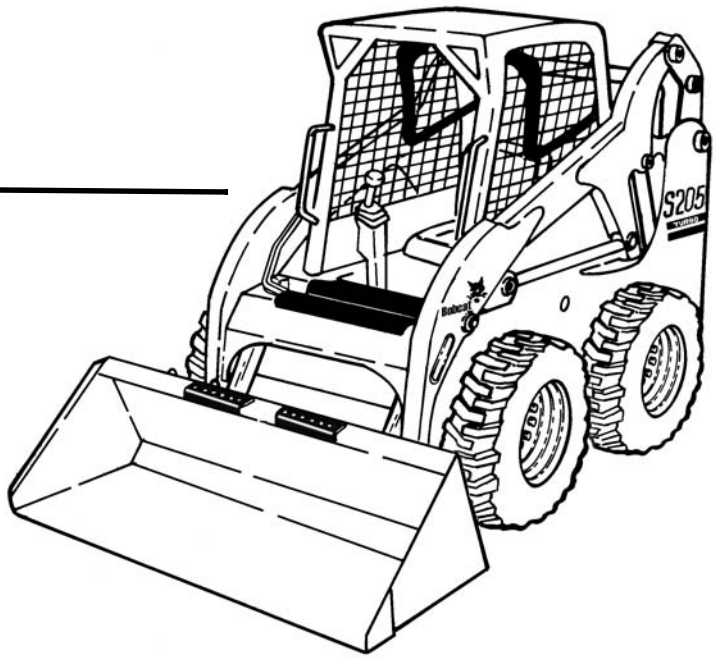
S205 TURBO

S205 TURBO HIGH FLOW

Bobcat®

Service Manual

S/N 528411001 & Above
S/N 528511001 & Above



EQUIPPED WITH BOBCAT INTERLOCK CONTROL SYSTEM (BICS™)

6902917 (7-09)

Printed in U.S.A.

The dealer and owner / operator review the recommended uses of the product when delivered. If the owner / operator will be using the machine for a different application(s) he or she must ask the dealer for recommendations on the new use.

Call Before You Dig

Dial 811 (USA Only)
1-888-258-0808 (USA & Canada)

When you call, you will be directed to a location in your state / province, or city for information about buried lines (telephone, cable TV, water, sewer, gas, etc.).

Cutting or drilling concrete containing sand or rock containing quartz may result in exposure to silica dust. Do not exceed Permissible Exposure Limits (PEL) to silica dust as determined by OSHA or other job site Rules and Regulations. Use a respirator, water spray or other means to control dust. Silica dust can cause lung disease and is known to the state of California to cause cancer.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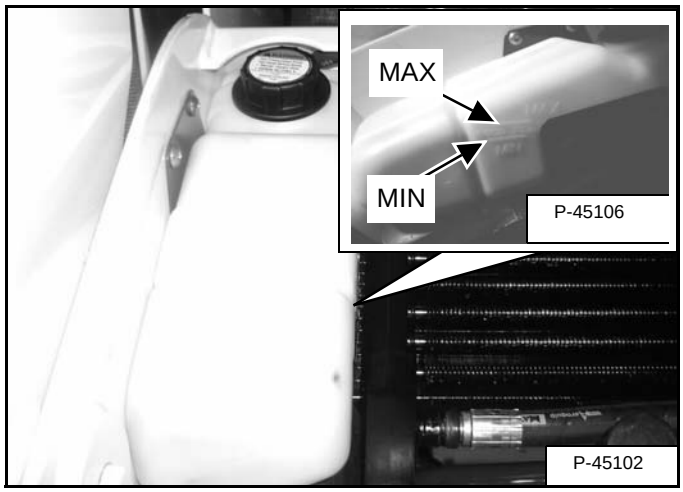
Checking The Coolant Level

Figure 10-90-3



Open the rear door and raise the rear grill.

Check the coolant level **[Figure 10-90-3]**. The level markers are on the outside of the tank. Coolant must be between the bottom marker and the top marker when the engine is cold.

Close the rear door before operating the loader.

Replacing the Coolant

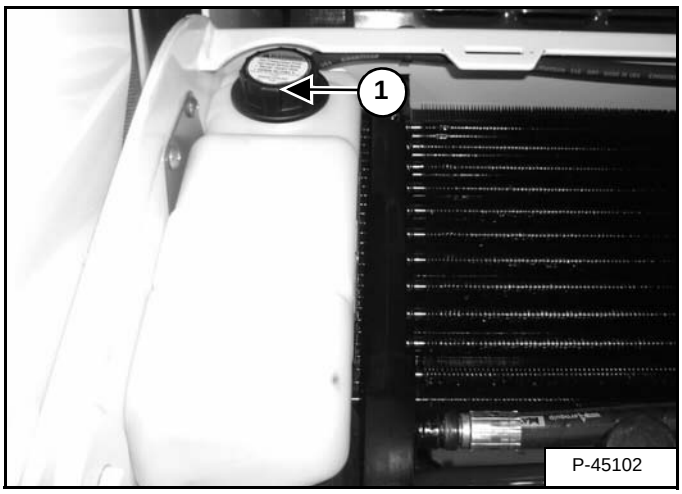
WARNING

AVOID BURNS

Do not remove radiator cap when the engine is hot. You can be seriously burned.

W-2070-1203

Figure 10-90-4



Open the rear door and remove the rear grill.

Remove the radiator cap (Item 1) **[Figure 10-90-4]**.

IMPORTANT

AVOID ENGINE DAMAGE

Always use the correct ratio of water to antifreeze.

Too much antifreeze reduces cooling system efficiency and may cause serious premature engine damage.

Too little antifreeze reduces the additives which protect the internal engine components; reduces the boiling point and freeze protection of the system.

Always add a premixed solution. Adding full strength concentrated coolant can cause serious premature engine damage.

I-2124-0497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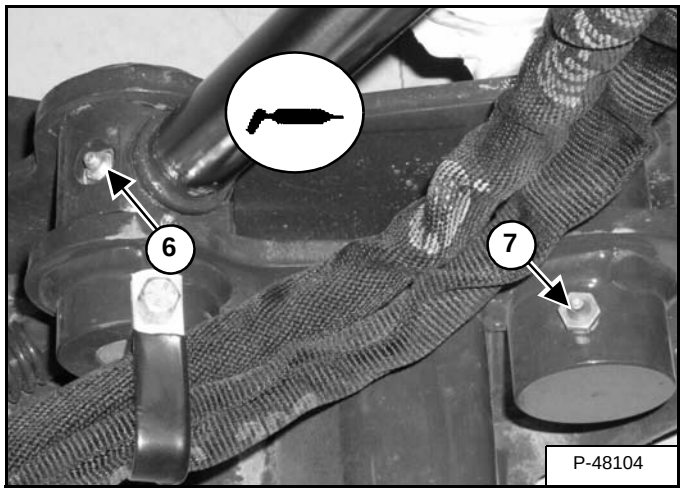
Procedure (Cont'd)

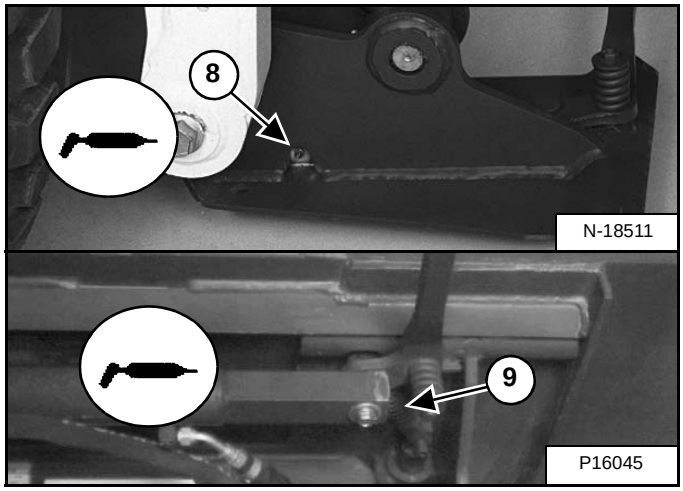
Figure 10-160-4



6. Tilt Cylinder Rod End. **[Figure 10-160-4]**.

7. Bob-Tach Pivot Pin (Both Sides) **[Figure 10-160-4]**.

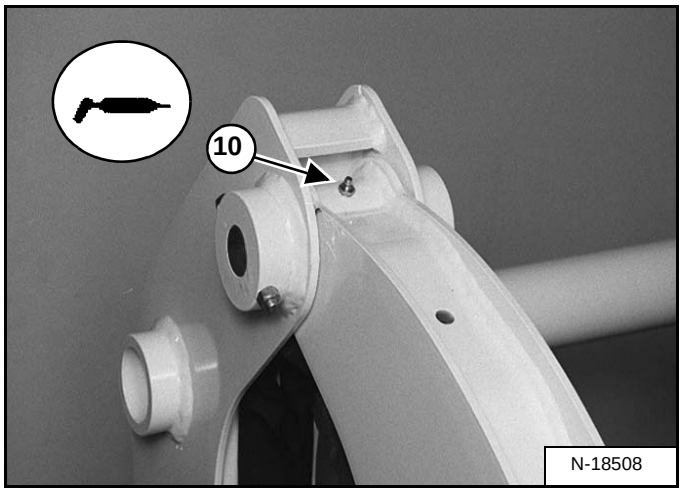
Figure 10-160-5



8. Bob-Tach Wedge (Both Sides) **[Figure 10-160-5]**.

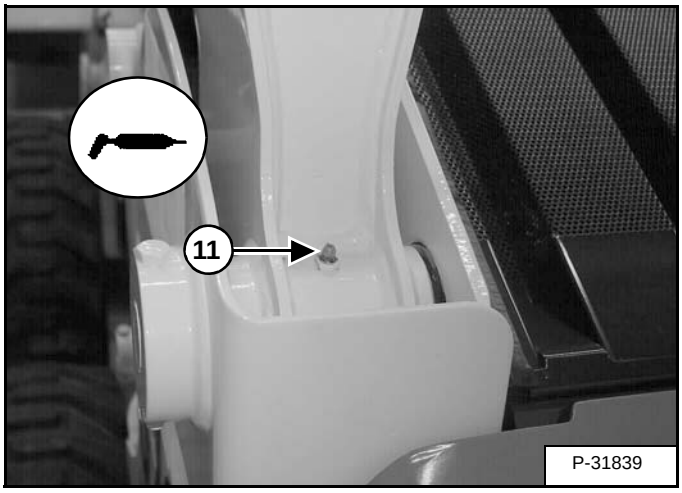
9. Power Bob-Tach Cylinder (Both Sides) **[Figure 10-160-5]**.

Figure 10-160-6



10. Lift Arm Pivot Pin (Both Sides) **[Figure 10-160-6]**.

Figure 10-160-7



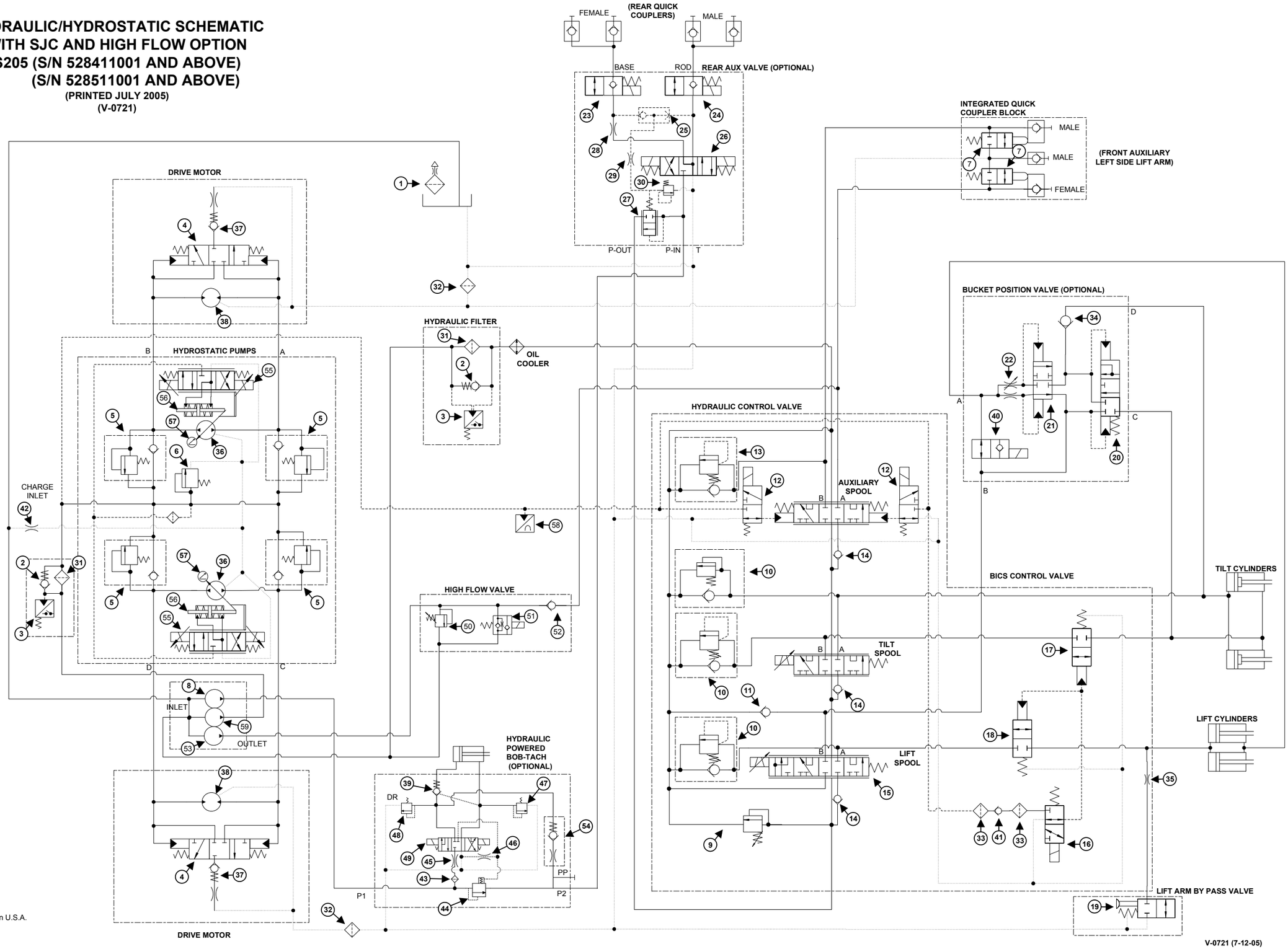
11. Lift Arm Link Pivot Pin (Both Sides) **[Figure 10-160-7]**.

HYDRAULIC SYSTEM (CONT'D)

Continued On Next Page

HYDRAULIC/HYDROSTATIC SCHEMATIC
WITH SJC AND HIGH FLOW OPTION
S205 (S/N 528411001 AND ABOVE)
(S/N 528511001 AND ABOVE)

(PRINTED JULY 2005)
(V-0721)



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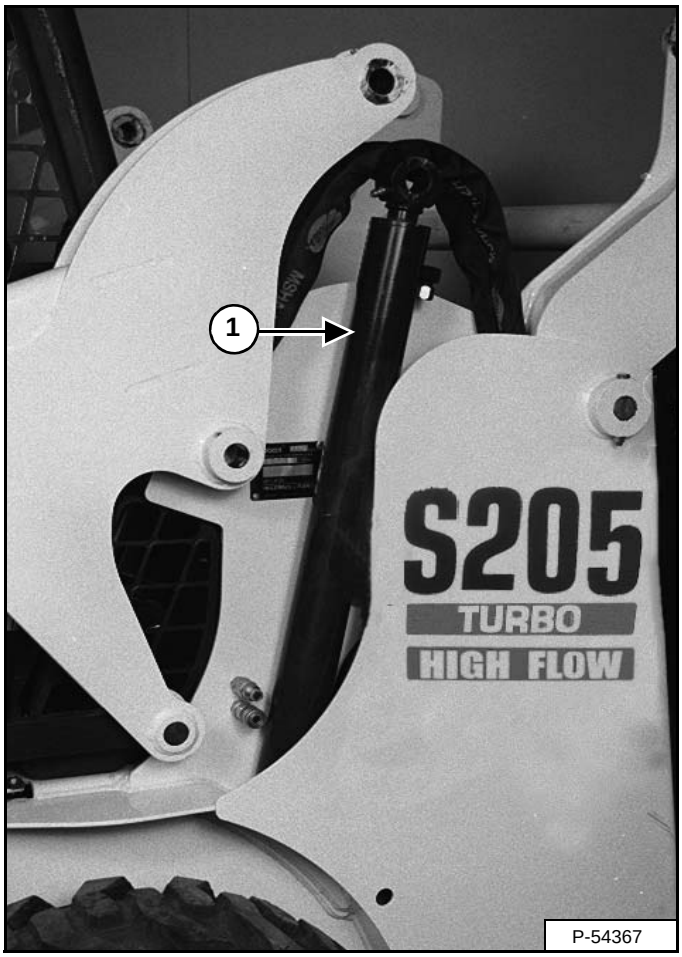
V-0721 (7-12-05)

Removal And Installation (Cont'd)

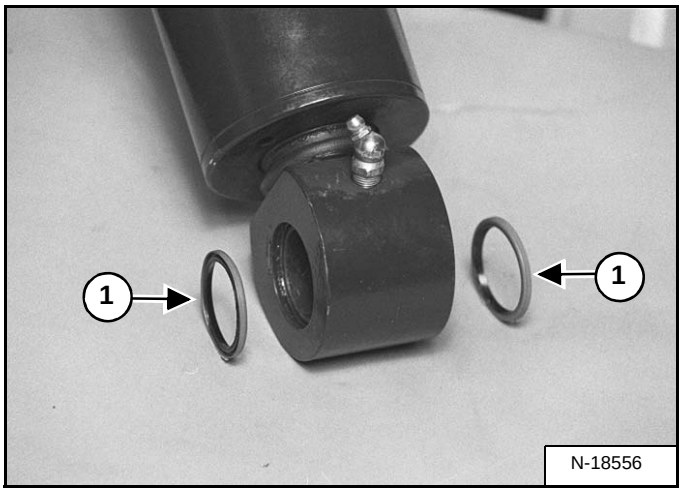
Figure 20-20-9



Remove the smaller pin (Item 1) **[Figure 20-20-7]** and lift the lift cylinder (Item 1) **[Figure 20-20-9]** out from the loader.

Rod End Pivot Pin Bushing And Seal Replacement

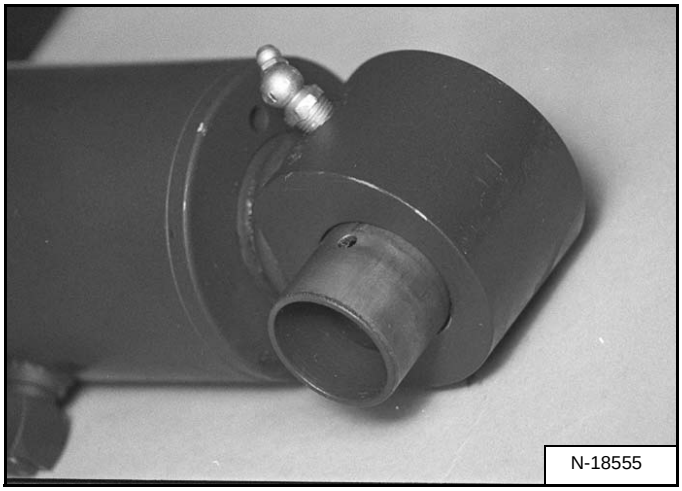
Figure 20-21-8



Remove the rod end of the tilt cylinder from the Bob-Tach. (See Removal And Installation, Page 20-20-2.)

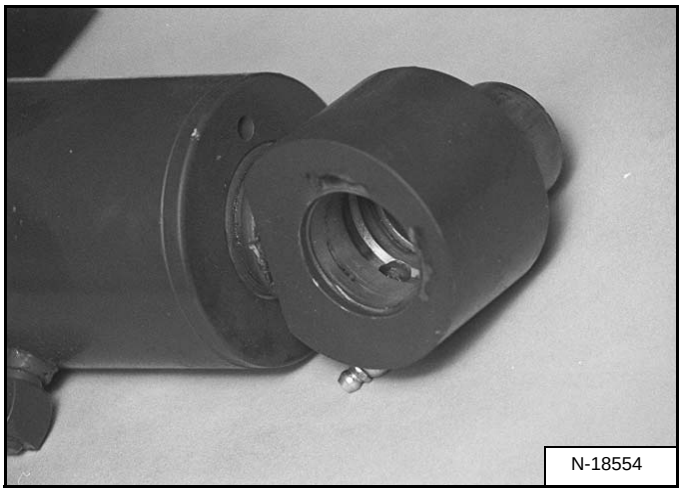
Use a seal pick to remove the seals (Item 1) **[Figure 20-21-8]** on both sides of the pivot bushing.

Figure 20-21-9



Remove and replace bushing with a driver tool and hammer **[Figure 20-21-9]**.

Figure 20-21-10



Reverse the removal procedure to install the pivot pin bushing and seal.

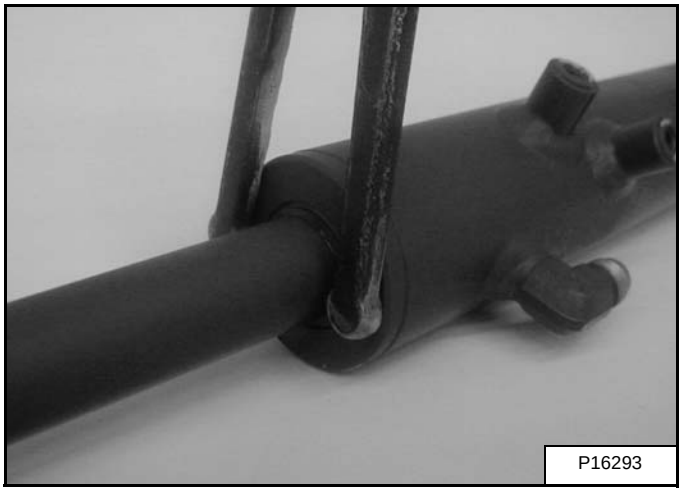
Disassembly

Use the following tools to disassemble the cylinder:

MEL1074 - O-ring Seal Hook
Spanner Wrench

Hold the hydraulic cylinder over a drain pan and move the rod in and out slowly to remove the fluid from the cylinder.

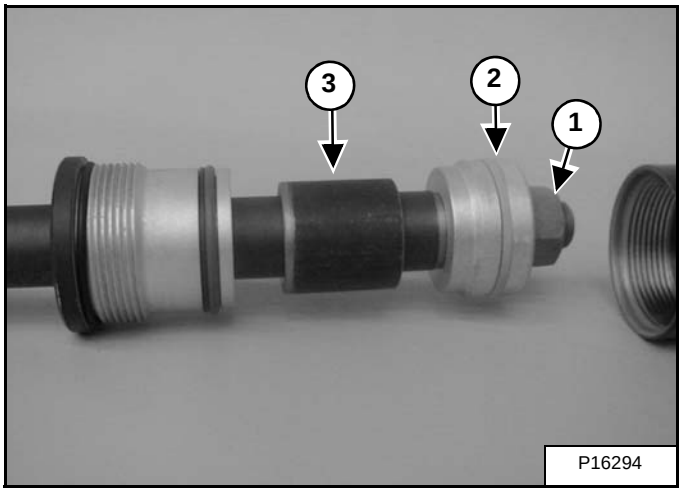
Figure 20-22-6



Put the base end of the cylinder in a vise.

Use a spanner wrench to loosen the head **[Figure 20-22-6]**.

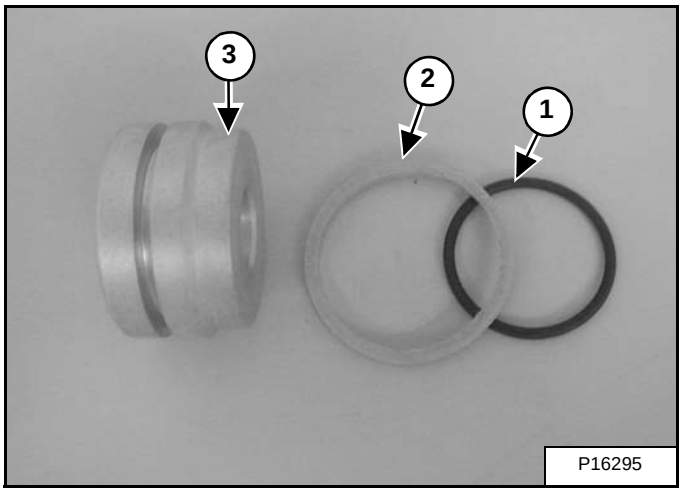
Figure 20-22-7



Remove the head and rod assembly from the cylinder **[Figure 20-22-7]**. Put the rod end in a vise.

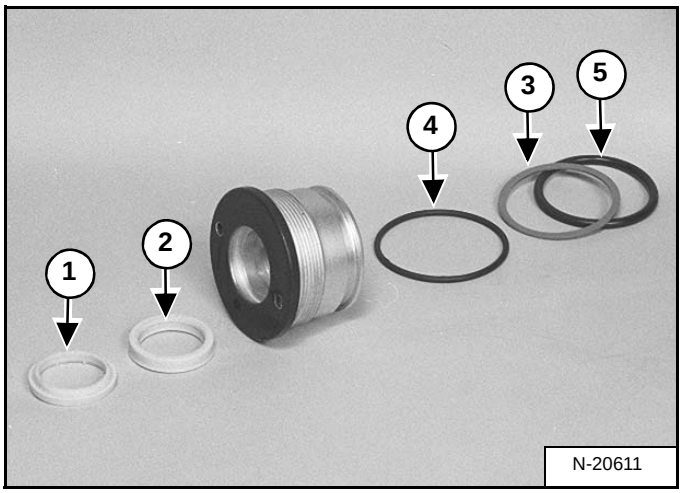
Remove the nut (Item 1) **[Figure 20-22-7]**, piston (Item 2) **[Figure 20-22-7]** and head (Item 3) **[Figure 20-22-7]** from the rod.

Figure 20-22-8



Piston: Remove the O-ring (Item 1) **[Figure 20-22-8]**, and seal (Item 2) **[Figure 20-22-8]** from the piston (Item 3) **[Figure 20-22-8]**.

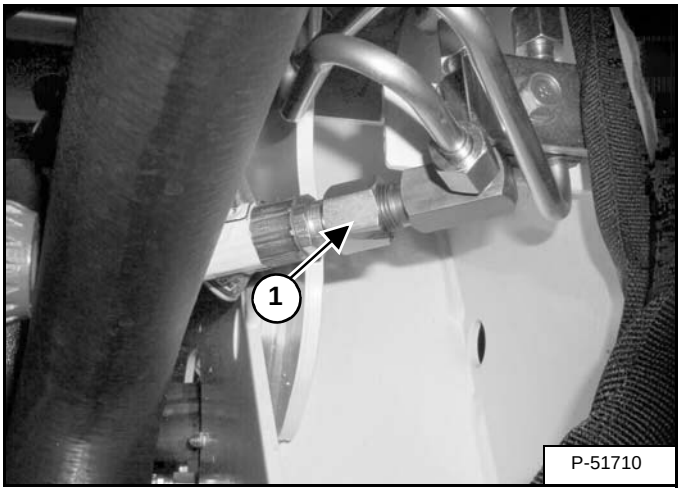
Figure 20-22-9



Remove the wiper seal (Item 1) **[Figure 20-22-9]**, and rod seal (Item 2) **[Figure 20-22-9]**, the back up washer (Item 3) **[Figure 20-22-9]** the thin O-ring (Item 4) **[Figure 20-22-9]** and the thick O-ring (Item 5) **[Figure 20-22-9]** from the head.

Removal and Installation (Cont'd)

Figure 20-40-3

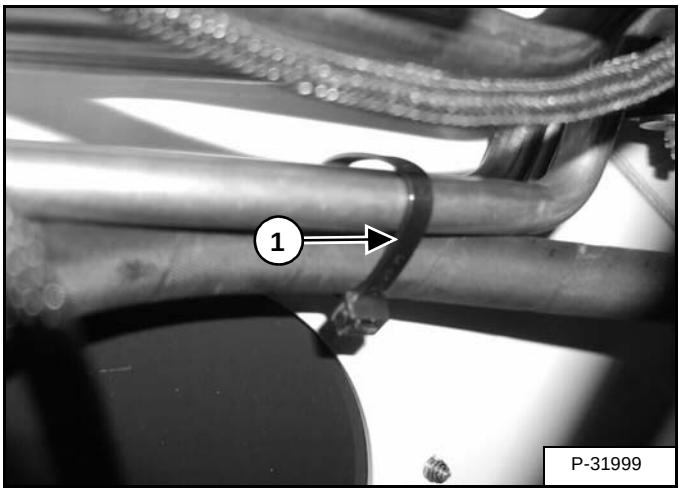


Mark all tubelines and hoses for correct installation.

The fixed end main valve hose (Item 1) **[Figure 20-40-3]** is connected to a fixed end fitting on the control valve. The hose is routed to the back upright where the hose is connected to a tee fitting that feeds the base end of both lift cylinders. The hose must be removed at the back tee fitting, located in the right side upright.

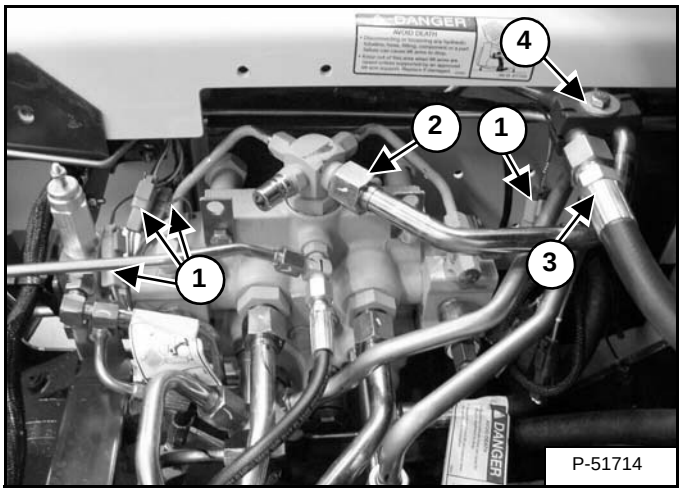
NOTE: Remember the hose routing for ease of control valve installation.

Figure 20-40-4



Remove the tie-strap (Item 1) **[Figure 20-40-4]** from the fixed end main valve hose.

Figure 20-40-5

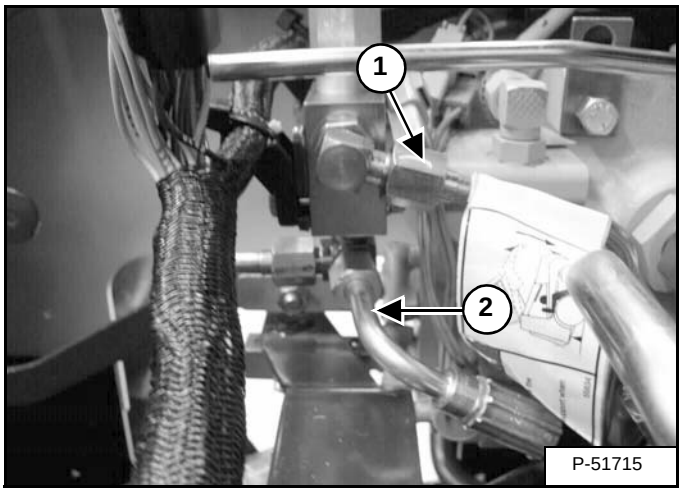


Mark and disconnect the four electric solenoid connectors for correct installation (Item 1) **[Figure 20-40-5]**.

Remove the outlet tubeline (Item 2) **[Figure 20-40-5]** from the control valve to the hydraulic oil cooler.

Disconnect and cap the supply hose (Item 3) and the supply hose clamp (Item 4) **[Figure 20-40-5]**.

Figure 20-40-6

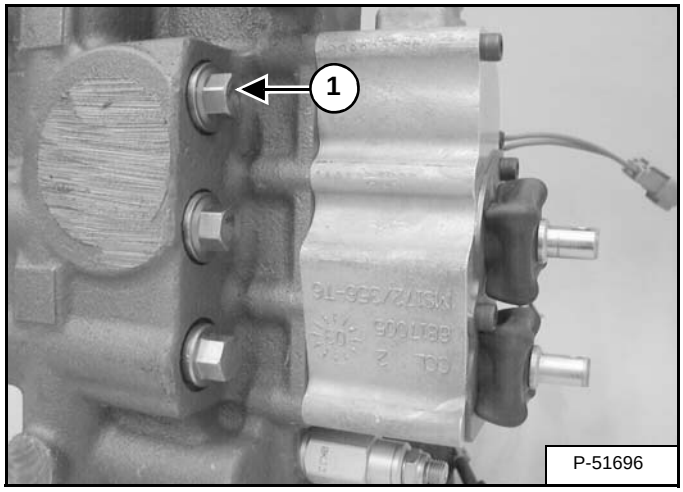


Disconnect and cap the tubeline (Item 1) **[Figure 20-40-6]** from the lift arm bypass valve to the control valve.

Disconnect and cap the hose (Item 2) **[Figure 20-40-6]** from the lift arm bypass valve to the drive motor case drain.

Port Relief Valve (Cont'd)

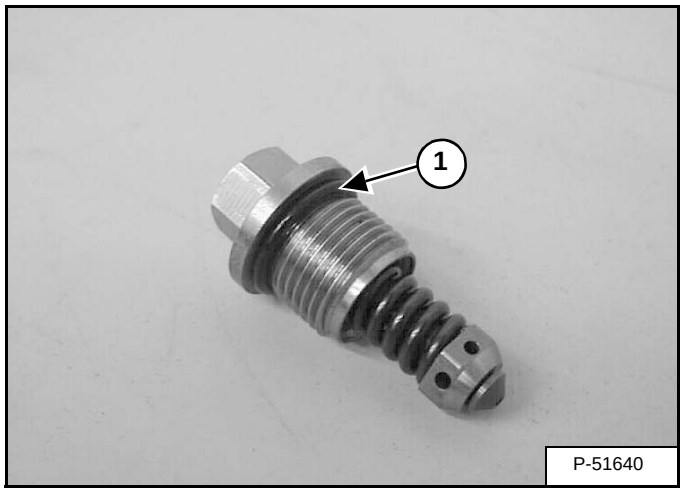
Figure 20-40-38



The control valve may be equipped with an optional auxiliary port relief valve (Item 1) **[Figure 20-40-38]**.

Remove the auxiliary port relief valve.

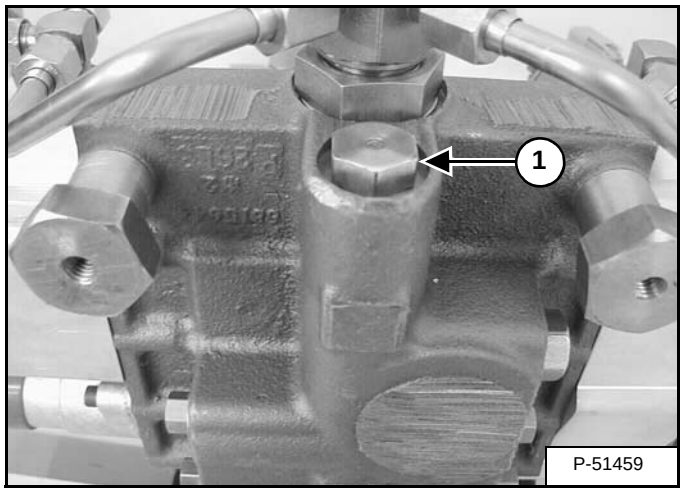
Figure 20-40-39



Installation: Always use new O-rings (Item 1) **[Figure 20-40-39]**. Tighten to 38 - 45 ft.-lb. (52 - 61 N•m) torque.

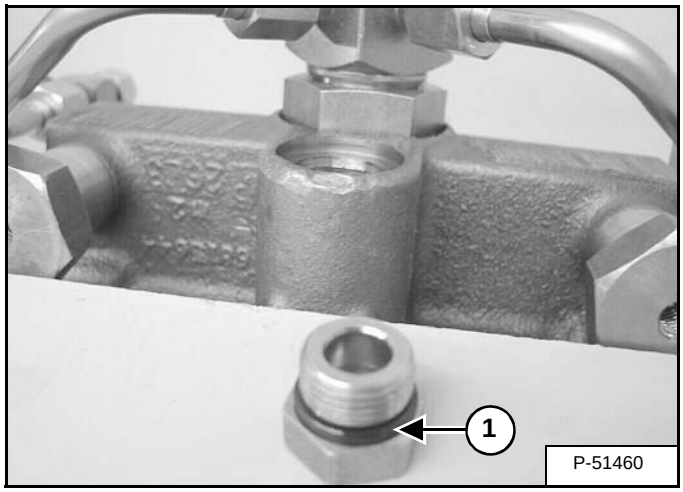
Plug Removal

Figure 20-40-40



At the top side of the control valve, remove the plug (Item 1) **[Figure 20-40-40]**.

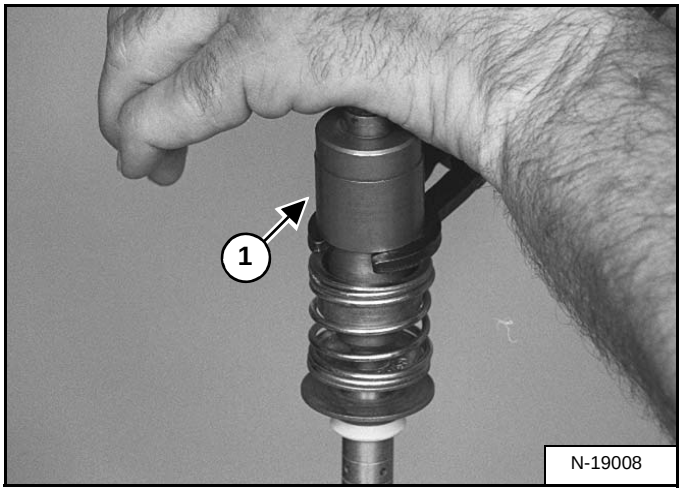
Figure 20-40-41



Installation: Always use new O-rings (Item 1) **[Figure 20-40-41]**. Tighten to 40 ft.-lb. (54 N•m) torque.

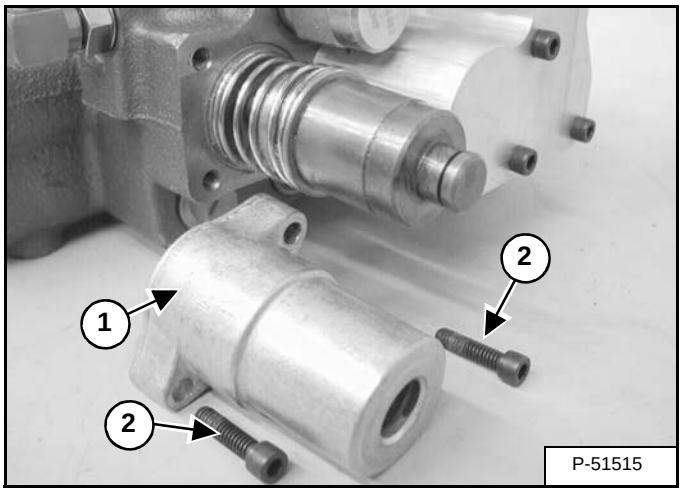
Lift Spool and Detent Removal and Installation (Cont'd)

Figure 20-40-78



Install the detent sleeve (Item 1) **[Figure 20-40-78]** to the detent adapter.

Figure 20-40-79



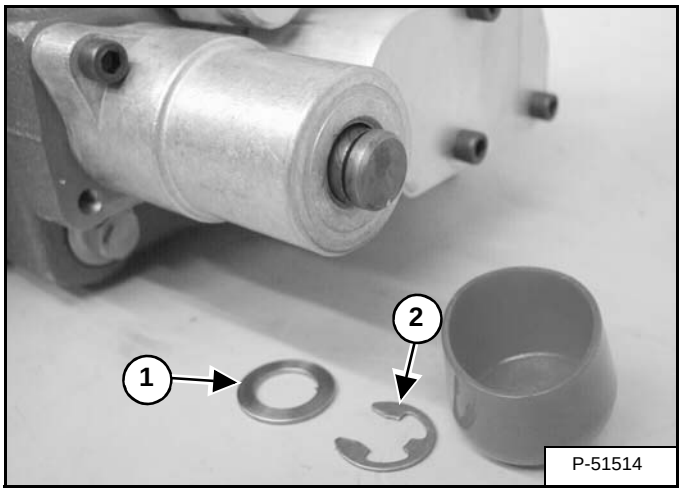
Install the lift spool assembly in the spool bore **[Figure 20-40-79]**.

Install the detent bonnet (Item 1) **[Figure 20-40-79]**.

Install the mounting screws (Item 2) **[Figure 20-40-79]**.

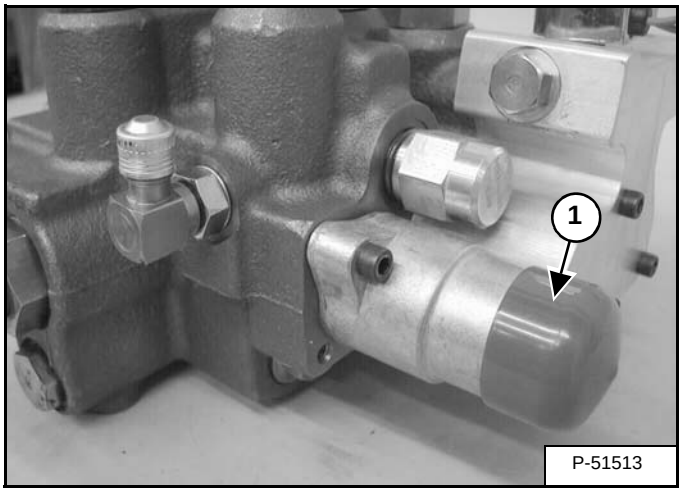
Installation: Lubricate the screws and tighten to 90 - 100 in.-lb. (10 - 11,3 N•m) torque.

Figure 20-40-80



Install the washer (Item 1) and snap ring (Item 2) **[Figure 20-40-80]**.

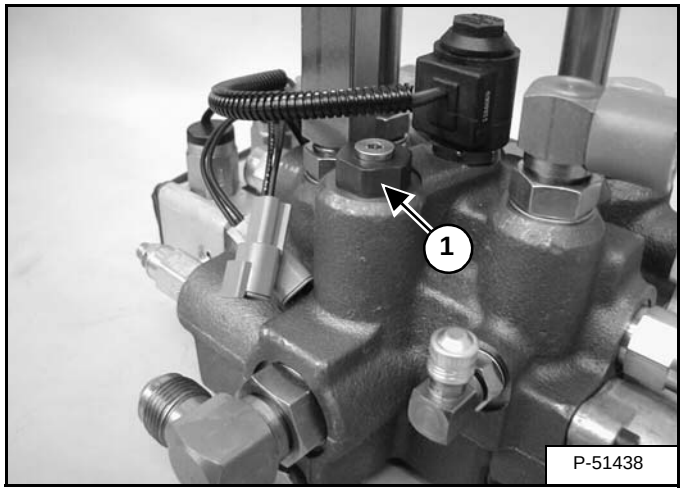
Figure 20-40-81



Install the end cap (Item 1) **[Figure 20-40-81]**.

BICS Valve, Check Valve Removal And Installation

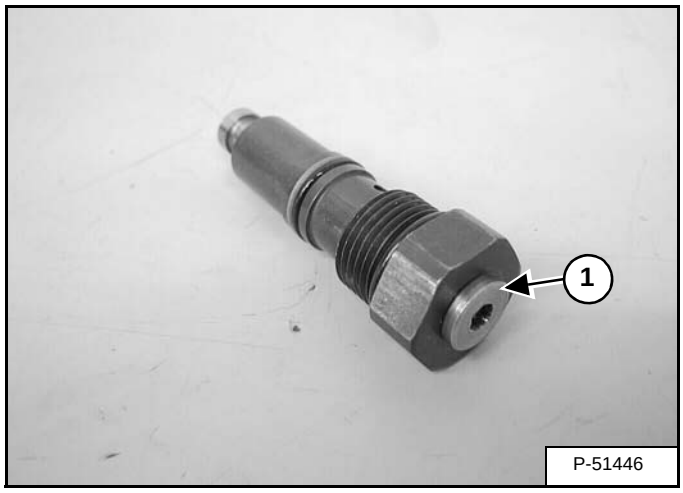
Figure 20-40-117



Remove the BICS valve (Item 1) **[Figure 20-40-117]**.

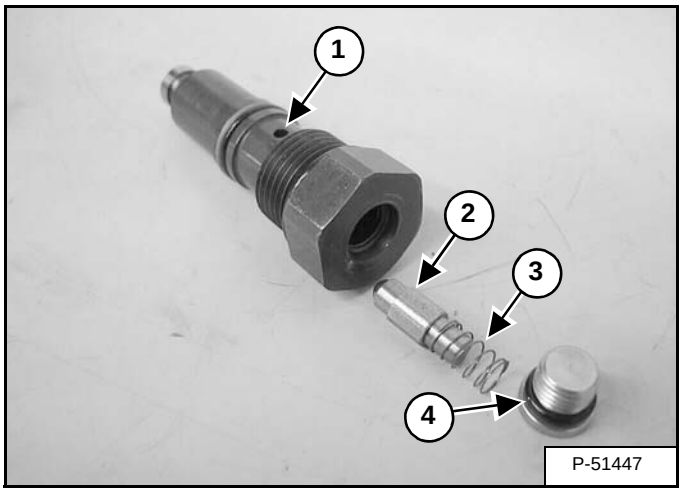
Installation: Lubricate the o-ring and tighten the valve to 55 - 65 ft.-lb. (75 - 88 N•m) torque.

Figure 20-40-118



Remove the plug (Item 1) **[Figure 20-40-118]** from the top of the BICS valve.

Figure 20-40-119



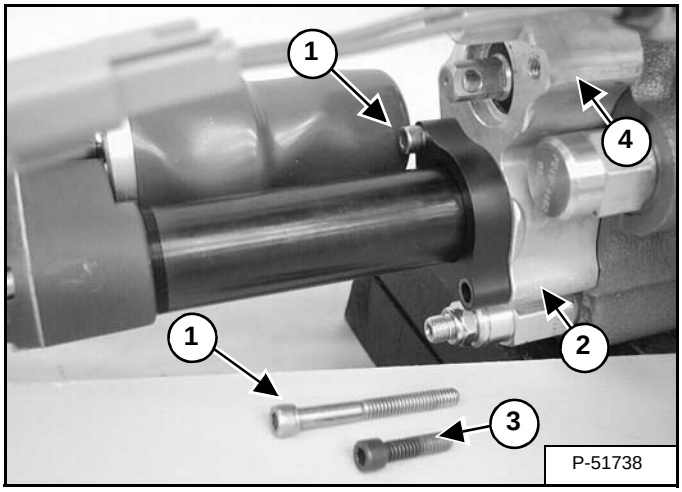
Check that there is no blockage in the orifice (Item 1) **[Figure 20-40-119]**.

Inspect the check valve (Item 2) and spring (Item 3) **[Figure 20-40-119]**.

Replace the O-ring (Item 4) **[Figure 20-40-119]** on the plug before installation.

Actuator Removal And Installation (Out of Loader) (Cont'd)

Figure 20-41-26

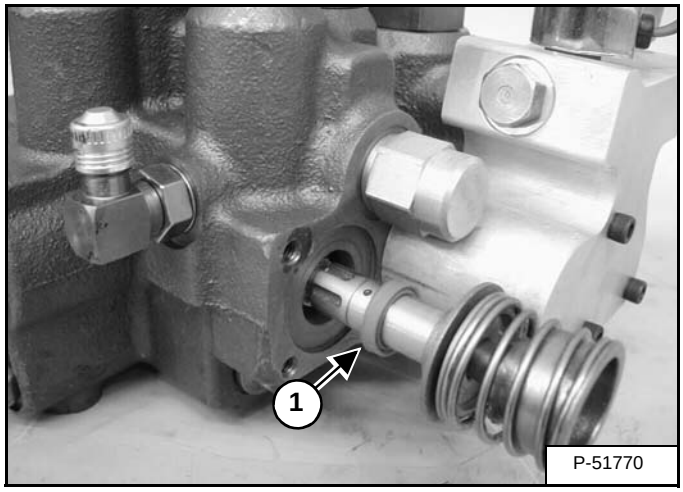


NOTE: The two longer bolts (Item 1) are used to mount the lift actuator and end cap (Item 2) [Figure 20-41-26] to the control valve.
The two shorter mount bolts (Item 3) are used to mount the tilt actuator to the end cap (Item 4) [Figure 20-41-26].

Installation: Tighten the mounting bolts to 90 - 100 in.-lb. (10,2 - 11,3 N•m) torque (Item 1) **[Figure 20-41-26]**

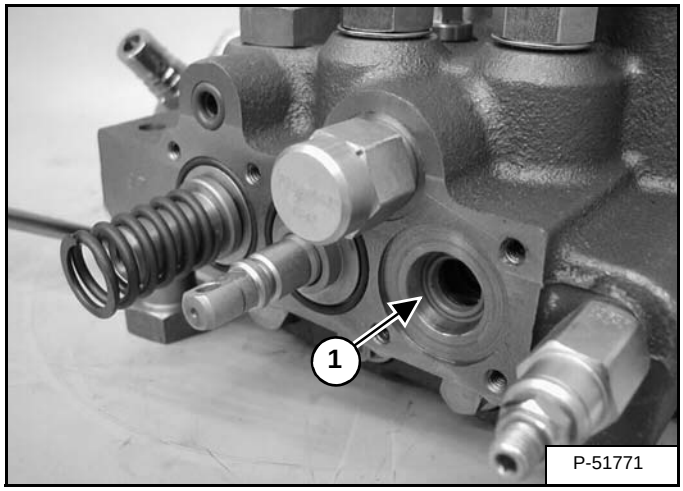
Lift Spool Removal and Installation (Cont'd)

Figure 20-41-58



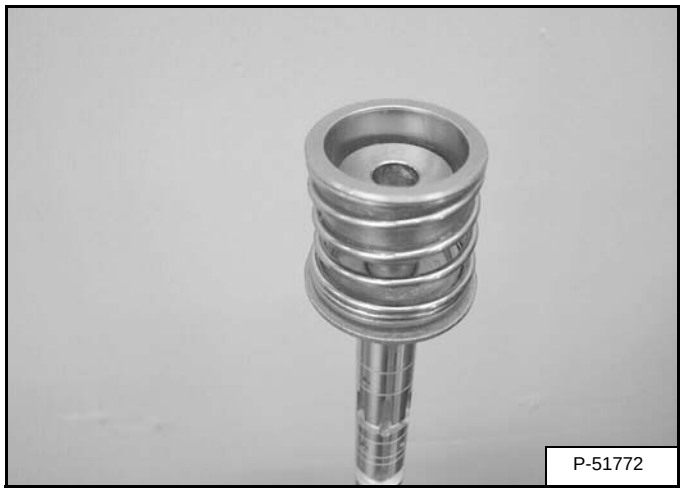
Remove the lift spool assembly and seal (Item 1) **[Figure 20-41-58]** from the control valve.

Figure 20-41-59



Remove the lift spool seal (Item 1) **[Figure 20-41-59]** from the linkage end of the valve.

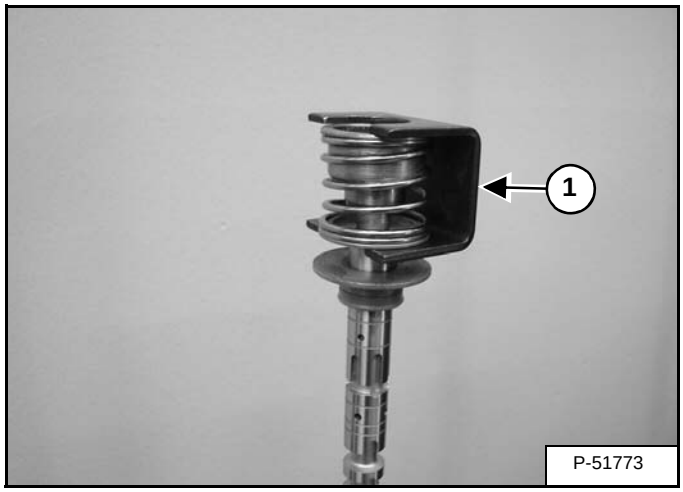
Figure 20-41-60



Clamp the linkage end of the spool in a vise **[Figure 20-41-60]**.

NOTE: Protect spool before clamping in vise.

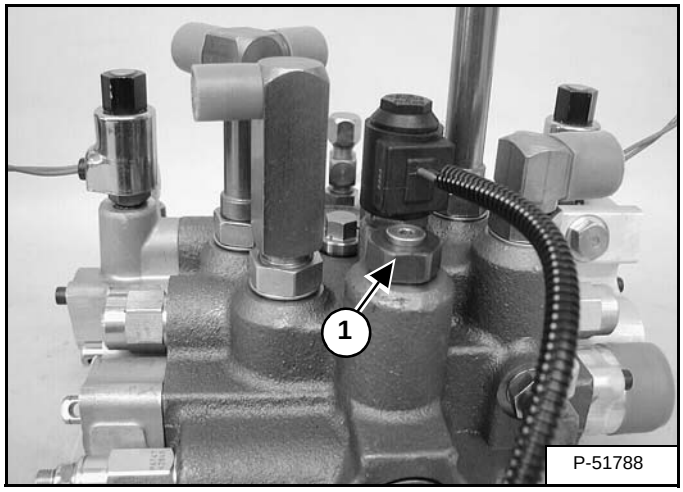
Figure 20-41-61



Install the spring tool (Item 1) **[Figure 20-41-61]** over the centering spring.

BICS Valve, Check Valve Removal And Installation

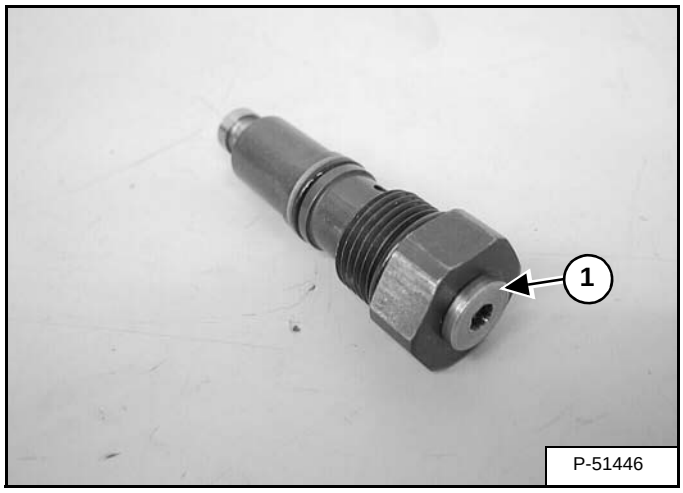
Figure 20-41-97



Remove the BICS valve (Item 1) **[Figure 20-41-97]**.

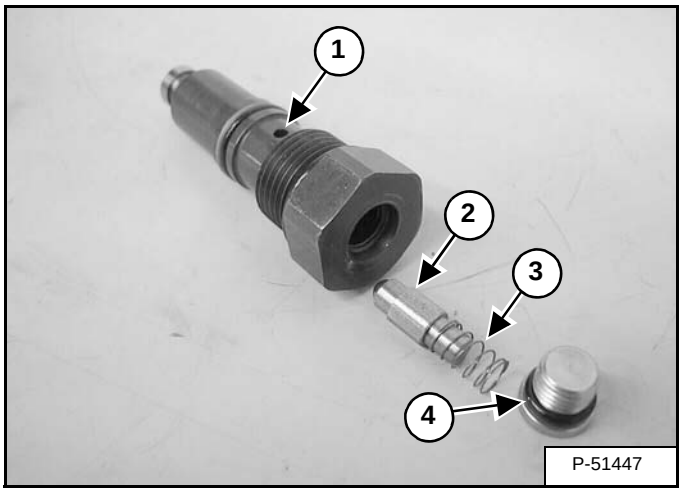
Installation: Lubricate the o-ring and tighten the valve to 55 - 65 ft.-lb. (75 - 88 N•m) torque.

Figure 20-41-98



Remove the plug (Item 1) **[Figure 20-41-98]** from the top of the BICS valve.

Figure 20-41-99



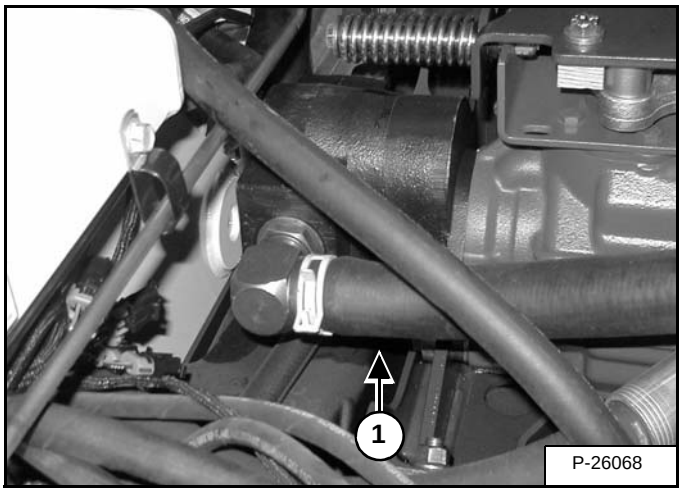
Check that there is no blockage in the orifice (Item 1) **[Figure 20-41-99]**.

Inspect the check valve (Item 2) and spring (Item 3) **[Figure 20-41-99]**.

Replace the O-ring (Item 4) **[Figure 20-41-99]** on the plug before installation.

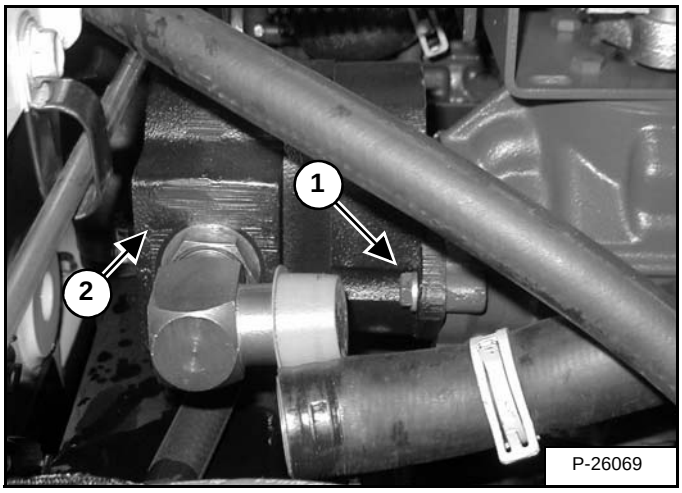
Removal And Installation (Cont'd)

Figure 20-60-8



Disconnect and cap the inlet hose (Item 1) **[Figure 20-60-8]** from the front of the hydraulic pump.

Figure 20-60-9

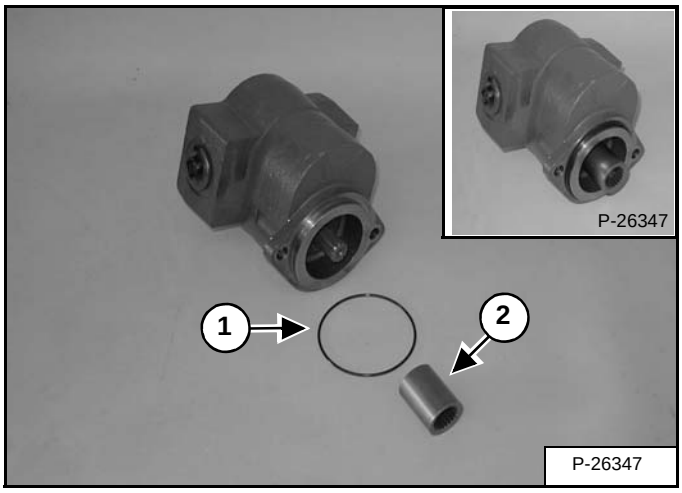


Remove the two mounting bolts (Item 1) **[Figure 20-60-9]** from the hydraulic pump.

Installation: Tighten the mounting bolts to 27 - 37 in.-lb. (37 - 50 N•m) torque.

Remove the hydraulic pump (Item 2) **[Figure 20-60-9]** from the hydrostatic pump.

Figure 20-60-10



Remove the O-ring (Item 1) **[Figure 20-60-10]**.

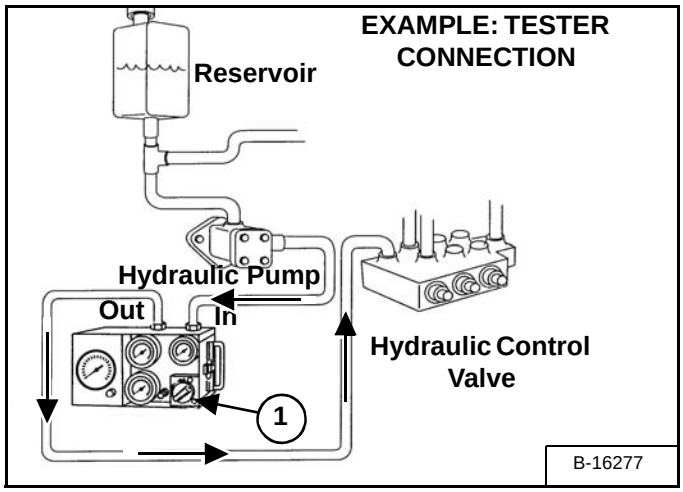
Remove the coupler (Item 2) **[Figure 20-60-10]** from the hydraulic pump shaft.

Reverse the removal procedure to install the hydraulic pump.

Installation: Use a new O-ring (Item 1) **[Figure 20-60-10]** when installing the hydraulic pump. (See Disassembly And Assembly on Page 20-60-8.)

Check The Output Of The Hydraulic Pump With Rear Auxiliary. (Cont'd)

Figure 20-61-6



Sample tester connection shown **[Figure 20-61-6]**.

Start the engine and run at low idle RPM. Make sure the tester is connected correctly. If no flow is indicated on the tester, the hoses are connected wrong. With the hoses connected correctly, increase the engine speed to full RPM*.

Warm the fluid to 140°F (60°C) by turning the restrictor control (Item 1) **[Figure 20-61-6]** on the tester to about 1000 PSI (6895 kPa). **DO NOT EXCEED SYSTEM RELIEF PRESSURE.** Open the restrictor control and record the free flow (GPM) at full RPM.

Push the maximum/variable flow switch (on the remote start tool) to engage the front auxiliary hydraulics, the light will come ON. Push the button (on the right control lever) for fluid flow to the quick coupler (fluid pressure will go over main relief). Record the highest pressure (PSI) and flow (GPM). The high pressure flow must be at least 80% of free flow.

$$\%= \frac{\text{HIGH PRESSURE FLOW (GPM)}}{\text{FREE FLOW (GPM)}} \text{ X100}$$

A low percentage may indicate a failed pump.

*Refer to *SPECIFICATIONS* Section SPEC-01 for system relief pressure and full RPM.

Disassembly And Assembly (Cont'd)

Figure 20-61-32

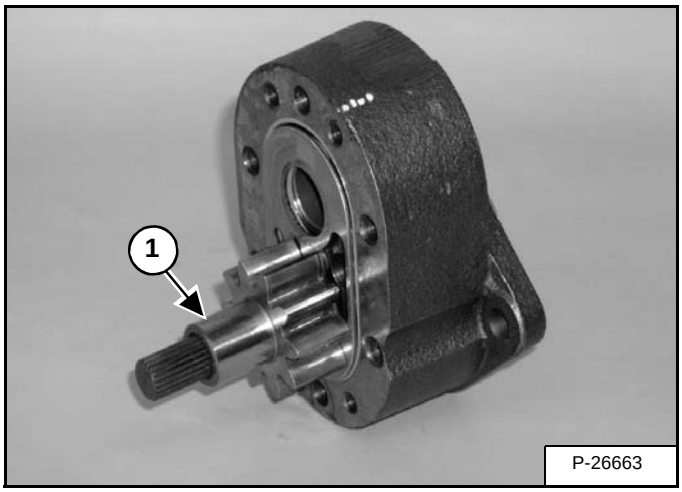
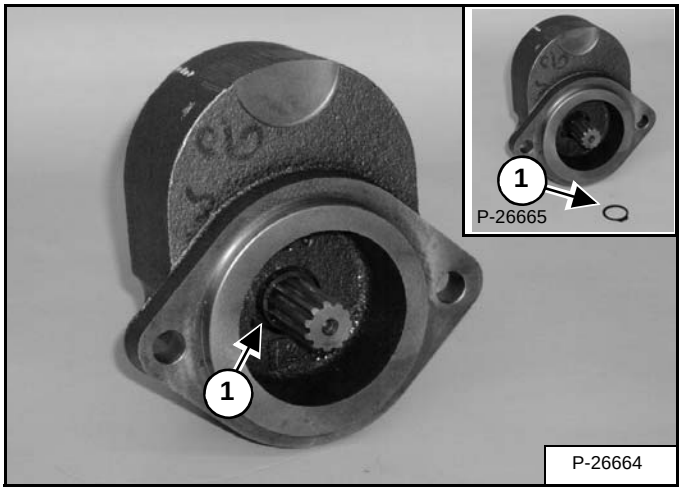
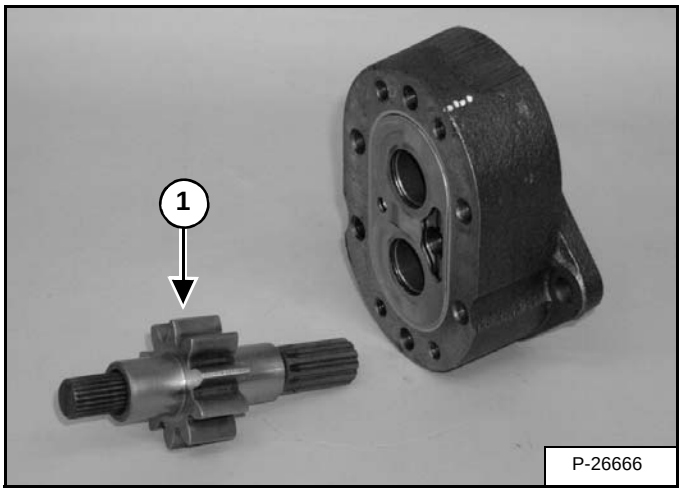


Figure 20-61-33



To remove the drive gear (Item 1) **[Figure 20-61-32]** from the pump end section, locate and remove the retaining ring (Item 1) **[Figure 20-61-33]** from the spline end of the drive gear.

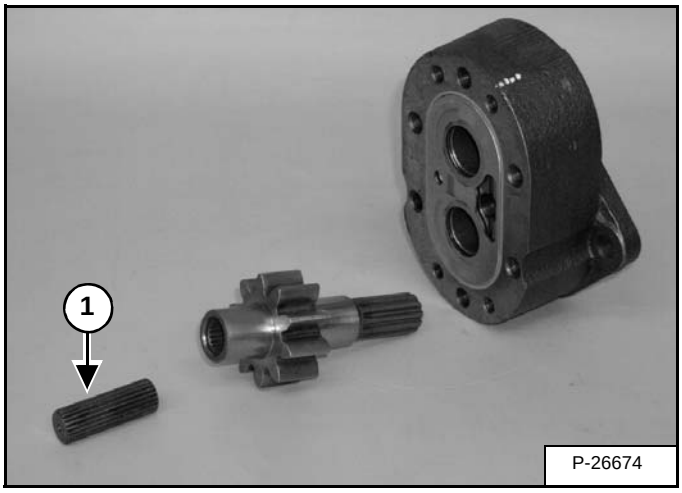
Figure 20-61-34



Remove the drive gear (Item 1) **[Figure 20-61-34]** from the pump end section.

NOTE: Inspect the drive gear (Item 1) [Figure 20-61-34]. If excessive wear or damage is visible, the pump must be replaced.

Figure 20-61-35



Remove the spline shaft (Item 1) **[Figure 20-61-35]** from the end of the drive gear.

NOTE: Inspect the spline shaft (Item 1) [Figure 20-61-35]. If excessive wear or damage is visible, the pump must be replaced.

Disassembly And Assembly (Cont'd)

Figure 20-62-13

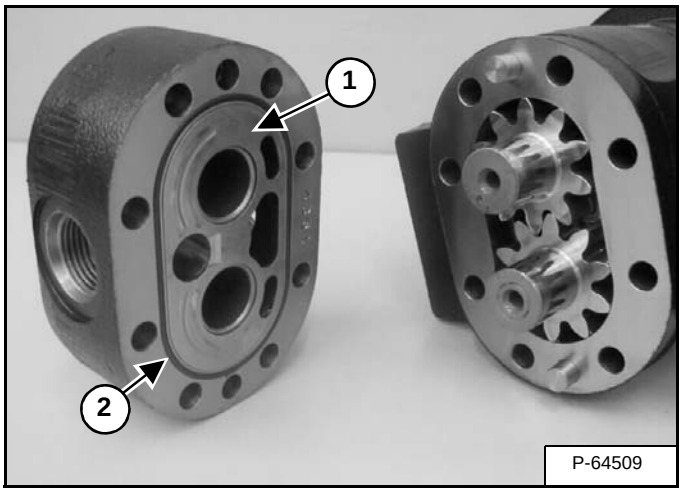
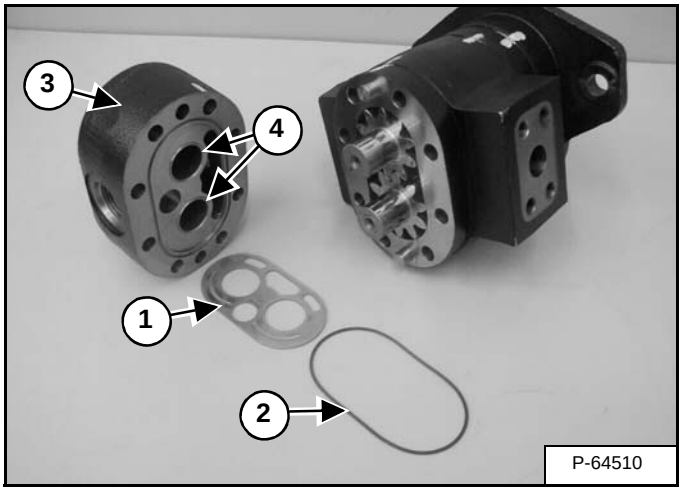


Figure 20-62-14



Remove the wear plate (Item 1) and section seal (Item 2) **[Figure 20-62-13]** & **[Figure 20-62-14]** from the pump end section.

NOTE: Position wear plate (Item 1) [Figure 20-62-14] inlets and traps as shown with bronze side toward gears.

NOTE: Inspect the pump end section (Item 3) [Figure 20-62-14] and bushings (Item 4) [Figure 20-62-14]. If excessive wear or damage is visible, the pump must be replaced.

Figure 20-62-15

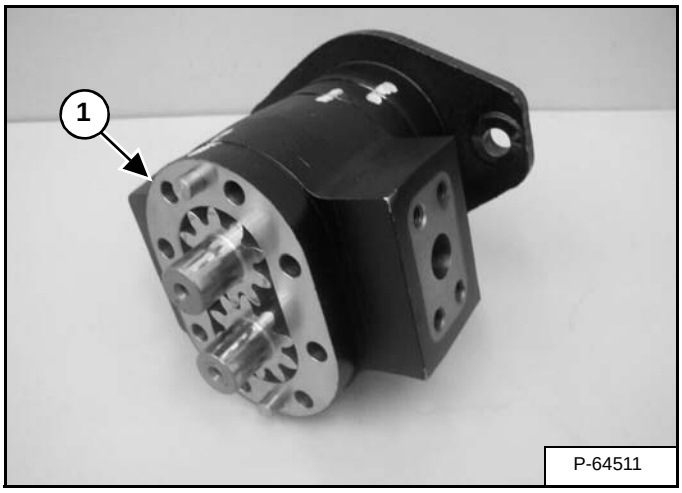
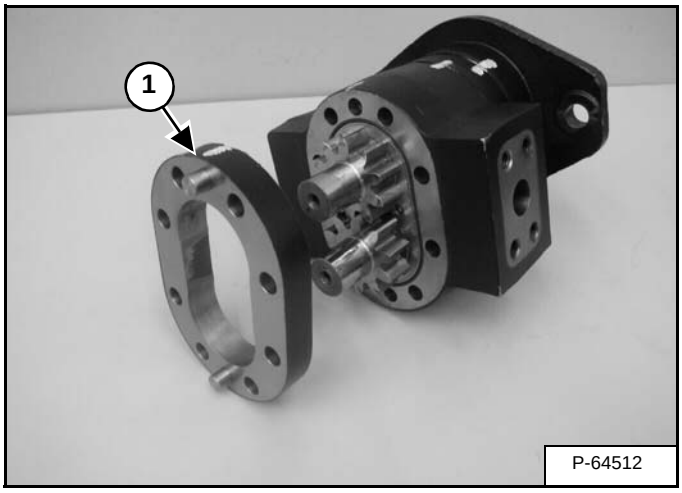


Figure 20-62-16



Remove the charge pump section (Item 1) **[Figure 20-62-15]** & **[Figure 20-62-16]** from the pump center section.

NOTE: Inspect the pump section (Item 1) [Figure 20-62-16]. If excessive wear or damage is visible, the pump must be replaced.

Test The Output Of The Hydraulic Pump (High Flow)

⚠ WARNING

Put jackstands under the front axles and rear corners of the frame before running the engine for service. Failure to use jackstands can allow the machine to fall or move and cause injury or death.

W-2017-0286

⚠ WARNING

Never work on a machine with the lift arms up unless the lift arms are secured by an approved lift arm support device. Failure to use an approved lift arm support device can allow the lift arms or attachment to fall and cause injury or death.

W-2059-0598

IMPORTANT

The hydraulic tester must be in the fully open position before you start the engine.

I-2024-0284

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

MEL1563 - Remote Start Tool
MEL10103 - Hydraulic Tester
MEL10106 - Hydraulic Test Kit

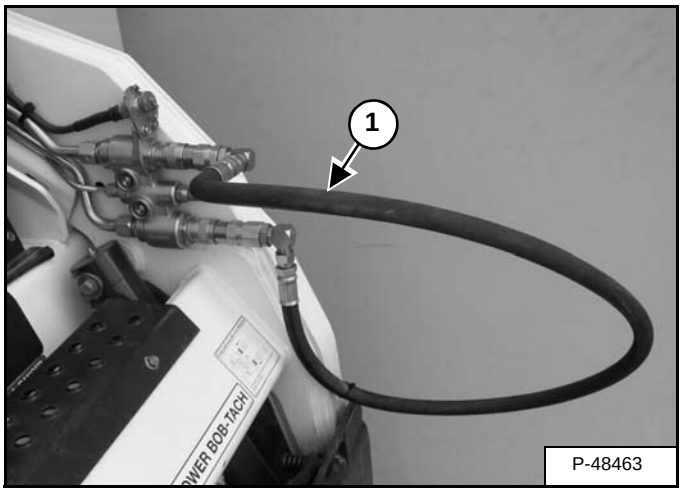
Lift and block the loader. (See Procedure on Page 10-10-1.)

Raise the operator cab. (See Raising The Operator Cab on Page 10-30-1.)

Open the rear door of the loader.

Connect the remote start tool. (See Procedure on Page 10-60-1.)

Figure 20-63-6



Install a jumper hose (Item 1) **[Figure 20-63-6]** onto the front auxiliary quick couplers.

Raise the lift arms and install an approved lift arm support device. (See Installing Lift Arm Support Device on Page 10-20-1.)

Disassembly And Assembly (Cont'd)

Figure 20-63-34

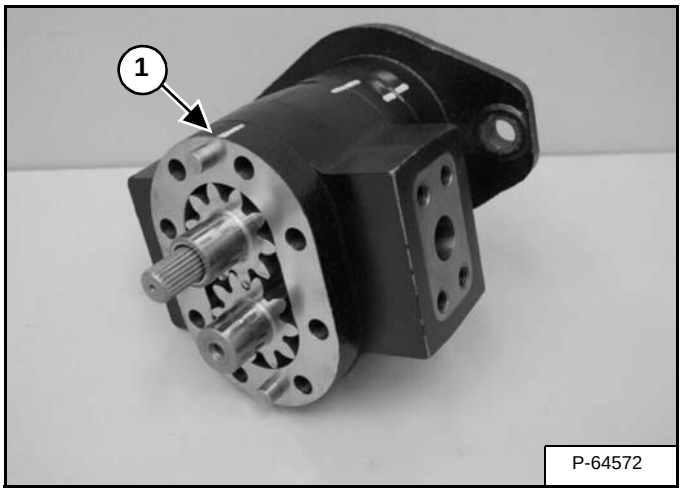
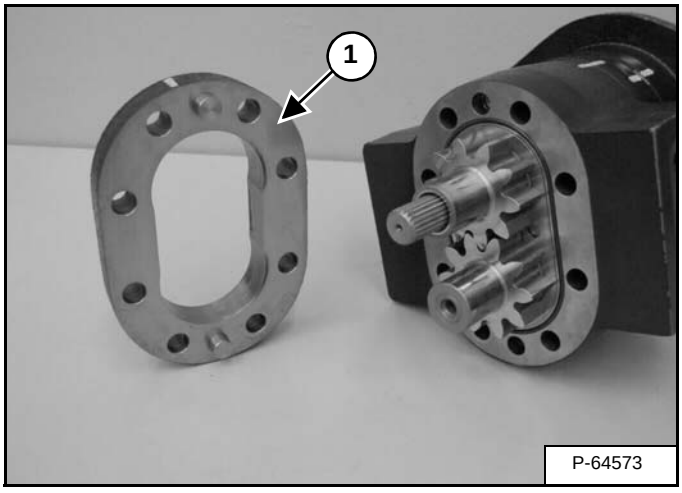


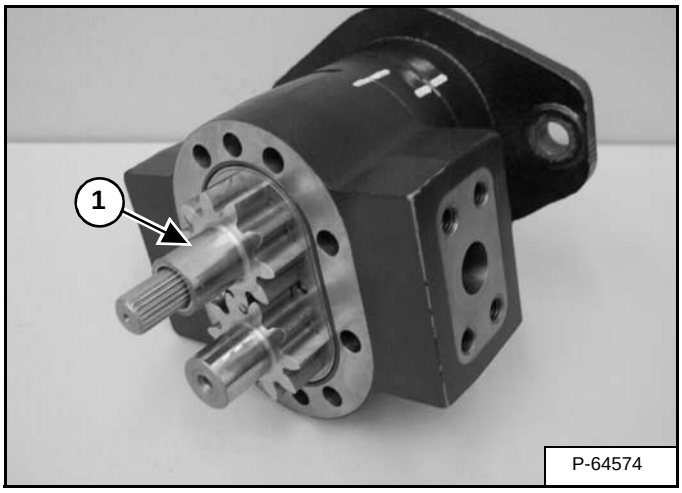
Figure 20-63-35



Remove the charge pump section (Item 1) **[Figure 20-63-34]** & **[Figure 20-63-35]** from the auxiliary pump center section.

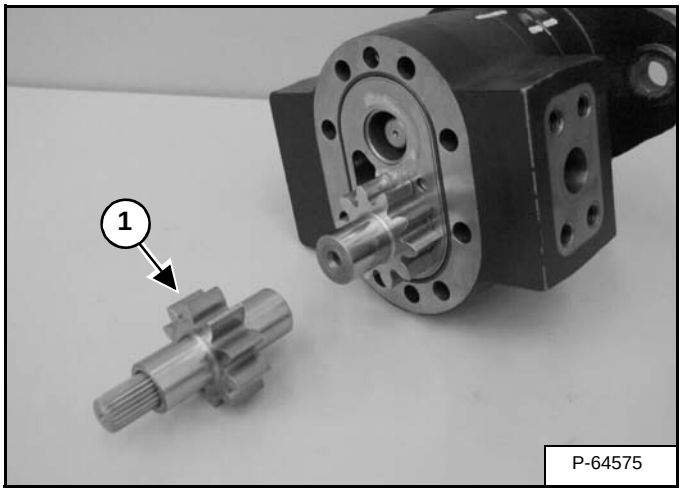
NOTE: Inspect the charge pump section (Item 1) [Figure 20-63-35]. If excessive wear or damage is visible, the pump must be replaced.

Figure 20-63-36



Remove the drive gear (Item 1) **[Figure 20-63-36]** from the auxiliary center section.

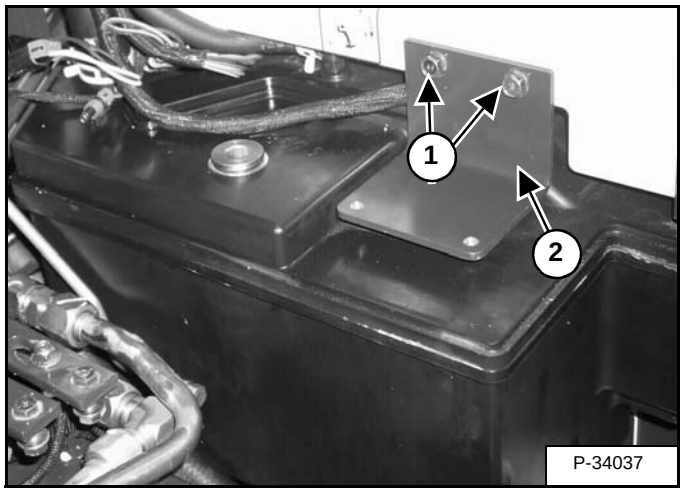
Figure 20-63-37



NOTE: Inspect the drive gear (Item 1) [Figure 20-63-37]. If excessive wear or damage is visible, the pump must be replaced.

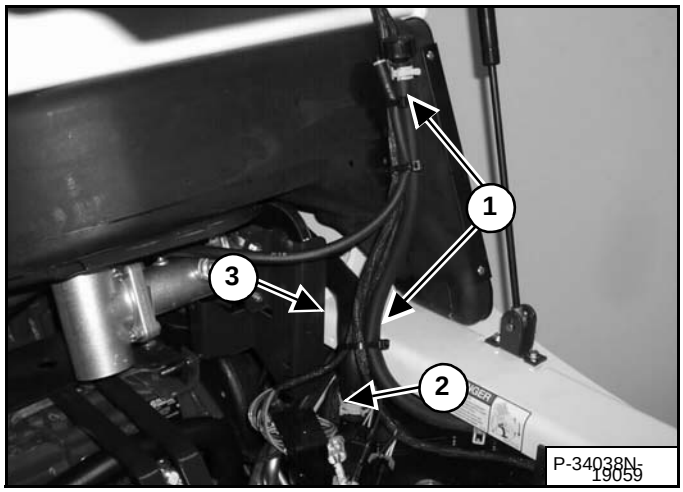
Removal And Installation (Cont'd)

Figure 20-80-3



Remove the two mounting bolts (Item 1) **[Figure 20-80-3]** and remove the plate (Item 2) **[Figure 20-80-3]** from the loader.

Figure 20-80-4

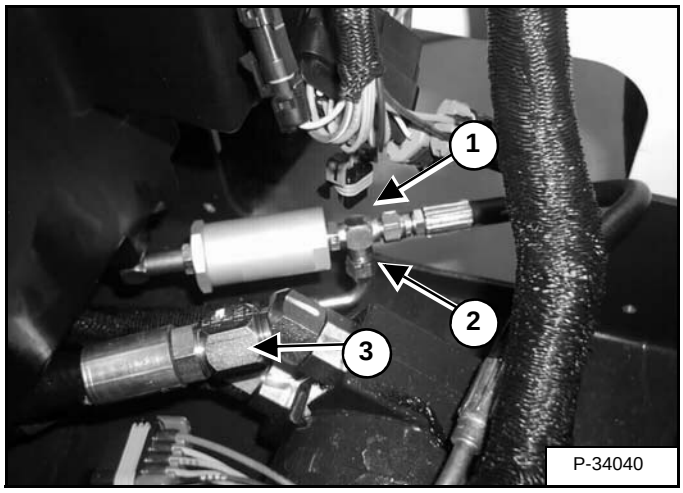


Remove the tie-straps (Item 1) **[Figure 20-80-4]** from the breather hose.

Remove the hose clamp (Item 2) **[Figure 20-80-4]**.

Remove the hydraulic fill hose (Item 3) **[Figure 20-80-4]** from the hydraulic reservoir.

Figure 20-80-5

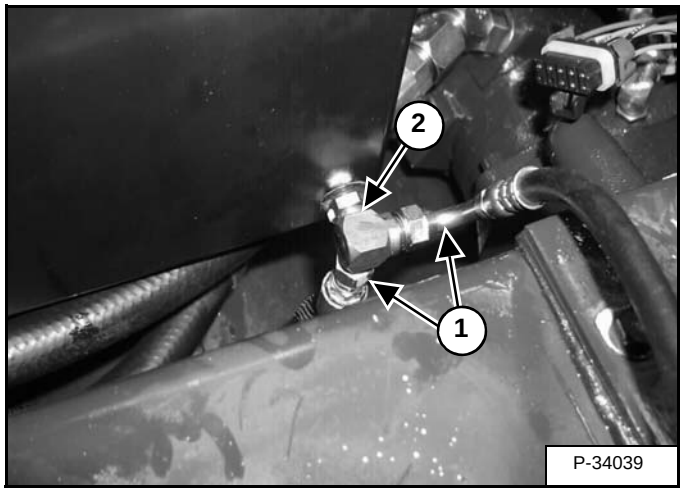


Remove the drive motor drain hose (Item 1) **[Figure 20-80-5]** at the drain filter

Remove the auxiliary pressure relief drain hose (Item 2) **[Figure 20-80-5]** at the drain filter.

Remove the drive motor supply hose (Item 3) **[Figure 20-80-5]**.

Figure 20-80-6

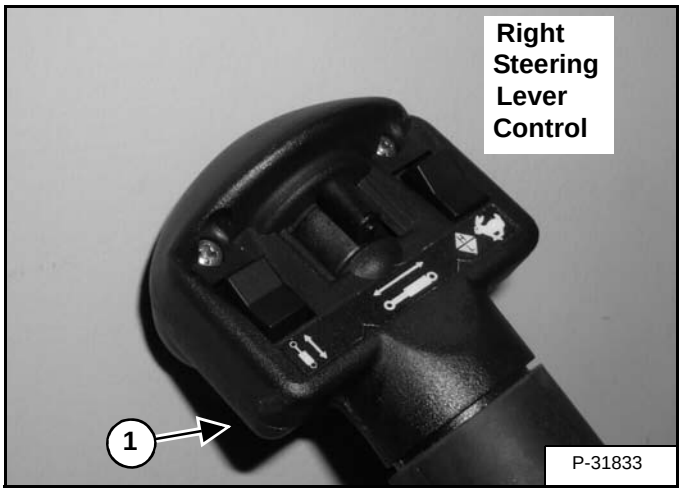


Remove the two control valve drain hoses (Item 1) **[Figure 20-80-6]**.

Remove the fitting (Item 2) **[Figure 20-80-6]** from the reservoir.

Checking The High Flow Relief Valve (Cont'd)

Figure 20-100-3



- Push the front switch (Item 1) **[Figure 20-100-3]** to give the **front** quick couplers a constant flow of fluid.

- To release from continuous operation, press the front switch (Item 1) **[Figure 20-100-3]** a second time.

Watch the flow meter on the hydraulic tester to make sure the flow is correct. Increase the engine speed to full RPM.

Warm the fluid to 140°F (60°C) by turning the restrictor control on the tester to about 1000 PSI (6895 kPa). DO NOT exceed system relief pressure.

NOTE: ***DO NOT EXCEED 3300 PSI.***

Turn the restrictor control on the tester counter clockwise, to obtain free flow, the flow should be at 27 GPM. Start turning the restrictor clockwise, causing more restriction on the flow. The GPM should drop off slightly until the pressure reaches approximately 3100 PSI. At approximately 3100 PSI the flow should start decreasing rapidly until the pressure reaches 3250 - 3350 PSI. At 3250 - 3350 PSI the flow should be at 0 GPM. Turn the restrictor control counter clockwise to free flow. Shut the front auxiliary hydraulics off.

If the specs from above are reached, the high flow relief valve is OK.

If the high flow relief pressure is not correct, stop the engine and adjust the high flow relief valve. (See High Flow Relief Valve Adjustment Procedure on Page 20-100-3.)

Disassembly And Assembly

Figure 20-110-10

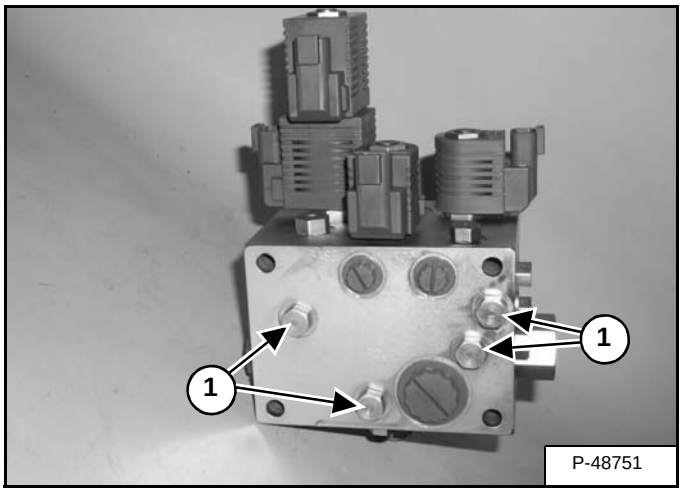
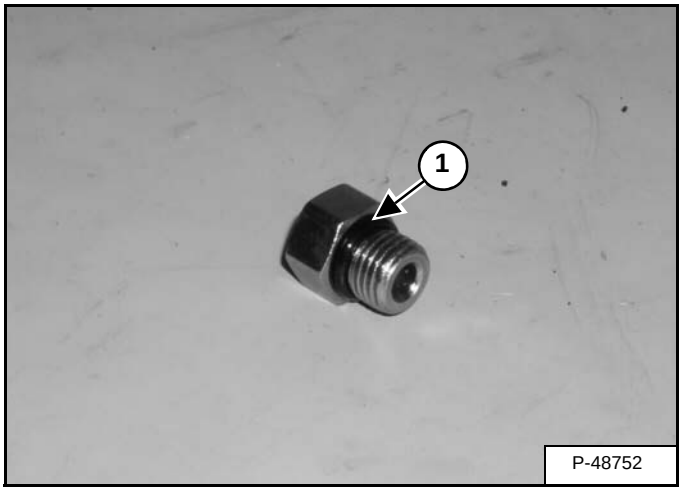


Figure 20-110-11



Clean the diverter valve to remove dirt before disassembly. Valve ports are labeled for correct assembly.

Several plugs (Item 1) **[Figure 20-110-10]** & **[Figure 20-110-11]** are located all over the diverter valve and can be removed for cleanout purposes.

Installation: Put oil on O-rings and back-up washers.Tighten to 10 ft.-lb. (13,6 N•m) torque.

IMPORTANT

When repairing hydrostatic and hydraulic systems, clean the work area before disassembly and keep all parts clean. Always use caps and plugs on hoses, tubelines and ports to keep dirt out. Dirt can quickly damage the system.

I-2003-0888

Figure 20-110-12

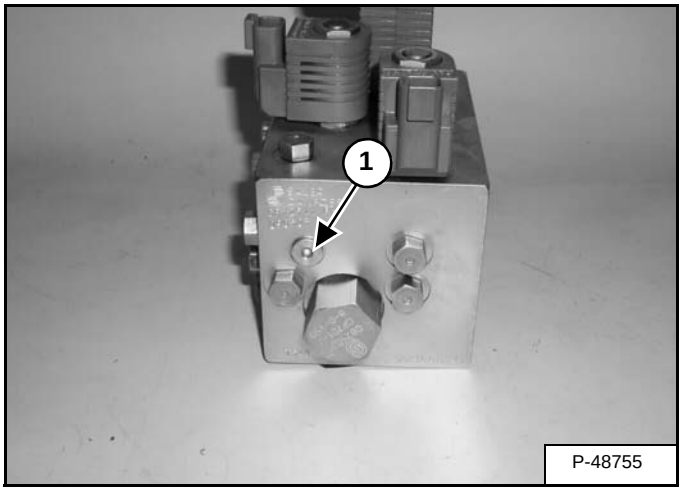
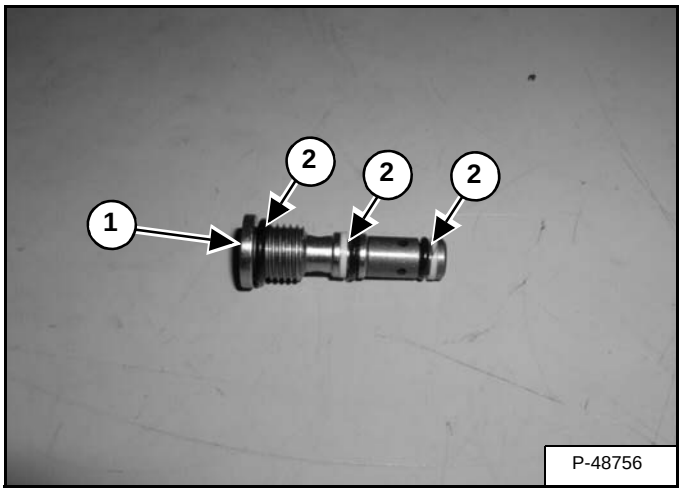


Figure 20-110-13

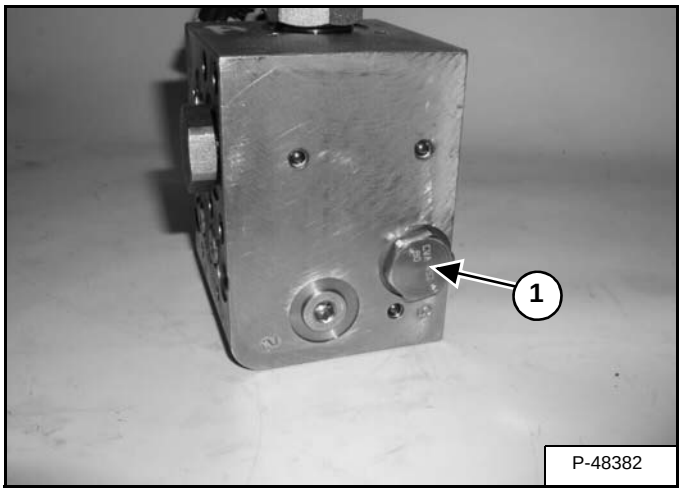


Remove the shuttle valve (Item 1) **[Figure 20-110-12]** & **[Figure 20-110-13]** from diverter valve and inspect the O-rings and back-up washers (Item 2) **[Figure 20-110-13]** for damage.

Installation: Put oil on the O-rings and back-up washers. Tighten to 10 - 12 ft.-lb. (14 - 16 N•m) torque.

Disassembly And Assembly (Cont'd)

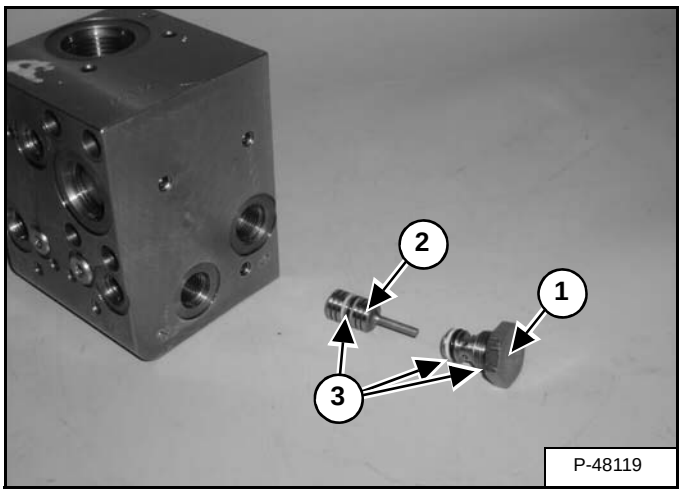
Figure 20-120-8



Remove the check valve (Item 1) **[Figure 20-120-8]**.

Installation: Oil the check valve and O-rings and tighten the check valve to 20 - 25 ft.-lb. (27,1 - 34 N•m) torque.

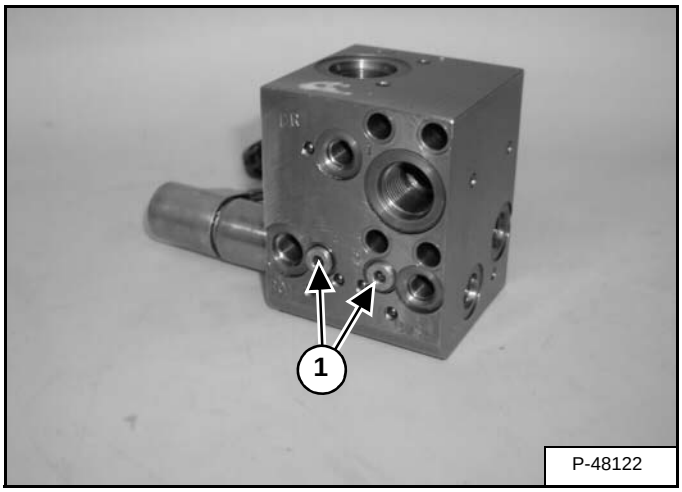
Figure 20-120-9



Inspect the check valve (Item 1) and piston assembly (Item 2) **[Figure 20-120-9]**.

Check the O-rings and back up washers (Item 3) **[Figure 20-120-9]** on the check valve and piston assembly and replace as needed.

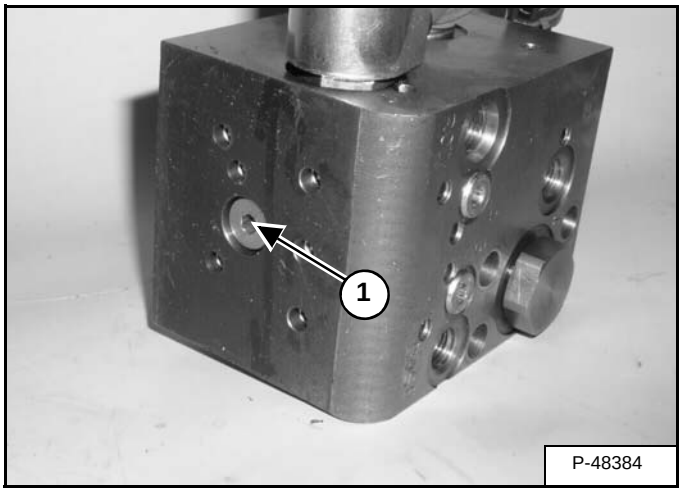
Figure 20-120-10



Do not remove the plugs (Item 1) **[Figure 20-120-10]**.

NOTE: Do not remove plugs. If the plugs are removed the internal pressure relieving spring setting will be altered.

Figure 20-120-11

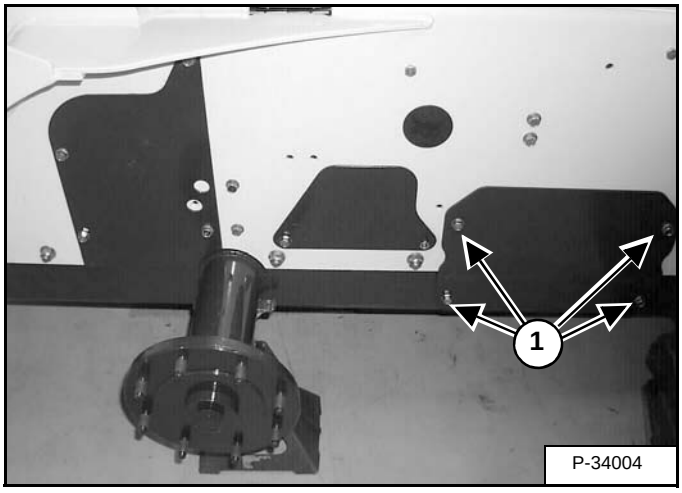


Remove the plug (Item 1) **[Figure 20-120-11]**, inspect the O-ring and replace as needed.

Installation: Tighten the plug (Item 1) **[Figure 20-120-11]** to 12 - 14 ft.-lb. (16,3 - 19 N•m) torque.

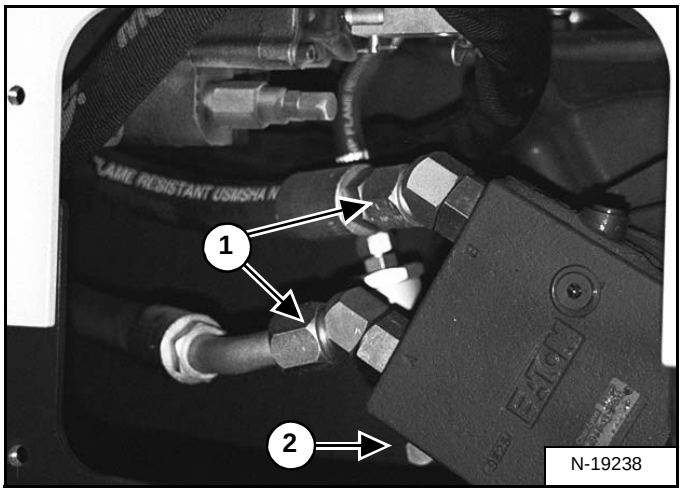
Removal And Installation (Cont'd)

Figure 30-20-3



Remove the four motor cover mounting bolts (Item 1) **[Figure 30-20-3]**.

Figure 30-20-4

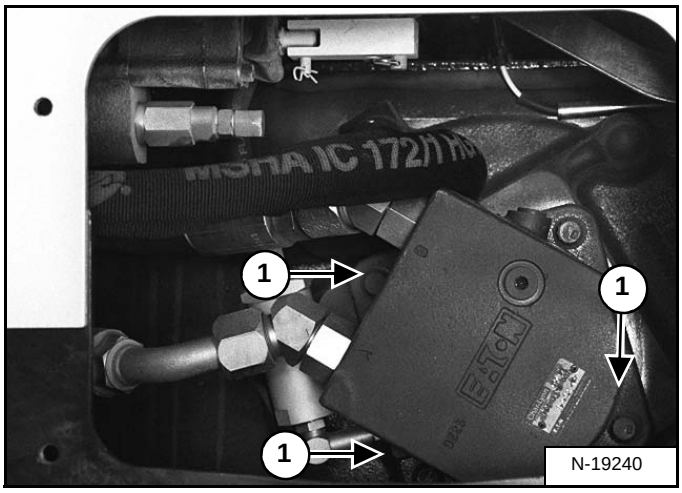


Mark the two hoses (Item 1) **[Figure 30-20-4]** before disconnecting them from the HYDROSTATIC MOTOR for correct installation.

Remove the two hoses (Item 1) **[Figure 30-20-4]** from the drive motor.

Remove the drain hose (Item 2) **[Figure 30-20-4]** from the drive motor.

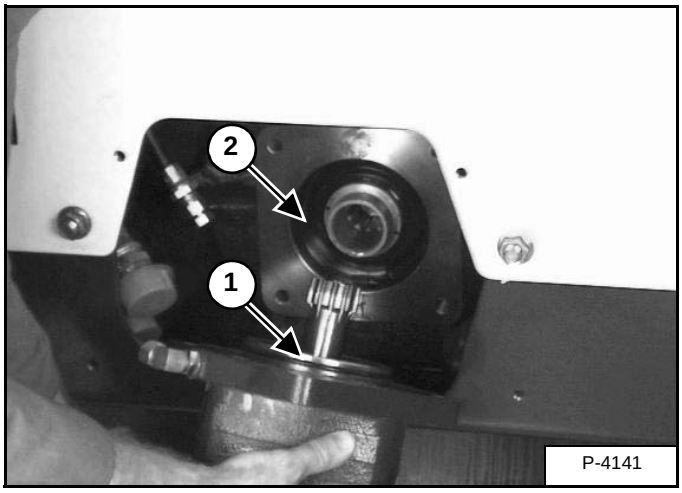
Figure 30-20-5



Remove the four drive motor mounting bolts (Item 1) **[Figure 30-20-5]**.

Installation: Tighten the drive motor mounting bolts to 90 - 100 ft.-lb. (122 - 136 N•m) torque.

Figure 30-20-6



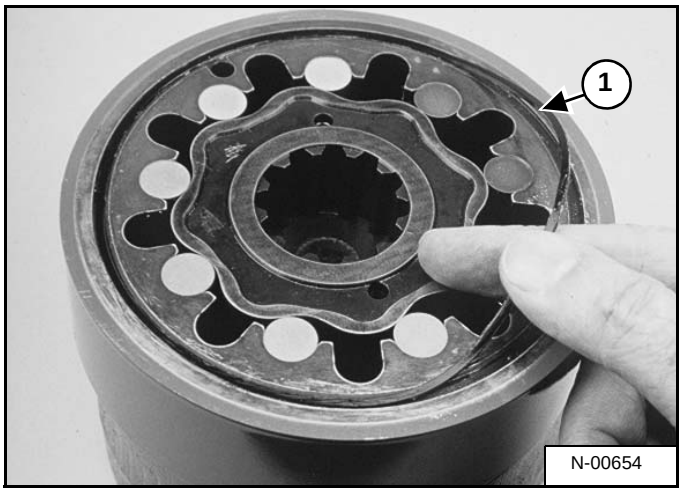
Remove the drive motor from the access hole in the loader frame **[Figure 30-20-6]**.

Inspect drive motor o-ring (Item 1) and carrier shaft seal (Item 2) **[Figure 30-20-6]**.

Reverse the removal procedure to install the HYDROSTATIC MOTOR.

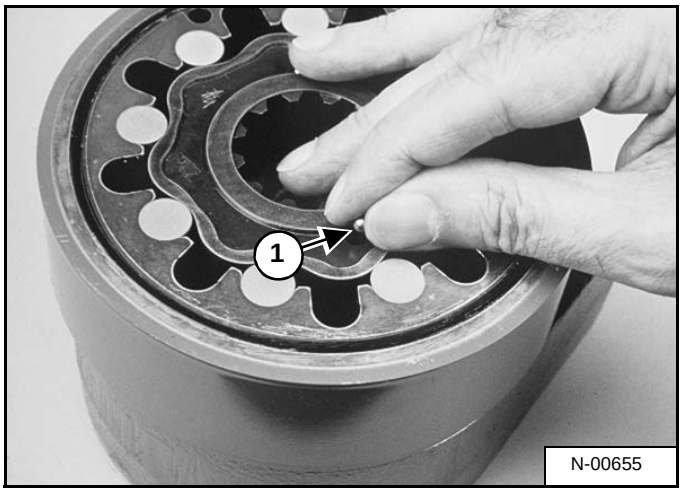
Assembly (Wet Bolt) (Cont'd)

Figure 30-20-38



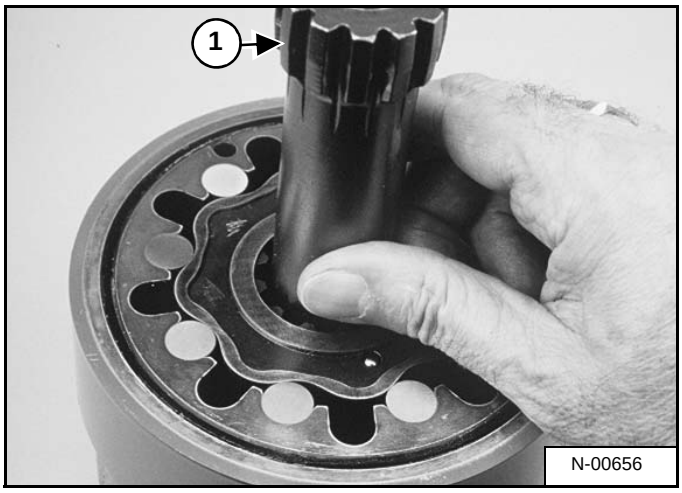
Install the square cut seal (Item 1) **[Figure 30-20-38]** in the Gerolor® outer ring.

Figure 30-20-39



Install the two check balls (Item 1) **[Figure 30-20-39]** in their bores in the Gerolor®.

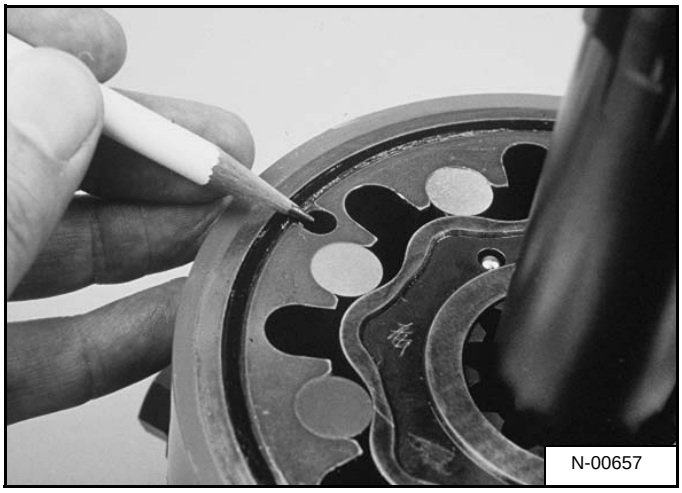
Figure 30-20-40



Install the main drive (Item 1) **[Figure 30-20-40]** in the Gerolor® (as shown).

NOTE: Whenever the main drive is not symmetrical, the smallest end of the main drive must be installed into the Gerolor®.

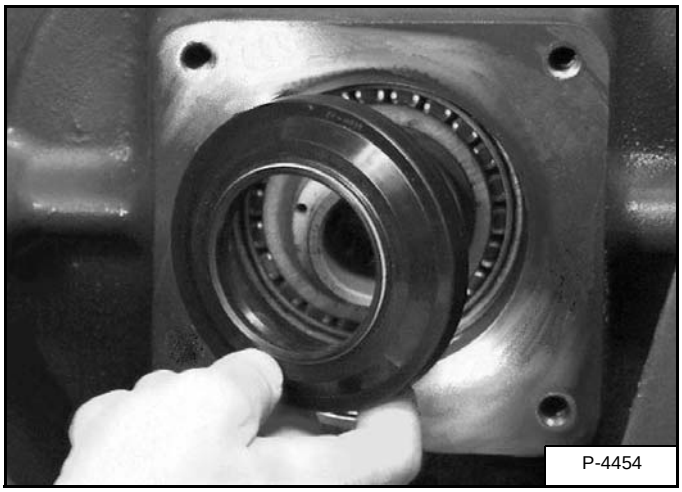
Figure 30-20-41



Mark the case drain hole on the outer ring of the Gerolor® (as shown) **[Figure 30-20-41]**.

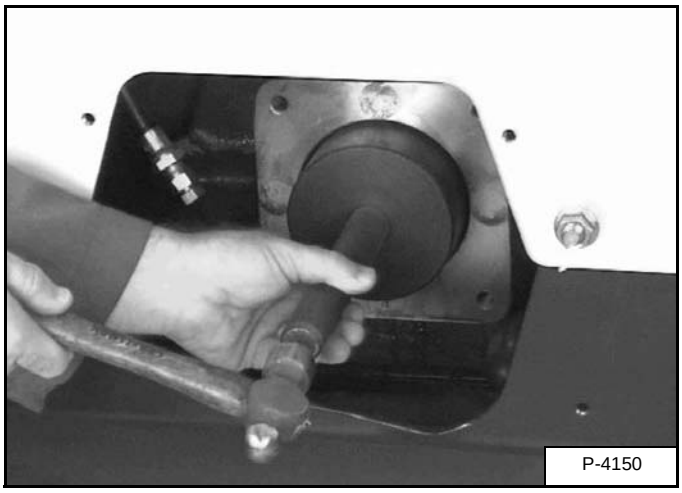
Shaft Seal Replacement (Cont'd)

Figure 30-21-4



Installation: Install a new seal over the motor carrier shaft **[Figure 30-21-4]**.

Figure 30-21-5



Installation: Install MEL1420 Carrier Seal Tool over the carrier seal **[Figure 30-21-5]**.

Hit the tool with a hammer until the seal is fully seated on the carrier shaft **[Figure 30-21-5]**.

Figure 30-21-6

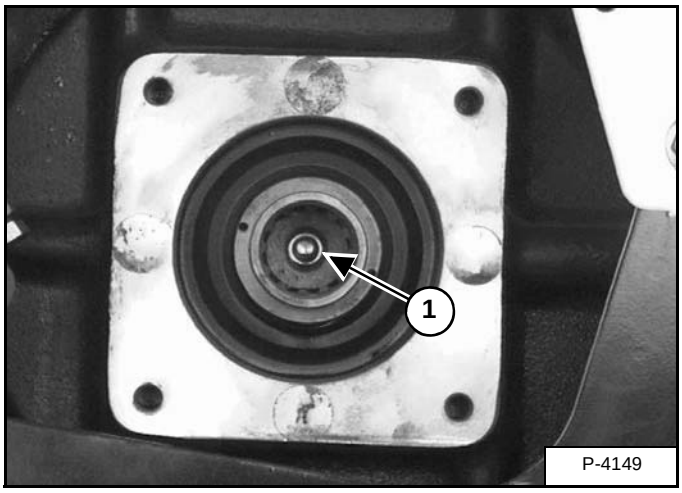
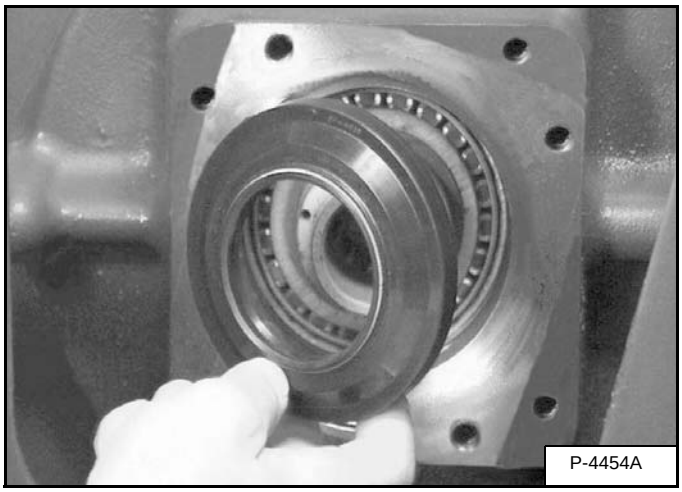


Photo **[Figure 30-21-6]** shows the motor carrier seal correctly installed.

NOTE: Before reinstalling the hydrostatic motor, check the plug (Item 1) [Figure 30-21-6] located in the center of the carrier shaft for tightness. If the plug becomes loosened, case drain lubrication oil from the hydrostatic motor can leak into the chaincase.

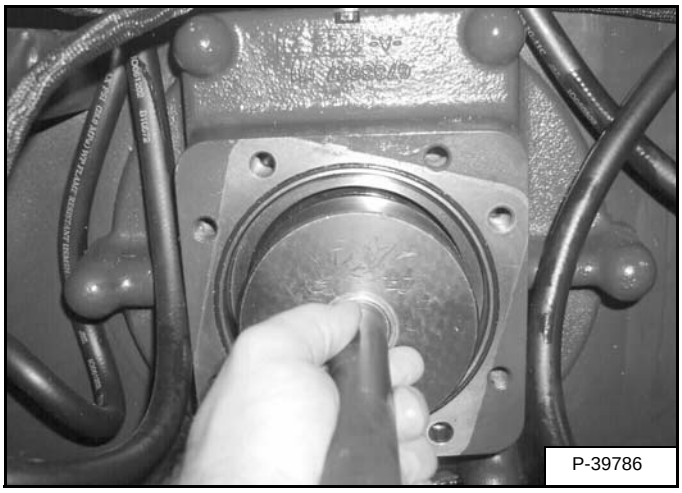
Shaft Seal Replacement (Cont'd)

Figure 30-22-4



Installation: Install a new seal over the motor carrier shaft **[Figure 30-22-4]**.

Figure 30-22-5



Installation: Install MEL1420 Carrier Seal Tool over the carrier seal **[Figure 30-22-5]**.

Hit the tool with a hammer until the seal is fully seated on the carrier shaft **[Figure 30-22-5]**.

Figure 30-22-6

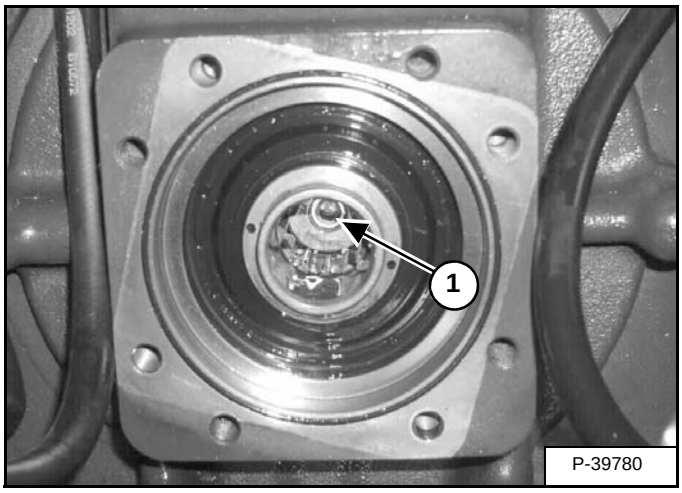


Photo **[Figure 30-22-6]** shows the motor carrier seal correctly installed.

NOTE: Before reinstalling the hydrostatic motor, check the plug (Item 1) [Figure 30-22-6] located in the center of the carrier shaft for tightness. If the plug becomes loosened, case drain lubrication oil from the hydrostatic motor can leak into the chaincase.

CHARGE PRESSURE (CONT'D)

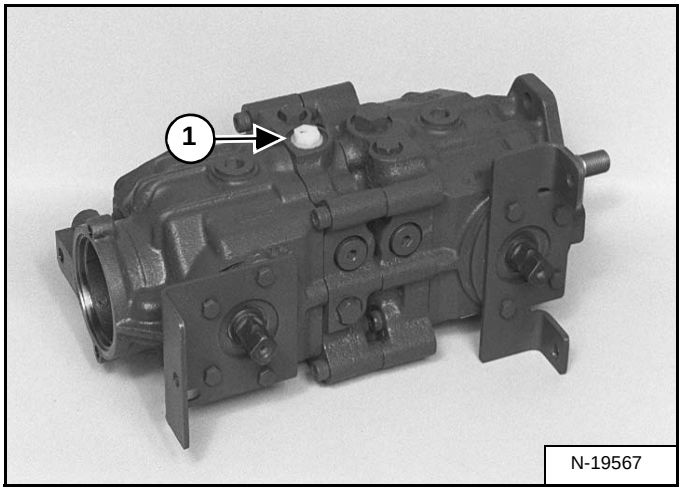
Adjusting (Non SJC Machines)

IMPORTANT

When repairing hydrostatic and hydraulic systems, clean the work area before disassembly and keep all parts clean. Always use caps and plugs on hoses, tubelines and ports to keep dirt out. Dirt can quickly damage the system.

I-2003-0888

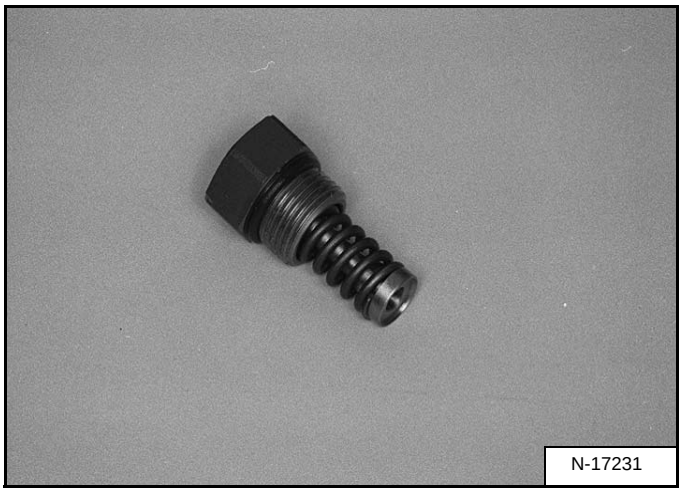
Figure 30-30-3



If the charge pressure is not correct loosen the charge relief valve plug (Item 1) **[Figure 30-30-3]**.

Assemble: Always use a new O-ring. Tighten the plug to 30 - 50 ft.-lb. (41 - 68 N•m) torque.

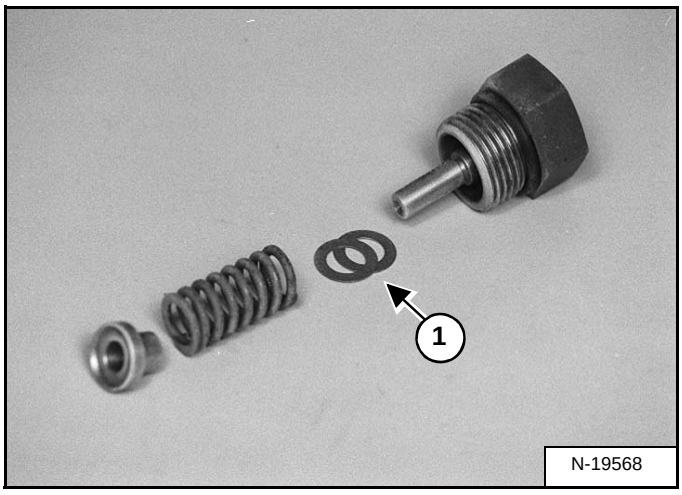
Figure 30-30-4



Remove the plug, spring and poppet **[Figure 30-30-4]**.

Check the poppet and spring for wear or damage.

Figure 30-30-5



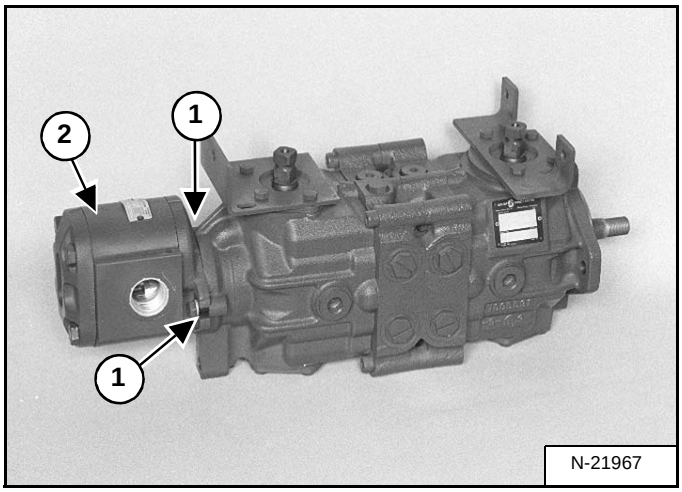
There are several different thickness of the shims (Item 1) **[Figure 30-30-5]** and are used to adjust the charge pressure.

NOTE: 0.010 inch (0,254 mm) is 8 PSI (55.16 kPa) increase in pressure.

The charge pressure should be set at 220 - 270 PSI (15,1 - 18,6 bar).

Hydraulic Pump Removal And Installation

Figure 30-40-8

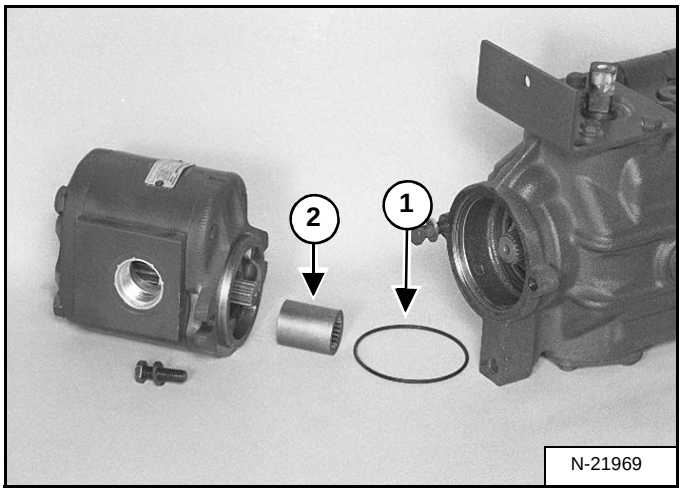


Remove the pump mounting bolts (Item 1) **[Figure 30-40-8]** (both sides).

Installation: Tighten the mounting bolts to 25 - 27 ft.-lb. (34 - 37 N•m) torque.

Remove the hydraulic pump (Item 2) **[Figure 30-40-8]** from the hydrostatic pumps.

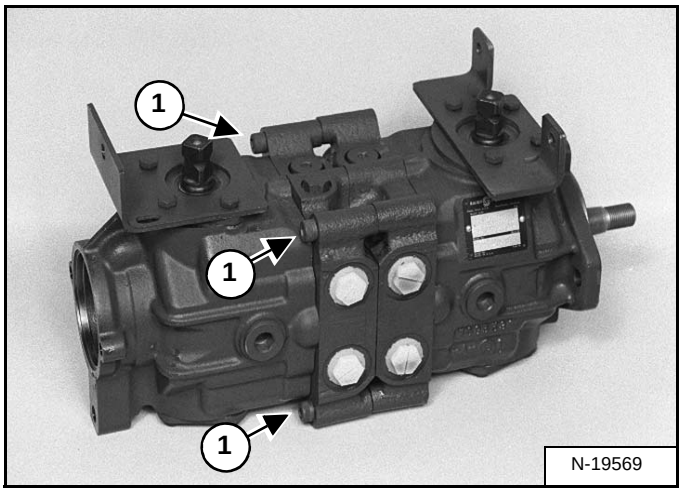
Figure 30-40-9



Remove the O-ring (Item 1) **[Figure 30-40-9]** and coupler (Item 2) **[Figure 30-40-9]** with the hydraulic pump.

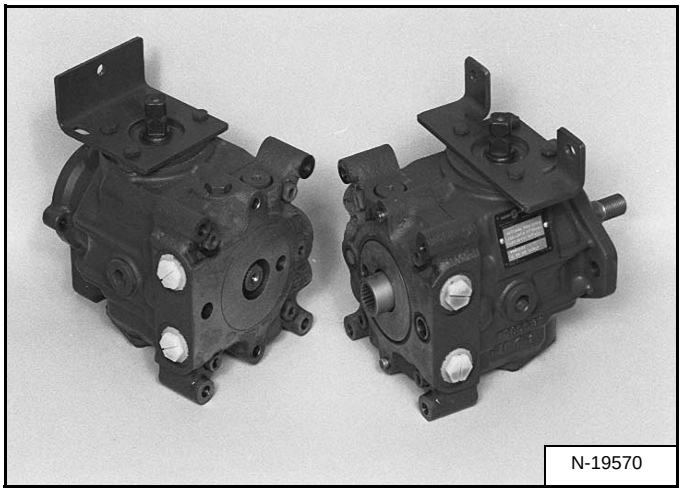
Pump Separation

Figure 30-40-10



Remove the four mounting bolts (Item 1) **[Figure 30-40-10]**.

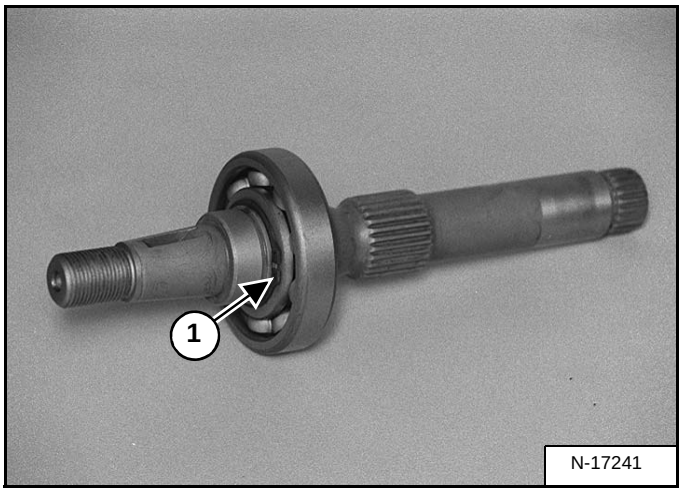
Figure 30-40-11



Separate the two hydrostatic pumps **[Figure 30-40-11]**.

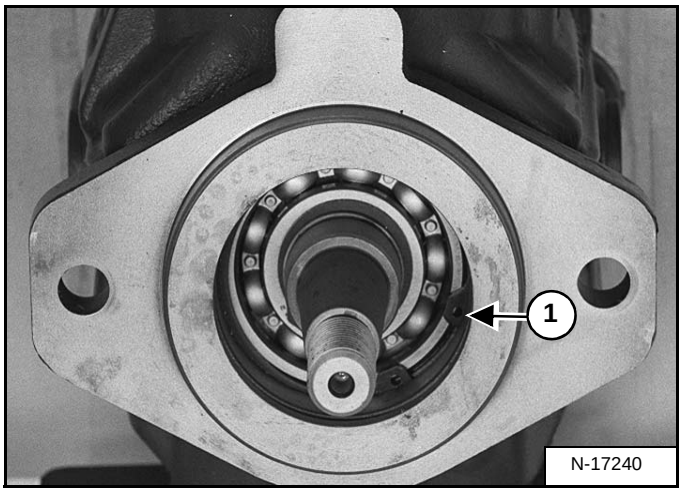
Assembly (Cont'd)

Figure 30-40-47



Install the bearing and snap ring (Item 1) **[Figure 30-40-47]** on the pump shaft.

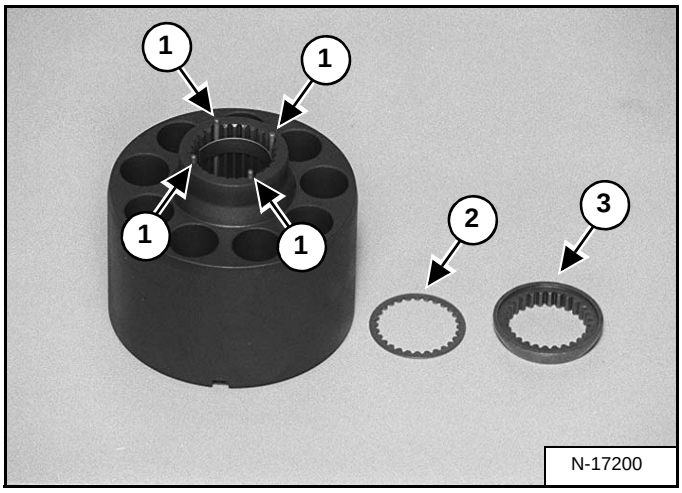
Figure 30-40-48



Install the pump shaft into the pump housing **[Figure 30-40-48]**.

Install the snap ring (Item 1) **[Figure 30-40-48]**.

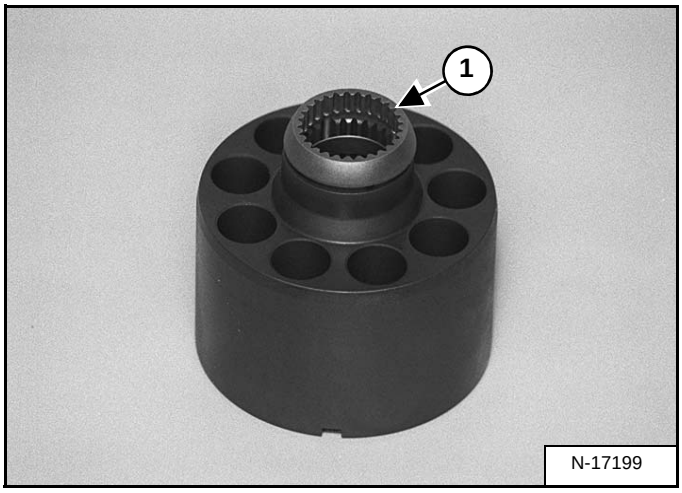
Figure 30-40-49



Install the four slipper pins (Item 1) **[Figure 30-40-49]** into the cylinder block.

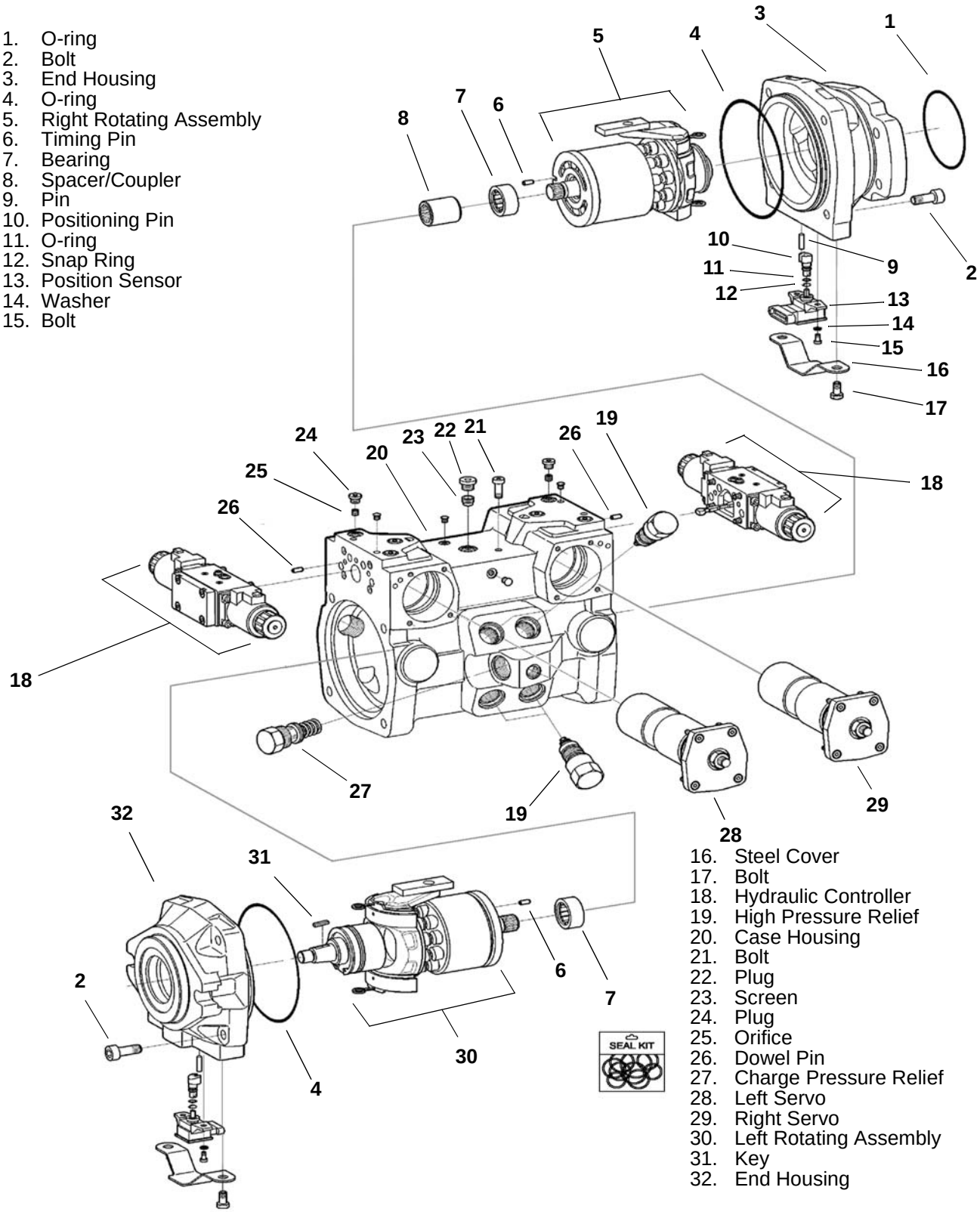
Apply a small amount of grease to the washer (Item 2) and install into the ball guide retainer (Item 3) **[Figure 30-40-49]**.

Figure 30-40-50



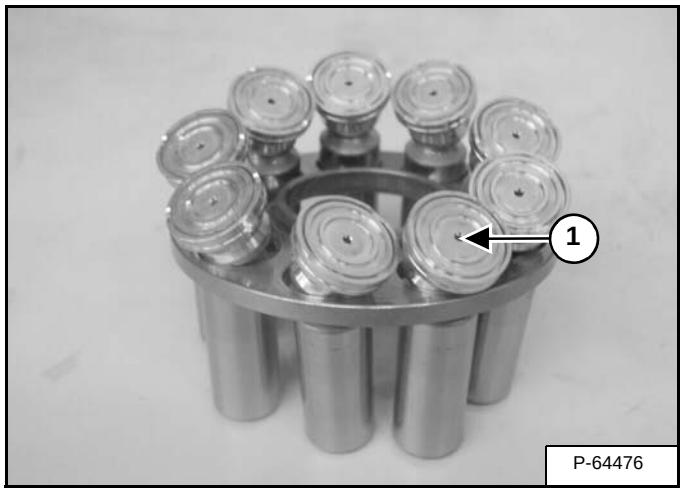
Install the ball guide retainer and washer (Item 1) **[Figure 30-40-50]** onto the slipper holddown pins.

Parts Identification



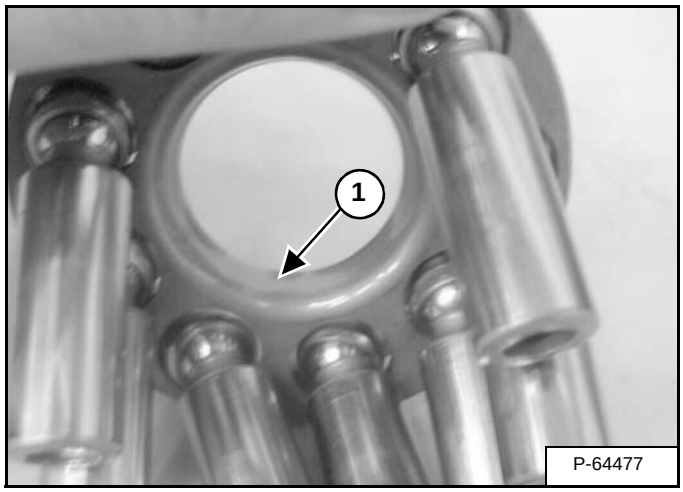
Disassembly and Assembly (Cont'd)

Figure 30-41-45



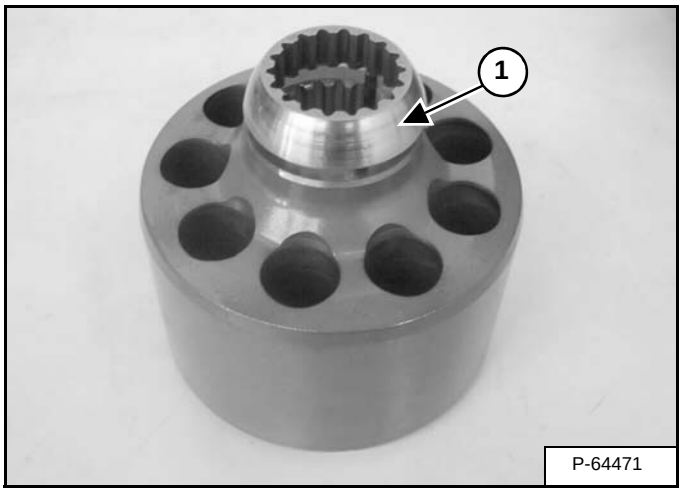
Inspect the pistons, look for scoring and scratches. Ensure the holes (Item 1) **[Figure 30-41-45]** in the slippers, are not plugged.

Figure 30-41-46



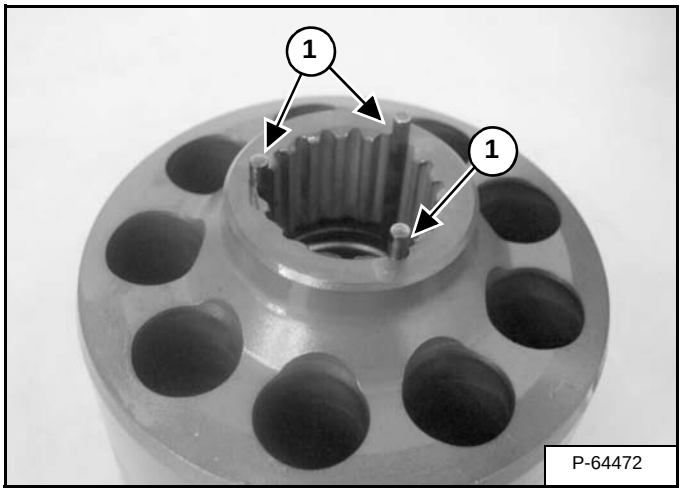
Inspect the mating surface of the spherical washer for scoring or scratches (Item 1) **[Figure 30-41-46]**.

Figure 30-41-47



Remove the spherical washer (Item 1) **[Figure 30-41-47]**.

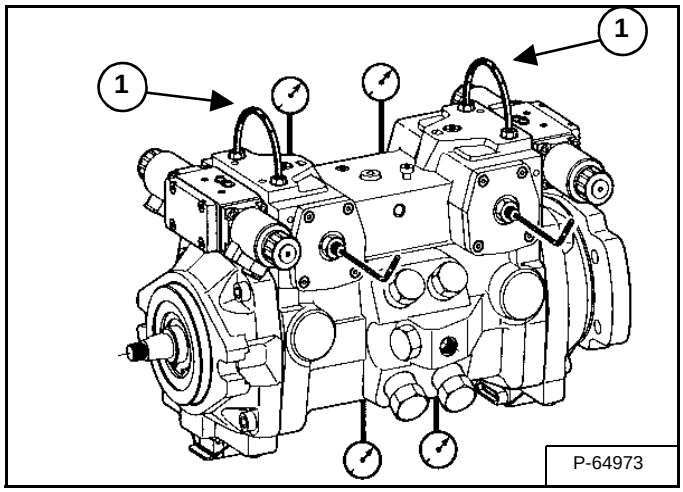
Figure 30-41-48



Inspect the pins (Item 1) **[Figure 30-41-48]**. They should be all the same length. Do not remove.

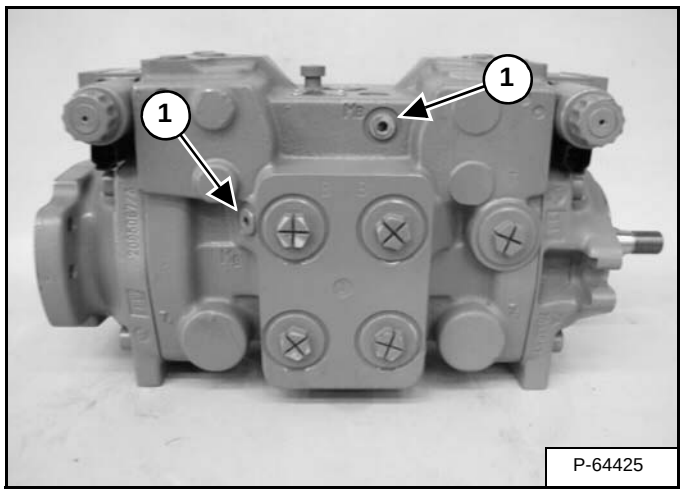
Mechanical Neutral Adjustment (Cont'd)

Figure 30-41-80



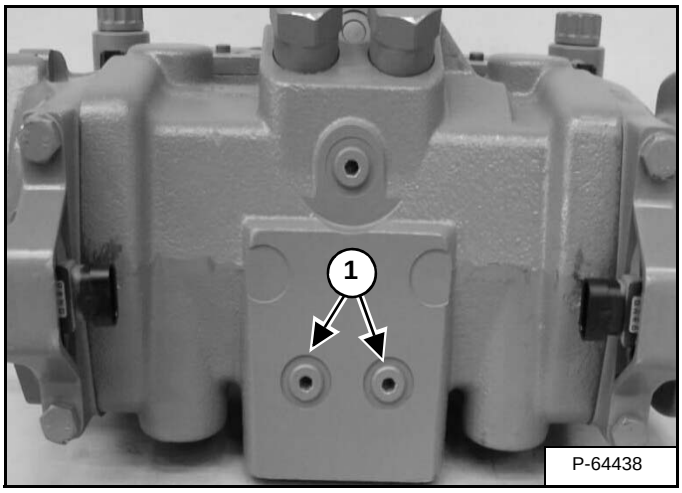
Connect a hydraulic hose (Item 1) **[Figure 30-41-80]** between port X1 and port X2 on each side of the hydrostatic pump, to equalize the pressures on both ends of the servo pistons.

Figure 30-41-81



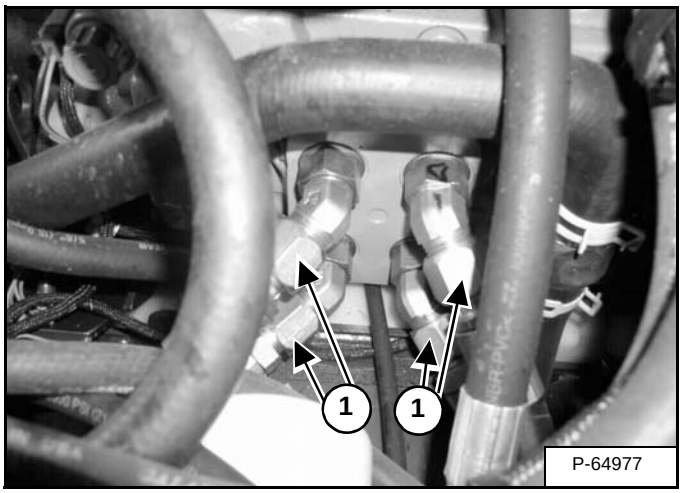
Remove the plugs (Item 1) **[Figure 30-41-81]** from the MB ports on the front side of the pump, and install 7500 PSI (241 bar) pressure gauges.

Figure 30-41-82



Remove the plugs (Item 1) **[Figure 30-41-82]** from the MA ports on the bottom of the pump, and install 7500 PSI pressure gauges.

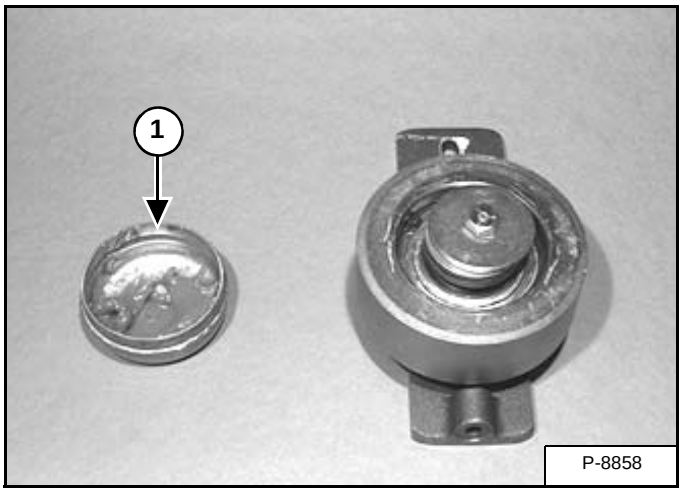
Figure 30-41-83



Remove drive hoses from the A and B ports (Item 1) **[Figure 30-41-83]**. Plug the ports with metal caps. The caps must be able to handle at least 7500 PSI. Plugging the A and B ports eliminates leakage at the drive motors from causing errors in the pump mechanical neutral setting.

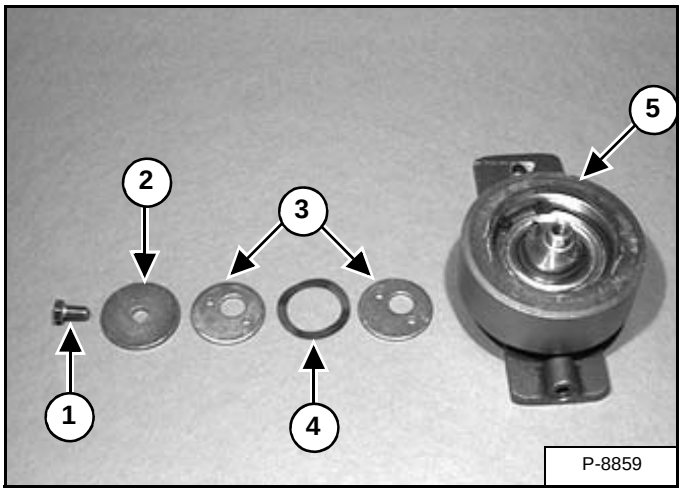
Tensioner Pulley Disassembly

Figure 30-50-11



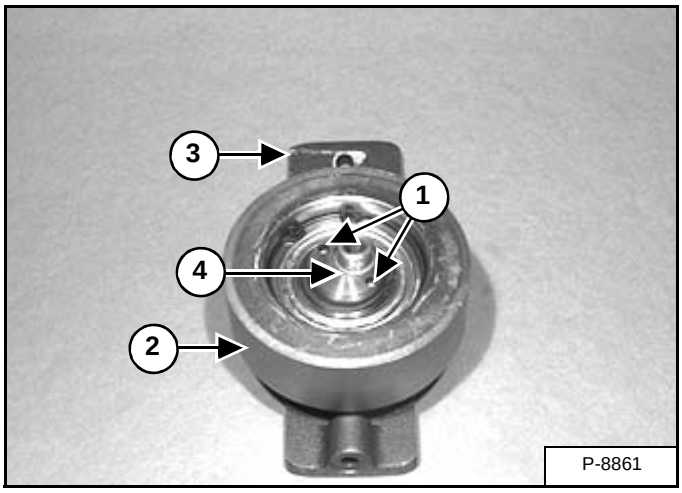
Remove the grease cover (Item 1) **[Figure 30-50-11]**.

Figure 30-50-12



Remove the bolt (Item 1), the flat washer (Item 2), the retainer washer (Item 3), the spring washer (Item 4) and the second retainer washer (Item 3) from the pulley assembly (Item 5) **[Figure 30-50-12]**.

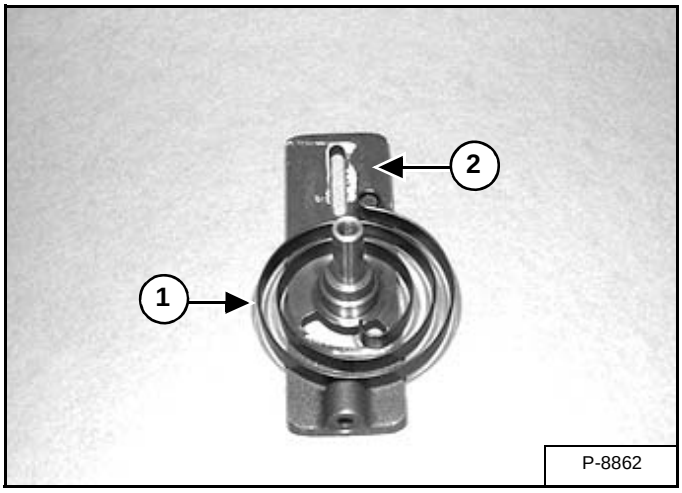
Figure 30-50-13



Remove the two pins (Item 1) from the hub assembly (Item 2) **[Figure 30-50-13]** only if they have been damaged.

Remove the bracket assembly (Item 3) by tapping on the shaft (Item 4) **[Figure 30-50-13]** with a plastic hammer.

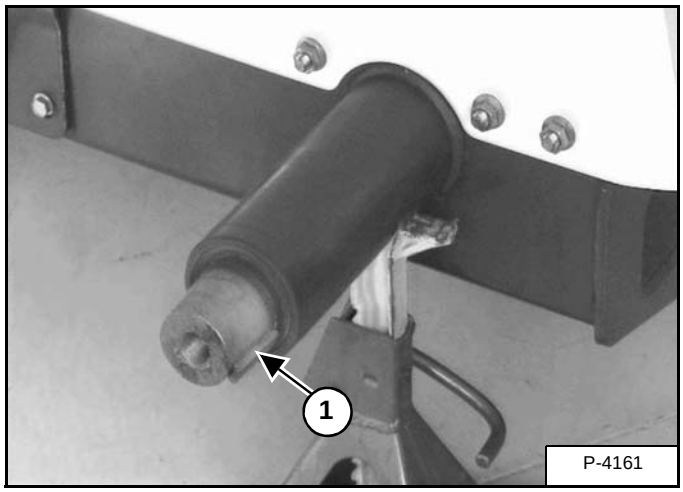
Figure 30-50-14



Remove the spring (Item 1) from the bracket (Item 2) **[Figure 30-50-14]**.

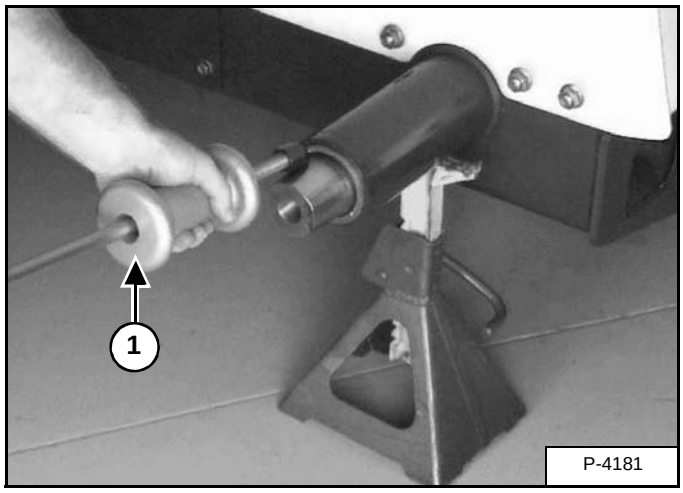
Axle Seal Removal And Installation (Cont'd)

Figure 40-20-3



Remove the key (Item 1) **[Figure 40-20-3]** from the axle.

Figure 40-20-4

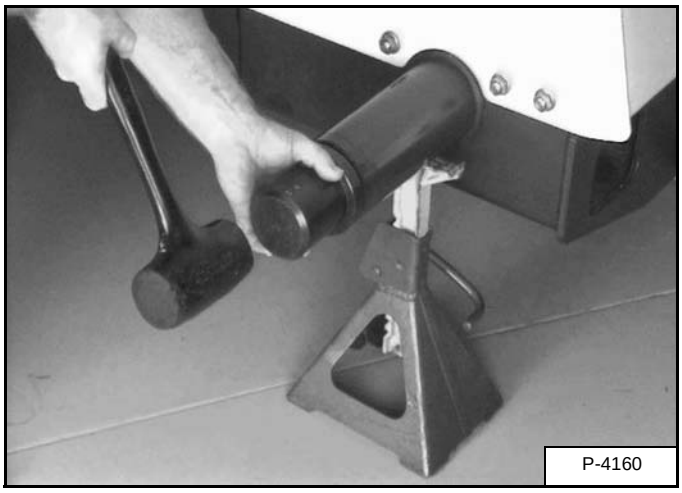


Drill a small hole in the axle seal.

Install a slide hammer (Item 1) **[Figure 40-20-4]** with a screw tip end in the axle seal.

Remove the axle seal.

Figure 40-20-5



Installation: MEL1399 seal driver tool is necessary for the following procedure:

Clean the seal area and inspect the shaft for wear.

NOTE: If the shaft is damaged or worn, an axle repair sleeve kit is available from Bobcat Parts.

Place the new axle seal over the axle and into the axle tube.

Install MEL1399 seal driver tool over the axle and put against the axle seal **[Figure 40-20-5]**.

Hit the seal driver tool with a hammer until the tool is flush with the edge of the axle tube **[Figure 40-20-5]**.

Reverse removal procedure to install the axle hub and wheel assembly.

General Information

Early chaincase designs were assembled with gaskets and polyurethane sealant between the chaincase covers and chaincase housing. This was due to a weld that ran down the middle of the top of the chaincase.The gasket helps seal around the welded area. The polyurethane sealant should be used with the gasket to ensure a good seal.

Later chaincase designs do not use a gasket because the weld was moved to the top edge of the chaincase. This creates a "flat top", on the chaincase, for the cover to seal against. Polyurethane sealant is all that is needed to seal the covers.

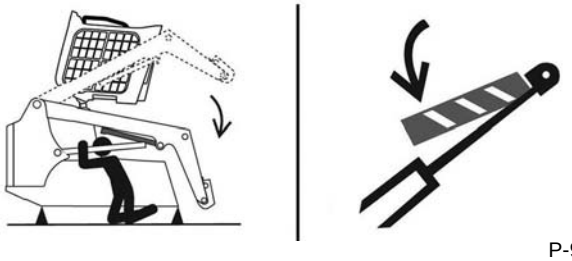
Note: Both the later "flat top" and early chaincase designs should use polyurethane sealer on the screw threads, to ensure a good seal.

Front Cover Removal And Installation

Raise the loader lift arms and install an approved lift arm support device. (See Installing Lift Arm Support Device on Page 10-20-1.)

Raise the loader operator cab. (See Raising The Operator Cab on Page 10-30-1.)

⚠ DANGER



P-90328

AVOID DEATH

- **Disconnecting or loosening any hydraulic tubeline, hose, fitting, component or a part failure can cause lift arms to drop.**
- **Keep out of this area when lift arms are raised unless supported by an approved lift arm support. Replace if damaged.**

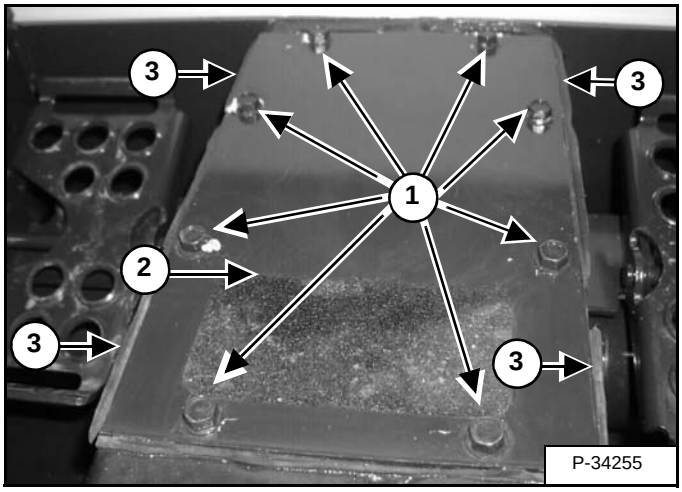
D-1009-0409

⚠ WARNING

Never work on a machine with the lift arms up unless the lift arms are secured by an approved lift arm support device. Failure to use an approved lift arm support device can allow the lift arms or attachment to fall and cause injury or death.

W-2059-0598

Figure 40-30-3



Remove the front chaincase cover mounting screws (Item 1) **[Figure 40-30-3]**.

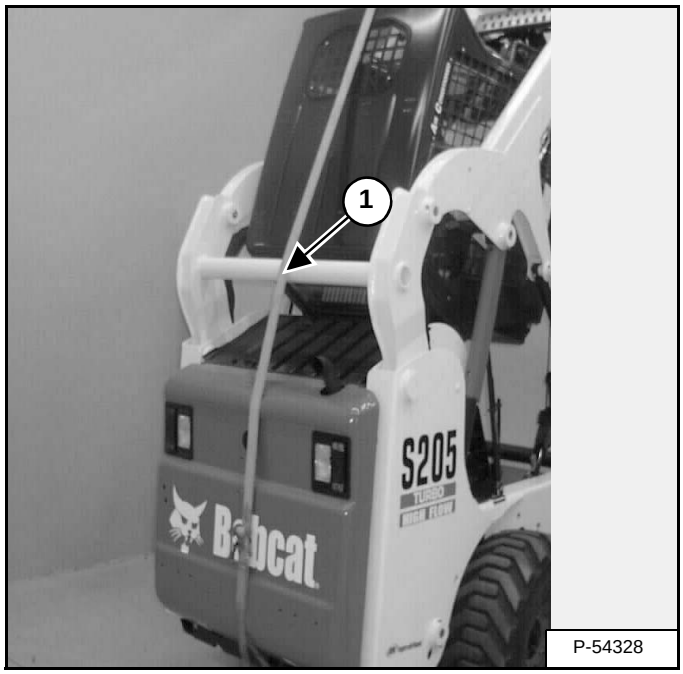
Remove the front chaincase cover (Item 2) **[Figure 40-30-3]** from the loader.

NOTE: On later "flat top" chaincases there are machined recesses (Item 3) [Figure 40-30-3] on the bottom side of the cover to help pry the covers off.

Installation: Install a new gasket (if equipped). When installing a cover on "flat top" chaincases, apply polyurethane sealer to mating surfaces. Polyurethane sealant should be applied to the screw threads and gasket (if equipped) to stop oil leakage. Tighten the mounting screws to 15 - 20 ft.-lb. (20 - 27 N•m) torque.

Gas Cylinder Removal And Installation (Cont'd)

Figure 50-20-4



Install a strap (Item 1) **[Figure 50-20-4]** from the operator cab to the loader main frame to prevent the cab from tipping forward when the gas cylinder(s) are removed.

Figure 50-20-5

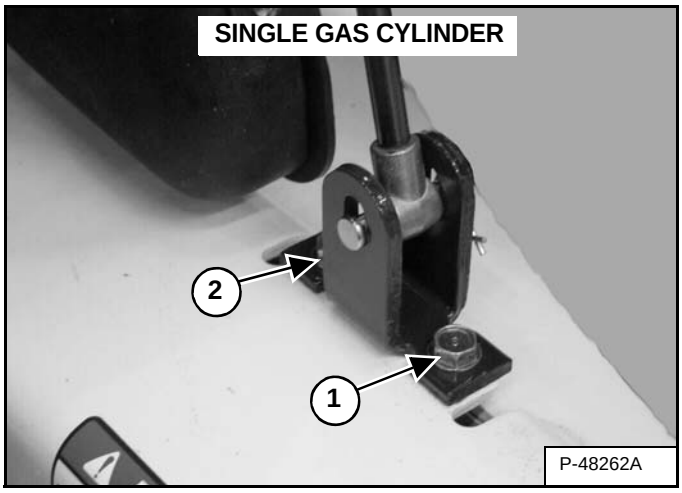
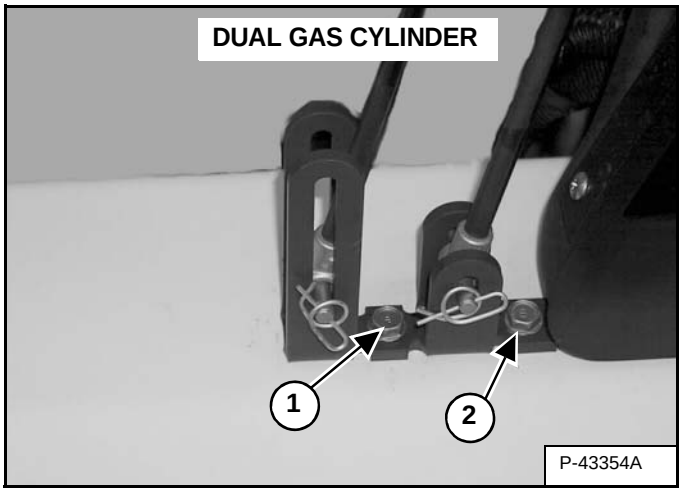


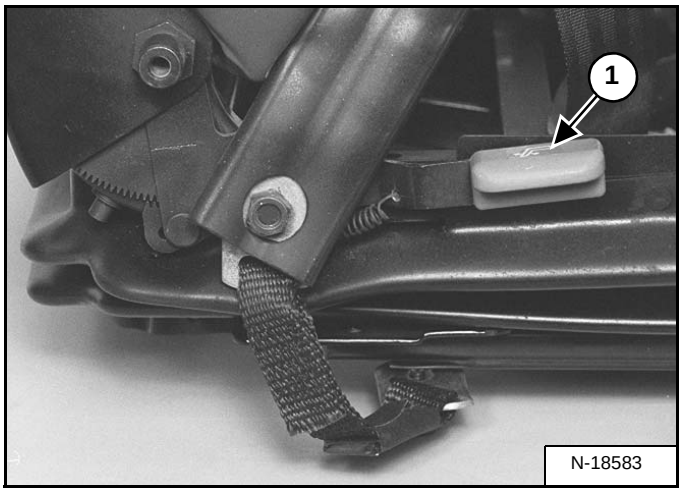
Figure 50-20-6



Loosen the front bolt (Item 1) and remove the rear bolt (Item 2) **[Figure 50-20-5]** and **[Figure 50-20-6]** from the gas cylinder mounting bracket.

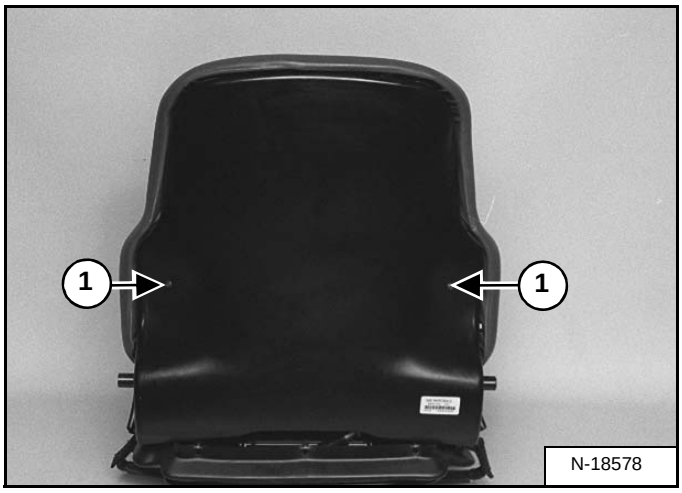
Back Removal And Installation

Figure 50-31-10



Pull the seat back adjustment lever (Item 1) **[Figure 50-31-10]** and tilt the seat back all the way forward.

Figure 50-31-11

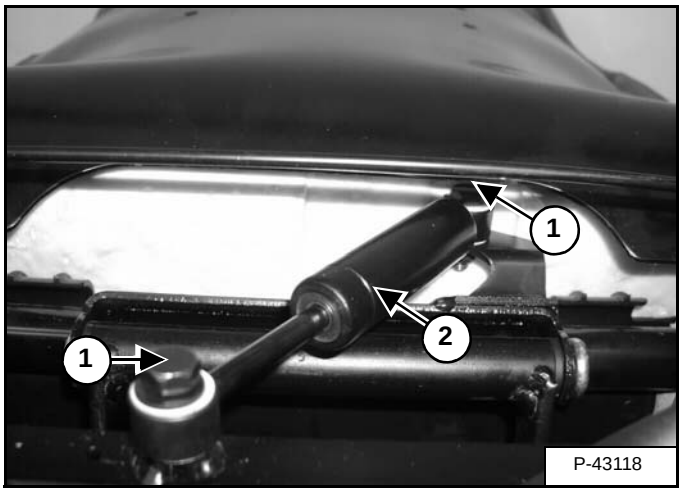


Remove the two mounting screws (Item 1) **[Figure 50-31-11]** from the seat back and remove the back.

Reverse the removal procedure to install the operator seat back.

Shock Removal And Installation

Figure 50-31-12



Raise the operator cab. (See Raising The Operator Cab on Page 10-30-1.)

Remove the operator seat. (See Removal And Installation on Page 50-31-1.)

Remove the seat shock mounting bolts (Item 1) **[Figure 50-31-12]** (Both ends.)

Remove the seat shock (Item 2) **[Figure 50-31-12]**.

Reverse the removal procedure to install the operator seat shock.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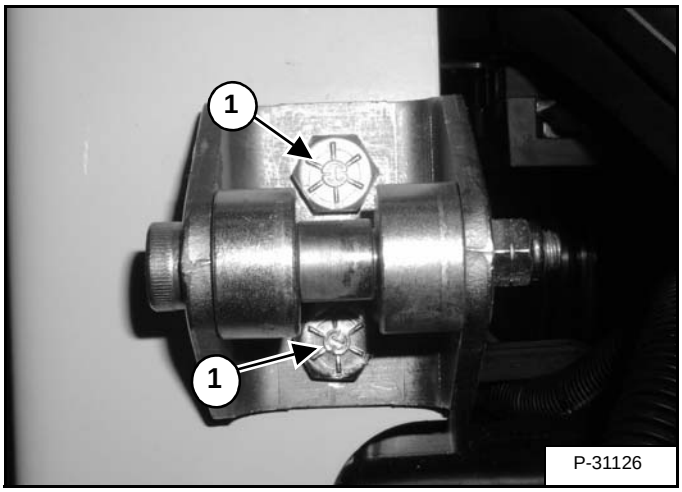
Striker Removal and Installation

Figure 50-70-4

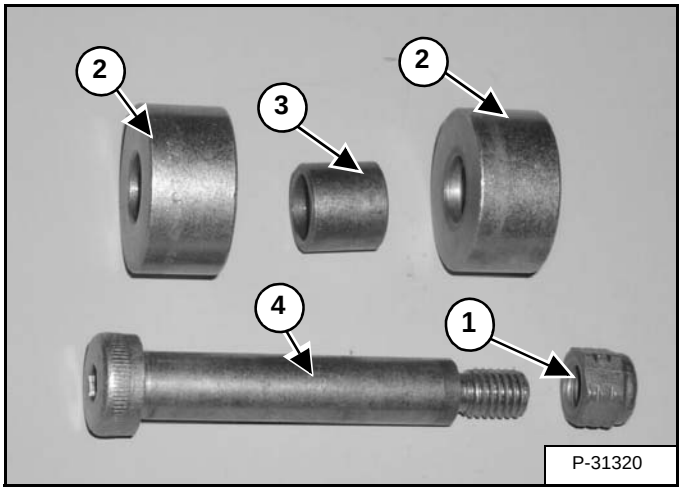


Remove the two striker mount bolts (Item 1) **[Figure 50-70-4]**.

Remove the striker assembly from the loader.

Striker Disassembly and Assembly

Figure 50-70-5



Remove the lock nut (Item 1) **[Figure 50-70-5]**.

Remove the rollers (Item 2) and the spacer (Item 3) from the bolt (Item 4) **[Figure 50-70-5]**.

Check the parts for wear and replace as needed.

Adjusting The Striker

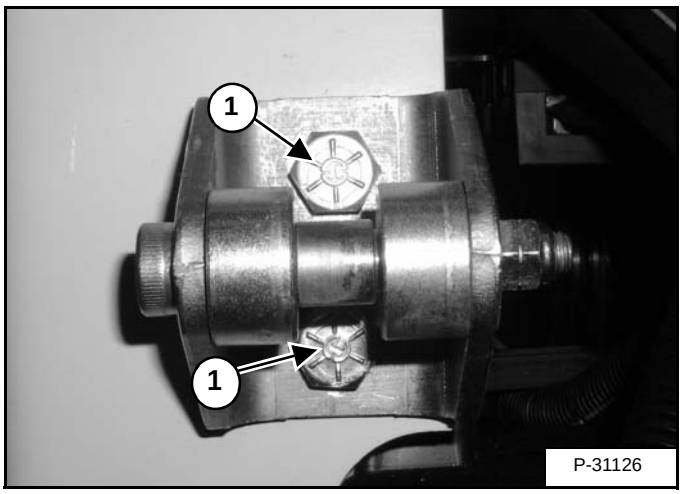
WARNING

AVOID INJURY OR DEATH

Never service or adjust the machine when the engine is running unless instructed to do so in the manual.

W-2012-0497

Figure 50-70-6



Loosen the striker assembly mount bolts (Item 1) **[Figure 50-70-6]**.

Align the striker assembly in the center of the mounting holes.

NOTE: Tighten the striker assembly, top mount bolt only, until it will hold the striker assembly in the center of the mounting slots.

Close the rear door. (This will align the striker assembly to the correct position.)

Open the door.

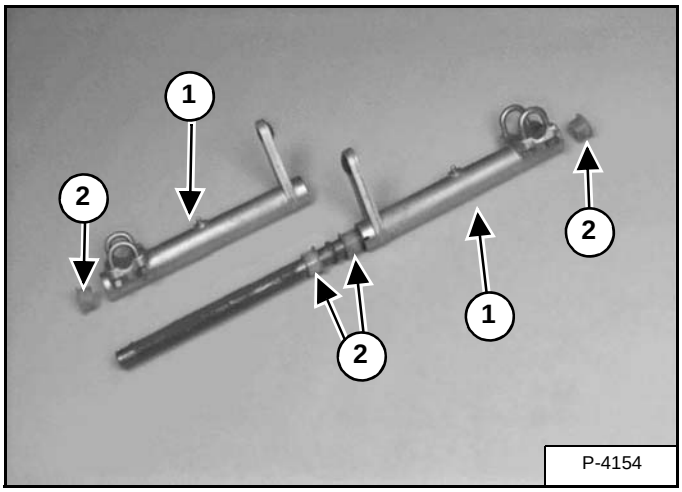
Tighten both striker mount bolts (Item 1) **[Figure 50-70-6]**.

Close the rear door.


Bobcat®

Shaft Disassembly And Assembly

Figure 50-100-12

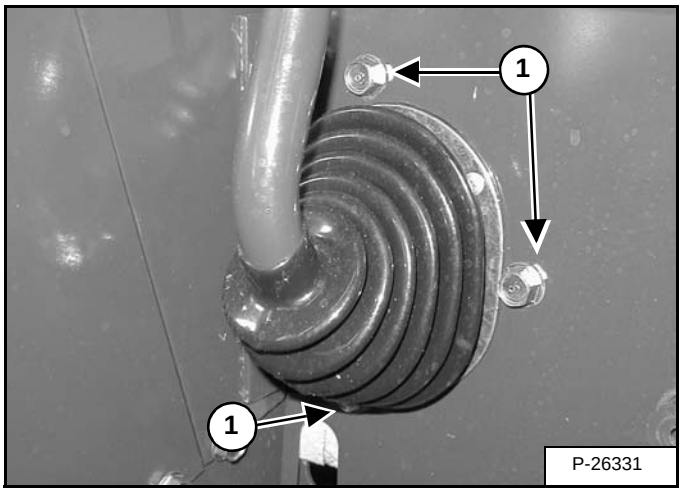


Disassemble the right and left steering bellcranks (Item 1) from the cross shaft assembly **[Figure 50-100-12]**.

Assembly: Install new nylon bushings (Item 2) **[Figure 50-100-12]** as needed when assembling the steering shaft. Be sure to apply grease on the cross shaft before installing the right and left bellcranks.

NOTE: The bellcranks should pivot freely on the cross shaft when assembled correctly.

Figure 50-100-13



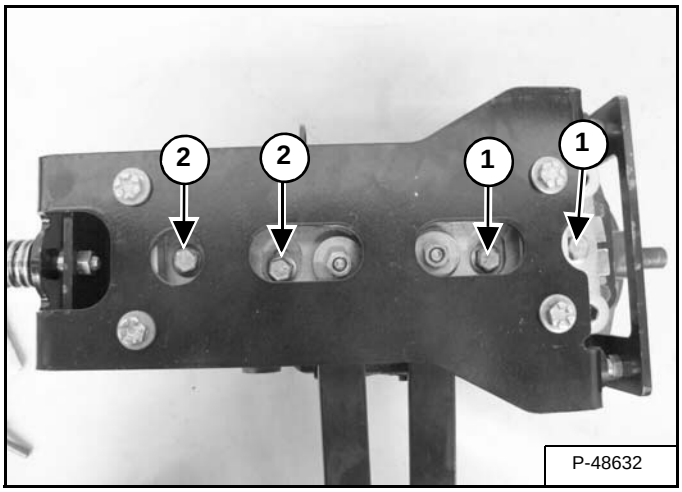
To remove the steering shaft mounting bracket (Item 3) **[Figure 50-100-11]**, remove the three mounting bolts (Item 1) **[Figure 50-100-13]** from the front of the control panel.

Remove the steering shaft mounting bracket.

Installation: Tighten the mounting bolts to 15 - 20 ft.-lb. (20 - 27 N•m) torque.

Linkage Neutral Adjustment (Cont'd)

Figure 50-100-36



Torque the left pump pintle adjustment lock bolts (Item 1) **[Figure 50-100-36]** to 35 - 40 ft.-lb. (47,5 - 54,2 N•m).

Repeat the adjustment procedure for the right pump.

Torque the right pump pintle adjustment lock bolts (Item 2) **[Figure 50-100-36]** to 35 - 40 ft.-lb. (47,5 - 54,2 N•m).

Test both levers by moving them backward and forward and letting them return to neutral by the return spring force.

If the levers do not return to neutral and the wheels/ tracks do not come to a complete stop, repeat the adjustment procedure again.

Stop the engine.

Remove one pintle adjustment bolt (Item 1) **[Figure 50-100-36]** at a time and apply Loctite® 242 or equivalent thread locker to the bolt and re-install the bolt. Torque the bolt to 35 - 40 ft.-lb. (47,5 - 54,2 N•m). Repeat for the three remaining pintle adjustment lock bolts.

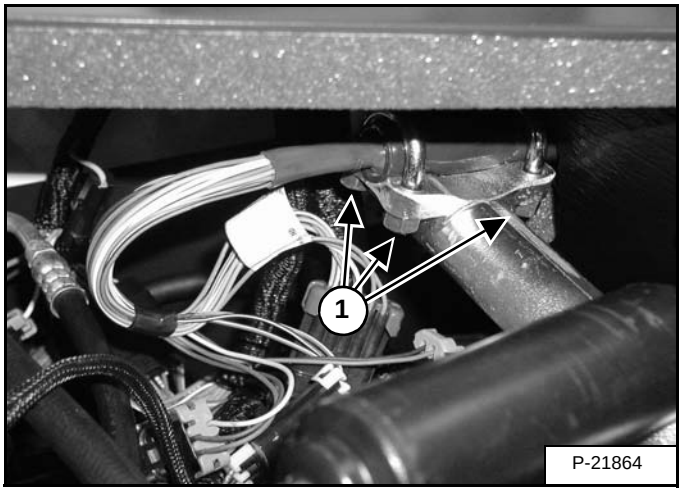
NOTE: To maintain proper adjustment setting, remove and reinstall only one bolt at a time. New bolts can be installed with pre applied Loctite®.

Remove the loader remote start tool.

NOTE: After the neutral adjustment is completed on both pumps, the linkage travel adjustment MUST be completed. (See Page 50-100-17.)

Handle Sensor Removal And Installation

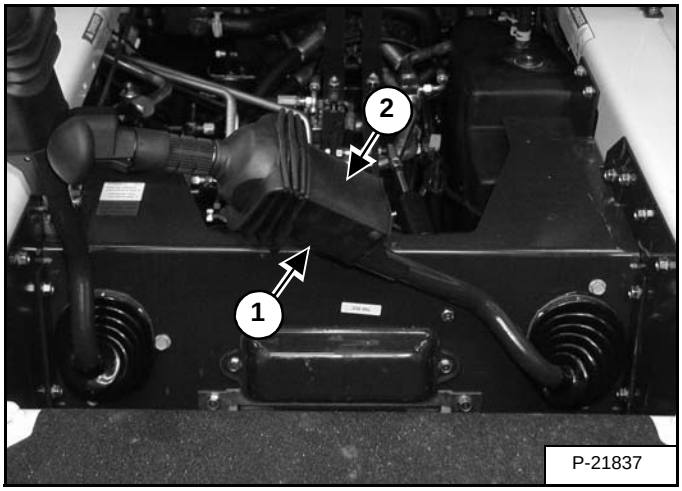
Figure 50-111-3



Loosen the nuts (Item 1) **[Figure 50-111-3]**.

Installation: Tighten the u-bolts so the lever can not be moved either right or left when seated in the operator seat. Be sure the control lever does not interfere with the operator cab when lowering or raising the cab.

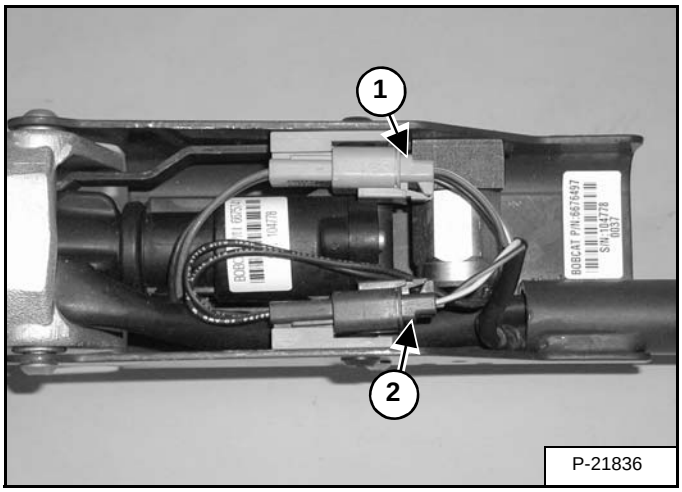
Figure 50-111-4



Tilt the control handle (Item 1) **[Figure 50-111-4]** to the center of the loader.

Lift the boot cover (Item 2) **[Figure 50-111-4]**.

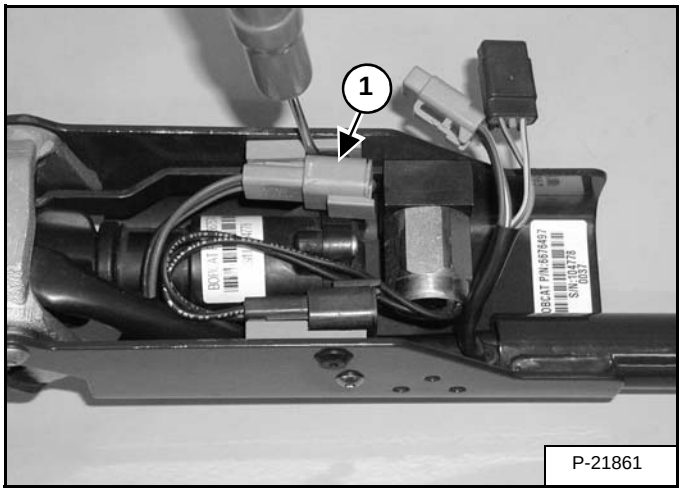
Figure 50-111-5



Disconnect the harness connector (Item 1) **[Figure 50-111-5]** from the handle sensor connector.

Disconnect the harness connector (Item 2) **[Figure 50-111-5]** from the handle lock solenoid connector.

Figure 50-111-6

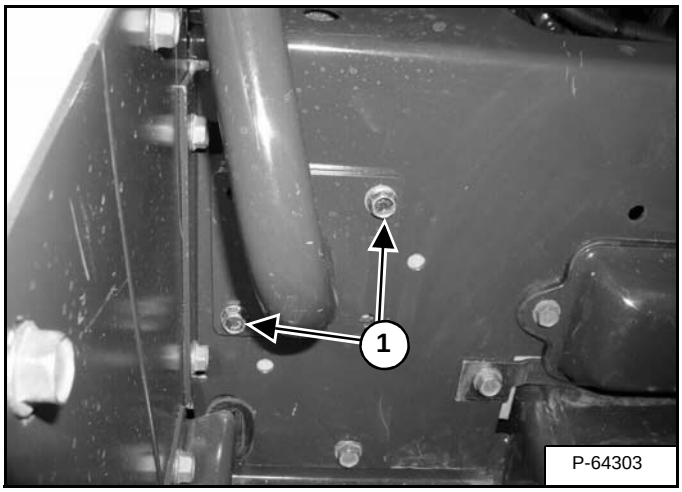


Remove the handle sensor connector (Item 1) **[Figure 50-111-6]** from the clip.

NOTE: Pry out with a small screw driver and push the connector down.

Lever Assembly Removal (Right & Left) (Cont'd)

Figure 50-112-11



Remove the two control lever mounting bolts (Item 1) **[Figure 50-112-11]**.

The mounting bolts are secured with lock-nuts on the back of the control panel. Once removed, they need to be replaced with new.

Figure 50-112-12

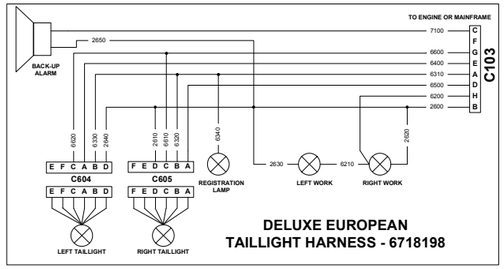
Remove the control lever from the loader **[Figure 50-112-12]**.

WIRING SCHEMATIC

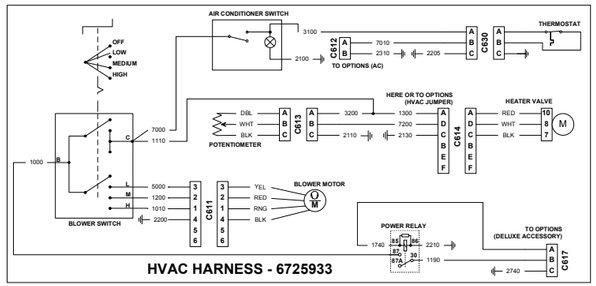
OPTIONS

S205 (S/N 528411001 AND ABOVE)
(S/N 528511001 AND ABOVE)

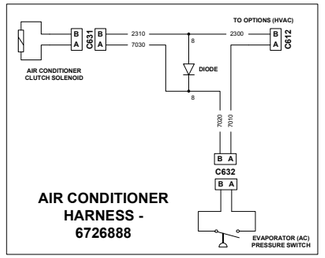
(PRINTED JULY 2005)
V-0571



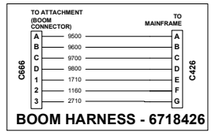
DELUXE EUROPEAN TAILLIGHT HARNESS - 6718198



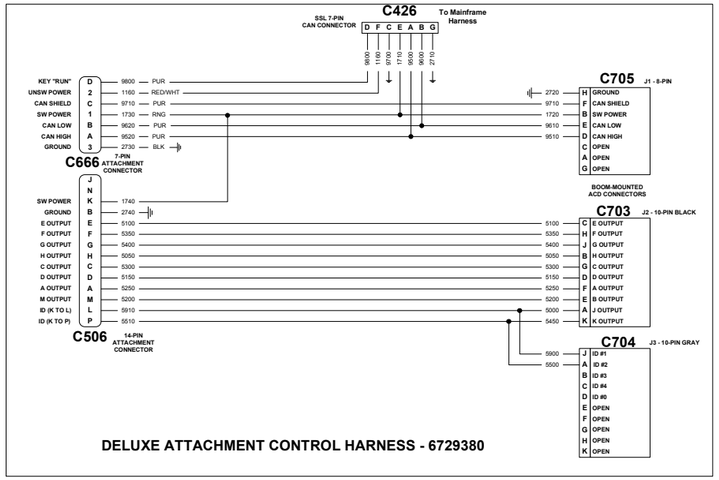
HVAC HARNESS - 6725933



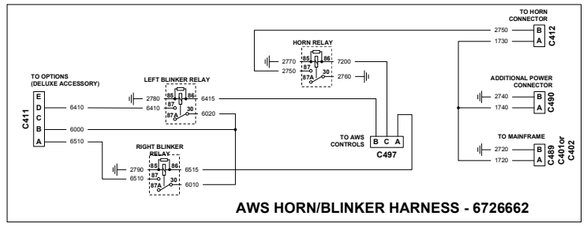
AIR CONDITIONER HARNESS - 6726888



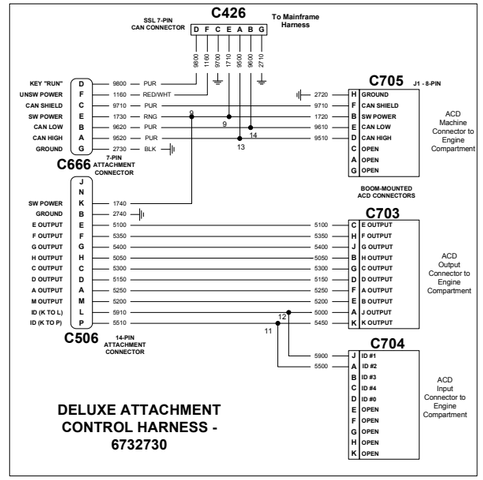
BOOM HARNESS - 6718426



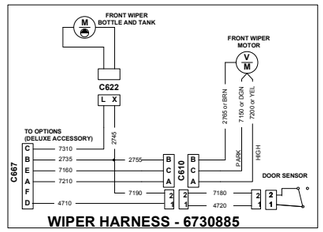
DELUXE ATTACHMENT CONTROL HARNESS - 6729380



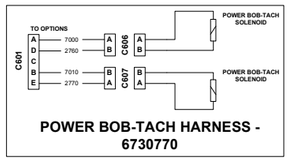
AWS HORN/BLINKER HARNESS - 6726662



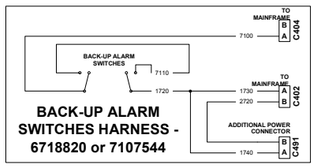
DELUXE ATTACHMENT CONTROL HARNESS - 6732730



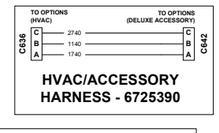
WIPER HARNESS - 6730885



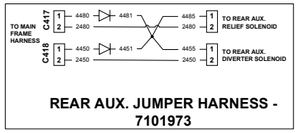
POWER BOB-TACH HARNESS - 6730770



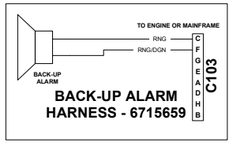
BACK-UP ALARM SWITCHES HARNESS - 6718820 or 7107544



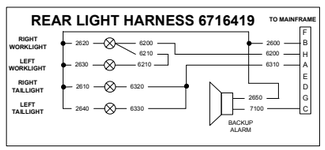
HVAC/ACCESSORY HARNESS - 6725390

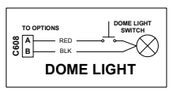


REAR AUX. JUMPER HARNESS - 7101973

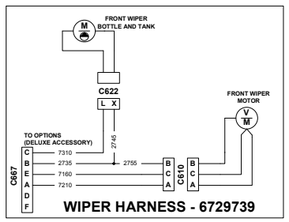


BACK-UP ALARM HARNESS - 6715659

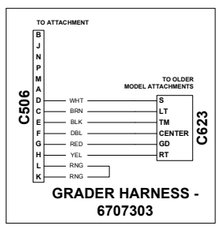




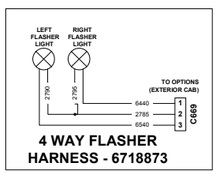
DOME LIGHT



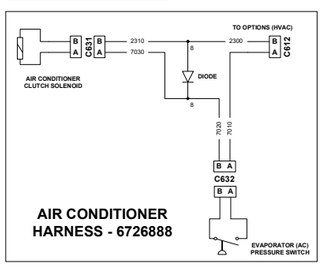
WIPER HARNESS - 6729739



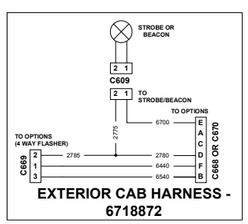
GRADER HARNESS - 6707303



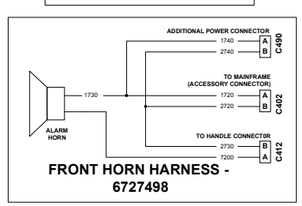
4 WAY FLASHER HARNESS - 6718873



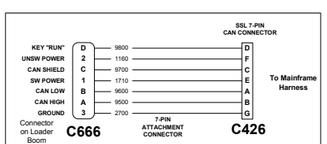
AIR CONDITIONER HARNESS - 6726888



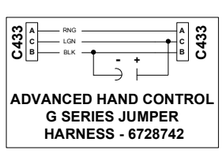
EXTERIOR CAB HARNESS - 6718872



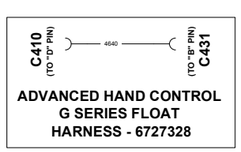
FRONT HORN HARNESS - 6727498



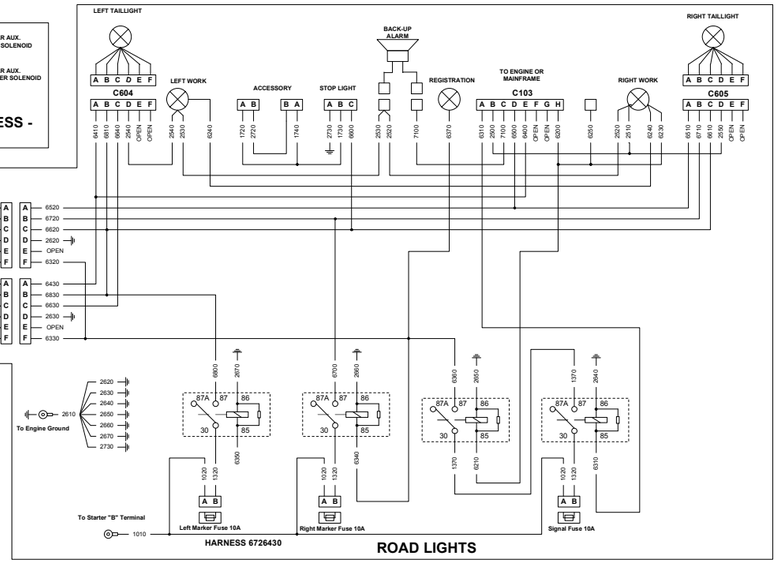
CONTROL HARNESS - 6718426



ADVANCED HAND CONTROL G SERIES JUMPER HARNESS - 6728742



ADVANCED HAND CONTROL G SERIES FLOAT HARNESS - 6727328



ROAD LIGHTS

RED = RED
RNG = ORANGE
BLK = BLACK
LBL = LIGHT BLUE
DBL = DARK BLUE
LGN = LIGHT GREEN
DGN = DARK GREEN
YEL = YELLOW
PNK = PINK
WHT = WHITE
BRN = BROWN
TAN = TAN
PUR = PURPLE
GRY = GRAY

BATTERY FEED 1000-1999 RED, RED/WHT, RNG
GROUND 2000-2999 BLK
MONITORING 3000-3999 LBL
HYDRAULIC 4000-4999 LGN
ATTACHMENT CONTROLS 5000-5999 YEL
LIGHTS 6000-6999 PNK
ACCESSORIES 7000-7999 WHT
ENGINE 8000-8999 TAN
COMMUNICATION 9000-9999 PUR

WIRES CONNECT BY LETTER ACROSS CONNECTORS

SOME CONNECTOR BODIES NOT SHOWN FOR DRAWING CLARITY

V-0571 (7-12-05)

Using A Booster Battery (Jump Starting)

If it is necessary to use a booster battery to start the engine, BE CAREFUL! There must be one person in the operator's seat and one person to connect and disconnect the battery cables.

The key switch must be OFF (*Standard Panel*) OR the STOP Button must be pressed (*Deluxe Panel*). The booster battery must be 12 volt.

⚠ WARNING

AVOID INJURY OR DEATH

Batteries contain acid which burns eyes and skin on contact. Wear goggles, protective clothing and rubber gloves to keep acid off body.

In case of acid contact, wash immediately with water. In case of eye contact get prompt medical attention and wash eye with clean, cool water for at least 15 minutes.

If electrolyte is taken internally drink large quantities of water or milk! DO NOT induce vomiting. Get prompt medical attention.

W-2065-0807

⚠ WARNING

AVOID INJURY OR DEATH

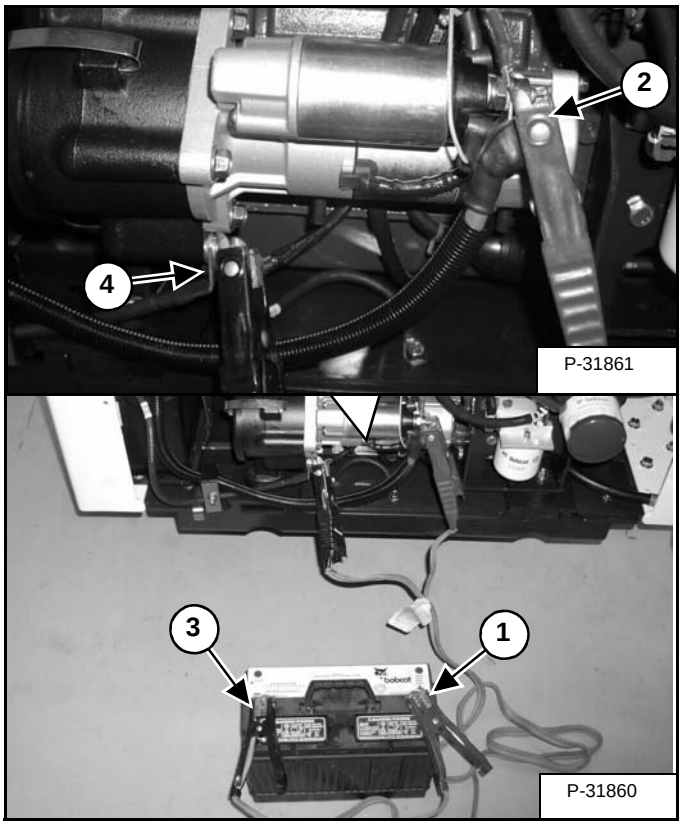
Keep arcs, sparks flames and lighted tobacco away from batteries. When *jumping* from booster battery make final connection (negative) at machine frame.

Do not jump start or charge a frozen or damaged battery. Warm battery to 60°F (16°C) before connecting to a charger. Unplug charger before connecting or disconnecting cables to battery. Never lean over battery while boosting, testing or charging.

Battery gas can explode and cause serious injury.

W-2066-0705

Figure 60-20-7



Connect the end of the first cable (Item 1) to the positive (+) terminal of the booster battery. Connect the other end of the same cable (Item 2) **[Figure 60-20-7]** to the positive terminal on the loader starter.

Connect the end of the second cable (Item 3) to the negative (-) terminal of the booster battery. Connect the other end of the same cable (Item 4) **[Figure 60-20-7]** to the engine.

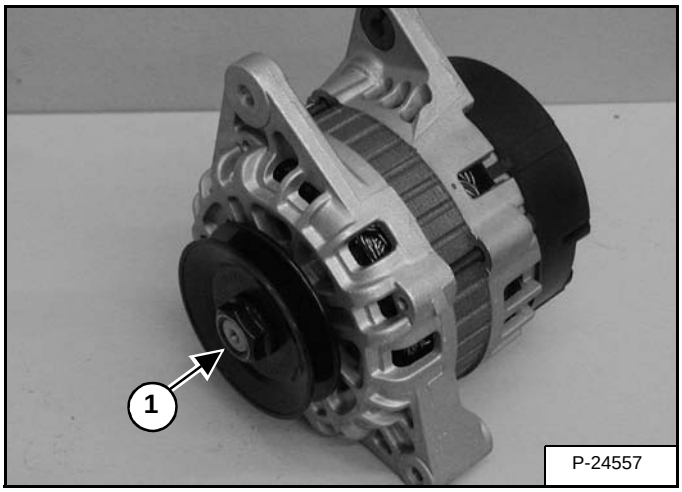
Keep cables away from moving parts. Start the engine. (See REMOTE START on Page 10-60-1.)

After the engine has started, remove the ground (-) cable (Item 4) **[Figure 60-20-7]** first.

Remove the cable from the positive terminal (Item 2) **[Figure 60-20-7]**.

Assembly

Figure 60-30-22



Reverse the order of disassembly.

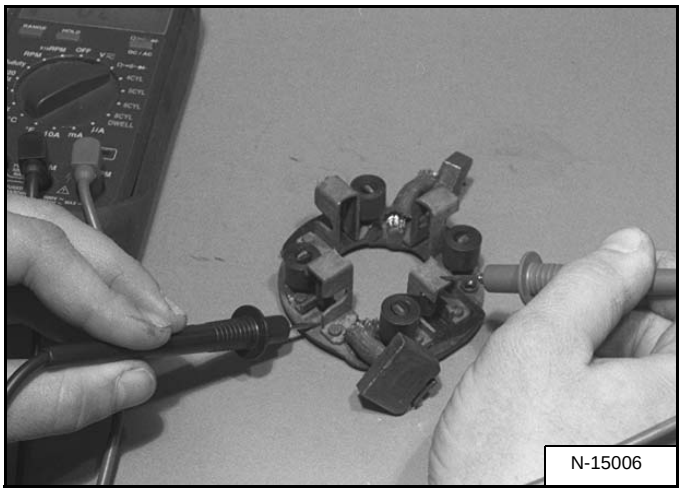
Do not assemble the rear case half.

Place the rotor in soft jaws when tightening the shaft nut (Item 1) **[Figure 60-30-22]**. Tighten to 72 - 14.5 ft.-lb. (98 - 20 N•m) torque.

Install the rear case half and the remaining parts.

Inspection and Repair (Cont'd)

Figure 60-40-24



Inspect the brushes for wear and damage.

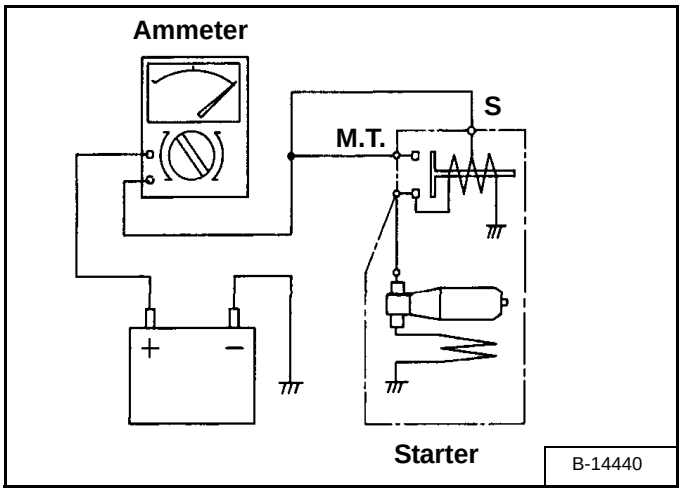
Replace the brush holder and yoke if the brushes need replacement.

Check brush spring, for damage or rust. Replace as needed.

Brush Holder Insulation Test: Use a circuit tester, touch one probe to the positive brush holder plate and the other probe to the holder plate **[Figure 60-40-24]**. There should be no continuity. If there is continuity, replace or repair.

No Load Test

Figure 60-40-25



The following test should be done after reassembling the starter:

Clamp the starter in a vise. Using a 12 volt battery and ammeter, connect the positive wire of the battery, and the ammeter to the terminal **[Figure 60-40-25]**. Connect the negative wire to the starter body. Using a jumper wire, connect the S terminal to the main terminal.

The starter should show smooth and steady rotation immediately after the pinion is engaged, it should draw less than the specified current.

Service Limit - 1150 Amp. Maximum @ Stall Condition

Clean all parts and apply high temperature grease to the armature bearing, return spring, steel ball, over running clutch, and idler gear rollers.

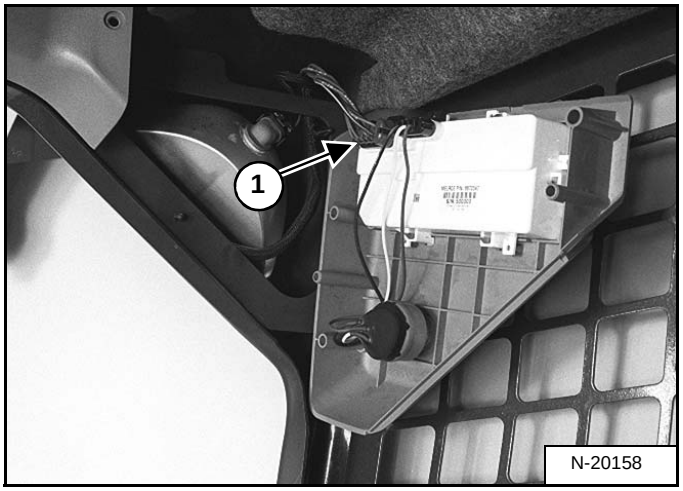
Standard Panel Removal And Installation (Right Side)

Figure 60-50-12

Remove the three mounting bolts (Item 1) **[Figure 60-50-12]**.

Installation: Be careful to not overtighten the instrument panel mounting bolts to prevent stripping of the threaded holes in the panels.

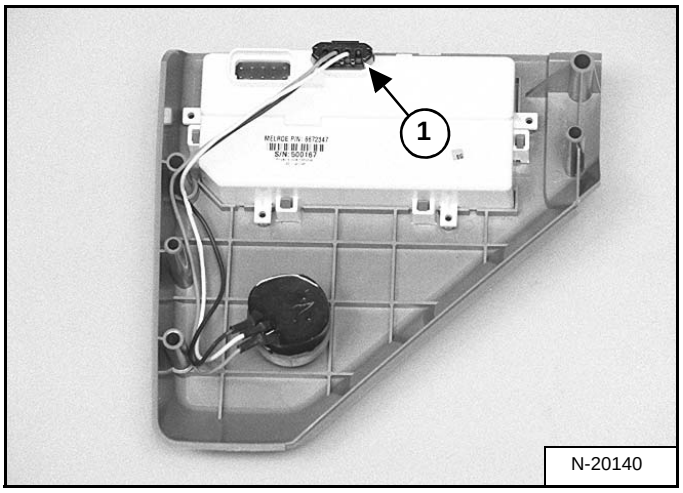
Figure 60-50-13



Pull the right instrument panel down and disconnect the wire harness connector (Item 1) **[Figure 60-50-13]** from the panel.

Remove the panel from the loader cab.

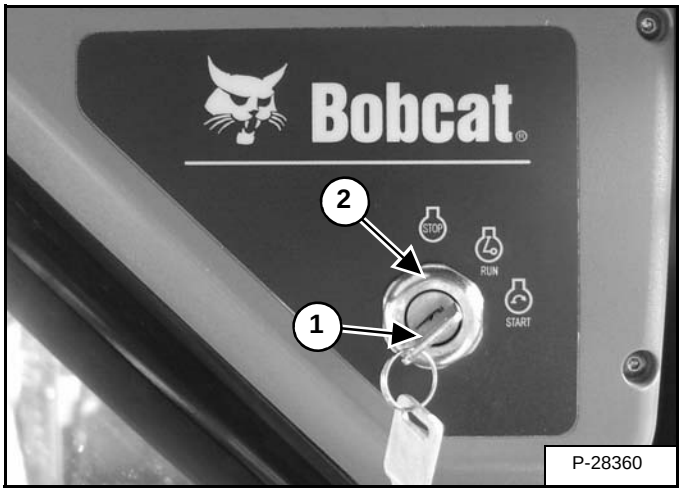
Figure 60-50-14



Ignition Switch Removal and Installation (Standard Panel)

Disconnect the key switch wiring harness (Item 1) **[Figure 60-50-14]** from the back of the control panel.

Figure 60-50-15



Remove the ignition key (Item 1) from the switch. Remove the ignition switch retaining nut (Item 2) **[Figure 60-50-15]** from the switch.

CONTROLLER (SELECTABLE JOYSTICK CONTROL) (SJC)

Removal and Installation

WARNING

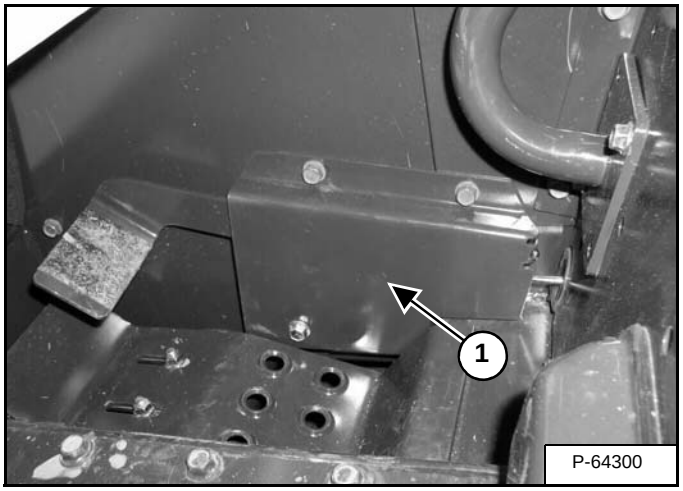
Never work on a machine with the lift arms up unless the lift arms are secured by an approved lift arm support device. Failure to use an approved lift arm support device can allow the lift arms or attachment to fall and cause injury or death.

W-2059-0598

Raise the lift arms and install an approved lift arm support device. (See Installing Lift Arm Support Device on Page 10-20-1.)

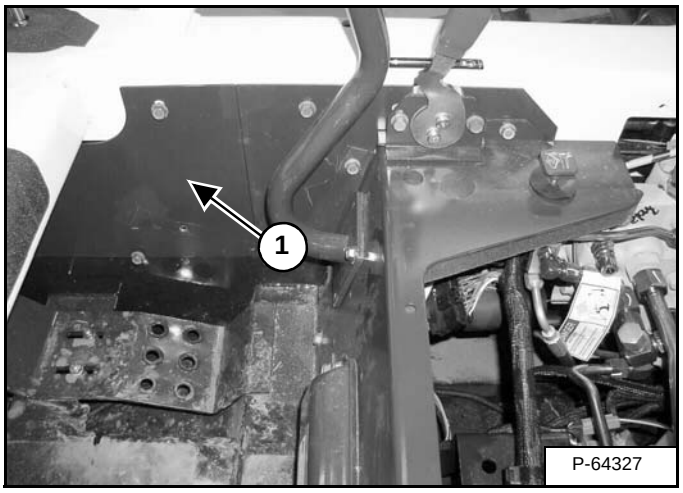
Raise the operator cab. (See Raising The Operator Cab on Page 10-30-1.)

Figure 60-71-1



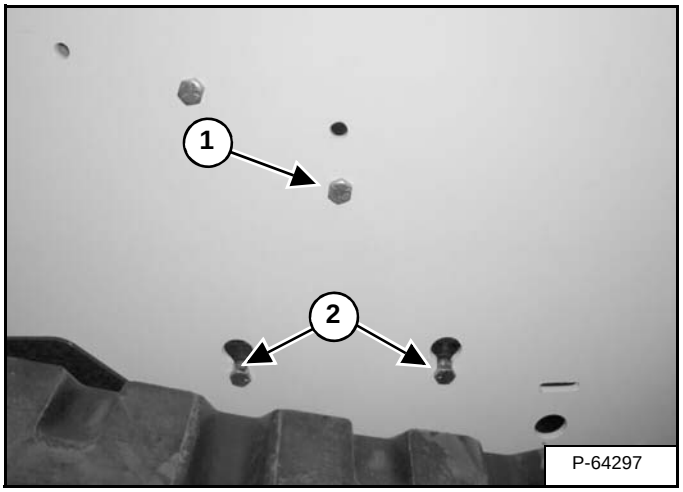
Remove the foot portion of the engine speed control (Item 1) **[Figure 60-71-1]**. (See Removal And Installation on Page 70-20-1.)

Figure 60-71-2



Remove the inside access panel (right side) (Item 1) **[Figure 60-71-2]**.

Figure 60-71-3



Remove the top controller mounting bolt (Item 1). Loosen the two bottom controller mounting bolts (Item 2) **[Figure 60-71-3]** from the right side fender.

Lift and remove the controller from the fender.

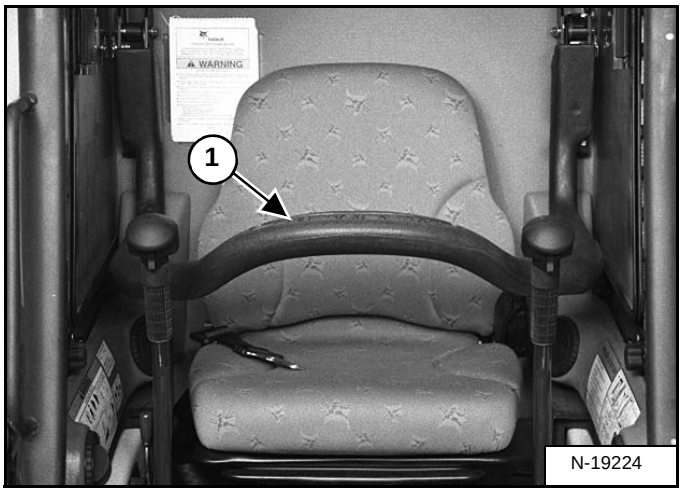
Installation: Tighten the mounting bolts to 12 - 14 ft.-lb. (16 - 19 N•m) torque.

Number Codes List (Cont'd)

CODE		CODE	
39-04	Left joystick no communication to Bobcat controller	50-38	Front reverse error OFF
		50-39	Rear PWM error on
40-04	Right joystick no communication to Bobcat controller	50-41	Rear PWM no signal
		50-42	Rear PWM not calibrate
44-02	Horn error ON	50-43	Rear forward error ON
44-03	Horn error OFF	50-44	Rear forward error OFF
		50-45	Rear reverse error ON
45-02	Right blinker error ON	50-46	Rear reverse error OFF
45-03	Right blinker error OFF	50-47	Two speed error OFF
		50-48	Two speed error ON
46-02	Left blinker error ON	50-49	Brake solenoid error ON
46-03	Left blinker error OFF	50-50	Brake solenoid error OFF
		50-51	Brake solenoid no signal
47-21	8 volt sensor supply out of range high	50-52	Brake light relay error ON
47-22	8 volt sensor supply out of range low	50-53	Brake light relay error OFF
		50-54	Differential lock error ON
48-02	Front light relay error ON	50-55	Differential lock error OFF
48-03	Front light relay error OFF	50-56	CAN communications fault
		50-57	Drive controller not calibrated
49-02	Rear light relay error ON		
49-03	Rear light relay error OFF	50-59	Front speed sensor missing pulses
		50-60	Rear speed sensor missing pulses
50-01	Travel pedal out of range high		
50-02	Travel pedal out of range low		
50-03	Travel pedal not calibrated	50-63	Front angle sensor not calibrated
50-04	Brake Pedal out of range high		
50-05	Brake Pedal out of range low		
50-06	Brake Pedal not calibrated	50-66	Rear angle sensor not calibrated
50-07	Drive selector switch no signal	50-67	Front forward no signal
50-08	Drive selector switch multiple inputs	50-68	Front reverse no signal
50-09	Front wheel speed sensor out of range high	50-69	Rear forward no signal
50-10	Front wheel speed sensor out of range low	50-70	Rear reverse no signal
50-11	Rear wheel speed sensor out of range high	50-99	In calibration mode
50-12	Rear wheel speed sensor out of range low		
50-13	Front wheel speed sensor no signal	60-21	Rear auxiliary control out of range high
50-14	Rear wheel speed sensor no signal	60-22	Rear auxiliary control out of range low
50-15	Dual wheel speed sensor fault	60-23	Rear auxiliary control not returning to neutral
50-24	Battery voltage over voltage		
50-27	5V sensor #1 over voltage	62-04	Load moment monitoring in error
50-28	5V sensor #1 under voltage		
50-29	5V sensor #2 over voltage	63-05	Short to battery
50-30	5V sensor #2 under voltage	63-06	Short to ground
50-31	Front PWM error on		
50-33	Front PWM no signal	64-02	Switched power relay error ON
50-34	Front PWM not calibrate	64-03	Switched power relay error OFF
50-35	Front forward error ON		
50-36	Front forward error OFF		
50-37	Front reverse error ON		

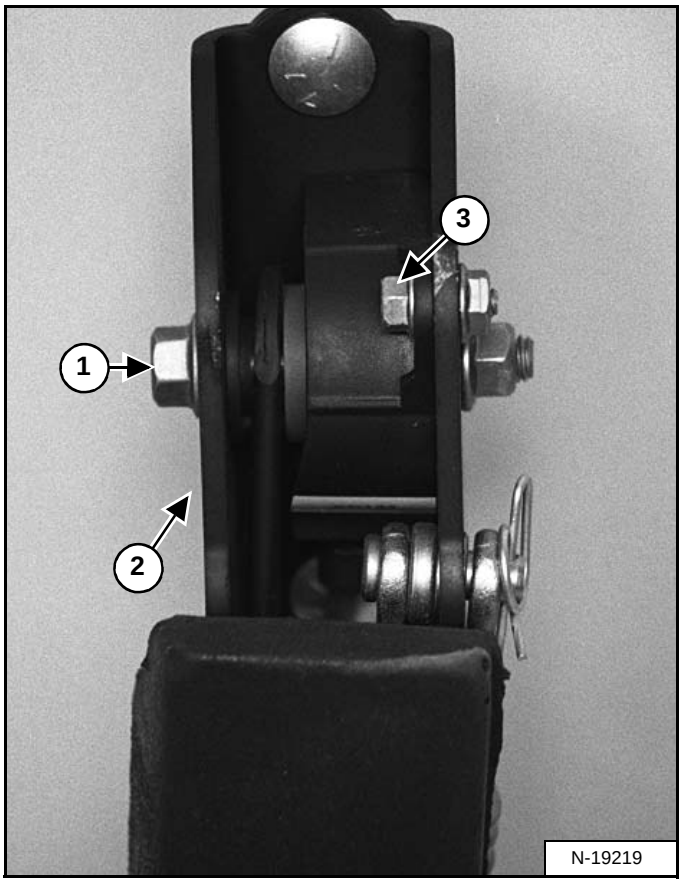
Removal And Installation

Figure 60-100-5



Remove the seat bar (Item 1) **[Figure 60-100-5]** from the loader. (See Removal And Installation on Page 50-10-1.)

Figure 60-100-6



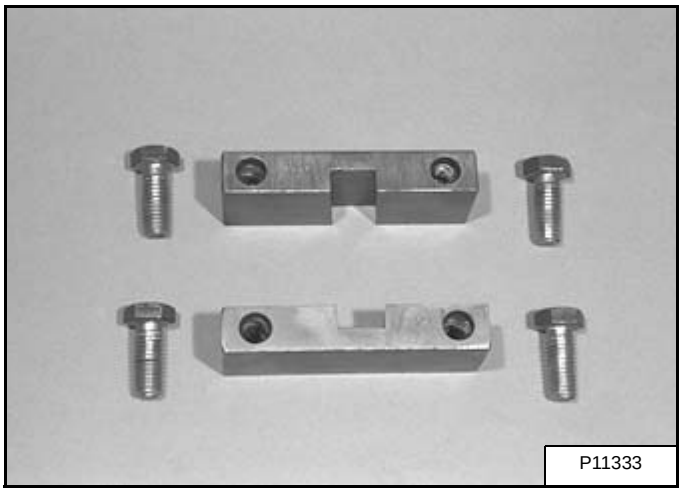
Remove the mounting bolt (Item 1) from the seat bar mount (Item 2) **[Figure 60-100-6]**.

Installation: Tighten the mounting bolt to 50 - 70 in.-lb. (5,6 - 7,9 N•m) torque.

Remove the sensor mounting bolt (Item 3) **[Figure 60-100-6]** and nut.

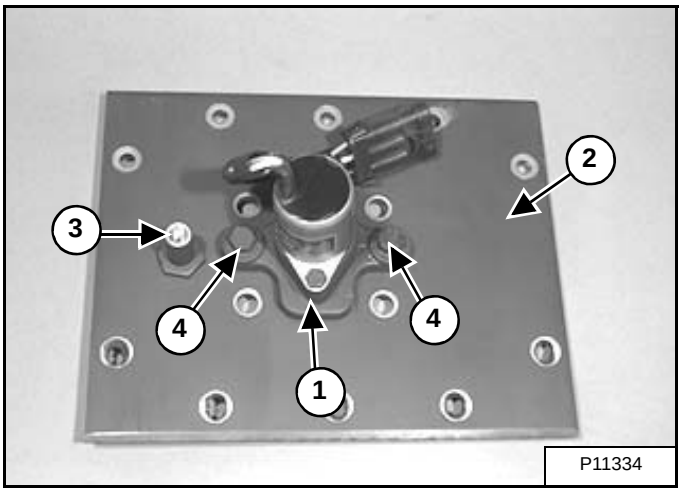
Guide Installation

Figure 60-110-13



Apply a bead of polyurethane (P/N 6633583) on the traction lock guides and bolts **[Figure 60-110-13]**.

Figure 60-110-14

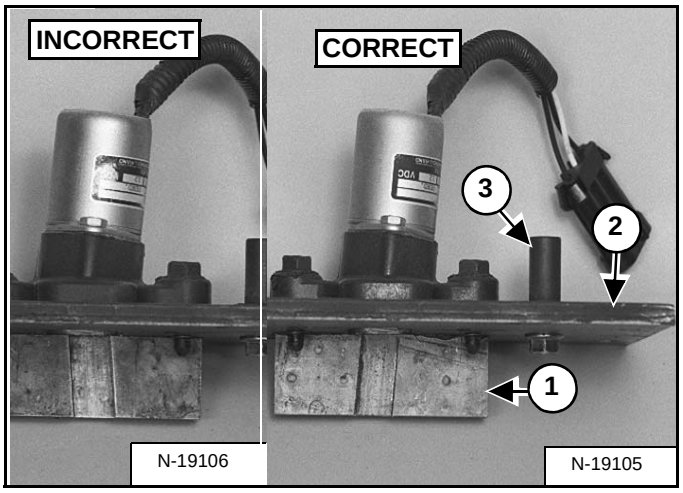


Install the electric solenoid/bracket assembly (Item 1) to the center chaincase cover (Item 2) **[Figure 60-110-14]**.

NOTE: Bolt (Item 3) [Figure 60-110-14] & [Figure 60-110-15] represents the rear of the chaincase cover.

Install and tighten the two bolts (Item 4) **[Figure 60-110-14]**.

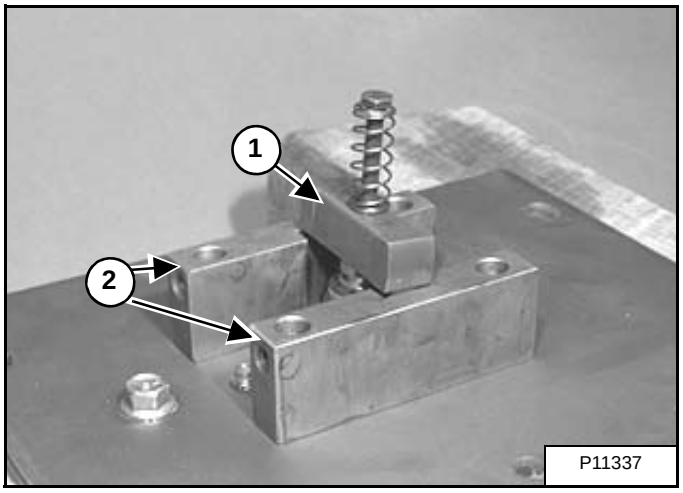
Figure 60-110-15



Install the traction lock guides (Item 1) to the chaincase cover (Item 2) **[Figure 60-110-15]** using the four bolts (removed earlier).

Do not tighten at this time.

Figure 60-110-16



Install the traction wedge assembly (Item 1) into the solenoid and traction lock guides (Item 2) **[Figure 60-110-16]**.

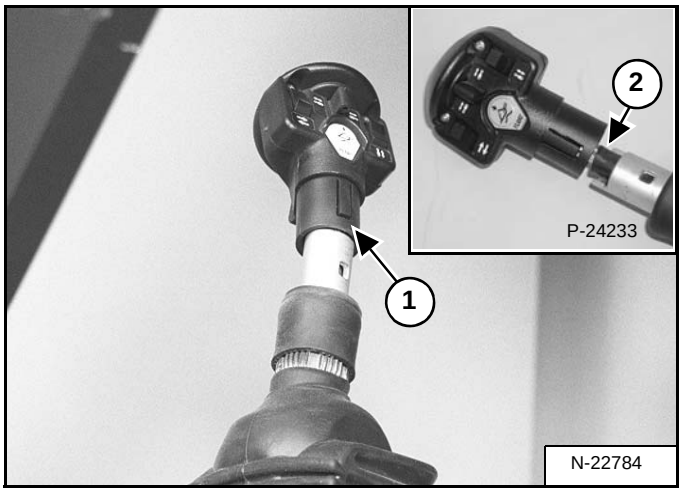
After the bolts have been tightened recheck to make sure the shaft assembly is moving freely in the guides.

Remove the wedge assembly (Item 1) **[Figure 60-110-16]**.

NOTE: The wedge assembly must slide freely in the grooves of the guides. Tighten the four guide bolts to 90 - 100 ft.-lb. (123 - 135 N•m) torque.

Switch Handle Removal (Cont'd)

Figure 60-120-20

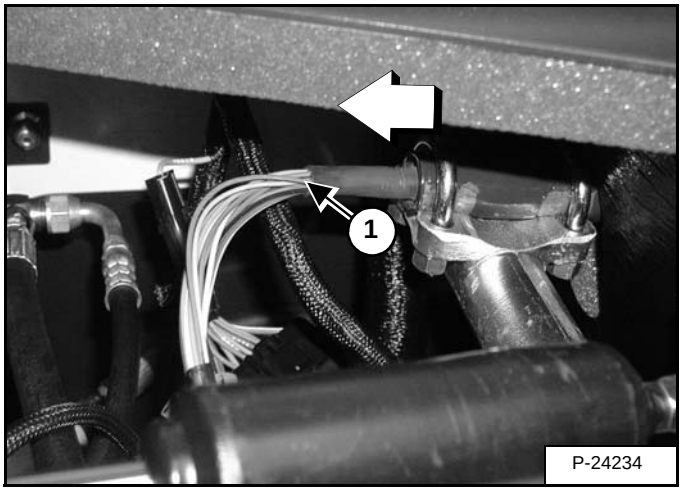


Pull the switch handle and wiring harness assembly (Item 1) **[Figure 60-120-20]** from the control lever.

Cut the wires (Item 2) **[Figure 60-120-20]** below the switch handle and remove switch handle.

NOTE: Only cut the wires if the switch handle is bad and needs replacement. If the switch handle is good and just needs to be removed for control handle or lever replacement, then remove the connectors on the end of the harness and pull switch handle and harness up through the top of the lever tube.

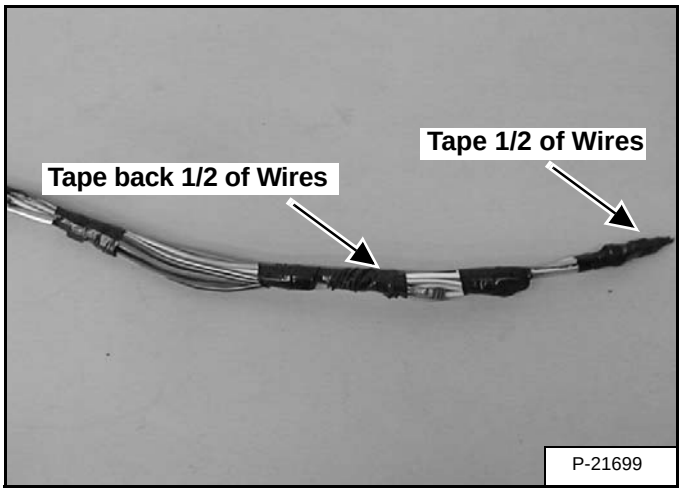
Figure 60-120-21



If the harness has been cut: pull the harness (Item 1) **[Figure 60-120-21]** out through the bottom of the control lever tube.

Switch Handle Installation

Figure 60-120-22



When installing the new switch handle, tape the wire terminals together.

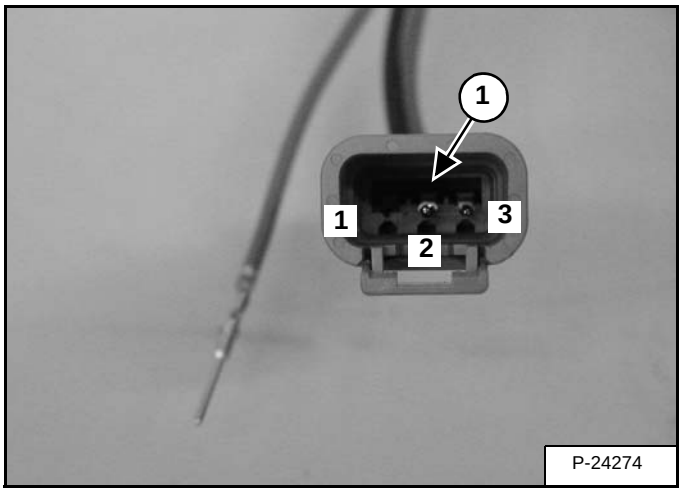
The switch handle comes with a 6 inch piece of heat shrink tube slid over the end of the wires. Remove the heat shrink tube from the end of the wires before routing the harness through handle and control lever tube.

NOTE: Leave all the other heat shrink tube on the wires for protection.

Tape half of the wires back and half forward **[Figure 60-120-22]** to keep the harness small enough to route through the control lever tube.

Foot Sensor Connector (Cont'd)

Figure 60-120-51



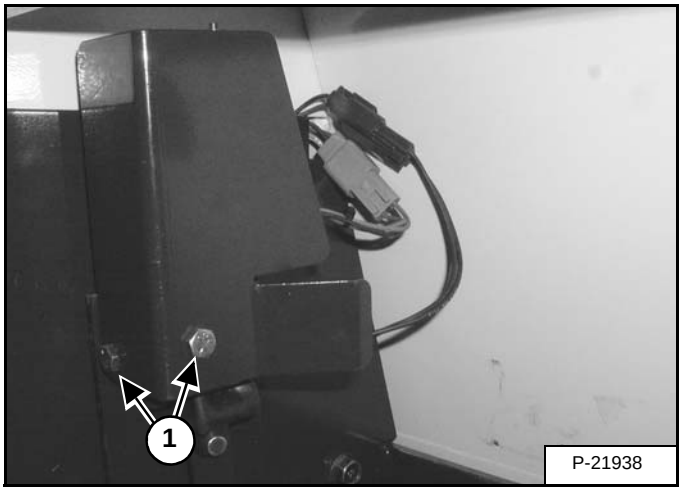
With a pointed tool, lift the tab (Item 1) **[Figure 60-120-51]** and pull the wire from the connector.

Installation: Install the wires into the connector as listed below **[Figure 60-120-51]**:

1 - Terminal - Red
2 - Terminal - Black
3 - Terminal - Green

Foot Lock Solenoid Removal And Installation

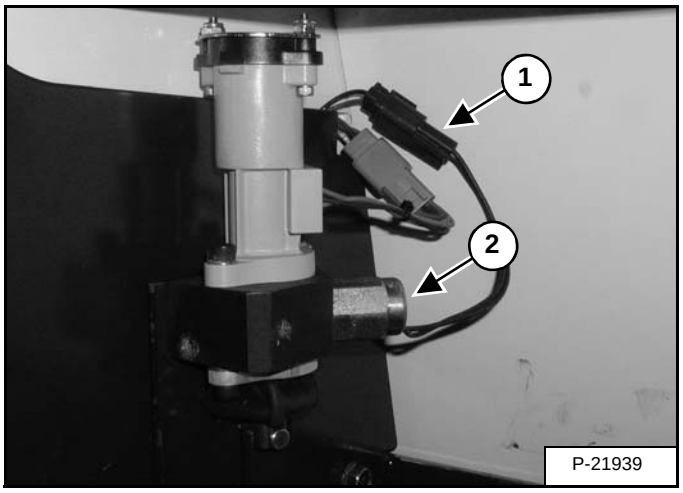
Figure 60-120-52



Remove the two bolts (Item 1) **[Figure 60-120-52]** from the foot sensor shield.

Installation: Tighten the bolts to 80 - 90 in.-lb. (9,0 - 10,2 N•m) torque.

Figure 60-120-53

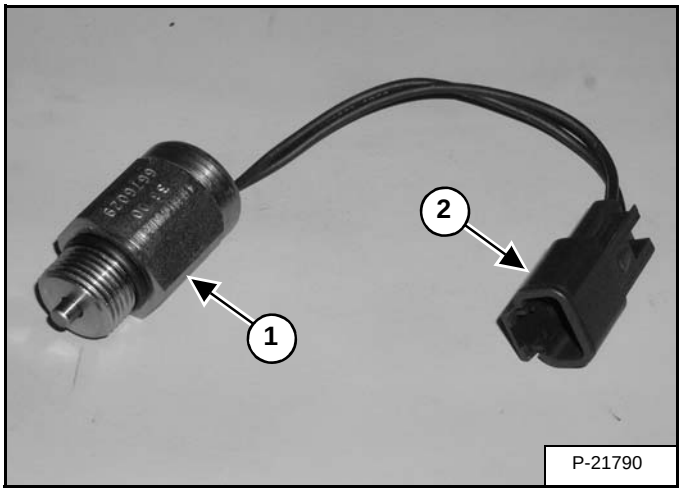


Disconnect the foot lock solenoid connector (Item 1) **[Figure 60-120-53]** from the harness.

Remove foot lock solenoid (Item 2) **[Figure 60-120-53]**.

Installation: Apply a drop of oil on the solenoid threads and tighten the solenoid to 35 - 40 ft.-lb. (47 - 54 N•m) lubed torque.

Figure 60-120-54

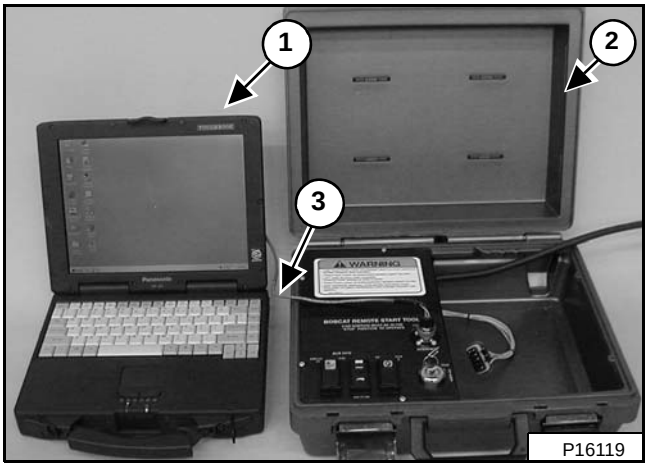


Check the O-ring (Item 1) **[Figure 60-120-54]** for damage. Replace as necessary.

SERVICE PC (LAPTOP COMPUTER)

Connecting The Service PC To Remote Start Tool

Figure 60-150-1



Tools that will be needed to complete the following steps are:

MEL1563 - Remote Start Tool
MEL1565 - Service Tool Harness Control
MEL1566 -Service Tool Harness Communicator (Computer Interface)

NOTE: Make all connections with the key in the OFF position.

The Service PC (Item 1) with the remote start tool (Item 2) **[Figure 60-150-1]**. When connected to the loader, the Service PC is used to monitor, conduct diagnostic and load software.

Connect the Service Tool Harness Communicator (MEL1566) (Item 3) **[Figure 60-150-1]** to the designated serial port on the Service PC.

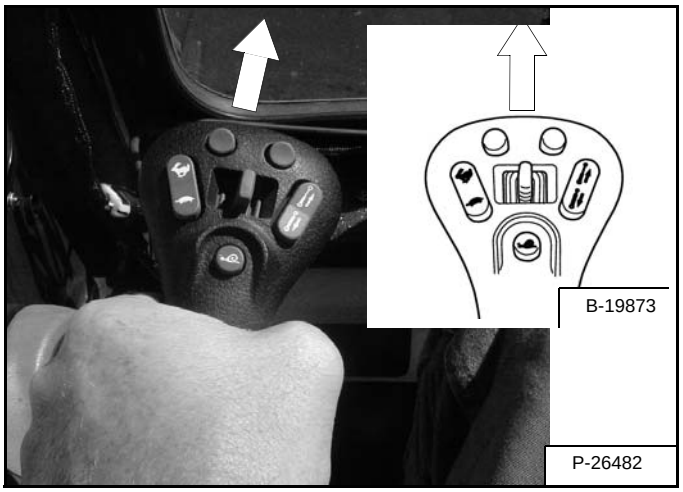
NOTE: The recommended serial cable length should not exceed 15 feet. A serial cable longer than 15 feet will create a degraded signal causing communication errors.

Connect the other end to the connector on the remote start tool.

Connect the remote start tool to the loader. (See Procedure on Page 10-60-1.)

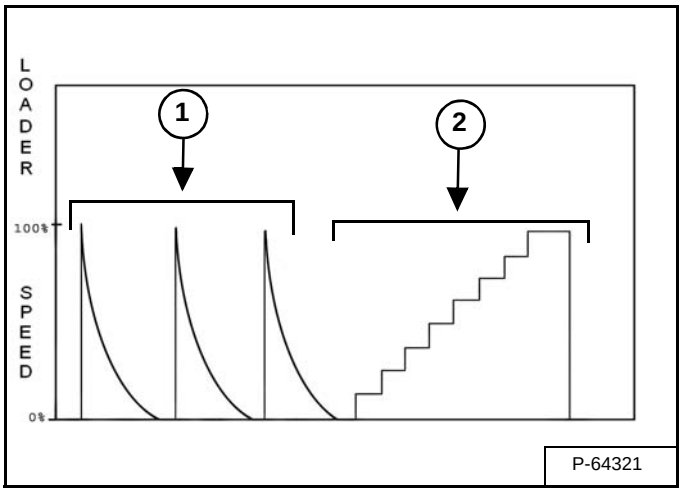
Hydrostatic Pump Calibration (SJC) (Cont'd)

Figure 60-160-23



Move and hold the left joystick to the forward position **[Figure 60-160-23]** until the forward calibration is completed.

Figure 60-160-24



The loader speed will “ramp up” quickly (Item 1) **[Figure 60-160-24]** and slow down 3 times in a row.

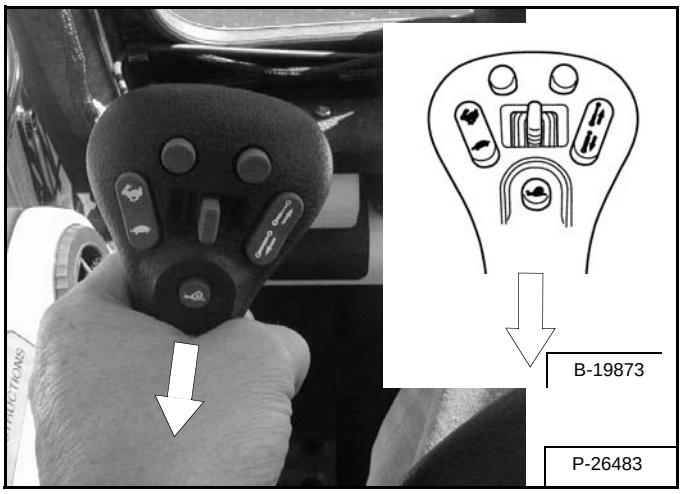
The loader will then “stair step” the speed (Item 2) **[Figure 60-160-24]** until it reaches full speed and then come to a stop.

Continue to hold the left joystick in the forward position until the loader tracks come to a stop and an audible beep is heard.

Forward calibration is complete.

NOTE: If the wheels do not stop moving in Full Speed Forward in 2 minutes or less, there was an error in the calibration procedure. The operator must shut the loader OFF, and start the calibration procedure from the beginning.

Figure 60-160-25



Move and hold the left joystick to the reverse position **[Figure 60-160-25]** until the reverse calibration is completed.

TROUBLESHOOTING

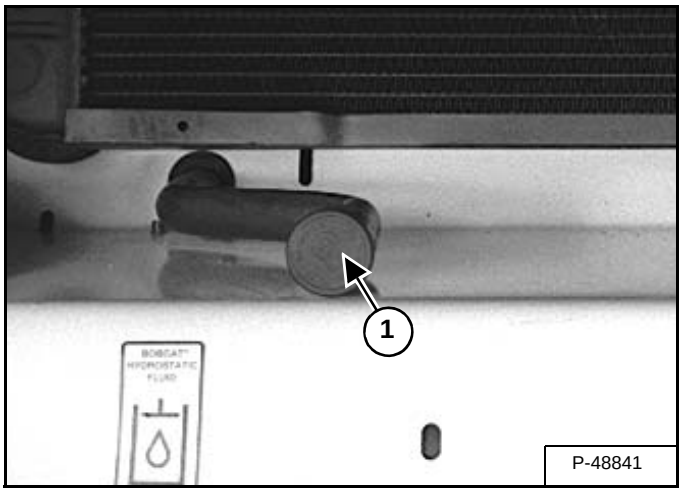
Chart

The following troubleshooting chart is provided for assistance in locating and correcting problems which are most common. Many of the recommended procedures must be done by authorized Bobcat Service Personnel only.

PROBLEM	CAUSE
Slow cranking speed.	1, 2, 3, 54
Engine will not start.	2, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 19, 27, 28, 29
Difficult to start.	1, 2, 5, 7, 8, 9, 10, 11, 12, 13, 15, 16, 17, 18, 19, 20, 25, 27, 28, 29,54
No power for engine.	8, 9, 10, 11, 12, 13, 15, 16, 17, 18, 20, 21, 22, 23, 27, 28, 29
Engine is mis-firing.	8, 9, 11, 12, 13, 15, 16, 17, 21, 22, 24, 25, 26, 28
Too much fuel consumption.	10, 12, 13, 15, 16, 17, 19, 20, 21, 23, 24, 25, 27, 28, 29
Black exhaust.	10, 12, 13, 15, 16, 17, 19, 20, 21, 23, 24, 25, 27, 28, 29
Blue/white exhaust.	4, 10, 15, 16, 17, 21, 23, 27, 29, 30, 50
Low oil pressure.	4, 31, 32, 33, 34, 35, 37, 38, 39, 52
Engine knocking.	13, 15, 16, 19, 22, 24, 25, 27, 29, 31, 40, 41, 53
Engine running rough.	7, 8, 9, 10, 11, 12, 13, 17, 18, 22, 24, 25, 26, 29, 40, 53
Vibration.	12, 13, 17, 21, 22, 25, 26, 29, 40, 42, 43
High oil pressure warning.	4, 33, 36
Overheating.	10, 12, 13, 15, 16, 20, 21, 40, 44, 45, 46, 47, 48, 51
Too much crankcase pressure.	22, 27, 29, 30, 40, 49
Poor compression.	10, 16, 21, 24, 25, 27, 28, 29, 30, 41, 53
Start and stop.	9, 10, 11

Removal And Installation (Cont'd)

Figure 70-50-8



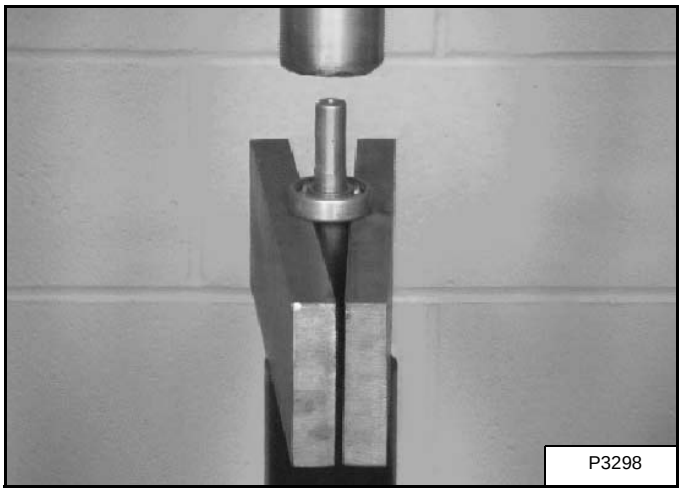
Remove the hydraulic fill tube (Item 1) **[Figure 70-50-8]**.

Lift the radiator up and remove it from the loader.

Reverse the above procedure to install the radiator.

Gearbox Disassembly (Cont'd)

Figure 70-60-25



Support the bearing and press the shaft from the bearing **[Figure 70-60-25]**.

Figure 70-60-26

Short Housing

Remove the end cap **[Figure 70-60-26]**.

Use care not to damage the housing.

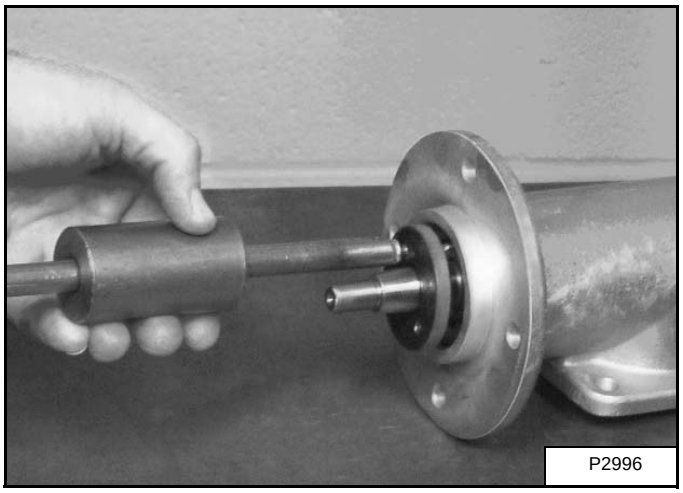
⚠ WARNING

AVOID INJURY OR DEATH

Wear safety goggles to prevent eye injury when drilling or grinding.

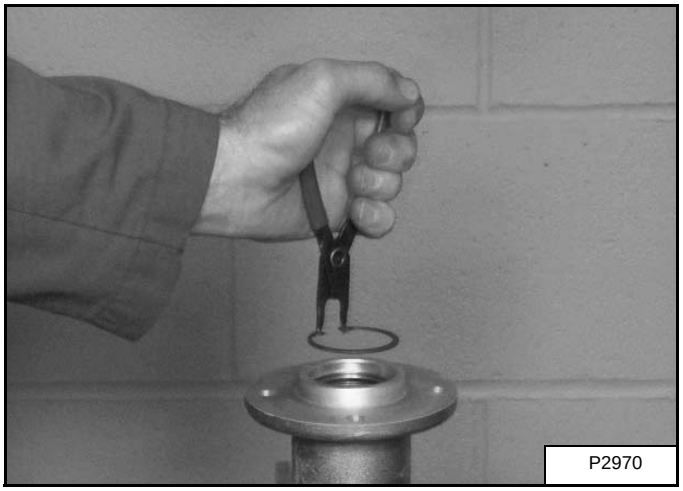
W-2108-1186

Figure 70-60-27



Drill an 1/8 inch (3 mm) hole in the seal. Use a slide hammer tool to remove the seal **[Figure 70-60-27]**.

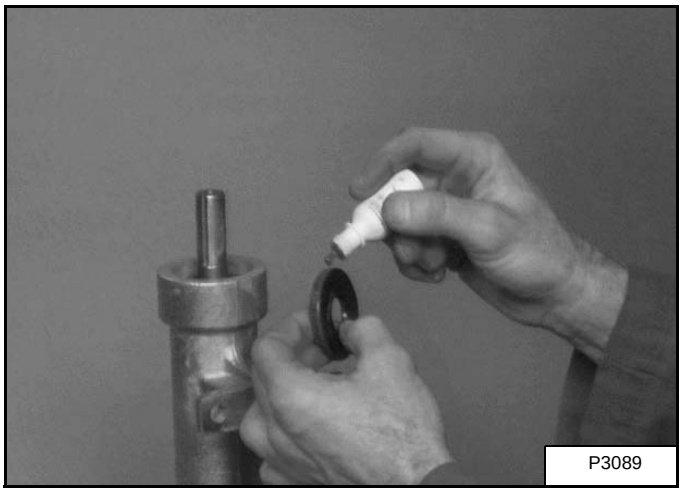
Figure 70-60-28



Remove the large snap ring from the flange end of the housing **[Figure 70-60-28]**.

Gearbox Checking Backlash (Cont'd)

Figure 70-60-60



When the backlash is correct, install the seals, cap and gear oil as follows:

Remove the bolts from the flanges and separate the two housings.

Put liquid adhesive (Loctite® #242) on the outside diameter of the seal(s) **[Figure 70-60-60]**.

Figure 70-60-61

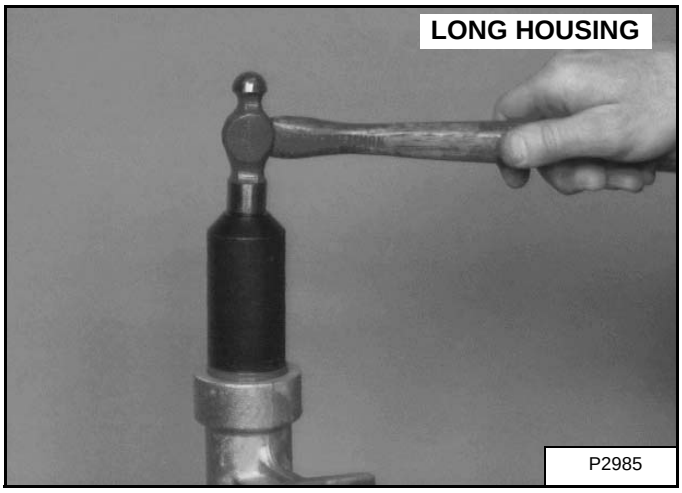
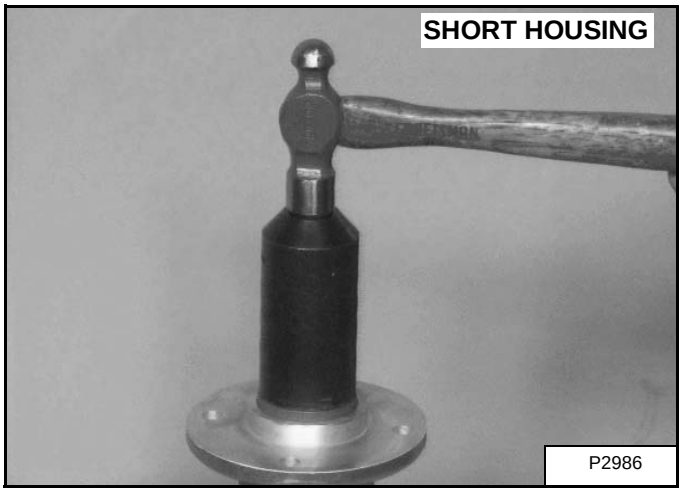


Figure 70-60-62



Install the seal(s) flush with the housing surface **[Figure 70-60-61]** & **[Figure 70-60-62]**.

Clean any oil from the flange surface.

Install the long housing on the short housing flange.

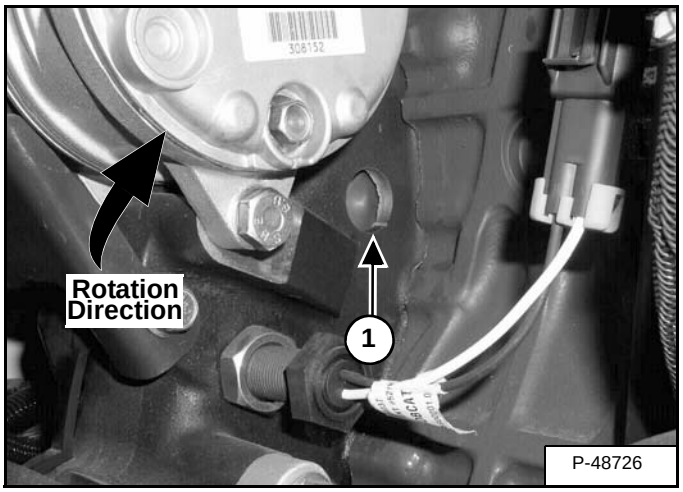
Install the four bolts and part number tag.

Install and tighten the nuts to 25 - 28 ft.-lb. (34 - 38 N•m) torque.

NOTE: When filling the fan gearbox with oil, be sure the level does not go above the top of the shaft in the gearbox. Use a light colored 90W gear lube.

Timing The Injection Pump (Cont'd)

Figure 70-70-26



Rotate the engine in the direction shown **[Figure 70-70-26]**.

Continue rotation until flywheel timing mark just appears in the window (Item 1) **[Figure 70-70-26]**.

NOTE: The flywheel has three timing marks.

The first mark to appear in the window with the rotation is 9.25° which is used for loaders with the Kubota V2003T engine.

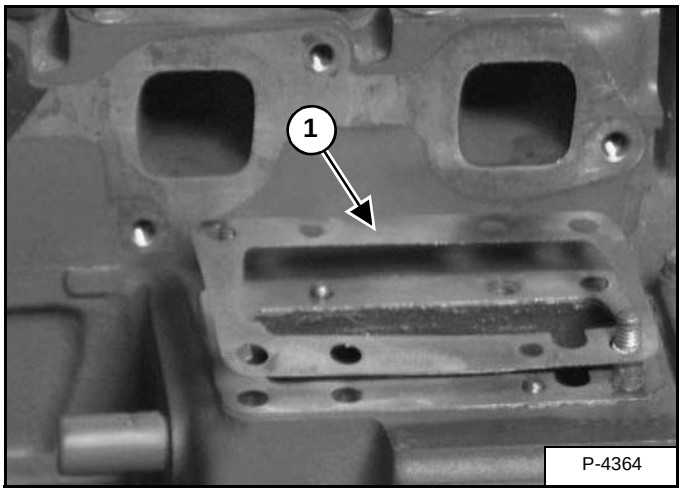
The second mark to appear in the window is 8.2° which is used for loaders with the Kubota V2203 engine.

The third mark to appear in the window is 6.75° which is used for loaders with the Kubota V2403 engine.

Rotate slowly until fuel just starts to flow upward into the plastic tube.

At this instant, the **6.75° BTDC** on the flywheel should be aligned with the mark in the window (Item 1) **[Figure 70-70-26]** for the **V2403** engine.

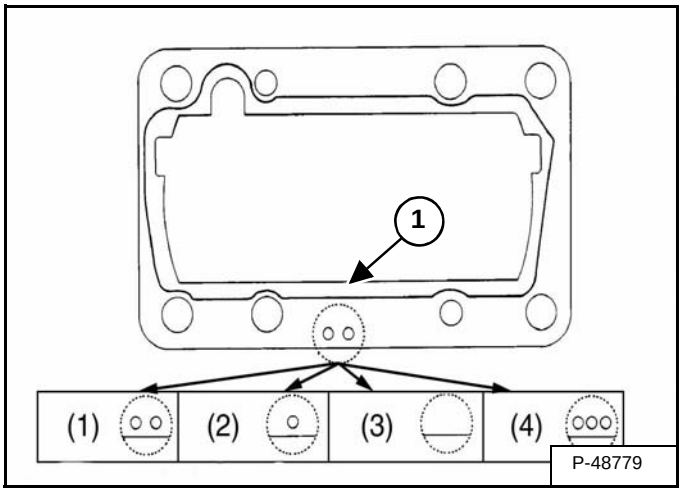
Figure 70-70-27



Add or subtract shim(s) (Item 1) **[Figure 70-70-27]** as needed to adjust the fuel delivery timing.

NOTE: Adding or removing one shim will vary the timing by 1.5°. Adding shims retards timing.

Figure 70-70-28



The size of shims are identified by a symbol on the shims (Item 1) **[Figure 70-70-28]**.

(1) Two holes means 0.008 in (0,20 mm) shim.

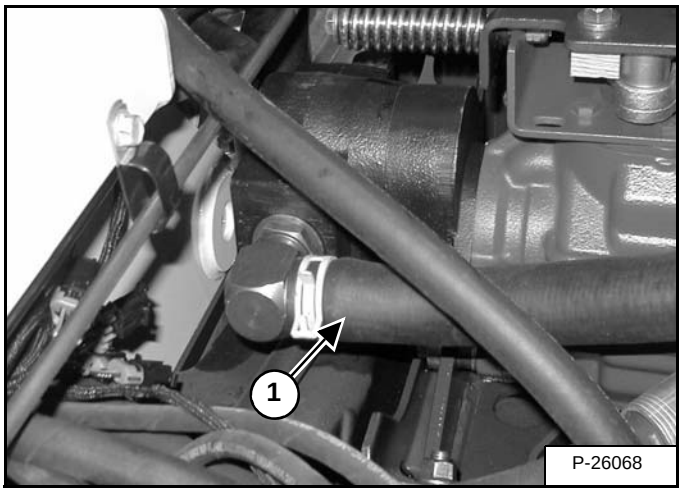
(2) One hole means 0.010 in (0,25 mm) shim.

(3) Without hole means 0.012 in (0,30 mm) shim.

(4) Three holes means 0.014 in (0,35 mm) shim.

Removal And Installation (Cont'd)

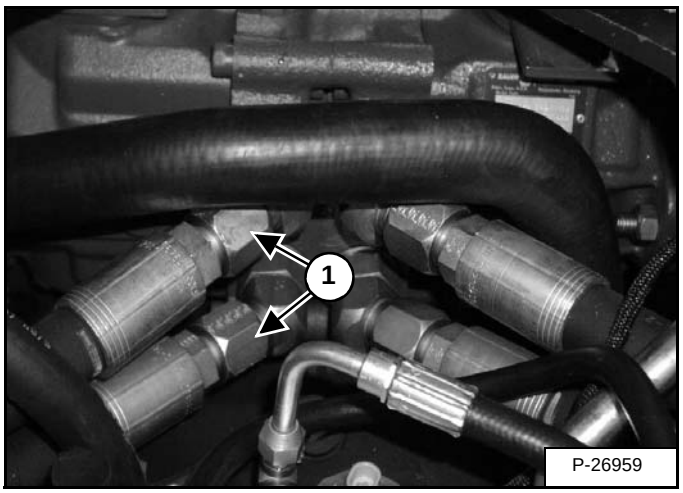
Figure 70-80-15



Disconnect inlet gear pump hose (Item 1) **[Figure 70-80-15]**.

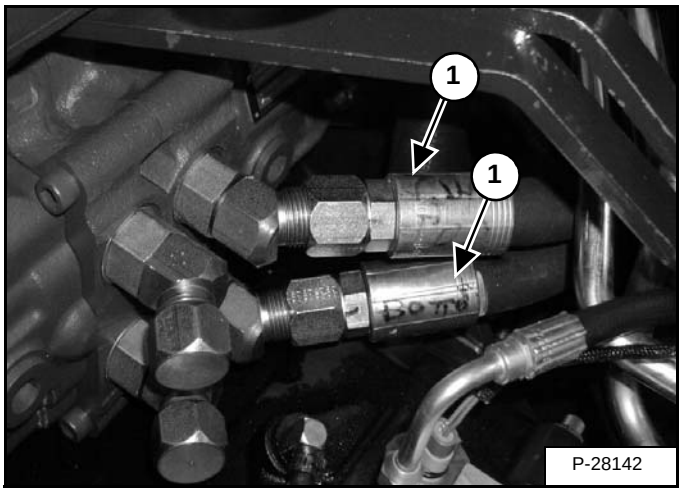
Cap or plug all hoses and fittings.

Figure 70-80-16



Mark and disconnect the two right drive motor hoses (Item 1) **[Figure 70-80-16]**.

Figure 70-80-17



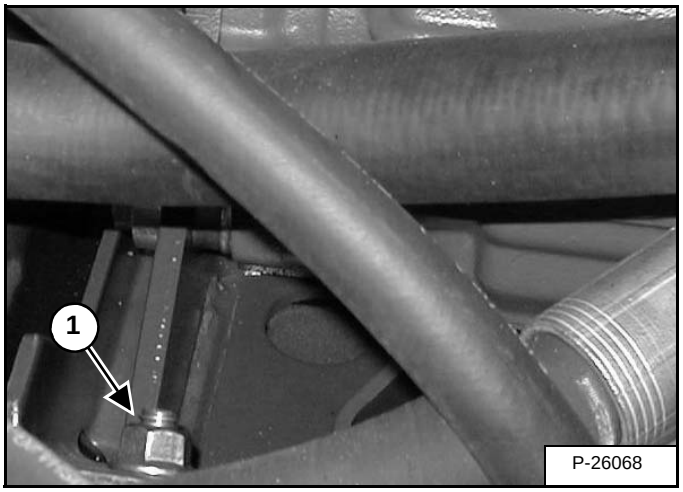
Mark and disconnect the left drive motor hoses (Item 1) **[Figure 70-80-17]**.

Cap or plug all hoses and fittings.

NOTE: Due to the left drive motor hoses (Item 1) [Figure 70-80-17] orientation, hoses may not be completely removed from fittings until engine and pump is partially removed.

Installation: Install the left drive motor hoses prior to alignment with engine mount bolts.

Figure 70-80-18



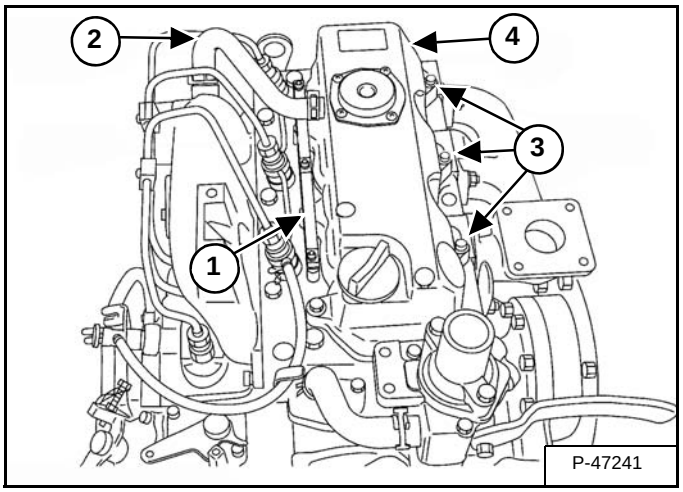
Remove the mounting bolt and nut (Item 1) **[Figure 70-80-18]** from the right front engine mount.

Installation: Tighten the mounting bolt to 70 ft.-lb. (95 N•m) torque.

RECONDITIONING THE ENGINE

Cylinder Head Removal And Installation

Figure 70-100-1



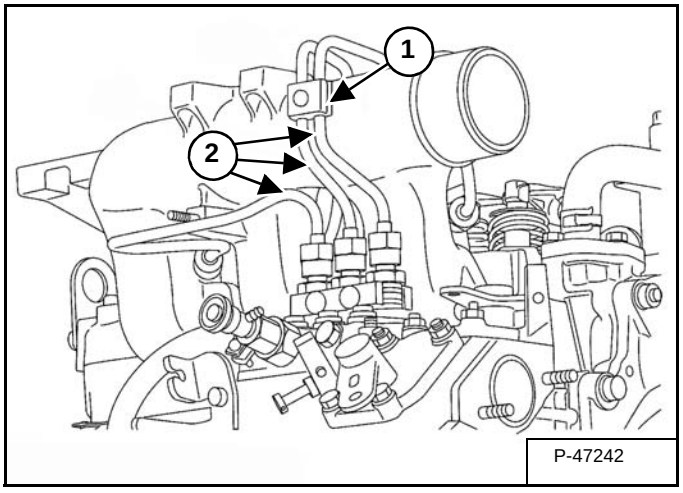
Remove the glow plug lead (Item 1), breather hose (Item 2), and valve cover bolts (Item 3) **[Figure 70-100-1]**.

Remove the valve cover (Item 4) **[Figure 70-100-1]** and gasket.

Installation: Tighten the valve cover bolts to 5 - 8 ft.-lb. (7 - 11 N•m)

NOTE: Tighten valve cover bolts starting from the center and working towards the ends. Otherwise, valve cover damage may occur.

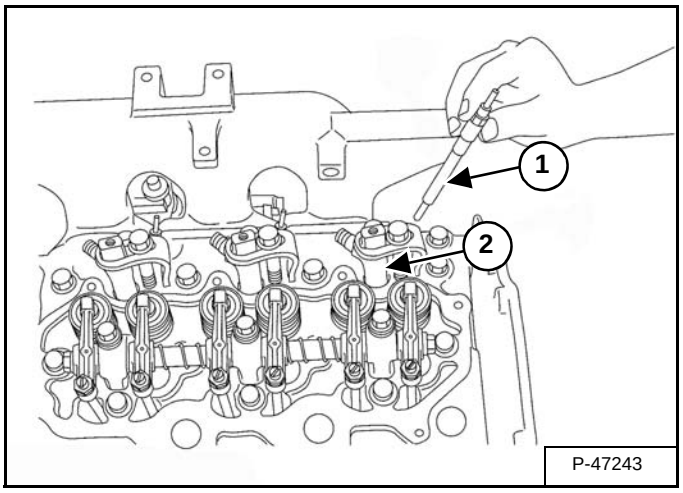
Figure 70-100-2



Loosen the bolts on the clamps (Item 1) and remove the injection tubes (Item 2) **[Figure 70-100-2]**.

Remove the overflow tube assembly.

Figure 70-100-3

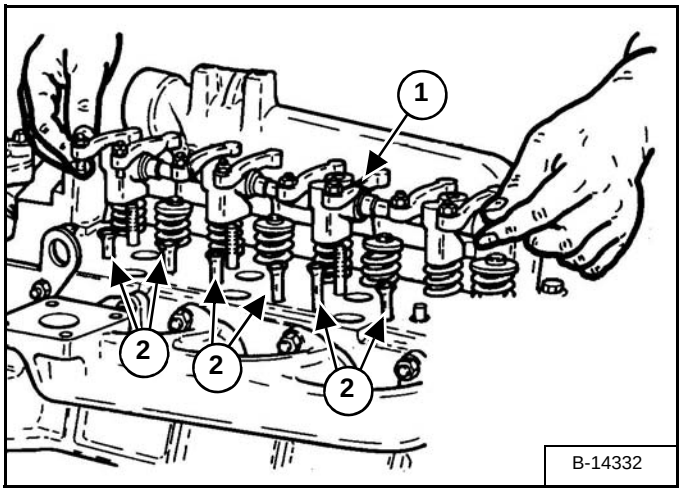


Remove the glow plugs (Item 1) and fuel injector holder assemblies (Item 2) **[Figure 70-100-3]**.

Installation: Tighten the glow plugs to 11 - 14.5 ft.-lb. (15 - 19.6 N•m) torque.

Tighten the injector holders to 19 - 22 ft.-lb. (25,5 - 29,4 N•m) torque.

Figure 70-100-4



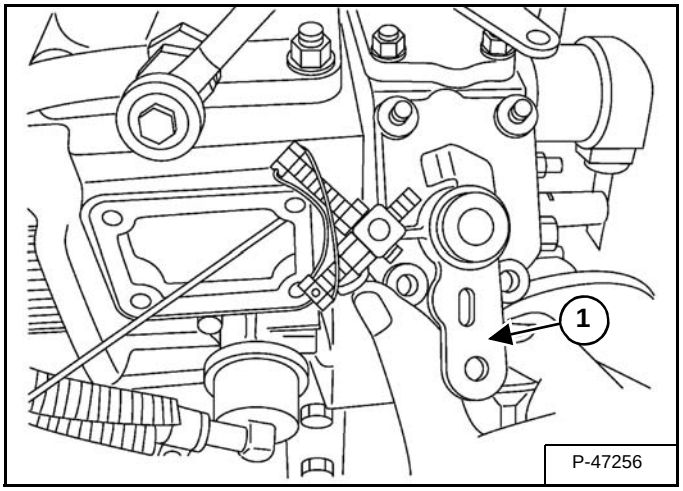
Remove the rocker arm bolts and remove the rocker arm assembly (Item 1) **[Figure 70-100-4]**.

Installation: Tighten the bolts to 17 - 20 ft.-lb. (23,5 - 27,5 N•m) torque.

Remove the pushrods (Item 2) **[Figure 70-100-4]**.

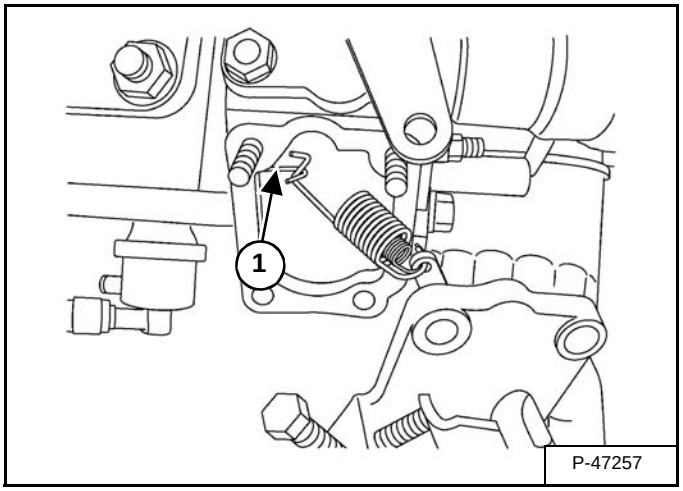
Timing Gearcase Cover Removal And Installation (Cont'd)

Figure 70-100-31



Remove the speed control plate (Item 1) **[Figure 70-100-31]**.

Figure 70-100-32



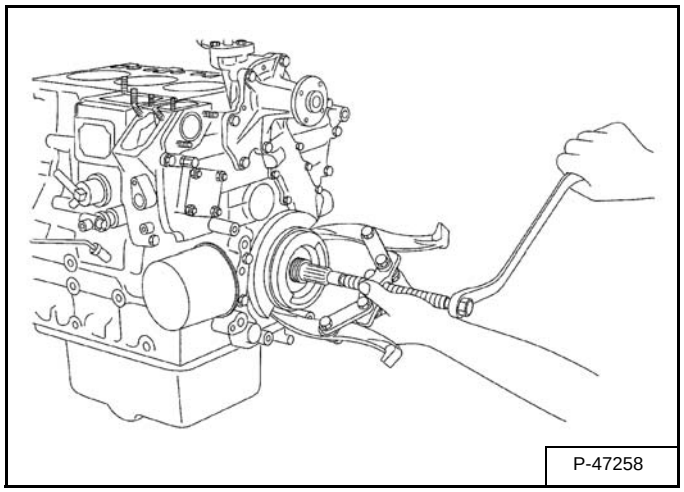
Remove the wire (Item 1) **[Figure 70-100-32]** from the springs.

Installation: Do not drop the governor springs into the gear case.

Remove the crankshaft pulley nut.

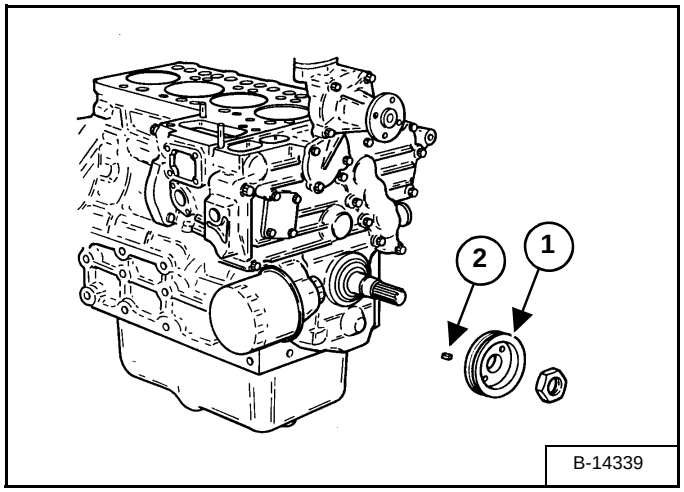
Installation: Tighten the nut to 101 - 116 ft.-lb. (137 - 157 N•m) torque.

Figure 70-100-33



Use a puller and remove the crankshaft pulley. **[Figure 70-100-33]**.

Figure 70-100-34



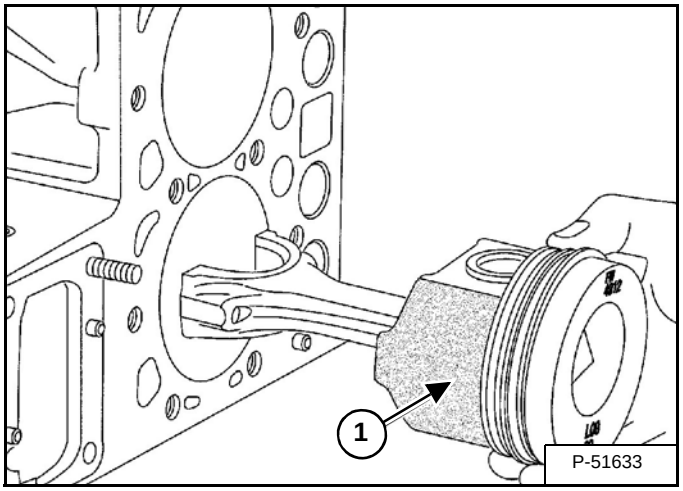
Remove the crankshaft pulley (Item 1) and key (Item 2) **[Figure 70-100-34]**.

Remove the bolts from the timing gearcase cover.

Installation: Tighten the bolts to 13 - 15 ft.-lb. (18 - 20 N•m) torque.

Piston And Connecting Rod Removal And Installation (Cont'd)

Figure 70-100-62



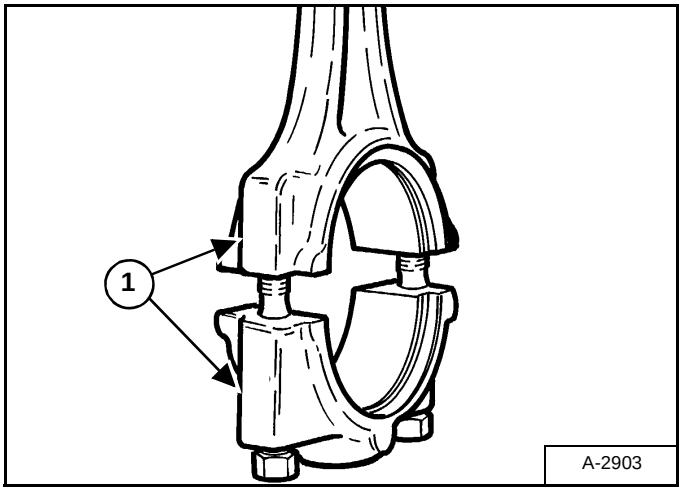
Remove the rod cap and bearing **[Figure 70-100-62]**.

Use a hammer handle and push the piston/connecting rod assembly out of the cylinder bore **[Figure 70-100-62]**.

NOTE: Make sure the pistons are marked so they will be returned to the same cylinder bore.

Installation: Do not damage the piston skirt (Item 1) **[Figure 70-100-62]** when installing piston assembly.

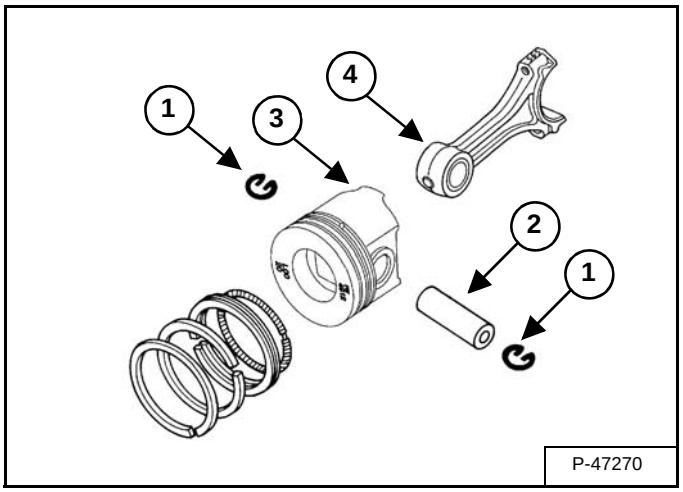
Figure 70-100-63



Installation: Make sure the marks on the connecting rod and bearing are aligned when installing the bearing cap (Item 1) **[Figure 70-100-63]**.

Repeat the procedure to remove the other piston/ connecting rod assemblies from the engine block.

Figure 70-100-64

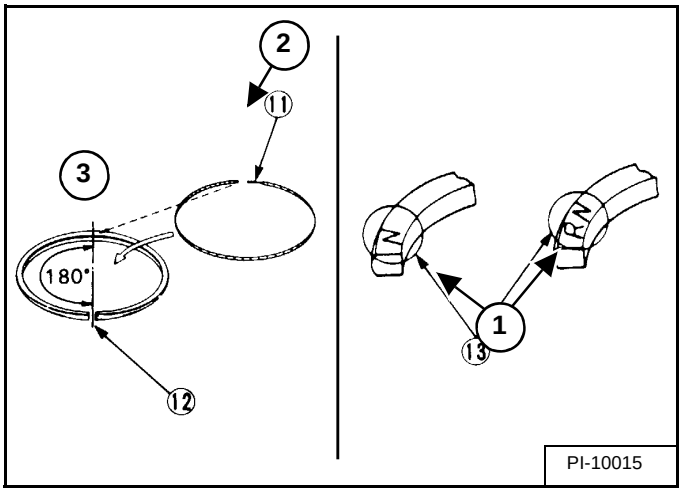


Remove the piston rings **[Figure 70-100-64]**.

Remove the snap ring (Item 1) and piston pin (Item 2) **[Figure 70-100-64]**.

Separate the piston (Item 3) from the connecting rod (Item 4) **[Figure 70-100-64]**.

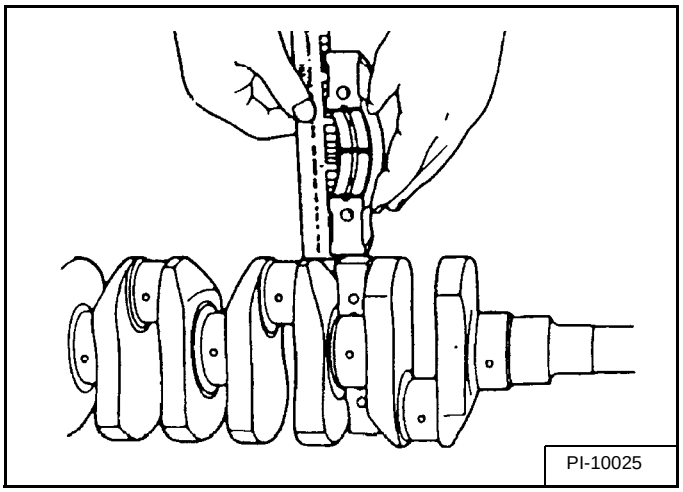
Figure 70-100-65



Installation: When installing new rings, assemble the ring so the mark (Item 1) near the gap faces the top of the piston. When installing the oil ring, place the expander joint (Item 2) on the opposite side of the oil ring gap (Item 3) **[Figure 70-100-65]**.

Crankshaft And Bearings, Servicing (Cont'd)

Figure 70-100-92



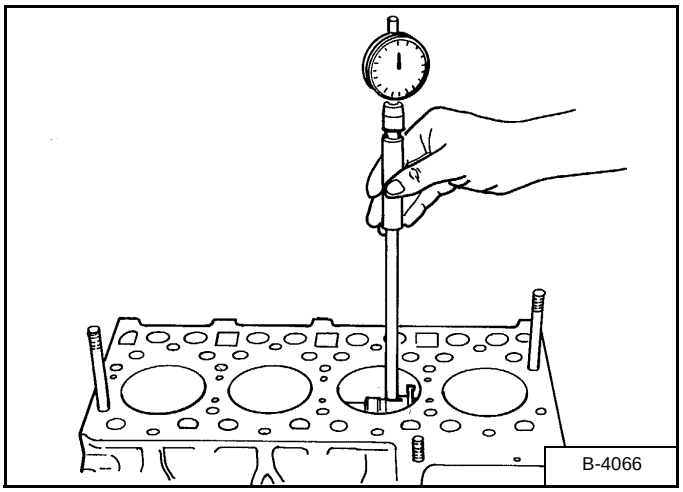
Measure the flattened press gauge **[Figure 70-100-92]**.

If the clearance exceeds the allowable limit, replace the No. 2 crankshaft bearing.

Journal O.D.	2.3591 - 2.3598 inch (59,92 - 59,94 mm)
Bearing I.D.	2.3614 - 2.3632 inch (59,98 - 60,02 mm)
Oil Clearance	0.0016 - 0.0041 inch (0,04 - 0,12 mm)
Allowable Limit	0.0079 inch (0,2 mm)

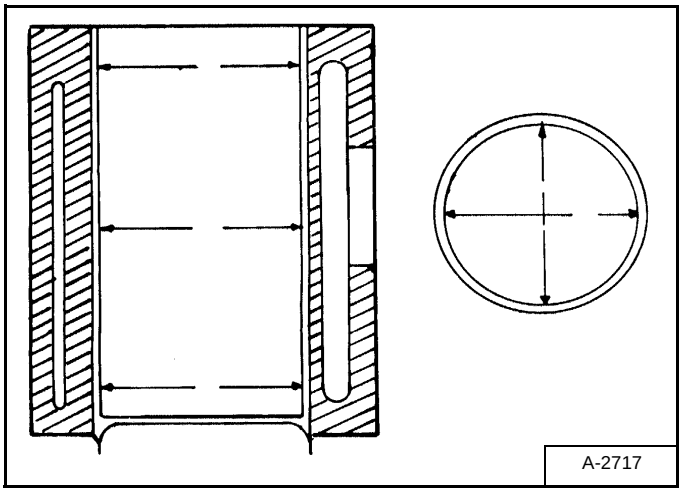
Cylinder Bore, Checking

Figure 70-100-93



Use a gauge to check the inside measurement of the cylinder bore **[Figure 70-100-93]**.

Figure 70-100-94



Measure the six points as shown in figure **[Figure 70-100-94]** to find the maximum wear.

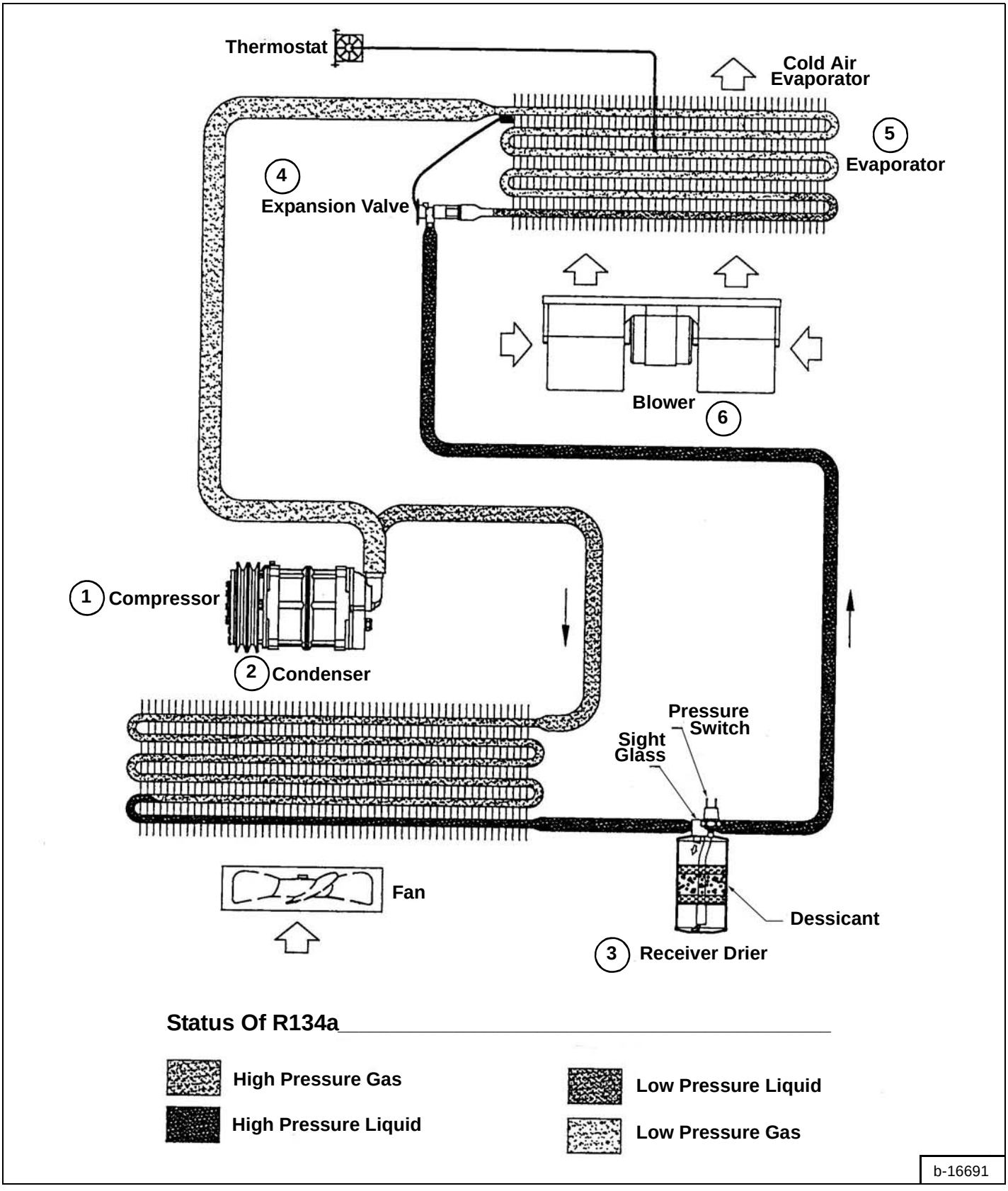
The factory specifications are:

3.4252 - 3.4261 inch (87,000 - 87,022 mm).

The wear limit is +0.0059 inch (+0,15 mm).

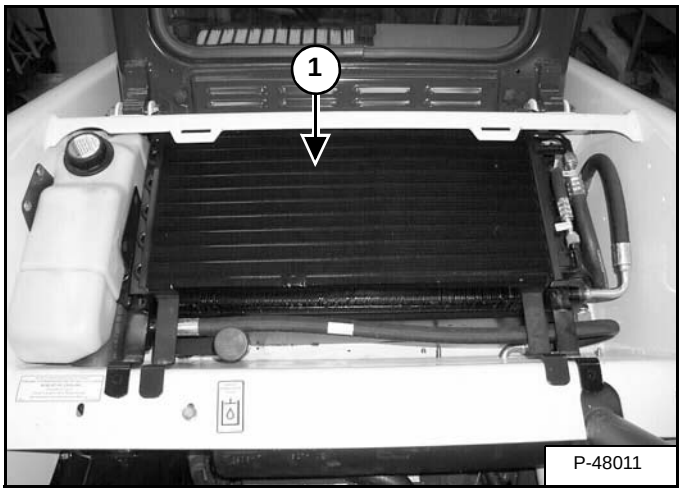
If the cylinder bore is not within specifications, re-bore the cylinder for oversize piston.

Chart


Thermostat
Cold Air
Evaporator
5
Evaporator
4
Expansion Valve
Blower
6
1
Compressor
2
Condenser
Pressure
Switch
Sight
Glass
Fan
Dessicant
3
Receiver Drier
Status Of R134a
High Pressure Gas
High Pressure Liquid
Low Pressure Liquid
Low Pressure Gas
b-16691

Cleaning The Condenser

Figure 80-40-8

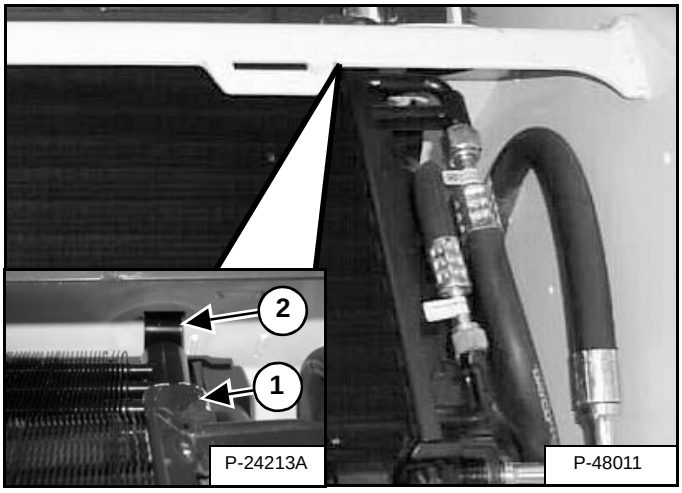


Open the rear door.

Remove the rear grill on the loader.

Check the condenser (Item 1) **[Figure 80-40-8]** for mud or dirt.

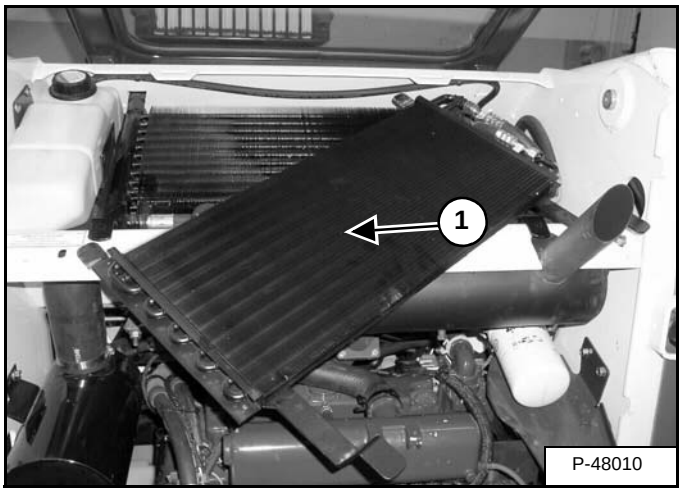
Figure 80-40-9



Lift the rear of the condenser and pull towards rear of machine until the front tabs (Item 1) slide out of mount (Item 2) **[Figure 80-40-9]**.

With the condenser removed from the machine, the oil cooler can also be lifted.

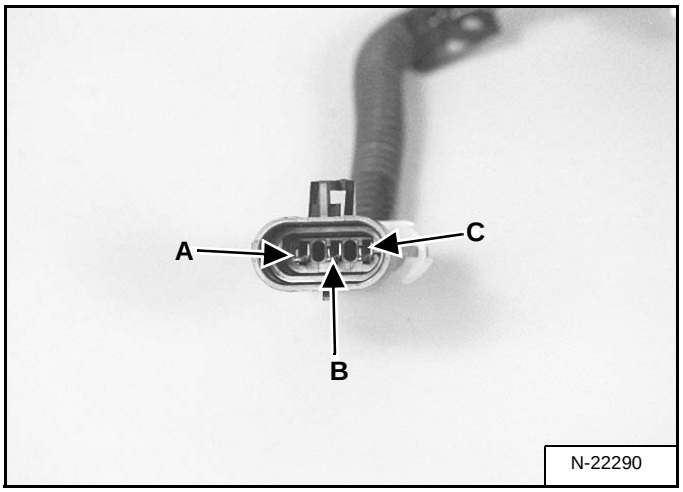
Figure 80-40-10



With water or air, the condenser (Item 1) **[Figure 80-40-10]** can be cleaned.

Checking The Electrical System (Cont'd)

Figure 80-50-30

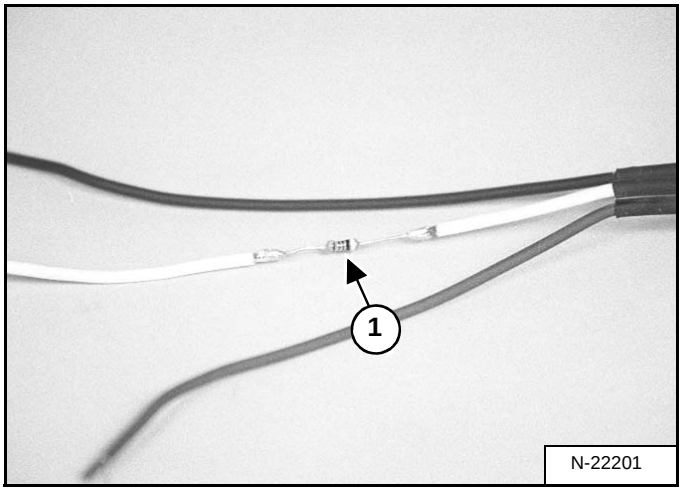


If there is voltage at the wiring harness, check the potentiometer **[Figure 80-50-30]** for resistance.

The resistance should be 10 K ohm between wire terminal A and wire terminal C frame **[Figure 80-50-30]**.

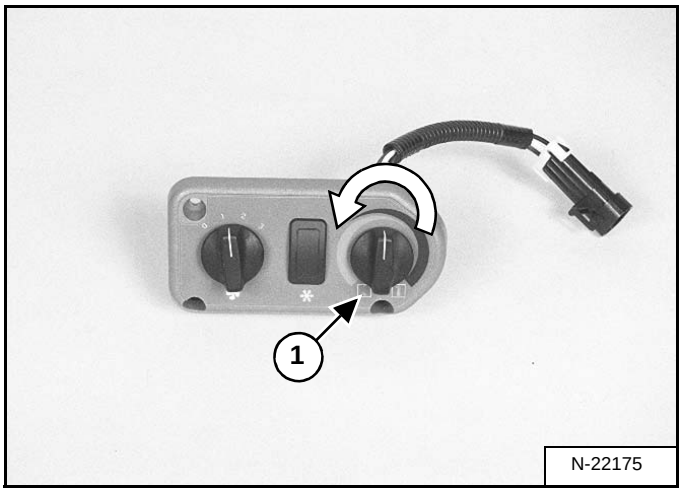
If no resistance is found, replace the potentiometer.

Figure 80-50-31



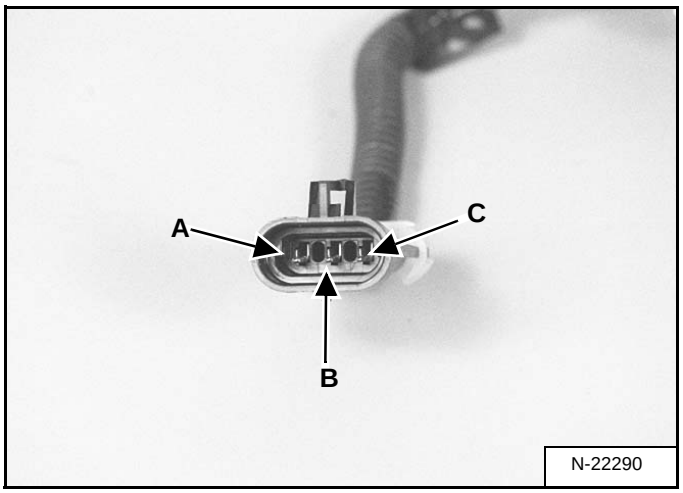
The white wire B, (Item 1) **[Figure 80-50-31]**, on the potentiometer, is a resistor wire.

Figure 80-50-32



To check the resistance of the white wire, turn the potentiometer control (Item 1) to the full A/C position **[Figure 80-50-32]**.

Figure 80-50-33



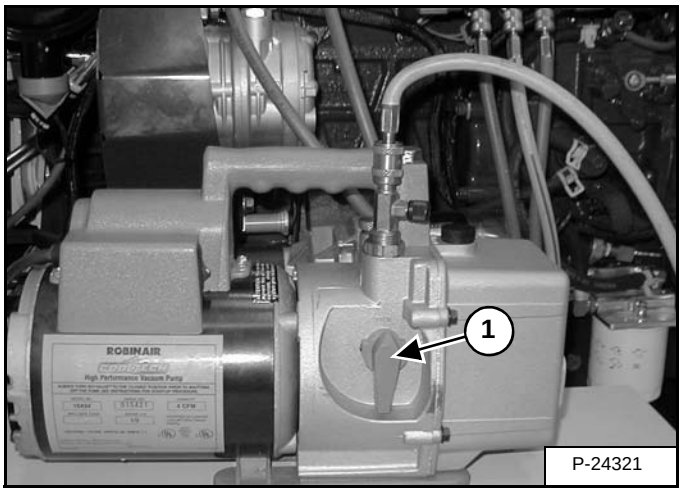
The resistance between the wire terminal A and wire terminal B frame **[Figure 80-50-33]** should be approximately 49 K ohm.

Check the resistance between the wire terminal C and wire terminal B frame **[Figure 80-50-33]** should be approximately 39 K ohm.

Gauge Pressure Related Troubleshooting (Cont'd)

Possible Cause	Inspection	Solution
System pressures equal		
1. Clutch not operating.	See magnetic clutch related topics above.	
2. Compressor not pumping.	Equal high and low pressures.	Replace compressor.

Figure 80-100-12



Start the vacuum pump and open ISO-valve (Item 1) **[Figure 80-100-12]** on the vacuum pump.

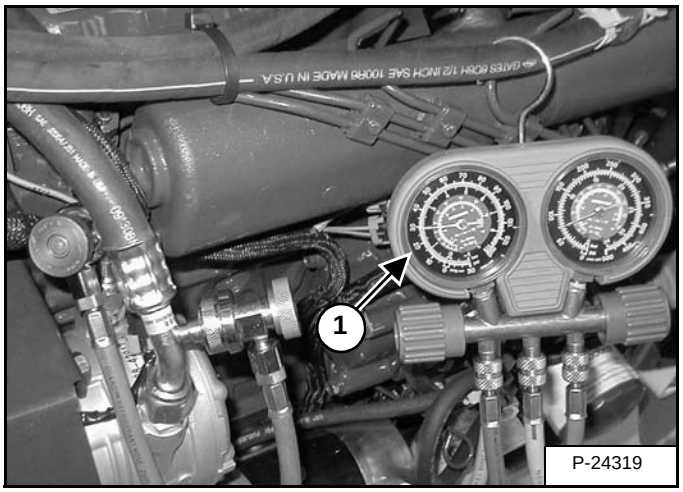
Run the vacuum pump for at least 5-10 minutes to insure that a vacuum has been pulled on the system.

Close the ISO-valve (Item 1) **[Figure 80-100-12]** (which isolates the vacuum pump from the A/C system) and turn OFF the vacuum pump.

SYSTEM CHARGING AND RECLAMATION (CONT'D)

Charging Procedure

Figure 80-100-13

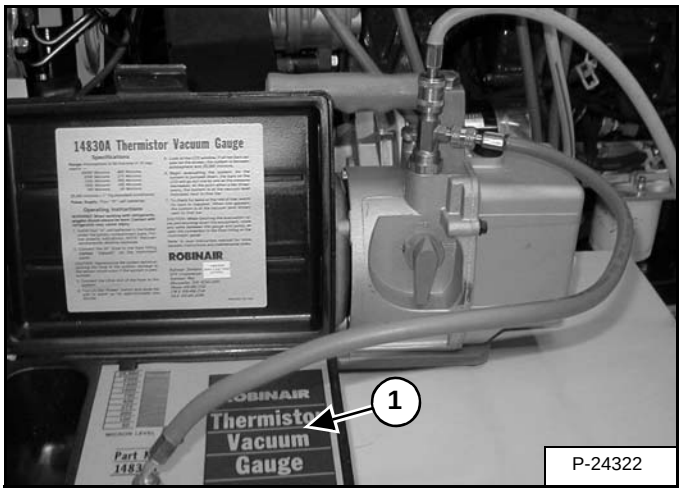


NOTE: Vacuum pressure indicated on the low pressure (Blue) gauge (Item 1) [Figure 80-100-13]. Let stand for 5-10 min. and recheck the pressure for changes.

If the pressure drops, this may be an indication of a leak in the A/C system.

Determine the problem with the A/C system and repair it.

Figure 80-100-14



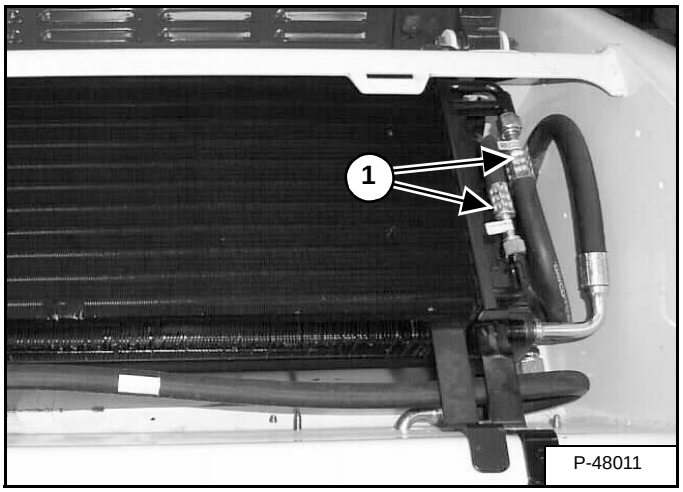
A thermistor vacuum gauge (Item 1) **[Figure 80-100-14]** can be used to determine the critical vacuum level during evacuation. It is a solid state instrument that constantly monitors and visually indicates the vacuum level.

The thermistor vacuum gauge is used with the vacuum pump **[Figure 80-100-14]**.

CONDENSER

Removal And Installation

Figure 80-120-1



Remove the refrigerant from the A/C system. (See SYSTEM CHARGING AND RECLAMATION on Page 80-100-1.)

Open the rear door of the loader.

Open the rear grill on the loader.

Mark the two A/C hoses (Item 1) **[Figure 80-120-1]** for proper installation.

⚠ WARNING

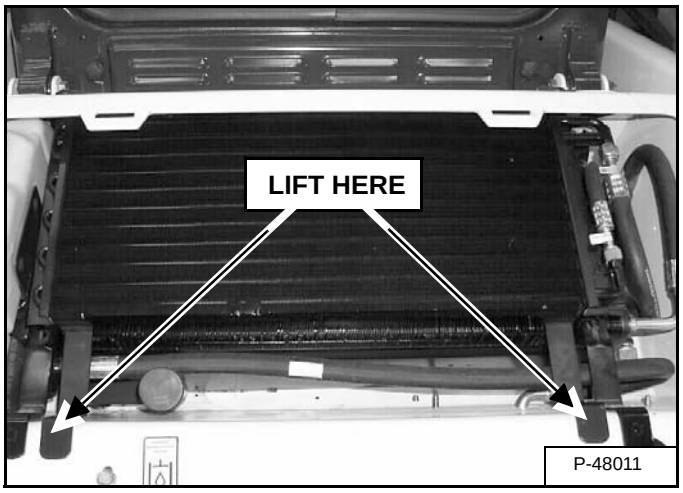
In the event of a leak, wear safety goggles. Escaping refrigerant can cause severe injuries to eyes. In contact with a flame, R134a refrigerant gives a toxic gas.

W-2371-0500

Disconnect the two hoses from the condenser (Item 1) **[Figure 80-120-1]**.

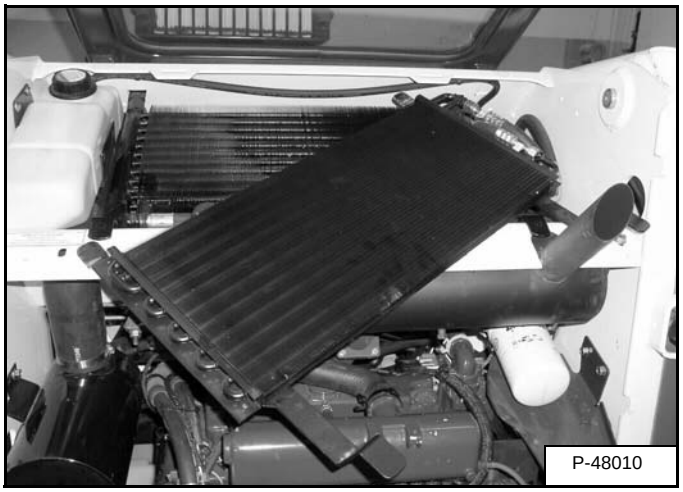
Cap and plug the hoses and the condenser fittings with the proper A/C caps and plugs.

Figure 80-120-2



Lift the rear of the condenser **[Figure 80-120-2]**, and pull toward the rear of the loader until the front tabs (Item 1) **[Figure 80-120-4]** slide out of bracket (Item 2) **[Figure 80-120-4]**

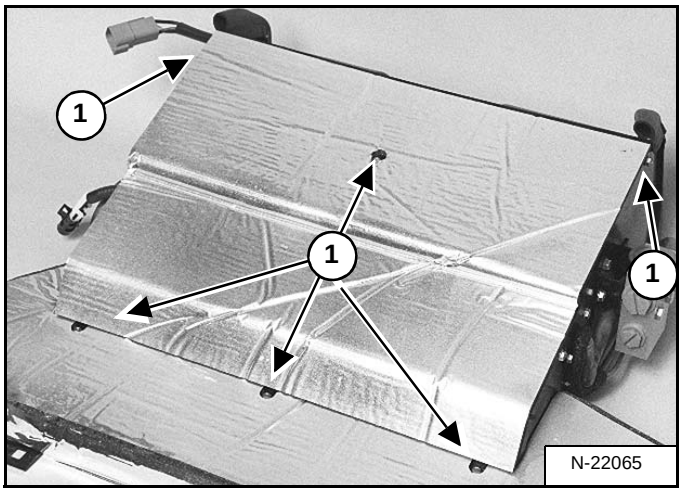
Figure 80-120-3



Remove the condenser from the loader **[Figure 80-120-3]**.

Disassembly And Assembly

Figure 80-160-8



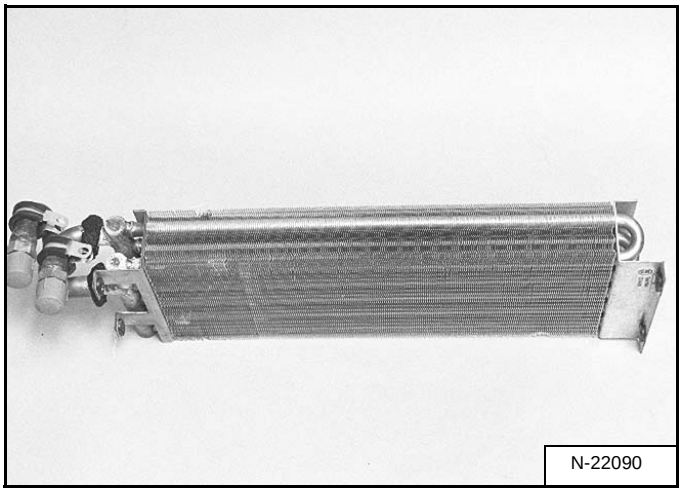
Remove the six mount bolts (Item 1) **[Figure 80-160-8]** from the Evaporator/Heater Unit rear cover.

Remove the rear cover from the unit.

HEATER COIL (CONT'D)

Removal And Installation With A/C (Cont'd)

Figure 80-200-5

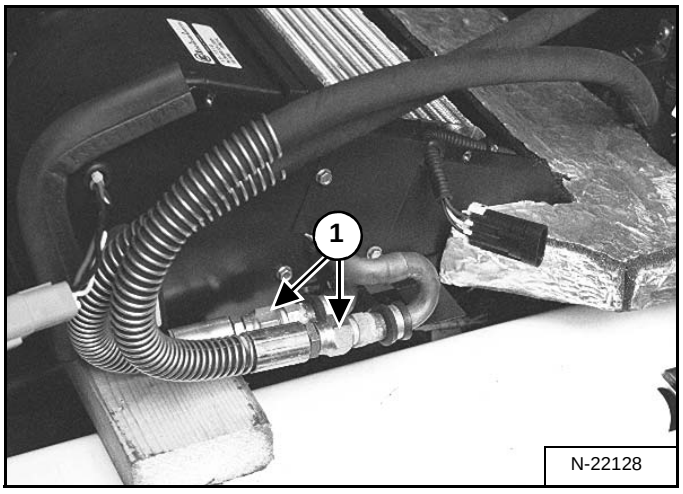


The heater coil **[Figure 80-200-5]** can be cleaned with low air or water pressure.

If the heater coil needs replacement it must be replaced as complete unit.

Removal And Installation Without A/C

Figure 80-200-6



Raise the lift arms and install an approved lift arm support device.(See Installing Lift Arm Support Device on Page 10-20-1.)

Raise the operator cab. (See Raising The Operator Cab on Page 10-30-1.)

Remove the heater unit from the back of the cab. (See EVAPORATOR/HEATER UNIT on Page 80-160-1.)

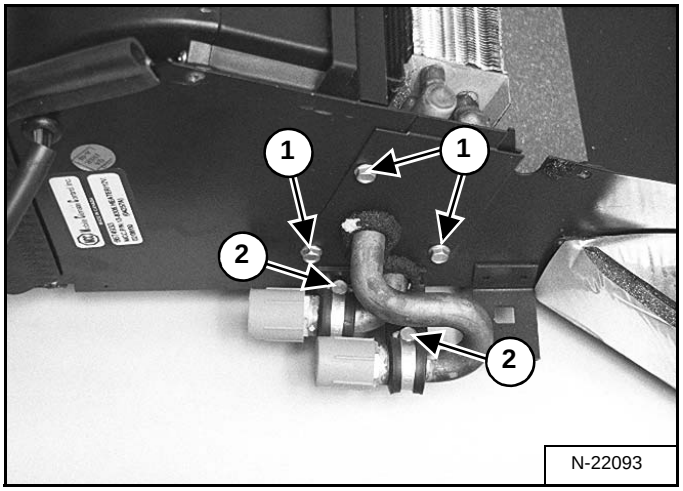
Mark the heater hoses (Item 1) **[Figure 80-200-6]** for proper installation.

Remove the two heater hoses from the heater coil.

Cap the hoses and the heater coil with hydraulic caps and plugs to prevent oil loss from the system.

Installation: Tighten the two heater hose fittings to 22 ft.-lb. (29,8 N•m) torque.

Figure 80-200-7

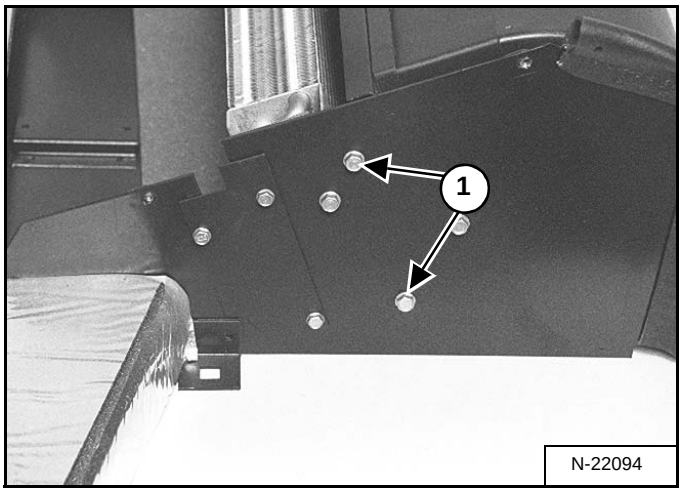


Remove the rear cover from the evaporator/heater unit. (See EVAPORATOR/HEATER UNIT on Page 80-160-1.)

Remove the three mount bolts (Item 1) **[Figure 80-200-7]** and remove the mount plate from the end of the unit.

Remove the two mount bolts (Item 2) **[Figure 80-200-7]** that support the heater coil tubelines to the unit.

Figure 80-200-8



Remove the two mount bolts (Item 1) **[Figure 80-200-8]** from the heater coil.

Remove the heater coil from the unit.

SPECIFICATIONS

TORQUE SPECIFICATIONS FOR BOLTS

Torque For General SAE Bolts

The following table shows standard torque specifications for bolts with zinc phosphate coating. Bolts purchased from Melroe that have zinc phosphate coating are specified by the letter H following the part number.

	Thread size	sae grade 5	sae grade 8
in.-lb. (N•m)	0.250	80 - 90 (9,0 - 10,2)	110 - 120 (12,4 - 13,6)
	0.3125	180 - 200 (20,3 - 22,6)	215-240 (24,2 - 27,1)
ft.-lb. (N•m)	0.375	25 - 28 (34 - 38)	35 - 40 (47 - 54)
	0.4375	40 - 45 (54 - 61)	60 - 65 (81 - 88)
	0.500	65 - 70 (88 - 95)	90 - 100 (122 - 136)
	0.5625	90 - 100 (122 - 136)	125 - 140 (170 - 190)
	0.625	125 - 140 (170 - 190)	175 - 190 (240 - 260)
	0.750	220 - 245 (300 - 330)	300 - 330 (410 - 450)
	0.875	330 - 360 (450 - 490)	475 - 525 (645 - 710)
	1.000	475 - 525 (645 - 710)	725 - 800 (985 - 1085)
	1.125	650 - 720 (880 - 975)	1050 - 1175 (1425 - 1600)
	1.250	900 - 1000 (1200 - 1360)	1475 - 1625 (2000 - 2200)
	1.375	1200 - 1350 (1630 - 1830)	2000 - 2200 (2720 - 2980)
	1.500	1500 - 1650 (2040 - 2240)	2600 - 2850 (3530 - 3870)
	1.625	2000 - 2800 (2720 - 2980)	3450 - 3800 (4680 - 5150)
	1.750	2500 - 2750 (3390 - 3730)	4300 - 4800 (5830 - 6500)
	1.875	3150 - 3500 (4270 - 4750)	5500 - 6100 (7450 - 8300)
	2.000	3800 - 4200 (5150 - 5700)	6500 - 7200 (8800 - 9800)

CONVERSIONS

Decimal And Millimeter Equivalents

FRACTIONS	DECIMALS	MM
1/64	0.015625	0.397
1/32	0.03125	0.794
3/64	0.046875	1.191
1/16	0.0625	1.588
5/64	0.078125	1.984
3/32	0.09375	2.381
7/64	0.109375	2.778
1/8	0.1250	3.175
9/64	0.140625	3.572
5/32	0.15625	3.969
11/64	0.171875	4.366
3/16	0.1876	4.762
13/64	0.203125	5.159
7/32	0.21875	5.556
15/64	0.234375	5.953
1/4	0.2500	6.350
17/64	0.265625	6.747
9/32	0.28125	7.144
19/64	0.296875	7.541
5/16	0.3125	7.938
21/64	0.328125	8.334
11/32	0.34375	8.731
23/64	0.359375	9.128
3/8	0.3750	9.525
25/64	0.390625	9.922
13/32	0.40625	10.319
27/64	0.421875	10.716
7/16	0.4375	11.112
29/64	0.453125	11.509
15/32	0.46875	11.906
31/64	0.484375	12.303
1/2	0.5000	12.700
33/64	0.515625	13.097
17/32	0.53125	13.494
35/64	0.546875	13.891
9/16	0.5625	14.288
37/64	0.578125	14.684
19/32	0.59375	15.081
39/64	0.609375	15.478
5/8	0.6250	15.875
41/64	0.640625	16.272
21/32	0.65625	16.669
43/64	0.671875	17.066
11/16	0.6875	17.462
45/64	0.703125	17.859
23/32	0.71875	18.256
47/64	0.734375	18.653
3/4	0.7500	19.050
49/64	0.765625	19.447
25/32	0.78125	19.844
51/64	0.796875	20.241
13/16	0.8125	20.638
53/64	0.828125	21.034
27/32	0.84375	21.431
55/64	0.859375	21.828
7/8	0.8750	22.225
57/64	0.890625	22.622
29/32	0.90625	23.019
59/64	0.921875	23.416
15/16	0.9375	23.812
61/64	0.953125	24.209
31/32	0.96875	24.606
63/64	0.984375	25.003
1	1.000	25.400

1 mm = 0.03937”

0.001 = 0.0254 mm

U.S. To Metric Conversion

	TO CONVERT	INTO	MULTIPLY BY
LINEAR MEASUREMENT	Miles	Kilometers	1.609
	Yards	Meters	0.9144
	Feet	Meters	0.3048
	Feet	Centimeters	30.48
	Inches	Meters	0.0254
	Inches	Centimeters	2.54
	Inches	Millimeters	25.4
AREA	Square Miles	Square Kilometers	2.59
	Square Feet	Square Meters	0.0929
	Square Inches	Square Centimeters	6.452
	Acre	Hectare	0.4047
VOLUME	Cubic Yards	Cubic Meters	0.7646
	Cubic Feet	Cubic Meters	0.02832
	Cubic Inches	Cubic Centimeters	16.39
WEIGHT	Tons (Short)	Metric Tons	0.9078
	Pounds	Kilograms	0.4536
	Ounces (Avdp.)	Grams	28.3495
PRESSURE	Pounds/Sq. In.	Kilopascal	6.895
WORK	Foot–Pounds	Newton–Meter	1.356
LIQUID VOLUME	Quarts	Liters	0.9463
	Gallons	Liters	3.785
LIQUID FLOW	Gallons/Minute	Liters/Minute	3.785
TEMPERATURE	Fahrenheit	Celsius	1.Subtract 32° 2. Multiply by 5/9