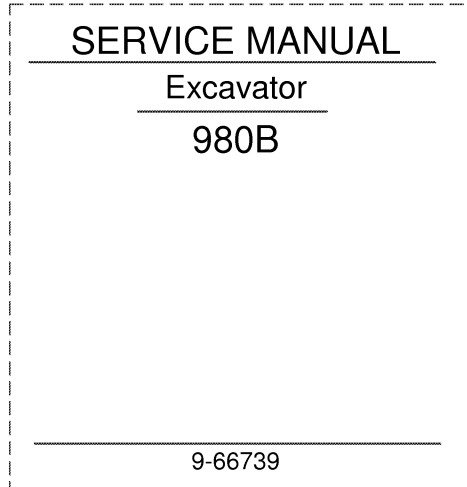


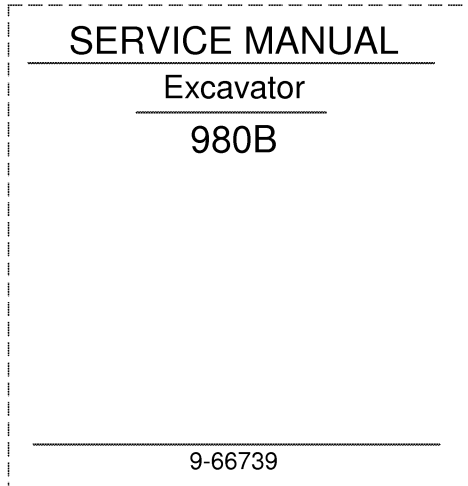
1. Trim along dashed line.
2. Slide into pocket on Binder Spine.

TYPE 1-4



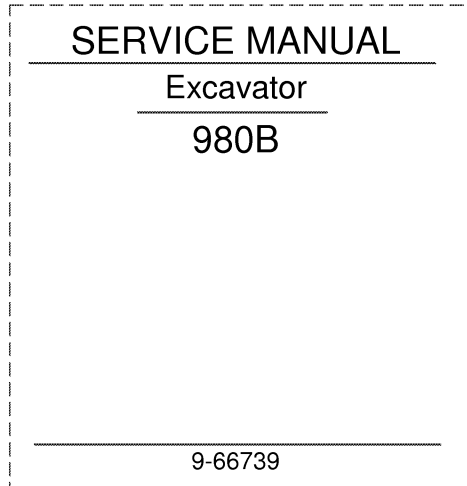
1. Trim along dashed line.
2. Slide into pocket on Binder Spine.

TYPE 1-4



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

TYPE 1-4



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

TYPE 1-4

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# **Section 1055**

## **GENERAL CLEANING INSTRUCTIONS**

## GENERAL CLEANING INSTRUCTIONS

### Complete Assemblies

Completely assembled components may be steam cleaned on the outside only, to make for easier removal and disassembly. All openings and breathers must be closed or plugged to prevent possibility of water entering the component.



**WARNING:** To prevent injury from burns always use a non-flammable solvent for cleaning component parts. **DO NOT USE** gasoline or other flammable substances.

### Rough Parts

Rough parts such as housings, castings, etc., may be cleaned in hot solution tanks with mild alkali solutions, providing these parts do not have ground or polished surfaces. The parts should remain in the tank long enough to be thoroughly cleaned and heated. This will aid the evaporation of rinse water. The parts should be thoroughly rinsed after cleaning to remove all traces of alkali.

### Finished or Machined Parts

Parts having ground or polished surfaces such as gears, bearings, shafts and collars, should be cleaned in non-flammable solvent.

**IMPORTANT:** DO NOT clean machined parts in hot solution tanks with water and alkaline solutions such as sodium hydroxide, orthosilicates or phosphates.

### Rubber Parts

Clean rubber parts by washing in clean denatured alcohol. DO NOT use mineral base cleaning solvents such as acetone or paint thinner on any rubber parts. If a mineral base solvent is used, the rubber will start to deteriorate and continue to deteriorate after the part is put back into service. The continued deterioration of the rubber could cause the part to fail.

### Drying

All parts cleaned must be thoroughly dried immediately. Use moisture-free compressed air or soft lintless absorbent wiping rags. The rags should be free of abrasive materials such as metal filings, contaminated oil or lapping compound. Bearings may be dried using compressed air, provided the air is directed across the bearings to avoid spinning. Do not spin bearings when drying. Bearings may be rotated slowly by hand to speed the drying process.



**CAUTION:** When using compressed air keep stream from direction of face. Use only low air pressure.

### Corrosion Prevention

Parts that have been cleaned, dried, inspected and are to be immediately reassembled should be coated with a light oil to prevent corrosion. If these parts are to be stored for any length of time, they should be treated with a good RUST PREVENTIVE and wrapped in special paper or other material to prevent corrosion.

# **Section 1056**

## **SAFETY RULES**

## SAFETY RULES



**This Safety Alert Symbol Indicates Important Safety Messages In This Manual. When You See This Symbol, Carefully Read The Message That Follows And Be Alert To The Possibility Of Personal Injury Or Death.**



**CAUTION:** Do not service machine with engine running. If necessary to make checks with engine running, have one man stay at the controls while the other makes the check.



**CAUTION:** When servicing the machine, tag mark the ignition switch to alert other operators and prevent accidental start-ups.



**CAUTION:** Engage digging brake whenever the unit is not "crawling". Accidental engagement of the drive lock switch will cause the machine to immediately move in the forward direction.



**CAUTION:** Before starting engine make sure all operating controls are in NEUTRAL.



**WARNING:** To prevent injury from burns always use a non-flammable solvent for cleaning component parts. DO NOT USE gasoline or other flammable substances.



Keep a fire extinguisher on hand and KNOW HOW TO USE IT. Check it regularly to ensure it is in good working order.



**WARNING:** To prevent eye injuries wear safety glasses when servicing this machine.



**POISON DANGER: BATTERY ACID CAUSES SEVERE BURNS. BATTERIES CONTAIN SULFURIC ACID.** Avoid contact with skin, eyes, or clothing.

Anti-dote: **EXTERNAL:** Flush with water. **INTERNAL:** Drink large quantities of water or milk. Follow with Milk of Magnesia, beaten egg or vegetable oil. Call physician immediately **EYES:** Flush with water for 15 minutes and get prompt medical attention. **KEEP OUT OF REACH OF CHILDREN.**



**WARNING:** Never attempt to disconnect any hydraulic lines unless boom is firmly supported or blocked, load is lowered to the ground and hydraulic line pressure is relieved by working the controls back and forth several times while cranking the engine with shutoff control pulled out.



**WARNING:** Never operate the alternator on an open circuit. With no battery or other electrical load on the circuit, a voltage buildup will occur within the alternator. This voltage buildup could be extremely hazardous to anyone touching the alternator "BAT" terminal.



**CAUTION:** Decals provide operating instructions and safety information to the operator. To help prevent accidents or personal injury, clean or replace any decal that cannot be easily read.



**CAUTION:** Before attempting to remove any major component, check the approximate weight of that component and make adequate provision for attaching and lifting. Use a hoist or crane capable of supporting the weight.



Clean rubber parts by washing in clean denatured alcohol. DO NOT use mineral base cleaning solvents such as acetone or paint thinner on any rubber parts. If a mineral base solvent is used, the rubber will start to deteriorate and continue to deteriorate after the part is put back into service. The continued deterioration of the rubber could cause the part to fail.



**CAUTION:** Never leave engine running when machine is unattended.



**WARNING:** Batteries produce explosive gases. Keep flames, sparks and cigarettes away. Ventilate when charging or using in enclosed space. Always shield eyes when working near batteries.



**CAUTION:** Disconnect both leads from the batteries when working on the engine or electrical system. Always disconnect the ground lead first.



**CAUTION:** When checking coolant level, remove radiator cap slowly to relieve pressure within the system.



**CAUTION:** Wipe oil spills immediately and keep work area as clean as possible. A cluttered work area invites accidents.



**WARNING:** Any changes to the controls must be clearly noted and posted in the operator's cab. If any control changes are made, a new operator's control pattern decal must be installed in the cab to warn other operators of the changes.



**CAUTION:** Inspect the machine daily for loose, worn or damaged parts. Have unsafe conditions corrected immediately.



**CAUTION:** Before removing or disassembling the swing brake, SET BOOM ON GROUND to prevent turntable from rotating.



**CAUTION:** DO NOT wear loose clothing which may catch in moving parts.



**WARNING:** This machine is equipped with a 24-volt starting system. Sparking will occur across greater distances than with a conventional 12 volt system. NEVER WEAR RINGS OR OTHER METAL OBJECTS that may ground a live circuit.



**WARNING:** This machine must be level when torquing turntable capscrews. Since it is necessary to disconnect the swing brake, the boom will swing to the down side unless the machine is level. Blocking or resting the boom in the required position is not recommended.



**CAUTION:** ENGINE FAN AND BELTS  
To prevent possible serious injury avoid contact with rotating fan and belts.



**WARNING:** Use extreme care when handling the track. Never insert fingers between track shoes when removing track.



**WARNING:** Never place fingers between track shoes when installing tracks.



**CAUTION:** Slowly loosen the adapter to allow grease to escape. Very high pressures exist in the adjustment cylinder when under tension. The adapter fitting could fly loose and cause personal injury.



**CAUTION:** Cylinders used on this machine are heavy and may be awkward to handle. Use suitable lifting equipment (a hoist is recommended).



**CAUTION:** Each track assembly weighs approximately 9,000 lbs. (4000 kg). Use a hoist or crane capable of supporting this weight.



**CAUTION:** The transmission and brake assembly weigh approximately 800 lbs. (360 kg). Make adequate provisions to handle this weight.



**CAUTION:** The idler wheel spring is under tension. If for any reason this spring must be removed, use extreme caution.



**CAUTION:** Use care when applying compressed air to brake release port. Housing may pop up causing personal injury. Use only low air pressure.



**WARNING:** Never place your hands inside the access hole while the turntable is moving. If you find it necessary to place hand inside opening, stop the turntable and set the swing brake.



**CAUTION:** When using compressed air keep stream from direction of face. Use only low air pressure.



**CAUTION:** Weight of the turntable with counterweight is approximately 10,000 lbs. (4540 kg).



**CAUTION:** Swivel is heavy and hard to handle. Use a hoist to handle to avoid possible damage to swivel or personal injury.



**CAUTION:** Cylinders on this machine are heavy and awkward to handle. Hoist cylinder weighs approximately 700 lbs. (320 kg), crowd cylinder - 665 lbs. (300 kg) and tool cylinder 460 lbs. (280 kg). Provide suitable support (a chain hoist is recommended) prior to removing the mounting pins.



**CAUTION:** Do not attempt repairs you do not understand. There is no disgrace in asking for help.



**WARNING:** Never check battery charge by placing a metal object across the posts - the sparks could cause an explosion. Use a voltmeter or hydrometer.



**CAUTION:** The battery on this machine is equipped with nonspill caps. Make absolutely certain that a replacement battery has nonspill caps. DO NOT operate this machine unless the battery is equipped with nonspill caps and that they function properly.



**CAUTION:** Storage areas for batteries must be well ventilated to prevent accumulation of hydrogen gas from newly recharged batteries.



**CAUTION:** Think out the circuit before making or breaking a connection. A wrong connection can be painful and expensive.



**WARNING:** Use extreme caution when disconnecting hydraulic lines. High pressure in a system could cause injury when fittings are disconnected. Relieve all pressure before working on system.



**DANGER:** Exhaust fumes can kill. If necessary to start an engine in an enclosed area, be sure to provide adequate ventilation.



**CAUTION:** Always lower all attachments to the ground or block them securely before performing any service or adjustment.



**WARNING:** Do not fuel the machine when smoking, when near an open fire or with the engine running.



**CAUTION:** Never grease, oil or perform any maintenance with the engine running unless so instructed in the operator's manual or service manual. If the attachment must be raised in order to perform the operation, block up the attachment securely.



Relieve hydraulic pressure before disconnecting circuits. When reassembling, make absolutely certain that all connections are tight.



If injured by hydraulic oil escaping under pressure, see a doctor immediately. Serious complications may arise if medical attention is not given at once.



**CAUTION:** Hydraulic systems are highly pressurized. Escaping hydraulic oil, even an invisible pinhole leak, can penetrate body tissue causing serious injury. Use a piece of wood or cardboard when looking for leaks - never use the hands or other parts of the body.



**CAUTION:** The four-spool valve weighs approximately 112 lbs. (51 kg); the one-spool valve weighs approximately 40 lbs. (18 kg). Use care in handling the valve to prevent personal injury and damage to the valve.



**CAUTION:** Swing gearbox and house brake weigh approximately 225 lbs. (102 kg). Use care when handling the assembly to prevent personal injury and damage to the assembly.



**CAUTION:** When bleeding brakes, loosen bleeder plug approximately one-half to three quarters turn or until oil just starts to flow. If plug is loosened too far, it may be blown out under pressure and cause personal injury.



**CAUTION:** The track motor is heavy and awkward to handle. Use care when handling the motor to prevent personal injury and damage to the motor.



**CAUTION** Always wear asbestos gloves to prevent burning your hands when handling heated parts.



The fuel spray from an injector has sufficient penetrating power to puncture the flesh and destroy tissue. Should the fuel enter the blood stream, it may cause blood poisoning.



**CAUTION:** Main boom weighs approximately 3450 lbs. (1565 kg) hoist cylinder weighs 700 lbs. (320 kg) and crowd cylinder weighs 665 lbs. (300 kg). Use appropriate hoist to remove these items or personal injury could result.



**CAUTION:** Dipperstick weighs approximately 1550 lbs. (700 kg) and tool cylinder weighs approximately 460 lbs. (208 kg). Use a hoist capable of lifting these items as personal injury could result.



**WARNING:** When testing or adjusting fuel injectors, do not place your hands or arms in front of the injector nozzle.

In the event the skin is punctured from the discharge of an injector, apply the following first aid immediately, then have the injury examined by a physician as quickly as possible.

Wash the injured part with boric acid solution, support the injured finger or hand with a splint or sling so the injured part will remain absolutely at rest until a physician can examine it.



**CAUTION:** Before removing leveler cylinders support turntable under both sides to prevent turntable from shifting and causing an unbalanced situation and possible personal injury.



**CAUTION:** Do not try to replace pump without using a hoist. Pump is heavy and could cause personal injury if not properly handled.



**CAUTION:** Do not try to remove pump without using a hoist. Pump is heavy and could cause personal injury if not properly handled.



**CAUTION:** The swing motor is heavy and awkward to handle. Use care when handling the motor to prevent personal injury and damage to the motor.



**CAUTION:** Do not place fingers around or near the edge of the housing bore when installing housing. Possible personal injury could occur.

# **Section 2001**

## **ENGINE DIAGNOSIS**

## 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".

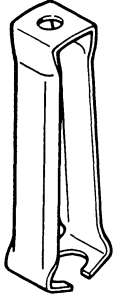
Proper compression is affected by the air cleaner condition, muffler restriction, valve condition and operation including proper valve adjustment, cylinder head gaskets condition of sleeves, rings, pistons, camshaft, and camshaft timing.

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.

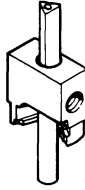
The engine diagnosis contained in the following pages covers many trouble symptoms, the causes, and what will be necessary to repair or eliminate the problem. Under each symptom are listed the most common and re-occurring problems progressively to the not so common problems. Locate your problem symptom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

# INSTALLATION INSTRUCTIONS FOR M20614 TEFLON VALVE SEAL KIT

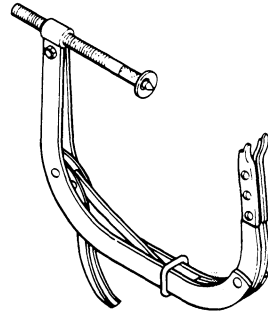
## Special Tools Required



M20624 SEAL INSTALLATION TOOL



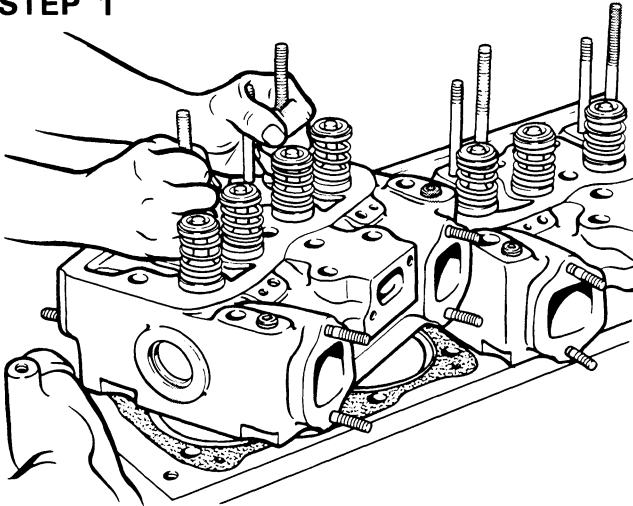
M20617 VALVE GUIDE CUTTING TOOL



VALVE SPRING COMPRESSOR

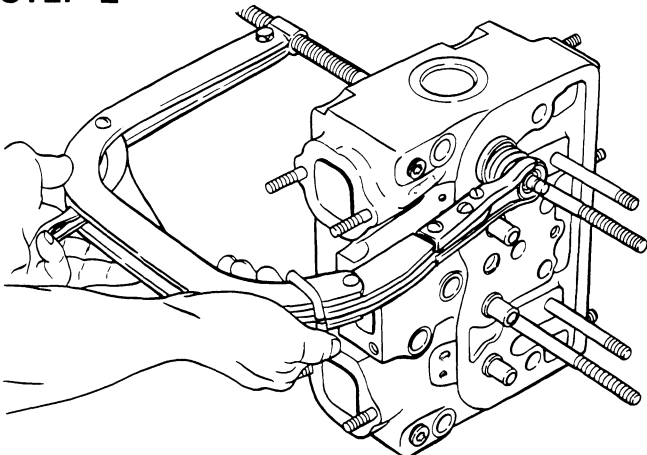
NOTE: FOUR CYLINDER ENGINES REQUIRE TWO M20614 KITS AND SIX CYLINDER ENGINES REQUIRE THREE M20614 KITS.

### STEP 1



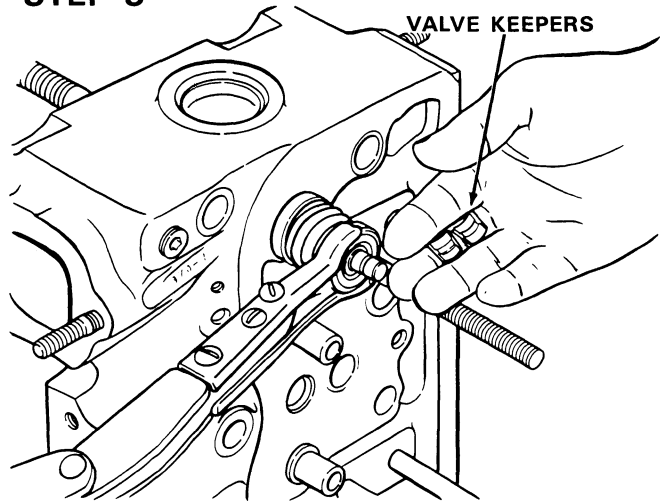
REMOVE THE CYLINDER HEADS FROM THE ENGINE, REFER TO SECTION 2015 FOR HEAD REMOVAL.

### STEP 2



INSTALL A VALVE SPRING COMPRESSOR.

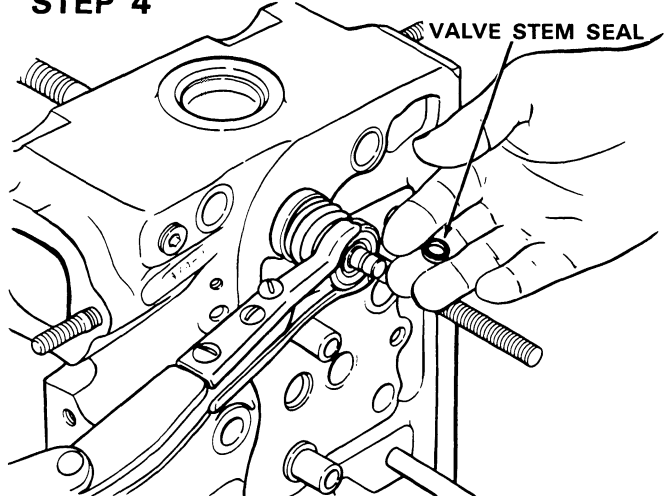
### STEP 3



COMPRESS VALVE SPRING AND REMOVE VALVE KEEPERS.

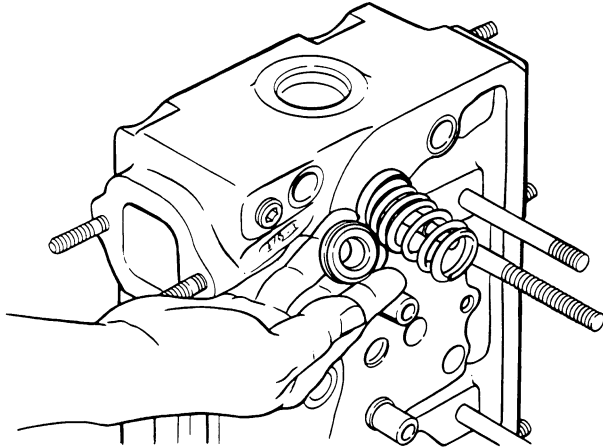
IMPORTANT: VALVES, VALVE RETAINERS OR ROTATORS AND VALVE KEEPERS SHOULD BE MARKED WHEN REMOVED, TO INSURE THAT THEY WILL BE REINSTALLED IN THEIR ORIGINAL LOCATION.

### STEP 4



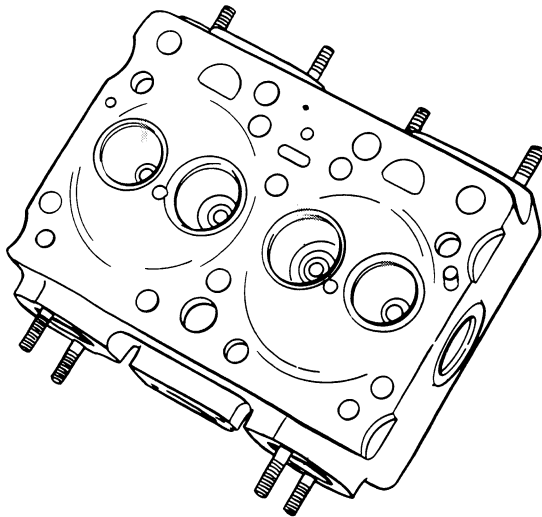
REMOVE VALVE STEM SEAL.

**STEP 5**



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

**STEP 6**



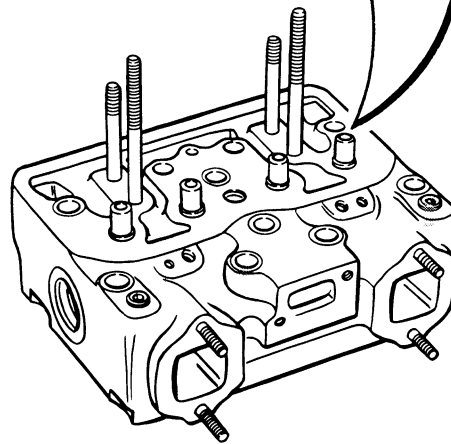
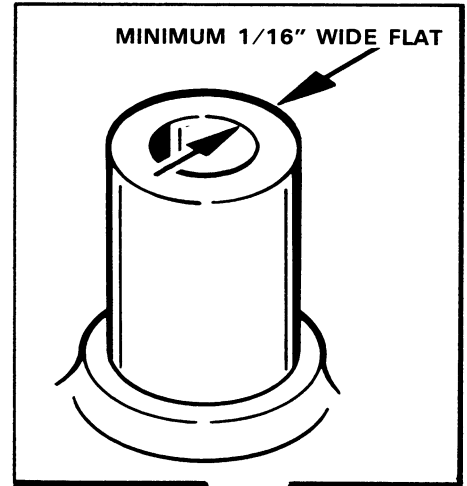
**CLEAN CYLINDER HEAD COMPLETELY, REMOVING ALL TRACES OF CARBON AND OTHER DEPOSITS.**

**STEP 7**



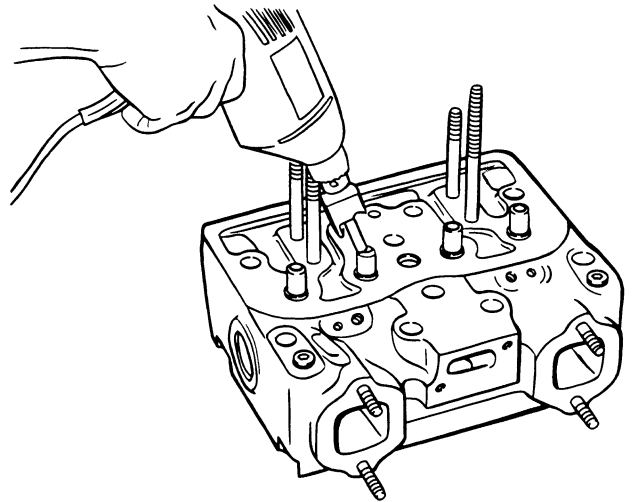
**CLEAN VALVES WITH A FINE POWER DRIVEN WIRE BRUSH, REMOVING ALL CARBON AND VARNISH DEPOSITS. BE CAREFUL NOT TO SCRATCH VALVE STEMS.**

**STEP 8**



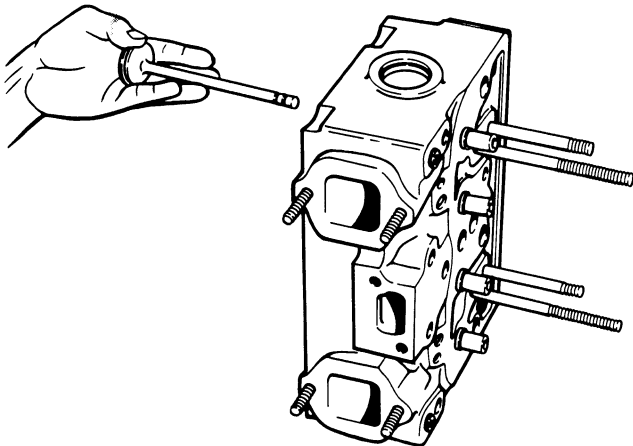
**CHECK VALVE GUIDE TOP SURFACE, THERE MUST BE A MINIMUM OF A 1/16\"/>A line drawing of a cylinder head with valve guides. A callout box from the previous image points to the top surface of the valve guides, showing the flat area.**

**STEP 9**



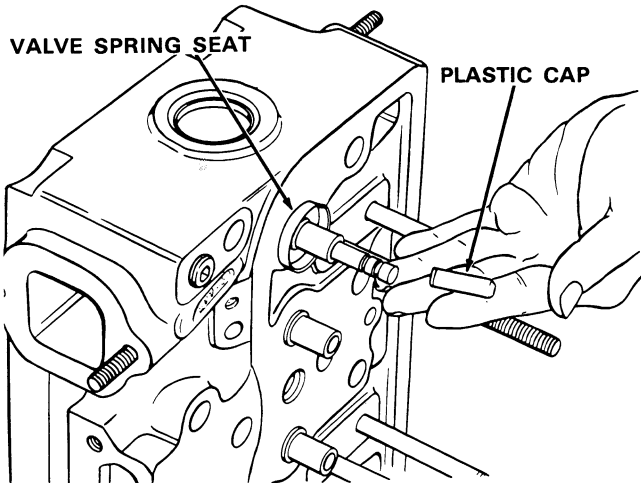
**USE M20617 TOOL IN A ELECTRIC DRILL (IF REQUIRED) TO PROVIDE NECESSARY FLAT AREA ON VALVE GUIDE. IMPORTANT: DO NOT EXCEED 450 RPM WHEN DRILLING**

**STEP 10**



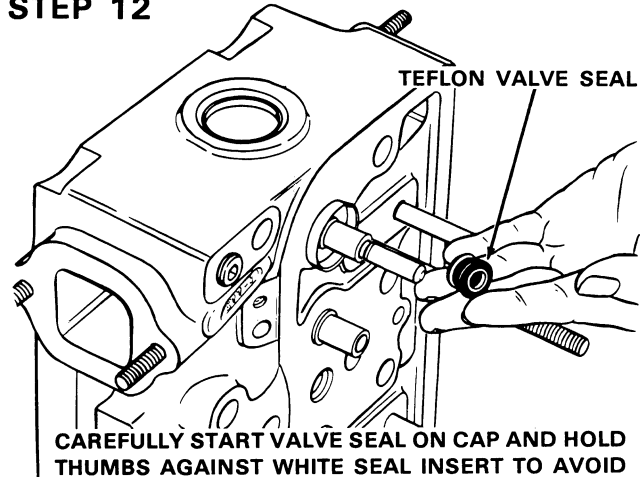
LUBRICATE VALVES WITH CLEAN ENGINE OIL BEFORE REINSTALLING INTO CYLINDER HEAD.

**STEP 11**



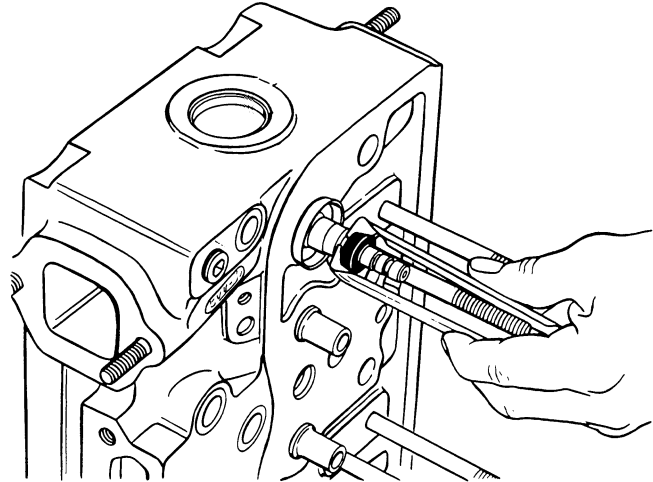
PLACE PLASTIC INSTALLATION CAP, PROVIDED IN KIT, ON THE END OF THE VALVE STEM. NOTE: CAP PREVENTS SHARP EDGES ON VALVE STEM GROOVES FROM CUTTING VALVE SEAL.

**STEP 12**



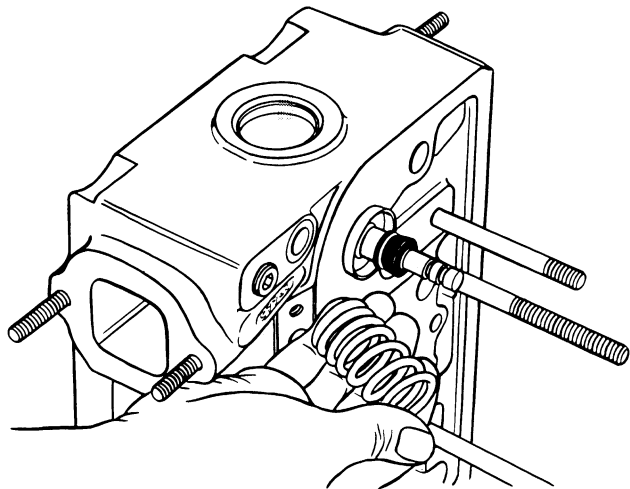
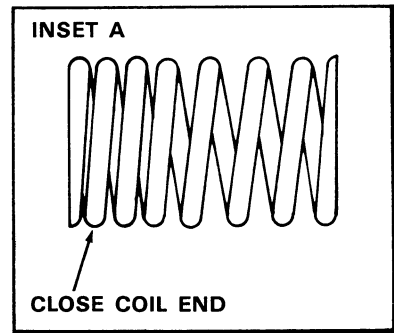
CAREFULLY START VALVE SEAL ON CAP AND HOLD THUMBS AGAINST WHITE SEAL INSERT TO AVOID DISLODGING IT, PUSH SEAL DOWN UNTIL SEAL JACKET TOUCHES TOP OF VALVE GUIDE. REMOVE INSTALLATION CAP AND SAVE, SINCE IT MUST BE REUSED.

**STEP 13**



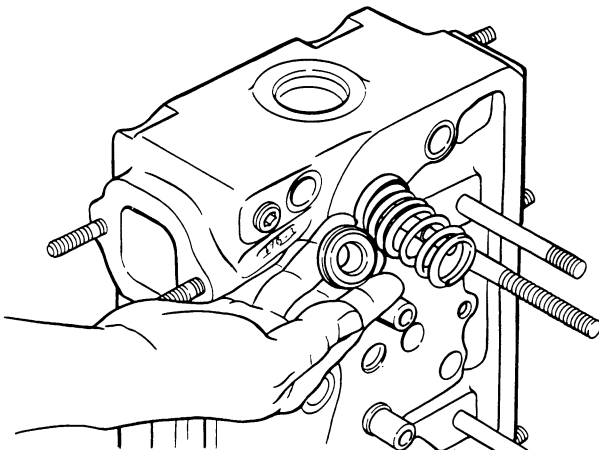
USE M20624 TOOL AND PRESS SEAL DOWN OVER VALVE GUIDE UNTIL SEAL IS FLUSH WITH TOP OF GUIDE.

**STEP 14**



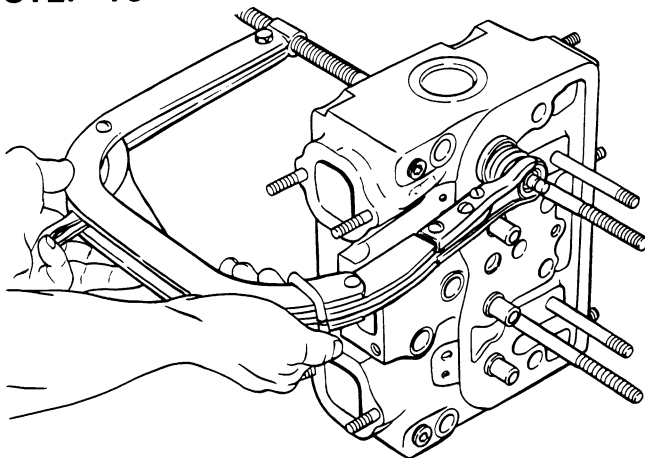
INSTALL THE VALVE SPRING. IMPORTANT: THE CLOSE COIL END OF THE SPRING MUST BE INSTALLED TOWARDS THE CYLINDER HEAD, SEE INSET A.

**STEP 15**



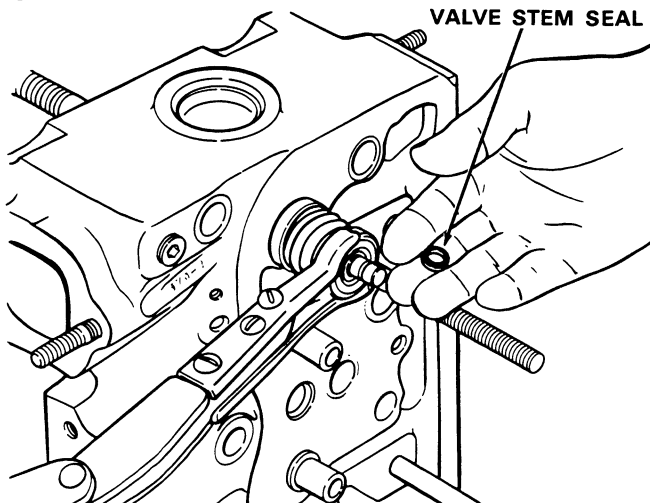
**INSTALL VALVE ROTATORS OR SPRING RETAINERS. IMPORTANT: ASSEMBLE VALVE ROTATORS WITH THEIR ORIGINAL VALVES SINCE THEY TEND TO WEAR IN AS A MATCHED SET.**

**STEP 16**



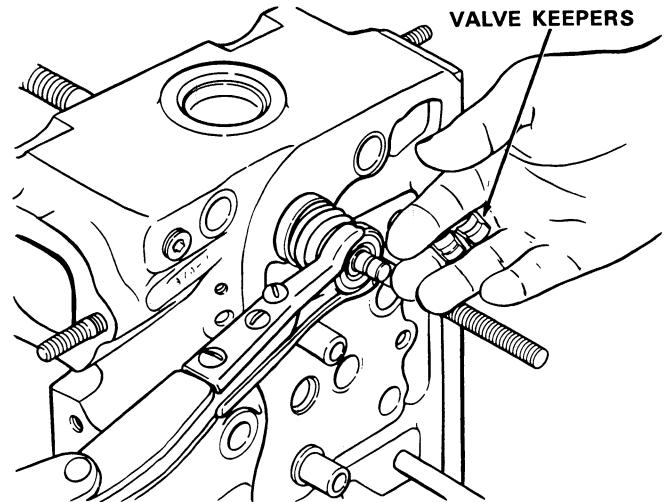
**INSTALL VALVE SPRING COMPRESSOR.**

**STEP 17**



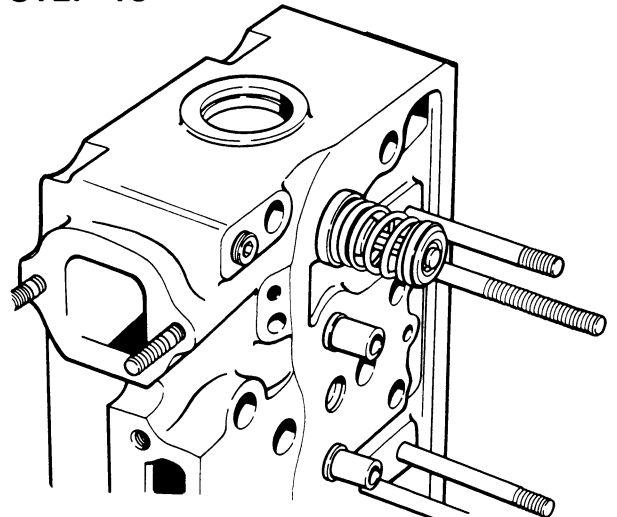
**INSTALL STEM SEAL IN LOWER VALVE STEM GROOVE.**

**STEP 18**



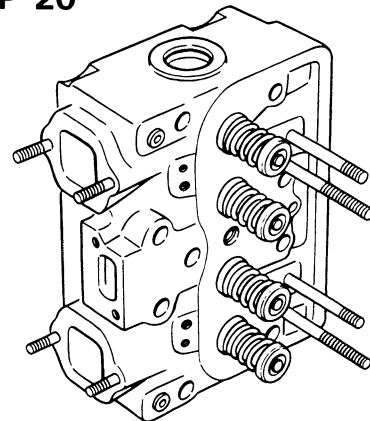
**INSTALL VALVE KEEPERS IN OUTER VALVE STEM GROOVE.**

**STEP 19**



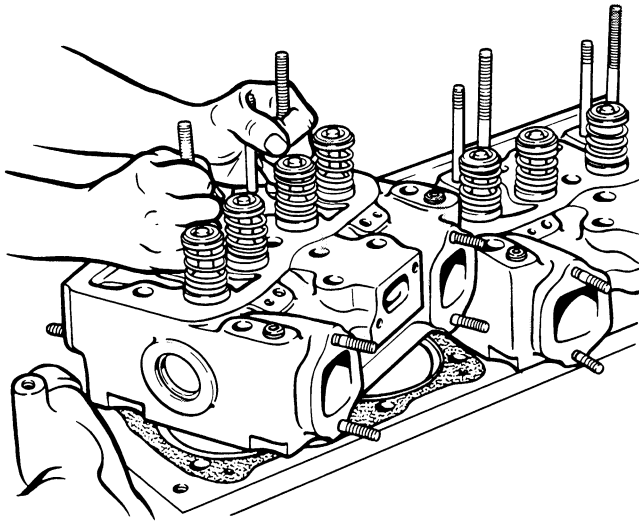
**REMOVE SPRING COMPRESSOR AND TAP VALVE STEM END TO SEAT KEEPERS.**

**STEP 20**



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

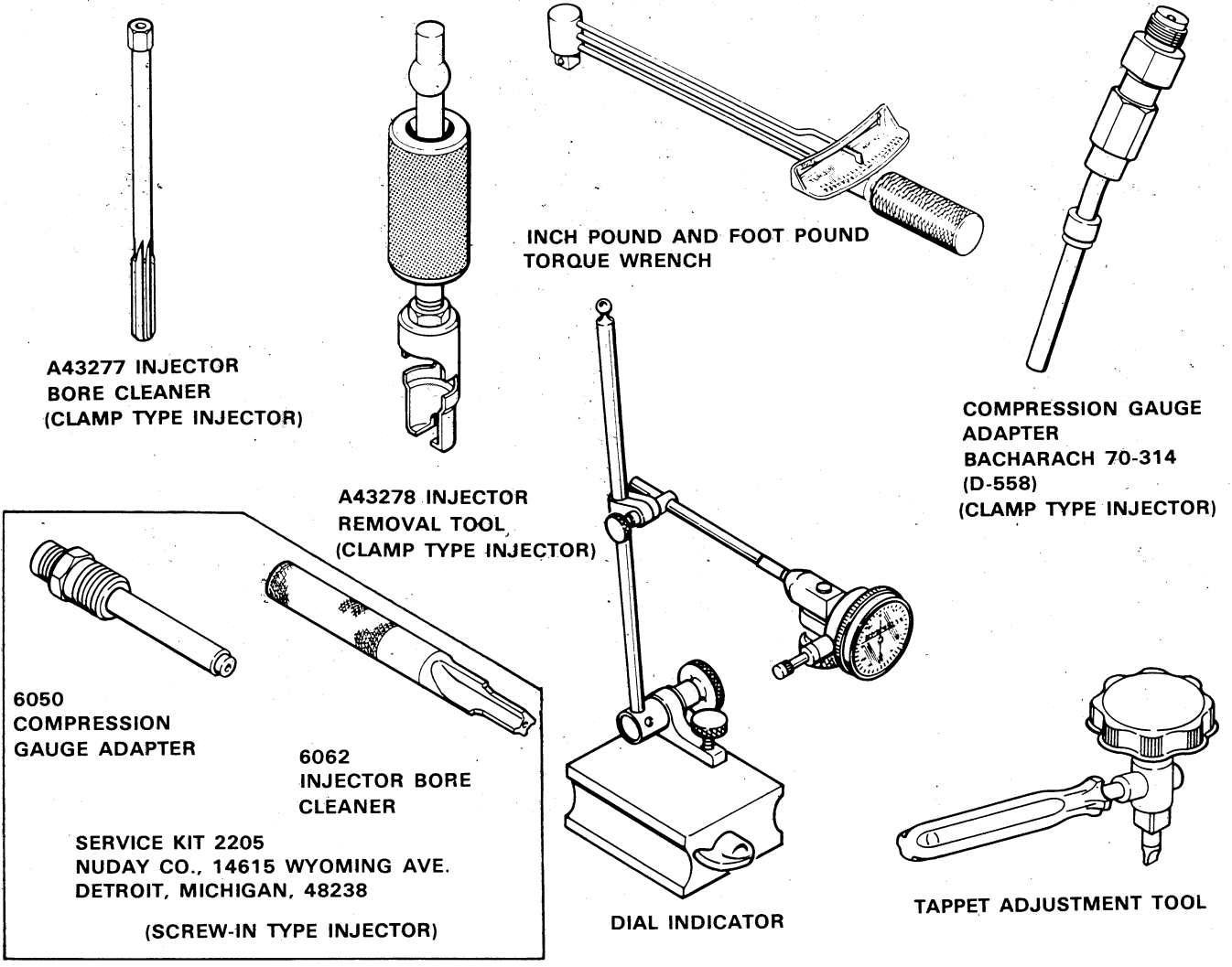
**STEP 21**



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

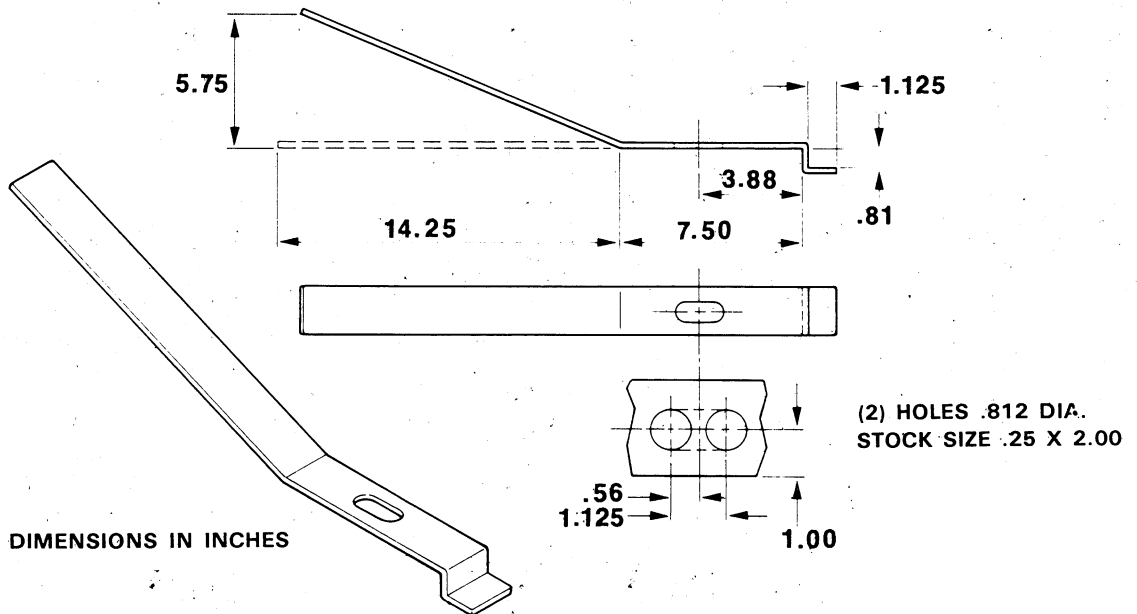
**NOTE:** The CASE CORPORATION reserves the right to make improvements in design or changes in specifications at any time without incurring any obligation to install them on units previously sold.

## SPECIAL TOOLS



## SPECIFICATIONS FOR TOOLS WHICH MUST BE MADE

### Valve Spring Compressor Tool



NOTE: ALL DIMENSIONS IN INCHES

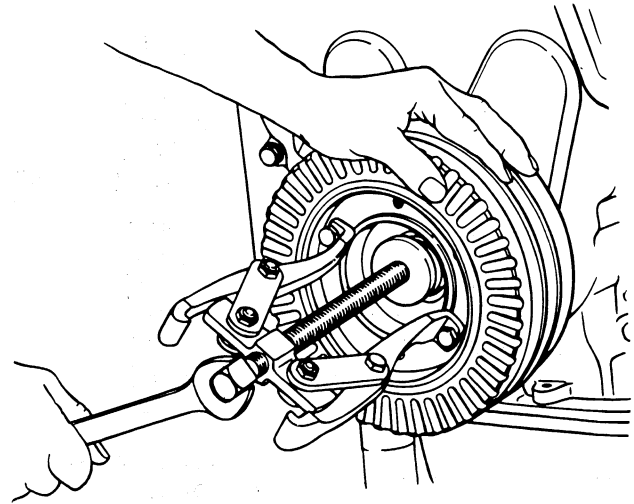
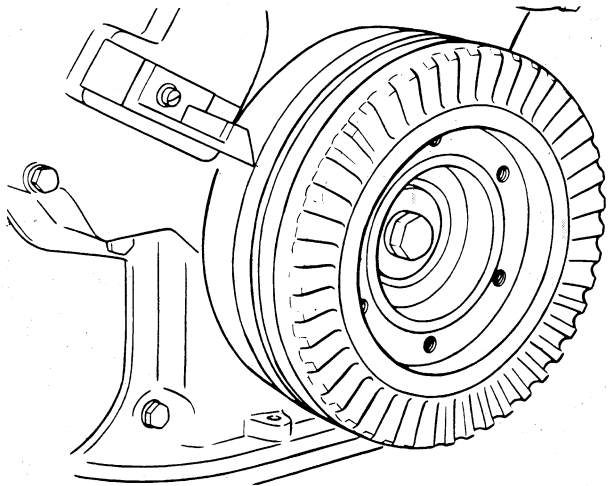
# ENGINE TUNEUP PROCEDURE

## Checking Crankshaft Damper Pulley

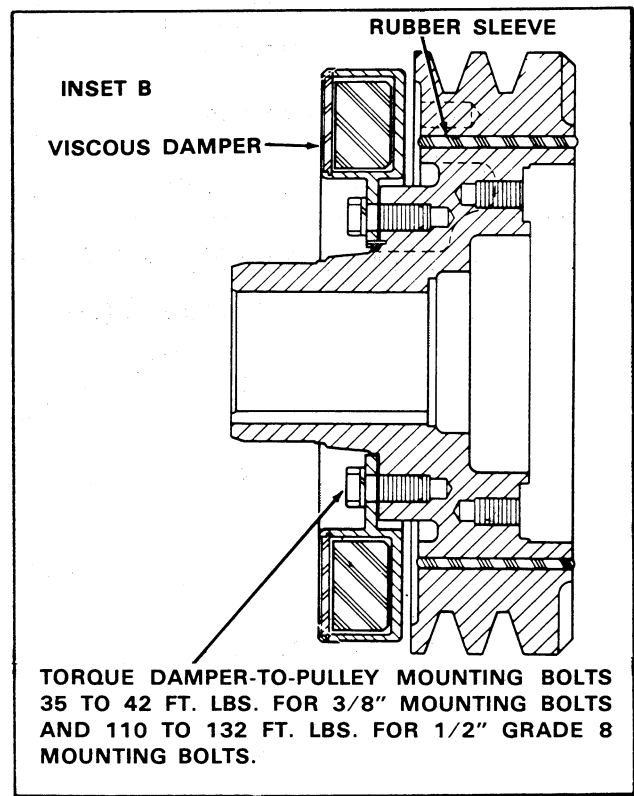
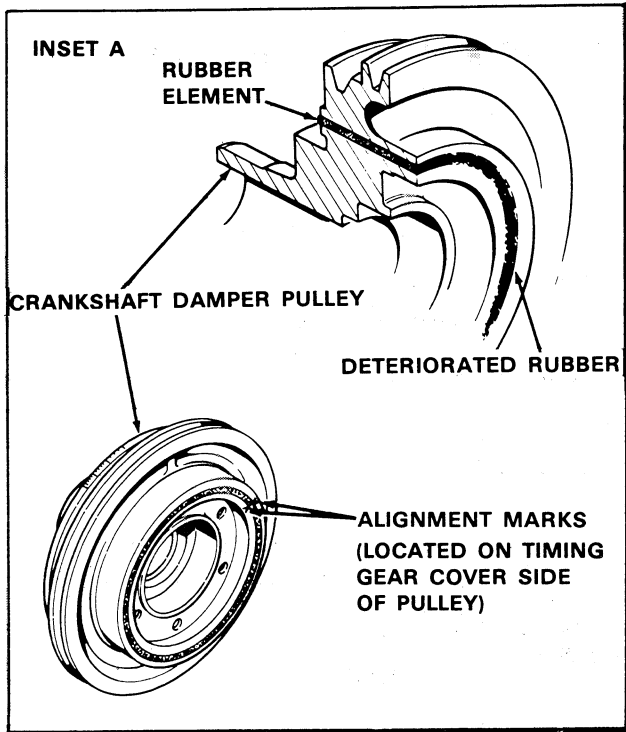
### STEP 1

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.

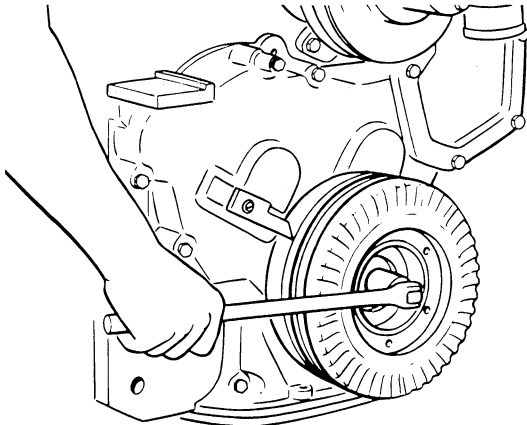


USE BOLT ON TYPE PULLER TO REMOVE PULLEY. REMOVE VISCOUS DAMPER FROM PULLEY (IF SO EQUIPPED). DO NOT PULL OR HAMMER ON OUTSIDE OF PULLEY OR VISCOUS DAMPER; SERIOUS DAMAGE TO PULLEY, DAMPER, AND RUBBER SLEEVE COULD RESULT.



# Checking Top Dead Center

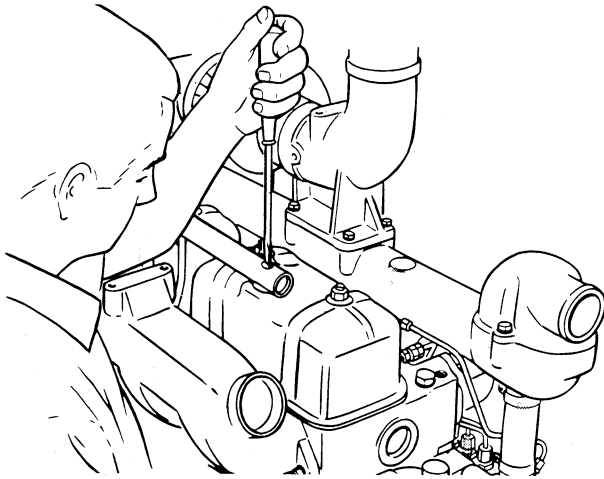
## STEP 2



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

---

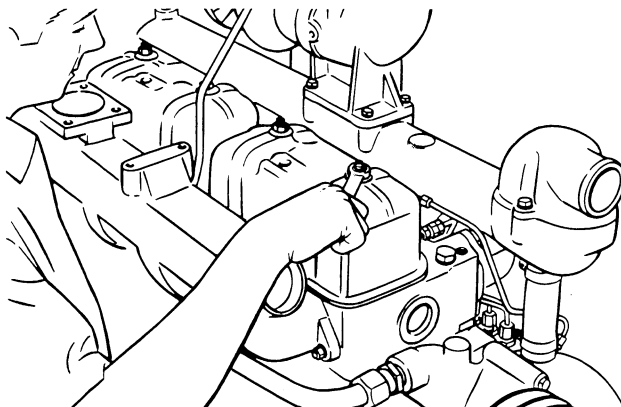
## STEP 3



REMOVE BREATHER TUBE.

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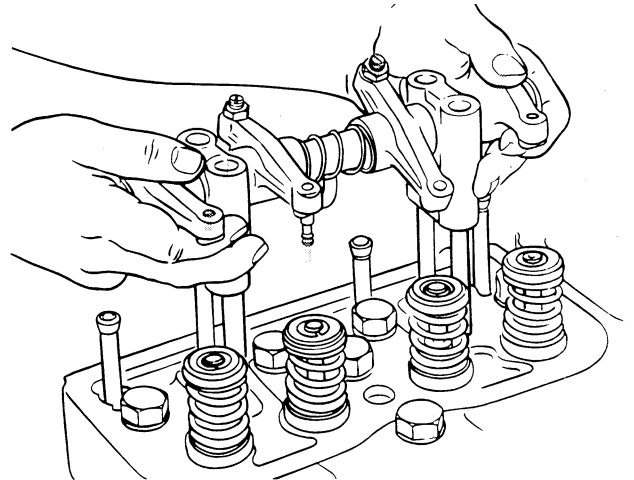
## STEP 4



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

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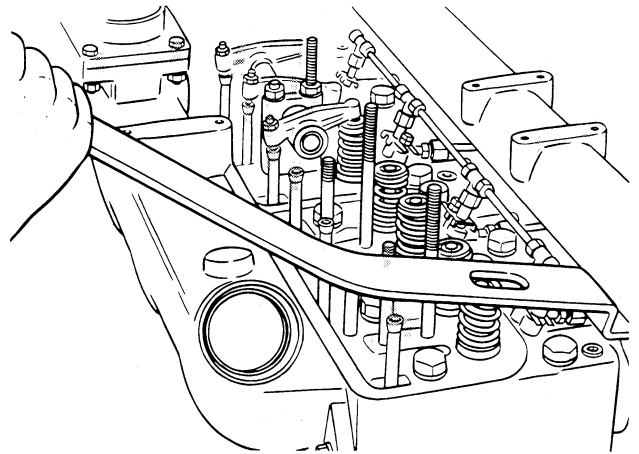
## STEP 5



REMOVE ROCKER ARM ASSEMBLY.

---

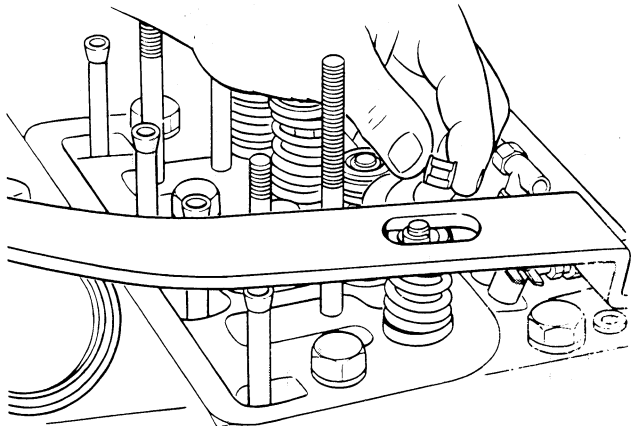
## STEP 6



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

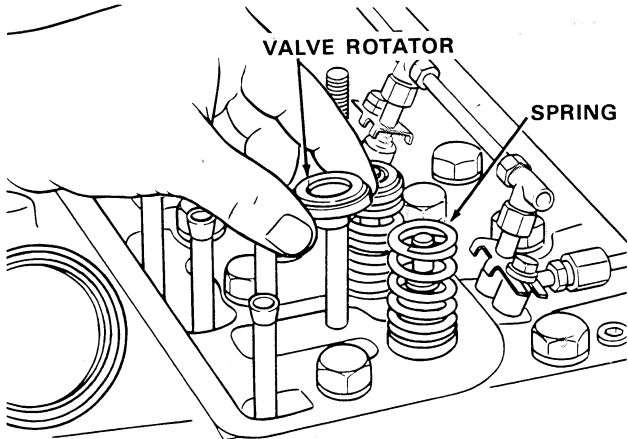
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## STEP 7



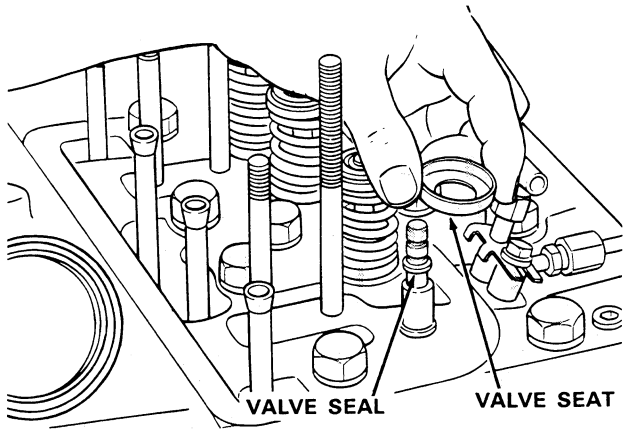
REMOVE VALVE KEEPERS

**STEP 8**



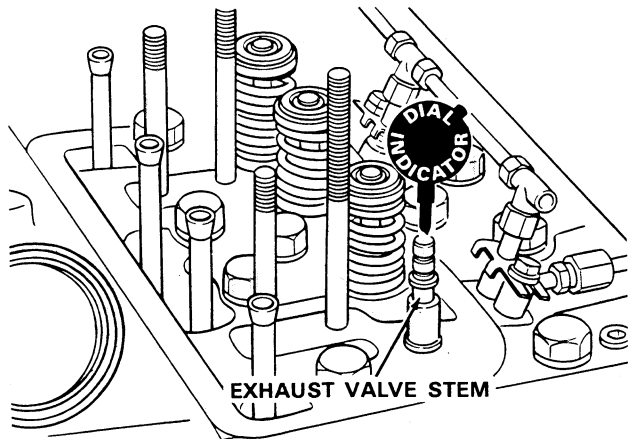
REMOVE VALVE ROTATOR, SPRING AND SEAT.

**STEP 9**

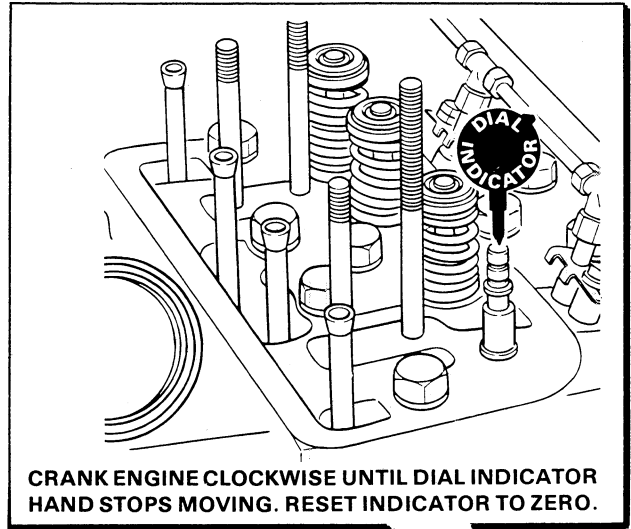


KEEP VALVE SEAL IN PLACE TO PREVENT VALVE FROM FALLING THROUGH VALVE GUIDE IF PISTON IS MOVED TOO FAR

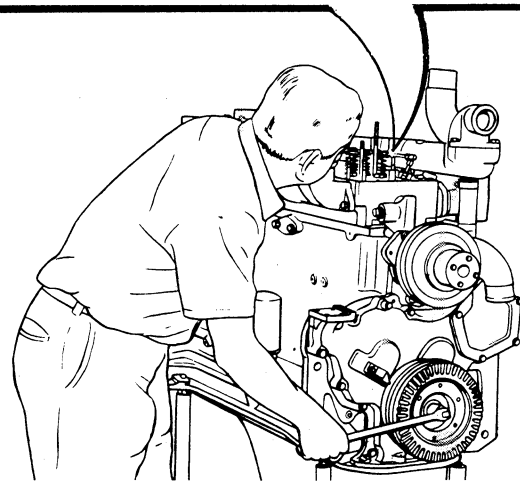
**STEP 10**



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

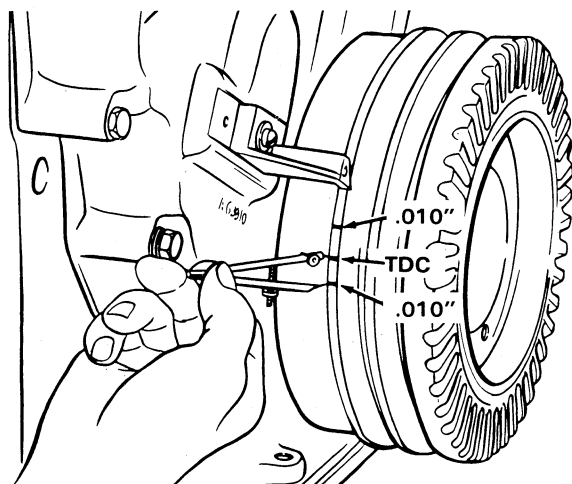


CRANK ENGINE CLOCKWISE UNTIL DIAL INDICATOR HAND STOPS MOVING. RESET INDICATOR TO ZERO.

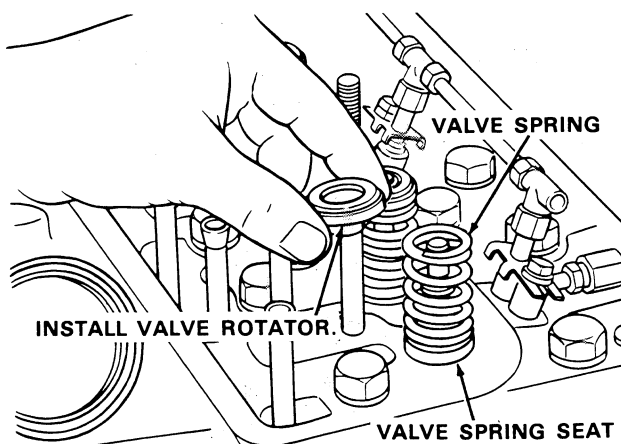
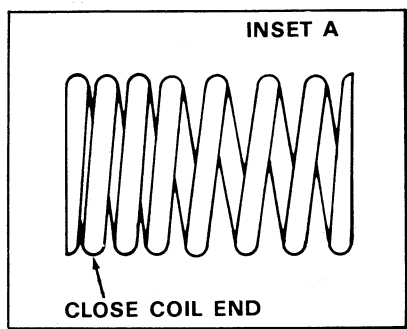


CRANK ENGINE CLOCKWISE UNTIL .010" SHOWS ON DIAL. SCRIBE A MARK ON CRANKSHAFT PULLEY IN LINE WITH TIMING POINTER.

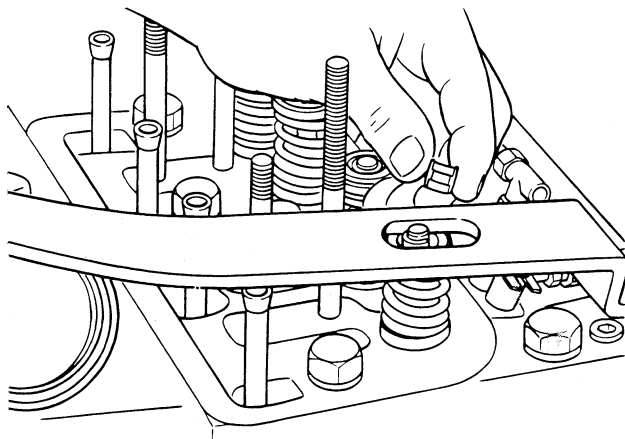
CRANK ENGINE COUNTERCLOCKWISE PAST ZERO MARK ON INDICATOR UNTIL .010" SHOWS ON DIAL. AGAIN, SCRIBE MARK ON CRANKSHAFT PULLEY.

**STEP 11**

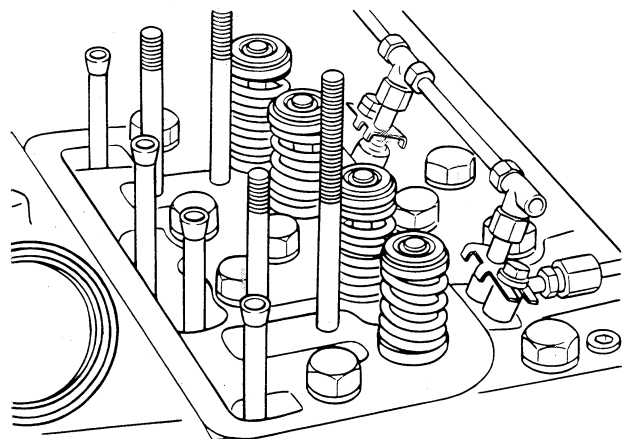
HALF THE DISTANCE BETWEEN THESE TWO SCRIBE MARKS ON CRANKSHAFT PULLEY WILL BE THE TOP DEAD CENTER (TDC) MARK. IF THE SCRIBE MARKS ARE NOT THE SAME AS ORIGINAL MARKS ON PULLEY CHECK DAMPER.

**STEP 12**

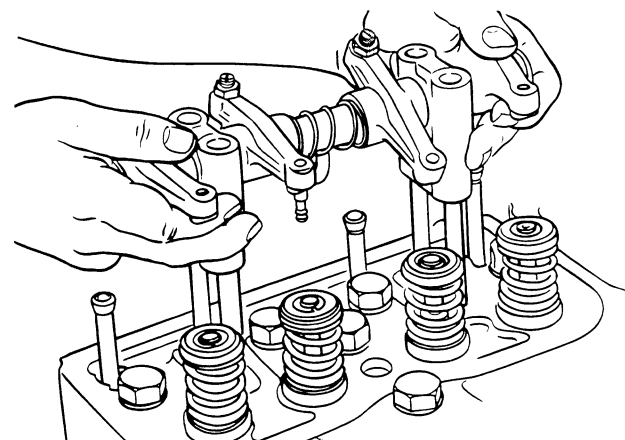
INSTALL SPRING SEAT AND VALVE SPRING. **NOTE:** IF EQUIPPED WITH VALVE SPRING HAVING ONLY ONE CLOSE COIL END, PLACE THIS END TOWARD CYLINDER HEAD, SEE INSET A.

**STEP 13**

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

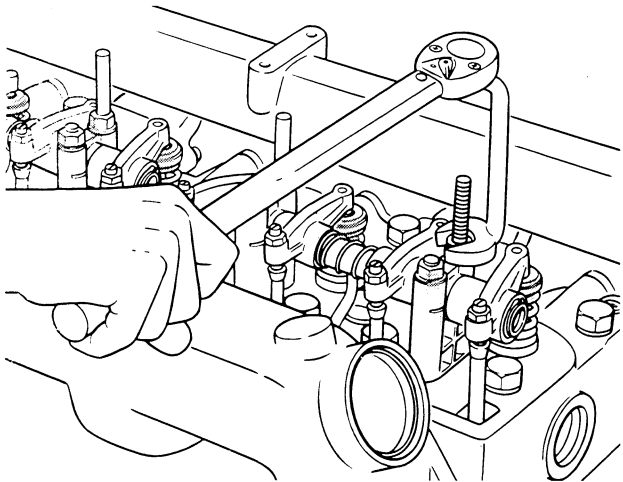
**STEP 14**

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

**STEP 15**

INSTALL ROCKER ARM ASSEMBLY ONTO CYLINDER HEAD.

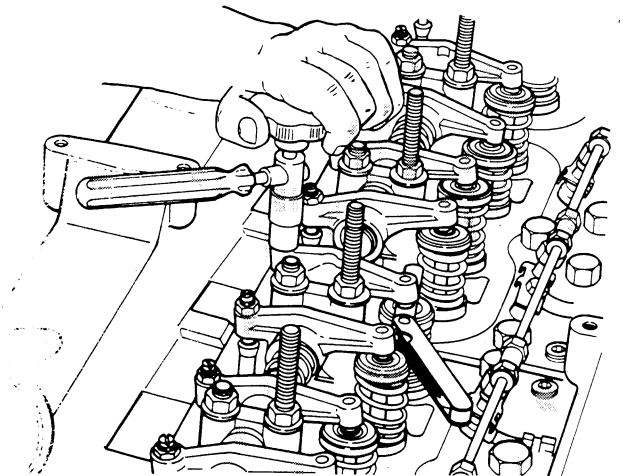
**STEP 16**



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

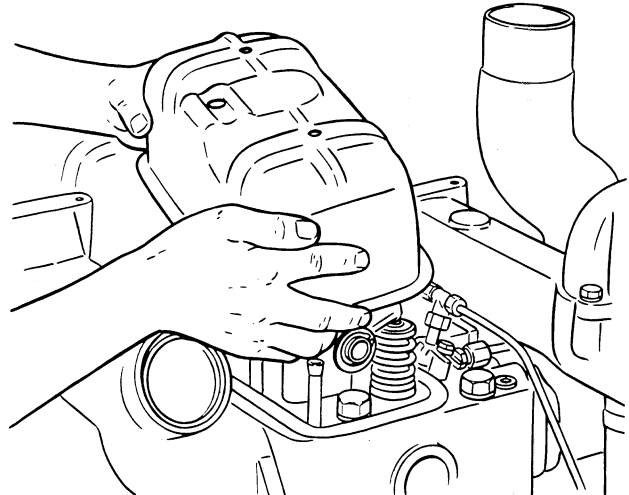
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**STEP 17**



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

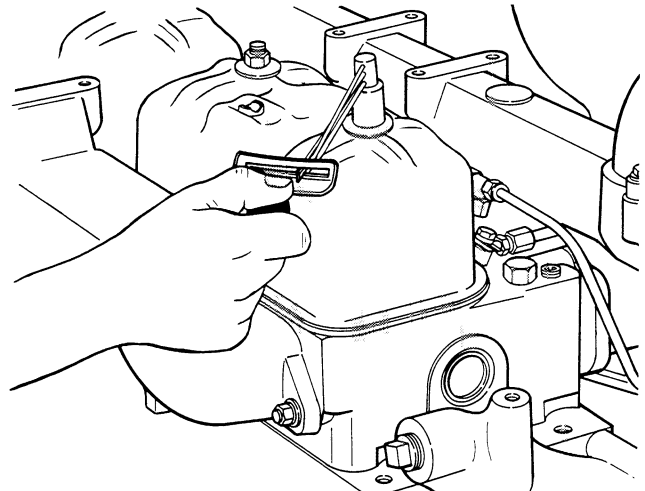
**STEP 18**



**INSTALL VALVE COVERS AND GASKETS.**

---

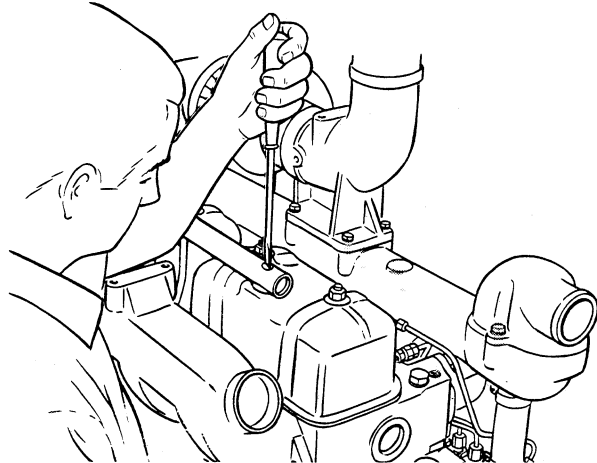
**STEP 19**



**TORQUE VALVE COVER NUTS 60 TO 70 IN. LBS.**

---

**STEP 20**

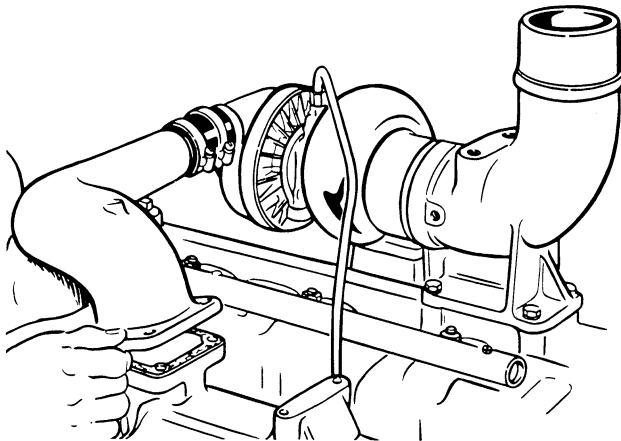


**INSTALL BREATHER TUBE AND GASKETS.**

# Adjusting Tappets

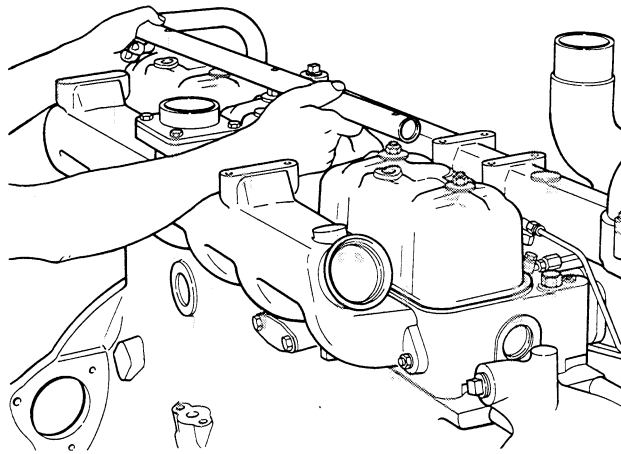
## Cold Setting

### STEP 21



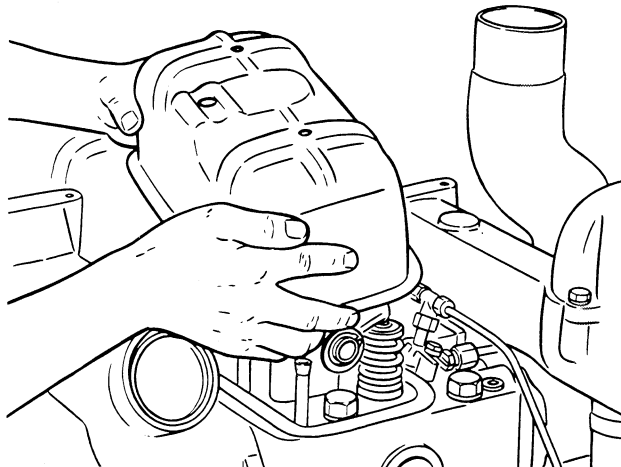
REMOVE TURBOCHARGER INTAKE ELBOW (IF SO EQUIPPED).

### STEP 22



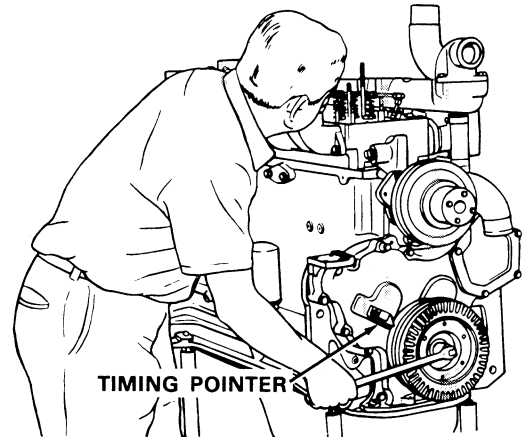
REMOVE BREATHER TUBE.

### STEP 23



REMOVE VALVE COVERS AND GASKETS FROM ALL CYLINDERS.

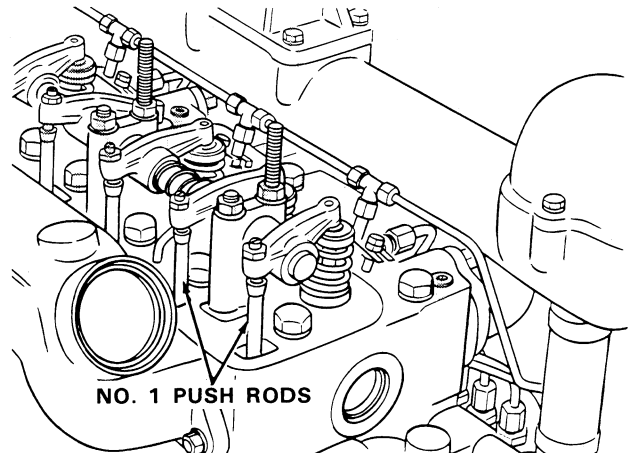
### STEP 24



TIMING POINTER

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

### STEP 25



NO. 1 PUSH RODS

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.



**Suggest:**

**If the above button click is invalid.**

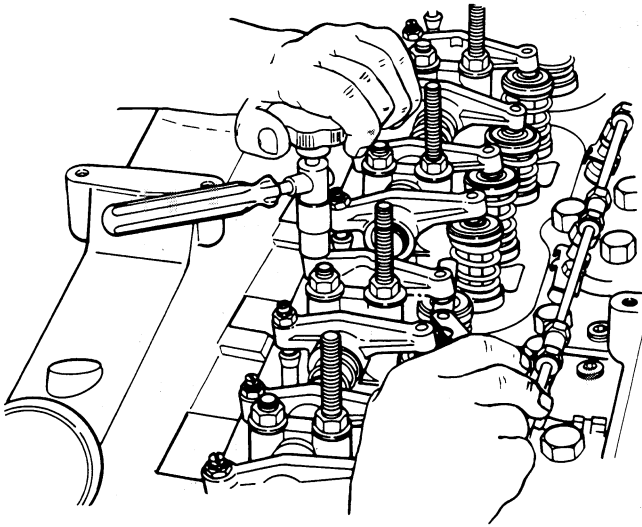
**Please download this document**

**first, and then click the above link**

**to download the complete manual.**

**Thank you so much for reading**

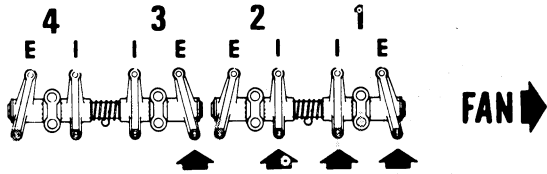
**STEP 26**



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

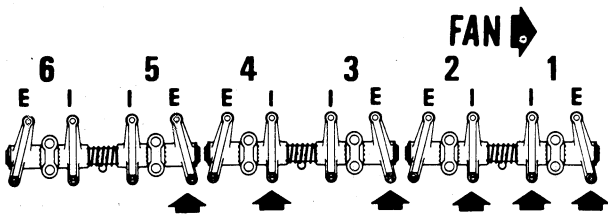
**TAPPET CLEARANCE COLD - INTAKE VALVES .015"  
EXHAUST VALVES - .025"**

**FOUR CYLINDER ENGINES**



**NO. 1 TDC COMPRESSION STROKE**

**SIX CYLINDER ENGINES**



**NO. 1 TDC COMPRESSION STROKE**

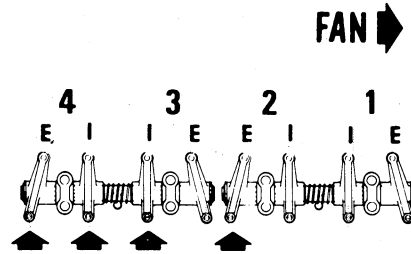
**STEP 27**

**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.**

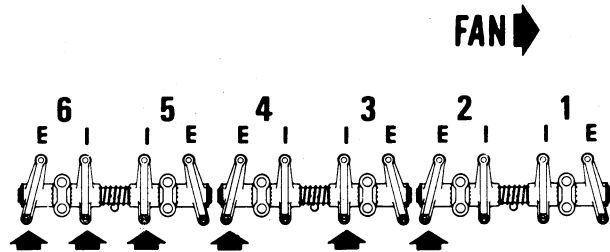
**TAPPET CLEARANCE COLD - INTAKE VALVES .015"  
EXHAUST VALVES .025"**

**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.**

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