1150C CRAWLER TABLE OF CONTENTS AND SERVICE MANUAL INTRODUCTION

CASE CORPORATION

C E Div. 9-67861
December 1979

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Section 1010

GENERAL ENGINE SPECIFICATIONS 1150C CRAWLER LOADER AND DOZER

DIESEL ENGINES

General

Type	6 Cylinder, 4 Stroke Cycle, Valve-in-Head
Firing Order	1-5-3-6-2-4
Bore	4-3/8 Inches
Stroke	5 Inches
Piston Displacement	16.5 to 1
No Load Governed Speed	2285 - 2315 RPM
Rated Engine Speed	2100 RPM
Engine Idling Speed	725 to 775 RPM
Exhaust Valve Rotators	Positive Type
Valve Tappet Clearance (Exhaust)	0.025 Inch
(Intake)	0.015 Inch

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 55 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 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

GENERAL INFORMATION

1. All decals about operation of the machine and/or attachments must be in a condition so that you can read the decals easily. Replace any decal that has damage or cannot be read.

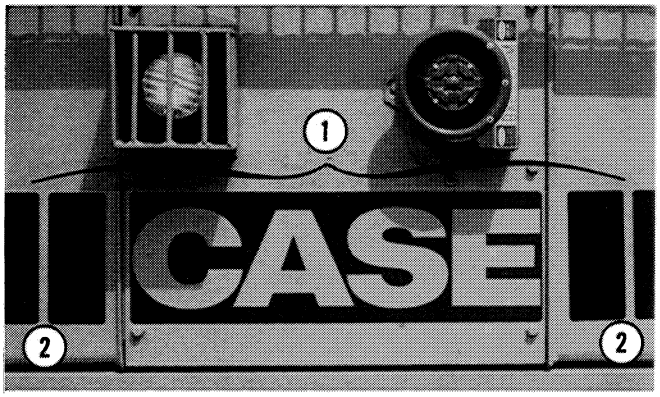
2. All decals that start with the words WARNING, CAUTION, or DANGER must be in a condition so that you can read the decals easily. Replace any decal that has damage or cannot be read.

3. When you paint the machine or attachment, put covers over the good decals and remove the decals which have damage or cannot be read easily. Use enamel thinner to make the decal easier to remove.

4. Remove the old decal before you install a new decal. Use enamel thinner to make the old decal easier to remove.

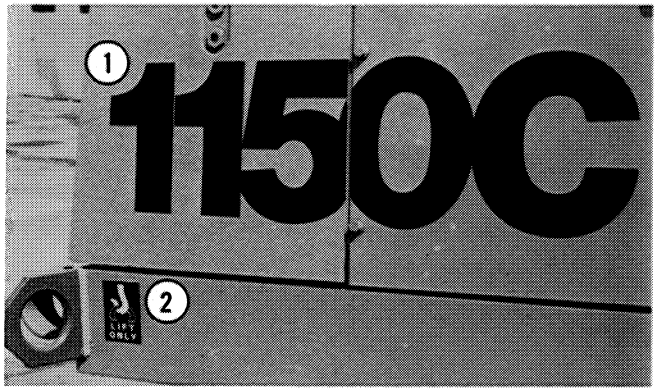
5. When you paint the machine or attachment, use standard procedure. Remove the grease, wash the area, use sandpaper to prepare the surface for paint, and put covers over all good decals and parts which you do not want to paint.

6. The following pages show decals installed on the machine or attachments. Part numbers of the decals are shown also. Check the parts catalog to make sure that the part number is correct before you make an order for the decals. Decals are available separately or in a kit for the machine.



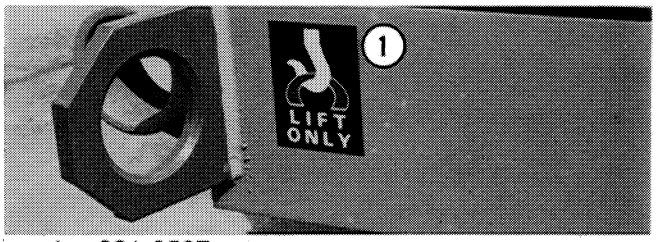
1. 321-5273 - Case and Treadmarks
2. 321-3122 - Treadmarks

Figure 1



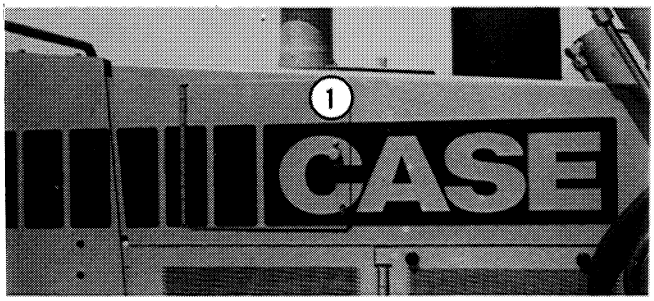
1. 321-4627
2. 321-3587

Figure 2



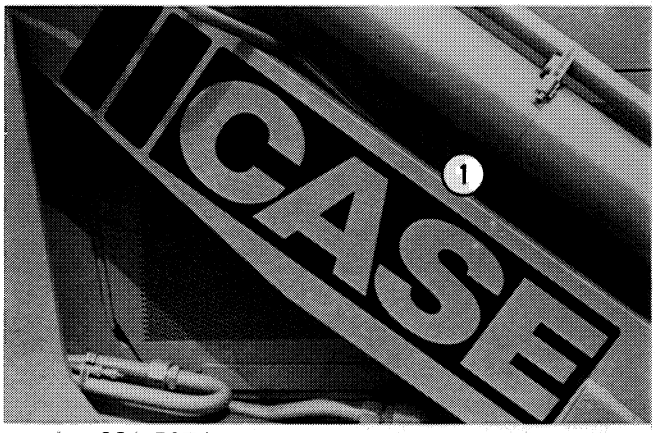
1. 321-3587

Figure 3



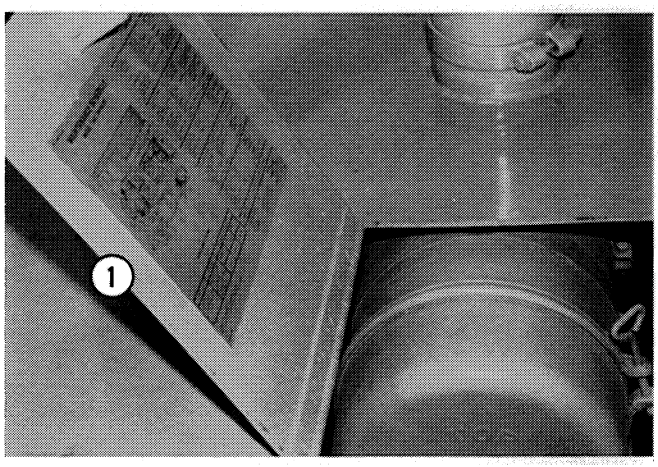
1. 321-5276

Figure 4



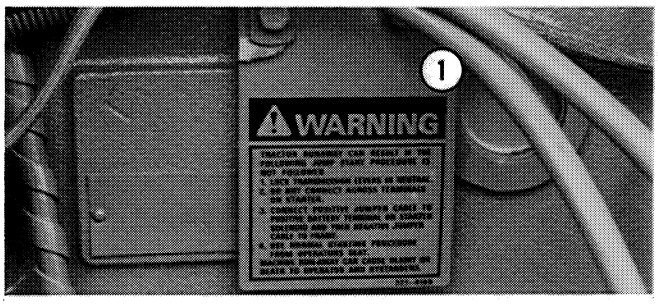
1. 321-5274

Figure 5



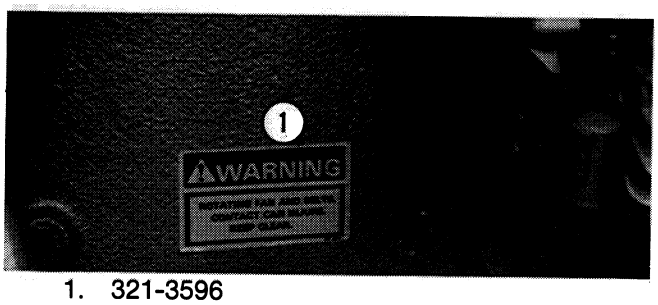
1. 321-4689 Location Shown is for Engines Without Turbocharger. Maintenance Decal for Engines With Turbocharger is on Door Right Side of Hood

Figure 6



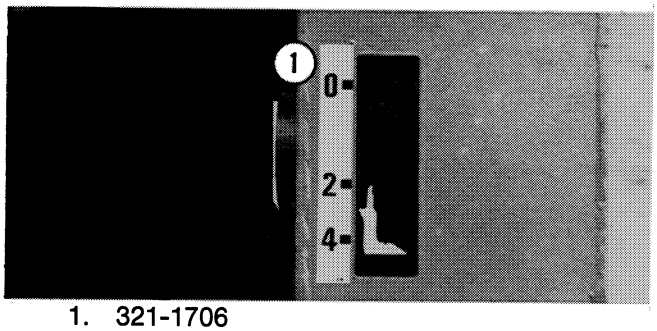
1. 321-4189

Figure 7



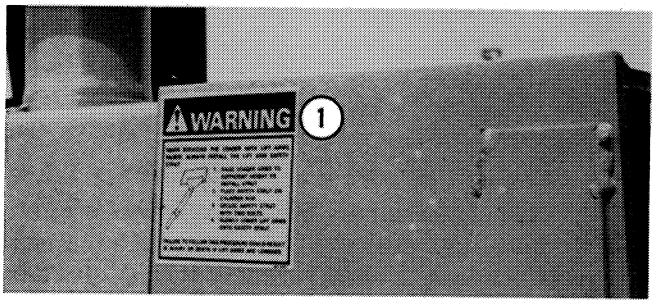
1. 321-3596

Figure 8



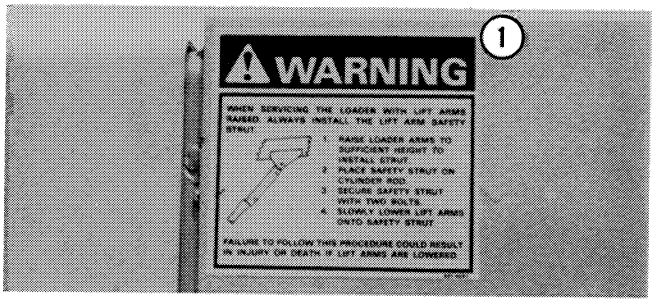
1. 321-1706

Figure 9



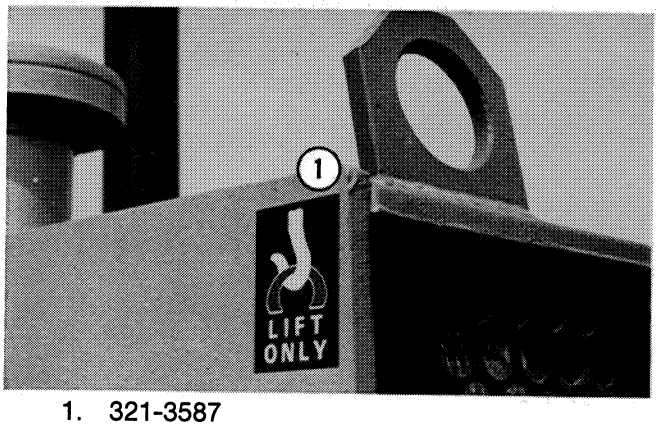
1. 321-4227

Figure 10



1. 321-4227 See Figure 10 for Location

Figure 11

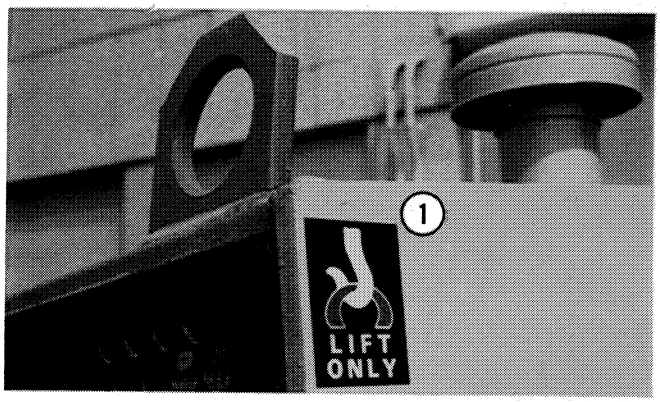


1. 321-3587

Figure 12

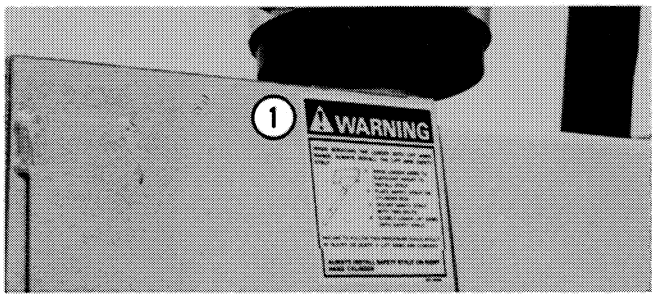
1. 321-3708

Figure 13



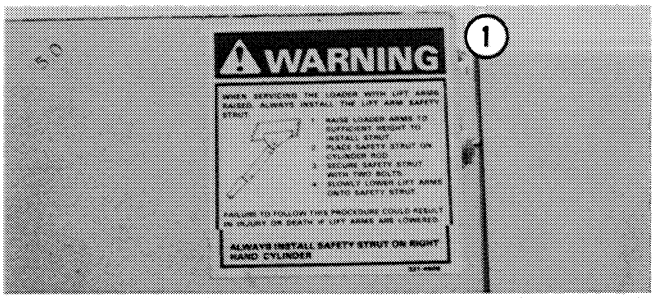
1. 321-3587

Figure 14



1. 321-4227

Figure 15

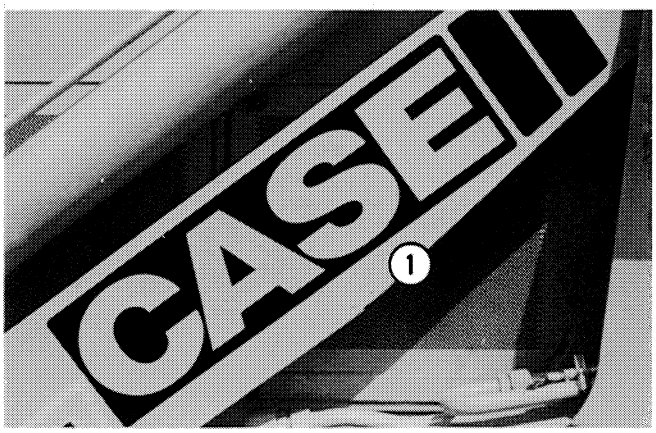


1. 321-4227 See Figure 15 for Location

Figure 16

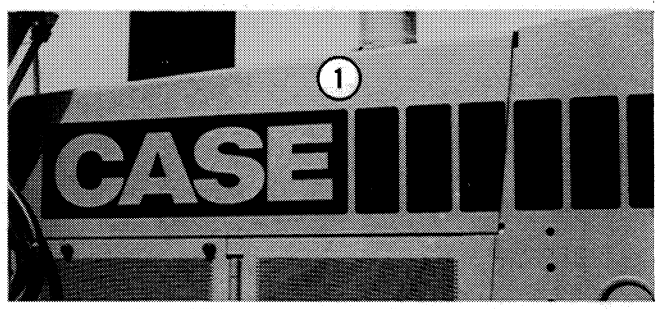
1. 321-3596

Figure 17



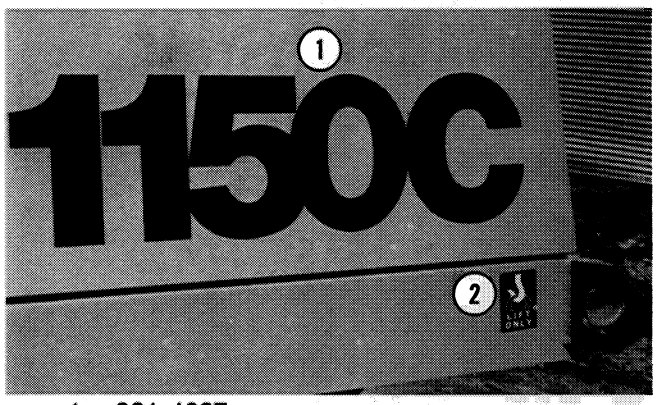
1. 321-5274

Figure 18



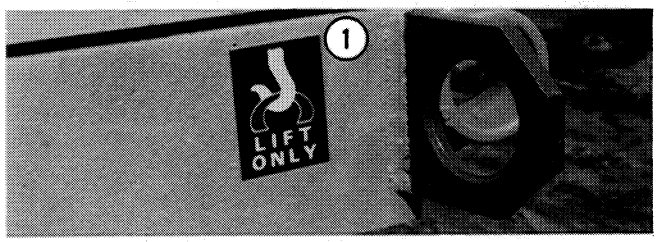
1. 321-5276

Figure 19



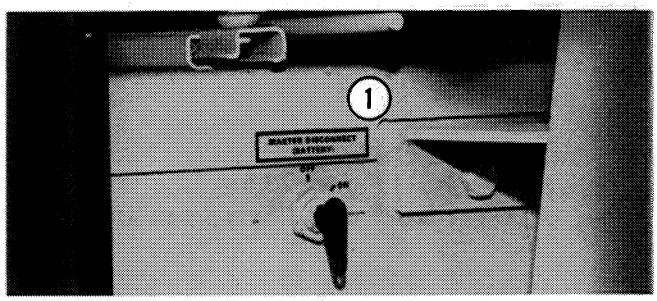
1. 321-4627
2. 321-3587

Figure 20



1. 321-3587 See Figure 20 for Location

Figure 21



1. 321-2392

Figure 22

Section
2001

ENGINE DIAGNOSIS

CASE CORPORATION

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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.

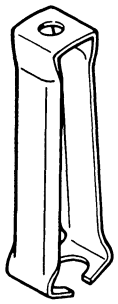
2. COMPRESSION. Compression on an engine is related to the "breathing function". Proper compression is affected by the air cleaner condition, muffler restriction, valve condition and operation including proper valve adjustment, cylinder head gaskets condition of sleeves, rings, pistons, camshaft, and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

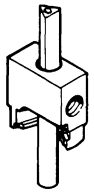
The engine diagnosis contained in the following pages covers many trouble symptoms, the causes, and what will be necessary to repair or eliminate the problem. Under each symptom are listed the most common and reoccuring problems progressively to the not so common problems. Locate your problem symptom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

INSTALLATION INSTRUCTIONS FOR M20614 TEFLON VALVE SEAL KIT

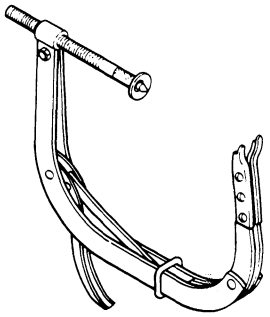
Special Tools Required



M20624 SEAL INSTALLATION TOOL



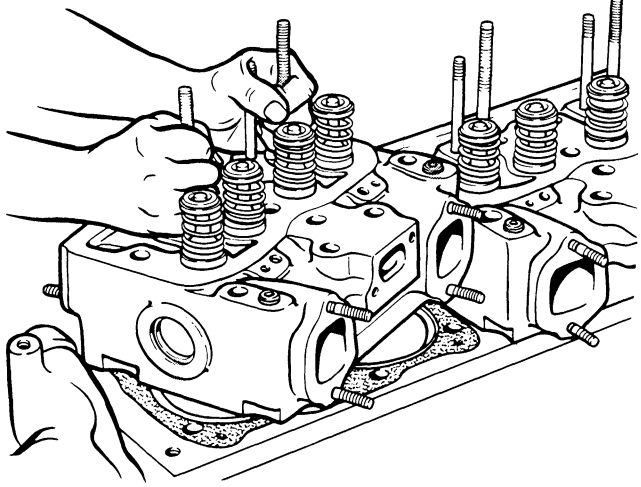
M20617 VALVE GUIDE CUTTING TOOL



VALVE SPRING COMPRESSOR

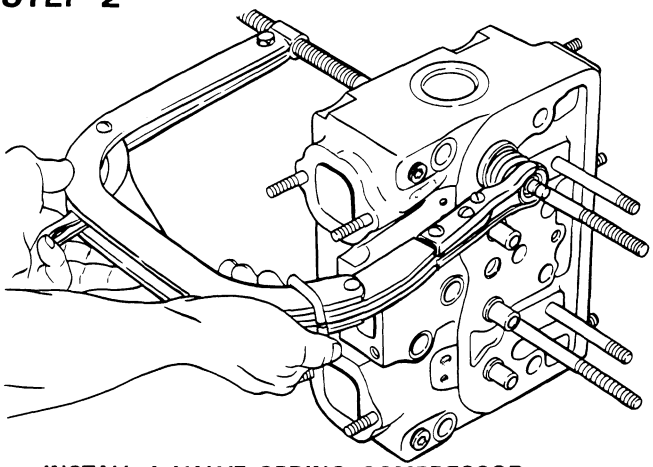
NOTE: FOUR CYLINDER ENGINES REQUIRE TWO M20614 KITS AND SIX CYLINDER ENGINES REQUIRE THREE M20614 KITS.

STEP 1



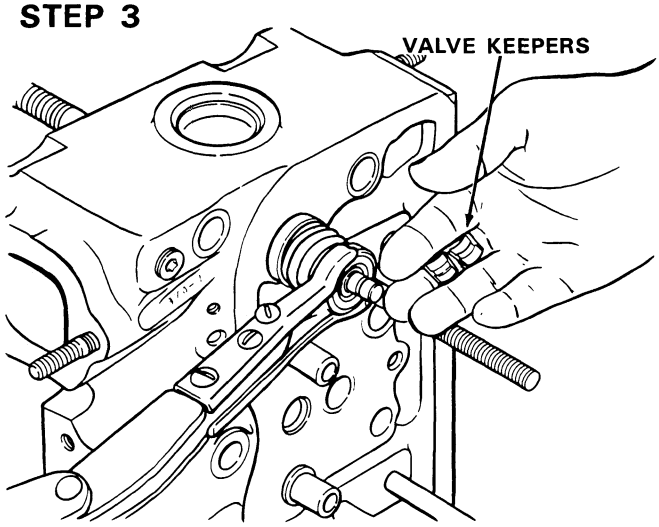
REMOVE THE CYLINDER HEADS FROM THE ENGINE, REFER TO SECTION 2015 FOR HEAD REMOVAL.

STEP 2



INSTALL A VALVE SPRING COMPRESSOR.

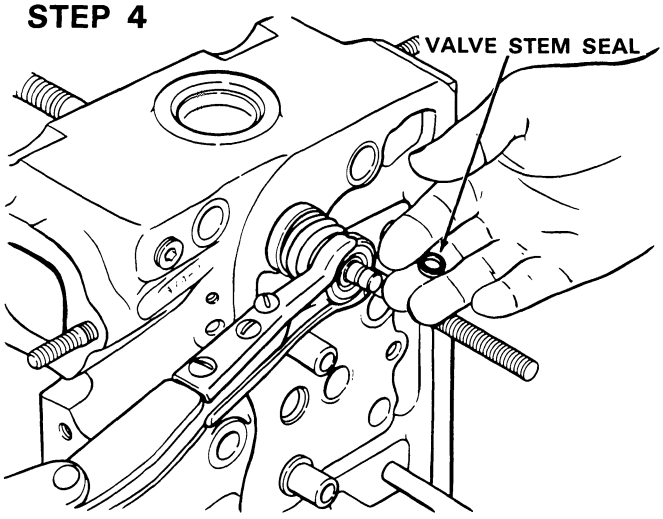
STEP 3



COMPRESS VALVE SPRING AND REMOVE VALVE KEEPERS.

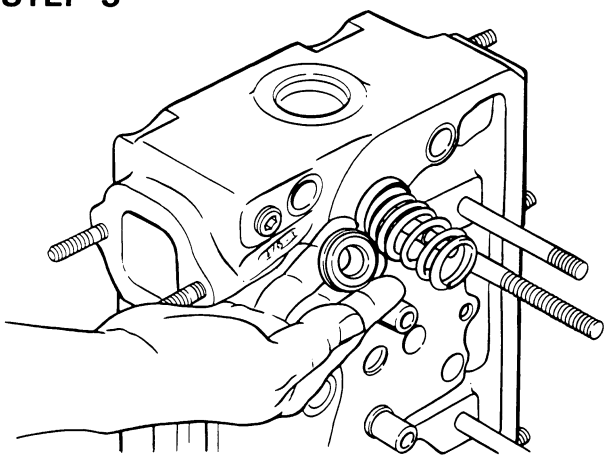
IMPORTANT: VALVES, VALVE RETAINERS OR ROTATORS AND VALVE KEEPERS SHOULD BE MARKED WHEN REMOVED, TO INSURE THAT THEY WILL BE REINSTALLED IN THEIR ORIGINAL LOCATION.

STEP 4



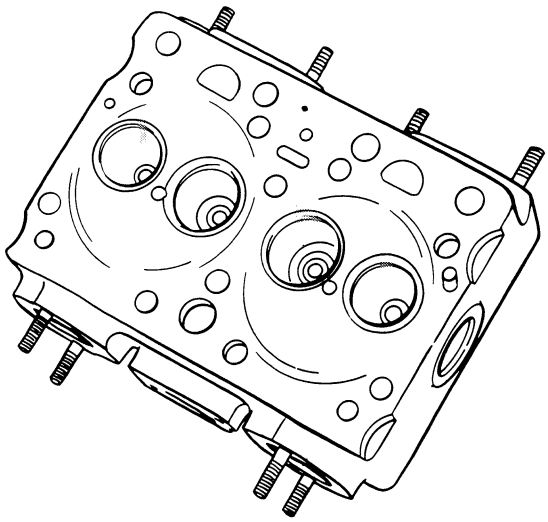
REMOVE VALVE STEM SEAL.

STEP 5



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

STEP 6

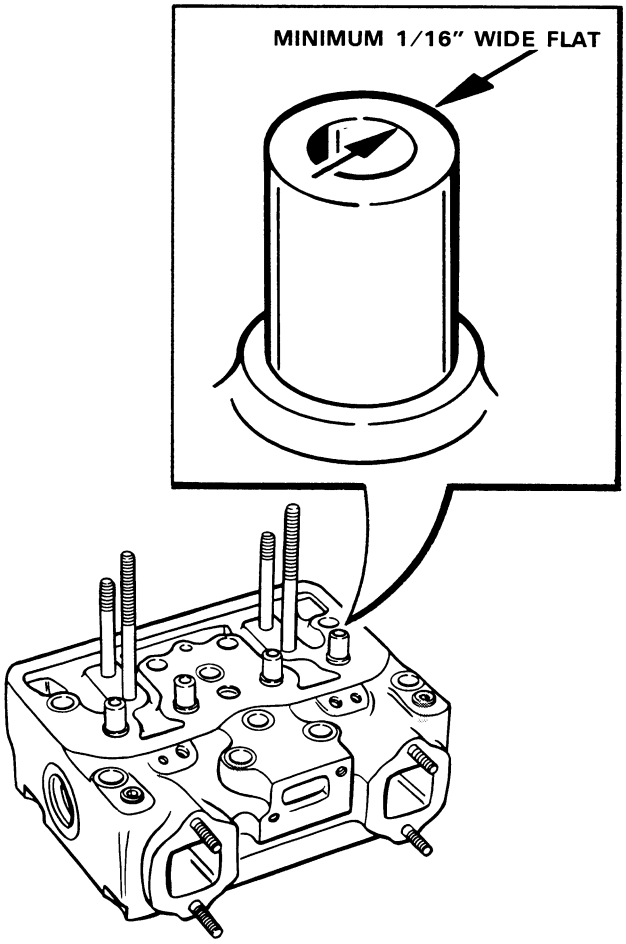


CLEAN CYLINDER HEAD COMPLETELY, REMOVING ALL TRACES OF CARBON AND OTHER DEPOSITS.

STEP 7

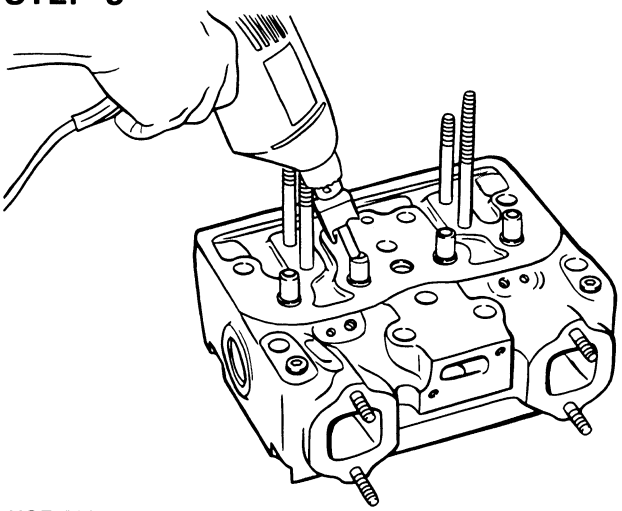
CLEAN VALVES WITH A FINE POWER DRIVEN WIRE BRUSH, REMOVING ALL CARBON AND VARNISH DEPOSITS. BE CAREFUL NOT TO SCRATCH VALVE STEMS.

STEP 8



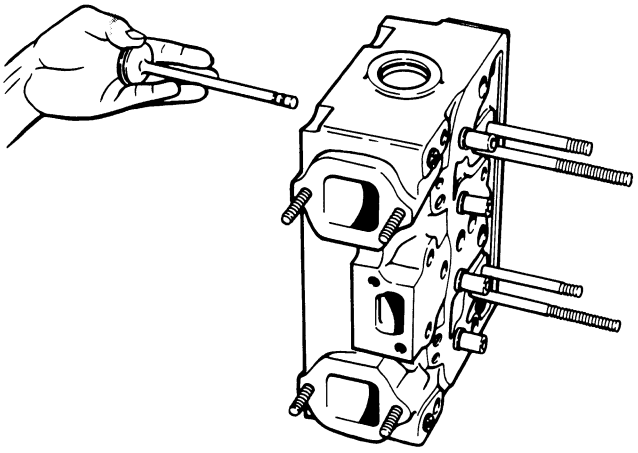
CHECK VALVE GUIDE TOP SURFACE, THERE MUST BE A MINIMUM OF A 1/16" WIDE FLAT AROUND ENTIRE TOP SURFACE.

STEP 9



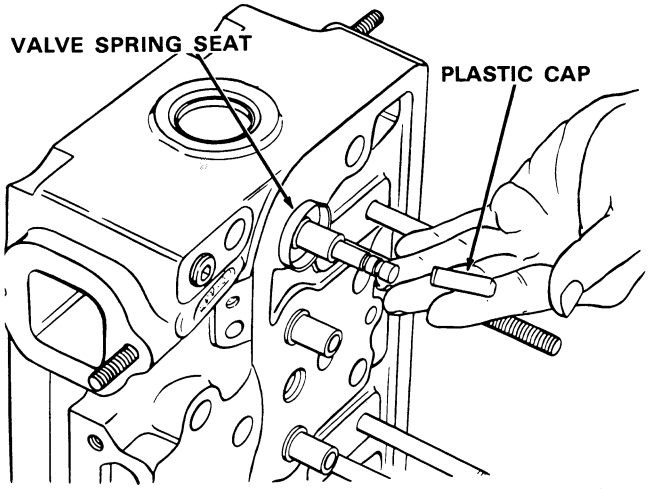
USE M20617 TOOL IN A ELECTRIC DRILL (IF REQUIRED) TO PROVIDE NECESSARY FLAT AREA ON VALVE GUIDE. IMPORTANT: DO NOT EXCEED 450 RPM WHEN DRILLING

STEP 10



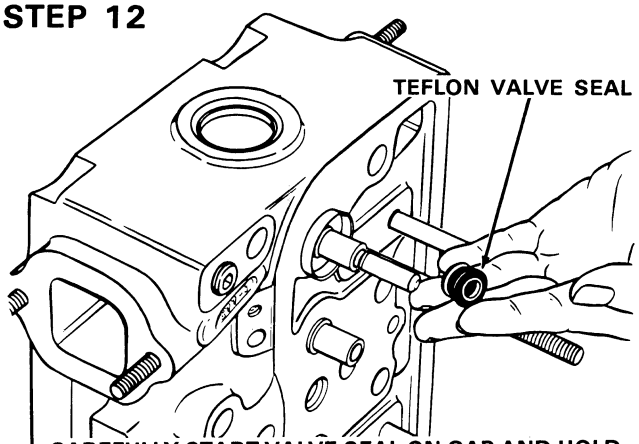
LUBRICATE VALVES WITH CLEAN ENGINE OIL BEFORE REINSTALLING INTO CYLINDER HEAD.

STEP 11



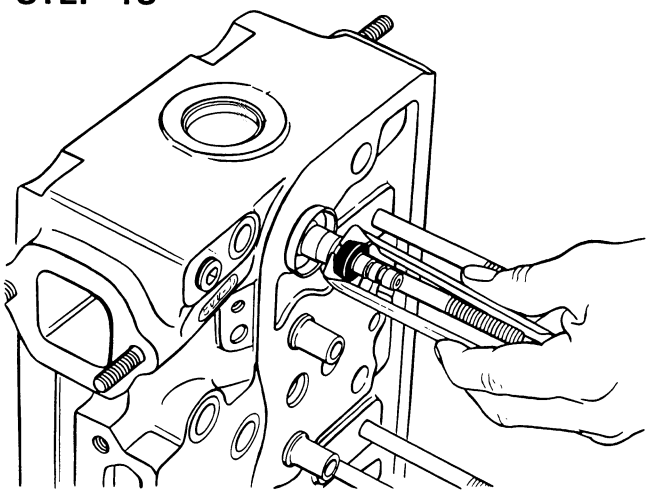
PLACE PLASTIC INSTALLATION CAP, PROVIDED IN KIT, ON THE END OF THE VALVE STEM. NOTE: CAP PREVENTS SHARP EDGES ON VALVE STEM GROOVES FROM CUTTING VALVE SEAL.

STEP 12



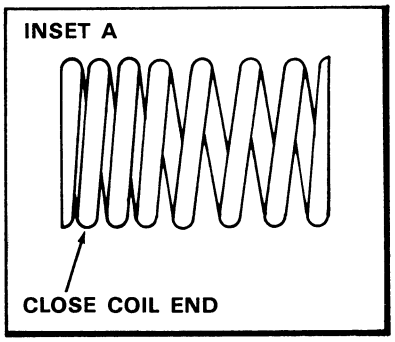
CAREFULLY START VALVE SEAL ON CAP AND HOLD THUMBS AGAINST WHITE SEAL INSERT TO AVOID DISLODGING IT, PUSH SEAL DOWN UNTIL SEAL JACKET TOUCHES TOP OF VALVE GUIDE. REMOVE INSTALLATION CAP AND SAVE, SINCE IT MUST BE REUSED.

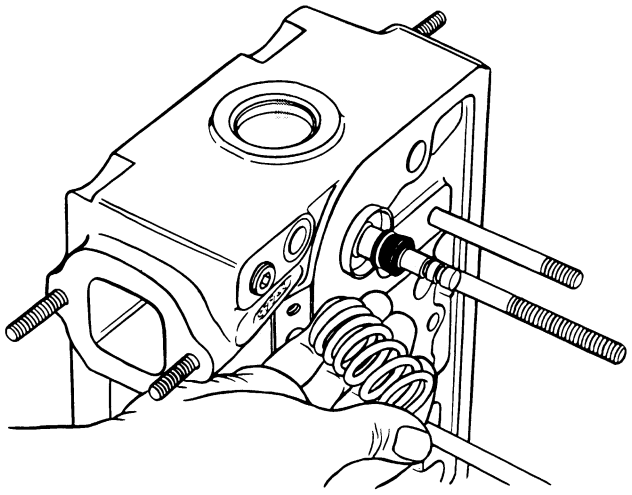
STEP 13



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

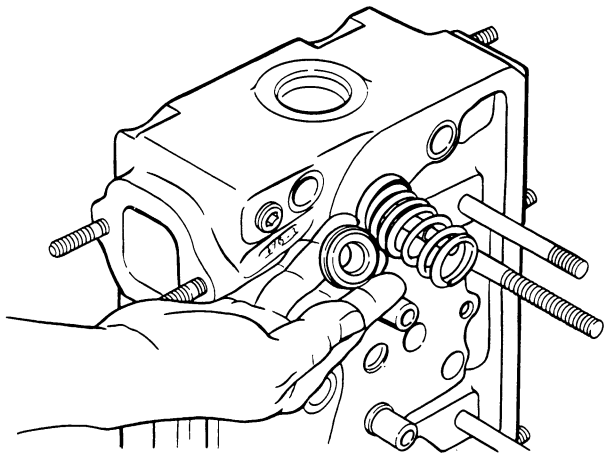
STEP 14





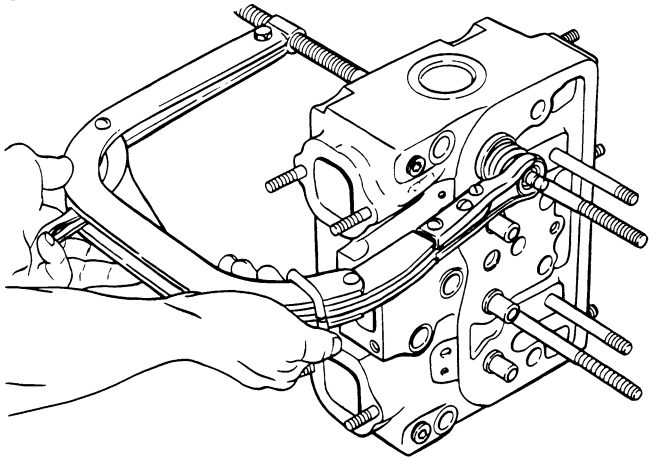
INSTALL THE VALVE SPRING. IMPORTANT: THE CLOSE COIL END OF THE SPRING MUST BE INSTALLED TOWARDS THE CYLINDER HEAD, SEE INSET A.

STEP 15



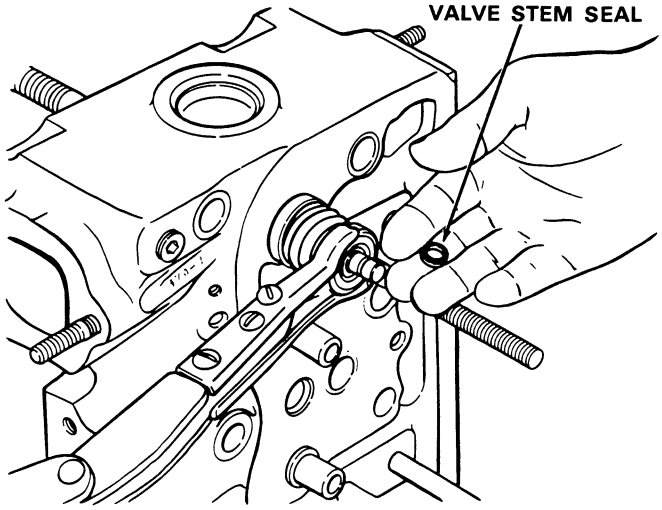
INSTALL VALVE ROTATORS OR SPRING RETAINERS. IMPORTANT: ASSEMBLE VALVE ROTATORS WITH THEIR ORIGINAL VALVES SINCE THEY TEND TO WEAR IN AS A MATCHED SET.

STEP 16



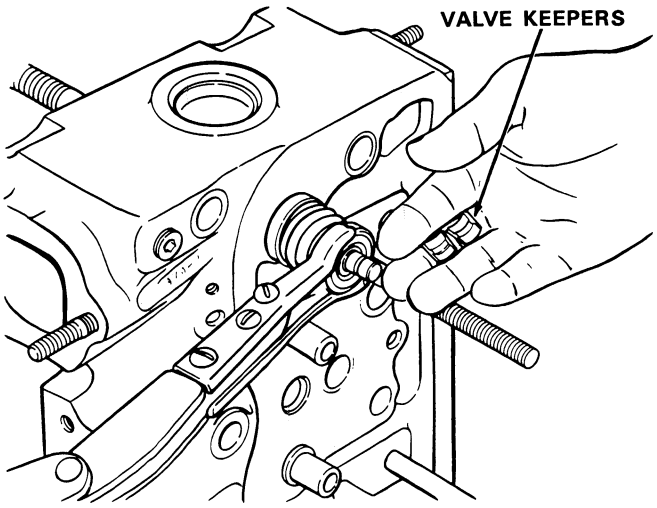
INSTALL VALVE SPRING COMPRESSOR.

STEP 17



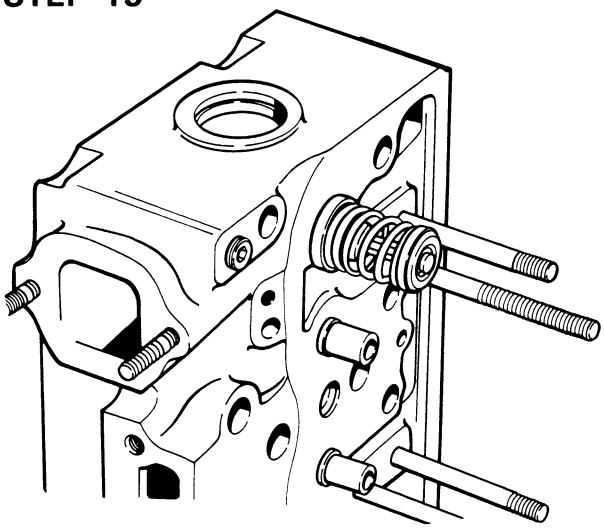
INSTALL STEM SEAL IN LOWER VALVE STEM GROOVE.

STEP 18



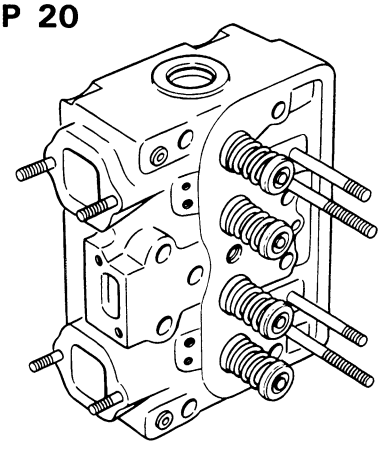
INSTALL VALVE KEEPERS IN OUTER VALVE STEM GROOVE.

STEP 19



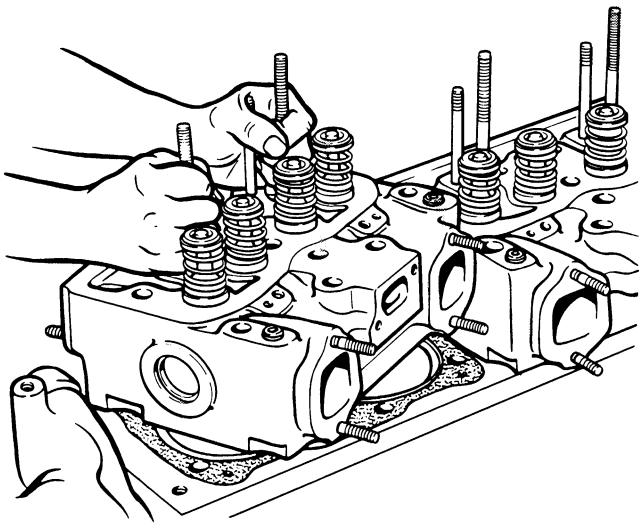
REMOVE SPRING COMPRESSOR AND TAP VALVE STEM END TO SEAT KEEPERS.

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.

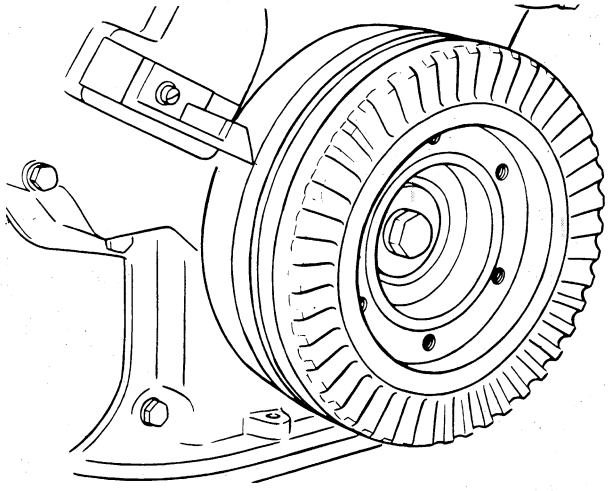
ENGINE TUNEUP PROCEDURE

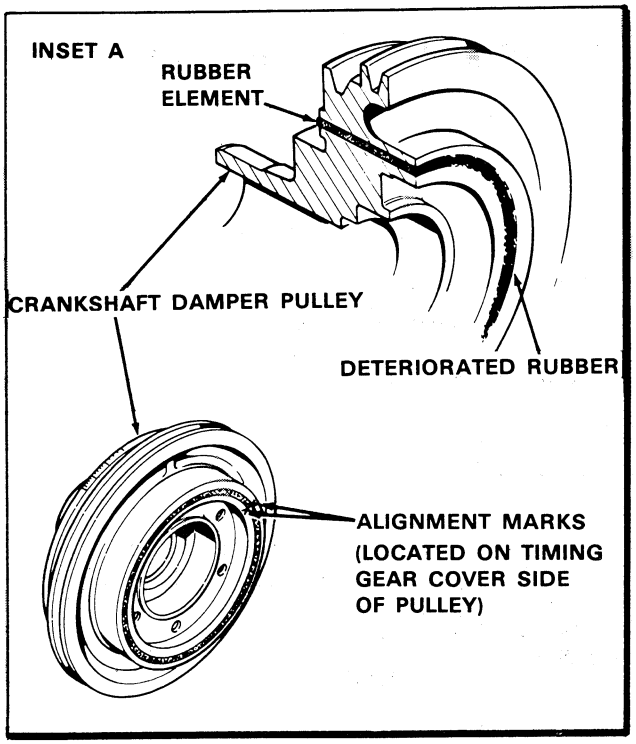
Checking Crankshaft Damper Pulley

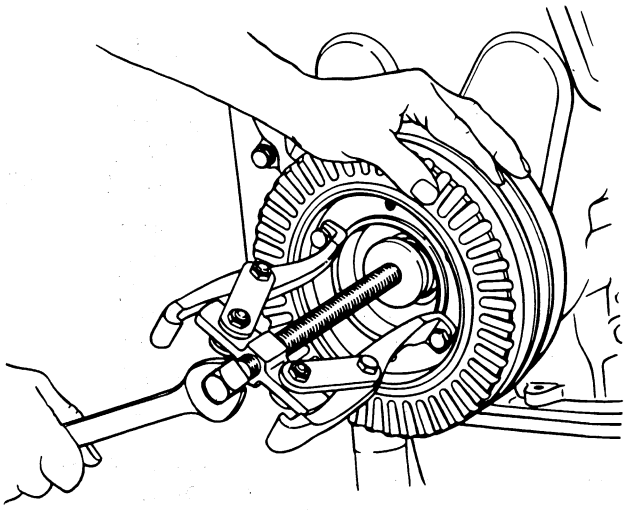
STEP 1

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.

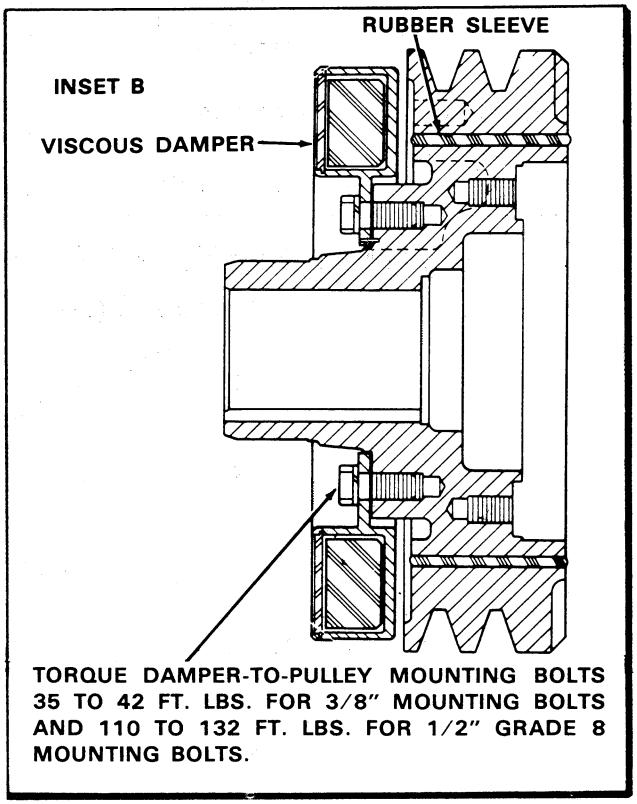
EVERY 500 HOURS AND AT ENGINE TUNEUP, VISUALLY INSPECT RUBBER ELEMENT FOR PEEL AREAS OR RUBBER MISSING. CHECK ALIGNMENT OF THE "V" MARKS BETWEEN THE INNER AND OUTER MEMBERS. IF "V" MARKS SHIFT, ENGINE TIMING WILL BE OFF AND DAMPER PULLEY MUST BE REPLACED.





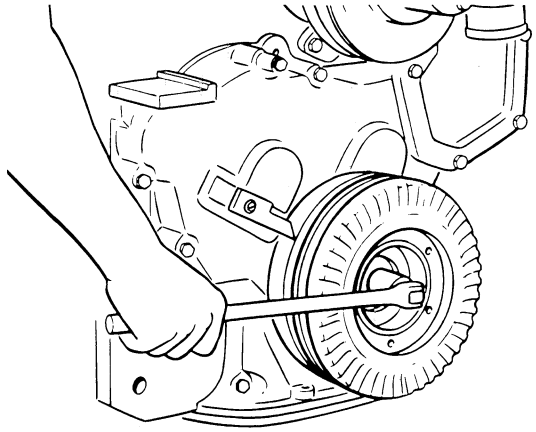


USE BOLT ON TYPE PULLER TO REMOVE PULLEY. REMOVE VISCOUS DAMPER FROM PULLEY (IF SO EQUIPPED). DO NOT PULL OR HAMMER ON OUTSIDE OF PULLEY OR VISCOUS DAMPER; SERIOUS DAMAGE TO PULLEY, DAMPER, AND RUBBER SLEEVE COULD RESULT.



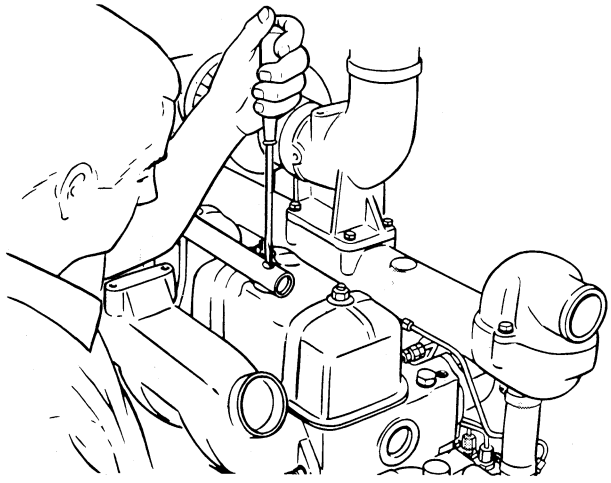
Checking Top Dead Center

STEP 2



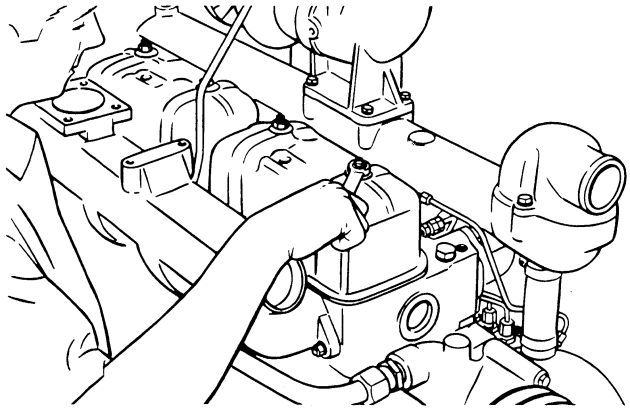
CRANK ENGINE UNTIL 10° BTDC MARK ON CRANKSHAFT PULLEY IS ALIGNED WITH TIMING POINTER.

STEP 3



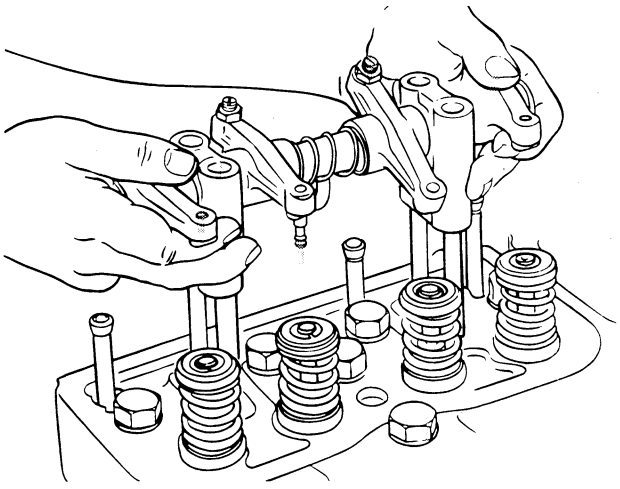
REMOVE BREATHER TUBE.

STEP 4



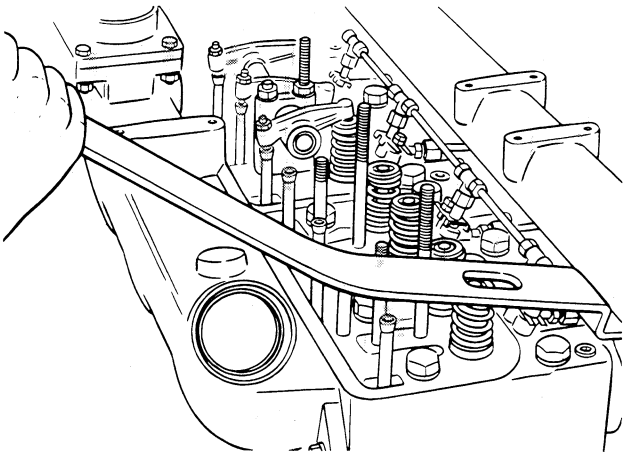
REMOVE VALVE COVER AND GASKET FROM NO. 1 AND NO. 2 CYLINDERS.

STEP 5



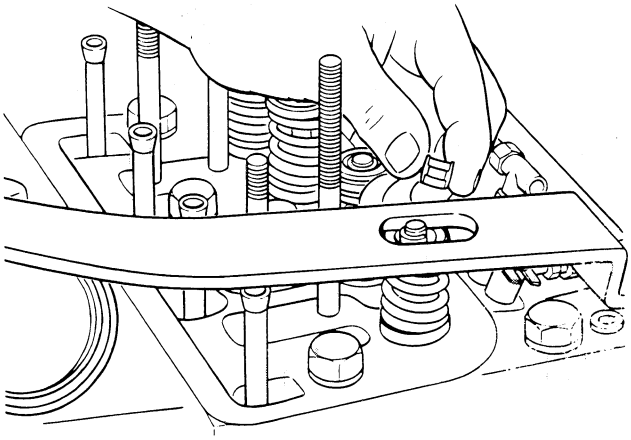
REMOVE ROCKER ARM ASSEMBLY.

STEP 6



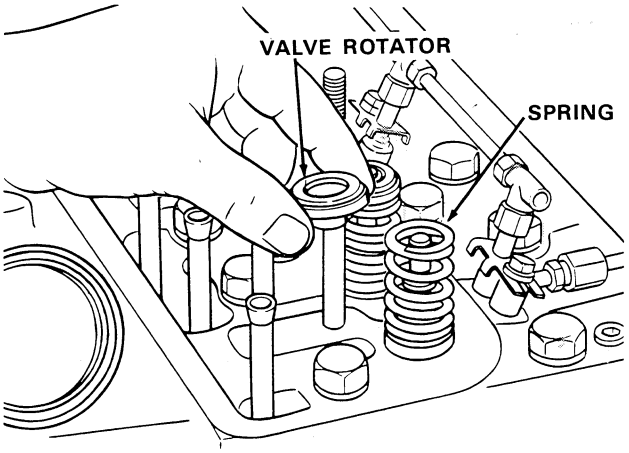
COMPRESS EXHAUST VALVE SPRING ON NO. 1 CYLINDER USING FABRICATED TOOL (SEE PAGE 3).

STEP 7



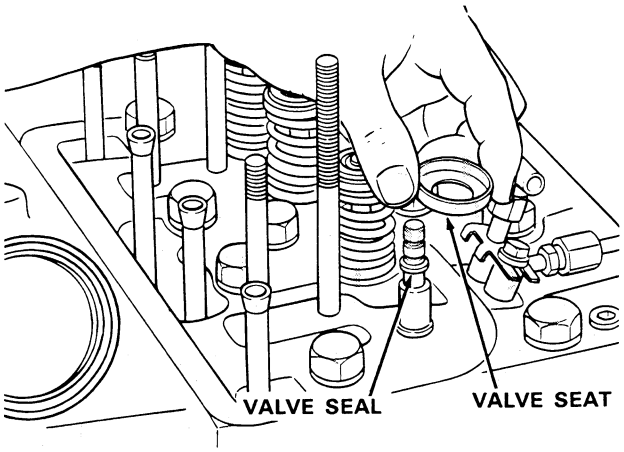
REMOVE VALVE KEEPERS

STEP 8



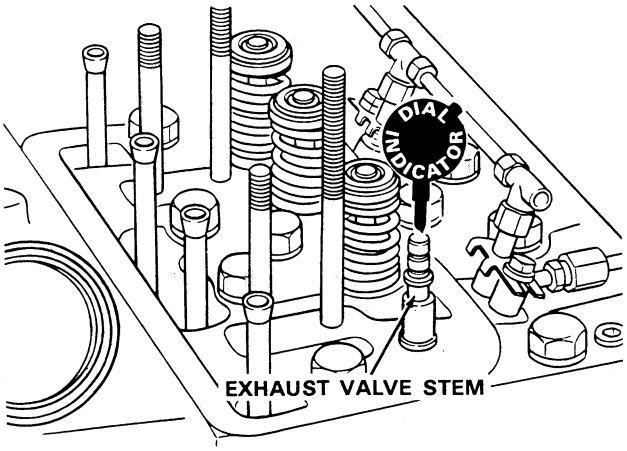
REMOVE VALVE ROTATOR, SPRING AND SEAT.

STEP 9

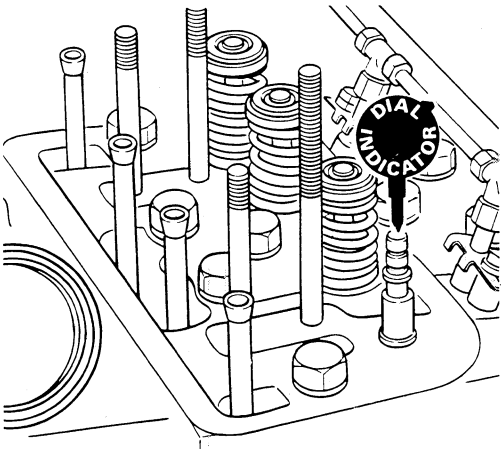


KEEP VALVE SEAL IN PLACE TO PREVENT VALVE FROM FALLING THROUGH VALVE GUIDE IF PISTON IS MOVED TOO FAR

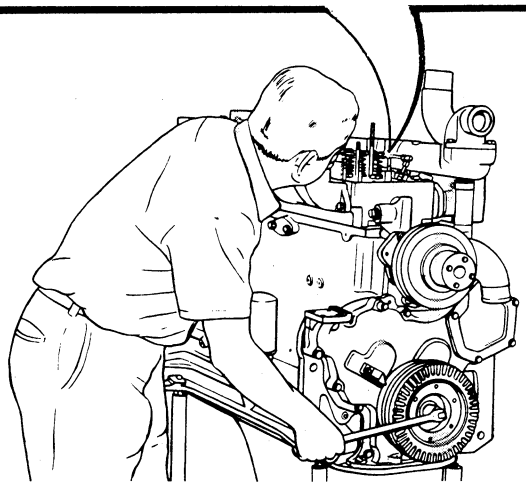
STEP 10



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



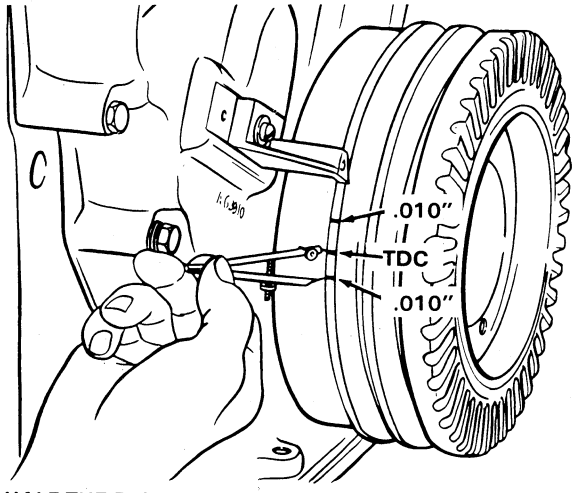
CRANK ENGINE CLOCKWISE UNTIL DIAL INDICATOR HAND STOPS MOVING. RESET INDICATOR TO ZERO.



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

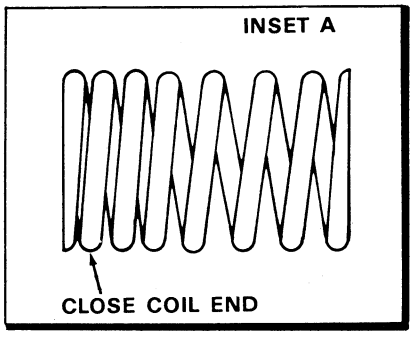
CRANK ENGINE COUNTERCLOCKWISE PAST ZERO MARK ON INDICATOR UNTIL .010" SHOWS ON DIAL. AGAIN, SCRIBE MARK ON CRANKSHAFT PULLEY.

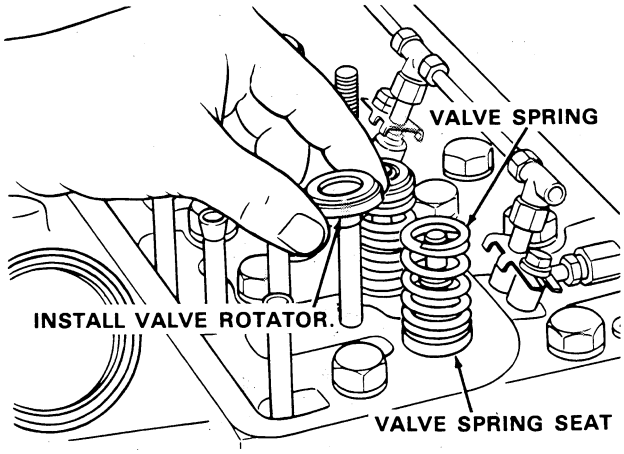
STEP 11



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.

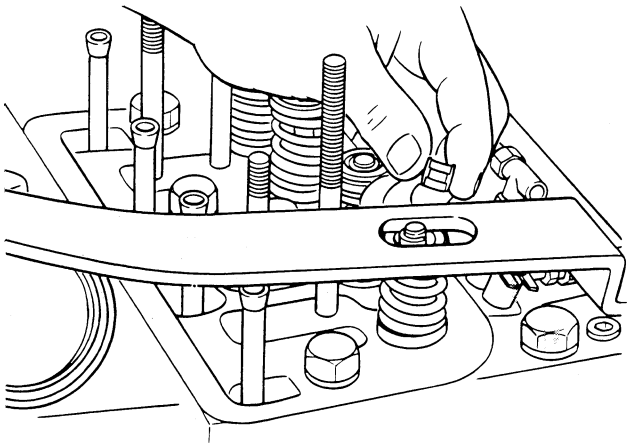
STEP 12





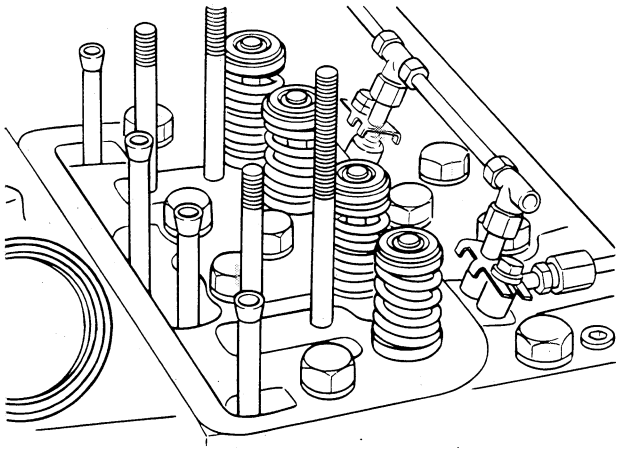
INSTALL SPRING SEAT AND VALVE SPRING. *NOTE:* IF EQUIPPED WITH VALVE SPRING HAVING ONLY ONE CLOSE COIL END, PLACE THIS END TOWARD CYLINDER HEAD, SEE INSET A.

STEP 13



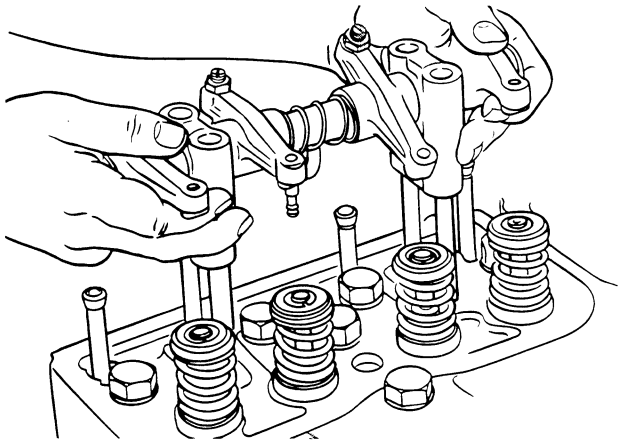
COMPRESS VALVE SPRING USING FABRICATED TOOL. INSTALL SEAL IN LOWER VALVE STEM GROOVE. INSTALL VALVE KEEPERS IN OUTER VALVE STEM GROOVE.

STEP 14



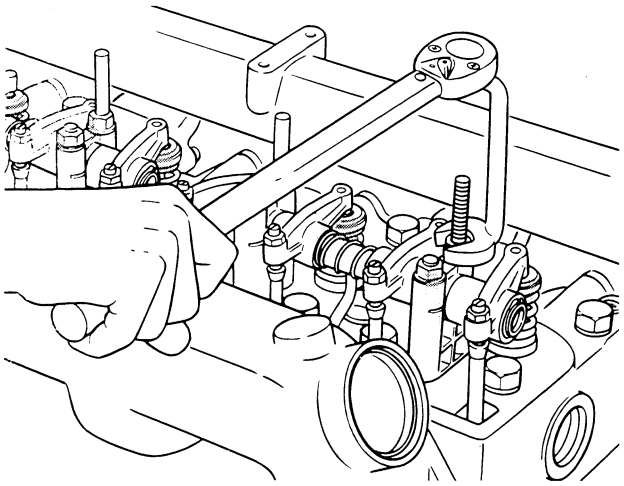
REMOVE SPRING COMPRESSING TOOL. TAP END OF VALVE STEM TO SEAT KEEPERS.

STEP 15



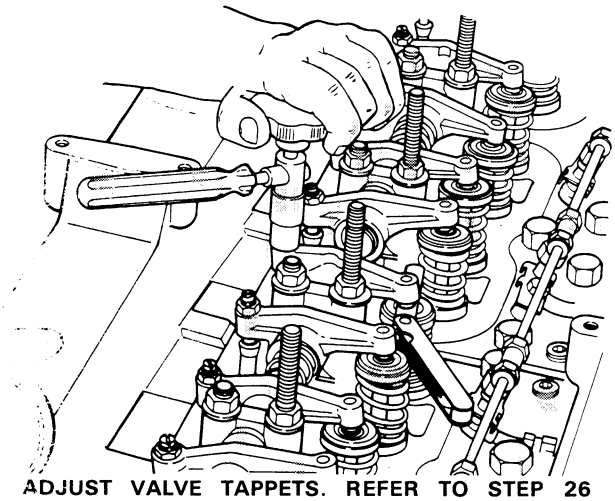
INSTALL ROCKER ARM ASSEMBLY ONTO CYLINDER HEAD.

STEP 16



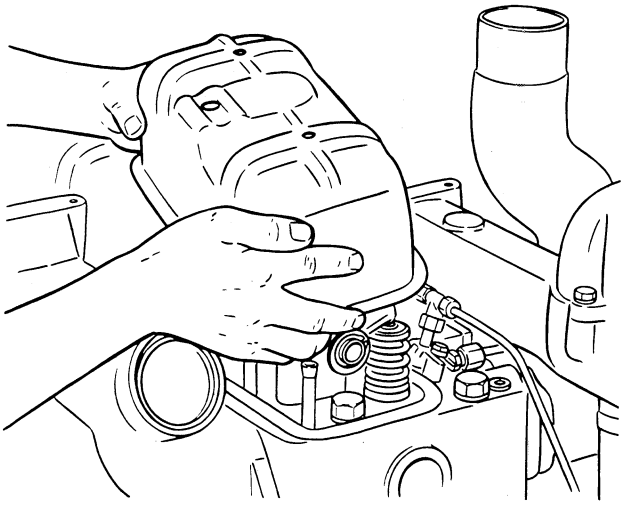
TORQUE ROCKER ARM ASSEMBLY RETAINING NUTS 40 TO 45 FT. LBS.

STEP 17



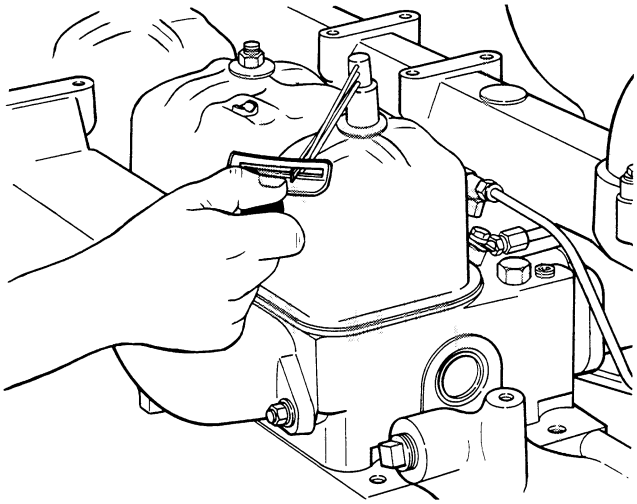
ADJUST VALVE TAPPETS. REFER TO STEP 26 FOR COLD SETTING OR TO STEP 33 FOR HOT SETTING.

STEP 18



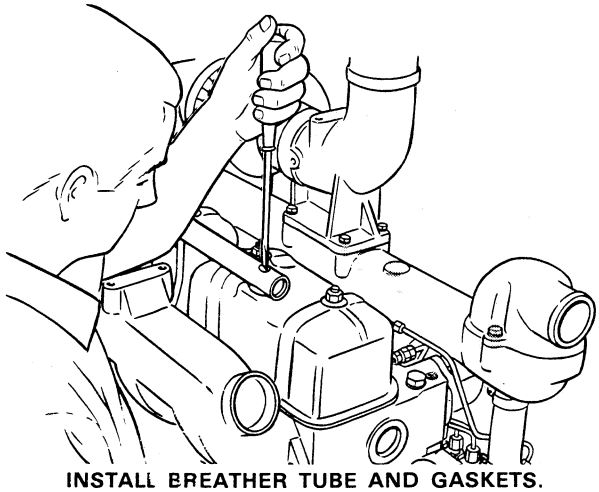
INSTALL VALVE COVERS AND GASKETS.

STEP 19



TORQUE VALVE COVER NUTS 60 TO 70 IN. LBS.

STEP 20

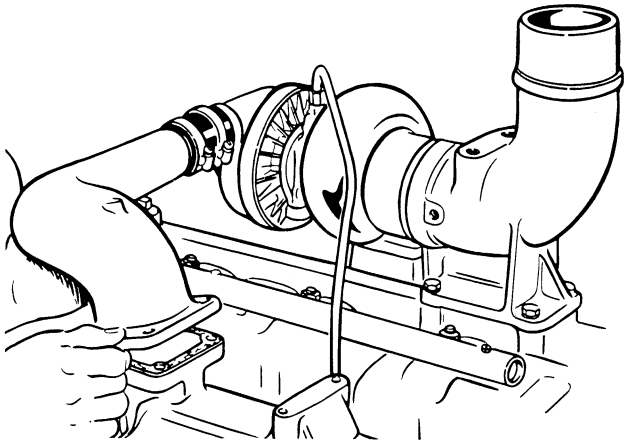


INSTALL BREATHER TUBE AND GASKETS.

Adjusting Tappets

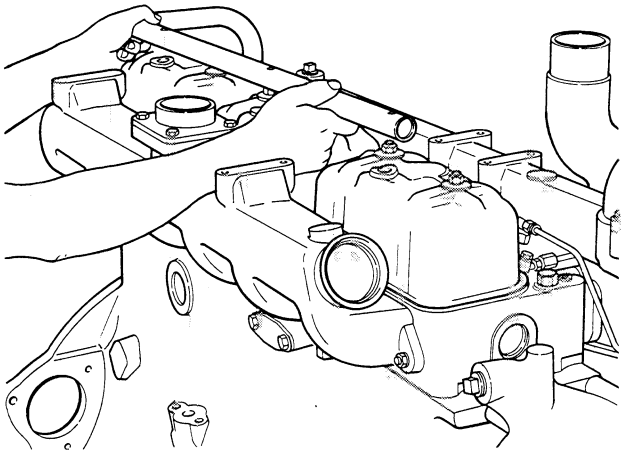
Cold Setting

STEP 21



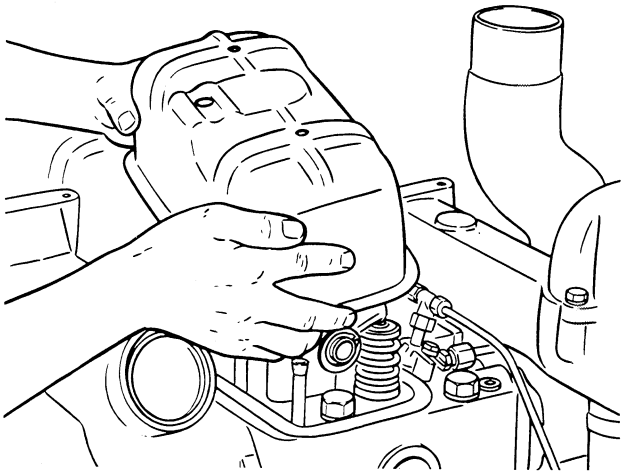
REMOVE TURBOCHARGER INTAKE ELBOW (IF SO EQUIPPED).

STEP 22



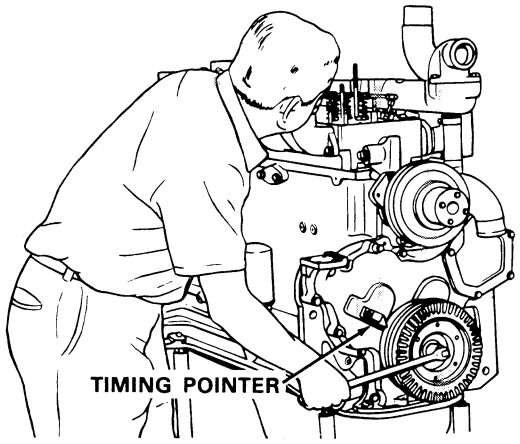
REMOVE BREATHER TUBE.

STEP 23



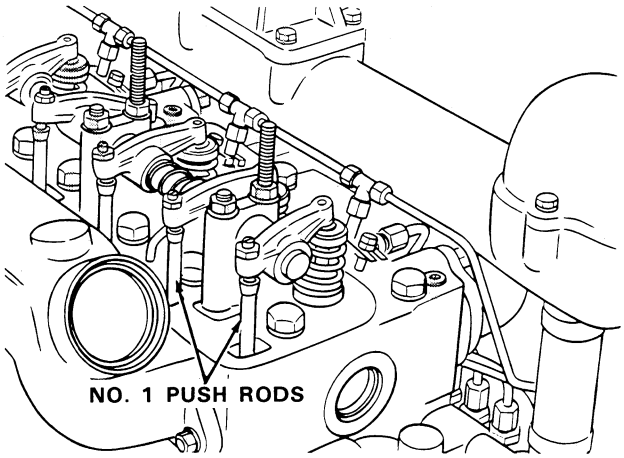
REMOVE VALVE COVERS AND GASKETS FROM ALL CYLINDERS.

STEP 24



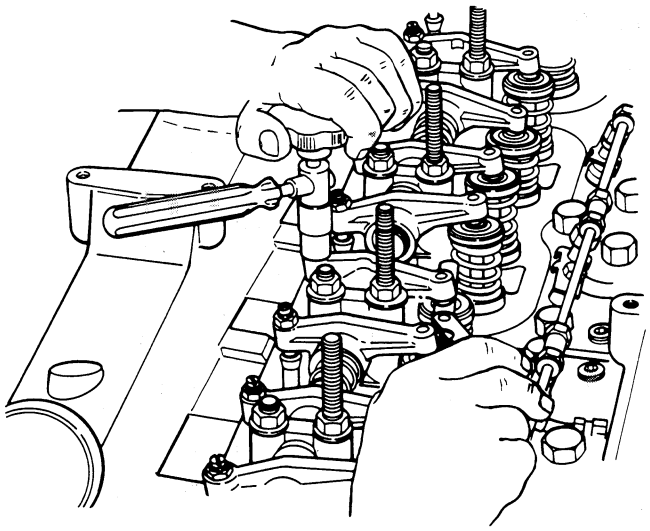
CRANK ENGINE UNTIL TIMING POINTER IS ALIGNED WITH TDC TIMING MARK ON CRANKSHAFT PULLEY.

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.

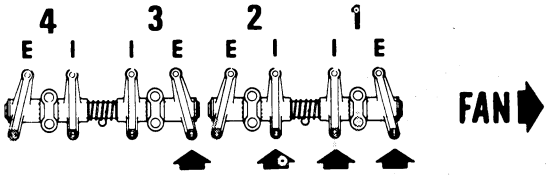
STEP 26



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

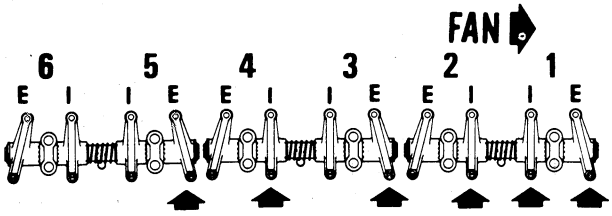
TAPPET CLEARANCE COLD - INTAKE VALVES .015"
EXHAUST VALVES - .025"

FOUR CYLINDER ENGINES



NO. 1 TDC COMPRESSION STROKE

SIX CYLINDER ENGINES



NO. 1 TDC COMPRESSION STROKE

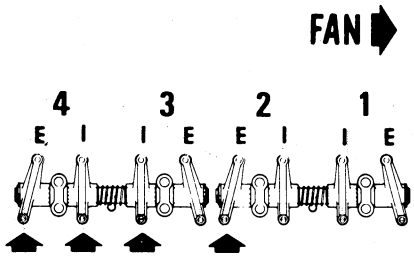
STEP 27

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.

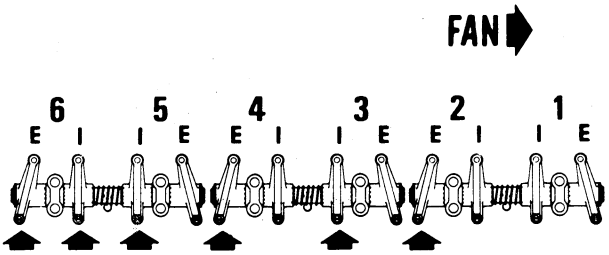
TAPPET CLEARANCE COLD - INTAKE VALVES .015"
EXHAUST VALVES .025"

FOUR CYLINDER ENGINES



NO. 4 TDC COMPRESSION STROKE

SIX CYLINDER ENGINES



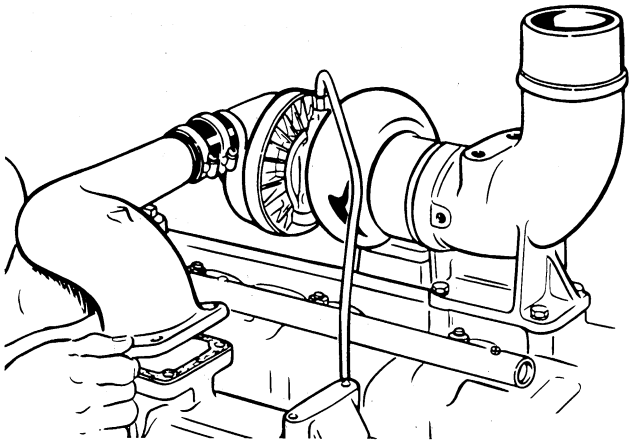
NO. 6 TDC COMPRESSION STROKE

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

Adjusting Tappets

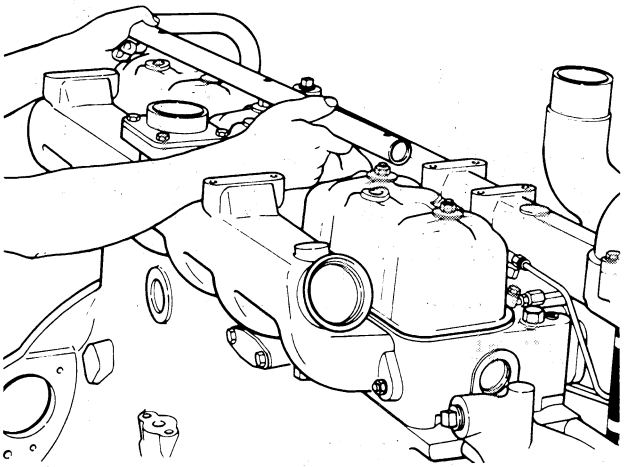
Hot Setting with Engine Stopped

STEP 28



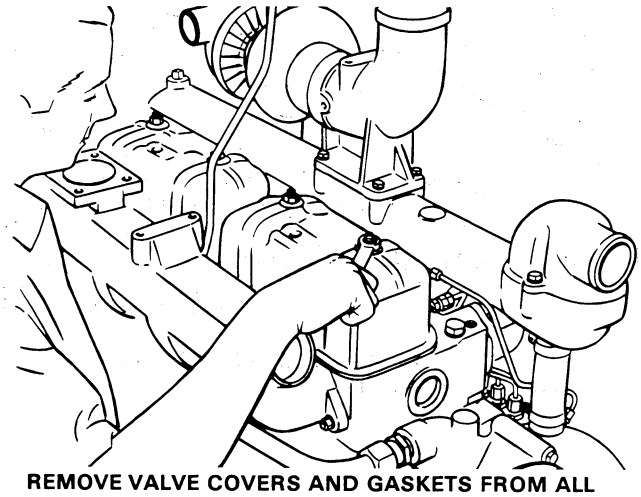
REMOVE TURBOCHARGER INTAKE ELBOW (IF SO EQUIPPED).

STEP 29



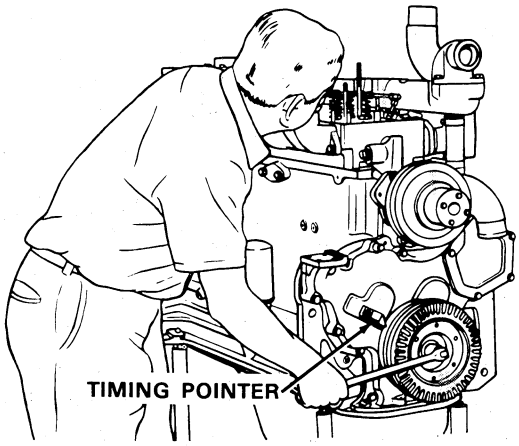
REMOVE BREATHER TUBE

STEP 30



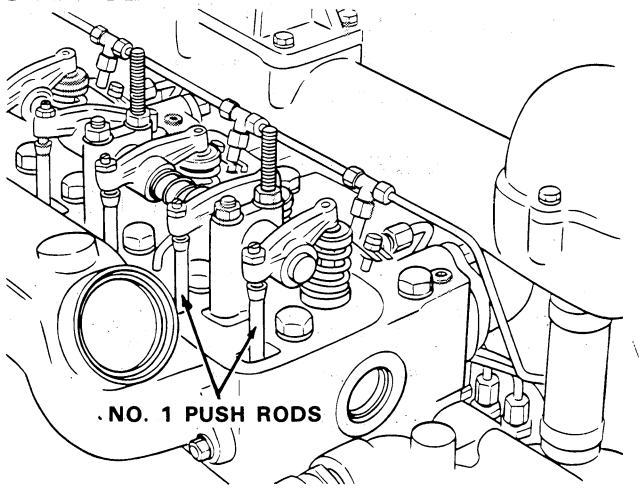
REMOVE VALVE COVERS AND GASKETS FROM ALL CYLINDERS.

STEP 31



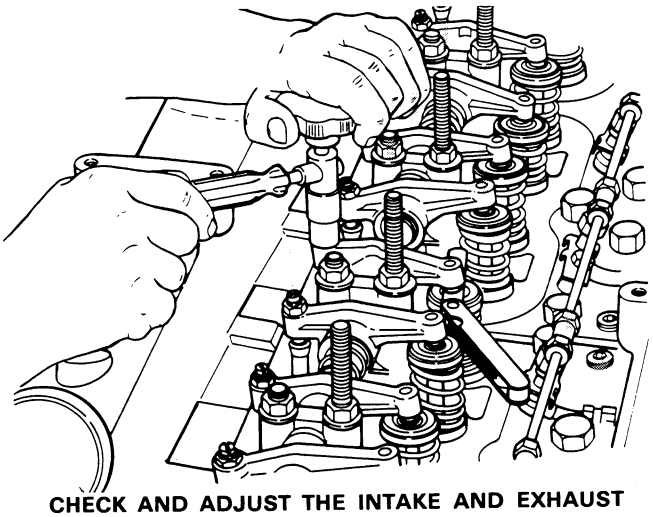
CRANK ENGINE UNTIL TIMING POINTER IS ALIGNED WITH TDC TIMING MARK ON CRANKSHAFT PULLEY.

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.

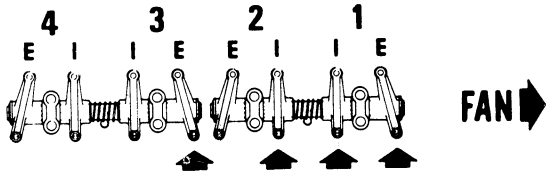
STEP 33



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

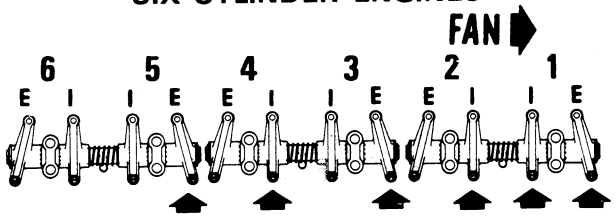
TAPPET CLEARANCE HOT - INTAKE VALVES .015"
EXHAUST VALVES .020"

FOUR CYLINDER ENGINES



NO. 1 TDC COMPRESSION STROKE

SIX CYLINDER ENGINES



NO. 1 TDC COMPRESSION STROKE

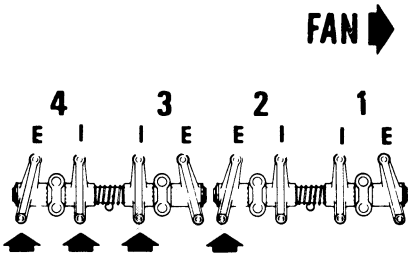
STEP 34

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.

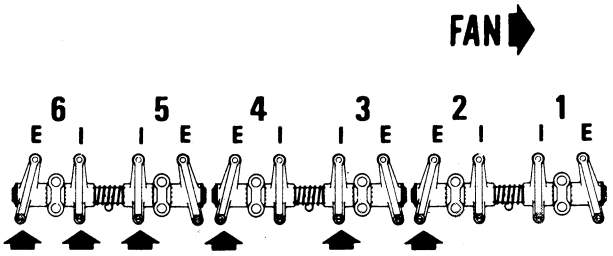
TAPPET CLEARANCE HOT - INTAKE VALVES .015"
EXHAUST VALVES .020"

FOUR CYLINDER ENGINES



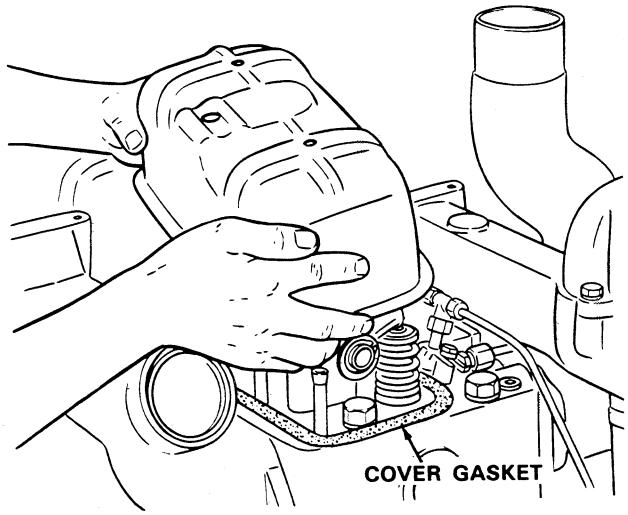
NO. 4 TDC COMPRESSION STROKE

SIX CYLINDER ENGINES



NO. 6 TDC COMPRESSION STROKE

STEP 35



AFTER TAPPET ADJUSTMENT, INSTALL VALVE COVERS AND GASKETS.

Suggest:

If the above button click is invalid.

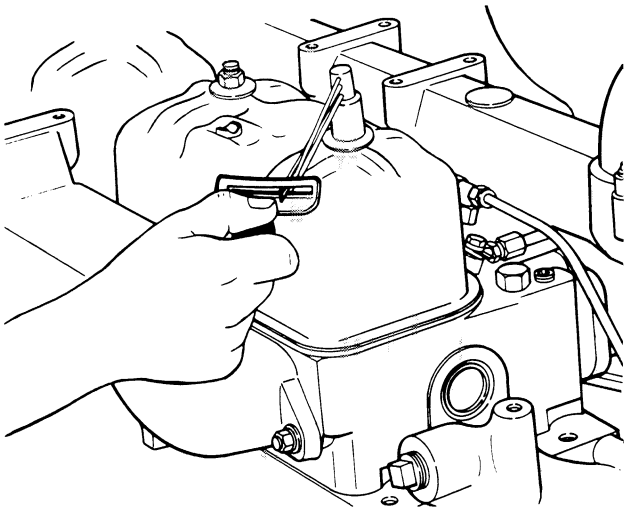
Please download this document

first, and then click the above link

to download the complete manual.

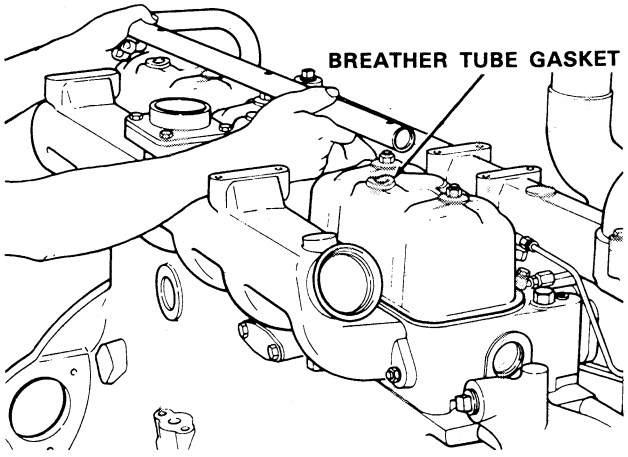
Thank you so much for reading

STEP 36



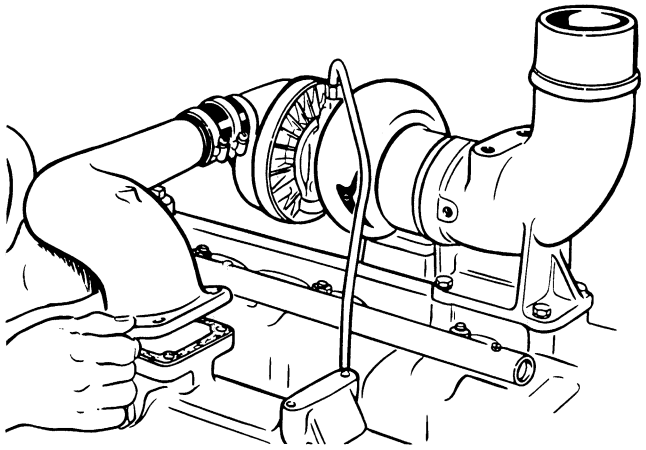
TORQUE VALVE COVER NUTS 60 TO 70 IN. LBS.

STEP 37



INSTALL BREATHER TUBE AND GASKETS.

STEP 38



INSTALL TURBOCHARGER INTAKE ELBOW