TABLE OF CONTENTS
380B Tractor

* New Sections
** Revised Sections

CASE CORPORATION

Don 8-58601

Printed in England
November, 1987

Reprinted

* New Sections
** Revised Sections

Section 1000

GENERAL SPECIFICATIONS

85 Series Tractors

CASE CORPORATION

Pub 8-57670

Printed in England
December, 1987

SERIAL NUMBERS

Compiled in this manual are the operating and maintenance instructions for the 85 Series Agricultural Tractors

When in need of service parts always quote the tractor, transmission unit, and engine serial numbers, including prefix and suffix letters.

If information is required that is not available in this manual see the nearest authorized Case Dealer.

Transmission Serial Number

EXAMPLE: 293805 BTY

The suffix letters, BTY denote the build of the unit.

The first letter denotes the type of drive train, B = fast speed transmission,
A or D = slow speed transmission.

The second letter denotes the bevel gear ratio,
T = 11:52, S = 14:51 and R = 12:53.

The third letter denotes the operating speeds for the PTO and the number of splines on the upper and lower shafts as shown below.

U	=	555 r/min	6 splines upper shaft
V	=	1000 r/min	6 splines lower shaft
W	=	580 r/min	6 splines upper shaft
X	=	606 r/min	6 splines upper shaft
Y	=	611 r/min	6 splines upper shaft
Z	=	614 r/min	6 splines upper shaft

V denotes that only the lower PTO shaft is fitted, as for compressor drive. When applicable, dual speed installations are indicated by a fourth suffix letter D.

GENERAL SPECIFICATIONS

Specifications for each machine are under individual headings which follow these GENERAL SPECIFICATIONS.

Capacities

Fuel Tanks	UK Value	U.S. Value	Metric Value
XL Tractors	24 6 gal	29.6 gal	112 litres
Non XL Tractors	17 gal	20.3 gal	77 litre
2WD Transmission	7.5 gal	8.9 gal	34 litre
MFD Transmissions	8 gal	9.6 gal	36.5 ltre

NOTE: *These capacities are only a guide to the quantities. Always use the dipstick or level plug to make sure that units are filled to the correct level.*

Electrical System

Type of System . . . . . 12 Volt, Negative ground

Battery (Rating IEC/BS)

Standard — Reserve Capacity . . . . . 170 minute
Cold Cranking Amperes . . . . . 420 ampere

Heavy Duty — Reserve Capacity . . . . . 170 minute
Cold Cranking Amperes . . . . . 510 ampere

Heavy Duty Plus — Reserve Capacity . . . . . 220 minute
Cold Cranking Amperes . . . . . 510 ampere

Alternators

XL Tractors . . . . . 65 amp
Non XL Tractors . . . . . 45 amp
North America with Simms Cab . . . . . 75 amp

XL Tractors

Head Lamps (2) . . . . . 12 Volt, 37.5/60 watt sealed beam or 40/45 watt British prefocus cap (export)
Side Lamps (2) . . . . . 12 Volt,10 watt small bayonet cap
Stop Lamps (2) . . . . . .12 Volt, 21 watt small bayonet cap
Tail Lamps (2) . . . . . 12 Volt, 10 watt small bayonet cap
Work Lamps . . . . . 12 Volt, 55 watt Halogen
Registration Number Plate Lamp . . . . . .12 Volt, 10 watt small bayonet cap
Direction Indicator Lamps (2) . . . . . 12 Volt, 21 watt small bayonet cap
Instrument Warning Lamps . . . . . 12 Volt, 1.2 watt capless wedge
Tachometer Lamp . . . . . 12 Volt, 3 watt capless wedge
Speedometer Lamp . . . . . 12 Volt, 3 watt capless wedge
Speed Decal Lamp . . . . . 12 Volt, 1.5 watt capless wedge

Non XL Tractors

Head Lamps . . . . . 12 Volt, 37.5/60 watt sealed beam 40/45 watt British prefocus cap (export)
Side Lamps (2) . . . . . 12 Volt, 5 watt festoon
Stop/Tail Lamps (2) . . . . . 12 Volt, 21/5 watt small bayonet cap
Work Lamp . . . . . 12 Volt, 35 watt sealed beam
Direction Indicator Lamps (2) . . . . . 12 Volt, 21 watt small bayonet cap
Registration Number Plate Lamp . . . . . 12 Volt, 5 watt miniture center contact
Instrument Warning Lamps . . . . . 12 Volt, 3 watt capless wedge
Tachometer Lamp . . . . . 12 Volt, 3 watt capless wedge
Speedometer Lamp . . . . . 12 Volt, 3 watt capless wedge
Panel Lamp . . . . . .12 Volt, 5 watt festoon

Pistons and Rods

Rings Per Piston 3
Compression Rings Per Piston 2
Oil Rings Per Piston 1
Type of Piston Pin ..... Full Float
Type of Bearings ..... Replacement Bearings Available Steel Back with Copper and Lead Liners

Main Bearings

Tractors 385 and 485 3
Tractors 585 685 and 885 5
Type of Bearings ..... Replacement Bearings Available Steel Back with Copper and Lead Liners

Engine Lubrication System

Type of System ..... Pressure Spray
Oil Pump ..... Gear Type
Oil Filter ..... Full Flow, Turn on Type, Bypass

Fuel System

Fuel Injection Pump ..... Robert Bosch Type CR
Fuel Transport Pump ..... None
Governor ..... Variable Speed, Part of the Fuel Injection Pump
First Stage Fuel Filter ..... Full Flow Element Type or Turn on Type
Second Stage Fuel Filter ..... Full Flow Element Type or Turn on Type
Water Trap and Drain for the Fuel Tank ..... Location is in the Bottom of the Fuel Filters
Fuel Gauge ..... Location is On the Instrument Panel
Fuel Level Gauge ..... Location is on the Instrument Panel
Fuel Strainer ..... None

Air Intake System

Type ..... Dry Type Air Induction System, Two Stage, with Dust Unloader

Cooling System

Type ..... Pressure System, Thermostat Controlled Bypass, Impeller Type Pump
Radiator ..... Fin and Tube Type
Thermostat ..... Starts to Open at Approximately 180 Degrees F (82 Degrees C) Fully Open at 203 Degrees F (94 Degrees C)
PressureCap ..... 9 to 12 PSI (62 to 82 kPa)
Water Level Monitor ..... None
Water Temperature Gauge ..... Location is on the Instrument Panel

Tractor Brakes

Type ..... Wet, Hydraulic, Self-Adjusting, Single Disc

Clutch

Type ..... Hydraulic Operated, Self Adjusting (XL only), Single Dry Plate

		U.S Value	Metric Value
Plate Diameter	385, 485 and 585	11 in	280 mm
	685 and 885	12 in	305 mm

Transmissions

BASIC

Type ..... 4 Speed Synchromesh with High/Low Ranges and Reverse

Number of Gears ..... 8 Forward, 4 Reverse

Controls ..... 2 Levers

OPTIONAL (Not 885/885XL)

Type ..... Forward/Reverse
Same as Synchromesh, plus a Hydraulically Operated Forward and an Increased Speed Reverse

Number of Gears ..... 8 Forward, 8 Reverse

Controls ..... 3 Levers

OPTIONAL

Type ..... 2 Speed Power Shift
Same as Synchromesh, Plus Hydraulically Operated Speed Decrease in all Gears

Number of Gears ..... 16 Forward, 8 Reverse

Controls ..... 2 Levers and an Electrical Switch

Foot Brakes

Type ..... Hydraulic, Self Adjusting, Oil Cooled Discs

	U.S Value	Metric Value
Disc Diameter	10 in	254 mm

Hydraulic System

Type ..... Independent, with Fully Live Hydraulic Pump in the Transmission

Operating Pressure ..... 175 kg/cm^2 (2500 lb/in^2)

Steering

Type ..... Hydrostatic

Turning Radius with Brake Assistance:	2WD 132 in	3352 mm
(with MFD engaged)	MFD 146 in	3708 mm
Turning Radius without Brake Assistance:	2WD 151 in	3835 mm
(with MFD engaged)	MFD 171 in	343 mm

Differential Lock

Type ..... Mechanical Actuated by the Operators Right Foot

Hitch system

Type of Sensing ..... Upper Link

Type of Control ..... Hand Lever

Type of Valve ..... Four-Position, Hold, Lift, Lower, and Float

Type of Draft Arms ..... Rigid, Swing Type, Manual Float Adjuster

Type of Hitch
385and 485 ..... Three Point, Catergory one and Two
585, 685 and 885 ..... Three Point, Category Two

Quick Hitch Coupler (Available)

Section 2215

CYLINDER HEAD, VALVES and ROCKER ARM

3 Cylinder Engine

85 Series Tractors

CASE CORPORATION

Pub 8-57110

Printed in England
December, 1986

TABLE OF CONTENTS

WARNING: *This safety symbol is used in this manual to indicate important safety messages.*
When you see this symbol, read the message carefully. It is shown when possible injury or death can be caused.

SPECIFICATIONS

	U.S. Value	Metric Value
Cylinder Head Maximum Warpage	0.0047 inch	0.12 mm
Cylinder Head Height		
Standard	3.8902 inch to 3.9098 inch	98.81 to 99.31 mm
Minimum	3.8795 inch	98.54 mm
NOTE: *The maximum amount of material that can be removed is 0.030 inch (0.77 mm)*		
Intake Valve Stem Diameter	0.3912 to 0.3915 inch	9.935 to 9.945 mm
Exhaust Valve Stem Diameter	0.3920 to 0.3924 inch	9.995 to 9.965 mm
Maximum Stem Clearance in Guide Before Reconditioning	0.006 inch	0.15 mm
Valve Clearances (Engine Warm)	0.012 inch	0.30 mm
Valve Seat Angle	45°	45°
Distance of Cylinder Head Face to Valve Face		
Intake	0.04 to 0.05 inch	1.00 to 1.40 mm
Exhaust	0.047 to 0.06 inch	1.20 to 1.60 mm
Valve guides		
Outside Diameter	0.6323 to 0.6330 inch	16.060 to 16.078 mm
Inside Diameter	0.3883 to 0.3893 inch	9.865 to 9.901 mm
Inside Diameter (Reamed)	0.3940 to 0.3945 inch	10.00 to 10.02 mm
Distance from Top of Valve Guide to		
Bottom of Valve Spring Recess	1.102 inch	28.0 mm
Seat Insert Thickness	0.344 inch	8.75 mm
Seat Outside Diameter		
Standard	1.656 to 1.657 inch	42.07 to 42.09 mm
0.006 inch (0.15mm) Oversize	1.662 to 1.663 inch	42.22 to 42.24 mm
0.016 inch (0.40 mm) Oversize	1.672 to 1.673 inch	42.47 to 42 49 mm
Minimum Valve Seat Contact Width	0.059 inch	1.5 mm
Cylinder Head Counterbore Diameter for Valve Seat Insert		
Standard	1.653 to 1.654 inch	42.000 to 42.020 mm
0.006 inch (0.15mm) Oversize	1.659 to 1.660 inch	42.150 to 42.170 mm
0.016 inch (0.40 mm) Oversize	1.669 to 1.670 inch	42.400 to 42.420 mm
Counterbore Depth from Cylinder Head Face	0.482 to 0.484 inch	12.24 to 12 29 mm
Valve Springs		
Free Length	2.125 ± 0.059 inch	54 ± 1.5 mm
Test Length	1.346 inch	34.2 mm
Test Load	145.5 to 158.7 lb	66 to 72 kg
Rocker Arm Shaft Diameter	0.848 to 0.850 inch	21.56 to 21.59 mm
Rocker Arm Bushing Diameter	0.850 to 0.851 inch	21 671 to 21 63 mm
Rocker Shaft Spring		
Free Length	1.484 inch	37.7 mm
Test Length	0.984 inch	25 mm
Test Load	6.614 lb	3 kg

SPECIAL TORQUES

	U.S. Value	Metric Value
Cylinder Head Bolts (Tighten in three stages)		
First Stage	29 lb ft	40 Nm
Second Stage	58 lb ft	80 Nm
Third Stage	101 to 109 lb ft	140 to 150 Nm
Rocker Arm Shaft Bracket Bolts	43.5 to 50.7 lb ft	60 to 70 Nm
Rocker Arm Shaft Bracket Clamping Bolts	7.4 to 8.8 lb ft	10 to 12 Nm
Exhaust Manifold Nuts	25.4 to 29 lb ft	35 to 40 Nm
Injector Nozzle Retaining Bolts	16.6 to 19.5 lb ft	24 to 27 Nm
Injection Pipe Union Nuts	14.5 to 18.1 lb ft	20 to 25 Nm

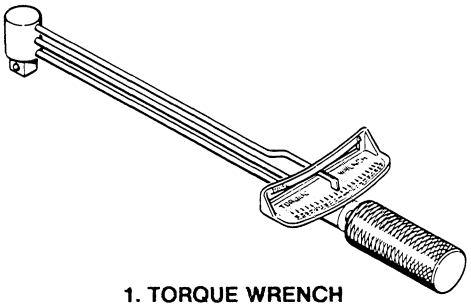
STANDARD TORQUES

STANDARD TORQUE DATA FOR NUTS AND BOLTS

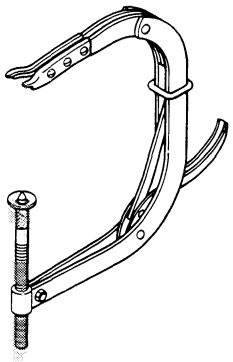
Where no special torque data is specified, the following torque figures should be applied. Threads should be lubricated with engine oil or chassis grease. Apply the minimum figure to bolts that have previously been used.

BOLT		TYPE 5				TYPE 8			
SIZE		MIN		MAX		MIN		MAX	
inch	(mm)	Nm	lb ft	Nm	lb ft	Nm	lb ft	Nm	lb ft
1/4	6	12	9	14	10	22	12	19	14
5/16	8	26	19	28	21	36	27	41	30
3/8	9	45	33	50	37	61	45	68	50
7/16	11	72	53	81	60	102	75	115	85
1/2	13	108	80	122	90	156	115	176	130
9/16	15	156	115	176	130	224	165	251	185
5/8	16	217	160	244	180	298	220	339	250
3/4	19	393	290	434	320	542	400	610	450
7/8	22	569	420	637	470	881	650	990	730
1	25	854	630	963	710	131	970	1478	1090
1-1/8	28	1152	850	1288	950	187	1380	2102	1550
1-1/4	31	1627	1200	1830	1350	263	1940	2956	2180

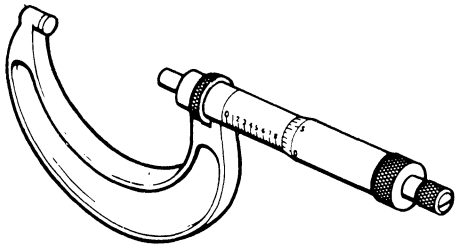
SPECIAL TOOLS



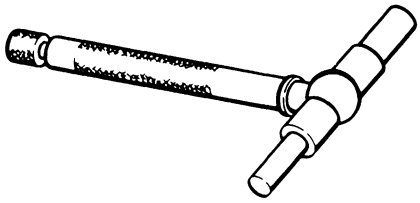
1. TORQUE WRENCH



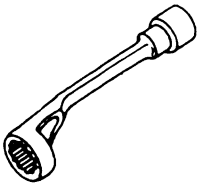
6. VALVE SPRING COMPRESSOR



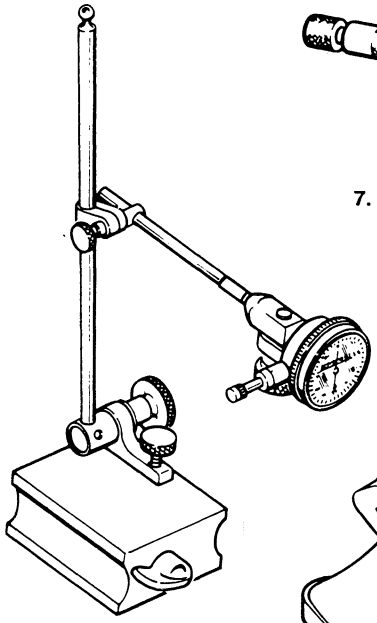
2. MICROMETER



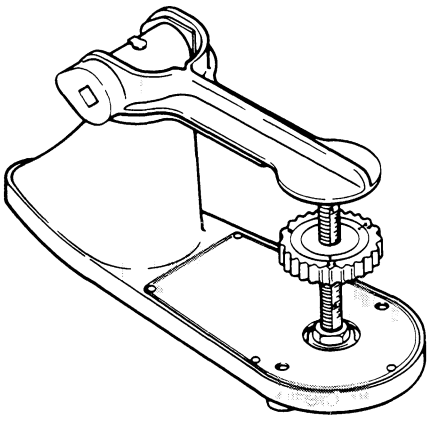
7. BORE GAUGE



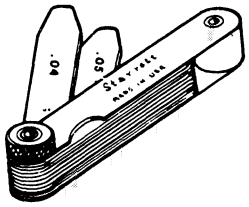
3. CRANKED WRENCH 3055 795 R2



4. DIAL INDICATOR



8. VALVE SPRING TESTER CAS-1357



5. FEELER GAUGES

For the Following Tools, Refer to the Engine Parts Catalog;

9. VALVE SEAT HOUSING REAMER: 3132 359 R1, 0.006 INCH (0.015 MM) OVERSIZE, OR 3132 358 R1, 0.016 INCH (0.400 MM) OVERSIZE
10. VALVE SEAT INSTALLATION DRIFT PUNCH: 3055 698 R1
11. VALVE SEAT CUTTING TOOL: 3132 120 R91
12. 45° ANGLED REAMER (USED WITH 3132 120 R91): 3132 363 R1
13. NOZZLE SLEEVE EXTRACTOR BOLT: PLT-509 (FES-25-12)
14. VALVE GUIDE DRIFT PUNCH: 3055 699 R1
15. EXPANSION PLUG DRIFT PUNCH: 3055 688 R11
16. NOZZLE SLEEVE DRIFT PUNCH: 3055 696 R1
17. SLIDE HAMMER ADAPTOR FOR PLT-509 (FES-25-12): OTC 12-M

CYLINDER HEAD
Removal

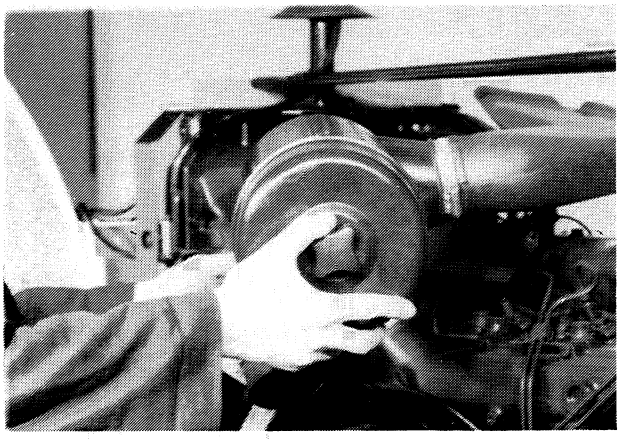
NOTE: *Some illustrations in this section show the engine removed from the tractor. It is not necessary to remove the engine to service the cylinder head and valves.*

WARNING: *If the engine has been running, the exhaust will be hot. Use protective gloves to remove the exhaust.*

STEP 1

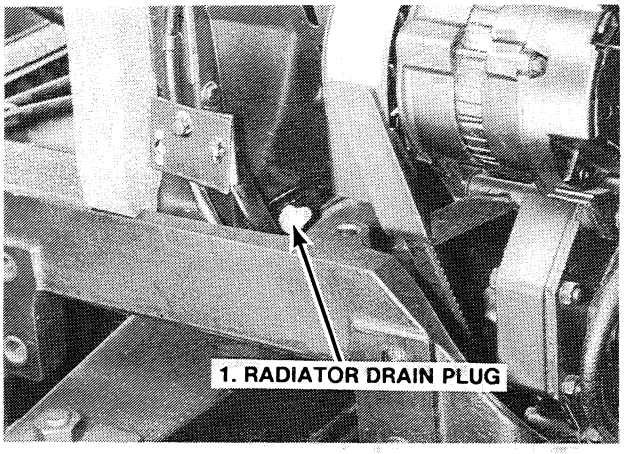
Remove the hood. Refer to Section 9240.

STEP 2



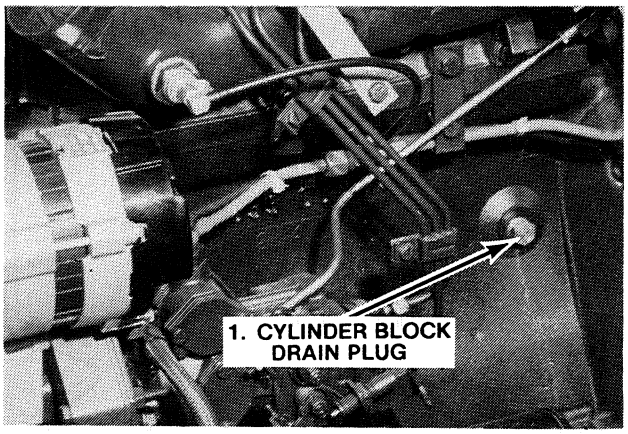
Remove the air cleaner.

STEP 3



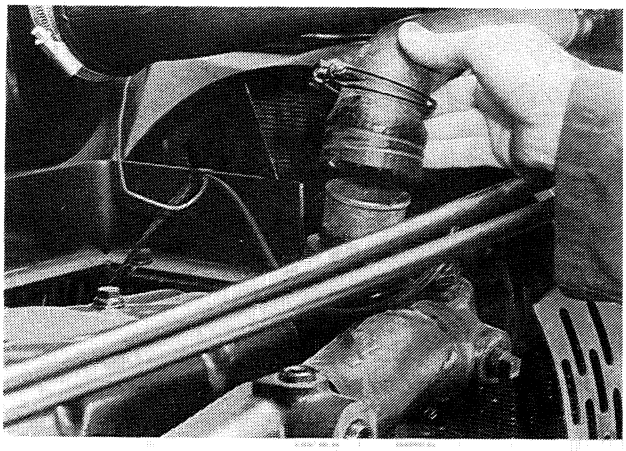
Open the radiator drain valve and drain the cooling system. Close the valve when coolant has drained.

STEP 4



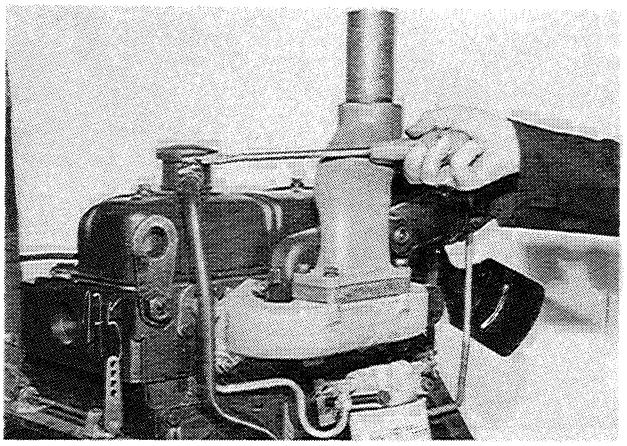
Drain coolant from the cylinder block.

STEP 5



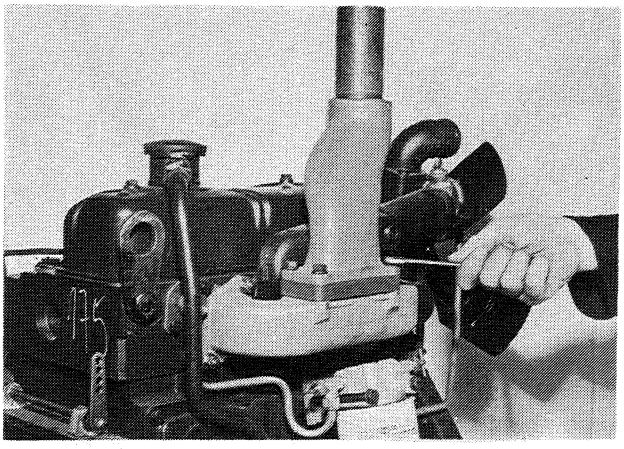
Disconnect the top coolant hose.

STEP 6



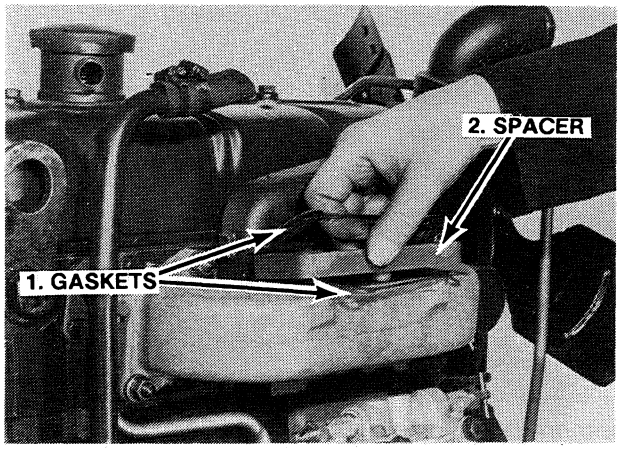
Loosen the breather pipe clip and pull the pipe clear of the rocker arm cover.

STEP 7



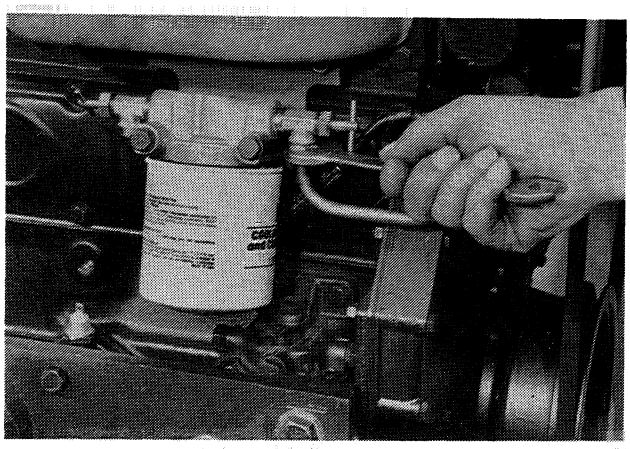
Remove the exhaust elbow.

STEP 8



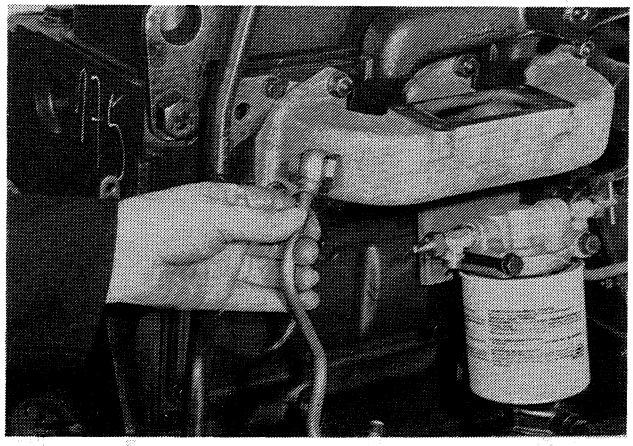
Remove the gasket, spacer and gasket.

STEP 9



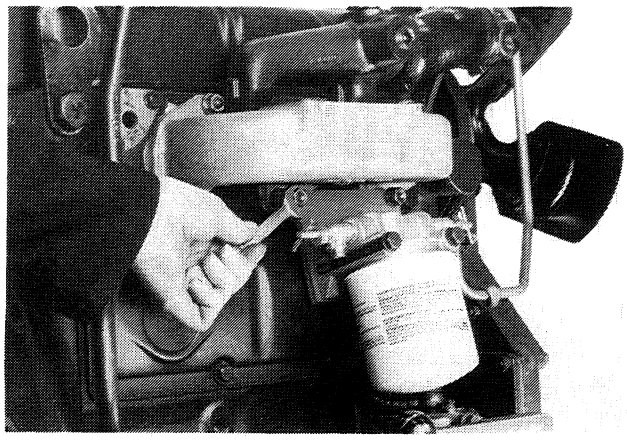
If fitted with a coolant filter/conditioner, disconnect the front pipe.

STEP 10



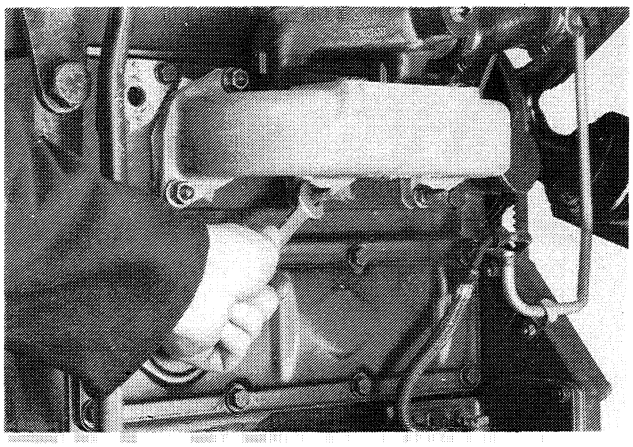
If fitted with a coolant filter/conditioner, remove the rear pipe.

STEP 11



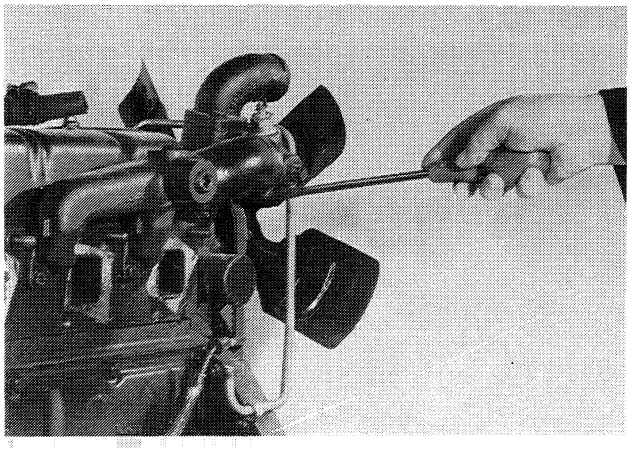
If fitted with a coolant filter/conditioner, remove the filter and its bracket.

STEP 12



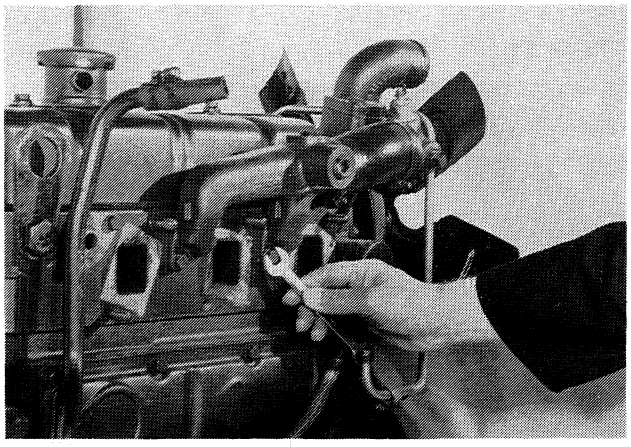
Remove the exhaust manifold and its gaskets.

STEP 13



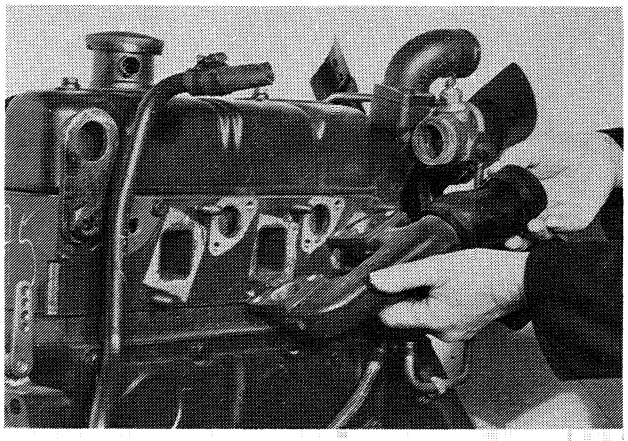
Loosen the coolant manifold hose clip.

STEP 14



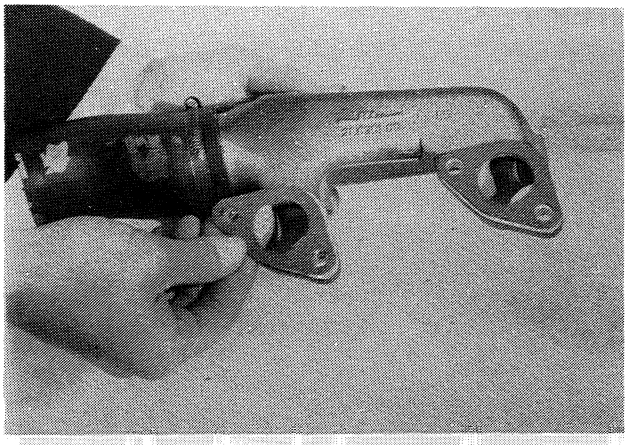
Remove the coolant manifold bolts.

STEP 15



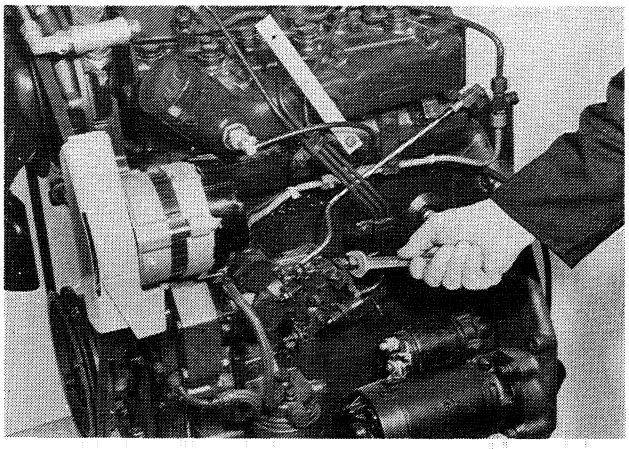
Remove the coolant manifold.

STEP 16



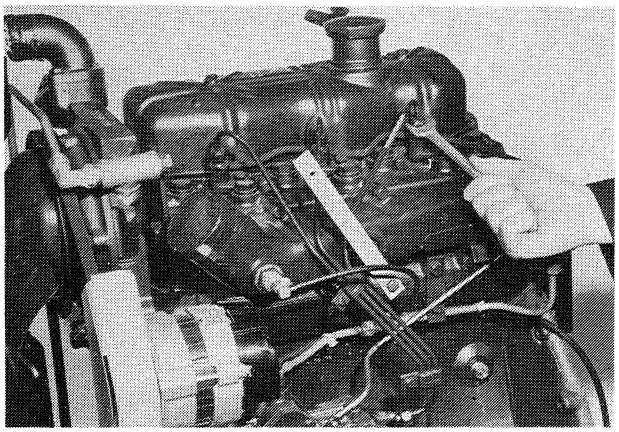
Remove the coolant manifold gaskets.

STEP 17



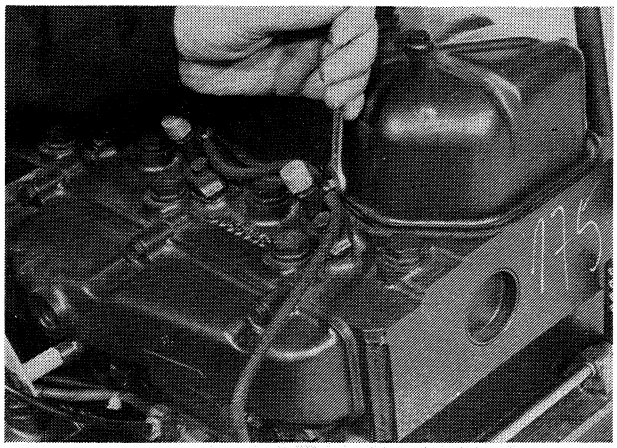
Disconnect the injector pipes at the injection pump.

STEP 18



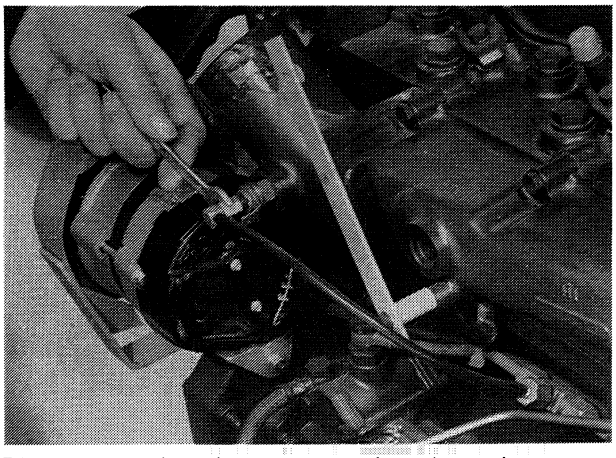
Disconnect the injector pipes at the injectors. Remove the pipes

STEP 19



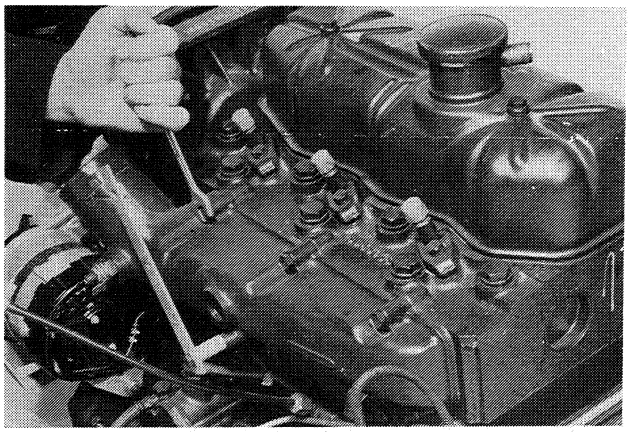
Remove the banjo bolts and two copper washers from the injector back leak unions.

STEP 20



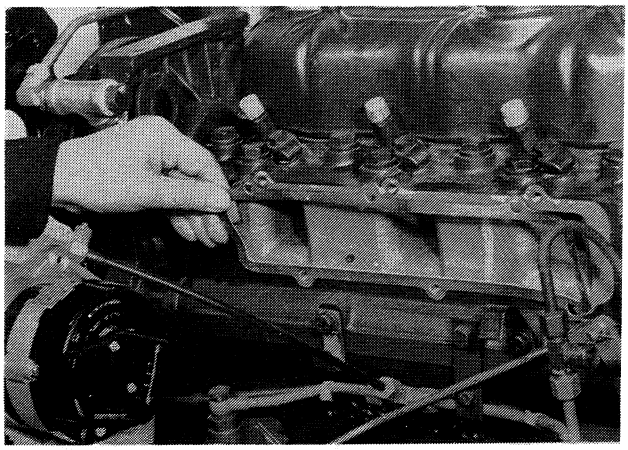
Disconnect the thermostart pipe (or ether start pipe, North America) and the thermostart electrical connection.

STEP 21



Remove the inlet manifold.

STEP 22

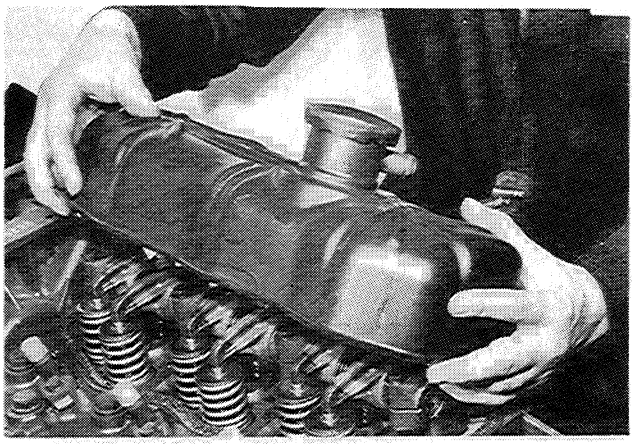


Remove the inlet manifold gasket.

STEP 23

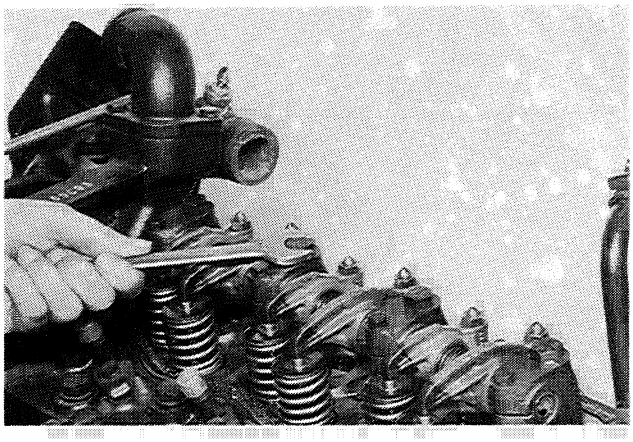
Remove the rocker arm cover bolts.

STEP 24



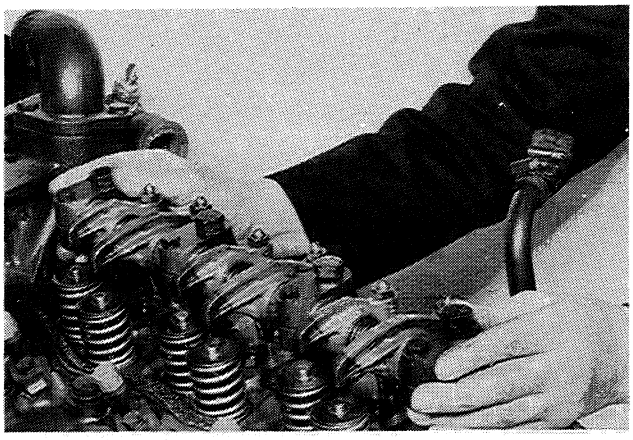
Remove the rocker arm cover.

STEP 25



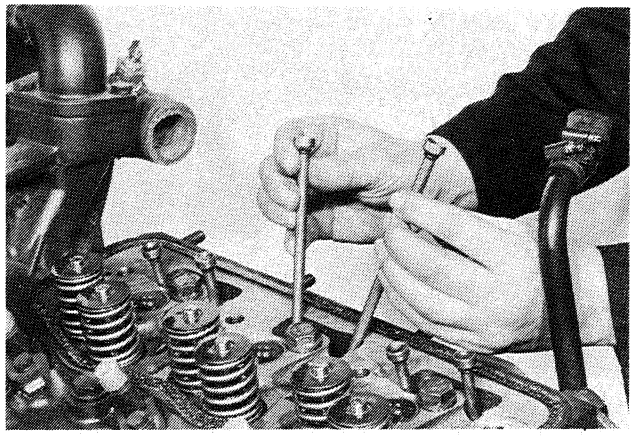
Remove the rocker arm pedestal bolts.

STEP 26



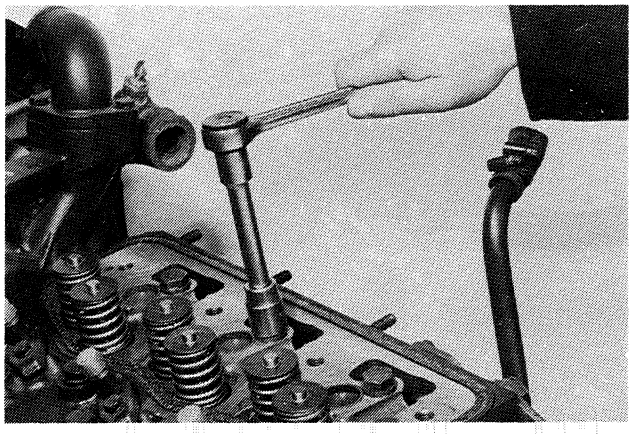
Lift off the rocker arm shaft assembly.

STEP 27



Remove the push rods.

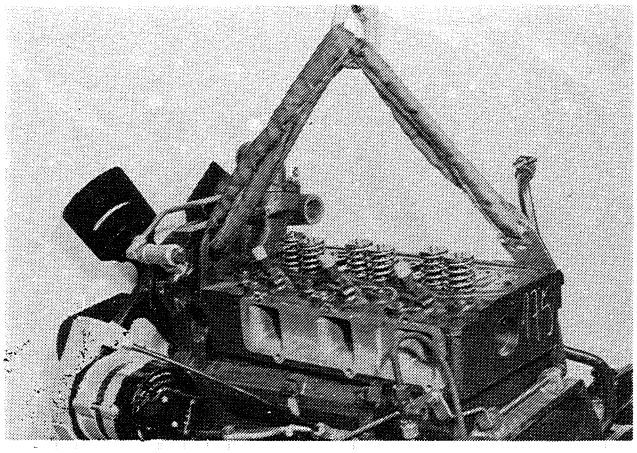
STEP 28



Remove the cylinder head bolts.

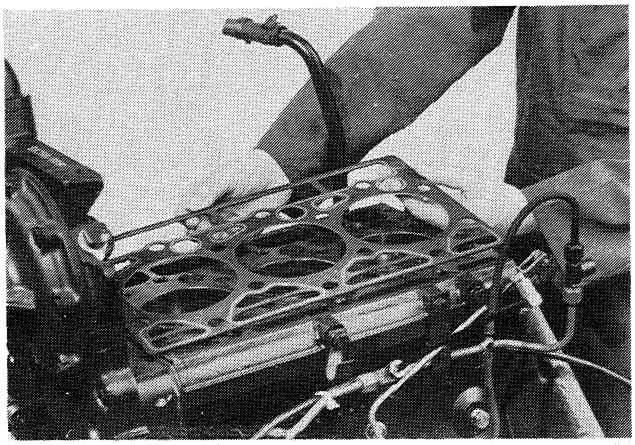
NOTE: *The cylinder head bolts are of two different lengths. The two outer rows are shorter than the two inner rows.*

STEP 29



Attach the cylinder head to a lifting hoist and lift off the cylinder head.

STEP 30

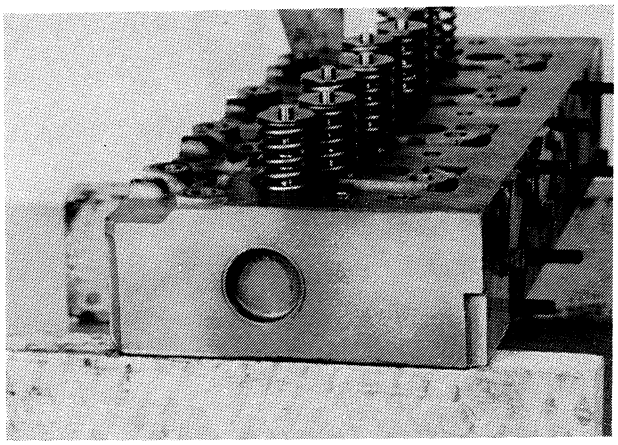


Remove and discard the cylinder head gasket.

Disassembly

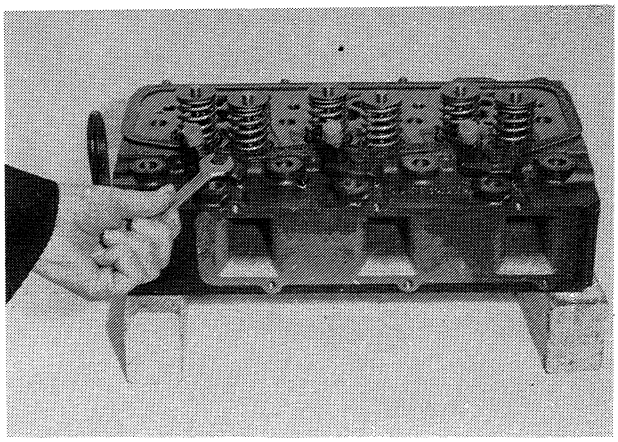
NOTE: *During disassembly, each part must be put on the workbench in removal order so that on assembly parts can be fitted to the original positions.*

STEP 31



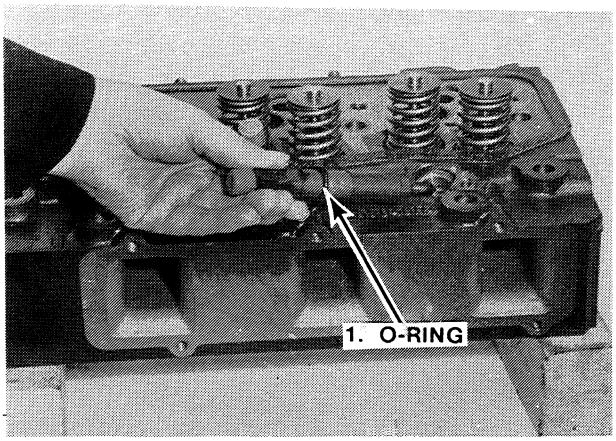
Put the cylinder head on a clean workbench.

STEP 32



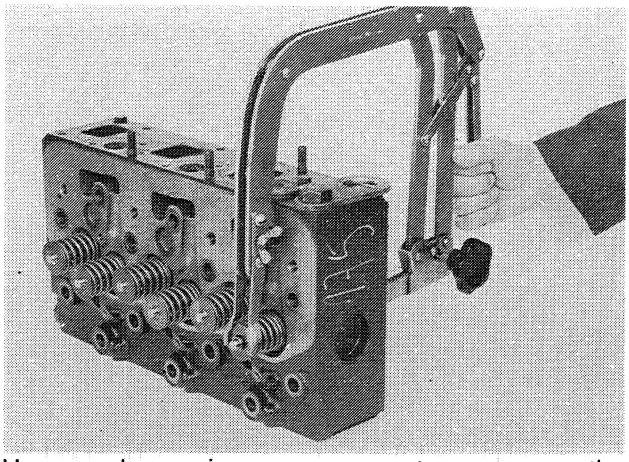
Remove the bolts and injector retainers.

STEP 33



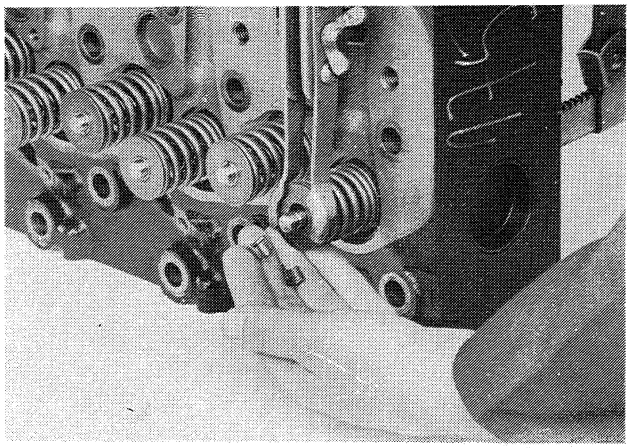
Remove the injectors. Remove and discard the o-rings.

STEP 34



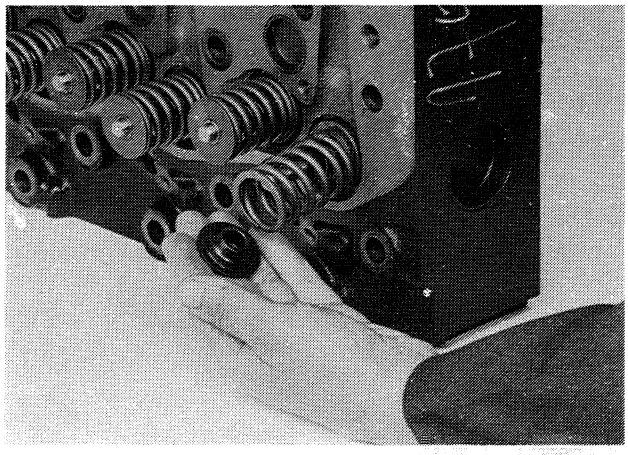
Use a valve spring compressor to compress the springs.

STEP 35



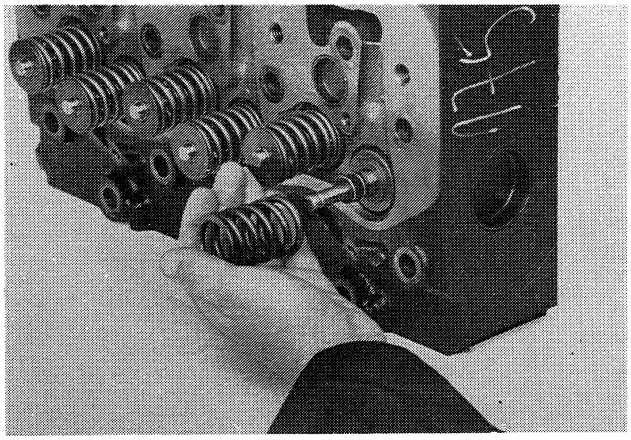
Remove the valve keepers.

STEP 36



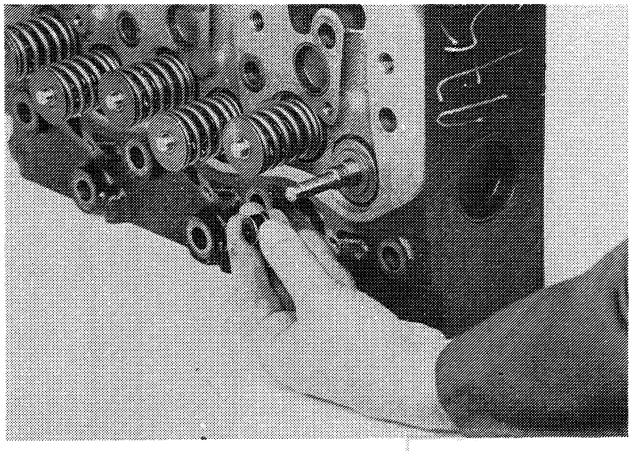
SLOWLY release and remove the valve spring compressor. Remove the valve spring retainer.

STEP 37



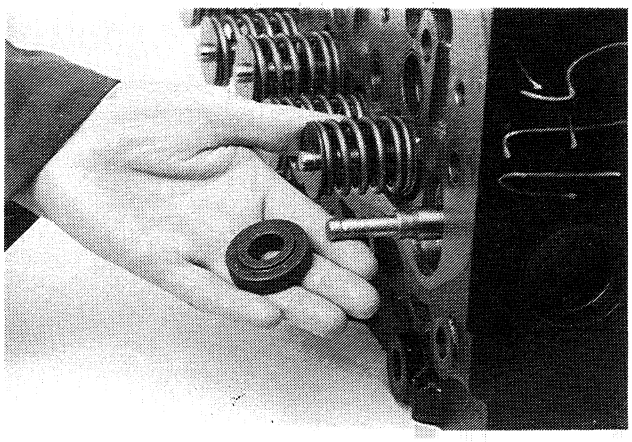
Remove the valve spring.

STEP 38



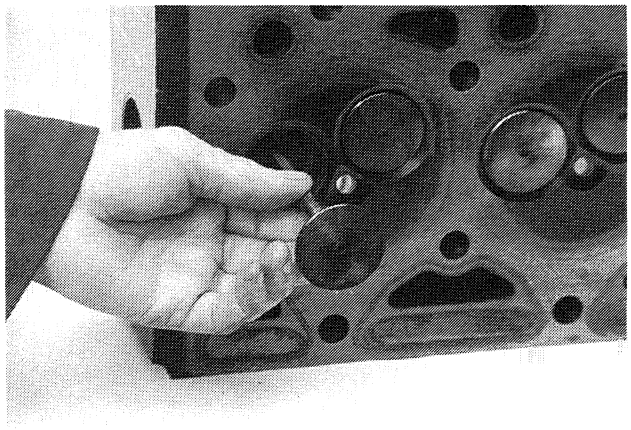
Remove and discard the valve stem seal.

STEP 39



Remove the valve spring seat or rotorcap.

STEP 40



Remove the valve from the cylinder head.

STEP 41

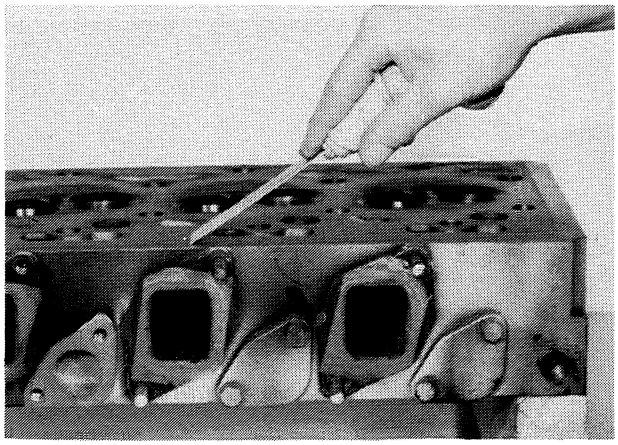
Repeat steps 34 to 41 to remove the other valves. Store all parts in removal order, so that on reassembly parts can be returned to the original positions in the cylinder head.

NOTE: *Valve sequence from front to rear of the engine is as follows;*

Exhaust, Intake, Exhaust, Intake, Exhaust, Intake

Inspection

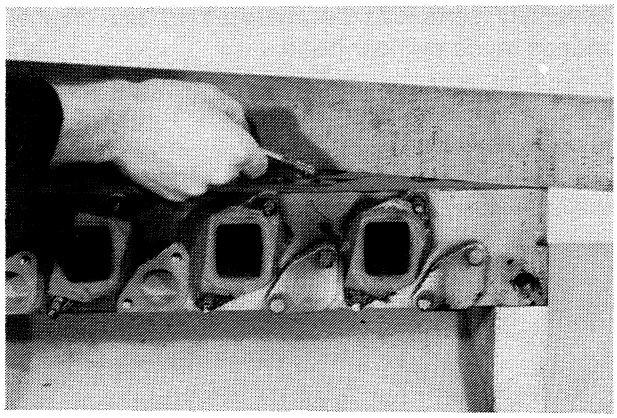
STEP 42

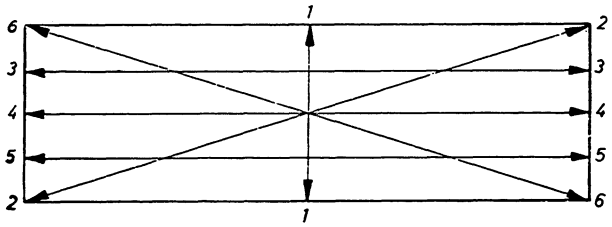


Clean the cylinder head, completely removing all carbon and other deposits.

NOTE: *Check for cracks or other damage.*

STEP 43



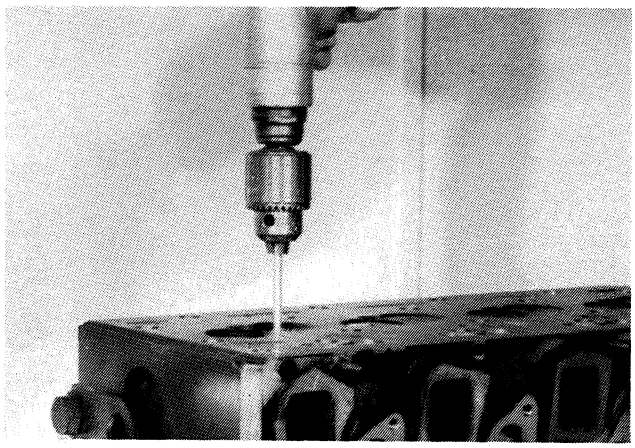


Check the cylinder head for warpage using a heavy, accurate straight edge and feeler gauges to the pattern shown in the diagram.

IMPORTANT: *If the measurement under the straight edge at the line 1 is more than 0.0047 inch (0.12 mm) the cylinder head must be machined or replaced. If the cylinder head height is less than 3.8795 inch (98.54 mm) after machining, the head must be replaced.*

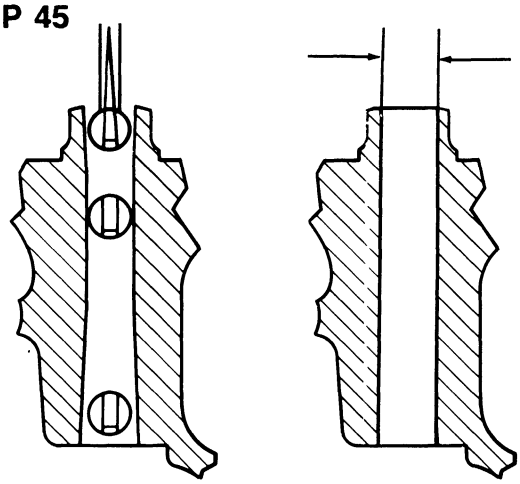
IMPORTANT: *The maximum amount of material that can be removed from a cylinder head is 0.030 inch (0.77 mm).*

STEP 44



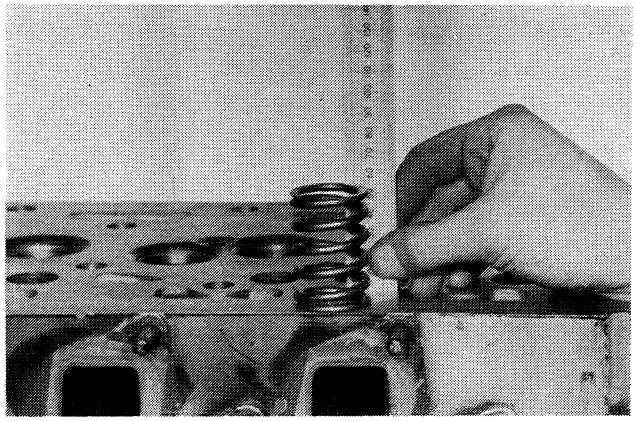
Use a steel spiral brush to remove carbon deposits from the valve guides.

STEP 45



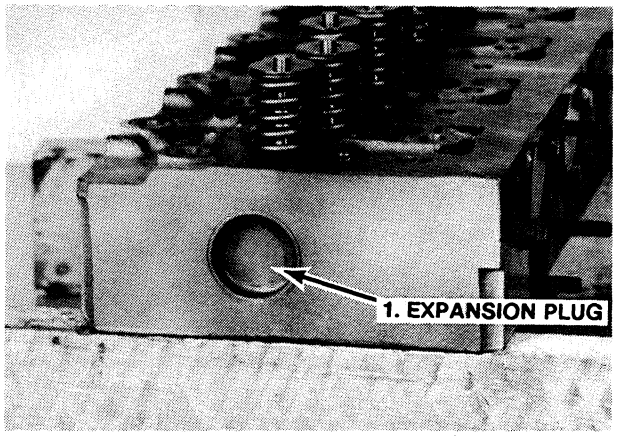
Use a bore gauge to check the valve guide bore in three positions as shown. If the internal diameter is more than 0.3951 inch (10.17 mm), replace the guide.

STEP 46



Check the valve springs. Refer to specifications.

STEP 47



If the expansion plug needs replacing, the plug must be drilled and pulled out.

STEP 48

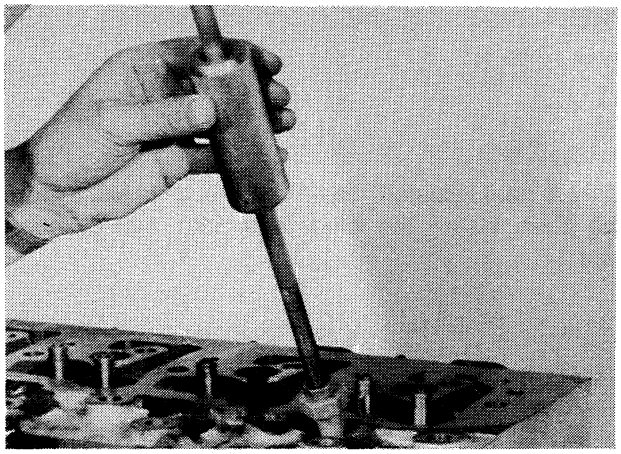
Apply a heat resistant sealer to the new expansion plug then install the plug level into the cylinder head.

Replacement of Injector Nozzle Sleeves

NOTE: *Injector nozzle sleeves can be removed from the cylinder head without removing or disassembling the head.*

IMPORTANT: *If the cylinder head has not been removed from the tractor, be sure to drain coolant below the level of the cylinder head before removing the sleeves.*

STEP 49



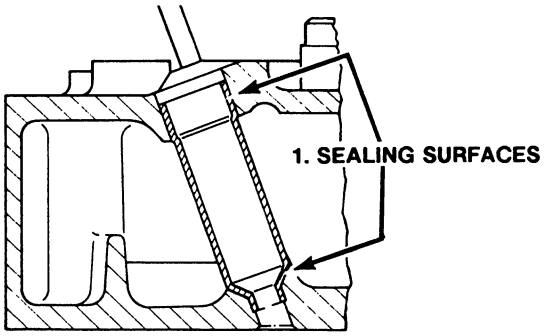
Screw in special bolt (7/8 X 4 inch) PLT- 509-11 (FES 25-12)

NOTE: *The bolt will cut a thread in the brass sleeve.*

Screw a slide hammer adapter OTC-12M (7/16 X 14 NC) into the end of the bolt and use the slide hammer to remove the injector sleeve.

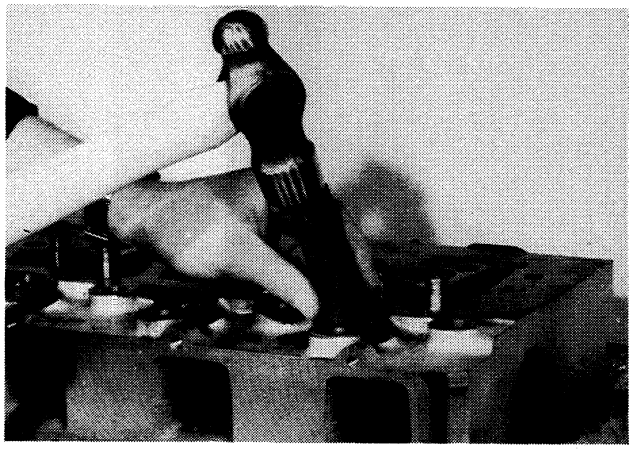
NOTE: *Clean and inspect the sleeve bore.*

STEP 50



Apply "Loctite" Grade B to the sealing surfaces of the new sleeve.

STEP 51



Use special tool 3055 344 R1 to drive in the new sleeve.

NOTE: *Be sure that the sleeve is completely bottomed in the cylinder head.*

Suggest:

If the above button click is invalid.

Please download this document

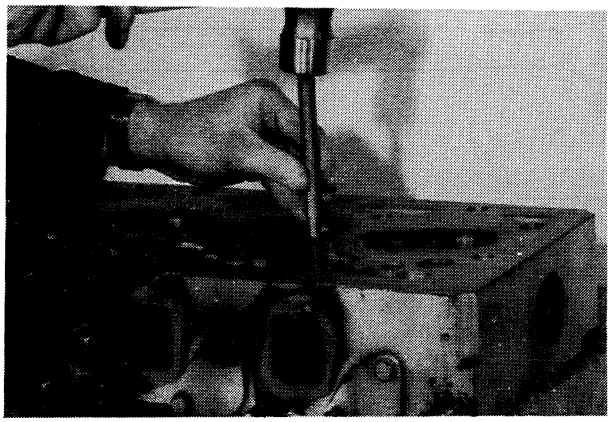
first, and then click the above link

to download the complete manual.

Thank you so much for reading

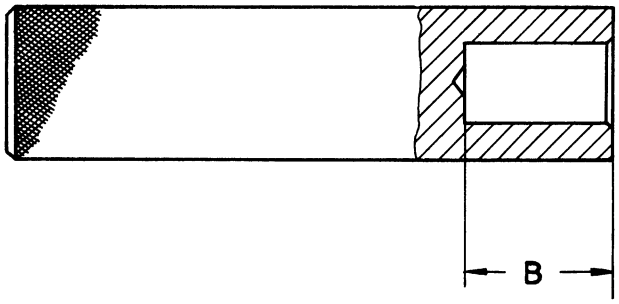
Replacement of Valve Guides

STEP 52



Drive out the old guides.

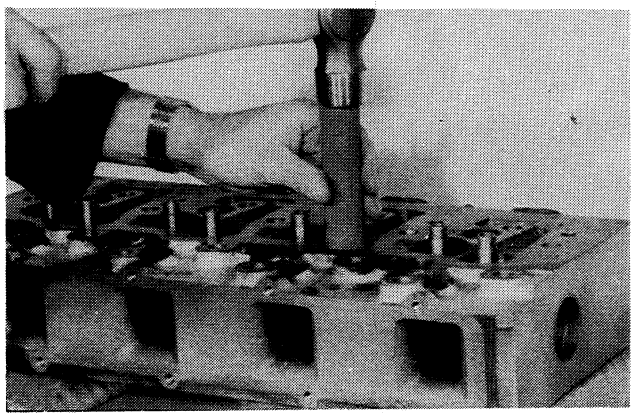
STEP 53



Use special tool 3055 699 R1 to make sure of correct depth when installing the guide.

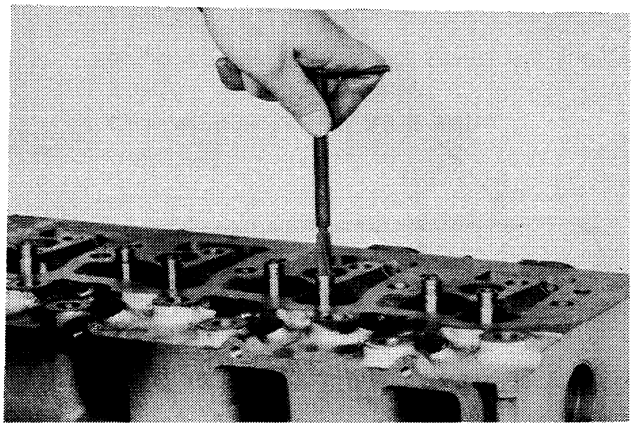
NOTE: *Check dimension B. This should be 1.102 inch (28 mm). Grind if necessary.*

STEP 54



Install new valve guides, stepped end upward.

STEP 55



Ream the guides to between 0.3940 and 0.3945 inch (10.00 and 10.02 mm).

NOTE: *Clean the guides after reaming.*