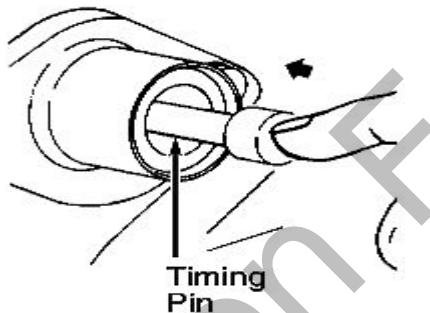


Inline Pump Removal and Installation

Cummins engine with "lock timed" inline injection pump

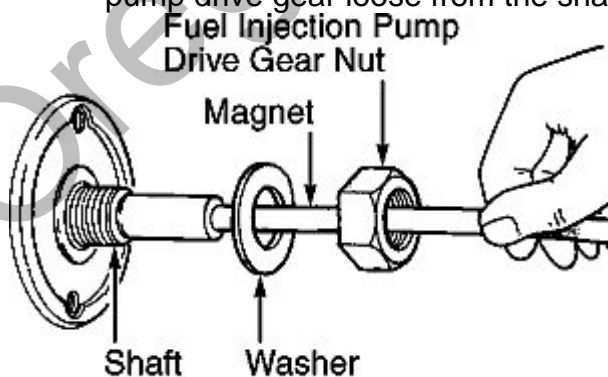
Removal

1. Clean the exterior of the injection pump and mounting surfaces.
2. Remove the fuel supply line and return lines, note the position of the overflow valve.
3. Remove the injection lines to the pump.
4. Remove the control linkage. See the OEM service manual.
5. Remove the fuel shutoff solenoid assembly, if equipped.
6. Remove the air fuel control (AFC) air line.
7. Disconnect Wastegate turbocharger control line (if applicable).
8. Disconnect the external oil feed line at the inboard side of the fuel injection pump (if applicable) and the main oil rifle.
9. Disconnect the external oil feed line at the rear of the pump or AFC latch-out if applicable.
10. Locate top dead center for cylinder Number 1. Push the top dead center pin into the hole in the camshaft gear while slowly barring the engine.

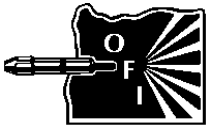


NOTE: Be certain to disengage the timing pin after locating top dead center.

11. Remove the fuel injection pump rear support mounting bracket.
12. Remove the gear cover access cap.
13. Remove the nut and washer use a gear puller to pull the fuel injection pump drive gear loose from the shaft.



NOTE: Do not drop the nut and washer. Dropping the nut and washer will result in the need to remove the front cover.



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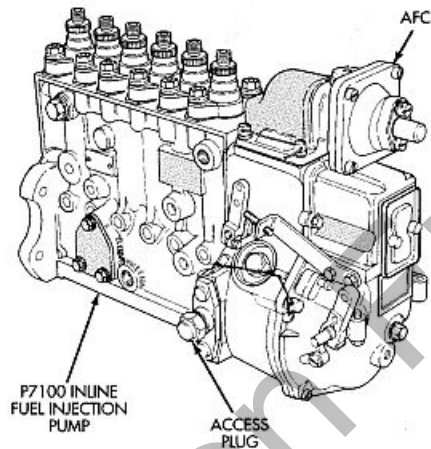
14. Remove the four mounting nuts.
15. Remove the fuel injection pump.

Inspection

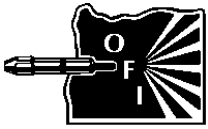
1. Inspect pump mounting surface making sure it is clean and free of burrs.
2. Inspect pump rear support brackets, if equipped, for cracks or damaged parts and replace or repair as necessary.

Installation

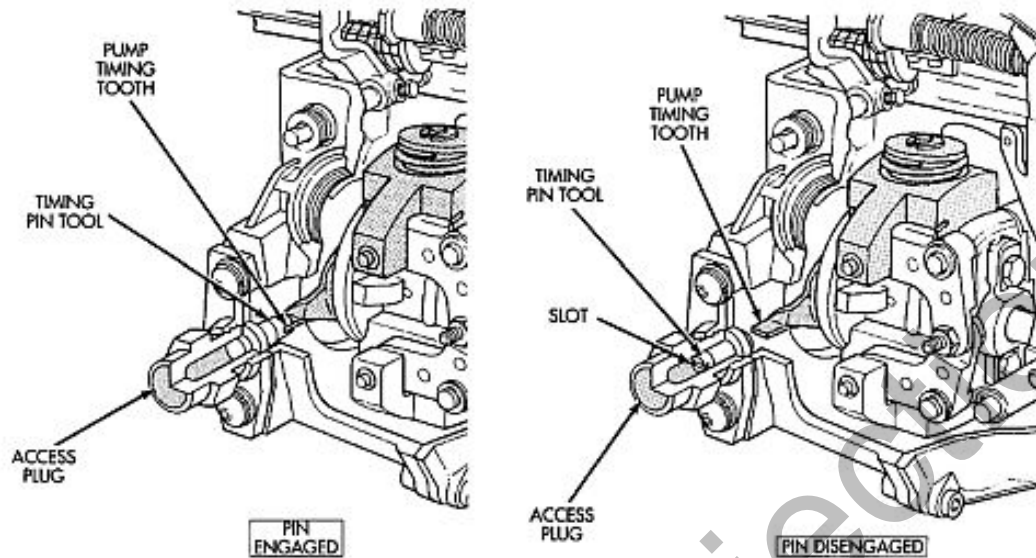
1. Make certain that the engine is rotated to cylinder Number 1 at top dead center.
2. Remove the access plug on the injection pump.



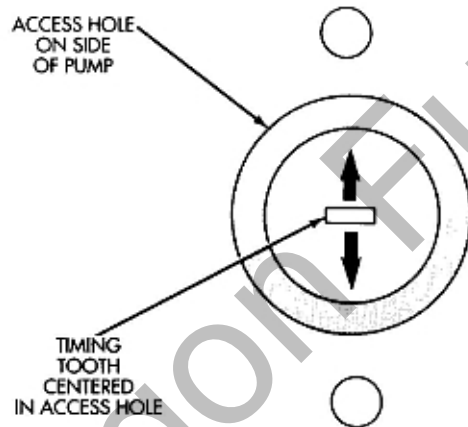
3. A rebuilt or repaired injection pump should be locked in time, with the timing pin engaged. Remove the timing pin.



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4. If the timing pin is not engaged, remove the timing pin, reverse the timing pin and insert it into the "pump timing pin tooth"
5. If the timing pin tooth is not aligned with the timing pin hole, rotate the fuel injection pump shaft until the timing tooth aligns, then insert the timing pin so the slot of the timing pin will fit over the timing tooth in the pump.



6. Install and secure the timing pin with the access plug.

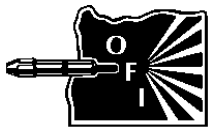
NOTE: Before installing the fuel pump drive gear, clean the injection pump shaft and drive gear taper with residue-free cleaner. Spray the cleaner into the gap between the shaft and the gear, then dry with compressed air.

NOTE: The fuel injection pump drive gear inside diameter and the shaft outside diameter must be clean and dry before installing the gear. Failure to do so can result in slipped timing.

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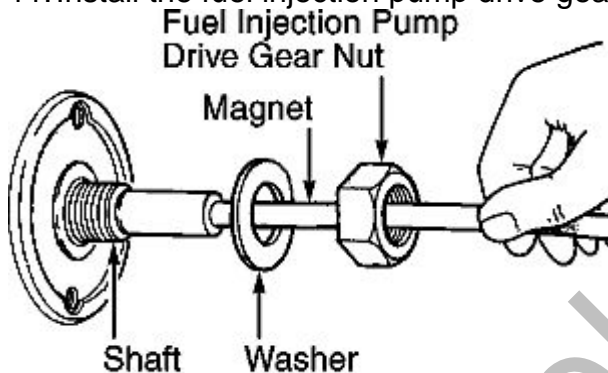


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NOTE: The in-line fuel injection pump driveshaft has a provision for a Woodruff key; however, it is not required. Timing mark alignment is not required for the in-line pump drive gear.

NOTE: Make certain that the engine has cylinder Number 1 at top dead center.

7. Install new pump mount pilot o-ring and fill orifice o-ring, if equipped.
8. Slide the pump shaft through the drive gear and position the pump flange onto the mounting studs.
9. Push the pump forward until the mounting flange and o-ring are properly fitted
10. Install the mounting nuts.
11. Install the fuel injection pump drive gear nut and washer.



NOTE: Do not drop the nut and washer into the engine.

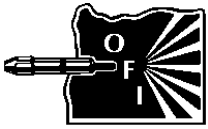
Dropping the nut and washer will result in the need to remove the front cover.

12. To prevent damage to the timing pins, do not exceed the torque value given. This is not the final torque value for the retaining nut. Torque Value: 10 to 15 nm [89 to 133 in-lb]
13. Disengage the engine timing pin.
14. The governor housing must be pre-lubricated before engine operation. Failure to do so can result in premature governor wear.
15. Remove the access plug and add clean engine oil to the governor in the appropriate quantity. • RSV 450 ML [0.48 qt]• RQV 750 ML [0.79 qt]• RQVK 750 ML [0.79 qt]
16. Remove the fuel injection pump timing pin, reverse the position of the timing pin to disengage the timing pin (see previous graphic), and install the timing pin, access plug, and sealing washer. Torque the access plug to: 27 nm [20 ft-lb].
17. Torque injection pump drive gear nut to the following specification, depending on which model injection pump you have. "A" Pump 85 nm [63 ft lb], P3000 and P7100 200 nm[150-160 ft lb], Denso 123 nm [91 ft lb]
Caution: Improper torque (less than specified) will cause the drive gear to slip under load resulting in incorrect pump to engine timing, or excessive torque can cause the drive gear to split and damage engine components. Verify the proper torque in your engine service manual.
18. Install the gear cover access cap hand-tight.
19. Install the fuel injection pump mounting bracket screws.

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20. Tighten all screws by hand for proper alignment, then torque.
21. Connect the external oil feed line at the inboard side of the fuel injection pump (if applicable) and the main oil rifle.
22. Connect the external oil feed line at the rear of the pump or AFC latch-out if applicable.
23. Connect Wastegate turbocharger control line (if applicable)
24. Install the air fuel control air line.
25. Install the fuel shutoff valve.
26. Install the control linkage. See your OEM service manual
27. Install the injection lines to the injection pump, leave loose for bleeding.
28. Install the fuel supply and the fuel return lines, reinstalling the overflow valve in the position noted.

Priming

The MW, A, and P fuel injection pumps are equipped with an engine-side fuel return line. The return fitting is a spring loaded over flow valve that maintains pressure in the injection pump fuel galley.

1. Operate the hand primer on the supply pump, when fuel flows freely from the fuel inlet line tighten the fuel inlet line at the injection pump.
2. Continue to operate the hand primer on the supply pump until fuel flows from the return line, tighten the return, or overflow fitting.
3. Crank the engine until fuel flows from the injection lines, tighten the injection lines.
4. Start the engine and check for fuel leaks.