2007 ENGINE

3.7L - Service Information - Nitro

DESCRIPTION

3.7L ENGINE DESCRIPTION

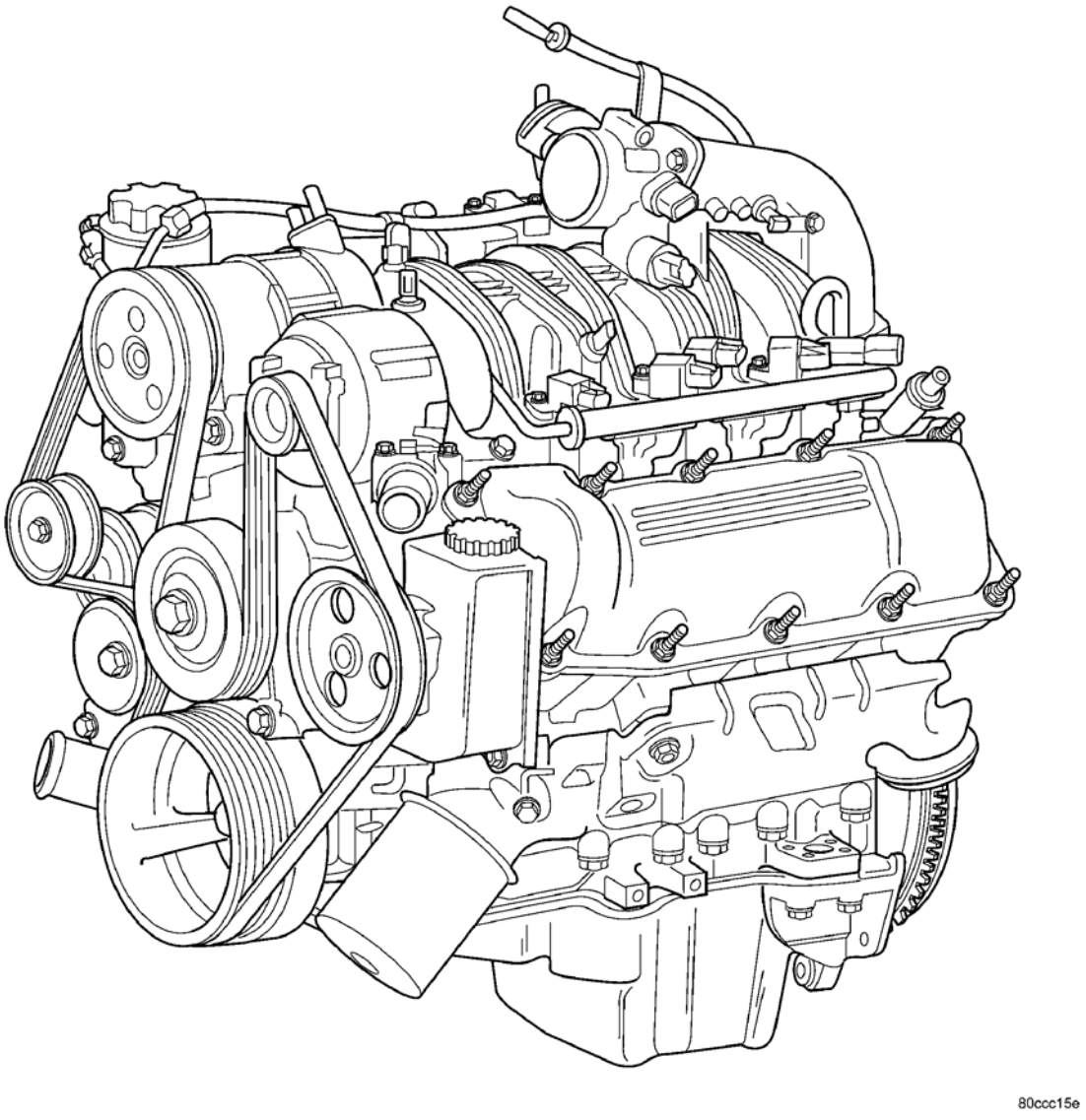


Fig. 1: 3.7L Engine
Courtesy of CHRYSLER LLC

The 3.7 liter (226 CID) six-cylinder engine is an 90° single overhead camshaft engine. The cast iron cylinder block is made up of two different components; the first component is the cylinder bore and upper block, the

CONDITION	POSSIBLE CAUSES	CORRECTION
OIL LEAKS	1. Gaskets and O-Rings. (a) Misaligned or damaged. (b) Loose fasteners, broken or porous metal parts. 2. Crankshaft rear seal 3. Crankshaft seal flange. Scratched, nicked or grooved. 4. Oil pan flange cracked. 5. Timing chain cover seal damaged. 6. Scratched or damaged vibration damper hub.	- (a) Replace as necessary. (b) Tighten fasteners, Repair or replace metal parts. 2. Replace as necessary. See **REMOVAL**. 3. Polish or replace crankshaft. 4. Replace oil pan. See **REMOVAL**. 5. Re-seal timing cover. 6. Polish or replace damper.
OIL PRESSURE DROP	1. Low oil level. 2. Faulty oil pressure sending unit. 3. Low oil pressure. 4. Clogged oil filter. 5. Worn oil pump. 6. Thin or diluted oil. 7. Excessive bearing clearance. 8. Oil pump relief valve stuck. 9. Oil pick up tube loose, damaged or clogged.	1. Check and correct oil level. 2. Replace sending unit. See **REMOVAL**. 3. Check oil pump and bearing clearance. 4. Replace oil filter. See **REMOVAL**. 5. Replace oil pump. See **REMOVAL**. 6. Change oil and filter. 7. Replace as necessary. 8. Replace oil pump. See **REMOVAL**. 9. Replace as necessary.
OIL PUMPING AT RINGS; SPARK PLUGS FOULING	1. Worn or damaged rings. 2. Carbon in oil ring slots. 3. Incorrect ring size installed. 4. Worn valve guides. 5. Leaking valve guide seals.	1. Hone cylinder bores and replace rings. 2. Replace rings. See **STANDARD PROCEDURE**. 3. Replace rings. See **STANDARD PROCEDURE**. 4. Ream guides and replace valves. See **STANDARD PROCEDURE**. 5. Replace valve guide seals.

ENGINE PERFORMANCE DIAGNOSTIC TABLE

CONDITION	POSSIBLE	CORRECTION	

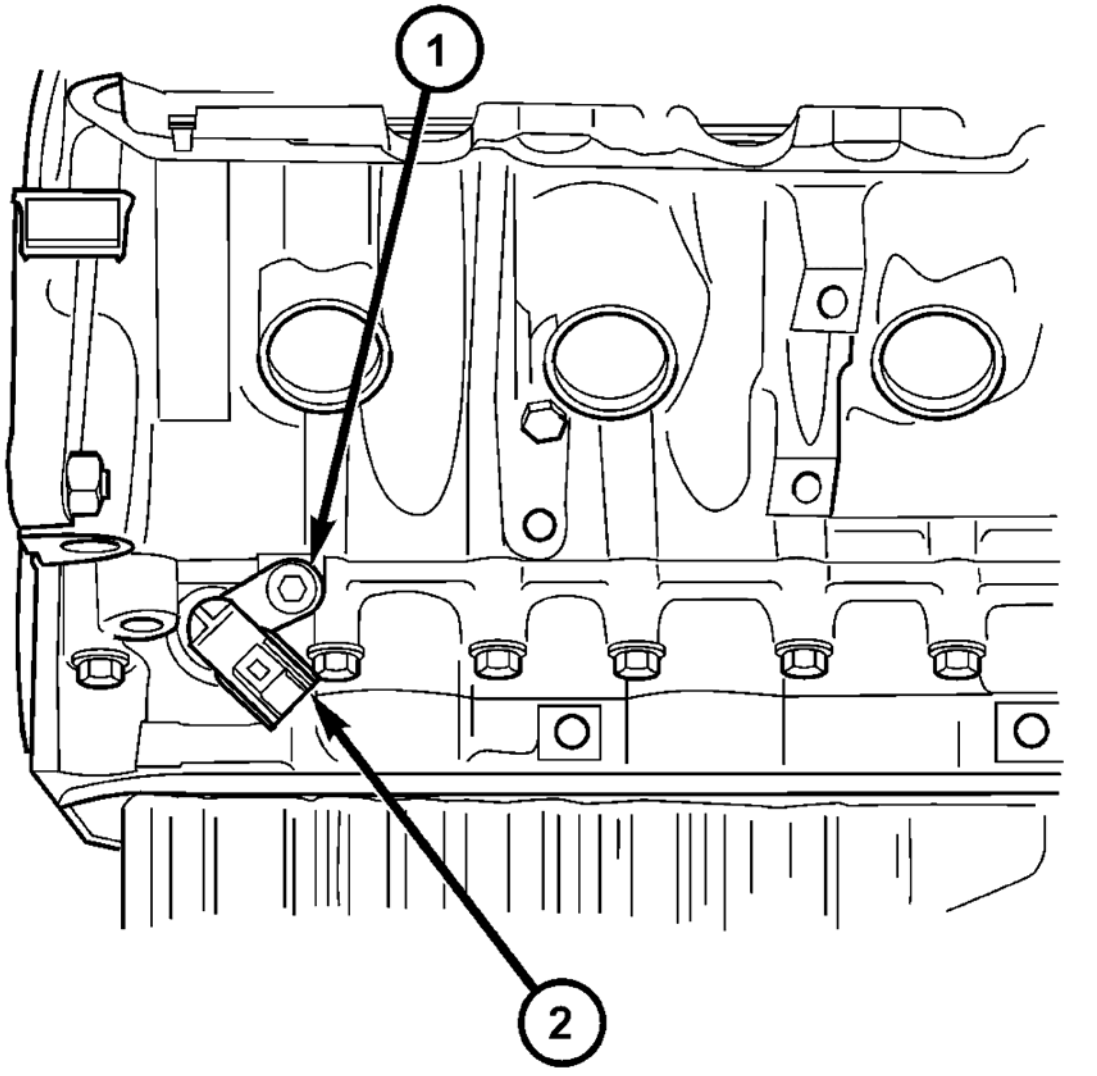


Fig. 6: Crankshaft Position Sensor & Cylinder Head Cover
Courtesy of CHRYSLER LLC

1 - CRANKSHAFT POSITION SENSOR
2 - CYLINDER HEAD COVER
3 - CAMSHAFT POSITION SENSOR

At Curb Idle Speed (MIN)*	25 kPa	4 psi
@ 3000 rpm	170 - 758 kPa	25 - 110 psi
*** CAUTION: If pressure is zero at curb idle, DO NOT run engine at 3000 rpm.**		

TORQUE SPECIFICATIONS

TORQUE SPECIFICATIONS

DESCRIPTION	N.m -	Ft. Lbs.	In. Lbs.
Camshaft	-	-	-
Non - Oiled Sprocket Bolt	122	90	-
Bearing Cap Bolts	11	-	100
Counterbalance shaft retaining bolt	28	-	250
Timing Chain Cover Bolts	58	43	-
Connecting Rod Cap Bolts	27	20	-
	PLUS 90° TURN		
Bed Plate-Bolts	Refer to Procedure		
Crankshaft Damper Bolt	175	130	-
Cylinder Head Bolts			
M11 Bolts	Refer To Procedure		
M8 Bolts	Refer To Procedure		
Cylinder Head Cover Bolts	12	-	105
Exhaust Manifold Bolts	25	18	-
Exhaust Manifold Heat Shield Nuts	8	-	72
	Then loosen 45°		
Flexplate Bolts	95	70	-
Engine Mount Bracket to Block Bolts	61	45	-
Rear Mount to Transmission Bolts	46	34	-
Generator Mounting Bolts			
M10 Bolts	54	40	-
M8 Bolts	28	-	250
Intake Manifold Bolts	12	-	105
	Refer to Procedure for Tightening Sequence		
Oil Pan Bolts	15	-	130
Oil Pan-Drain Plug	34	25	-
Oil Pump Bolts	28	-	250
Oil Pump Cover Bolts	12	-	105
Oil Pickup Tube Bolt and Nut	28	-	250
Oil Dipstick Tube to Engine	-	-	-
Block Bolt	15	-	130
Oil Fill Tube Bolts	12	-	105

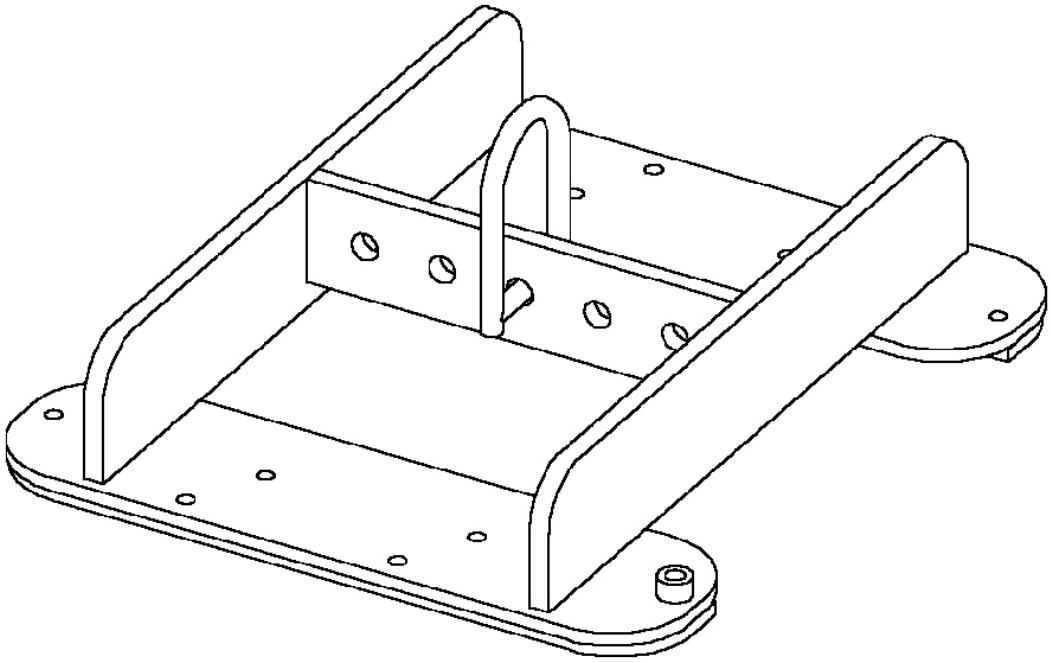


Fig. 32: Engine Lifting Fixture 8427
Courtesy of CHRYSLER LLC

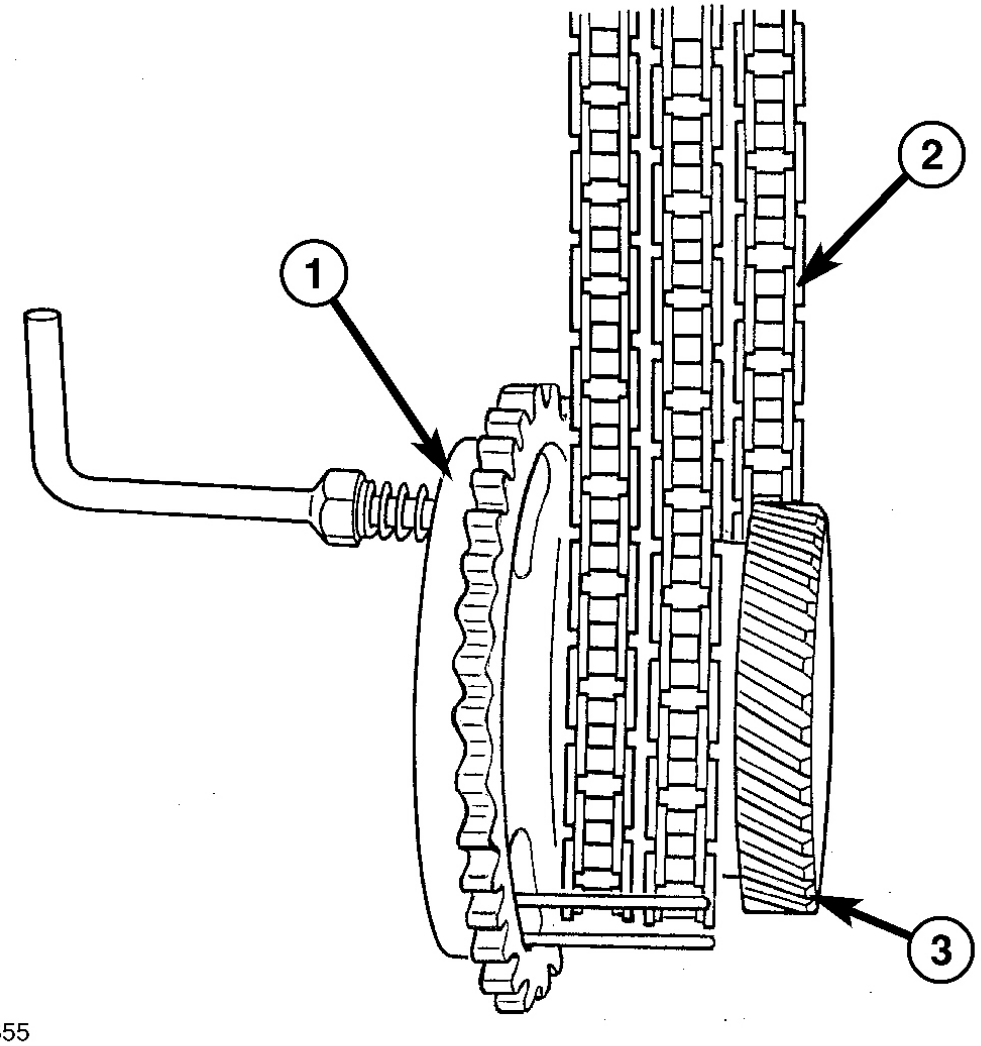


Fig. 50: Special Tool 8429, Camshaft Chain & Crankshaft Timing Gear
Courtesy of CHRYSLER LLC

1 - SPECIAL TOOL 8429
2 - CAMSHAFT CHAIN
3 - CRANKSHAFT TIMING GEAR

15. Lock the secondary timing chains to the idler sprocket using Secondary Camshaft Chain Holder 8429 (1). See **Fig. 50**.

NOTE: Mark the secondary timing chain prior to removal to aid in installation.

16. Mark the secondary timing chain, one link on each side of the V6 mark on the camshaft drive gear.

2 - RETAINER
3 - VALVE STEM OIL SEAL
4 - INTAKE VALVE
5 - EXHAUST VALVE
6 - VALVE SPRING

1. Coat the valve stem with clean engine oil and insert it into the cylinder head.
2. Install the valve stem seal. Make sure the seal is fully seated and that the garter spring at the top of the seal is intact.
3. Install the spring and the spring retainer.
4. Using the valve spring compressor, compress the spring and install the two valve spring retainer halves.
5. Release the valve spring compressor and make sure the two spring retainer halves and the spring retainer are fully seated. See **Fig. 65**.

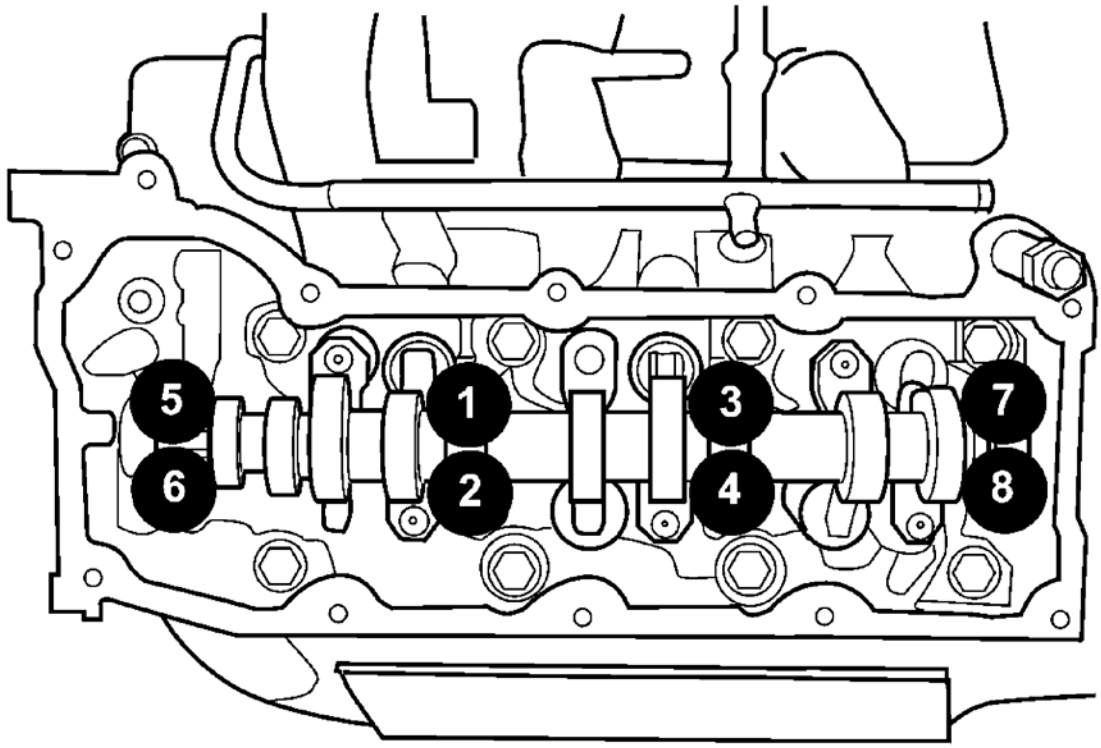


Fig. 66: Camshaft Bearing Caps Tightening Sequence
Courtesy of CHRYSLER LLC

1 - TIMING CHAIN COVER
2 - CRANKSHAFT TIMING MARKS

1. Disconnect battery negative cable.
2. Raise the vehicle on a hoist.
3. Disconnect the exhaust pipe at the right side exhaust manifold.
4. Drain the engine coolant. Refer to **STANDARD PROCEDURE** .
5. Lower the vehicle.
6. Remove the intake manifold. See **REMOVAL**.
7. Remove the cylinder head cover. See **REMOVAL**.
8. Remove the fan shroud. Refer to **REMOVAL** .
9. Remove oil fill housing from cylinder head.
10. Remove accessory drive belt. Refer to **REMOVAL** .
11. Rotate the crankshaft until the damper timing mark is aligned with TDC indicator mark. See **Fig. 68**(2).

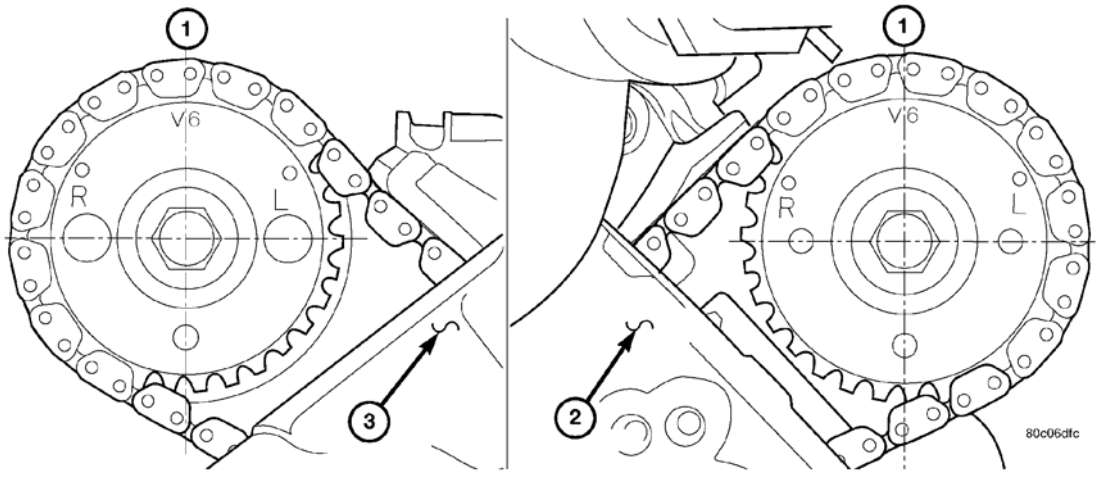


Fig. 69: Camshaft Sprocket V6 Marks
Courtesy of CHRYSLER LLC

12. Verify the V6 mark on the camshaft sprocket is at the 12 o'clock position. See **Fig. 69**. Rotate the crankshaft one turn if necessary.
13. Remove the crankshaft damper. See **REMOVAL**.
14. Remove the timing chain cover. See **REMOVAL**)

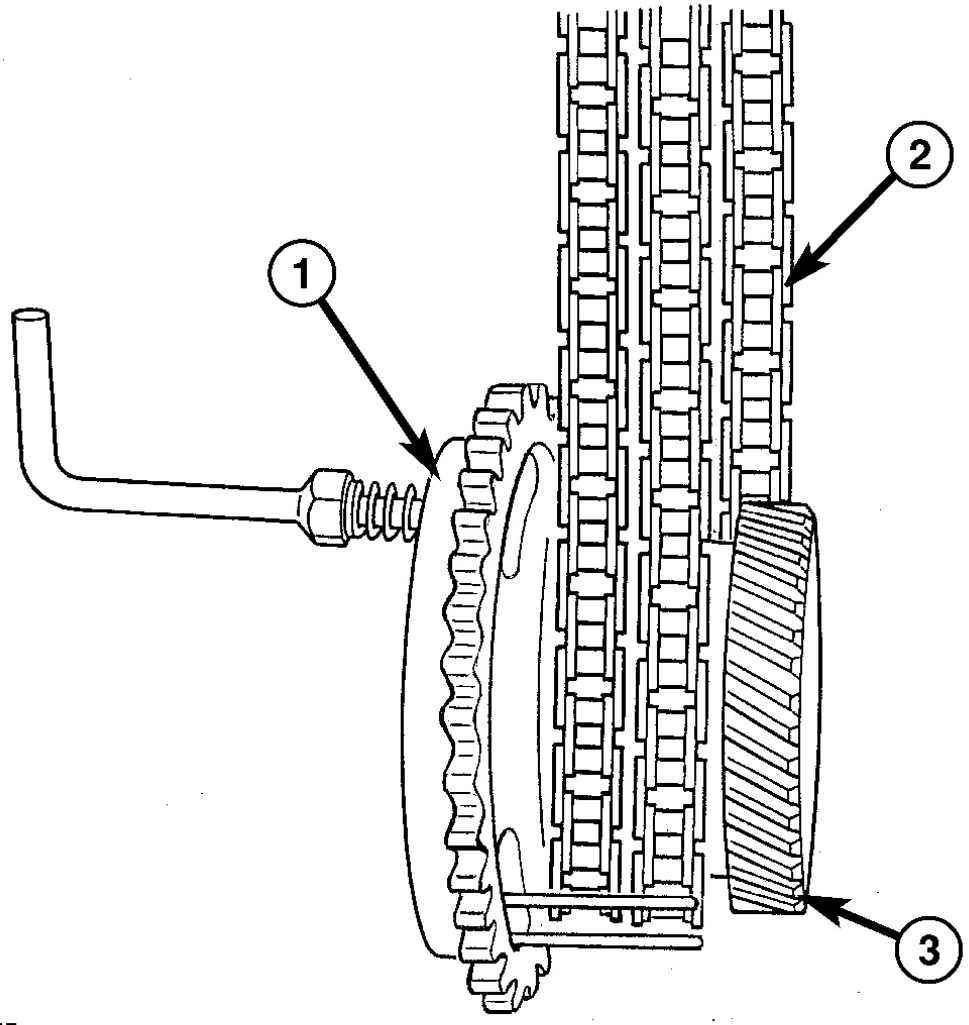


Fig. 80: Special Tool 8429, Camshaft Chain & Crankshaft Timing Gear
Courtesy of CHRYSLER LLC

1 - SPECIAL TOOL 8429
2 - CAMSHAFT CHAIN
3 - CRANKSHAFT TIMING GEAR

12. Remove the Camshaft Holder 8429. See **Fig. 80**(1).
13. Install the timing chain cover. See **REMOVAL**).
14. Install the crankshaft damper. See **INSTALLATION**. Tighten damper bolt 175 N.m (130 Ft. Lbs.).
15. Install accessory drive belt. Refer to **INSTALLATION** .
16. Install the fan shroud. Refer to **INSTALLATION** .

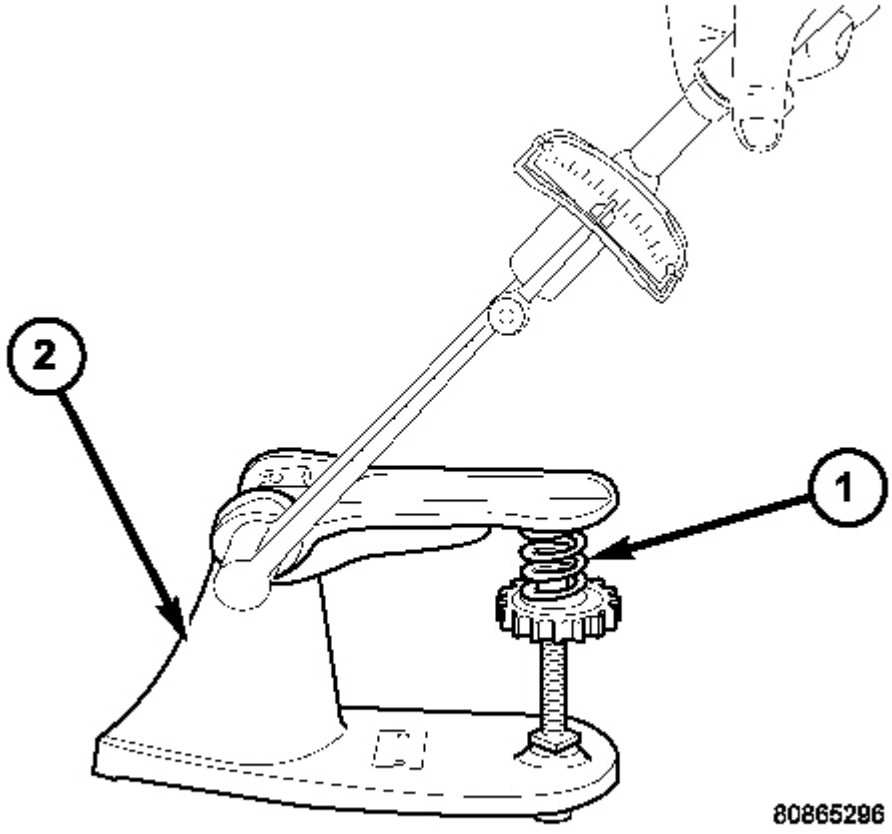


Fig. 92: Testing Valve Spring
Courtesy of CHRYSLER LLC

1 - SPECIAL TOOL C-647

NOTE: Whenever the valves are removed from the cylinder head it is recommended that the valve springs be inspected and tested for reuse.

Inspect the valve springs for physical signs of wear or damage. Turn table of tool C-647 (1) until surface is in line with the 40.12 mm (1.579 in.) mark on the threaded stud and the zero mark on the front. Place spring over the stud on the table and lift compressing lever to set tone device. Pull on torque wrench until a Ping is heard. Take reading on torque wrench at this instant. Multiply this reading by two. This will give the spring load at test length. Fractional measurements are indicated on the table for finer adjustments. Refer to **SPECIFICATIONS** to obtain specified height and allowable tensions. Replace any springs that do not meet specifications.

4. Install the thrust washers (1).

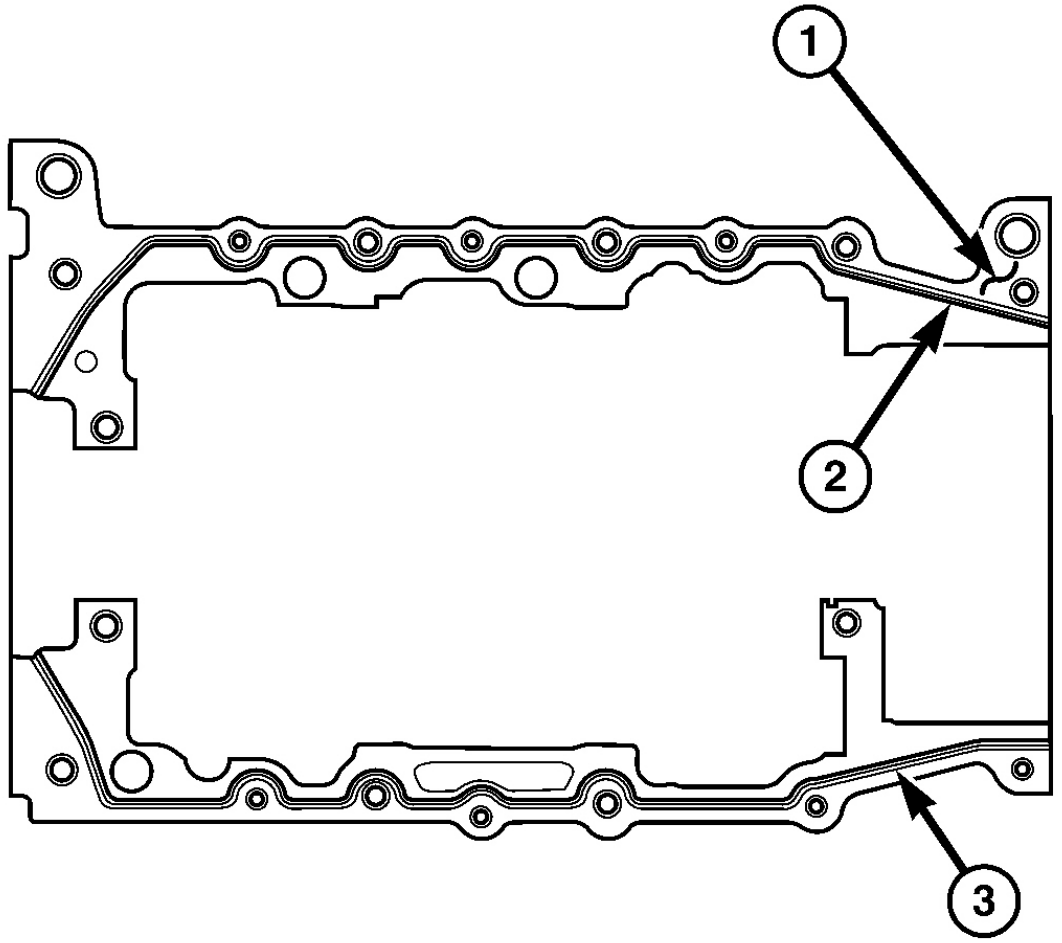


Fig. 102: Bedplate Sealant Locations
Courtesy of CHRYSLER LLC

1 - CYLINDER BLOCK
2 - SEALANT
3 - SEALANT

CAUTION: The bedplate to cylinder block mating surface must be coated with Mopar® Engine RTV sealant prior to installation. Failure to do so will cause severe oil leaks.

REMOVAL

REMOVAL PISTON AND CONNECTING ROD

1. Disconnect negative cable from battery.
2. Remove the following components:

   Oil pan and gasket/windage tray. See **REMOVAL**.

   Cylinder head covers. See **REMOVAL**)

   Timing chain cover. See **REMOVAL**).

   Cylinder head(s). See **REMOVAL**.
3. If necessary, remove top ridge of cylinder bores with a reliable ridge reamer before removing pistons from cylinder block. **Be sure to keep tops of pistons covered during this operation.** Pistons and connecting rods must be removed from top of cylinder block. When removing piston and connecting rod assemblies from the engine, rotate crankshaft so the each connecting rod is centered in cylinder bore.

CAUTION: DO NOT use a number stamp or a punch to mark connecting rods or caps, as damage to connecting rods could occur

NOTE: Connecting rods and bearing caps are not interchangeable and should be marked before removing to ensure correct reassembly.

4. Mark connecting rod and bearing cap positions using a permanent ink marker or scribe tool.

CAUTION: Care must be taken not to damage the fractured rod and cap joint face surfaces, as engine damage may occur.

5. Remove connecting rod cap. Install the Connecting Rod Guides 8507 into the connecting rod being removed. Remove piston from cylinder bore. Repeat this procedure for each piston being removed.

CAUTION: Care must be taken not to nick crankshaft journals, as engine damage may occur

6. Immediately after piston and connecting rod removal, install bearing cap on the mating connecting rod to prevent damage to the fractured cap and rod surfaces.

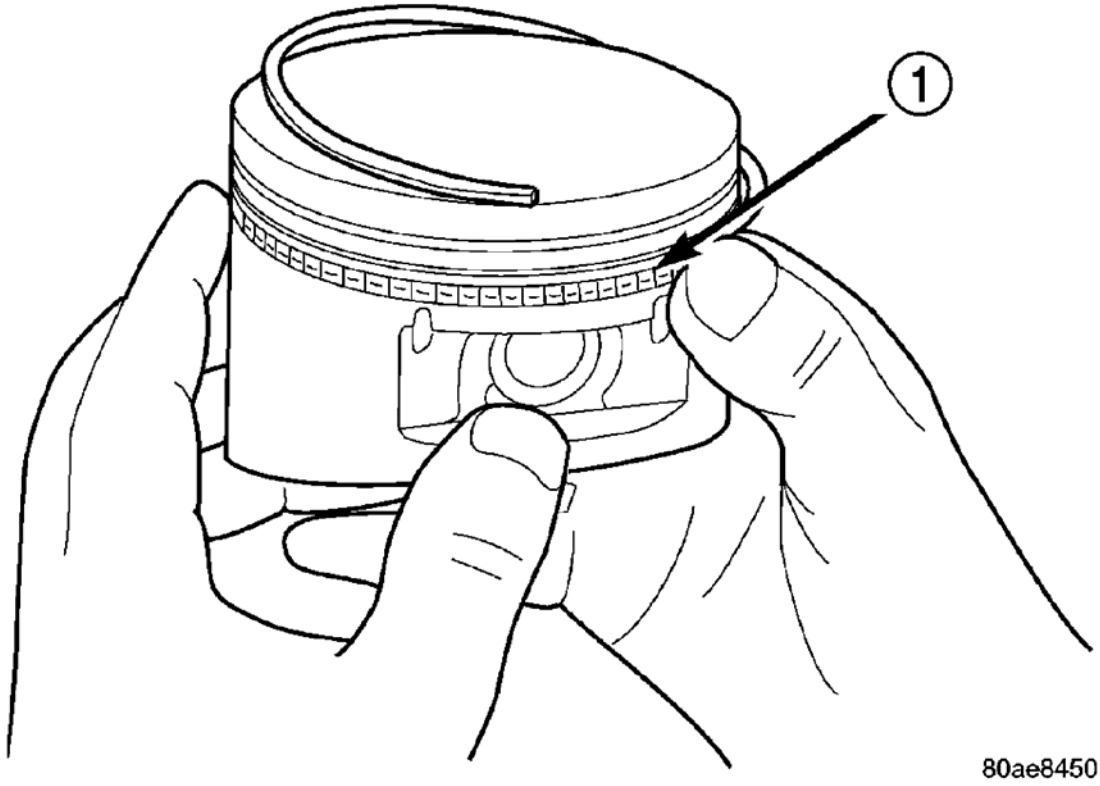
CLEANING

PISTON AND CONNECTING ROD

CAUTION: DO NOT use a wire wheel or other abrasive cleaning devise to clean the pistons or connecting rods. The pistons have a Moly coating, this coating must not be damaged.

PISTON RING SPECIFICATION CHART

Ring Position	Groove Clearance	Maximum Clearance
Upper Ring	0.051 - 0.094 mm (0.0020 - 0.0037 in.)	0.11 mm (0.004 in.)
Intermediate Ring	0.04 - 0.08 mm (0.0016 - 0.0031 in.)	0.10 mm (0.004 in.)
Oil Control Ring (Steel Rails)	0.019 - 0.229 mm (0.0007-.0090 in.)	0.25 mm (0.010 in.)
Ring Position	**Ring Gap**	**Wear Limit**
Upper Ring -	0.20 - 0.36 mm (0.0079 - 0.0142 in.)	0.43 mm (0.0017 in.)
Intermediate Ring -	0.37 - 0.63 mm (0.0146 - 0.0249 in.)	0.74 mm (0.029 in.)
Oil Control Ring (Steel Rail)	0.025 - 0.76 mm (0.0099 - 0.03 in.)	1.55 mm (0.061 in.)



4. Remove the transmission support.
5. Lower the vehicle.
6. Connect negative cable to battery.

AUTOMATIC TRANSMISSION:

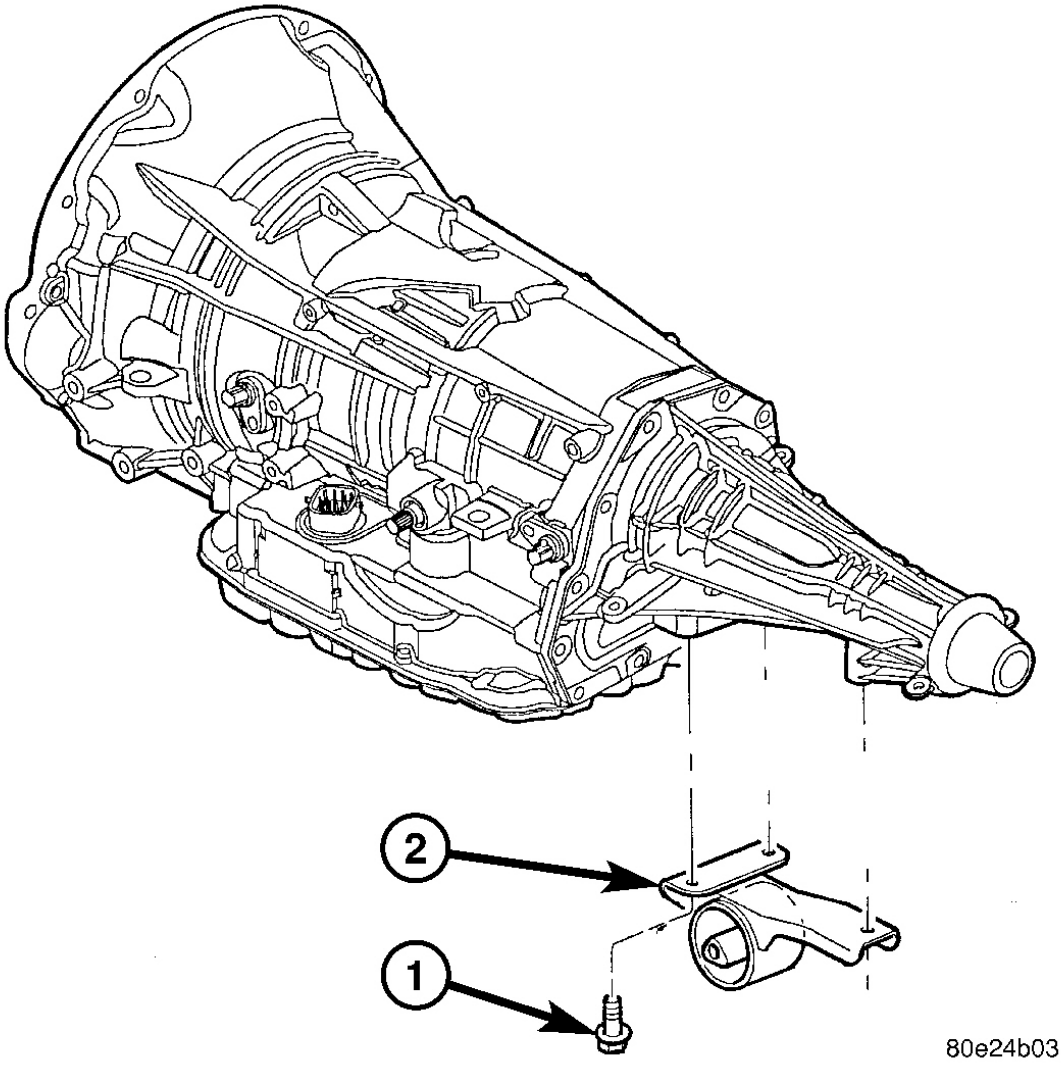


Fig. 136: Transmission Mount - 3.7L 2WD Auto Trans
Courtesy of CHRYSLER LLC

1 - BOLT 2 - MOUNT

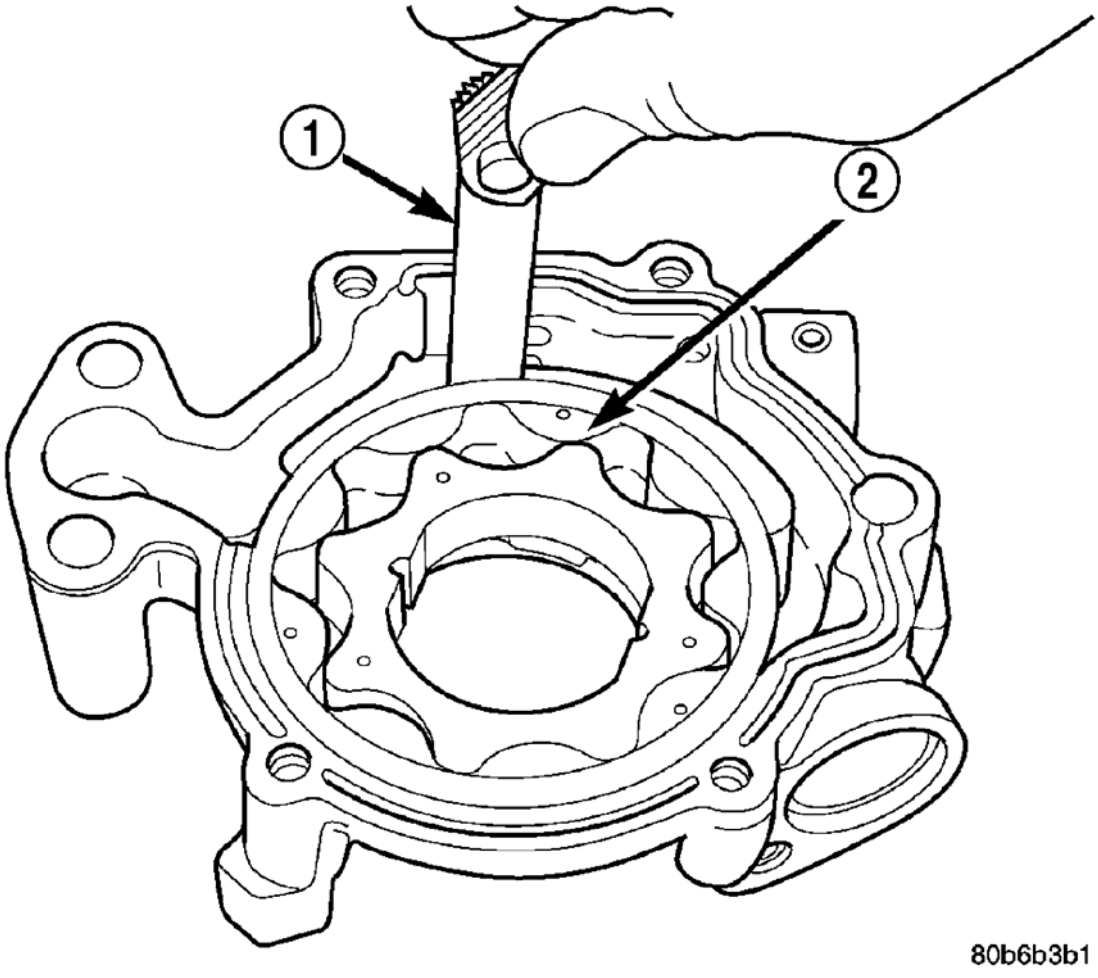


Fig. 150: Measuring Outer Rotor Clearance
Courtesy of CHRYSLER LLC

1 - FEELER GAUGE
2 - OUTER ROTOR

6. Slide outer rotor (2) into the body of the oil pump. Press the outer rotor to one side of the oil pump body and measure clearance between the outer rotor and the body. If the measurement is 0.235mm (0.009 in.) or more the oil pump assembly must be replaced.