

- 1. Fuel Injection Nozzle
- 21. Fuel Return Line
- 22. Fuel Delivery Line
- 23. Hole Cover
- 24. Mounting Bolt
- 25. Engine Stop Cable
- 26. Mounting Bracket
- 27. Accelerator Cable
- 28. Fuel Injection Lines
- 40. Boost Compensator
- 41. Aneroid Compensator
- 42. Fast Idle Actuator
- J. Fuel Injection Pump Assembly

Figure 17. Fuel Injection Pump and Related Parts

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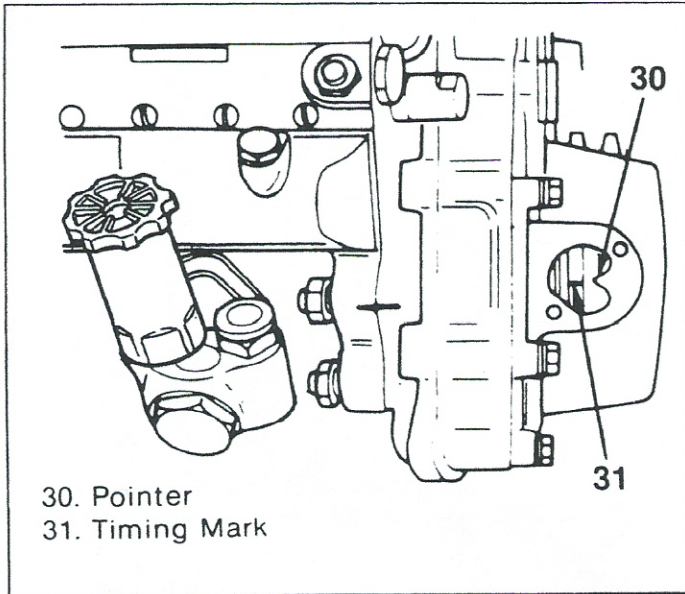


Figure 18. Timing Marks and Pointer

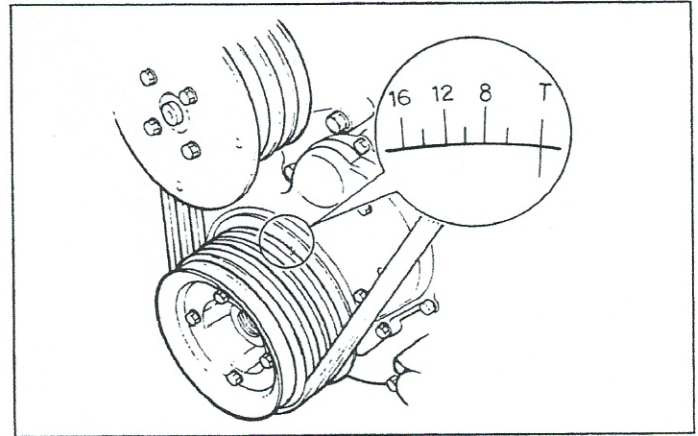


Figure 19. TDC Mark and Crank Pulley Mark

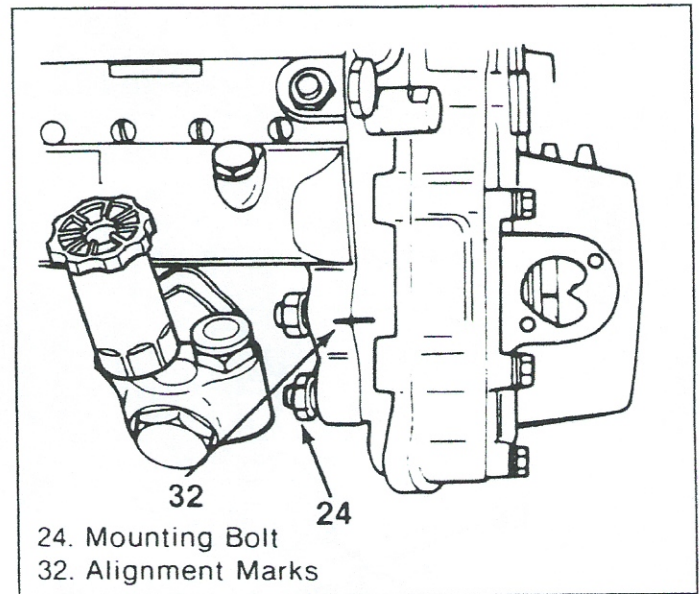


Figure 20. Alignment Marks

### Install or Connect (Figures 17, 18, 19 and 20)

- Before installing the fuel injection pump, add 1/2 liter (one pint) of engine oil in through the engine oil feed hole.
- Turn the crank to align the timing mark on the crank pulley with the TDC mark (figure 19).
  1. Injection pump to the engine.
    - Install the injection pump so that the timing mark on the timer aligns with the pointer on the timer housing (figure 18).
    - Also align the marks on the injection pump and the timing gear housing (figure 20).
  2. Injection pump mounting bolts (24).
  3. Fuel delivery lines between the filter and the pump (22).
  4. Accelerator cable (27).
  5. Intake manifold.
  6. Fuel return lines (21).
  7. fuel injection lines (28).
  8. Engine stop cable (25).
  9. Hole cover on timing gear housing (23).
  10. Battery positive cable.
  11. Check the injection pump to engine timing as described under "Checking the Injection Pump Timing" in this section and time if necessary.
  12. Bleed the fuel system of air.

## BLEEDING THE FUEL SYSTEM

Anytime the fuel system is opened to the atmosphere, outside air can enter. Air bubbles, trapped in the fuel system, will cause the engine to run poorly. After any service that requires opening the fuel system has been performed, all trapped air must be removed by bleeding the system (figure 21).

1. Tilt the cab.
2. Loosen jam nut and bleed screw on the injection pump.
3. Pump the primer pump until fuel flow is free of air bubbles.
4. Tighten the bleed screw and jam nut.
5. Lower the cab.

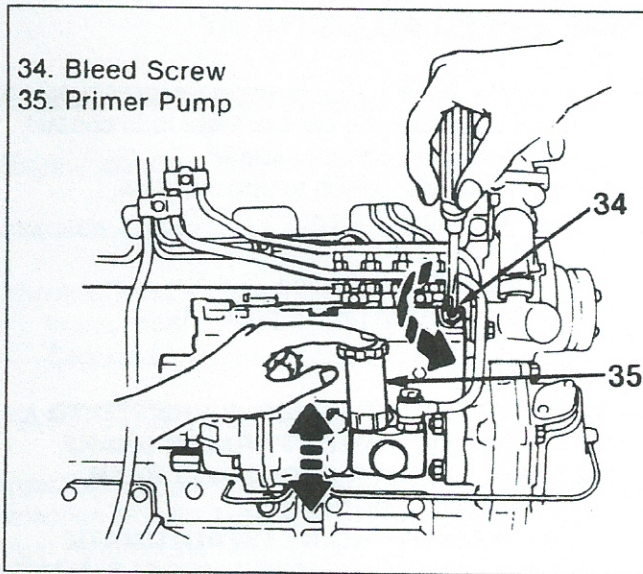


Figure 21. Bleeding the Fuel System

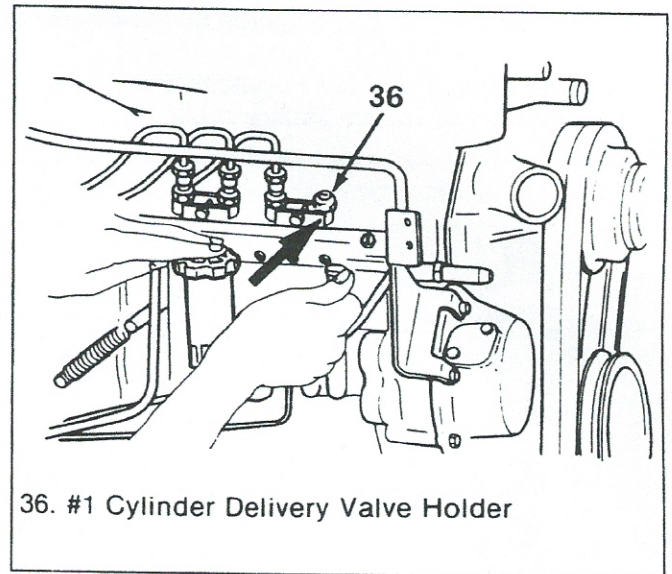


Figure 22. Timing the Injection Pump

### CHECKING THE FUEL INJECTION PUMP TIMING

1. Tilt the cab.
2. Disconnect the positive battery cable.
3. Check that the marks on the automatic timer and the pump housing are properly aligned (figure 18).
4. Check that the timer mounting bolts are tight (figure 20).
5. Disconnect the fuel line from the #1 cylinder fuel injection line (figure 22).
6. Remove the delivery valve holder, spring and the delivery valve (figure 23).
7. Install the delivery valve holder back into the injection pump and tighten to 40 N-m (30 lb-ft).
8. Rotate the crankshaft until fuel appears at the open top of the delivery valve holder.
9. Observe the timing mark on the crank pulley (figure 19). Refer to "Specifications" for the correct timing figures.
10. If timing is correct, install the delivery valve and spring and tighten the delivery valve holder to 40 N-m (30 lb-ft). If timing is not correct, proceed as follows:

### FUEL INJECTION PUMP TIMING ADJUSTMENT

1. Turn the crank until the timing mark on the crank pulley is aligned with the correct number of degrees from the "Specifications" at the end of this section.
2. Remove the fuel line between the fuel feed pump and the fuel filter for access to the automatic timer mounting nuts. Do not bend the fuel line.
3. Loosen the four timer mounting nuts (figure 20).
4. Replace the fuel line.
5. Disconnect the fuel line from the #1 cylinder fuel injection (figure 21).
6. Remove the delivery valve holder, spring and the delivery valve (figure 22).
7. Install the delivery valve holder back into the injection pump and tighten to 40 N-m (30 lb-ft).
8. Pump the fuel primer pump till fuel flows from the open top of the delivery valve holder. Continue to pump the primer pump and at the same time turn the injection pump housing in the opposite direction to crankshaft rotation (figure 22).
9. Turn the pump housing until the fuel flow from the delivery valve holder stops. Then pump the primer pump a little more to be sure that the fuel flow has completely stopped.
10. Remove the fuel line for access to the timer mounting nuts.
11. Tighten the timer mounting nuts.
12. Re-install the fuel line.
13. Check the timing as described earlier under "Checking the Fuel Injection Pump Timing"
14. Install the delivery valve and spring back into

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the injection pump and tighten to 40 N·m (30 lb·ft).

15. Install the fuel line to #1 cylinder fuel injection.
16. Connect the positive battery cable.

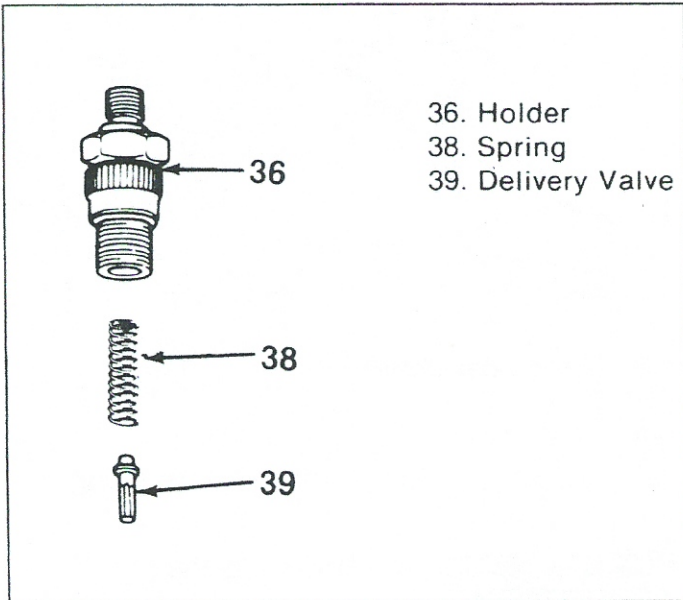


Figure 23. Delivery Valve Components

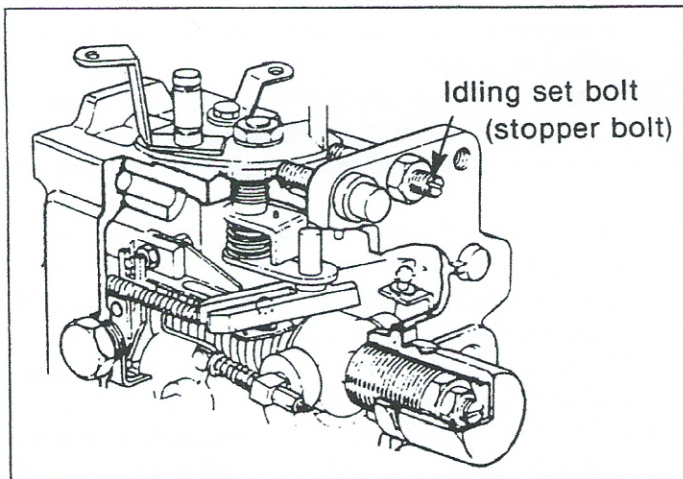


Figure 24. Idling Speed Adjustment

## IDLE SPEED ADJUSTMENT

1. Bring the engine to operating temperature.
2. Make sure that the control lever is in contact with the stopper bolt at idle.
3. Adjust the idle speed to specification.  
Manual Transmission:  
650 ± 30 RPM  
Automatic Transmission:  
650 ± 30 RPM (in "D" position)

### WARNING:

- WHEN SELECTOR LEVER IS SHIFTED TO "D" POSITION, APPLY PARKING BRAKE AND BLOCK BOTH FRONT AND REAR WHEELS WITH CHOCKS.
- WHEN RACING ENGINE ON AUTOMATIC TRANSMISSION EQUIPPED MODELS, MAKE SURE THAT SHIFT LEVER IS IN "N" POSITION AND DEPRESS BRAKE PEDAL TO PREVENT FORWARD SURGE OF VEHICLE.
- AFTER THE ADJUSTMENT HAS BEEN MADE, SHIFT THE LEVER TO THE "N" POSITION AND REMOVE WHEEL CHOCKS.

### Adjust

- Loosen the jam nut and turn the stopper bolt.
  - Turn the stopper bolt clockwise to increase engine speed.
  - Turn the stopper bolt counterclockwise to decrease engine speed.
- Tighten the jam nut.

## SPECIFICATIONS

### EMISSION SPECIFICATIONS

Engine Idle Speed.....	Manual Transmission 650 ± 30 RPM
Injection Timing.....	Automatic Transmission 650 ± 30 RPM (in "D" position) BTDC 8°
Injection Nozzle Opening Pressure	
Production.....	13 700–14 500 kPa (2 000–2 100 psi)
Service Limit.....	13 240 kPa (1 920 psi)

### FASTENER TORQUES

Injection Nozzle Retaining Nut.....	88 N·m (65 lb·ft)
Injection Nozzle Assembly to Cylinder Head.....	64 N·m (47 lb·ft)
Fuel Return Line Nut.....	35 N·m (26 lb·ft)
Fuel Line Sleeve Nut.....	30 N·m (22 lb·ft)

## SPECIAL TOOLS

J-28829	Nozzle Tester
J-39531	Nozzle Cleaning Kit
J-39543	Nozzle Guide