Bobcat®

Service Manual

Skid-Steer Loader

S550 S/N B4ZD11001 & Above

7417391enUS (11-20) (0)

Printed in Belgium

EU S5

SAFETY INSTRUCTIONS

Safety Alert Symbol

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

WARNING

AVOID INJURY OR DEATH

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

W-2003-0807

IMPORTANT

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

I-2019-0284

DANGER

The signal word DANGER on the machine and in the manuals indicates a hazardous situation which, if not avoided, will result in death or serious injury.

D-1002-1107

WARNING

The signal word WARNING on the machine and in the manuals indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

W-2044-1107

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

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

SI SSL-1016 SM

Lowering

Always stop the engine before raising or lowering the operator cab.

NOTE: Always use the grab handles to lower the operator cab.

Figure 10-30-6

Pull down on the bottom of the operator cab until stopped by the latching mechanism **[Figure 10-30-6]**.

NOTE: The weight of the operator cab increases when equipped with options and accessories such as: cab door, heater, air conditioning. In these cases, the operator cab may need to be raised slightly from the latch to be able to release the latch.

⚠ WARNING

UNEXPECTED LOADER, LIFT ARM OR ATTACHMENT MOVEMENT CAUSED BY CAB CONTACT WITH CONTROLS CAN CAUSE SERIOUS INJURY OR DEATH

- **STOP ENGINE before raising or lowering cab.**

W-2758-0908

NOTE: On some machines, the operator cab frame can contact the steering levers while raising or lowering the operator cab. The engine MUST be stopped before raising or lowering the operator cab.

Support the operator cab and release the latching mechanism (Inset) **[Figure 10-30-6]**. Remove your hand from the latch mechanism when the operator cab is past the latch stop. Use both hands to lower the operator cab all the way down.

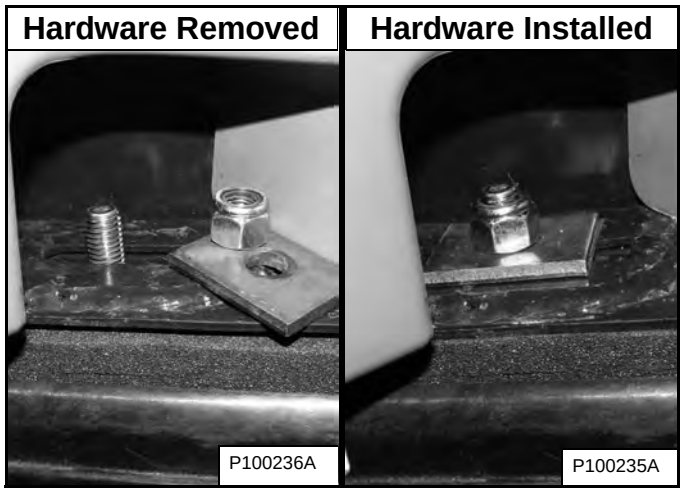
⚠ WARNING

PINCH POINT CAN CAUSE INJURY

Remove your hand from the latching mechanism when the cab is past the latch stop.

W-2469-0803

Figure 10-30-7



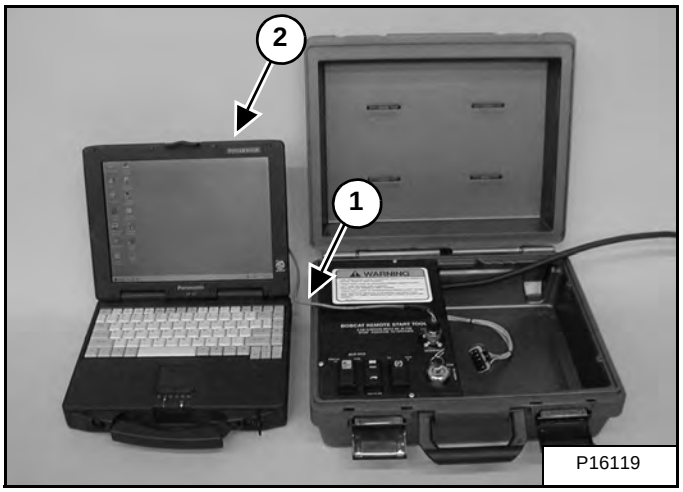
Install the washers and nuts (both sides) **[Figure 10-30-7]**.

Tighten the nuts to 54 - 61 N•m (40 - 45 ft-lb) torque.

Remove the jackstands.

Service Tool Harness Communicator - MEL1566

Figure 10-60-6



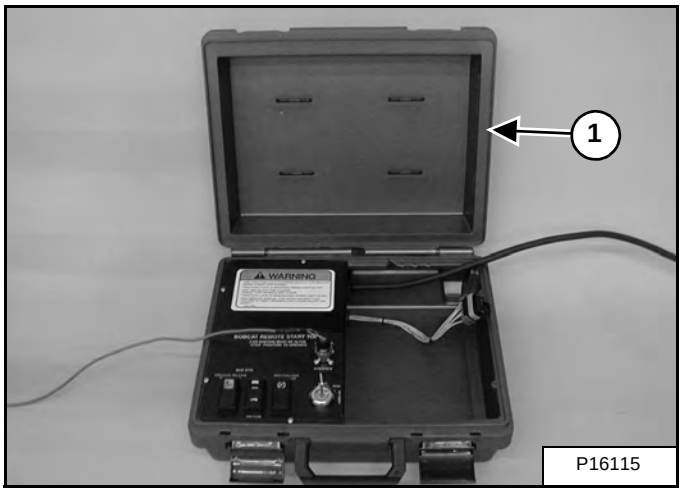
The Service Tool Harness Communicator (Item 1) is required to connect Remote Start Tool to the Service PC (Item 2) **[Figure 10-60-6]**.

Remote Start Procedure

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

MEL1563: Remote Start Tool Kit

Figure 10-60-7



The Remote Start Tool (Item 1) **[Figure 10-60-7]** is required when the operator cab is in the raised position for service and the service technician needs to turn the key switch on or start the engine. Example: adjusting the steering linkage.

Lift and block the loader.

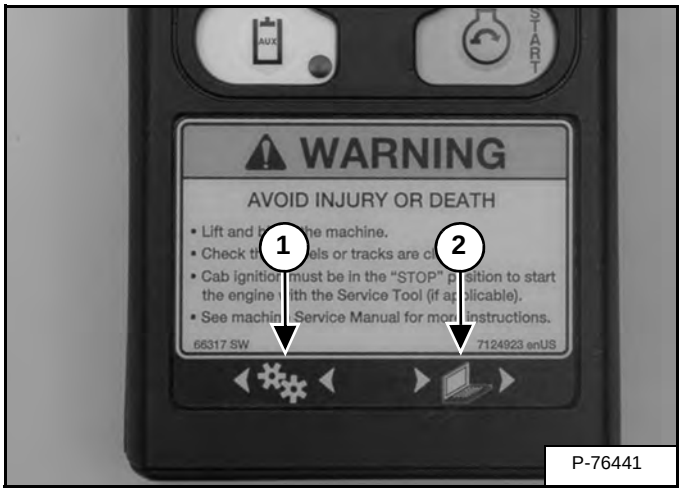
Raise the lift arms (if required by the procedure) and install an approved lift arm support.

Raise the operator cab (if required by the procedure).

Open the rear door of the loader.

Remote Start Procedure (Cont'd)

Figure 10-61-13

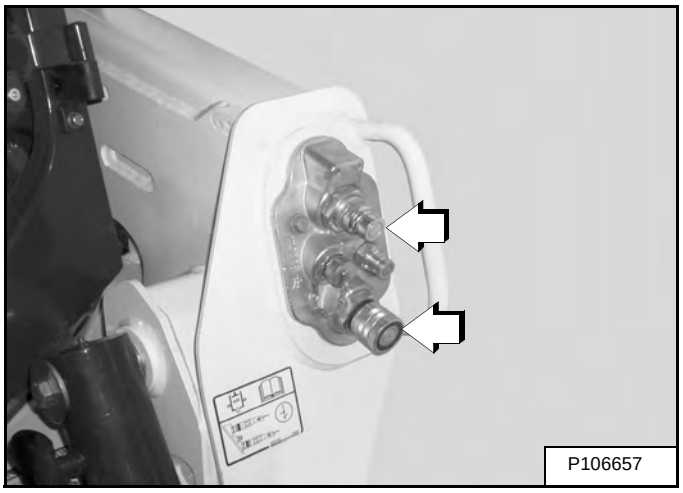


The gear icon with the left facing arrows (Item 1) **[Figure 10-61-13]** will illuminate and blink when the RUN key is pressed and the loader is communicating with the service tool.

The computer icon with the right facing arrows (Item 2) **[Figure 10-61-13]** will illuminate and blink when the Remote Start Tool (Service Tool) is transmitting data to and from the computer.

NOTE: To relieve the pressure at the rear or secondary front auxiliary, (if equipped) press the RUN button on the Remote Start Tool. Then press the auxiliary (AUX) hydraulics button on the Remote Start Tool and move the AUXILIARY Hydraulic Switch to the right and left several times.

Figure 10-61-14



Push the couplers on the front auxiliary block toward the block and hold for five seconds to release the front auxiliary pressure **[Figure 10-61-14]**.

Removing And Replacing Coolant

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

Stop the engine, open the rear door, and remove the rear grille. (See REAR GRILLE on Page 50-60-1.)

⚠ WARNING

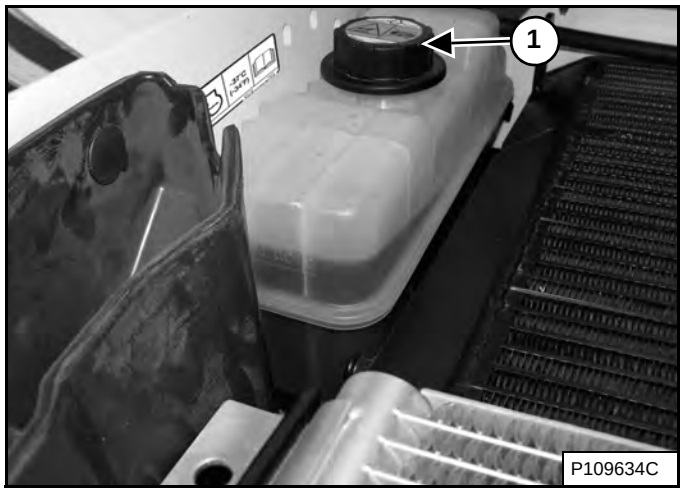
AVOID INJURY

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

W-2607-0804

NOTE: This procedure requires the use of a spare 0.75 in coolant hose approximately 600 mm (24 in) long.

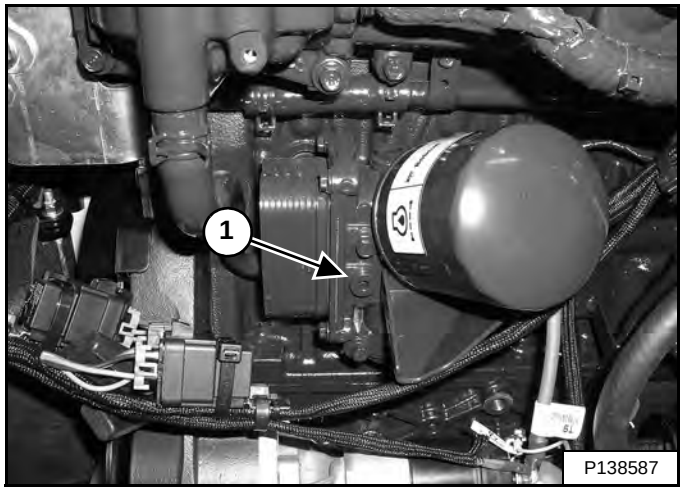
Figure 10-90-9



Remove the coolant fill cap (Item 1) **[Figure 10-90-9]** to relieve pressure.

Install the coolant fill cap **[Figure 10-90-9]**.

Figure 10-90-10



Remove the drain plug (Item 1) **[Figure 10-90-10]** from the engine oil cooler.

Quickly install the spare 0.75 in. coolant hose over the drain opening.

Drain the coolant into a container.

Remove the coolant fill cap **[Figure 10-90-9]** to drain the coolant faster.

Remove the spare 0.75 in. coolant hose from the drain opening after the coolant has drained.

Install the drain plug **[Figure 10-90-10]**.

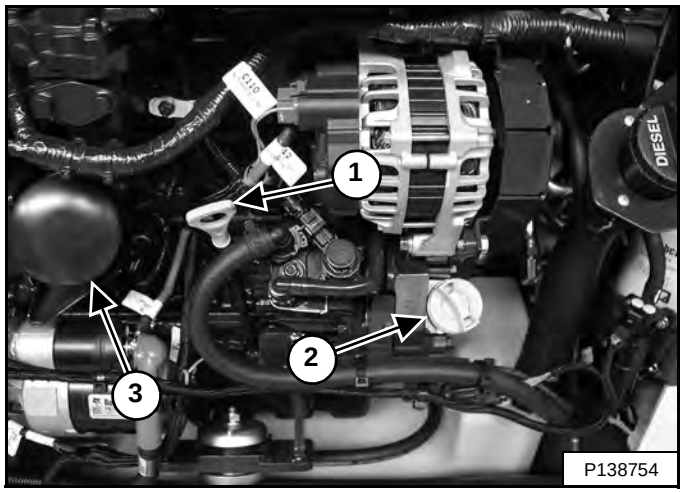
Recycle or dispose of used coolant in an environmentally safe manner.

Mix new coolant in a separate container. (See Capacities on Page -222.)

The correct mixture of coolant to provide a -37°C (-34°F) freeze protection is 5 L propylene glycol mixed with 4,4 L of water **OR** 1 U.S. gal propylene glycol mixed with 3.5 qt of water.

Removing and Replacing Oil And Filter (Cont'd)

Figure 10-110-6



Remove the oil filter (Item 3) **[Figure 10-110-6]** and clean the filter base.

Put clean oil on the new filter gasket, install the new filter, and hand tighten. Use genuine Bobcat filter only.

Remove the oil fill cap (Item 2) **[Figure 10-110-6]**.

Put oil into the engine and replace the oil fill cap. (See Capacities on Page SPEC-10-5.) Do not overfill.

Start the engine and allow to operate for several minutes.

⚠ 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

Stop the engine and check for leaks at the filter.

Remove the dipstick (Item 1) **[Figure 10-110-6]** and check the oil level.

Add oil as needed if oil level is not at the top mark on the dipstick. Install the dipstick and close the rear door.

⚠ WARNING

AVOID INJURY OR DEATH

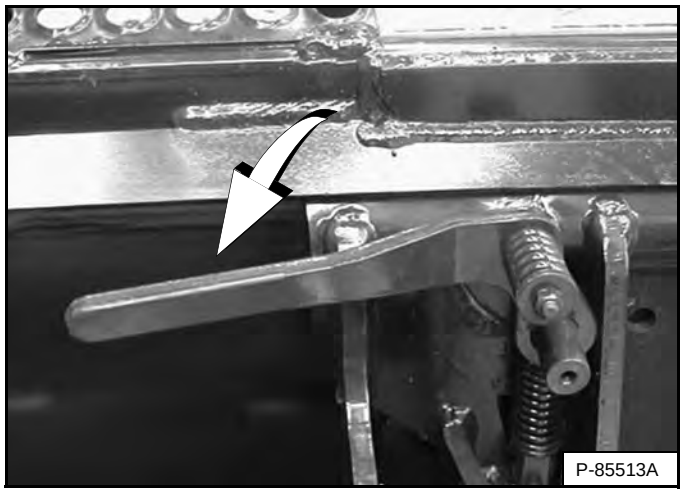
Always clean up spilled fuel or oil. Keep heat, flames, sparks or lighted tobacco away from fuel and oil. Failure to use care around combustibles can cause explosion or fire.

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.

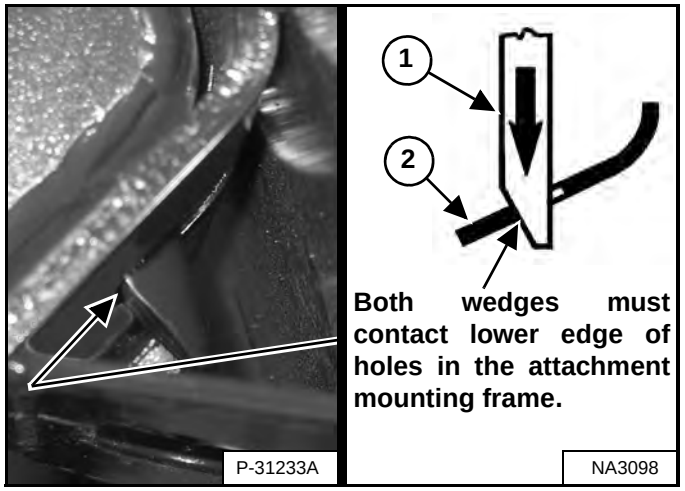
⚠ WARNING

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

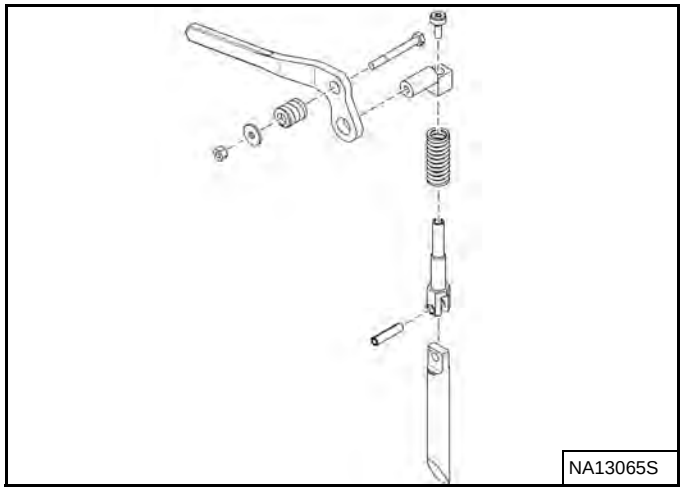


The wedges (Item 1) **[Figure 10-140-2]** must extend through the holes in the attachment mounting frame.

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.

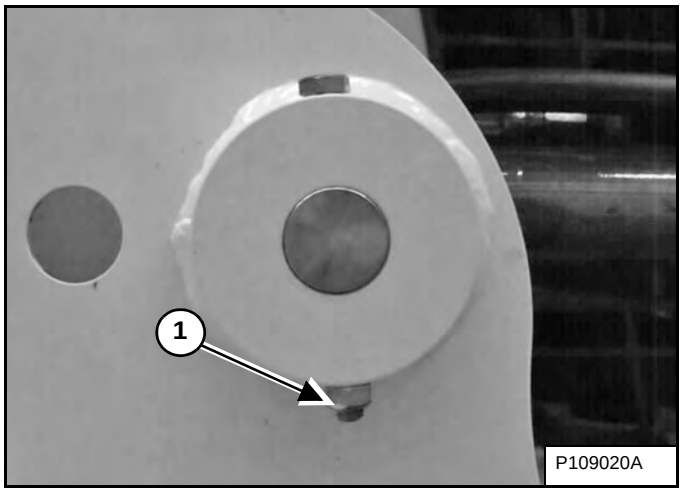
Inspect for cracked welds.

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

PIVOT PINS

Inspection And Maintenance

Figure 10-170-1



All lift arm and cylinder pivots have a large pin held in position with a retainer bolt and locknut (Item 1) **[Figure 10-170-1]**.

Check that the locknuts are tightened to 48 - 54 N•m (35 - 40 ft-lb) torque.

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 10-210-1]**.

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.

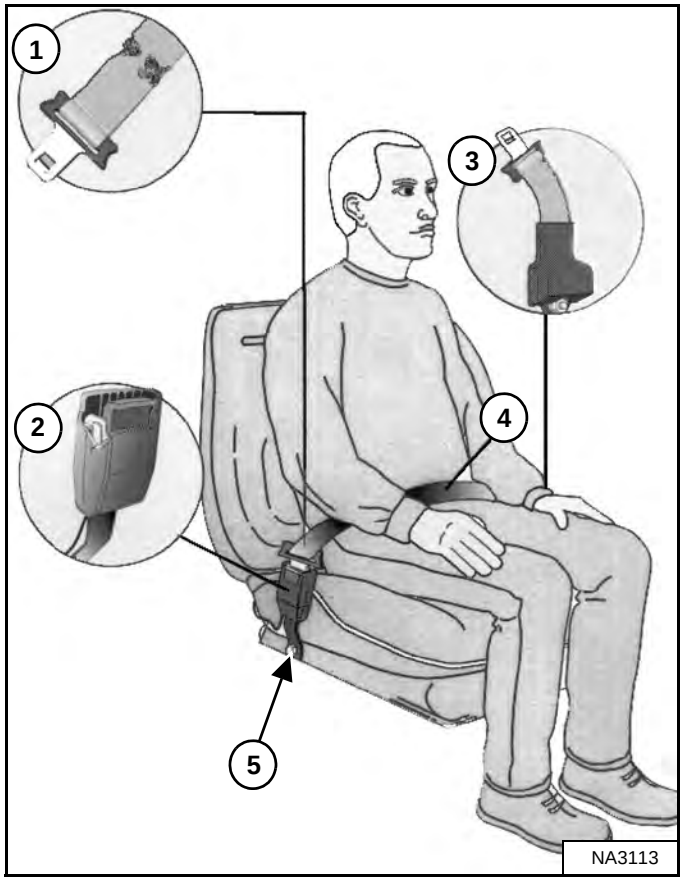
2. Check the buckle and latch for correct operation. Make sure latch plate is not excessively worn or deformed and buckle is not damaged or casing broken.

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.

5. Check the hardware on both sides of the seat. Hardware should be tight. Hardware must not be missing, rusted, corroded, or damaged.

Figure 10-210-1



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HYDRAULIC/HYDROSTATIC SCHEMATIC
SJC WITH NO OPTIONS
S550 (S/N B4ZD11001 AND ABOVE)

(PRINTED SEPTEMEBER 2020)
V-1712 legend

LEGEND

1. RESERVOIR:
   Capacity at sight gauge . . 7,6 L (2.0 U.S. gal)
   System Capacity . . . . . 32,2 L (8.5 U.S. gal)
2. SIGHT GUAGE
3. DIFFERENTIAL PRESSURE SWITCH:
   107 kPa (1,07 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
6A. DIAGNOSTIC COUPLER – FILL PORT – Factory Hydraulic Oil
7. RELIEF VALVE - MAIN:
   24100 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. ANTICAVITATION VALVE
13. PILOTED ACTIVATED DIRECTIONAL CONTROL VALVE - TILT CONTROL
14. PILOTED ACTIVATED DIRECTIONAL CONTROL VALVE - LIFT CONTROL
15. SOLENOID ACTIVATED DIRECTIONAL CONTROL VALVE - BICS CONTROL
16. FILTER - BICS CONTROL VALVE (SCREEN)
17. CHECK VALVE - With 100 kPa (1,0 bar) (14.5 psi) Spring
18. RESTRICTION . . . . . 2,0 mm (0.079 in)
19. PULL BUTTON ACTIVATED DIRECTIONAL CONTROL VALVE - LIFT ARM BY-PASS
20. LIFT CYLINDER SPOOL - MADE TO RESTRICT FLOW DURING BOOM DOWN BUT NOT DURING BOOM UP
21. ANTICAVITATION VALVE
22. PROPORTIONAL RELIEF VALVE – (Fan Speed Regulator): 16547 kPa (165 bar) (2400 psi)
23. SPRING LOADED FILTER BY-PASS VALVE: 300 – 390 kPa (3 - 3,9 bar) (43 - 57 psi)
24. FIXED CAPACITY DISPLACEMENT HYDRAULIC MOTOR
25. FILTER - HYDRAULIC (CANISTER)
26. SENSOR – CHARGE PRESSURE
27. FRONT AUXILIARY MANUAL PRESSURE BLEED-OFF VALVE
28. SENSOR – HYD. TEMPERATURE
29. FLUSHING RELIEF VALVE:
    450 kPa (4,5 bar) (65 psi)
30. DRIVE MOTOR SHUTTLE VALVE - Cracking: 634 kPa (6,3 bar) (92 psi) Full: 814 kPa (8,1 bar) (118 psi)
31. NOT USED FOR THIS MODEL
32. FIXED CAPACITY DISPLACEMENT BIDIRECTIONAL HYDROSTATIC MOTOR
33. NOT USED FOR THIS MODEL
34. ANGLE SENSOR
35. NOT USED FOR THIS MODEL
36. CHARGE PUMP - 49,1 L/min (13.0 U.S. gpm) at High Engine Idle
37. HYDRAULIC PUMP . . . . . Gear Type 64,7 L/min (17.1 U.S. gpm) at High Engine Idle
38. VARIABLE CAPACITY DISPLACEMENT BIDIRECTIONAL HYDROSTATIC PUMP
39. RELIEF/REPLENISHING VALVE - HIGH PRESSURE: 35000 kPa (350 bar) (5076 psi)
40. RELIEF VALVE - CHARGE INLET: 2825-3515 kPa (28-35 bar) (410-510 psi) at High Engine Idle With 60 ° C (140 ° F) Fluid
41. CHECK VALVE – COLD WEATHER BY-PASS With 345 kPa (3,45 bar) (50 psi) Spring
42. SOLENOID ACTIVATED DIRECTIONAL CONTROL VALVE – FORWARD/REVERSE
43. FILTER
44. SERVO PISTON – Swash Plate

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

CYLINDER (LIFT)

Testing

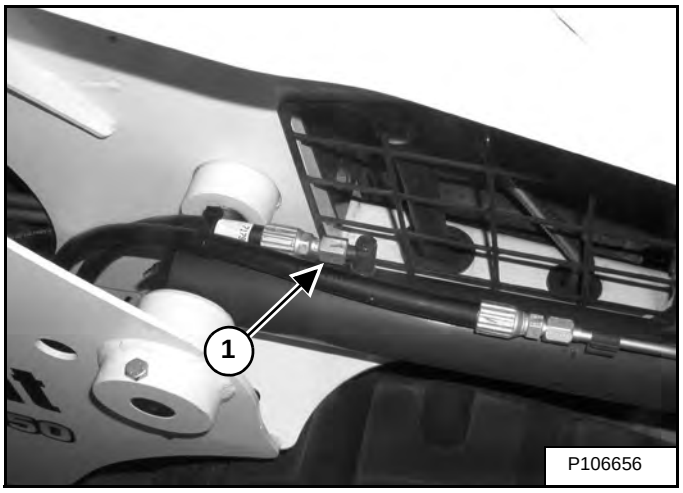
WARNING

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

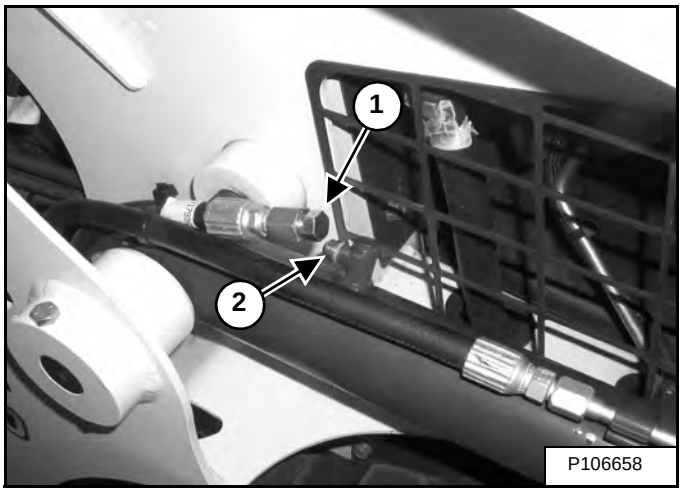
Lower the lift arms. Stop the engine. Raise the seat bar.

Figure 20-20-1



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

Figure 20-20-2



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

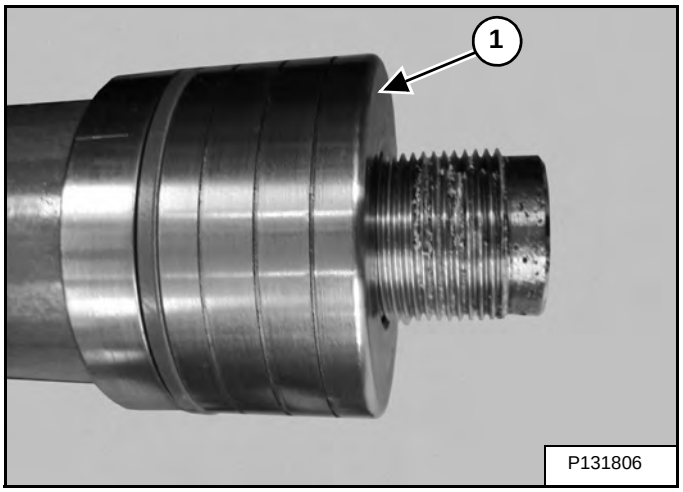
Engage the parking brake. Lower the seat bar. Start the engine and press the PTOL button.

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 cylinder for repair. Repeat the procedure to test the other cylinder.

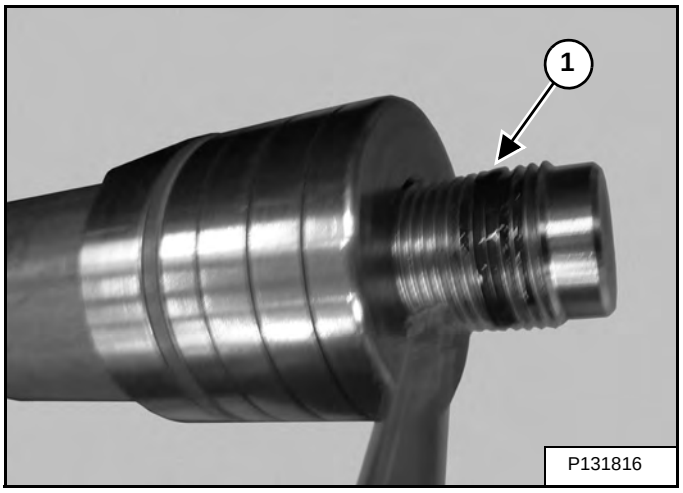
Assembly (Cont'd)

Figure 20-20-31



Install the piston (Item 1) **[Figure 20-20-31]** on the rod.

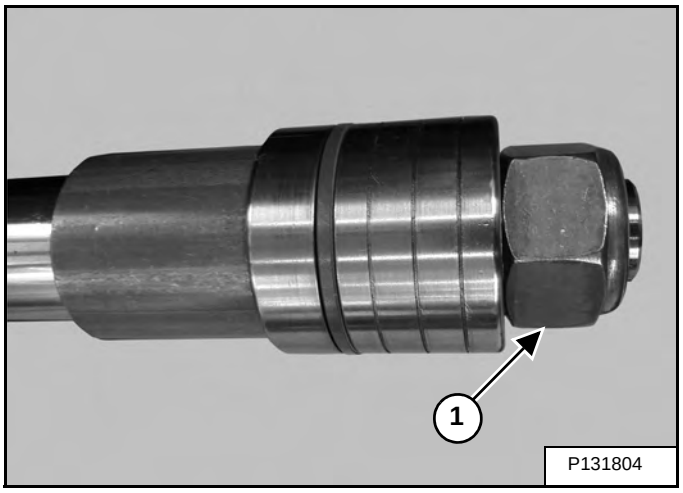
Figure 20-20-32



Provide an adequate support for the cylinder before tightening.

NOTE: Clean and dry the rod threads. Apply thread locking adhesive (Item 1) [Figure 20-20-32].

Figure 20-20-33

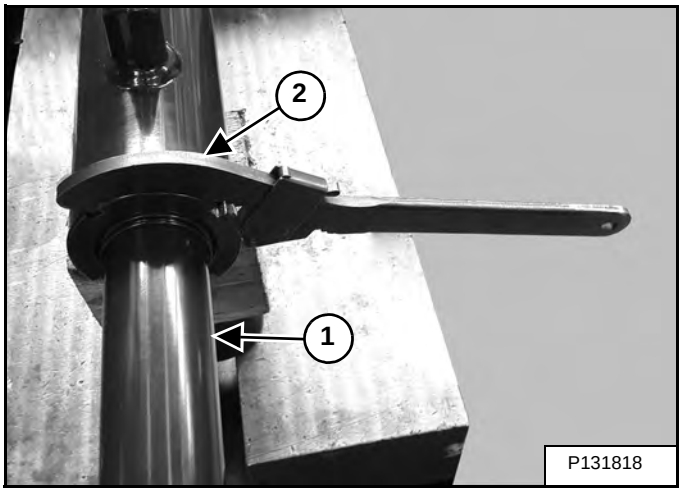


Install the nut (Item 1) **[Figure 20-20-33]**.

Tighten the nut to 780 N•m (575 ft-lb) torque.

Put the base end of the cylinder in a vise.

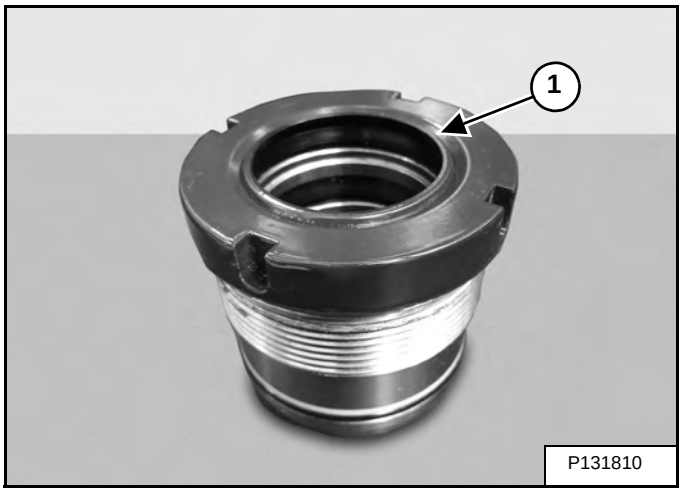
Figure 20-20-34



Install the head and rod assembly (Item 1) into the cylinder tube and thread the head into the cylinder. Install the Adjustable Gland Nut Wrench (Item 2) **[Figure 20-20-34]** onto the head. Tighten to 550 N•m (405 ft-lb) torque.

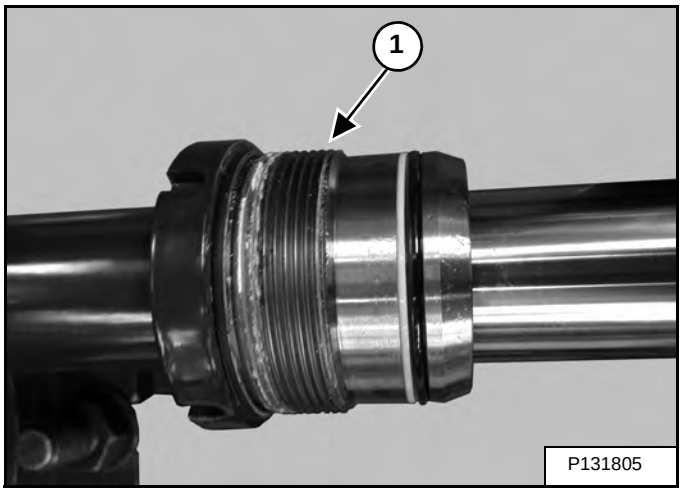
Assembly (Cont'd)

Figure 20-21-23



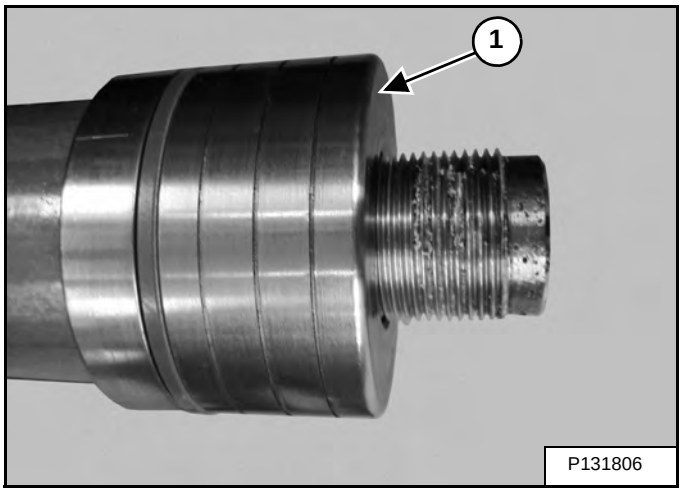
Install the wiper seal with the wiper (Item 1) **[Figure 20-21-23]** toward the outside of the head.

Figure 20-21-24



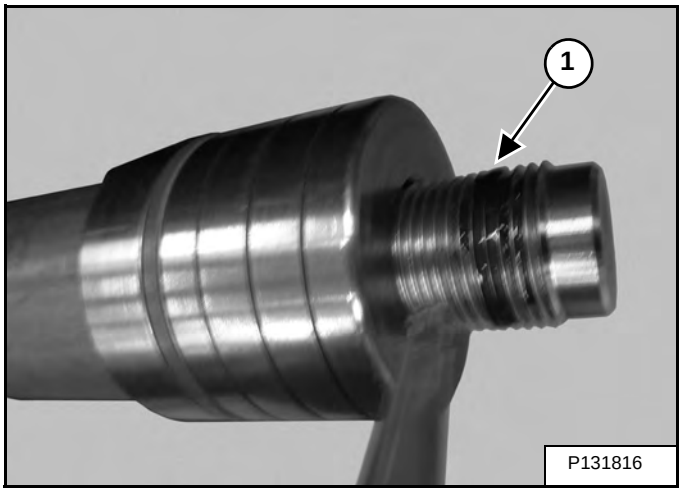
Install the head (Item 1) **[Figure 20-21-24]** onto the rod.

Figure 20-21-25



Install the piston (Item 1) **[Figure 20-21-25]** on the rod.

Figure 20-21-26



Provide an adequate support for the cylinder before tightening.

NOTE: Clean and dry the rod threads. Apply thread locking adhesive (Item 1) [Figure 20-21-26].

MAIN RELIEF VALVE

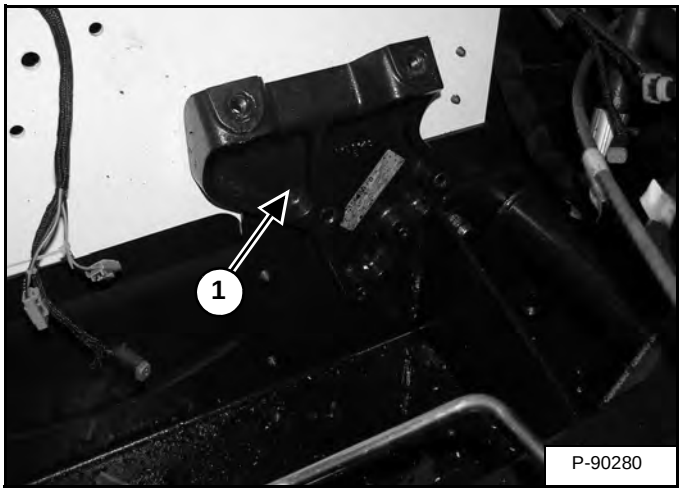
Description

The main relief valve limits the hydraulic system pressure by opening at a certain pressure and allowing the hydraulic fluid to flow back to the hydraulic reservoir. (See Hydraulic System on Page SPEC-10-4.)

The main relief valve is adjustable and is located on the hydraulic control valve near the bottom, facing the front of the loader.

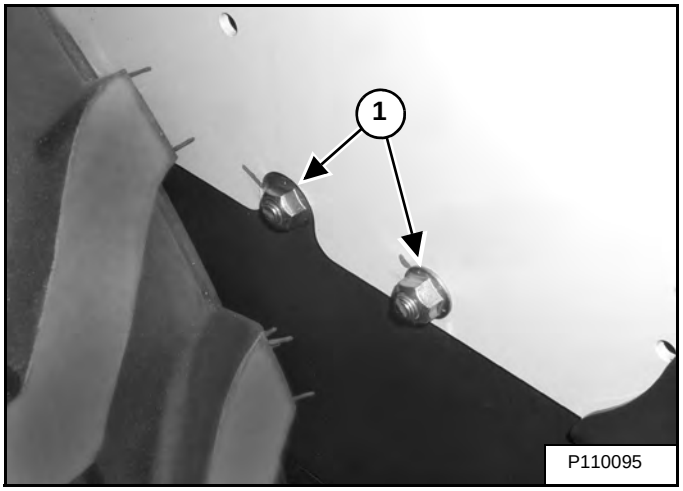
Mount Bracket Removal And Installation

Figure 20-40-11



Support the mounting bracket (Item 1) **[Figure 20-40-11]**.

Figure 20-40-12

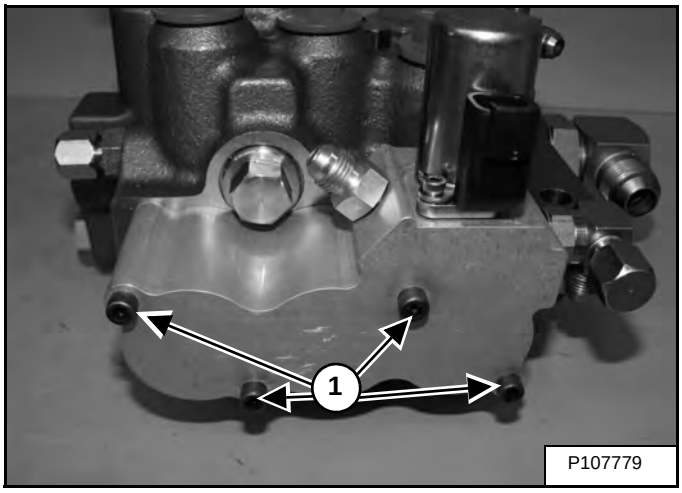


Remove the two control valve mount bolts (Item 1) **[Figure 20-40-12]**.

Remove the control valve bracket from the loader.

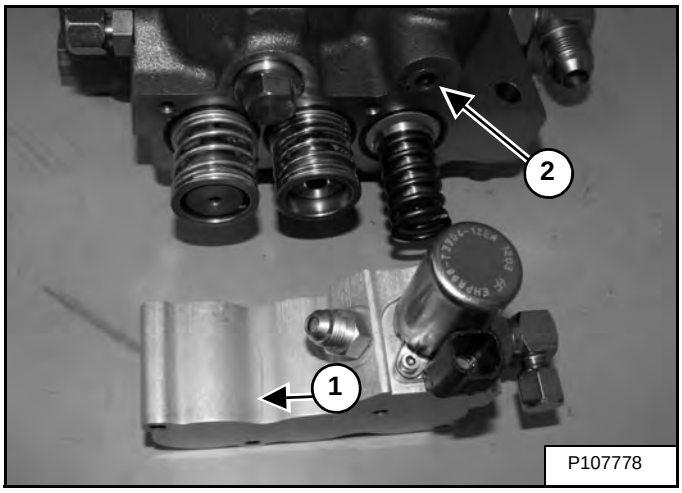
Lift Spool And Detent Removal And Installation (Cont'd)

Figure 20-40-42



Remove the four screws (Item 1) **[Figure 20-40-42]** from the spool centering block.

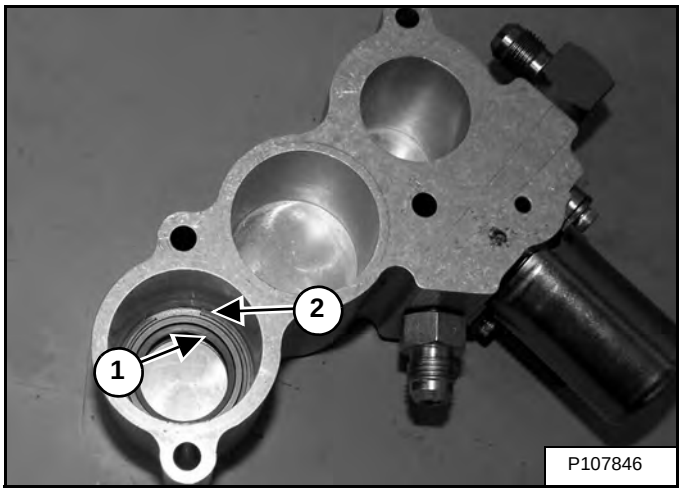
Figure 20-40-43



Remove the spool centering block (Item 1) **[Figure 20-40-43]**.

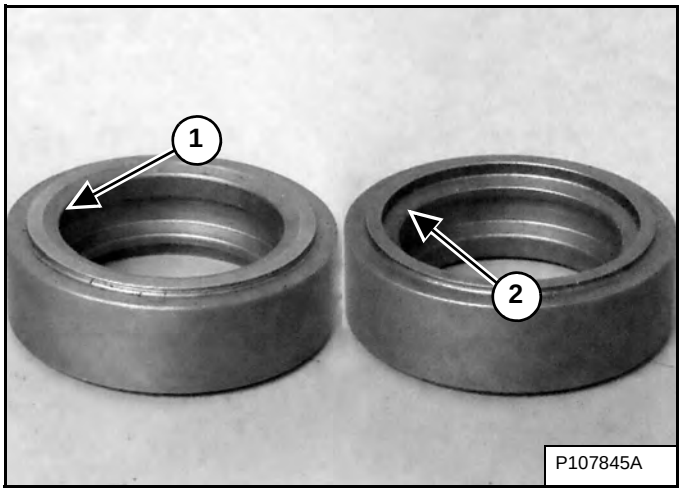
Remove the O-ring (Item 2) **[Figure 20-40-43]**.

Figure 20-40-44



NOTE: Do not remove the sleeve detent (Item 1) or retaining ring (Item 2) [Figure 20-40-44] from the spool centering block. If removed, the sleeve detent must be inserted with the original orientation.

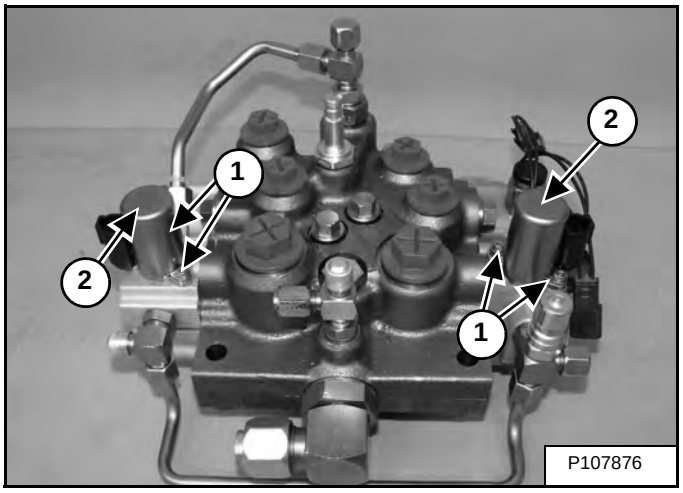
Figure 20-40-45



NOTE: If removed, use the following for correct installation: for a radius lift pattern machine, align the radius side (Item 1) [Figure 20-40-45] so it faces the opening of the spool centering block when seated. For a vertical lift pattern machine, align the vertical side (Item 2) [Figure 20-40-45] so it faces the opening when seated. Install retaining ring over detent sleeve.

Auxiliary Solenoid Removal And Installation

Figure 20-40-80

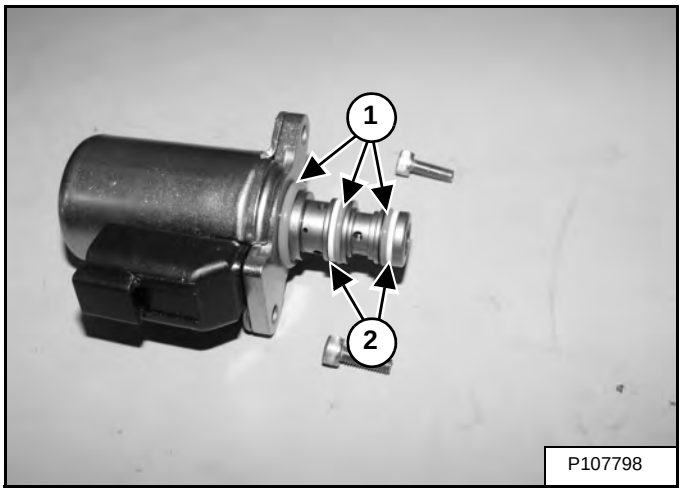


Remove the screws (Item 1) **[Figure 20-40-80]** from both solenoids.

Remove the solenoids (Item 2) **[Figure 20-40-80]** from the control valves.

Installation: Tighten the nut to 2,3 - 2,7 N•m (21.4 - 23.9 in-lb) torque.

Figure 20-40-81



Remove the O-rings (Item 1) and back-up rings (Item 2) **[Figure 20-40-81]** from the solenoid stem.

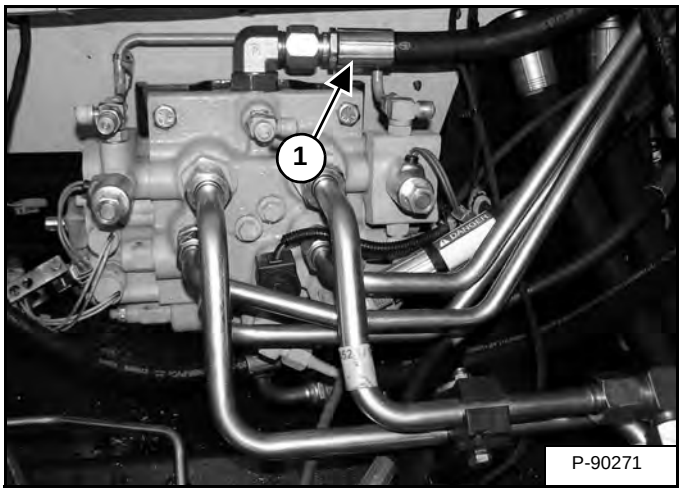
Use an ohmmeter to measure the solenoid coil resistance.

The correct resistance for the coil is 5.1 ohm.

Installation: Lubricate and install new O-rings (Item 1) and back-up rings (Item 2) **[Figure 20-40-81]**.

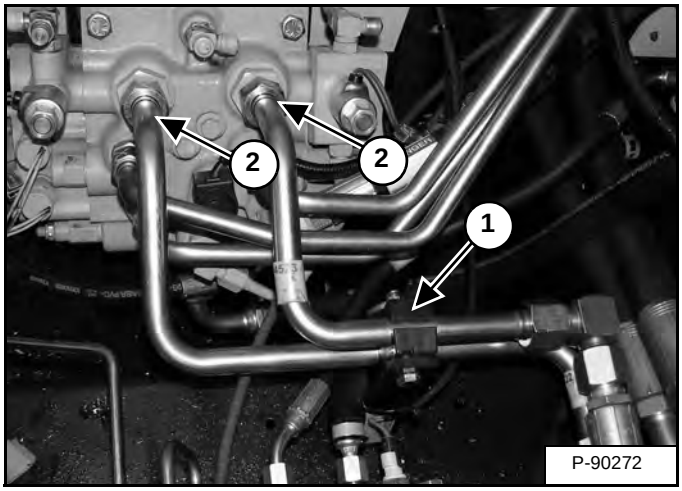
Removal And Installation (Cont'd)

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.

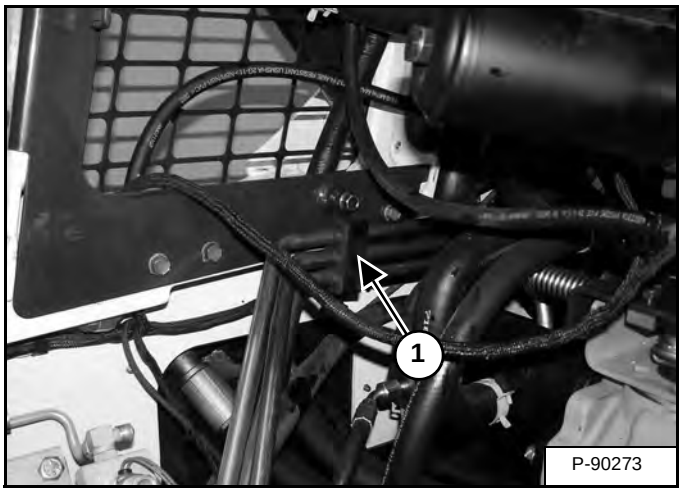
Figure 20-41-6



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

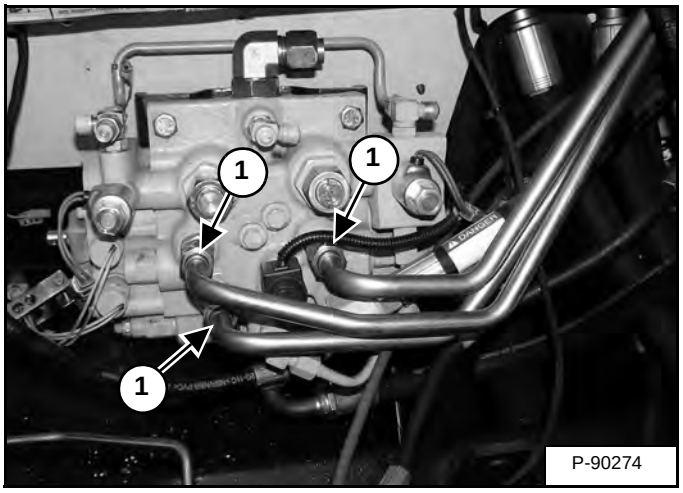
Disconnect the two tubelines (Item 2) **[Figure 20-41-6]** that route from the control valve to the front auxiliary hydraulics.

Figure 20-41-7



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

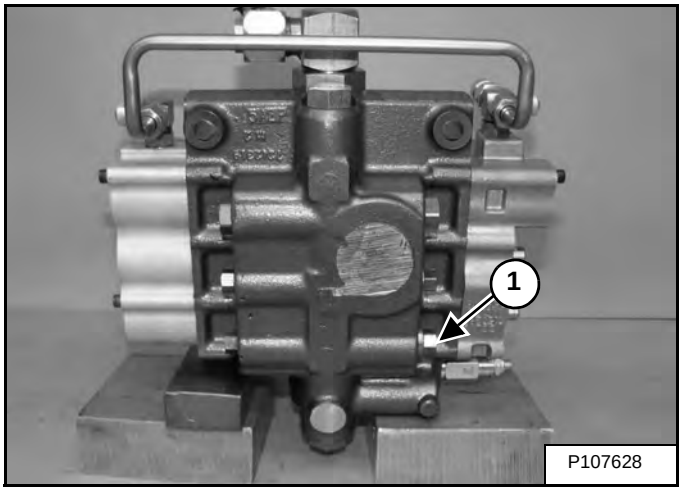
Figure 20-41-8



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.

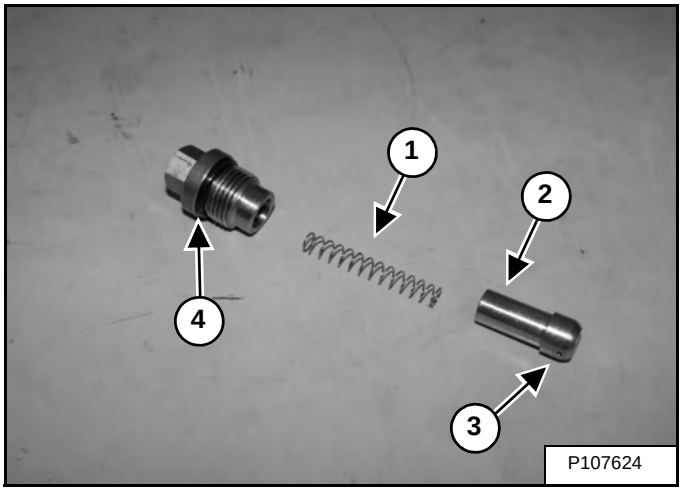
Anti-Cavitation Valve Removal And Installation (Lift, Rod End)

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



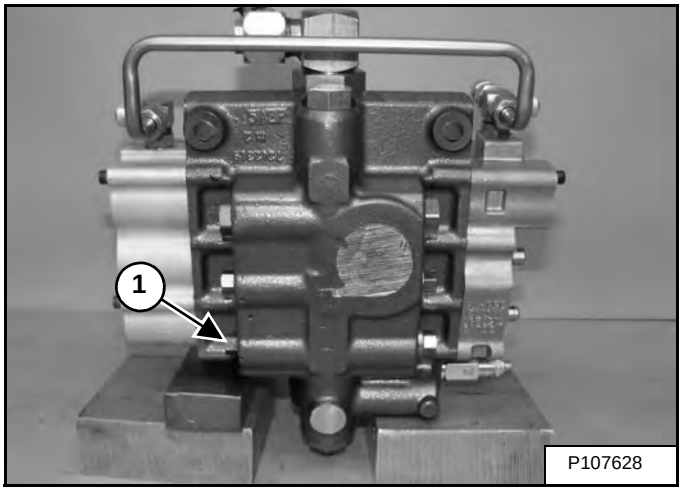
Remove the spring (Item 1) and poppet (Item 2) **[Figure 20-41-34]**.

Inspect the orifice (Item 3) **[Figure 20-41-34]** in the poppet to make 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 51 - 61 N•m (38 - 45 ft-lb) torque.

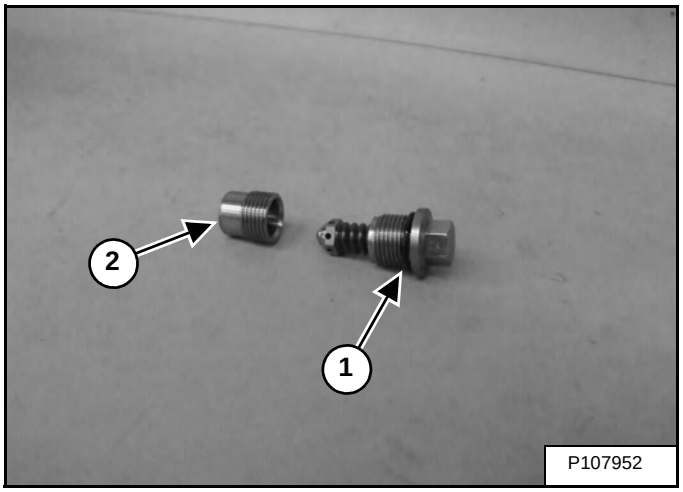
Port Relief / Anti-Cavitation Valve Removal And Installation (Lift, Base End)

Figure 20-41-35



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

Figure 20-41-36



Remove the O-ring (Item 1) **[Figure 20-41-36]** from the port relief / anti-cavitation relief valve.

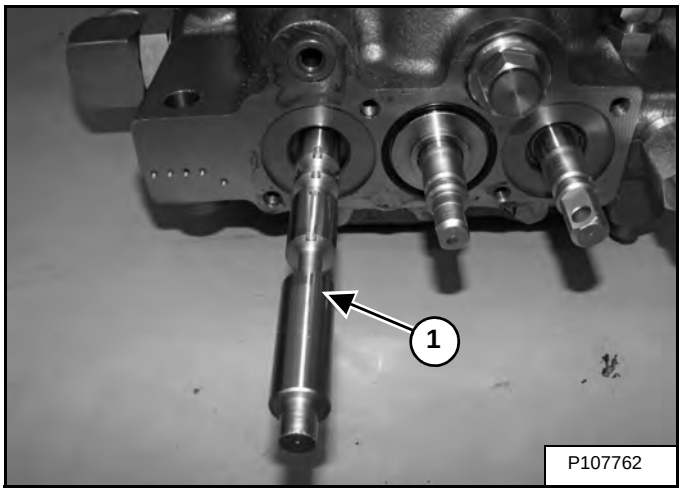
Inspect the port relief / anti-cavitation seat (Item 2) **[Figure 20-41-36]** for wear or damage and replace as needed.

Installation: Tighten the port relief / anti-cavitation relief valve to 51 - 61 N•m (38 - 45 ft-lb) torque.

Installation: Tighten the port relief / anti-cavitation seat to 47 N•m (35 ft-lb) torque.

Auxiliary Spool Removal And Installation (Cont'd)

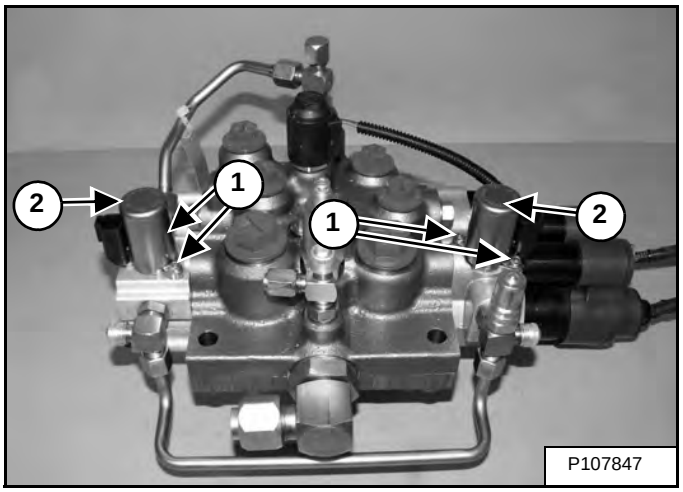
Figure 20-41-72



Remove the auxiliary spool (Item 1) **[Figure 20-41-72]**.

Auxiliary Solenoid Removal And Installation

Figure 20-41-73

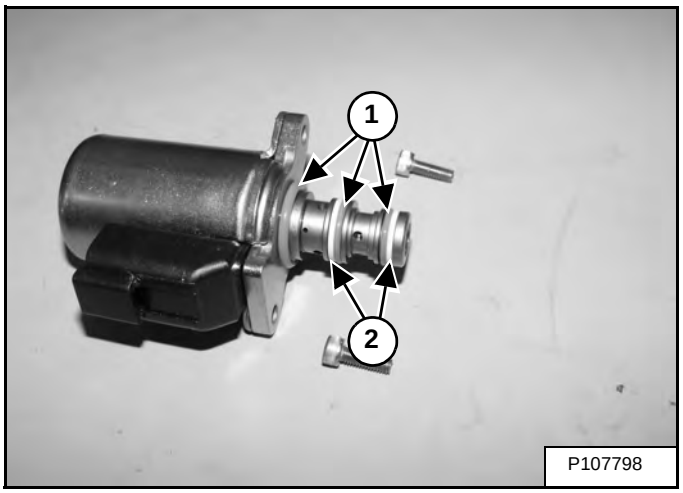


Remove the screws (Item 1) **[Figure 20-41-73]** from both solenoids.

Remove the solenoids (Item 2) **[Figure 20-41-73]**.

Installation: Tighten the screws to 2,3 - 2,7 N•m (21.4 - 23.9 in-lb) torque.

Figure 20-41-74



Remove the O-rings (Item 1) and back-up rings (Item 2) **[Figure 20-41-74]** from the solenoid stem.

Use an ohmmeter to measure the solenoid coil resistance.

The correct resistance for the coil is 5.1 ohm.

Installation: Lubricate and install new O-rings (Item 1) and back-up rings (Item 2) **[Figure 20-41-74]**.

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.

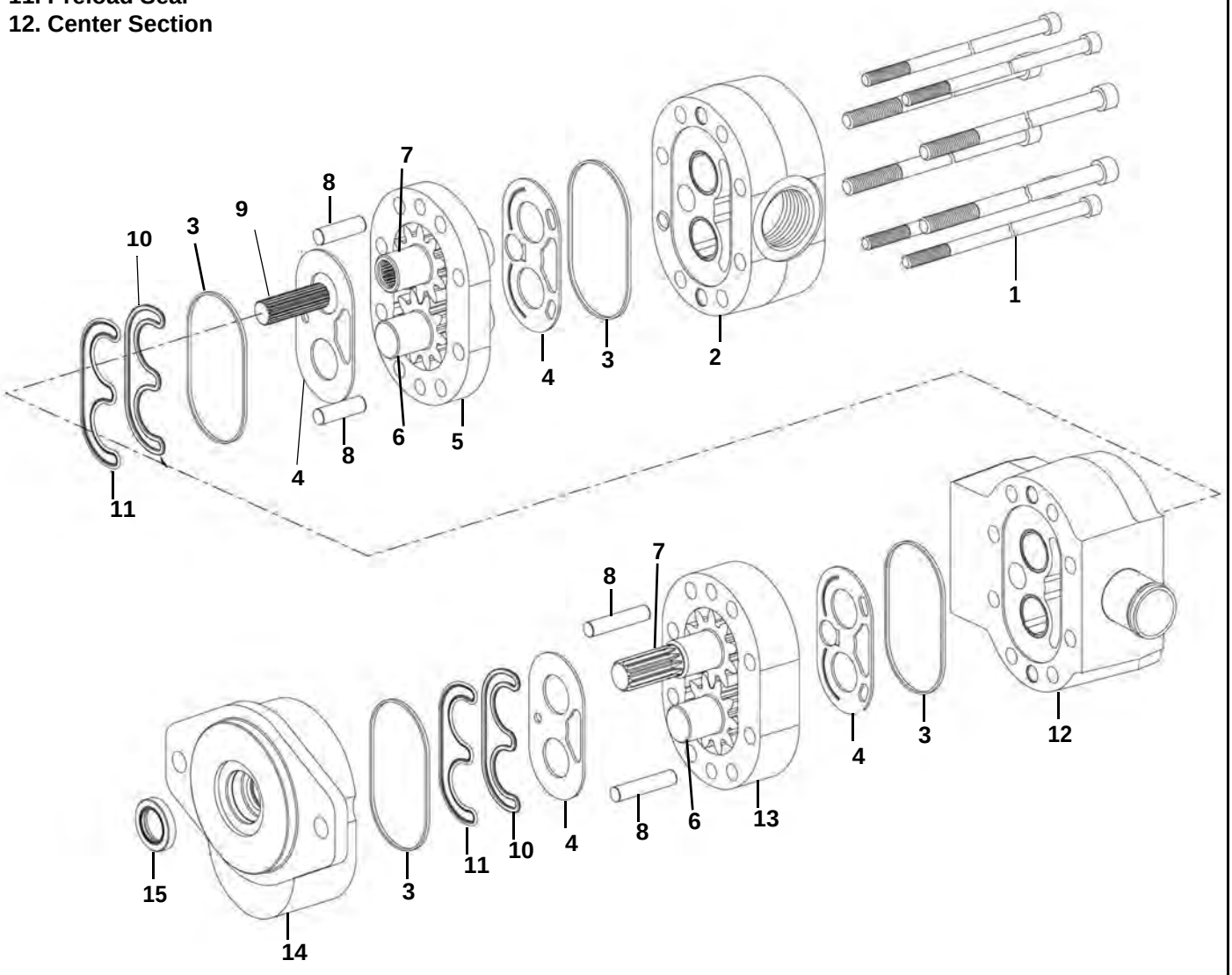
The hydraulic pump has a dedicated charge pump. This supplies flow to the hydraulic fan motor and charge pressure to the hydrostatic pump.

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.

Parts Identification

Figure 20-60-16

1. Bolt
2. Charge Pump End Section
3. Section Seal
4. Wear Plate
5. Charge Pump Center Section
6. Idler Gear
7. Drive Gear
8. Dowel Pin
9. Spline Shaft
10. Load Seal
11. Preload Seal
12. Center Section
13. Auxiliary Pump Center Section
14. Auxiliary Pump End Section
15. Shaft Seal



P-66540

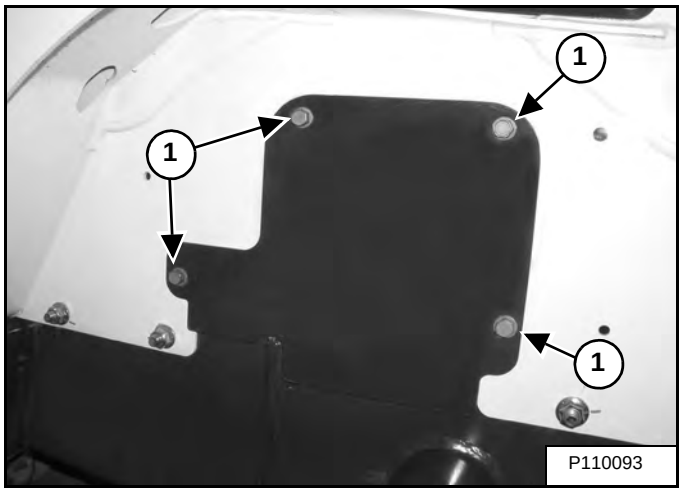
High Flow Relief Valve Adjustment

If the pump is unable to reach 24132 kPa (241,3 bar) (3500 psi) stop the engine. The relief screw (Item 1) **[Figure 20-61-15]** will need to be turned clockwise 1/4 turn and retested with the procedure above. (1/4 turn equals approximately 1379 kPa (13,8 bar) (200 psi).)

NOTE: If the relief screw has been turned in 1/4 turn and the pressure remains the same, go to the high flow relief valve removal and installation section. (See High Flow Relief Valve Removal And Installation on Page 20-61-11.) If relief valve has been tested and is OK, go to the high flow pump disassembly and assembly section. (See Disassembly And Assembly on Page 20-61-17.)

Remove right rear wheel. (See Wheel Nuts on Page 10-160-1.)

Figure 20-61-12



Remove the bolts (Item 1) **[Figure 20-61-12]** from the cover and remove the cover from the loader.

Figure 20-61-13

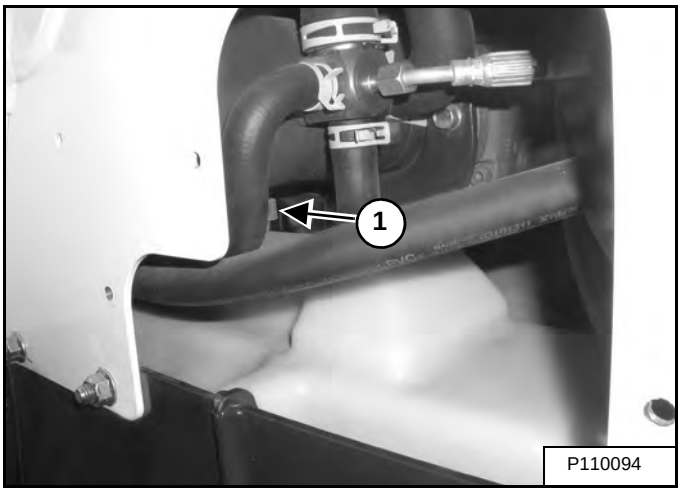
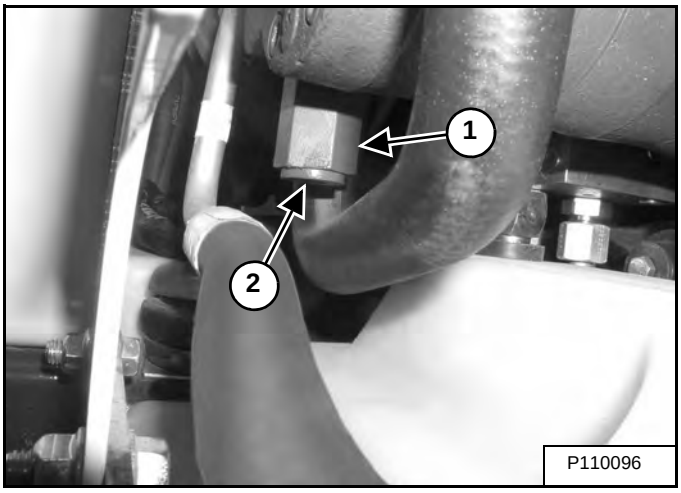


Figure 20-61-14



Locate the high flow relief valve (Item 1) **[Figure 20-61-13]** and **[Figure 20-61-14]** along the right side of the engine.

Remove the plug (Item 2) **[Figure 20-61-14]** located on the bottom of the high flow relief valve.

HYDRAULIC / HYDROSTATIC FILTERS

Description

The hydraulic / hydrostatic filters help to remove contaminants from the fluid when the hydraulic / hydrostatic systems are operating.

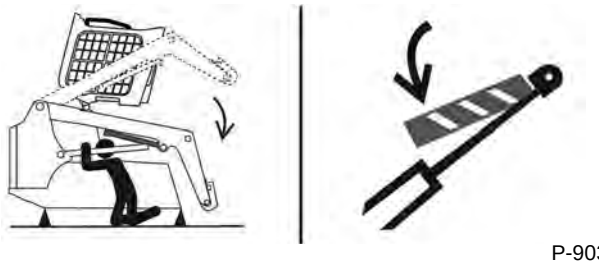
The hydraulic / hydrostatic filter system consists of one main filter and one charge flow filter.

The main filter removes contaminants before entering gear pumps including fluid returning from the main valve.

The charge flow filter removes contaminants after the charge pump.

Housing 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

IMPORTANT

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

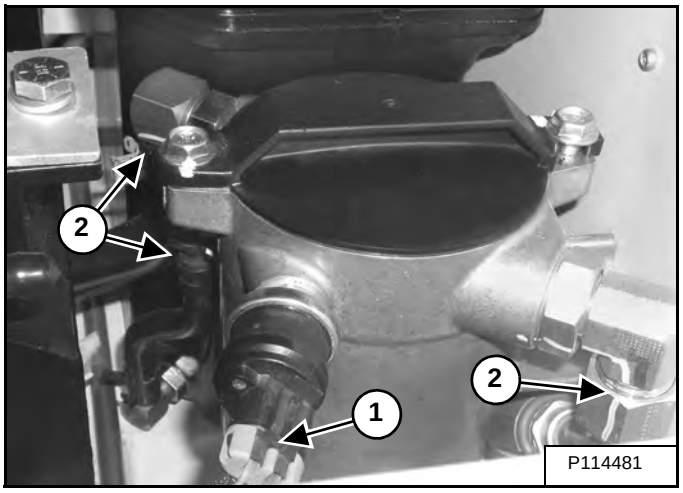
I-2003-0888

Raise the lift arms and install an approved lift arm support device. (See Installing on Page 10-20-2.)

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

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

Figure 20-70-1



Disconnect the wire harness (Item 1) **[Figure 20-70-1]** from the hydraulic / hydrostatic filter sender.

Disconnect the three hoses (Item 2) **[Figure 20-70-1]** from the hydraulic / hydrostatic filter housing.

REAR AUXILIARY DIVERTER VALVE

Description

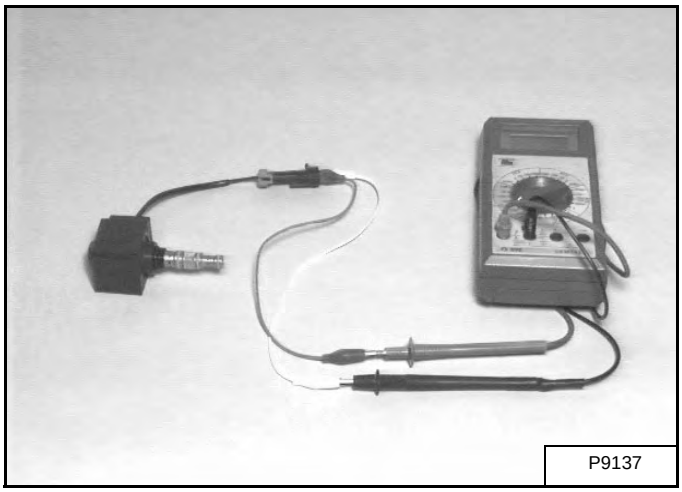
The rear auxiliary diverter valve is an optional valve that diverts fluid from the main valve inlet to two sets of rear auxiliary couplers. The couplers are used for rear mounted attachments.The right side auxiliaries are used for older attachments.

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

See Hydraulic Schematic for more circuit information.

Solenoid Testing

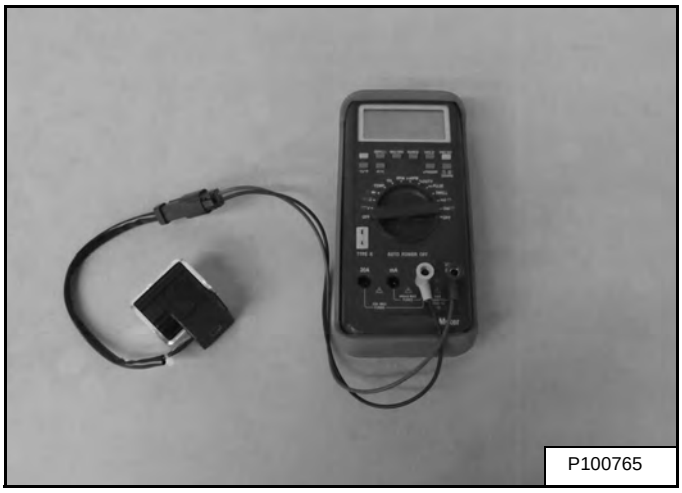
Figure 20-110-1



Use a test meter to measure coil resistance **[Figure 20-110-1]**. Solenoid coil wires do not have polarity. Correct resistance is 8.6 - 9.5 ohm.

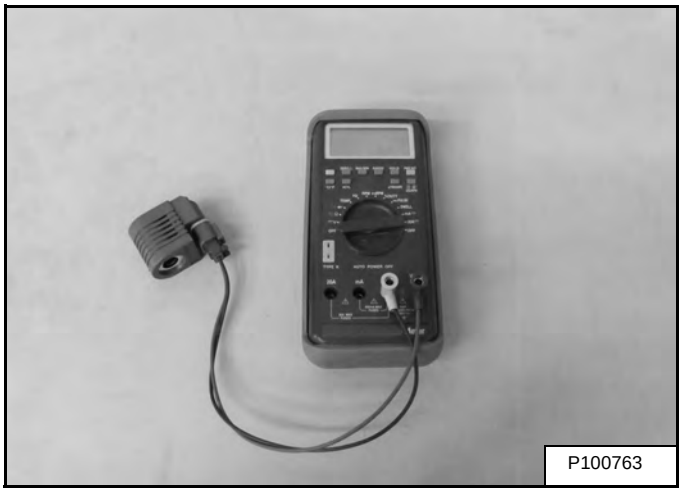
Replace the test meter with 12 volt power. You can see and hear the spool shift.

Figure 20-110-2



Use a test meter to measure coil resistance **[Figure 20-110-2]**. Solenoid coil wires do not have polarity. Correct resistance for the solenoid coil with a pigtail connector is 4.6 - 5.7 ohm.

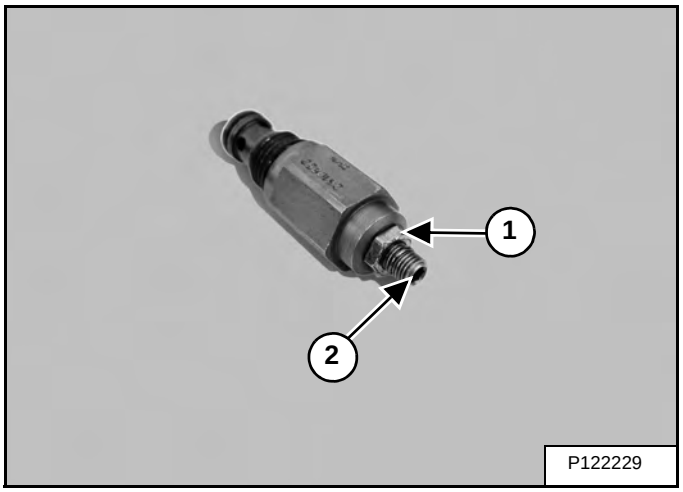
Figure 20-110-3



Use a test meter to measure coil resistance **[Figure 20-110-3]**. Solenoid coil wires do not have polarity. Correct resistance for the solenoid coil with a molded connector is 8.1 - 9.9 ohm.

Testing Relief Valve (Cont'd)

Figure 20-120-4



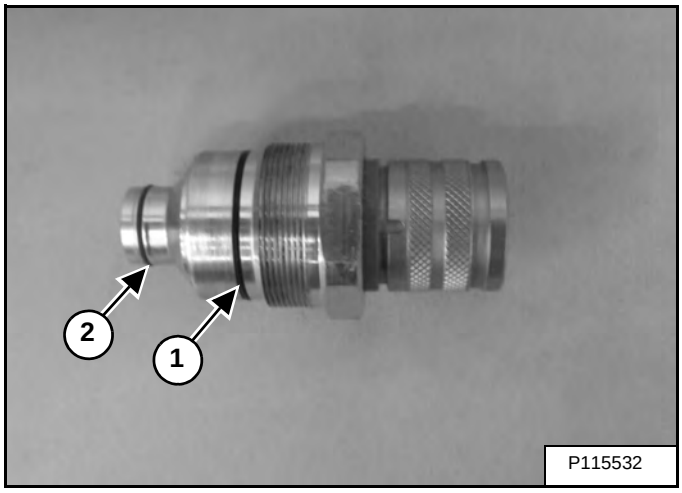
NOTE: Relief valve removed from block for photo clarity.

If adjustment is required loosen the locknut (Item 1) and turn the adjusting screw (Item 2) **[Figure 20-120-4]** clockwise to increase pressure or counterclockwise to decrease pressure.

Test the relief valve setting after adjustment has been made.

Disassembly And Assembly (Cont'd)

Figure 20-130-8



Inspect the O-ring (Item 1) and seal (Item 2) **[Figure 20-130-8]** and replace coupler if damaged.

Assembly: Lightly lubricate the O-ring and seal with oil before installation.

HYDROSTATIC SYSTEM INFORMATION

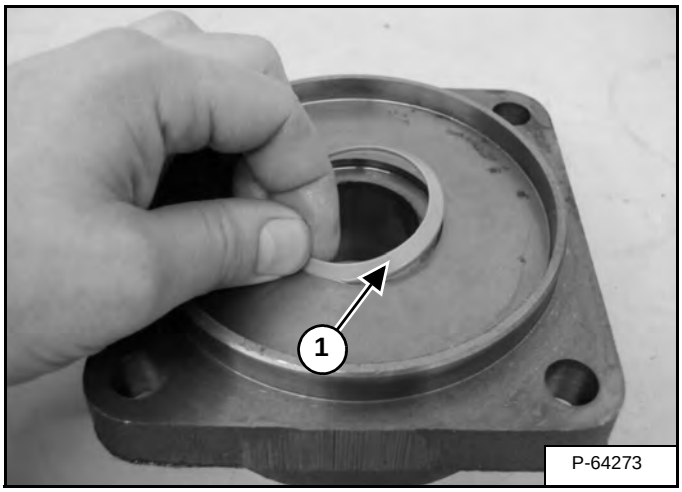
Description

The hydrostatic system consists of tandem hydrostatic pump and two hydrostatic motors. The hydrostatic system allows forward and reverse motion in the loader.

The hydrostatic pump is connected to the engine by a drive belt and provides fluid to the hydrostatic motors. The charge pressure system assists in replenishing the fluid that is lost do to internal leakage in the components of the hydrostatic system.

Disassembly And Assembly (Cont'd)

Figure 30-20-23

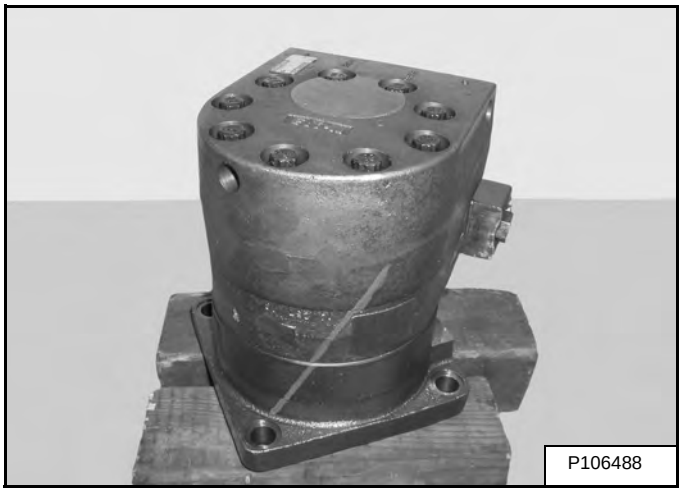


Turn the mounting flange over and remove the seal (Item 1) **[Figure 30-20-23]**.

Disassembly

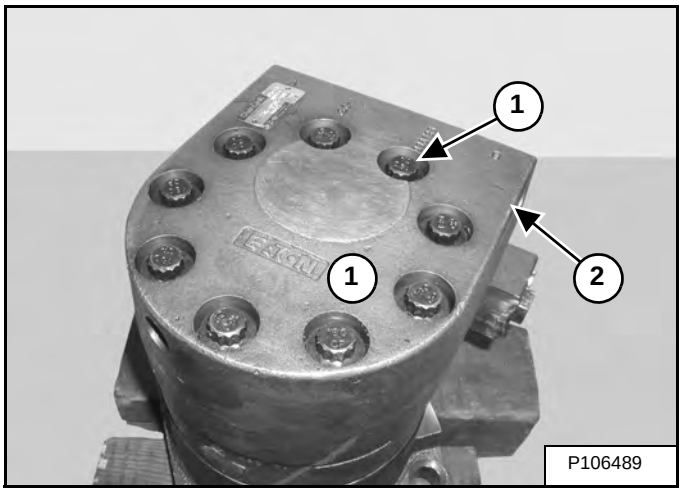
Drain the fluid from the motor casing.

Figure 30-21-18



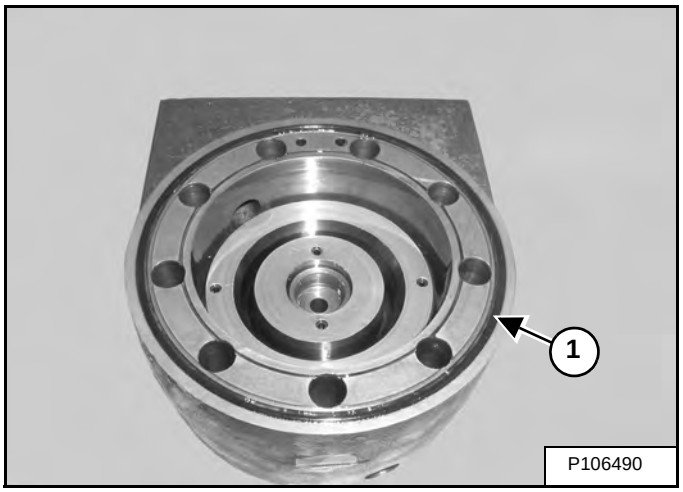
Mark the side of the motor for ease of assembly **[Figure 30-21-18]**.

Figure 30-21-19



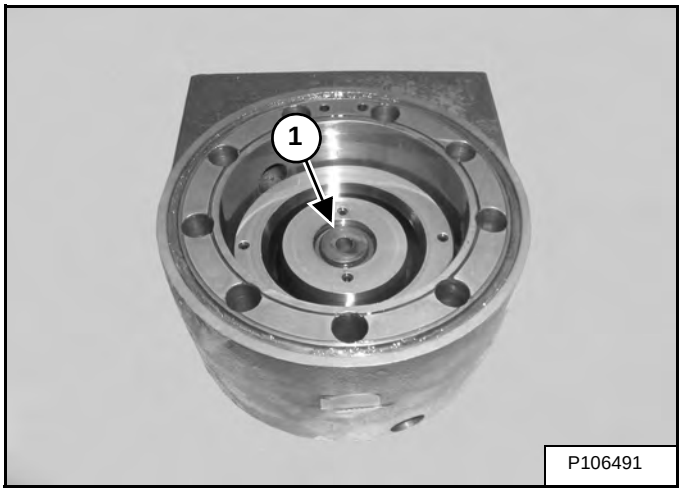
Remove the bolts (Item 1) and valve housing (Item 2) **[Figure 30-21-19]**.

Figure 30-21-20



Remove the O-ring (Item 1) **[Figure 30-21-20]**.

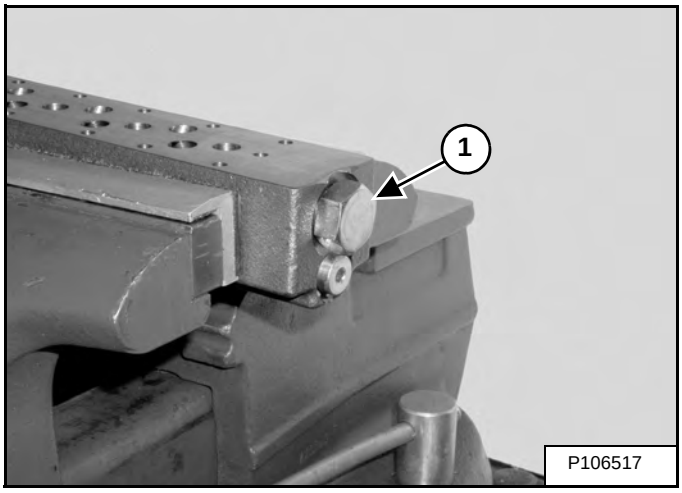
Figure 30-21-21



Remove the dowel pin (Item 1) **[Figure 30-21-21]**.

Disassembly (Cont'd)

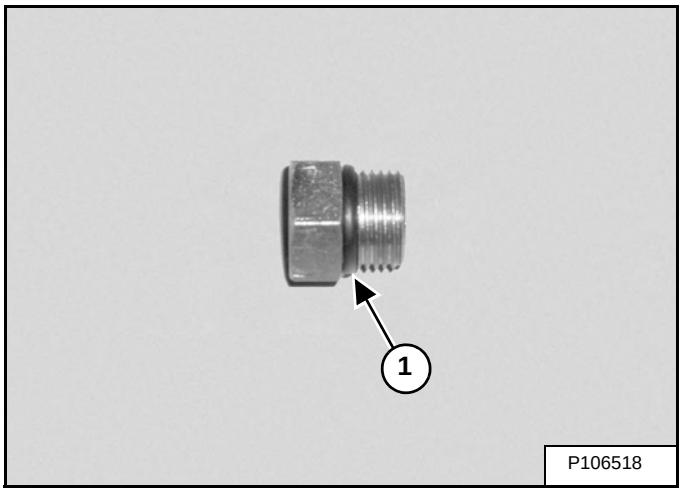
Figure 30-21-58



Remove the plug (Item 1) **[Figure 30-21-58]**.

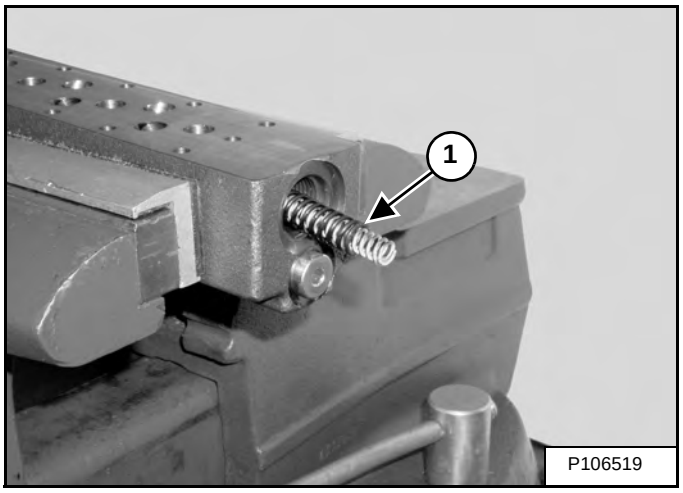
NOTE: The plug is under spring pressure.

Figure 30-21-59



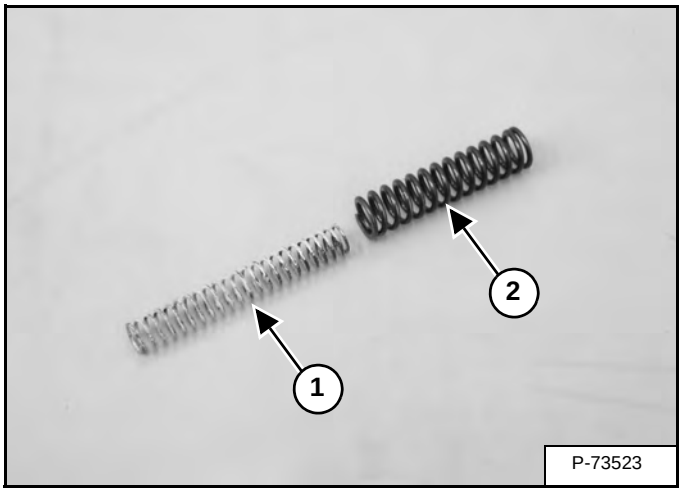
Remove the O-rings (Item 1) **[Figure 30-21-59]**.

Figure 30-21-60



Remove the springs (Item 1) **[Figure 30-21-60]** from the spool housing.

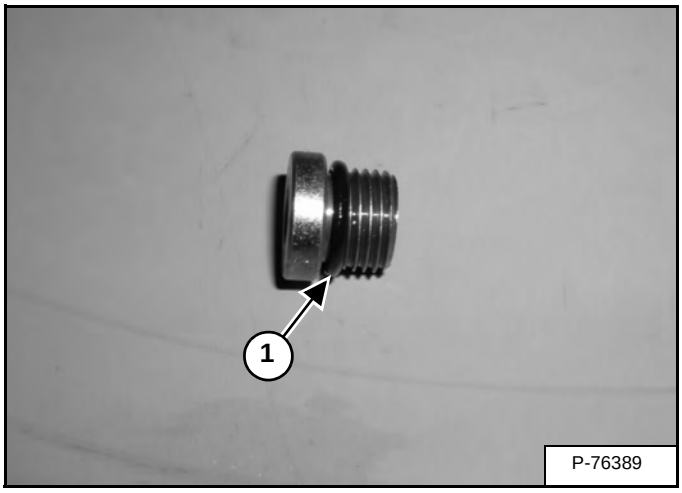
Figure 30-21-61



Remove the inner spring (Item 1) from the outer spring (Item 2) **[Figure 30-21-61]**.

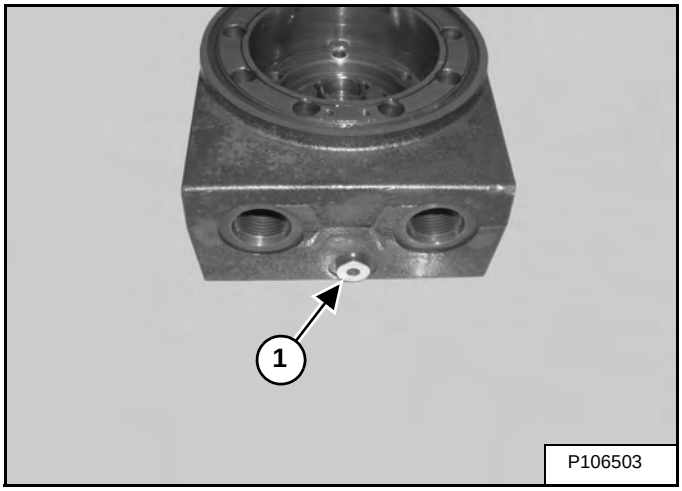
Assembly (Cont'd)

Figure 30-21-92



Install the O-ring (Item 1) **[Figure 30-21-92]**.

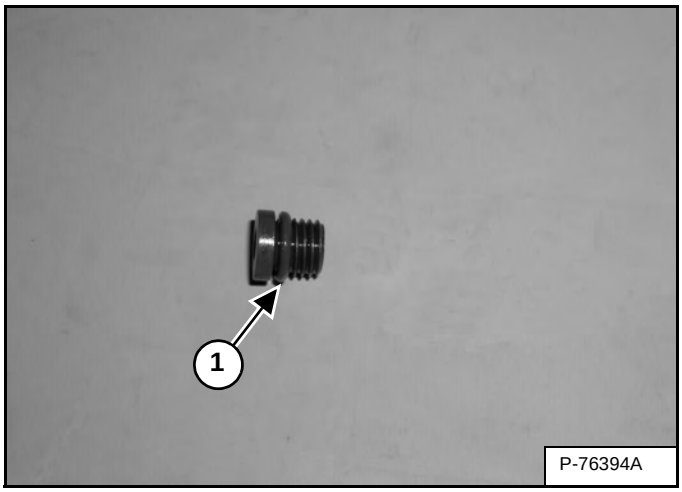
Figure 30-21-93



Install the plug (Item 1) **[Figure 30-21-93]**.

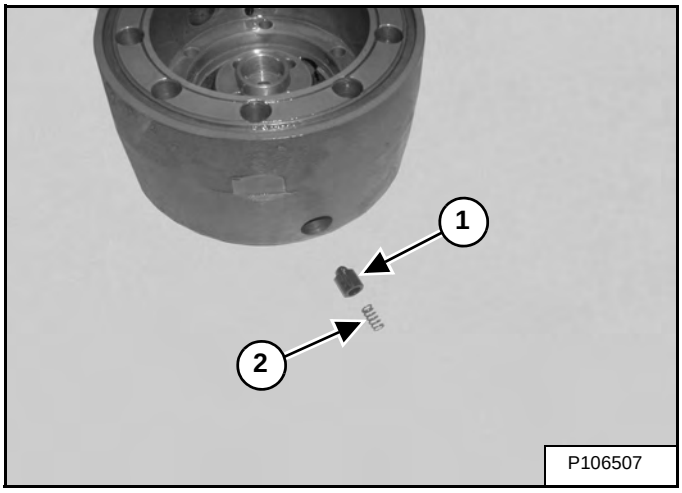
Tighten the plug to 37 - 45 N•m (27 - 33 ft-lb) torque.

Figure 30-21-94



Install the O-ring (Item 1) **[Figure 30-21-94]** on the plug.

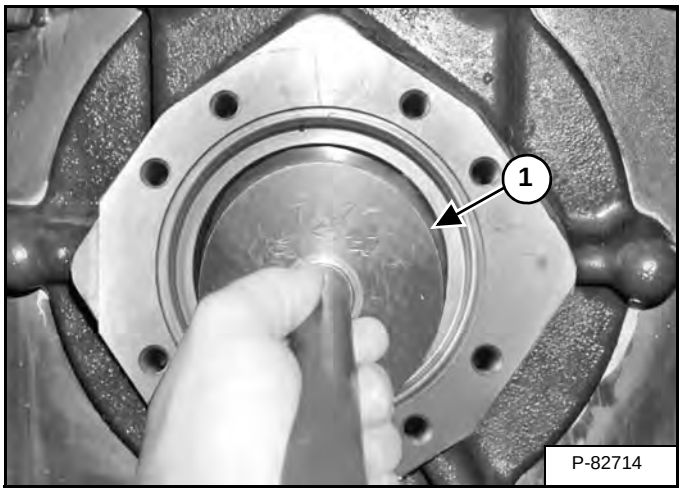
Figure 30-21-95



Install the poppet (Item 1) and spring (Item 2) **[Figure 30-21-95]**.

Shaft Seal Removal And Installation (Cont'd)

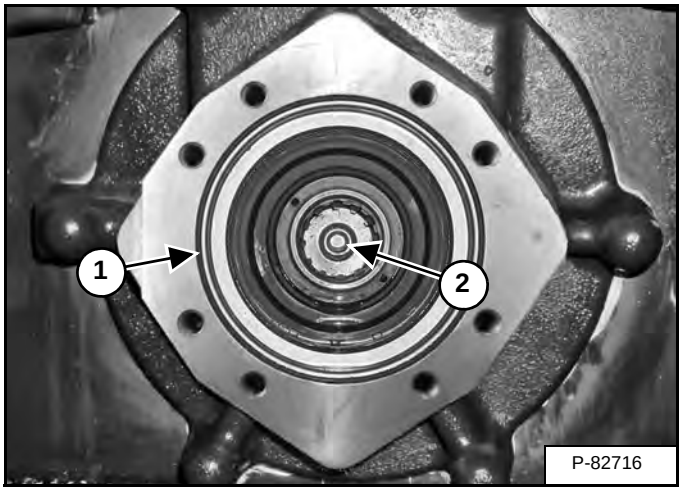
Figure 30-30-4



Install MEL1420 Carrier Seal Tool (Item 1) **[Figure 30-30-4]** over the carrier seal.

Hit the tool with a hammer until the seal is fully seated on the carrier shaft.

Figure 30-30-5



Install the O-ring (Item 1) **[Figure 30-30-5]**.

NOTE: Before installing the hydrostatic motor, inspect the plug (Item 2) [Figure 30-30-5] located in the center of the carrier shaft. If the plug is loose, case drain fluid from the hydrostatic motor can leak into the chaincase.

HYDROSTATIC MOTOR CARRIER (TWO-SPEED)

Description

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

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 fluid from the hydrostatic motor case drain fluid.

A brake disk is installed on each hydrostatic motor carrier. The brake disk is mounted to the shaft in the motor carrier.

The hydrostatic motor carriers are made to fit on both the right or left hand side of the loader. There are two sets of mounting holes on each hydrostatic motor carrier to fasten the hydrostatic motors. One set for the left hand side and another set for the right hand side of the loader.

Figure 30-31-1

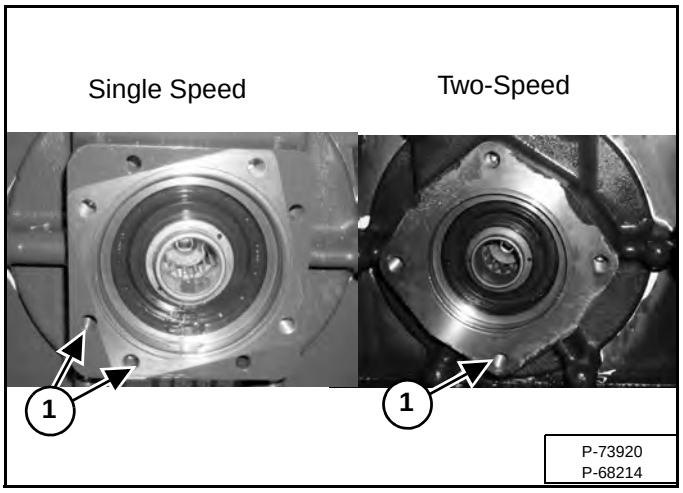
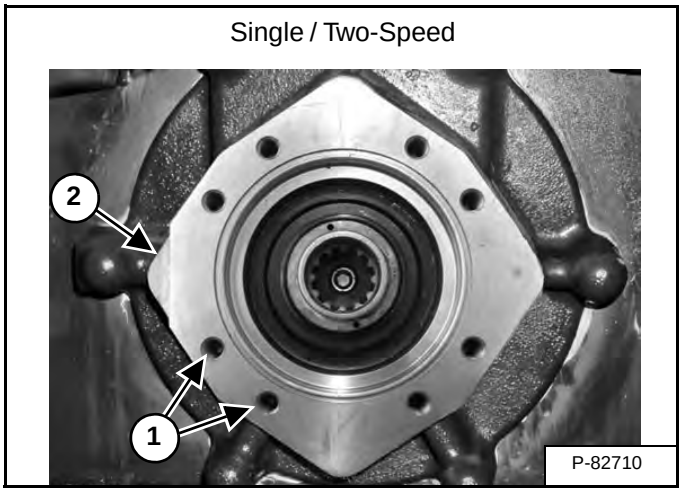


Figure 30-31-2

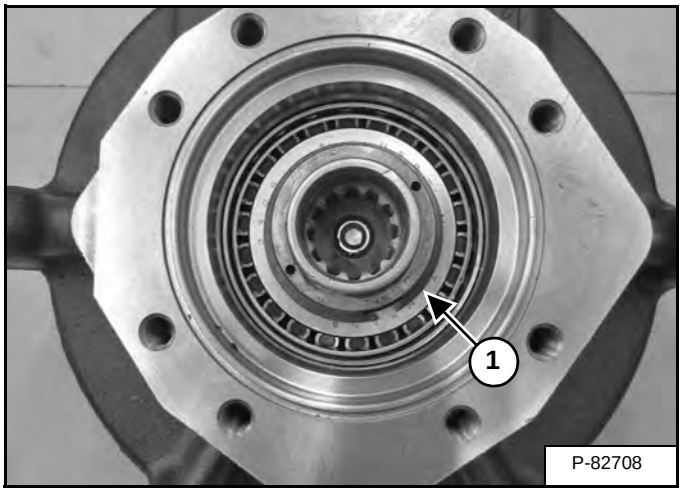


The motor carrier hydrostatic motor mounting holes (Item 1) **[Figure 30-31-1]** and **[Figure 30-31-2]** are the only difference between the single, two-speed and single / two-speed motor carriers with SJC controls. The disassembly and assembly procedures are the same.

The single / two-speed motor carrier has a notch (Item 2) **[Figure 30-31-2]** removed from one side of the carrier.

Assembly (Cont'd)

Figure 30-31-23



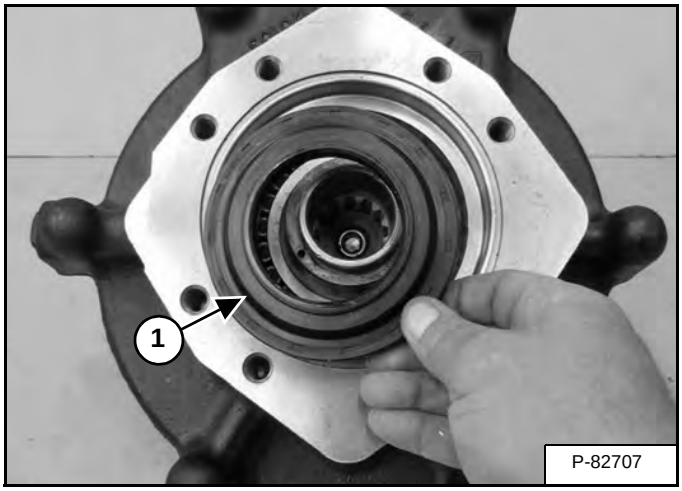
Put the snap ring (Item 1) **[Figure 30-31-23]** over the end of the sprocket shaft.

NOTE: Use the snap ring pliers to spread the snap ring so it will fit over the sprocket shaft.

Using the press and driver tools, press the snap ring (Item 1) **[Figure 30-31-23]** over the shaft.

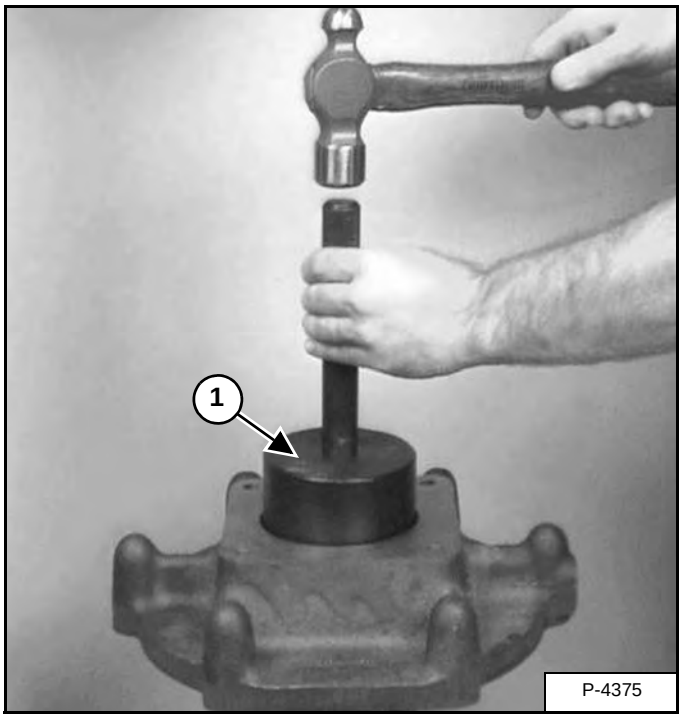
Press the snap ring on until it snaps into the groove on the shaft.

Figure 30-31-24



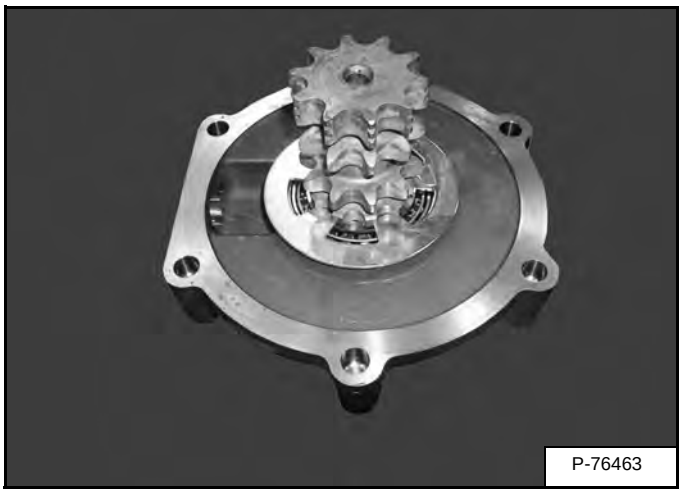
Put the shaft seal (Item 1) **[Figure 30-31-24]** on the shaft.

Figure 30-31-25



Use MEL1420 Carrier Seal Tool (Item 1) **[Figure 30-31-25]** and install the shaft seal.

Figure 30-31-26



Use a rubber mallet **[Figure 30-31-26]**, tap down on the shaft.

Removal And Installation (Cont'd)

Remove the hydrostatic pump from the mounting bracket and drive belt housing.

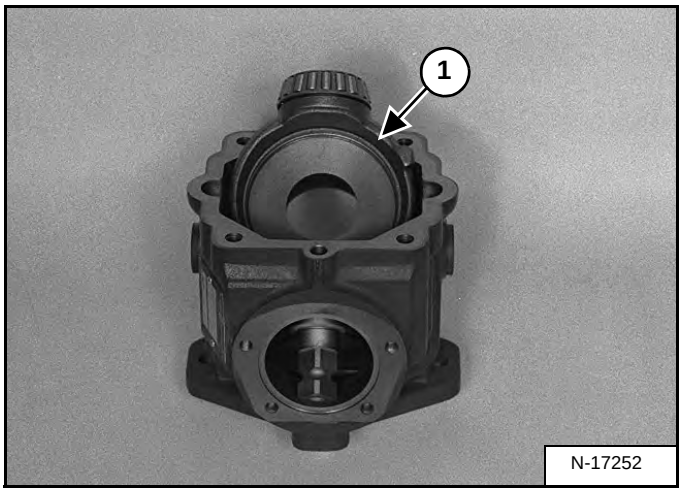
BEFORE STARTUP: Fill the hydrostatic pump with hydraulic fluid. This will remove trapped air in the hydrostatic pumps before startup. (See Hydrostatic Pump Startup on Page 30-50-3.)

Hydrostatic Pump Startup

Follow the hydraulic pump startup procedure. (See Hydraulic Pump Startup on Page 20-60-10.)

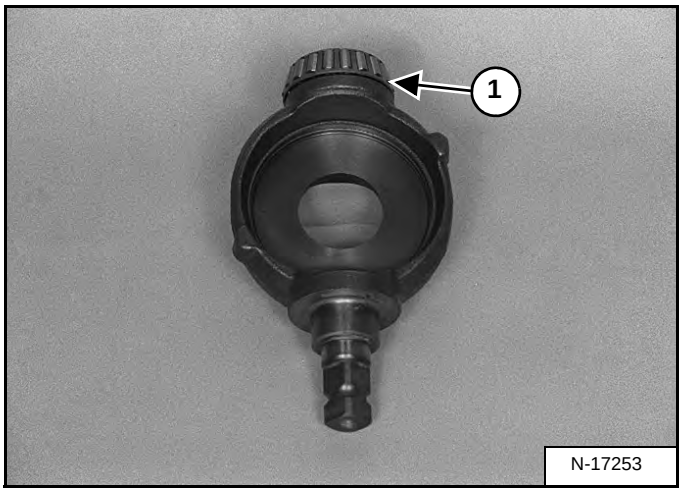
Disassembly (Cont'd)

Figure 30-50-30



Tilt the swash plate (Item 1) **[Figure 30-50-30]** and remove the swash plate and bearing from the pump housing.

Figure 30-50-31



Remove the bearing (Item 1) **[Figure 30-50-31]** from the swash plate.

Removal And Installation

Remove the hydrostatic pump / engine assembly from the loader. (See Engine Removal And Installation on Page 70-10-13.)

Remove the Hydraulic Pump. (See Removal And Installation on Page 20-60-8.)

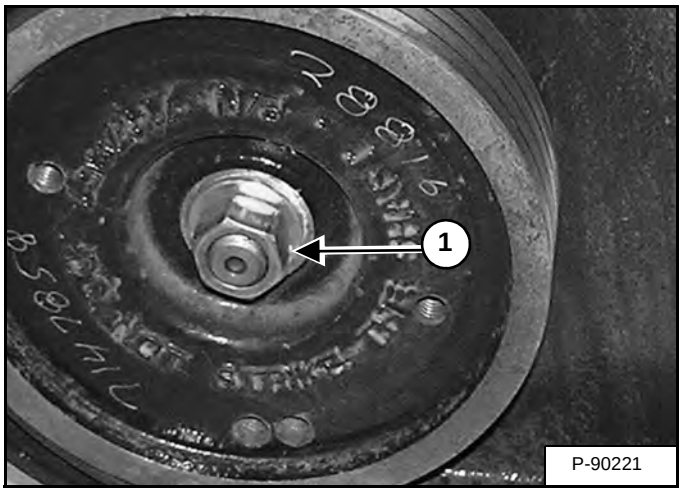
Remove the Drive Belt. (See Belt Replacement on Page 30-60-2.)

IMPORTANT

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

I-2003-0888

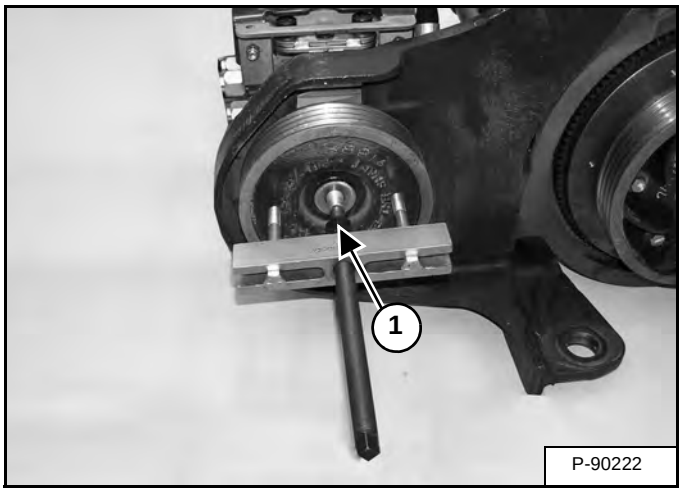
Figure 30-51-2



Loosen the nut (Item 1) **[Figure 30-51-2]** on the hydrostatic pump drive shaft.

Installation: Tighten the nut to 258 - 325 N•m (190 - 240 ft-lb) torque

Figure 30-51-3



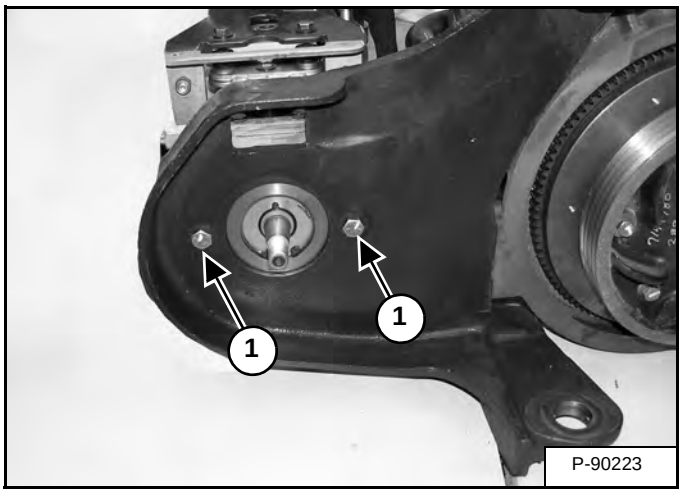
Use a puller (Item 1) **[Figure 30-51-3]** to loosen the pulley from the pump drive shaft.

NOTE: DO NOT strike puller or pump shaft with a hammer. Internal pump damage may result.

Remove the nut and washer from the pump drive shaft.

Remove the pump pulley from the pump drive shaft.

Figure 30-51-4

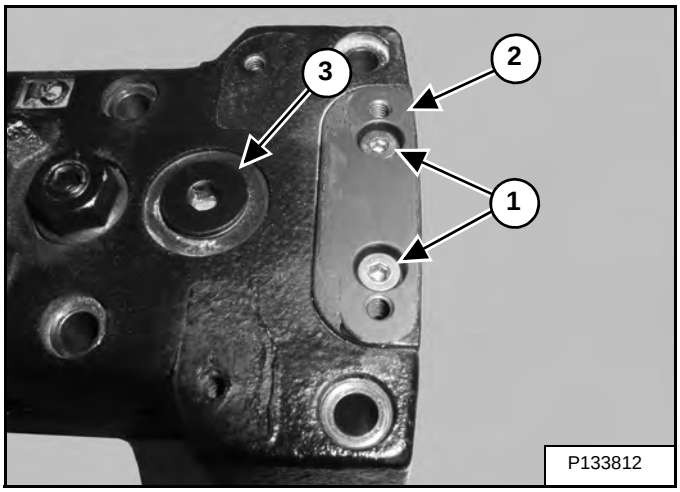


Remove the two mounting bolts and nuts (Item 1) **[Figure 30-51-4]**.

Installation: Tighten the mounting bolts and nuts to 88 - 95 N•m (65 - 70 ft-lb) torque.

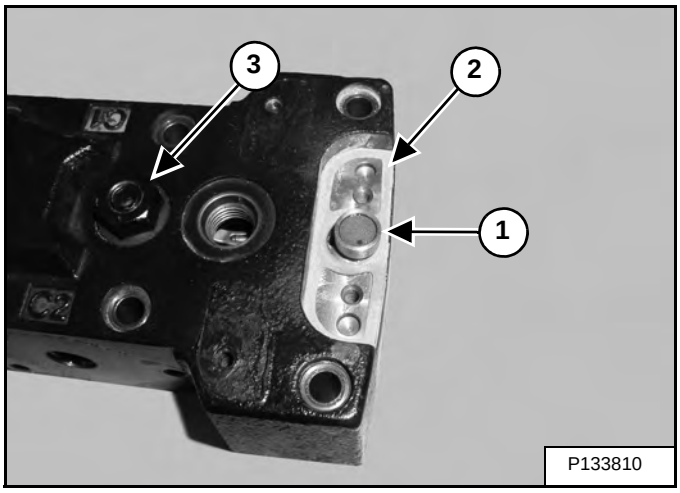
Disassembly And Assembly (Cont'd)

Figure 30-51-21



Remove the screws (Item 1), spacer (Item 2) and plug (Item 3) **[Figure 30-51-21]**.

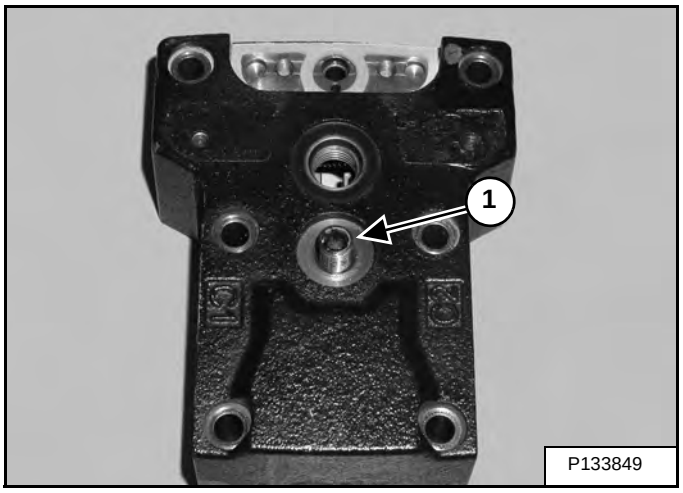
Figure 30-51-22



Remove the sensor magnet (Item 1),gasket (Item 2) and adjusting screw locknut (Item 3) **[Figure 30-51-22]**.

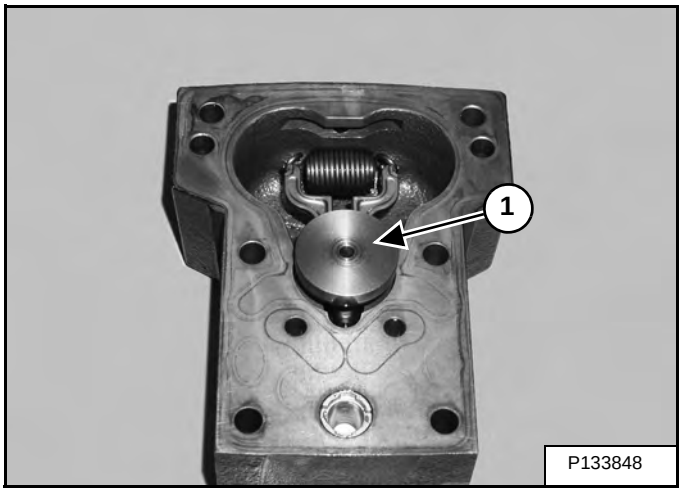
Assembly: Tighten locknut to 10 N•m (7 ft-lb) torque.

Figure 30-51-23



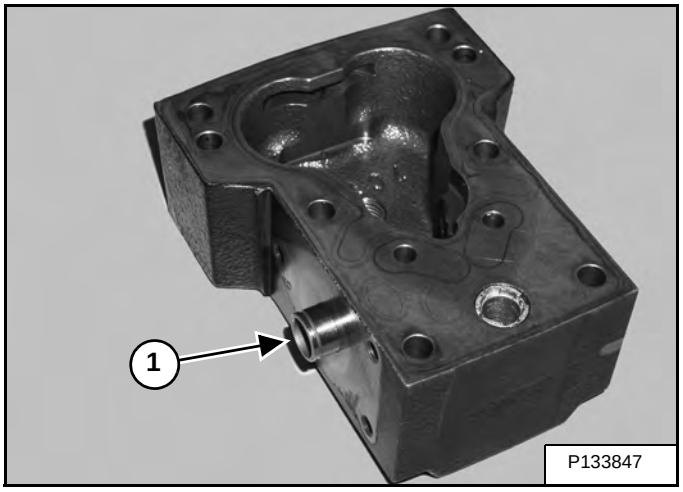
Lightly tap on adjusting screw (Item 1) **[Figure 30-51-23]**.

Figure 30-51-24



Remove actuator assembly (Item 1) **[Figure 30-51-24]**.

Figure 30-51-25



Remove the spool (Item 1) **[Figure 30-51-25]**.

HYDROSTATIC PUMP (SJC) (CONT'D)

Mechanical Neutral Adjustment

The mechanical neutral adjustment sets the position of the servo piston and pump swash plate relative to the hydraulic controller. This procedure should be followed if the hydrostatic pump has been disassembled for servicing the servo piston and the setting has been disrupted.

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

⚠ WARNING

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

W-2017-0286

Raise the lift arms, and install an approved lift arm support. (See Installing on Page 10-20-2.)

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

Connect the Remote Start Tool. (See REMOTE START TOOL KIT - MEL1563 on Page 10-60-1.)

Disconnect the swash plate sensors in the electrical harness. This prevents unwanted swash plate movement error codes from occurring during adjustments. Disconnecting the sensors does not have to be done directly at the sensor, follow the harness back to find an accessible connector to disconnect.

⚠ 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

Mechanical neutral is set with the pump running at 1800 (rpm). To set neutral, you must stroke the pump in each direction. You can do this with a small movement of the eccentric screw on EDC controls. If you perform this adjustment with the pump installed in a machine, safely elevate the wheels or disconnect the mechanism to allow safe operation during adjustment.

This procedure details setting neutral for the entire pump, one side at a time. The procedure is the same for each side of each pump so you will need to repeat it four times to set mechanical neutral for both the front and rear sections. Alternate M4/M5 and MA/MB to zero out forward and reverse directions of the front unit, then move the gauges to M4/M5 of the rear unit and MC/MD (system gauge ports for the rear unit). Refer to the drawing to identify all ports (See Port Locations And Gauge Installation on Page 30-51-2.). The front and rear sections are basically mirror images of each other. The control solenoids C1 and C2 are marked on each control. While performing this adjustment, you monitor the following pressures:

1. Servo pressure at M4 and M5.

2. System pressure at MA and MB or MC and MD.

Pump setup

1. Attach a 50 bar [1000 psi] gauge to each servo pressure port M4 and M5.

2. Attach a 600 bar [10 000 psi] gauge to each system pressure port (MA and MB for front pump, MC and MD for rear pump).

3. Remove servo cylinder locking screws (E350) and plates (E300) from both sides of the pump.

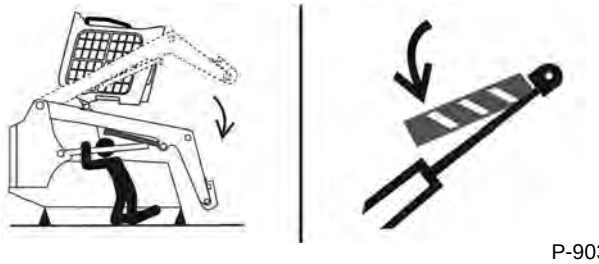
4. Disconnect the control solenoids from the vehicle wiring harness.

5. If using a PWM signal to set mechanical neutral, connect the control solenoids C1 and C2 to the signal source. Ensure the source supplies no current to the solenoids until required in the following procedure.

TWO-SPEED

Valve Block 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

WARNING

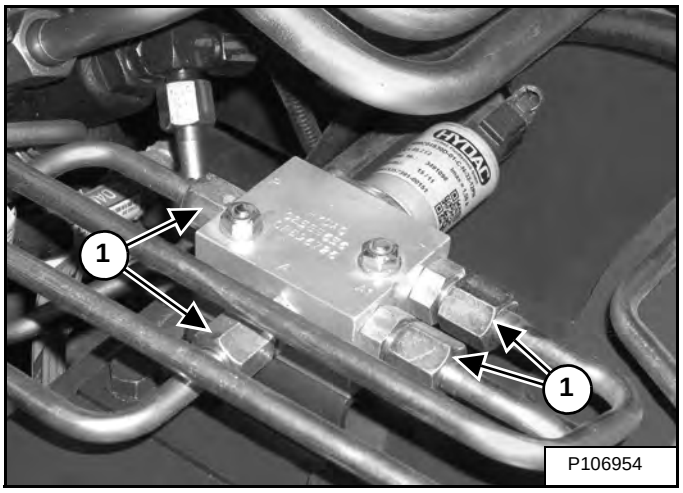
Put jackstands under the front axles and rear corners of the frame before running the engine for service. Failure to use jackstands can allow the machine to fall or move and cause injury or death.

W-2017-0286

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

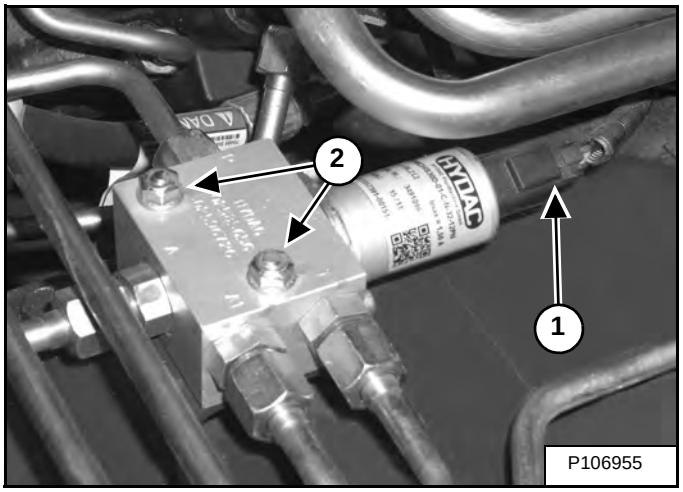
Mark all hydraulic hoses for proper installation.

Figure 30-70-1



Remove the four hydraulic lines (Item 1) **[Figure 30-70-1]** from the two-speed valve block.

Figure 30-70-2

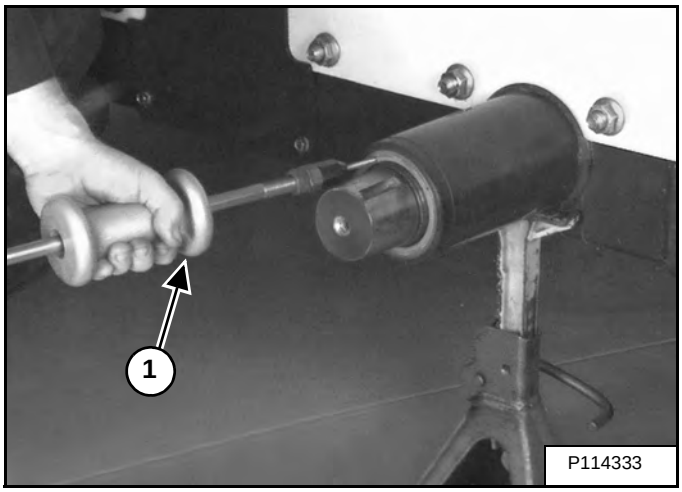


Disconnect the wire harness connector (Item 1) **[Figure 30-70-2]** from the two-speed solenoid.

Remove the two bolts (Item 2) **[Figure 30-70-2]** and remove the valve block.

Axle Seal Removal And Installation (Cont'd)

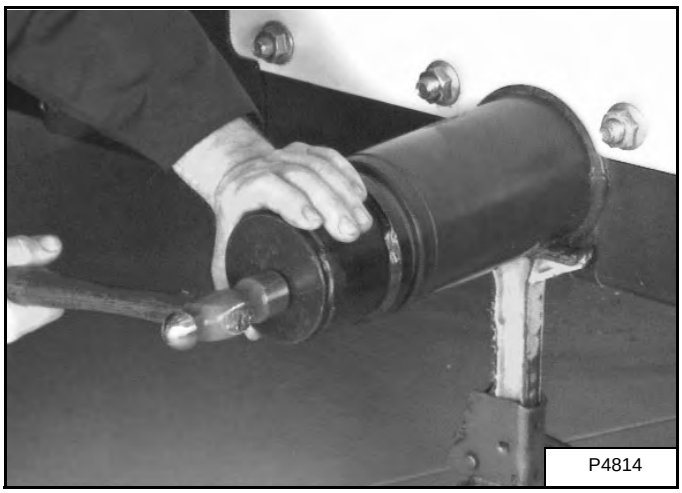
Figure 40-20-4



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

Remove the axle seal.

Figure 40-20-5



Installation: Place the seal with the lip facing in **[Figure 40-20-5]**.

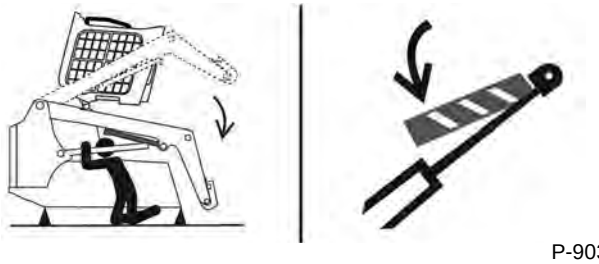
Installation: Using a hammer, install the new axle seal until the tool (MEL1407) is flush with the edge of the axle tube **[Figure 40-20-5]**.

Rear Cover Removal And Installation

Raise the loader lift arms and install an approved lift arm support. (See Installing on Page 10-20-2.)

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

DANGER



P-90328

AVOID DEATH

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

D-1009-0409

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

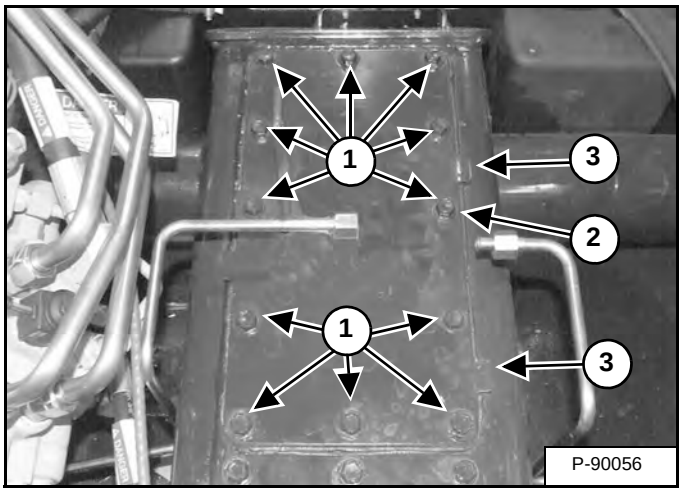
If loader is equipped with two-speed, remove the two-speed valve. (See Valve Block Removal And Installation on Page 30-70-1.)

Remove the drain manifold. (See Drain Manifold Removal And Installation on Page 30-80-1.)

Disconnect the front steering linkage bars from the rear linkage bars. (See Removal And Installation on Page 50-100-2.)

Move the linkage bars to allow adequate space to remove the rear chaincase cover.

Figure 40-30-4



Remove the rear chaincase cover mounting screws (Item 1) **[Figure 40-30-4]**.

Remove chain case cover (Item 2) **[Figure 40-30-4]**.

NOTE: There are tabs (Item 3) [Figure 40-30-4] on the side of the cover to help pry the covers off.

Installation: Apply polyurethane sealer to mating surfaces. Polyurethane sealant should be applied to the screw threads to stop fluid leakage. Tighten the mounting screws to 34 - 38 N•m (25 - 28 ft-lb) torque.

Gas Spring Removal And Installation

WARNING

Cylinder contains high pressure gas. Do not open. Opening cylinder can release rod and cause injury or death.

W-2113-0288

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

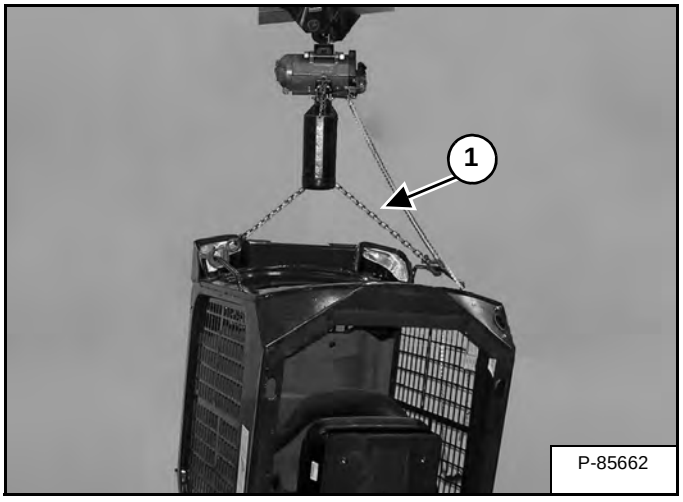
WARNING

AVOID INJURY OR DEATH

Attach a chain hoist to the grab handles of the operator cab before removing the operator cab gas spring(s). If the operator cab is tilted forward without the gas spring(s) operational, the cab will fall and could cause injury or death.

W-2760-0309

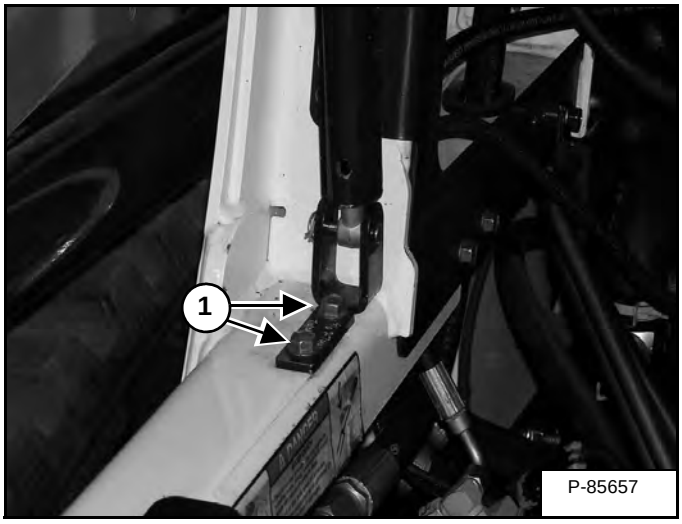
Figure 50-20-1



Install a strap and hoist (Item 1) **[Figure 50-20-1]** to the cab handles.

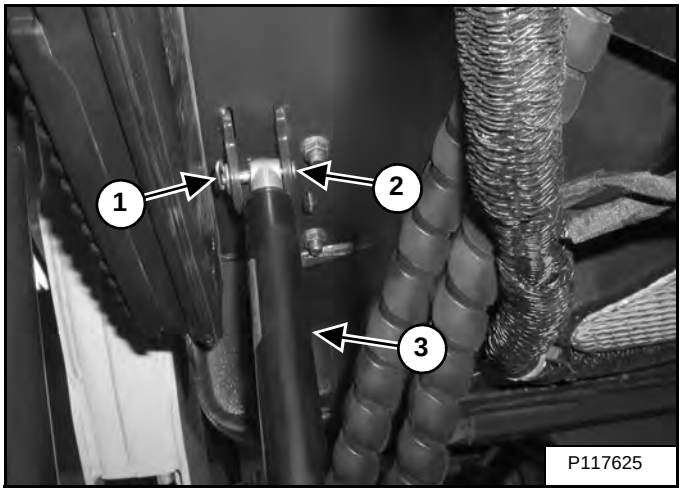
Lift the cab with the hoist to release the pressure on the gas spring(s).

Figure 50-20-2



Remove the two bolts (Item 1) **[Figure 50-20-2]**.

Figure 50-20-3

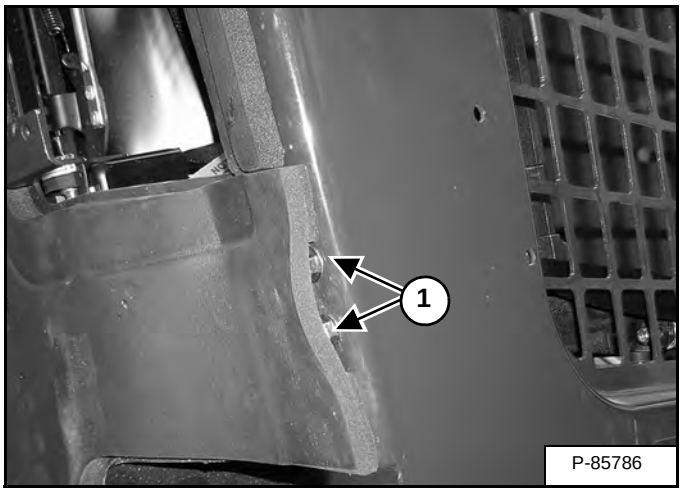


Remove the retaining pin (Item 1), pin (Item 2), and the gas spring (Item 3) **[Figure 50-20-3]** from the loader.

NOTE: If the loader is equipped with a second gas spring repeat the procedure for the other side.

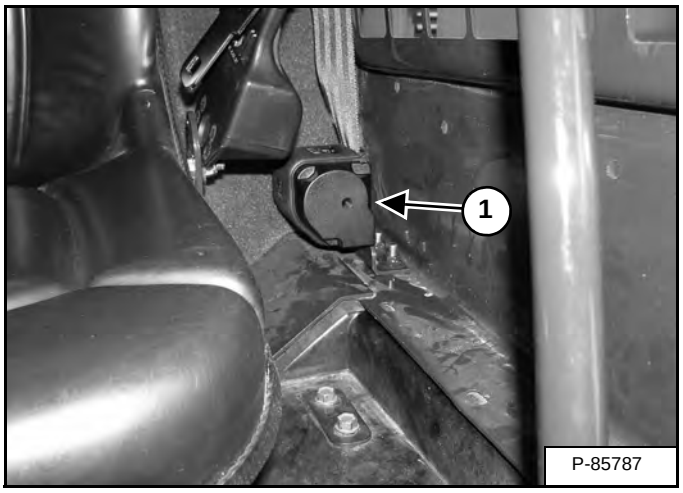
3-Point Seat Belt Removal And Installation (Cont'd)

Figure 50-31-13



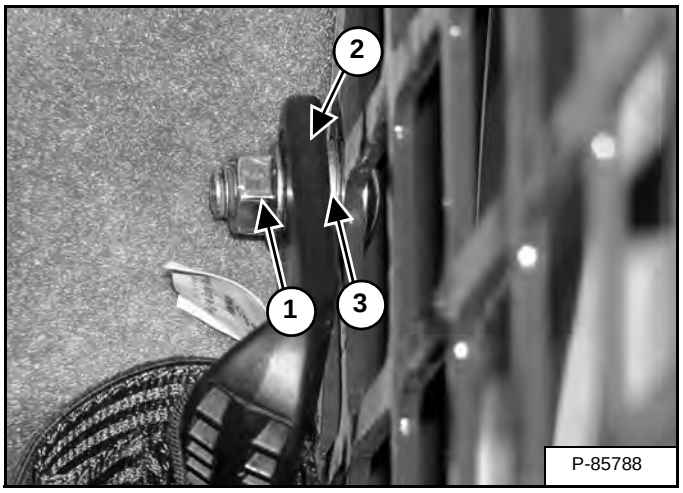
Remove the two mounting bolts (Item 1) **[Figure 50-31-13]**.

Figure 50-31-14



Remove the shoulder harness retractor (Item 1) **[Figure 50-31-14]**.

Figure 50-31-15

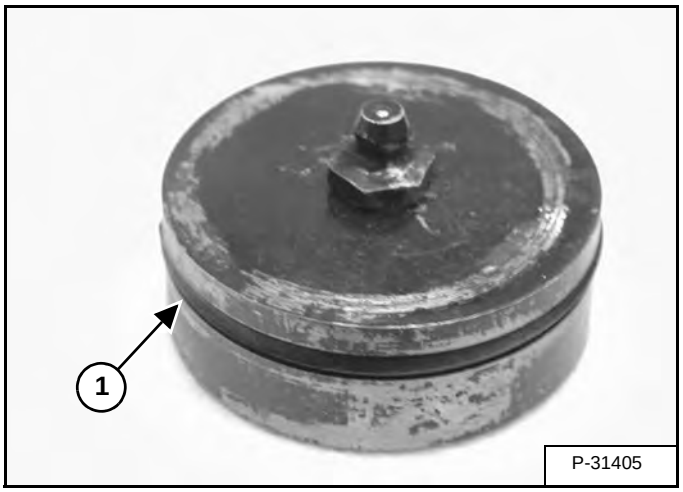


Remove the nut (Item 1) **[Figure 50-31-15]**.

Remove the shoulder harness guide and bushing (Item 2) and hardened washer (Item 3) **[Figure 50-31-15]**.

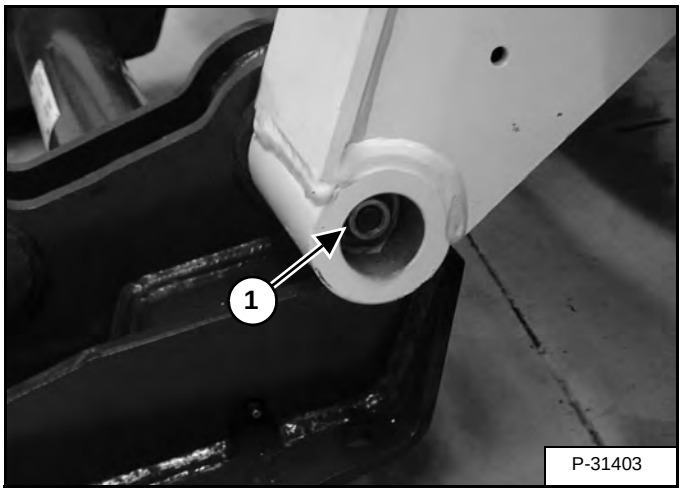
Removal And Installation (Cont'd)

Figure 50-41-6



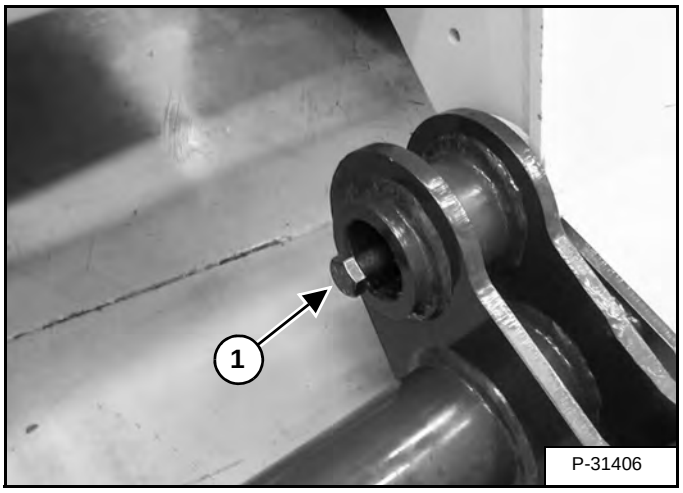
Remove the O-ring (Item 1) **[Figure 50-41-6]**.

Figure 50-41-7



Remove the nut (Item 1) **[Figure 50-41-7]** from the Bob-Tach pivot pin bolts.

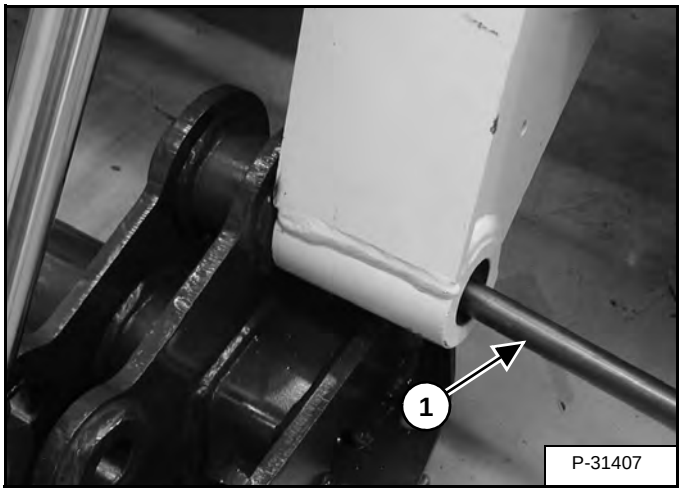
Figure 50-41-8



Remove the bolt (Item 1) **[Figure 50-41-8]** from both of the Bob-Tach pivot pin.

Installation: Tighten the bolt to 264 N•m (195 ft-lb) torque.

Figure 50-41-9



With a 22 mm (0.875 in) punch (Item 1) **[Figure 50-41-9]** and a hammer, drive the pivot pin out of the lift arm and Bob-Tach (both sides).

Remove the Bob-Tach from the loader.

NOTE: Use tapered ream MEL1734 to clean the tapered hole in the lift arms. The tapered hole must be clean and free of debris to provide a good contact surface for the pivot pin.

Striker Adjusting

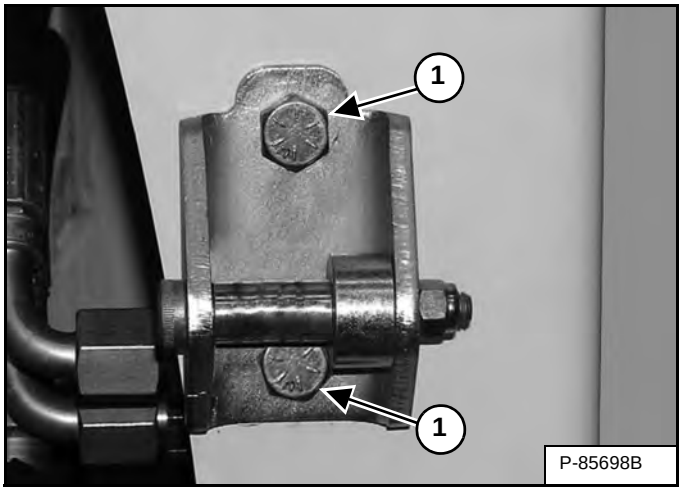
⚠ WARNING

AVOID INJURY OR DEATH

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

W-2012-0497

Figure 50-70-6



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

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

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

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

Open the door.

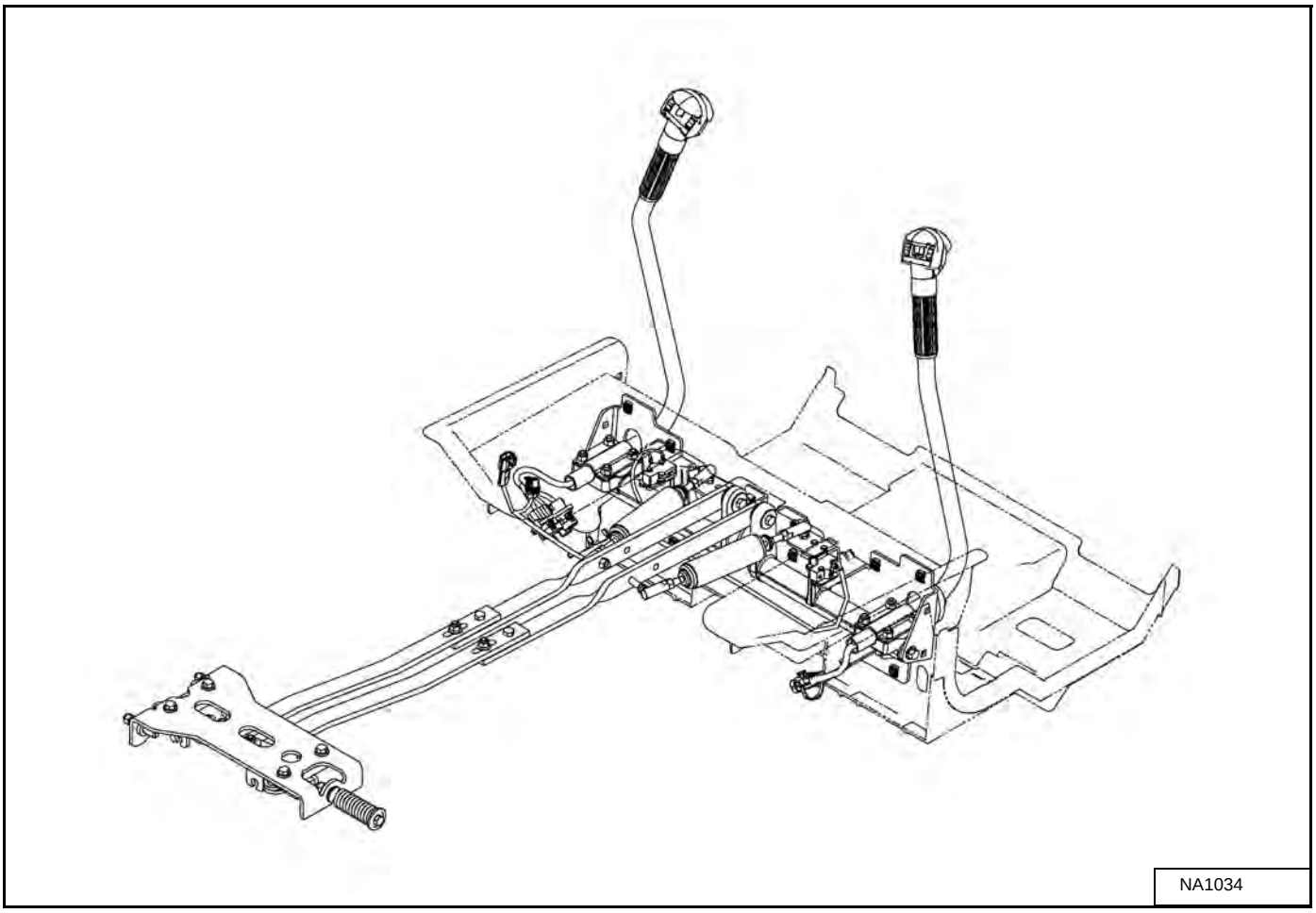
Tighten both bolts (Item 1) **[Figure 50-70-6]** to 125 - 135 N•m (90 - 100 ft-lb) torque.

Close the rear door.

CONTROL PANEL

Description

Figure 50-100-1



The steering system consists of independent steering levers the operator uses to provide steering input to the loader.

The steering levers are attached to pivoting bellcranks that pivot on a steering shaft and plastic bushings.

The forward travel is adjusted by drift adjustment bolts.

The bellcranks are attached to steering linkage bars with torsion bushings pressed into the bellcranks. Bellcranks mount to the control handle assembly and mount to the control panel.

Steering linkage bars are a two-piece design. Steering linkage bars are adjustable in length for “full travel adjustment”.

Steering linkage bars attach to the pintle arms where a rubber torsion bushing is pressed into the pintle arms.

Pintle arms are of a two-piece design that allow easy adjustment of the neutral or “creep”.

The steering system returns the levers to their starting position by means of the centering spring and the returning force of the torsion bushings **[Figure 50-100-1]**.

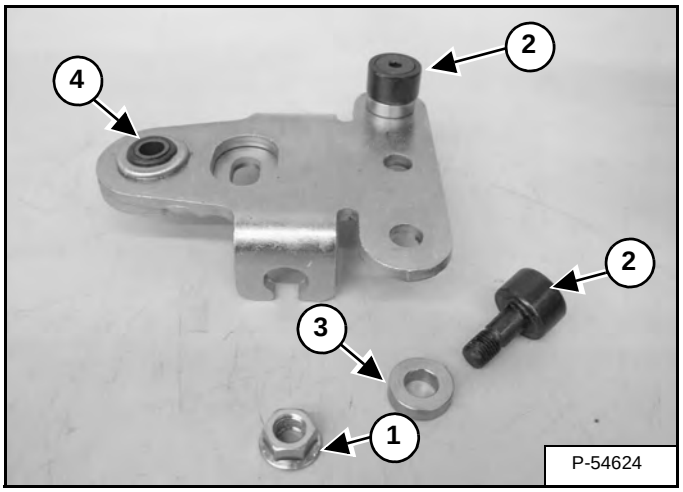
NOTE: Torsion bushings need to be replaced if torn or rotating in the housing. Loosen torsion bushing bolts slightly before adjustments are made.

Sequence of steering adjustments:

1. Set neutral of pintle arms, “creep”
2. Set full travel at steering linkage bars
3. Set drift at drift adjustment bolts

Pintle Arm Disassembly And Assembly

Figure 50-100-30

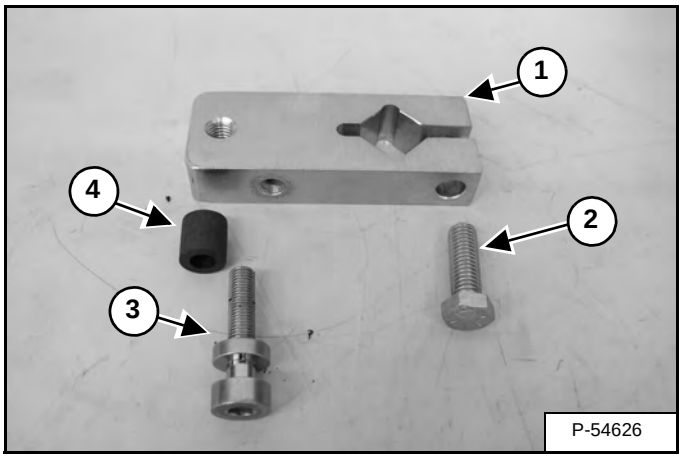


Remove the nut (Item 1) from the pintle roller cams (Item 2) and inspect the pintle roller cams and washers (Item 3) for damage **[Figure 50-100-30]**.

Inspect the torsion bushing (Item 4) **[Figure 50-100-30]** for damage and replace as needed.

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

Figure 50-100-31



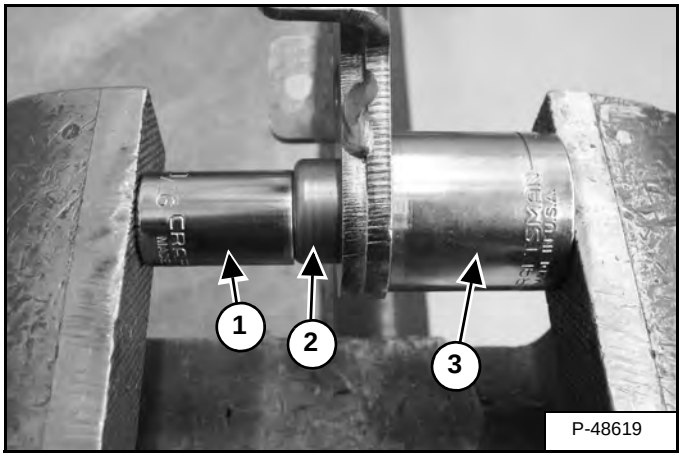
Remove the pintle base (Item 1) **[Figure 50-100-31]** from the pump shaft.

Remove the retaining bolt (Item 2), adjusting screw (Item 3) and neoprene dampener (Item 4) **[Figure 50-100-31]** from the pintle base.

Inspect parts for wear and damage, replace as needed.

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

Figure 50-100-32



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 50-100-32]**.

Installation: Install the torsion bushing (Item 2) **[Figure 50-100-32]** 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.

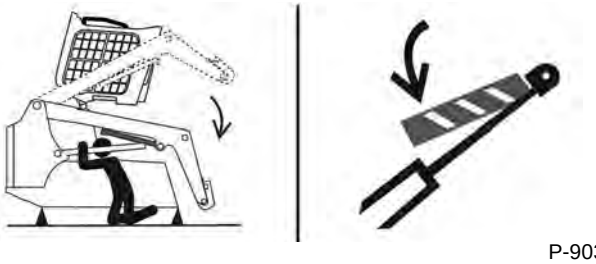
Removal And Installation

⚠ 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

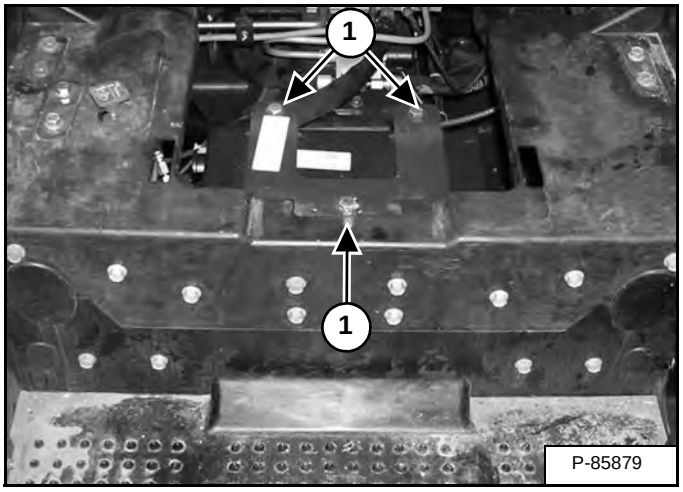
Never work on a machine with the lift arms up unless the lift arms are secured by an approved lift arm support device. Failure to use an approved lift arm support device can allow the lift arms or attachment to fall and cause injury or death.

W-2059-0598

Raise the lift arms and install an approved lift arm support. (See Installing on Page 10-20-2.)

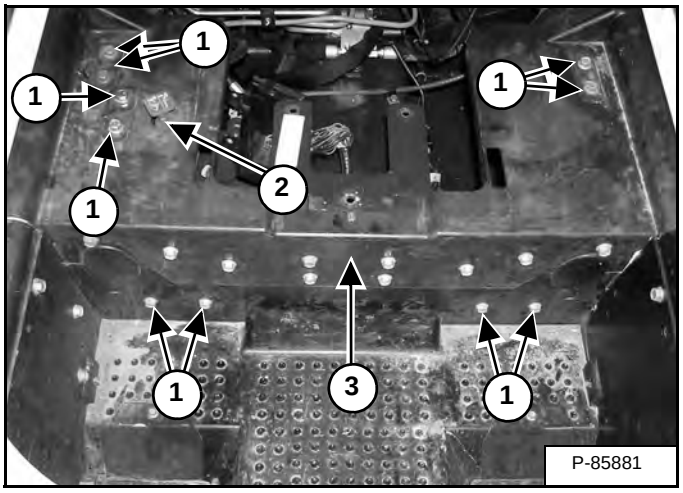
Raise the operator cab. (See Raising on Page 10-30-2.)

Figure 50-101-1



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

Figure 50-101-2



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

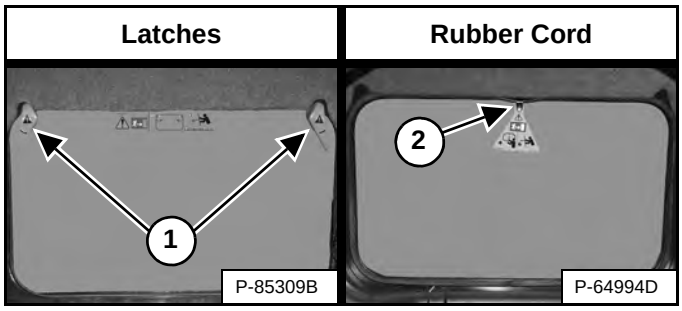
Remove the lift arm bypass knob and rubber washer (Item 2) **[Figure 50-101-2]**.

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

WINDOW (REAR)

Rear Window Identification

Figure 50-130-1



There are two different procedures for removing the rear window from your machine:

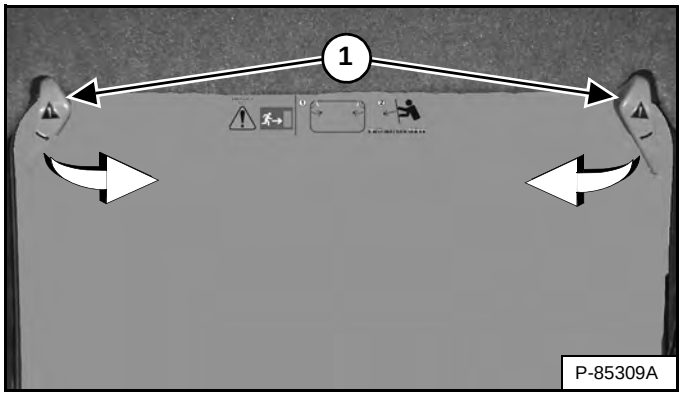
1. This window is equipped with latches **[Figure 50-130-1]**.

2. This window is equipped with a rubber cord and tag **[Figure 50-130-1]**.

NOTE: Use these procedures to remove the rear window only under emergency conditions. Damage to machine may occur.

Rear Window Removal (Latches)

Figure 50-130-2



Turn both latches (Item 1) **[Figure 50-130-2]** in until they disengage from the window frame.

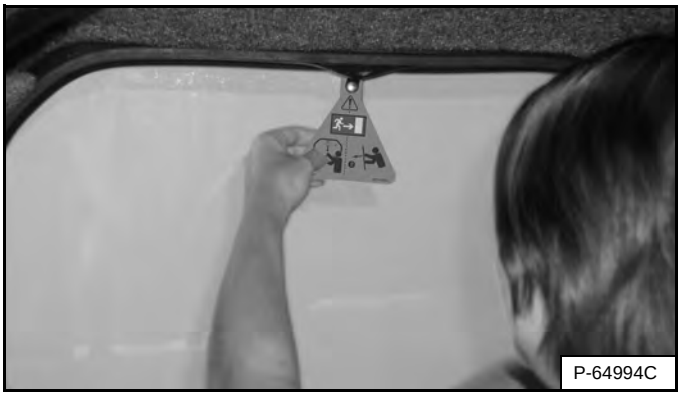
Push the rear window out of the rear of the operator cab.

Figure 50-130-3

Exit through the rear of the operator cab **[Figure 50-130-3]**.

Rear Window Removal (Rubber Cord)

Figure 50-130-4



Pull on the tag on the top of the rear window to remove the rubber cord **[Figure 50-130-4]**.

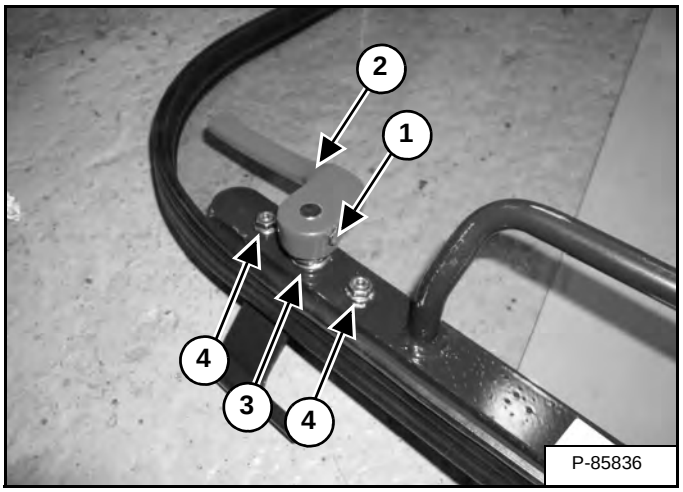
Push the rear window out of the rear of the operator cab.

Figure 50-130-5

Exit through the rear of the operator cab **[Figure 50-130-5]**.

Disassembly And Assembly (Cont'd)

Figure 50-140-9

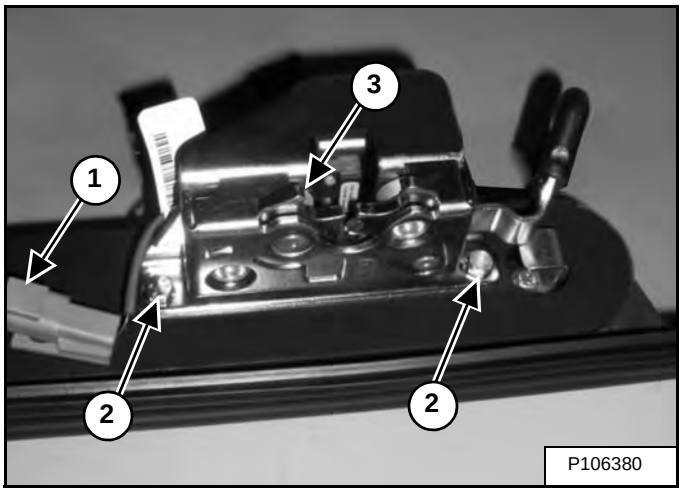


Remove the bolt (Item 1), latch (Item 2), and spring (Item 3) **[Figure 50-140-9]**.

Remove the two nuts and bolts (Item 4) **[Figure 50-140-9]**.

Installation: Tighten the nuts to 31 - 34 N•m (270 - 300 in-lb) torque.

Figure 50-140-10



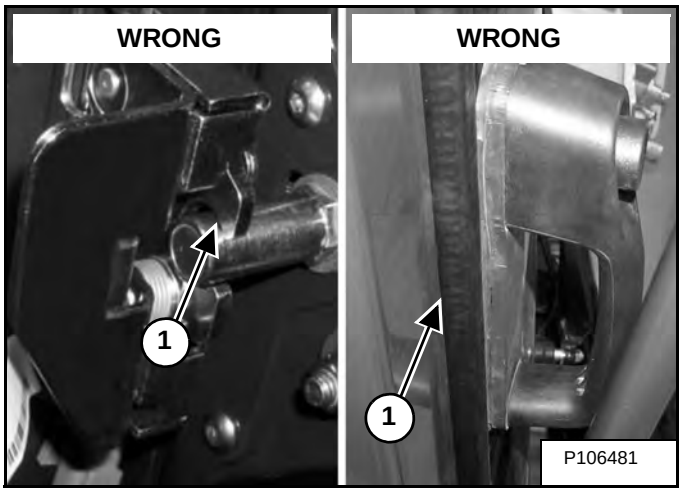
Disconnect the wire harness (Item 1) **[Figure 50-140-10]**.

Remove the two bolts (Item 2), and the latch assembly (Item 3) from the cab door **[Figure 50-140-10]**.

Remove the glass from the frame.

Aligning

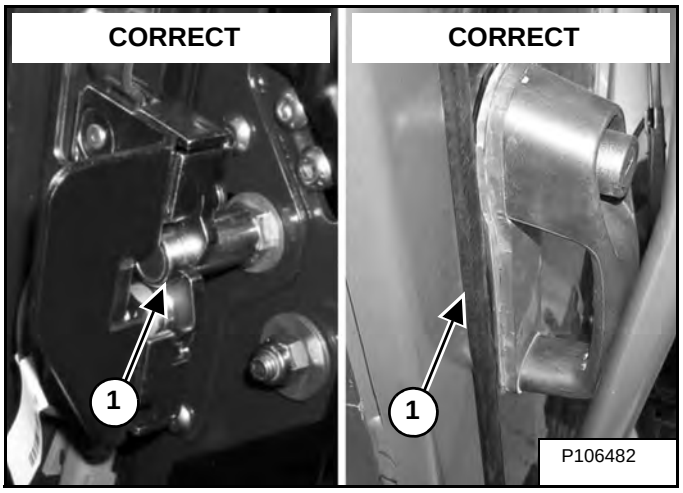
Figure 50-140-11



When the striker or latch is NOT adjusted properly there will be a gap (Item 1) **[Figure 50-140-11]** between the door and the cab or the striker and the latch.

Adjust as needed. (See Adjusting on Page 50-140-4.)

Figure 50-140-12



When the striker or latch is adjusted properly there will be no gap (Item 1) **[Figure 50-140-12]** between the door and the cab or the striker and the latch.

After verifying alignment check for proper operation. (See Checking Operation on Page 50-140-4.)

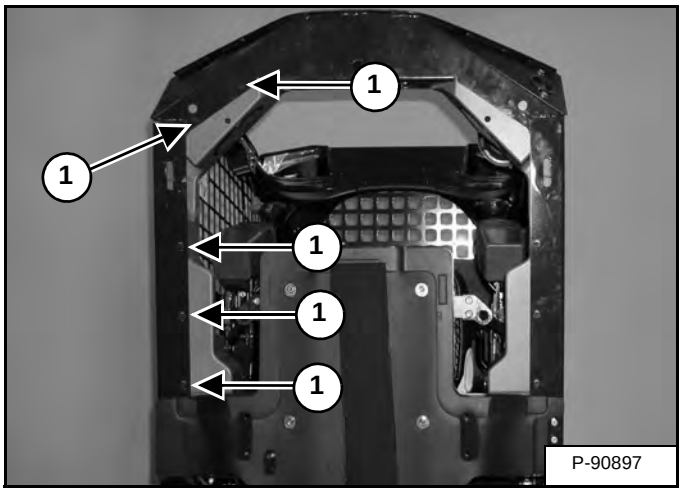
RIGHT SIDE LOWER PANEL

Removal And Installation

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

Raise the operator cab.

Figure 50-170-1

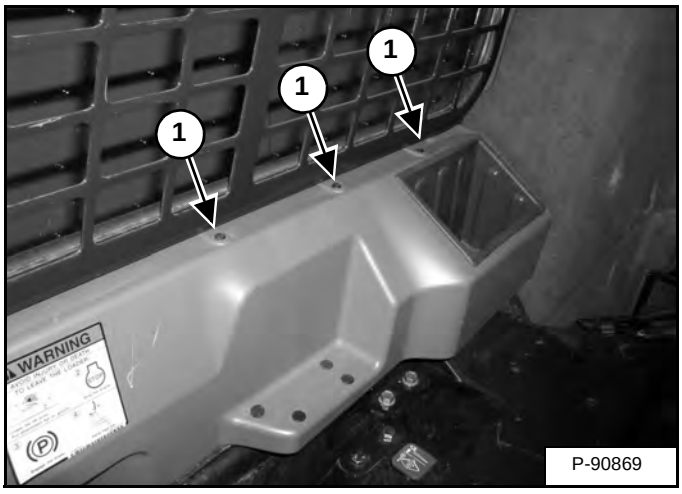


Remove the five plastic rivets (Item 1) **[Figure 50-170-1]**.

Lower the operator cab.

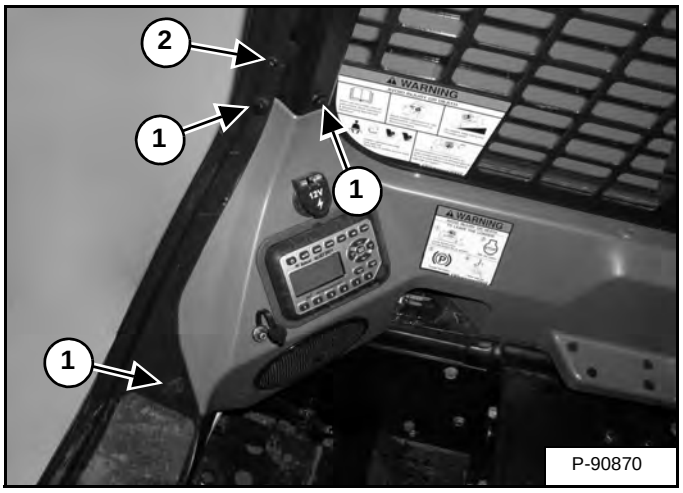
NOTE: With the seat removed, the cab may raise.

Figure 50-170-2



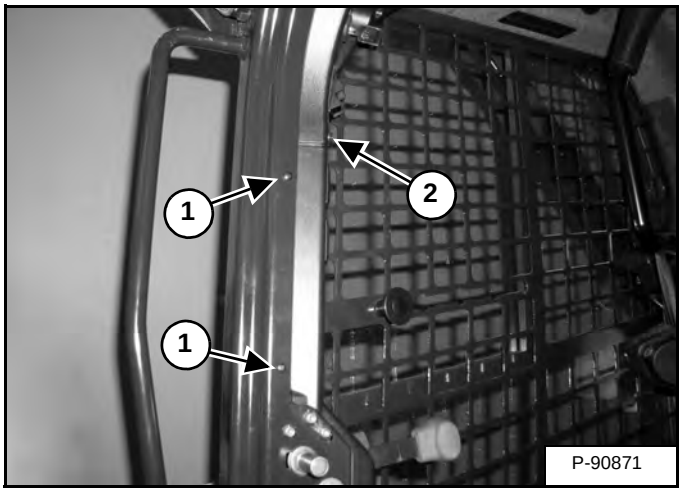
Remove the three plastic screws and the anchors (Item 1) **[Figure 50-170-2]** from the right side lower panel.

Figure 50-170-3



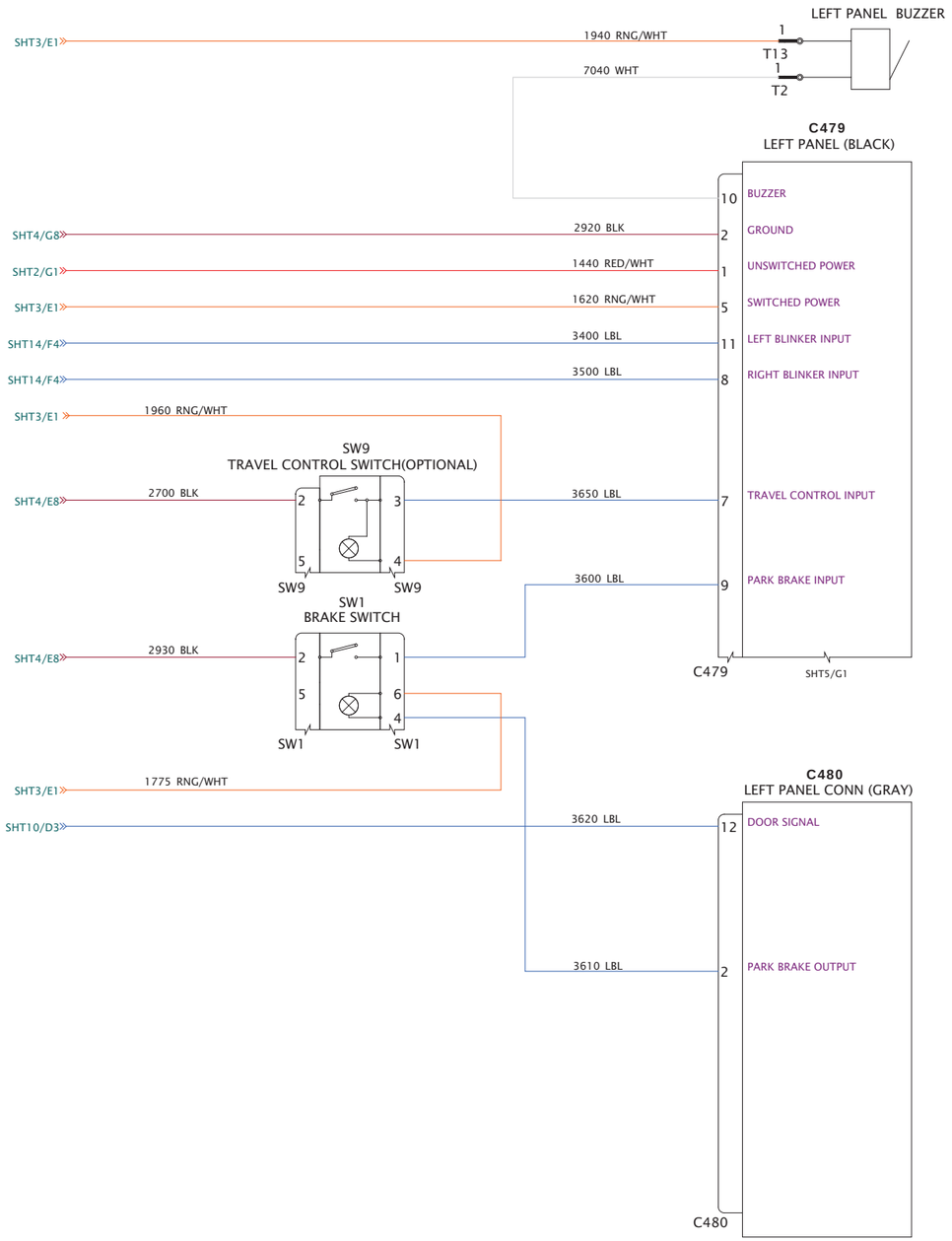
Remove the three plastic rivets, anchors (Item 1) and the screw (Item 2) **[Figure 50-170-3]**.

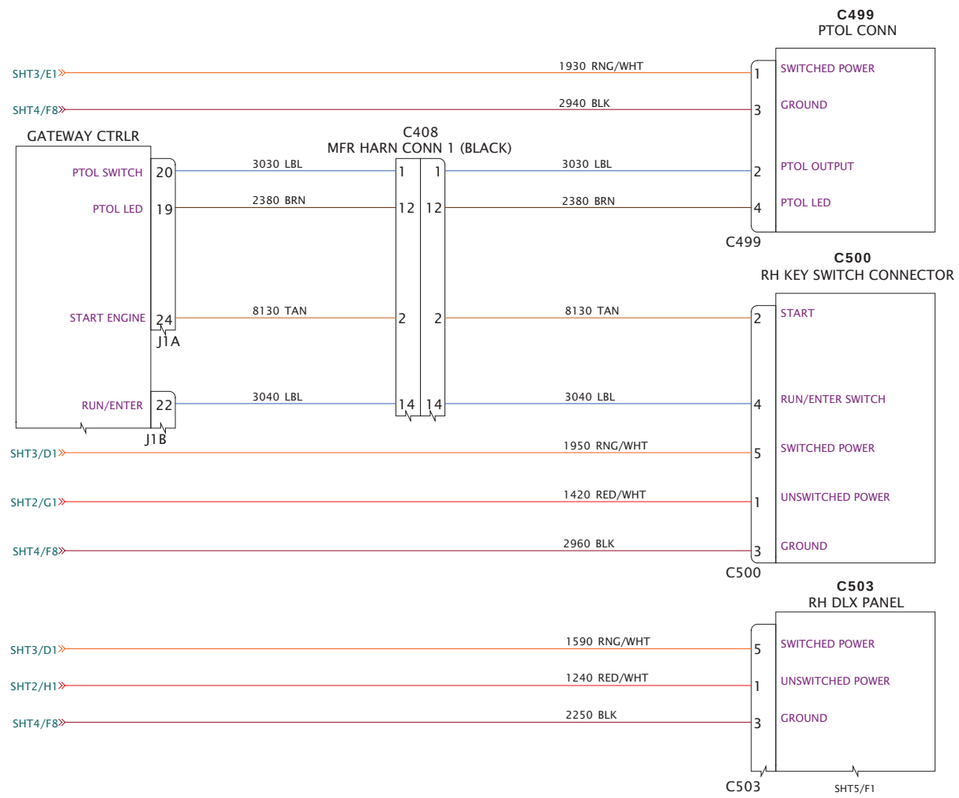
Figure 50-170-4



Remove the two screws (Item 1) and the plastic rivet (Item 2) **[Figure 50-170-4]**.

CAB DISPLAY





Wiring Schematic **S550** S/N B4ZD11001 & Above

Standard Machine

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7347083 (A)

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GROUND

ENG ECU CTRLR
T32
ECU CASE GND
J7A
2001 BLK
2002 BLK
2003 BLK
2004 BLK
2155 BLK
SHT15/F4
SP53
2893 BLK
SHT7/D4
2810 BLK

SHT8/F7 2320 BRN
SHT10/D8 2370 BRN
SHT8/F7 2220 BRN
SHT8/D7 2190 BRN
SHT6/E7 2180 BRN
SHT6/G7 2150 BRN
SHT6/F7 2695 BRN
SP12
2230 BRN
GATEWAY CTRLR
SENSOR GROUND
J1B

C493
ACS/SJC/AWS CONN 2
C493
2235 BLK
2240 BLK
T6
BATT GND

SHT5/E3 2080 BLK
SHT5/F3 2070 BLK
SHT9/G8 2920 BLK
SHT9/G4 2940 BLK
SHT9/E4 2960 BLK
SHT9/D4 2250 BLK
SHT5/D7 2605 BLK
SP4
2950 BLK
C408
MFR HARN CONN 1 (BLACK)
2950 BLK
GATEWAY CTRLR
2510 BLK
2500 BLK
J1B
SP3
2110 BLK

SHT12/H8 2765 BLK
SHT13/D7 2745 BLK
SHT10/D8 2790 BLK
SHT14/E7 2780 BLK
SHT10/E8 2730 BLK
T8
BATT GND

AUX CTRLR
2540 BLK
2550 BLK
J2B
SP28
2090 BLK

SHT15/D4 2860 BLK
SHT15/H4 2890 BLK
SHT9/E8 2930 BLK
SHT14/D5 2830 BLK
SHT9/F8 2700 BLK
SHT14/B7 2785 BLK
SP47
2900 BLK
C428
MFR HARN CONN 2 (LT GRAY)
2900 BLK

SHT14/H6 2770 BLK
SHT8/H4 2200 BLK
C489
MFR ACCESSORY
2720 BLK

SHT6/F3 2015 BLK
T10
ENGINE GROUND

SHT12/C4 2620 BLK
SHT11/F8 2650 BLK
SHT12/C4 2640 BLK
SHT12/E4 2610 BLK
SHT12/B4 2630 BLK
SP51
2600 BLK
C103
TAILGATE HARN
2600 BLK
SP6
2390 BLK
T1
BATT GND

SHT7/D7 2894 BLK
SHT11/G2 2195 BRN
SHT15/E7 2185 BRN
SP58
2995 BRN
AUX CTRLR
SENSOR GROUND
J2B

SHT14/D6 2455 BLK
SHT5/B7 2710 BLK
SHT5/C2 2715 BLK
SHT13/B8 2290 BLK
SP27
2300 BLK

SHT3/C6 2065 BLK
SHT7/C7 2901 BLK
SHT15/G4 2505 BLK
SHT12/B8 2045 BLK
SHT8/G8 2035 BLK
SHT12/D8 2115 BLK
SHT3/D6 2055 BLK
SHT13/F8 2030 BLK
SHT6/G7 2005 BLK
SHT12/E8 2120 BLK
SP55
2105 BLK
SP5
2000 BLK
SHT11/D2 2520 BLK
SHT11/F2 2530 BLK

Wiring Schematic SJC Machine **S550** S/N B4ZD11001 & Above

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7347082 (A)
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OPTIONS 1

(#) DLX FUEL HARN 7266824 ONLY
(NOT IN STD FUEL HARN 7149219)

(*) DLX CAB HARN 7301237 ONLY
(NOT IN STD CAB HARN 7303755)

POWER BOB CLOSE
POWER BOB OPEN
C607
C606
SIG
GND
4470 LGN
2470 BLK
4480 LGN
2480 BLK
2770 BLK
SP33
C355 FUEL HARN
4470 LGN
4480 LGN
2770 BLK
SHT4/E6
C428 MFR HARN CONN 2 (LT GRAY)
SW5 POWER BOBTACH SWITCH
1380 RED/WHT
SW5

LEFT HANDLE
LIFT (ACS/AHC ONLY)
HANDLE LOCK (ACS ONLY)
FLOAT (ACS/AHC ONLY)
RIGHT POSTION SWITCH
PADDLE
LEFT POSITION SWITCH
TRIGGER
LEFT HANDLE (FLASHER) 5 WAY
(SEE ADDITIONAL OPTIONS DWG)
C411
6010 PNK
1550 RNG/WHT
SHT3/F1
C438 MFR HARN CONN 3 (DK GRAY)
SHT2/C1
1410 RED/WHT
SP21
6500 PNK
SP22
6400 PNK
6415 PNK
6515 PNK
C103 TAILGATE HARN
6410 PNK
6510 PNK
EURO TAIL LIGHTS
(SEE ADDITIONAL
OPTIONS DWG)
SHT4/E3
2780 BLK
SP43
1405 RED/WHT
1430 RED/WHT
1200 RED/WHT
SHT15/D6
T3 FLASHER
SHT9/F8
3500 LBL
D14
6530 PNK
D13
6430 PNK
SHT9/G8
3400 LBL
SW2 BEACON SWITCH
SW3 HAZARD SWITCH
(PINS 3 & 6
INTERNALLY INSULATED)
6570 PNK
2850 BLK
SP46
2725 BLK
6700 PNK

BUCKET POSITION SOLENOID 9.8 OHM
C423
4450 LGN
4455 LGN
2450 BLK
2455 BLK
D3
SHT4/C6
SW6 BUCKET POSITION SWITCH
SW6
2830 BLK
SHT4/E8

SHT15/F6
SHT15/F4
SHT15/D5
2905 BLK
2970 BLK
2810 BLK
6440 PNK
6540 PNK
2420 BLK
C670 BEACON/FLASHER EXTERIOR HARNESS
(SEE ADDITIONAL OPTIONS DWG)

LEFT HANDLE
LIFT (ACS/AHC ONLY)
HANDLE LOCK (ACS ONLY)
FLOAT (ACS/AHC ONLY)
RIGHT POSTION SWITCH
PADDLE
LEFT POSITION SWITCH
TRIGGER
LEFT HANDLE (HORN) 2 WAY
(SEE ADDITIONAL OPTIONS DWG)
C412
1460 RED/WHT
7210 WHT
SHT2/C1
AUX CTRLR
HORN SIGNAL
RIGHT BLINKER SIGNAL
LEFT BLINKER SIGNAL
HIGH FLOW SOLENOID GROUND
HIGH FLOW SOLENOID
7200 WHT
6420 PNK
6520 PNK
2460 BRN
4460 LGN
J2A
J2B
C497
SJC HORN/BLINKER
(SEE ADDITIONAL
OPTIONS DWG)
C415
HIGH FLOW
SOLENOID
7.5 OHM 12 V
C408 MFR HARN CONN 1 (BLACK)
C126 HORN CONNECTOR
7210 WHT
2785 BLK
SHT4/E8
HORN

LEFT SPEAKER
RIGHT SPEAKER
C279
C278
7820 WHT
7830 WHT
7810 WHT
7800 WHT
1885 RNG/WHT
2885 BLK
SHT10/E1
SHT10/D1
C676 RADIO CONN
LEFT SPEAKER (+)
LEFT SPEAKER (-)
RIGHT SPEAKER (-)
RIGHT SPEAKER (+)
L010 AIR RIDE SEAT
1510 RNG/WHT
2210 BLK
PWR
GND
C277
GATEWAY CTRLR
TWO SPEED GROUND
TWO SPEED SIGNAL
J1A
J1B
2350 BRN
4350 LGN
C441
TWO SPEED
SOLENOID
5.1 OHM 12 V
TRACK 2 SPEED
(SEE ADDITIONAL
OPTIONS DWG)

Wiring Schematic
SJC Machine

S550

S/N B4ZD11001 & Above

Printed On September 2020
7347082 (A)
Sheet 14 of 17

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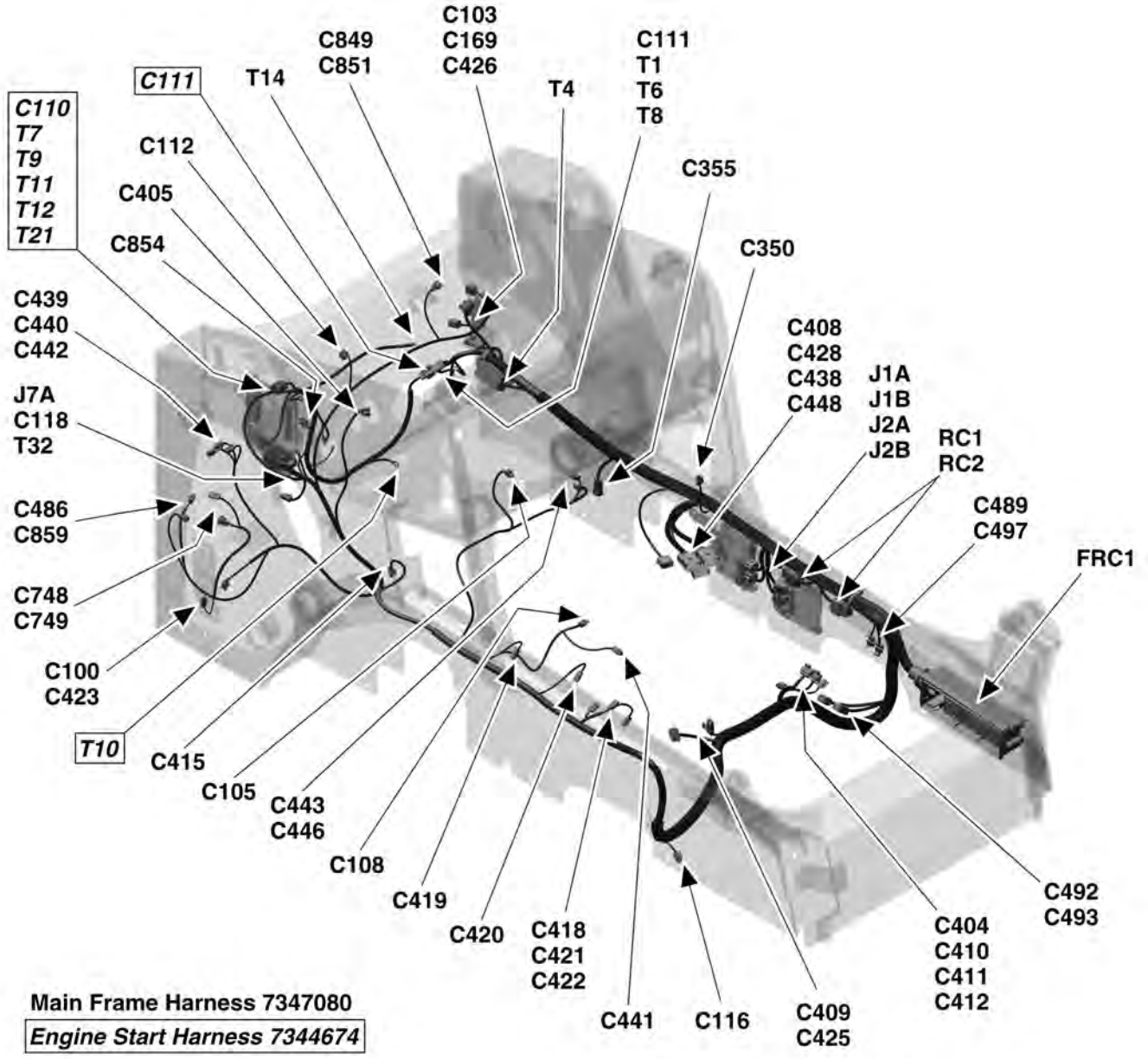
Mainframe Harness Connectors



NA18997a

BATTERY (CONT'D)

Using A Booster Battery (Jump Starting)

If the engine will not start without using a booster battery, BE CAREFUL! There must be one person in the operator's seat and one person to connect and disconnect the battery cables.

The key switch must be in the STOP position. The booster battery must be 12 volt.

⚠ WARNING

BATTERY GAS CAN EXPLODE AND CAUSE SERIOUS INJURY OR DEATH

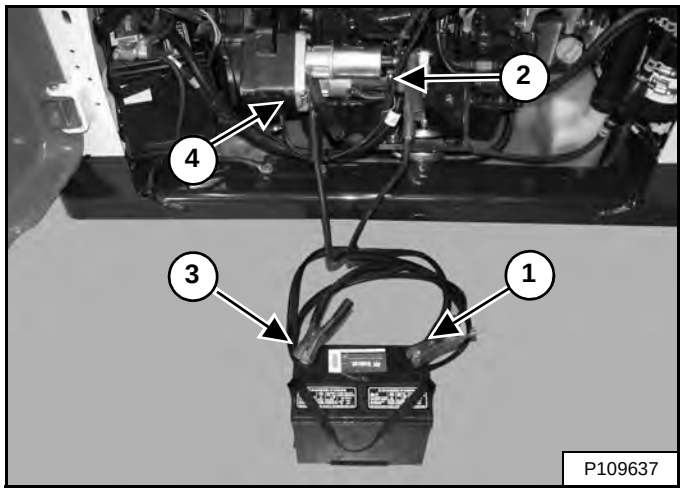
Keep arcs, sparks, flames and lighted tobacco away from batteries. When *jumping* from booster battery make final connection (negative) at machine frame.

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

W-2066-0910

Open the rear door.

Figure 60-20-5



Connect the end of the first cable (Item 1) to the positive (+) terminal of the booster battery. Connect the other end of the same cable (Item 2) **[Figure 60-20-5]** to the positive (+) terminal on the engine starter.

Connect the end of the second cable (Item 3) to the negative (-) terminal of the booster battery. Connect the other end of the same cable (Item 4) **[Figure 60-20-5]** to the engine.

Keep cables away from moving parts. Start the engine.

After the engine has started, remove the negative (-) cable (Item 4) first. Remove the cable from the positive (+) terminal (Item 2) **[Figure 60-20-5]**.

Remove the cables from the booster battery.

Close the rear door.

IMPORTANT

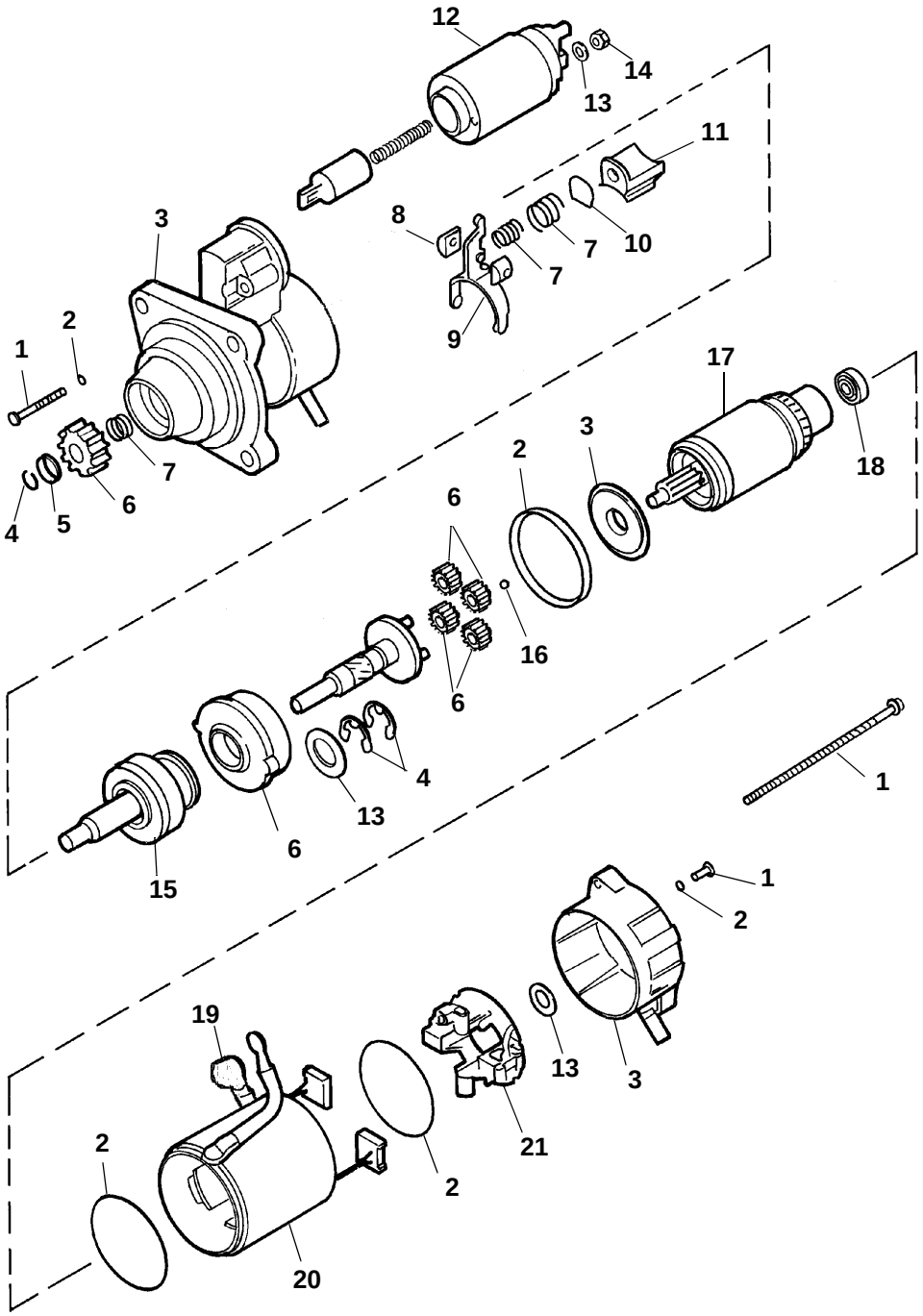
Damage to the alternator can occur if:

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

I-2023-1285

Parts Identification

1. Bolt
2. O-ring
3. Bracket
4. Snap Ring
5. Stop
6. Gear
7. Spring
8. Holder
9. Lever
10. Plate
11. Lever
12. Switch
13. Washer
14. Nut
15. Shaft
16. Ball
17. Armature
18. Bearing
19. Boot
20. Yoke
21. Holder

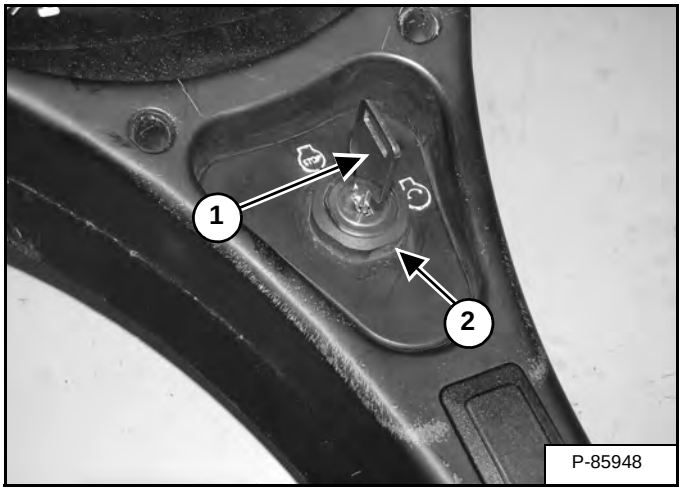


B-19824

Key Switch Disassembly And Assembly

Remove the right instrument panel. (See INSTRUMENT PANEL IDENTIFICATION on Page 60-50-1.)

Figure 60-50-16



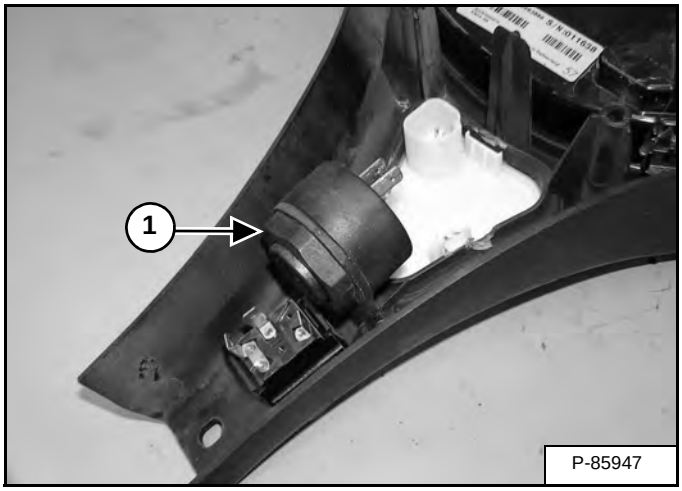
Remove the key (Item 1) from the switch. Remove the nut (Item 2) **[Figure 60-50-16]** from the switch.

Remove the key switch from the control panel.

Alarm Disassembly And Assembly

Remove the left instrument panel. (See Left Panel Removal And Installation on Page 60-50-9.)

Figure 60-50-17



Remove the left side instrument panel.

Remove the nut (Item 1) **[Figure 60-50-17]** from the loader alarm.

Remove the alarm from the loader instrument panel.

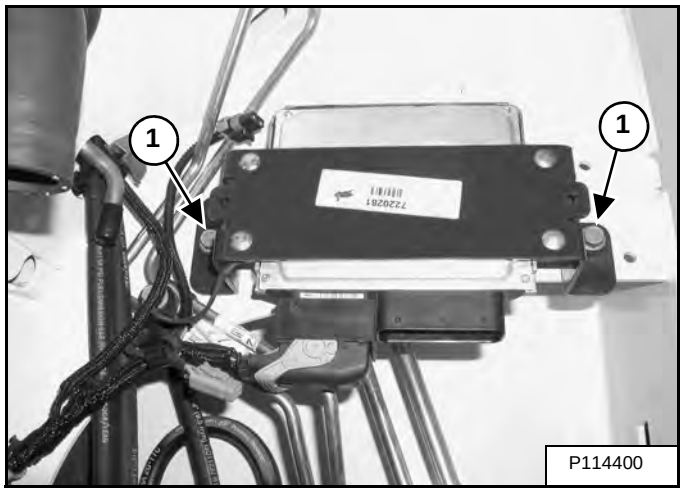
Connector Identification (Cont'd)

J2A

PIN	WIRE NUMBER	COLOR	DESCRIPTION
1	2340	BRN	FRONT BASE SOLENOID GROUND
2	OPEN	NA	NA
3	6520	PINK	LEFT BLINKER SIGNAL
4	6420	PINK	RIGHT BLINKER SIGNAL
5	7200	WHITE	HORN SIGNAL
6	OPEN	NA	NA
7	3480	LBL	RIDE CONTROL RELAY SIGNAL
8	OPEN	NA	NA
9	OPEN	NA	NA
10	OPEN	NA	NA
11	4810	LGN	LEFT HANDLE PADDLE RIGHT
12	4820	LGN	LEFT HANDLE PADDLE LEFT
13	4910	LGN	RIGHT HANDLE RIGHT ROCKER UP
14	OPEN	NA	NA
15	OPEN	NA	NA
16	3475	LBL	REVERSING FAN MANUAL SIGNAL
17	8895	TAN	FUEL PUMP COMMAND
18	2330	BRN	FRONT ROD SOLENOID GROUND
19	3920	LBL	FUEL PRESSURE SIGNAL
20	4640	LGN	FLOAT SIGNAL
21	3415	LBL	RIDE CONTROL COIL SIGNAL
22	4830	LGN	LEFT HANDLE RIGHT ROCKER DOWN
23	3410	LBL	RIDE CONTROL SW AUTO
24	OPEN	NA	NA
25	OPEN	NA	NA
26	2460	BRN	HIGH FLOW SOLENOID GROUND
27	2175	BRN	REVERSING FAN RETURN SIGNAL
28	4840	LGN	LEFT HANDLE RIGHT ROCKER UP
29	3470	LBL	REVERSING FAN AUTO SIGNAL
30	4940	LGN	RIGHT HANDLE LEFT ROCKER UP
31	4930	LGN	RIGHT HANDLE LEFT ROCKER DOWN
32	OPEN	NA	NA
33	OPEN	NA	NA
34	OPEN	NA	NA

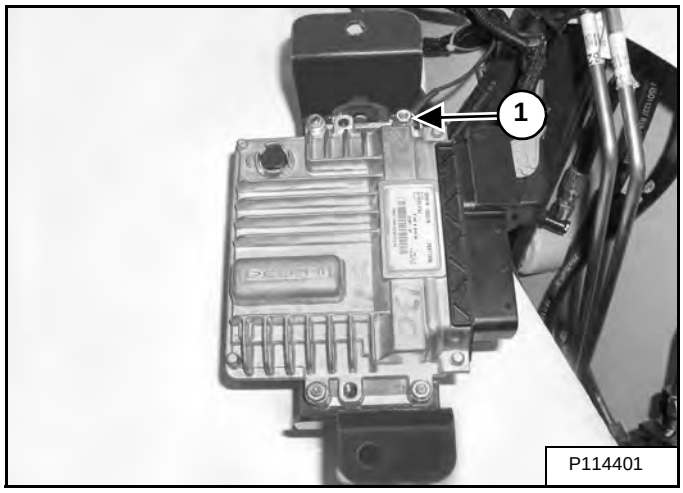
Removal And Installation (Cont'd)

Figure 60-80-10



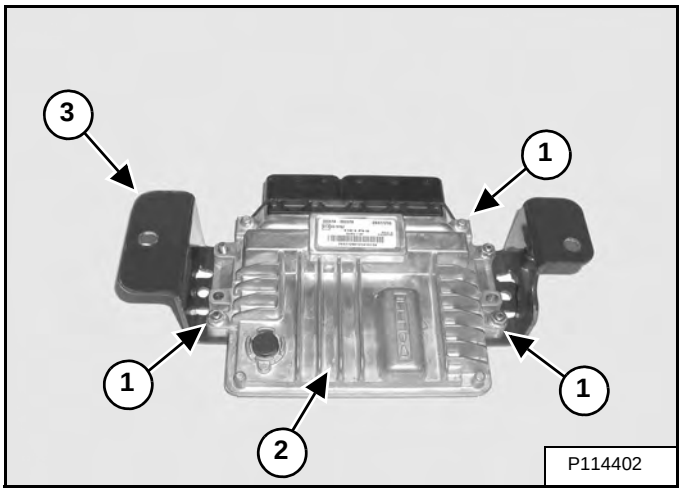
Remove the two mounting bolts (Item 1) **[Figure 60-80-10]**.

Figure 60-80-11



Remove the nut and the ground wire (Item 1) **[Figure 60-80-11]** from the ECU.

Figure 60-80-12



Remove the nuts (Item 1) and remove the ECU (Item 2) from the bracket (Item 3) **[Figure 60-80-12]**.

DIAGNOSTIC SERVICE CODES (CONT'D)

Service Codes List (Cont'd)

CODE	DESCRIPTION	CODE	DESCRIPTION
P0523	Engine Oil Pressure Sensor Out of Range High	P06F0	DEF Supply Module Fault
P0527	Fan Speed Timeout Fault	P06F1	DEF Supply Module Fault
P0528	Cooling Fan Overspeed	P0C17	EGR Closed Position Fault
P0529	Cooling Fan Underspeed	P0C18	EGR Closed Position Fault
P0544	Turbine Inlet Temperature Fault	P0C19	EGR Closed Position Fault
P0545	Turbine Inlet Temperature Sensor Out of Range Low	P1013	Engine Speed Fault
P0546	Turbine Inlet Temperature Sensor Out of Range High	P101A	ECU Internal Fault
P055B	Oil Pressure Warning Lamp Open Circuit	P1033	High DPF Inlet Temperature
P055C	Oil Pressure Warning Lamp Short to Ground	P1044	DEF Tank Temperature Sensor Error Low
P055D	Oil Pressure Warning Lamp Short to Battery	P1045	DEF Tank Temperature Sensor Error High
P0562	ECU Battery Voltage Extremely Low	P106C	Low DEF Quality
P0563	ECU Battery Voltage Extremely High	P106D	High DEF Quality
P056D	DEF Supply Module Communication Fault	P1073	High Engine Compartment Temperature
P0591	PTO Lamp Open Circuit	P107D	High Inlet Air Temperature
P0592	PTO Lamp Short to Ground	P108A	DEF Supply Pump Motor Speed Fault
P0593	PTO Lamp Short to Battery	P108B	DEF Supply Pump Motor Speed Fault
P05ED	DEF Heater Line Short to Battery	P108C	DEF Supply Pump Motor Fault
P060B	ECU Calculation Error	P10AD	High Intake Manifold Temperature
P060C	ECU Communication Fault	P1118	High Engine Coolant Temp
P0615	Starter Relay Open Circuit	P1183	High Fuel Temperature
P0616	Starter Relay Short to Ground	P1227	Low DEF Tank Temperature Fault
P0617	Starter Relay Short to Battery	P1230	DEF Tank Level Signal Error
P062D	Injector Bank Short Circuit 1	P12E5	EGR Fault - Level 1 Inducement
P062E	Injector Bank Short Circuit 2	P12E6	EGR Fault - Level 2 Inducement
P062F	ECU Data Read Fault	P12E7	EGR Fault - Level 3 Inducement
P0630	ECU Data Write Fault	P12E8	EGR Fault - Warning
P0641	ECU 5V Sensor Supply Voltage Out of Range High	P12E9	SCR Dosing Interrupted - Level 1 Inducement
P0642	ECU 5V Sensor Supply Voltage Out of Range Low	P12EA	SCR Dosing Interrupted - Level 2 Inducement
P0657	ECU Sensor Supply 1 Short to Ground	P12EB	SCR Dosing Interrupted - Level 3 Inducement
P0658	ECU Sensor Supply 1 Voltage Low	P12EC	SCR Dosing Interrupted - Warning
P0659	ECU Sensor 1 Voltage High	P12F2	DEF Quality - Level 1 Inducement
P0669	High ECU Temperature	P12F3	DEF Quality - Level 2 Inducement
P0685	ECU Main Relay Fault	P12F4	DEF Quality - Level 3 Inducement
P068A	ECU Main Relay Fault	P12F5	DEF Quality - Warning
P06AD	ECU Temperature Sensor Short to Ground	P12F6	SCR Tampering - Level 1 Inducement
P06AE	ECU Temperature Sensor Short to Battery	P12F7	SCR Tampering - Level 2 Inducement


Bobcat®

Troubleshooting

The following troubleshooting chart is provided for assistance in locating and correcting BICS™ system problems. It is recommended that these procedures be done 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 #
Brake stays engaged.	1, 2, 3, 4, 5, 6, 7,11
Intermittent activation of brake.	8, 9, 10,11

SOLUTION SUGGESTIONS	
1.	Make sure brake switch is not engaged.
2.	Check the display for an error code.
3.	If all lights indicate the brake should be released, but it doesn't, check the brake 30 amp fuse.
4.	When checking fuse, also check other fuses. Check the fuse block for correct orientation and location of fuses. (See Electrical System, Information Page 60-01.)
5.	To test the solenoid, the coil should be about 9.8 ohm.
6.	Test brake solenoid wiring voltage, solenoid wiring should read 12 volts.
7.	Inspect the brake solenoid mounting nut for correct torque.
8.	Inspect wire connections for loose connector body.
9.	Inspect for loose or bent pins in connectors.
10.	Inspect for loose spade connectors in fuse holder.

Description

The Attachment Control Device (ACD) uses a 7 or 14 pin connector to communicate between the loader and the attachment.

Attachments with a 14 pin connector use four different groups to control operations and hydraulic flow. Use service Analyzer to determine what group is being used and to troubleshoot the attachment / loader functions. If service analyzer is not available use a Ohmmeter to test for jumpers on the attachment harness.

Group 0 = No Jumpers

Group 1 = Pins K, L

Group 2 = Pins K, P

Group 3 = Pins C, D

Refer to the Identification Chart ACD Group 0, 1, 2, or 3 for more detailed information.

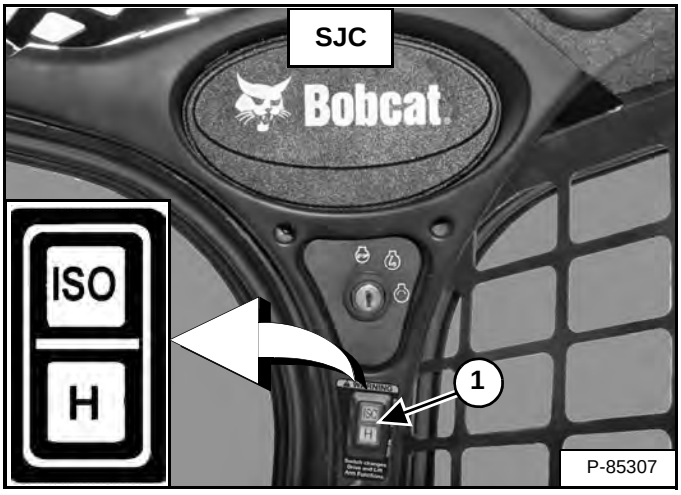
Lift And Tilt Calibration (SJC)

The controller uses a calibration sequence to optimize the control system. The optimizing ensures full spool stroke (full flow) while preventing over stroke (loading) of the actuator and resets the calibration points in the controller.

NOTE: The Actuator Test is the preferred method to calibrate the lift and tilt actuator. (See Actuator Testing on Page 60-150-1.)

NOTE: This calibration procedure must be followed when replacing the hydraulic control valve, lift or tilt actuator. Failure to calibrate after component replacement may result in poor performance or reduced life of actuator(s).

Figure 60-150-3

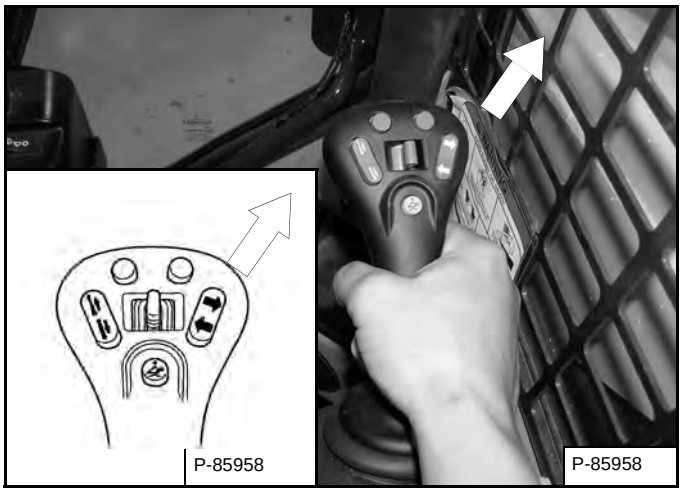


With an operator in the seat and the seat bar down.

Close the cab door. (If loader is equipped.)

Place the loader Control Pattern Switch (Item 1) **[Figure 60-150-3]** in the ISO position.

Figure 60-150-4



Move the right joystick to the forward-right corner position **[Figure 60-150-4]** and hold in position.

STEERING DRIFT COMPENSATION (SERVICE MODE) (CONT'D)

Operation (Cont'd)

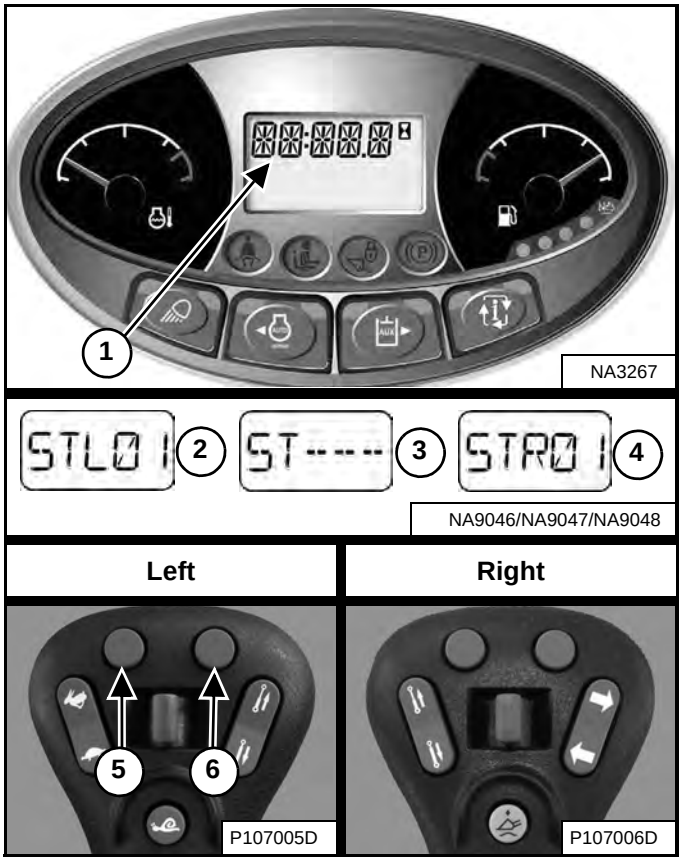
Perform PRE-STARTING PROCEDURE and STARTING THE ENGINE procedures:

1. Close door.
2. Fasten seat belt.
3. Lower seat bar.
4. Put controls in NEUTRAL position.
5. Start the engine.
6. Press the PRESS TO OPERATE LOADER button.
7. Current drive response setting is displayed briefly in the data display. Wait for machine to cycle to machine hours.

NOTE: (SJC) Raising the seat bar or changing control mode (ISO / H) will cause the machine to disengage from steering drift compensation. The last displayed setting will remain in effect until the machine is turned OFF.

8. Press and hold the PRESS TO OPERATE LOADER button for three seconds to enter drive response menu.
9. Press the PRESS TO OPERATE LOADER button to enter steering drift compensation adjustment.
10. Current setting will appear.

Figure 60-161-3



Press the buttons on the left joystick (Item 5 & 6)**[Figure 60-161-3]** to adjust. The number will change by one each time the button is pressed. Use the left button to increase machine left or the right button to increase machine right.

Forward adjustment is performed with left joystick in NEUTRAL or during forward travel. Reverse adjustment is performed during reverse travel. Adjustments are effective immediately.

NOTE: Using a high throttle setting will make the machine response to adjustment more obvious.

To save a desired setting, press and hold the PRESS TO OPERATE LOADER button for three seconds. [SET] will appear in the left panel (Item 1) **[Figure 60-161-3]** and the machine will exit from the adjustment menu.

BACK-UP ALARM SYSTEM (CONT'D)

Adjusting Switch Position

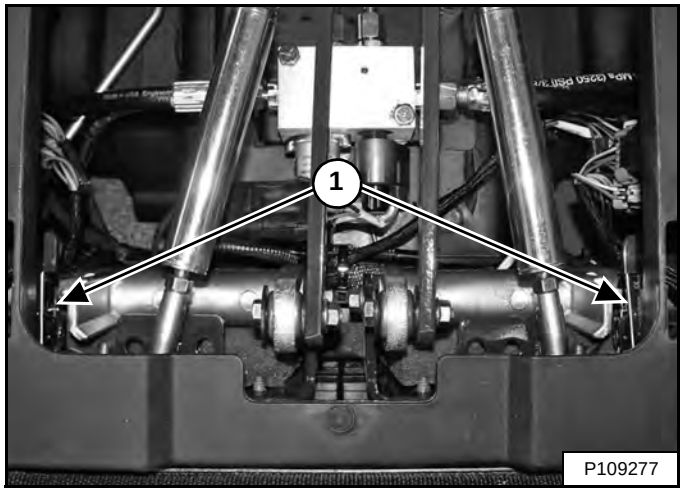
NOTE: Joystick equipped machines do not have back-up alarm switches and cannot be adjusted.

Standard Controls (If Equipped)

Stop the engine and raise the operator cab. (See Raising on Page 10-30-2.)

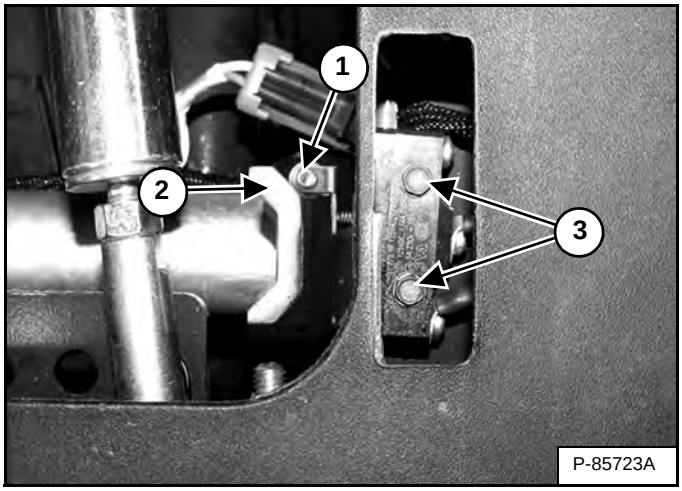
Place the steering levers in the NEUTRAL position.

Figure 60-200-3



The back-up alarm switches (Item 1) **[Figure 60-200-3]** are located alongside the steering bellcranks. Both switches must be adjusted properly for the back-up alarm to operate correctly.

Figure 60-200-4



Loosen the screws (Item 3) **[Figure 60-200-4]** securing the back-up alarm switch. (Left side shown)

Position the back-up alarm switch so that the roller (Item 1) just makes contact with the bellcrank (Item 2) **[Figure 60-200-4]** without compressing the switch spring.

Torque the screws (Item 3) **[Figure 60-200-4]** securing the switch to the bracket to 1,6 - 2,1 N•m (14 - 19 in-lb).

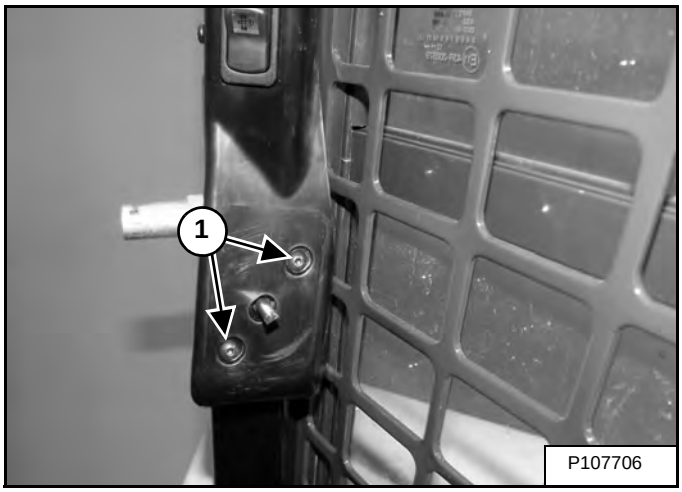
Repeat adjustment procedure for the other switch.

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

Inspect back-up alarm system for proper function. (See Inspecting on Page 60-200-1.)

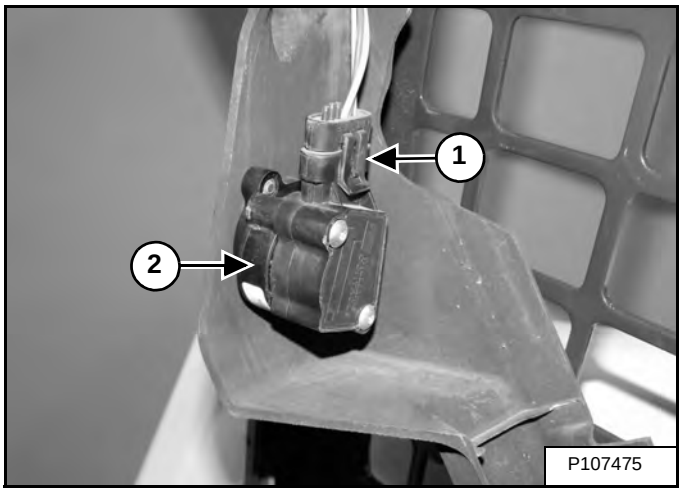
Removal And Installation (Cont'd)

Figure 60-220-5



Remove the two screws (Item 1) **[Figure 60-220-5]**.

Figure 60-220-6



Disconnect the electrical connector (Item 1) and remove the engine speed control (Item 2) **[Figure 60-220-6]**.

MACHINE IQ (CONT'D)

Procedure

This device is equipped with three Status LED's.

1. GPS
2. COM 1 - For wireless network status
3. COM 2 - Not used

The LED's use the following blink patterns to indicate service.

COM 1 - LED (Orange) Definitions	
Condition	**COM 1 - LED**
Modem Off	Off
Comm On - Searching	Slow Blinking
Network Available	Fast Blinking
Registered but no Inbound Acknowledgment	Alternates from Solid to Fast Blink every 1s
Registered and Receiving Inbound Acknowledgment	Solid

GPS - LED (Yellow) Definitions	
Condition	**GPS - LED**
GPS Off	Off
GPS On	Slow Blinking
GPS Time Sync	Fast Blinking
GPS Fix	Solid

Com 1 will go through the sequence listed above. Initial experience is:

- Slow Blink ~ 15 seconds.
- Fast Blink ~ 40 seconds.
- Solid LED achieved within 1 minute.
- If solid LED is not achieved after 1 minute, the system will reset and try again. This may occur several times if the appropriate type of cell coverage is marginal in the area.

GPS:

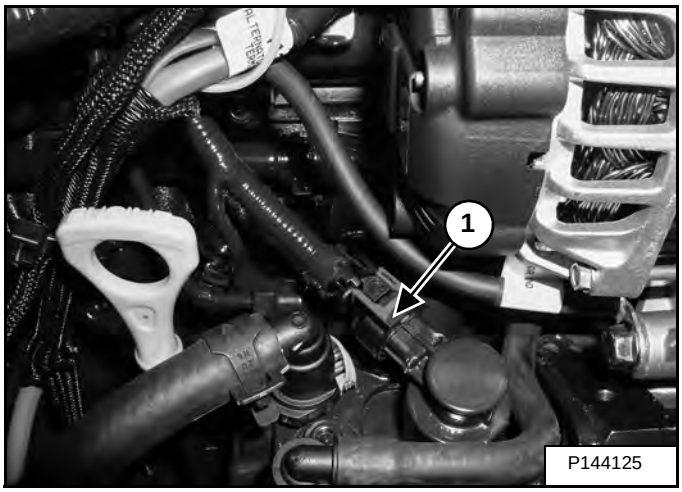
- Slow Blink - not observed, may be a very brief moment.
- Fast Blink ~ 2 minutes.
- Solid LED achieved within 2 minutes.

Times may vary depending on systems ability to pickup GPS satellites.

More information can be found on BobcatDealerNet.com: Connected Machine.

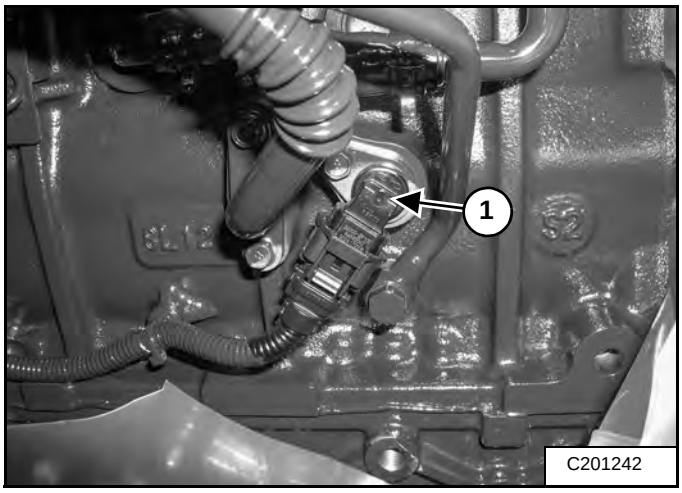
Sensor Location (Cont'd)

Figure 70-10-7



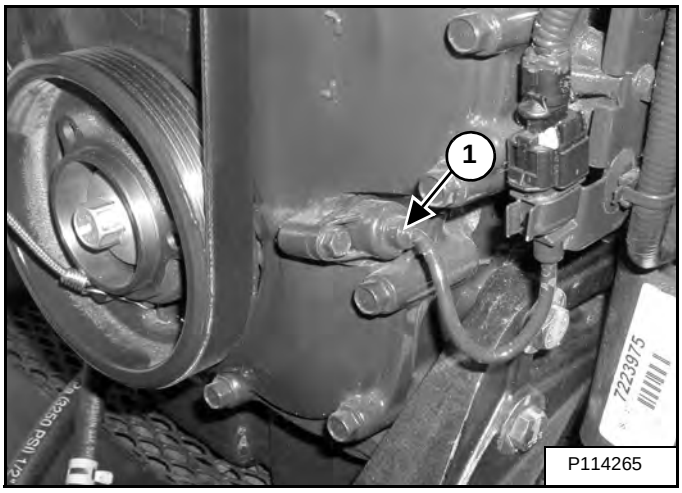
Inlet metering valve (Item 1) **[Figure 70-10-7]**.

Figure 70-10-8



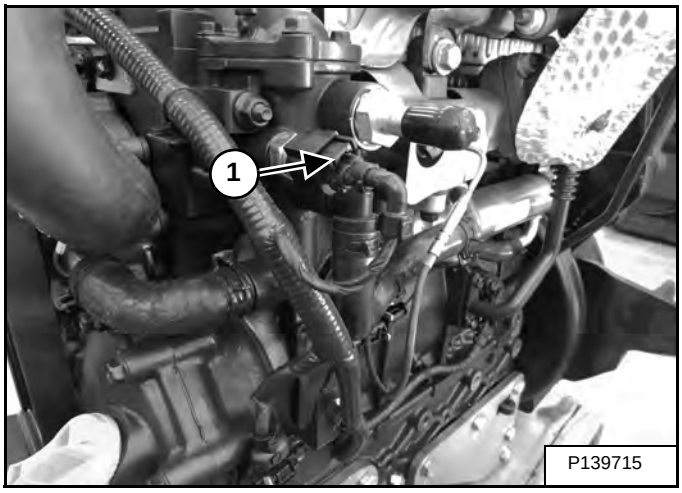
Camshaft position sensor (Item 1) **[Figure 70-10-8]**.

Figure 70-10-9



Crankshaft position sensor (Item 1) **[Figure 70-10-9]**.

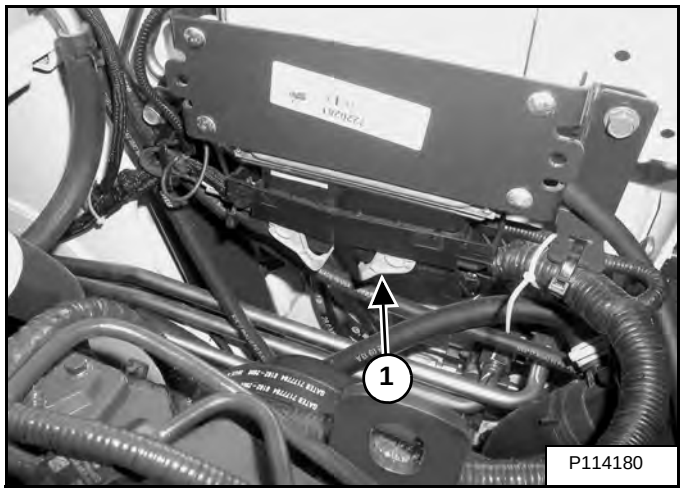
Figure 70-10-10



Coolant temperature sensor (Item 1) **[Figure 70-10-10]**.

Engine Removal And Installation (Cont'd)

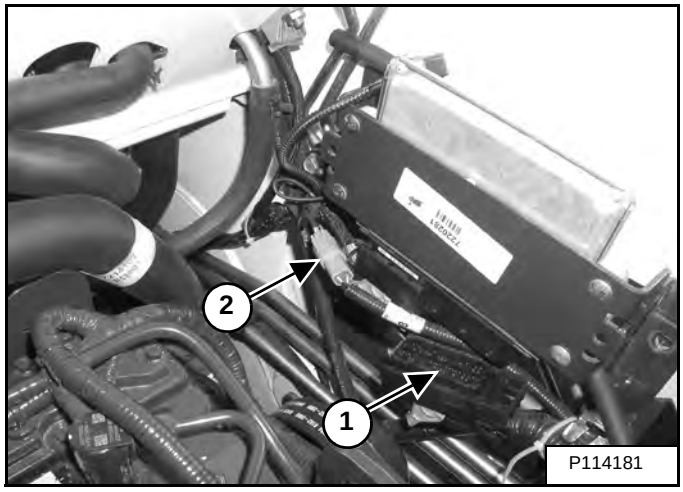
Figure 70-10-27



Remove the ECU rear harness (Item 1) **[Figure 70-10-26]** by rotating the lock lever (Item 1) **[Figure 70-10-27]** towards the front of the machine.

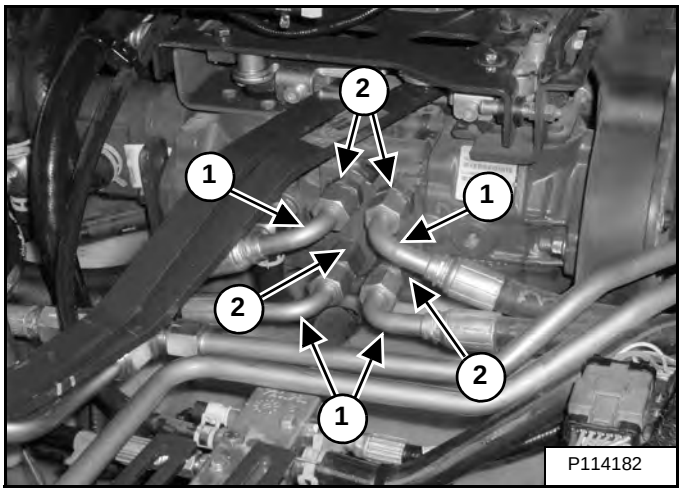
For detailed information on ECU harness removal and installation. (See Removal And Installation on Page 60-80-3.)

Figure 70-10-28



Remove the unlocked connector (Item 1) from the ECU. Disconnect the wire harness (Item 2) **[Figure 70-10-28]**.

Figure 70-10-29

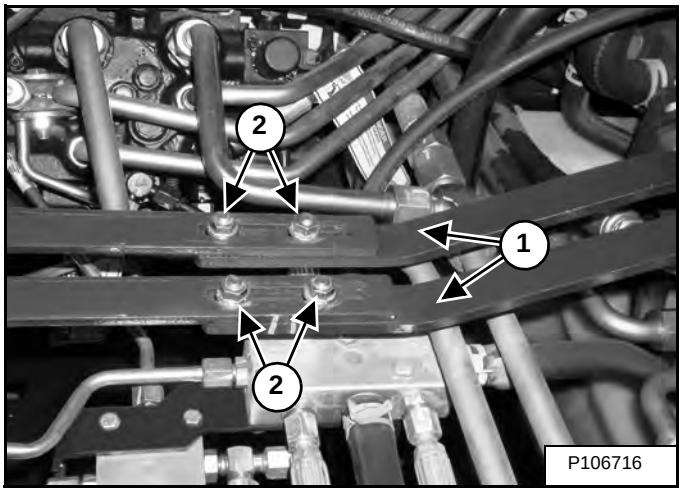


Remove the hoses (Item 1) **[Figure 70-10-29]**.

Installation: Tighten the hoses to 127 - 138 N•m (94 - 102 ft-lb) torque.

NOTE: Tighten the fittings (Item 2) [Figure 70-10-29] to 127 - 138 N•m (94 - 102 ft-lb) torque.

Figure 70-10-30

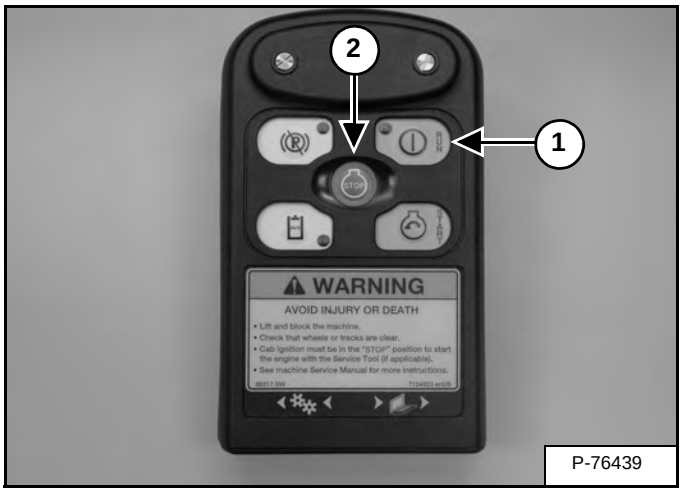


Scribe a mark across the top of the steering linkage bars (Item 1) **[Figure 70-10-30]** which are connected to the steering shaft on the control panel.

Remove the four steering linkage bolts and nuts (Item 2) **[Figure 70-10-30]**.

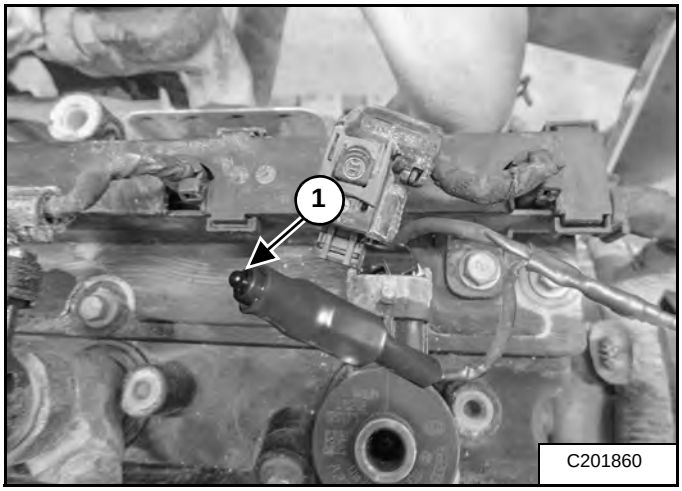
Injector Signal - Testing (Cont'd)

Figure 70-10-54



Press the RUN button (Item 1) **[Figure 70-10-54]** on the Remote Start Tool.

Figure 70-10-55



The signal tester light (Item 1) **[Figure 70-10-55]** should flash once.

To repeat the test, press the STOP button (Item 2) **[Figure 70-10-54]** and wait one minute.

If the signal tester light flashes, the electrical system is working.

If the signal tester light is on continuously or not at all, there is an electrical malfunction.

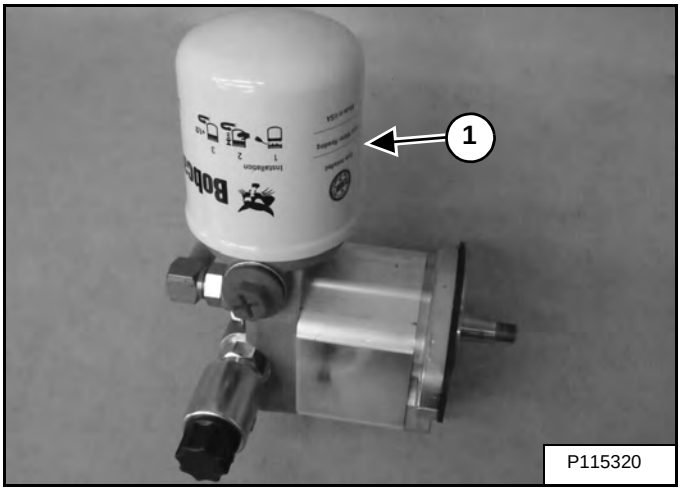
Repeat the above procedure for the remaining injectors.


Bobcat®

Hydraulic Fan Motor Disassembly And Assembly

Standard Model

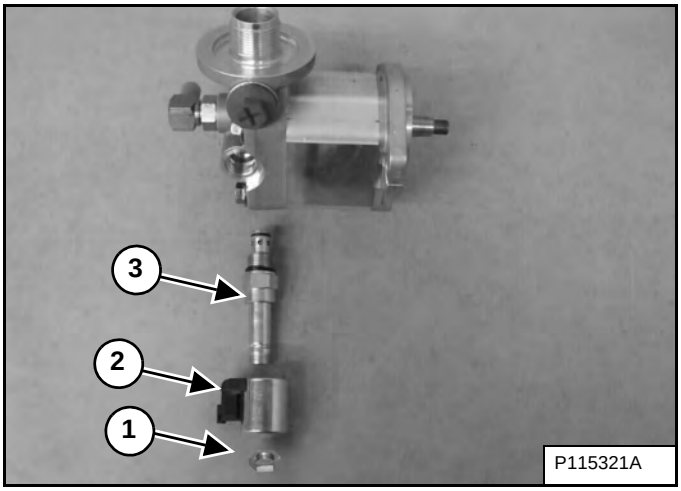
Figure 70-40-23



Remove the filter (Item 1) **[Figure 70-40-23]**.

Installation: Lubricate threads and filter O-ring prior to installation. Tighten the filter (Item 1) **[Figure 70-40-23]** to 37 - 45 N•m (27 - 33 ft-lb) torque.

Figure 70-40-24

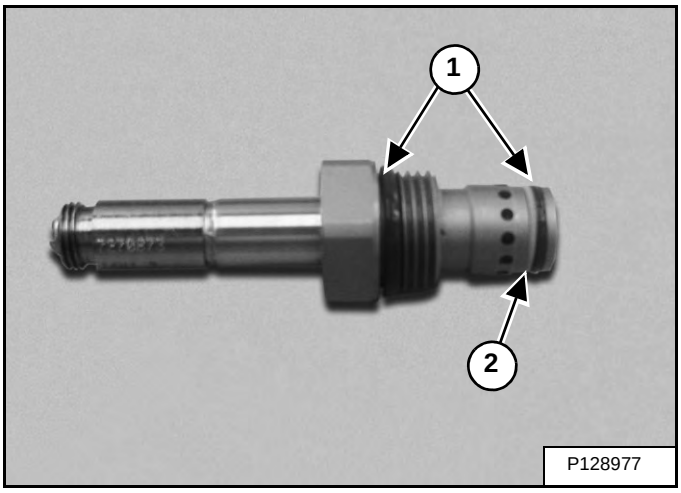


Remove coil mounting nut (Item 1), the coil (Item 2), and the proportional valve (Item 3) **[Figure 70-40-24]**.

Installation: Tighten the proportional valve (Item 3) **[Figure 70-40-24]** to 28 - 34 N•m (21 - 25 ft-lb) torque.

Installation: Tighten the coil mounting nut (Item 1) **[Figure 70-40-24]** to 7 - 9 N•m (5 - 7 ft-lb) torque.

Figure 70-40-25

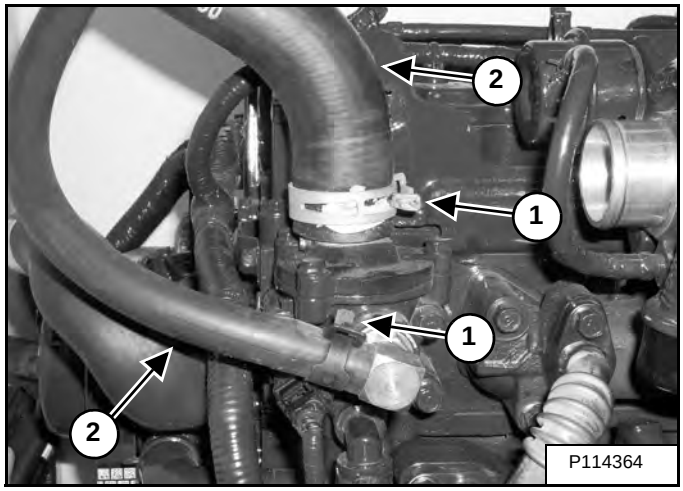


Replace the O-rings (Item 1) and back-up ring (Item 2) **[Figure 70-40-25]**.

Thermostat Housing Removal And Installation

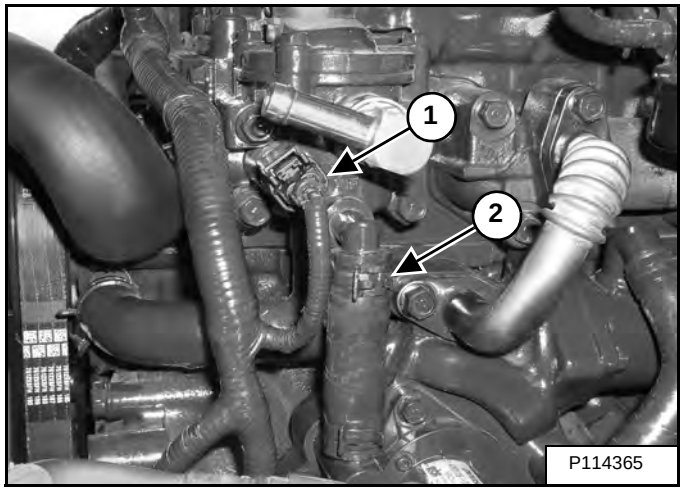
Drain the coolant. (See Removing And Replacing Coolant on Page 10-90-5.)

Figure 70-40-60



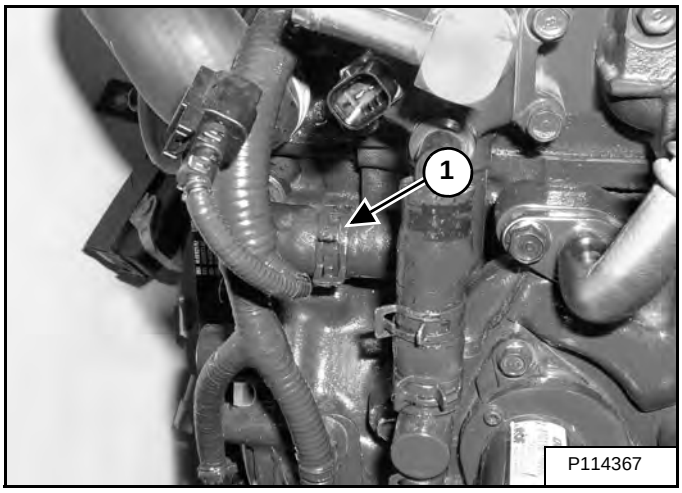
Reposition the clamps (Item 1) and remove the hose (Item 2) **[Figure 70-40-60]** from the thermostat housing.

Figure 70-40-61



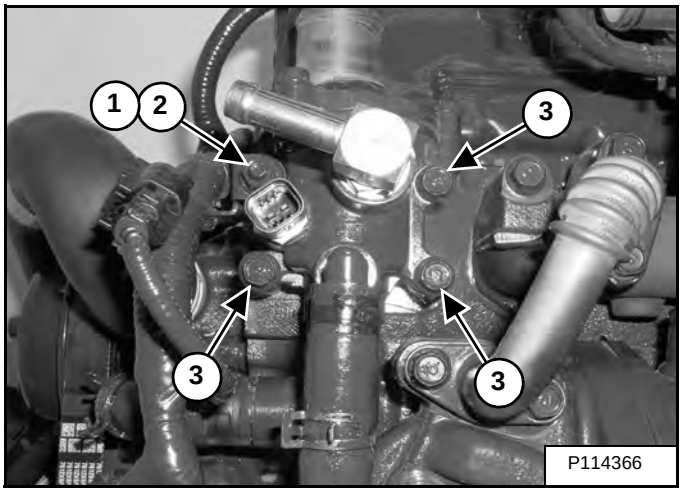
Disconnect the wire harness (Item 1). Reposition the clamp (Item 2) **[Figure 70-40-61]**.

Figure 70-40-62



Reposition the clamp (Item 1) **[Figure 70-40-62]**.

Figure 70-40-63



Remove the nut (Item 1). Reposition the wire harness bracket and remove the stud (Item 2) **[Figure 70-40-63]**.

Remove the bolts (Item 3) **[Figure 70-40-63]** and remove the thermostat housing.

Installation: Tighten the bolts and stud to 22 N•m (16 ft-lb) torque.


Bobcat®

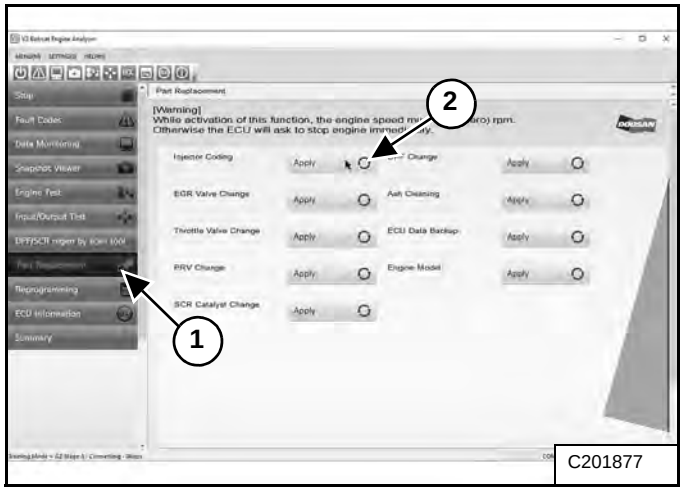
Injector Coding

NOTE: When replacing any of the injectors the ID code must be written to the ECU using the Bobcat Engine Analyzer Diagnostic Tool.

Each injector has there own Identification code to inform the ECU of the injectors performance (compensating for slight mechanical differences).

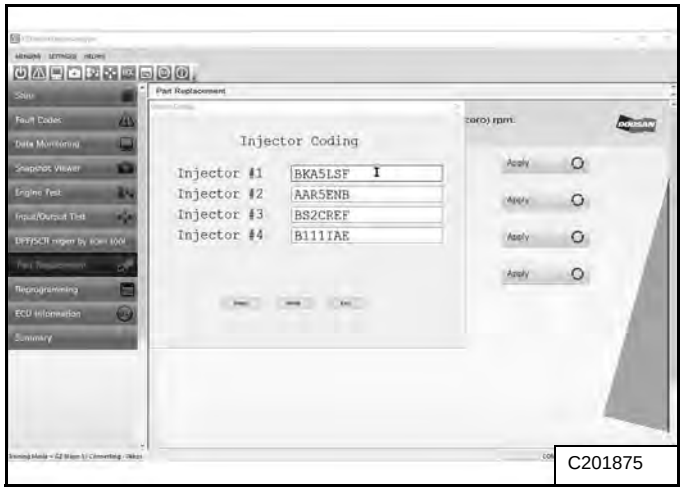
Connect the Bobcat Engine Analyzer Diagnostic Tool.

Figure 70-60-27



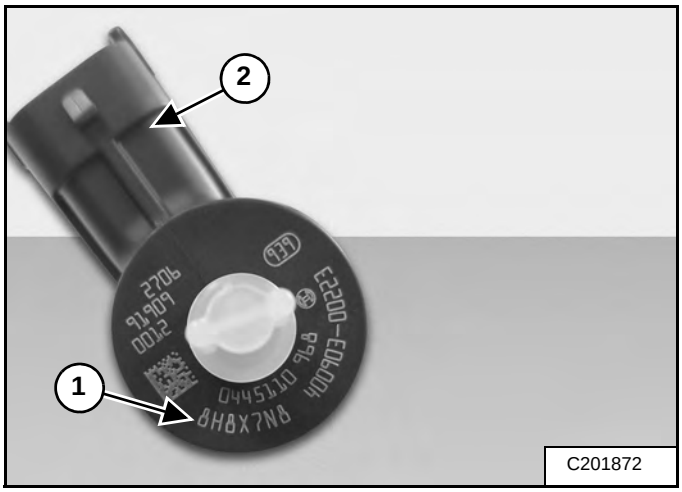
From the menu, click "Part Replacement" button (Item 1), then click IQA or IMA Injector Coding "Apply" button (Item 2) **[Figure 70-60-27]**.

Figure 70-60-28



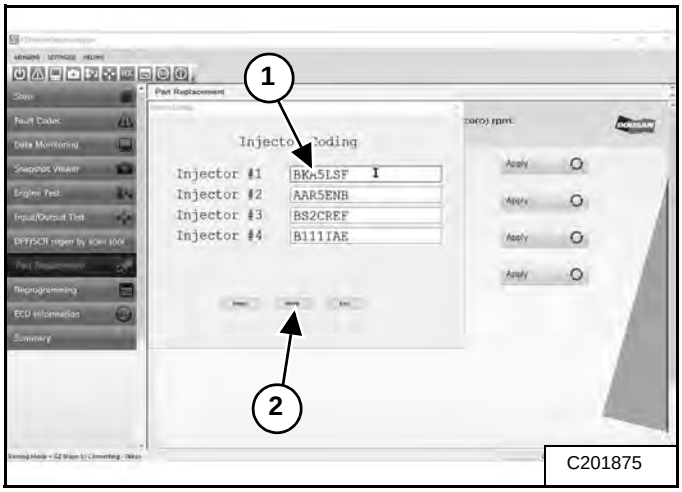
The current injector codes that are stored in the ECU will be displayed **[Figure 70-60-28]**.

Figure 70-60-29



The injector ID code (Item 1) is written on the top of the injector (Item 2) **[Figure 70-60-29]**.

Figure 70-60-30



Write the ID code(s) (Item 1) **[Figure 70-60-30]** to the correct cylinder box for the injector.

NOTE: There are no letters i or o in the injector code, the numbers 1 and 0 are used for the code.

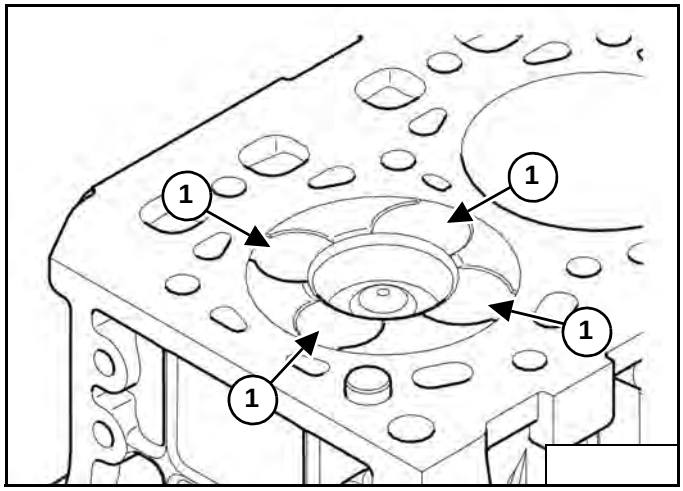
Click on "Write" button (Item 2) **[Figure 70-60-30]** to save the code(s) to the ECU.

Start the engine and let the machine run at full throttle for ten minutes to allow ECU learning.

Cylinder Head Top Clearance

Put the piston being checked at T.D.C.

Figure 70-70-27



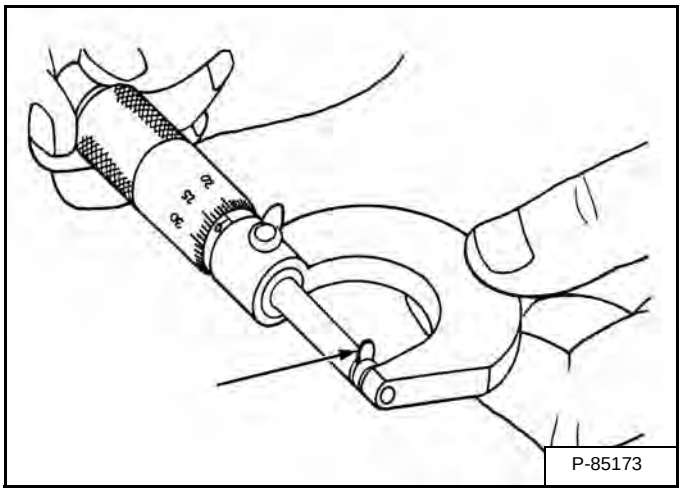
Place four pieces of 3 mm (0.118 in) solder on the piston where shown (Item 1) **[Figure 70-70-27]**.

Turn the piston to B.D.C.

Install the cylinder head and bolts. Torque the bolts in the correct sequence.

Rotate the crankshaft.

Figure 70-70-28

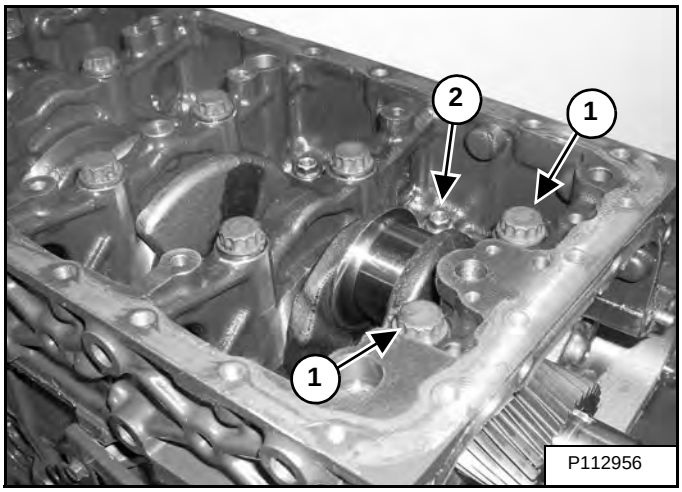


Remove the solder and measure it **[Figure 70-70-28]**.

Top Clearance	
Intake Valve	1,12 - 2,29 mm (0.0441 - 0.0902 in)
Exhaust Valve	1,44 - 2,58 mm (0.0567 - 0.1016 in)

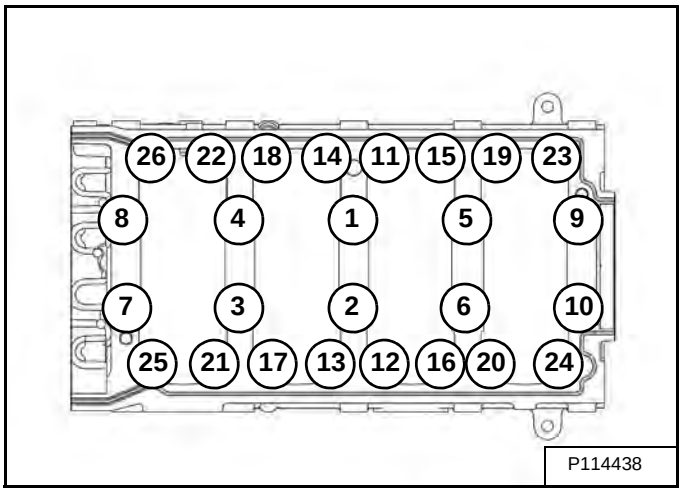
Crankshaft Removal And Installation

Figure 70-80-11



Remove the main bearing bolts (Item 1) and crankcase bolts (Item 2) **[Figure 70-80-11]**.

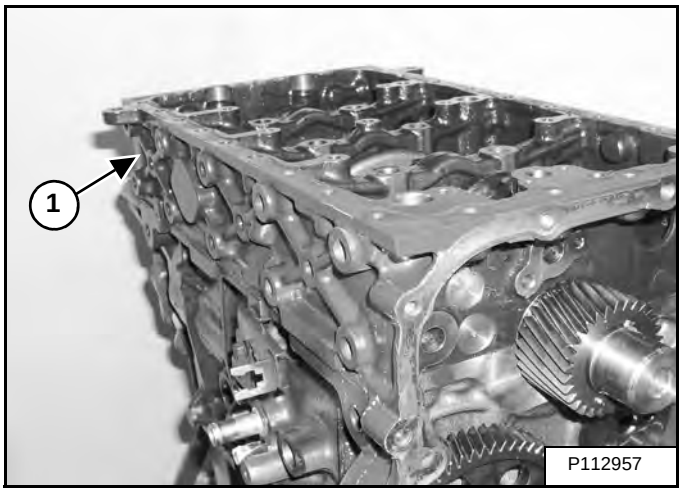
Figure 70-80-12



Installation: Tighten the main bearing bolts (Item 1 - 10) **[Figure 70-80-12]** to an initial torque of 54 N•m (40 ft-lb) torque in the order shown. After the initial torque, tighten the main bearing bolts an additional 90°. Tighten the main bearing bolts a second time by an additional 90°.

Tighten the crankcase bolts (Item 11 - 26) 22 N•m (16 ft-lb) torque in the order shown.

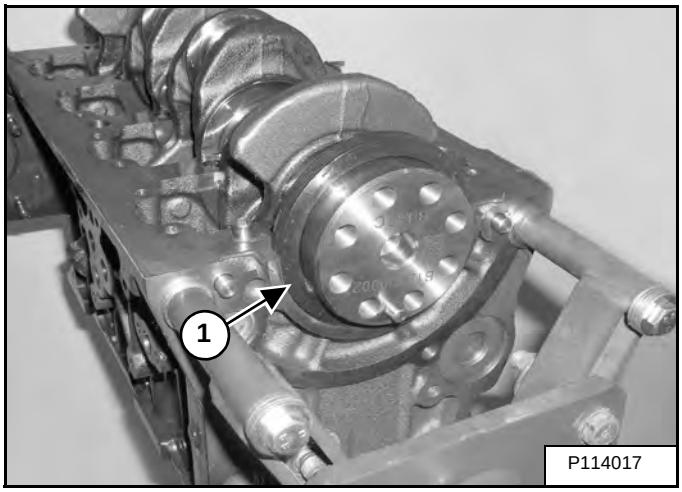
Figure 70-80-13



Remove the crankcase (Item 1) **[Figure 70-80-13]**.

Installation: Apply Loctite® 5900 on the sealing edge of the crankcase.

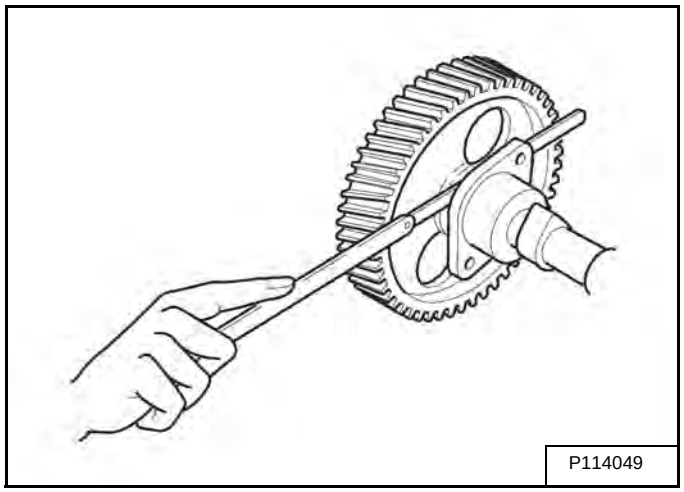
Figure 70-80-14



Remove the oil seal (Item 1) **[Figure 70-80-14]** from the rear of the crankshaft.

Inspecting

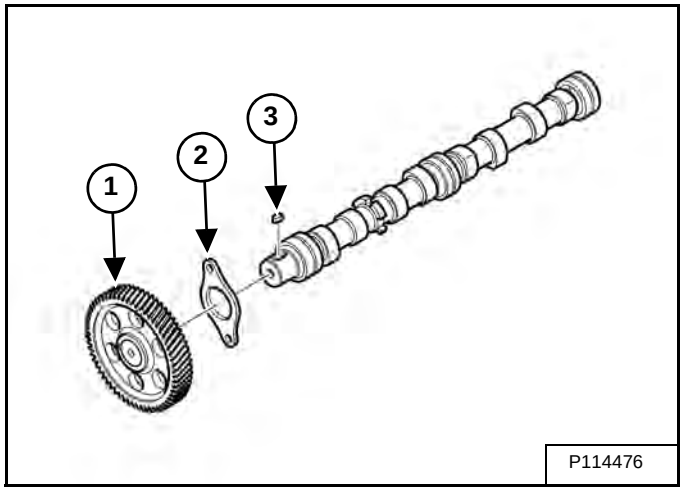
Figure 70-90-4



Measure the gap between the thrust washer and the gear **[Figure 70-90-4]**.

Thrust washer to gear clearance	0,1 - 0,2 mm (0.0039 - 0.0079 in)

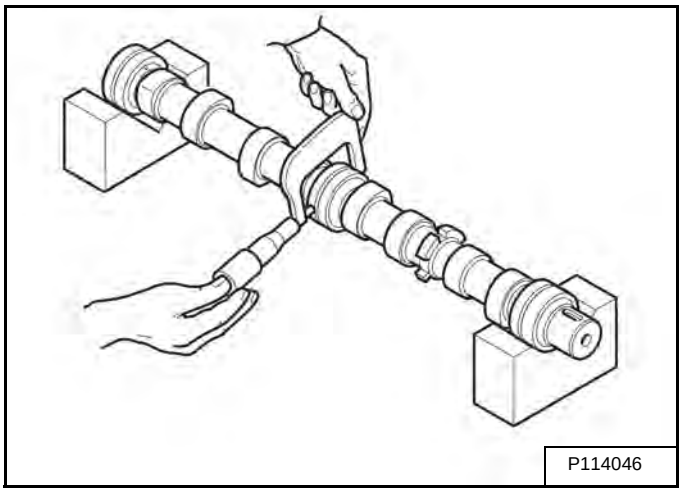
Figure 70-90-5



Remove the gear (Item 1), thrust washer (Item 2), and key (Item 3) **[Figure 70-90-5]**.

Installation: Heat the camshaft gear to 170 - 190°C (338 - 374°F) and press the gear on to the camshaft.

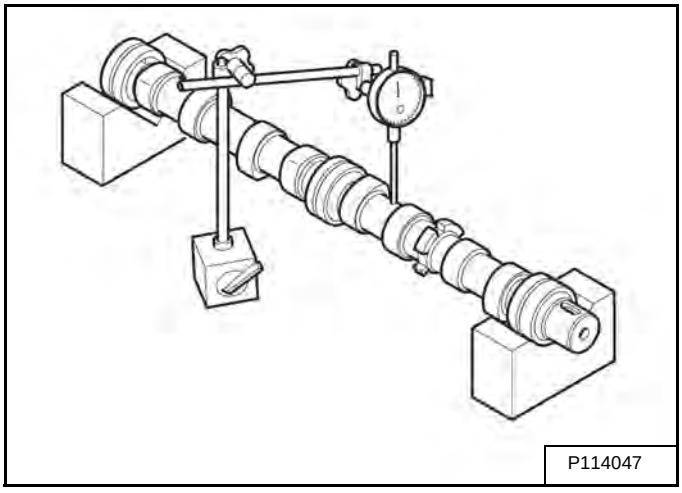
Figure 70-90-6



Measure the three camshaft journals. Measure each journal in two different areas 90° apart **[Figure 70-90-6]**.

Camshaft Journal	44,95 - 44,966 mm (1.7697 - 1.7703 in)

Figure 70-90-7



Place the camshaft on V Blocks. Set up a dial indicator as shown **[Figure 70-90-7]**.

Rotate the camshaft and record the warpage of the camshaft.

Camshaft warpage	0,01 mm (0.0004 in)

Inspection

Figure 70-110-10

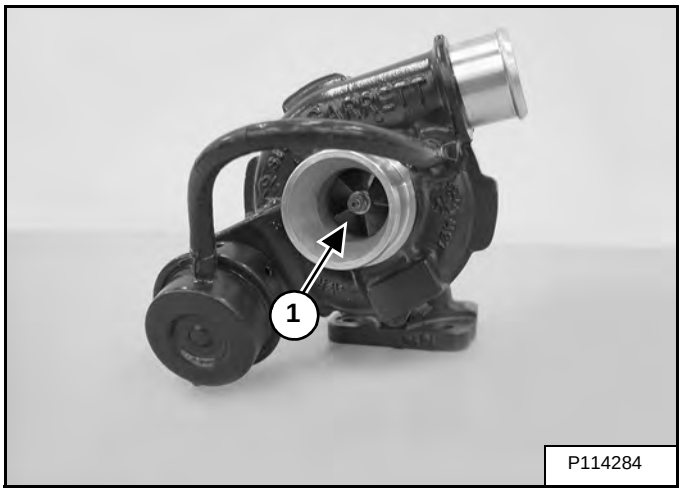
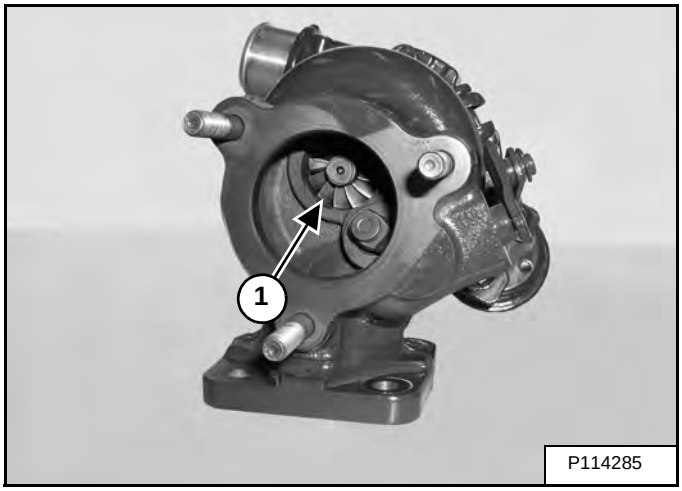


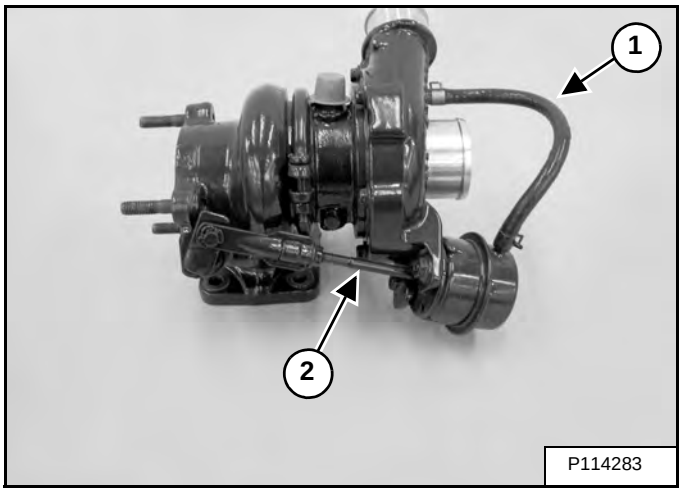
Figure 70-110-11



Move the compressor wheel (Item 1) **[Figure 70-110-10]** and **[Figure 70-110-11]**. Inspect the compressor wheel for radial and axial clearance.

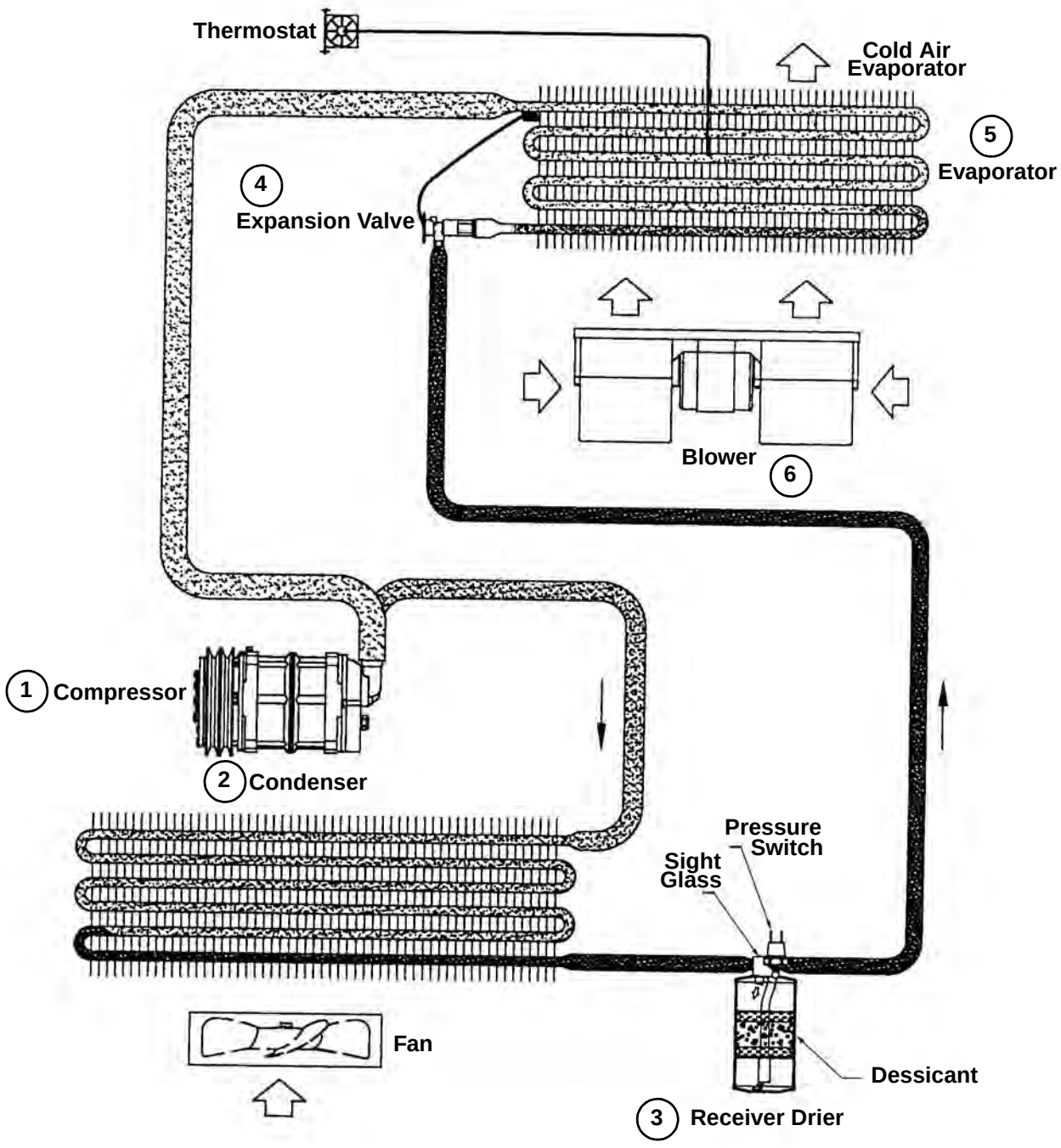
If the wheel contacts the housing, replace the turbocharger assembly with a new one.

Figure 70-110-12



Inspect the hose (Item 1) and linkage (Item 2) **[Figure 70-110-12]** for wear and damage.

Chart


Thermostat
Cold Air Evaporator
5
Evaporator
4
Expansion Valve
Blower
6
1
Compressor
2
Condenser
Pressure Switch
Sight Glass
Fan
Dessicant
3
Receiver Drier
Status Of R-134a
High Pressure Gas
High Pressure Liquid
Low Pressure Liquid
Low Pressure Gas
b-16691


Bobcat®

Poor A/C Performance

Start the loader, lock the park brake, and engage the A/C system with the blower fan on High. Run the loader at full rpm for approximately 15 minutes, with the loader cab door closed.

Figure 80-30-1

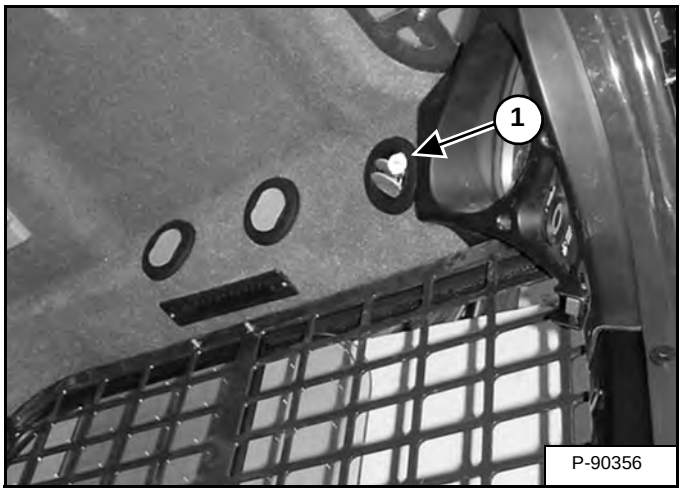
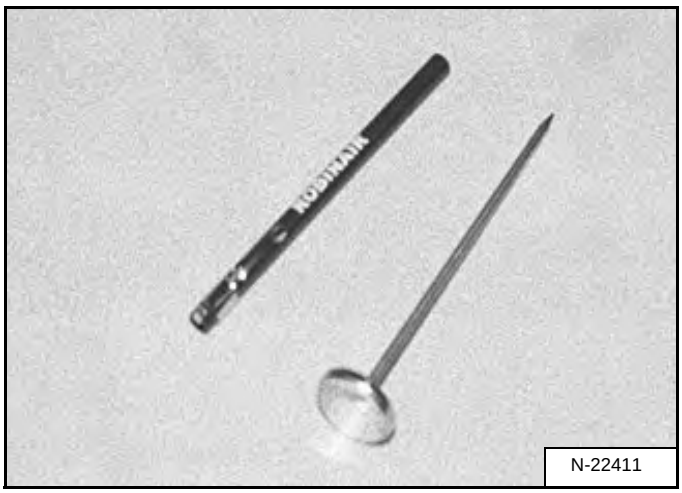


Figure 80-30-2



Measure the temperature at the louvers (Item 1) **[Figure 80-30-1]** with a thermometer **[Figure 80-30-2]**.

The louver temperature should be between 2,2 - 11,6°C (45 - 53°F) depending on the amount of humidity in the air and ambient temperature.

If louver temperature is too high. (See Troubleshooting Tree on Page 80-30-4.)

Inspect the blower for proper operation, or noise, and replace if necessary. (See Removal And Installation on Page 80-130-1.)

Inspect the A/C condenser for dirt or mud and clean if necessary. (See Removal And Installation on Page 80-60-1.)

Inspect the A/C evaporator coil for dirt or mud and clean if necessary. (See EVAPORATOR COIL on Page 80-110-1.)

Inspect the engine coolant to see if it is bypassing the heater valve. (See Engine Coolant Bypassing The Heater Valve on Page 80-30-18.)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THERMOSTAT (CONT'D)

Removal And Installation

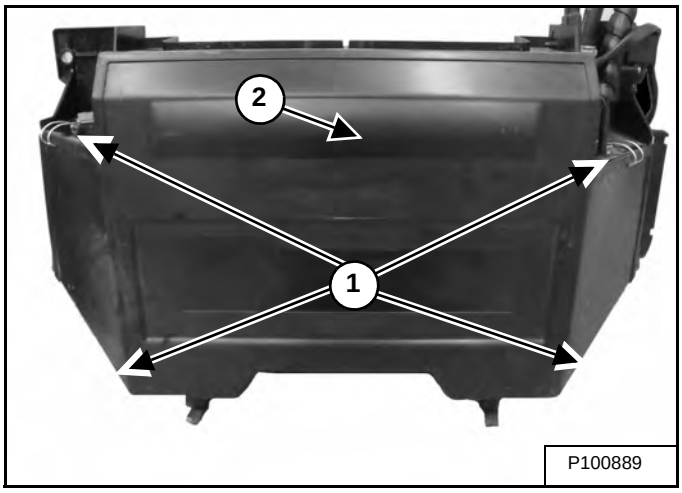
Raise the lift arms and install an approved lift arm support. (See Installing on Page 10-20-2.)

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

NOTE: The thermostat can be changed without evacuating the A/C system, or removing the evaporator / heater unit from the loader.

NOTE: The evaporator / heater unit is shown removed for photo clarity.

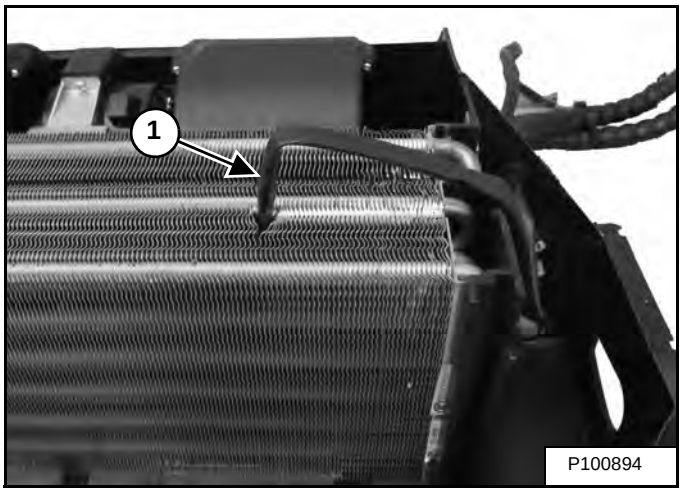
Figure 80-90-2



Release the four latches (Item 1) and remove the cover (Item 2) **[Figure 80-90-2]**.

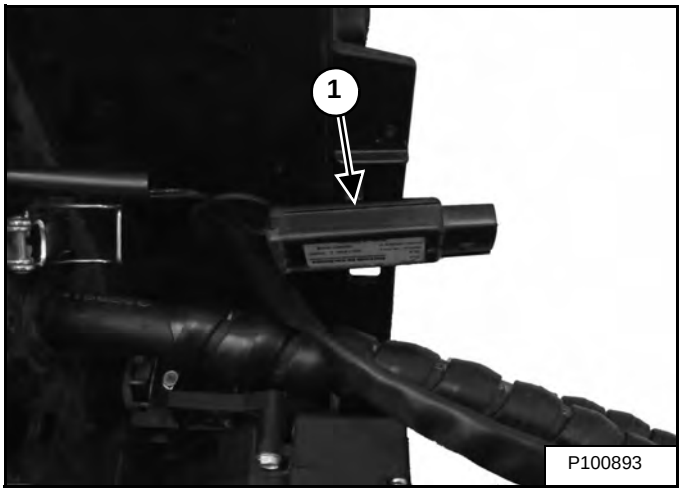
Installation: (See Installing on Page 80-150-1.)

Figure 80-90-3



Remove the thermostat probe (Item 1) **[Figure 80-90-3]** from the A/C evaporator coil.

Figure 80-90-4



Remove the thermostat (Item 1) from the evaporator / heater unit **[Figure 80-90-4]**.


Bobcat®

Hydraulic System

Pump Type	Engine driven, gear type
Pump Capacity – Standard-Flow	64,7 L/min (17.1 U.S. gpm)
Pump Capacity – High-Flow (Option)	101,1 L/min (26.7 U.S. gpm)
System Relief at Quick Couplers	23,8 – 24,5 MPa (238 – 245 bar) (3450 – 3550 psi)
Filter (Hydraulic / Hydrostatic)	Replaceable beta 10 micron = 200, drop in element
Filter (Charge)	Replaceable beta 10 micron = 200, spin-on element
Hydraulic Cylinders:	Double-acting; lift cylinders have cushioning feature on lower, tilt cylinders have cushioning feature on dump and rollback
Lift Cylinder (2):	
Bore Diameter	58,0 mm (2.28 in)
Rod Diameter	40,0 mm (1.58 in)
Stroke	698,5 mm (27.50 in)
Tilt Cylinder (2):	
Bore Diameter	70,0 mm (2.76 in)
Rod Diameter	40,0 mm (1.58 in)
Stroke	331,0 mm (13.03 in)
Control Valve – Standard	3-Spool, open center, manually operated with spring detent for lift float; Electrically controlled auxiliary spool
Control Valve – SJC	3-Spool, open center with electric actuator controlled lift with float and tilt; Electrically controlled auxiliary spool
Fluid Lines	SAE Standard tubelines, hoses, and fittings
Fluid Type	BOBCAT FLUID, Hydraulic / Hydrostatic 6903117 – (Two – 2.5 U.S. gal) 6903118 – (5 U.S. gal) 6903119 – (55 U.S. gal)
Hydraulic Function Time:	
Raise Lift Arms	3.6 seconds
Lower Lift Arms	3.3 seconds
Bucket Dump	2.7 seconds
Bucket Rollback	2.0 seconds


Bobcat®

SERVICE TOOLS REQUIRED (CONT'D)

Electrical Tools

TOOL PART NUMBER	DESCRIPTION	MODELS USED ON	COMMENT	IMAGE
MEL1609	Wheel Speed	S630 - S850 T630 - T870 A770		
MEL1428	Sensor Tester	S70,S100, T110 S450 - S850 T450 - T870 A770		
MEL1567	Seat Bar Adapter			
7313846 Was 7299829	Injector Signal Tester	S450 - S850 T450 - T870 A770	Used to test injector signal on Bobcat 1.8L, 2.4L and 3.4L engines.	
7299830	Injector Signal Tester	S750 - S850 T750 - T870 A770	Used to test injector signal on Kubota iT4 engines.	
7399522	Injector Signal Tester	V2 Bobcat Engines	Used to test injector signal on Kubota iT4 engines.	

See BobcatDealerNET.com for parts ordering information. (For EMEA dealers see the Bobcat Special Tools Catalogue and Doosan Shop for parts ordering information.)

ST LDR-0820