G. Install the barrel with a new seal ring.

H. Lubricate the piston, then install the piston and connecting rod. Lubricate the bearings and install the bearing cap. Tighten the capscrews to 12-15 N.m (9-11 lbf ft). Install the sump cover.

I. Install the valves in the cylinder head and manifold as shown in Figure 47. Use a new gasket and install manifold and cylinder head together.

J. Install the cylinder head, making sure the marks are aligned. Tighten the nuts to 20-22 N.m (15-16 lbf ft).

INSTALLATION

A. Rotate the crankshaft of the engine until the Number 1 piston is at TDC on the compression stroke.

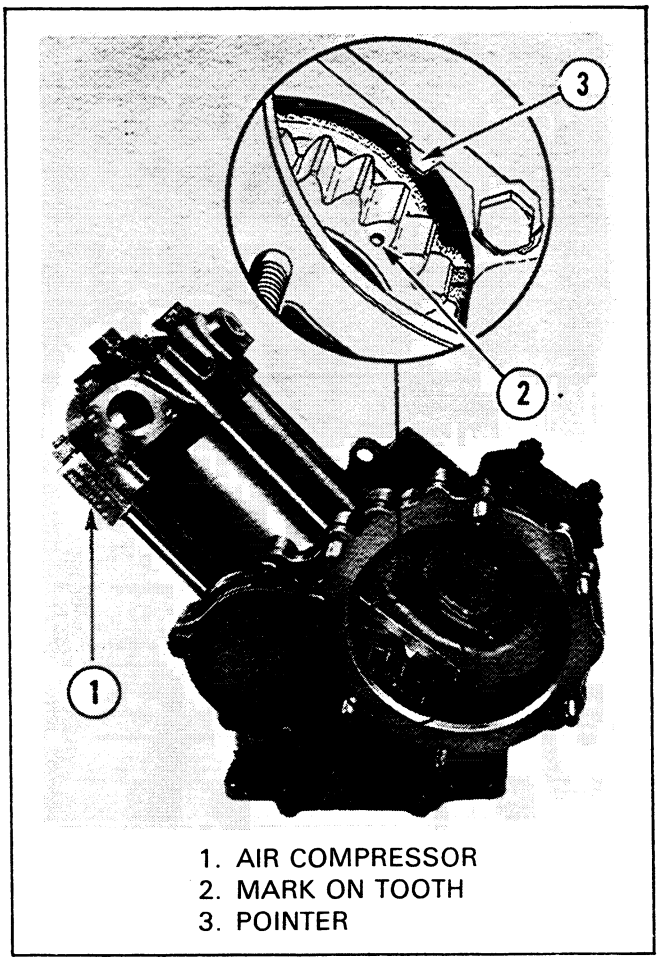
B. Rotate the crankshaft of the air compressor. Make sure the gear tooth for the fuel injection pump is approximately half a tooth to the left of the pointer. (See Figure 48).

C. Install the air compressor with new gaskets. Make sure the gear for the air compressor engages with the camshaft gear. When installed, make sure the gear tooth for the fuel injection pump is closest to the pointer.

D. Install the capscrews for the air compressor.

E. Install the fuel injection pump. Check the timing.

F. Connect the coolant and air lines at the compressor.



1. AIR COMPRESSOR
2. MARK ON TOOTH
3. POINTER

FIGURE 48. INSTALLING THE AIR COMPRESSOR

G. Fill the cooling system. Remove air from the fuel system. Run the engine and check for correct operation and leaks.

CHECKS AND ADJUSTMENTS

REMOVING AIR FROM THE FUEL SYSTEM (See Figure 49)

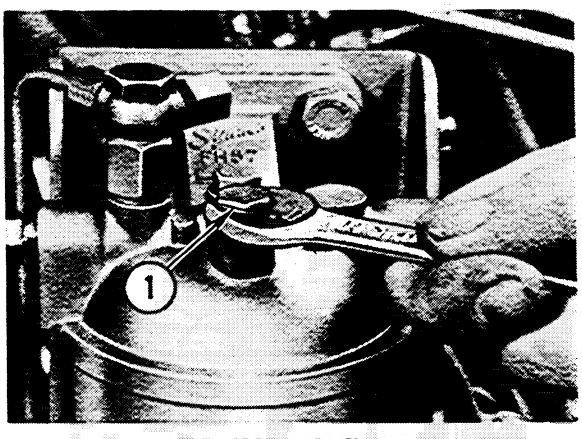
Air must be removed from the fuel system if: (1) the engine has run out of fuel, or (2) a fuel line has been disconnected.

A. Clean the area around the vent ports.

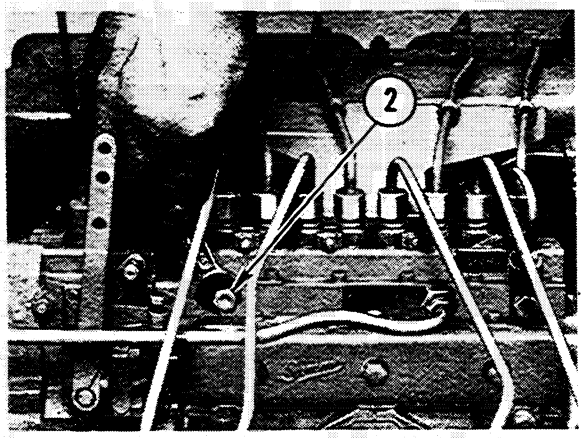
B. Loosen the vent plug at the top of the fuel filter(s). Loosen the vent plug on the left-hand side of the fuel injection pump.

C. Operate the primer lever on the fuel pump until fuel, free of bubbles, flows from each vent port. If it is not possible to operate the primer lever, rotate the crankshaft of the engine 180°, then try the lever again.

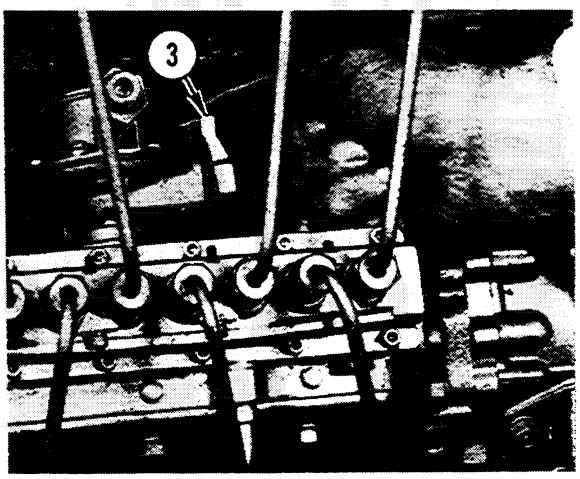
D. Tighten the vent plug on the fuel filter and then the vent plug on the fuel injection pump.



1. FUEL FILTER VENT



2. FUEL INJECTION PUMP VENT



3. FUEL PUMP LEVER 11331

FIGURE 49. REMOVING AIR FROM THE FUEL SYSTEM

TIMING THE FUEL INJECTION PUMP (See Figure 50)

A. The excess fuel device must be disengaged before timing the fuel injection pump. The excess fuel device is installed on the governor housing.

1. Disconnect the oil line at the excess fuel device.

2. Remove the capscrew and fitting. Install just the capscrew and turn it until it pushes the internal piston fully into the excess fuel device.

3. Move the stop control on the fuel injection pump to the stop position and then to the run pmsition.

B. Put the Number 1 piston at TDC on the compression stroke.

C. Release a valve of the Number 1 cylinder and let it sit on the piston (A). Use a collar on the valve stem to keep it from falling into the cylinder.

D. Install a dial indicator with the plunger on top of the valve stem. Move the Number 1 piston until it is exactly on TDC (A).

E. Disconnect the fuel line for the Number 1 cylinder at the fuel injection pump. Remove the valve and spring from the port (B). Check that the plunger in the fuel ijection pump is on the correct stroke as follows:

1. The plunger must be coming up the bore as the Number 1 piston reaches TDC.

2. Rotate the engine backward through 45° and then forward in the normal direction of rotation. Check that the plunger is moving as the Number 1 piston reaches TDC.

F. Connect a fuel line to the Number 1 outlet on the fuel injection pump (C). Connect a small fuel tank to the inlet of the fuel injection pump (D). This will give a gravity supply of fuel for timing.

G. Rotate the crankshaft backward through 90° and then forward in the normal direction of rotation. Stop rotation just as the flow of fuel from the Number 1 outlet stops (one drop every 10 seconds) (E). With the engine in this position, check the position of the Number 1 piston with the dial indicator. The correct position of the piston is 10.85 mm (0.27 in) BTDC. Also check that the exhaust valve on the Number 4 cylinder is open (F).