1971-73 TOYOTA (2T-C ENGINES) 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
1971-72	96.9	1588	1x2-Bbl.	102@6000	101@3800	8.5:1	3.346	85	2.756	70
1973	96.9	1588	1x2-Bbl.	88@6000	92@3800	8.5:1	3.346	85	2.756	70

ENGINE IDENTIFICATION

Engine number is stamped on right side of cylinder block. The first group of numerals or letters designates engine type (2T-C).

ENGINE REMOVAL

1) Disconnect battery and drain cooling system. Scribe alignment marks on hood and hinge and remove hood. Remove hood support from body. Remove headlight door and remove radiator grille, lower grille molding, hood lock base, and lock brace.

2) Remove radiator hoses and radiator. On vehicles with Auto. Trans., disconnect oil hose from radiator. Disconnect heater hoses from engine and disconnect water temperature gauge wiring.

3) Remove air cleaner, accelerator torque rod, bond cable and clutch hose bracket. Disconnect right front engine mount. Remove distributor wiring, fuel hose, and disconnect exhaust pipe from manifold. Disconnect left front engine mount.

4) Remove shift lever from inside of vehicle and jack up rear end of vehicle and support on stands. Remove exhaust pipe support bracket, propeller shaft, and disconnect speedometer cable. Remove engine rear support member and lightly support transmission with jack and remove engine rear support.

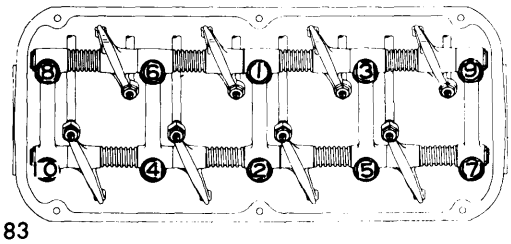
5) With suitable engine hoist, lift up engine, remove jack and move engine to front and remove from vehicle. To install, reverse removal procedure.

CYLINDER HEAD REMOVAL

1) Drain cooling system and remove air cleaner assembly. Disconnect radiator hoses, heater hoses, and water temperature sending unit wiring.

2) Remove carburetor torque rod and disconnect choke stove pipe and intake pipe. Disconnect PCV valve hose at intake manifold. Disconnect fuel line and vacuum hose at carburetor.

3) Remove clutch flexible hose bracket at cylinder head and jack up vehicle. Remove exhaust pipe clamp No. 1 and disconnect exhaust manifold from cylinder head. Remove cylinder head. To install, reverse removal procedure.



2EM5183

CYLINDER HEAD TIGHTENING

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)
1971-73							
Int.	1.61-1.62 (40.89-41.15)	45°	45°	....	.3138-.3146 (7.9701-7.9910)	.0012-.0024 (.0304-.0610)	....
Exh.	1.41-1.42 (35.81-36.07)	45°	45°	....	.3138-.3146 (7.9701-7.9910)	.0012-.0028 (.0304-.0711)	....

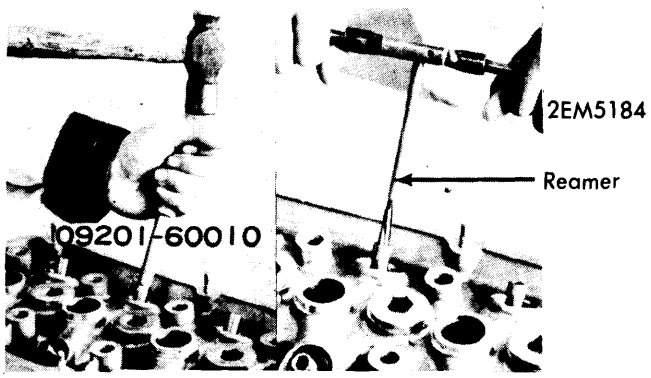
VALVE ARRANGEMENT

Right Side – All intake.
Left Side – All exhaust.

VALVE GUIDE SERVICING

1) Measure clearance between valve stem and valve guide bushing. If greater than .003" (intake), or .004" (exhaust), replace valve and guide bushing.

2) Using suitable tool, drive out guide bushing toward combustion chamber. Drive in new guide bushing in same direction it was driven out (from top toward combustion chamber). If necessary, finish bore with reamer to achieve clearance of .0010-.0021" (intake) and .0014-.0030" (exhaust). Bushing should protrude .67" for both intake and exhaust.



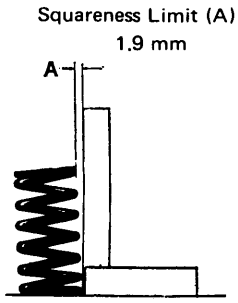
VALVE GUIDE BUSHING REPLACEMENT

1971-73 TOYOTA (2T-C ENGINES) 4 CYLINDER (Cont.)

VALVE SPRINGS			
Engine	Free Length In. (mm)	PRESSURE Lbs. @ In. (kg @ mm)	
		Valve Closed	Valve Open
1971-73	1.657 (42.089)	58.4 (26.49)	....

VALVE SPRING FREE LENGTH & INSTALLED HEIGHT

Check all valve springs and make sure that height of spring is 1.657" free length. When installed, valve spring height should be 1.484". When checking free length, also check that valve squareness is within .079". See specification for pressures.



2EM5185

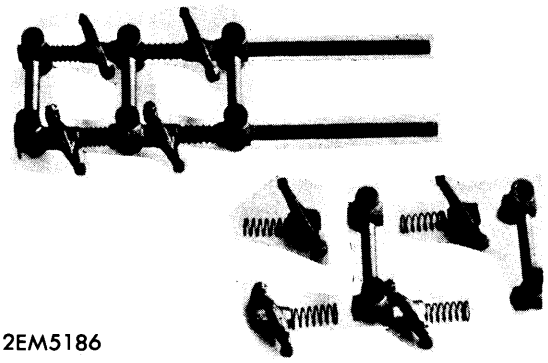
VALVE SPRING SQUARENESS LIMIT

ROCKER ARM ASSEMBLY

NOTE — There are three kinds of valve rocker shaft supports and two kinds of valve rocker shafts and rocker arms. Do not mix them up.

1) Remove rocker arm cover and rocker arm assembly. To disassemble, remove retainer springs, valve rocker support number 1, compression springs, valve rocker arms for intake valves, valve rocker arms for exhaust valves and rocker support number 3 and 2.

2) Mark or identify all components to ensure all parts are assembled in original order. To assemble rocker arm assembly, reverse removal procedure. Install number 1 rocker arm support with "F" mark toward front of engine. Make sure washer is installed between inboard side of number 3 support and rocker arms.

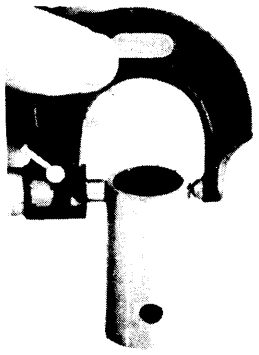


2EM5186

VALVE ROCKER ASSEMBLY

VALVE LIFTERS

Inspect lifters and check clearance in bore. If clearance exceeds .004", select oversize lifter and grind lifter bore to obtain clearance of .0006-.0011".



2EM5187

VALVE LIFTER MEASUREMENT

PISTONS, PINS, RINGS						
Engine	PISTONS	PINS		RINGS		
	Clearance In. (mm)	Piston Fit	Rod Fit	Rings	End Gap In. (mm)	Side Clearance In. (mm)
1971-73	.0024-.0031 (.0601-.0787)	Press Fit	Press Fit	1	.008-.016 (.203-.406)	.0008-.0024 (.0203-.0601)
				2	.004-.012 (.101-.305)	.0006-.0022 (.0152-.0559)
				Oil	.004-.012 (.101-.305)	.0006-.0024 (.0152-.0601)

1971-73 TOYOTA (2T-C ENGINES) 4 CYLINDER (Cont.)

OIL PAN REMOVAL

Drain engine oil and remove engine undercover. Remove right side stiffener plate. Remove stabilizer bracket and right bolts. Loosen left and right stabilizer-to-strut bar bolts. Remove oil pan bolts. Jack engine up under clutch housing, raise stabilizer and carefully pull oil pan forward to remove. Oil pan must be carefully removed to avoid damaging oil pump.

PISTON & ROD REMOVAL

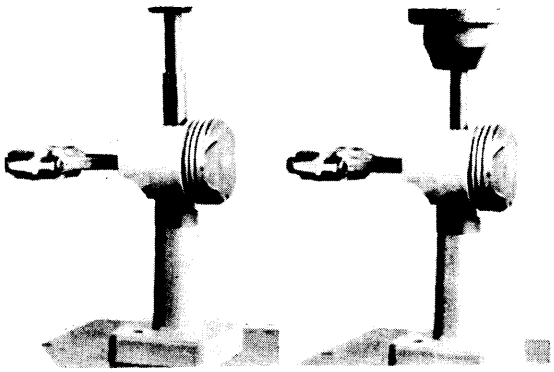
1) Drain engine coolant system and crankcase. Remove engine undercover, stiffener plate on right hand side and remove oil pan. Remove oil pump.

2) Remove connecting rod caps and using a wood bar or hammer handle, drive out pistons toward cylinder block upper side. To install, reverse removal procedure.

NOTE – Keep pistons arranged so that they will be replaced in the correct bores.

PISTON PIN REPLACEMENT

Using suitable tool and press, press out pin from connecting rod and piston assembly. When installing connecting rod to piston, position so that notch at piston top will be on same side as mark on rod center.

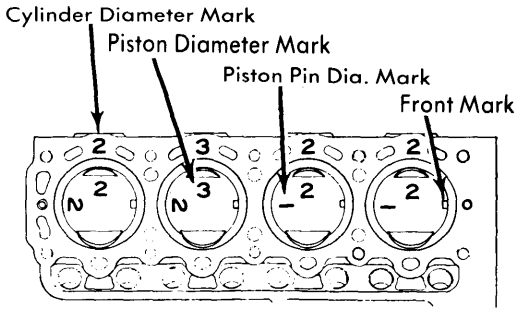


2EM5188

PISTON PIN REPLACEMENT

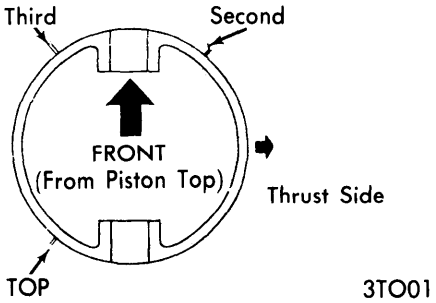
INSTALLING PISTONS

Using suitable piston ring compressor, insert pistons in cylinders, making sure that notch on piston top is toward front of engine. Ring gaps should be spaced and positioned as indicated in illustration. Install connecting rod bearing caps and tighten to specified torque.



2EM5189

PISTON FITTING MARKS



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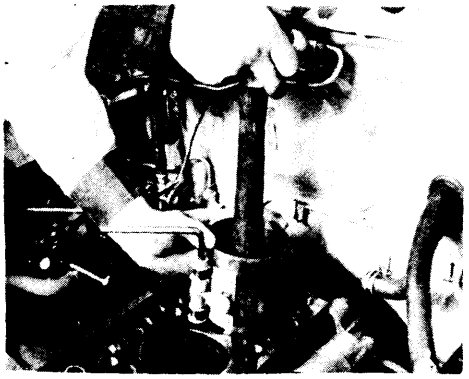
PISTON RING POSITIONS



2EM5190

PISTON INSTALLATION

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)
1971-73	2.285-2.2835 (58.039-58.001)	.0013-.0022 (.0330-.0559)	Center	.0028-.0071 (.0711-.1803)	1.8889-1.8898 (47.978-48.001)	.0009-.0019 (.0239-.0482)	.006-.010 (.152-.254)

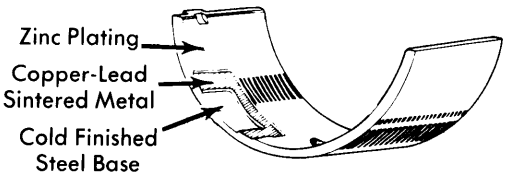
1971-73 TOYOTA (2T-C ENGINES) 4 CYLINDER (Cont.)

CONNECTING ROD BEARINGS

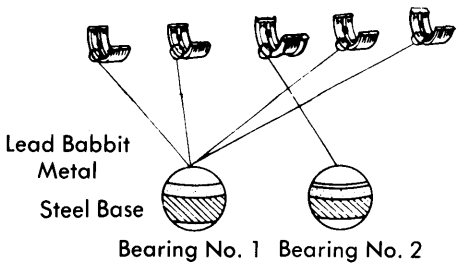
Inspect bearing for any wear or damage and replace bearing if defective. Measure clearance with Plastigage, placing Plastigage material on crankshaft. Tighten cap bolts, remove cap bolts, and measure Plastigage width with scale provided in package. Clearance should be as specified.

CRANKSHAFT BEARINGS

Using Plastigage, measure clearance of bearings in same manner as for connecting rod bearings. Make sure that clearances are to specifications.



CONNECTING ROD BEARING

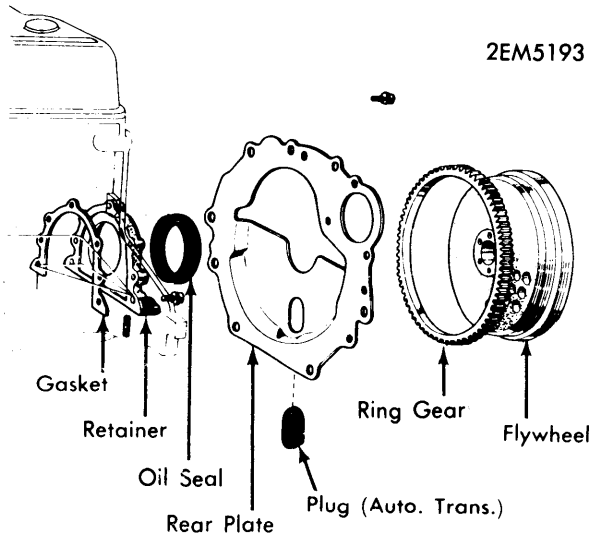


CRANKSHAFT BEARINGS

FLYWHEEL REMOVAL

NOTE — Procedure includes rear oil seal removal.

Remove transmission from engine, remove clutch cover and clutch disc, remove flywheel. Remove rear end plate and rear oil seal retainer. Inspect seal lip and if damaged or worn, replace oil seal. Special Tool 09250-10011 is recommended to drive in oil seal. To replace components, reverse removal procedure and tighten flywheel bolts to 41.9-47.7 ft. lbs.



FLYWHEEL & RELATED PARTS

TIMING CHAIN COVER REMOVAL

1) Jack up vehicle and remove headlamp door and radiator grille. Remove grille lower molding, hood lock base and lock brace. Remove radiator grille and radiator upper baffle. Drain cooling system, disconnect hoses and remove radiator.

2) If equipped with Auto. Trans., remove oil cooler hose from radiator. Remove fan belt and water pump assembly. Remove crankshaft pulley. Drain engine oil and remove engine undercover. Remove right hand stiffener plate, and remove oil pan bolts.

3) Timing chain cover may now be removed. To install, reverse removal procedure and tighten components to specifications.

FRONT OIL SEAL REPLACEMENT

Special Tool 09308-10010 is recommended to pull out oil seal. To install, drive new oil seal into recess in timing cover by using Special Tool 09223-22010.

2EM5194

FRONT OIL SEAL INSTALLATION

CAMSHAFT			
Engine	Journal Diam. In. (mm)	Clearance In. (mm)	Lobe Lift In. (mm)
1971-73			
1	1.8291-1.8297 (46.459-46.474)	.0010-.0026 (.0254-.0660)	.....
2	1.8192-1.8199 (46.208-46.255)	.0010-.0026 (.0254-.0660)	
3	1.8094-1.8100 (45.959-45.974)	.0010-.0026 (.0254-.0660)	
4	1.7996-1.8002 (45.709-45.725)	.0010-.0026 (.0254-.0660)	
5	1.7897-1.7903 (45.458-45.474)	.0010-.0026 (.0254-.0660)	

CAMSHAFT REMOVAL

1) Remove timing chain cover and remove timing gears with suitable tool. Remove cam timing gear bolt. Remove timing chain and gears for camshaft and crankshaft as a unit. Remove cylinder head, distributor and fuel pump.

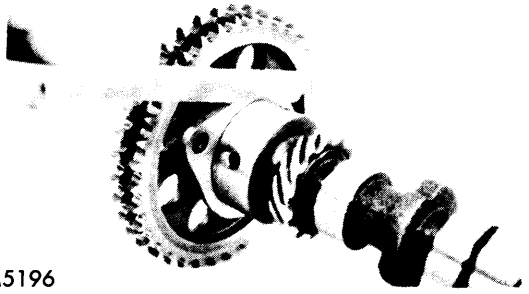
2) Remove shift lever and support transmission lightly on jack and remove engine rear support member. Then carefully lower jack. Remove camshaft thrust plate and pull out camshaft, being careful not to damage bearings.

1971-73 TOYOTA (2T-C ENGINES) 4 CYLINDER (Cont.)

CAMSHAFT END THRUST

To measure end thrust, install thrust plate and timing gear. Tighten bolts to 21.7-28.9 ft. lbs. Use feeler gauge to measure end thrust. Thrust limit is .012". Standard clearance for overhaul is .003-.006".

CAMSHAFT REMOVAL 2EM5197



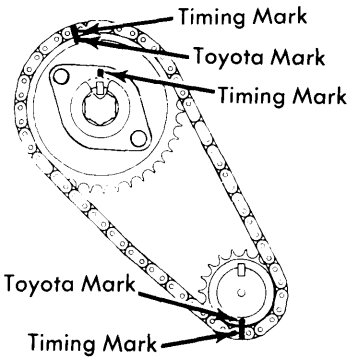
2EM5196

CAMSHAFT THRUST CLEARANCE

TIMING CHAIN AND GEAR INSTALLATION

1) After camshaft has been replaced, rotate crankshaft so that key is pointing up with pistons No. 1 and No. 4 at TDC. Turn camshaft and position key so that it lines up with timing mark in thrust plate.

2) Assemble crankshaft timing gear and camshaft timing gear to chain so that Toyota mark in each gear lines up with chain timing marks. Install gears and chains onto crankshaft and camshaft. Tighten bolts to 50.6-79.6 ft. lbs. Install chain tensioner, chain damper and install timing cover.



2EM5195

TIMING CHAIN & GEAR TIMING MARKS

VALVE TIMING				
	INTAKE		EXHAUST	
Engine	Open (BTDC)	Close (ABDC)	Open (BBDC)	Close (ATDC)
1971-72 2T-C	16°	54°	58°	12°

ENGINE OILING

Crankcase Capacity – Approximately 3 qts. Add 1 qt. with filter change.

Oil Filter – Full flow type filter.

Normal Oil Pressure – 28 psi at idle; 43 psi running (minimum values).

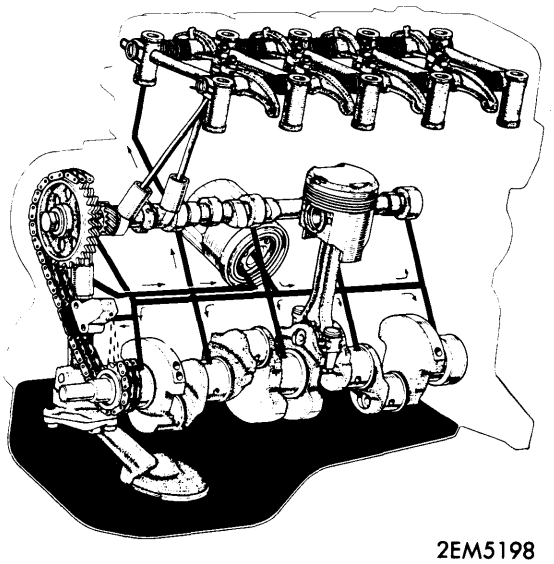
Oil Pressure Regulator Valve – Begins to open at 51-63 psi; completely open at 84-101 psi.

OIL PUMP

Oil pan must be removed to gain access to oil pump. If oil pump assembly is tight, tap it out lightly from distributor side. Tip clearance of rotors should be .0016-.0063". Side clearance should be .0012-.0035". The clearance between driven rotor and body should be .0039-.0063". If clearances exceed limits, replace rotor set and/or body as necessary.

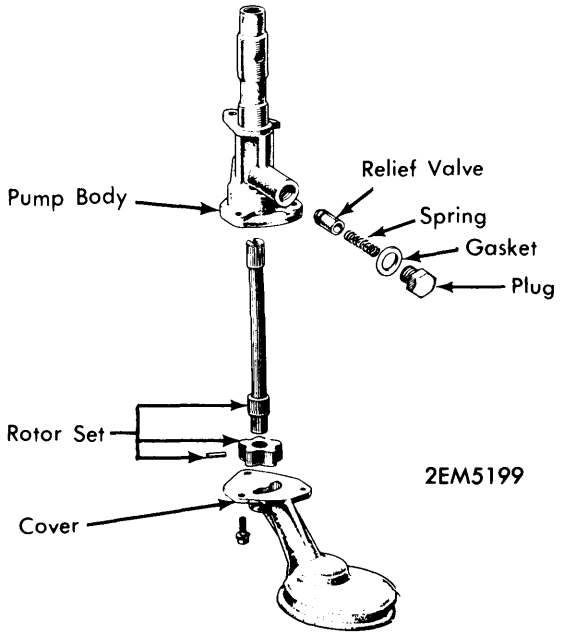
1971-73 TOYOTA (2T-C ENGINES) 4 CYLINDER (Cont.)

ENGINE OILING (Cont.)



2EM5198

ENGINE OILING SYSTEM

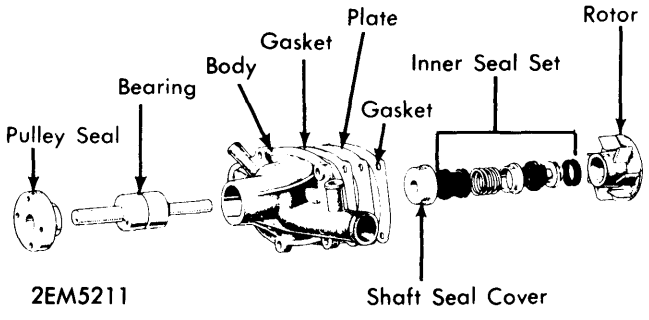


OIL PUMP COMPONENT PARTS

ENGINE COOLING

WATER PUMP REMOVAL

Drain cooling system, remove radiator hoses and by-pass and heater hoses. Remove fan belt. Remove attaching bolts and remove water pump. Separate fan and pulley. To install, reverse removal procedure.



WATER PUMP

Thermostat – Wax pellet type thermostat with opening temperature of 145-182°F. Fully opened at 203°F.

Coolant Capacity – Approximately 7 qts.

TIGHTENING SPECIFICATIONS

Application	Ft. Lbs. (mkg)
Cylinder Head Bolts	58 (8.0)
Manifold Bolts	10 (1.4)
Cylinder Head Cover	4 (.6)
Timing Gear Thrust Plate	25 (3.5)
Timing Gear Bolt	65 (9.0)
Crankshaft Pulley Bolt	35 (4.8)
Connecting Rod Cap Bolts	32 (4.4)
Oil Pan Bolts	6 (.9)
Stabilizer Bracket Bolts	27 (3.7)
Flywheel Bolts	45 (6.2)
Main Bearing Cap Bolts	58 (8.0)
Clutch Cover Bolts	12 (1.7)
Transmission-to-Engine Bolts	42 (5.8)