

## CRESSIDA 5M-E 6-CYLINDER

### ENGINE CODING

#### ENGINE IDENTIFICATION

Engine number is stamped on a machined pad on the front, right side of engine block. Engine code is also printed on a sticker attached to cylinder head cover.

#### ENGINE IDENTIFICATION CODE

Application	Code
Cressida (2759 cc) .....	5M-E

### ENGINE, MANIFOLDS & CYLINDER HEAD

#### ENGINE

##### Removal

1) Disconnect battery and drain cooling system. Remove hood and fan shroud. Remove radiator hoses, radiator, heater hoses and all oil cooler hoses. Remove oil pressure sending wire and alternator wiring.

2) Remove air cleaner and air intake ducting. Disconnect brake booster vacuum hose. Disconnect distributor primary wiring and coil secondary wiring.

3) Label and disconnect all fuel lines, vacuum hoses and electrical wiring connecting engine and engine compartment.

4) Disconnect starter wiring and accelerator connecting rod. If equipped with manual transmission, disconnect clutch flexible hose from master cylinder tube. Cap hose end to prevent fluid leakage.

5) On all models, disconnect power steering feed hose. Raise front and rear of vehicle with jack, and support on stands. Disconnect exhaust pipe from manifold, and remove exhaust pipe supports and insulator.

6) Disconnect speedometer drive cable and back-up light wiring. On manual transmission models, remove console box and gear shift lever.

7) On automatic transmission models, remove connecting rod swivel nut. Disconnect control rod from shift lever. On all models, remove propeller shaft. Plug rear of transmission to prevent oil leakage.

8) Take off rear engine undercover, and remove front engine mounts. Support transmission with jack, and remove rear engine mount and crossmember.

9) Lower jack supporting transmission, and remove stands. Using an engine hoist, remove engine and transmission assembly from vehicle.

##### Installation

To install, reverse removal procedure. Be sure to check all fluid levels and linkage adjustments prior to starting engine.

#### INTAKE MANIFOLD

##### Removal

1) Disconnect battery and drain coolant. Remove air cleaner and distributor cap. Remove radiator inlet hose and heater hoses. Disconnect temperature gauge sending wire and fuel line.

**CAUTION:** When disconnecting delivery pipe and injectors, use container to catch the large amount of gasoline which will be expelled.

2) It is necessary to remove air intake chamber with throttle body prior to intake manifold removal. Mark all vacuum, coolant and fuel hoses for identification and disconnect from air chamber.

3) Disconnect intake connector, cold start injector, throttle link and throttle wire for automatic transmission. Remove mounting bolts and lift air chamber off of manifold.

4) Disconnect fuel injection wiring connectors, and remove wiring clamps. Remove 4 bolts and pull out fuel delivery pipe with injectors.

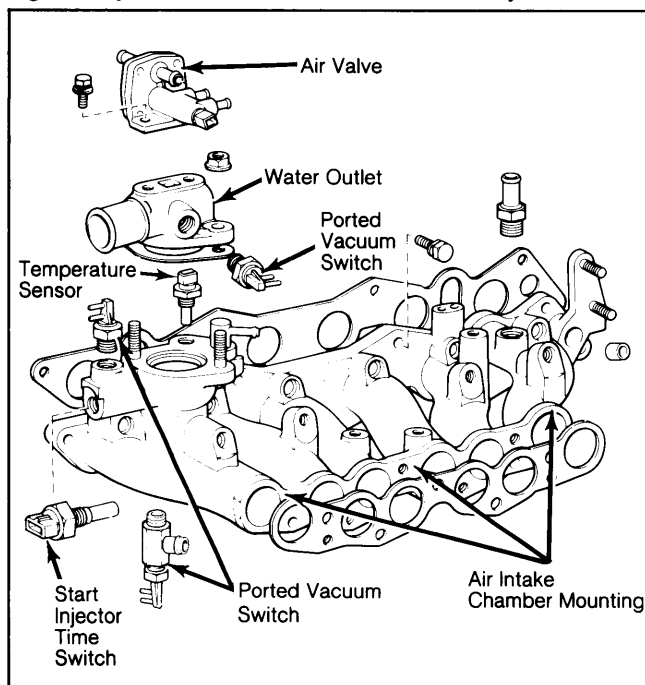
5) Remove pressure regulator at center of manifold. Remove EGR valve, and disconnect remaining hoses. Remove mounting bolts and lift off manifold.

##### Installation

Thoroughly clean all gasket surfaces and install new gasket. Install manifold assembly and gradually tighten bolts working from center out. Install remaining components in reverse of removal procedure.

**NOTE:** When installing injectors, lubricate "O" rings and insulators with gasoline.

Fig. 1: Toyota 5M-E Intake Manifold Assembly



#### CYLINDER HEAD

##### Removal

1) Remove intake and exhaust manifolds. Remove heater and by-pass hoses attached to head. Remove spark plugs and valve cover.

2) Turn crankshaft so that No. 1 piston is at TDC on firing stroke. Note that mating marks are aligned on timing gear and timing chain.

3) Remove chain tensioner. Camshaft timing gear bolt has LEFT hand threads. Therefore, use care when removing it. Loosen head and rocker shaft bolts in 2 or 3 steps in reverse of tightening sequence. See Fig. 2.

4) Lift off rocker arm assembly, and lift head straight up from block.

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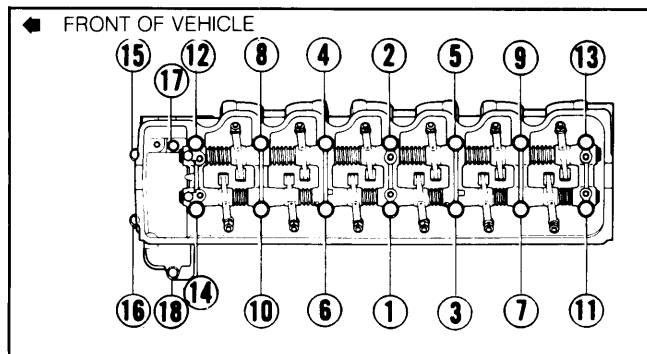
### Installation

1) Clean all gasket surfaces and apply sealer to cylinder head, around oil holes in the block, and in area of timing chain cover and block. Install new gasket.

2) Clean all foreign matter from bolt holes and place cylinder head on block. Make sure valve adjusting screws have been loosened. Install rocker shaft assembly.

3) Install bolts and torque in several steps. See Fig. 2. Align timing marks. See Timing Chain. Reverse removal procedure to complete assembly.

**Fig. 2: Cylinder Head and Rocker Arm Bolt Tightening Sequence**



Loosen bolts in reverse order shown.

## CAMSHAFT

### ENGINE FRONT COVER

#### Removal

Remove crankshaft pulley attaching bolt and remove pulley using puller (09213-41013). Remove oil pan. See Oil Pan. Remove front cover bolts and front cover.

#### Installation

Thoroughly clean front cover and block mating surfaces. Use liquid sealer on front cover gaskets when assembling.

### ENGINE FRONT COVER OIL SEAL

Inspect oil seal lip and replace if worn or damaged. Pry old seal out without damaging cover or retainer. Install seal using replacer tool (09223-50010). Apply multipurpose lubricant to seal lip.

### TIMING CHAIN

#### Checking for Stretch

1) After removing valve cover, set No. 1 cylinder to TDC. Crankshaft pulley timing mark must be aligned with "0" mark on engine front cover.

2) Check to see that the timing pin of the camshaft flange is aligned with embossed mark on the No. 1 rocker support. See Fig. 3.

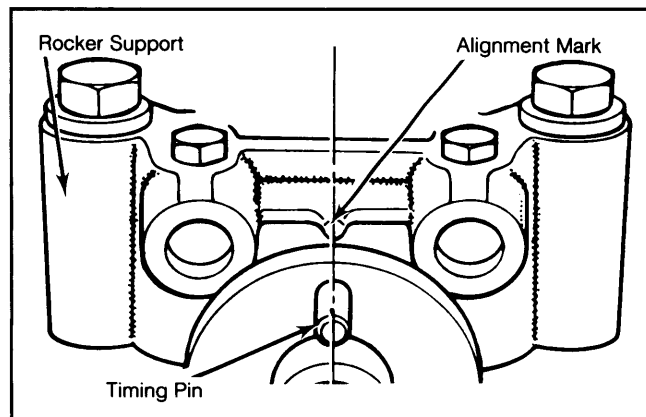
3) If the timing pin is not aligned, turn the crankshaft clockwise until pin and rocker support mark are lined up. Check the graduations on the engine front cover.

4) If the pulley timing mark is in the 0° to 4° ATDC range, valve timing is good. If pulley timing mark is over 4° ATDC, replace timing chain.

#### Removal

1) Remove rocker arm shafts and camshaft. Remove cylinder head. Remove crankshaft damper attaching bolt and remove damper using puller.

**Fig. 3: Aligning Camshaft Timing Pin & Rocker Support**



Set No. 1 piston on TDC on compression stroke.

2) Remove oil pan, timing chain cover and timing chain. Oil pump drive shaft and crankshaft timing gears must be removed using a gear puller.

#### Inspection

1) Timing chain may be checked off the vehicle. Stretch chain tight, and check distance between 17 links. Use the inside jaws of a Vernier caliper, inserted between links.

2) Check at 3 different places. Timing chain measurement for 17 links should not exceed 5.787" (147.0 mm).

3) To check wear of each timing gear, wrap timing chain completely (360°) around each gear, one gear at a time. Using Vernier caliper, measure the gear outside diameter (outer sides of chain rollers). See Timing Gear Specifications table.

### TIMING GEAR SPECIFICATIONS

Gear & Chain	Minimum Diameter
Crankshaft Gear .....	2.555" (64.9 mm)
Pump Drive Shaft .....	3.776" (95.5 mm)
Camshaft Timing Gear .....	4.961" (126.0 mm)

4) Inspect tension gear for wear or damage. Oil clearance limit between tension gear and arm is .004" (.1 mm). If worn beyond limits, replace gear and/or arm.

5) Check chain tensioner plunger for smooth operation. DO NOT disassemble chain tensioner. Replace if necessary.

#### Installation

1) Position crankshaft sprocket so that key is pointed vertically. Toyota marks on crankshaft and pump drive shaft gears must be aligned. Plated chain links must mate with punch marks on crankshaft and pump drive gears. See Fig. 4.

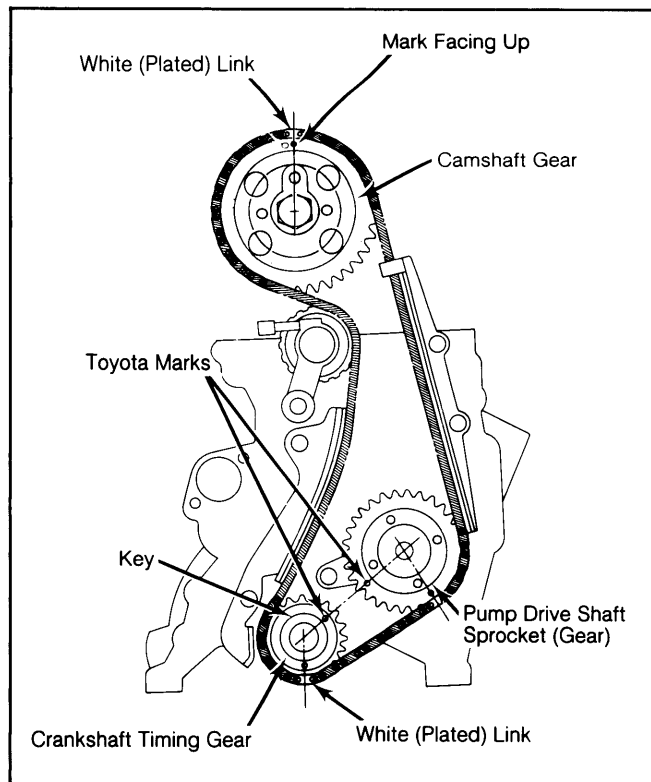
2) Insert bolt in collar, and install both chain vibration dampers and guide. With head and camshaft installed, ensure that camshaft timing pin is aligned with embossed mark on No. 1 rocker support.

3) Align mating link on chain with punch mark on camshaft drive gear. Install drive gear on camshaft. Note that attaching bolt has LEFT-HAND threads. Install tension arm, gear and chain tensioner.

4) Adjust chain tension by first rotating engine in a clockwise direction to take up chain slack. Loosen tensioner lock nut. Turn adjusting screw clockwise until resistance is felt.

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Fig. 4: Aligning Timing Chain



Set No. 1 cylinder at TDC on compression stroke.

5) Loosen screw 2 full turns, and tighten lock nut. If chain is noisy after running engine, loosen adjusting screw 1/2 turn.

### VALVE TIMING

The intake valve opens at 14° BTDC and closes at 46° ATDC. The exhaust valve opens at 54° BBDC and closes at 6° ATDC.

### CAMSHAFT

#### Removal

1) Remove air cleaner assembly, spark plug wires and valve cover. Remove rocker arm assembly. See Cylinder Head. Remove camshaft sprocket bolt (LEFT-HAND threads), and separate sprocket from camshaft.

2) Remove camshaft bearing caps and keep in order for assembly. Remove camshaft from head and check for wear. Maximum runout is .0024" (.060 mm).

3) Measure cam height. Minimum for intake is 1.696" (43.08 mm). Minimum for exhaust is 1.699" (43.15 mm). If height is less than specified, replace camshaft.

#### Installation

Lubricate camshaft bearing journals, and place camshaft in position. Assemble bearing caps in original positions with arrow marks toward front. Complete assembly in reverse of removal procedure.

### CAMSHAFT END THRUST

Install camshaft and bearings in cylinder head, and torque all bearing caps. Attach dial indicator, and check end thrust at flange end. Maximum thrust is .012" (.3 mm). Specified standard clearance is .003-.007" (.08-.18 mm).

### CAMSHAFT BEARINGS

#### Removal

1) Remove camshaft. See Camshaft. Inspect camshaft for wear or damage. Check oil clearance using Plastigage method. Clearance must not exceed .004" (.10 mm).

2) If clearance exceeds specifications, replace bearings. Bearings are available in standard, .002", .010" and .020" (.05, .25 and .50 mm) oversizes.

#### Installation

Lubricate camshaft and bearings with engine oil. Reverse removal procedure to complete installation.

### OIL PUMP SHAFT

#### Removal

1) Oil pump shaft can be removed with engine in vehicle. Turn engine to TDC for No. 1 cylinder. Drain cooling system and remove radiator. Remove engine front cover. See Engine Front Cover.

2) Loosen timing chain tensioner until chain is slack. Remove distributor. Unbolt thrust plate and pull pump shaft from engine block.

#### Inspection

1) Check end play between gear and plate with feeler gauge. If beyond limits, press gear from shaft and replace thrust plate.

2) Measure bearing bore diameter and journal diameter for oil clearance. If clearance exceeds specifications, replace bearings using special tool (09233-41010).

### OIL PUMP SHAFT SPECIFICATIONS

Application	In. (mm)
Out-of-Round & Taper Limit	.0004 (.01)
End Play	
Standard	.002-.005 (.05-.13)
Wear Limit	.012 (.30)
Bearing Clearance	
Standard	.0010-.0026 (.025-.066)
Wear Limit	.003 (.08)

## VALVES

### VALVE ARRANGEMENT

Left Side — Intake valves.  
Right Side — Exhaust valves.

### ROCKER ARM SHAFT ASSEMBLY

**NOTE:** When disassembling, mark all parts for reassembly in proper order. Loosen adjusting screws and nuts prior to installing rocker arm assembly.

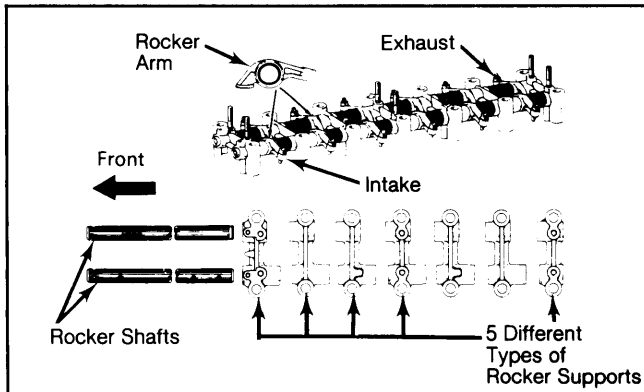
1) Check arm-to-shaft clearance by twisting on shaft. Little or no movement should be felt. If movement is felt, disassemble and inspect. Bushings may be replaced and finished, using pin hole grinder, to give standard clearance of .0005-.0013" (.012-.033 mm).

2) If the rocker arm face that contacts the camshaft is worn excessively, replace the rocker arm. If lightly scored, reface with oil stone or valve refacer. Reassemble rocker arm assembly, starting with No. 1 rocker support. Install on head and torque bolts in sequence. See Fig. 2..

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**Fig. 5: Assembling Rocker Arm Shaft**



Note location of differently designed rocker supports.

### VALVE SPRINGS

#### Removal

1) Remove air cleaner assembly and valve cover. Rocker arm shaft must be removed for access to springs. See Rocker Arm Shaft Assembly.

2) Using valve spring compressor, remove valve retainers locks, retainers and springs. Check springs for squareness and tension.

#### Installation

When installing valve springs, closed coil end faces toward cylinder head. Reverse removal procedure to complete installation.

### VALVE SPRING INSTALLED HEIGHT

Measure valve spring free length with Vernier caliper. Check for squareness within .063" (1.6 mm). Using a spring tester, check load when spring is compressed to its normal installed height. See Valve Spring Installed Height table.

### VALVE SPRING INSTALLED HEIGHT

Application	In. (mm)
Intake & Exhaust	
Inner Spring .....	1.492 (37.9)
Outer Spring .....	1.630 (41.4)

### VALVE STEM LENGTH

If valve stem tip is worn, resurface with valve grinder. DO NOT grind more than .020" (.5 mm). The overall valve length is 4.579" (116.3 mm) for intake valves. The overall exhaust valve length is 4.441" (112.8 mm).

### VALVE STEM OIL SEALS

Intake and exhaust valve oil seals are not the same. Intake seals are slightly longer than exhaust valve seals, and must not be switched.

### VALVE GUIDE SERVICING

1) Break off valve guide bushing at snap ring and remove snap ring. Heat cylinder head to approximately 176-212°F (80-100°C), and drive out bushing toward combustion chamber.

2) Allow head to cool and measure cylinder head bushing bore. If bore is .5118-.5211" (13.000-13.027 mm) use standard size valve guide.

3) If bore measurement is in excess of .5211" (13.027 mm), machine bore size to .5138-.5145" (13.050-13.068 mm). Install .05" (1.2 mm) oversize valve guide.

4) Measure installed height of .650" (16.5 mm) for intake guide and .551 (14 mm) for exhaust guide. Hand ream guide bore to provide specified stem clearance.

**NOTE:** Valve guide replacement is recommended whenever new valves are installed.

### VALVE CLEARANCE ADJUSTMENT

1) Valve clearance is adjusted with engine at operating temperature. Rotate crankshaft so that No. 1 piston is at TDC of compression stroke.

2) Adjust intake valves 1, 2, and 4, and exhaust valves 1, 3, and 5 to specified clearance. Rotate crankshaft one turn (360°) clockwise and adjust intake valves 3, 5 and 6, and exhaust valves 2, 4 and 6. See Valve Clearance Specifications table.

### VALVE CLEARANCE SPECIFICATIONS

Valve	In. (mm)
Intake .....	.011 (.28)
Exhaust .....	.014 (.35)

## PISTONS, RINGS & PINS

### OIL PAN

#### Removal

1) Raise and support vehicle. Drain engine oil and coolant. Disconnect air connector pipe from air cleaner. Remove oil level gauge.

2) Disconnect upper radiator hose, and loosen fan belts. Remove clutch fan and shroud.

3) Remove engine and flywheel housing undercovers. Remove exhaust pipe clamp and stiffener plates.

4) Remove motor mount bolts on both sides of engine. Place a jack under the transmission and raise the engine approximately 2" (50 mm). Remove oil pan.

#### Installation

Clean oil pan and block thoroughly. Apply sealer to corners of new oil pan gasket. Install oil pan and gasket. Install remaining parts in reverse of removal sequence.

### PISTON & ROD ASSEMBLY

#### Removal

1) With cylinder head and oil pan removed, remove connecting rod caps. Place a short length of hose over rod bolts to prevent damage to crankshaft. Keep all parts in order for reassembly.

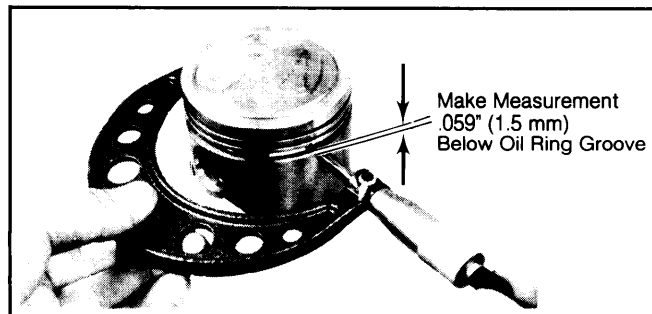
2) Remove bearings. If there is a ridge at the top of cylinder, use a ridge reamer before removing piston and rod. Push piston and rod assembly up through cylinder head side.

#### Installation

1) Apply oil to piston and piston rings. Using ring compressor, install piston and rod assembly in cylinder block. Make sure mark on piston faces front. See Fig. 6.

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**Fig. 6: Typical Reference Marks on Piston Head**



2) Replace connecting rod caps with mating marks aligned. Tighten nuts evenly in 2 or 3 steps, and check connecting rod side play.

### FITTING PISTONS

1) Measure top, center and bottom of cylinder bore with dial indicator. If wear exceeds .008" (.20 mm) or taper and out-of-round exceeds .0008" (.020 mm), cylinders must be rebored.

2) Bore in proper sequence — cylinders number 1, 3, 6, 4, 2 and 5. Last cut of boring bar should not remove more than .0025 (.050 mm). Finish to final dimension by honing the last .0008" (.020 mm).

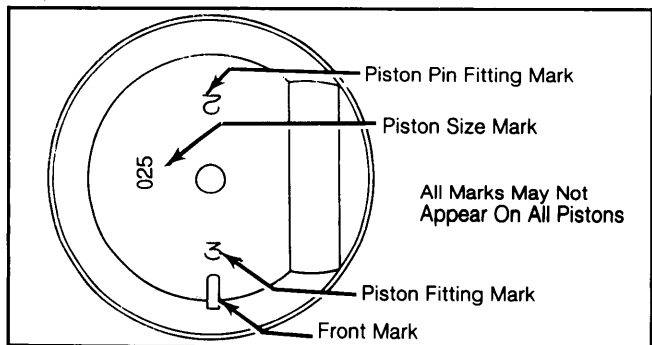
**NOTE:** To avoid erroneous readings while measuring, allow bore to cool after boring and honing. Cool measurement of piston and bore should provide .0020-.0028" (.05-.07 mm) clearance.

3) Measure piston diameter at right angles to piston pin. See Fig. 7. Measurement is taken at .059" (1.5mm) below oil ring groove. See Piston Diameter Specifications table.

### PISTON DIAMETER SPECIFICATIONS

Application	Piston O.D. In. (mm)
Standard .....	3.2650-3.2669 (82.931-82.979)
.020" (.50 mm) Oversize .....	3.2846-3.2866 (83.428-83.479)
.030" (.75 mm) Oversize .....	3.2945-3.2965 (83.680-83.731)
.039" (1.0 mm) Oversize .....	3.3043-3.3063 (83.929-83.980)

**Fig. 7: Measuring Piston Diameter**

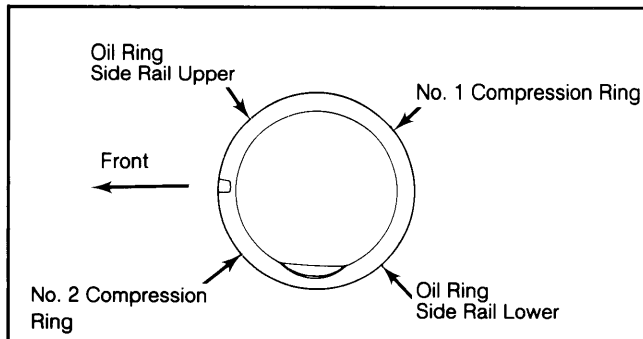


Measure at 68°F (20°C).

### FITTING RINGS

Check piston ring end gap at lowest part of cylinder. Measure ring groove clearance in piston. Replace rings if they will not meet specifications. Install rings with mark on flat portion of ring facing upwards. Position piston ring gaps. See Fig. 8.

**Fig. 8: Positioning Piston Ring Gaps**



Install piston with notch facing forward.

### PISTON PIN REPLACEMENT

#### Removal

Using needle nose pliers, remove circlips in piston pin hole. Heat piston to about 140°F (60°C). Remove pin by tapping lightly with plastic hammer. Keep piston, pin and rod together as a set.

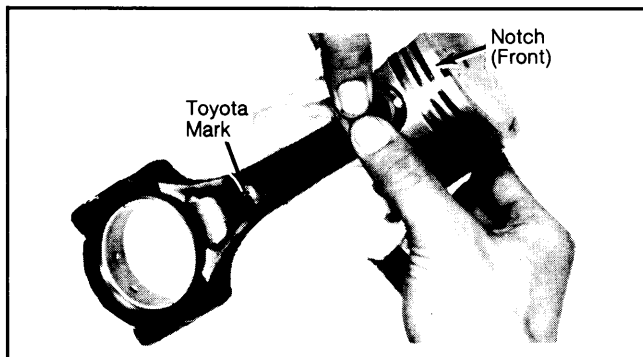
#### Inspection

Check pistons and pins for wear or scoring. Inspect rod for bend or twist. The rod bend limit is .002" (.05 mm). The rod twist limit is .006" (.15 mm).

#### Installation

Install one circlip in piston, and heat to about 140°F (60°C). Align piston notch with rod mark. See Fig. 9. Coat piston pin with engine oil, and push pin in with thumb. Install remaining circlip.

**Fig. 9: Assembling Piston & Rod**



Press pin into piston using thumb pressure.

## CRANKSHAFT MAIN & CONNECTING ROD BEARINGS

### MAIN BEARINGS

1) Check crankshaft runout with dial indicator. If runout exceeds .0024" (.060 mm), correct or replace crankshaft. Check main bearing journal for taper and out-of-round.

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2) Check main bearing clearance using Plastigage. If required, crankshaft may be reground for undersize bearings. Undersize bearings are available in .002" (.05 mm), .010" (.25 mm) and .020" (.50 mm) as well as standard.

### CONNECTING ROD BEARINGS

1) Measure connecting rod side play with dial indicator. If greater than .012" (.30 mm), rod must be replaced. Wipe off bearing journal; then check clearance with Plastigage.

2) If clearance exceeds .003" (.08 mm) and cannot be corrected with .002" (.05 mm) undersize bearings, or if taper or out-of-round exceeds .0008" (.020 mm), grind crankshaft to next undersize.

3) Connecting rod bearings are available in .002" (.05 mm), .010" (.25 mm) and .020" (.50 mm) undersize.

### THRUST BEARING ALIGNMENT

1) Measure crankshaft end play with center (No. 4) main bearing and cap installed. If clearance exceeds .012" (.30 mm), replace thrust washers to achieve standard clearance of .0020-.0098" (.050-.248 mm).

2) Standard thickness of thrust washer is .115" (2.92 mm) with .005" (.13 mm) and .010" (.25 mm) oversizes available.

**NOTE:** Install thrust washers with oil grooves facing outward.

### REAR MAIN OIL SEAL

Inspect oil seal lip and replace if worn or damaged. Pry old seal out without damaging cover or retainer. Install seal using replacer tool (09223-41010). Apply multipurpose lubricant to seal lip.

## ENGINE OILING

### CRANKCASE CAPACITY

The crankcase capacity is 4.9 qts. (4.7L) with filter; 4.3 qts. (4.1L) without filter.

### OIL FILTER

The oil filter is a full-flow, spin-on type.

### OIL PRESSURE REGULATOR VALVE

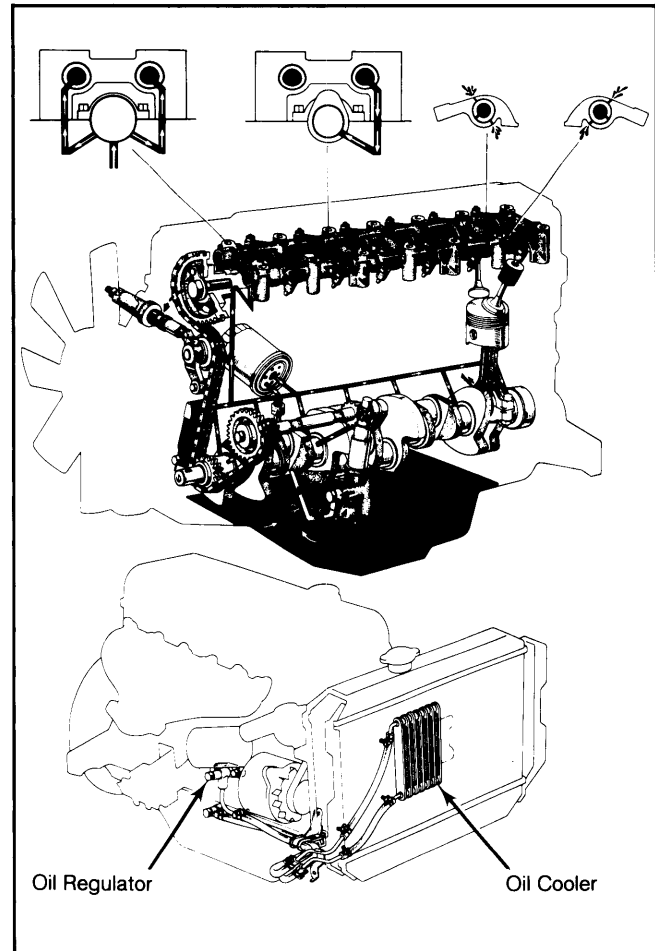
There are 3 relief valves in the engine oiling system. The pressure relief valve in the oil pump opens at 71-85 psi (5.0-6.0 kg/cm<sup>2</sup>). The oil regulator valve-to-cooler opens at 38-50 psi (2.7-3.5 kg/cm<sup>2</sup>). The relief valve in the filter opens with a pressure difference of 1-17 psi (.8-1.2 kg/cm<sup>2</sup>).

### ENGINE OILING SYSTEM

System is force-feed type with a full-flow filtering unit. See Fig. 10. Pressure is delivered by a gear-driven oil pump. From the filter, oil travels through cylinder block passages, lubricating internal components.

An external oil cooler is mounted at the upper left front of the radiator. It receives oil from the regulator, mounted on the block. After cooling, oil returns the oil to the pan.

Fig. 10: Toyota 5M-E Engine Oiling System.



### OIL PUMP

#### Removal

Raise vehicle and remove oil pan. See Oil Pan. Loosen bolt, and remove oil pump.

#### Disassembly

Disassemble pump by removing the following components in order: snap ring, spacer, drive shaft gear, Woodruff key, pump cover, pump shaft sub-assembly, driven gear, relief valve plug, gasket, spring and relief valve.

#### Inspection

Check oil pump for signs of wear or scoring. Measure body and side clearance. See Oil Pump Specifications table. Measure gear backlash.

### OIL PUMP SPECIFICATIONS

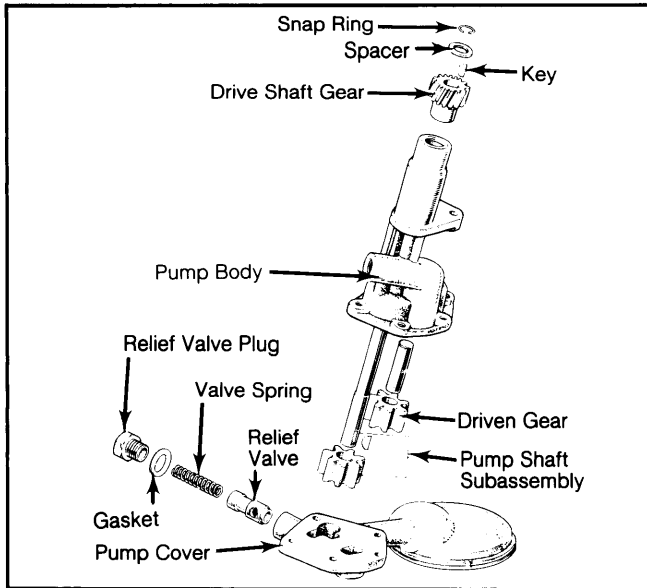
Application	Standard In. (mm)	Wear Limit In. (mm)
Body Clearance .....	.0012-.0024 (.030-.060)	.0079 (.20)
Gear Backlash .....	.020-.024 (.50-.60)	.035 (.88)
Side Clearance .....	.0012-.0035 (.030-.088)	.0059 (.150)

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### Reassembly

After inspection is finished, reassemble pump. See Fig. 11. Check pump operation by immersing inlet tube in engine oil. Turn pump shaft counterclockwise, and check for oil discharge.

Fig. 11: Exploded View of Gear-Driven Oil Pump



### Installation

Install oil pump. Clean gasket from oil pan and block. Install oil pan, using new gasket. Reverse removal procedure.

### THERMOSTAT

Wax pellet type, begins to open at 176-183°F (80-84°C), and should open to more than .32" (8 mm) at 203°F.

### WATER PUMP

#### Removal

1) It is not necessary to remove complete water pump housing to service water pump. Pump cover may be removed from housing, and housing may be left on cylinder block.

2) Remove fluid coupling and fan assembly. Remove fan belt and pulley. Remove 5 pump bolts, and remove pump assembly.

#### Installation

Install water pump with water drain hole positioned downward. Using new gasket, reverse removal procedure.

### TIGHTENING SPECIFICATIONS

Application	Ft. Lbs. (N.m)
Camshaft Bearing Cap	9-13 (12-18)
Camshaft Timing Gear (L.H. Thread)	47-54 (64-73)
Chain Tensioner	22-28 (30-38)
Connecting Rod Cap	31-34 (42-46)
Crankshaft Pulley	98-119 (133-162)
Cylinder Head	
8 mm Bolts	11-15 (15-20)
12 mm Bolts	55-61 (75-83)
Exhaust Manifold	13-16 (18-22)
Flywheel	51-57 (69-78)
Intake Manifold	15-17 (20-24)
Main Bearing Caps	72-78 (98-106)

## ENGINE COOLING

### COOLANT CAPACITY

The coolant capacity is 11.6 qts. (10.9L).

## ENGINE SPECIFICATIONS

### GENERAL SPECIFICATIONS

Year	Displacement		Fuel System	HP@RPM	Torque Ft. Lbs.@RPM	Compr. Ratio	Bore		Stroke	
	Cu. In.	cc					In.	mm	In.	mm
1982	168.4	2759	Fuel Inj.	116@4800	145@3600	8.8:1	3.27	83	3.35	85

### VALVES

Engine Size & 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)
2759 cc Intake	.....	44.5°	45°	.047-.063 (1.2-1.6)	.3138-.3144 (7.970-7.985)	.0010-.0024 (.025-.060)	.....
Exhaust	.....	44.5°	45°	.047-.063 (1.2-1.6)	.3134-.3140 (7.960-7.975)	.0014-.0028 (.035-.070)	.....

<sup>1</sup> — Wear limit for intake — .004" (.10 mm); Exhaust — .005" (.13 mm).

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## CRESSIDA 5M-E 6-CYLINDER (Cont.)

### ENGINE SPECIFICATIONS (Cont.)

#### PISTONS, PINS, RINGS

Engine	PISTONS	PINS		RINGS		
	Clearance In. (mm)	Piston Fit In. (mm)	Rod Fit In. (mm)	Ring No.	End Gap In. (mm)	Side Clearance In. (mm)
2759 cc	.0020-.0028 (.050-.071)	.....	.0002-.0004 (.005-.011) limit .0006 (.015)	No. 1	.0039-.0110 (.10-.28)	.0012-.0028 (.03-.07) .0008-.0024 (.02-.06)
				No. 2	.0060-.0118 (.15-.30)	
				Oil (w/wire)	.0079-.0276 (.20-.70)	
				Oil (w/o wire)	.0039-.0236 (.10-.60)	

#### 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)
2759 cc	2.3617-2.3627 (59.988-60.012)	.0013-.0023 (.034-.058)	No. 4	.002-.010 (.05-.25)	2.0463-2.0472 (51.976-52.000)	.0008-.0021 (.021-.053)	.012 (.30)

#### VALVE SPRINGS

Engine	Free Length In. (mm)	PRESSURE Lbs. @ In. (Kg @ mm)	
		Valve Closed <sup>1</sup>	Valve Open
2759 cc	1.77 (44.9)	14.1-17.2@1.49 (6.4-7.8@37.9) 37.3-46.5@1.63 (17.1-21.1@41.4)	.....
	Outer 1.85 (46.9)		

<sup>1</sup> — If valve spring is out of square more than .063" (1.6 mm), replace spring.

#### CAMSHAFT

Engine	Journal Diam. In. (mm)	Clearance In. (mm)	Lobe Lift In. (mm)
2759 cc	1.3378-1.3384 (33.979-33.995)	.0007-.0026 (.017-.067)	.0024 (.060)