1971-73 DODGE COLT 4 CYLINDER

GENERAL SPECIFICATIONS										
Year	Displ.		Carburetor	HP at RPM	Torque (Ft. Lbs. at RPM)	Compr. Ratio	Bore		Stroke	
	cu. ins.	cc					in.	mm	in.	mm
1971-73	97.5	1600	2-Bbl.	100@6300	101@4000	8.5-1	3.03	77	3.39	86

▶ CHANGES, CAUTIONS, CORRECTIONS

See "Engine Notes" at end of article.

ENGINE IDENTIFICATION

Engine model code is stamped at rear, lower part of left-hand bank of the cylinder block. Engine serial number is stamped at front right side on top of block.

Year	Engine Model Code
1971-73	4G32

ENGINE REMOVAL

1) Drain cooling system, remove battery, disconnect ground strap, wiring from ignition coil, vacuum control solenoid valve, fuel cut-off solenoid valve, generator, starter, transmission switch, back-up light switch, water temperature gauge and oil pressure switch.

2) Remove air cleaner and disconnect attaching hoses. Disconnect accelerator linkage and heater hoses. Unbolt and separate exhaust pipe from manifold. Disconnect pipe mounting bracket at transmission.

3) Disconnect hose between fuel filter and fuel pump return pipe. Remove vacuum hose from purge valve, and purge air hose from intake manifold and purge valve. Remove hood, front grille, bridge panel, and radiator.

4) Disconnect transmission coolant lines (Auto. Trans.). Remove clutch cable from clutch lever and control rod from cross shaft beneath transmission. Disconnect shift control lever from inside of vehicle. Drain transmission. Disconnect speedometer cable, back-up light and inhibitor wires.

5) Lift engine slightly, unbolt engine mounts, remove engine and transmission assembly by moving up and forward. To install, reverse removal procedure.

INTAKE MANIFOLD

1) Drain cooling system, remove air cleaner assembly, water outlet hose, heater hoses, accelerator linkage and choke cable.

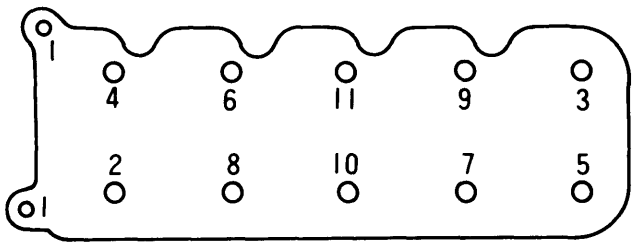
2) Disconnect vacuum line, fuel line, water hose on carburetor side and wiring for water temperature gauge. Remove carburetor and then remove intake manifold.

CYLINDER HEAD

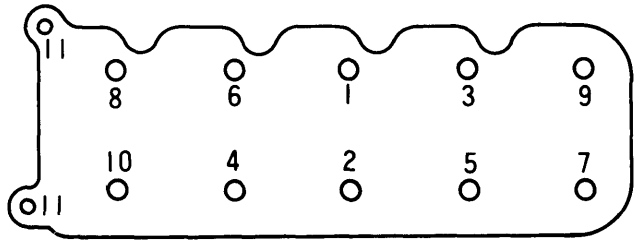
1) Remove rocker arm cover. Loosen timing chain tensioner and remove camshaft sprocket (with chain). Remove cylinder head bolts and nuts in sequence (see illustration).

NOTE – Loosen bolts in two or three stages to prevent head from warping. Head is positioned on guide pins, front and rear. Therefore care should be taken not to damage pins during removal or installation.

2) Check head for distortion. Maximum allowable machining is .012". Install head, torquing bolts in sequence (see illustration).



CYLINDER HEAD LOOSENING SEQUENCE



CYLINDER HEAD TIGHTENING SEQUENCE

VALVES							
Engine & Valve	Head Diam. In. (mm)	Face Angle	Seat Angle	Seat Width In. (mm)	Stem Diameter In. (mm)	Stem Clearance In. (mm)	Valve Lift In. (mm)
1600 cc							
Int.	.....	45°	45°	.035-.051	.315	.0010-.0022	.....
	.....			(.889-1.29)	(8.0)	(.0305-.0559)	.....
Exh.	.....	45°	45°	.035-.051	.315	.0020-.0033	.....
	.....			(.889-1.29)	(8.0)	(.0508-.0838)	.....

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VALVE ARRANGEMENT

Intake — Left side.
Exhaust — Right side.

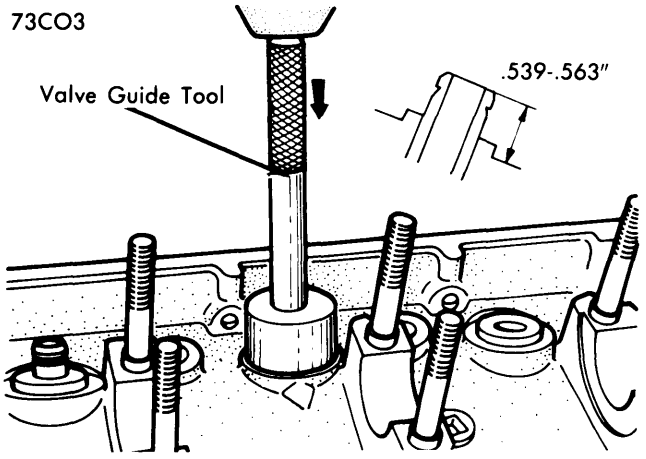
VALVE GUIDE SERVICING

1) Check valve stem-to-guide clearance. If clearance exceeds service limit (.004" for intake; .006" for exhaust), replace with next oversize component. Valve stem-to-guide clearance can be obtained from the difference between ID of the guide and OD of valve stem. Guides are available in the following oversizes:

Valve Guide Oversizes

Size Mark①	Oversize In. (mm)	Cyl. Head Hole Size In. (mm)
5	.002 (.05)	.5138-.5145 (13.050-13.0683)
25	.010 (.25)	.5216-.5224 (13.2486-13.2689)
50	.020 (.50)	.5315-.5323 (13.5001-13.5204)

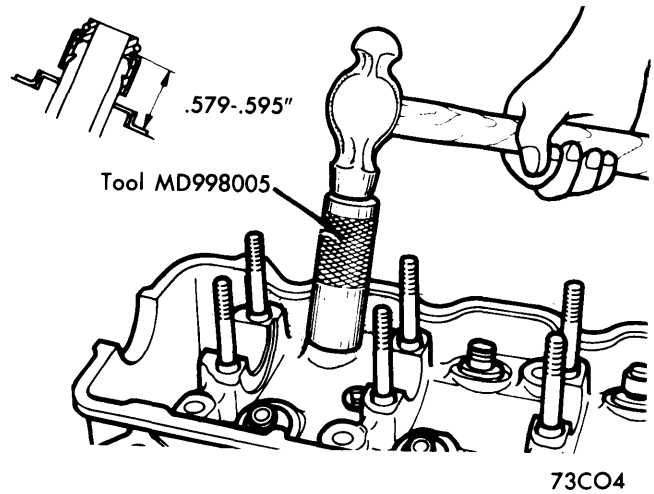
① — Intake and exhaust guides.



VALVE GUIDE INSTALLATION

2) Heat cylinder head to approximately 482°F. Using suitable valve guide tool, drive or hammer out each guide toward combustion chamber. Ream guide hole to specified size at normal temperature.

3) To install, heat head to approximately 482°F. Insert guides and quickly drive into head. Remove any burrs on lower end of guides. Guide should protrude .539-.563"above head (see illustration). Check ID and ream if necessary.



VALVE STEM OIL SEAL INSTALLATION

VALVE STEM OIL SEALS

After installing valve spring seat, place stem seal on valve guide. Using suitable tool (MD998005), lightly hammer seal into proper position (see illustration). When installing, use care not to twist seal. Do not reuse old seals.

VALVE SEAT SERVICING

1) Check valve seat for damage or wear. Replace or rework seat, as necessary. If reworking seat, check valve guide first. Make proper replacement, if required, then check seat for necessary corrections.

2) Recondition valve seat with suitable grinder or cutter to specified contact width. After rework, valve and seat should be lapped with suitable compound.

3) Check valve seat shrinkage, by measuring installed height of spring between spring seat and retainer, with spring seat, retainer and retainer lock installed. Proper spring installed height is 1.469".

4) Remove valve seat by thinning down with suitable cutter, then machine seat bore to proper size. Heat cylinder head to approximately 482°F and press in oversize seat. Rework seat surface as necessary.

VALVE SPRINGS

Engine	Free Length In. (mm)	PRESSURE Lbs. @ In. (kg @ mm)	
		Valve Closed	Valve Open
1971-72 1600 cc	1.872 (46.30)	61.7 @ 1.469 (27.98 @ 37.31)	137 @ 1.133 (62.13 @ 28.78)
1973 1600 cc	1.872 (46.30)	61.7 @ 1.469 (27.98 @ 37.31)	137 @ 1.094 (62.13 @ 27.79)

VALVE SPRING

1) With camshaft removed, install spring compressor, remove retainer lock, retainer and spring. Keep components in proper order for reassembly.

2) Install valve spring with enamel identification mark toward rocker arm. Compress spring, making sure spring compressor does not interfere with stem seal. Install retainer and lock.

VALVE SPRING INSTALLED HEIGHT

1) Check free length and tension of each valve spring. If beyond specifications, replace spring. Using a square, check each spring for proper squareness (1.5°or less). Replace spring if excessively out of square.

2) Measure installed height of spring between spring seat and retainer, with spring seat, retainer and retainer lock installed.

ROCKER ARM & CAMSHAFT ASSEMBLY

Removal — Remove camshaft bearing cap nuts. Holding assembly by front and rear caps, lift rocker arm shaft off

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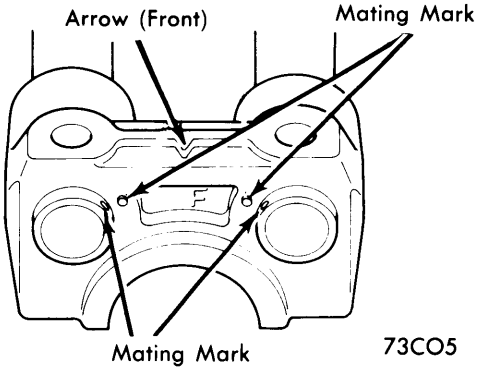
head. Disassemble individual components, keeping rocker arms and corresponding components in proper sequence for reassembly. Remove camshaft from cylinder head.

Installation – 1) Install camshaft on head. Check camshaft end play and determine if clearance is within specifications. Install caps, rocker arms, springs and washers onto both rocker arm shafts. Front bearing cap has a .079" diameter mating mark on front side and rocker arm shaft has .118" diameter mating mark near front end. Assemble cap and shaft with marks aligned and shaft oil hole facing down.

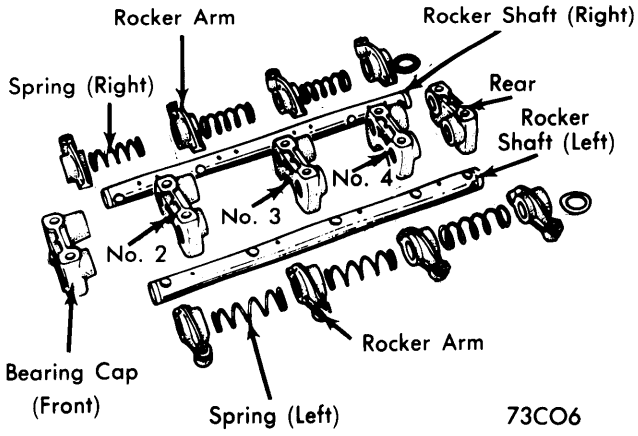


ROCKER SHAFT MATING MARKS

2) There are five kinds of caps; front, No. 2, No. 3, No. 4 and rear. Each cap has an arrow mark indicating direction of installation (front).

3) Rocker arms are identical, but should be installed in original positions. Shafts are installed with eight hole shaft on right side and four hole shaft on left side. Longer springs are installed on left shaft. Washers are installed with convex side forward.

4) Install assembly on cylinder head. Camshaft dowel pin (on front end) should be at "two o'clock" position. Tighten bearing cap nuts in three stages in following order: No. 3, No. 2, No. 4, front, and rear.



ROCKER ARM ASSEMBLY

VALVE CLEARANCE ADJUSTMENT

1) Ensure timing marks on camshaft sprocket and chain are aligned. With head assembly installed, temporarily adjust valves (sequence for adjustment; 1-3-4-2), according to following procedure: At compression stroke TDC, for cylinder being adjusted, loosen rocker arm nuts, then, turning adjusting screw, adjust valve clearance to specifications.

2) *NOTE – Torque head bolts with engine cold prior to final valve clearance adjustment; otherwise, clearance will change if head bolts are torqued last.* After head is properly torqued, run engine until coolant temperature is 176°F, then readjust valves.

Valve Clearance

Application	Hot In. (mm)	Cold In. (mm)
Intake	.006 (.15)	.003 (.08)
Exhaust	.010 (.25)	.007 (.18)

PISTONS, PINS, RINGS

Engine	PISTONS	PINS		RINGS		
	Clearance In. (mm)	Piston Fit In. (mm)	Rod Fit In. (mm)	Rings	End Gap In. (mm)	Side Clearance In. (mm)
1600 cc	.0008-.0016 (.0203-.0406)	.0002-.0004 (.0051-.0102)	①.0006-.0013 (.0152-.0330)	No.1	.006-.014 (.152-.356)	.0012-.0028 (.0305-.0711)
				No.2	.006-.014 (.152-.356)	.0008-.0024 (.0203-.0610)
				Oil	.006-.014 (.152-.356)	.0010-.0030 (.0254-.0762)

① – Interference fit.

PISTON & ROD ASSEMBLY

Removal – Remove connecting rod caps and push piston and rod assembly out top of cylinder. Use care not to damage bearing inserts. Retain assemblies in proper cylinder order.

Installation – 1) Install piston on connecting rod with arrow (front) on piston and embossed number on connecting rod on the same side. Position ring end gaps 120° apart with no gaps inline with piston pin or thrust face.

2) Slide short pieces of vinyl tubing on rod bolts to prevent damage to bearing journals. Using a ring compressor, install piston and rod assemblies in their proper bore with arrow facing forward.

1971-73 DODGE COLT 4 CYLINDER (Cont.)

FITTING PISTONS

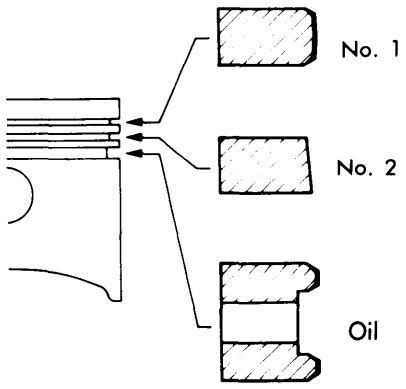
1) After checking block for distortion (not to exceed .002"), cracks, scratches or other abnormalities, measure cylinder bore at three levels. If any bore distortion exceeds .001" from 3.0276" (standard bore size), refinish all cylinders and install oversize pistons. Pistons are available in the following sizes:

Piston Oversizes

Size/Mark	Size In. (mm)
STD/-	3.0276 (76.9010)
.010"/0.25	3.0374 (77.1499)
.020"/0.50	3.0472 (77.3988)
.030"/0.75	3.0571 (77.6503)
.039"/1.00	3.0669 (77.8992)

2) Check outside diameter of piston, by measuring at a point .079" above bottom of piston skirt and also across thrust face. Determine amount of cylinder reboring required to meet specified clearance.

3) To prevent distortion due to high temperature during cutting, operation should be done in stages and in sequence of 2-4-1-3 or 3-1-4-2. Hone bore to finish size (finish margin is .002"). Honing angle should be 30-45°.



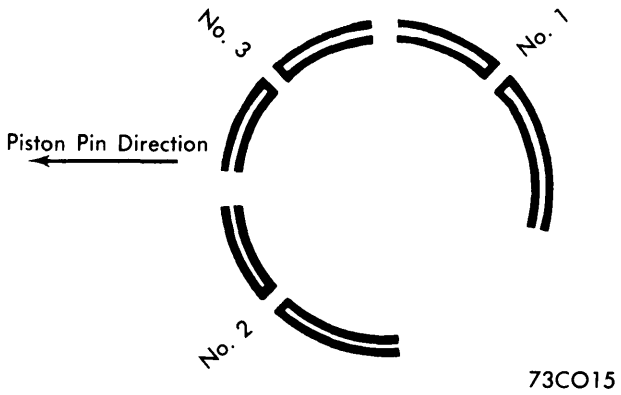
RING INSTALLATION ORDER

4) Check piston pin-to-pin hole fit. Pin should press in smoothly by hand, at room temperature. Measure piston ring gap and side clearance. Replace rings, if necessary. Rings are available in the following sizes:

Piston Ring Oversizes

Size/Mark	Size In. (mm)
STD/-	3.028 (76.9112)
.010"/0.25	3.037 (77.1398)
.020"/50	3.047 (77.3938)
.030"/75	3.057 (77.6478)
.039"/100	3.067 (77.9081)

5) Install piston rings with manufacturers marks upward. Stagger end spacing (see illustration). Lay engine on side, insert pistons with "Front" mark on piston head facing forward.



PISTON RING END POSITION

PISTON PINS

1) Mark pistons for reassembly in original cylinder. Remove piston rings. Set piston and rod assembly on suitable holding tool (D998006), insert suitable drift in pin hole, and press pin out of piston.

2) To install, apply engine oil to outside of piston pin and to connecting rod bore. Set piston and rod with "Front" mark facing up, align pin with pressing tool and pin bore and press pin through rod and piston.

CRANKSHAFT MAIN & CONNECTING ROD BEARINGS

Engine	MAIN BEARINGS				CONNECTING ROD BEARINGS		
	Journal Diam. In. (mm)	Clearance In. (mm)	Thrust Bearing	Crankshaft End Play In. (mm)	Journal Diam. In. (mm)	Clearance In. (mm)	Side Play In. (mm)
1600 cc	2.244 (56.997)	.0006-.0031 (.0152-.0787)	No.4	.0020-.0069 (.0508-.1753)	1.7717 (45.001)	.0004-.0028 (.0102-.0711)	.004-.010 (.102-.254)

MAIN & CONNECTING ROD BEARINGS

1) Inspect each bearing for peeling, melting, seizure or improper contact. Replace defective bearings. Measure outside diameter of crankshaft and connecting rod journals to determine if out-of-round or tapered.

2) Cut Plastigage to same length as width of bearing. Place it parallel with journal (not over oil holes). Install crankshaft bearings and caps, tightening to specifications. Always install caps with arrow facing forward.

NOTE — Do not turn crankshaft with Plastigage installed.

1971-73 DODGE COLT 4 CYLINDER (Cont.)

3) Remove rod assembly from crankshaft and measure Plastigage at widest part (using scale on Plastigage package). Repeat procedure for connecting rod bearings. If clearance exceeds limits, bearing should be replaced or undersize bearing used. Undersize bearings are available in .010" (.254 mm), .020" (.508 mm) and .030" (.762 mm).

THRUST BEARING

With crankshaft bearing caps installed, check thrust clearance (end play) by inserting feeler gauge between center main bearing and crankshaft thrust face. If clearance exceeds specified limits, replace center main bearing.

REAR MAIN BEARING OIL SEAL

If seal case, seal and separator are apart, drive oil seal from inside of case, using suitable tool (D998011), then install separator with oil hole toward bottom of crankcase. Lubricate inner lip of seal prior to installation on crankshaft.

CAMSHAFT

Engine	Journal Diam. In. (mm)	① Clearance In. (mm)	Lobe Lift In. (mm)
1600 cc	.984 (24.9)	.002-.0035 (.0508-.0889)	.....

① – End play .002-.006" (.0508-.1524 mm).

CAMSHAFT SERVICE

1) Check camshaft for bend (not to exceed .0008"). With dial indicator set to No. 2 or No. 3 journal, turn camshaft one revolution and read indicator. Half of indicated value is bend of camshaft.

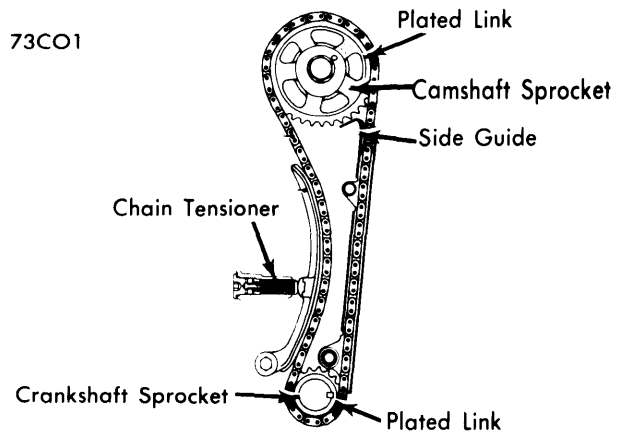
2) Check camshaft end play. If play exceeds service limit (.012"), replace camshaft or cylinder head, as required.

3) Check cam lobes and cam profile for damage.

4) Check each camshaft bearing cap for inner surface damage. If damage is excessive, replace head. To check, install cap to cylinder head and check clearance between cap ID and camshaft journal OD.

VALVE TIMING

Engine	INTAKE Open (BTDC)	INTAKE Close (ABDC)	EXHAUST Open (BBDC)	EXHAUST Close (ATDC)
1600cc 1971 All Trans.	32°	60°	63°	29°
1972-73 Man. Trans.	32°	60°	63°	29°
1972-73 Auto. Trans.	22°	70°	53°	39°



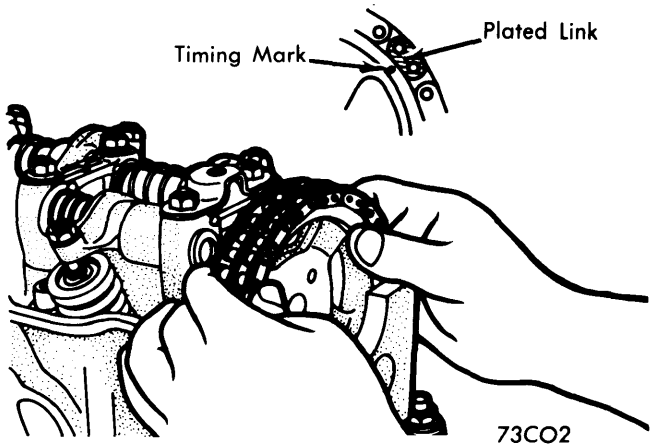
TIMING CHAIN ASSEMBLY

TIMING CHAIN

1) Rotate crankshaft until No. 1 cylinder is at TDC. If engine is removed, invert cylinder block and install timing chain guide with oil jet toward chain and sprocket meshing point.

2) With mating marks of crankshaft sprocket and camshaft sprocket aligned with plated links of chain, install sprocket onto crankshaft with chain fitted in guide groove against tensioner lever (see illustration).

3) Install Woodruff key, then install crankshaft gear with "F" mark and oil slinger concave side facing forward. Install gasket and front cover. Insert tensioner lever plunger through hole in right side of cover. Tighten plunger holder.



CAMSHAFT TIMING MARKS

ENGINE OILING

Crankcase Capacity – 4.2 pts., including .53 qt. in filter.

Oil Filter – Full-flow cartridge type.

Oil Pressure Switch Operating Pressure – 2.9-5.7 psi.

Oil Pressure - 14.2 psi @ idle.

Pressure regulator Valve - Opens 56.9-71.1 psi.

ENGINE OILING SYSTEM

Lubrication system is force-feed type, using trochoid gear pump with full-flow filter. Oil pump is driven by pawl located

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ENGINE OILING (Cont.)

at top end of distributor shaft, which is rotated by crankshaft gear.

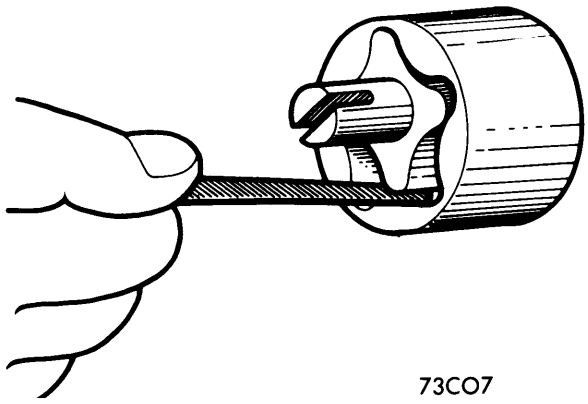
OIL PUMP

Removal – Remove oil filter and oil pump cover bolts, then withdraw rotor assembly and cover. Measure inner and outer rotor clearances. Place a straightedge across pump face; using a feeler gauge, measure rotor-to-cover end play. Replace any parts not within specifications.

Reassembly – Insert rotor assembly into chain case. Lightly coat gasket with gasket sealant. Install cover and oil filter.

Oil Pump Specification

Application	Dimension In. (mm)
Pump Shaft O.D.	.489-.490 (12.42-12.446)
Chain Case-to-Shaft	.0008-.0022 (.0203-.0559)
Inner-to-Outer Rotor	.0046 (.1168) or Less
Rotor-to-Cover	.0008-.0039 (.0203-.0991)
Outer Rotor-to-Chain Case	.0039-.0063 (.0991-.1600)



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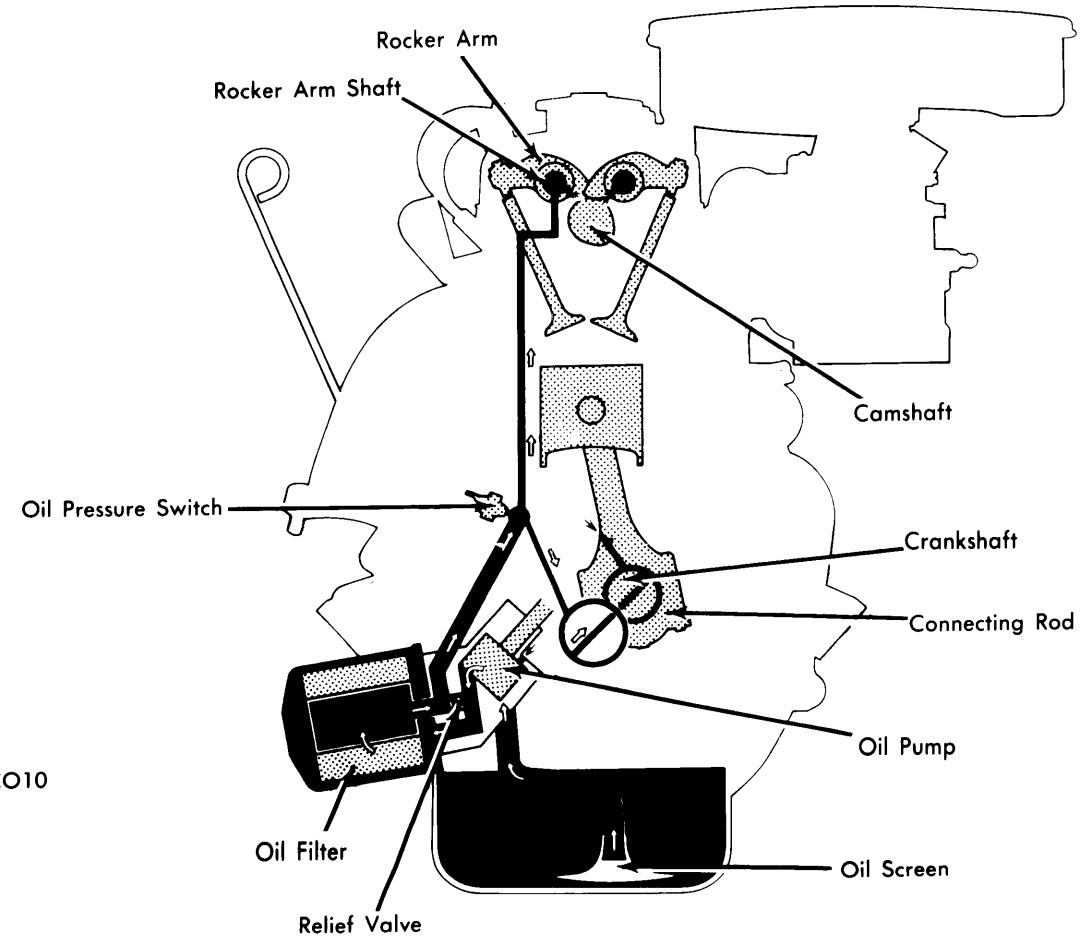
ROTOR-TO-ROTOR CLEARANCE



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ENGINE OILING SYSTEM

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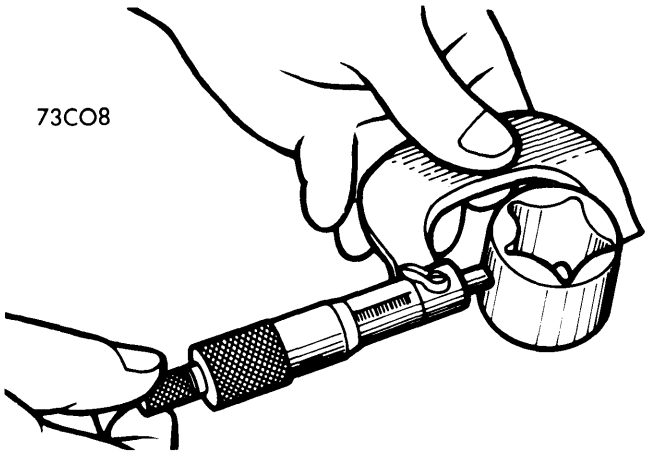
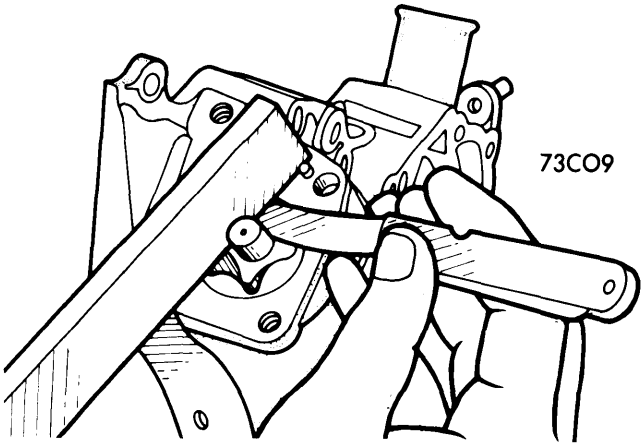
ENGINE OILING (Cont.)



OUTER ROTOR-TO-CHAIN CASE CLEARANCE



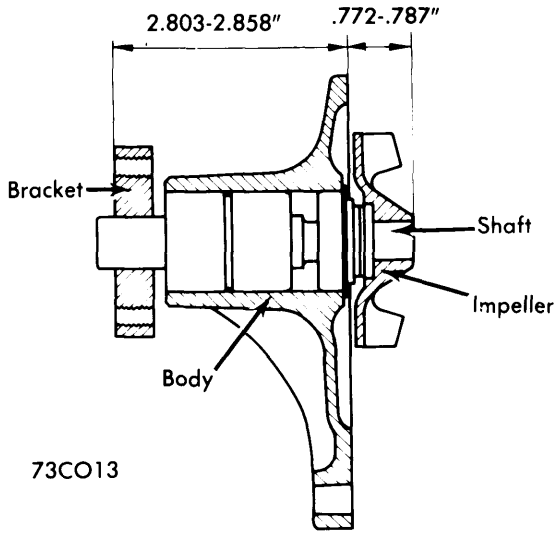
ROTOR END PLAY CLEARANCE

ENGINE COOLING

Thermostat – Opens @ 177-183°F.

Radiator Cap – 13 psi.

Cooling System Capacity – 7.2 qts.



WATER PUMP ASSEMBLY DIMENSIONS

WATER PUMP

1) Drain coolant, loosen alternator, remove fan pulley and fan belt. Remove water pump body from timing cover. Using suitable puller, remove impeller. Drive out seal assembly.

2) Heat pump body to approximately 212°F and press shaft assembly out towards pulley. To assemble and install, reverse removal procedure, using new seal and gaskets.

TIGHTENING SPECIFICATIONS

Application	Ft. Lbs. (mkg)
Engine Mounts	14-18 (1.9-2.5)
Intake & Exhaust Manifolds	11-14 (1.5-1.9)
Flywheel	83-90 (11.5-12.4)
Crankshaft Pulley	43-51 (6-7)
Cylinder Head	
Cold	51-54 (7-7.5)
Camshaft Sprocket	36-43 (5-6)
Camshaft Studs	13-14 (1.8-1.9)
Connecting Rod Caps	23-25 (3-3.5)
Chain Tensioner Holder	26-36 (3.6-5)
Oil Pan	4.5-6 (.7-.8)
Oil Pump Cover	11-14 (1.5-1.9)
Main Bearing Caps	36-39 (5-5.4)

1971-73 ENGINE NOTE

The only basic replacement engine available for the Colt is set up for manual transmission (MD 005911). To convert to automatic transmission, it is necessary to replace camshaft sprocket with suitable replacement part (MD 004920). The new sprocket changes valve timing necessary for exhaust emission standards (see illustration for Valve Timing).