

Model:

Engine identification:

Year:

**Ram Truck 2500/
3500 5.9L Turbo Diesel**

ETB, ETC

1994-00

Special tools

- Crankshaft turning/holding tool – No. SP371, MTE3377371.

General precautions

- Disconnect battery ground cable.
- Do NOT turn crankshaft or camshaft with timing gear(s) removed.
- Remove glow plugs to ease turning engine.
- Turn crankshaft in normal direction of rotation (unless otherwise stated).
- If fitted: Mark position of crankshaft position (CKP) sensor before removal.
- Do NOT turn crankshaft via camshaft or other gears.
- Observe all tightening torques.
- Check diesel injection pump timing after gear replacement.

Valve timing procedures

- Engine at TDC No.1 cylinder.
- Crankshaft can be turned on flywheel end using special tool **1**.
NOTE: Turning tool counterclockwise will rotate crankshaft clockwise.
- Engine with in-line fuel injection pump:
 - Slowly turn crankshaft with tool until timing pin **2** can be inserted into hole in back of camshaft gear **3**.
 - Timing pin is located below injection pump.
 - Ensure crankshaft gear and camshaft gear timing marks aligned **4**.
- Engine with VP-type fuel injection pump:
 - Ensure crankshaft gear, camshaft gear and injection pump gear timing marks aligned **4** & **5**.

- Engine with in-line fuel injection pump:
 - Injection pump can be aligned with pin.
 - Remove plug from injection pump, timing pin is stored behind plug **6**.
 - Rotate injection pump shaft until timing tooth positioned in center of access hole **7**.
 - Insert pin with slotted end facing inwards, install and loosely tighten plug **8**.

NOTE: After engine repairs, install injection pump timing pin with slotted end facing outwards (injection pump unlocked) **9.**

- Install injection pump gear **10**:
 - Torque injection pump gear to 7-11 ft. lbs.
 - To prevent shearing of timing pin, temporarily remove pin from back of camshaft gear **2**.
 - Remove injection pump timing pin **9**.
 - Torque injection pump gear to 122 ft. lbs. **10**.
 - Crankshaft rotation can be prevented using special tool **1**.
 - Ensure timing pins can be refitted **2** & **11**.
- Engine with VP-type fuel injection pump:
 - Install injection pump gear **10**, ensure keyway arrow points to injection pump **12**.
 - Ensure 3-digit number on keyway **12** matches 3-digit number on injection pump data plate **13**.

NOTE: Injection pump has been calibrated to pump keyway.

- Torque injection pump gear to 125 ft. lbs. **10**.
- Install camshaft gear:
 - Camshaft gear may need to be heated to 350°F for 45 min. to ease installation.
- Check camshaft endplay is between 0.006-0.010 in.
- Check camshaft gear backlash is between 0.003-0.013 in.

