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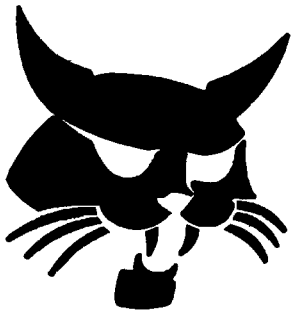

Service Manual

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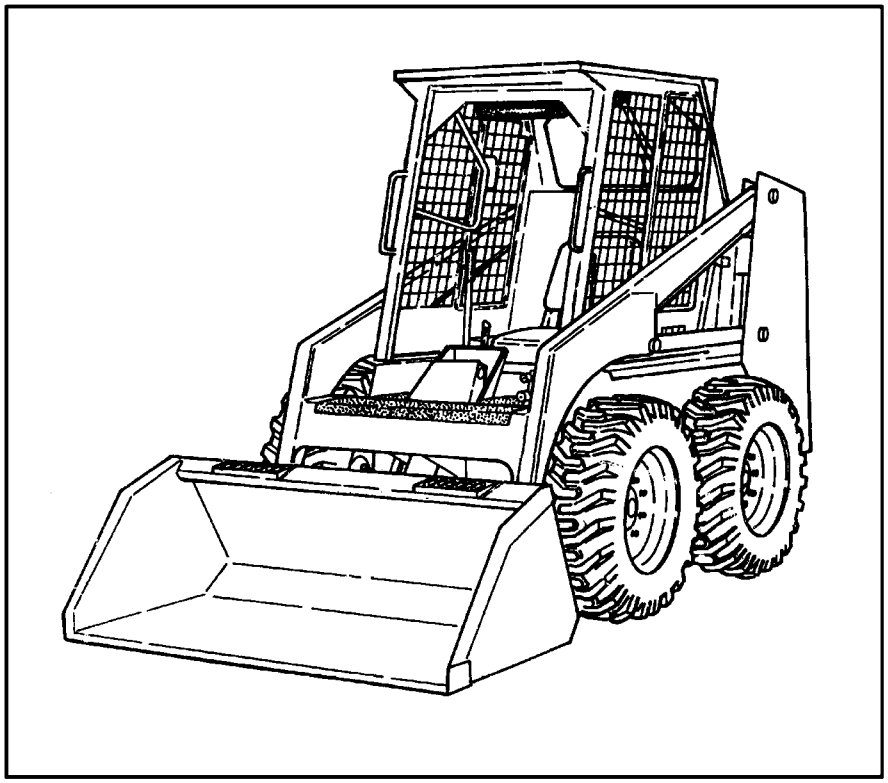

MELROE
INGERSOLL-RAND
6566091 (12–85)
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bobcat

SERIAL NUMBER LOCATIONS

Always use the serial number of the loader when requesting service information or when ordering parts. Early or later models (identification made by serial number) may use different parts, or it may be necessary to use a different procedure in doing a specific service operation.

LOADER SERIAL NUMBER

The loader serial number plate is located on the inside of the left upright, above the grill **[A]**.

Explanation of loader Serial Number:

XXXX XXXXX

- XXXXX — Production Sequence (Series)
- XXXX — Model/Engine Version

ENGINE SERIAL NUMBER

Perkins (4.154)

The engine serial number is on the left side of the engine block, above the fuel injection pump **[B]**.

Perkins TK200 (4.154)

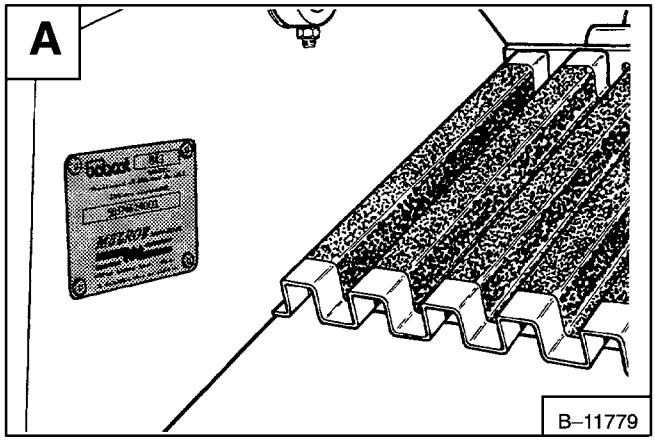
The engine serial number is on the left side of the engine block, above the fuel injection pump **[B]**.

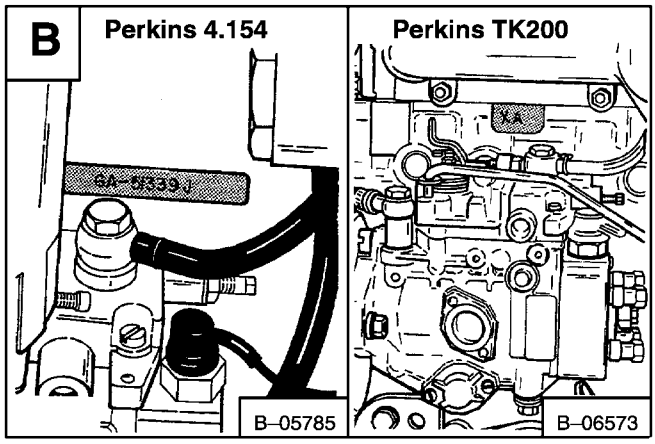
Isuzu 4JB1–PK01

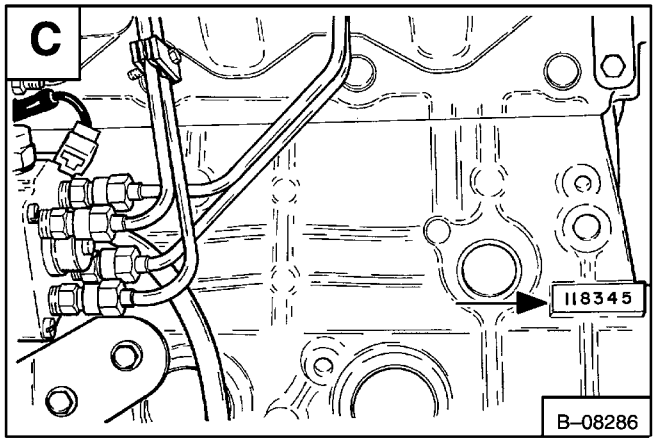
The engine serial number is located on the fuel injection pump side and at the rear of the engine block **[C]**.

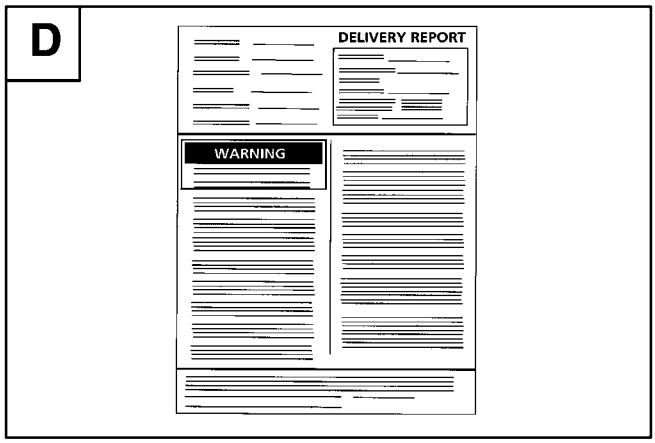
DELIVERY REPORT

The Delivery Report must be filled out by the dealer and signed by the owner or operator when the Bobcat loader is delivered. An explanation of the form must be given to the owner. Make sure it is filled out completely **[D]**.









OPERATOR CAB (Cont'd)

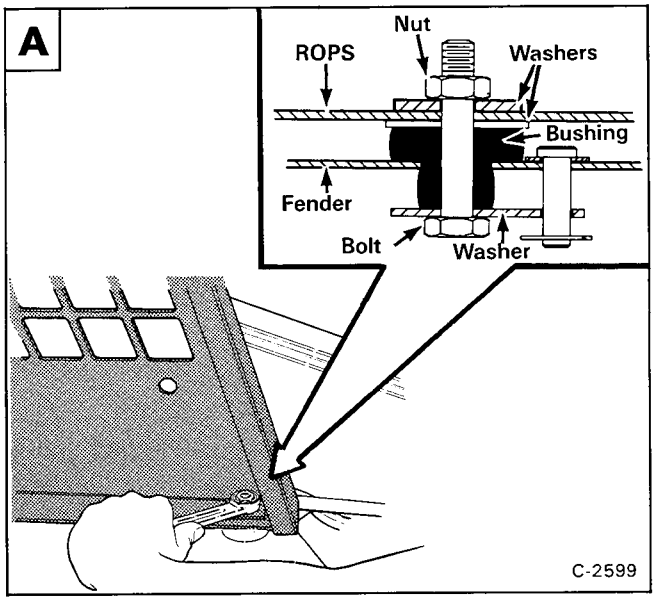
Raising the Operator Cab

The cab can be raised or lowered with the lift arms up or down.

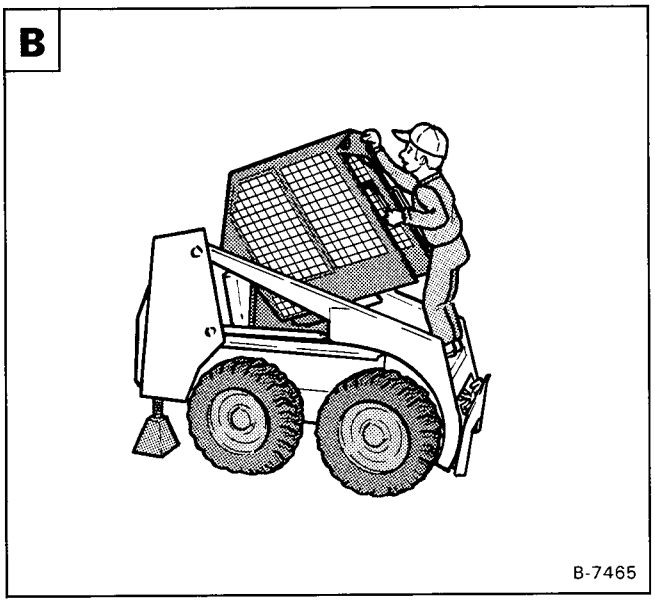
If the lift arms are up, a lift arm stop must be installed (See Page 1—4).

Stop the loader on a level surface. Stop the engine and engage the brake. Put jackstands under the rear of the loader.

Disconnect the two front fasteners [A].



If the lift arms are down, stand on the safety tread [B].



If the lift arms are up, stand beside the loader [C].

Slowly raise the cab until it is all the way up [B] or [C].

Lowering the Operator Cab

Stand on the safety tread A or beside the loader [C] and slowly lower the operator cab.

⚠ WARNING

Both sets of fasteners at the front of the operator cab (ROPS) must be assembled as shown in this Operator's Manual. Failure to secure ROPS correctly can cause injury or death.

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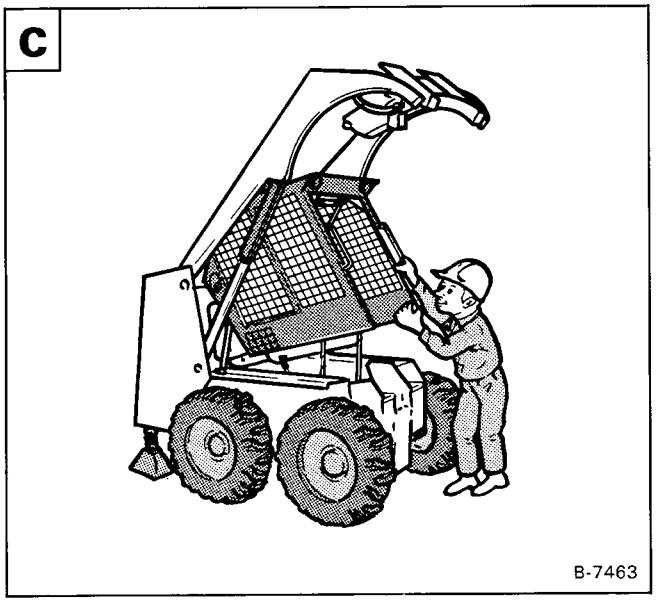
Install the fasteners [A] before operating the loader.



pumps ❸ force fluid, under high pressure, to the hydrostatic motors ❷ . The hydrostatic motors ❷ turn and push the low pressure fluid back to the hydrostatic pumps ❸ to be used again. The hydrostatic motors ❷ also contain a shuttle valve to allow some of the fluid from the "drive loop" to go to the oil cooler ⓴ for cooling. The hydrostatic pumps ❸ center section contains four high pressure relief/replenishing valves ❹ . Two for each side, one for forward travel and one for reverse travel. The high pressure replenishing valves ❹ have a dual function. In neutral the valve cartridges ❹ are pushed off their seats to allow fluid flow from the charge loop to the cool, lubricate and replenish the pumps and the motors. When the swashplates are angled, the fluid is at a higher pressure than the charge fluid, this pressure difference causes the high pressure replenishing valves ❹ to be forced against the seats. The high pressure replenishing valves ❹ also act as a high pressure relief valve for the hydrostatic pumps ❸ , in case of excessive pressure being generated by the hydrostatic pumps ❸ . The high pressure replenishing valves ❹ will open allowing the "drive pressure" to relieve into the charge loop to be used again.

Excess charge pressure fluid which is relieved over the charge by-pass valve ❽ is routed to the "tee" and joins the hydrostatic motor ❷ case drain fluid and flows to the oil cooler ⓴ . The "tee" fitting has a pressure switch ㉑ that senses a drop in pressure of the fluid which goes to the oil cooler ⓴ . Fluid from the oil cooler ⓴ flows through the filter ⓲ which has a built in by-pass valve ⓳ . The fluid then flows into the inlet of the port block and back to the hydraulic pump ❺ .

HYDRAULIC / HYDROSTATIC SYSTEM OPERATION

To Be Used With

HYDRAULIC / HYDROSTATIC FLOW CHART

For Model

843 (S/N 15001 Thru 25999)

Chart # 6570242 (Printed April 1986)

CHART LEGEND

1. **RESERVOIR,** Cap.: . . . . . 3.5-4.0 Gals. (13,2-15,1 L)
2. **TEMPERATURE SWITCH,** . 225-232°F (108-111°C)
3. **COLD OIL BY-PASS VALVE,** . . 297 PSI (2048 kPa)
4. **PORT BLOCK**
5. **CHARGE BY-PASS VALVE,** . . . 110 PSI (758 kPa)
6. **ORIFICE** . . . Motor Case Drain 0.217" (5,51 mm) Dia.
7. **HYDROSTATIC MOTOR**
8. **PRESSURE SWITCH (Dual Function),** Hourmeter Starts @ 19-23 PSI (132-158 kPa) Warning Light Turns off @ 17-21 PSI (118-144 kPa)
9. **HYDRAULIC PUMP,** Gear Type
   a. Charge Pump, 11.5 GPM (43,5 L/min.) @ 2700 RPM @ 1050 PSI (7239 kPa)
   b. Hydraulic Pump, 16.1 GPM (60,9 L/min.) @ 2700 RPM @ 1050 PSI (7239 kPa)
10. **HYDRAULIC AUXILIARY LINES**
11. **LIFT CYLINDERS**
12. **TILT CYLINDERS**
13. **LOAD CHECK VALVES (Four)**
14. **ANTI-CAVITATION CHECK VALVE**
15. **ORIFICE**
16. **MAIN RELIEF VALVE,** . 2250-2400 PSI (15514-16548 kPa)
17. **PORT RELIEF VALVE** . . . . . 3500 PSI (24132 kPa)
18. **HYDRAULIC CONTROL VALVE**
19. **BUCKET POSITION VALVE**
20. **FLOW-CONTROL SPOOL**
21. **CHECK VALVE**
22. **PRESSURE RELIEF VALVE**
23. **UN-LOADING SPOOL**
24. **FILTER,** Hydraulic . . . . . #10 Micron
25. **BY-PASS VALVE** . . . 72 PSI (496 kPa)
26. **OIL COOLER**
27. **FILTER,** Hydrostatic . . . . . #3 Element
28. **DIAGNOSTIC COUPLER**
29. **PRESSURE SWITCH,** Differential
    S/N 15001-20991 — 19 PSI (131 kPa)
    Starting W/ S/N 20992 — 40 PSI (276 kPa)
30. **BY-PASS VALVE,**
    S/N 15001-20991 — 25 PSI (172 kPa)
    Starting W/ S/N 20992 — 50 PSI (345 kPa)
31. **DEFUSER**
32. **SCREEN** . . . . . 100 Mesh
33. **BREATHER CAP** . . . . . 5 Micron
34. **HYDROSTATIC PUMPS**
35. **HIGH PRESSURE RELIEF VALVES** 3500 PSI (24133 kPa)

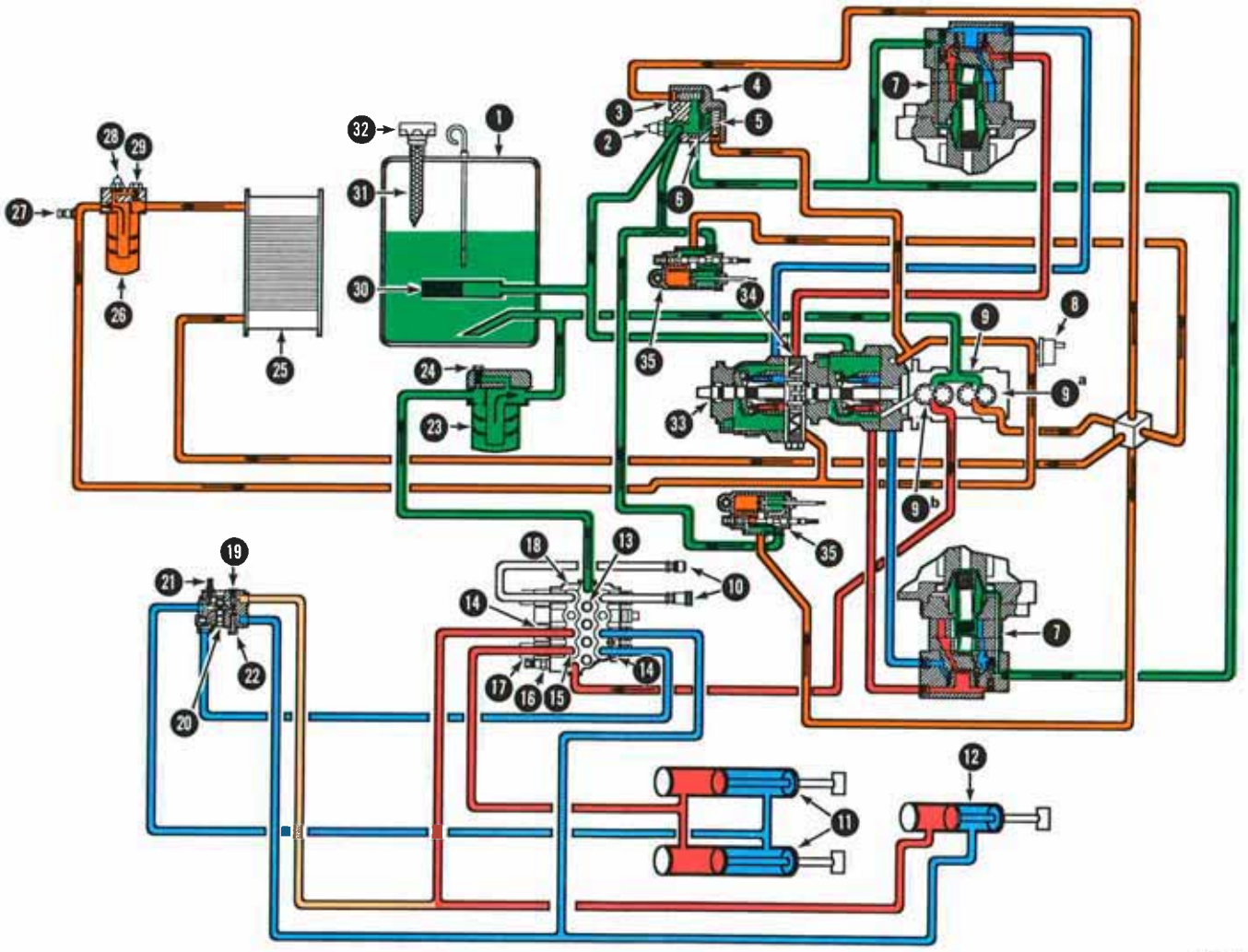
HYDRAULIC / HYDROSTATIC FLOW CHART

For Model

843 (S/N 29926 & Above)

Chart #6720178 (Printed May 1989)

RED - - - - - - - High Pressure
BLUE - - - - - - Low Pressure
GREEN - - - - - Case Drain & Reservoir
ORANGE - - - - Charge Pressure
LT. ORANGE - Bucket Position Fluid Flow



MC-1252

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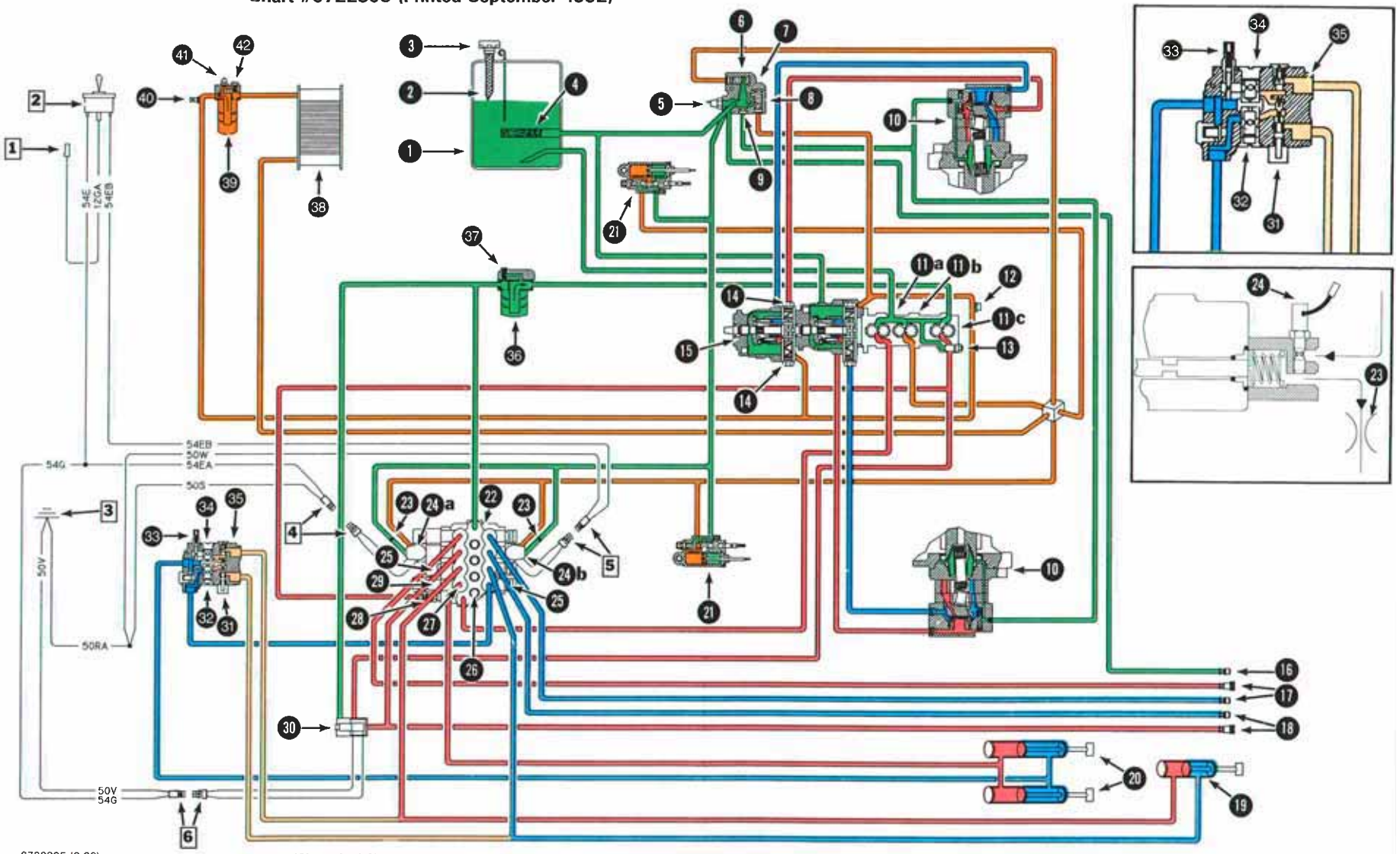
HYDRAULIC / HYDROSTATIC FLOW CHART AND WIRING DIAGRAM

For Model

843H (With Pilot Operated Main Relief)

Chart #6722305 (Printed September 1992)

RED - - - - - - - High Pressure
BLUE - - - - - - Low Pressure
GREEN - - - - - Case Drain & Reservoir
ORANGE - - - - Charge Pressure
LT. ORANGE - Bucket Position Fluid Flow



FLUID FLOW EXPLANATION

Hydraulic fluid flows from the reservoir ❶ and enters the inlet port of the triple (3 section) gear pump ⓫ . The larger section ⓫ [a] of the pump supplies flow to the inlet of the hydraulic control valve ㉒ . The pump pressure is controlled by the main relief valve ㉘ . The control valve ㉒ is a four-section, open center, closed port, series type valve. When all four spools are in neutral position, the fluid goes through the control valve ⓲ and to the hydraulic filter ㊲ .

When the lift arms are raised, the hydraulic pump ⓫ [a] fluid flow is directed to the base end of the lift cylinders ⓴ . The fluid from the rod end of the lift cylinders ⓴ returns to the bucket position valve㉞ and is directed to the center of the flow-control spool ㉜ . The flow-control spool ㉜ and flow adjustment valve ㉝ direct this flow. A percentage of the fluid is directed over the flow adjustment valve ㉝ to position the bucket. The rest of the fluid is directed through the orifice in the flow-control spool ㉜ and onto the return port of the control valve ㉒ (lift section).

The fluid flow from the flow-control spool ㉜ and flow adjustment valve ㉝ are against the un-loading spool/pressure relief valve ㉛ . The un-loading spool/pressure relief valve ㉛ moves to allow extension of the tilt cylinder ⓳ as the lift cylinders ⓴ raise the lift arms.

The un-loading spool/pressure relief valve ㉛ is to relief fluid from the base end of the tilt cylinder ⓳ if the bucket is fully rolled out and the lift cylinders ⓴ are still extending.

The fluid from the charge pump ⓫ [b] flows to the four-way cross fitting and is called "charge pressure fluid". The fluid flows to the oil cooler ㊳ or oil cooler by-pass valve ❻ . The oil cooler by-pass valve ❻ will open when the fluid temperature is cold or if there is excessive fluid pressure. The fluid flows through the oil cooler ㊳ , then through the hydrostatic filter ❹ and past the pressure switch ⓬ to supply the front and rear hydrostatic pump ⓯ with charge pressure and on to the charge by-pass valve ❽ . The pressure switch ⓬ has a dual function, it starts the hourmeter and turns the warning light off. The charge pressure fluid flows into each pump ⓯ and motor ⓾ to cool, lubricate and replenish the fluid supply which has been lost through case drain. Also fluid from the four-way cross fitting supplies fluid to actuate the steering servo controls ㉑ and the electrical solenoids ㉔ for high horsepower operation. The return fluid from the steering servo controls ㉑ and electrical solenoids ㉔ flows to the port block ❼ .

There are two hydrostatic pumps ⓯ and two hydrostatic motors ⓾ . One pump and one motor work together as a pair to drive one side of the loader. The other pump and motor work as a pair to drive the opposite side of the loader.

The swash plates of the hydrostatic pumps ⓯ are angled by the steering servo controls ㉑ in either direction, the pumps ⓯ force fluid, under pressure, to the motors ⓾ . The motors ⓾ turn and push the low pressure fluid back to the pumps ⓯ to be used again. The motors ⓾ contain a shuttle valve which allows some fluid from the drive loop to go to the port block ❼ and back to the reservoir ❶ . The hydrostatic pumps ⓯ contain four high pressure relief/replenishing valves ⓮ . There are two valves ⓮ for drive on each side of the loader: one for forward travel and one for reverse travel. The high pressure relief/replenishing valves ⓮ have a dual function. The valve cartridges ⓮ are pushed off their seats to allow fluid flow from the charge loop to cool, lubricate and replenish the

LIFT CYLINDER

Checking the Lift Cylinder(s)

Lower the lift arms. Stop the engine. Activate the lift pedal to release the hydraulic pressure.

Open the rear door.

Disconnect the hose from the tubeline which comes from the base end of the lift cylinder (right side) [A], (left side) [B]. Only check one cylinder at a time.

Put a plug in the tubeline.

⚠ WARNING

Diesel fuel or hydraulic fluid under pressure can penetrate skin or eyes causing serious injury. Fluid leaks under pressure may not be visible. Use a piece of cardboard or wood to find leaks. Do not use your bare hand. Wear safety goggles. If fluid enters skin or eyes, get immediate medical attention.

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Start the engine and push the top (toe) of the lift pedal. If there is any leakage from the open hose, remove the cylinder for repair.

Repeat this procedure to check the lift cylinder on the other side.

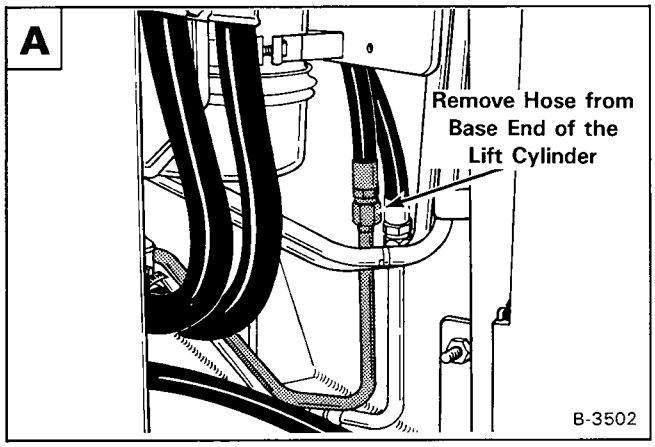
Removal and Installation

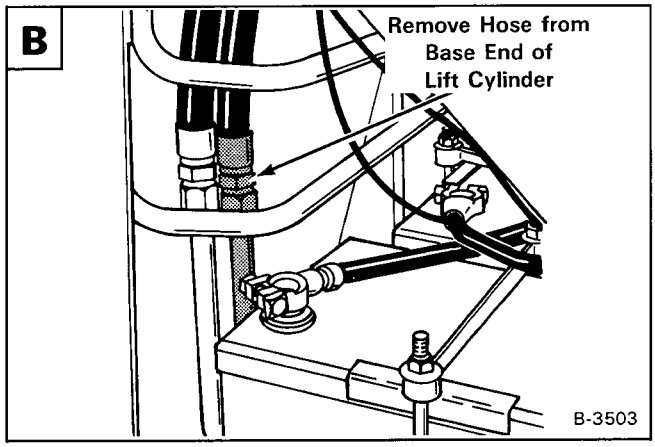
Raise the lift arms. Install jackstands under the Bob-Tach. Stop the engine. Activate the lift pedal to release the hydraulic pressure.

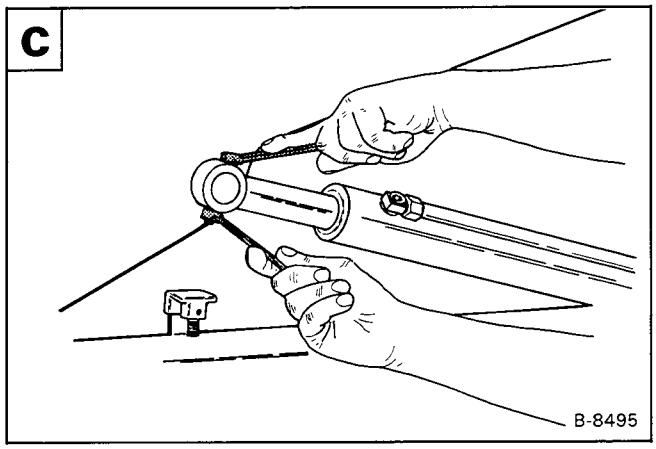
Remove the lock bolt at the rod end of the cylinder [C].

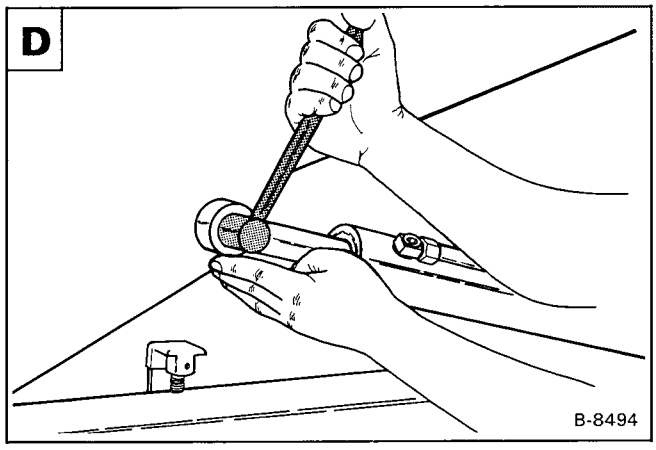
Installation: Tighten the lock bolt to 8-10 ft.-lbs. (11-14 Nm) torque.

Remove the rod end pin [D].









HYDRAULIC CYLINDER REPAIR

NOTE: The following procedure can be used for the lift and tilt cylinders.

Disassembly

The tools listed will be needed to do the following procedure:

MEL-1074 — O-ring Seal Hook
MEL-1033 — Rod Seal Installation Tool
MEL-1075 — Gland Nut Wrench
MEL-1215 — Seal Installation Tool
MEL-1178 — Seal Installation Tool

Put the base end of the cylinder in a drain pan. Move the rod in and out to remove the fluid from the cylinder barrel.

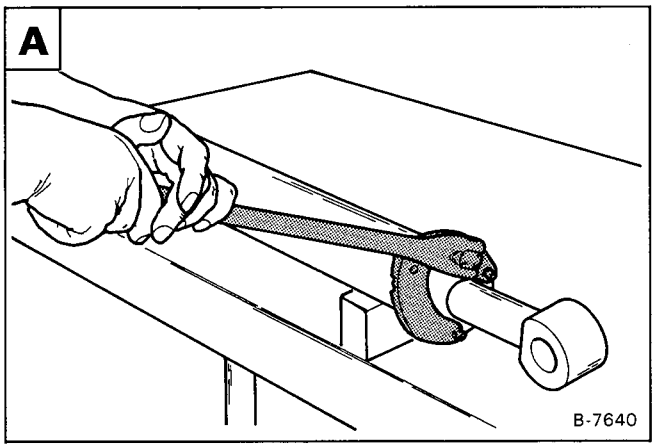
Put the base end of the cylinder in a vise. Remove the end cap from the from the cylinder using the special tool [A].

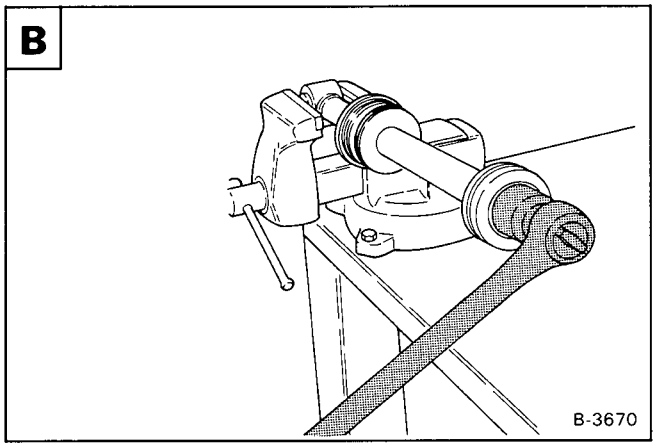
Remove the rod with the end cap and piston from the cylinder barrel.

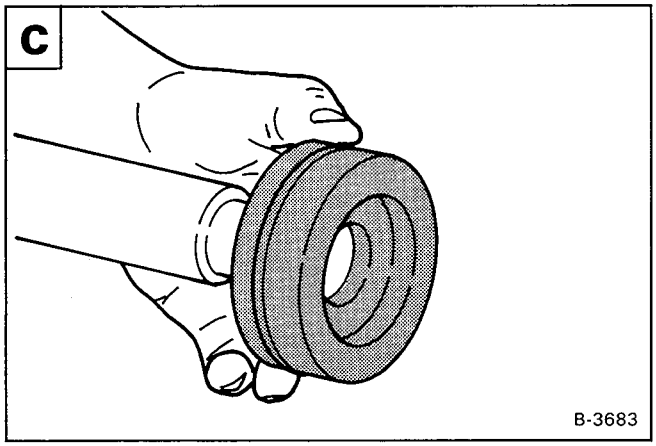
Put the rod end of the shaft in the vise and remove the nut [B].

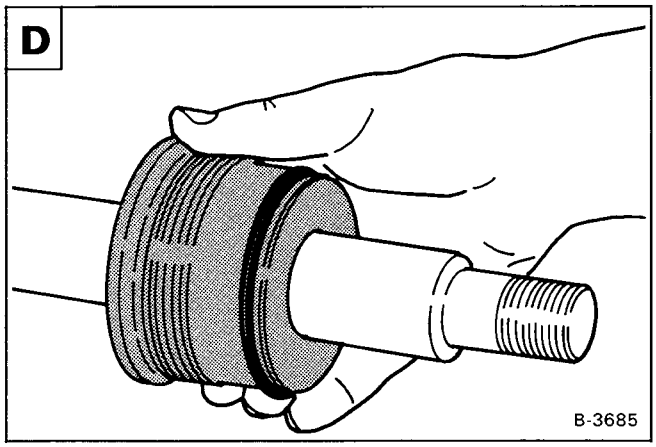
Remove the piston from the rod [C].

Remove the end cap from the rod [D].





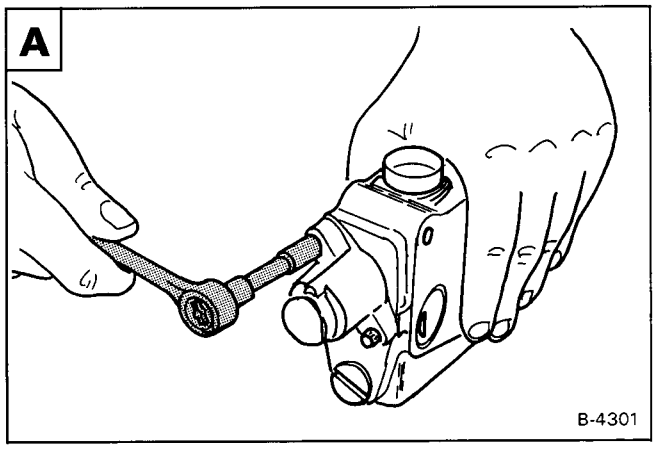




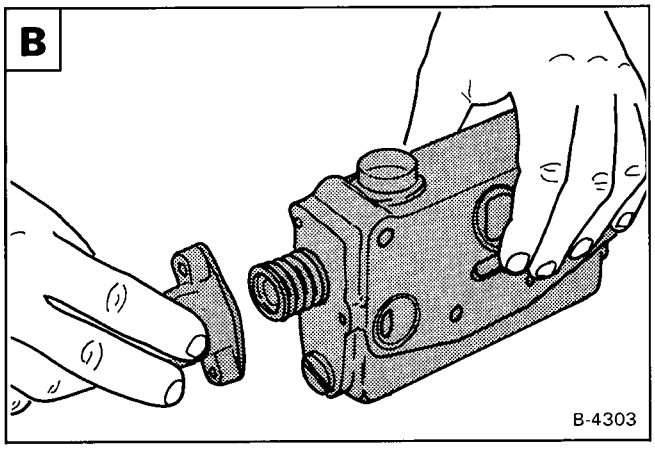
Tilt Section

Remove the bolts from the end cap [A].

Installation: Tighten the bolts to 10-13 ft.-lbs. (14-17 Nm) torque.



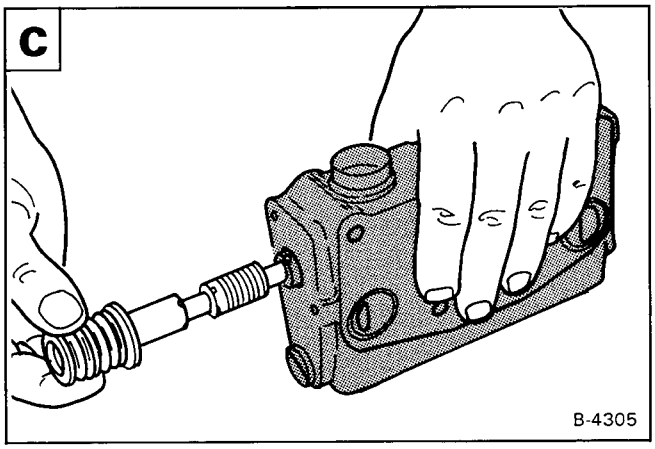
Remove the end cap [B].



Remove the valve spool assembly [C].

Installation: CAREFULLY install the spool from the rear of the valve section to prevent damage to the O-rings.

Installation: Check the valve spool, it must move freely in the bore. If not, rotate it 180°.

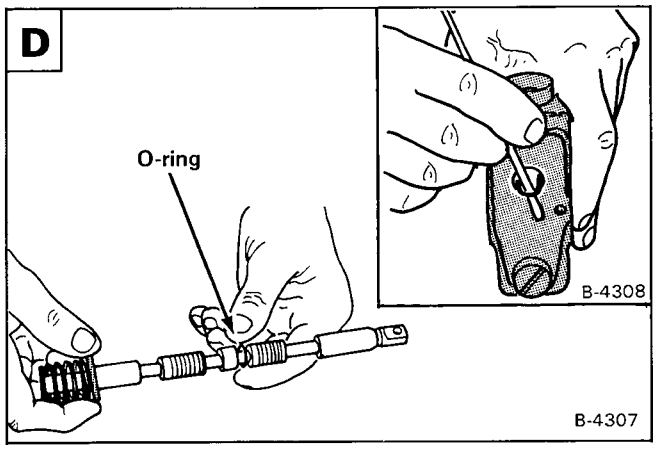


Remove the O-ring from the valve spool [D].

Remove the O-rings from the valve spool bore [D].

Installation: Always use NEW O-rings before installing the spool assembly.

NOTE: **DO NOT remove the spool bolt from the valve spool unless the spring is broken. If the spool bolt is to be removed (See Page 2—28 for the correct procedure).**



HYDRAULIC CONTROL VALVE (MELROE) (Cont'd)

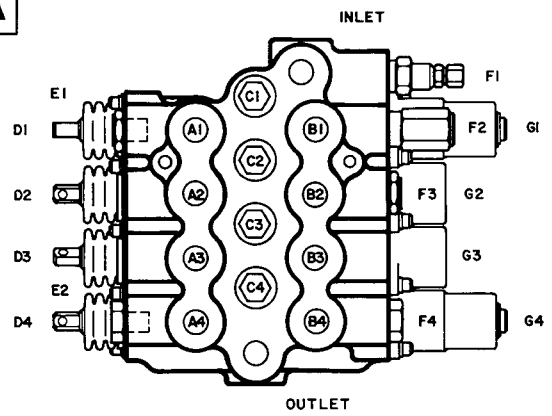
Disassembly and Assembly

NOTE: The 843B control valve is a 3 spool valve. The D3 rear auxiliary section is NOT there, but the procedure for disassembly and assembly is the same.

Mark each spool and section for correct assembly.

Check the control valve layout before disassembly for correct identification and location of the parts [A].

A

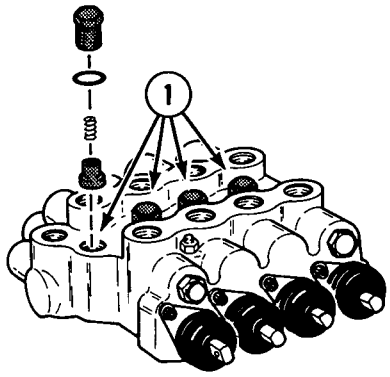


A1	Lift Cylinder, Rod End	D2	Tilt Spool
A2	Tilt Cylinder, Rod End	D3	Rear Auxiliary Spool
A3	Rear Auxiliary	D4	Front Auxiliary Spool
A4	Front Auxiliary	E1	Anti-Cavitation Valve
B1	Lift Cylinder, Base End	E2	Plug
B2	Tilt Cylinder, Base End	F1	Main Relief Valve
B3	Rear Auxiliary	F2	Port Relief Valve
B4	Front Auxiliary	F3	Anti-Cavitation Valve
C1	Lift Load Check	F4	Plug
C2	Tilt Load Check	G1	Lift Detent
C3	Rear Auxiliary, Load Check	G2	Tilt Centering Mechanism
C4	Front Auxiliary, Load Check	G3	Rear Aux. Centering Mechanism
D1	Lift Spool	G4	Front Auxiliary Detent

B-6581

Remove the load check valves (Item 1) from the four center ports [B].

B



B-6886

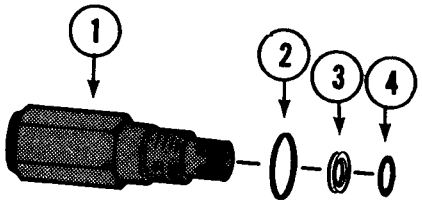
Remove the port relief valve from the lift section [C].

Remove the O-rings and back-up washer.

Assembly: Always use NEW O-rings and back-up washer. Tighten to 35-40 ft.-lbs. (47-54 Nm) torque.

C

1. **Relief Valve**
2. **O-ring**
3. **Back-Up Washer**
4. **O-ring**



E-1509

HYDRAULIC PUMP (DOUBLE STAGE)

The hydraulic pump is a two stage (double gear) pump, each section of the pump must be checked separately.

The tools listed will be needed to do the following procedure:

OEM-1238 — Hydraulic Tester
MEL-10006 — Hydraulic Test Kit

Checking the Output of the Hydraulic Pump

NOTE: Make sure that all the air is removed from the system before beginning the test. Air in the system can give an inaccurate test.

Lift and block the loader (See Page 1—2 for the correct procedure).

Raise the operator cab (See Page 1—7 for the correct procedure).

Connect the jumper start switch (See Page 1—9 for the correct procedure).

Small Section of the Pump Only: Disconnect the outlet hose from the pump [A]. Connect the inlet hose of the tester to the outlet of the pump [A]. Connect the outlet of the tester to the hose which was removed from the pump [A]. Disconnect the hose which goes to the port block (at the hydraulic pump). Put plugs in the hose and the fitting on the pump.

Disconnect the hose which goes to the port block (on the hydraulic pump). Plug the hose and the fitting on the hydraulic pump.

Large Section of the Pump Only: Disconnect the outlet hose from the pump [B]. Connect the inlet hose of the tester to the outlet of the pump [B]. Connect the outlet of the tester to the hose which was removed [B].

NOTE: Make sure that the restrictor valve on the tester is fully open.

Start the engine and run at low RPM. Make sure that the tester is connected correctly. If no flow is indicated on the tester, the hoses are connected wrong.

Increase the engine speed to full RPM*. Warm the hydraulic fluid to 140°F (60°C) by turning the restrictor knob on the tester to about 1000 PSI (6895 kPa). Do not exceed system relief pressure.

Open the restrictor on the tester and record the free flow at full RPM.

Small Section of the Pump Only: Turn the restrictor knob so there is about 500 - 600 PSI (3448 - 4137 kPa). Record the highest pressure (PSI) and flow (GPM) at full RPM.

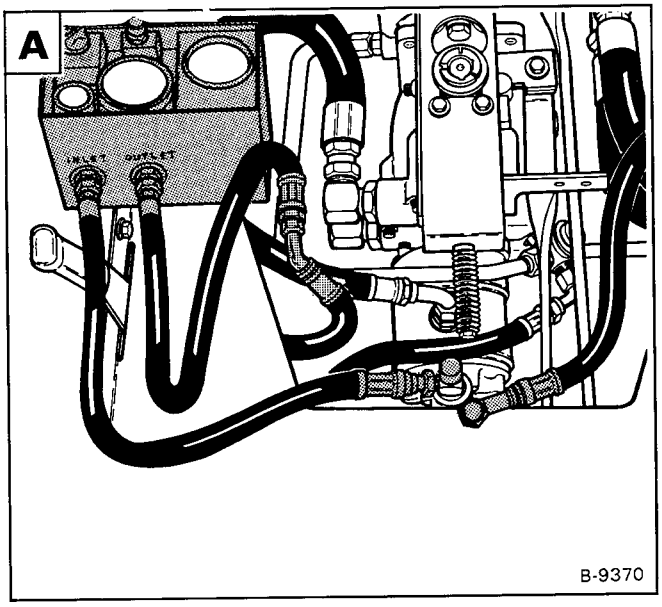
Large Section of the Pump Only: Use the right steering lever to engage the auxiliary hydraulics. Record the highest pressure and flow at full RPM.

The highest pressure flow must be at least 80% of free flow.

$$\% = \frac{\text{HIGH PRESSURE FLOW (GPM-LPM)}}{\text{FREE FLOW (GPM-LPM)}} \times 100$$

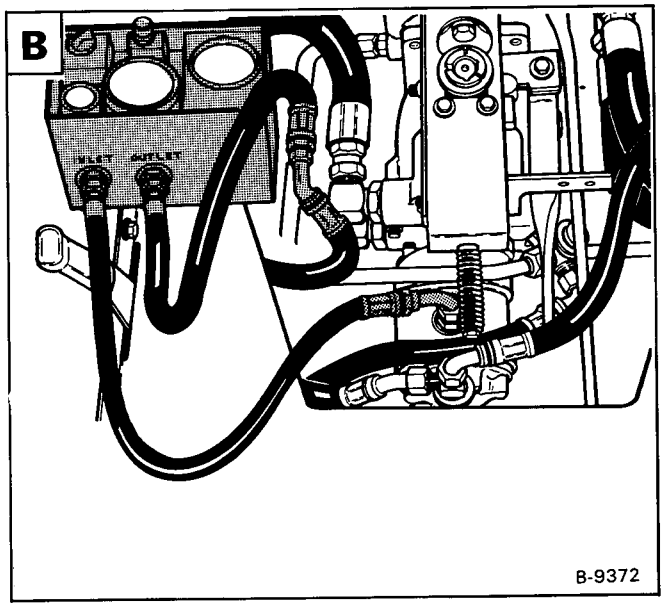
A low percentage may indicate a failed hydraulic pump, or it may be caused by air in the system. Make sure that all the air is removed form the system.

*Refer to the Specifications (Section 8) for system relief pressure and full RPM. The system relief pressure must be per specifications before test is run.



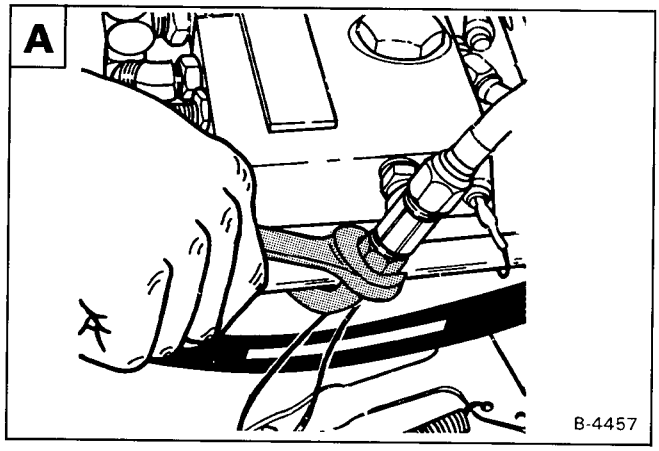
IMPORTANT

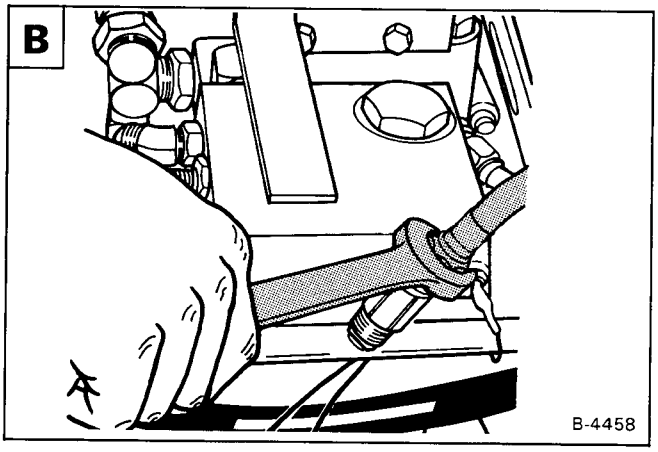
Be careful when turning the flow control restrictor at the hydraulic tester. When the tester is connected this way there is no relief valve in the system. DO NOT close the flow restrictor, on the tester, all the way.



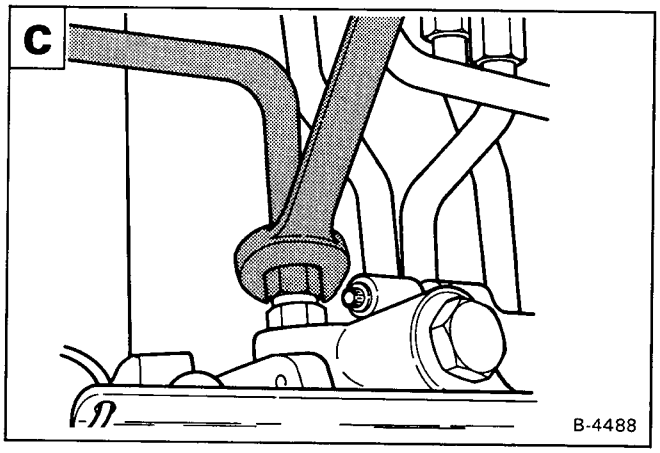
PORT BLOCK (S/N 14999 & Below) (Cont'd)

Disconnect the charge tubelines at the front of the port block [A] [B].

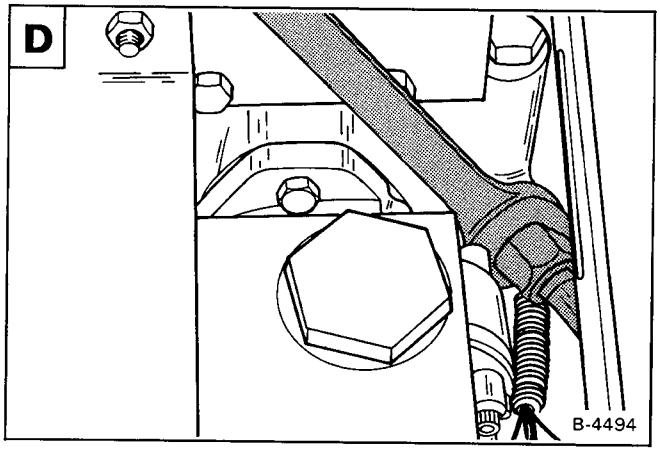




Disconnect the charge tubeline at the rear of the hydrostatic pump [C].



Disconnect the charge tubeline at the front of the hydrostatic pump [D].



HYDROSTATIC SYSTEM

FRONT AND SIDE PANEL (ONE PIECE) (S/N 20001 & Above) & 843B

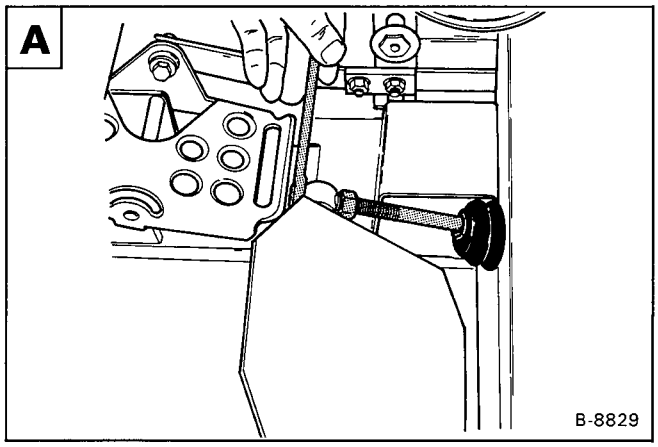
Removal and Installation

Raise the lift arms and have a second person install a lift arm stop (See Page 1—4) for the correct procedure).

Stop the engine.

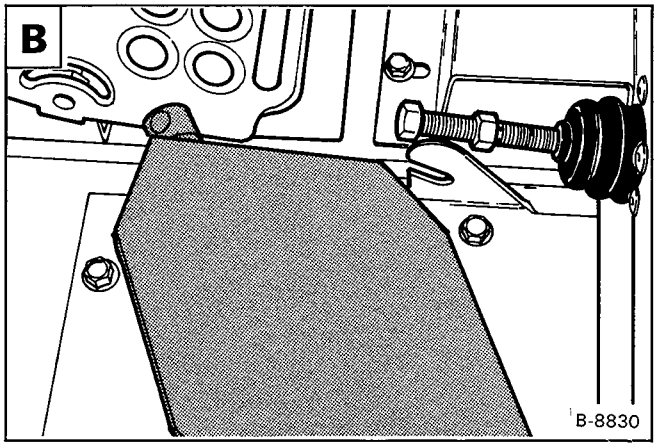
Raise the operator cab (See Page 1—7) for the correct procedure).

Remove the nuts from the parking brake pedal [A].

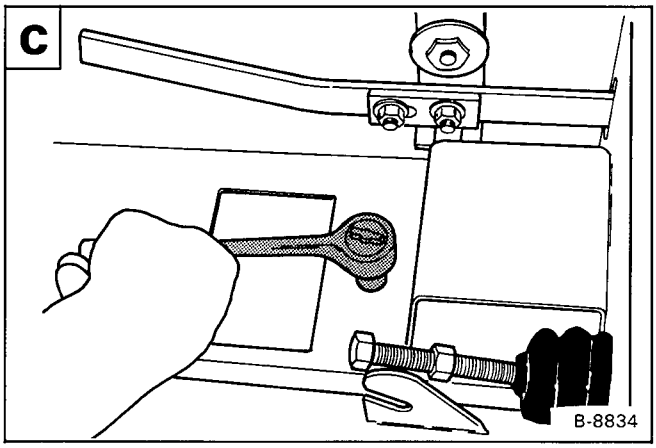


Remove the brake pedal [B].

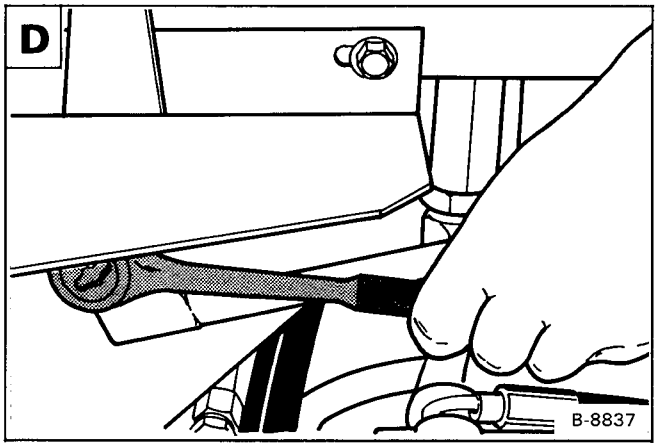
Remove the hydraulic foot pedals and linkage (See Page 2—60 or 2—61 for the correct procedure).



Remove the foot rest (both sides) [C].



Disconnect the throttle linkage and remove the throttle lever [D].



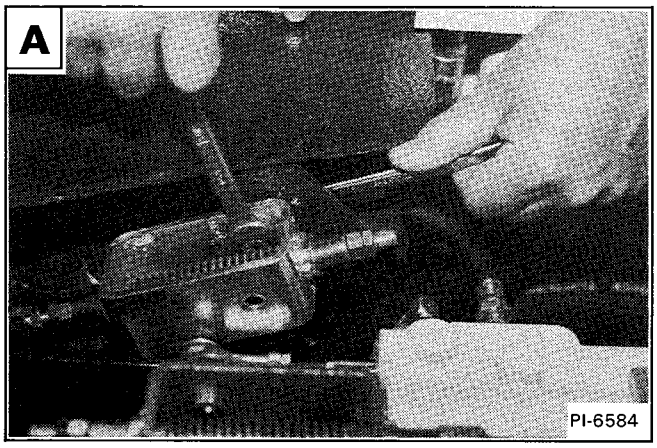
STEERING LINKAGE (S/N 16000 Thru 29869) (Cont'd)

NOTE: TORQUE ALL STEERING LINKAGE HARDWARE TO GRADE 5 SPECIFICATIONS UNLESS OTHERWISE SPECIFIED.

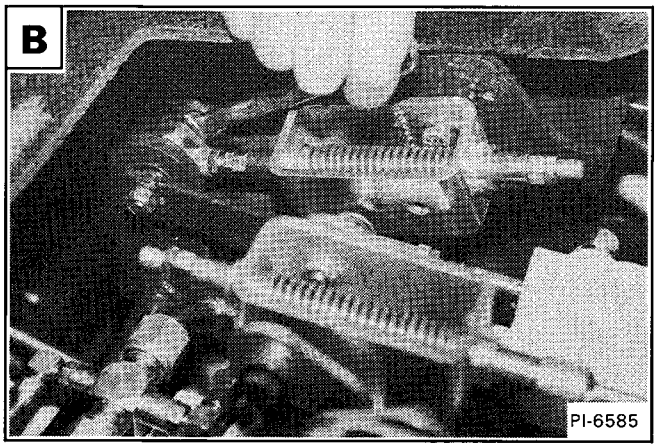
Steering Lever Centering Spring Mechanism

To remove, install or repair the centering spring mechanism, use the following procedure:

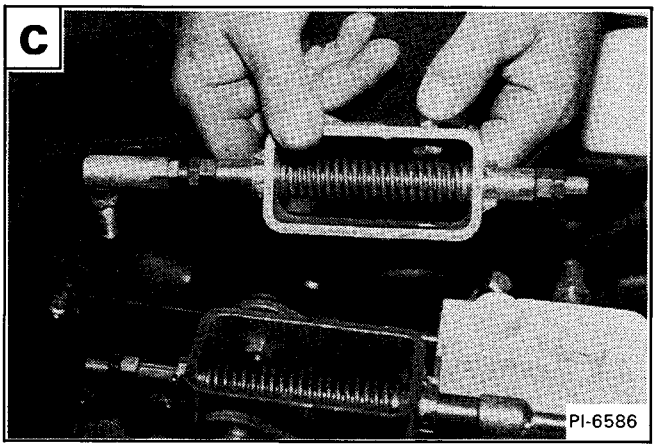
Remove the bolt and nut from the mounting bracket [A].



Remove the bolt and nut from the steering lever [B].

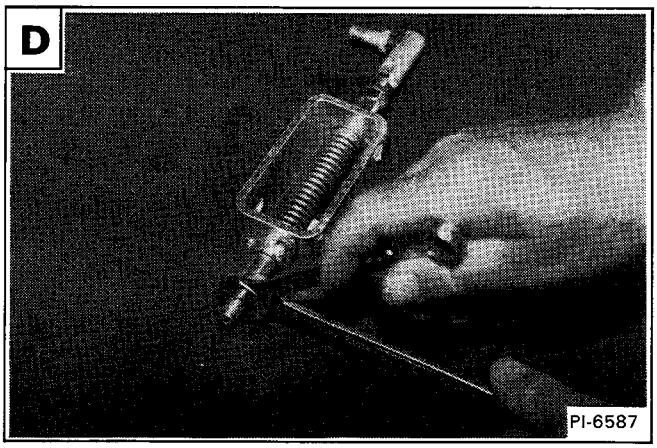


Remove the centering spring assembly [C].



Remove the lock nuts [D].

Installation: Tighten the lock nuts to 16-20 ft.-lbs. (22-27 Nm) torque.



STEERING LINKAGE (S/N 29870 Thru 31863) (Cont'd)

9. Make a final adjustment on the clevis threaded rod [A]. Tighten the clevis jam nut.

NOTE: **The servo spool has a neutral band of approximately 0.10" (0,25 mm) in width. The steering lever centering should position the spool near the center of this neutral band when the pintle levers are positioned at absolute neutral by their centering springs.**

10. Stroke the steering lever forward and backward letting it return to neutral by itself several times. If the wheels do not creep the adjustment is correct.

11. Repeat the above steps to adjust neutral of the other pump.

Steering Lever Centering Spring Mechanism

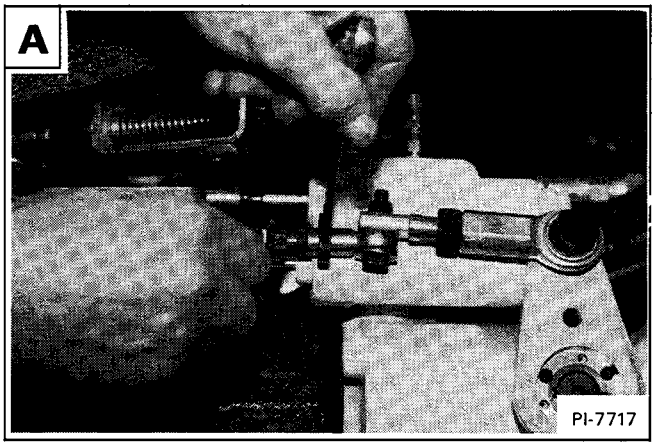
The remove and disassemble the steering lever centering spring mechanism, See Page 3—19 (S/N 2600 thru 29869) for the procedure.

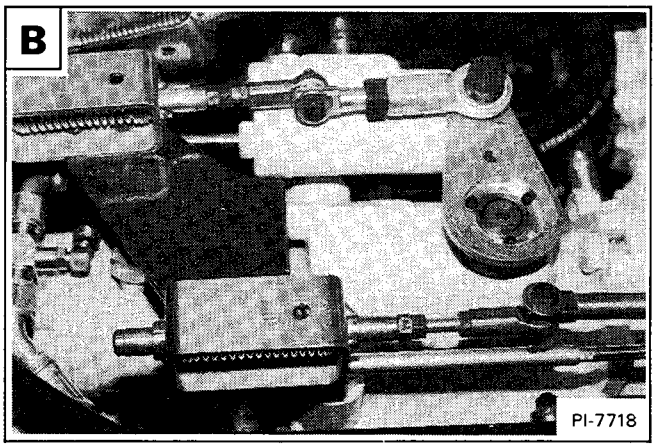
Creep Centering Spring Mechanism

To remove and disassemble the spring mechanism, See Page 3—20 (S/N 26000 thru 29869), the photo's may look different but the procedure is the same [B].

Pintle Arm

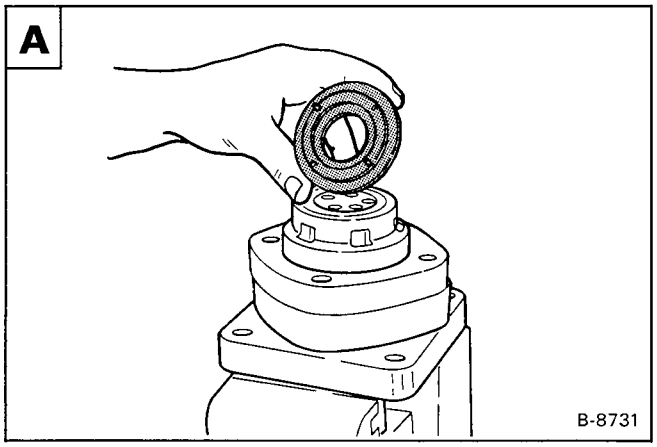
To remove and install the hydrostatic pump pintle arm See Page 3—25 (S/N 26000 thru 29869), the photo's may be different by the procedure is the same [B].





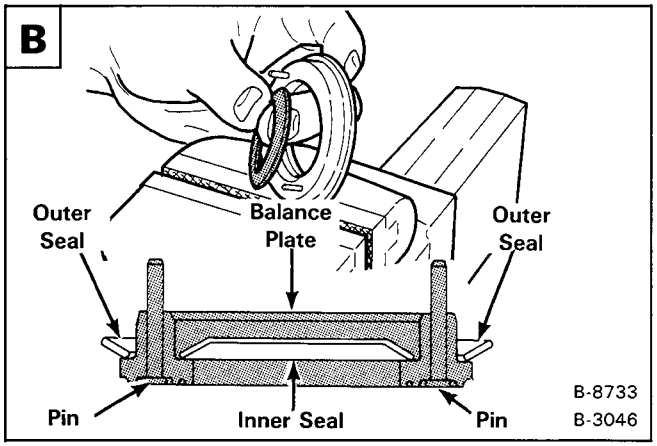
HYDROSTATIC MOTOR (Cont'd)

Remove the balance plate [A].



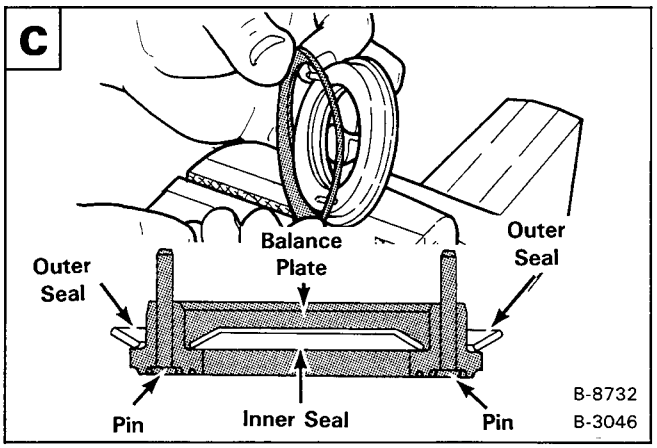
Remove the inner seal from the balance plate [B].

Assembly: Put grease on the inner seal and install as shown [B].

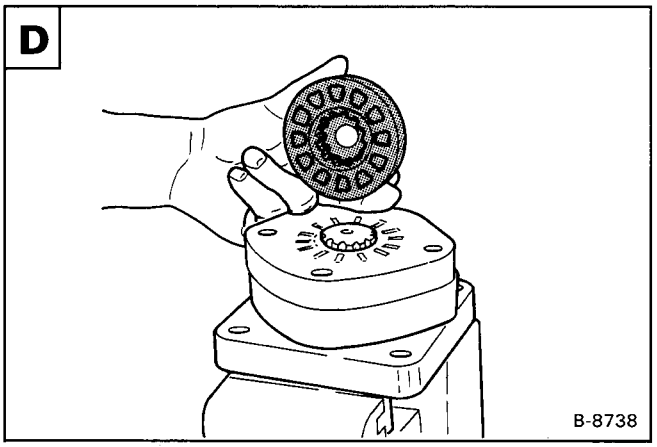


Remove the outer seal from the balance plate [C].

Assembly: Put grease on the outer seal and install as shown [C].

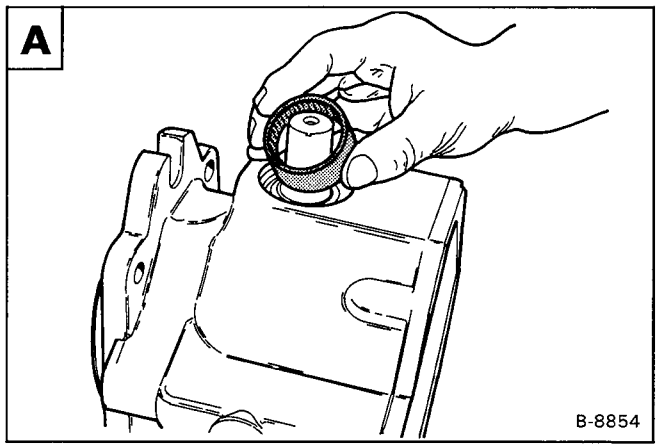


Remove the valve [D].

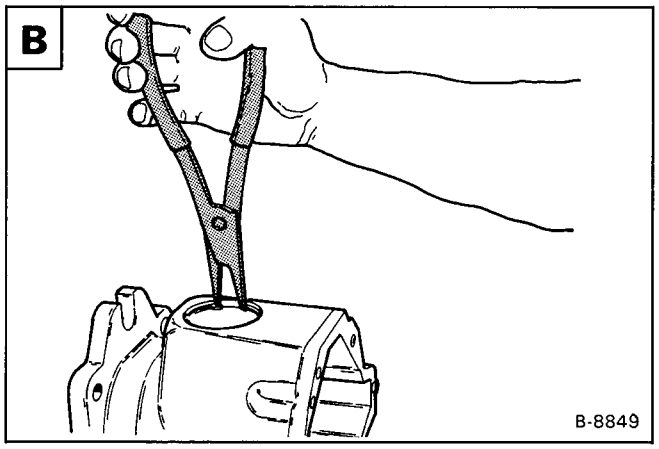


Remove the bearing from the pintle shaft [A].

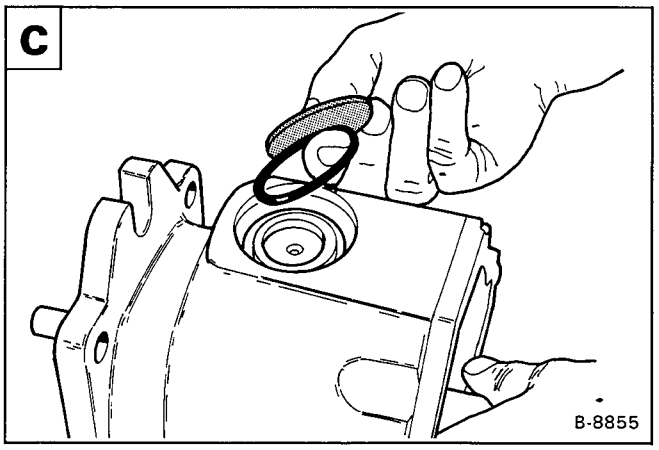
Assembly: When installing the bearing, make sure the number side of the bearing is toward the outside.



Remove the snap ring from the camplate shaft on the other side. Remove the cover [B].

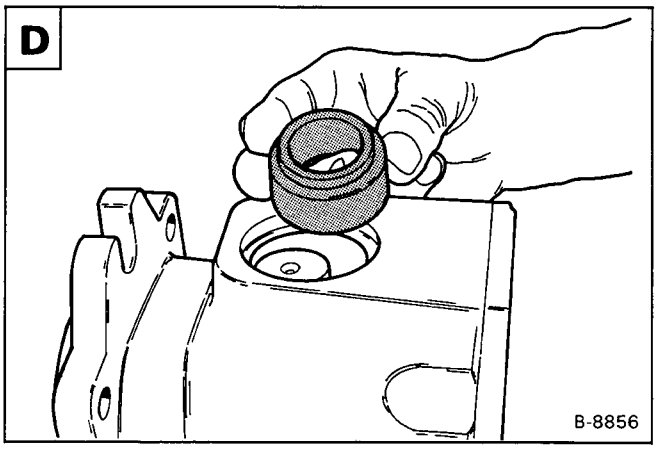


Remove the O-ring [C].



Remove the bearing and race [D].

Assembly: When installing the race make sure the chamfer side is toward the camplate.

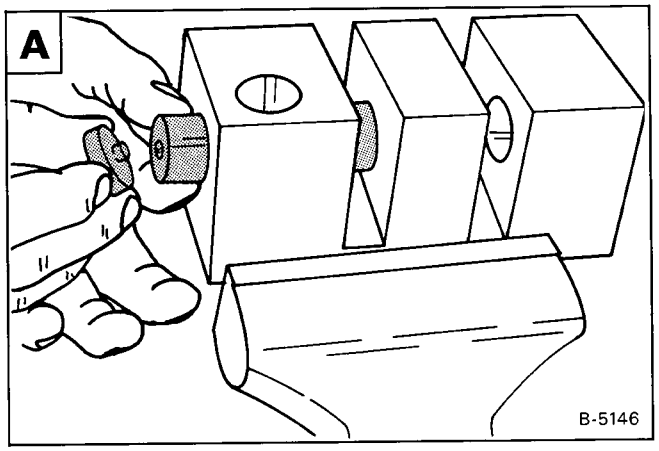


PARKING BRAKE (Cont'd)

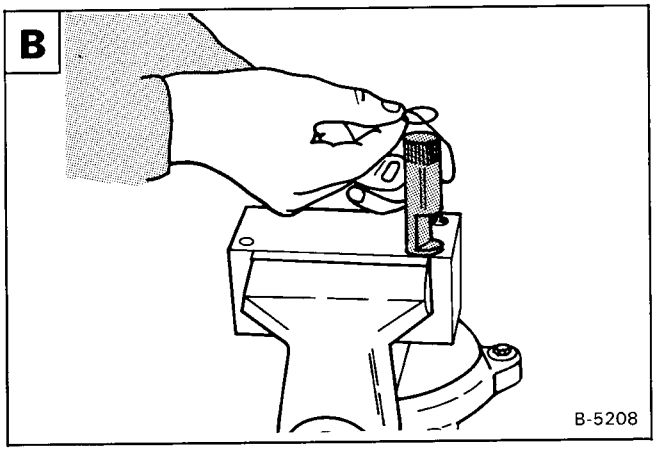
Remove the pucks form the block [A].

Check the pucks for wear or damage. The pucks can be turned 180° and the smooth side used again.

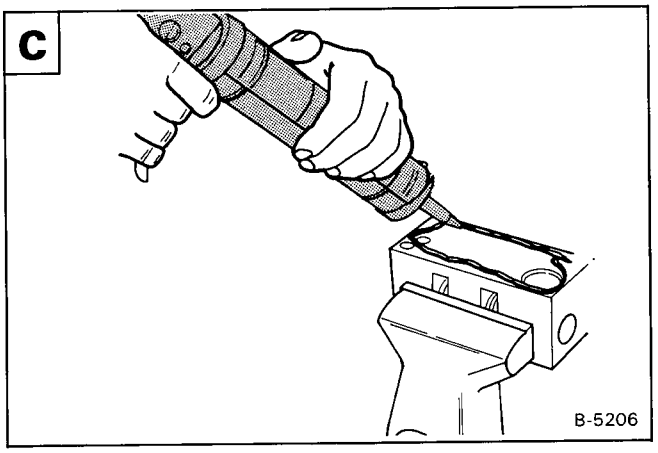
Check for a good fit between the pucks and block bore. They must slide in and out freely.



Install a new O-Ring on the cam pin [B].

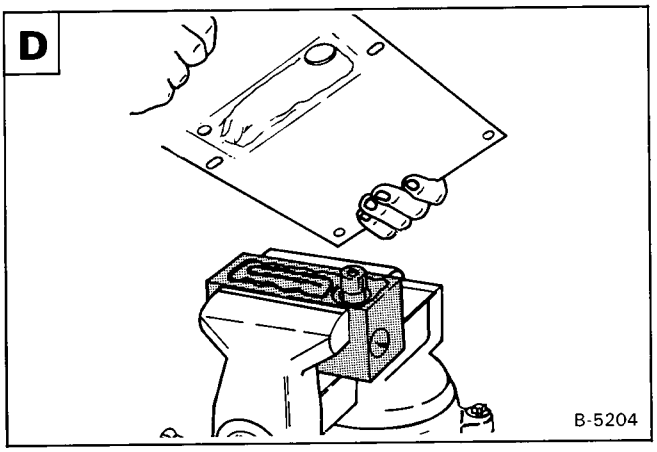


Clean and dry the block and put a bead of R.T.V. sealant on the brake block [C].



Install the center cover on the brake block [D].

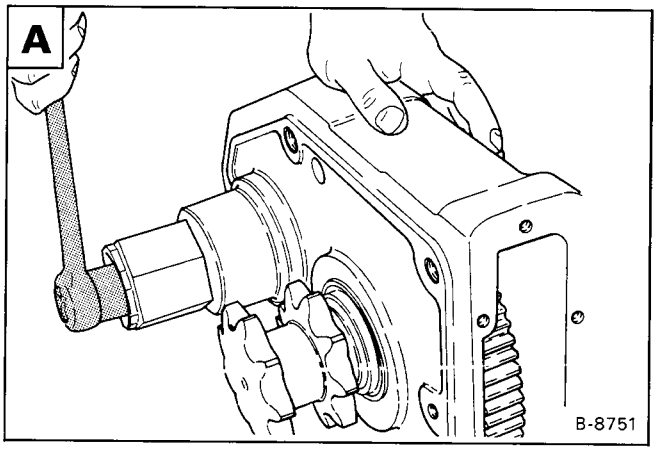
Install the bolts and tighten.



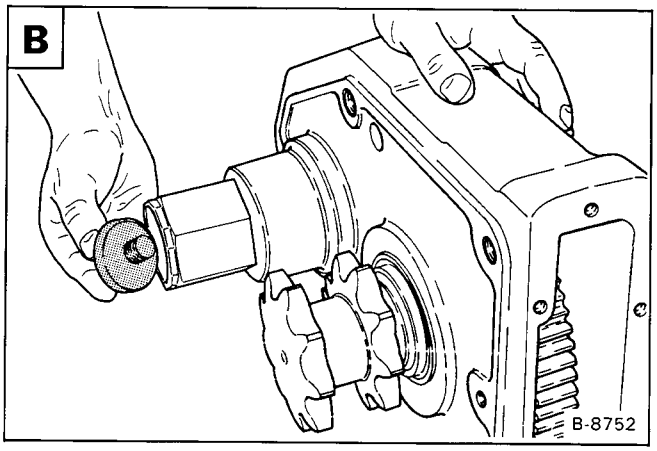
REDUCTION GEARCASE (Cont'd)

Remove the bolt at the disc hub [A].

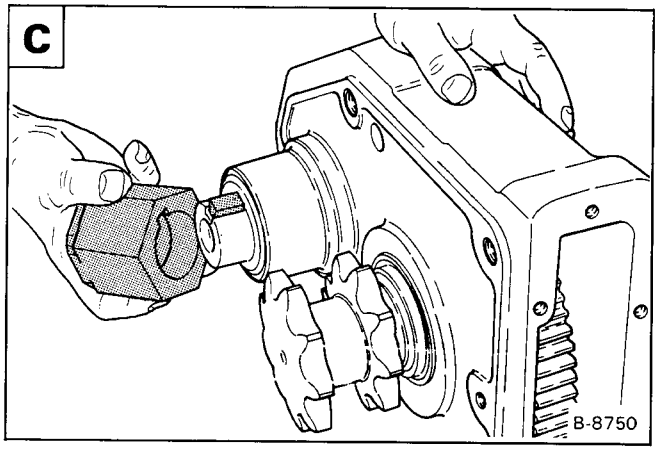
Installation: Put Loctite on the bolt and tighten to 210-235 ft.-lbs. (285-305 Nm) torque.



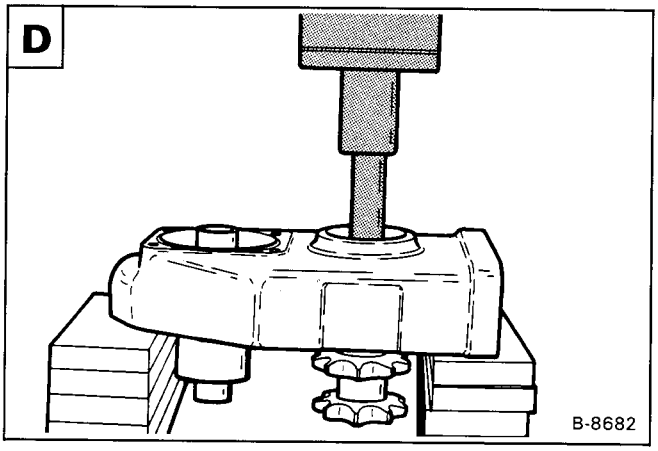
Remove the bolt and washer [B].



Remove the disc hub and key [C].



Put the gearcase housing in the press and remove the output shaft [D].



OPERATOR CAB (S/N 20001 & Above)

Removal and Installation

Remove the stop blocks at the rear of the operator cab [A].

IMPORTANT

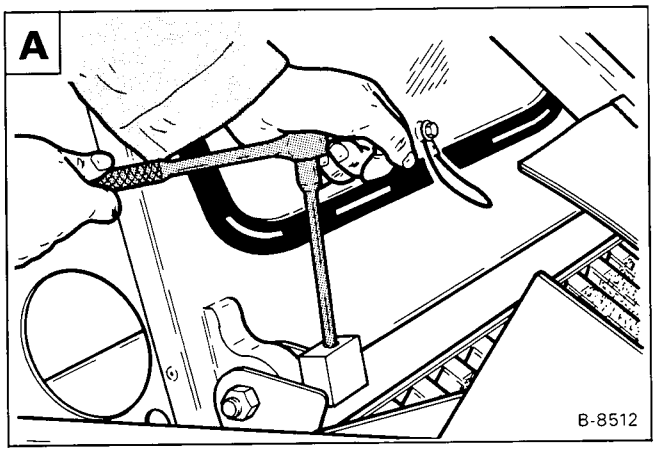
After the stop blocks are removed and the operator cab has a rear window, REMOVE THE REAR WINDOW to prevent damage to the rear window.

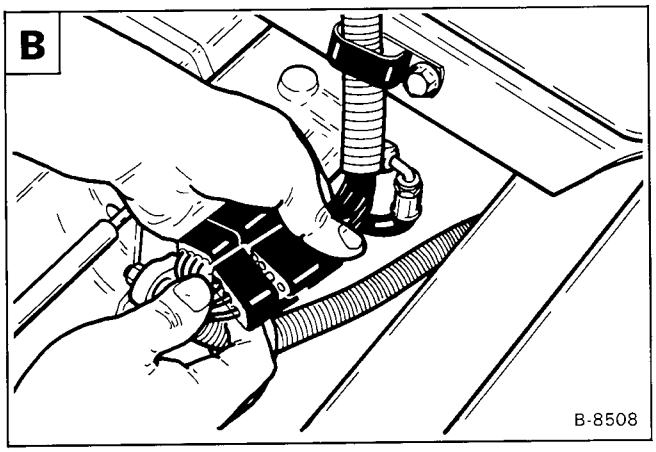
Raise the operator cab (See Page 1—7 for the correct procedure).

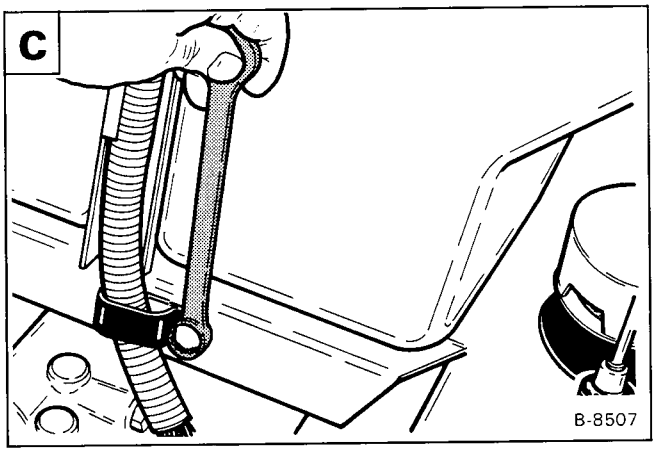
Disconnect the electrical harness [B].

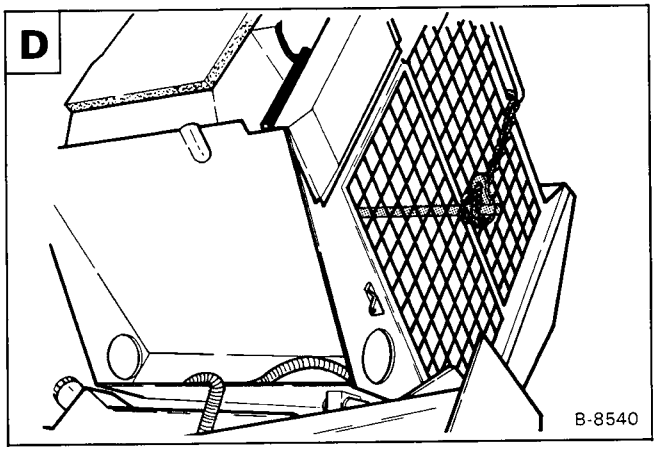
Remove the electrical harness clamp [C].

Install a bar through the operator cab balance point. Install a chain and chain hoist [D].



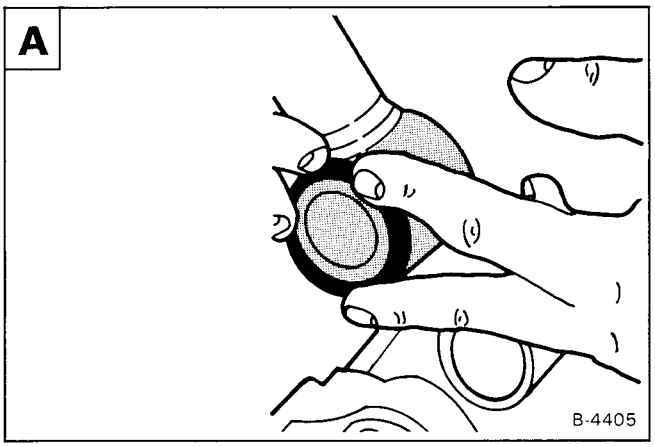






BOB-TACH (Cont'd)

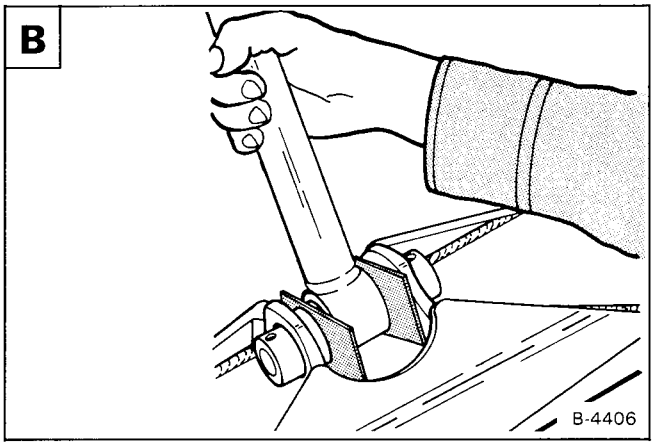
Install the new seals at the rod end [A].



Put a piece of shim stock on each side of the seals [B].

Lift the Bob-Tach with the floor jack and install the rod end into the Bob-Tach frame [B].

Remove the shim stock and finish installing the Bob-Tach

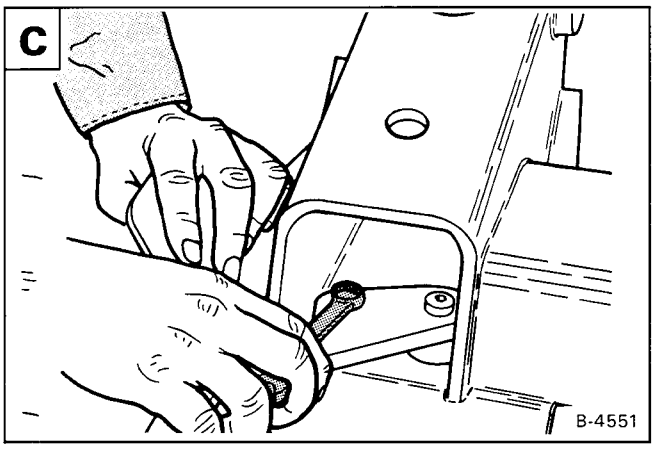


Disassembly and Assembly

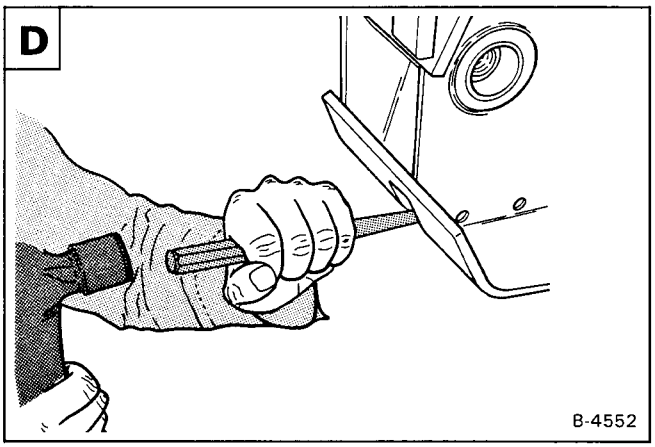
Put the Bob-Tach on a work bench.

Remove the bolt at the Bob-Tach lever [C].

Installation: Tighten the bolt to 25-28 ft.-lbs. (34-38 Nm) torque.



Using a punch and hammer, remove the Bob-Tach wedge and spring assembly from the frame [D].



CAB HARNESS

WIRE LEGEND

NO.'s	COLOR	GAUGE
1D	Red	12
1F	Red	16
10A	Black	12
10B	Black	12
12	Orange	16
12A	Orange	18
12B	Orange	12
12C	Orange	16
12F	Orange	18
12L	Orange	18
12T	Orange	18
19C	Red/White	16
19F	Red/White	16
19H	Red/White	18
19L	Red/White	16
19S	Red/White	16
19W	Red/White	16
21R	White	16
21RM	White	16
23F	White/Black	16
26	Lt. Blue	16
28	Lt. Blue/Black	16
30	Black	16
30F	Black	16
30G	Black	16
30T	Black	16
31FP	Yellow	16
31P	Yellow/Green	18
32FPT	Yellow	18
32PT	Yellow	18
35H	Yellow/Brown	18
36	Purple	16
36T	Purple/White	18
40FL	Black	16
40FR	Black	16
40R	Black	16
41	Pink	16
42FL	Dk. Blue	16
42FR	Dk. Blue	16
42R	Dk. Blue/White	16
46	Brown	16
46L	Brown	16
46R	Brown	16
49F	Gray	16
49T	Gray	16
49V	Gray	16
60W	Black	16
66	Orange/Green	16

PARTS LEGEND

1. Harness Connectors
2. Operator Cab Ground
3. Fuel Sender
4. Back-Up Alarm (Opt.)
5. Rear Lamp
6. Tail Lamp
7. Left Flasher Lamp (Opt.)
8. Left Front Lamp
9. Wiper (Opt.)
10. Wiper Switch (Opt.)
11. Shut Down Module (Opt.)
12. Flasher (Opt.)
13. Right Front Lamp
14. Right Flasher Lamp (Opt.)
15. Engine Temperature Gauge
16. Fuel Gauge
17. Light Switch
18. Trans. Warning Light
19. Engine Warning Light
20. Fuse - Ignition
21. Fuse - Accessory
22. Voltmeter
23. Ignition Switch
24. Hourmeter

- ● Tee splice
- ○ Butt splice

ENGINE HARNESS

WIRE LEGEND

NO.'s	COLOR	GAUGE
0	Black	Cable
1	Red	Cable
1A	Red	8
1B	Red	10
1C	Red	12
1D	Red	12
10A	Black	12
12C	White/Orange	16
14F	Lt. Green	16
14R	Lt. Green/White	16
21R	White	16
21S	White/Green	12
23F	White/Black	16
28	Lt. Blue/Black	16
28B	Lt. Blue/Orange	8
28S	Lt. Blue/Yellow	16
31P	Yellow/Lt. Green	16
32F	Yellow/Dk. Blue	16
32PT	Yellow	16
32T	Yellow/Black	16
35H	Yellow/Brown	16
36T	Purple/White	16
60BA	Black	16
60B	Black	16
66	Orange/Green	16

PARTS LEGEND

1. Harness Connectors
2. Unfused & Live Accessories
3. Engine Connector
4. Back-Up Alarm Switchs (Opt.)
5. Trans. Oil Temperature Switch
6. Trans. Charge Pressure Switch
7. Starter
8. Engine Oil Pressure Switch
9. Fuel Shut-Off Solenoid (Internal)
10. Hydraulic Fluid Filter Pressure Switch
11. Glow Plugs
12. Engine Coolant Temp. Sender
13. Diode
14. Alternator
15. Battery
16. Pre-Heat Relay
17. Start Relay
18. Frame Ground
19. Engine Ground

CAB HARNESS

WIRE LEGEND

PARTS LEGEND

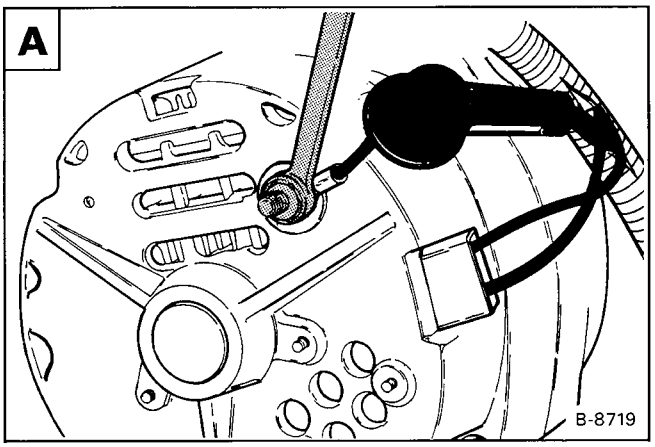
ALTERNATOR (Cont'd)

Removal and Installation

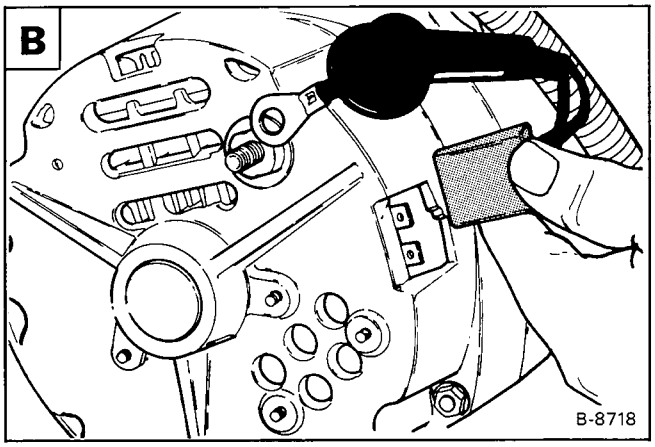
Remove the belt shield at the engine.

Disconnect the negative (—) cable at the battery.

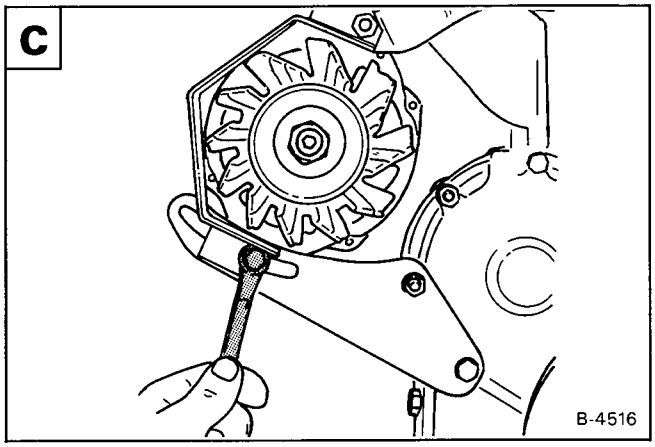
Disconnect the wire at the "BAT" terminal [A].



Disconnect the No. 1 & 2 terminals [B].

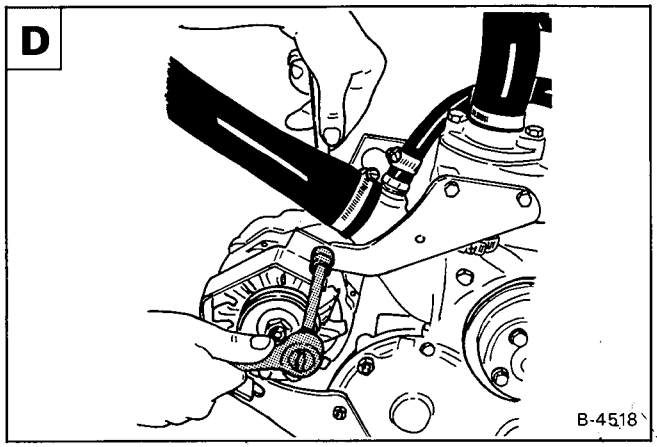


Remove the adjustment bolt [C].



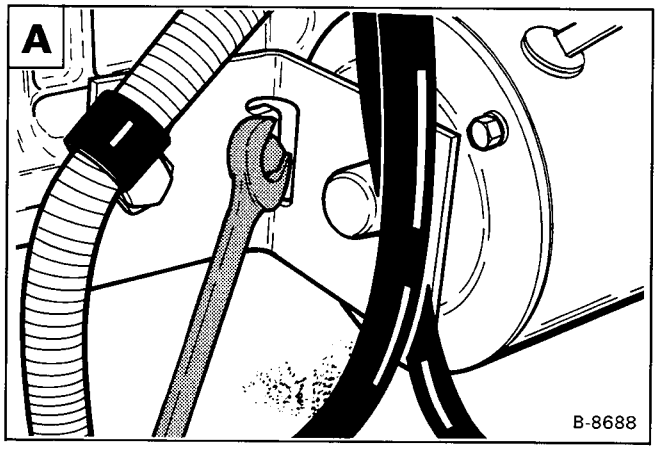
Remove the mounting bolt [D].

Remove the alternator from the engine.

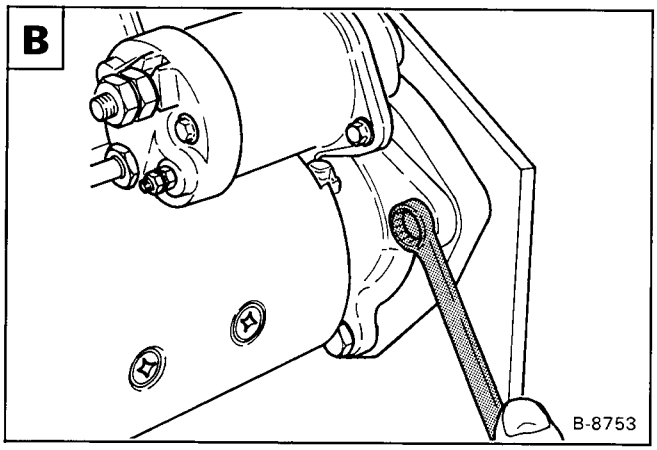


STARTER (Cont'd)

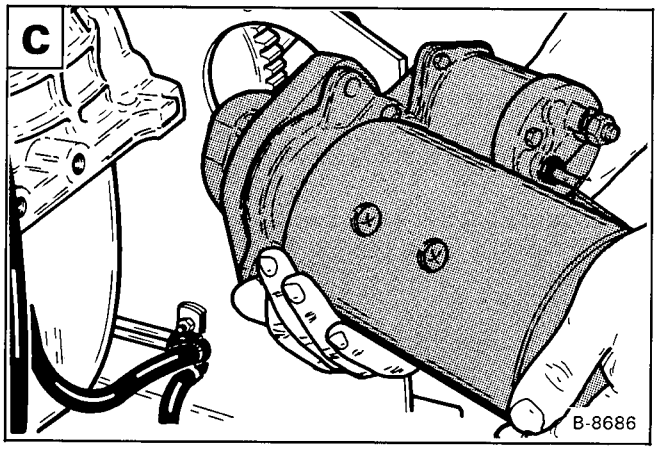
Remove the bolts at the starter bracket [A].



Remove the starter mounting bolts [B].



Remove the starter from the engine [C].



ENGINE COMPRESSION

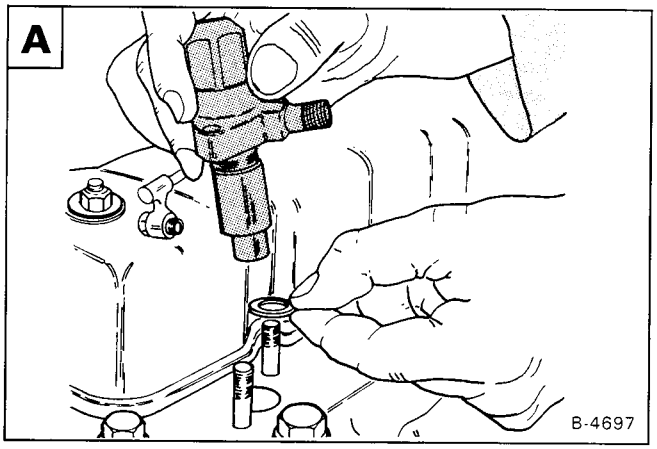
Checking

The tools listed will be needed to do the following procedure:

MEL-10630 — Engine Compression Kit

The engine must be at operating temperature.

Remove the fuel injectors (See Page 7A—11) [A].

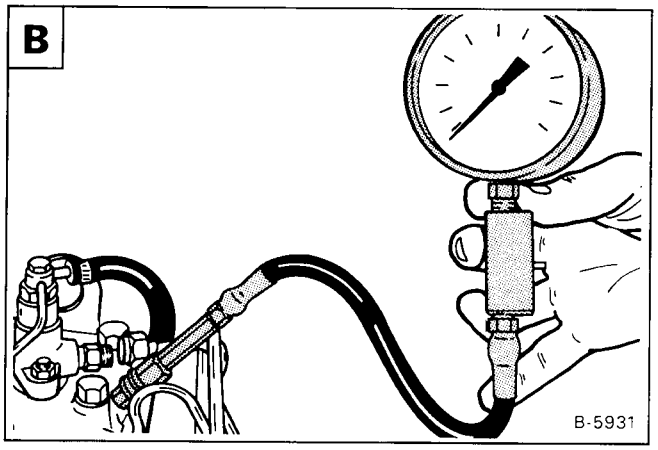


Install the correct compression adapter into the engine.

Connect the compression gauge [B].

The engine must be turning at about 300 RPM.

The compression must be between 300 - 500 PSI (2069 - 3448 kPa) with no more than 50 PSI (345 kPa) difference between cylinders.



ENGINE

Removal and Installation

Lift and block the loader (See Page 1—2 for the correct procedure).

Raise the operator cab (See Page 1—7 for the correct procedure).

Remove the batteries (See Page 6—2 for the correct procedure).

Disconnect all the wires at the two solenoids.

Disconnect the engine wire harness [A].

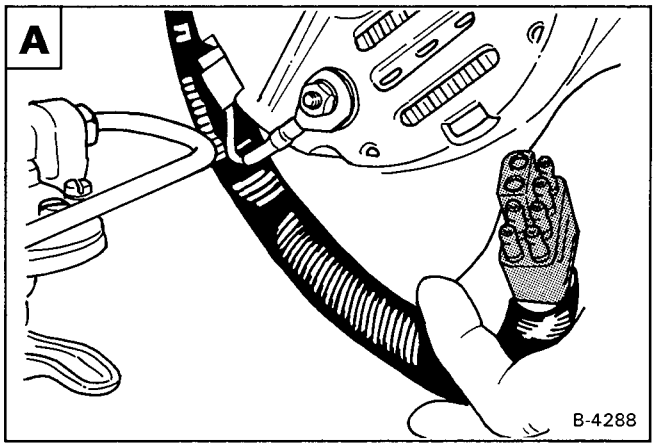
Disconnect the ground wire at the left side of the engine.

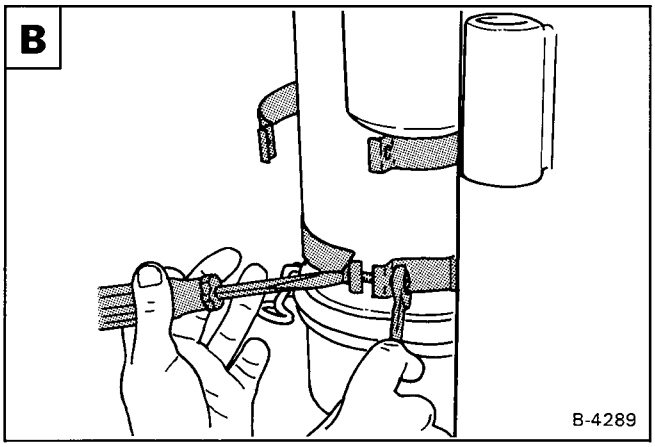
Remove the air cleaner hose at the intake manifold.

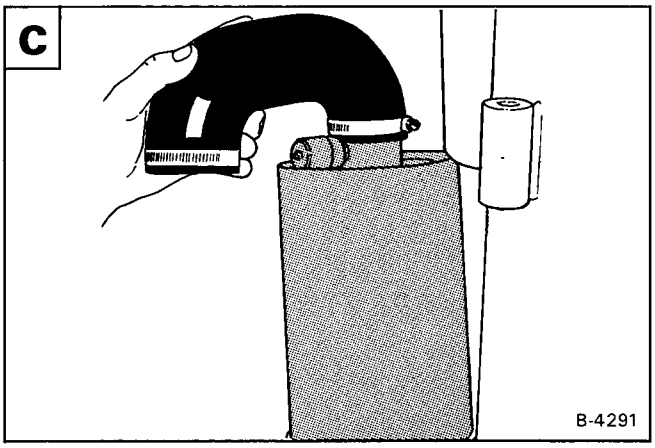
Remove the bolts and nuts at the air cleaner clamps [B].

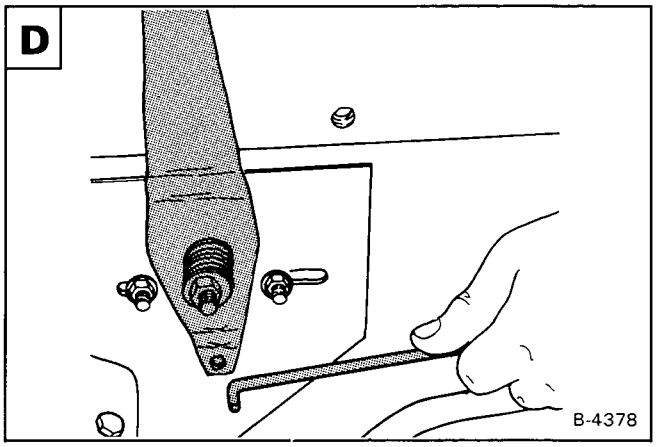
Remove the air cleaner assembly from the engine compartment [C].

Disconnect the throttle linkage at the throttle lever [D].









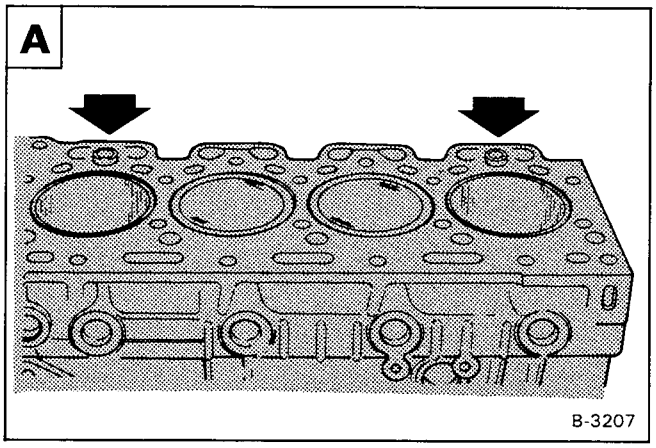
CYLINDER HEAD (Cont'd)

Installing the Cylinder Head

Install a new head gasket. Install it dry, no gasket cement is needed.

When the new head gasket is installed, make sure it is positioned correctly over the dowel pins and the markings "TOP" and "FRONT" are located correctly [A].

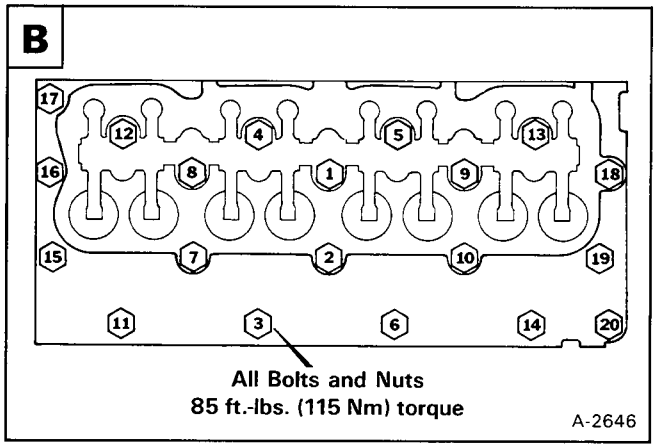
Put oil on the threads of the head bolts. Install the head bolts.



Tighten the bolts in the correct sequence [B]. Do this in a three step procedure to 85 ft.-lbs. (115 Nm) torque.

Example: First tighten all bolts to 30 ft.-lbs. (41 Nm) torque, then 65 ft.-lbs. (88 Nm) torque and then the final torque.

To reduce the risk of early cylinder head gasket failure, after a cylinder head has been fitted, the loader is to be operated under a partially load for about a half an hour. Then re-torque the bolts again. It is not a good practice to just run the engine without a load to bring it to operating temperature.



Install the push rods. Install the rocker arms and support brackets.

Adjust the valve clearance (See Page 7A—2).

Install the valve cover.

Install the fuel injector nozzles and fuel tubelines.

Install the fuel filter and bracket.

Install radiator hoses.

Add coolant to the engine and radiator.

MAIN BEARINGS

The crankshaft has five main bearings. The end play is controlled by a thrust washer on both sides of the center main bearing.

Each main bearing cap has an identification mark in relation to the engine block [A].

The position of each cap can not be changed from the original location.

Removal

Remove the oil pan. Remove the oil pump (See Page 7A—47).

Remove the bolts from the main bearing caps.

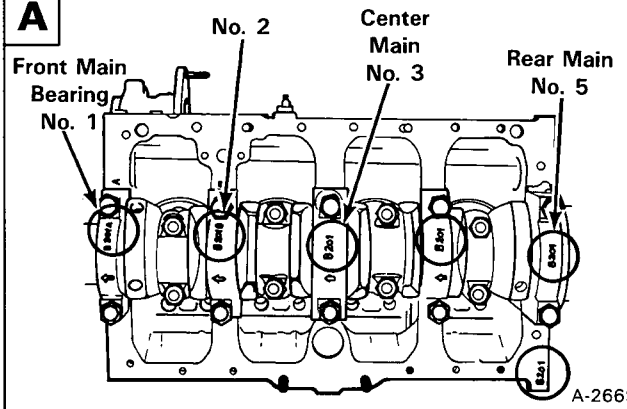
Remove the main bearing cap and remove the bearing from the cap half.

Remove the top half of the bearing by pushing on one side of the bearing and rotating the crankshaft [B].

On the center main bearing, remove the cap and thrust washers from each side of the cap [C].

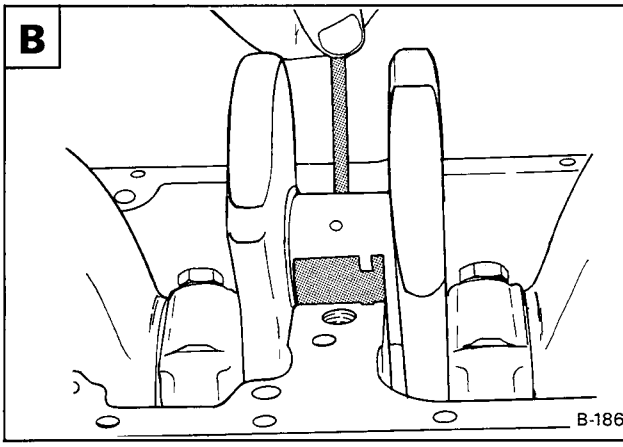
Remove the top half of the bearing and thrust washer by pushing on one side of the bearing and rotating the crankshaft [D].

A



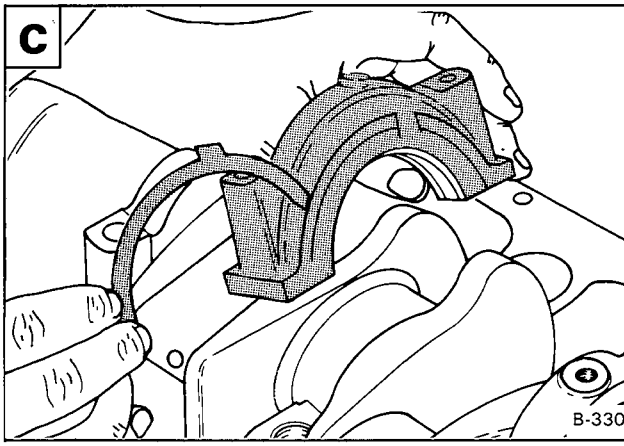
A-2669

B



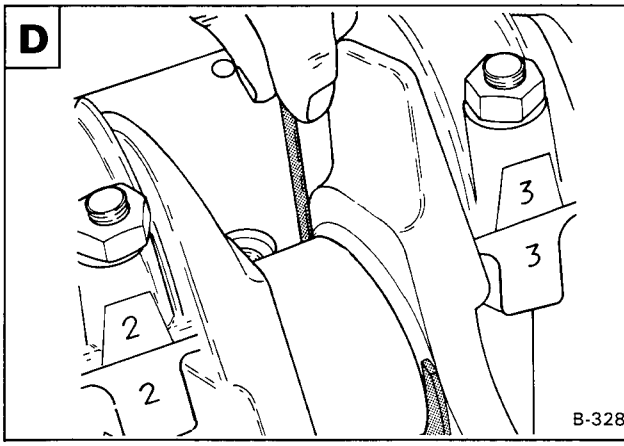
B-1865

C



B-3308

D



B-3289

TIMING CASE

Removal and Installation

Remove the timing case cover (See Page 7A—38).

Remove the idler gear (See Page 7A—39).

Remove the camshaft gear (See Page 7A—41).

Remove the fuel injection pump drive gear (See Page 7A—42).

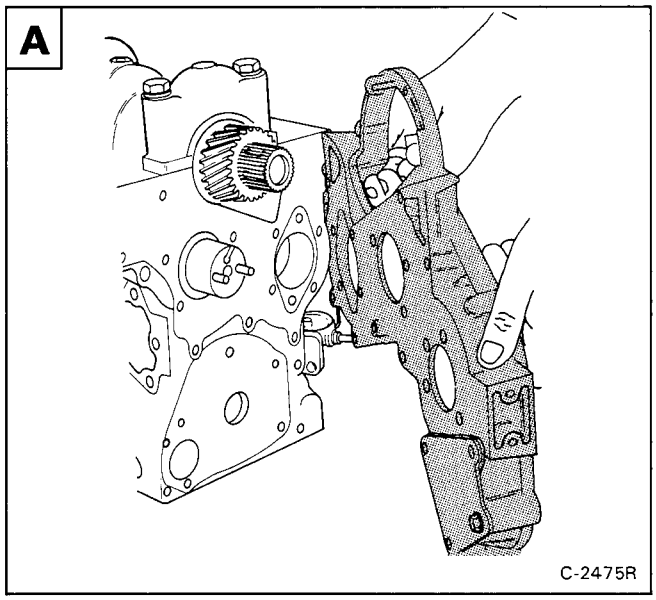
NOTE: The crankshaft gear does not have to be removed.

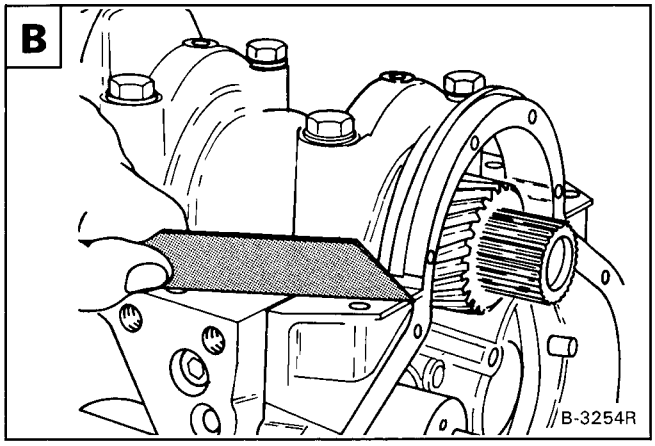
Remove the front bolts at the oil pan.

Remove the bolt and washers from the timing case.

Remove the timing case [A].

Installation: Check that the bottom of the timing case is even with the face of the oil pan attaching surface [B].





ENGINE SERVICE (200 Series)

Continued on Next Page

TIMING THE FUEL INJECTION PUMP

Procedure

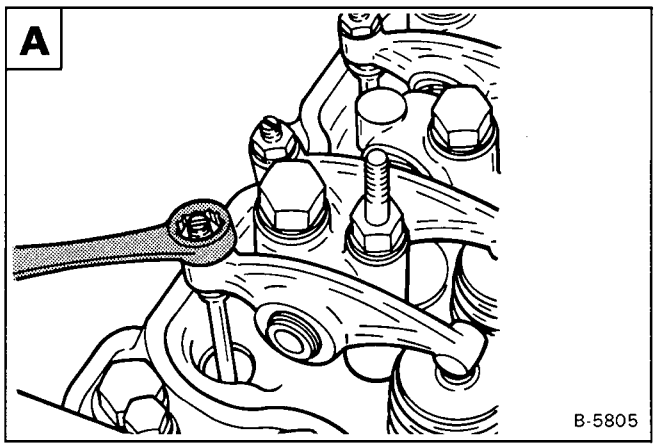
The tool listed will be needed to do the following procedure:

MEL-1201 — Timing Tool

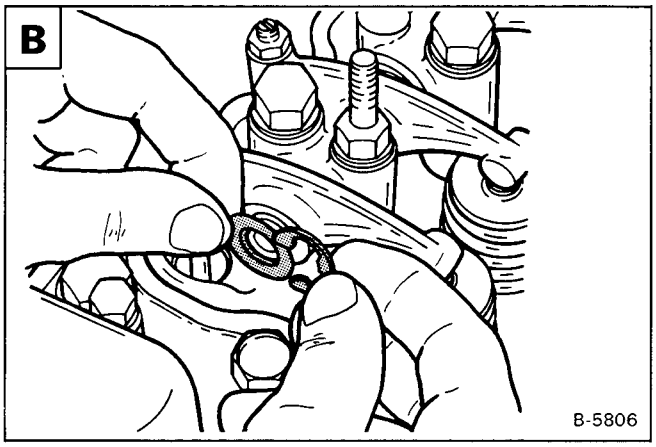
Remove the valve cover.

Turn the engine crankshaft until No. 1 piston is at TDC on the compression stroke. Both valves at No. 4 cylinder are moving.

Loosen the adjustment bolt at the rocker arm intake valve [A].

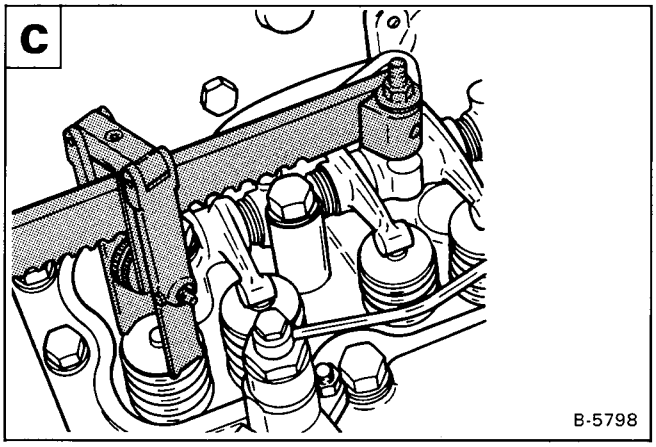


Remove the snap ring at the end of the rocker arm shaft and remove the rocker arm [B].



Remove the valve spring [C].

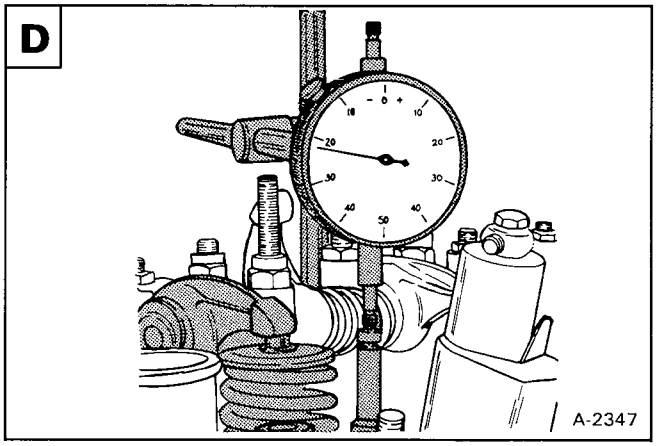
Put the valve head on the top of the piston crown.



Install a dial indicator on the top of the valve stem [D].

Turn the engine crankshaft backward and forward a small amount to find TDC (maximum piston height) and zero the dial indicator.

Remove the high pressure fuel lines from the injection pump.



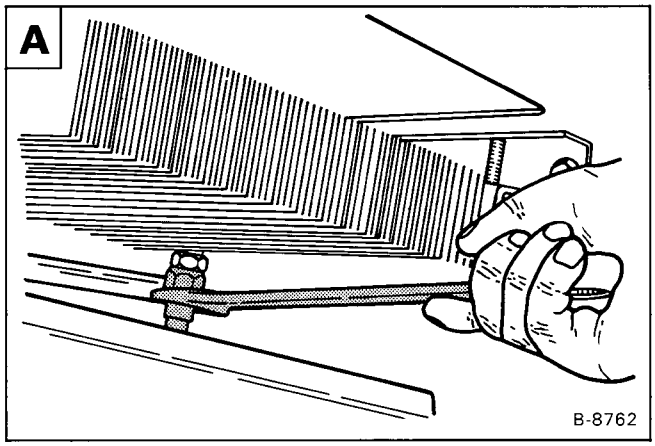
OIL COOLER

Removal and Installation

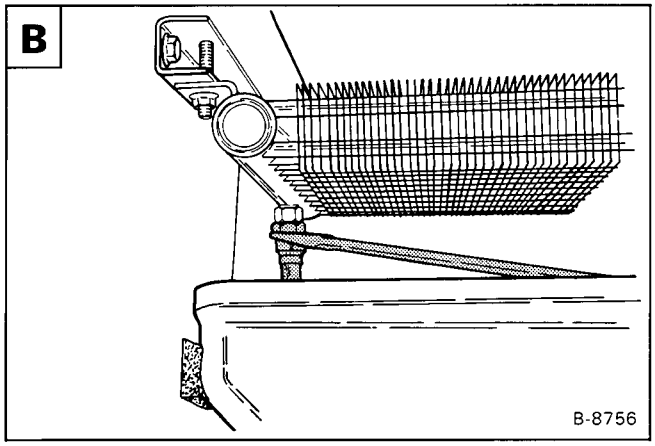
Remove the panels above the engine on the blower housing.

Remove the radiator (See Page 7B—17).

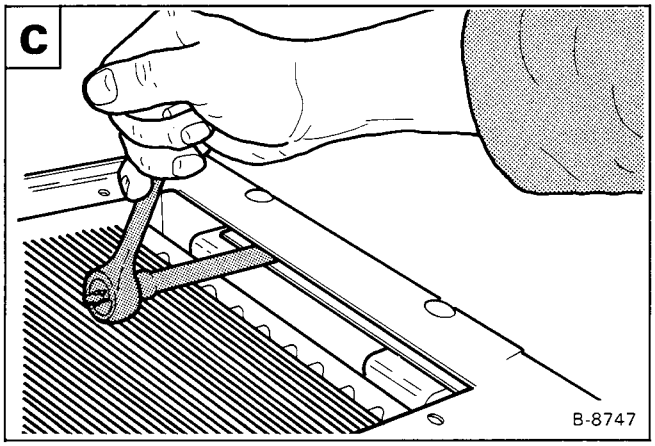
Disconnect the tubeline at the right side of the oil cooler [A].



Disconnect the tubeline at the left side of the oil cooler [B].

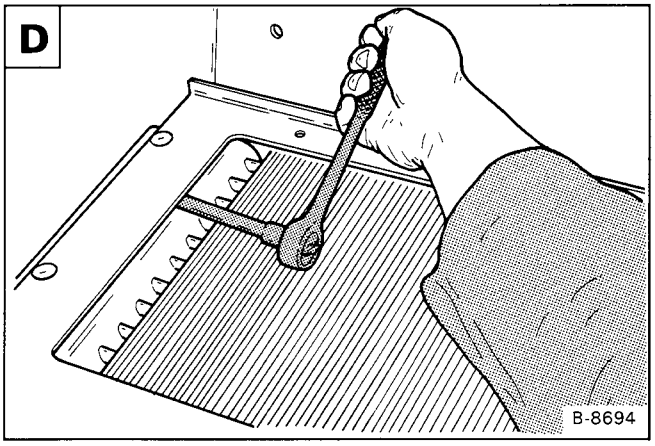


Remove the bolts at the right side bracket for the oil cooler [C].



Remove the bolts at the left side bracket for the oil cooler [D].

Remove the oil cooler from the mounting frame.



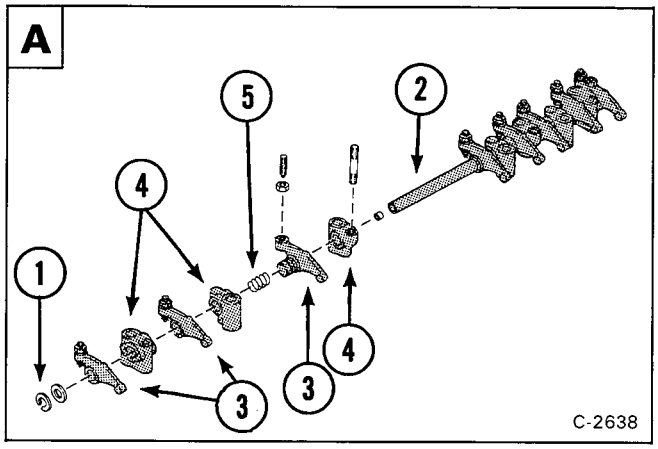
ROCKER ARMS

Disassembly

Mark the rocker arms and support bracket for correct assembly.

Remove the snap rings (Item 1) from each end of the shaft (Item 2) [A].

Remove the rocker arm (Item 3), bracket (Item 4) and spring (Item 5) [A].



Inspect the rocker arm bushings for wear [B].

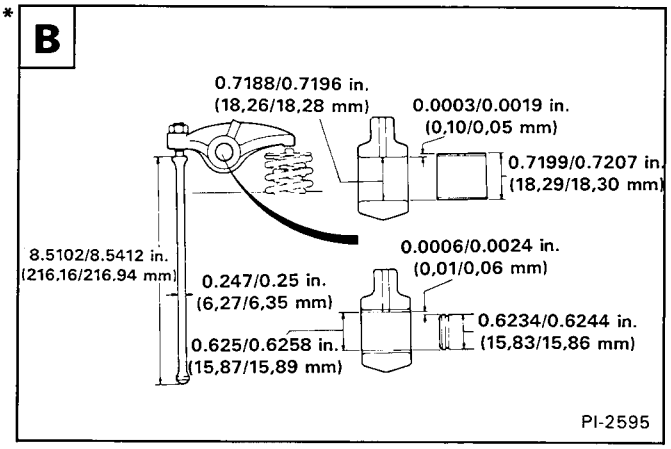
Replace the parts as needed.

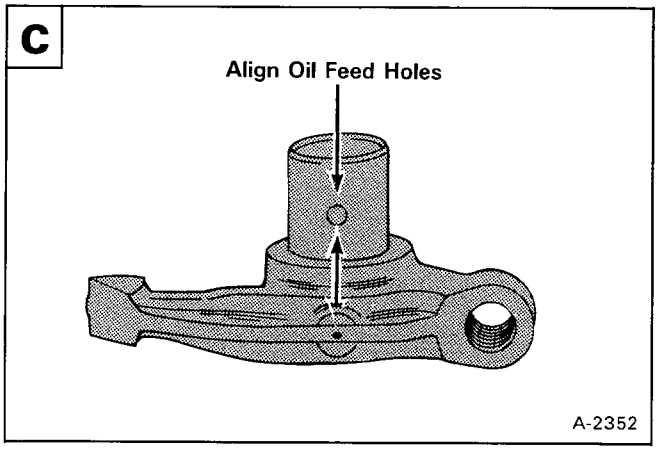
Assembly

When installing a new bushing in the rocker arms, make sure the oil holes are in alignment [C].

Reverse the order of disassembly and make sure that each set of rocker arm pair has the correct off-set.

Put oil on all the parts for protection.



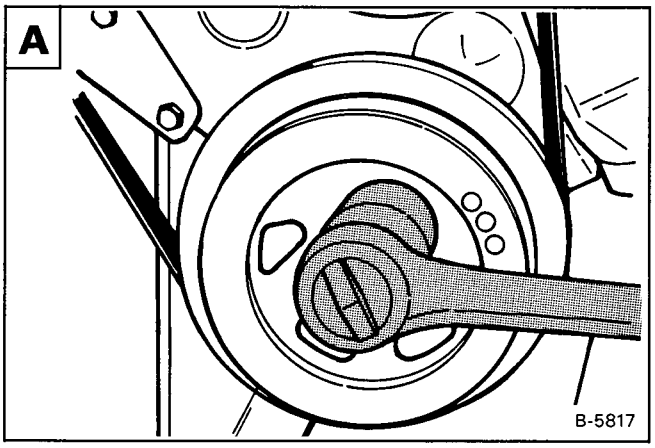


TIMING CASE COVER

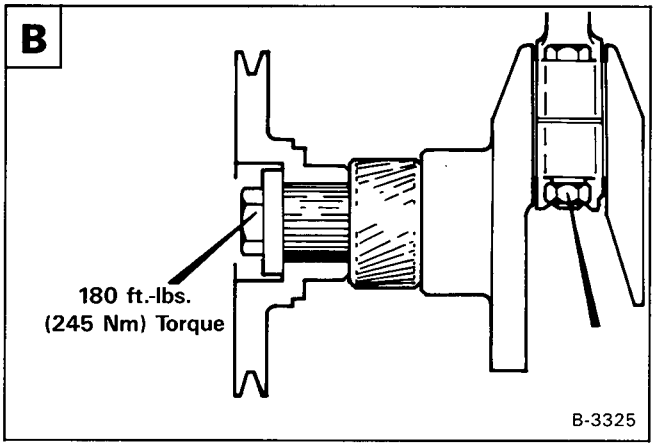
Removal and Installation

Remove the alternator and belt.

Remove the crankshaft pulley bolt [A].

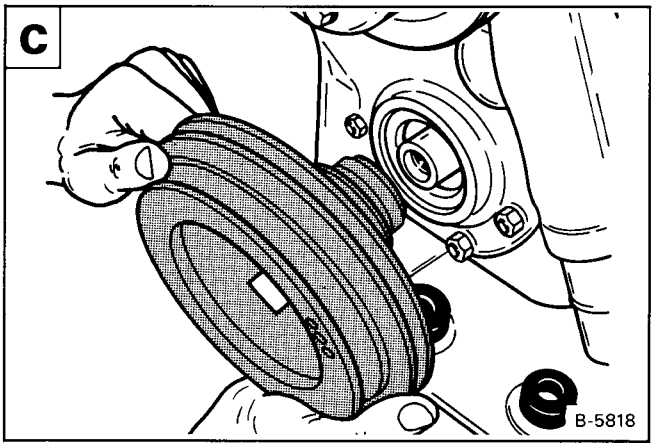


Installation: Tighten the bolt to 180 ft.-lbs. (245 Nm) torque [B].



Remove the pulley from the crankshaft [C].

Remove the bolts and nuts from the cover.



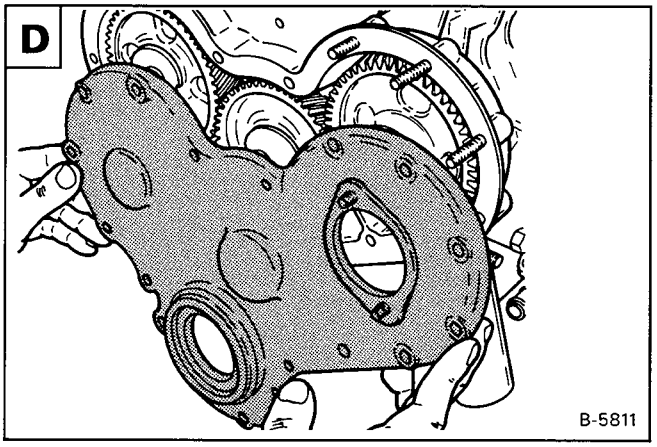
Remove the timing case cover from the engine [D].

Clean the timing case cover and timing case back plate.

Installation: Put a new gasket on the cover. Install the front cover, be careful not to damage the seal.

Install the bolts and finger tighten only. Install the crankshaft pulley to center the front seat on the pulley hub.

Tighten the bolts and nuts. Remove the pulley to tighten the bolts behind the pulley.

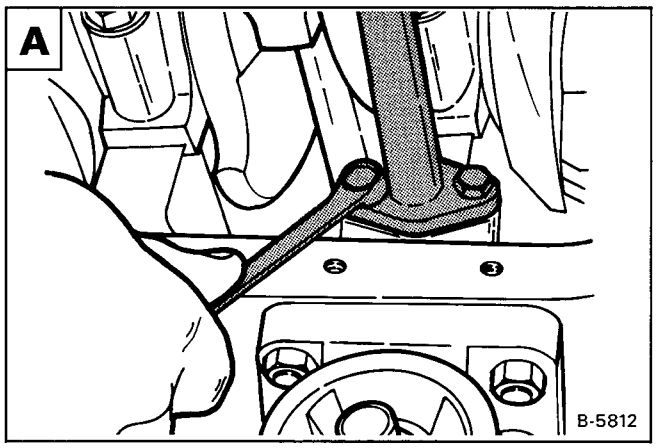


OIL PUMP

Removal and Installation

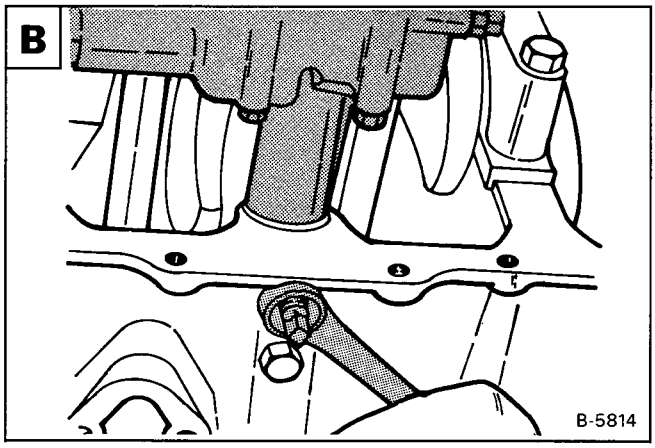
Remove the oil pan.

Remove the bolts which fasten the oil tube to the engine block [A].



Loosen the locknut at the bolt which holds the oil pump in the block [B].

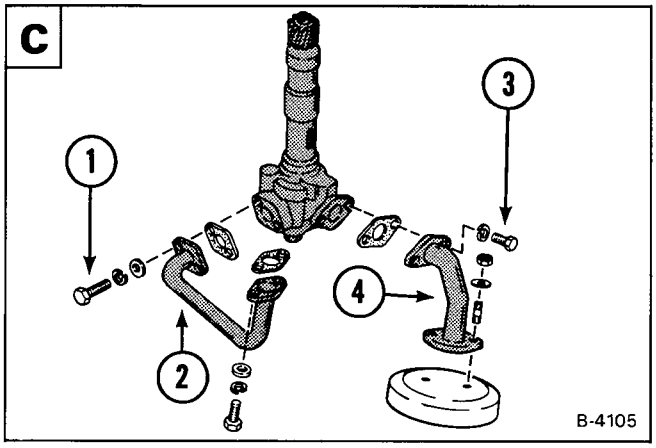
Remove the bolt and remove the oil pump.



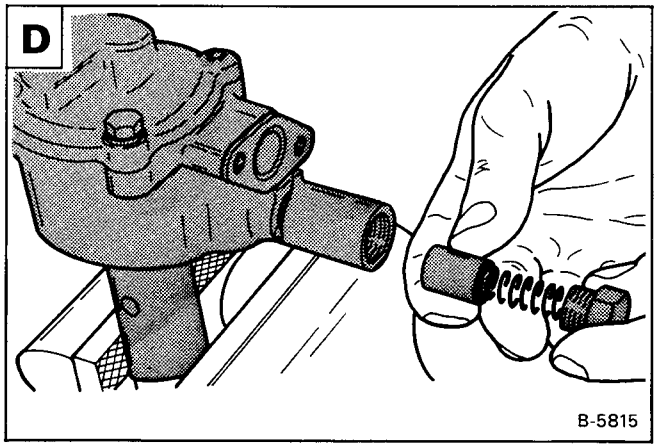
Disassembly and Assembly

Remove the bolts (Item 1) and remove the tube (Item 2) [C].

Remove the bolts (Item 3) and remove the tube (Item 4) with the screen [C].



Remove the relief valve plunger and spring [D].



ENGINE COMPRESSION

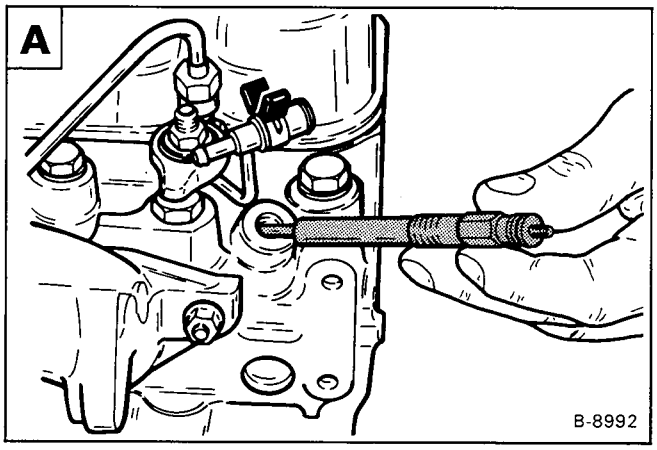
Checking

The tools listed will be needed to do the following procedure:

MEL-10630-1 — Engine Compression Kit
MEL-1268 — Compression Gauge Test Adapter

The engine must be at operating temperature.

Remove the glow plugs (See Page 7C—14 for the correct procedure) [A].



Install the correct compression adapter into the cylinder head.

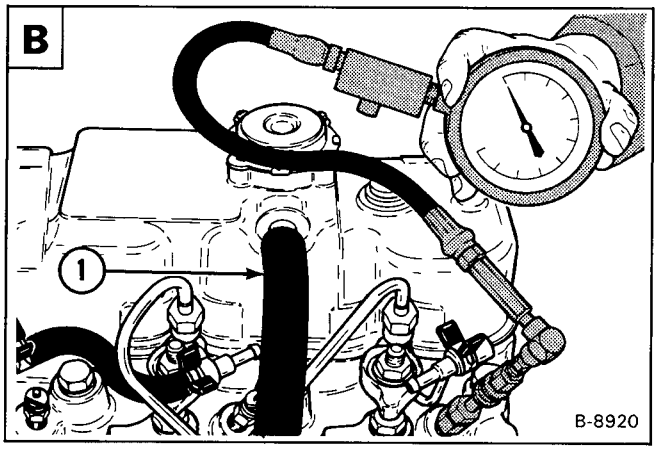
Connect the compression gauge [B].

The engine must be turning at about 175 RPM.

The compression must be between 300 and 500 PSI (2069 - 3448 kPa) with no more than 50 PSI (345 kPa) difference between cylinders.

The engine has an open crankcase ventilation system.

The ventilation hose comes from the valve cover tube (Item 1) and passes down the side of the engine block [B].



If the pressure is not correct, do the following:

Disassemble the injector nozzle and clean.

Replace the shim (Item 6) [A].

Check the pressure again.

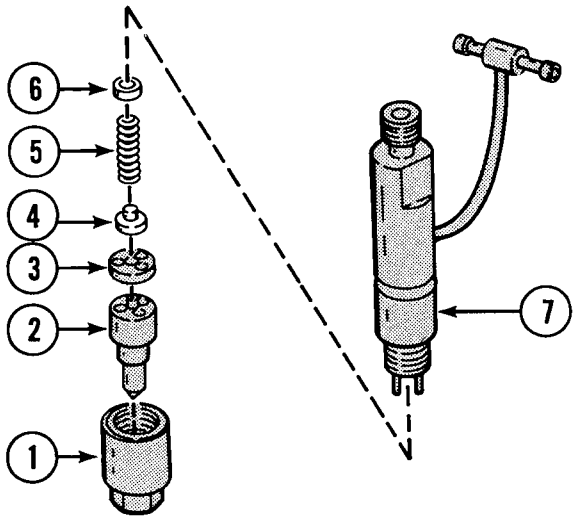
⚠ WARNING

Do not disassemble or test fuel injector nozzles unless you have correct service and testing tools. Keep away from fuel coming from the nozzles. Wear safety goggles. Fuel under pressure can penetrate skin or eyes. If fuel enters skin or eyes, get immediate medical attention. Failure to obey warnings can cause injury or death.

W-2075-0284

Assembly: Tighten the retaining nut (Item 1) to 29-32 ft.-lbs. (39-43 Nm) torque [A].

A



1. Retaining Nut
2. Injection Nozzle
3. Spacer
4. Push Rod
5. Spring
6. Adjusting Shim
7. Nozzle Holder

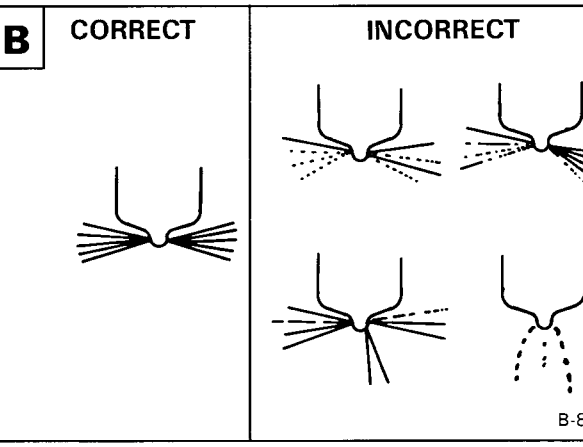
B-8959

Checking nozzles spray pattern [B].

Does not come out the side of the nozzle. Does not have drops coming from the nozzle. Does not have a solid stream coming from nozzle.

Any of the above conditions show a defect or dirty injector nozzle. Clean or replace any injector nozzle that does not operate correctly.

B

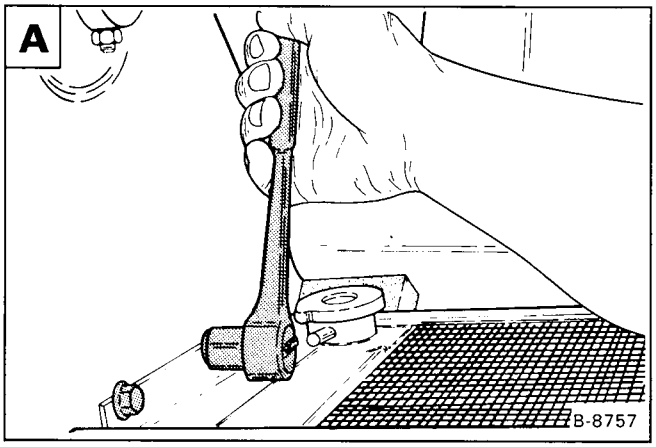


B-8895

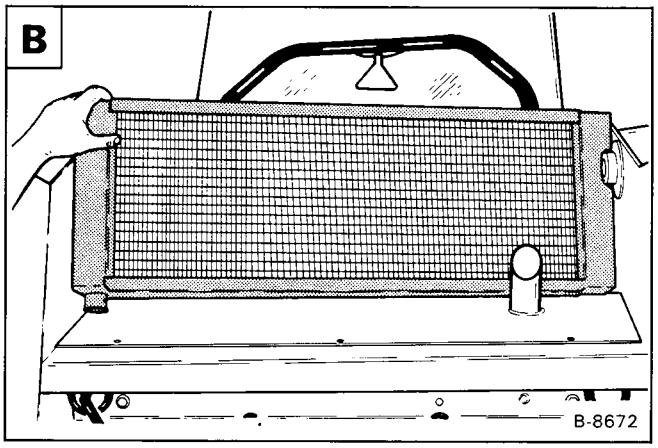
RADIATOR (Cont'd)

Remove the holddown bracket at the left side of the frame [A].

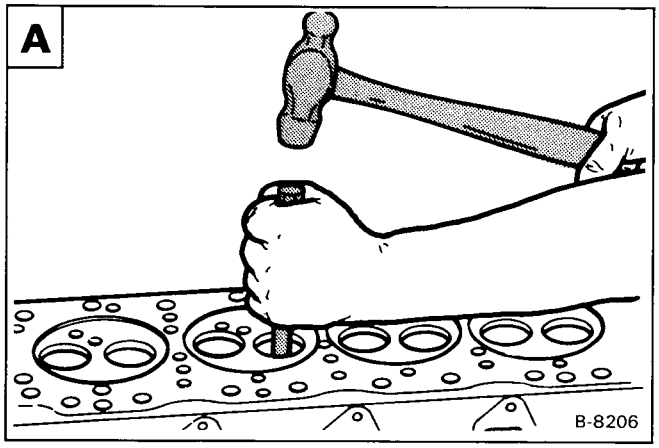
Remove the bolts under the radiator.



Lift the radiator up and remove it from the loader [B].

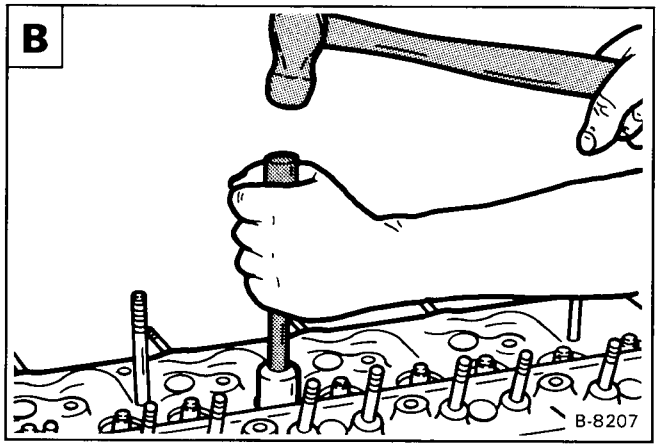


Remove the guide [A].



Install the new guide [B].

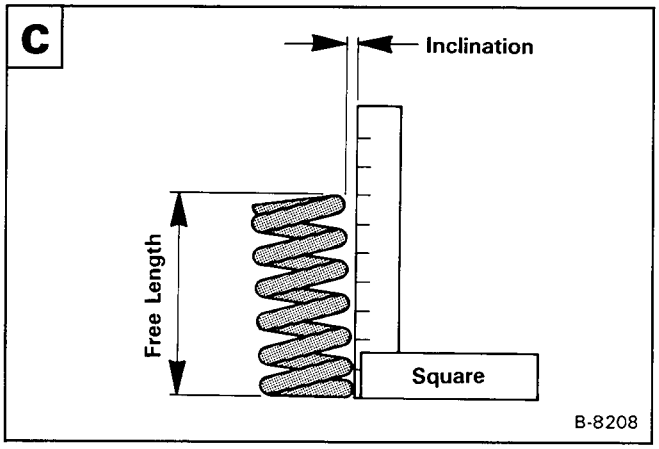
The height of the valve guide top edge to the cylinder is 0.51" (13 mm).



Valve Springs

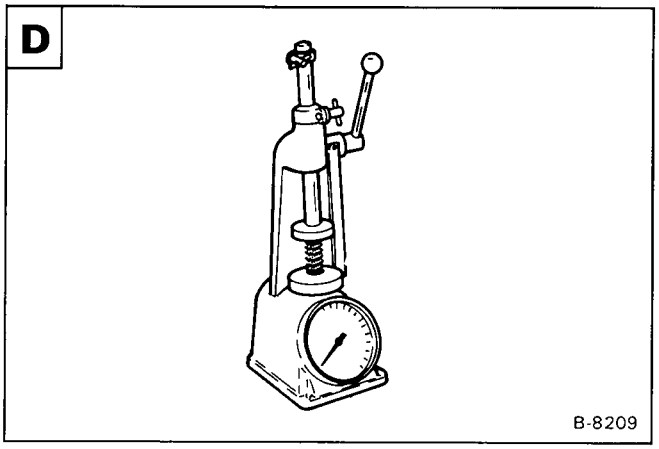
Check the free length and inclination [C].

		Std.	Limit
Free Length	Inner	1.783" (45,3 mm)	1.748" (44,4 mm)
	Outer	1.957" (49,7 mm)	1.898" (48,2 mm)
Inclination	Inner	- - -	0.118" (3,0 mm)
	Outer	- - -	0.126" (3,2 mm)



Check the valve spring tension [D].

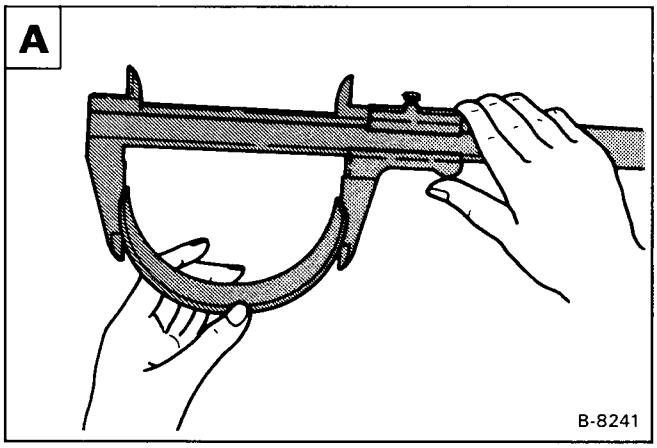
	Set Length	Std.	Limit
Inner	1.46" (37 mm)	13 lbs. (5,9 kg)	11 lbs. (5,02 kg)
Outer	1.54" (39,0 mm)	46 lbs. (20,9 kg)	40 lbs. (18,1 kg)



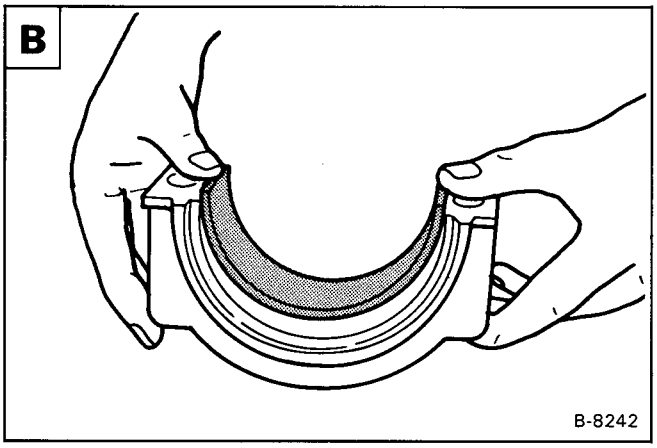
MAIN BEARING (Cont'd)

Check the bearing spread as listed [A].

Limit – 2.93'' (74,5 mm)



Check to see if the bearing has enough tension, so that finger pressure is needed to fit the bearing into the cap [B].



Installation

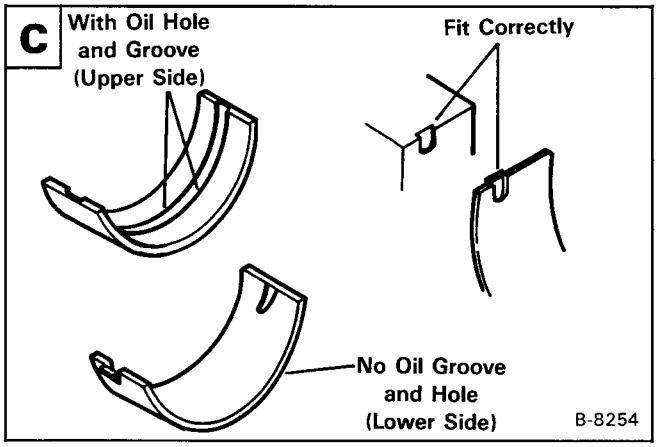
Check the crankshaft journals before installing the main bearings (See Page 7C–45).

Make sure to position the bearing halves in their correct locations [C].

Lubricate the new bearings. Install them by putting the end without the tab into the block and rotating the crankshaft until the tab is on its seat.

Install the other bearing half in the bearing cap. Lubricate the bearing and install the cap on the engine block.

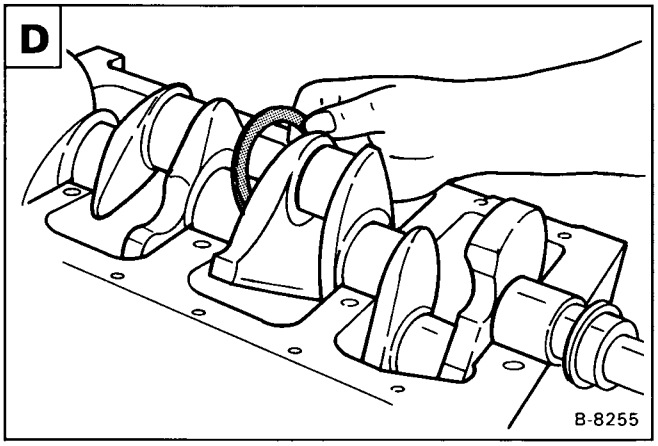
Lubricate the bolts, install them finger tight only.



Install the center main bearing and thrust washers [D].

The thrust washer must be installed so that their oil grooves are turned to the rotating face of the crankshaft.

Repeat the procedure until all the main bearings and caps are installed.



FUEL INJECTION PUMP IDLER GEAR

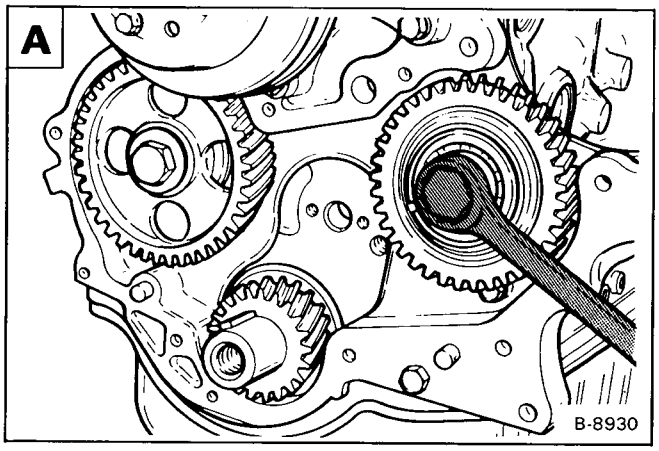
Removal and Installation

Remove the timing case cover (See Page 7C—49).

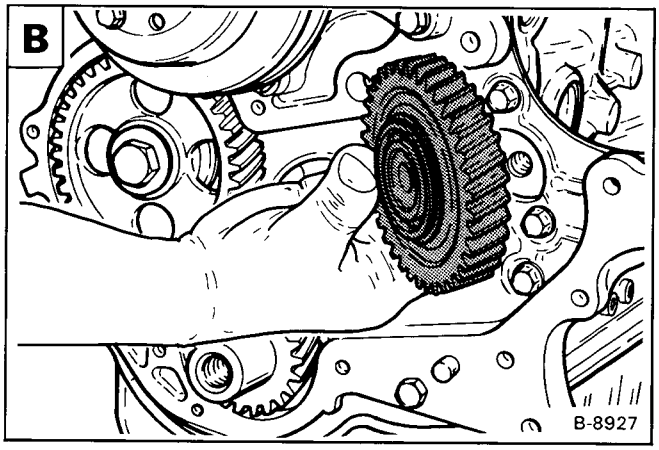
Remove the idler gear (See Page 7C—51).

Remove the bolt at the fuel injection pump idler gear [A].

Installation: Tighten the bolt to 72-87 ft.-lbs. (98-118 Nm) torque.

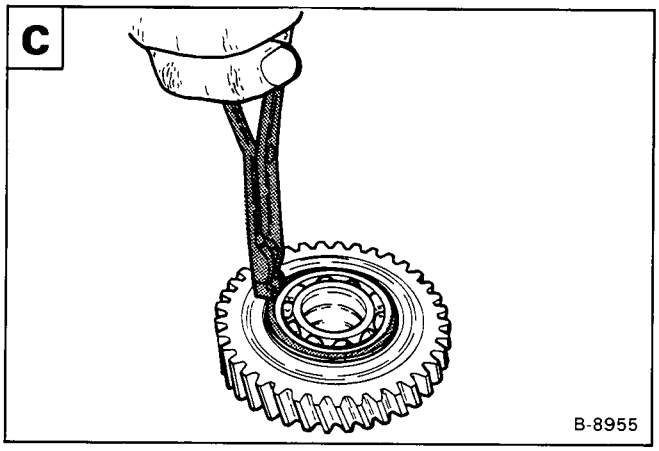


Remove the idler gear and bearing [B].



If the bearing needs replacement, remove the snap ring at the bearing [C].

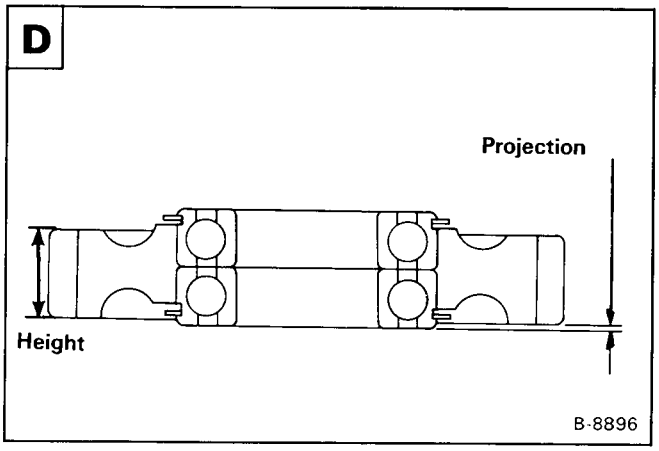
Use a press to remove and install the new bearing.



Bearing Installation

When installing the new bearing, make sure the projection and height is correct [D].

Projection — 0.016-0.024" (0,4-0,6 mm)
Height — 0.933-0.945" (23,7-24 mm)

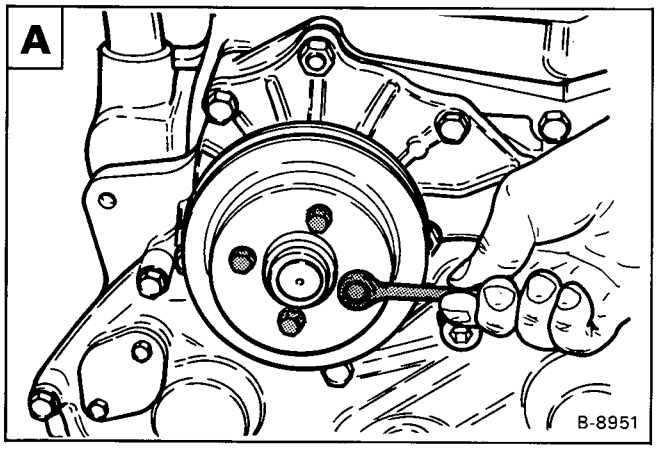


WATER PUMP

Removal and Installation

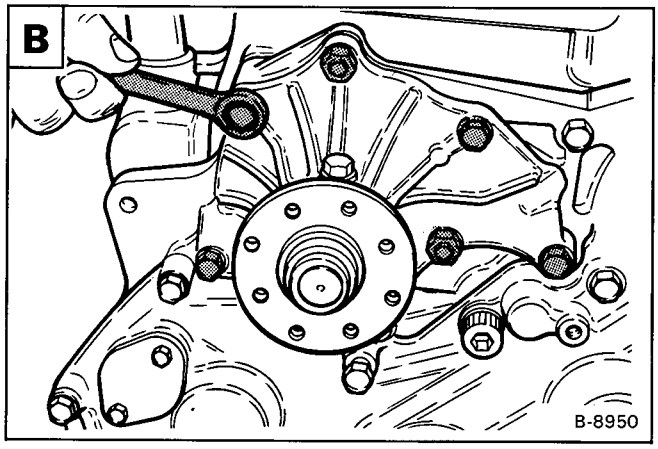
Remove the alternator belt.

Remove the water pump pulley [A].

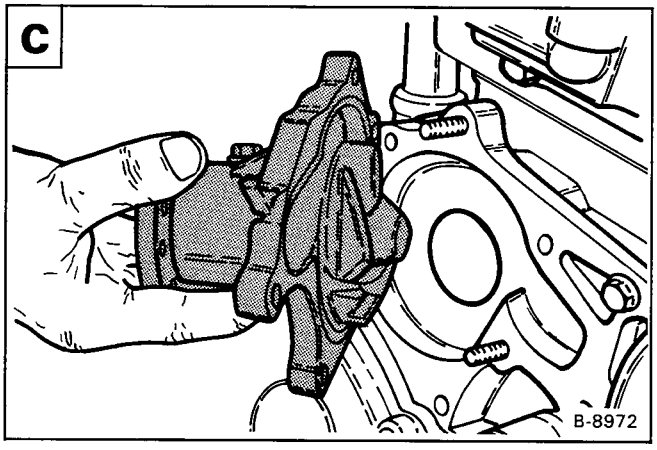


Remove the water pump bolts [B].

Installation: Tighten the bolts to 11-18 ft.-lbs. (15-24 Nm) torque.

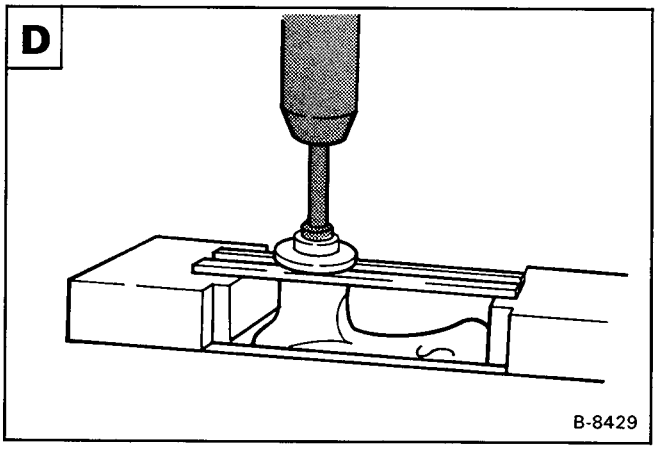


Remove the water pump from the engine block [C].



Disassembly

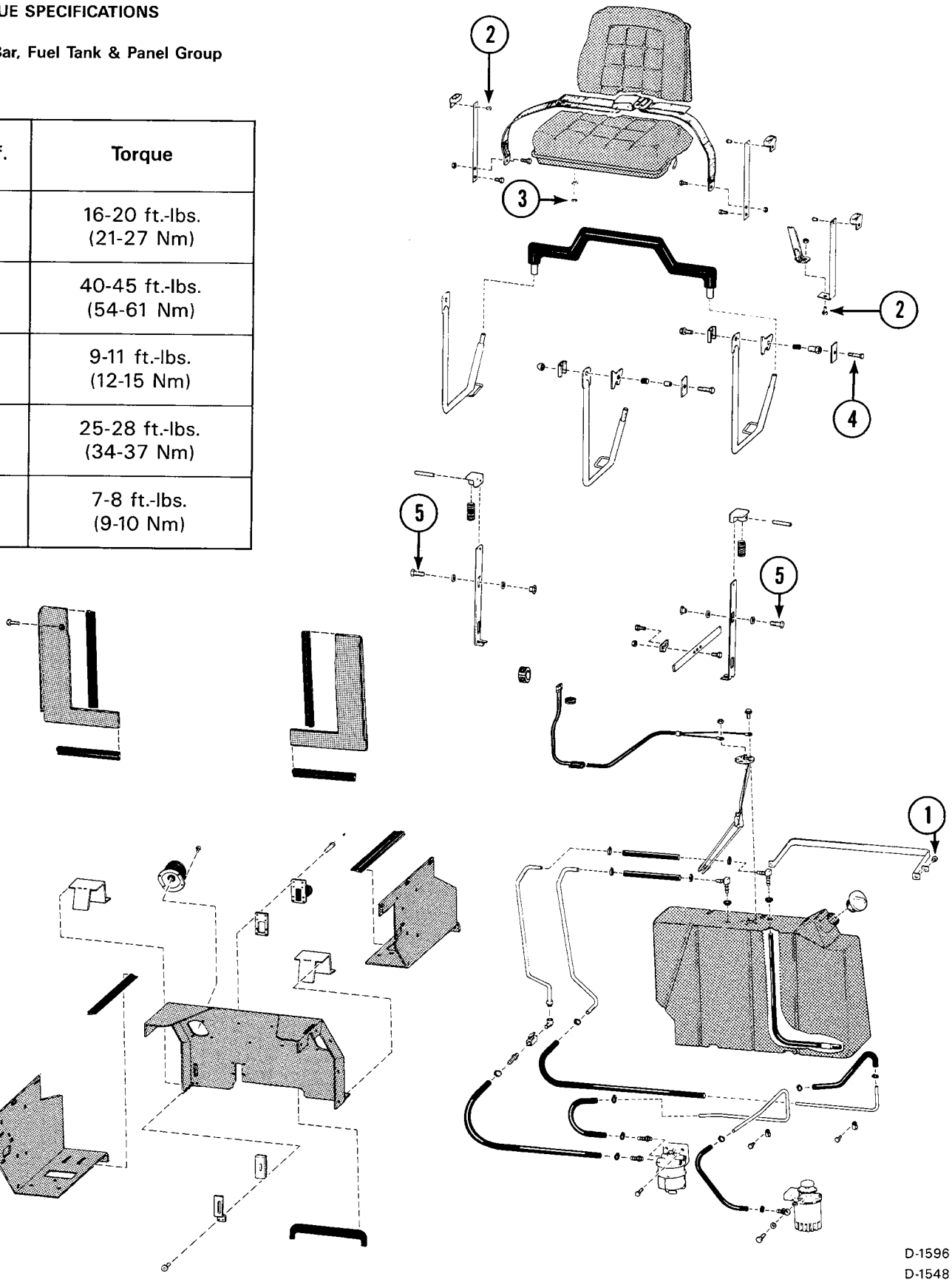
Remove the hub for the pulley using a press [D].



TORQUE SPECIFICATIONS

Seat Bar, Fuel Tank & Panel Group

Ref.	Torque
1.	16-20 ft.-lbs. (21-27 Nm)
2.	40-45 ft.-lbs. (54-61 Nm)
3.	9-11 ft.-lbs. (12-15 Nm)
4.	25-28 ft.-lbs. (34-37 Nm)
5.*	7-8 ft.-lbs. (9-10 Nm)

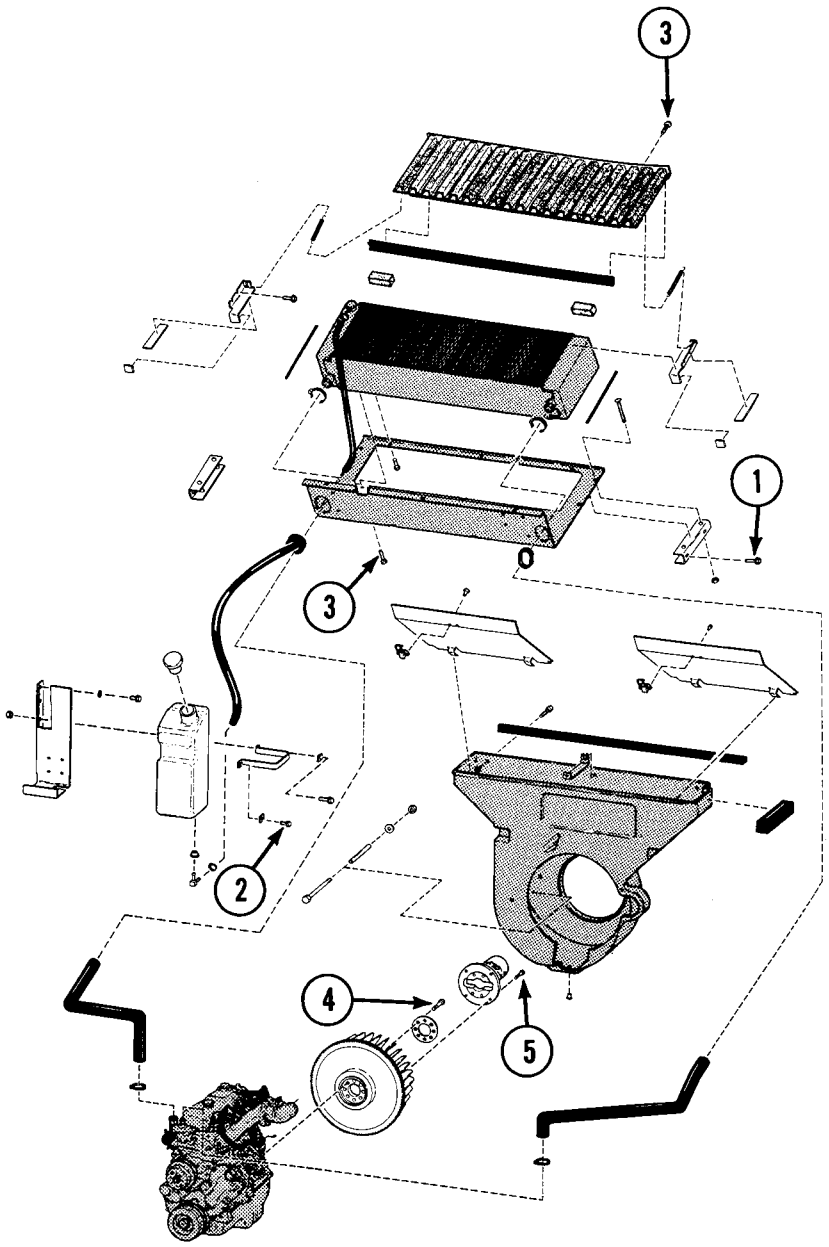


D-1596
D-1548
D-1696

* Put Lock-Tite on the Treads

Engine Group (Isuzu)

Ref.	Torque
1.	15-17 ft.-lbs. (21-23 Nm)
2.	25-28 ft.-lbs. (34-38 Nm)
3.	16-20 ft.-lbs. (21-27 Nm)
4.	75-80 ft.-lbs. (102-108 Nm)
5.*	25-28 ft.-lbs. (34-38 Nm)



* Put Lock-Tite on the Treads

E-1701

All dimensions are given in inches. Respective metric dimensions are given in millimeters enclosed by parenthesis.

Piston and Connecting Rod Dimensions (Cont'd)

Connecting Rod Bearings:	
Type	Steel Backed, Aluminum Tin Lined
Width	1.1208/1.1280 (28,47/28,65)
Outside Diameter	2.3955 (60,85)
Inside Diameter	2.2504/2.2515 (57,16/57,19)
Bearing Running Clearance	0.0014/0.003 (0,036/0,076)

Cylinder Block and Liners Dimensions

Cylinder Block:	
Total Height of Cylinder Block	11.177/11.181 (283,9/284,0)
Bore Diameter for Cylinder Liner	3.8125/3.8135 (96,84/96,86)
Liner Flange Depth in Block	0.150/0.152 (3,81/3,86)
Cylinder Block Recess Bore	3.990/3.995 (101,35/101,47)
Main Bearing Bore	2.916/2.917 (74,07/74,09)
No. 1 Bore for Camshaft	2.0472/2.0484 (52,0/52,03)
No. 2 Bore for Camshaft	2.0374/2.0386 (51,75/51,78)
No. 3 Bore for Camshaft	2.0275/2.0287 (51,5/51,53)
No. 4 Bore for Camshaft	2.0177/2.0189 (51,25/51,28)
Tappet Bore Diameter	0.5625/0.56375 (14,29/14,32)
Crankshaft Thrust Washer Recess in Block Diameter	3.756/3.764 (95,4/95,6)
Cylinder Liners:	
Type	Dry Interference Fit
Outside Diameter	3.8145/3.8155 (96,89/96,91)
Interference Fit of Liner into Cylinder Block Bore	0.001/0.003 (0,025/0,076)
Liner Finish Bore	3.501/3.502 (88,93/88,95)
Liner Flange Thickness	0.148/0.150 (3,76/3,81)
Depth of Flange BELOW Top Face of Cylinder Block	0.000/0.004 (0,00/0,102)
Liner Flange Diameter	3.972/3.976 (100,88/100,99)
Height of Liner Collar ABOVE Flange	0.028/0.033 (0,71/0,84)
Height of Collar ABOVE Top Face of Cylinder Block	0.026/0.031 (0,66/0,79)
Clearance Fit of Liner Flange in Block Recess	0.014/0.023 (0,356/0,584)

Crankshaft and Main Bearings Dimensions

Crankshaft:	
Main Journal Diameter	2.7485/2.749 (69,81/69,82)
Main Journal Width, No. 1	1.391/1.421 (35,3/36,09)
Main Journal Width, No. 2, 4 & 5	1.4335/1.4415 (36,4/36,6)
Main Journal Width, No. 3	1.4365/1.4385 (36,49/36,54)
Main Journal Fillet Radius	9/64 - 5/32 (3,57/3,97)
Crankshaft Pin Diameter	2.2485/2.248 (57,11/57,12)
Crankshaft Pin Width	1.3725/1.3741 (34,86/34,9)
Crankshaft Pin Fillet Radius	1/8 - 9/64 (3,2/3,57)
Surface Finish, All Journals	15 micro. max. (0,4 microns max.)
Crankshaft Journals & Pins Grinding Undersizes	0.010, 0.020 & 0.030 (0,25, 0,51 & 0,76)
Oil Seal Heliz Diameter	2.211/2.212 (56,16/56,18)
Oil Seal Heliz Width	0.050/0.080 (1,27/2,03)
Oil Seal Heliz Depth	0.004/0.008 (0,101/0,203)
Crankshaft Flange Diameter	3.9985/3.9995 (101,56/101,59)
Crankshaft Flange Width	0.5 (12,7)
Crankshaft End Play	0.001/0.015 (0,025/0,38)

NOTES

ENGINE SPECIFICATIONS

All dimensions are given in inches. Respective metric dimensions are given in millimeters enclosed by parenthesis.

Cylinder Head Dimensions

Cylinder Head:	
Grinding Allowance	DO NOT GRIND
Valve Seat Angle (Intake)	45° (90° Included Angle)
(Exhaust)	30° (120° Included Angle)
Valve Seat Width	0.079 (2,0 mm)
Combustion Chamber Inserts:	
Height of Insert in Relation to Cylinder Head Face	0.001 (0,025) Above 0.0029 (0,073) Below
Valve Guide, Inlet & Exhaust:	
Guide Height Above Cylinder Head	0.065 (1,65)
Valve Guide Bore Diameter	0.3145/0.3155 (7,99/8,01)
Valves, Inlet:	
Maximum Worn Valve Stem Diameter	0.3102 (7,88)
Maximum Worn Clearance of Valve Stem in Guide	0.005 (0,13)
Minimum Valve Head Thickness	0.053 (1,35)
Valve Face Angle	45°
Valve Stem Seal	Synthetic Rubber Deflector
Valve Clearance (Cold)	0.012 (0,30)
Valves, Exhaust:	
Minimum Worn Valve Stem Diameter	0.3097 (7,87)
Maximum Worn Clearance of Valve Stem in Guide	0.0055 (0,14)
Minimum Valve Head Thickness	0.053 (1,35)
Valve Face Angle	30°
Valve Stem Seal	Not Used
Valve Clearance (Cold)	.012 (0,30)
Valve Springs, Inner:	
Fitted Length	1.49 (37,85)
Load at Fitted Length	28 lbs. ± 1.5 lbs. (12,7 kg ± 0,68 kg)
Free Length	1.74 (44,20)
Valve Springs, Outer:	
Fitted Length	1.59 (40,39)
Load at Fitted Length	40 lbs. ± 2.0 lbs. (18,2 kg ± 0,91 kg)
Free Length	1.181 (10,0)
Rocker Arms:	
Clearance Fit of Rocker Arm Bushing on Shaft	0.0006/0.0024 (0,015/0,06)
Maximum Worn Clearance	0.003 (0,08)
Inside Diameter of Bushing (Fitting)	0.625/0.6528 (15,88/15,90)
Rocker Arm Shaft:	
Outside Diameter of Shaft	0.6234/0.6244 (15,83/15,86)

Pistons and Connecting Rod Dimensions

Pistons:	
Type	Flat Topped, Controlled Expansion, Offset Piston Pin
Piston Diameter (Measured at 90° to piston pin and 0.7 (18) above bottom of piston)	3.499/3.500 (88,87/88,90)
Maximum Ring Clearance in Groove (New Ring Fitted)	0.008 (0,20)

NOTES

ENGINE SPECIFICATIONS

All dimensions are given in inches. Respective metric dimensions are given in millimeters enclosed by parenthesis.

Cylinder Head

Distortion	Std. 0.002 (0,05)
	Limit 0.008 (0,20)
Re-Grind	Limit 0.012 (0,30)
Valve Seat Angle	45 degrees

Valve, Valve Guide & Seat Insert

Valve Seat Width	
Intake	Std. 0.067 (1,7)
	Limit 0.087 (2,2)
Exhaust	Std. 0.029 (2,0)
	Limit 0.079 (2,0)
Valve Head Depth	
Intake	Std. 0.029 (0,73)
	Limit 0.05 (1,28)
Exhaust	Std. 0.028 (0,70)
	Limit 0.047 (1,2)
Valve Seat Angle	45 degrees
Valve Head Thickness	Std. 0.07 (1,8)
	Limit 0.059 (1,5)
Valve Stem Diameter	
Intake	Std. 0.3128-0.3134 (7,946-7,961)
	Limit 0.310 (7,88)
Exhaust	Std. 0.3119-0,3124 (7,921-7,936)
	Limit 0.310 (7,88)
Valve & Valve Guide Clearance	
Intake	Std. 0.0015-0.0027 (0,039-0,068)
	Limit 0.008 (0,2)
Exhaust	Std. 0.0025-0.0038 (0,064-0,096)
	Limit 0.010 (0,25)
Valve Guide Height	0.51 (13)

Valve Springs

Free Length	
Inner	Std. 1.783 (45,3)
	Limit 1.748 (44,4)
Outer	Std. 1.957 (49,7)
	Limit 1.898 (48,2)
Inclination	
Inner	Limit 0.118 (3,0)
Outer	Limit 0.126 (3,2)
Tension	
Inner—Set Length	1.46 (37) Std. 13 lbs. (5,9 kg)
	Limit 11 lbs. (5,02 kg)
Outer—Set Length	1.54 (39) Std. 46 lbs. (20,9 kg)
	Limit 40 lbs. (18,1 kg)

Rocker Arm

Shaft Diameter	Std. 0.7478-0.7486 (18,98-19,0)
	Limit 0.7427 (18,85)
Rocker Arm I.D.	Std. 0.7489-0.7497 (19,01-19,03)
	Limit 0.7505 (19,05)
Clearance between Rocker Arm & Shaft	Std. 0.0003-0.0020 (0,01-0,05)
	Limit 0.0078 (0,2)
Push Rod Run-Out	Limit 0.012 (0,3)

NOTES

MELROE COMPANY

bobcat

843—4
Revision Number

20 February 1987
Date

SERVICE MANUAL REVISION

AFFECTING:

Product BOBCAT LOADER

Model 843

Manual No. 6566091 (12-85)

ROUTE TO ATTENTION

PARTS MANAGER ☐
SERVICE MANAGER ☑
SALES MANAGER ☐
☐

Remove the following pages from the 843 Service Manual (P/N 6566091) and put in the revised pages.

TAKE OUT	PUT IN
1—1, 1—2	1—1, 1—2 (Revised Feb. 87)
1—5, 1—6	1—5, 1—6 (Revised Feb. 87)
2—37, 2—38	2—37 (Revised Feb. 87), 2—38
5—13, 5—14	5—13, 5—14 (Revised Feb. 87)
7C—1, 7C—2	7C—1, 7C—2 (Revised Feb. 87)
TECHNICAL DATA TAB PAGE	TECHNICAL DATA TAB PAGE (Revised Feb. 87)
8C—1, 8C—2	8C—1 (Revised Feb. 87), 8C—2
8C—5, 8C—6	8C—5 (Revised Feb. 87), 8C—6 (Revised Feb. 87)

MELROE COMPANY

bobcat

843—9
Revision Number
8 May 1989
Date

SERVICE MANUAL REVISION

AFFECTING:

Product BOBCAT LOADER

Model 843

Manual No. 6566091 (12-85)

ROUTE TO ATTENTION	
PARTS MANAGER	☐
SERVICE MANAGER	☑
SALES MANAGER	☐
_____	☐

Remove the following pages, Hydraulic/Hydrostatic Flow Charts and Wiring Diagram from the 843 Service Manual (P/N 6566091) and put in the revised or added pages, Hydraulic/Hydrostatic Flow Charts and Wiring Diagram.

TAKE OUT	PUT IN
Hydraulic/Hydrostatic Flow Chart and Wiring Diagram 843 High Horse Power Hydraulics (Optional) Chart #6570916 (Printed July 1988)	Hydraulic/Hydrostatic Flow Chart and Wiring Diagram 843 High Horse Power Hydraulics (Optional) Chart #6570916 (Printed May 1989)
Hydraulic/Hydrostatic Flow Chart 843 (S/N 26000 & Above) Chart #6570552 (Printed July 1988)	Hydraulic/Hydrostatic Flow Chart 843 (S/N 26000 Thru 19925) Chart #6570552 (Printed May 1989)
	Hydraulic/Hydrostatic Flow Chart 843 (Starting With S/N 29926) Chart #6720178 (Printed May 1989)
Hydrostatic System - Tab Page (Revised July 88)	Hydrostatic System - Tab Page (Revised May 1989)
3—16a thru 3—16j (Added June 87)	3—16a thru 3—16j (Revised May 1989) 3—16k thru 3—16m (Added May 1989)
Wiring Diagram (P/N 6570915) 843 (S/N 28135 & Above) (Printed July 1988)	Wiring Diagram (6570915) 843 (S/N 28135 & Above) (Printed May 1989)