Bobcat®

Service Manual

S750

Skid-Steer Loader

S/N A3P211001 & Above

6989464enUS (09-20) (H)

Printed in U.S.A.

FIRE PREVENTION

Maintenance

The machine and some attachments have components that are at high temperatures under normal operating conditions. The primary source of high temperatures is the engine and exhaust system. The electrical system, if damaged or incorrectly maintained, can be a source of arcs or sparks.

Flammable debris (leaves, straw, etc.) must be removed regularly. If flammable debris is allowed to accumulate, it can cause a fire hazard. Clean often to avoid this accumulation. Flammable debris in the engine compartment is a potential fire hazard.

The operator's area, engine compartment and engine cooling system must be inspected every day and cleaned if necessary to prevent fire hazards and overheating.

All fuels, most lubricants and some coolants mixtures are flammable. Flammable fluids that are leaking or spilled onto hot surfaces or onto electrical components can cause a fire.

Operation

Do not use the machine where exhaust, arcs, sparks or hot components can contact flammable material, explosive dust or gases.

Electrical

Check all electrical wiring and connections for damage. Keep the battery terminals clean and tight. Repair or replace any damaged part or wires that are loose or frayed.

Battery gas can explode and cause serious injury. Use the procedure in the Operation & Maintenance Manual for connecting the battery and for jump starting. Do not jump start or charge a frozen or damaged battery. Keep any open flames or sparks away from batteries. Do not smoke in battery charging area.

Hydraulic System

Check hydraulic tubes, hoses and fittings for damage and leakage. Never use open flame or bare skin to check for leaks. Hydraulic tubes and hoses must be properly routed and have adequate support and secure clamps. Tighten or replace any parts that show leakage.

Always clean fluid spills. Do not use gasoline or diesel fuel for cleaning parts. Use commercial nonflammable solvents.

Fueling

Stop the engine and let it cool before adding fuel. No smoking! Do not refuel a machine near open flames or sparks. Fill the fuel tank outdoors.

Ultra Low Sulfur Diesel (ULSD) poses a greater static ignition hazard than earlier diesel formulations with higher Sulfur content. Avoid death or serious injury from fire or explosion. Consult with your fuel or fuel system supplier to ensure the delivery system is in compliance with fueling standards for proper grounding and bonding practices.

Starting

Do not use ether or starting fluids on any engine that has glow plugs or air intake heater. These starting aids can cause explosion and injure you or bystanders.

Use the procedure in the Operation & Maintenance Manual for connecting the battery and for jump starting.

Spark Arrester Exhaust System

The spark arrester exhaust system is designed to control the emission of hot particles from the engine and exhaust system, but the muffler and the exhaust gases are still hot.

Check the spark arrester exhaust system regularly to make sure it is maintained and working properly. Use the procedure in the Operation & Maintenance Manual for cleaning the spark arrester muffler (if equipped).

SI SSL-1016 SM

LIFT ARM SUPPORT DEVICE

Installing

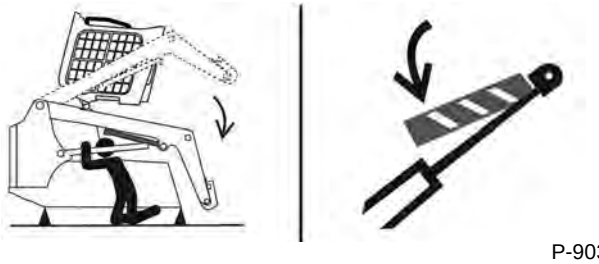
WARNING

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.

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

W-2572-0407

DANGER



P-90328

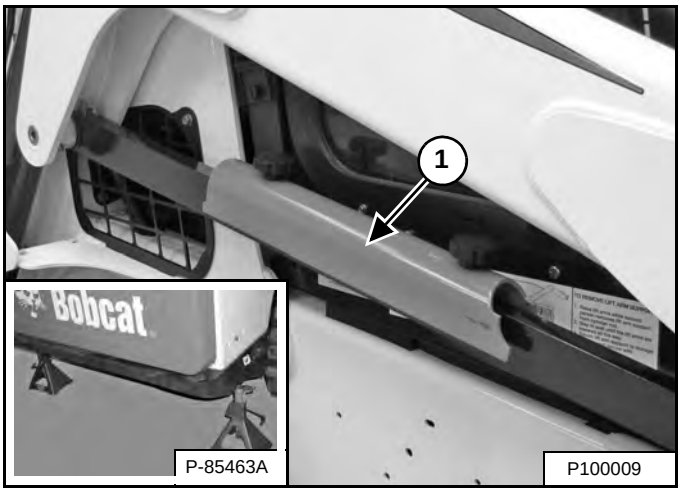
AVOID DEATH

- **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

Remove attachment from the loader. (See Removal And Installation on Page 50-40-1.) ***OR*** (See Removal And Installation on Page 50-41-1.)

Figure 10-20-1



Put jack stands under the rear corners of the loader frame (Inset) **[Figure 10-20-1]**.

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

The operator must stay in the operator seat with the seat belt fastened and the seat bar lowered until the lift arm support device is installed.

Start the engine and raise the lift arms all the way up.

Figure 10-20-2

Have a second person install the lift arm support device over the rod of one of the lift cylinders **[Figure 10-20-2]**.

The lift arm support device must be tight against the cylinder rod.

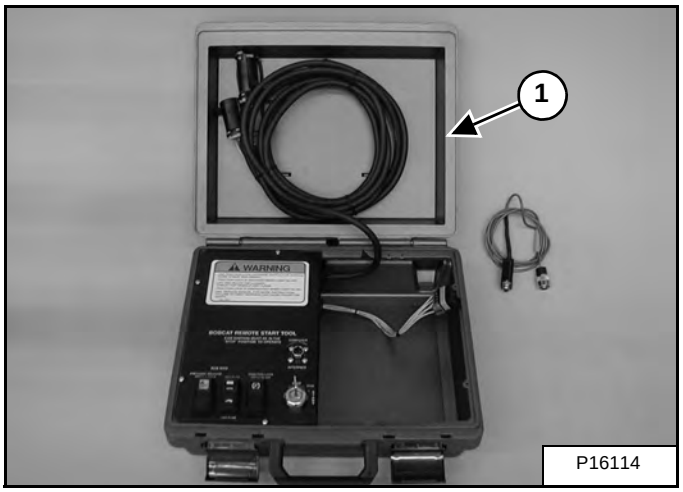
REMOTE START TOOL KIT - MEL1563

Remote Start Tool - MEL1563

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

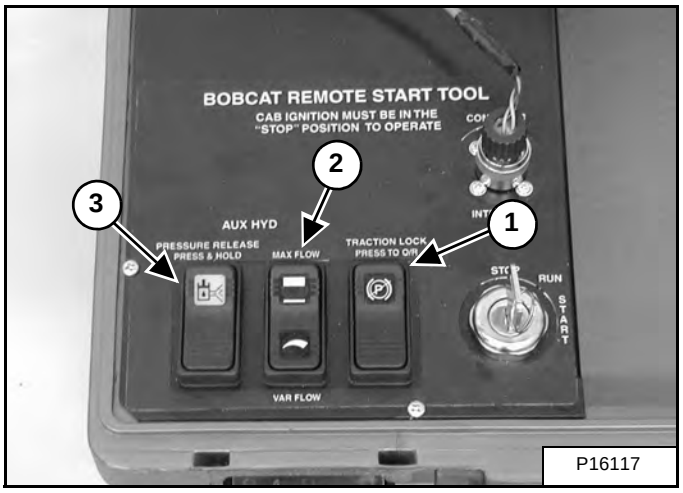
MEL1563 - Remote Start Tool
MEL1566 - Service Tool Harness Communicator (Computer Interface)

Figure 10-60-1



The Remote Start Tool (Item 1) **[Figure 10-60-1]** is required when the service technician is testing the hydraulic / hydrostatic system, adjusting the steering linkage, and electrical diagnostics.

Figure 10-60-2



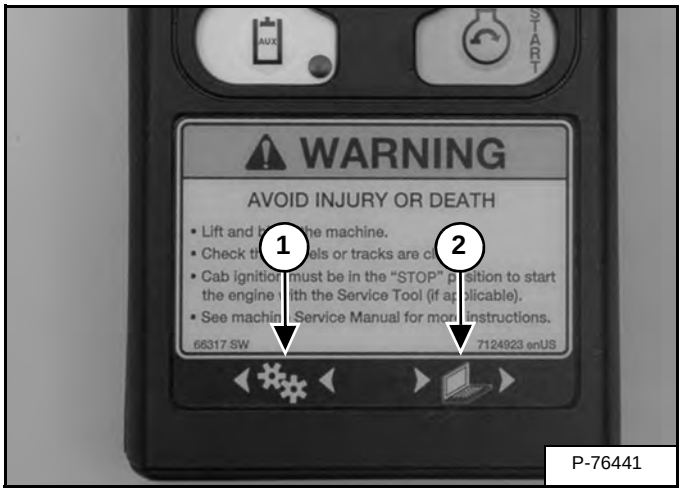
The traction lock switch (Item 1) **[Figure 10-60-2]** is used to turn traction lock ON or OFF. Push the switch to the override position. The switch will illuminate to indicate traction lock OVERRIDE, in this position the wheels are able to turn.

The maximum flow / variable flow switch (Item 2) **[Figure 10-60-2]** is used to activate the auxiliary hydraulics. Pressing the switch will activate variable flow. The switch will illuminate to indicate the flow rate is active. Pressing the switch again will turn the flow OFF. The switch is used when testing pressures and flow rate.

NOTE: With the engine running; pushing and holding the pressure release switch (Item 3) [Figure 10-60-2] will cause the engine to stop.

Remote Start Procedure (Cont'd)

Figure 10-61-13

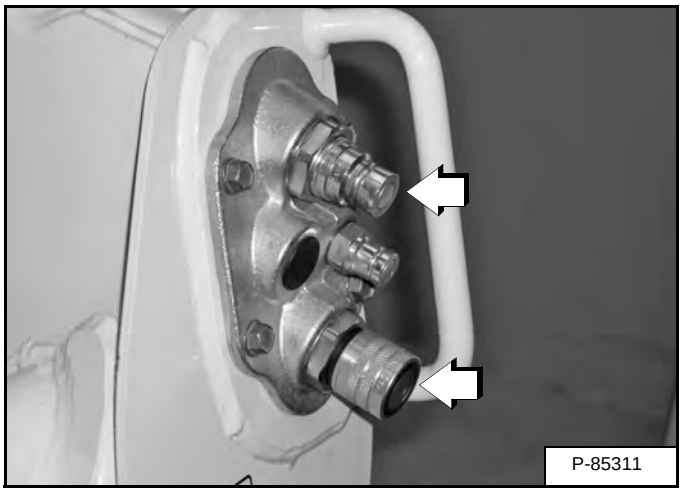


The gear icon with the left facing arrows (Item 1) **[Figure 10-61-13]** will illuminate and blink when the RUN key is pressed and the loader is communicating with the service tool.

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



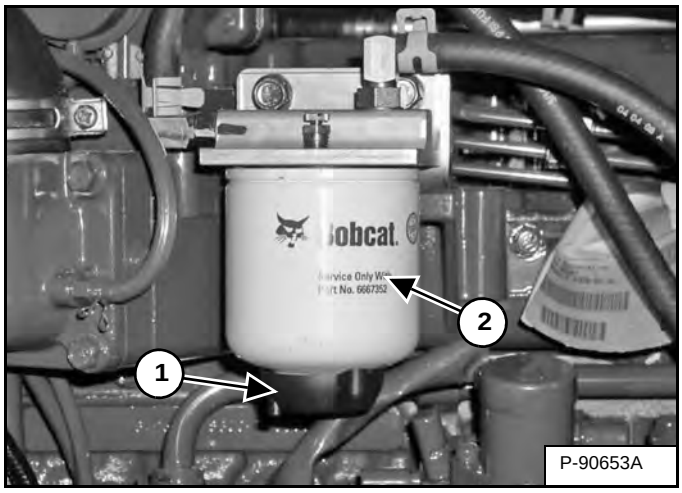
Push the couplers on the front auxiliary block toward the block and hold for five seconds to release the front auxiliary pressure **[Figure 10-61-14]**.

Fuel Filter

For the service interval for removing water from, or replacing the fuel filter (See SERVICE SCHEDULE on Page 10-70-1.)

Removing Water

Figure 10-100-3



Loosen the drain (Item 1) **[Figure 10-100-3]** at the bottom of the filter element to remove water from the filter.

Replacing Element

Remove the filter element (Item 2) **[Figure 10-100-3]**.

Clean the area around the filter housing. Put clean oil on the seal of the new filter element. Install the fuel filter, and hand tighten.

Remove air from the fuel system.

⚠ 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

Removing Air From The Fuel System

After replacing the filter element or when the fuel tank has run out of fuel, the air must be removed from the fuel system before starting the engine.

⚠ 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.

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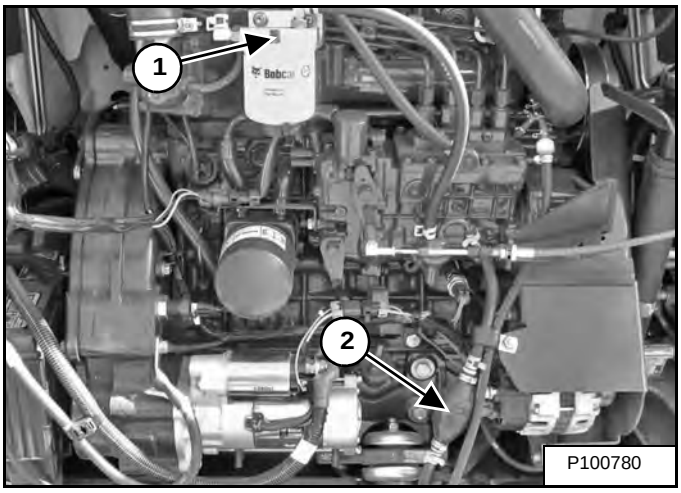
Figure 10-100-4



Open the vent (Item 1) **[Figure 10-100-4]** on the fuel filter housing.

Squeeze the hand pump (priming bulb) (Item 2) **[Figure 10-100-4]** until fuel flows from the vent with no air bubbles.

Close the vent (Item 1) **[Figure 10-100-4]**.

FINAL DRIVE TRANSMISSION (CHAINCASE)

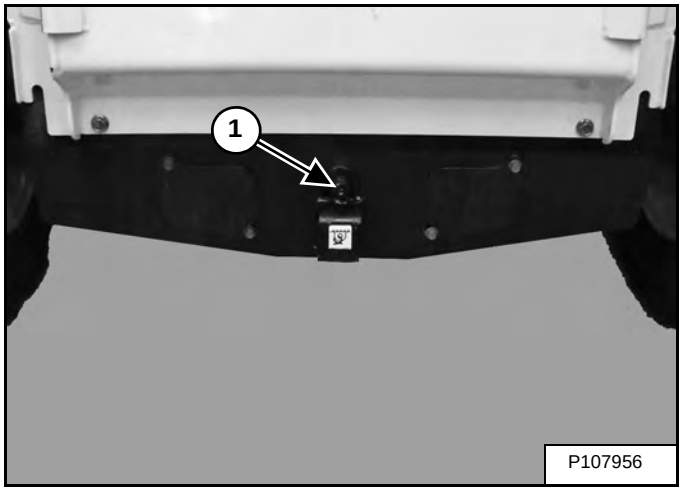
Checking And Adding Fluid

See your SERVICE SCHEDULE for the correct interval to check the final drive transmission fluid level. (See SERVICE SCHEDULE on Page 10-70-1.)

The chaincase contains the final drive sprockets and chains and uses the same type of fluid as the hydraulic / hydrostatic system. (See Hydraulic / Hydrostatic Fluid Chart on Page 10-120-1.)

Park the loader on a level surface and stop the engine.

Figure 10-130-1



Remove the check plug (Item 1) **[Figure 10-130-1]** from the front of the chaincase housing. (Lift arms shown raised for visual clarity.)

If fluid can be reached with the tip of your finger through the hole, the fluid level is correct.

If the level is low, add fluid through the check plug hole until the fluid flows from the hole. Install and tighten the plug.

⚠ 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.

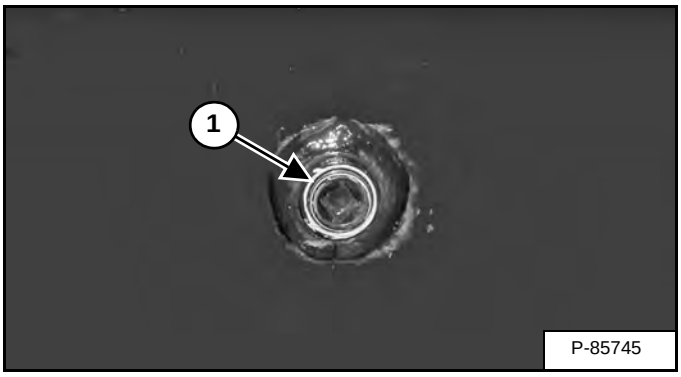
W-2103-0508

Removing And Replacing Fluid

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

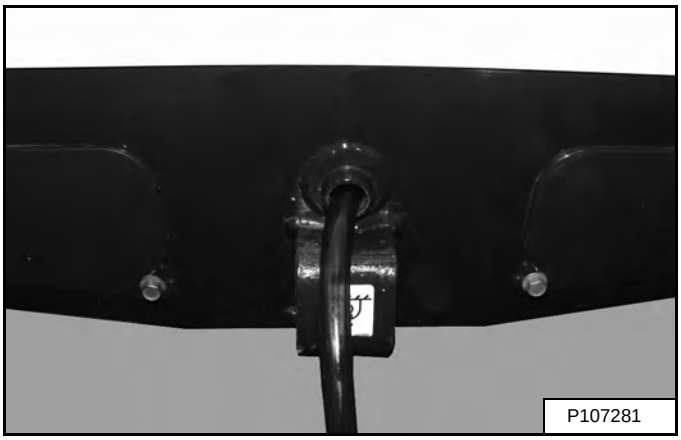
Park the loader on a level surface and stop the engine.

Figure 10-130-2



Remove the check plug (Item 1) **[Figure 10-130-2]** from the front of the chaincase housing.

Figure 10-130-3



Pump the fluid out of the chaincase **[Figure 10-130-3]**. Recycle or dispose of the used fluid in an environmentally safe manner.

Add fluid through the check plug hole until the fluid flows from the hole. (See Capacities on Page SPEC-10-5.) Install and tighten the plug.

⚠ 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

SPARK ARRESTER MUFFLER

Cleaning Procedure

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

Do not operate the loader with a defective exhaust system.

IMPORTANT

This machine is factory equipped with a U.S.D.A. Forestry Service Approved spark arrester exhaust system that must be maintained for proper function.

- **WITH MUFFLER**
  The muffler spark chamber must be emptied every 100 hours of operation to keep it in working condition.

- **WITH SELECTIVE CATALYST REDUCTION (SCR) AND / OR DIESEL OXIDATION CATALYST (DOC)**
  Do not remove or modify the DOC or SCR.

  The SCR must be maintained according to the instructions in the Operation & Maintenance Manual for proper function.

- **WITH DIESEL PARTICULATE FILTER (DPF)**
  The DPF must be maintained according to the instructions in the Operation & Maintenance Manual for proper function.

(If this machine is operated on flammable forest, brush or grass cover land, the engine must be equipped with a spark arrester and maintained in working order. Failure to do so will be in violation of California state law section 4442 PRC. Refer to local laws and regulations for spark arrester requirements.)

I-2350-1114

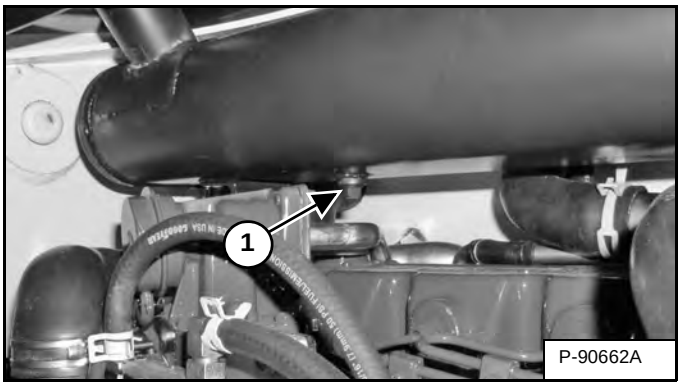
⚠ WARNING

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

W-2068-1285

Stop the engine and open the rear door.

Figure 10-170-1



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

⚠ WARNING

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

W-2006-1209

Start the engine and run for about 10 seconds while a second person, wearing safety glasses, holds a piece of wood over the outlet of the muffler. This will force contaminants out through the cleanout hole.

Stop the engine. Install and tighten the plug. Close the rear door.

⚠ WARNING

AVOID INJURY OR DEATH

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

W-2050-0807

⚠ WARNING

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

W-2011-1285

SEAT BELT

Inspection And Maintenance

⚠ WARNING

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

W-2466-0703

Check the seat belt daily for correct function.

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

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

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

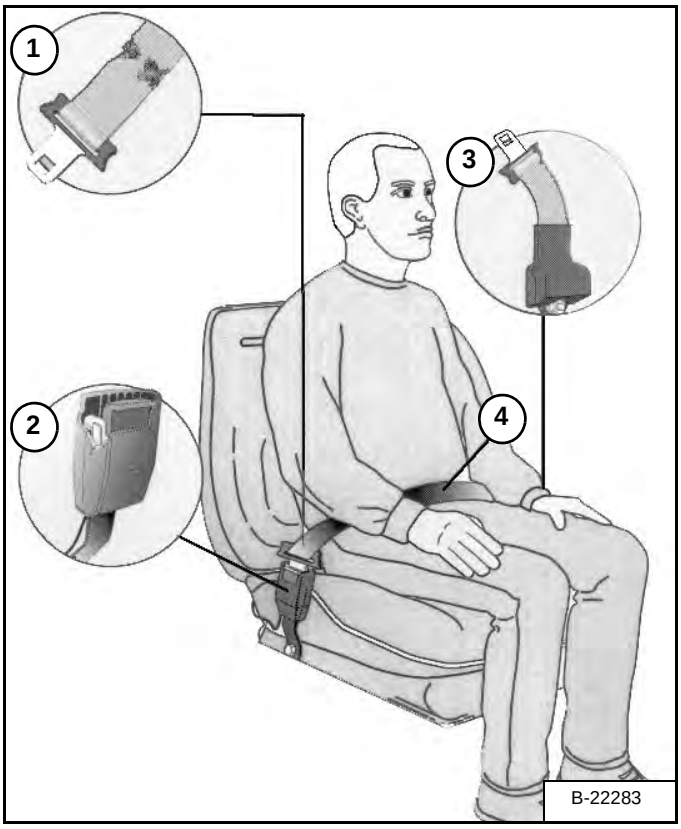
1. Check the webbing. If the system is equipped with a retractor, pull the webbing completely out and inspect the full length of the webbing. Look for cuts, wear, fraying, dirt and stiffness.

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

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

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

Figure 10-220-1



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HYDRAULIC/HYDROSTATIC-SCHEMATIC WITH-ALL-OPTIONS

S750 (S/N A3P214550 - A3P215701)

(PRINTED MARCH 2019)

V-1460legend

LEGEND

1. RESERVOIR:
   Capacity at sight gauge . . 9,8 L (2.6 U.S. gal)
   System Capacity . . . . . 37,9 L (10.0 U.S. gal)
2. SIGHT GUAGE
3. DIFFERENTIAL PRESSURE SWITCH:
   103 kPa (1,03 bar) (15 psi)
   Normally Closed
4. FILTER - HYDRAULIC (CANISTER)
5. SPRING LOADED FILTER BY-PASS VALVE: 172 kPa (1,7 bar) (25 psi)
6. DIAGNOSTIC COUPLER
7. RELIEF VALVE - MAIN:
   23787 - 24476 kPa (238 - 245 bar)
   (3450 - 3550 psi) at Front Quick Couplers
   RELIEF VALVE – MAIN (OPTIONAL):
   27234 – 27924 kPa (272 - 279 bar)
   (3950 - 4050 psi) at Diagnostic Coupler (6)

7A. RELIEF VALVE – AUXILIARY (OPTIONAL):
   23787 – 24476 kPa (238 - 245 bar)
   (3450 - 3550 psi) at Diagnostic Coupler (6)

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): 10797 – 12300 kPa (108 - 123 bar) (1566 - 1784 psi)
23. SPRING LOADED FILTER BY-PASS VALVE: 517 – 572 kPa (5,2 - 5,7 bar) (75 - 83 psi)
24. FIXED CAPACITY DISPLACEMENT HYDRAULIC MOTOR
25. FILTER - HYDRAULIC (CANISTER)
26. SENSOR – CHARGE PRESSURE – Fan Filter
27. FRONT AUXILIARY MANUAL PRESSURE BLEED-OFF VALVE
28. SENSOR – HYD. TEMPERATURE
29. RESTRICTION - 1,5 mm (0.06 in)
30. CHECK VALVE - With 1379 kPa 13,8 bar (200 psi) Spring
31. DRIVE MOTOR SHUTTLE VALVE
32. FIXED CAPACITY DISPLACEMENT BIDIRECTIONAL HYDROSTATIC MOTOR
33. HYDRAULIC BRAKE – SPRING APPLIED – PRESSURE RELEASE (SAPR)
34. PILOT ACTIVATED DIRECTIONAL CONTROL VALVE – 2 Speed
35. FIXED CAPACITY DISPLACEMENT BIDIRECTIONAL HYDROSTATIC MOTOR
36. CHARGE PUMP -
    51,1 L/min (13.5 U.S. gpm) at High Engine Idle
37. HYDRAULIC PUMP . . . . . Gear Type
    87,1 L/min (23.0 U.S. gpm) at High Engine Idle
38. VARIABLE CAPACITY DISPLACEMENT BIDIRECTIONAL HYDROSTATIC PUMP
39. RELIEF/REPLENISHING VALVE - HIGH PRESSURE: 36500 kPa (365 bar) (5294 psi)
40. RELIEF VALVE - CHARGE INLET:
    3206 kPa (32, bar) (465 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. FILL PORT – Factory hydraulic Oil
43. PILOT ACTIVATED DIRECTIONAL CONTROL VALVE – HYDRAULIC POWERED BOB-TACH
    With Build-up Valve 207 kPa (2,07 bar) (30 psi)
44. FILTER - BOB-TACH VALVE
45. RESTRICTION - 2,08 mm (0.08 in)
46. SOLENOID ACTIVATED DIRECTIONAL CONTROL VALVE (TWO COIL)
47. RELIEF VALVE - 8274 kPa (83 bar) (1200 psi)
48. CHECK VALVE - With 552 kPa) (5,5 bar) (80 psi) Spring
49. RELIEF VALVE - 13790 kPa (137 bar) (2000 psi)
50. CHECK VALVE - With 2068 kPa (20,7 bar) (300 psi) Spring And With 0,40 mm (0.016 in) Orifice
51. RESTRICTION - 0,51 mm (0.020 in)
52. SHUTTLE VALVE
53. RESTRICTION - 0,51 mm (0.020 in)
54. PILOT ACTIVATED DIRECTIONAL CONTROL VALVE - REAR AUXILIARY
55. RELIEF VALVE: 22753 kPa (228 bar) (3300 psi)
56. SOLENOID ACTIVATED DIRECTIONAL CONTROL VALVE - TWO COIL
57. RESTRICTOR - 0,8 mm (0.031 in)
58. LOAD SHUTTLE VALVE - BLEED OFF
59. SOLENOID ACTIVATED DIRECTIONAL CONTROL VALVE - Female
60. SOLENOID ACTIVATED DIRECTIONAL CONTROL VALVE - Male
61. SOLENOID ACTIVATED DIRECTIONAL CONTROL VALVE - BUCKET POSITION VALVE (ON/OFF)
62. FLOW DIVIDER ADJUSTMENT VALVE
63. PILOTED ACTIVATED DIRECTIONAL CONTROL VALVE - FLOW CONTROL SPOOL
64. CHECK VALVE - BUCKET POSITION VALVE
65. PILOTED ACTIVATED DIRECTIONAL CONTROL VALVE - UNLOADING SPOOL
66. HIGH FLOW HYDRAULIC PUMP Gear Type
    51,1 L/min (13.5 U.S. gal) at High Engine Idle
67. RELIEF VALVE - 24132 kPa (241 bar) (3500 psi)
68. DUMP VALVE – ON / OFF
69. CHECK VALVE - With 34,5 kPa (0,34 bar) (5.0 psi) Spring
70. SOLENOID ACTIVATED DIRECECTIONAL CONTROL VALVE – BRAKE
71. FILTER – BRAKE VALVE
72. NOT USED ON THIS MODEL
73. SOLENOID ACTIVATED DIRECTIONAL CONTROL VALVE – 2 Speed Shift
74. NOT USED ON THIS MODEL
75. RIDE CONTROL VALVE
76. HIGH PRESSURE CHAMBER
77. LOW PRESSURE CHAMBER

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

V-1460legend (3-11-19)

Printed in U.S.A.

Glossary Of Hydraulic / Hydrostatic Symbols

SYMBOL | DESCRIPTION

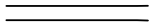
FLOW LINES and CONNECTIONS

WORKING CIRCUITS - Continuous, Solid Line - Working (Main) Line, Return Line (line conducting fluid from working devices to the reservoir) and Feed line (main line conductor).

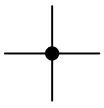
PILOT PRESSURE - Dashed Line - Pilot Line (Line which conducts control fluid).

DRAIN CIRCUITS - Dotted Line - Drain Line (drain or bleed line - line conducting fluid from a component housing to the reservoir.

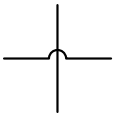
COMPONENTS - Long Chain Line - Enclosure outline for several components assembled in one unit.



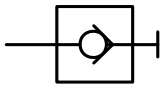
MECHANICAL CONNECTIONS - Double Line (Shaft, Lever, Piston Rod).



CONNECTED JUNCTION OF OIL LINES (Flow Line Connection).



OIL LINES CROSSING (NOT Connected).

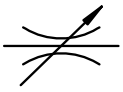


COUPLER - Quick - Acting Coupling (uncoupled, closed by non-return valve).

SYMBOL | DESCRIPTION

BASIC and MISCELLANEOUS SYMBOLS

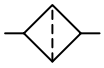
RESTRICTION - Line with Fixed Restriction - Affected by Viscosity (property of resistance to flowing fluid).



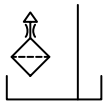
VARIABLE ADJUSTMENT RESTRICTION - Regulated or Variable Restriction.

TEMPERATURE CONTROL - (Indication of temperature).

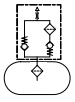
TEMPERATURE INDICATOR - (temperature measurement - thermometer).



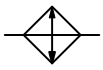
FILTER (strainer or screen) - For fluid conditioning.



VENTED AND FILTERED RESERVOIR (reservoir open to atmosphere).

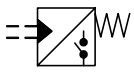


PRESSURIZED, VENTED AND FiLTERED RESERVOIR (Reservoir uses a pressured cap).



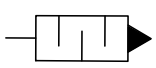
OIL COOLER (heat exchanger) - The arrows in the diamond indicate the extraction of heat (heat dissipation).

PRESSURE SENSOR - Varies electric signal with pressure.



DIFFERENTIAL PRESSURE SWITCH - Switch activates when pressure difference reaches specified level.

PRESSURE SWITCH - Switch activates when pressure reaches specified level.



MUFFLER (silencer) - Reduces noise.

Disassembly

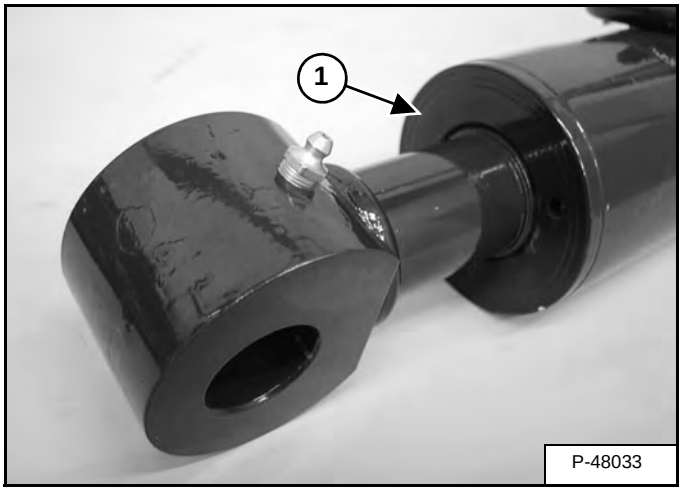
Use the following tools to disassemble the cylinder:

MEL1074 - O-ring Seal Hook
Spanner Wrench

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

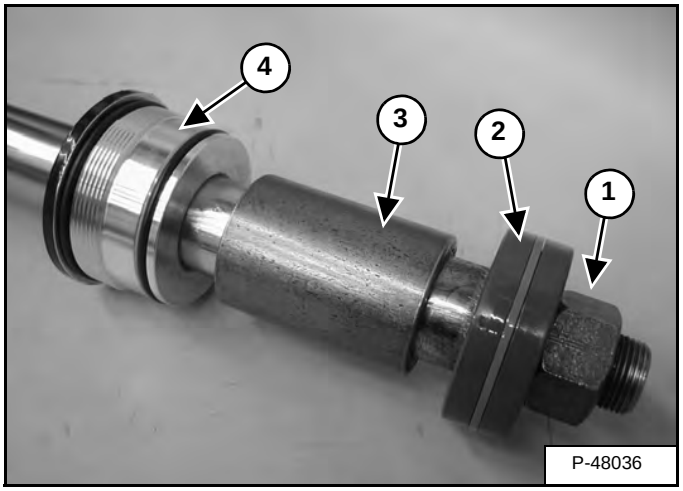
Put the base end of the cylinder in a vise.

Figure 20-20-13



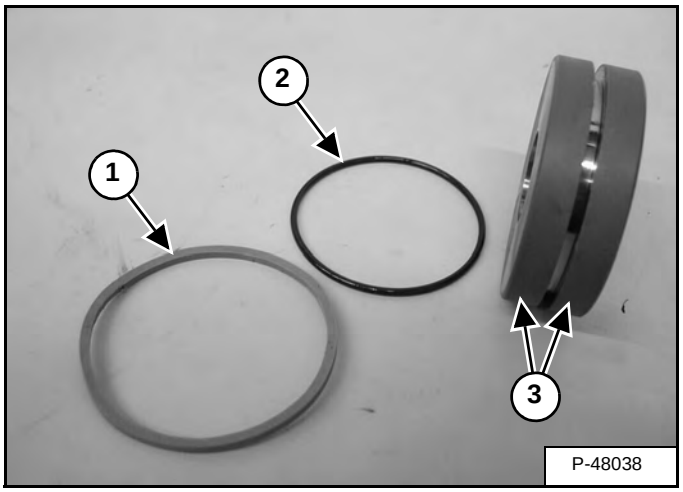
Use a spanner wrench to loosen the head (Item 1) **[Figure 20-20-13]** from the cylinder case.

Figure 20-20-14



Remove the nut (Item 1), piston (Item 2), spacer (Item 3) and head (Item 4) **[Figure 20-20-14]**.

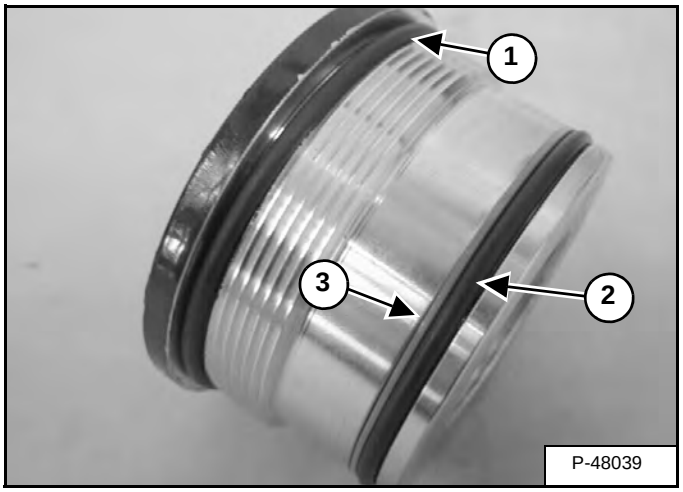
Figure 20-20-15



Remove the back-up ring (Item 1) and O-ring (Item 2) **[Figure 20-20-15]** from the piston.

NOTE: If the fiber surface (Item 3) [Figure 20-20-15] on the piston, becomes damaged, the complete piston must be replaced.

Figure 20-20-16

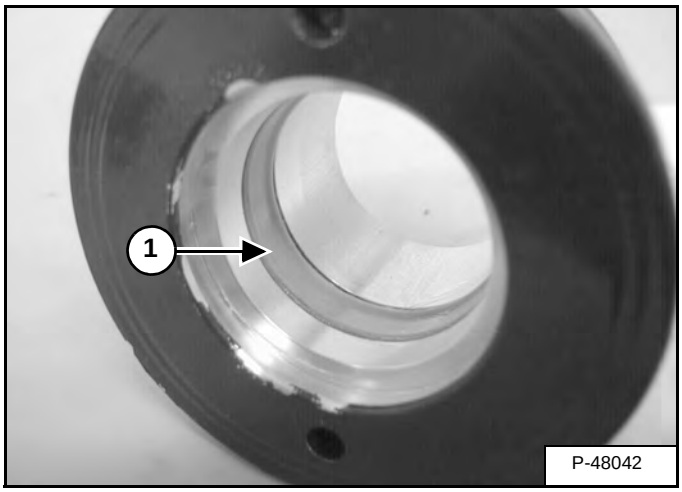


Remove the O-ring (Item 1). Remove the O-ring (Item 2) and the back-up ring (Item 3) **[Figure 20-20-16]** from the cylinder head.

NOTE: The O-ring (Item 2) and back-up ring (Item 3) [Figure 20-20-16] are no longer available parts. The seal kit will contain a one piece seal that is used in place of the O-ring and back-up ring.

Disassembly (Cont'd)

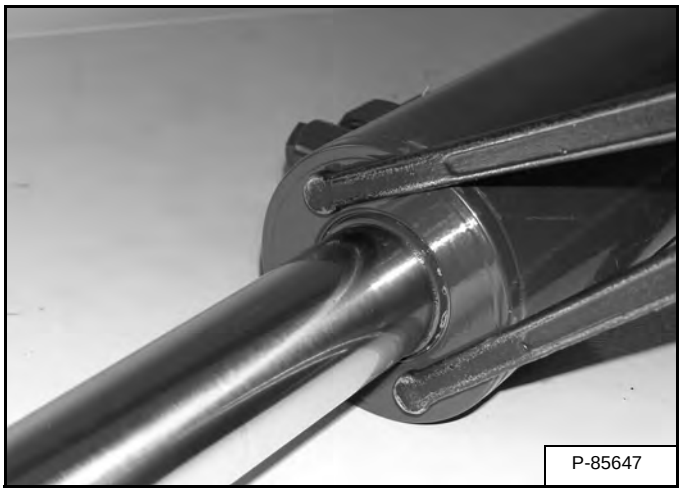
Figure 20-21-19



Remove the rod seal (Item 1) **[Figure 20-21-19]** from the cylinder head.

Assembly (Cont'd)

Figure 20-22-17

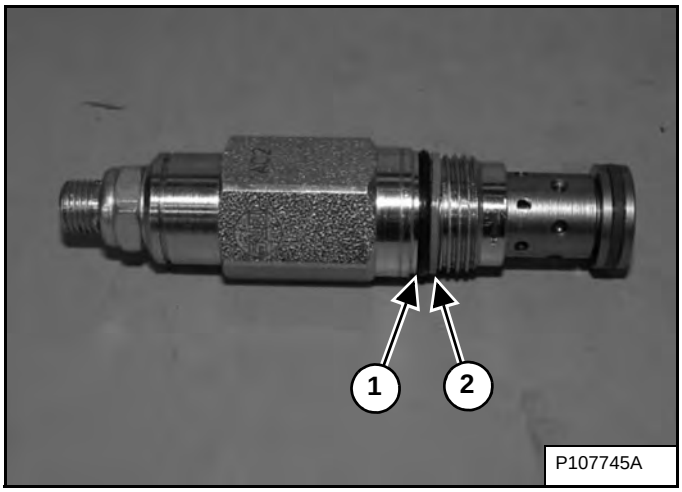


Put the base end of the hydraulic cylinder in a vise.

Tighten the head using a spanner wrench **[Figure 20-22-17]** to 183 N•m (135 ft-lb) torque.

Main Relief Valve Removal And Installation (Cont'd)

Figure 20-31-8



Remove the O-ring (Item 1) and back-up ring (Item 2) **[Figure 20-31-8]** from the relief valve.

Clean the relief valve in clean solvent. Use air pressure to dry the valve.

Install a new O-ring (Item 1) and back-up ring (Item 2) **[Figure 20-31-8]**. Install the main relief valve and tighten.

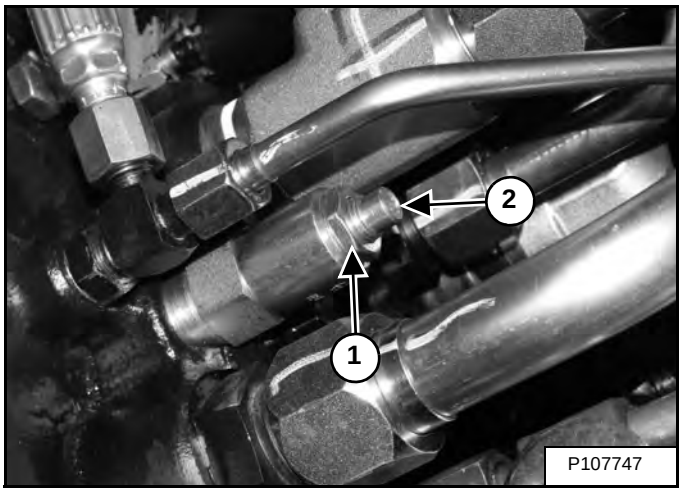
Installation: Tighten the relief valve to 51 - 62 N•m (38 - 45 ft-lb) torque.

Test the relief valve. (See Testing on Page 20-31-2.)

Auxiliary Relief Valve Adjustment

NOTE: This procedure is for loaders equipped with ACS or SJC controls. The auxiliary relief valve is located in the same place on all of the loaders.

Figure 20-31-9



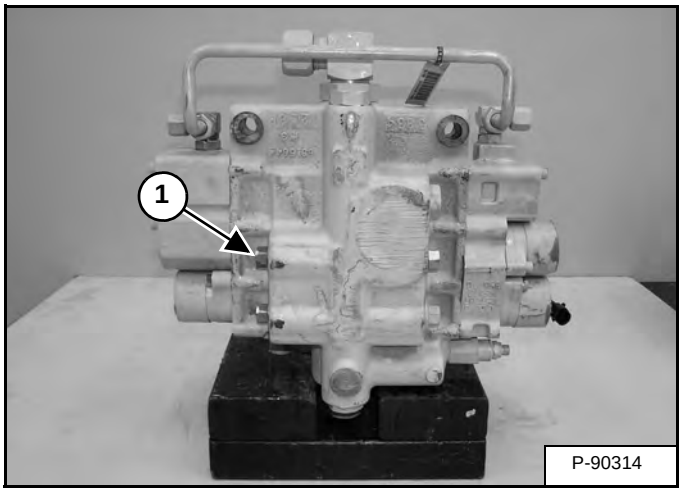
Loosen the locknut (Item 1) **[Figure 20-31-9]**.

Turn the adjustment screw (Item 2) **[Figure 20-31-9]** in or out until the pressure is correct. Turning the screw in will increase pressure.

NOTE: If the correct pressure can not be reached, replace the auxiliary relief valve. Test the pressure setting of the new relief valve.

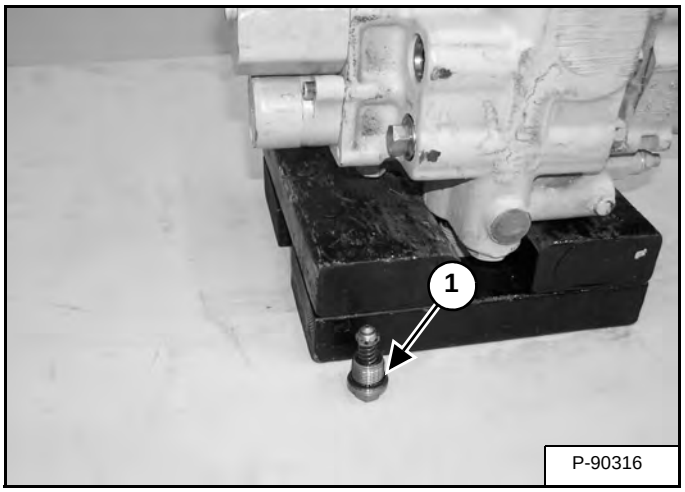
Port Relief / Anti-Cavitation Valve Removal And Installation (Tilt, Base End)

Figure 20-40-27



Remove the tilt port relief / anti-cavitation valve (Item 1) **[Figure 20-40-27]** from the base end of the tilt section.

Figure 20-40-28

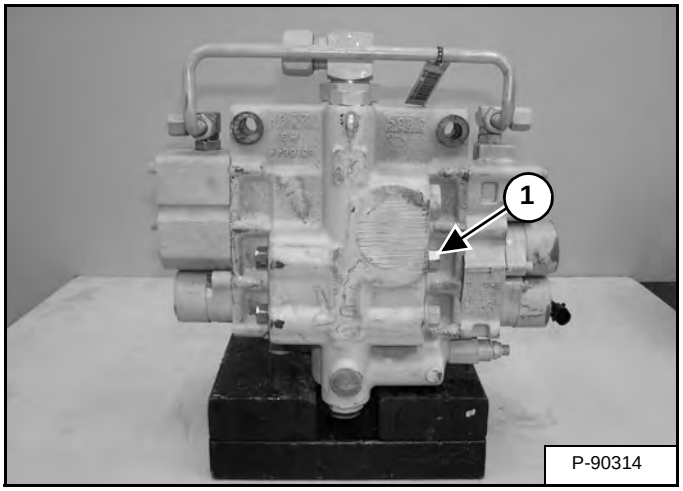


Replace the O-ring (Item 1) **[Figure 20-40-28]** before installation.

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

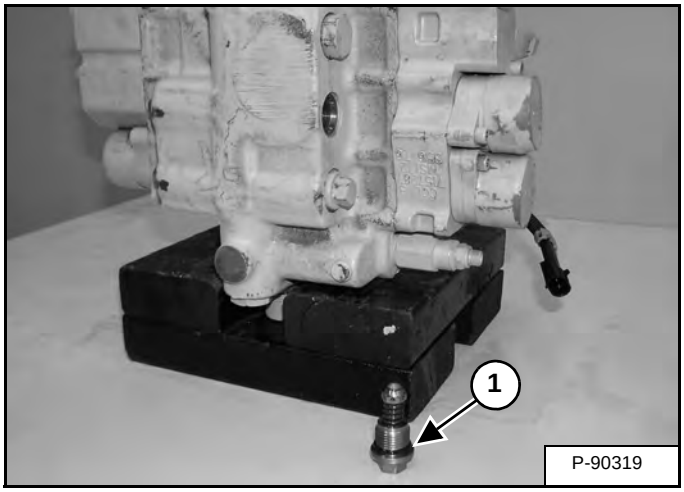
Port Relief / Anti-Cavitation Valve Removal And Installation (Tilt, Rod End)

Figure 20-40-29



Remove the tilt port relief / anti-cavitation valve (Item 1) **[Figure 20-40-29]** from the rod end of the tilt section.

Figure 20-40-30

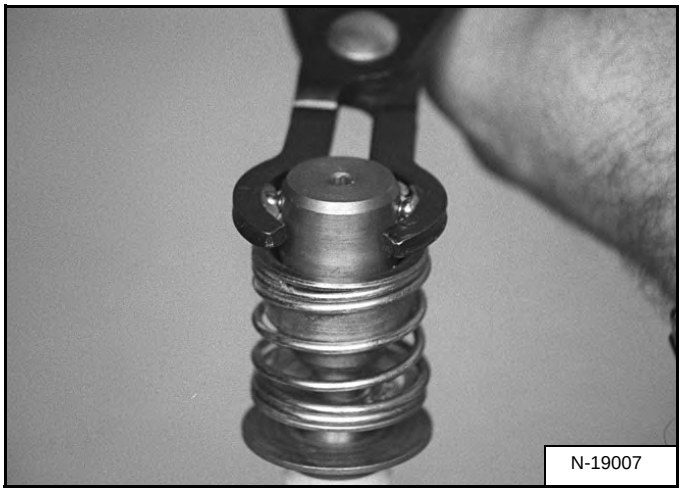


Replace the O-ring (Item 1) **[Figure 20-40-30]** before installation.

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

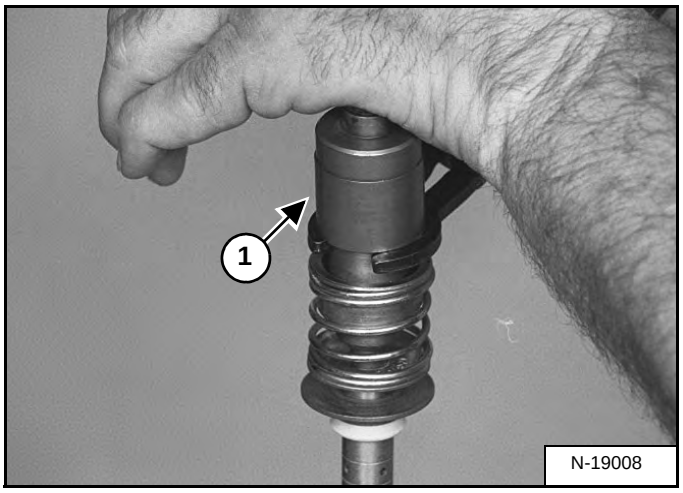
Lift Spool And Detent Removal And Installation (Cont'd)

Figure 20-40-72



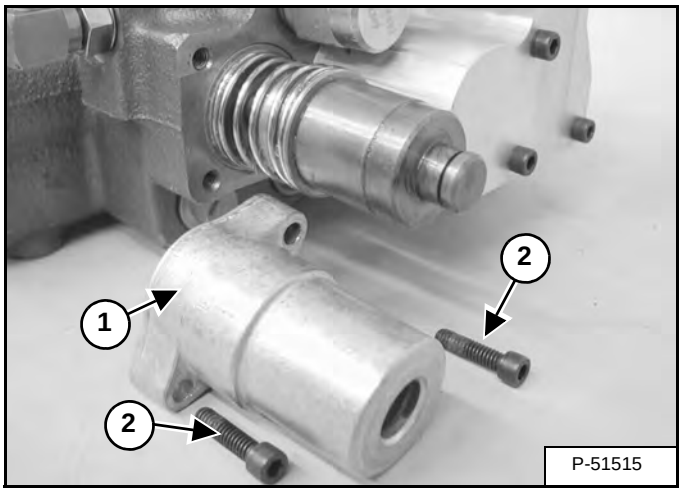
Hold the detent balls in place with the detent pliers **[Figure 20-40-72]**.

Figure 20-40-73



Install the detent sleeve (Item 1) **[Figure 20-40-73]** to the detent adapter.

Figure 20-40-74



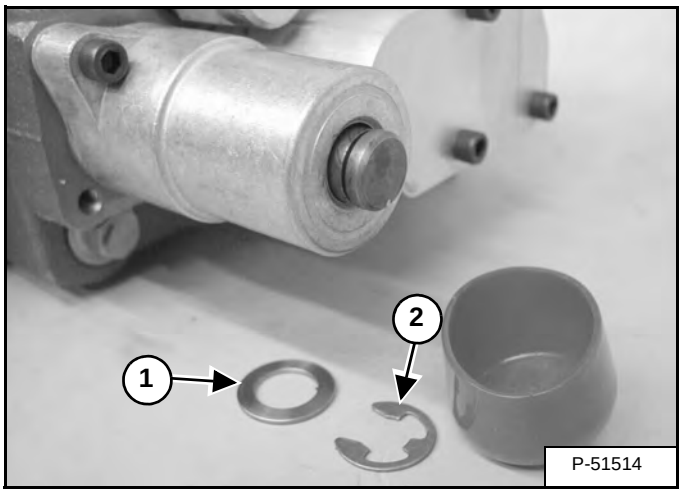
Install the lift spool assembly in the spool bore **[Figure 20-40-74]**.

Install the detent bonnet (Item 1) **[Figure 20-40-74]**.

Install the mounting bolts (Item 2) **[Figure 20-40-74]**.

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

Figure 20-40-75

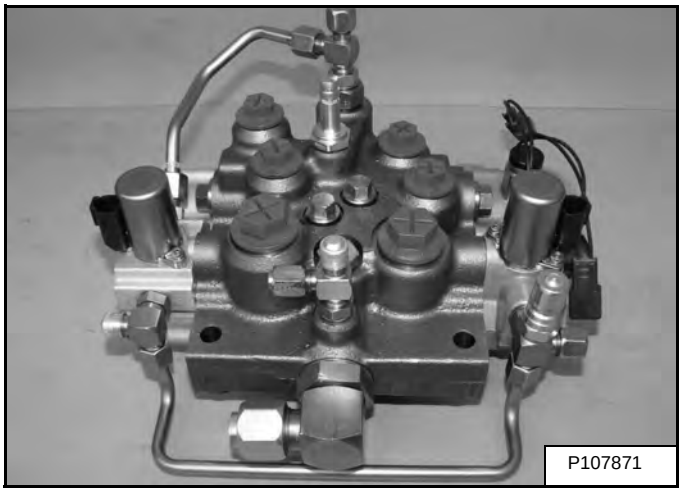


Install the washer (Item 1) and snap ring (Item 2) **[Figure 20-40-75]**.

HYDRAULIC CONTROL VALVE (STANDARD) (LATER MODELS)

Description

Figure 20-41-1



The hydraulic control valve is located inside the main frame on the right hand side, below the operator's cab.

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

The lift and tilt functions in the hydraulic control valve are operated by linkage connected to the foot pedals.

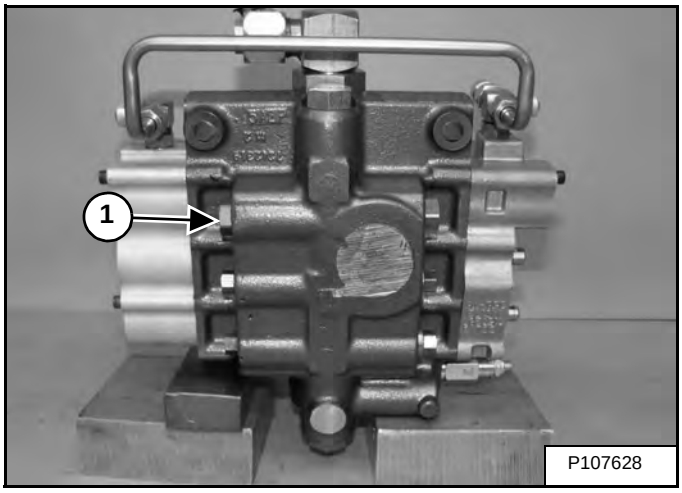
The auxiliary function is operated by pilot pressure. There is one solenoid located by each side of the spool. Only one solenoid at a time is activated by the switch on the right side control handle / lever. The activated solenoid sends pilot pressure fluid to one side of the spool and forces the spool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

The hydraulic control valve is designed with two relief valve ports. The main relief valve is used on the 800, 700, and 600 series loaders. The auxiliary relief valve is standard on the 800 series and may be present on the 700 and 600 series.

The relief valves are adjustable and located on the hydraulic control valve. The main relief valve port is adjacent to the spool linkages. The auxiliary relief valve port is located on top of the control valve between the case drain and load check valves.

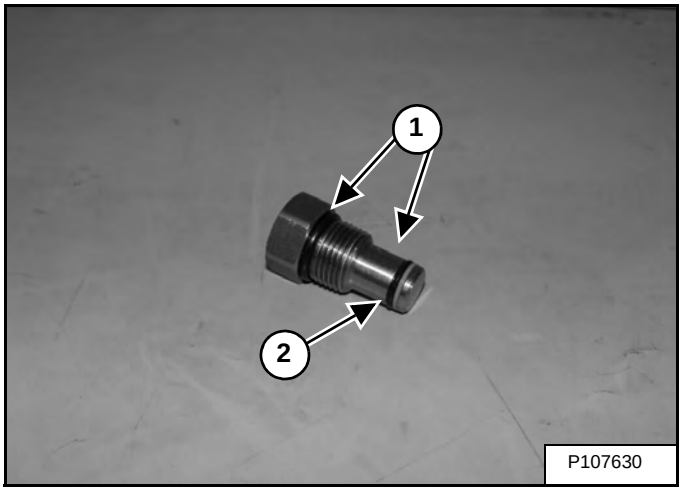
Port Relief Valve Removal And Installation (Cont'd)

Figure 20-41-35



Remove the port relief plug (Item 1) **[Figure 20-41-35]** from the auxiliary circuit of the control valve.

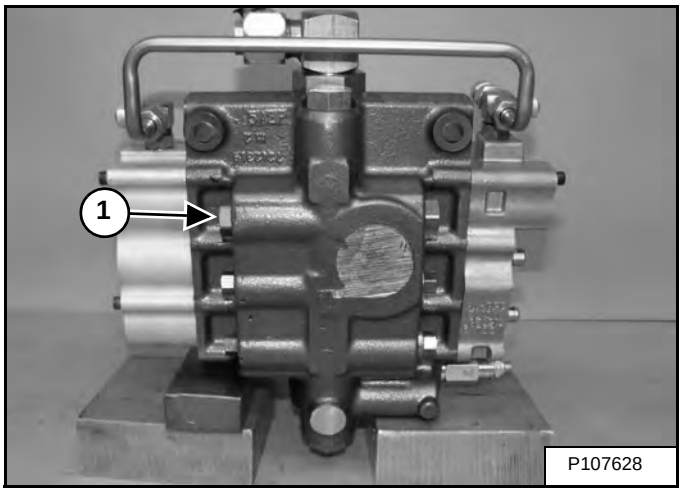
Figure 20-41-36



Remove the O-rings (Item 1) and back-up ring (Item 2) **[Figure 20-41-36]** from the port relief plug.

Installation: Tighten to 51 - 61 N•m (38 - 45 ft-lb) torque.

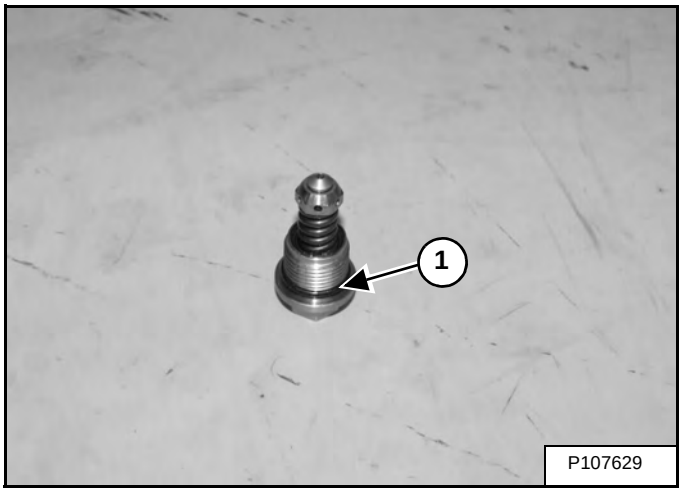
Figure 20-41-37



The control valve may be equipped with an optional auxiliary port relief valve (Item 1) **[Figure 20-41-37]**.

Remove the auxiliary port relief valve.

Figure 20-41-38

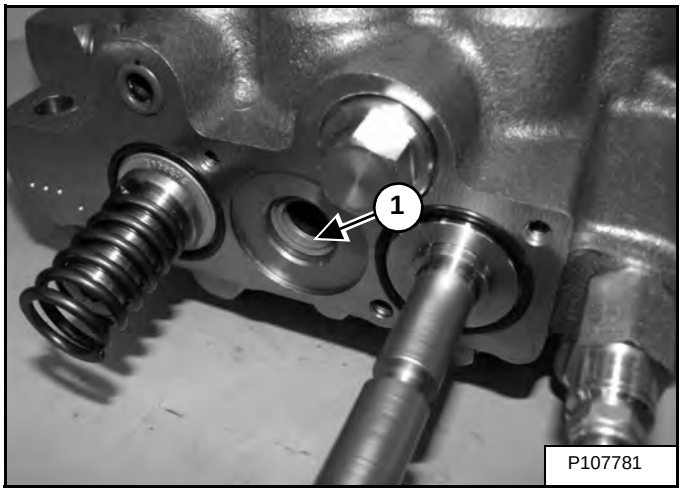


Remove the O-ring (Item 1) **[Figure 20-41-38]** from the optional auxiliary port relief valve.

Installation: Tighten to 51 - 61 N•m (38 - 45 ft-lb) torque.

Tilt Spool Removal And Installation (Cont'd)

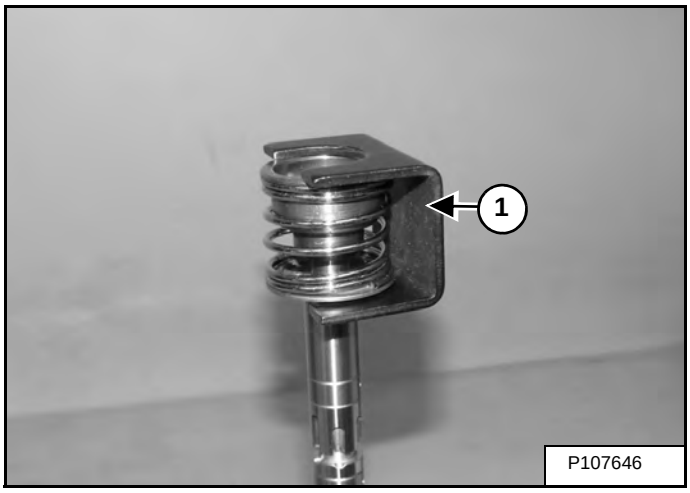
Figure 20-41-81



Remove the tilt spool seal (Item 1) **[Figure 20-41-81]**.

Assembly: Always use a new spool seal.

Figure 20-41-82

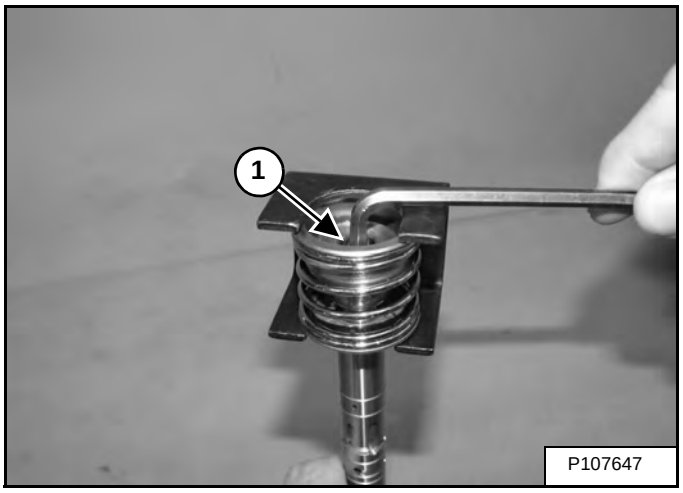


Put the linkage end of the spool in the vise **[Figure 20-41-82]**.

NOTE: Protect spool before clamping in vise.

Install the spring tool (Item 1) **[Figure 20-41-82]** over the centering spring.

Figure 20-41-83

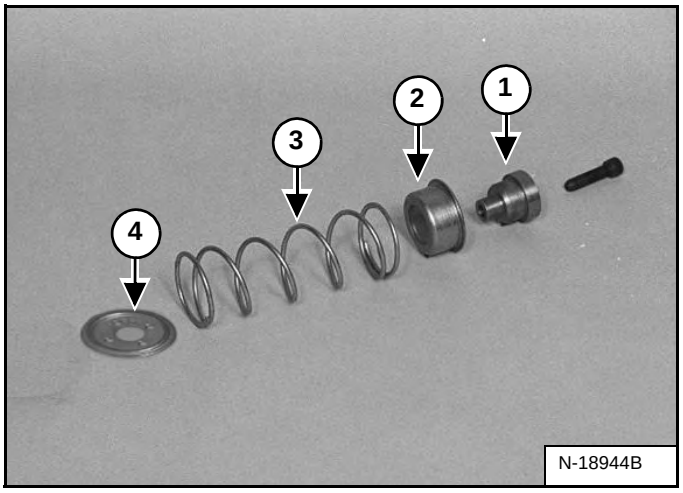


Remove the bolt (Item 1) **[Figure 20-41-83]** holding the centering spring to the spool.

Installation: Tighten the bolt to 10,4 - 11,6 N•m (95 - 105 in-lb) torque.

Remove the spring tool from the spring assembly.

Figure 20-41-84



Inspect the adapter (Item 1), collar (Item 2), spring (Item 3), and washer (Item 4) **[Figure 20-41-84]**.

Removal And Installation (Cont'd)

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

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

Drain the hydraulic reservoir. (See Removing And Replacing Fluid on Page 10-130-1.)

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

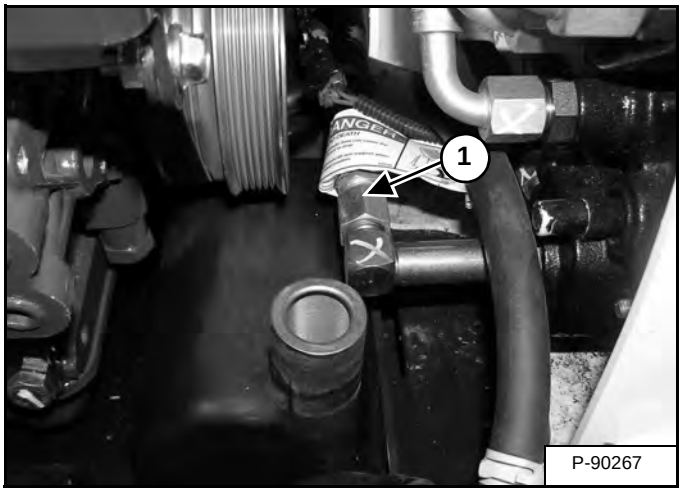
NOTE: Mark all tubelines, hoses, and electrical connections for correct installation.

NOTE: Cap and plug all hydraulic connection points when tubelines or hoses are removed.

Clean area around control valve.

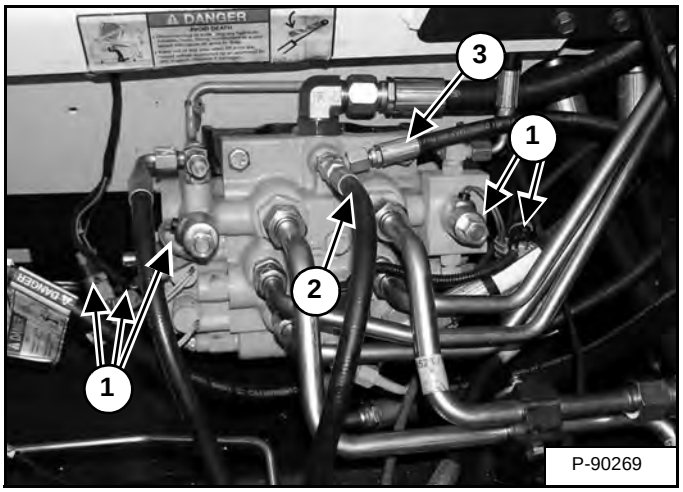
Open rear door.

Figure 20-42-5



The fixed end main valve hose assembly is connected to a fixed end fitting on the control valve. The hose is routed to the junction block at the rear of the loader where it feeds the base end of both lift cylinders. The hose can only be removed by first removing it from the fitting (Item 1) **[Figure 20-42-5]**.

Figure 20-42-6



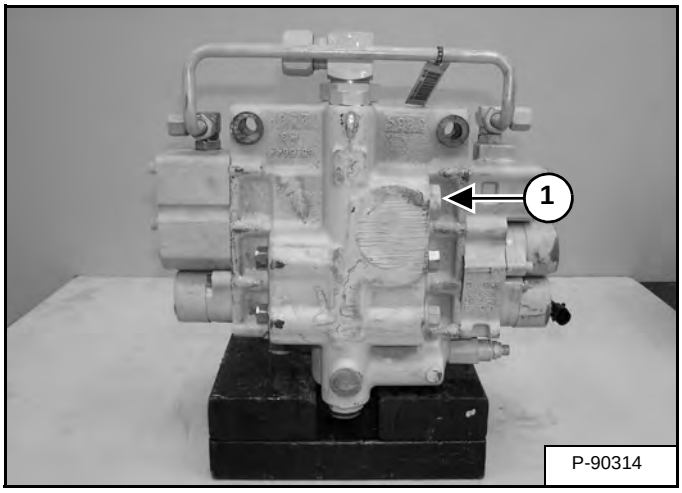
Disconnect the wire harness connectors (Item 1) **[Figure 20-42-6]** from the control valve.

Disconnect the hose (Item 2) **[Figure 20-42-6]** that routes from the control valve to the drain manifold.

Disconnect the hose (Item 3) **[Figure 20-42-6]** that routes from the control valve to the inlet fitting of the hydraulic pump.

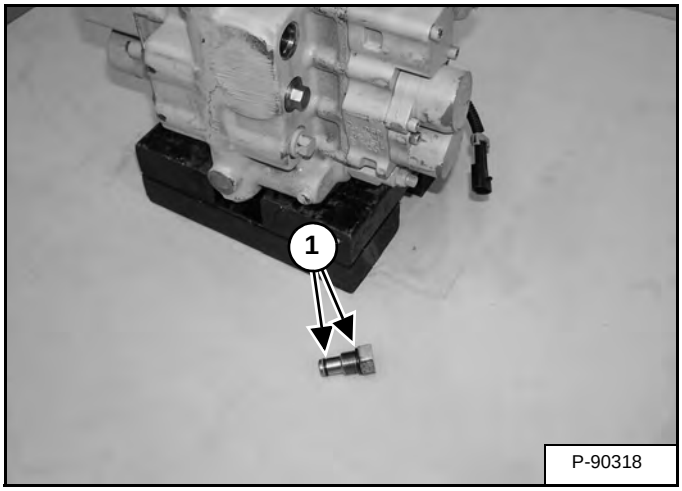
Port Relief Valve Removal And Installation

Figure 20-42-44



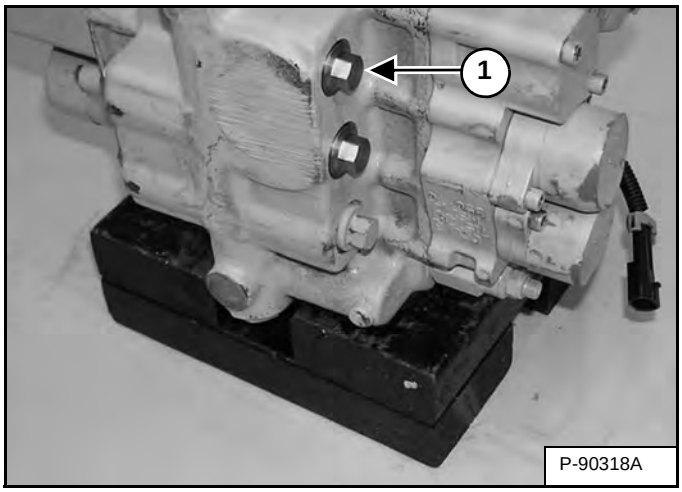
Remove the port relief plug (Item 1) **[Figure 20-42-44]** from the auxiliary circuit of the control valve.

Figure 20-42-45



Installation: Always use new O-rings (Item 1) **[Figure 20-42-45]**. Tighten to 52 - 61 N•m (38 - 45 ft-lb) torque.

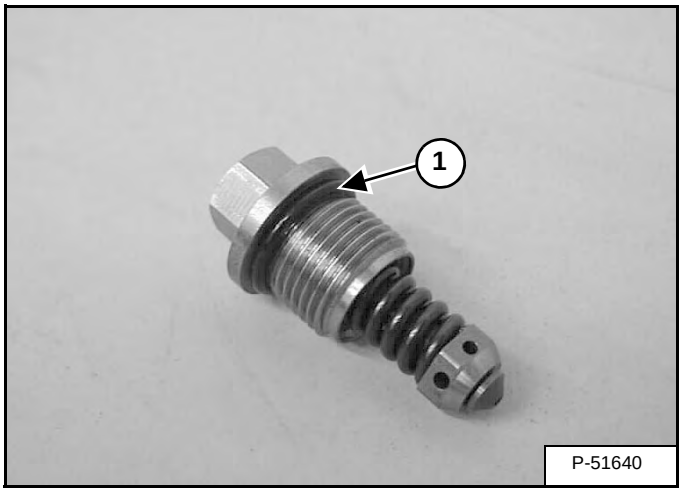
Figure 20-42-46



The control valve may be equipped with an optional auxiliary port relief valve (Item 1) **[Figure 20-42-46]**.

Remove the auxiliary port relief valve.

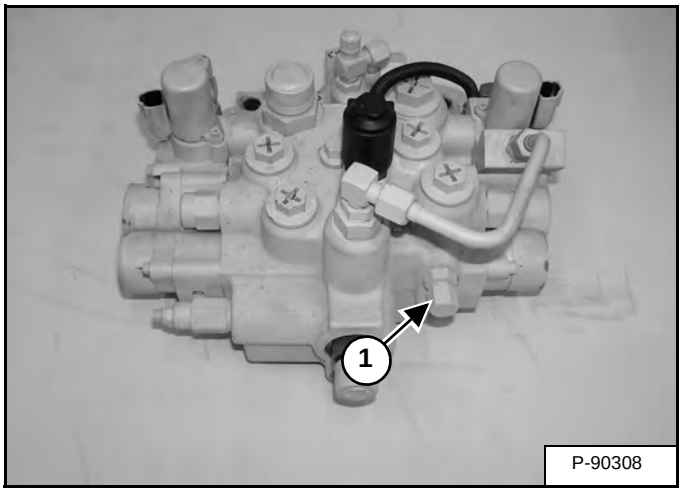
Figure 20-42-47



Installation: Always use new O-rings (Item 1) **[Figure 20-42-47]**. Tighten to 52 - 61 N•m (38 - 45 ft-lb) torque.

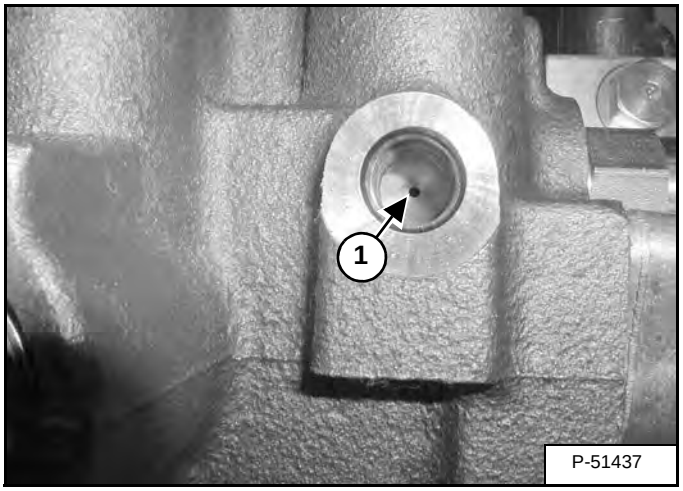
Lift Arm Bypass Orifice Removal And Installation

Figure 20-42-92



Remove the fitting (Item 1) **[Figure 20-42-92]** from the valve.

Figure 20-42-93

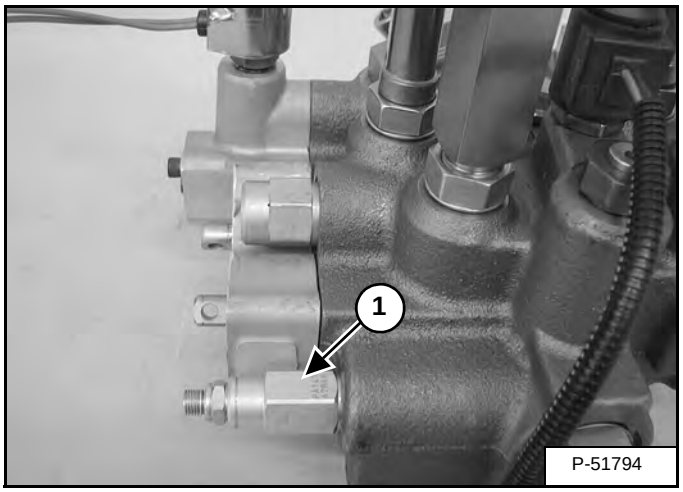


Inspect the lift arm bypass orifice (Item 1) **[Figure 20-42-93]**.

NOTE: This orifice is not removable from the valve casting.

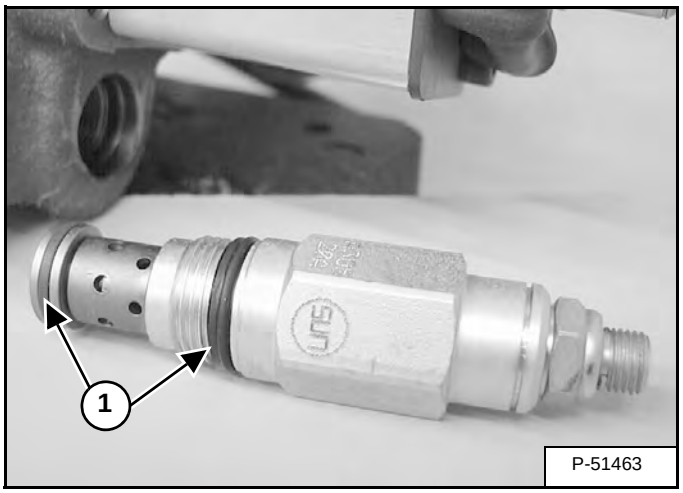
Main Relief Valve Removal And Installation

Figure 20-42-94



Remove the main relief valve (Item 1) **[Figure 20-42-94]**.

Figure 20-42-95

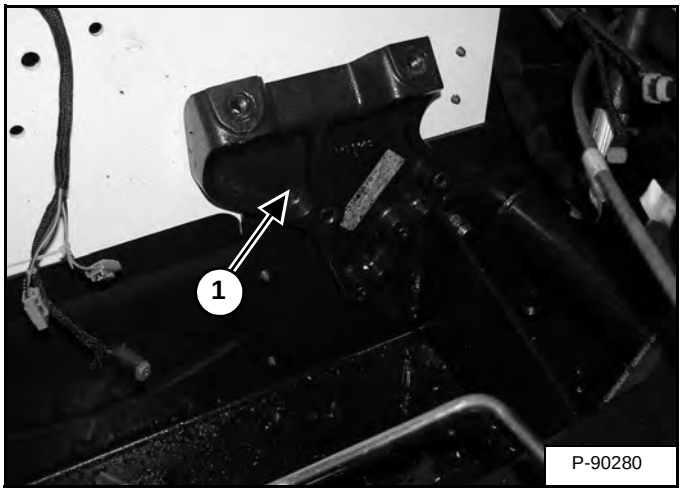


Remove the O-rings and back-up rings from the main relief valve (Item 1) **[Figure 20-42-95]**.

Installation: Always use new O-rings and back-up rings. Tighten to 52 - 61 N•m (38 - 45 ft-lb) torque.

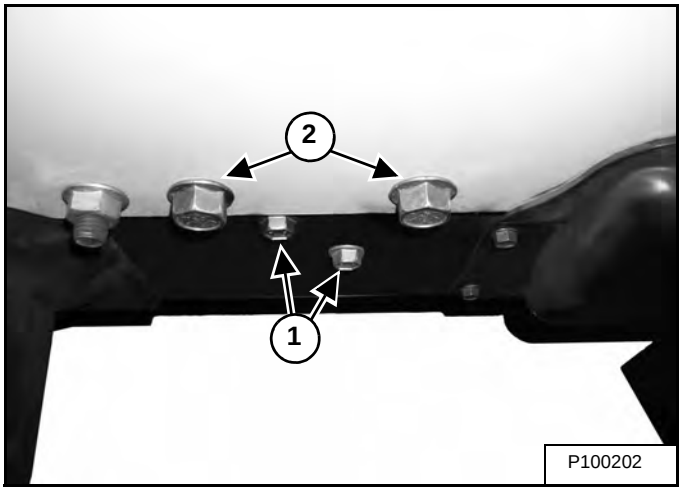
Mount Bracket Removal And Installation

Figure 20-43-29



Support the mounting bracket (Item 1) **[Figure 20-43-29]**.

Figure 20-43-30



Remove the two control valve mount bolts (Item 1) **[Figure 20-43-30]**.

Remove the two frame bolts (Item 2) **[Figure 20-43-30]**

Installation: Torque the two frame bolts (Item 2) **[Figure 20-43-30]** to 300 - 330 ft lb (406 - 447 N•m).

Remove the control valve bracket from the loader.

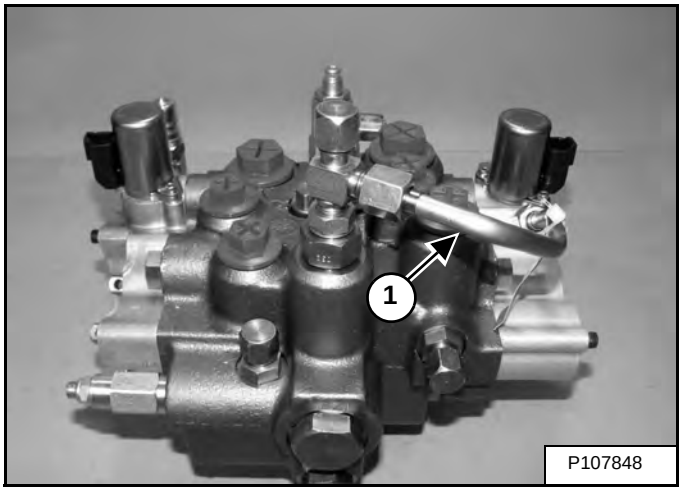
Lift Load Check Valve Removal And Installation

IMPORTANT

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

I-2003-0888

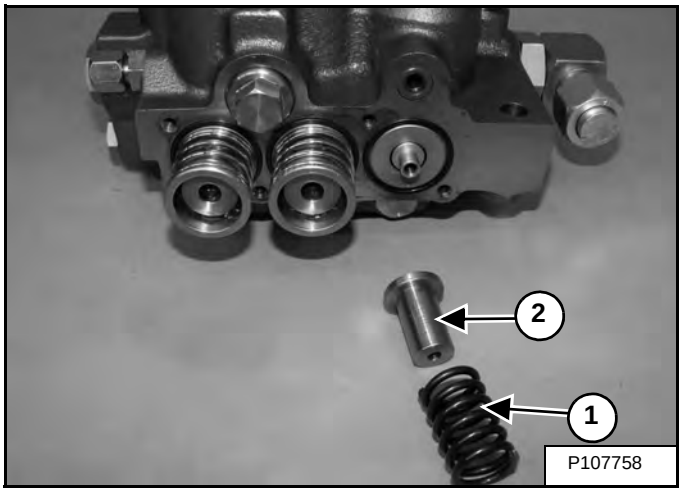
Figure 20-43-31



Remove the charge tubeline (Item 1) **[Figure 20-43-31]** from the BICS™ valve fitting on the top of the lift load check valve.

Auxiliary Spool Removal And Installation

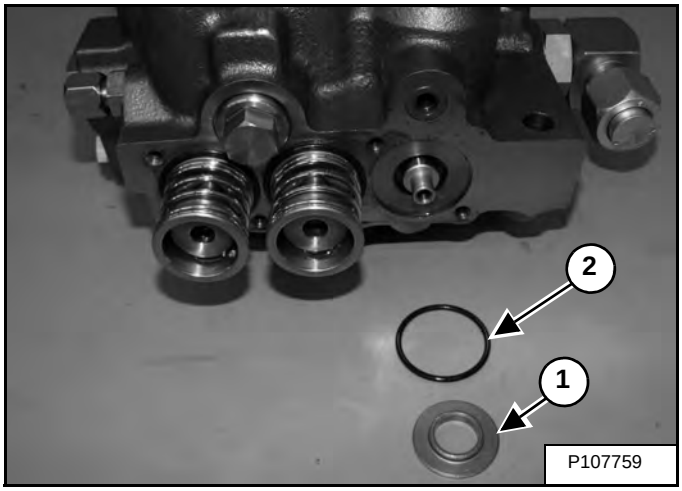
Figure 20-43-75



Remove the spring (Item 1) and center spring retainer (Item 2) **[Figure 20-43-75]** from the auxiliary spool.

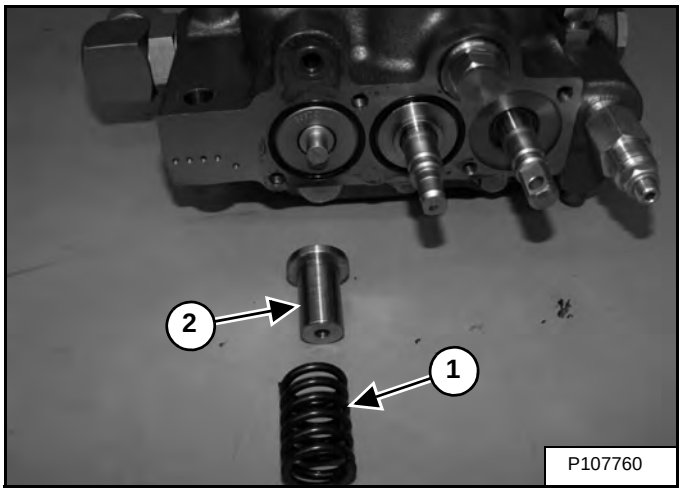
NOTE: If the centering spring retainer (Item 2) [Figure 20-43-75] must be replaced, replace the retainer on the opposite end also.

Figure 20-43-76



Remove the spacer (Item 1) and O-ring (Item 2) **[Figure 20-43-76]** from the auxiliary spool.

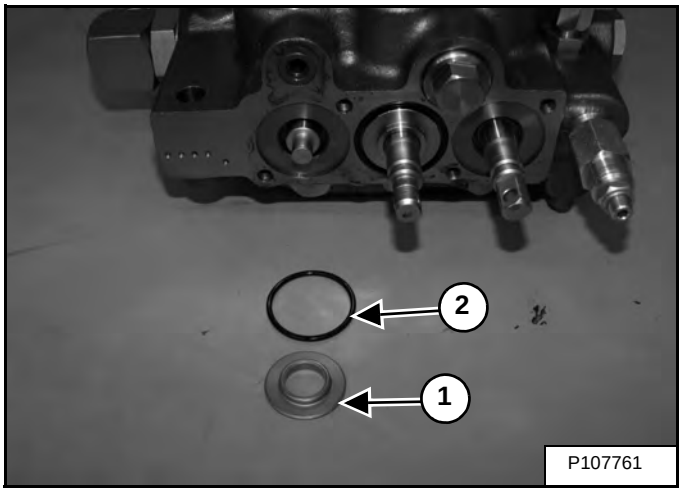
Figure 20-43-77



Remove the spring (Item 1) and center spring retainer (Item 2) **[Figure 20-43-77]** from the auxiliary spool.

NOTE: If the centering spring retainer (Item 2) [Figure 20-43-77] must be replaced, replace the retainer on the opposite end also.

Figure 20-43-78



Remove the spacer (Item 1) and O-ring (Item 2) **[Figure 20-43-78]** from the auxiliary spool.

HYDRAULIC PUMP

Description

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

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

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

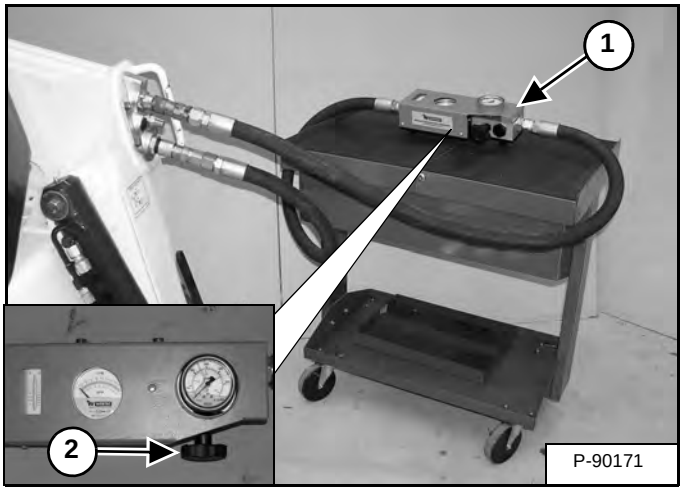
A seal kit is available to service the hydraulic pump. If any of the main components of the pump are damaged, the entire pump must be replaced.

Pump Test At Quick Couplers

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

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

Figure 20-60-1



NOTE: When testing the hydraulic flow of a machine, hoses must be at least 19,05 mm (3/4 in) in diameter and connected directly to the hydraulic tester without using any type of "quick coupler" on the connection to the tester. Also make sure your hydraulic tester is capable of at least 189,3 L/min (50 U.S. gpm).

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

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

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

Warm the fluid to 60°C (140°F) by turning the restrictor control clockwise on the tester so it reads about 6895 kPa (68,9 bar) (1000 psi).

NOTE: DO NOT EXCEED 25511 kPa (255,1 bar) (3700 psi).

Turn the restrictor control (Item 2) **[Figure 20-60-1]** on the tester counterclockwise to obtain free flow, the flow should be approximately 87,1 - 90,8 L/min (23 - 24 U.S. gpm). Start turning the restrictor clockwise, causing more restriction on the flow. The L/min (U.S. gpm) should drop off slightly until the pressure reaches approximately 21374 kPa (213,7 bar) (3100 psi). At approximately 21374 kPa (213,7 bar) (3100 psi) the flow should start decreasing rapidly until the pressure reaches 23787 - 24132 kPa (237,9 - 241,3 bar) (3450 - 3500 psi). At 23787 - 24132 kPa (237,9 - 241,3 bar) (3450 - 3500 psi) the flow should be at 0 L/min (0 U.S. gpm). Turn the restrictor (Item 2) **[Figure 20-60-1]** counterclockwise to free flow. Shut the auxiliary hydraulics off.

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

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

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

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

Warm the fluid to 60°C (140°F) by turning the restrictor control on the tester to about 6895 kPa (68,9 bar) (1000 psi). DO NOT exceed system relief pressure. Open the restrictor control and record the free flow (L/min [U.S. gpm]) at full rpm*.

On the Remote Start Tool engage the auxiliary hydraulics, the light will come ON. Pull the trigger on the right handle or joystick for fluid flow to the quick coupler (fluid pressure will go over main relief). Record the highest pressure (psi) and flow (L/min [U.S. gpm]). The high pressure flow must be at least 80% of free flow.

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

A low percentage may indicate a failed pump.

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

Direct Pump Test (Charge Section)

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

MEL1563 or 7217666 - Remote Start Tool Kit
TWX-RFIK200-S-6 204 L/min (54 U.S. gpm) Flow Meter
MEL10006 - Fitting Kit

⚠ 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

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

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

⚠ 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

NOTE: The fluid from the charge pump must be filtered after it passes through the Hydraulic Tester, to prevent any contamination to the Hydrostatic Pumps.

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

Open the rear door of the loader.

Connect the Remote Start Tool. (See REMOTE START TOOL KIT - MEL1563 on Page 10-60-1.) or (See REMOTE START TOOL (SERVICE TOOL) KIT - 7217666 on Page 10-61-1.)

HYDRAULIC / HYDROSTATIC FILTERS

Description

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

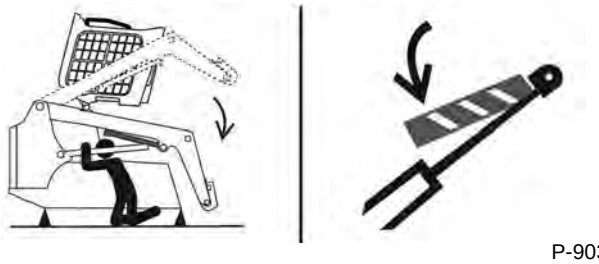
The hydraulic / hydrostatic filter system consists of one main filter and one charge flow filter.

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

REAR AUXILIARY DIVERTER VALVE

Description

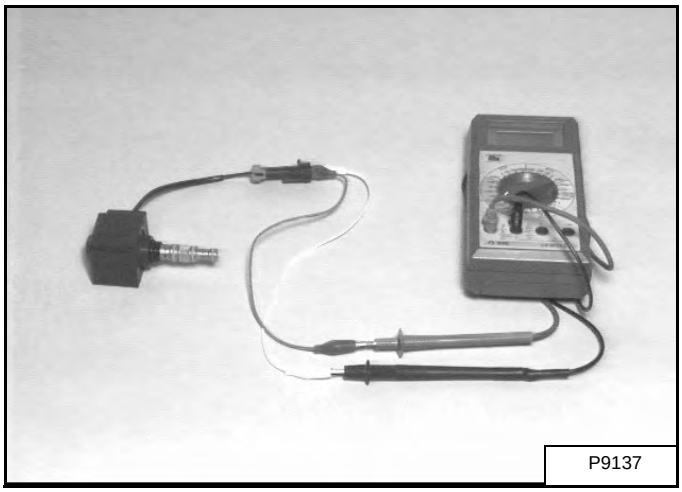
The rear auxiliary diverter valve is an optional valve that diverts fluid from the main valve inlet to two sets of rear auxiliary couplers. The couplers are used for rear mounted attachments.The right side auxiliaries are used for older attachments.

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

See Hydraulic Schematic for more circuit information.

Solenoid Testing

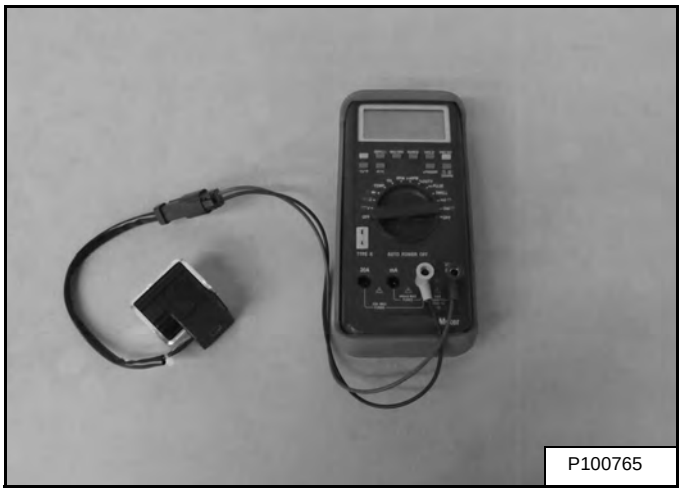
Figure 20-110-1



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

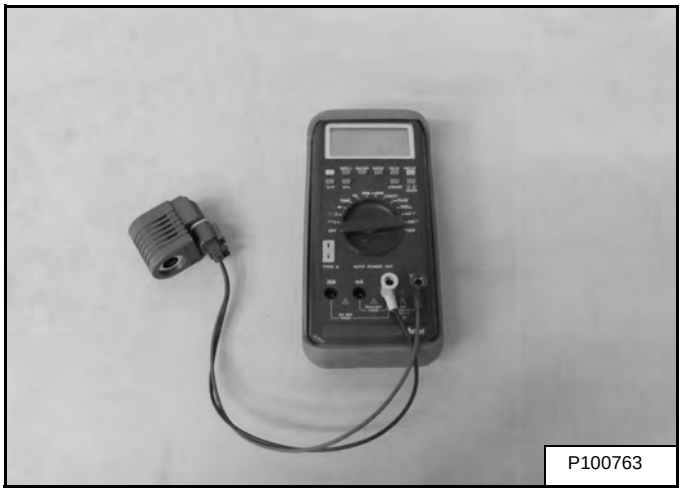
Replace the test meter with 12 volt power. You can see and hear the spool shift.

Figure 20-110-2



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

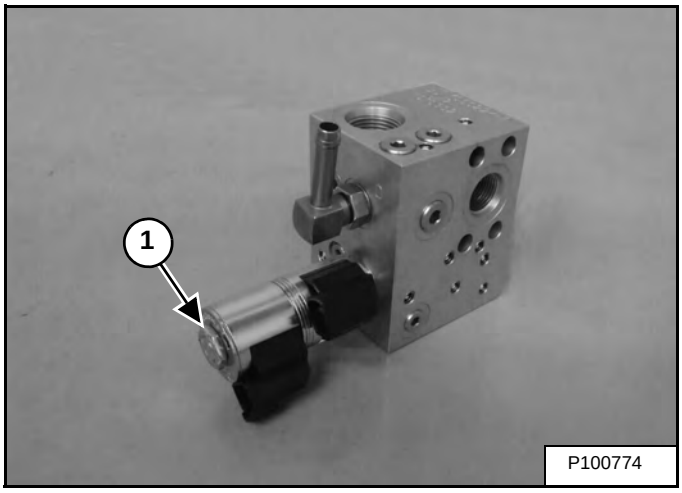
Figure 20-110-3



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

Disassembly And Assembly (Cont'd)

Figure 20-120-11

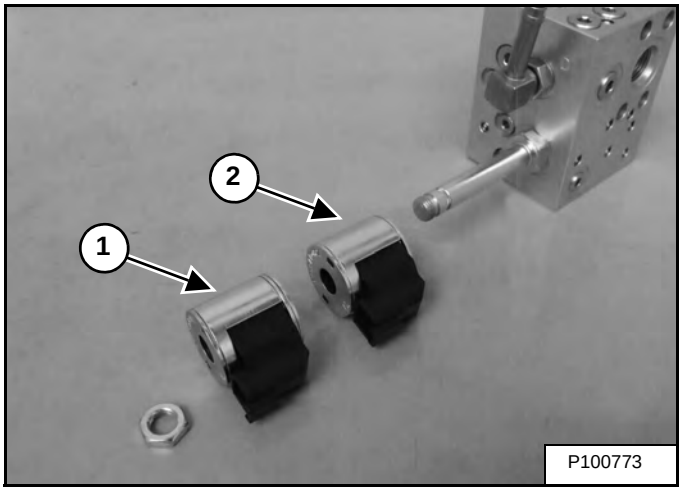


NOTE: Mark the solenoid coil orientation for ease of installation.

Remove the solenoid coil nut (Item 1) **[Figure 20-120-11]**.

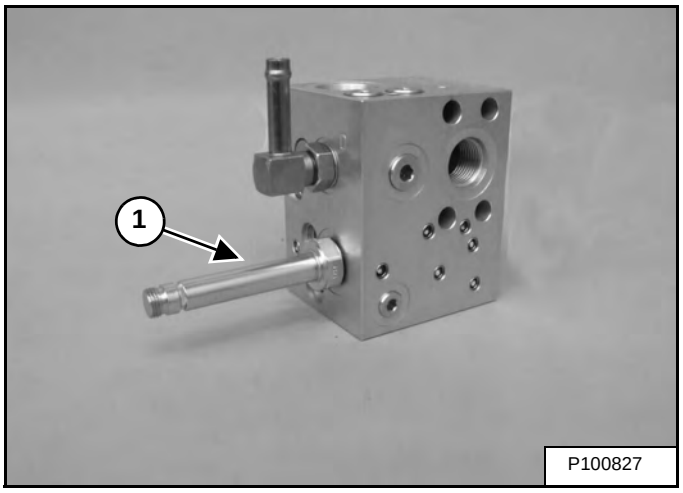
Installation: Tighten the solenoid coil valve stem nut to 6,8 N•m (5 ft-lb) torque.

Figure 20-120-12



Remove the first solenoid coil (Item 1) and the second solenoid coil (Item 2) **[Figure 20-120-12]**.

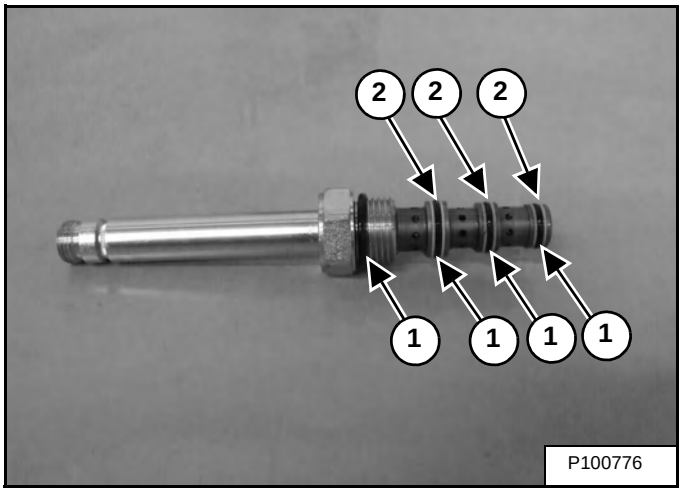
Figure 20-120-13



Remove the solenoid coil stem (Item 1) **[Figure 20-120-13]**.

Installation: Tighten the solenoid coil stem to 27,14 N•m (20 ft-lb) torque.

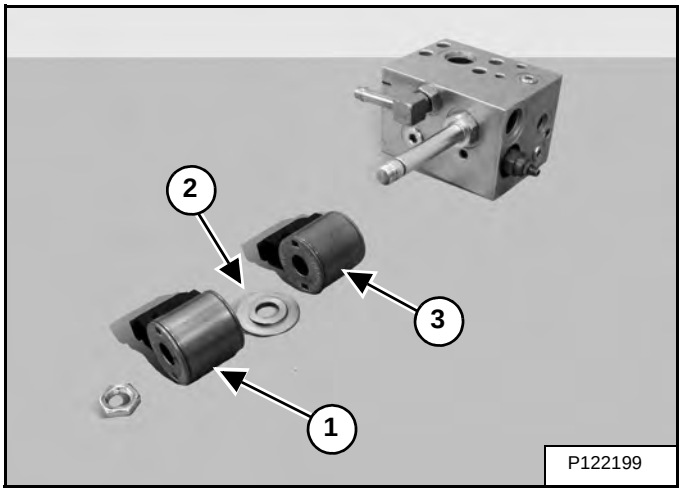
Figure 20-120-14



Inspect the O-rings (Item 1) and the back-up rings (Item 2) **[Figure 20-120-14]**.

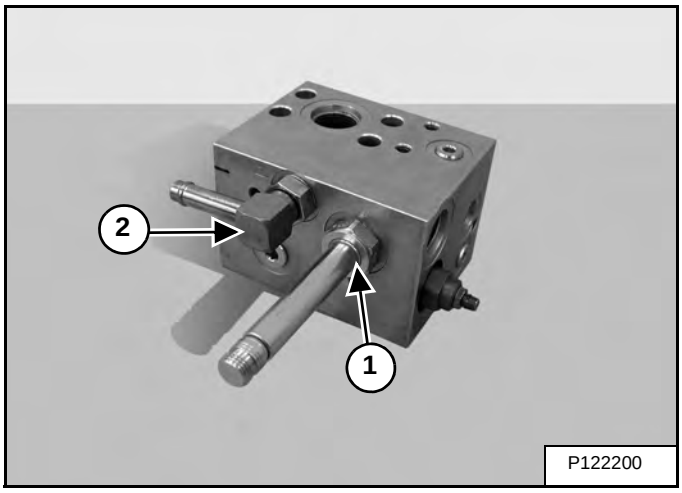
Disassembly And Assembly (Cont'd)

Figure 20-121-11



Remove the first solenoid coil (Item 1), the spacer (Item 2) and the second solenoid coil (Item 3) **[Figure 20-121-11]**.

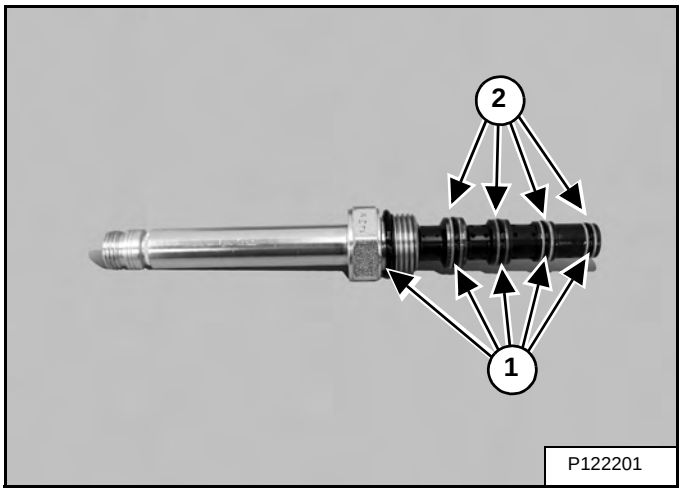
Figure 20-121-12



Remove the solenoid coil stem (Item 1) **[Figure 20-121-12]**.

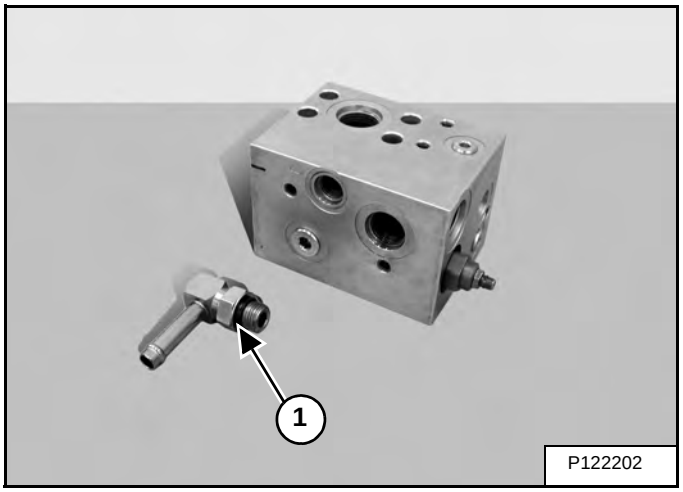
Installation: Tighten the solenoid stem to 27,14 N•m (20 ft-lb) torque.

Figure 20-121-13



Replace the O-rings (Item 1) and the back-up rings (Item 2) **[Figure 20-121-13]**.

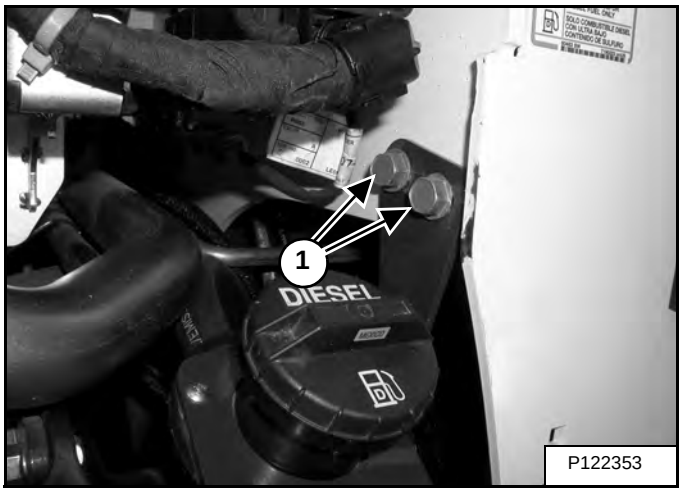
Figure 20-121-14



Remove the fitting (Item 2) **[Figure 20-121-12]** and replace the O-ring (Item 1) **[Figure 20-121-14]**.

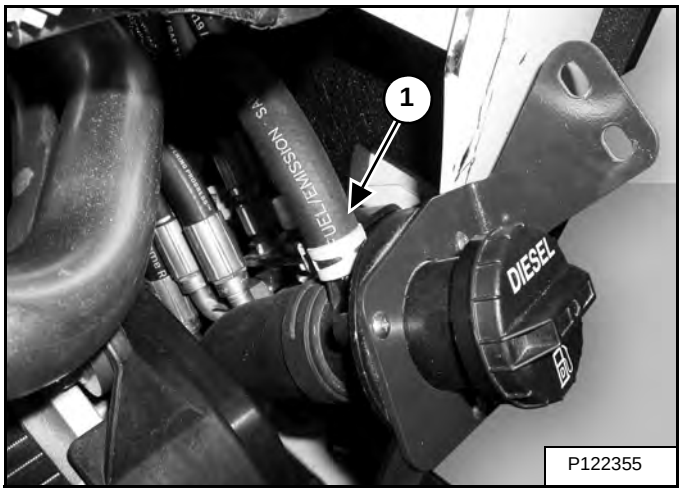
Removal And Installation (Cont'd)

Figure 20-140-2



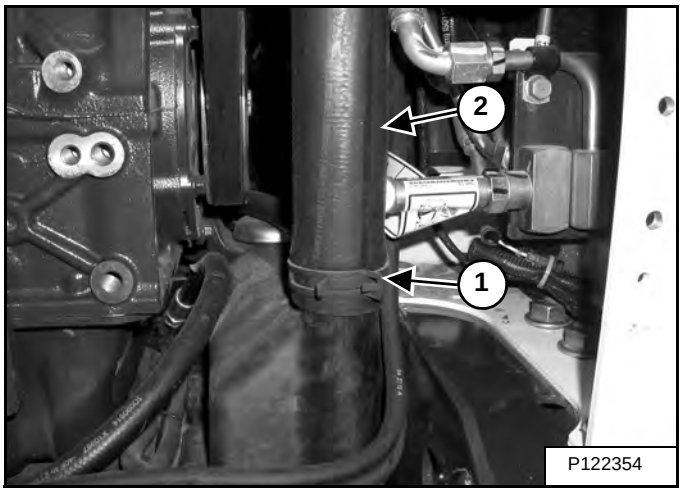
Remove the two bolts (Item 1) **[Figure 20-140-2]**.

Figure 20-140-3



Remove the hose (Item 1) **[Figure 20-140-3]**.

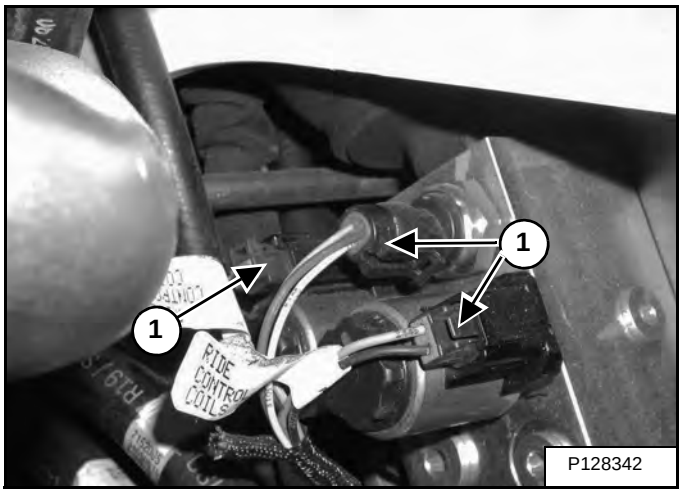
Figure 20-140-4



Reposition the clamp (Item 1) and remove the fuel fill hose (Item 2) **[Figure 20-140-4]** from the tank.

Cover the fuel tank inlet.

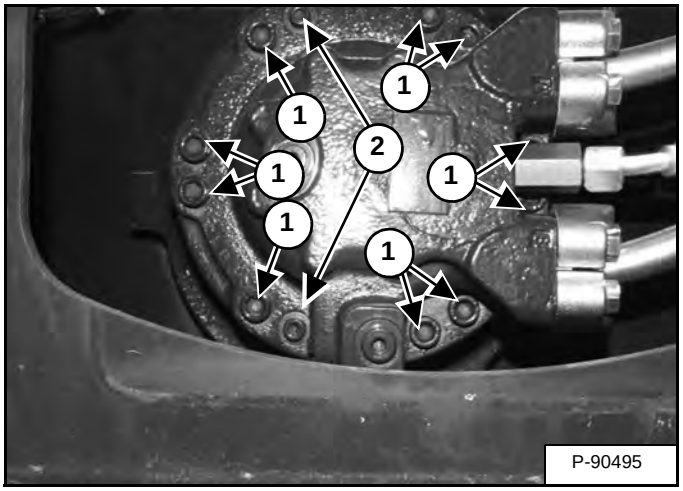
Figure 20-140-5



Disconnect the three connectors (Item 1) **[Figure 20-140-5]** from the manifold.

Removal And Installation (Cont'd)

Figure 30-20-3



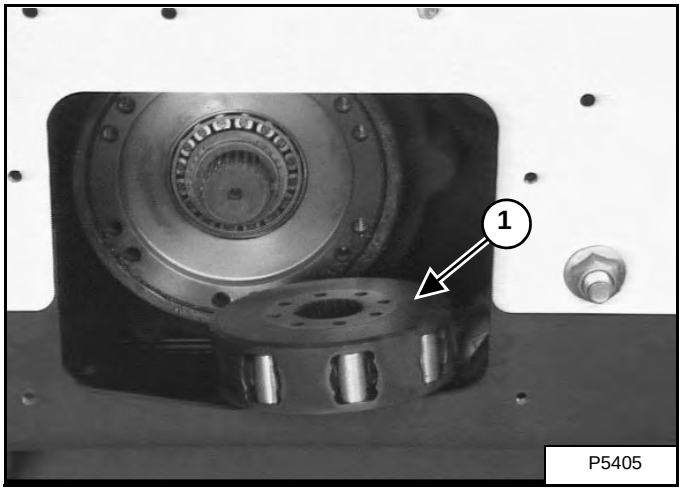
Remove the ten mounting bolts (Item 1) **[Figure 30-20-3]**.

Installation: Tighten the mounting bolts to 149,2 N•m (110 ft-lb) torque.

NOTE: The two bolts (Item 2) [Figure 30-20-3] mount the cam ring to the motor, and do not have to be removed, to remove the motor from the loader.

Remove the motor / cam ring section from the loader.

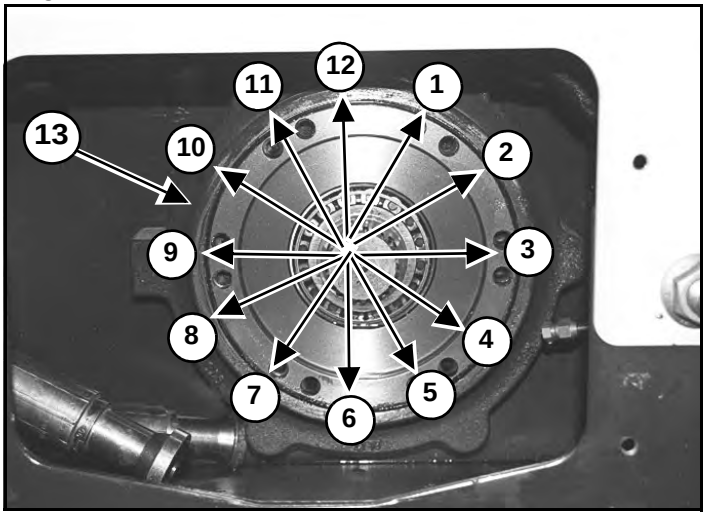
Figure 30-20-4



Remove the piston / roller section (Item 1) **[Figure 30-20-4]** from the loader, if it was not removed with the motor / cam ring.

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

Figure 30-20-5



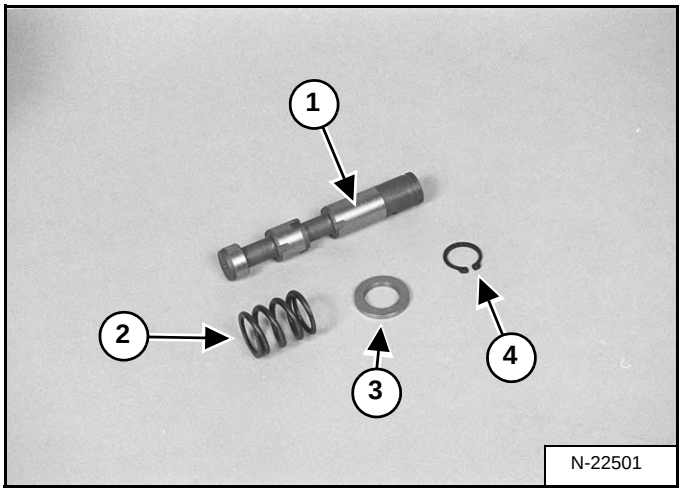
Remove and replace O-ring (Item 13) **[Figure 30-20-5]** with new O-ring

Installation: Install the O-ring (Item 1) by pressing the O-ring into the groove starting at the 12 o'clock position then 6, 2, 10, 3, 9, 4, 8, 5, 7, 1 and 11 **[Figure 30-20-5]** until the O-ring is fully seated in the groove.

NOTE: Do not roll, kink or stretch O-ring in to groove and verify the O-ring is completely flush with no protrusions.

Disassembly (Cont'd)

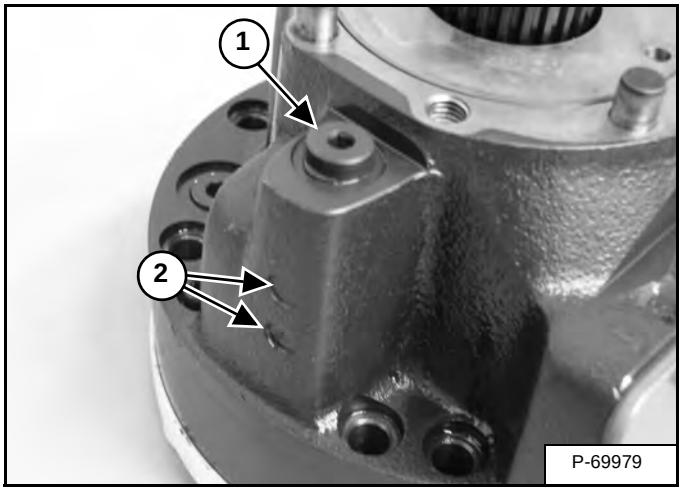
Figure 30-21-16



Inspect the spool (Item 1), the spring (Item 2), washer (Item 3) and the snap ring (Item 4) and replace as needed **[Figure 30-21-16]**.

NOTE: The spool (Item 1) [Figure 30-21-16] is marked with either an A or B. The spool must be replaced with a spool with the same mark.

Figure 30-21-17

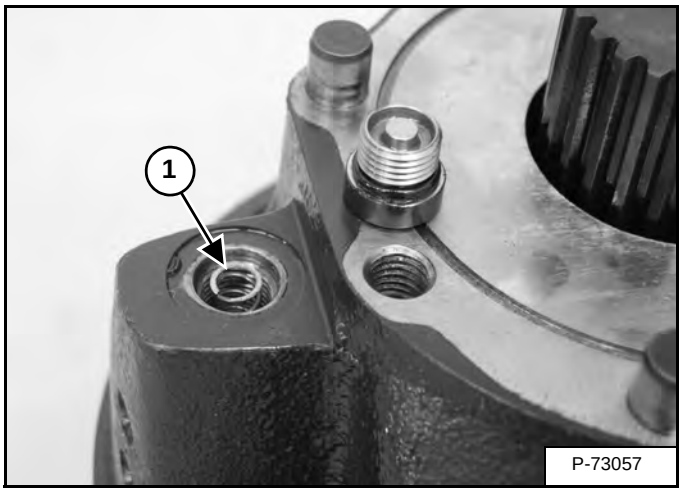


Remove the flushing spool plug (Item 1) **[Figure 30-21-17]** from the housing.

Installation: Tighten the plug to 30 N•m (22 ft-lb) torque.

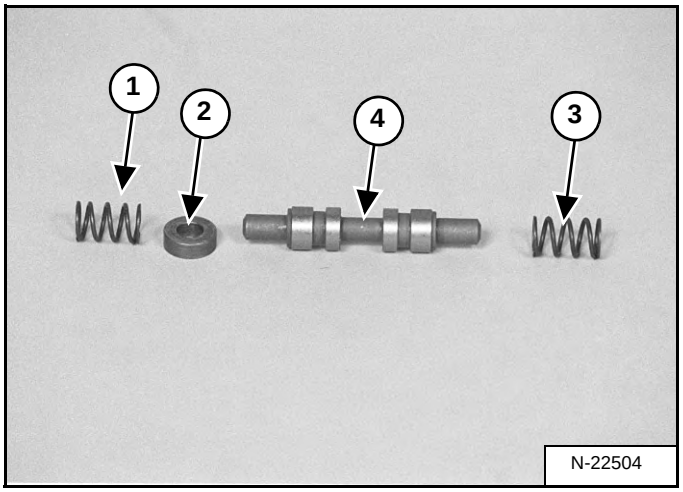
NOTE: Current motor housings are provided with break off plugs (Item 2) [Figure 30-21-17] on the side of the flushing spool housing. Earlier motors were equipped with threaded plugs.

Figure 30-21-18



Remove the flushing spool assembly (Item 1) **[Figure 30-21-18]** from the housing.

Figure 30-21-19

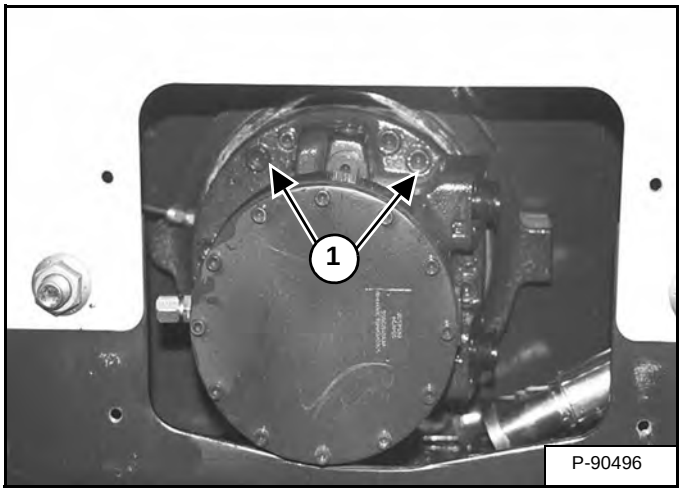


Remove the spring (Item 1), washer (Item 2) and rear spring (Item 3) from the spool (Item 4) **[Figure 30-21-19]**.

Inspect all parts and replace as needed.

Removal And Installation (Cont'd)

Figure 30-22-5

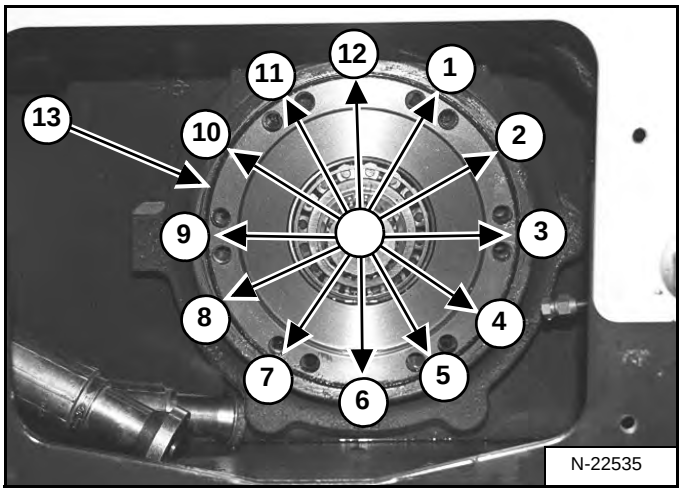


Remove the ten (12 mm) mount bolts (Item 1) **[Figure 30-22-5]** from the motor.

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

Remove the motor from the loader.

Figure 30-22-6



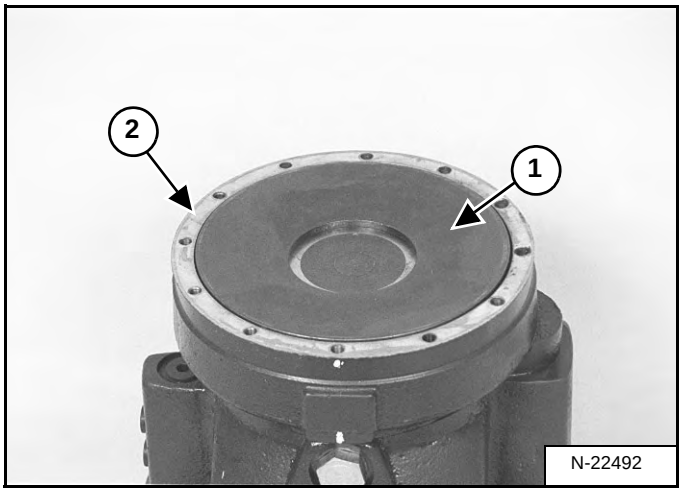
Remove and replace O-ring (Item 13) **[Figure 30-22-6]** with new O-ring.

Installation: Install the O-ring (Item 1) by pressing the O-ring into the groove starting at the 12 o'clock position then 6, 2, 10, 3, 9, 4, 8, 5, 7, 1 and 11 **[Figure 30-22-6]** until the O-ring is fully seated in the groove.

NOTE: Do not roll, kink or stretch O-ring in to groove and verify the O-ring is completely flush with no protrusions.

Assembly (Cont'd)

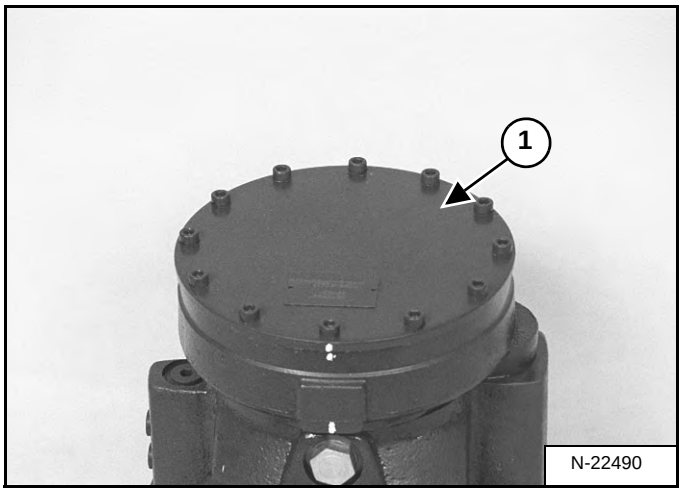
Figure 30-22-47



Install the brake spring (Item 1) **[Figure 30-22-47]**.

Install the end plate gasket (Item 2) **[Figure 30-22-47]**.

Figure 30-22-48



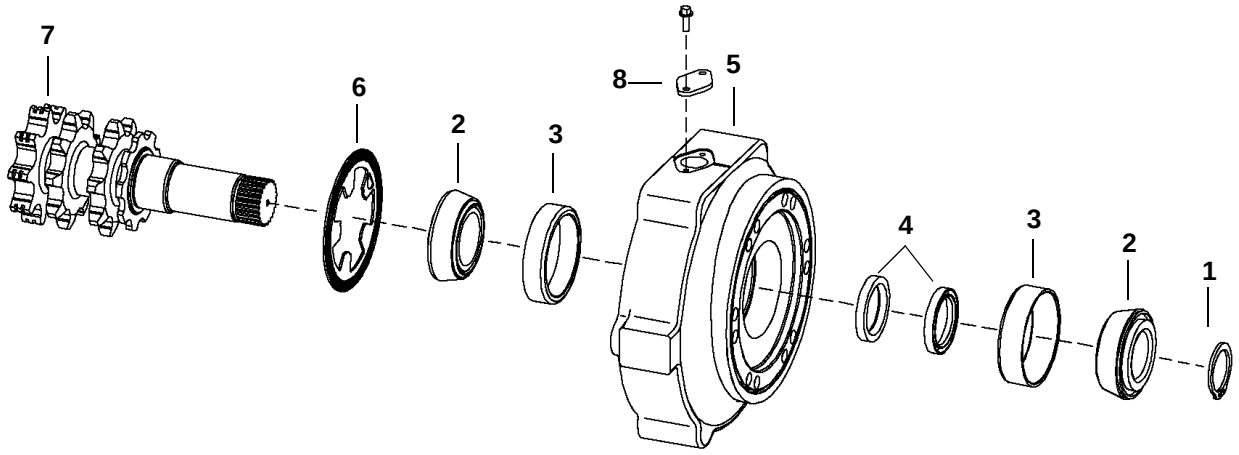
Install the brake end cover (Item 1) **[Figure 30-22-48]**.

Install the twelve end cover mount bolts.

NOTE: Remove and / or tighten the bolts one turn at a time to maintain equal preload on the end cap and the brake spring.

Parts Identification

Ref.	Description
1.	Snap Ring
2.	Bearing
3.	Race
4.	Seal
5.	Housing
6.	Speed Washer
7.	Shaft
8.	Cover



Speed washer (Item 6) and cover (Item 8) have been removed on late model machines. Housing (Item 5) will no longer be machined to allow the installation of speed sensors.

PE3328SA

CHARGE PRESSURE (LATER MODELS)

Description

Charge pressure is a supply of fluid to the hydrostatic pumps. Charge pressure is regulated by a charge relief valve located inside the hydrostatic pump. Charge pressure is used to replenish hydrostatic fluid removed from the drive circuit, pump and motor “internal leakage” and from the hydrostatic motors shuttle (flushing) valve.

Charge pressure is also used to operate other hydraulic functions, such as shifting the auxiliary spool, and to pilot open the BICS™ system for the lift and tilt in the main hydraulic control valve.

The charge pressure sender is located on the hydraulic fan motor. Charge pressure alarm settings are pre-programmed into the main controller and are based on loader type and options installed.

Testing

WARNING

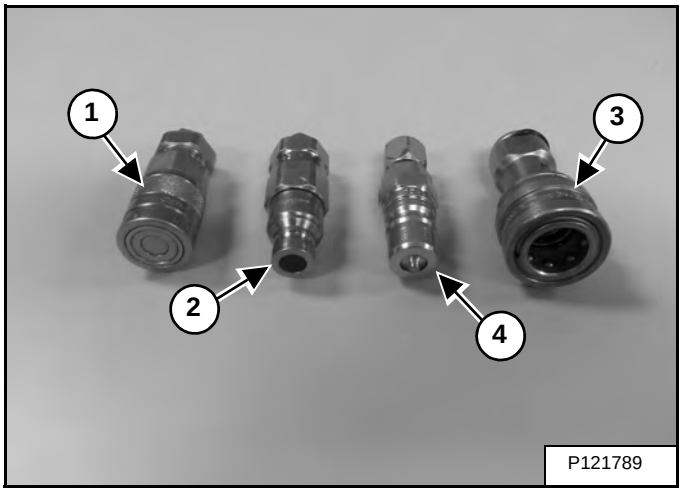
When the engine is running during service, the driving and steering controls must be in neutral and the parking brake engaged. Failure to do so can cause injury or death.

W-2006-1209

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

MEL1355-2 - Pressure gauge 6,9 MPa (68,9 bar) (1000 psi)
MEL1723 - Female Test Coupler
7246786 - Female Test Coupler
Hydraulic hose - Must be rated for pressures above 6,9 MPa (68,9 bar) (1000 psi).

Figure 30-41-1



Test ports have changed on the Main valve. If your test port looks like (Item 2) use test coupler (Item 1). If your test port looks like (Item 4) Use test coupler (Item 3) **[Figure 30-41-1]**.

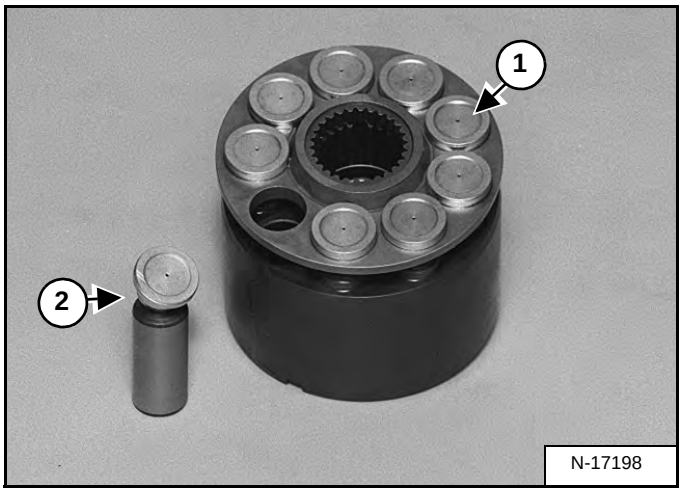
WARNING

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

W-2145-0290

Disassembly (Cont'd)

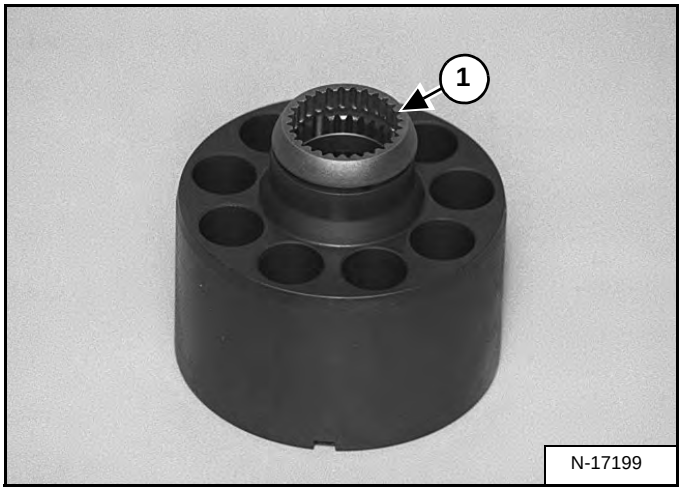
Figure 30-50-15



Remove the slipper guide and pistons (Item 1) **[Figure 30-50-15]** from the cylinder block.

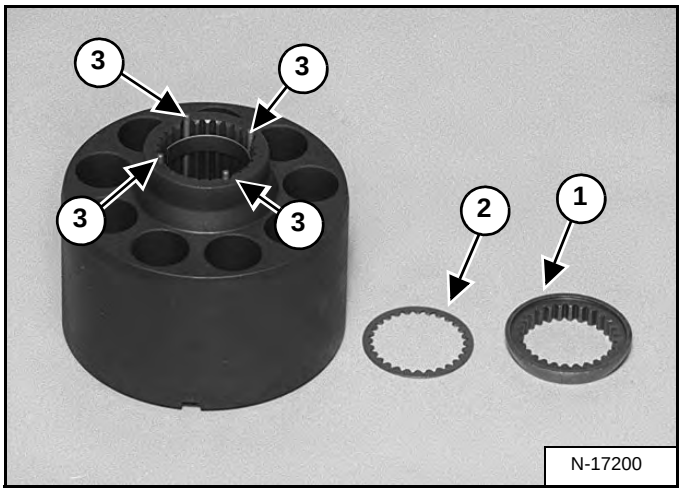
Inspect all the pistons (Item 2) **[Figure 30-50-15]** for wear and replace the rotating group as needed.

Figure 30-50-16



Remove the ball guide retainer (Item 1) **[Figure 30-50-16]** from the cylinder block.

Figure 30-50-17



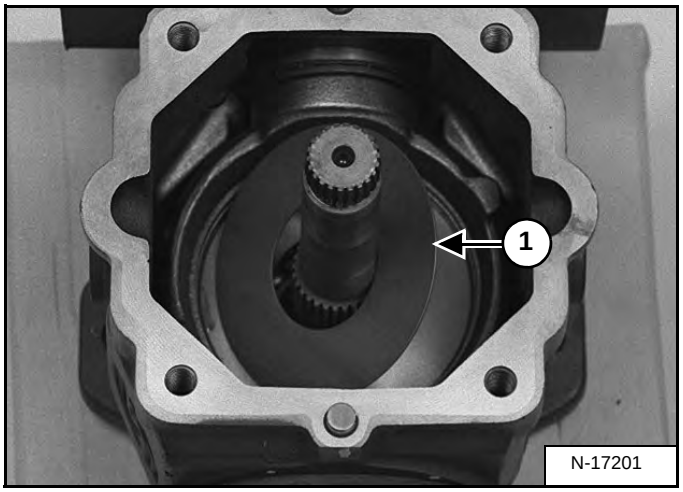
Inspect the ball guide retainer (Item 1) and washer (Item 2) **[Figure 30-50-17]** for wear and replace as needed.

Remove the four pins (Item 3) **[Figure 30-50-17]** from the cylinder block.

Inspect the cylinder block for wear and replace as needed.

Inspect pins (Item 3) **[Figure 30-50-17]** to see if they are all the same length.

Figure 30-50-18



Remove the thrust plate (Item 1) **[Figure 30-50-18]** from the pump housing.

HYDROSTATIC PUMP (SJC)

Description

The hydrostatic pump is a fully proportional dual piston pump in one pump casing. The end caps are removable to gain access to the rotating assemblies.

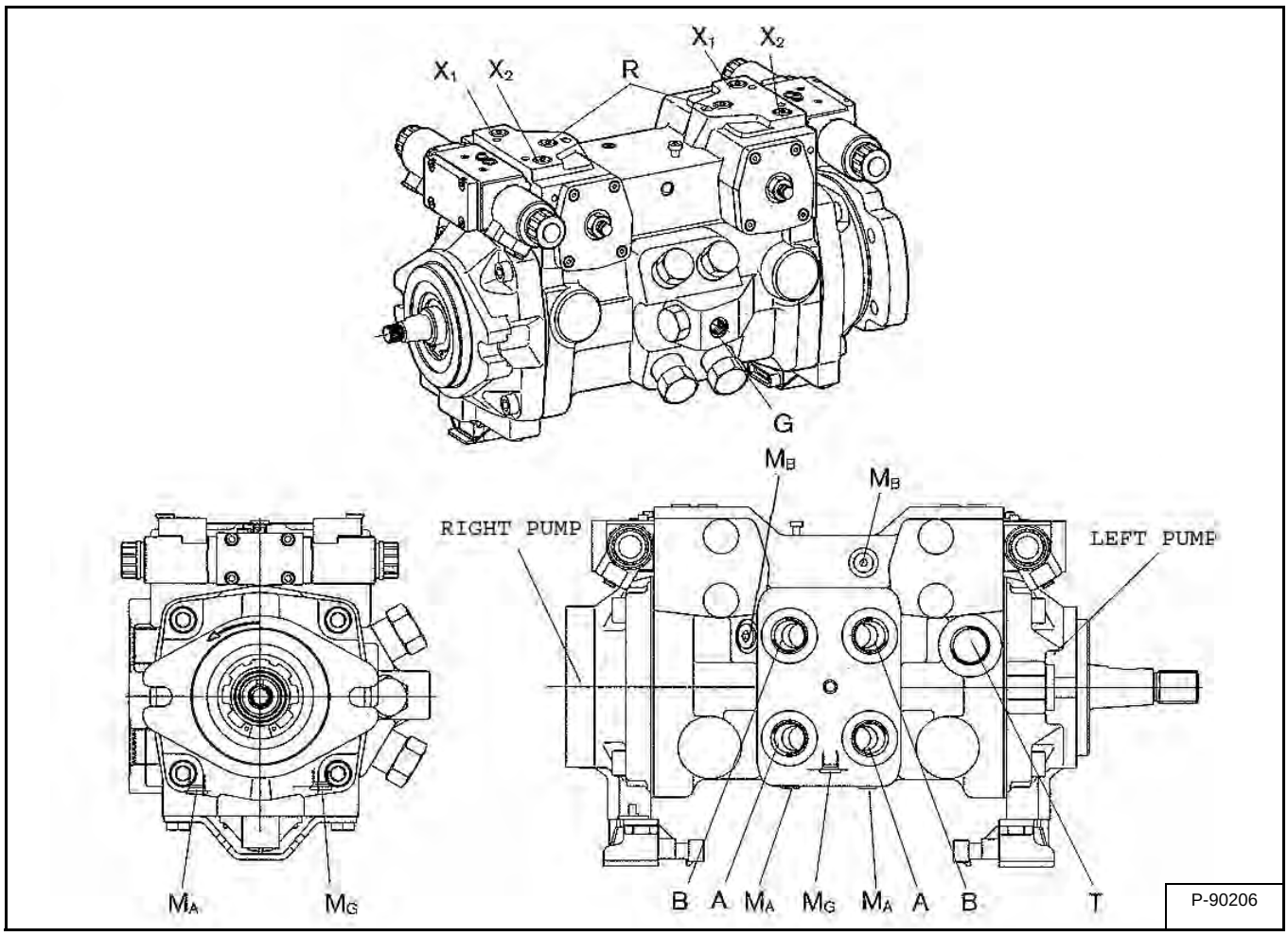
The hydraulic controllers are supplied with charge pressure from an external charge pump. 12 volt electrical solenoids shift a spool in the hydraulic controller that directs flow to a servo piston.

The servo piston strokes the swash plate in the rotating group. The rotating group generates flow to the A or B ports on the hydrostatic pump. The flow from the A and B ports is sent to the hydrostatic drive motors where forward or reverse drive motor rotation is obtained.

There are swash plate angle sensors on the bottom of the pump that monitor swash plate movement.

Ports are labeled on the hydrostatic pump casting.

Figure 30-51-1



A,B Service Line Ports (High Pressure Outlet Ports to Drive Motors)

T_1 Case Drain Port

M_A Operating Pressure of “A” Port

M_B Operating Pressure of “B” Port

R Air Bleed Port

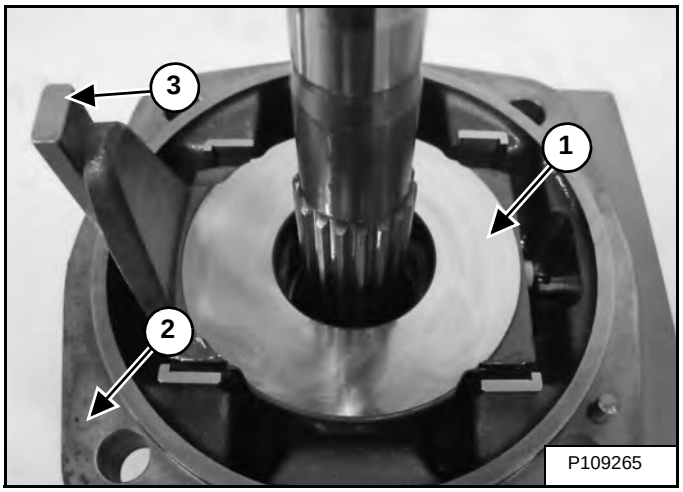
X_1,X_2 Control Pressure Gauge Port

G Charge Pressure Inlet Port

M_G Gauge Port For Charge Pressure

Disassembly (Cont'd)

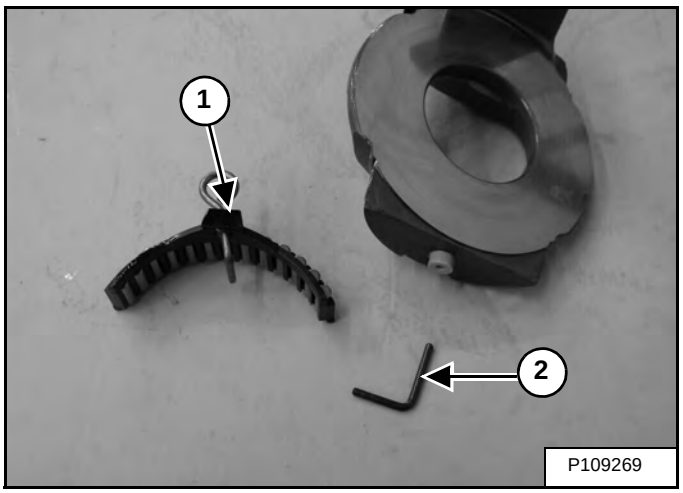
Figure 30-51-33



Remove the swash plate (Item 1) from the end cap housing (Item 2) **[Figure 30-51-33]**.

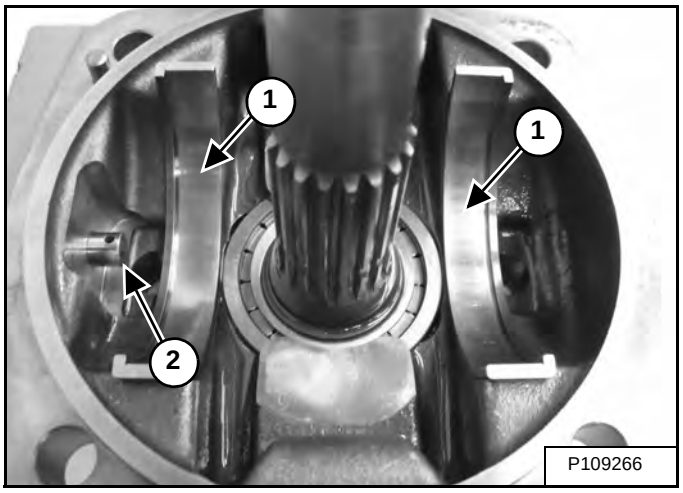
Remove the link (Item 3) **[Figure 30-51-33]**,

Figure 30-51-34



Remove the shell bearing (Item 1) and the pin (Item 2) **[Figure 30-51-34]**.

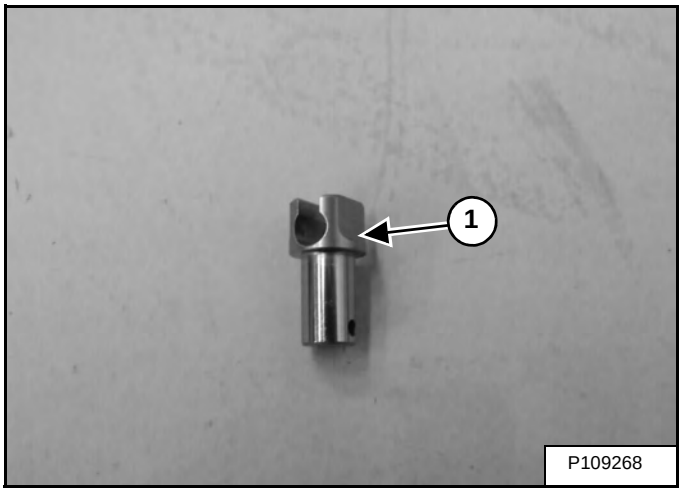
Figure 30-51-35



Remove the shell bearing races (Item 1) **[Figure 30-51-35]**.

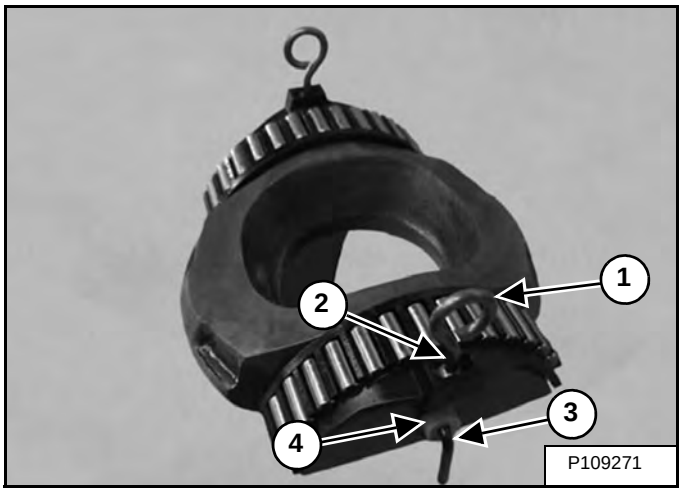
Remove the positioning pin (Item 2) **[Figure 30-51-35]** and (Item 1) **[Figure 30-51-36]**.

Figure 30-51-36



Assembly (Cont'd)

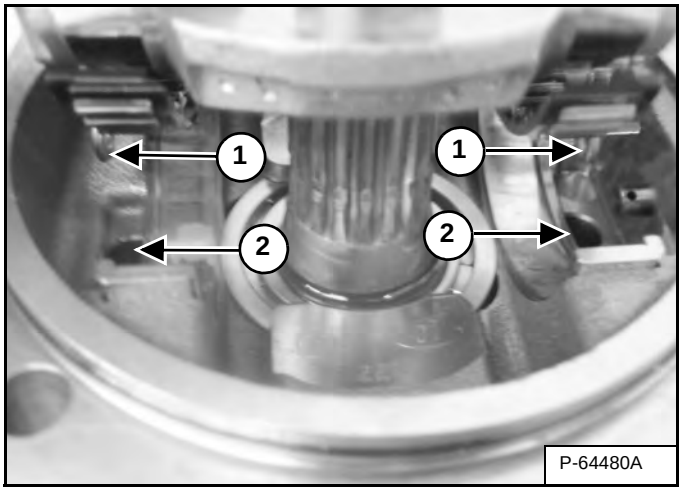
Figure 30-51-81



Install the locating wires (Item 1) through the bearings and into the hole (Item 2) **[Figure 30-51-81]** in the side of the swash plate.

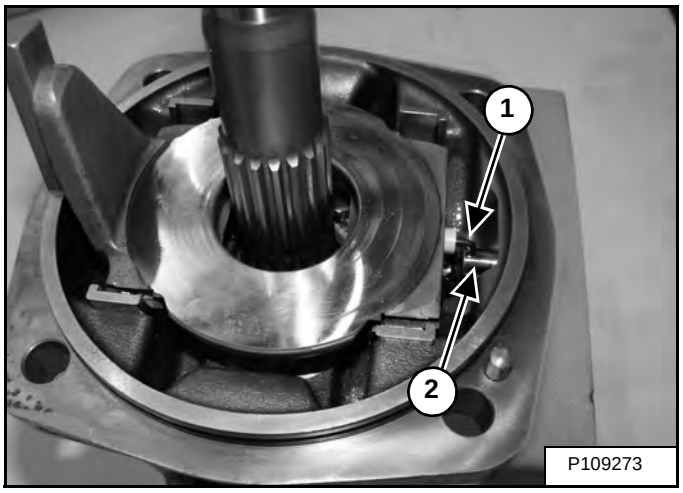
Install the pin (Item 3) into the hole (Item 4) **[Figure 30-51-81]** in the side of the swash plate.

Figure 30-51-82



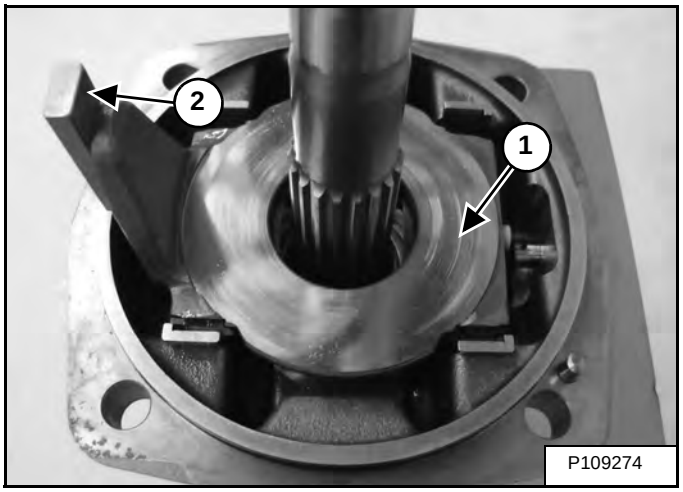
Install the swash plate assembly over the shaft and into the end cap housing. The locating wires (Item 1) must engage the holes (Item 2) **[Figure 30-51-82]** of the end cap housing.

Figure 30-51-83



Install the pin (Item 1) into the positioning pin (Item 2) **[Figure 30-51-83]**.

Figure 30-51-84



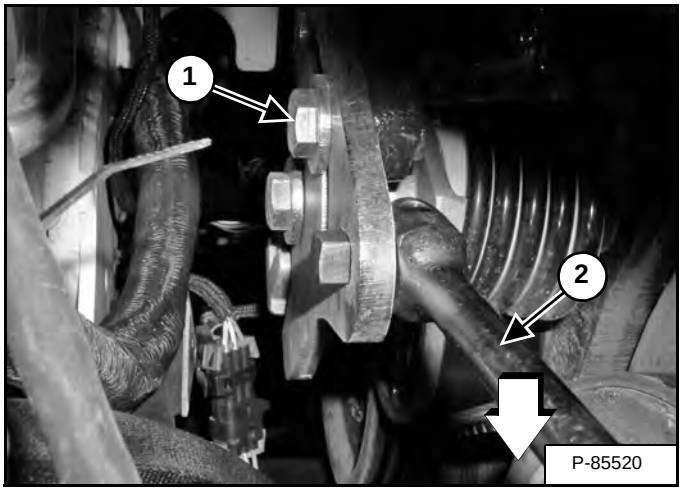
The swash plate (Item 1) must move smoothly on the bearings. Install the feedback link (Item 2) **[Figure 30-51-84]** on the swash plate.

Tensioner Pulley Removal And Installation

Remove the engine air cleaner. (See Housing Removal And Installation on Page 70-40-1.)

Remove the belt. (See Belt Replacement on Page 30-60-1.)

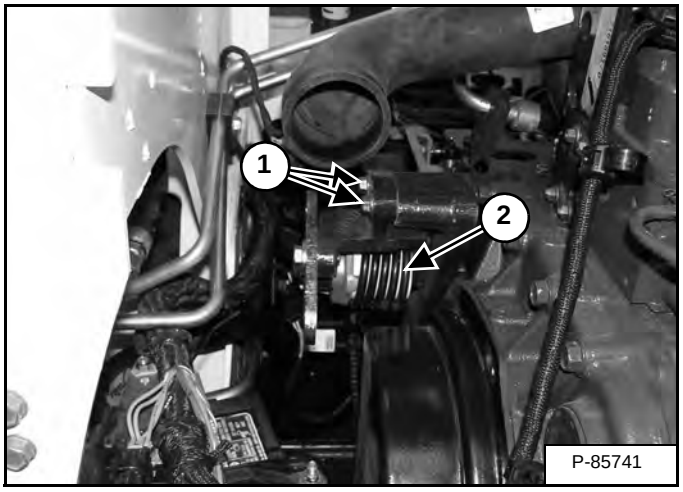
Figure 30-60-9



Loosen the spring loaded idler adjustment bolt (Item 1). Insert a 12,7 mm (1/2 in) breaker bar (Item 2) **[Figure 30-60-9]** into the slot provided in the stop arm as shown and push breaker bar down to release tension on drive belt.

Tighten adjustment bolt (Item 1) **[Figure 30-60-9]** to hold the spring loaded idler off the drive belt.

Figure 30-60-10



Remove the two mounting bolts (Item 1) **[Figure 30-60-10]**.

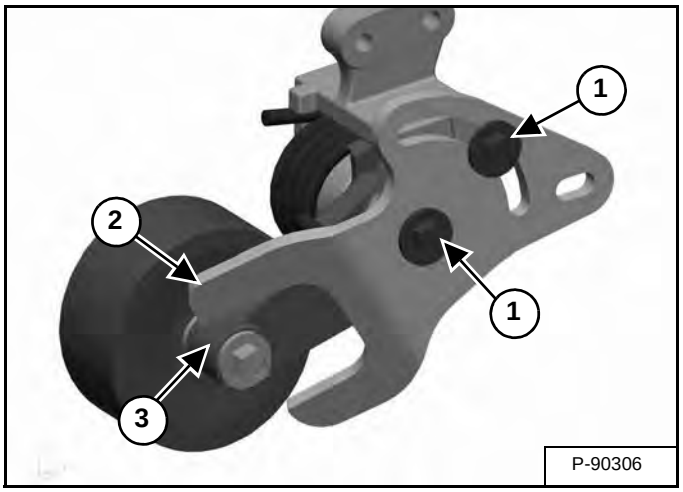
Remove the tensioner pulley (Item 2) **[Figure 30-60-10]**.

Installation: Apply Loctite® 242 to the mounting bolts (Item 1) **[Figure 30-60-10]**.

Tighten the spring loaded idler adjustment bolt (Item 1) **[Figure 30-60-9]** to 105 - 115 N•m (78 - 85 ft-lb) torque.

Tensioner Pulley Disassembly And Assembly

Figure 30-60-11

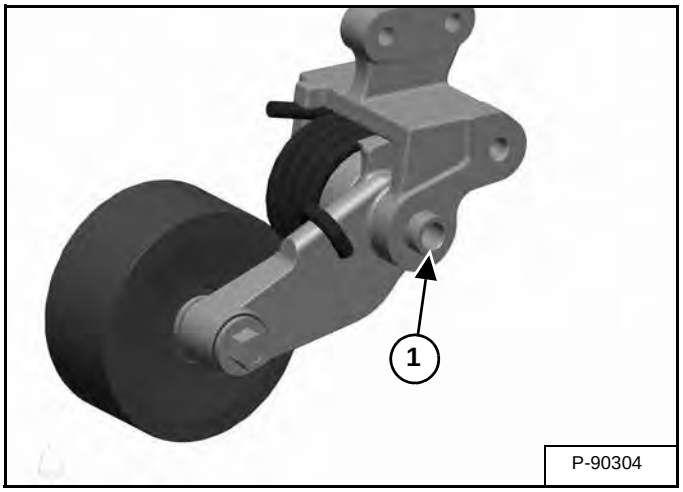


Loosen the two bolts (Item 1) **[Figure 30-60-11]** but do not remove.

Release the spring tension by allowing the adjustment plate (Item 2) to slide past the tensioner pulley stop (Item 3) **[Figure 30-60-11]**.

Remove the two bolts (Item 1) and the adjustment plate (Item 2) **[Figure 30-60-11]**.

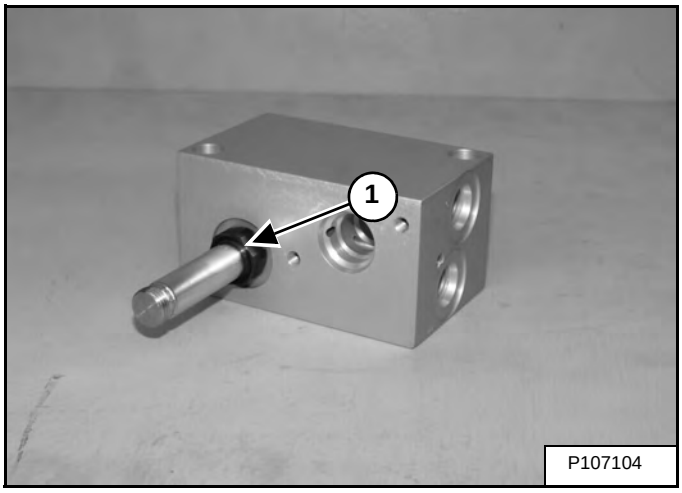
Figure 30-60-12



Remove the pivot sleeve (Item 1) **[Figure 30-60-12]**.

Valve Block Disassembly And Assembly (Cont'd)

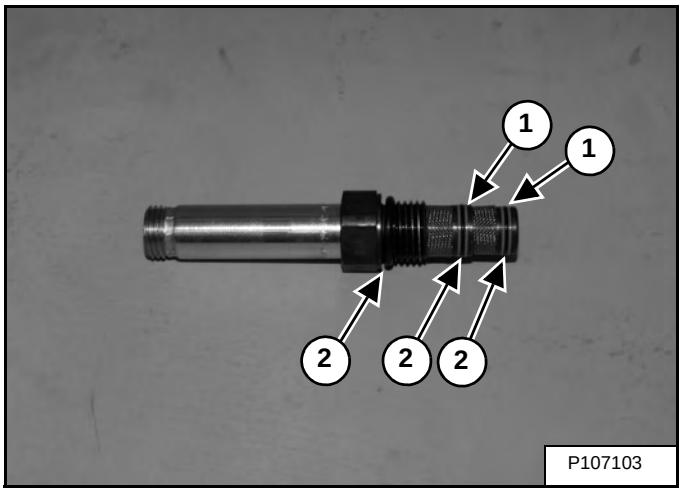
Figure 30-71-9



Remove the brake solenoid valve (Item 1) **[Figure 30-71-9]** from the valve block.

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

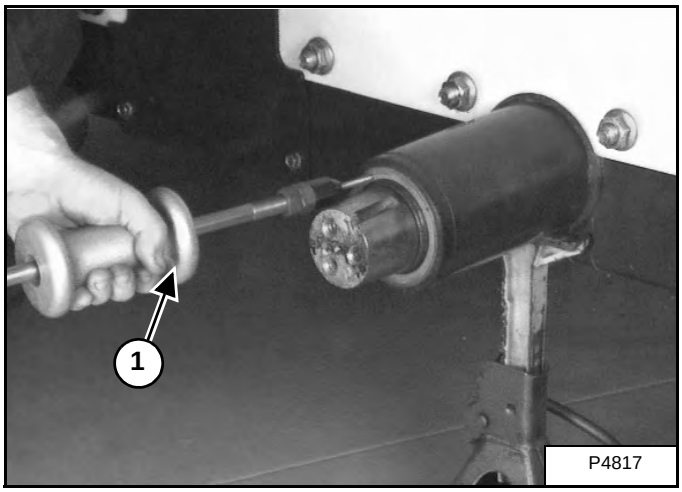
Figure 30-71-10



Replace the back-up rings (Item 1) and O-rings (Item 2) **[Figure 30-71-10]**.

Axle Seal Removal And Installation (Cont'd)

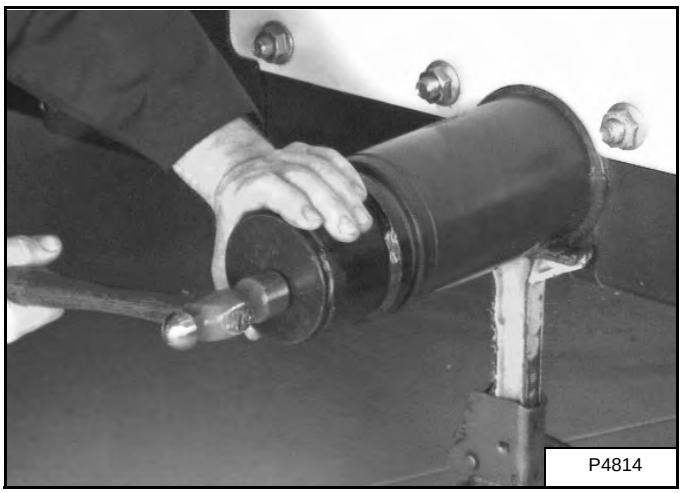
Figure 40-20-4



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]**.

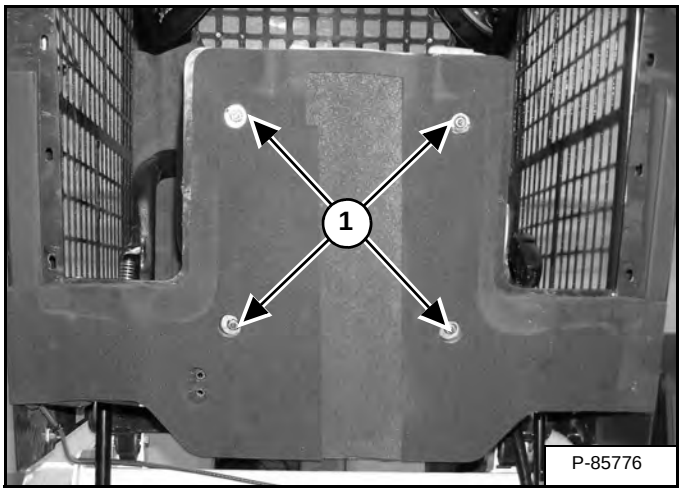
Installation: Use a hammer, install the new axle seal until the tool (MEL1714) is flush with the edge of the axle tube **[Figure 40-20-5]**.

MAINFRAME

OPERATOR SEAT

Removal And Installation

Figure 50-30-1



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

Remove the four seat mounting nuts (Item 1) **[Figure 50-30-1]** and washers from the operator seat mounting studs.

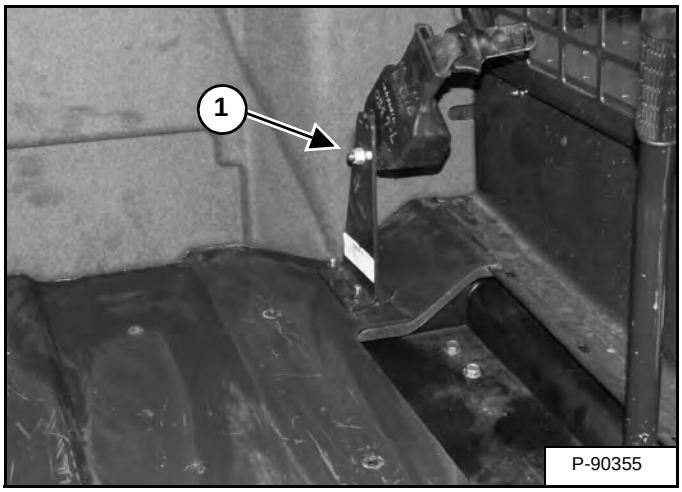
Lower the operator cab. (See Lowering on Page 10-30-3.)

Remove the seat.

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

Seat Belt Removal And Installation (Retractable)

Figure 50-30-2



Remove the mounting nut (Item 1) **[Figure 50-30-2]**.

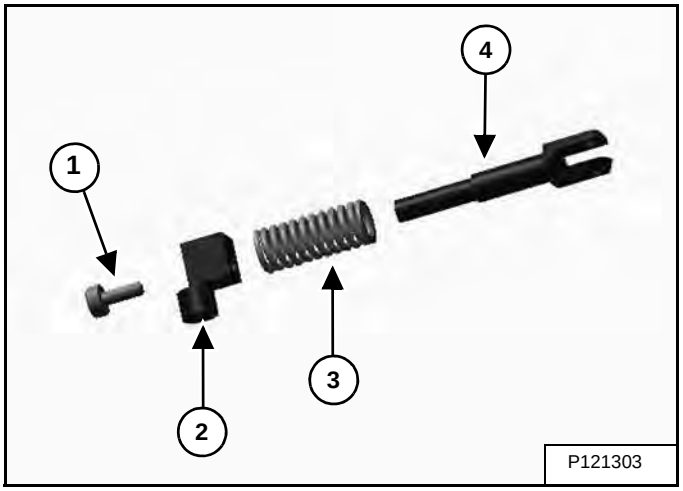
Remove the seat belt.

Installation: Tighten the mounting nut to 73 N•m (54 ft-lb) torque.

Lever And Wedge Disassembly And Assembly (Cont'd)

Later Design

Figure 50-40-15

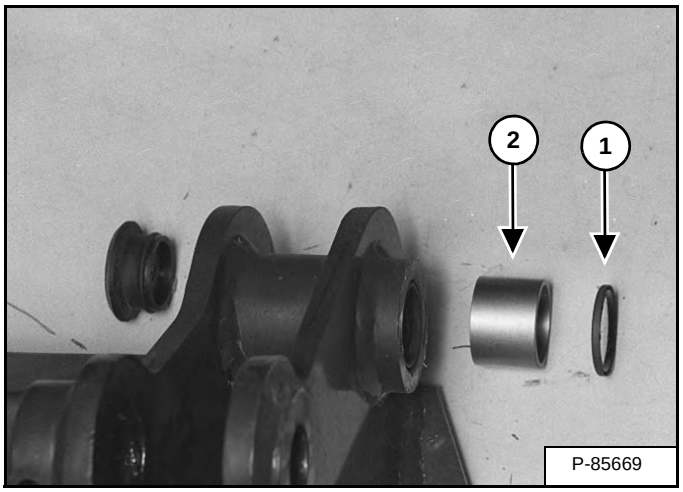


If the bolt (Item 1), handle pivot (Item 2), spring (Item 3), or clevis (Item 4) are damaged, put the assembly in a vise. Remove the bolt (Item 1) **[Figure 50-40-15]** and replace the damaged parts as needed.

Assembly: Clean the threads and apply Loctite® 242 to the bolt (Item 1) **[Figure 50-40-15]**, tighten to 48 - 54 N•m (35 - 40 ft-lb) torque.

Pivot Pin Bushing And Seal Removal And Installation

Figure 50-40-16

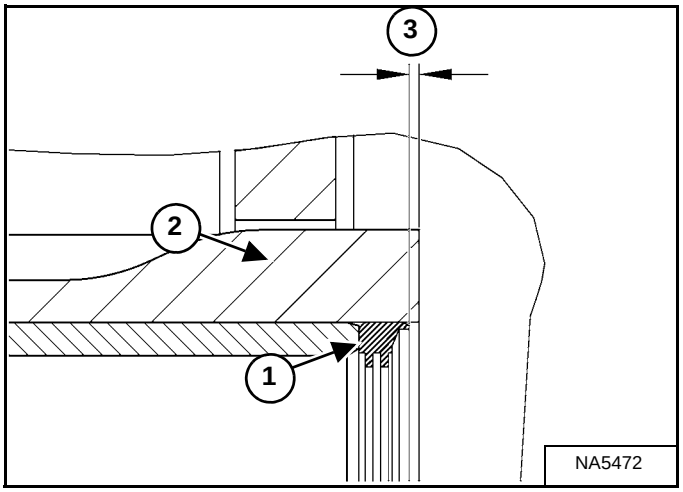


Remove the Bob-Tach. (See Removal And Installation on Page 50-40-1.)

Use a seal pick to remove seal (Item 1) **[Figure 50-40-16]** from the Bob-Tach.

Remove and replace bushing (Item 2) **[Figure 50-40-16]** with a driver tool and hammer.

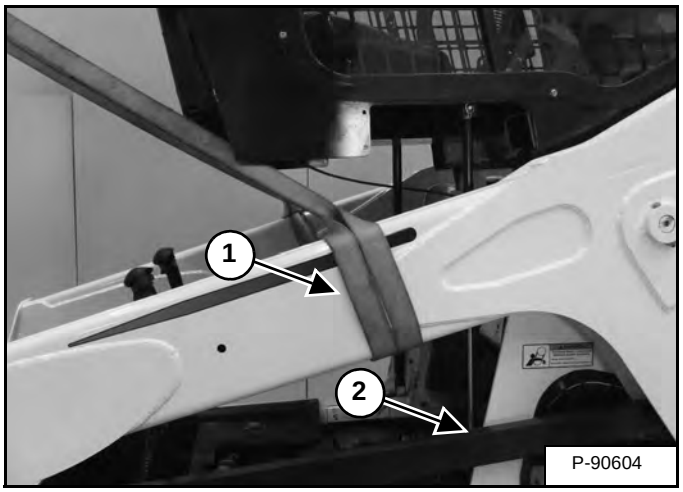
Figure 50-40-17



Installation: The seal (Item 1) needs to be seated in the Bob-Tach (Item 2) to a depth of 1,27 mm (0.050 in) (Item 3) **[Figure 50-40-17]**.

Removal And Installation (Cont'd)

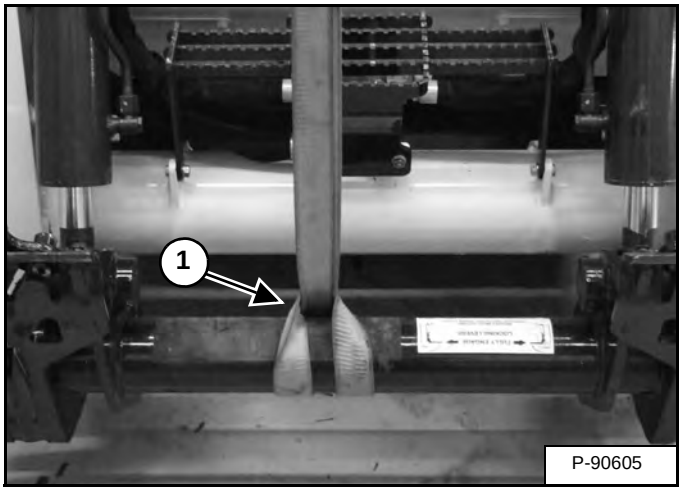
Figure 50-50-16



NOTE: Be sure the slings on the lift arms are in a position to balance the lift arms when being removed. See (Item 1) [Figure 50-50-16].

Disconnect the stabilizer bar from both sides of the lift arms (Item 2) **[Figure 50-50-16]**.

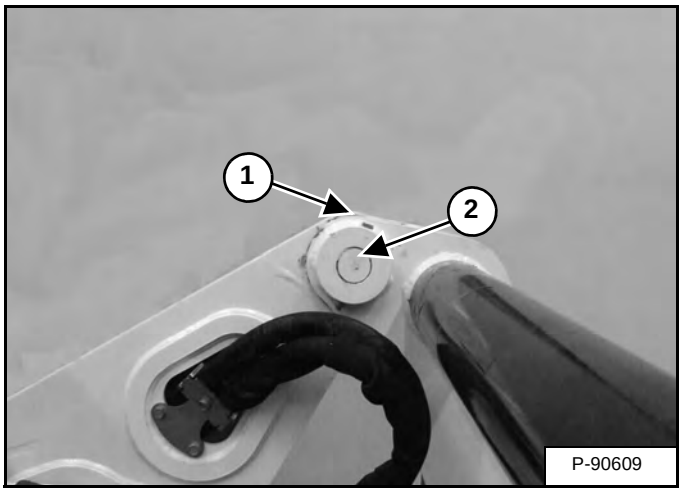
Figure 50-50-17



Position the front sling in the middle of the Bob-Tach as shown in (Item 1) **[Figure 50-50-17].**

Support the lift arms with the chain hoist.

Figure 50-50-18



Remove the retaining bolt and nut (Item 1) and the pin (Item 2) **[Figure 50-50-18]** (both sides).

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

Remove the lift arms from the loader.

CONTROL PEDALS AND LINKAGES

Description

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

The control pedals and linkages are located on the lower mainframe at the operator's feet.

Pedal Removal And Installation

⚠ WARNING

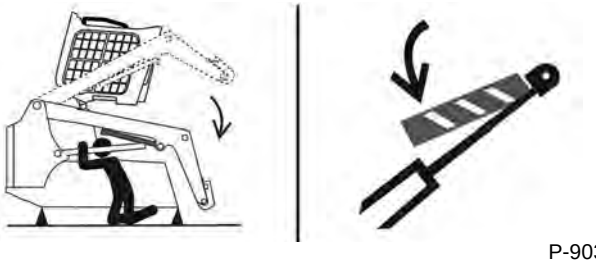
Never work on a machine with the lift arms up unless the lift arms are secured by an approved lift arm support device. Failure to use an approved lift arm support device can allow the lift arms or attachment to fall and cause injury or death.

W-2059-0598

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

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

⚠ DANGER



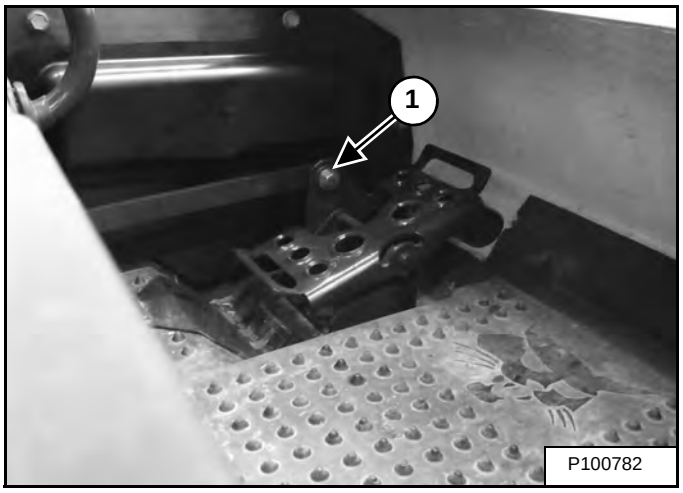
P-90328

AVOID DEATH

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

D-1009-0409

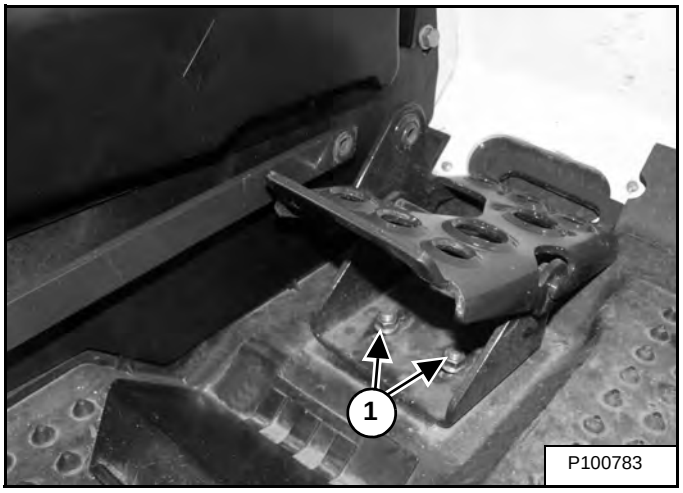
Figure 50-90-1



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

Inspect the bushing in the pedal for wear and replace as needed.

Figure 50-90-2



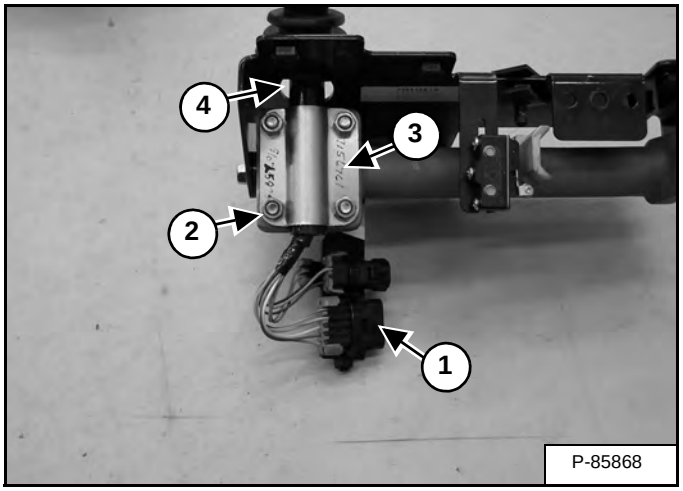
Remove the two nuts (Item 1) **[Figure 50-90-2]** from the pedal mounting bracket.

Remove the pedal assembly from the loader.

Disassembly And Assembly (Cont'd)

Two Piece Shaft (Cont'd)

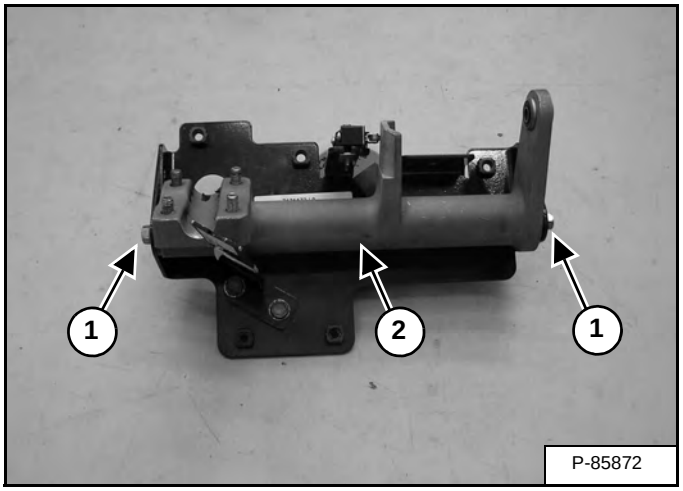
Figure 50-100-10



Remove the tie straps (Item 1), the four nuts (Item 2), and the plate (Item 3) **[Figure 50-100-10]**.

Remove the control handle (Item 4) **[Figure 50-100-10]**.

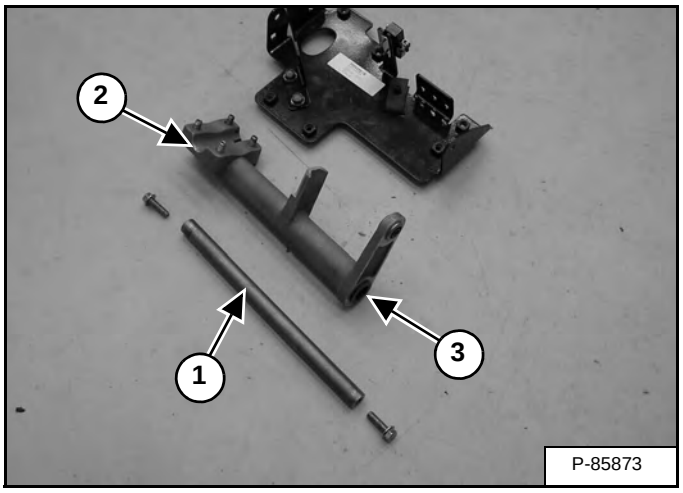
Figure 50-100-11



Remove the two bolts (Item 1) from the bellcrank (Item 2) **[Figure 50-100-11]**.

Remove the bellcrank from the bracket **[Figure 50-100-11]**.

Figure 50-100-12



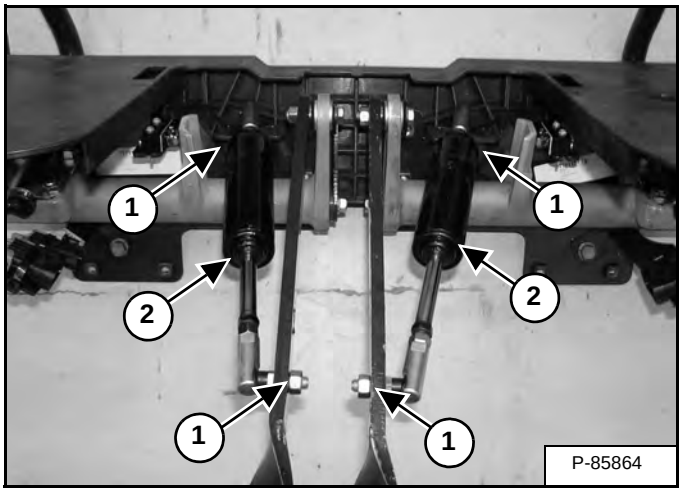
Inspect the shaft (Item 1), the bellcrank (Item 2), and the bushings (Item 3) **[Figure 50-100-11]** for wear and replace as needed.

Repeat the procedure for the other control handle assembly.

One Piece Shaft

Remove Control Panel. (See Removal And Installation on Page 50-100-2.)

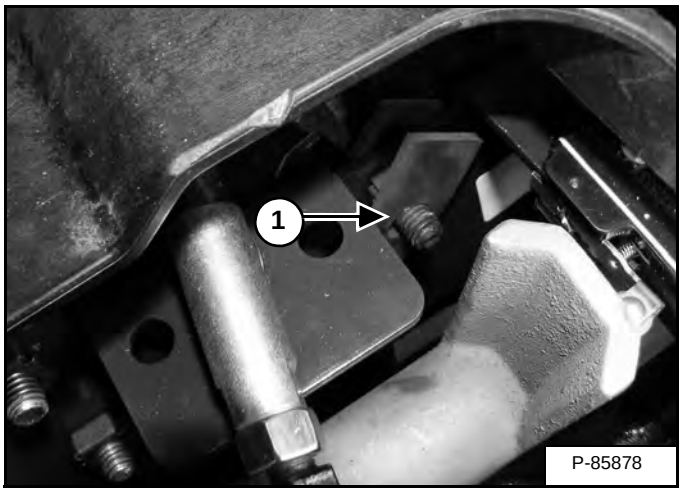
Figure 50-100-13



Remove the nuts (Item 1) and the steering stabilizers (Item 2) **[Figure 50-100-13]**.

Linkage Travel (Adjusting) (Cont'd)

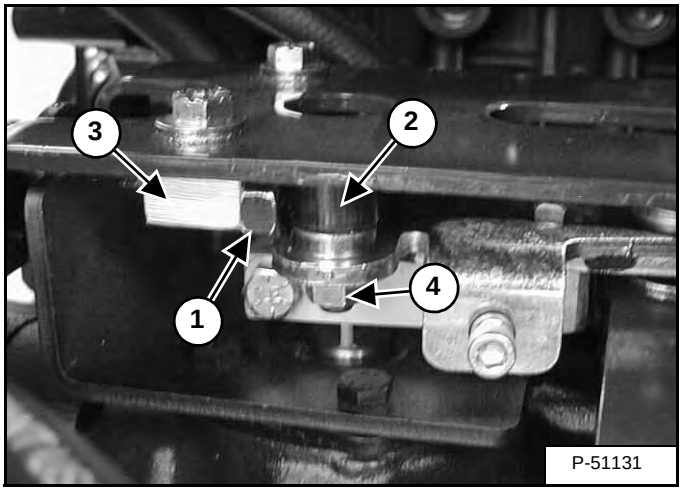
Figure 50-100-44



Locate the control lever drift adjustment access hole in the front of the control panel.

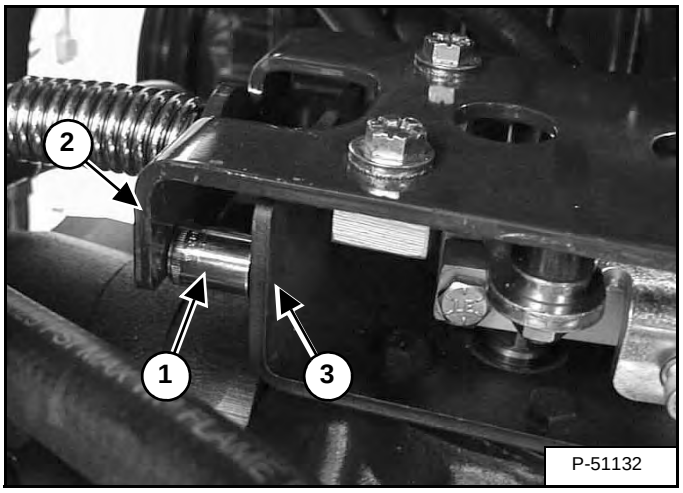
Turn the control lever drift adjustment bolts (Item 1) **[Figure 50-100-44]** (one on each control lever) out until they no longer contact the bellcrank.

Figure 50-100-45



Move the right side steering lever to the rear and install a 10 mm (3/8 in) thick spacer (Item 1) between the pintle arm cam (Item 2) and the centering block (Item 3) **[Figure 50-100-45]**.

Figure 50-100-46

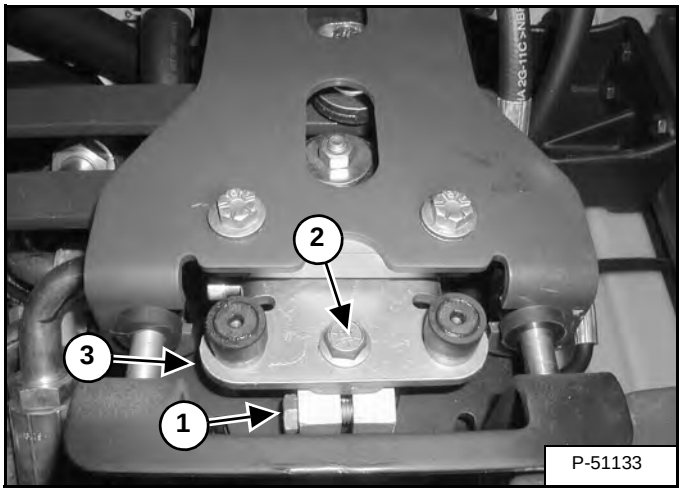


Move the right side steering lever forward and install a 24 mm (15/16 in) thick spacer (Item 1) between the center plate (Item 2) and the mounting plate (Item 3) **[Figure 50-100-46]**.

This will allow the pintle arms to move freely while adjusting the steering linkage for full forward travel speed.

Remove the 10 mm (3/8 in) thick spacer.

Figure 50-100-47

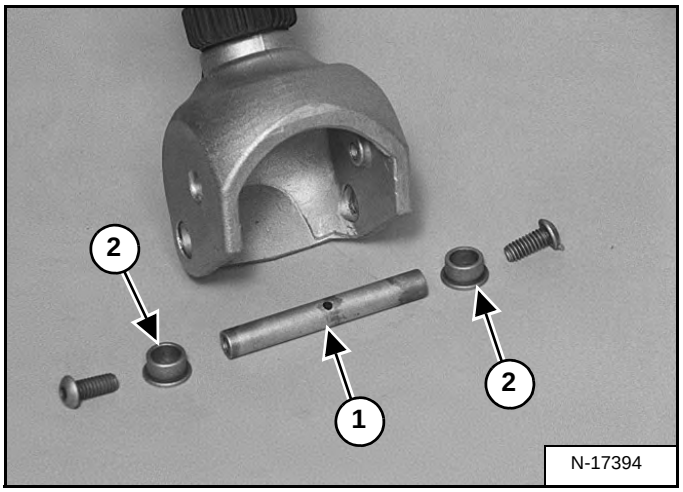


Before adjusting the linkage, verify the base pintle arm mounting bolt (Item 1) and both of the upper pintle mount bolts (Item 2) are tightened to 48 - 54 N•m (35 - 40 ft-lb) torque. There should be no play between the pintle arm and the square pump shaft **[Figure 50-100-47]**.

Verify the cam mounting nuts (Item 4) **[Figure 50-100-45]** are tightened to 48 - 54 N•m (35 - 40 ft lb) torque.

Handle Disassembly And Assembly

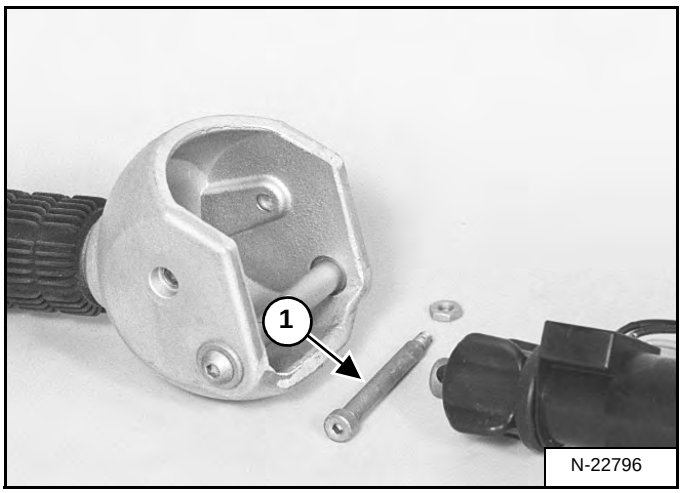
Figure 50-111-15



Remove the handle sleeve (Item 1) and bushings (Item 2) **[Figure 50-111-15]** from the handle.

Inspect all parts for wear and replace as needed.

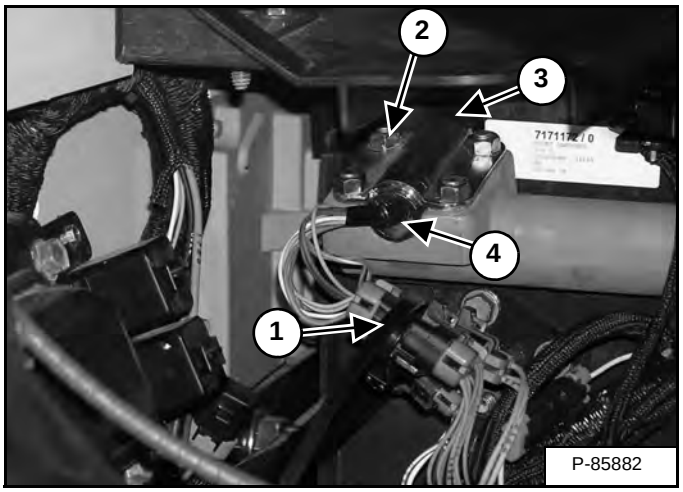
Figure 50-111-16



Inspect the mounting bolt (Item 1) **[Figure 50-111-16]** that connects the handle to the handle sensor unit for wear, replace as needed.

Lever Removal And Installation

Figure 50-111-17



Remove the tie strap and disconnect the electrical connectors (Item 1) **[Figure 50-111-17]** from the control lever.

Remove the four nuts (Item 2) and the plate (Item 3) **[Figure 50-111-17]** used to mount the control lever.

Remove the control lever (Item 4) **[Figure 50-111-17]** by sliding the lever through the control panel.

Installation: Tighten the four nuts to the plate so the lever cannot be moved either right or left when seated in the operator's seat.

WINDOW (SIDE)

Removal And Installation

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

Figure 50-132-1

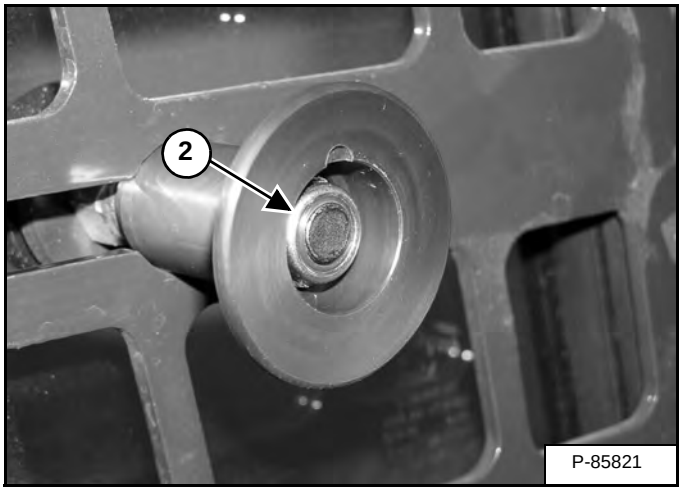
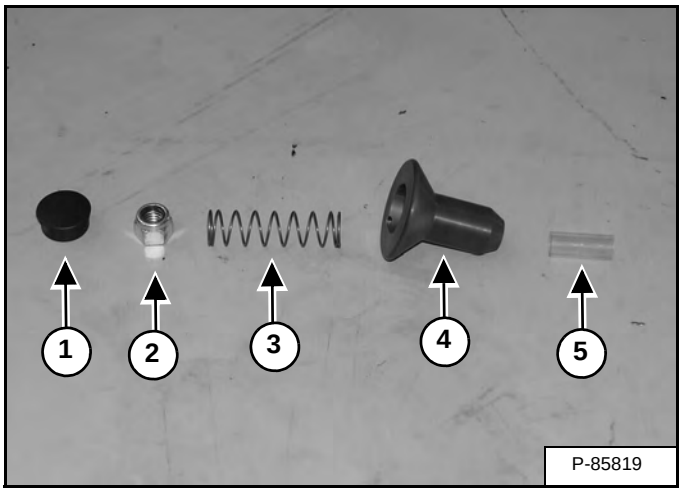


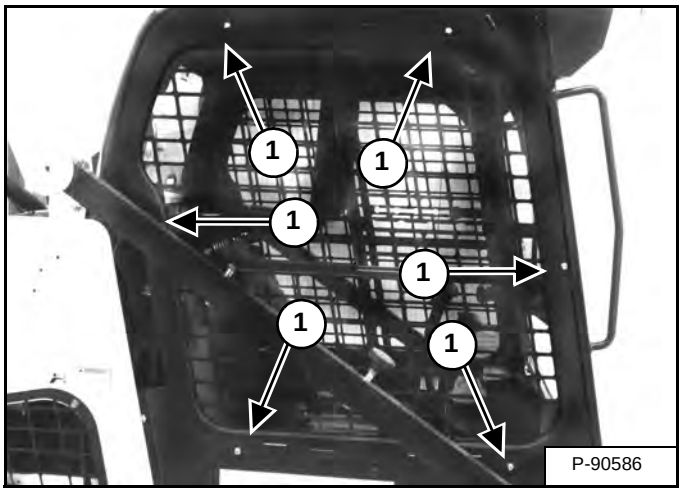
Figure 50-132-2



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

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

Figure 50-132-3



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

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

Remove the window assembly.

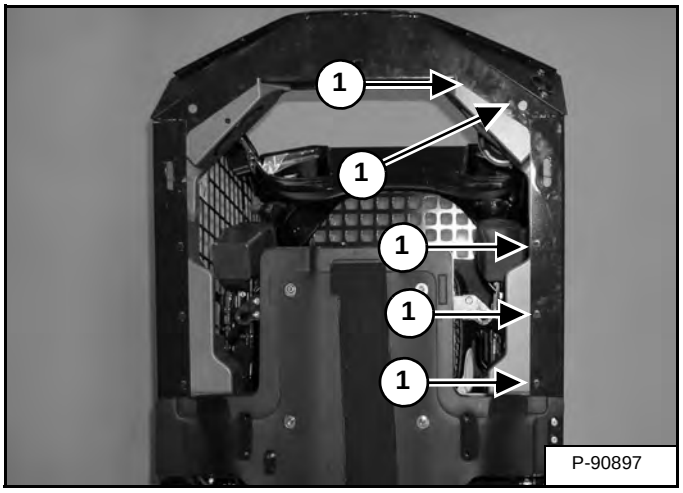
NOTE: The window assembly can only be replaced as a complete unit.

LEFT SIDE LOWER PANEL

Removal And Installation

Raise the operator's cab.

Figure 50-160-1



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

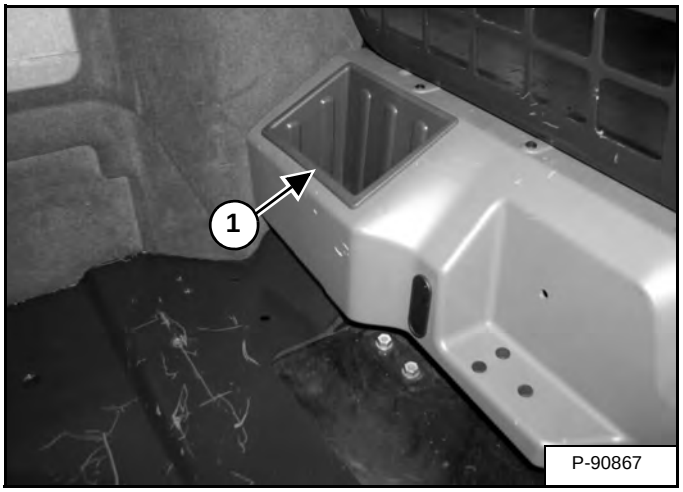
Remove the seat. (See Removal And Installation on Page 50-30-1.)

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

Lower the operator's cab.

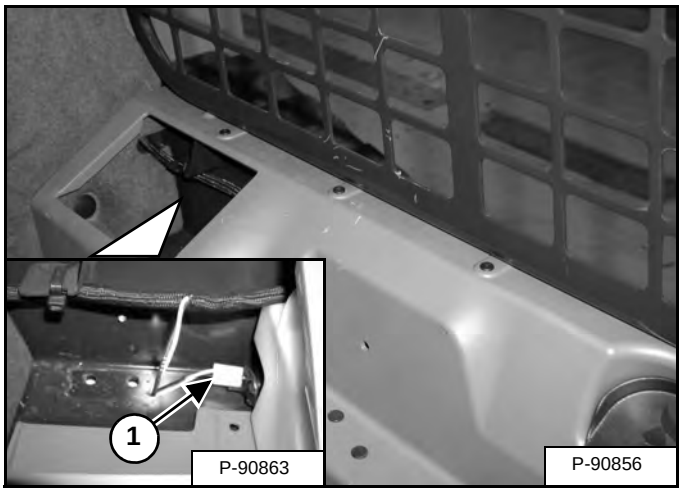
NOTE: With the seat removed, the cab may raise.

Figure 50-160-2



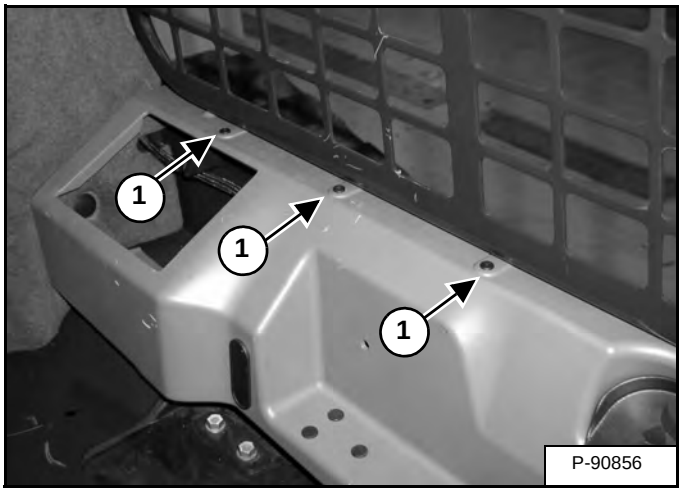
Remove the storage compartment (Item 1) (if equipped) **[Figure 50-160-3]** from the left side lower panel.

Figure 50-160-3



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

Figure 50-160-4



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

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

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ACS	PAGE 14
SJC	PAGE 15

LEGEND

PARTIAL CONNECTOR

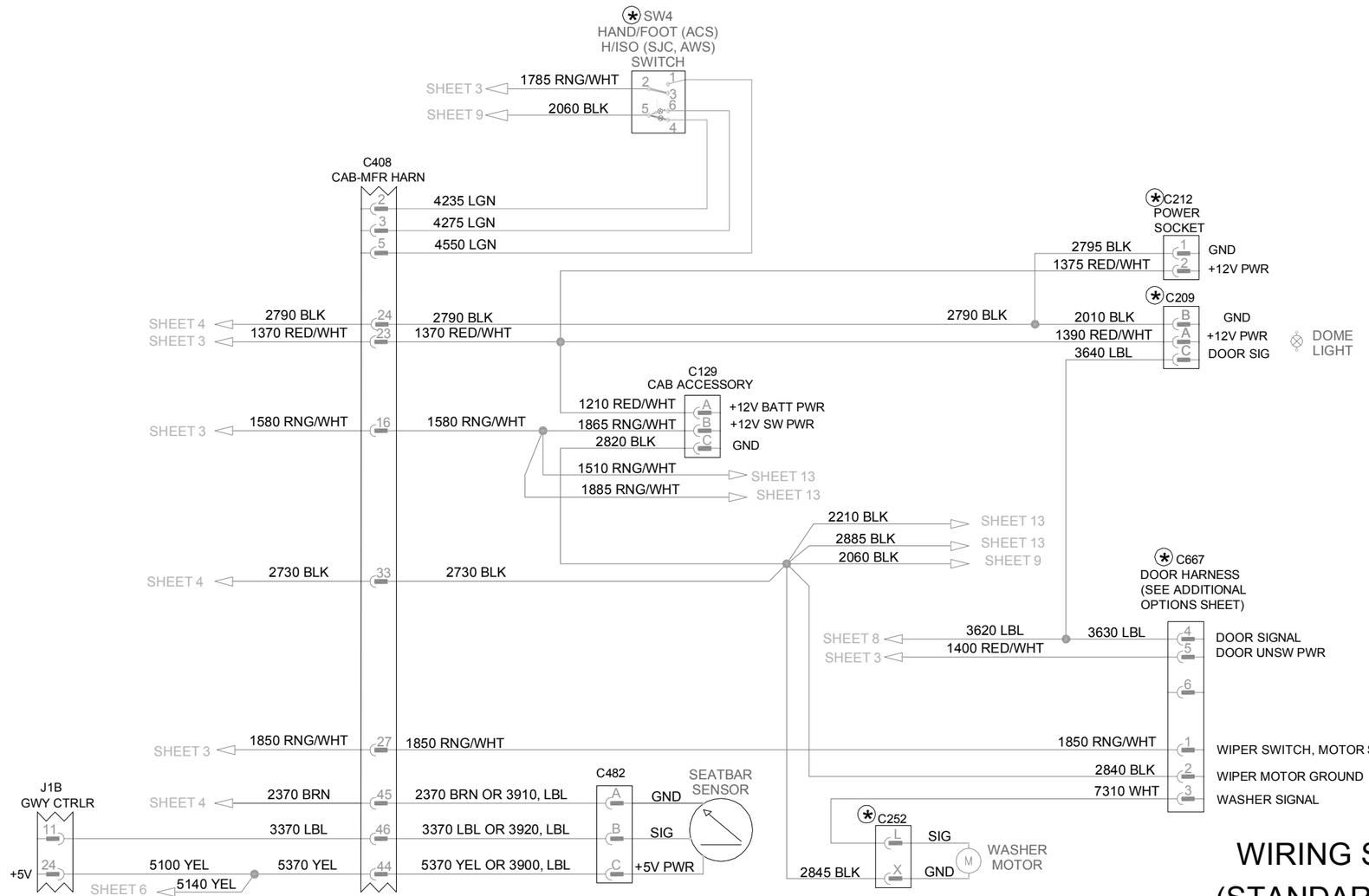
CONNECTOR

WIRE BREAK
(TWO WIRE BREAKS
JOIN ONE WIRE)

SHEET #

CAB

* DLX CAB HARN 7196753 ONLY
(NOT IN STD CAB HARN 7165991)



WIRING SCHEMATIC
(STANDARD MACHINE)
S750 (S/N A3P211001 - A3P214672)
(S/N A3P311001 AND ABOVE)
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7197683

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

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LEGEND

PARTIAL CONNECTOR

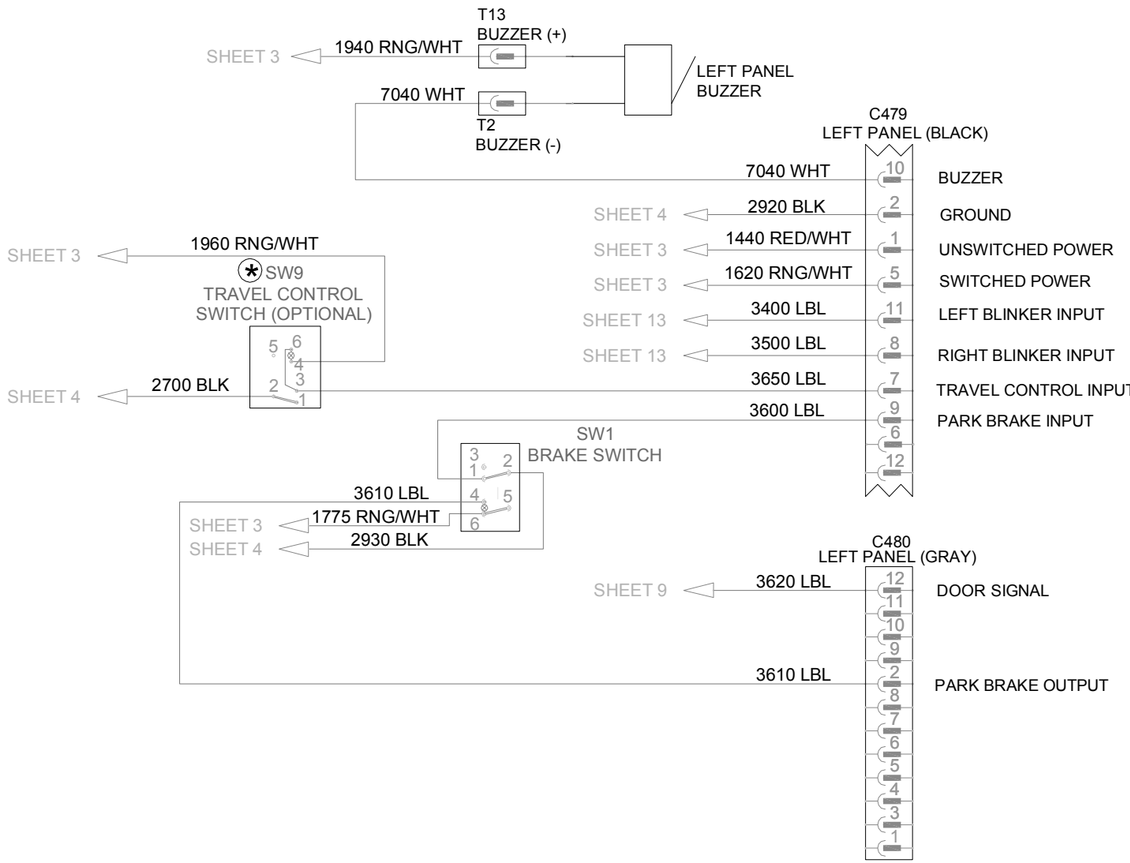
CONNECTOR

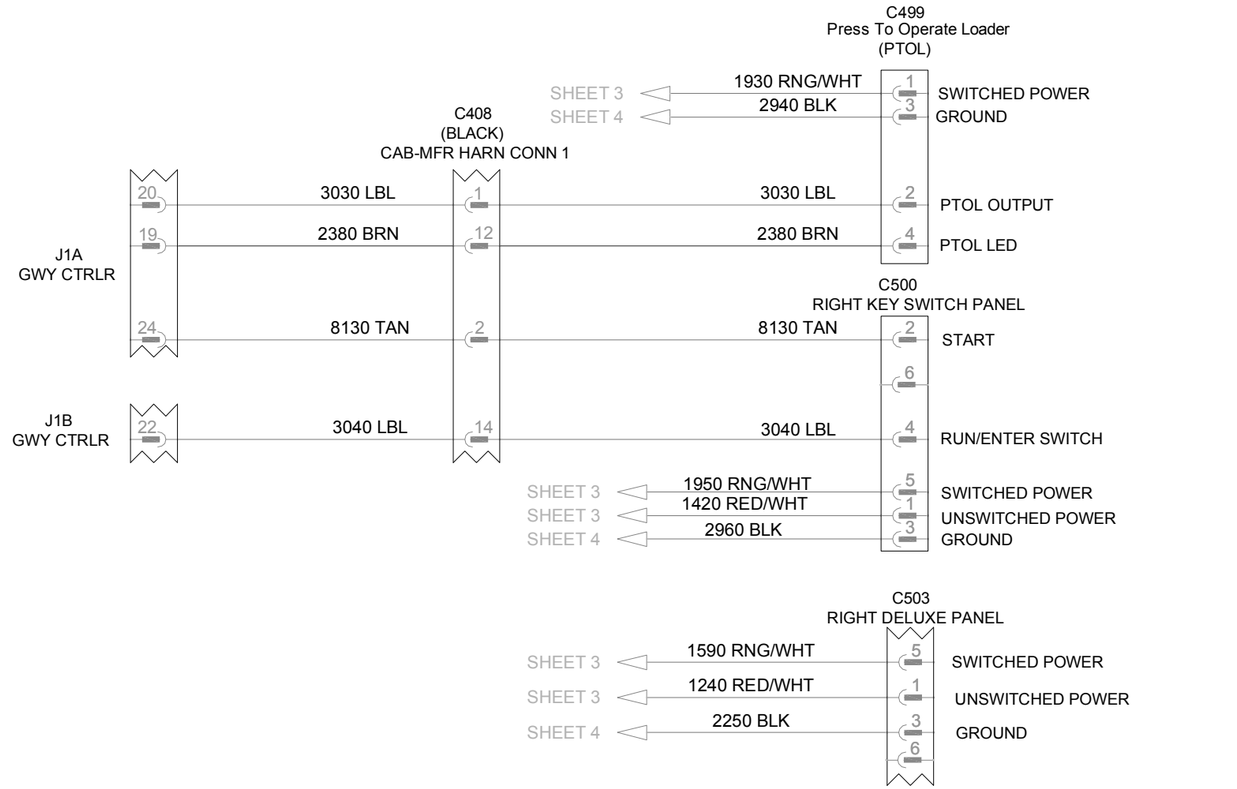
WIRE BREAK
(TWO WIRE BREAKS JOIN ONE WIRE)

SHEET #

CAB DISPLAY

* DLX CAB HARN 7210556 ONLY
(NOT IN STD CAB HARN 7210557)





WIRING SCHEMATIC

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(STANDARD MACHINE)

S750 (S/N A3P214673 - A3P214829)

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7210766 (A)

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

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LEGEND

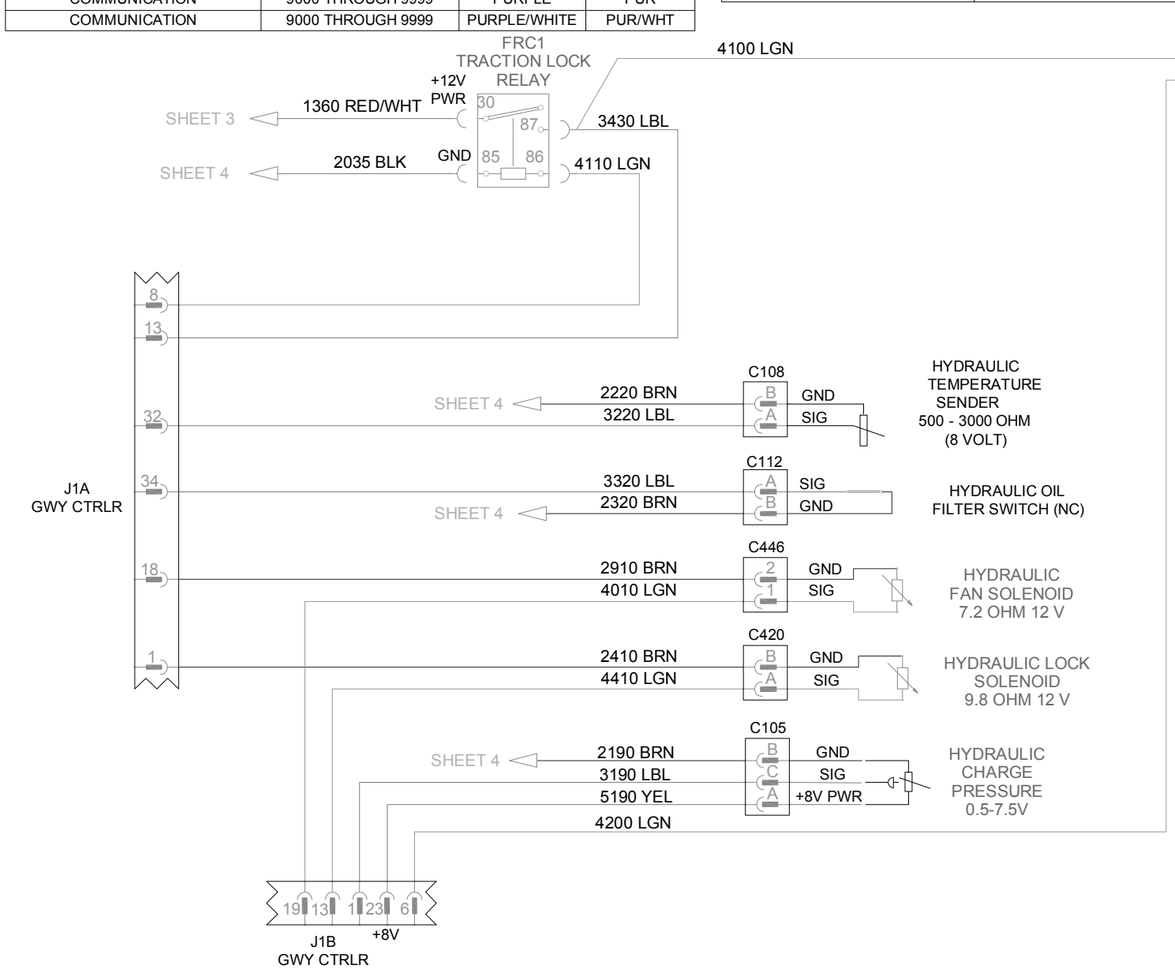
PARTIAL CONNECTOR

CONNECTOR

WIRE BREAK
(TWO WIRE BREAKS
JOIN ONE WIRE)

SHEET #

HYDRAULICS



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WIRING SCHEMATIC
(STANDARD MACHINE)
S750 (S/N A3P214830 - A3P215229 & A3P215231 - A3P215250)
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7210766 (C)

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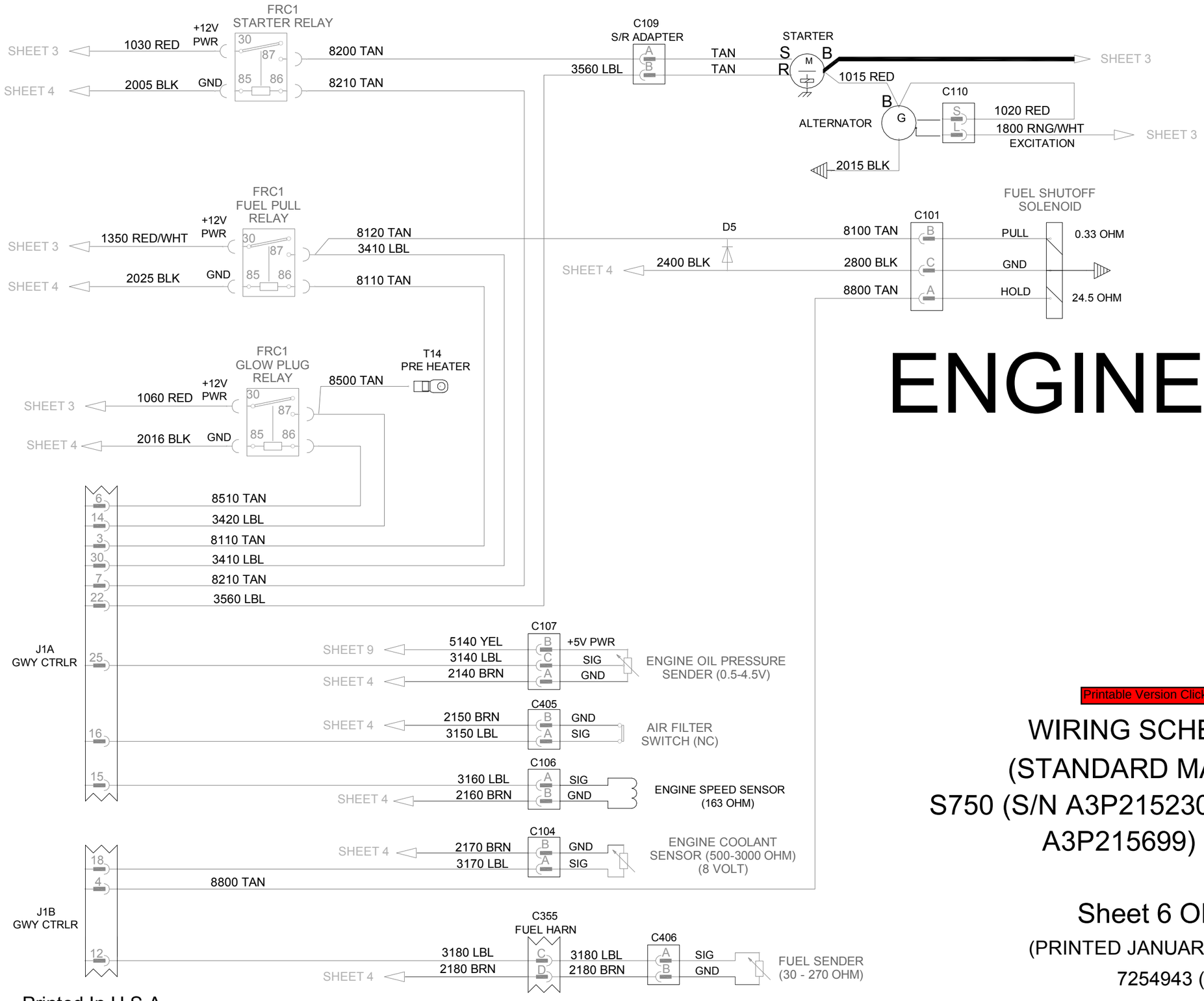

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WIRING SCHEMATIC
(STANDARD MACHINE)
S750 (S/N A3P215230 & A3P215251 - A3P215699)

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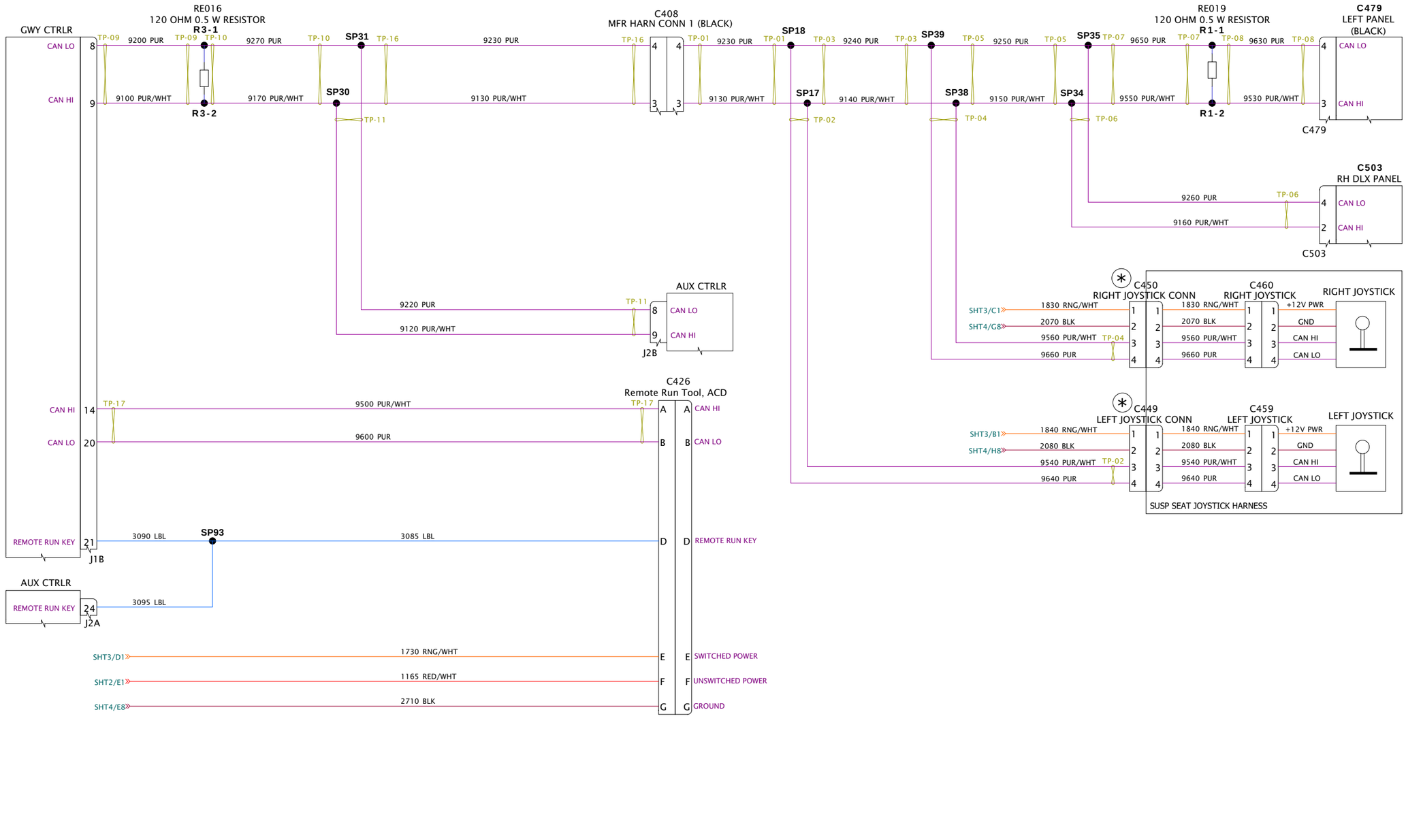
7254943 (0)

CAN BUS

(*) DLX CAB HARN 7304511 ONLY
(NOT IN STD CAB HARN 7210557)



Wiring Schematic
Standard Machine

S750

S/N A3P215700 through A3P215899

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SWITCHED POWER

FUSE RELAY CENTER

FUSE 1 25 A
FUSE 2 25 A
FUSE 3 15 A
FUSE 4 5 A
FUSE 7 25 A
FUSE 8 25 A
FUSE 12 15 A

1A 2A 3A 4A 7A 8A 12A — BUS BAR — FRC1
1B 2B 3B 4B 7B 8B 12B — FRC1

1760 RNG/WHT

1750 RNG/WHT — SP52
1720 RNG/WHT — C404 BU ALARM-MFR HARN (SEE ADDITIONAL OPTION DWG)
1780 RNG/WHT — C489 MFR ACCESSORY

1850 RNG/WHT — SHT9/D8
1575 RNG/WHT — SHT14/G4
1550 RNG/WHT — SHT13/F7

C428 MFR HARN CONN 2 (LT GRAY)
1660 RNG/WHT — 2 2 — 1660 RNG/WHT — SP42
1620 RNG/WHT — SHT8/G8
1940 RNG/WHT — SHT8/H8
1930 RNG/WHT — SHT8/H3
1775 RNG/WHT — SHT8/D8
1590 RNG/WHT — SHT8/E3
1950 RNG/WHT — SHT8/F3
1785 RNG/WHT — SHT9/H6
1960 RNG/WHT — SHT8/E8
1565 RNG/WHT — SHT14/E4

1570 RNG/WHT — SP11
1520 RNG/WHT — SHT10/G3
1530 RNG/WHT — SHT10/D3
1560 RNG/WHT — 22 AUX CTRLR — J2B

1730 RNG/WHT — SHT5/C8
1580 RNG/WHT — SHT9/F8
1800 RNG/WHT — SHT6/G4

1795 RNG/WHT
1820 RNG/WHT
1815 RNG/WHT

SWITCHED POWER RELAY-RC2
SHT2/B1 — 1050 RED — 30 — 87 — 1765 RNG/WHT — SP25
3390 LBL — 86 — 85 — 2055 BLK — SHT4/B8
RC2 RC2

SWITCHED POWER RELAY-RC1
SHT2/B1 — 1205 RED — 30 — 87 — 1820 RNG/WHT
SP100 — 3385 LBL — 86 — 85 — 2065 BLK — SHT4/C8
RC1 RC1

1790 RNG/WHT — SHT12/E8

GWY CTRLR
3450 LBL — 21 SWITCHED POWER RELAY FEEDBACK
3380 LBL — 4 SWITCHED POWER RELAY SIGNAL
J1A

C428 MFR HARN CONN 2 (LT GRAY)
1920 RNG/WHT — 6 6 — 1920 RNG/WHT — SP37
1830 RNG/WHT — SHT5/E3
1840 RNG/WHT — SHT5/D3

Wiring Schematic Standard Machine | **S750** | S/N A3P215900 & Above

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CONNECTOR ASSIGNMENTS												
CONN	DESCRIPTION	NUM OF PINS	SHEET		CONN	DESCRIPTION	NUM OF PINS	SHEET		CONN	DESCRIPTION	NUM OF PINS	SHEET
C101	FUEL SHUTOFF SOLENOID	3	6		C446	HYDRAULIC FAN	2	7		FC1	FUSE CENTER 1	8	3
C103	TAILGATE	8	4,10,11,13		C449	LEFT JOYSTICK (CAB HARN)	4	5		FC2	FUSE CENTER 2	8	3
C104	ENGINE COOLANT SENSOR	2	6		C450	RIGHT JOYSTICK (CAB HARN)	4	5		FRC1	FUSE RELAY CENTER	64	3,6,7,11,12
C105	HYD CHARGE PRESSURE	3	7		C453	RIGHT QUAD A DRIVE	4	15					
C106	ENGINE SPEED SENSOR	2	6		C454	LEFT QUAD DRIVE	4	15		J1A	GATEWAY CONTROLLER	34	3,6-8,10-13
C107	ENGINE OIL PRESSURE	3	6		C467	LIFT PEDAL LOCK	3	14		J1B	GATEWAY CONTOLLER	26	3-10,13
C108	HYD TEMPERATURE SENDER	2	7		C468	TILT PEDAL LOCK	3	14		J2A	AUX CONTROLLER	34	7,10,13
C109	S/R ADAPTER HARNESS	2	6		C469	TILT HANDLE	3	14		J2B	AUX CONTROLLER	26	3-5,7,10,13
C110	ALTERNATOR	2	6		C470	TILT PEDAL	3	14					
C112	HYD OIL FILTER SWITCH	2	7		C471	LIFT PEDAL	3	14		J1-ACS	ACS CONTROLLER	8	14, 15
C126	HORN	2	13		C472	LIFT HANDLE	3	14		J2-ACS	ACS CONTROLLER	10	14, 15
C129	CAB ACCESSORY	3	9		C474	BRAKE LIGHT	1	15		J3-ACS	ACS CONTROLLER	10	14, 15
C209	DOME LIGHT	3	9		C479	LEFT PANEL(BLACK)	12	5,8		J5	DRIVE CONTROLLER	50	15
C212	POWER SOCKET	2	9		C480	LEFT PANEL(GRAY)	12	8					
C252	WASHER	2	9		C482	SEATBAR SENSOR	3	9		SW1	BRAKE SWITCH	6	8
C277	AIR RIDE SEAT	6	13		C483	TEMP CONTROL SWITCH	3	12		SW2	BEACON SWITCH	6	13
C278	RIGHT SPEAKER	2	13		C486	AC COMPRESSOR	2	12		SW3	HAZARD SWITCH	6	13
C279	LEFT SPEAKER	2	13		C489	MFR ACCESSORY	2	3,4		SW4	HAND/FOOT, H/ISO SWITCH	6	9
C308	BRAKE SOLENOID	2	7		C492	ACS/SJC/AWS-MFR HARN	8	3,5,9		SW5	POWER BOBTACH SWITCH	6	13
C350	AC EVAPORATOR SWITCH	2	12		C493	ACS/SJC/AWS-MFR HARN	4, 15	3,4		SW6	BUCKET POSITION SWITCH	6	13
C355	DLX or STD FUEL HARNESS	6	6,12,13		C497	SJC HORN/BLINKER	3	13		SW9	TRAVEL CONTROL SWITCH	6	8
C404	BU ALARM-MFR HARN	2	3,10		C499	PTOL	4	8		SW10	BLOWER SWITCH	5	12
C405	AIR FILTER SWITCH	2	6		C500	RH KEY SWITCH	6	8		SW11	AC SWITCH	3	12
C406	FUEL SENDER	2	6		C501	A22 PUMP HARNESS	8	15					
C408	CAB - MFR HARN CONNECTOR	48	3-5,8-9,11-13		C503	RH DLX PANEL	6	5,8		T1	BATT GROUND	1	4
C409	RIGHT HANDLE	10	10		C542	LEFT SWASHPLATE	3	15		T2	BUZZER GROUND	1	8
C410	LEFT HANDLE	10	10		C543	RIGHT SWASHPLATE	3	15		T3	FLASHER	2	13
C411	LEFT HANDLE 5 WAY (FLSHR)	5	13		C544	LEFT FORWARD DRIVE	2	15		T6	BATT GROUND	1	4
C412	LEFT HANDLE 2 WAY (HORN)	2	13		C545	LEFT REVERSE DRIVE	2	15		T8	BATT GROUND	1	4
C415	HIGH FLOW SOLENOID	2	13		C546	RIGHT FORWARD DRIVE	2	15		T13	BUZZER POWER	1	8
C418	FRONT ROD (MALE)	2	7		C547	RIGHT REVERSE DRIVE	2	15		T14	PRE HEATER	1	6
C419	FRONT BASE (FEMALE)	2	7							T15	RIGHT REAR WORK LIGHT(+)	1	11
C420	HYD LOCK	2	7							T16	RIGHT REAR WORK LIGHT(-)	1	11
C440	RF BASE	2	14		C602	LEFT REAR TAIL LIGHT	2	11		T17	LEFT REAR WORK LIGHT (+)	1	11
C422	TILT SPOOL LCOK	3	10		C603	RIGHT REAR TAIL LIGHT	2	11		T18	LEFT REAR WORK LIGHT (-)	1	11
C423	BUCKET POSITION	2	13		C606	POWER BOBTACH OPEN	2	13		T19	BACKUP ALARM	1	10
C425	BRAKE SOLENOID	3	7		C607	POWER BOBTACH CLOSE	2	13		T20	BACKUP ALARM (GND)	1	10
C426	CAN (Remote Start Tool, ACD)	7	5		C610	HVAC DUCT FAN	2	12					
C428	TILT ACTUATOR	8	14, 15		C611	BLOWER MOTOR	4	12					
C429	LIFT ACTUATOR	8	14,15		C630	THERMOSTAT	3	12					
C434-1	LEFT WORKLIGHT 1	2	11		C635	HEATER VALVE	6	12					
C434-2	LEFT WORKLIGHT 2	2	11		C667	DOOR	6	9					
C435-1	RIGHT WORKLIGHT 1	2	11		C670	EXTERIOR BEACON	6	13					
C435-2	RIGHT WORKLIGHT 2	2	11		C676	RADIO	6	13					
C437	TWO SPEED MAKEUP	2	13										
C441	TWO SPEED	2	13		C707	OBW STOP BRAKE LIGHT	3	15					

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

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WIRING SCHEMATIC
(ACS / SJC MACHINE)
S750 (S/N A3P211001 - A3P214672)
(S/N A3P311001 AND ABOVE)

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7197682

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

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LEGEND

PARTIAL CONNECTOR

CONNECTOR

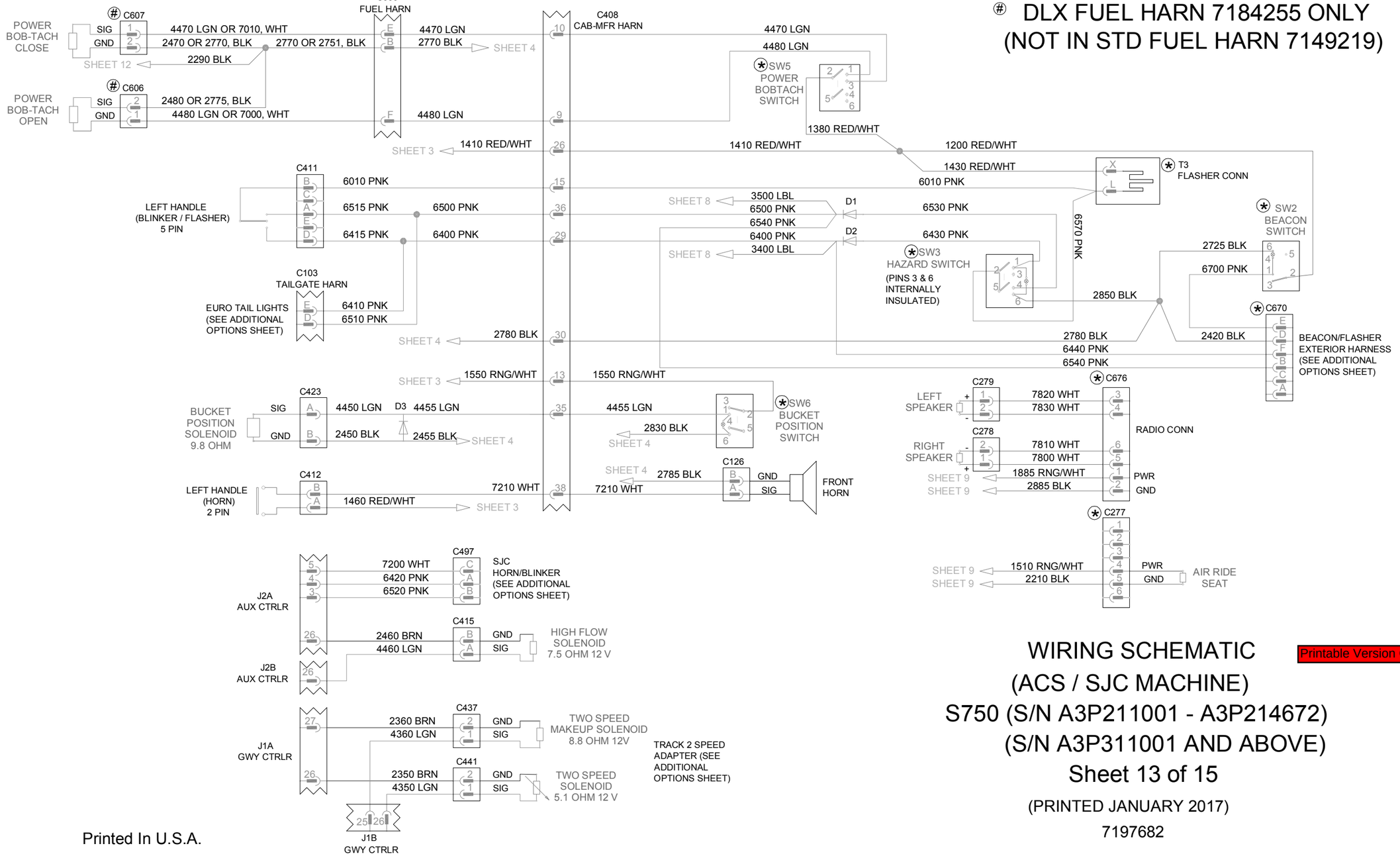
WIRE BREAK
(TWO WIRE BREAKS
JOIN ONE WIRE)

SHEET #

OPTIONS

* DLX CAB HARN 7196753 ONLY
(NOT IN STD CAB HARN 7165991)

DLX FUEL HARN 7184255 ONLY
(NOT IN STD FUEL HARN 7149219)



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(S/N A3P311001 AND ABOVE)

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WIRE CATEGORIES FOR COLORS AND NUMBER RANGE			
GROUP DESCRIPTION	GROUP NUMBER RANGE	WIRE COLOR	COLOR CODE
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HYDRAULIC	4000 THROUGH 4999	LIGHT GREEN	LGN
CONTROLLER SUPPLY	5000 THROUGH 5999	YELLOW	YEL
LIGHTS	6000 THROUGH 6999	PINK	PNK
OTHER FUNCTIONS	7000 THROUGH 7999	WHITE	WHT
ENGINE	8000 THROUGH 8999	TAN	TAN
COMMUNICATION	9000 THROUGH 9999	PURPLE	PUR
COMMUNICATION	9000 THROUGH 9999	PURPLE/WHITE	PUR/WHT

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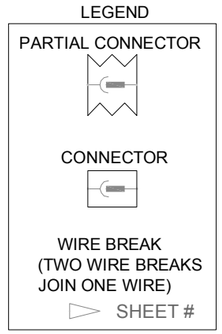
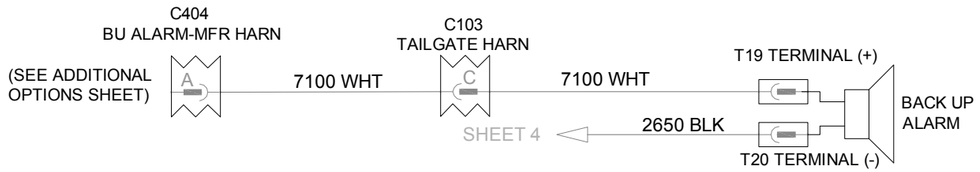
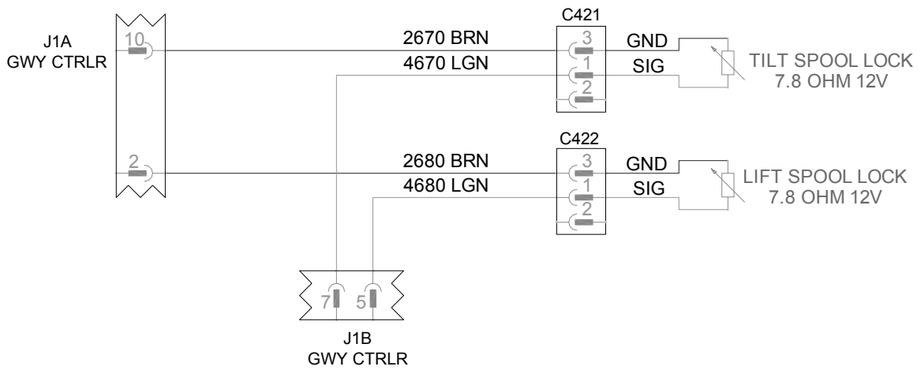
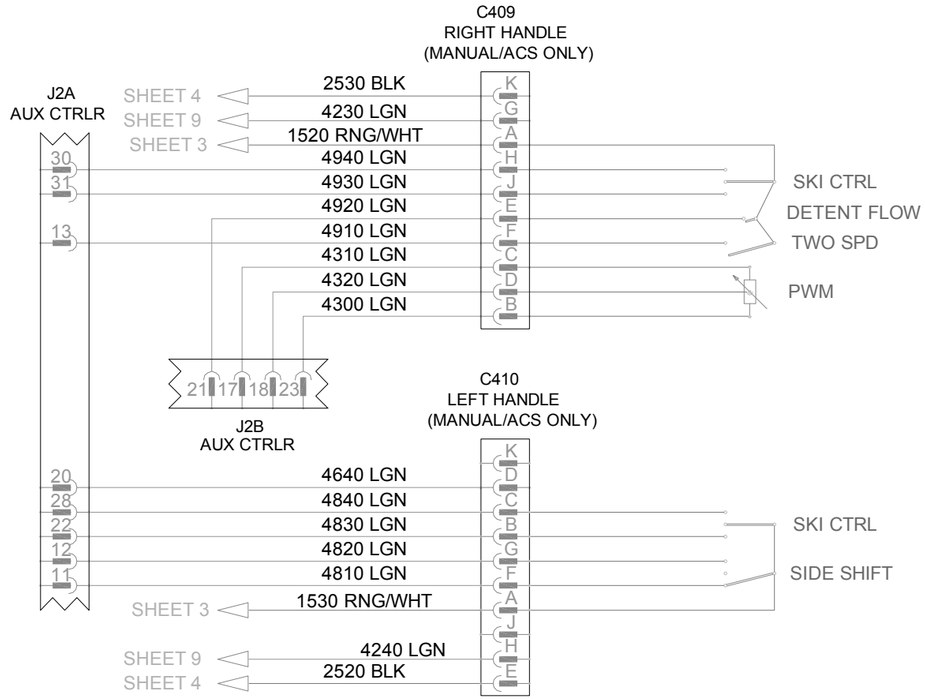


MANUAL CONTROLS







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WIRING SCHEMATIC
(ACS / SJC MACHINE)
S750 (S/N A3P214673 - A3P214829)

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7210767 (A)

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HYDRAULICS

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

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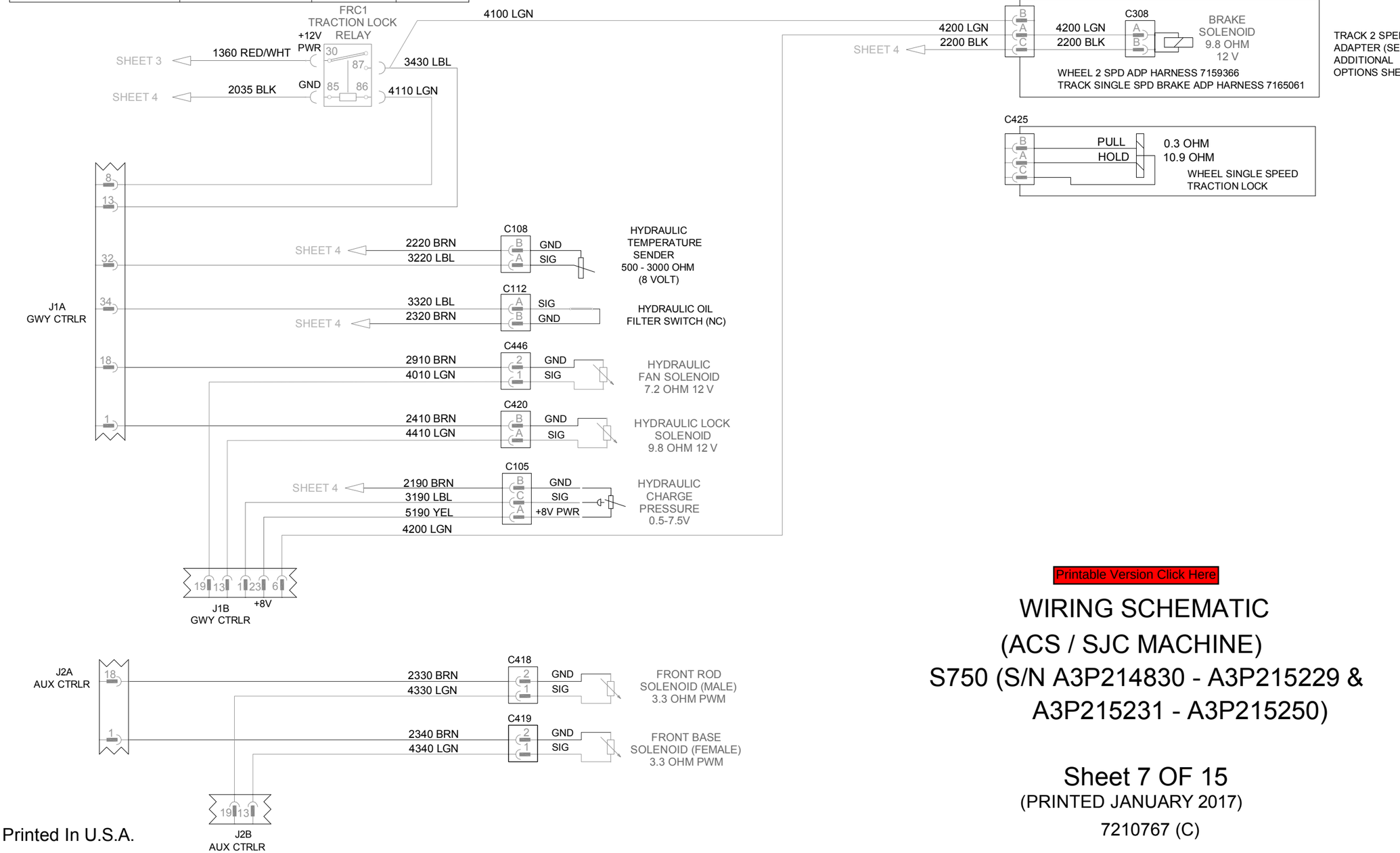
LEGEND

PARTIAL CONNECTOR

CONNECTOR

WIRE BREAK
(TWO WIRE BREAKS JOIN ONE WIRE)

SHEET #



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S750 (S/N A3P214830 - A3P215229 & A3P215231 - A3P215250)

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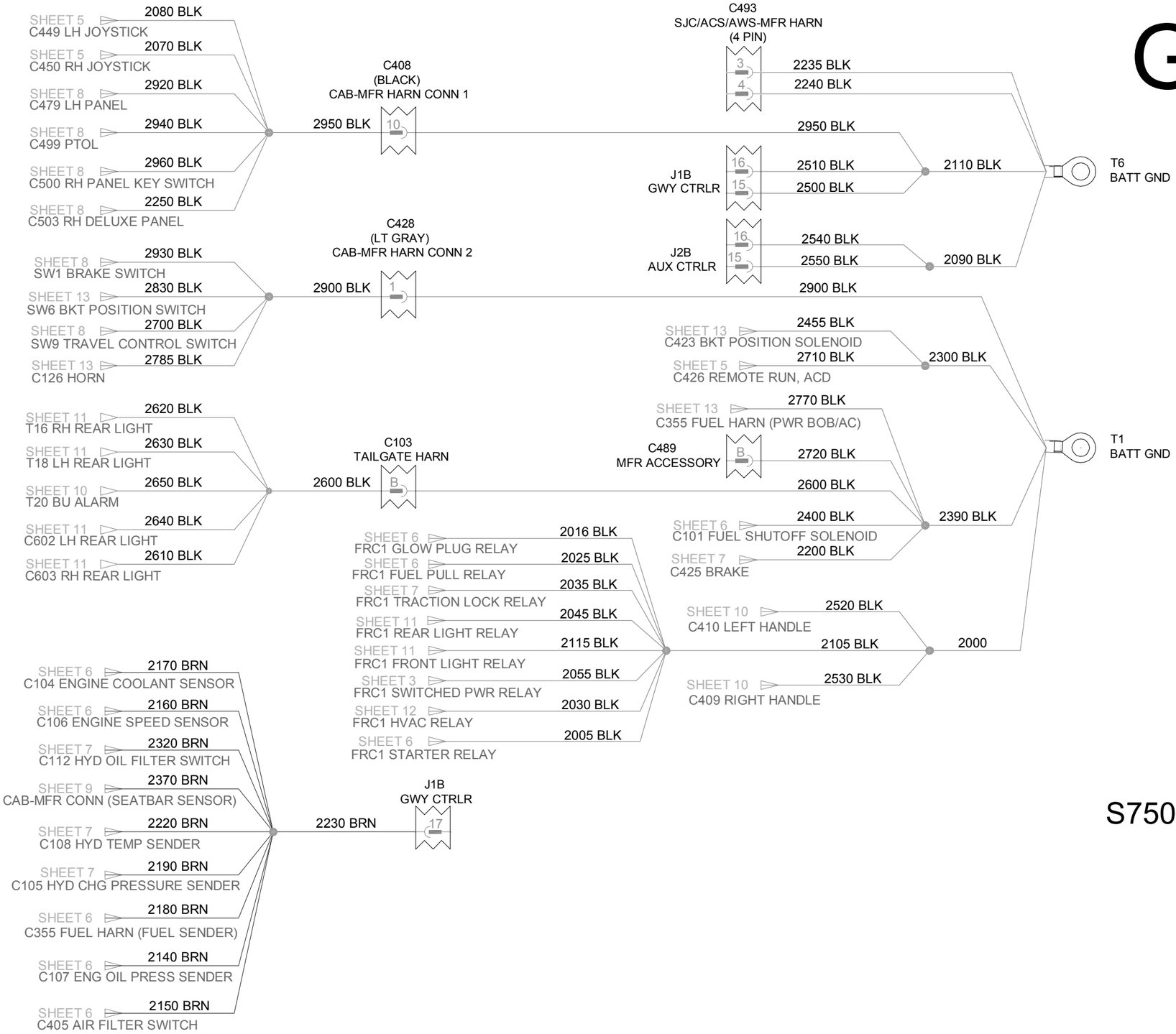
GROUND



SHEET 5 C449 LH JOYSTICK — 2080 BLK
SHEET 5 C450 RH JOYSTICK — 2070 BLK
SHEET 8 C479 LH PANEL — 2920 BLK
SHEET 8 C499 PTOL — 2940 BLK
SHEET 8 C500 RH PANEL KEY SWITCH — 2960 BLK
SHEET 8 C503 RH DELUXE PANEL — 2250 BLK

SHEET 8 SW1 BRAKE SWITCH — 2930 BLK
SHEET 13 SW6 BKT POSITION SWITCH — 2830 BLK
SHEET 8 SW9 TRAVEL CONTROL SWITCH — 2700 BLK
SHEET 13 C126 HORN — 2785 BLK

SHEET 11 T16 RH REAR LIGHT — 2620 BLK
SHEET 11 T18 LH REAR LIGHT — 2630 BLK
SHEET 10 T20 BU ALARM — 2650 BLK
SHEET 11 C602 LH REAR LIGHT — 2640 BLK
SHEET 11 C603 RH REAR LIGHT — 2610 BLK

SHEET 6 FRC1 GLOW PLUG RELAY — 2016 BLK
SHEET 6 FRC1 FUEL PULL RELAY — 2025 BLK
SHEET 7 FRC1 TRACTION LOCK RELAY — 2035 BLK
SHEET 11 FRC1 REAR LIGHT RELAY — 2045 BLK
SHEET 11 FRC1 FRONT LIGHT RELAY — 2115 BLK
SHEET 3 FRC1 SWITCHED PWR RELAY — 2055 BLK
SHEET 12 FRC1 HVAC RELAY — 2030 BLK
SHEET 6 FRC1 STARTER RELAY — 2005 BLK

SHEET 13 C355 FUEL HARN (PWR BOB/AC) — 2770 BLK
SHEET 6 C101 FUEL SHUTOFF SOLENOID — 2400 BLK
SHEET 7 C425 BRAKE — 2200 BLK
SHEET 10 C410 LEFT HANDLE — 2520 BLK
SHEET 10 C409 RIGHT HANDLE — 2530 BLK

SHEET 13 C423 BKT POSITION SOLENOID — 2455 BLK
SHEET 5 C426 REMOTE RUN, ACD — 2710 BLK

SHEET 6 C104 ENGINE COOLANT SENSOR — 2170 BRN
SHEET 6 C106 ENGINE SPEED SENSOR — 2160 BRN
SHEET 7 C112 HYD OIL FILTER SWITCH — 2320 BRN
SHEET 9 C408 CAB-MFR CONN (SEATBAR SENSOR) — 2370 BRN
SHEET 7 C108 HYD TEMP SENDER — 2220 BRN
SHEET 7 C105 HYD CHG PRESSURE SENDER — 2190 BRN
SHEET 6 C355 FUEL HARN (FUEL SENDER) — 2180 BRN
SHEET 6 C107 ENG OIL PRESS SENDER — 2140 BRN
SHEET 6 C405 AIR FILTER SWITCH — 2150 BRN

SHEET 11 C408 CAB-MFR CONN (FR LIGHTS) — 2765 BLK
SHEET 12 C408 CAB-MFR CONN (HVAC) — 2745 BLK
SHEET 9 C408 CAB-MFR CONN (ACCESSORIES) — 2790 BLK
SHEET 13 C408 CAB-MFR CONN (OPTIONS) — 2780 BLK
SHEET 9 C408 CAB-MFR CONN (ACCESSORIES,OPTIONS) — 2730 BLK

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WIRING SCHEMATIC
(ACS / SJC MACHINE)
S750 (S/N A3P215230 & A3P215251 - A3P215699)

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4	SH04 - GROUND
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7	SH07 - HYDRAULICS
8	SH08 - CAB DISPLAY
9	SH09 - CAB
10	SH10 - MANUAL CONTROLS
11	SH11 - LIGHTS
12	SH12 - HVAC
13	SH13 - OPTIONS 1
14	SH14 - OPTIONS 2

HARNESS PART NUMBER	
EXMF	7305834
LF MFR	7304712
DLX CAB	7304511
STD CAB	7210557
STD FUEL	7149219
S/R (STARTER)	6733370
TAILGATE DOM	7217484
WHL 2 SPD ADP	7159366
(1 PC) TRK 2 SPD	7243409
SUSP JSTK	7163706

WIRE CATEGORIES FOR COLORS AND NUMBER RANGE

GROUP DESCRIPTION	GROUP NUMBER RANGE	WIRE COLOR	COLOR CODE
BATT FEED, GENERAL	1000 THROUGH 1499	RED	RED
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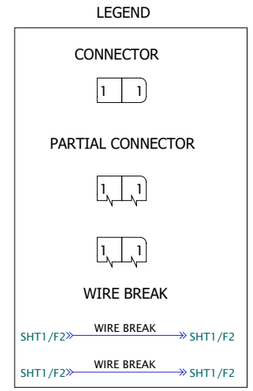
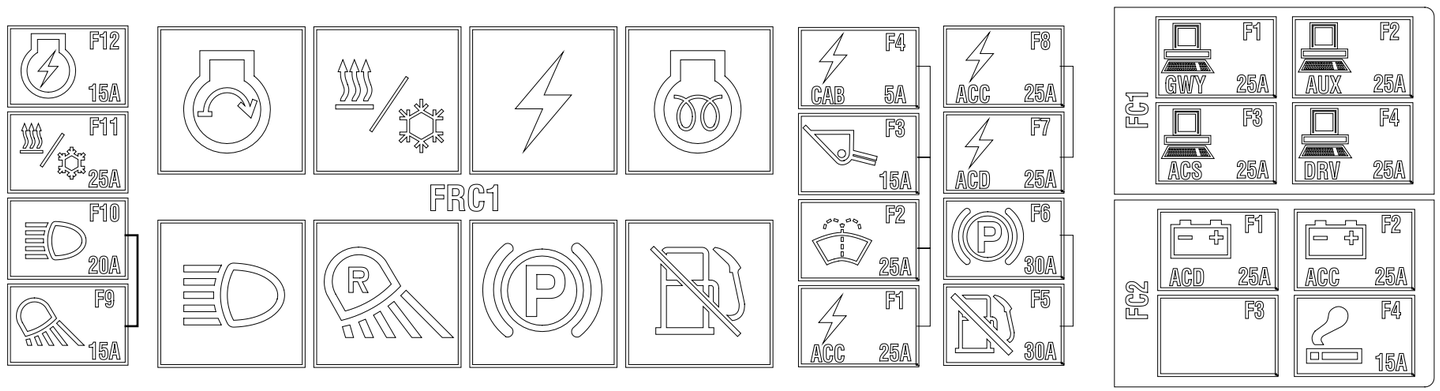
BATTERY GROUND	2000 THROUGH 2999	BLACK	BLK
CONTROLLER GROUND	2000 THROUGH 2999	BROWN	BRN
MONITORING	3000 THROUGH 3999	LIGHT BLUE	LBL
HYDRAULIC	4000 THROUGH 4999	LIGHT GREEN	LGN
CONTROLLER SUPPLY (5V, 8V)	5000 THROUGH 5999	YELLOW	YEL
LIGHTS	6000 THROUGH 6999	PINK	PNK
OTHER FUNCTIONS	7000 THROUGH 7999	WHITE	WHT
ENGINE	8000 THROUGH 8999	TAN	TAN
COMMUNICATION CAN LO	90XX, 92XX, 94XX, 96XX, 98XX	PURPLE	PUR
COMMUNICATION CAN HI	91XX, 93XX, 95XX, 97XX, 99XX	PURPLE/WHITE	PUR/WHT

LEGEND





Wiring Schematic
ACS / SJC Machine

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S750

S/N A3P215700 through A3P215899

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OPTIONS 1

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

(*) DLX CAB HARN 7304511 ONLY
(NOT IN STD CAB HARN 7210557)

POWER BOB CLOSE
POWER BOB OPEN
C606
C607
SHT12/B8
SP33
C355 FUEL HARN
C428 MFR HARN CONN 2 (LT GRAY)
SHT4/E8
SW5 POWER BOBTACH SWITCH
SW5
SHT14/D6
T3 FLASHER
T3
SP43
SP22
SHT2/E1
SHT3/F1
SHT8/G8
SHT8/F8
D5
D2
SW2 BEACON SWITCH
SW2
SW3 HAZARD SWITCH
SW3
SW3 (PINS 3 & 6 INTERNALLY INSULATED)
SP46
SHT14/F6
SHT14/F4
SHT14/D5
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 (FLASHER) 5 WAY (SEE ADDITIONAL OPTIONS DWG)
C411
C438 MFR HARN CONN 3 (DK GRAY)
SP21
C103 TAILGATE HARN
EURO TAIL LIGHTS (SEE ADDITIONAL OPTIONS DWG)
BUCKET POSITION SOLENOID 9.8 OHM
C423
D3
SW6 BUCKET POSITION SWITCH
SW6
SHT4/E3
LEFT HANDLE
LEFT HANDLE (HORN) 2 WAY (SEE ADDITIONAL OPTIONS DWG)
C412
AUX CTRLR
HORN SIGNAL
RIGHT BLINKER SIGNAL
LEFT BLINKER SIGNAL
HIGH FLOW SOLENOID GROUND
HIGH FLOW SOLENOID SIGNAL
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
HORN
SHT4/E8
GWY CTRLR
TWO SPEED MAKEUP GROUND
TWO SPEED GROUND
TWO SPEED MAKEUP
TWO SPEED SIGNAL
J1A
J1B
C437
C441
TWO SPEED MAKEUP SOLENOID 8.8 OHM 12V
TWO SPEED SOLENOID 5.1 OHM 12 V
TRACK 2 SPEED (SEE ADDITIONAL OPTIONS DWG)
C676 RADIO CONN
LEFT SPEAKER
RIGHT SPEAKER
C279
C278
L010 AIR RIDE SEAT
C277
SHT9/E3
SHT9/D3

Wiring Schematic
ACS / SJC Machine

S750

S/N A3P215700 through A3P215899

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CAB

(*) DLX CAB HARN 7304511 ONLY
(NOT IN STD CAB HARN 7210557)

SW4
(*) HAND/FOOT (ACS)
H/ISO (SJC, AWS)
SWITCH

SHT3/E1 » 1785 RNG/WHT → SW4 2
SHT9/E3 » 2060 BLK → SW4 5
SW4 1 → 1785 RNG/WHT → SW4 3
SW4 6 → 2060 BLK → SW4 4

C492
ACS/SJC/AWS-MFR HARN (8 PIN)

SHT10/F3 » 4230 LGN
SHT10/D3 » 4240 LGN

HAND CONTROL LIGHT 5 — 4220 LGN — SP29 — 4235 LGN — C438 4 — 4235 LGN — SW4 1
FOOT CONTROL LIGHT 3 — 4275 LGN — C438 5 — 4275 LGN — SW4 6
FOOT CONTROL SIGNAL 2 — 4550 LGN — C438 6 — 4550 LGN — SW4 4

C438
MFR HARN CONN 3 (DK GRAY)

(*) C212
POWER SOCKET
2795 BLK GND → C212 1
+12V PWR → C212 2

1375 RED/WHT → C212 +12V PWR

C408
MFR HARN CONN 1 (BLACK)

SHT2/D1 » 1370 RED/WHT — C408 7 — 1370 RED/WHT — SP45 — 1390 RED/WHT → (*) T37 1
SHT3/D1 » 1580 RNG/WHT — C408 5 — 1580 RNG/WHT — SP8 — 1210 RED/WHT → C129 A +12V BATT PWR
SP8 — 1865 RNG/WHT → C129 B +12V SW PWR
SP8 — 2820 BLK → C129 C GND

C129
CAB ACCESSORY

DOME LIGHT
(*) T37 1
SP41 — 2010 BLK → (*) T38 1

SP45 — 1510 RNG/WHT → SHT13/C2
SP45 — 1885 RNG/WHT → SHT13/C3

SHT4/F3 » 2730 BLK — C408 11 — 2730 BLK — SP44
SP44 — 2060 BLK → SHT9/H6
SP44 — 2210 BLK → SHT13/C2
SP44 — 2885 BLK → SHT13/B3

C428
MFR HARN CONN 2 (LT GRAY)

SHT4/E3 » 2790 BLK — C428 11 — 2790 BLK → C667 DOOR HARNESS (SEE ADDITIONAL OPTIONS DWG)

(*) C667
DOOR HARNESS
(SEE ADDITIONAL
OPTIONS DWG)

SHT8/D8 » 3630 LBL → C667 4 DOOR SIGNAL
SHT2/G1 » 1400 RED/WHT → C667 5 DOOR UNSW PWR
2840 BLK → C667 2 WIPER MOTOR GROUND
C667 1 WIPER SWITCH, MOTOR SWITCHED POWER
7310 WHT → C667 3 WASHER SIGNAL

SHT3/F1 » 1850 RNG/WHT — C428 13 — 1850 RNG/WHT
SHT4/G3 » 2370 BRN — C428 4 — 2370 BRN

SEATBAR SENSOR
GND → C482 A
SIG → C482 B
+5V PWR → C482 C

GWY CTRLR
SEATBAR SENSOR SIGNAL 11 — 3370 LBL — C428 5 — 3370 LBL
5V CTRLR POWER 24 — 5100 YEL — SP13 — 5370 YEL — C428 3 — 5370 YEL
J1B
SHT6/F7 » 5140 YEL → SP13
SHT7/D7 » 5190 YEL → SP13

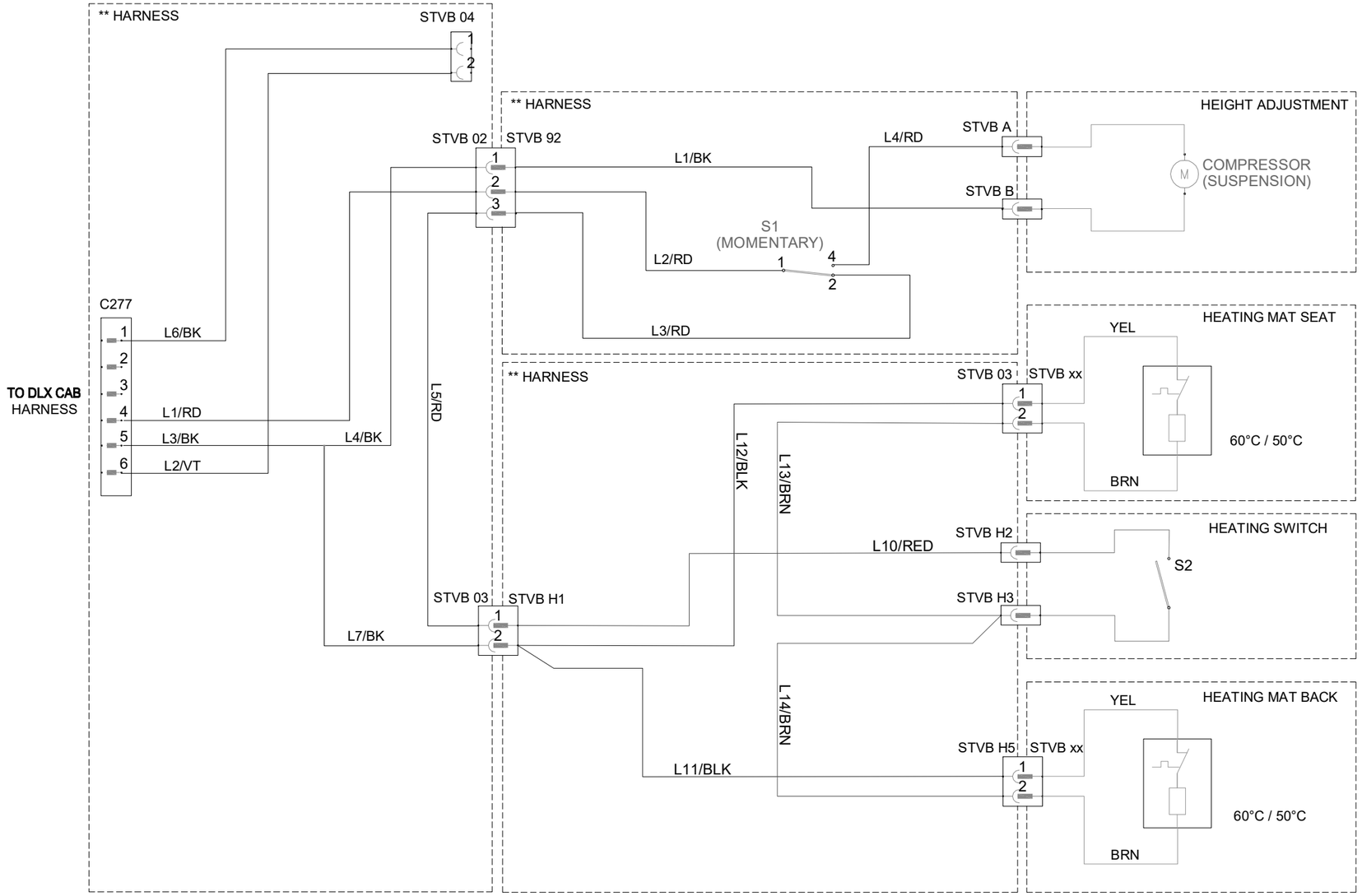
HARNESS WASHER PUMP
7253378

(*) C252
A — 7310 WHT — C253 PWR 1
B — 2845 BLK — C253 GND 2
2845 BLK → C252 B
C253 → WASHER MOTOR

Wiring Schematic **S750** S/N A3P215900 & Above
ACS / SJC Machine

Printed On December 2018
7322219_0
Sheet 9 of 16

Printable Version Click Here



LEGEND

PARTIAL CONNECTOR

CONNECTOR

WIRE BREAK
(TWO WIRE BREAKS
JOIN ONE WIRE)

SHEET #

7308952 HEATED SEAT

Printable Version Click Here

WIRING SCHEMATIC
(KIT AND OPTION HARNESS)
ALL MODELS
Sheet 5 of 7

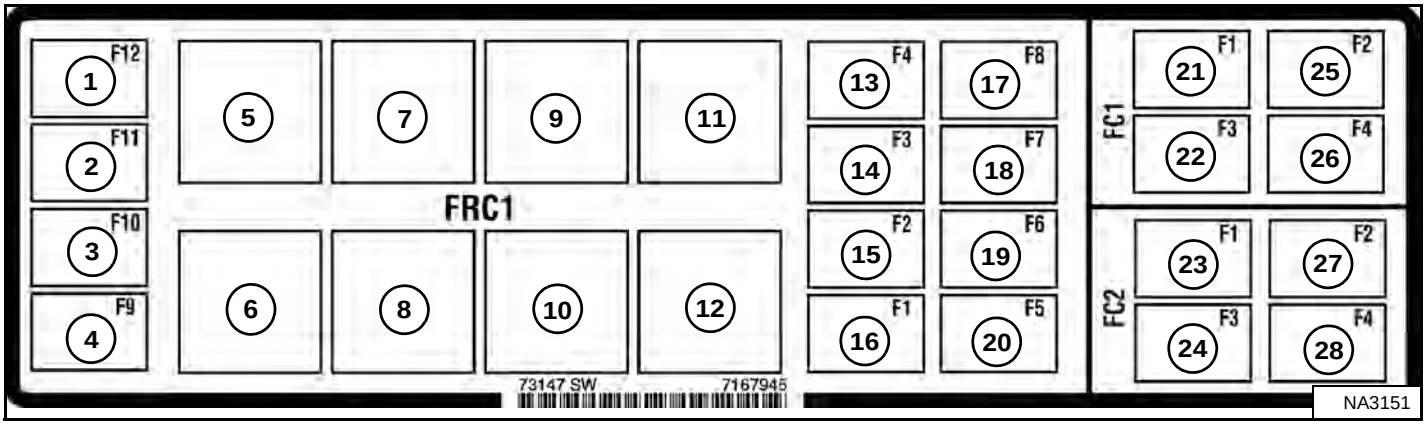
(PRINTED DECEMBER 2018)

7195572 (E)

Printed In U.S.A.

Fuse And Relay Location / Identification (Cont'd)

Figure 60-10-5

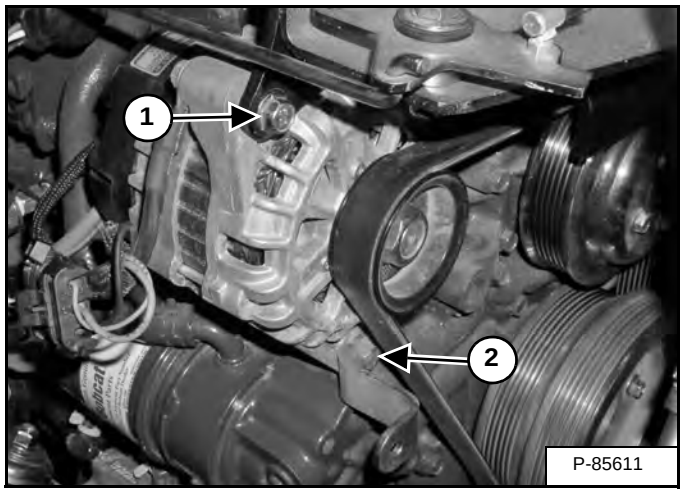


The table below is for models with decal part number 7167945. The location and amperage ratings are shown in the table below and on the decal **[Figure 60-10-5]**. Relays are identified by the letter "R" in the AMP column.

REF	ICON	DESCRIPTION	AMP	REF	ICON	DESCRIPTION	AMP	REF	ICON	DESCRIPTION	AMP
1		Alternator	15	11		Glow Plugs	R	21	GWY	Bobcat Controller	25
2		Heater / HVAC	25	12		Fuel Shutoff	R	22	ACS	ACS Controller	25
3		Front Lights	20	13	CAB	Cab Switched Power	5	23	ACD	Attachments	25
4		Rear Lights	15	14		Bucket Position	15	24		Not Used	- -
5		Starter	R	15		Wiper / Washer	25	25	AUX	Auxiliary Controller	25
6		Front Lights	R	16	ACC	Switched Power and Non-SJC Back-up Alarm	25	26	DRV	Drive Controller and SJC Back-up Alarm	25
7		Heater / HVAC	R	17	ACC	Switched Power	25	27	ACC	Accessories and Front Horn	25
8	R	Rear Lights	R	18	ACD	Switched Power	25	28		Power Port	15
9		Switched Power	R	19	P	Traction	30				
10	P	Traction	R	20		Fuel Shutoff	30				

Removal And Installation (Cont'd)

Figure 60-30-12



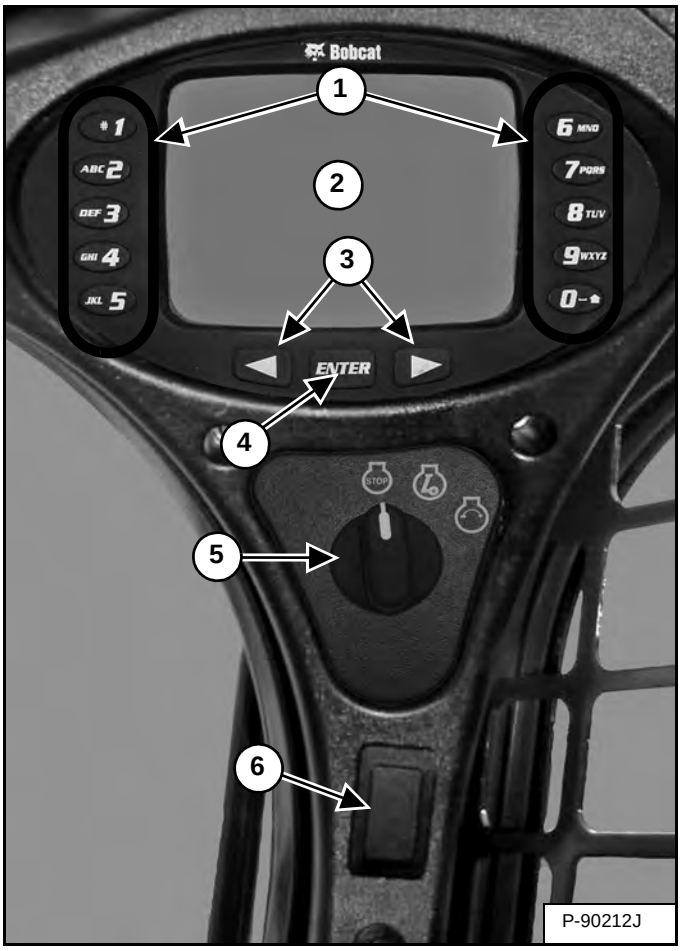
Remove the top alternator mounting bolt (Item 1) and the bottom alternator mounting bolt (Item 2) **[Figure 60-30-12]**.

Remove the belt and alternator from the loader.

INSTRUMENT PANEL IDENTIFICATION (CONT'D)

Right Panel (Deluxe Instrumentation Panel)

Figure 60-50-7



This machine may be equipped with a Deluxe Instrumentation Panel **[Figure 60-50-7]**.

1. **Keypad (1 through 0):** The keypad has two functions:

   - To enter a number code (password) to allow starting the engine.

   - To enter a number as directed for further use of the display screen.

2. **Display Screen:** The Display Screen is where all system setup, monitoring and error conditions are displayed.

3. **Scroll Buttons:** Used to scroll through display screen choices.

4. **ENTER Button:** Used to make selections on the display screen.

5. **Key Switch:** Used to turn the loaders electrical system on and off, and to start and stop the engine.

The switch location (Item 6) **[Figure 60-50-7]** can have different functions depending on machine configuration. See the following table for more information.

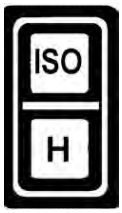
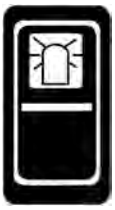
REF.	DESCRIPTION	FUNCTION / OPERATION
	ADVANCED CONTROL SYSTEM (ACS) (Option)	Press the top to select Hand Controls; bottom to select Foot Controls.
	SELECTABLE JOYSTICK CONTROLS (SJC) (Option)	Press the top to select 'ISO' Control Pattern; bottom to select 'H' Control Pattern.
	FOUR-WAY FLASHER LIGHTS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

Figure 60-50-8

Earlier models used a push button switch assembly **[Figure 60-50-8]** instead of a key switch.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DIAGNOSTIC SERVICE CODES (CONT'D)

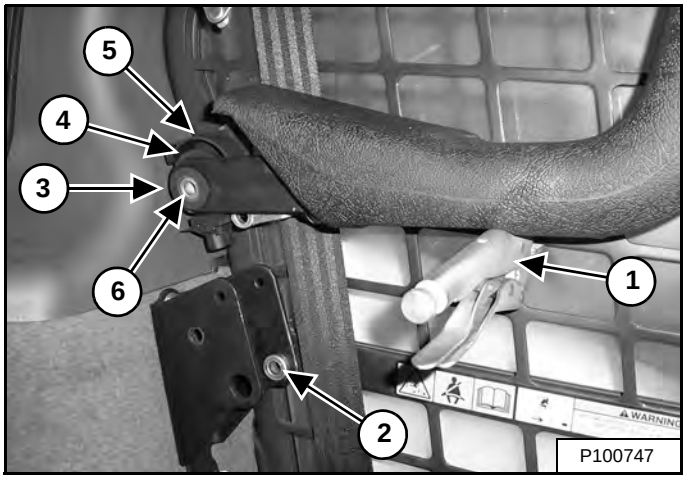
Service Codes List (Cont'd)

CODE	DESCRIPTION	CODE	DESCRIPTION
D7598	Drive controller in calibration mode	H2807	Diverter open circuit
D7599	Drive AWS controller in wheel position calibration mode	H2905	High-flow short to battery
		H2906	High-flow short to ground
H1221	Right thumb switch out of range high	H2907	High-flow open circuit
H1222	Right thumb switch out of range low	H2932	High-flow overcurrent
H1224	Right thumb switch not in NEUTRAL	H3028	Controller memory failure
H1321	Left thumb switch out of range high	H3128	Interrupted power failure
H1322	Left thumb switch out of range low	H3648	Multiple ACD conflict error
H1324	Left thumb switch not in NEUTRAL	H3904	Left joystick in error
H1421	Lift base pressure out of range high	H3912	Left joystick thumb switch not in NEUTRAL
H1422	Lift base pressure out of range low	H3913	Left joystick grip no communication
H1502	Ride control output error ON	H3916	Left joystick no communication
H1503	Ride control output error OFF	H3928	Left joystick internal failure
H1507	Ride control output open circuit	H3948	Left joystick multiple
H1528	Ride control output failure	H4004	Right joystick in error
H1602	Ride control relay error ON	H4012	Right joystick thumb switch not in NEUTRAL
H1603	Ride control relay error OFF	H4013	Right joystick grip no communication
H2005	Boost solenoid short to battery	H4016	Right joystick no communication
H2006	Boost solenoid short to ground	H4028	Right joystick internal failure
H2007	Boost solenoid open circuit	H4048	Right joystick multiple
H2032	Boost solenoid overcurrent	H4302	Horn error ON
H2105	Reverse fan solenoid short to battery	H4303	Horn error OFF
H2106	Reverse fan solenoid short to ground	H4423	Auxiliary not programmed
H2107	Reverse fan solenoid open circuit	H4497	Auxiliary controller programmed
H2132	Reverse fan solenoid overcurrent	H4502	Right blinker error ON
H2305	Rear base output short to battery	H4503	Right blinker error OFF
H2306	Rear base output short to ground	H4602	Left blinker error ON
H2307	Rear base output open circuit	H4603	Left blinker error OFF
H2332	Rear base output overcurrent	H4721	8 volt sensor supply out of range high
H2405	Rear rod output short to battery	H4722	8 volt sensor supply out of range low
H2406	Rear rod output short to ground	H4821	5 volt sensor supply out of range high
H2407	Rear rod output open circuit	H4822	5 volt sensor supply out of range low
H2432	Rear rod output overcurrent	H7404	Main controller no communication
H2505	Diverter #2 short to battery	H9004	Press to operate loader keypad no communication
H2506	Diverter #2 short to ground		
H2507	Diverter #2 open circuit	L0102	Lights button error ON
H2605	Front base output short to battery	L0202	High-flow enable / auto idle enable button error ON
H2606	Front base output short to ground	L0302	Auxiliary enable button error ON
H2607	Front base output open circuit	L0402	Information button error ON
H2632	Front base output overcurrent	L7404	Main controller no communication
H2705	Front rod output short to battery	L7672	Left display panel needs programming
H2706	Front rod output short to ground		
H2707	Front rod output open circuit	M0116	Air filter not connected
H2732	Front rod output overcurrent	M0117	Air filter plugged
H2805	Diverter short to battery	M0216	Hydraulic / Hydrostatic filter not connected
H2806	Diverter short to ground	M0217	Hydraulic / Hydrostatic filter plugged

SEAT BAR SENSOR (CONT'D)

Removal And Installation (Cont'd)

Figure 60-110-9



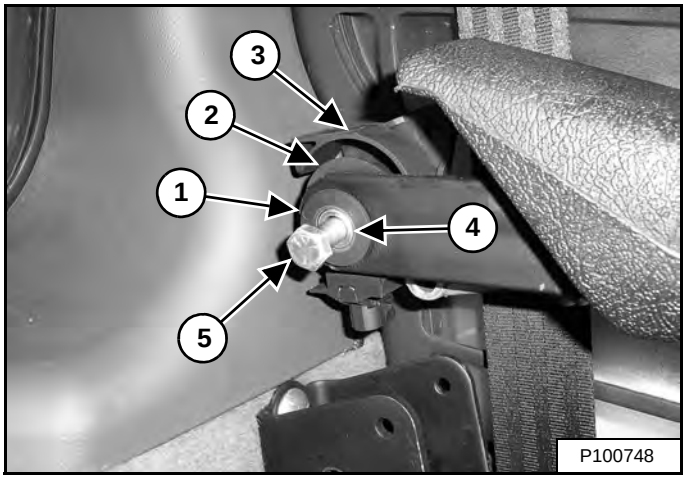
Place a soft jaw locking pliers (Item 1) **[Figure 60-110-9]** on the cab side screen to hold the seat bar above the mount.

Remove the clevis pin bushing (Item 2) **[Figure 60-110-9]**. Apply grease to the shoulder of the bushing to help retain it during assembly. Reinstall the clevis pin bushing.

Remove and dispose of the keyed bushing (Item 3), magnet bushing (Item 4), and seat bar sensor (Item 5) **[Figure 60-110-9]**.

Remove and save the metal pivot bushing (Item 6) **[Figure 60-110-9]**.

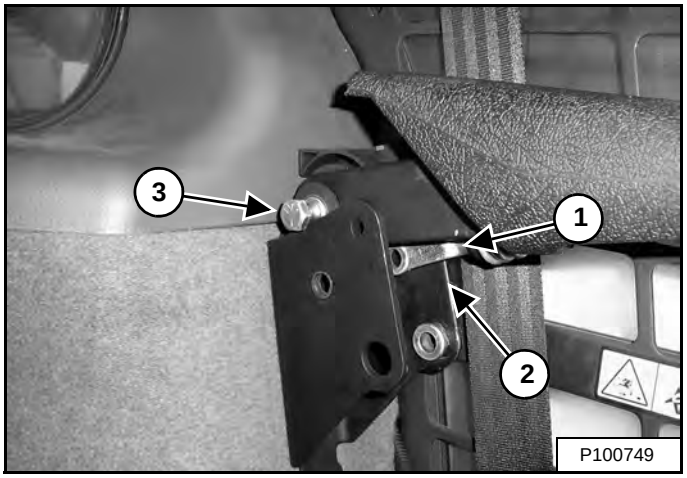
Figure 60-110-10



Install the new keyed bushing (Item 1), magnet bushing (Item 2) and seat bar sensor (Item 3). Reinstall the metal pivot bushing (Item 4) **[Figure 60-110-10]**.

NOTE: The sensor must be centered on the metal pivot bushing. When centered, the assembly will slide freely into the mount.

Figure 60-110-11

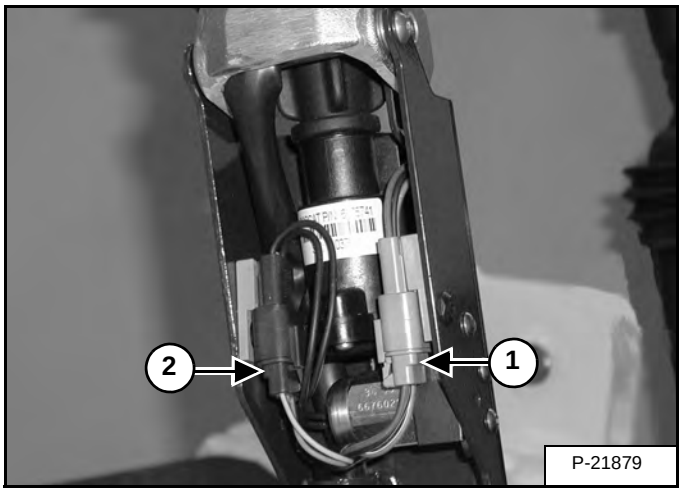


Position the clevis (Item 1) over the mount (Item 2) and lower the end of the seat bar until the mounting bolt (Item 3) **[Figure 60-110-11]** is resting on the top of the mount.

Remove the nut from the mounting bolt. Remove the mounting bolt and lower the seat bar until the seat bar and mount holes align and the clevis is over the clevis pin bushing. Reinstall the seat bar mounting bolt. Apply Loctite® 243 to the nut threads. Install the nut and tighten to 46 N•m (34 ft-lb) torque.

Switch Handle Removal

Figure 60-130-4

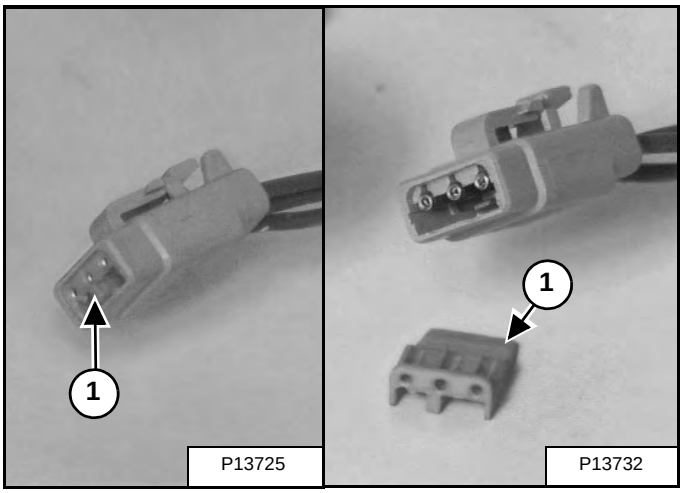


NOTE: Switch handle can be removed and installed while in loader.

Disconnect the harness connector (Item 1) **[Figure 60-130-4]** from the handle sensor connector.

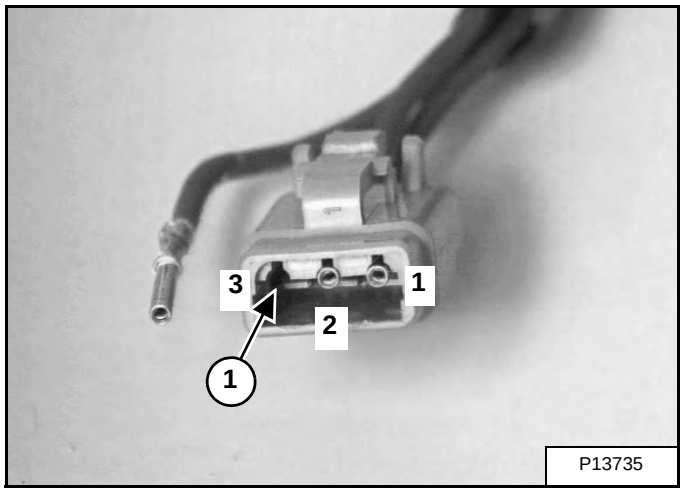
Disconnect the harness connector (Item 2) **[Figure 60-130-4]** from the handle lock solenoid connector.

Figure 60-130-5



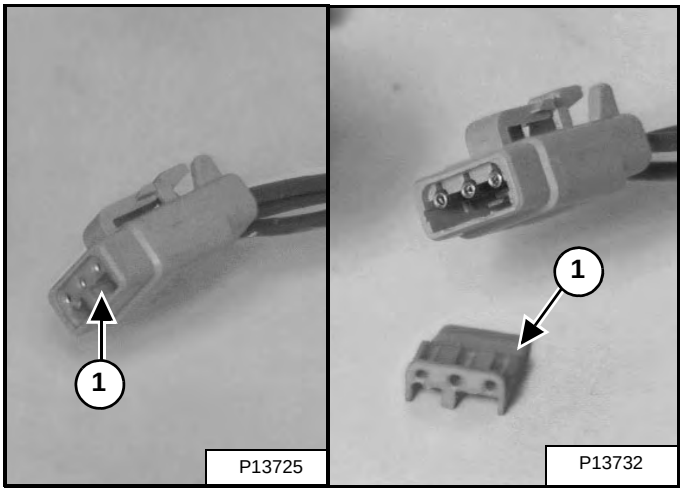
Remove the wedge (Item 1) **[Figure 60-130-5]** from the harness connector (Gray) that connects to the handle sensor connector.

Figure 60-130-6



Using a pointed tool, press down on the tab (Item 1) **[Figure 60-130-6]** and pull the wire from the connector.

Figure 60-130-7



Remove the wedge (Item 1) **[Figure 60-130-7]** from the harness connector (Black) that connects to the handle lock solenoid connector.

Identification Chart ACD Group 1

Left side Control Handle Switches	Switch Number	Solenoid Number Activated				Attachment Harness Terminal Activated	Attachment Harness Connector	RIght Side Control Handle Switches
		STD	RH	HFH	RH / HFH		Fourteen Pin Connector Viewed from front (pin side of connector) of loader.	
	1	1	1	1, 7	1,7	K		
	2	2	2	2	2	K		
	3	1	1	1, 7	1,7	K		
	4	1	1	1	1	K,M,D		
	5	1	1	1	1	K,M,C		
	6	1	1	1	1	K,M,E		
	7	1	1	1	1	K,M,F		
	8	1	1	1	1	K,M,G		
	9	1	1	1	1	K,M,H		
	10, 11, 12, 13, 14	-	--	--		K	Jumpers K,L	
B-16447								B-16448

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

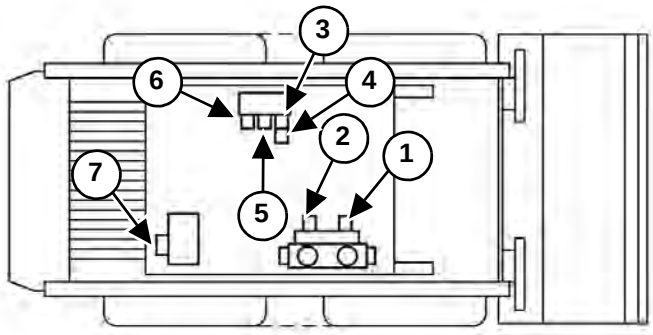
NOTE: For diagnostics and troubleshooting connect the Service PC. (See SERVICE PC (LAPTOP COMPUTER) on Page 60-150-1.)

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

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

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

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



NA1892

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

Identification Chart ACD Group 1

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

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

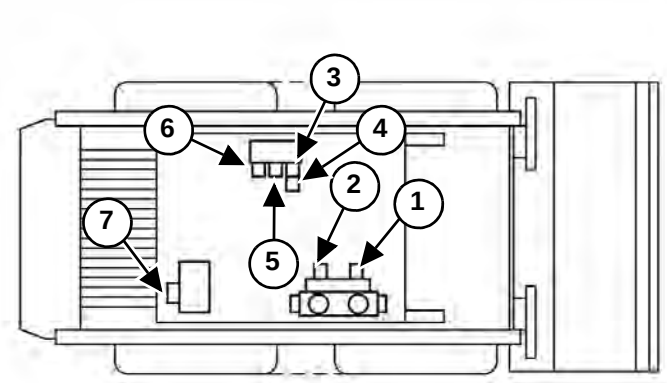
NOTE: For diagnostics and troubleshooting connect the Service PC. (See SERVICE PC (LAPTOP COMPUTER) on Page 60-150-1.)

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

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

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

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



NA1892

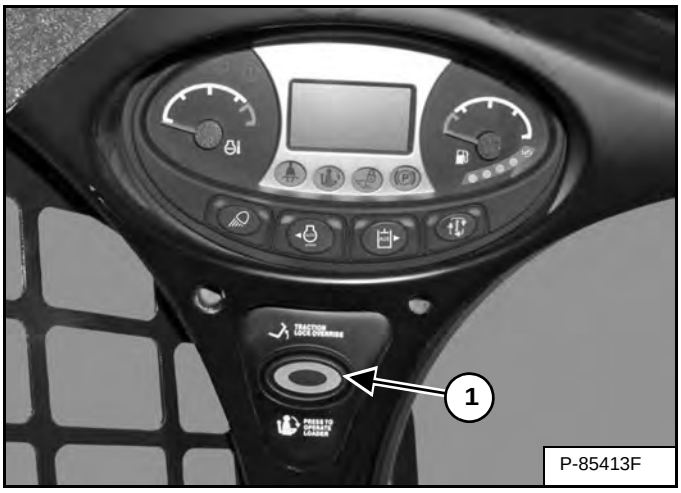
Solenoid Number	Hydraulic Coupler	Wiring Number
1	Front Male (Rod)	4330
2	Front Female (Base)	4340
3	Diverter Rear (Rod)	4430
4	Diverter Rear (Base)	4440
5	Bleed / Lock Valve (Base)	4480
6	Bleed / Lock Valve (Rod)	4450
7	High Flow on Pump	4460

Hydrostatic Pump Calibration (SJC) (Cont'd)

Figure 60-160-15

Allow the left joystick to go to the NEUTRAL position **[Figure 60-160-15]**.

Figure 60-160-16

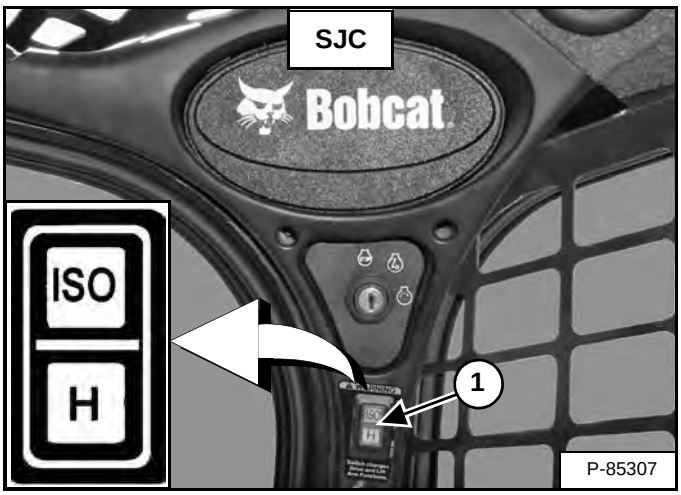


Press the PRESS TO OPERATE LOADER Button (Item 1) **[Figure 60-160-16]**.

Audible beeps will sound.

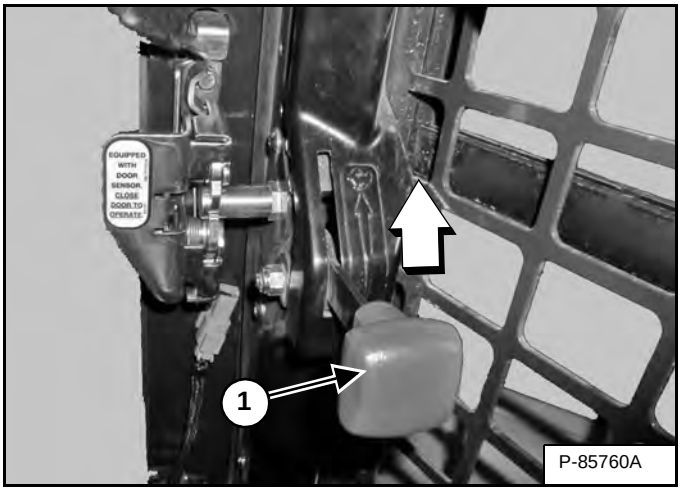
Start the engine from the RUN, RUN / ENTER position. **DO NOT TURN TO OFF POSITION**. This would cancel the calibration mode and the procedure would have to be repeated.

Figure 60-160-17



The Control Pattern ISO Switch (Item 1) **[Figure 60-160-17]** will stop flashing, and will remain ON for the rest of the calibration procedure.

Figure 60-160-18



Move the Engine Speed Control (Item 1) **[Figure 60-160-18]** to high idle.

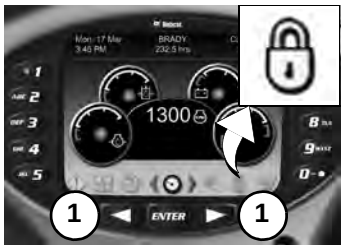
NOTE: If at any time, during calibration, the operator needs to stop the loader, turn the key OFF, lift the seat bar, or return the joystick to the NEUTRAL position.

The calibration procedure will stop.

To return to calibration mode, the operator must start the complete procedure from the beginning.

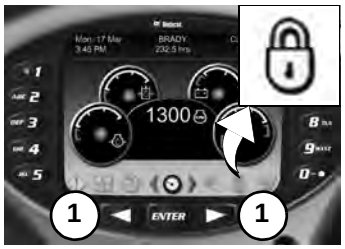
Right Panel Setup (Deluxe Instrumentation Panel) (Cont'd)

Machine Lockouts (High Flow And Two-Speed)

	Press a scroll button (Item 1) repeatedly until the Security screen icon (Inset) is highlighted.
	Select **[1. PASSWORDS / LOCKOUTS]**.
	Enter owner password and press **[ENTER]**.
	Select **[3. HIGH FLOW]**. ***OR*** Select **[4. TWO-SPEED]**.
	**HIGH FLOW** Press user number to cycle between LOCKED and UNLOCKED.
	**TWO-SPEED** Press user number to cycle between LOCKED and UNLOCKED.

NOTE: High-Flow and Two-Speed lockouts for the owner are active even if the Password Lockout feature is unlocked.

Machine Lockouts (Travel Speed) (SJC Only)

	Press a scroll button (Item 1) repeatedly until the Security screen icon (Inset) is highlighted.
	Select **[1. PASSWORDS / LOCKOUTS]**.
	Enter owner password and press **[ENTER]**.
	Select **[5. TRAVEL SPEED]**.
	**TRAVEL SPEED** Select user.
	**FORWARD / REVERSE TRAVEL SPEED LIMIT** Enter forward travel speed limit as a percentage and press **[ENTER]** to save. Enter reverse travel speed limit as a percentage and press **[ENTER]** to save.


Bobcat®

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 minutes.
- 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:

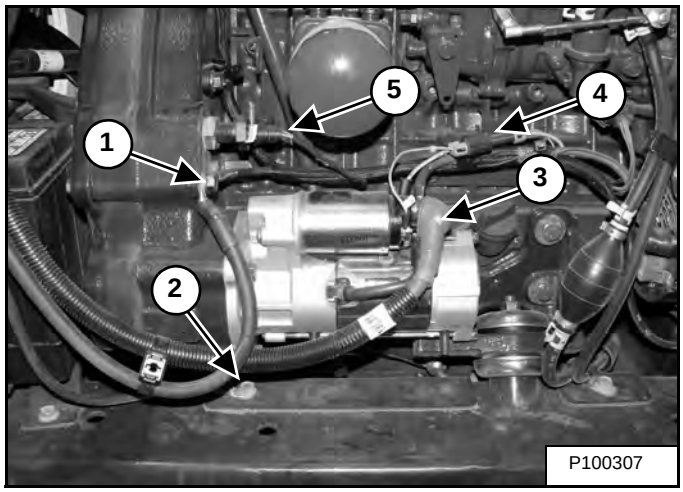
- Slow Blink - not observed, may be a very brief moment.
- Fast Blink ~ 2 minutes.
- Solid LED achieved within 2 minute.

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

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

Engine Removal And Installation (Cont'd)

Figure 70-10-4



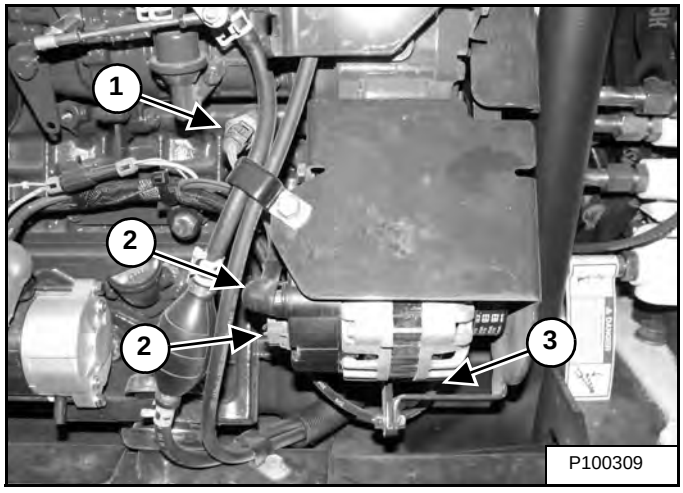
Disconnect engine ground cable (Item I) and chassis ground cable (Item 2) **[Figure 70-10-4]**.

Disconnect the engine starter positive cable (Item 3) **[Figure 70-10-4]**.

Disconnect the starter wiring harness connector (Item 4)**[Figure 70-10-4]**.

Disconnect flywheel rpm sensor (Item 5) **[Figure 70-10-4]**.

Figure 70-10-5

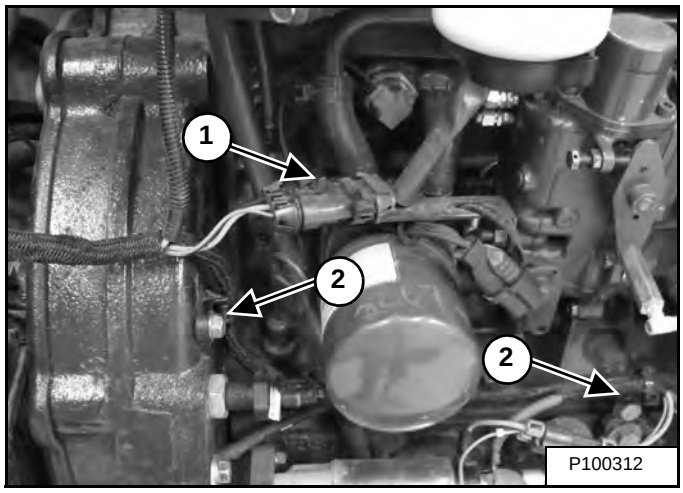


Disconnect engine oil pressure sender connector (Item 1) **[Figure 70-10-5]**.

Disconnect the alternator wiring (Item 2) **[Figure 70-10-5]**.

Disconnect the engine ground cable (Item 3) **[Figure 70-10-5]**.

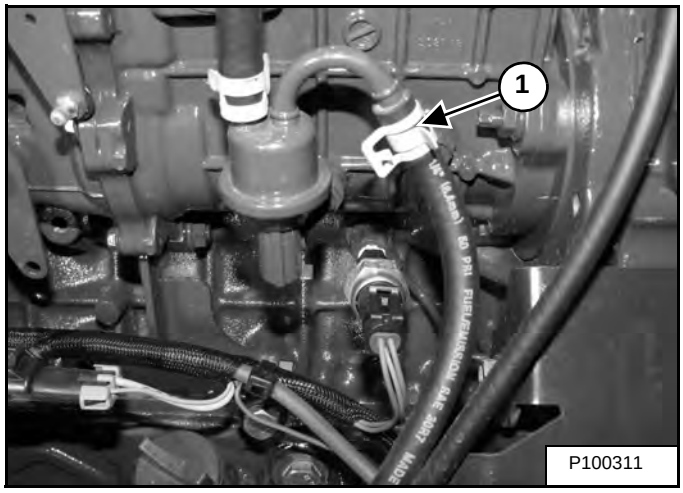
Figure 70-10-6



Disconnect fuel shut-off solenoid connector (Item 1) **[Figure 70-10-6]**.

Remove the bolts for the wiring harness hold down clamps (Item 2) **[Figure 70-10-6]**.

Figure 70-10-7

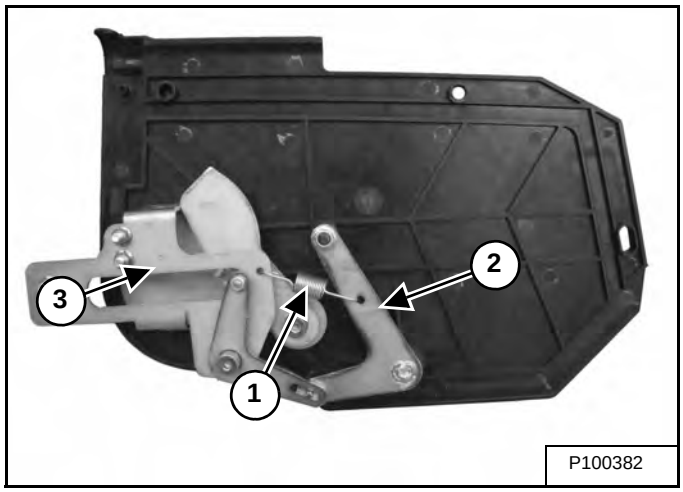


Disconnect fuel line (Item 1) **[Figure 70-10-7]** for lift pump and plug.

Engine Speed Control cable bracket removed for photo clarity.

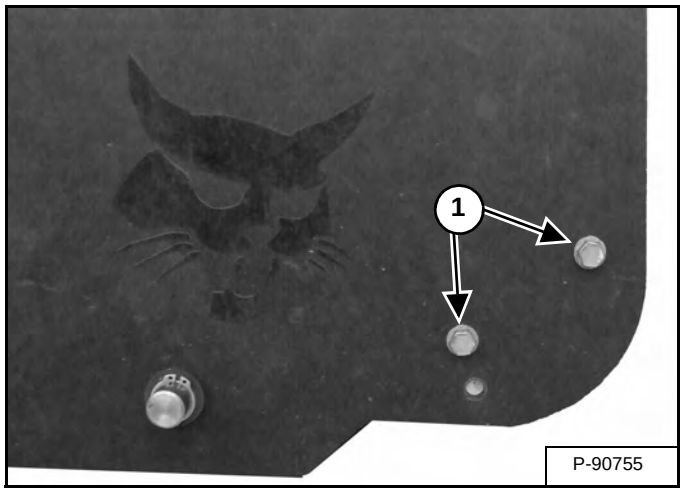
Disassembly And Assembly

Figure 70-21-5



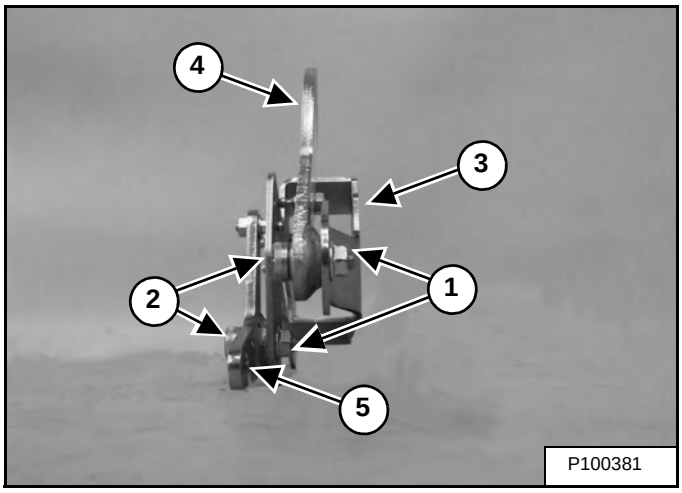
Remove the spring (Item 1) from the engine speed control foot pedal pivot assembly (Item 2) and the engine speed control hand bracket (Item 3) **[Figure 70-21-5]**

Figure 70-21-6



Remove the two bolts (Item 1) **[Figure 70-21-6]** from the engine speed control hand assembly.

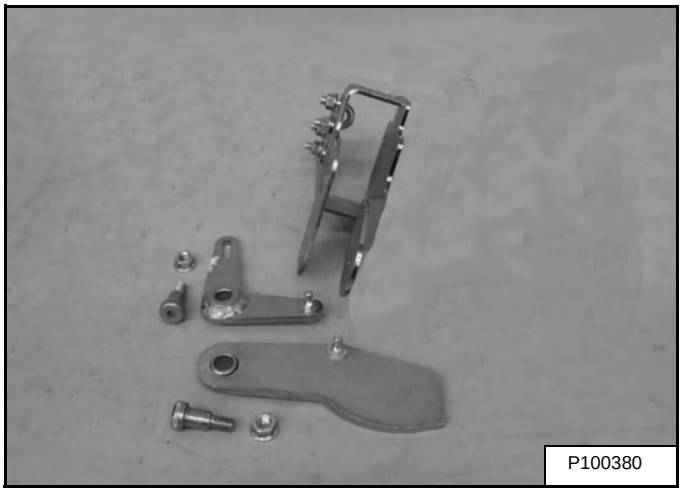
Figure 70-21-7



Remove the nuts (Item 1) and pivot bolts (Item 2) from the engine speed control hand bracket assembly (Item 3) **[Figure 70-21-7]**.

Remove the engine speed control hand cam lever (Item 4) and engine speed control cable lever Item 5) **[Figure 70-21-7]**.

Figure 70-21-8

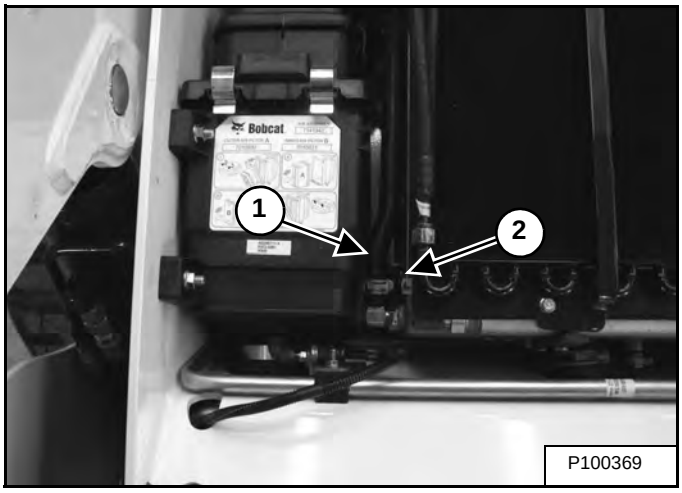


The pivot assemblies shown disassembled **[Figure 70-21-8]**.

NOTE: No lubrication is necessary or recommended on the engine speed control.

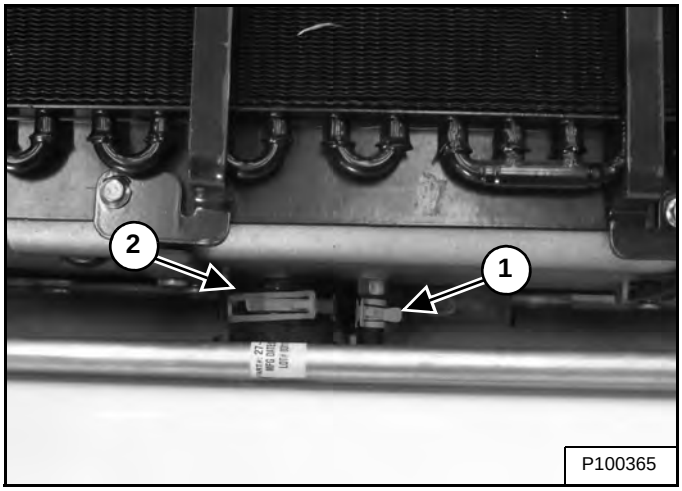
Radiator Removal And Installation (Cont'd)

Figure 70-50-4



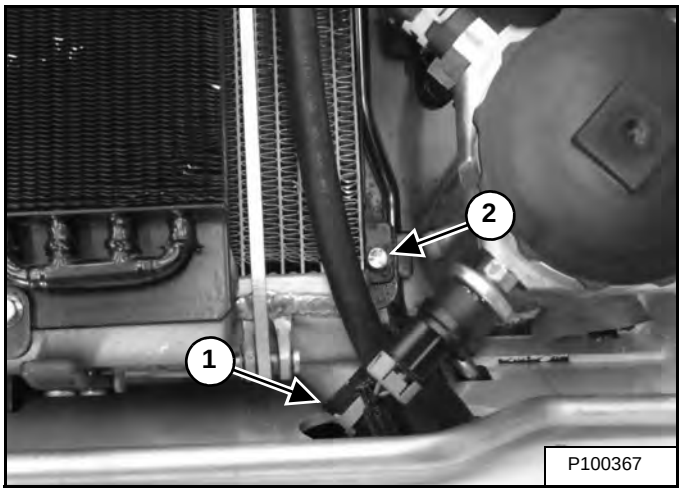
Disconnect the pressurized expansion tank fill hose (Item 1) and radiator hold down bolt (Item 2) **[Figure 70-50-4]**.

Figure 70-50-5



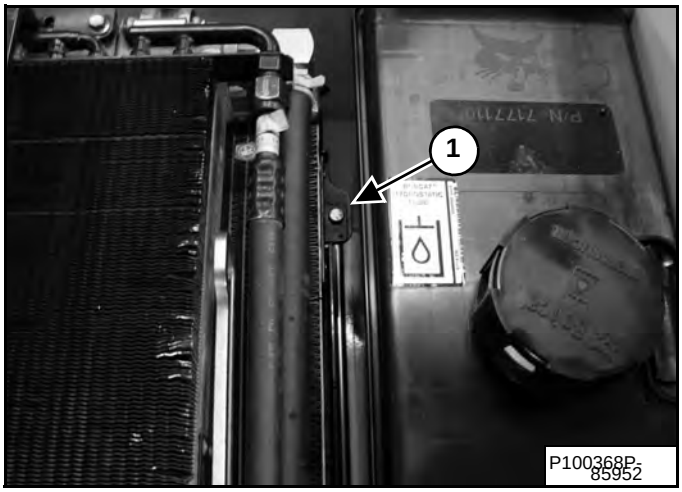
Disconnect the coolant air bleed hose (Item 1) and the radiator hose (Item 2) **[Figure 70-50-5]**.

Figure 70-50-6



Disconnect the radiator hose (Item 1) and remove the radiator hold down bolt (Item 2) **[Figure 70-50-6]**.

Figure 70-50-7



Remove radiator hold down bolt (Item 1) **[Figure 70-50-7]**.

Hydraulic Fan Motor Assembly Removal And Installation

Standard Models

IMPORTANT

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

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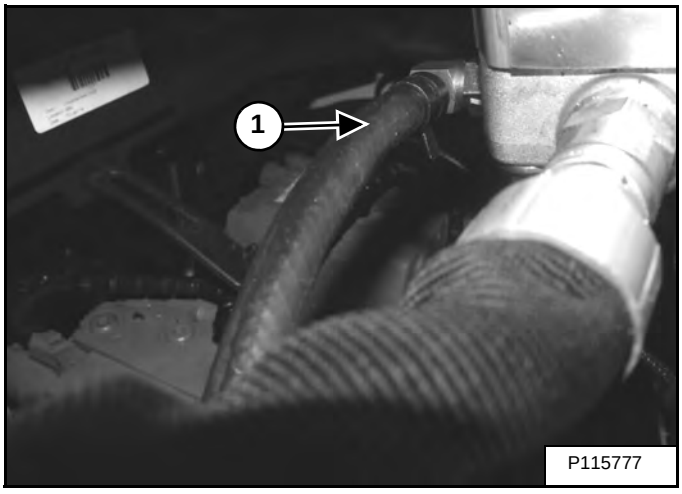
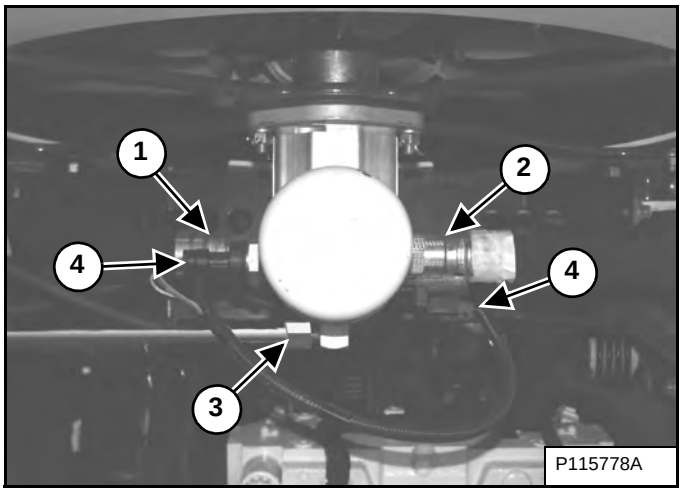
Figure 70-51-7



Remove the fan case drain hose (Item 1) **[Figure 70-51-7]** from the back of the fan motor assembly.

Figure 70-51-8

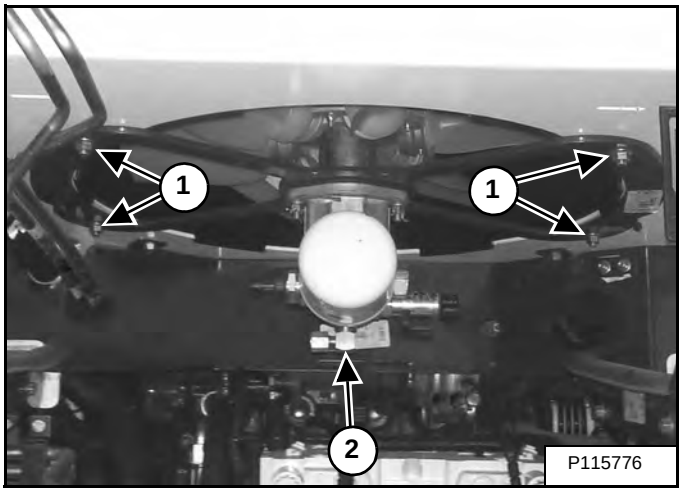


Remove the fan motor inlet hose (Item 1) and outlet hose (Item 2) **[Figure 70-51-8]**.

Remove the charge pressure tubeline (Item 3) **[Figure 70-51-8]**.

Disconnect the electrical connectors (Item 4) **[Figure 70-51-8]**.

Figure 70-51-9



Remove the four nuts (Item 1) **[Figure 70-51-9]**.

Remove fan assembly (Item 2) **[Figure 70-51-9]**.

NOTE: The fan mounting nuts are a single use part and should be replaced whenever the nuts are removed.

Blower Housing Removal And Installation

IMPORTANT

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

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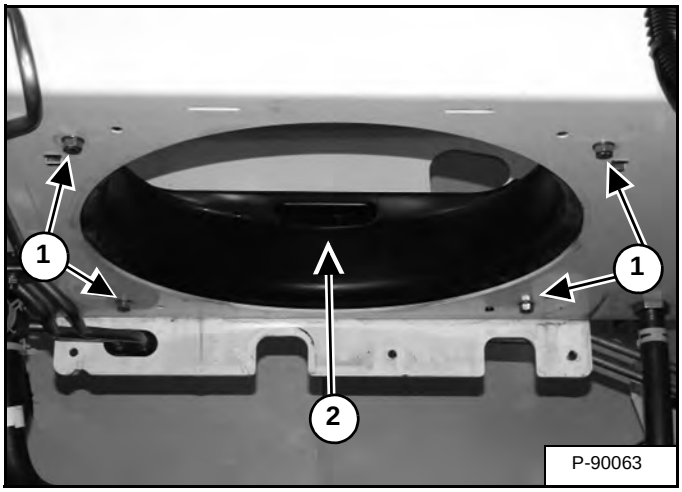
Remove the air conditioning condenser (if equipped). (See Removal And Installation on Page 80-60-1.)

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

Remove the radiator. (See Radiator Removal And Installation on Page 70-51-1.)

Figure 70-51-53



Remove the four bolts (Item 1) **[Figure 70-51-53]**.

Remove the blower housing (Item 2) **[Figure 70-51-53]** from the loader.

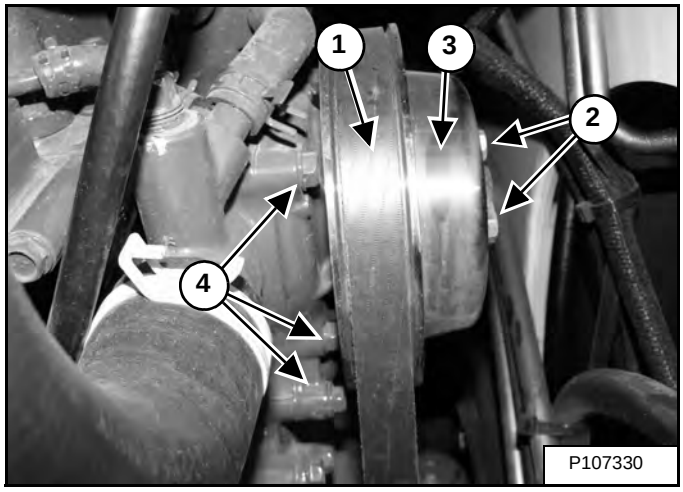
NOTE: Engine and hydraulic fan assembly removed for photo clarity.

NOTE: A seal has been installed between the radiator and the radiator mount to improve debris control in the cooling package area.

Water Pump Removal And Installation

Drain the fluid from the radiator. (See Removing And Replacing Coolant on Page 10-90-3.)

Figure 70-51-54



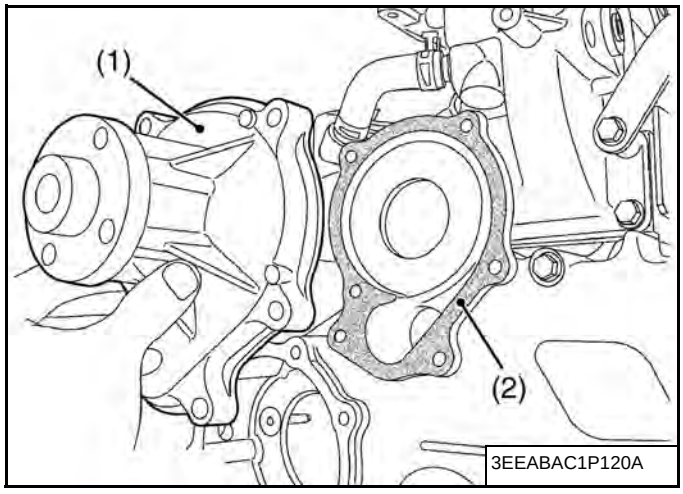
Remove the alternator belt (Item 1) **[Figure 70-51-54]**.

Remove the four bolts (Item 2) from the water pump pulley (Item 3) **[Figure 70-51-54]**.

Remove the water pump pulley (Item 3) **[Figure 70-51-54]**

Remove the six water pump bolts (Item 4) **[Figure 70-51-54]**.

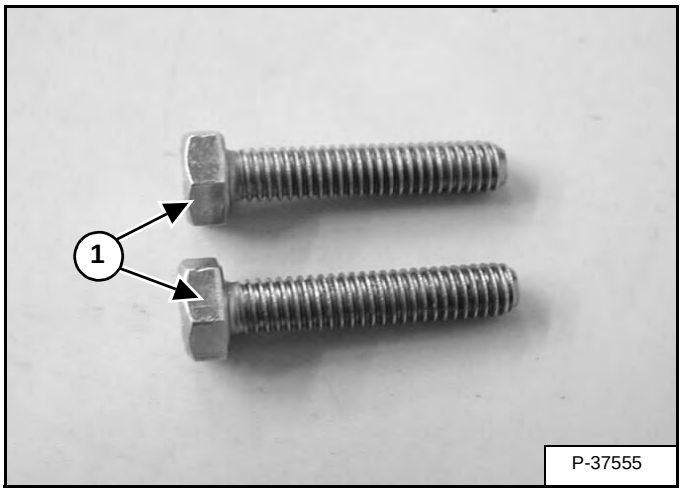
Figure 70-51-55



Remove the water pump (Item 1) and gasket (Item 2) **[Figure 70-51-55]** from the gearcase.

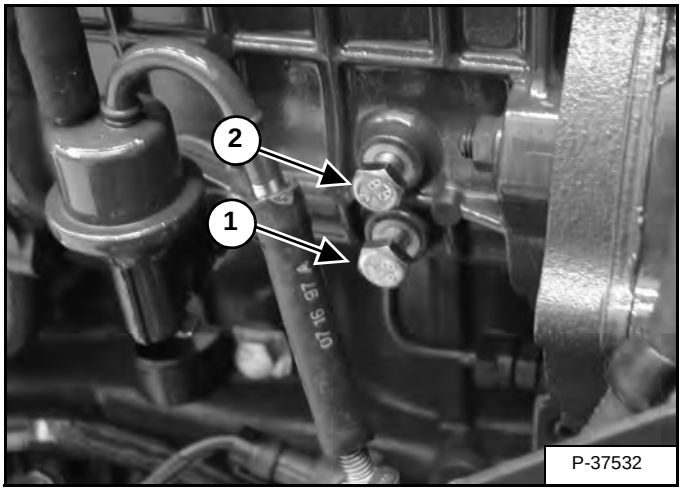
Fuel Injection Pump Assembly Removal (Cont'd)

Figure 70-70-10



Install two fuel camshaft lock bolts (Item 1 and 2) **[Figure 70-70-10]** and **[Figure 70-70-11]** that are M8 X P1.25 X L30 mm.

Figure 70-70-11

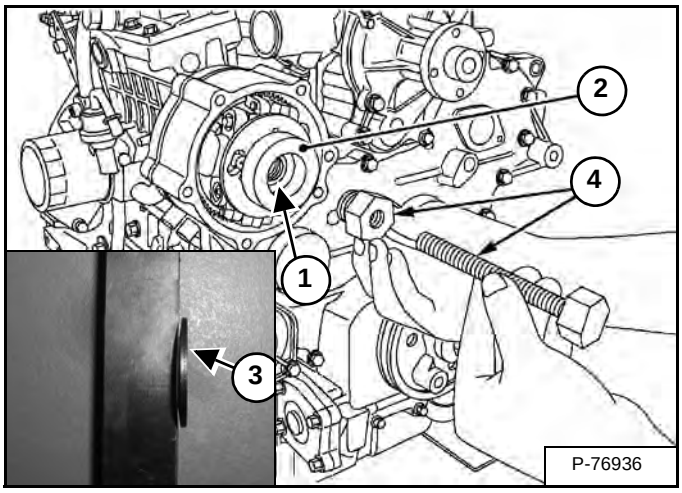


Tighten the lower fuel camshaft lock bolt (Item 1) **[Figure 70-70-11]** until it comes into contact with the fuel camshaft.

Tighten the upper fuel camshaft lock bolt (Item 2) **[Figure 70-70-11]** until it comes into contact with the fuel camshaft.

NOTE: Do not over tighten the lock bolts when in contact with the camshaft.

Figure 70-70-12

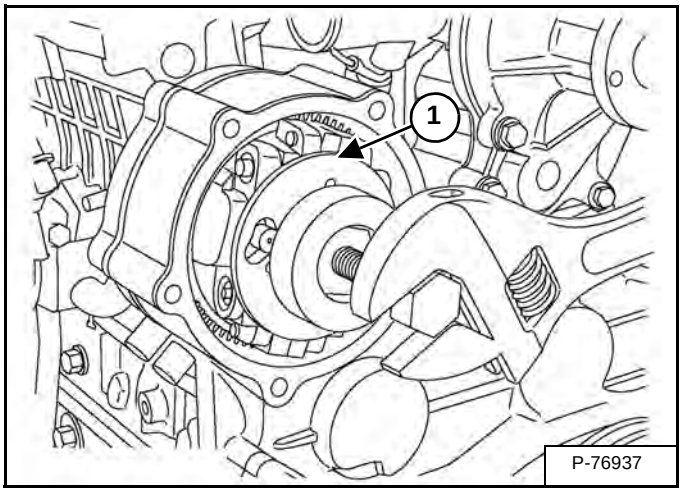


Remove the timer gear nut and washer (Item 1) from the timer gear (Item 2) **[Figure 70-70-12]**.

Install the timer gear puller (Item 4) onto the timer gear (Item 2) **[Figure 70-70-12]**.

Installation: Install the washer with the concave surface (Item 3) **[Figure 70-70-12]** towards the timer gear.

Figure 70-70-13

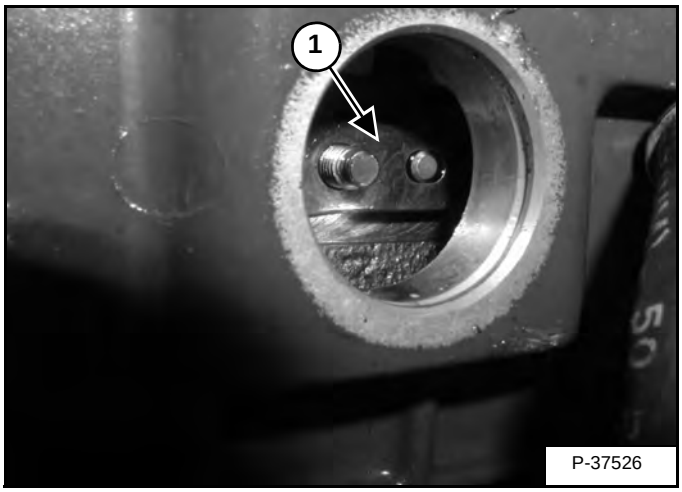


Remove the timer gear (Item 1) **[Figure 70-70-13]**.

NOTE: Timer Gear is not serviceable. If timer gear is damaged the entire assembly must be replaced.

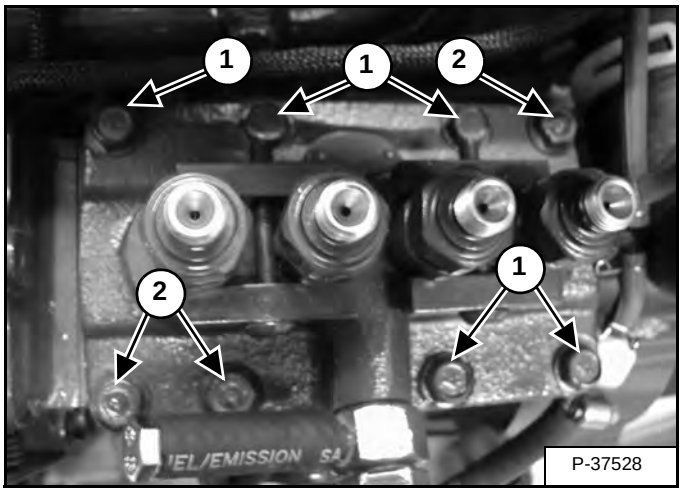
Fuel Injection Pump Removal (Cont'd)

Figure 70-70-51



Disconnect the governor connecting rod (Item 1) **[Figure 70-70-51]** from the fuel injection pump.

Figure 70-70-52

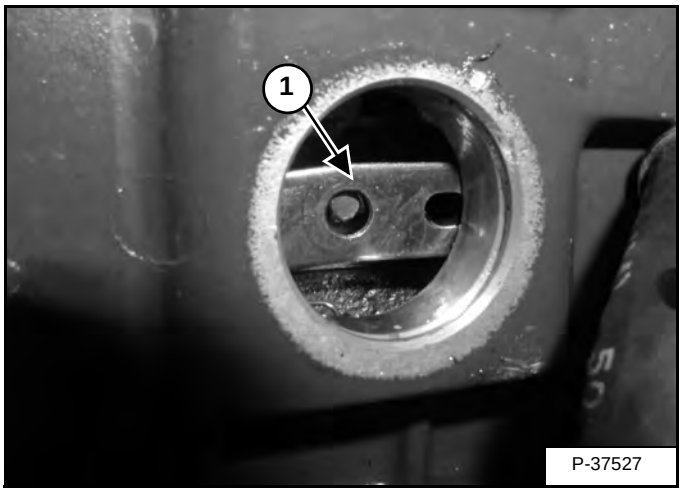


Remove the five fuel injection pump mounting bolts (Item 1) **[Figure 70-70-52]**.

Remove the three fuel injection pump mounting nuts (Item 2) **[Figure 70-70-52]**.

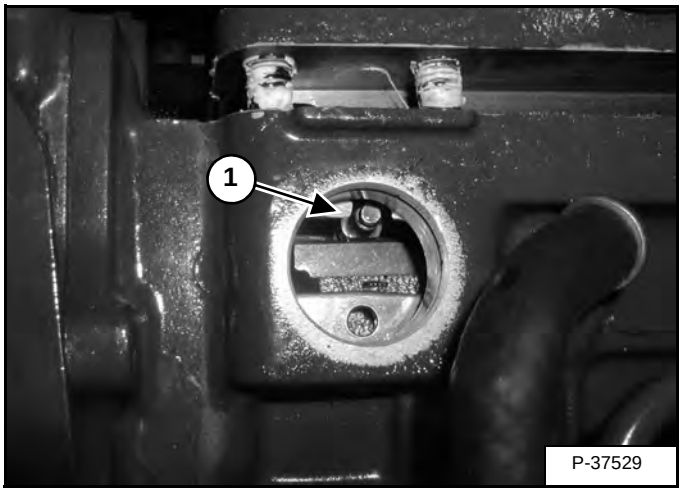
Installation: Tighten the fuel injection pump mounting bolts to 24 - 28 N•m (17 - 20 ft-lb) torque. Tighten the fuel injection pump mounting nuts to 18 - 21 N•m (13 - 15 ft-lb) torque.

Figure 70-70-53



With the fuel injection pump mounting bolts and nuts loose, be sure the governor connecting rod (Item 1) **[Figure 70-70-53]** clears the pin on the fuel injection pump.

Figure 70-70-54



Align the pin on the fuel injection pump (Item 1) **[Figure 70-70-54]** with the notch in the housing.

Remove the fuel injection pump from the fuel injection pump housing.

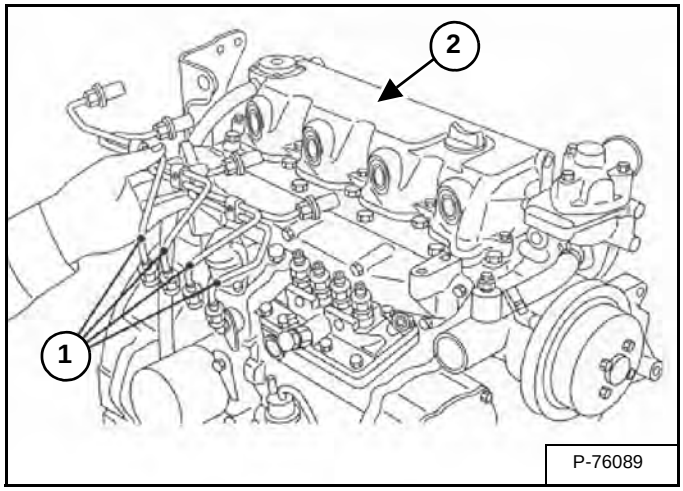
NOTE: When taking out the fuel injection pump, be careful not to hit it against the governor connecting rod.

CYLINDER HEAD (CONT'D)

Valve Clearance Adjustment

NOTE: Valve clearance must be checked and adjusted when engine is cold.

Figure 70-80-5

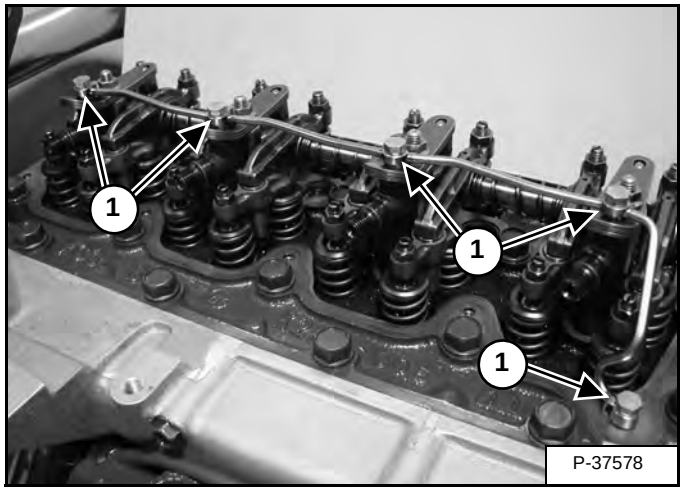


Remove the high pressure tubelines (Item 1) and the valve cover (Item 2) **[Figure 70-80-5]**.

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

Installation: Tighten the cylinder head valve cover bolts to 6,9 - 11,2 N•m (5.1 - 8.31 ft-lb) torque.

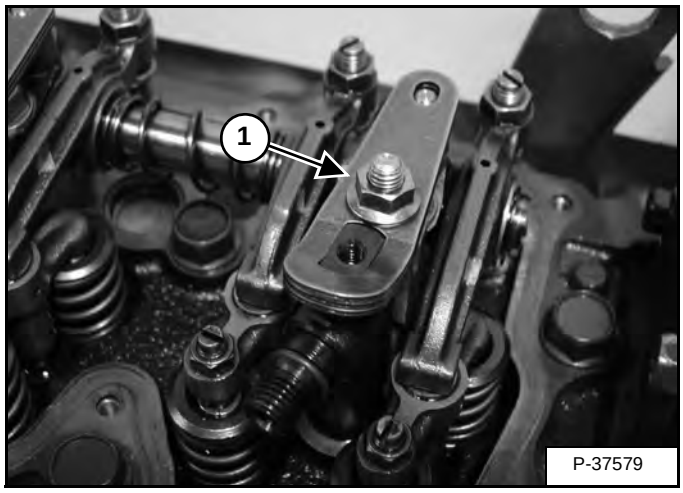
Figure 70-80-6



Remove the five over flow pipe retaining bolts (Item 1) **[Figure 70-80-6]**.

Installation: Tighten the retaining bolts to 9,8 - 11,2 N•m (7.24 - 8.31 ft-lb) torque.

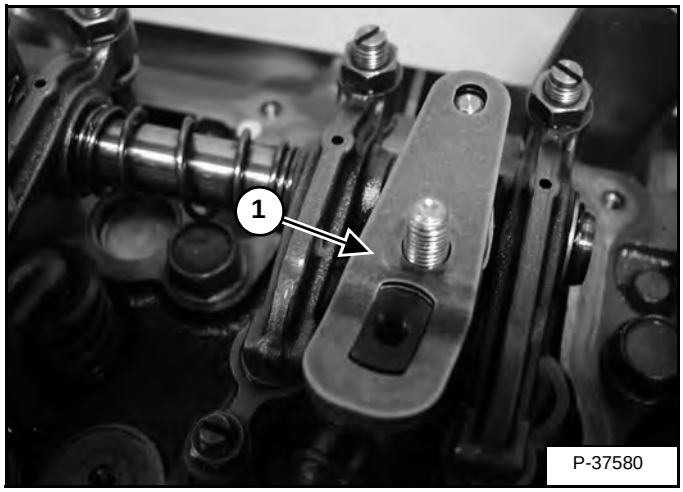
Figure 70-80-7



Remove the nut (Item 1) **[Figure 70-80-7]** from the injector nozzle holder clamp.

Installation: Tighten the injector nozzle holder clamp nut to 18 - 20 N•m (13 - 15 ft-lb) torque.

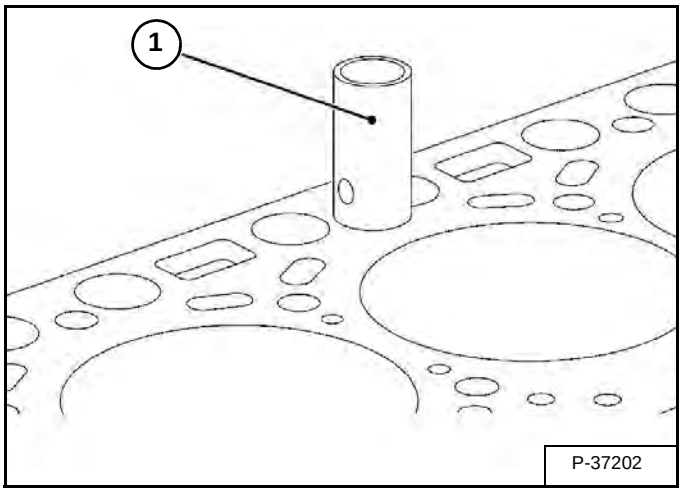
Figure 70-80-8



Remove the nozzle holder clamps (Item 1) **[Figure 70-80-8]** from the injector nozzle.

Valve Tappets

Figure 70-80-40

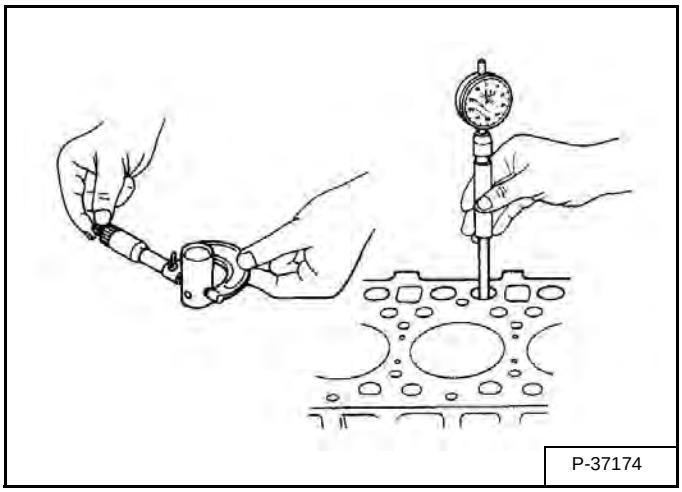


Remove the tappets (Item 1) **[Figure 70-80-40]** from the crankcase.

Before installing the tappets (Item 1) **[Figure 70-80-40]**, apply engine oil to aid in assembly and initial startup.

NOTE: Mark the cylinder number to the tappets to prevent interchanging.

Figure 70-80-41



Measure the tappet O.D. with an outside micrometer **[Figure 70-80-41]**.

Measure the I.D. of the tappet guide bore with a cylinder gauge, and calculate the oil clearance **[Figure 70-80-41]**.

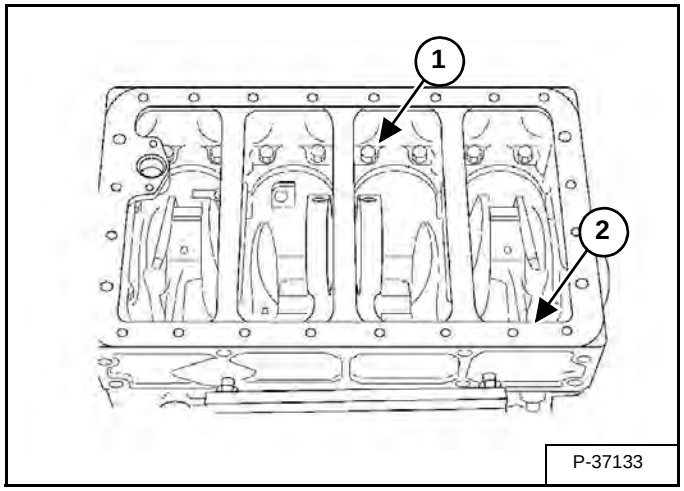
If the oil clearance exceeds the allowable limit or the tappet is damaged, replace the tappet.

Oil clearance between tappet and guide	Factory spec.	0,020 - 0,062 mm (0.00079 - 0.0024 in)
	Allowable limit	0,07 mm (0.003 in)

Tappet O.D.	Factory spec.	23,959 - 23,980 mm (0.94327 - 0.94409 in)
Tappet guide I.D.	Factory spec.	24,000 - 24,021 mm (0.94489 - 0.94570 in)

Crankshaft And Bearings Removal (Cont'd)

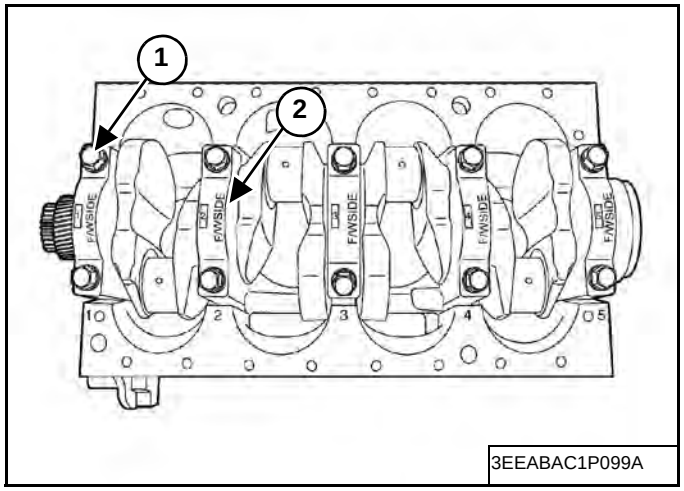
Figure 70-90-24



Remove the bolts (Item 1) that secure the crankcase 2 **[Figure 70-90-24]** to crankcase 1.

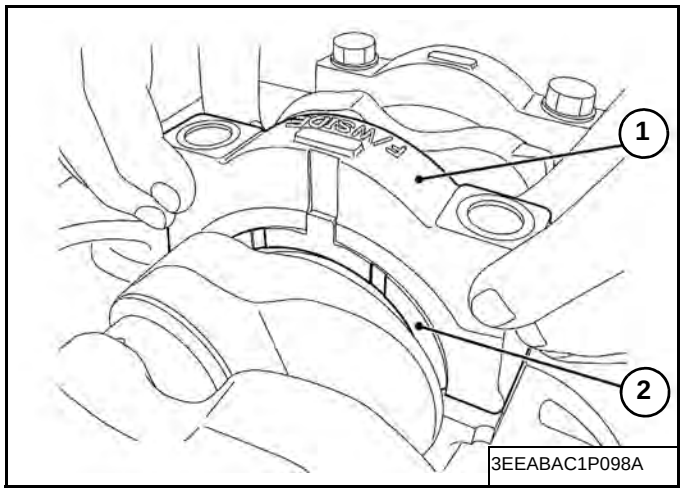
Remove the crankcase 2 (Item 2) **[Figure 70-90-24]**.

Figure 70-90-25



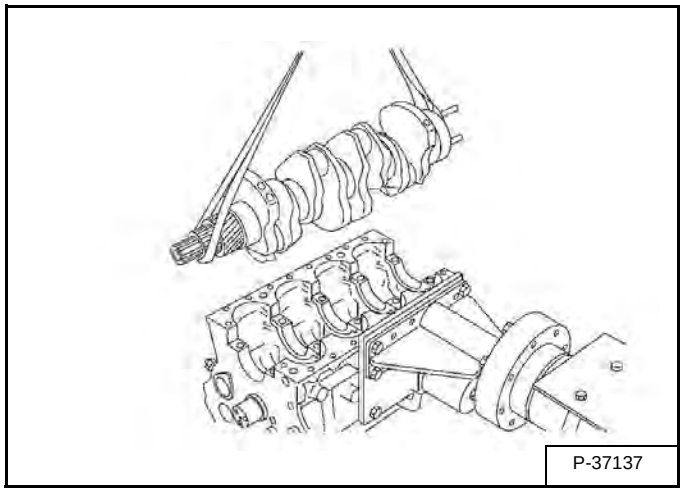
Remove the bolts (Item 1) and the bearing cases (Item 2) **[Figure 70-90-25]** from crankcase 1.

Figure 70-90-26



Remove the fourth bearing case (Item 1) and the thrust bearing (Item 2) **[Figure 70-90-26]**.

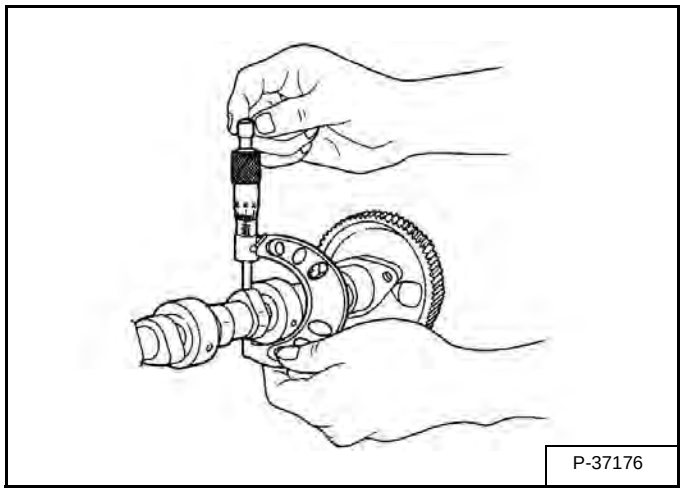
Figure 70-90-27



Remove the crankshaft **[Figure 70-90-27]**.

Camshaft - Servicing (Cont'd)

Figure 70-100-10

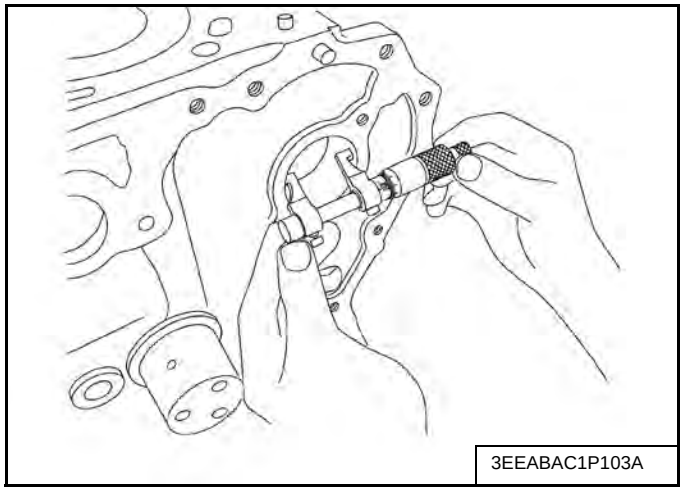


Measure the height of the camshaft lobe at its highest point with an outside micrometer **[Figure 70-100-10]**.

If the measurement is less than the allowable limit, replace the camshaft.

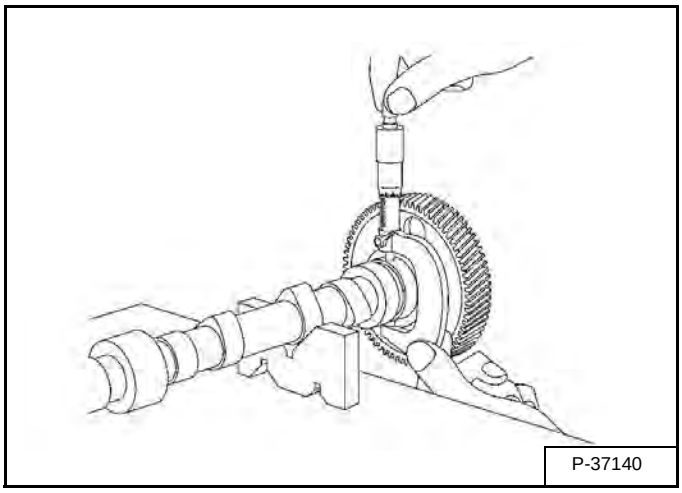
Intake and exhaust camshaft lobe height	Factory spec.	Intake valve	37,63 mm (1.481 in)
		Exhaust valve	38,96 mm (1.534 in)
	Allowable limit	Intake valve	37,13 mm (1.462 in)
		Exhaust valve	38,46 mm (1.514 in)

Figure 70-100-11



Measure the cylinder block bore I.D. for camshaft with an inside micrometer **[Figure 70-100-11]**.

Figure 70-100-12



Measure the camshaft journal O.D. with an outside micrometer **[Figure 70-100-12]**.

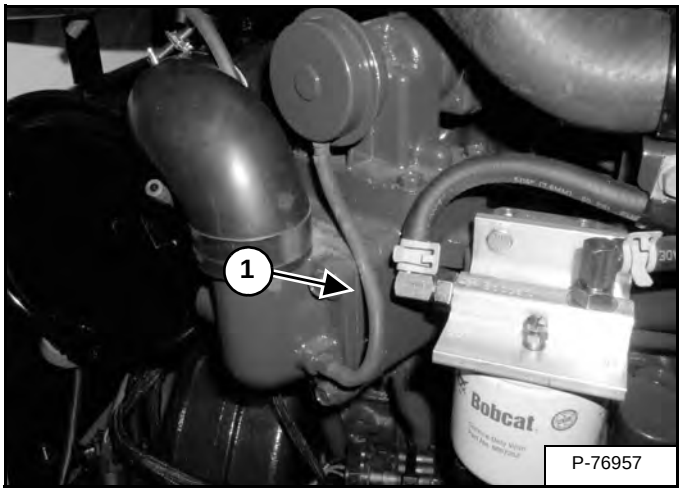
If the clearance exceeds the allowable limit, replace the camshaft.

Oil clearance of camshaft journal	Factory spec.	0,050 - 0,091 mm (0.0020 - 0.0035 in)
	Allowable limit	0,15 mm (0.0059 in)

Camshaft journal O.D.	Factory spec.	45.934 - 45.950 mm (1.8084 - 1.8091 in)
Camshaft journal I.D.	Factory spec.	46.000 - 46.025 mm (1.8110 - 1.8120 in)

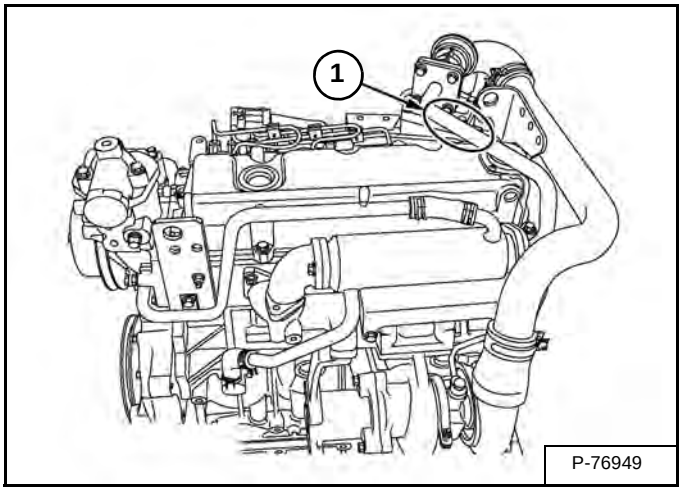
Testing (Cont'd)

Figure 70-130-7



Connect a hose (Item 1) **[Figure 70-130-7]** directly between the intake manifold and the EGR valve.

Figure 70-130-8



Measure the surface temperature of the EGR pipe (Item 1) **[Figure 70-130-8]** with an Infrared Thermometer.

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

If the surface temperature of the EGR pipe is 50°C (122°F) or below, the EGR valve has failed.

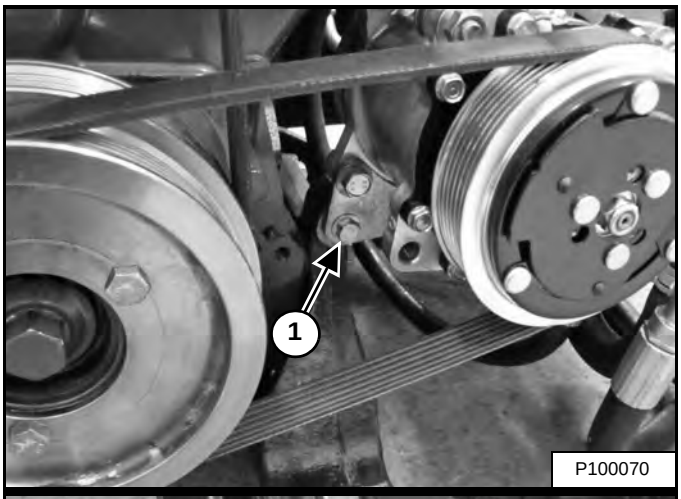
Compressor Drive Belt Adjustment

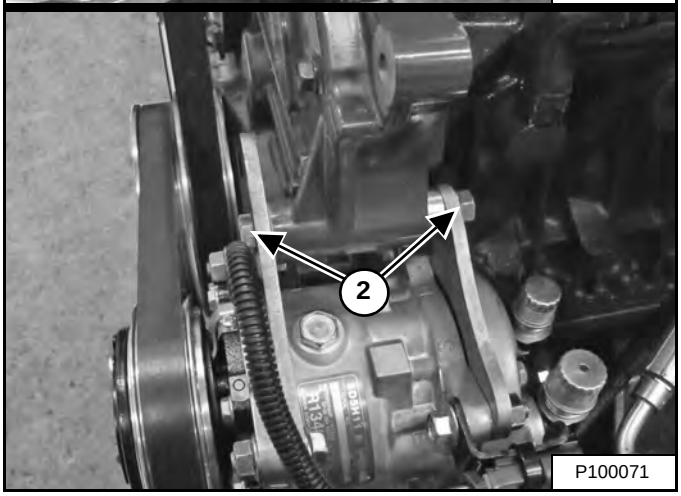
The air conditioning belt is a special maintenance free type that is pretensioned over the pulleys. This belt eliminates the need for a tensioning device and does not require periodic adjustment.

Compressor Drive Belt Replacement

Stop the engine and open the rear door.

Figure 80-20-3





NOTE: The engine is shown removed for visual clarity.

Remove the bottom air conditioning compressor mounting bolt (Item 1) **[Figure 80-20-3]**.

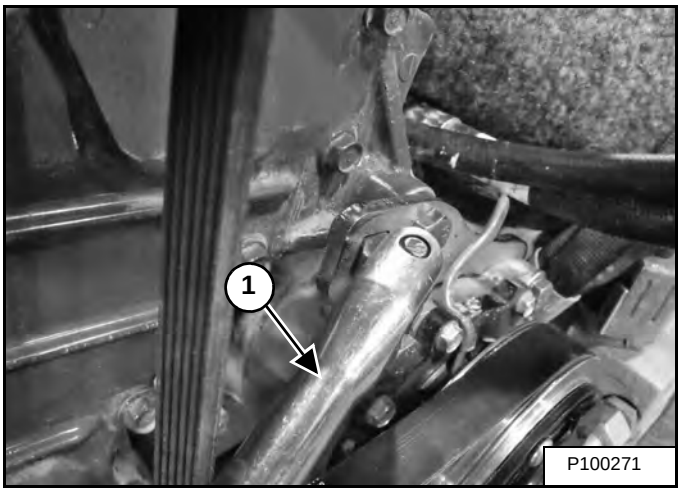
Loosen the top air conditioning compressor mounting nut and bolt (Item 2) **[Figure 80-20-3]**.

Move the air conditioning compressor toward the engine as far as it will go and remove the belt from the pulleys.

Inspect the pulleys for wear.

Install new belt.

Figure 80-20-4



Insert a breaker bar (Item 1) **[Figure 80-20-4]** into the square opening provided in the air conditioning compressor bracket as shown. Move the breaker bar down until the bottom air conditioning compressor mounting bolt (Item 1) **[Figure 80-20-3]** can be installed.

Tighten the mounting nut and bolts (Items 1 and 2) **[Figure 80-20-3]**.

Close the rear door.

Condenser

The condenser should be cleaned with the oil cooler and the radiator.

Air Conditioning Lubrication

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

Temperature / Pressure Chart (Cont'd)

Evaporator

Pressures represent gas temperatures inside the coil. not the coil surface. For an estimate of the temperature of the air coming off the coil add 4,5 - 5,5°C (8 - 10°F) to the temperature on the chart.

Condenser

Temperatures are not ambient temperatures but condensing temperatures. Add 4,4°C (40°F) to the ambient temperature to get the condensing temperature and then refer to the pressure chart to see appropriate pressure for ambient temperature.

Example: Ambient Temperature = 90°F
90°F
+40°F
130°F condenser temperature = 200 psig

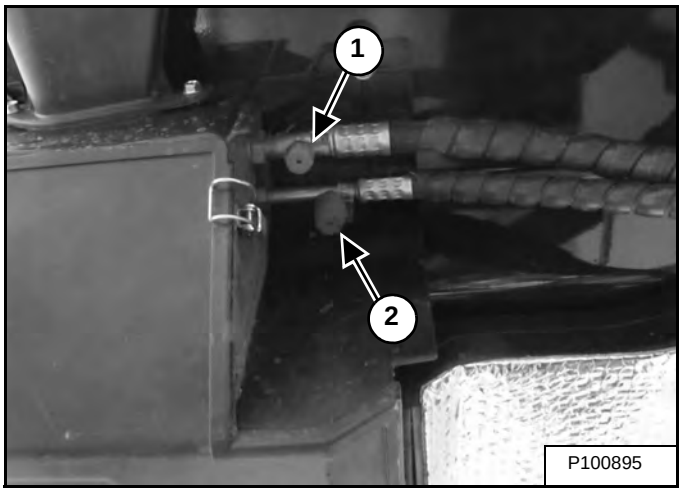
Conditions and pressures will vary from system to system.

Reclamation And Charging With Recovery / Charging Unit

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

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

Figure 80-40-2



Locate the low pressure port (Item 1), and high pressure port (Item 2) **[Figure 80-40-2]**.

⚠ WARNING

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

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IMPORTANT: Only trained technicians should perform the reclaiming and recharging.

⚠ WARNING

HFC R-134a refrigerant can be dangerous if not properly handled. Liquid R-134a may cause blindness if it contacts the eyes and may cause serious frostbite if it contacts the skin.

- **Gaseous R-134a becomes lethal (phosgene) gas when it contacts open flame or very hot substances.**
- **NEVER SMOKE when there is the possibility of even small amounts of R-134a in the air.**

Any servicing work that involves release or addition of R-134a to the system must be done by a competent refrigeration dealer who has the proper equipment, knowledge, and experience to service refrigeration equipment.

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Figure 80-40-3

Use an approved recovery / charging unit **[Figure 80-40-3]** to evacuate the system.