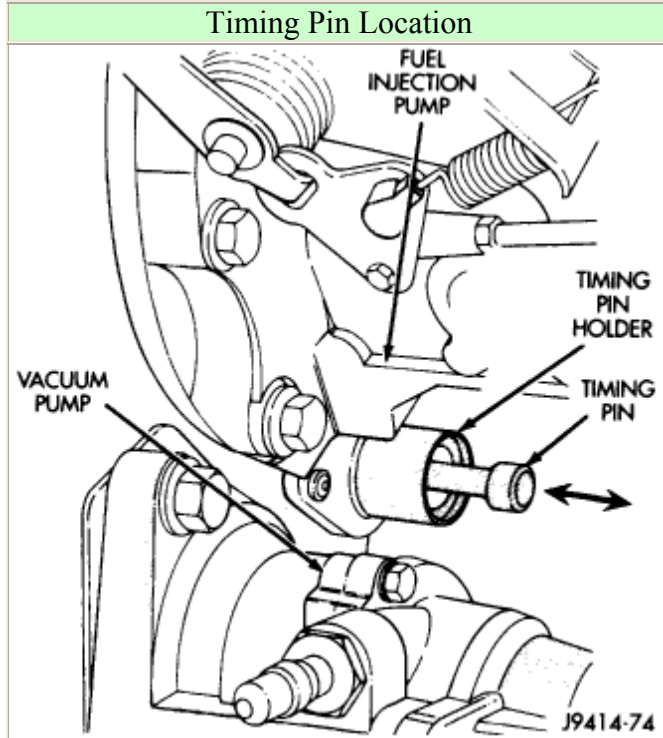


## P7100 PUMP INSTALLATION INSTRUCTIONS

### Diesel Care & Performance Inc

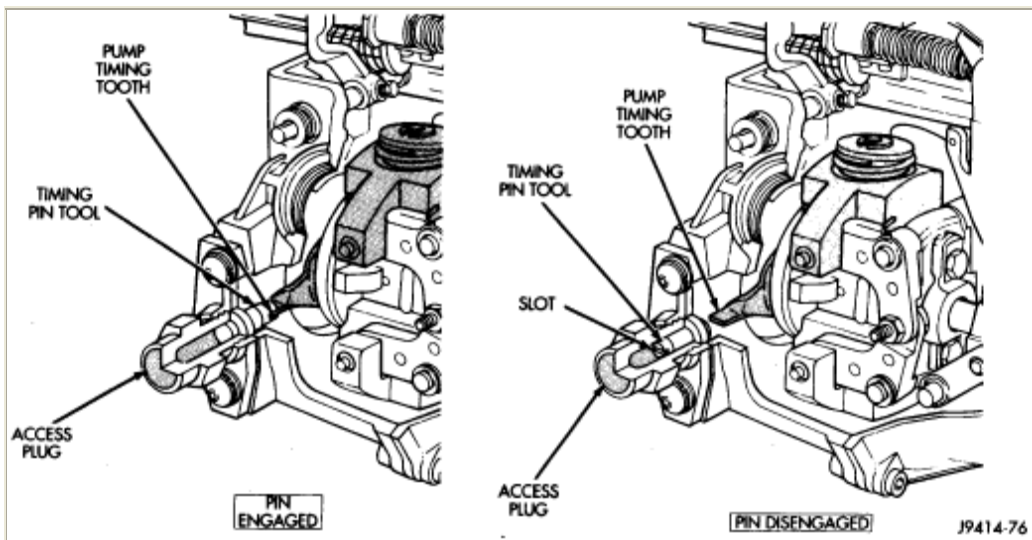
#### Installation



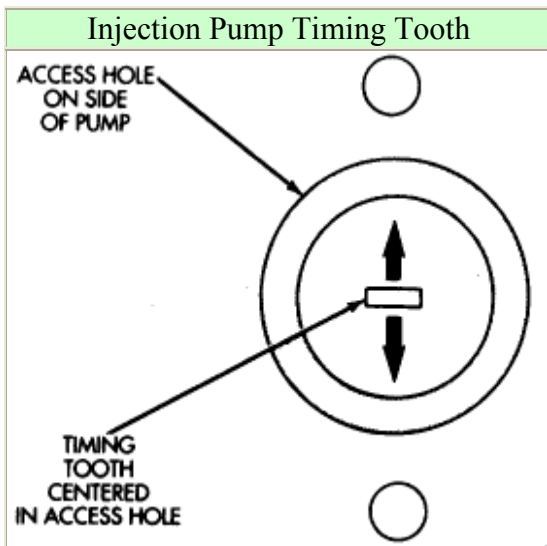
**CAUTION:** Before installing the injection pump, be sure that number 1 cylinder is at the Top Dead Center (**TDC**) (compression stroke) position. Engage the timing pin on the rear of the gear cover into the rear of the camshaft gear. Rotate crankshaft if necessary.

Before injection pump installation, it must be set (pump shaft rotated) to a certain position to attain accurate pump timing. Remove the access plug from the side of pump.

Injection Pump Timing Pin Tool

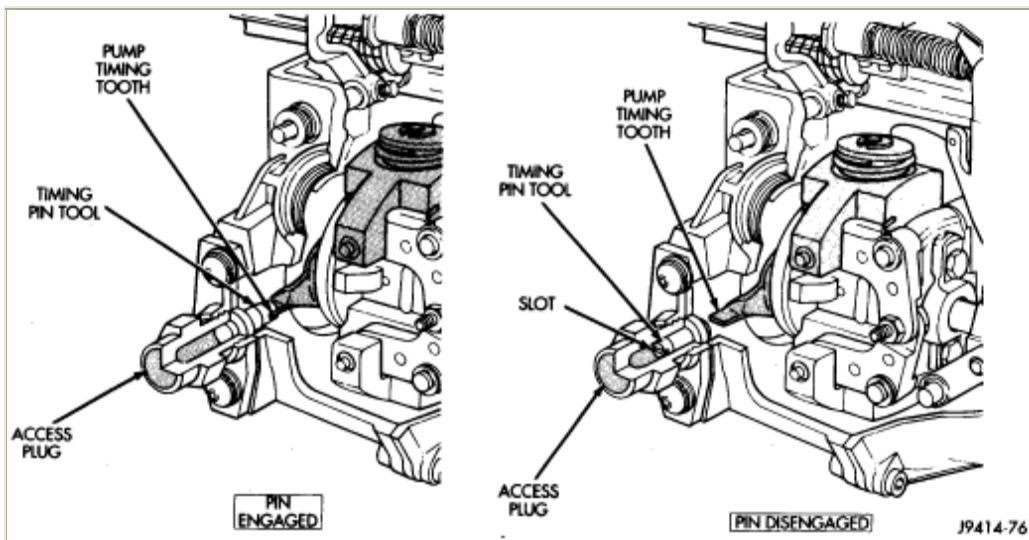


Stored behind this access plug is a plastic timing pin tool.



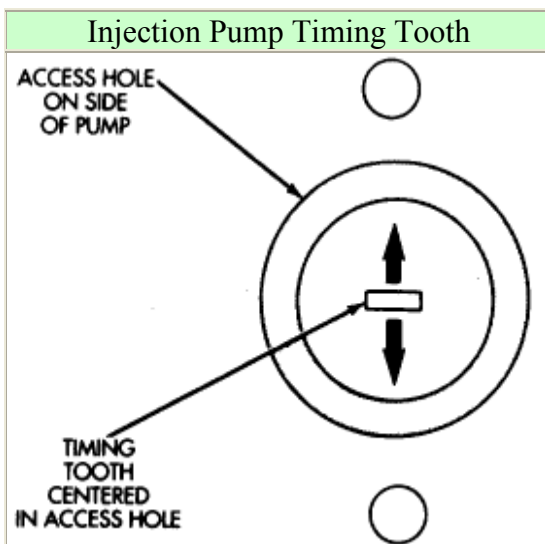
This tool is used to align the injection pump timing tooth to the center of access hole,

Injection Pump Timing Pin Tool



**Installing Original Pump:** If the original pump is being reinstalled, the pin tool should already be mounted with the slotted end facing outward. When the position of this tool has been reversed, with the slotted end facing inward, it is used as a pump timing pin tool.

**Installing New or Rebuilt Pump:** If a new or rebuilt pump is being installed, the pump should have been shipped with the slotted end of the timing pin tool engaged to the timing tooth in the pump.

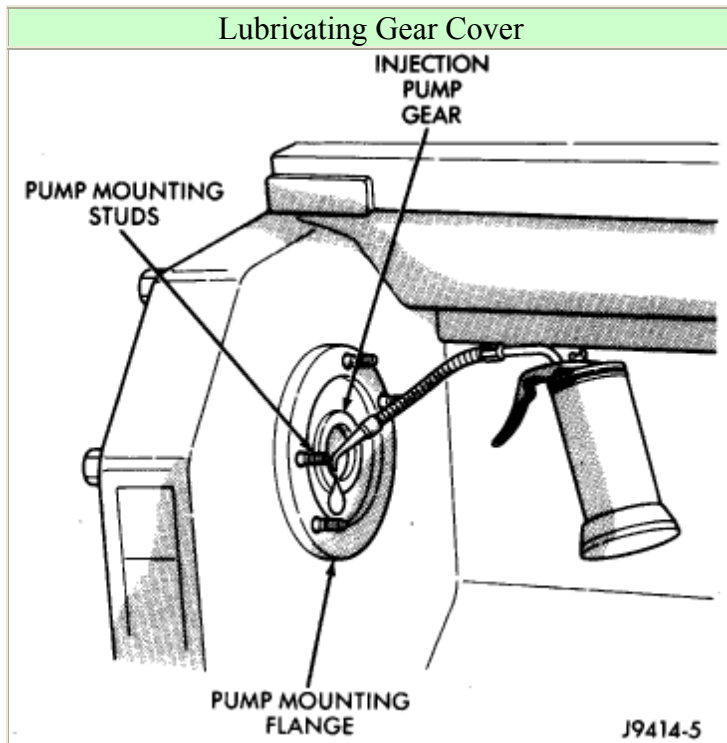


To set injection pump timing on an original pump or when checking timing on a new pump, rotate the pump shaft until the timing tooth appears in the center of the plug opening. Install the slotted end of the timing pin tool over the timing tooth. The pump

shaft may have to be rotated slightly to align the tool to the tooth. Do not force the slots in the tool over the timing tooth.

After the tool has been temporarily installed to the timing tooth, install and loosely tighten the access plug. New pumps should have been shipped with this tool already engaged.

1. If the original pump is being installed, check the condition of the rubber O-ring at pump mounting area.

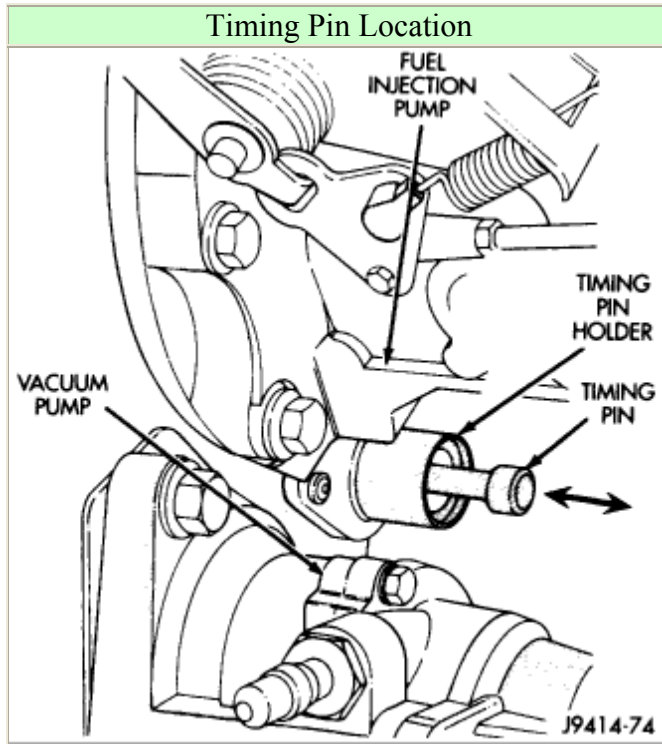


ZOOM

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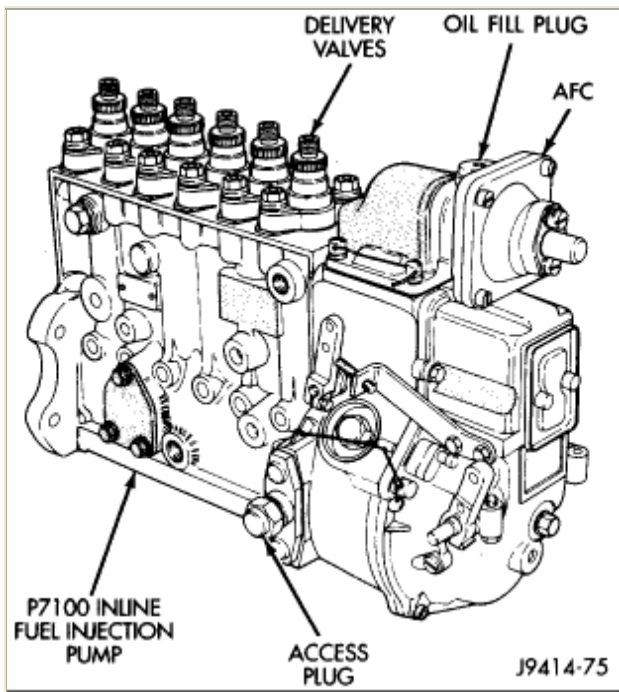
2. Apply clean engine oil to the injection pump mounting flange opening in gear cover housing to allow easier pump installation. Also apply engine oil to the pump O-ring seal at pump mounting area. The injection pump shaft and its mounting area in the center of the injection pump gear, should be clean and free of any oil. This will ensure of proper gear-to-shaft tightening.
3. Position the pump assembly to the mounting flange on gear cover while aligning the injection pump shaft through the back of injection pump gear.
4. Install the four pump mounting nuts finger tight. Do not attempt to tighten (pull) the pump to the gear cover using the mounting nuts. Damage to pump or gear cover may occur. The pump must be positioned flat to its mounting flange before attempting to tighten mounting nuts.
5. Install two (vertical) pump mounting bracket bolts finger tight.

6. Tighten the four pump mounting nuts to **24 Nm (18 ft lb)** torque. Tighten the two pump mounting bracket bolts. To prevent damage to pump and mounting flange, tighten the pump mounting nuts first.
7. Install injection pump drive shaft-to-injection pump gear retaining nut and washer. Do a preliminary tightening of this nut to **10 to 15 Nm (7 to 11 ft lb)** torque. Do not over tighten. This is not the final tightening torque. To prevent damage to the timing pin, do not exceed this torque.



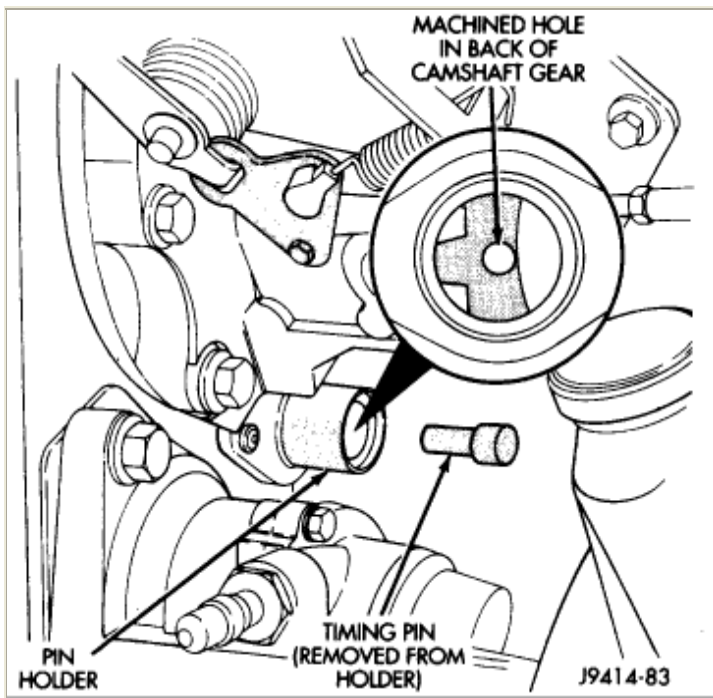
8. Disengage the timing pin from the rear of camshaft gear by pulling it straight back.

### Fuel Injection Pump

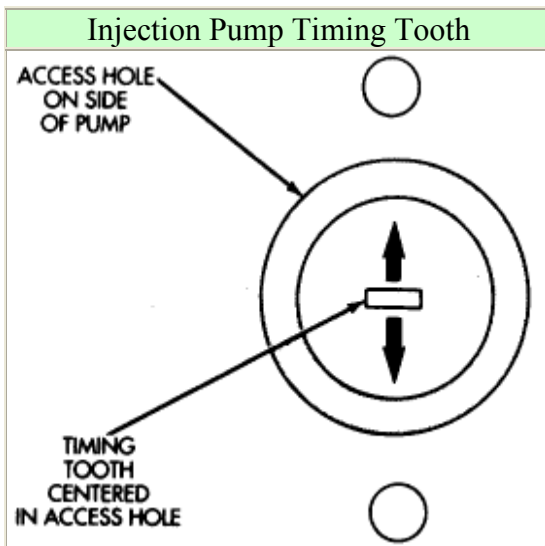


9. Remove the access plug from injection pump and remove timing pin tool from pump.
10. Do a final tightening of the injection pump gear-to-injection pump shaft nut. Tighten to **165 Nm (122 ft lb)** torque. Use the barring tool to prevent the engine from rotating when tightening gear.
11. After the injection pump gear has received a final tightening, verify injection pump timing.
  - a. Rotate the engine counter-clockwise with the barring tool (clockwise as observed at the crankshaft from the front of vehicle).

Back Of Camshaft Gear

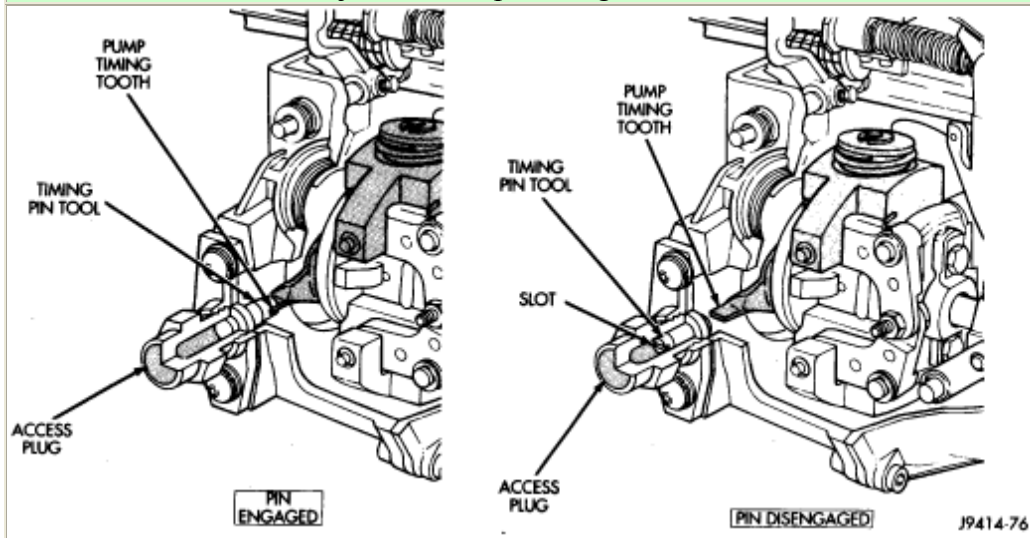


Continue rotating engine until the timing pin aligns into hole at rear of camshaft gear. The engine is now at TDC of number cylinder.



- b. With the timing pin aligned into the rear of the camshaft gear, the timing tooth should also be centered in the access hole on the side of the injection pump.

## Injection Pump Timing Pin Tool

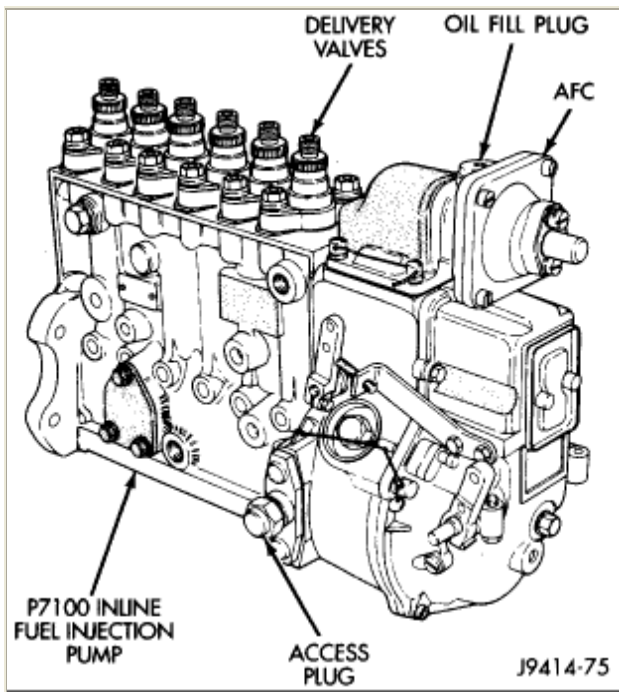


Install timing pin tool to verify.

- c. If the timing pin tool will not fit into the timing tooth in the pump, the pump gear nut must be removed. Loosen the pump gear from the pump shaft with the T-bar puller tool. With the gear loosened, rotate the injection pump shaft until it aligns to the center of access hole on side of pump. Tighten injection gear nut and remove barring tool.
12. Remove the timing pin tool from the pump. Reverse the position of this tool. The slotted part of tool should be facing outward and will be stored in pump in this direction. Place tool back into pump. Install access plug and its sealing washer. Tighten plug to **15 Nm (11 ft lb)** torque.
13. Install the engine oil supply line and [fuel return line](#)/overflow valve to pump.
14. Install the six high-pressure fuel lines to the top of pump. Tighten lines to **30 Nm (22 ft lb)** torque.
15. Install the low-pressure [fuel supply line](#) to pump.
16. Install the [turbocharger wastegate](#) line and AFC sensing line at the pump.
17. New or rebuilt P7100 series fuel injection pumps must be pre-lubricated before operation. Failure to do so may result in pre-mature governor wear.

Fuel Injection Pump





- a. Remove the 10 mm hex plug (oil fill plug) on the top of the injection pump governor.
  - b. Add **750 ml (25 ounces)** of clean engine oil through this opening.
  - c. Install oil fill plug and tighten to **28 Nm (21 ft lb)** torque.
18. Install the throttle linkage assembly to pump. Tighten bolts to **24 Nm (18 ft lb)** torque.
  19. Connect electrical connector to fuel solenoid.
  20. Connect the main engine wiring harness at top of injection pump.
  21. Install the engine oil dipstick tube mounting clamp and bolt at the opening to the intake manifold.
  22. Install oil fill tube and tube adapter.
  23. Install oil fill tube bracket and mounting bolt.
  24. Install electrical connector to [throttle position sensor](#) (if equipped).
  25. Install air filter housing-to-[turbocharger](#) tube at air filter housing.
  26. Using a new gasket, install air heater assembly (five bolts).
  27. Install intake manifold-to-[intercooler](#) tube.
  28. Check and adjust throttle linkage. Refer to [Throttle Position Sensor](#).
  29. Bleed air from [fuel system](#). Refer to the Air Bleed Procedure. [See: Adjustments](#)
  30. Adjust the low [idle speed](#) if required. Refer to Idle Speed Adjustment. [See: Idle Speed](#)
  31. Inspect throttle linkage to be sure that the control lever is opening to the full open position.
  32. Some engine oil was lost when removing pump. Check and adjust engine oil level.