

# Capri Engines

## 2800 CC V6

GENERAL SPECIFICATIONS										
Year	Displ.		Carburetor	HP at RPM	Torque (Ft. Lbs. at RPM)	Compr. Ratio	Bore		Stroke	
	cu. ins.	cc					in.	mm	in.	mm
1974	170.9	2800	2-Bbl.	...	...	8.2-1	3.659	92.938	2.699	68.555

### ENGINE IDENTIFICATION

The second series of digits of vehicle identification plate, located on top of right front fender apron, indicates engine type.

### Application

2800 cc..... PX

### Engine Code

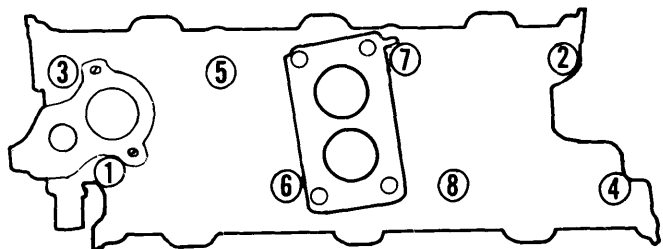
### ENGINE REMOVAL

- 1) Disconnect battery, drain cooling system and remove hood. Remove air cleaner and intake duct assembly. Disconnect hoses from radiator; remove fan shrouding and radiator. Remove alternator and bracket positioning them out-of-way. Disconnect alternator ground wire and all additional electrical wires from engine block.
- 2) Disconnect heater hoses from block and water pump. Separate fuel inlet line from pump and plug opening. Disconnect the following: Accelerator cable or linkage from carburetor and intake manifold, transmission downshift linkage (if equipped), wire loom at ignition coil, and brake booster line.
- 3) Raise vehicle and place on safety stands. Disconnect head pipes at exhaust manifolds. Separate starter cable and unbolt starter. Remove engine front support through bolts.
- 4) On manual transmission models, remove clutch linkage and bell housing-to-engine block bolts. On automatic transmission models, remove converter inspection cover and disconnect flywheel from converter. Remove down shift rod (if equipped). Remove converter housing-to-engine block bolts and adaptor plate-to-converter housing bolt.
- 5) Attach suitable lifting device and place a jack under transmission. Raise engine slightly while pulling it away from transmission. Carefully hoist engine out of vehicle ensuring components are not damaged or bent. Place engine on a suitable work stand.

### INTAKE MANIFOLD REMOVAL

1) Remove air cleaner, disconnect battery negative cable, and throttle cables. Drain coolant, disconnect hose from water outlet to radiator, and hoses and line from water outlet to water pump. Remove distributor cap and spark plug wires as an assembly. Disconnect distributor wire and distributor vacuum line.

- 2) Remove distributor hold-down screw and lift out distributor. Note position of rotor for reassembly. Remove both fuel pump and carburetor. Remove mounting nuts and bolts, tap manifold with a plastic hammer to break seal and lift off manifold.

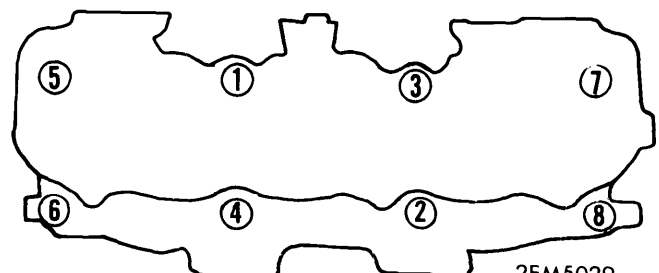


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### INTAKE MANIFOLD TIGHTENING SEQUENCE

### CYLINDER HEAD REMOVAL

- 1) Remove air cleaner. Disconnect battery ground cable, throttle linkage, and drain coolant. Remove distributor cap with spark plug wires. Remove distributor vacuum line, distributor coolant outlet line, coolant hose from pump to water outlet, rocker arm covers, fuel line and filter, carburetor and intake manifold.
- 2) Remove rocker arm shafts and oil baffels. Remove push rods and keep in proper sequence. Remove exhaust manifold. Remove cylinder head bolts and lift off heads.



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### CYLINDER HEAD TIGHTENING SEQUENCE

## 2800 CC V6 (Cont.)

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)
2800 cc Int.	1.570 (39.87)	44°	45°	.....	.3159-.3166 (8.024-8.042)	.002-.003 (.051-.076)	.373 ① (9.474)
Exh.	1.269 (32.22)	44°	45°	.....	.3149-.3157 (7.998-8.019)	.002-.003 (.051-.076)	.373 ① (9.474)

① — .0015" (.038 mm).

### VALVE ARRANGEMENT

I-E-E-I-E-I (Left Side Front-to-Rear).

I-E-I-E-E-I (Right Side Front-to-Rear).

### VALVE GUIDES

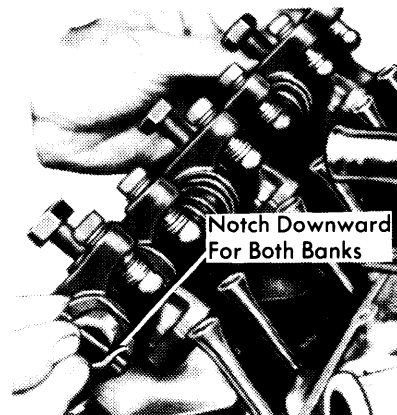
Worn valve guides can be reamed to .008" (.203 mm), .016" (.406 mm), or .032" (.813 mm) oversizes. When going from standard size valve to an oversize, always use reamers in sequence. After reaming, break sharp corner (ID) at top of valve guide. When valve guides are reamed, valve seats must be refaced to maintain proper valve seal.

### VALVE STEM OIL SEALS

**NOTE** — Replacing valve stem oil seal can be accomplished with either cylinder head installed or removed.

Using suitable spring compressor, collapse valve spring and remove spring retainer, locks, retainer, and valve spring. Withdraw valve stem oil seal. When installing new seal, place open side toward head.

**Assembly** — Fit shaft supports, springs, rocker arms and spring washers. Install new drive lock sleeve (pin). Rocker arm shaft must be fitted to cylinder head with oil holes facing down toward head. Position notch on front of rocker shaft downward (see illustration).



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VALVE SPRINGS			
Engine	Free Length In. (mm)	PRESSURE Lbs. @ In. (kg @ mm)	
		Valve Closed	Valve Open
2800 cc All	1.988 (50.5)	.....	.....

### VALVE SPRING INSTALLED HEIGHT

Install valve springs with open spaced coils away from head. Measure distance between cylinder head spring pad and valve spring retainer. Install spacers if necessary to bring spring to proper specifications. **CAUTION** — Excess spacers will result in possible spring breakage and camshaft lobe wear.

### ROCKER ARM ASSEMBLY OVERHAUL

**Disassembly** — With rocker arm cover removed, remove rocker arm shaft stand bolts and lift off rocker arm assembly. Using a drift, drive lock sleeve (pin) out of rocker. Remove spring washers, rocker arms, springs and rocker shaft supports.

### ROCKER ARM ASSEMBLY ALIGNMENT

#### VALVE CLEARANCE ADJUSTMENT

**Preliminary (Cold) Adjustment** — 1) Before adjusting valves, torque rocker arm stand bolts to specifications.

2) Adjust valves at TDC on compression stroke in firing order sequence (1-4-2-5-3-6).

3) Rotate crankshaft clockwise, (viewed from front), until number one piston is at TDC. Using a step-type feeler gauge (go and no go), adjust intake to .014" and exhaust to .016".

4) Adjust remaining valves by rotating crankshaft a 1/3 of a turn for each cylinder until all valves have been adjusted. Two complete revolutions will adjust all valves.

**Final (Hot) Adjustment** — 1) Run engine until normal operating temperature is reached.

2) Using a step-type feeler gauge and engine at idle, adjust intake and exhaust valves to .014" intake and .016" exhaust.

# Capri Engines

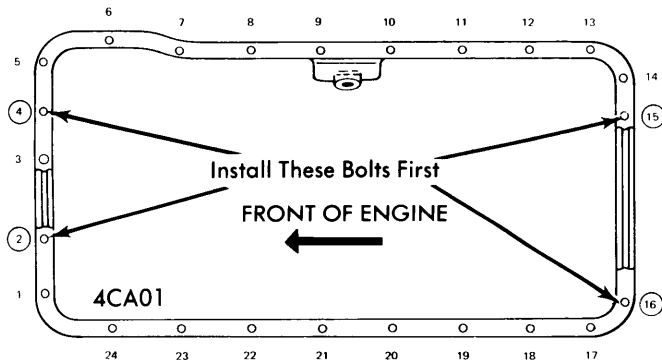
## 2800 CC V6 (Cont.)

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)
2800 cc	.001-.003 (.025-.076)	.0002-.0004 (.005-.001)	.0007-.004 (.018-.102)	Comp. Oil	.015-.023 (.381-.584) .015-.055 (.381-1.397)	.0019-.0032 (.050-.082) Snug

### OIL PAN REMOVAL

**Removal** — Remove oil level dipstick and bolts attaching fan shroud to radiator. Position shroud over fan. Disconnect battery ground cable. Loosen alternator bracket and adjusting bolts. Raise vehicle, drain crankcase, remove splash shield, and starter. Remove engine front support nuts, raise engine, then place wood blocks between front supports and chassis. Remove clutch or converter housing cover, then withdraw oil pan bolts and oil pan.

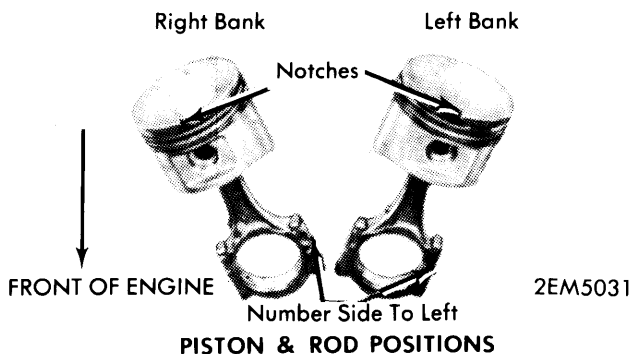
**Installation** — Using a suitable sealing compound, coat contact surfaces and place two piece gasket on face of block. Position front and rear oil pan seals in place with tabs of seals lapping over oil pan gasket. Position oil pan on block and tighten bolts as shown in illustration.



OIL PAN TIGHTENING SEQUENCE

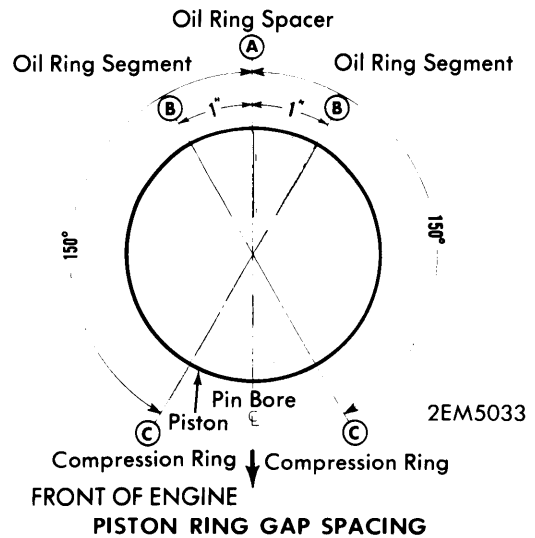
### PISTON PIN REPLACEMENT

Piston pin bore and OD of piston pin must be within specifications. Remove old pin using an arbor press and suitable piston support and driver tool. Assemble piston to rod with notches on piston facing forward. Rod numbers face to left side of engine (see illustration).



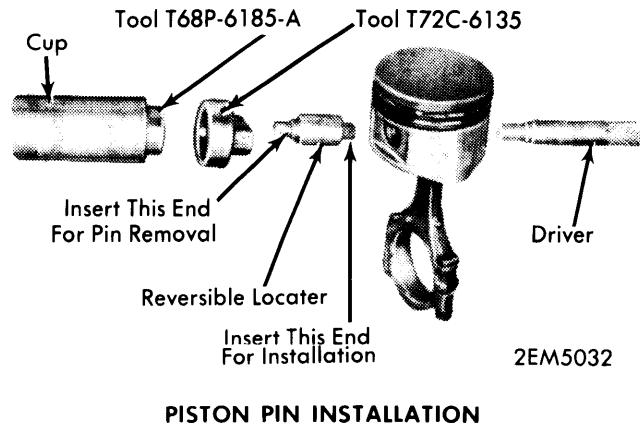
### PISTON & ROD INSTALLATION

Oil piston, rings, and cylinder walls with light engine oil. Correctly place ring end gaps (see illustration). Insert pistons into proper bores with piston head index mark toward front of engine and connecting rod fitted to correct journal. Connecting rods are numbered one to three in right bank and four to six in left bank (front to rear).



### FITTING PISTONS

Check piston to cylinder bore clearance by measuring piston and bore diameters. Measure OD of piston at centerline of piston pin bore and at 90° to pin bore axis. Refer to specifications for correct clearance. Oversize pistons are available in .020" and .040" oversizes.



## 2800 CC V6 (Cont.)

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)
2800 cc Red	2.2437-2.2441 (56.989-57.001)	.0006-.0019 (.015-.048)	No. 3	.004-.008 (.102-.048)	2.1260-2.1271 (54.000-54.028)	.0006-.0021 (.152-.053)	.004-.011 (.092-.268)
Blue	2.2433-2.2437 (56.519-56.989)	.0006-.0019 (.015-.048)	No. 3	.004-.008 (.102-.203)	2.1256-2.1267 (53.990-54.028)	.0006-.0021 (.152-.053)	.004-.011 (.092-.268)

### CRANKSHAFT MAIN & CONNECTING ROD BEARINGS

1) Determine crankshaft journal clearance in bearing using Plastigage method. Place a jack under counterweight adjoining bearing being checked so that weight of crankshaft will not aid in compressing Plastigage and provide an erroneous reading.

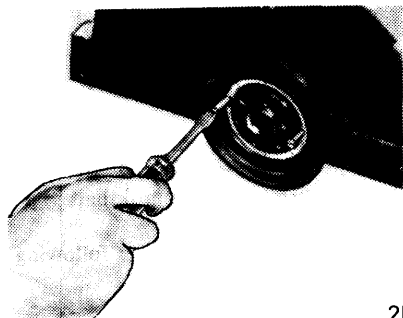
2) If bearing clearance using standard size bearing inserts is excessive, a .002" (.051 mm) undersize bearing may be used in combination with a standard bearing half. If .002" (.051 mm) bearings are used on two or more journals, they must be positioned in the cylinder block rather than bearing cap. If standard and .002" (.051 mm) undersize combinations do not bring the bearing clearance within specified limits, crankshaft will have to be refinished and undersize bearings installed. Undersize bearings are available as follows: .010", .020", .030", and .040".

### THRUST BEARING ALIGNMENT

Thrust bearing is the number three main bearing counting from front of engine. Align thrust bearing by forcing crankshaft forward and thrust bearing rearward. While holding in this position tighten cap bolts to specifications.

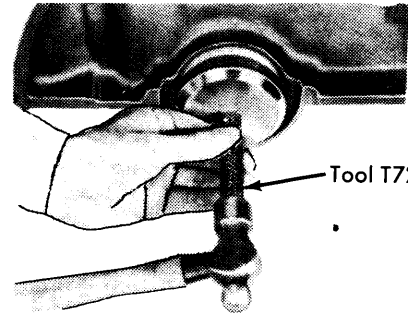
### REAR MAIN BEARING OIL SEAL

Remove transmission, clutch pressure plate and clutch disc or flywheel, flywheel housing and rear plate. Punch two holes in seal on either side of crankshaft above bearing cap. Insert metal screws in holes, using screwdrivers or pry bars, pry out seal. Install new seal with oil on OD and Lubriplate on ID of seal. Drive new seal in position using a suitable tool (see illustration).



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REMOVING CRANKSHAFT REAR OIL SEAL



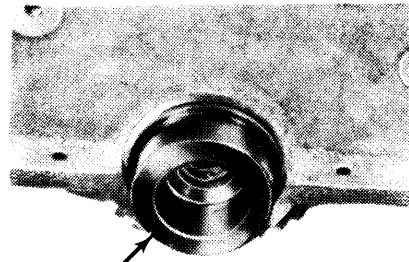
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INSTALLING CRANKSHAFT REAR OIL SEAL

### ENGINE FRONT COVER

**Removal** — Remove oil pan, radiator, alternator, drive belts, water pump, water hoses and pan. Remove drive belt pulley and if necessary, remove guide sleeves from block. Remove front cover attaching bolts. Tap cover with a plastic hammer to break seal and remove cover.

**Installation** — Apply sealing compound to gasket surfaces on cylinder block and both sides of gasket. Position gasket and front cover, then install retaining bolts. Fit new seal rings to guide sleeve and insert guides in block with chamfered end toward front cover. Apply sealer to front cover and place gasket on cover. Using suitable tool (T72C-6150) center cover and install bolts.



Tool T72C-6150

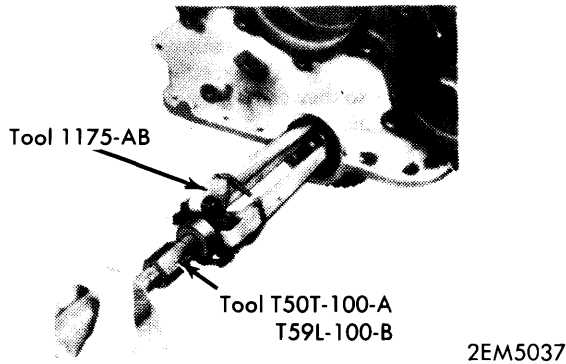
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ALIGNING FRONT COVER

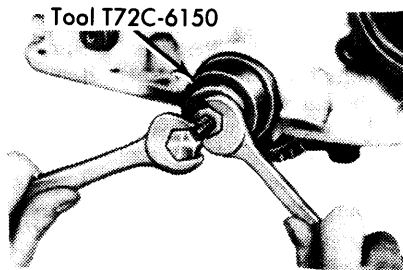
## 2800 CC V6 (Cont.)

### ENGINE FRONT COVER OIL SEAL

**Removal & Installation** — Remove radiator and crankshaft pulley. Using suitable tool as shown in illustration, remove front cover seal. To install new seal, slide tool T72C-6150 and seal onto crankshaft. Seat seal until tool bottoms out on front cover. Reinstall crankshaft pulley, radiator, and adjust drive belt.



REMOVING FRONT OIL SEAL



INSTALLING FRONT OIL SEAL

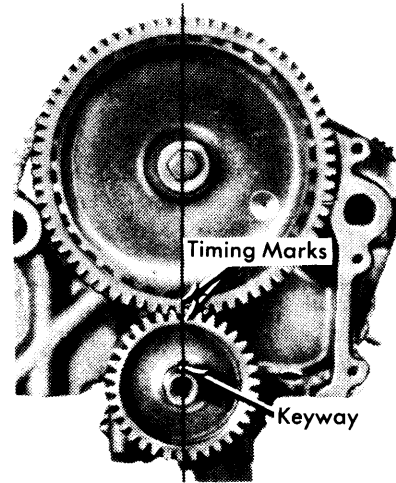
CAMSHAFT			
Engine	Journal Diam. In. (mm)	Clearance In. (mm)ⓐ	Lobe Lift In. (mm)
2800 cc Front	1.6497-1.6505 (41.902-41.923)	.002 (.051)	.....
2	1.6347-1.6355 (41.521-41.542)		
3	1.6197-1.6205 (41.140-41.161)		
Rear	1.6047-1.6055 (40.759-40.779)		

ⓐ — End play .001-.004" (.025-.102 mm).

### CAMSHAFT GEAR REPLACEMENT

**Removal** — Drain cooling system and crankcase. Remove oil pan and radiator. Remove front cover and pry or pull off camshaft gear. Remove thrust plate, spacer and key.

**Installation** — Replace spacer and thrust plate on camshaft. Install key in camshaft and press camshaft gear on until it seats against spacer. **NOTE** — Ensure timing marks are properly aligned before pressing on camshaft gear.

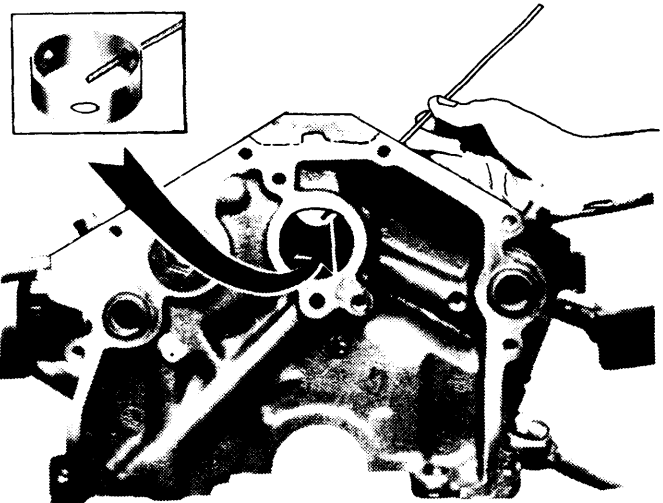


TIMING MARKS

### CAMSHAFT & BEARING REPLACEMENT

**Removal** — 1) With camshaft gear removed, remove camshaft. Drive out rear bearing bore plug.

2) Using a suitable puller, remove camshaft bearings. Use care not to damage bearing bores.



OIL HOLE ALIGNMENT NO. 2 & 3  
CAMSHAFT BEARING

**Installation** — 1) New camshaft bearings are available in standard and undersize. They are prefinished and require no reaming.

## 2800 CC V6 (Cont.)

2) Using suitable tools, press in new bearings. Check oiling holes in bearings to make sure they are properly aligned (see illustration).

3) Install new bearing bore plug. Replace camshaft, spacer, thrust plate, key and camshaft gear.

### CAMSHAFT END THRUST

1) Back off rocker arm adjusting nuts until camshaft has no valve spring load on tappets.

2) Using a dial indicator, push camshaft toward rear of engine. Place a large screwdriver between gear and block, pull camshaft forward and release it. Compare dial indicator reading with specifications.

3) If end play is excessive, replace thrust plate.

### CHECKING CAMSHAFT LOBE LIFT

Check lift of each camshaft lobe in consecutive order as follows:

1) Remove rocker arm shaft assemblies, making sure each push rod is in valve lifter socket. Install a dial indicator so that ball socket adapter of indicator rests on the end of push rod and in same plane as push rod movement.

2) With an auxiliary starter switch connected to starter solenoid and ignition switch "OFF", bump crankshaft until tappet is on base circle of camshaft lobe. This will be push rods lowest point.

3) Zero dial indicator and continue to rotate crankshaft until push rod is in fully raised position (highest indicator reading). Compare total lift from indicator readings with specifications.

4) To check accuracy of indicator readings, continue to rotate crankshaft until indicator reads zero. If lift on any lobe is .005" less than specifications, camshaft and tappet operating on worn lobe must be replaced.

VALVE TIMING				
Engine	INTAKE		EXHAUST	
	Open (BTDC)	Close (ABDC)	Open (BBDC)	Close (ATDC)
2800 cc Int.	20°	56°	62°	74°

### VALVE TIMING

Valve timing is correct when marks on pinion gear align with marks on camshaft gear.

## ENGINE OILING

### ENGINE OILING SYSTEM

The V-6 engine is pressure feed by a rotor type oil pump, which filters all oil through a full flow filter before entering engine. An oil gallery supplies oil to crankshaft main bearings, from there through slanted passages in crankshaft to connecting rod journals. Connecting rod big ends have a squirt hole which sprays oil on thrust side of cylinder bores. Oil from the oil gallery also feeds camshaft main bearings, which have grooves 180° of their circumference. From these grooves passages lead to distributor drive gear and rocker arm shafts.

**Crankcase Capacity** – 4.25 qts. and with filter change add .25 qts.

**Oil Filter Type** – Full Flow.

**Normal Oil Pressure** – 40 psi (min.) @ 2000 RPM.

**Pressure Regulator Valve** – Non-adjustable.

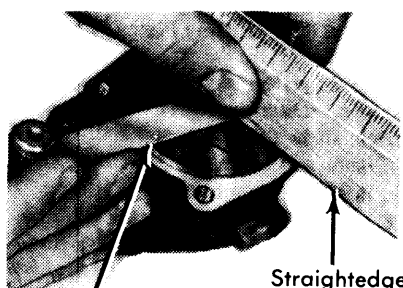
### OIL PUMP

Oil pump is a rotor-type pump. A non-adjustable spring loaded relief valve limits maximum pressure to approximately 50

psi. To service oil pump remove oil pan (See Oil Pan Removal). Remove bolt that retains oil pick-up screen to main bearing cap. Remove oil pump attaching bolts and lift off oil pump. Remove oil pump drive shaft. *NOTE – When reinstalling oil pump drive shaft, make sure pointed end, (pointed end is closest to pressed-on flange), is facing inward.* Lift off pump cover and remove rotors. To remove pressure relief spring, drill a small hole in pressure relief valve plug. Screw in a metal screw and pull plug out. A new plug must be used when spring is reinstalled. Check clearances, (see illustration) against specifications listed below. If rotor wear is present, replace rotors as an assembly only. Prime pump before remounting in engine.

### Oil Pump Specifications

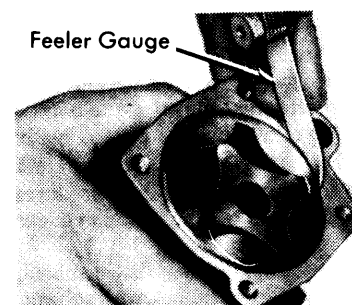
Application	Specification In. (mm)
Rotor Assembly End Clearance .....	.001-.004 (.028-.104)
Outer Race-to-Housing Clearance (Radial) .....	.006-.012 (.15-.30)



2EM5042 Feeler Gauge

Straightedge

### OIL PUMP ROTOR END PLAY



2EM5043

### OIL PUMP OUTER RACE CLEARANCE

# Capri Engines

## 2800 CC V6 (Cont.)

### ENGINE COOLING

#### WATER PUMP

**Removal** – 1) Drain coolant, and remove lower radiator hose and heater return hose.

2) Loosen alternator mounting bolts and remove belt. Remove fan and pulley.

3) Remove water pump bolts. Remove water pump, water inlet housing and thermostat from front cover.

**Reinstallation** – 1) Apply sealer to both sides of a new gasket, and place gasket on water pump.

2) Position water pump on front cover using two bolts finger tight.

3) Apply sealer to both sides of a new gasket and place gasket on water pump.

4) Install thermostat and fit rubber gasket. Position water inlet housing and screw it together with water pump. Fit and torque all remaining bolts to specifications. Note different length bolts.

5) Reinstall fan, pulley and belt. Reconnect both hoses.

#### THERMOSTAT

To test thermostat, suspend in water so that it doesn't touch side of container. Gradually heat water, checking water temperature frequently to see when thermostat starts to operate. If thermostat does not function properly, replace. See table below for opening temperatures.

Thermostat	Opening Temperatures
<b>New</b> – Starts to Open .....	185-192°F.
Fully Open .....	210-216°F.

**Cooling System Capacity** – 10.8 qts.

**Pressure Radiator Cap** – Opens at 13 psi.

#### TIGHTENING SPECIFICATIONS

Application	Ft. Lbs. (mkg)
Main Bearing Caps.....	65-75 (9.0-10.4)
Connecting Rod Bearing Caps .....	22-26 (3.0-3.6)
Crankshaft Gear.....	32-36 (4.4-5.0)
Camshaft Gear.....	32-36 (4.4-5.0)
Crankshaft & Balance Shaft Pulley.....	32-36 (4.4-5.0)
Threaded Plugs in Engine Block (Front).....	42-45 (5.8-6.2)
Flywheel .....	47-52 (6.5-7.2)
Front Cover.....	12-15 (1.7-2.1)
Water Pump .....	6-9 (.83-1.2)
Oil Pump.....	10-12 (1.4-1.7)
Rocker Shaft Supports .....	43-49 (5.0-6.8)
Oil Pan	
Step One .....	2-4 (.28-.55)
Step Two .....	5-8 (.69-1.1)
Rocker Arm Covers	
Step One .....	2-4 (.28-.55)
Step Two .....	5-8 (.69-1.1)
Intake Manifold	
Step One .....	2-6 (.28-.83)
Step Two .....	15-18 (2.1-2.5)
Cylinder Head	
Step One .....	30-40 (4.2-5.5)
Step Two .....	40-50 (5.5-6.9)
Step Three .....	65-80 (9.0-11.1)
Temperature Sending Unit .....	8-12 (1.1-1.7)
Spark Plugs .....	15-22 (2.1-3.0)