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2094, 2294 AND 3294 TRACTORS

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Reprinted

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Section 1210

GENERAL SPECIFICATIONS

2094 Tractors

Written In *Clear
And
Simple
English*

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GENERAL TRACTOR SPECIFICATIONS

Air Intake System

Type Dry Type Air Cleaner System, Two Stage,
With a Light Emitting Diode (LED) Service
Monitor Located in the Digital Instrument
Cluster

Cooling System

Capacity 38 U.S. Quarts (36 Litres)
Type Pressure System, Thermostat Controlled
By-Pass, Impeller Type Pump
Radiator Heavy Duty Fin and Tube Type
Thermostats Two, Start to Open at Approximately
175° F (79° C), Fully Open at 202° F (94° C)
Pressure Cap 10 PSI (69 kPa) (6.9 bar)
Water Level Light Emitting Diode (LED) Service Monitor
Located in the Digital Instrument Cluster
Coolant Temperature Liquid Crystal Display (LCD) Bar Indicator
Located in the Digital Instrument Cluster

Electrical System

Type of System 12 Volt, Negative Ground
Batteries Two 12 Volt Batteries Connected in Parallel,
AABM Group Size 30H-580, Rated in 1.255 to
1.265 Specific Gravity. Discharge Rate 300
Amperes at 0° F. Voltage Decrease to 9.2 Af-
ter 10 Seconds. Voltage Decreases 1.0 Volt
Per Cell After Five Minutes.
Alternator 12 Volt, 61 Ampere Output, Negative Ground;
12 Volt, 72 Ampere Output, Negative Ground
or 12 Volt, 105 Ampere Output, Negative
Ground With a Light Emitting Diode (LED)
Service Monitors Located in the Digital Instru-
ment Cluster.
Voltage Regulator 12 Volt, Solid State, Inside Component of Alternator
Starter Motor 12 Volt with Solenoid Switch
Head Lamps (2) 12 Volt, 40/60 Watt Sealed Beam High-Low
Front Flood Lamps (4 Max) 12 Volt, 50 Watt, Sealed Beam
Rear Flood Lamps (4 Max) 12 Volt, 50 Watt, Sealed Beam
Flasher Lamps (2) With Direction Turn Signals 12 Volt, Amber Lens
Tail Lamps (2) 12 Volt, Red Lens
Tractor Electrical System Circuit Breaker 12 Volt, Three 50 Ampere Circuit
Breakers Connected In Parallel,
150 Ampere Rating, 120 Ampere
Continuing Capacity.
Cab Electrical System Circuit Breaker 12 Volt, 20 Ampere

Electrical System

Bulb And Lamp Replacement:

Instrument Cluster Lamps	No. 73
Dome Lamp Bulb	No. 561
Console Lamp Bulb	No. 194
Flasher Lamp Bulb	No. 1156
Head Lamp	No. 4652
Front and Rear Flood Lamp	No. A48265
Tail Lamp Bulb	No. 168

Fuse Replacement:

Instrument Cluster	3.0 Ampere
Automatic Shutoff Solenoid	7.5 Ampere
Tail Lamp	15 Ampere
Lamp Switch Feed	25 Ampere
Accessories	3.0 Ampere
Ether Switch and Cab Relay	10 Ampere
Head Lamp Low Beam	15 Ampere
Head Lamp High Beam	15 Ampere
Front Flood Lamps	25 Ampere
Radio and Night Lamp	10 Ampere
Ignition Switch	15 Ampere
Flasher and Dome Lamp	15 Ampere
Rear Flood lamps	25 Ampere
Wiper	7.5 Ampere
Blower	15 Ampere
Cigarette Lighter	15 Ampere
Instrument Reset	5.0 Ampere
Transmission Control Differential Lock	20 Ampere
Range Switch	3.0 Ampere

Tractor Brakes

Type Hydraulic, Power Assistance, Self-Adjusting,
Several Plate Wet Type Differential Brakes.

Power Shift Transmission

Type Three Speed, Power Shift, Compound Planetary With
Hydraulically Actuated Clusters and a Four Speed Gear Section

Gear Selection 12 Speeds Forward and Three Speeds Reverse

Shift Control Actuated by a Lever on the Console.

Oil Cooler Transmission, Remote Hydraulics, Steering and Brake Oil

Axle, Differential and Planetaries

Mechanical Front Drive (MFD)

Front Axle Spiral Bevel with Planetary Reduction in Hub

Differential Oil Capacity 16 U.S. Quarts (15 Litres)

Planetary Oil Capacity 4.5 U.S. Quarts (4.25 Litres) Each Planetary

Parking Lock System

Parking Lock Actuated By Gear Shift Lever

Differential Lock

Type Hydraulically Actuated By Switch on Control Console

Hydrostatic Power Steering

Type	Gear Pump of Hydraulic Pump
Pump Capacity at 2100 RPM	8 GPM (30.3 l/min)
Steering Pump	Hydrostatic Type, Actuated By the Steering Wheel
Steering Cylinder	Double Action Cylinder

Hitch System

Type of Sensing	Lower Link
Type of Control	Hand Lever
Type of Valve	Three Position-Lift, Hold and Lower
Type of Draft Arms	Rigid, Swing Type or Extendable With Manual Float Adjuster
Type of Hitch	Three Point, Category II
Conversion Hitch Coupler (Available)	Category II To III

Remote Hydraulic System

Pump	Axial Piston Pump, Pressure And Flow Compensated.
Type of Remote Valve	Closed Center, One to Four Sections, Hand Lever Control, Variable Flow Control For Each Section Or Remote Valve With Lock Check
Pump Capacity at 2100 Engine RPM	21 to 23 GPM (80 to 88 l/min)
Maximum System Pressure	2250 PSI (15 503 kPa)(155.03 bar) With a Light Emitting Diode (LED) Service Monitor for Both Transmission Oil Pressure and Transmission Filter Located in the Digital Instrument Cluster
Couplings	ASAE R366 Standard, Fast Removal, Breakaway Type

Power Takeoff

Type of Clutch	Hydraulic Actuated
Rotation	Clockwise
Spline Size	1000 RPM, 21 Splines, 1-3/8 inch (34.9 mm) Diameter
Spline Size - Two Size Conversion Optional	540 RPM, 6 Splines, 1-3/8 inch (34.9 mm) Diameter and 1000 RPM, 21 Splines, 1-3/8 inch (34.9 mm) Diameter
Engine Speed at 2100 RPM	540 or 1000 RPM Shaft Speed

Drawbar

Standard or Yoke Type Slide Type, Takes a 1-1/4 inch
(31.75 mm) Diameter Pin

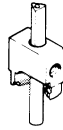
Roller Drawbar or Yoke Type On Tractors without 3 Point Hitch

INSTALLATION INSTRUCTIONS FOR M20614 TEFLON VALVE SEAL KIT

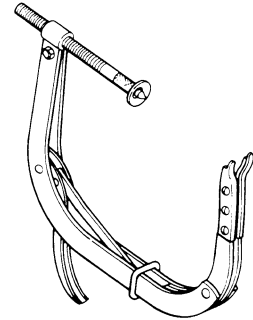
Special Tools Required



M20624 SEAL INSTALLATION TOOL

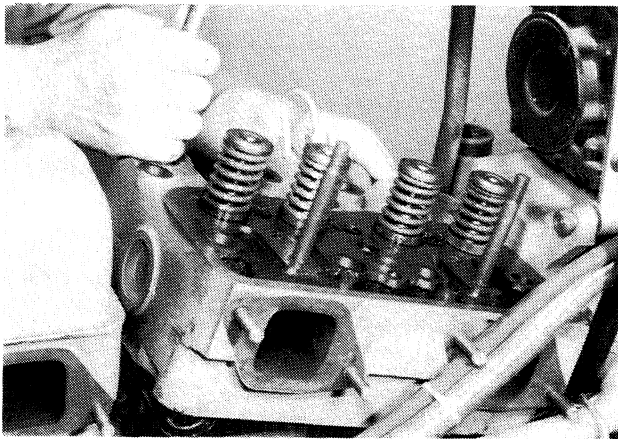


M20617 VALVE GUIDE CUTTING TOOL



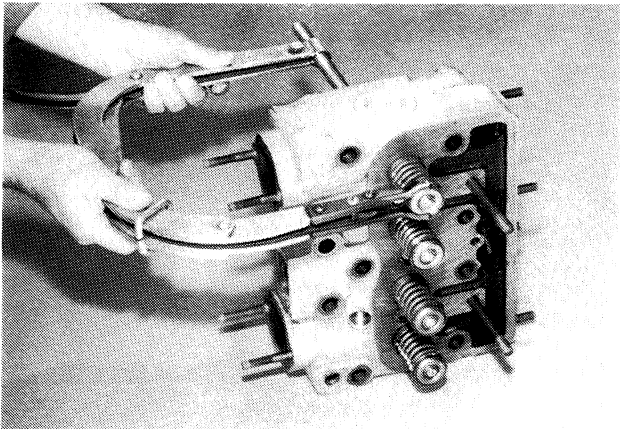
VALVE SPRING COMPRESSOR

STEP 1



Remove the cylinder heads. See Section 2215 of the Service Manual for removal of the cylinder heads.

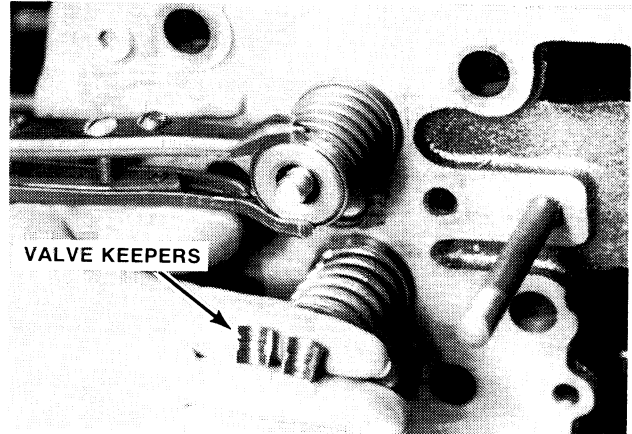
STEP 2



Use a valve spring compressor to push down the valve springs.

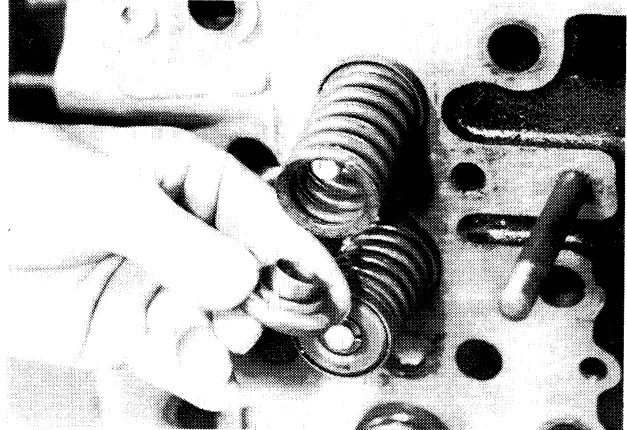
IMPORTANT: Make a mark on the valves, rotators, spring retainers and keepers. This will make sure that the parts are installed in the original location.

STEP 3

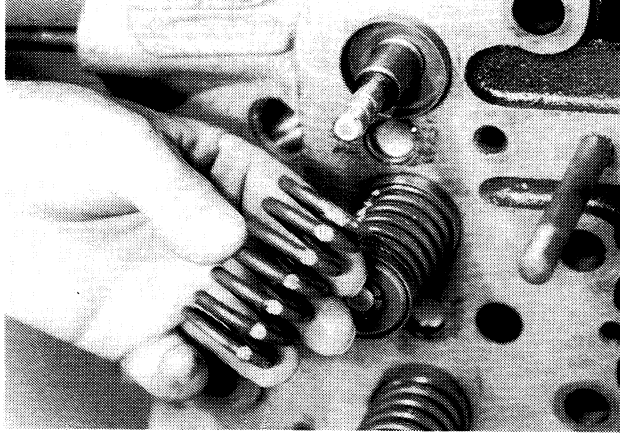


Push down the valve springs and remove the valve keepers.

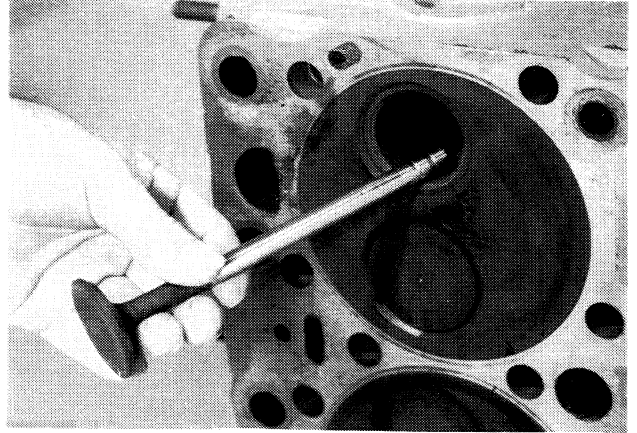
STEP 4



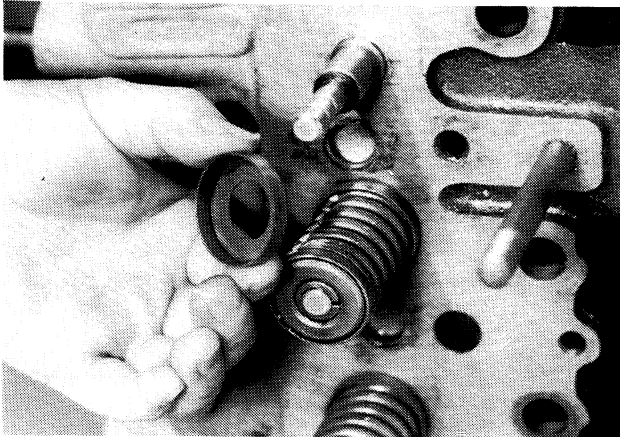
Remove the valve rotators or the valve spring retainers.

STEP 5

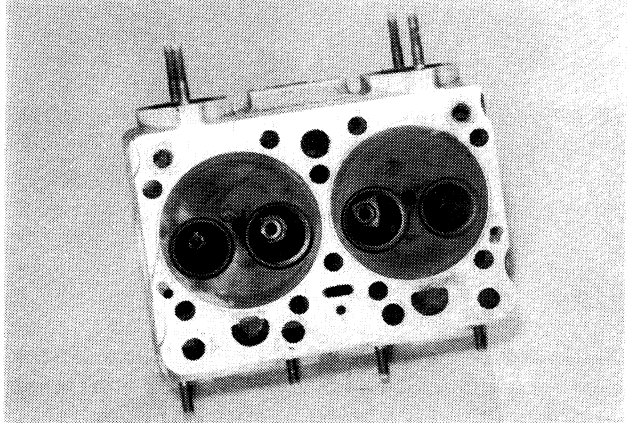
Remove the valve springs.

STEP 8

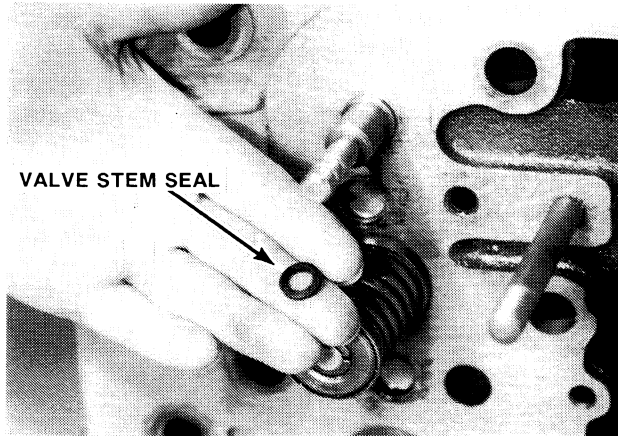
Remove the valves.

STEP 6

Remove the spring seats.

STEP 9

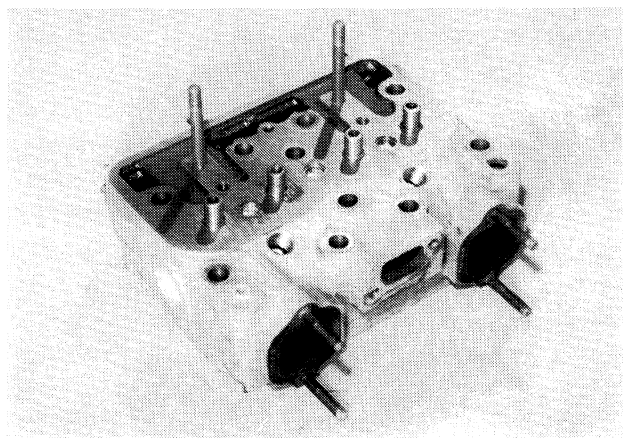
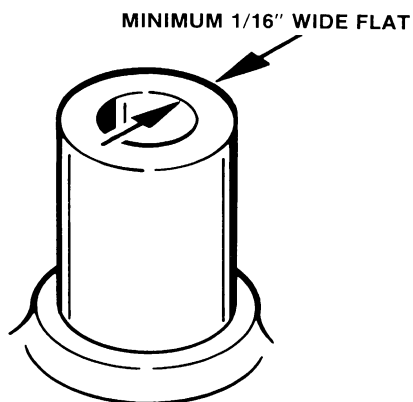
Clean the cylinder head completely, removing all the carbon and other deposits. Check for cracks and for any sign of damage, existing in the area of the fire ring contact.

STEP 7

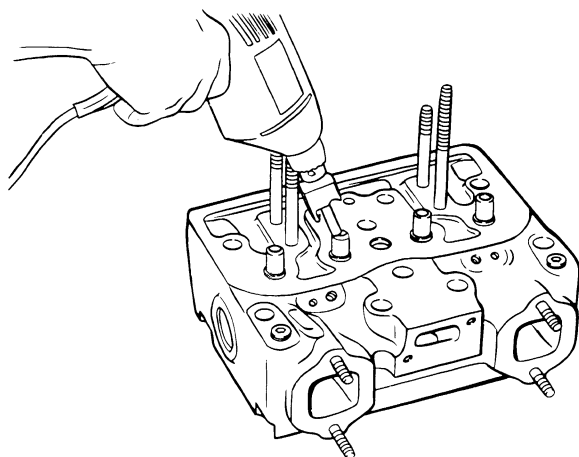
Remove the valve stem seals.

STEP 10

Clean the valves with a fine wire brush that is power driven. Remove all carbon and varnish deposits. Do not scratch the valve stems.

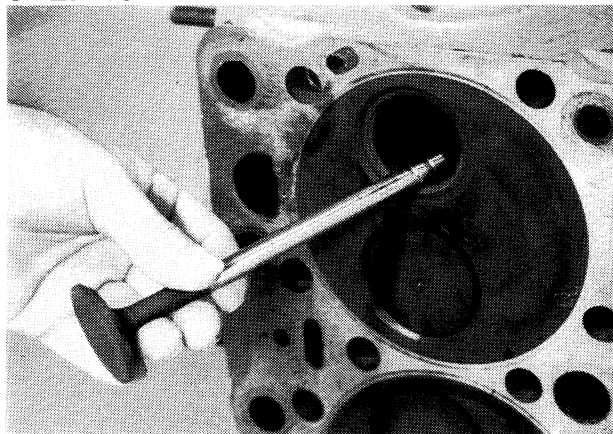
STEP 11

Check the top surface of the valve guide. There must be a minimum of a 1/16" (0.0625 mm) wide flat around the complete top surface.

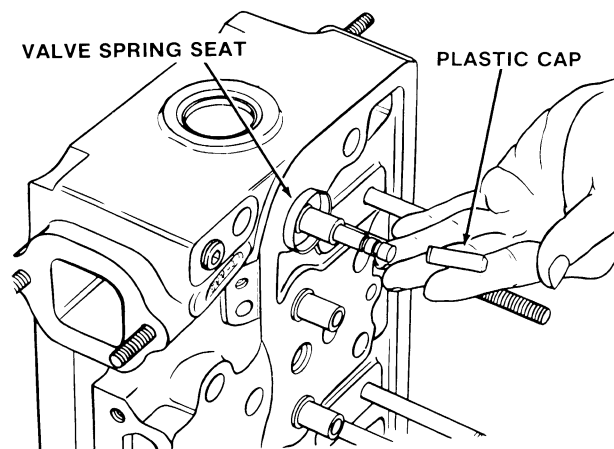
STEP 12

Use the M20617 tool in an electric drill to give the necessary flat area on the valve guide.

IMPORTANT: Do not go over 450 RPM when drilling.

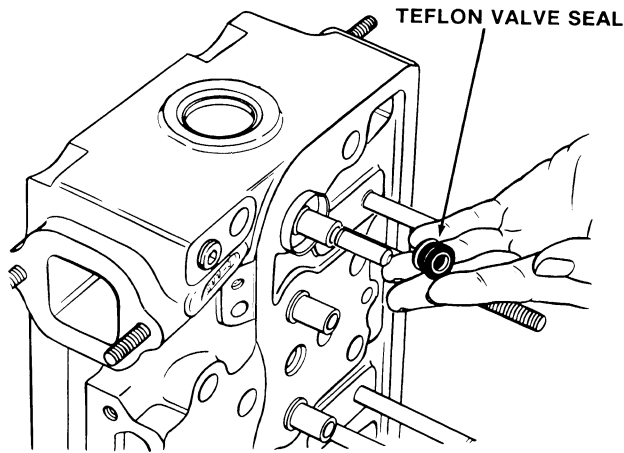
STEP 13

Put clean engine oil on the valves before installing the valves in the cylinder head.

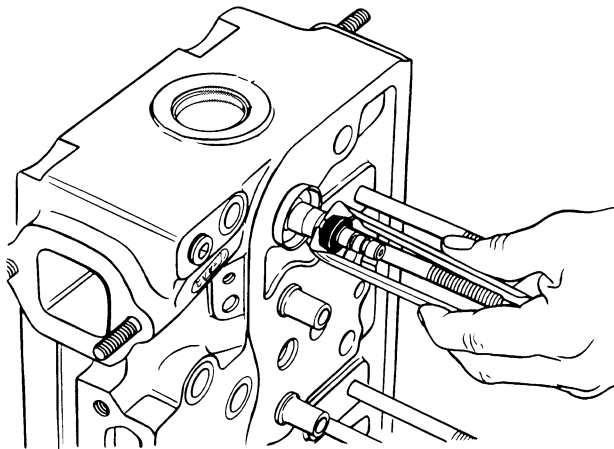
STEP 14

Install the spring seats. Put the plastic installation cap on the end of the valve stem. The plastic cap prevents the sharp edges on the valve stem grooves from cutting the valve seal.

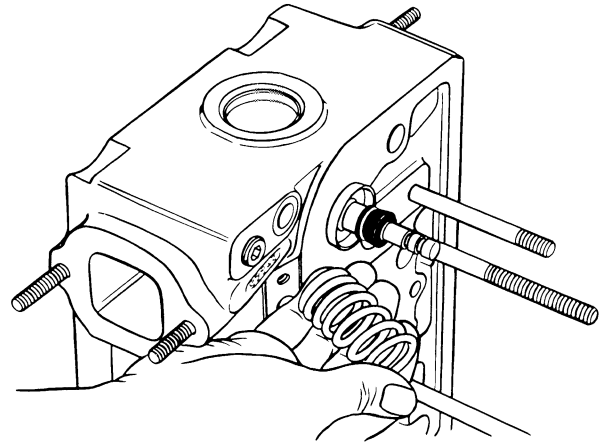
NOTE: One M20614 kit is required for one cylinder head.

STEP 15

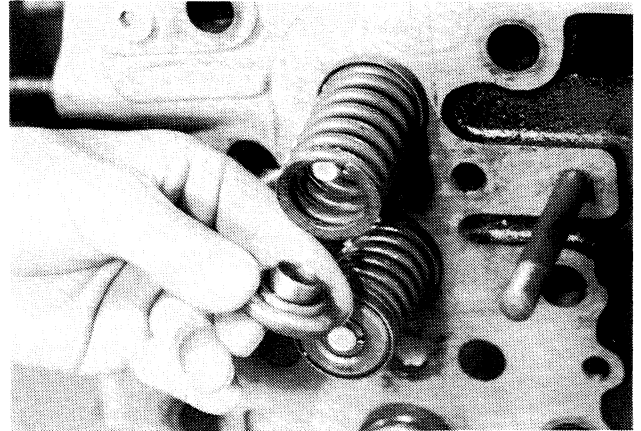
Put the valve seal over the plastic cap. Hold your thumb against the white seal insert to keep the insert from coming out. Push the valve seal down so that the seal jacket is against the top of the valve guide. Remove the installation cap. Keep the cap since the cap will be used again.

STEP 16

Use the M20624 tool and push the seal down over the valve guide until the seal is level with the top of the guide.

STEP 17

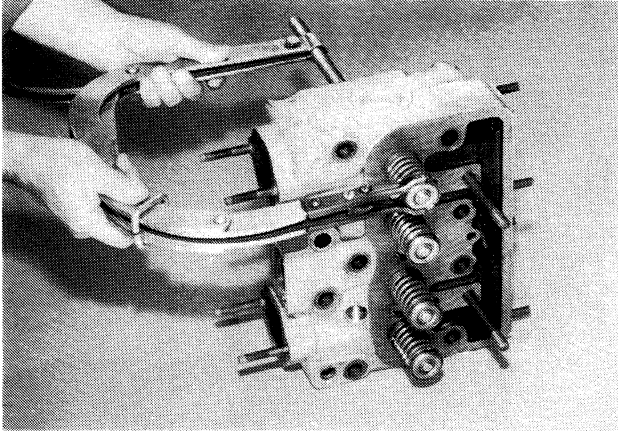
Install the valve spring. Either end of the valve spring can be installed in the valve spring seat because both ends of the spring are closed.

STEP 18

Install the valve rotators or the valve spring retainers (flat side up).

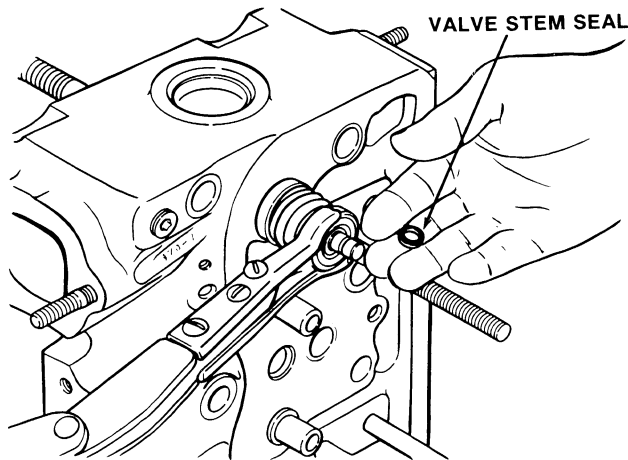
IMPORTANT: *Install the valve rotators or the valve spring retainers with the original valves because these parts are worn as counterparts of each other.*

STEP 19



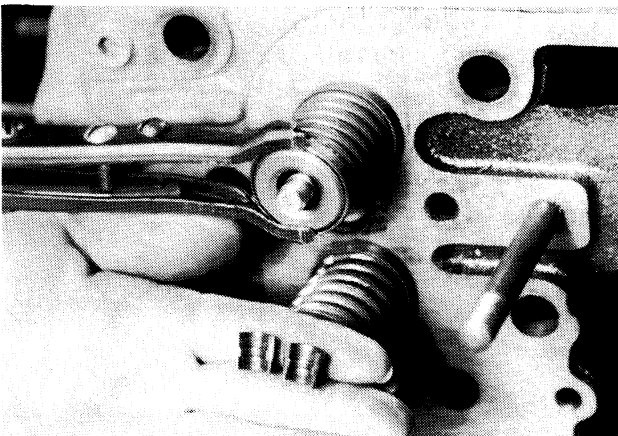
Push down the valve springs with a spring compressor.

STEP 20



Install a new valve seal in the lower valve stem groove.

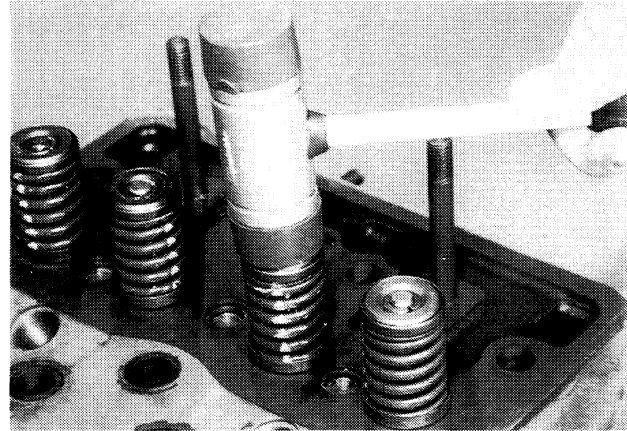
STEP 21



Install the valve keepers in the upper valve stem groove.

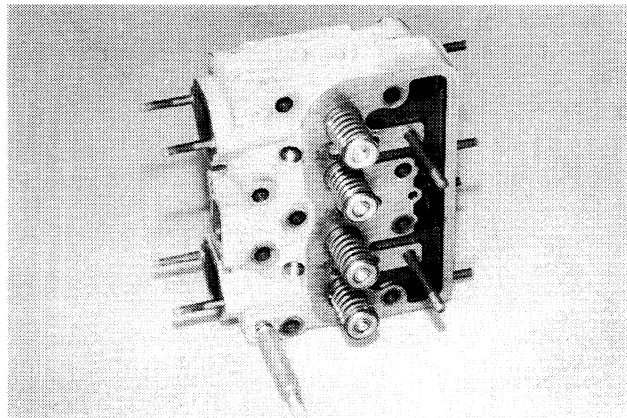
Rac 8-20111

STEP 22



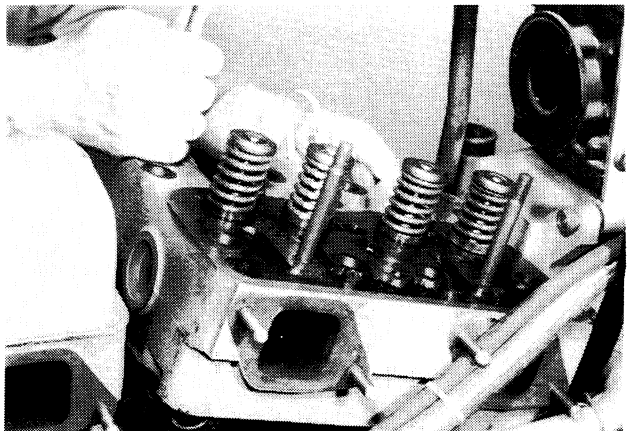
Remove the spring compressor. Hit the end of the valve stems with a soft hammer to seat the valve keepers.

STEP 23



Install teflon seals on all the intake and exhaust valves.

STEP 24



Install the cylinder heads. See Section 2215 of the Service Manual for installation of the cylinder heads.

Revised 7-83 Printed in U.S.A.

Section

2202

ENGINE TUNE-UP

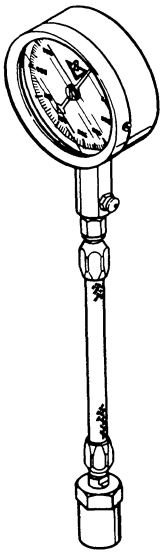
Written In *Clear
And
Simple
English*

ENGINE TUNE-UP

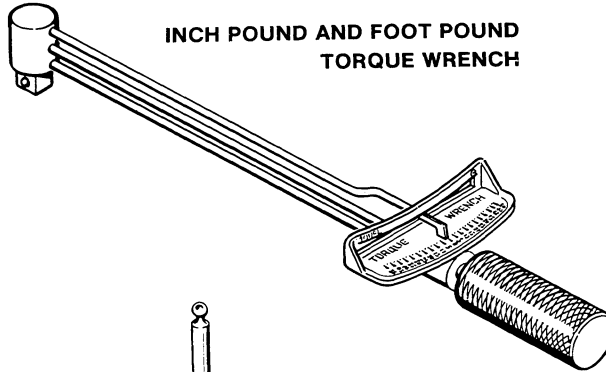
A COMPLETE ENGINE TUNE-UP MUST INCLUDE ALL OF THE FOLLOWING ITEMS:

Checking The Crankshaft Damper Pulley (If Equipped)	4-7
Checking Top Dead Center	8-14
Adjusting The Rocker Arm To Valve Clearance	15,16
Checking The Nozzle Spray Pattern And The Engine Compression	20-22
Cleaning The Fuel Filters	22
Cleaning The Air Intake Filters	23
Timing The Injection Pump	23-25
Adjusting The Governed Speed	25
Adjusting The Fan Belts And The Compressor Belt	26
Checking The Valve Timing	27,28

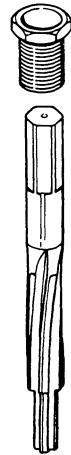
SPECIAL TOOLS



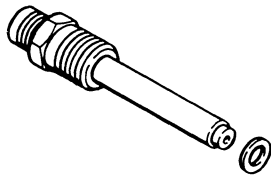
COMPRESSION GAUGE



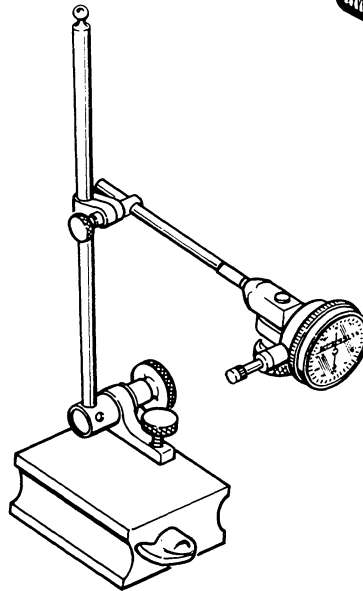
INCH POUND AND FOOT POUND
TORQUE WRENCH



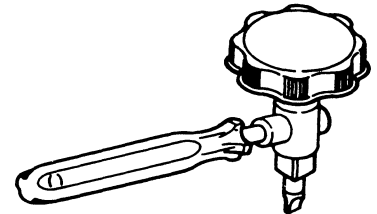
CAS-1411
INJECTOR BORE CLEANER



CAS-1410
COMPRESSION GAUGE ADAPTER



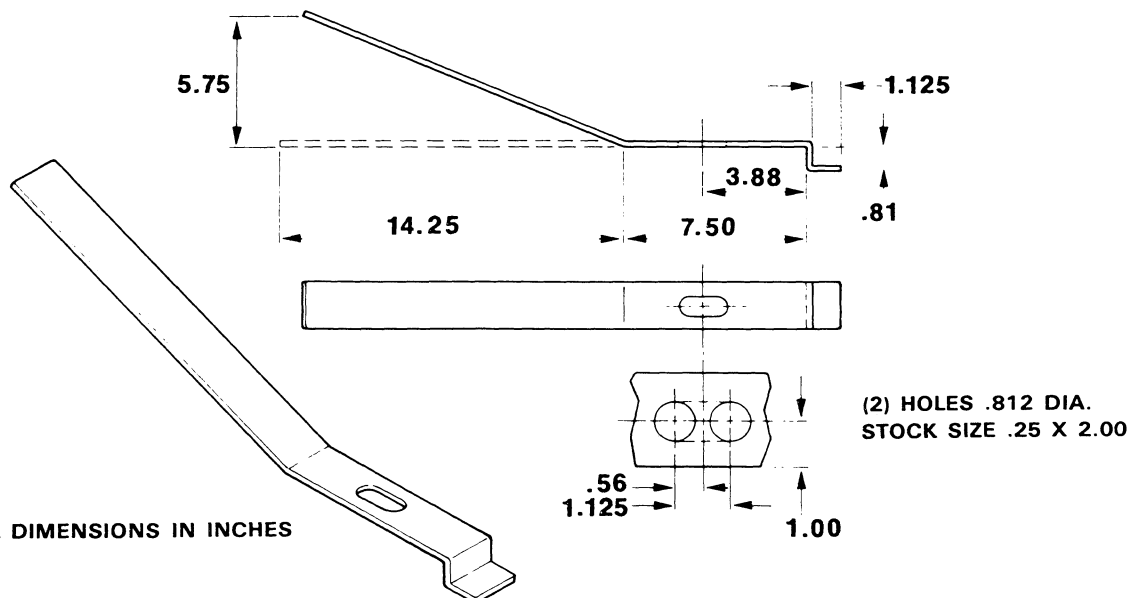
DIAL INDICATOR



TAPPET ADJUSTMENT TOOL

SPECIFICATIONS FOR TOOLS WHICH MUST BE MADE

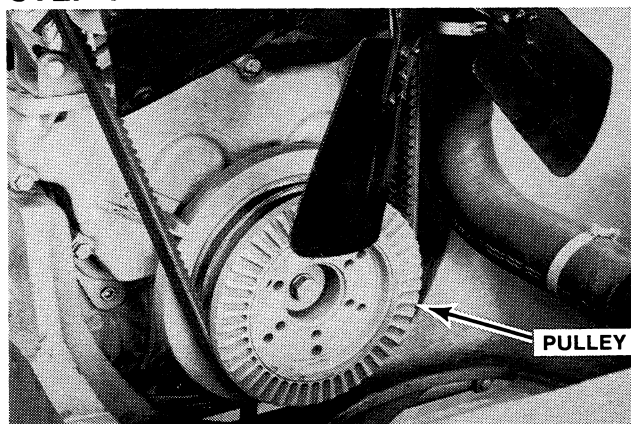
Valve Spring Compressor Tool



ENGINE TUNE-UP PROCEDURE

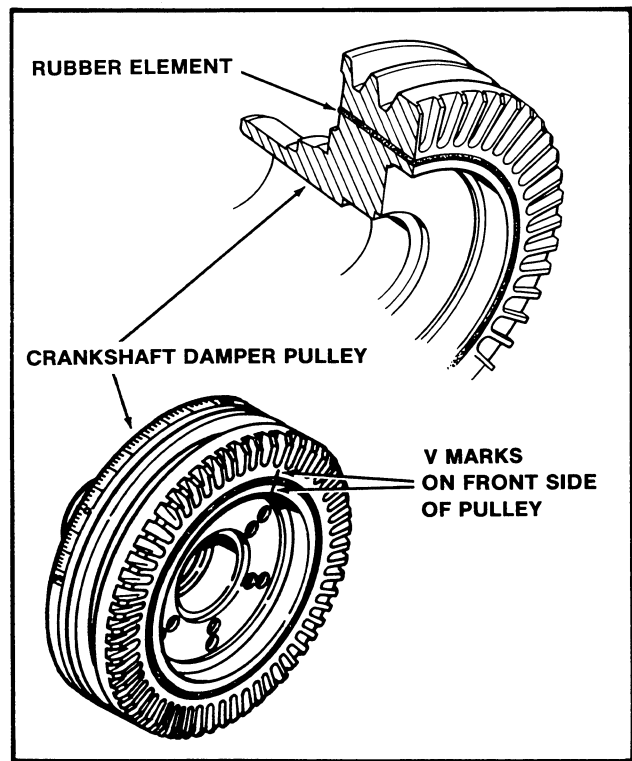
Checking The Crankshaft Damper Pulley (If Equipped)

STEP 1

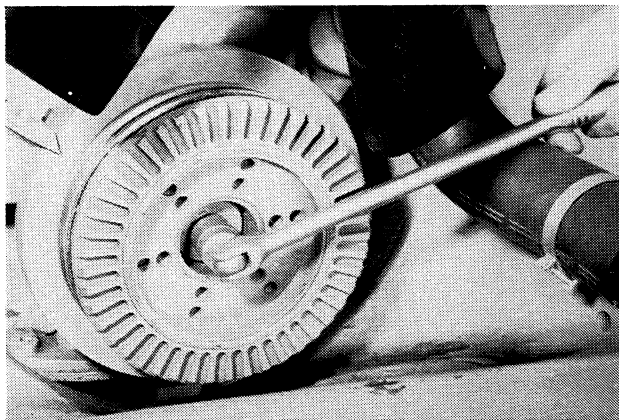


The recommendation for the change interval for the crankshaft damper pulley is 2000 hours maximum. At any time over 1500 hours change the pulley at any engine overhaul or tune-up.

Every 500 hours and during the engine tune-up, visually check the rubber element for areas where the rubber is coming off or cracked. Check the alignment of the marks between the inner and outer units. If the marks move, the damper pulley must be replaced. Go to Step 2 for pulley removal.



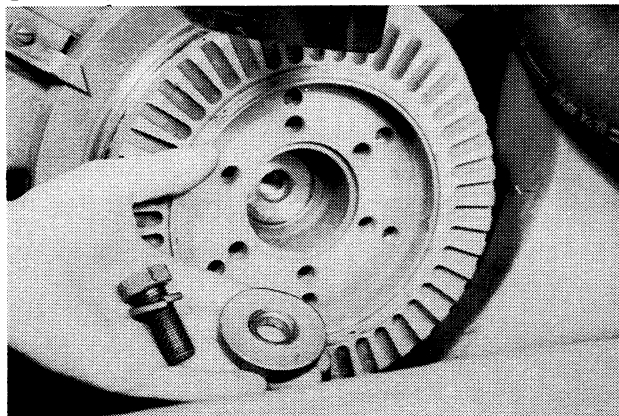
STEP 2



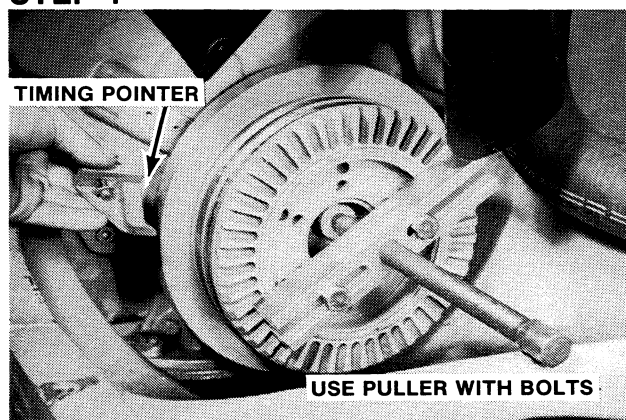
Loosen the pulley to crankshaft bolt.

NOTE: See Section 9260 or 9360 of the Service Manual for hood removal and Section 2255 for radiator and alternator belts removal.

STEP 3

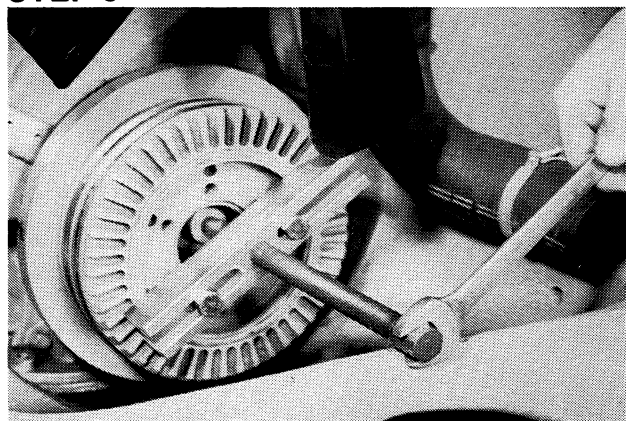


Remove the bolt, lockwasher and the retainer washer.

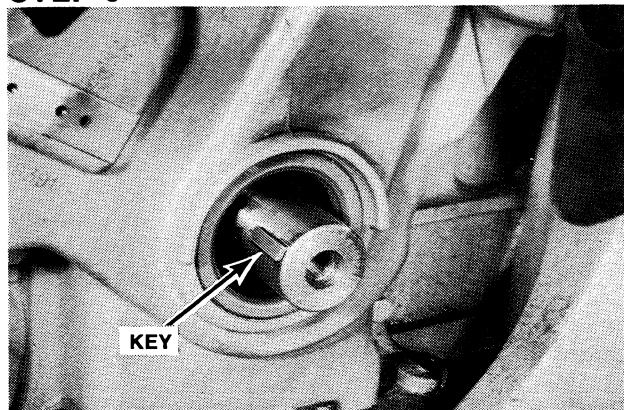
STEP 4

Remove the timing pointer.

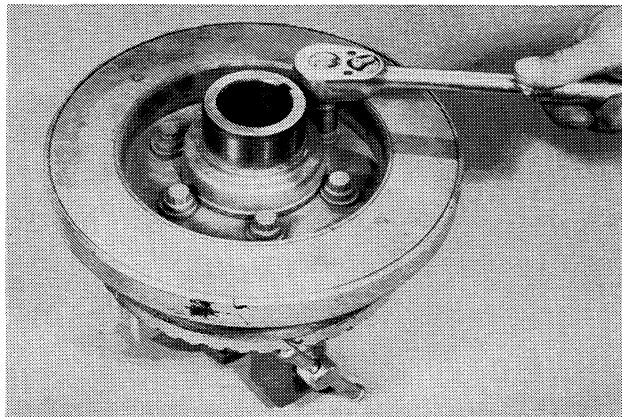
IMPORTANT: Use a puller with bolts to remove the pulley. Do not pull or hit the pulley or the viscous damper. Serious damage to the pulley, damper and the rubber sleeve in the pulley can result.

STEP 5

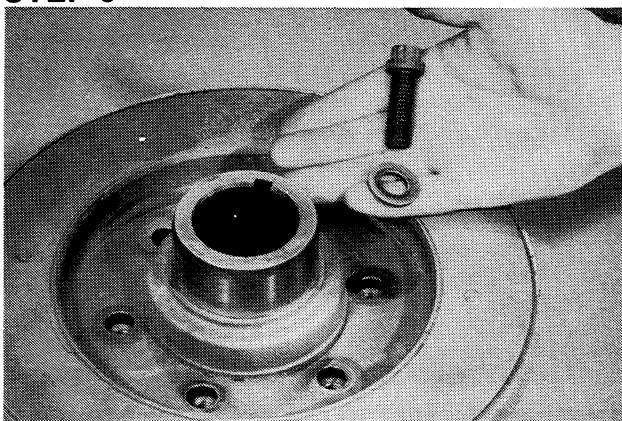
Remove the pulley.

STEP 6

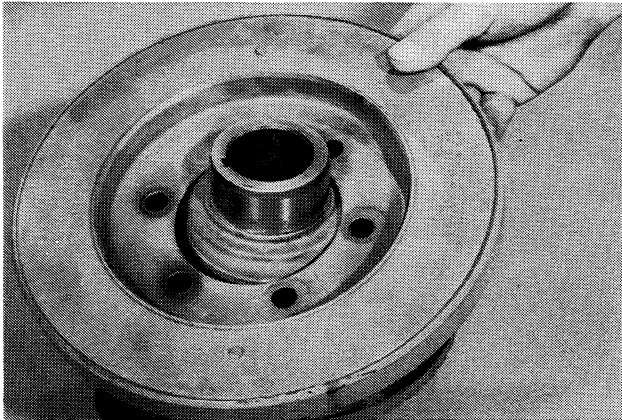
Do not lose the pulley retaining key.

STEP 7

Leave the puller on the pulley and put the puller in a vise. Loosen the bolts that hold the damper (if equipped) to the pulley.

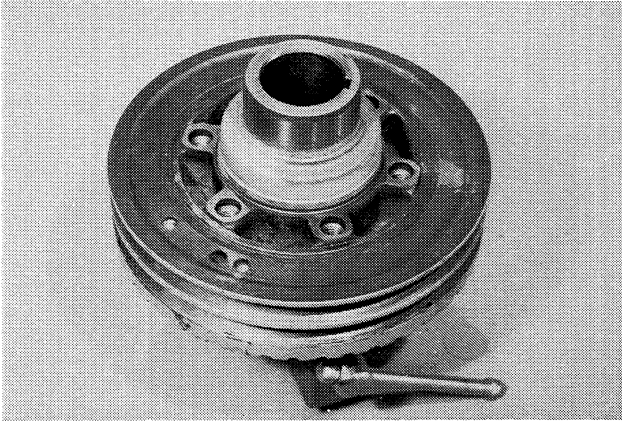
STEP 8

Remove the bolts and the washers.

STEP 9

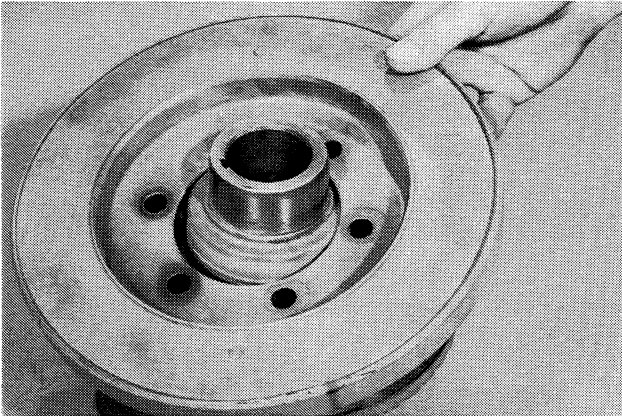
Remove the damper.

STEP 10



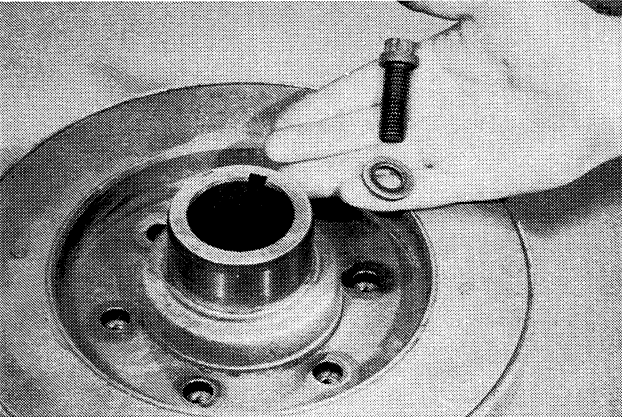
Fasten the puller to the front side of a new pulley and put the puller in a vise.

STEP 11



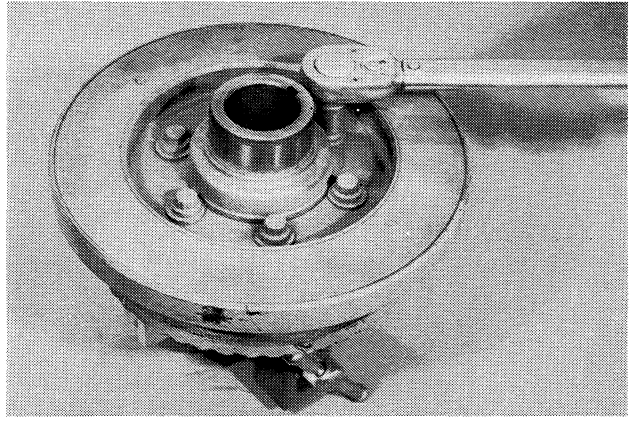
Install the damper to the pulley. The flat side of the damper is against the pulley.

STEP 12



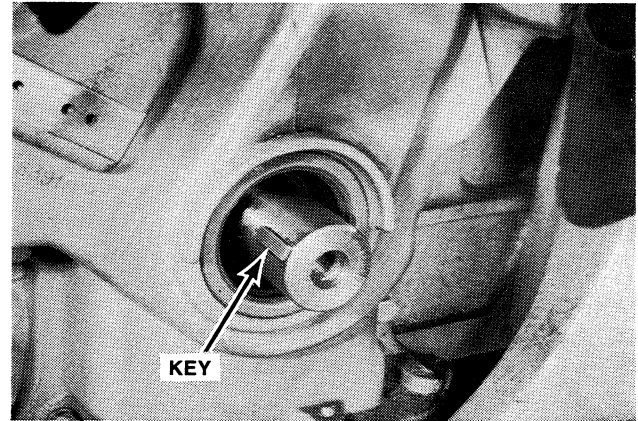
Install the bolts and new hardened washers.

STEP 13



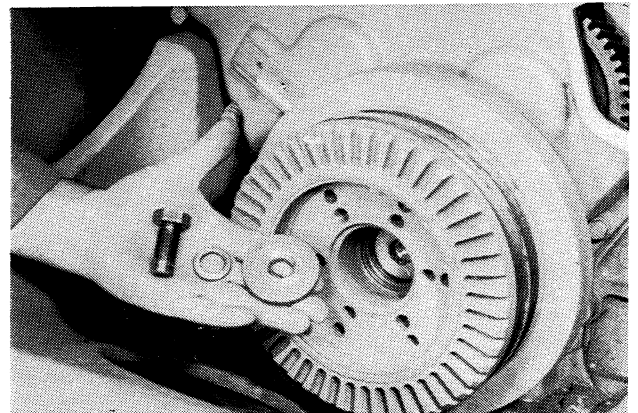
Tighten the bolts to a torque of 110 to 132 ft. lbs. (149 to 179 Nm)(14.9 to 17.9 kgm). Remove the puller.

STEP 14



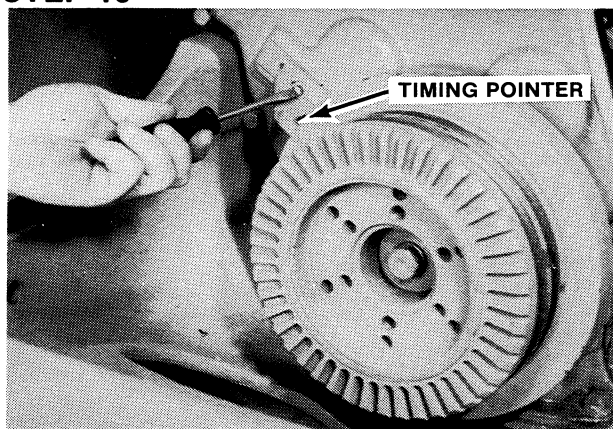
Replace the key if the key shows damage.

STEP 15

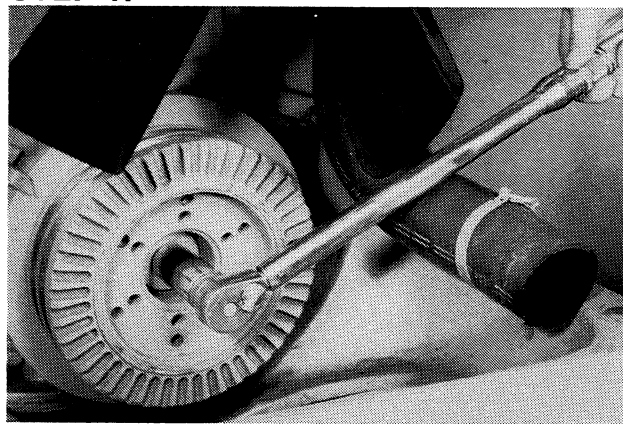


Install the pulley to the crankshaft. Install the bolt, lockwasher and retaining washer.

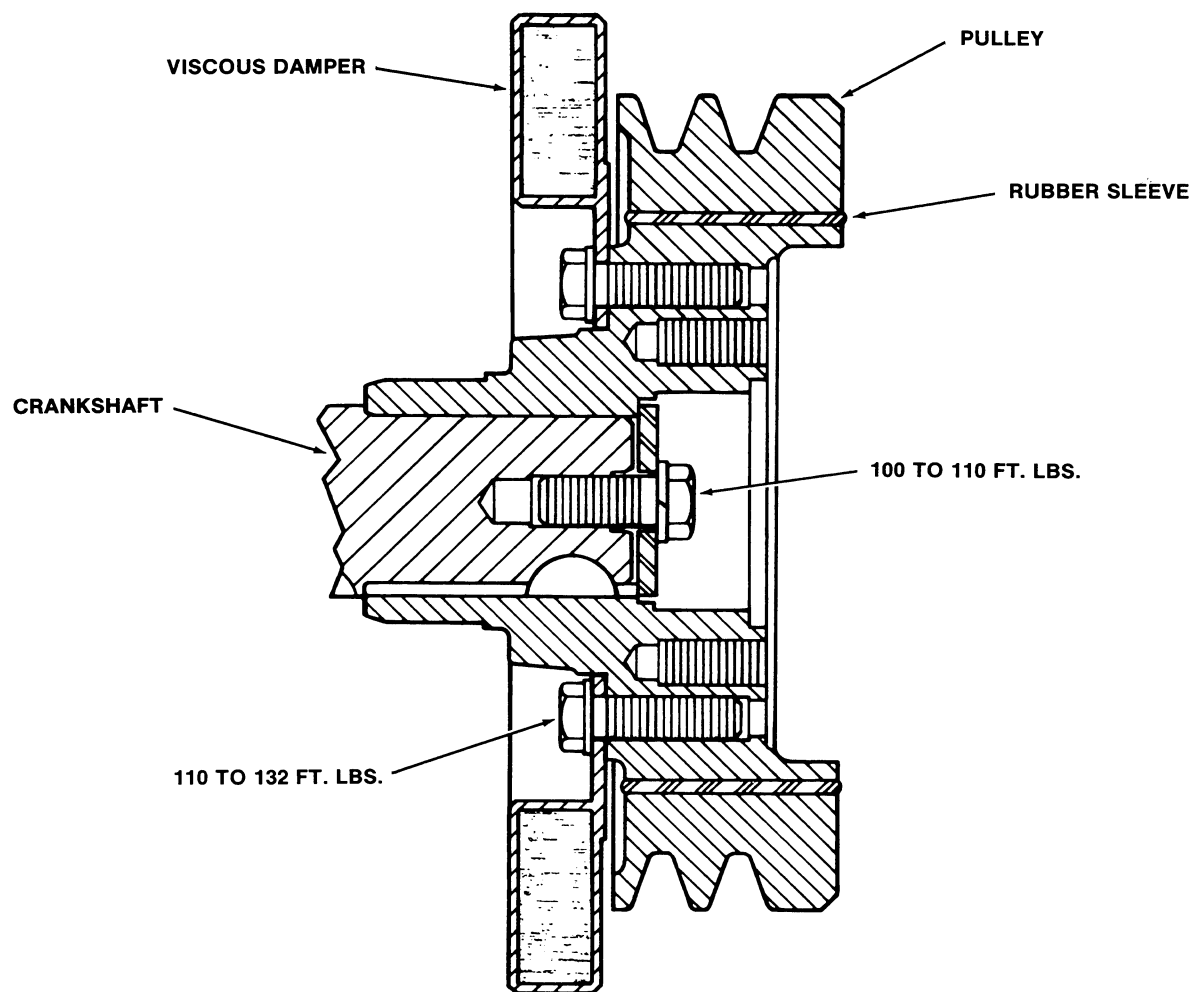
NOTE: The hub side of the pulley must be put against the engine. Align the crankshaft key with the slot in the pulley.

STEP 16

Install the timing pointer.

STEP 17

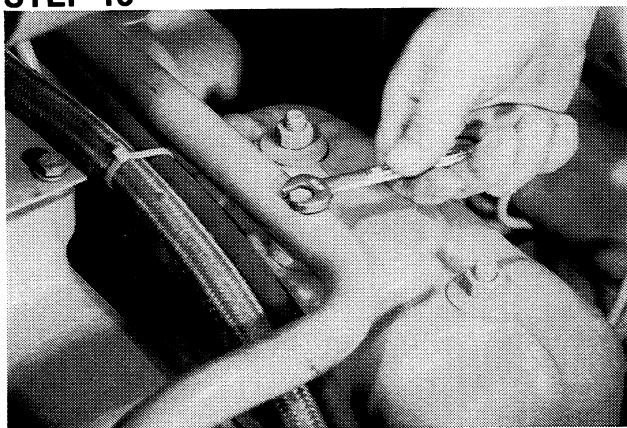
Tighten the bolt to a torque of 100 to 110 ft. lbs.
(136 to 149 Nm)(13.6 to 14.9 kgm).



Checking Top Dead Center

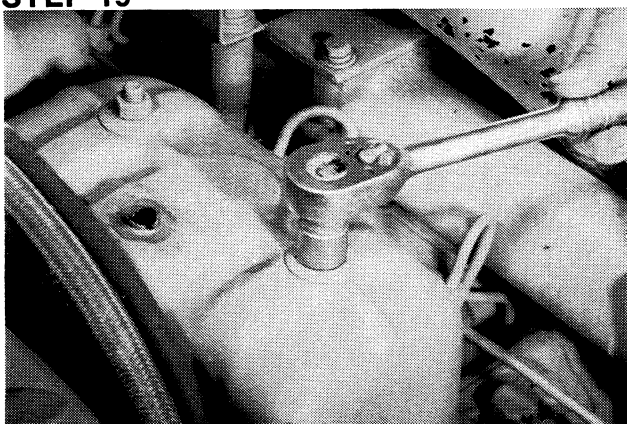
IMPORTANT: Before checking top dead center, check the alignment marks on the pulley, see Step 1.

STEP 18



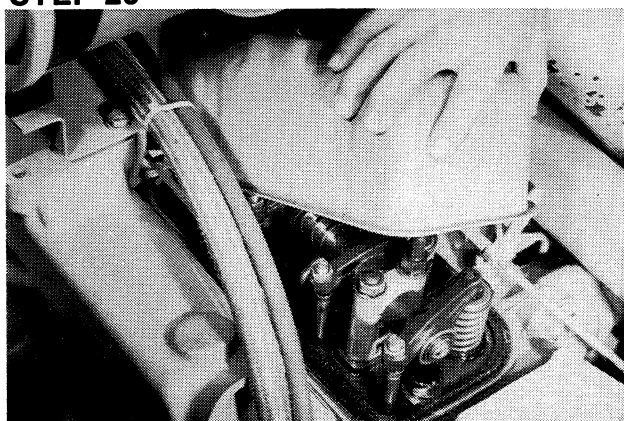
Remove the breather tube.

STEP 19



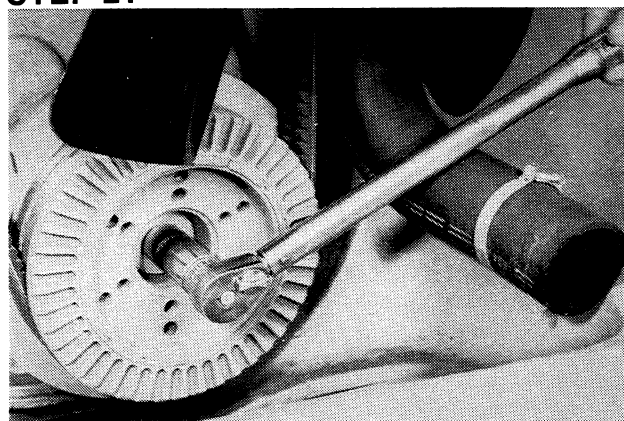
Remove the nuts, washers and rubber gaskets from the front valve cover.

STEP 20

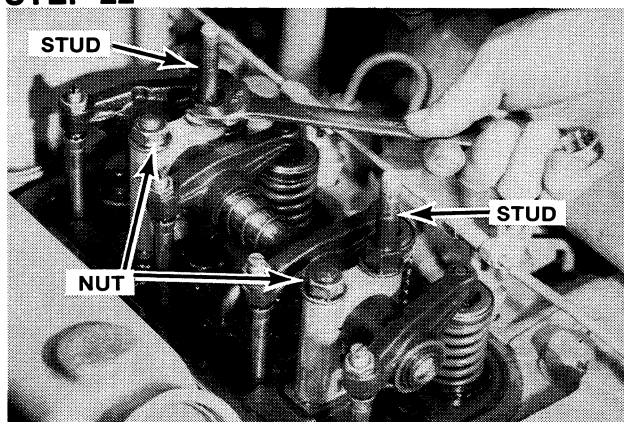


Remove the front valve cover.

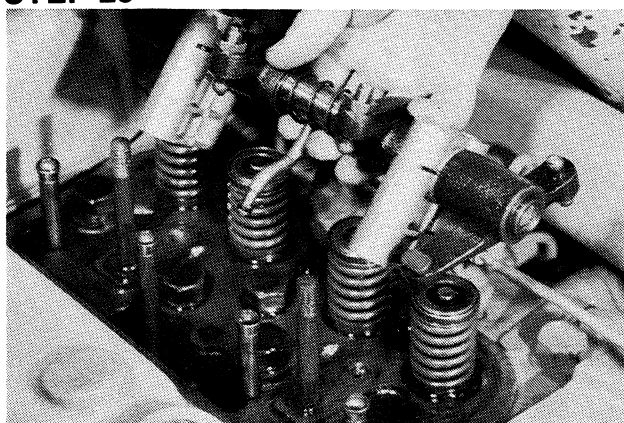
STEP 21



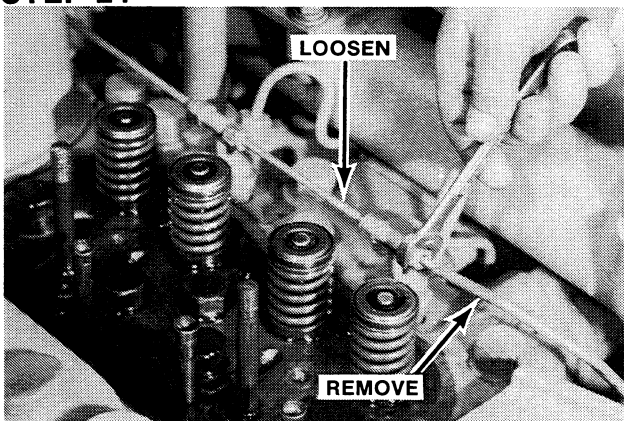
Turn the engine over until the Top Dead Center mark on the crankshaft pulley is aligned with the timing pointer.

STEP 22

Remove the rocker arm retaining studs, nuts and washers.

STEP 23

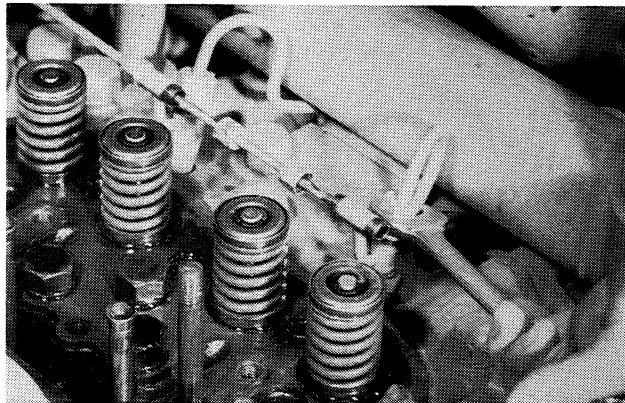
Remove the rocker arm assembly.

STEP 24

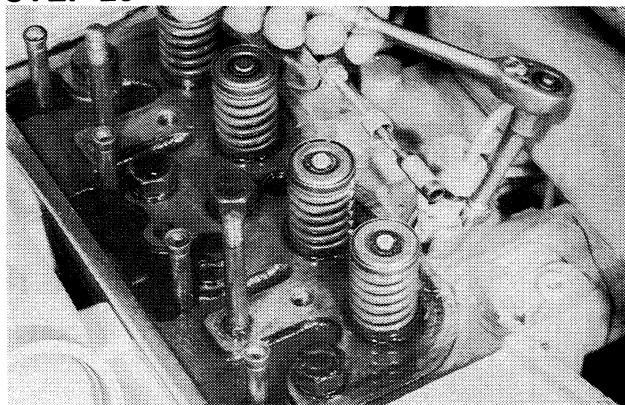
Remove the leak off line from the Number One fuel injection nozzle to the fuel pump. Loosen the leak off line between the Number One and the Number Two fuel injection nozzles.

NOTE: Removal of fuel lines will prevent damage to the lines when removing the exhaust valve spring.

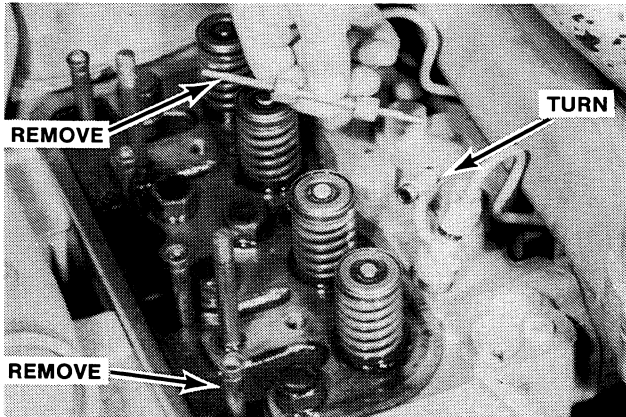
Rac 8-20120

STEP 25

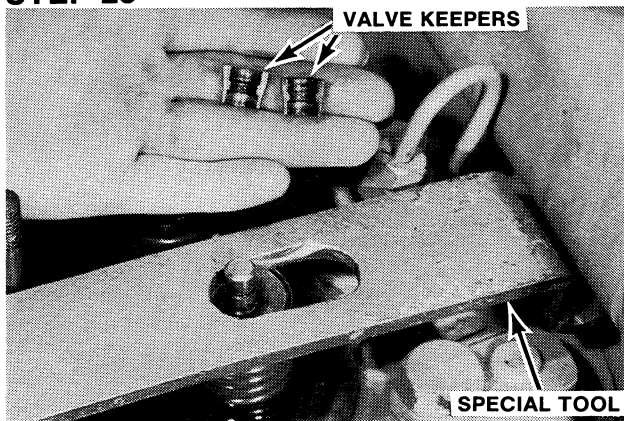
Loosen the Number One nozzle fuel line.

STEP 26

Loosen the retaining nut of the Number One nozzle using a 7/8" crow's foot wrench (Snap-On Tool Part Number AN-8508-14, flared nut type or AN-8506-8, open end type) with an extension and ratchet wrench.

STEP 27

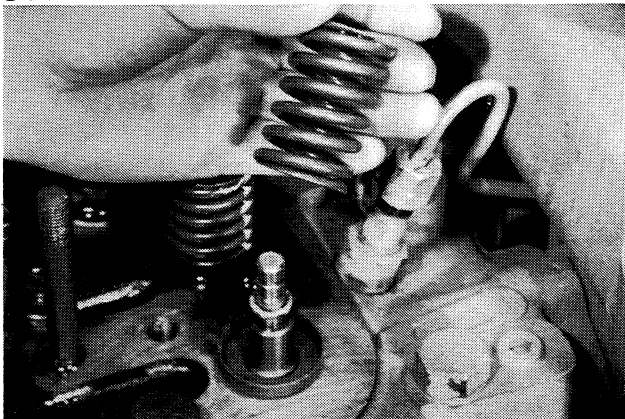
Remove the leak off line and turn the fuel injector nozzle towards the rear of the engine. Remove the Number One cylinder exhaust push rod.

STEP 28

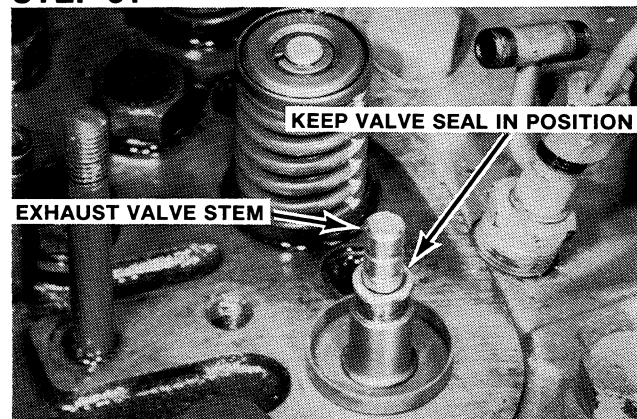
Push down the exhaust valve spring on the Number One cylinder, using a special tool and remove the valve keepers. See Page 3 for making this tool.

STEP 29

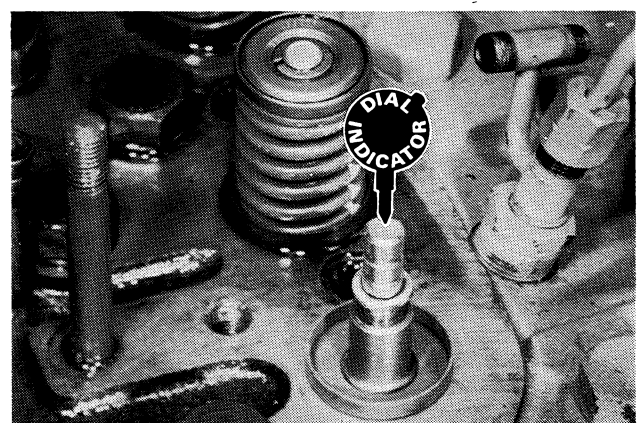
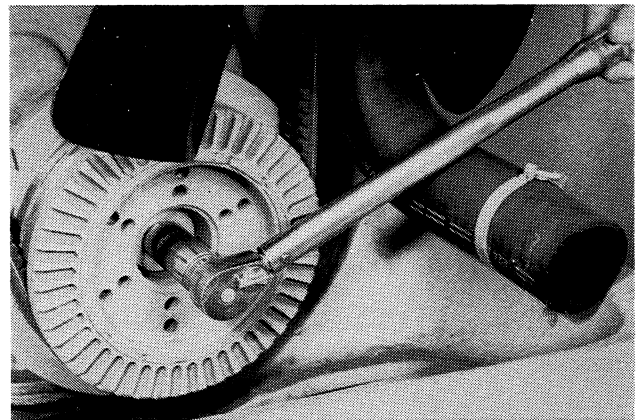
Remove the exhaust valve rotator.

STEP 30

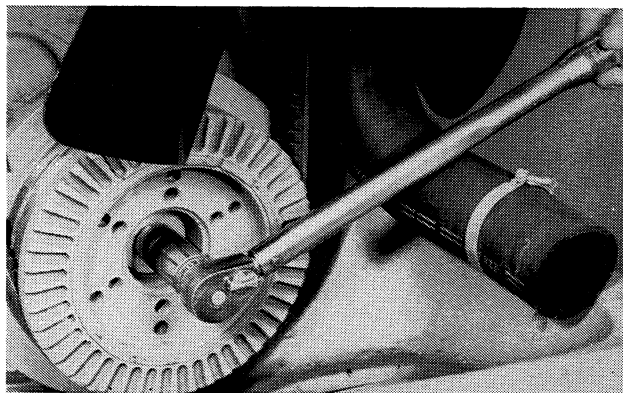
Remove the exhaust valve spring.

STEP 31

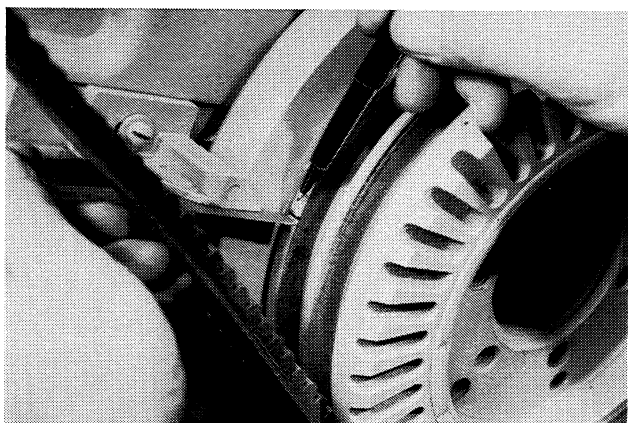
Keep the valve seal in position to prevent the valve from falling through the valve guide if the piston is moved too far. Install a dial indicator on the end of the valve stem with the valve setting on top of the piston.

STEP 32

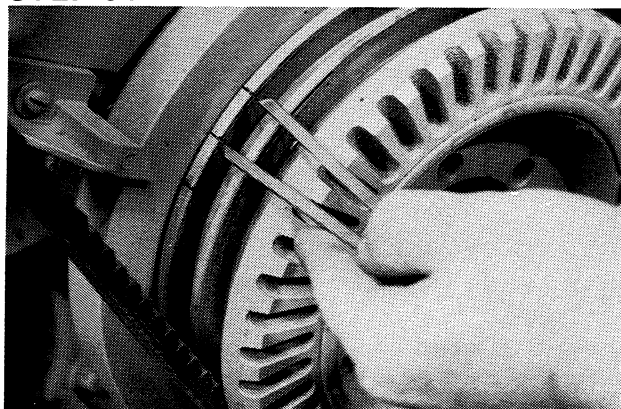
Turn the engine over clockwise until the dial indicator hand stops moving. Reset the indicator to zero.

STEP 33

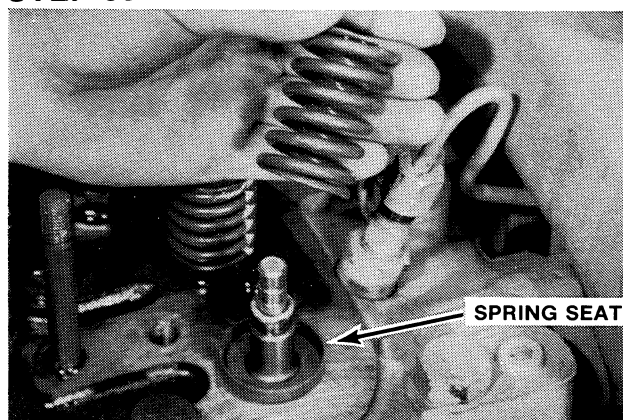
Turn the engine over clockwise, approximately 5 degrees until 0.010" (0.254 mm) shows on the dial. Put a mark on the crankshaft pulley in line with the timing pointer.



Turn the engine over counterclockwise past the zero mark on the indicator until 0.010" (0.254 mm) shows on the dial. Again, put a mark on the crankshaft pulley.

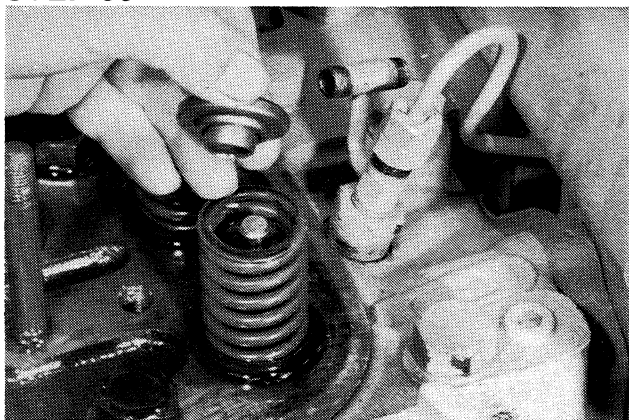
STEP 34

Half the distance between the two marks on the crankshaft pulley will be the Top Dead Center mark. If the marks are not the same as the original marks on the pulley, check the damper pulley for alignment marks as in Step 1.

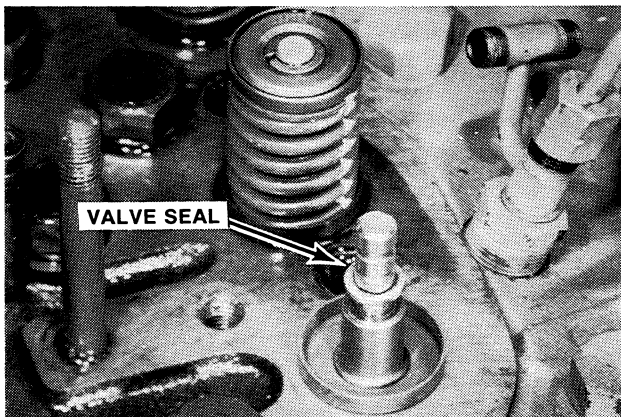
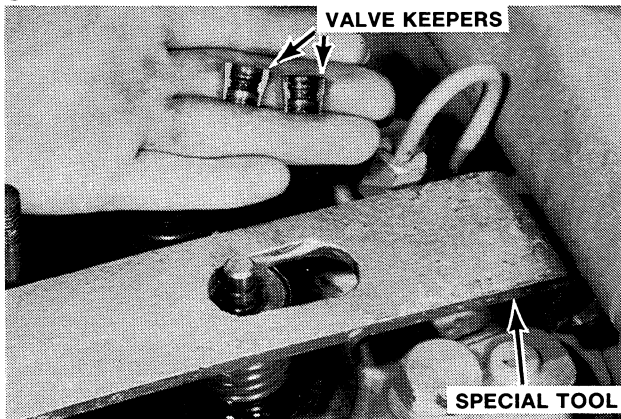
STEP 35

Turn the engine over to TDC and install the valve spring in the spring seat.

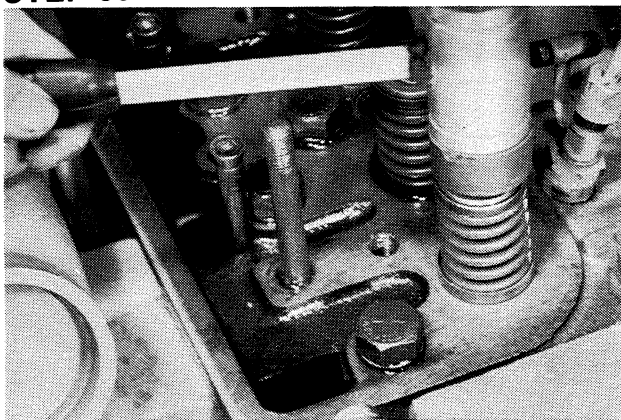
NOTE: Install either end of the spring against the spring seat because both ends of the spring are closed.

STEP 36

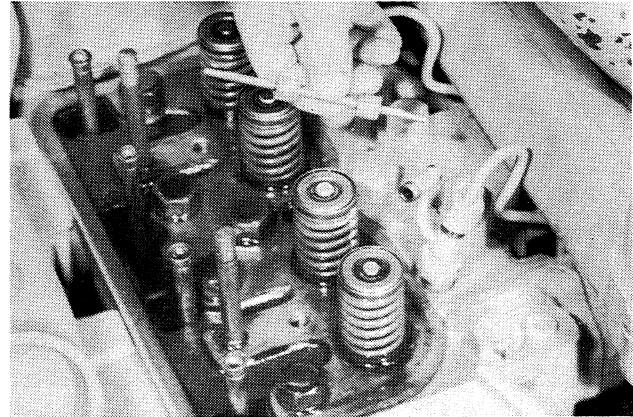
Install the valve rotator (flat side up).

STEP 37

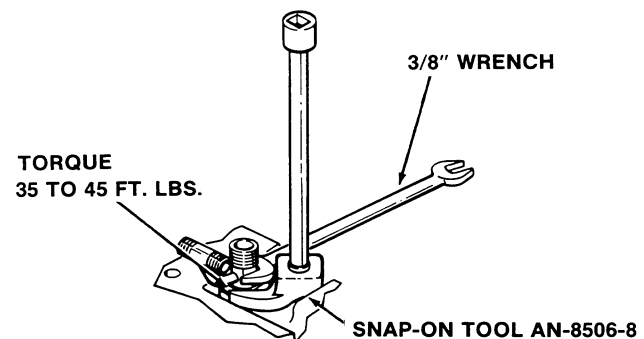
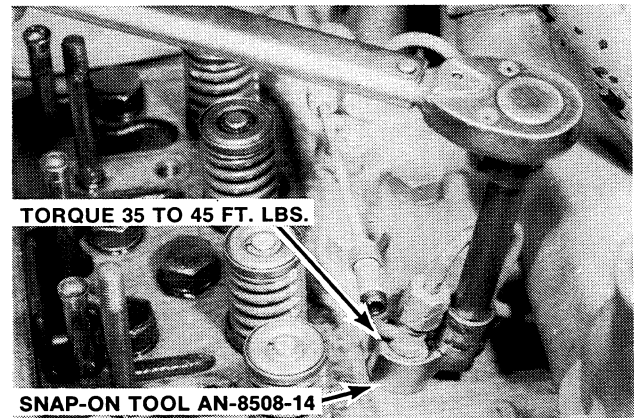
Push down the valve spring using a special tool. Install a new valve seal in the lower valve stem groove. Install the valve keepers (narrow end down) in the upper valve stem groove.

STEP 38

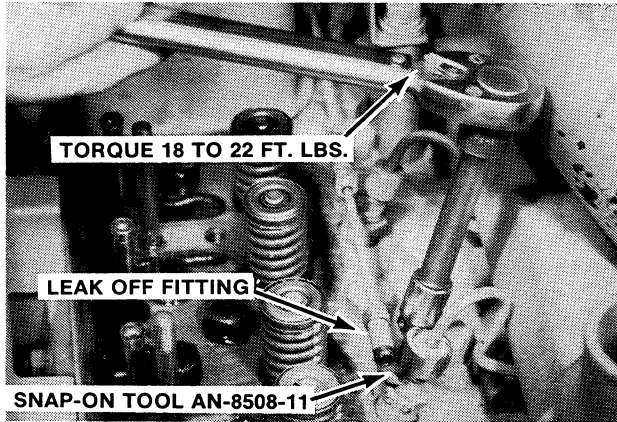
Remove the spring compressor tool. Lightly hit the end of the valve stem to seat the keepers.

STEP 39

Install the Number One Cylinder exhaust push rod. Install the leak off line, loosely, between the Number One and the Number Two fuel injection nozzles, to put the injector in alignment with the other injectors.

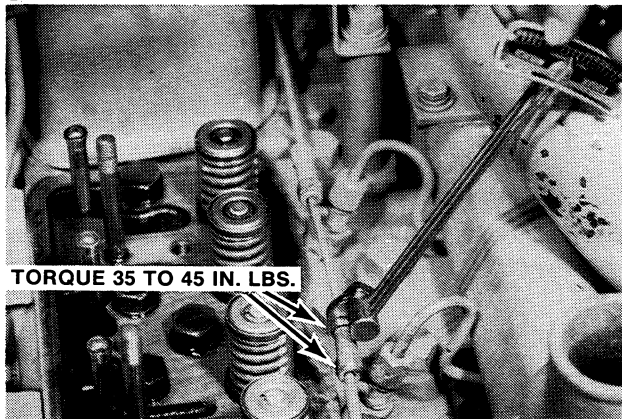
STEP 40

Use a 3/8" open end wrench on the flats of the injector body to hold the injector in alignment with the other injectors. Tighten the injector retaining nut to a torque of 35 to 45 ft. lbs. (48 to 61 Nm) (4.8 to 6.1 kgm), using a 7/8" crowsfoot wrench (Snap-On Tool Part Number AN-8508-14, Flared Nut Type) or (Snap-On Tool Part Number AN-8506-8, Open End Type).

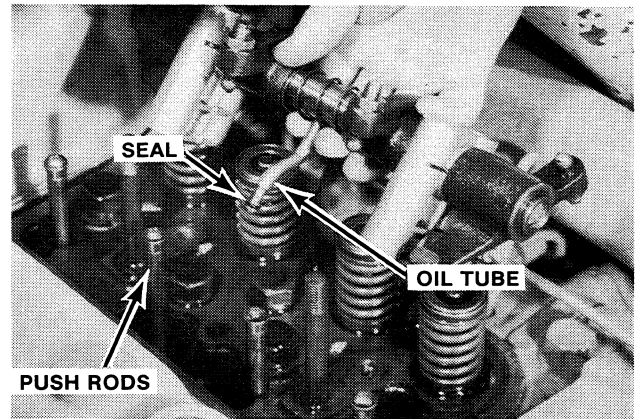
STEP 41

Connect the inlet fitting to the fuel injector. Tighten to a torque of 18 to 22 ft. lbs. (24 to 30 Nm) (2.4 to 3.0 kgm), using a 11/16" crowfoot wrench (Snap-On Tool Part Number AN-8508-11).

IMPORTANT: Be careful not to hit the injector leak off fitting with the wrench. Leakage in the fittings can result.

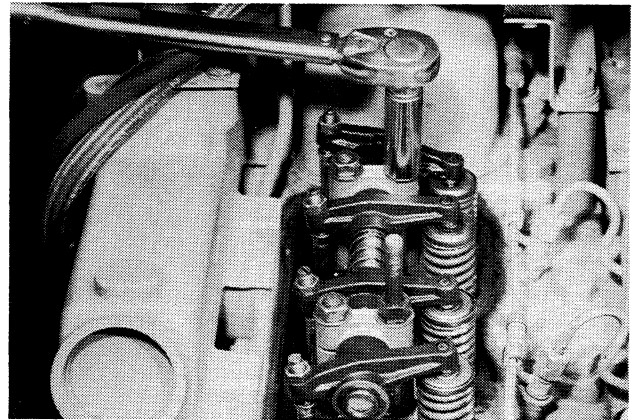
STEP 42

Install the leak off line from the Number One fuel injection nozzle to the fuel pump. Tighten the leak off line nuts to a torque of 35 to 45 in. lbs. (4 to 5 Nm) (0.4 to 0.5 kgm).

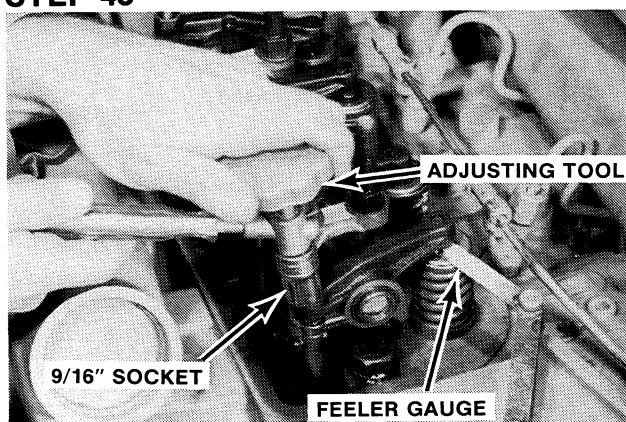
STEP 43

Install the rocker arm assembly. Check the seal to make sure seal is not damaged.

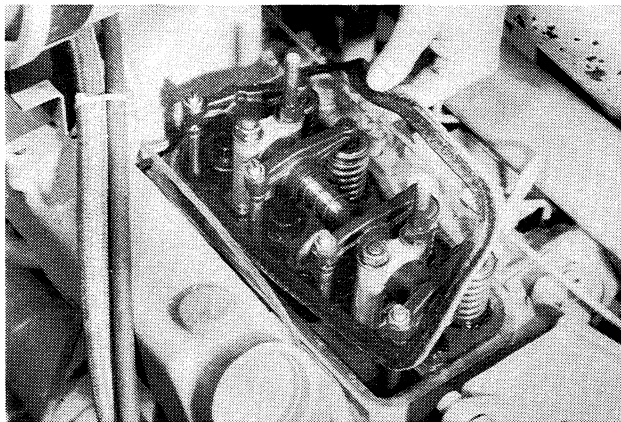
IMPORTANT: Make sure that the seal is on the oil tube and that the oil tube is facing towards the push rods.

STEP 44

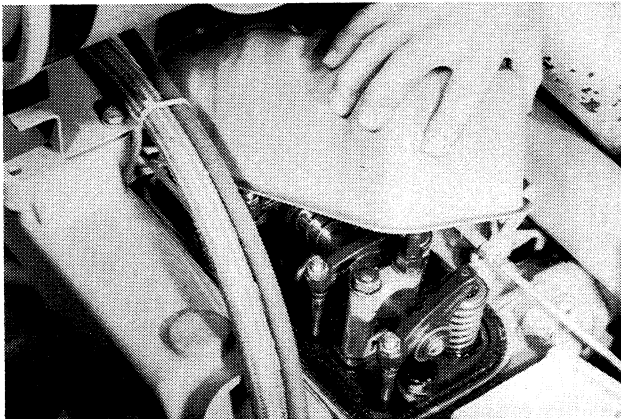
Install the rocker arm retaining studs, nuts and washers. Tighten the studs and nuts to a torque of 40 to 45 ft. lbs. (54 to 61 Nm) (5.4 to 6.1 kgm).

STEP 45

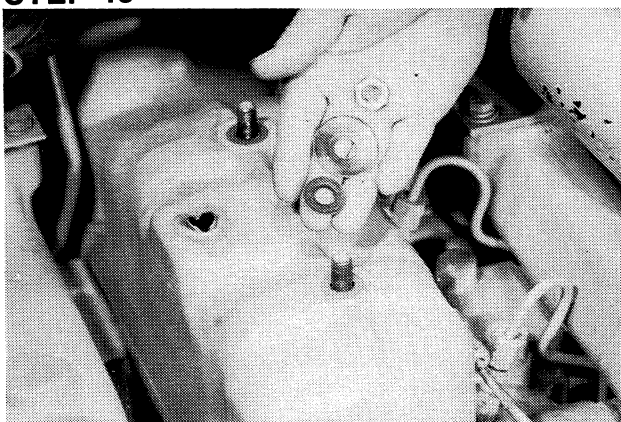
Turn the engine over two revolutions to seat the push rod. Then, adjust the valve clearance on No. 1 and No. 2 cylinders, see Steps 55 through 58.

STEP 46

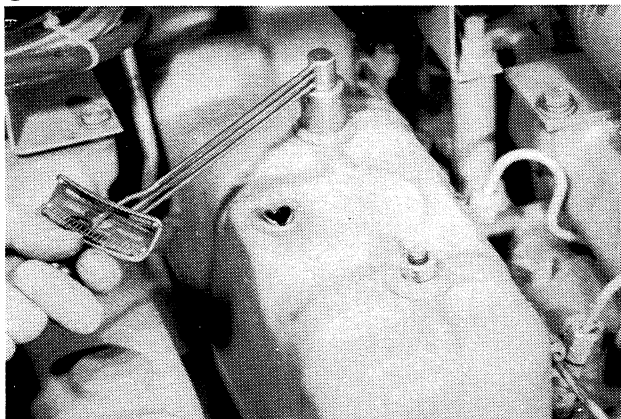
Install a new valve cover gasket.

STEP 47

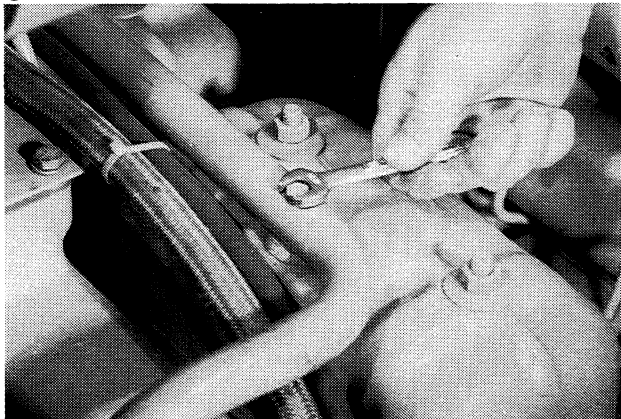
Install the valve cover.

STEP 48

Install the valve cover seals, washers and nuts.

STEP 49

Tighten the nuts to a torque of 8 to 10 ft. lbs. (11 to 14 Nm) (1.1 to 1.4 kgm).

STEP 50

Install the breather tube and gaskets.



Suggest:

If the above button click is invalid.

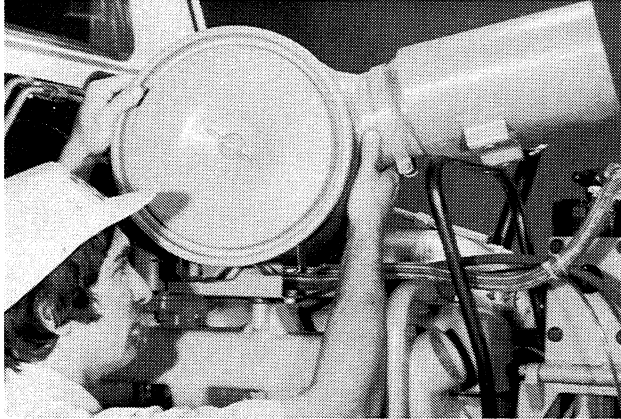
Please download this document first, and then click the above link to download the complete manual.

Thank you so much for reading

Adjusting The Rocker Arm To Valve Clearance

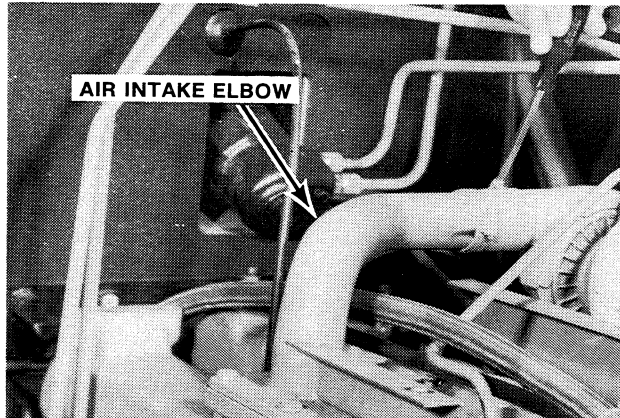
IMPORTANT: Valve clearance adjustments must be made when the engine is not running.

STEP 51



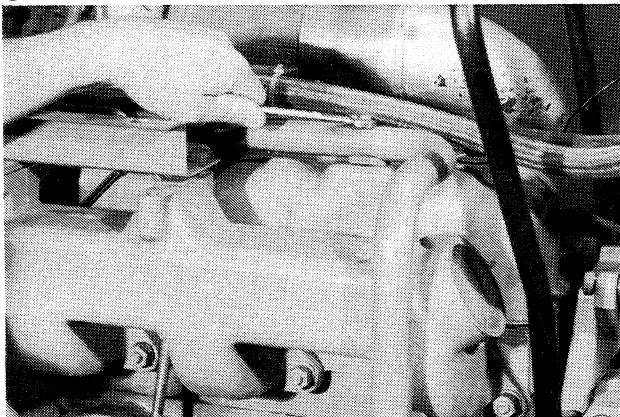
Remove the air cleaner system. See Section 2275 or 2375 in this Service Manual for removal.

STEP 52



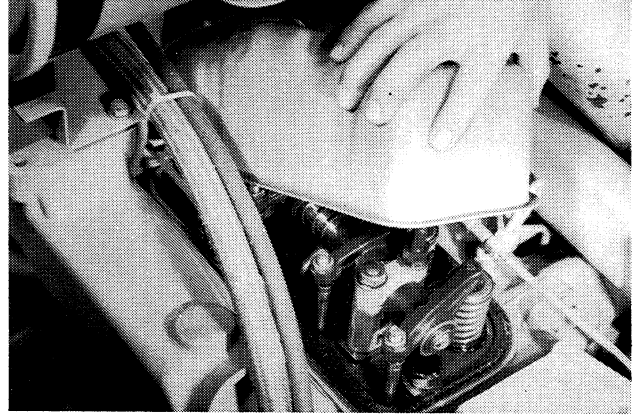
Remove the turbocharger air intake elbow, if equipped and cover the air inlet with a clean cloth..

STEP 53



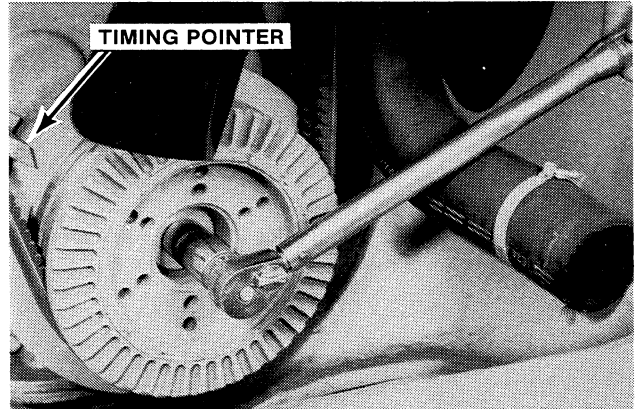
Remove the breather tube.

STEP 54



Remove the cylinder head covers.

STEP 55



Turn the engine over until the timing pointer is aligned with the Top Dead Center timing mark on the crankshaft pulley.

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