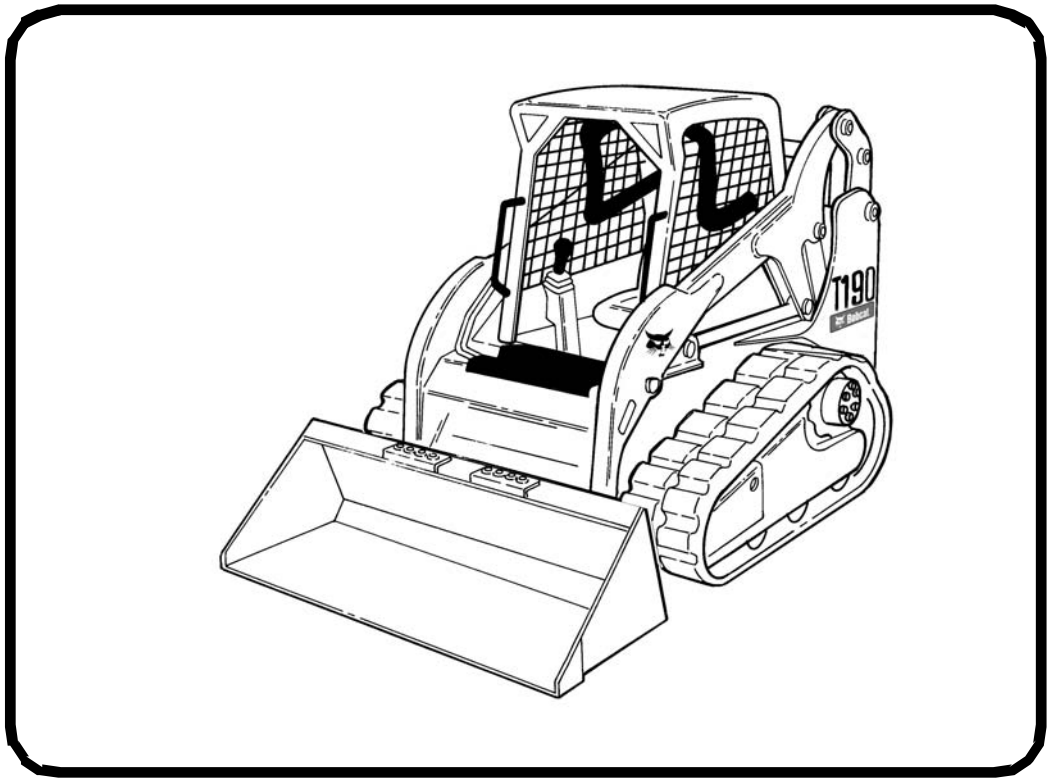
Bobcat®

Service Manual
T190 Compact Track Loader

S/N A3LN11001 & Above
S/N A3LP11001 & Above



EQUIPPED WITH BOBCAT INTERLOCK CONTROL SYSTEM (BICS™)

6987052enUS (07-14) (R)

Printed in U.S.A.

FW SSL-1008 SM

LIFTING AND BLOCKING THE LOADER

Procedure

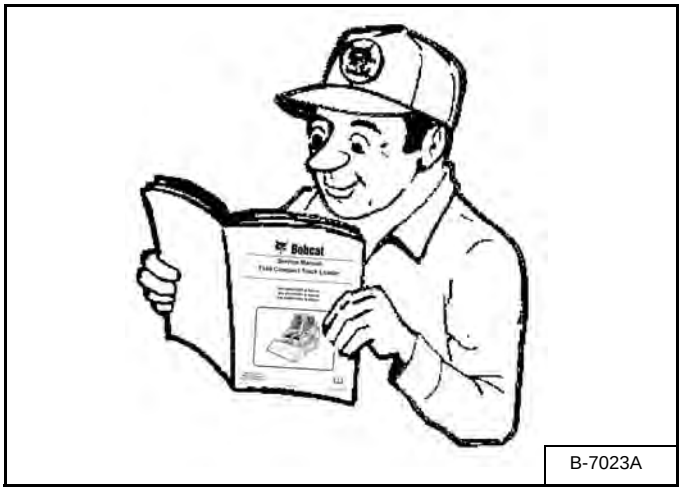
⚠ WARNING

AVOID INJURY OR DEATH

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-2003-0807

Figure 10-10-1

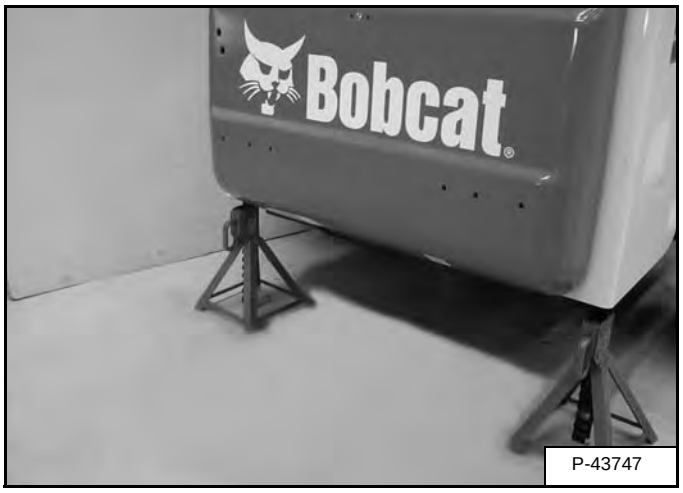


⚠ WARNING

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

W-2017-0286

Figure 10-10-2

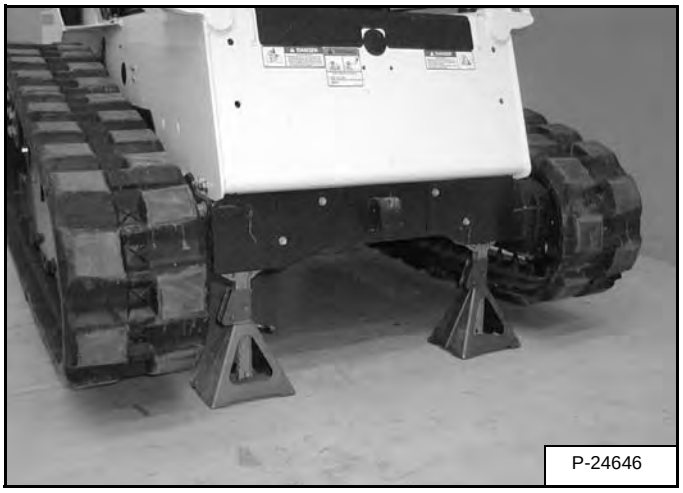


Always park the loader on a level surface.

Put floor jack under the rear of the loader **[Figure 10-10-2]**.

Lift the rear of the loader and install jackstands **[Figure 10-10-2]**.

Figure 10-10-3



Put the floor jack under the front of the loader **[Figure 10-10-3]**.

Lift the front of the loader and put jackstands under the axle tubes **[Figure 10-10-3]**.

NOTE: Make sure the jackstands do not touch the tracks. Make sure the tracks clear the floor or any obstacles.

TOWING THE LOADER

Procedure

Because of the design of the loader, there is not a recommended towing procedure.

- The loader can be lifted onto a transport vehicle.

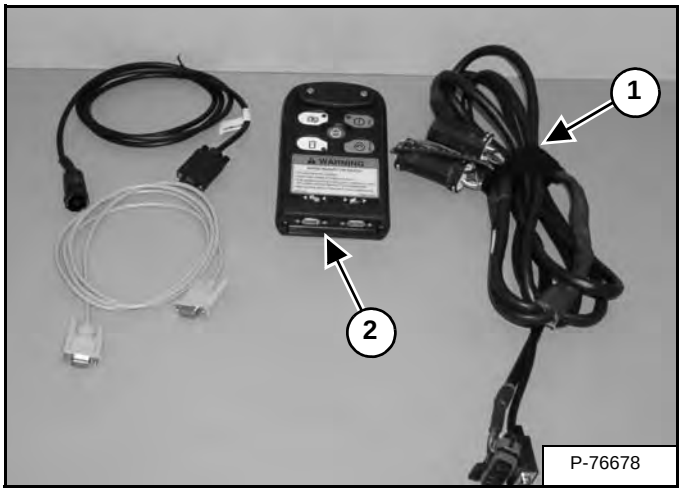
- The loader can be skidded a short distance to move for service (EXAMPLE: Move onto a transport vehicle.) without damage to the hydrostatic system. (The tracks will not turn.) There might be slight wear to the tracks when the loader is skidded.

The towing chain (or cable) must be rated at 1.5 times the weight of the loader. (See Performance on Page SPEC-10-2.)

REMOTE START TOOL (SERVICE TOOL) KIT - 7003031 (CONT'D)

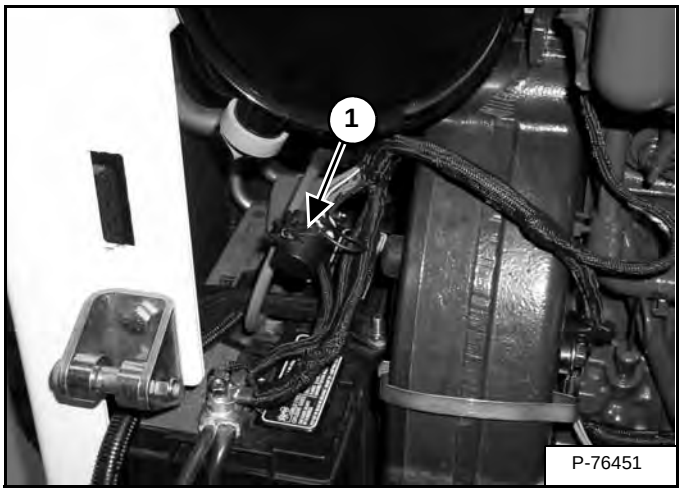
Loader Service Tool Harness - 6689747

Figure 10-61-3



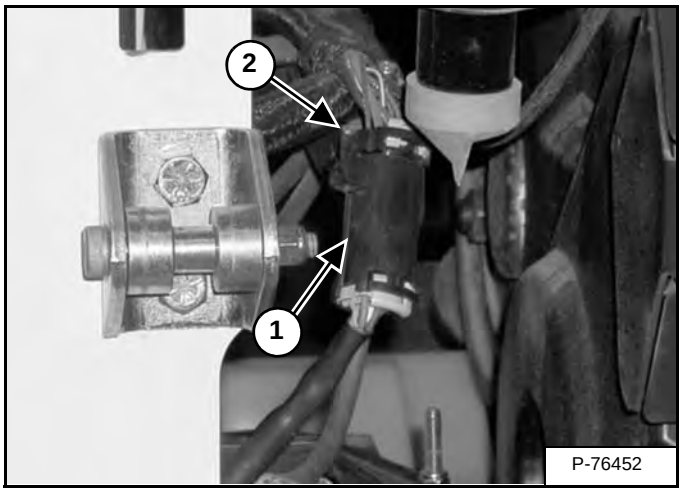
The loader service tool harness (Item 1) **[Figure 10-61-3]** is used to connect the remote start tool (service tool) (Item 2) **[Figure 10-61-3]** to the electrical system on the loader.

Figure 10-61-4



Loaders without an attachment control harness, remove the loader harness cap (Item 1) **[Figure 10-61-4]** and connect the Loader Service Tool Harness from the Remote Start Tool (Service Tool).

Figure 10-61-5



Loaders with an attachment control harness (7 pin or 14 pin), the attachment harness (Item 1) must be disconnected from the loader harness (Item 2) **[Figure 10-61-5]**.

When the remote start procedure is completed, replace the loader connector cap (Item 1) **[Figure 10-61-4]** or reconnect the attachment control harness to the loader harness **[Figure 10-61-5]**.

ENGINE COOLING SYSTEM

Check the cooling system every day to prevent overheating, loss of performance or engine damage.

⚠ WARNING

AVOID INJURY OR DEATH

Wear safety glasses to prevent eye injury when any of the following conditions exist:

- **When fluids are under pressure.**
- **Flying debris or loose material is present.**
- **Engine is running.**
- **Tools are being used.**

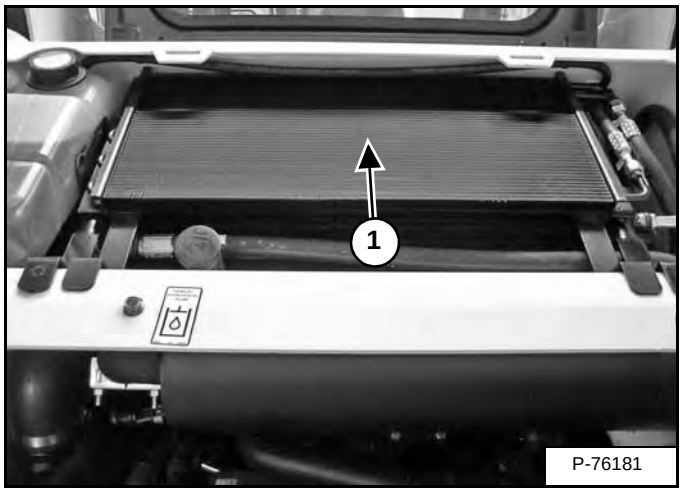
W-2019-0907

Cleaning

Open the rear door. (See REAR DOOR (TAILGATE) on Page 50-70-1.)

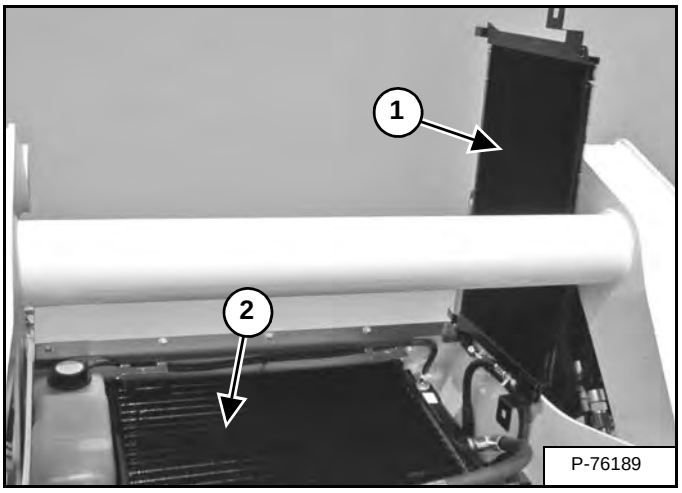
Remove the rear grille. (See REAR GRILLE on Page 50-60-1.)

Figure 10-90-1



Use low air pressure or water pressure to clean the top of the air conditioning condenser (Item 1) **[Figure 10-90-1]**, if equipped.

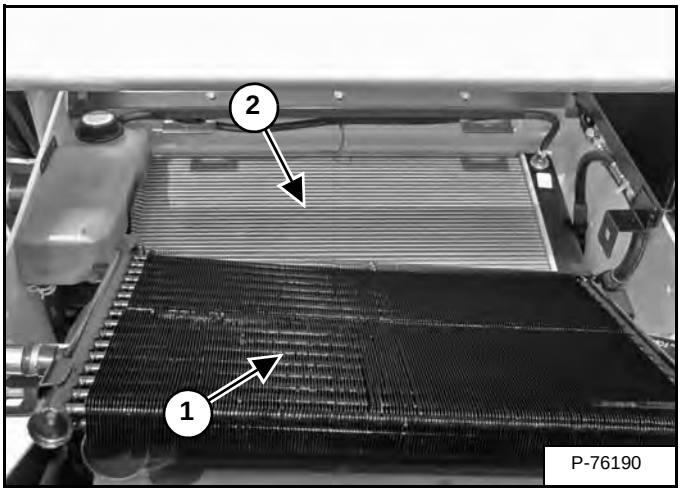
Figure 10-90-2



NOTE: Be careful when raising and lowering the air conditioning condenser so that the air conditioning condenser does not fall on the oil cooler and damage the fins.

Raise the air conditioning condenser (Item 1) and use low air pressure or water pressure to clean the top of the oil cooler (Item 2) **[Figure 10-90-2]**.

Figure 10-90-3



NOTE: Be careful when raising and lowering the oil cooler so that the oil cooler does not fall on the radiator and damage the fins.

Raise the oil cooler (Item 1) and use low air pressure or water pressure to clean the top of the radiator (Item 2) **[Figure 10-90-3]**.

Lower the oil cooler.

Lower the air conditioning condenser, if equipped.

Install the fasteners and lower the overflow tank. Check the cooling system for leaks.

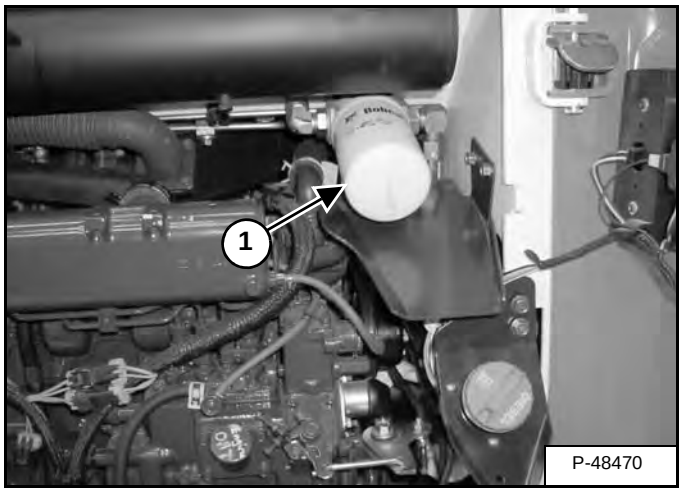
Install the rear grille and close the rear door.

Removing And Replacing Hydraulic / Hydrostatic Filter

For the correct service interval (See SERVICE SCHEDULE on Page 10-70-1.)

Open the rear door.

Figure 10-120-5



Remove the filter (Item 1) **[Figure 10-120-5]**.

Clean the surface of the filter housing where the filter seal contacts the housing.

Put clean oil on the seal of the new filter element. Install and hand tighten the filter element.

⚠ WARNING

AVOID INJURY OR DEATH

Always clean up spilled fuel or oil. Keep heat, flames, sparks or lighted tobacco away from fuel and oil. Failure to use care around combustibles can cause explosion or fire.

W-2103-0508

Close the rear door.

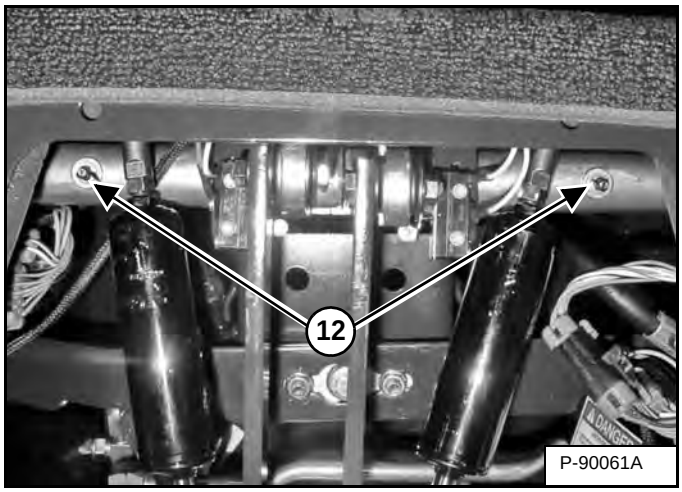
Start the engine and operate the loader hydraulic controls.

Stop the engine and check for leaks at the filter.

Check the fluid level in the reservoir and add as needed. (See Checking And Adding Fluid on Page 10-120-1.)

Lubrication Locations (Cont'd)

Figure 10-140-8



NOTE: SJC equipped machines do not have a steering lever shaft.

12. **250 Hours:** Steering Lever Shaft (2) **[Figure 10-140-8]**.

EMERGENCY EXIT

The front opening on the operator cab and rear window provide exits.

Rear Window

Figure 10-190-1

Pull on the tag on the top of the rear window to remove the rubber cord **[Figure 10-190-1]**.

Push the rear window out of the rear of the operator cab.

Figure 10-190-2

Exit through the rear of the operator cab **[Figure 10-190-2]**.

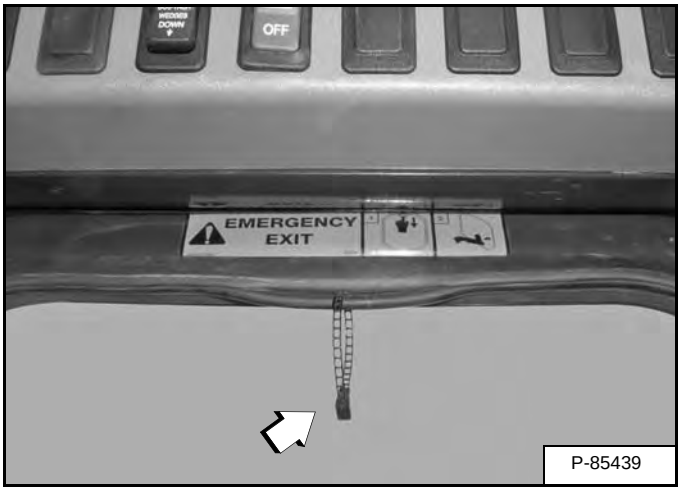
Front Door

This machine may be equipped with a front door.

NOTE: When an Operator Cab Enclosure Kit is installed, the window of the front door can be used as an emergency exit. [Figure 10-190-3]

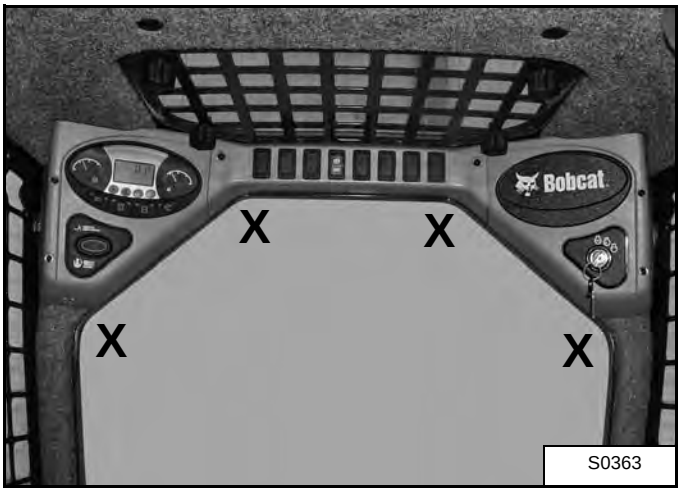
NOTE: If the loader has a Special Application Door Kit installed, the window of the front door is NOT an emergency exit.

Figure 10-190-3



Pull the plastic loop at the top of the window in the front door to remove the rubber cord **[Figure 10-190-3]**.

Figure 10-190-4



Push the window out with your foot at any corner of the window **[Figure 10-190-4]**.

Exit through the front door.

HYDRAULIC/HYDROSTATIC SCHEMATIC
T190 (S/N A3LN11001 AND ABOVE)
(S/N A3LP11001 AND ABOVE)

Printable Version Click Here

(PRINTED MARCH 2008)
V-1176legend

LEGEND

1. RESERVOIR:
   Capacity . . . . . 19.2 Qts. (18,2 L)
2. SPRING LOADED FILTER BY-PASS VALVE: 45-55 PSI (3,1-3,8 Bar)
3. DIFFERENTIAL PRESSURE SWITCH:
   36-44 PSI (2,5-3,0 Bar)
   Normally Closed
4. DRIVE MOTOR SHUTTLE VALVE
5. RELIEF/REPLENISHING VALVE - HIGH PRESSURE: 5000 PSI (345 Bar)
6. RELIEF VALVE - CHARGE INLET:
   360 PSI (24,8 Bar)
   at High Engine Idle
   With 140 degrees F. (60 degrees C.) Fluid
7. FRONT AUXILIARY MANUAL PRESSURE BLEED-OFF VALVE
8. HYDRAULIC PUMP . . . . . Gear Type
   16.3 GPM (61,6 L/min.) at High Engine Idle
9. RELIEF VALVE - MAIN:
   3250-3350 PSI (224-231 Bar)
   at Front Quick Couplers
10. RELIEF/ANTICAVITATION VALVE - PORT 3500 PSI (241,3 Bar)
11. ANTICAVITATION VALVE
12. SOLENOID ACTIVATED DIRECTIONAL CONTROL VALVE - AUXILIARY
13. RELIEF/ANTICAVITATION VALVE - PORT (OPTIONAL) 3500 PSI (241,3 Bar)
14. LOAD CHECK VALVE
15. LIFT CYLINDER SPOOL - MADE TO RESTRICT FLOW DURING BOOM DOWN BUT NOT DURING BOOM UP
16. SOLENOID ACTIVATED DIRECTIONAL CONTROL VALVE - BICS CONTROL
17. PILOTED ACTIVATED DIRECTIONAL CONTROL VALVE - TILT CONTROL
18. PILOTED ACTIVATED DIRECTIONAL CONTROL VALVE - LIFT CONTROL
19. PULL BUTTON ACTIVATED DIRECTIONAL CONTROL VALVE - LIFT ARM BY-PASS
20. PILOTED ACTIVATED DIRECTIONAL CONTROL VALVE - UNLOADING SPOOL
21. PILOTED ACTIVATED DIRECTIONAL CONTROL VALVE - FLOW CONTROL SPOOL
22. FLOW DIVIDER ADJUSTMENT VALVE
23. SOLENOID ACTIVATED DIRECTIONAL CONTROL VALVE - BASE
24. SOLENOID ACTIVATED DIRECTIONAL CONTROL VALVE - ROD
25. LOAD SHUTTLE VALVE - BLEED OFF
26. SOLENOID ACTIVATED DIRECTIONAL CONTROL VALVE - TWO COIL
27. PILOT ACTIVATED DIRECTIONAL CONTROL VALVE - REAR AUXILIARY
28. RESTRICTOR - 0.140 inch (3,6 mm)
29. RESTRICTOR - 0.031 inch (0,8 mm)
30. RELIEF VALVE: 3300 PSI (228 Bar)
31. FILTER - HYDRAULIC (CANISTER)
32. FILTER - CASE DRAIN (SINTERED BRONZE)
33. FILTER - BICS CONTROL VALVE (SCREEN)
34. CHECK VALVE - BUCKET POSITION VALVE
35. RESTRICTION
36. VARIABLE CAPACITY DISPLACEMENT BIDIRECTIONAL HYDROSTATIC PUMP
37. SHUTTLE RELIEF VALVE
    (Not Adjustable - Factory Set)
    65 PSI (4,5 Bar)
38. FIXED CAPACITY DISPLACEMENT BIDIRECTIONAL HYDROSTATIC MOTOR
39. CHECK VALVE - With 80 PSI (5,5 Bar) Spring
40. SOLENOID ACTIVATED DIRECTIONAL CONTROL VALVE - BUCKET POSITION VALVE (ON/OFF)
41. CHECK VALVE - BICS CONTROL VALVE
42. CHARGE PUMP -
    12.8 GPM (48,5 L/min) at High Engine Idle
43. CHECK VALVE - With 300 PSI (20,7 Bar) Spring And With 0.016 inch (0,40 mm) Orifice
44. PILOT ACTIVATED DIRECTIONAL CONTROL VALVE - HYDRAULIC POWERED BOB-TACH
45. RESTRICTION - 0.089 inch (2,26 mm)
46. RESTRICTION - 0.025 inch (0,6 mm)
47. RELIEF VALVE - 2000 PSI (137 Bar)
48. RELIEF VALVE - 1200 PSI (83 Bar)
49. SOLENOID ACTIVATED DIRECTIONAL CONTROL VALVE (TWO COIL)
50. FIXED CAPACITY DISPLACEMENT HYDRAULIC MOTOR
51. ANTICAVITATION VALVE
52. PROPORTIONAL RELIEF VALVE – (Fan Speed Regulator):
    1566 - 1784 PSI (108 - 123 bar)
53. FILTER - BOB-TACH VALVE
54. RESTRICTION - 0.343 inch (8,73 mm)
55. CHECK VALVE
56. SOLENOID ACTIVATED DIRECTIONAL CONTROL VALVE - BRAKE
57. HYDRAULIC BRAKE - SPRING APPLIED - PRESSURE RELEASE

NOTE: Unless otherwise specified springs have NO significant pressure value.

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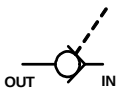
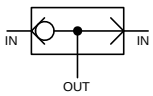
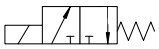
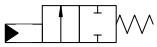
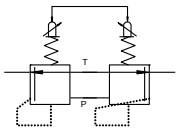
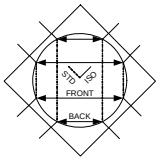
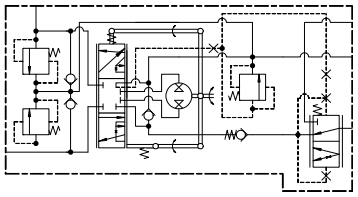
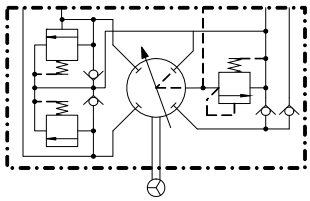
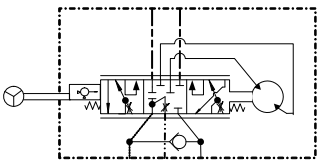
Glossary Of Hydraulic / Hydrostatic Symbols (Cont'd)

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, Lock 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.

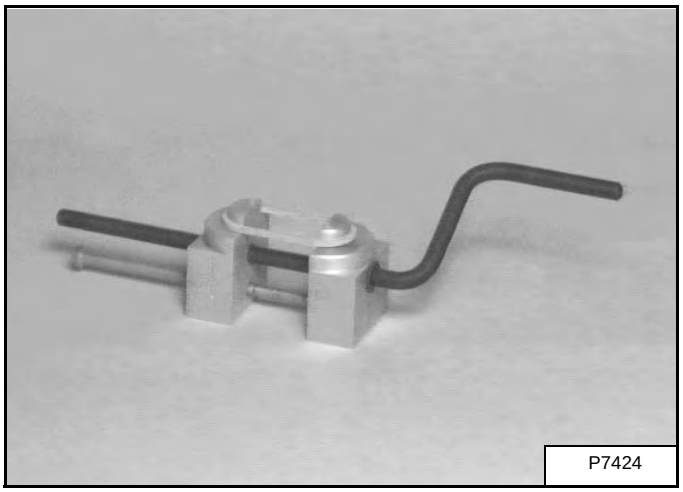
SYMBOL	DESCRIPTION
	DIRECTIONAL CONTROL VALVE: Valve providing for the opening (fully or restricted) or the closing of one or more flow paths (represented by several squares).
	TWO PORTS and CLOSED FLOW PATHS
	SOLENOID ACTIVATED DIRECTIONAL CONTROL VALVE (Two Position) - controlled by an electric solenoid (with return spring).
	PILOT ACTIVATED DIRECTIONAL CONTROL VALVE (Two Position) - controlled by pressure (with return spring).
	MANUALLY ACTIVATED DIRECTION CONTROL VALVE (Variable Position) Joystick Controlled, variable pressure to shift the pilot activated directional control valve spool.
	MANUALLY ACTIVATED FLOW CONTROL VALVE (Two Position) allows for changing pilot flow to control switching joystick functions for STD / ISO Control (Excavators Only).
	STEERING CONTROL VALVE (Variable Position) - Used for controlling the hydraulic flow for the steering cylinders in relationship to the amount the steering wheel is rotated.





Disassembly And Assembly (Cont'd)

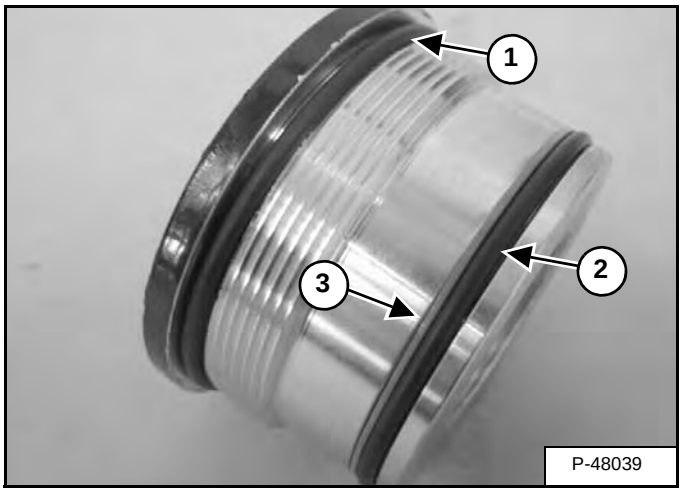
Figure 20-20-13



Assembly: Install the new seal on the tool and slowly stretch it until it fits the piston **[Figure 20-20-13]**. Allow the seal to stretch for 30 seconds before installing it on the piston.

Once the seal is installed on the piston, a piston ring compressor can be used on the piston for 3 minutes to compress the seal into place.

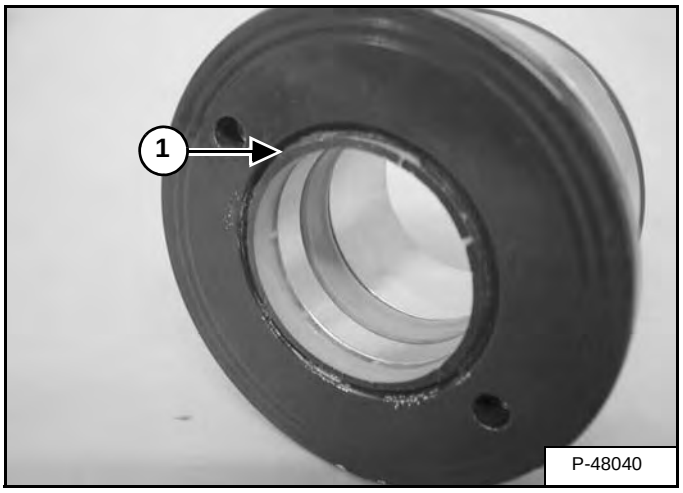
Figure 20-20-14



Remove the O-ring (Item 1). Remove the O-ring (Item 2) and the back-up ring (Item 3) **[Figure 20-20-14]** from the cylinder head.

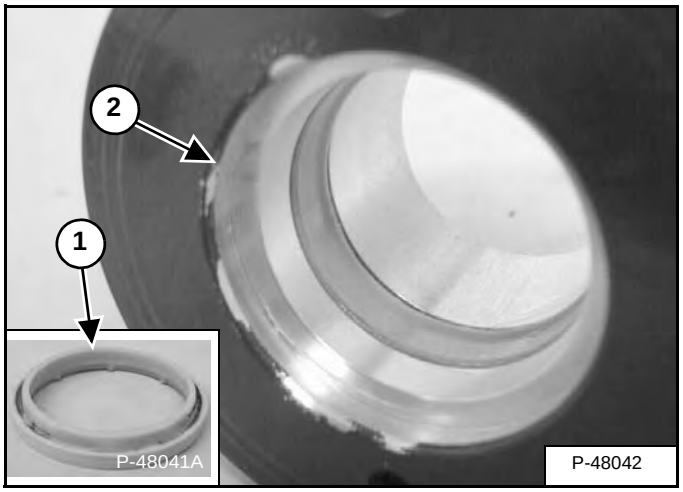
NOTE: The O-ring (Item 2) and back-up ring (Item 3) [Figure 20-20-14] are no longer available parts. The seal kit will contain a one piece seal that is used in place of the O-ring and back-up ring.

Figure 20-20-15



Remove the wiper seal (Item 1) **[Figure 20-20-15]** from the cylinder head.

Figure 20-20-16



Install the wiper seal, with the wiper side of the seal (Item 1), toward the outside of the head (Item 2) **[Figure 20-20-16]**.

CYLINDER (BOB-TACH)

Testing

WARNING

AVOID INJURY OR DEATH

Always clean up spilled fuel or oil. Keep heat, flames, sparks or lighted tobacco away from fuel and oil. Failure to use care around combustibles can cause explosion or fire.

W-2103-0508

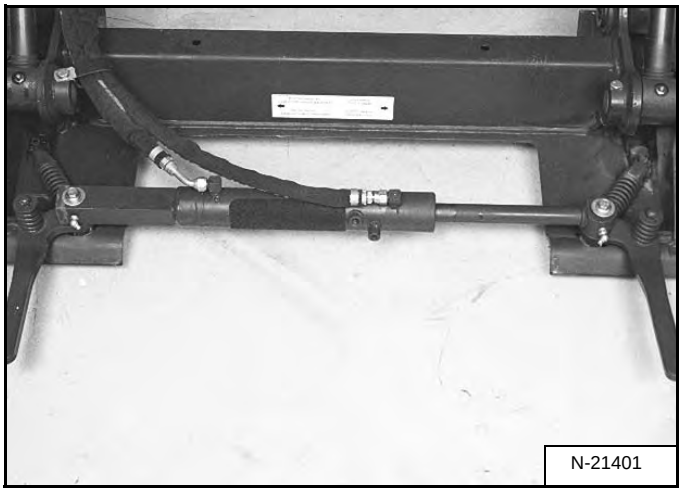
WARNING

AVOID INJURY OR DEATH

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.

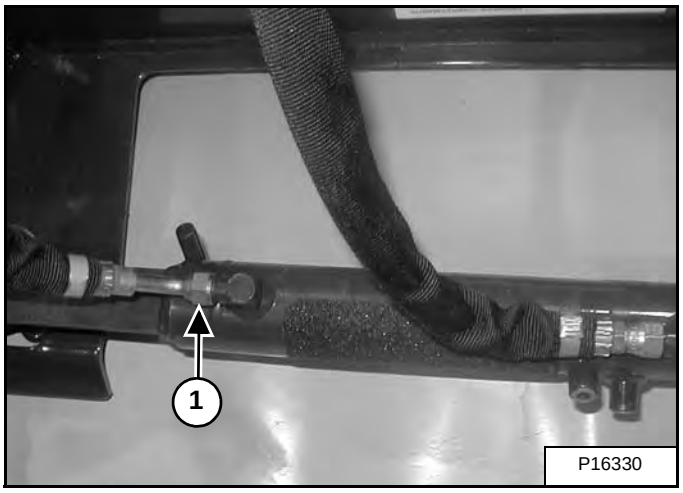
W-2072-0807

Figure 20-22-1



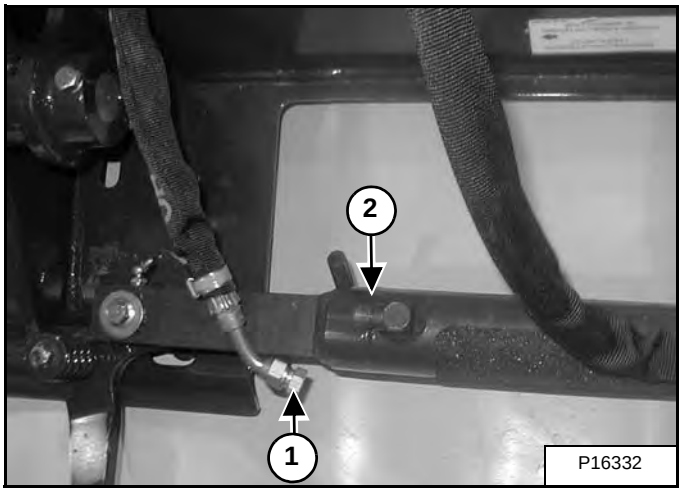
Tilt the Bob-Tach forward, so it is parallel to the floor **[Figure 20-22-1]**.

Figure 20-22-2



Disconnect the hose (Item 1) **[Figure 20-22-2]** from the Bob-Tach cylinder base end port.

Figure 20-22-3



Install a plug in the hose (Item 1) **[Figure 20-22-3]** and tighten.

Engage the parking brake. Lower the seat bar. Start the engine.

Push and hold the BOB-TACH “WEDGES UP” Switch (Front Accessory Panel).

If there is any leakage from the base end cylinder port (Item 2) **[Figure 20-22-3]**, remove the Bob-Tach cylinder for repair.

HYDRAULIC CONTROL VALVE (STANDARD)

Description

Figure 20-40-1

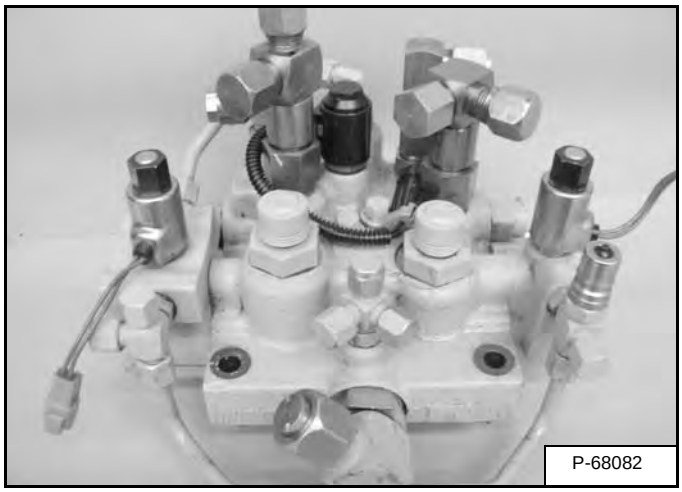
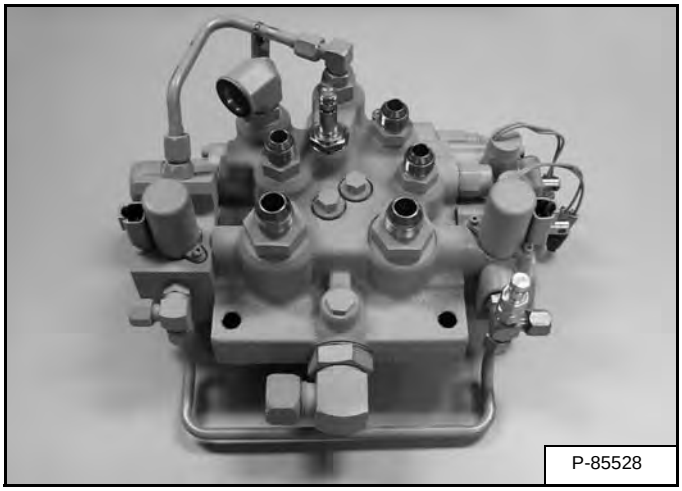


Figure 20-40-2



NOTE: The hydraulic control valve can be equipped with two different auxiliary hydraulic solenoids shown in [Figure 20-40-1] and [Figure 20-40-2].

The hydraulic control valve is located inside the mainframe on the right hand side, below the operators cab.

The hydraulic control valve is the hydraulic component that uses spools to direct the flow of hydraulic fluid to the lift, tilt and auxiliary functions.

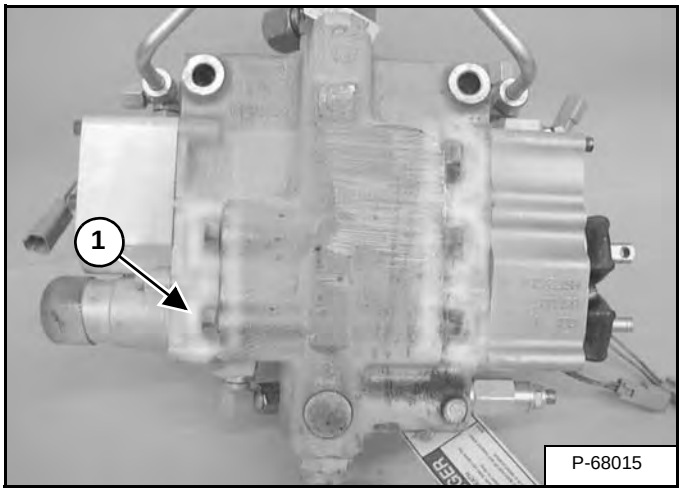
The lift and tilt functions are operated using mechanical linkages to connect the foot pedals to the lift and tilt spools.

The auxiliary function is operated by pilot pressure. There is one solenoid located by each side of the spool. Only one solenoid at a time is activated by the switch on the right side control handle / lever. The activated solenoid sends pilot pressure oil to one side of the spool and forces the spool to shift.

The hydraulic control valve contains a main relief valve which is adjustable.

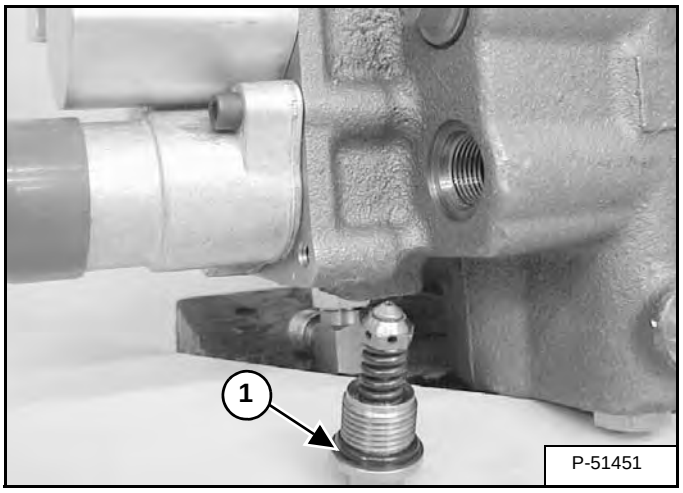
Port Relief / Anti-Cavitation Valve Removal And Installation (Lift, Base End)

Figure 20-40-30



Loosen the lift circuit port relief / anti-cavitation valve (Item 1) **[Figure 20-40-30]**.

Figure 20-40-31

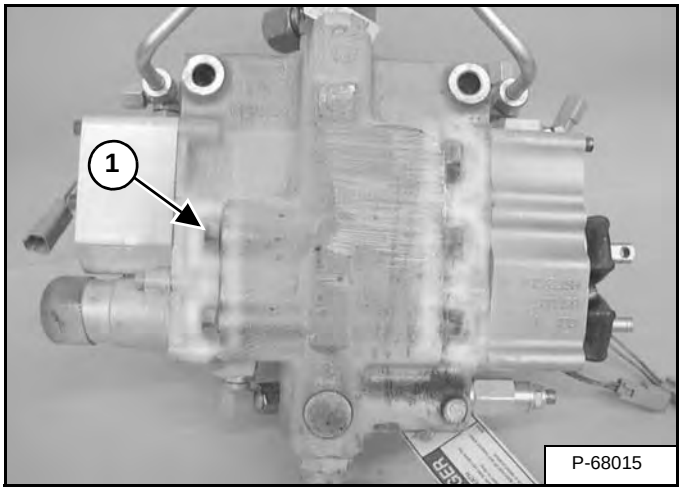


Replace the O-ring (Item 1) **[Figure 20-40-31]** before installation.

Installation: Tighten to 52 - 61 N•m (38 - 45 ft-lb) torque.

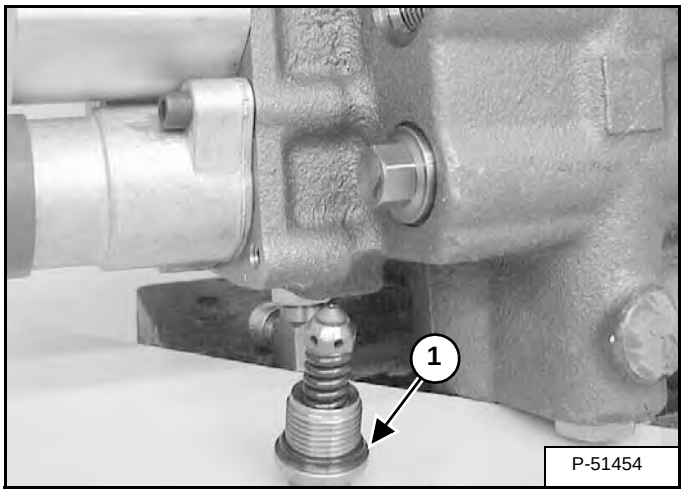
Port Relief / Anti-Cavitation Valve Removal And Installation (Tilt, Base End)

Figure 20-40-32



Remove the tilt port relief / anti-cavitation valve (Item 1) **[Figure 20-40-32]** from the base end of the tilt section.

Figure 20-40-33

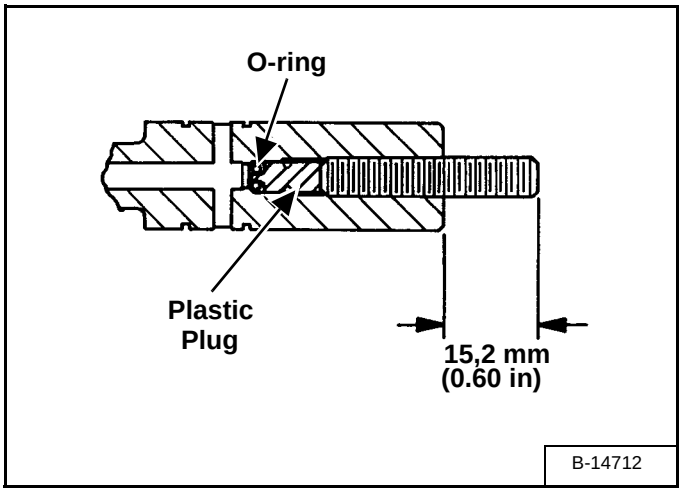


Replace the O-ring (Item 1) **[Figure 20-40-33]** before installation.

Installation: Tighten to 52 - 61 N•m (38 - 45 ft-lb) torque.

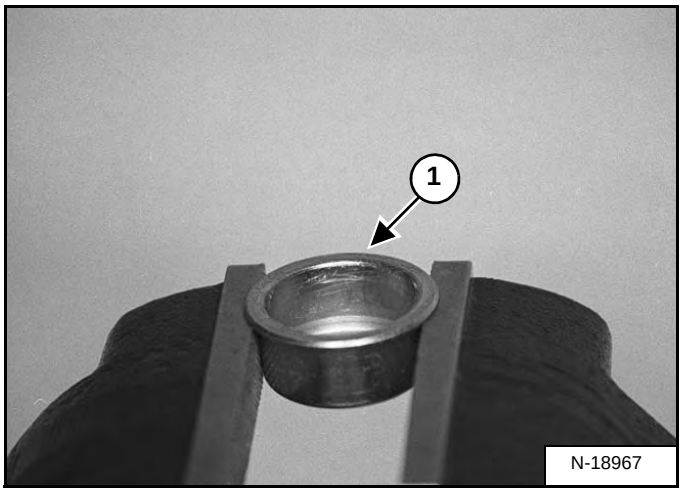
Lift Spool And Detent Removal And Installation (Cont'd)

Figure 20-40-69



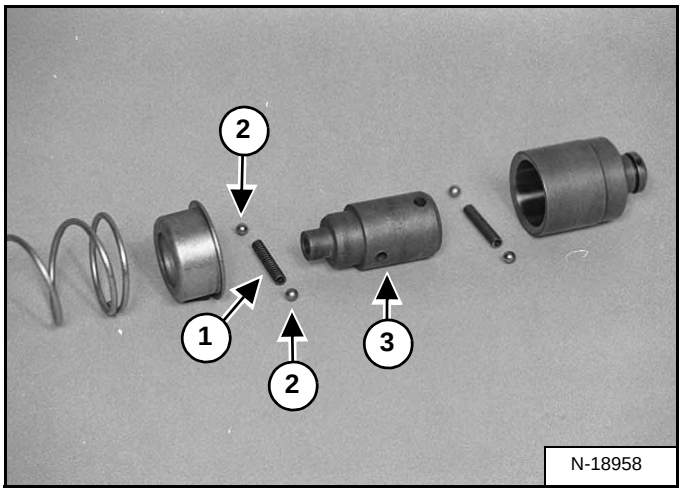
Install the stud and tighten until the other end of the stud is out about 15,2 mm (0.600 in) from the spool **[Figure 20-40-69]**.

Figure 20-40-70



Clamp the collar (Item 1) **[Figure 20-40-70]** in a vice.

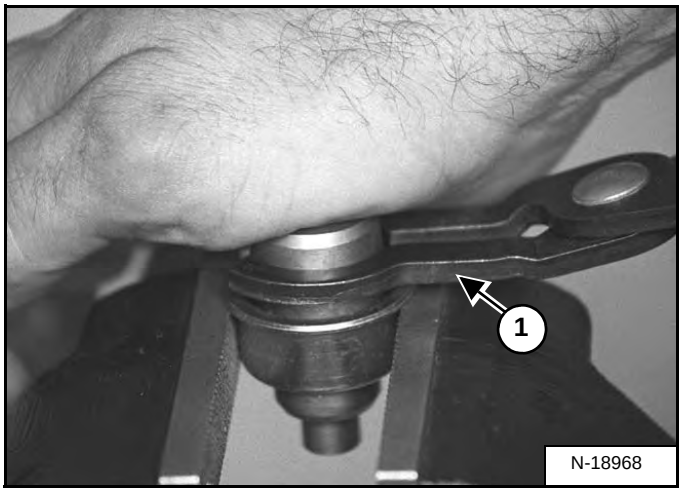
Figure 20-40-71



Apply grease on all the detent component surfaces before assembly **[Figure 20-40-71]**.

Install the spring (Item 1) and detent balls (Item 2) into the adapter (Item 3) **[Figure 20-40-71]** and compress with the detent pliers (Item 1) **[Figure 20-40-72]**.

Figure 20-40-72

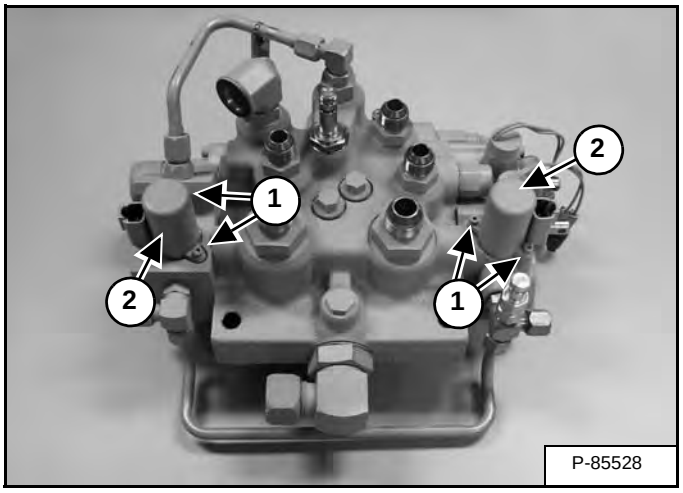


Install the detent adapter to the collar **[Figure 20-40-72]**.

NOTE: The collar and the detent adapter are held together by spring pressure when assembled to the lift spool not the detent balls. Hold the detent adapter and collar together to prevent the detent balls and spring from falling out.

Auxiliary Solenoid Removal And Installation (S/N A3LN35001 & Above And A3LP35001 & Above)

Figure 20-40-106

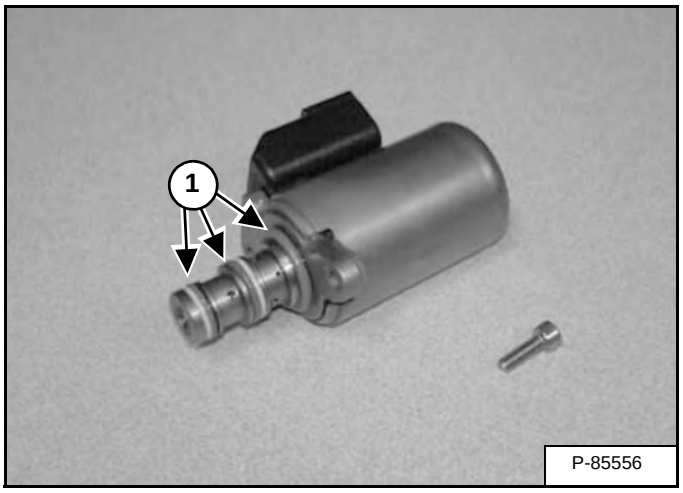


Remove the screws (Item 1) **[Figure 20-40-106]** from both solenoids.

Remove the solenoids (Item 1) **[Figure 20-40-106]** from the control valve.

Installation: Tighten the nut to 2,44 - 2,98 N•m (21.6 - 26.4 in-lb) torque.

Figure 20-40-107



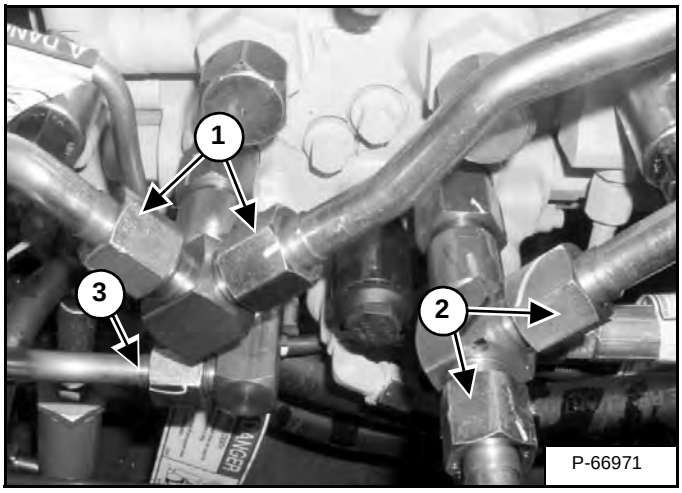
Check and remove the O-rings (Item 1) **[Figure 20-40-107]** from the solenoid stem.

Use an ohm meter to measure the solenoid coil resistance.

The correct resistance for the coil is 4.1 ± 6.1 ohm.

Removal And Installation (Cont'd)

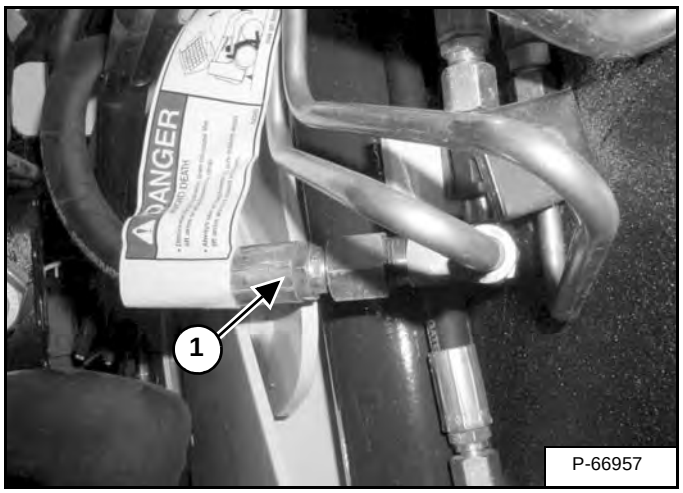
Figure 20-41-12



Disconnect and cap the tubelines (Item 1) and (Item 2) **[Figure 20-41-12]** from the tilt section of the control valve.

Disconnect and cap the tubeline (Item 3) **[Figure 20-41-12]** from the lift section of the control valve.

Figure 20-41-13

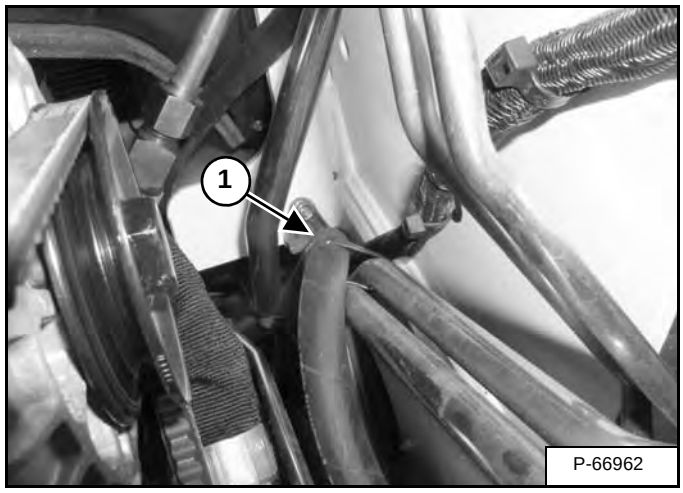


Mark all tubelines and hoses for correct installation.

The fixed end main valve hose (Item 1) **[Figure 20-41-13]** is connected to a fixed end fitting on the control valve. The hose is routed to the back upright where the hose is connected to a tee fitting that feeds the base end of both lift cylinders. The hose must be removed at the back tee fitting, located in the right side upright.

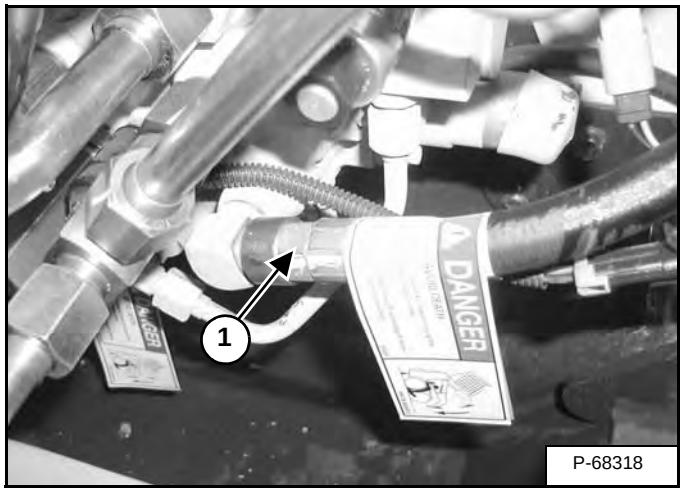
NOTE: Remember the hose routing for ease of control valve installation.

Figure 20-41-14



Remove any tie-straps (Item 1) **[Figure 20-41-14]** securing the fixed end main valve hose.

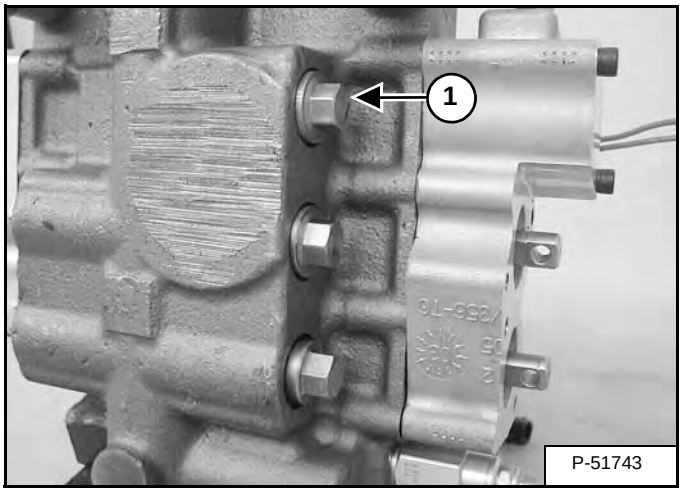
Figure 20-41-15



Remove the fixed-end main valve hose (Item 1) **[Figure 20-41-15]** from the main control valve fitting.

Port Relief Valve Removal And Installation (Cont'd)

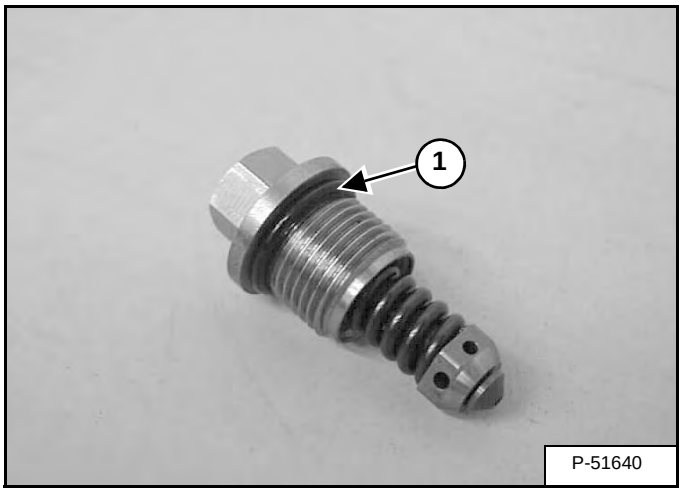
Figure 20-41-46



The control valve may be equipped with an optional auxiliary port relief valve (Item 1) **[Figure 20-41-46]**.

Remove the auxiliary port relief valve.

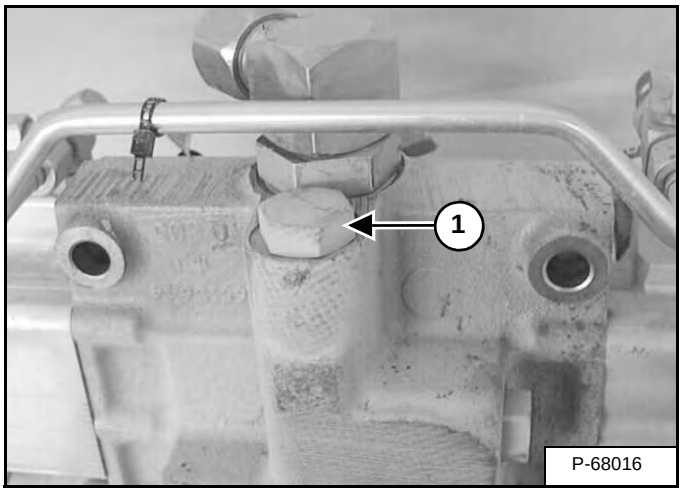
Figure 20-41-47



Installation: Always use new O-rings (Item 1) **[Figure 20-41-47]**. Lightly lubricate with oil and tighten to 52 - 61 N•m (38 - 45 ft-lb) torque.

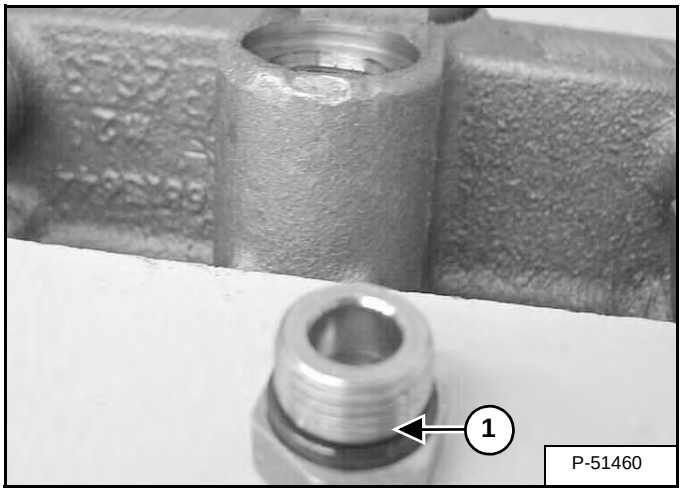
Plug Removal And Installation

Figure 20-41-48



At the top side of the control valve, remove the plug (Item 1) **[Figure 20-41-48]**.

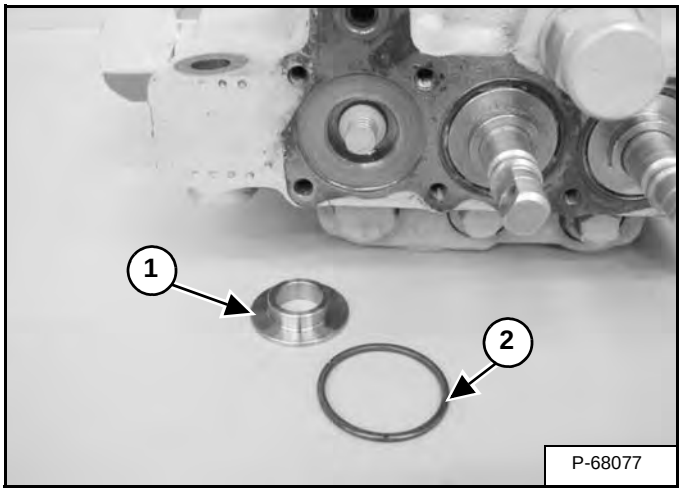
Figure 20-41-49



Installation: Always use new O-rings (Item 1) **[Figure 20-41-49]**. Tighten to 54 N•m (40 ft-lb) torque.

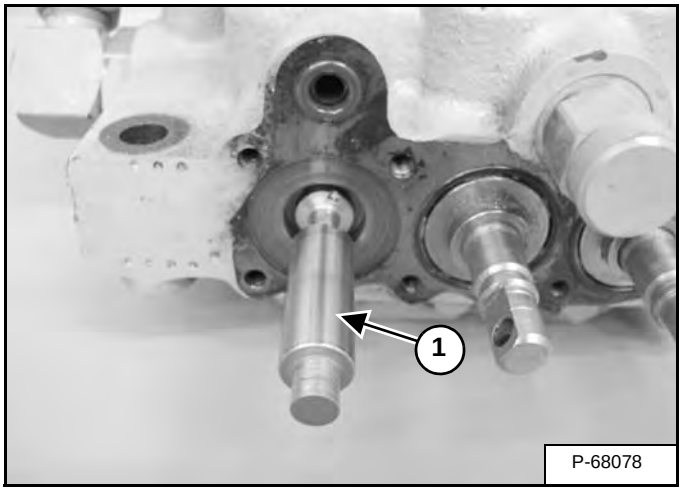
Auxiliary Spool Removal And Installation (Cont'd)

Figure 20-41-85



Remove the spacer (Item 1) and O-ring (Item 2) **[Figure 20-41-85]** from the auxiliary spool.

Figure 20-41-86



Remove the auxiliary spool (Item 1) **[Figure 20-41-86]**.

HYDRAULIC PUMP (STANDARD)

Description

The hydraulic gear pump is attached to the end of the hydrostatic pumps and is located on the right side of the loader between the hydraulic control valve and the engine.

The hydraulic gear pump is a combination of gear pumps that provide hydraulic flow to several hydraulic systems.

The hydraulic gear pump has a dedicated charge pump. This supplies flow to the hydraulic fan motor and charge pressure to the hydrostatic pump.

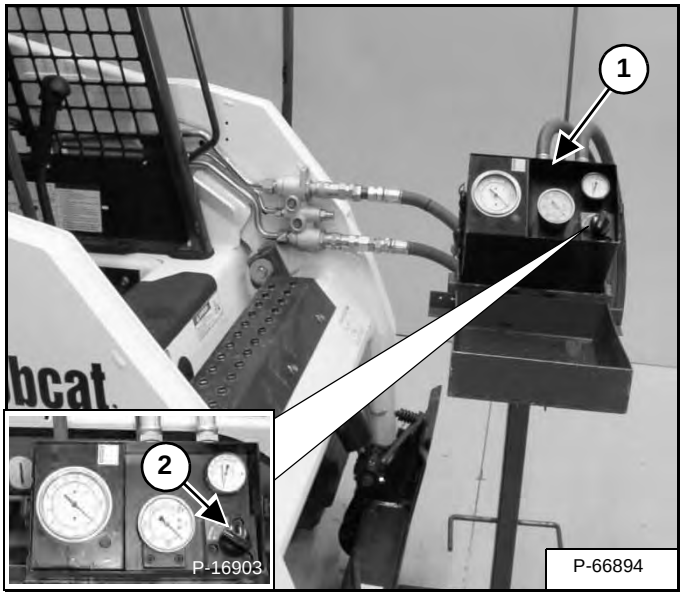
A seal kit is available to service the hydraulic pump. If any of the main components of the pump are damaged, the entire pump must be replaced.

Pump Test At Quick Couplers

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

MEL10003 - In-Line Hydraulic Tester
MEL10006 - Flow Meter Fitting Kit

Figure 20-60-1



NOTE: When testing the hydraulic flow of a machine, hoses must be at least 19,05 (0.75 in) in diameter and connected directly to the hydraulic tester without using any type of "quick coupler" on the connection to the tester. Also make sure your hydraulic tester is capable of at least 189,3 L/min (50 U.S. gpm).

Install a hydraulic tester (Item 1) **[Figure 20-60-1]** onto the front auxiliary quick couplers.

This procedure will require a operator in the cab and one operator running the tester.

Start the engine and run at low idle rpm. Press the Front Auxiliary button. Engage the front auxiliary with the trigger on the right handle. Make sure the tester is connected correctly. If no flow is indicated on the tester, the hoses are connected wrong. With the hoses connected correctly, increase the engine speed to full rpm*.

Warm the fluid to 60°C (140°F) by turning the restrictor control clockwise on the tester so it reads about a 6895 kPa (69 bar) (1000 psi).

NOTE: DO NOT EXCEED 22753 kPa (228 bar) (3300 psi).

Turn the restrictor control (Item 2) **[Figure 20-60-1]** on the tester counterclockwise to obtain free flow, the flow should be approximately 61 - 64 L/min (16 -17 U.S. gpm). Start turning the restrictor clockwise, causing more restriction on the flow. The L/min (U.S. gpm) should drop off slightly until the pressure reaches approximately 19305 kPa (193 bar) (2800 psi). At approximately 19305 kPa (193 bar) (2800 psi) the flow should start decreasing rapidly until the pressure reaches 22408 - 22753 kPa (224 - 228 bar) (3250 - 3300 psi). At 22408 - 22753 kPa (224 - 228 bar) (3250 - 3300 psi) the flow should be at 0 L/min (0 U.S. gpm). Turn the restrictor (Item 2) **[Figure 20-60-1]** counterclockwise to free flow. Shut the front auxiliary hydraulics off.

If flow and pressure specs are not obtained, go to Direct Pump Testing. (See Direct Pump Test (Standard Section) on Page 20-60-2.)

*Refer to (See Hydraulic System on Page SPEC-10-3.) for system relief pressure and full rpm.

Disassembly And Assembly (Cont'd)

Figure 20-60-19

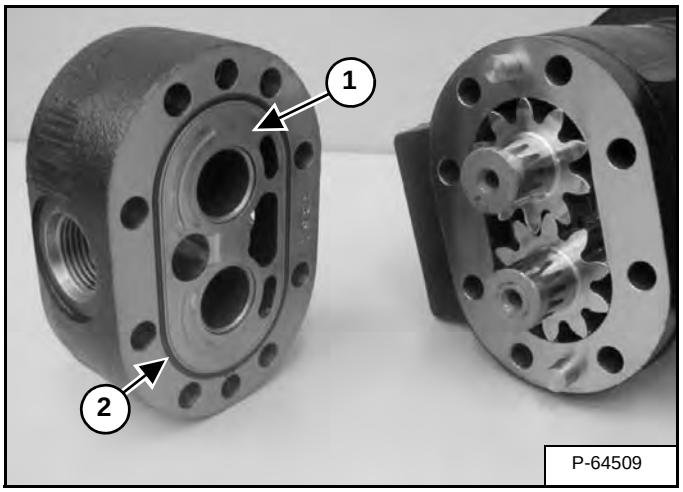
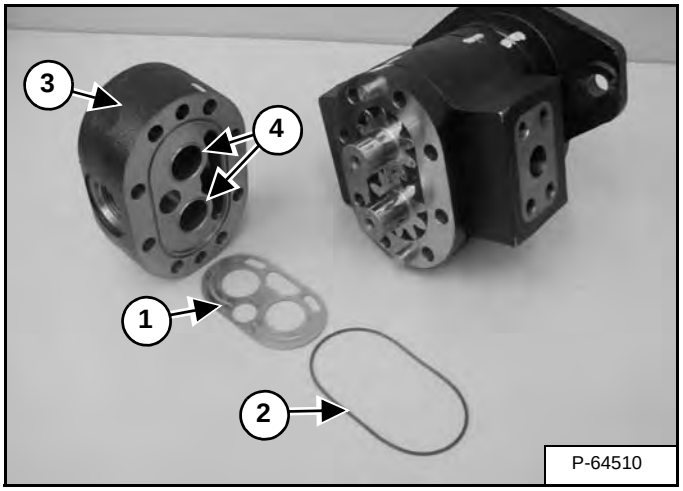


Figure 20-60-20



Remove the wear plate (Item 1) and section seal (Item 2) **[Figure 20-60-19]** and **[Figure 20-60-20]** from the pump end section.

NOTE: Position wear plate (Item 1) [Figure 20-60-20] inlets and traps as shown with bronze side toward gears.

NOTE: Inspect the pump end section (Item 3) [Figure 20-60-20] and bushings (Item 4) [Figure 20-60-20]. If excessive wear or damage is visible, the pump must be replaced.

Figure 20-60-21

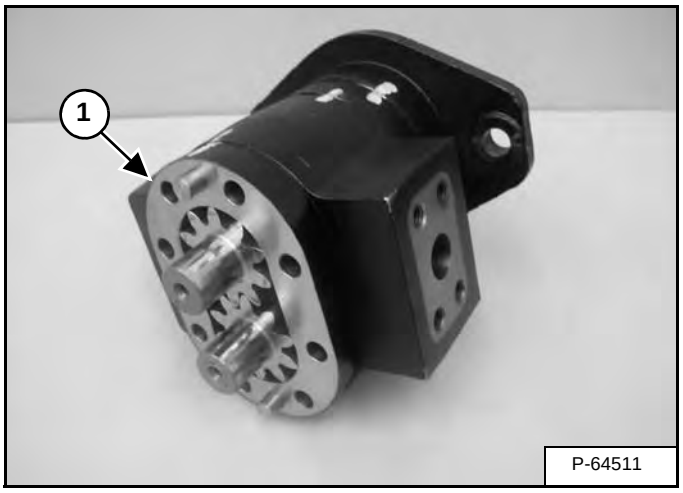
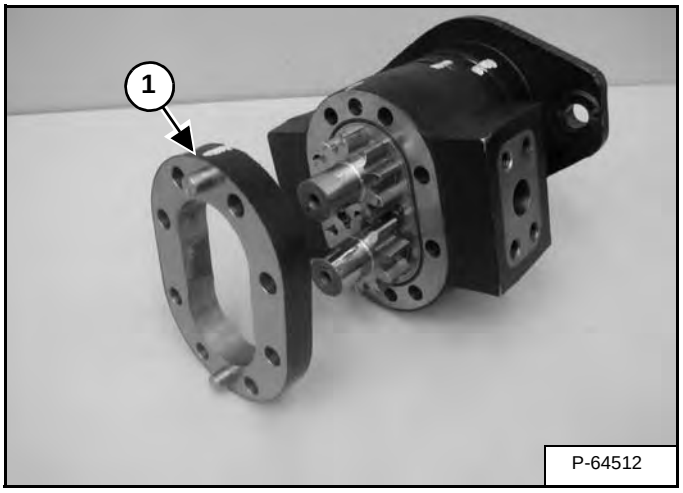


Figure 20-60-22

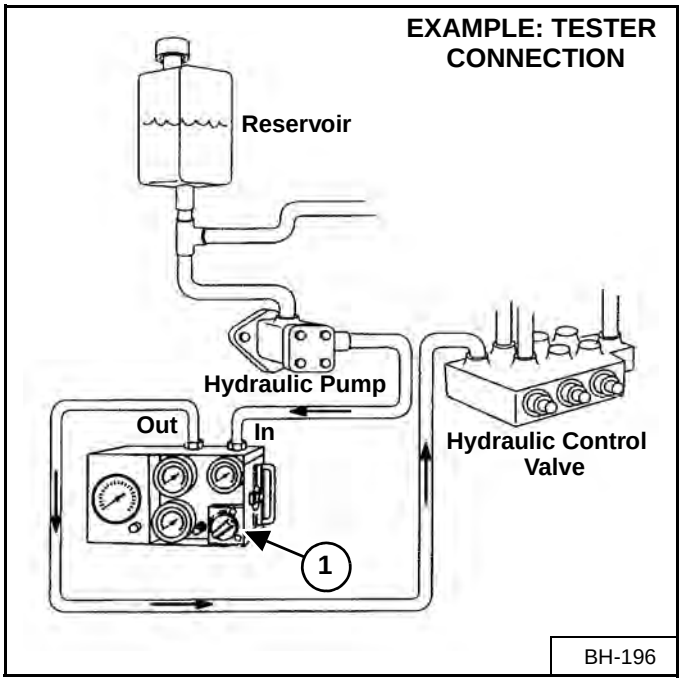


Remove the charge pump section (Item 1) **[Figure 20-60-21]** and **[Figure 20-60-22]** from the pump center section.

NOTE: Inspect the pump section (Item 1) [Figure 20-60-22]. If excessive wear or damage is visible, the pump must be replaced.

Direct Pump Test (Standard Section) (Cont'd)

Figure 20-61-4



Sample tester connection shown **[Figure 20-61-4]**.

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

Warm the fluid to 60°C (140°F) by turning the restrictor control (Item 1) **[Figure 20-61-4]** on the tester to about 6895 kPa (69 bar) (1000 psi). DO NOT exceed system relief pressure. Open the restrictor control and record the free flow (L/min [U.S. gpm]) at full rpm*.

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

$$\% = \frac{\text{HIGH PRESSURE FLOW (L/min [U.S. gpm])}}{\text{FREE FLOW (L/min [U.S. gpm])}} \times 100$$

A low percentage may indicate a failed pump.

*Refer to (See Hydraulic System on Page SPEC-10-3.) for system relief pressure and full rpm.

Disassembly And Assembly (Cont'd)

Figure 20-61-23

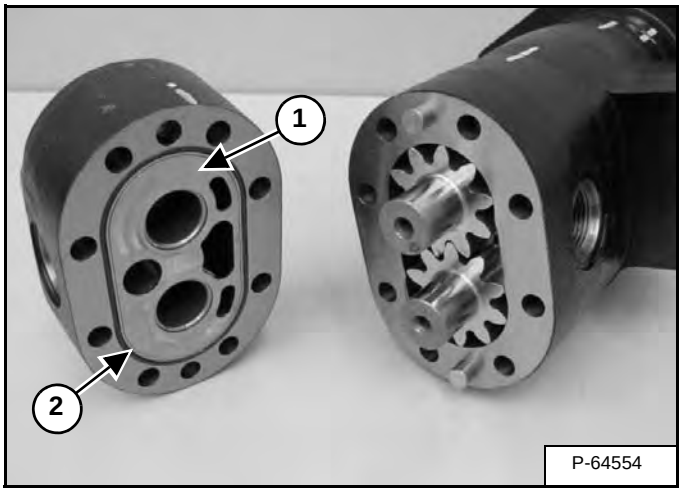
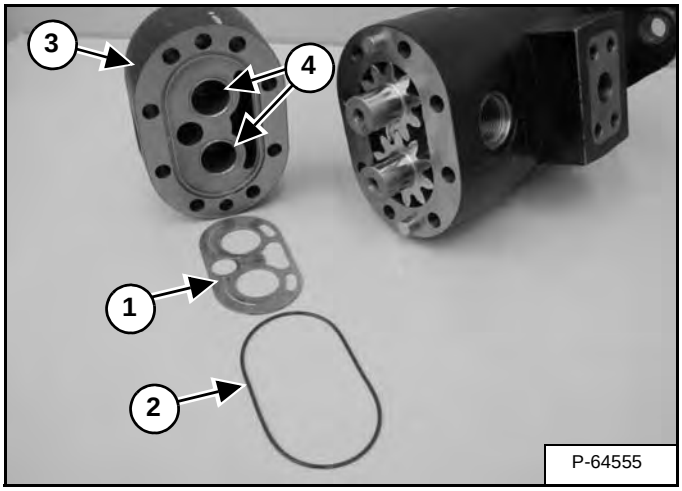


Figure 20-61-24



Remove the wear plate (Item 1) and O-ring (Item 2) **[Figure 20-61-23]** and **[Figure 20-61-24]** from the high flow end section.

NOTE: Position wear plate (Item 1) [Figure 20-61-24] inlets and traps as shown with bronze side toward gears.

NOTE: Inspect the high flow end section (Item 3) and bushings (Item 4) [Figure 20-61-24]. If excessive wear or damage is visible, the pump must be replaced.

Figure 20-61-25

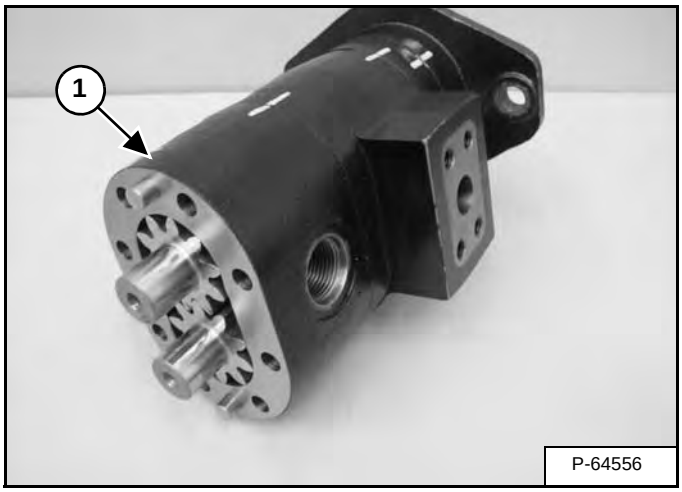
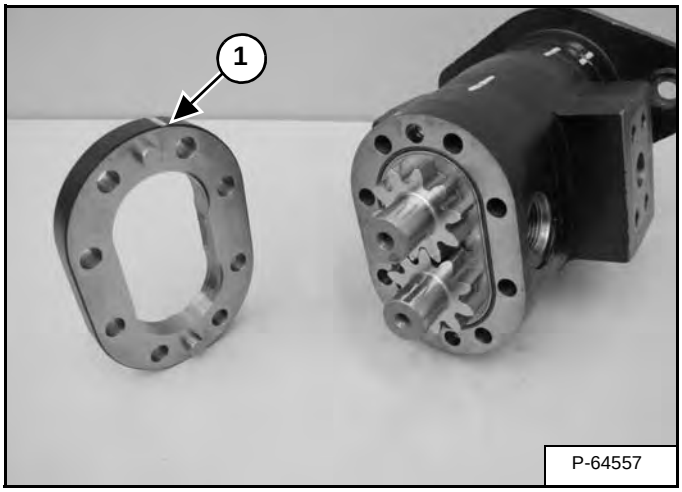


Figure 20-61-26

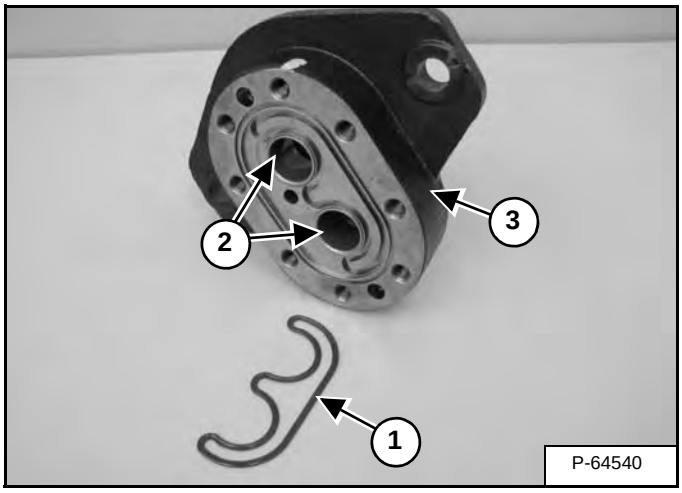


Remove the high flow pump section (Item 1) **[Figure 20-61-25]** and **[Figure 20-61-26]** from the charge center section.

NOTE: Inspect the high flow pump section (Item 1) [Figure 20-61-26]. If excessive wear or damage is visible, the pump must be replaced.

Disassembly And Assembly (Cont'd)

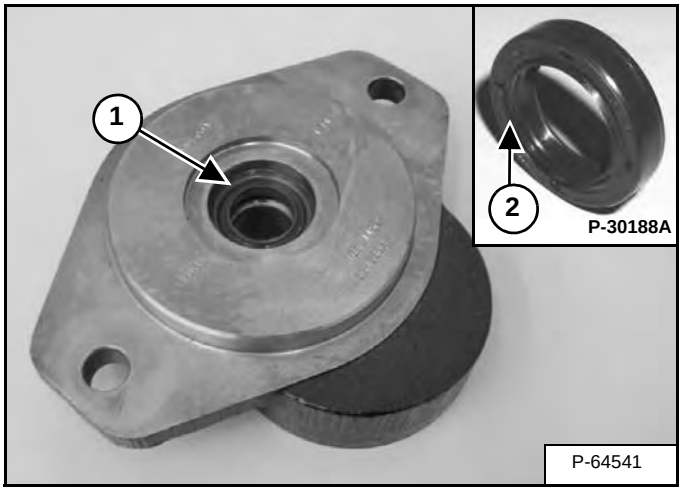
Figure 20-61-63



Inspect the pre-load seal (Item 1) **[Figure 20-61-63]** for damage and replace as needed.

NOTE: Inspect the pump flange section (Item 2) and bushings (Item 3) [Figure 20-61-63]. If excessive wear or damage is visible, the pump must be replaced.

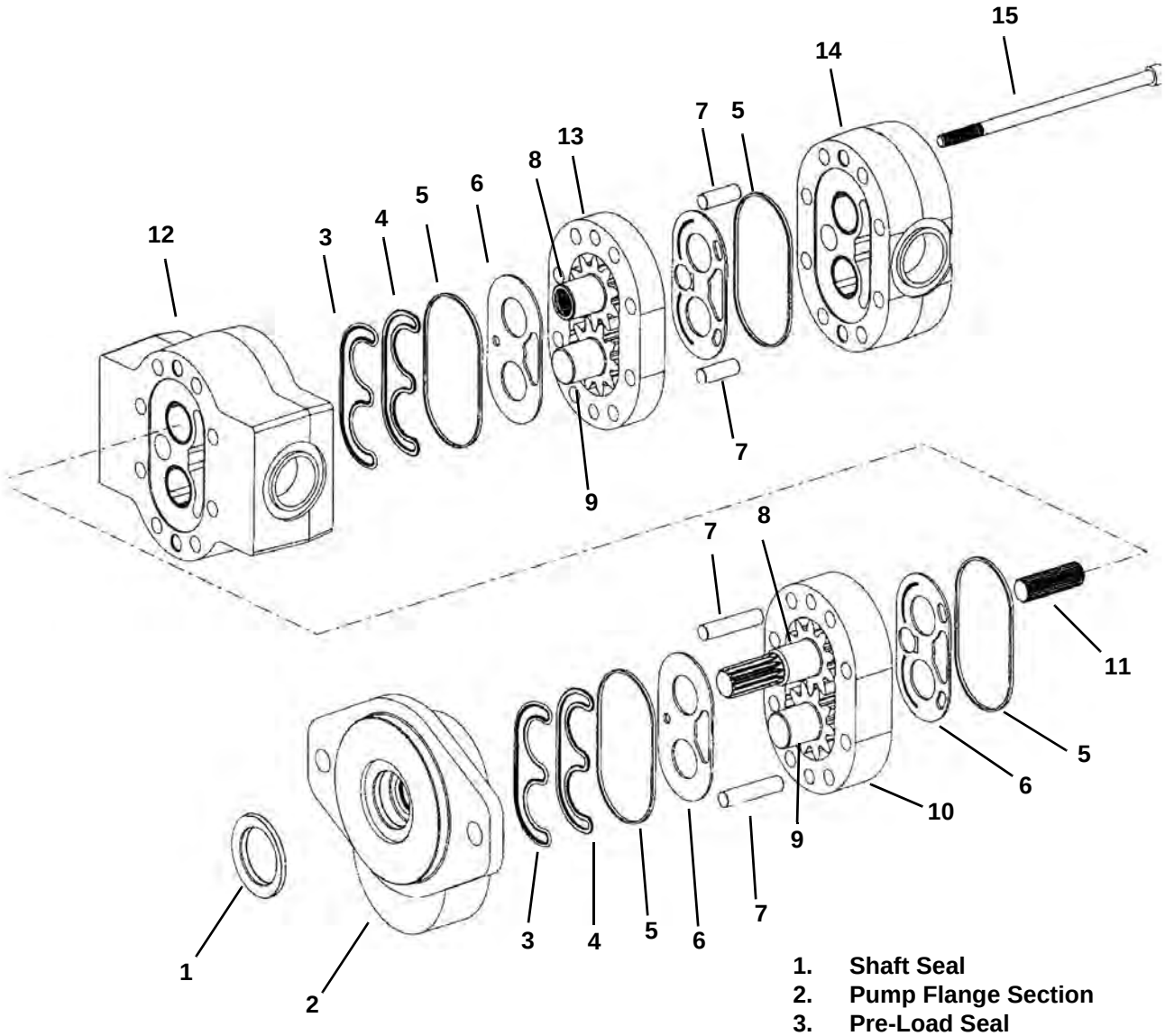
Figure 20-61-64



Remove the shaft seal (Item 1) **[Figure 20-61-64]** from the pump flange section.

Installation: The shaft seal flush surface (Item 2) **[Figure 20-61-64]** must be facing out away from the pump.

Parts Identification



1. Shaft Seal
2. Pump Flange Section
3. Pre-Load Seal
4. Load Seal
5. O-ring
6. Wear Plate
7. Pins
8. Drive Gear
9. Idler Gear
10. Auxiliary Pump Section
11. Spline Shaft
12. Pump Center Section
13. Charge Pump Section
14. Pump End Section
15. Bolt (8)

B-21259A

HYDRAULIC PUMP (SJC) (HIGH FLOW)

Description

The hydraulic gear pump is attached to the end of the hydrostatic pumps and is located on the right side of the loader between the hydraulic control valve and the engine.

The hydraulic gear pump is a combination of gear pumps that provide hydraulic flow to several hydraulic systems.

The hydraulic gear pump has a dedicated charge pump. This supplies flow to the hydraulic fan motor and charge pressure to the hydrostatic pump.

The high flow hydraulic pump has an additional pump section that provides an additional amount of flow that is controlled by an external valve. The valve is switched from a button on the panel in the cab.

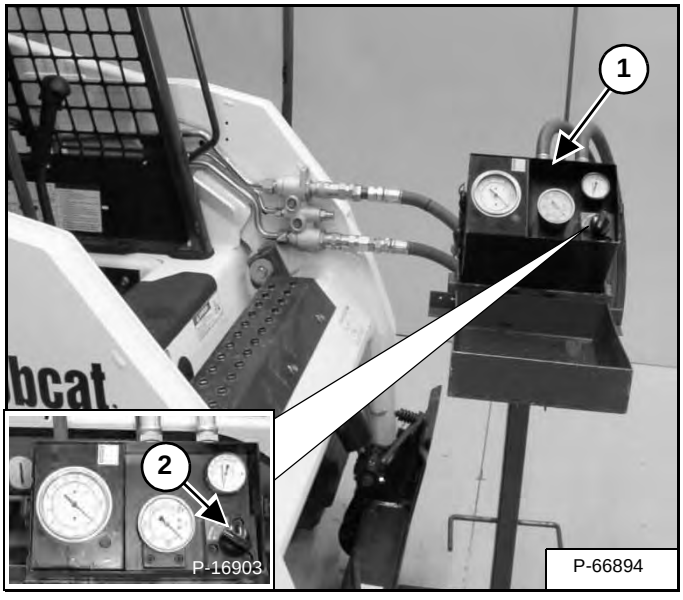
A seal kit is available to service the hydraulic pump. If any of the main components of the pump are damaged, the entire pump must be replaced.

Pump Test At Quick Couplers

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

MEL10003 - In-Line Hydraulic Tester
MEL10006 - Flow Meter Fitting Kit

Figure 20-71-1



NOTE: When testing the hydraulic flow of a machine, hoses must be at least 19,05 mm (0.75 in) in diameter and connected directly to the hydraulic tester without using any type of "quick coupler" on the connection to the tester. Also make sure your hydraulic tester is capable of at least 189,3 L/min (50 U.S. gpm).

Install a hydraulic tester (Item 1) **[Figure 20-71-1]** onto the front auxiliary quick couplers.

This procedure will require a operator in the cab and one operator running the tester.

Start the engine and run at low idle rpm. Press the Front Auxiliary button. Engage the front auxiliary with the trigger on the right handle. Make sure the tester is connected correctly. If no flow is indicated on the tester, the hoses are connected wrong. With the hoses connected correctly, increase the engine speed to full rpm*.

Warm the fluid to 60°C (140°F) by turning the restrictor control clockwise on the tester so it reads about a 6895 kPa (69 bar) (1000 psi).

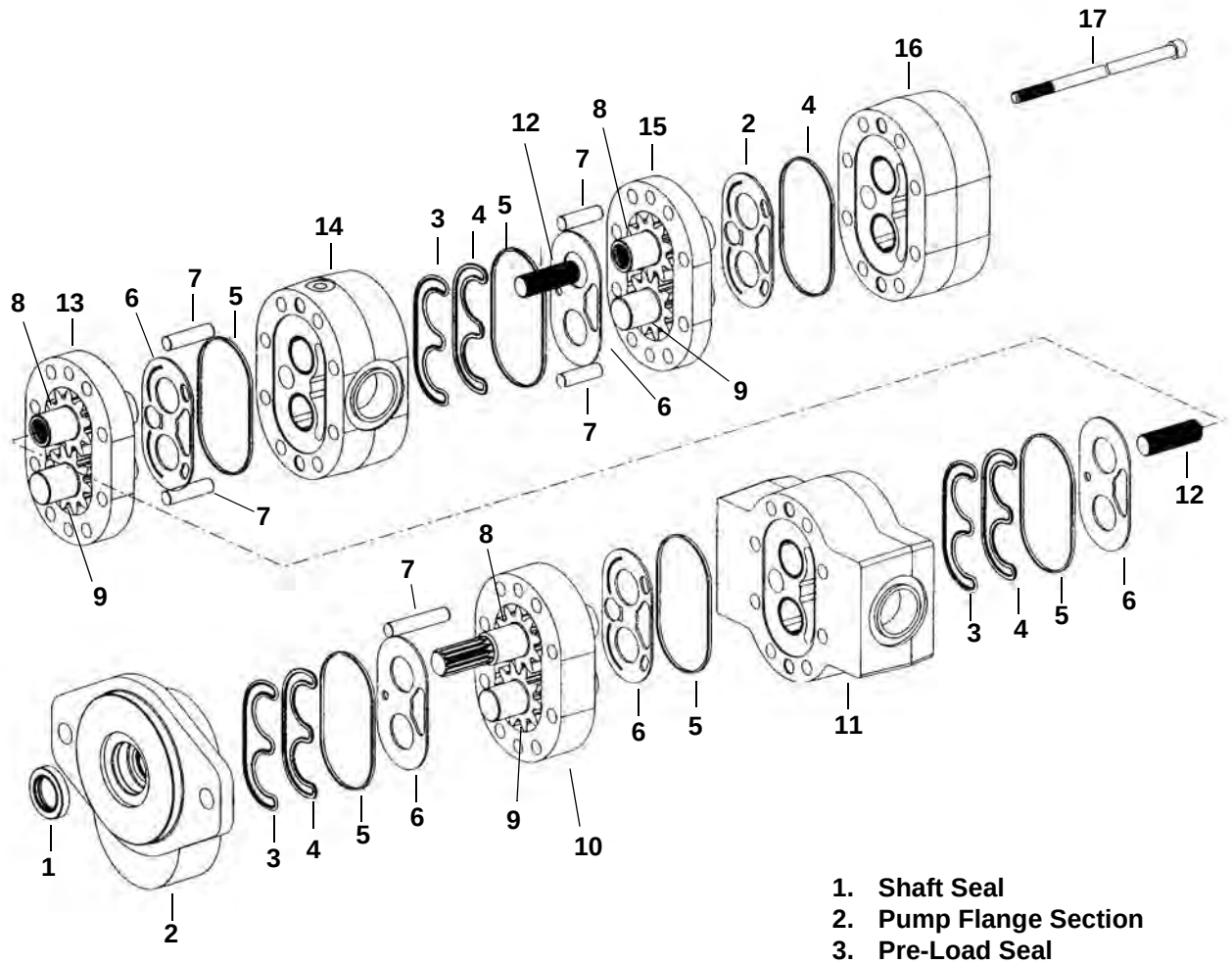
NOTE: DO NOT EXCEED 22753 kPa (228 bar) (3300 psi).

Turn the restrictor control (Item 2) **[Figure 20-71-1]** on the tester counterclockwise to obtain free flow, the flow should be approximately 61 - 64 L/min (16 - 17 U.S. gpm). Start turning the restrictor clockwise, causing more restriction on the flow. The L/min (U.S. gpm) should drop off slightly until the pressure reaches approximately 19305 kPa (193 bar) (2800 psi). At approximately 19305 kPa (193 bar) (2800 psi) the flow should start decreasing rapidly until the pressure reaches 22408 - 22753 kPa (224 - 228 bar) (3250 psi - 3300 psi). At 22408 - 22753 kPa (224 - 228 bar) (3250 - 3300 psi) the flow should be at 0 U.S. gpm (0 L/min). Turn the restrictor (Item 2) **[Figure 20-71-1]** counterclockwise to free flow. Shut the front auxiliary hydraulics off.

If flow and pressure specs are not obtained, go to Direct Pump Testing. (See Direct Pump Test (Standard Section) on Page 20-71-2.)

*Refer to (See Hydraulic System on Page SPEC-10-3.) for system relief pressure and full rpm.

Parts Identification

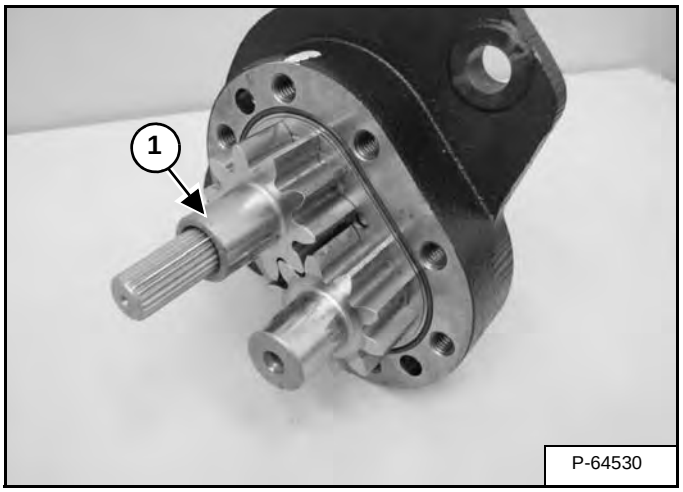


1. Shaft Seal
2. Pump Flange Section
3. Pre-Load Seal
4. Load Seal
5. O-ring
6. Valve Plate
7. Pin
8. Drive Gear
9. Idler Gear
10. Auxiliary Pump Section
11. Auxiliary Center Section
12. Splined Shaft
13. Charge Pump Section
14. Charge Center Section
15. High Flow Pump Section
16. High Flow End Section
17. Bolt

B-18248

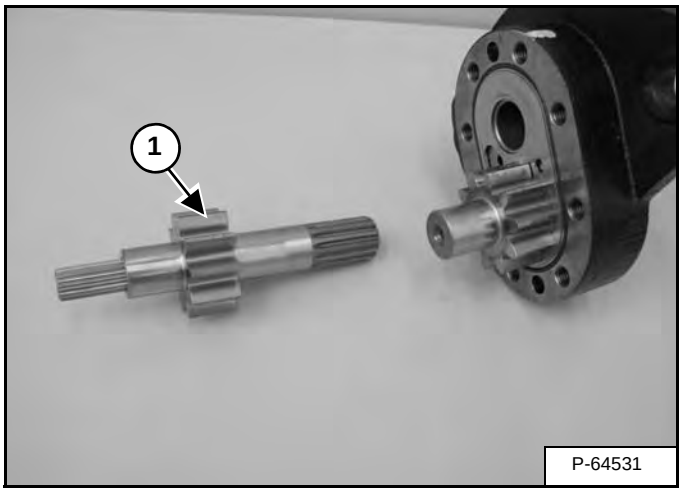
Disassembly And Assembly (Cont'd)

Figure 20-71-56



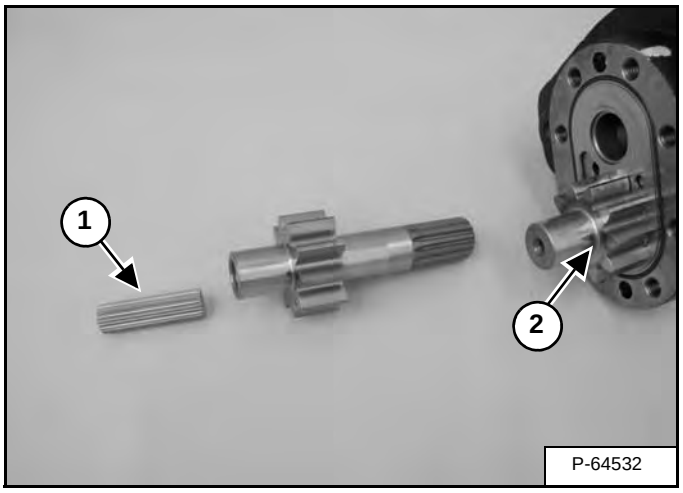
Remove the drive gear (Item 1) **[Figure 20-71-56]** from the pump flange section.

Figure 20-71-57



NOTE: Inspect the drive gear (Item 1) [Figure 20-71-57]. If excessive wear or damage is visible, the pump must be replaced.

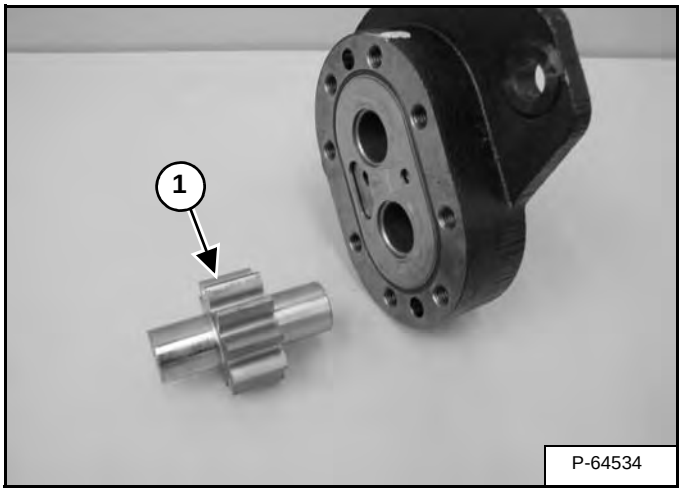
Figure 20-71-58



Remove the spline shaft (Item 1) **[Figure 20-71-58]** from the end of the drive gear.

Remove the idler gear (Item 2) **[Figure 20-71-58]**.

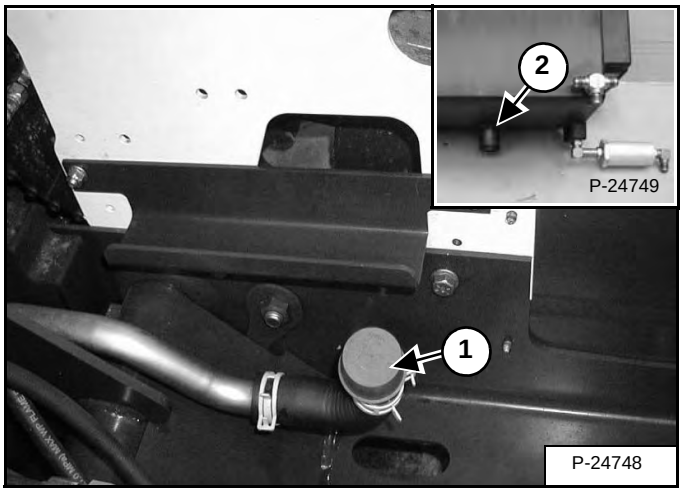
Figure 20-71-59



Remove the idler gear (Item 1) **[Figure 20-71-59]** from the pump flange section.

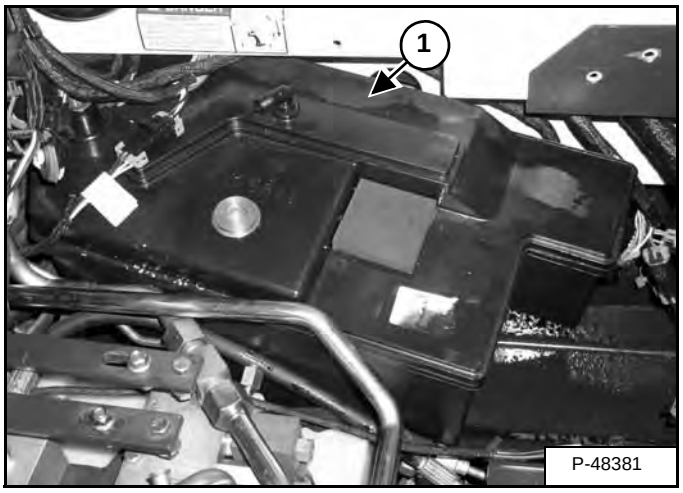
Removal And Installation (Cont'd)

Figure 20-90-7



Disconnect and cap the hose (Item 1) from the fitting (Item 2) **[Figure 20-90-7]** at the bottom of the reservoir.

Figure 20-90-8

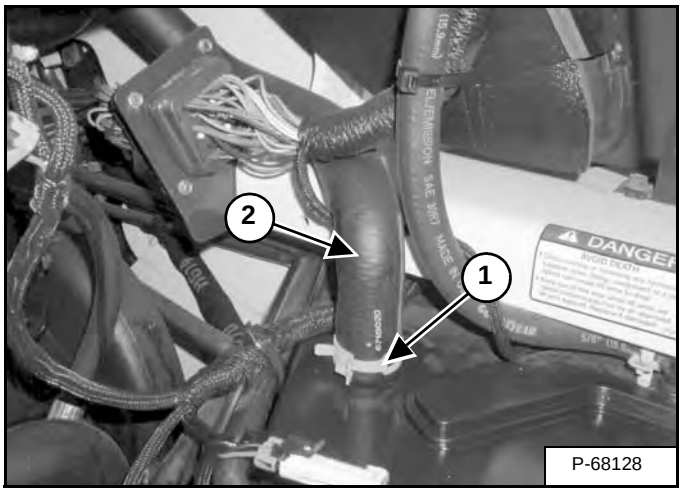


Tilt the front of the hydraulic reservoir bracket down, by pushing down on the hydraulic reservoir.

Roll the hydraulic reservoir (Item 1) **[Figure 20-90-8]** out from under the fender and remove from the front of the loader.

Hydraulic Fluid Screen

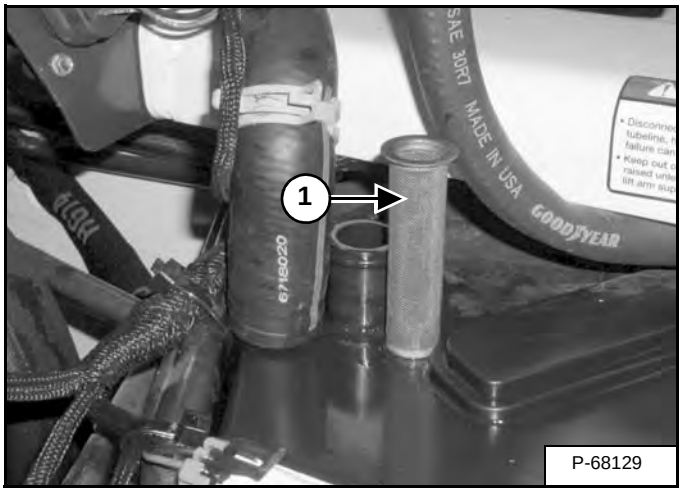
Figure 20-90-9



Raise the operator cab. (See Raising on Page 10-30-2.)

Remove the hose clamp (Item 1) and remove the hydraulic fill hose (Item 2) **[Figure 20-90-9]** from the hydraulic reservoir.

Figure 20-90-10



Remove the hydraulic fluid screen (Item 1) **[Figure 20-90-10]** from the reservoir.

Wash the screen in clean solvent and air dry, before replacing.

REAR AUXILIARY DIVERTER VALVE

Description

The rear auxiliary diverter valve is an optional valve that diverts oil from the front auxiliary circuit to two sets of rear auxiliary couplers or the right side auxiliaries. The couplers are used for rear mounted attachments.The right side auxiliaries are used for older attachments.

The rear couplers are located, one set on each side of the rear frame uprights.

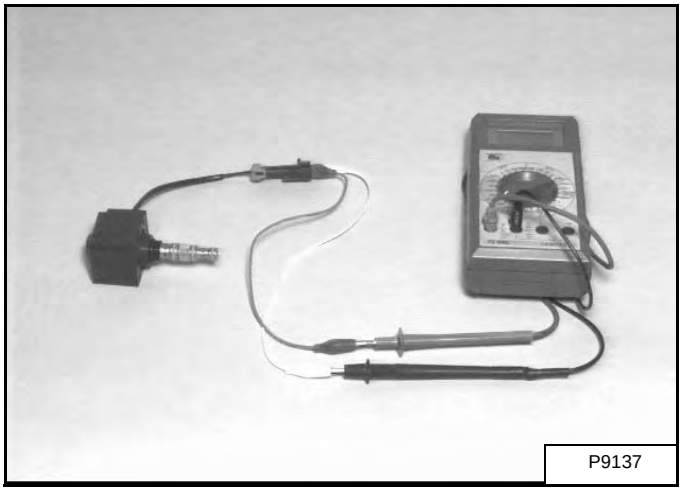
The right side auxiliaries are located on the inside of the right side lift arm at the front of the machine.

The rear auxiliary valve is located on the right side of the machine behind the blower housing. The valve is accessed by remove a panel on the right side of the machine.

See Hydraulic Schematic for more circuit information.

Solenoid Testing

Figure 20-120-1



Use a test meter to measure coil resistance **[Figure 20-120-1]**. Coil wires do not have polarity. Correct resistance is 68°F (8.6 - 9.5 ohm @ 20°C).

Replace the test meter with 12 volt power. You can see and hear the spool shift.

BOB-TACH (POWER) BLOCK

Description

The power Bob-Tach block is an option that allows the operator to hydraulically control the Bob-Tach levers for mounting and dismounting the attachments.

The power Bob-Tach is operated by a switch on the front console.

The power Bob-Tach block is mounted on the right side of the machine in front of the engine on the backside of the hydraulic gear pump.

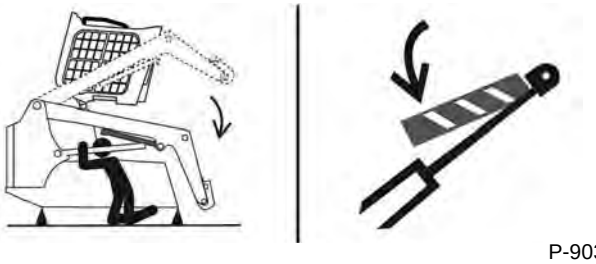
Removal And Installation

WARNING

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

W-2059-0598

DANGER



P-90328

AVOID DEATH

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

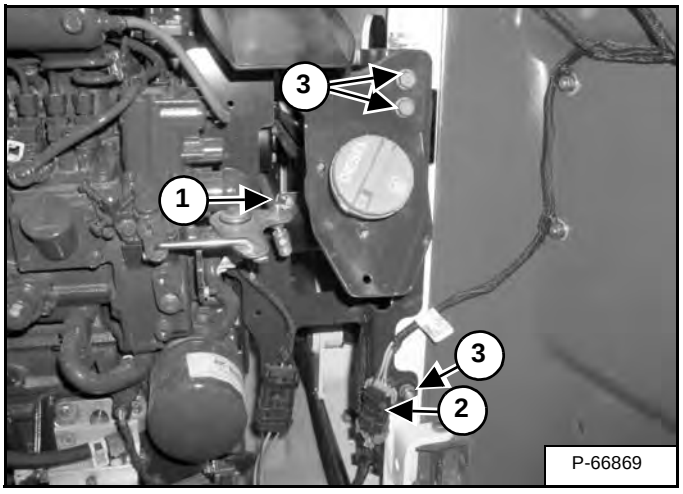
D-1009-0409

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 20-130-1



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

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

Raise the operator cab. (See Raising on Page 10-30-2.)

Open the rear door.

Drain the hydraulic reservoir. (See Removing And Replacing Hydraulic Fluid on Page 10-120-2.) and (See Removing And Replacing Case Drain Filters on Page 10-120-4.)

Remove the nut from the speed control linkage (Item 1) and unplug the rear lights electrical connector (Item 2) **[Figure 20-130-1]**.

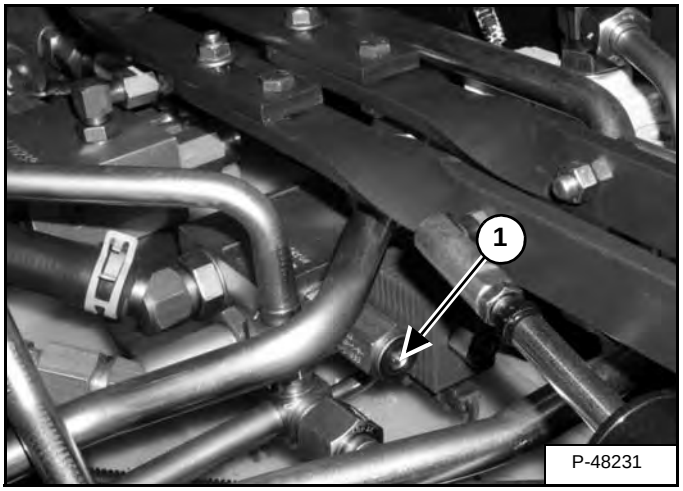
Remove the fuel fill bracket mounting bolts (Item 3) **[Figure 20-130-1]**.

HIGH FLOW VALVE (CONT'D)

High Flow Relief Valve Adjustment

NOTE: The high flow relief valve is located between the control valve and the hydraulic reservoir.

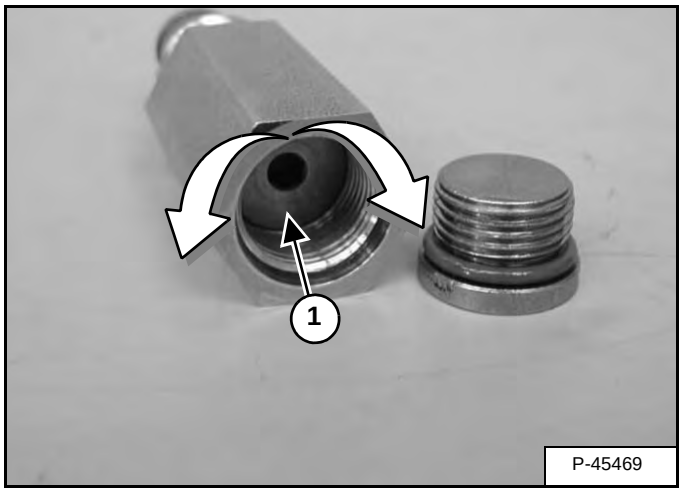
Figure 20-150-4



If the relief pressure is not correct, stop the engine and raise the operator cab. (See Raising on Page 10-30-2.)

Remove the high flow relief valve adjustment plug (Item 1) **[Figure 20-150-4]**.

Figure 20-150-5



To increase the high flow relief valve psi turn the screw (Item 1) **[Figure 20-150-5]** clockwise a 1/4 turn and recheck the high flow relief valve. (1/4 turn equals approximately 1379 kPa [13,8 bar] [200 psi].)

To decrease the high flow relief valve psi turn the screw (Item 1) **[Figure 20-150-5]** counterclockwise a 1/4 turn and recheck the high flow relief valve. (1/4 turn equals approximately 1379 kPa [13,8 bar] [200 psi].)

NOTE: If the relief screw (Item 1) [Figure 20-150-5] has been turned in 1/4 turn and the pressure remains the same, remove and inspect the high flow relief valve, replace as needed.

Install the plug into the high flow relief valve.

HYDROSTATIC DRIVE MOTOR (A3LN35196 & BELOW, A3LP35009 & BELOW)

Description

The hydrostatic drive motors are driven by the hydrostatic pumps. Machines equipped with SJC are monitored by a sensor mounted onto the motor housing. The sensor is used for detection of motion and for rate of speed for the SJC option. Standard machines use the same motor but have a plate and o-ring that covers the sensor hole.

The hydrostatic drive motors contain a spring applied pressure release braking system to stop the loader. In addition there is a separate oil chamber in the motor that is filled with high performance synthetic oil for maximum durability, this oil has a recommended service interval. (See Header on Page 10-70-1.)

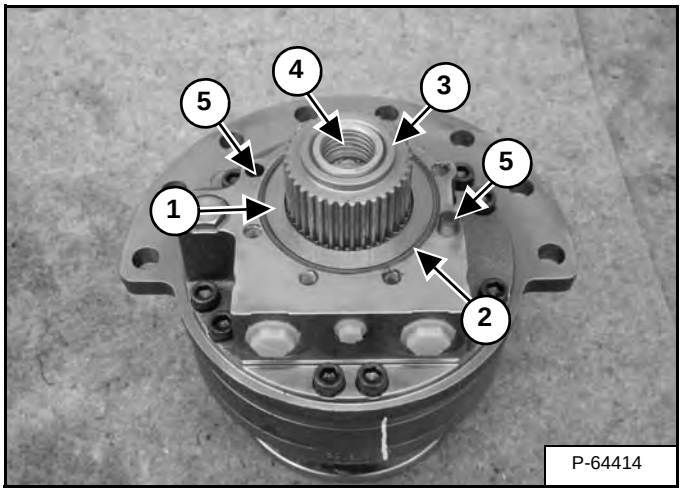
In this system there is a case drain filter for each motor to filter the excess oil before the hydraulic reservoir.

There are two hydrostatic drive motors and they are located on the track undercarriage.

Charge pressure from the hydraulic gear pump keeps the motors cool.

Disassembly And Assembly (Cont'd)

Figure 30-20-19



Remove the brake washer (Item 1) **[Figure 30-20-19]**.

Remove and replace the O-ring (Item 2) **[Figure 30-20-19]**.

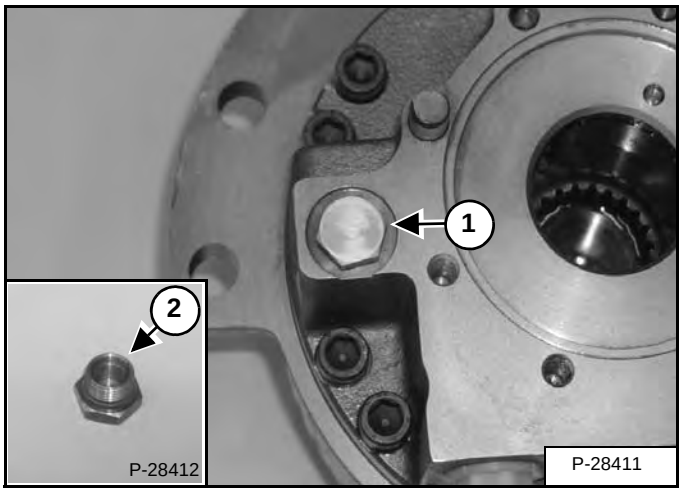
Assembly: Slightly coat the O-ring (Item 2) **[Figure 30-20-19]** with a layer of oil.

Remove the brake shaft (Item 3) **[Figure 30-20-19]** from the rear housing.

NOTE: The bushing (Item 4) [Figure 30-20-19] can be replaced in the brake shaft. When bushing is replaced, install flush with the top of the brake shaft.

Inspect the alignment pins (Item 5) **[Figure 30-20-19]** for damage and replace as needed.

Figure 30-20-20

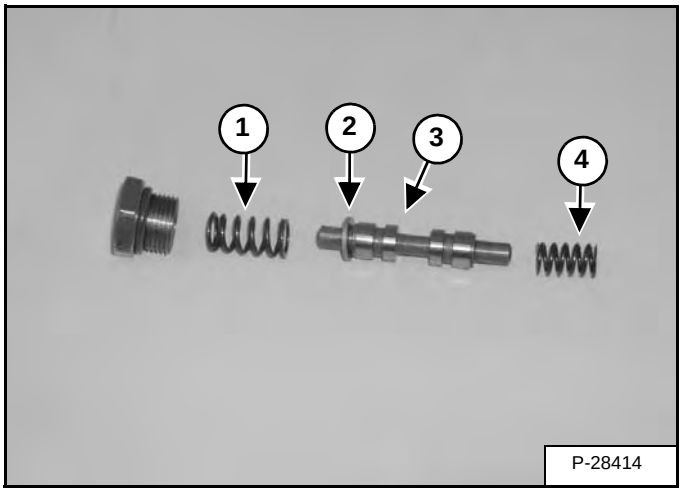


Remove the flushing valve plug (Item 1) **[Figure 30-20-20]** from the rear housing assembly.

Inspect O-ring (Item 2) **[Figure 30-20-20]** and replace.

Assembly: Tighten plug to 40 N•m (29.5 ft-lb) torque.

Figure 30-20-21

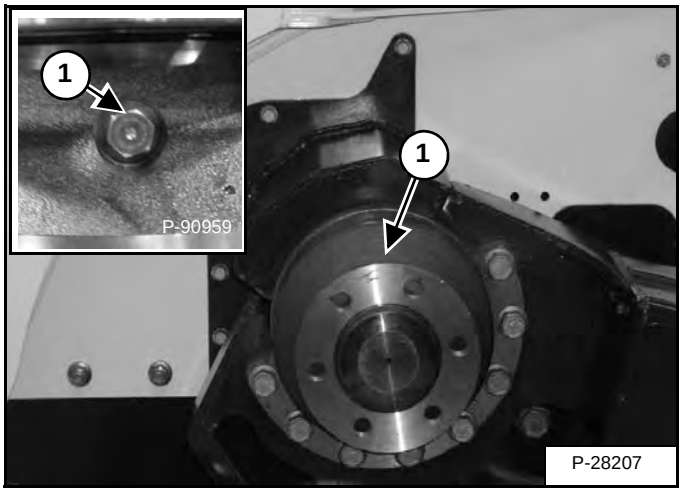


Remove spring (Item 1), washer (Item 2), spool (Item 3) and rear spring (Item 4) **[Figure 30-20-21]**.

Inspect all parts and replace as needed.

Removing And Replacing Oil (Cont'd)

Figure 30-21-3



Install the bottom plug into the motor.

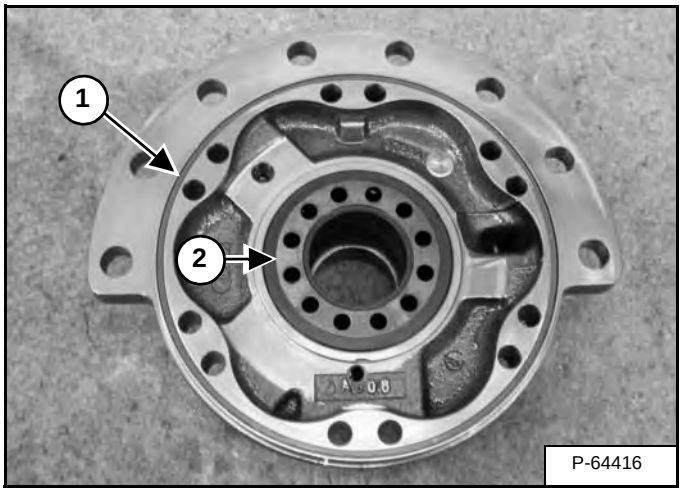
Remove the top plug (Item 1) **[Figure 30-21-3]** from the motor.

Fill the motor with 45 mL (1.5 U.S. fl oz) of high performance synthetic oil, Bobcat p/n 7003026. The motor will be approximately 1/2 to 2/3 full.

Installation: Tighten the plugs to 20 N•m (14.8 ft-lb) torque.

Disassembly And Assembly (Cont'd)

Figure 30-21-26

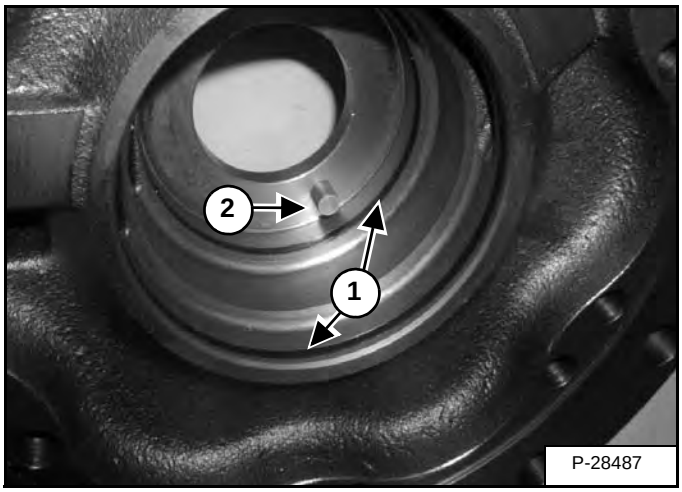


Remove and replace the O-ring (Item 1) **[Figure 30-21-26]**.

Remove the distributor (Item 2) **[Figure 30-21-26]** from the rear housing.

Assembly: Install the distributor (Item 2) **[Figure 30-21-26]** by using the alignment pin (Item 2) **[Figure 30-21-27]**.

Figure 30-21-27

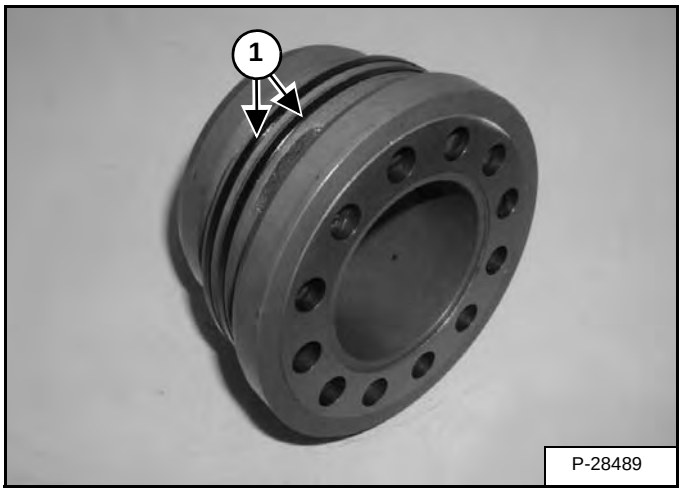


Remove and replace the two seals and back-up O-rings (Item 1) **[Figure 30-21-27]** on the rear housing.

Assembly: Apply a slight amount of oil to the O-rings and seals (Item 1) **[Figure 30-21-27]**

Remove and inspect the alignment pin (Item 2) **[Figure 30-21-27]**.

Figure 30-21-28

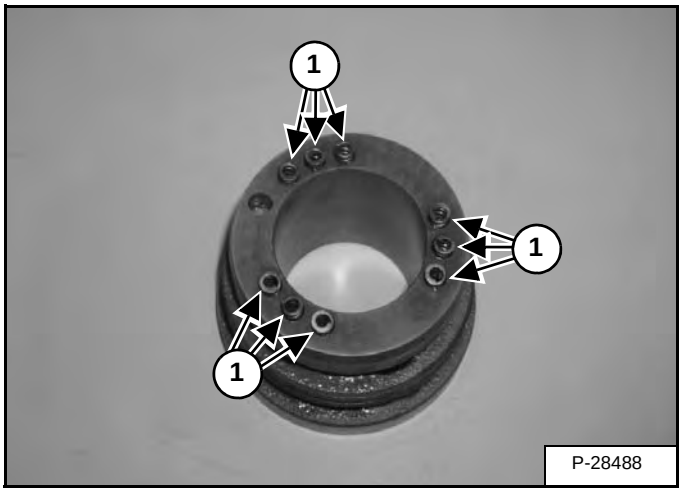


Remove and replace the two seals (Item 1) **[Figure 30-21-28]** and the back-up O-rings under the seals on the distributor.

Assembly: Apply a slight amount of oil to the O-rings and seals (Item 1) **[Figure 30-21-28]**

Inspect the distributor surfaces for scratches.

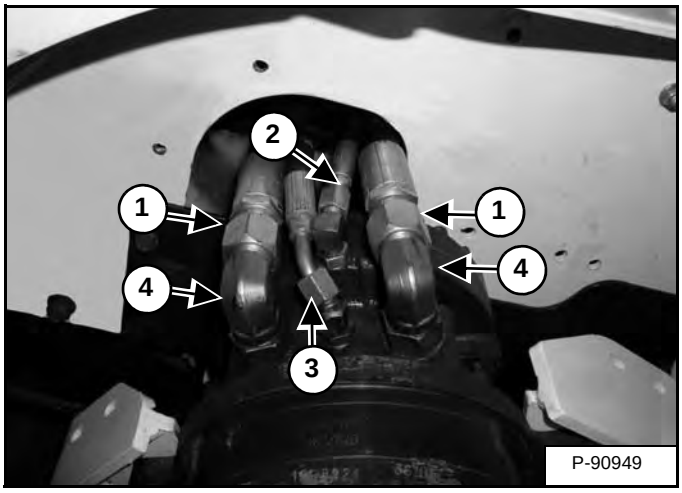
Figure 30-21-29



Remove and inspect the nine springs (Item 1) **[Figure 30-21-29]** from the distributor. Replace as necessary.

Removal And Installation (Cont'd)

Figure 30-22-6



Mark and remove the main drive hoses (Item 1) **[Figure 30-22-6]** from the motor.

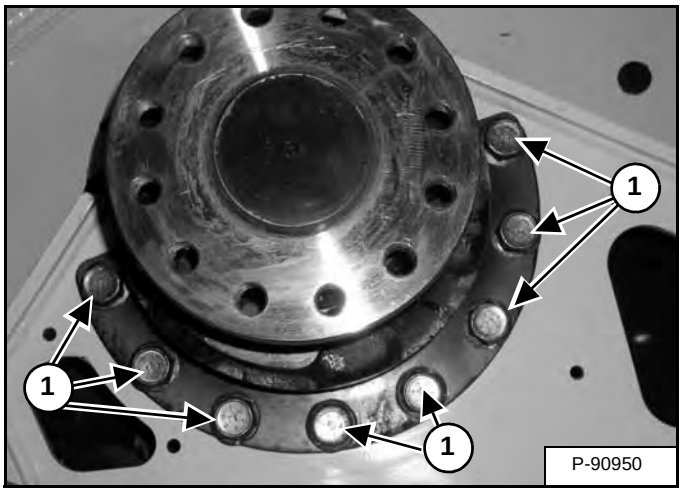
Mark and remove the brake release hose (Item 2) **[Figure 30-22-6]** from the motor.

Mark and remove the case drain hose (Item 3) **[Figure 30-22-6]**.

Cap and plug all hydraulic lines and hoses.

NOTE: The hydraulic fitting (Item 4) [Figure 30-22-6] on the hydrostatic motor must be tightened to 156 - 170 N•m (115 - 125 ft-lb) torque.

Figure 30-22-7



With an arm hoist support the hydraulic motor.

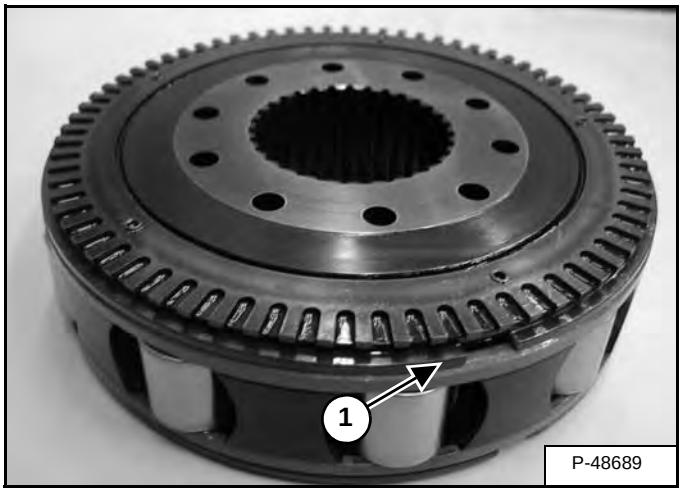
Remove the eight hydraulic motor mounting bolts (Item 1) **[Figure 30-22-7]**.

Installation: Tighten the motor mounting bolts to 240 - 260 N•m (175 - 190 ft-lb) torque. Apply thread locker equivalent to (Loctite® #242).

Remove the hydrostatic motor from the loader.

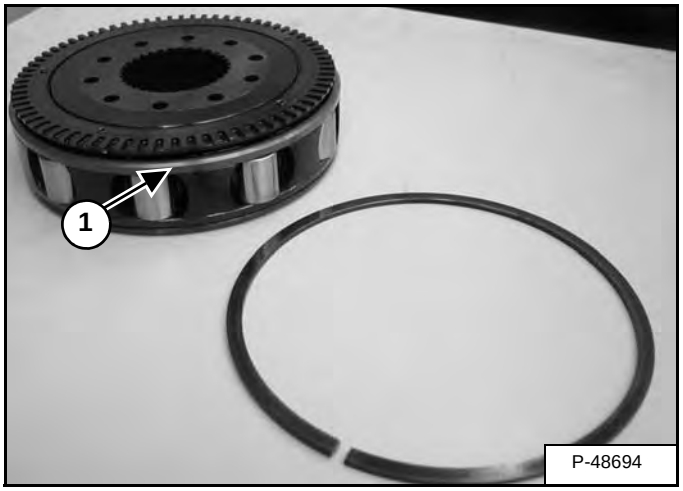
Disassembly And Assembly (Cont'd)

Figure 30-22-34



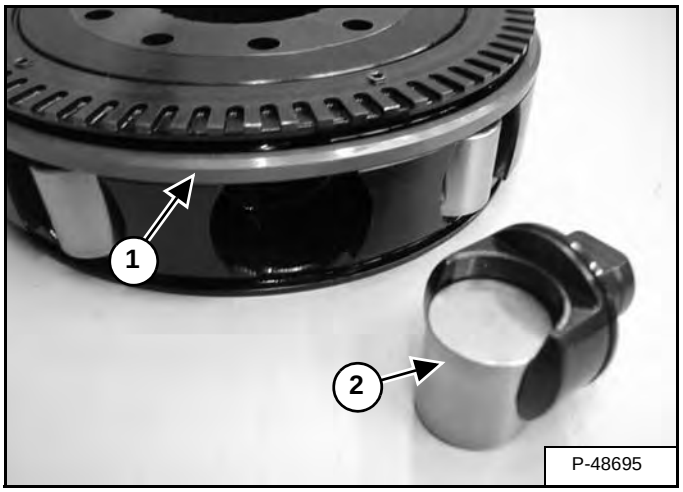
Remove the snap ring (Item 1) **[Figure 30-22-34]** from the top side of the rotating group.

Figure 30-22-35



The retainer ring (Item 1) **[Figure 30-22-35]** cannot be removed from the top side of the rotating group, because the rpm target disk is attached directly to the rotating group.

Figure 30-22-36



Lift the retaining ring (Item 1) **[Figure 30-22-36]**.

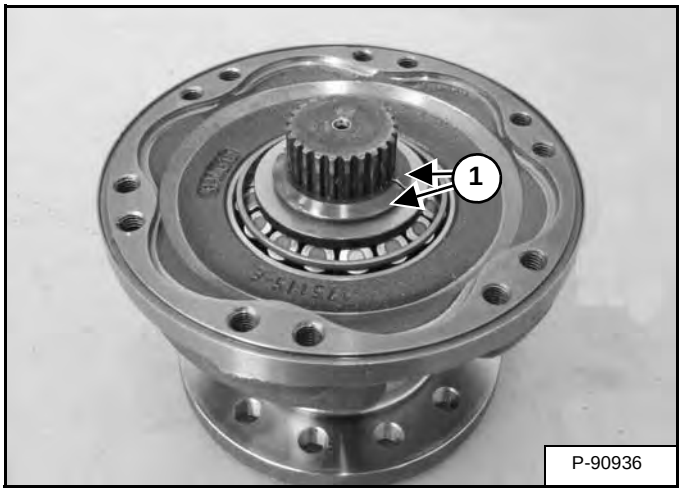
Use low air pressure and remove the roller / piston assembly (Item 2) **[Figure 30-22-36]** from the cylinder block.

Inspect the roller / piston assembly (Item 2) **[Figure 30-22-36]** for wear and replace as needed.

NOTE: Soak the roller / piston assembly (Item 2) [Figure 30-22-36] in oil and put all roller / piston assembles back in the original bore.

NOTE: The roller / piston assembly (Item 2) [Figure 30-22-36] is not a serviceable part.

Figure 30-22-37



With a hammer and punch remove the split ring (Item 1) **[Figure 30-22-37]**.

Adjusting (Cont'd)

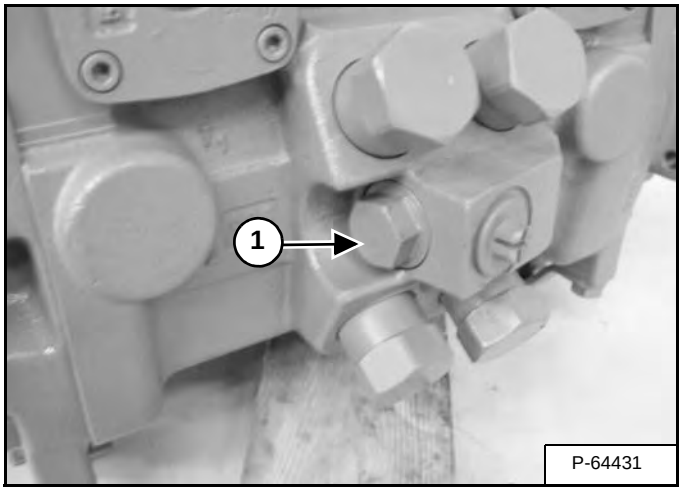
SJC Machines

IMPORTANT

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

I-2003-0888

Figure 30-30-14

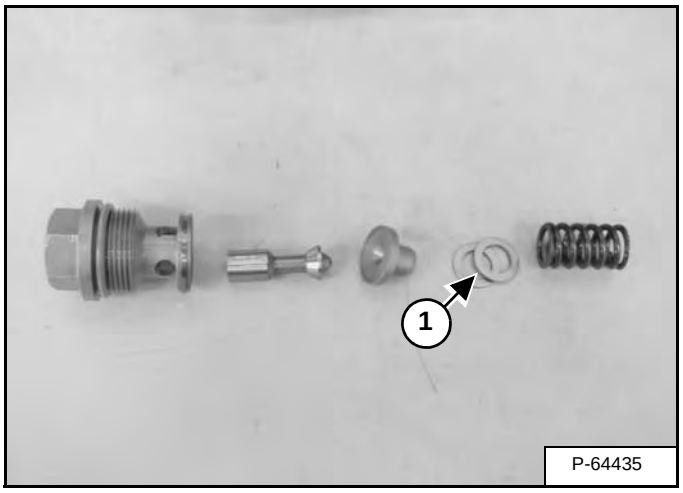


If the charge pressure is not correct remove the charge relief valve (Item 1) **[Figure 30-30-14]**.

NOTE: The pump has been removed for photo clarity. The charge pressure relief valve is located on the engine side of the hydrostatic pump when installed in the loader.

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

Figure 30-30-15



Check the poppet and spring for wear or damage.

Inspect the seat inside the hydrostatic pump case for wear or damage.

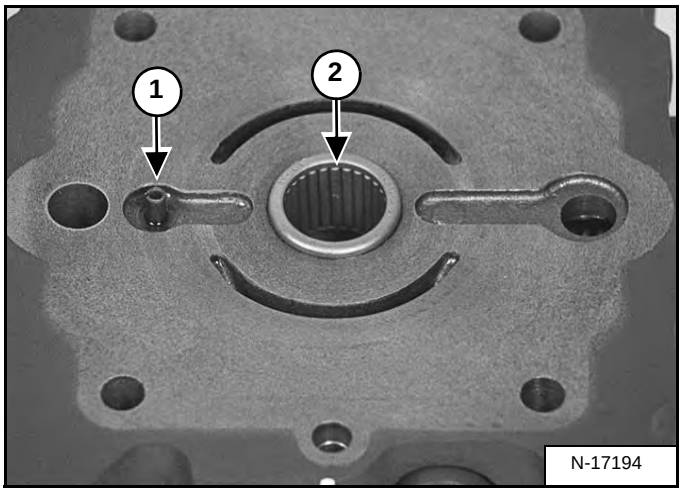
There are several different thickness of shims (Item 1) **[Figure 30-30-15]** used to adjust the charge pressure.

NOTE: 1,0 mm shim (Item 1) [Figure 30-30-15] = 300 kPa (3 bar) (43.5 psi) in pressure change. Adding shims increases charge pressure. Removing shims decreases charge pressure.

The charge pressure should be set at 2310 - 2654 kPa (23 - 27 bar) (335 - 385 psi).

Disassembly (Cont'd)

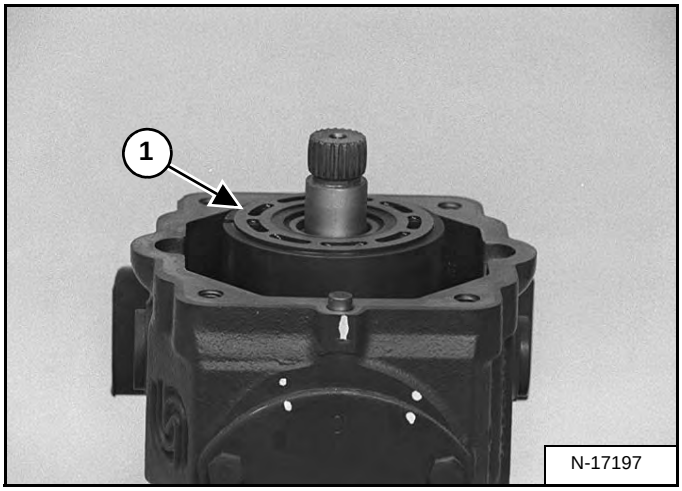
Figure 30-40-11



Check the valve plate locating pin (Item 1) **[Figure 30-40-11]** for wear and replace if needed.

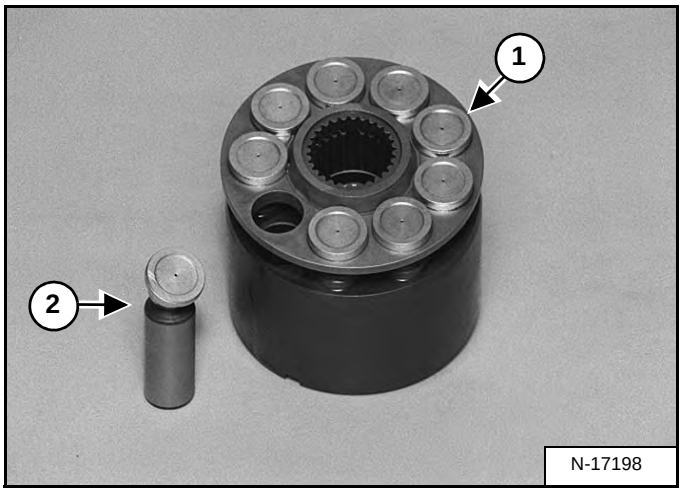
Check the needle bearing (Item 2) **[Figure 30-40-11]** for wear and replace if needed.

Figure 30-40-12



Remove the rotating group (Item 1) **[Figure 30-40-12]** from the pump.

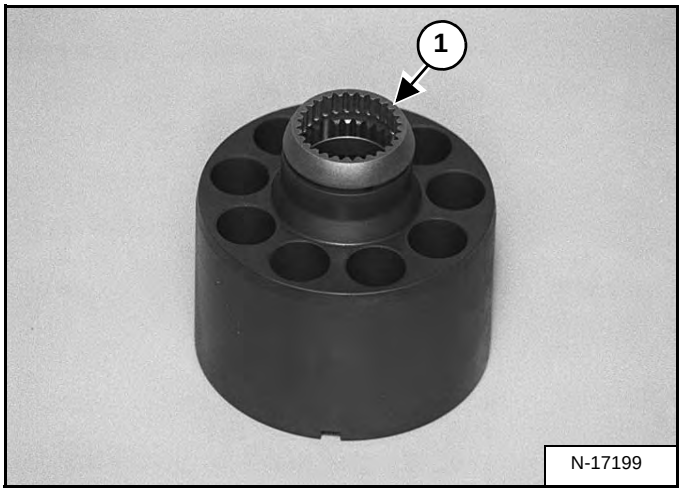
Figure 30-40-13



Remove the slipper guide and pistons (Item 1) **[Figure 30-40-13]** from the cylinder block.

Check all the pistons (Item 2) **[Figure 30-40-13]** for wear and replace the rotating group as needed.

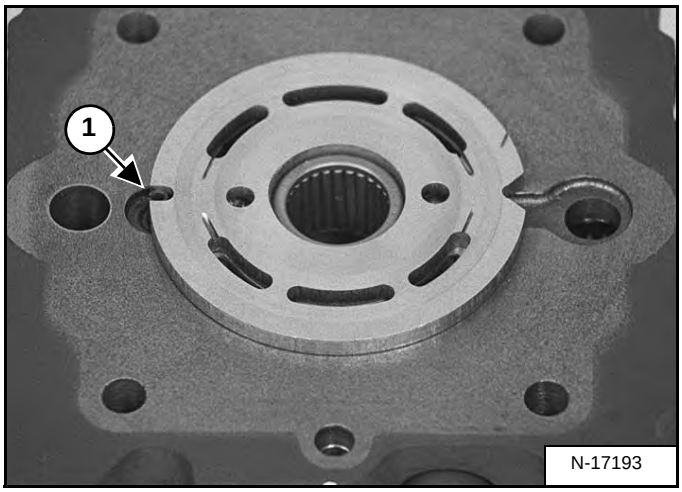
Figure 30-40-14



Remove the ball guide retainer (Item 1) **[Figure 30-40-14]** from the cylinder block.

Assembly (Cont'd)

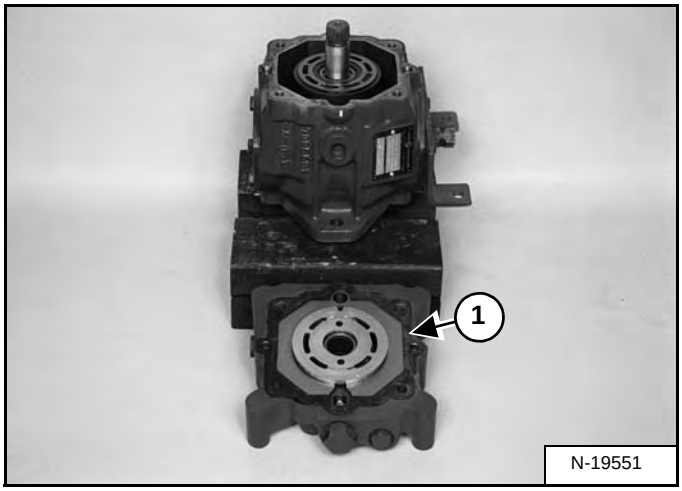
Figure 30-40-50



Coat the backside of the valve plate with petroleum jelly to hold it in position and install the valve plate onto the charge pump, bronze face up **[Figure 30-40-50]**.

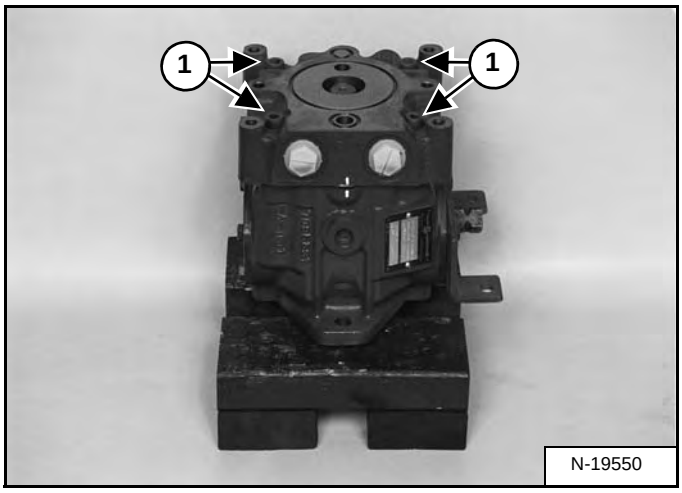
The notch (Item 1) **[Figure 30-40-50]** on the valve plate must engage the locating pin.

Figure 30-40-51



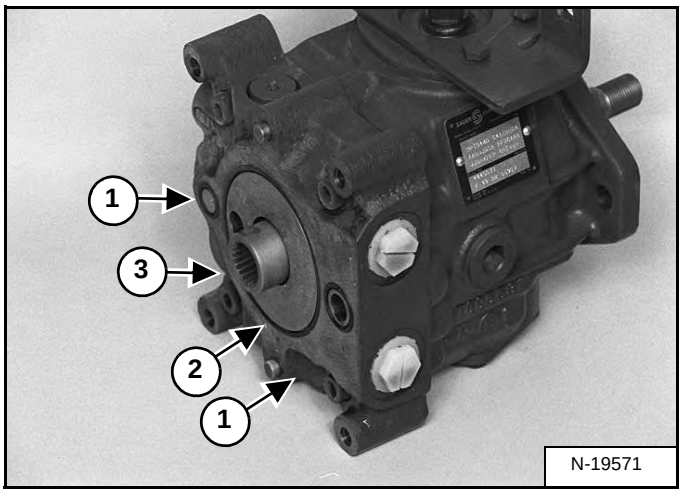
Coat a new end cap gasket (Item 1) **[Figure 30-40-51]** with petroleum jelly and install onto the end cap.

Figure 30-40-52



Install the valve plate and end cap on the pump housing. Tighten the bolts (Item 1) **[Figure 30-40-52]** to 47 - 61 N•m (35 - 45 ft-lb) torque.

Figure 30-40-53



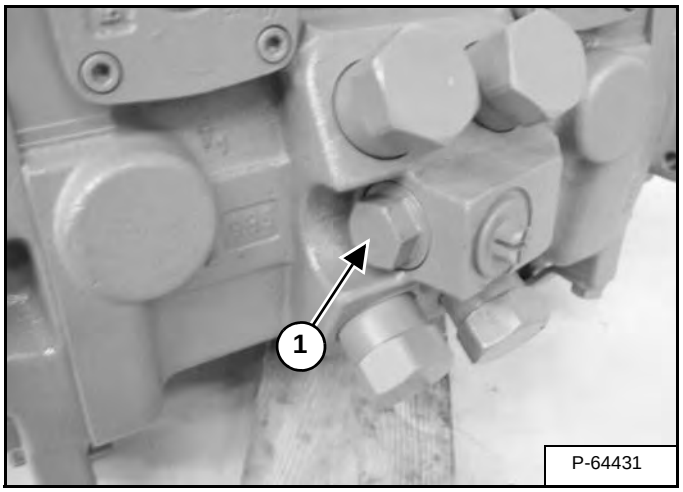
Install the two small O-rings (Item 1) **[Figure 30-40-53]**.

Install the large new O-ring (Item 2) **[Figure 30-40-53]**.

Install the pump coupler (Item 3) **[Figure 30-40-53]**.

Charge Relief Valve

Figure 30-41-19

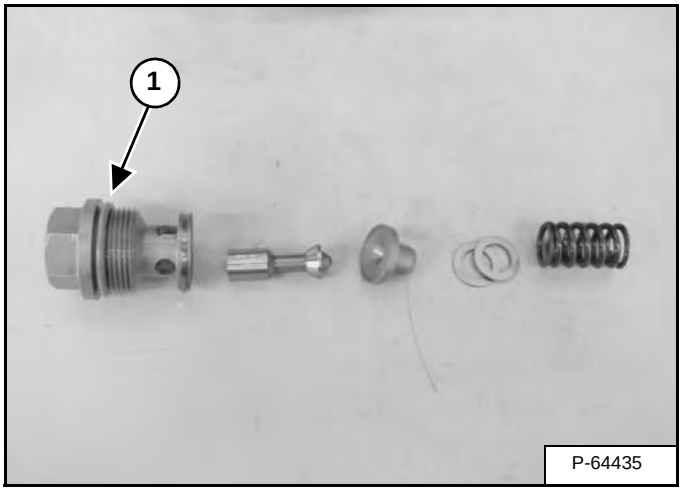


The charge relief valve (Item 1) **[Figure 30-41-19]** is located on the back of the hydrostatic pump.

Remove the charge relief valve.

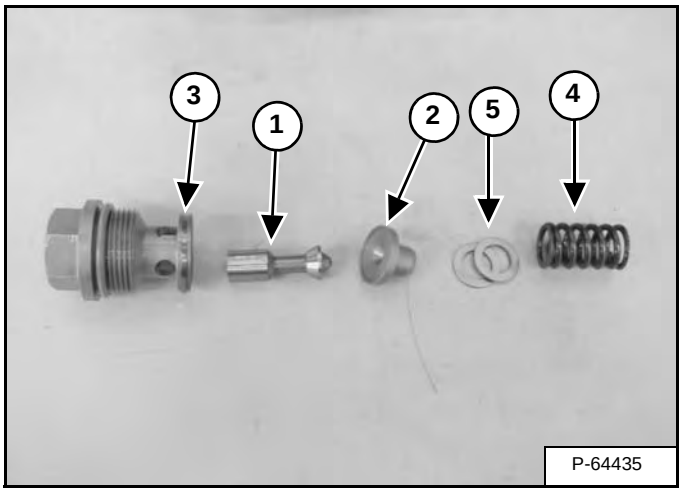
Assembly: Tighten charge relief valve to 70 N•m (52 ft-lb) torque.

Figure 30-41-20



Check and replace the O-ring (Item 1) **[Figure 30-41-20]**.

Figure 30-41-21



Inspect the poppet (Item 1) and the mating seat (Item 2) **[Figure 30-41-21]** for damage or foreign material. Ensure the poppet moves freely in it's bore.

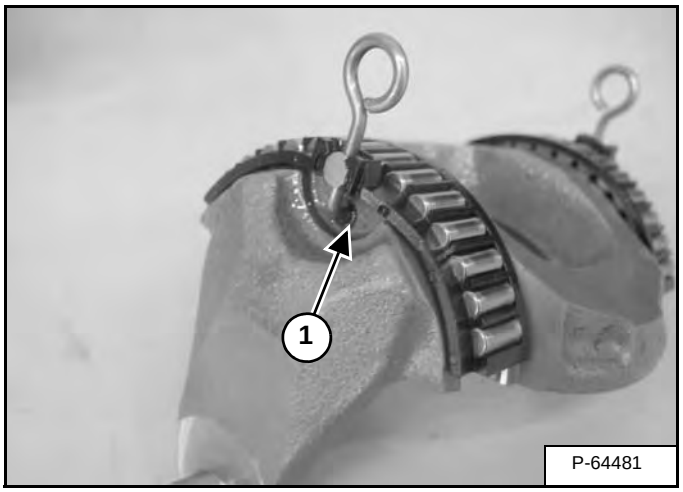
Inspect the sealing ring (Item 3) **[Figure 30-41-21]** and the mating seat in the pump housing for damage or foreign material.

Inspect the spring (Item 4) and the charge relief valve shims (Item 5) **[Figure 30-41-21]**.

NOTE: 1,0 mm shim (Item 5) [Figure 30-41-21] = 300 kPa (3 bar) (43.5 psi) in pressure change. Adding shims increases charge pressure. Removing shims decreases charge pressure.

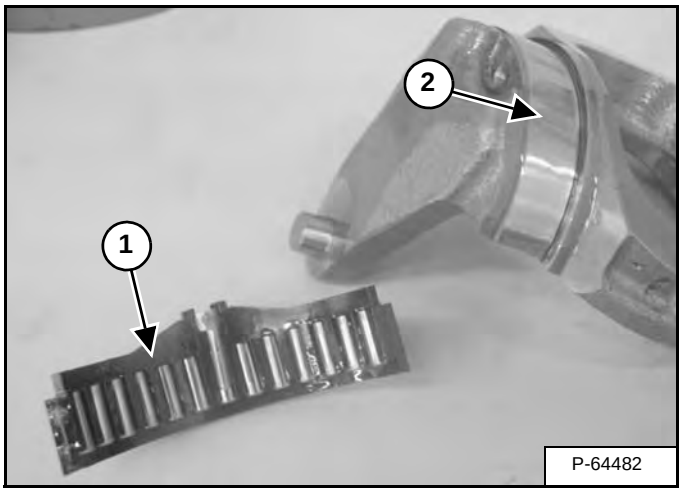
Disassembly And Assembly (Cont'd)

Figure 30-41-53



Assembly: Ensure bearing pins are in the holes of the swash plate (Item 1) **[Figure 30-41-53]**.

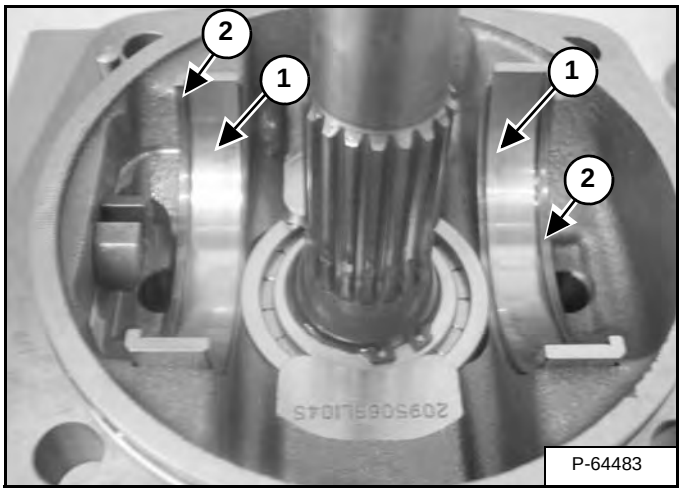
Figure 30-41-54



Remove the shell bearing (Item 1) **[Figure 30-41-54]**.

Inspect individual roller bearings and machined surfaces (Item 2) **[Figure 30-41-54]** on swash plate.

Figure 30-41-55



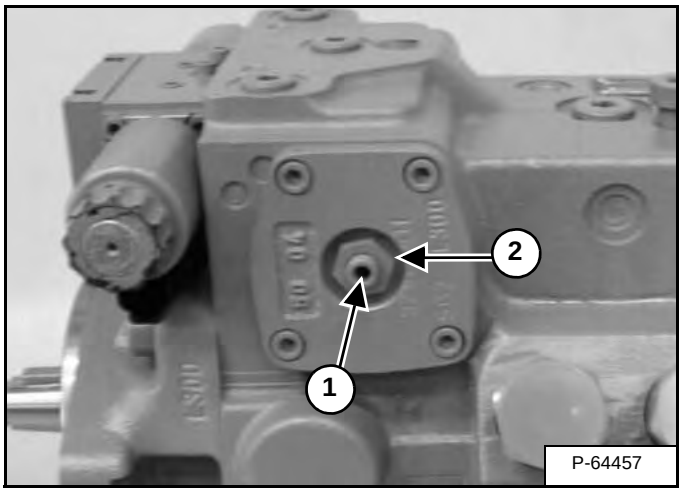
Remove the shell bearing races (Item 1) **[Figure 30-41-55]**.

Assembly: Note shell bearing races have an edge (Item 2) **[Figure 30-41-55]** on them. The edges face towards the outside of the endcap housing

Inspect bearing surfaces for scratches or scoring.

Mechanical Neutral Adjustment (Cont'd)

Figure 30-41-87



While holding the adjustment screw (Item 1) in position, tighten the lock nut (Item 2) **[Figure 30-41-87]** to 30 N•m (22 ft-lb) torque.

Shut loader OFF.

Remove the hydraulic hose from the X1 and X2 ports on the pump. Install the plugs and tighten to 25 N•m (18 ft-lb) torque.

Remove the pressure gauges from the MA and MB ports on the pump. Install the plugs and tighten to 25 N•m (18 ft-lb) torque.

NOTE: The Hydraulic Controller Neutral Adjustment must be performed whenever the Mechanical Neutral Adjustment is done. (See Hydraulic Controller Neutral Adjustment on Page 30-41-29.)

Hydraulic Controller Neutral Adjustment

The hydraulic controller neutral adjustment, aligns the pump swash plate and the control spool so that a zero angle control setting provides a zero degree swash plate setting. This adjustment should be performed whenever any part of the control or swash plate mechanisms are adjusted or removed or after the pump mechanical neutral setting is adjusted. Ensure the pump mechanical neutral setting is correct before performing hydraulic controller neutral adjustments.

NOTE: Procedure is shown for the left side hydraulic controller. Procedure is the same for the right side hydraulic controller, except you disconnect the electrical connectors for the right side hydraulic controller and connect pressure gauges in the X1 and X2 ports on the right side of the pump.

Place the loader on jack stands. (See Procedure on Page 10-10-1.)

⚠ WARNING

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

W-2017-0286

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

Raise the operator cab. (See Raising on Page 10-30-2.)

Connect the remote start tool. (See REMOTE START TOOL KIT-MEL1563 on Page 10-60-1.)

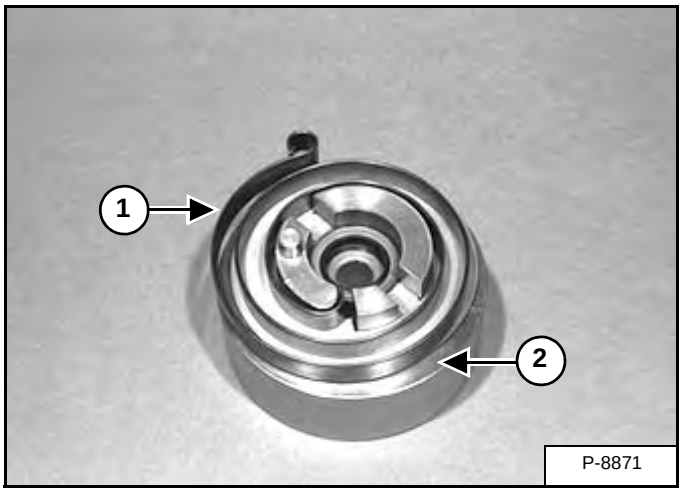
⚠ WARNING

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

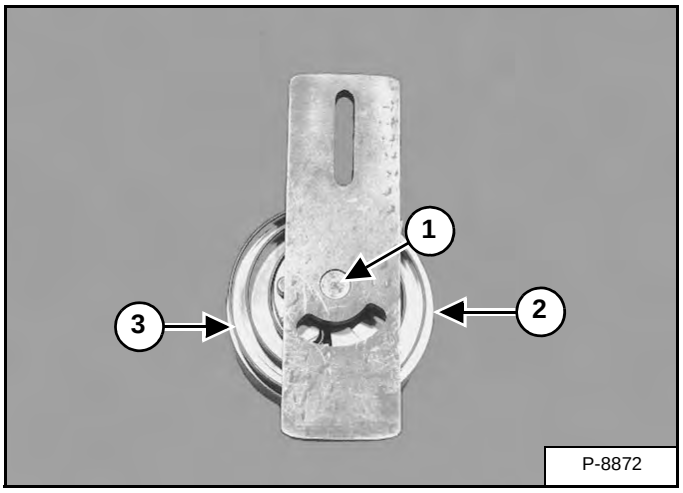
Tensioner Pulley Assembly

Figure 30-50-14



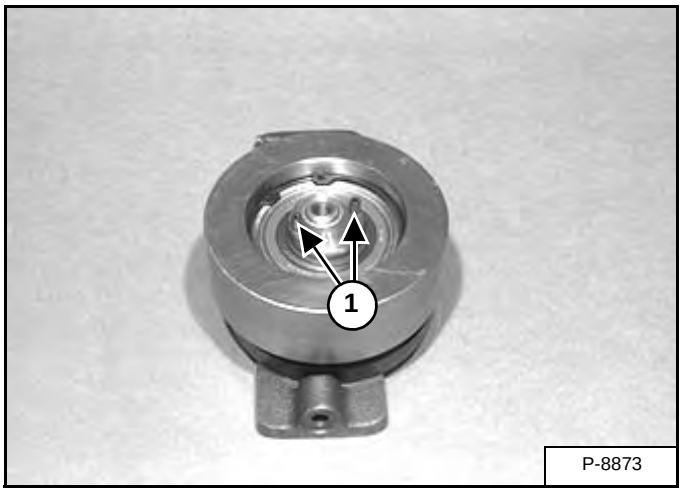
Install the spring (Item 1) on the pulley (Item 2) **[Figure 30-50-14]** as shown.

Figure 30-50-15



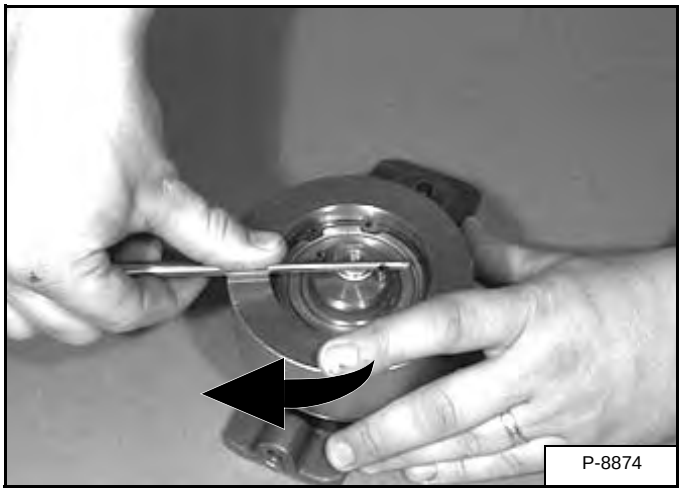
Install the shaft from the bracket assembly (Item 1) into the pulley assembly (Item 2) and align the spring (Item 3) **[Figure 30-50-15]** over the alignment pin on the bracket.

Figure 30-50-16



Turn the pulley assembly over and install the two pins (Item 1) **[Figure 30-50-16]** into the hub.

Figure 30-50-17

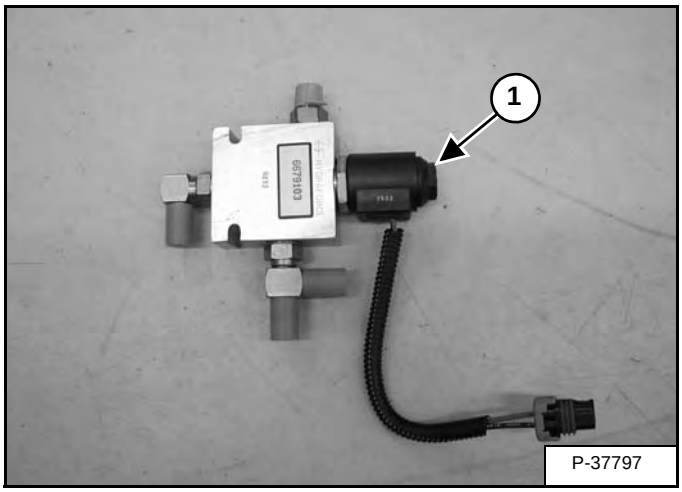


Install a punch as shown and turn clockwise while applying down pressure on the pulley.

Turn until the pulley snaps down into place; this procedure winds the spring and retains the end of the spring in proper location **[Figure 30-50-17]**.

Block Disassembly And Assembly

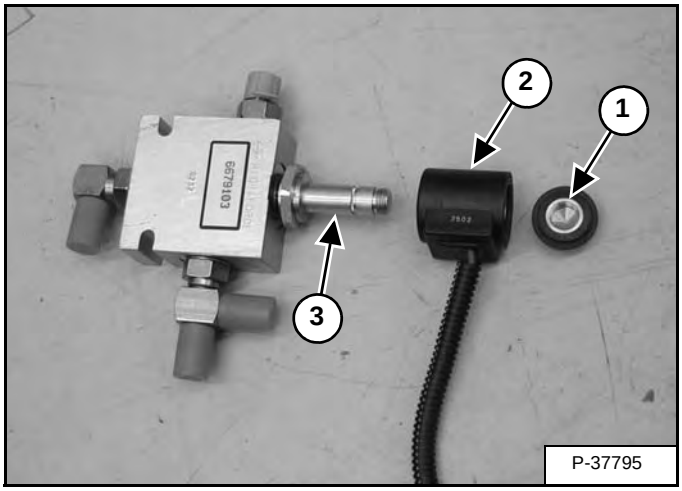
Figure 40-10-8



Loosen the electrical brake solenoid nut (Item 1) **[Figure 40-10-8]**.

Assembly: Tighten the solenoid nut 5,4 - 6,8 N•m (4 - 5 ft-lb) torque.

Figure 40-10-9

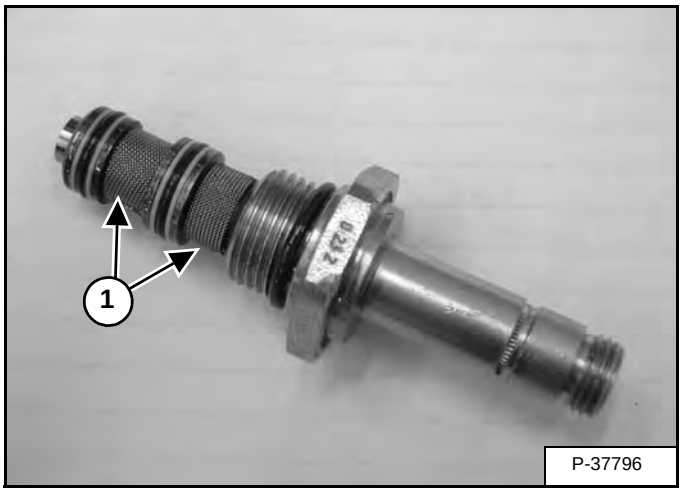


Remove the solenoid nut (Item 1) and solenoid coil (Item 2) **[Figure 40-10-9]**.

Remove the solenoid valve (Item 3) **[Figure 40-10-9]** from the block.

Assembly: Tighten the solenoid valve to 21,7 - 27,1 N•m (16 - 20 ft-lb) torque.

Figure 40-10-10



Inspect the O-rings and back-up washer on the solenoid valve and replace as needed **[Figure 40-10-10]**.

Check the screens (Item 1) **[Figure 40-10-10]** and clean with solvent.

Track Tensioner Disassembly And Assembly

⚠ WARNING

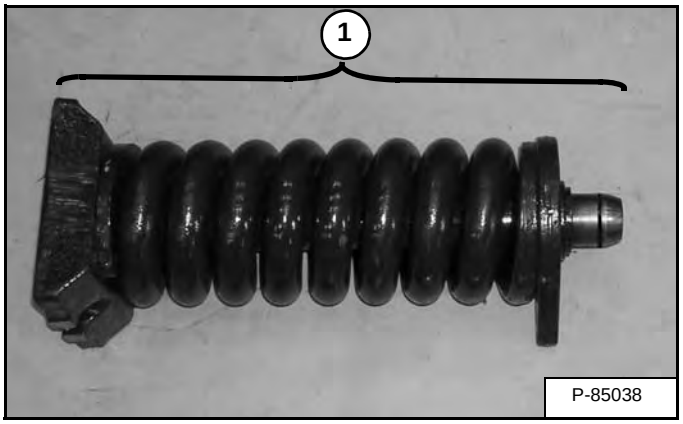
P-62574

AVOID INJURY OR DEATH

- **Spring loaded components under pressure can cause serious injury or death.**
- **Do not disassemble the coil spring assembly**

W-2617-1004

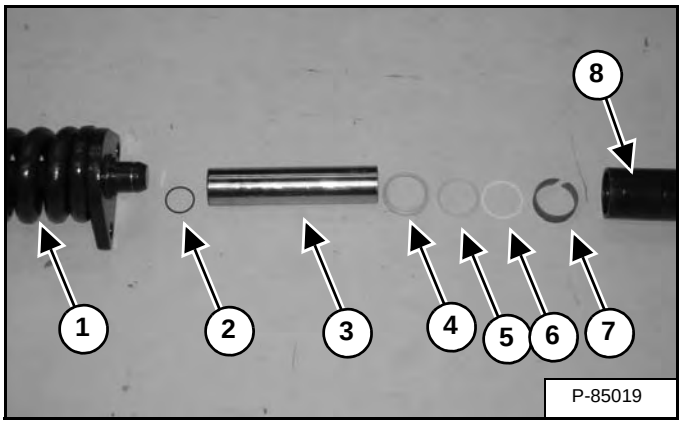
Figure 40-20-25



DO NOT DISASSEMBLE OR REPAIR THE COIL SPRING ASSEMBLY. THE COMPRESSION FORCE OF THE SPRING EXCEEDS 4536 kg (10,000 lb).

NOTE: The coil spring assembly (Item 1) [Figure 40-20-25] is only sold as a complete assembly from Bobcat Parts.

Figure 40-20-26



Inspect and replace any damaged parts.

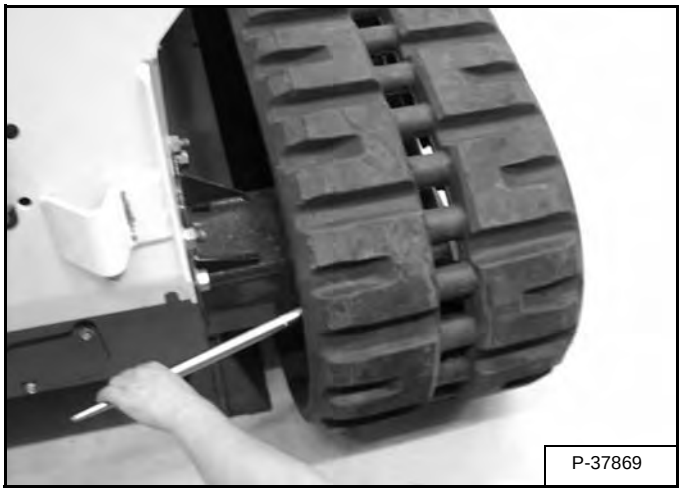
The items listed below refer to **[Figure 40-20-26]**.

1. Coil Spring Assembly
2. O-ring
3. Chrome Shaft
4. Seal
5. Back-up Ring
6. O-ring
7. Wear Ring
8. Grease Tube

NOTE: The O-ring (Item 2) is used to secure the chrome shaft (Item 3) to the coil spring assembly (Item 1) [Figure 40-20-26] during the installation of the track tensioner into the track housing.

Track Removal And Installation (Cont'd)

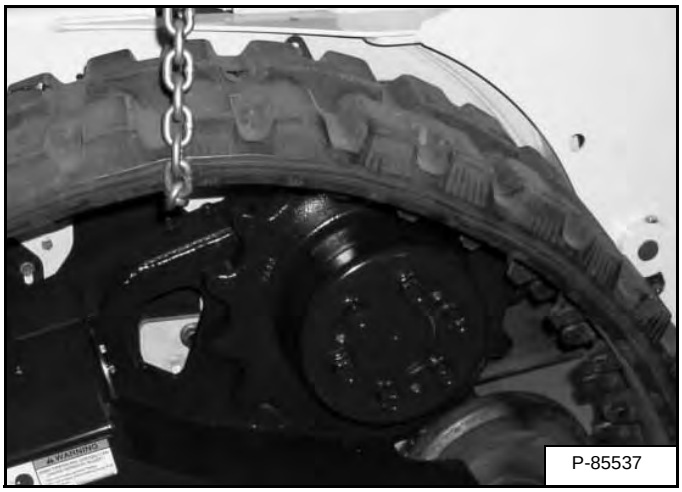
Figure 40-21-10



With pry bars, pry the track up and over the front idler **[Figure 40-21-10]**.

Completely remove the track from the front track assembly.

Figure 40-21-11



With a chain hoist or arm hoist lift the track clear of the drive sprocket and remove the track from the loader **[Figure 40-21-11]**.

To install the rubber track:

Completely retract the front idler and track tensioner.

Put the track over the rear drive sprocket lugs.

Put the track over the rear idler.

Slide the track under the rollers.

Put the track on the front idler wheel.

Adjust the track to the proper tension. (See Checking Tension on Page 40-21-2.)

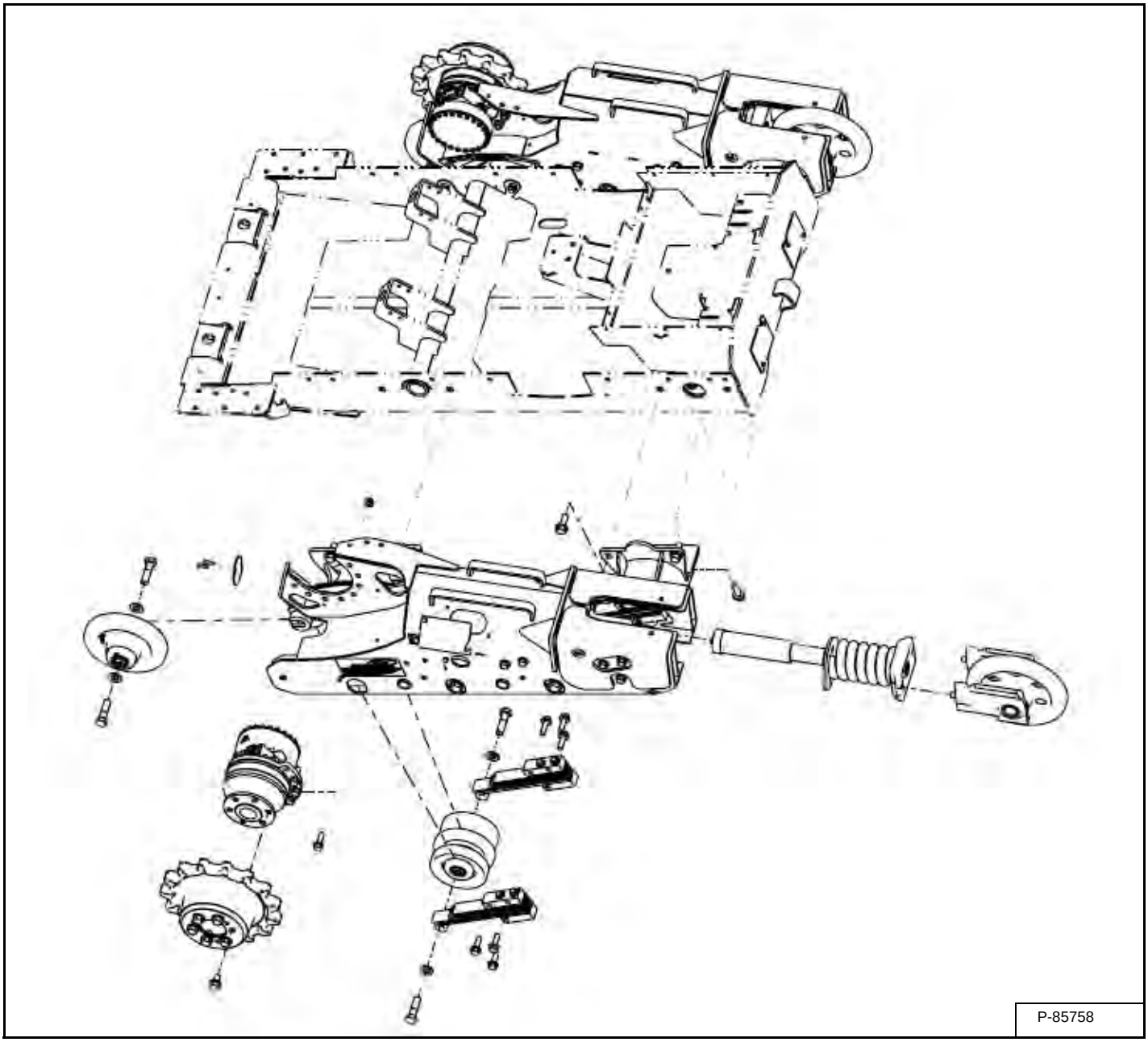
NOTE: The grease tube must be completely retracted against the coil spring assembly before adding grease, to prevent air from being trapped in the grease tube.

NOTE: Check the alignment of the grease tube (Item 1) [Figure 40-21-20] before adjusting the track.

TRACK UNDERCARRIAGE (ROLLER SUSPENSION)

Description

Figure 40-22-1

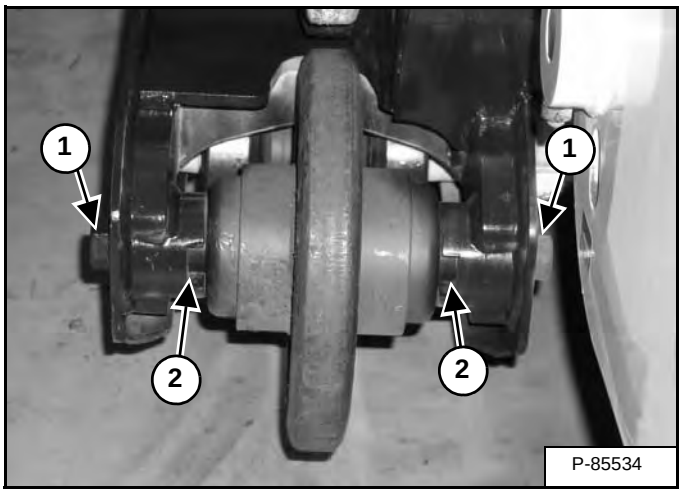


The track undercarriage components consist of front and rear idlers, rollers, leaf springs, the track, track tensioner, the drive sprocket and the track housing **[Figure 40-22-1]**.

Idler (Rear) Removal And Installation

Remove the track. (See Track Removal And Installation on Page 40-22-4.)

Figure 40-22-25



Remove the two mount bolts and washers (Item 1) **[Figure 40-22-25]**.

Remove the rear idler from the loader.

Installation: Align the square sides of the idler shaft with the notches in the track housing (Item 2) **[Figure 40-22-25]**.

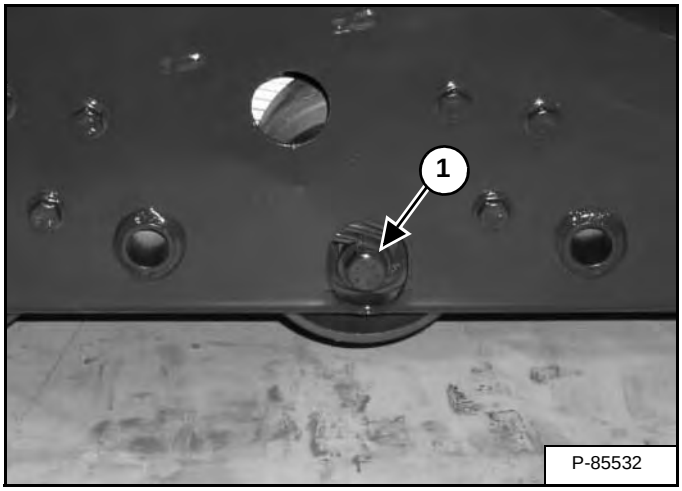
Align the holes in the housing with the holes in the shaft.

Install the bolts and washers and tighten to 711,5 N•m (525 ft-lb) torque.

Roller Removal And Installation

Remove the track from the loader. (See Track Removal And Installation on Page 40-22-4.)

Figure 40-22-26



Remove the bolt and washer (Item 1) **[Figure 40-22-26]** from the roller shaft. (Both ends of the roller shaft.)

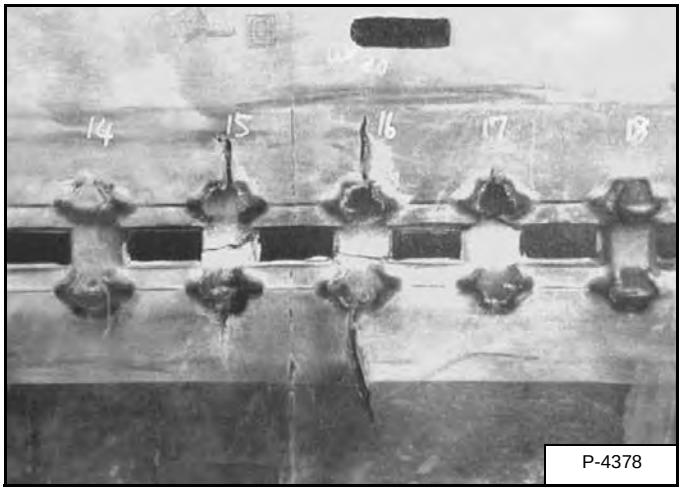
Remove the roller from the track assembly.

Installation: Support the roller from underneath with a hydraulic floor jack and tighten the bolts to 711,5 N•m (525 ft-lb) torque.

Track Damage Identification (Cont'd)

Separation Of Embedded Metals Due To Corrosion

Figure 40-30-12



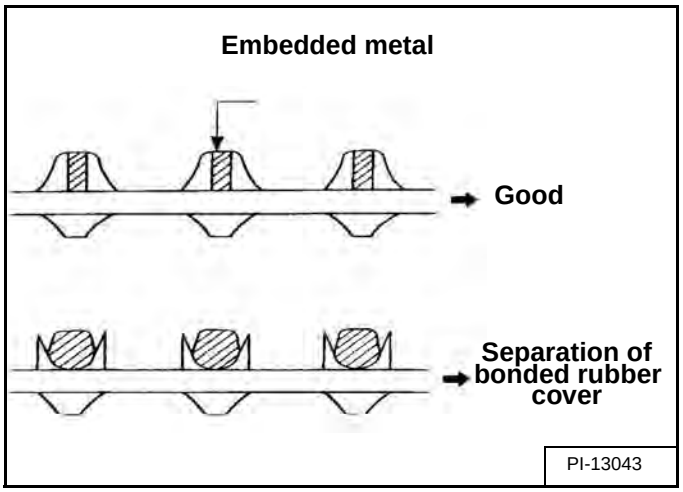
Damage:

Due to corrosion of embedded metals, the adhesion to the rubber body deteriorates, resulting in complete separation **[Figure 40-30-12]**.

Replacement:

Even a partial separation of embedded metals requires a rubber track replacement.

Figure 40-30-13



Causes of the damage:

Embedded metals are bonded to the rubber body. The following operating conditions cause embedded metals to corrode, causing deterioration of the bonding, and finally resulting in separation of the embedded metals from the rubber body **[Figure 40-30-13]**.

Excessively salty fields, like the sea shore

Strong acidic or alkali soil conditions

Compost spread grounds

On tracks that are out of adjustment, the track rollers, idlers and sprockets will gradually wear the rubber surface at track roller side, causing exposure of the embedded metals. Consequently the embedded metals will corrode resulting in their separation from the rubber body.

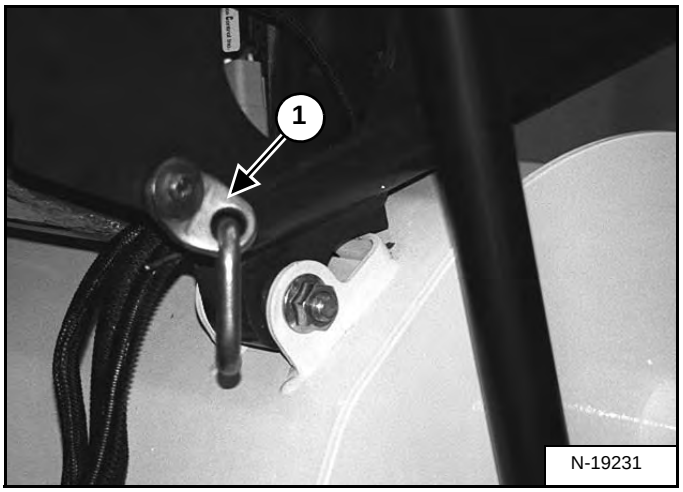
Prevention:

If rubber tracks are used under such field conditions as described under (Causes of the damage), they should be washed with plenty of water. After being completely dried, they should be stored correctly.

When the bonded rubber cover is separated from the embedded metal projections and the metals in the rubber body become loose, it is time to consider replacement of the rubber track.

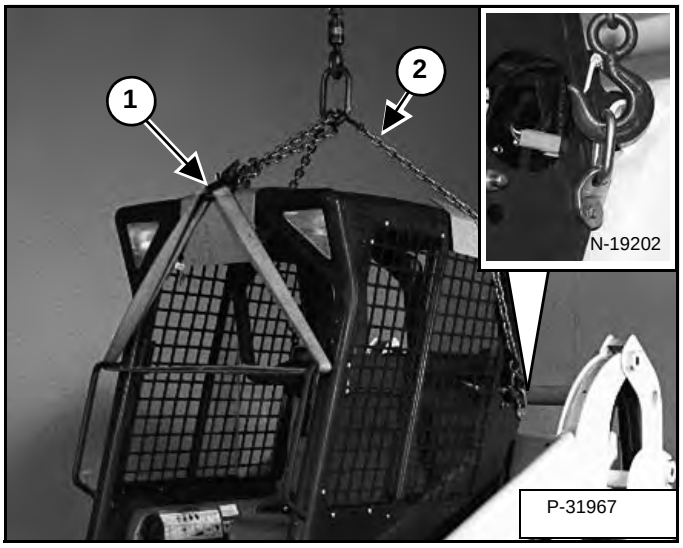
Removal And Installation (Cont'd)

Figure 50-20-14



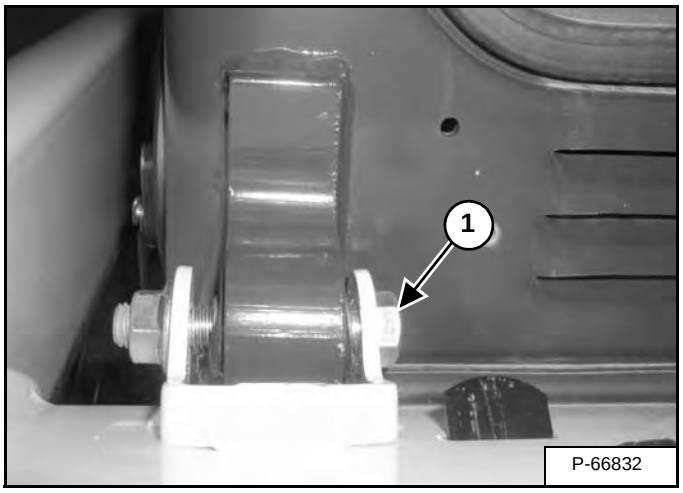
Install lift eye (Item 1) **[Figure 50-20-14]** (both sides) to the cab.

Figure 50-20-15



Connect the slings (Items 1 and 2) **[Figure 50-20-15]** to a chain hoist.

Figure 50-20-16



Remove the rear mounting bolt (Item 1) **[Figure 50-20-16]** (both sides) and nut from the operator cab.

Installation: Tighten the bolt and nut to 34 - 47 N•m (25 - 35 ft-lb) torque.

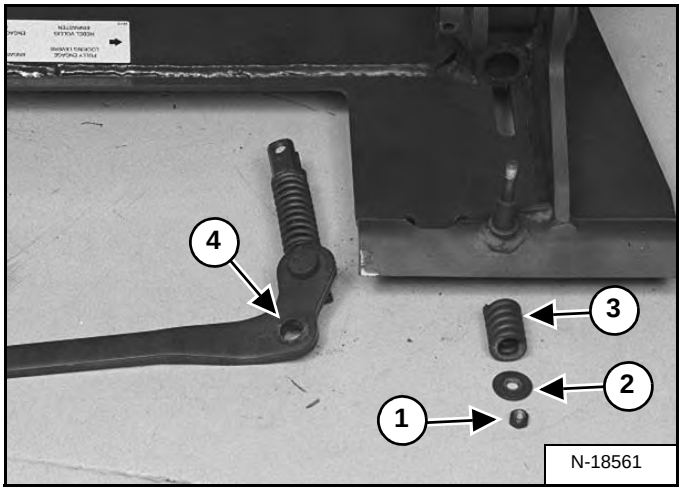
Lift the operator cab up and forward.

Remove the operator cab from the loader.

Reverse the above procedure to install the operator cab.

Lever And Wedge Disassembly And Assembly (Cont'd)

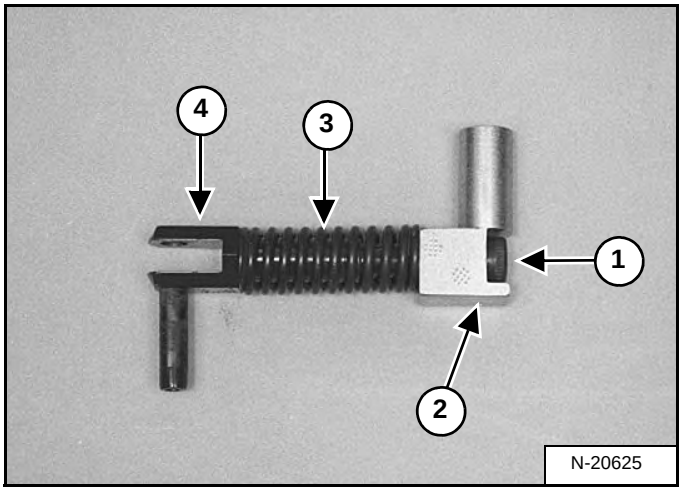
Figure 50-40-8



Remove the lever mounting nut (Item 1), washer (Item 2), spring (Item 3) and lever (Item 4) **[Figure 50-40-8]**.

Installation: Tighten the nut to 34 - 38 N•m (25 - 28 ft-lb) torque.

Figure 50-40-9

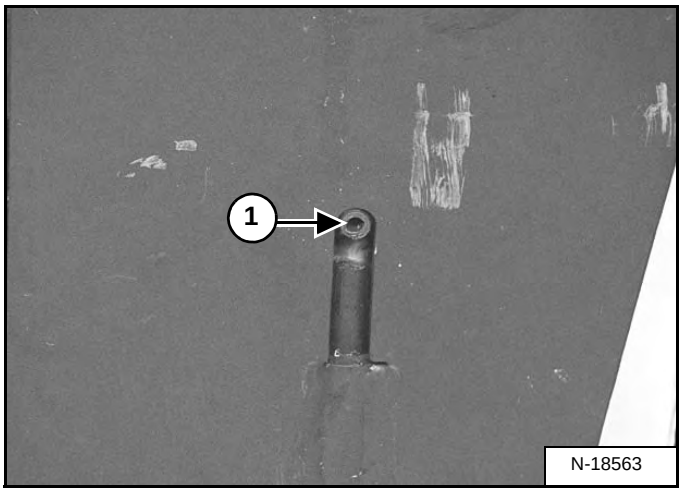


If the bolt (Item 1), handle pivot (Item 2), spring (Item 3), or clevis (Item 4) **[Figure 50-40-9]** are damaged, put the assembly in a vise.

Remove the bolt and replace the damaged parts as needed.

Assembly: Clean the threads and apply Loctite® 242 to the bolt (Item 1) **[Figure 50-40-9]** torque to 88,0 - 95,0 N•m (65 - 70 ft-lb).

Figure 50-40-10

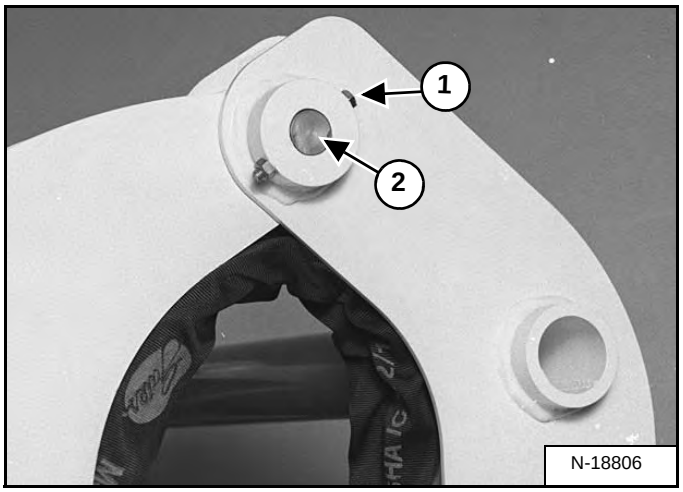


Use a punch and hammer to drive the roll pin (Item 1) **[Figure 50-40-10]** flush with the face of the Bob-Tach.

Reverse the removal procedure to install the Bob-Tach lever and wedge **[Figure 50-40-10]**.

Removal And Installation (Cont'd)

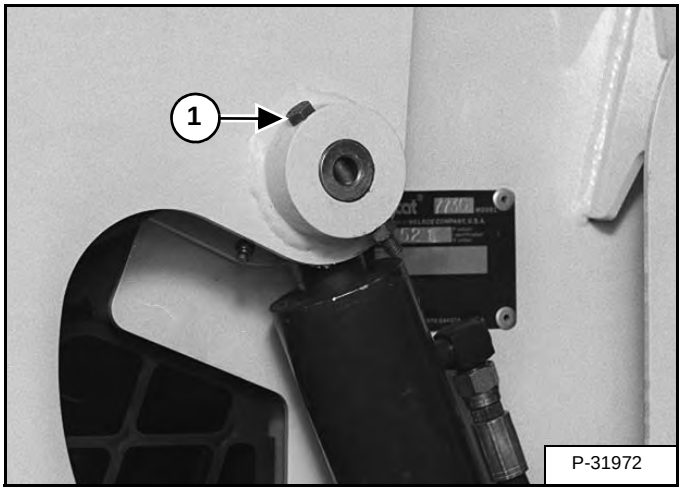
Figure 50-50-16



Remove the retainer bolt (Item 1) **[Figure 50-50-16]** and nut from the lift arm pin (both sides).

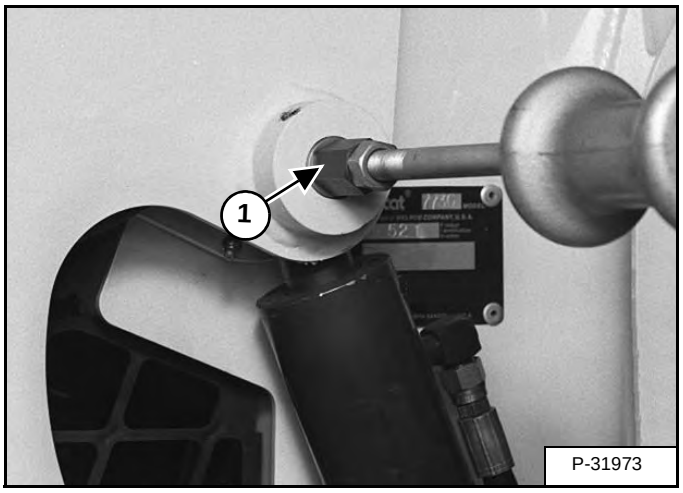
Use a drift pin and hammer remove the lift arm pivot pin (Item 2) **[Figure 50-50-16]** (both sides).

Figure 50-50-17



Remove the retainer bolt (Item 1) **[Figure 50-50-17]** and nut from the lift cylinder rod end pivot pin (both sides).

Figure 50-50-18



Use a slide hammer remove the lift cylinder rod end pivot pin (Item 1) **[Figure 50-50-18]** (both sides).

Strap the lift cylinders to rear of the uprights.

CONTROL PEDALS AND LINKAGES

Description

The control pedals and linkages are connected to the control valve. The control pedals will mechanically move the lift and tilt spools on the control valve.

The control pedals and linkages are located on the lower mainframe at the operators feet.

Pedal Removal And Installation

⚠ WARNING

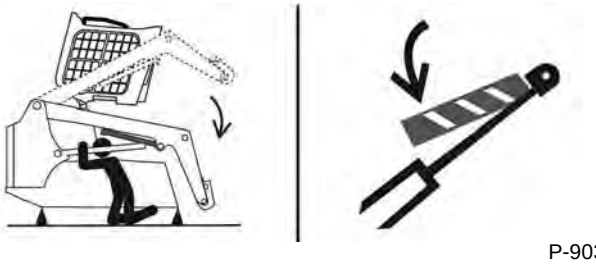
Never work on a machine with the lift arms up unless the lift arms are secured by an approved lift arm support device. Failure to use an approved lift arm support device can allow the lift arms or attachment to fall and cause injury or death.

W-2059-0598

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

Raise the operator cab. (See Raising on Page 10-30-2.)

⚠ DANGER



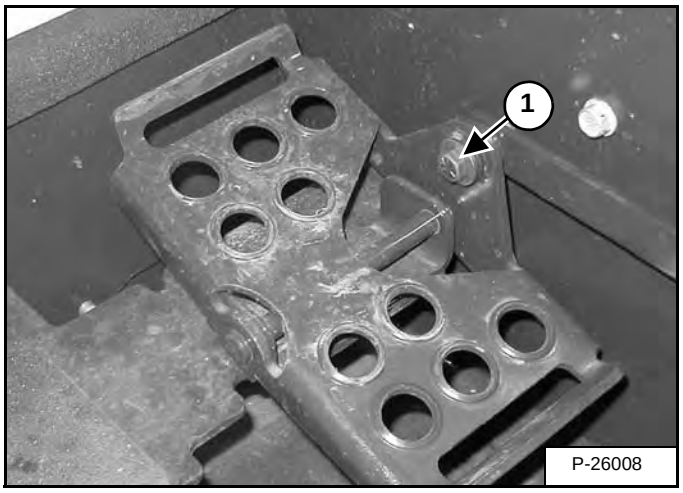
P-90328

AVOID DEATH

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

D-1009-0409

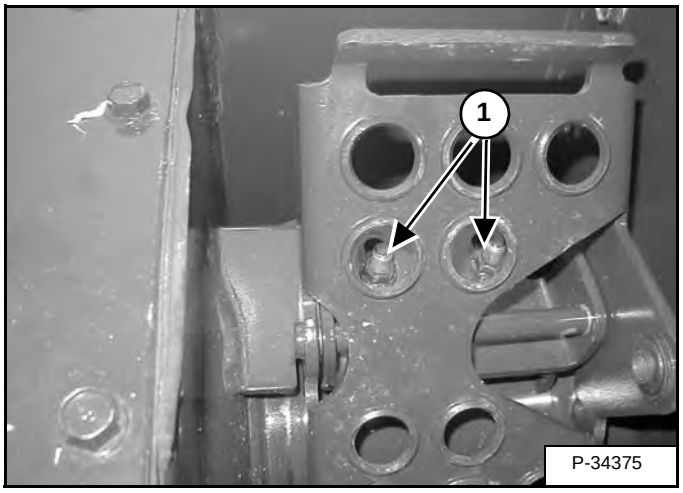
Figure 50-90-1



Remove the bolt (Item 1) **[Figure 50-90-1]** and nut from the pedal linkage.

Check the rubber bushing in the pedal for wear and replace as needed.

Figure 50-90-2

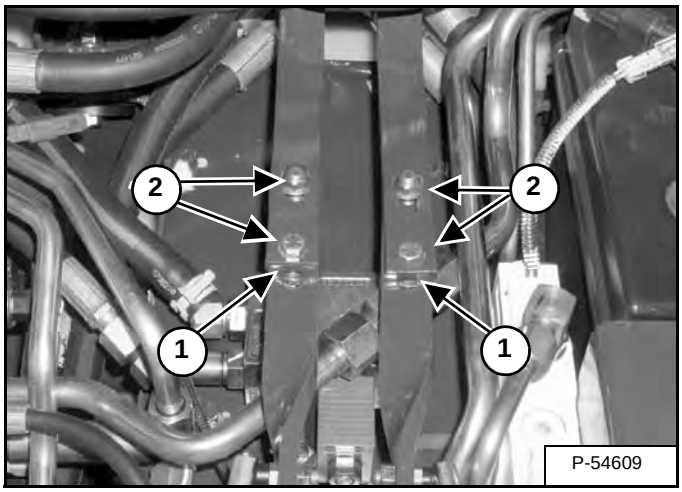


Remove the two mounting bolts (Item 1) **[Figure 50-90-2]** from the pedal mounting bracket.

Remove the pedal assembly from the loader.

Removal And Installation (Cont'd)

Figure 50-100-4

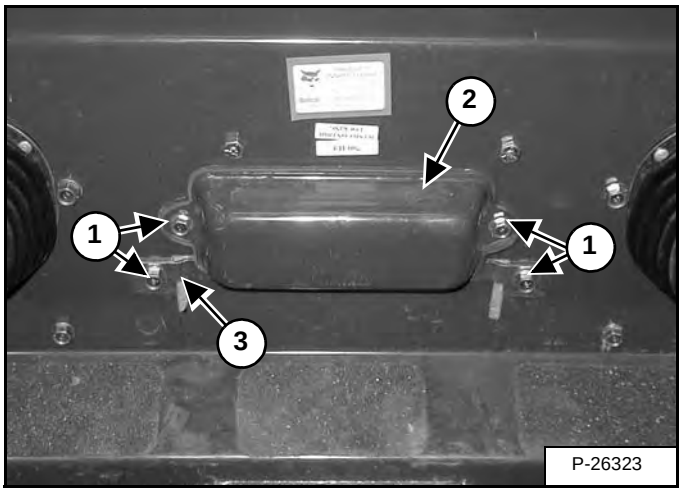


Scribe a mark across the top of the steering linkage bars (Item 1) **[Figure 50-100-4]** which are connected to the steering shaft on the control panel.

Remove the four steering linkage mounting bolts (Item 2) **[Figure 50-100-4]**.

Installation: Align the marks on the steering linkage bars. Tighten the steering linkage mounting bolts to 47,5 - 54,2 N•m (35 - 40 ft-lb) torque.

Figure 50-100-5



Remove the fuse cover mount screws (Item 1) **[Figure 50-100-5]**.

Installation: Tighten screws to 11 - 15 N•m (8 - 11 ft-lb) torque.

Remove the fuse / relay cover (Item 2) **[Figure 50-100-5]**.

Remove the fuse / relay shield mounting screws (Item 3) **[Figure 50-100-5]**.

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

Remove the fuse / relay shield (Item 4) **[Figure 50-100-5]**

Figure 50-100-6

Remove the fuse / relay block **[Figure 50-100-6]**.

Linkage Neutral (Adjusting)

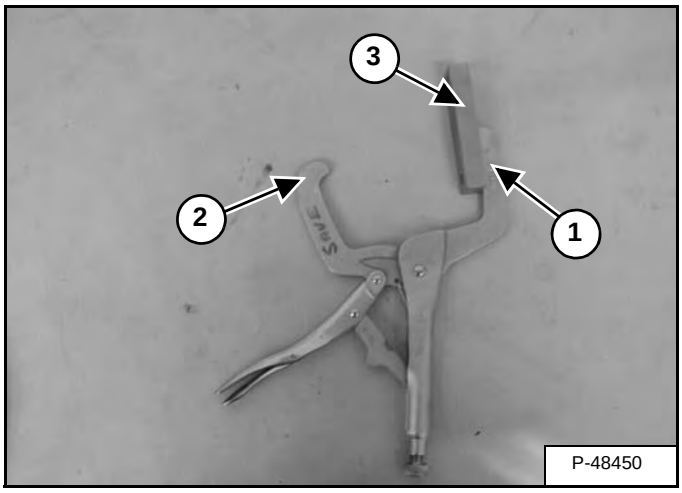
The following tool listed will be needed to do the following procedure:

MEL1563 or 6689779 - Remote Start Tool Kit

Connect the remote start tool to the engine harness. (See REMOTE START TOOL KIT-MEL1563 on Page 10-60-1.)

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

Figure 50-100-28



Tool that may assist in the neutral adjustment **[Figure 50-100-28]**.

To make this tool use a locking grip C-Clamp and grind one edge flat (Item 1) and grind the other edge (Item 2) **[Figure 50-100-28]** to a small rounded edge.

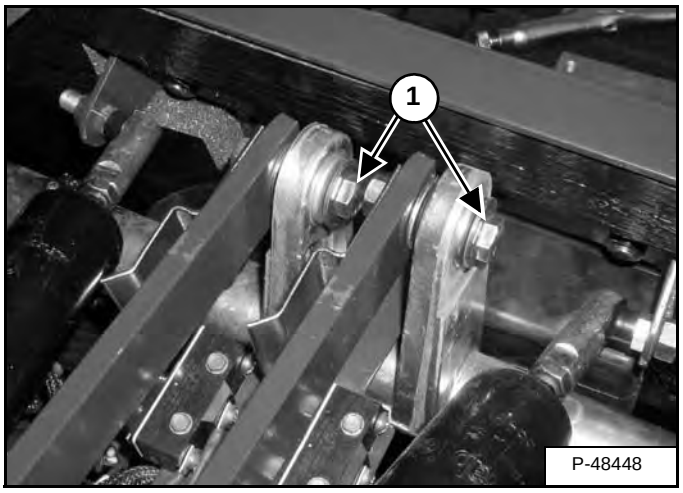
A steering centering block (Item 3) **[Figure 50-100-28]** is also needed. The centering block can be placed as shown and welded to the C-clamp if desired.

⚠ WARNING

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

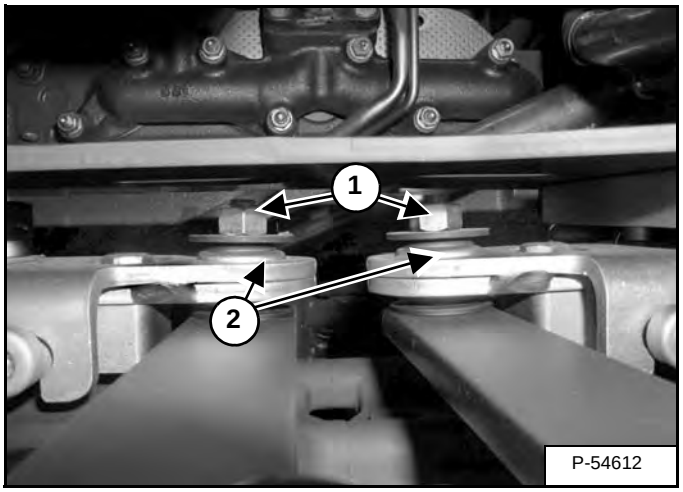
W-2017-0286

Figure 50-100-29



Loosen the bolt / nut (Item 1) **[Figure 50-100-29]** only until the tension is released from the torsion bushing.

Figure 50-100-30



Loosen the nut (Item 1) only until the tension is released from the torsion bushing (Item 2) **[Figure 50-100-30]**.

NOTE: The bolt must be loose enough to allow the torsion bushing (Item 2) [Figure 50-100-30] to turn freely between the torsion bushing and the steering linkage bar.

CONTROL HANDLE / LEVER

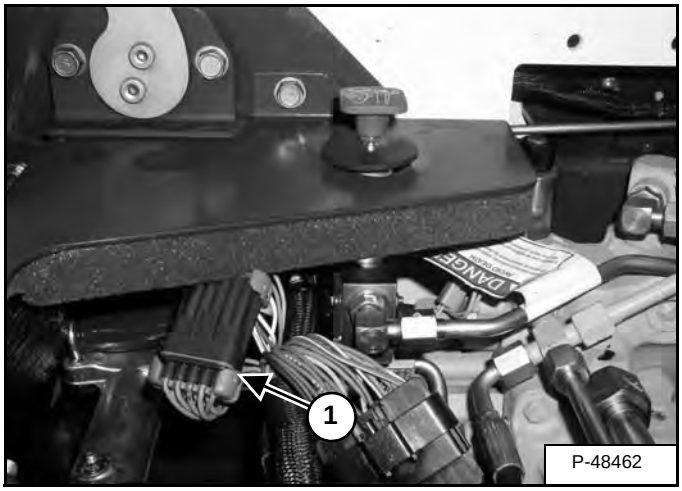
Description

The control handles / levers are used to control the forward and reverse travel.

The control handles / levers are mounted to the control panel.

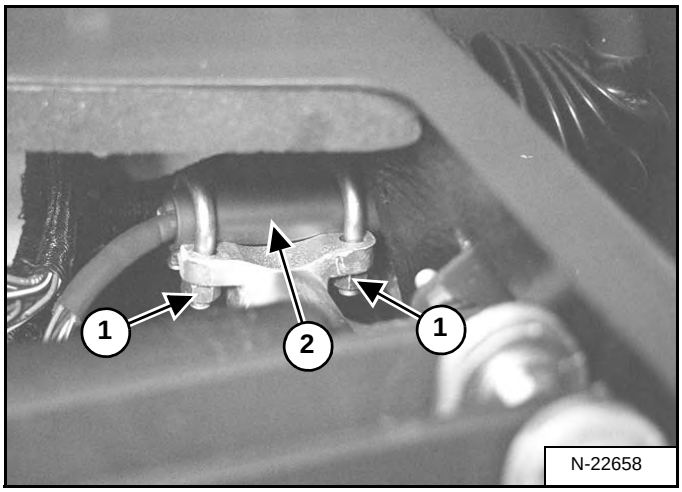
Lever Removal And Installation

Figure 50-110-1



Disconnect the electrical connectors from the control lever **[Figure 50-110-1]**.

Figure 50-110-2



Remove the nuts from the two U-bolts (Item 1) **[Figure 50-110-2]** used to mount the control lever.

Remove the U-bolts from the control lever mount.

Remove the control lever (Item 2) **[Figure 50-110-2]** by sliding the lever through the rubber boot (Item 1) **[Figure 50-110-3]** on the front of the control panel.

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

CONTROL HANDLE / LEVER (SJC)

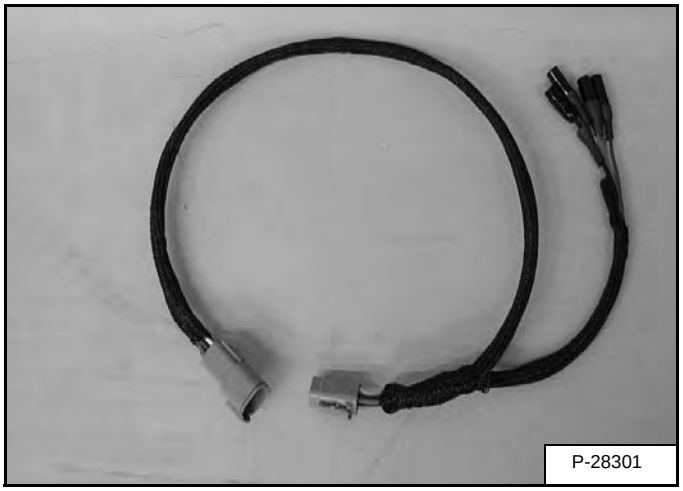
Description

The control handles / levers are used to control the forward and reverse travel and the lift and tilt functions.

The control handles / levers are mounted to the control panel.

Joystick Testing

Figure 50-112-1



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

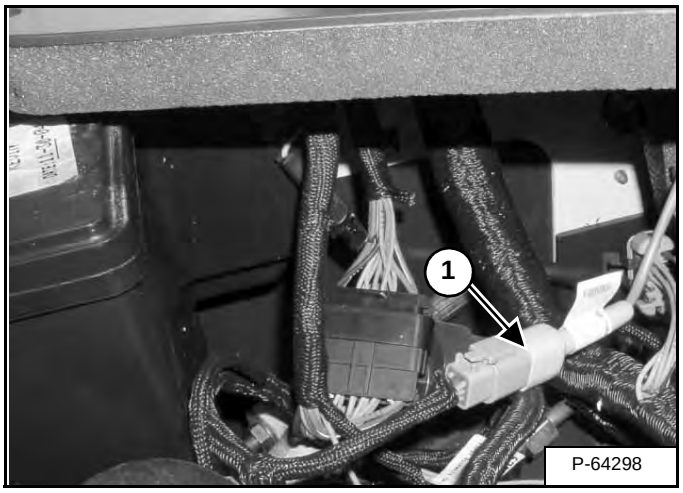
MEL1608-Joystick Test Harness **[Figure 50-112-1]**
MEL1563 or 6689779-Remote Start Tool
Multimeter

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

Raise the operator cab. (See Raising on Page 10-30-2.)

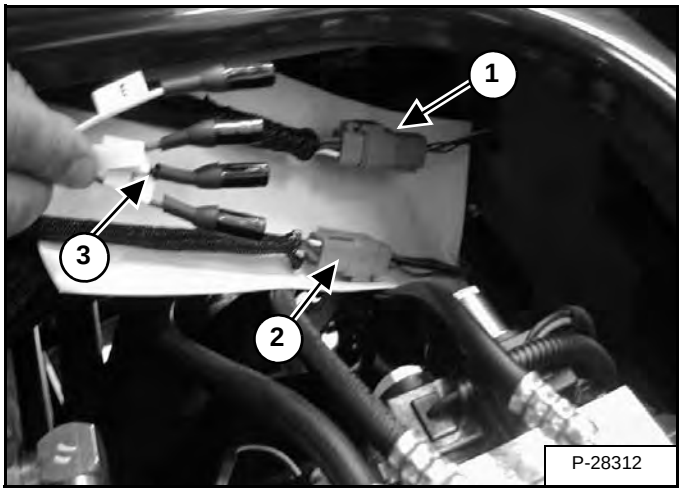
Connect the remote start tool to the loader. (See REMOTE START TOOL KIT-MEL1563 on Page 10-60-1.)

Figure 50-112-2



At the back side of the control panel, locate the left joystick wire connector (Item 1) **[Figure 50-112-2]**.

Figure 50-112-3



Disconnect the joystick harness connector (Item 1) from the loader wiring harness (Item 2) **[Figure 50-112-3]**.

Install the test harness (Item 3) **[Figure 50-112-3]** between the two connectors.

Turn the remote start key to ON position without starting the loader.

Check the voltage between pin 3 and pin 5 on the joystick test harness (Item 3) **[Figure 50-112-3]**.

The voltage should be between 2.45 and 2.55 volt.

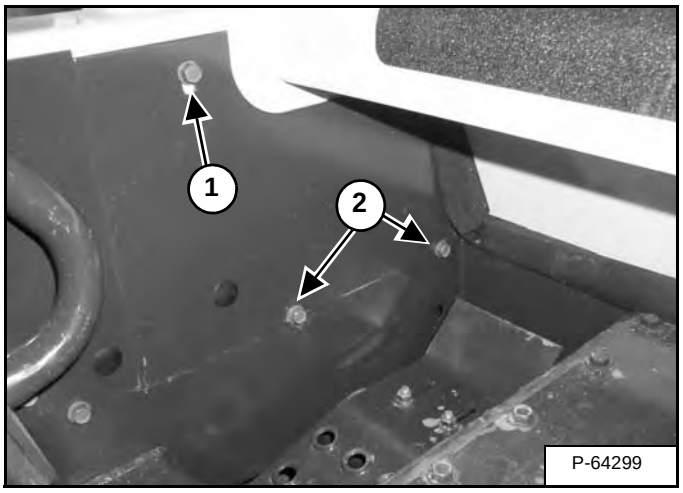
ACCESS PANEL (INSIDE) (SJC)

Removal And Installation (Left)

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

Raise the operator cab. (See Raising on Page 10-30-2.)

Figure 50-121-1

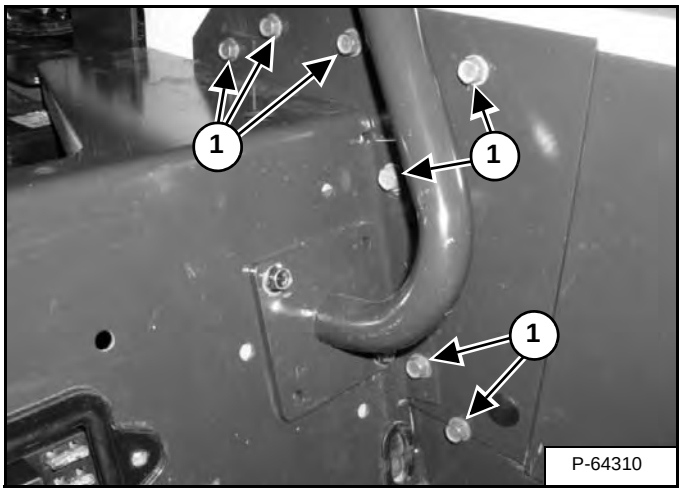


Remove the top mounting screw (Item 1) and loosen the two bottom screws (Item 2) **[Figure 50-121-1]**.

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

Remove the inside front access panel from the loader.

Figure 50-121-2



Remove the seven mount screws (Item 1) **[Figure 50-121-2]**

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

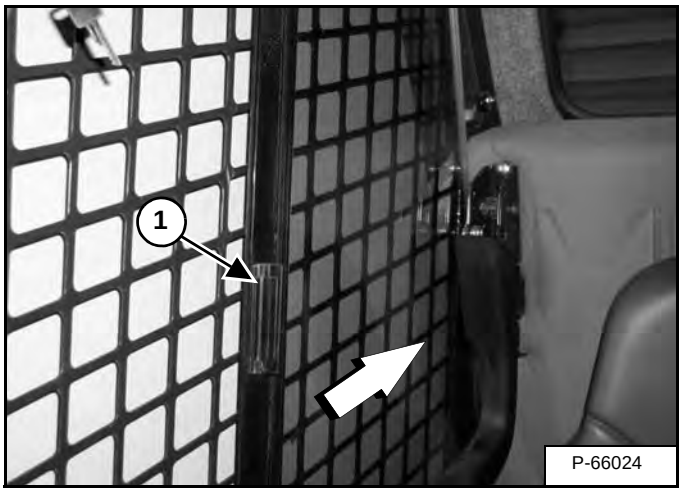
Move the lever assembly a slight amount toward the center of the loader, to allow clearance for the panel to be removed.

Remove the inside rear access panel from the loader.

WINDOW (SIDE)

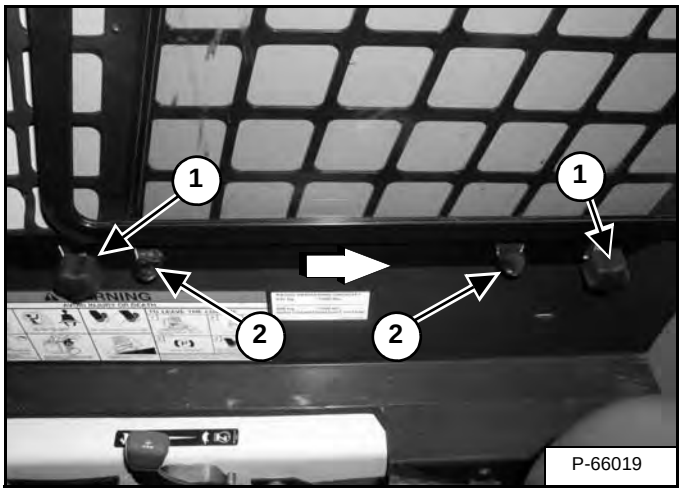
Removal And Installation

Figure 50-132-1



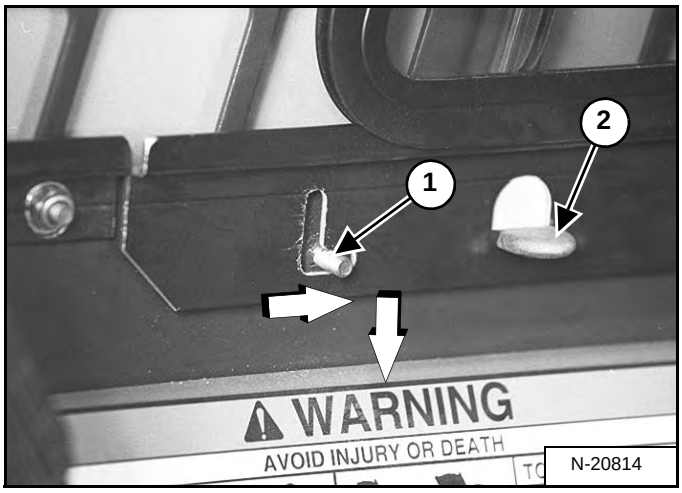
Release the latch (Item 1) **[Figure 50-132-1]** and slide the front window back towards the rear of the operator cab.

Figure 50-132-2



From inside the operator cab, loosen the knobs (Item 1) **[Figure 50-132-2]** and **[Figure 50-132-3]** on the window slide rail bolts.

Figure 50-132-3



NOTE: [Figure 50-132-3] is shown with the washer and knob removed to illustrate the direction of movement.

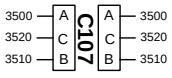
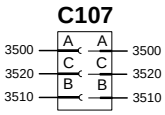
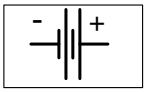
Move the window slide rail using the two thumb pads (Item 2) **[Figure 50-132-2]** and **[Figure 50-132-3]** towards the rear of the operator cab and then down towards the bottom of the operator cab.

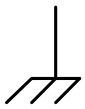
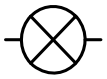
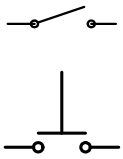
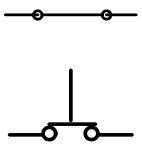
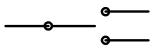
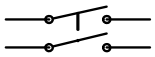
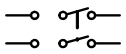
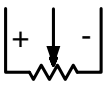
NOTE: The top of the window should come out of the top slide rail at this time. Make sure the window is secure and does not fall. Make sure the slide rails are in alignment and the window is positioned in the top track during installation.

Remove the front side window from the operator cab.

ELECTRICAL SYSTEM & ANALYSIS

Glossary Of Electrical Symbols

SYMBOL	DESCRIPTION
	CONNECTIONS
	CONNECTOR - Harness - Used for connecting 2 harnesses together or a harness to a component. The connector can vary from a single pin to any number of pins (Example: 3 pin connectors shown). The connector pins can be numbered alphabetical (shown) or numerical (1, 2, 3 etc.). The harness wires numbers are called out next to the connector (Example: 3500).
	The connector number is called out next to the connector (Example: C107). These connector numbers are used for schematic identification only and do not appear on the harness or connector.
	COMPONENTS
	BATTERY - Used for supplying and storing electrical power for the machine.
+	POSITIVE ELECTRICAL CIRCUIT - Indicates positive battery circuit.
-	NEGATIVE ELECTRICAL CIRCUIT - Indicates battery ground circuit.
	ALTERNATOR - Used to create the electrical current to supply voltage to the battery and components.
	STARTER - Uses battery current to start the machine engine.
	GROUND - Used to represent an external ground connection.

SYMBOL	DESCRIPTION
	COMPONENTS
	GROUND - Frame - Used to represent an component that is internally grounded.
	LIGHT -
	SWITCH - Single Pole - Single Throw (ON-OFF) Normally Open
	SWITCH - Single Pole - Single Throw (ON-OFF) Normally Closed.
	SWITCH - Single Pole - Double Throw (ON-OFF-ON) - This switch can be in any of three positions. (Some switches are spring activated to return them to a certain position when released.)
	SWITCH - Double Pole - Single Throw (ON-OFF) Open and Closed positions will be specified depending on switch application.)
	SWITCH - Double Pole - Double Throw (ON-OFF) Open and Closed positions will be specified depending on switch application.
	POTENTIOMETER - Variable resistance - Provides variable resistance.

BATTERY

Removal And Installation

WARNING

AVOID INJURY OR DEATH

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

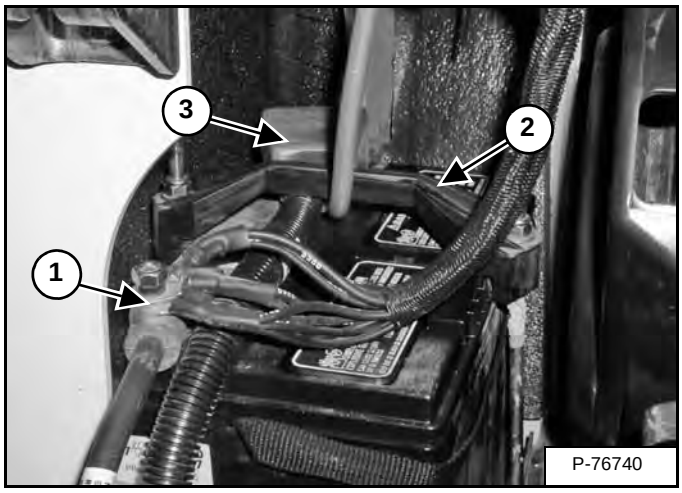
In case of acid contact, wash immediately with water. In case of eye contact get prompt medical attention and wash eye with clean, cool water for at least 15 minutes.

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

W-2065-0807

Open the rear door.

Figure 60-20-1



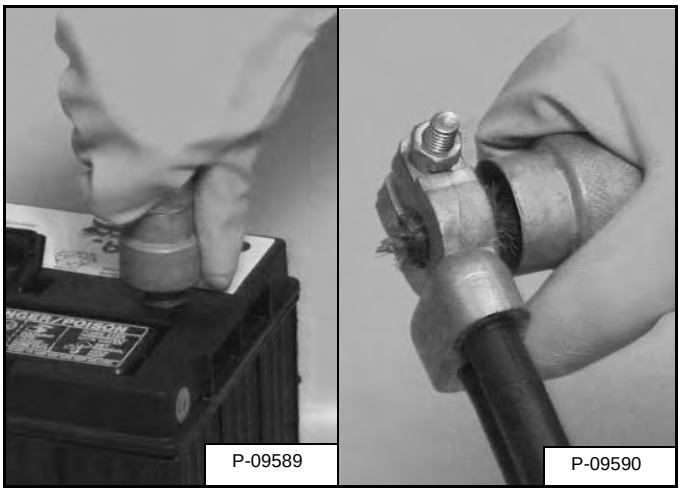
Disconnect the negative (-) battery cable (Item 1) **[Figure 60-20-1]**.

Remove the battery hold down clamp (Item 2) **[Figure 60-20-1]**.

Disconnect the positive (+) cable (Item 3) **[Figure 60-20-1]** from the battery.

Remove the battery from the loader.

Figure 60-20-2



Always clean the battery terminals and cable ends when installing a new or used battery **[Figure 60-20-2]**.

When installing the battery in the loader, do not touch any metal parts with the battery terminals.

Connect the negative (-) cable last to prevent sparks.

Connect and tighten the battery cables.

Install and tighten the battery hold down.

Close the rear door before operating the loader.

WARNING

BATTERY GAS CAN EXPLODE AND CAUSE SERIOUS INJURY OR DEATH

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

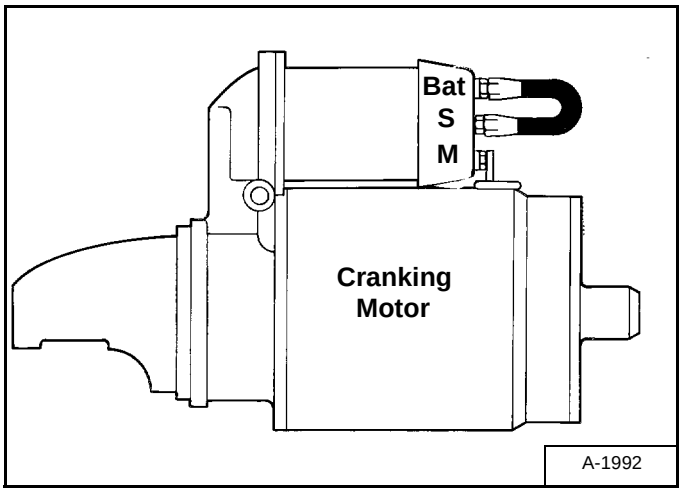
Do not jump start or charge a frozen or damaged battery. Warm battery to 16°C (60°F) before connecting to a charger. Unplug charger before connecting or disconnecting cables to battery. Never lean over battery while boosting, testing or charging.

W-2066-0910

STARTER

Testing

Figure 60-40-1



The key switch must be in the OFF position.

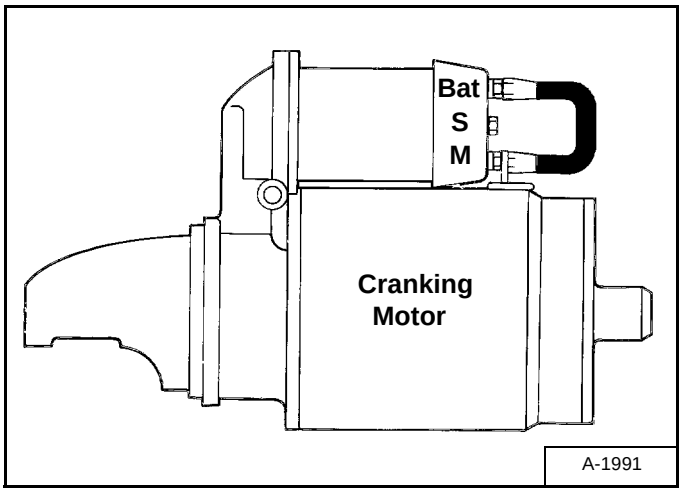
The battery must be at full charge.

The cable connections on the battery must be clean and tight.

Connect a jumper wire between S terminal and BAT terminal **[Figure 60-40-1]**.

If the starter turns but does not turn the engine, the starter drive has a defect.

Figure 60-40-2



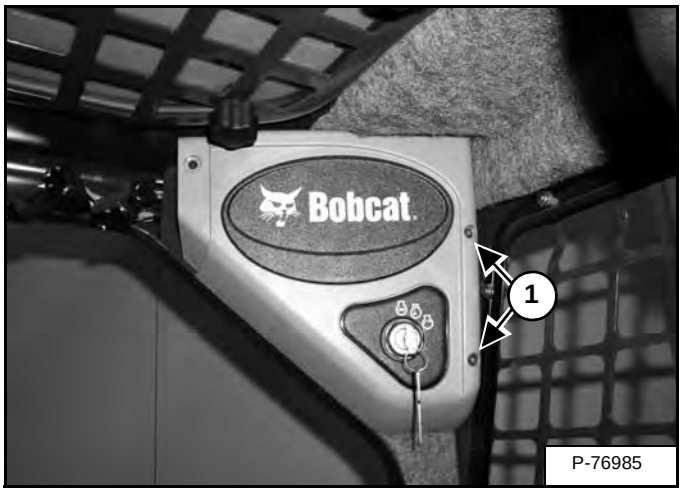
Connect a jumper wire (of at least 4 gauge in size) between the M terminal and the BAT terminal **[Figure 60-40-2]**.

If the starter turns, the defect is in the solenoid.

If the starter does not turn, the starter is defective.

Removal And Installation (Left And Right)

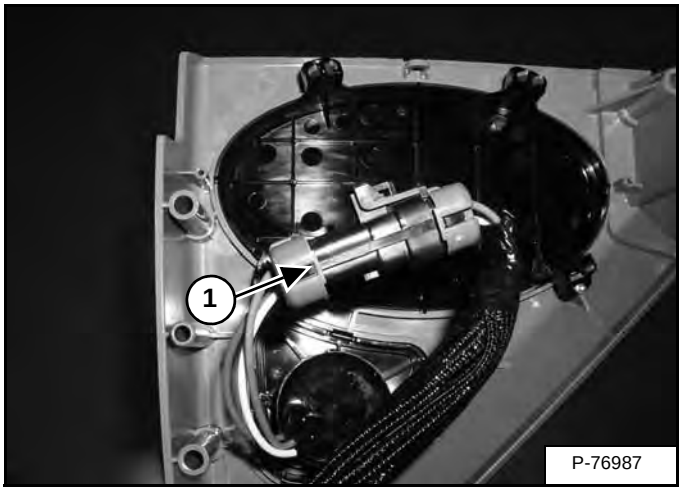
Figure 60-50-10



Remove the two mounting bolts (Item 1) **[Figure 60-50-10]**.

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

Figure 60-50-11



Pull the right instrument panel down and disconnect the wire harness connector (Item 1) **[Figure 60-50-11]** from the panel.

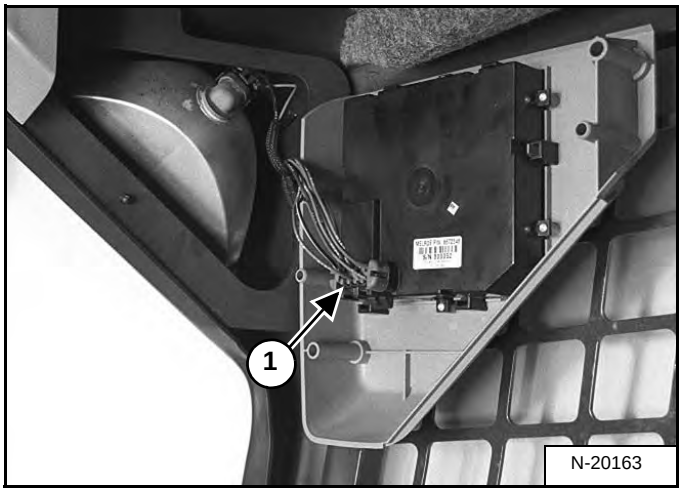
Remove the panel from the loader cab.

Figure 60-50-12

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

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

Figure 60-50-13

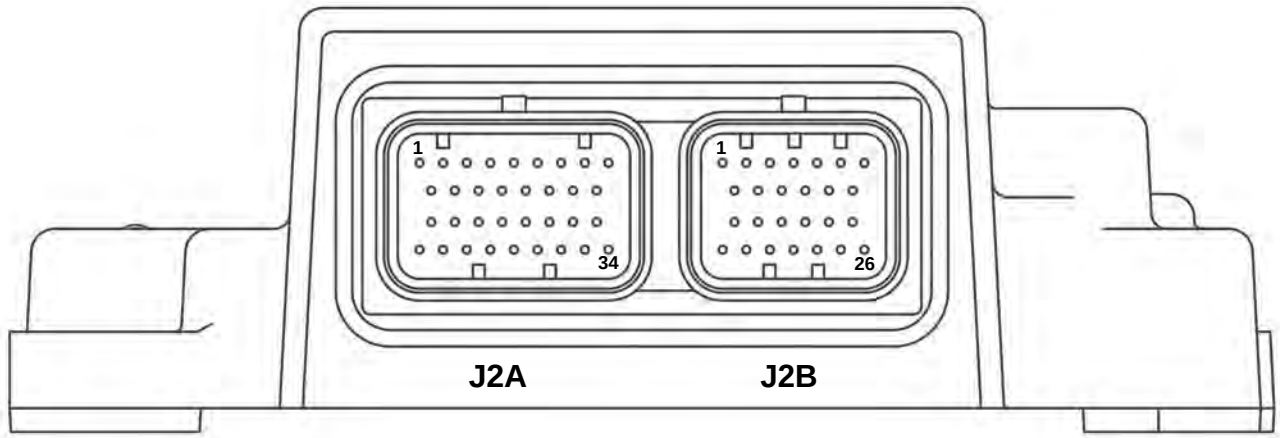


Pull the right instrument panel down and disconnect the wire harness connector (Item 1) **[Figure 60-50-13]** from the panel.

Remove the panel from the loader cab.

Connector Identification (Cont'd)

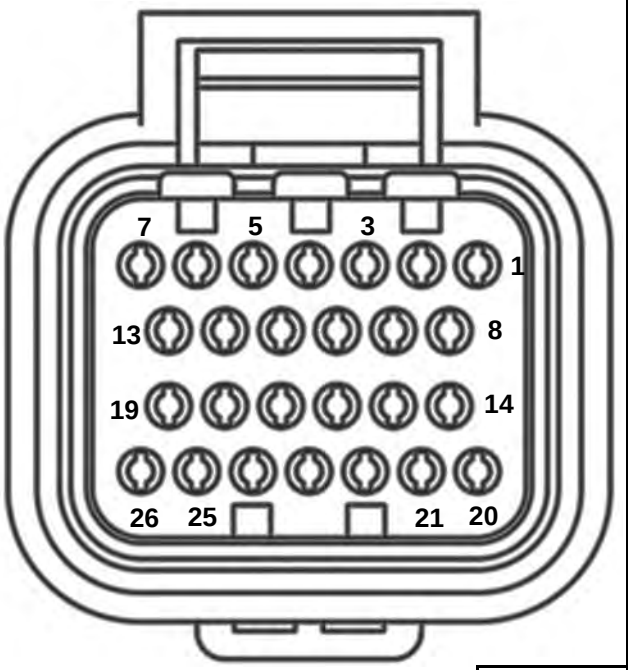
Auxiliary Controller



Harness Connector View

J2A

Harness Connector View



J2B

P-76647
P-76646
P-76645

BOBCAT CONTROLLER (SJC) (DRIVE)

Description

The drive controller is only on loaders equipped with the SJC option. This controller processes information for the drive functions.

The drive controller is located behind the right side access panel near the operators right foot.

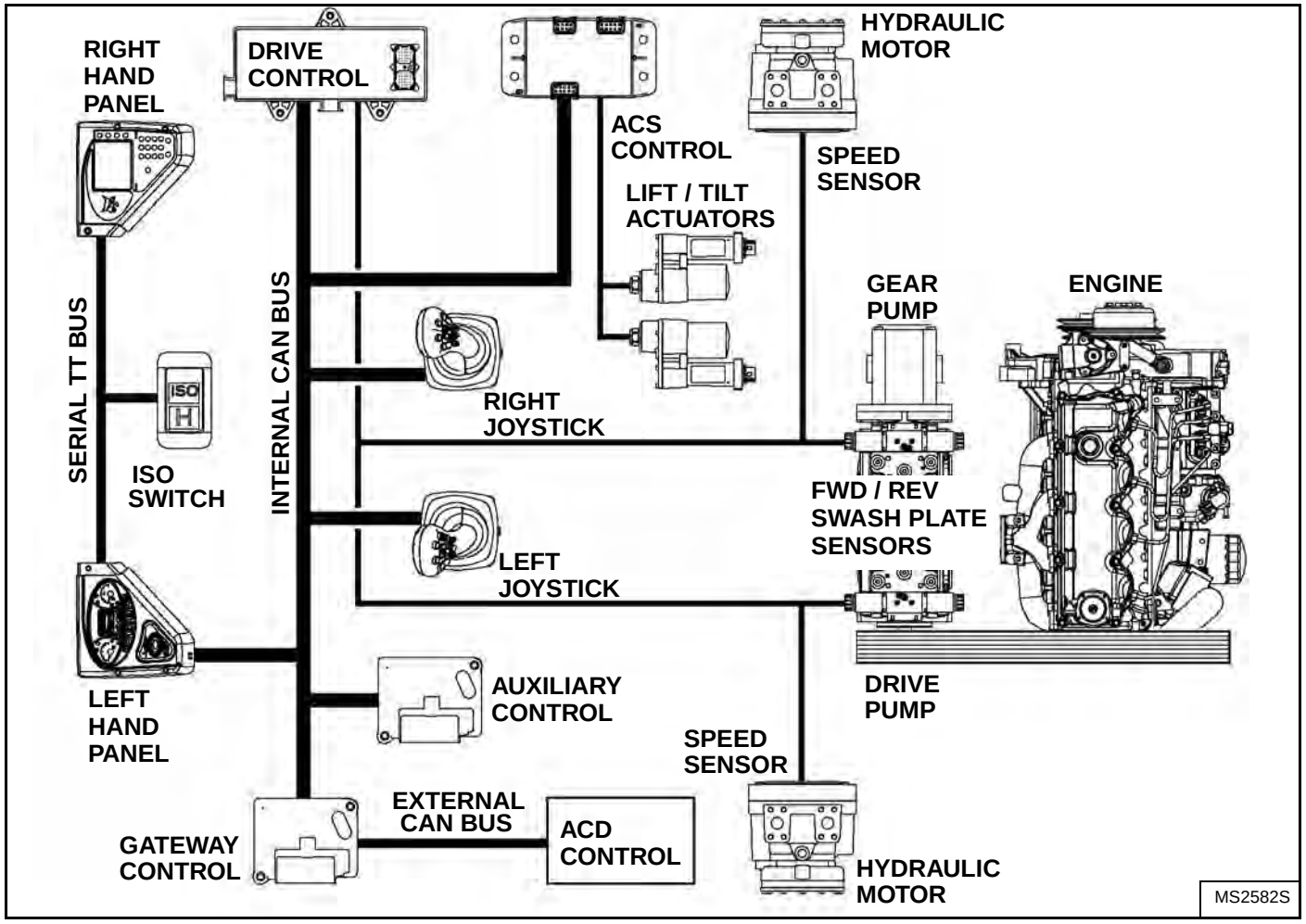
The drive controller monitors the position of the left joystick, pump swash plate angles and the output of the wheel speed sensors.

The drive controller works along with the ACS controller and communicates with the Gateway controller in an SJC system. All these controllers are capable of software upgrades.

The SJC system uses electronic joysticks to control both of the workgroups (lift and tilt) and the drive functions of the loader. The control can be switched from ISO and H-Pattern drive control layouts.

The workgroup actuators are the same used on the ACS system.

The hydrostatic drive pump is a Rexroth A22 unit. It has two electromagnetic coils on each of the two pumps to control the drive of the loader. The coils will direct the forward and reverse outputs of the pump to the drive motors. The Rexroth pump is equipped with position sensors mounted to the bottom of the swash plates to provide feedback to the controllers to sense uncommanded swash plate movement.

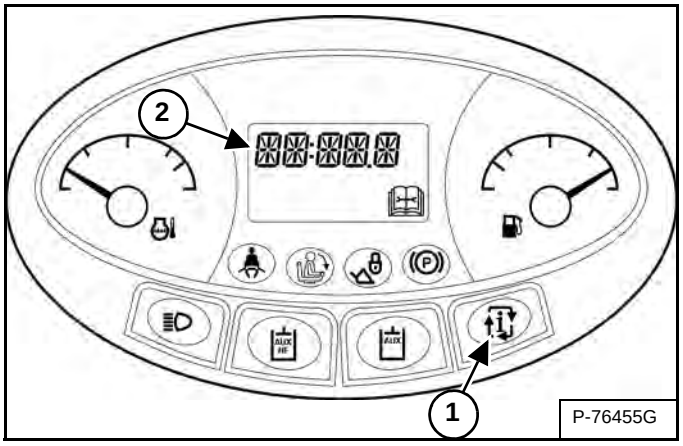


DIAGNOSTIC SERVICE CODES

Viewing Service Codes

The Service Codes will aid your dealer in diagnosing conditions which can damage your machine.

Figure 60-90-1



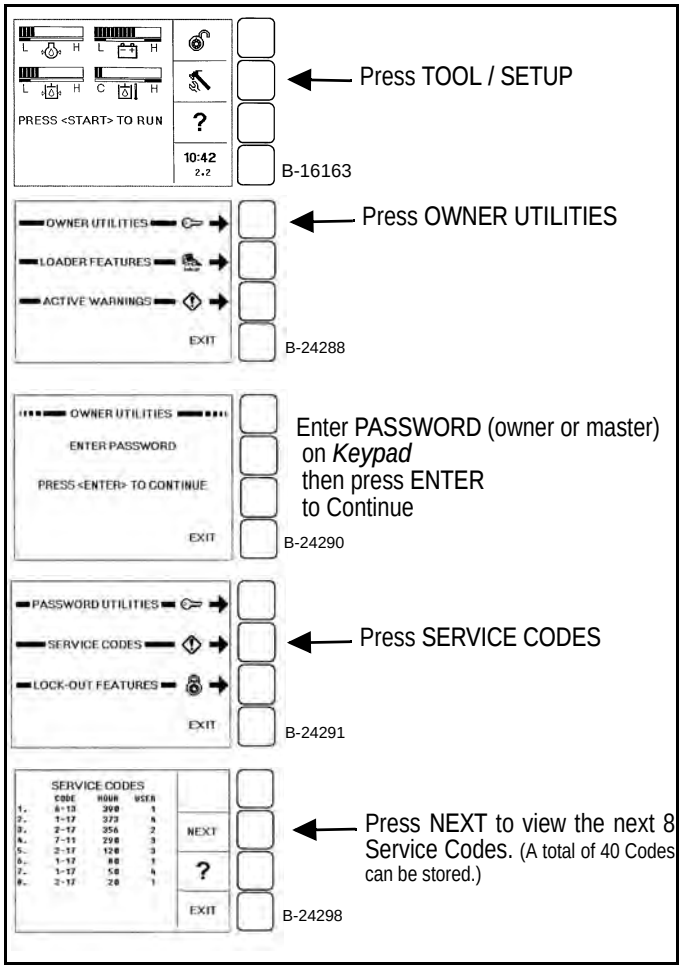
Press the INFORMATION button (Item 1) to cycle the DATA DISPLAY (Item 2) **[Figure 60-90-1]** until the service code screen is displayed. If more than one SERVICE CODE is present, the codes will scroll on the DATA DISPLAY.

NOTE: Corroded or loose grounds can cause multiple service codes and / or abnormal symptoms. All instrument panel lights flashing, alarm sounding, headlights and taillights flashing, could indicate a bad ground. The same symptoms could apply if the voltage is low, such as loose or corroded battery cables. If you observe these symptoms, check grounds and positive leads first.

Deluxe Instrumentation Panel

The optional Deluxe Instrumentation Panel offers an additional view of service codes.

Figure 60-90-2



The Display Panel will list the Code Number, **(CODE)** hourmeter reading when the error occurred **(HOUR)**, and the User **(USER)** who was logged in to operate the machine when the error occurred **[Figure 60-90-2]**.

A total of 40 Codes can be stored. When more than 40 codes occur, the oldest code will disappear and the newest code will be in the number 1 position.

SEAT BAR SENSOR

Description

The seat bar sensor is part of the BICS™ system. The seat bar sensor sends a signal that indicates whether the seat bar is in the down or up position.

The sensor is located on the left side of the seat bar.

Troubleshooting

The following troubleshooting chart is provided for assistance in locating and correcting BICS™ system problems. It is recommended that these procedures be performed by authorized Bobcat Service Personnel only.

⚠ WARNING

Check for correct function after adjustments, repairs or service. Failure to make correct repairs or adjustments can cause injury or death.

W-2004-1285

PROBLEM	SOLUTION #
Indicator light does not turn OFF when seat bar is lowered.	1, 2, 3, 4, 5

SOLUTION SUGGESTIONS

1. Check sensor wire connection.
2. Use the BICS™ sensor tester MEL1428 with seat bar adapter MEL1567 to check sensor and controller.
3. Check for loose hardware.
4. Check keyed bushing to make sure magnet collar rotates with seat bar.
5. Check magnet collar magnets for contamination such as metal particles.

Inspecting

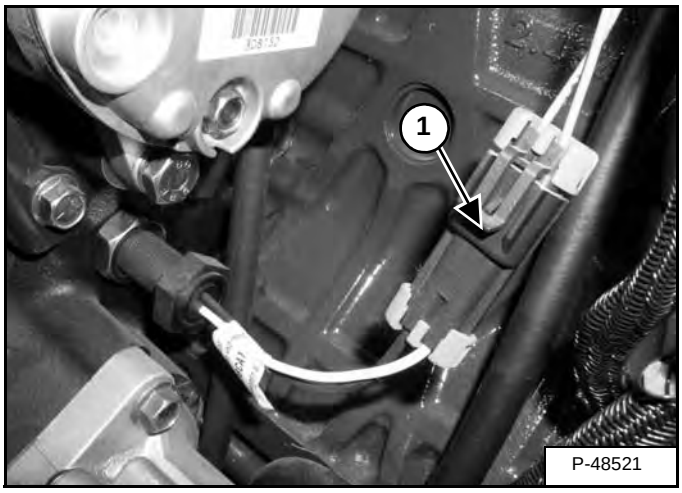
Figure 60-120-2

Fasten the seat belt, disengage the parking brake button, press the PRESS TO OPERATE LOADER Button (Item 1) **[Figure 60-120-2]** and raise the Seat Bar fully. Move the steering levers slowly forward and backward. The TRACTION lock (Item 4) **[Figure 60-120-2]** should be engaged. Lower the Seat Bar. Press the PRESS TO OPERATE LOADER Button (Item 1) **[Figure 60-120-2]**.

Engage the parking brake pedal and move the steering levers slowly forward and backward. The TRACTION lock should be engaged.

NOTE: The TRACTION light on the left instrument panel will remain OFF until the engine is started, the PRESS TO OPERATE LOADER Button is pressed and the parking brake is disengaged.

Figure 60-120-3



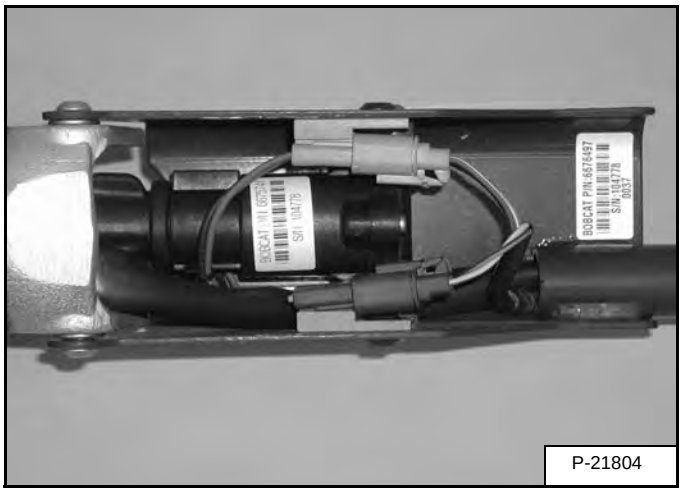
Check the wire connections at the engine flywheel rpm speed sensor (Item 1) **[Figure 60-120-3]**.

NOTE: When the Traction Lock Override Button is activated, the Traction Lock Override Control System will NOT engage the Traction Lock if the engine stops.

(See Adjusting on Page 60-170-1.)

Switch Handle Installation (Cont'd)

Figure 60-130-21

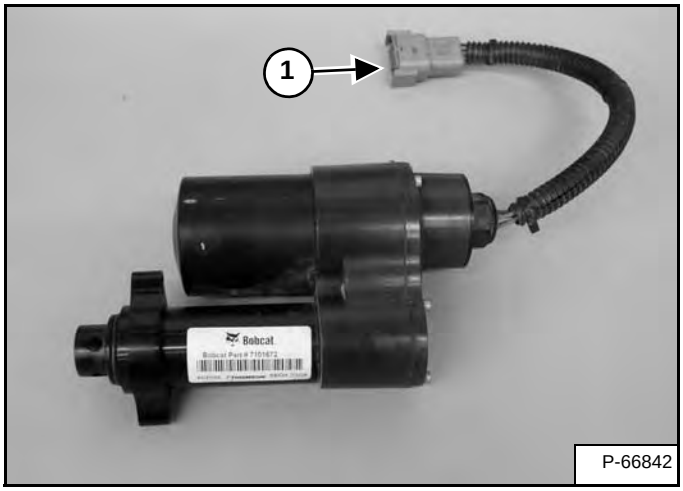


Connect the handle harness connectors to the sensor and lock solenoid connectors **[Figure 60-130-21]**.

Actuator Connector Disassembly And Assembly

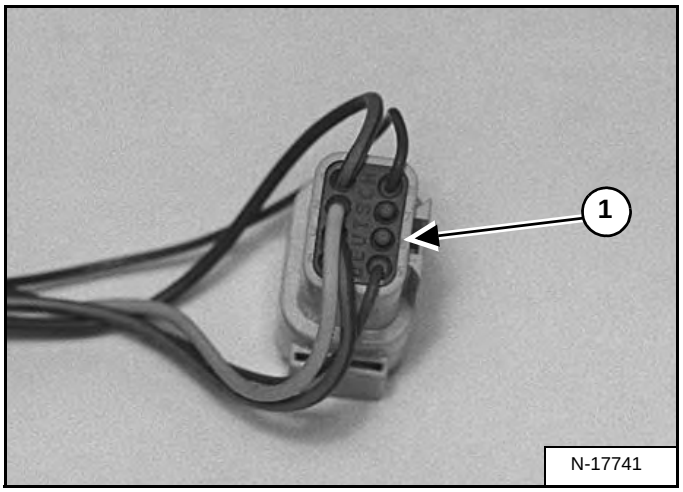
NOTE: Actuator shown removed for clarity. Not necessary for procedure.

Figure 60-130-22



Check the actuator wiring harness connector (Item 1) **[Figure 60-130-22]** and replace if broken.

Figure 60-130-23



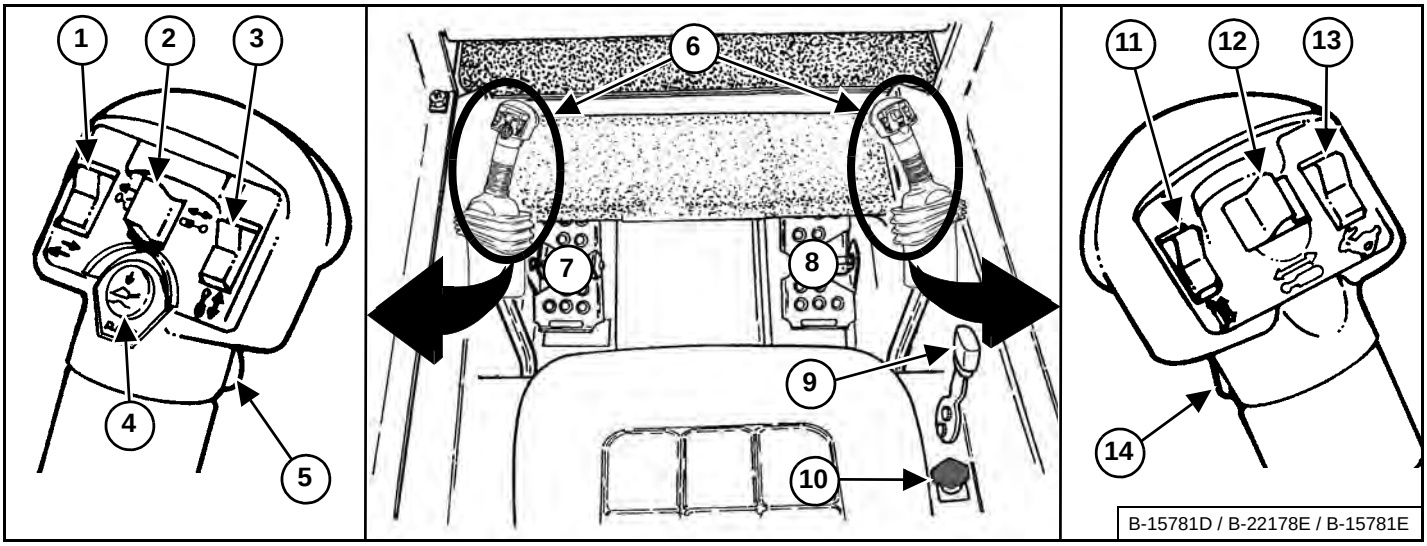
Installation: Install the wires into the connector as listed below. The terminal numbers are written on the back of the connector (Item 1) **[Figure 60-130-23]**.

Lift And Tilt Actuator

1. Terminal-Black/Green-Larger diameter wire (16 gauge)
2. Terminal-Green-Larger diameter wire (16 gauge)
3. Terminal-Red/Green-Larger diameter wire (16 gauge)
4. Terminal-Open
5. Terminal-Red-Smaller diameter wire (18 gauge)
6. Terminal-Open
7. Terminal-Open
8. Terminal-Black-Smaller diameter wire (18 gauge)

ELECTRICAL / HYDRAULIC CONTROLS (ACS)

Identification Chart



REF. NO.	DESCRIPTION
1	TURN SIGNALS (Option)
2	REAR AUXILIARY HYDRAULICS (Option) Also: ATTACHMENT FUNCTION CONTROL
3	ATTACHMENT FUNCTION CONTROL
4	FLOAT CONTROL
5	FRONT HORN
6	STEERING LEVERS AND LIFT / TILT HANDLES
7	LIFT ARM PEDAL
8	TILT PEDAL
9	ENGINE SPEED CONTROL
10	LIFT ARM BYPASS CONTROL
11	ATTACHMENT FUNCTION CONTROL
12	FRONT AUXILIARY HYDRAULICS
13	TWO-SPEED CONTROL (Option)
14	CONTINUOUS FLOW CONTROL FOR AUXILIARY HYDRAULICS

Identification Chart ACD Group 2

Left side Control Handle Switches	Switch Number	Solenoid Number Activated				Attachment Harness Terminal Activated	Attachment Harness Connector	RIght Side Control Handle Switches
		STD	RH	HFH	RH / HFH		Fourteen Pin Connector Viewed from front (pin side of connector) of loader.	
	1	1	1	1, 7	1,7	K		
	2	2	2	2	2	K		
	3	1	1	1, 7	1,7	K		
	4	2	2	2	2	K,A		
	5	1	1	1,7	1,7	K,A		
	6	-	-	-	-	K,E		
	7	-	-	-	-	K,F		
	8	-	-	-	-	K,G		
	9	-	-	-	-	K,H		
P-24820A P-28316A	10, 11, 12, 13, 14	-	--	--		K	Jumpers K,P	P-24802A P-28316A

RH - Loaders with Rear Hydraulics Option.
HFH - Loaders with High Flow Hydraulics Option.
RH / HFH - Loaders with Rear Hydraulics and High Flow Hydraulics Option.
Terminal K is activated with Key switch ON.

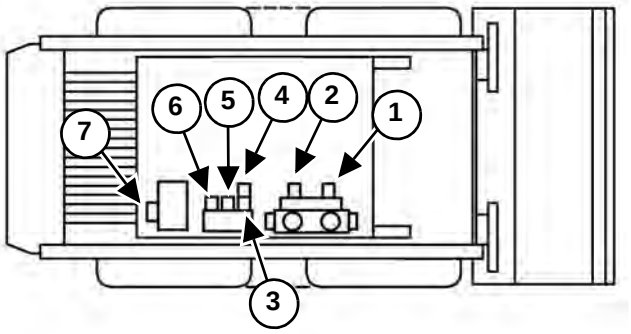
NOTE: For diagnostics and troubleshooting connect the Service PC (See SERVICE PC (LAPTOP COMPUTER) on Page 60-150-1.)

The ACD (Attachment Control Device) automatically recognizes the use of the seven or fourteen pin connector when connected.

Pressing the auxiliary hydraulics button and moving the rear auxiliary hydraulic switch to the right and left several times activates solenoid numbers 3,4,5, and 6 at the diverter valve.

Front Auxiliary Pressure Release is accomplished by manually pushing the male and female couplers in at the front auxiliary block.

The High Flow Button in the left side instrument panel must be pushed ON to activate solenoid number seven at the gear pump.

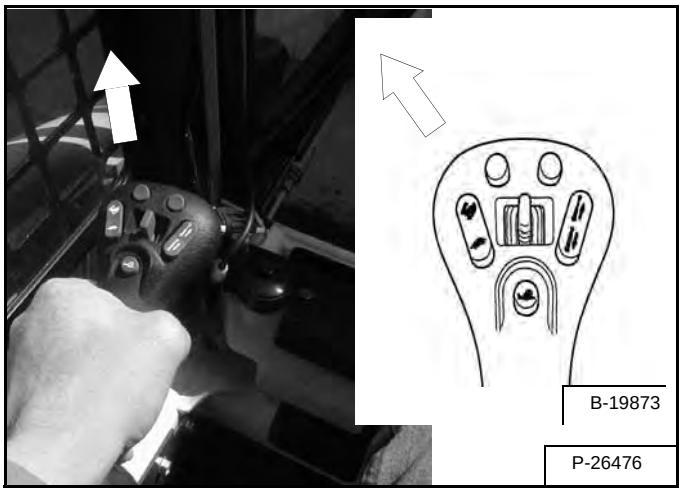


NA1891

Solenoid Number	Hydraulic Coupler	Wiring Number
1	Front Male (Rod)	4330
2	Front Female (Base)	4340
3	Diverter Rear (Rod)	4430
4	Diverter Rear (Base)	4440
5	Bleed / Lock Valve (Base)	4480
6	Bleed / Lock Valve (Rod)	4450
7	High Flow on Pump	4460

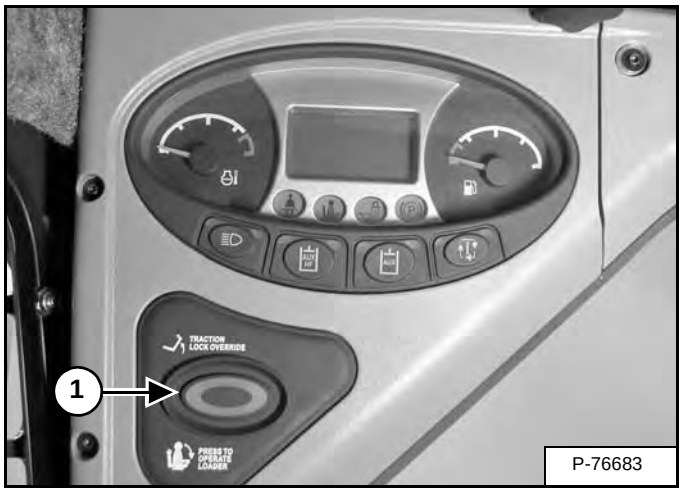
Hydrostatic Pump Calibration (SJC) (Cont'd)

Figure 60-160-10



Move the left joystick to the forward-left corner position **[Figure 60-160-10]** and hold in position.

Figure 60-160-11

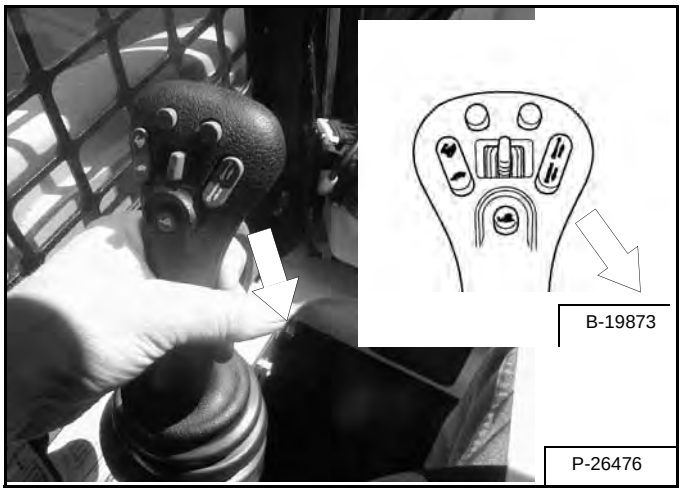


Press the *PRESS TO OPERATE LOADER* Button (Item 1) **[Figure 60-160-11]** while holding the left joystick in position.

Three audible beeps will sound.

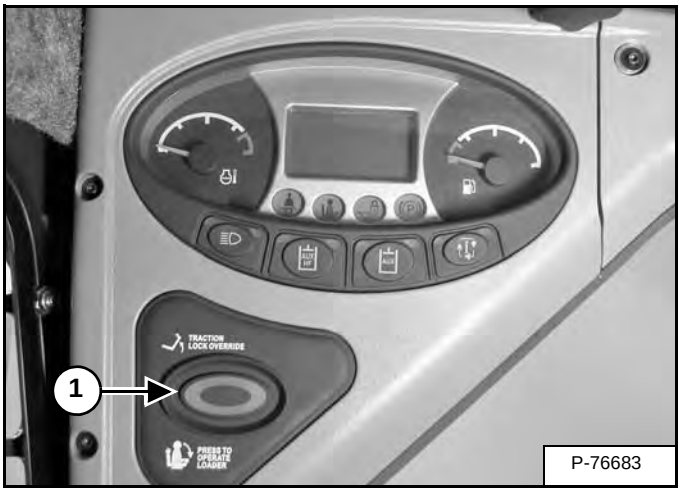
NOTE: Codes D3905 and D3907 will be displayed if the info button is pressed four times.

Figure 60-160-12



Move the left joystick to the reverse-right corner position **[Figure 60-160-12]** and hold in position.

Figure 60-160-13



Press the *PRESS TO OPERATE LOADER* Button (Item 1) **[Figure 60-160-13]** while holding the left joystick in position.

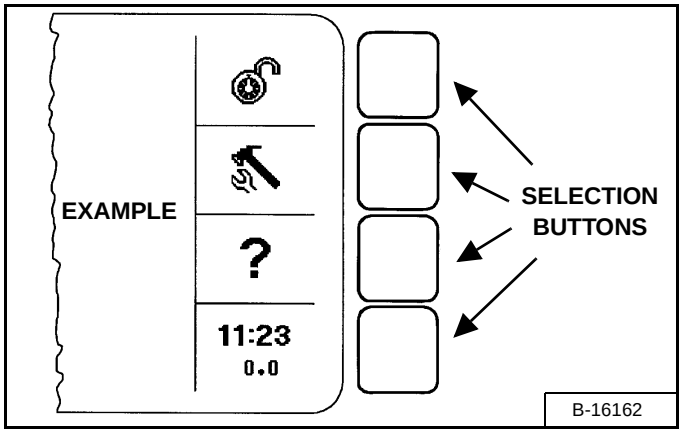
Three audible beeps will sound.

CONTROL PANEL SETUP

Right Panel Setup (Deluxe Instrumentation Panel)

Icon Identification

Figure 60-180-3

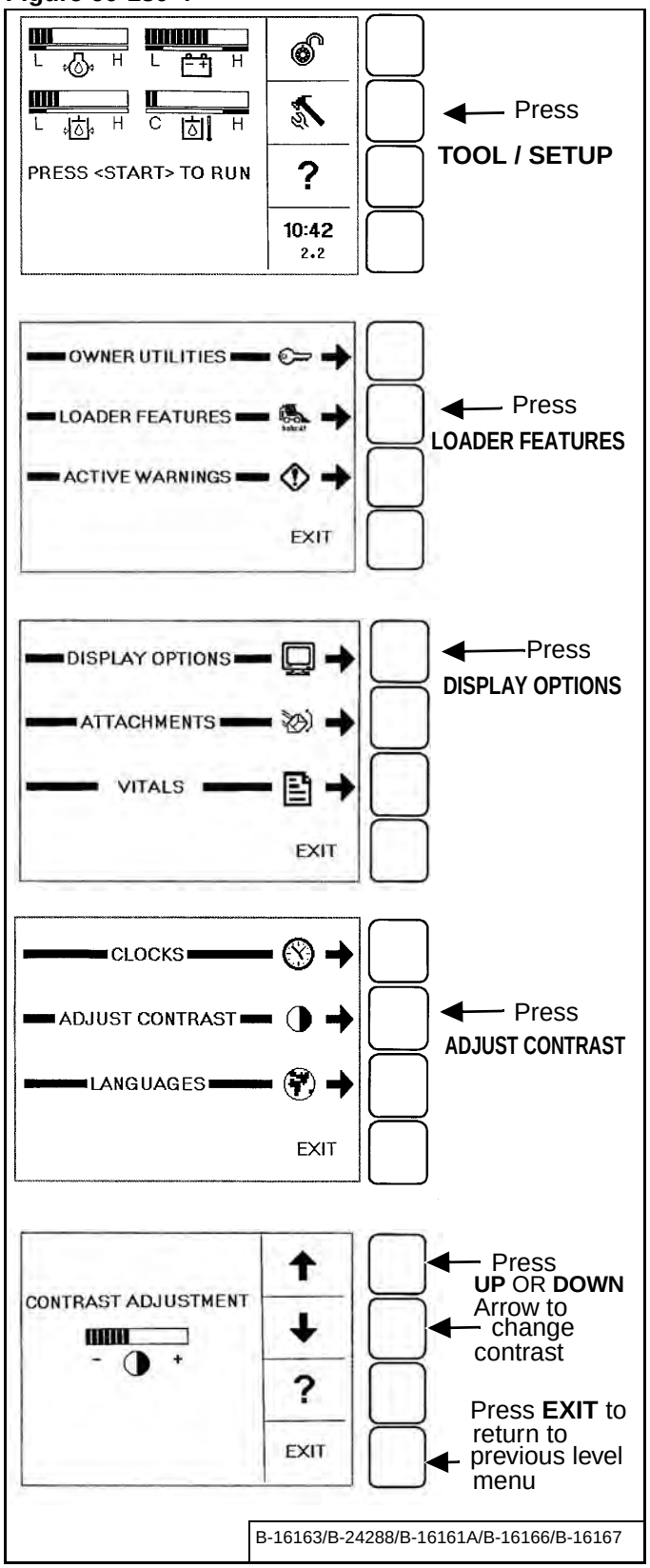


Make selection by pressing the SELECTION BUTTON adjacent to the icon **[Figure 60-180-3]**.

ICON	DESCRIPTION
	LOCK / UNLOCK: Allows machine to be locked / unlocked. You must lock machine to activate security system. When system is unlocked, the user can press RUN / ENTER then press START to begin operation. A valid password will need to be entered at startup to run a locked machine.
	TOOL / SETUP: Access system options. Use to set clock, check system warnings, select language, set passwords, etc.
?	HELP: Access help on current menu item.
EXIT	EXIT returns you to previous level menu.
11:23 0.0	CLOCK / JOB CLOCK: Press to clear or lock job clock; TOOL / SETUP to set time.
	UP ARROW: Goes backward one screen. DOWN ARROW: Goes forward one screen.
	OUTLINE ARROWS: No screen available (backward / forward).
	SELECTION ARROW: Use to select menu item.
NEXT	Goes to the NEXT screen in series. EXAMPLE: the next Active Warning screen.
INFO	Goes to more information about attachments.
YES / NO	Answer yes / no to current setup question.
CLEAR	Removes previously installed password.
SET	Set accepts current installed password.

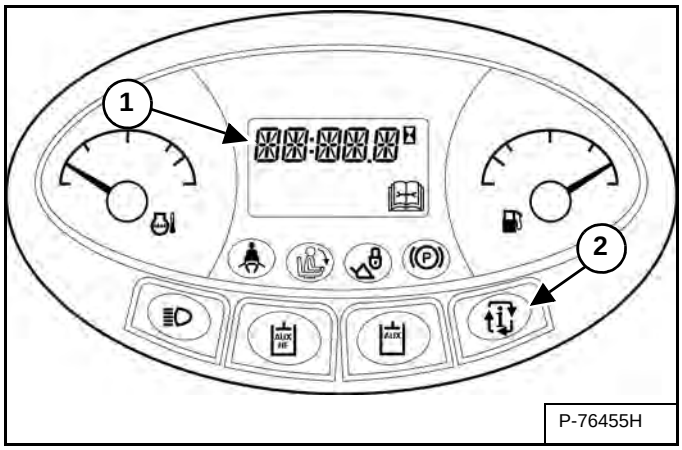
Examples

Figure 60-180-4



Reset

Figure 60-200-16



Press the information button (Item 2) until the display screen (Item 1) **[Figure 60-200-16]** shows the maintenance clock.

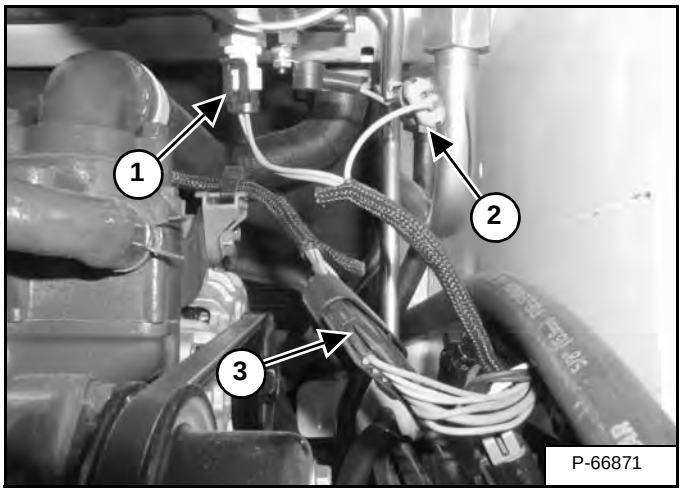
Press and hold the information button (Item 2) for seven seconds until [RESET] appears in the display screen (Item 1) **[Figure 60-200-16]**.

The maintenance clock can also be reset by clicking Set / Reset (Item 4) **[Figure 60-200-11]** in service analyzer.

NOTE: If the interval is set to 10 hours or less, the maintenance clock will reset and log a reset time but the wrench icon, alternating hour interval and [SEr] will NOT be removed from the left and right instrument panel display screens.

Engine Removal And Installation (Cont'd)

Figure 70-10-4

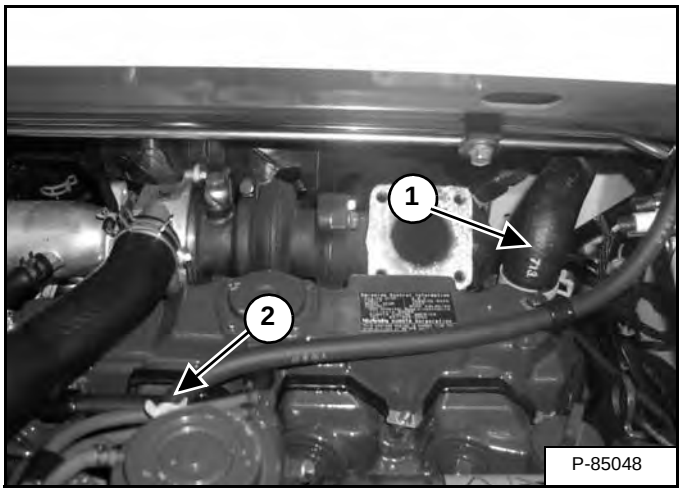


Disconnect the temperature sender connector (Item 1) **[Figure 70-10-4]** from the filter housing.

Disconnect the wire connector (Item 2) **[Figure 70-10-4]** for the differential pressure switch on the filter housing.

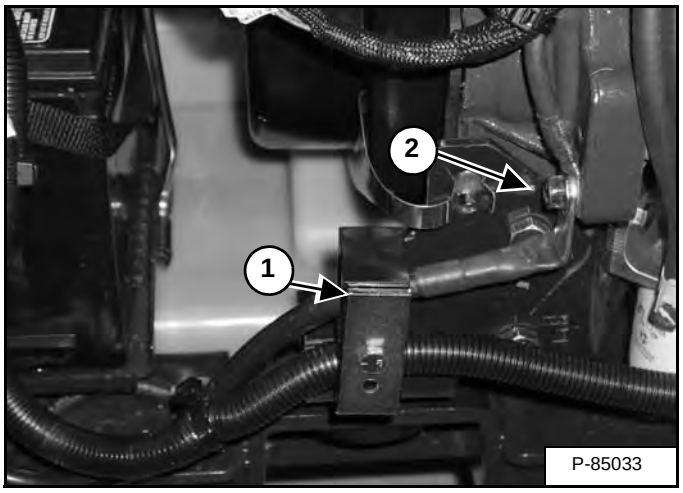
Disconnect the electrical connector (Item 3) **[Figure 70-10-4]**.

Figure 70-10-5



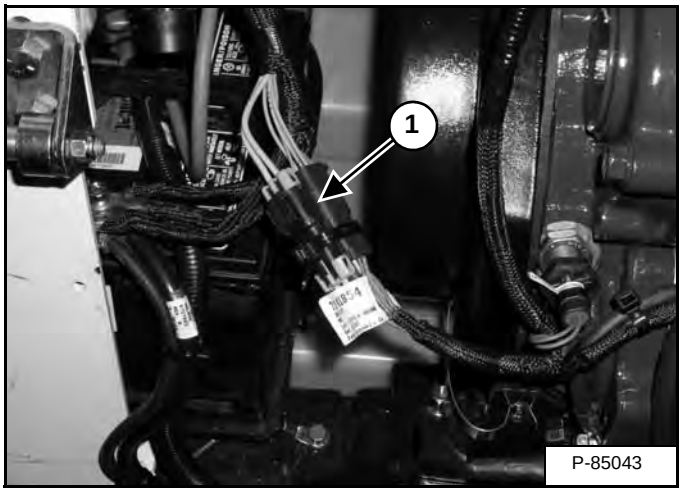
Disconnect radiator hose (Item 1) and the coolant return hose (Item 2) **[Figure 70-10-5]**.

Figure 70-10-6



Remove battery cable bracket (Item 1) and disconnect engine ground cable (Item 2) **[Figure 70-10-6]**.

Figure 70-10-7



Disconnect the three main wiring connections (Item 1) **[Figure 70-10-7]**.

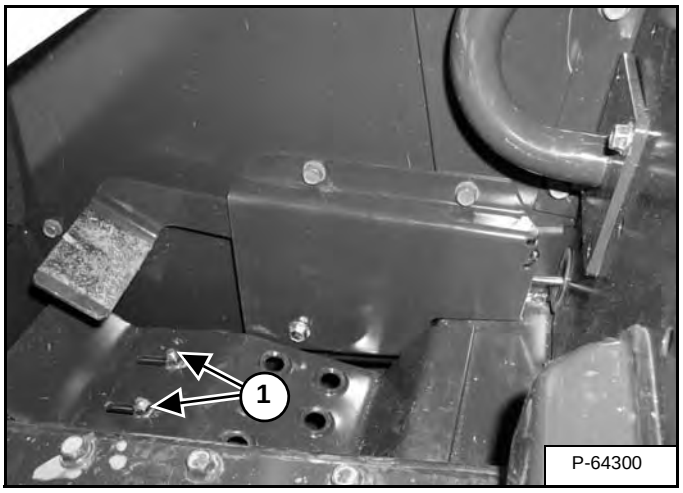
ENGINE SPEED CONTROL (SJC)

Removal And Installation

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

Raise the operator cab. (See Raising on Page 10-30-2.)

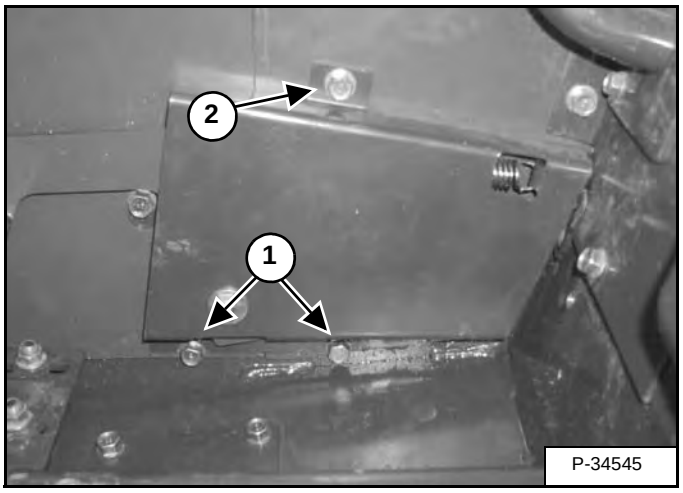
Figure 70-21-1



Remove the two mounting bolts (Item 1) **[Figure 70-21-1]** from the right side foot rest.

Remove the foot rest, from the loader.

Figure 70-21-2

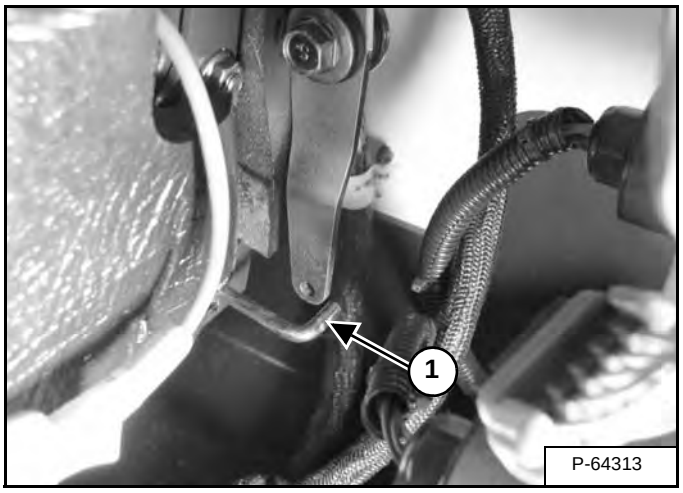


Loosen the two lower access panel mount screws (Item 1) **[Figure 70-21-2]**.

Remove the upper mount screw (Item 2) **[Figure 70-21-2]**.

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

Figure 70-21-3

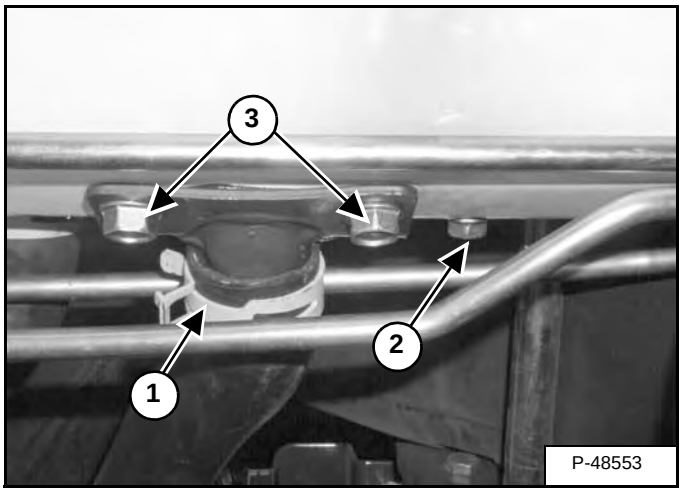


Disconnect the foot speed control linkage (Item 1) **[Figure 70-21-3]** from the hand control pivot arm.

Remove the foot speed control assembly from the loader.

Radiator Removal And Installation (Cont'd)

Figure 70-50-7



Remove the clamp (Item 1) **[Figure 70-50-7]** from the hydraulic fill tube.

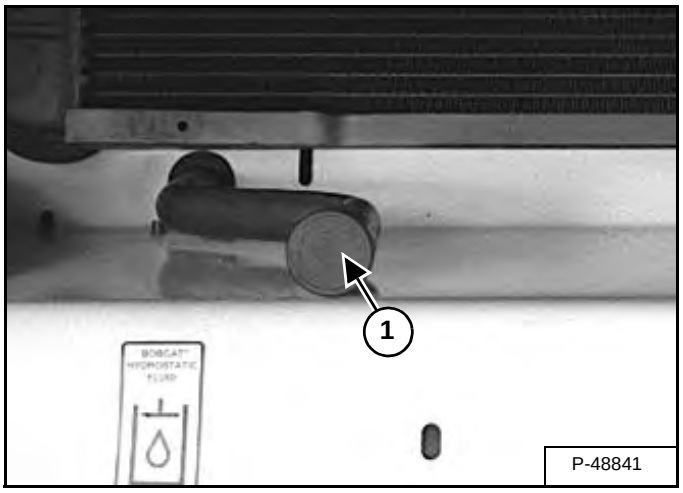
Remove the radiator mounting bolt (Item 2) **[Figure 70-50-7]**.

Installation: Tighten the radiator mounting bolt to 15 - 17 N•m (11 - 13 ft-lb) torque.

Remove the two hydraulic fill tube mounting screws (Item 3) **[Figure 70-50-7]**.

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

Figure 70-50-8



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

Lift the radiator up and remove it from the loader.

Reverse the above procedure to install the radiator.

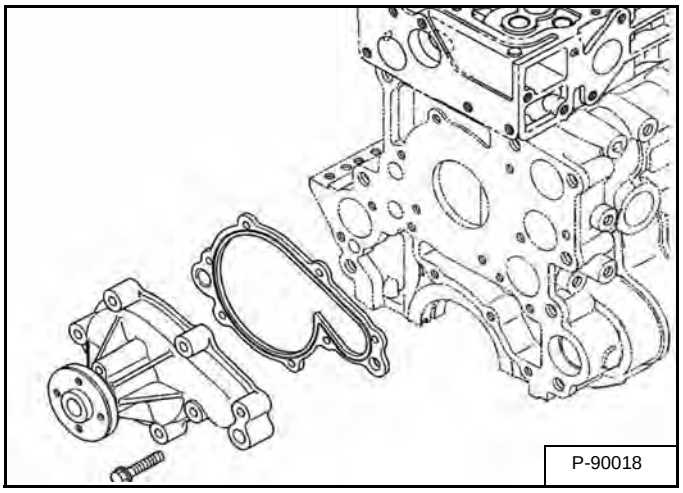
Water Pump Removal And Installation

Drain the cooling system.

Remove the alternator belt.

Remove the water pump bolts.

Figure 70-50-32

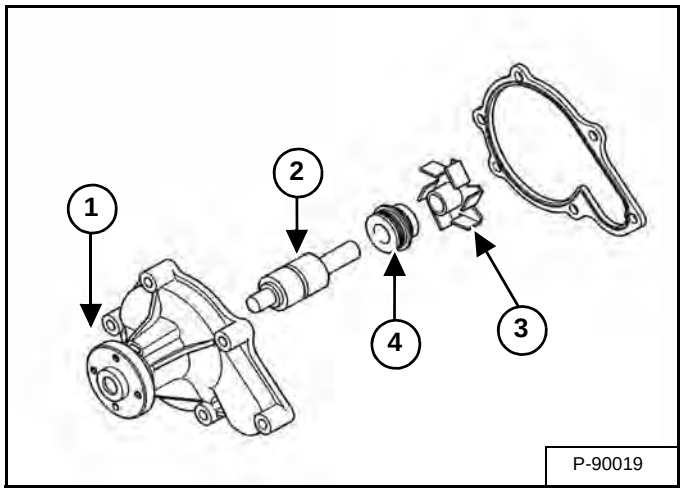


Remove the water pump **[Figure 70-50-32]**.

Installation: Always use a new gasket when installing the water pump.

Water Pump Disassembly And Assembly

Figure 70-50-33



Remove the flange (Item 1) **[Figure 70-50-33]**.

Press the shaft (Item 2) and impeller (Item 3) **[Figure 70-50-33]** out the impeller side of the water pump.

Remove the impeller (Item 3) **[Figure 70-50-33]** from the shaft.

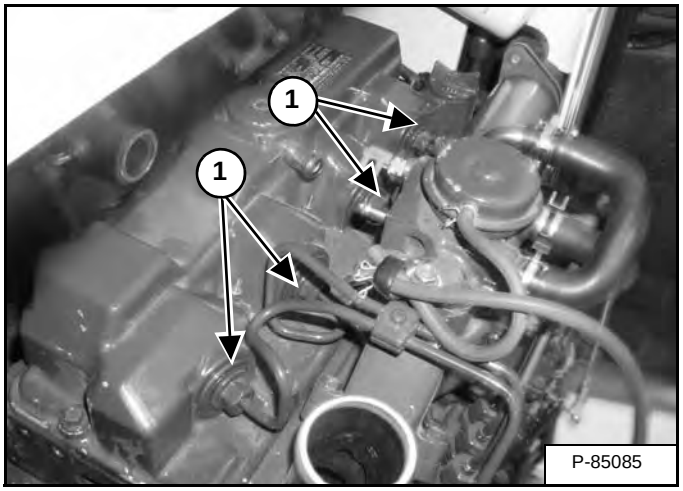
Remove the seal (Item 4) **[Figure 70-50-33]**.

Install a new seal (Item 4) **[Figure 70-50-33]** when assembling the water pump.

Fuel Injection Pump Assembly Removal And Installation

Remove the alternator. (See Removal And Installation on Page 60-30-5.)

Figure 70-70-6



Clean the area around the injection pump thoroughly.

Disconnect the high pressure fuel lines (Item 1) **[Figure 70-70-6]** from the fuel injectors.

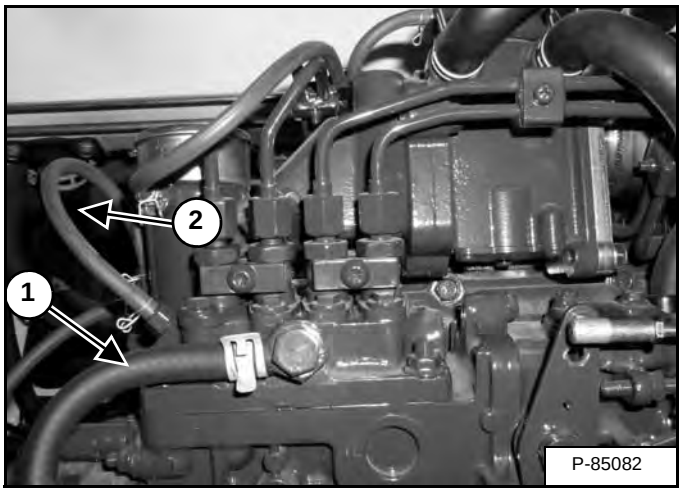
Installation: Tighten the injection pipe retaining nut to 23 - 36 N•m (17 - 26 ft-lb) torque.

IMPORTANT

Do not bend the high pressure fuel injection tubes when removing or installing them.

I-2029-0289

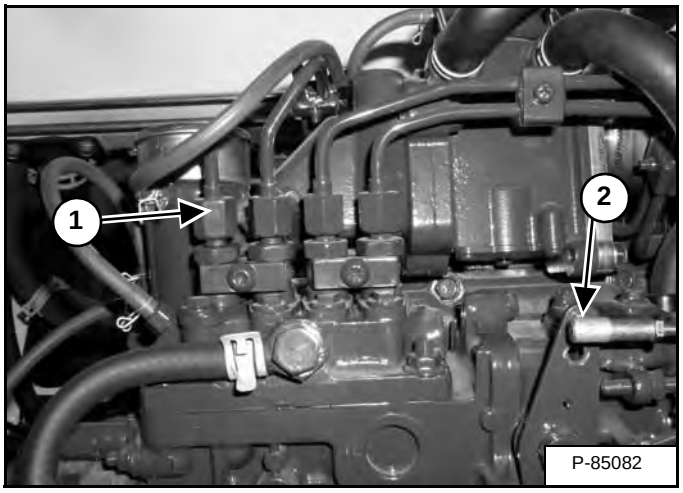
Figure 70-70-7



Disconnect the fuel inlet hose (Item 1) and the fuel return hose (Item 2) **[Figure 70-70-7]** from the injection pump vent.

Cap the inlets on the injection pump vent where the hoses were removed **[Figure 70-70-7]**.

Figure 70-70-8



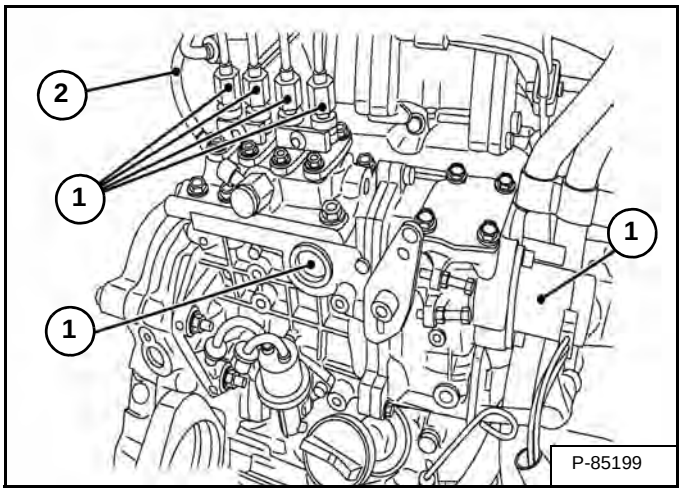
Remove the high pressure fuel lines (Item 1) **[Figure 70-70-8]** from the injection pump.

Installation: Tighten the injection pipe retaining nut to 23 - 36 N•m (17 - 26 ft-lb) torque.

Remove the engine speed control linkage (Item 2) **[Figure 70-70-8]**.

Fuel Injection Pump Removal And Installation

Figure 70-70-33



Remove all injection pipes (Item 1) **[Figure 70-70-33]**.

Installation: Tighten the injection pipe retaining nut to 23 - 36 N•m (17 - 26 ft-lb) torque.

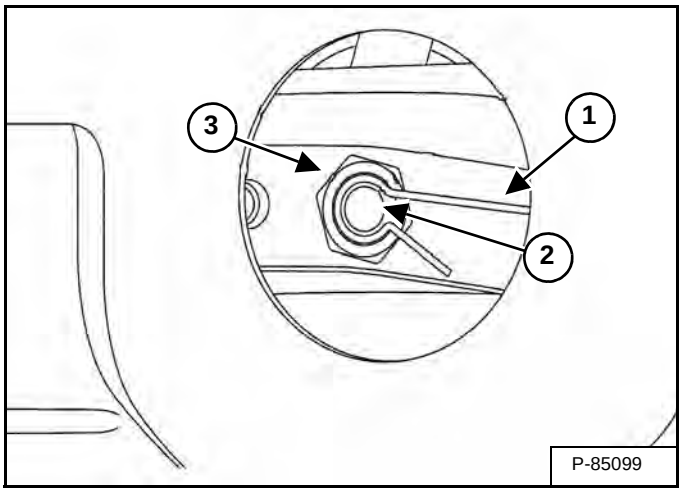
Remove overflow hose (Item 2) **[Figure 70-70-33]**.

Remove fuel stop solenoid (Item 3) **[Figure 70-70-33]**.

Remove sight cover from housing (Item 4) **[Figure 70-70-33]**.

NOTE: The injection pump can be removed and installed with the crankshaft at any position.

Figure 70-70-34



Unhook the start spring (Item 1) from the rack pin (Item 2) **[Figure 70-70-33]** of injection pump assembly.

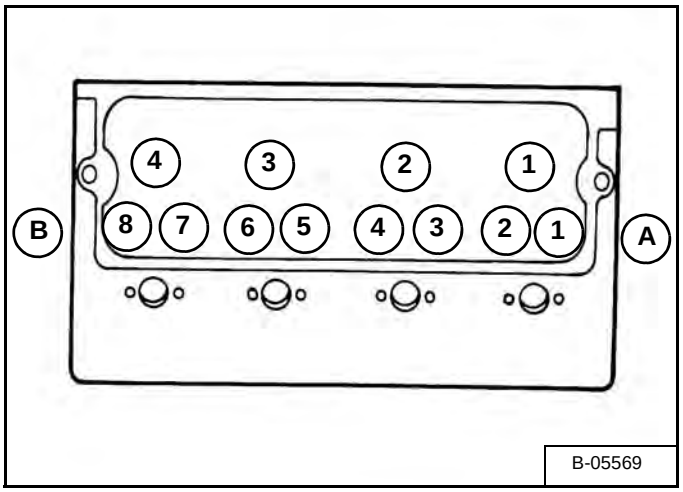
Remove the nut (Item 3) **[Figure 70-70-33]**.

Installation: Reverse procedure to install. Tighten the nut to 2.9 - 4,0 N•m (2.1 - 2.9 ft-lb) torque.

NOTE: Be careful not to drop the nut inside.

Valve Clearance Adjustment (Cont'd)

Figure 70-80-7



NOTE: (A) is the front cover side, (B) is the flywheel housing side.

Figure 70-80-8

Cylinder Number	1		2		3		4	
Valve Number	1	2	3	4	5	6	7	8
Valve I=Intake E=Exhaust	I	E	I	E	I	E	I	E

Adjust the valve clearance as follows:

0,13 - 0,17 mm (0.0052 - 0.0066 in) Intake And Exhaust

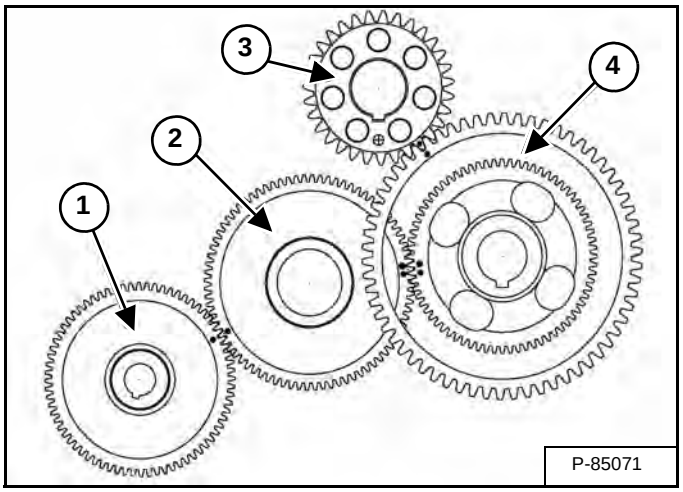
Use the following sequence to set the valves **[Figure 70-80-7]** and **[Figure 70-80-8]**:

1. With the No. 1 cylinder set at compression top dead center set valves 1,2,3 and 6.

2. With the No. 1 cylinder at overlap position set valves 4,5,7 and 8.

Valve Timing - Checking

Figure 70-80-9



Stop the engine and open the rear door.

Remove the engine / hydrostatic pump package from the loader. (See Engine Removal And Installation on Page 70-10-8.)

Remove the flywheel. (See Flywheel Removal And Installation on Page 70-120-1.)

Remove the timing gearcase cover. (See Timing Gearcase Cover Removal on Page 70-100-1.)

Make sure timing marks are in correct alignment **[Figure 70-80-9]**.

Injection Pump Gear (Item 1) **[Figure 70-80-9]**.

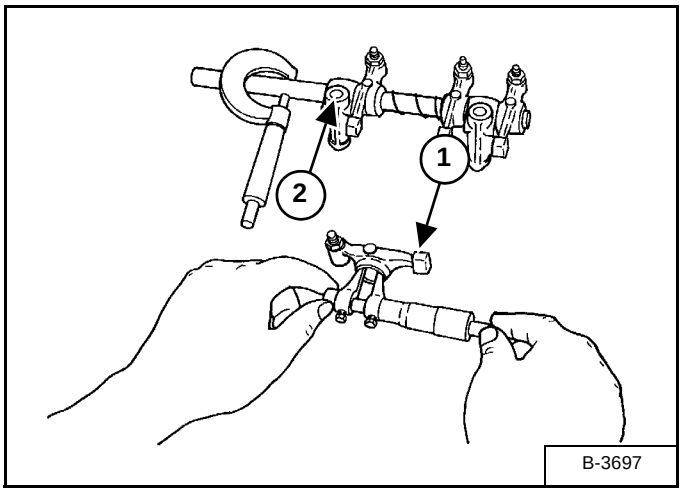
Idle Gear (Item 2) **[Figure 70-80-9]**.

Crank Gear (Item 3) **[Figure 70-80-9]**.

Cam Gear (Item 4) **[Figure 70-80-9]**.

Rocker Arm And Shaft - Checking

Figure 70-80-42



Measure the rocker arm I.D. (Item 1) **[Figure 70-80-42]** with an inside micrometer.

Measure the rocker arm shaft O.D. (Item 2) **[Figure 70-80-42]** with an outside micrometer.

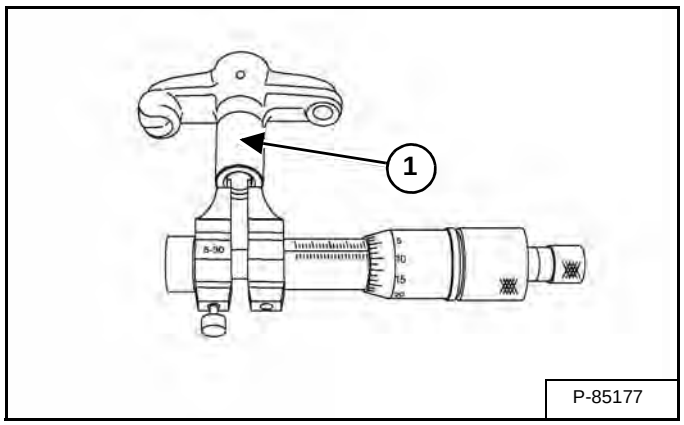
If the clearance exceeds the allowable limit, replace the bushing.

If the clearance still exceeds the allowable limit after the bushing is replace, replace the rocker arm shaft.

Oil Clearance Between Rocker Arm And Shaft	0,016 - 0,045 mm (0.00063 - 0.0017 in)
Allowable Limit	0,15 mm (0.0059 in)
Rocker Arm Shaft O.D.	13,973 - 13,984 mm (0.55012 - 0.55055 in)
Rocker Arm I.D.	14,0 - 14,018 mm (0.55119 - 0.55188 in)

Bridge Arm And Bridge Arm Shaft - Checking

Figure 70-80-43

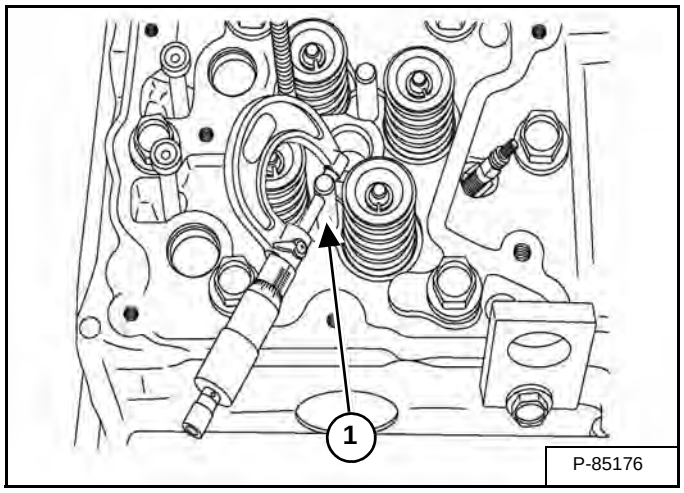


Measure the bridge arm ID (Item 1) **[Figure 70-80-43]**.

If the clearance exceeds the allowable limit, replace the bridge arm (Item 1) **[Figure 70-80-43]**.

Bridge arm ID.	8,050 - 8,080 mm (0.3170 - 0.3181 in)

Figure 70-80-44



Measure the bridge arm shaft OD (Item 1) **[Figure 70-80-44]**.

If the clearance exceeds the allowable limit, replace the bridge arm shaft (item 1) **[Figure 70-80-44]**.

Oil Clearance between Bridge arm and Bridge arm shaft.	0,018 -0,057 mm (0.0.00071 - 0.0022 in)
Bridge arm shaft OD.	8,023 - 8,8032 mm (0.3159 - 0.3162 in)
Allowable Limit	0,15 mm (0.0059 in)

Connecting Rod Alignment

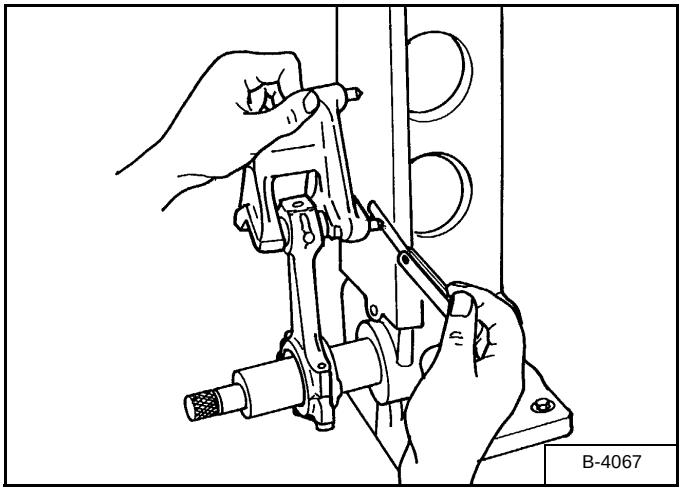
NOTE: The small end bushing is the basis of this check, check the bushing for wear before doing this check.

Install the piston pin into the connecting rod.

Install the connecting rod on an alignment tool.

Put the gauge over the piston pin and move it against the face plate.

Figure 70-90-17



If the gauge does not fit squarely against the face plate, measure the space between the gauge and face plate **[Figure 70-90-17]**.

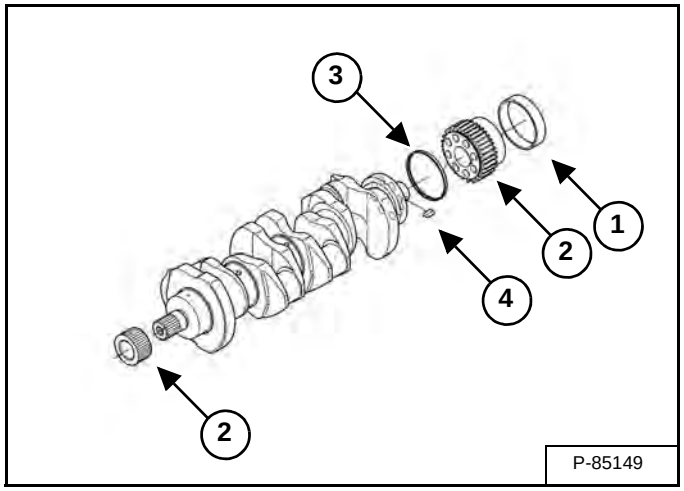
If the measurement exceeds the allowable limit, replace the connecting rod.

Rod Alignment	0,05 mm (0.002 in)

Crankshaft Gear Removal And Installation

Remove the crankshaft. (See Crankshaft And Bearings Removal And Installation on Page 70-90-8.)

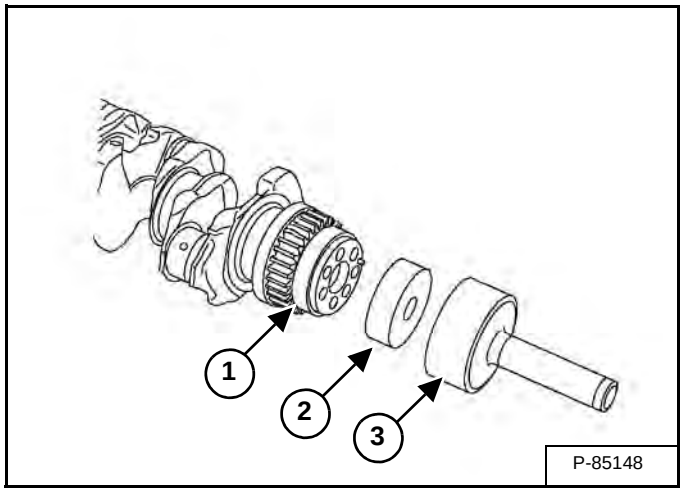
Figure 70-90-18



Remove the crankshaft sleeve (Item 1), the crankshaft gears (Item 2), the seal (Item 3) and the key (Item 4) **[Figure 70-90-18]**.

Installation: Install a new seal (Item 3) when servicing **[Figure 70-90-18]**.

Figure 70-90-19

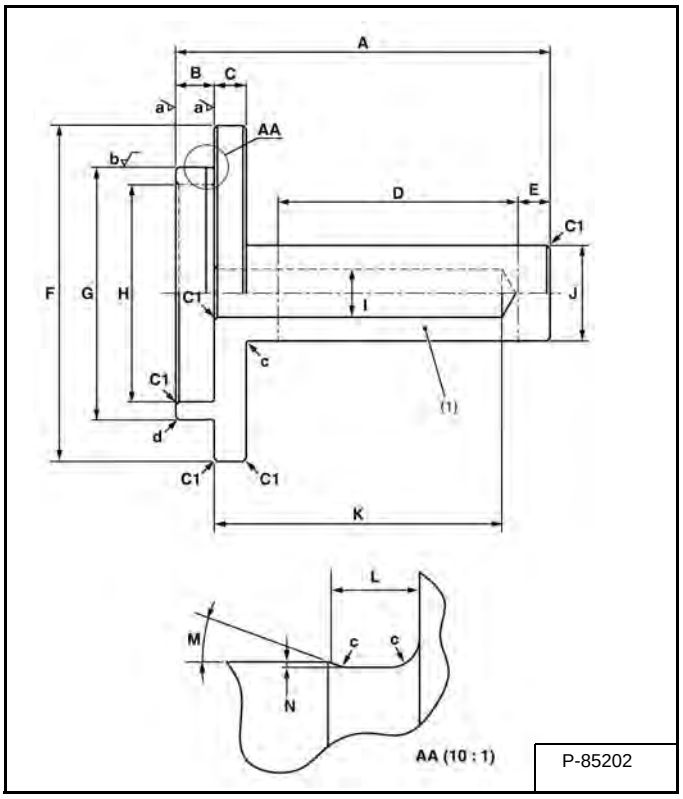


Installation: Heat the crankshaft sleeve (Item 1) **[Figure 70-90-18]** and **[Figure 70-90-19]** to 150 - 200°C (302 - 392°F). Install the crankshaft sleeve onto the crankshaft using the crankshaft sleeve guide (Item 2) and the crankshaft replacing tool (Item 3) MEL1660 **[Figure 70-90-19]**.

Installation: Install the crankshaft sleeve (Item 1) with the chamfered surface facing outward **[Figure 70-90-19]**.

Timing Gearcase Cover Installation (Cont'd)

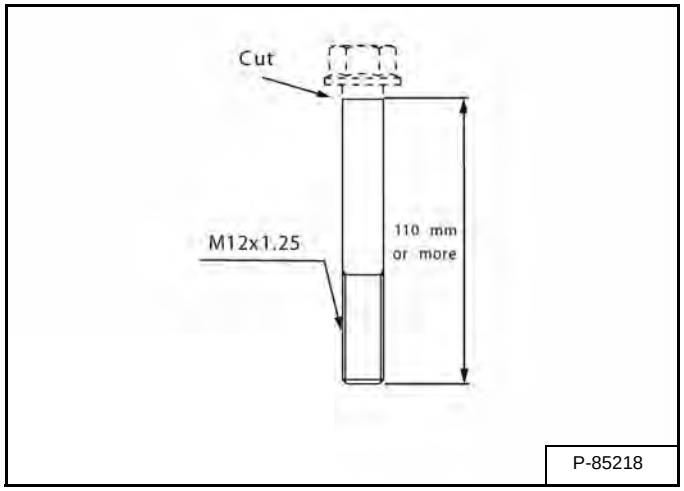
Figure 70-100-3



A	117 mm (4.61 in)
B	12,0 mm (0.472 in)
C	10,0 mm (0.394 in)
D	75,0 mm (2.95 in)
E	10,0 mm (0.394 in)
F	105 mm dia. (4.13 in dia.)
G	78,9971 - 78,9990 mm dia. (3.11013 - 3.11019 in dia.)
H	68,0 mm dia. (2.68 in dia.)
I	15,0 mm dia. (0.591 in dia.)
J	30,0 mm dia. (1.18 in dia.)
K	90,0 mm (3.54 in)
L	2,5 mm (0.098 in)
M	0,35 rad (20°)
N	0,15 - 0,25 mm (0.0059 - 0.0098 in)
a	Ra = 3.2 a
b	Ra = 1.6 a
c	0,80 mm radius (0.031 in radius)
d	1,5 mm radius (0.059 in radius)
C1	Chamfer 1,0 mm (0.039 in)

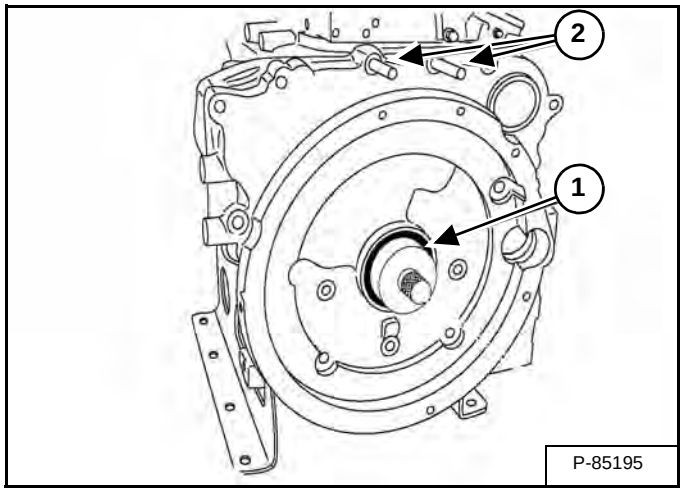
Make timing gearcase oil seal replacing tool **[Figure 70-100-3]**.

Figure 70-100-4



Make timing gearcase guide screws as shown above **[Figure 70-100-4]**.

Figure 70-100-5



Apply engine oil to the timing gearcase oil seal (Item 1) **[Figure 70-100-5]**.

Install timing gearcase guide screws (Item 2) **[Figure 70-100-5]**.

Housing Removal And Installation

Remove the engine / hydrostatic pump package from the loader. (See Engine Mount Replacement on Page 70-10-15.)

Remove the drive belt shield. (See Shield Removal And Installation on Page 30-50-1.)

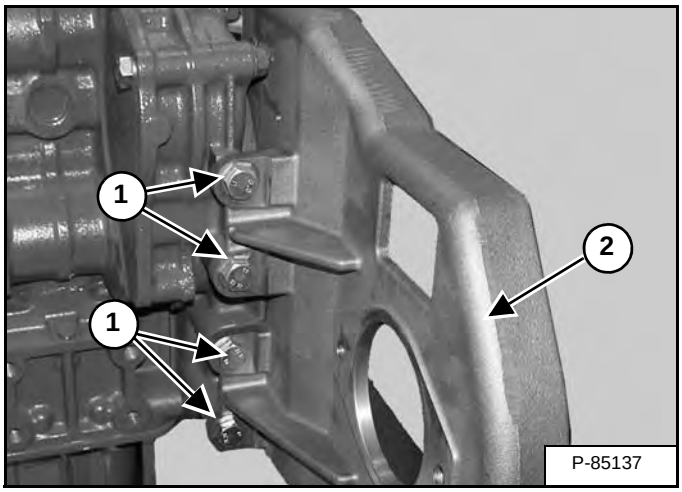
Remove the drive belt tension pulley. (See Tensioner Pulley Removal And Installation on Page 30-50-4.)

Remove the drive belt. (See Belt Removal And Installation on Page 30-50-3.)

Remove the starter. (See Removal And Installation on Page 60-40-2.)

Remove the flywheel. (See Flywheel Removal And Installation on Page 70-120-1.)

Figure 70-120-7



Remove the four mounting bolts (Item 1) and the housing (Item 2) **[Figure 70-120-7]**.

Installation: Tighten the mounting bolts to 80 - 84 N•m (56 - 62 ft-lb) torque.


Bobcat®

Compressor Drive Belt Replacement

Stop the engine and open the rear door.

Remove bolt (Item 3) **[Figure 80-20-3]** holding harness clamp.

Remove nuts (Item 1) and remove belt shield (Item 2) **[Figure 80-20-3]**.

Loosen the mounting nut (Item 1) **[Figure 80-20-4]** at bottom of compressor.

Loosen the adjustment nut (Item 1) **[Figure 80-20-5]** at top of compressor.

Move the air conditioning compressor toward the front of the machine to loosen the belt.

Remove the belt from the pulleys and inspect the pulleys for wear. Replace as needed.

Install new air conditioning belt.

Adjust the belt.

Close the rear door before operating the loader.

Condenser

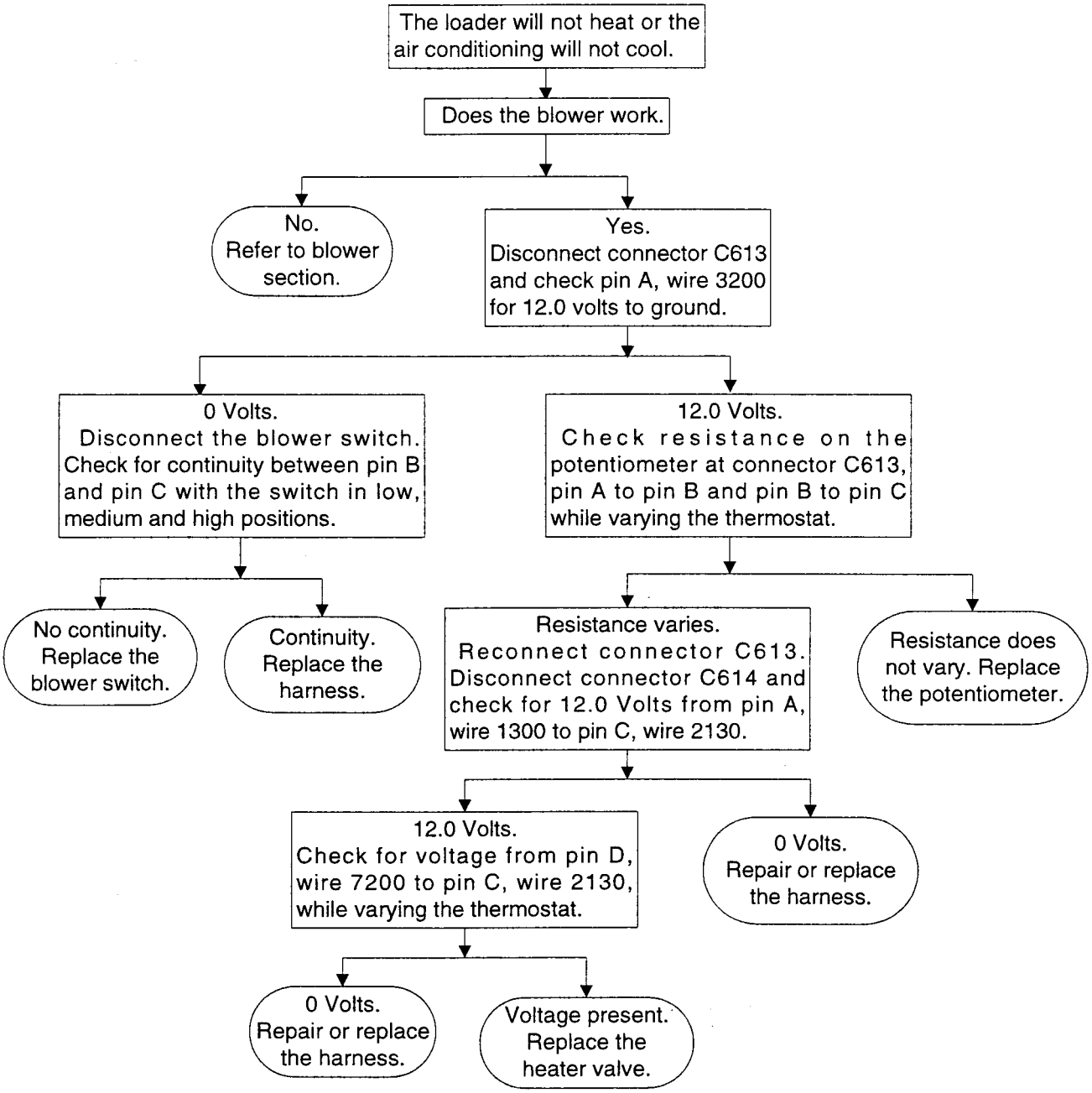
(See ENGINE COOLING SYSTEM on Page 10-90-1.)

Air Conditioning Lubrication

Run the air conditioning for about five minutes every week to lubricate the internal components.

Troubleshooting Tree (Cont'd)

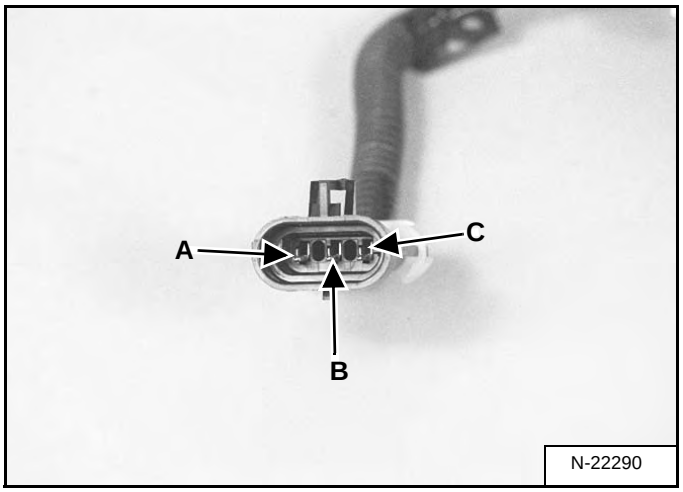
Heater Valve



B-21493

Electrical System (Cont'd)

Figure 80-30-25

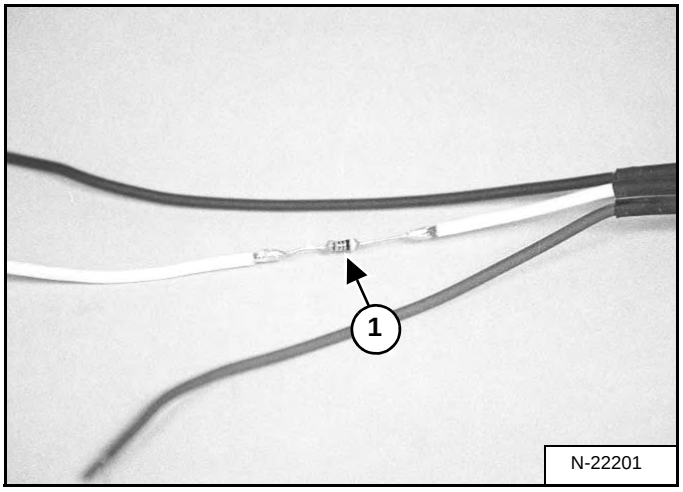


If there is voltage at the wiring harness, check the potentiometer **[Figure 80-30-25]** for resistance.

The resistance should be 10 K ohm between wire terminal A and wire terminal C frame **[Figure 80-30-25]**.

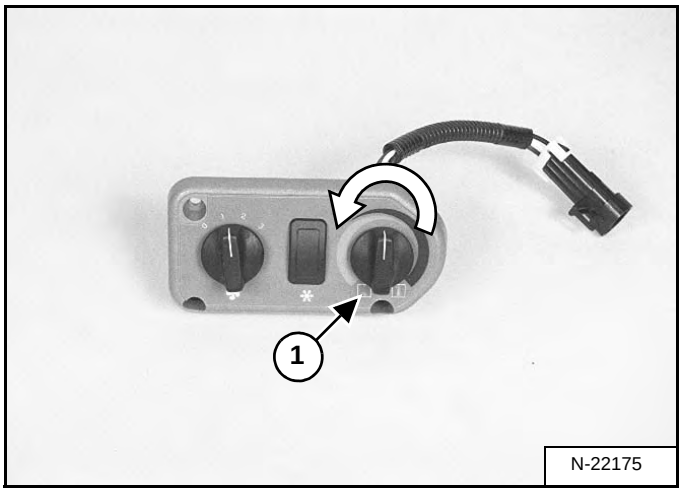
If no resistance is found, replace the potentiometer.

Figure 80-30-26



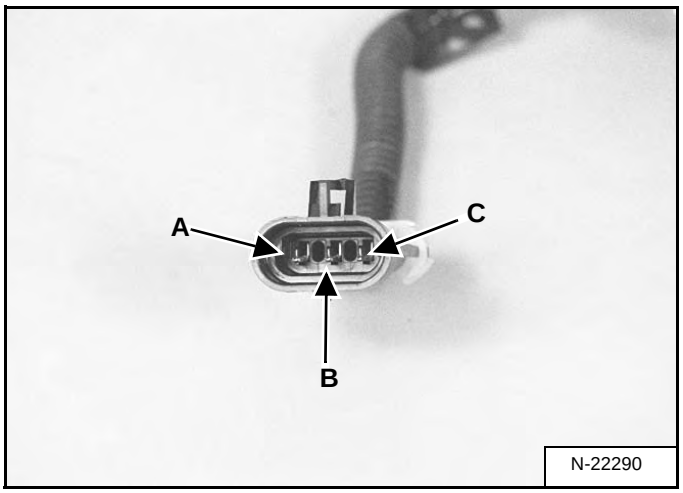
The white wire B, (Item 1) **[Figure 80-30-26]**, on the potentiometer, is a resistor wire.

Figure 80-30-27



To check the resistance of the white wire, turn the potentiometer control (Item 1) to the full A/C position **[Figure 80-30-27]**.

Figure 80-30-28



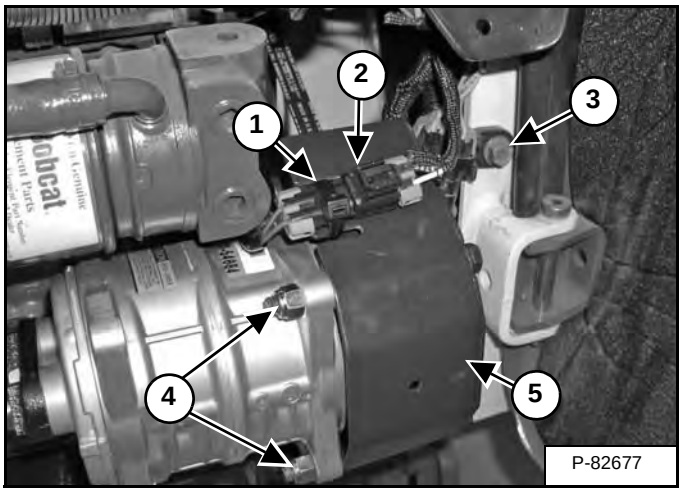
The resistance between the wire terminal A and wire terminal B frame **[Figure 80-30-28]** should be approximately 49 K ohm.

Check the resistance between the wire terminal C and wire terminal B frame **[Figure 80-30-28]** should be approximately 39 K ohm.

COMPRESSOR

Removal And Installation

Figure 80-50-1



Remove the tie strap (Item 1) and disconnect the clutch harness (Item 2). Remove the bolt (Item 3)**[Figure 80-50-1]** holding the harness clamp.

Remove the nuts (Item 4) and remove the belt shield (Item 5) **[Figure 80-50-1]**.

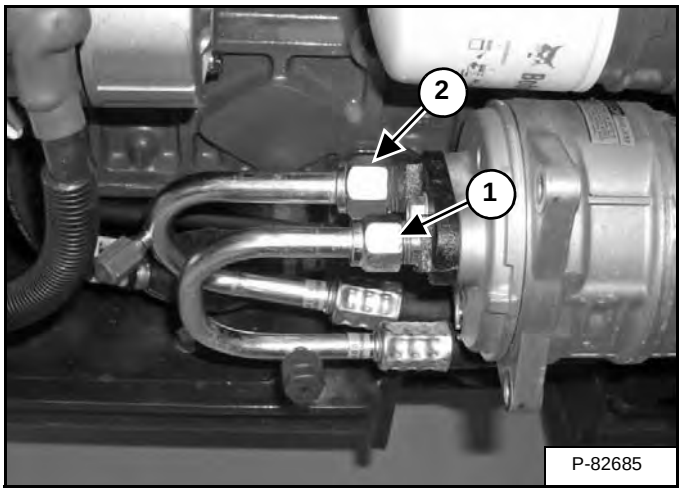
⚠ WARNING

In the event of a leak, wear safety goggles. Escaping refrigerant can cause severe injuries to eyes. In contact with a flame, R-134a refrigerant gives a toxic gas.

W-2371-0611

Evacuate the A/C system. (See SYSTEM CHARGING AND RECLAMATION on Page 80-40-1.)

Figure 80-50-2



Disconnect the high pressure compressor hose (Item 1) and low pressure compressor hose (Item 2) **[Figure 80-50-2]** from the compressor.

Installation: Tighten the compressor hoses to 29,8 N•m (22 ft-lb) torque.

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

Mark the compressor hoses for proper installation.

RECEIVER / DRIER

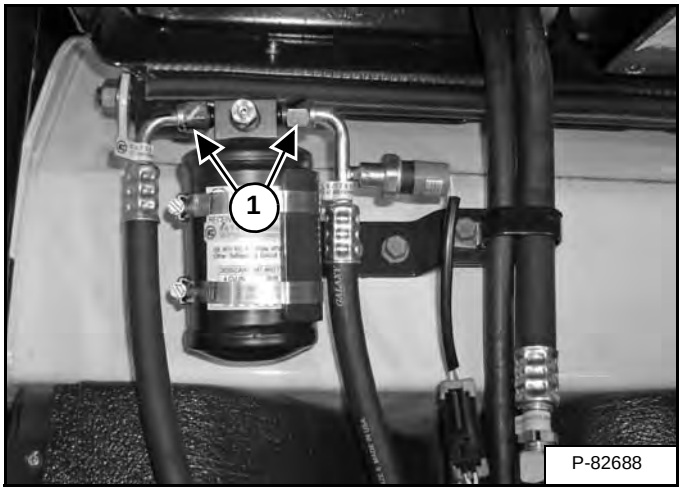
Receiver / Drier Removal And Installation

WARNING

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

W-2059-0598

Figure 80-70-1



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

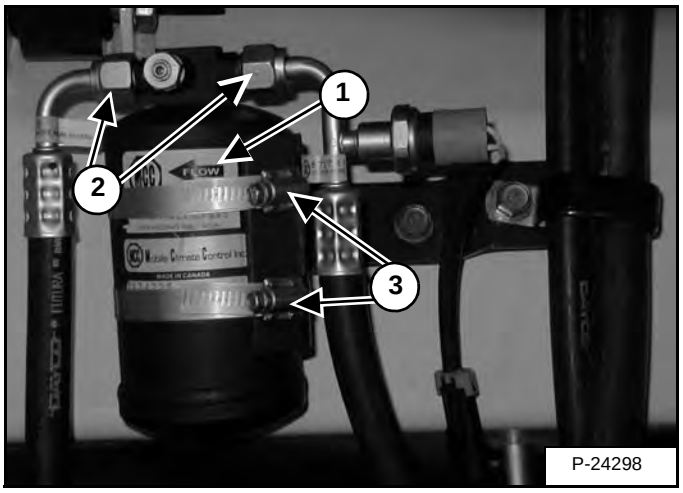
Raise the operator cab. (See Raising on Page 10-30-2.)

Remove the refrigerant from the A/C system.(See Reclamation And Charging With Recovery / Charging Unit on Page 80-40-2.)

Mark the A/C hoses (Item 1) **[Figure 80-70-1]** for proper installation.

Both fittings on the drier are the same size, so the hoses can be hooked up incorrectly.

Figure 80-70-2



Note the flow direction on the drier (Item 1) **[Figure 80-70-2]** for proper installation.

WARNING

In the event of a leak, wear safety goggles. Escaping refrigerant can cause severe injuries to eyes. In contact with a flame, R-134a refrigerant gives a toxic gas.

W-2371-0611

Remove the two A/C hoses (Item 2) **[Figure 80-70-2]** from the receiver / drier.

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

Loosen the hose clamps (Item 3) **[Figure 80-70-2]** that holds the receiver / drier to the mount.

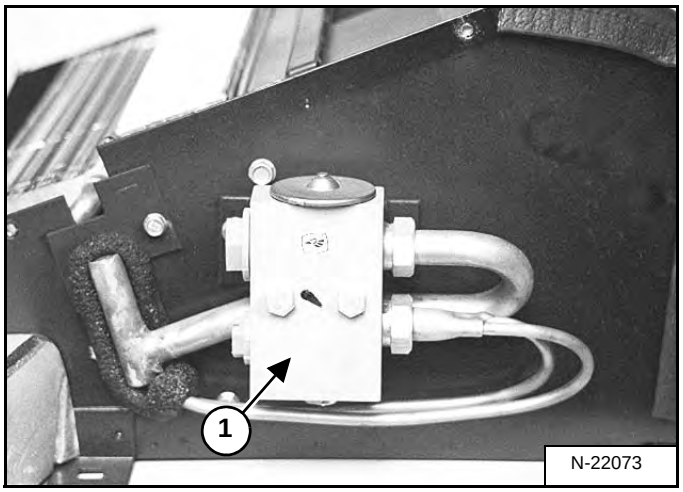
Remove the receiver / drier from the loader.

NOTE: When replacing a receiver / drier in an A/C system 30 cc (1 fl. oz) of PAG 100 oil must be added to the system when recharging.

EVAPORATOR COIL

Removal And Installation

Figure 80-110-1



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

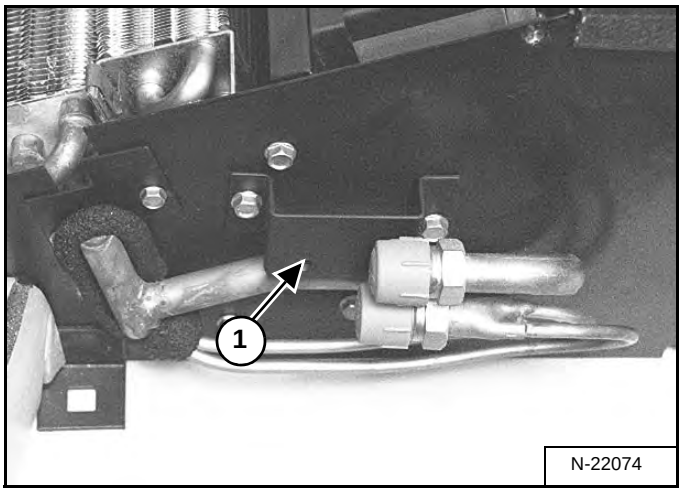
Raise the operator cab. (See Raising on Page 10-30-2.)

Evacuate the A/C system. (See Reclamation And Charging With Recovery / Charging Unit on Page 80-40-2.)

Remove the evaporator / heater unit from the back of the cab. (See Removal And Installation on Page 80-80-1.)

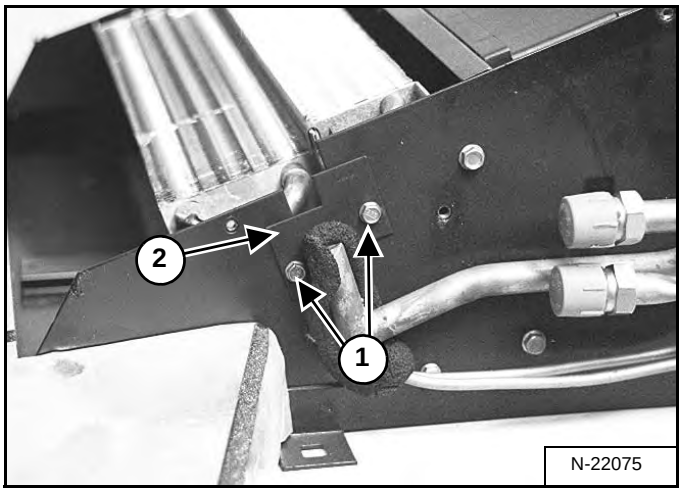
Remove the expansion valve (Item 1) **[Figure 80-110-1]** from the unit. (See Removal And Installation on Page 80-100-1.)

Figure 80-110-2



Remove the expansion valve mount bracket (Item 1) **[Figure 80-110-2]** from the unit.

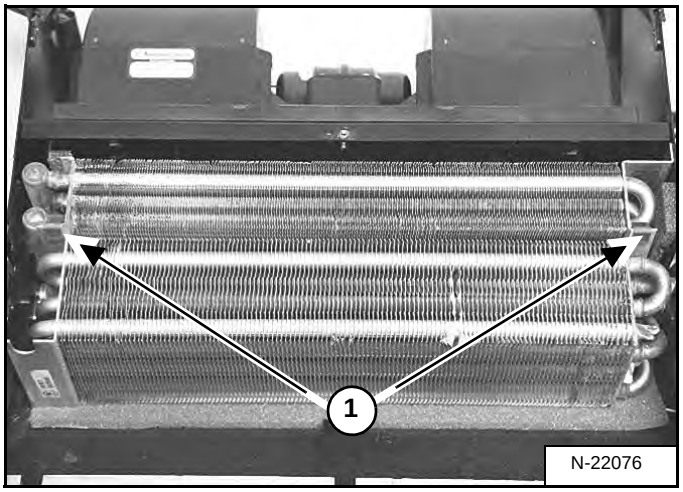
Figure 80-110-3



Remove the two mount bolts (Item 1) from the mount plate (Item 2) **[Figure 80-110-3]**.

Remove the mount plate from the unit.

Figure 80-110-4



Remove the two retaining clips (Item 1) **[Figure 80-110-4]** that connect the evaporator coil, to the heater coil.

Remove the evaporator coil from the unit.

HEATER VALVE

Removal And Installation

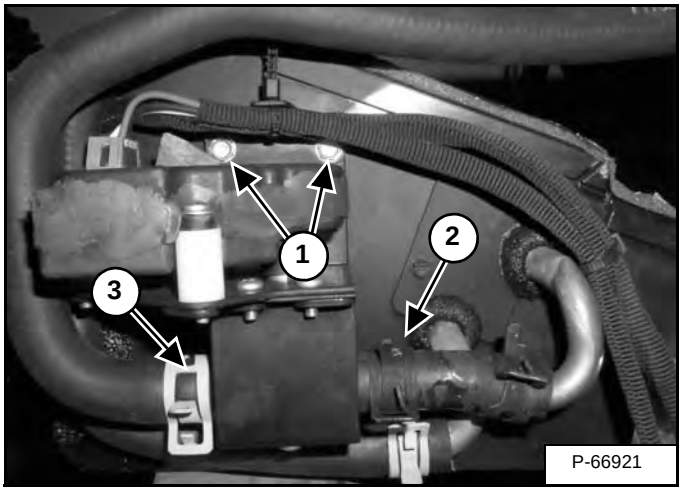
Raise the lift arms and install an approved lift arm support device. (See Installing on Page 10-20-1.)

Raise the operator cab. (See Raising on Page 10-30-2.)

Remove the Evaporator / Heater Unit from under the cab and place it across the mainframe supported by blocks (See Removal And Installation on Page 80-80-1.)

Remove any tie-straps that hold the heater hoses.

Figure 80-140-1



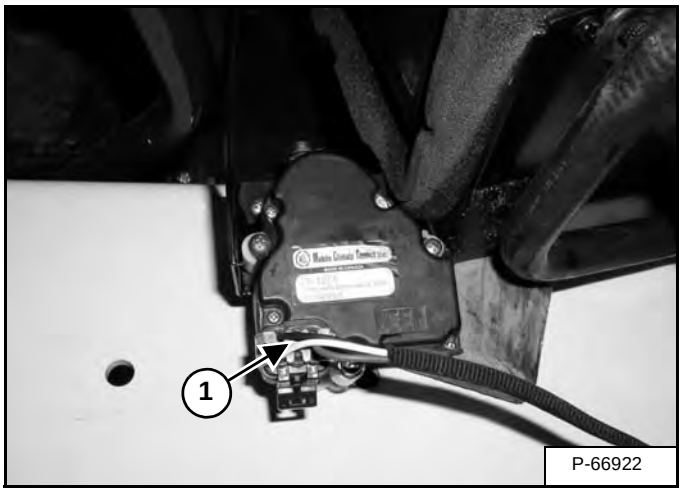
Remove the mount bolts (Item 1) **[Figure 80-140-1]** from the heater valve mount.

Remove the heater hose clamps (Item 2) and (Item 3) **[Figure 80-140-1]**.

Remove the heater hoses from the heater valve.

Cap the heater hoses and the heater valve with plugs to prevent coolant loss from the system.

Figure 80-140-2



Disconnect the loader wiring harness (Item 1) **[Figure 80-140-2]** from the heater valve.

HYDRAULIC CONNECTION SPECIFICATIONS

O-ring Face Seal Connection

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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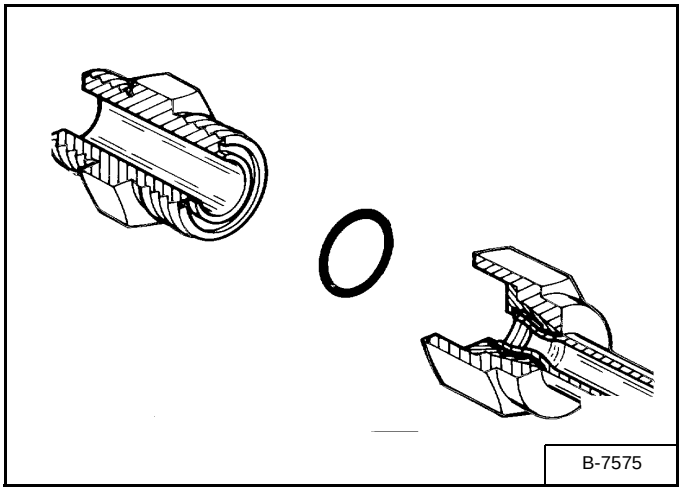
Figure SPEC-30-1



When the fitting is tightened, you can feel when the fitting is tight to eliminate leakage caused by under or over torqued fittings. Use vaseline petroleum jelly to hold the O-ring in position until the fittings are assembled **[Figure SPEC-30-1]**.

Figure SPEC-30-2

O-ring Face Seal Tightening Torque		
Tubeline Outside Diameter	**Thread Size**	* **TORQUE N•m (ft-lb)**
1/4”	9/16” - 18	18 (13)
3/8”	11/16” - 16	30 (22)
1/2”	13/16” - 16	54 (40)
5/8”	1” - 14	81 (60)
3/4”	1-3/16” - 12	114 (84)
7/8”	1-3/16” - 12	133 (98)
1”	1-7/16” - 12	160 (118)
1-1/4”	1-11/16” - 12	209 (154)
1-1/2”	2” - 12	221 (163)