1971-73 DATSUN 1200 (A12 ENGINE) 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	71.5	1171	1x2-Bbl.	69@6000	70@4000	9.0-1	2.874	73	2.756	70
1973	71.5	1171	1x2-Bbl.	.....	.....	8.5-1	2.874	73	2.756	70

ENGINE IDENTIFICATION

Engine serial and code number is stamped on right rear side of crankcase, below mating surface of crankcase and cylinder head. First three digits are engine code.

Application	Code
1171 cc Engine (1200 Model)	A12

ENGINE REMOVAL

NOTE — Engine and transmission are removed as one unit.

1) Remove hood and disconnect battery terminals. Drain cooling system and remove radiator. Disconnect electrical connections at thermal transmitter, oil pressure switch, primary side of distributor, starter and alternator.

2) Remove coil wire. Disconnect and plug fuel line at fuel pump. Remove air cleaner and disconnect choke cable and accelerator cable at carburetor.

3) Disconnect hydraulic line at clutch slave cylinder. Disconnect exhaust pipe at exhaust manifold. Disconnect electrical connection at back-up light switch. Disconnect speedometer cable. Remove propeller shaft.

4) Remove boot from gearshift lever, pull out lock pin and remove gearshift lever. On automatic transmission models, remove pins from both ends of cross shafts and remove shift rod. Suspend engine with a suitable hoist. Remove front engine mounting nuts. Place a floor jack under transmission and remove rear engine mounting nuts. Remove engine by lifting up and out toward front of vehicle. To install, reverse removal procedure.

INTAKE MANIFOLD REMOVAL

1) Remove air cleaner and disconnect accelerator cable and choke cable. Disconnect and plug fuel line at carburetor. Disconnect exhaust pipe at exhaust manifold.

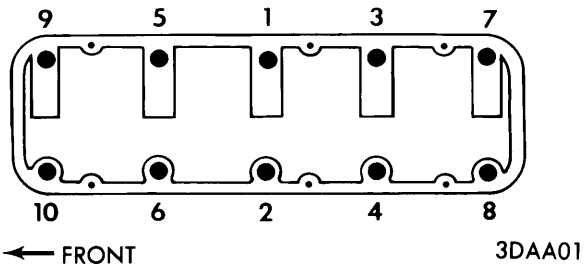
2) Remove nuts retaining intake and exhaust manifold to cylinder head and remove. Remove gasket and thoroughly clean mating surfaces. Remove bolts and separate intake and exhaust manifold.

3) To install, use new gasket and reverse removal procedure. Tighten nuts to specifications.

CYLINDER HEAD REMOVAL

1) Remove intake manifold as previously outlined. Remove rocker arm cover. Remove rocker arm assembly and push rods. Remove cylinder head retaining bolts and remove cylinder head.

2) To install, thoroughly clean mating surfaces. Use new gasket without sealer, and install cylinder head. Install cylinder head retaining bolts making sure bolt with "T" stamped in head is installed on center right side of head (No. 1 position).



CYLINDER HEAD TIGHTENING SEQUENCE

3) Tighten bolts to specifications in sequence shown in illustration. Reverse removal procedure to install remaining components and adjust valve clearance.

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							
Intake	1.378-1.386 (35.0-35.2)	45½°	45°	.051 (1.3)	.3138-.3144 (7.970-7.985)	.0006-.0018 (.015-.045)	.3346 (8.5)
Exhaust	1.142-1.150 (29.0-29.2)	45½°	45°	.071 (1.8)	.3128-.3134 (7.945-7.960)	.0016-.0028 (.040-.070)	.3346 (8.5)

1971-73 DATSUN 1200 (A12 ENGINE) 4 CYLINDER (Cont.)

VALVE ARRANGEMENT

E-I-I-E-E-I-I-E (front to rear).

VALVE GUIDE SERVICING

Check valve stem-to-guide clearance, if clearance is more than .0039" and valve stem is not worn, valve guide must be replaced. Replace valve guide using the following procedure.

1) Using a suitable driver (SR11320000) press guide from cylinder head with a press. Ream guide hole in cylinder head to .4803-.4807" (12.200-12.211 mm) to install replacement guide.

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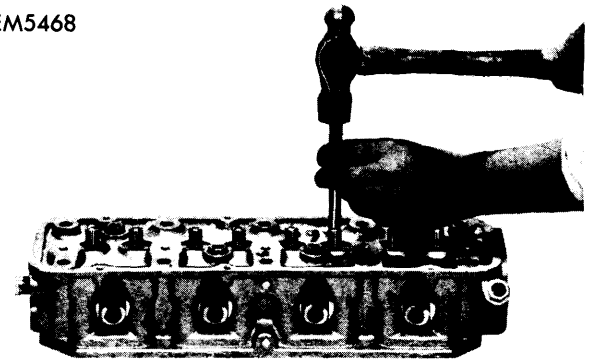

VALVE GUIDE REMOVAL & INSTALLATION

2) Heat cylinder head to approximately 302-392°F (150-200°C). Press in using same driver as used for removal. Ream valve stem bore in guide to .3150-.3156" (8.000-8.015 mm) using a suitable reamer (ST11080000). Correct valve seat surface.

VALVE STEM OIL SEALS

Prior to 1973, oil seals are installed on intake valves only. Later engines have oil seals on both intake and exhaust valves. Install seal with large end over valve guide.

VALVE SPRINGS

Engine	Free Length In. (mm)	PRESSURE Lbs. @ In. (kg @ mm)	
		Valve Closed	Valve Open
1971-73	1.831 (46.5)	52.7@1.52 (23.9@38.7)	129@1.19 (58.5@30.2)

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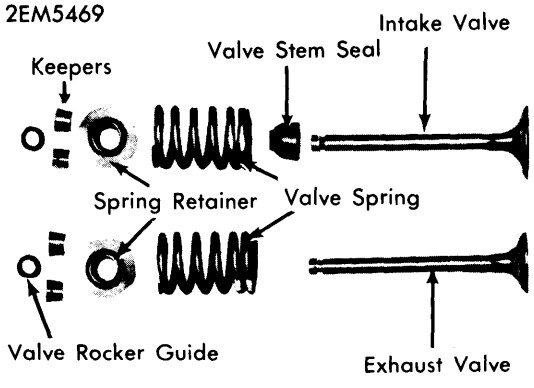
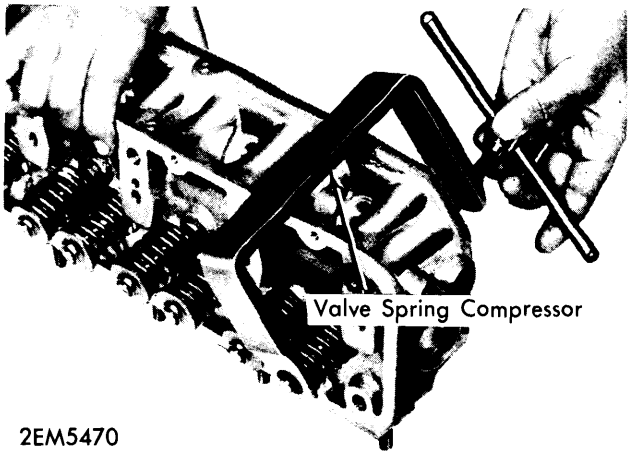


VALVE COMPONENTS

VALVE SPRING REMOVAL

With cylinder head removed, compress valve spring using a suitable valve spring compressor (ST12070000) and remove valve keepers. Release spring compressor and remove spring retainer and spring. To install, reverse removal procedure.



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VALVE SPRING REMOVAL

VALVE SPRING INSTALLED HEIGHT

Valve spring installed height is 1.524". Check valve spring in a spring tester by applying specified load and checking spring length. If spring length is less than measurement given in table, replace valve spring.

ROCKER ARM ASSEMBLY

1) Remove valve cover and remove bolts securing rocker arm assembly to cylinder head. Remove rocker arm assembly.

2) Slide off support stands, rocker arms and springs. Thoroughly clean and inspect all components for wear or signs of seizure. Check rocker arm-to-shaft clearance, standard clearance is .0008-.0020". Replace as necessary.

3) If valve contact surface of rocker arm is worn, resurface using a suitable grinder. If more than .0197" has to be removed from rocker arm to resurface, replace rocker arm.

4) Reverse disassembly and removal procedures to assemble and install rocker arm assembly. Tighten bolts to specifications and adjust valve clearance.

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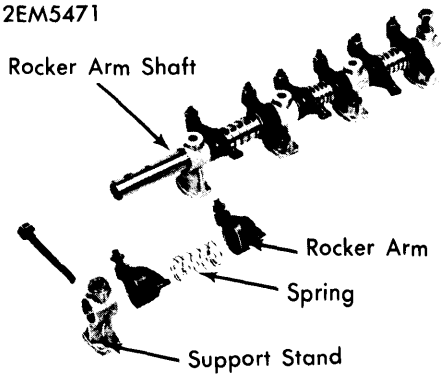


ROCKER ARM ASSEMBLY COMPONENTS

1971-73 DATSUN 1200 (A12 ENGINE) 4 CYLINDER (Cont.)

VALVE TAPPET SERVICE

Check valve tappet for wear or signs of seizure. Check clearance between valve tappet and tappet bore in crankcase. If clearance is more than .0059", replace valve tappet. Standard clearance is .0008-.0020". Check push rod for bending or wear and replace as necessary.

VALVE CLEARANCE ADJUSTMENT

Rotate engine until piston of valves being adjusting is at TDC of compression stroke. Adjust both intake and exhaust valves. Valves may be adjusted either hot or cold.

Valve Clearance Adjustment

Application	Hot In. (mm)	Cold In. (mm)
1971-73 Int. & Exh.	.014 (.35)	.010 (.25)

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)
1971-73	.0009-.0017 (.023-.043)	.0002-.0003 (.006-.008)	.0007-.0013① (.017-.034)	No. 1	.0079-.0138 (.20-.35)	.0016-.0028 (.04-.07)
				No. 2	.0079-.0138 (.20-.35)	.0016-.0028 (.04-.07)
				Oil	.0118-.0354 (.30-.90)	.0016-.0031 (.04-.08)

① — Interference fit.

OIL PAN REMOVAL

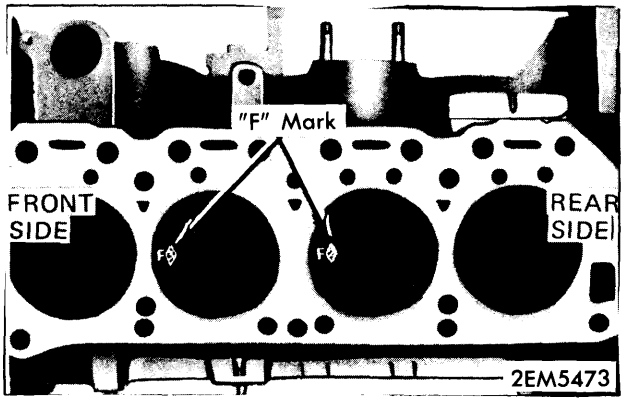
NOTE — Oil pan may be removed with engine in vehicle, but this procedure is not recommended by manufacturer.

Removal — With engine removed, drain oil, remove oil pan retaining screws and remove oil pan.

Installation — To install, thoroughly clean mating surfaces, use new gasket, install oil pan and screws, and tighten retaining screws evenly.

PISTON & ROD ASSEMBLY

1) Remove cylinder head and oil pan as previously outlined. Remove nuts from connecting rod and remove connecting rod cap with bearing half. Push piston and connecting rod assembly with bearing half up and out through top of crankcase.

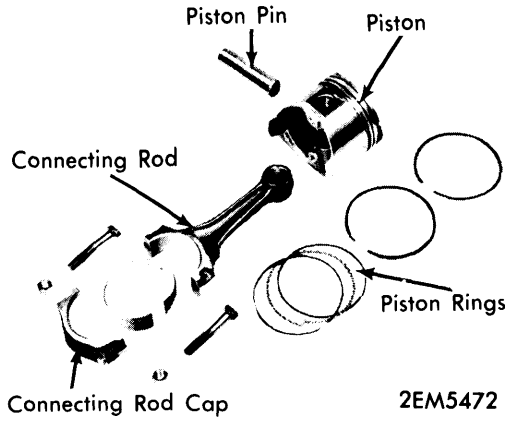


PISTON INSTALLATION

2) To install piston and connecting rod assembly, thoroughly oil rings, piston and cylinder wall. Make sure ring gaps are situated approximately 180° apart and not on thrust side of piston. Make sure bearing halves are properly seated in connecting rod and cap.

3) Install a ring compressor on piston and compress rings. Install piston in cylinder with "F" on top of piston toward front of engine. With piston installed in cylinder and connecting rod and bearing seated against crankshaft journal, install rod cap with numbers on same side as connecting rod. Tighten nuts to specifications.

4) Install cylinder head and oil pan as previously outlined.



PISTON & CONNECTING ROD ASSEMBLY COMPONENTS

FITTING PISTONS

1) Check piston-to-cylinder clearance with a feeler gauge and a spring tension gauge. With a .0012" feeler gauge installed between piston and cylinder wall, a force of 1.1 to 3.3 lbs., measured on spring tension gauge, should be needed to extract feeler gauge.

2) Check cylinder bore size. If more than .008" (.20 mm) over standard size, cylinder must be bored to next oversize piston. Pistons and rings are available in standard and .02", .04" and .06" (.50, 1.00 and 1.50 mm) oversizes.

3) Check piston ring side clearance. Side clearance of top ring should be no more than .0079". Side clearance of middle and bottom ring should be no more than .0039". Replace rings or piston as necessary.

1971-73 DATSUN 1200 (A12 ENGINE) 4 CYLINDER (Cont.)


2EM5475

PISTON RING SIDE CLEARANCE

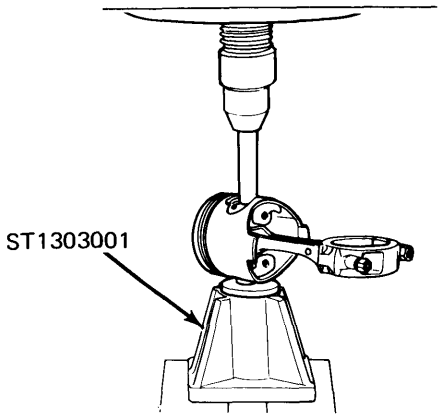
4) Check piston ring end gap in cylinders. Push ring into lower cylinder bore with top of piston. Measure gap with a feeler gauge. Ring gap should be no more than .0394".

PISTON PIN REPLACEMENT

1) Remove piston and connecting rod assembly as previously outlined. Piston pin is press fit in connecting rod and is removed by pressing out with a press and a suitable mandrel and driver (ST1303001).

2) Check piston pin-to-piston clearance, if more than .0003", replace both piston and piston pin. Piston pin should push fit through piston by hand with both piston and pin at room temperature.

3) Piston pin should be press fit into connecting rod. If interference fit is less than .0008", replace connecting rod or piston pin as necessary. If connecting rod is replaced, replace with one within 5 grams of defective connecting rod.



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PISTON PIN REMOVAL & INSTALLATION

4) To assemble piston and connecting rod assembly, use same mandrel and driver as used for disassembly. Thoroughly oil pin, piston and connecting rod. Install piston on connecting rod so when "F" on top of piston is pointing toward front of engine, oil squirt hole on connecting rod is toward right side of crankcase.

5) Install piston and connecting rod assembly as previously outlined. Install cylinder head and oil pan as previously outlined.

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	1.9666-1.9671 (49.951-49.964)	.0008-.0024 (.020-.062)	No. 3	.002-.006 (.05-.15)	1.7701-1.7706 (44.961-44.974)	.0008-.0020 (.02-.05)	.008-.012 (.20-.30)

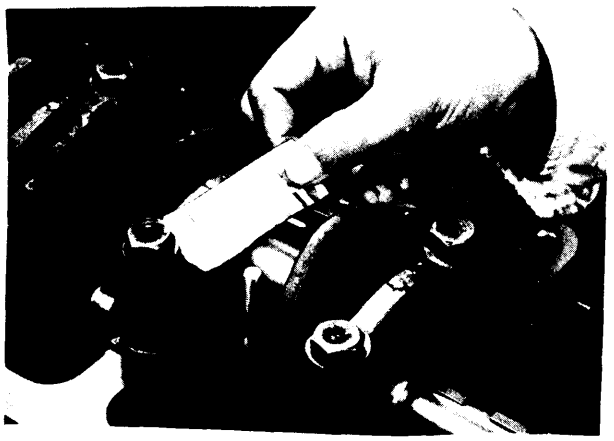
MAIN & CONNECTING ROD BEARING SERVICE

1) Remove cylinder head, oil pan, and piston and connecting rod assemblies as previously outlined. Remove alternator and engine mounting bracket from left side. Remove crankshaft pulley, timing chain cover and chain tensioner.

2) Remove crankshaft and camshaft sprockets with timing chain. Remove clutch and flywheel. Remove main bearing caps with bearing halves and rear main bearing oil seal. Remove crankshaft.

3) Thoroughly clean and inspect crankshaft. Blow out oil passages with compressed air. Check crankshaft for runout on center main bearing journal. If runout is more than .002", crankshaft is bent and must be replaced.

4) Check main and connecting rod journals for out-of-round or taper. If more than .0012" (.03 mm), crankshaft must be ground to next undersize. Main and connecting rod bearings are available in standard and .01", .02", .03" and .04" (.25, .50, .75 and 1.00 mm) undersizes.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PLASTIGAGE CLEARANCE METHOD

1971-73 DATSUN 1200 (A12 ENGINE) 4 CYLINDER (Cont.)

5) Main and connecting rod bearing clearance is checked by the Plastigage method. Place a piece of Plastigage wire on journal and install main cap or rod cap and tighten to specification. Remove main or rod cap and compare flattened wire to scale on back of Plastigage package.

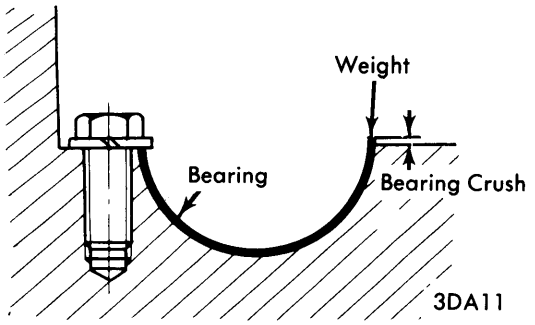
6) If connecting rod bearing clearance is slightly more than specified, but not enough to warrant grinding of crankshaft, bearings that are .0031" (.08 mm) and .0047" (.12 mm) undersize are available. Install bearing that will give correct clearance. If these bearings will not obtain specified clearance, crankshaft must be ground to next undersize and appropriate bearings installed.

7) Install main bearing halves in crankcase and main bearing caps. Apply oil to main bearing surface and install crankshaft. Install main bearing caps with arrow pointing toward front of motor. Install rear main bearing cap with oil seal. *See Rear Main Bearing Oil Seal Service*. Tighten main bearing cap bolts to specification.

8) Check crankshaft end play. *See Thrust Bearing Alignment*. Install timing chain in correct position with crankshaft and camshaft sprockets. *See Valve Timing*. Install remaining components in reverse of removal order or as previously outlined.

BEARING CRUSH

Set bearing on main bearing cap or cylinder block bearing recess. Lock one side of bearing and press other side so bearing back touches recess. Measure distance bearing extends above mating surface. Measure connecting rod bearing in similar manner. Bearing crush of main bearings should be .0000-.0012" (.00-.03 mm) and connecting rod bearings should be .0006-.0016" (.015-.040 mm). If not as specified, replace bearing.



CHECKING BEARING CRUSH

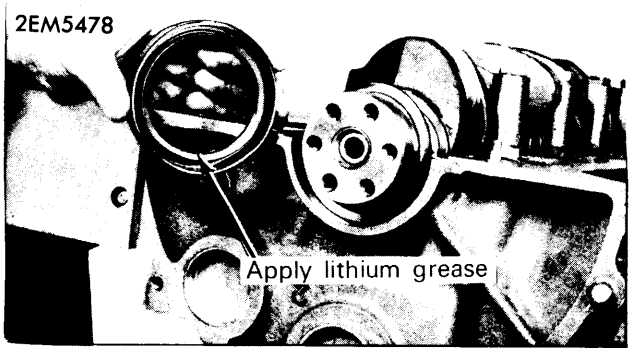
THRUST BEARING ALIGNMENT

Thrust bearing is installed on number three main bearing journal. Check crankshaft end play by inserting a feeler gauge between flange of thrust bearing and crankshaft. End play should be no more than .0118".

CRANKSHAFT END PLAY

REAR MAIN BEARING OIL SEAL SERVICE

Apply sealer to corners of crankcase that holds rear main bearing cap. Apply lithium grease to sealing edge on seal and install seal. Install rear main bearing cap and tighten bolts to specifications.



REAR MAIN BEARING OIL SEAL INSTALLATION

ENGINE FRONT COVER & OIL SEAL

1) Remove drive belt, fan and water pump pulley. Remove water pump and crankshaft pulley. Remove oil pan and front engine cover.

2) Replace seal in cover whenever cover is removed. Thoroughly clean mating surfaces and apply sealer to both sides of gasket. Install gasket and cover.

3) Tighten bolts and nuts to specifications. Reverse removal procedure to install remaining components.

CAMSHAFT

Engine	Journal Diam. In. (mm)	Clearance In. (mm) ①	Lobe Lift In. (mm)
1971-73			.222
No. 1	1.7237-1.7242 (43.783-43.796)	.0015-.0024 (.037-.060)	(5.65)
No. 2	1.7041-1.7046 (43.283-43.296)	.0011-.0020 (.027-.050)	
No. 3	1.6845-1.6849 (42.783-42.796)	.0016-.0025 (.040-.063)	
No. 4	1.6647-1.6652 (42.283-42.296)	.0011-.0020 (.027-.050)	
No. 5	1.6224-1.6229 (41.208-41.221)	.0015-.0024 (.037-.060)	

① — End play is .0008-.0031" (.02-.08 mm).

1971-73 DATSUN 1200 (A12 ENGINE) 4 CYLINDER (Cont.)

TIMING CHAIN REPLACEMENT

1) Remove engine front cover as previously outlined. Remove timing chain tensioner and bolt securing camshaft sprocket to camshaft. Pull off sprocket with timing chain.

2) Thoroughly clean and inspect chain for wear or damage. Make sure links are not stretched. Replace chain if necessary.

3) To install, reverse removal procedure. Make sure timing chain and sprockets are correctly timed when installed. See *Valve Timing*.

4) Measure distance between timing chain tensioner pad and tensioner body of installed timing chain tensioner. If distance exceeds .591" (15 mm), replace worn parts.

CAMSHAFT REMOVAL

1) Remove engine front cover as previously outlined. Remove fuel pump and oil pump with filter. Remove timing chain tensioner and remove timing chain with sprockets. Remove two bolts from camshaft lock plate and pull camshaft from crankcase.

2) Thoroughly clean and inspect camshaft for wear or scoring. Check runout of camshaft with a dial indicator on center bearing journal. If runout exceeds .002", replace camshaft.

3) Check journal diameter, if diameter is less than .0039" (.10 mm) from standard, camshaft journals must be ground to next undersize and appropriate bearings installed in crankcase. See *Camshaft Bearing Replacement*. Bearings are available in .010", .020" and .030" (.25, .50, .75 mm) undersizes.

4) Check camshaft end play. See *Camshaft End Thrust*. Install camshaft sprocket on camshaft and check runout with a dial indicator. If runout exceeds .0039", replace sprocket. Check both sprockets for wear or damage and replace as necessary.

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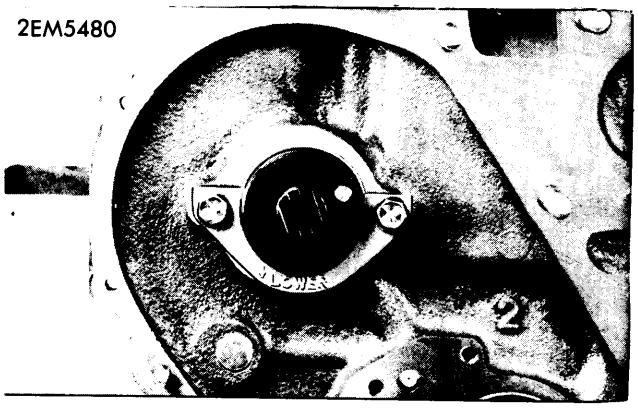

CAMSHAFT LOCK PLATE INSTALLATION

5) To install camshaft, insert in crankcase and position lock plate with word "LOWER" at bottom. Tighten bolts to specifications. Temporarily install camshaft and crankshaft sprockets to check installed height.

6) Measure height of both sprockets. If difference in height is more than .0197", install a spacer washer under crankshaft sprocket to obtain correct height. Washers are .006" thick. Remove sprockets and reinstall with timing chain and sprockets in correct position. See *Valve Timing*.

7) Install engine front cover as previously outlined. To install remaining components, reverse removal order.

CAMSHAFT BEARING REPLACEMENT

1) With camshaft removed, check journal diameter and bearing inside diameter. If journal measurement is within tolerance and clearance between camshaft journals and bearings exceeds .0059", bearings must be replaced.

2) Remove and install appropriate bearings in crankcase using a suitable driver (ST16110000). Make sure oil holes in bearings align with oil holes in crankcase. Bearings must be line bored after installation. Install taper plug in crankcase using sealer. Install camshaft as previously outlined.

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CAMSHAFT END PLAY

CAM LOBE LIFT

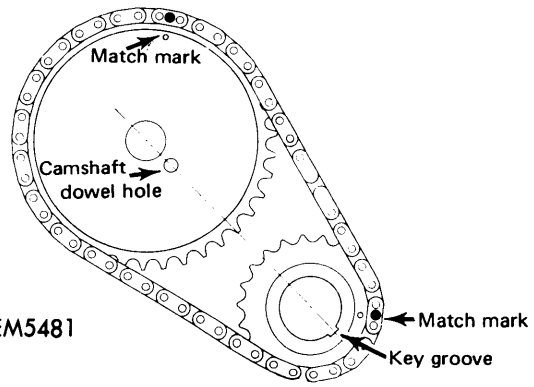
Standard total lobe height is 1.435-1.439". Measure total height of lobe, if down more than .0197" from standard, replace camshaft as the lobe lift is less than the specified .222".

CAMSHAFT END THRUST

Check clearance between lock plate and front portion of camshaft, if more than .0039", replace lock plate.

VALVE TIMING

Engine	INTAKE		EXHAUST	
	Open (BTDC)	Close (ABDC)	Open (BBDC)	Close (ATDC)
All	14°	54°	56°	12°



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TIMING CHAIN INSTALLATION

VALVE TIMING

Marks on timing chain must line up with marks on crankshaft and camshaft sprockets (see illustration).

1971-73 DATSUN 1200 (A12 ENGINE) 4 CYLINDER (Cont.)

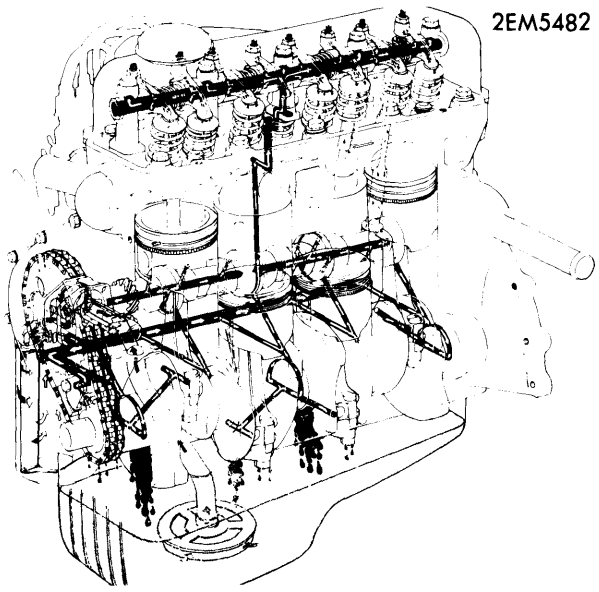
ENGINE OILING

Crankcase Capacity – 2.85 qts. (2.70 ltr). With filter, 3.42 qts. (3.24 ltr).

Oil Filter – Full flow mounted under oil pump.

Normal Oil Pressure – 13-17 psi (0.9-1.2 kg/cm²) at idle and 43-50 psi (3.0-3.5 kg/cm²) at 2000 RPM.

Pressure Regulator Valve – Mounted in oil pump cover. See *Oil Pump*.



ENGINE LUBRICATION SYSTEM

ENGINE OILING SYSTEM

Oil is circulated through engine by pressure provided by a trochoid rotor type pump. Oil pump is mounted on side of crankcase and driven by camshaft. Oil is drawn from oil pan by oil pump and into full flow oil filter mounted under oil pump. Oil is then pumped into main oil gallery of crankcase where it is distributed to crankshaft journals, timing chain tensioner and squirter that lubricates timing chain. Oil is circulated from crankshaft main bearing journals to camshaft journals and from center camshaft journal to rocker arm shaft to lubricate rocker arms and valves. Cylinder walls and piston pins are lubricated by oil squirted from squirt hole in connecting rod.

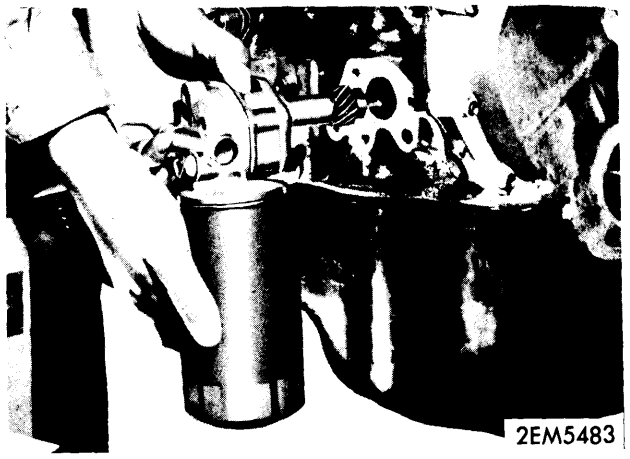
OIL PUMP

1) To remove oil pump, drain engine oil, remove front suspension stabilizer bar and splash shield. Remove oil filter. Remove bolts securing oil pump to crankcase and remove oil pump.

2) Remove bolt securing pump cover to pump body and separate cover from body. Remove inner and outer rotors with pump drive. Remove plug from cover and pull out pressure regulator valve spring and piston.

3) Thoroughly clean and inspect all components for wear or scoring. Check side and tip clearance between rotors. Check clearance between outer rotor and pump body. If clearances are excessive, replace components as necessary (see specifications).

4) To determine if pressure regulator valve spring is installed at correct height, insert piston all the way to bottom of bore in pump cover. Measure distance between open end of piston and spring seat of plug. Add distance to .7806" which is total length of piston.



OIL PUMP REMOVAL

5) Apply 8.09 lbs. to spring and measure distance. Subtract length of spring under load from total of piston length and distance between open end of piston and spring seat of plug. The difference is thickness of shim needed to install spring at correct height. Install suitable shim or shims between plug and spring.

6) Reverse disassembly and removal procedures to assemble and install oil pump. Use new gaskets and tighten bolts to specifications.

Oil Pump Specifications

Application	Measurement In. (mm)
Rotor-to-Rotor Side Clearance	.0020-.0047 (.05-.12)
Rotor-to-Rotor Tip Clearance	.0016-.0047 (.04-.12)
Outer Rotor-to-Pump Body Clearance	.0059-.0083 (.15-.21)
Regulator Valve Spring	
Free Length	1.71 (43.49)
Pressure Length	1.19" @ 8.09 lbs. (30.3 mm @ 3.67 kg)

1971-73 DATSUN 1200 (A12 ENGINE) 4 CYLINDER (Cont.)

ENGINE COOLING

Thermostat – Opens at 177-183°F (80.5-83.5°C).

Cooling System Capacity – 5.2 qts. (4.9 ltr) with heater.

WATER PUMP

1) Drain cooling system and remove fan belt. Remove fan and pulley. Remove bolts and nuts securing water pump to engine front cover and remove water pump.

2) To install, reverse removal procedure. Thoroughly clean mating surfaces and use new gasket.

TIGHTENING SPECIFICATIONS

Application	Ft. Lbs. (mkg)
Cylinder Head Bolts	
1971-72	33-40 (4.5-5.5)
1973	40-43 (5.5-6.0)
Connecting Rod Nuts	23-27 (3.2-3.8)
Main Bearing Cap Bolts	36-43 (5.0-6.0)
Camshaft Sprocket Bolt	29-35 (4.0-4.8)
Camshaft Lock Plate Bolts	3-4 (0.4-0.5)
Timing Chain Tensioner Bolts	4-6 (0.6-0.8)
Engine Front Cover Bolts	4-5 (0.5-0.7)
Oil Pan Bolts	3-4 (0.4-0.6)
Oil Pump Bolts	
1971-72	8-12 (1.1-1.7)
1973	9-11 (1.3-1.5)
Rocker Arm Shaft Bolts	14-18 (2.0-2.5)
Intake & Exhaust Manifold Bolts	7-10 (0.9-1.4)
Crankshaft Pulley Bolt	108-116 (15-16)
Flywheel Bolts	47-54 (6.5-7.5)
Oil Strainer Bolts	7-10 (0.9-1.4)