SERVICE MANUAL

Crawler

1450

9-72858

1. Trim along dashed line.
2. Slide into pocket on Binder Spine.

TYPE 1-4

SERVICE MANUAL

Crawler

1450

9-72858

1. Trim along dashed line.
2. Slide into pocket on Binder Spine.

TYPE 1-4

SERVICE MANUAL

Crawler

1450

9-72858

1. Trim along dashed line.
2. Slide into pocket on Binder Spine.

TYPE 1-4

SERVICE MANUAL

Crawler

1450

9-72858

1. Trim along dashed line.
2. Slide into pocket on Binder Spine.

TYPE 1-4

1450 CRAWLER

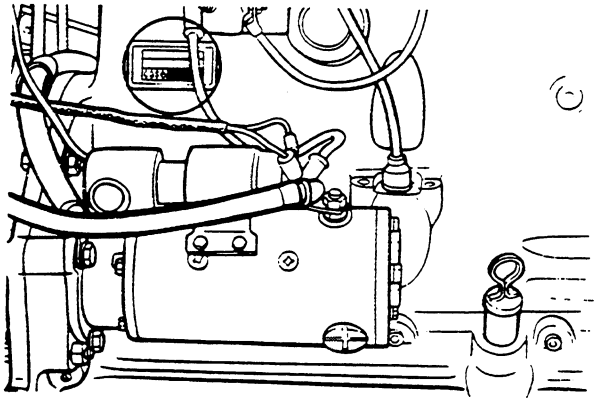
Table of Contents

Section 1010

GENERAL ENGINE SPECIFICATIONS 1450 CRAWLER LOADER AND DOZER

504BDT DIESEL ENGINES

THE ENGINE MODEL AND SERIAL NUMBER IS STAMPED ON A PLATE LOCATED ON THE SIDE OF THE ENGINE ABOVE THE CRANKING MOTOR.



General

Type	6 Cylinder, 4 Stroke Cycle, Valve-in-Head Turbo-Charged
Firing Order	1-5-3-6-2-4
Bore	4-5/8 Inches
Stroke	5 Inches
Piston Displacement	504 Cubic Inches
Compression Ratio	15.8 to 1
No Load Governed Speed	2230-2270 RPM
Rated Engine Speed	2100 RPM
Engine Idling Speed	725 to 775 RPM
Exhaust Valve Rotators	Positive Type
*Valve Tappet Clearance (Exhaust)	(Hot) .020 Inch (Cold) .025 Inch
(Intake)	(Hot and Cold) .015 Inch

*Hot Settings Are Made After the Engine Has Operated At Thermostat Controlled Temperature For At Least Fifteen Minutes.

Rac. 9-76885

PRINTED IN U.S.A.

CASE CORPORATION

Piston and Connecting Rods

Rings per Piston	3
Number of Compression Rings	2
Number of Oil Rings	1
Type Pins	Full Floating Type
Type Bearing	Replaceable Precision, Steel Back, Copper-Lead or Aluminum Alloy Liners

Main Bearings

Number of Bearings	7
Type Bearings	Replaceable Precision Steel Back, Copper-Lead or Aluminum Alloy Liners

Engine Lubricating System

Crankcase Capacity	14 Quarts
with Filter Change	15 Quarts
Oil Pressure	45 to 60 PSI with Engine Warm and Operating at Rated Engine Speed
Type System	Pressure and Spray Circulation
Oil Pump	Gear Type
Oil Filter	Full Flow Spin on Type

Fuel System

Fuel Injection Pump	Robert Bosch, Type PES Multiple Plunger
Pump Timing	30 Degrees Before Top Dead Center (Port Closing)
Fuel Injectors	Pencil Type (Opening Pressure 3200 PSI)
Fuel Transfer Pump	Plunger Type, Integral Part of Injection Pump
Governor	Variable Speed, Fly-Weight Centrifugal Type, Integral Part of Injection Pump
1st Stage Fuel Filter	Full Flow Spin on Type
2nd Stage Fuel Filter	Full Flow Spin on Type

Section
1020

DETAILED SPECIFICATIONS

504BDT ENGINE

FRACTION to DECIMAL to MILLIMETER CONVERSION TABLE

Fraction	Decimal	MM	Fraction	Decimal	MM	Fraction	Decimal	MM
1/64	.0156	0.397	23/64	.3593	9.128	45/64	.7031	17.859
1/32	.0312	0.794	3/8	.3750	9.525	23/32	.7187	18.256
3/64	.0468	1.191	25/64	.3906	9.922	47/64	.7343	18.653
1/16	.0625	1.587	13/32	.4062	10.319	3/4	.7500	19.050
5/64	.0781	1.984	27/64	.4218	10.716	49/64	.7656	19.447
3/32	.0937	2.381	7/16	.4375	11.113	25/32	.7812	19.844
7/64	.1093	2.778	29/64	.4531	11.509	51/64	.7968	20.240
1/8	.1250	3.175	15/32	.4687	11.906	13/16	.8125	20.637
9/64	.1406	3.572	31/64	.4843	12.303	53/64	.8281	21.034
5/32	.1562	3.969	1/2	.5000	12.700	27/32	.8437	21.431
11/64	.1718	4.366	33/64	.5156	13.097	55/64	.8593	21.828
3/16	.1875	4.762	17/32	.5312	13.494	7/8	.8750	22.225
13/64	.2031	5.159	35/64	.5468	13.890	57/64	.8906	22.622
7/32	.2187	5.556	9/16	.5625	14.287	29/32	.9062	23.019
15/64	.2343	5.953	37/64	.5781	14.684	59/64	.9218	23.415
1/4	.2500	6.350	19/32	.5937	15.081	15/16	.9375	23.812
17/64	.2656	6.747	39/64	.6093	15.478	61/64	.9531	24.209
9/32	.2812	7.144	5/8	.6250	15.875	31/32	.9687	24.606
19/64	.2968	7.541	41/64	.6406	16.272	63/64	.9843	25.003
5/16	.3125	7.937	21/32	.6562	16.669	1	1.0000	25.400
21/64	.3281	8.334	43/64	.6718	17.065			
11/32	.3437	8.731	11/16	.6875	17.462			

INCH to MILLIMETER CONVERSION TABLE

Inch	MM	Inch	MM	Inch	MM	Inch	MM
1	25.400	6	152.000	10	254.000	60	1,524.000
2	50.800	7	177.800	20	508.000	70	1,778.000
3	76.200	8	203.200	30	762.000	80	2,032.000
4	101.600	9	228.600	40	1,016.000	90	2,286.000
5	127.000	10	254.000	50	1,270.000	100	2,540.000

TABLE OF CONTENTS

RUN-IN INSTRUCTIONS

Engine Lubrication

When the engine rebuild is complete, fill the engine crankcase with Case HDM oil and install new engine oil filters. **NOTE:** If Case HDM oil is not used, use only a Series 3 DS or CD Service Classification oil that has the proper viscosity rating for prevailing air temperature. Refer to vehicle Operators Manual.

After the first 20 hours of operation, change the engine oil while the engine is hot and replace the the engine oil filter/s. DO NOT DRAIN OIL UNTIL THE ENGINE HAS BEEN OPERATED 20 HOURS.

Change the engine oil and filter/s at the recommended intervals thereafter as outlined in the Operator's Manual.

Break-In Procedure for Rebuilt Engines (With a Dynamometer)

The following procedure must be implemented when using a PTO dynamometer to break-in the engine. The dynamometer will insure control of the engine load at each speed and will eliminate over stressing new parts during break-in.

During the break-in, continually check the oil pressure, coolant level, and coolant temperature.

STEP	TIME	ENGINE SPEED	DYNAMOMETER SCALE LOAD*
1	**10 Minutes	1000 RPM	None
2	**10 Minutes	1800 RPM	None
3	20 Minutes	1800 RPM	1/3
4	20 Minutes	1800 RPM	1/2
5	***30 Minutes	100 RPM below rated speed	3/4
6	Retorque the cylinder head bolts using the procedure described in Section 2015 of this service manual.		

*Based upon normal dynamometer scale load at rated speed for the particular vehicle model. Reduce this scale load as indicated.

**The most ideal break-in procedure would be to constantly vary the throttle between 750 to 1000 RPM for the first 10 minutes and from 1000 RPM to 1800 RPM for the next 10 minutes. The purpose of this changing RPM is to vary the lubrication and coolant flow.

***30 minutes at 3/4 load is a minimum amount of time the engine should be run. It is recommended that whenever possible the engine (especially turbocharged diesels) should be run for four (4) hours or more at the above speed and load before checking the full engine horsepower or before using the engine for heavy field work.

Break-In Procedure for Rebuilt Engines (Without a Dynamometer)

STEP	TIME	ENGINE SPEED	LOAD
1	*10 Minutes	1000 RPM	None
2	*10 Minutes	1800 RPM	None
3	30 Minutes	2/3 Rated RPM	Light Load
4	1 Hour	Full RPM (not over 2000 RPM)	80 to 90%
5	Retorque the cylinder head bolts using the procedure described in Section 2015 of this service manual.		

*If engine must then run at or near full load to operate the machine - for first hour remove load and run at high idle for a few minutes at 15 minute intervals.

Run-In Procedure (Agricultural Tractors)

For the first 8 hours of field operation stay one gear lower than normal. For the next 12 hours DO NOT "lug" the engine. Prevent "lugging" by shifting to a lower gear. The engine must not be "lugged" below its Rated Engine RPM during the early hours of life.

Run-In Procedure (Construction Equipment)

For the first 8 hours, operate the engine at full throttle maintaining a normal load. DO NOT baby the engine, but avoid prolonged converter or hydraulic stall. Engine must not be "lugged" below its Rated Engine RPM (Do not exceed 10 seconds of stall).

Run-In Procedure (Power Units)

For the first 1/2 hour, operate engine at 2/3 rated RPM with a light load or no load. For the next (1) hour, run engine at 80 to 90% load at rated RPM (but not over 2000 RPM). Then full load and rated RPM as required in application.

DETAILED ENGINE SPECIFICATONS

Cylinder Sleeves

	Decimal System	Metric System
I.D. of sleeve including wear	4.6250 to 4.6333″	117.475 to 117.7163mm
Sleeve out of round (installed in block)	.001″	.025mm
Maximum Limit including wear	.002″	.0508mm
Taper (installed in block)	.001″	.0254mm
Maximum limit including wear	.007″	.1778mm
Clearance to bottom of piston skirt, 90^0 to piston pin including wear	.0052 to .0175″	.1321 to .445mm

Piston

Type	Cam ground	
Material	Aluminum Alloy	
O.D. at bottom of skirt, 90^0 to piston pin including wear	4.6178 to 4.6198″	117.2921 to 117.3429mm
I.D. of piston pin bore including wear	1.8001 to 1.8015″	45.7225 to 45.7581mm
Width of 3rd ring groove including wear	.188 to .191″	4.775 to 4.851mm

Piston Rings

No. 1 Compression (chrome)	Keystone	
End gap in 4.625 I.D. (117.475 I.D.) sleeve including wear	.017 to .037″	.432 to .940mm
No. 2 Compression (chrome)	Keystone	
End gap in 4.625 I.D. (117.475mm I.D.) sleeve including wear	.013 to .033″	.330 to .838mm

Oil Ring

Width	.186 to .187″	4.724 to 4.75mm
End gap in 4.625 I.D. (117.475mm I.D.) sleeve	.013 to .033″	.330 to .838mm
Side clearance including wear	.001 to .005″	.025 to .127mm

Piston Pin

Type	Full Floating	
O.D. of pin	1.7994 to 1.7996″	45.7052 to 45.7102mm
Fit in piston	.0005 to .0011″	.0127 to .0279mm
Fit in rod bushing	.0008 to .0014″	.0203 to .0356mm

Connecting Rod

	Decimal System	Metric System
Bushing	Replaceable	
Bushing I.D. installed (ream to size)	1.8004 to 1.8008″	45.7302 to 45.7403mm
Maximum limit including wear	1.8018″	45.7657mm
Bushing out of round including wear	.0015″	.0377mm
Bearing liners	Replaceable	
Bearing liner width	1.586 to 1.596″	40.284 to 40.538mm
Journal I.D. without bearing liners	3.1503 to 3.1513″	80.0176 to 80.0426mm
Bearing oil clearance including wear	.0013 to .005″	.0326 to .127mm
Undersize bearings for service	.002,.010,.020,.030″	.051,.254,.508,.762mm
Side clearance	.007 to .016″	.178 to .406mm
Cap bolts	12 point flange head	

Crankshaft

Type	Balanced	
Main bearing liners	Replaceable	
End play, No. 5 main bearing cap including wear	.003 to .020″	.076 to .508mm
Thrust bearings std. thickness including wear	.147 to .157″	3.734 to 3.988mm
Thrust bearings oversize thickness for service including wear	.153 to .163″	3.886 to 4.140mm
Connecting rod journal std. O.D.	2.998 to 2.999″	76.149 to 76.175mm
.010″ (.254mm) O.D. undersize, grind to	2.988 to 2.989″	75.895 to 75.921mm
.020″ (.508mm) O.D. undersize, grind to	2.978 to 2.979″	75.641 to 75.667mm
.030″ (.762mm) O.D. undersize, grind to	2.968 to 2.969″	75.387 to 75.413mm
Connecting rod journal maximum taper including wear	.0015″	.0377mm
Journals out of round	.0005″	.0127mm
Main bearing liner width 1st, 3rd, 5th and 7th	2.1515 to 2.1615″	54.6477 to 54.9017mm
Main bearing liner width 2nd, 4th and 6th	1.214 to 1.224″	30.836 to 31.09mm
Undersize main bearing liners for service	.002,.010,.020,.030″	.051,.254,.508,.762mm
Main bearing oil clearance including wear	.0016 to .006″	.0402 to .152mm
Main bearing journal std. O.D.	3.498 to 3.499″	88.849 to 88.875mm
.010″ (.254mm) O.D. undersize, grind to	3.488 to 3.489″	88.595 to 88.621mm
.020″ (.508mm) O.D. undersize, grind to	3.478 to 3.479″	88.341 to 88.367mm
.030″ (.762mm) O.D. undersize, grind to	3.468 to 3.469″	88.087 to 88.113mm
Main journal bore I.D. without liners	3.691 to 3.692″	93.751 to 93.777mm

Section
2001

ENGINE DIAGNOSIS

CASE CORPORATION

Rac. 9-76365

PRINTED IN U.S.A

GENERAL INFORMATION

Before making any repairs or adjustments on an engine, a mechanic or technician must properly diagnose the trouble.

Locating the trouble and repairing it is only part of the job, a technician must find and eliminate the cause of the trouble as well. Too many repairs are made with no thought to removing the causes that made the repair necessary.

For any engine to start or perform properly, three main requirements must be present.

1. FUEL
2. COMPRESSION
3. IGNITION

When any of these requirements are not present or limited by some mechanical reason the engine will not start or fails to operate properly throughout the power range.

1. FUEL. Fuel system problems can be present anywhere from the fuel tank, through the filters and injection pump as well as the injectors. Correct injection pump timing is important in the overall fuel system performance.

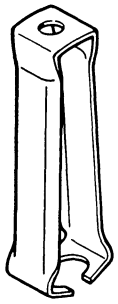
2. COMPRESSION. Compression on an engine is related to the "breathing function". Proper compression is affected by the air cleaner condition, muffler restriction, valve condition and operation including proper valve adjustment, cylinder head gaskets condition of sleeves, rings, pistons, camshaft, and camshaft timing.

3. IGNITION. Ignition is the result of adequate compression to develop enough heat in the air charge on the compression stroke to fire the fuel being injected into the engine cylinders. Proper spray pattern and atomization of the fuel by the injector is very important. Timing the fuel injection pump to the engine to a precise degree BTDC is a vital requirement for proper ignition.

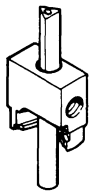
The engine diagnosis contained in the following pages covers many trouble symptoms, the causes, and what will be necessary to repair or eliminate the problem. Under each symptom are listed the most common and reoccuring problems progressively to the not so common problems. Locate your problem symptom in the diagnosis chart and refer to the pages listed for the probable causes and remedies.

INSTALLATION INSTRUCTIONS FOR M20614 TEFLON VALVE SEAL KIT

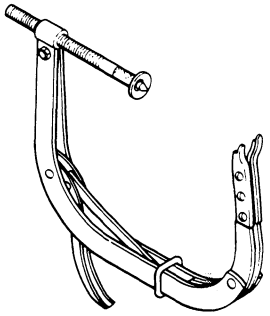
Special Tools Required



M20624 SEAL INSTALLATION TOOL



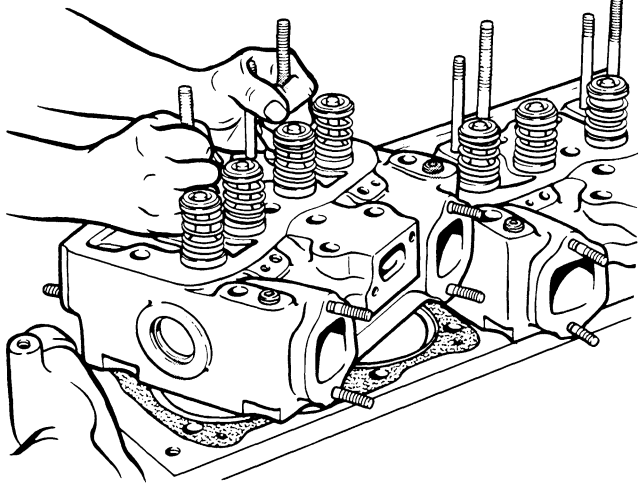
M20617 VALVE GUIDE CUTTING TOOL



VALVE SPRING COMPRESSOR

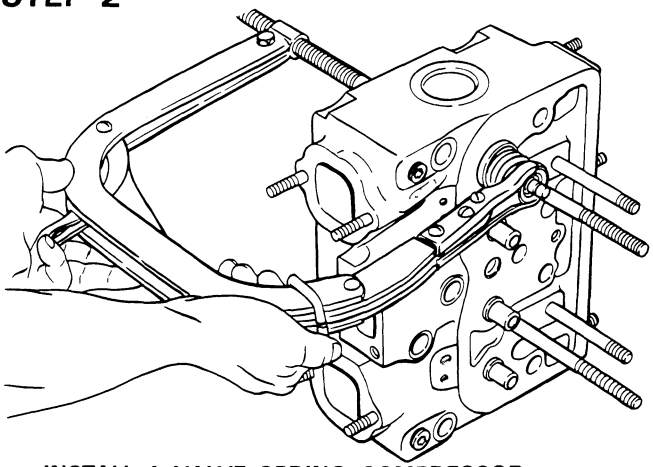
NOTE: FOUR CYLINDER ENGINES REQUIRE TWO M20614 KITS AND SIX CYLINDER ENGINES REQUIRE THREE M20614 KITS.

STEP 1



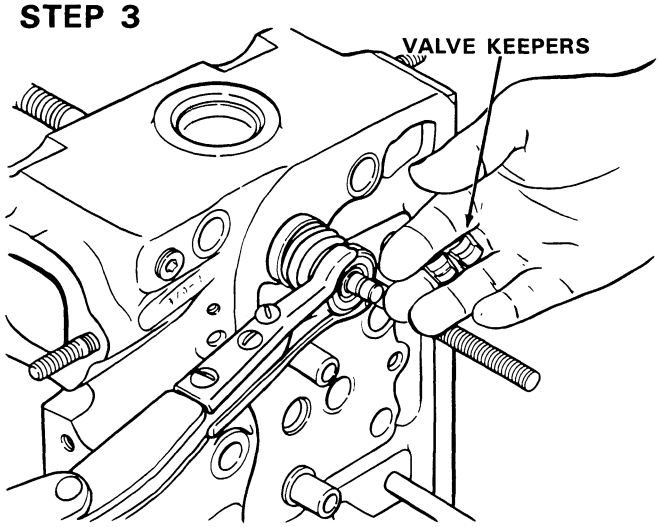
REMOVE THE CYLINDER HEADS FROM THE ENGINE, REFER TO SECTION 2015 FOR HEAD REMOVAL.

STEP 2



INSTALL A VALVE SPRING COMPRESSOR.

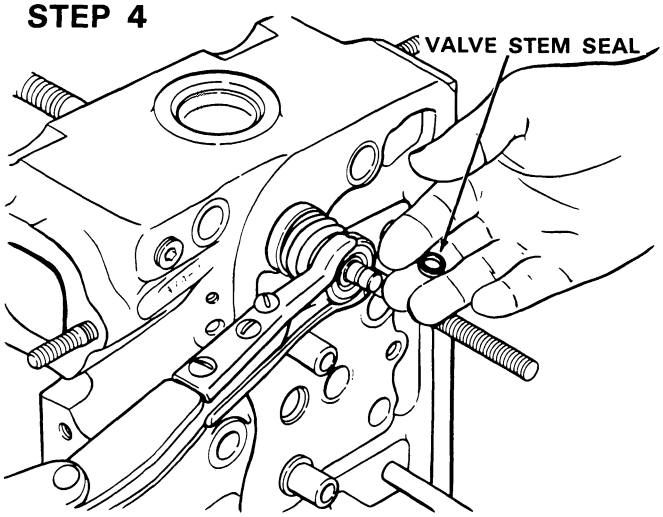
STEP 3



COMPRESS VALVE SPRING AND REMOVE VALVE KEEPERS.

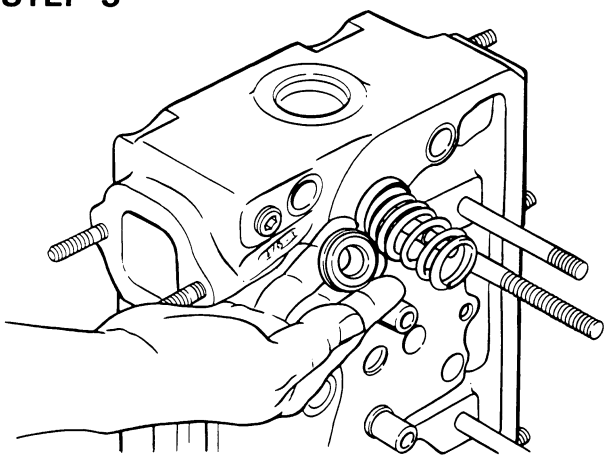
IMPORTANT: VALVES, VALVE RETAINERS OR ROTATORS AND VALVE KEEPERS SHOULD BE MARKED WHEN REMOVED, TO INSURE THAT THEY WILL BE REINSTALLED IN THEIR ORIGINAL LOCATION.

STEP 4



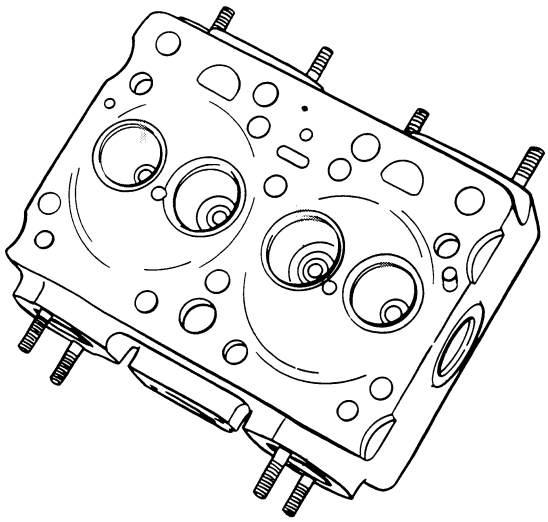
REMOVE VALVE STEM SEAL.

STEP 5



REMOVE VALVE ROTATORS OR SPRING RETAINERS, SPRINGS, SPRING SEATS AND VALVES.

STEP 6

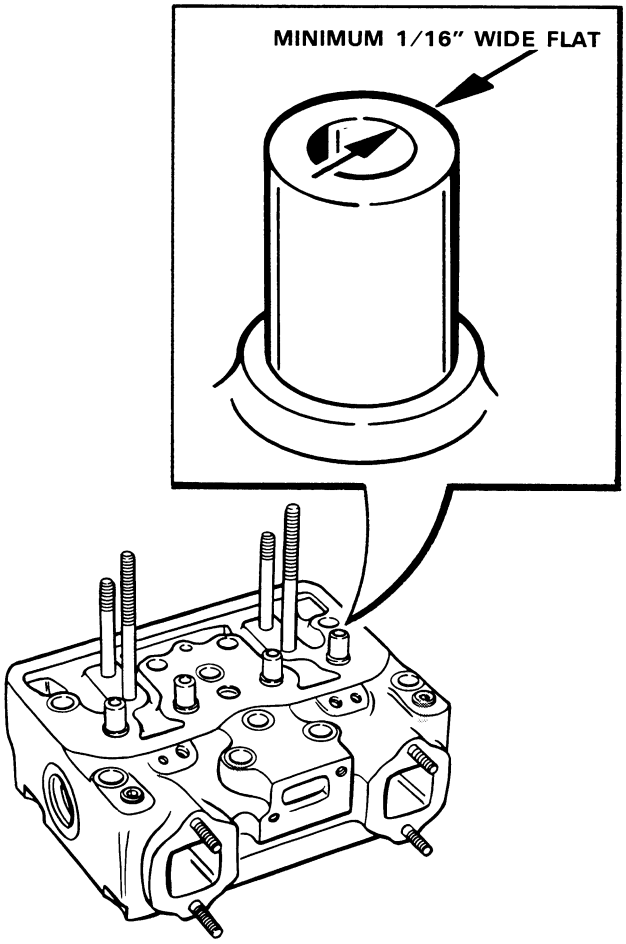


CLEAN CYLINDER HEAD COMPLETELY, REMOVING ALL TRACES OF CARBON AND OTHER DEPOSITS.

STEP 7

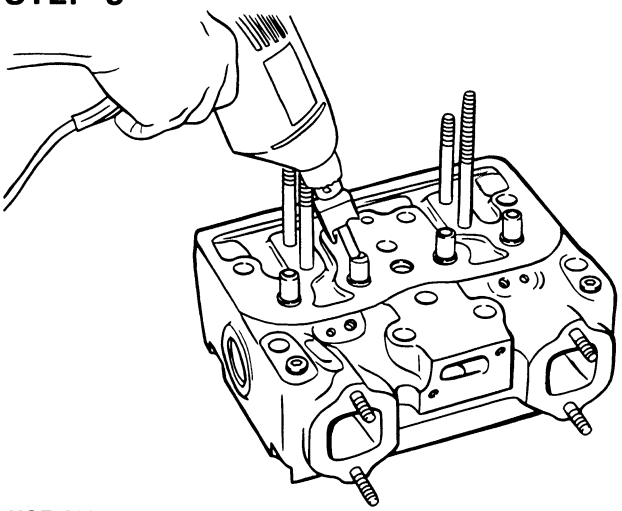
CLEAN VALVES WITH A FINE POWER DRIVEN WIRE BRUSH, REMOVING ALL CARBON AND VARNISH DEPOSITS. BE CAREFUL NOT TO SCRATCH VALVE STEMS.

STEP 8



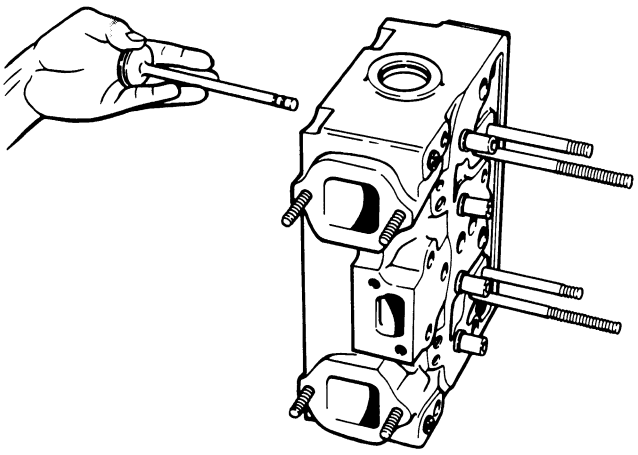
CHECK VALVE GUIDE TOP SURFACE, THERE MUST BE A MINIMUM OF A 1/16" WIDE FLAT AROUND ENTIRE TOP SURFACE.

STEP 9



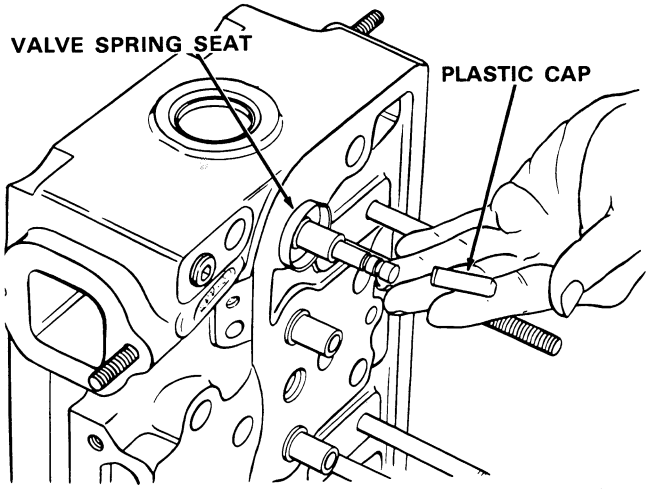
USE M20617 TOOL IN A ELECTRIC DRILL (IF REQUIRED) TO PROVIDE NECESSARY FLAT AREA ON VALVE GUIDE. IMPORTANT: DO NOT EXCEED 450 RPM WHEN DRILLING

STEP 10



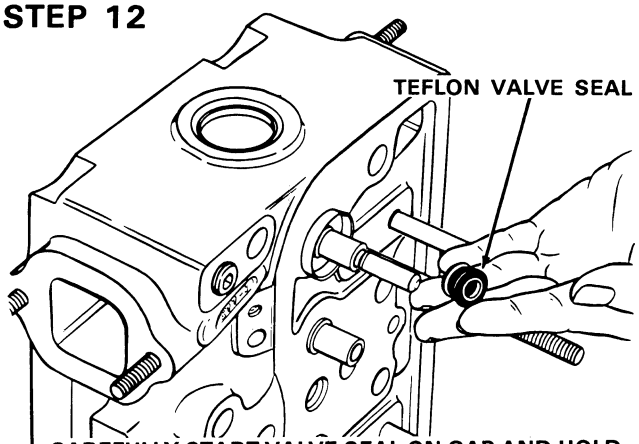
LUBRICATE VALVES WITH CLEAN ENGINE OIL BEFORE REINSTALLING INTO CYLINDER HEAD.

STEP 11



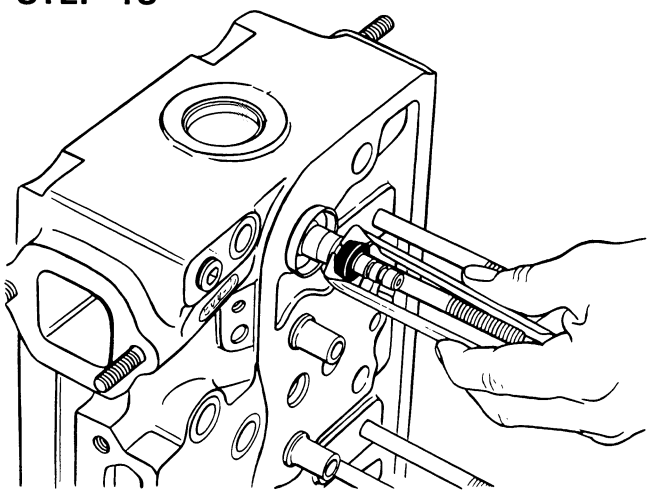
PLACE PLASTIC INSTALLATION CAP, PROVIDED IN KIT, ON THE END OF THE VALVE STEM. NOTE: CAP PREVENTS SHARP EDGES ON VALVE STEM GROOVES FROM CUTTING VALVE SEAL.

STEP 12



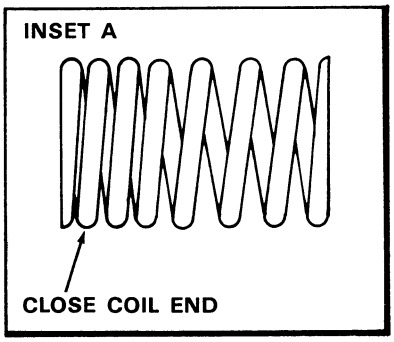
CAREFULLY START VALVE SEAL ON CAP AND HOLD THUMBS AGAINST WHITE SEAL INSERT TO AVOID DISLODGING IT, PUSH SEAL DOWN UNTIL SEAL JACKET TOUCHES TOP OF VALVE GUIDE. REMOVE INSTALLATION CAP AND SAVE, SINCE IT MUST BE REUSED.

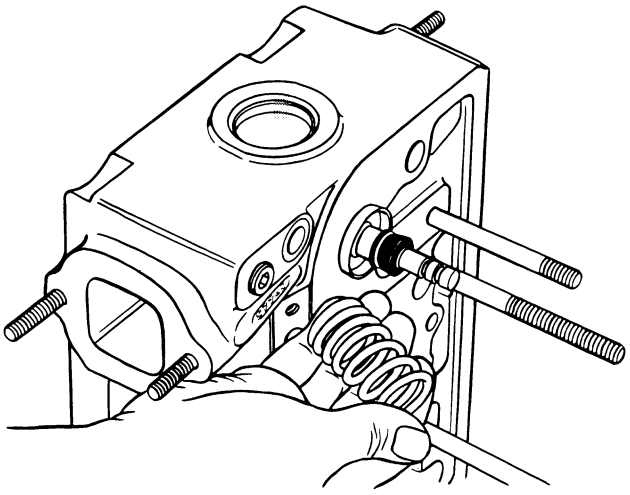
STEP 13



USE M20624 TOOL AND PRESS SEAL DOWN OVER VALVE GUIDE UNTIL SEAL IS FLUSH WITH TOP OF GUIDE.

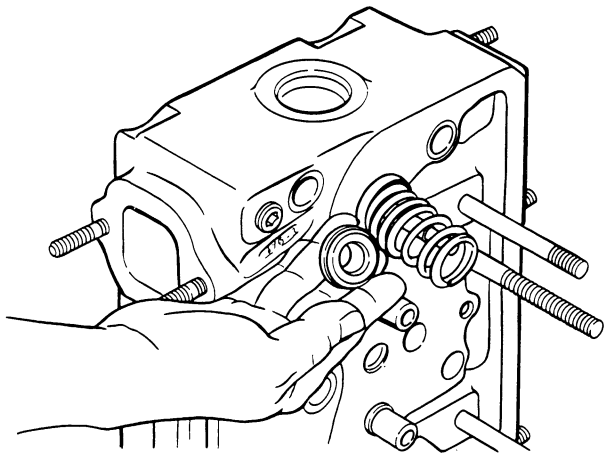
STEP 14





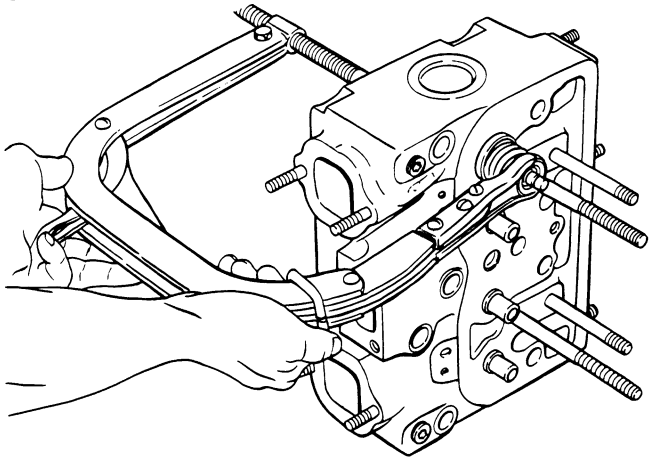
INSTALL THE VALVE SPRING. IMPORTANT: THE CLOSE COIL END OF THE SPRING MUST BE INSTALLED TOWARDS THE CYLINDER HEAD, SEE INSET A.

STEP 15



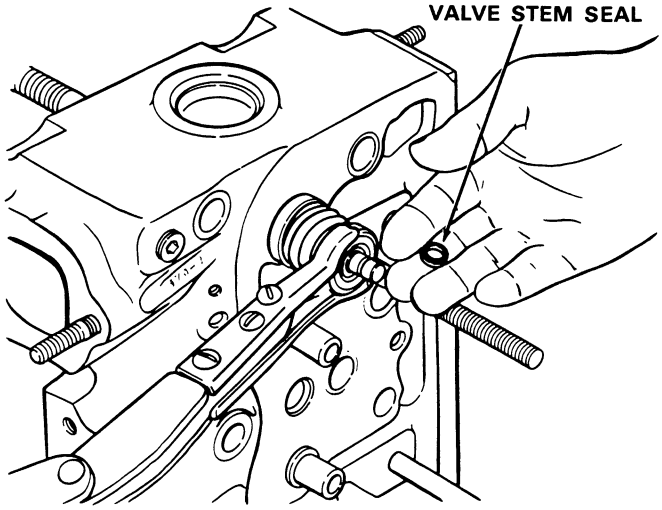
INSTALL VALVE ROTATORS OR SPRING RETAINERS. IMPORTANT: ASSEMBLE VALVE ROTATORS WITH THEIR ORIGINAL VALVES SINCE THEY TEND TO WEAR IN AS A MATCHED SET.

STEP 16



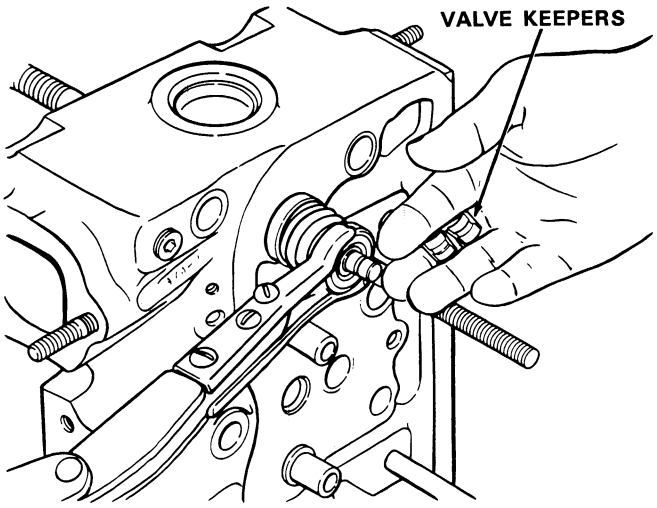
INSTALL VALVE SPRING COMPRESSOR.

STEP 17



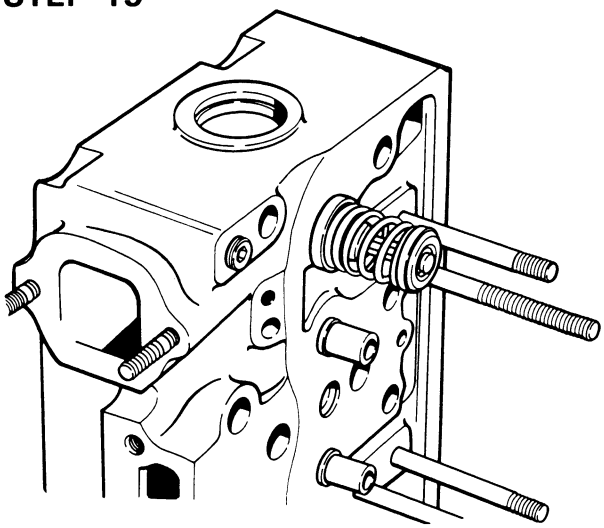
INSTALL STEM SEAL IN LOWER VALVE STEM GROOVE.

STEP 18



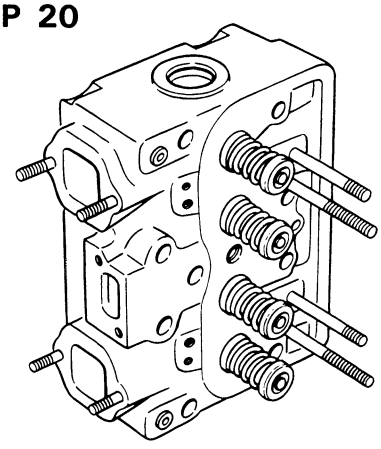
INSTALL VALVE KEEPERS IN OUTER VALVE STEM GROOVE.

STEP 19



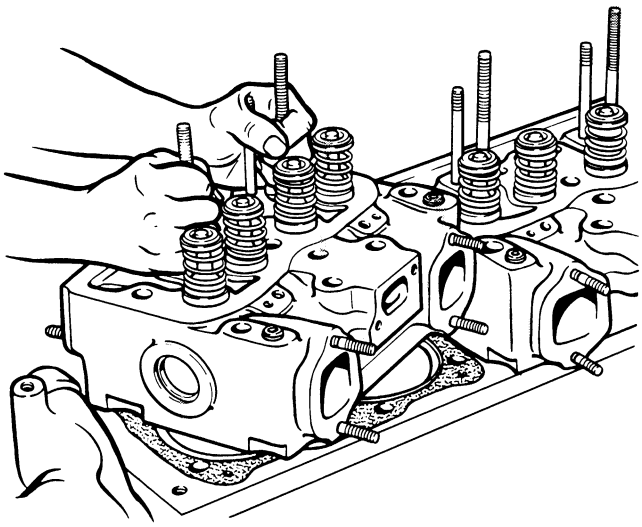
REMOVE SPRING COMPRESSOR AND TAP VALVE STEM END TO SEAT KEEPERS.

STEP 20



INSTALL TEFLON SEALS ON THE OTHER INTAKE AND EXHAUST VALVES, FOLLOWING THE PRECEDING PROCEDURE.

STEP 21



REINSTALL CYLINDER HEAD ON ENGINE FOLLOWING PROCEDURE OUTLINED IN SECTION 2015.

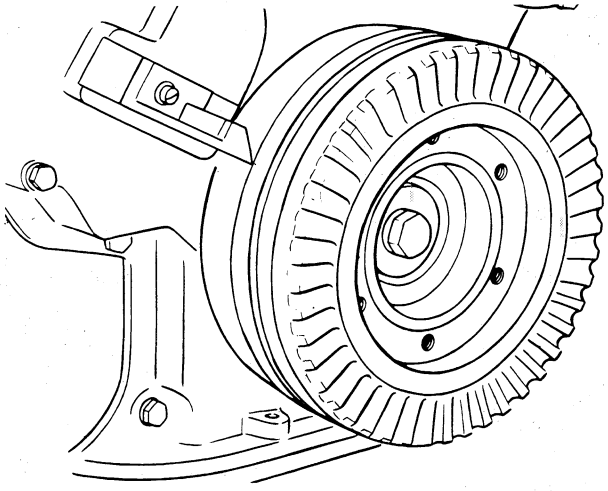
ENGINE TUNEUP PROCEDURE

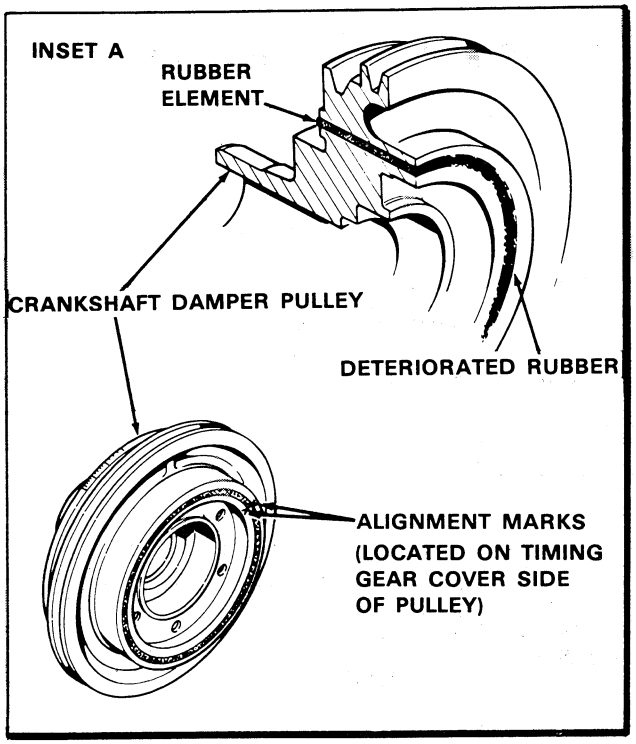
Checking Crankshaft Damper Pulley

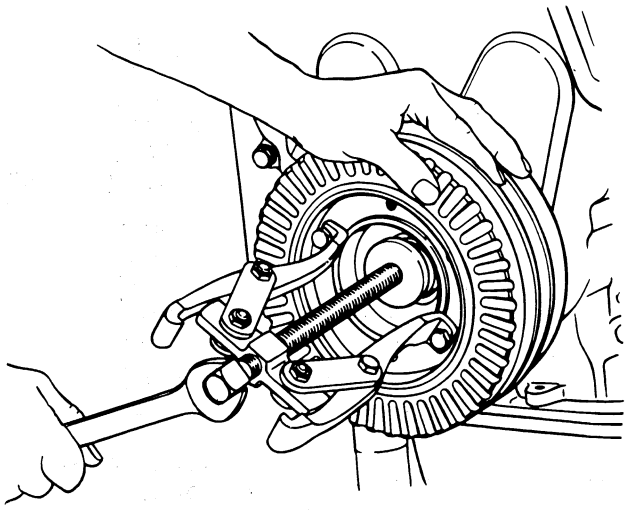
STEP 1

THE RECOMMENDED CHANGE INTERVAL FOR THE CRANKSHAFT DAMPER PULLEY IS 2000 HOURS MAXIMUM. AT ANY TIME OVER 1500 HOURS. CONSIDER CHANGING PULLEY AT ANY MAJOR ENGINE OVERHAUL OR TUNE UP.

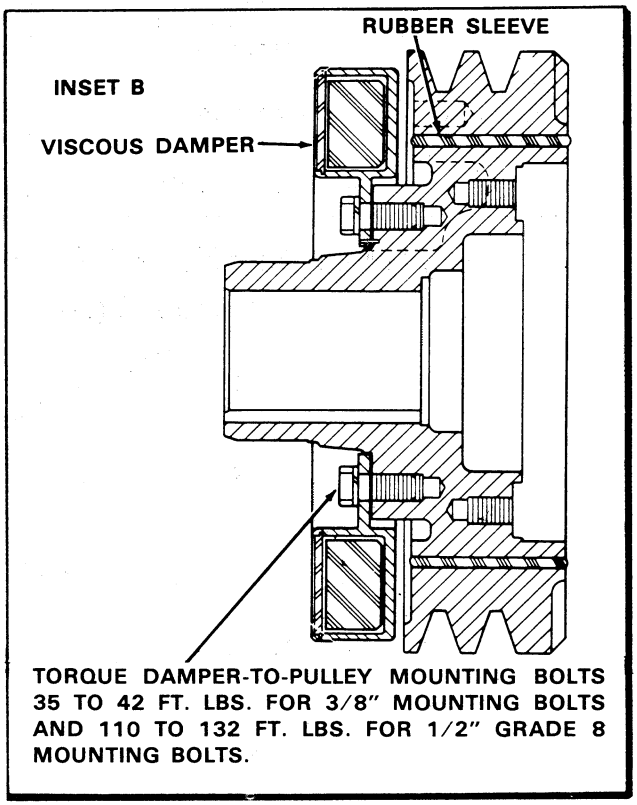
EVERY 500 HOURS AND AT ENGINE TUNEUP, VISUALLY INSPECT RUBBER ELEMENT FOR PEEL AREAS OR RUBBER MISSING. CHECK ALIGNMENT OF THE "V" MARKS BETWEEN THE INNER AND OUTER MEMBERS. IF "V" MARKS SHIFT, ENGINE TIMING WILL BE OFF AND DAMPER PULLEY MUST BE REPLACED.





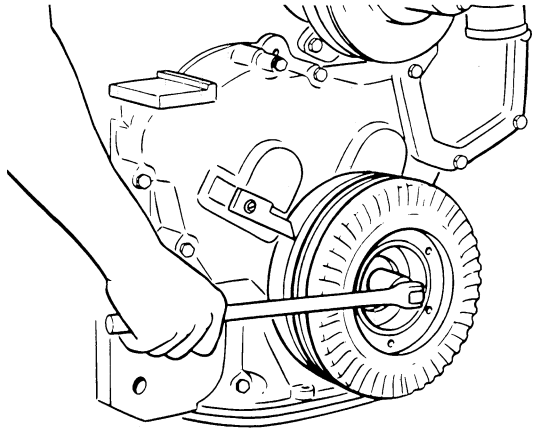


USE BOLT ON TYPE PULLER TO REMOVE PULLEY. REMOVE VISCOUS DAMPER FROM PULLEY (IF SO EQUIPPED). DO NOT PULL OR HAMMER ON OUTSIDE OF PULLEY OR VISCOUS DAMPER; SERIOUS DAMAGE TO PULLEY, DAMPER, AND RUBBER SLEEVE COULD RESULT.



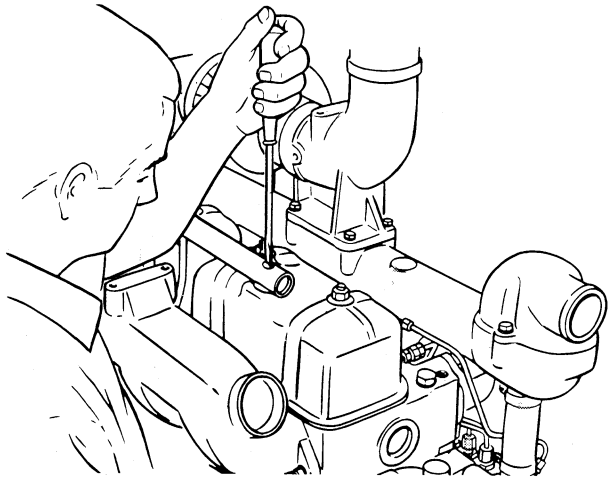
Checking Top Dead Center

STEP 2



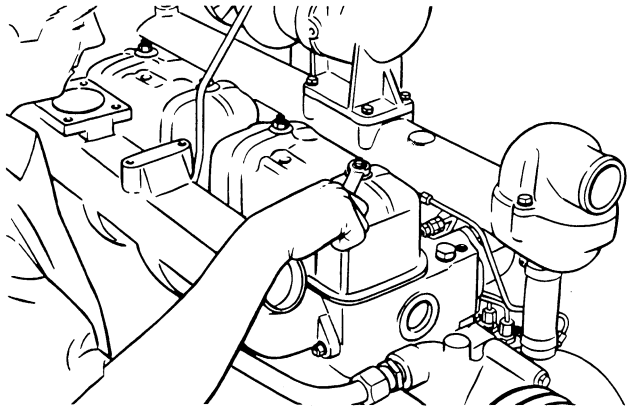
CRANK ENGINE UNTIL 10° BTDC MARK ON CRANKSHAFT PULLEY IS ALIGNED WITH TIMING POINTER.

STEP 3



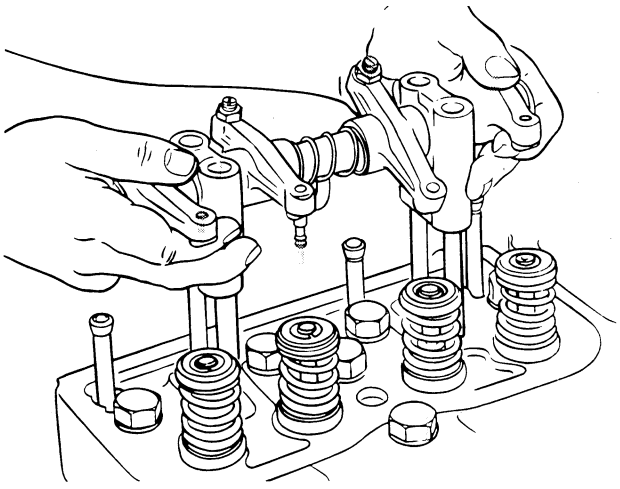
REMOVE BREATHER TUBE.

STEP 4



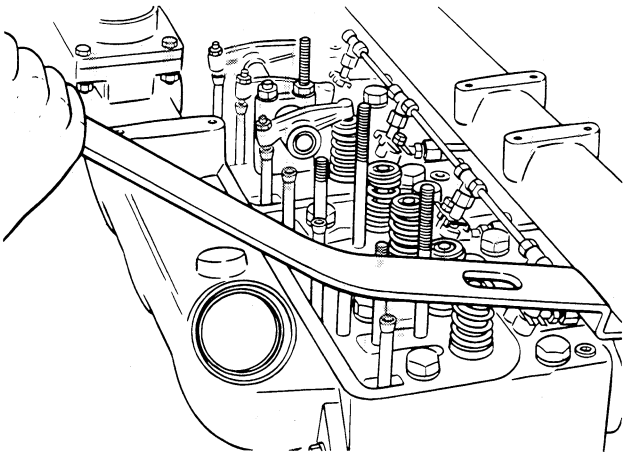
REMOVE VALVE COVER AND GASKET FROM NO. 1 AND NO. 2 CYLINDERS.

STEP 5



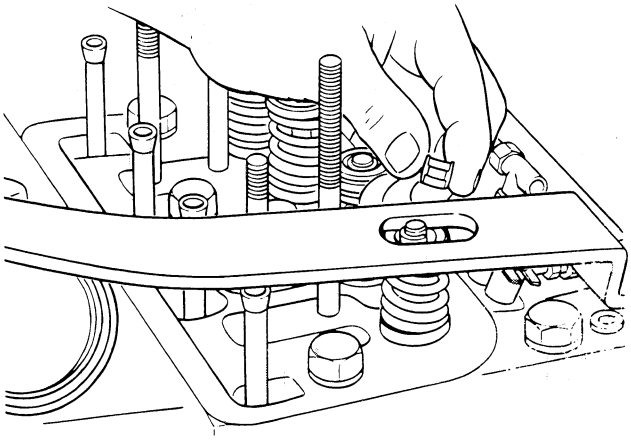
REMOVE ROCKER ARM ASSEMBLY.

STEP 6



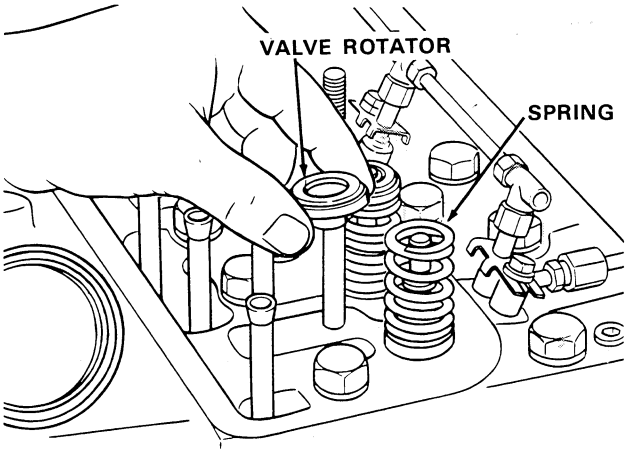
COMPRESS EXHAUST VALVE SPRING ON NO. 1 CYLINDER USING FABRICATED TOOL (SEE PAGE 3).

STEP 7



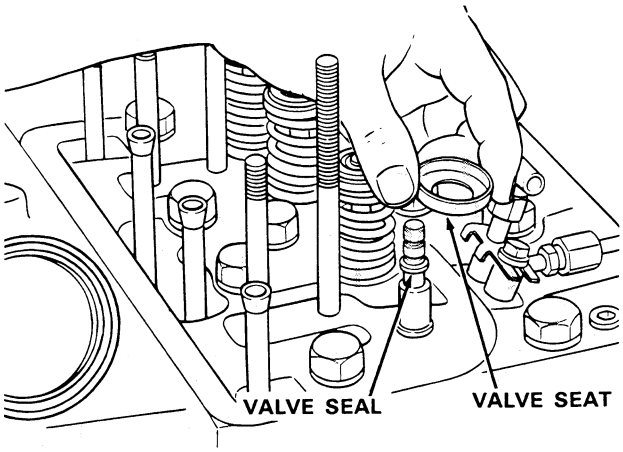
REMOVE VALVE KEEPERS

STEP 8



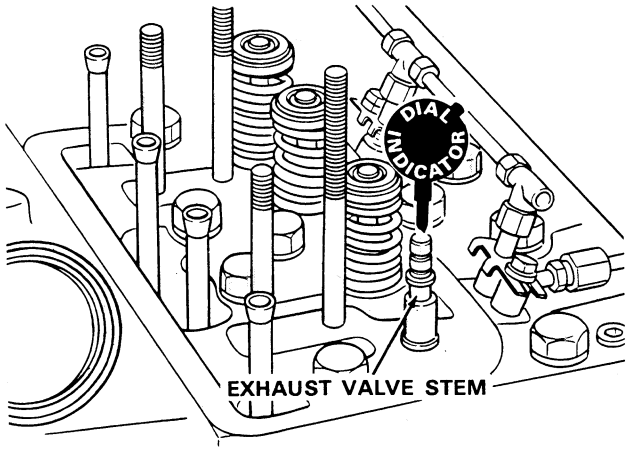
REMOVE VALVE ROTATOR, SPRING AND SEAT.

STEP 9

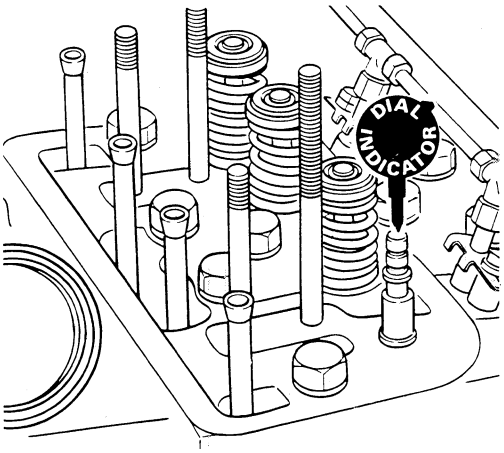


KEEP VALVE SEAL IN PLACE TO PREVENT VALVE FROM FALLING THROUGH VALVE GUIDE IF PISTON IS MOVED TOO FAR

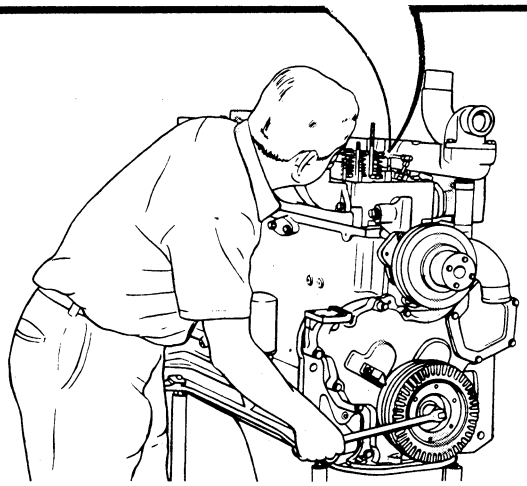
STEP 10



INSTALL DIAL INDICATOR ON END OF VALVE STEM WITH VALVE RESTING ON TOP OF PISTON.



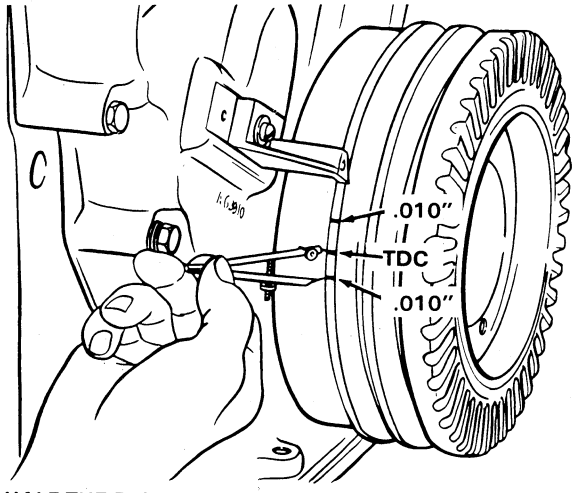
CRANK ENGINE CLOCKWISE UNTIL DIAL INDICATOR HAND STOPS MOVING. RESET INDICATOR TO ZERO.



CRANK ENGINE CLOCKWISE UNTIL .010" SHOWS ON DIAL. SCRIBE A MARK ON CRANKSHAFT PULLEY IN LINE WITH TIMING POINTER.

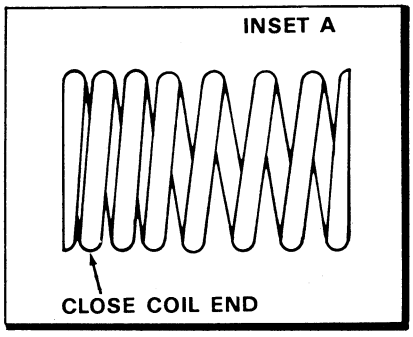
CRANK ENGINE COUNTERCLOCKWISE PAST ZERO MARK ON INDICATOR UNTIL .010" SHOWS ON DIAL. AGAIN, SCRIBE MARK ON CRANKSHAFT PULLEY.

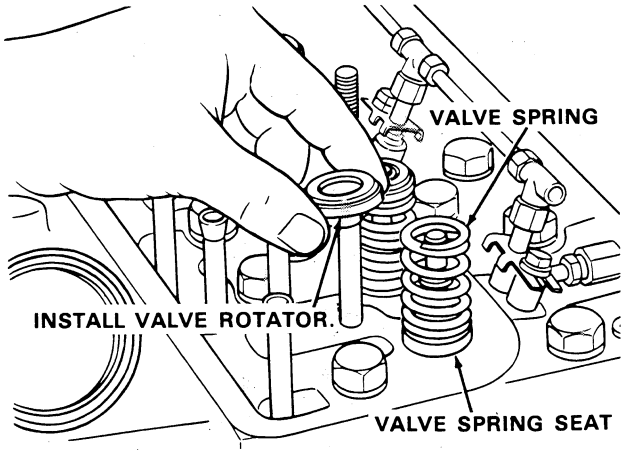
STEP 11



HALF THE DISTANCE BETWEEN THESE TWO SCRIBE MARKS ON CRANKSHAFT PULLEY WILL BE THE TOP DEAD CENTER (TDC) MARK. IF THE SCRIBE MARKS ARE NOT THE SAME AS ORIGINAL MARKS ON PULLEY CHECK DAMPER.

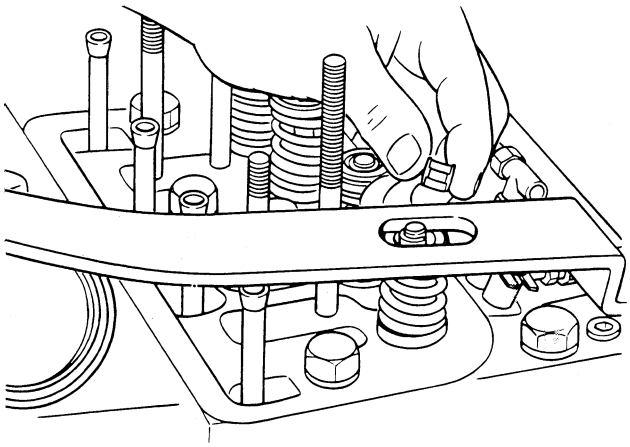
STEP 12





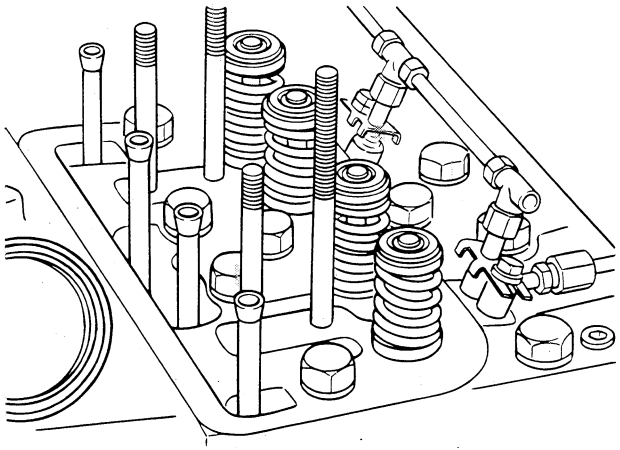
INSTALL SPRING SEAT AND VALVE SPRING. *NOTE:* IF EQUIPPED WITH VALVE SPRING HAVING ONLY ONE CLOSE COIL END, PLACE THIS END TOWARD CYLINDER HEAD, SEE INSET A.

STEP 13



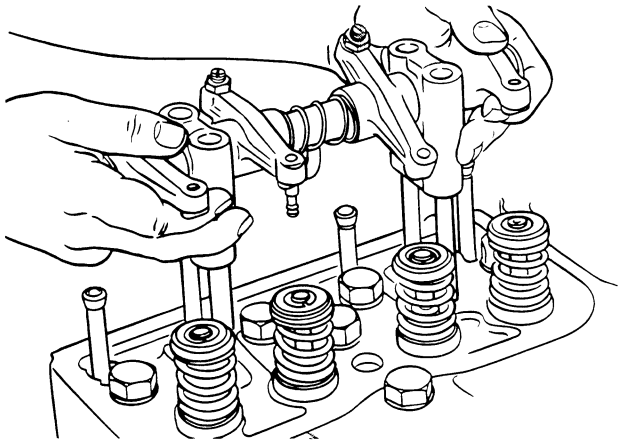
COMPRESS VALVE SPRING USING FABRICATED TOOL. INSTALL SEAL IN LOWER VALVE STEM GROOVE. INSTALL VALVE KEEPERS IN OUTER VALVE STEM GROOVE.

STEP 14



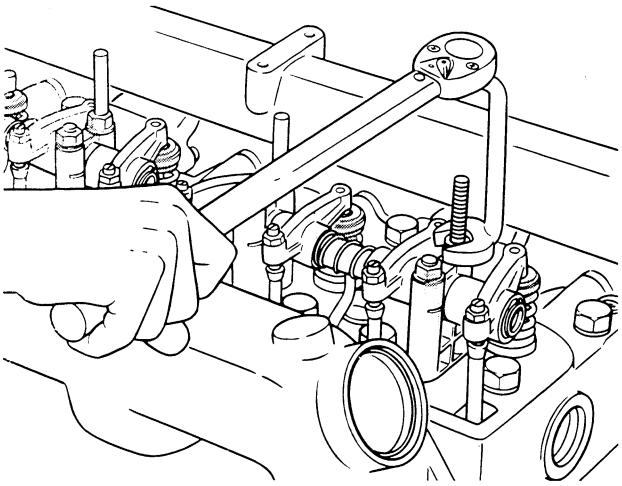
REMOVE SPRING COMPRESSING TOOL. TAP END OF VALVE STEM TO SEAT KEEPERS.

STEP 15



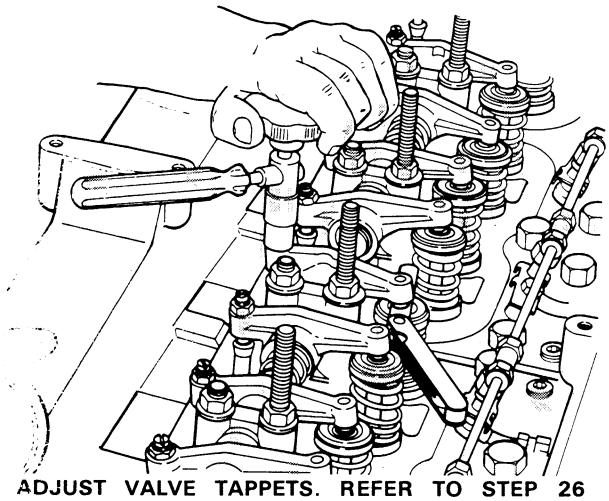
INSTALL ROCKER ARM ASSEMBLY ONTO CYLINDER HEAD.

STEP 16



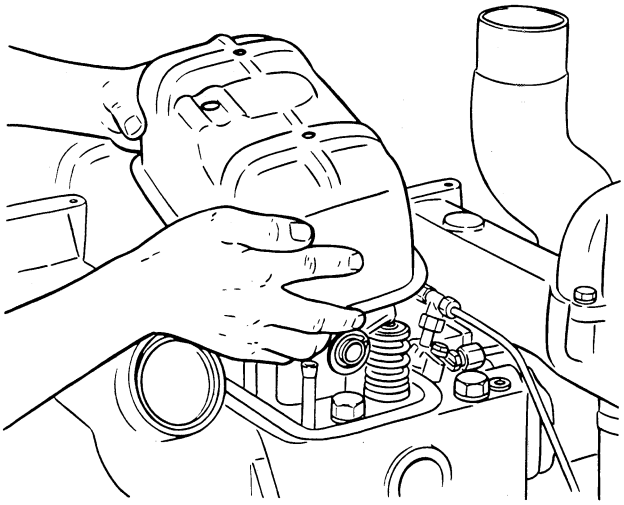
TORQUE ROCKER ARM ASSEMBLY RETAINING NUTS 40 TO 45 FT. LBS.

STEP 17



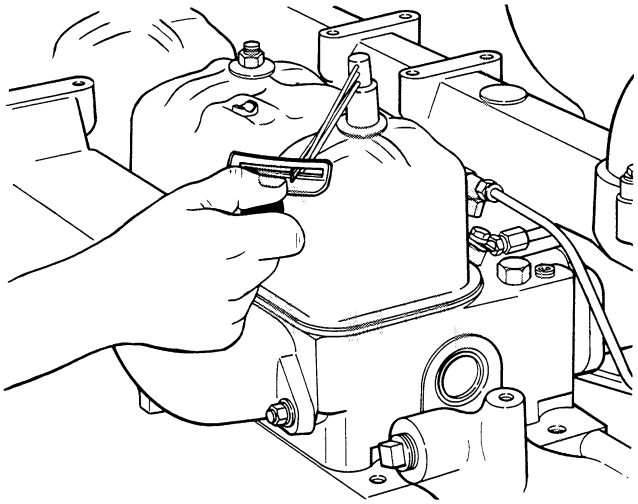
ADJUST VALVE TAPPETS. REFER TO STEP 26 FOR COLD SETTING OR TO STEP 33 FOR HOT SETTING.

STEP 18



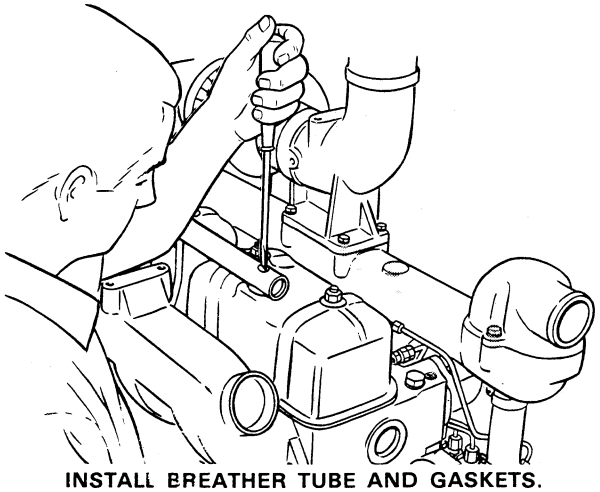
INSTALL VALVE COVERS AND GASKETS.

STEP 19



TORQUE VALVE COVER NUTS 60 TO 70 IN. LBS.

STEP 20

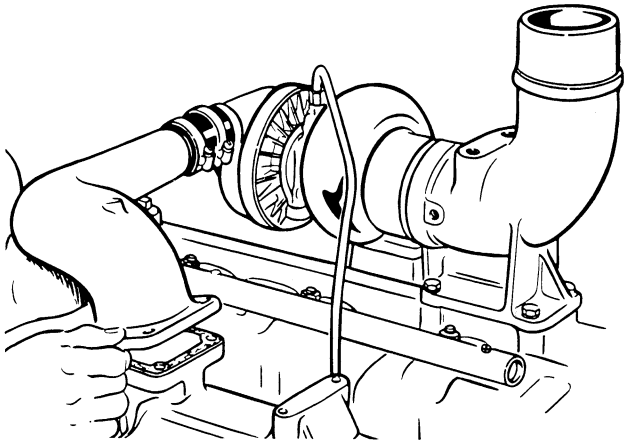


INSTALL BREATHER TUBE AND GASKETS.

Adjusting Tappets

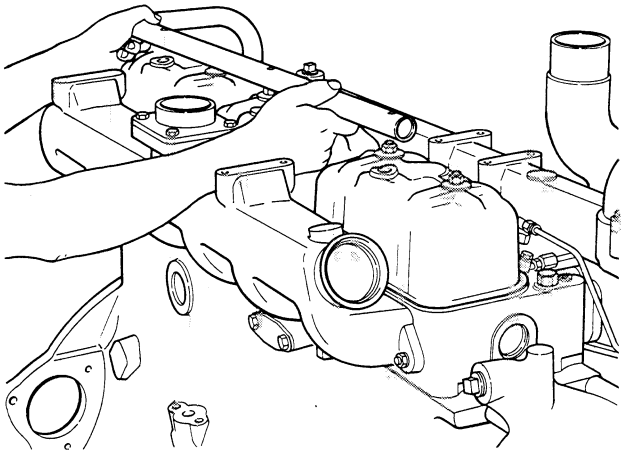
Cold Setting

STEP 21



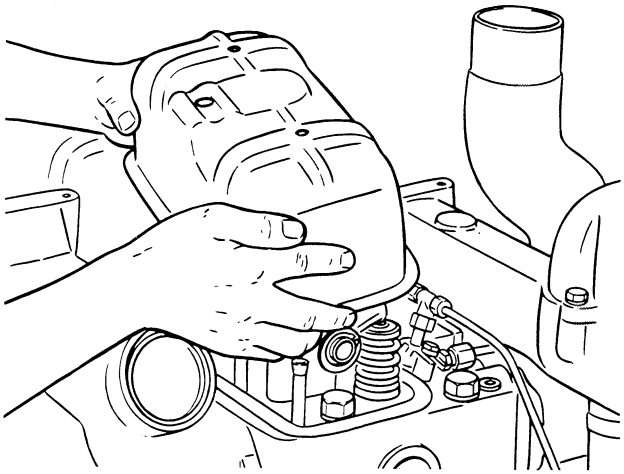
REMOVE TURBOCHARGER INTAKE ELBOW (IF SO EQUIPPED).

STEP 22



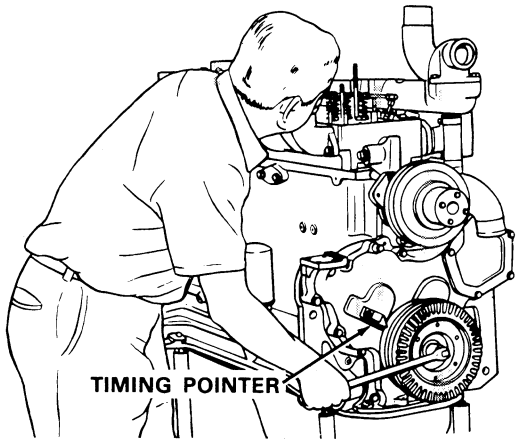
REMOVE BREATHER TUBE.

STEP 23



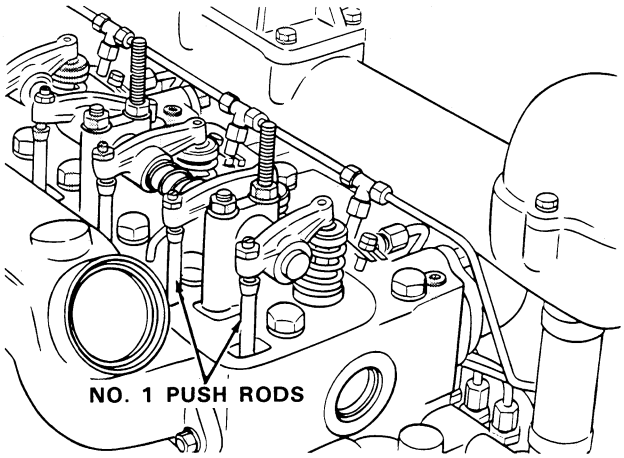
REMOVE VALVE COVERS AND GASKETS FROM ALL CYLINDERS.

STEP 24



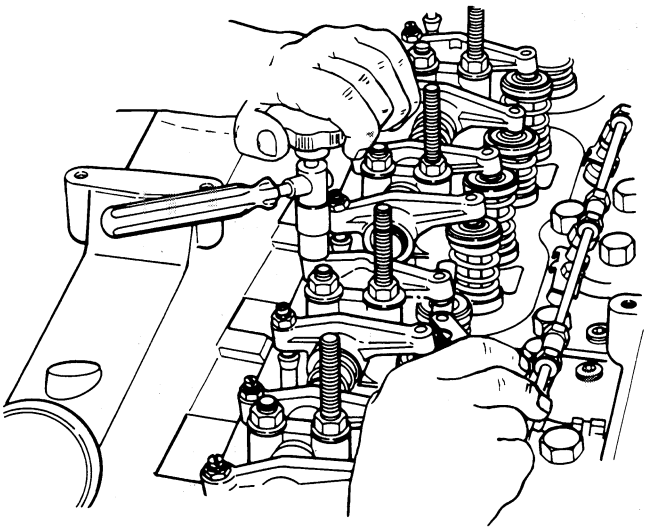
CRANK ENGINE UNTIL TIMING POINTER IS ALIGNED WITH TDC TIMING MARK ON CRANKSHAFT PULLEY.

STEP 25



CHECK PUSH RODS ON NO. 1 CYLINDER FOR LOOSENESS. IF PUSH RODS ARE LOOSE, NO. 1 CYLINDER IS AT TDC ON THE COMPRESSION STROKE. IF PUSH RODS ARE TIGHT, CRANK ENGINE ONE COMPLETE REVOLUTION AND ALIGN TIMING POINTER WITH TDC MARK ON PULLEY.

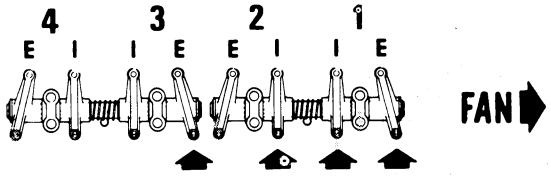
STEP 26



CHECK AND ADJUST THE INTAKE AND EXHAUST VALVES AS POINTED OUT BY THE ARROWS BELOW.

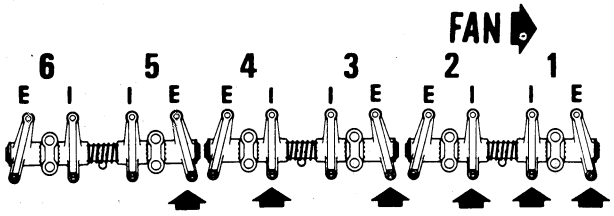
TAPPET CLEARANCE COLD - INTAKE VALVES .015"
EXHAUST VALVES - .025"

FOUR CYLINDER ENGINES



NO. 1 TDC COMPRESSION STROKE

SIX CYLINDER ENGINES



NO. 1 TDC COMPRESSION STROKE

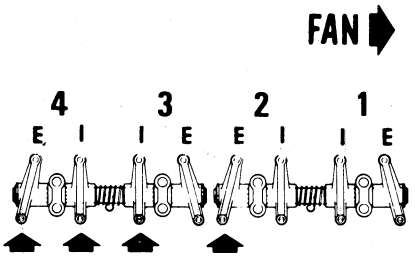
STEP 27

CRANK THE ENGINE ONE COMPLETE REVOLUTION AND ALIGN THE TIMING POINTER WITH THE TDC MARK ON CRANKSHAFT PULLEY.

CHECK AND ADJUST THE INTAKE AND EXHAUST VALVES AS POINTED OUT BY THE ARROWS BELOW.

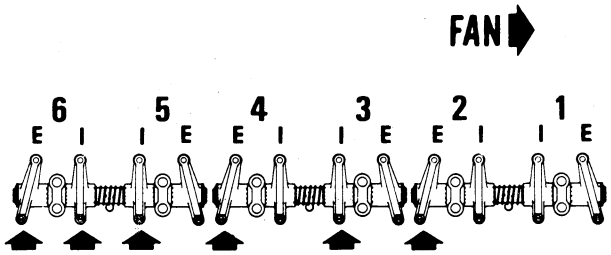
TAPPET CLEARANCE COLD - INTAKE VALVES .015"
EXHAUST VALVES .025"

FOUR CYLINDER ENGINES



NO. 4 TDC COMPRESSION STROKE

SIX CYLINDER ENGINES



NO. 6 TDC COMPRESSION STROKE

NOTE: AFTER COMPLETING COLD SETTING VALVE TAPPET ADJUSTMENT PROCEED TO STEP 35.

Suggest:

If the above button click is invalid.

Please download this document

first, and then click the above link

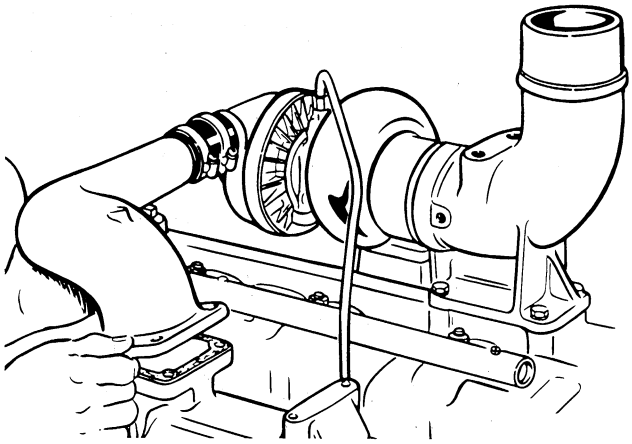
to download the complete manual.

Thank you so much for reading

Adjusting Tappets

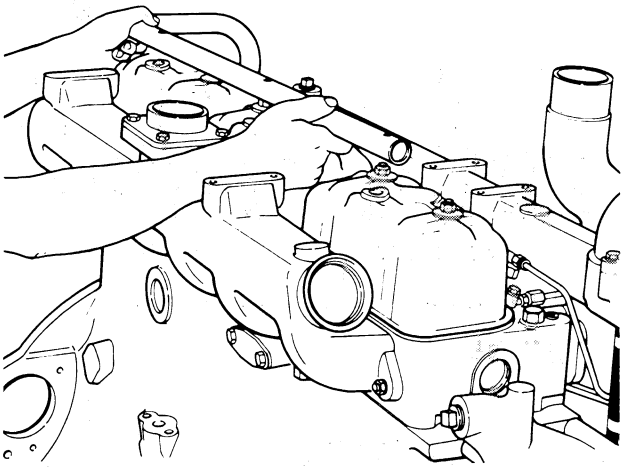
Hot Setting with Engine Stopped

STEP 28



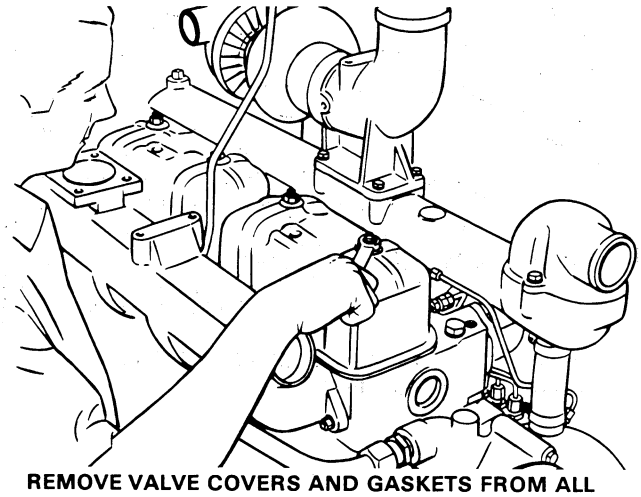
REMOVE TURBOCHARGER INTAKE ELBOW (IF SO EQUIPPED).

STEP 29



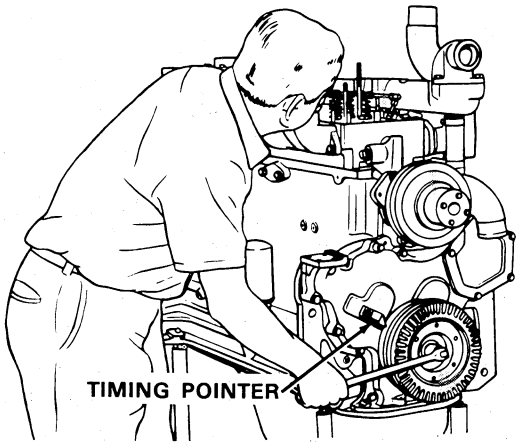
REMOVE BREATHER TUBE

STEP 30



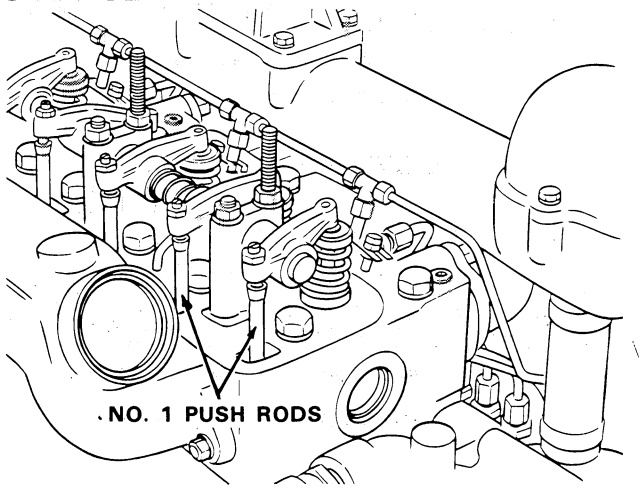
REMOVE VALVE COVERS AND GASKETS FROM ALL CYLINDERS.

STEP 31



CRANK ENGINE UNTIL TIMING POINTER IS ALIGNED WITH TDC TIMING MARK ON CRANKSHAFT PULLEY.

STEP 32



CHECK PUSH RODS ON NO. 1 CYLINDER FOR LOOSENESS. IF PUSH RODS ARE LOOSE, NO.1 CYLINDER IS AT TDC ON THE COMPRESSION STROKE. IF PUSH RODS ARE TIGHT, CRANK ENGINE ONE COMPLETE REVOLUTION AND ALIGN TIMING POINTER WITH TDC MARK ON PULLEY.