



DISASSEMBLY AND ASSEMBLY OF SUBASSEMBLIES

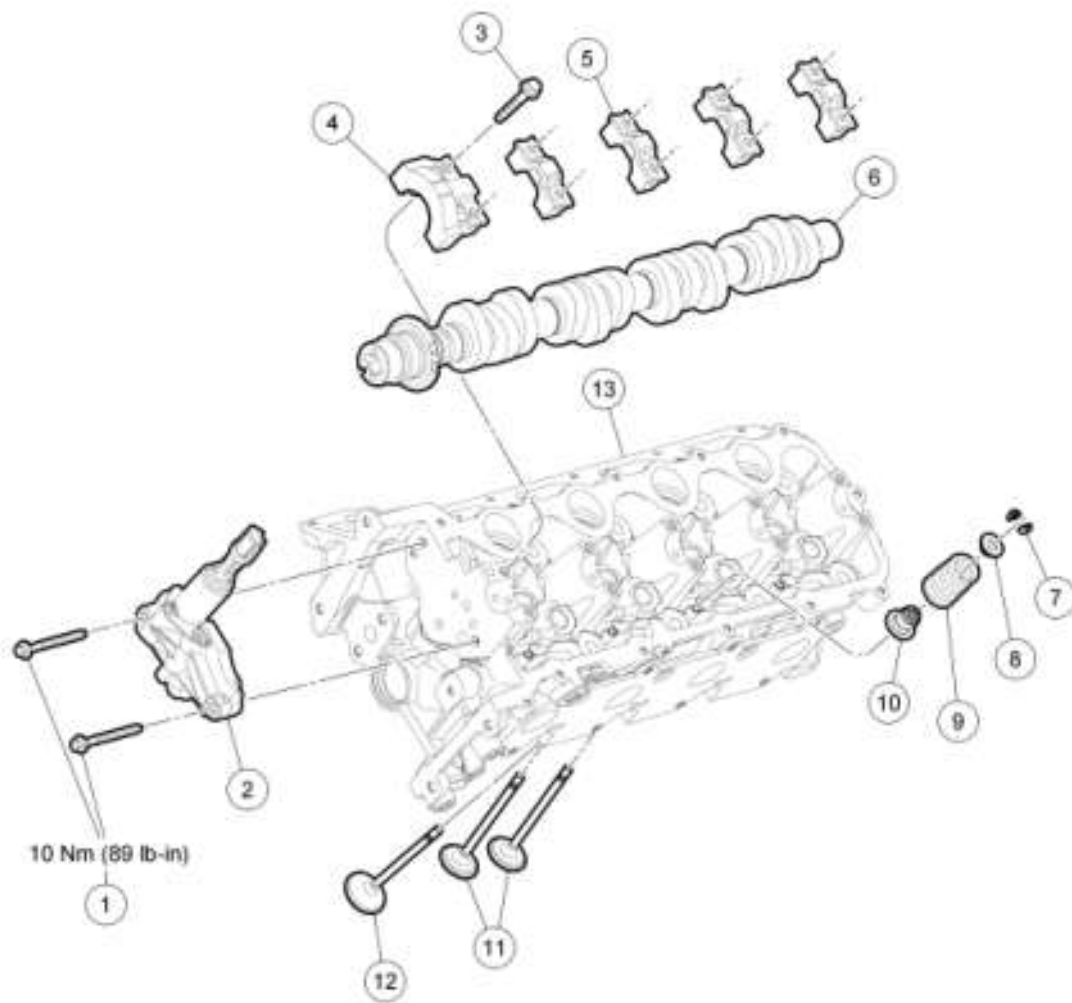
CYLINDER HEAD

Special Tools

Illustration	Tool Name	Tool Number
 ST2804-A	Compressor, Valve Spring	303-1039
 ST1332-A	Installer, Valve Stem Oil Seal	303-383 (T91T-6571-A)

Material

Item	Specification
Motorcraft SAE 5W-20 Premium Synthetic Blend Motor Oil XO-5W20-QSP (US); Motorcraft SAE 5W-20 Super Premium Motor Oil CXO-5W20-LSP12 (Canada); or equivalent	WSS-M2C930-A



N0010131

Fig. 427: Identifying Cylinder Head With Specifications
 Courtesy of FORD MOTOR CO.

Item	Part Number	Description
1	W701520	Variable camshaft timing (VCT) housing assembly bolts (2 required)
2	6C261	VCT housing assembly
3	N807834	Camshaft bearing cap bolt (10 required)
4	6B284	Camshaft front bearing cap
5	6B280	Camshaft bearing cap (4 required)
6	6C255	Camshaft
7	6518	Valve spring retainer key (24 required)
8	6514	Valve spring retainer (12 required)
9	6513	Valve spring (12 required)
10	6A517	Valve seal (12 required)
11	6507	Intake valves (8 required)
12	6505	Exhaust valve (4 required)

DISASSEMBLY

1. Remove the bolts and the variable camshaft timing (VCT) housing.
 - Discard the gasket.
2. Lubricate the camshaft and camshaft journals with clean engine oil and install the camshaft.
3. Install the camshaft bearing caps in their original locations.
 - Lubricate the camshaft bearing caps with clean engine oil.
 - Position the front camshaft bearing cap.
 - Position the remaining camshaft bearing caps.
 - Install the bolts finger tight.
4. Using the special tool, compress the valve spring and remove the valve spring retainer keys.



Fig. 428: Compressing Valve Spring With Special Tool
Courtesy of FORD MOTOR CO.

5. Remove the valve spring retainer, the valve spring and the valve seal.
 - Discard the valve seal.
6. Remove the valve from the cylinder head.
7. Repeat the previous 3 steps for each valve.
8. Inspect the components. For additional information, refer to **ENGINE SYSTEM - GENERAL INFORMATION** article.

CAUTION: Remove the front thrust camshaft bearing cap straight upward from the bearing towers, or the bearing cap may be damaged from sideloading.

9. Remove the bolts, the front camshaft bearing cap and then the remaining bearing caps.
10. Remove the camshaft.
11. Check the cylinder head for distortion. For additional information, refer to **ENGINE SYSTEM - GENERAL INFORMATION** article.

ASSEMBLY

1. Lubricate the camshaft and camshaft journals with clean engine oil and install the camshaft.
2. Install the camshaft bearing caps in their original locations.

- Lubricate the camshaft bearing caps with clean engine oil.
- Position the front camshaft bearing cap.
- Position the remaining camshaft bearing caps.
- Install the bolts finger tight.

NOTE: Lubricate the valve stem with clean engine oil prior to installation.

3. Install the valve into the cylinder head.

NOTE: Lubricate the valve seal and valve stem with clean engine oil prior to installation.

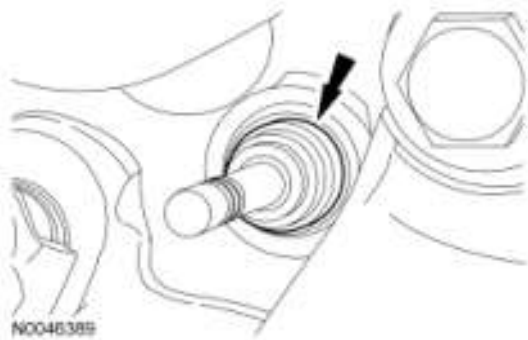


Fig. 429: Positioning New Valve Seal Onto Valve Stem
Courtesy of FORD MOTOR CO.

4. Position a new valve seal onto the valve stem.
5. Using the special tool, install the new valve seal.

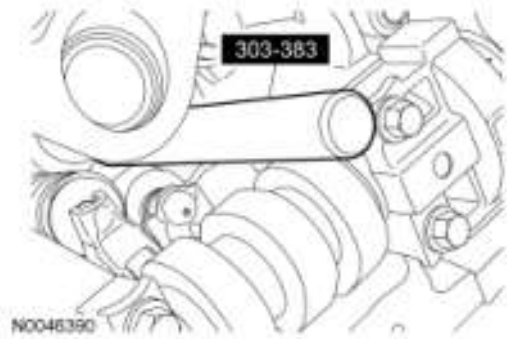


Fig. 430: Installing Valve Seal Using Special Tool
Courtesy of FORD MOTOR CO.

CAUTION: If the components are to be reinstalled, they must be installed into their original locations.



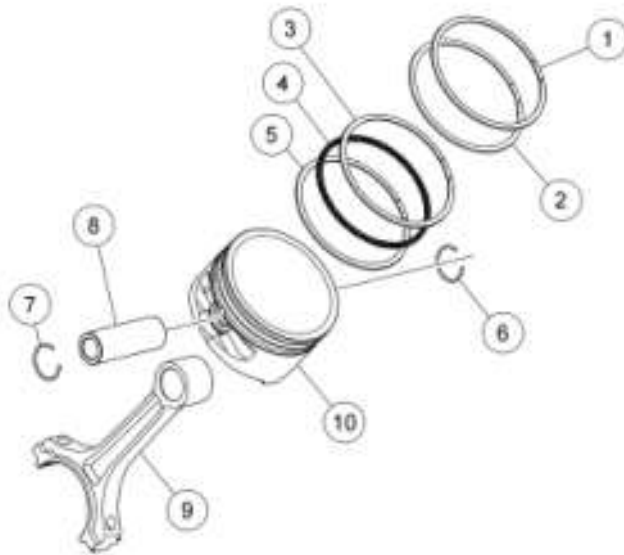
Fig. 431: Compressing Valve Spring With Special Tool
Courtesy of FORD MOTOR CO.

6. Using the special tool, install the valve spring, the valve spring retainer and the valve spring retainer keys.
7. Repeat the previous 2 steps for each valve.
8. Remove the bolts the front camshaft bearing cap and then the remaining bearing caps.
9. Remove the camshaft.
10. Install a new gasket, the VCT housing and the bolts.
 - Tighten to 10 N.m (89 lb-in).

PISTON

Material

Item	Specification
Motorcraft SAE 5W-20 Premium Synthetic Blend Motor Oil XO-5W20-QSP (US); Motorcraft SAE 5W-20 Super Premium Motor Oil CXO-5W20-LSP12 (Canada); or equivalent	WSS-M2C930-A



N0010114

Fig. 432: Identifying Piston Components
 Courtesy of FORD MOTOR CO.

Item	Part Number	Description
1	6150	Piston compression upper ring
2	6152	Piston compression lower ring
3	6159	Piston oil control upper segment ring
4	6161	Piston oil control spacer
5	6159	Piston oil control lower segment ring
6	6140	Piston pin retainer
7	6140	Piston pin retainer
8	6135	Piston pin
9	6200	Connecting rod
10	6110	Piston

DISASSEMBLY

1. Remove the piston rings from the piston.
 - Discard the piston rings.
2. Remove the piston pin retainers and the piston pin.
3. Separate the piston from the connecting rod.
4. Clean and inspect the piston and connecting rod. For additional information, refer to **ENGINE SYSTEM - GENERAL INFORMATION** article.

ASSEMBLY

NOTE: The connecting rod must be installed into the piston with identification

markings toward the front.

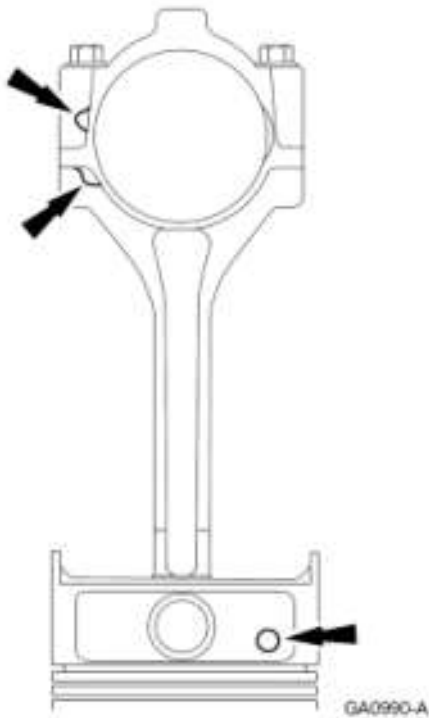


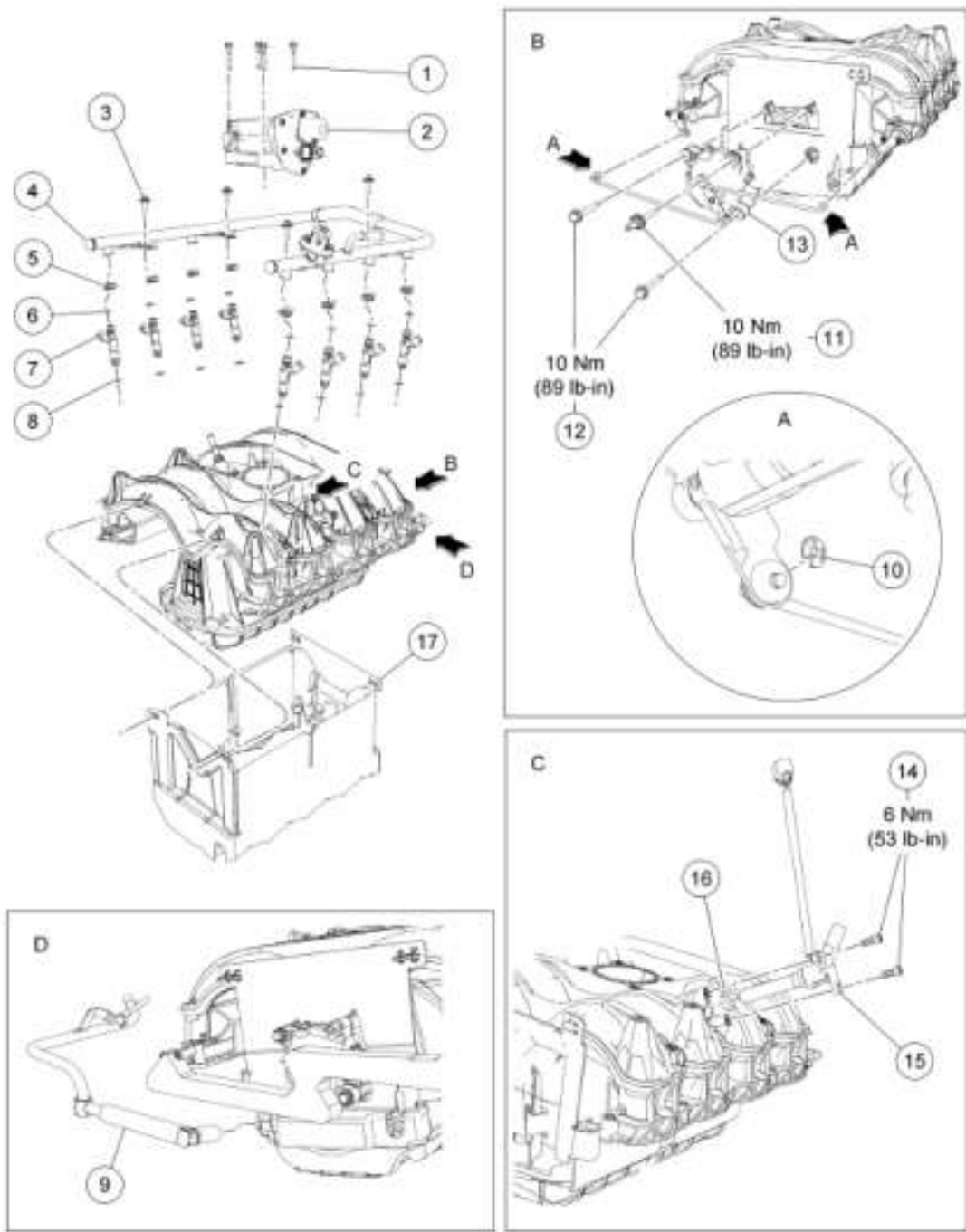
Fig. 433: Positioning Connecting Rod In Piston
Courtesy of FORD MOTOR CO.

1. Position the connecting rod in the piston.
2. Lubricate the piston pin and pin bore with clean engine oil.
3. Install the piston pin in the piston and connecting rod assembly.
4. Install the piston pin retaining clips in the piston.
5. Lubricate the piston and the new piston rings with clean engine oil.
6. Install the piston rings onto the piston.

INTAKE MANIFOLD ASSEMBLY

Material

Item	Specification
Motorcraft SAE 5W-20 Premium Synthetic Blend Motor Oil XO-5W20-QSP (US); Motorcraft SAE 5W-20 Super Premium Motor Oil CXO-5W20-LSP12 (Canada); or equivalent	WSS-M2C930-A
Motorcraft Premium Gold Engine Coolant with Bittering Agent (US only) VC-7-B (US); CVC-7-A (Canada); or equivalent (yellow color)	WSS-M97B51-A1



N0010498

Fig. 434: Identifying Intake Manifold Assembly With Specifications
 Courtesy of FORD MOTOR CO.

Item	Part Number	Description
1	N705438	Throttle body bolt (4 required)
2	9F991	Throttle body
3	W705800	Fuel rail bolt (4 required)
4	9F792	Fuel rail
5	9F907	Fuel injector-to-fuel rail locking clip (8 required)

6	-	Fuel injector-to-fuel rail O-ring seal (8 required)
7	9F593	Fuel injector (8 required)
8	-	Fuel injector-to-intake manifold O-ring seal (8 required)
9	9A474	Intake manifold vacuum tube assembly
10	-	Charge motion control valve (CMCV) rod locking clip (2 required)
11	W708165	CMCV stud bolt
12	W709184	CMCV bolts (2 required)
13	9L490	CMCV
14	W500204	Positive crankcase ventilation (PCV) heater element bolts (2 required)
15	9F624	PCV heater element
16	-	PCV heater element O-ring seal
17	6N041	Engine noise shield insulator

DISASSEMBLY

1. Remove the 4 bolts and the throttle body (TB).
 - Discard the TB O-ring seal.
2. Remove the 4 bolts and the fuel rail.
3. Remove the fuel injector-to-fuel rail locking clips and separate the fuel injectors from the fuel rail.
 - Discard the 2 O-ring seals from each fuel injector.
4. Remove the vacuum tube assembly from the intake manifold.
5. Remove the charge motion control valve (CMCV) rod locking clips.
6. Remove the stud bolt, the 2 bolts and the CMCV.
7. Remove the 2 bolts and the positive crankcase ventilation (PCV) heater element.
 - Discard the O-ring seal.
8. Remove the engine noise shield insulator from the intake manifold.

ASSEMBLY

1. Install the engine noise shield insulator onto the intake manifold.

NOTE: **Lubricate the new O-ring seal with clean engine oil prior to installation.**

2. Using a new O-ring seal, install the PCV heater element and the 2 bolts.
 - Tighten to 6 N.m (53 lb-in).
3. Position the CMCV and install the stud bolt and the 2 bolts.
 - Tighten to 10 N.m (89 lb-in).
4. Install the CMCV rod locking clips.
5. Install the vacuum tube assembly onto the intake manifold.

NOTE: **Lubricate the new O-ring seals with clean engine oil prior to**

installation.

6. Install new O-ring seals on each of the fuel injectors.
7. Assemble the fuel injectors onto the fuel rail and install the locking clips.
8. Install the fuel rail and fuel injector assembly onto the intake manifold.
9. Install the 4 fuel rail bolts.
 - Tighten to 10 N.m (89 lb-in).

NOTE: Lubricate the TB O-ring seal with clean engine coolant prior to installation.

10. Using a new TB seal, install the TB and tighten the bolts in 2 stages.
 - Stage 1: Tighten to 9 N.m (80 lb-in).
 - Stage 2: Tighten an additional 90 degrees.