

Ford Motor Co. 6 Engines

1965-73 170", 200", 240", 250" 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	9.2-1	4.00"	3.18"
1966	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.	155@4200	239@2200	9.2-1	4.00"	3.18"
1967	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"	3.13"
	240"	1-Bbl.	155@4200	239@2200	9.2-1	4.00"	3.18"
1968	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"	3.13"
	240"	1-Bbl.	150@4000	234@2200	9.2-1	4.00"	3.18"
	Police & Taxi	1-Bbl.	155@4200	239@2200	9.2-1	4.00"	3.18"
1969	170"	1-Bbl.	105@4400	158@2400	9.1-1	3.50"	2.94"
	200"	1-Bbl.	120@4400	190@2400	8.1-1	3.68"	3.126"
	250"	1-Bbl.	155@4000	240@1600	9.0-1	3.68"	3.91"
	240"	1-Bbl.	150@4000	234@2200	9.2-1	4.00"	3.18"
	Police & Taxi	1-Bbl.	155@4200	239@2200	9.2-1	4.00"	3.18"
1970	170"	1-Bbl.	105@4400	158@2400	9.1-1	3.50"	2.94"
	200"	1-Bbl.	120@4400	190@2400	8.1-1	3.68"	3.13"
	240"	1-Bbl.	150@4000	234@2200	9.2-1	4.00"	3.18"
	Police & Taxi	1-Bbl.	155@4200	239@2200	9.2-1	4.00"	3.18"
	250"	1-Bbl.	155@4400	240@1600	9.1-1	3.68"	3.91"
1971	170"	1-Bbl.	100@4200	148@2600	8.7-1	3.50"	2.94"
	200"	1-Bbl.	115@4000	180@2200	8.7-1	3.68"	3.13"
	240"	1-Bbl.	140@4000	230@2200	8.9-1	4.00"	3.18"
	250"	1-Bbl.	145@4000	232@1600	9.0-1	3.68"	3.91"
1972	170"	1-Bbl.	82@4400	129@1800	8.3-1	3.50"	2.94"
	200"	1-Bbl.	91@4000	154@2200	8.3-1	3.68"	3.13"
	240"	1-Bbl.	103@3800	170@2200	8.5-1	4.00"	3.18"
	250"	1-Bbl.	98@3600	183@1600	8.0-1	3.68"	3.91"
1973	200"	1-Bbl.	.....	.....	.....	3.68"	3.13"
	250"	1-Bbl.	.....	.....	.....	3.68"	3.91"

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

MODEL IDENTIFICATION

ENGINE IDENTIFICATION

1965-67 - Serial Number or Vehicle Warranty Number is stamped on patent plate attached to left front door hinge pillar post. Number includes identification data as follows:

5H01S800001

- First Digit** - Model Year.
- Second Digit** - Assembly Plant.
- Third & Fourth Digits** - Body Series.
- Fifth Digit** - Engine Displacement (See *Engine Code Designations*).
- Remaining Digits** - Vehicle Unit Number.

Engine Code Designations

Engine	Code Letters	
	Standard Compression	Low Compression
144".....	S.....	D, K, 2
170".....	U.....	E, R, 4
200".....	T.....	2
240".....	V.....	5

1968 - Same as 1967 except code letters are as follows:

Engine	Code Letter
170" (Standard Compression).....	U
200" (Standard Compression).....	T
200" (Low Compression).....	2
240" (Standard Compression).....	V
240" (Low Compression).....	5
240" (Taxi).....	E
240" (Police).....	B

1965-73 170", 200", 240", 250" 6 CYL. ENGINES (Cont.)

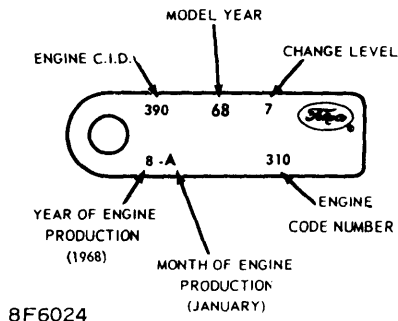
1969-73 — Identification of engine may be established by the fifth digit of the Vehicle Warranty Plate identification number, attached to rear face of left front door. 1970-73 Vehicle Identification Number also appears on a tab attached to instrument panel and visible from outside of car. Engine code designations are as follows:

1969-70

Engine	Code Letter
170".....	U
200".....	T
200" (Low Compression)	2
240".....	V
240" (Low Compression)	5
240" (Police)	B
240" (Taxi)	E
250".....	L
250" (Low Compression)	3

1971-73

Engine	Code Letters
170".....	U
200".....	T
200" (Low Compression)	2
240".....	V
240" (Police)	B
240" (Taxi).....	E
250".....	L
250" (Low Compression)	3



ENGINE IDENTIFICATION TAG

Engine Identification Tag — On cars built after early January 1964, an engine identification tag is attached under coil-to-engine attaching bolt.

SPECIAL ENGINE MARKS

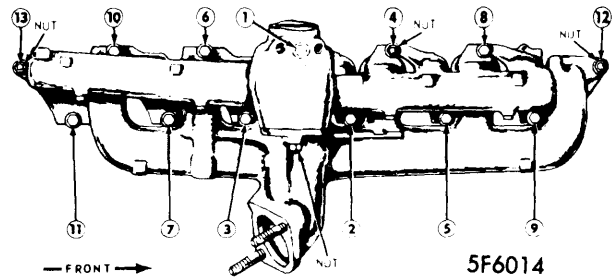
Engines with undersize crankshaft journals are identified by the following marks on cylinder block date stamp pad.

- .010" Undersize rod journals P
- .010" Undersize main journals M

ENGINE REMOVAL

See *Engine Removal at end of ENGINE Section.*

▶ **INTAKE MANIFOLD INSTALLATION NOTE:** Install intake manifold nuts and tighten to specifications, then run engine to normal operating temperature, and retorque to specifications.



240" ENGINE INTAKE & EXHAUST MANIFOLD TIGHTENING SEQUENCE

CYLINDER HEAD

Removal — 1) Drain cooling system and disconnect upper radiator hose at engine. Disconnect muffler inlet pipe and remove gasket.

2) Disconnect accelerator retracting spring and accelerator rod from carburetor. Disconnect accelerator kickdown rod and linkage at bellcrank assembly.

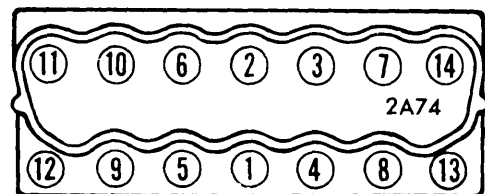
3) Disconnect fuel lines and distributor vacuum lines.

4) Disconnect all wires and remove crankcase ventilation system. Remove rocker cover, rocker arm shaft, and push rods.

5) Remove cylinder head bolts and cylinder head.

Installation — 1) Clean all old gasket material from cylinder head and block. Apply head gasket sealer to both sides of new steel gasket. **NOTE** — When installing composition gaskets, no sealer is used.

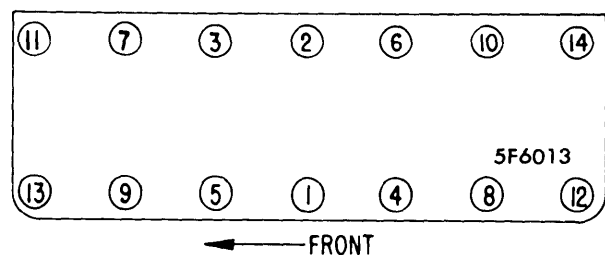
2) Position head gasket on block and install cylinder head. Install bolts and tighten in three steps to specification. Use tightening sequence shown in illustration.



170", 200" & 250" ENGINES CYLINDER HEAD TIGHTENING SEQUENCE

Cylinder Head Tightening (Ft. Lbs.)

Engine	Step 1	Step 2	Step 3
All.....	55.....	65.....	75



240" ENGINE CYLINDER HEAD TIGHTENING SEQUENCE

Ford Motor Co. 6 Engines

1965-73 170", 200", 240", 250" 6 CYL. ENGINES (Cont.)

VALVES								
Engine & Valve	Head Diam.	Face Angle	Seat Angle	Seat Width	Stem Diameter	Stem Clearance	Valve Lift	
170" & 200" 1965	Int.	1.650"	44°	45°	.070-.080"	.3100-.3107"	.0008-.0025"	.....
	Exh.	1.389"	44°	45°	.070-.080"	.3090-.3097"	.0018-.0035"	.....
1966-67	Int.	1.650"	44°	45°	.070-.080"	.3100-.3107"	.0008-.0025"	.348"①
	Exh.	1.389"	44°	45°	.070-.080"	.3098-.3105"	.0010-.0027"	.348"①
1968-69	Int.	1.650"	44°	45°	.040-.060"	.3100-.3107"	.0008-.0025"	.348"
	Exh.	1.389"	44°	45°	.070-.090"	.3098-.3105"	.0010-.0027"	.348"
1970-73	Int.	1.650"	44°	45°	.060-.080"	.3100-.3107"	.0008-.0025"	.348"
	Exh.	1.389"	44°	45°	.070-.090"	.3098-.3105"	.0010-.0027"	.348"
240" 1965-66	Int.	1.780"	44°	45°	.060-.080"	.3416-.3423"	.0010-.0027"	.376"
	Exh.	1.560"	44°	45°	.070-.090"	.3416-.3423"	.0010-.0027"	.400"
1967-69	Int.	1.780"	44°	45°	.060-.080"	.3416-.3423"	.0010-.0027"	.376"
	Exh.	1.560"	44°	45°	.080-.090"	.3416-.3423"	.0010-.0027"	.400"
1970	Int.	1.780"	44°	45°	.060-.080"	.3416-.3423"	.0010-.0027"	.376"②
	Exh.	1.560"	44°	45°	.070-.090"	.3416-.3423"	.0010-.0027"	.400"
250" 1969	Int.	1.650"	44°	45°	.040-.060"	.3100-.3107"	.0008-.0025"	.368"
	Exh.	1.388"	44°	45°	.070-.090"	.3098-.3105"	.0010-.0027"	.368"
1970-73	Int.	1.650"	44°	45°	.060-.080"	.3100-.3107"	.0008-.0025"	.368"③
	Exh.	1.388"	44°	45°	.070-.090"	.3098-.3105"	.0010-.0027"	.368"④

- ① - 200" Engine .3675".
- ② - 1972 .400".
- ③ - Calif. .379".
- ④ - Calif. .348".

VALVE STEM OIL SEALS

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

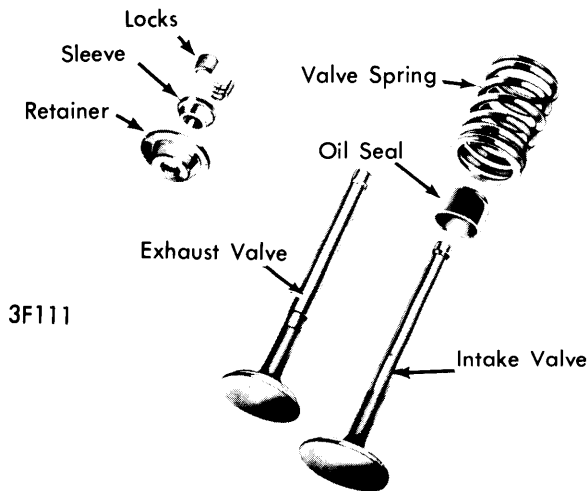
VALVE ARRANGEMENT

All (Exc. 240") - E-I-E-I-E-I-E-I-E-I-E

240" - E-I-E-I-E-I-E-I-E-I-E

VALVE GUIDE SERVICING

To ream guides for installation of valves with oversize stems, always use reamers in sequence and reface valve seat after guide is reamed. Reamers are furnished .003" oversize with standard diameter pilot; .015" oversize reamer with .003" oversize pilot; and .030" oversize reamer with .015" oversize pilot.



VALVE ASSEMBLY

VALVE SPRINGS

Engine	Free Length	PRESSURE (LBS.)	
		Valve Closed	Valve Open
170", 200", 250" 1965-69 1970-72	1.79"	51-57@1.590"	142-159@1.22"
	1.79"	51-57@1.590"	142-159@1.22"
	1.79"	51-57@1.590"	142-159@1.22"
200" 1973 Int. Exh.	.....	55-61@1.58"	143-149@1.20"
	.....	53-60@1.58"	150-156@1.21"
250" 1973 Int. Exh.	.....	55-61@1.58"	143-149@1.20"
	.....	60-66@1.55"	146-152@1.18"
240" 1965-69 1970-71 1972	1.99"	76-84@1.700"	180-200@1.325"
	1.99"	78-84@1.700"	187-207@1.300"
	1.99"	78-84@1.700"	187-207@1.300"
	1.99"	78-84@1.700"	187-207@1.300"
240" Police & Taxi 1968-69 Int. Exh.	1.99"	76-84@1.700"	187-207@1.300"
	1.87"	77-85@1.580"	187-202@1.300"
1970-71 Int. Exh.	1.99"	76-84@1.700"	187-207@1.300"
	1.87"	77-85@1.580"	182-202@1.180"
1972 Int. Exh.	1.99"	76-84@1.700"	187-207@1.300"
	1.87"	77-85@1.580"	182-202@1.180"

1965-73 170", 200", 240", 250" 6 CYL. ENGINES (Cont.)

VALVE SPRING INSTALLATION

Valve spring ends must be square within 1/16". Install springs with damper (closed) coil end downward. Installed height of springs (measured from spring contact area on head to underside of spring retainer) should be as specified in table below. If height greater than maximum allowable, install .030" spacers as necessary to meet specifications. **NOTE - To avoid overstressing springs and overloading camshaft lobes, DO NOT install more than 2 spacers under each spring.**

Valve Spring Installed Height

1965-69

Engine	Height
170", 200", 250".....	1 9/16-1 39/64"
240".....	1 35/64-1 39/64"
240" Police & Taxi.....	1 43/64-1 47/64"

1970-72

Engine	Height
170", 200", 250".....	1 9/16-1 5/8"
240".....	1 21/32-1 39/64"
240" Police & Taxi.....	1 17/32-1 19/32"

1973

Engine	Height
200" & 250".....	1 9/16-1 19/32"

Conventional Type

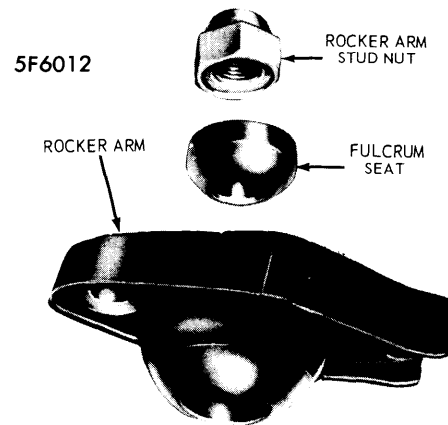
170", 200", 250" Engines

See illustration for arrangement of parts. End plugs must have cup side facing out, and oil holes in shaft must be facing downward. When installing, make sure that inlet line "O" ring seals are in place, and that support end of outlet pipe enters location hole in shaft to position shaft properly.

240" Engine

Apply Lubriplate to top of valve stem and at pushrod guide in cylinder head, then install rocker arm, fulcrum seat and stud nut. Adjust valve clearance (see "Hydraulic Lifter Operating Range Adjustment").

► **ROCKER ARM ADJUSTING SCREW NOTE:** If torque required to turn self-adjusting screw is less than 3 ft. lbs., install new standard or .002" oversize screw. If minimum 7 ft. lbs. torque cannot be obtained with oversize adjusting screw, replace rocker arm and adjusting screw assembly.



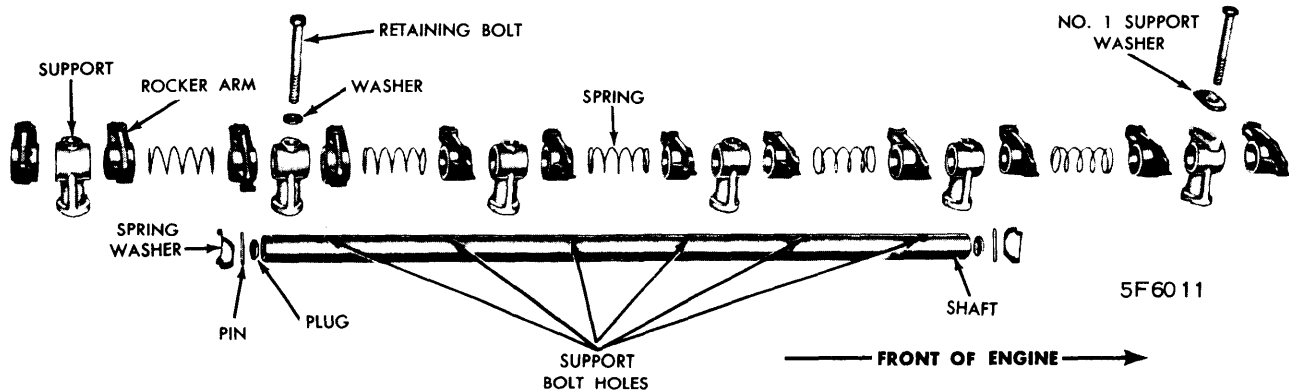
240" ENGINE ROCKER ASSEMBLY

ROCKER ARM ASSEMBLY OVERHAUL

► **1965 (LATE) & 1966-67 240" ENGINE ROCKER ARM STUD REPLACEMENT NOTE:** Longer press-in type studs (2.60") are available in three diameters for replacement. Standard size has no identification marks; .006" oversize has a .070" deep drill point in pilot end of stud; .015" oversize has a step in stud diameter approximately 1 1/8" from pilot end. **NOTE - New threaded type studs for high performance engines are also longer (early type are 2.38", later type are 2.50").** To install longer type studs, use Tool T65P-6A527-A.

HYDRAULIC LIFTERS

Lifters should be serviced as assemblies only; their parts are not interchangeable. 240" Engine uses 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 1/16" plunger travel. Use lifter tester according to directions of manufacturer.

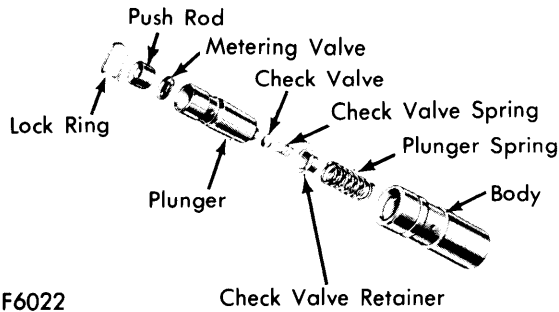


170", 200", 250" ENGINES ROCKER ARM AND SHAFT ASSEMBLY

Ford Motor Co. 6 Engines

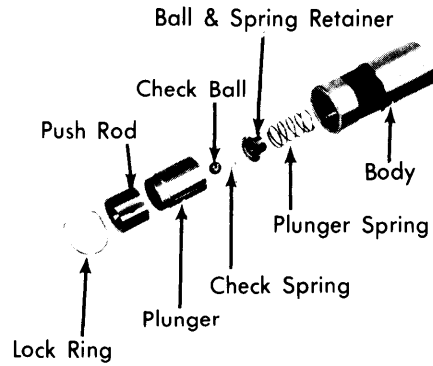
1965-73 170", 200", 240", 250" 6 CYL. ENGINES (Cont.)

► **NOISY HYDRAULIC LIFTERS CORRECTION:** This may be caused by carburetor air cleaner element being restricted by oil vapor causing crankcase dilution due to over-rich air-fuel ratio. Renew air cleaner, change oil, install carburetor vent lever C3AZ-9D585-B. **NOTE - oil filler caps with more than 1 air hole must not be used on cars with Closed Crankcase Ventilation.**



8F6022

VALVE LIFTER ASSEMBLY, TYPE 1



8F6023

VALVE LIFTER ASSEMBLY, TYPE 2

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-.055"	Snug Fit
1966	.0014-.002"	.0003-.0005"	Press Fit	1	.010-.020"	.0009-.0026"
				2	.010-.020"	.002-.004"
				3	.015-.055"	Snug Fit
1967	.0014-.002"	.0003-.0005"	Press Fit	1	.010-.020"	.0019-.0036"
				2	.010-.020"	.002-.004"
				3	.015-.055"	Snug Fit
1968-69	.0014-.002"	.0003-.0005"	Press Fit	1	.010-.020"	.002-.004"
				2	.010-.020"	.002-.004"
				3	.015-.055"	Snug Fit
1970-72	.0013-.0021"	.0003-.0005"	Press Fit	1	.010-.020"	.002-.004"
				2	.010-.020"	.002-.004"
				3	.015-.020"	Snug Fit
200" 1965	.002-.0026"	.0003-.0005"	Press Fit	1	.010-.020"	.0019-.0036"
				2	.010-.020"	.002-.004"
				3	.015-.055"	Snug Fit
1966-67	.0014-.002"	.0003-.0005"	Press Fit	1	.010-.020"	.002-.004"
				2	.010-.020"	.002-.004"
				3	.015-.055"	Snug Fit
1968-69	.0014-.002"	.0003-.0005"	Press Fit	1	.010-.020"	.002-.004"
				2	.010-.020"	.002-.004"
				3	.015-.055"	Snug Fit
1970-72	.0013-.0021"	.0003-.0005"	Press Fit	1	.010-.020"	.002-.004"
				2	.010-.020"	.002-.004"
				3	.015-.055"	Snug Fit
1973	.0013-.0021"	.0003-.0005"	Press Fit	1	.008-.016"	.002-.004"
				2	.008-.016"	.002-.004"
				3	.015-.055"	Snug

1965-73 170", 200", 240", 250" 6 CYL. ENGINES (Cont.)

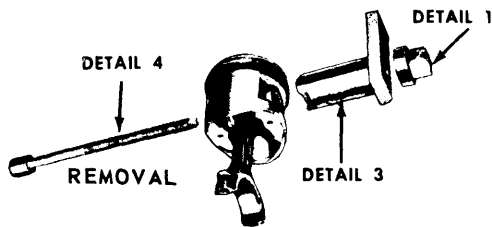
PISTONS, PINS, RINGS						
Engine	PISTONS	PINS		RINGS		
	Clearance	Piston Fit	Rod Fit	Rings	End Gap	Side Clearance
240" 1965	.0014-.0022"	.0001-.0003"	Press Fit	1	.010-.020"	.0019-.0036"
				2	.010-.020"	.002-.004"
				3	.015-.055"	Snug Fit
1966	.0014-.0022"	.0002-.0004"	Press Fit	1	.010-.020"	.0019-.0036"
				2	.010-.020"	.002-.004"
				3	.015-.055"	Snug Fit
1967	.0014-.0022"	.0002-.0004"	Press Fit	1	.010-.020"	.0019-.0036"
				2	.010-.020"	.002-.004"
				3	.015-.055"	Snug Fit
1968-72	.0014-.0022"	.0002-.0004"	Press Fit	1	.010-.020"	.002-.004"
				2	.010-.020"	.002-.004"
				3	.015-.055"	Snug Fit
250" 1969	.0014-.002"	.0003-.0005"	Press Fit	1	.010-.020"	.002-.004"
				2	.010-.020"	.002-.004"
				3	.015-.055"	Snug Fit
1970-72	.0013-.0021"	.0003-.0005"	Press Fit	1	.010-.020"	.002-.004"
				2	.010-.020"	.002-.004"
				3	.015-.055"	Snug Fit
1973	.0013-.0021"	.0003-.0005"	Press Fit	1	.008-.016"	.002-.004"
				2	.008-.016"	.002-.004"
				3	.015-.055"	Snug

PISTON PIN REPLACEMENT

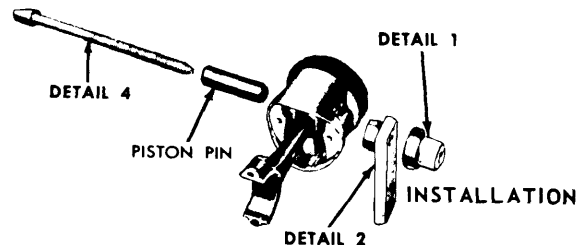
► **TOOL T60K-6135-A MODIFICATION NOTE:** If tool not previously modified to prevent damage to piston, make following modifications so piston will not be damaged when Detail 2 of tool seats against piston pin boss: Grind a 1/16" - 45° chamfer around outer edge of Detail 2.

Removal - Press pin out of piston and connecting rod using Tool T60K-6135-A and vise and wrench, or Tool 6135-J and arbor press, as shown in illustrations.

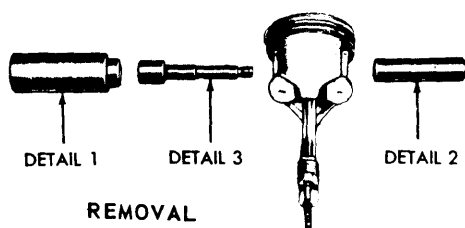
Installation - Lightly coat all parts with engine oil, assemble piston and connecting rod correctly and press pin into piston and rod as follows: 1) With Tool T60K-6135-A and vise and wrench, draw pin into assembly until pin seats in Detail 2. 2) With Tool 6135-J and arbor press, press pin into assembly until Detail 2 is firmly seated in Detail 1. See illustrations.



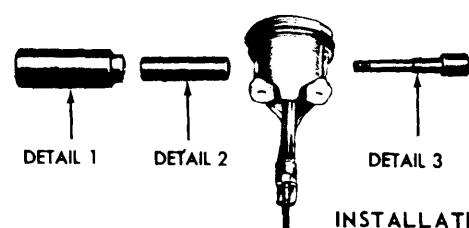
3F110



PISTON PIN REPLACEMENT (VISE & WRENCH METHOD)



3F109



PISTON PIN REPLACEMENT (ARBOR PRESS METHOD)

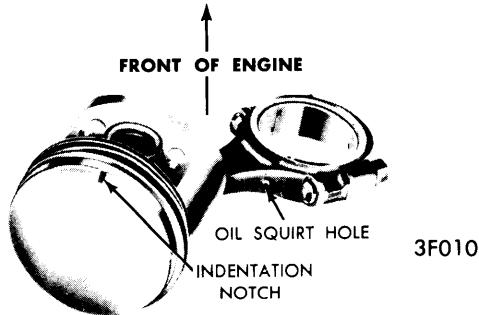
Ford Motor Co. 6 Engines

1965-73 170", 200", 240", 250" 6 CYL. ENGINES (Cont.)

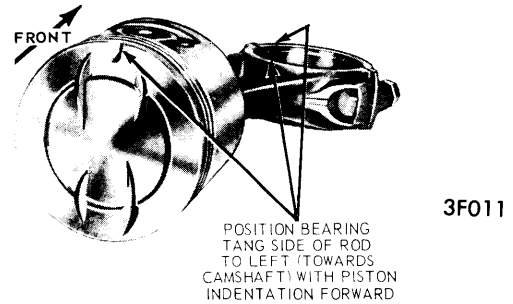
FITTING PISTONS

Measure cylinder bore at right angle to engine centerline two inches below head surface to nearest ten thousandth

of an inch. Select piston to give specified clearance (see "Pistons, Pins, Rings" table) by measuring piston diameter at right angle to piston pin centerline, and at piston pin centerline height. **NOTE** - Cylinder bore taper should not exceed .001".



170", 200", 250" PISTON & ROD ASSEMBLY



240" PISTON & ROD ASSEMBLY

CRANKSHAFT MAIN & CONNECTING ROD BEARINGS							
Engine	MAIN BEARINGS				CONNECTING ROD BEARINGS		
	Journal Diam.	Clearance	Thrust Bearing	Crankshaft Endplay	Journal Diam.	Clearance	Sideplay
170"							
1965	2.2482-2.2490"	.0007-.0026"	No.3	.004-.008"	2.1232-2.1240"	.0006-.0022"	.0035-.0105"
1966-69	2.2482-2.2490"	.0005-.0015"	No.3	.004-.008"	2.1232-2.1240"	.0008-.0015"	.0035-.0105"
1970-71	2.2482-2.2490"	.0005-.0015"	No.3	.004-.008"	2.1232-2.1240"	.0008-.0024"	.0035-.0105"
1972	2.2482-2.2490"	.001-.0015"	No.3	.004-.008"	2.1232-2.1240"	.0007-.0023"	.0035-.0105"
200"							
1965	2.2482-2.2490"	.0007-.0026"	No.5	.004-.008"	2.1232-2.1240"	.0006-.0022"	.0035-.0105"
1966-69	2.2482-2.2490"	.0005-.0015"	No.5	.004-.008"	2.1232-2.1240"	.0006-.0022"	.0035-.0105"
1970-71	2.2482-2.2490"	.0005-.0015"	No.5	.004-.008"	2.1232-2.1240"	.0008-.0024"	.0035-.0105"
1972	2.2482-2.2490"	.0008-.0024"	No.5	.004-.008"	2.1232-2.1240"	.0007-.0023"	.0035-.0105"
1973	2.2482-2.2490"	.0008-.0024"	No.5	.004-.008"	2.1232-2.1240"	.0008-.0024"	.0035-.0105"
240"							
1965	2.2482-2.2490"	.0007-.0026"	No.5	.004-.008"	2.1232-2.1236"	.0006-.0022"	.0035-.0105"
1966-67	2.2482-2.2490"	.0005-.0015"	No.5	.004-.008"	2.1228-2.1236"	.0008-.0024"	.006-.013"
1968-71	2.3982-2.3990"	.0005-.0015"	No.5	.004-.008"	2.1228-2.1236"	.0008-.0015"	.006-.013"
1972	2.3982-2.3990"	.0005-.0022"	No.5	.004-.008"	2.1228-2.1236"	.0008-.0026"	.006-.013"
250"							
1969-71	2.3982-2.3990"	.0005-.0015"	No.5	.004-.008"	2.1232-2.1240"	.0008-.0024"	.0035-.0105"
1972	2.3982-2.3990"	.0008-.0024"	No.5	.004-.008"	2.1232-2.1240"	.0007-.0023"	.0035-.0105"
1973	2.3983-2.3990"	.0008-.0024"	No.5	.004-.008"	2.1232-2.1240"	.0008-.0024"	.0035-.0105"

OIL PAN REMOVAL

See Oil Pan Removal at end of ENGINE Section.

MAIN BEARINGS

Installation - Be sure that all bearing caps are installed in their original location. Coat rear mating surface of rear main bearing cap with oil resistant sealer. **NOTE** - Do not use sealer forward of oil slinger groove.

If bearing clearance using standard size bearing inserts is excessive, a .001" or .002" undersize bearing half may be used in combination with a standard size bearing half. If .002" undersized bearings are used on more than one journal, they may be

positioned in the cylinder block rather than in the bearing cap. If standard and .002" undersize combination do not bring bearing clearance within specified limits, the crankshaft will have to be refinished and undersize bearings installed.

THRUST BEARING ALIGNMENT

Install all bearing caps except thrust bearing cap and torque to specifications. Install thrust bearing cap with bolts finger tight. Pry crankshaft to front of engine; pry thrust bearing cap to rear of engine. While holding crankshaft forward, tighten thrust bearing cap bolts to specifications. Check crankshaft end play.

1965-73 170", 200", 240", 250" 6 CYL. ENGINES (Cont.)

REAR MAIN BEARING OIL SEAL

Upper and lower seals may be installed without removing crankshaft as follows:

- 1) Remove main bearing cap. Loosen remaining bearing caps allowing crankshaft to drop down slightly.
- 2) Remove old seals and clean seal groove in cylinder block and cap.

NOTE - Prior to installing new type seal, the crankshaft rear oil seal pin must be removed from bearing cap and discarded.

- 3) Dip halves into clean oil. Install upper seal in groove with under cut side of seal towards front of engine. Allow approximately 3/8" to protrude below parting surface.

CAUTION - Make sure that no rubber is shaved from outside of seal.

- 4) Apply sealer to parting faces of cap and block.
- 5) Install lower seal in bearing cap with under cut side toward front of engine. Allow approximately 3/8" to protrude above parting surface.
- 6) Install cap and tighten to specified torque.

ENGINE FRONT COVER

Removal - Drain crankcase and cooling system. Remove radiator, fan, belt, pulley, water pump, damper and oil pan. Remove front cover.

ENGINE FRONT COVER OIL SEAL

Remove old seal with punch and clean recess in cover. Drive new seal in cover with tool listed in table below until seal is fully seated and make sure spring is positioned properly in seal.

FLYWHEEL INSTALLATION

Flywheel attaching bolt holes in crankshaft flange are drilled through flange. Flywheel retaining capscrews must be coated with oil resistant sealer to prevent engine oil leak at this location (may be diagnosed as a rear oil seal leak).

CAMSHAFT

Removal - Remove radiator and grille. Remove A/C condenser if equipped. **NOTE** - Do not disconnect refrigerant lines. Remove distributor, fuel pump and oil filter. Remove cylinder head and valve lifters. Loosen and remove drive belt, fan and pulley. Using suitable tool (T58P-6316-B), remove crankshaft damper. Remove oil dipstick, oil pan, oil pump and inlet tube assembly. Remove cylinder front cover and gasket. Remove timing chain and sprockets, camshaft thrust plate and carefully remove camshaft.

CAMSHAFT BEARING REPLACEMENT

► **CAMSHAFT BEARING INSTALLATION CAUTION:** When installing bearings, special care must be taken to align oil holes in bearings with drilled oil passages in cylinder block bearing bore. Also, bearings with 2 holes provide lubrication to valve system and extensive engine damage would result if these holes were blocked. **DO NOT** install any bearing with 1 hole in a 2-hole bearing position.

CHECKING CAM LOBE LIFT

Check with dial indicator to specifications listed in "Valves" table.

CAMSHAFT END THRUST

Taken by thrust plate and spacer located behind camshaft sprocket.

VALVE TIMING

See illustration for alignment of sprocket marks. See "Cam Lobe Lift" in "Valves" table to check cam lobe wear.

170", 200", 250" Engines - Turn shaft so No. 1 piston is on TDC after compression stroke and check the valve clearance of the valves shown in Table 1 as follows: Use a suitable tool and apply pressure to push rod end of rocker arm to slowly bleed down the valve lifter until plunger is completely bottomed. Hold lifter in this position and check the clearance between rocker arm and valve stem tip with a feeler gauge. If clearance is less than .066", install an undersize pushrod. If clearance is greater than .216", install an oversize pushrod. After checking all valves listed in Table 1, turn crankshaft so No. 6 piston is on TDC after compression stroke and check clearance on the valves shown in Table 2.

Table 1

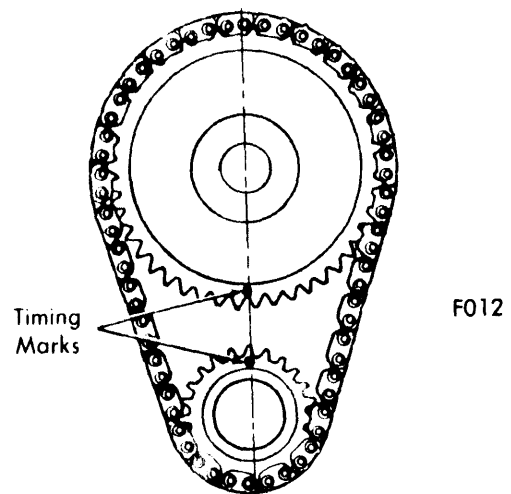
No. 1 Int.	No. 3 Exh.
No. 1 Exh.	No. 4 Int.
No. 2 Int.	No. 5 Exh.

Table 2

No. 2 Exh.	No. 5 Int.
No. 3 Int.	No. 6 Int.
No. 4 Exh.	No. 6 Exh.

CAMSHAFT			
Engine	Journal Diam.	Clearance	Lobe Lift
170" 1965-72	1.8095-1.8105"	.001-.003"	.232"
200" 1965-72 1973	1.8095-1.8105" 1.8095-1.8105"	.001-.003" .001-.003"	.245" .232"
250" 1969-72 1973	1.8095-1.8105" 1.8095-1.8105"	.001-.003" .001-.003"	.232" .245"
240" 1965-72 1973	2.017-2.018" 2.017-2.018"	.001-.003" .001-.003"	①.233" .249"

① - Exhaust .249".



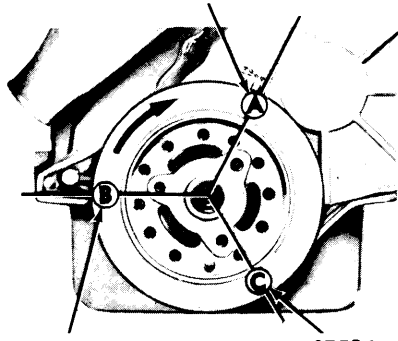
170", 200", 250" VALVE TIMING MARKS

1965-73 170", 200", 240", 250" 6 CYL. ENGINES (Cont.)

240" Engine - Make two chalk marks approximately 120° apart so that with the timing mark, the damper is divided into three equal parts. Rotate crankshaft until No. 1 piston is on TDC at the end of the compression stroke. **NOTE** - Before proceeding further, check the torque required to turn each rocker arm stud nut in a counter-clockwise direction. If the required torque is not within the limits of 4.5 to 15 ft. lbs. replace stud nut. If torque is still not within specifications, replace stud. Loosen

STEP 1-SET NO. 1 PISTON ON T.D.C. 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

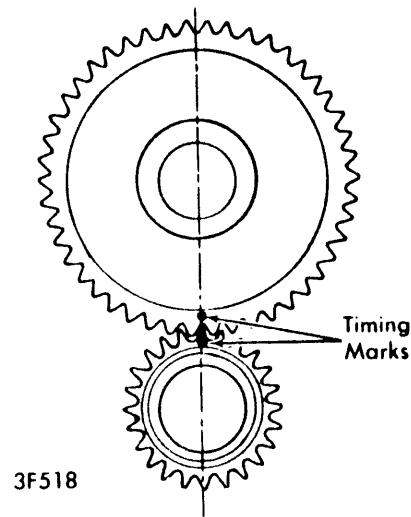
STEP 5-ADJUST NO. 2 INTAKE AND EXHAUST

5F6016

STEP 3-ADJUST NO. 3 INTAKE AND EXHAUST

STEP 6-ADJUST NO. 4 INTAKE AND EXHAUST

stud nuts of both valves of No. 1 cylinder until there is end clearance in the pushrod, then tighten stud nut just to remove all pushrod to rocker arm clearance (determine by rotating pushrod with fingers as stud nut is tightened). With end clearance completely eliminated, tighten stud nut an additional 3/4 turn (supersedes previous setting of 1 1/2 turns) to place lifter plunger in center of its travel. Repeat this procedure for the remaining sets of valves, turning the crankshaft 1/3 of a turn at a time, in the direction of rotation, while adjusting the valves in the firing order sequence (1-5-3-6-2-4). **NOTE** - This procedure requires two complete turns of crankshaft.



3F518

240" LIFTER OPERATING RANGE ADJUSTMENT

240" VALVE TIMING MARKS

ENGINE OILING

Crankcase Capacity - 3 1/2 quarts (except 240"); 4 quarts (240"). Add one quart with filter change.

Replacing Oil Filter - Disposable Type - Replace every 6000 miles. To install, coat gasket face of filter with oil, thread filter on bracket by hand until gasket contacts adapter surface, then tighten filter an additional 1/2 turn. Do not overtighten. Operate engine and check for leaks.

Normal Oil Pressure - 35-55 lbs. at 2000 RPM (Hot).

Pressure Regulator Valve - In pump body. Not adjustable.

bolt to hollow rocker arm shaft, and is distributed to each rocker arm for rocker arm, pushrod, and valve tip lubrication. Excess oil is discharged from rocker arm shaft at front shaft bracket. Oil from rocker chamber runs down pushrods to lubricate pushrod seat and lifter and drains back into the oil pan through cored openings in the block.

Oil Filter - Full flow type. Mounted externally on left front corner of engine. Filter has integral bypass valve and anti-drain back diaphragm.

ENGINE OILING SYSTEM

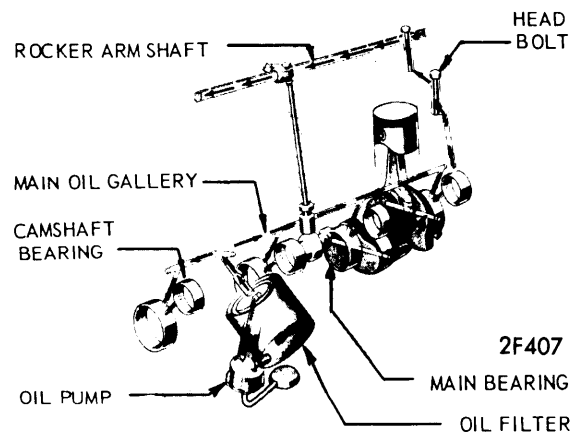
170", 200", 250" Engines

Force feed type. Rotor type oil pump used. See illustration and note the following:

Hydraulic Lifters - Lubricated directly from main oil gallery.

Timing Chain & Sprockets - Lubricated by splash from oil pan.

Rocker Arms, Pushrods & Valve Stems - Oil from Lower hole in rear camshaft bearing flows around grooved rear camshaft journal and out through upper hole in rear camshaft bearing through vertical passage in block and around left rear corner cylinder head bolt to oil port at rear rocker arm shaft bracket pad. Oil then flows around this bracket



170", 200", 250" ENGINES OILING SYSTEM

1965-73 170", 200", 240", 250" 6 CYL. ENGINES (Cont.)

ENGINE OILING (Cont.)

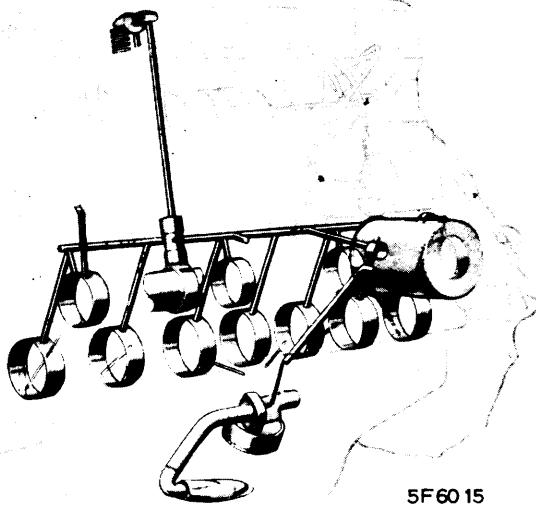
240" Engine

Force feed type with a rotor type oil pump. See illustration and note the following:

Hydraulic Lifters – Lubricated directly from main oil gallery.

Timing Chain & Sprockets – Lubricated by squirt hole in main oil gallery at front of cylinder block.

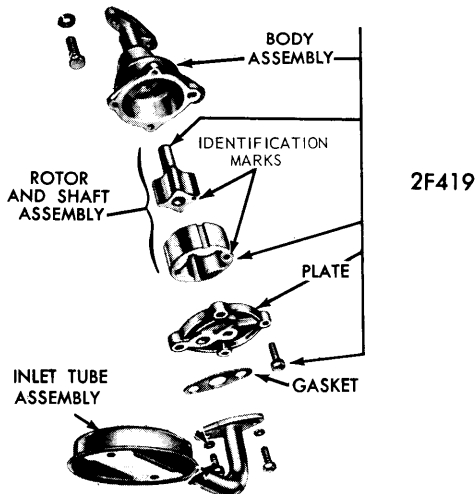
Rocker Arms, Pushrods & Valve Stems – Oil is metered through hydraulic lifter disc then through the oil passages in the pushrod cup and up the hollow pushrod. In this position, the drilled hole in the ball end of the pushrod is indexed with a drilled hole in rocker arm, lubricating the upper valve train bearing areas.



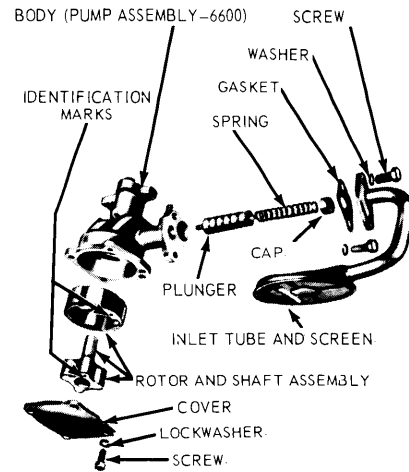
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240" ENGINE OILING SYSTEM

OIL PUMP

Rotor type used on all engines. See illustrations for arrangement of parts. Pump cover screw torque is 6-9 ft. lbs.



2F419
170", 200", 250" ENGINES OIL PUMP



5F6019
240" ENGINE OIL PUMP

Oil Pump Specifications (All Engines)

Outer Race-to-Housing .....	.006-.012"
Rotor Endplay .....	.0011-.0041"
Shaft-to-Housing .....	.0015-.0029"
Relief Valve-to-Bore .....	.0015-.0029"

TIGHTENING SPECIFICATIONS (Ft. Lbs.)

Application	170", 200", 250"	240"
Cylinder Head	70-75	70-75
Intake Manifold (1965-66)	20-25	20-25
(1967-73)	23-28	23-28
Exhaust Manifold (1965-66)	13-18	20-25
(1967-73)	13-18	23-28
Oil Pan (1965-68)	7-9	10-12
(1968-71)	7-9	7-9
(1972-73)	7-9	10-12
Main Bearing Caps	60-70	60-70
Connecting Rod Caps	19-24	40-45
(1969-73 250")	21-26	.....
Vibration Damper (1965-66)	85-100	130-145
(1967-73)	85-100	130-150
Camshaft Sprocket	35-45	35-45
Camshaft Thrust Plate	12-15	19-21
Flywheel	75-85	75-85
Rocker Arm Cover (1965)	3-5	8-11
(1966-73)	3-5	7-9
Engine Front Cover	7-9	15-20
(1968-72 250")	12-15	.....
Water Pump	12-15	15-20
Oil Pump	12-15	12-15
Oil Filter Adapter (1965-66)	10-15	15-20
(1967-68)	10-15	38-42
(1969-73)	10-15	32-42

1965-73 170", 200", 240", 250" 6 CYL. ENGINES (Cont.)

ENGINE NOTES

- ▶ **THERMOSTAT REPLACEMENT NOTE:** When replacing thermostat, see if rocker cover front bolt boss extends into water passage at thermostat opening causing improper thermostat operation. If bolt boss interferes with thermostat, remove just enough of bottom of boss to provide proper clearance.
- ▶ **THERMOSTAT INSTALLATION NOTE:** Coolant elbow gasket must be placed on cylinder head before thermostat installed. Install thermostat with copper pellet (element) toward engine side of passage.
- ▶ **1966 CONNECTING ROD NOTE:** Some connecting rods may be found that are copper colored. These copper colored rods in no way adversely affect performance.
- ▶ **1966 200" ENGINE WATER OUTLET CONNECTION (THERMOSTAT HOUSING) REMOVAL CAUTION:** Two raised surfaces have been added to the inside of some water outlet connections. Thermostat must be rotated counterclockwise to remove, and clockwise to install.
- ▶ **1966 240" ENGINE ROCKER ARM ASSEMBLY CAUTION:** Whenever individually mounted rocker arms are assembled, the valve stem tip, fulcrum seat area, and pushrod socket should be lubricated with lubriplate or equivalent, to prevent scoring and wear from dry start.
- ▶ **NEW VALVE GUIDE REPAIR BUSHING:** New valve guide bushings are available to repair cylinder heads when valve guides are worn to the extent that oversize service valves cannot be used. Install as follows:
 - 1) Machine upper portion of cylinder head guide flush with top surface of valve spring inside pilot diameter.
 - 2) Ream the cylinder head valve guide to .5001-.5005" inside diameter on the 240" engine and .4376-.4380" on all other 6 cyl. engines. These bore diameters will accommodate a .001-.0015" press fit.
 - 3) Press new valve guide bushing into cylinder head from bottom side of head until bushing is flush with bottom side of head.
 - 4) Ream bushing to standard valve guide bore diameter.