

Ford V8 Engines

7.5 LITER V8

IDENTIFICATION CODING

ENGINE IDENTIFICATION

Engine is identified by a letter code in eighth position of Vehicle Identification Number (VIN). VIN is located near windshield on left upper side of instrument panel. The VIN number is also located on the Safety Compliance Certification Label, attached to left door lock pillar.

ENGINE IDENTIFICATION CODE

Engine	Code
7.5L (460") 4-Bbl.	L

ENGINE REMOVAL

See *Engine Removal* at end of *ENGINE* Section.

CYLINDER HEAD & MANIFOLD

INTAKE MANIFOLD

Removal

1) Drain cooling system. Remove air cleaner and intake duct assembly. Disconnect radiator and heater hoses at intake manifold and water pump, and position aside. Remove PCV valve and hose. Disconnect and label all vacuum hoses at carburetor, vacuum control valve and intake manifold.

2) Disconnect spark plug wires at spark plugs and remove wires from brackets on rocker arm covers. Disconnect high-tension lead at coil, and remove distributor cap and spark plug wires as an assembly. Remove distributor with vacuum lines attached.

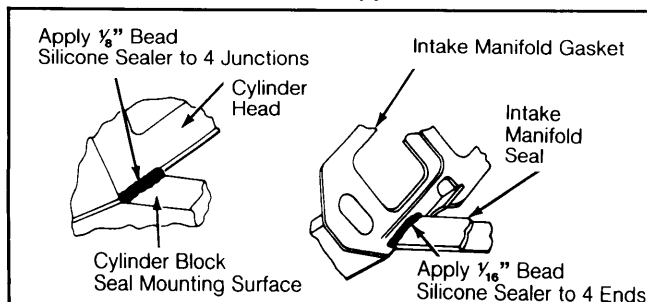
3) Disconnect accelerator linkage. If equipped, disconnect transmission kickdown linkage and speed control linkage bracket at carburetor. Remove accelerator linkage attaching bolts. Position all linkages out of way. Disconnect fuel line at carburetor.

4) Disconnect and label all electrical wiring that may interfere with intake manifold removal, and position aside. Remove coil and bracket assembly. Remove intake manifold and carburetor as an assembly.

Installation

1) Clean all gasket surfaces. Apply $\frac{1}{8}$ " bead silicone sealer to 4 corners of cylinder block seal mounting surface. See *Fig. 1*. Install manifold gasket and front and rear seals. Apply $\frac{1}{16}$ " bead silicone sealer along full width of front and rear seal ends. See *Fig. 1*.

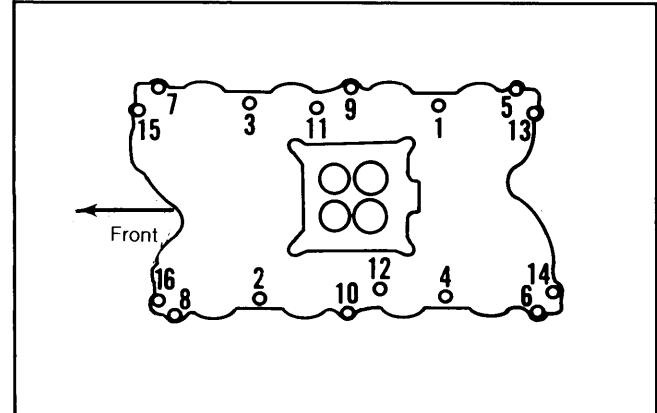
Fig. 1: Intake Manifold Sealer Application Points



Install intake manifold within 15 minutes of sealer application.

2) Position intake manifold over 4 studs in cylinder heads. Check for correct alignment of gaskets and seals before installing attaching bolts and nuts. Install and tighten intake manifold bolts and nuts, then repeat sequence. See *Fig. 2*.

Fig. 2: Intake Manifold Tightening Sequence



Tighten to 22-32 ft. lbs. (30-43 N.m), then repeat sequence. Retighten after engine has reached normal operating temperature.

3) To install remaining components, reverse removal procedure. After engine has been started and allowed to reach normal operating temperature, retighten manifold attaching bolts and nuts.

CYLINDER HEAD

Removal

1) Drain cooling system. Remove intake manifold and carburetor as an assembly. Disconnect exhaust pipes at manifolds. Loosen alternator attaching bolts and remove bolt attaching alternator bracket to right cylinder head.

2) If A/C equipped, loosen drive belt. Shut off compressor at service valves and remove valves and hoses from compressor. Remove nuts attaching compressor support bracket to water pump. Remove and position compressor aside. Remove compressor upper mounting bracket from cylinder head.

3) If equipped, remove bolts attaching power steering reservoir bracket to left cylinder head. Position reservoir and bracket out of way.

4) Remove rocker arm covers. Remove rocker arm assemblies and push rods in sequence, so they can be installed in their original positions. Remove cylinder heads and exhaust manifolds as assemblies. Discard head gaskets.

Installation

1) Clean all gasket mating surfaces. Check flatness of cylinder head and block gasket surfaces. If exhaust manifolds were removed, lightly coat cylinder head and manifold port areas with graphite grease, and install manifolds and gaskets to heads.

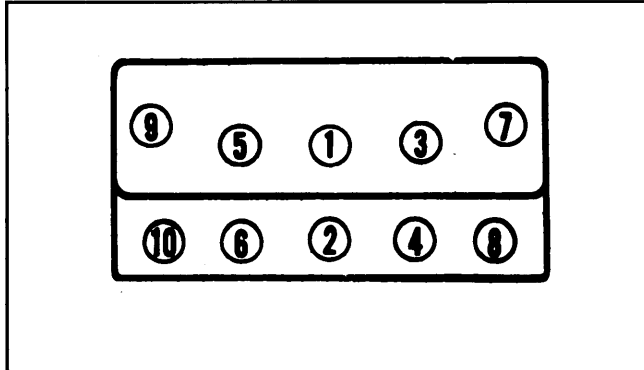
2) Place 2 long head bolts in 2 rear lower bolt holes of left cylinder head. Place 1 long head bolt in rear lower bolt hole of right cylinder head. Keep bolts in position until heads are installed.

3) Position head gaskets on block. Do not apply sealer to head gasket surfaces. Install and tighten cylinder heads in 3 steps. See *Fig. 3*. To install remaining

7.5 LITER V8 (Cont.)

components, reverse removal procedure. Adjust valve clearance as outlined in *VALVE CLEARANCE ADJUSTMENT*, in this article.

Fig. 3: Cylinder Head Tightening Sequence



Tighten in 3 steps: First to 80 ft. lbs. (108 N.m); then to 110 ft. lbs. (149 N.m); and finally to 130-140 (176-190 N.m).

VALVES

VALVE ARRANGEMENT

E-I-E-I-E-I-E-I (Left bank, front to rear)
I-E-I-E-I-E-I-E (Right bank, front to rear)

VALVE GUIDE SERVICING

When reaming guides for installation of valves with oversize stems, always use reamers in proper sequence. Always reface valve seats and valves after valve guides are reamed. Replacement valves are available with standard, .015" (.38 mm), and .030 (.76 mm) oversize stems.

VALVE STEM OIL SEALS

Umbrella-type oil seals are used on all valves. Lubricate valve stem with engine oil and install new seal with cup-side down over valve guide. Using $\frac{5}{8}$ " deep-well socket and light mallet, seat seal on valve stem.

VALVE SPRINGS

Removal

1) Remove air cleaner and duct assembly. Remove rocker arm cover and spark plug from cylinder to be serviced. Crank engine until piston is at TDC at end of compression stroke. Remove rocker arm assembly and push rod from cylinder to be serviced.

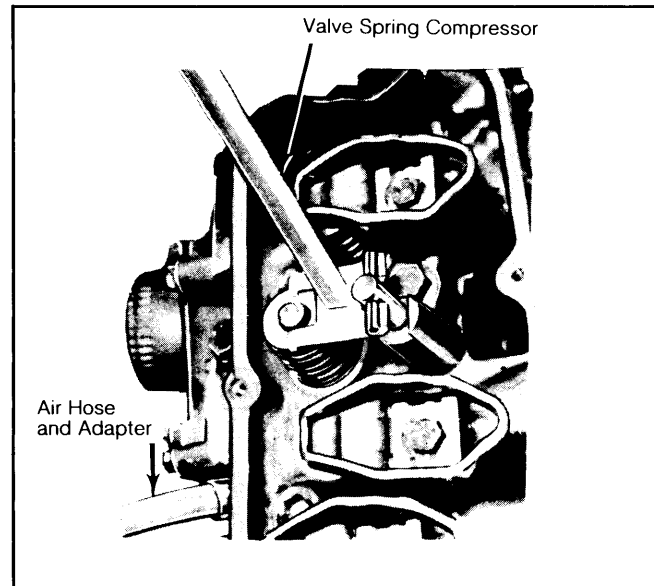
2) Install air line with adapter into spark plug hole and turn on air supply. Install fulcrum bolt. Use spring compressor tool to compress valve spring and remove retainer locks. Remove retainer, spring and oil seal. Do not remove air pressure at this time. See Fig. 4.

Inspection

1) Wrap a rubber band or tape around end of valve stem. This will keep valve from falling into cylinder, if air pressure forces piston downward. Shut off air supply.

2) Inspect valve stem for wear and out-of-round condition. Move valve up and down in guide and check for binding. Using valve spring tester, check springs for proper pressure. Replace faulty springs as necessary. See *Valve Springs table*.

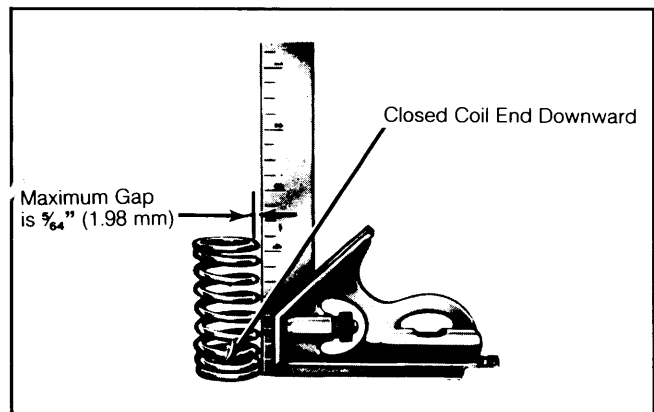
Fig. 4: Compressing Valve Spring For Removal



If air pressure fails to hold valve closed, remove and inspect cylinder head for valve damage.

3) Inspect each spring for squareness, using a steel square and flat surface. Observe gap between top of spring coil and square, while slowly rotating spring. Replace spring if more than $\frac{3}{64}$ " (1.98 mm) out-of-square. See Fig. 5.

Fig. 5: Checking Valve Spring Squareness



Observe gap, while slowly rotating spring.

Installation

1) If valve proves satisfactory, hold valve in closed position and turn on air pressure. With valve stem oil seals installed, place spring in position over valve and position spring retainer. Compress valve spring and install retainer locks.

2) Apply polyethelene grease (or equivalent) to push rod ends, valve stem tip, fulcrum seats and sockets. Install push rods and rocker arm assemblies. Turn off air pressure, and remove air line and adapter. To install remaining components, reverse removal procedure.

VALVE SPRING INSTALLED HEIGHT

1) Using dividers and a scale, measure installed height of valve spring. Measure from surface of

Ford V8 Engines

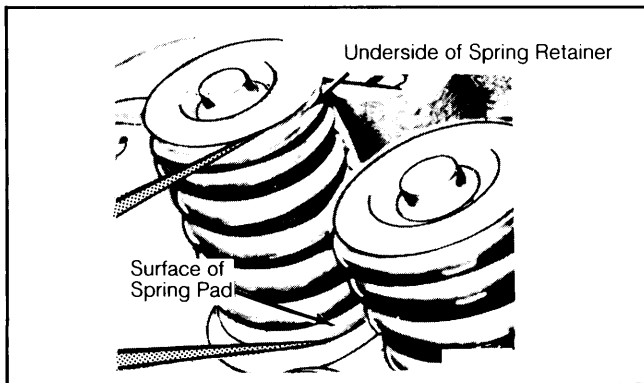
7.5 LITER V8 (Cont.)

cylinder head spring pad to underside of spring retainer (or rotator). See Fig. 6.

2) Installed height for intake and exhaust valves is $1\frac{5}{64}$ – $1\frac{53}{64}$ " (45.64–46.43 mm). If height is greater than specified, install .030" (.76 mm) spacer(s) between cylinder head spring pad and valve spring, to correct spring height.

CAUTION: Install spacers only if necessary. Excess use of spacers will overstress the valve train, causing unnecessary damage.

Fig. 6: Checking Installed Height of Valve Spring

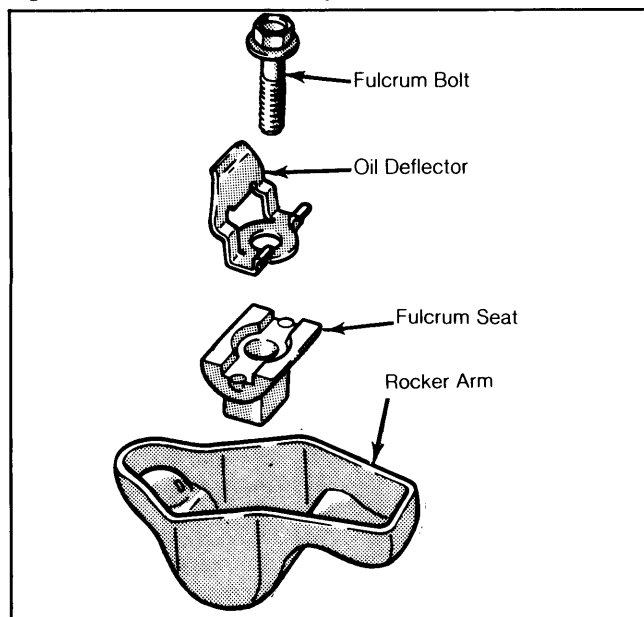


Do not install spacer(s) unless necessary.

ROCKER ARM ASSEMBLY

Inspect all rocker arm components for excessive wear or damage, and correct as necessary. Before installing rocker arm assembly, lubricate top of valve stem, fulcrum seat and socket area of rocker arm with polyethylene grease (or equivalent). Ensure fulcrum seat base is inserted in its slot on cylinder head, before tightening fulcrum bolt. See Fig. 7.

Fig. 7: Rocker Arm Assembly

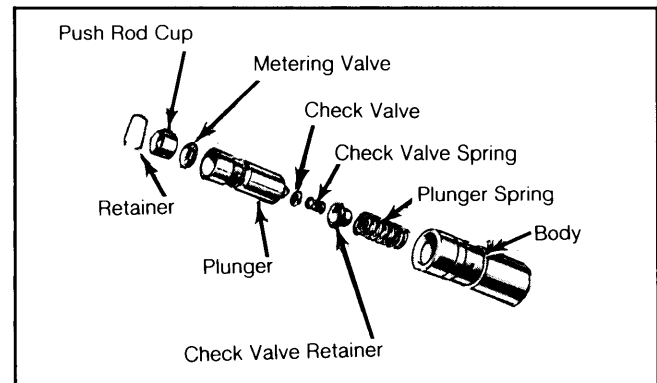


Tighten rocker arm fulcrum bolt to 18-25 ft. lbs. (24-34 N.m).

HYDRAULIC VALVE LIFTER ASSEMBLY

1) Service lifters as assemblies only. Disassemble lifters and clean, prior to testing. Test lifters with hydraulic lifter test fluid. Do not interchange parts between lifters. See Fig. 8.

Fig. 8: Hydraulic Valve Lifter Assembly



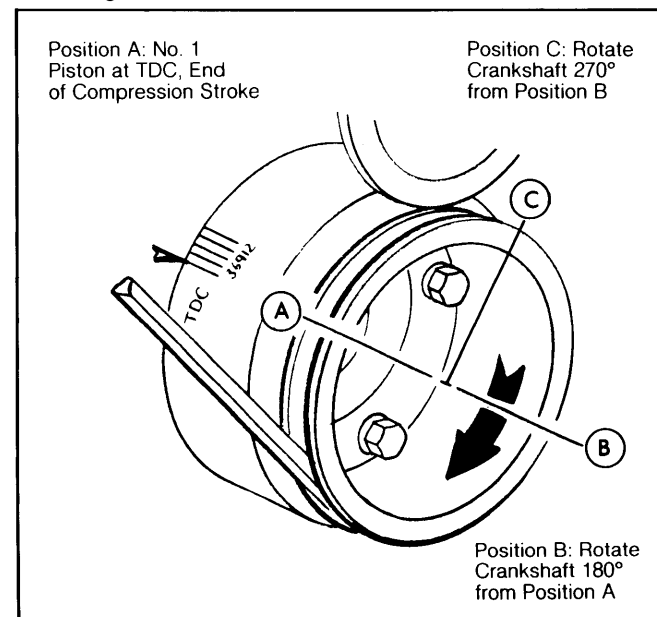
Parts are not interchangeable between lifters.

2) Leak-down rate on hydraulic lifters is 10-50 seconds at $\frac{1}{16}$ " (1.59 mm) plunger travel (under a 50 lb., 23 kg load). Perform test using lifter leak-down tester. Replace lifter if any sign of wear or damage is noted, or if lifter fails leak-down test.

VALVE CLEARANCE ADJUSTMENT

1) Turn crankshaft to place No. 1 piston on TDC at end of compression stroke. With crankshaft in this position, make chalk marks at points A, B and C, approximately 90° apart. See Fig. 9.

Fig. 9: Crankshaft Positions for Checking Valve Clearance



Space chalk marks approximately 90° apart.

2) Using Fig. 9 as a reference, check clearance of valves listed in VALVE CLEARANCE ADJUSTMENT table, using the following procedure:

7.5 LITER V8 (Cont.)

3) Using lifter bleed-down tool, apply pressure to push rod end of rocker arm. Slowly bleed down lifter, until lifter plunger is completely bottomed. Hold lifter in this position and check clearance between rocker arm and valve stem tip with a feeler gauge.

4) Desired collapsed lifter gap clearance is .075-.175" (1.91-4.45 mm); allowable clearance is .100-.150" (2.54-3.81 mm). If clearance is less than specified, install a .060" (1.52 mm) shorter push rod; if clearance is greater, install a .060" (1.52 mm) longer push rod.

VALVE CLEARANCE ADJUSTMENT

Crankshaft Position	Check Int. Nos.	Check Ex. Nos.
A	1, 7, 8	1, 5, 4
B	4, 5	2, 6
C	2, 3, 6	3, 7, 8

PISTON, PINS & RINGS

OIL PAN

See Oil Pan Removal at end of ENGINE Section.

PISTON & ROD ASSEMBLY

Removal

1) Remove cylinder heads, oil pan and oil pump. Position piston at bottom of its stroke and cover with a cloth to collect metal cuttings. Use ridge reamer to remove any ridge or deposits from upper end of cylinder bore.

NOTE: Never cut into ring travel area in excess of $\frac{1}{32}$ " (.79 mm), when removing ridge.

2) Ensure that all connecting rods and caps are marked so they can be installed in their original positions. Remove rod cap and push piston and rod

assembly out top of cylinder, taking care not to damage crankshaft journal or cylinder wall. Install rod cap on mating rod.

Installation

1) Lightly coat cylinder bore, piston and rings with engine oil. Space ring gaps as shown in Fig. 10. Install a ring compressor, ensuring ring gap positions do not change.

2) Position crankshaft journal at bottom of stroke. Install piston into its bore, with notch in piston head towards front of engine. Carefully push piston into cylinder until it is slightly below top of cylinder.

3) Push piston downward until rod bearing seats on crankshaft journal. Install and tighten connecting rod cap. Check side clearance between connecting rods on each crankshaft journal. Install cylinder heads, oil pump and oil pan.

FITTING PISTONS

NOTE: Take measurements at normal room temperature (70°F, 21°C).

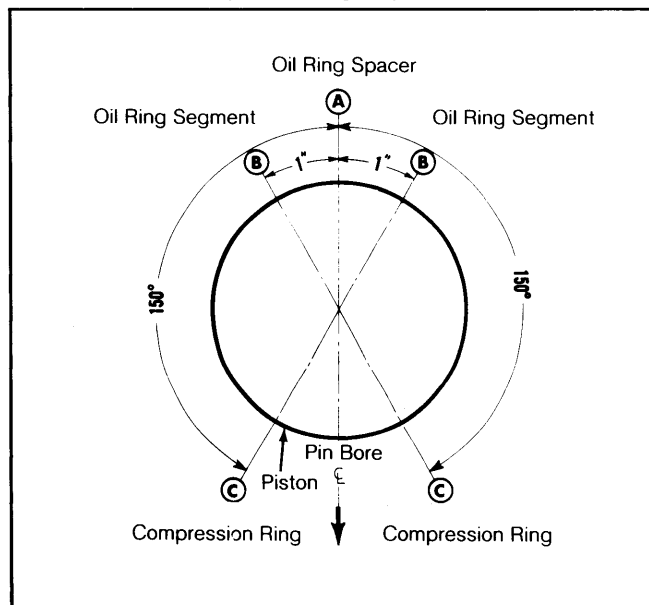
1) Measure piston at centerline of piston pin, and at 90° to piston pin axis. Measure cylinder bore 90° to crankshaft centerline, at top, middle, and bottom of bore. Use measurements to determine piston-to-cylinder bore clearance.

2) Measure cylinder bore 90° to crankshaft centerline at top of bore (below ring travel) and at bottom of bore (above ring travel). Taper is the difference between the 2 measurements, and must not exceed .010" (.25 mm).

3) Measure cylinder bore at center of piston travel, 90° to crankshaft centerline. Measure bore at center of piston travel, in line with crankshaft centerline. Out-of-round is the difference between the 2 measurements, and must not exceed .005" (.13 mm).

4) If taper or out-of-round are not within limits, or cylinder walls are deeply scored, hone or bore cylinders for installation of new pistons. Check Piston Size Code Chart.

Fig. 10: Correctly Spaced Ring Gaps



Space oil ring segments 1" (25.4 mm) from oil ring spacer.

PISTON SIZE CODE CHART

Code	Piston Size In. (mm)
Red	4.3585-4.3591 (110.706-110.721)
Blue	4.3597-4.3603 (110.736-110.752)
.003" Oversize	4.3609-4.3615 (110.767-110.782)

FITTING RINGS

1) Position ring in cylinder bore at a point where normal ring wear is not present. Use care not to damage ring or cylinder bore. Ring must be square in bore. Check ring end gap with a feeler gauge.

2) Check side clearance of compression rings with feeler gauge inserted between ring and its lower land. Feeler gauge should slide freely around entire circumference of piston without binding. If lower lands have high steps, replace piston.

PISTON PINS

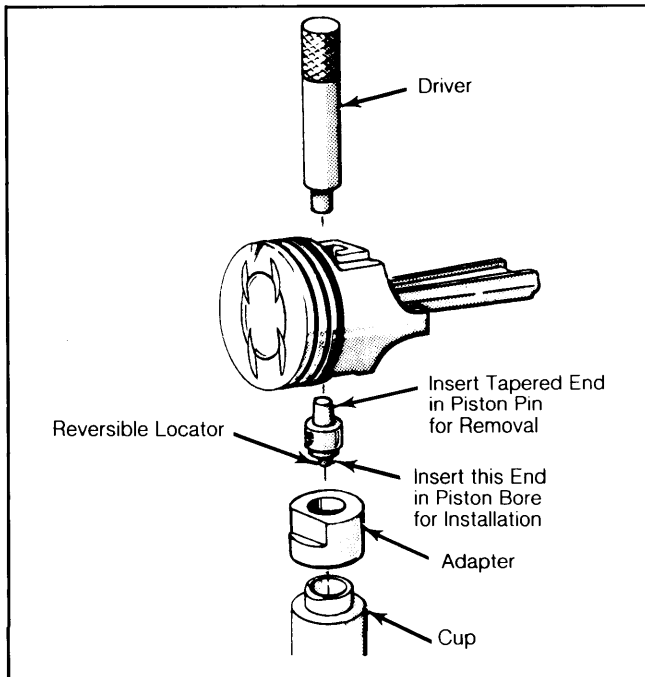
Removal

Using an arbor press and piston pin remover/installer tool, press piston pin from piston and connecting rod. See Fig. 11.

Ford V8 Engines

7.5 LITER V8 (Cont.)

Fig. 11: Tool Arrangement for Removing and Installing Piston Pin

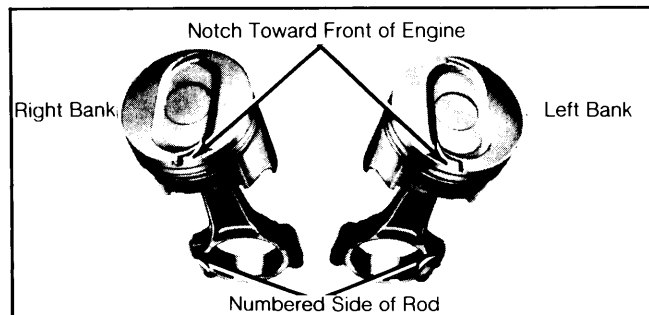


Install pin until end of pin is $\frac{1}{16}$ – $\frac{1}{8}$ " (1.59–3.18 mm) below chamfer of pin bore.

Installation

1) Apply light coat of engine oil to all parts to be assembled. Assemble piston to connecting rod with numbered side of rod toward outboard side of engine, and notch in piston head positioned forward. See Fig. 12.

Fig. 12: Proper Piston to Connecting Rod Position



Position numbered side of rod towards outboard side of engine.

2) Start piston pin in piston and connecting rod. Using arbor press and pin remover/installer tool, press pin into piston and connecting rod until end of pin is $\frac{1}{16}$ – $\frac{1}{8}$ " (1.59–3.18 mm) below chamfer of piston pin bore.

CRANKSHAFT & ROD BEARINGS

MAIN & CONNECTING ROD BEARINGS

NOTE: Use Plastigage method for checking bearing clearances. Following procedures are per-

formed with oil pan and oil pump removed, and oil film removed from surfaces to be checked.

Connecting Rod Bearings

1) Ensure rod caps are marked for cylinder identification. Place crankshaft journal of cylinder to be checked at bottom of stroke and remove rod cap.

2) Place strip of Plastigage on bearing surface over full width of cap about $\frac{1}{4}$ " off center, and away from oil holes. Install cap and tighten to specifications. Do not allow crankshaft to turn.

3) Remove cap and measure width of Plastigage with scale furnished. A standard bearing may be used in combination with a .001" (.025 mm) or .002" (.051 mm) undersize bearing to obtain proper bearing clearance. With rod cap and bearing installed, check connecting rod side clearance.

Main Bearings

1) Fit main bearings 1 at a time, while leaving other bearings securely fastened. Make sure main bearing caps are marked for identification. Remove main bearing cap. Support crankshaft weight with a jack. Position jack under counterweight, next to bearing being checked.

2) Use Plastigage method (as explained in Connecting Rod Bearings) to measure main bearing clearance, tightening caps to specifications.

3) Standard size bearings may be used in combination with a .001" (.025 mm) or .002" (.051 mm) undersize bearings. If .002" (.051 mm) undersize main bearings are used on more than 1 journal, bearings must be installed in cylinder block side of crankshaft journal.

4) Replace main bearing sets 1 at a time, while leaving other bearings securely fastened. Remove bearing cap to which new bearings are to be installed.

5) Insert upper bearing remover/installer tool (6331 or equivalent) into crankshaft journal oil hole. Turn crankshaft in direction of engine rotation, forcing upper bearing out of block.

6) Lightly oil bearing and journal surfaces. Partially install plain end of upper bearing in place. Insert tool (6331 or equivalent) into journal oil hole. Turn crankshaft slowly in opposite direction of engine rotation until bearing is seated, then remove tool. Install and tighten main bearing cap.

THRUST BEARING ALIGNMENT

Install thrust bearing cap after all other main bearing caps have been tightened. Install thrust bearing cap bolts finger tight. Pry crankshaft forward against thrust surface of upper half of bearing. Hold crankshaft forward, and pry thrust bearing cap to rear. Tighten cap bolts, while retaining forward pressure on crankshaft. See Fig. 13.

REAR MAIN BEARING OIL SEAL

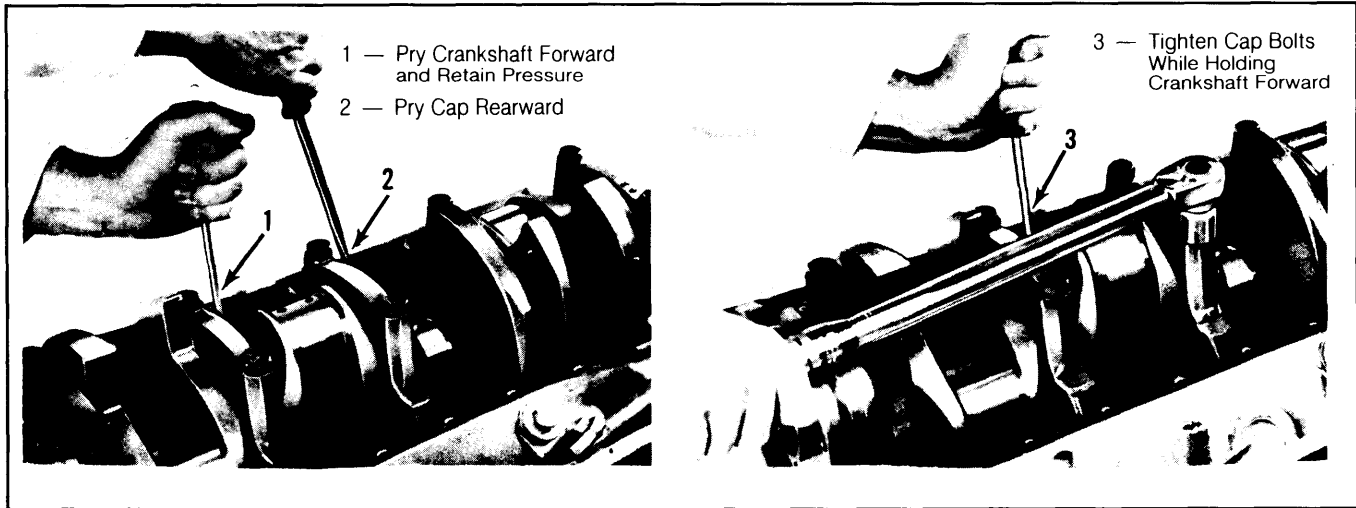
Removal

1) Remove oil pan and oil pump (if required). Loosen all main bearing cap bolts to slightly lower crankshaft. Do not lower more than $\frac{1}{32}$ " (.79 mm).

2) Remove rear main bearing cap and remove lower oil seal half. Use seal removing tool to remove upper seal. If tool is not available, install a small metal screw in one end of the seal, and pull on screw to remove seal. Use care not to damage crankshaft seal surface.

7.5 LITER V8 (Cont.)

Fig. 13: Aligning Thrust Bearing



Align thrust bearing after all other bearings have been tightened.

3) If equipped, remove oil seal retaining pin from bearing cap. The pin is not used with the split-lip type seal.

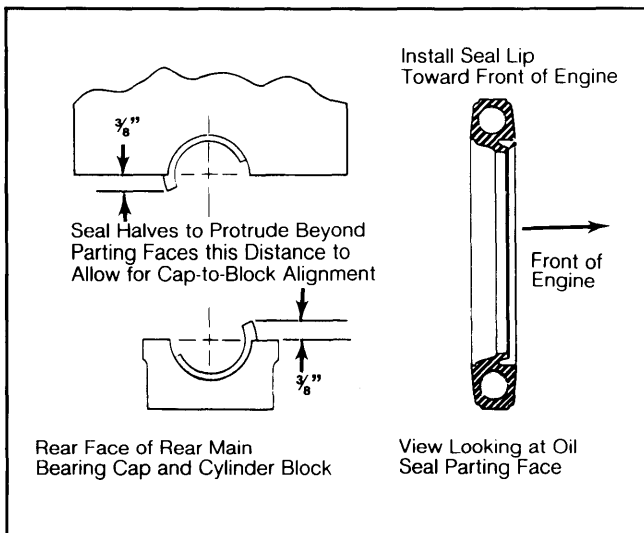
Installation

1) Carefully clean oil seal grooves in bearing cap and block. Dip split-lip seal halves in engine oil. Carefully install upper seal into groove in cylinder block, with lip (undercut side) toward front of engine.

CAUTION: Avoid shaving any rubber from outside diameter of seal when installing in groove. Do not allow oil to get onto area where sealer will be applied.

2) Rotate seal on crankshaft journal until approximately $\frac{3}{8}$ " of seal protrudes below parting surface. See Fig. 14.

Fig. 14: Installing Rear Main Bearing Oil Seal



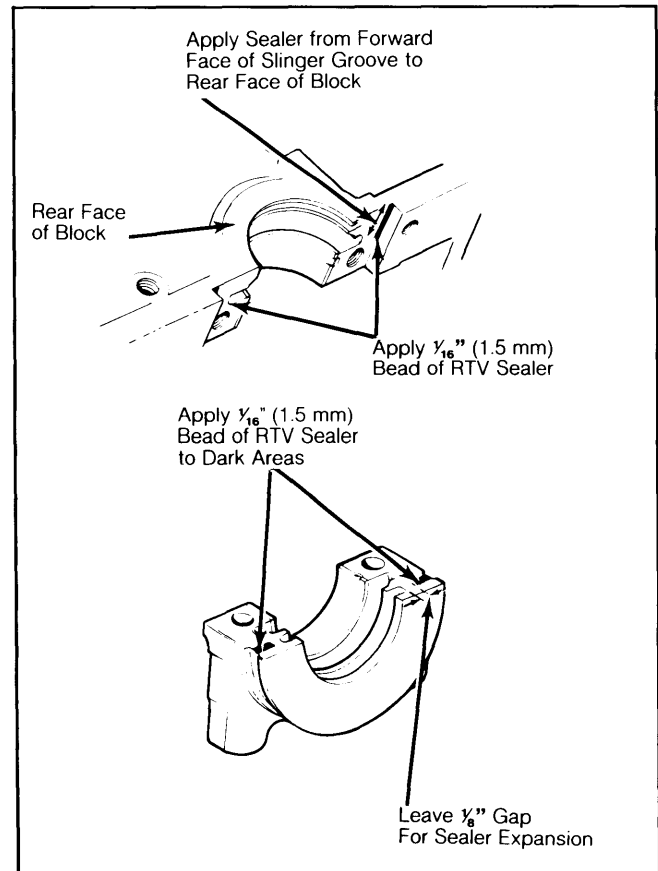
Use care not to damage crankshaft or new oil seal.

3) Tighten all main bearing cap bolts, except rear main. Install lower seal in rear main bearing cap with undercut side of seal toward front of engine. Allow seal to

protrude approximately $\frac{3}{8}$ " above parting surface, to mate with upper seal when cap is installed.

4) Apply $\frac{1}{16}$ " bead of silicone sealer to both sides of cylinder block-to-cap mating surface, and to both sides of bearing cap. See Fig. 15. Install and tighten rear main bearing cap before sealer sets up (approximately 15 minutes). Install oil pump (if removed) and pan.

Fig. 15: Silicone Sealer Application Points



Do not allow sealer to contact lip of seal.

Ford V8 Engines

7.5 LITER V8 (Cont.)

CAMSHAFT

ENGINE FRONT COVER

Removal

1) Drain cooling system and crankcase. Remove fan and radiator shroud. Disconnect radiator hoses at engine and oil cooler lines at radiator and remove radiator.

2) Remove all drive belts and water pump pulley. Remove air pump. If equipped, remove A/C compressor support bracket from water pump. Disconnect heater hose from water pump and loosen by-pass hose clamp at pump.

3) Remove crankshaft pulley, vibration damper and Woodruff key from crankshaft. Disconnect and plug fuel line inlet at fuel pump and remove fuel pump. Remove bolts attaching front cover to cylinder block.

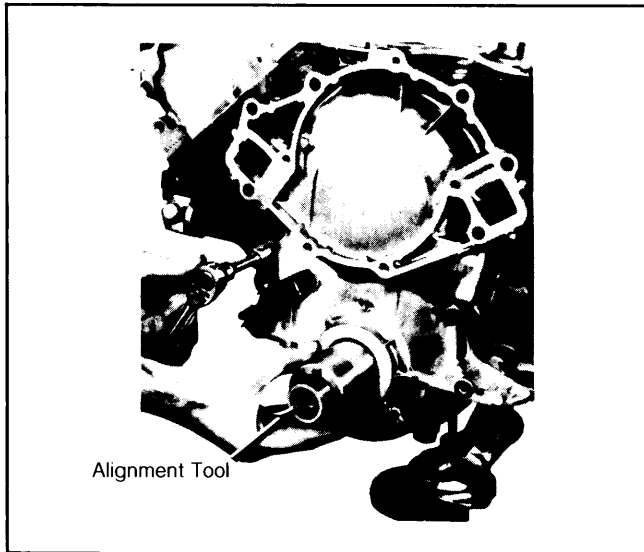
4) Using a thin blade knife, cut oil pan seal flush with cylinder block face. Remove front cover and water pump as an assembly. Discard front cover gasket and pan seal.

Installation

1) Coat gasket surface of oil pan with gasket sealer. Cut and position required section of a new seal on oil pan. Apply silicone sealer at block-to-pan junction. Apply gasket sealer to front cover and cylinder block gasket surfaces.

2) Position front cover on cylinder block. Install front cover seal alignment tool (T68P-6019-A or equivalent) on crankshaft. See Fig. 16. Coat threads of cover bolts with oil-resistant sealer and install bolts.

Fig. 16: Aligning Front Cover



To install alignment tool, it may be necessary to force cover downward against pan seal.

3) While pushing in on alignment tool, tighten oil pan-to-cover bolts. Remove tool and tighten cover-to-cylinder block bolts. To install remaining components, reverse removal procedure.

FRONT COVER OIL SEAL

Removal

With engine front cover removed, drive out old oil seal with pin punch. Clean seal recess in front cover.

Installation

Coat new seal with polyethelene grease (or equivalent), and install seal using seal installing tool. Ensure seal spring remains in proper position.

TIMING CHAIN

NOTE: The following procedures are performed with engine front cover removed.

Checking Timing Chain Deflection

1) Rotate crankshaft counterclockwise (as viewed from front of engine), to take up slack on left side of timing chain. Establish a reference point on the block, and measure from this point to left side of chain. See Fig. 17.

Fig. 17: Measuring Timing Chain Deflection

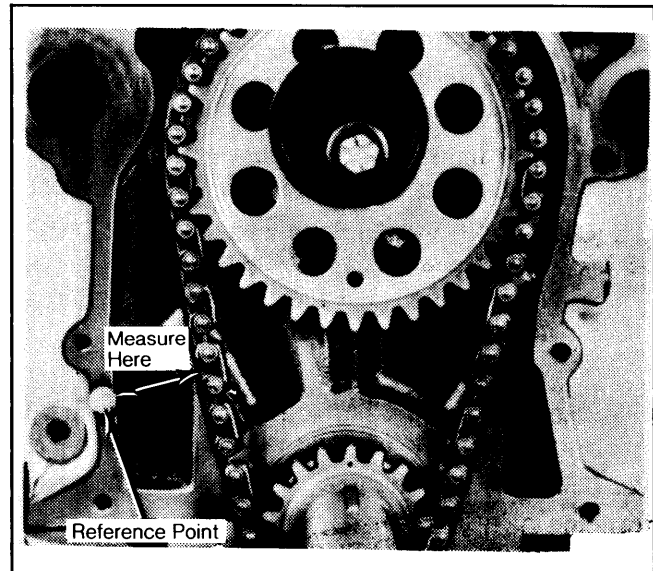
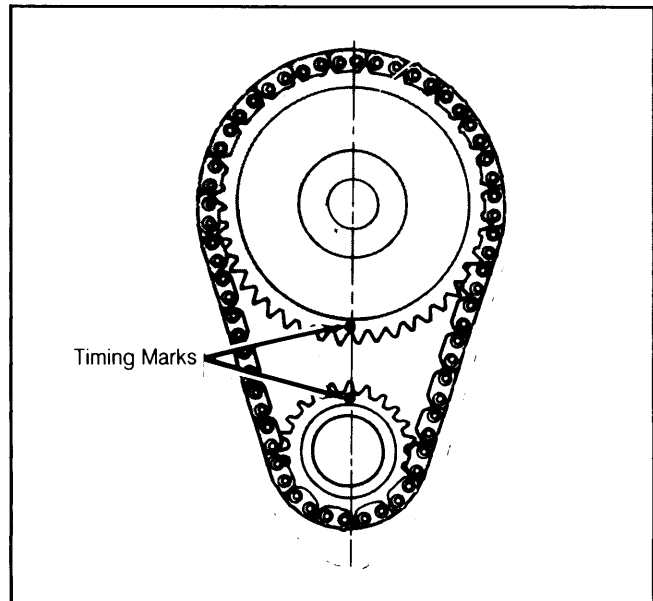


Fig. 18: Aligning Timing Marks



Remove and install chain and sprockets as an assembly.

7.5 LITER V8 (Cont.)

2) Rotate crankshaft clockwise to take up slack on right side of chain. Force left side of chain outward and measure distance between reference point and chain. Deflection is the difference between the 2 measurements. If deflection exceeds $\frac{1}{2}$ " (12.7 mm), replace timing chain and sprockets.

Removal

Crank engine until timing marks are aligned. Remove camshaft sprocket bolt and washer, 2-piece fuel pump eccentric and front oil slinger. Slide timing chain and sprockets forward and remove as an assembly.

Installation

Assemble timing chain and sprockets so sprocket timing marks are aligned. See Fig. 18. Install chain and sprockets as an assembly. Lubricate timing chain with engine oil. To install remaining components, reverse removal procedure.

CAMSHAFT

Removal

1) Remove radiator, front cover, timing chain and sprockets. Remove intake manifold and carburetor as an assembly. Remove rocker arm covers. Loosen all rocker arm bolts, and rotate rocker arms to one side. Remove push rods and valve lifters, keeping them in order for later installation in their original positions.

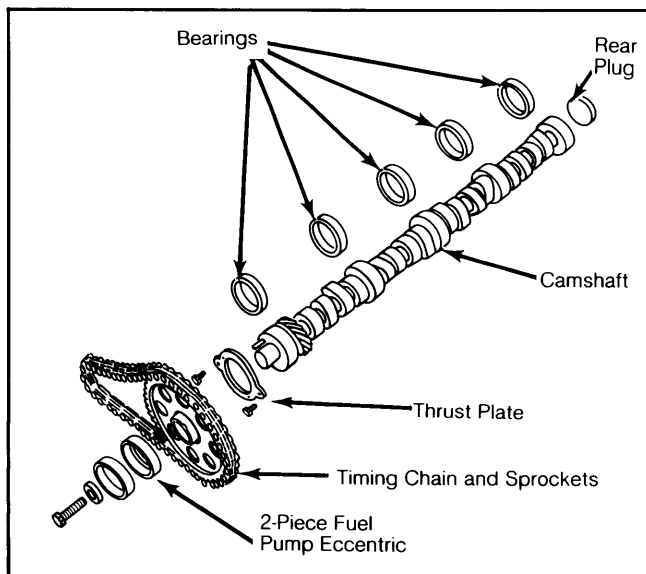
2) If equipped, remove A/C condenser from chassis, and carefully secure condenser to left fender well. Remove grille. Remove camshaft thrust plate attaching bolts and remove camshaft, taking care not to damage camshaft bearings or journals.

Installation

1) Oil camshaft journals and apply polyethylene grease (or equivalent) to cam lobes. Carefully slide camshaft into position and install thrust plate attaching bolts. Lubricate lifters with engine oil and install.

2) Lubricate rocker arms, fulcrum seats, valve stem tips and push rods with polyethylene grease (or equivalent) prior to installing. Reassemble components in reverse order of removal procedures, using new gaskets. See Fig. 19.

Fig. 19: Camshaft Assembly



Tighten camshaft sprocket bolt to 40-45 ft. lbs. (54-61 N.m).

CAMSHAFT BEARINGS

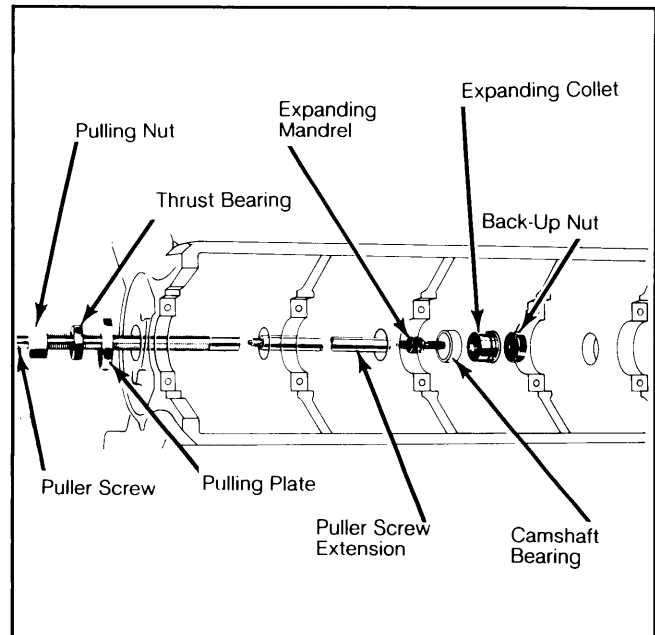
Removal

With engine removed, remove camshaft, flywheel and crankshaft. Push pistons to top of cylinders. Remove camshaft rear bearing bore plug. Using camshaft bearing installer/remover tool, remove cam bearings.

Installation

Using camshaft bearing installer/remover tool, install bearings into place. Oil holes in bearings and cylinder block must be aligned. Install front bearing .040-.060" (1.02-1.52 mm) rearward of front face of cylinder block. Coat new rear bore plug with sealer and install. See Fig. 20.

Fig. 20: Installing Camshaft Bearings



Install front cam bearing .040-.060" (1.02-1.52 mm) rearward of front face of block.

CAMSHAFT END THRUST

CAUTION: Do not pry against camshaft sprocket, without first relieving the valve train load on the camshaft.

1) Loosen rocker arm fulcrum bolts to relieve load on camshaft. Push camshaft towards rear of engine. Install dial indicator so that indicator point is on camshaft sprocket attaching bolt. Zero dial indicator.

2) Pull camshaft forward and release. Check dial indicator reading to obtain end play. If end play is excessive, replace camshaft thrust plate.

CAM LOBE LIFT

1) Remove rocker arm cover, fulcrum bolt, fulcrum seat and rocker arm. Make sure push rod end is in valve lifter socket. Install a remote starter switch to rotate crankshaft.

2) Use a dial indicator to check lobe lift in consecutive order. Position dial indicator point (or cup-shaped adapter) on end of push rod (in same plane as push rod movement).

Ford V8 Engines

7.5 LITER V8 (Cont.)

3) Rotate crankshaft until lifter and push rod are at lowest position. Zero dial indicator. Rotate crankshaft slowly until push rod is in fully raised position. Record dial indicator reading and compare with specifications.

4) Maximum allowable lift loss is .005" (.13 mm). If lift on any lobe is below specifications, replace camshaft and valve lifter(s) operating on worn lobe(s).

ENGINE OILING

Crankcase Capacity

Capacity is 5 quarts (4.75L). Add 1 quart (.95L) with filter change.

Oil Filter

Change filter at first oil change, and at alternate oil changes thereafter.

Normal Oil Pressure

With engine at normal operating temperature, oil pressure should be 40-65 psi (2.8-4.6 kg/cm²) at 2,000 RPM.

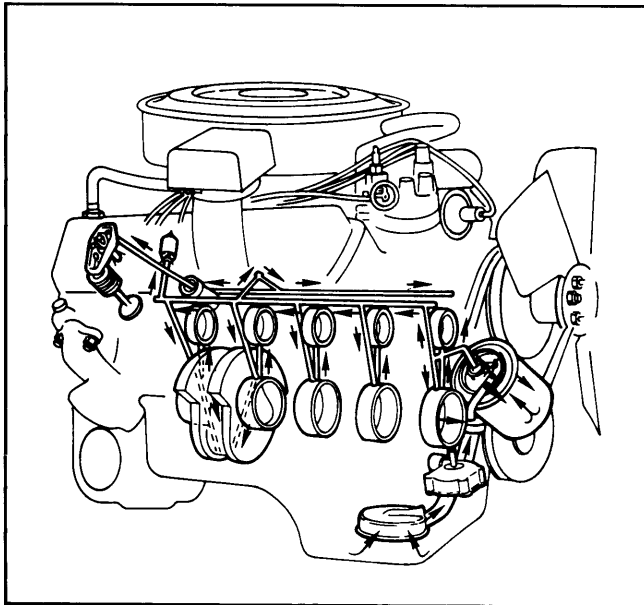
Pressure Regulator Valve

Located in pump body, not adjustable.

ENGINE OILING SYSTEM

Distributor driven oil pump provides full pressure lubrication to all camshaft and crankshaft bearings. Engine feeds oil through hydraulic valve lifters and hollow push rods to rocker arms and upper valve train area. Timing chain and sprockets are lubricated by drainage from No. 1 camshaft bearing. See Fig. 21.

Fig. 21: Engine Oiling System



Timing chain components are lubricated by oil flow from No. 1 cam bearing.

OIL PUMP

Removal

Raise engine a minimum of 4" from engine mounts. Loosen oil pan attaching bolts and lower pan. Remove oil pump and oil inlet tube and lay assembly in pan. Remove pan with pump assembly.

Disassembly

Remove oil inlet tube from pump. Remove pump cover. Remove inner rotor and shaft and outer rotor. Drill small hole in oil pressure relief valve cap. Insert self-threading sheet metal screw into cap, and pull cap from chamber. Remove spring and plunger.

NOTE: If any part of the oil pump requires replacement, the complete pump assembly must be replaced.

Inspection

1) Wash all parts thoroughly, and dry with compressed air. Check inside of pump housing, outer rotor, and inner rotor and shaft for damage, scoring or excessive wear. Check mating surface of pump cover for wear, scoring or grooved condition.

2) Remove rotor assembly from pump housing. Using feeler gauge, measure inner-to-outer rotor tip clearance. Install rotor assembly in pump housing. Lay a straightedge over rotor assembly and housing. Insert feeler gauge between straightedge and housing to measure rotor end play.

3) Measure outer rotor-to-housing clearance, using feeler gauge. Measure the shaft outside diameter and the housing bearing inside diameter. Difference between readings is the shaft-to-housing bearing clearance.

4) Relief valve spring should test to 20.6-22.6 lbs. (9-10 kg) at 2.40" (63.2 mm). Inspect relief valve spring for worn or collapsed condition. Check relief valve plunger for scores and free operation in bore. Check clearance between relief valve plunger and bore.

OIL PUMP SPECIFICATIONS

Application	Specifications In. (mm)
Rotor Tip Clearance .....	.012 (.30)
Rotor End Play .....	.004 (.10) Max.
Outer Rotor-to-Housing Clearance .....	.001-.013" (.03-.33)
Shaft-to-Housing Clearance .....	.0015-.0030 (.038-.076)
Relief Valve-to-Bore Clearance .....	.0015-.0030 (.038-.076)

Reassembly

Clean and oil all parts thoroughly. Install relief valve plunger, spring and new cap. Stake cap into position. Reassemble remaining components in reverse order of disassembly.

Installation

Prime oil pump. Install oil pump in reverse order of removal procedure. Use new gaskets where required.

ENGINE COOLING

WATER PUMP

Removal

1) Drain cooling system. Remove fan shroud and fan. Loosen power steering pump attaching bolts. If A/C equipped, remove compressor top bracket. Remove A/C idler pulley and bracket assembly. Remove all drive

Ford V8 Engines

7-75

7.5 LITER V8 (Cont.)

belts. Remove air pump, alternator and bracket, and power steering pump.

2) Disconnect all hoses from water pump, and loosen by-pass hose clamp at pump. Remove remaining attaching bolts and remove water pump. Remove separator plate from water pump and discard gaskets.

Installation

To install, reverse removal procedures, using new gaskets coated on both sides with water resistant sealer.

NOTE: For further information on cooling system capacities and other cooling system components, see appropriate article in "Engine Cooling Systems" at end of ENGINE Section.

TIGHTENING SPECIFICATIONS

Application	Ft. Lbs. (N.m)
Camshaft Sprocket Bolt	40-45 (54-61)
Camshaft Thrust Plate Bolts	9-12 (12-16)
Connecting Rod Cap Nuts	45-50 (61-68)
Cylinder Head Bolts	
Step 1	80 (108)
Step 2	110 (149)
Step 3	130-140 (176-190)
Engine Front Cover Bolts	15-21 (20-28)
Exhaust Manifold Bolts	28-33 (38-45)
Flywheel-to-Crankshaft Bolts	75-85 (102-115)
Intake Manifold Bolts	22-32 (30-43)
Main Bearing Cap Bolts	95-105 (129-142)
Oil Filter Insert/Adapter	45-55 (61-75)
Oil Pump Attaching Bolts	22-32 (30-43)
Rocker Arm Fulcrum Bolt	18-25 (24-34)
Vibration Damper Bolt	70-90 (95-122)
Water Pump Bolts	12-18 (16-24)

ENGINE SPECIFICATIONS

GENERAL SPECIFICATIONS

Year	Displ.		Carburetor	HP at RPM	Torque Ft. Lbs. @RPM	Compr. Ratio	Bore		Stroke	
	cu. ins.	liters					in.	mm	in.	mm
1982	460	7.5	4-Bbl.	.....	.....	.....	4.36	110.7	3.85	97.8

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)
7.5L Int.	2.075-2.090 (52.70-53.09)	44°	45°	.060-.080 (1.52-2.03)	.3416-.3423 (8.677-8.694)	.0010-.0027 (.025-.069)	.....
Exh.	1.646-1.661 (41.81-42.19)	44°	45°	.060-.080 (1.52-2.03)	.3416-.3423 (8.677-8.694)	.0010-.0027 (.025-.069)	.....

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)
7.5L	.0022-.0030 (.056-.076)	.0002-.0004 (.005-.010)	Interference Fit	1 & 2 3	.010-.020 (.25-.51) .010-.035 (.25-.89)	.0025-.0045 (.064-.114) Snug

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)
7.5L	2.9994-3.0020 (76.185-76.205)	.0008-.0015 (.020-.038)	No. 3	.004-.008 (.10-.20)	2.4992-2.5000 (63.480-63.500)	.0008-.0015 (.020-.038)	.010-.020 (.25-.51)

Ford V8 Engines

7.5 LITER V8 (Cont.)

ENGINE SPECIFICATIONS (Cont.)

VALVE SPRINGS

Engine	Free. Length In. (mm)	PRESSURE Lbs. @ In. (kg @ mm)	
		Valve Closed	Valve Open
7.5L Int. & Exh.	2.06 (52.3)	76-84@1.81 (34-38@46.0)	218-240@1.33 (99-109@33.8)

CAMSHAFT

Engine	Journal In. (mm)	Clearance In. (mm)	Lobe Lift In. (mm)
7.5L ¹	2.1238-2.1248 (53.945-53.970)	.001-.003 (.03-.08)	² .252 (6.4) ³ .278 (7.06)

¹ — End play is .001-.006" (.05-.15 mm).

² — Intake.

³ — Exhaust.