

# Ford Motor Co. 6 Engines

## 1965-74 170", 200", 240", 300" 6 CYL. ENGINES

GENERAL SPECIFICATIONS							
Year	Displ. Cu. Ins.	Carburetor	HP at RPM	Torque (Ft. Lbs. at RPM)	Compr. Ratio	Bore	Stroke
1965	170"	1-Bbl.	105@4400	158@2400	9.1-1	3.50"	2.94"
	200"	1-Bbl.	120@4400	190@2400	9.2-1	3.68"	3.126"
	240"	1-Bbl.	150@4000	234@2200	①8.75-1	4.00"	3.18"
	300"	1-Bbl.	170@3600	283@1400-2400	②8.4-1	4.00"	3.98"
1966-67	170"	1-Bbl.	105@4400	158@2400	9.1-1	3.50"	2.94"
	240"	1-Bbl.	150@4000	234@2200	9.2-1	4.00"	3.18"
	300"	1-Bbl.	170@3600	283@1400-2400	8.1-1	4.00"	3.98"
1968-70	170"	1-Bbl.	100@4000	156@2200	8.7-1	3.50"	2.94"
	240"	1-Bbl.	150@4000	234@2200	9.2-1	4.00"	3.18"
	300"	1-Bbl.	165@3600	294@2000	8.8-1	4.00"	3.98"
1971	170"	1-Bbl.	100@4200	148@2600	8.7-1	3.50"	2.94"
	240"	1-Bbl.	140@4000	230@2200	8.9-1	4.00"	3.18"
	300"	1-Bbl.	165@3600	294@2000	8.8-1	4.00"	3.98"
1972	170"	1-Bbl.	.....	.....	8.3-1	3.50"	2.94"
	240"	1-Bbl.	.....	.....	8.5-1	4.00"	3.18"
	300"	1-Bbl.	.....	.....	8.4-1	4.00"	3.98"
1973	240"	1-Bbl.	.....	.....	8.5-1	4.00"	3.18"
	300"	1-Bbl.	.....	.....	8.4-1	4.00"	3.98"
1974	240"	1-Bbl.	.....	.....	.....	4.00"	3.18"
	300"	1-Bbl.	.....	.....	.....	4.00"	3.98"

- ① — Compression ratio on E-100 models is 9.2-1.  
 ② — Compression ratio on 300" H.D. engine is 8.0-1.

► **NET HORSEPOWER & TORQUE NOTE** — Horsepower and Torque figures given for 1972 and later are NET. NET Horsepower and Torque represent power at the flywheel when the engine is installed in the vehicle, with wide open throttle and all systems operating such as; air cleaner, exhaust system, water pump, generator, oil pump and air conditioning.

### ENGINE IDENTIFICATION

Rating plate carries information concerning vehicle model, series, point of manufacture, and unit number. Plate is located on cowl surface under hood. Number code is as follows:

#### F10BLQ00000

- First Digit** — Truck Series Letter.  
**Second & Third Digits** — Truck Series Number.  
**Fourth Digit** — Engine Code.  
**Fifth Digit** — Assembly Plant.  
**Remaining Digits** — Consecutive Unit Number.

#### 6 Cylinder Engine Identification Codes

Engine	Low Compression	Standard
170" (1965).....	3.....	T
170" (1966-72).....	6.....	F
200" (1965).....	2.....	S
200" (1973-74).....	.....	T
240" (1965).....	1.....	J
240" (1966-74).....	1.....	A
300" (1965).....	K.....	B
300" (1966-74).....	2.....	B

### ENGINE REMOVAL

See Engine Removal at end of ENGINE Section.

### INTAKE MANIFOLD

**Removal, 170" & 200"** — Intake manifold is cast integrally with cylinder head. See *Cylinder Head Removal*.

**Removal, 240" & 300"** — 1) Remove air cleaner, if equipped with Thermactor (1966-68 only), remove air cleaner and mounting bracket assembly. Disconnect choke cable and accelerator cable or rod at carburetor. Remove accelerator retracting spring.

2) Remove kick-down rod retracting spring (vehicles with automatic transmission), remove accelerator rod bellcrank assembly. Vehicles with positive crankcase ventilating systems require disconnection of vent hose from inlet tube on intake manifold.

3) On vehicles equipped with Thermactor exhaust emission control system, remove air tube and vacuum hose from air bypass valve and intake manifold. Disconnect air pump outlet hoses at air manifold and at air by-pass valve. Disconnect air pump to air cleaner hose at pump and remove pump. Remove exhaust manifold heat shield, air pump mounting bracket, and air by-pass valve and bracket assembly.

4) Disconnect fuel inlet line and distributor vacuum line from carburetor, disconnect muffler inlet pipe from exhaust manifold, and disconnect power brake vacuum line if equipped.

## 1965-74 170", 200", 240", 300" 6 CYL. ENGINES (Cont.)

5) Remove bolts and nuts retaining both manifolds to cylinder head. Lift manifold assemblies from engine, remove and discard gaskets. Separate manifolds by removing nuts joining both pieces, discard gaskets between manifolds.

**Installation, 170" & 200"** - Intake manifold is cast integrally with cylinder head. See *Cylinder Head Installation*.

**Installation, 240" & 300"** - 1) Clean joining surfaces of cylinder head and manifolds. If one of the manifolds is to be replaced, remove tube fittings from discarded part and install in new part as required, also install new studs in replacement part.

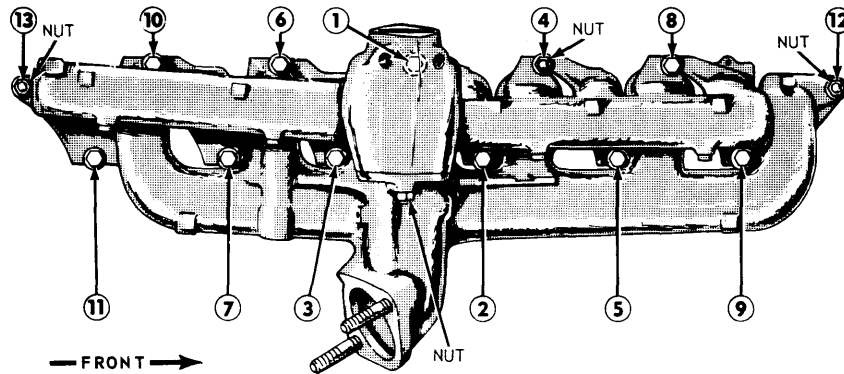
2) If intake manifold and exhaust manifold have been separated, position new gasket on intake manifold and place exhaust manifold over studs on intake part. Install lock washers and nuts and tighten fingertight. Install new intake manifold gasket.

3) Coat mating surfaces lightly with graphite grease, place manifold assemblies in position against cylinder head. Make sure gaskets have not become dislodged. Install attaching washers, bolts, and nuts. Torque bolts and nuts to specifications using sequence shown in this section. If intake and exhaust manifolds were separated, tighten nuts joining both parts.

4) Position new gasket on muffler inlet pipe and connect inlet pipe to exhaust manifold. Torque nuts to specifications. Connect crankcase vent hose to intake manifold inlet tube, and position hose clamp.

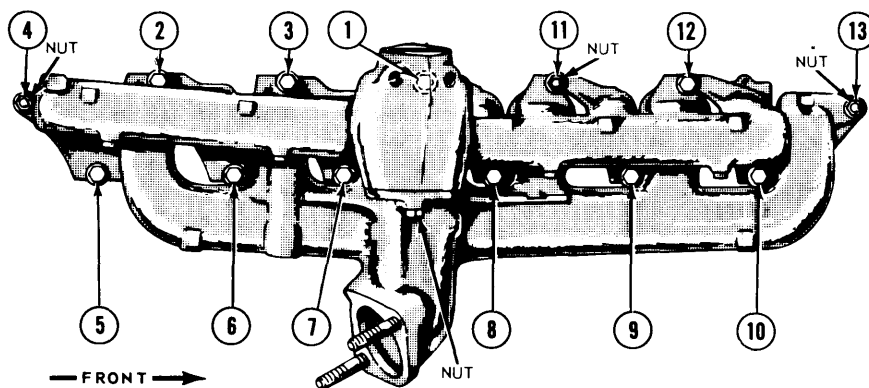
5) If equipped with Thermactor exhaust emission control system, install backfire suppressor valve and bracket assembly, air pump mounting bracket, exhaust manifold heat shield, and air cleaner and mounting bracket assembly.

6) Install air pump and adjust belt tension to specifications. Connect air pump to air pump air cleaner hose at pump. Connect air pump outlet hoses at backfire suppressor valve and air manifold. Position backfire suppressor valve air tube and vacuum hose and connect to valve and intake manifold.



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**INTAKE AND EXHAUST MANIFOLD TIGHTENING SEQUENCE  
240" & 300" (1965-70)**



1FO002

**INTAKE AND EXHAUST MANIFOLD TIGHTENING SEQUENCE  
240" & 300" (1971-74)**

## 1965-74 170", 200", 240", 300" 6 CYL. ENGINES (Cont.)

7) Connect accelerator cable to carburetor and install retracting spring. Connect choke cable to carburetor.

8) On vehicles with automatic transmission, install bellcrank assembly and kickdown rod retracting spring. Adjust transmission control linkage as necessary.

9) Install air cleaner, adjust engine idle speed and idle fuel mixture.

**CYLINDER HEAD**

**Removal** — 1) If cylinder head is to be replaced, disassemble and transfer all valves, springs, rocker arms, etc. to new cylinder head. Clean and inspect all parts, reface valves and check valve guide clearances before assembling used parts to new head. Drain cooling system, remove air cleaner.

2) Remove PCV valve from rocker cover, disconnect vent tube at intake manifold inlet tube.

3) Disconnect and remove carburetor fuel inlet line and distributor vacuum line. Disconnect choke cable at carburetor and position choke cable and housing out of way for removal of head.

4) Remove accelerator cable retracting spring, disconnect accelerator cable from carburetor. On vehicles with automatic transmission, disconnect kickdown rod at carburetor.

5) If equipped with Thermactor exhaust emission control system, remove air tube and vacuum hose from backfire suppressor valve and intake manifold. Disconnect air pump outlet hoses at air manifold and at backfire suppressor valve. Disconnect air pump to air cleaner hose at pump. Remove air pump, remove air manifold assembly from cylinder head.

6) Remove air cleaner and mounting bracket assembly, exhaust manifold heat shield, air pump mounting bracket, and backfire suppressor valve and bracket assembly.

7) Disconnect upper radiator hose and heater hose at coolant outlet elbow. Remove coil bracket retaining bolt and position coil away from head assembly.

8) Disconnect muffler inlet pipe from exhaust manifold and throw away inlet pipe gasket.

9) Remove valve rocker arm cover, loosen rocker arm stud nuts so that rocker arms can be rotated to one side. Remove and identify valve push rods in sequence to allow reinstallation in original positions. Disconnect spark plug wires at spark plugs.

10) Remove cylinder head bolts. Install cylinder head lifting eyes (if used) in positions shown in Cylinder Head Torque Sequence illustration.

11) Position a floor crane or other suitable elevating device and attach hoist and lifting sling to lifting eyes. Raise cylinder head and manifold assembly off engine. **CAUTION** — Do not pry between cylinder head and block when freeing head assembly as gasket surface may be damaged.

**Installation** — 1) Clean cylinder head and cylinder block gasket surfaces. Clean gasket surfaces on exhaust manifold and muffler inlet pipe.

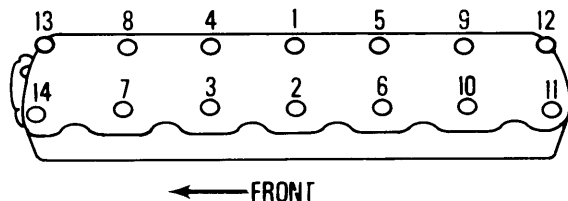
2) If cylinder head was removed for head gasket replacement, check flatness of block and head gasket surfaces, then position new gasket over dowel pins on cylinder block.

3) Install lifting eyes on cylinder head in previous locations used to detach head assembly. Use suitable hoist to lift cylinder head over block, lowering carefully until head assembly is properly positioned on block and dowel pins. Remove hoist and lifting eyes.

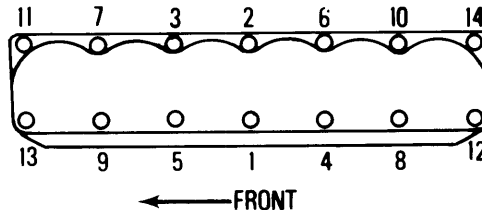
4) Coat threads of head bolts with engine oil and install bolts. Tighten cylinder head bolts in sequence shown in applicable illustration to specified torque. Once head bolts have been tightened following sequence shown, it should not be necessary to retorquer head bolts after extended operation unless desired.

5) Reverse removal procedure to complete installation of all head assembly pieces.

7FO003



3FO004



170" &amp; 200" CYLINDER HEAD TORQUE SEQUENCE

240" &amp; 300" CYLINDER HEAD TORQUE SEQUENCE

## 1965-74 170", 200", 240", 300" 6 CYL. ENGINES (Cont.)

VALVES							
Engine & Valve	Head Diam.	Face Angle	Seat Angle	Seat Width	Stem Diameter	Stem Clearance	Valve Lift
170" 1965 Int. Exh.	1.650"	44°	45°	.07-.08"	.3100-.3107"	① .0008-.0025"	.....
	1.389"	44°	45°	.07-.08"	.3090-.3097"	.0018-.0035"	.....
1966-71 Int. Exh.	1.650"	44°	45°	.07-.08"	.3100-.3107"	① .0008-.0025"	.361"
	1.389"	44°	45°	.07-.08"	.3098-.3105"	.0010-.0027"	.359"
1972 Int. Exh.	1.650"	44°	45°	.06-.08"	.3100-.3107"	① .0008-.0025"	.361"
	1.389"	44°	45°	.07-.08"	.3098-.3105"	.0010-.0027"	.359"
200" 1965 Int. Exh.	1.650"	44°	45°	.07-.08"	.3100-.3107"	①.0008-.0025"	.....
	1.389"	44°	45°	.07-.08"	.3090-.3097"	.0018-.0035"	.....
240" 1965-71 Int. Exh.	1.780"	44°	45°	.06-.08"	.3416-.3423"	①.0010-.0027"	.376"
	1.560"	44°	45°	.07-.09"	.3416-.3423"	.0010-.0027"	.400"
1972-74 Int. Exh.	1.781"	44°	45°	.06-.08"	.3416-.3423"	④.0010-.0027"	.400"
	1.560"	44°	45°	.07-.09"	.3416-.3423"	.0010-.0027"	.400"
300" 1965-74 Int. Exh.	1.780"	44°	45°	.06-.08"	.3416-.3423"	④.0010-.0027"	.400"
	1.560"	44°	45°	②.07-.09"	③.3416-.3423"	.0010-.0027"	.400"

- ① — Wear limit is +.002".
- ② — Seat width on 1966-69 300" H.D. is .088-.102".
- ③ — Stem diameter on 1972 300" H.D. is .3411-.3418".
- ④ — Wear limit is .0055".

### VALVE ARRANGEMENT

170" & 200" Engine  
E-I-I-E-I-E-E-I-E-I-E

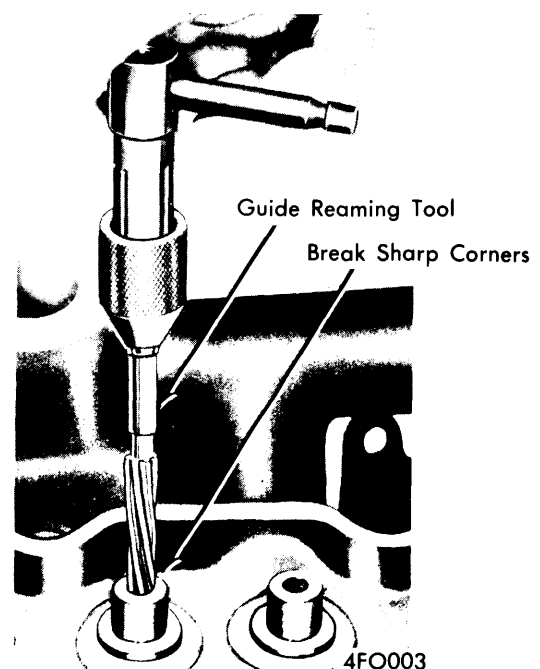
240" & 300" Engine  
E-I-E-I-E-I-E-I-E-I-E-I

### VALVE GUIDE SERVICING

To ream valve guides for installation of valves with oversize stems, always use reamers in sequence and reface valve seat after valve guide is reamed. Reamers are available .003" oversize with standard diameter pilots; .015" oversize with .003" oversize pilot; .030" oversize with .015" oversize pilot. **NOTE** — Always break sharp corner (ID) at top of valve guide after reaming.

### VALVE STEM OIL SEALS

Cup type used on all valves. Install cupped side down, below upper spring retainer.



VALVE GUIDE REAMING PROCEDURE

## 1965-74 170", 200", 240", 300" 6 CYL. ENGINES (Cont.)

VALVE SPRINGS			
Engine	Free Length	PRESSURE (LBS.)	
		Valve Closed	Valve Open
170" 1965-72 Int.	2.00"	48-56@1.585"	112-122 @1.222"
	2.00"	48-56@1.585"	112-122 @1.222"
200" 1965 Int.	1.79"	51-57@1.59"	142-158 @1.222"
	1.79"	51-57@1.59"	142-158 @1.222"
240" 1965-66 Int.	1.99"	76-84@1.70"	181-200 @1.325"
	1.99"	76-84@1.70"	187-207 @1.30"
1967-73 Int.	1.99"	76-84@1.70"	187-207 @1.30"
	1.99"	76-84@1.70"	187-207 @1.30"
1974 Int.	1.99"	76-84@1.70"	187-207 @1.30"
	1.87"	76-84@1.69"	182-202 @1.18"
300" L.D. 1965-66 Int.	1.99"	76-84@1.70"	181-200 @1.325"
	1.99"	76-84@1.70"	187-207 @1.30"
1967 Int.	1.99"	76-84@1.70"	187-207 @1.30"
	1.99"	76-84@1.70"	187-207 @1.30"
1968-71 Int.	1.87"	77-85@1.58"	182-202 @1.18"
	1.87"	77-85@1.58"	182-202 @1.18"
1972-74 Int.	1.99"	76-84@1.70"	187-207 @1.30"
	1.87"	77-85@1.58" ①	182-202 @1.18"
300" H.D. 1965-74 Int.	1.99"	76-84@1.70"	187-207 @1.30"
	1.87"	77-87@1.58" ①	182-202 @1.18"

## VALVE SPRINGS

**Removal** — 1) Remove air cleaner. Remove crankcase ventilation regulator valve and any Thermactor air hoses (if equipped) as necessary from rocker arm cover, remove cover. Remove spark plug(s) on cylinder(s) to be serviced.

2) Loosen rocker arm shaft support bolts two turns at a time until valve spring pressure is relieved. Remove push rods of cylinder to be serviced. Install compressed air line with adapter in spark plug hole.

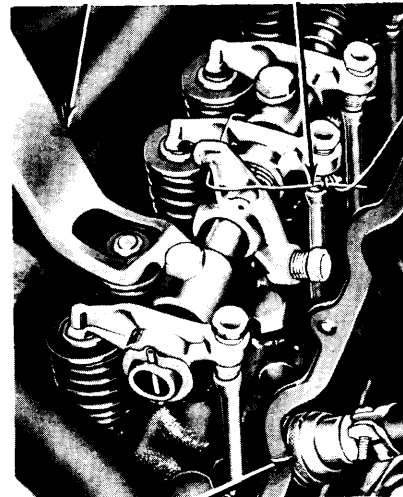
3) Tighten rocker arm shaft bolts just enough to seat shaft supports on cylinder head. Push rocker arm to one side and secure in position. **NOTE** — To move end rocker arms, it is necessary to remove retaining pin and spring washer and slide rocker arm off shaft.

4) Using valve spring compressing tool (T65P-6513-A or equivalent), compress valve and remove retainer locks, sleeve, spring retainer and valve spring. **NOTE** — If compressed air pressure fails to hold valve closed during this operation, remove cylinder head for inspection. Remove valve stem seal. Do not remove air pressure as this may allow valve to fall into cylinder if piston has been forced down to bottom of cylinder, a rubber band, tape, or string wrapped around end of valve will prevent droppage of valve, yet still allow enough movement to check for valve binding.

**Installation** — 1) Install new valve stem seal. Place spring over valve and position spring retainer and sleeve. Compress valve spring and insert valve spring retainer locks.

2) Apply Lubriplate or equivalent to both ends of push rod, valve, and push rod ends of rocker arm, and to valve stem tip. Install push rods ensuring lower end is positioned in valve lifter push rod cup. Slide rocker arm into position.

Tool — T65P-6513-A Secure Rocker Arm



Tool — 6513-ABA

7FO004

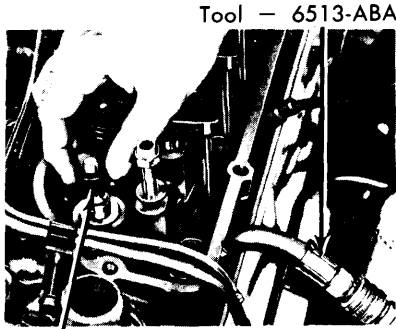
FORD 6 CYLINDER VALVE SPRING COMPRESSION  
(TYPICAL) — IN CHASSIS

① — On 1974 only, specification is 76-84@1.69".

3) Secure rocker arm shaft. Turn off compressed air and remove air line and adapter. Replace spark plug and wire.

## 1965-74 170", 200", 240", 300" 6 CYL. ENGINES (Cont.)

Place new rocker arm cover gasket on cover and secure over rocker arm assembly. Install regulator valve, Thermactor air hoses (if equipped), and air cleaner.



Tool — 6513-ABA

Oil Seal

4FO005

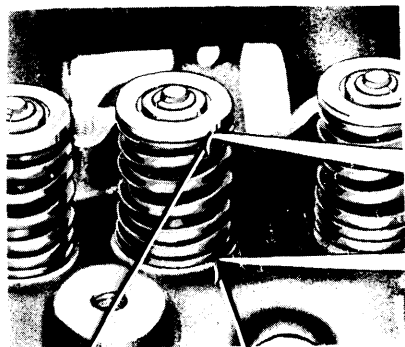
### FORD 6 CYLINDER REMOVING OR INSTALLING VALVE STEM SEAL (TYPICAL)

### VALVE SPRING INSTALLED HEIGHT

1) Check valve springs for squareness using steel square and surface plate. Stand spring against edge of square and rotate spring slowly observing space between top coil of spring and square. If spring is out of square more than  $\frac{5}{64}$ " , spring must be replaced.

2) Measure assembled height of valve spring from surface of cylinder head spring pad to underside of spring retainer using dividers. Check divider against scale, if assembled height of spring is greater than specified height, install necessary .030" spacers between cylinder head spring pad and valve spring to bring assembled height to recommended dimensions.

**CAUTION** — Do not install spacers unless necessary to meet specifications. Excess use of spacers will result in overstressing of valve spring assembly, and will overload camshaft lobes, causing possible spring breakage and/or camshaft wear.



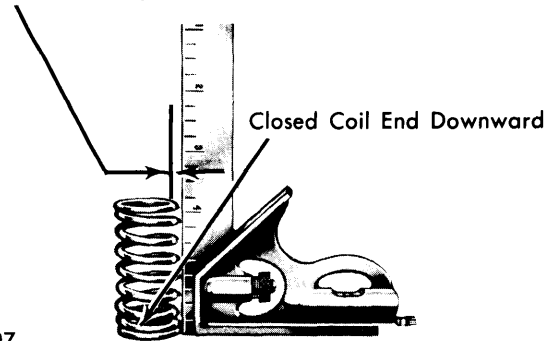
Surface of Spring Pad

Underside Of Spring Retainer

7FO006

### CHECKING ASSEMBLED VALVE SPRING HEIGHT

Not More Than  $\frac{5}{64}$ "



4FO007

### VALVE SPRING SQUARENESS CHECK PROCEDURE

### Valve Spring Installed Height Specifications

Application	Intake Valve	Exhaust Valve
1965-67		
170" & 200"	$1\frac{9}{16}$ - $1\frac{39}{64}$ "	$1\frac{9}{16}$ - $1\frac{39}{64}$ "
240"	$1\frac{35}{64}$ - $1\frac{39}{64}$ "	$1\frac{35}{64}$ - $1\frac{39}{64}$ "
300" LD	$1\frac{43}{64}$ - $1\frac{47}{64}$ "	$1\frac{43}{64}$ - $1\frac{47}{64}$ "
300" HD	$1\frac{43}{64}$ - $1\frac{47}{64}$ "	$1\frac{35}{64}$ - $1\frac{39}{64}$ "
1968		
240"	$1\frac{43}{64}$ - $1\frac{49}{64}$ "	$1\frac{43}{64}$ - $1\frac{49}{64}$ "
300" LD	$1\frac{35}{64}$ - $1\frac{39}{64}$ "	$1\frac{35}{64}$ - $1\frac{39}{64}$ "
300" HD	$1\frac{43}{64}$ - $1\frac{49}{64}$ "	$1\frac{35}{64}$ - $1\frac{39}{64}$ "
1969		
170"	$1\frac{9}{16}$ - $1\frac{39}{64}$ "	$1\frac{9}{16}$ - $1\frac{39}{64}$ "
240"	$1\frac{43}{64}$ - $1\frac{49}{64}$ "	$1\frac{43}{64}$ - $1\frac{49}{64}$ "
300" LD	$1\frac{35}{64}$ - $1\frac{39}{64}$ "	$1\frac{35}{64}$ - $1\frac{39}{64}$ "
300" HD	$1\frac{43}{64}$ - $1\frac{47}{64}$ "	$1\frac{35}{64}$ - $1\frac{39}{64}$ "
1970-72		
170"	$1\frac{9}{16}$ - $1\frac{5}{8}$ "	$1\frac{9}{16}$ - $1\frac{5}{8}$ "
240"	$1\frac{21}{32}$ - $1\frac{23}{32}$ "	$1\frac{21}{32}$ - $1\frac{23}{32}$ "
300" LD <sup>⓪</sup>	$1\frac{35}{64}$ - $1\frac{39}{64}$ "	$1\frac{35}{64}$ - $1\frac{39}{64}$ "
300" HD <sup>⓪</sup>	$1\frac{21}{32}$ - $1\frac{23}{32}$ "	$1\frac{35}{64}$ - $1\frac{39}{64}$ "
1973-74		
240" & 300"	$1\frac{11}{16}$ - $1\frac{23}{64}$ "	$1\frac{9}{16}$ - $1\frac{13}{32}$ "

<sup>⓪</sup> — Not available after 1971.

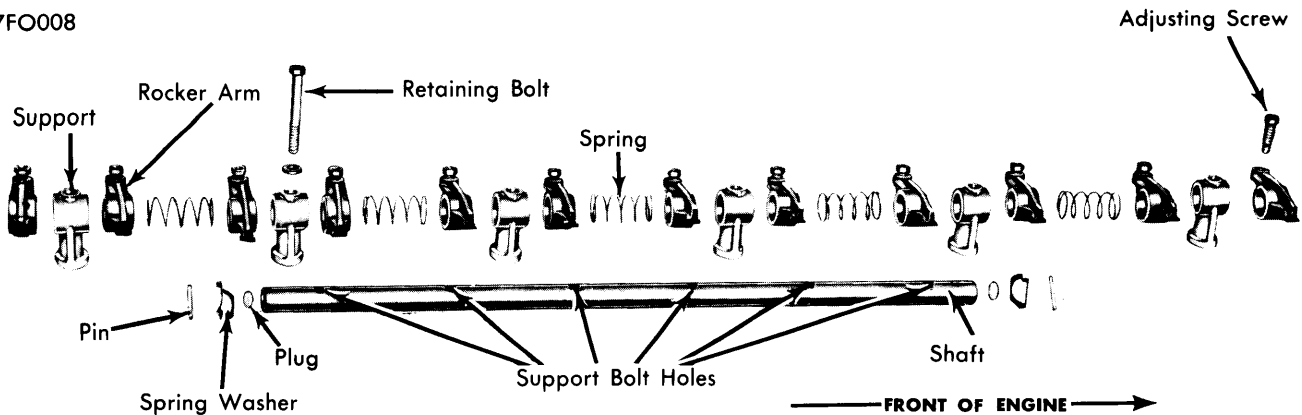
### ROCKER ARM ASSEMBLY

Inspect all parts carefully for excessive wear, and replace all pieces which do not measure up to specification. **NOTE** — See illustration for arrangement of parts. All rocker arms and rocker arm shaft must be well lubricated with engine oil before assembly and installation. End plugs in rocker arm shaft must be facing cup side outward, and all holes in rocker arm shaft must be facing downward to ensure proper lubrication.

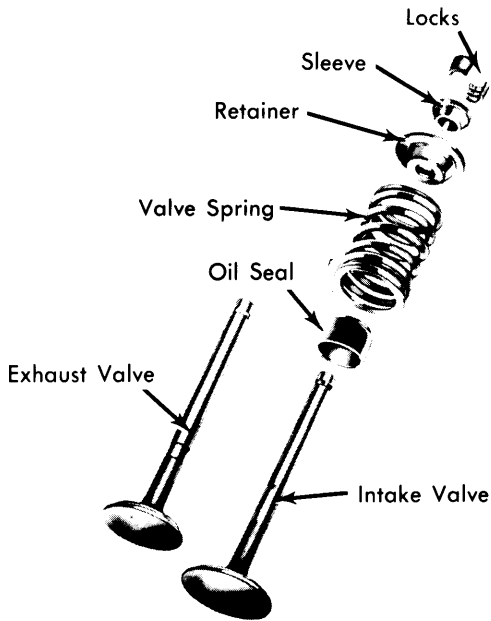
# Ford Motor Co. 6 Engines

1965-74 170", 200", 240", 300" 6 CYL. ENGINES (Cont.)

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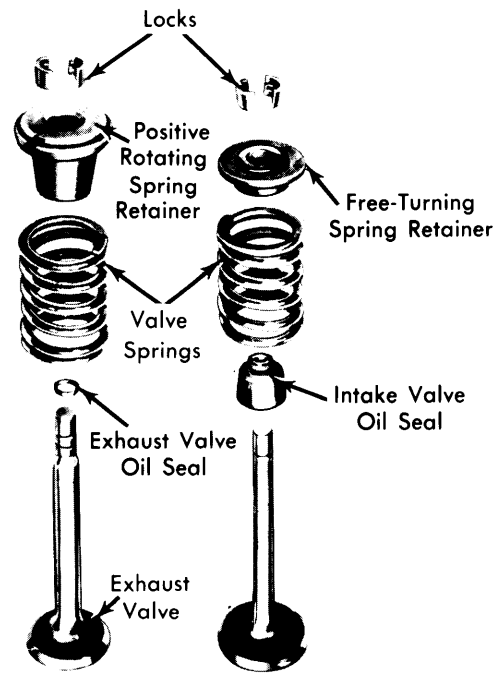


ROCKER ARM AND SHAFT ASSEMBLY (TYPICAL)



1FO009

170" & 200" VALVE ASSEMBLIES



1FO010

240" & 300" VALVE ASSEMBLIES

## ROCKER ARM STUDS

**Removal, 240" & 300"** - 1) Use suitable stud pulling tool kit (T62F-6A527-B) to facilitate removal of faulty studs, follow instructions of manufacturer for proper use.

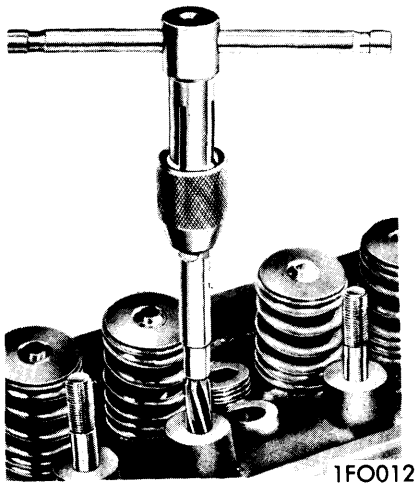
2) If rocker arm stud was broken off flush with stud boss, use suitable easy-out tool to remove broken stud.

**Installation, 240" & 300"** - 1) Replacement studs may be pressed into head using suitable stud replacement tool

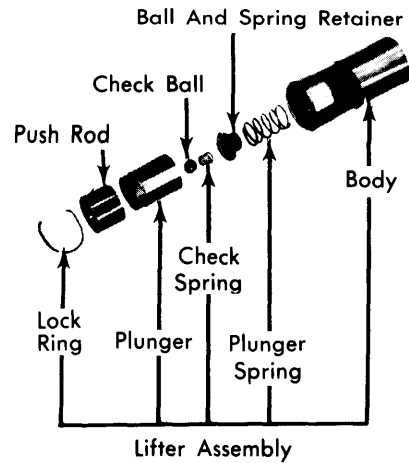
(T69P-6049-D). Align stud and replacement tool with stud bore and tap sliding driver on tool until installer tool contacts stud boss, indicating stud is installed to correct height.

2) If rocker arm stud being replaced was loose, ream stud bore using proper reamer (or reamers in sequence) for selected oversize stud. Studs are available in oversizes of .006", .010", and .015". **CAUTION** - Make sure metal particles from reaming process of stud bore do not enter valve area. Install rocker arm stud using same replacement tool as for standard size stud.

## 1965-74 170", 200", 240", 300" 6 CYL. ENGINES (Cont.)



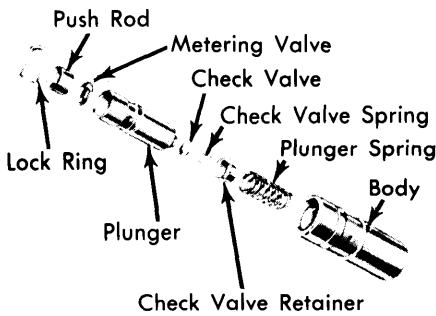
**ROCKER ARM STUD OVERSIZE REAMING TOOL (TYPICAL)**



**TYPE II HYDRAULIC VALVE LIFTER ASSEMBLY, 240" & 300" (1967-74)**

### HYDRAULIC VALVE LIFTER ASSEMBLY, 240" & 300"

Lifters should be serviced as assemblies only, parts are not interchangeable. 1967-74 240" and 300" engines utilize two different valve lifters, either or both can be used in an engine. Leak down rate on all lifters should be 5-50 seconds at  $\frac{1}{16}$ " plunger travel using suitable lifter leak down tester. Replace lifter assembly if any evidence of malfunction occurs.



**TYPE I HYDRAULIC VALVE LIFTER ASSEMBLY, 240" & 300" (1967-74)**

### HYDRAULIC VALVE LIFTER ADJUSTMENT, 240" & 300"

1) Make two chalk marks on crankshaft pulley spaced approximately 120° apart, which together with timing marks, will divide damper pulley into three equal parts. Rotate crankshaft until number one piston is on TDC at end of compression stroke.

2) Adjust intake and exhaust valve clearance for number one cylinder by loosening rocker arm stud nut until there is end clearance in push rod, then tighten nut to just remove all push rod to rocker arm clearance (determined by rotating or moving push rod with fingers as nut is tightened).

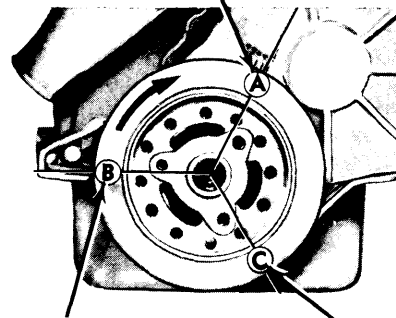
3) When push rod to rocker arm clearance has been eliminated, tighten stud nut an additional one turn to place hydraulic lifter piston in desired range.

4) Repeat procedure for remaining set of valves, turning engine with auxiliary starter switch 1/3 turn at a time, in direction of rotation, while adjusting valves in firing order sequence of 1-5-3-6-2-4.

5) Start engine and check for rough engine idle or noisy lifters. Valve clearance set too tight will cause rough idle and valve clearance set too loose will cause noisy lifters. Readjust if necessary.

Step 1 — Set No. 1 Piston on TDC at End of Compression Stroke, Adjust No. 1 Intake and Exhaust

Step 4 — Adjust No. 6 Intake and Exhaust



Step 2 — Adjust No. 5 Intake and Exhaust

Step 3 — Adjust No. 3 Intake and Exhaust

Step 5 — Adjust No. 2 Intake and Exhaust

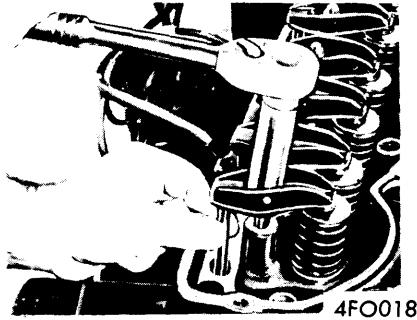
Step 6 — Adjust No. 4 Intake and Exhaust

4FO017

**CRANKSHAFT PULLEY MARKING FOR VALVE CLEARANCE ADJUSTMENT**

# Ford Motor Co. 6 Engines

## 1965-74 170", 200", 240", 300" 6 CYL. ENGINES (Cont.)



4FO018

### HYDRAULIC VALVE CLEARANCE ADJUSTMENT 240" & 300"

### MECHANICAL VALVE LIFTER ASSEMBLY, 170" & 200"

Mechanical valve lifter is one piece unit and requires no service. Lifter body should be inspected for scoring, pitting, or

nonrotation. Any indication of undue wear will require replacement of lifter.

### MECHANICAL VALVE LIFTER ADJUSTMENT, 170" & 200"

1) Make two chalk marks on crankshaft pulley spaced approximately 120° apart which together with timing marks will divide crankshaft pulley into three equal parts.

2) Rotate crankshaft until number one piston comes to TDC at end of compression stroke. Adjust intake and exhaust valve lash to specifications using a go and no-go feeler gauge.

3) Repeat procedure for remaining set of valves turning engine with auxiliary starter switch 1/3 turn at a time in direction of rotation while adjusting valves in firing order sequence of 1-5-3-6-2-4. This procedure requires two complete turns of crankshaft.

### PISTONS, PINS, RINGS

Engine	PISTONS	PINS		RINGS		
	Clearance	Piston Fit	Rod Fit	Rings	End Gap	Side Clearance
170" 1965	.0021-.0027"	.0003-.0005"	Press Fit	1	.010-.020"	.0009-.0026"
				2	.010-.020"	.002-.004"
				3	.015-.55"	Snug
1966-71	.0014-.0020	.0003-.0005"	Press Fit	1	.010-.020"	.0019-.0026"ⓐ
				2	.010-.020"	.002-.004"
				3	.015-.55"	Snug
1972	.0013-.0021"	.0003-.0005"	Press Fit	1	.010-.020"	.002-.004"
				2	.010-.020"	.002-.004"
				3	.015-.55"	Snug
200" 1965	.0020-.0026"	.0003-.0005"	Press Fit	1	.010-.020"	.0019-.0036"
				2	.010-.020"	.002-.004"
				3	.015-.55"	Snug
240" 1965-71	.0014-.0022"	ⓑ	Press Fit	1	.010-.020"	.0019-.0036"
				2	.010-.020"	.002-.004"
				3	.015-.55"	Snug
1972	.0014-.0022"	.0002-.0004"	Press Fit	1	.010-.020"	.0024-.0041"
				2	.010-.020"	.0025-.0045"
				3	.015-.55"	Snug
1973-74	.0014-.0022"	.0002-.0004"	Press Fit	1	.010-.020"	.002-.004"
				2	.010-.020"	.0025-.0040"ⓐ
				3	.015-.55"	Snug
300" 1965-71	.0014-.0022"	.0003-.0005"	Press Fit	1	.010-.020"	.0019-.0036"
				2	.010-.020"	.0025-.0045"ⓐ
				3	.015-.55"	Snug
1972	.0014-.0022"	.0002-.0004"	Press Fit	1	.010-.020"	.0024-.0041"
				2	.010-.020"	.0025-.0045"
				3	.015-.55"	Snug
1973-74	.0014-.0022"	.0002-.0004"	Press Fit	1	.010-.020"	.002-.004"
				2	.010-.020"	.0025-.0045"ⓐ
				3	.015-.55"	Snug

ⓐ — Side clearance on 1971 170" is .002-.004".

ⓑ — Piston fit on 1965 240" is .0003-.0005".

ⓐ — Side clearance on 1974 240" is .002-.004" on second compression ring.

ⓑ — Side clearance on 1965 300" is .002-.004".

ⓒ — Side clearance on 1974 300" is .002-.004" on second compression ring.

## 1965-74 170", 200", 240", 300" 6 CYL. ENGINES (Cont.)

### OIL PAN

See Oil Pan Removal at end of ENGINE Section.

### PISTON & ROD ASSEMBLY

**Removal** - 1) Turn crankshaft until piston to be removed is at bottom of stroke. Place cloth or shop towel lightly soaked with oil on head of piston to collect metal cutting from cylinder ridge.

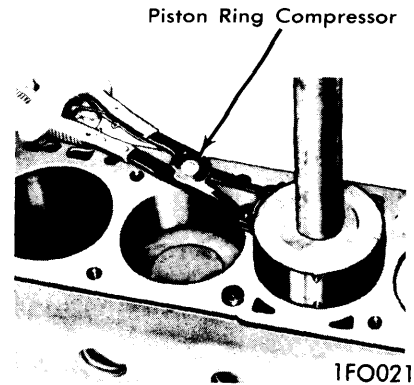
2) Remove any ridge and deposits from upper end of cylinder bore using suitable ridge cutter. Follow instructions furnished by tool manufacturer. **CAUTION** - Never cut into ring travel area in excess of  $\frac{1}{32}$ " when removing ridges.

3) Make sure all connecting rod caps are marked to the appropriate pistons to ensure installation in original locations. Remove connecting rod cap.

4) Push connecting rod and piston out of top of cylinder using handle end of a hammer. Avoid damage to crankshaft journal or cylinder wall when removing piston and rod.

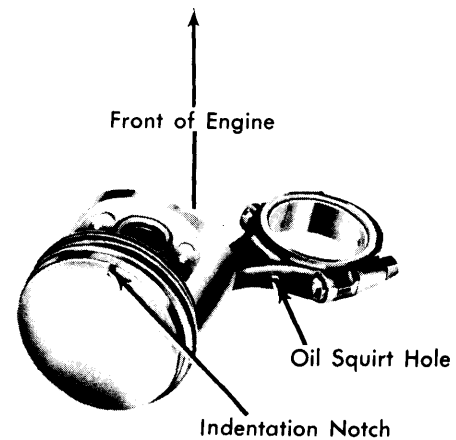
**Installation** - 1) Oil piston rings, piston, and cylinder wall with light engine oil. Install piston into original cylinder making sure that ring gaps are spaced properly on piston (see illustration), and install suitable ring compressor on piston.

2) Insert rod and piston assembly into cylinder bore and guide rod over crankshaft journal. **NOTE** - Arrow on piston top should point towards front of engine. Tap piston into cylinder bore using wooden handle tool until rod seats on crankshaft journal, install and tighten rod cap. Repeat procedure for each piston removed.



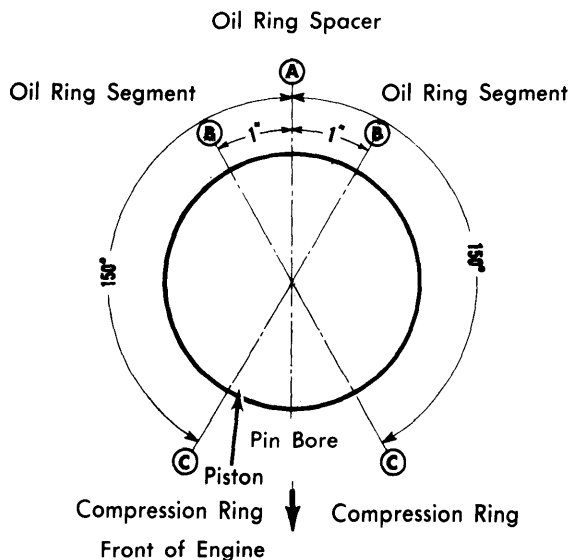
PISTON INSTALLATION (TYPICAL)

7FO022



PISTON AND CONNECTING ROD ASSEMBLY

1FO020



PISTON RING SPACING

### FITTING PISTONS

- 1) Calculate size of piston to be used by measuring cylinder bore at right angles to centerline of crankshaft below ring travel.
- 2) Measure piston diameter in line with centerline of piston pin and at 90° to piston pin axis.
- 3) Make sure that both piston and cylinder block are at normal room temperature (70°F) when fitting.

### PISTON PINS

**Removal** - Using arbor press and suitable tool (T65L-6135-C), press piston pin from piston and connecting rod.

**Installation** - Start piston pin in piston and connecting rod. Using arbor press and suitable tool (T65L-6135-C), press piston pin through piston and connecting rod until pin is centered in connecting rod.

# Ford Motor Co. 6 Engines

## 1965-74 170", 200", 240", 300" 6 CYL. ENGINES (Cont.)

CRANKSHAFT MAIN & CONNECTING ROD BEARINGS							
Engine	MAIN BEARINGS				CONNECTING ROD BEARINGS		
	Journal Diam.	Clearance	Thrust Bearing	Crankshaft Endplay	Journal Diam.	Clearance	Sideplay
<b>170"</b>							
1965	2.2482-2.2490"	.0007-.0026"	.....	.004-.008"	2.1232-2.1240"	.0006-.0022"	.0035-.0105"
1966-69	2.2482-2.2490"	.0005-.0015"	.....	.004-.008"	2.1232-2.1240"	.0008-.0015"	.0035-.0105"
1970-71	2.2482-2.2490"	.0010-.0015"	.....	.004-.008"	2.1232-2.1240"	.0010-.0015"	.0035-.0105"
1972	2.2482-2.2490"	.0008-.0024"	.....	.004-.008"	2.1232-2.1240"	.0010-.0015"	.0035-.0105"
<b>200"</b>							
1965	2.248-2.249"	.0007-.0026"	.....	.004-.008"	2.1232-2.1240"	.0006-.0026"	.0035-.0105"
<b>240"</b>							
1965	①2.3986-2.3990"	.006-.0024"	.....	.004-.008"	②2.1232-2.1236"	.0006-.0022"	.006-.013"
1966-69	2.3982-2.3990"	.0005-.0015"	.....	.004-.008"	2.1228-2.1236"	.0008-.0015"	.006-.013"
1970-72	2.3982-2.3990"	.0010-.0015"	.....	.004-.008"	2.1228-2.1236"	.0010-.0015"	.006-.013"
1973-74	2.3982-2.3990"	.0005-.0015"	.....	.004-.008"	2.1228-2.1236"	.0008-.0015"	.006-.013"
<b>300"</b>							
1965	2.3982-2.3990"	.0006-.0026"	.....	.004-.008"	2.1228-2.1236"	.0006-.0022"	.006-.013"
1966-69	2.3982-2.3990"	.0009-.0015"	.....	.004-.008"	2.1228-2.1236"	.0008-.0015"	.006-.013"
1970-71	2.3982-2.3990"	.0010-.0015"	.....	.004-.008"	2.1228-2.1236"	.0010-.0015"	.006-.013"
1972	2.3982-2.3990"	.0009-.0026"	.....	.004-.008"	2.1228-2.1236"	③.0008-.0015"	.006-.013"
1973-74	2.3982-2.3990"	.0009-.0015"	.....	.004-.008"	2.1228-2.1236"	③.0008-.0015"	.006-.013"

- ① - Crankshafts which are colored blue are 2.3982-2.3986".  
 ② - Crankshafts which are colored blue are 2.1228- 2.1232".  
 ③ - On 300" H.D. clearance is .0009-.0027".

### MAIN & CONNECTING ROD BEARINGS

**Removal** - Remove oil pan as previously outlined and proceed as follows:

1) To change connecting rod bearings, remove and inspect connecting rod caps for cylinder identification to ensure correct position for replacement. With crankshaft lined up in center of cylinder bore, push piston upwards into block enough to allow removal of upper half of bearing.

2) Mark main bearing caps for identification purposes before removal. Remove main bearing cap. Remove upper half of main bearing by inserting suitable tool (6331-B) in oil hole of crankshaft, and slowly rotate crankshaft in direction of engine rotation to force out upper half of main bearing. **NOTE** - Replace only one bearing at a time, leaving other bearings secured until ready to be changed.

**Installation** - Thoroughly clean all bearing surfaces and proceed as follows:

1) Determine crankshaft bearing journal clearance using Plastigage method. When checking main bearings, place a jack under counterweight adjoining bearing being gauged to avoid weight of crankshaft compressing Plastigage and giving erroneous readings. Place Plastigage on bearing surface over full width of bearing cap and about 1/4" off center. Fit main cap or rod cap and torque to specified tightness. Remove cap and check width of Plastigage using scale provided with Plastigage.

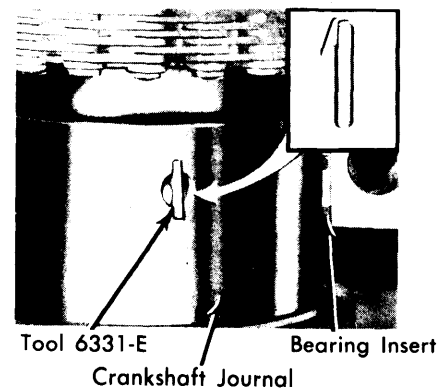
2) If bearing clearance is excessive, a .001" or .002" undersize bearing half may be used in combination with a standard size bearing half. If .002" undersize main bearings are used on more than one journal, they may be positioned in engine block rather than in bearing cap. If standard and .002" undersize combination did not bring bearing clearance within specified

limits, crankshaft will have to be refinished and undersized bearings installed.

3) After rod bearings have been fitted, apply light coat of engine oil to journals and bearings. With crankshaft throw to bottom of stroke and upper half of rod bearing installed, move piston down until connecting rod bearing seats on journal. Install connecting rod cap and tighten. Check connecting rod side clearance.

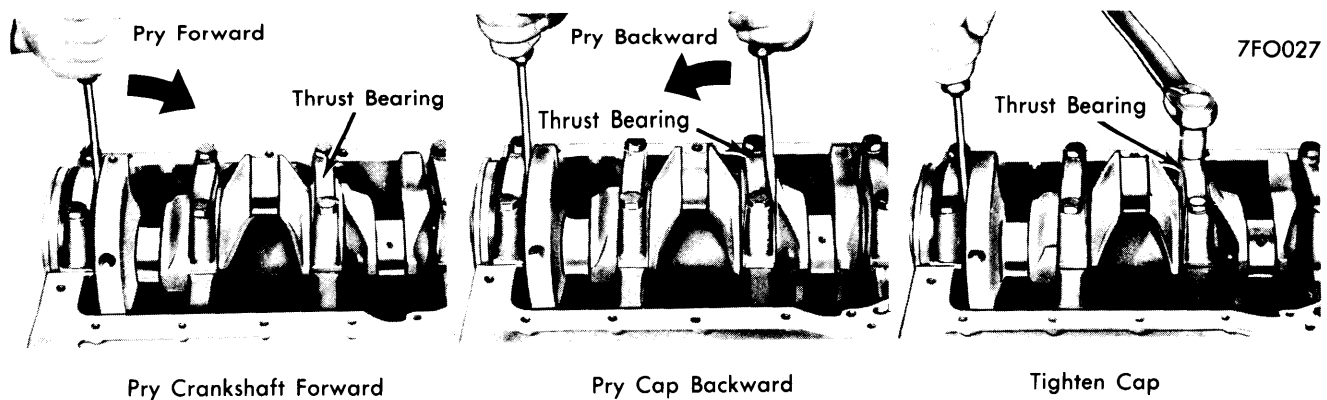
4) To install upper main bearing, lubricate bearing with engine oil and place plain end of bearing over shaft on locking tang side of block. Partially insert bearing to allow suitable tool (6331-E) to be inserted into oil hole in crankshaft journal. Rotate crankshaft in opposite direction of engine rotation until bearing tang is seated. Remove bearing tool, install bearing cap and tighten.

7FO024



UPPER MAIN BEARING REMOVAL OR  
INSTALLATION (TYPICAL)

## 1965-74 170", 200", 240", 300" 6 CYL. ENGINES (Cont.)



### THRUST BEARING ALIGNMENT (TYPICAL)

#### THRUST BEARING ALIGNMENT

Install thrust bearing cap after all other main caps have been tightened. Install thrust bearing cap with bolts finger tight. Pry crankshaft forward against thrust surface of upper half of bearing. Hold crankshaft forward and pry thrust bearing cap to rear. This will align thrust surfaces of both halves of bearing. Retain forward pressure on crankshaft and torque cap bolts to specifications.

#### REAR MAIN BEARING OIL SEAL

**Removal, 170" & 200" (1965-69)** — Lower rear seal can be pried out of rear bearing and discarded. Upper seal should be replaced if any sign of leakage is noted. Removal of crankshaft is required for replacement.

**Installation, 170" & 200" (1965-69)** — 1) Clean mating surface of block and rear main bearing cap, clean rear journal oil seal groove. Preform new seal to approximate radius of cap.

2) Insert seal in oil seal groove, seating center of seal first with seal extending equally on both ends. Press down firmly at center of seal then press both ends of seal into groove working from ends to center.

3) Position seal forming tool (T60K-6701-A or equivalent) and complete seal installation. After installation, cut ends of seal flush to cap, apply thin coat of oil resistant sealer to rear main bearing cap at rear of top mating surface and fit bearing. **NOTE** — Upper oil seal in block cannot be replaced with crankshaft installed.

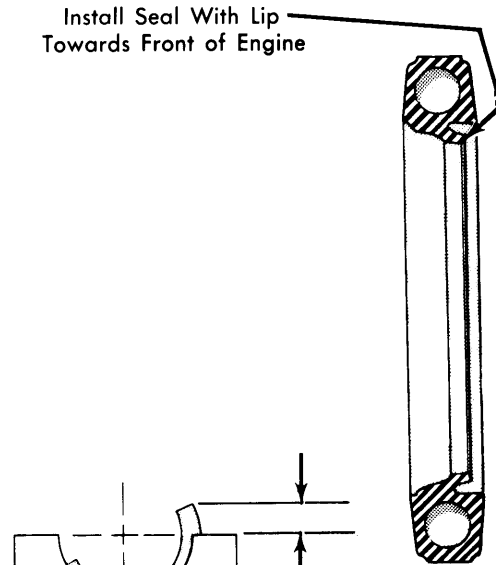
**Removal, 170" (1970-72)** — Remove main bearing cap and loosen remaining bearing caps allowing crankshaft to drop slightly. Remove old seals and rear seal pin (if equipped).

**Installation, 170" (1970-72)** — 1) Clean seal groove in cylinder block and in cap. Dip new seal halves in engine oil.

2) Install upper seal in groove with undercut side of seal towards engine. Allow approximately  $\frac{3}{8}$ " of seal to protrude below parting surface. **CAUTION** — Make sure no rubber is shaved from outside of seal during installation.

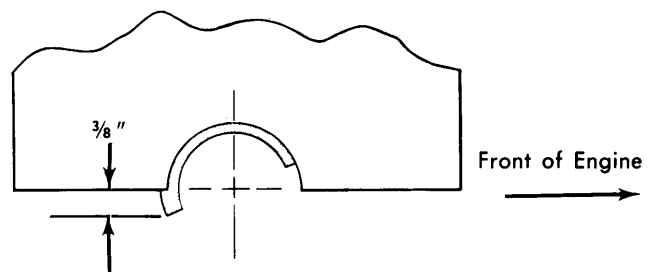
3) Apply suitable sealer to parting faces of main cap and block. Install lower seal in bearing cap with approximately  $\frac{3}{8}$ " of seal protruding above parting surface opposite upper seal protrusion. Install cap and tighten. Tighten all other bearing caps.

Install Seal With Lip Towards Front of Engine



View Looking at Parting Face of Split Lip-Type Crankshaft Seal

Rear Face of Rear Main Bearing Cap and Cylinder Block



Seal Halves to Protrude Beyond Parting Faces This Distance to Allow for Cap-to-Block Alignment

### UPPER & LOWER REAR MAIN SEAL INSTALLATION, 170" (1970-72)

# Ford Motor Co. 6 Engines

## 1965-74 170", 200", 240", 300" 6 CYL. ENGINES (Cont.)

**Removal, 240" & 300"** — 1) *NOTE* — If oil seal is being replaced in conjunction with rear main bearing replacement, engine must be removed from vehicle. Remove transmission, flywheel, and engine rear cover plate.

2) Use an awl or other suitable tool to punch two holes in crankshaft rear oil seal. Punch holes on opposite sides of crankshaft and just above bearing cap-to-cylinder block split line.

3) Install sheet metal screw in each hole and pry out rear oil seal using two large screwdrivers or small pry bars. Avoid scratching or damaging crankshaft oil seal surface.

**Installation, 240" & 300"** — 1) Coat new oil seal and crankshaft with light film of engine oil. Start seal in recess with seal lip facing forward.

2) Install seal using suitable tool (T65L-6701-A or equivalent) to pressure seal into place until tool contacts cylinder block surface. Inspect seal for any possible damage.

3) Replace engine rear cover plate, flywheel, and transmission.

### ENGINE FRONT COVER

**Removal** — 1) Remove any front end sheet metal which may interfere with front cover removal. Disconnect, drain and remove radiator, drive belt, fan and pulley.

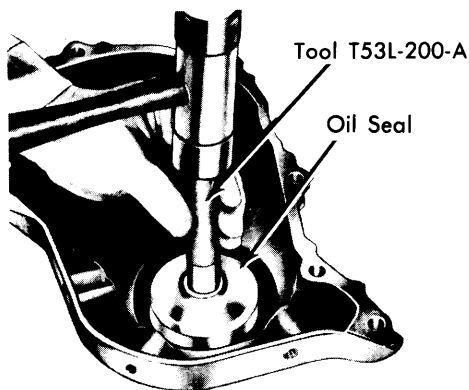
2) Using suitable tool (T58P-6316-B or equivalent), remove crankshaft damper. Remove front cover and gasket.

**Installation** — 1) Oil seal should be replaced before cover is reinstalled. Clean off gasket surfaces, position and secure front cover.

2) Install fan and pulley, all drive belts, radiator, and all other parts or front end sheet metal.

### FRONT COVER OIL SEAL

**Removal & Installation** — With front cover removed from engine, drive oil seal out of cover using suitable pin punch.



7FO030

FRONT COVER OIL SEAL INSTALLATION (TYPICAL)

Clean out recess in cover. Coat new seal with grease and drive in seal until seal is fully seated in front cover recess. Check seal after installation to see that spring is properly positioned in seal.

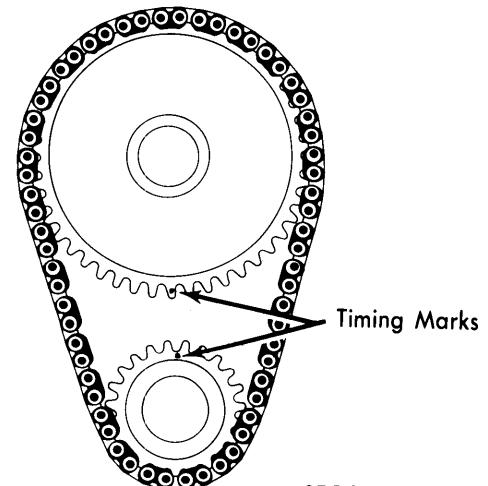
CAMSHAFT			
Engine	Journal Diam.	Clearance	Lobe Lift
170" 1965-72	1.8095-1.8105"	.001-.003"	.2405"②
200" 1965	1.8095-1.8105"	.001-.003"	.2450"
240" 1965-71 1972-74	2.017-2.018" 2.017-2.018"	.001-.003" .001-.003"	.2330"③ .2490"
300" 1965-72	2.017-2.018"	.001-.003"	.2490"

- ① — End play is .001-.007" for all engines except 1965-71 240" and 1965-72 300" which have .003-.007".
- ② — Exhaust lift is .2395".
- ③ — Exhaust lift is .2490".

### TIMING CHAIN

**Removal & Installation, 170" & 200"** — 1) Remove front cover. Crank engine until timing marks are aligned (see illustration) and remove camshaft sprocket bolt and washer. Slide both sprockets and timing chain forward and remove as an assembly.

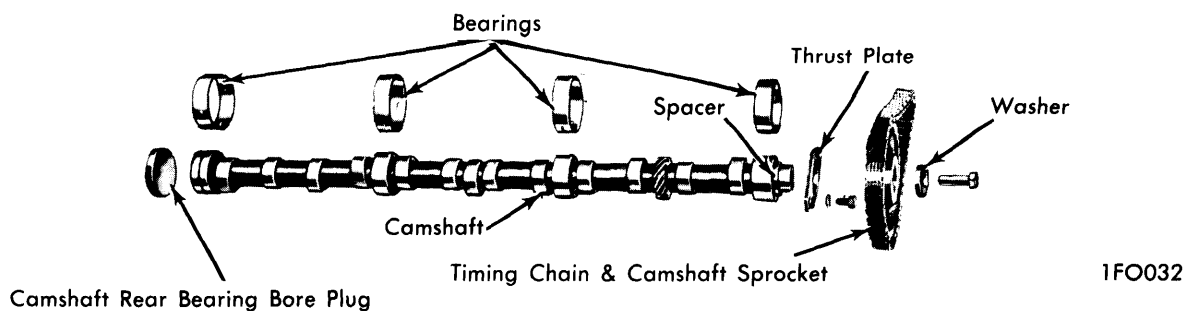
2) Install timing chain on sprockets with timing marks positioned properly (see illustration). Slide both sprockets and timing chain onto engine. Install camshaft sprocket bolt and washer. Tighten bolt and oil timing chain. Replace front cover assembly.



0FO031

TIMING GEAR ALIGNMENT MARKS, 170" & 200"

## 1965-74 170", 200", 240", 300" 6 CYL. ENGINES (Cont.)



**CAMSHAFT & RELATED PARTS, 170" & 200"**

### TIMING GEAR

**Removal & Installation, 240" & 300" w/Metal Gear** - 1) Drain cooling system and crankcase and follow procedure for Front Cover Removal. Crank engine until timing marks are aligned (see illustration). Using suitable gear puller, remove camshaft gear and crankshaft gear.

2) Ensure that key and spacer are properly installed. Align gear keyway with key and install timing gear on camshaft. Be sure that timing marks line up on camshaft and crankshaft gears. Install front cover and related parts.

**Removal & Installation, 240" & 300" w/Fiber Gear** - 1) Camshaft must be removed in order to change timing gear. Follow procedures under Camshaft Removal. Press camshaft gear off camshaft using suitable arbor press, remove thrust plate, spacer, and key.

2) Install camshaft in engine and place spacer and thrust plate on camshaft. Position camshaft gear on camshaft with timing marks aligned (see illustration). Using suitable tool (T65L-6306-A or equivalent), tighten camshaft gear to camshaft. *NOTE* - Ensure that gear and spacer are tight against shoulder on camshaft and that thrust plate can be moved freely. Install thrust plate screws and tighten. Install front cover and related parts.

### CAMSHAFT

**Removal** - 1) Drain cooling system and crankcase. Remove radiator and grille assemblies. Remove condenser attaching bolts and position to one side. *NOTE* - Do not disconnect refrigerant lines from condenser. Remove distributor, fuel pump, and oil filter. Remove cylinder head and valve lifters. Remove drive belt, fan and pulley.

2) Remove crankshaft damper, remove front cover and timing chain. Remove oil dipstick, oil pump, and inlet tube. Remove camshaft thrust plate and carefully remove camshaft by pulling toward front of engine. *CAUTION* - Exercise care to avoid damaging camshaft bearings, journals, or lobes while removing camshaft.

**Installation** - Clean oil passage at rear of cylinder block, which feeds rocker arm shaft, by blowing compressed air into opening in block. Coat camshaft lobes with Lubriplate and coat journals with engine oil. Carefully slide camshaft through bearings and install thrust plate with oil groove toward rear of engine and tighten bolts. Replace front oil seal in front cover. Reverse removal procedure.

### CAMSHAFT BEARINGS

**Removal & Installation** - Remove engine from vehicle and remove flywheel. Remove camshaft and rear bearing bore

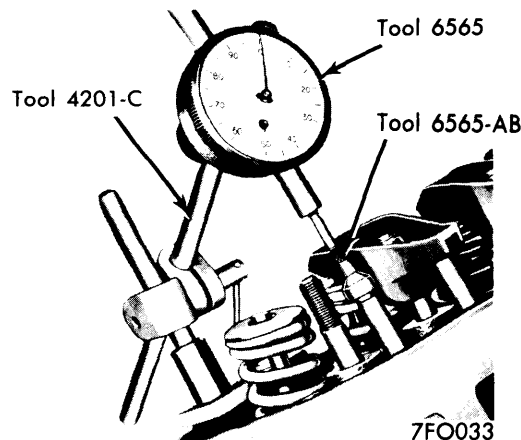
plug. Using suitable driver-puller tool (T65L-6250-A or equivalent), remove camshaft bearings. Position new bearings at bearing bores and press into place while noting the following: Oil holes in bearings must be aligned with oil holes in cylinder block. Front bearing must be installed below front face of cylinder block to following specifications, 170" & 200" engines (1965-72), .115-.125". All 240" & 300" engines (1965-73), .020-.035". All 240" & 300" engines (1974), .030-.050". Rear bearing on all 170" & 200" engines has two oil holes and must be installed 24 3/4" from face of camshaft thrust plate surface.

### CAMSHAFT END THRUST

With engine front cover removed, push camshaft toward rear of engine and install dial indicator so indicator point is on camshaft sprocket cap screw. Zero the dial indicator. Position large screwdriver between camshaft sprocket and block. Pull camshaft forward and then release. If dial indicator reading is not within specifications, replace thrust plate.

### CAM LOBE LIFT

With rocker arm shaft removed, check lift of each lobe in consecutive order. Using a suitable dial indicator, position point on end of push rod and in same plane as push rod movement. Rotate crankshaft until lifter and push rod are at lowest position and zero the indicator. Rotate crankshaft slowly until push rod is in fully raised position. Check that total lift recorded with indicator is within specifications. If lift on any lobe is below specifications, camshaft and valve lifter(s) operating on worn lobe(s) must be replaced.



**CHECKING CAMSHAFT LOBE LIFT**

# Ford Motor Co. 6 Engines

## 1965-74 170", 200", 240", 300" 6 CYL. ENGINES (Cont.)

### ENGINE OILING

Application	Crankcase Capacity	①Capacity
170" & 200"		
1965-70		②3.5 qts.
1971-72		6 qts.
240"		
1965-67		5 qts.
1968-74		③4 qts.
300" LD		
1965-74		5 qts.
300" HD		
1965-66		5 qts.
1967-72		6 qts.
1973-74		7 qts.

- ① — Add one quart when changing filter.  
 ② — Bronco 170" holds 6 qts.  
 ③ — Econoline 240" holds 5 qts.

**Oil Filter** — Replace filter at first oil change, then every second oil change after.

Application	Normal Oil Pressure	①Pressure
170" & 200"		
1965-67		35-55 psi
1968-72		35-60 psi
240" & 300"		
1965-72		35-60 psi
1973-74		40-60 psi

- ① — @2000 RPM.

**Pressure Regulator Valve** — Located in pump body. Nonadjustable.

#### ENGINE OILING SYSTEM

**170" & 200"** — Oil supply is moved by oil pump through oil filter to passages in block which supply lubrication to crankshaft and camshaft bearing surfaces. Oil then moves from rear camshaft bearing to raise up left rear head bolt to oil port at rear of rocker arm shaft on top of engine. Oil moves along rocker arm shaft and supplies oil to rocker arms, push

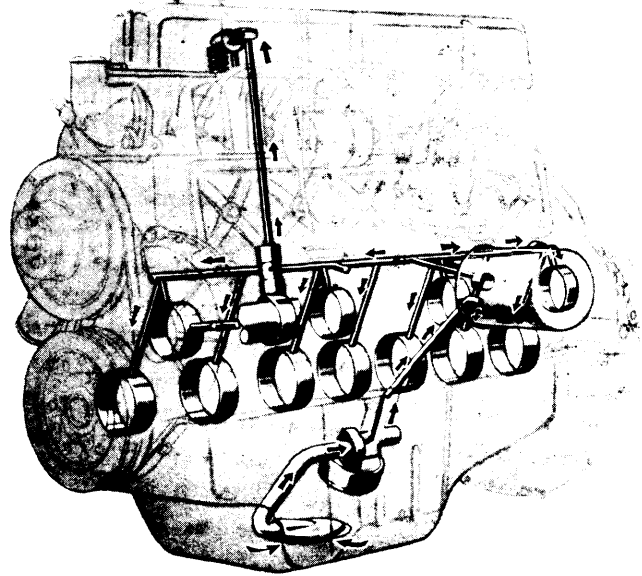
rods, and valve tips. Oil moves down push rods to oil lifters. Oil is also returned to oil pan by running off rocker arm assembly through cored openings in head and block assembly.

**240" & 300"** — Oil supply is picked up from pan by oil pump which routes oil through filter element to passages in block supplying crankshaft bearings, camshaft bearings, and lifters. Oil is moved up to top of engine by means of push rods from the lifters. Rocker arms are lubricated in this fashion. Oil is returned to pan through drain holes in head assembly leading back down to oil pan.

**Timing Chain & Gears** — Lubricated by splash method from oil pan.

**Oil Filter** — Full flow externally mounted type located on left side of engine. Filter has integral by-pass valve and anti-drain back diaphragm. Filter is disposable, throw-away type.

7FO036

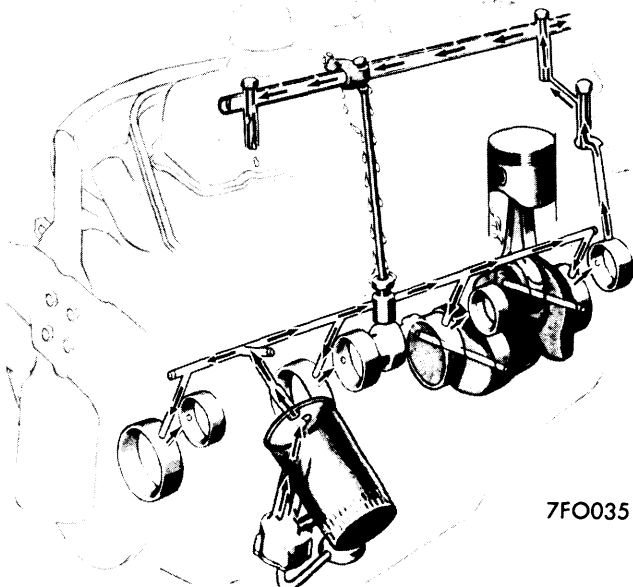


ENGINE OILING SYSTEM, 240" & 300"

#### OIL PUMP

**Removal & Disassembly** — Remove oil pan, remove attaching bolts and oil pump from engine. Remove oil inlet tube, cover attaching screws and cover. Remove inner rotor and shaft assembly, remove outer race. Drill small hole into oil pressure relief spring valve chamber cap, insert self-threading sheet metal screw into cap and pull from chamber. Remove spring and plunger.

**Inspection and Reassembly** — Clean, inspect, and oil all parts thoroughly. Install outer race and inner rotor and shaft assembly (see specifications for clearances). **NOTE** — Identification mark on rotor and on outer race both are to face bottom of pump. Inner rotor and shaft, and outer race are serviced as an assembly. Install cover and tighten cover bolts.



ENGINE OILING SYSTEM, 170" & 200"

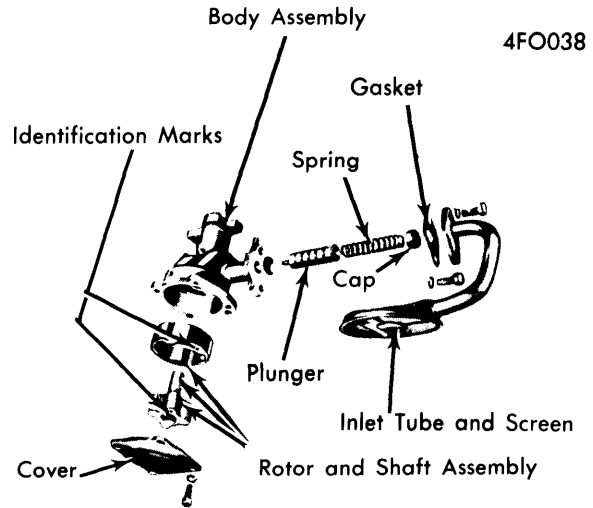
7FO035

## 1965-74 170", 200", 240", 300" 6 CYL. ENGINES (Cont.)

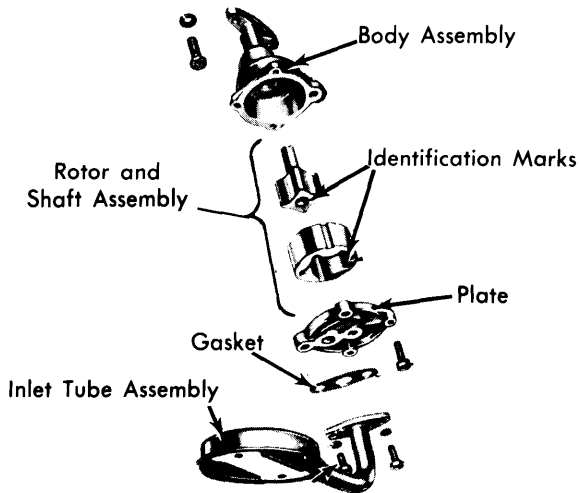
### ENGINE OILING (Cont.)

Position oil inlet tube on oil pump, install new gasket, and tighten attaching bolts. Prime oil pump by submerging inlet port in oil and rotating shaft until oil flows from outer port.

Application	Oil Pump Specifications	Specification
Relief Valve Spring Tension		
170" & 200" (1965)		8.6-9.5 Lbs.@1.078"
170" (1966-72)		9.0-10.1 Lbs.@1.078"
240" & 300" (1965-74)		20.6-22.6 Lbs.@2.490"
Shaft-to-Housing Clearance		
All Engines (1965-74)		.0015-.0029"
Relief Valve Clearance		
All Engines (1965-74)		.0015-.0029"
Rotor Assembly End Clearance		
All Engines (1965-74)		.0011-.0041"
Outer Race-to-Housing Clearance		
All Engines (1965-74)		.006-.012"



OIL PUMP ASSEMBLY, 240" & 300"



1FO037

OIL PUMP ASSEMBLY, 170" & 200"

### TIGHTENING SPECIFICATIONS (FT. LBS.)

Application	170" & 200"	240" & 300"
Cylinder Head ①	70-75	70-75
Exhaust Manifold	13-18	20-25
Oil Pan	7-9	10-12
Main Bearing Caps	60-70	60-70
Connecting Rod Caps	19-24	40-45
Vibration Damper	85-100	130-145
Camshaft Sprocket	35-45	
Camshaft Thrust Plate	12-15	19-21
Flywheel	75-85	75-85
Rocker Shaft Support	35-45	
Engine Front Cover	7-9	12-15
Water Outlet Housing	12-15	12-15
Pulley-to-Damper	35-50	35-50
Water Pump	12-15	12-15
Oil Pump	12-15	12-15

① - Tighten cylinder head bolts in three steps as follows:  
Step 1 - 55 ft. lbs. Step 2 - 65 ft. lbs. Step 3 - 70-75 ft. lbs.