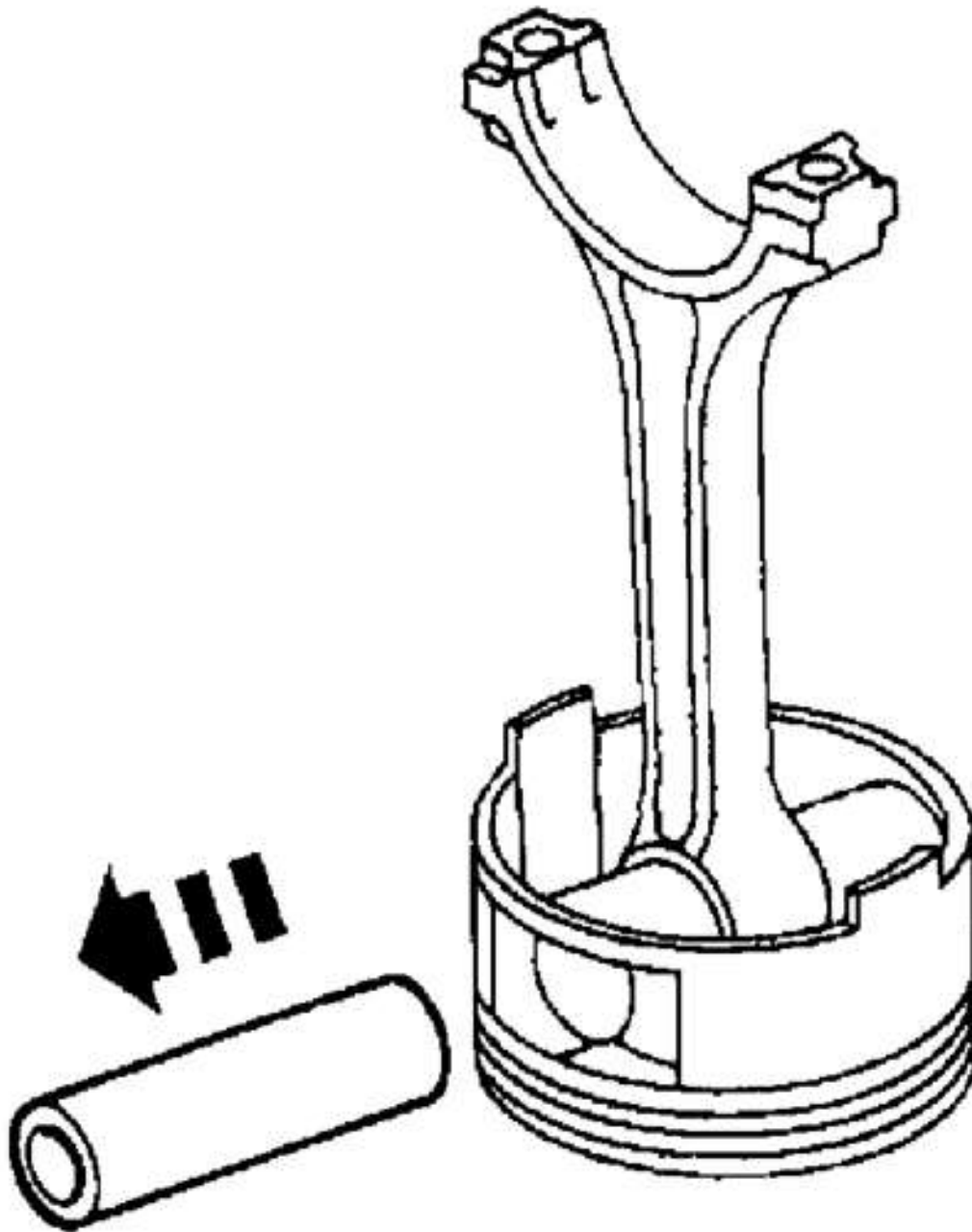
1. Remove the clips.



G01548715

**Fig. 551: Removing Clips**  
Courtesy of FORD MOTOR CO.

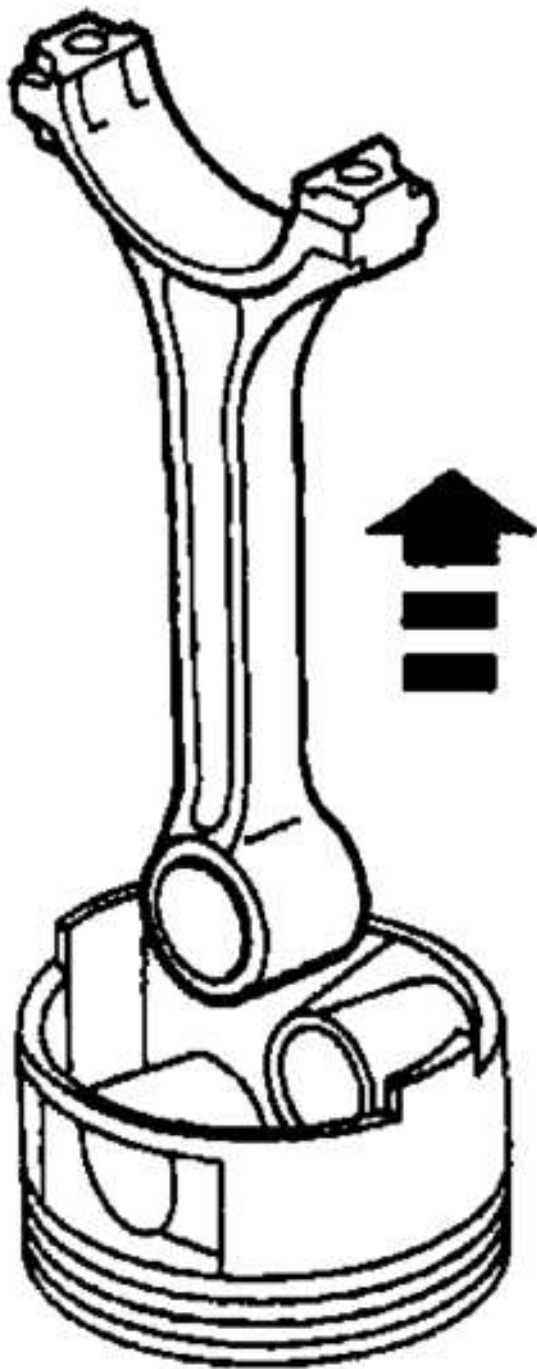
2. Remove the piston pin (6135) from the piston (6108) and connecting rod assembly.



G01548716

**Fig. 552: Removing Piston Pin From Piston And Connecting Rod Assembly**  
Courtesy of FORD MOTOR CO.

3. Remove the connecting rod (6200) from the piston.



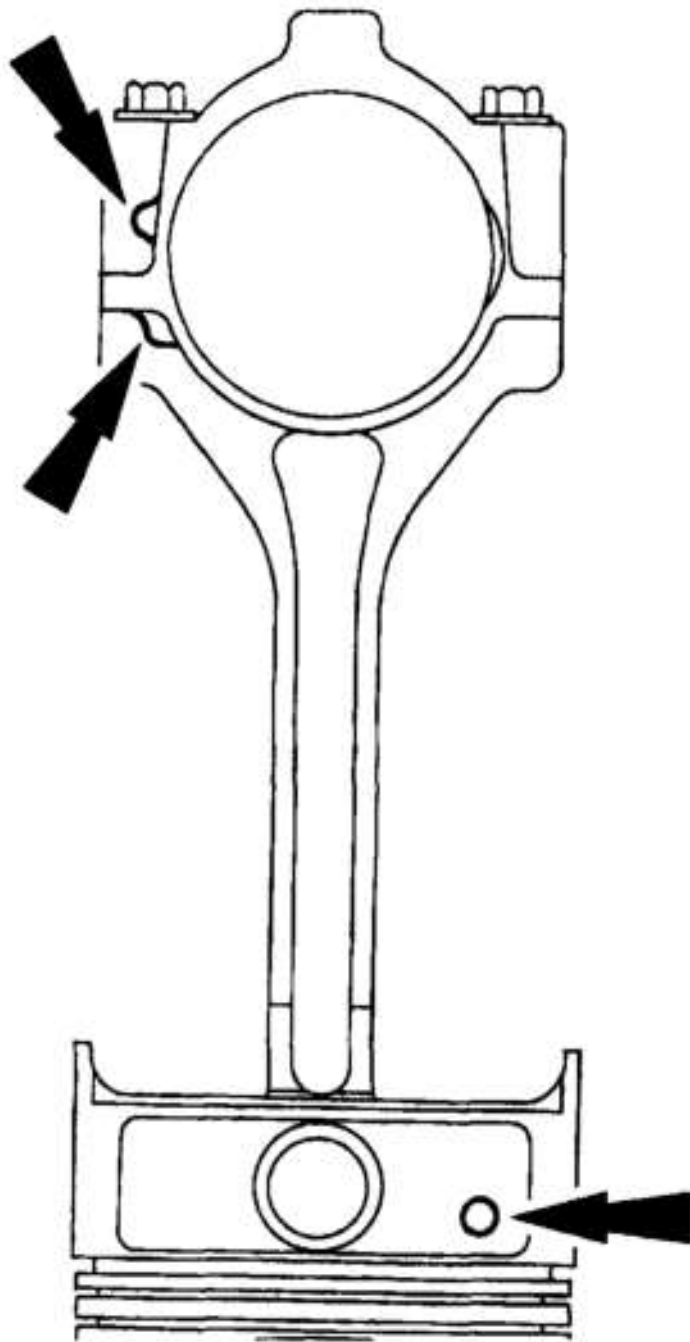
G01548717

**Fig. 553: Removing Connecting Rod From Piston**  
Courtesy of FORD MOTOR CO.

4. Clean and inspect the piston and connecting rod. Refer to **ENGINE SYSTEM - GENERAL INFORMATION** .

**Assembly**

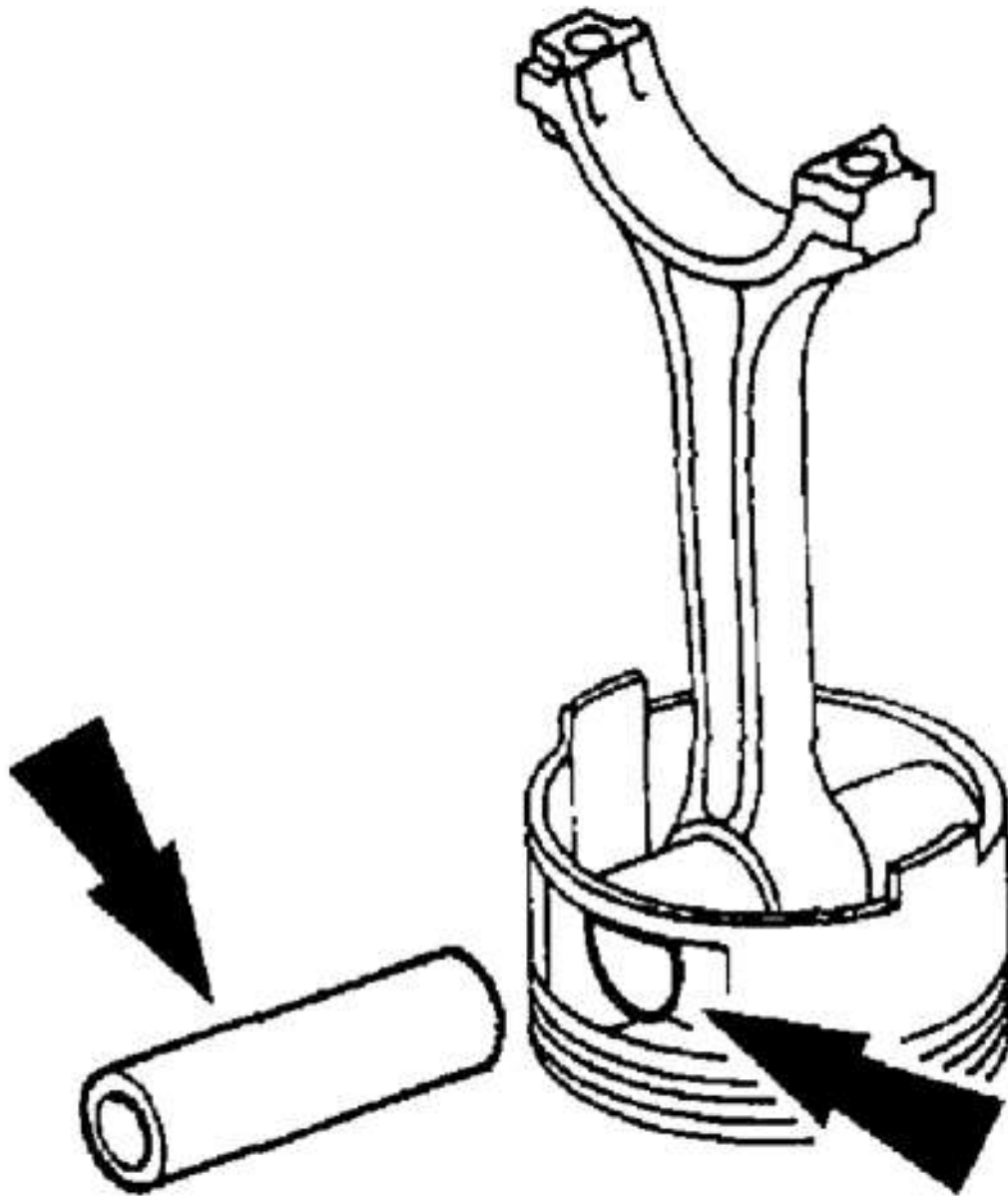
**NOTE:** Connecting rod must be installed into piston with identification markings toward front.



G01548718

**Fig. 554: Positioning Connecting Rod In Piston**  
Courtesy of FORD MOTOR CO.

1. Position the connecting rod in the piston.
2. Lubricate the piston pin and pin bore with clean engine oil.

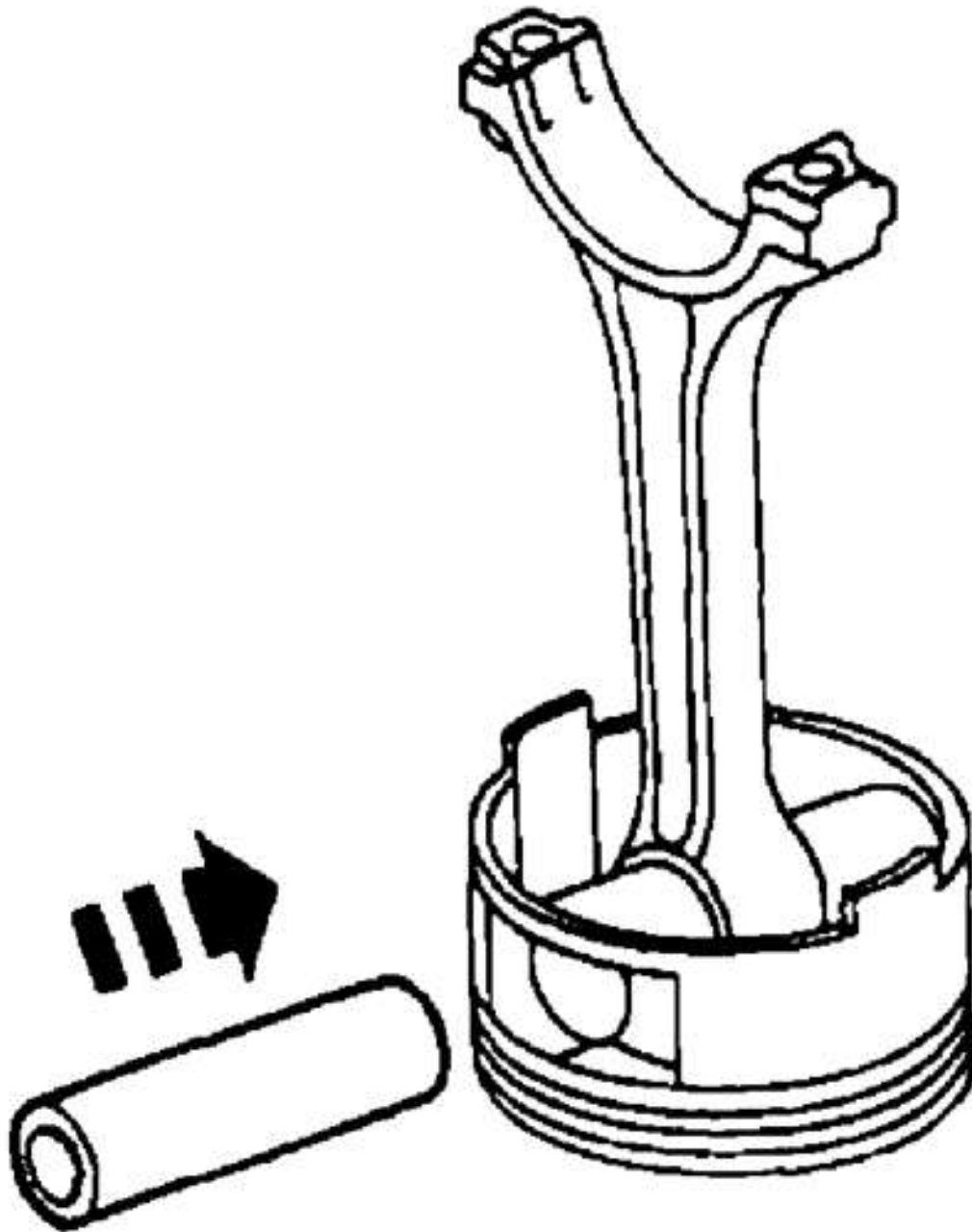


G01548719

**Fig. 555: Lubricating Piston Pin And Pin Bore With Clean Engine Oil**  
Courtesy of FORD MOTOR CO.

3. Install the piston pin in the piston and connecting rod assembly.

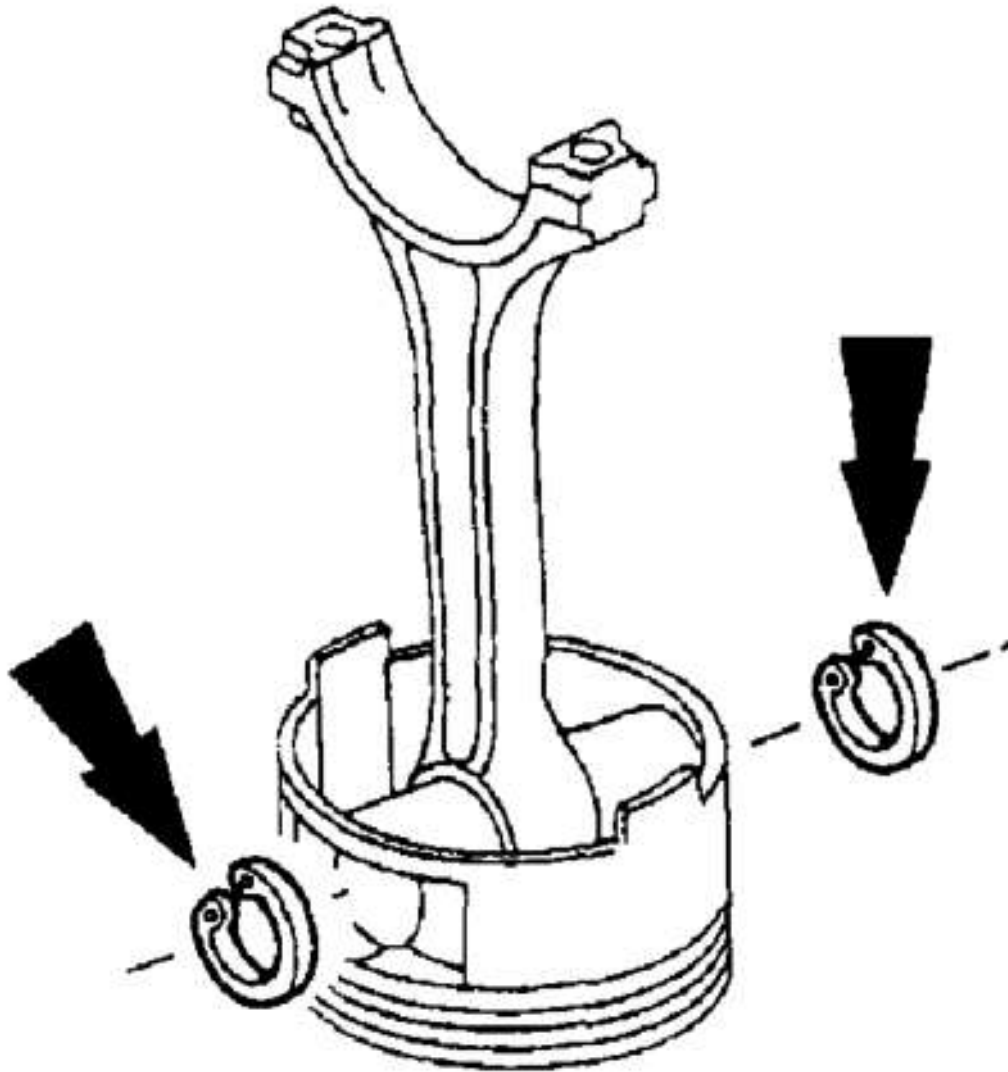




G01548720

**Fig. 556: Installing Piston Pin In Piston And Connecting Rod Assembly**  
Courtesy of FORD MOTOR CO.

4. Install the piston pin retaining clips in the piston.



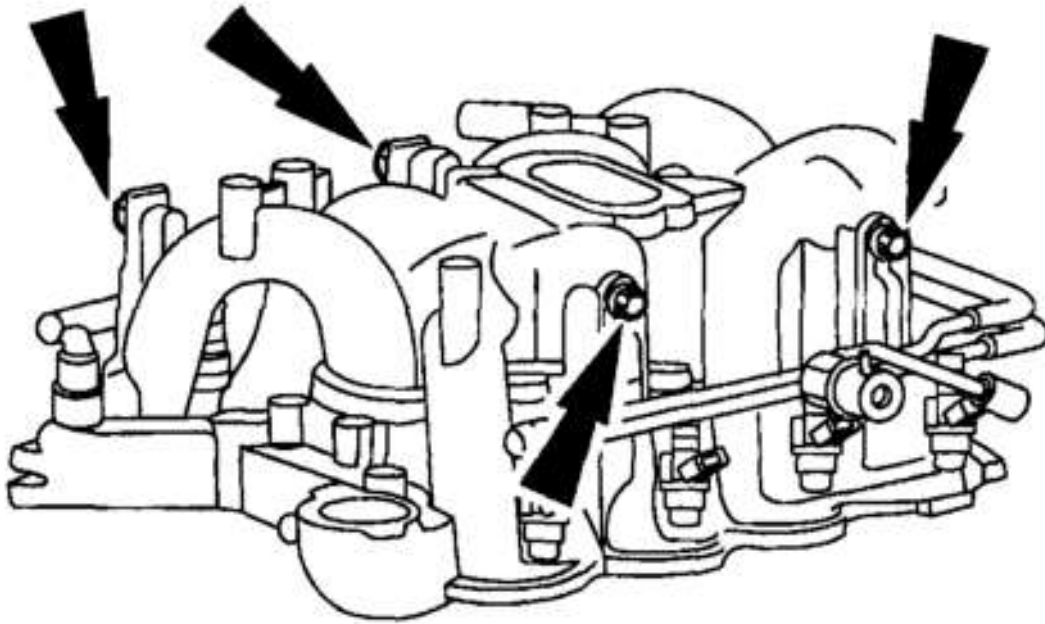
G01548721

**Fig. 557: Installing Piston Pin Retaining Clips In Piston**  
Courtesy of FORD MOTOR CO.

## INTAKE MANIFOLD ASSEMBLY

### Disassembly

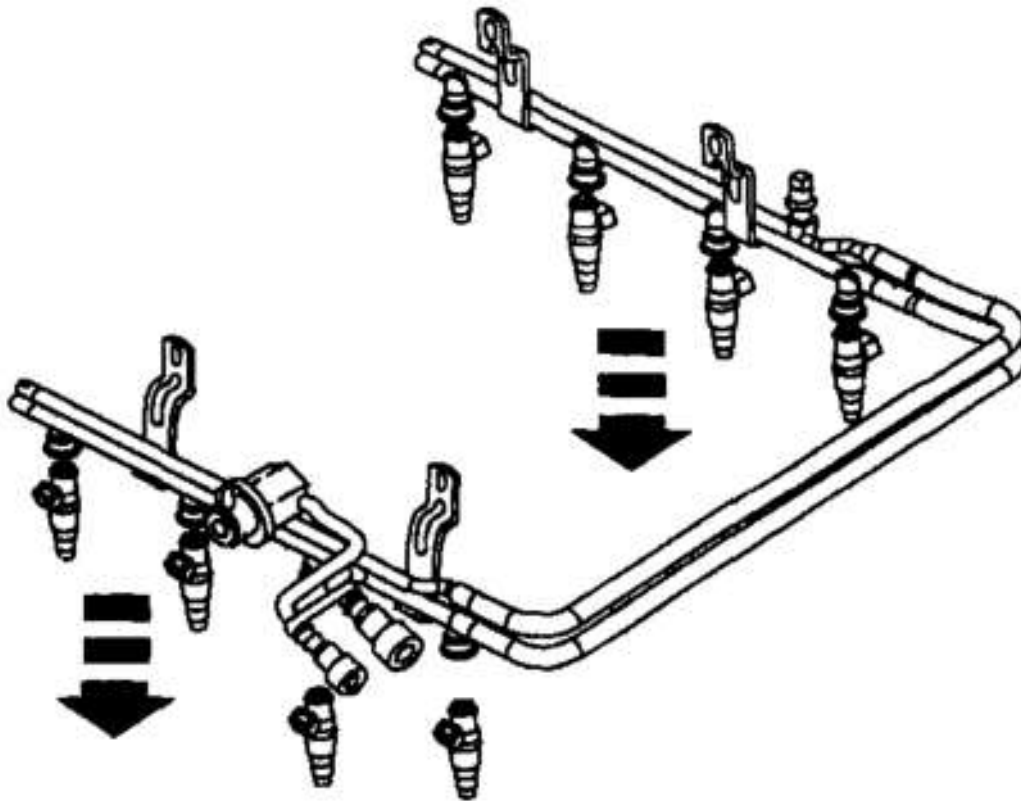
1. Remove the fuel injection supply manifold.



G01548722

**Fig. 558: Removing Fuel Injection Supply Manifold**  
Courtesy of FORD MOTOR CO.

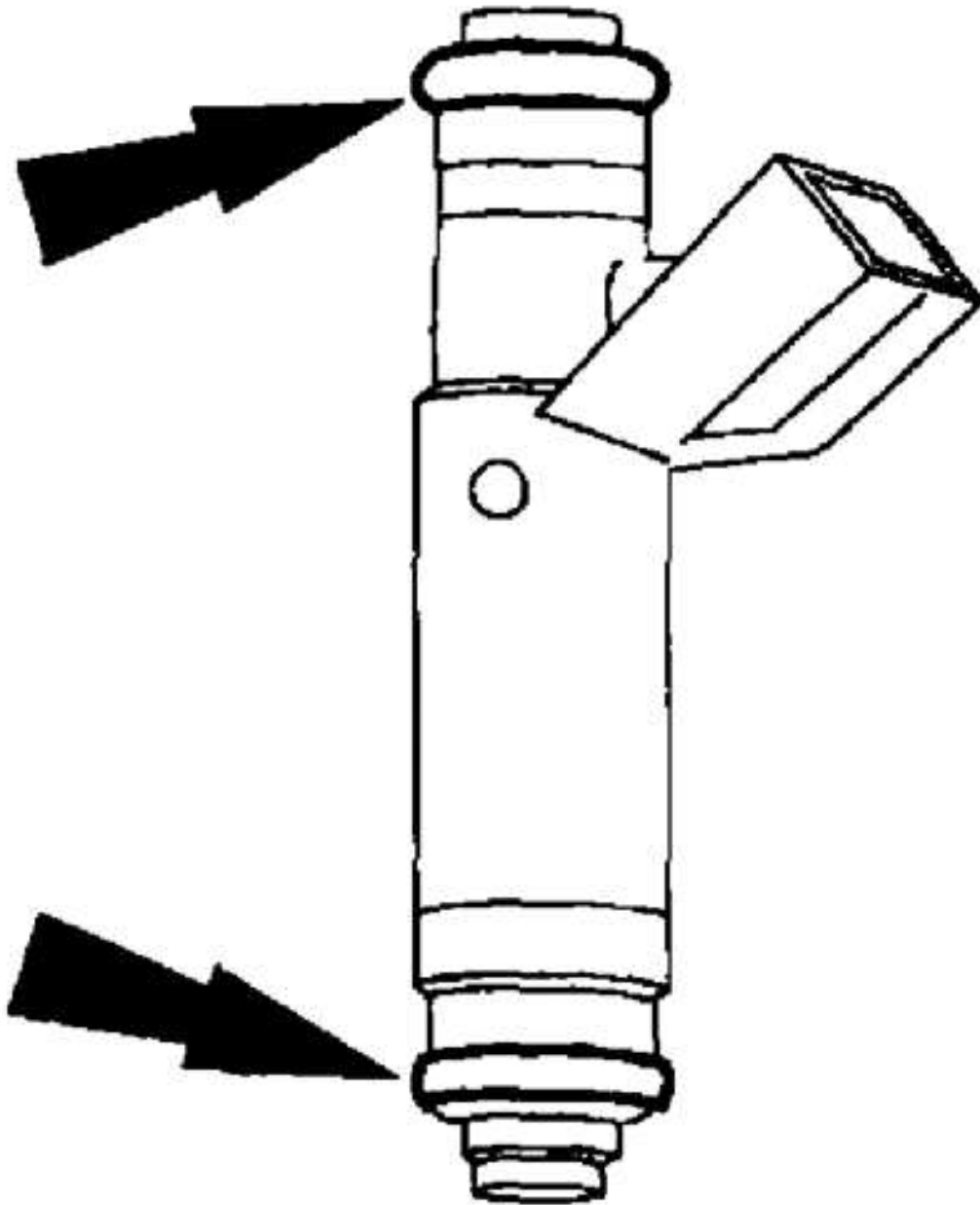
2. Remove the fuel injectors from the fuel injection supply manifold.



G01548723

**Fig. 559: Removing Fuel Injectors From Fuel Injection Supply Manifold**  
Courtesy of FORD MOTOR CO.

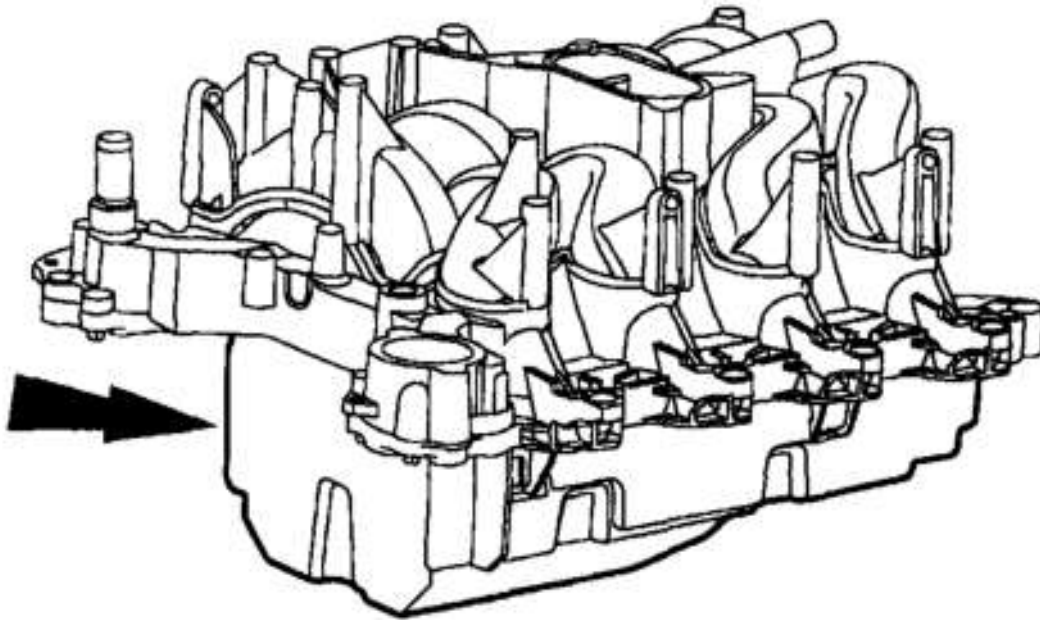
3. Inspect the two O-ring seals from each fuel injector. Install new O-ring seals as needed.



G01548724

**Fig. 560: Inspecting O-Ring Seals From Fuel Injector**  
Courtesy of FORD MOTOR CO.

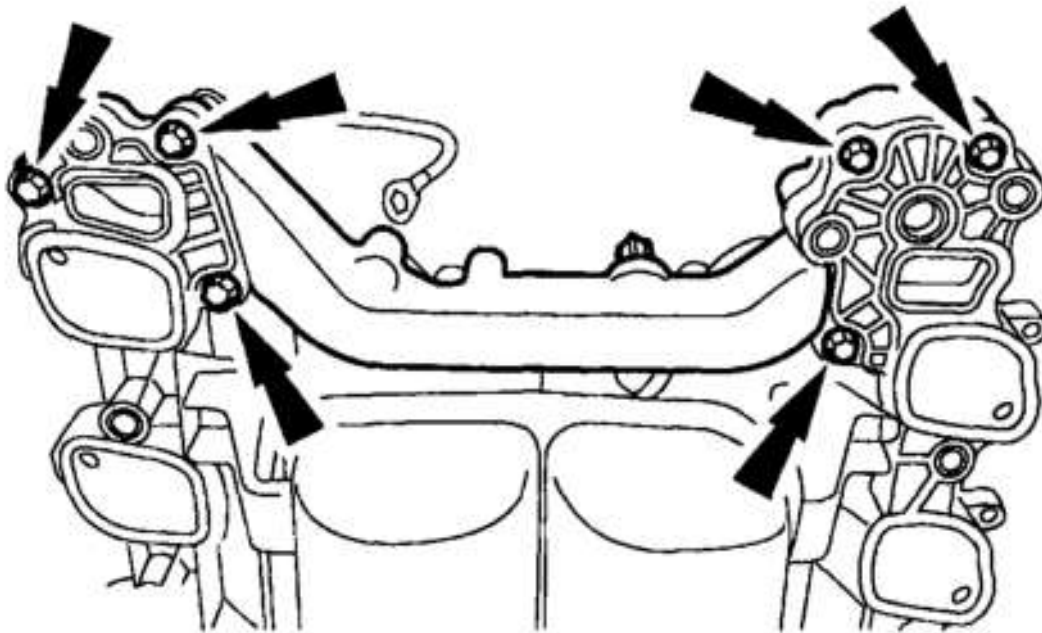
4. Remove the engine noise shield.



G01548725

**Fig. 561: Removing Engine Noise Shield**  
Courtesy of FORD MOTOR CO.

5. Remove the water crossover tube.
  - Inspect and install new gaskets as necessary.



G01548726

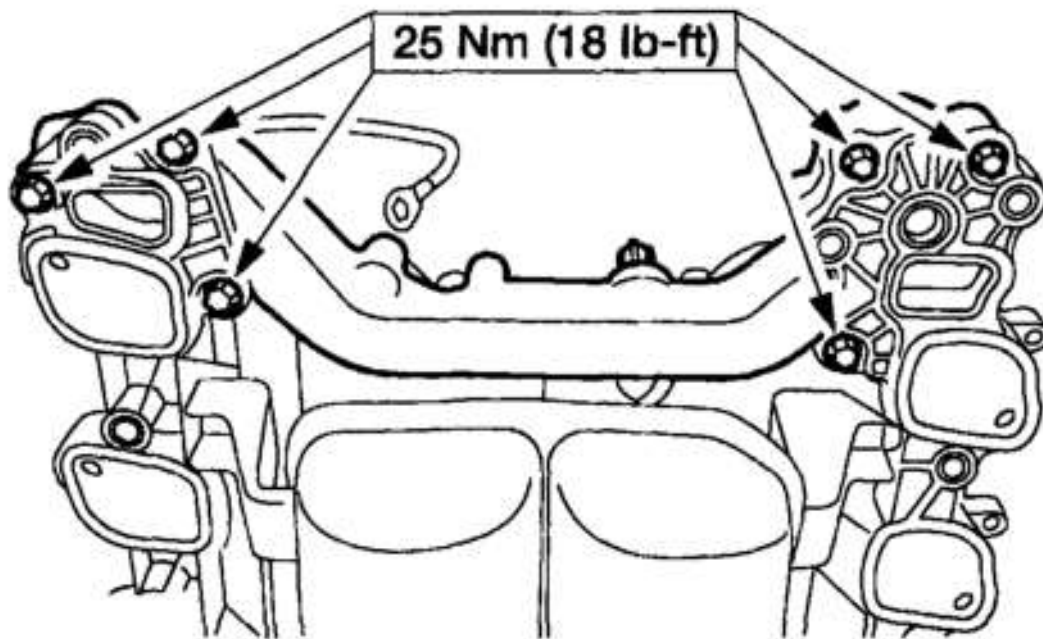
**Fig. 562: Removing Water Crossover Tube**  
Courtesy of FORD MOTOR CO.

**CAUTION:** If the engine has been internally damaged and metal or other foreign material has entered the manifold, it is recommended the manifold be discarded.

6. Inspect all external and internal surfaces of the intake manifold.
  - Inspect for cracks or other damage.
  - Inspect for foreign material inside of the manifold.
  - Clean the intake manifold with a suitable cleaner.

#### **Assembly**

1. Install the water crossover tube.

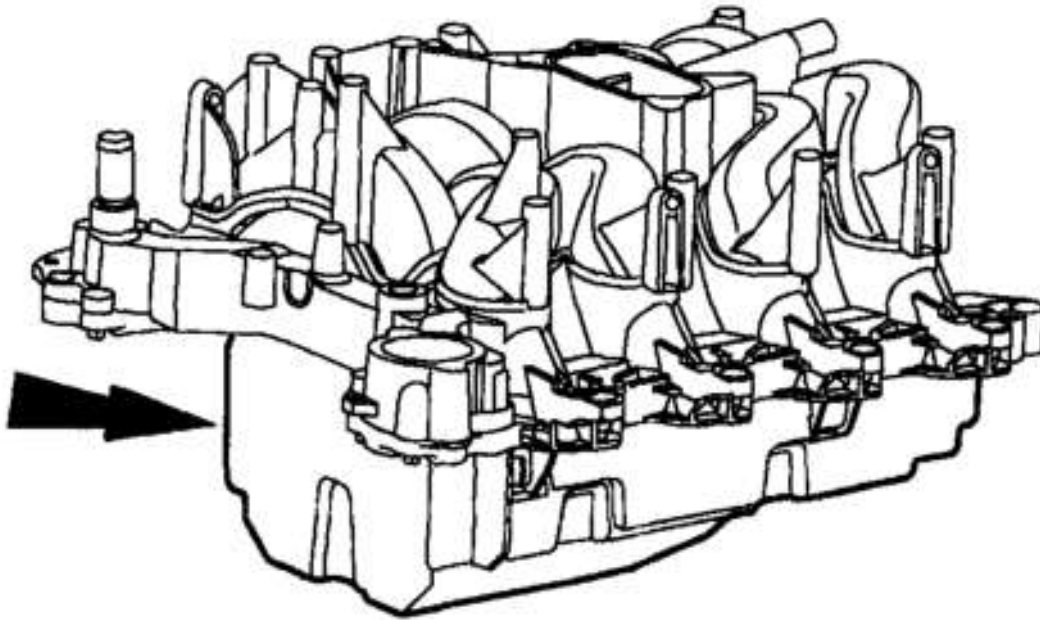


G01548727

**Fig. 563: Inspecting All External And Internal Surfaces Of Intake Manifold**  
Courtesy of FORD MOTOR CO.

2. Install the engine noise shield.

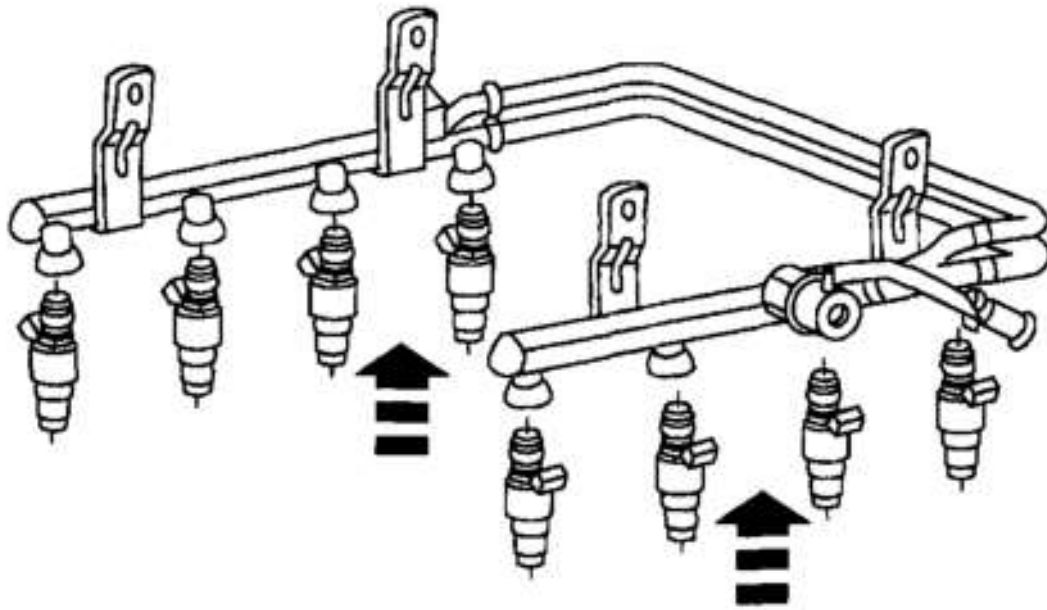




G01548728

**Fig. 564: Installing Engine Noise Shield**  
Courtesy of FORD MOTOR CO.

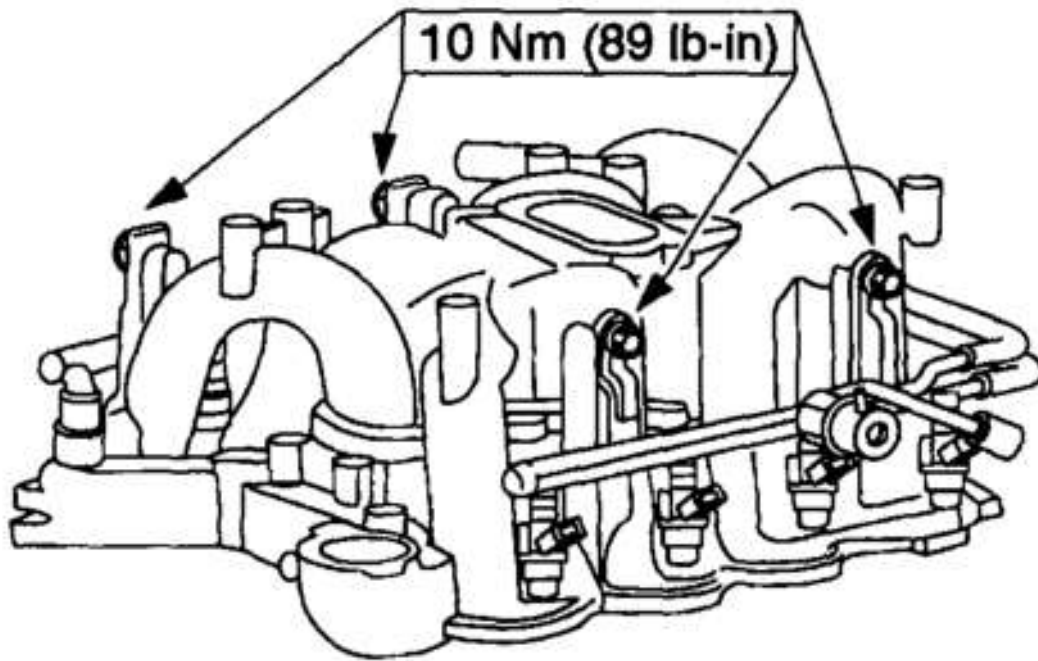
**NOTE:** Lubricate the O-ring seals with clean engine oil, to aid installation.



G01548729

**Fig. 565: Installing Fuel Injectors Into Fuel Injection Supply Manifold**  
Courtesy of FORD MOTOR CO.

3. Install the fuel injectors into the fuel injection supply manifold.
4. Install the fuel injection supply manifold.



G01548730

**Fig. 566: Installing Fuel Injection Supply Manifold**  
Courtesy of FORD MOTOR CO.