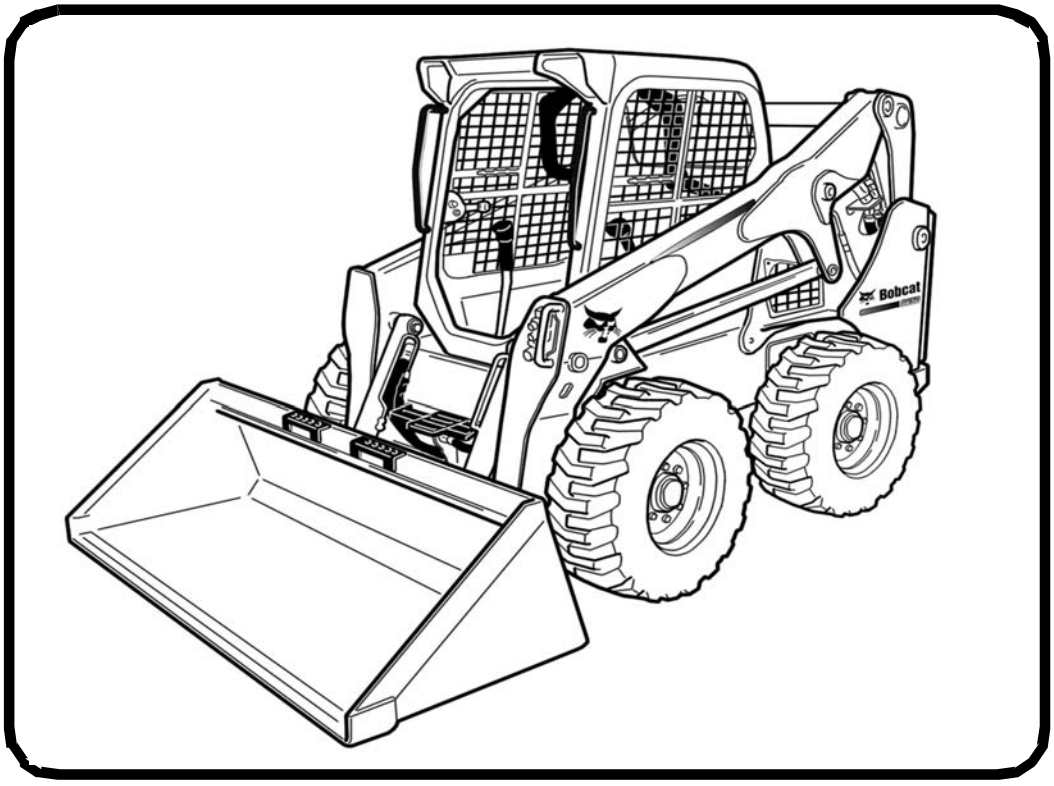
Bobcat®

Service Manual
S750 Skid-Steer Loader

S/N A3P211001 & Above
S/N A3P311001 & Above



EQUIPPED WITH
BOBCAT INTERLOCK
CONTROL SYSTEM (BICS™)

6989464 (12-10)

Printed in U.S.A.

FW SSL-1008 SM

TRANSPORTING LOADER ON A TRAILER

Loading And Unloading

WARNING

AVOID SERIOUS INJURY OR DEATH

Adequately designed ramps of sufficient strength are needed to support the weight of the machine when loading onto a transport vehicle. Wood ramps can break and cause personal injury.

W-2058-0807

Be sure the transport and towing vehicles are of adequate size and capacity for weight of loader. (See Performance on Page SPEC-10-2.)

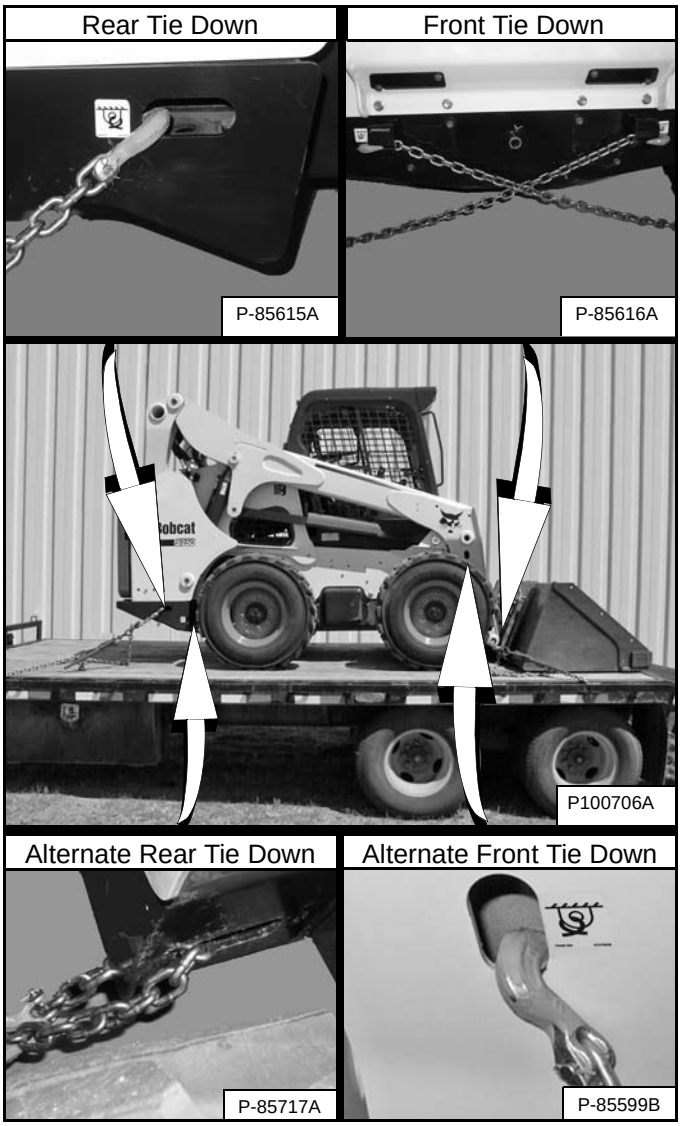
Figure 10-40-1

A loader with an empty bucket or no attachment must be loaded backward onto the transport vehicle **[Figure 10-40-1]**.

The rear of the trailer must be blocked or supported (Item 1) **[Figure 10-40-1]** when loading or unloading the loader to prevent the front end of the trailer from raising up.

Fastening

Figure 10-40-2



Use the following procedure to fasten the Bobcat loader to the transport vehicle to prevent the loader from moving during sudden stops or when going up or down slopes **[Figure 10-40-2]**.

1. Lower the bucket or attachment to the floor.
2. Stop the engine.
3. Engage the parking brake.
4. Install chains at the front and rear loader tie down positions **[Figure 10-40-2]**. (Lift arms shown raised for clarity.)
5. Fasten each end of the chain to the transport vehicle.
6. Use chain binders to tighten the chains.

REMOTE START TOOL (SERVICE TOOL) KIT - 7003031

Description

The Remote Start Tool (Service Tool) Kit is a replacement tool for MEL 1563 Remote Start Tool and MEL 1400B - BOSS® Diagnostic Tool.

The Remote Start Tool (Service Tool) Kit, P/N 7003031, can be used to service newer loaders using the supplied harness P/N 6689747.

A computer can be connected to the Remote Start Tool (Service Tool) for diagnostics and software updates using the computer harness P/N 6689746 in conjunction with the loader harness.

AIR CLEANER SERVICE

Replacing Filter Elements

Figure 10-80-1

It is important to change the air filter element only when necessary. The service indicator (Item 1) will FLASH. Press the information button (Item 3) until the display screen (Item 2) shows the service codes. Service code **[M0117]** (Air Filter Plugged) will show in the display screen (Item 2) **[Figure 10-80-1]** when air filter change is necessary.

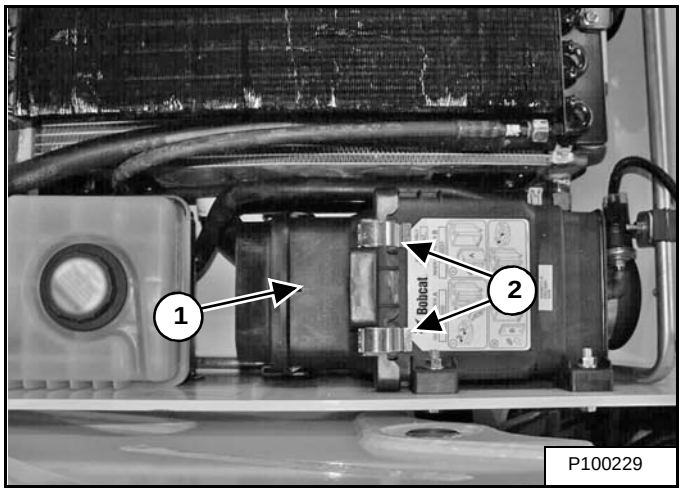
Replace the inner filter every third time the outer filter is replaced or as indicated.

Outer Filter

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

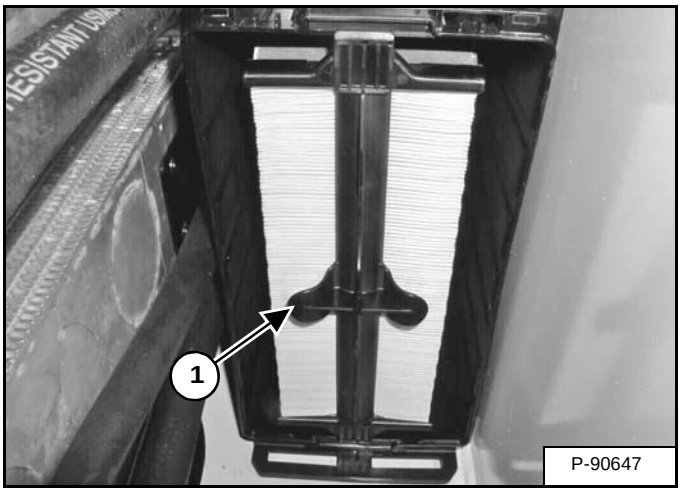
NOTE: The coolant tank can be raised to facilitate access to the air cleaner.

Figure 10-80-2



Open the latches (Item 2) and remove the cover (Item 1) **[Figure 10-80-2]**.

Figure 10-80-3



Pull the outer filter element (Item 1) **[Figure 10-80-3]** out and discard.

NOTE: Make sure the filter housing is free of dirt and debris. Verify that sealing surfaces are clean. DO NOT use compressed air.

Install new filter element. Push all the way in until it contacts the base of the housing.

Install the cover and secure the latches **[Figure 10-80-2]**.

NOTE: Ensure the intake hose is connected to the fitting on the fan housing (Inset) [Figure 10-80-5].

NOTE: Ensure the coolant tank is secured into the coolant tank bracket.

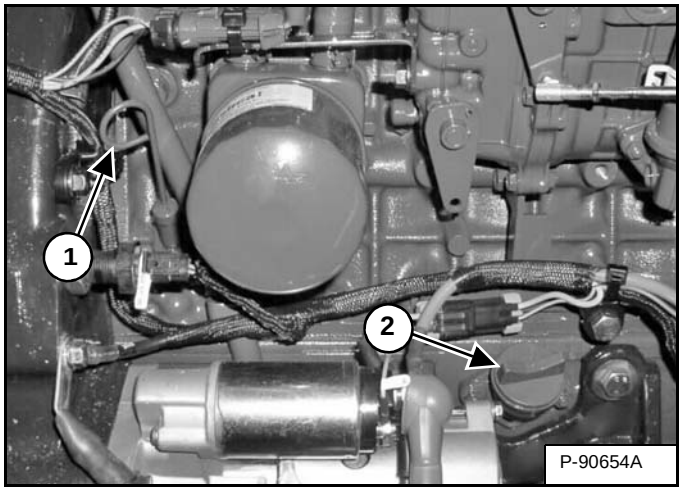
Install the rear grille.

ENGINE LUBRICATION SYSTEM

Checking And Adding Engine Oil

Check the engine oil level every day before starting the engine for the work shift.

Figure 10-110-1



Park the machine on level ground. Open the rear door and remove the dipstick (Item 1) **[Figure 10-110-1]**.

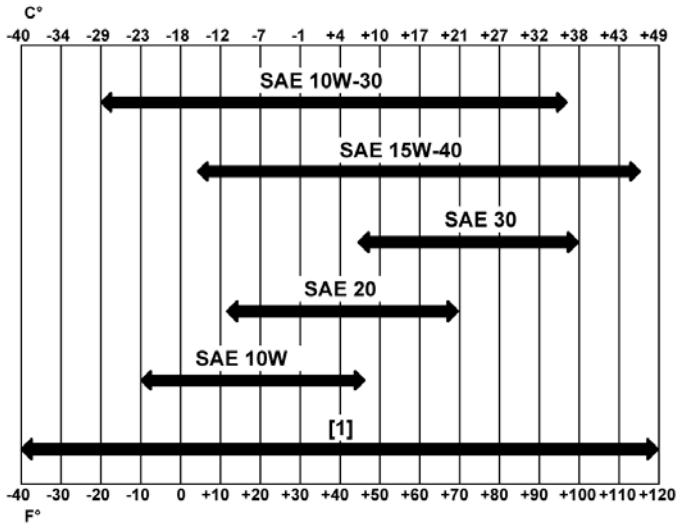
Keep the oil level between the marks on the dipstick. Do not overfill.

Remove the oil fill cap (Item 2) **[Figure 10-110-1]** to add engine oil.

Engine Oil Chart

Figure 10-110-2

ENGINE OIL
RECOMMENDED SAE VISCOSITY NUMBER (LUBRICATION OILS FOR DIESEL ENGINE CRANKCASE)



TEMPERATURE RANGE ANTICIPATED BEFORE NEXT OIL CHANGE (DIESEL ENGINES MUST USE API CLASSIFICATION CI-4 OR BETTER)

[1] Synthetic Oil - Use recommendation from Synthetic Oil Manufacturer.

Use good quality engine oil that meets API Service Classification of CI-4 or better **[Figure 10-110-2]**.

⚠ WARNING

AVOID INJURY OR DEATH

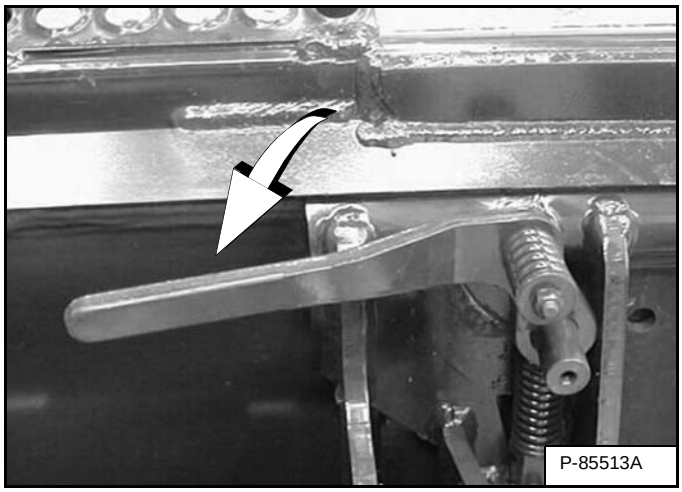
Always clean up spilled fuel or oil. Keep heat, flames, sparks or lighted tobacco away from fuel and oil. Failure to use care around combustibles can cause explosion or fire.

W-2103-0508

BOB-TACH (HAND LEVER)

Inspection And Maintenance

Figure 10-140-1



Move the Bob-Tach levers down to engage the wedges **[Figure 10-140-1]**.

The levers and wedges must move freely.

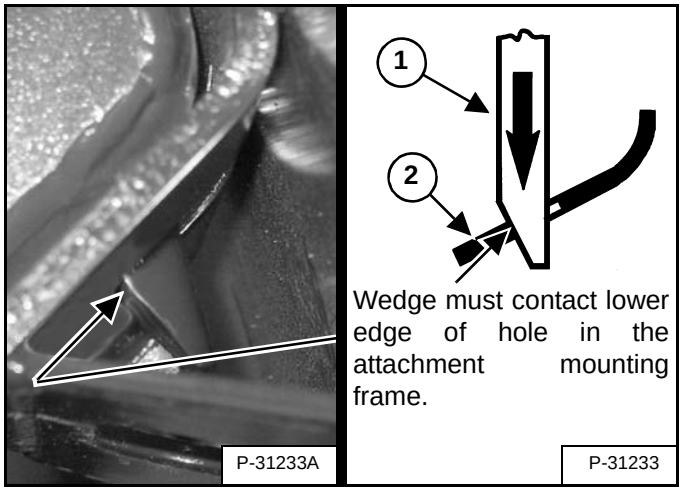
⚠ WARNING

AVOID INJURY OR DEATH

The Bob-Tach wedges must extend through the holes in the attachment mounting frame. Levers must be fully down and locked. Failure to secure wedges can allow attachment to come off.

W-2715-0208

Figure 10-140-2

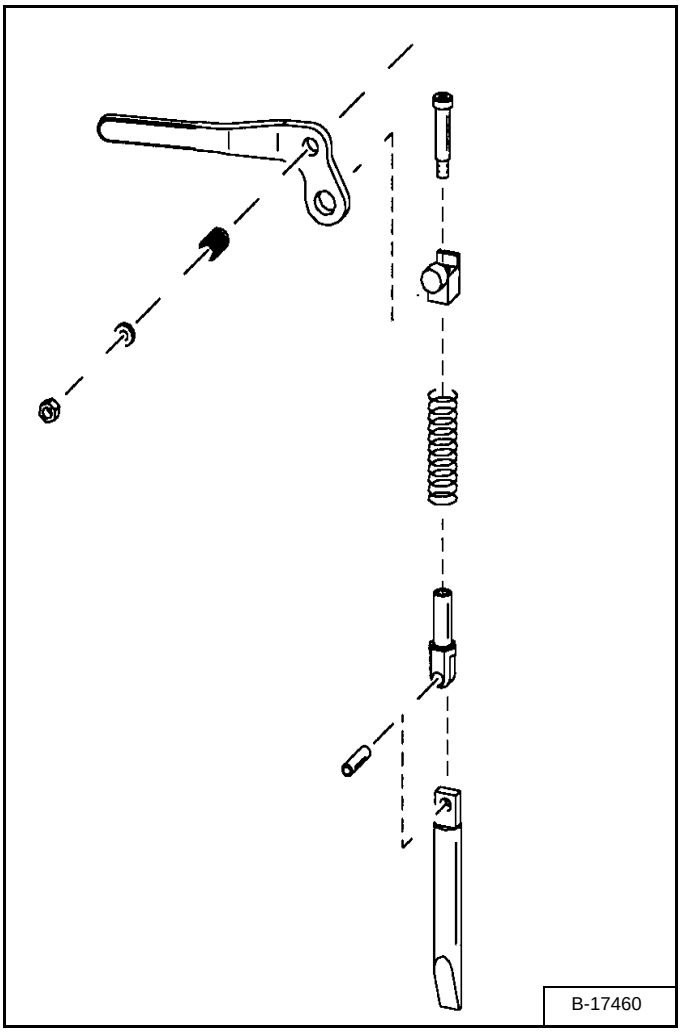


The wedges (Item 1) **[Figure 10-140-2]** must extend through the holes in the attachment mounting frame.

The spring loaded wedges (Item 1) must contact the lower edge of the holes in the attachment mounting frame (Item 2) **[Figure 10-140-2]**.

If the wedges do not contact the lower edge of the holes **[Figure 10-140-2]**, the attachment will be loose and can come off the Bob-Tach.

Figure 10-140-3



Inspect the mounting frame on the attachment and Bob-Tach, linkages and wedges for excessive wear or damage **[Figure 10-140-3]**. Replace any parts that are damaged, bent or missing. Keep all fasteners tight.

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

Lubricate the wedges. (See SERVICE SCHEDULE on Page 10-70-1.) and (See LUBRICATING THE LOADER on Page 10-150-1.)

SPARK ARRESTOR MUFFLER

Cleaning Procedure

See the SERVICE SCHEDULE for service interval for cleaning the spark arrester muffler. (See SERVICE SCHEDULE on Page 10-70-1.)

Do not operate the loader with a defective exhaust system.

IMPORTANT

This machine is factory equipped with a U.S.D.A. Forestry Service approved spark arrestor exhaust system.

The spark arrestor muffler, if equipped, must be cleaned to keep it in working condition. The spark arrestor muffler must be serviced by dumping the spark chamber every 100 hours of operation.

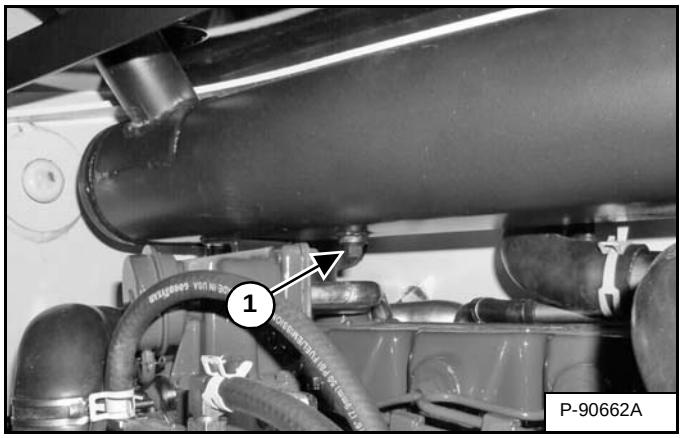
On some models, the turbocharger functions as the spark arrestor and must operate correctly for proper spark arrestor function.

If this machine is operated on flammable forest, brush, or grass covered land, it must be equipped with a spark arrestor attached to the exhaust system and maintained in working order. Failure to do so will be in violation of California State Law, Section 4442. PRC. Refer to local laws and regulations for spark arrestor requirements.

I-2284-0409

Stop the engine and open the rear door.

Figure 10-170-1



Remove the plug (Item 1) **[Figure 10-170-1]** from the bottom of the muffler.

WARNING

When the engine is running during service, the driving and steering controls must be in neutral and the parking brake engaged. Failure to do so can cause injury or death.

W-2006-1209

Start the engine and run for about 10 seconds while a second person, wearing safety glasses, holds a piece of wood over the outlet of the muffler.

This will force contaminants out through the cleanout hole.

Stop the engine.

Install and tighten the plug. Close the rear door.

WARNING

AVOID INJURY OR DEATH

When an engine is running in an enclosed area, fresh air must be added to avoid concentration of exhaust fumes. If the engine is stationary, vent the exhaust outside. Exhaust fumes contain odorless, invisible gases which can kill without warning.

W-2050-0807

WARNING

Stop engine and allow the muffler to cool before cleaning the spark chamber. Wear safety goggles. Failure to obey can cause serious injury.

W-2011-1285

WARNING

Never use machine in atmosphere with explosive dust or gases or where exhaust can contact flammable material. Failure to obey warnings can cause injury or death.

W-2068-1285

SEAT BELT

Inspection And Maintenance

WARNING

Failure to properly inspect and maintain the seat belt can cause lack of operator restraint resulting in serious injury or death.

W-2466-0703

Check the seat belt daily for correct function.

Inspect the seat belt system thoroughly at least once each year or more often if the machine is exposed to severe environmental conditions or applications.

Any seat belt system that shows cuts, fraying, extreme or unusual wear, significant discolorations due to ultraviolet UV exposure, dusty / dirty conditions, abrasion to the seat belt webbing, or damage to the buckle, latch plate, retractor (if equipped), hardware or any other obvious problem should be replaced immediately.

The items below are referenced in **[Figure 10-220-1]**.

1. Check the webbing. If the system is equipped with a retractor, pull the webbing completely out and inspect the full length of the webbing. Look for cuts, wear, fraying, dirt and stiffness.

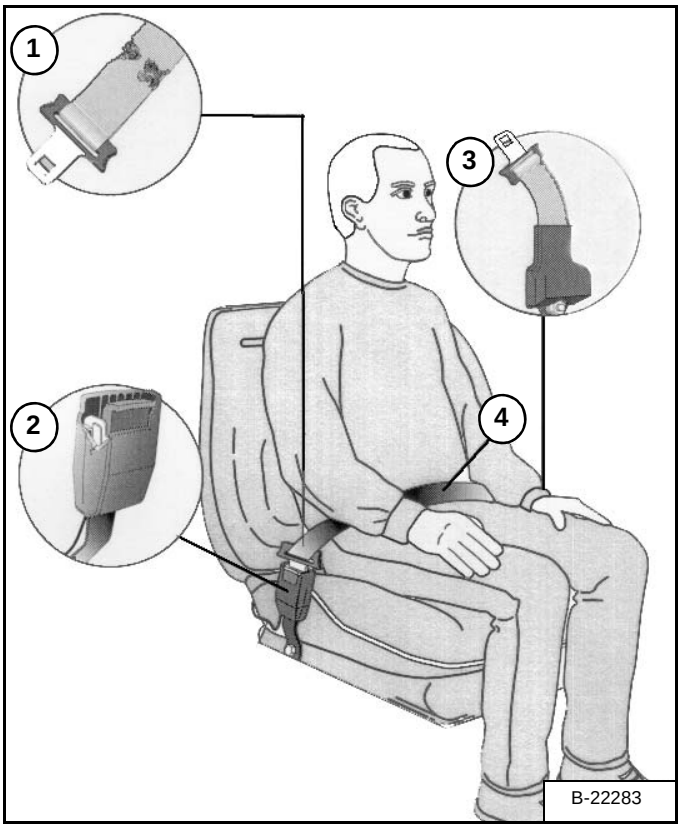
2. Check the buckle and latch for correct operation. Make sure latch plate is not excessively worn, deformed or buckle is not damaged or casing broken.

3. Check the retractor web storage device (if equipped) by extending webbing to determine if it looks correct and that it spools out and retracts webbing correctly.

4. Check webbing in areas exposed to ultraviolet (UV) rays from the sun or extreme dust or dirt. If the original color of the webbing in these areas is extremely faded and / or the webbing is packed with dirt, the webbing strength may have deteriorated.

See your Bobcat dealer for seat belt system replacement parts for your machine.

Figure 10-220-1



HYDRAULIC/HYDROSTATIC SCHEMATIC
SJC WITH NO OPTIONS
S750 (S/N A3P211001 AND ABOVE)

(PRINTED NOVEMBER 2010)
V-1423legend

LEGEND

1. RESERVOIR:
   Capacity at sight gauge . . 9,8 L (2.6 U.S. gal)
   System Capacity . . . . . 37,9 L (10.0 U.S. gal)
2. SIGHT GUAGE
3. DIFFERENTIAL PRESSURE SWITCH:
   103 kPa (1,03 bar) (15 psi)
   Normally Closed
4. FILTER - HYDRAULIC (CANISTER)
5. SPRING LOADED FILTER BY-PASS VALVE: 172 kPa (1,7 bar) (25 psi)
6. DIAGNOSTIC COUPLER
7. RELIEF VALVE - MAIN:
   24132 kPa (241 bar) (3500 psi)
   at Front Quick Couplers
8. RELIEF/ANTICAVITATION VALVE - PORT: 27579 kPa (276 bar) (4000 psi)
9. RELIEF/ANTICAVITATION VALVE - PORT (OPTIONAL): 27579 kPa (276 bar) (4000 psi)
10. SOLENOID ACTIVATED DIRECTIONAL CONTROL VALVE - AUXILIARY
11. LOAD CHECK VALVE
12. FRONT AUXILIARY MANUAL PRESSURE BLEED-OFF VALVE
13. ANTICAVITATION VALVE
14. LIFT CYLINDER SPOOL - MADE TO RESTRICT FLOW DURING BOOM DOWN BUT NOT DURING BOOM UP
15. PILOTED ACTIVATED DIRECTIONAL CONTROL VALVE - TILT CONTROL
16. PILOTED ACTIVATED DIRECTIONAL CONTROL VALVE - LIFT CONTROL
17. SOLENOID ACTIVATED DIRECTIONAL CONTROL VALVE - BICS CONTROL
18. FILTER - BICS CONTROL VALVE (SCREEN)
19. CHECK VALVE - With 100 kPa 1,0 bar (14.5 psi) Spring
20. RESTRICTION . . . . . 2,0 mm (0.079 in)
21. PULL BUTTON ACTIVATED DIRECTIONAL CONTROL VALVE - LIFT ARM BY-PASS
22. SENSOR – HYD. TEMPERATURE
23. ANTICAVITATION VALVE
24. PROPORTIONAL RELIEF VALVE – (Fan Speed Regulator): 10797-12300 kPa (108 - 123 bar) (1566 - 1784 psi)
25. SPRING LOADED FILTER BY-PASS VALVE: 517 – 572 kPa (5,2 - 5,7 bar) (75 - 83 psi)
26. FIXED CAPACITY DISPLACEMENT HYDRAULIC MOTOR
27. FILTER - HYDRAULIC (CANISTER)
28. SENSOR – CHARGE PRESSURE – Fan Filter
29. HYDRAULIC PUMP . . . . . Gear Type 87,1 L/min (23.0 U.S. gpm) at High Engine Idle
30. CHARGE PUMP - 51,1 L/min (13.5 U.S. gpm) at High Engine Idle
31. VARIABLE CAPACITY DISPLACEMENT BIDIRECTIONAL HYDROSTATIC PUMP
32. RELIEF/REPLENISHING VALVE - HIGH PRESSURE: 36500 kPa (365 bar) (5294 psi)
33. RELIEF VALVE - CHARGE INLET: 2654 kPa (26,5 bar) (385 psi) at High Engine Idle With 60 ° C (140 ° F) Fluid
34. SERVO PISTON – Swash Plate
35. SOLENOID ACTIVATED DIRECTIONAL CONTROL VALVE – FORWARD/REVERSE
36. FILTER
37. CHECK VALVE – COLD WEATHER BY-PASS With 345 kPa (3,45 bar) (50 psi) Spring
38. RESTRICTION – 1,5 mm (0.06 in)
39. CHECK VALVE - With 1379 kPa (13,8 bar) (200 psi) Spring
40. DRIVE MOTOR SHUTTLE VALVE
41. FIXED CAPACITY DISPLACEMENT BIDIRECTIONAL HYDROSTATIC MOTOR

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

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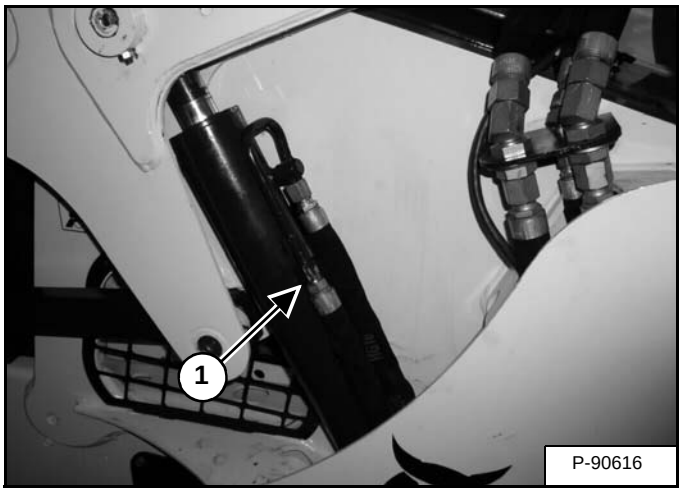
CYLINDER (LIFT)

Testing

Figure 20-20-1



Lower the lift arms. Stop the engine. Raise the seat bar.

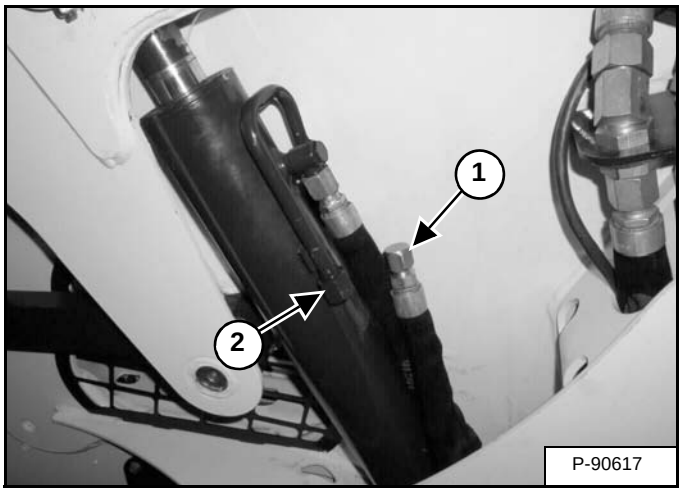
⚠ WARNING

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

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

Figure 20-20-2



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

Engage the parking brake. Lower the seat bar. Start the engine and press the PTOL button.

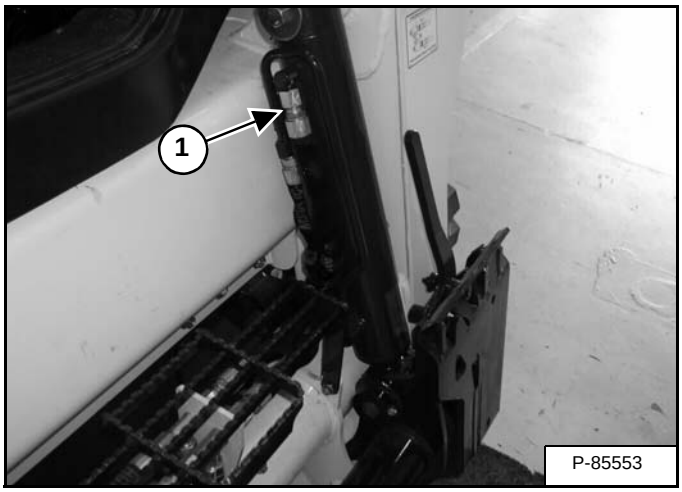
Operate the controls that lower the lift arms.

If there is any leakage from the fitting on the cylinder (Item 2) **[Figure 20-20-2]**, remove the lift cylinder for repair. Repeat the procedure to check the other lift cylinder.

CYLINDER (TILT)

Testing

Figure 20-21-1



Remove the attachment. Roll the Bob-Tach fully back. Stop the engine. Raise the seat bar.

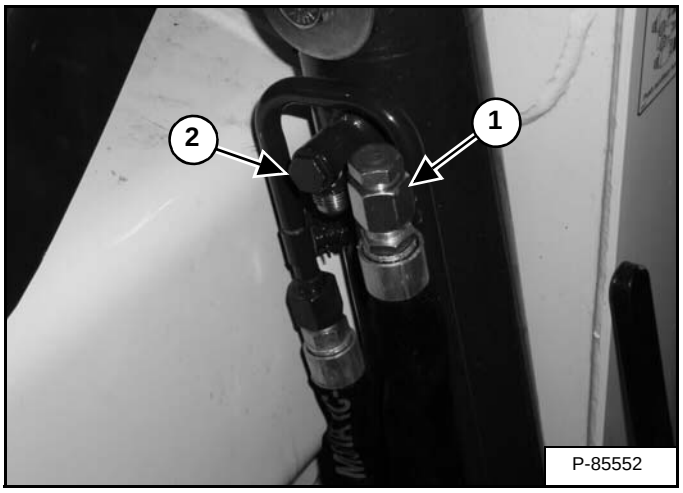
⚠ WARNING

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

Disconnect the hose (Item 1) **[Figure 20-21-1]** which goes to the base end of the tilt cylinder.

Figure 20-21-2



Install a cap (Item 1) **[Figure 20-21-2]** in the hydraulic hose and tighten.

Engage the parking brake. Lower the seat bar. Start the engine and press the PTOL button.

Operate the controls that rolls the Bob-Tach forward.

If there is any leakage from the fitting on the cylinder (Item 2) **[Figure 20-21-2]**. Remove the lift cylinder for repair.

Repeat procedure to check the other tilt cylinder.

CYLINDER (BOB-TACH)

Testing

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

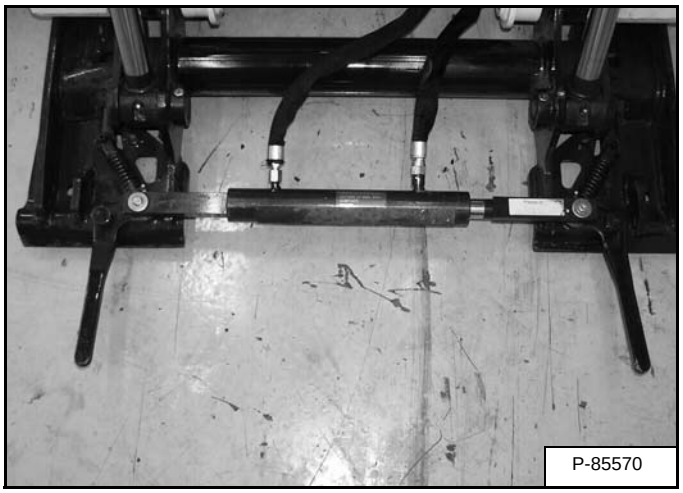
WARNING

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

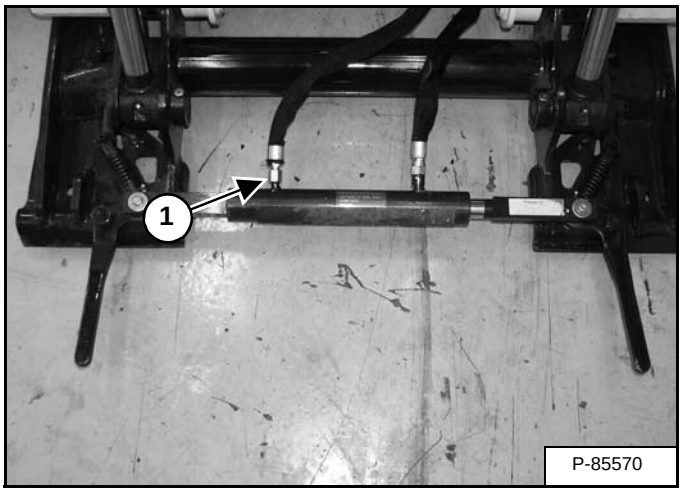
Figure 20-22-1



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

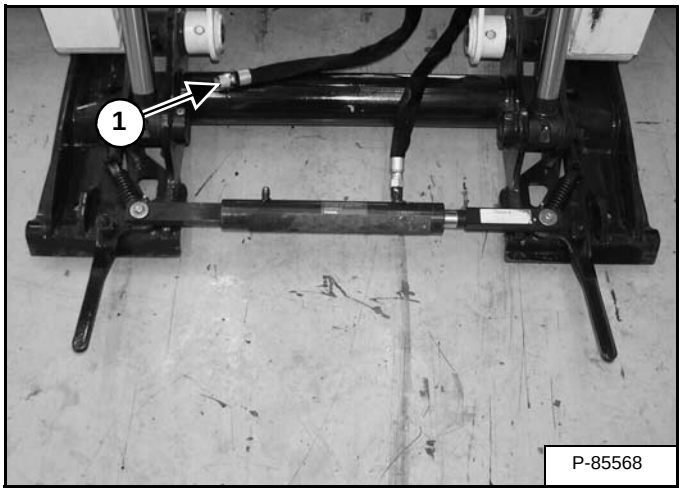
Push and hold BOB-TACH “WEDGES UP” switch until levers are in the unlocked position (Wedges fully raised).

Figure 20-22-2



Disconnect the hose (Item 1) **[Figure 20-22-2]** from the power 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 cylinder for repair.

MAIN RELIEF VALVE (CONT'D)

Testing (Cont'd)

Figure 20-30-3

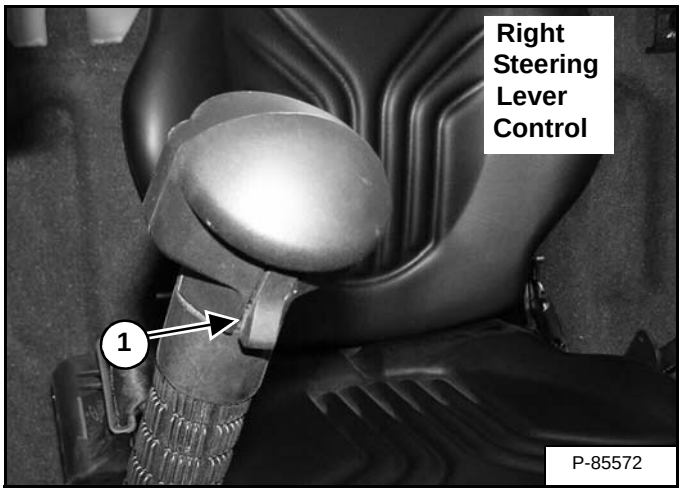
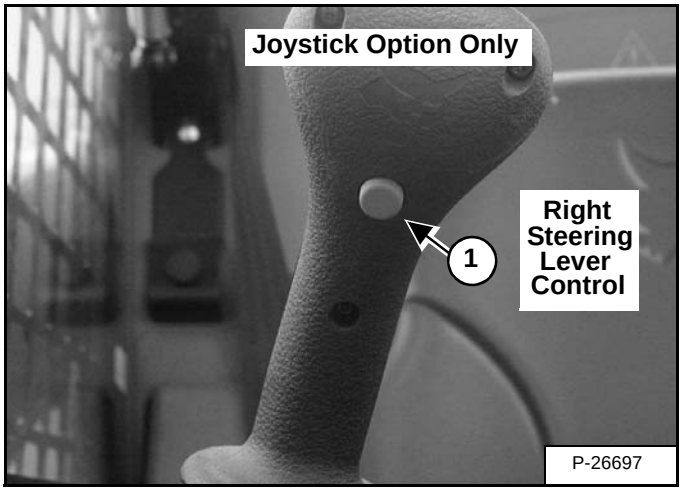


Figure 20-30-4



- Push the front switch (Item 1) **[Figure 20-30-3]** and **[Figure 20-30-4]** to give the **front** quick couplers a constant flow of fluid.

- To release from continuous operation, press the front switch (Item 1) **[Figure 20-30-3]** and **[Figure 20-30-4]** a second time.

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

Refer to (See Hydraulic System on Page SPEC-10-4.) for both flow and pressure specifications of the hydraulic system.

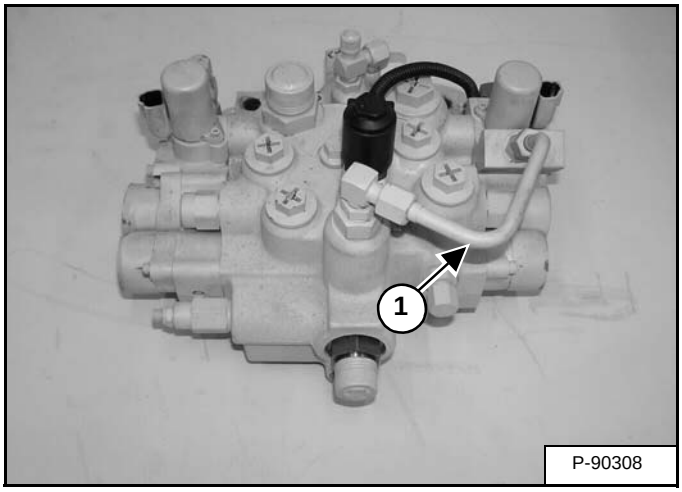
Check the free flow specification.

With the engine at high idle and hydraulic oil at 60°C (140°F) turn the restrictor control on the tester until the flow through the tester drops to zero. Check the relief pressure.

If the relief pressure is not correct, stop the engine and adjust the main relief valve.

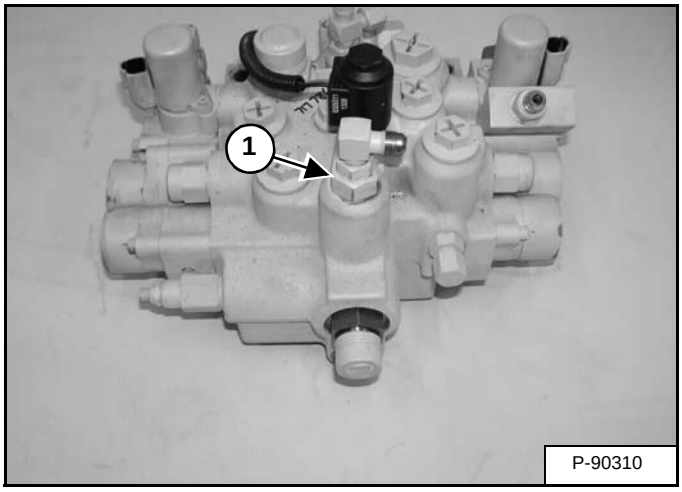
Lift Load Check Valve Removal And Installation

Figure 20-40-1



Remove the charge tubeline (Item 1) **[Figure 20-40-1]** from the BICS valve fitting on the top of the lift load check valve.

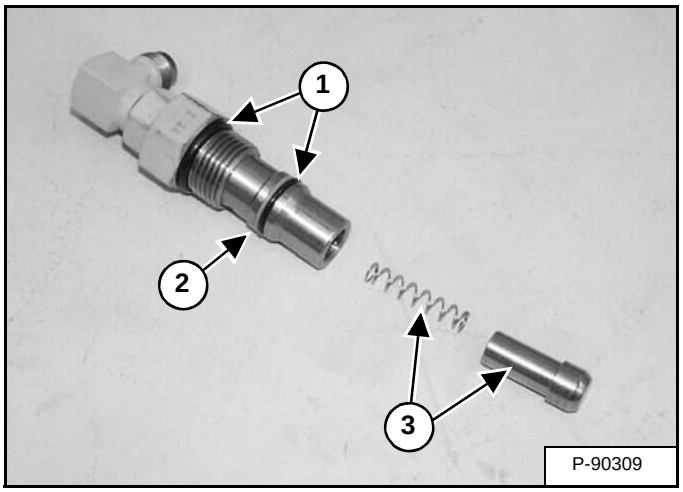
Figure 20-40-2



Remove the lift load check valve (Item 1) **[Figure 20-40-2]** and fitting from the top of the control valve.

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

Figure 20-40-3

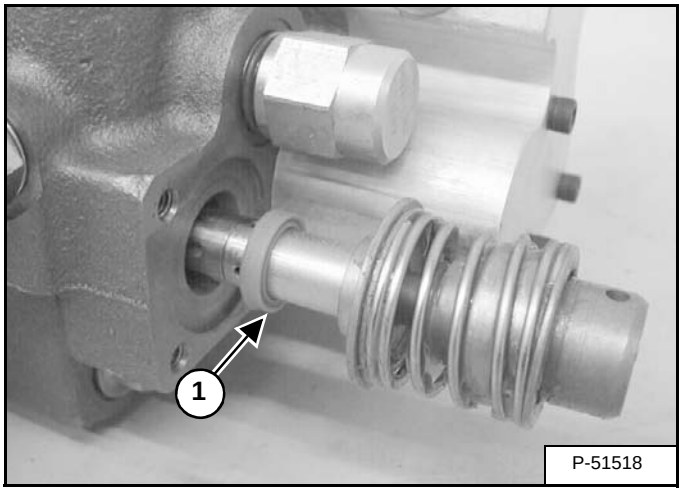


Remove and install new O-rings (Item 1) and back-up ring (Item 2) **[Figure 20-40-3]**.

Check the free movement load check valve and spring (Item 3) **[Figure 20-40-3]**.

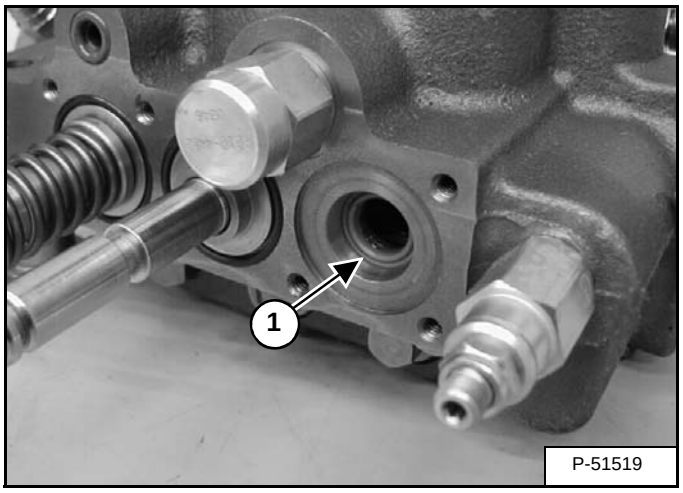
Lift Spool And Detent Removal And Installation (Cont'd)

Figure 20-40-35



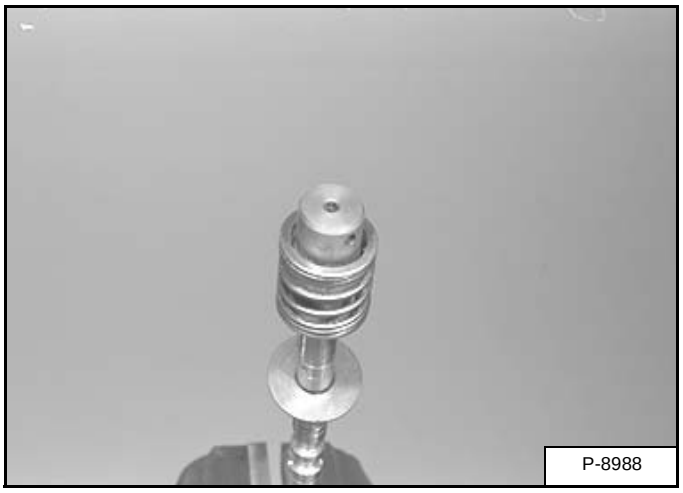
Remove the lift spool assembly and seal (Item 1) **[Figure 20-40-35]** from the control valve.

Figure 20-40-36



Remove the lift spool seal (Item 1) **[Figure 20-40-36]** from the linkage end of the valve.

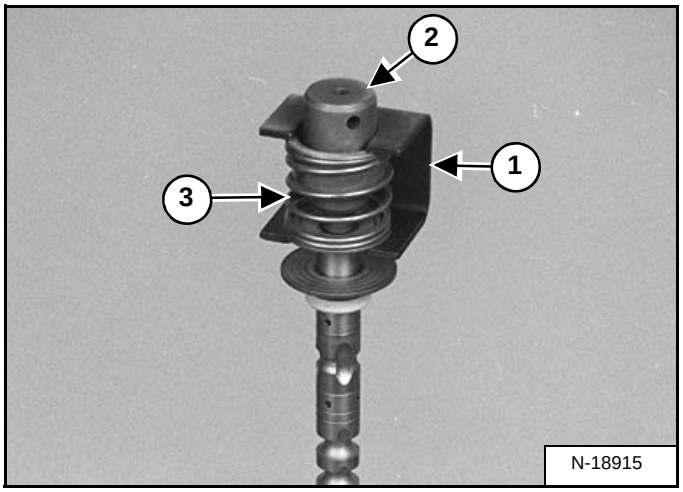
Figure 20-40-37



Clamp the linkage end of the spool in a vise **[Figure 20-40-37]**.

NOTE: Protect spool before clamping in vise.

Figure 20-40-38

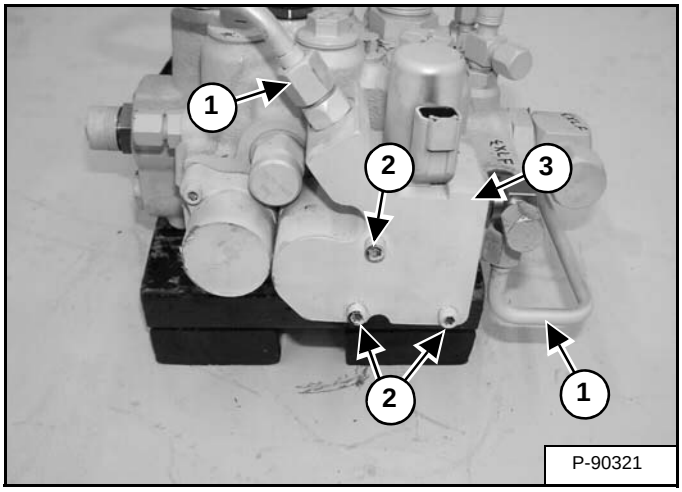


Install the spring tool (Item 1) **[Figure 20-40-38]** over the centering spring.

NOTE: Be careful when removing the detent adapter (Item 2) [Figure 20-40-38] from the centering spring, as it is under spring pressure.

Auxiliary Spool Removal And Installation

Figure 20-40-74



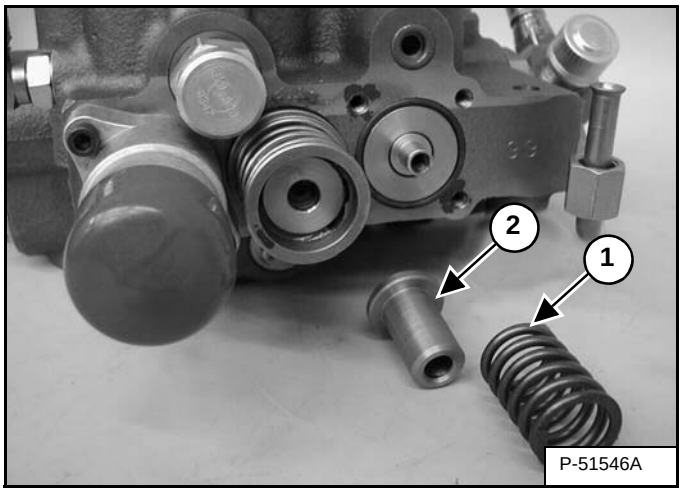
Remove the two tubelines (Item 1) **[Figure 20-40-74]** from the spool centering block.

Remove the three screws (Item 2) **[Figure 20-40-74]** from the spool centering block.

Installation: Tighten the bolt to 10,2 - 11,3 N•m (90 - 100 in-lb) torque.

Remove the spool centering block (Item 3) **[Figure 20-40-74]** from the control valve.

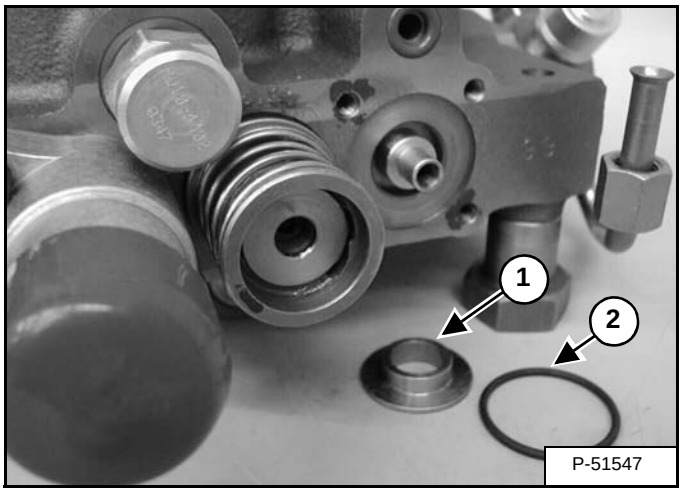
Figure 20-40-75



Remove the spring (Item 1) and center spring retainer (Item 2) **[Figure 20-40-75]** from the auxiliary spool.

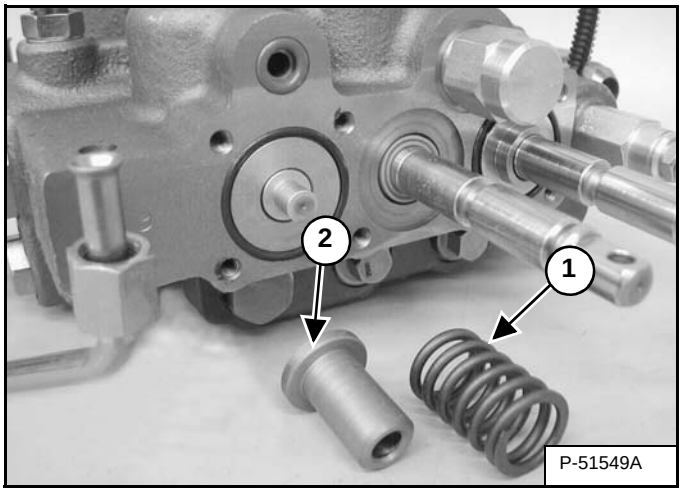
NOTE: If the centering spring retainer (Item 2) [Figure 20-40-75] must be replaced, replace the retainer on the opposite end also.

Figure 20-40-76



Remove the spacer (Item 1) and O-ring (Item 2) **[Figure 20-40-76]** from the auxiliary spool.

Figure 20-40-77

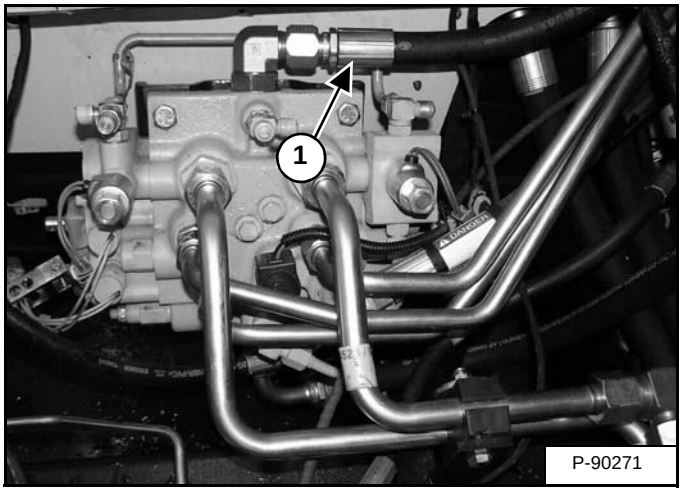


Remove the spring (Item 1) and center spring retainer (Item 2) **[Figure 20-40-77]** from the auxiliary spool.

NOTE: If the centering spring retainer (Item 2) [Figure 20-40-77] must be replaced, replace the retainer on the opposite end also.

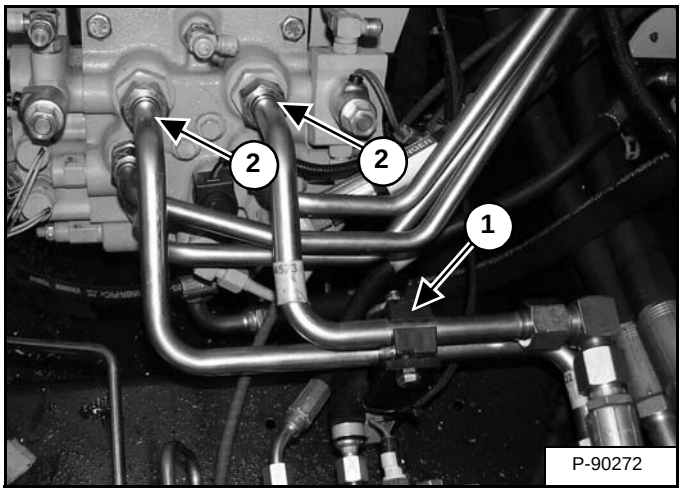
Removal And Installation (Cont'd)

Figure 20-41-5



Disconnect the hose (Item 1) **[Figure 20-41-5]** that routes from the top of the control valve to the hydraulic filter.

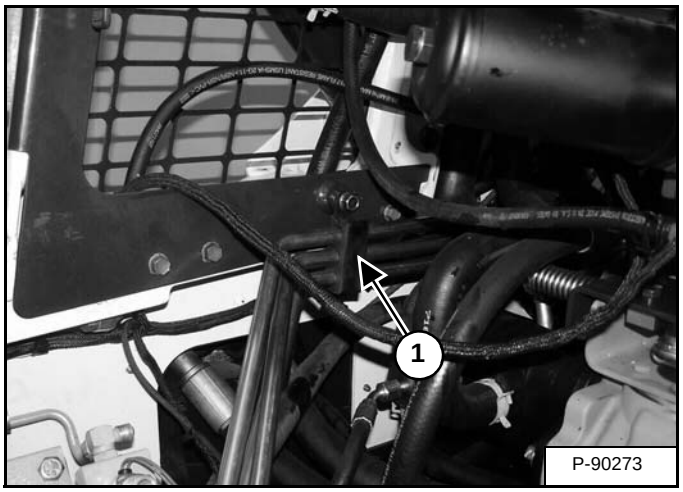
Figure 20-41-6



Remove the tubeline clamp (Item 1) **[Figure 20-41-6]**.

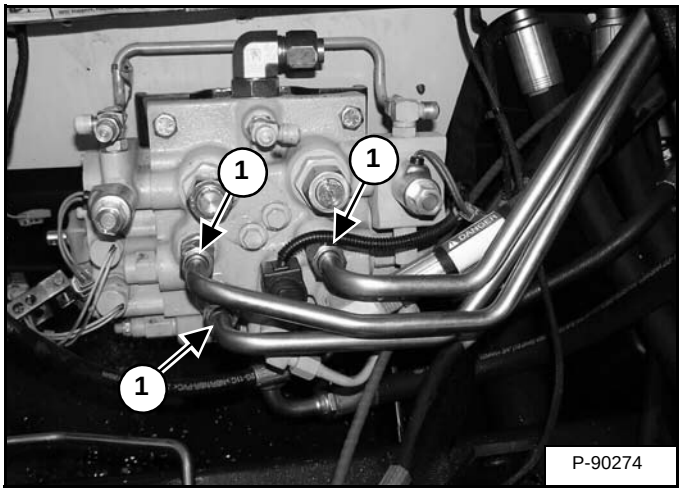
Disconnect the two tubelines (Item 2) **[Figure 20-41-6]** that route from the control valve to the front auxiliary hydraulics.

Figure 20-41-7



Remove the tubeline clamp (Item 1) **[Figure 20-41-7]**.

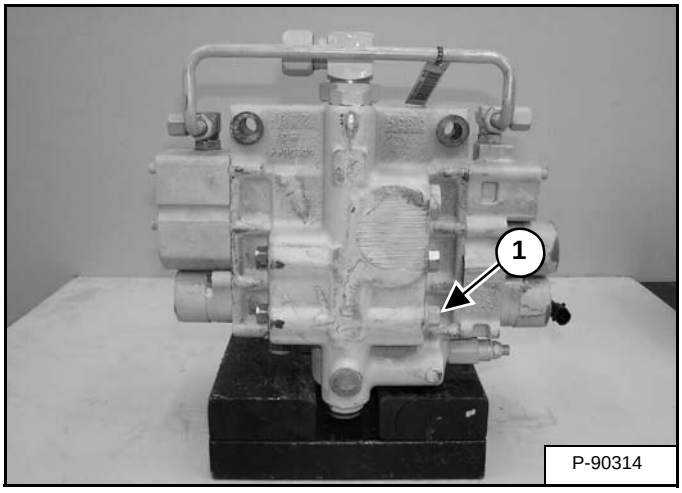
Figure 20-41-8



Disconnect the three tubelines (Item 1) **[Figure 20-41-8]** that route from the control valve to the junction block at the rear of the loader.

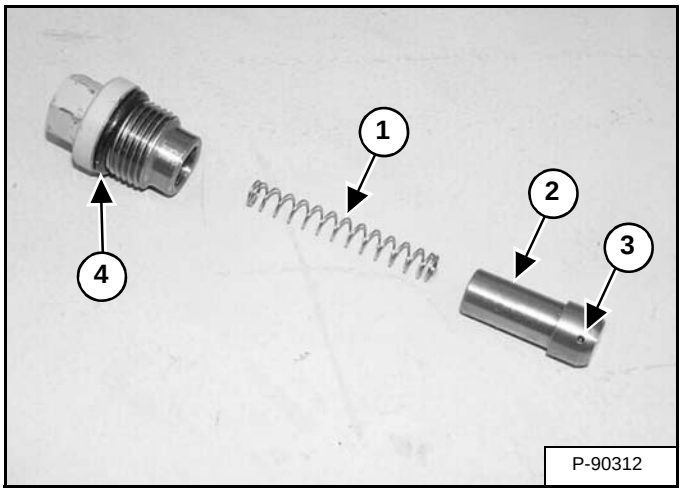
Anti-Cavitation Valve Removal And Installation (Lift, Rod End)

Figure 20-41-33



At the back side of the control valve, remove the lift section anti-cavitation valve (Item 1) **[Figure 20-41-33]**.

Figure 20-41-34



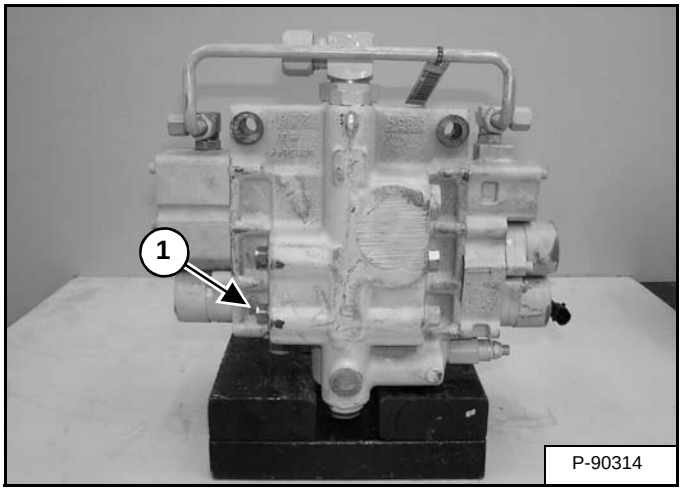
Remove the spring (Item 1) and poppet (Item 2) **[Figure 20-41-34]**.

Inspect the orifice (Item 3) **[Figure 20-41-34]** in the poppet to be sure it is not plugged.

Installation: Install a new O-ring (Item 4) **[Figure 20-41-34]** on the plug and lightly lubricate with oil before installing. Tighten the plug to 52 - 61 N•m (38 - 45 ft-lb) torque.

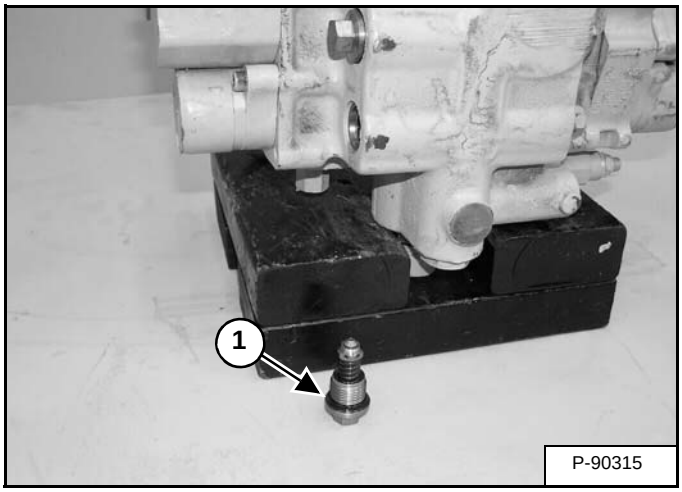
Port Relief / Anti-Cavitation Valve Removal And Installation (Lift, Base End)

Figure 20-41-35



Loosen the lift circuit port relief / anti cavitation valve (Item 1) **[Figure 20-41-35]**.

Figure 20-41-36

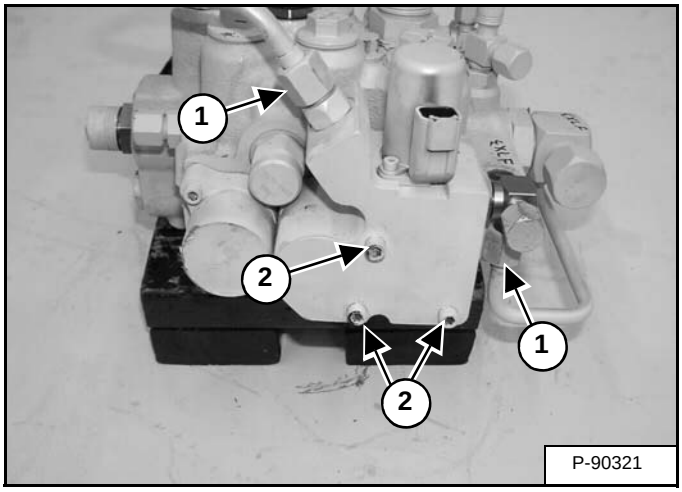


Replace the O-ring (Item 1) **[Figure 20-41-36]** before installation.

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

Auxiliary Spool Removal And Installation

Figure 20-41-73



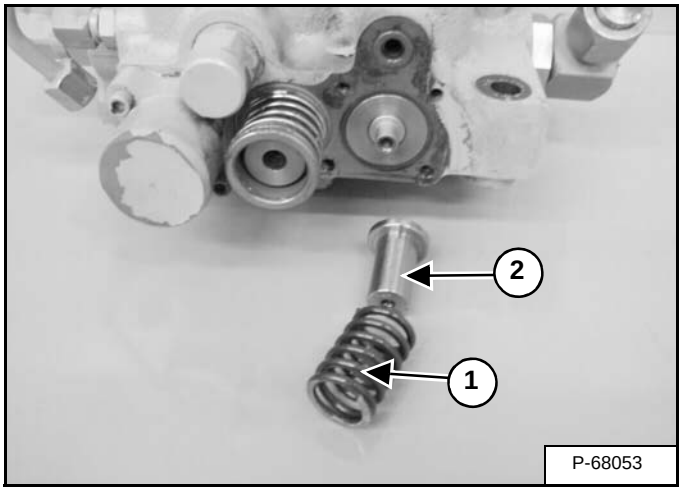
Disconnect the two tubelines (Item 1) **[Figure 20-41-73]** from the spool centering block.

Remove the three screws (Item 2) **[Figure 20-41-73]** from the spool centering block.

Installation: Tighten the bolts to 10,2 - 11,3 N•m (90 - 100 in-lb) torque.

Remove the spool centering block from the control valve.

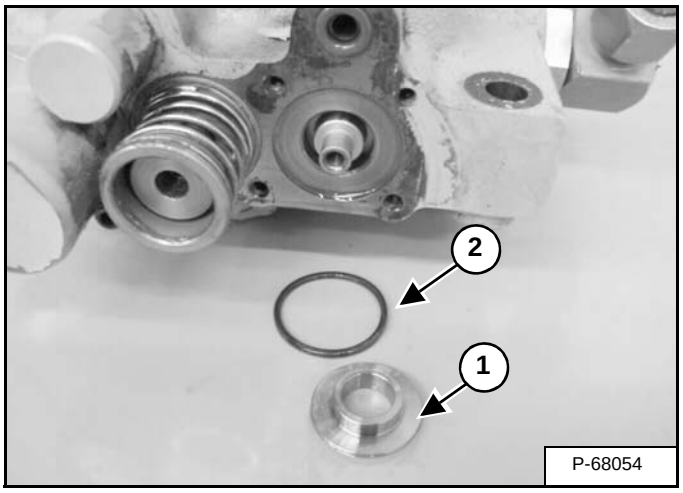
Figure 20-41-74



Remove the spring (Item 1) and center spring retainer (Item 2) **[Figure 20-41-74]** from the auxiliary spool.

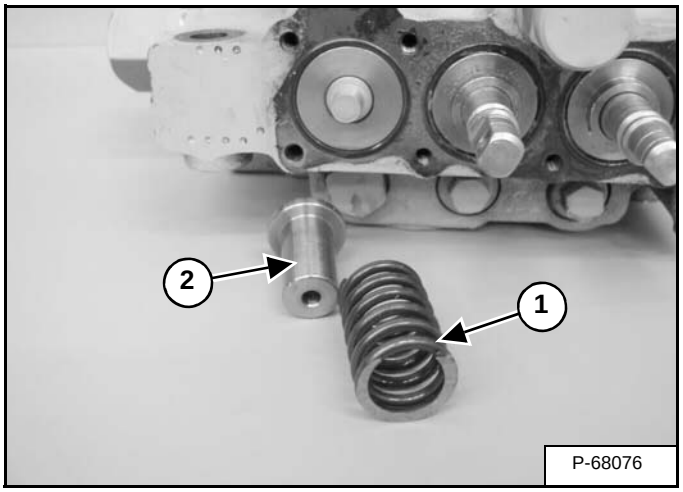
NOTE: If the centering spring retainer (Item 2) [Figure 20-41-74] must be replaced, replace the retainer on the opposite end also.

Figure 20-41-75



Remove the spacer (Item 1) and O-ring (Item 2) **[Figure 20-41-75]** from the auxiliary spool.

Figure 20-41-76



Remove the spring (Item 1) and center spring retainer (Item 2) **[Figure 20-41-76]** from the auxiliary spool.

NOTE: If the centering spring retainer (Item 2) [Figure 20-41-76] must be replaced, replace the retainer on the opposite end also.

HYDRAULIC PUMP

Description

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

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

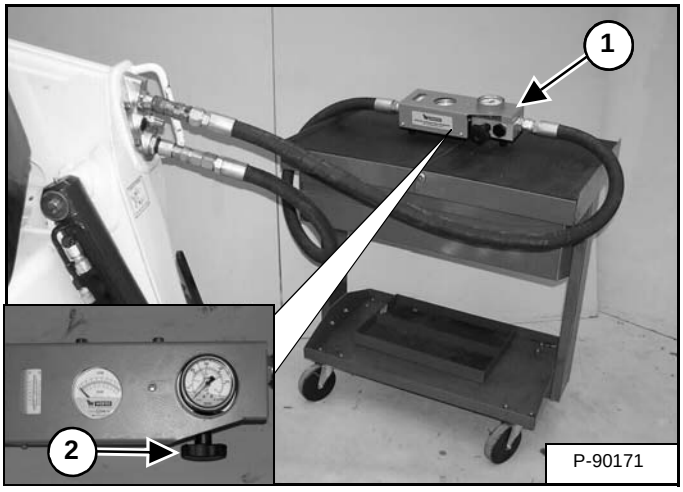
A seal kit is available to service the hydraulic pump. If any of the main components of the pump are damaged, the entire pump must be replaced.

Pump Test At Quick Couplers

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

TWX-RFIK200-S-6 204,4 L/min (54 U.S. gpm) Flow Meter
MEL10006 - Fitting Kit

Figure 20-60-1



NOTE: When testing the hydraulic flow of a machine, hoses must be at least 19,05 mm (3/4 inch) 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 one operator in the cab and one operator running the tester.

Start the engine and run at low idle rpm. Press the Auxiliary hydraulics button. Engage the front auxiliary with the trigger on the right handle or joystick. 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 6,9 MPa (68,9 bar) (1000 psi).

NOTE: DO NOT EXCEED 25,5 MPa (255,1 bar) (3700 psi).

Turn the restrictor control (Item 2) **[Figure 20-60-1]** on the tester counterclockwise to obtain free flow, the flow should be approximately 87,1 - 90,8 L/min (23 - 24 U.S. gpm). Start turning the restrictor clockwise, causing more restriction on the flow. The U.S. gpm should drop off slightly until the pressure reaches approximately 21,4 MPa (213,7 bar) (3100 psi). At approximately 21,4 MPa (213,7 bar) (3100 psi) the flow should start decreasing rapidly until the pressure reaches 23,8 - 24,1 MPa (237,9 - 241,3 bar) (3450 - 3500 psi). At 23,8 - 24,1 MPa (237,9 - 241,3 bar) (3450 - 3500 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 auxiliary hydraulics off.

If flow and pressure specifications 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-10-4.) for system relief pressure and full rpm.

HYDRAULIC PUMP (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.

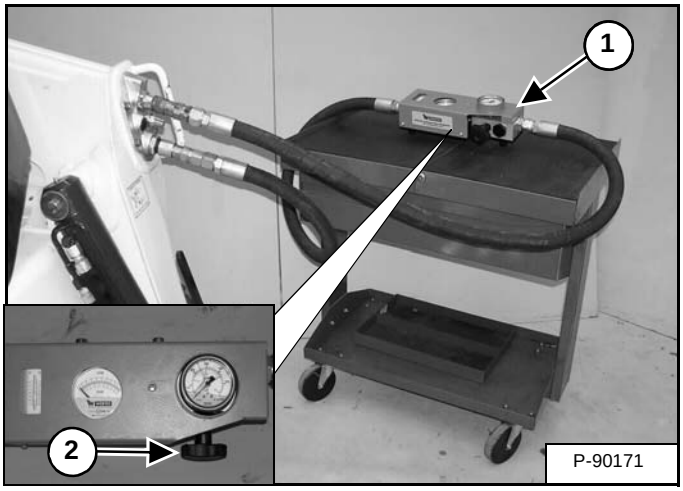
A seal kit is available to service the hydraulic pump. If any of the main components of the pump are damaged, the entire pump must be replaced.

Pump Test At Quick Couplers

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

TWX-RFIK200-S-6 204,4 L/min (54 U.S. gpm) Flow Meter
MEL10006 - Fitting Kit

Figure 20-61-1



NOTE: When testing the hydraulic flow of a machine, hoses must be at least 19,05 mm (3/4 inch) 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 20-61-1]** onto the front auxiliary quick couplers.

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

Start the engine and run at low idle rpm. Press the Auxiliary hydraulics button. Engage the front auxiliary with the trigger on the right handle or joystick. 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 6,9 MPa (68,9 bar) (1000 psi).

NOTE: DO NOT EXCEED 25,5 MPa (255,1 bar) (3700 psi).

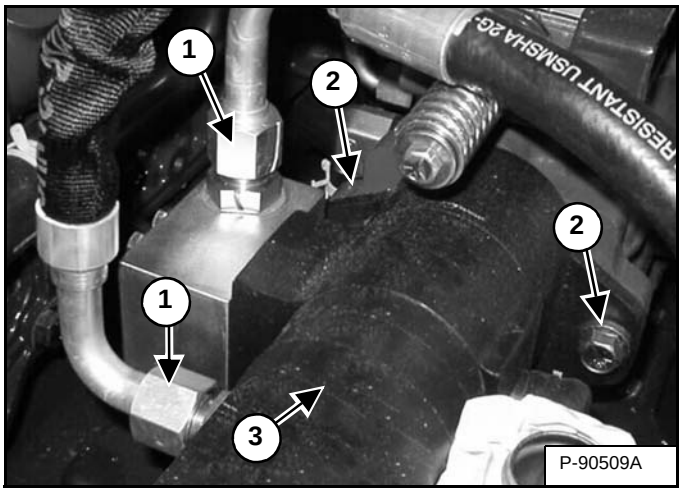
Turn the restrictor control (Item 2) **[Figure 20-61-1]** on the tester counterclockwise to obtain free flow, the flow should be approximately 87,1 - 90,8 L/min (23 - 24 U.S. gpm). Start turning the restrictor clockwise, causing more restriction on the flow. The U.S. gpm should drop off slightly until the pressure reaches approximately 21,4 MPa (213,7 bar) (3100 psi). At approximately 21,4 MPa (213,7 bar) (3100 psi) the flow should start decreasing rapidly until the pressure reaches 23,8 - 24,1 MPa (237,9 - 241,3 bar) (3450 - 3500 psi). At 23,8 - 24,1 MPa (237,9 - 241,3 bar) (3450 - 3500 psi) the flow should be at 0 L/min (0 U.S. gpm). Turn the restrictor (Item 2) **[Figure 20-61-1]** counterclockwise to free flow. Shut the auxiliary hydraulics off.

If flow and pressure specifications are not obtained, go to Direct Pump Testing. (See Direct Pump Test (Standard Section) on Page 20-61-2.)

*Refer to (See Hydraulic System on Page SPEC-10-4.) for system relief pressure and full rpm.

Removal And Installation (Cont'd)

Figure 20-61-21



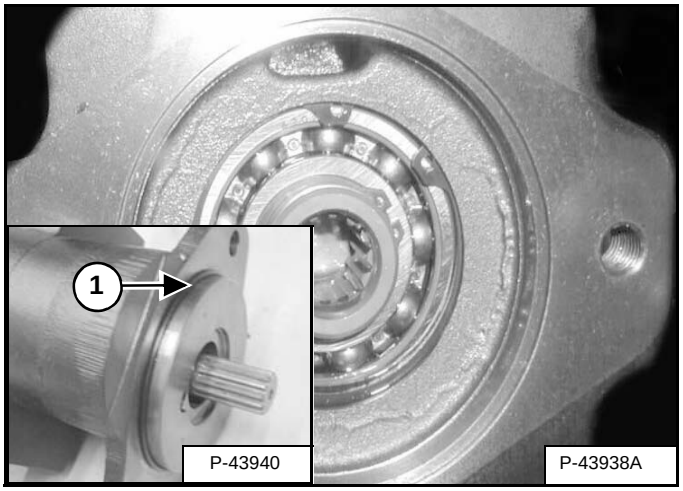
Disconnect and cap the outlet hoses (Item 1) **[Figure 20-61-21]** from the hydraulic pump.

Remove the two mounting bolts (Item 2) **[Figure 20-61-21]** from the hydraulic pump.

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

Remove the hydraulic pump (Item 3) **[Figure 20-61-21]** from the loader.

Figure 20-61-22



Replace the O-ring (Item 1) **[Figure 20-61-22]** on the hydraulic pump.

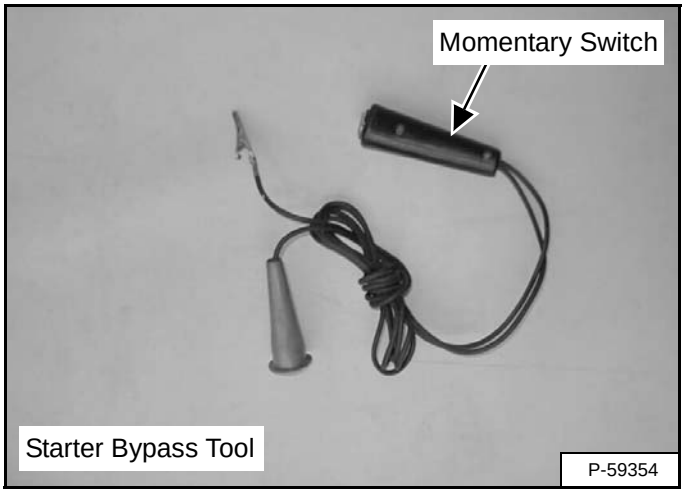
Reverse the removal procedure to install the hydraulic pump.

Hydraulic Pump Startup

NOTE: This procedure is necessary to prevent a dry startup of the hydraulic pump.

Fill the system with hydraulic fluid. (See Removing And Replacing Hydraulic Fluid on Page 10-120-2.)

Figure 20-61-23



To crank the engine without starting, the machine key switch can be bypassed. Obtain a starter bypass tool from a local source which can be used as a universal connection to remotely crank the engine without starting.

The starter bypass tool consists of two wires, each with a clamp. The momentary switch, when depressed, will allow current to pass through the circuit.

Connect the starter bypass tool to the starter solenoid battery terminal and S terminal. Crank the engine for 15 seconds, then stop for at least 30 seconds. Again, crank the engine for 15 seconds. Remove the starter bypass tool.

Start the loader from the operators cab and run the engine at low idle for 1 - 2 minutes without operating the hydraulics.

After operating the engine at low idle, remove the lift arm support device and fully raise and lower the loader lift arms several times or until air is purged from the system. ***Avoid running over the relief valve setting at the end of cylinder stroke.***

With the loader parked on a level surface and lift arms down, check and fill the hydraulic reservoir as required. Check for hydraulic leaks.

BUCKET POSITION VALVE

Description

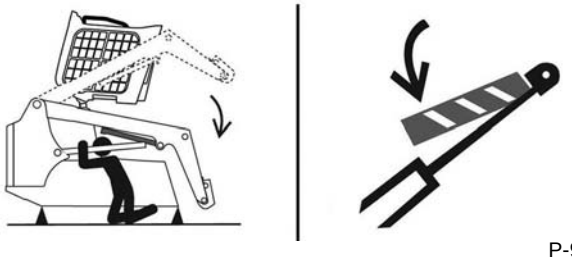
The Bucket Position Valve is an option that allows the operator to hold the attachment at the same angle from the ground to maximum lift height without using the tilt function.

The bucket position valve is mounted to the inside lower right rear side of the loader frame.

See Hydraulic Schematic for more circuit information.

Solenoid Removal And Installation

⚠ DANGER



P-90328

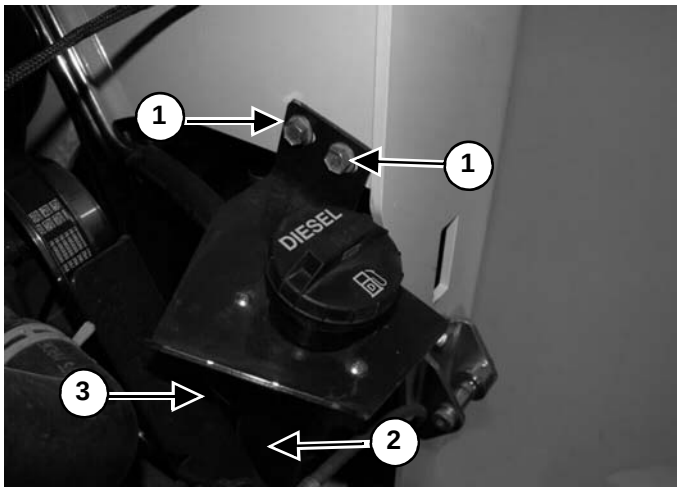
AVOID DEATH

- **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

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

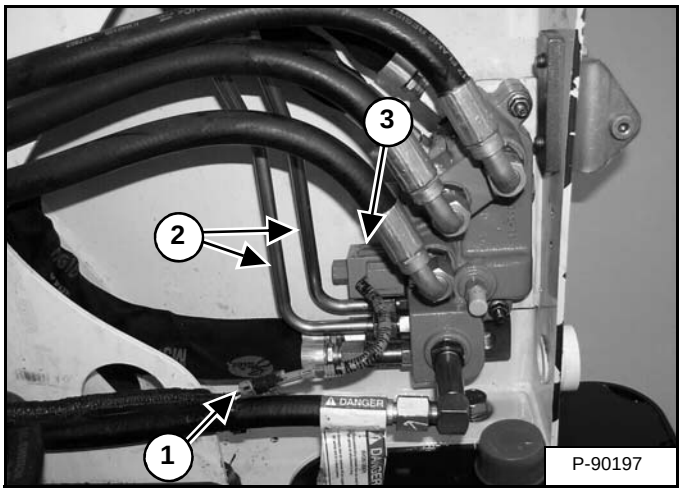
Figure 20-100-1



Remove the two bolts (Item 1), move the hose clamp (Item 2) to the middle of the hose, and the place the fuel inlet assembly (Item 3) **[Figure 20-100-1]** off to the side.

Cover the fuel tank inlet.

Figure 20-100-2



Disconnect the wire harness connector (Item 1) **[Figure 20-100-2]** from the bucket position shut-off solenoid.

Disconnect the cap the two tubelines (Item 2) **[Figure 20-100-2]**.

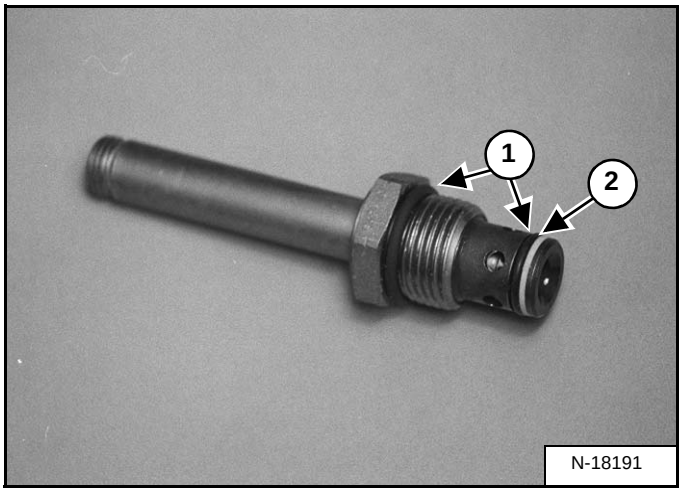
Remove the solenoid nut, coil, and stem (Item 3) from the bucket positioning valve **[Figure 20-100-2]**.

Installation: Put oil on O-rings and back-up washers and tighten the solenoid stem to 40,7 - 50,2 N•m (30 - 40 ft-lb) torque.

Installation: Tighten the solenoid nut to 8 N•m (6 ft-lb) torque. Overtightening may cause valve failure.

NOTE: The engine is shown removed for photo clarity.

Figure 20-100-3



Inspect the solenoid stem and replace the O-rings (Item 1) and the back-up washer (Item 2) **[Figure 20-100-3]**.

Disassembly And Assembly (Cont'd)

Figure 20-110-19

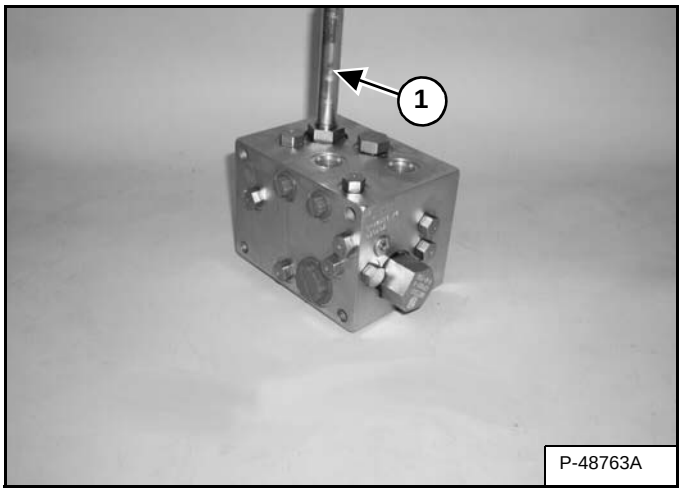
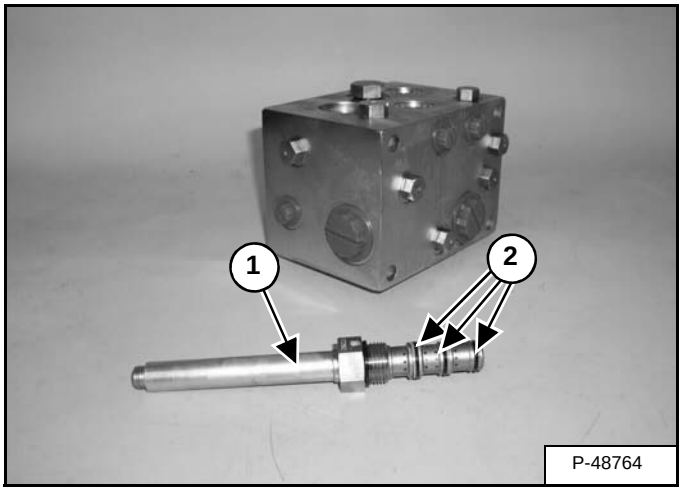


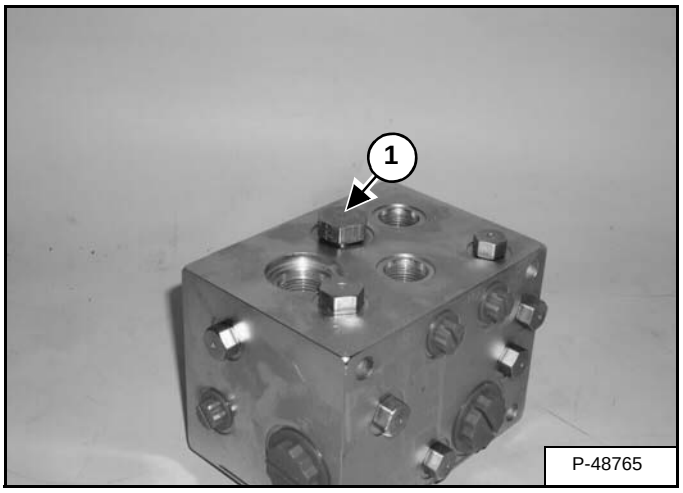
Figure 20-110-20



Remove the solenoid valve stem (Item 1) **[Figure 20-110-19]** and **[Figure 20-110-20]** and inspect the O-rings and back-up washers (Item 2) **[Figure 20-110-20]** for damage.

Assembly: Put oil on O-rings and back-up washers. Tighten to 41 - 47 N•m (30 - 35 ft-lb) torque.

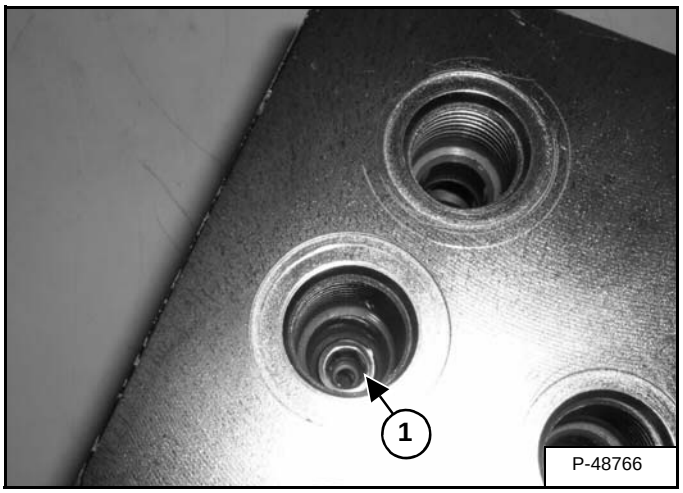
Figure 20-110-21



Remove the plug (Item 1) **[Figure 20-110-21]**.

Assembly: Tighten the plug to 51,5 N•m (38 ft-lb) torque.

Figure 20-110-22

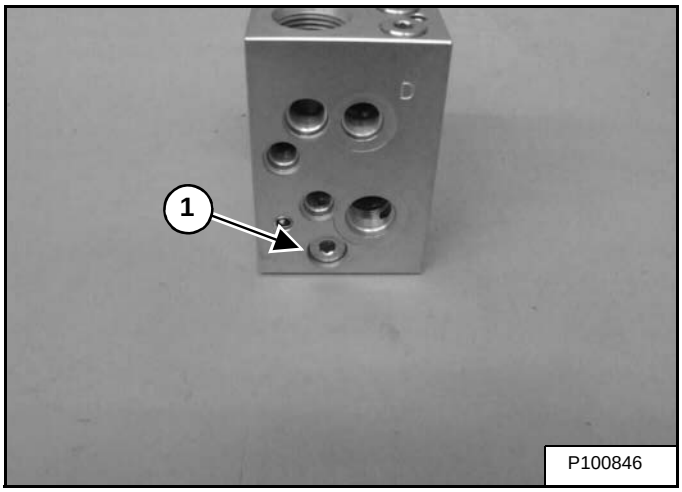


Remove and inspect the orifice (Item 1) **[Figure 20-110-22]** for dirt and debris.

Assembly: Tighten the orifice to 29,8 N•m (22 ft-lb) torque.

Disassembly And Assembly (Cont'd)

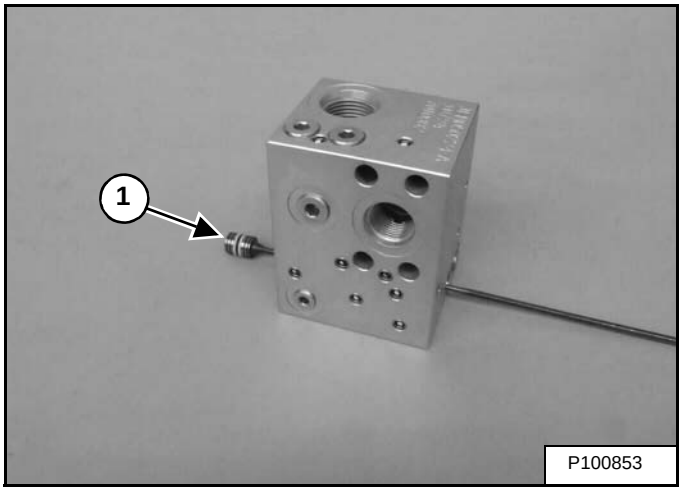
Figure 20-120-26



Remove the plug (Item 1) **[Figure 20-120-26]**, inspect the O-ring and replace as needed.

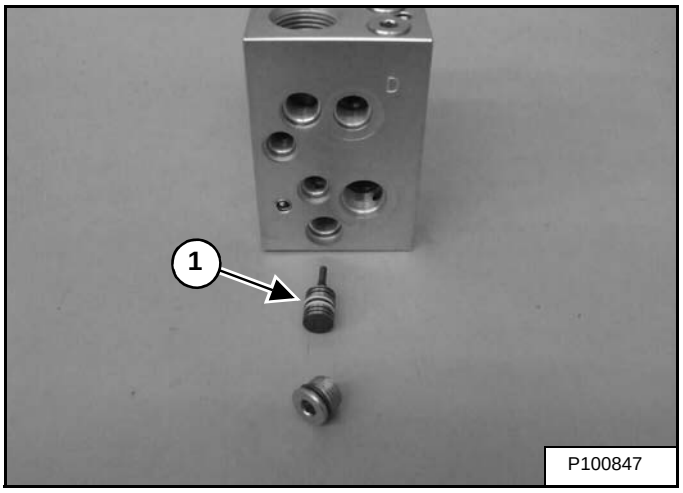
Installation: Tighten the plug (Item 1) **[Figure 20-120-26]** to 30 N•m (22 ft-lb) torque.

Figure 20-120-27



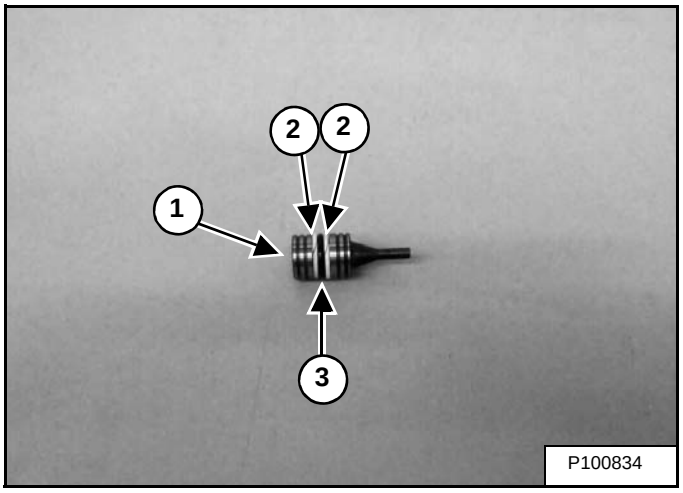
Using a small diameter tool remove the pilot piston (Item 1) **[Figure 20-120-27]**.

Figure 20-120-28



Remove pilot piston **[Figure 20-120-28]**.

Figure 20-120-29



Inspect the pilot piston (Item 1), the back-up washers (Item 2) and the O-ring (Item 3) **[Figure 20-120-29]** for damage and replace as needed.

HYDROSTATIC DRIVE MOTOR

Description

The hydrostatic motors are driven by high pressure from the hydrostatic pumps.

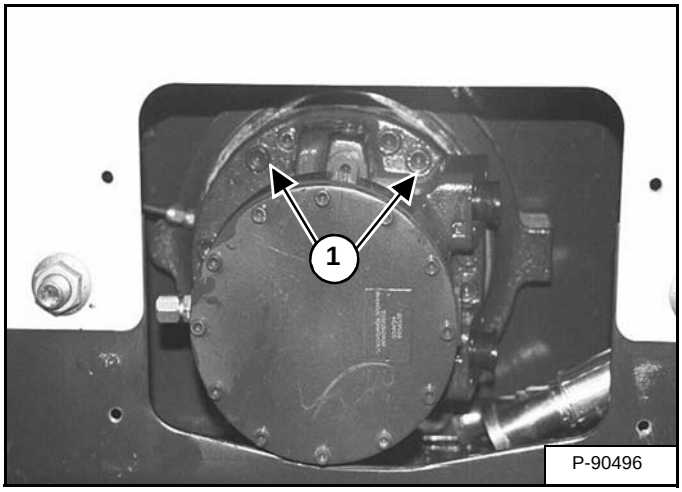
The hydrostatic motors do not have an internal brake.

Inside the endcap of the hydrostatic motor, there is a shuttle valve. The shuttle valve helps to keep the motor cool by mixing case drain oil with cooled low pressure oil from the charge circuit. The shuttle valve is shifted by the high pressure oil coming from the hydrostatic pumps. If the shuttle valve sticks, a delay or lack of drive may or may not be felt in the controls and / or an overheated hydrostatic motor will result.

There are two hydrostatic motors mounted to motor carriers. The motor carriers are mounted to the transmission chaincase which houses the drive chains.

Removal And Installation (Cont'd)

Figure 30-21-5

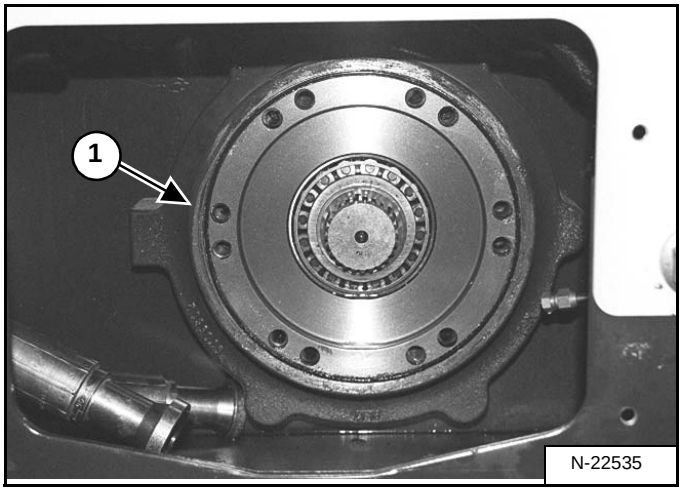


Remove the 10 (12 mm) mount bolts (Item 1) **[Figure 30-21-5]** from the motor.

NOTE: The two smaller diameter bolts (8 mm), hold the cam ring to the motor and do not have to be remove for motor removal.

Remove the motor from the loader.

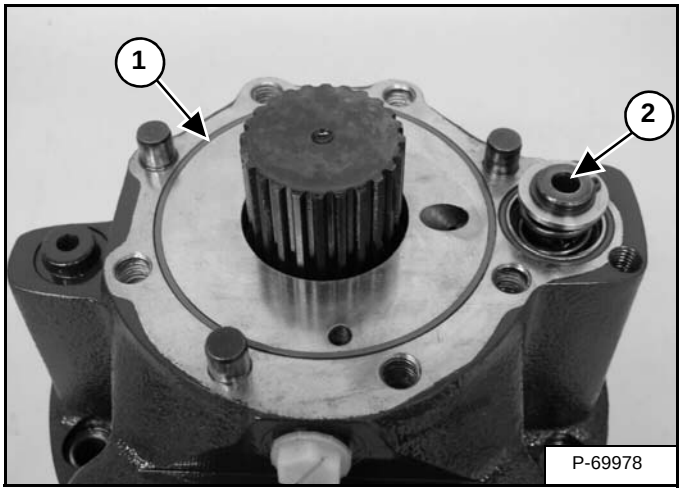
Figure 30-21-6



Installation: Replace the O-ring (Item 1) **[Figure 30-21-6]** and hold it in place with a light cover of lithium base grease. Tighten the 10 mounting bolts to 149 N•m (110 ft-lb) torque.

Assembly (Cont'd)

Figure 30-21-39

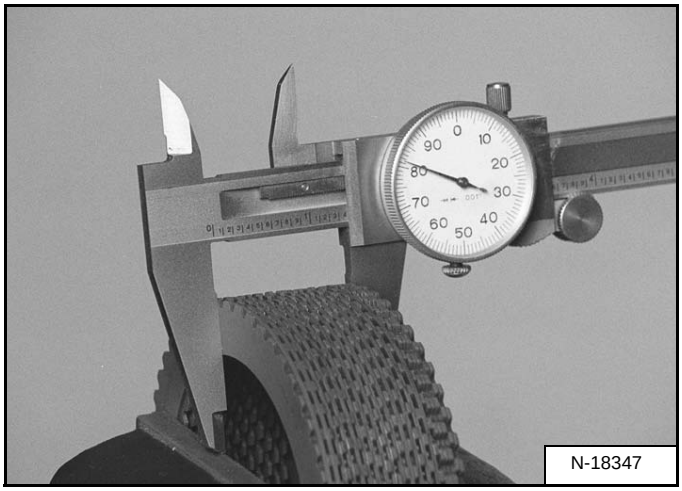


Install new o-rings (Item 1) **[Figure 30-21-39]** on the housing assembly and apply grease to the o-rings.

Install the two speed spool (Item 2) **[Figure 30-21-39]**.

Install the shaft into the distributor **[Figure 30-21-39]**.

Figure 30-21-40

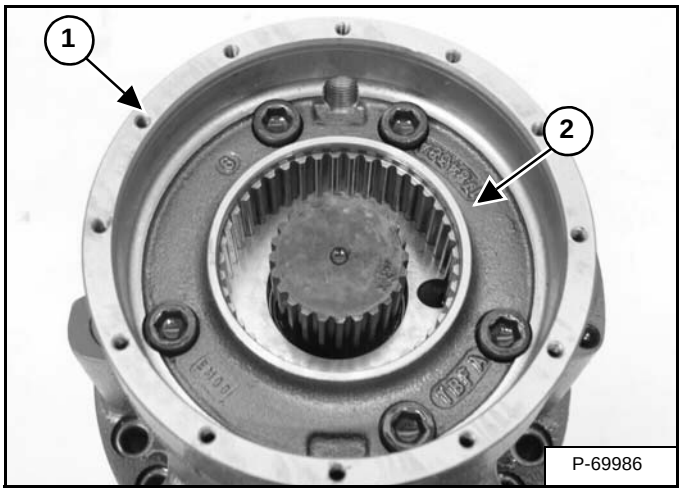


Clamp the disc pack in a vise and measure the height **[Figure 30-21-40]**. The height must be 31,1 mm (1.22 in).

The normal thickness of the individual brake disc is 1 mm (0.039 in).

If any individual disc's thickness is 0,95 mm (0.037 in) or less, replace the complete disc pack.

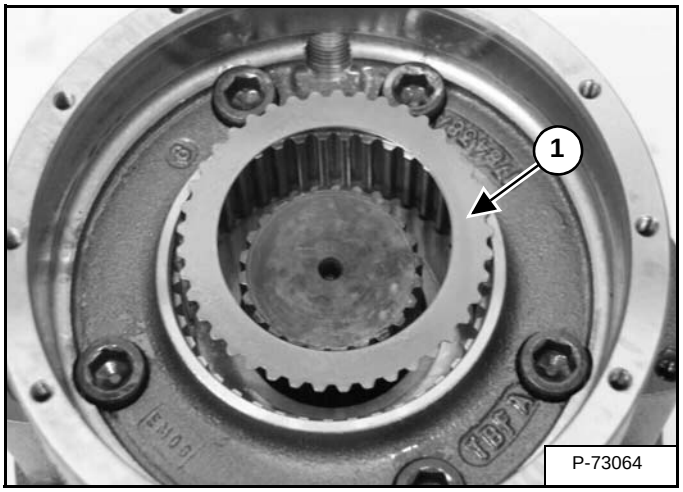
Figure 30-21-41



Install the brake housing (Item 1) **[Figure 30-21-41]** on the motor housing.

Apply liquid adhesive (Loctite® 243) to the five mounting bolts. Install the bolts (Item 2) **[Figure 30-21-41]** and tighten evenly to 117 - 122 N•m (86 - 90 ft-lb) torque.

Figure 30-21-42



If needed, install the shims first, then install the brake disc pack starting with an outer disc (Item 1) **[Figure 30-21-42]** and alternating with an inner disc, throughout the pack.

End the disc pack with an outer disc.

HYDROSTATIC MOTOR CARRIER (SJC)

Description

The hydrostatic motor carrier is the mating connection from the hydrostatic drive motor to the transmission chaincase.

The hydrostatic motor carrier contains a shaft that rotates on two tapered roller bearings. The shaft has two sprockets that turn the drive chains.

The hydrostatic motor carrier has a seal which isolates the chain case oil from the hydrostatic motor case drain oil.

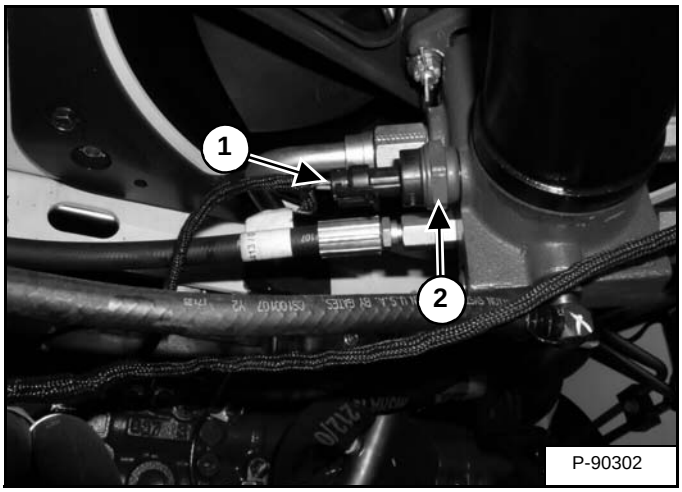
The hydrostatic motor carrier with (SJC) uses a speed sensor installed in the motor carrier housing. The speed sensor senses a disk that is fixed to the shaft in the motor carrier.

A brake disk is installed on each hydrostatic motor carrier. The brake disk is mounted to the shaft in the motor carrier (single speed loaders only).

The hydrostatic motor carriers are made to fit on both the right and left hand side of the loader.

Sender Removal And Installation

Figure 30-40-5



Disconnect the wire (Item 1) **[Figure 30-40-5]** from the sender.

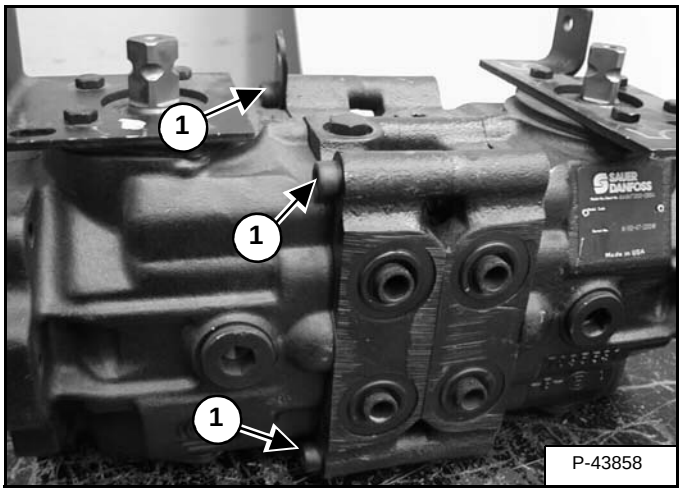
Remove the sender (Item 2) **[Figure 30-40-5]** from the motor.

Installation: Tighten the charge pressure sender to 10 - 10,9 N•m (7.4 - 8.1 ft-lb) torque.

NOTE: Inspect the O-ring on the sender before installation.

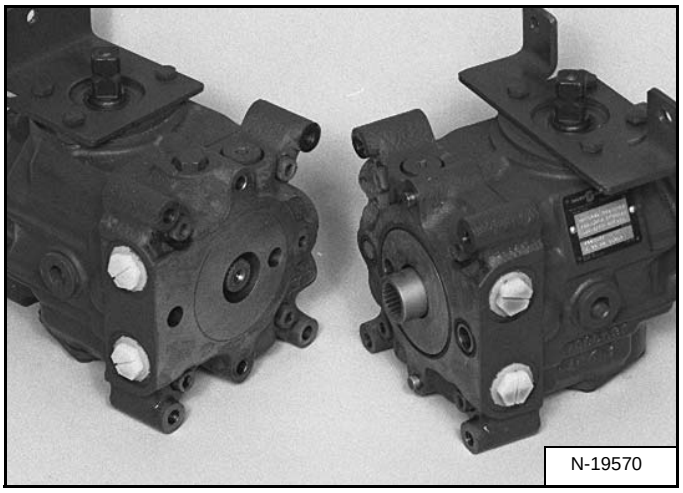
Disassembly

Figure 30-50-7



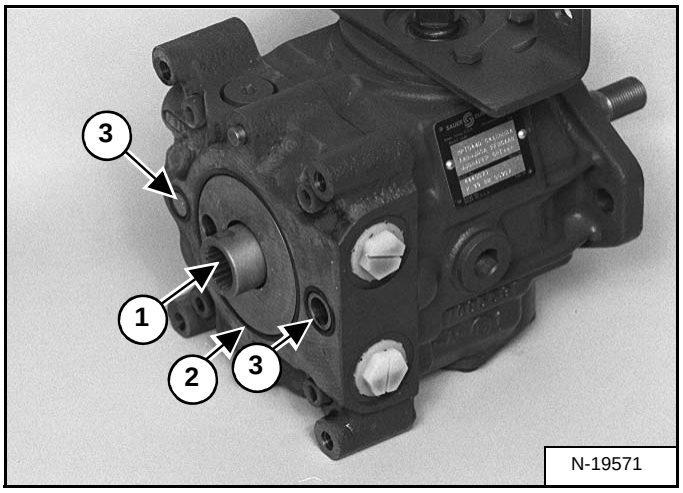
Remove the four mounting bolts (Item 1) **[Figure 30-50-7]**.

Figure 30-50-8



Separate the two hydrostatic pumps **[Figure 30-50-8]**.

Figure 30-50-9

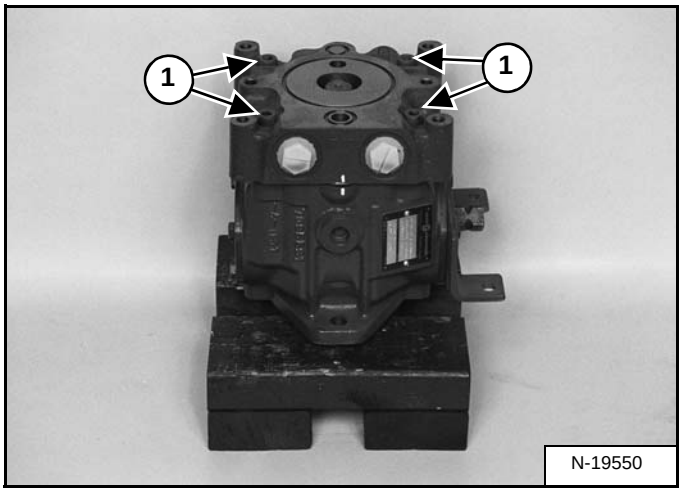


Remove the pump coupler (Item 1) **[Figure 30-50-9]**.

Remove the large O-ring (Item 2) **[Figure 30-50-9]**.

Remove the two small O-rings (Item 3) **[Figure 30-50-9]**.

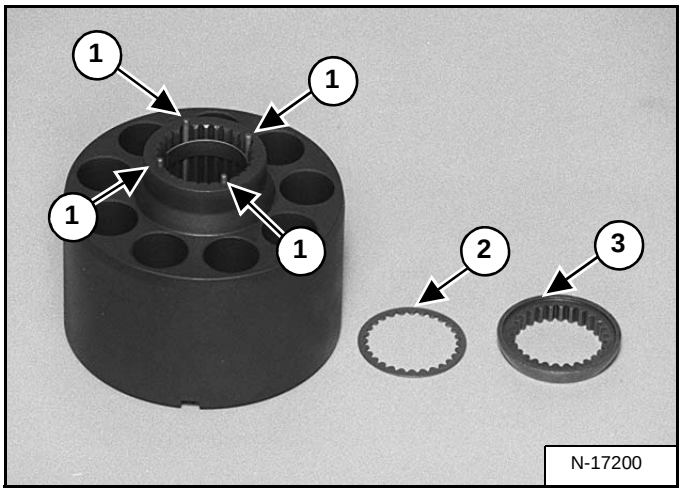
Figure 30-50-10



Remove the four bolts (Item 1) **[Figure 30-50-10]** from the pump housing end cap.

Assembly (Cont'd)

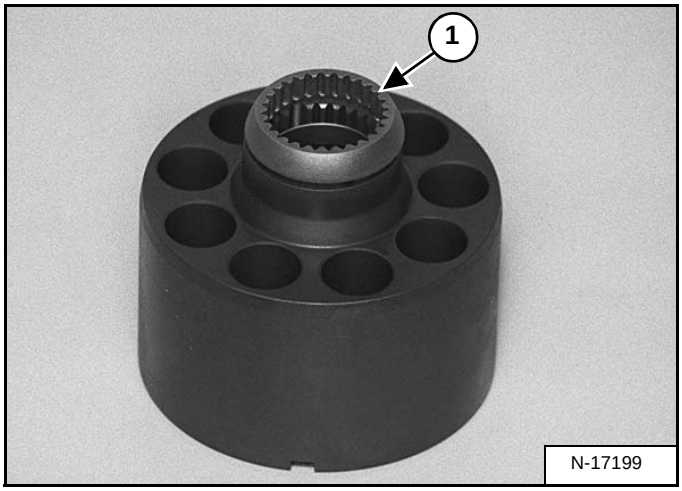
Figure 30-50-46



Install the four slipper pins (Item 1) **[Figure 30-50-46]** into the cylinder block.

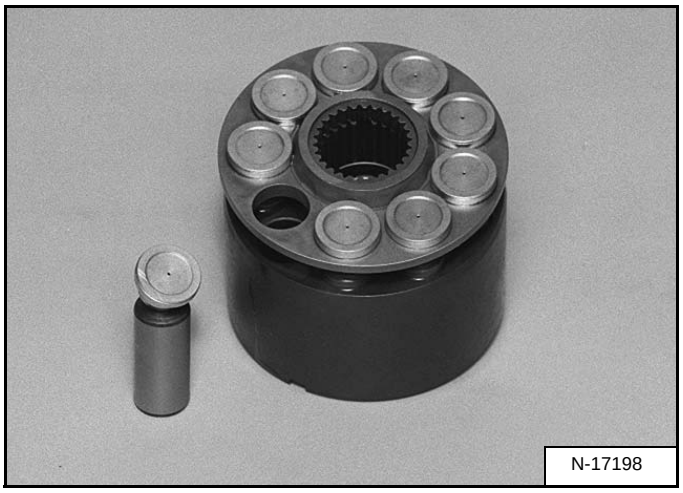
Apply a small amount of grease to the washer (Item 2) and install into the ball guide retainer (Item 3) **[Figure 30-50-46]**.

Figure 30-50-47



Install the ball guide retainer and washer (Item 1) **[Figure 30-50-47]** onto the slipper holddown pins.

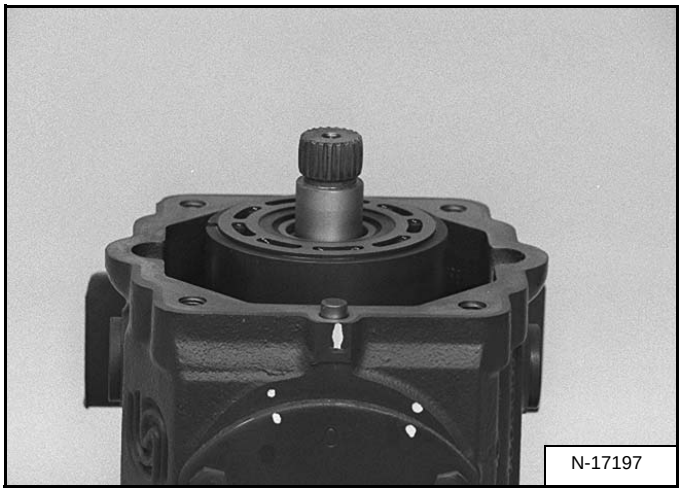
Figure 30-50-48



Assemble the piston assemblies into the slipper guide. Lubricate the pistons and cylinder block bores and insert the piston assemblies into the cylinder bores **[Figure 30-50-48]**.

Lay the pump housing on its side and install the cylinder block, piston assembly into the housing.

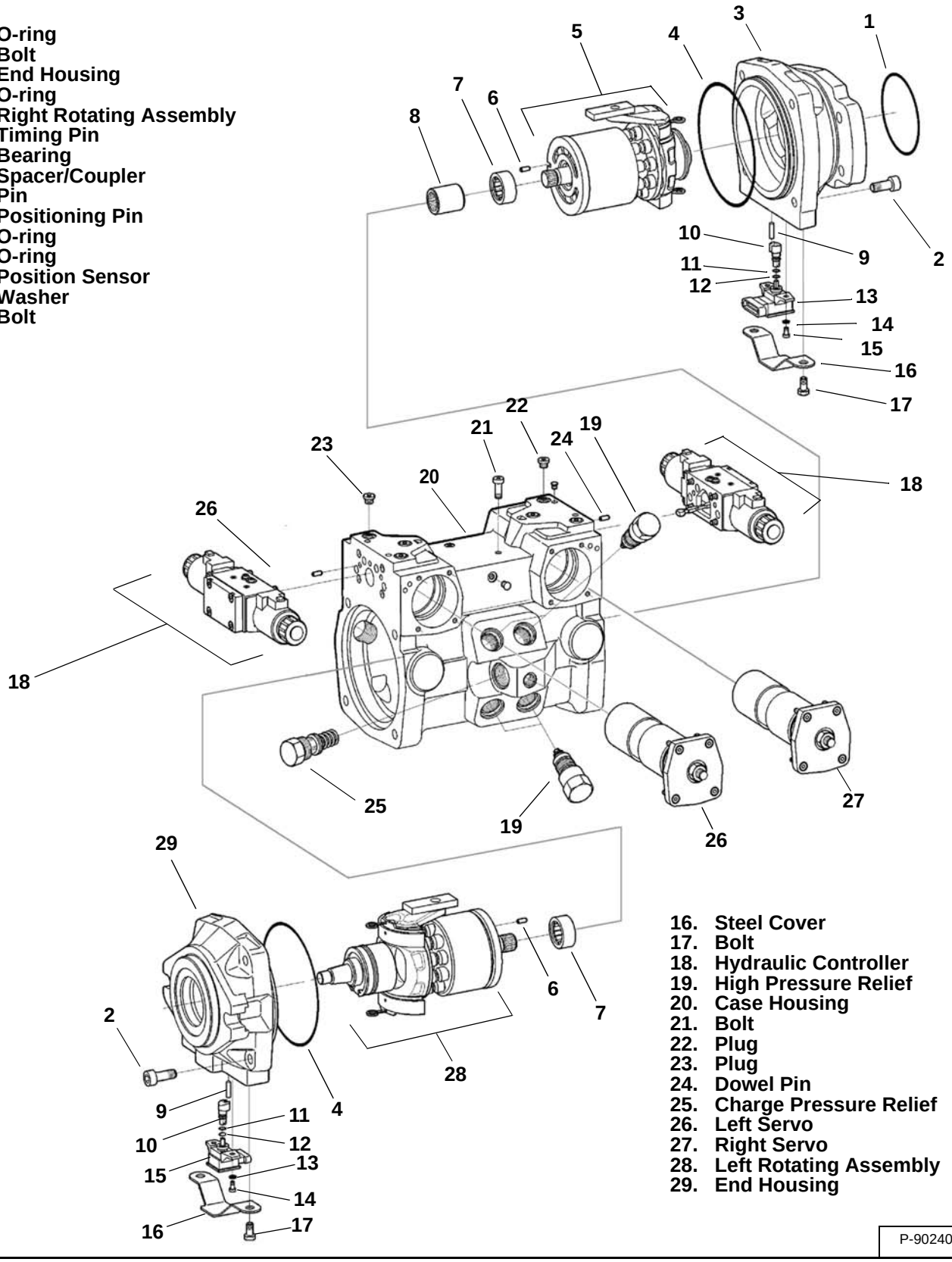
Figure 30-50-49



Place the pump on a work surface with the end cap opening up **[Figure 30-50-49]**.

Parts Identification

1. O-ring
2. Bolt
3. End Housing
4. O-ring
5. Right Rotating Assembly
6. Timing Pin
7. Bearing
8. Spacer/Coupler
9. Pin
10. Positioning Pin
11. O-ring
12. O-ring
13. Position Sensor
14. Washer
15. Bolt

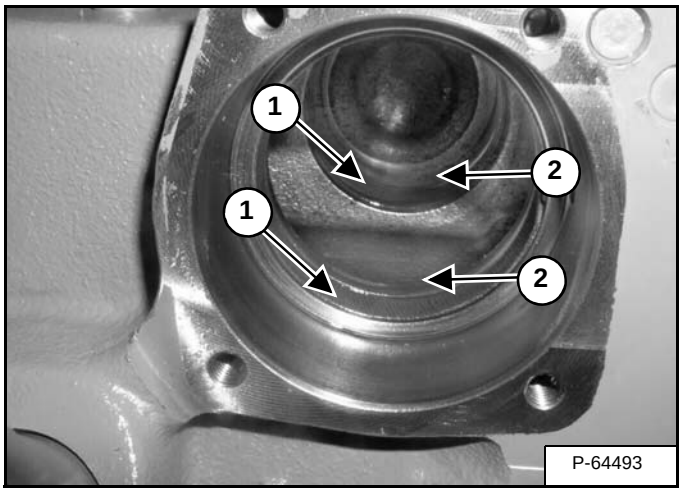


16. Steel Cover
17. Bolt
18. Hydraulic Controller
19. High Pressure Relief
20. Case Housing
21. Bolt
22. Plug
23. Plug
24. Dowel Pin
25. Charge Pressure Relief
26. Left Servo
27. Right Servo
28. Left Rotating Assembly
29. End Housing

P-90240

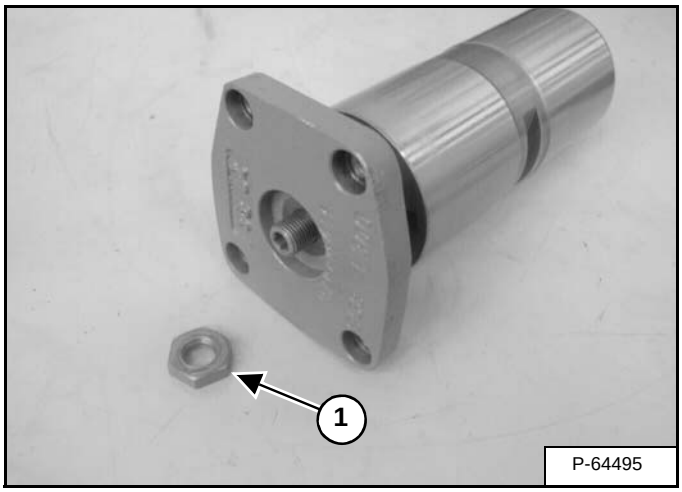
Disassembly (Cont'd)

Figure 30-51-46



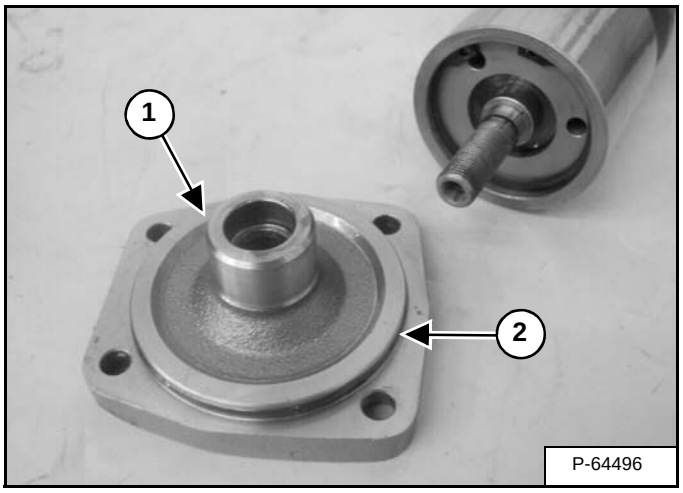
Remove the bushings (Item 1), seals and O-rings (Item 2) **[Figure 30-51-46]** from the pump housing.

Figure 30-51-47



Remove the lock nut (Item 1) **[Figure 30-51-47]** from the servo piston.

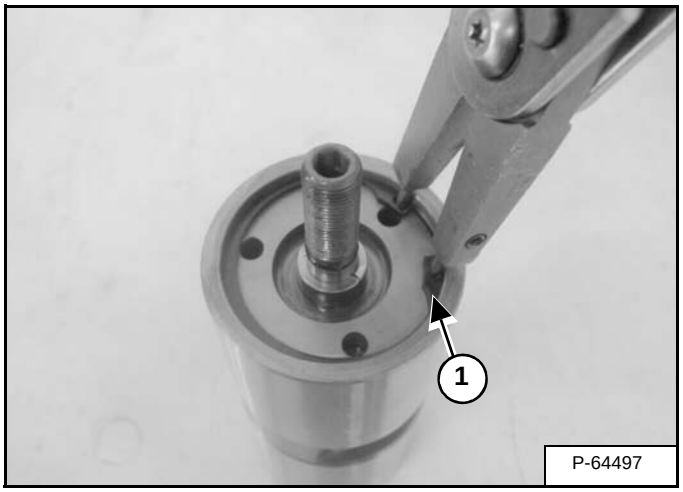
Figure 30-51-48



Remove the servo cover (Item 1) **[Figure 30-51-48]** from the servo piston.

Remove the O-ring (Item 1) **[Figure 30-51-48]** from the cover.

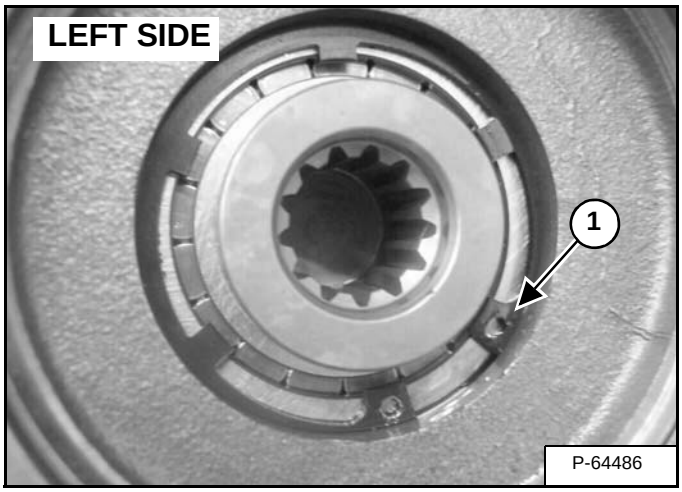
Figure 30-51-49



Remove snap ring (Item 1) **[Figure 30-51-49]** from the servo piston.

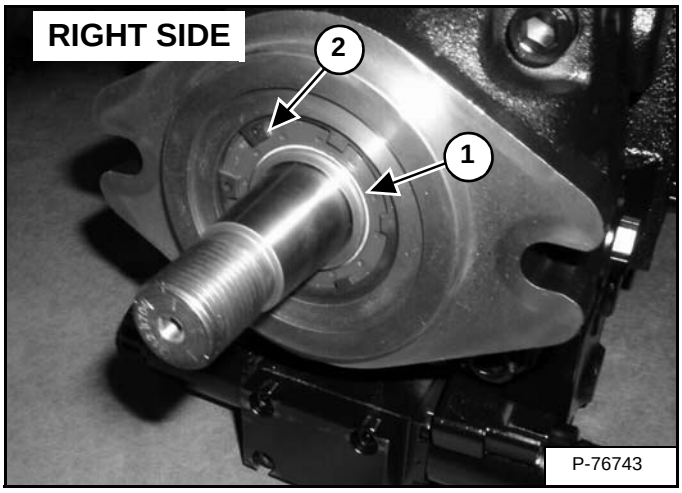
Assembly (Cont'd)

Figure 30-51-79



Install the snap ring (Item 1) **[Figure 30-51-79]** on both sides of the pump.

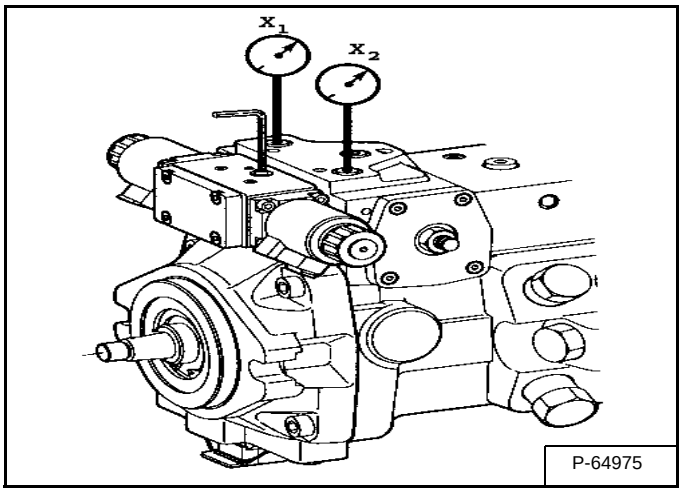
Figure 30-51-80



Install the seal (Item 1) and snap ring (Item 2) **[Figure 30-51-80]** on the right side pump.

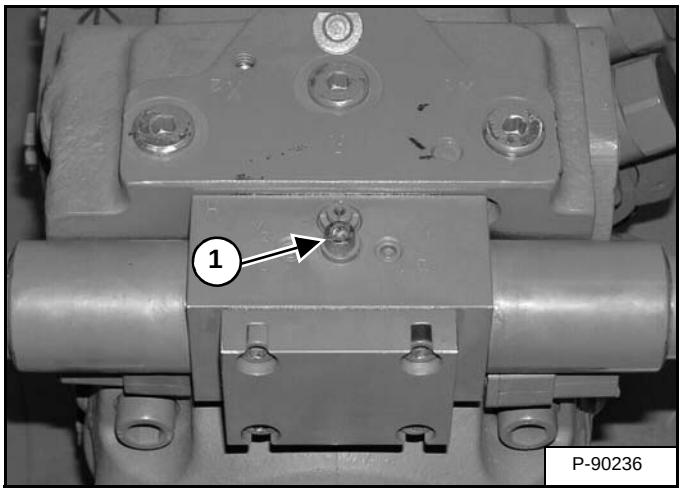
Hydraulic Controller Neutral Adjustment (Cont'd)

Figure 30-51-110



Install 3447 kPa (34 bar) (500 psi) pressure gauges in the X1 and X2 ports **[Figure 30-51-110]**.

Figure 30-51-111



Loosen the screw (Item 1) **[Figure 30-51-111]**.

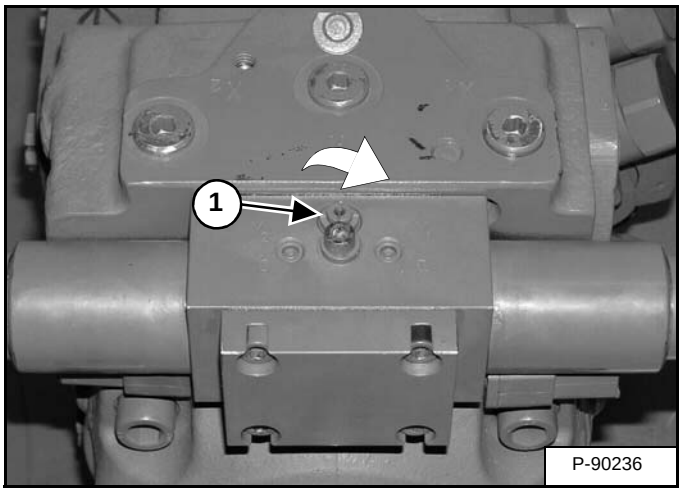
Start the loader using the remote start tool and run at an idle.

⚠ WARNING

Stay clear of the loader wheels. They will turn whenever the pump is not centered.

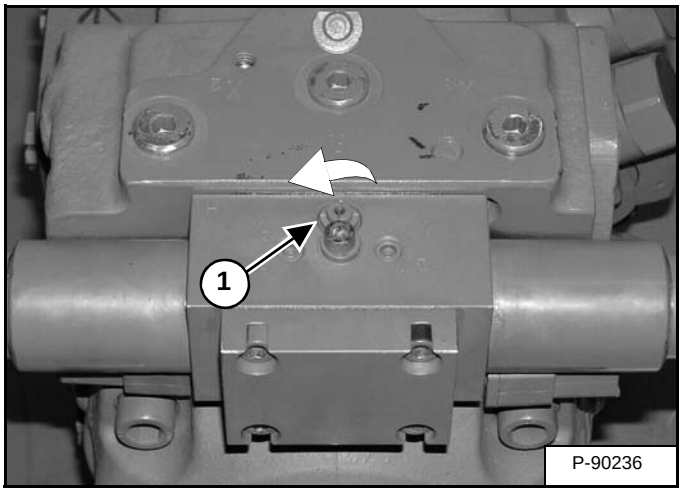
W-2276-1297

Figure 30-51-112



Turn the adjustment screw (Item 1) **[Figure 30-51-112]** clockwise, until one of the gauges registers an increase in system pressure. Mark the position of the adjustment screw.

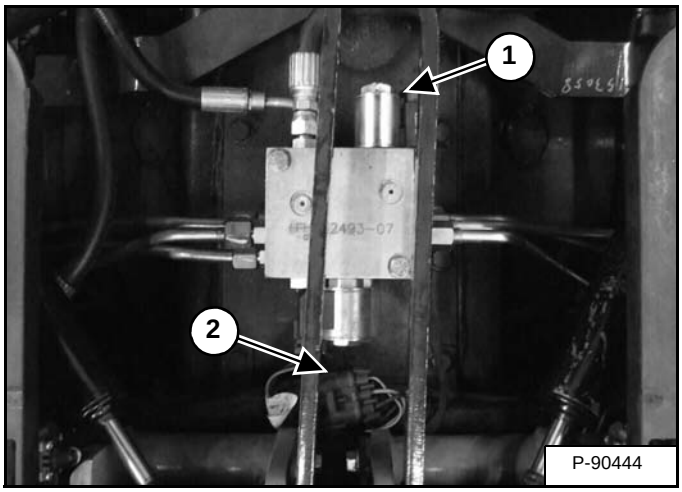
Figure 30-51-113



Turn the adjustment screw (Item 1) **[Figure 30-51-113]** counterclockwise, until the other gauge registers an increase in system pressure. Mark the position of the adjustment screw.

Valve Block Removal And Installation (Cont'd)

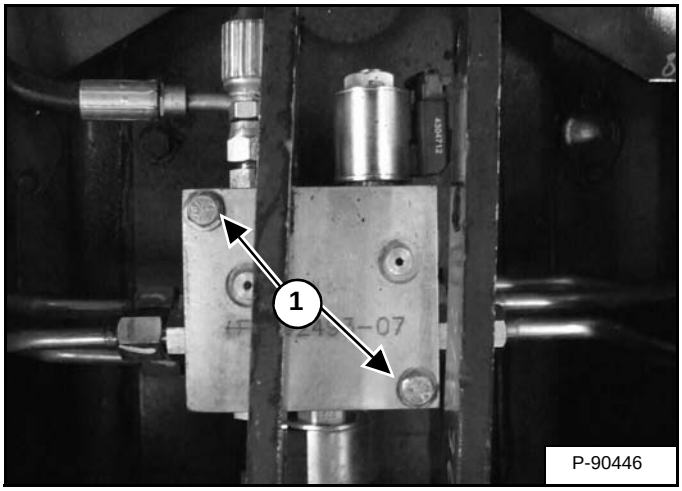
Figure 30-70-4



Disconnect the wire harness connector (Item 1) **[Figure 30-70-4]** from the two speed solenoid.

Disconnect the wire harness connectors (Item 2) **[Figure 30-70-4]** from the brake solenoid and make-up valve.

Figure 30-70-5

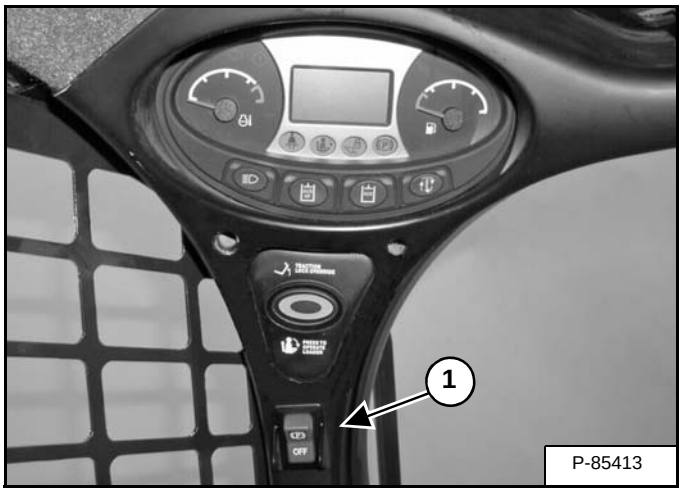


Remove the two mounting bolts (Item 1) **[Figure 30-70-5]** from the valve block.

BRAKE (TWO-SPEED)

Description

Figure 40-11-1



The brake is used to hold the machine in place. The brake is operated by a switch (Item 1) **[Figure 40-11-1]** located on the front accessory panel.

The brake is a spring applied pressure release system, which is self contained on the end of each drive motor.

The brake block solenoid is sent power from a relay to open the circuit which releases the charge pressure oil to the brakes. The charge pressure oil pushes the spring away from the brake discs allowing the drive motor to move.

A signal from the main Bobcat controller holds the brake solenoid open to allow constant flow of the charge pressure oil to hold the spring away from the brake discs.

When the hold signal is interrupted the solenoid will close the circuit and the charge oil will be shut off an the spring will apply the brakes. This will happen if the engine rpm drops below a set rpm, the seat bar sensor fails or if there is a break in the wires for the brake block solenoid.

For more information on the brake. (See TWO-SPEED / BRAKE VALVE on Page 30-70-1.)

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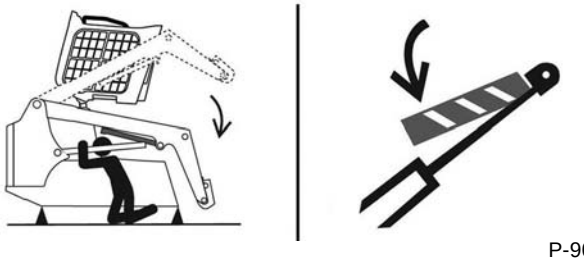
Chain Removal And Installation

DANGER



P-90328

AVOID DEATH

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

D-1009-0409

WARNING

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

W-2059-0598

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

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

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

Remove the control panel. (See Removal And Installation on Page 50-100-2.)

Remove the front or rear chaincase cover. (See Front Cover Removal And Installation on Page 40-30-1.)

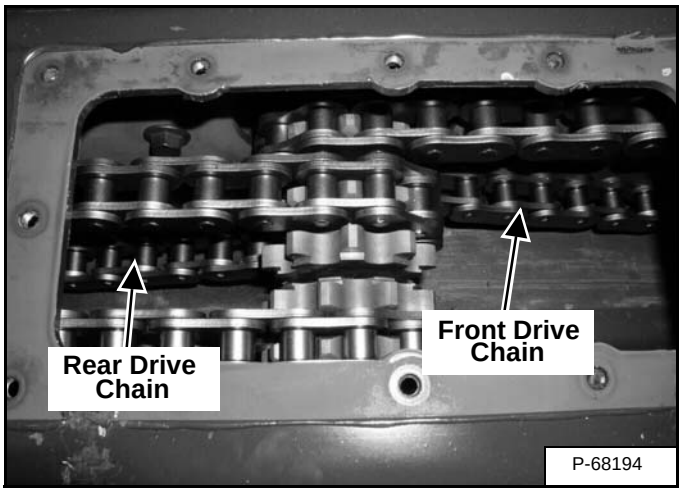
Remove the center chaincase cover. (See Center Cover Removal And Installation on Page 40-30-2.)

Remove the fluid from the chaincase. (See Removing And Replacing Oil on Page 10-130-1.)

Remove the brake disc. (See Disc Removal And Installation on Page 40-10-1.)

Remove the front or rear axle and sprocket. (See Axle, Sprocket And Bearings Removal And Installation on Page 40-20-4.)

Figure 40-20-19



NOTE: It is necessary to remove the rear axle and drive chain if the front chain has to be removed.

Remove the motor carrier. (See Removal And Installation on Page 30-30-2.)

SEAT BAR

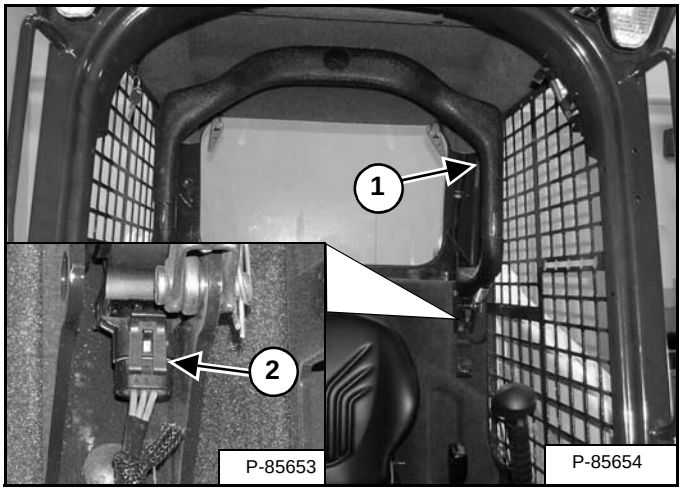
Description

The seat bar is the secondary restraint system that has a sensor that automatically stops the loader functions until the seat bar is lowered.

The seat bar is located in the operator cab.

Removal And Installation

Figure 50-10-1



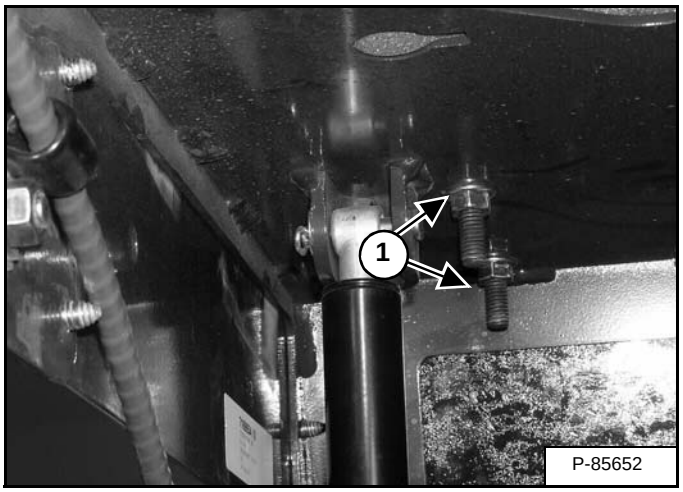
Raise the seat bar (Item 1) **[Figure 50-10-1]**.

Disconnect the seat bar sensor (Item 2) **[Figure 50-10-1]** from the cab harness.

Lower the seat bar.

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

Figure 50-10-2

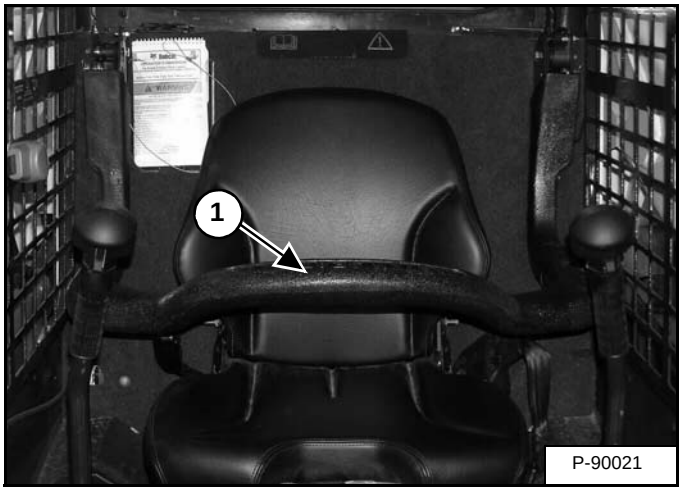


Remove the seat bar mounting nuts (Item 1) **[Figure 50-10-2]** (both sides).

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

Lower the operator cab. (See Lowering on Page 10-30-3.)

Figure 50-10-3



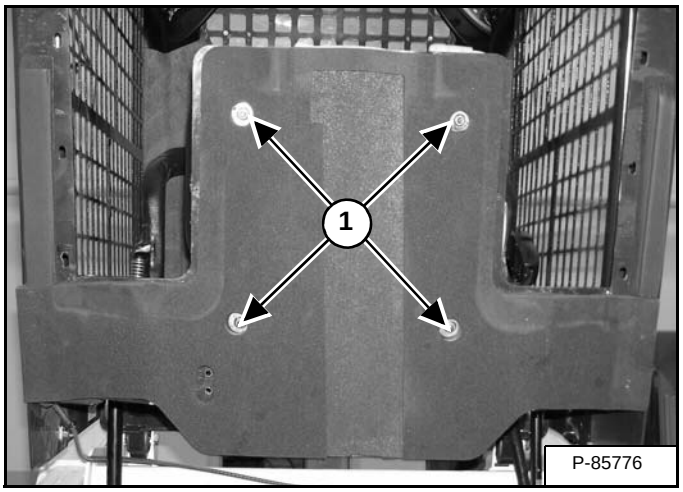
Remove the seat bar (Item 1) **[Figure 50-10-3]** from the operator cab.

Reverse the above procedure to install the seat bar into the operator cab.

OPERATOR SEAT (SUSPENSION)

Removal And Installation

Figure 50-31-1



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

Remove the four seat mounting nuts (Item 1) **[Figure 50-31-1]** and washers from the operator seat mounting studs.

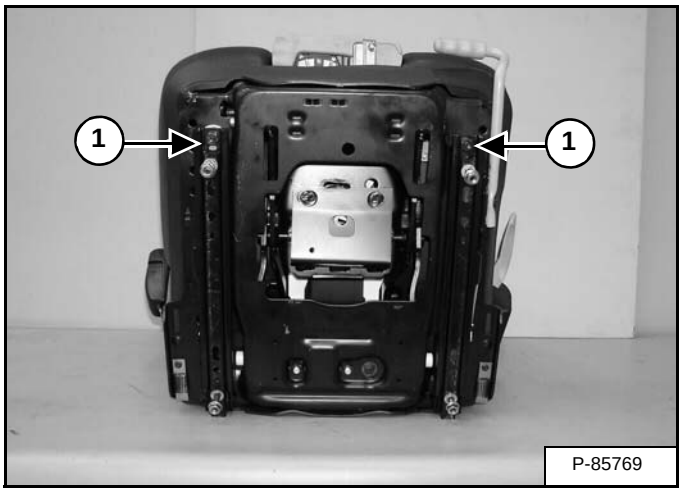
Lower the operator cab. (See Lowering on Page 10-30-3.)

Remove the seat.

NOTE: With the seat removed, the cab may raise.

Slide Rail Removal And Installation

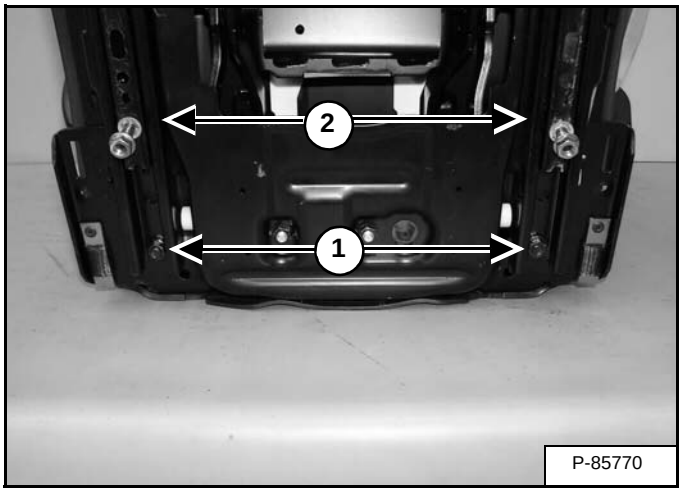
Figure 50-31-2



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

Remove the two slide rail mounting bolts (Item 1) **[Figure 50-31-2]**.

Figure 50-31-3

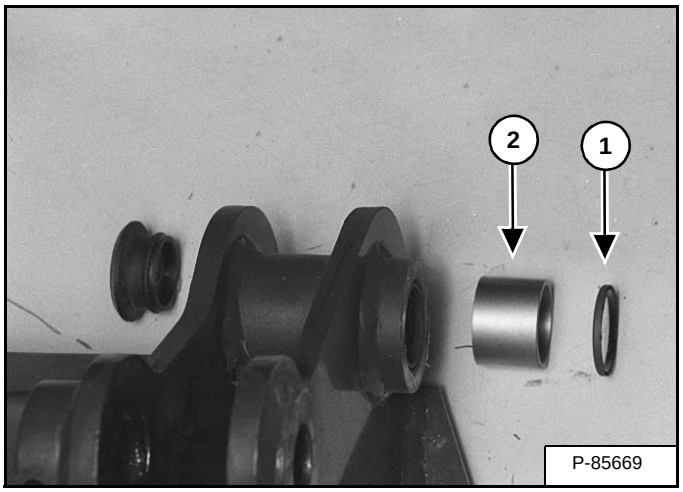


Remove the two slide rails mounting bolts (Item 1) **[Figure 50-31-3]**.

Remove the slide rail (Item 2) **[Figure 50-31-3]** from the bottom of the seat frame.

Pivot Pin Bushing And Seal Removal And Installation

Figure 50-40-14

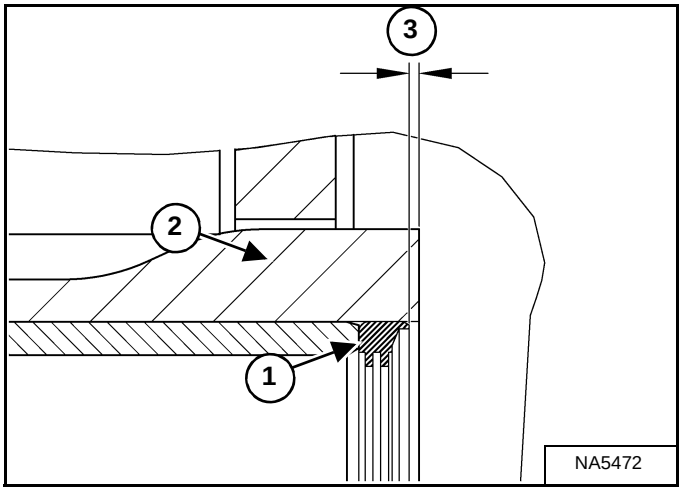


Remove the Bob-Tach. (See Removal And Installation on Page 50-40-1.)

Use a seal pick to remove seal (Item 1) **[Figure 50-40-14]** from the Bob-Tach.

Remove and replace bushing (Item 2) **[Figure 50-40-14]** with a driver tool and hammer.

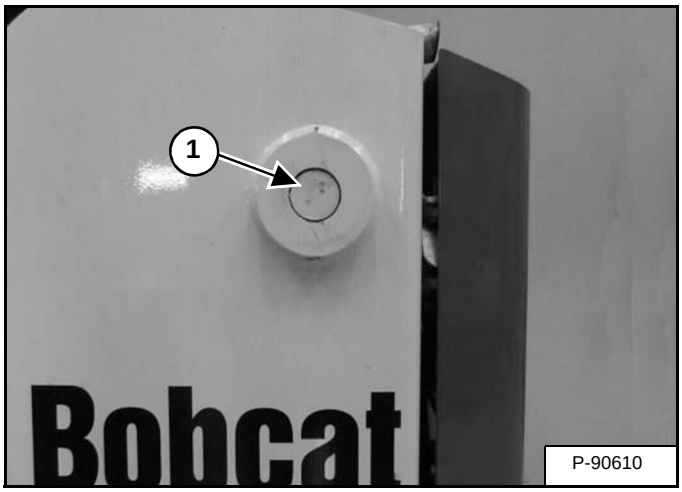
Figure 50-40-15



Installation: The seal (Item 1) needs to be seated in the Bob-Tach (Item 2) to a depth of 0.050 in (12,7 mm) (Item 3) **[Figure 50-40-15]**.

Link Removal And Installation (Cont'd)

Figure 50-50-9



Remove the lift arm link pivot pin (Item 1) **[Figure 50-50-9]** (both sides).

Installation: Tighten the retainer bolt and nut to 48 - 54 N•m (35 - 40 ft-lb) torque.

Remove the lift arm link from the loader.

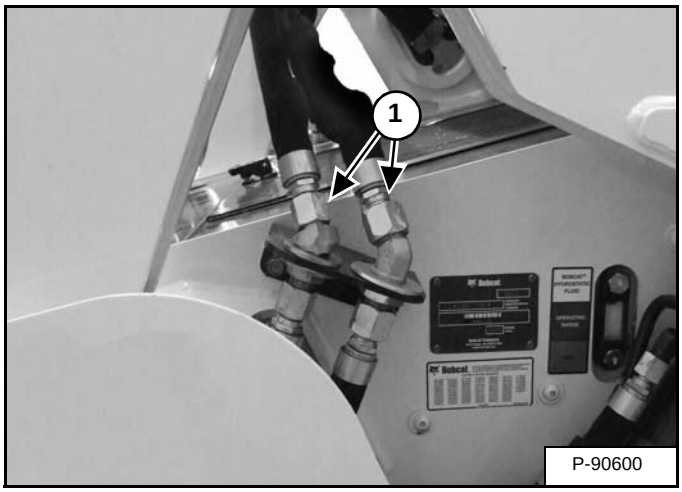
Removal And Installation

Put jackstands under the rear corners of the loader.

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

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

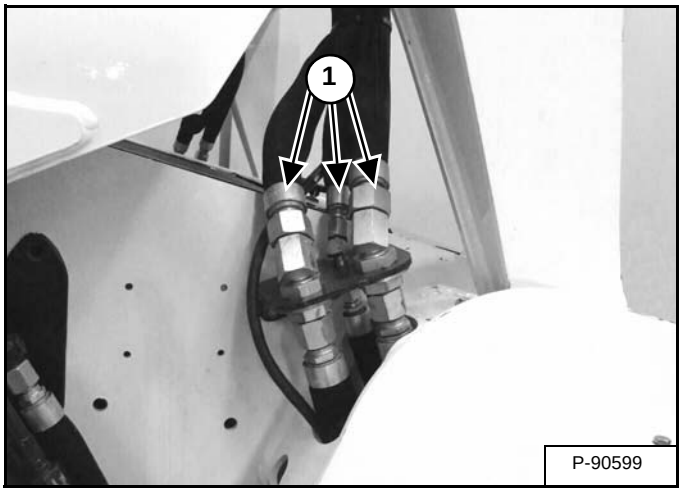
Figure 50-50-10



At the right side upright disconnect and cap the two tilt cylinder hoses (Item 1) **[Figure 50-50-10]**.

NOTE: Mark the hoses for proper installation.

Figure 50-50-11



At the left side upright disconnect and cap the three auxiliary hydraulic hoses (Item 1) **[Figure 50-50-11]**.

NOTE: Mark the hoses for proper installation.

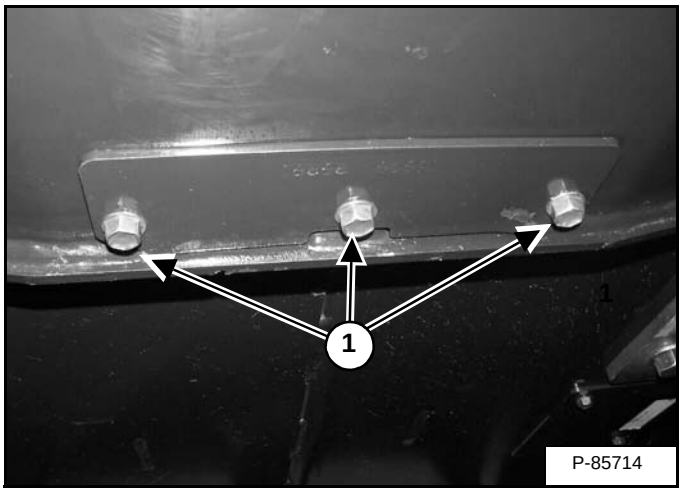
FUEL TANK

Removal And Installation

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

Remove the engine / hydrostatic pump assembly from the loader. (See Engine Removal And Installation on Page 70-10-7.)

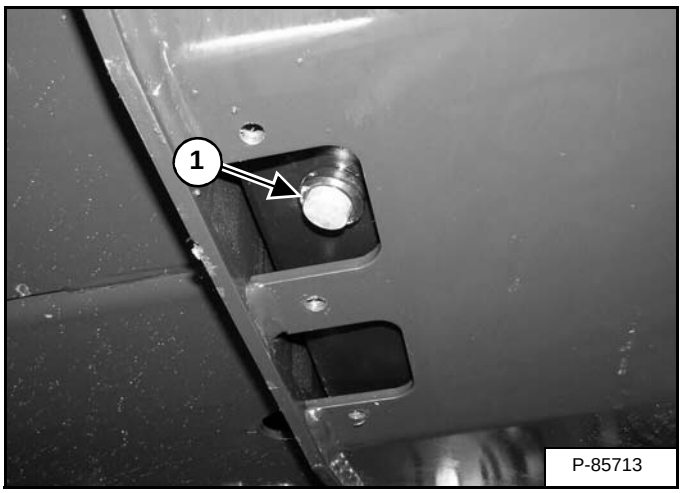
Figure 50-80-1



Remove the three mount bolts (Item 1) **[Figure 50-80-1]** from the access cover at the rear of the loader frame.

Remove the access cover.

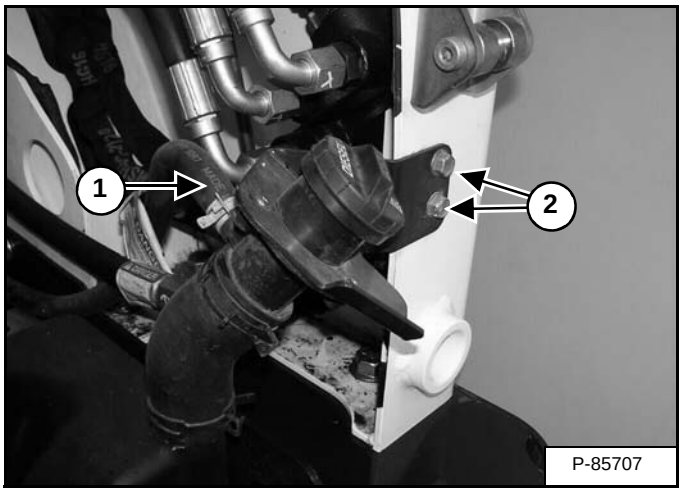
Figure 50-80-2



Remove the drain plug (Item 1) **[Figure 50-80-2]**.

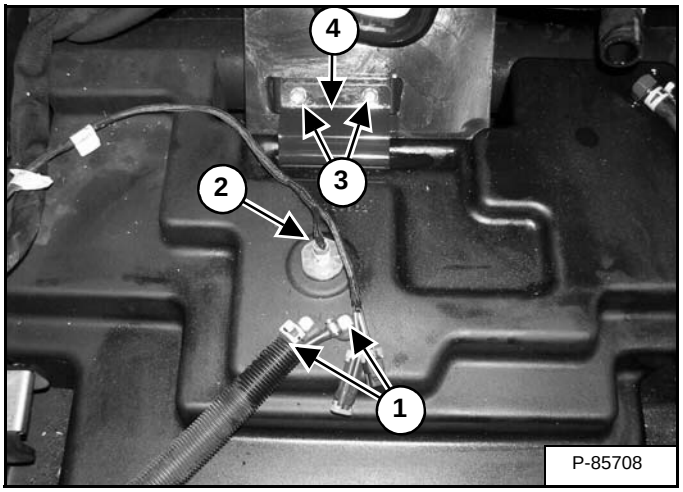
Drain the fuel into a container.

Figure 50-80-3



Disconnect the fuel vent hose (Item 1) and remove the two bolts (Item 2) **[Figure 50-80-3]**.

Figure 50-80-4



Disconnect the two fuel lines (Item 1) **[Figure 50-80-4]**.

Disconnect the wire harness connector (Item 2) **[Figure 50-80-4]** from the fuel level sender.

Remove the two mounting bolts (Item 3) and remove the bracket (Item 4) **[Figure 50-80-4]**.

Floor Pan Removal And Installation

Remove the control panel. (See Removal And Installation on Page 50-100-2.)

Remove the pedals. (See Pedal Removal And Installation on Page 50-91-1.)

Remove the access panels. (See ACCESS PANEL (INSIDE) on Page 50-120-1.)

Figure 50-91-7

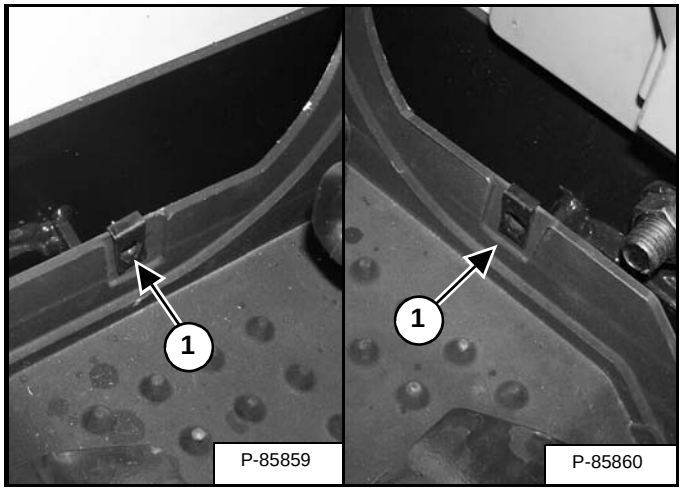
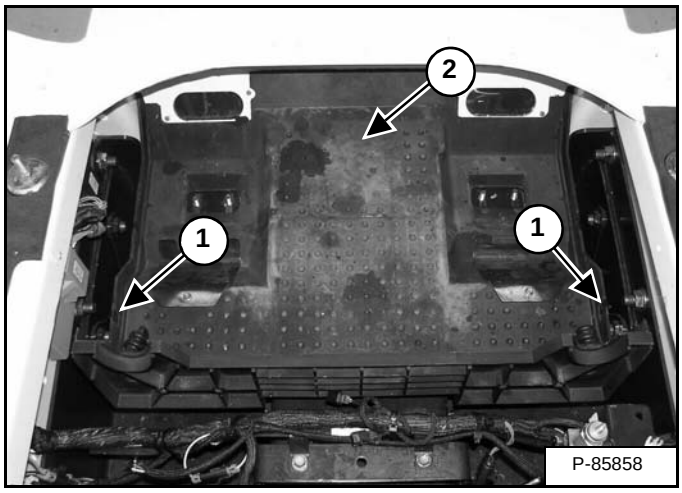


Figure 50-91-8

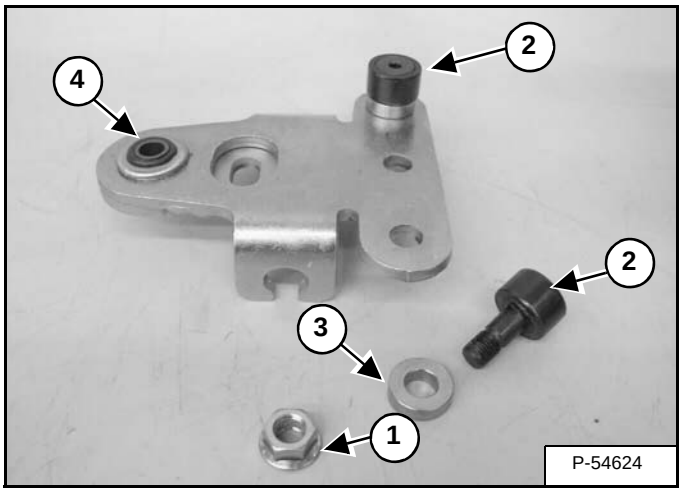


Remove the clips (Item 1) **[Figure 50-91-7]** and **[Figure 50-91-8]** from the sides of the floor pan.

Remove the floor pan (Item 2) **[Figure 50-91-8]**.

Pintle Arm Disassembly And Assembly

Figure 50-100-22

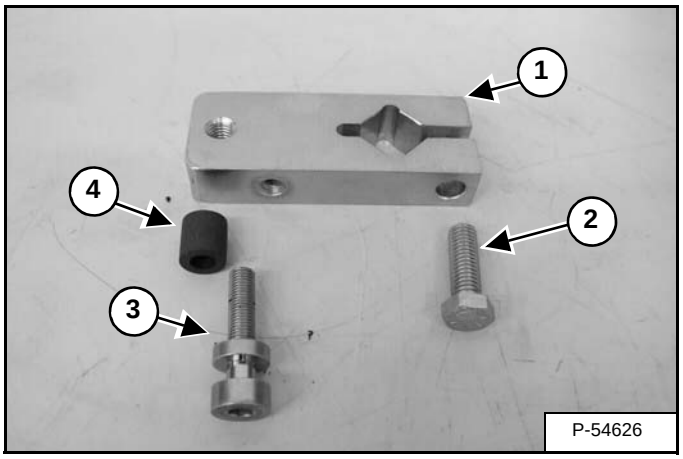


Remove the nut (Item 1) from the pintle roller cams (Item 2) and inspect the pintle roller cams and washers (Item 3) for damage **[Figure 50-100-22]**.

Inspect the torsion bushing (Item 4) **[Figure 50-100-22]** for damage and replace as needed.

Installation: Tighten the nuts to 47,5 - 54,2 N•m (35 - 40 ft-lb) torque.

Figure 50-100-23



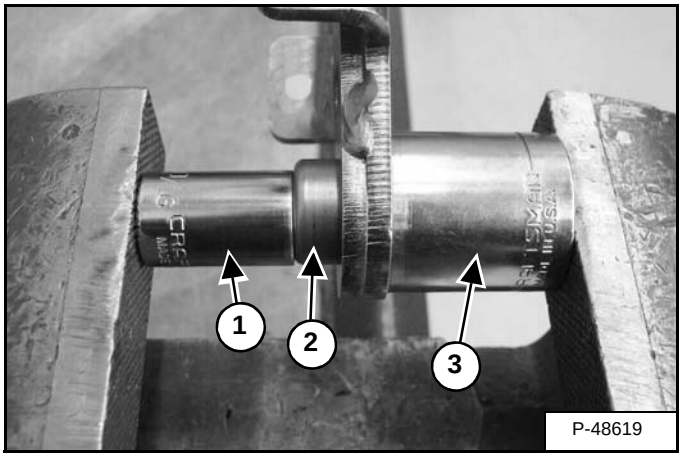
Remove the base pintle (Item 1) **[Figure 50-100-23]** from the pump shaft.

Remove the retaining bolt (Item 2), adjusting screw (Item 3) and neoprene dampener (Item 4) from the base pintle **[Figure 50-100-23]**.

Inspect parts for wear and damage, replace as needed **[Figure 50-100-23]**.

NOTE: Anti-seize should be used on the adjusting screw to prevent corrosion and allow free movement while adjusting.

Figure 50-100-24



Using a bushing driver (Item 1) remove the torsion bushing (Item 2) by pressing the bushing through the pintle arm into an oversized socket (Item 3) to catch the torsion bushing **[Figure 50-100-24]**.

Installation: Install the torsion bushing (Item 2) **[Figure 50-100-24]** into the pintle arm using the same procedure as the removal.

NOTE: When the torsion bushing is installed, the amount of bushing on each side of the pintle arm should be the same.

CONTROL PANEL (SJC)

Description

The control panel is connected to the lower main frame and wraps around the operator seat. There are no mechanical linkages connecting to the hydrostatic pumps or the control valve.

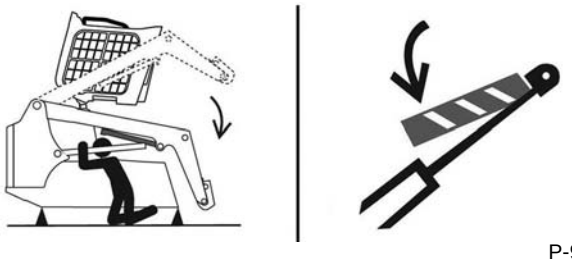
Removal And Installation

⚠ 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

⚠ DANGER



P-90328

AVOID DEATH

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

D-1009-0409

⚠ WARNING

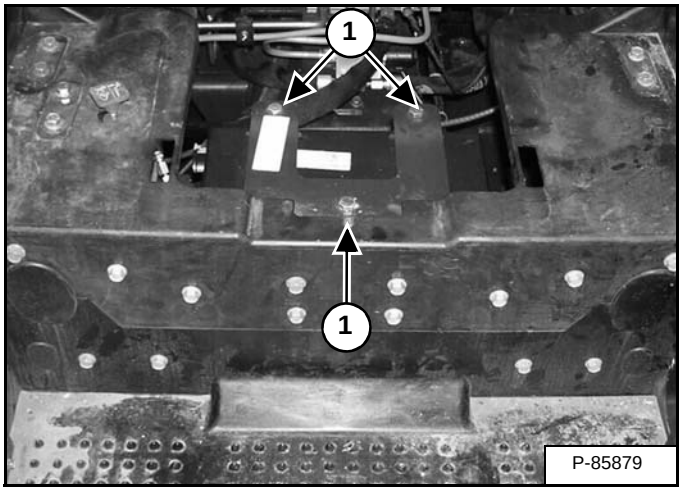
Never work on a machine with the lift arms up unless the lift arms are secured by an approved lift arm support device. Failure to use an approved lift arm support device can allow the lift arms or attachment to fall and cause injury or death.

W-2059-0598

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

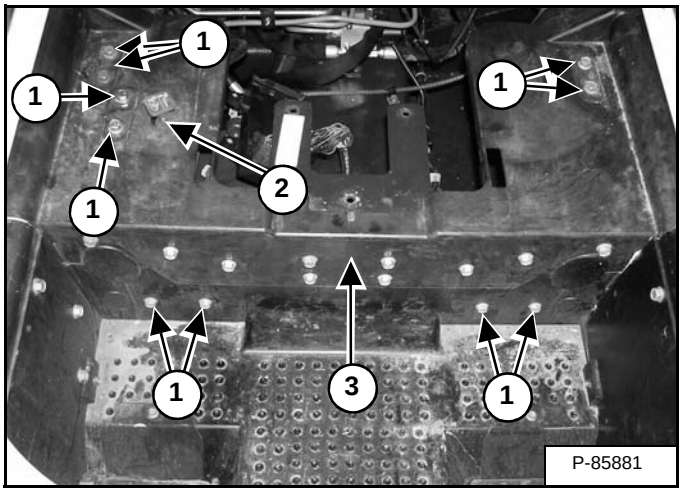
Raise the operator cab. (See Raising on Page 10-30-2.)

Figure 50-101-1



Remove the three mount bolts (Item 1) **[Figure 50-101-1]** that secure the controller.

Figure 50-101-2



Remove the 10 panel mount bolts (Item 1) **[Figure 50-101-2]**.

Remove the lift arm bypass knob and rubber washer (Item 2) **[Figure 50-101-2]**.

Remove the control panel (Item 3) **[Figure 50-101-2]**.

CONTROL HANDLE / LEVER (SJC)

Description

The control panel has two electronic handles that control the steering, lift, and tilt functions. There are no mechanical connections to the hydrostatic pumps or the control valve.

Joystick Testing

See Bobcat Advanced Troubleshooting System (B.A.T.S.) or connect to service analyzer to check function.

WINDOW (SIDE)

Removal And Installation

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

Figure 50-132-1

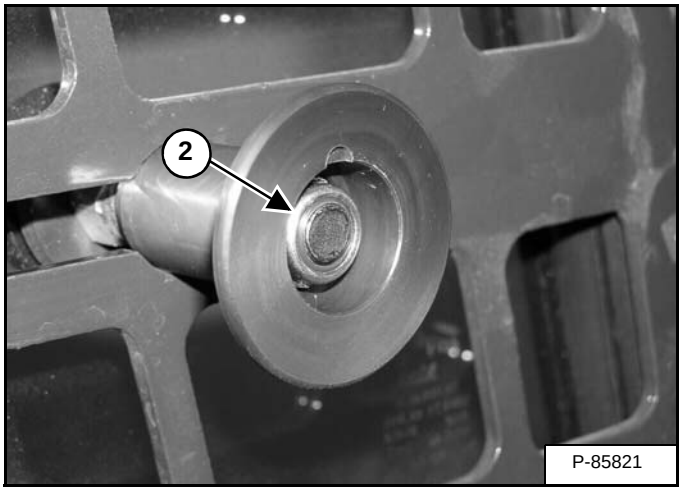
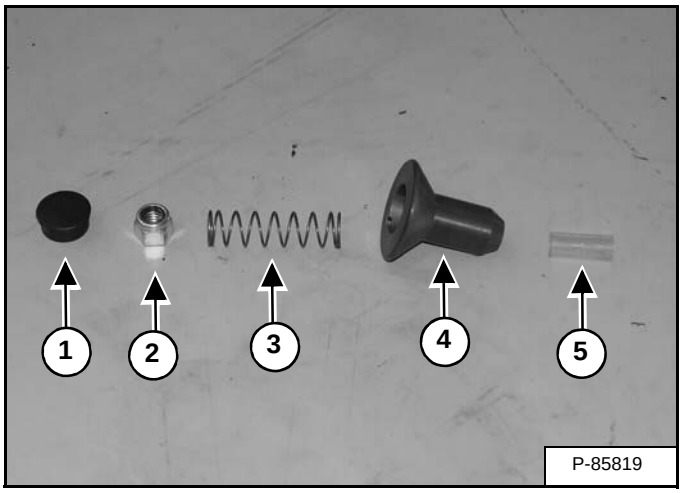


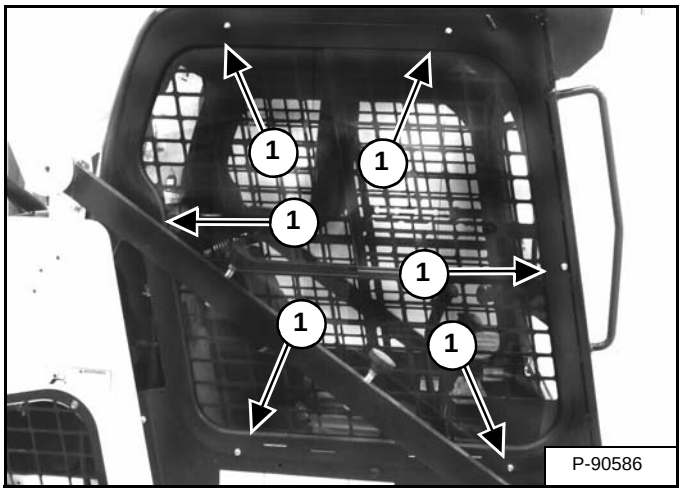
Figure 50-132-2



From inside the operator cab, remove the plastic cap (Item 1), nut (Item 2), spring (Item 3), knob (Item 4), and sleeve (Item 5) **[Figure 50-132-1]** and **[Figure 50-132-2]** from the window assembly.

Installation: Tighten the nut (Item 2) **[Figure 50-132-1]** flush to the end of the bolt.

Figure 50-132-3



Support the window assembly and remove the six bolts (Item 1) **[Figure 50-132-3]** from the window frame and the operator cab.

Installation: Tighten the six bolts (Item 1) **[Figure 50-132-3]** to 9 - 10 N•m (80 - 90 in-lb) torque.

Remove the window assembly.

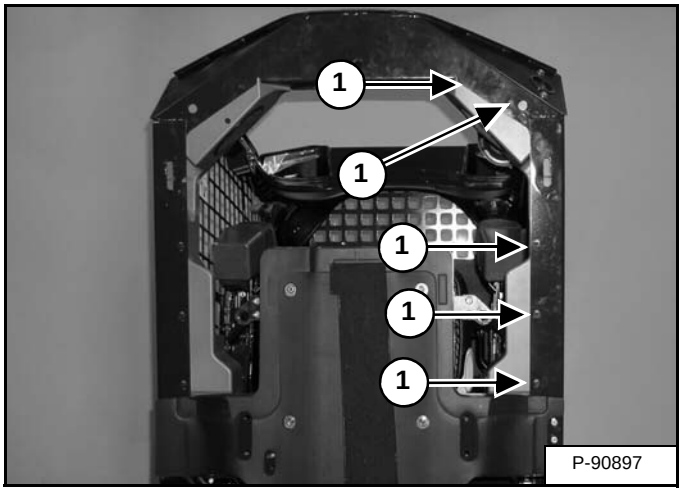
NOTE: The window assembly can only be replaced as a complete unit.

LEFT SIDE LOWER PANEL

Removal And Installation

Raise the operator's cab.

Figure 50-160-1



Remove the five plastic rivets (Item 1) **[Figure 50-160-1]**.

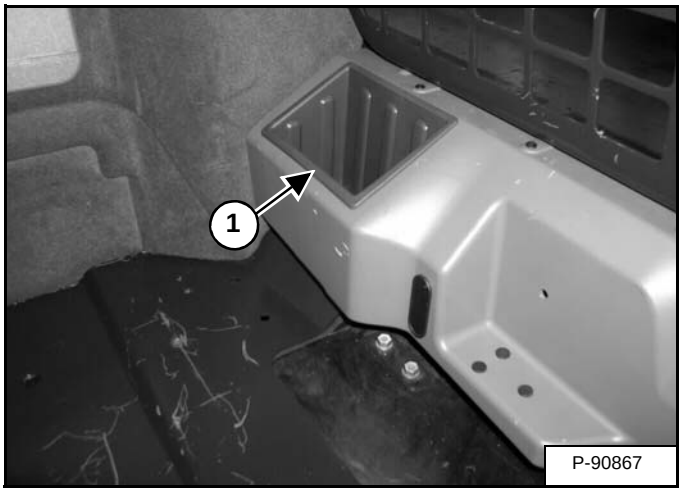
Remove the seat. (See Removal And Installation on Page 50-30-1.)

Remove the 3-Point seat belt retractor (If equipped). (See 3-Point Seat Belt Removal And Installation on Page 50-31-4.)

Lower the operator's cab.

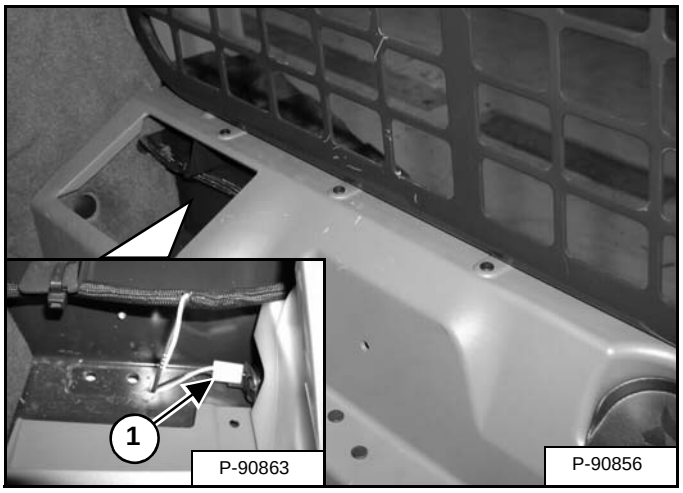
NOTE: With the seat removed, the cab may raise.

Figure 50-160-2



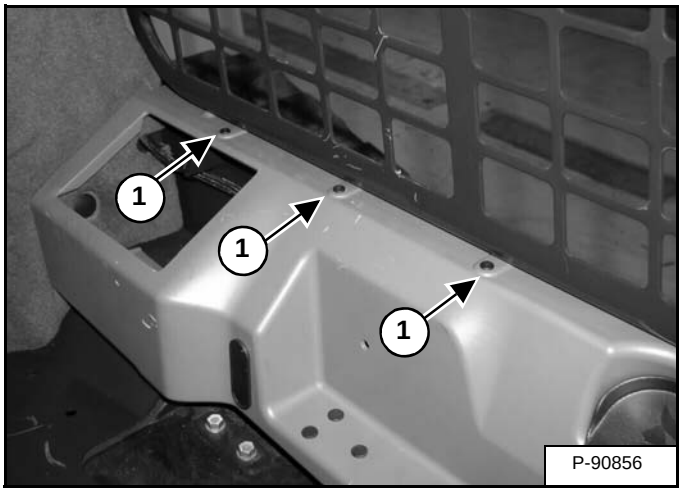
Remove the storage compartment (Item 1) (if equipped) **[Figure 50-160-3]** from the left side lower panel.

Figure 50-160-3



Disconnect the wiper washer pump (Item 1) (if equipped) **[Figure 50-160-3]** from the left side lower panel.

Figure 50-160-4



Remove three plastic screws and the anchors (Item 1) **[Figure 50-160-4]** from the left side lower panel.

ELECTRICAL SYSTEM & ANALYSIS

HYDRAULICS

WIRE CATEGORIES FOR COLORS AND NUMBER RANGE			
GROUP DESCRIPTION	GROUP NUMBER RANGE	WIRE COLOR	COLOR CODE
BATT FEED, GENERAL	1000 THROUGH 1499	RED	RED
BATT FEED, FUSED	1000 THROUGH 1499	RED/WHITE	RED/WHT
BATT FEED, SWITCHED	1500 THROUGH 1999	ORANGE/WHITE	RNG/WHT
BATTERY GROUND	2000 THROUGH 2999	BLACK	BLK
CONTROLLER GROUND/RETURN	2000 THROUGH 2999	BROWN	BRN
MONITORING	3000 THROUGH 3999	LIGHT BLUE	LBL
HYDRAULIC	4000 THROUGH 4999	LIGHT GREEN	LGN
CONTROLLER SUPPLY	5000 THROUGH 5999	YELLOW	YEL
LIGHTS	6000 THROUGH 6999	PINK	PNK
OTHER FUNCTIONS	7000 THROUGH 7999	WHITE	WHT
ENGINE	8000 THROUGH 8999	TAN	TAN
COMMUNICATION	9000 THROUGH 9999	PURPLE	PUR
COMMUNICATION	9000 THROUGH 9999	PURPLE/WHITE	PUR/WHT

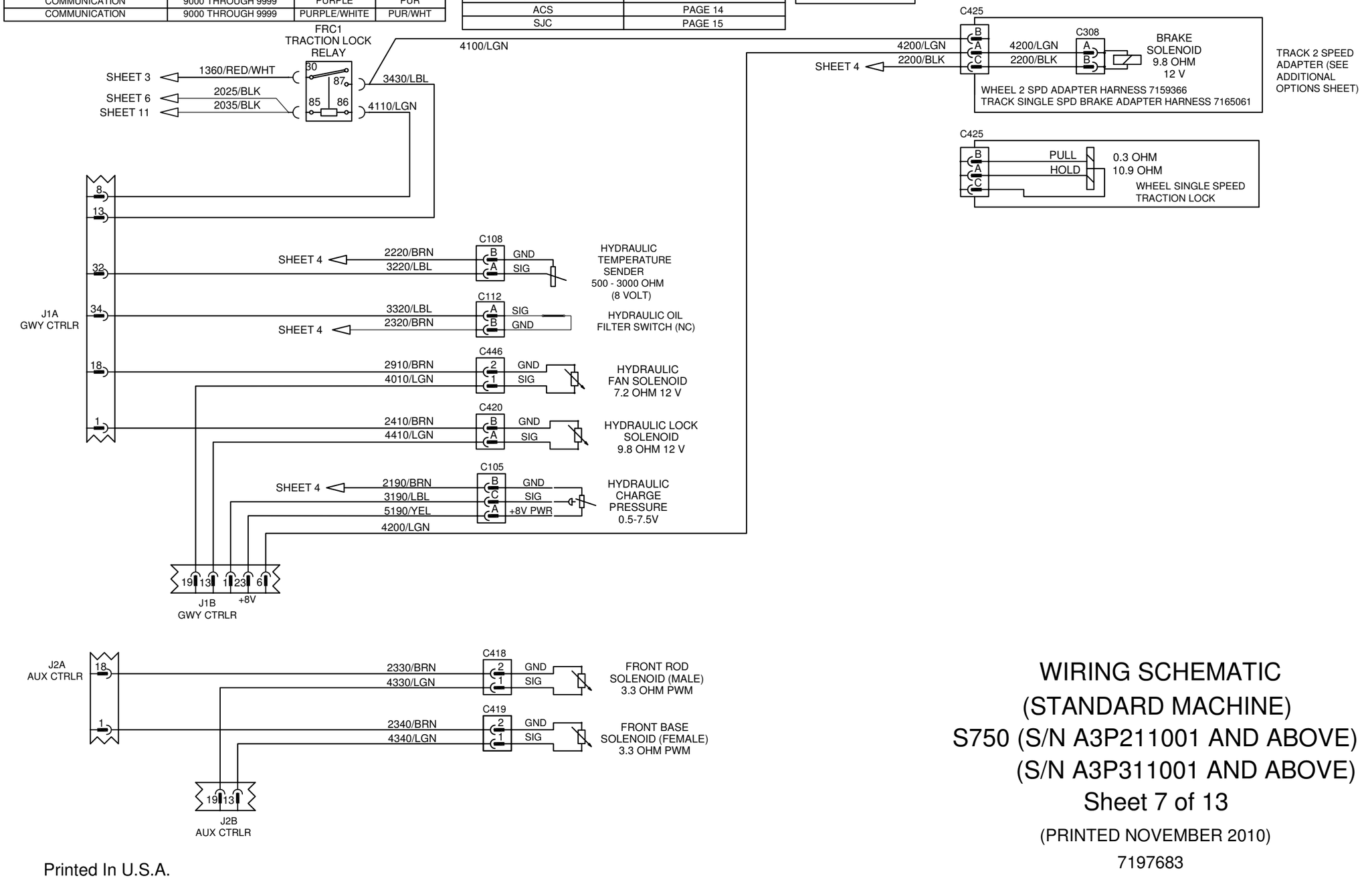
LEGEND

PARTIAL CONNECTOR

CONNECTOR

WIRE BREAK
(TWO WIRE BREAKS JOIN ONE WIRE)

SHEET #



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WIRING SCHEMATIC
(STANDARD MACHINE)
S750 (S/N A3P211001 AND ABOVE)
(S/N A3P311001 AND ABOVE)
Sheet 7 of 13

(PRINTED NOVEMBER 2010)
7197683

WIRE CATEGORIES FOR COLORS AND NUMBER RANGE			
GROUP DESCRIPTION	GROUP NUMBER RANGE	WIRE COLOR	COLOR CODE
BATT FEED, GENERAL	1000 THROUGH 1499	RED	RED
BATT FEED, FUSED	1000 THROUGH 1499	RED/WHITE	RED/WHT
BATT FEED, SWITCHED	1500 THROUGH 1999	ORANGE/WHITE	RNG/WHT
BATTERY GROUND	2000 THROUGH 2999	BLACK	BLK
CONTROLLER GROUND/RETURN	2000 THROUGH 2999	BROWN	BRN
MONITORING	3000 THROUGH 3999	LIGHT BLUE	LBL
HYDRAULIC	4000 THROUGH 4999	LIGHT GREEN	LGN
CONTROLLER SUPPLY	5000 THROUGH 5999	YELLOW	YEL
LIGHTS	6000 THROUGH 6999	PINK	PNK
OTHER FUNCTIONS	7000 THROUGH 7999	WHITE	WHT
ENGINE	8000 THROUGH 8999	TAN	TAN
COMMUNICATION	9000 THROUGH 9999	PURPLE	PUR
COMMUNICATION	9000 THROUGH 9999	PURPLE/WHITE	PUR/WHT

SCHEMATIC INDEX	
OVERVIEW	PAGE 1,2
POWER	PAGE 3
GROUND	PAGE 4
CAN BUS	PAGE 5
ENGINE	PAGE 6
HYDRAULICS	PAGE 7
CAB DISPLAY	PAGE 8
CAB	PAGE 9
MANUAL CONTROLS	PAGE 10
LIGHTS	PAGE 11
HVAC	PAGE 12
OPTIONS	PAGE 13
ACS	PAGE 14
SJC	PAGE 15

LEGEND

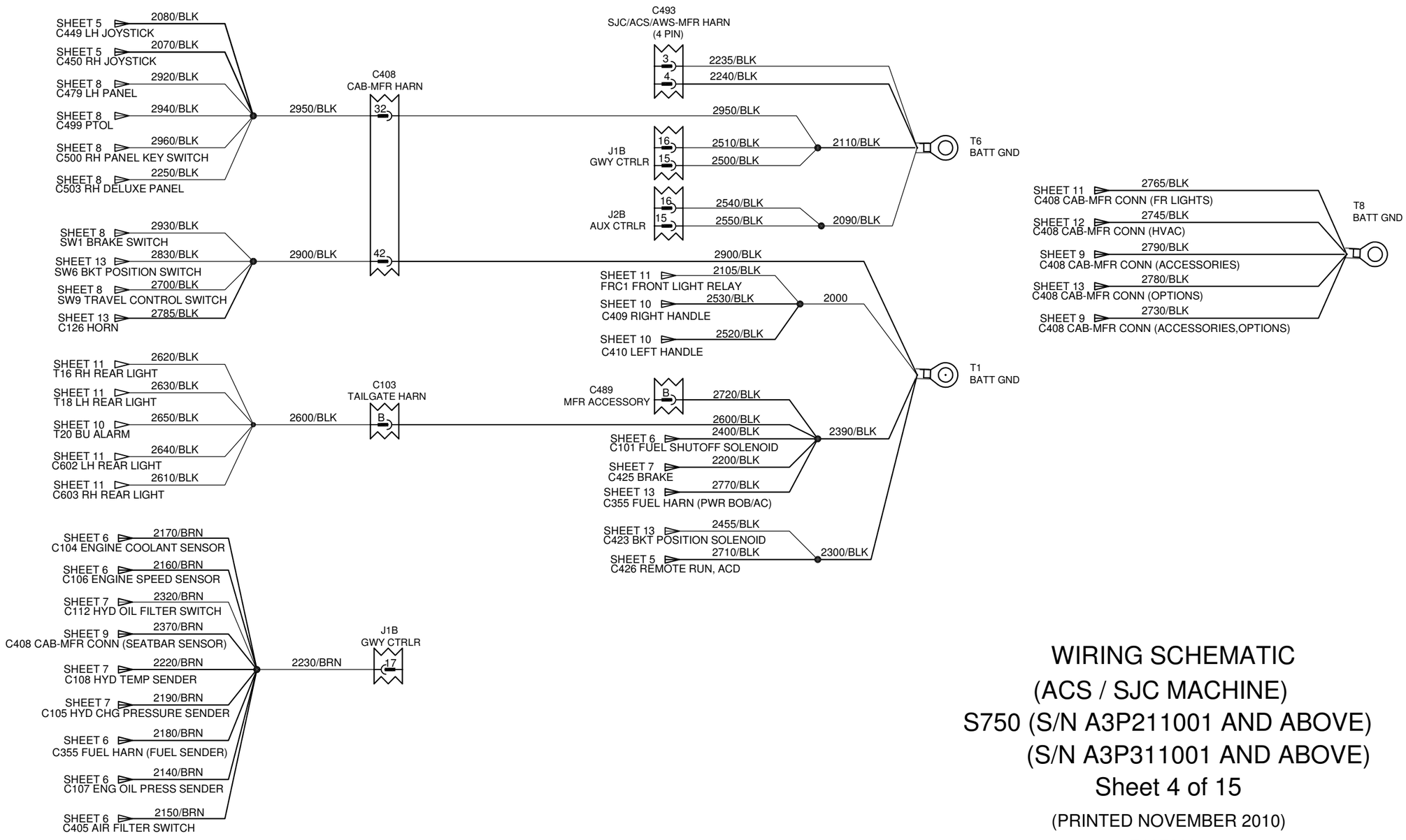
PARTIAL CONNECTOR

CONNECTOR

WIRE BREAK
(TWO WIRE BREAKS
JOIN ONE WIRE)

SHEET #

GROUND



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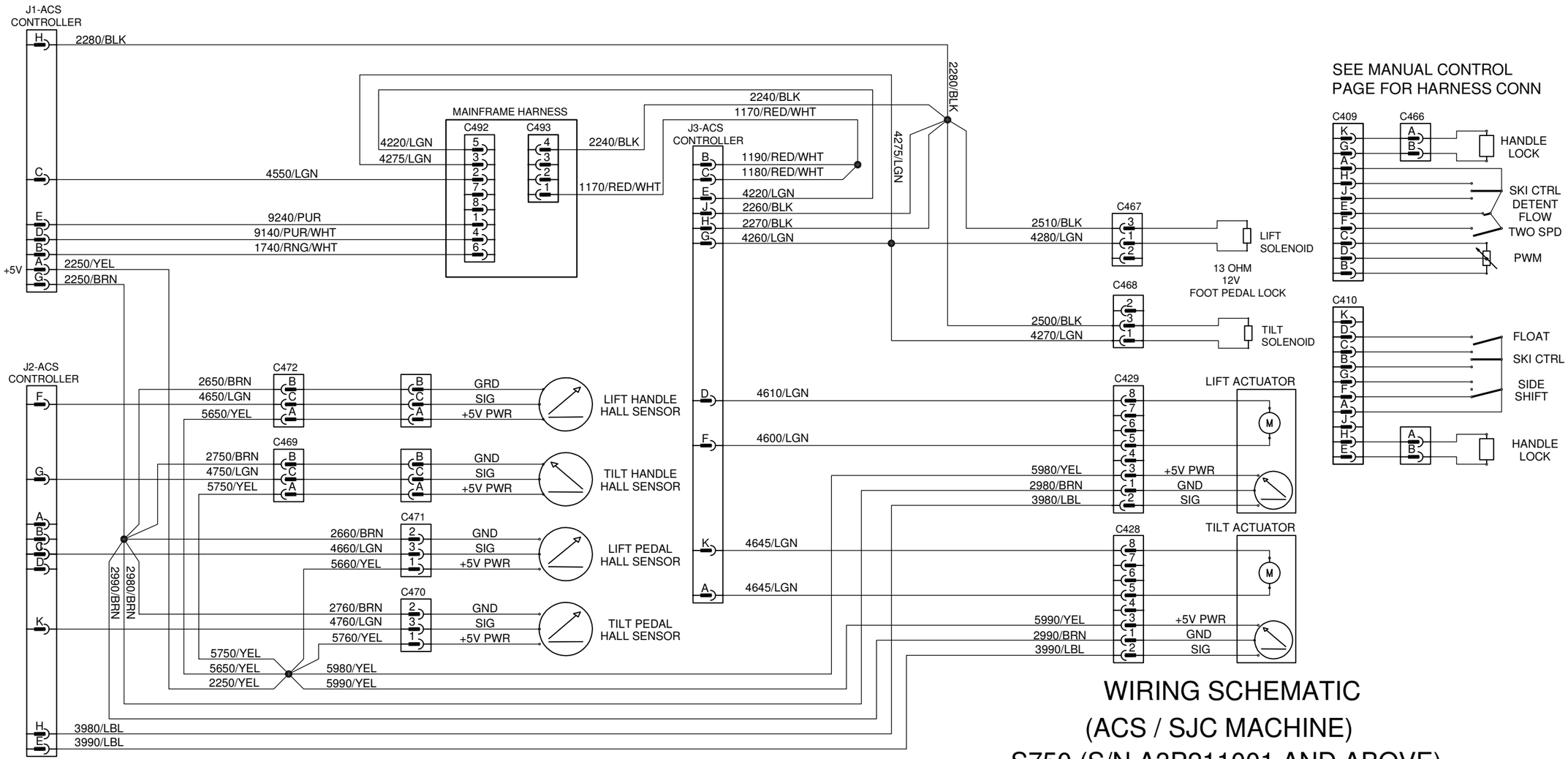
WIRING SCHEMATIC
(ACS / SJC MACHINE)
S750 (S/N A3P211001 AND ABOVE)
(S/N A3P311001 AND ABOVE)
Sheet 4 of 15

(PRINTED NOVEMBER 2010)
7197682

ACS CONTROLS

ACS CONTROLLER					
CONNECTOR J1-ACS		CONNECTOR J2-ACS		CONNECTOR J3-ACS	
PIN	FUNCTION	PIN	FUNCTION	PIN	FUNCTION
A	+5V TO SENSORS	A	LIFT CYLINDER SENSOR-SPARE	A	TILT MOTOR 1
B	SWITCHED POWER	B	FLOAT-SPARE	B	UNSWITCHED POWER
C	HAND/FOOT INPUT	C	RESPONSE SELECTOR-SPARE	C	UNSWITCHED POWER
D	CAN HIGH	D	TILT CYLINDER SENSOR-SPARE	D	LIFT MOTOR 2
E	CAN LOW	E	TILT ACTUATOR FEEDBACK	E	HANDLE ENABLE
F		F	LIFT HANDLE	F	LIFT MOTOR 1
G	GROUND	G	TILT HANDLE	G	PEDAL ENABLE
H	GROUND	H	LIFT ACTUATOR FEEDBACK	H	GROUND
		J	LIFT PEDAL	J	GROUND
		K	TILT PEDAL	K	TILT MOTOR 2

ACS HARNESS 7164144



WIRING SCHEMATIC
(ACS / SJC MACHINE)
S750 (S/N A3P211001 AND ABOVE)
(S/N A3P311001 AND ABOVE)

Sheet 14 of 15

(PRINTED NOVEMBER 2010)

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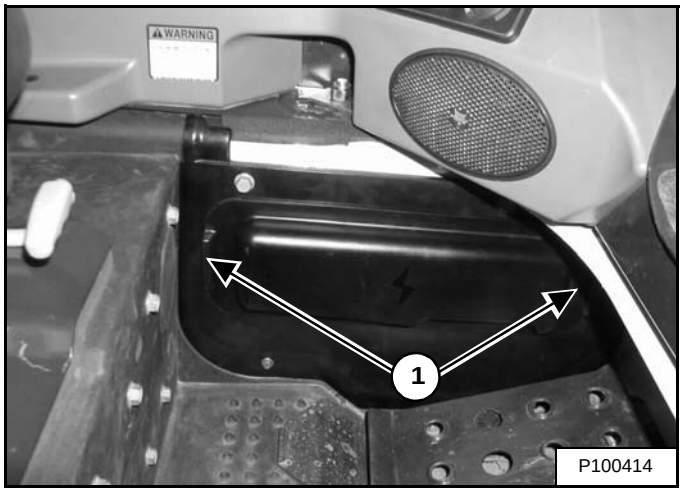
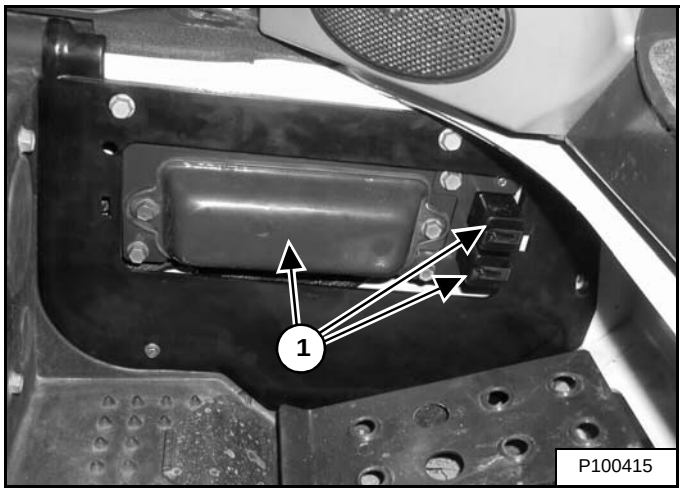
Fuse And Relay Location / Identification

Figure 60-10-2



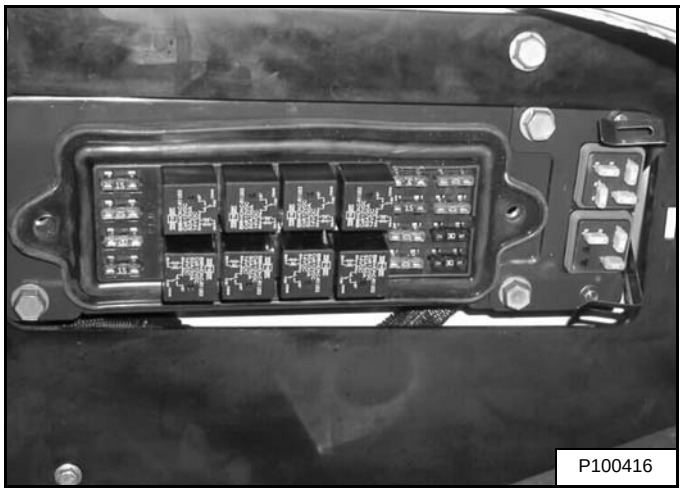
The fuse / relay panels are located behind an access panel near the left foot pedal / footrest. Pull the panel at each end (Item 1) **[Figure 60-10-2]** to remove.

Figure 60-10-3



The electrical system is protected from overload by fuses and relays located under three fuse panel covers (Item 1) **[Figure 60-10-3]**.

Figure 60-10-4



Remove the covers to check or replace the fuses **[Figure 60-10-4]**.

A decal is located inside the access panel to show location and amperage ratings.

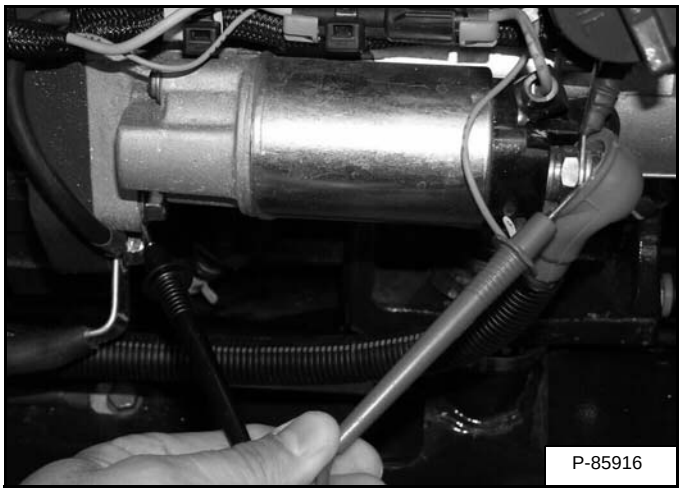
Install the fuse panel covers **[Figure 60-10-3]**.

Line up the clips on the back of the access panel with the slots provided and push the panel into place when finished **[Figure 60-10-2]**. A locating pin prevents the panel from being installed upside down.

A table is provided with details on amperage ratings and circuits affected by each fuse and relay. **[Figure 60-10-5 on Page 10]**

Alternator Voltage Testing

Figure 60-30-5



Open rear door.

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

Turn the engine on with the remote start tool and run at idle. With a voltmeter, check the voltage between the B+ terminal and ground at the starter **[Figure 60-30-5]**.

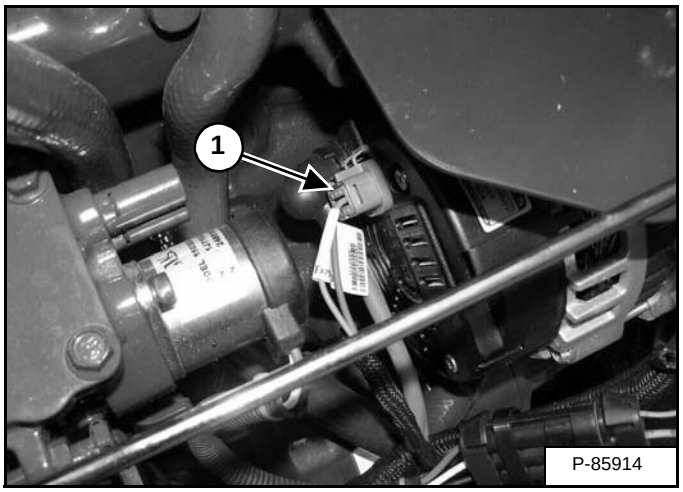
The voltage must be higher than 13.5 volts but lower than 14.7 volts at 21.1°C (70°F) (Alternator Temperature).

If the voltage is higher that 14.7 volts, proceed to the following high voltage test.

If the voltage is lower than 13.5 volts, run the engine at high idle and recheck voltage. If voltage is still below 13.5 volts, proceed with the following low voltage test.

Low Voltage Testing

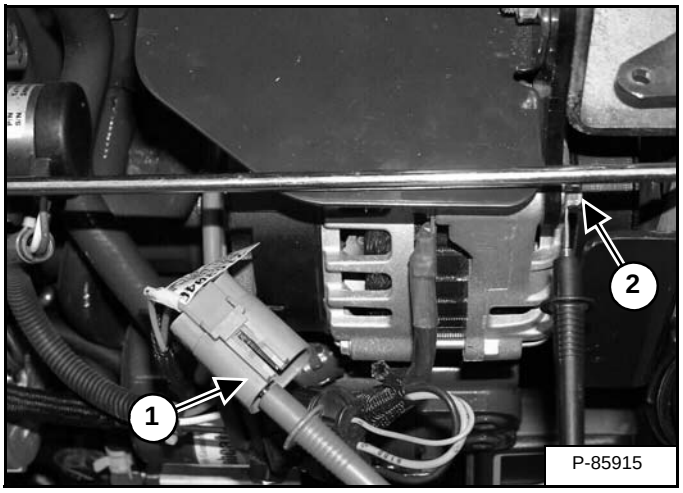
Figure 60-30-6



Turn engine OFF and remove the L & S terminal connector (Item 1) **[Figure 60-30-6]** from the alternator.

Turn the remote start tool key to the ON position.

Figure 60-30-7

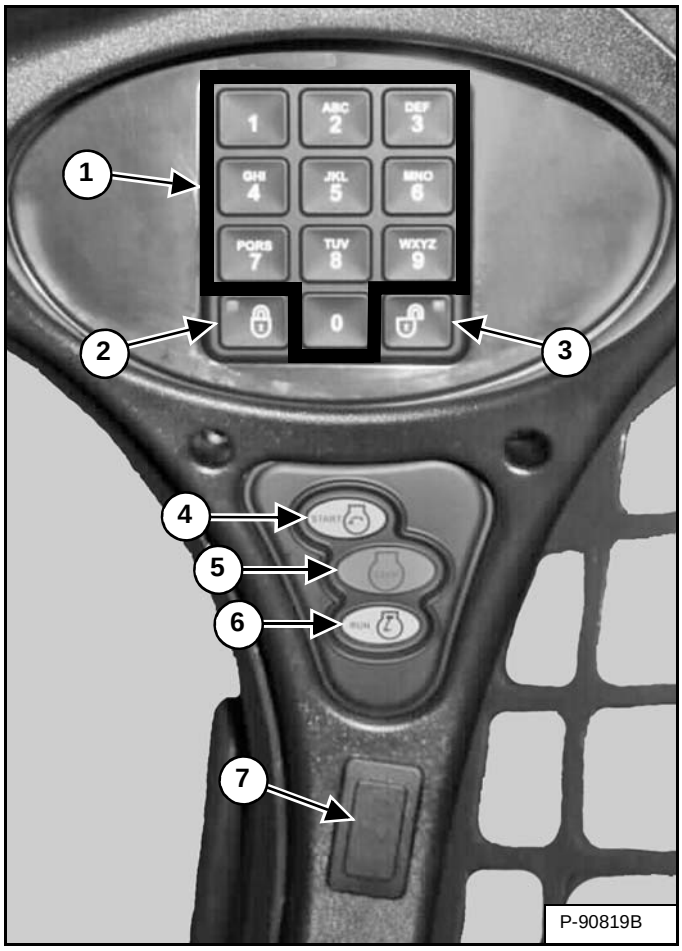


Check the voltage across the "L" terminal (Item 1) and ground (Item 2) **[Figure 60-30-7]**. The voltage should be what the battery voltage is. If not, check wire harness, relay and fuses. If the wire harness, relay and fuses are okay remove alternator for replacement or repair.

INSTRUMENT PANELS (CONT'D)

Right Panel (Keyless Start Panel)

Figure 60-50-4



This machine may be equipped with a Keyless Start Panel **[Figure 60-50-4]**.

1. **Keypad (keys 1 through 0):** Used to enter a number code (password) to allow starting the engine. An asterisk will show in the left panel display screen for each key press.

2. **LOCK Key:** Used to lock keypad. The lock key will display a red light to indicate a password is required to start the loader. (See Password Lockout Feature on Page 60-191-1.)

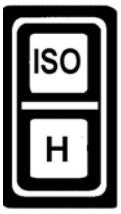
3. **UNLOCK Key:** Used to unlock keypad. The unlock key will display a green light to indicate the loader can be started without a password. (See Password Lockout Feature on Page 60-191-1.)

4. **START Button:** Used to start the engine.

5. **STOP Button:** Used to stop the engine and shut down the loaders electrical system.

6. **RUN Button:** Used to turn on the loaders electrical system.

The switch location (Item 7) **[Figure 60-50-4]** can have different functions depending on machine configuration. See the following table for more information.

REF.	DESCRIPTION	FUNCTION / OPERATION
	ADVANCED CONTROL SYSTEM (ACS) (Option)	Press the top to select Hand Controls; bottom to select Foot Controls.
	SELECTABLE JOYSTICK CONTROLS (SJC) (Option)	Press the top to select 'ISO' Control Pattern; bottom to select 'H' Control Pattern.
	FOUR-WAY FLASHER LIGHTS (Option)	Press the top to turn lights ON; bottom to turn OFF.
	ROTATING BEACON (Option) ***or*** STROBE LIGHT (Option)	Press the top to turn light ON; bottom to turn OFF.

BOBCAT CONTROLLERS (GATEWAY AND AUXILIARY)

Description

The Gateway controller is the main controller, it provides information to all other controllers. All loaders have a Gateway and Auxiliary controller.

The Gateway and Auxiliary controller are located behind the access panel near the operators left foot.

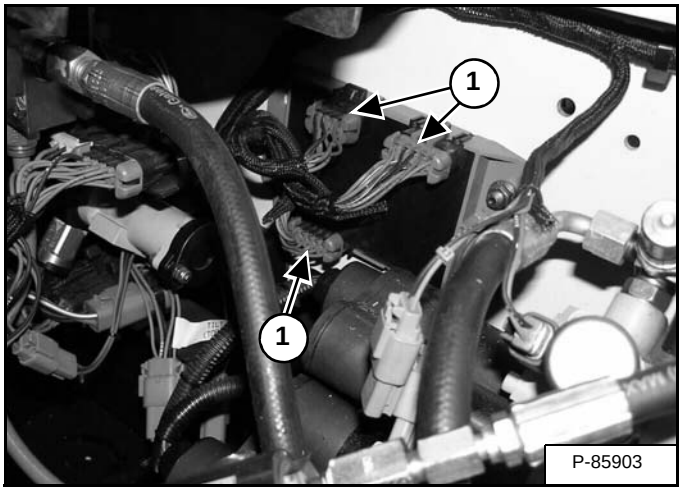
Removal And Installation

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

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

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

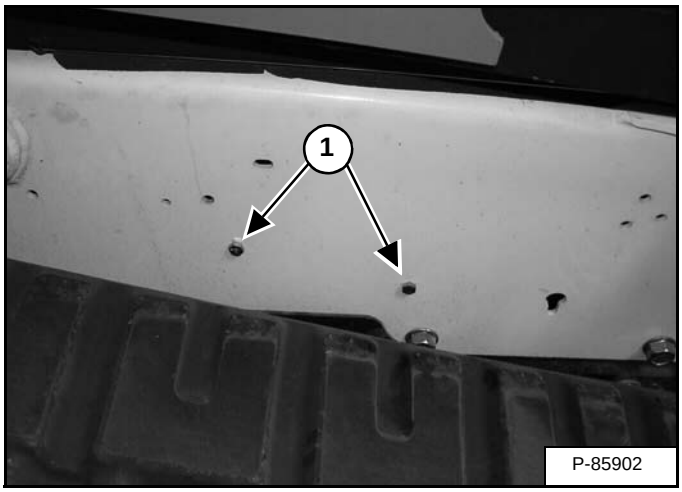
Figure 60-71-1



Unplug the harness connectors (Item 1) **[Figure 60-71-1]** from the controller.

NOTE: The connectors are keyed and will only plug in one way.

Figure 60-71-2



Remove the two mounting bolts (Item 1) **[Figure 60-71-2]** from the controller.

Remove the controller from the loader.

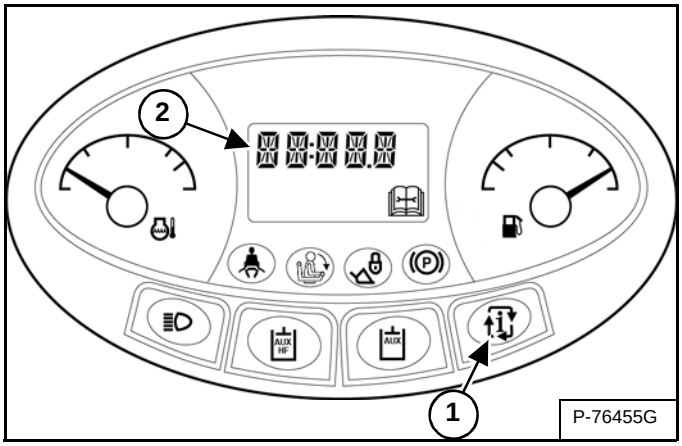
NOTE: The calibration procedure must be followed when replacing a controller. (See Lift And Tilt Calibration (ACS) on Page 60-160-11.)

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.

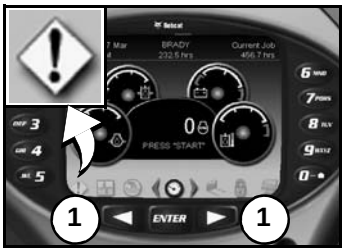
NOTE: Corroded or loose grounds can cause multiple service codes and / or abnormal symptoms. All instrument panel lights flashing, alarm sounding, headlights and taillights flashing, could indicate a bad ground. The same symptoms could apply if the voltage is low, such as loose or corroded battery cables. 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 that includes a brief description.

The last 40 codes stored in history can also be viewed using the Deluxe Instrumentation Panel.

Figure 60-90-2



Press a scroll button (Item 1) repeatedly until the Active Warnings screen icon (Inset) is highlighted.

The ACTIVE WARNINGS screen displays active service codes. Press **[9]** to view the next service code if more than one is present. Press **[4]** to display a history of service codes.

The WARNINGS HISTORY screen will list the Service 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.

Press **[9]** to view the next eight Service Codes.

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.

Press the list number next to the service code for more detail.

Press left scroll button to back up one screen.

P-90378 / NA3025 / NA3000 / NA3038 / NA3035

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

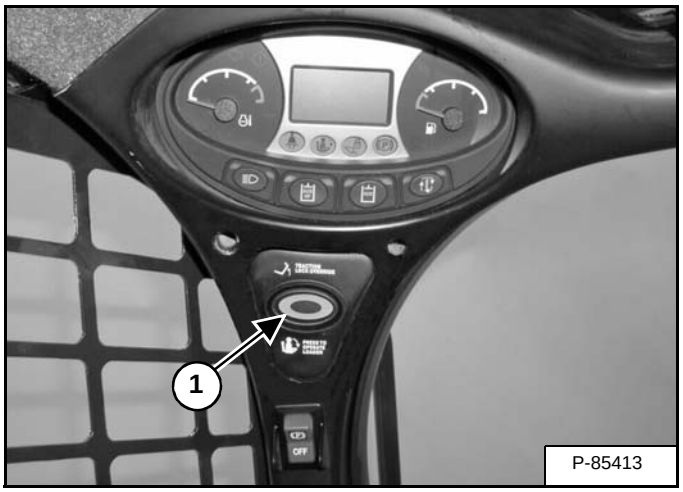
PROBLEM	SOLUTION #
Indicator light does not turn OFF when seat bar is lowered.	1, 2, 3, 4, 5

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 60-120-1

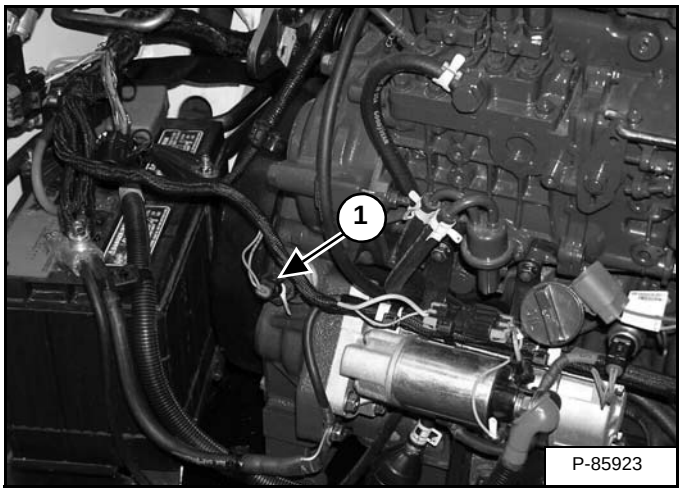


Fasten the seat belt, disengage the parking brake button, press the PRESS TO OPERATE LOADER Button (Item 1) and raise the Seat Bar fully. Move the steering levers slowly forward and backward. The TRACTION lock (Item 4) should be engaged. Lower the Seat Bar. Press the PRESS TO OPERATE LOADER Button (Item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

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 ON until the engine is started, the PRESS TO OPERATE LOADER Button is pressed and the parking brake is disengaged.

Figure 60-120-2



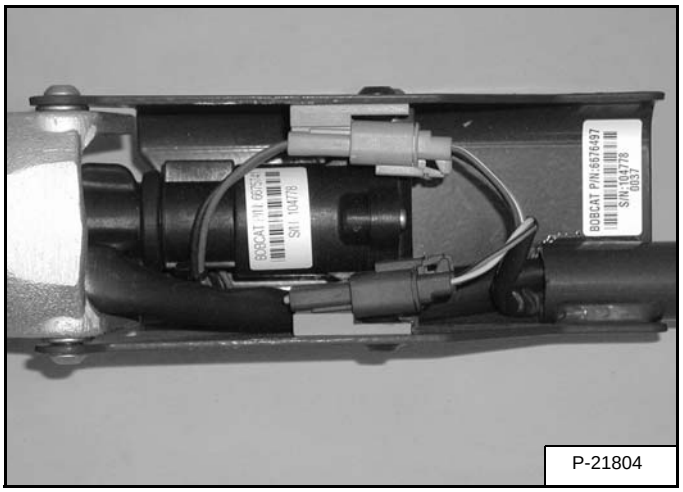
Check the wire connections at the engine speed sensor (Item 1) **[Figure 60-120-2]**.

Check the adjustment of the flywheel speed sensor and replace the speed sensor if needed. (See Adjustment on Page 60-170-2.)

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.

Switch Handle Installation (Cont'd)

Figure 60-130-21

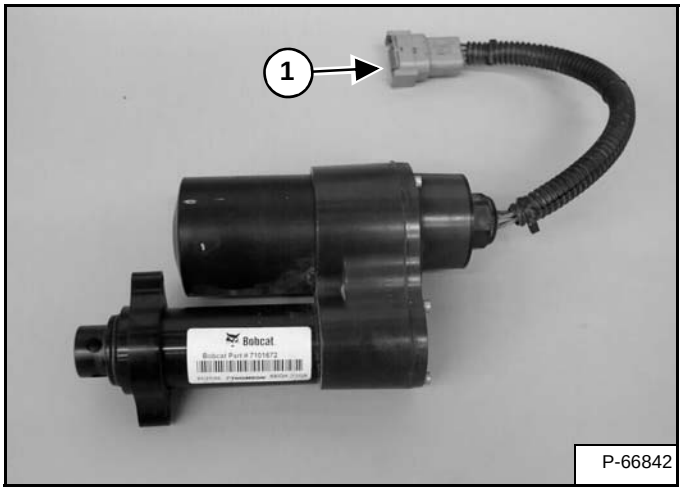


Connect the handle harness connectors to the sensor and lock solenoid connectors **[Figure 60-130-21]**.

Actuator Connector Disassembly And Assembly

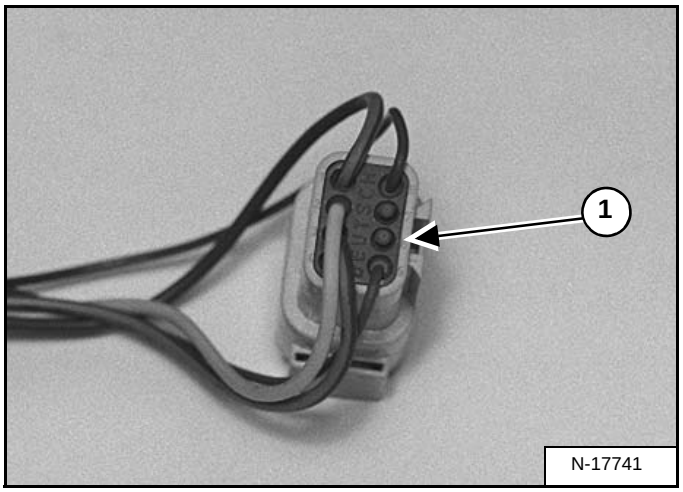
NOTE: Actuator shown removed for clarity. Not necessary for procedure.

Figure 60-130-22



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

Figure 60-130-23



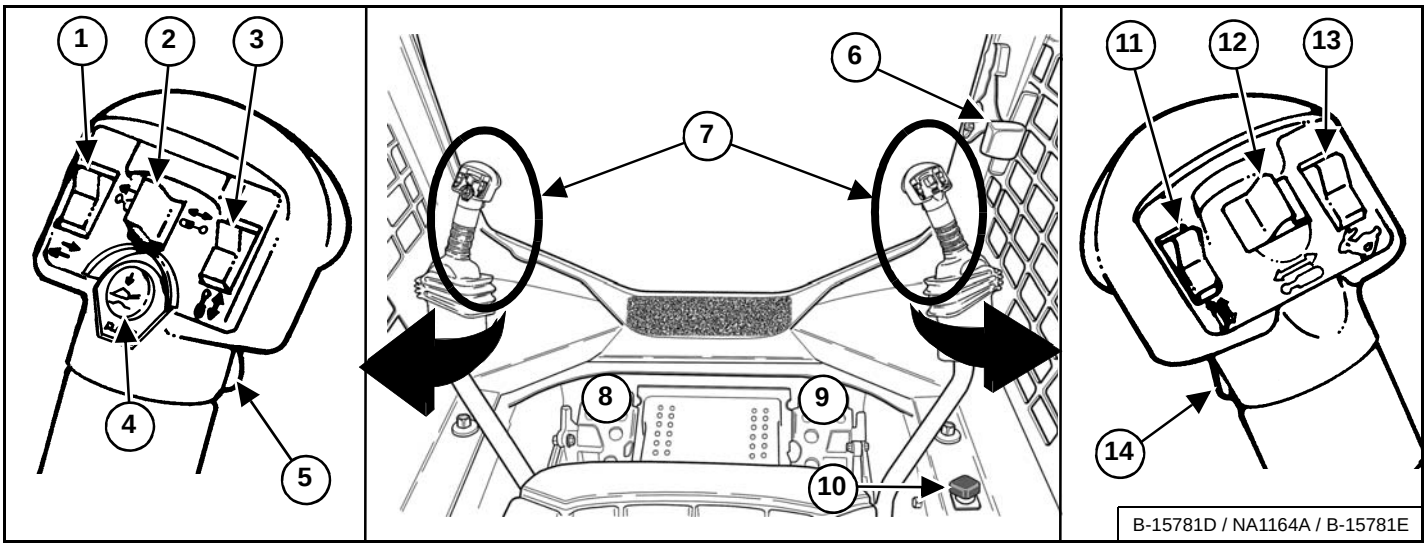
Installation: Install the wires into the connector as listed below. The terminal numbers are written on the back of the connector (Item 1) **[Figure 60-130-23]**.

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	ENGINE SPEED CONTROL
7	STEERING LEVERS AND LIFT / TILT HANDLES
8	LIFT ARM PEDAL
9	TILT PEDAL
10	LIFT ARM BYPASS CONTROL
11	ATTACHMENT FUNCTION CONTROL
12	FRONT AUXILIARY HYDRAULICS
13	NOT USED
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		
	10, 11, 12, 13, 14	-	--	--		K	Jumpers K,P	
P-24820A P-28316A								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.

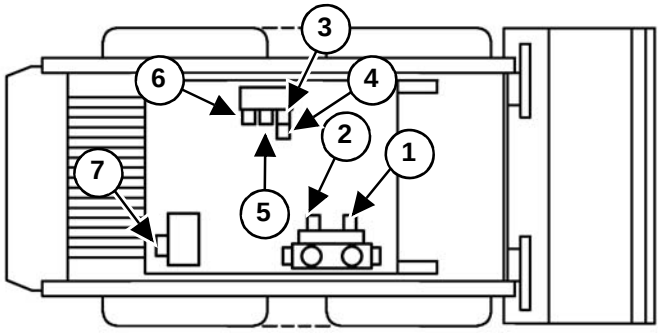
NOTE: For diagnostics and troubleshooting connect the Service PC (See SERVICE PC (LAPTOP COMPUTER) on Page 60-150-1.)

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.



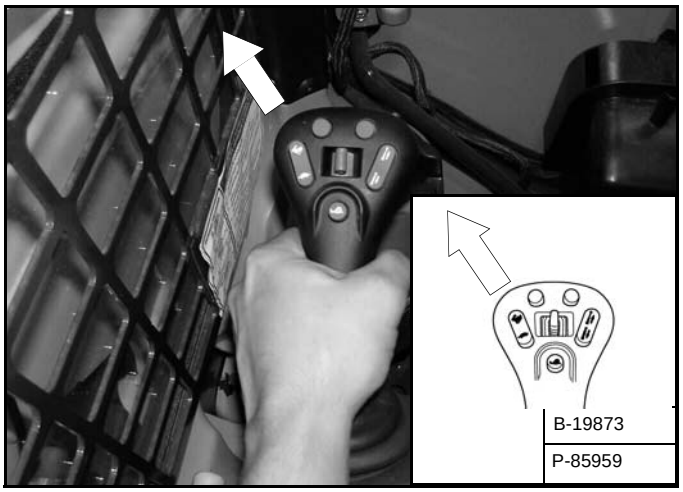
NA1892

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

CALIBRATION (CONT'D)

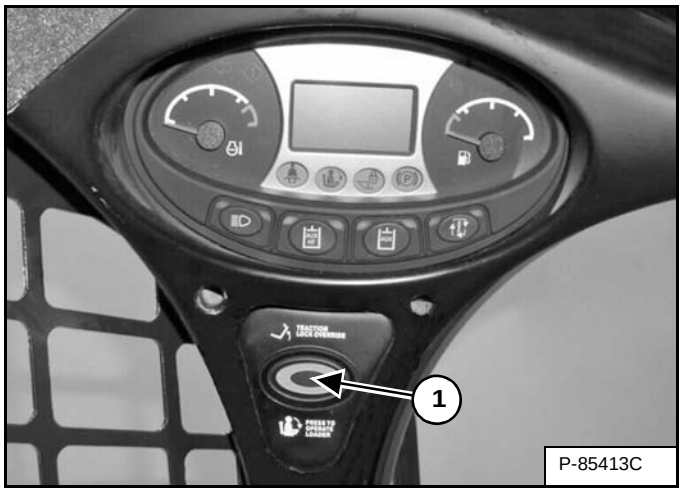
Hydrostatic Pump Calibration (SJC) (Cont'd)

Figure 60-160-11



Move the left joystick to the forward-left corner position **[Figure 60-160-11]** and hold in position.

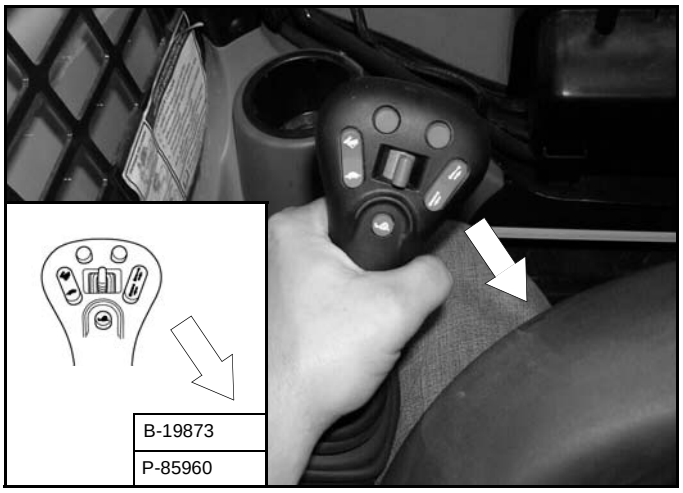
Figure 60-160-12



Press the *PRESS TO OPERATE LOADER* Button (Item 1) **[Figure 60-160-12]** while holding the left joystick in position.

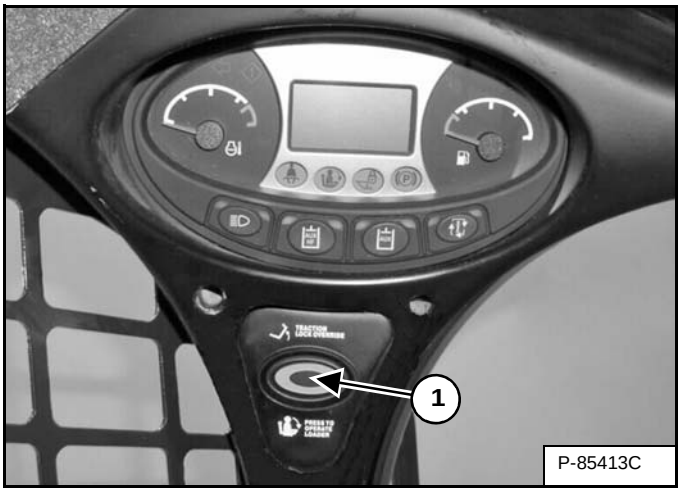
Three audible beeps will sound.

Figure 60-160-13



Move the left joystick to the reverse-right corner position **[Figure 60-160-13]** and hold in position.

Figure 60-160-14



Press the *PRESS TO OPERATE LOADER* Button (Item 1) **[Figure 60-160-14]** while holding the left joystick in position.

Three audible beeps will sound.

CONTROL PANEL SETUP

Right Panel Setup (Deluxe Instrumentation Panel)

Icon Identification

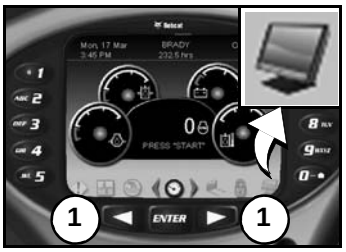
Figure 60-180-1

ICON	DESCRIPTION
Mon, 17 Mar 3:45 PM	DATE / TIME
BRADY 232.5 hrs	USER / HOURMETER
Current Job 456.7 hrs	CURRENT JOB HOURS
	ACTIVE WARNINGS screen icon
	VITALS screen icon
	SERVICE screen icon
	MAIN screen icon
	ATTACHMENTS screen icon
	SECURITY screen icon
	DISPLAY screen icon
	LEFT SCROLL button
	RIGHT SCROLL button
ENTER	ENTER button

Example

Languages

Figure 60-180-2



Press a scroll button (Item 1) repeatedly until the Display screen icon (Inset) is highlighted.

Select **[2. LANGUAGES]**.

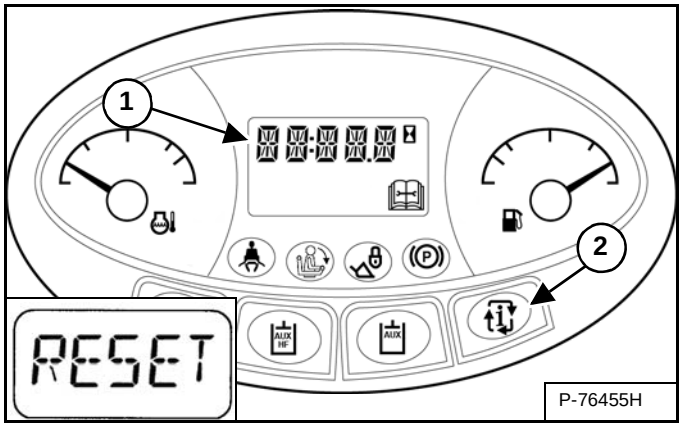
Select the desired language.

P-90385 / NA3025 / NA3012 / NA3023

MAINTENANCE CLOCK (CONT'D)

Reset

Figure 60-200-16



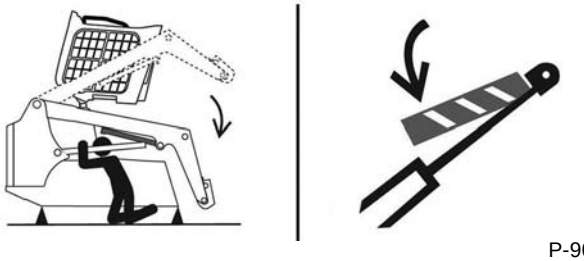
Press the information button (Item 2) until the display screen (Item 1) **[Figure 60-200-16]** shows the maintenance clock.

Press and hold the information button (Item 2) for 7 seconds until **[RESET]** (Inset) appears in the display screen (Item 1) **[Figure 60-200-16]**.

ENGINE SERVICE

Engine Removal And Installation

DANGER



P-90328

AVOID DEATH

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

D-1009-0409

WARNING

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

W-2059-0598

Put jackstands under the rear corners of the loader.

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.)

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

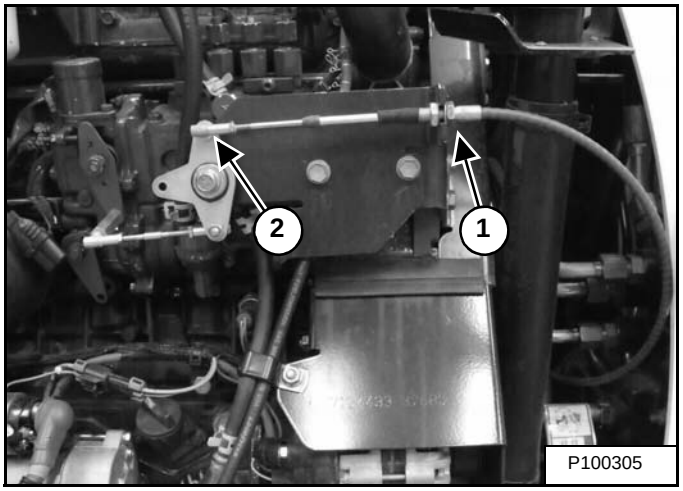
Remove the battery from the loader. (See Removal And Installation on Page 60-20-1.)

Drain the engine coolant from the cooling system. (See Removing And Replacing Coolant on Page 10-90-3.)

NOTE: If compressor is being removed for engine removal it is not necessary to remove the A/C hoses. Remove the mounting bolts and belt and reposition the compressor.

Remove the muffler. (See Removal And Installation on Page 70-30-1.)

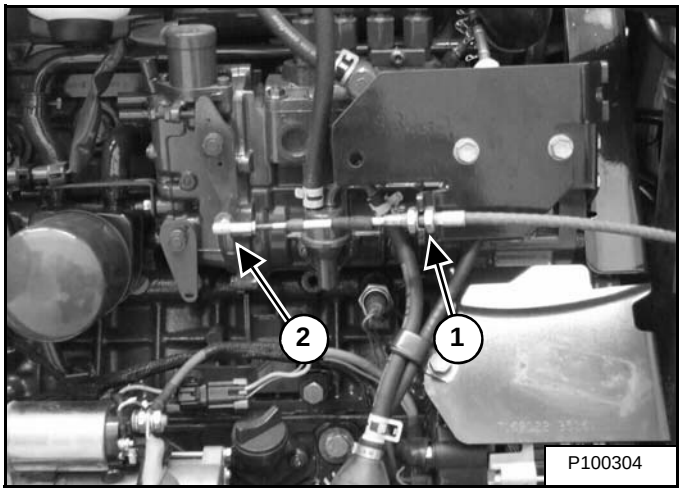
Figure 70-10-2



(SJC controls equipped)

Loosen the engine speed control cable adjustment nuts (Item 1) and remove the engine speed control cable from the ball pivot (Item 2). **[Figure 70-10-2]**.

Figure 70-10-3



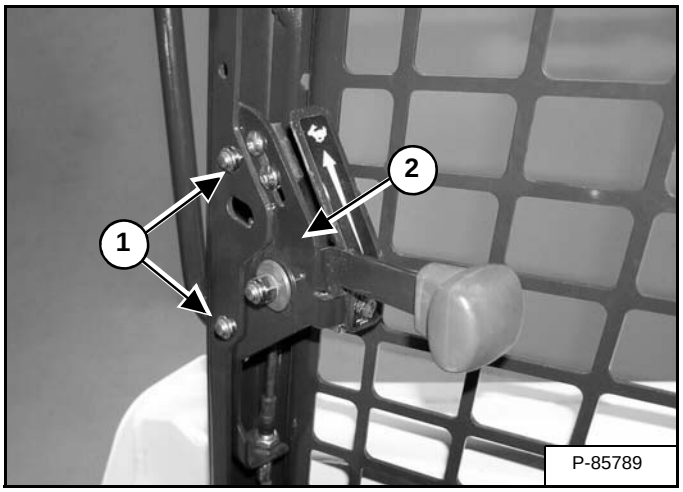
(Manual controls equipped)

Loosen the engine speed control cable adjustment nuts (Item 1) and remove the engine speed control cable from the ball pivot (Item 2) **[Figure 70-10-3]**.

ENGINE SPEED CONTROL (SCPA)

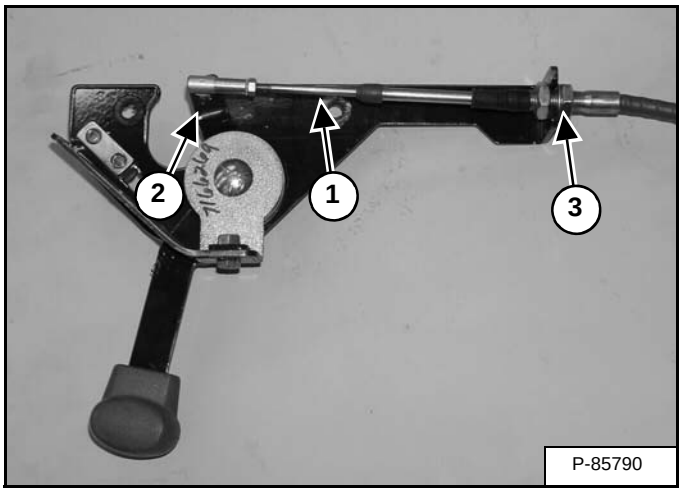
Removal And Installation

Figure 70-20-1



Remove the two mounting bolts (Item 1) **[Figure 70-20-1]**.

Figure 70-20-2



The speed control cable (Item 1) is connected to the speed control handle (Item 2) by a ball and socket end **[Figure 70-20-2]**.

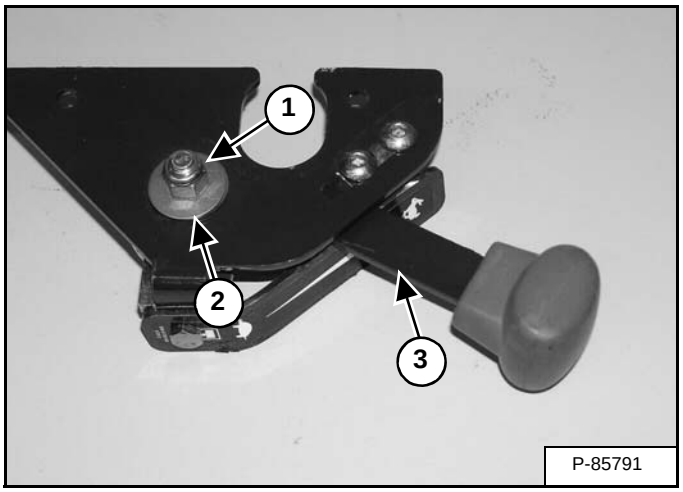
Disconnect the speed control cable (Item 1) from the speed control handle (Item 2) **[Figure 70-20-2]**.

Loosen the jam nut (Item 3) **[Figure 70-20-2]** from the speed control cable.

Remove the cable from the speed control handle.

Disassembly And Assembly

Figure 70-20-3



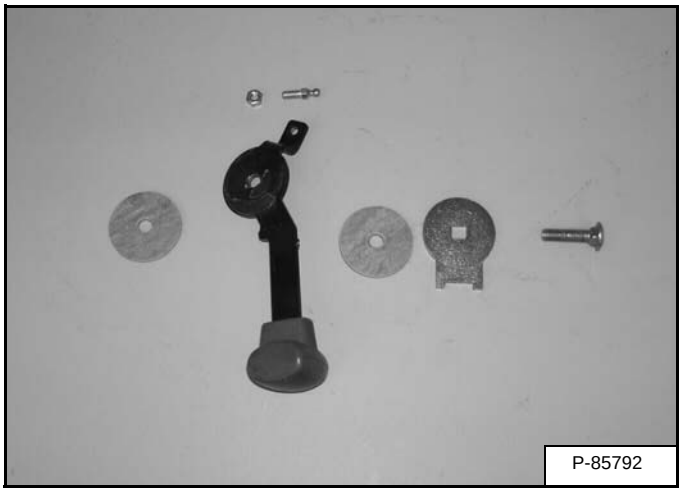
Remove the nut (Item 1) and remove the two conical washers (Item 2) **[Figure 70-20-3]**.

Remove the handle (Item 3) **[Figure 70-20-3]**.

Installation: Install the two conical washers with the concave surfaces facing each other (Item 2) **[Figure 70-20-3]**.

Installation: Tighten the nut (Item 1) **[Figure 70-20-3]** until the speed control lever moves backward and forward at a comfortable tension.

Figure 70-20-4



Inspect and replaced any damaged parts **[Figure 70-20-4]**.

Radiator Removal And Installation

Stop the engine and open the rear door.

Remove the rear grille and side panels. (See Removal And Installation on Page 50-60-1.)

Remove the oil cooler. (See Removal And Installation on Page 20-90-1.)

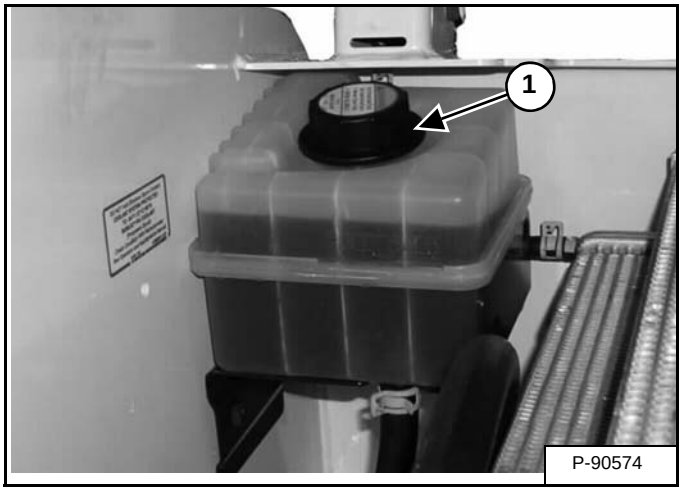
⚠ WARNING

AVOID BURNS

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

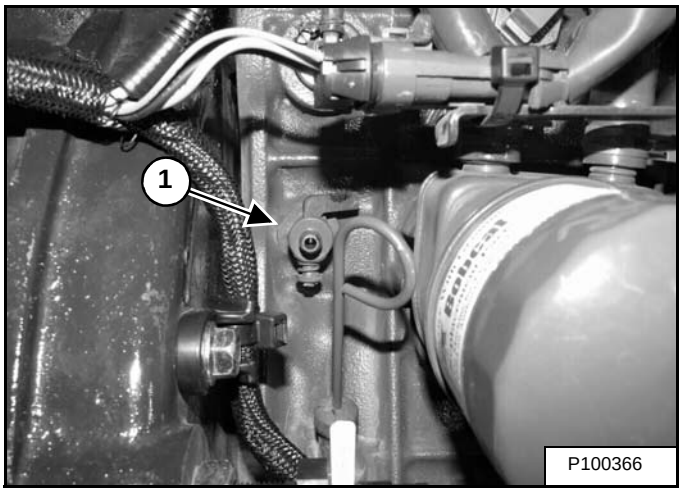
W-2070-1203

Figure 70-50-1



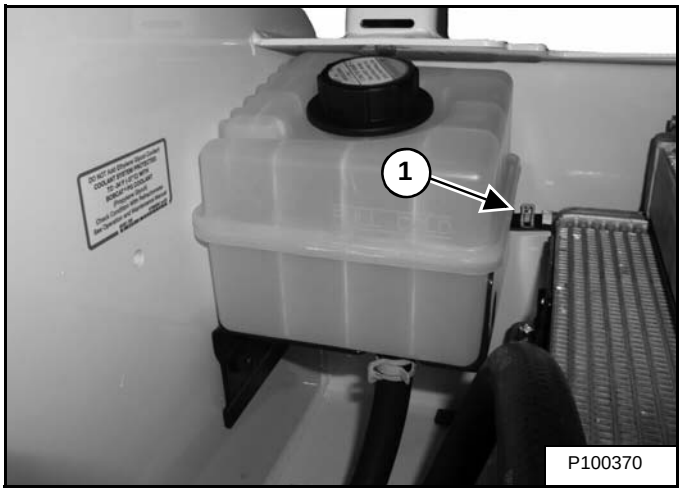
Loosen the radiator cap (Item 1) from the pressurized expansion tank **[Figure 70-50-3]**.

Figure 70-50-2



Attach a hose to the coolant drain petcock (Item 1) **[Figure 70-50-2]** located to the left of the oil filter assembly. Open the petcock and drain the coolant into a container. Close the petcock and remove the hose.

Figure 70-50-3



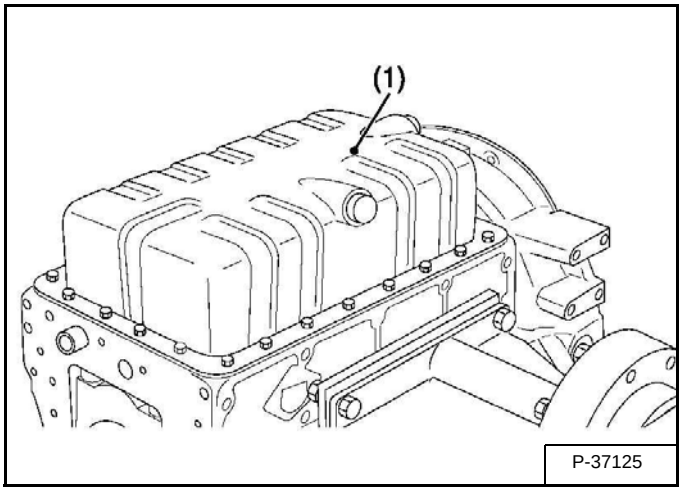
Disconnect and plug radiator air bleed hose (Item 1) **[Figure 70-50-3]**.

LUBRICATION SYSTEM

Oil Pan Removal And Installation

Remove the engine / hydrostatic pump package from the loader. (See Engine Removal And Installation on Page 70-10-7.)

Figure 70-60-1



Remove the oil pan mounting bolts and remove the oil pan (Item 1) **[Figure 70-60-1]**.

Figure 70-60-2

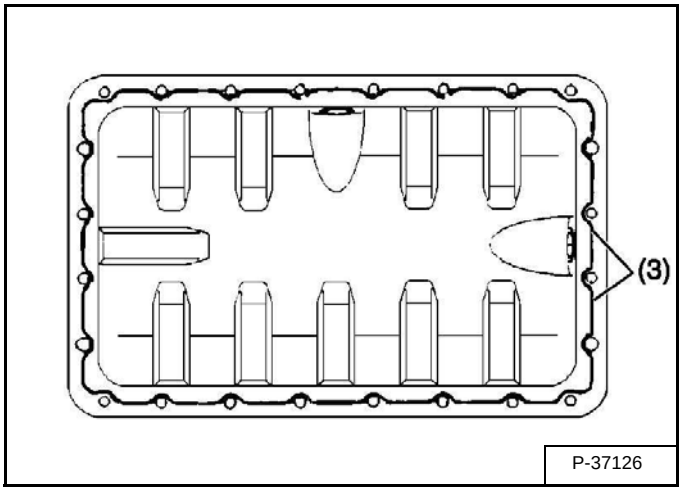
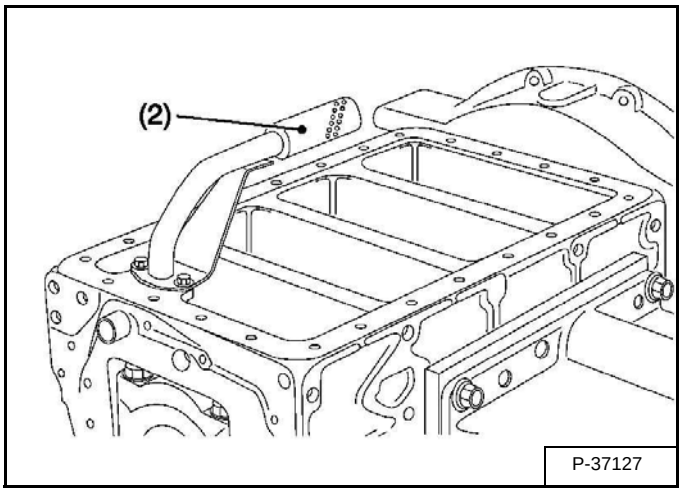


Figure 70-60-3



Remove the oil strainer mounting bolts and remove the oil strainer (Item 2) **[Figure 70-60-3]**.

Install the oil strainer, using care not to damage the O-ring.

Apply liquid gasket to the oil pan (Item 3) **[Figure 70-60-2]**.

Confirm that the liquid gasket coating surface is free of water, dust and oil in order to maintain sealing effect.

Carefully apply the adhesive evenly.

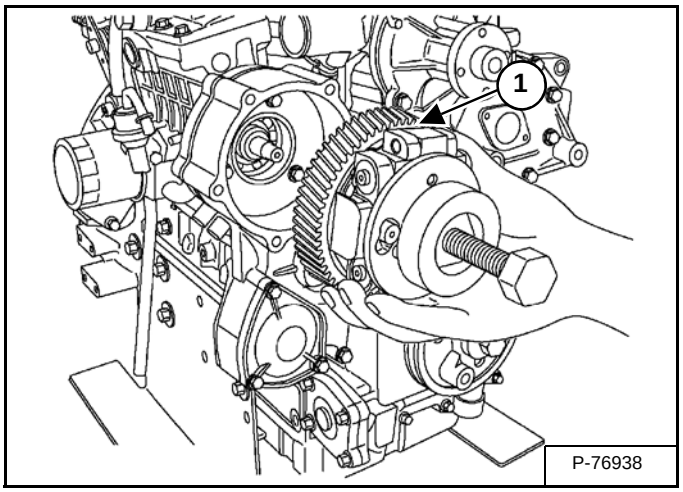
NOTE: When mounting the adhesive-applied parts, take care to fit them to the mating parts.

Assemble the adhesive-applied parts within ten minutes.

To avoid uneven tightening, tighten mounting bolts in diagonal order from the center.

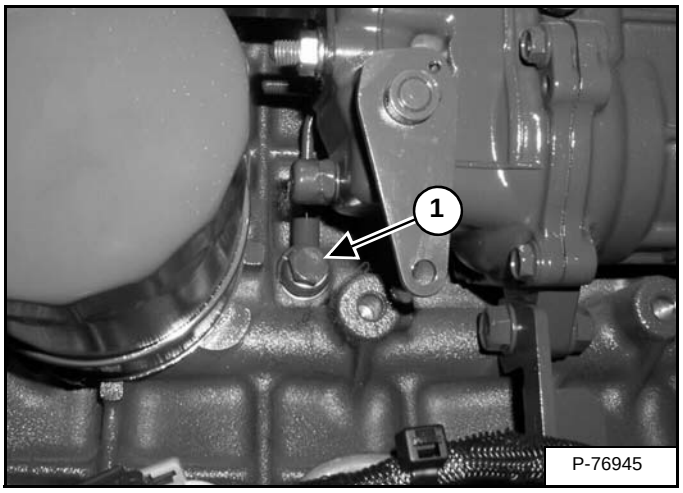
Fuel Injection Pump Assembly Removal (Cont'd)

Figure 70-70-14



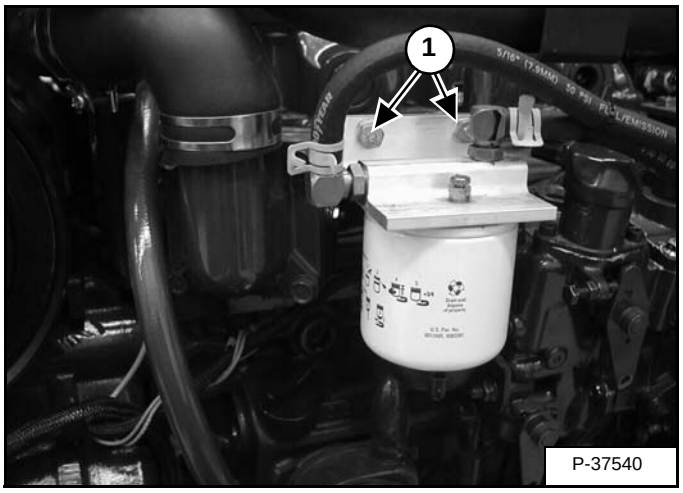
Remove the timer gear assembly (Item 1) **[Figure 70-70-14]**.

Figure 70-70-15



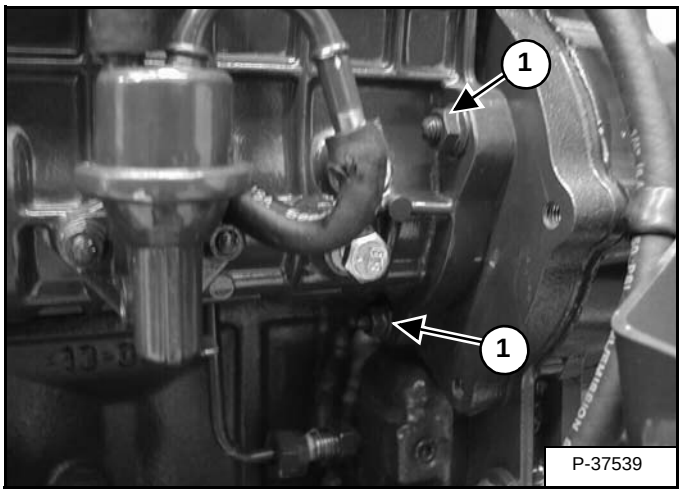
Disconnect the lubrication oil tubeline (Item 1) **[Figure 70-70-15]**.

Figure 70-70-16



Remove the two mounting bolts (Item 1) **[Figure 70-70-16]** and move the fuel filter, to allow clearance for the injection pump assembly to be removed.

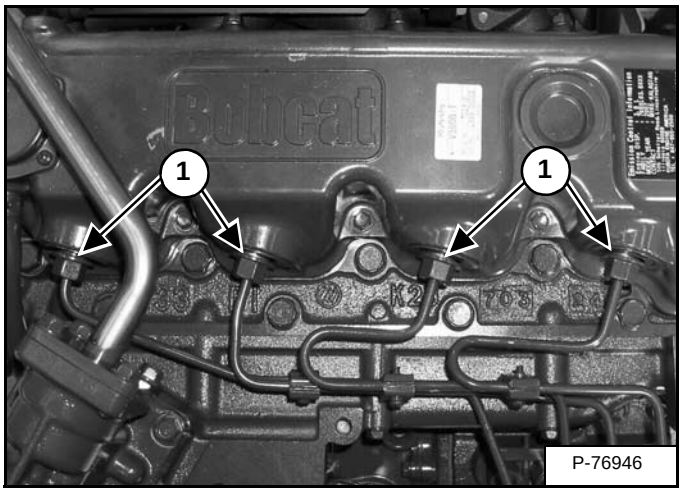
Figure 70-70-17



Remove the three injection pump assembly mounting flange nuts (Item 1) **[Figure 70-70-17]**. (Two on the front side and one on the back side of the injection pump assembly.)

Fuel Injection Pump Removal (Cont'd)

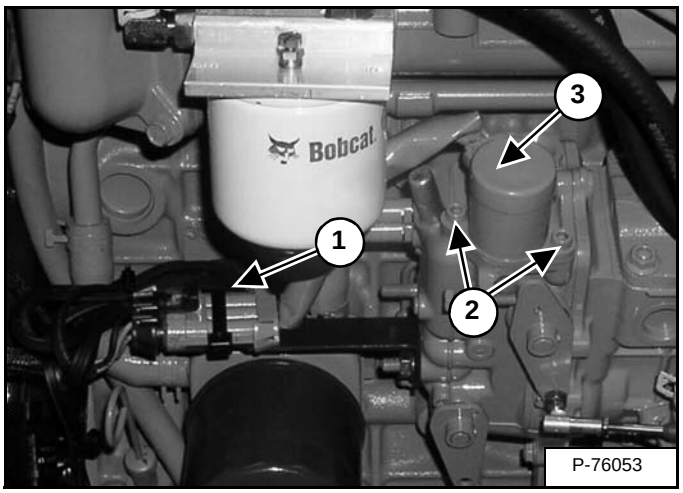
Figure 70-70-47



Disconnect the four injection lines (Item 1) **[Figure 70-70-47]** at the injection nozzle assemblies.

Remove the injection lines from the loader.

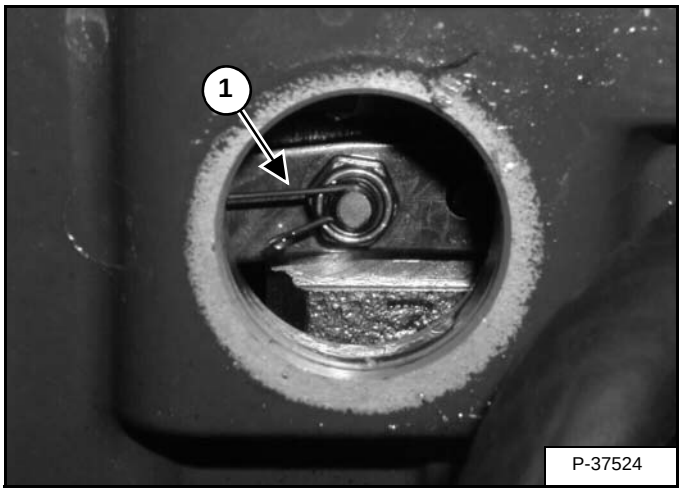
Figure 70-70-48



Disconnect the electrical connector (Item 1) from the fuel stop solenoid. Then remove the two mounting bolts (Item 2) **[Figure 70-70-48]** from the fuel stop solenoid.

Remove the solenoid (Item 3) **[Figure 70-70-48]** from the injection pump.

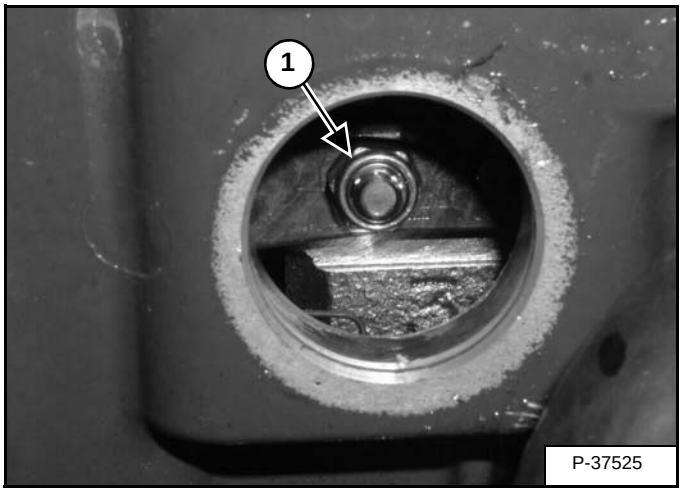
Figure 70-70-49



Disconnect the starter spring hook (Item 1) **[Figure 70-70-49]**.

NOTE: Be careful to not deform the starter spring.

Figure 70-70-50



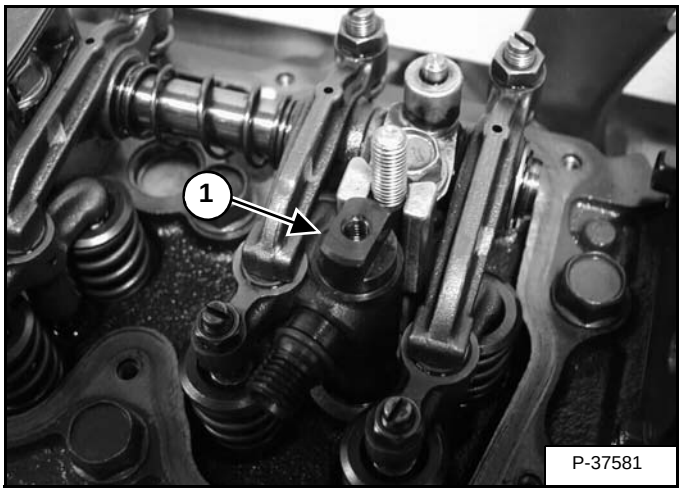
Remove the governor connecting rod nut (Item 1) **[Figure 70-70-50]**.

NOTE: Be careful not to drop the governor connecting rod nut.

Installation: Tighten the governor connecting rod nut to 2,8 - 4,0 N•m (2.1 - 2.9 ft-lb) torque.

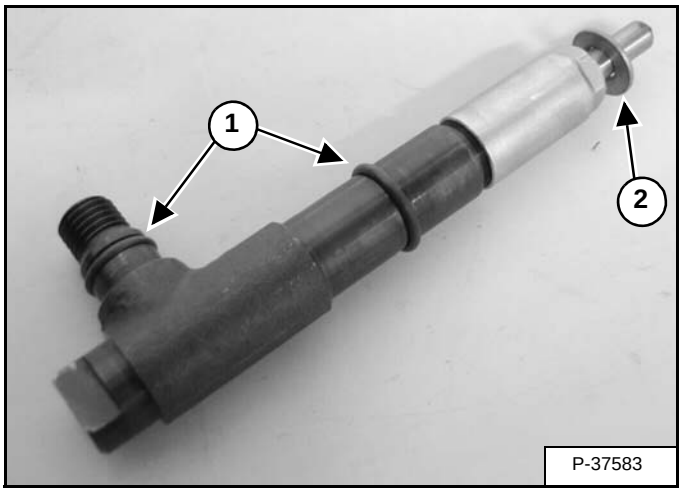
Fuel Injector Removal And Installation (Cont'd)

Figure 70-70-85



Remove the injection nozzle assembly (Item 1) **[Figure 70-70-85]** from the engine.

Figure 70-70-86

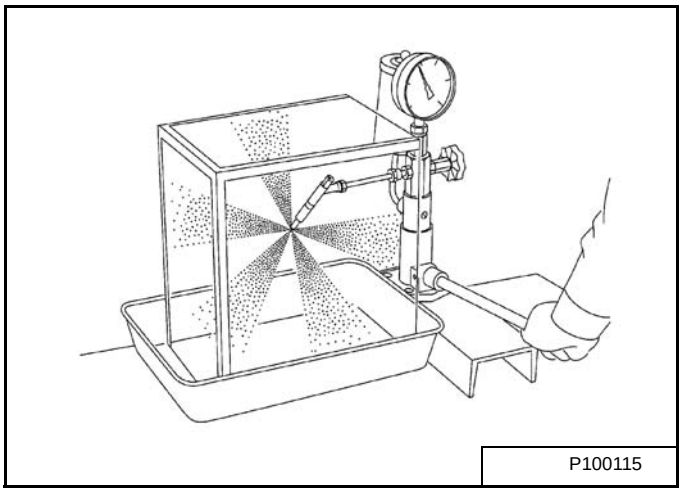


Check the injection nozzle assembly O-rings (Item 1) and nozzle washer (Item 2) **[Figure 70-70-86]**.

Always replace the injection nozzle assembly O-rings and washer before installation.

Fuel Injector Nozzle Pressure - Checking

Figure 70-70-87



Install the injection nozzle assembly onto the nozzle tester (OEM1064).

Slowly move the tester handle to measure the pressure at which fuel begins jetting out from the nozzle.

If the measurement is not within the factory specifications, repair or replace the injection nozzle assembly.

NOTE: injection nozzle assembly gasket must be replaced when the injection nozzle assembly is removed for checking.

Injection pressure	Factory specification	1st stage	18,6 - 19,6 MPa (186,4 - 196,1 bar) (2703 - 2844 psi)

Valve Guide - Checking

The tool described below is not provided. The tool is used for inserting and removing the valve guides.Use the dimensions below **[Figure 70-80-28]** and **[Figure 70-80-29]** to make this tool.

Figure 70-80-28

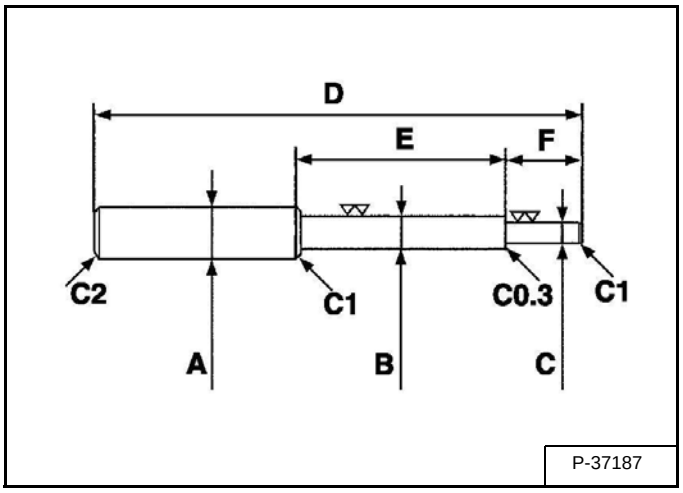
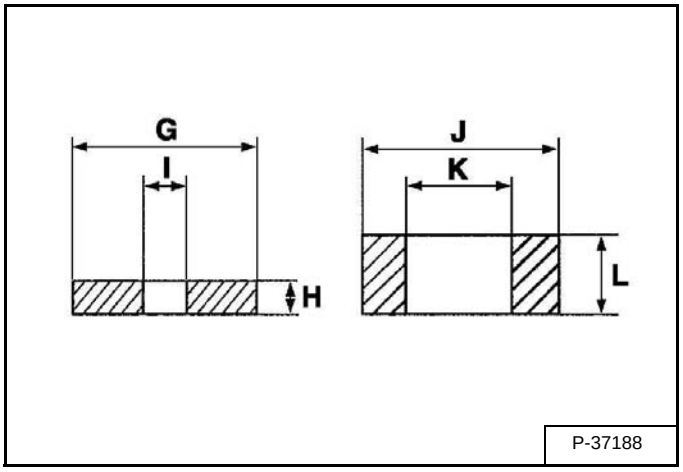
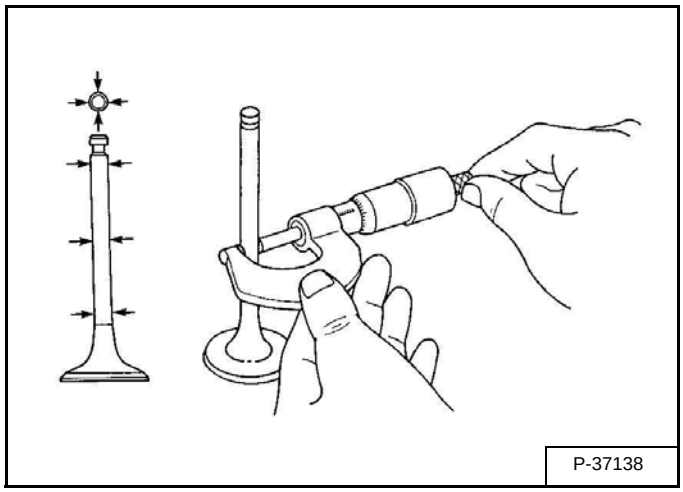


Figure 70-80-29



A	20 mm dia. (0.79 in dia.)
B	11,7 - 11,9 mm dia. (0.461 - 0.468 in dia.)
C	6,50 - 6,60 mm dia. (0.256 - 0.259 in dia.)
D	225 mm (8.86 in)
E	70 mm (2.8 in)
F	45 mm (1.8 in)
G	25 mm (0.98 in)
H	5 mm (0.2 in)
I	6.70 - 7.00 mm dia. (0.264 - 0.275 in dia.)
J	20 mm dia. (0.79 in dia.)
K	12,5 - 12,8 mm dia. (0.493 - 0.503 in dia.)
L	8,90 - 9,10 mm dia. (0.351 - 0.358 in dia.)
C1	Chamfer 1,0 mm (0.039 in)
C2	Chamfer 2,0 mm (0.079 in)
C0.3	Chamfer 0,3 mm (0.01 in)

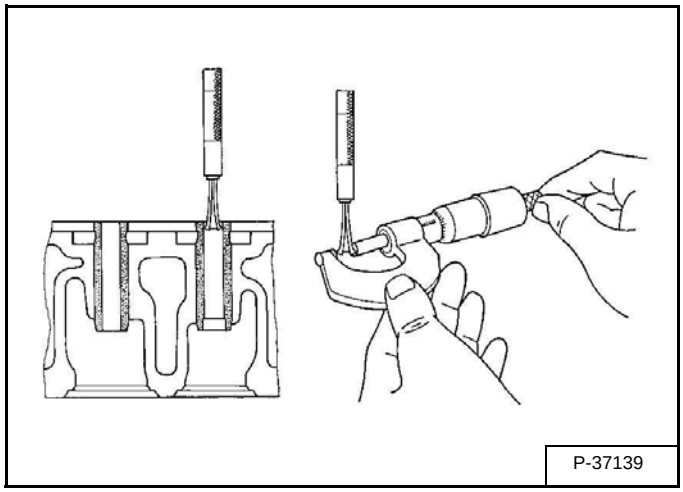
Figure 70-80-30



Remove carbon from the valve guide section.

Measure the valve stem O.D. with an outside micrometer **[Figure 70-80-30]**.

Figure 70-80-31

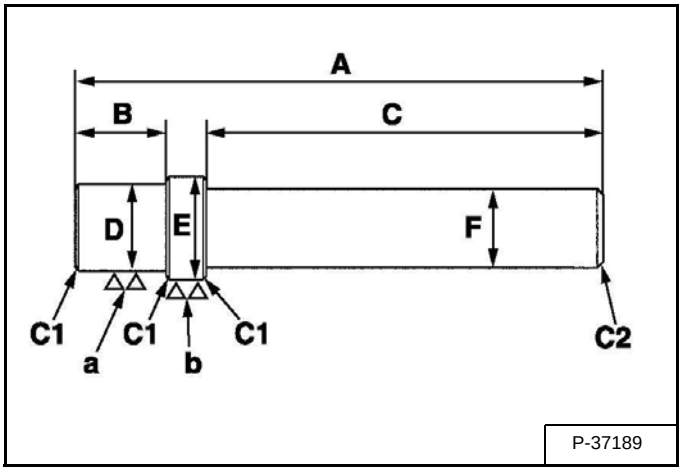


Measure the valve guide I.D. of the cylinder head at the most wear part as shown in **[Figure 70-80-31]** with a small hole gauge and calculate the clearance.

Piston And Connecting Rod - Servicing

The Small End Bushing Replacing Tool can be made using the dimensions below. One set of dimensions is for the press out tool and one for press fit.

Figure 70-90-6



Small End Bushing Replacing Tool

Application: Use to press out and to press fit the small end bushing in the connection rod.

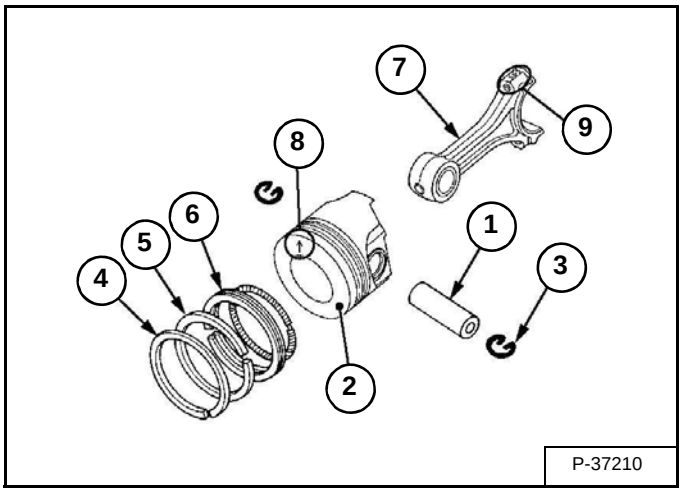
(Press out)

A	157 mm (6.18 in)
B	14,5 mm (0.571 in)
C	120 mm (4.72 in)
D	30 mm dia. (1.181 in dia.)
E	32,95 mm dia. (1.297 in dia.)
F	20 mm (0.79 in)
a	0,0000063 mm (0.00025 in)
b	0,0000063 mm (0.00025 in)
C1	Chamfer 1,0 mm (0.039 in)
C2	Chamfer 2,0 mm (0.079 in)

(Press fit)

A	157 mm (6.18 in)
B	14,5 mm (0.571 in)
C	120 mm (4.7244 in)
D	30 mm dia. (1.181 in dia.)
E	42,000 mm dia. (1.6535 in dia.)
F	20 mm (0.79 in)
a	0,0000063 mm (0.00025 in)
b	0,0000063 mm (0.00025 in)
C1	Chamfer 1,0 mm (0.039 in)
C2	Chamfer 2,0 mm (0.079 in)

Figure 70-90-7



1. Piston Pin

2. Piston

3. Piston Pin Snap Ring

4. Compression Ring 1

5. Compression Ring 2

6. Oil Ring

7. Connecting Rod

8. Mark (↑)

9. Numbering Mark

Remove the piston rings using a piston ring tool **[Figure 70-90-7]**.

Remove the piston pin (Item 1), and separate the connecting rod (Item 7) from the piston (Item 2) **[Figure 70-90-7]**.

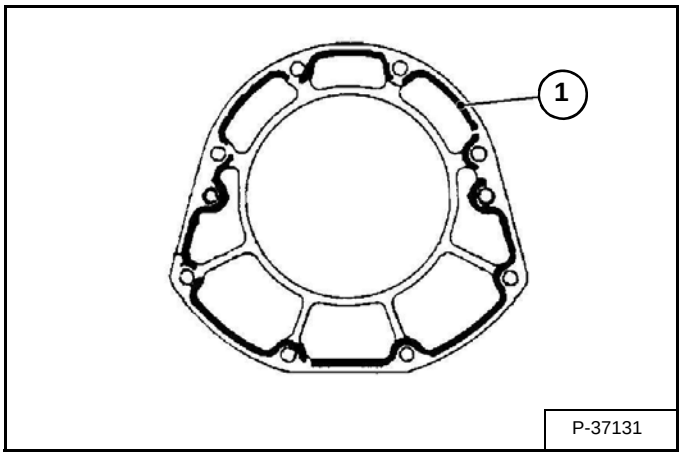
Installation: When installing the piston pin, immerse the piston in 80° C (176° F) oil for 10 to 15 minutes and insert the piston pin to the piston.

Assemble the piston to the connecting rod with the ↑ mark (Item 8) and the connecting rod numbering mark (Item 9) **[Figure 70-90-7]** facing same side.

NOTE: Mark the same number on the connecting rod and the piston so as not to change the combination.

Crankshaft And Bearings Installation (Cont'd)

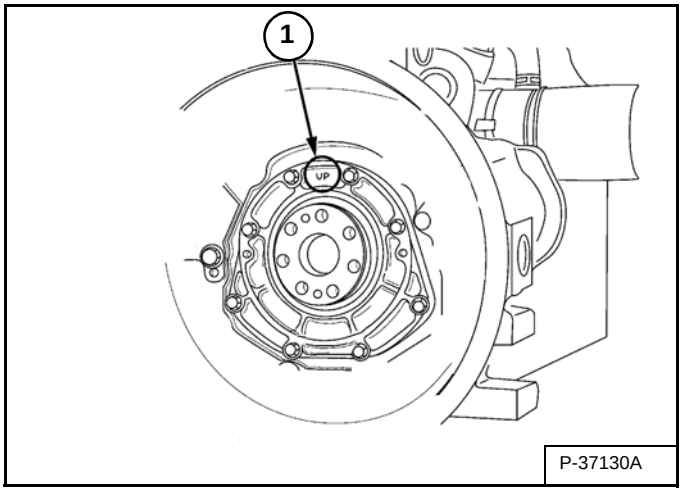
Figure 70-90-35



NOTE: When replacing the oil seal, use caution installing the seal in the bearing case cover as not to install it tilted. The seal should be flush with the cover.

Apply liquid gasket (Item 1) **[Figure 70-90-35]** to the bearing case cover evenly.

Figure 70-90-36



NOTE: Install the bearing case cover / oil seal assembly with the casting mark labeled "UP" (Item 1) [Figure 70-90-36] at the top.

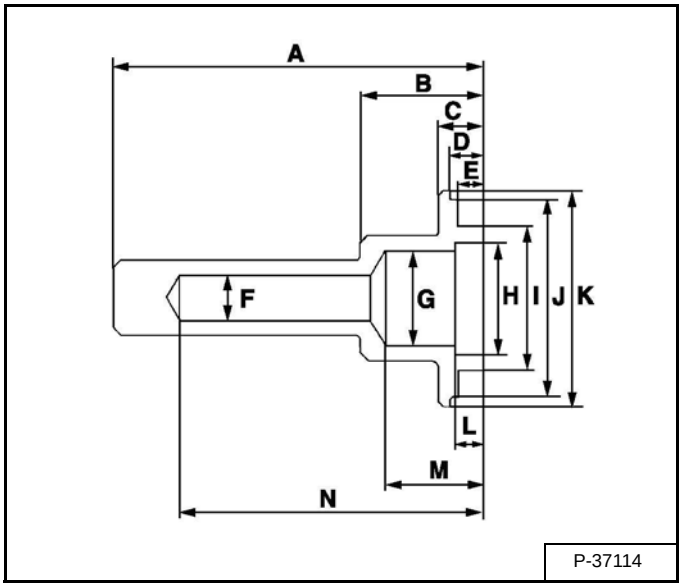
Tighten the bearing case cover mounting bolts with even force on the diagonal line.

Tightening torque	Bearing Case Cover mounting bolt	24 - 27 N•m (18 - 20 ft-lb)

Crankshaft And Bearings - Servicing

The following special tools are not provided, **[Figure 70-90-37]**, **[Figure 70-90-38]** and **[Figure 70-90-22]**.

Figure 70-90-37



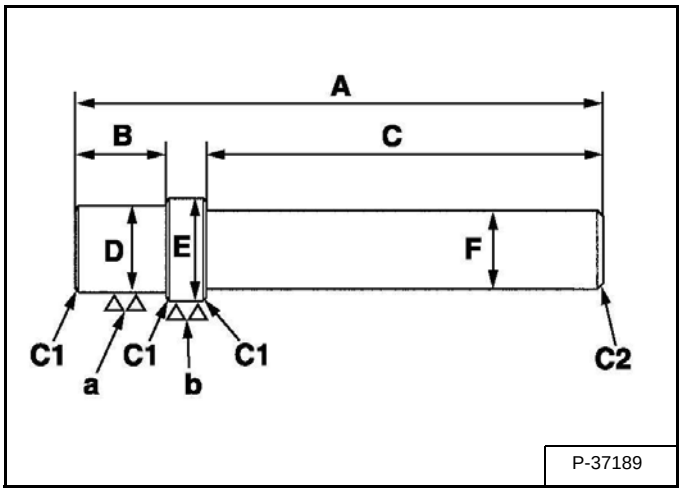
Gearcase Oil Seal Replacing Tool

Application: Use to press fit the oil seal.

A	148,8 mm (5.858 in)
B	50 mm (2.0 in)
C	18,8 mm (0.740 in)
D	13,7 - 13,9 mm (0.540 - 0.547 in)
E	11 mm (0.43 in)
F	18 mm dia. (0.71 in dia.)
G	38 mm dia. (1.5 in dia.)
H	45 mm dia. (1.8 in dia.)
I	57,90 - 58,10 mm (2.280 - 2.287 in)
J	79,5 mm dia. (3.13 in dia.)
K	87 mm (3.4 in)
L	12 mm (0.47 in)
M	40 mm (1.6 in)
N	120 mm (4.72 in)

Idler Gear And Shaft - Servicing

Figure 70-100-13



Bushing Replacing Tool

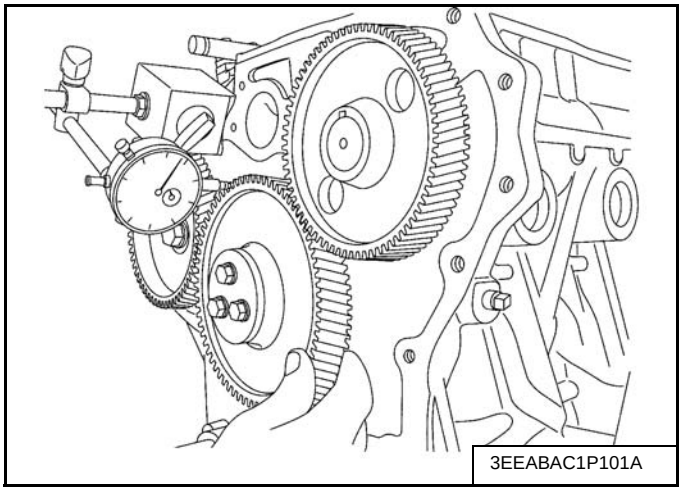
Application: Use to press out and press fit the bushing.

1. For idle gear bushing.

A	196 mm (7.72 in)
B	37,5 mm (1.48 in)
C	150 mm (5.91 in)
D	44,95 mm dia. (1.770 in dia.)
E	48,075 - 48,100 mm dia. (1.8928 - 1.8937 in dia.)
F	20 mm dia (0.79 in dia)
a	0,0000063 mm (0.00025 in)
b	0,0000063 mm (0.00025 in)
C1	Chamfer 1,0 mm (0.039 in)
C2	Chamfer 2,0 mm (0.079 in)

Side Clearance

Figure 70-100-14



Set a dial indicator with its tip on the idle gear **[Figure 70-100-14]**.

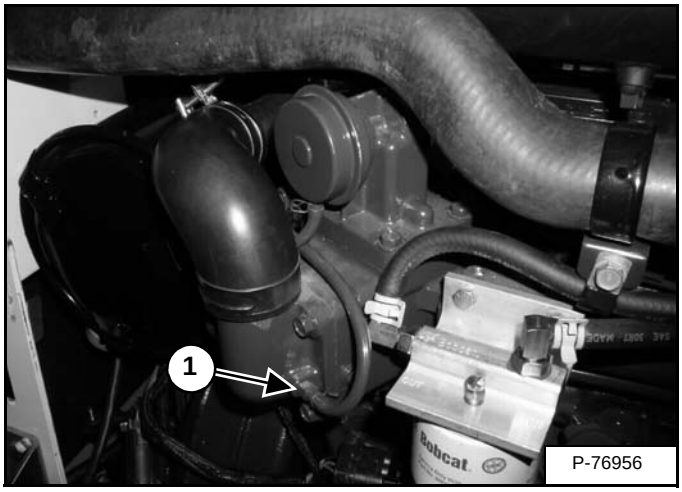
Measure the side clearance by moving the idle gear to the front and rear.

If the measurement exceeds the allowable limit, replace the idle gear collar.

Side clearance	Factory spec.	0,15 - 0,30 mm (0.0059 - 0.011 in)
	Allowable limit	0,9 mm (0.04 in)

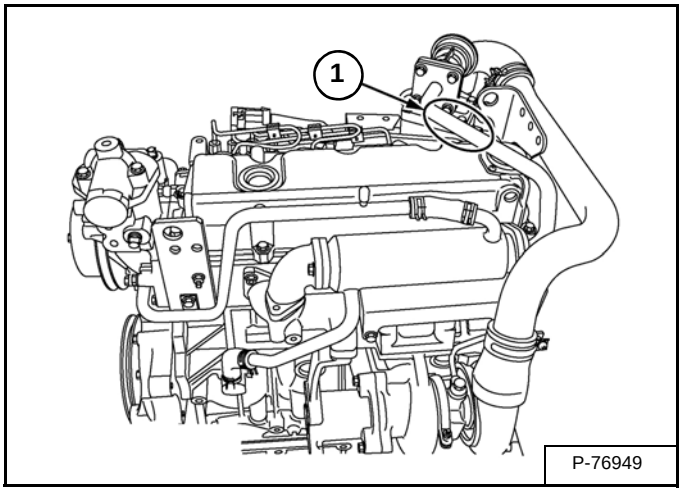
Testing (Cont'd)

Figure 70-130-2



Disconnect the boost hose (Item 1) **[Figure 70-130-2]** from the intake.

Figure 70-130-3



Measure the surface temperature of the EGR pipe (Item 1) **[Figure 70-130-3]** with an Infrared Thermometer.

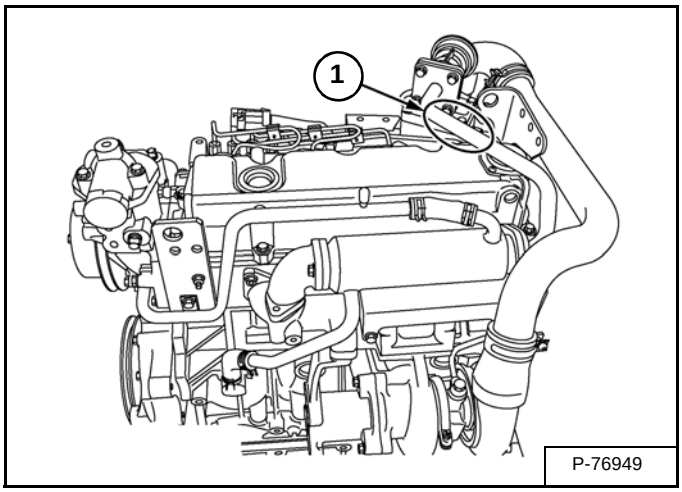
If the surface temperature of the EGR pipe declines, the thermo valve has failed.

If the surface temperature of the EGR pipe stays above 100°C (212°F), the EGR valve has failed.

Hot Engine Coolant Temperature Test

Verify the engine temperature is above 70°C (158°F), if the engine temperature is below 70°C (158°F) run the engine to bring the temperature above 70°C (158°F) then continue with the Hot Engine Coolant Temperature Test.

Figure 70-130-4

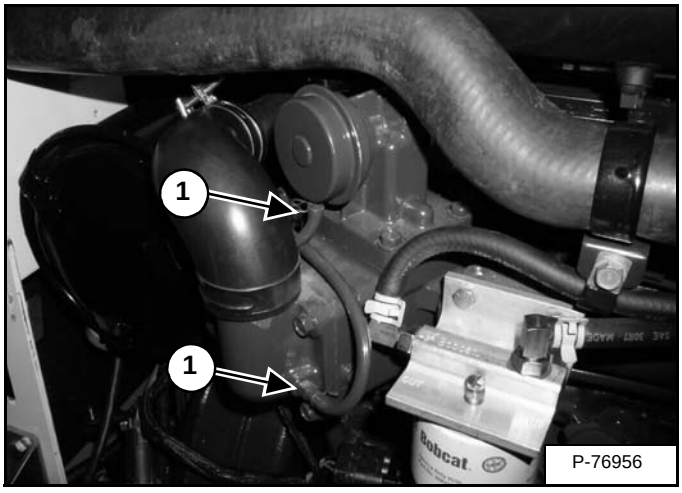


Measure the surface temperature of the EGR pipe (Item 1) **[Figure 70-130-4]** with an Infrared Thermometer.

With the engine coolant temperature above 70°C (158°F) and the surface temperature of the EGR pipe 100°C (212°F) or above, the EGR system is OK.

If the surface temperature of the EGR pipe is 50°C (122°F) or below continue this Hot Engine Coolant Temperature Test.

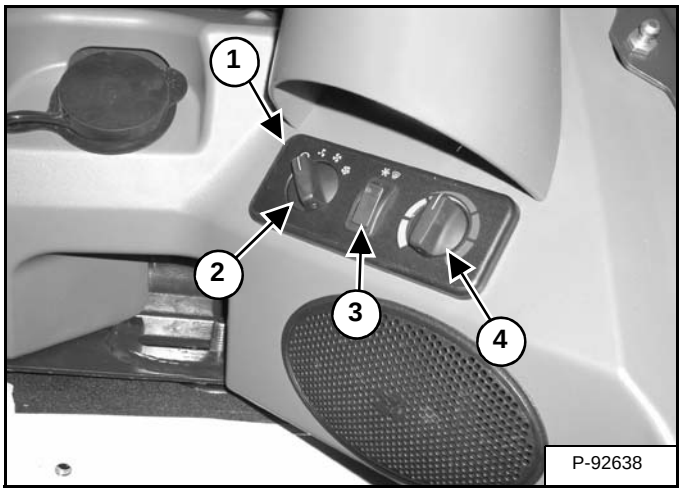
Figure 70-130-5



Disconnect the two hoses (Item 1) **[Figure 70-130-5]**.

Components (Cont'd)

Figure 80-10-8



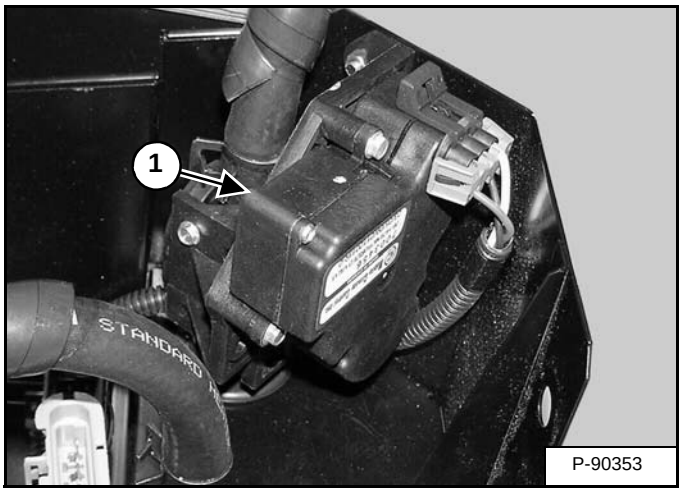
Control Panel: The panel (Item 1) **[Figure 80-10-8]** has three separate components.

Fan Switch: This is a four position rotary switch (Item 2) **[Figure 80-10-8]**. When the fan switch is in the off position the A/C will not engage, but the heat valve will operate, as it is controlled by the ignition power.

A/C Switch: The rocker switch (Item 3) **[Figure 80-10-8]** will be illuminated when the A/C is engaged.

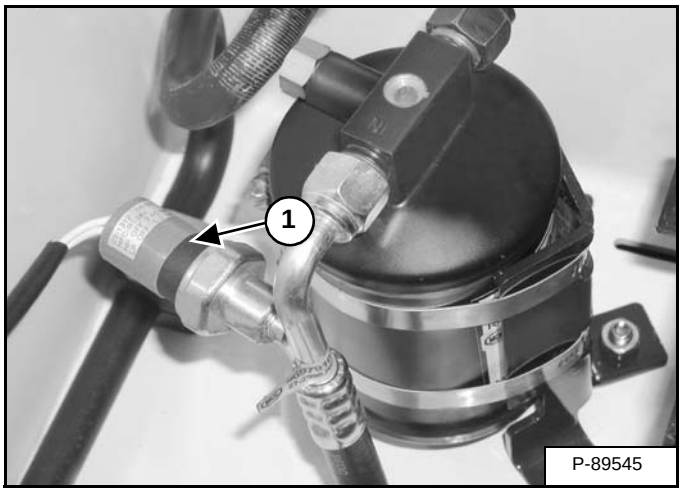
Potentiometer: The potentiometer (Item 4) **[Figure 80-10-8]** controls the Heat Valve from fully Off to fully On. This can be used in conjunction with the A/C for defrost of the windows and temperature control.

Figure 80-10-9



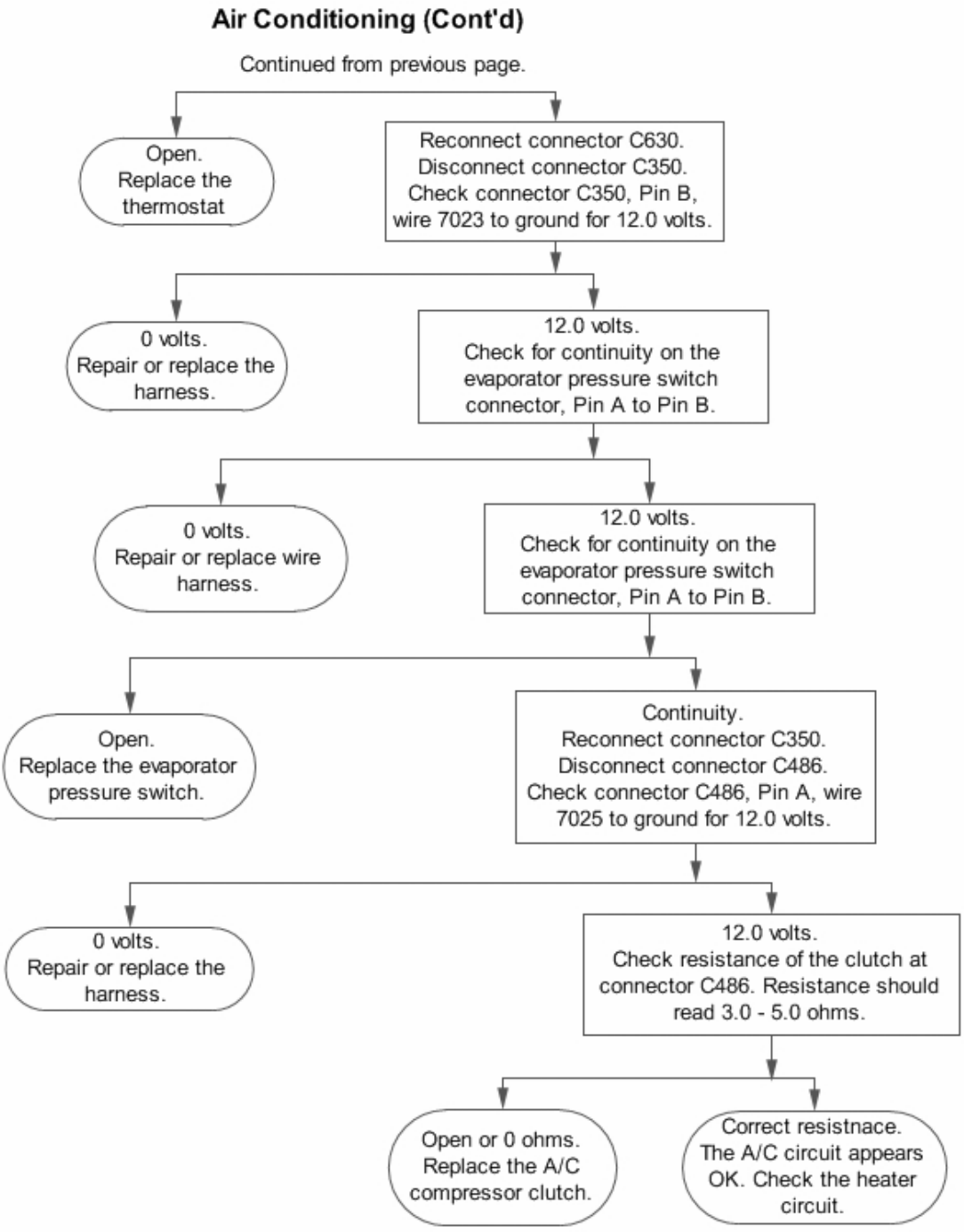
Heater Valve: The heater valve (Item 1) **[Figure 80-10-9]** is used to control the amount of engine coolant that flows to the heater coil.

Figure 80-10-10



Pressure Switch: The pressure switch (Item 1) **[Figure 80-10-10]** will disengage the compressor clutch at high pressure readings over 2,6 MPa (26,5 bar) (384 psi.) on the high side, or at very low pressure of 193,1 kPa (1,9 bar) (28 psi) or less on the high side, which indicates loss of refrigerant.

Troubleshooting Tree (Cont'd)



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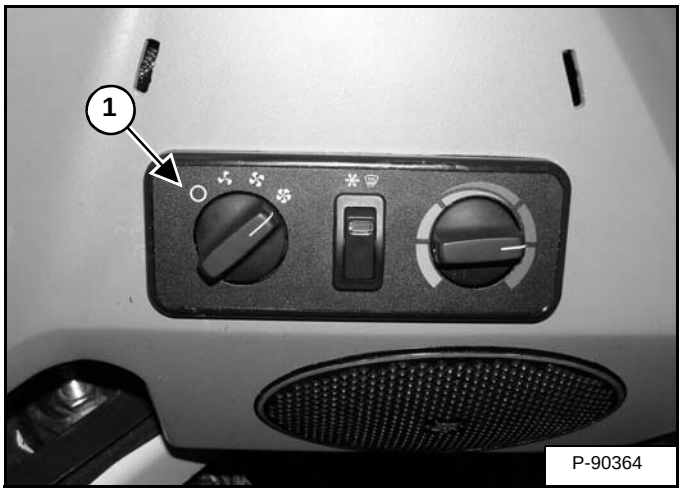
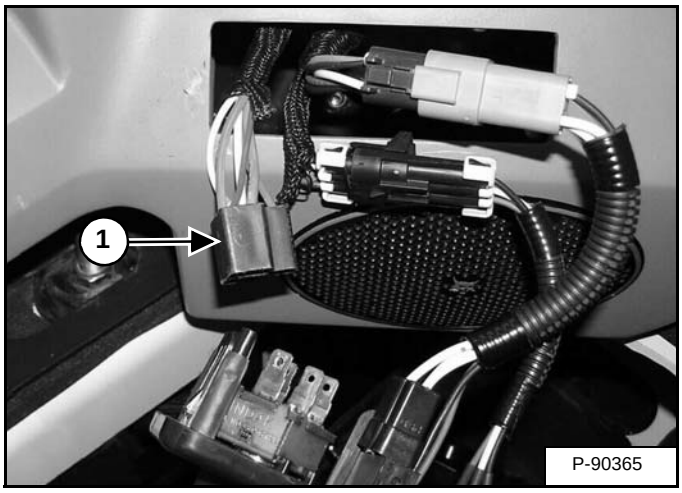
Electrical System (Cont'd)

Figure 80-30-16



Remove the control panel (Item 1) **[Figure 80-30-16]** from the left side lower panel.

Figure 80-30-17

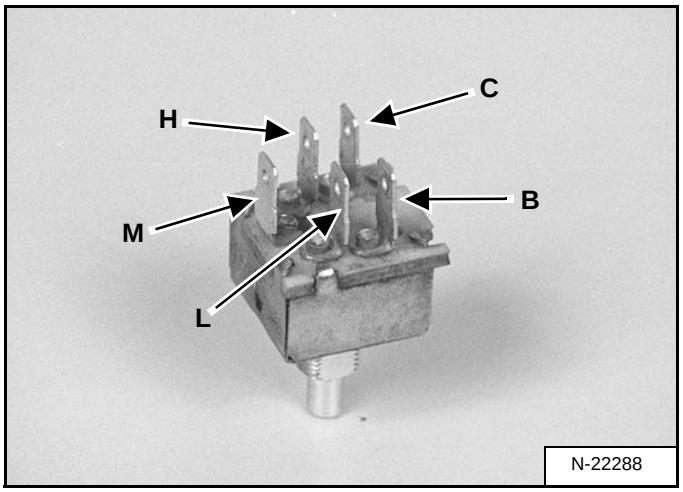


Disconnect the loader wiring harness (Item 1) **[Figure 80-30-17]** from the blower switch.

Check the loader harness for voltage. The voltage should be 12 volts.

If there is no voltage at the wiring harness, check the harness for broken wires.

Figure 80-30-18



If there is voltage at the wiring harness, check the blower switch **[Figure 80-30-18]** for resistance.

With the switch in the **1** position, there should be resistance between **C** terminal and the **B** terminal. And also between the **C** terminal and the **L** terminal frame **[Figure 80-30-18]**.

With the switch in the **2** position, there should be resistance between **C** terminal and the **B** terminal. And also between the **C** terminal and the M terminal frame **[Figure 80-30-18]**.

With the switch in the **3** position, there should be resistance between **C** terminal and the **B** terminal. And also between the **C** terminal and the **H** terminal frame **[Figure 80-30-18]**.

If any of the above resistance tests fail, replace the blower switch.

If the above resistance tests are good, check the A/C switch.

COMPRESSOR

Removal And Installation

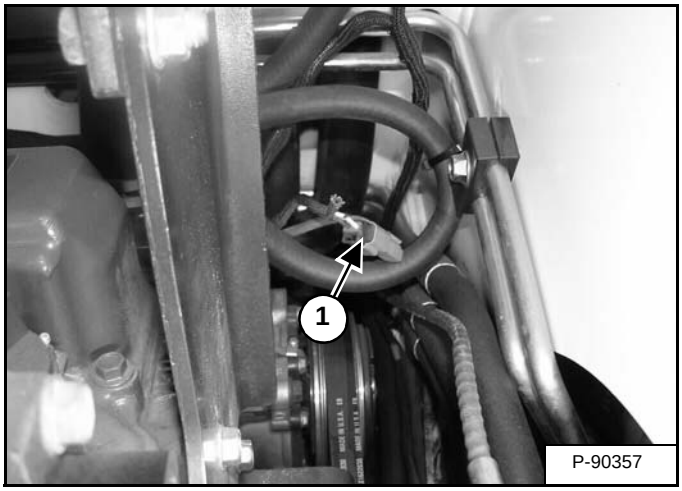
Raise the lift arms and install an approved lift arm support device. (See Installing on Page 10-20-1.)

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

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

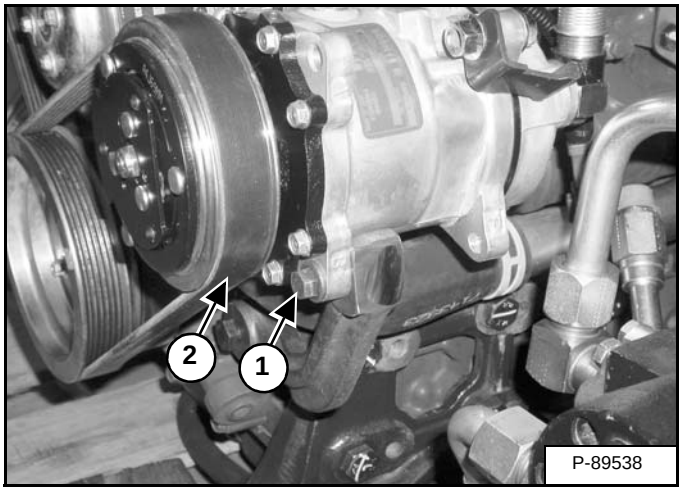
Open the rear door.

Figure 80-50-1



Disconnect the loader harness (Item 1) **[Figure 80-50-1]** from the compressor clutch wire.

Figure 80-50-2



Remove the compressor mount bolt (Item 1) and the belt (Item 2) **[Figure 80-50-2]**.

Installation: Tighten the compressor mount bolt to 46 N•m (34 ft-lb) torque.

⚠ WARNING

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

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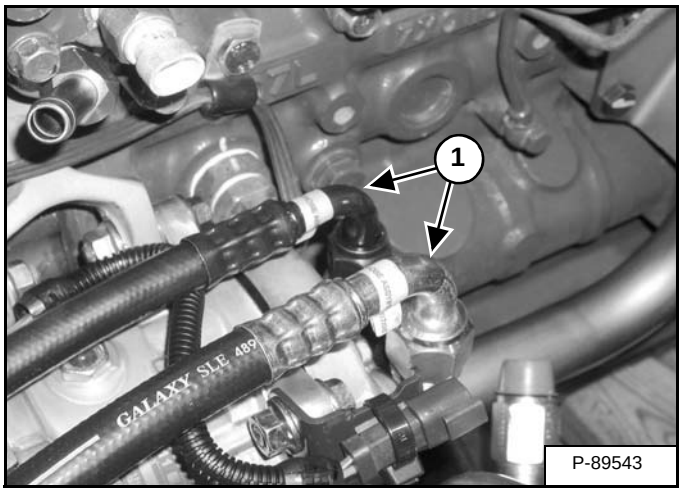
Figure 80-50-3

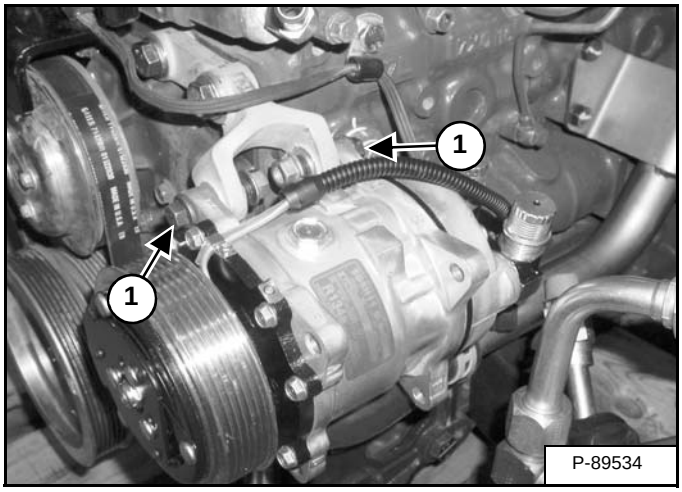


Remove the compressor hoses (Item 1) **[Figure 80-50-3]** from the compressor.

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.

Figure 80-50-4



Remove the compressor mount bolts and nuts (Item 1) **[Figure 80-50-4]**.

Remove the compressor from the loader.

EVAPORATOR / HEATER UNIT

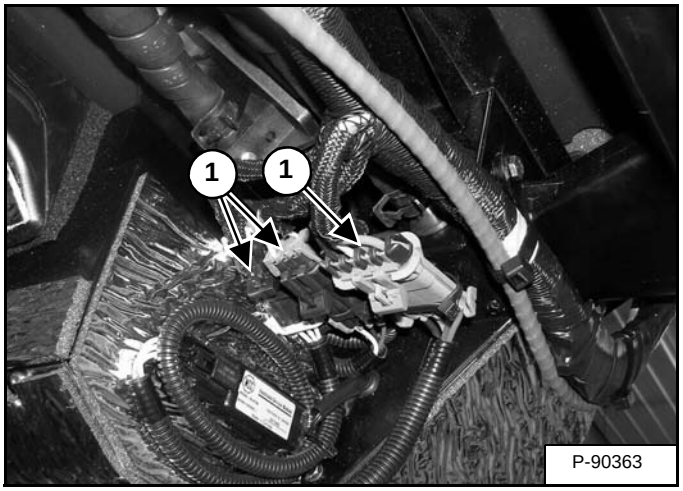
Removal And Installation

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.)

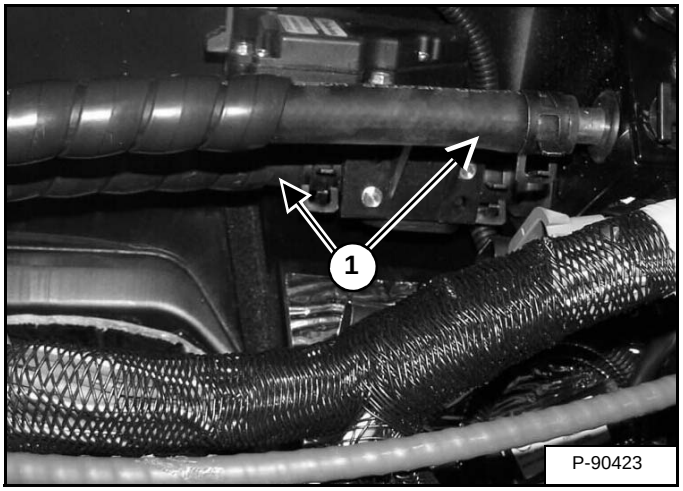
Evacuate the A/C system. (See Reclamation And Charging With Recovery / Charging Unit on Page 80-40-2.)

Figure 80-80-1



Disconnect the expansion / heater unit wiring (Item 1) **[Figure 80-80-1]**.

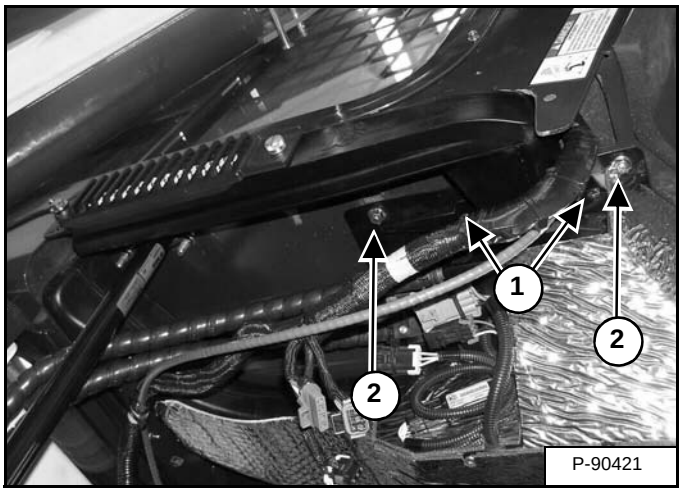
Figure 80-80-2



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

Remove the two hoses (Item 1) **[Figure 80-80-2]**.

Figure 80-80-3

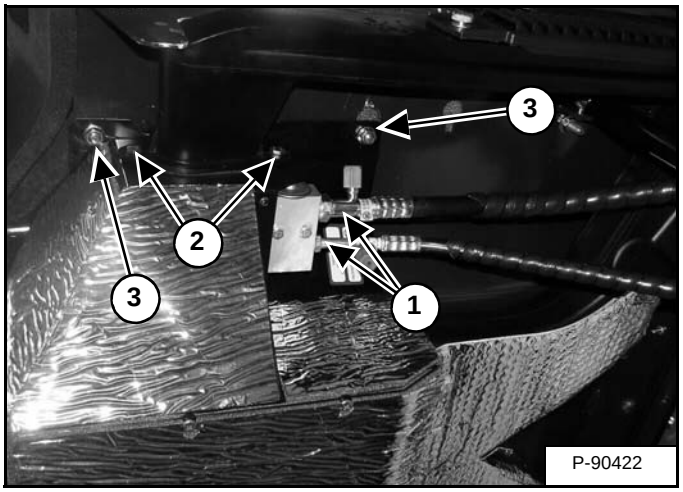


NOTE: Support the evaporator / heater unit before removing the mounting hardware.

Remove the two bolts (Item 1) **[Figure 80-80-3]**.

Remove the two nuts (Item 2) **[Figure 80-80-3]**.

Figure 80-80-4



Disconnect the two A/C hoses (Item 1) **[Figure 80-80-4]**.

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

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

Remove the two bolts (Item 2) **[Figure 80-80-4]**.

Remove the two nuts (Item 3) **[Figure 80-80-4]**.

Remove evaporator / heater unit from the loader.

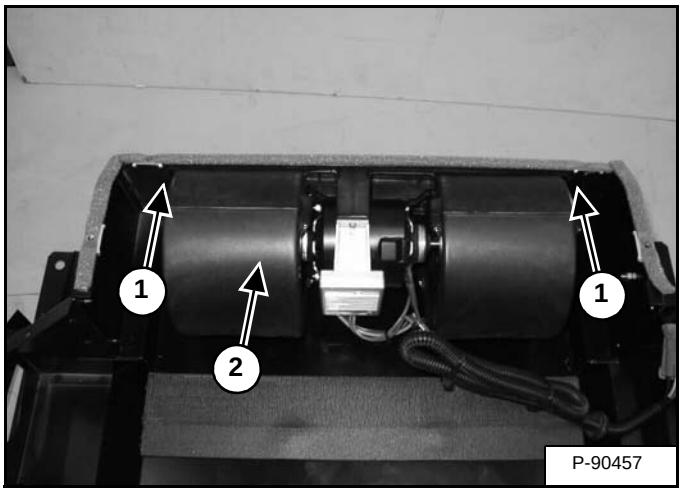
BLOWER FAN

Removal And Installation

Remove the evaporator / heater unit. (See Removal And Installation on Page 80-120-1.)

Remove the heater coil. (See Removal And Installation on Page 80-120-1.)

Figure 80-130-1

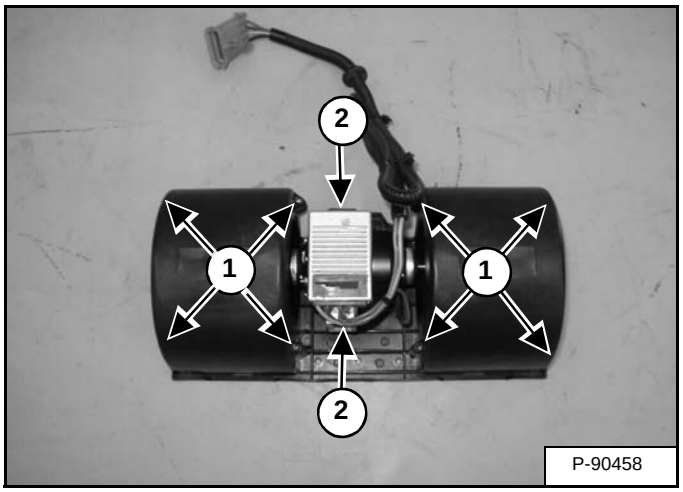


Remove the two screws (Item 1) **[Figure 80-130-1]**.

Remove the blower fan (Item 2) **[Figure 80-130-1]** from the evaporator / heater unit.

Disassembly And Assembly

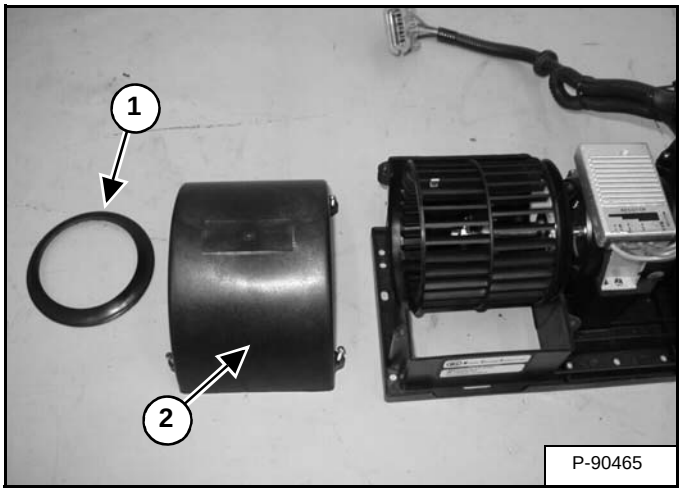
Figure 80-130-2



Remove the eight screws (Item 1) **[Figure 80-130-2]** from the blower wheel cover.

Remove the two screws (Item 2) **[Figure 80-130-2]** from the resistor.

Figure 80-130-3



Remove the outside rings (Item 1) and the blower wheel cover (Item 2) **[Figure 80-130-3]**.

Repeat for other side.

Inspect the outside rings and blower wheel covers for wear and replace as needed **[Figure 80-130-3]**.

Drive System

Main Drive	Fully hydrostatic, 4-wheel drive
Transmission	Infinitely variable tandem hydrostatic piston pumps, driving two fully reversing hydrostatic motors
Final Drive	Pre-stressed #120 HSOC endless roller chain (no master link) and sprockets in sealed chaincase with oil lubrication (Chains do not require periodic adjustments) Two chains per side with no idler sprocket
Axle Size	68,6 mm (2.70 in), Heat treated
Wheel Bolts	Eight - 9/16 inch Wheel bolts fixed to axle hubs

Controls

Vehicle Steering	Direction and speed controlled by two hand operated steering levers *or* optional joystick(s)
Loader Hydraulics - Lift and Tilt - Front Auxiliary - Rear Auxiliary (Option)	 Controlled by separate foot pedals or optional Advanced Control System (ACS) or optional Selectable Joystick Controls (SJC) Controlled by electrical switch on Right Hand steering lever or joystick Controlled by electrical switch on Left Hand steering lever or joystick
Auxiliary Pressure Release	Pressure relieved through quick couplers; Push couplers in, hold for 5 seconds
Engine	Hand lever speed control, additional foot operated speed control pedal with SJC option; key-type start switch *or* optional Keyless Start Panel *or* optional Deluxe Instrumentation Panel and function error shutdown.
Starting Aid	Air intake heater automatically activated as needed in RUN position
Service Brake	Two independent hydrostatic systems controlled by two hand operated steering levers *or* optional joystick(s)
Secondary Brake	One of the hydrostatic transmissions
Parking Brake (Standard)	Mechanical disc, manually operated switch on left instrument panel
Parking Brake (Two-Speed Option)	Spring applied pressure release multi-disk brake activated by manually operated switch on left instrument panel