

105" 4 CYLINDER

IDENTIFICATION CODING

ENGINE IDENTIFICATION

The fifth digit of the Vehicle Identification Number, located on the upper left of the instrument panel, identifies the engine displacement. This number is visible through the windshield from outside the vehicle. An engine sequence number is located on a machined pad on the engine block above the fuel pump.

Application	VIN Code
105" (1.7 Liter) 2-Bbl.	A

ENGINE REMOVAL

See Engine Removal at end of ENGINE Section.

CYLINDER HEAD & MANIFOLDS

INTAKE & EXHAUST MANIFOLDS

Removal & Installation — 1) Disconnect battery. Remove air cleaner and disconnect all vacuum lines, electrical wiring and fuel line from carburetor. Remove throttle linkage.

2) Loosen power steering pump and remove belt. Raise vehicle and remove exhaust pipe from manifold. Remove power steering pump and set aside. Remove intake and exhaust manifold retaining nuts and screws. Lower vehicle and remove carburetor and manifold assembly and separate.

CYLINDER HEAD

NOTE — Due to light alloy used in cylinder head, engine **MUST** be cold before removal. If engine is hot, cylinder head could warp.

Removal — Drain cooling system and remove intake and exhaust manifolds. Remove camshaft cover and timing belt from camshaft sprocket. See *Timing Belt Removal* in this section. Remove camshaft bearing caps and camshaft. Identify all parts being removed for reinstallation in original position. Remove cylinder head bolts in reverse order of installation. Remove cylinder head and gasket.

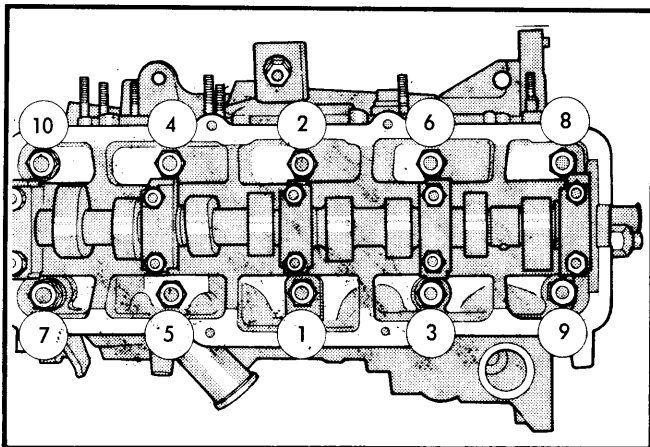


Fig. 1 Cylinder Head Tightening Sequence (Loosen in Reverse Order — No. 10 To No. 1)

NOTE — To prevent breakage of camshaft, carefully remove bearing caps 5, 1 and 3 first. Then diagonally loosen and remove bearing caps 2 and 4.

Installation — Coat gasket with suitable sealer. Install gasket and head on block. Make sure marking on gasket "OBEN" is toward cylinder head. Insert bolts 8 and 10 to center head. Tighten bolts in sequence. After all bolts have been tightened to specification, turn another 1/4 turn. See Fig. 1.

VALVES

VALVE GUIDE INSPECTION

Insert valve with valve head positioned 3/8" above cylinder head gasket surface. Attach dial indicator to cylinder head. Position against valve head at a right angle to the valve stem. Rock valve in guide and measure guide wear shown on indicator. If dial reading is excessive, guides should be replaced.

VALVE GUIDE REPLACEMENT

- 1) Using a press and a suitable guide drift, press worn guide from cylinder head working from combustion chamber side.
- 2) Coat new guides with oil and press into cold cylinder head from camshaft side. Press guides in as far as they will go. (Service guides have a shoulder stop.)

NOTE — Once guide shoulder is seated, do not use more than 1 ton pressure or guide shoulder may break.

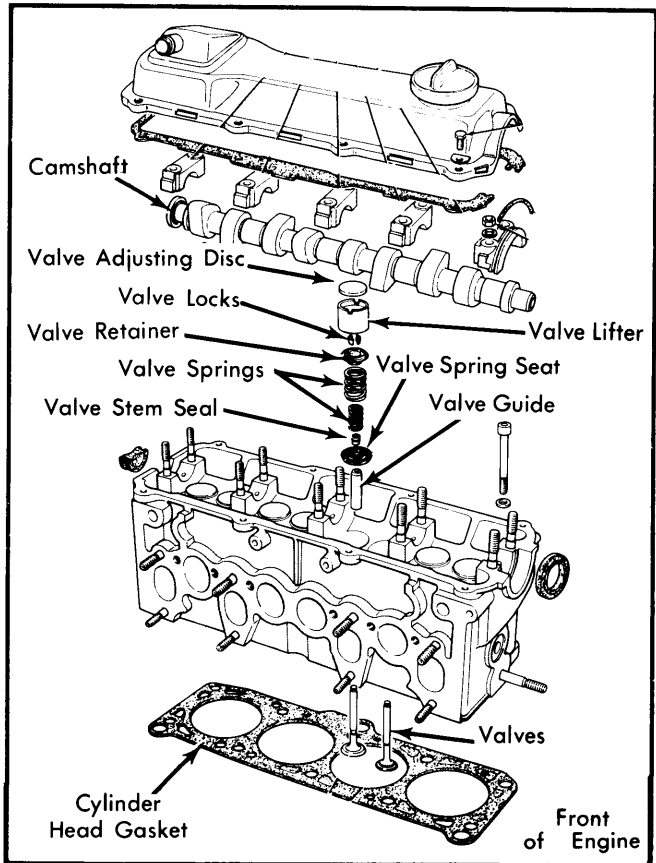


Fig. 2 Cylinder Head and Valve Assembly

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VALVE SPRINGS

Removal — Remove camshaft and cam followers (valve lifters). See *Camshaft Removal Section*. Turn crankshaft until piston of cylinder concerned is at TDC. Remove spark plug and install air line adapter to spark plug port and apply compressed air to hold valves in place. Using a suitable tool (L-4419), compress valve spring and remove valve locks, valve springs, valve seat and seal.

Installation — Check springs on spring tester and inspect for cracks or distortion. Reverse removal procedure and make sure the closely spaced coils of the outer springs are against spring seat.

VALVE STEM OIL SEAL

NOTE — Steel-backed rubber valve stem seals are used on all valves.

Removal & Installation — Use seal protector from gasket set to prevent valve keeper grooves from cutting seal. Lubricate valve stem seal and using suitable tool (L-4421), carefully push seal onto valve guide.

MECHANICAL VALVE LIFTERS

Steel, bucket-type valve lifters surround and bear directly on the valve tips. A separate case-hardened steel disc, retained in the top of each lifter, serves as a cam lobe contact surface. These discs are selected for thickness, thereby insuring correct valve adjustment. Discs must be installed with numbers facing down toward valve lifters. See Fig. 2

PISTONS, PINS & RINGS

OIL PAN

See *Oil Pan Removal at end of ENGINE Section*.

PISTON & ROD ASSEMBLY

Removal — 1) With cylinder head and oil pan removed, use ridge reamer to remove any deposits or ridge from upper portion of cylinder bore.

NOTE — Piston must be at bottom of stroke and covered with cloth to collect cuttings.

2) Inspect connecting rods and caps for cylinder identification and mark as necessary for installation in original locations. Remove rod cap and push piston and rod assembly out top of block.

Installation — Lightly coat piston rings and cylinder walls with engine oil. Make sure ring gaps are properly spaced. "TOP" mark on upper, intermediate and oil scraper piston rings must point toward piston crown. Using ring compressor, install pistons in cylinder with arrow pointing toward timing gear. See Fig. 3. Forged marks on connecting rods and caps must face toward intermediate shaft.

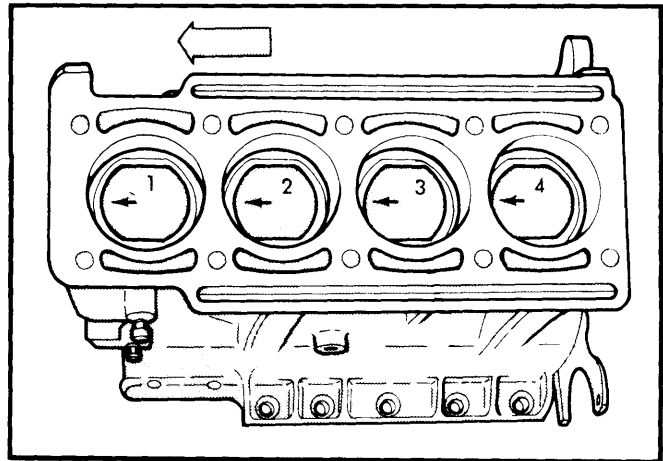


Fig. 3 Cylinder Block and Connecting Rod Assembly

FITTING PISTONS

1) Measure cylinder at three points: .39" (10 mm) from top and bottom and at center of bore. Take measurements in line with thrust face and at 90° to thrust face. Cylinder wear limit is .0027" (0.07 mm) beyond standard dimensions; if this is exceeded, rebore cylinder and install oversize pistons.

2) Measure pistons at .63" (16 mm) from bottom of piston skirt (measuring 90° to pin bore). Combining this measurement with the measurement from the corresponding cylinder bore, note piston-to-cylinder clearance. If this exceeds .0027" (0.07 mm), oversize piston must be installed.

PISTON PINS

Removal & Installation — Use drift punch to remove piston pin circlip. Push pin from piston. Reverse removal procedures to reinstall.

CRANKSHAFT & ROD BEARINGS

MAIN & CONNECTING ROD BEARINGS

Connecting Rod Bearings — 1) Use Plastigage method to check rod bearings. Place Plastigage across full width of lower bearing at center of bearing cap. Tighten cap bolts to 35 ft. lbs.

2) Remove cap and determine amount of clearance by measuring width of compressed Plastigage with scale furnished on package. Side play should be .006-.025".

3) When fitting bearings, the following bearing inserts can be used together. A standard and .001" undersize, two .001" undersize and a .001" with a .002" undersize.

NOTE — Do not use bearings with more than .001" difference in size on the same journal.

Main Bearings — 1) Support weight of crankshaft with jacks or stand placed under counterweight adjacent to main bearing being checked.

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2) Remove cap and bearing. Place Plastigage across full width of bearing. Install cap with bearing and torque bolts to 47 ft. lbs.

3) Remove cap and determine amount of clearance by measuring width of compressed Plastigage with furnished gauge. Do not use shells with more than .001" difference. Reinstall bearings and caps.

4) Check crankshaft end play with dial indicator. Move crankshaft forward and backward. Take readings with pressure released from rods. If end play is less than .002", loosen No. 3 main bearing cap and reposition with bolts finger tight. Move crankshaft fore and aft before retorquing bolts. If end play exceeds .009", install new thrust bearing.

REAR MAIN BEARING OIL SEAL

Removal & Installation — Transmission must be removed for seal service. Pry old seal from engine. Using a suitable oil seal installation tool (L-4455-1), install new seal. Oil lip of new seal with engine oil and tap into place with a plastic mallet.

CAMSHAFT

TIMING BELT

Removal — 1) Raise vehicle and remove inner fender shield. Remove "V" belt(s) and idler pulley assembly. Remove crankshaft pulley and power steering belt. Remove lower plastic timing belt cover.

2) Lower vehicle and place jack under engine. Remove right motor mount through bolt and slightly raise engine. Loosen timing belt tensioner and remove timing belt.

NOTE — If "whirring" sound is heard from timing belt after installation, belt is too tight.

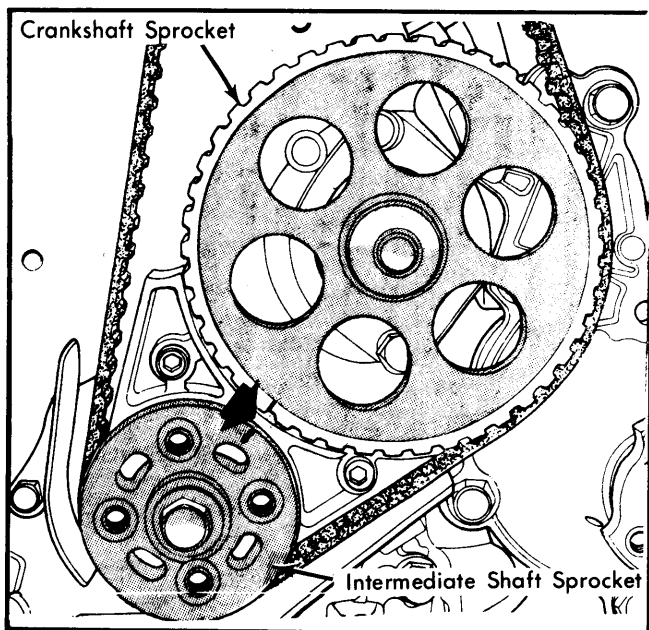


Fig. 4 Crankshaft and Intermediate Sprocket Alignment Marks.

Installation — 1) Align timing mark on crankshaft and intermediate sprockets. See Fig. 4. Turn camshaft sprocket until mark on sprocket is lined up with camshaft cover sealing surface on head. See Fig. 5. Install timing belt and suitable belt tension tool (L-4502) horizontally on large hex of belt tensioner pulley. Loosen belt tensioner locknut.

2) Reset if necessary to have axis within 15° of horizontal. Turn engine clockwise from TDC two crank revolutions to TDC. Tighten lock nut on tensioner holding wrench in position.

CAMSHAFT

Removal — 1) Remove timing belt and camshaft cover. Loosen and remove bearing caps in following sequence: 5, 1 and 3. Then loosen and remove bearing caps 2 and 4 diagonally. Caps are numbered front to rear.

2) Check camshaft end play. Lift out camshaft and followers. Reinstall camshaft using bearing caps and 5. Fit dial indicator to end of camshaft and slide cam back and forth. Reading should not exceed .006" (0.15 mm). If end play is beyond limits, camshaft or cylinder head should be replaced.

3) Runout should be checked on the center journal with a dial indicator. Runout should not exceed .0004" (.01 mm). Replace camshaft if runout is excessive.

Installation — Lube cam followers with engine oil and install in original bores. Install adjusting discs and place camshaft on cylinder head. Loosely attach No. 2 and No. 4 bearing caps. Gradually tighten caps. Install No. 5 and No. 3 bearing caps. Install new oil seal on end of camshaft and install No. 1 bearing cap. Reverse removal procedure to complete operation.

VALVE TIMING

See Timing Belt.

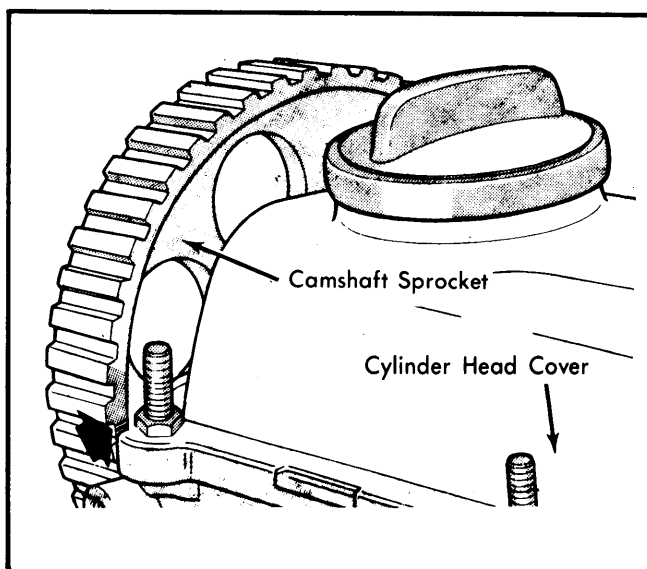


Fig. 5 Camshaft Alignment Marks

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ENGINE OILING

Crankcase Capacity — 4 quarts with or without filter change.

Oil Filter — Replace every second oil change.

Normal Oil Pressure — 28 psi at 2000 RPM.

Pressure Relief Valve — Relief valve is staked and is not serviceable.

up and remove shaft and gear assembly. Remove driven gear and pry deflector plate off to remove strainer.

Inspection — Check end play by placing straightedge across pump housing. With feeler gauge, measure between gears and straightedge. Limits are .001" minimum to .006" maximum. Also check gear backlash. Backlash should be within .002-.008", if not, replace gears.

OIL PUMP

Disassembly — Clamp pump lightly in vise with shaft down. Remove hex head mounting screws from cover. Push drive shaft

Reassembly — Reverse disassembly procedures and install pump in engine.

ENGINE SPECIFICATIONS

TIGHTENING SPECIFICATIONS

Application	Ft. Lbs. (mkg)	Application	Ft. Lbs. (mkg)
Cylinder Head [Ⓛ]	60 (8.30)	Oil Pan	
Connecting Rod Cap	35 (4.84)	Hex Head	14 (1.94)
Main Bearing Cap	47 (6.50)	Allen Head	7.4 (.98)
Camshaft Bearing Cap	14 (1.94)	Intake-to-Exhaust Manifold	
Rocker Arm Cover	4.0 (0.55)	Inboard Nut	12.5 (1.73)
Oil Pump		Outboard Nuts	16.7 (2.30)
Long Bolts	14 (1.94)	Exhaust Manifold Stud Nuts	12.5 (1.73)
Short Bolts	7 (0.97)	Intake Manifold Screws	16.7 (2.30)

[Ⓛ] — Then tighten an additional ¼ turn.

GENERAL SPECIFICATIONS

Year	Displ.		Carburetor	HP at RPM	Torque (Ft. Lbs. at RPM)	Compr. Ratio	Bore		Stroke	
	cu. ins.	cc					in.	mm	in.	mm
1979	105	1700	2-Bbl.	75@5600	90@3200	8.2:1	3.13	80	3.40	86

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)
105" 1.7 L	2.1236-2.1244 (53.94-53.96)	.001-.003 (.03-.08)	No. 3	.003-.007 (.07-.18)	1.8086-1.809 (45.94-45.96)	.0004-.0025 (.010-.064)	.015 [Ⓛ] (.37)

[Ⓛ] — Maximum clearance permitted.

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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)
105" 1.7 L Int.	1.338 (34.0)	45°	45°	.079 (2.00)	.314 (7.97)	.020 (0.5)
Exh.	1.220 (31.0)	45°	45°	.094 (2.40)	.314 (7.97)	.027 (0.7)

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)
105" 1.7 L	.0004-.0015 (.011-.039)	.00004-.00035 (.001-.009)	.0004-.0008 (.011-.021)	1	.012-.018 (.30-.45)	.0016-.0028 (.04-.07)
				2	.012-.018 (.30-.45)	.0008-.0020 (.02-.05)
				3 [Ⓢ]	.012-.018 (.30-.45)	.0008-.0020 (.02-.05)

Ⓢ — Optional 3-piece oil ring steel rails have .008" (.2 mm) side clearance; .016-.055" (.4-1.4 mm) end gap.