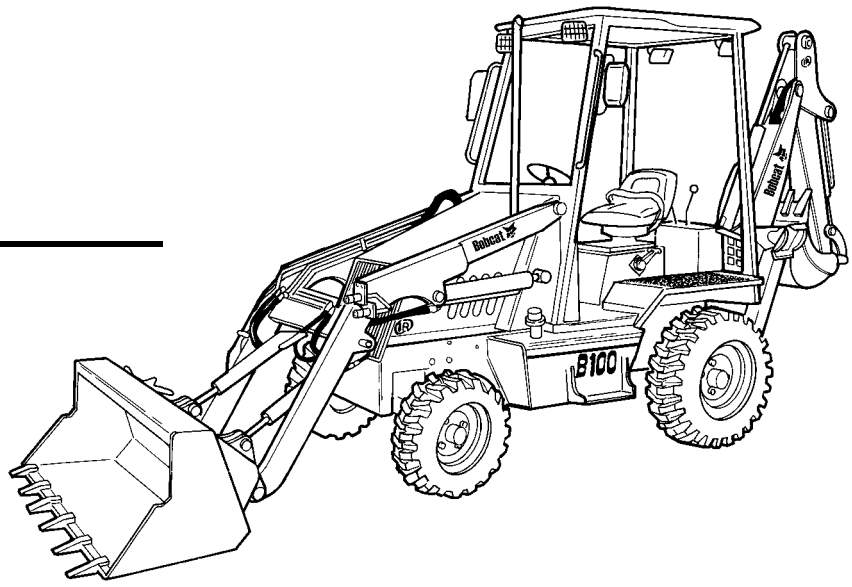
B100

Bobcat®

Service Manual

(S/N 570011001 & Above)
(S/N 570111001 & Above)



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6901844 (6-12) Printed in U.S.A.

SAFETY INSTRUCTIONS

Safety Alert Symbol

This symbol with a warning statement means: "Warning, be alert! Your safety is involved!" Carefully read the message that follows.

WARNING

Instructions are necessary before operating or servicing machine. Read and understand the Operation & Maintenance Manual, Operator's Handbook and signs (decals) on machine. Follow warnings and instructions in the manuals when making repairs, adjustments or servicing. Check for correct function after adjustments, repairs or service. Untrained operators and failure to follow instructions can cause injury or death.

W-2003-0903

WARNING

Warnings on the machine and in the manuals are for your safety. Failure to obey warnings can cause injury or death.

W-2044-1285

IMPORTANT

This notice identifies procedures which must be followed to avoid damage to the machine.

I-2019-0284

The following publications provide information on the safe use and maintenance of the Bobcat machine and attachments:

- The Delivery Report is used to assure that complete instructions have been given to the new owner and that the machine is in safe operating condition.
- The Operation & Maintenance Manual delivered with the machine or attachment contains operating information as well as routine maintenance and service procedures. It is a part of the machine and can be stored in a container provided on the machine. Replacement Operation & Maintenance Manuals can be ordered from your Bobcat dealer.
- Machine signs (decals) instruct on the safe operation and care of your Bobcat machine or attachment. The signs and their locations are shown in the Operation & Maintenance Manual. Replacement signs are available from your Bobcat dealer.
- An Operator's Handbook fastened to the operator cab. It's brief instructions are convenient to the operator. The handbook is available from your dealer in an English edition or one of many other languages. See your Bobcat dealer for more information on translated versions.
- The AEM Safety Manual delivered with the machine gives general safety information.
- The Service Manual and Parts Manual are available from your dealer for use by mechanics to do shop-type service and repair work.
- The Loader Backhoe Operator Training Course is available through your local dealer or at **www.training.bobcat.com** or **www.bobcat.com**. This course is intended to provide rules and practices of correct operation of the Loader Backhoe.
- The Loader Backhoe Safety Video is available from your Bobcat dealer or at **www.training.bobcat.com** or **www.bobcat.com**.

LIFT ARM SUPPORT DEVICE

Maintenance and service work can be done with the lift arms lowered. If the lift arms are raised, use the following procedures to install and remove the approved lift arm support device:

Installing The Lift Arm Support Device

⚠ 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.

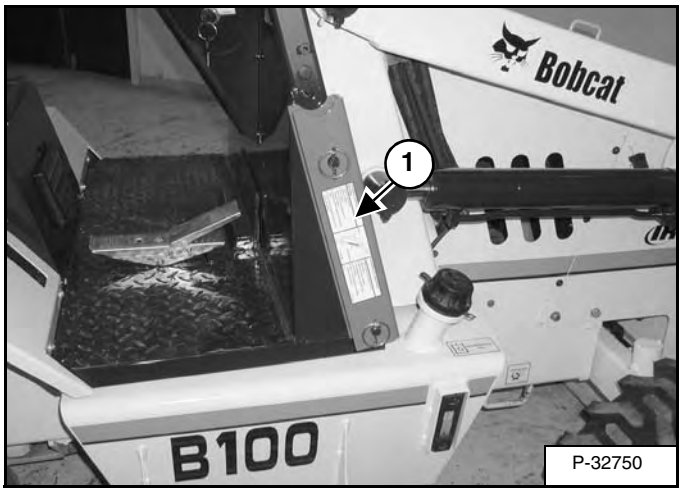
W-2059-0598

⚠ WARNING

Service lift arm support device if damaged or if parts are missing. Using a damaged lift arm support or with missing parts can cause lift arms to drop causing injury or death.

W-2271-1197

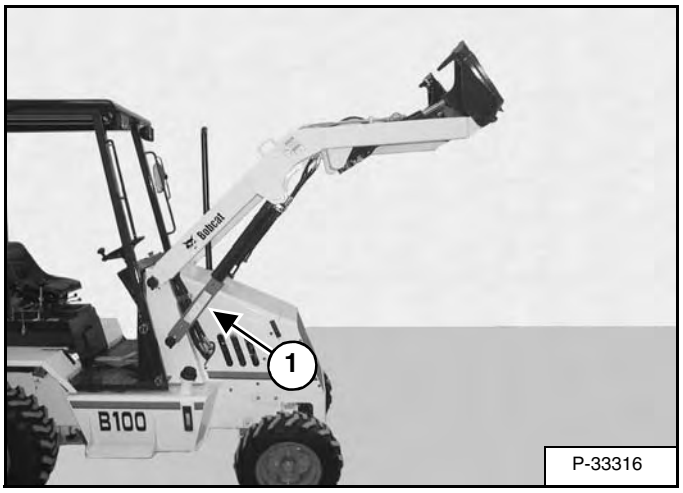
Figure 10-20-1



Remove the approved lift arm support device (Item 1) **[Figure 10-20-1]** from the storage position.

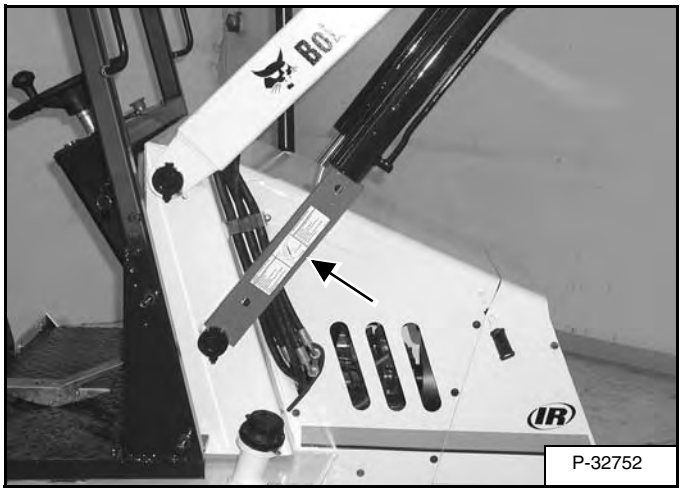
With the operator in the seat, fasten seat belt and engage the parking brake. Start the engine and raise the lift arms. After the lift arms are raised fully, stop the engine.

Figure 10-20-2



Install the lift arm support device (Item 1) **[Figure 10-20-2]** over the lift cylinder rod.

Figure 10-20-3



Start the engine and lower the lift ams slowly until the support device is held securely **[Figure 10-20-3]**.

Stop the engine.

SERVICE SCHEDULE

Chart

Maintenance work must be done at regular intervals. Failure to do so will result in excessive wear and early failures. The service schedule is a guide for correct maintenance of the Bobcat loader backhoe.

⚠ WARNING

Instructions are necessary before operating or servicing machine. Read and understand the Operation & Maintenance Manual and signs (decals) on machine. Follow warnings and instructions in the manuals when making repairs, adjustments or servicing. Check for correct function after adjustments, repairs or service. Untrained operators and failure to follow instructions can cause injury or death.

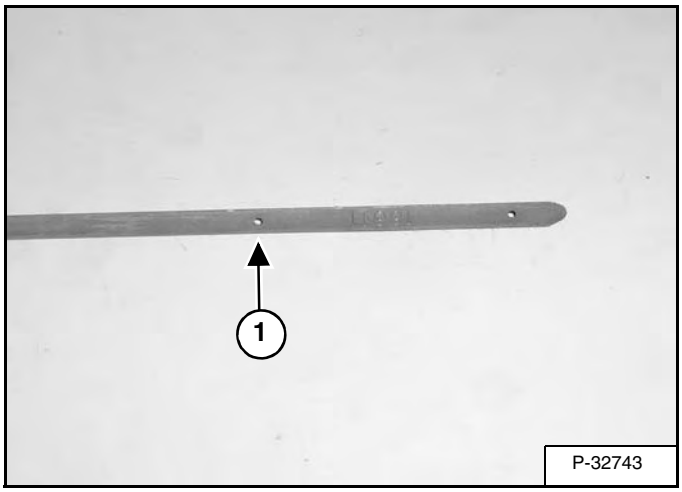
W-2003-1285

SERVICE SCHEDULE		HOURS					
ITEM	**SERVICE REQUIRED**	**8-10**	**50**	**100**	**250**	**500**	**■ 1000**
Engine Oil	Check the engine oil level and add as needed.						
Engine Air Filter and Air System	Check display panel. Service only when required. Check for leakes and damaged components.						
Engine Cooling System	Clean debris from oil cooler radiator & grill.						
Lift Arms, Cyl., Bob-Tach Pivot Pins, Wedges	Lubricate with multi-purpose lithium based grease.						
Tires	Check for damaged tires and correct air pressure.						
Seat Belt, Seat Belt Reactors	Check the condition of seat belt. Clean or replace seat belt retractors as needed.						
Stabilizers	Check the pins and operating parts.						
Safety Signs and Safety Treads	Check for damaged signs (decals) and safety treads. Replace any signs or safety treads that are damaged or worn.						
Operator Cab	Check the fastening bolts, washers and nuts. Check the condition of the cab.						
Indicators and Lights	Check for correct operation of all indicators and lights.						
Parking Brake	Check operation, adjust as required.						
Hydraulic Fluid, Hoses and Tubelines	Check fluid level & add as needed. check for damage & leaks. Repair or replace as needed.						
Rear Differential	Check oil level. Add oil as needed.						
Wheel Nuts	Check for loose wheel nuts and tighten to 140 ft.-lb. (190 N•m) torque.						
Hydraulic Filter	Check filter.						
Battery	Check cables, connnections and electrolyte level. Add distilled water as needed.						
Engine Cooling System	Check engine cooling system.		*				
Alternator Belt	Check tension and adjust as needed.						
Fuel Injectors	Check fuel injector nozzles.						
Fuel Filter	Replace the filter element.						
Steering King Pins	Lubricate with multi-purpose lithium based grease.						
Hyd./Hydro. Filter	Replace the filter element						
Engine Oil and Filter	Replace oil & filter. Use CD or better grade oil and Bobcat filter.						
Hyd. Res. Breather Cap	Replace the reservoir breather cap.						
Hydraulic Reservoir	Replace the fluid.						
Engine Valves	Adjust the engine valves.					#	
Wheel Bearings	Repack the wheel bearings.						

❑ **Check wheel nut torque every 8 hours for the first 24 hours.**
* **Inspect the new belt after first 50 hours.**
● **Also replace gydraulic/hydrostatic filter element when the transmission warning light comes ON.**
† **First oil and filter change must occur at 50 hours: 250 hours thereafter.**
 # After the first 500 hours on new engine, adjust engine valves; 1000 hours thereafter. (See Service Manual for procedure.)
■ **Or every 12 months.**
▼ **Or every five years**

Replacing Oil And Filter (Cont'd)

Figure 10-110-5



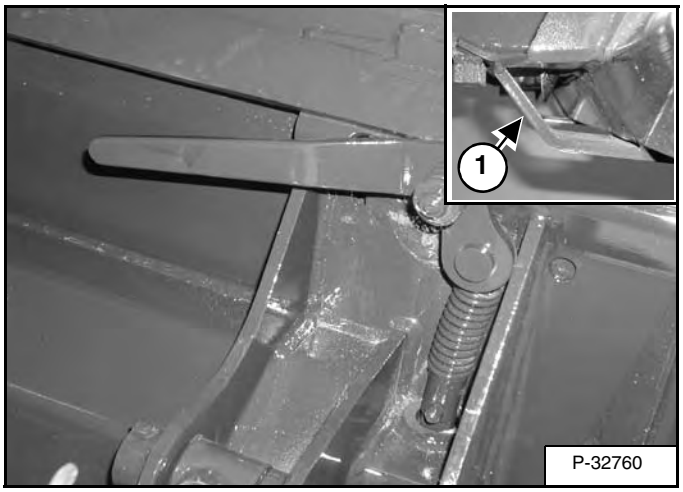
Remove the dipstick (Item 2) **[Figure 10-110-4 on Page 10-110-2]** and check the oil level. Add oil as needed if it is not at the top mark on the dipstick (Item 1) **[Figure 10-110-5]**.

Install the dipstick and close the engine cover.

BOB-TACH HAND LEVER

Inspection And Maintenance

Figure 10-150-1



Move the Bob-tach levers to engage the wedges **[Figure 10-150-1]**. The levers and wedges must move freely.

The wedges must extend through the holes in th e attachment mounting frame (Item 1) **[Figure 10-150-1]**.

⚠ WARNING

Bob-Tach wedges must extend through the holes in attachment. Levers must be fully down and locked. Failure to secure wedges can allow attachment to come off and cause injury or death.

W-2102-0588

Figure 10-150-2

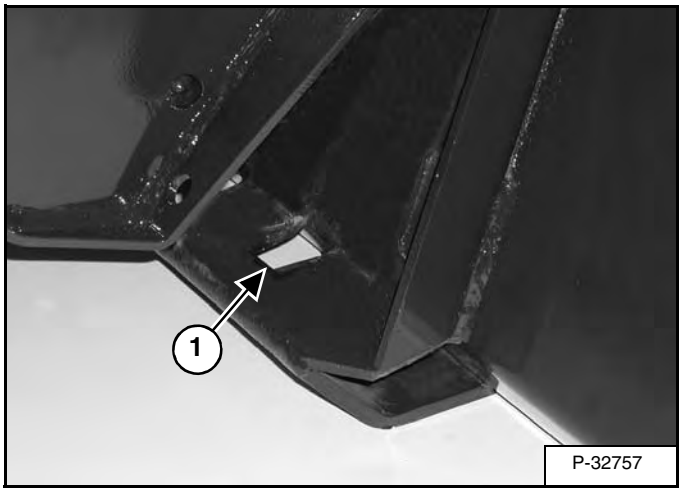
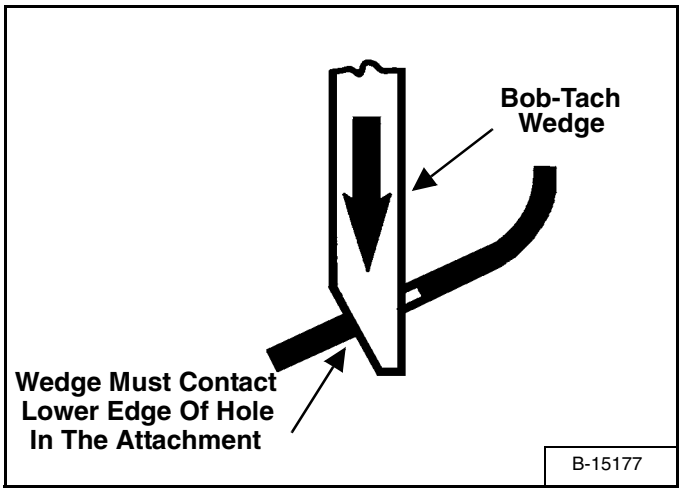


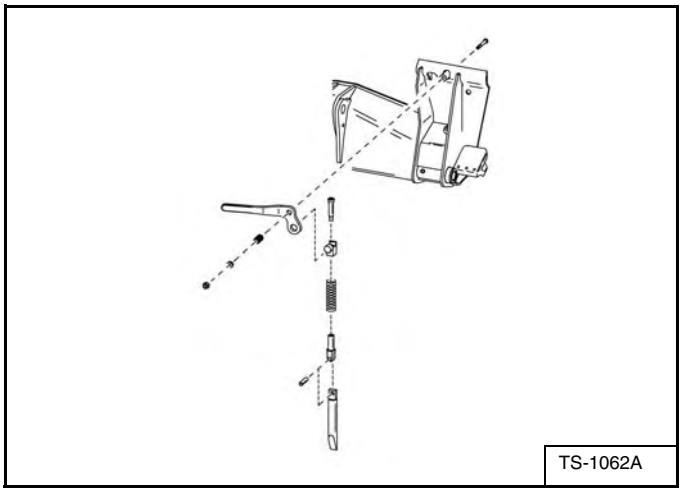
Figure 10-150-3



The spring loaded wedge (Item 1) **[Figure 10-150-1]** must contact the lower edge of the hole in the attachment (Item 1) **[Figure 10-150-2]** and **[Figure 10-150-3]**.

If the wedge does not contact the lower edge of the hole **[Figure 10-150-2]** and **[Figure 10-150-3]**, the attachment will be loose and can come off the Bob-Tach.

Figure 10-150-4



Inspect the mounting frame on th e attachment and the Bob-Tach, linkages and wedges for excessive wear or damage **[Figure 10-150-4]**. Replace any parts that are damaged, bent, or missing. Keep all fasteners tight.

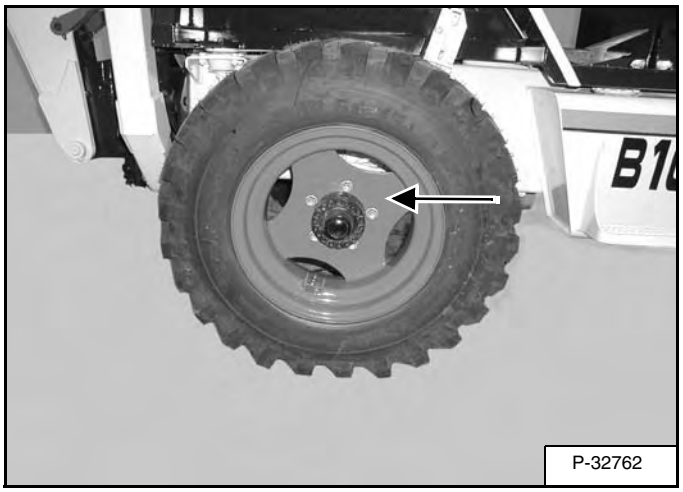
Look for cracked welds. Contact your Bobcat dealer for repair or replacement parts.

Lubricate the wedges. (See SERVICE SCHEDULE on Page 10-70-1.)

TIRE MAINTENANCE

Wheel Nuts

Figure 10-180-1



See SERVICE SCHEDULE on Page 10-70-1 for the service interval to check the wheel nuts. The correct torque is 140 ft.-lb. (190 N•m) torque **[Figure 10-180-1]**.

Mounting

IMPORTANT

Inflate tires to the MAXIMUM pressure shown on the sidewall of the tire. DO NOT mix brands of tires used on the same loader.

I-2057-0794

Check the tires regularly for wear, damage and pressure.

Tires are to be repaired only by an authorized person using the proper procedures and safety equipment.

Tires and rims must always be checked for correct size before mounting. Check rim and tire bead for damage.

The rim flange must be cleaned and free of rust.

The tire bead and rim flange must be lubricated with a rubber lubricant before mounting the tire.

Avoid excessive pressure which can rupture the tire and cause serious injury or death.

During inflation of th e tire, check the ti re pressure frequently to avoid over inflation.

Tire Pressure

WARNING

Do not inflate tires above specified pressure. Failure to use correct tire mounting procedure can cause an explosion which can result in injury or death.

W-2078-1285

Front tire pressure - 36 PSI (250 kPa)
Rear tire pressure - 58 PSI (400 kPa)

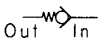
Always replace the tires with the same size tires.

GLOSSARY OF HYDRAULIC/HYDROSTATIC SYMBOLS FOR LOADERS

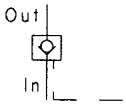
SYMBOL DESCRIPTION

NON-RETURN VALVE, SHUTTLE VALVE: Valve which allows free flow in one direction only

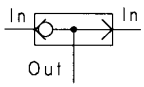
NON-RETURN VALVE (Check Valve) - Used as Replenishing Valve, Load Check Valve or Anticavitation Valve - Opens if the Inlet pressure is higher than the Outlet pressure. Often contains internal spring which has NO significant pressure value



SPRING LOADED VALVE (Bypass Valve) - Opens if the Inlet pressure is greater than the Outlet pressure plus the spring pressure



PILOT CONTROLLED NON-RETURN VALVE - It is possible to open the valve by pilot pressure

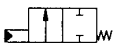


SHUTTLE VALVE - The Inlet port connected to the higher pressure is automatically connected to the Outlet port while the other Inlet port is closed

DIRECTIONAL CONTROL VALVE: Valve providing for the opening (fully or restricted) or the closing of one or more flow paths (represented by several squares)

TWO PORTS and CLOSED FLOW PATHS

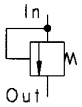
SOLENOID ACTIVATED DIRECTIONAL CONTROL VALVE (Two Position) - controlled by an electric solenoid (with return spring)



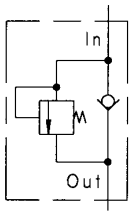
PILOT ACTIVATED DIRECTIONAL CONTROL VALVE (Two Position) - controlled by pressure (with return spring)

SYMBOL DESCRIPTION

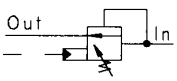
PRESSURE CONTROL VALVE: Valve ensuring the control of pressure



RELIEF VALVE - When the Inlet pressure overcomes the opposing force of the spring, the valve opens permitting flow from the Outlet port.

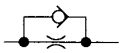


RELIEF/REPLENISHING VALVE or RELIEF/ANTICAVITATION VALVE - When the Inlet pressure overcomes the opposing force of the spring, the valve opens permitting flow from the Outlet port - Allows free flow in the opposite direction



DUAL PRESSURE RELIEF VALVE - When the inlet pressure overcomes the opposing force of the spring, the valve opens permitting flow from the Outlet port. Pilot pressure provides a second pressure value.

FLOW CONTROL VALVE: Valve controlling the flow in one or both directions



ONE WAY RESTRICTOR VALVE (Non-Return Valve with Restriction) - Unit allowing free flow in one direction but restricted flow in the other direction

TOW VALVE - Normally in closed position

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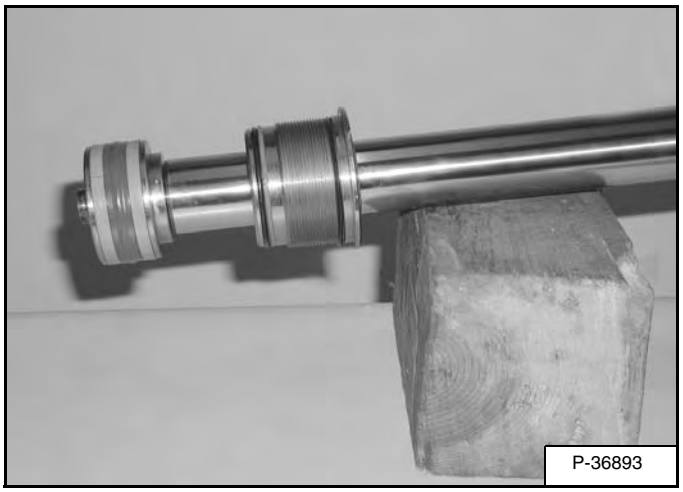
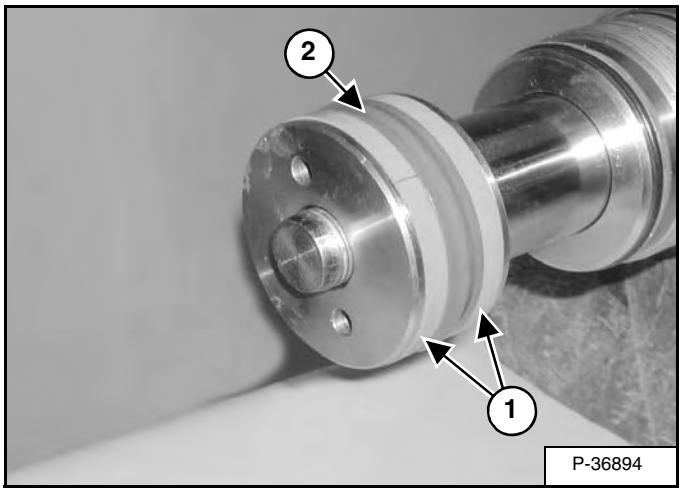
Disassembly (Cont'd)

Figure 20-20-14



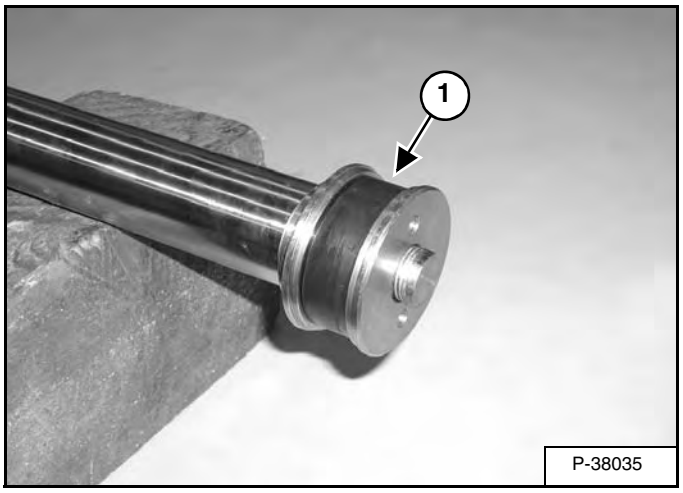
Support the cylinder rod on a wood block **[Figure 20-20-14]**.

Figure 20-20-15



Remove the two wear rings (Item 1) **[Figure 20-20-15]** and seal (Item 2) **[Figure 20-20-15]** from the piston.

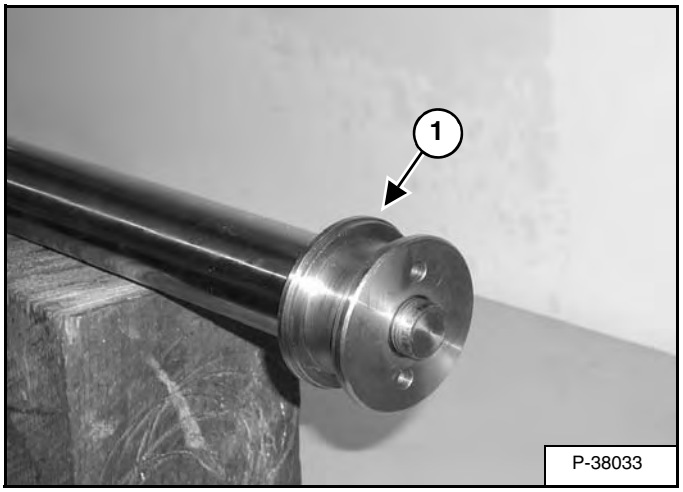
Figure 20-20-16



Remove the expander band (Item 1) **[Figure 20-20-16]** from the piston.

Apply moderate heat to the piston/rod to break the loctite bond. Do not overheat.

Figure 20-20-17



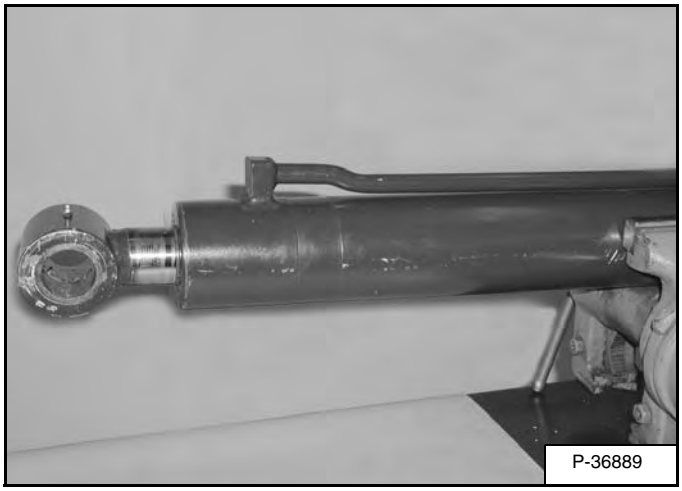
Use a gland nut wrench (MEL1075) and remove the piston assembly (Item 1) **[Figure 20-20-17]** from the rod.

Disassembly

Use the following tool to disassemble the cylinder:

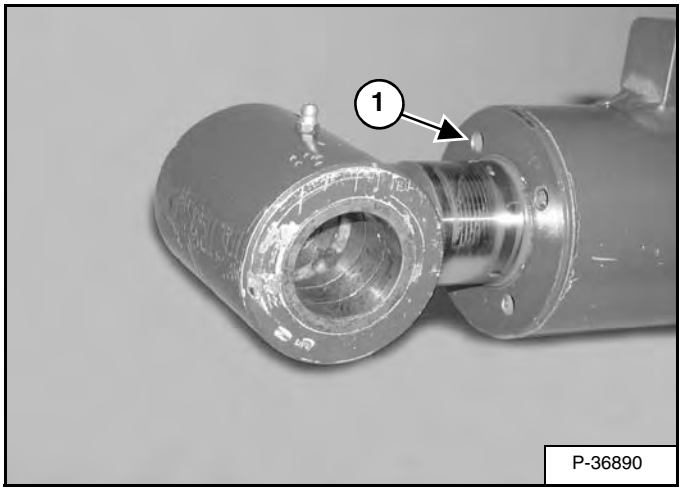
MEL1075

Figure 20-21-8



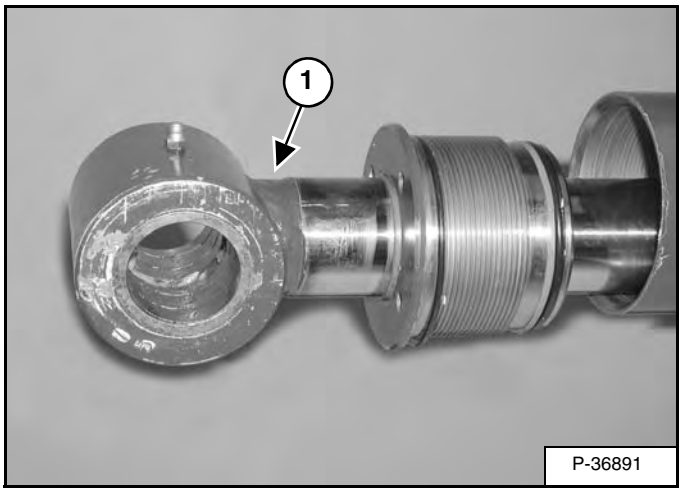
Put the base end of the cylinder in a vise **[Figure 20-21-8]**.

Figure 20-21-9



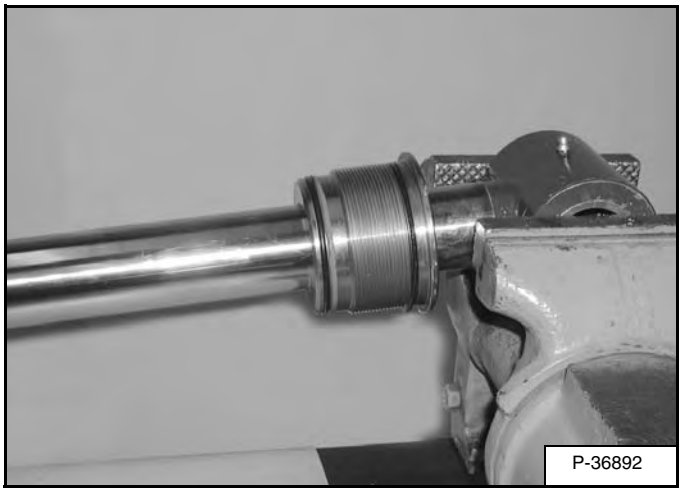
Use a gland nut wrench (MEL 1075) and remove the head gland (Item 1) **[Figure 20-21-9]**.

Figure 20-21-10



Remove the rod assembly (Item 1) **[Figure 20-21-10]** from the housing.

Figure 20-21-11



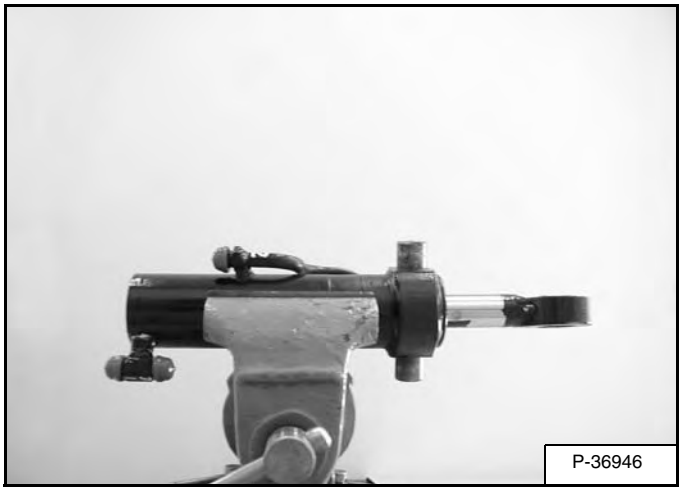
Put the rod end of the cylinder in a vise **[Figure 20-21-11]**.

Disassembly

Use the following tool to disassemble the cylinder:

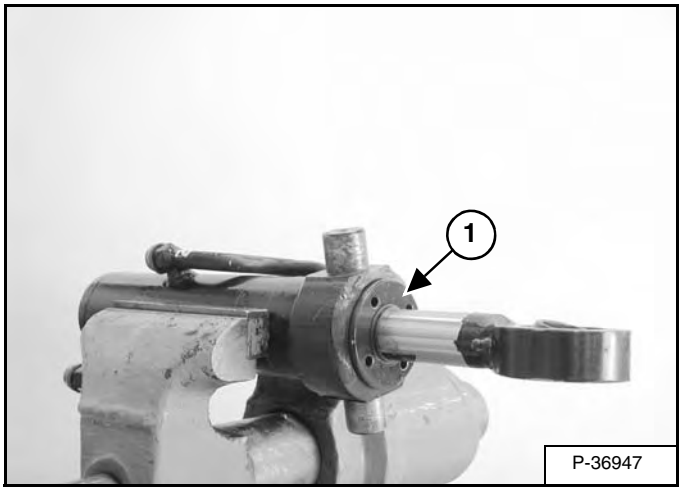
MEL1075

Figure 20-22-6



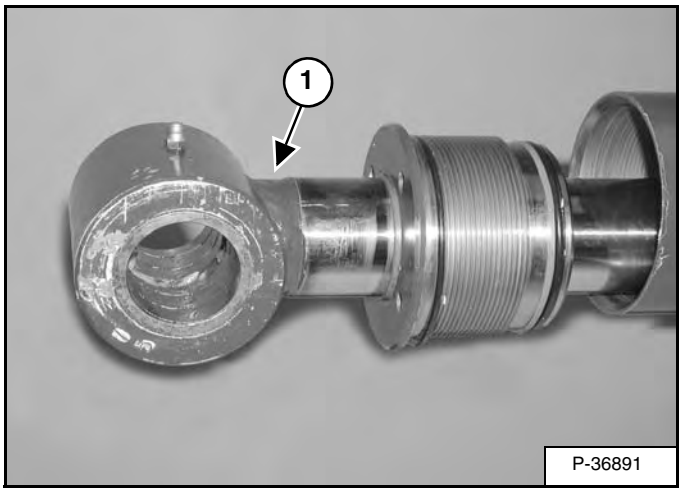
Put the cylinder in a vise **[Figure 20-22-6]**.

Figure 20-22-7



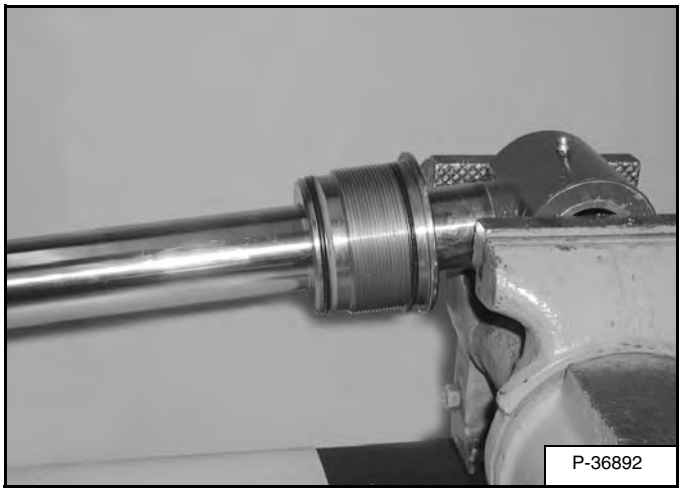
Use a gland nut wrench (MEL 1075) and remove the head gland (Item 1) **[Figure 20-22-7]**.

Figure 20-22-8



Remove the rod assembly (Item 1) **[Figure 20-22-8]** from the housing.

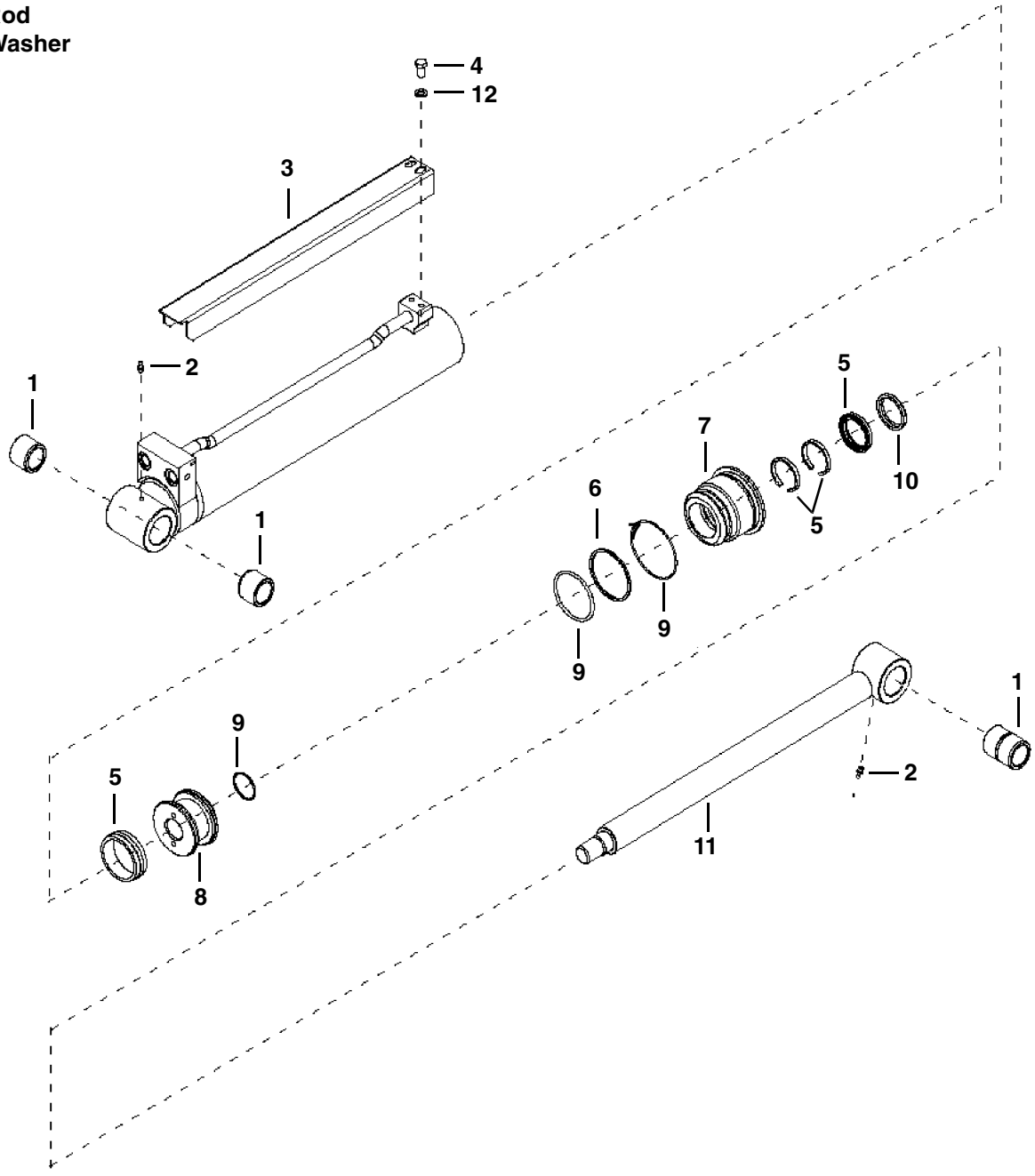
Figure 20-22-9



Put the rod end of the cylinder in a vise **[Figure 20-22-9]**.

Parts Identification

1. Bushing
2. Grease fitting
3. Cover
4. Bolt
5. Seal
6. Back-up Ring
7. Head
8. Piston
9. O-ring
10. Wiper
11. Rod
12. Washer



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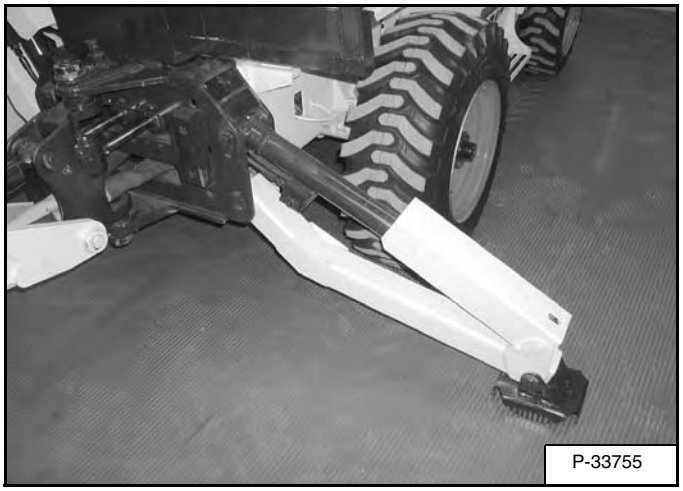
Removal And Installation

The procedure is the same for both stabilizer cylinders. The right stabilizer is shown.

Figure 20-24-8



Lower the stabilizer to the work surface **[Figure 20-24-8]**. Stop the engine and engage the parking brake.

Relieve hydraulic pressure.

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.

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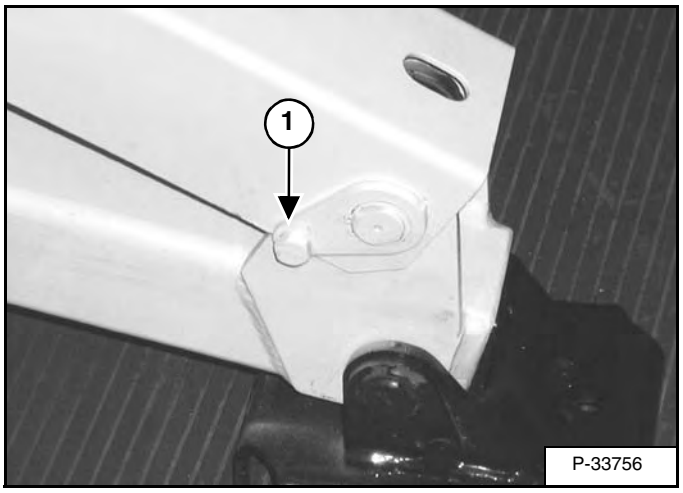
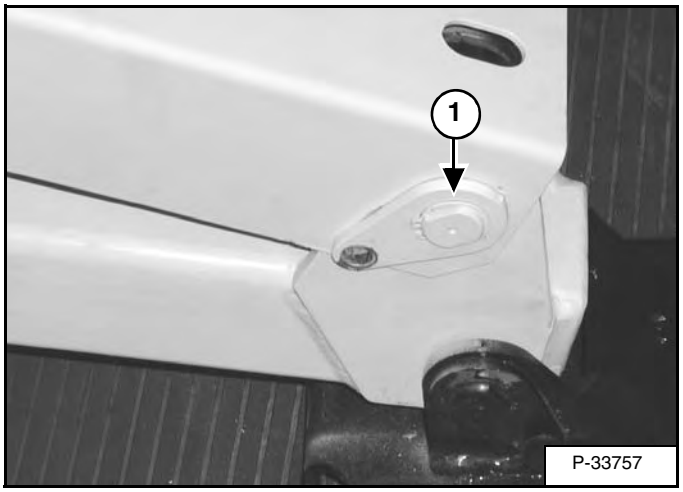
Figure 20-24-9



Remove the retainer bolt (Item 1) **[Figure 20-24-9]**.

Installation: Tighten the bolt to 18-19 ft.-lb. (24-26 N•m) torque.

Figure 20-24-10



Remove the pivot pin (Item 1) **[Figure 20-24-10]**.

TILT CYLINDER

Checking

Remove attachment from the Bob-Tach.

Lower the lift arms to the ground, fully retract the tilt cylinders.

Stop the engine, engage the parking brake.

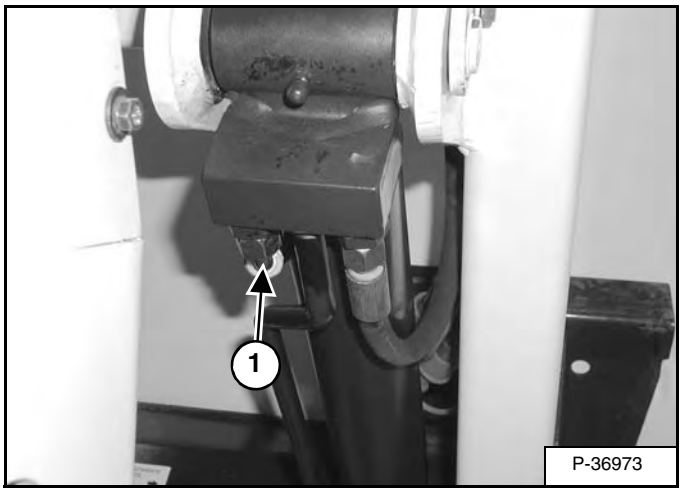
Operate the control lever to relieve hydraulic pressure.

⚠ WARNING

Hydraulic fluid escaping under pressure can have sufficient force to enter a person's body by penetrating the skin. This can cause serious injury and possible death if proper medical treatment by a physician familiar with this injury is not received immediately.

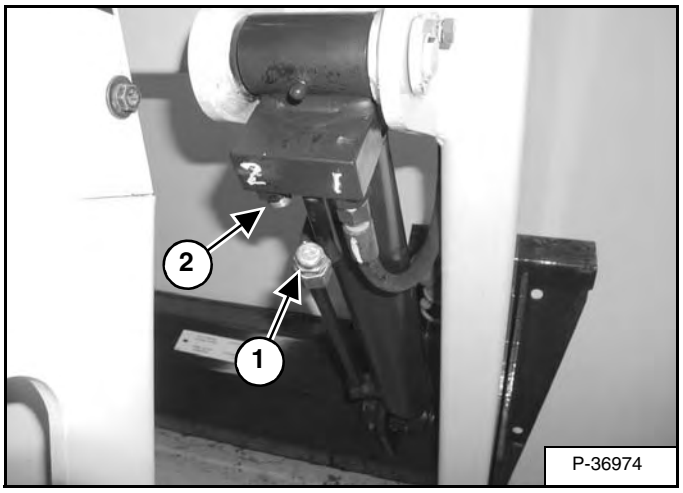
W-2145-0290

Figure 20-30-1



Check only one cylinder at a time. Disconnect the hose (Item 1) **[Figure 20-30-1]** from the base end of the tilt cylinder.

Figure 20-30-2



Install a plug (Item 1) **[Figure 20-30-2]** in the hose and tighten.

With the parking brake engaged, start the engine and retract the cylinder.

Stop the engine and engage the parking brake.

If there is any leakage from the base end fitting (Item 2) **[Figure 20-30-2]**, remove the cylinder for repair or replacement.

LIFT CYLINDER

Checking

Lower the lift arms. Stop the engine.

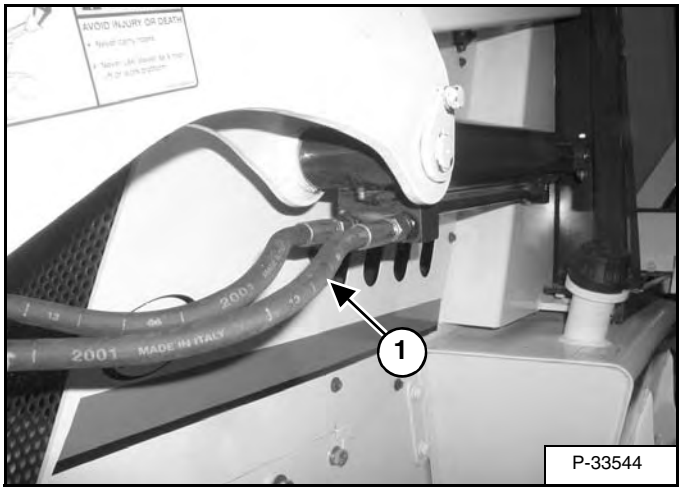
Engage the parking brake and exit the machine.

⚠ WARNING

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

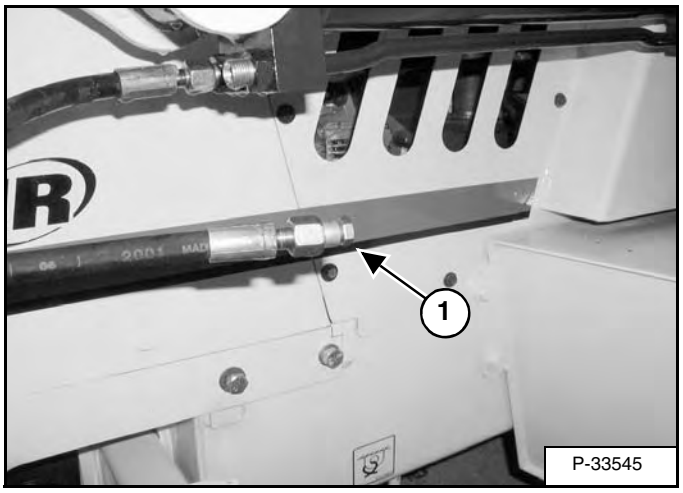
W-2072-0496

Figure 20-31-1



Check only one cylinder at a time. Disconnect the hose (Item 1) **[Figure 20-31-1]** which goes to the base end of the lift cylinder.

Figure 20-31-2



Install a plug (Item 1) **[Figure 20-31-2]** in the hose and tighten.

Engage the parking brake. Start the engine and retract the lift cylinder.

If there is any leakage from the fitt ing, remove the cylinder for repair or replacement.

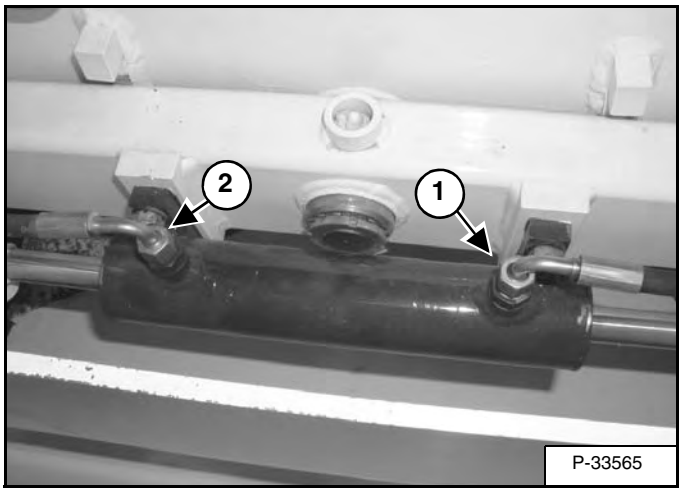
STEERING CYLINDER

Checking

Remove the grill. (See GRILL on Page 50-40-1.)

Remove the grill guard. (See GRILL FRAME on Page 50-50-1.)

Figure 20-32-1

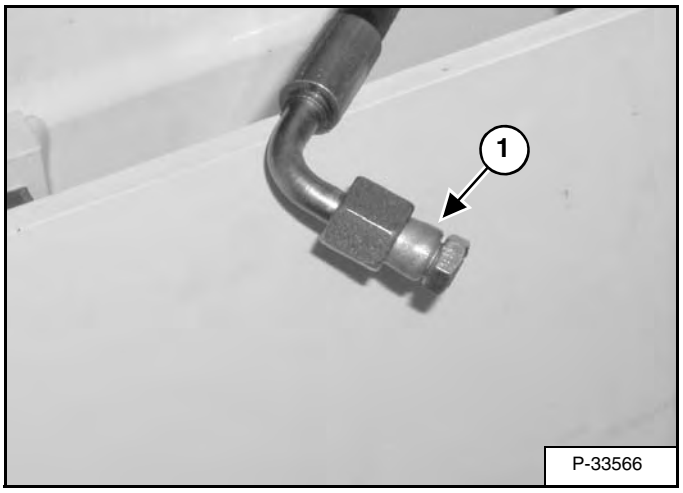


The steering cylinder can be checked by fully turning the steering wheel in either direction.

Start the engine and turn the steering wheel fully in either direction. Stop the engine.

If the steering wheel was turned to the left remove the hose (Item 1) **[Figure 20-32-1]** from the steering cylinder. If the steering wheel was turned to the right remove the hose (Item 2) **[Figure 20-32-1]** from the steering cylinder.

Figure 20-32-2



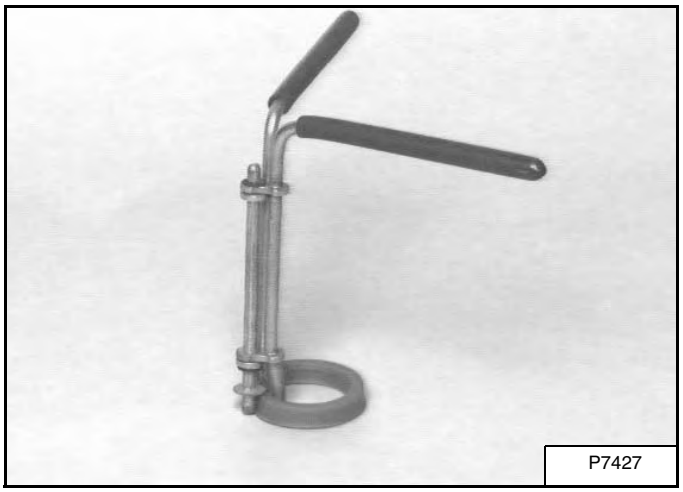
Install a plug (Item 1) **[Figure 20-32-2]** on the hose and tighten.

Start the engine and turn the steering wheel in the same direction it was originally turned.

If there is any leakage from the open port, remove the cylinder for repair or replacement.

Assembly (Cont'd)

Figure 20-32-28

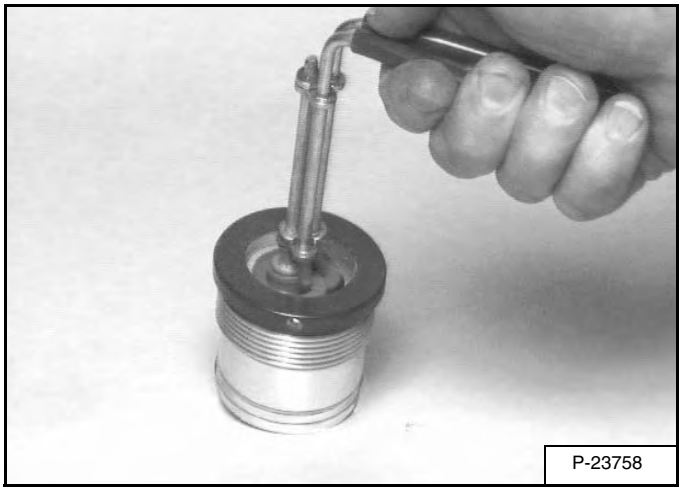


Install the rod seal on the rod seal tool **[Figure 20-32-28]**.

NOTE: During installation, the spring side of the seal must be toward the inside of the cylinder.

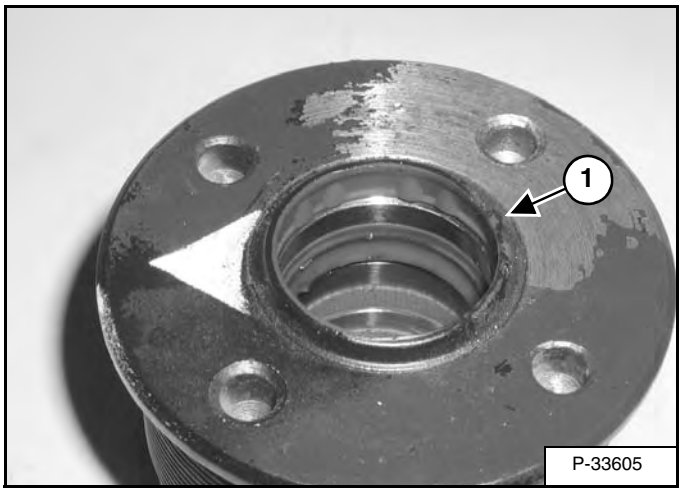
Rotate the handles to collapse the rod seal **[Figure 20-32-28]**.

Figure 20-32-29



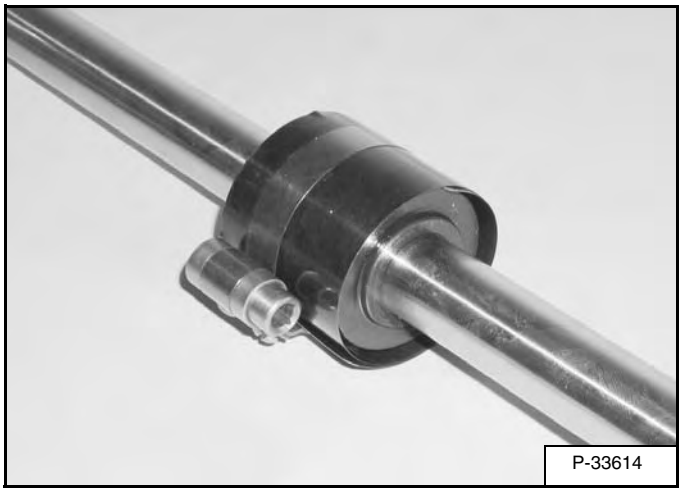
Install the rod seal in the head **[Figure 20-32-29]**.

Figure 20-32-30



Install the wiper (Item 1) **[Figure 20-32-30]** in the heads.

Figure 20-32-31

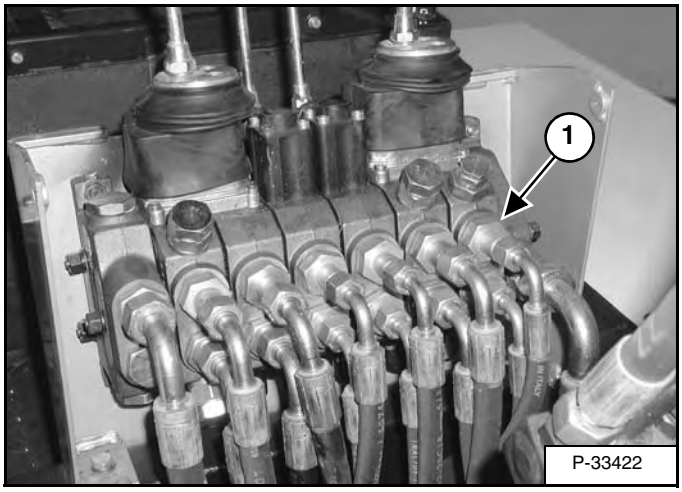


Use a ring compressor to compress the seal to the correct size. Leave the piston in the compressor for approximately three minutes **[Figure 20-32-31]**.

PORT RELIEF VALVE (BACKHOE CONTROL VALVE) (CONT'D)

Testing And Adjusting (Boom Swing Control)

Figure 20-41-9

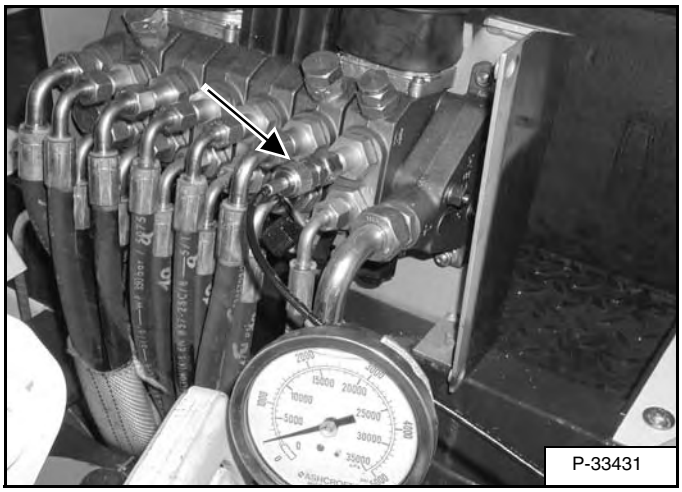


Remove the cover from the backhoe control panel.

A portable hydraulic hand pump will be used to test the work port relief valves. The hand pump must have clean hydraulic fluid that is compatible with the Bobcat hydraulic fluid or use SAE 10W-30 motor oil.

Remove the h ose (Item 1) **[Figure 20-41-9]** from the boom swing section.

Figure 20-41-10



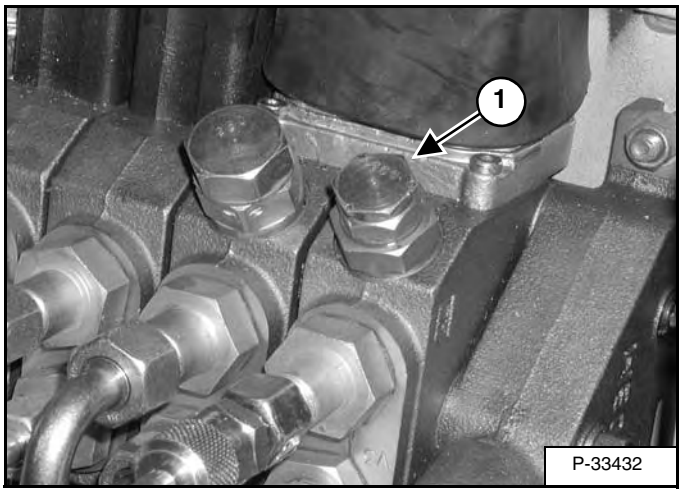
Install the hand pump hose and a pr essure gauge (minimum of 5000 PSI) into the valve section work port in which the port relief valve is located **[Figure 20-41-10]**. Pressurize this section with the hand pump until the port relief valve opens and make a note of the pressure reading.

The correct reading should be:

Rod End	2320-2900 PSI (17500 kPa)
Base End	2320-2900 PSI (17500 kPa)

If the port relief pressure setting needs to be adjusted, release the hand pump pressure valve.

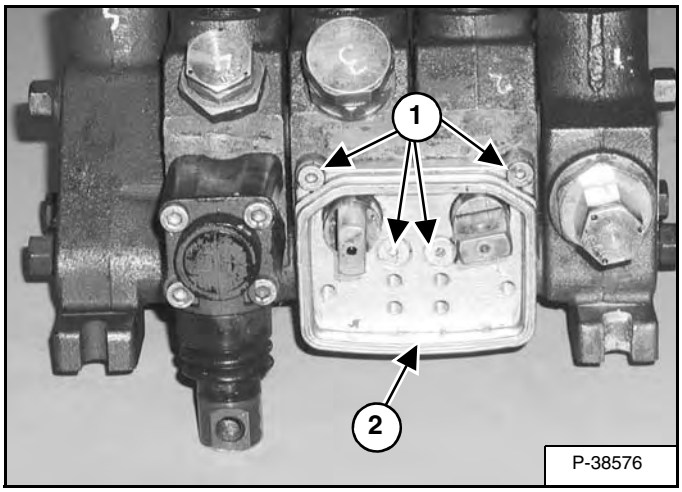
Figure 20-41-11



Remove the cap (Item 1) **[Figure 20-41-11]**.

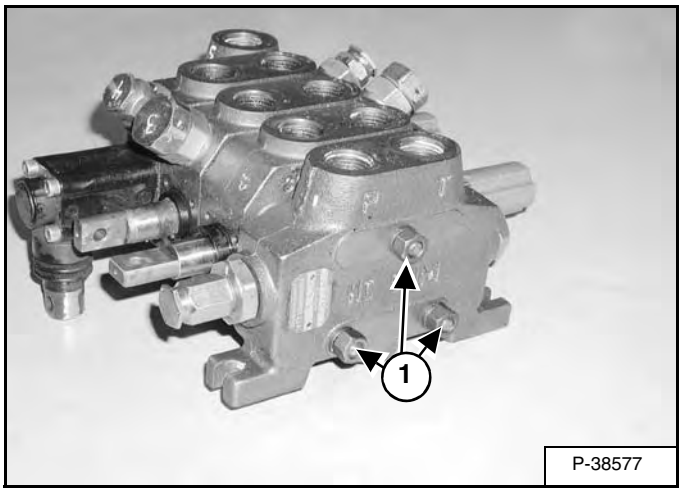
Disassembly And Assembly (Cont'd)

Figure 20-50-10



Remove the 4 bolts (Item 1) and plate (Item 2) **[Figure 20-50-10]**.

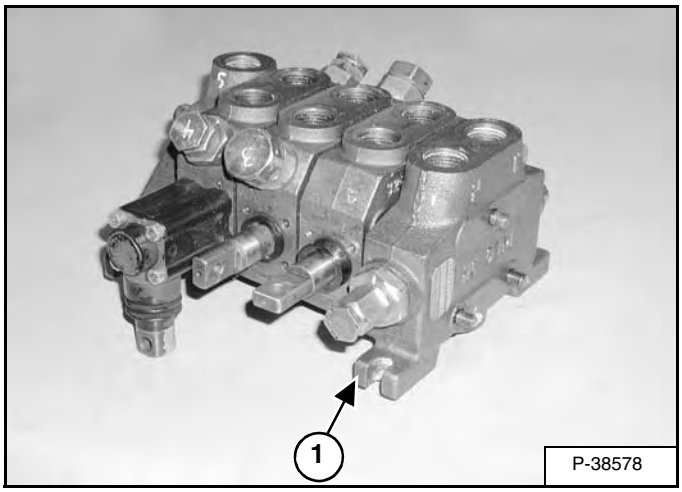
Figure 20-50-11



Remove the thru-bolt nuts and washers (Item 1) **[Figure 20-50-11]**.

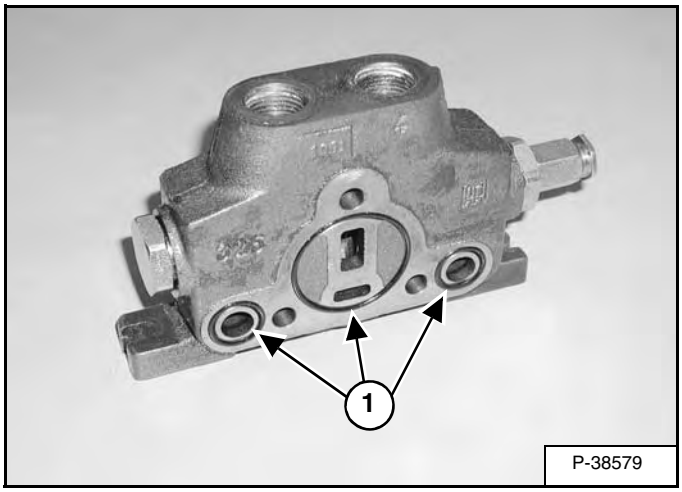
Inlet/Outlet Valve Section

Figure 20-50-12



Remove the inlet/outlet valve section (Item 1) **[Figure 20-50-12]**.

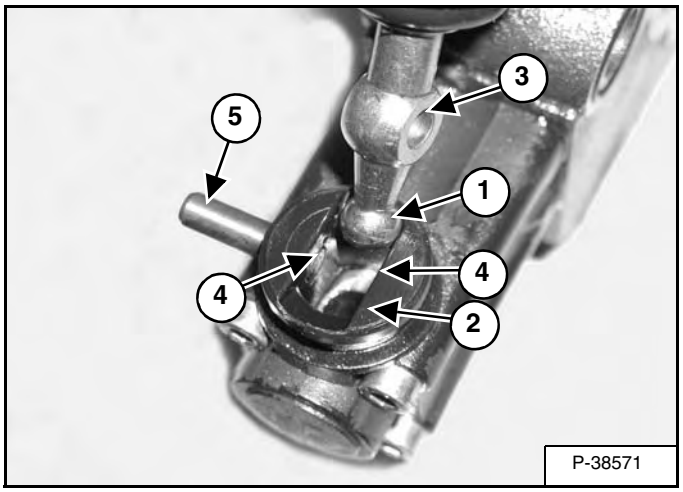
Figure 20-50-13



Remove the 3 O-rings (Item 1) **[Figure 20-50-13]** from the valve section.

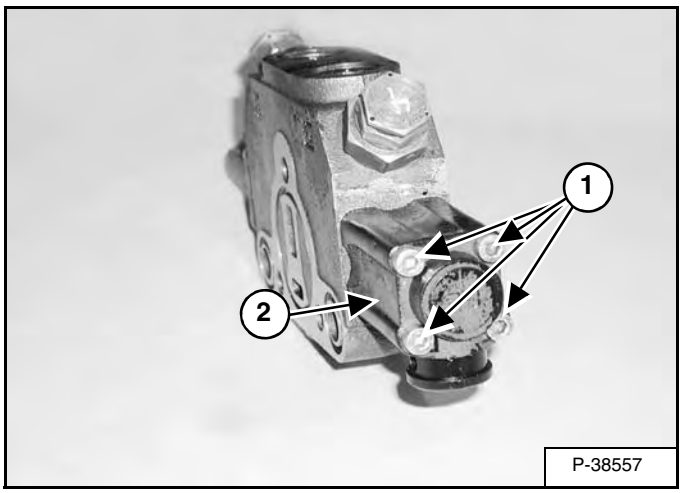
Auxiliary Valve Section (Cont'd)

Figure 20-50-50



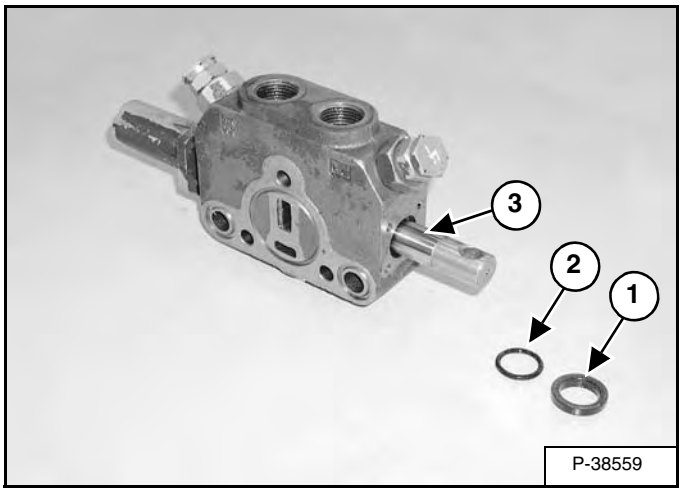
Installation: Install the end of the actuator (Item 1) into the hole (Item 2) in the spool. Align the hole (Item 3) in the actuator with the pin holes (Item 4) and install the pin (Item 5) **[Figure 20-50-50]**.

Figure 20-50-51



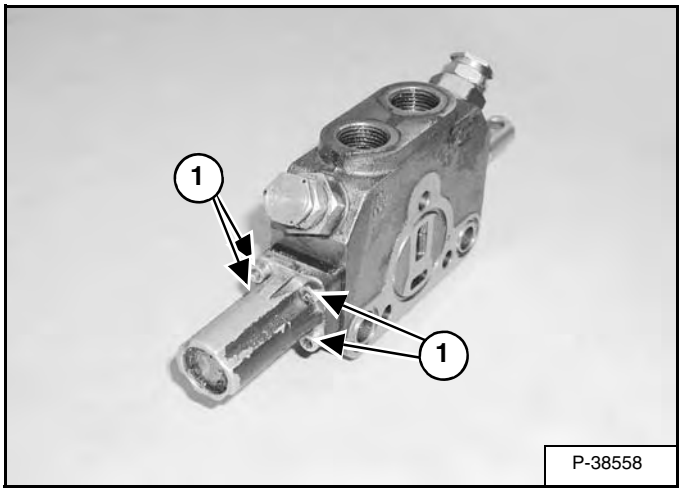
Remove the 4 bolts (Item 1) and cover (Item 2) **[Figure 20-50-51]**.

Figure 20-50-52



Remove the seal (Item 1) and O-ring (Item 2) from the actuating end of the spool (Item 3) **[Figure 20-50-52]**.

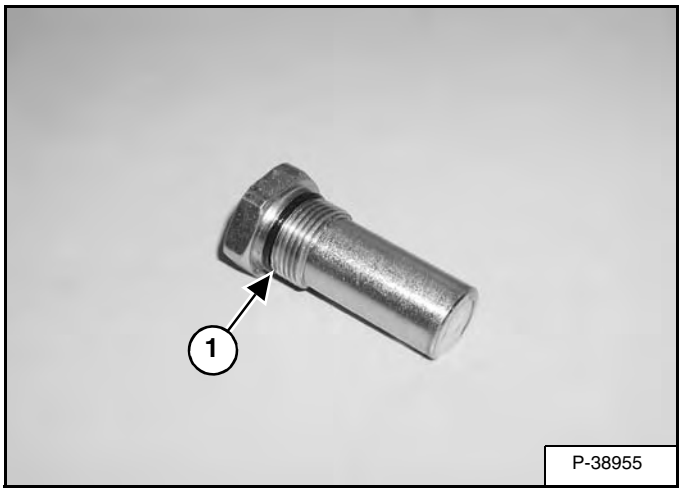
Figure 20-50-53



Remove the 4 bolts (Item 1) **[Figure 20-50-53]** from the cover.

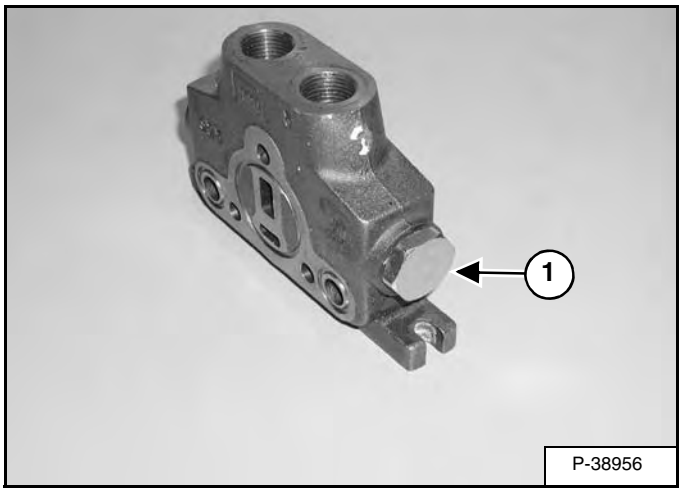
Inlet/Outlet Valve Section (Cont'd)

Figure 20-60-16



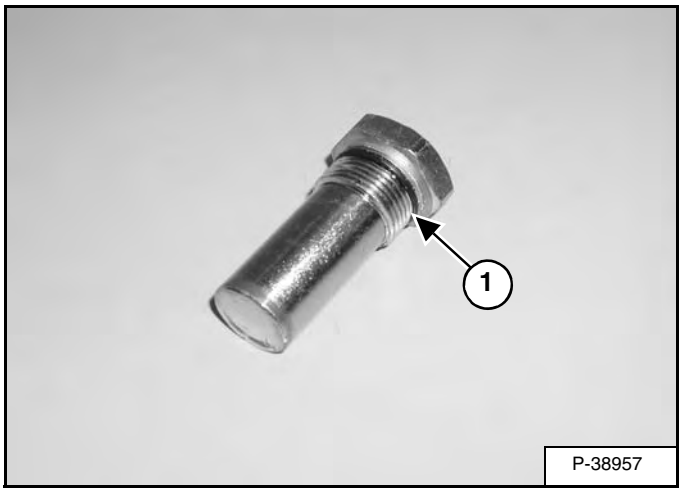
Remove the O-ring (Item 1) **[Figure 20-60-16]** from the plug. Replace as needed.

Figure 20-60-17



Remove the plug (Item 1) **[Figure 20-60-17]** from the valve section.

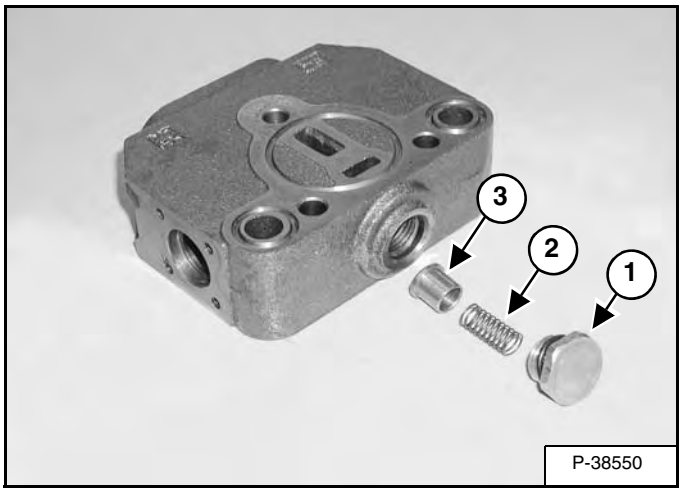
Figure 20-60-18



Remove the O-ring (Item 1) **[Figure 20-60-18]** from the plug. Replace as needed.

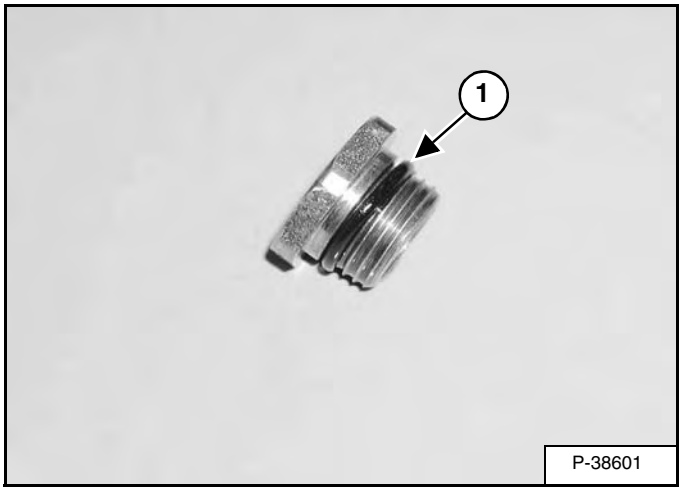
Right Stabilizer Valve Section (Cont'd)

Figure 20-60-54



Remove the plug (Item 1), spring (Item 2) and poppet (Item 3) **[Figure 20-60-54]**. Check the spring and poppet for damage or wear.

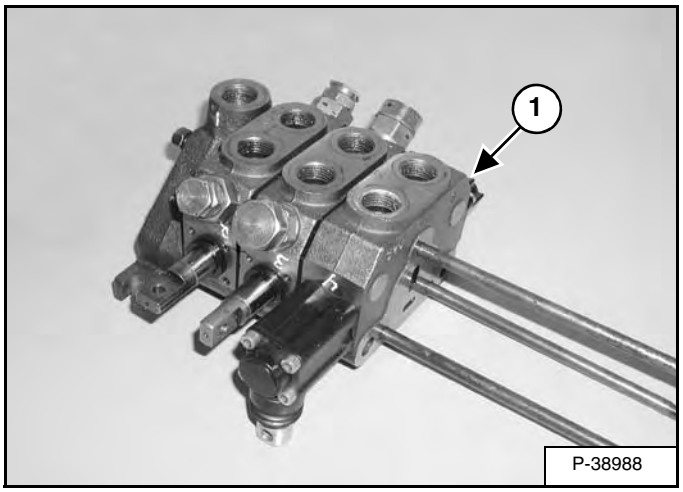
Figure 20-60-55



Remove the O-ring (Item 1) **[Figure 20-60-55]** from the plug. Replace as needed.

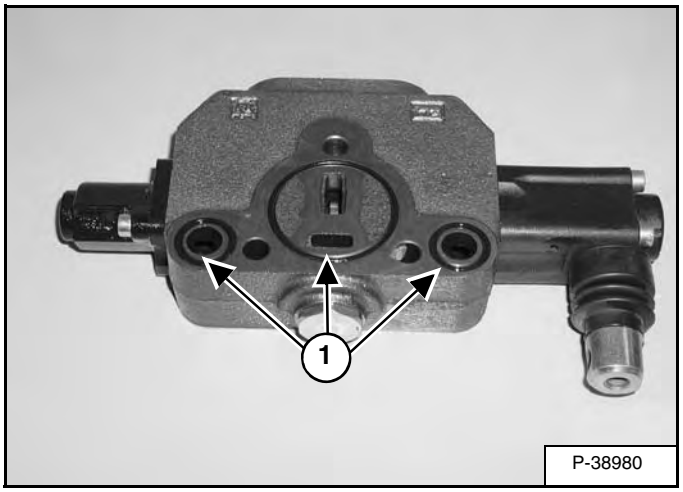
Left Stabilizer Valve Section

Figure 20-60-56



Remove the left stabilizer valve section (Item 1) **[Figure 20-60-56]**

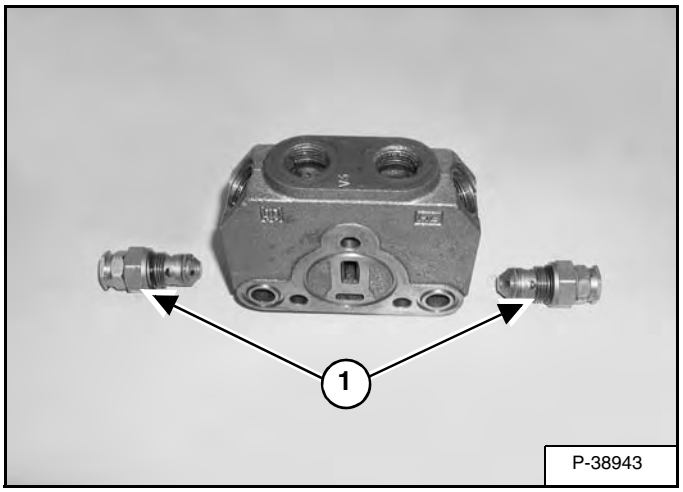
Figure 20-60-57



Remove the 3 O-rings (Item 1) **[Figure 20-60-57]** from the stabilizer valve section.

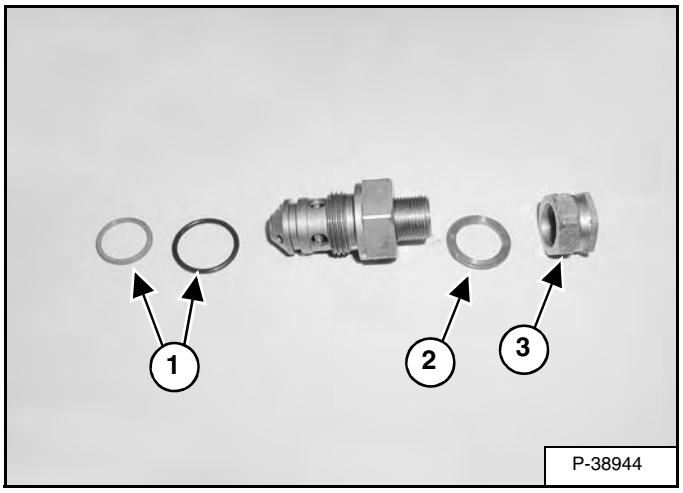
Boom Swing Valve Section (Cont'd)

Figure 20-60-94



Remove the 2 port relief valves (Item 1) **[Figure 20-60-94]**.

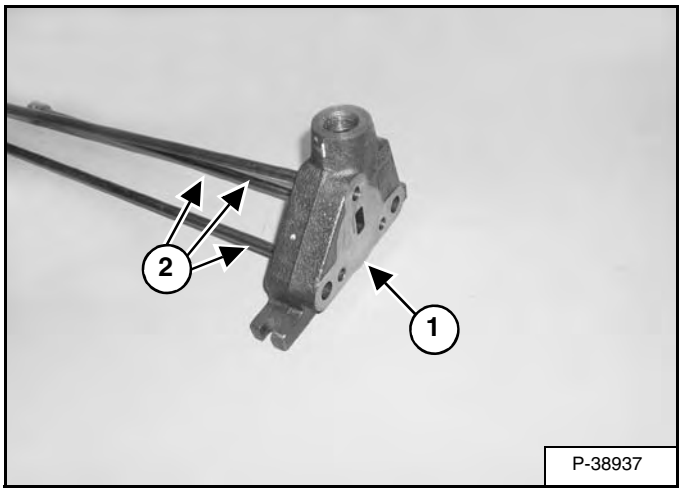
Figure 20-60-95



Remove the two O-rings (Item 1), washer (Item 2) and cap (Item 3) **[Figure 20-60-95]** Replace O-rings and washer as needed.

Outlet Valve Section

Figure 20-60-96



Inspect outlet valve section (Item 1) and thru-bolts (Item 2) **[Figure 20-60-96]** for wear and damage. Replace as needed.

GEAR PUMP

Removal And Installation

Remove the front floor panel. (See FLOOR PANELS on Page 50-30-1.)

IMPORTANT

When making repairs on hydraulic system, clean the work area before disassemble and keep all parts clean. Always use caps and plugs on hos es, tubelines and ports to keep dirt out. Dirt can quickly damage the system.

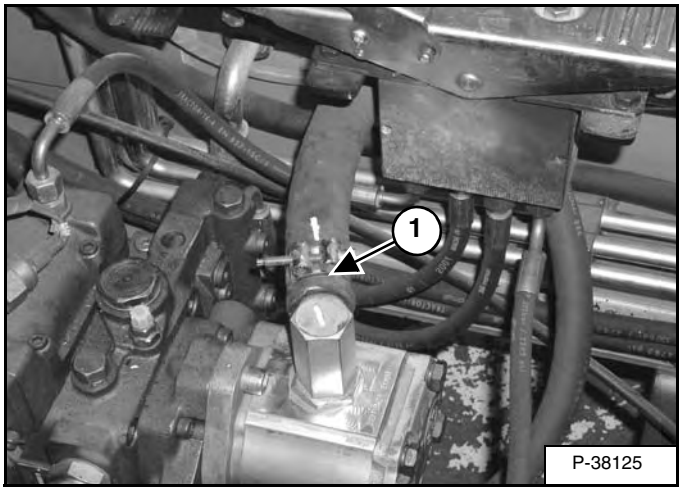
I-2056-0793

⚠ WARNING

Hydraulic fluid escaping under pressure can have sufficient force to enter a person's body by penetrating the skin. This can cause serious injury and possible death if proper medical treatment by a physician familiar with this injury is not received immediately.

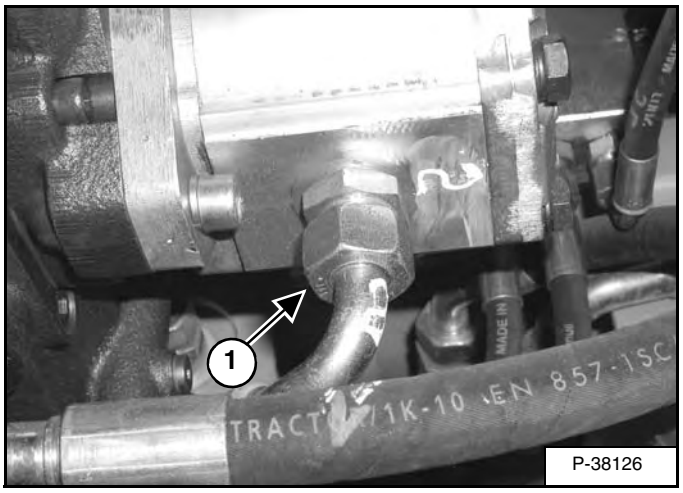
W-2145-0290

Figure 20-80-1



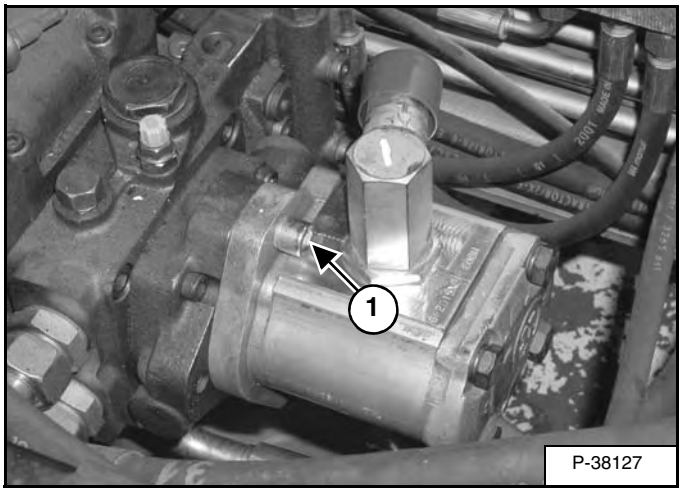
Remove the hose (Item 1) **[Figure 20-80-1]**.

Figure 20-80-2



Remove the lower hose (Item 1) **[Figure 20-80-2]**.

Figure 20-80-3

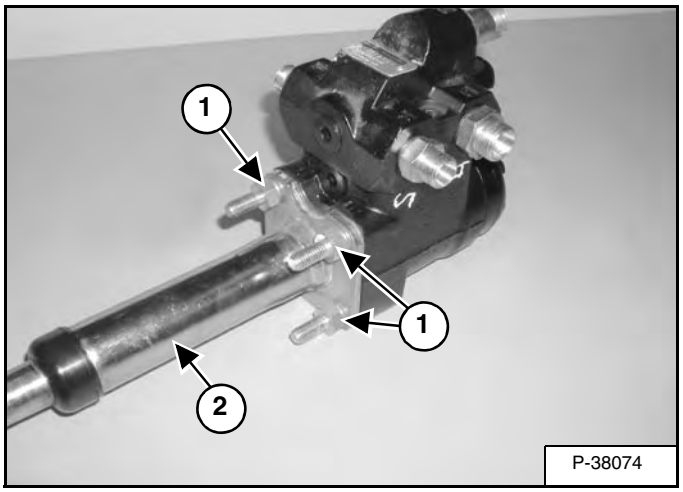


Remove the mounting bolts (Item 1) **[Figure 20-80-3]**

Remove the pump.

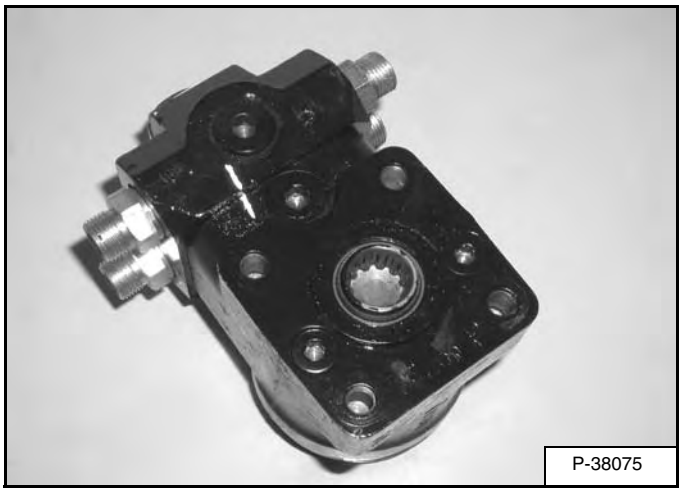
Disassembly

Figure 20-90-11



Remove the four nuts and washers (Item 1) **[Figure 20-90-11]** and remove the steering shaft (Item 2) **[Figure 20-90-11]**.

Figure 20-90-12



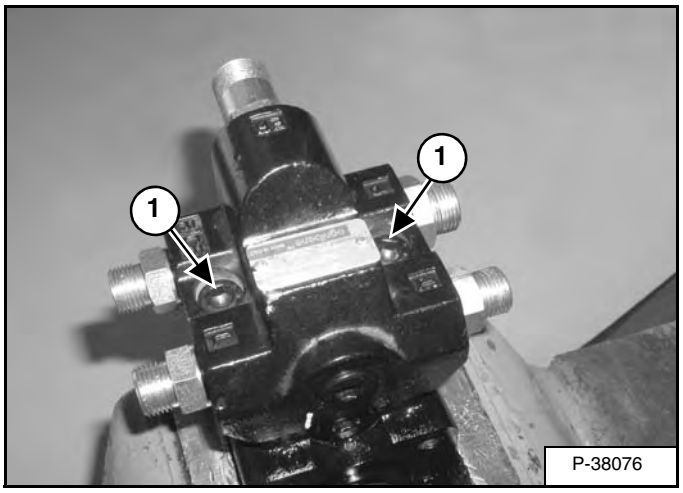
Mark the housing for correct assembly **[Figure 20-90-12]**.

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

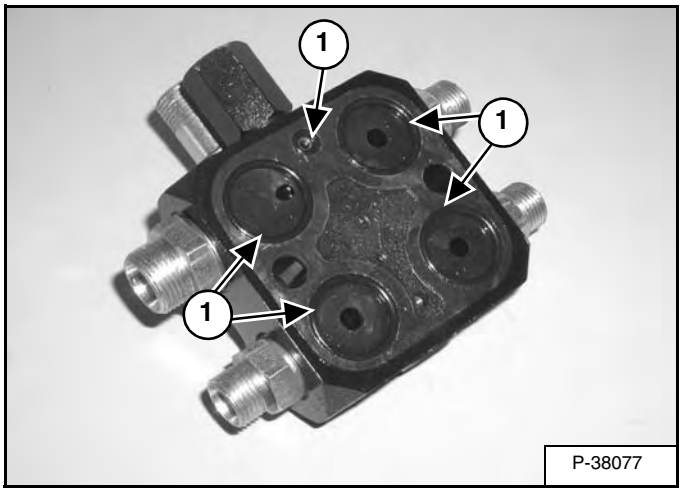
Figure 20-90-13



Remove the two priority valve mounting bolts (Item 1) **[Figure 20-90-13]**.

Remove the priority valve.

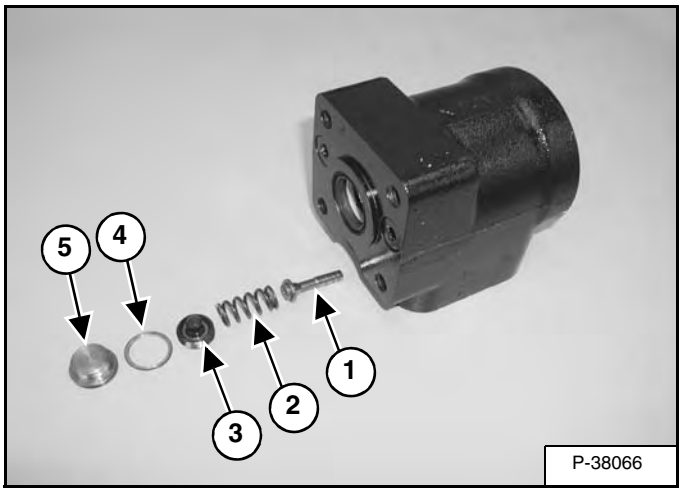
Figure 20-90-14



Remove the five O-rings (Item 1) **[Figure 20-90-14]** from the priority valve.

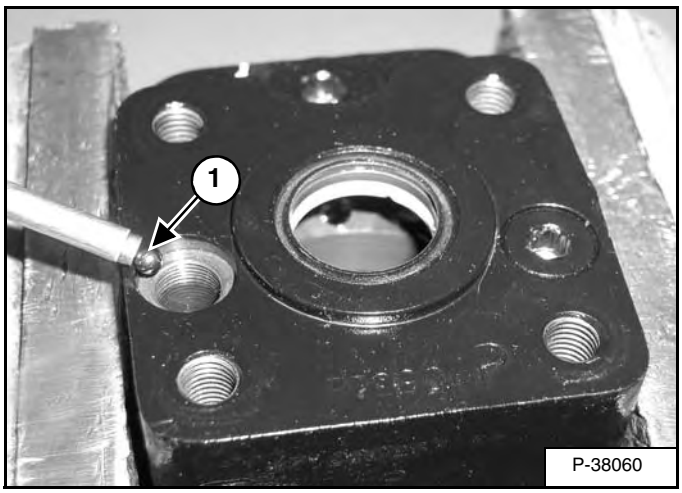
Assembly (Cont'd)

Figure 20-90-51



Install the poppet (Item 1) **[Figure 20-90-51]**, spring (Item 2) **[Figure 20-90-51]**, spring seat (Item 3) **[Figure 20-90-51]**, washer (Item 4) **[Figure 20-90-51]** and plug (Item 5) **[Figure 20-90-51]** into the port.

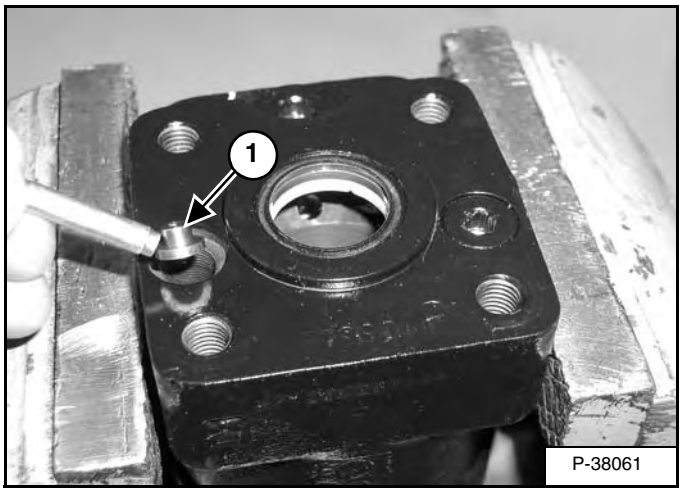
Figure 20-90-52



Install the check ball (Item 1) **[Figure 20-90-52]** into the port.

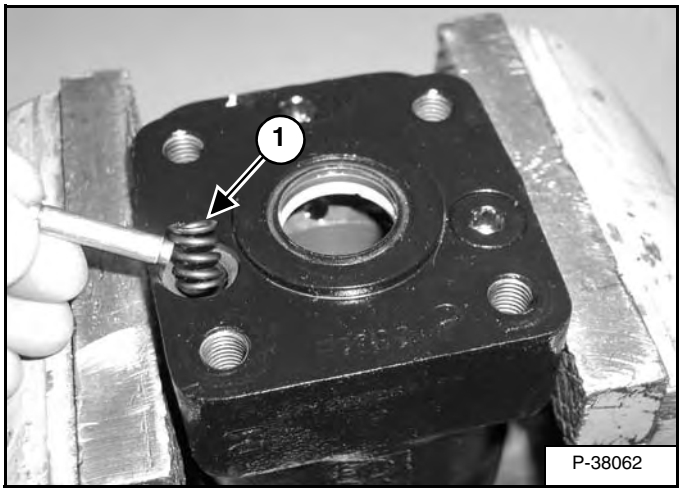
NOTE: The following procedures will be performed on the second port.

Figure 20-90-53



Install the poppet (Item 1) **[Figure 20-90-53]**.

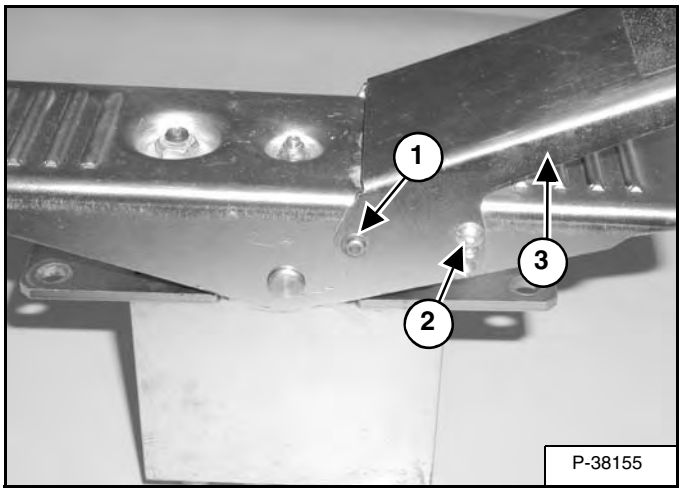
Figure 20-90-54



Install the spring (Item 1) **[Figure 20-90-54]**.

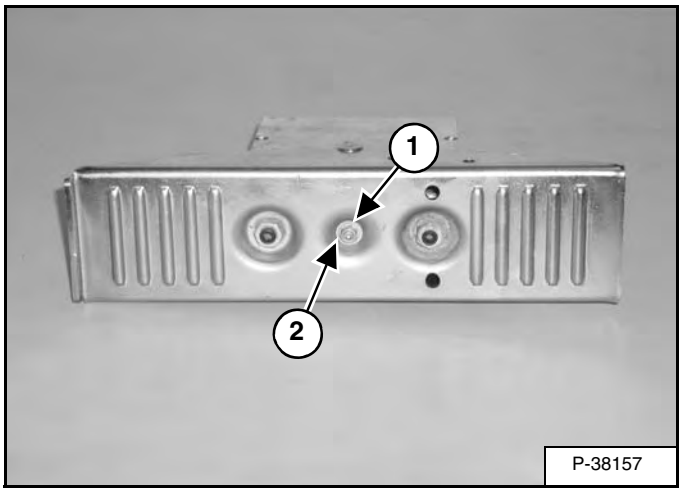
Disassembly And Assembly

Figure 20-100-3



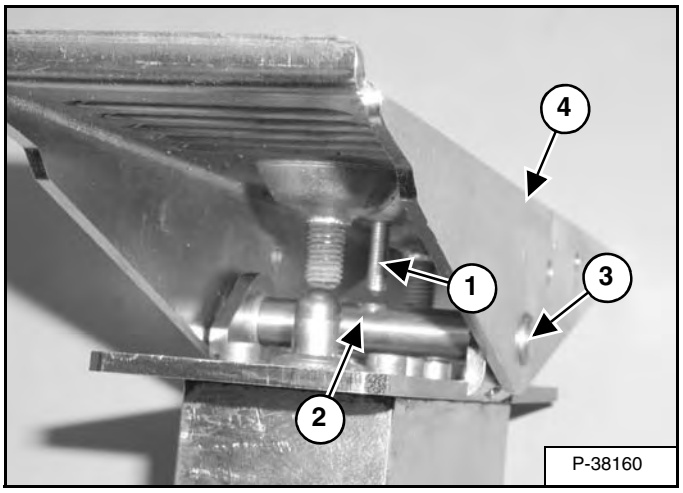
Remove the 2 retainer clips (Item 1) and pins (Item 2) (both sides).Remove the ped al angle plate (Item 3) **[Figure 20-100-3]**.

Figure 20-100-4



Loosen the locknut (Item 1) and set screw (Item 2) **[Figure 20-100-4]**.

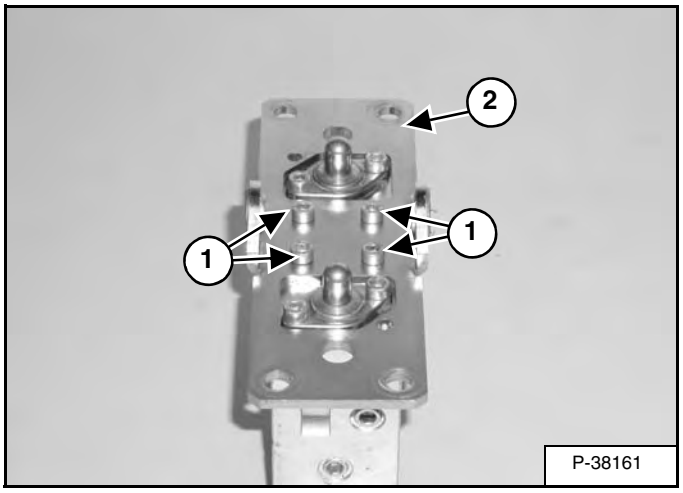
Figure 20-100-5



Back the set screw (Item 1) o ut of the pin (Item 2). Remove the pin (Item 3) and pedal (Item 4) **[Figure 20-100-5]**.

Installation: Algin the set screw (Item 1) with the hole in the pin (Item 2) **[Figure 20-100-5]**.

Figure 20-100-6



Remove the 4 bolts (Item 1) and the mount plate (Item 2) **[Figure 20-100-6]**.

OIL COOLER

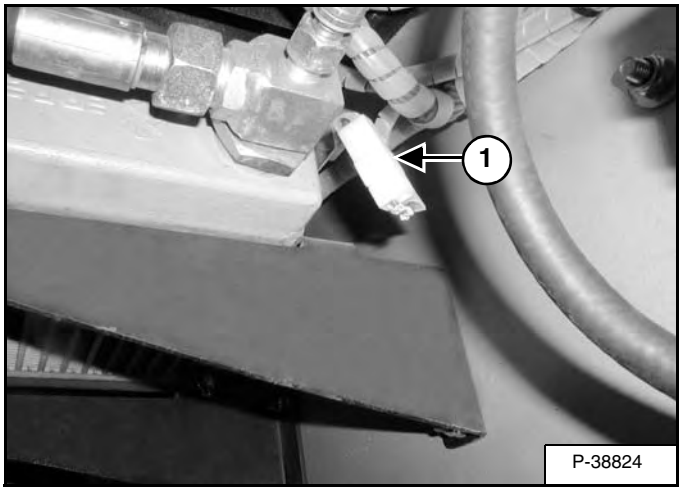
Removal And Installation

Stop the engine, engage parking brake.

Rotate the battery disconnect lever counterclockwise to disconnect the battery from system.

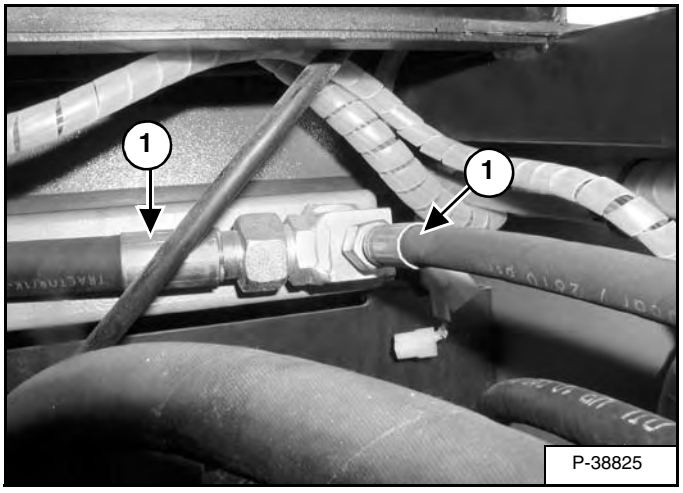
Remove the front and rear floor panels. (See FLOOR PANELS on Page 50-30-1.)

Figure 30-20-1



Disconnect the harness connector (Item 1) **[Figure 30-20-1]**.

Figure 30-20-2



Remove the two hoses (Item 1) **[Figure 30-20-2]**.

NOTE: Mark hoses for correct assembly.

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.

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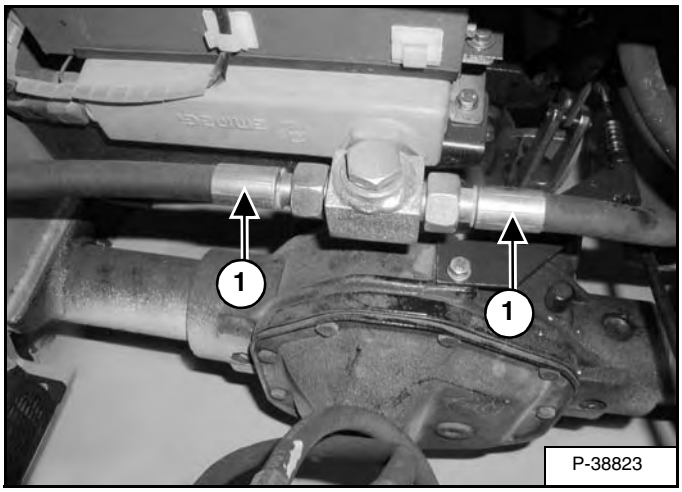
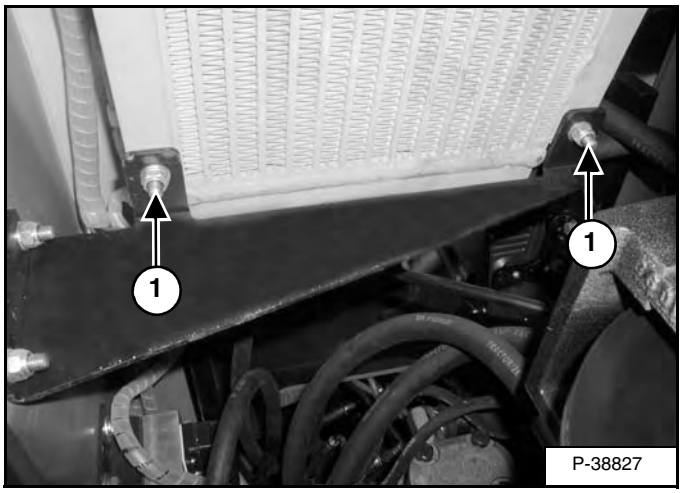
Figure 30-20-3



Remove the two hoses (Item 1) **[Figure 30-20-3]**.

Figure 30-20-4

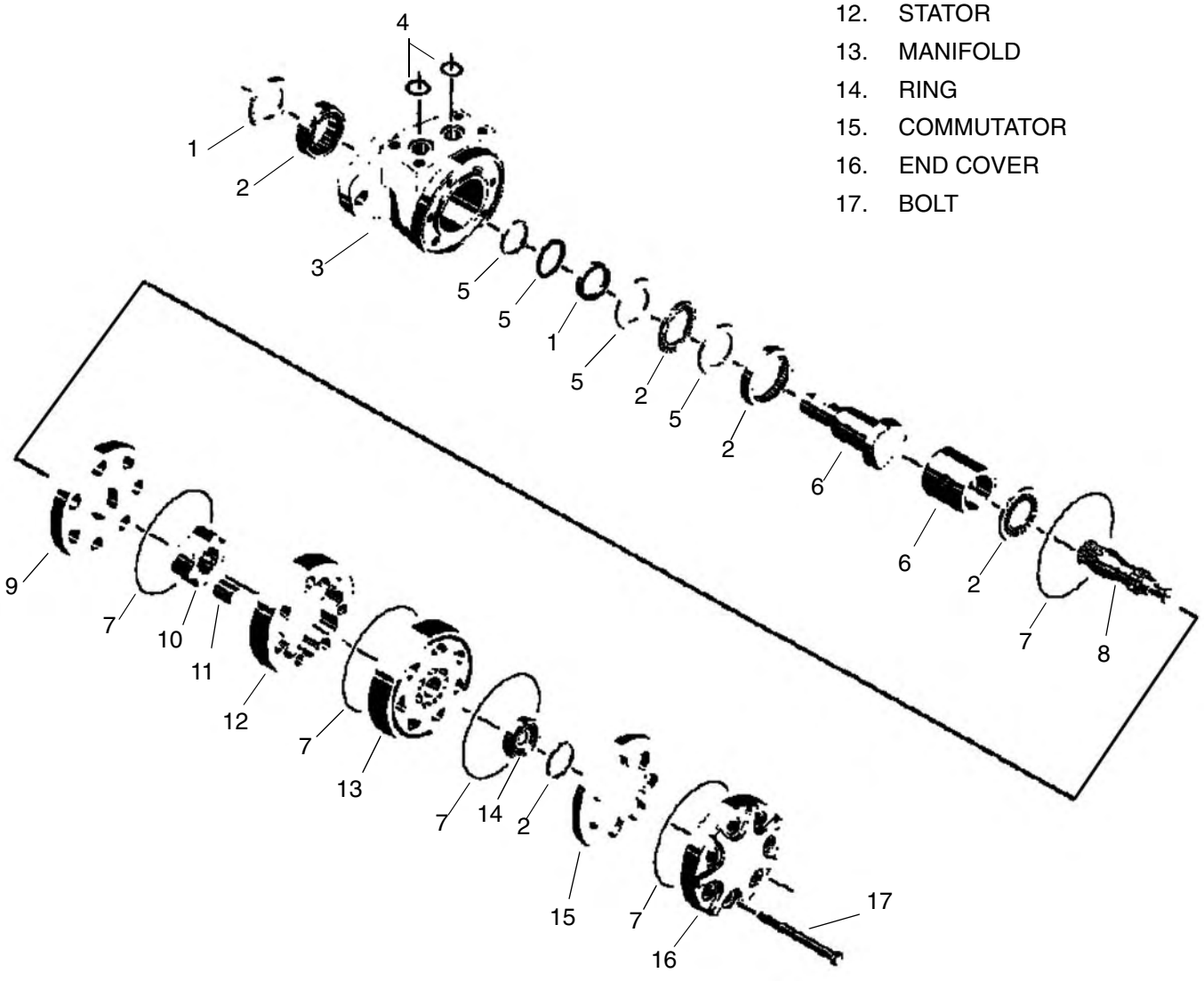


Remove the two front cooler mounting bolts (Item 1) **[Figure 30-20-4]**.

Installation: Tighten bolts to 18- 19 ft.-lb. (24-26 N•m) torque.

Parts Identification

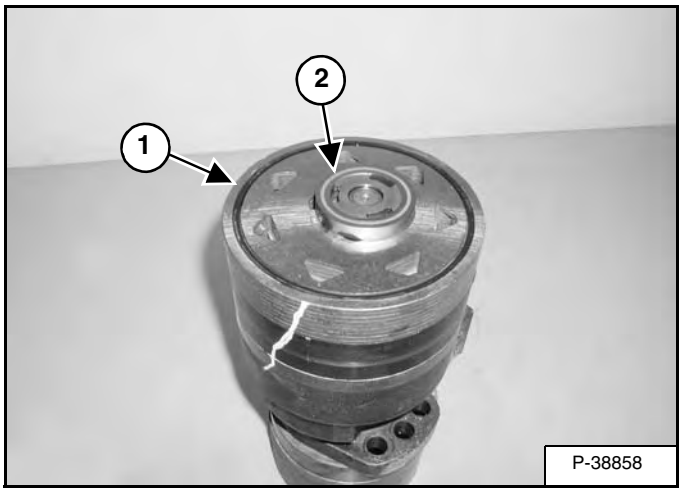
1. SEAL
2. BEARING
3. HOUSING
4. O-RING
5. WASHER
6. KEYED COUPLER
7. SEAL RING
8. DRIVE LINK
9. WEAR PLATE
10. ROTOR
11. VANE
12. STATOR
13. MANIFOLD
14. RING
15. COMMUTATOR
16. END COVER
17. BOLT



B-19613

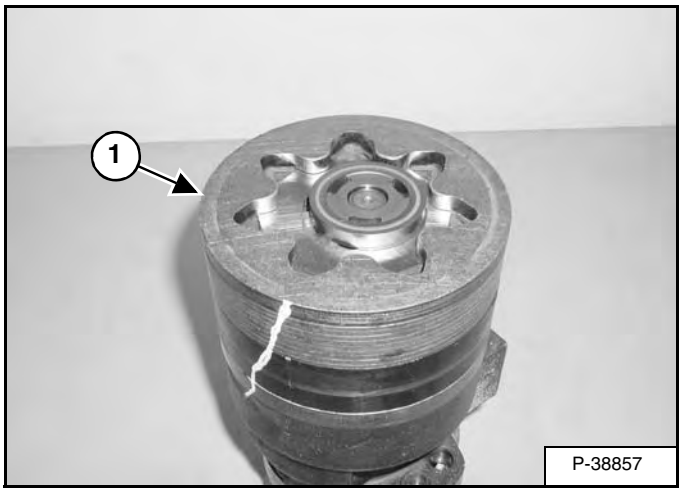
Assembly (Cont'd)

Figure 30-30-41



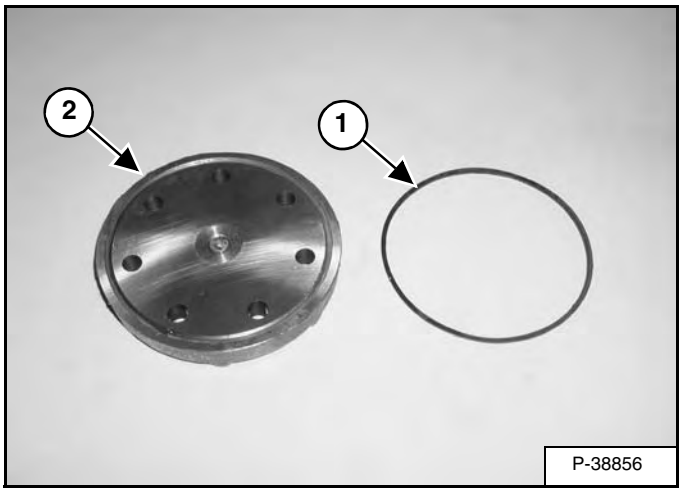
Install the sealing ring (Item 1) and control washer (Item 2) **[Figure 30-30-41]**.

Figure 30-30-42



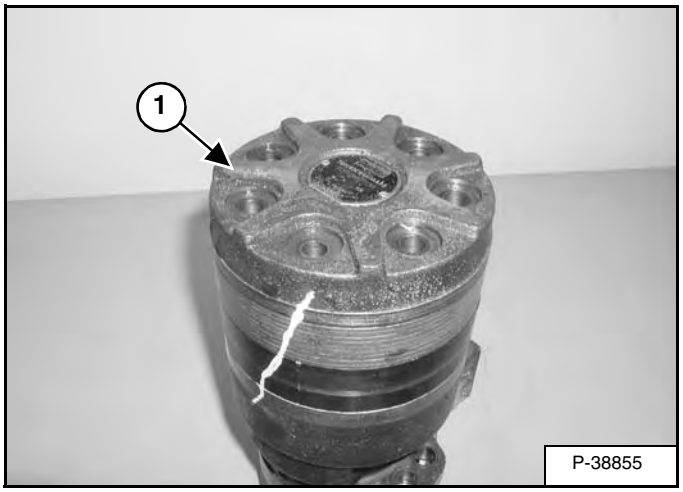
Install the spacer plate (Item 1) **[Figure 30-30-42]**.

Figure 30-30-43



Install the sealing ring (Item 1) into the end cover (Item 2) **[Figure 30-30-43]**.

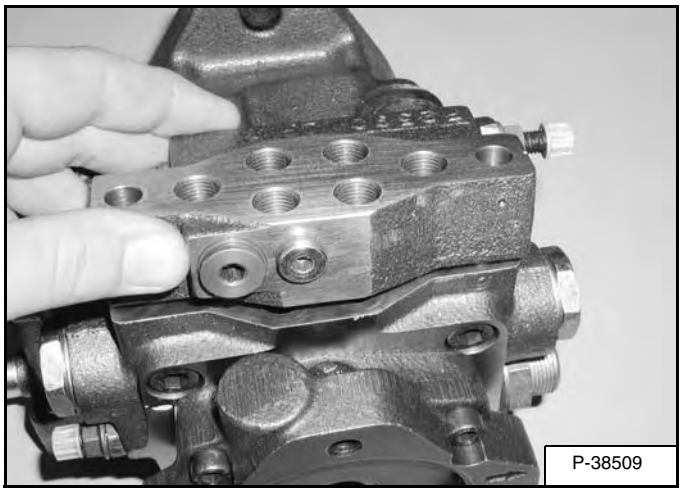
Figure 30-30-44



Install the end cover (Item 1) **[Figure 30-30-44]**.

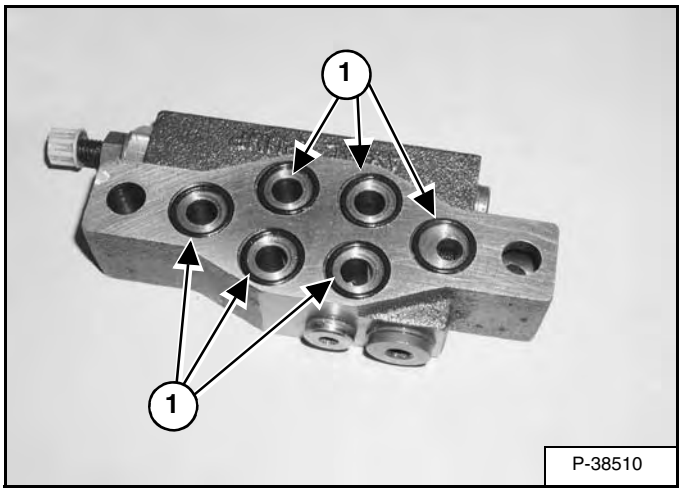
Disassembly (Cont'd)

Figure 30-40-25



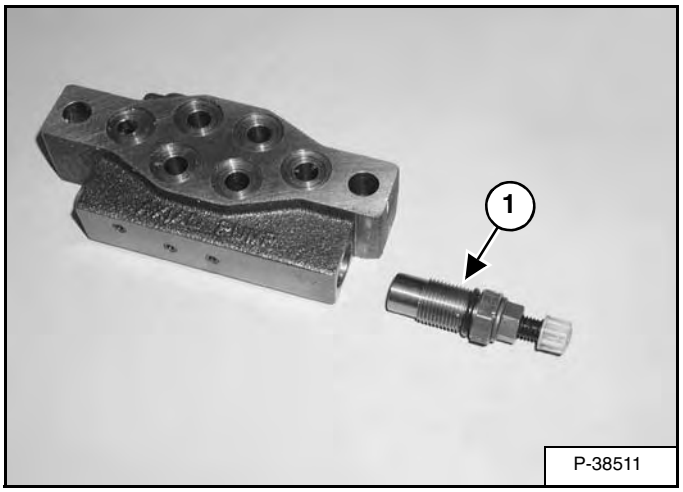
Remove the second manifold assembly **[Figure 30-40-25]**.

Figure 30-40-26



Remove and discard the 6 o-rings (Item 1) **[Figure 30-40-26]**.

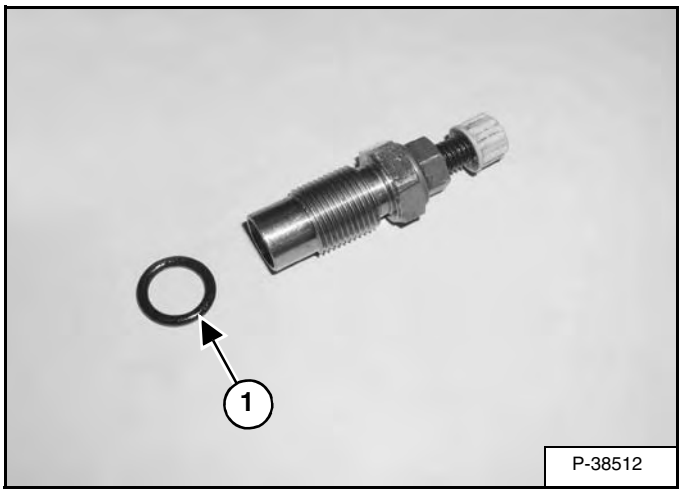
Figure 30-40-27



Remove the adjusting screw (Item 1) **[Figure 30-40-27]**.

NOTE: Do not loosen the jam nut.

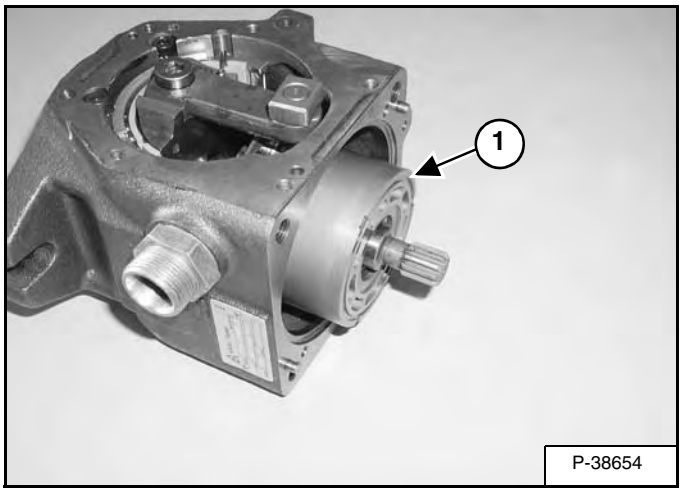
Figure 30-40-28



Remove and discard the o- ring (Item 1) **[Figure 30-40-28]**.

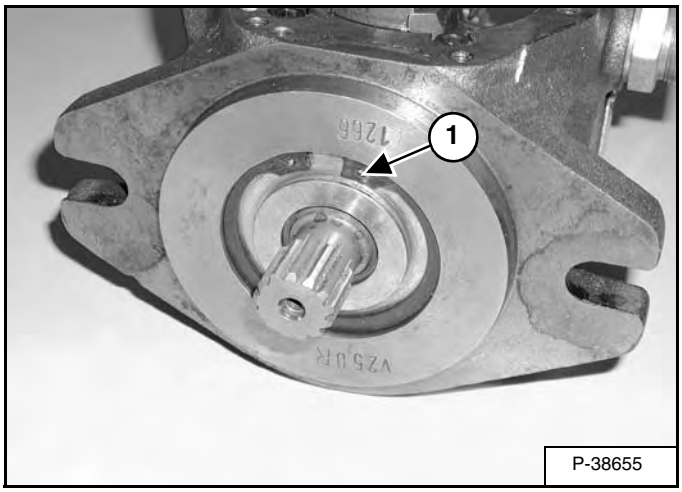
Disassembly (Cont'd)

Figure 30-40-65



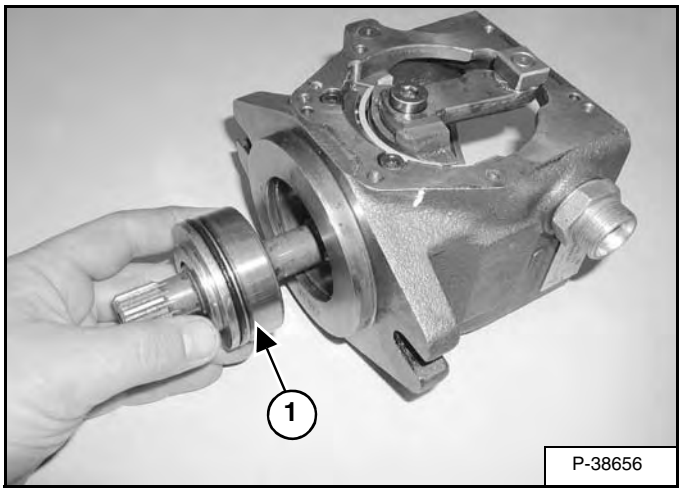
Lay the housing on i ts side and remove the cylinder block/piston assembly (Item 1) **[Figure 30-40-65]** from the drive shaft.

Figure 30-40-66



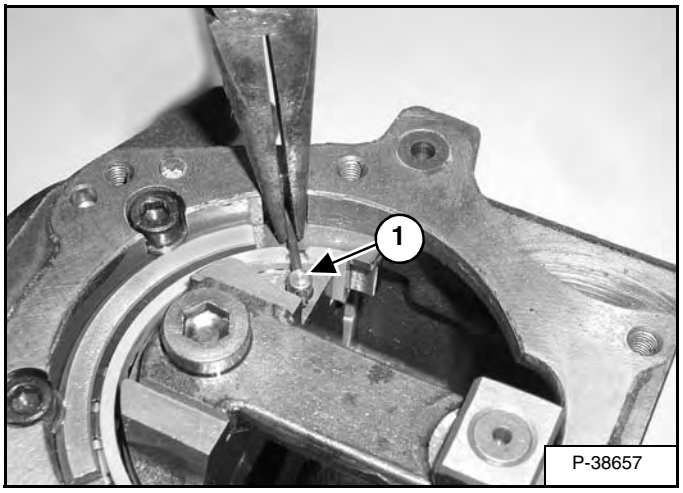
Remove the snap ring (Item 1) **[Figure 30-40-66]**.

Figure 30-40-67



Remove the shaft assembly (Item 1) **[Figure 30-40-67]**.

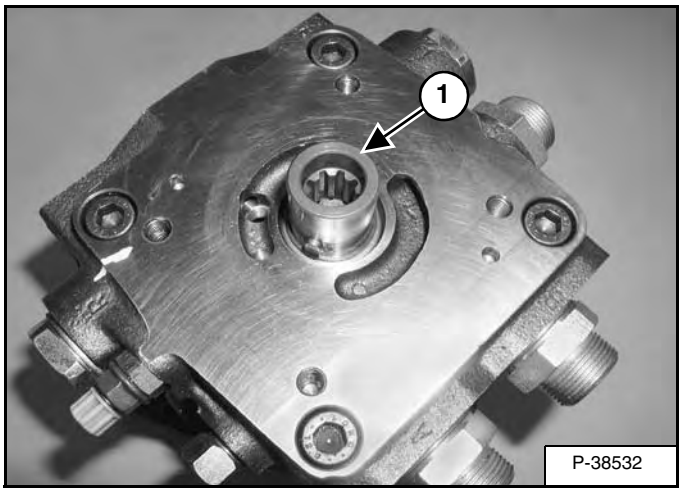
Figure 30-40-68



Remove the locator link and pin (Item 1) **[Figure 30-40-68]**.

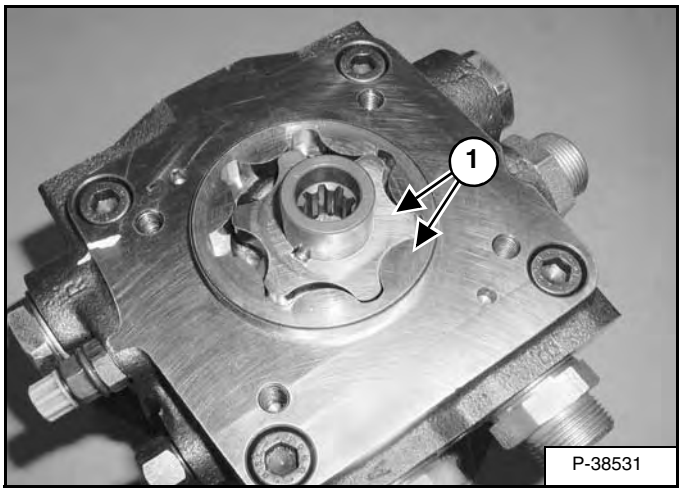
Assembly (Cont'd)

Figure 30-40-104



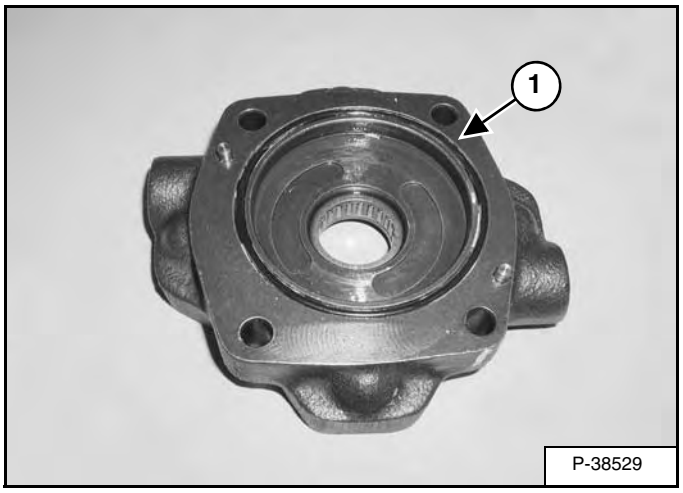
Install the coupler (Item 1) **[Figure 30-40-104]**.

Figure 30-40-105



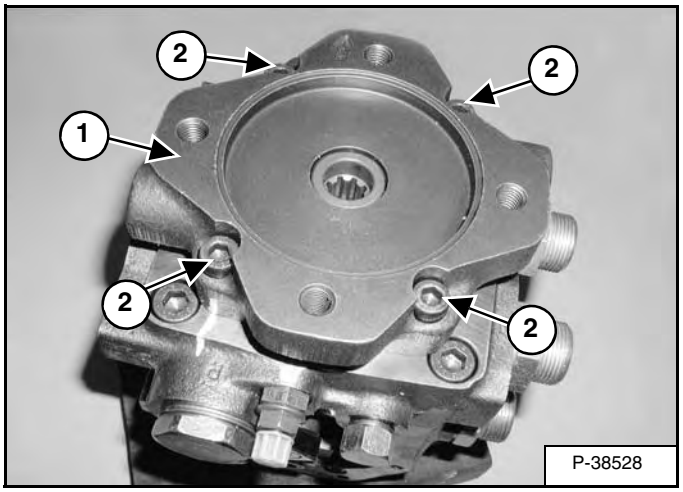
Apply assembly lube and install the gear assembly (Item 1) **[Figure 30-40-105]** over the coupler key.

Figure 30-40-106



Install the o-ring (Item 1) **[Figure 30-40-106]** into the mounting flange.

Figure 30-40-107



Install the mounting flange (Item 1) and four bolts (Item 2) **[Figure 30-40-107]**. Tighten the bo lts to 55 ft.-lb. (75 N•m) torque.

HYDROSTATIC TESTING

Pump Adjustment

The testing of the hydrostatic pump must be done in the following order:

CHARGE PRESSURE
FLUSHING VALVE
TORQUE LIMITER

All testing is done with the hydraulic oil at 150° F (66° C)

The hydraulic hoses, tubelines and fittings are 24° DIN cone metric fittings.

To test the charge pressure, stop the engine and engage the parking brake. Raise the machine and install jackstands. (See LIFTING AND BLOCKING THE LOADER BACKHOE on Page 10-10-1.)

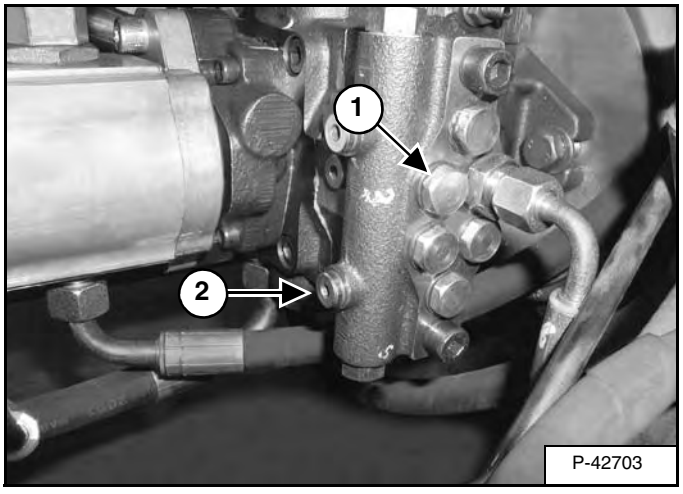
⚠ WARNING

Put jackstands under the front and rear axle before running the engine for service. Failure to us e jackstands can allow the machine to fall or move and cause injury or death.

W-2461-0303

Remove the left front floor panel. (See Left Front Panel Removal And Installation on Page 50-30-1.)

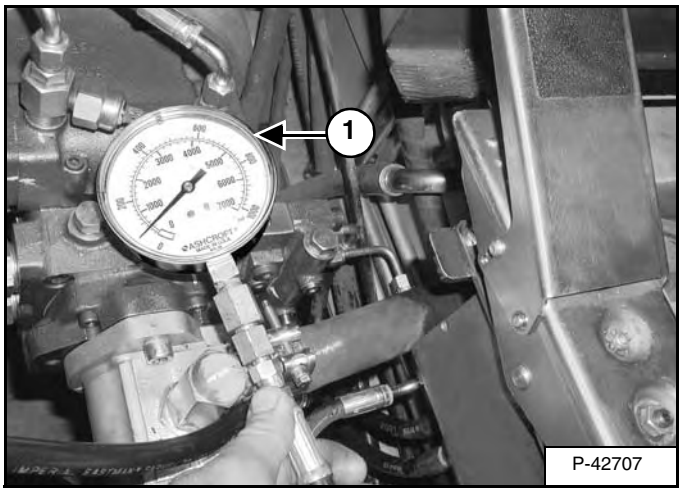
Figure30-50-1



Remove the plug (Item 1) **[Figure30-50-1]** from the charge port and install a 1000 psi (6895 kPa) gauge.

Remove the plug (Item 2) **[Figure30-50-1]** from the forward travel test port and install a 1 0,000 psi (68950 kPa) gauge.

Figure 30-50-2

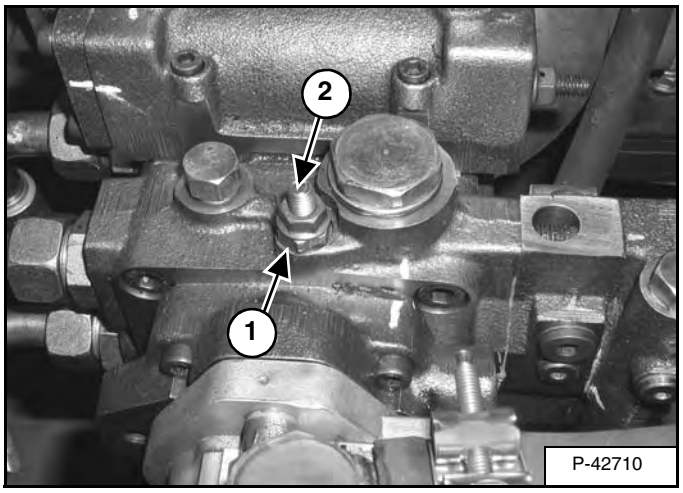


With the park brake engaged, hydraulic fluid temperature at 150° F (66° C), start the engine and set the engine to 1000 RPM. Record pressure on the gauge (Item 1) **[Figure 30-50-2]**

The correct pressure should be 320 psi (2206 kPa).

Stop the engine.

Figure 30-50-3



If the pressure is incorrect, loosen the jam nut (Item 1) on the relief valve. Turn the ad justment screw (Item 2) **[Figure 30-50-3]** clockwise to in crease the pressure or counterclockwise to decrease the pressure.

Tighten the jam nut (Item 1) **[Figure 30-50-3]**.

Retest the charge pressure after adjustment.

NOTE: If the charge pressure was adjusted the flushing valve test must be performed. If no adjustment was made continue to the Torque Limiter Test.

BRAKE CALIPER

Removal And Installation

Lift and block the loader backhoe. (See LIFTING AND BLOCKING THE LOADER BACKHOE on Page 10-10-1.)

NOTE: The bracket (Item 1) [Figure 40-20-1] must be supported before removing the mounting bolts.

Figure 40-20-1

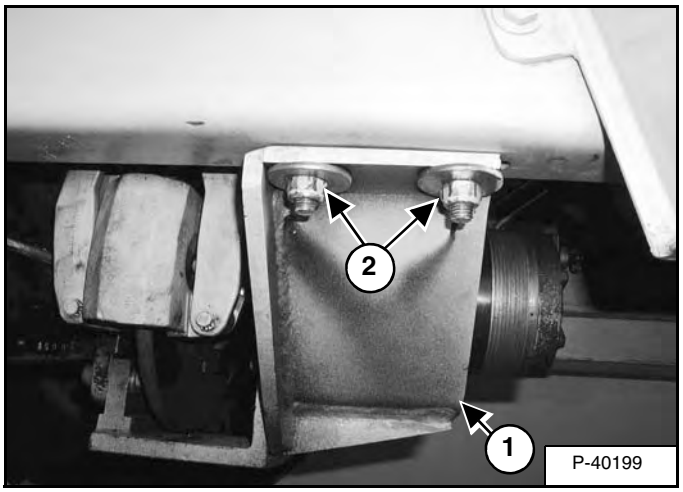
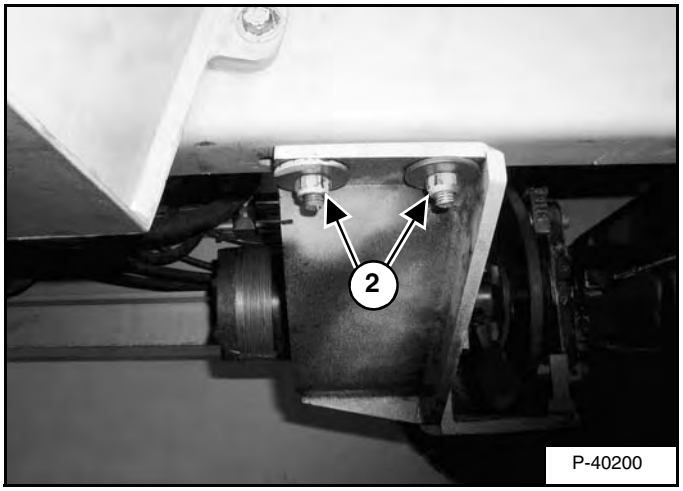


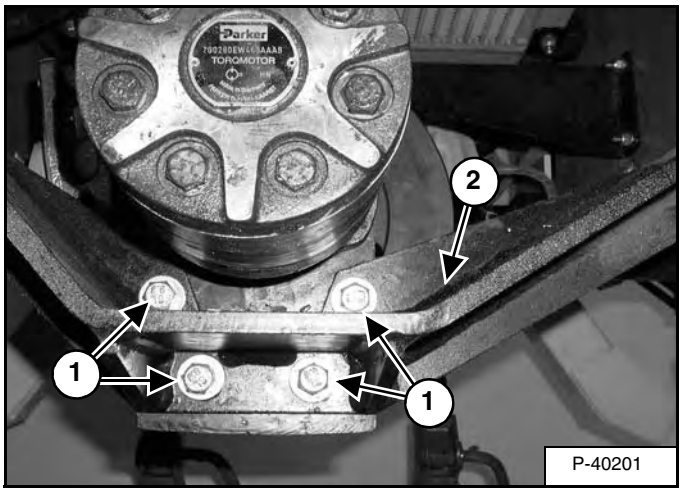
Figure 40-20-2



Remove the four bracket mount bolts (Item 2) **[Figure 40-20-1]** & **[Figure 40-20-2]**.

Installation: Tighten bolts to 55- 60 ft.-lb. (75-85 N•m) torque.

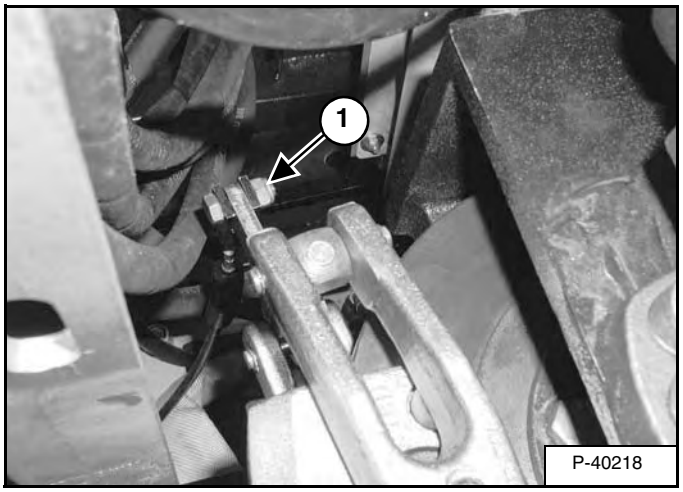
Figure 40-20-3



Remove the four mount bolts (Item 1). Remove the bracket (Item 2) **[Figure 40-20-3]**

Installation: Tighten bolts to 18 to 19 ft.-lb. (24 to 26 N•m) torque.

Figure 40-20-4



Remove the clevis bolt (Item 1) **[Figure 40-20-4]**.

Installation: Do not overtighten bolt causing clevis to deflect and bind.

BRAKE CALIPER

Removal And Installation

Lift and block the loader backhoe. (See LIFTING AND BLOCKING THE LOADER BACKHOE on Page 10-10-1.)

NOTE: The bracket (Item 1) [1] must be supported before removing the mounting bolts.

Figure 40-21-1

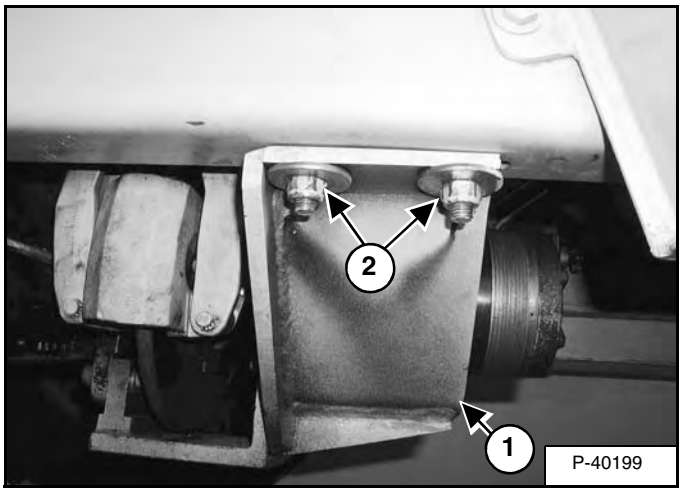
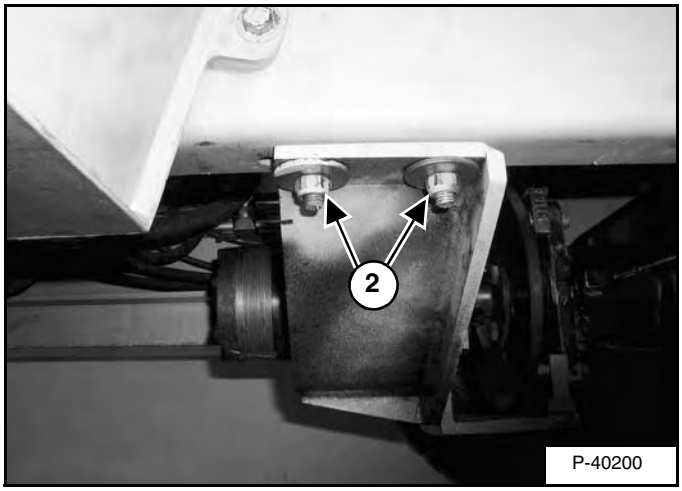


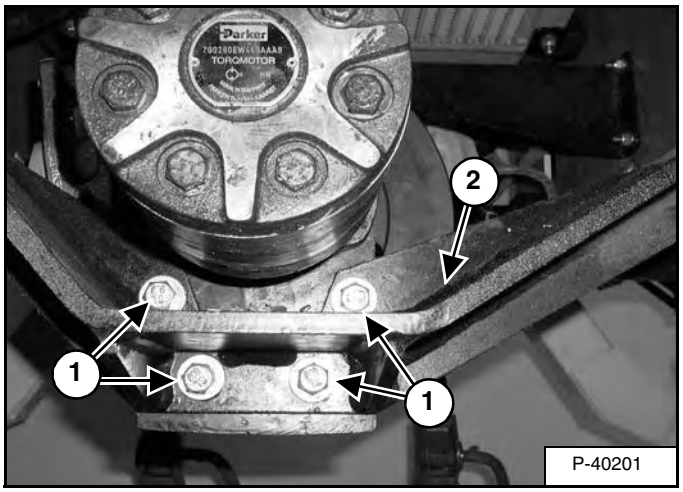
Figure 40-21-2



Remove the four bracket mount bolts (Item 2) **[Figure 40-21-1]** & **[Figure 40-21-2]**.

Installation: Tighten bolts to 55- 60 ft.-lb. (75-85 N•m) torque.

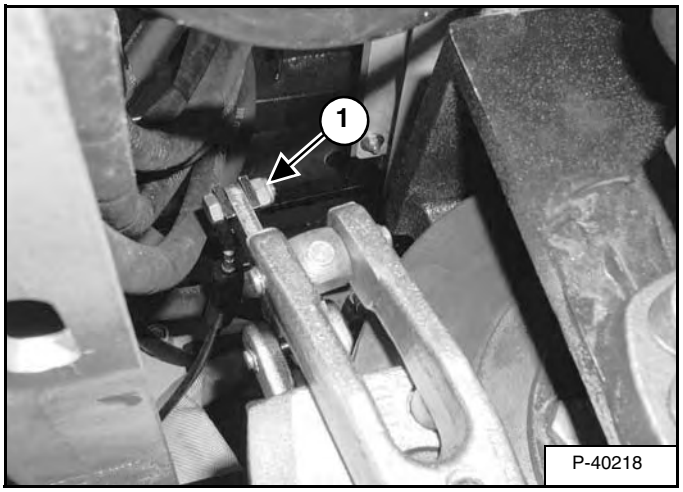
Figure 40-21-3



Remove the four mount bolts (Item 1) **[Figure 40-21-3]**. Remove the bracket (Item 2) **[Figure 40-21-3]**

Installation: Tighten bolts to 18- 19 ft.-lb. (24-26 N•m) torque.

Figure 40-21-4



Remove the clevis bolt (Item 1) **[Figure 40-21-4]**.

Installation: Do not overtighten bolt causing clevis to deflect and bind.

REAR AXLE

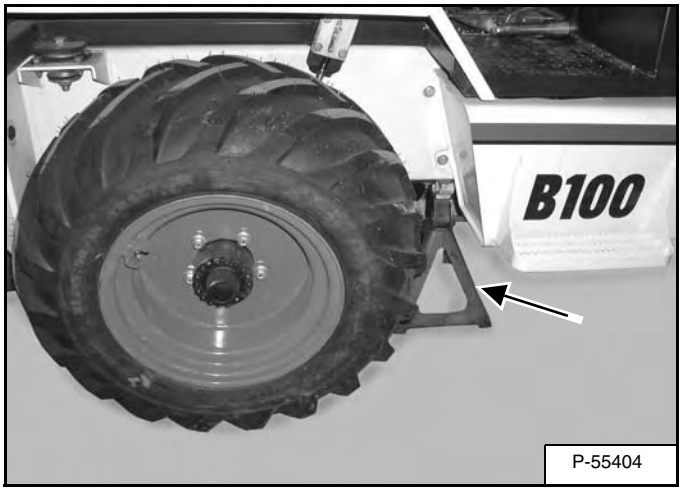
Removal And Installation

Install the boom lock. (See Engaging Boom Lock on Page 10-140-2.)

Stop the engine. Engage the parking brake.

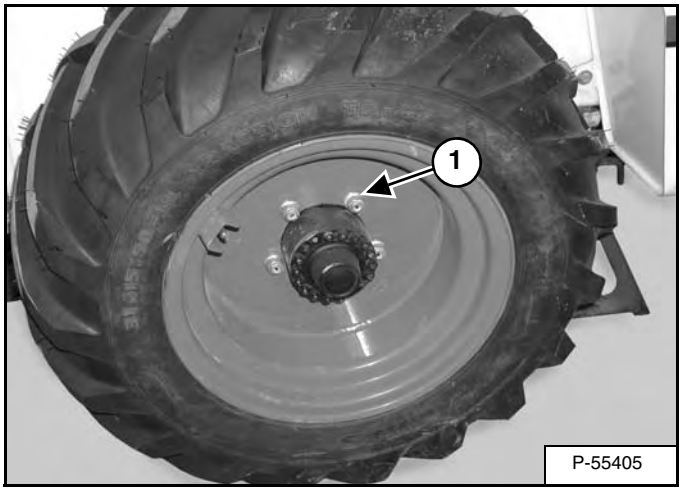
Remove the left front and rear floor panels. (See FLOOR PANELS on Page 50-30-1.)

Figure 40-30-1



Using a floor jack raise the rear of the machine and install jack stands in front of the drive motor mounting bracket **[Figure 40-30-1]**.

Figure 40-30-2



Remove the 5 lug nuts and washers (Item 1) **[Figure 40-30-2]** from each rear tire.

Remove both rear tires.

Installation: Tighten the lug nuts to 140 ft.-lb. (190 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.

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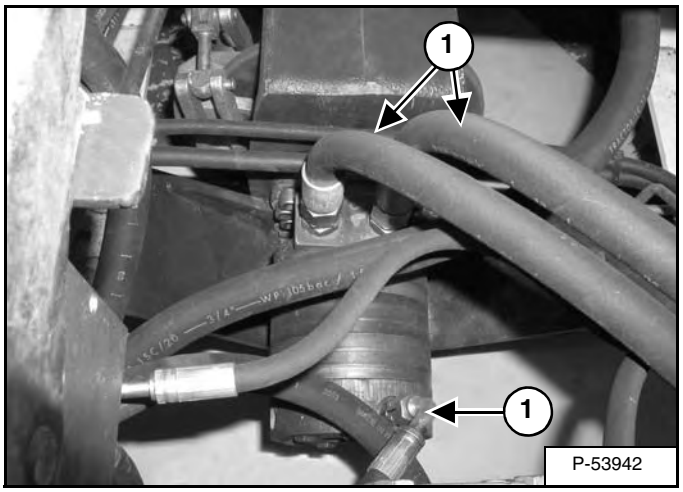
Figure 40-30-3

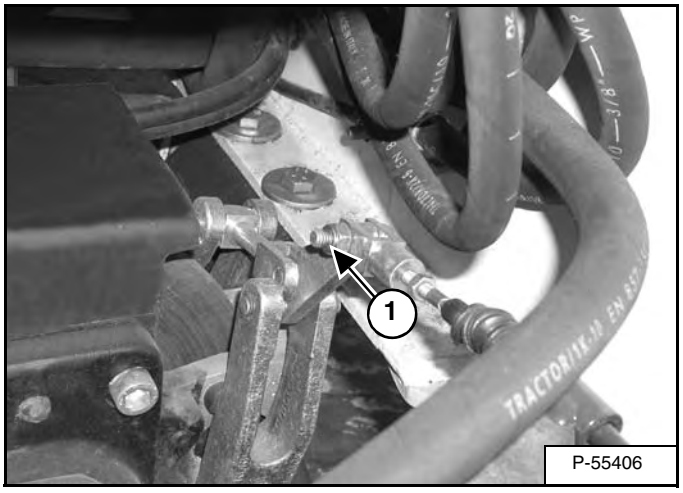


Remove the three hoses (Item 1) **[Figure 40-30-3]** from the drive motor.

NOTE: Mark hoses for correct installation.

Release the parking brake.

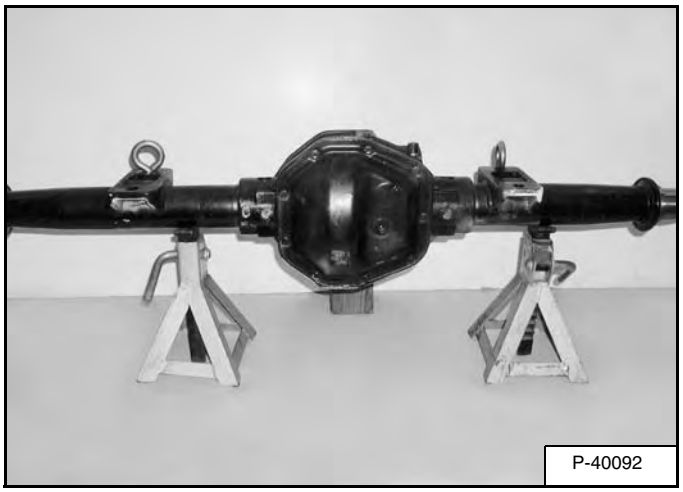
Figure 40-30-4



Remove the brake cable clevis bolt (Item 1) **[Figure 40-30-4]**.

Differential Disassembly

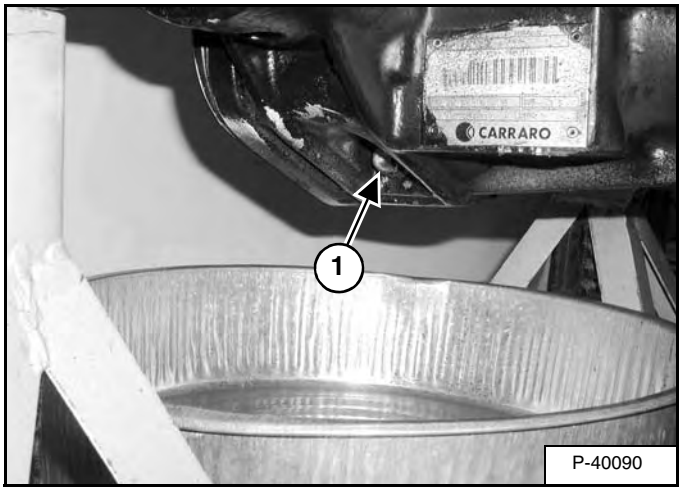
Figure 40-40-14



Place the axle assembly on a secure work surface **[Figure 40-40-14]**.

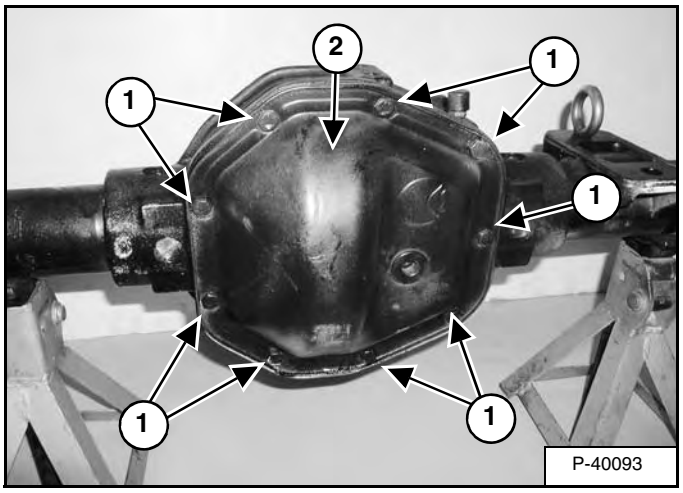
Remove the wheel hub/axle (both sides). (See Wheel Hub/Axle Disassembly on Page 40-40-3.)

Figure 40-40-15



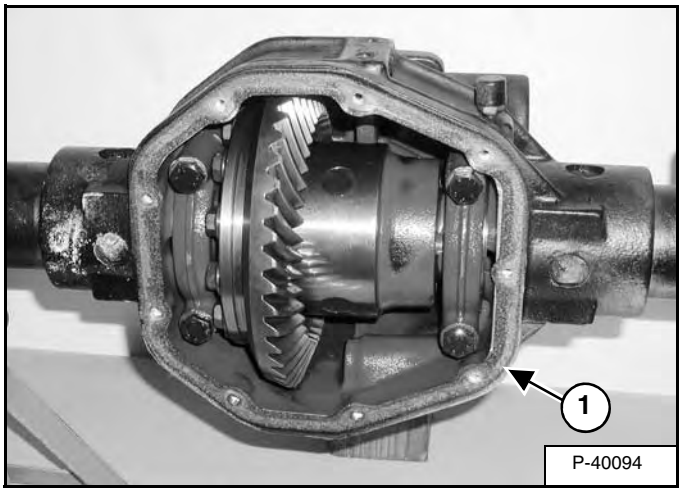
Remove the drain plug (Item 1) **[Figure 40-40-15]** and drain fluid into an approved container and dispose of in an environmentally safe manner.

Figure 40-40-16



Remove the 9 bolts (Item 1) and remove the cover (Item 2) **[Figure 40-40-16]**.

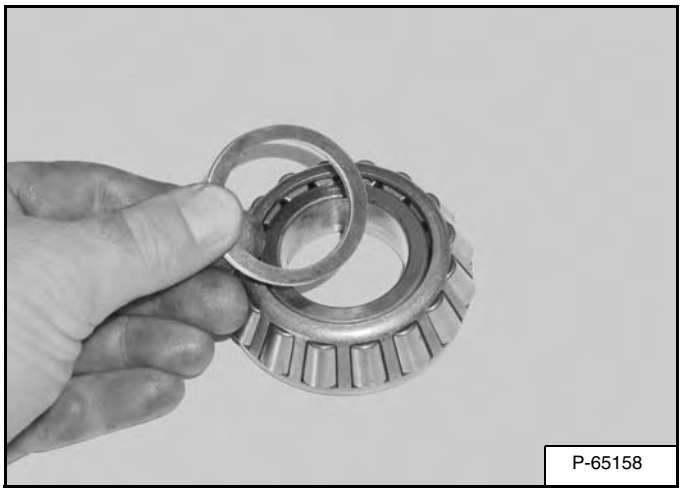
Figure 40-40-17



Remove the gasket (Item 1) **[Figure 40-40-17]** from the axle housing.

Pinion Group Disassembly (Cont'd)

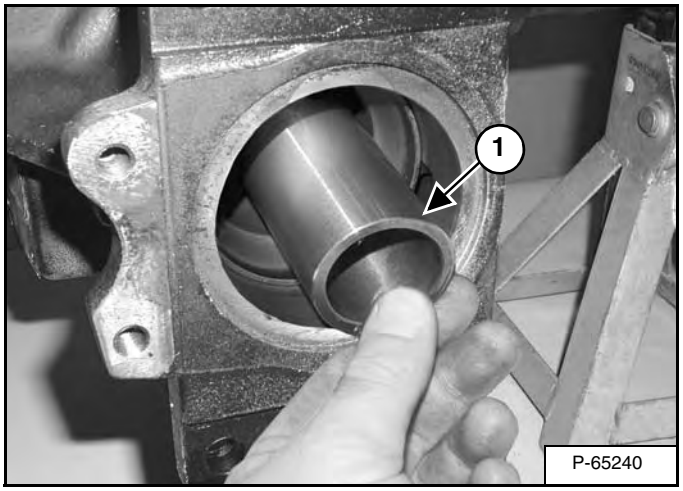
Figure 40-40-47



Remove and record the s him pack from the bearing **[Figure 40-40-47]**.

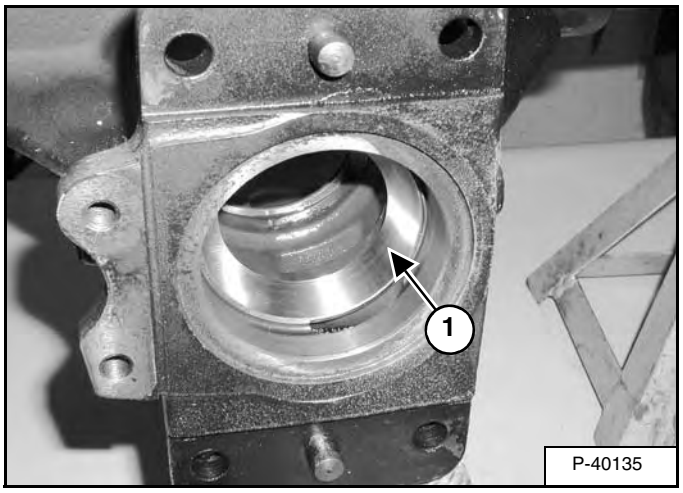
NOTE: The shim pack may stay in the housing when the bearing is removed.

Figure 40-40-48



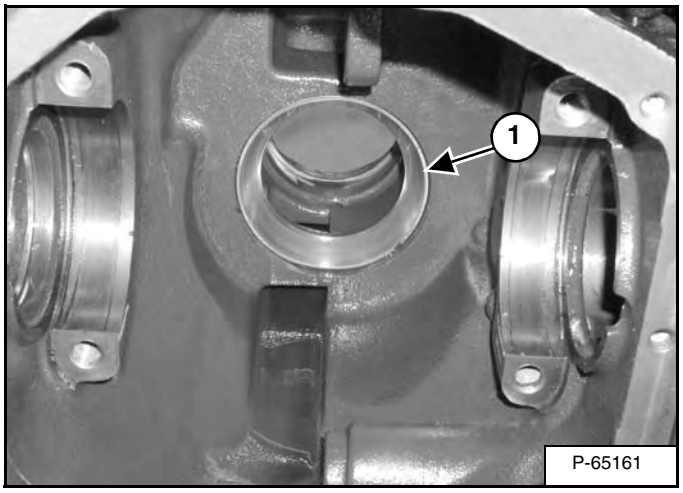
Remove the shim shaft (Item 1) **[Figure 40-40-48]**.

Figure 40-40-49



Remove the outer race (Item 1) **[Figure 40-40-49]**.

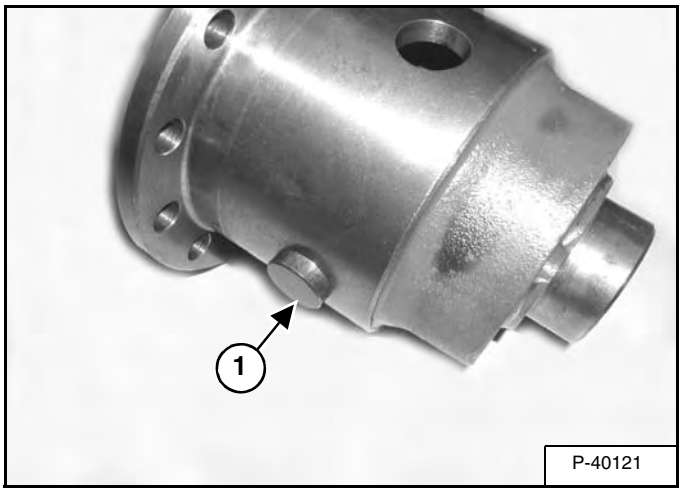
Figure 40-40-50



Remove the inner race (Item 1) **[Figure 40-40-50]**.

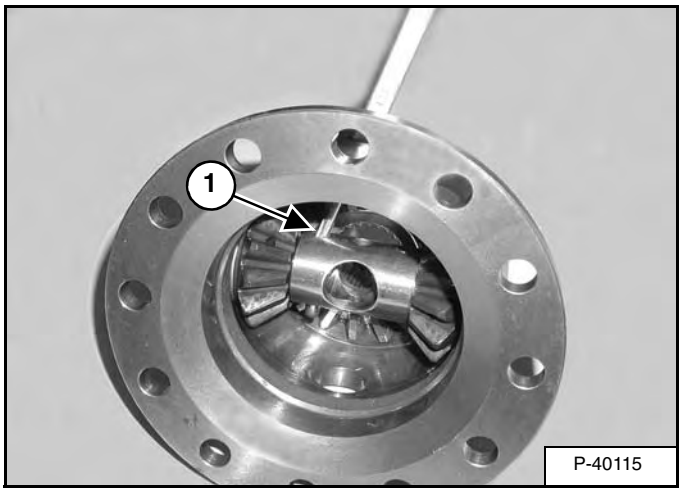
Differential Assembly (Cont'd)

Figure 40-40-82



Install the half shaft (Item 1) **[Figure 40-40-82]** in the housing and through the side gear.

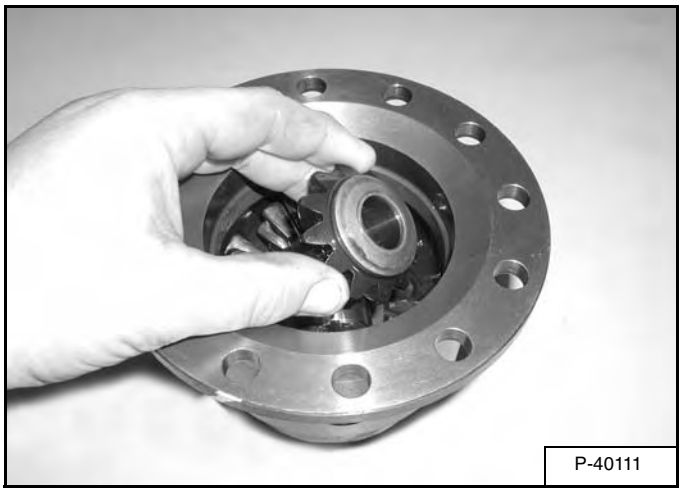
Figure 40-40-83



Align the roll pin hole and install the roll pin (Item 1) **[Figure 40-40-83]** through the spider shaft side gear and half shaft.

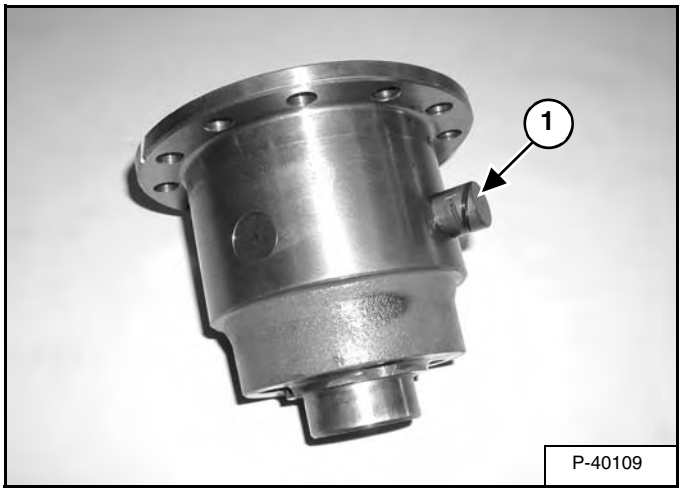
Repeat above procedure for the other side gear.

Figure 40-40-84



Install the side gear/thrust washer (both sides) **[Figure 40-40-84]**.

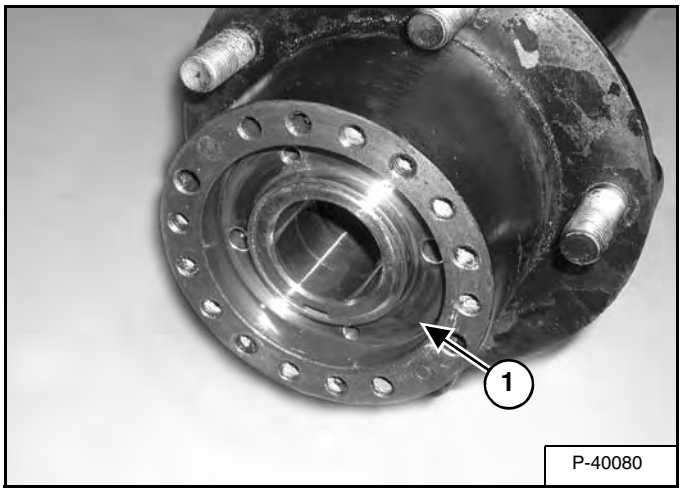
Figure 40-40-85



Install the center shaft (Item 1) **[Figure 40-40-85]** in the housing through both side gears and spider shaft.

Wheel Hub/Axle Assembly (Cont'd)

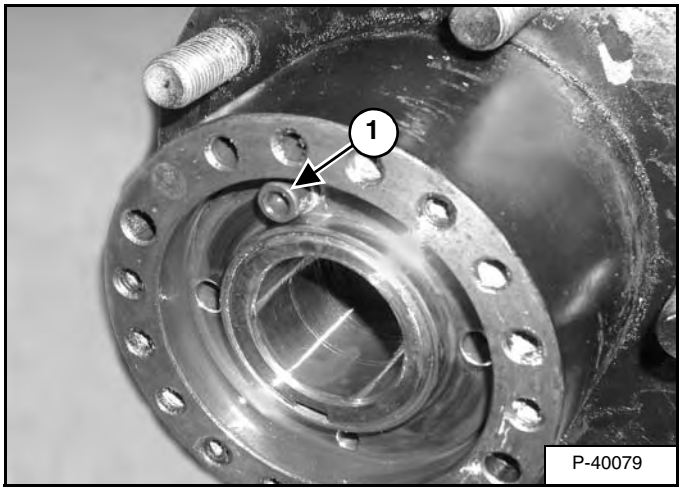
Figure 40-40-117



Install the hub nut (Item 1) **[Figure 40-40-117]** and tighten.

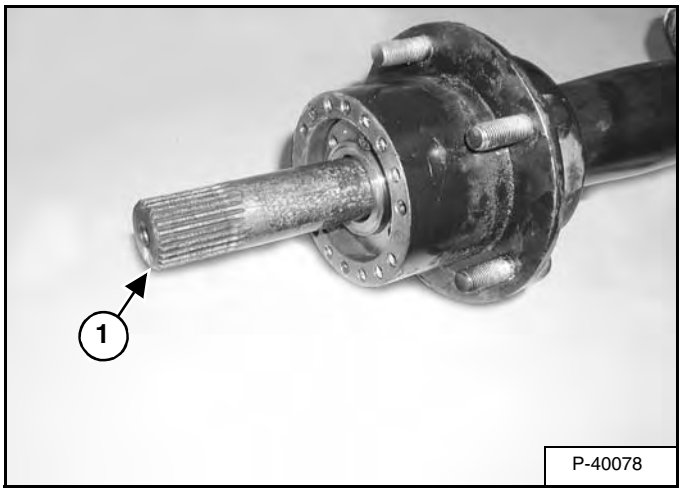
NOTE: After the hub nut has been tightened, back the nut off approximately 1/4 of a turn.

Figure 40-40-118



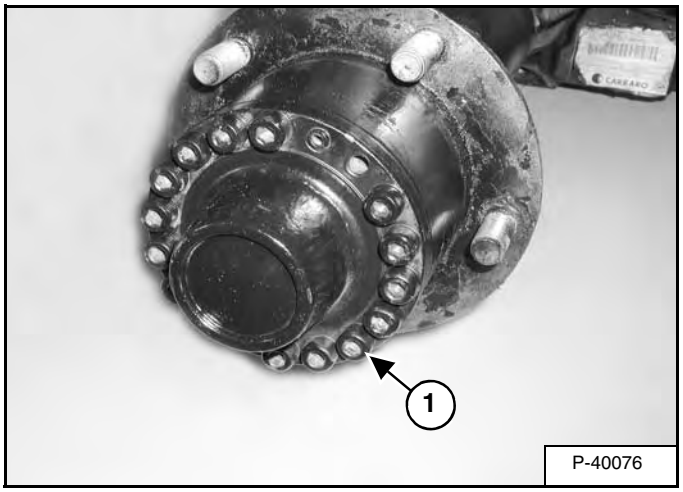
Install the set screw (Item 1) **[Figure 40-40-118]**.

Figure 40-40-119



Install the axle shaft (Item 1) **[Figure 40-40-119]** into the axle housing aligning the shaft with the splines.

Figure 40-40-120

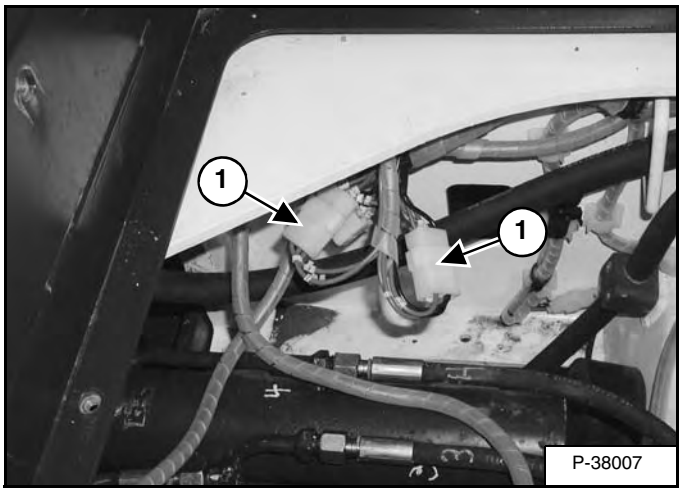


Install the flange (Item 1) using the 14 bolts (Item 2) **[Figure 40-40-120]**.

Apply Loctite® 270 or equivalent and tighten to 25 to 28 ft.-lb. (35 to 39 N•m) torque.

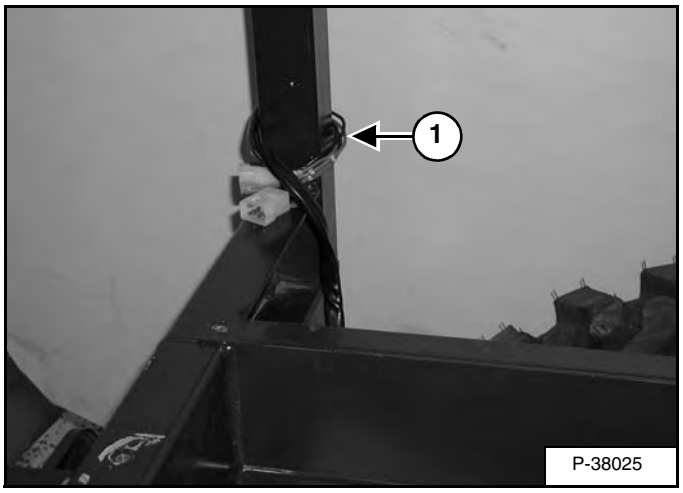
Removal And Installation (Cont'd)

Figure 50-10-24



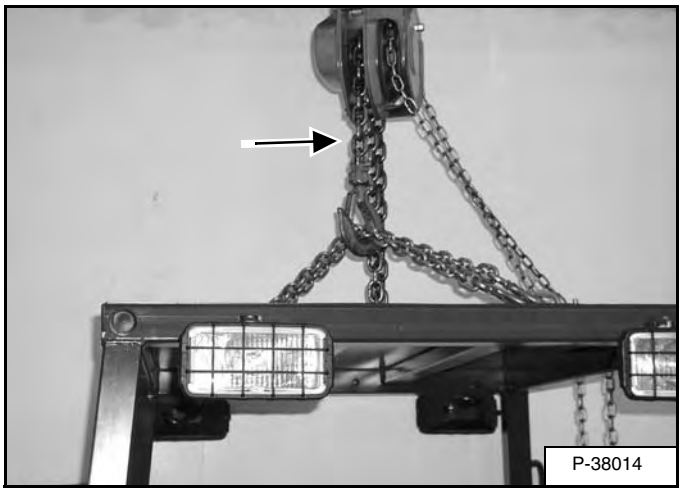
Disconnect light harness (Item 1) **[Figure 50-10-24]**.

Figure 50-10-25



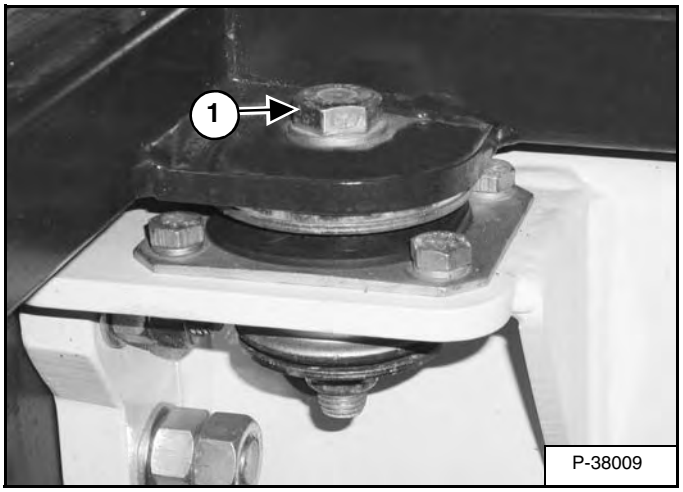
Secure harness (Item 1) **[Figure 50-10-25]** to operator cab as shown (both sides).

Figure 50-10-26



Install a chain and hoist to lift and support operator cab **[Figure 50-10-26]**.

Figure 50-10-27



Remove the cab mounting bolts (Item 1) **[Figure 50-10-27]**.

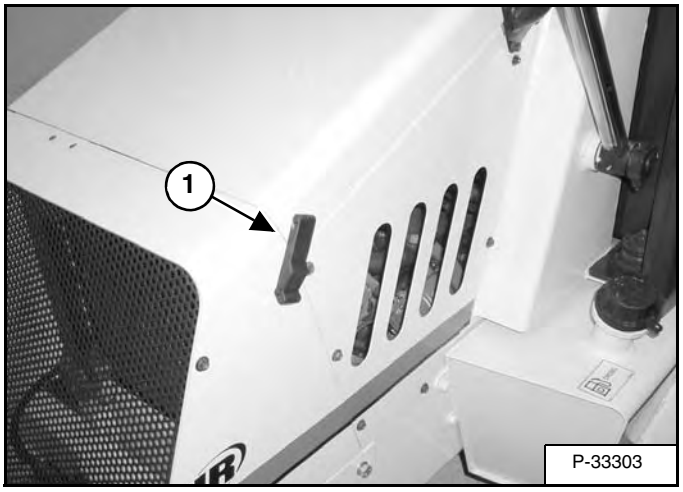
Installation: Tighten bolts to 118-133 ft.-lb. (160-180 N•m) torque.

ENGINE SIDE COVERS

Removal And Installation

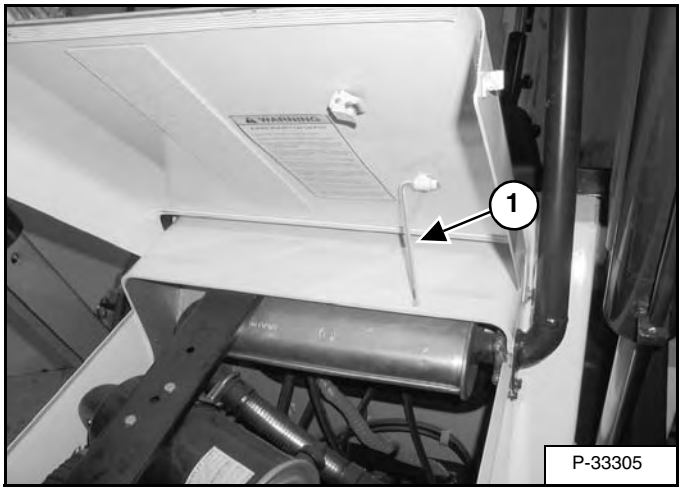
Raise the lift arms and install an approved lift arm support device. (See Installing The Lift Arm Support Device on Page 10-20-1.)

Figure 50-60-1



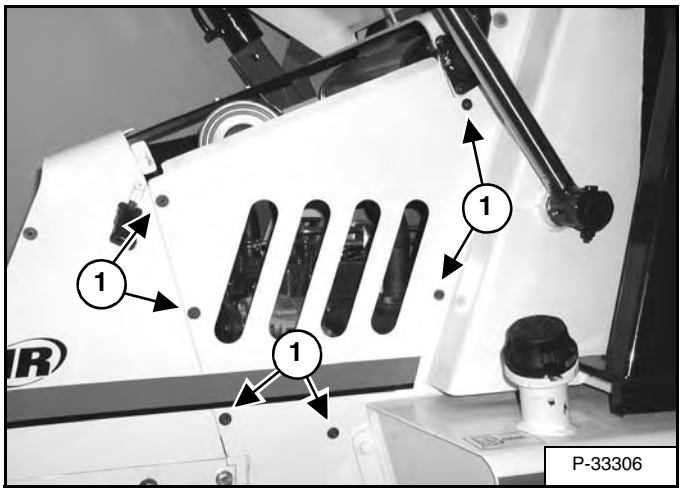
Release both engine cover latches (Item 1) **[Figure 50-60-1]**.

Figure 50-60-2



Open the engine cover and put the support rod (Item 1) **[Figure 50-60-2]** in the hole in the hood.

Figure 50-60-3



Remove the six side cover mounting bolts (Item 1) **[Figure 50-60-3]**.

Figure 50-60-4

Remove the side cover **[Figure 50-60-4]**.

Removal And Installation (Cont'd)

Figure 50-100-7

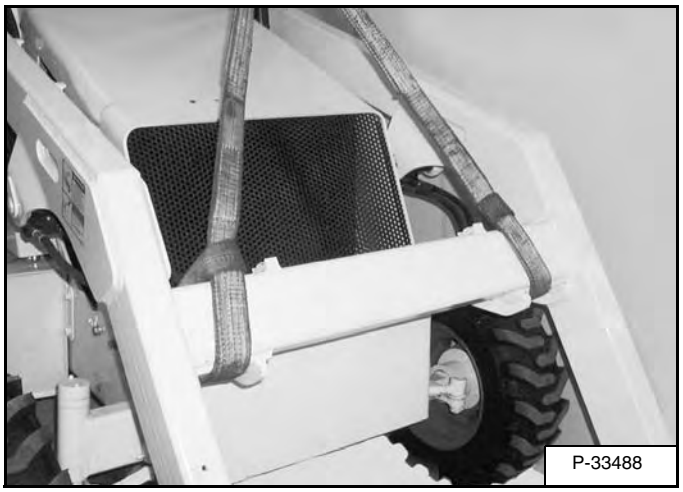
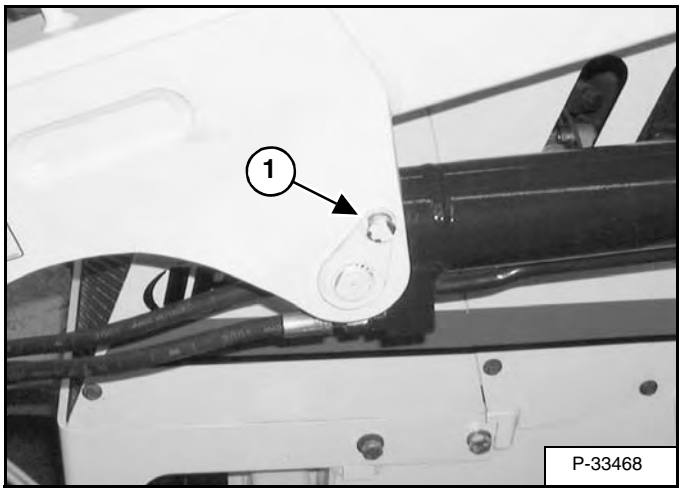


Figure 50-100-8

Position the lifting straps **[Figure 50-100-7]** and **[Figure 50-100-8]** and chain hoist in the arrangement shown to lift and support the lift arms.

Raise the hoist until the weight of the lift arm is supported by the hoist.

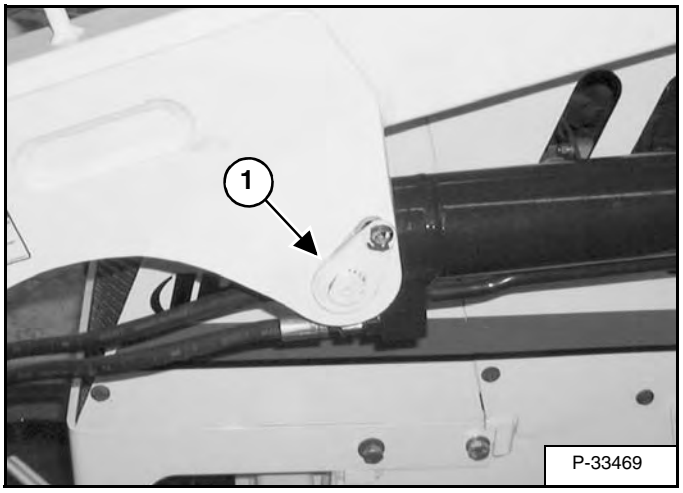
Figure 50-100-9



Remove the pivot pin retainer bolt (Item 1) **[Figure 50-100-9]** from the lift cylinder mount pin (both sides).

Installation: Tighten the bolt to 32-35 ft.-lb. (43-47 N•m) torque.

Figure 50-100-10

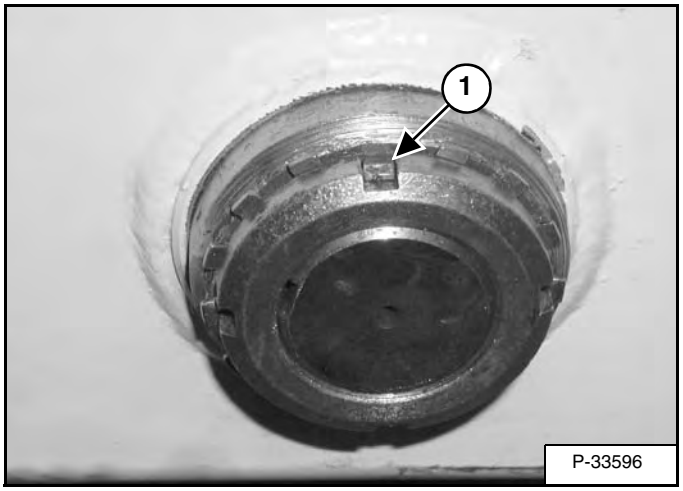


Remove the lift cylinder pivot pin (Item 1) **[Figure 50-100-10]** (both sides).

Pivot Bushing Removal And Installation

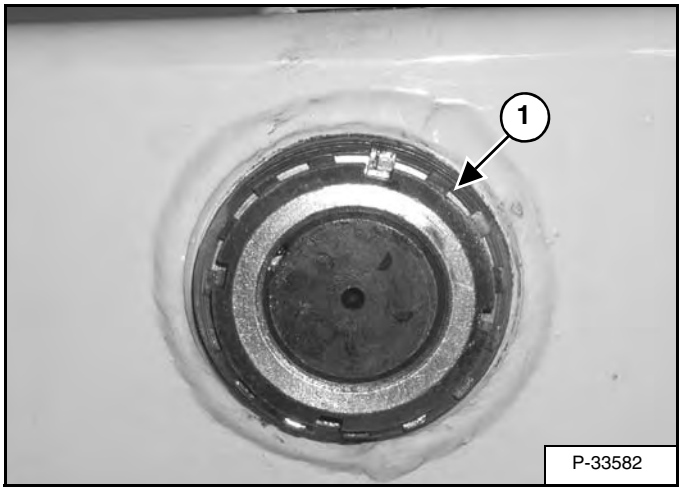
Remove the front axle. (See AXLE HUB (FRONT) on Page 50-130-1.)

Figure 50-120-6



Straighten the locking tab (Item 1) **[Figure 50-120-6]** up and out of the axle pivot pin lock nut.

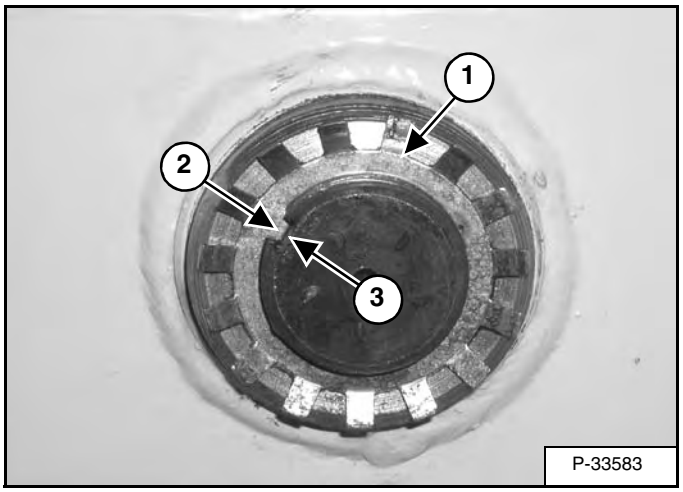
Figure 50-120-7



Remove the nut (Item 1) **[Figure 50-120-7]**.

Installation: Tighten the nut until the pivot pin does not move forward or back and the locking tab (Item 1) **[Figure 50-120-6]** aligns with the notch in the nut.

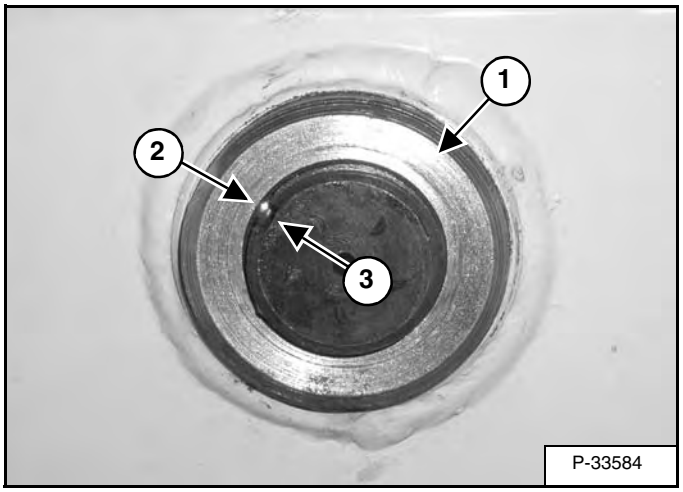
Figure 50-120-8



Remove the lock ring (Item 1) **[Figure 50-120-8]**.

Installation: Align the tab (Item 2) **[Figure 50-120-8]** on the lock ring with the groove (Item 3) **[Figure 50-120-8]** in the pin.

Figure 50-120-9



Remove the bushing (Item 1) **[Figure 50-120-9]**.

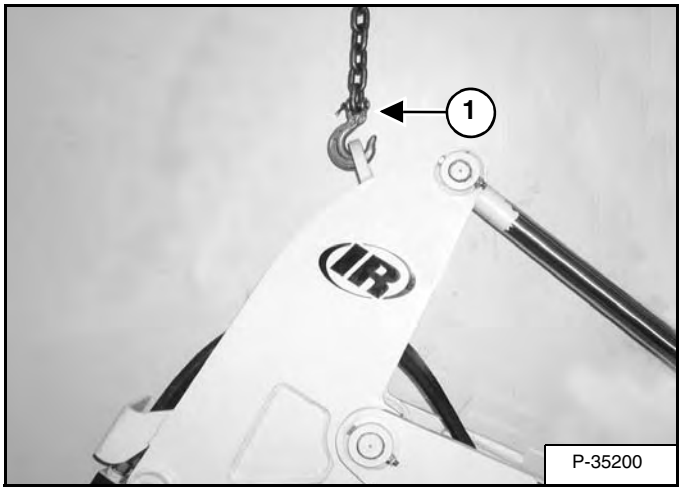
Installation: Align the tab (Item 2) **[Figure 50-120-9]** in the bushing with the groove (Item 3) **[Figure 50-120-9]** in the pin.

ARM

Removal And Installation

Set the bucket flat on the ground.

Figure 50-150-1

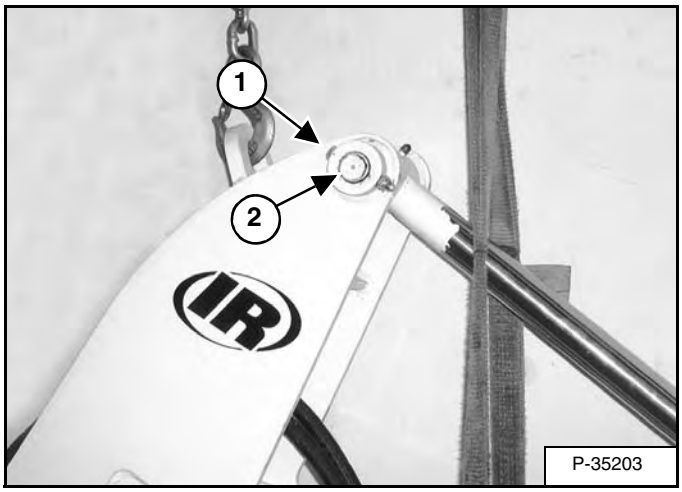


Support the boom wiht a hoist (Item 1) **[Figure 50-150-1]**.

Figure 50-150-2

Install a hoist on the arm **[Figure 50-150-2]**.

Figure 50-150-3



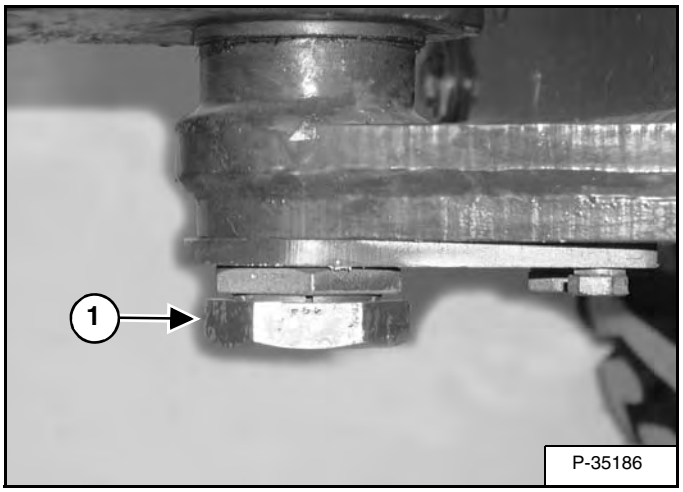
Remove the bolt (Item 1) **[Figure 50-150-3]** and nut. Remove the pin (Item 2) **[Figure 50-150-3]** from the rod end of the arm cylinder.

Installation: Tighten the bolt to 18-19 ft.-lb. (24-26 N•m) torque.

Retract the arm cylinder.

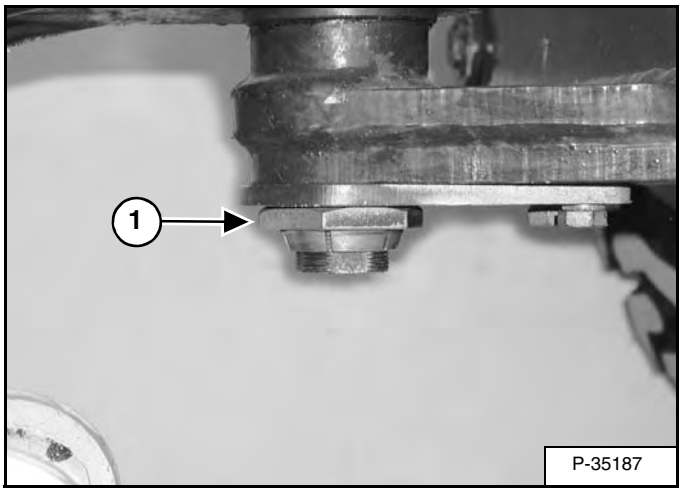
Removal And Installation (Cont'd)

Figure 50-170-6



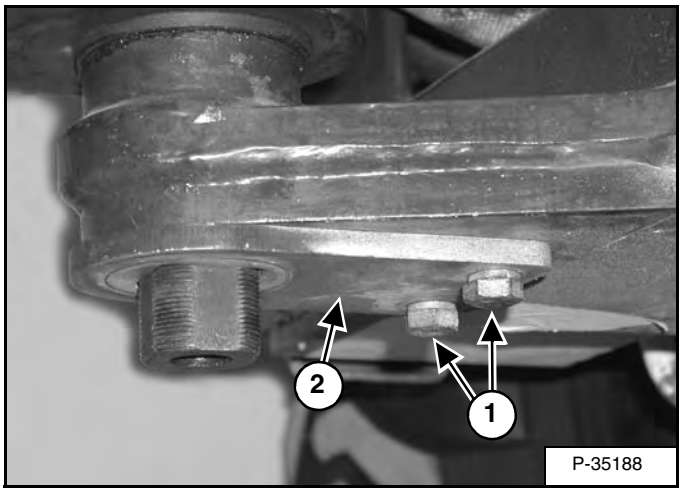
Remove the jam nut (Item 1) **[Figure 50-170-6]** from the bottom pivot pin.

Figure 50-170-7



Remove the lock nut (Item 1) **[Figure 50-170-7]**.

Figure 50-170-8

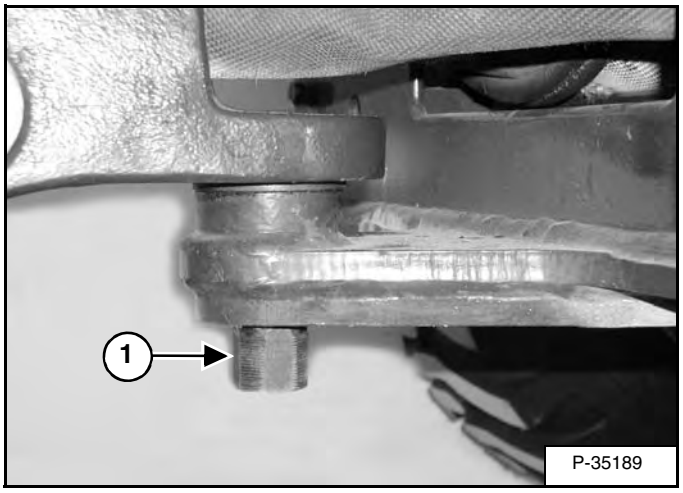


Remove the two bolts (Item 1) **[Figure 50-170-8]**.

Installation: Tighten the bolts to 55-60 ft.-lb. (75-85 N•m) torque.

Remove the plate (Item 2) **[Figure 50-170-8]**.

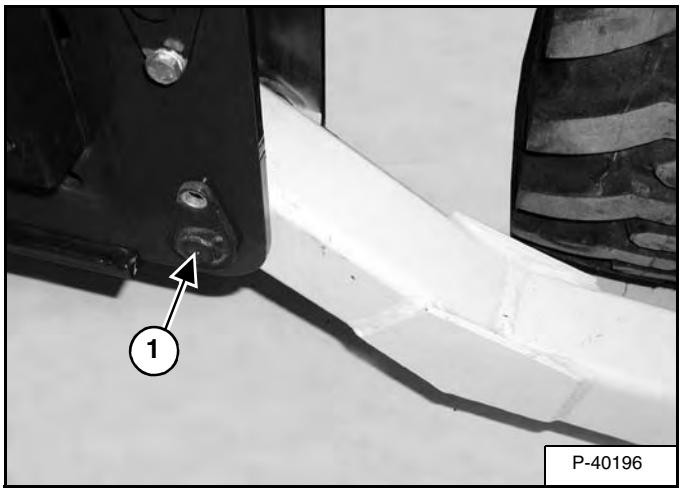
Figure 50-170-9



Remove the pin (Item 1) **[Figure 50-170-9]**.

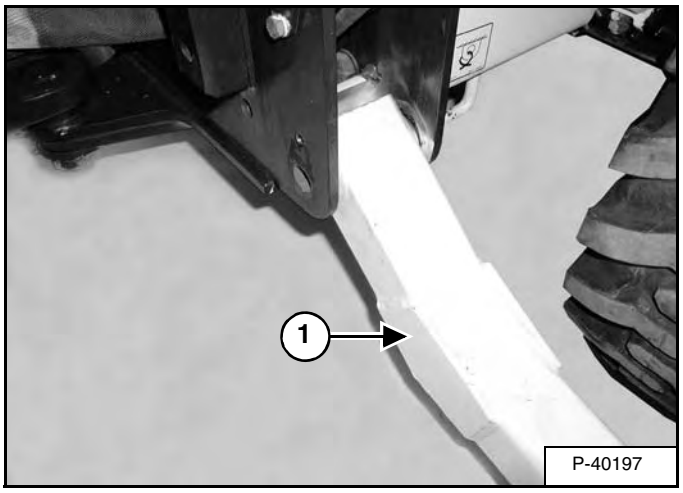
Removal And Installation (Cont'd)

Figure 50-200-9



Remove the pin (Item 1) **[Figure 50-200-9]**.

Figure 50-200-10



Remove the stabilizer (Item 1) **[Figure 50-200-10]**.

BATTERY (CONT'D)

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 co nnect and disconnect the battery cables.

The key must be OFF. The booster battery must be 12 volt.

⚠ WARNING

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 NO T induce vomiting. Get prompt medical attention.

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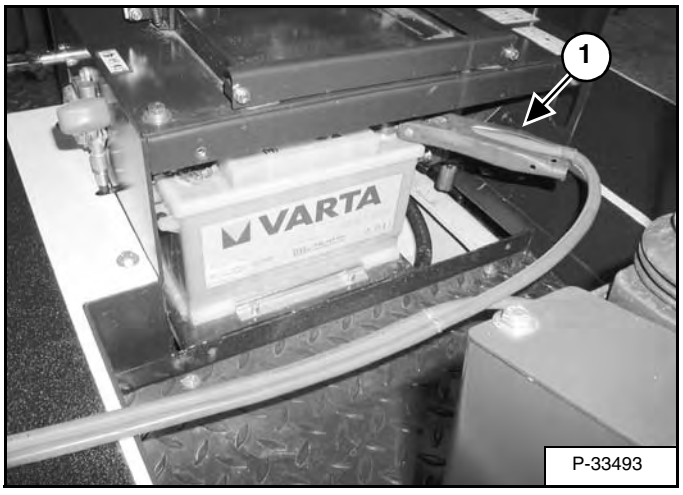
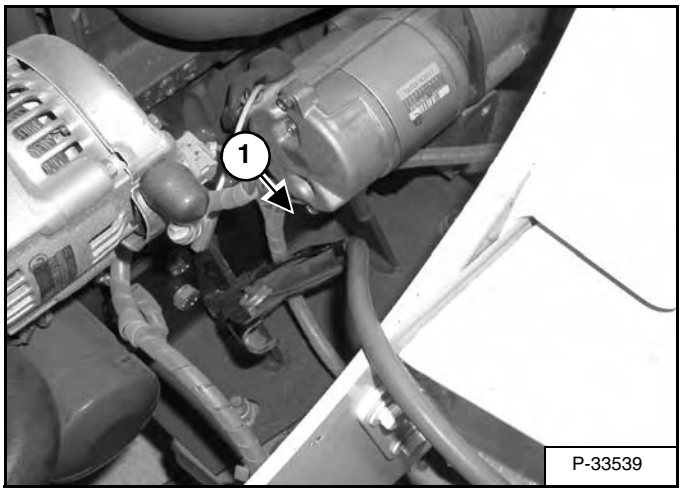
Remove the battery box cover.

Figure 60-20-7



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

Figure 60-20-8



Connect the end of the second cable to the negative (-) terminal of the booster battery. Connect the other end of the same cable (Item 1) **[Figure 60-20-8]** to the loader backhoe frame near the engine.

Start the engine.

⚠ WARNING

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

Do not jump s tart or charge a frozen or damaged battery. Warm battery to 60°F (16°C) before connecting to a charger. Unplug c harger 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-2066-1296

IMPORTANT

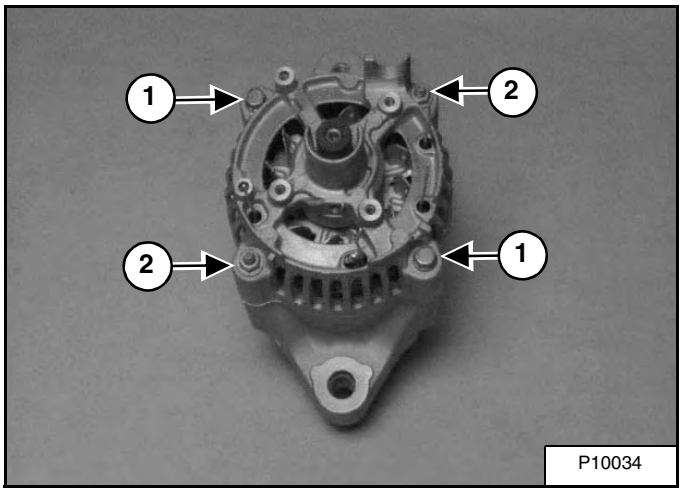
Damage to the alternator can occur if:

- **Engine is operated with ba ttery cables disconnected.**
- **Battery cables are connected when using a fast charger or when welding on the loader. (Remove both cables from the battery.)**
- **Extra battery cables (booster cables) are connected wrong.**

I-2023-1285

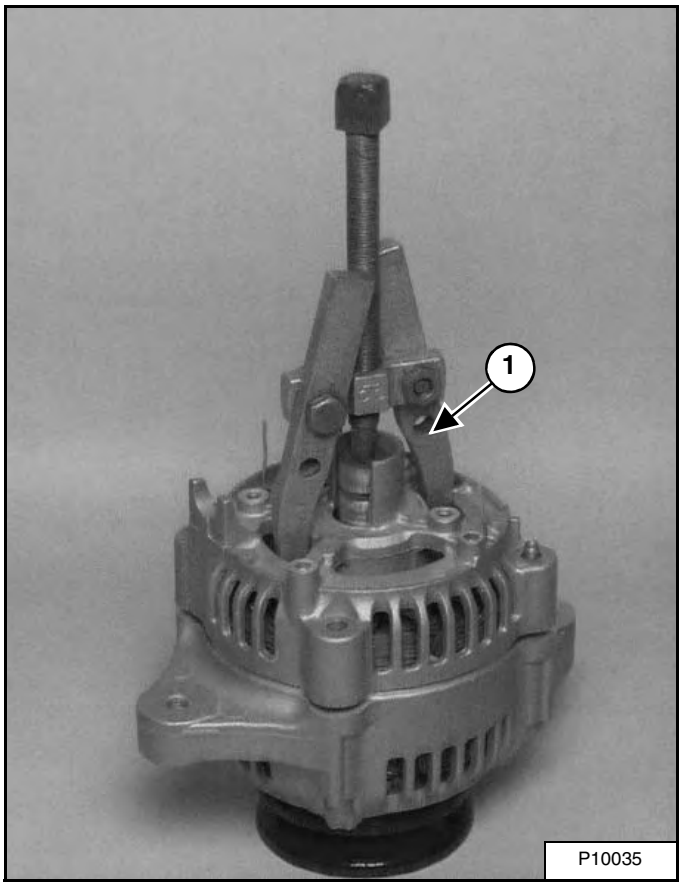
Disassembly And Assembly (Cont'd)

Figure 60-30-19



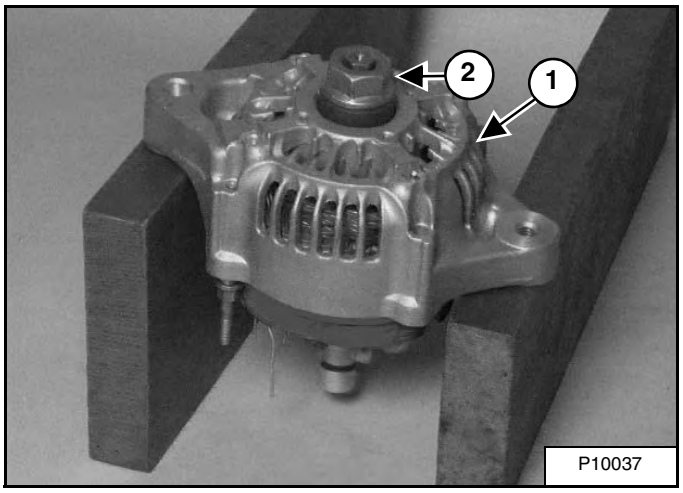
Remove the two bolts (Item 1) **[Figure 60-30-19]** and two nuts (Item 2) **[Figure 60-30-19]**.

Figure 60-30-20



Using a puller (Item 1) **[Figure 60-30-20]**, remove the rear housing as shown in **[Figure 60-30-20]**.

Figure 60-30-21

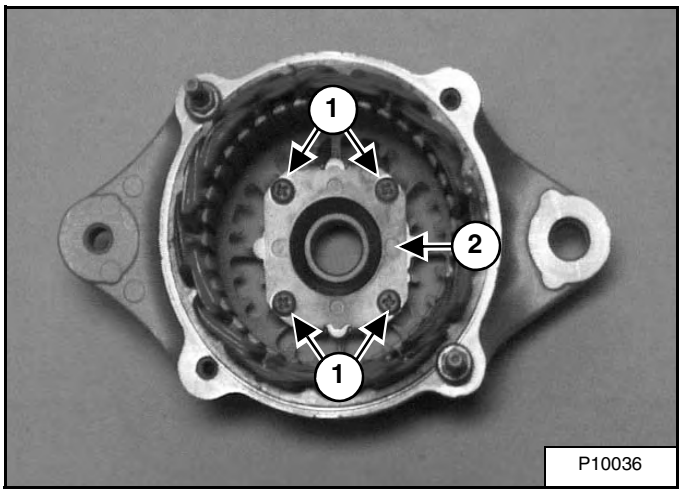


Support the alternator housing (Item 1) **[Figure 60-30-21]** on blocks.

With the nut (Item 2) **[Figure 60-30-21]** on the pulley shaft, tap the rotor out of the bearing. A press may be needed if the bearing is stuck to the rotor shaft.

NOTE: Care should be used not to damage the fan, slip ring, etc.

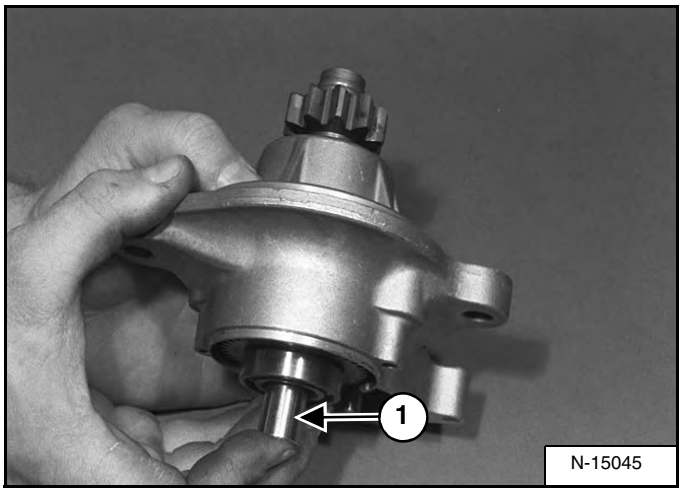
Figure 60-30-22



Remove the four screws (Item 1) **[Figure 60-30-22]** and remove the retainer plate (Item 2) **[Figure 60-30-22]**.

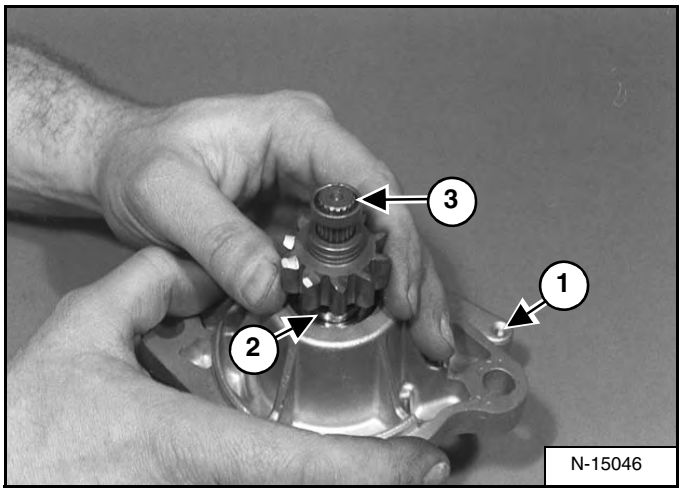
Disassembly (Cont'd)

Figure 60-40-17



Install the tube (Item 1) **[Figure 60-40-17]** in over the running clutch.

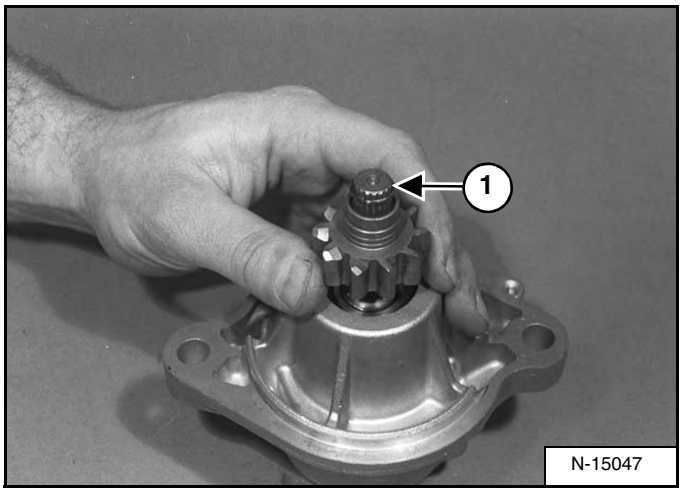
Figure 60-40-18



Press down on the starter carrier (Item 1) **[Figure 60-40-18]** to extend the pinion shaft. Press down on the pinion (Item 2) **[Figure 60-40-18]**.

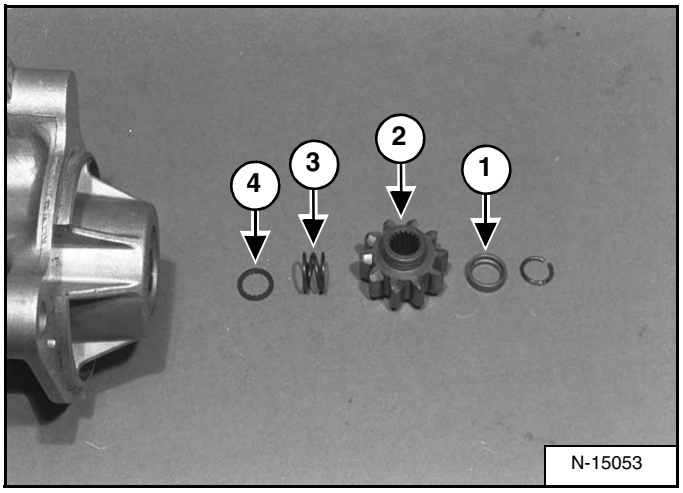
Press the collar (Item 3) **[Figure 60-40-18]** down to gain access to the snap ring.

Figure 60-40-19



Remove the snap ring (Item 1) **[Figure 60-40-19]**.

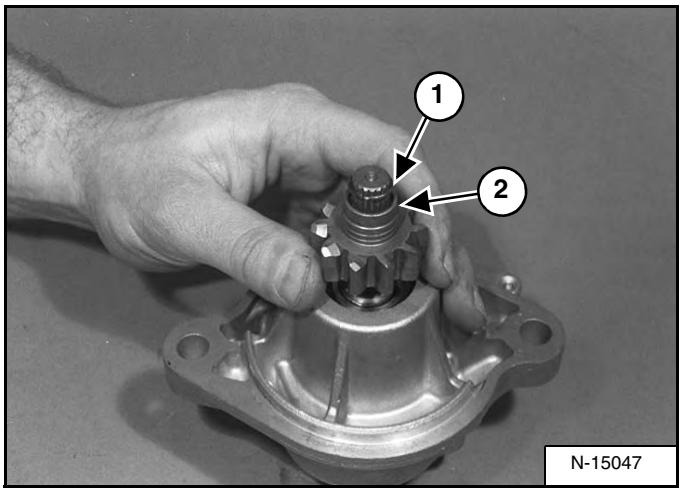
Figure 60-40-20



Remove the collar (Item 1) **[Figure 60-40-20]**, pinion (Item 2) **[Figure 60-40-20]** spring (Item 3) **[Figure 60-40-20]** and spring seat (Item 4) **[Figure 60-40-20]**.

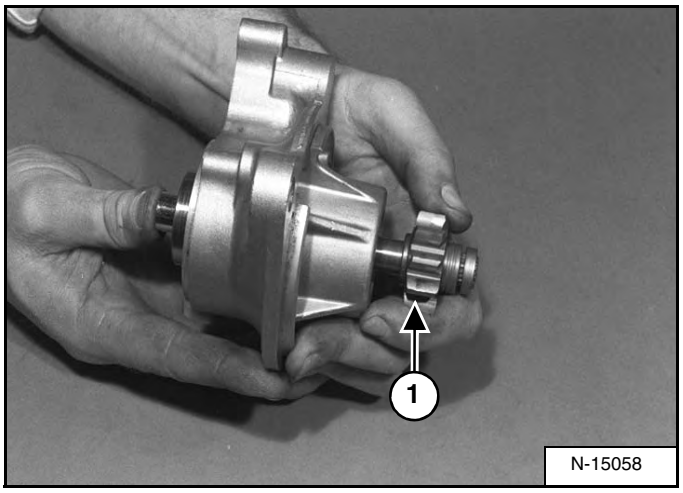
Assembly (Cont'd)

Figure 60-40-52



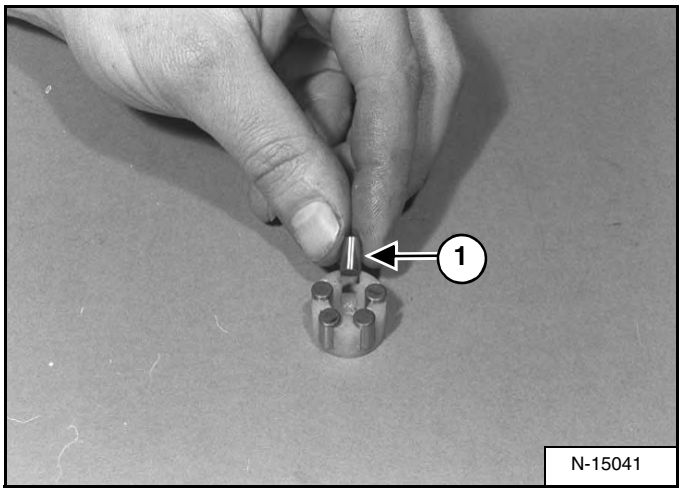
Install the snap ring (Item 1) **[Figure 60-40-52]**. Pull the collar (Item 2) **[Figure 60-40-52]** over the snap ring.

Figure 60-40-53



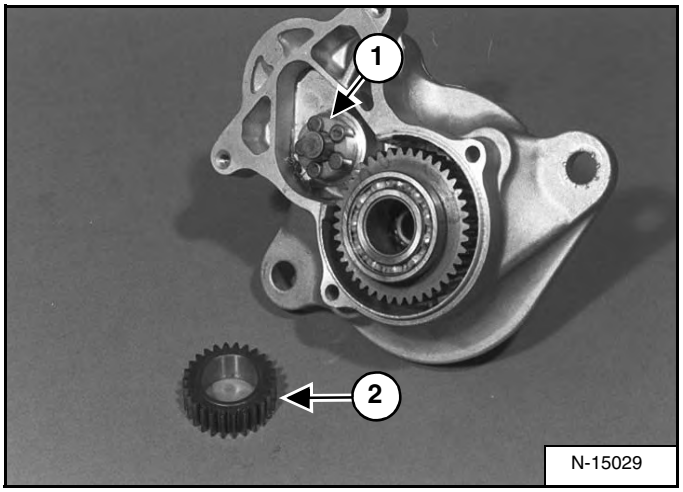
With the pinion shaft extended, extend and release the pinion (Item 1) **[Figure 60-40-53]**. The pinion must return to the fully retracted position.

Figure 60-40-54



Install the rollers (Item 1) **[Figure 60-40-54]** in th e retainer.

Figure 60-40-55



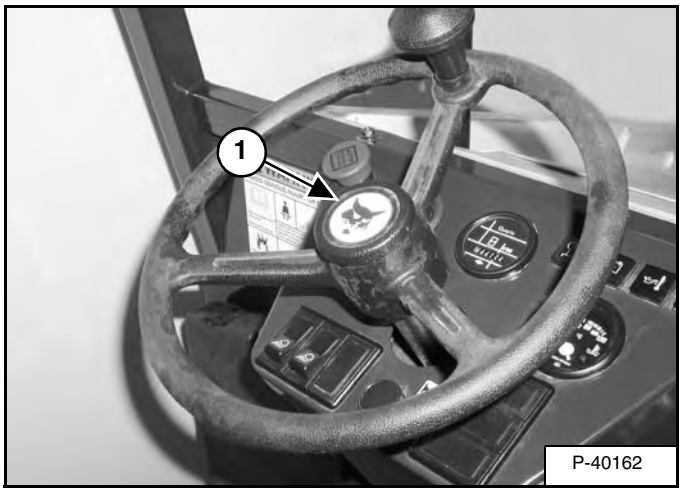
Install the roller/retainer assembly (Item 1) **[Figure 60-40-55]** on the starter housing.

Install the idler gear (Item 2) **[Figure 60-40-55]** over the roller/retainer assembly.

INSTRUMENT PANEL

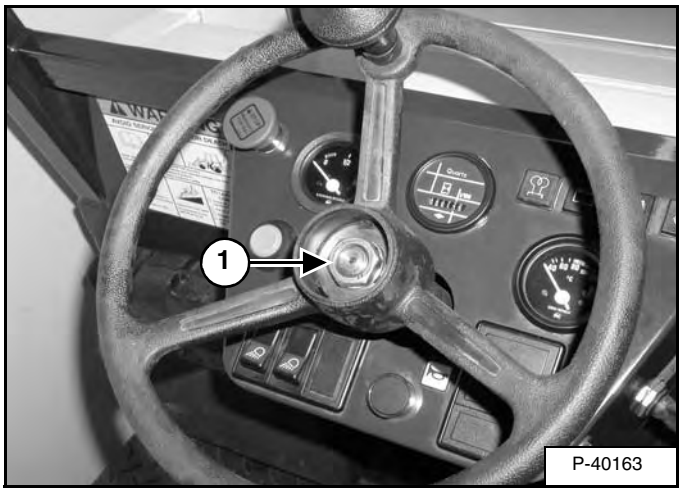
Removal And Installation

Figure 60-70-1



Remove the steering wheel cover (Item 1) **[Figure 60-70-1]**

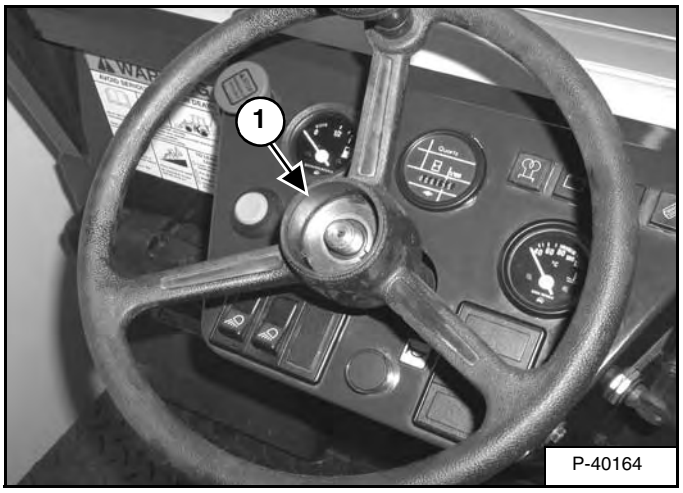
Figure 60-70-2



Remove the nut and washer (Item 1) **[Figure 60-70-2]**.

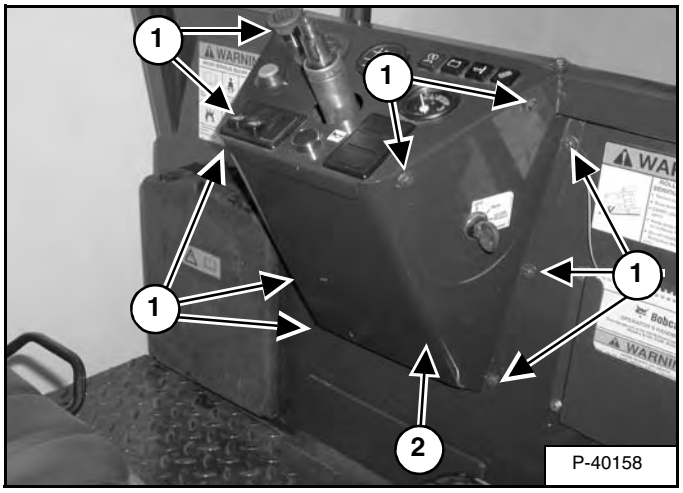
Installation: Tighten nut to 55-60 ft.-lb. (75-85 N•m) torque.

Figure 60-70-3



Remove the steering wheel (Item 1) **[Figure 60-70-3]**

Figure 60-70-4



Remove the ten lower cover bolts (Item 1) **[Figure 60-70-4]** and lower cover (Item 2) **[Figure 60-70-4]**.

Installation: Tighten bolts to 6-7 ft.-lb. (9-10 N•m) torque.

MUFFLER

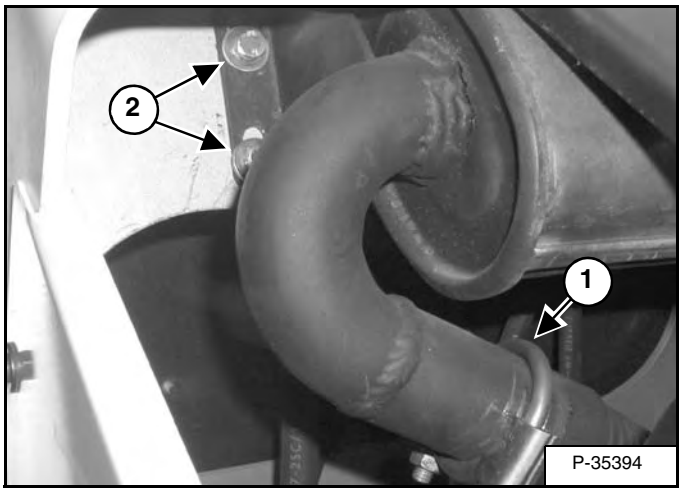
Removal And Installation

Raise the lift arm and install the approved lift arm support device.

Stop the engine, engage parking brake.

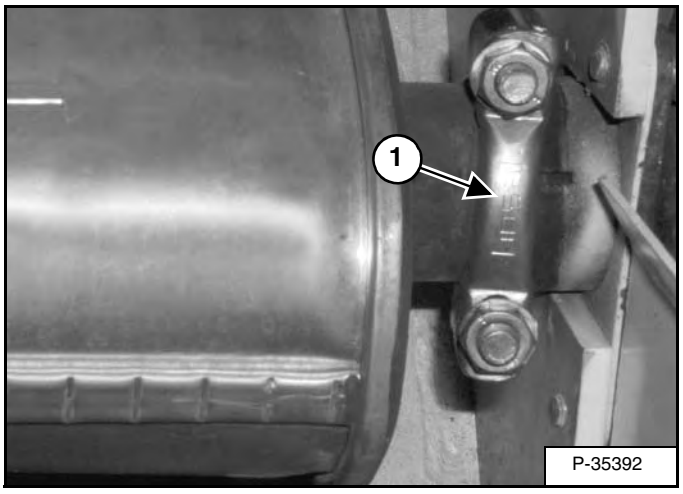
Open the engine cover.

Figure 70-30-1



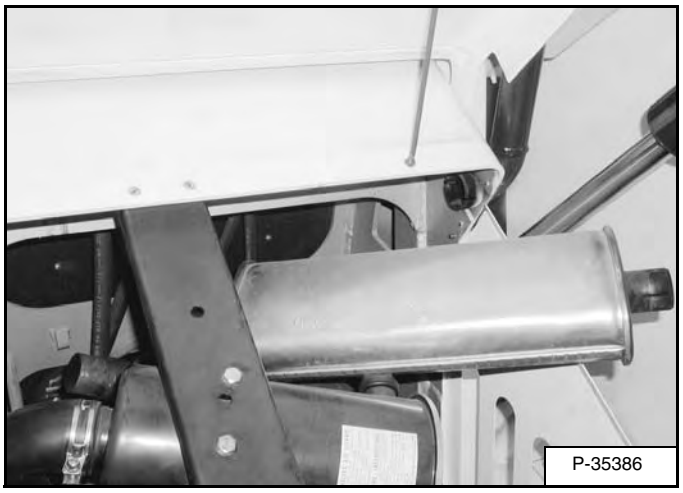
Remove the exhaust clamp (Item 1) **[Figure 70-30-1]** and remove the two mounting bolts (Item 2) **[Figure 70-30-1]**.

Figure 70-30-2



Remove the outlet exhaust pipe clamp (Item 1) **[Figure 70-30-2]**.

Figure 70-30-3



Remove the muffler **[Figure 70-30-3]**.

Checking Fuel Injection Pump

The injection pump contains parts which have a very close tolerance and its operation has a direct effect on the performance of the engine. Be sure to clean the area around the injection pump and injectors before removal to prevent contamination from dirt.

⚠ WARNING

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

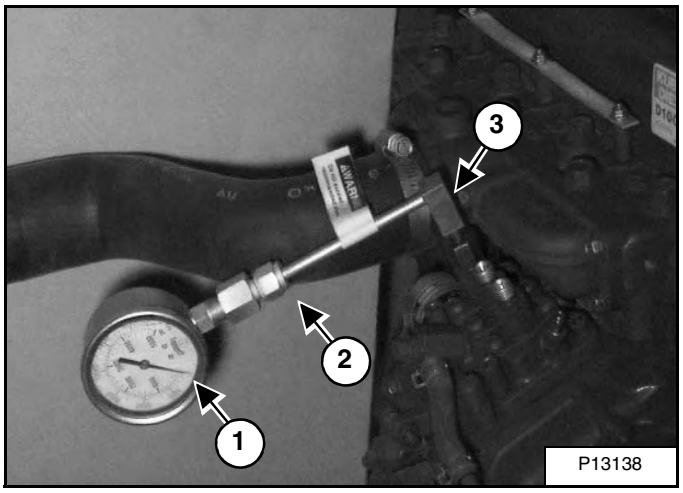
W-2072-0496

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

MEL1237-Adapter Fuel Line
MEL1173A-Pressure Gauge

To check the initial discarge pressure, remove the high pressure tubelines from the fuel injection pump. (See Fuel Injection Pump Removal And Installation on Page 70-60-6.)

Figure 70-60-13



Connect a pressure gauge (Item 1) **[Figure 70-60-13]** to the long leg of the test tubeline (Item 2) **[Figure 70-60-13]** and tighten.

Connect the short leg of the tubeline to the fitting at the fuel injection pump (Item 3) **[Figure 70-60-13]**.

Rotate the engine, with the starter, to increase the pressure 1990-2133 PSI (13721-14707 kPa).

With the pressure at 1990-2133 PSI (13721-14707 kPa), it should hold this for 5 seconds or more.

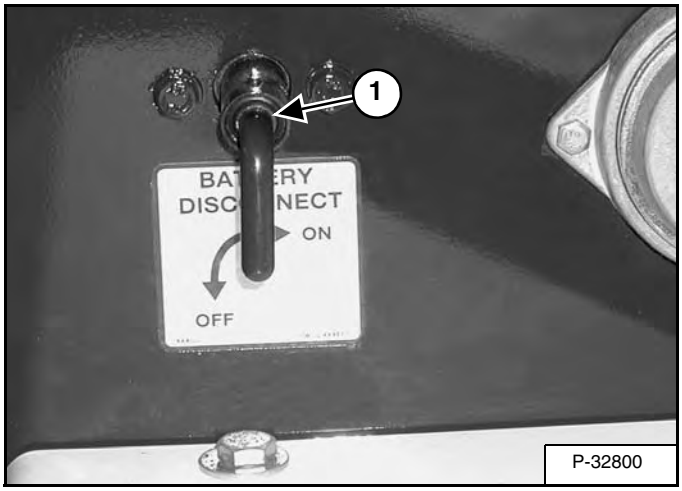
If the time is less than the allowable limit, replace the injection pump.

ENGINE

Removal And Installation

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

Figure 70-70-1



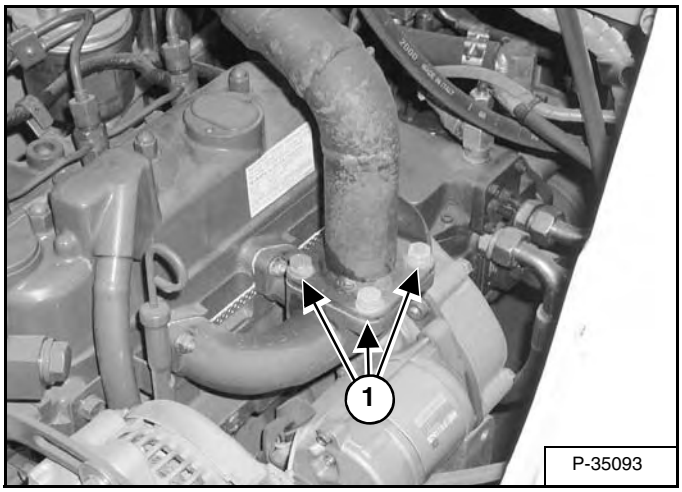
Rotate the battery disconnect switch (Item 1) **[Figure 70-70-1]** to the position shown, to d isconnect the power supply from the battery.

Remove the grill frame. (See GRILL FRAME on Page 50-50-1.)

Remove the air cleaner housing. (See AIR CLEANER on Page 70-40-1.)

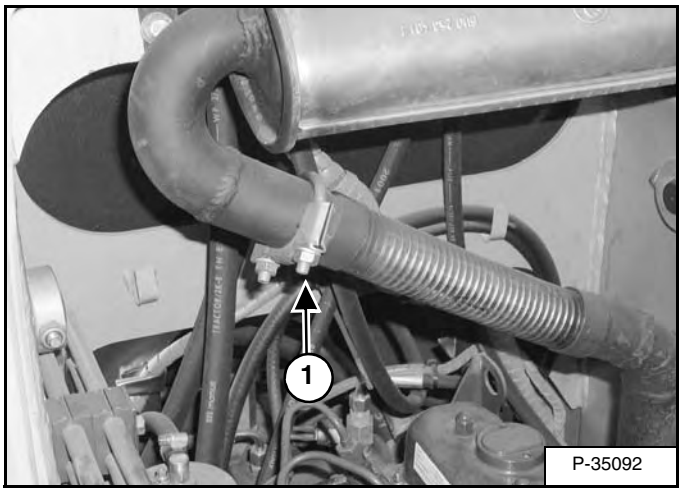
Remove the radiator. (See RADIATOR on Page 70-50-1.)

Figure 70-70-2



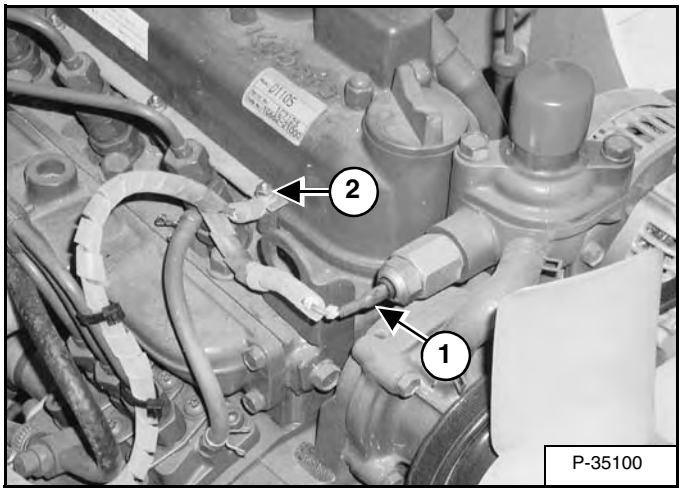
Remove the four mounting bolts (Item 1) **[Figure 70-70-2]** from the exhaust manifold.

Figure 70-70-3



Remove the clamp (Item 1) **[Figure 70-70-3]** and remove the exhaust pipe.

Figure 70-70-4



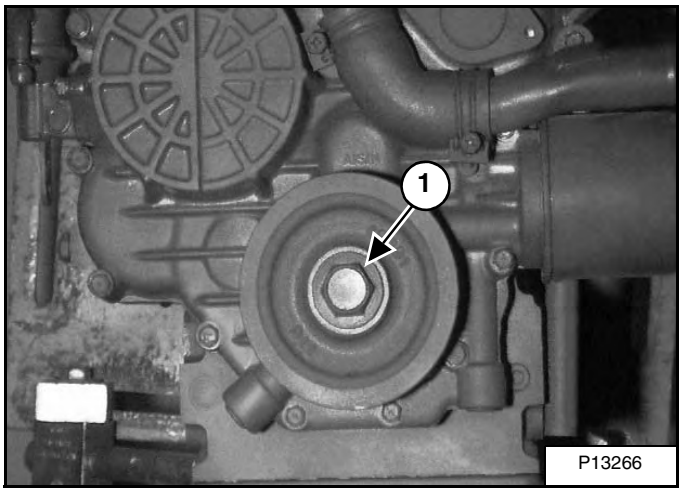
Disconnect the engine temperature wire (Item 1) **[Figure 70-70-4]**.

Disconnect the wire (Item 2) **[Figure 70-70-4]** from the glow plugs.

NOTE: Mark all wires for correct installation.

Crankshaft Front Seal Removal And Installation

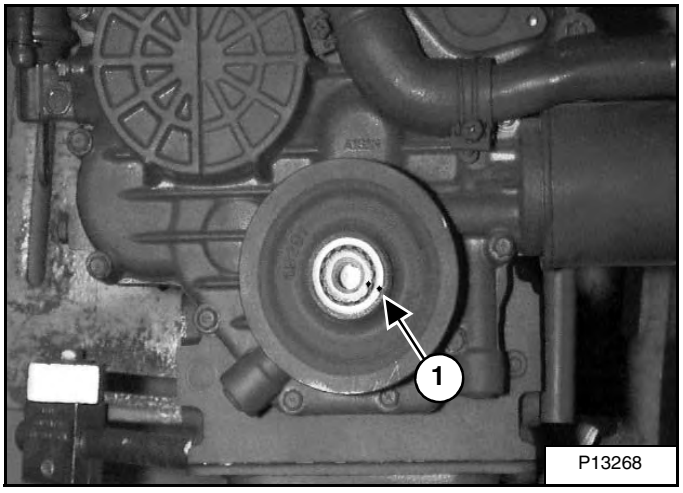
Figure 70-80-17



Remove the crankshaft pulley bolt (Item 1) **[Figure 70-80-17]** and remove the crankshaft pulley.

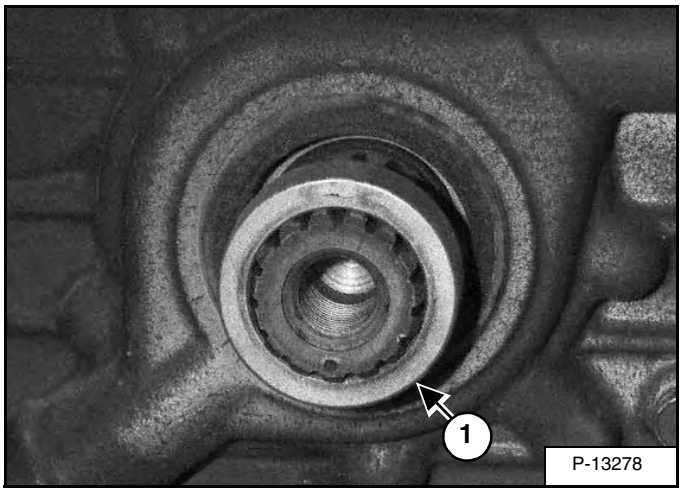
Installation: Tighten crankshaft pulley bolt to 101-116 ft.-lb. (137-157 N•m) torque.

Figure 70-80-18



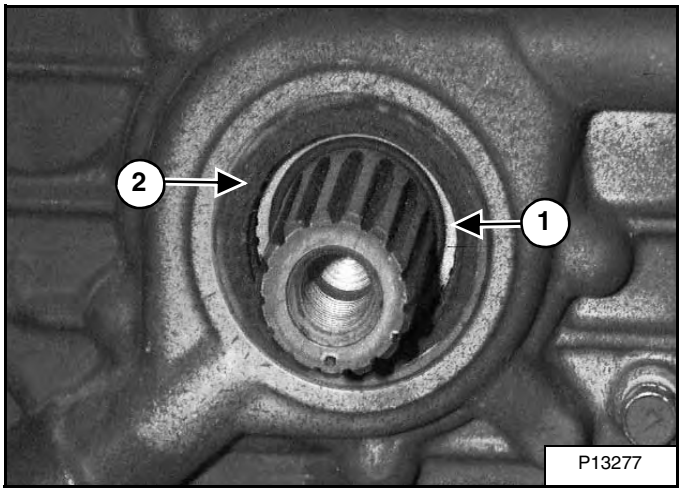
When installing the crankshaft pulley on the crankshaft, be sure the timing marks are aligned (Item 1) **[Figure 70-80-18]**.

Figure 70-80-19



Remove the crankshaft collar (Item 1) **[Figure 70-80-19]**.

Figure 70-80-20



Remove the O-ring (Item 1) **[Figure 70-80-20]** from the crankshaft.

Remove the front seal (Item 2) **[Figure 70-80-20]** from the timing gear case cover.

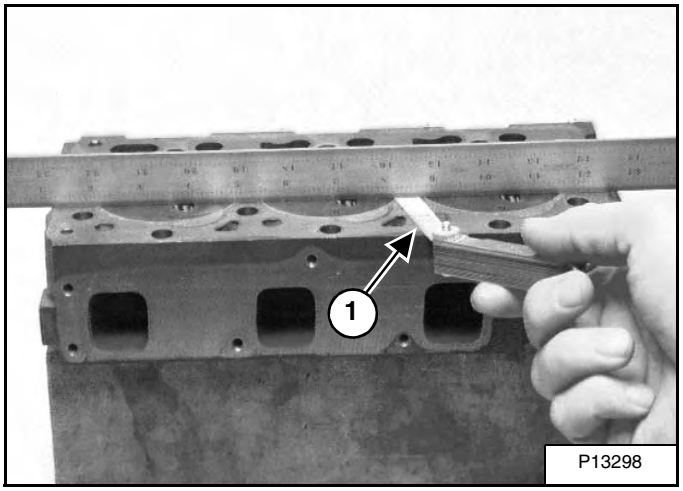
Replace the seal.

Replace the O-ring.

Servicing The Cylinder Head

Clean the surface of the cylinder head.

Figure 70-80-48



Put a straight edge on the cylinder head **[Figure 70-80-48]**.

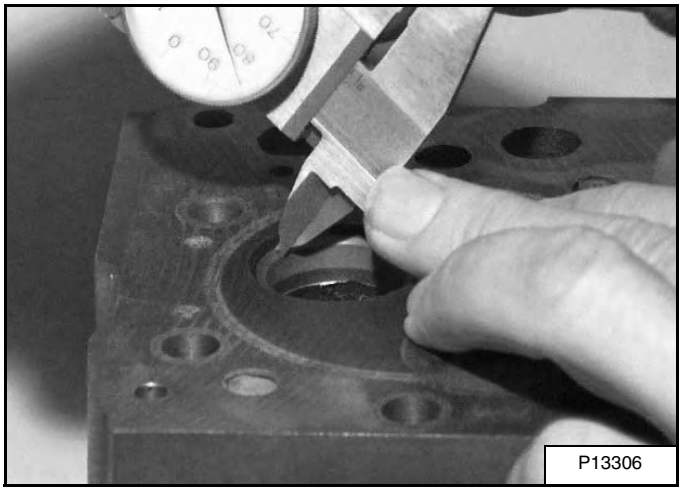
Put a feeler gauge (Item 1) **[Figure 70-80-48]** between the straight edge and the surface of the cylinder head.

The maximum distortion of the cylinder head surface is ± 0.0019 inch (± 0.05 mm).

If the measurement is more than the specification, remove the combustion chambers (See Combustion Chamber Removal And Installation on Page 70-80-18.), then grind the cylinder head.

Clean the surface of the valve seat area.

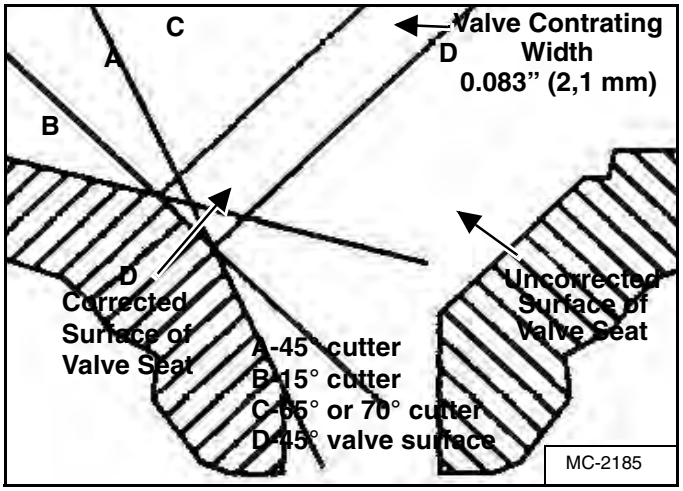
Figure 70-80-49



Measure the width of the valve seat **[Figure 70-80-49]**.

The correct width of the valve seat for both intake and exhaust, is 0.083 inch (2,1 mm). The seat angle is 45° for the exhaust valve and 60° for the intake valve.

Figure 70-80-50



Use the following steps to grind the valve seats **[Figure 70-80-50]**.

Item A-Use a 45° cutter to grind the surface of the valve seat.

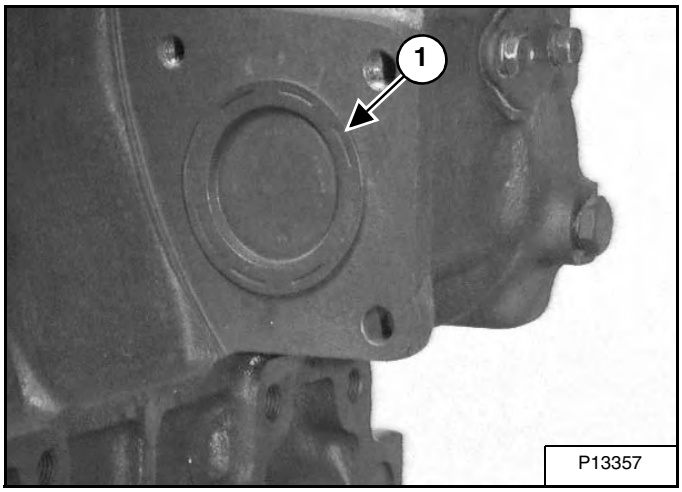
Item B-Use a 15° cutter to grind the front surface of the valve seat.

Item C-Use A 65° or 70° cutter to grind the rear surface of the valve seat to finish the seat of a 0.083 inch (2,1 mm) width.

Item D-Grind the valve surface to a 45° angle.

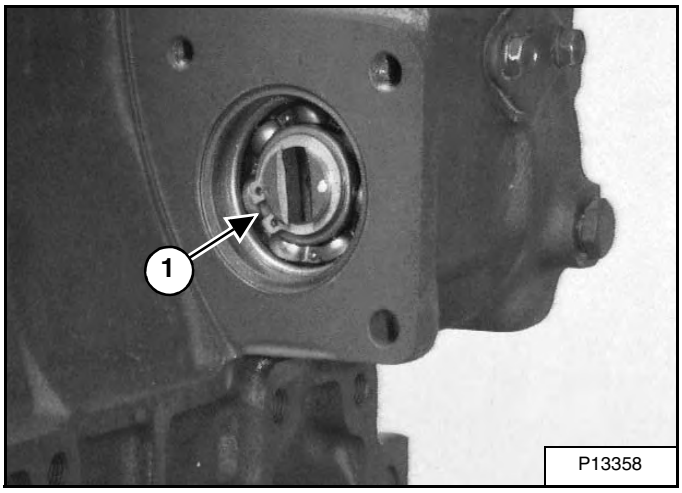
Governor Shaft Removal And Installation

Figure 70-80-80



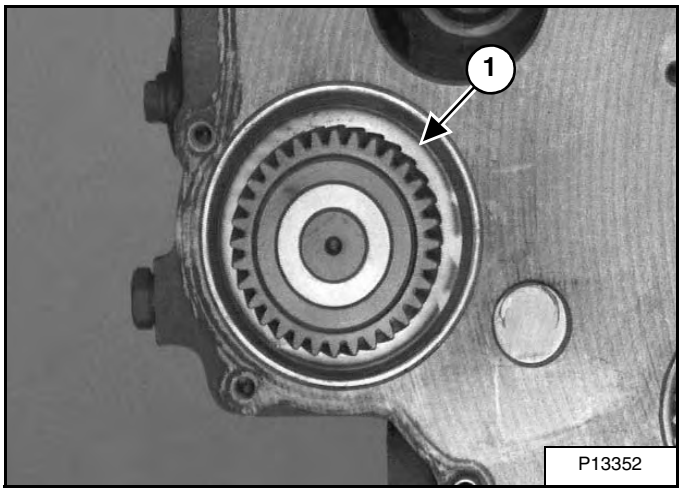
Remove the fuel camshaft plug (Item 1) **[Figure 70-80-80]** from the block.

Figure 70-80-81



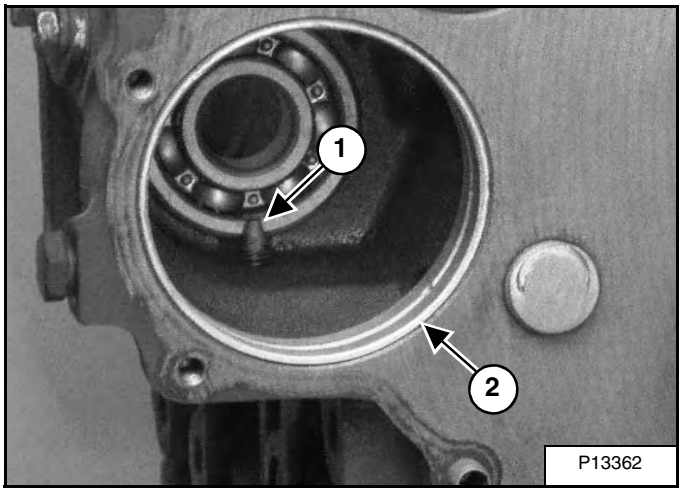
Remove the snap ring (Item 1) **[Figure 70-80-81]** from the governor shaft.

Figure 70-80-82



Remove the governor shaft assembly (Item 1) **[Figure 70-80-82]** from the front of the block.

Figure 70-80-83

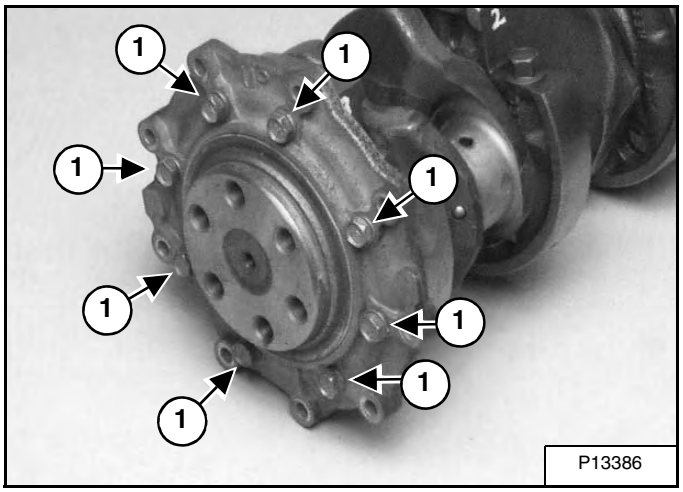


NOTE: The set screw (Item 1) [Figure 70-80-83] must be removed to remove the rear governor shaft bearing.

Check the governor gear bushing (Item 2) **[Figure 70-80-82]** and replace if needed.

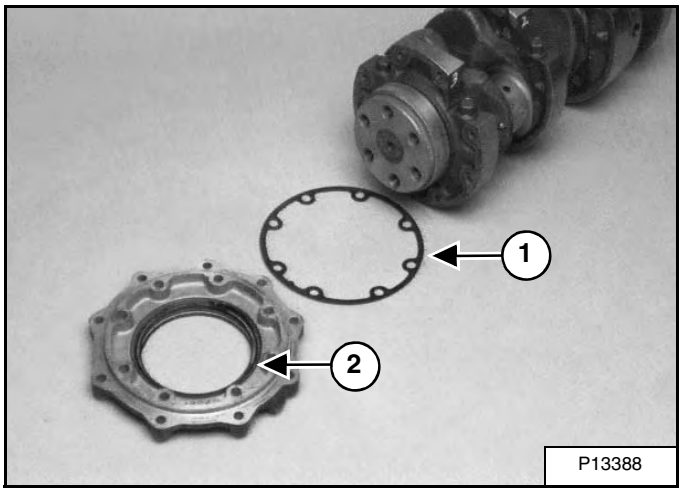
Crankshaft Removal And Installation (Cont'd)

Figure 70-80-111



Remove the eight mounting bolts (Item 1) **[Figure 70-80-111]** from the crankshaft bearing case cover and remove the cover.

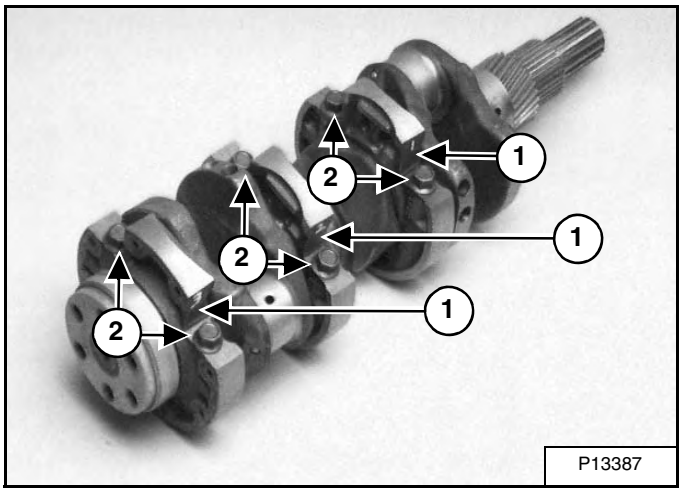
Figure 70-80-112



Replace the crankshaft bearing case cover gasket (Item 1) **[Figure 70-80-112]**.

Replace the oil seal (Item 2) **[Figure 70-80-112]**.

Figure 70-80-113



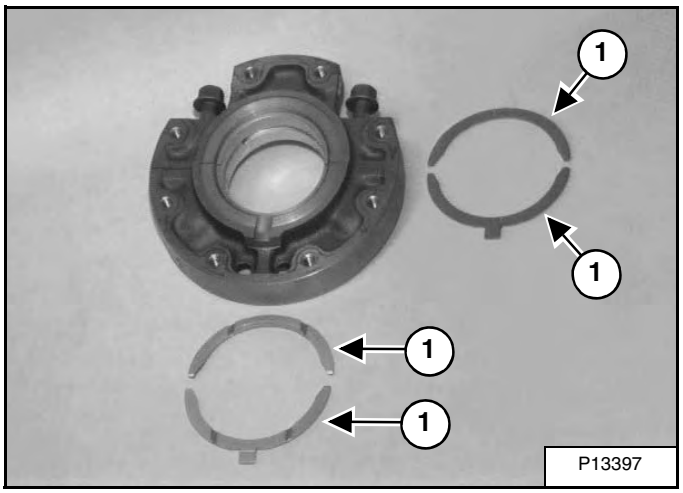
Mark the main bearing caps (Item 1) **[Figure 70-80-113]**.

Remove the main bearing cap bolts (Item 2) **[Figure 70-80-113]**.

Installation: Tighten the main bearing cap bolts to 22-25 ft.-lb. (24,4-34,3 N•m) torque.

NOTE: Since diameters of main bearings vary, install the caps back on the bearings as they are removed. Install them in the order they were marked from the gear case side. When installing the main bearing cap assemblies face the mark (FLYWHEEL) on the assemblies, toward the flywheel end of the crankshaft.

Figure 70-80-114



Check the thrust bearings (Item 1) **[Figure 70-80-114]**, located on the rear main bearing only, and replace if worn.

NOTE: When replacing the thrust bearings be sure to install the oil groove facing outward.

FLYWHEEL

Removal And Installation

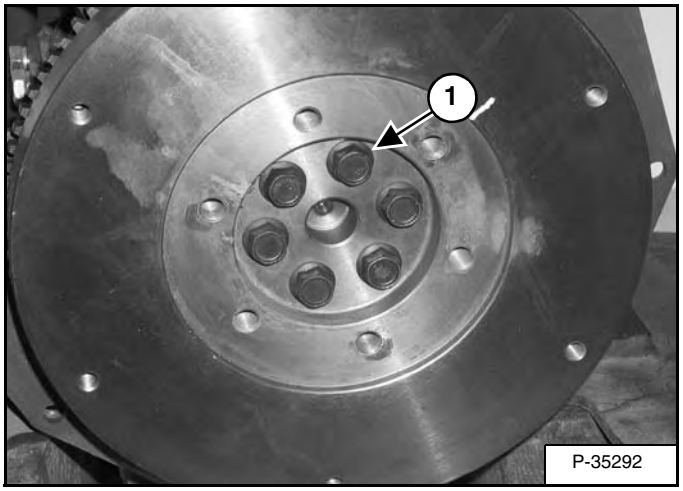
Remove the engine. (See Removal And Installation on Page 70-70-1.)

Remove the flywheel housing. (See FLYWHEEL HOUSING on Page 70-90-1.)

Remove the rubber drive coupler. (See RUBBER DRIVE COUPLER on Page 70-110-1.)

Mark the location of the flywheel for correct installation.

Figure 70-100-1



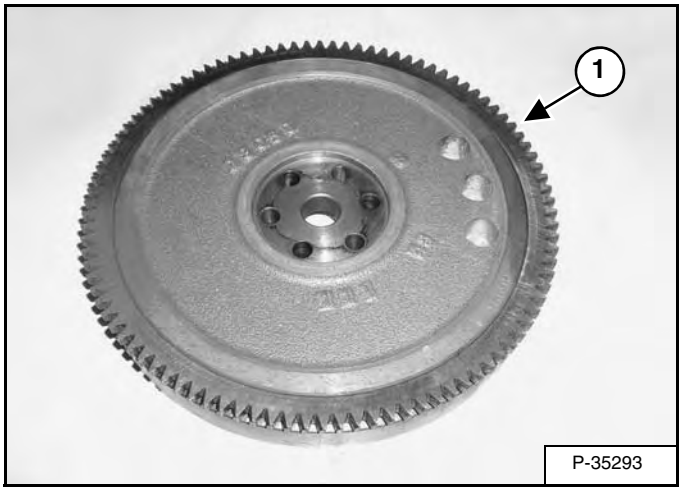
Remove the six flywheel mounting bolts (Item 1) **[Figure 70-100-1]**. Remove the flywheel.

Installation: Apply Loctite #242 or equivalant to the bolts and tighten to 40-43 ft.-lb. (54-59 N•m) torque.

Ring Gear Removal And Installation

NOTE: The lead chamfer on ring gear tooth must face the starter.

Figure 70-100-2



The ring gear (Item 1) **[Figure 70-100-2]** on the flywheel is an i nterference fit. Heat the ring gear enough to expand it and hit it with a hammer to remove it evenly.

Clean the outer surface of the flywheel to give it a smooth fit.

Clean the new ring gear and heat it to a ma ximum temperature of 428°F (220°C).

Fit the ring gear over the flywheel. Make sure the gear is on the seat correctly.

Hydraulic System

	B100
Pump Capacity @ 2615 Engine RPM (std)	10.7 GPM (40,5 L/min.
System Main Relief	2320-2900 PSI (17500 kPa)
Hydraulic Cylinders	
Bore Diameter:	
Boom Cylinder	2.5 (63)
Bucket Cylinder	2.5 (63)
Arm Cylinder	2.5 (63)
Lift Cylinder	2.5 (63)
Stabilizer Cylinder	2.2 (55)
Steering Cylinder	2.2 (55)
Swing Cylinder	2.2 (55)
Tilt Cylinder	2.2 (55)
Rod Diameter:	
Boom Cylinder	1.6 (40)
Bucket Cylinder	1.4 (36)
Arm Cylinder	1.4 (36)
Lift Cylinder	1.4 (36)
Stabilizer Cylinder	1.2 (30)
Steering Cylinder	1.0 (25)
Swing Cylinder	1.2 (30)
Tilt Cylinder	1.2 (30)
Stroke:	
Boom Cylinder	24.2 (615)
Bucket Cylinder	15 (380)
Arm Cylinder	15 (380)
Lift Cylinder	15.4 (390)
Stabilizer Cylinder	13 (330)
Steering Cylinder	6.5 (164)
Swing Cylinder	5.6 (141)
Tilt Cylinder	15 (380)

TORQUE SPECIFICATIONS FOR BOLTS

Torque For General Metric Bolts

THREAD SIZE (DIA. X PITCH)	MATERIAL		
	HEAD MARK 4	HEAD MARK 7	HEAD MARK 10
M 5 x 0.8		3-4 ft.-lb. (4-5 N•m)	
M 6 x 1.0		6-7 ft.-lb. (8-9 N•m)	6-9 ft.-lb. (8-12 N•m)
M 8 x 1.25	6-9 ft.-lb. (8-12 N•m)	11-16 ft.-lb. (15-22 N•m)	18-25 ft.-lb. (24-34 N•m)
M 10 x 1.25	13-18 ft.-lb. (18-24 N•m)	22-30 ft.-lb. (30-41 N•m)	36-50 ft.-lb. (49-68 N•m)
M 12 x 1.25	22-30 ft.-lb. (30-41 N•m)	40-54 ft.-lb. (54-73 N•m)	69-87 ft.-lb. (94-118 N•m)
M 14 x 1.5	36-50 ft.-lb. (49-68 N•m)	58-80 ft.-lb. (79-108 N•m)	116-137 ft.-lb. (157-186 N•m)

Bobcat®

SERVICE MANUAL REVISION

ROUTE TO ATTENTION	
PARTS MANAGER	☐
SERVICE MANAGER	☒
SALES MANAGER	☐

NOTICE **Insert This Sheet With The Above Listed Manual For Future Reference.**

Revision No: **B100-3**
Date: **March 1, 2003**
Product: **Bobcat Loader Backhoe**
Model: **B100**
Manual No: **6901844 (10-02)**

The following pages are a revision to the above Service Manual.

Take out existing pages and put in the new pages as listed below:

TAKE OUT	PUT IN	CHANGE DECRIPTION
ALPHABETICAL INDEX	ALPHABETICAL INDEX	Revised text
10-50-1 & 10-50-2	10-50-1 & 10-50-2	Revised text
20-01 through 20-04	20-01 through 20-04	Revised text
20-50-1 through 20-50-18	20-50-1 through 20-50-18	Revised text
	20-71-1 through 20-71-4	Added text
20-80-1 through 20-80-6	20-80-1 through 20-80-6	Revised text
30-01 & 30-02	30-01 & 30-02	Revised text
30-10-1 & 30-10-2	30-10-1 & 30-10-2	Revised text
30-30-1 through 30-30-14	30-30-1 through 30-30-14	Revised text
	30-50-1 through 30-5-4	Added text
60-01 & 60-02	60-01 & 60-02	Revised text
SPEC 10-1 through SPEC 10-4	SPEC 10-1 through SPEC 10-4	Revised text

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