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PAUL REDEHOFT

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 Conversion Calculator**2004 Dodge Truck RAM 1500 Truck 2WD V8-4.7L VIN N**[Vehicle Level](#) → [Engine, Cooling and Exhaust](#) → [Engine](#) → [Timing Chain](#) → [Service and Repair](#) → [Timing Chain](#) ←

Timing Chain

[Notes](#)

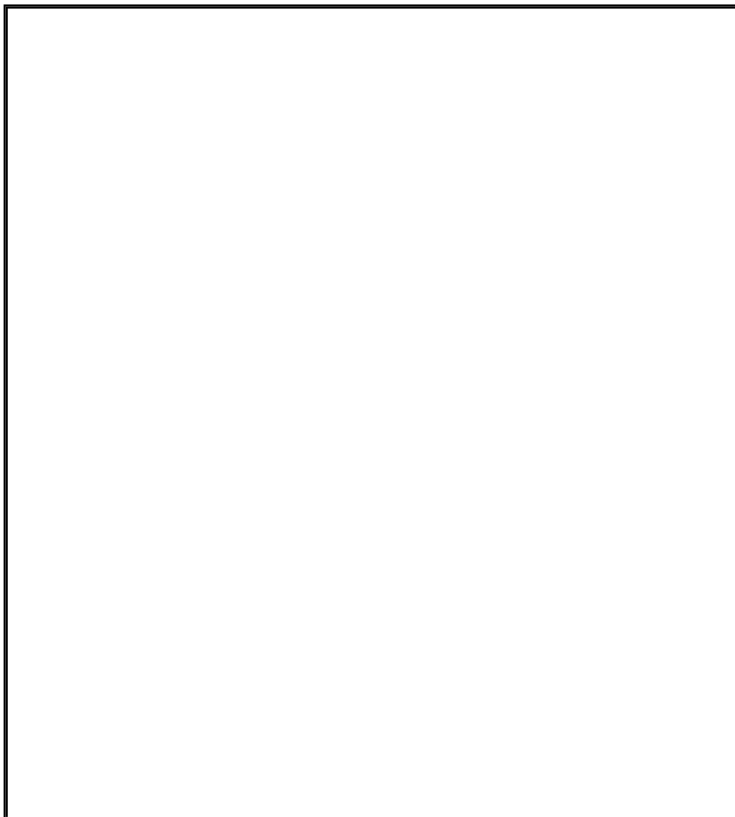
TIMING CHAIN AND SPROCKETS

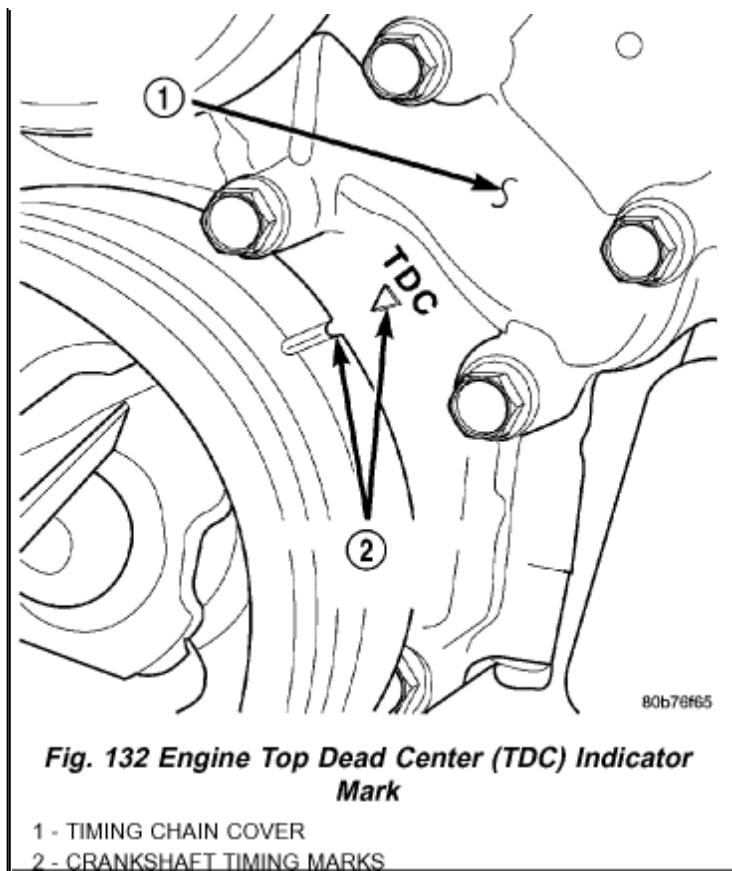
Precaution: Timing Chain Replacement

CHAIN GUIDES AND TENSIONER ARMS: Replace these parts if grooving in plastic face is more than **1 mm (0.039 inch)** deep. If plastic face is severely grooved or melted, the tensioner lube jet may be clogged. The tensioner should be replaced.

REMOVAL

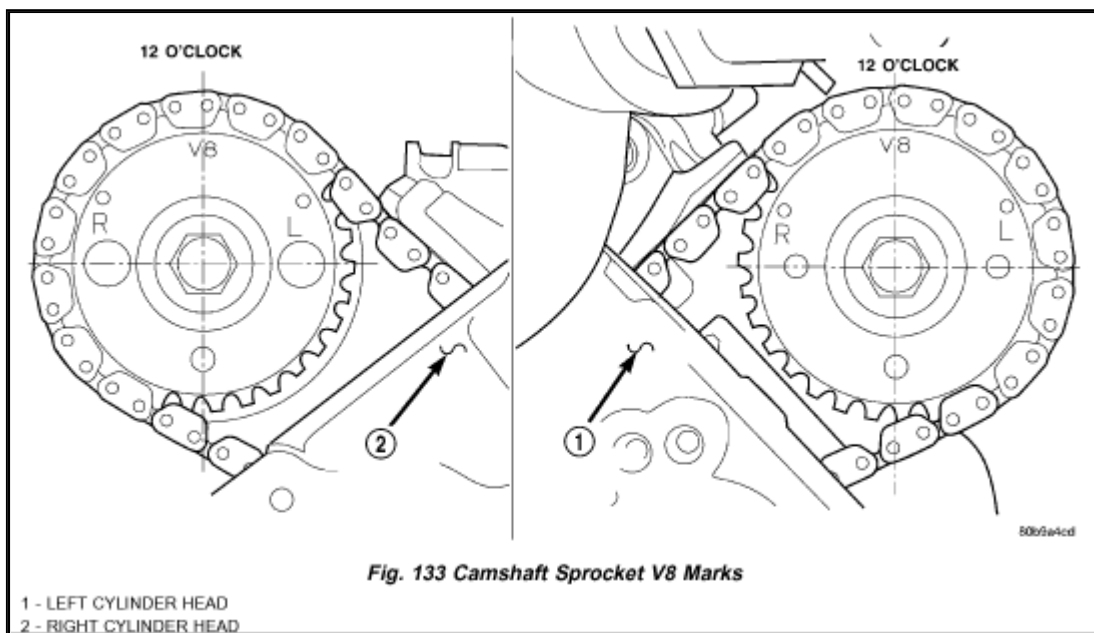
1. Disconnect negative cable from battery.
2. Drain [cooling system](#).
3. Remove right and left cylinder head covers.
4. Remove radiator fan shroud.





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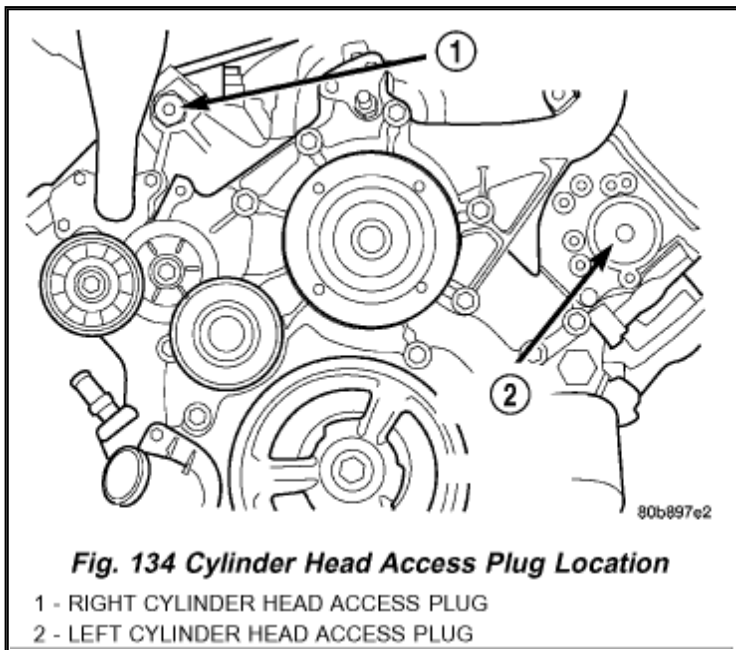


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5. Rotate engine until timing mark on crankshaft damper aligns with TDC mark

- on timing chain cover (Fig. 132) (# 1 cylinder exhaust stroke) and the camshaft sprocket "V8" marks are at the 12 o'clock position (Fig. 133).
6. Remove power steering pump.

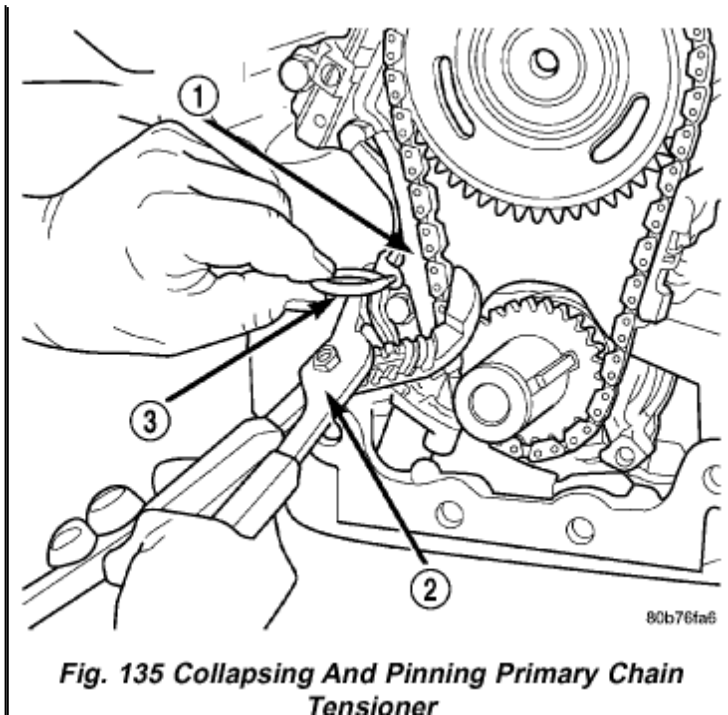


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7. Remove access plugs (2) from left and right cylinder heads for access to chain guide fasteners (Fig. 134).
8. Remove the oil fill housing to gain access to the right side tensioner arm fastener.
9. Remove crankshaft damper and timing chain cover.



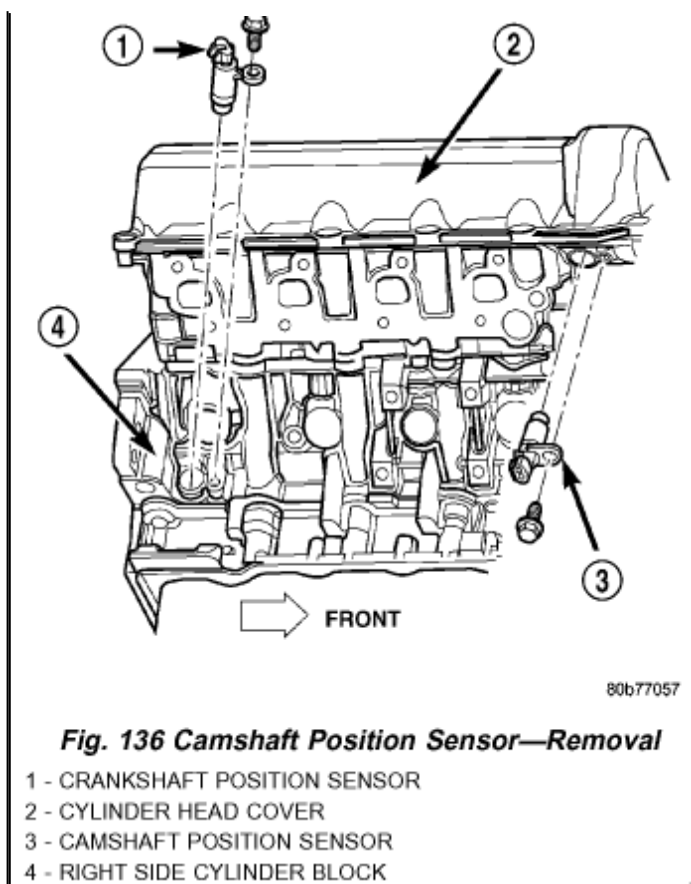


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10. Collapse and pin primary chain tensioner (Fig. 135). **CAUTION:** Plate behind left secondary chain tensioner could fall into [oil pan](#). Therefore, cover pan opening.
11. Remove secondary chain tensioners.



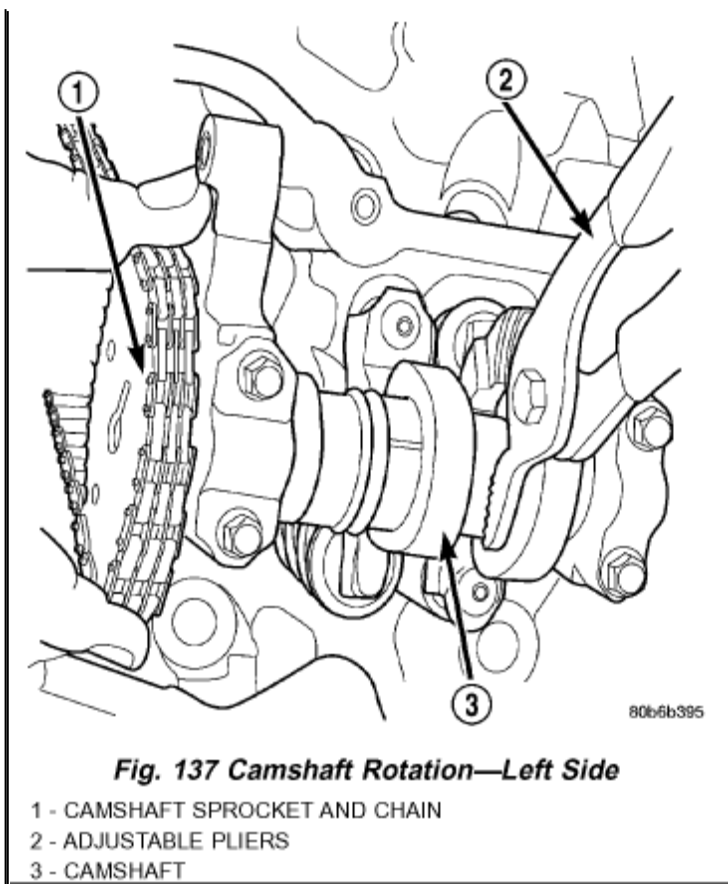


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12. Remove camshaft position sensor from right cylinder head (Fig. 136).
CAUTION: Care should be taken not to damage [camshaft](#) target wheel. Do not hold target wheel while loosening or tightening camshaft sprocket. Do not place the target wheel near a magnetic source of any kind. A damaged or magnetized target wheel could cause a vehicle no start condition.
CAUTION: Do not forcefully rotate the camshafts or [crankshaft](#) independently of each other. Damaging intake valve to [piston](#) contact will occur. Ensure negative battery cable is disconnected to guard against accidental starter engagement.
13. Remove left and right camshaft sprocket bolts.



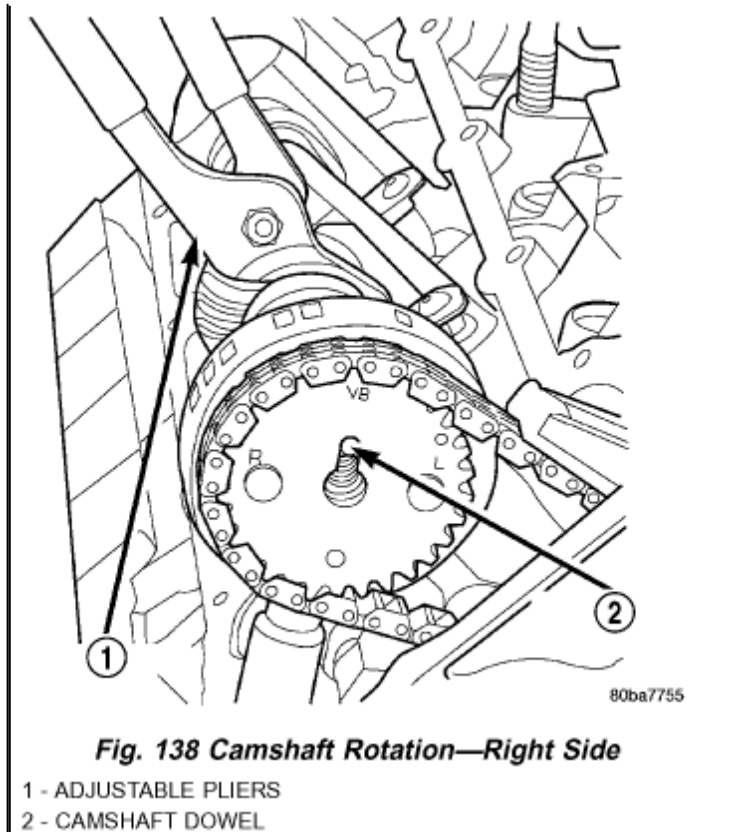


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14. While holding the left [camshaft](#) steel tube with adjustable pliers, (Fig. 137) remove the left camshaft sprocket. Slowly rotate the camshaft approximately 15 degrees clockwise to a neutral position.





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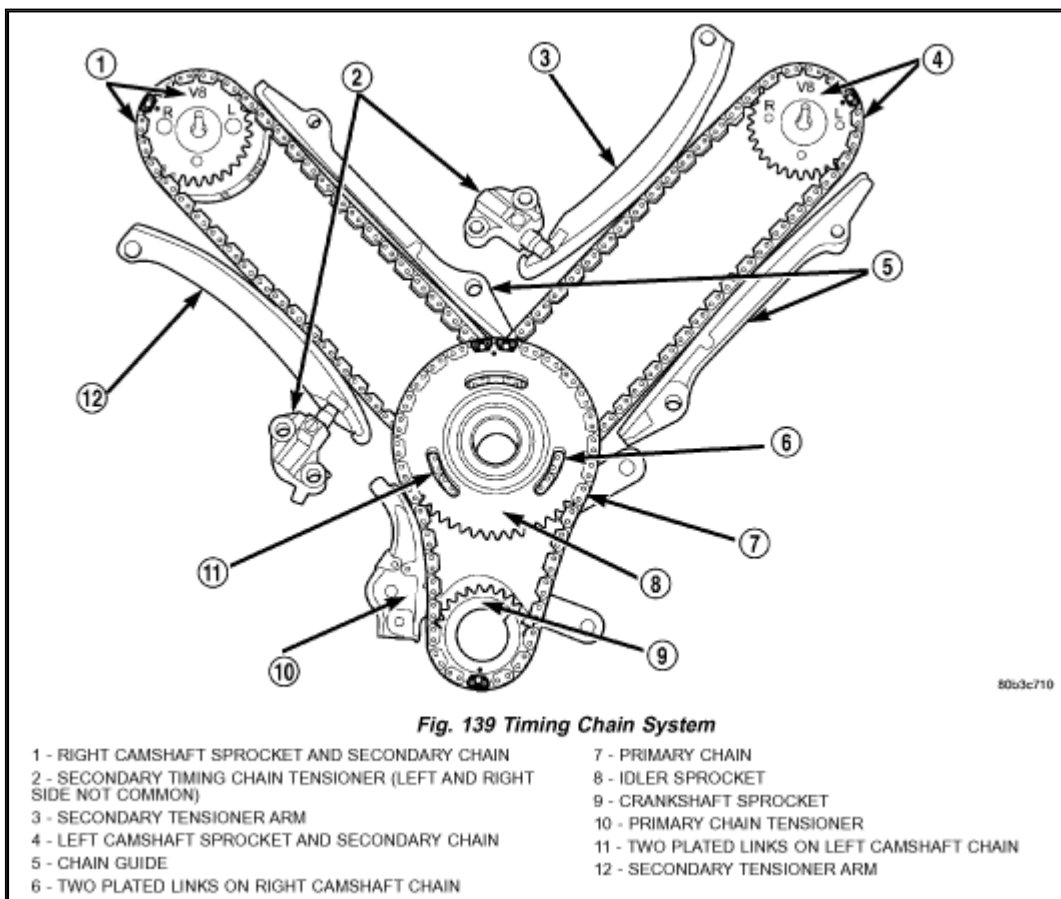
15. While holding the right [camshaft](#) steel tube with adjustable pliers, (Fig. 138) remove the right camshaft sprocket. Slowly rotate the camshaft approximately 45 degrees counterclockwise to a neutral position.
16. Remove idler sprocket assembly bolt.
17. Slide the idler sprocket assembly and crank sprocket forward simultaneously to remove the primary and secondary chains.
18. Remove both pivoting tensioner arms and chain guides.
19. Remove chain tensioner.

INSPECTION

Inspect the following components:

- Sprockets for excessive tooth wear. Some tooth markings are normal and not a cause for sprocket replacement.
- Idler sprocket assembly bushing and shaft for excessive wear.
- Idler sprocket assembly spline joint. The joint should be tight with no backlash or axial movement.
- Chain guides and tensioner arms. Replace these parts if grooving in plastic face is more than **1 mm (0.039 inch)** deep. If plastic face is severely grooved or melted, the tensioner lube jet may be clogged. The tensioner should be replaced.
- secondary chain tensioner [piston](#) and ratcheting device. Inspect for evidence

of heavy contact between tensioner piston and tensioner arm. If this condition exist the tensioner and tensioner arm should be replaced.



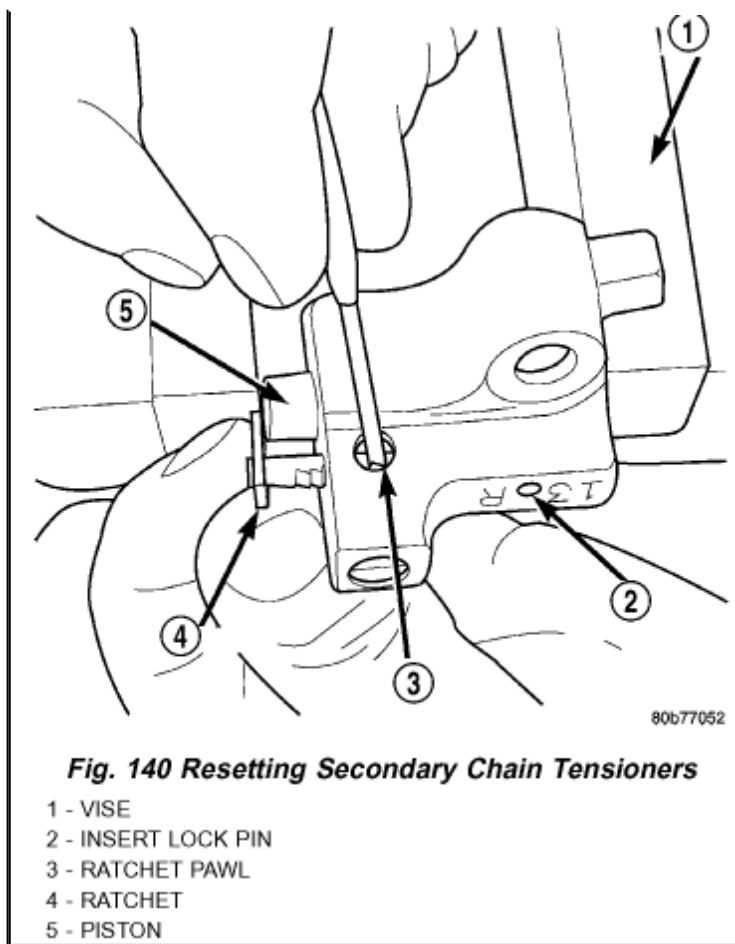
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- Primary chain tensioner plastic faces. Replace as required (Fig. 139).

INSTALLATION



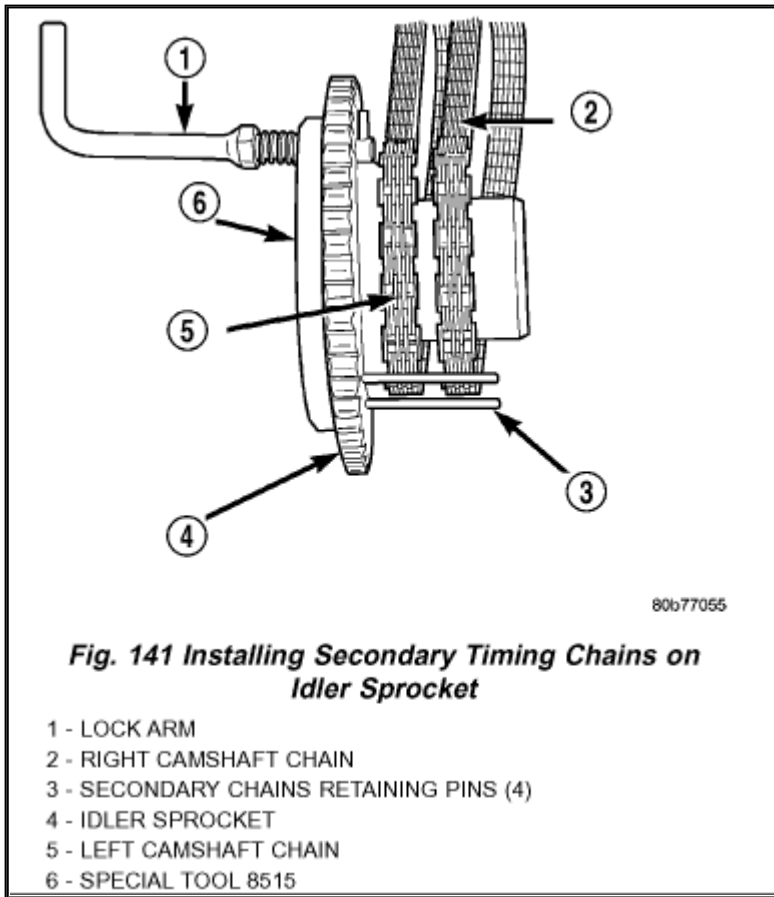


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1. Using a vise, lightly compress the secondary chain tensioner [piston](#) until the piston step is flush with the tensioner body Using a pin or suitable tool, release ratchet pawl by pulling pawl back against spring force through access hole on side of tensioner. While continuing to hold pawl back, Push ratchet device to approximately 2 mm from the tensioner body Install Special Tool 8514 lock pin into hole on front of tensioner. Slowly open vise to transfer piston spring force to lock pin (Fig. 140).
2. Position primary chain tensioner over [oil pump](#) and insert bolts into lower two holes on tensioner bracket. Tighten bolts to **28 Nm (250 inch lbs.)**.
CAUTION: overtightening the tensioner arm torx bolt can cause severe damage to the cylinder head. Tighten torx bolt to specified torque only.
3. Install right side chain tensioner arm. Apply Mopar Lock N, Seal to torx bolt, tighten bolt to **17 Nm (150 inch lbs.)**. **NOTE:** The silver bolts retain the guides to the cylinder heads and the black bolts retain the guides to the engine block.
4. Install the left side chain guide. Tighten the bolts to **28 Nm (250 inch lbs.)**.
CAUTION: Overtightening the tensioner arm torx bolt can cause severe damage to the cylinder head. Tighten torx bolt to specified torque only.
5. Install left side chain tensioner arm. Apply Mopar Lock N, Seal to torx bolt,

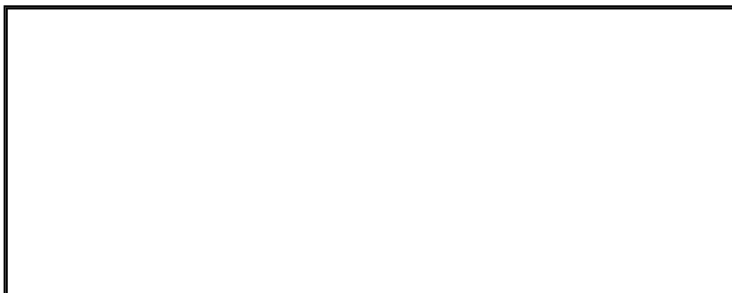
- tighten bolt to **17 Nm (150 inch lbs.)**.
6. Install the right side chain guide. Tighten the bolts to **28 Nm (250 inch lbs.)**.

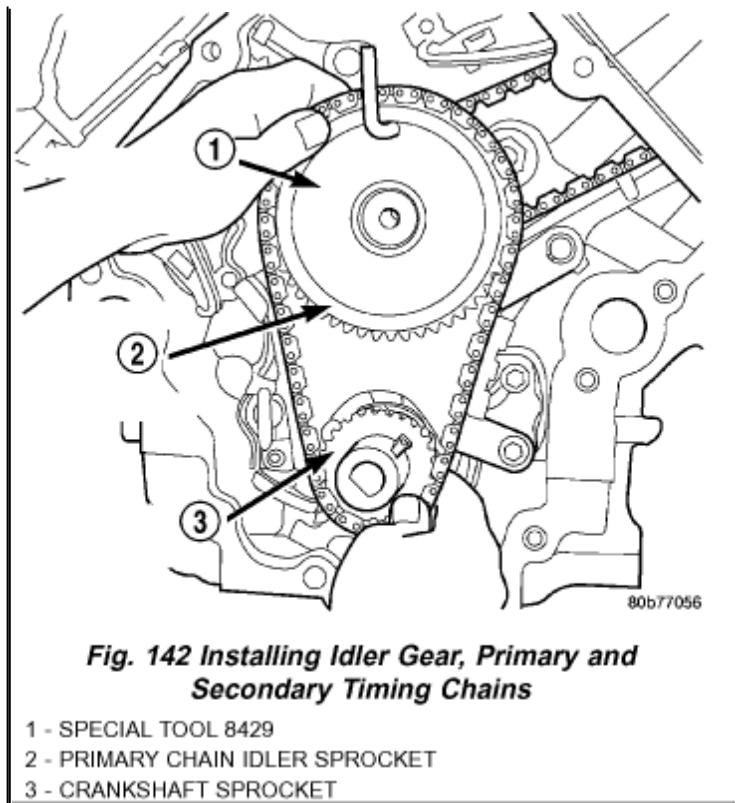


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7. Install both secondary chains onto the idler sprocket. Align two plated links on the secondary chains to be visible through the two lower openings on the idler sprocket (4 o'clock and 8 o'clock). Once the secondary timing chains are installed, position special tool 8515 to hold chains in place for installation (Fig. 141).
8. Align primary chain double plated links with the timing mark at 12 o'clock on the idler sprocket. Align the primary chain single plated link with the timing mark at 6 o'clock on the crankshaft sprocket (Fig. 139).
9. Lubricate idler shaft and bushings with clean engine oil.



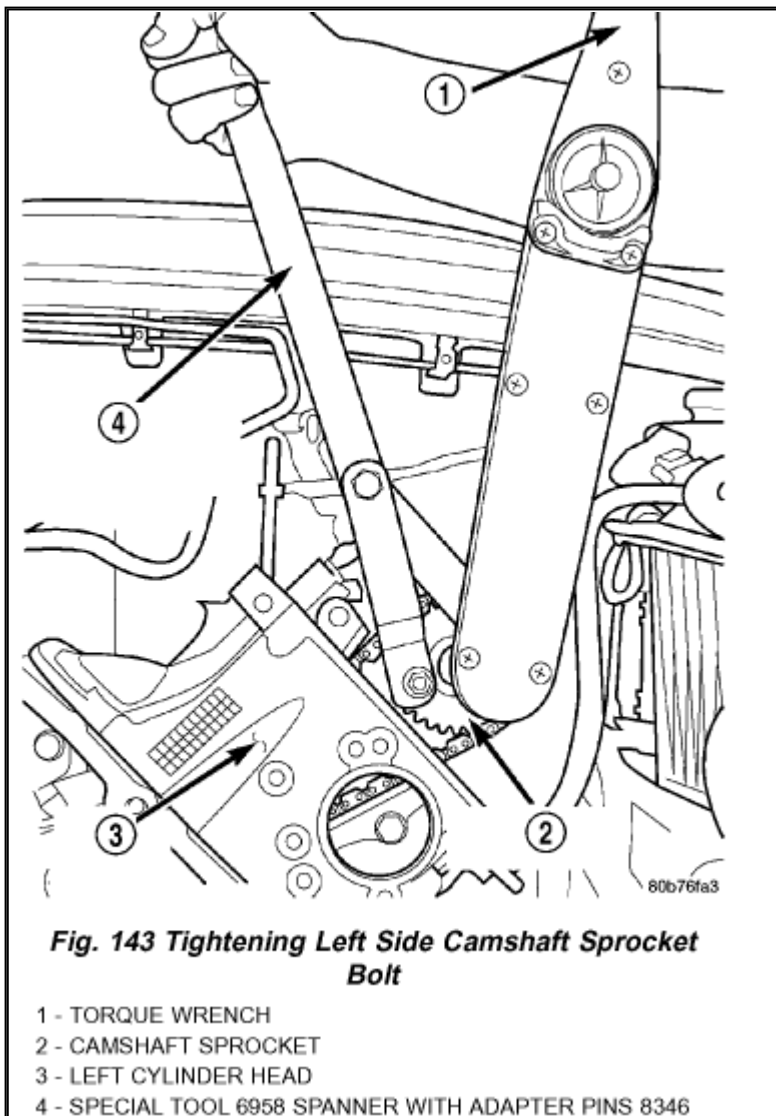


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10. Install all chains, crankshaft sprocket, and idler sprocket as an assembly (Fig. 142). After guiding both secondary chains through the block and cylinder head openings, affix chains with an elastic strap or the equivalent. This will maintain tension on chains to aid in installation. **NOTE:** It will be necessary to slightly rotate camshafts for sprocket installation.
11. Align left camshaft sprocket "L" dot to plated link on chain.
12. Align right camshaft sprocket "R" dot to plated link on chain. **CAUTION:** Remove excess oil from the camshaft sprocket bolt. Failure to do so can result in overtorque of bolt resulting in bolt failure.
13. Remove Special Tool 8515, then attach both sprockets to camshafts. Remove excess oil from bolts, then install sprocket bolts, but do not tighten at this time.
14. Verify that all plated links are aligned with the marks on all sprockets and the "V8" marks on camshaft sprockets are at the 12 o'clock position (Fig. 139). **CAUTION:** Ensure the plate between the left secondary chain tensioner and block is correctly installed.
15. Install both secondary chain tensioners. Tighten bolts to **28 Nm (250 inch lbs.)**. **NOTE: Left and right secondary chain tensioners are not common.**
16. **Before installing idler sprocket bolt, lubricate washer with oil, and tighten idler sprocket assembly retaining bolt to 34 Nm (25 ft. lbs.)**.
17. **Remove all locking pins (3) from tensioners. CAUTION: After pulling locking pins out of each tensioner, DO NOT manually extend the**

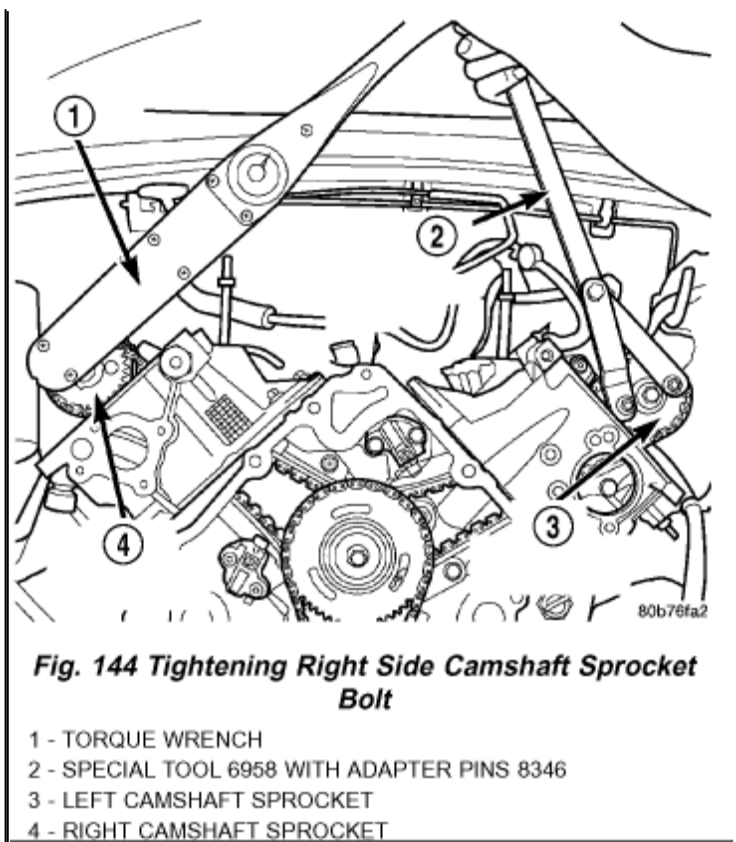
tensioner(s) ratchet. Doing so will over tension the chains, resulting in noise and/or high timing chain loads.



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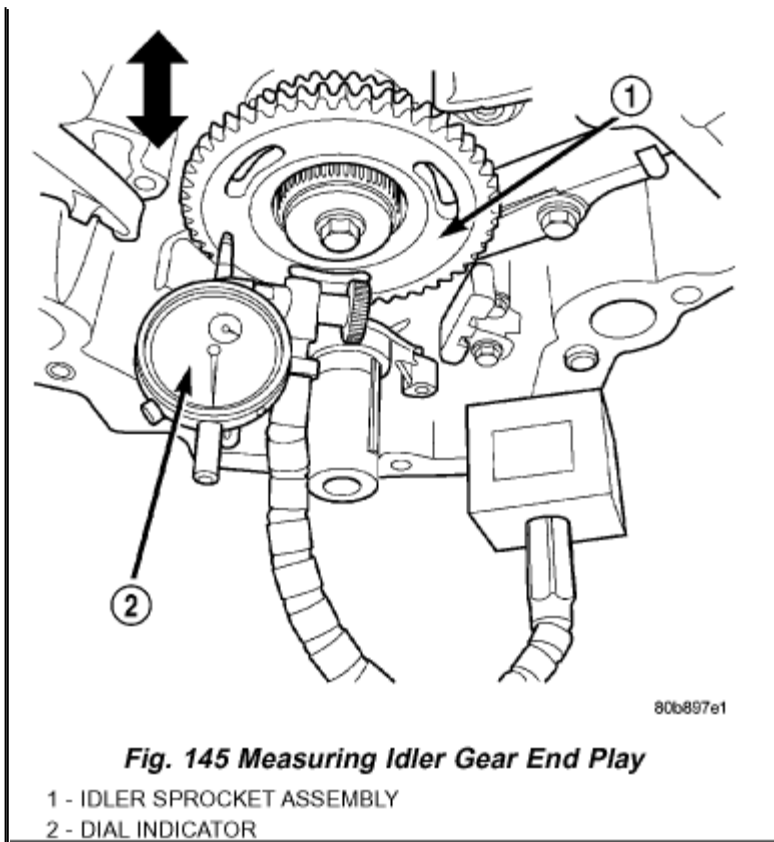
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18. Using Special Tool 6958, Spanner with Adaptor Pins 8346, tighten left (Fig. 143) and right (Fig. 144). camshaft sprocket bolts to 122 Nm (90 ft. lbs.).
19. Rotate engine two full revolutions. Verify timing marks are at the follow locations:
 - primary chain idler sprocket dot is at 12 o'clock (Fig. 139)
 - primary chain crankshaft sprocket dot is at 6 o'clock (Fig. 139)
 - secondary chain camshaft sprockets "V8" marks are at 12 o'clock (Fig. 139)

20. Lubricate all three chains with engine oil.





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21. After installing all chains, it is recommended that the idler gear end play be checked (Fig. 145). The end play must be within 0.10 - 0.25 mm (0.004 - 0.010 inch). If not within specification, the idler gear must be replaced.
22. Install timing chain cover and crankshaft damper.
23. Install cylinder head covers. **NOTE:** Before installing threaded plug in right cylinder head, the plug must be coated with sealant to prevent leaks.
24. Coat the large threaded access plug with Mopar Thread Sealant with Teflon, then install into the right cylinder head and tighten to 81 Nm (60 ft. lbs.) (Fig. 134).
25. Install the oil fill housing.
26. Install access plug in left cylinder head (Fig. 134).
27. Install power steering pump.
28. Install radiator fan shroud.
29. Fill [cooling system](#).
30. Connect negative cable to battery.

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