Bobcat®

Service Manual

S530

Skid-Steer Loader

S/N A7TV11001 & Above
S/N B42811001 & Above

6989670enUS (12-20) (G)

Printed in U.S.A.

MEA CIS iT4

The dealer and owner / operator review the recommended uses of the product when delivered. If the owner / operator will be using the machine for a different application(s) he or she must ask the dealer for recommendations on the new use.

Call Before You Dig

Dial 811 (USA Only)
1-888-258-0808 (USA & Canada)

When you call, you will be directed to a location in your state / province, or city for information about buried lines (telephone, cable TV, water, sewer, gas, etc.).

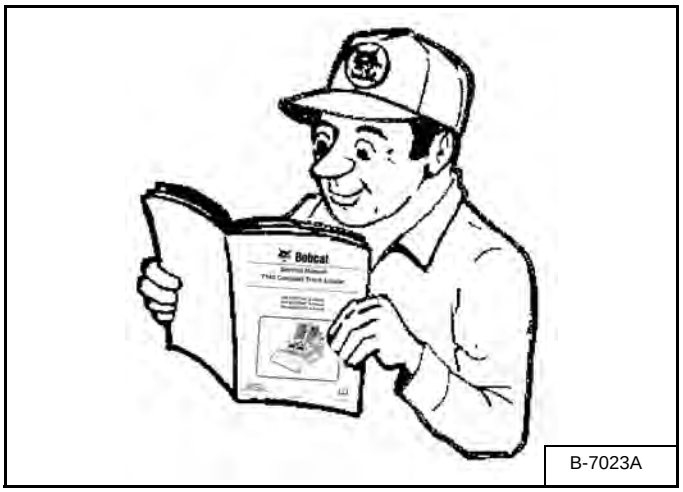
Cutting or drilling concrete containing sand or rock containing quartz may result in exposure to silica dust. Do not exceed Permissible Exposure Limits (PEL) to silica dust as determined by OSHA or other job site Rules and Regulations. Use a respirator, water spray or other means to control dust. Silica dust can cause lung disease and is known to the state of California to cause cancer.

SI SSL-1016SM

LIFTING AND BLOCKING THE LOADER

Procedure

Figure 10-10-1



WARNING

AVOID INJURY OR DEATH

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

W-2003-0807

Read the Removal And Installation, Disassembly And Assembly, etc. completely to become familiar with the procedure before beginning **[Figure 10-10-1]**.

Always park the loader on a level surface.

WARNING

MACHINE FALLING OR MOVING CAN CAUSE SERIOUS INJURY OR DEATH

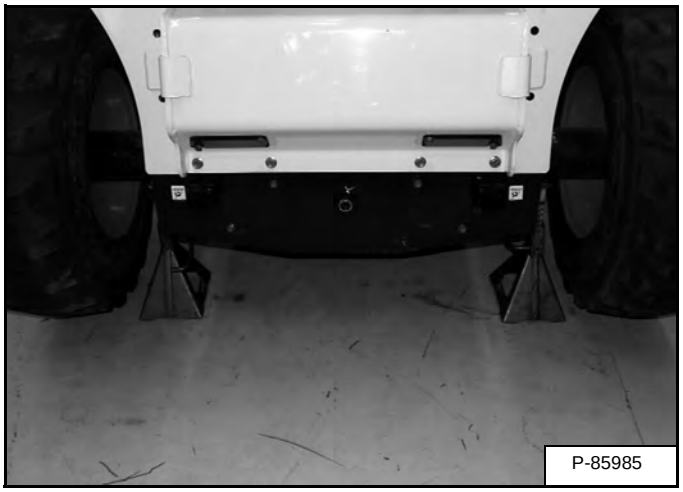
Put jackstands under the front and rear of the machine before running engine for service.

W-2718-0208

Figure 10-10-2

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

Figure 10-10-3



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

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

NOTE: The lift arms are raised for photo clarity.


Bobcat®

REMOTE START TOOL (SERVICE TOOL) KIT - 7217666

Description

The Remote Start Tool (Service Tool) Kit is a replacement tool for MEL1563 Remote Start Tool and MEL1400B - BOSS® Diagnostic Tool.

The Remote Start Tool (Service Tool) Kit, P/N 7217666, can be used to service newer loaders using the supplied harness P/N 6689747.

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

Replacing Filters (Cont'd)

Inner Filter

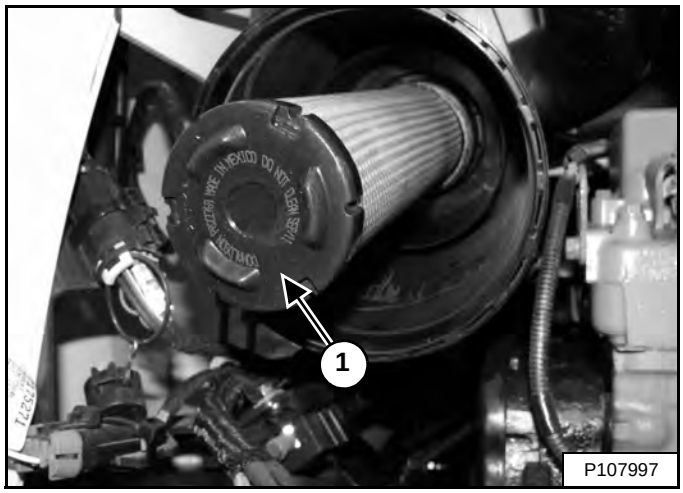
Replace the inner filter only under the following conditions:

- Replace the inner filter every *third* time the outer filter is replaced.
- After the outer filter has been replaced, start the engine and operate at full rpm. If service code **[M0117]** (Air Filter Plugged) is still displayed in the data display, replace the inner filter.

Stop the engine and open the rear door.

Remove the cover **[Figure 10-80-2]** and the outer filter **[Figure 10-80-3]**.

Figure 10-80-4



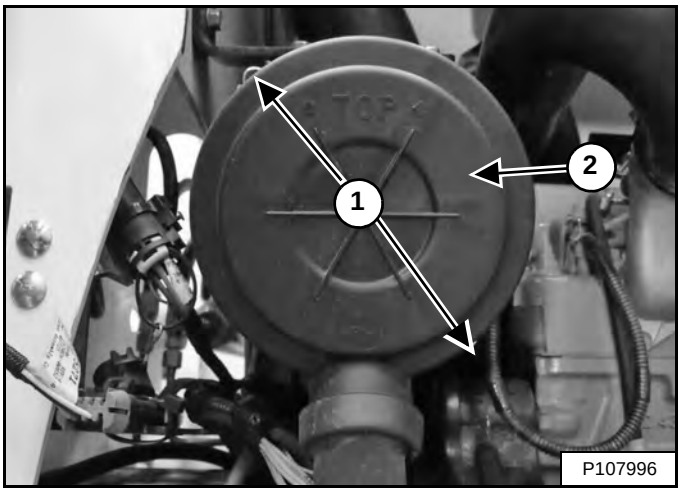
Remove the inner filter (Item 1) **[Figure 10-80-4]**.

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

Install new inner filter. Push in until the filter contacts the base of the housing.

Install the outer filter **[Figure 10-80-3]**.

Figure 10-80-5



Install the cover (Item 2) and secure the latches (Item 1) **[Figure 10-80-5]**.

Close the rear door.

FUEL SYSTEM

Fuel Specifications

NOTE: Contact your local fuel supplier to receive recommendations for your region.

U.S. Standard (ASTM D975)

Use only clean, high quality diesel fuel, Grade Number 2-D or Grade Number 1-D.

Ultra low sulfur diesel fuel must be used in this machine. Ultra low sulfur is defined as 15 mg/kg (15 ppm) sulfur maximum.

The following is one suggested blending guideline that should prevent fuel gelling during cold temperatures:

TEMPERATURE	GRADE 2-D	GRADE 1-D
Above -9°C (+15°F)	100%	0%
Down to -21°C (-5°F)	50%	50%
Below -21°C (-5°F)	0%	100%

NOTE: Biodiesel blend fuel may also be used in this machine. Biodiesel blend fuel must contain no more than 5% biodiesel mixed with ultra low sulfur petroleum based diesel. This biodiesel blend fuel is commonly marketed as B5 blended diesel fuel. B5 blended diesel fuel must meet ASTM specifications.

E.U. Standard (EN590)

Use only clean, high quality diesel fuel that meets the EN590 specifications listed below:

- Ultra low sulfur diesel fuel defined as 10 mg/kg (10 ppm) sulfur maximum
- Diesel fuel with cetane number of 51.0 and above.

NOTE: Biodiesel blend fuel may also be used in this machine. Biodiesel blend fuel must contain no more than 7% biodiesel mixed with ultra low sulfur petroleum based diesel. This biodiesel blend fuel is commonly marketed as B7 blended diesel fuel. B7 blended diesel fuel must meet EN590 specifications.

Biodiesel Blend Fuel

Biodiesel blend fuel has unique qualities that should be considered before using in this machine:

- Cold weather conditions can lead to plugged fuel system components and hard starting.
- Biodiesel blend fuel is an excellent medium for microbial growth and contamination that can cause corrosion and plugging of fuel system components.
- Use of biodiesel blend fuel may result in premature failure of fuel system components, such as: plugged fuel filters and deteriorated fuel lines.
- Shorter maintenance intervals may be required, such as: cleaning the fuel system and replacing fuel filters and fuel lines.
- Using biodiesel blended fuels containing more than five percent biodiesel can affect engine life and cause deterioration of hoses, tubelines, injectors, injector pump, and seals.

Apply the following guidelines if biodiesel blend fuel is used:

- Ensure the fuel tank is as full as possible at all times to prevent moisture from collecting in the fuel tank.
- Ensure that the fuel tank cap is securely tightened.
- Biodiesel blend fuel can damage painted surfaces, remove all spilled fuel from painted surfaces immediately.
- Drain all water from the fuel filter daily before operating the machine.
- Do not exceed engine oil change interval. Extended oil change intervals can cause engine damage.
- Before machine storage; drain the fuel tank, refill with 100% petroleum diesel fuel, add fuel stabilizer, and operate the engine for at least 30 minutes.

NOTE: Biodiesel blend fuel does not have long-term stability and should not be stored for more than 3 months.

Removing And Replacing Hydraulic Charge Filter (Cont'd)

WARNING

AVOID INJURY OR DEATH

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

W-2072-0807

Stop the engine and check for leaks at the filter.

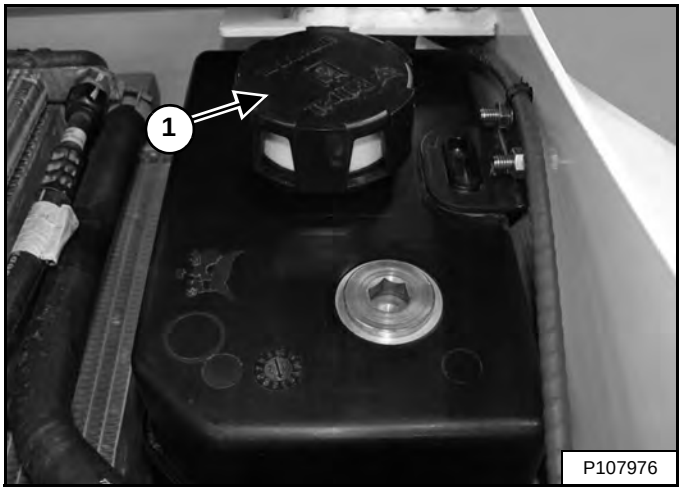
Check the fluid level in the reservoir and add as needed. (See Checking And Adding Fluid on Page 10-120-1.)

Replacing Reservoir Breather Cap

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

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

Figure 10-120-15



Remove the breather cap (Item 1) **[Figure 10-120-15]** and discard.

Install new breather cap.

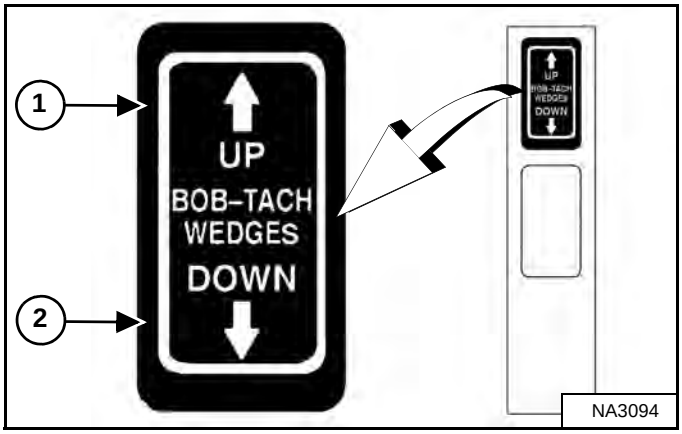
Install the rear grille and close the rear door.

BOB-TACH (POWER)

This machine may be equipped with a Power Bob-Tach.

Inspection And Maintenance

Figure 10-141-1



Push and hold the BOB-TACH WEDGES “UP” switch (Item 1) until wedges are fully raised. Push and hold the BOB-TACH WEDGES “DOWN” switch (Item 2) **[Figure 10-141-1]** until the wedges are fully down.

The levers and wedges must move freely.

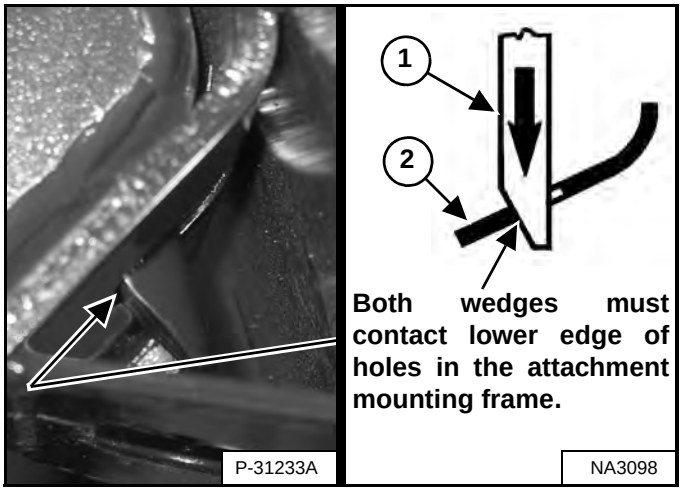
⚠ WARNING

AVOID INJURY OR DEATH

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

W-2715-0208

Figure 10-141-2

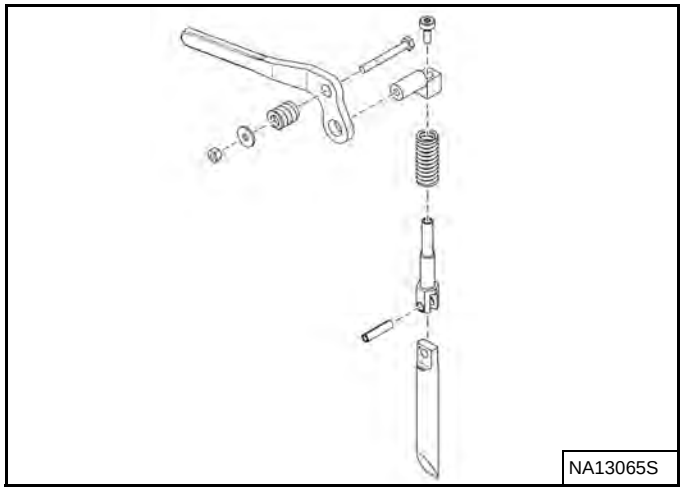


The wedges (Item 1) **[Figure 10-141-2]** must extend through the holes in the attachment mounting frame.

The spring loaded wedges (Item 1) must contact the lower edge of the holes in the attachment mounting frame (Item 2) **[Figure 10-141-2]**.

If the wedges do not contact the lower edge of the holes **[Figure 10-141-2]**, the attachment will be loose and can come off the Bob-Tach.

Figure 10-141-3



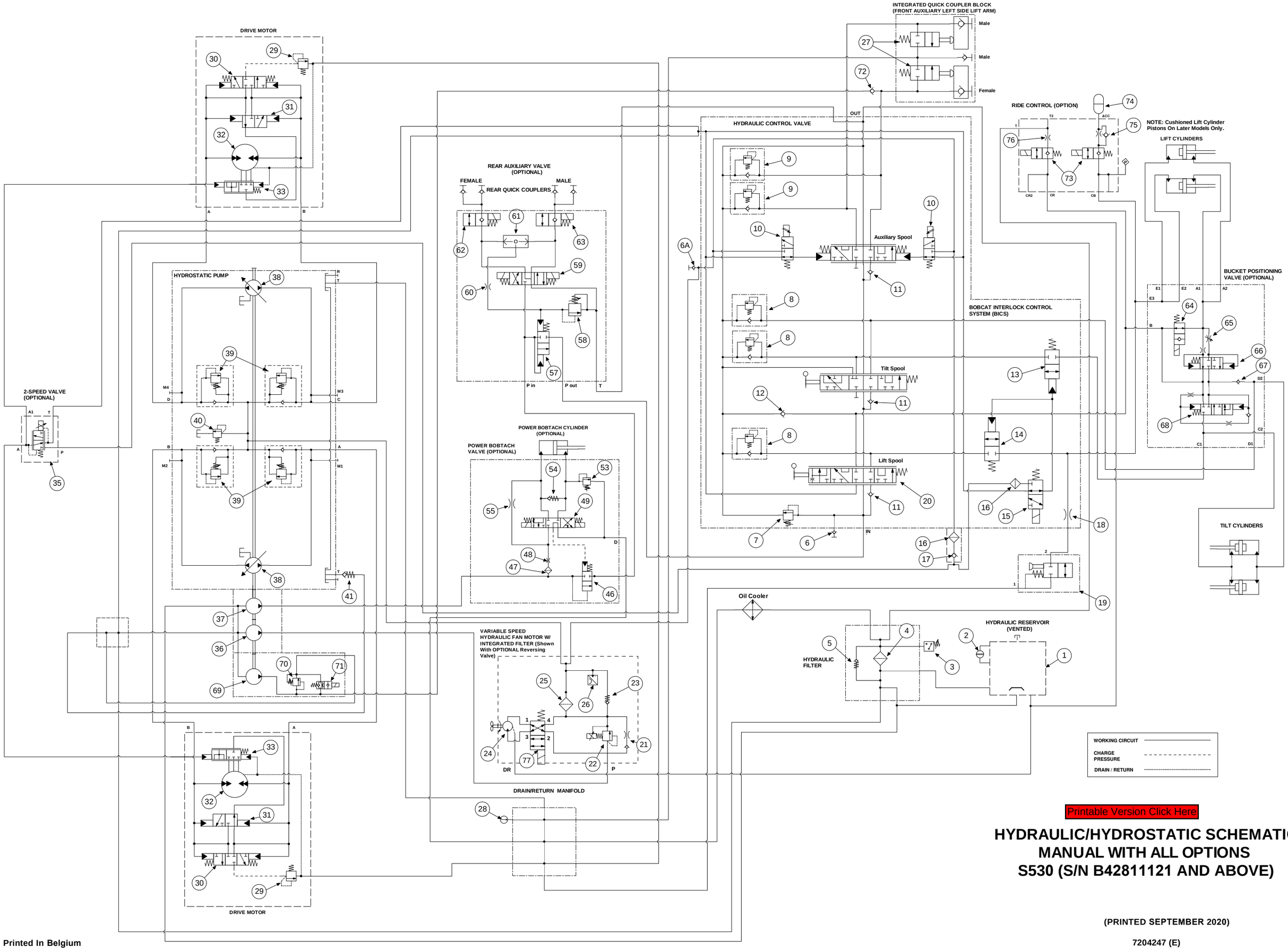
Inspect the mounting frame on the attachment and Bob-Tach, linkages, and wedges for excessive wear or damage **[Figure 10-141-3]**. Replace any parts that are damaged, bent, or missing. Keep all fasteners tight.

Inspect for cracked welds.

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


Bobcat®

HYDRAULIC SYSTEM



Printable Version Click Here

HYDRAULIC/HYDROSTATIC SCHEMATIC MANUAL WITH ALL OPTIONS S530 (S/N B42811121 AND ABOVE)

(PRINTED SEPTEMBER 2020)

7204247 (E)

Printed In Belgium

Printable Version Click Here

HYDRAULIC/HYDROSTATIC SCHEMATIC
SJC WITH ALL OPTIONS
S530 (S/N B42813001 AND ABOVE)

(PRINTED SEPTMBER 2020)
V-1713 legend

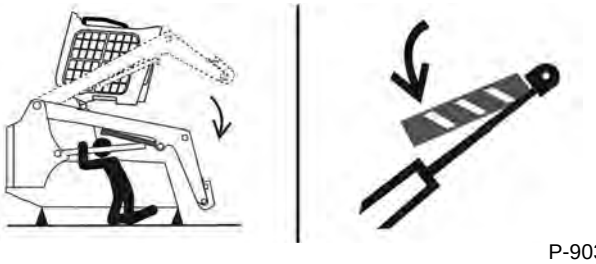
LEGEND

1. RESERVOIR:
   Capacity at sight gauge . . 7,6 L (2.0 U.S. gal)
   System Capacity . . . . . 32,2 L (8.5 U.S. gal)
2. SIGHT GUAGE
3. DIFFERENTIAL PRESSURE SWITCH:
   107 kPa (1,07 bar) (15 psi)
   Normally Closed
4. FILTER - HYDRAULIC (CANISTER)
5. SPRING LOADED FILTER BY-PASS VALVE: 172 kPa (1,7 bar) (25 psi)
6. DIAGNOSTIC COUPLER
6A. DIAGNOSTIC COUPLER – FILL PORT – Factory Hydraulic Oil
7. RELIEF VALVE - MAIN:
   24100 kPa (241 bar) (3500 psi) at Front Quick Couplers
8. RELIEF/ANTICAVITATION VALVE - PORT: 27579 kPa (276 bar) (4000 psi)
9. RELIEF/ANTICAVITATION VALVE - PORT (OPTIONAL):
   27579 kPa (276 bar) (4000 psi)
10. SOLENOID ACTIVATED DIRECTIONAL CONTROL VALVE - AUXILIARY
11. LOAD CHECK VALVE
12. ANTICAVITATION VALVE
13. PILOTED ACTIVATED DIRECTIONAL CONTROL VALVE - TILT CONTROL
14. PILOTED ACTIVATED DIRECTIONAL CONTROL VALVE - LIFT CONTROL
15. SOLENOID ACTIVATED DIRECTIONAL CONTROL VALVE - BICS CONTROL
16. FILTER - BICS CONTROL VALVE (SCREEN)
17. CHECK VALVE - With 100 kPa (1,0 bar) (14.5 psi) Spring
18. RESTRICTION . . . . . 2,0 mm (0.079 in)
19. PULL BUTTON ACTIVATED DIRECTIONAL CONTROL VALVE - LIFT ARM BY-PASS
20. LIFT CYLINDER SPOOL - MADE TO RESTRICT FLOW DURING BOOM DOWN BUT NOT DURING BOOM UP
21. ANTICAVITATION VALVE
22. PROPORTIONAL RELIEF VALVE – (Fan Speed Regulator): 16547 kPa (165 bar) (2400 psi)
23. SPRING LOADED FILTER BY-PASS VALVE: 300 – 390 kPa (3 - 3,9 bar) (43 - 57 psi)
24. FIXED CAPACITY DISPLACEMENT HYDRAULIC MOTOR
25. FILTER - HYDRAULIC (CANISTER)
26. SENSOR – CHARGE PRESSURE
27. FRONT AUXILIARY MANUAL PRESSURE BLEED-OFF VALVE
28. SENSOR – HYD. TEMPERATURE
29. FLUSHING RELIEF VALVE: 450 kPa (4,5 bar) (65 psi)
30. DRIVE MOTOR SHUTTLE VALVE - Cracking: 634 kPa (6,3 bar) (92 psi) Full: 814 kPa (8,1 bar) (118 psi)
31. HIGH PRESSURE SHUTTLE
32. FIXED CAPACITY DISPLACEMENT BIDIRECTIONAL HYDROSTATIC MOTOR
33. PILOT ACTIVATED DIRECTIONAL CONTROL VALVE – HIGH / LOW SPEED 1034 kPa (10,3 bar) (150 psi)
34. ANGLE SENSOR
35. SOLENOID ACTIVATED DIRECTIONAL CONTROL VALVE – Brake Valve
36. CHARGE PUMP - 49,1 L/min (13.0 U.S. gpm) at High Engine Idle
37. HYDRAULIC PUMP . . . . . Gear Type 64,7 L/min (17.1 U.S. gpm) at High Engine Idle
38. VARIABLE CAPACITY DISPLACEMENT BIDIRECTIONAL HYDROSTATIC PUMP
39. RELIEF/REPLENISHING VALVE - HIGH PRESSURE: 35000 kPa (350 bar) (5076 psi)
40. RELIEF VALVE - CHARGE INLET: 2825-3515 kPa (28-35 bar) (410-510 psi) at High Engine Idle With 60 ° C (140 ° F) Fluid
41. CHECK VALVE – COLD WEATHER BY-PASS With 345 kPa (3,45 bar) (50 psi) Spring
42. SOLENOID ACTIVATED DIRECTIONAL CONTROL VALVE – FORWARD/REVERSE
43. FILTER
44. SERVO PISTON – Swash Plate
45. FAN REVERSING VALVE (OPTIONAL)
46. PILOT ACTIVATED DIRECTIONAL CONTROL VALVE – HYDRAULIC POWERED BOB-TACH With Build-up Valve: 280 kPa (2,8 bar) (40 psi)
47. FILTER - BOB-TACH VALVE
48. RESTRICTION - 1,17 mm (0.46 in)
49. SOLENOID ACTIVATED DIRECTIONAL CONTROL VALVE (TWO COIL)
50. RELIEF VALVE - 24131 kPa (241 bar) (3500 psi)
51. CHECK VALVE
52. RESTRICTION - 0,25 mm (0.010 in)
53. ACCUMULATOR – Ride Control (OPTIONAL)
54. ORIFICE WITH CHECK VALVE: 2,54 mm (0.10 in)
55. SOLENOID ACTIVATED DIRECTIONAL CONTROL VALVE – Ride Control (OPTIONAL)
56. ORIFICE: 1,60 mm (0.063 in)
57. PILOT ACTIVATED DIRECTIONAL CONTROL VALVE - REAR AUXILIARY 1030 kPa (10,3 bar) (150 psi)
58. RELIEF VALVE: 22753 kPa (228 bar) (3300 psi)
59. SOLENOID ACTIVATED DIRECTIONAL CONTROL VALVE - TWO COIL
60. RESTRICTOR - 0,8 mm (0.031 in)
61. LOAD SHUTTLE VALVE - BLEED OFF
62. SOLENOID ACTIVATED DIRECTIONAL CONTROL VALVE - Female
63. SOLENOID ACTIVATED DIRECTIONAL CONTROL VALVE - Male
64. SOLENOID ACTIVATED DIRECTIONAL CONTROL VALVE - BUCKET POSITION VALVE (ON/OFF)
65. FLOW DIVIDER ADJUSTMENT VALVE
66. PILOTED ACTIVATED DIRECTIONAL CONTROL VALVE - FLOW CONTROL SPOOL
67. CHECK VALVE - BUCKET POSITION VALVE
68. PILOTED ACTIVATED DIRECTIONAL CONTROL VALVE - UNLOADING SPOOL
69. HIGH FLOW HYDRAULIC PUMP Gear Type 36,4 L/min (9.6 U.S. gal) at High Engine Idle
70. RELIEF VALVE - 26890 kPa (269 bar) (3900 psi)
71. DUMP VALVE – ON / OFF
72. CHECK VALVE - With 34,5 kPa (0,34 bar) (5.0 psi) Spring

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

Printed in BELGIUM

⚠ 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.**

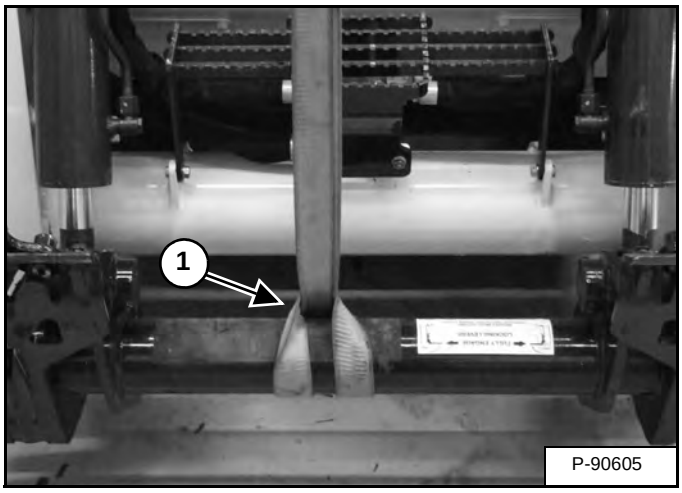
D-1009-0409

⚠ 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

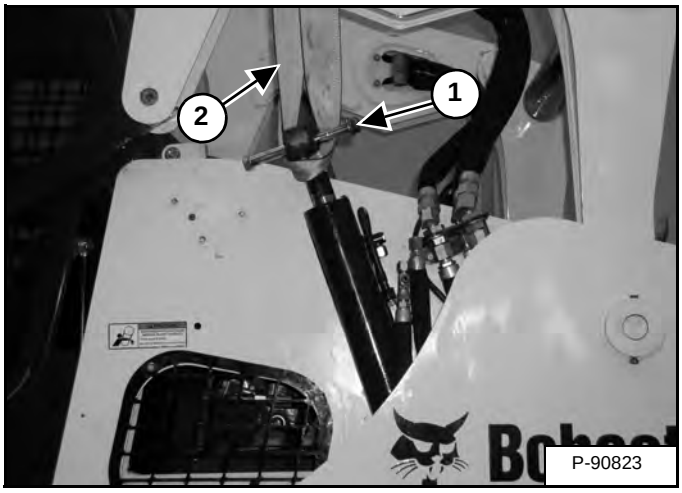
Figure 20-20-7



Install a sling (Item 1) **[Figure 20-20-7]** in the middle of the Bob-Tach.

Using a chain hoist raise the lift arms and install an approved lift arm support on the cylinder that is connected to the lift arm.

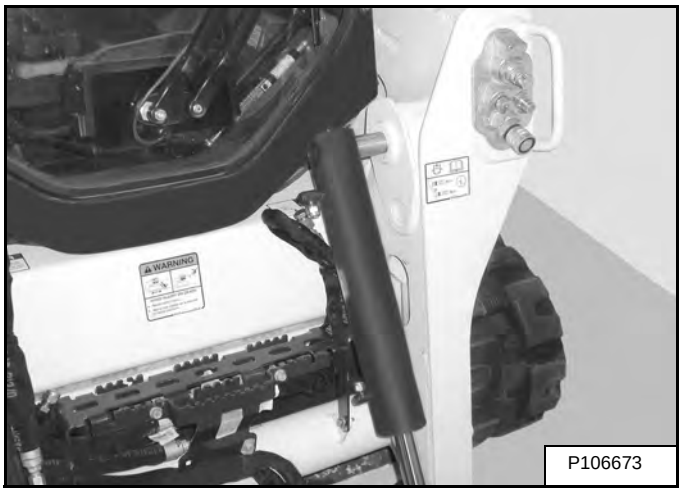
Figure 20-20-8



Install a bolt (Item 1) through the eyelet of the cylinder and install a strap (Item 2) **[Figure 20-20-8]** to secure the cylinder.

Removal And Installation (Cont'd)

Figure 20-21-7

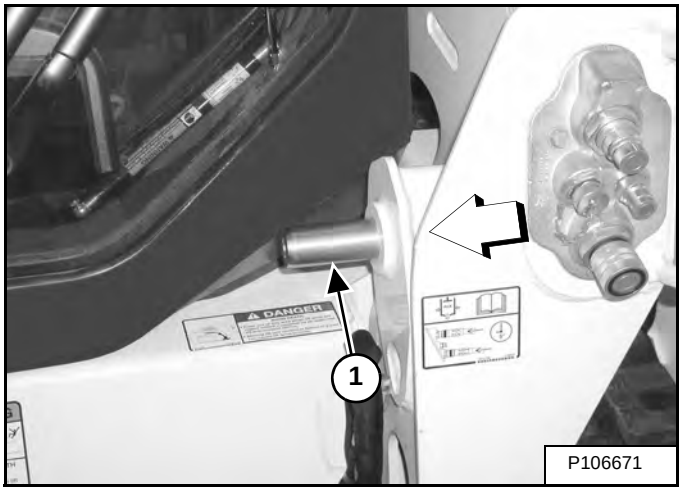


Slide the cylinder from the base pin and remove the cylinder **[Figure 20-21-7]**.

Base End Pivot Pin Removal And Installation

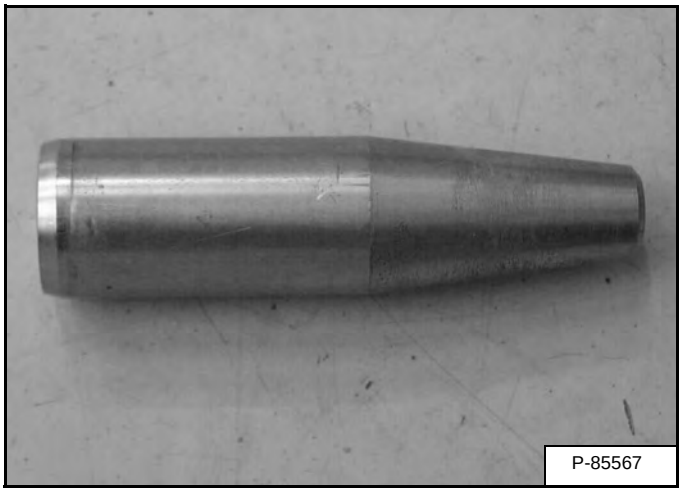
Remove the tilt cylinder from the cylinder base pin. (See Removal And Installation on Page 20-21-2.)

Figure 20-21-8



Using a 22 mm (0.875 in) drift, drive the taper pin (Item 1) **[Figure 20-21-8]** from the track side of the loader out of the lift arm.

Figure 20-21-9



Inspect the pivot pin and replace as needed **[Figure 20-21-9]**.

Disassembly

Clean the outside of the cylinder before disassembly.

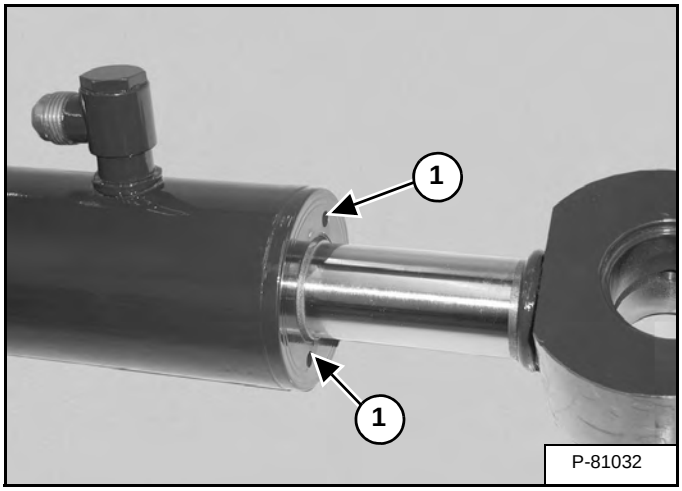
Use the following tools to disassemble the cylinder:

MEL1074 - O-ring Seal Hook
MEL1075 - Adjustable Gland Nut Wrench
MEL1075-2 - Offset Pins

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.

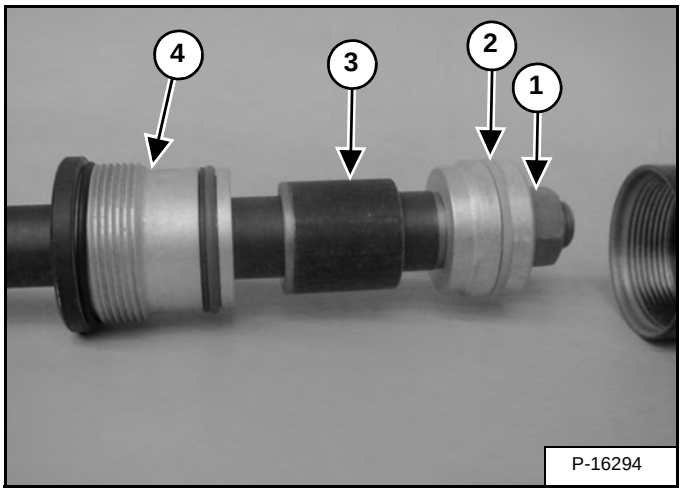
Figure 20-22-6



Insert the adjustable gland nut wrench into the holes (Item 1) **[Figure 20-22-6]** to loosen the head.

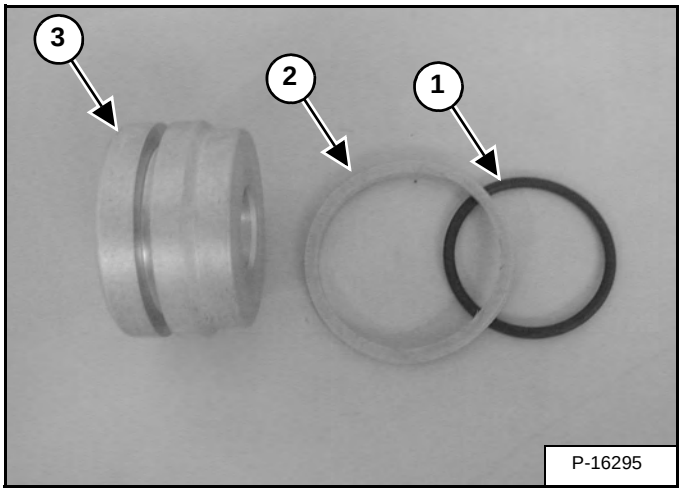
Remove the head and the rod assembly from the cylinder. Put the rod end in a vise.

Figure 20-22-7



Remove the nut (Item 1), piston (Item 2), spacer (Item 3), and head (Item 4) **[Figure 20-22-7]**.

Figure 20-22-8

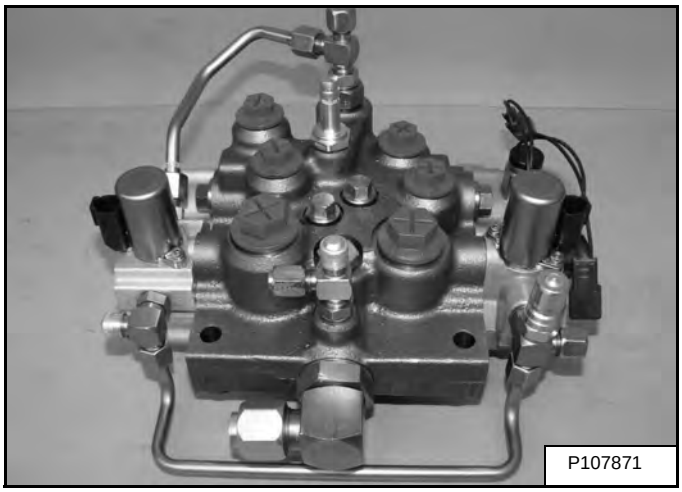


Remove the seal (Item 1) and O-ring (Item 2) from the piston (Item 3) **[Figure 20-22-8]**.

HYDRAULIC CONTROL VALVE (STANDARD)

Description

Figure 20-40-1



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.

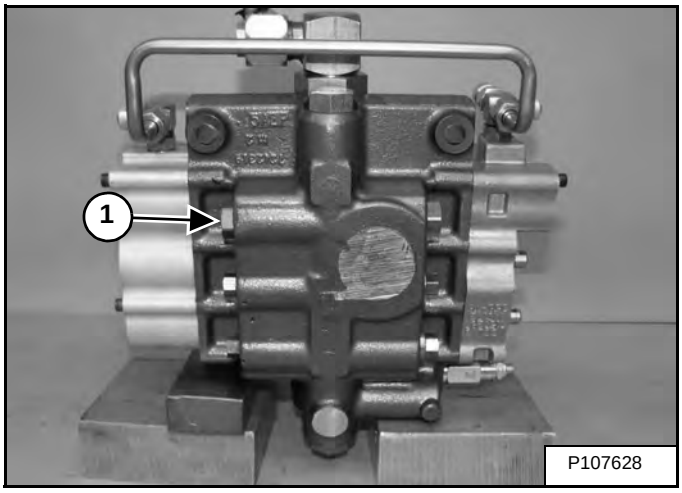
The lift and tilt functions in the hydraulic control valve are operated by linkage connected to the foot pedals.

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 also contains a main relief valve which is adjustable.

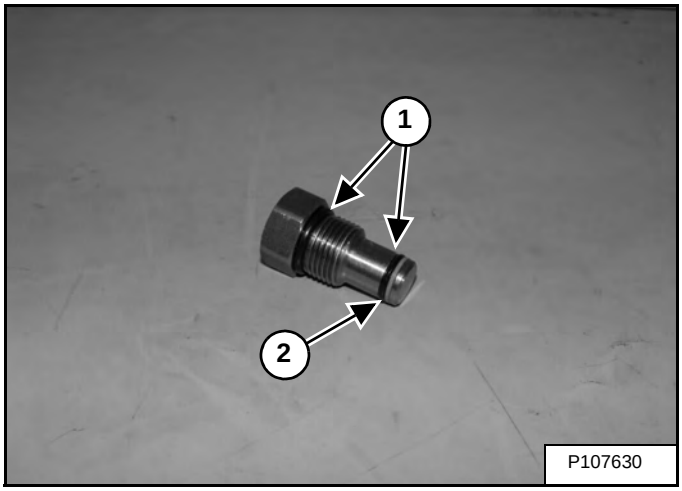
Port Relief Valve Removal And Installation (Cont'd)

Figure 20-40-32



Remove the port relief plug (Item 1) **[Figure 20-40-32]** from the auxiliary circuit of the control valve.

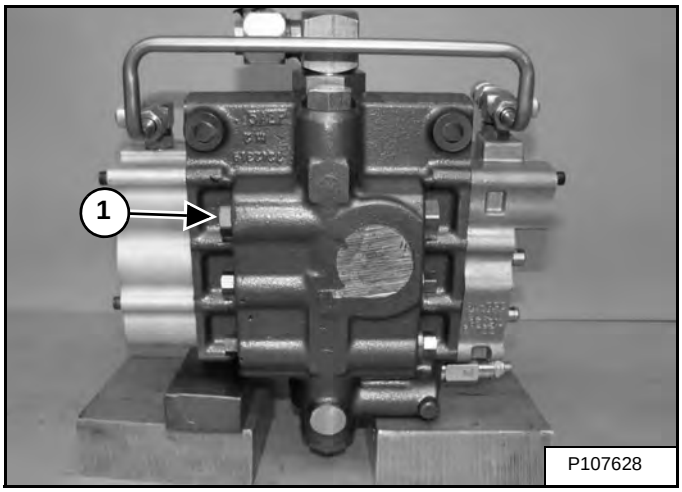
Figure 20-40-33



Remove the O-rings (Item 1) and back-up ring (Item 2) **[Figure 20-40-33]** from the port relief plug.

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

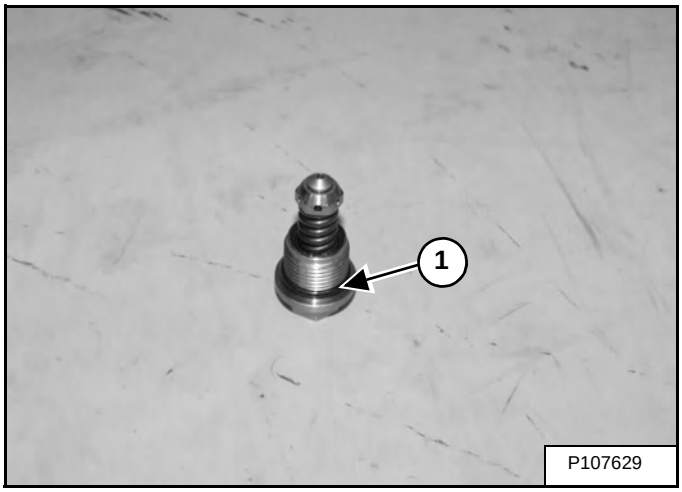
Figure 20-40-34



The control valve may be equipped with an optional auxiliary port relief valve (Item 1) **[Figure 20-40-34]**.

Remove the auxiliary port relief valve.

Figure 20-40-35



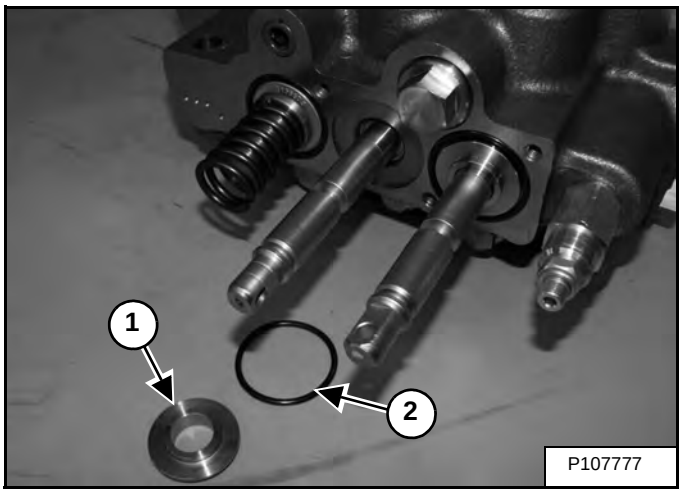
Remove the O-ring (Item 1) **[Figure 20-40-35]** from the optional auxiliary port relief valve.

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

Tilt Spool Removal And Installation

Remove the lift and tilt end cap block. (See End Cap Block Removal And Installation on Page 20-40-14.)

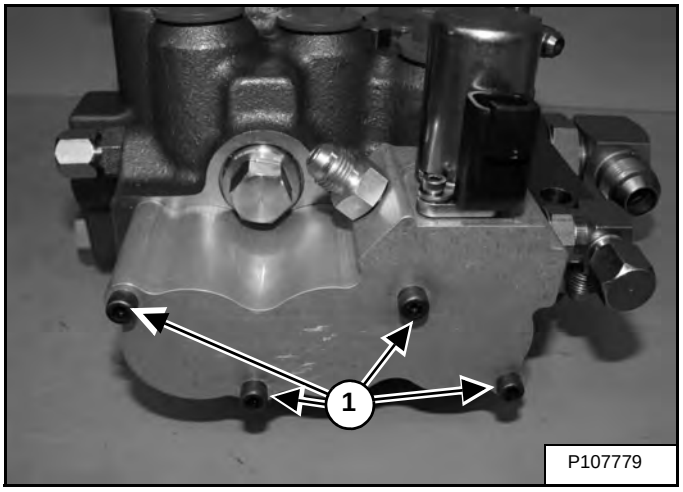
Figure 20-40-74



Remove the spacer (Item 1) and O-ring (Item 2) **[Figure 20-40-74]** from the tilt spool.

Installation: Install the spacer (Item 1) and an O-ring (Item 2) **[Figure 20-40-74]**.

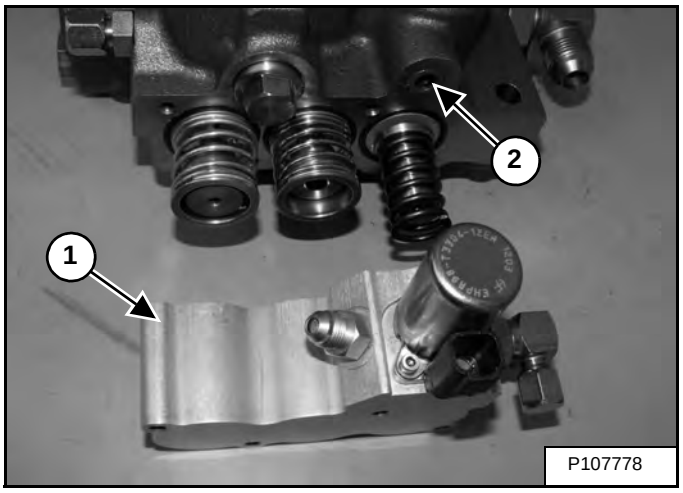
Figure 20-40-75



Remove the four screws (Item 1) **[Figure 20-40-75]** from the spool centering block.

Installation: Lubricate the screws and tighten to 10,4 - 11,6 N•m (95 - 105 in-lb) torque.

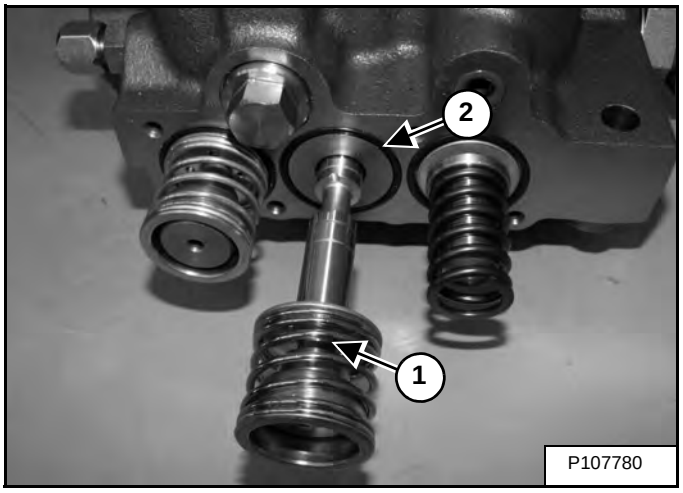
Figure 20-40-76



Remove the spool centering block (Item 1) **[Figure 20-40-76]** from the control valve.

Installation: Replace the O-ring (Item 2) **[Figure 20-40-76]** and lubricate the O-ring lightly with grease or oil before installation of the spool centering block.

Figure 20-40-77



Remove the tilt spool (Item 1) and O-ring (Item 2) **[Figure 20-40-77]**.

Installation: Replace the O-ring (Item 2) **[Figure 20-40-77]** and lubricate the O-ring lightly with grease or oil before installation of the spool centering block.

HYDRAULIC CONTROL VALVE (ACS) OR (SJC) (CONT'D)

Removal And Installation (Cont'd)

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

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

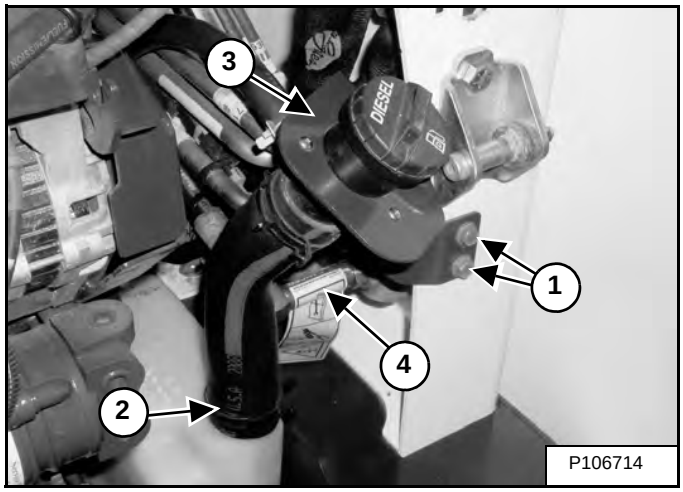
Drain the hydraulic reservoir. (See Removing And Replacing Hydraulic Fluid on Page 10-120-2.) OR (See Removing And Replacing Hydraulic Fluid on Page 10-121-2.).

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

Clean area around control valve.

Open rear door.

Figure 20-41-2

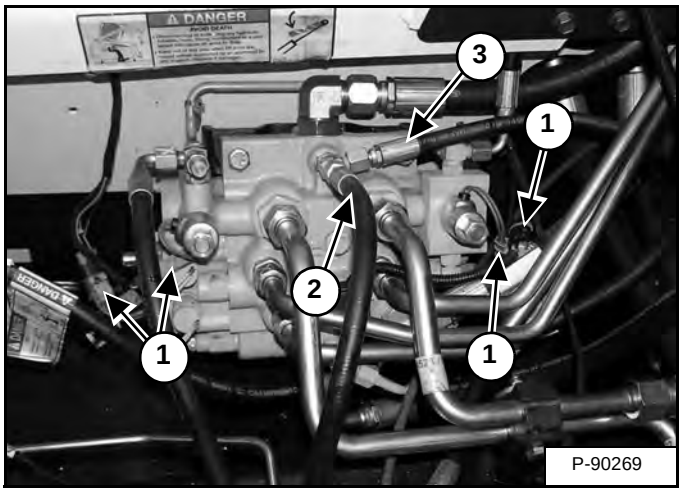


Remove the two bolts (Item 1), move the hose clamp (Item 2) to the middle of the hose, and place the fuel inlet assembly (Item 3) **[Figure 20-41-2]** off to the side.

Cover the fuel tank inlet.

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 4) **[Figure 20-41-2]**.

Figure 20-41-3



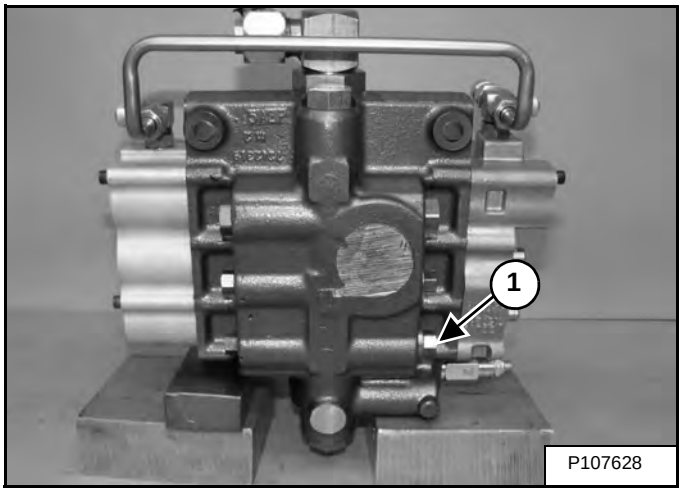
Disconnect the wire harness connectors (Item 1) **[Figure 20-41-3]** from the control valve.

Disconnect the hose (Item 2) **[Figure 20-41-3]** that routes from the control valve to the drain manifold.

Disconnect the hose (Item 3) **[Figure 20-41-3]** that routes from the control valve to the inlet fitting of the hydraulic pump.

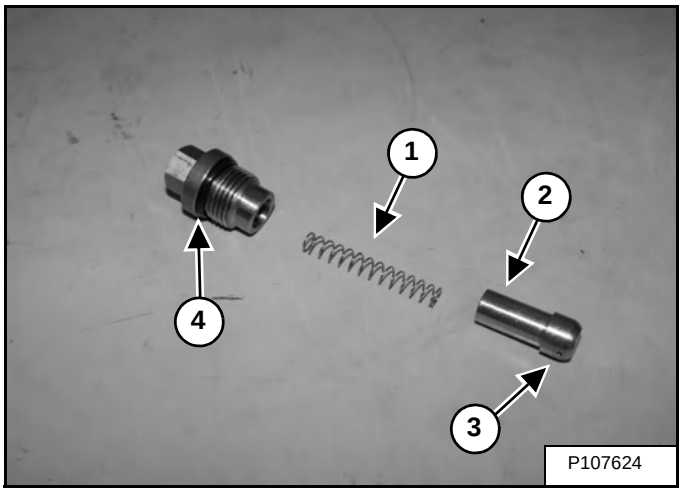
Anti-Cavitation Valve Removal And Installation (Lift, Rod End)

Figure 20-41-33



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

Figure 20-41-34



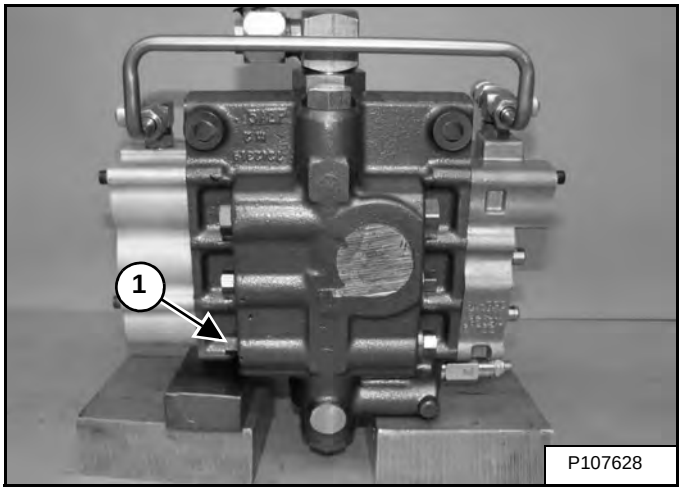
Remove the spring (Item 1) and poppet (Item 2) **[Figure 20-41-34]**.

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

Installation: Install a new O-ring (Item 4) **[Figure 20-41-34]** on the plug and lightly lubricate with oil before installing. Tighten the plug to 51 - 61 N•m (38 - 45 ft-lb) torque.

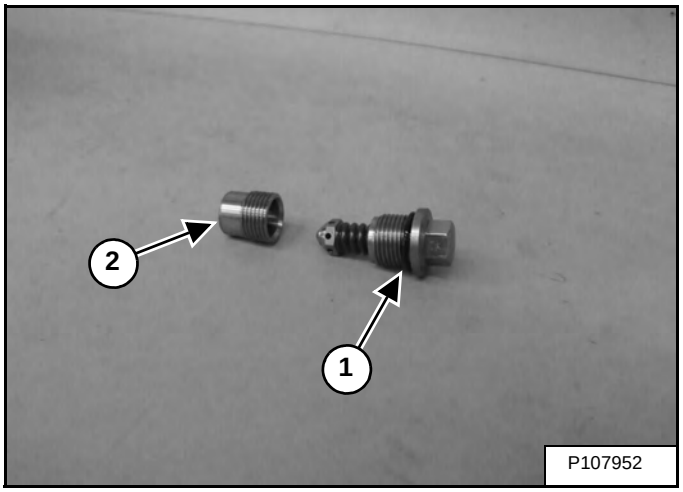
Port Relief / Anti-Cavitation Valve Removal And Installation (Lift, Base End)

Figure 20-41-35



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

Figure 20-41-36



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

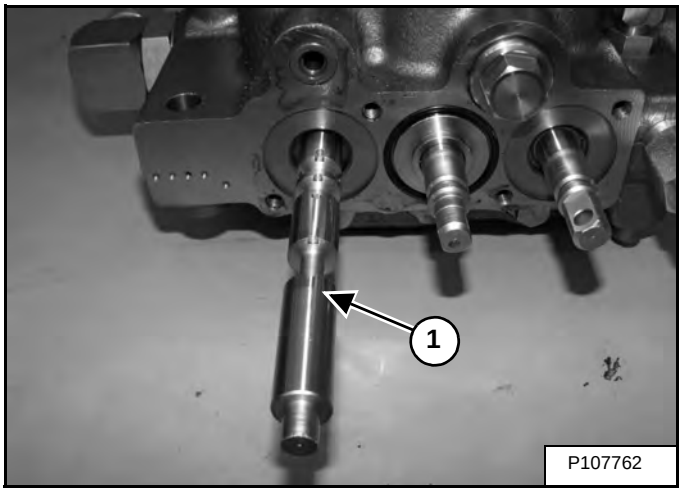
Inspect the port relief / anti-cavitation seat (Item 2) **[Figure 20-41-36]** for wear or damage and replace as needed.

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

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

Auxiliary Spool Removal And Installation (Cont'd)

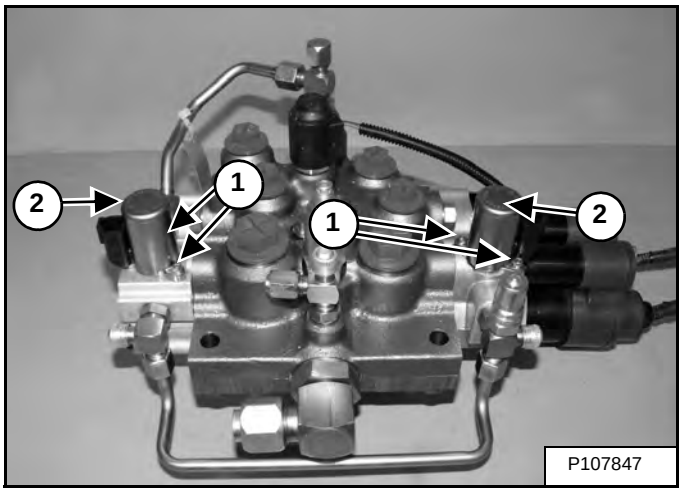
Figure 20-41-76



Remove the auxiliary spool (Item 1) **[Figure 20-41-76]**.

Auxiliary Solenoid Removal And Installation

Figure 20-41-77

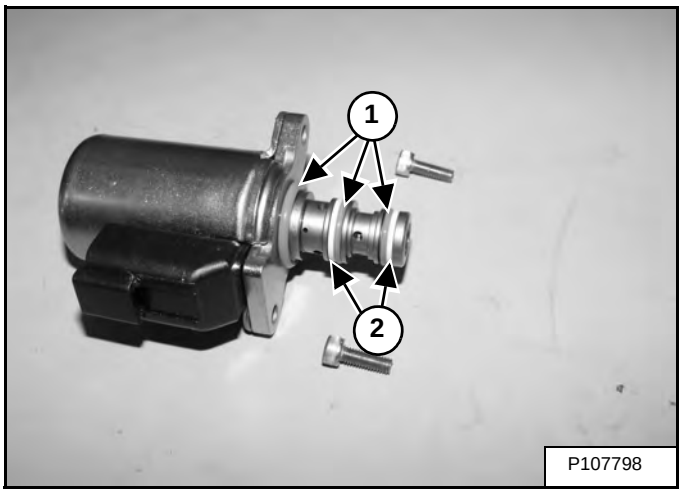


Remove the screws (Item 1) **[Figure 20-41-77]** from both solenoids.

Remove the solenoids (Item 2) **[Figure 20-41-77]**.

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

Figure 20-41-78



Remove the O-rings (Item 1) and back-up rings (Item 2) **[Figure 20-41-78]** from the solenoid stem.

Use an ohmmeter to measure the solenoid coil resistance.

The correct resistance for the coil is 5.1 ohm.

Installation: Lubricate and install new O-rings (Item 1) and back-up rings (Item 2) **[Figure 20-41-78]**.

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.

Disassembly And Assembly

IMPORTANT

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

I-2003-0888

Mark the pump sections for correct assembly.

To disassemble and assemble the hydraulic pump, follow the Parts Identification page (See Parts Identification on Page 20-60-11.) for proper placement of components along with the information below.

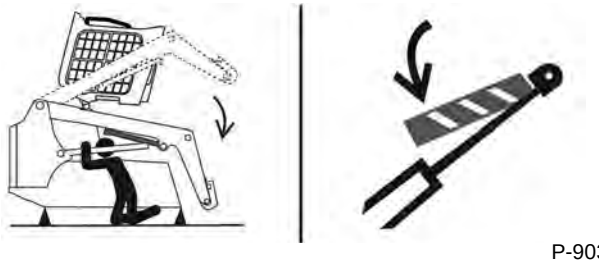
Assembly: Tighten the eight pump housing bolts (Item 1) **[Figure 20-60-16]** to 50 N•m (37 ft-lb) torque.

NOTE: Position the wear plates (Item 4) [Figure 20-60-16] as shown with the bronze side toward the gears.

NOTE: Inspect all gears, shafts, and pump end sections. If any of these components are worn or damaged, the complete pump must be replaced.

Removal And Installation

DANGER



P-90328

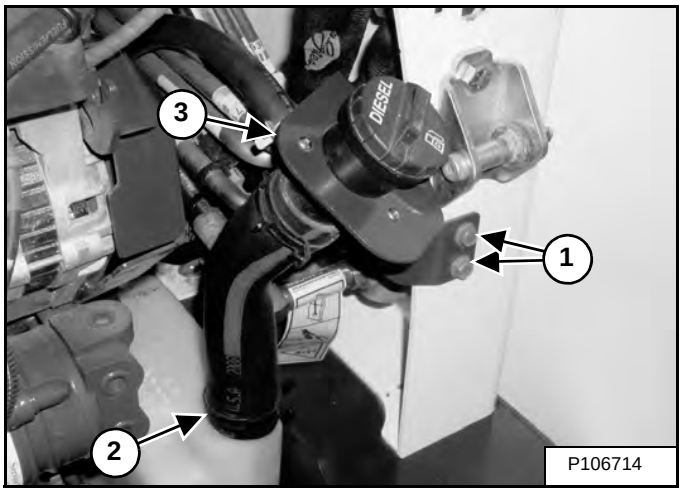
AVOID DEATH

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

D-1009-0409

Drain the hydraulic reservoir. (See Removing And Replacing Hydraulic Fluid on Page 10-120-2.) OR (See Removing And Replacing Hydraulic Fluid on Page 10-121-2.)

Figure 20-100-4

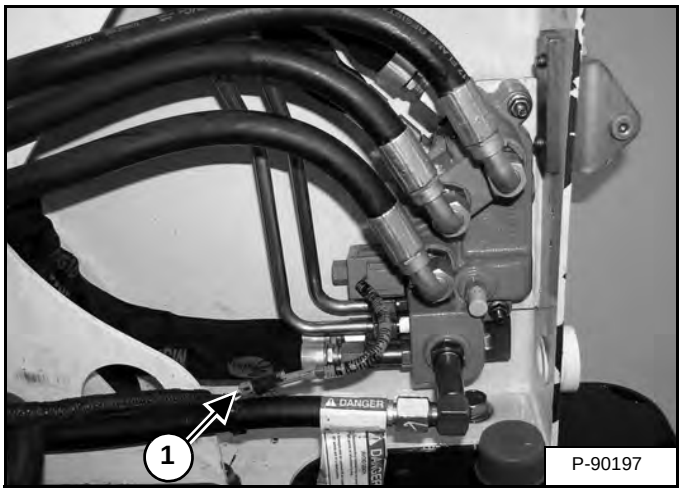


P106714

Remove the two bolts (Item 1), move the hose clamp (Item 2) to the middle of the hose, and the place the fuel inlet assembly (Item 3) **[Figure 20-100-4]** off to the side.

Cover the fuel tank inlet.

Figure 20-100-5

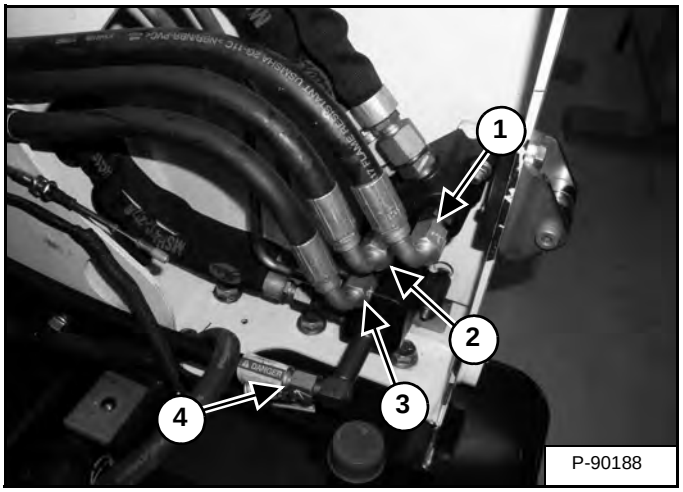


P-90197

Disconnect the wire harness (Item 1) **[Figure 20-100-5]**.

NOTE: The engine is shown removed for photo clarity.

Figure 20-100-6

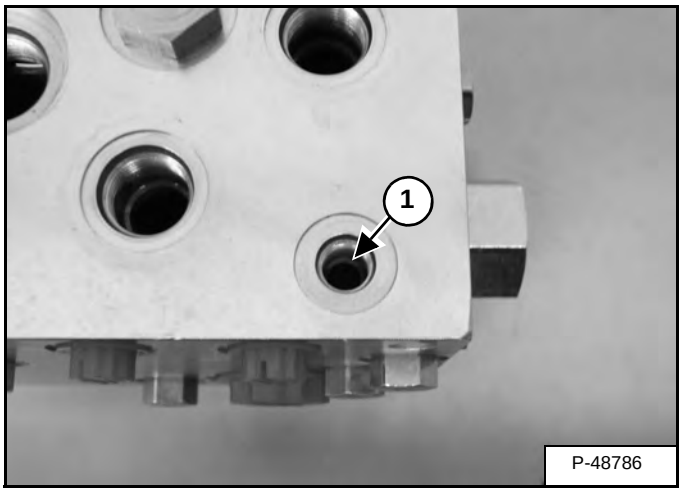


P-90188

Disconnect the tilt base inlet hose (Item 1), the tilt rod inlet hose (Item 2), the lift rod inlet hose (Item 3), and the lift base inlet hose (Item 4) **[Figure 20-100-6]**.

Disassembly And Assembly (Cont'd)

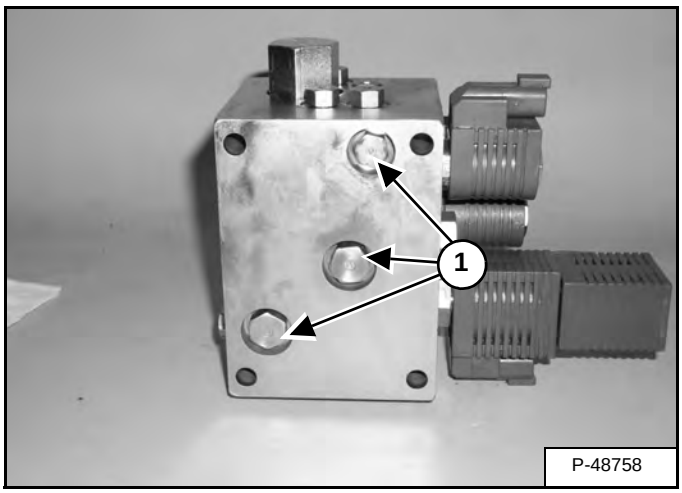
Figure 20-110-26



Remove the orifice (Item 1) **[Figure 20-110-26]**.

Installation: Tighten the orifice to 4,5 N•m (3.3 ft-lb) torque.

Figure 20-110-27



Remove the plugs (Item 1) **[Figure 20-110-27]**.

Installation: Tighten the plugs to 19 N•m (14 ft-lb) torque.

BOB-TACH (POWER) BLOCK (S/N A7TV13266 AND B42811001 & ABOVE)

Description

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

The Power Bob-Tach is operated by a switch on the right switch panel.

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

FRONT AUXILIARY HYDRAULIC COUPLER BLOCK (CONT'D)

Removal And Installation

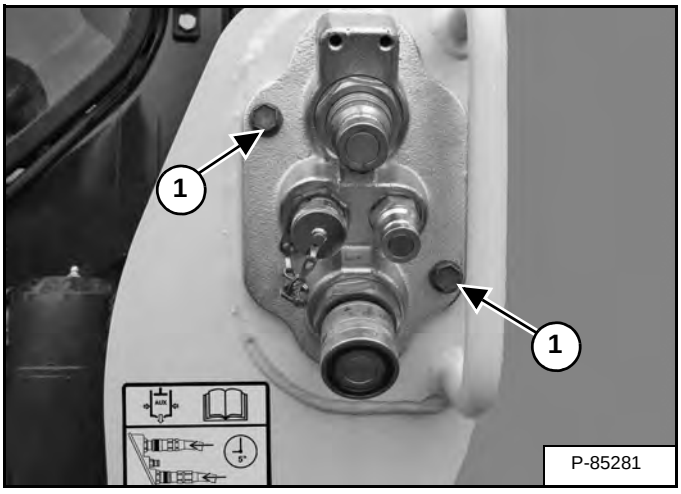
All Models

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.

I-2003-0888

Figure 20-130-4

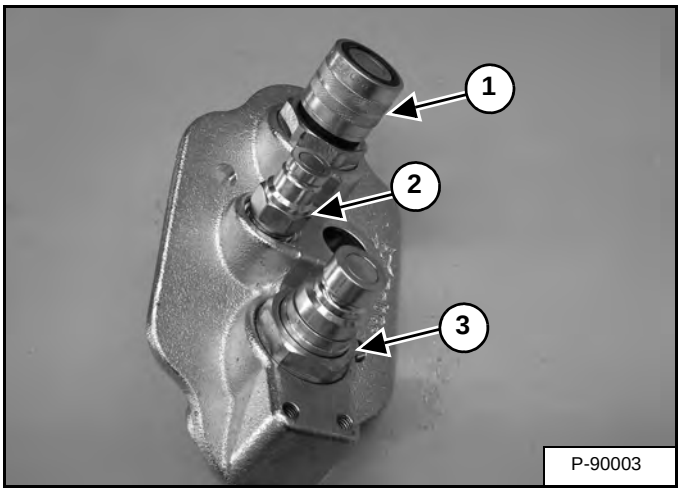


Remove the two mounting bolts (Item 1) **[Figure 20-130-4]**.

Pull the block away from the lift arms and disconnect the auxiliary hoses from the coupler block **[Figure 20-130-4]**.

Disassembly And Assembly (FFI/FI)

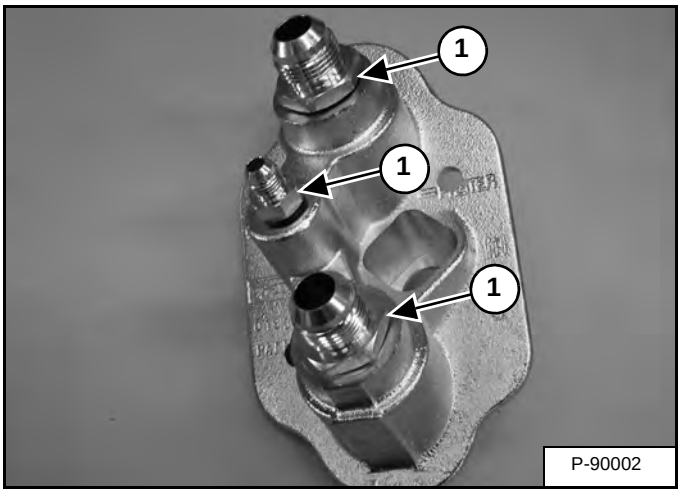
Figure 20-130-5



Remove the female coupler (Item 1), case drain coupler (Item 2) and male coupler (Item 3) **[Figure 20-130-5]**.

Installation: Tighten the female and male coupler to 80 N•m (59 ft-lb) torque. Tighten the case drain coupler to 50 N•m (37 ft-lb) torque.

Figure 20-130-6



Remove the fittings (Item 1) **[Figure 20-130-6]**.

Adding Nitrogen To The Accumulator

Remove the automatic ride control assembly. (See Removal And Installation on Page 20-140-2.)

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

Hydac Adapter Tool Kit Bobcat P/N 7311020.

⚠ WARNING

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

- **Pressurized fluids and springs or other stored energy components.**
- **Flying debris or loose material is present.**
- **Engine is running.**
- **Tools are being used.**

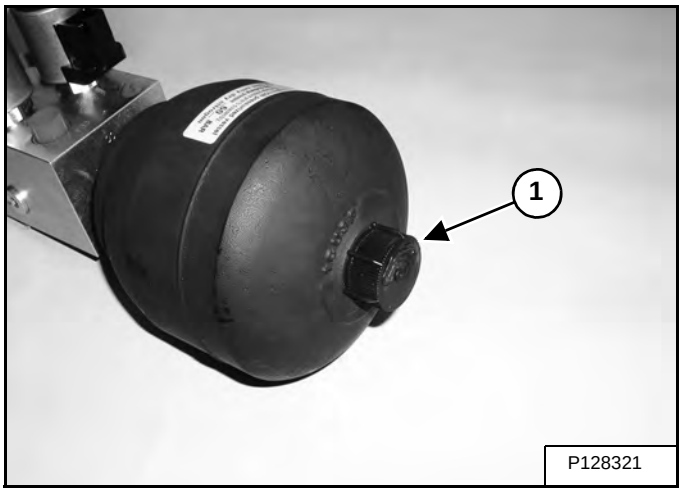
W-2505-0604

⚠ WARNING

RIDE CONTROL ACCUMULATOR INSTALLED PRESSURIZED FLUID CAN CAUSE SERIOUS INJURY
After fully lowering the lift arms or installing an approved lift arm support device, use lift arm bypass control for 5 seconds to release pressure from lift circuit before servicing.
See Operation & Maintenance Manual or Service Manual for lift arm bypass control instructions.

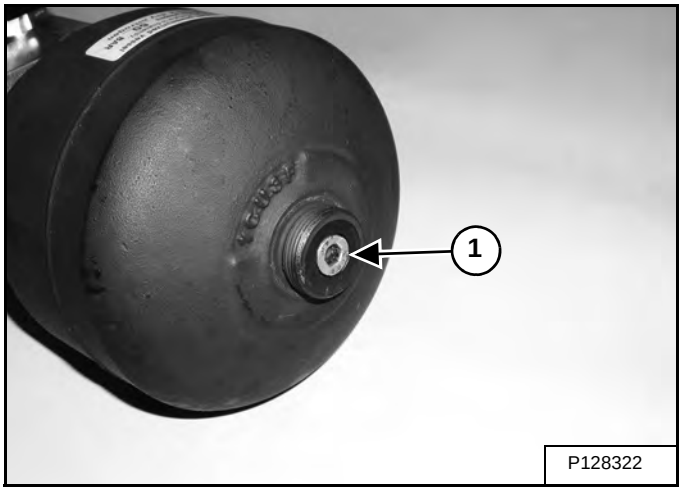
W-3015-0816

Figure 20-140-13



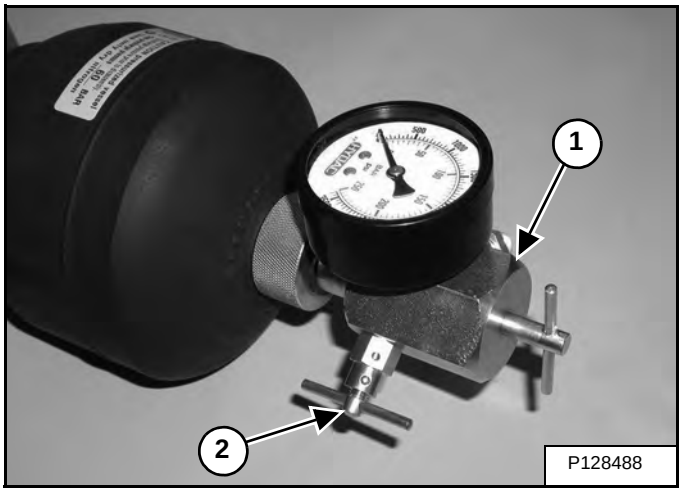
Remove the cap (Item 1) **[Figure 20-140-13]** from the accumulator.

Figure 20-140-14



Loosen the Allen screw (Item 1) **[Figure 20-140-14]** approximately 1/4 turn.

Figure 20-140-15

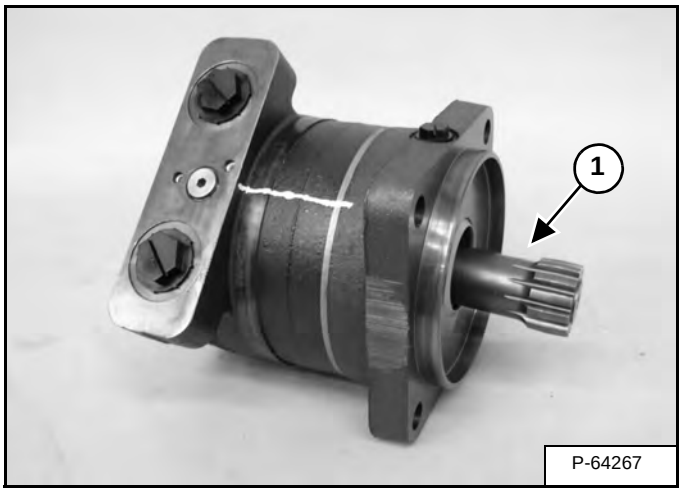


Install the tool / gauge (Item 1) **[Figure 20-140-15]** onto the accumulator.

Make sure the manual bleed valve (Item 2) **[Figure 20-140-15]** is closed.

Disassembly And Assembly (Cont'd)

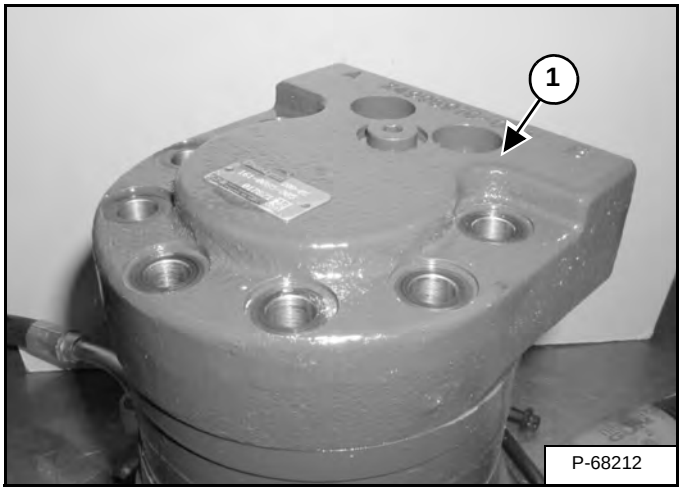
Figure 30-20-10



Once the bolts have been removed and the motor begins to separate, the drive shaft (Item 1) **[Figure 30-20-10]** can be removed.

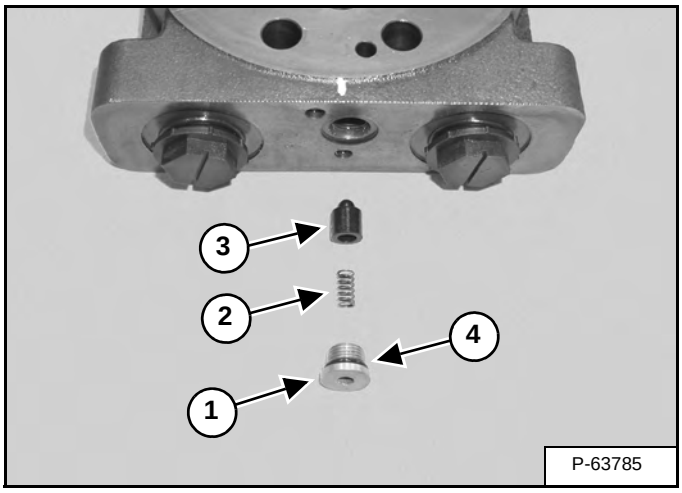
Assembly: Install drive shaft before tightening the bolts.

Figure 30-20-11



Remove the end cap (Item 1) **[Figure 30-20-11]** from the motor.

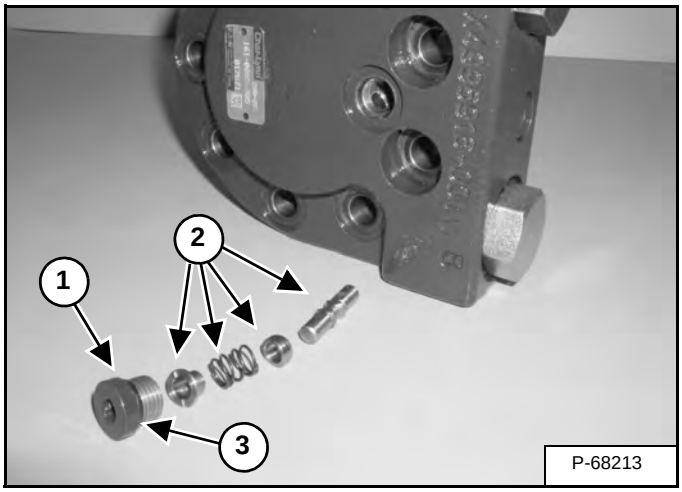
Figure 30-20-12



Remove the plug (Item 1) spring (Item 2) and poppet (Item 3) that make up the relief valve assembly. Remove the O-ring (Item 4) **[Figure 30-20-12]**.

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

Figure 30-20-13

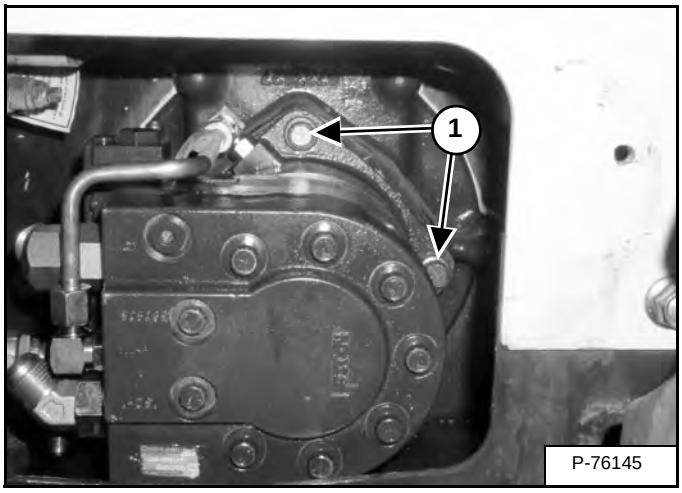


Remove the plug (Item 1) and shuttle valve assembly (Item 2). Remove the O-ring (Item 3) **[Figure 30-20-13]**.

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

Removal And Installation (Right Side) (Cont'd)

Figure 30-21-15

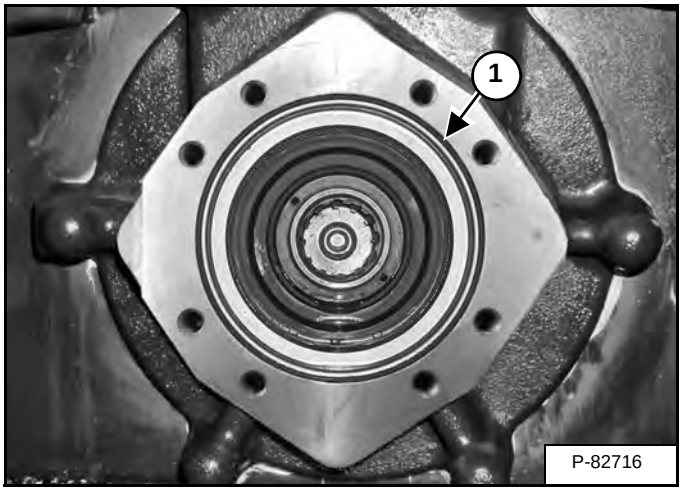


Remove two bolts (Item 1) **[Figure 30-21-15]** from the motor.

Installation: Tighten the bolts to 285 N•m (210 ft-lb) torque.

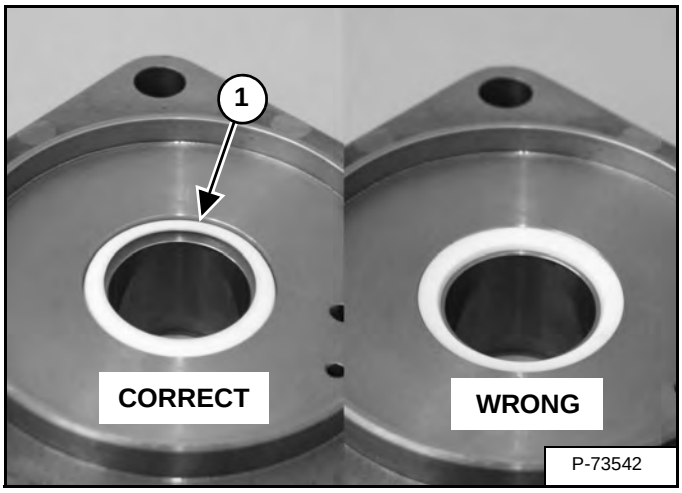
Remove the motor from the loader.

Figure 30-21-16



Remove the O-ring (Item 1) **[Figure 30-21-16]**.

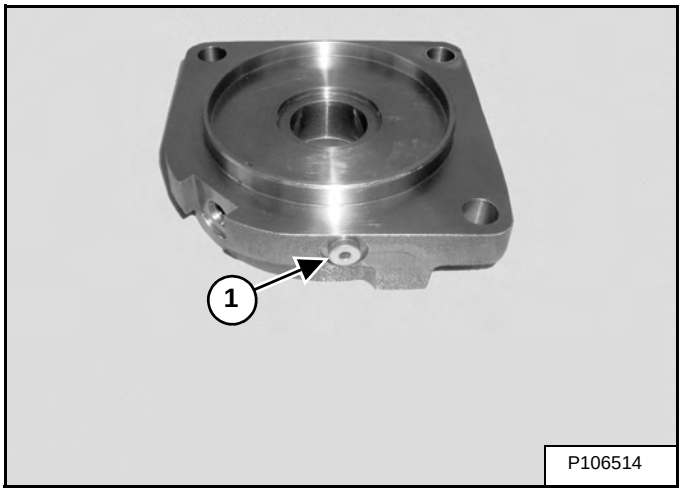
Figure 30-21-17



Installation: Install the seal (Item 1) **[Figure 30-21-17]** in the flange of the motor with the convex surface facing outward.

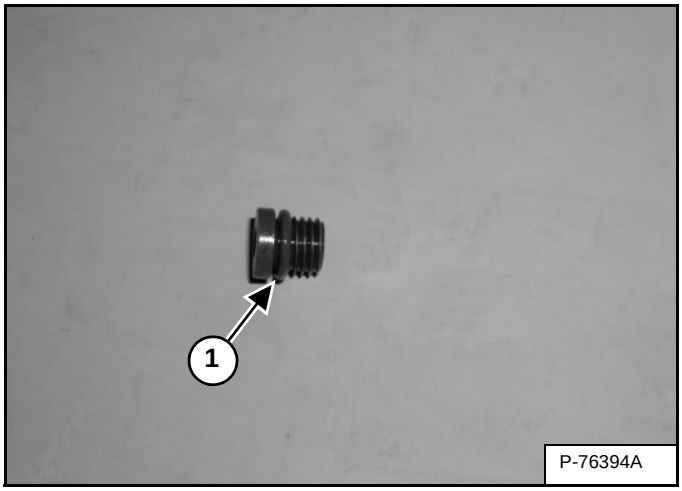
Disassembly (Cont'd)

Figure 30-21-54



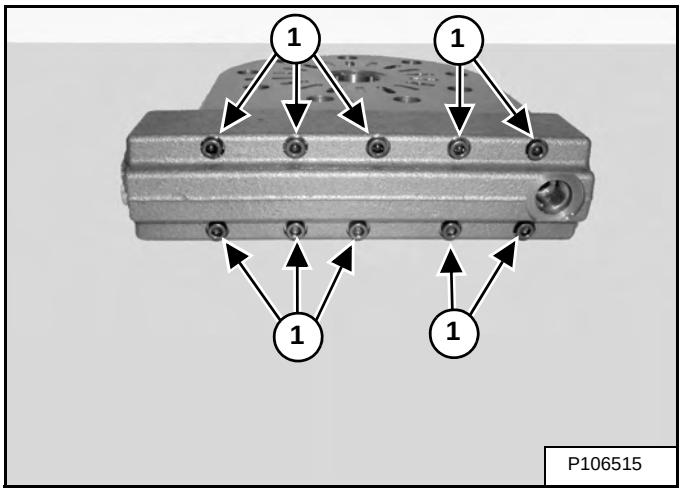
Remove the plug (Item 1) **[Figure 30-21-54]**.

Figure 30-21-55



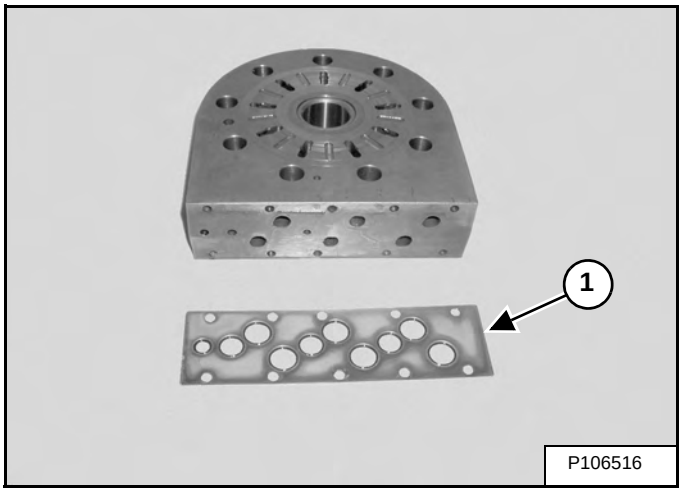
Remove the O-ring (Item 1) **[Figure 30-21-55]** from the plug.

Figure 30-21-56



Remove the screws (Item 1) **[Figure 30-21-56]** from the selector spool housing.

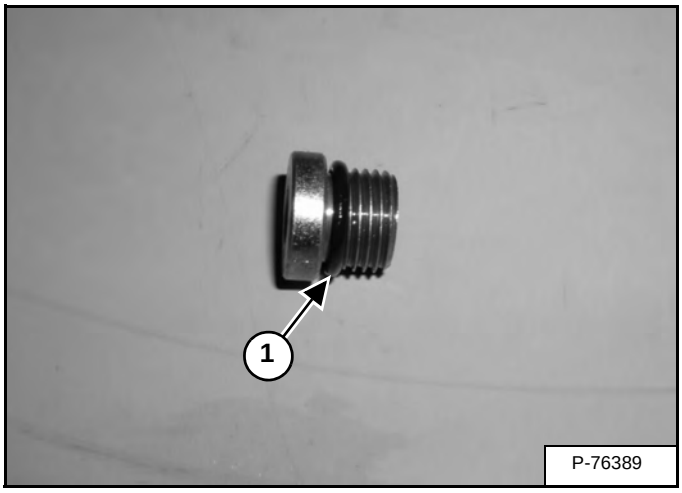
Figure 30-21-57



Remove the gasket (Item 1) **[Figure 30-21-57]**.

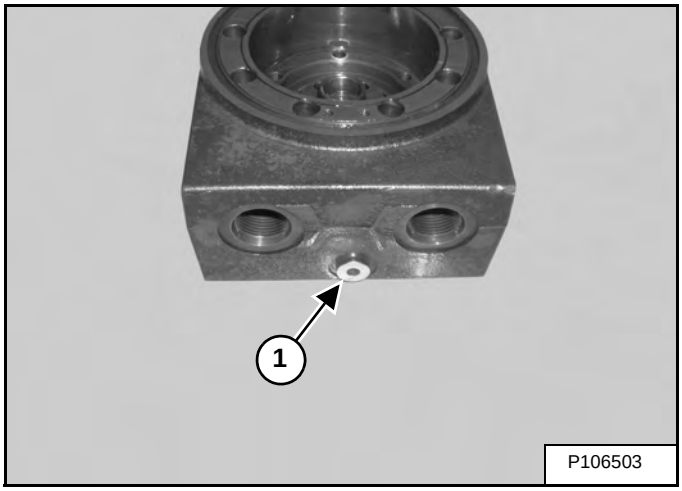
Assembly (Cont'd)

Figure 30-21-92



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

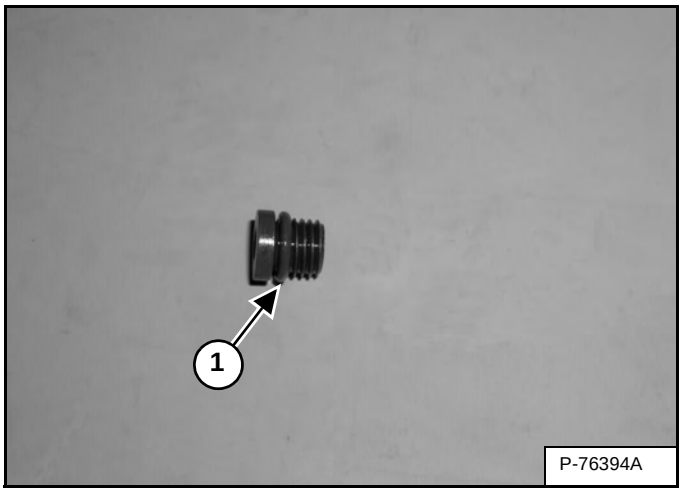
Figure 30-21-93



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

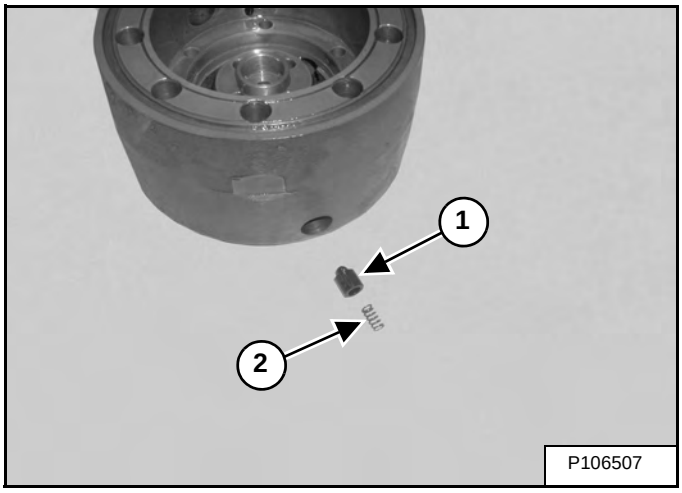
Tighten the plug to 37 - 45 N•m (27 - 33 ft-lb) torque.

Figure 30-21-94



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

Figure 30-21-95



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

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

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

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

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

Remove the engine speed control. (See Removal And Installation on Page 70-20-1.)

Remove the control panel. (See Removal And Installation on Page 50-100-2.) or (See Removal And Installation on Page 50-101-1.).

Remove the lift arm bypass control valve. (See Removal And Installation on Page 20-50-2.)

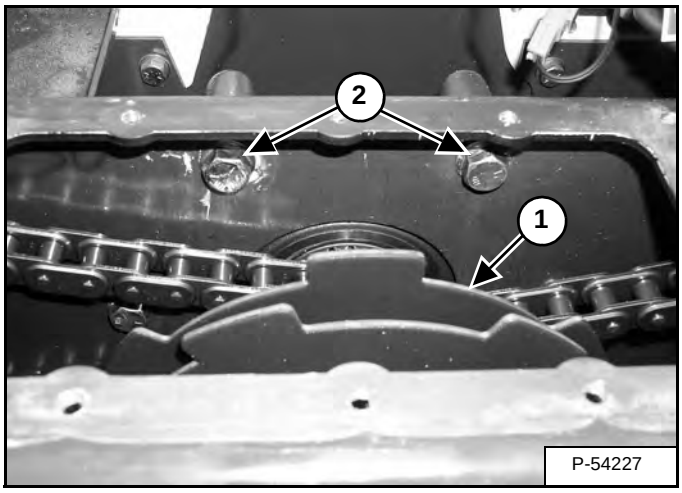
Remove the center chaincase cover. (See Center Cover Removal And Installation on Page 40-30-2.)

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

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

Remove the hydrostatic motor. (See HYDROSTATIC DRIVE MOTOR on Page 30-20-1.)

Figure 30-30-6

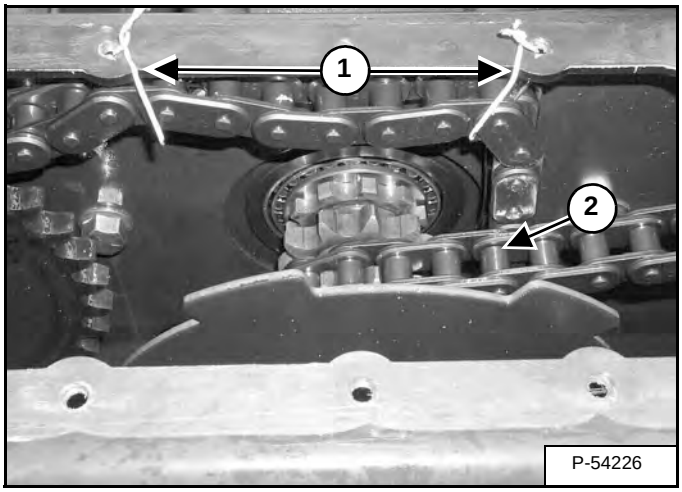


Remove the parking brake disc (Item 1) **[Figure 30-30-6]**. (See BRAKE on Page 40-10-1.)

Remove the bolts (Item 2) **[Figure 30-30-6]** from the inside of the chaincase.

Installation: Tighten the bolts to 170 - 190 N•m (125 - 140 ft-lb) torque.

Figure 30-30-7

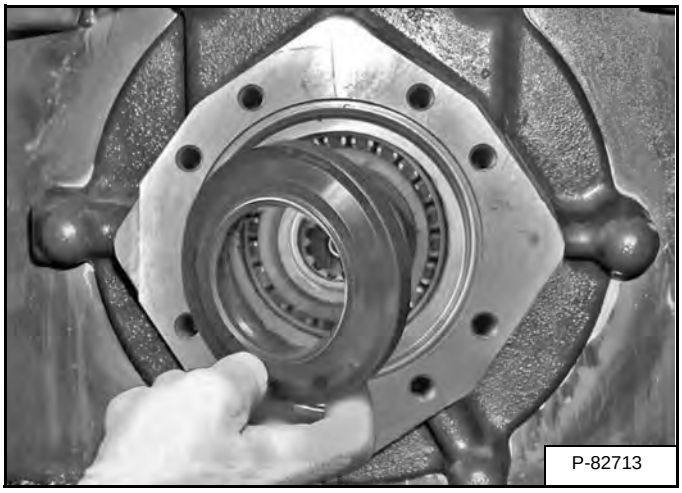


Fasten the front drive chain to the chaincase as shown (Item 1) **[Figure 30-30-7]**.

Tip the end of the sprocket toward the rear of the loader and remove the rear drive chain (Item 2) **[Figure 30-30-7]** from the sprocket.

Shaft Seal Removal And Installation (Cont'd)

Figure 30-31-6



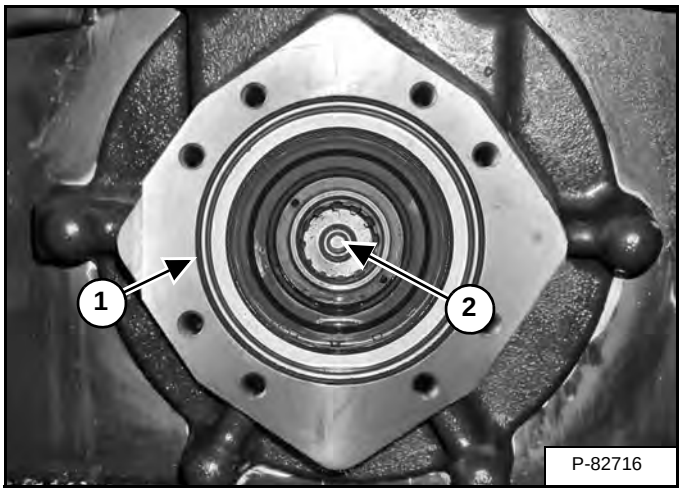
Installation: Install a new seal over the motor carrier shaft **[Figure 30-31-6]**.

Figure 30-31-7

Installation: Install MEL1420 Carrier Seal Tool over the carrier seal **[Figure 30-31-7]**.

Hit the tool with a hammer until the seal is fully seated on the carrier shaft **[Figure 30-31-7]**.

Figure 30-31-8



Install the O-ring (Item 1) **[Figure 30-31-8]**.

NOTE: Before installing the hydrostatic motor, inspect the plug (Item 2) [Figure 30-31-8] located in the center of the carrier shaft for correct torque. If the plug becomes loosen, case drain lubrication fluid from the hydrostatic motor can leak into the chaincase.

Testing

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

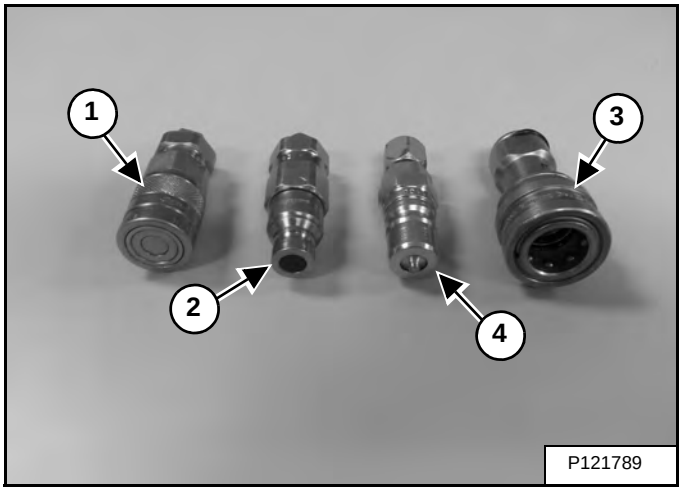
The tools listed will be needed to do the following procedure:

MEL1355-2 - Pressure gauge 6895 kPa (68,9 bar) (1000 psi)
MEL1723 - Female Test Coupler

7246786 - Female Test Coupler

Hydraulic hose, approximately 1,5 m (5.0 ft), purchased locally. Must be rated for pressures above 6895 kPa (68,9 bar) (1000 psi).

Figure 30-40-1



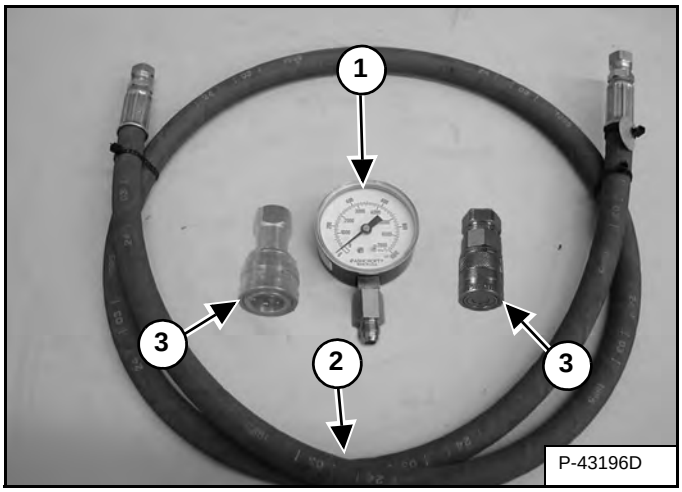
Test ports have changed on the Main valve. If your test port looks like (Item 2) use test coupler (Item 1). If your test port looks like (Item 4) Use test coupler (Item 3) **[Figure 30-40-1]**.

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

Figure 30-40-2



Assemble the gauge (Item 1), hose (Item 2) and the correct test coupler (Item 3) **[Figure 30-40-2]**. Tighten all fittings.

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

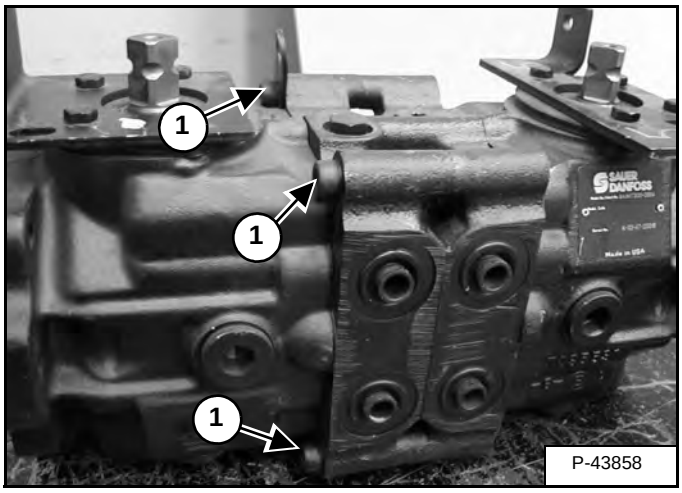
Raise the loader lift arms and install an approved lift arm support. (See Installing on Page 10-20-2.)

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

Disassembly

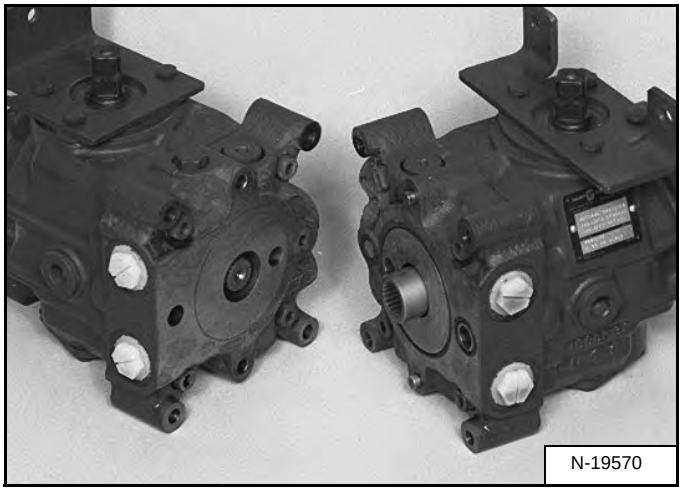
NOTE: The disassembly procedure is shown on the left half of the hydrostatic pump. The procedure is the same for the right half of the hydrostatic pump.

Figure 30-50-6



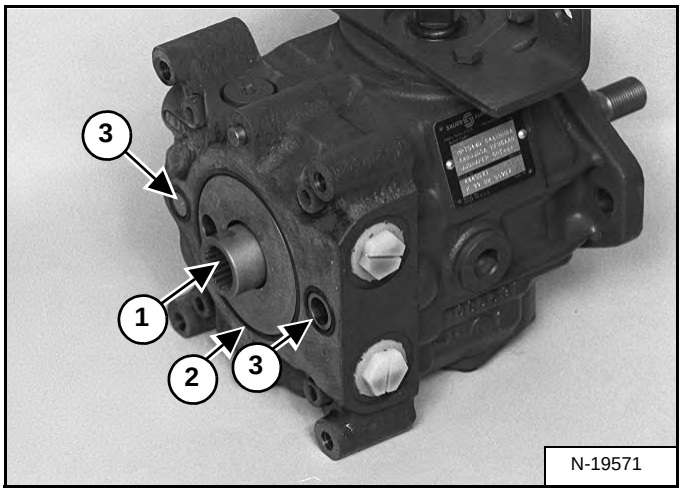
Remove the four bolts (Item 1) **[Figure 30-50-6]**.

Figure 30-50-7



Separate the two hydrostatic pumps **[Figure 30-50-7]**.

Figure 30-50-8

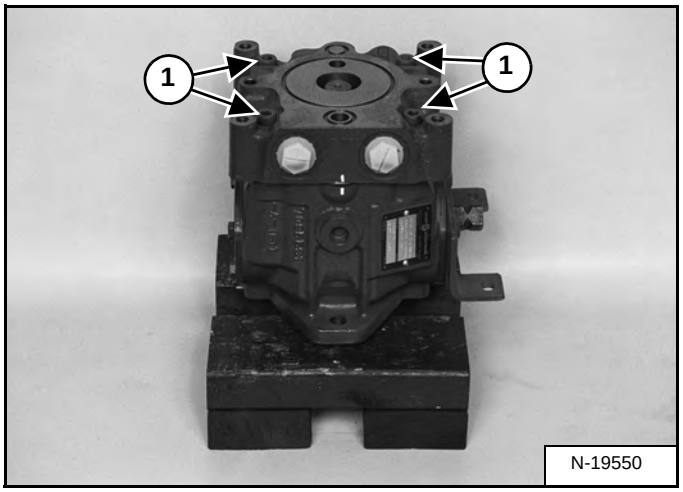


Remove the pump coupler (Item 1) **[Figure 30-50-8]**.

Remove the O-ring (Item 2) **[Figure 30-50-8]**.

Remove the two O-rings (Item 3) **[Figure 30-50-8]**.

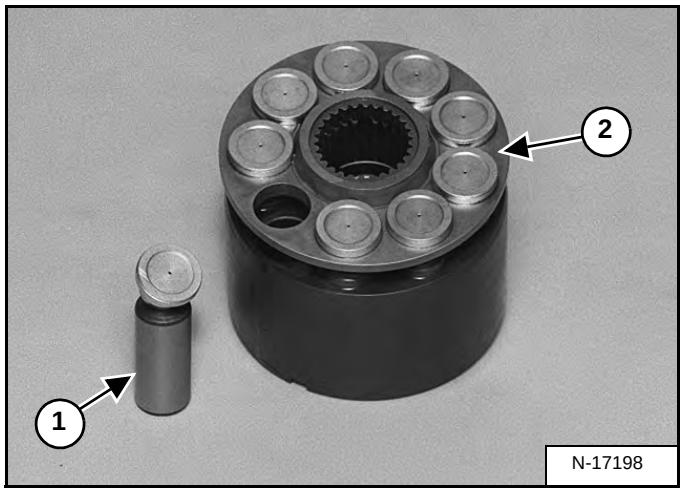
Figure 30-50-9



Remove the four bolts (Item 1) **[Figure 30-50-9]** from the pump housing end cap.

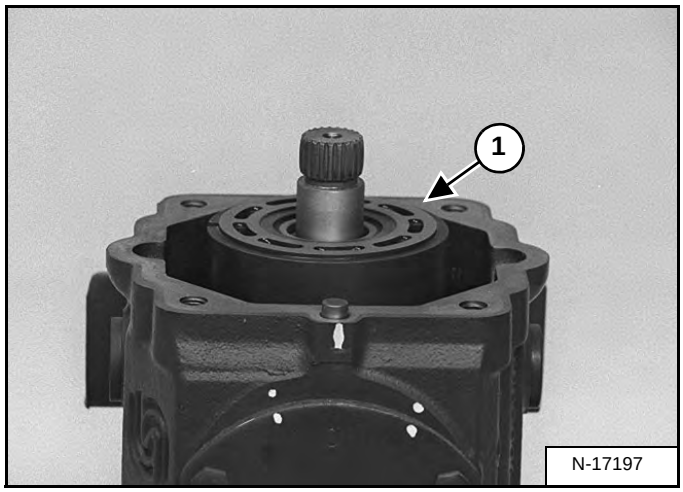
Assembly (Cont'd)

Figure 30-50-48



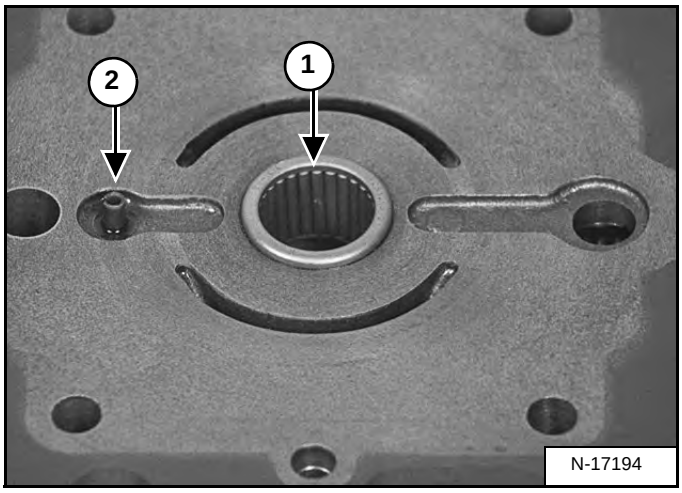
Install the pistons (Item 1) into the piston retainer. Install the piston / piston retainer (Item 2) **[Figure 30-50-48]** into the cylinder bores.

Figure 30-50-49



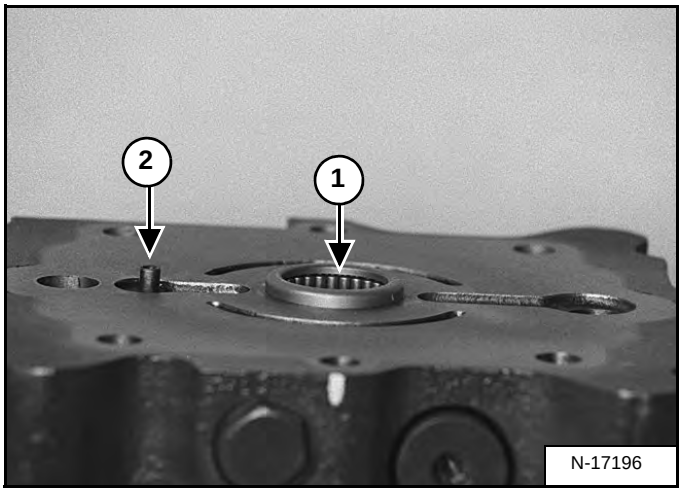
Install the cylinder block (Item 1) **[Figure 30-50-49]** and piston assembly over the shaft and into the housing.

Figure 30-50-50



Install the needle bearing (Item 1) and valve plate locating pin (Item 2) **[Figure 30-50-50]**.

Figure 30-50-51

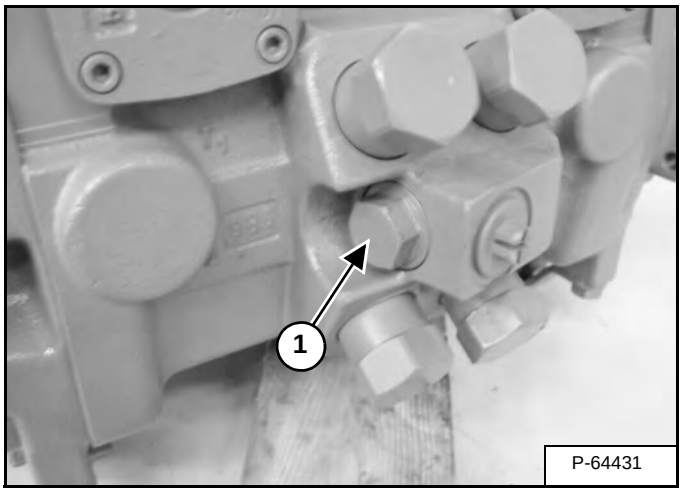


The bearing cage (Item 1) **[Figure 30-50-51]** must protrude from 2,0 - 2,5 mm (0.08 - 0.10 in) from the surface of the end cap.

The valve plate locating spring pin (Item 2) **[Figure 30-50-51]** must protrude from 4,19 - 4,70 mm (0.165 - 0.185 in) from the surface of the end cap.

Charge Relief Valve

Figure 30-51-17

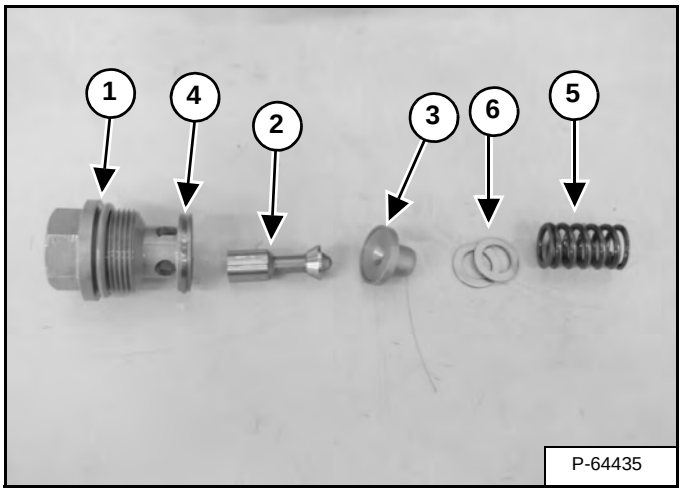


The charge relief valve (Item 1) **[Figure 30-51-17]** is located on the back of the hydrostatic pump.

Remove the charge relief valve.

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

Figure 30-51-18



Inspect the O-ring (Item 1) **[Figure 30-51-18]**.

Inspect the poppet (Item 2) and the mating seat (Item 3) **[Figure 30-51-18]** for damage or foreign material. Ensure the poppet moves freely in its bore.

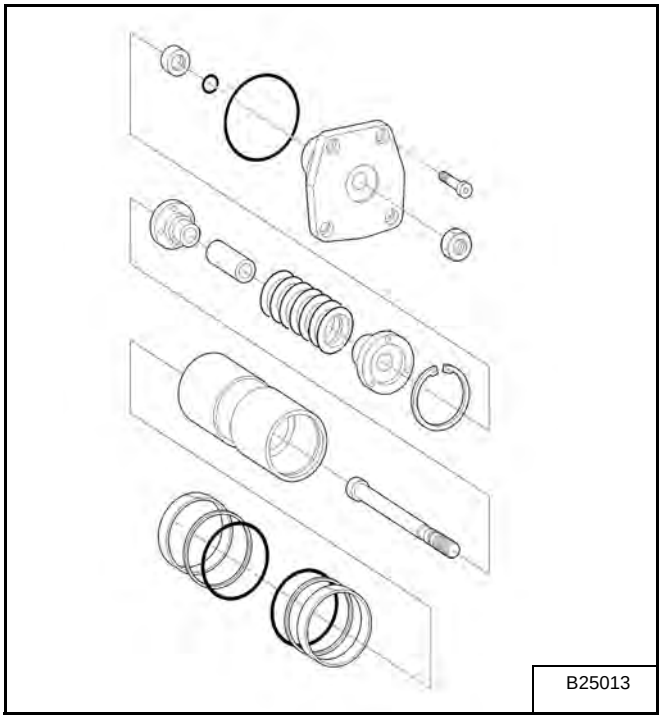
Inspect the sealing ring (Item 4) **[Figure 30-51-18]** and the mating seat in the pump housing for damage or foreign material.

Inspect the spring (Item 5) and the charge relief valve shims (Item 6) **[Figure 30-51-18]**.

NOTE: 1,0 mm shim (Item 6) [Figure 30-51-18] = 299,9 kPa (3 bar) (43.5 psi) in pressure change. Adding shims increases charge pressure. Removing shims decreases charge pressure.

Disassembly And Assembly (Cont'd)

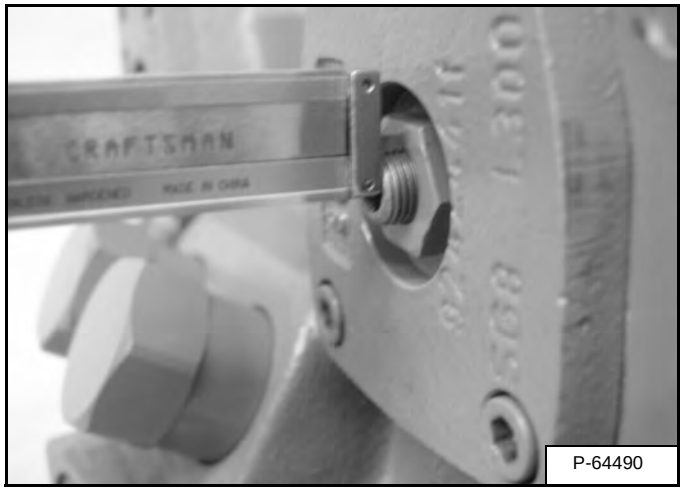
Figure 30-51-56



Servo Piston Assembly **[Figure 30-51-56]**.

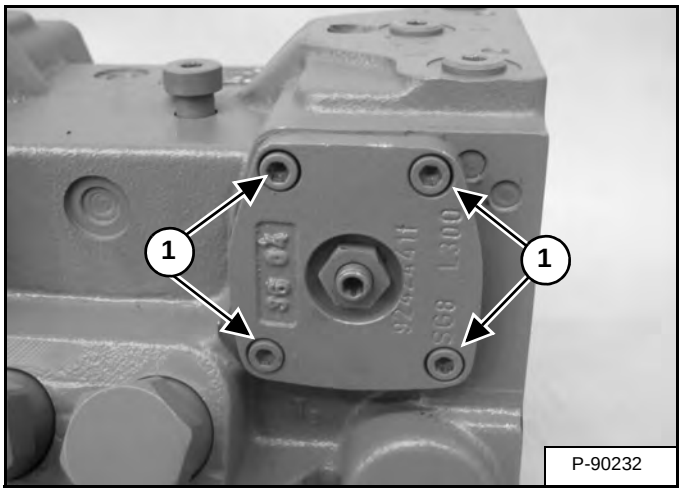
The Servo Piston Assembly **[Figure 30-51-56]** cannot be removed unless the hydraulic controller and rotating group is removed first.

Figure 30-51-57



Measure and record servo piston depth at the adjustment screw **[Figure 30-51-57]**.

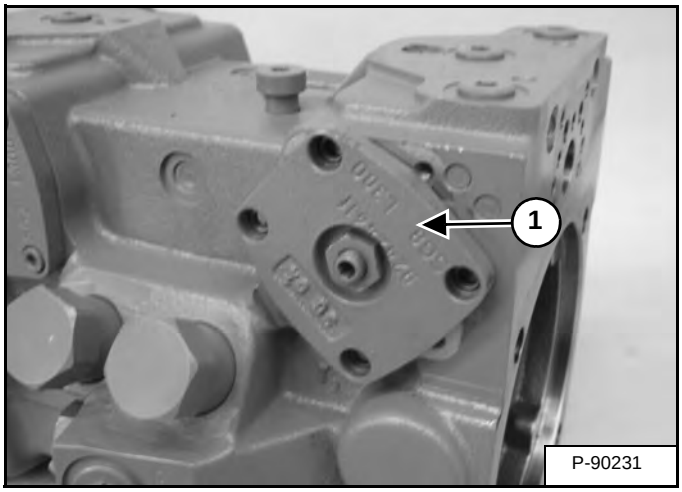
Figure 30-51-58



Remove servo piston mounting bolts (Item 1) **[Figure 30-51-58]**.

Installation: Tighten bolts to 10,4 N•m (7.7 ft-lb) torque.

Figure 30-51-59



Use a rubber mallet to rotate servo piston cover (Item 1) **[Figure 30-51-59]**.

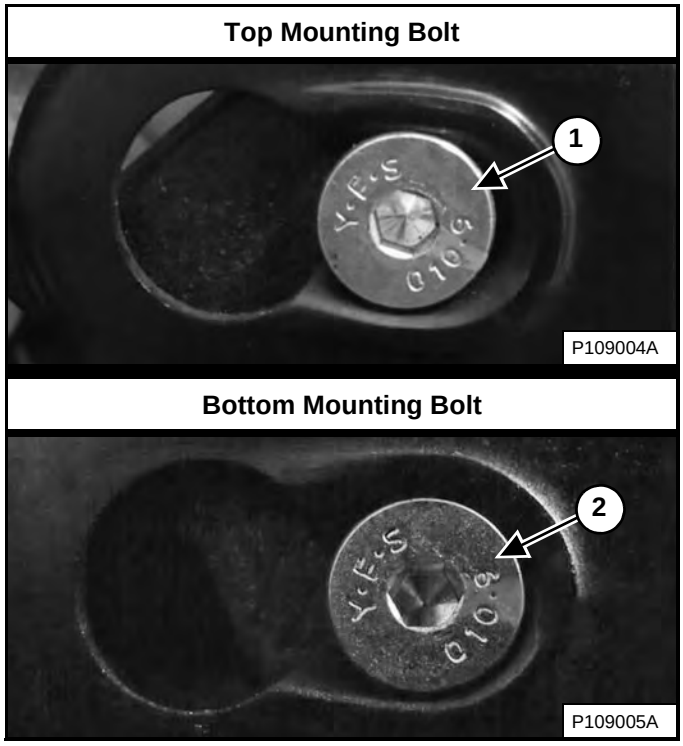
Belt Replacement (Cont'd)

Allow the spring loaded drive idler to raise slightly so that the idler is operating on spring tension and not against the stop.

NOTE: Do not set the spring loaded drive idler against the travel stop.

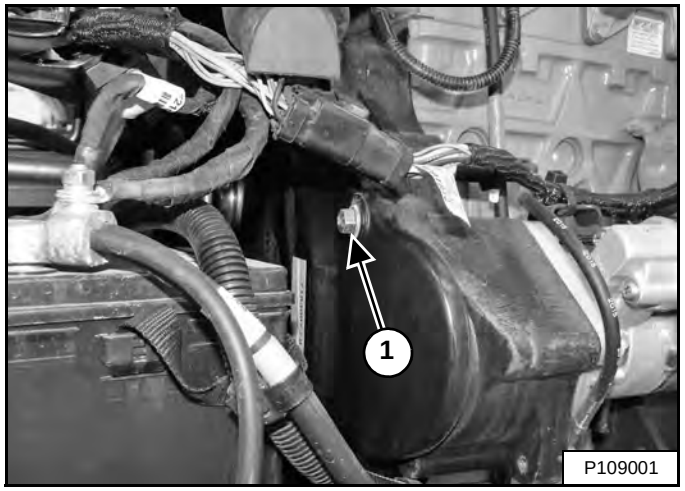
Tighten the spring loaded drive idler mounting bolt (Item 1) **[Figure 30-60-7]** to 48 - 54 N•m (35 - 40 ft-lb) torque.

Figure 30-60-8



Position the drive belt shield over the drive belt shield mounting bolts. Slide the drive belt shield toward the front of the loader to fully seat the shield onto the top and bottom mounting bolts (Items 1 and 2) **[Figure 30-60-8]**.

Figure 30-60-9



Install the drive belt shield bolt (Item 1) **[Figure 30-60-9]**.

Close the rear door.

DRIVE COMPONENTS (CONT'D)

Axle Seal Removal And Installation

The tools listed are needed for the following procedure:

Axle Hub Puller Tool
MEL1714 - Seal Driver Tool
MEL1242 - Power Ram (may be used if desired)

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

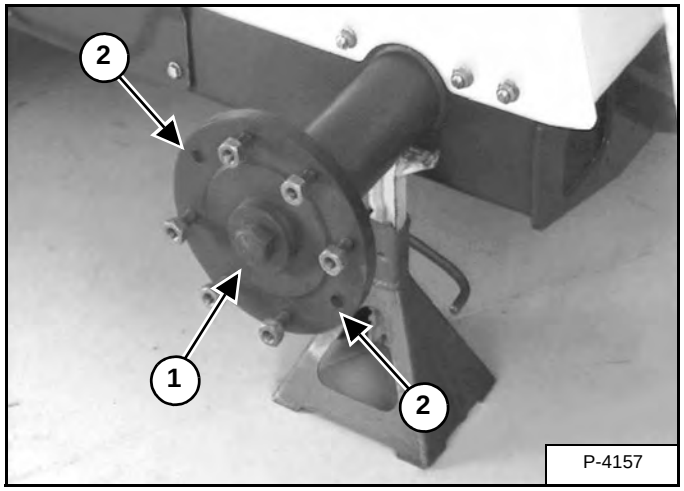
NOTE: If the axle and bearings are being replaced, also loosen the sprocket mounting bolt inside the chaincase before lifting and blocking the loader. (See Axle, Sprocket And Bearings Removal And Installation on Page 40-20-4.)

Remove the tire / wheel assembly. (See TIRE MAINTENANCE on Page 10-160-1.)

Remove the front chaincase cover. (See CHAINCASE on Page 40-30-1.)

Remove the fluid from the chaincase. (See FINAL DRIVE TRANSMISSION (CHAINCASE) on Page 10-130-1.)

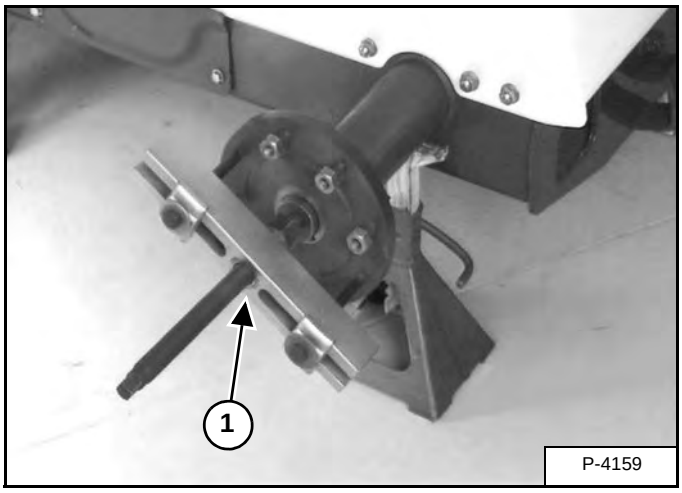
Figure 40-20-1



Remove the bolt (Item 1) **[Figure 40-20-1]** and plate.

Remove two wheel studs (Item 2) **[Figure 40-20-1]** across from each other.

Figure 40-20-2



Install puller (Item 1) **[Figure 40-20-2]** on the wheel hub.

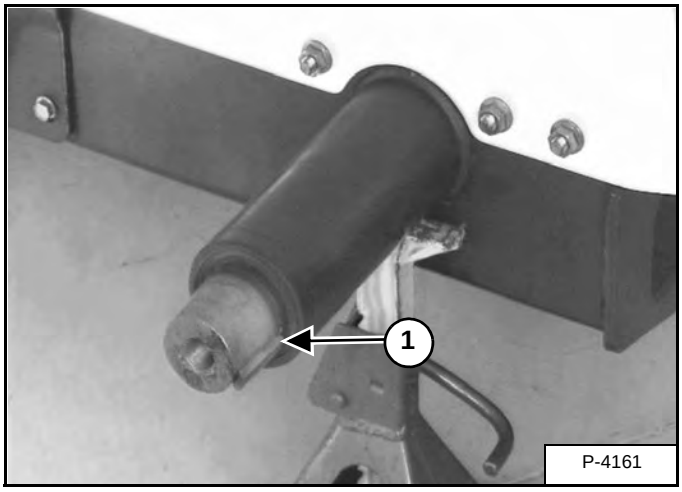
⚠ WARNING

NEVER STAND IN-LINE OF THE HUB WHEN REMOVING A HUB FROM AN AXLE. The hub has a tapered fit on the axle end and can come off the axle with great force and cause serious injury.

W-2186-0395

Remove the hub from the axle.

Figure 40-20-3



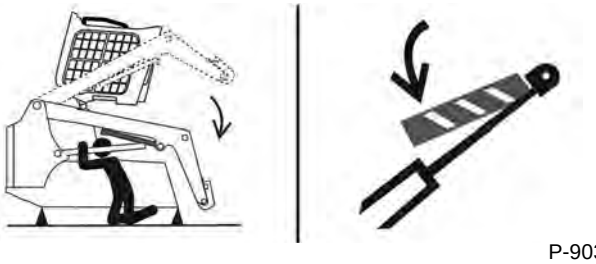
Remove the key (Item 1) **[Figure 40-20-3]** from the axle.

Rear Cover Removal And Installation

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

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

DANGER



P-90328

AVOID DEATH

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

D-1009-0409

WARNING

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

W-2059-0598

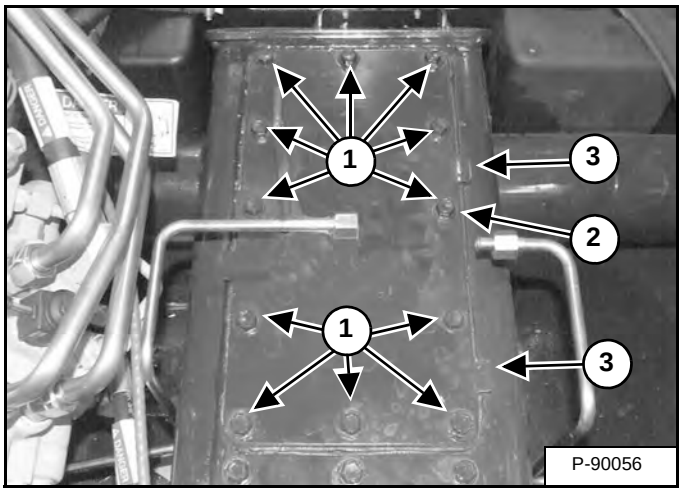
If loader is equipped with two-speed, remove the two-speed valve. (See Valve Block Removal And Installation on Page 30-70-1.)

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

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

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

Figure 40-30-4



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

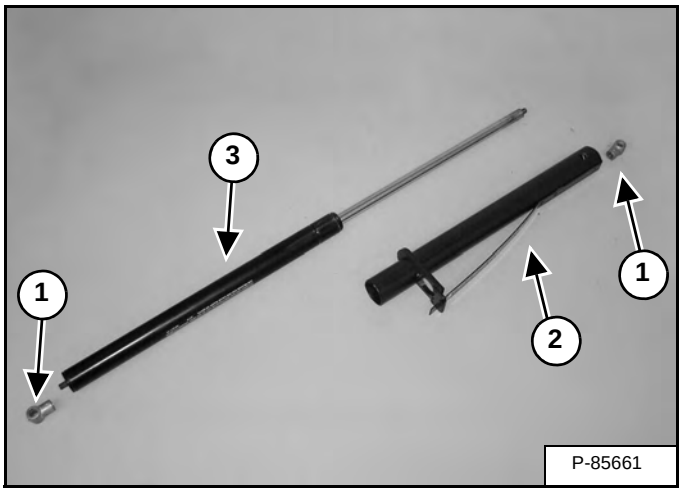
Remove chain case cover (Item 2) **[Figure 40-30-4]**.

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

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

Gas Spring Bracket Disassembly And Assembly

Figure 50-20-4



Remove the clevis (Item 1) from both ends, and the outer housing (Item 2) from the gas spring (Item 3) **[Figure 50-20-4]**.

Installation: Apply threadlocker on the threads of the gas spring rod before installing the clevis.

⚠ WARNING

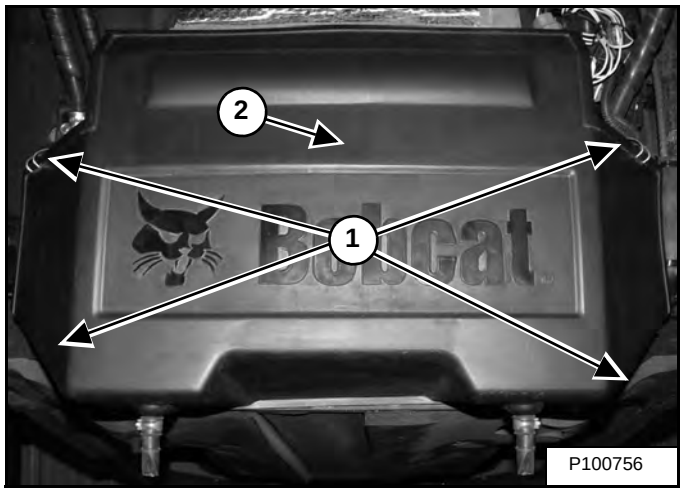
AVOID INJURY

Cylinders for raising and lowering operator cab have gas under pressure. Do not open cylinder. Only qualified service personnel can remove the cylinder.

W-2112-0987

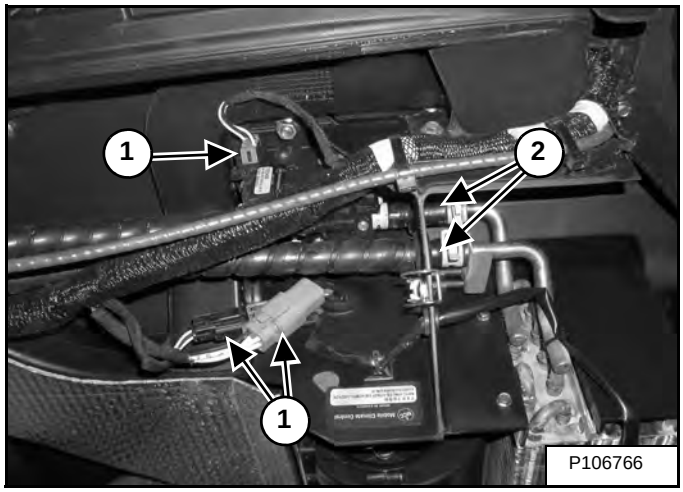
Removal And Installation

Figure 50-20-5



Unhook the four fasteners (Item 1) and remove the cover (Item 2) **[Figure 50-20-5]**.

Figure 50-20-6



Disconnect the expansion / heater unit wiring harness (Item 1) **[Figure 50-20-6]**.

Remove the two heater hoses (Item 2) **[Figure 50-20-6]**.

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

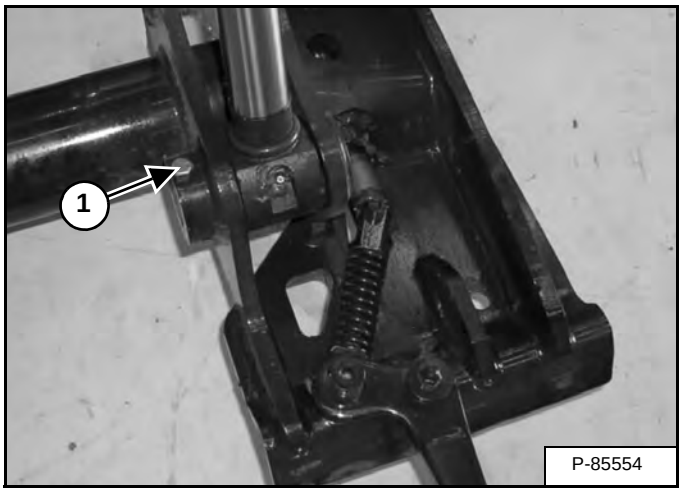
BOB-TACH (HAND LEVER)

Description

The Bob-Tach is the section of the loader lift arm that attachments mount to. The Hand Lever Bob-Tach uses two manually operated, spring assisted, locking wedge and lever assemblies to secure the attachment the Bob-Tach.

Removal And Installation

Figure 50-40-1



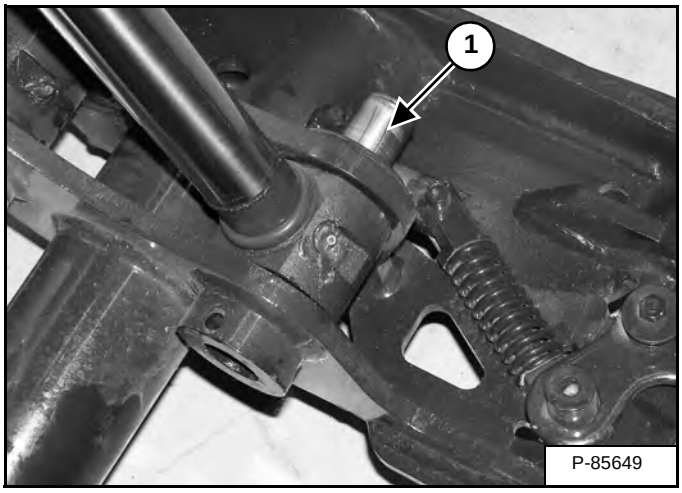
Tilt the Bob-Tach forward, parallel to the floor. Put blocks (approximately 76,2 mm [3 inches]) under each side of the Bob-Tach **[Figure 50-40-1]**.

Lower the Bob-Tach onto the blocks.

Remove the bolt and nut (Item 1) **[Figure 50-40-1]** from the rod end pivot pin.

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

Figure 50-40-2

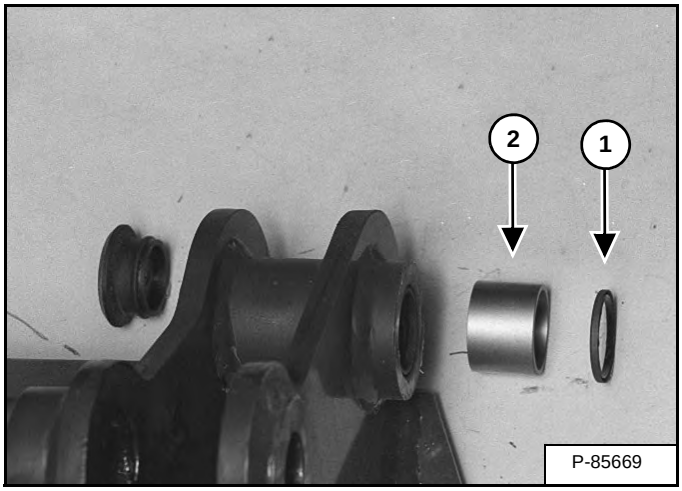


Remove the rod end pivot pin (Item 1) **[Figure 50-40-2]**.

Pivot Pin Bushing And Seal Removal And Installation

Remove the Power Bob-Tach. (See Removal And Installation on Page 50-41-1.)

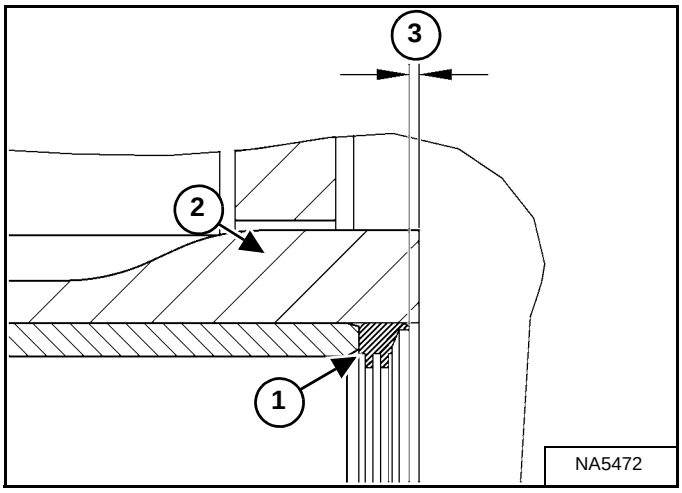
Figure 50-41-18



Remove the seal (Item 1) **[Figure 50-41-18]** from the Bob-Tach.

Remove the bushing (Item 2) **[Figure 50-41-18]** from the Bob-Tach.

Figure 50-41-19



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 50-41-19]**.

Striker Adjusting

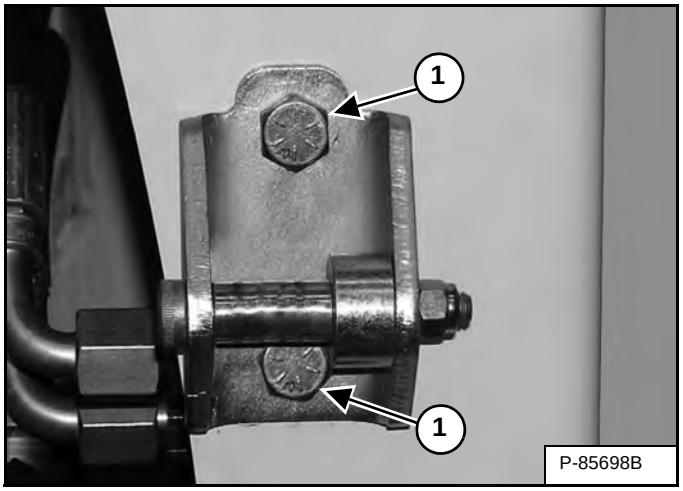
⚠ WARNING

AVOID INJURY OR DEATH

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

W-2012-0497

Figure 50-70-6



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

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

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

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

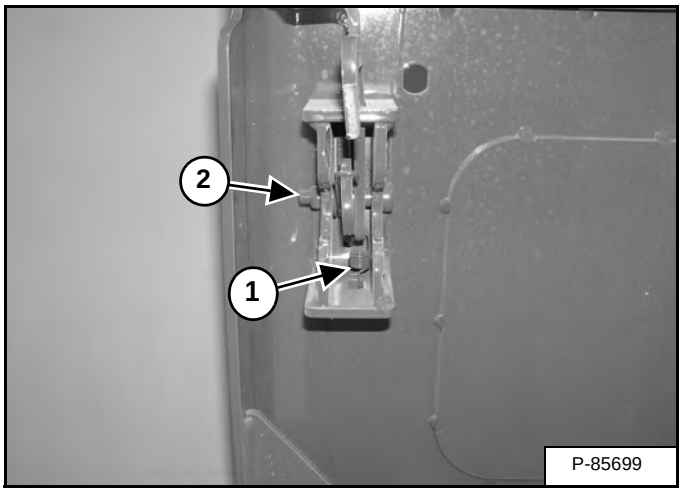
Open the door.

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

Close the rear door.

Latch Removal And Installation

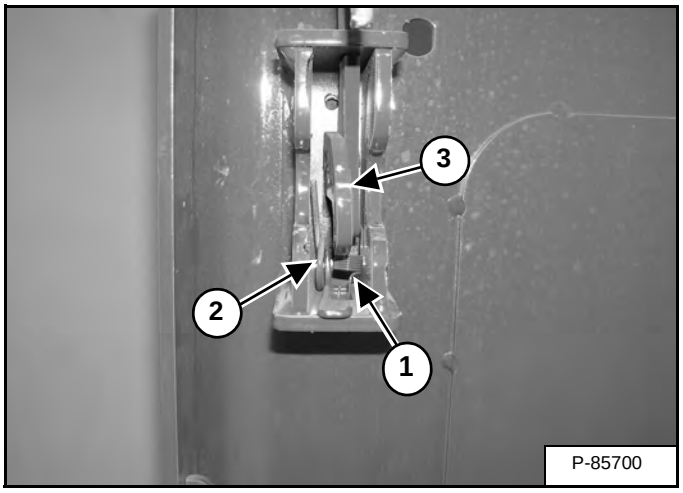
Figure 50-70-7



Disconnect the spring (Item 1) **[Figure 50-70-7]**.

Remove the bolt and nut (Item 2) **[Figure 50-70-7]** from the latch.

Figure 50-70-8



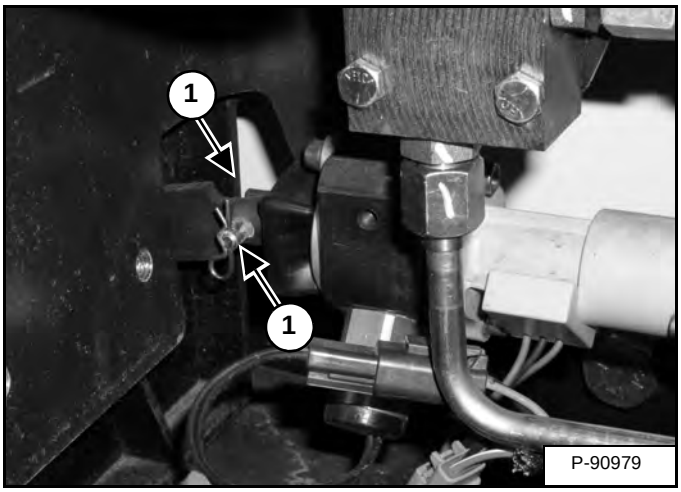
Remove the spring (Item 1) **[Figure 50-70-8]** from the door handle.

Remove the spring (Item 2) **[Figure 50-70-8]** from the door latch.

Remove the door latch (Item 3) **[Figure 50-70-8]** from the door handle.

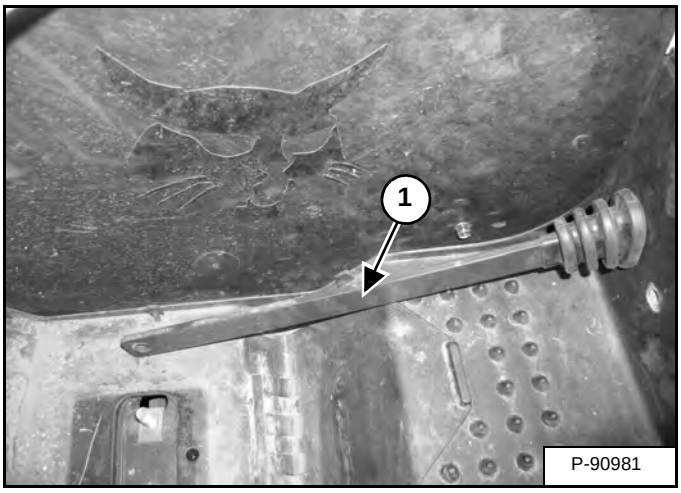
Linkage Removal And Installation

Figure 50-91-3



Remove the hairpin clip and the pin (Item 1) **[Figure 50-91-3]** from the foot sensor.

Figure 50-91-4



Remove the linkage (Item 1) **[Figure 50-91-4]** and the rubber boot.

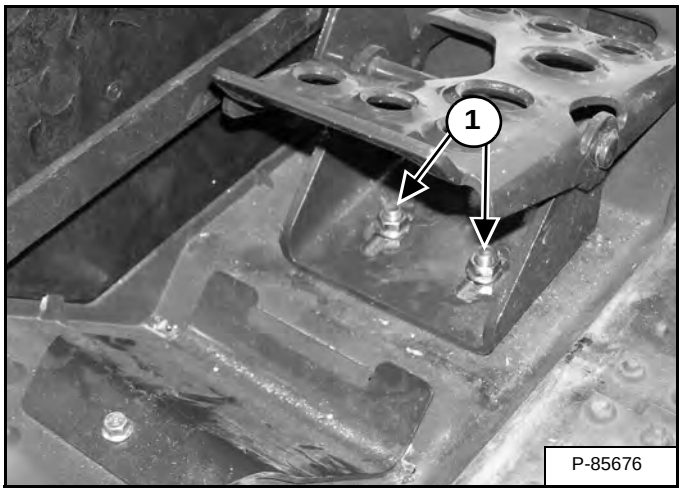
Repeat for other side.

Pedal (Adjusting)

After installing the pedal, adjust the pedal angle so that there is clearance under the rear of the pedal. The valve spool must travel full stroke without the pedal hitting the floor panel.

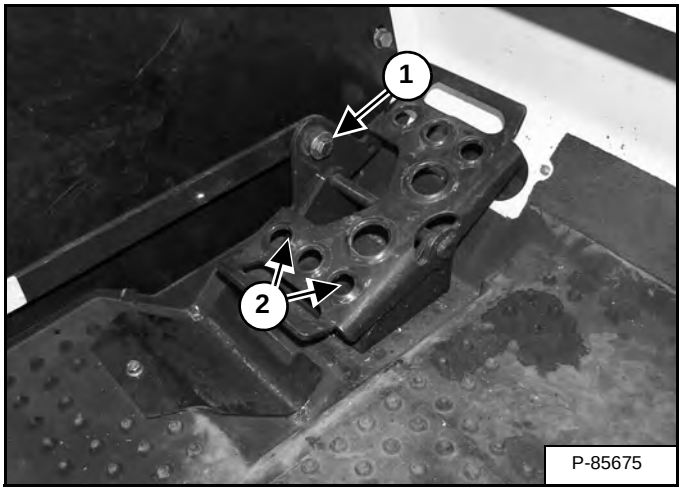
The pedals should be positioned at a comfortable angle so full movement of the pedal can be reached easily while properly sitting in the loader seat.

Figure 50-91-5



Loosen the two mounting nuts (Item 1) **[Figure 50-91-5]** from the pedal mounting bracket.

Figure 50-91-6



Loosen the bolt (Item 1) **[Figure 50-91-6]** and nut on the pedal linkage.

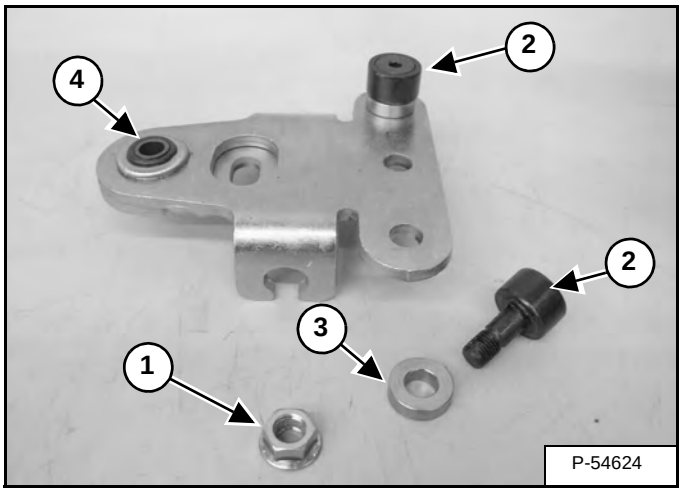
Inspect the bushing in the pedal for wear and replace as needed.

Tilt the pedal back and forth until an acceptable "neutral" angle is achieved on the pedal.

Tighten the two nuts (Item 2) and pivot bolt (Item 1) **[Figure 50-91-6]** on the pedal assembly to standard torque.

Pintle Arm Disassembly And Assembly

Figure 50-100-22

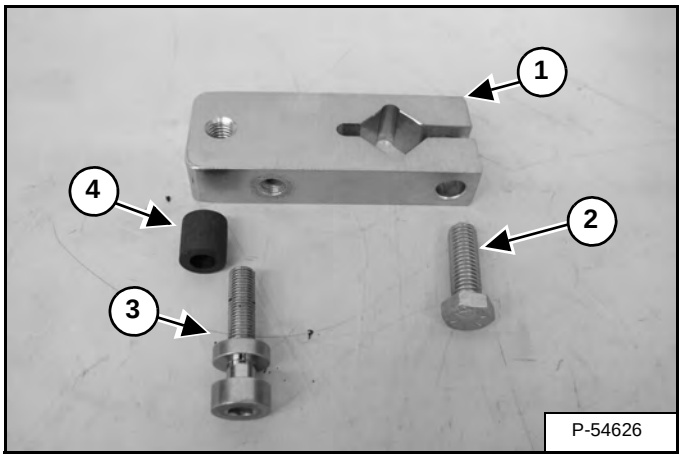


Remove the nut (Item 1) from the pintle roller cams (Item 2) and inspect the pintle roller cams and washers (Item 3) for damage **[Figure 50-100-22]**.

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

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

Figure 50-100-23



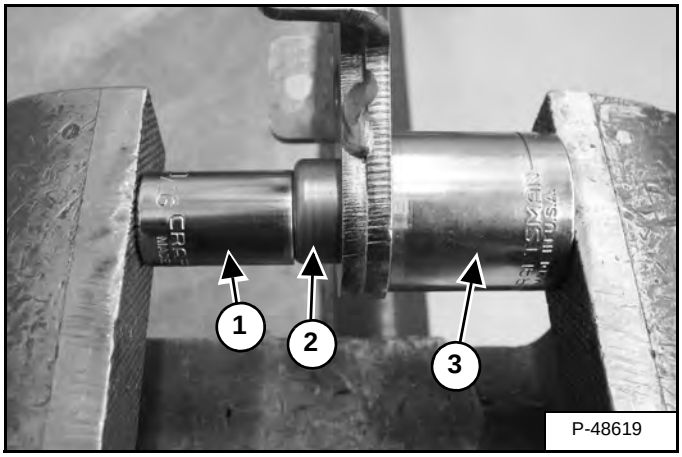
Remove the pintle base (Item 1) **[Figure 50-100-23]** from the pump shaft.

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

Inspect parts for wear and damage, replace as needed.

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

Figure 50-100-24



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

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

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

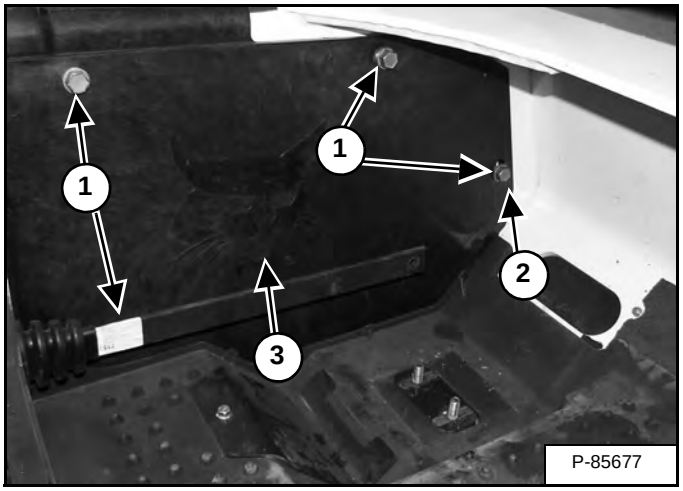

Bobcat®

ACCESS PANEL (INSIDE)

Removal And Installation (Left)

Remove the control pedal. (See Pedal Removal And Installation on Page 50-90-1.)

Figure 50-120-1

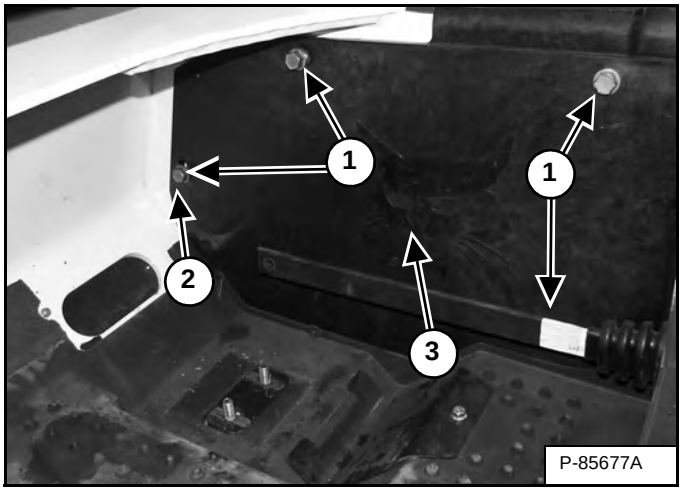


Remove the four bolts, (Item 1), washer (Item 2), and remove the left access panel (Item 3) **[Figure 50-120-1]**.

Removal And Installation (Right)

Remove the control pedal. (See Pedal Removal And Installation on Page 50-90-1.)

Figure 50-120-2

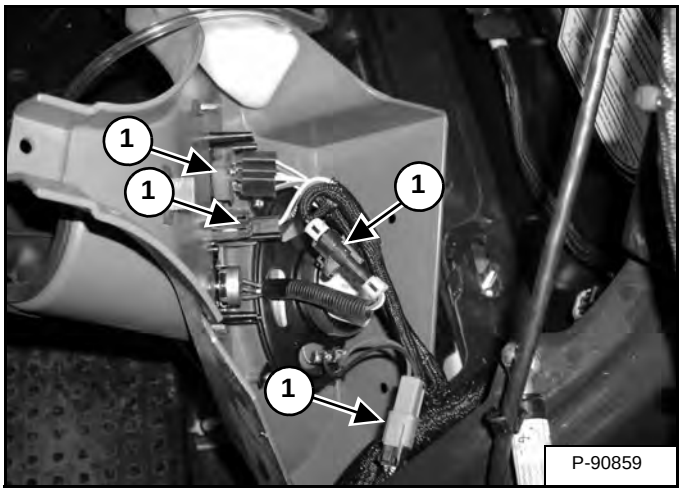


Remove the four bolts (Item 1), washer (Item 2), and remove the right access panel (Item 3) **[Figure 50-120-2]**.


Bobcat®

Removal And Installation (Cont'd)

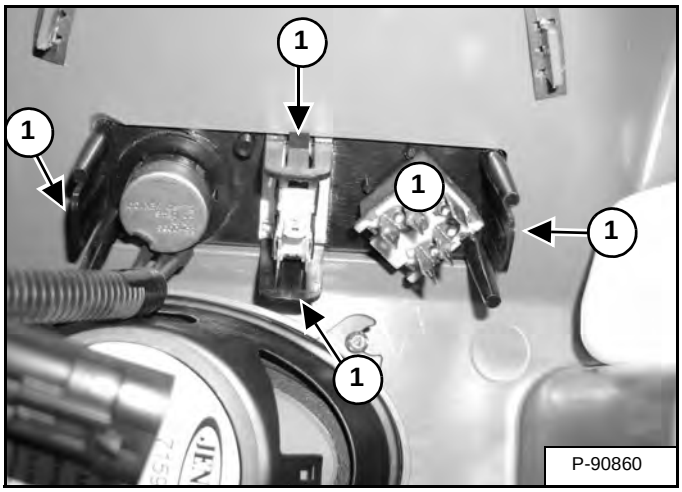
Figure 50-160-9



Disconnect the HVAC or radio wire harnesses (Item 1) **[Figure 50-160-9]** (if equipped).

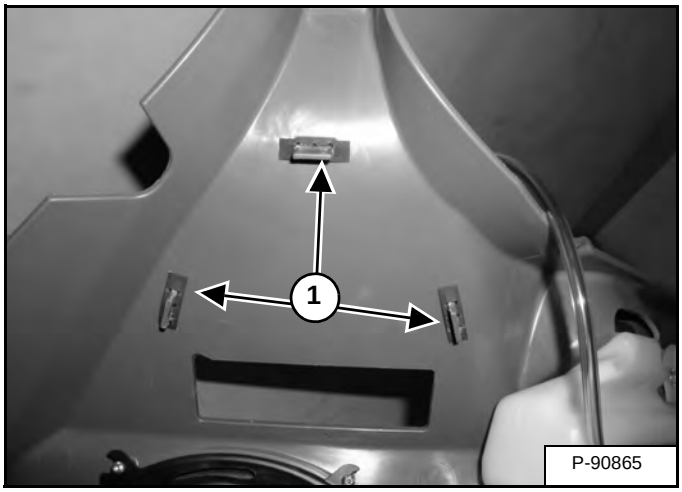
Disassembly And Assembly

Figure 50-160-10



Press the four tabs (Item 1) **[Figure 50-160-10]** and remove the HVAC control out of the left side lower panel.

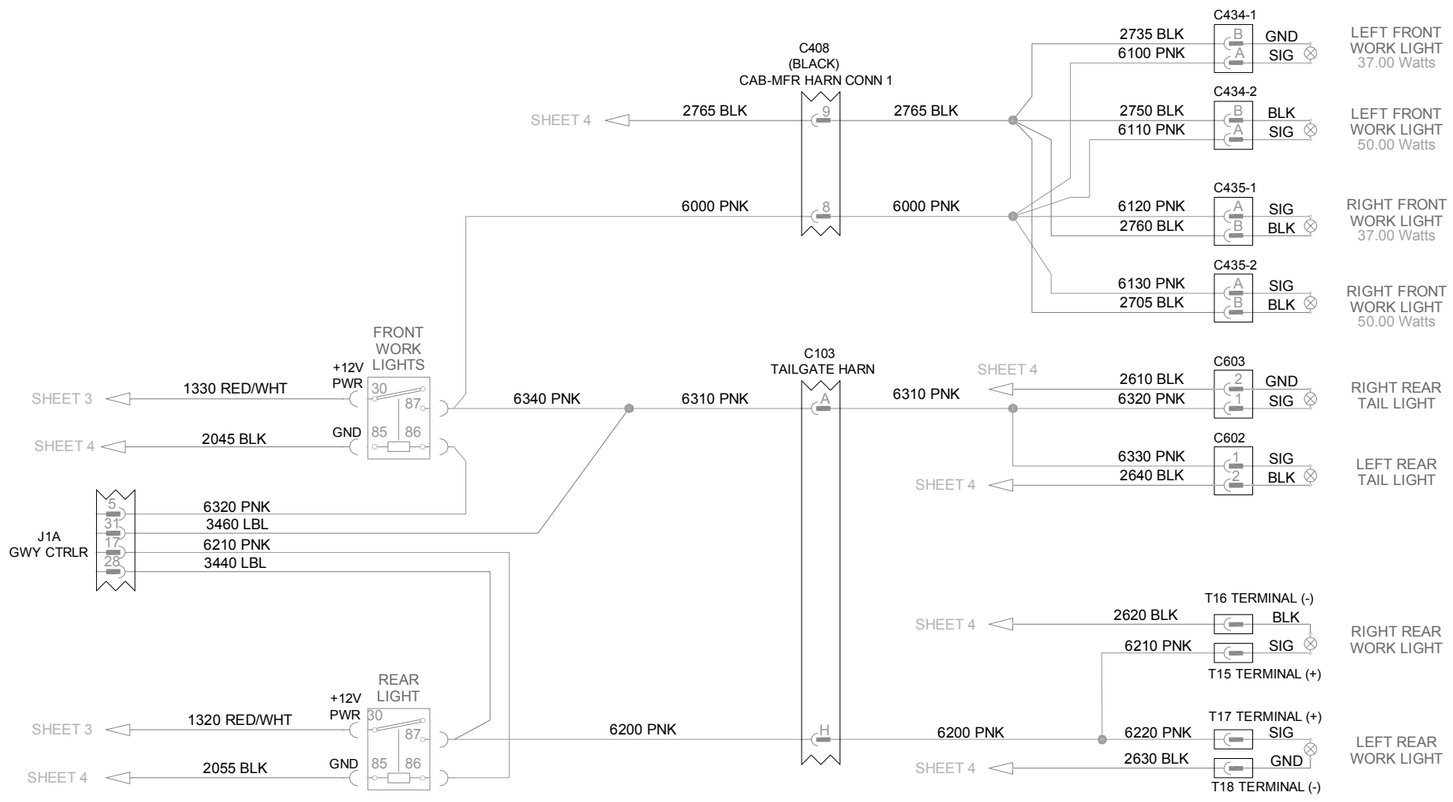
Figure 50-160-11



NOTE: If the three clips (Item 1) [Figure 50-160-11] are removed the cup holder will need to be replaced.

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

LIGHTS



Printable Version Click Here

WIRING SCHEMATIC
(MANUAL MACHINE)
S530 (S/N A7TV11001 - A7TV11395)
Sheet 11 of 13

(PRINTED NOVEMBER 2016)

7210762 (A)

Printed In U.S.A.

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

LEGEND

PARTIAL CONNECTOR

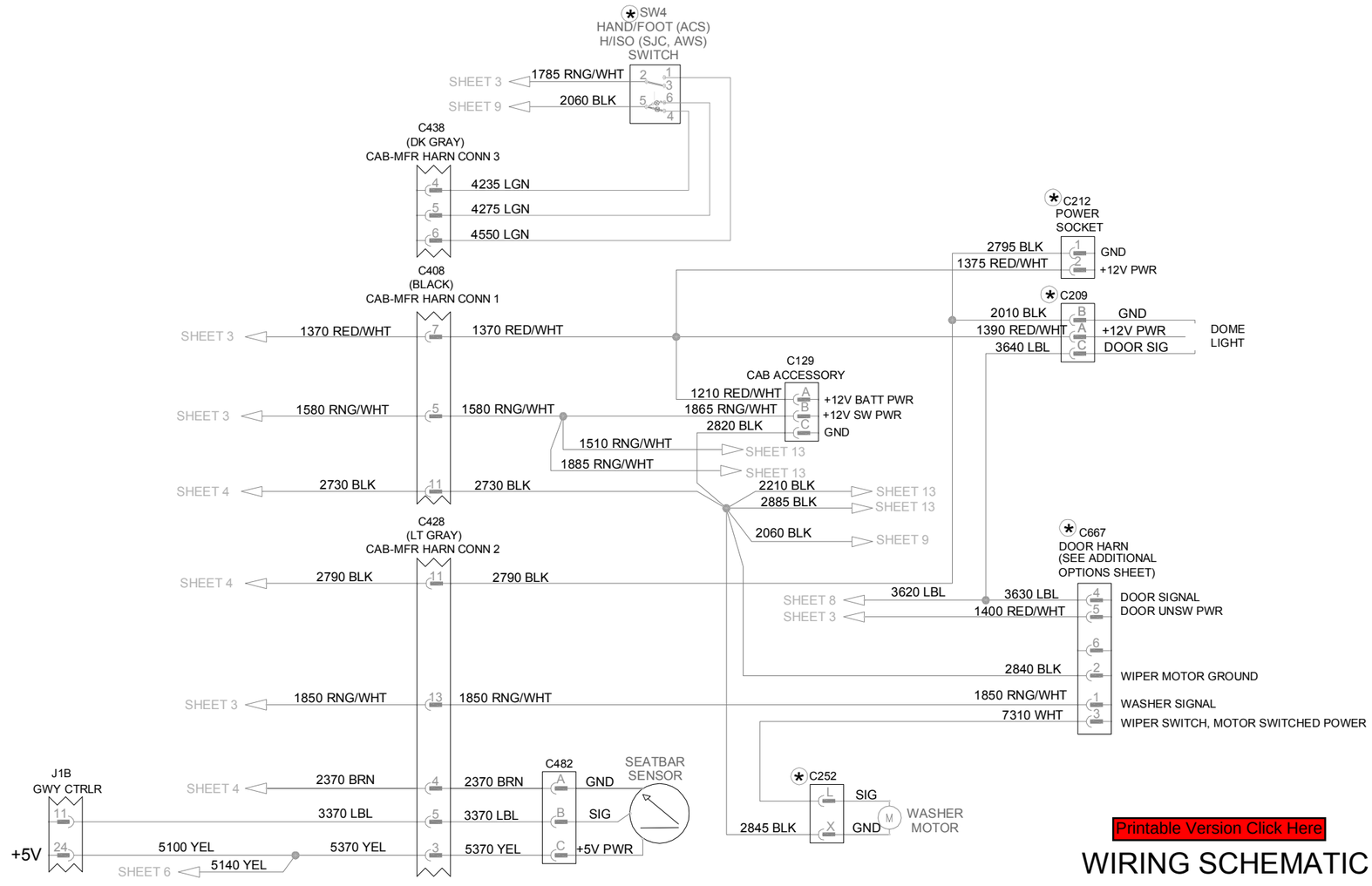
CONNECTOR

WIRE BREAK
(TWO WIRE BREAKS
JOIN ONE WIRE)

SHEET #

CAB

* DLX CAB HARN 7231782 ONLY
(NOT IN STD CAB HARN 7210557)



Printable Version Click Here

WIRING SCHEMATIC
(MANUAL MACHINE)
S530 (S/N A7TV11396 - A7TV12597)

Sheet 9 of 13

(PRINTED NOVEMBER 2016)

7210762 (B)

Printed In U.S.A.

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

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

LEGEND

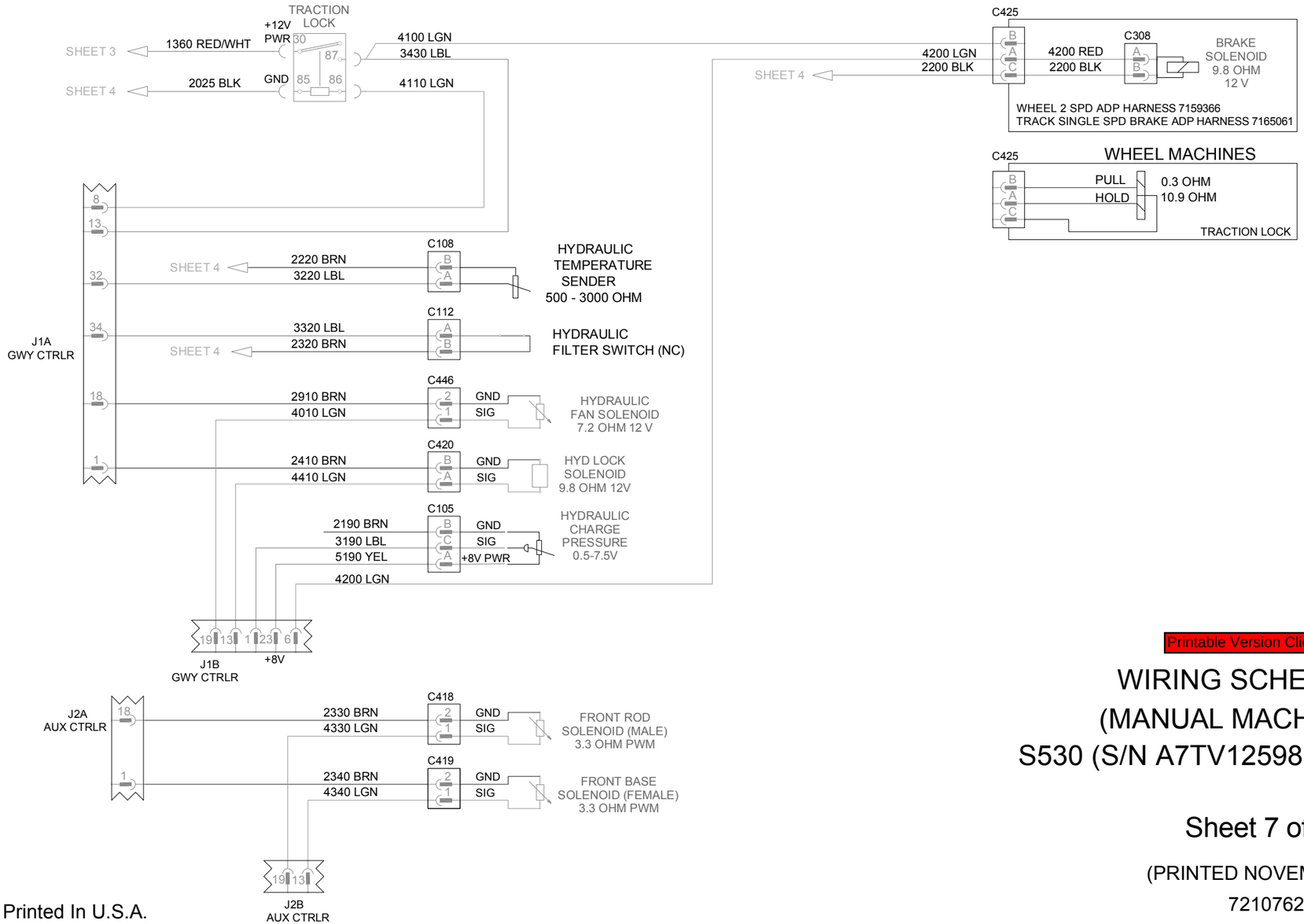
PARTIAL CONNECTOR

CONNECTOR

WIRE BREAK
(TWO WIRE BREAKS
JOIN ONE WIRE)

SHEET #

HYDRAULICS



Printed In U.S.A.

Printable Version Click Here

WIRING SCHEMATIC
(MANUAL MACHINE)
S530 (S/N A7TV12598 - A7TV13155)

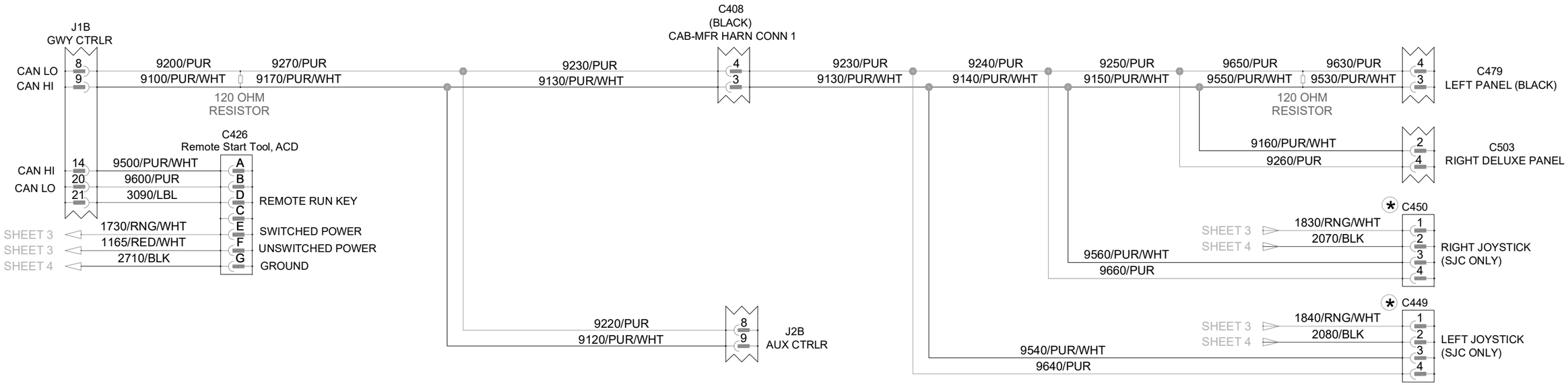
Sheet 7 of 13

(PRINTED NOVEMBER 2016)

7210762 (C)

CAN BUS

* DLX CAB HARN 7253409 ONLY
(NOT IN STD CAB HARN 7210557)



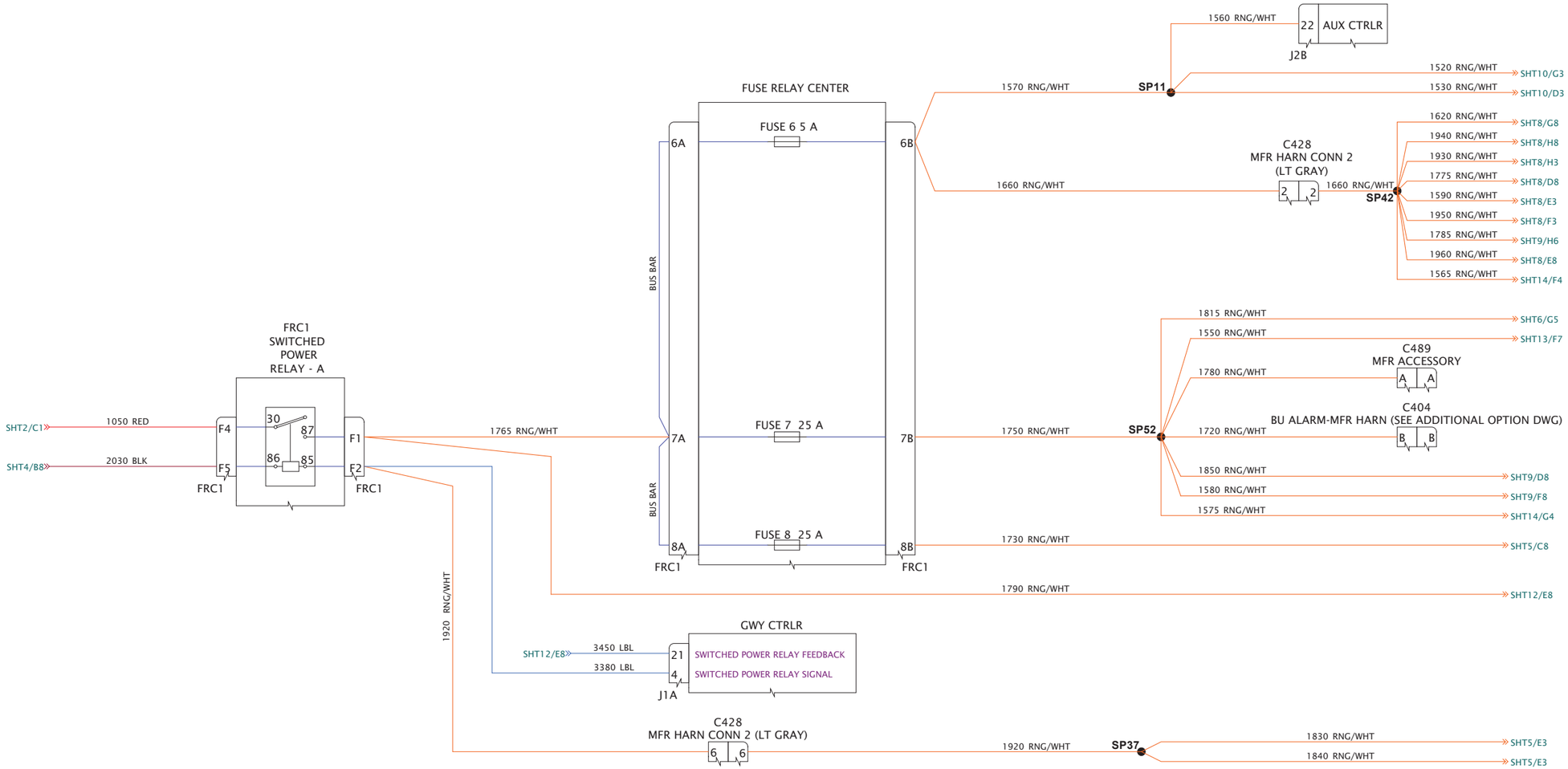
Printable Version Click Here

WIRING SCHEMATIC
(MANUAL MACHINE)
S530 (S/N A7TV13156 - A7TV13680)
(S/N B42811001 - B42811121)
Sheet 5 of 13

(PRINTED NOVEMBER 2017)
7254944 (0)

Printed In U.S.A.

SWITCHED POWER



Wiring Schematic **S530**
Standard Machine

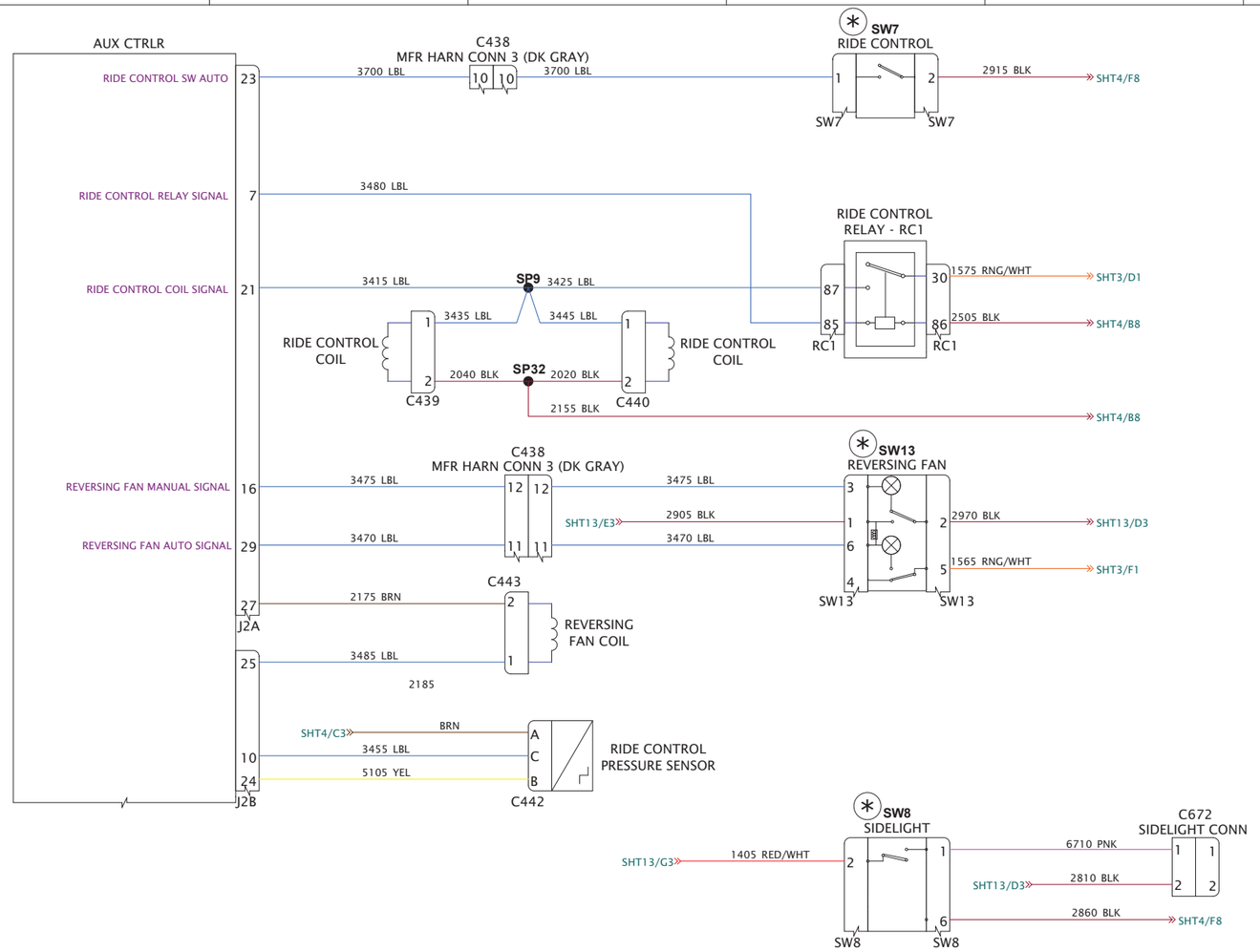
S/N A7TV13681 & Above
S/N B42811122 through B42812000

Printed On November 2018
7307215
Sheet 3 of 14

Printable Version Click Here

OPTIONS 2

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



Wiring Schematic **S530** S/N A7TV13681 & Above
Standard Machine S/N B42811122 through B42812000

Printed On November 2018
7307215
Sheet 14 of 14

Printable Version Click Here

LIGHTS

SHT4/E3

C408
MFR HARN CONN 1 (BLACK)
2765 BLK — 9 — 9 — 2765 BLK

SP14

6100 PNK
2735 BLK
2750 BLK
6110 PNK

C434-1
A SIG — 37 WATT
B GND
B GND — 50 WATT
A SIG
C434-2

LEFT FRONT
WORKLIGHT

6000 PNK — 8 — 8 — 6000 PNK

SP15

6120 PNK
2760 BLK
6130 PNK
2705 BLK

C435-1
A SIG — 37 WATT
B GND
A SIG — 50 WATT
B GND
C435-2

RIGHT FRONT
WORK LIGHT

FRC1
FRONT WORK
LIGHTS RELAY - B

SHT2/D1 — 1330 RED/WHT — D1
SHT4/C8 — 2045 BLK — D2
FRC1
D4 — 6340 PNK
D5
FRC1

SP10

C103
TAILGATE HARN
6310 PNK — A — A — 6310 PNK

SP49

SHT4/D8 — 2610 BLK — GND 2
6320 PNK — SIG 1
C603

RIGHT REAR
TAIL LIGHT

6330 PNK — SIG 1
SHT4/D8 — 2640 BLK — GND 2
C602

LEFT REAR
TAIL LIGHT

GWY CTRLR
MRKR LIGHT PWR RELAY SIGNAL — 5 — 6320 PNK
MRKR LIGHT PWR RELAY FEEDBACK — 31 — 3460 LBL
REAR LIGHT RELAY SIGNAL — 17 — 6210 PNK
REAR LIGHT RELAY FEEDBACK — 28 — 3440 LBL
J1A

FRC1
REAR LIGHT
RELAY - C

SHT2/C1 — 1320 RED/WHT — C1
SHT4/C8 — 2055 BLK — C2
FRC1
30 — 87 — C4
85 — C5
86
FRC1

6200 PNK — H — H — 6200 PNK

SP96

SHT4/E8 — 2620 BLK — C604 1
6210 PNK — C604 2

RIGHT REAR
WORK LIGHT

6220 PNK — C605 1
SHT4/D8 — 2630 BLK — C605 2

LEFT REAR
WORK LIGHT

Wiring Schematic
Standard Machine

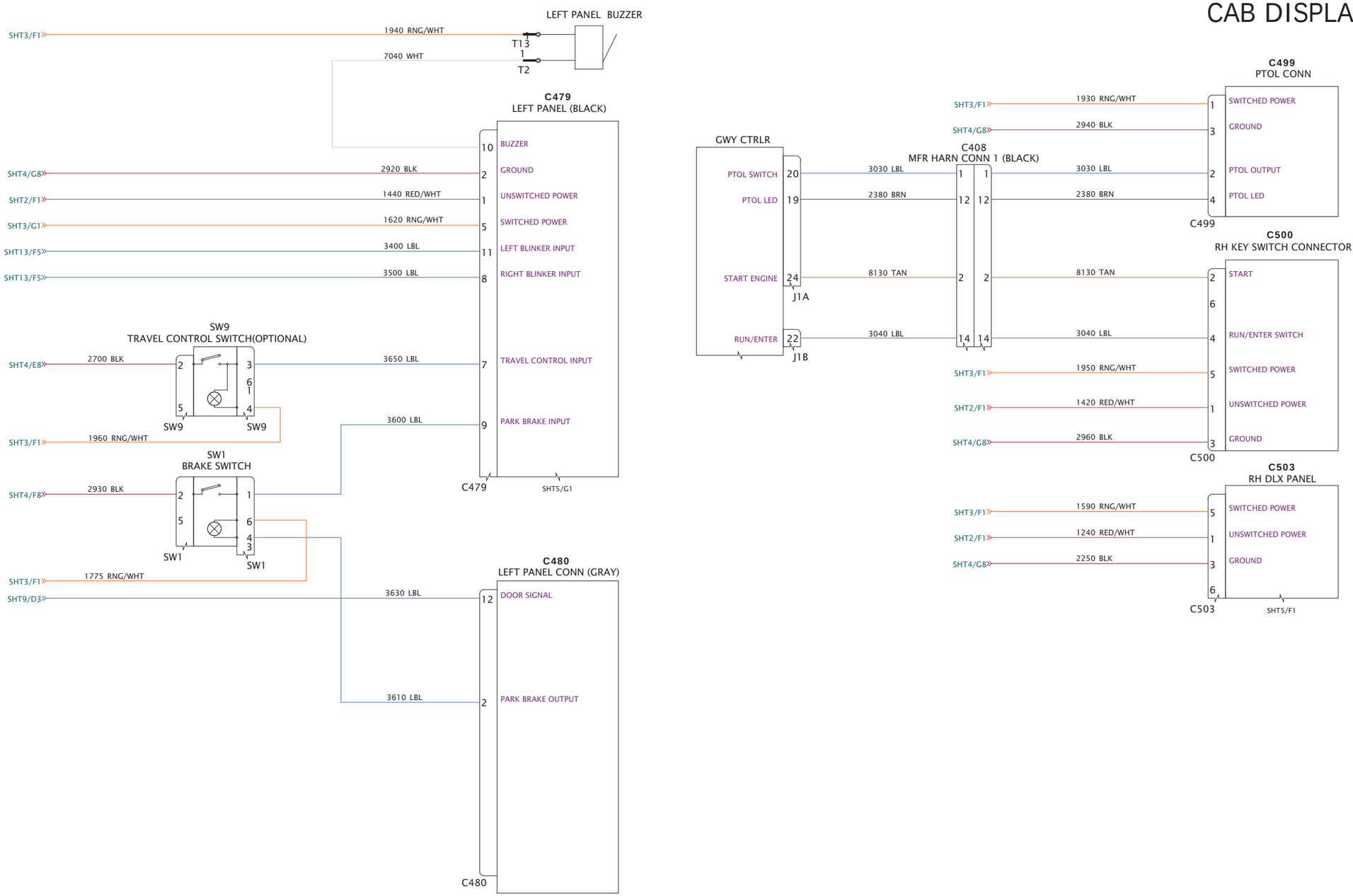
S530

S/N B42812001 through B42813000

Printed On August 2020
7331095 (0)
Sheet 11 of 14

Printable Version Click Here

CAB DISPLAY



Wiring Schematic **S530** S/N B42813001 & Above

Standard Machine

Printed On August 2020
7367944 (0)
Sheet 8 of 14

Printable Version Click Here

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

SCHEMATIC INDEX	
OVERVIEW	PAGE 1,2
POWER	PAGE 3
GROUND	PAGE 4
CAN BUS	PAGE 5
ENGINE	PAGE 6
HYDRAULICS	PAGE 7
CAB DISPLAY	PAGE 8
CAB	PAGE 9
ACS / SJC CONTROLS	PAGE 10
LIGHTS	PAGE 11
HVAC	PAGE 12
OPTIONS	PAGE 13
ACS	7196667
SJC	7196668

LEGEND

PARTIAL CONNECTOR

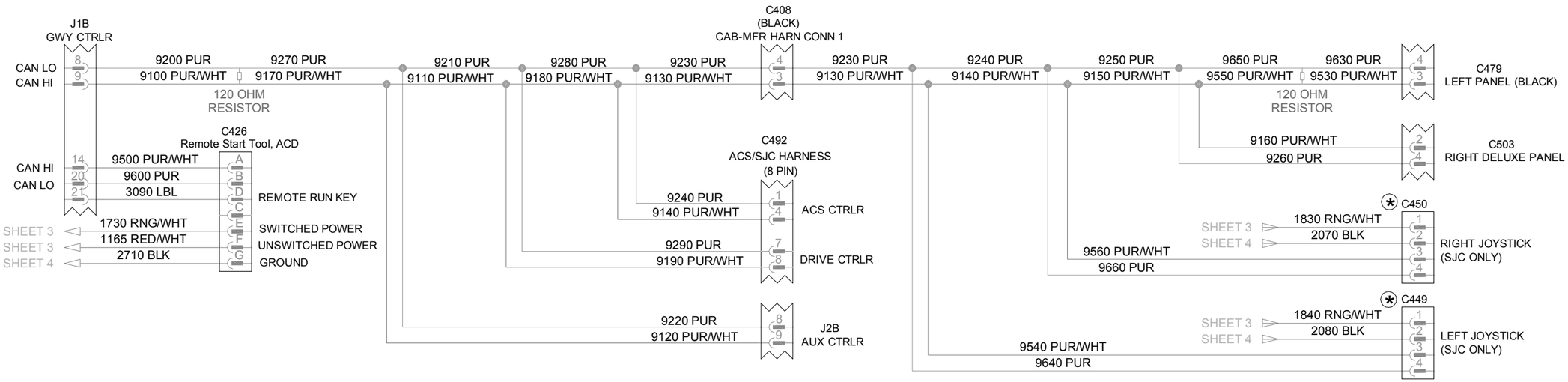
CONNECTOR

WIRE BREAK
(TWO WIRE BREAKS
JOIN ONE WIRE)

SHEET #

CAN BUS

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



Printable Version Click Here

WIRING SCHEMATIC
(ACS / SJC MACHINE)
S530 (S/N A7TV11001 - A7TV11395)

Sheet 5 of 15

(PRINTED NOVEMBER 2016)
7210761 (A)

Printed In U.S.A.

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	C434-1	LEFT WORKLIGHT 1	2	11	T1	BATT GROUND		4
C103	TAILGATE HARNESS	8	4,10,11,13	C434-2	LEFT WORKLIGHT 2	2	11	T2	BUZZER GROUND		8
C104	ENGINE COOLANT SENSOR	2	6	C435-1	RIGHT WORKLIGHT 1	2	11	T3	FLASHER		13
C105	HYD CHARGE PRESSURE	3	7	C435-2	RIGHT WORKLIGHT 2	2	11	T6	BATT GROUND		4
C106	ENGINE SPEED SENSOR	2	6	C438	CAB-MFR HARN CONN (DK GRY)	14	9,12,13	T8	BATT GROUND		4
C107	ENGINE OIL PRESSURE	3	6	C441	TWO SPEED	2	13	T13	BUZZER POWER		8
C108	HYD TEMPERATURE SENDER	2	7	C446	HYDRAULIC FAN	2	7	T14	PRE HEATER		6
C110	ALTERNATOR	2	6	C449	LEFT JOYSTICK (CAB HARN)	4	5	T15	RIGHT REAR WORK LIGHT(+)		11
C112	HYD OIL FILTER SWITCH	2	7	C450	RIGHT JOYSTICK (CAB HARN)	4	5	T16	RIGHT REAR WORK LIGHT(-)		11
C113	ENGINE HARNESS	10	6	C479	LEFT PANEL(BLACK)	12	5,8	T17	LEFT REAR WORK LIGHT (+)		11
C126	HORN	2	13	C480	LEFT PANEL(GRAY)	12	8	T18	LEFT REAR WORK LIGHT (-)		11
C129	CAB ACCESSORY	3	9	C482	SEATBAR SENSOR	3	9	T19	BACKUP ALARM		10
C209	DOME LIGHT	3	9	C483	TEMP CONTROL SWITCH	3	12	T20	BACKUP ALARM (GND)		10
C212	POWER SOCKET	2	9	C486	AC COMPRESSOR	2	12				
C252	WASHER	2	9	C489	MFR ACCESSORY	2	3,4	SW1	BRAKE SWITCH		8
C277	AIR RIDE SEAT	6	13	C492	ACS/SJC HARNESS	8	3,5,9	SW2	BEACON SWITCH		13
C278	RIGHT SPEAKER	2	13	C493	ACS/SJC HARNESS	4	3,4	SW3	HAZARD SWITCH		13
C279	LEFT SPEAKER	2	13	C499	PTOL	4	8	SW4	HAND/FOOT, H/ISO SWITCH		9
C308	BRAKE SOLENOID	2	7	C500	RH KEY SWITCH	6	8	SW5	POWER BOBTACH SWITCH		13
C350	AC EVAPORATOR SWITCH	2	12	C503	RH DLX PANEL	6	5,8	SW6	BUCKET POSITION SWITCH		13
C355	DLX or STD FUEL HARNESS	6	6,12,13	C602	LEFT REAR TAIL LIGHT	2	11	SW9	TRAVEL CONTROL SWITCH		8
C404	BACKUP ALARM	2	3,10	C603	RIGHT REAR TAIL LIGHT	2	11	SW10	BLOWER SWITCH		12
C405	AIR FILTER SWITCH	2	6	C606	POWER BOBTACH OPEN	2	13	SW11	AC SWITCH		12
C406	FUEL SENDER	2	6	C607	POWER BOBTACH CLOSE	2	13				
C408	CAB-MFR HARN CONN (BLK)	14	3-5,8,9,11,13	C610	HVAC DUCT FAN	2	12				
C409	RIGHT HANDLE	10	10	C611	BLOWER MOTOR	4	12				
C410	LEFT HANDLE	10	10	C630	THERMOSTAT	3	12				
C411	LEFT HANDLE 5 WAY (FLSHR)	5	10,13	C635	HEATER VALVE	6	12				
C412	LEFT HANDLE 2 WAY (HORN)	2	10,13	C667	DOOR	6	9				
C415	HIGH FLOW SOLENOID	2	7	C670	EXTERIOR BEACON	6	13				
C418	FRONT ROD	2	7	C676	RADIO	6	9				
C419	FRONT BASE	2	7								
C420	HYD LOCK	2	7	J1A	GATEWAY COTROLLER	34					
C421	TILT SPOOL LOCK	3	10	J1B	GATEWAY CONTOLLER	26					
C422	LIFT SPOOL LOCK	3	10	J2A	AUX CONTROLLER	34					
C423	BUCKET POSITION	2	13	J2B	AUX CONTROLLER	26					
C425	BRAKE SOLENOID	3	7								
C426	CAN (Remote Start Tool, ACD)	7	5	FRC1	FUSE RELAY CENTER		3,6,7,11,12				
C428	CAB-MFR HARN CONN (LT GRY)	14	3,4,9,13								

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

Printed In U.S.A.

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

Printable Version Click Here

WIRING SCHEMATIC
(ACS / SJC MACHINE)
S530 (S/N A7TV11396 - A7TV12597)

Sheet 1 of 15

(PRINTED NOVEMBER 2016)
7210761 (B)

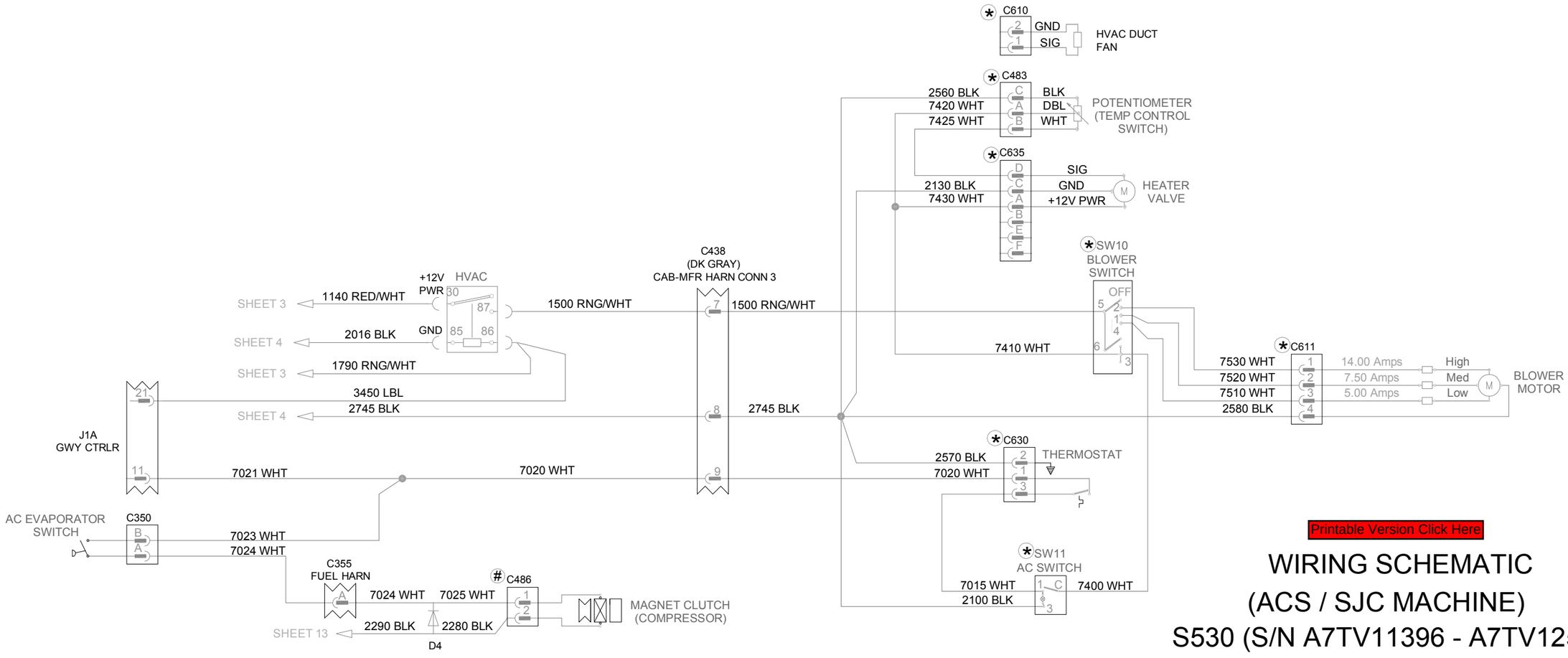
WIRE CATEGORIES FOR COLORS AND NUMBER RANGE			
GROUP DESCRIPTION	GROUP NUMBER RANGE	WIRE COLOR	COLOR CODE
BATT FEED, GENERAL	1000 THROUGH 1499	RED	RED
BATT FEED, FUSED	1000 THROUGH 1499	RED/WHITE	RED/WHT
BATT FEED, SWITCHED	1500 THROUGH 1999	ORANGE/WHITE	RNG/WHT
BATTERY GROUND	2000 THROUGH 2999	BLACK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

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

HVAC

* DLX CAB HARN 7231782 ONLY
(NOT IN STD CAB HARN 7210557)

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



Printable Version Click Here

WIRING SCHEMATIC
(ACS / SJC MACHINE)
S530 (S/N A7TV11396 - A7TV12597)

Sheet 12 of 15

(PRINTED NOVEMBER 2016)

7210761 (B)

Printed In U.S.A.

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

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

LEGEND

PARTIAL CONNECTOR

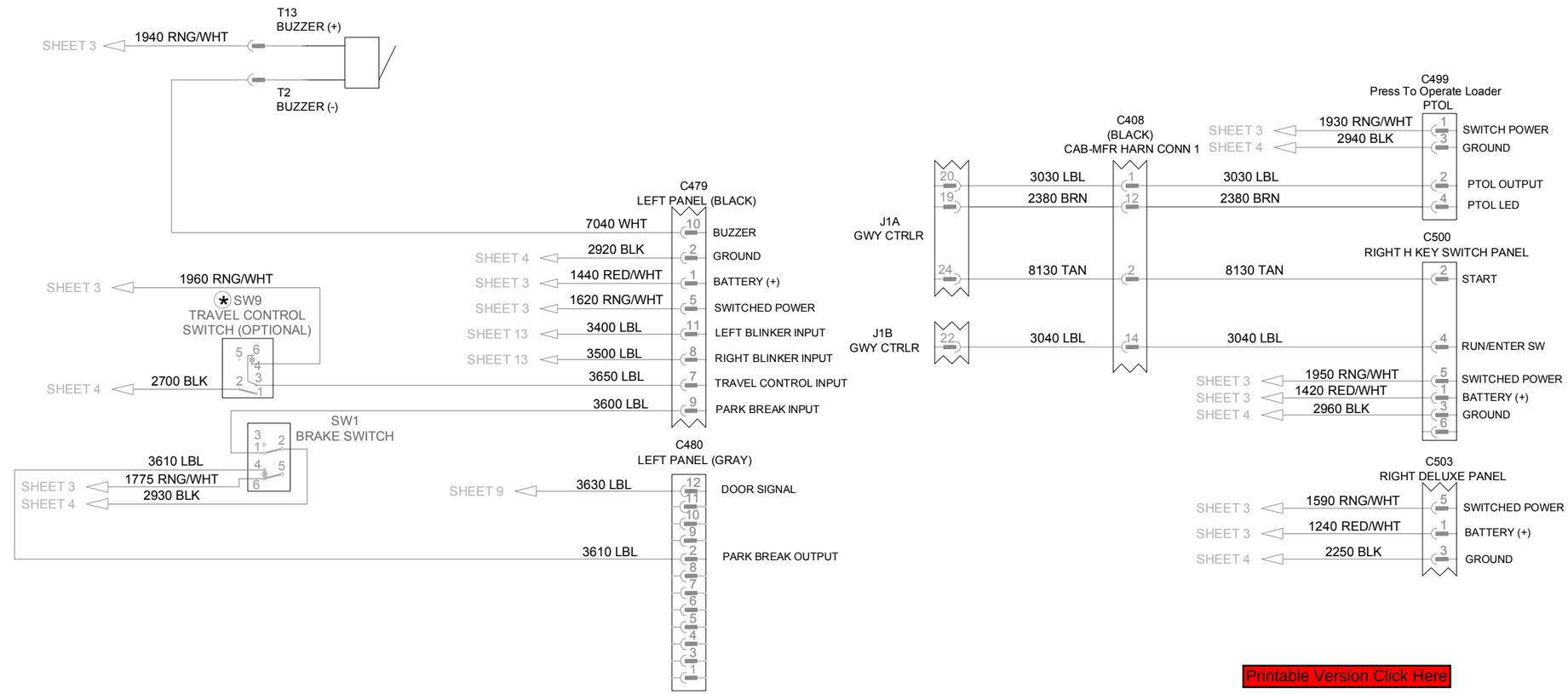
CONNECTOR

WIRE BREAK
(TWO WIRE BREAKS
JOIN ONE WIRE)

SHEET #

CAB DISPLAY

* DLX CAB HARN 7231782 ONLY
(NOT IN STD CAB HARN 7210557)



Printable Version Click Here

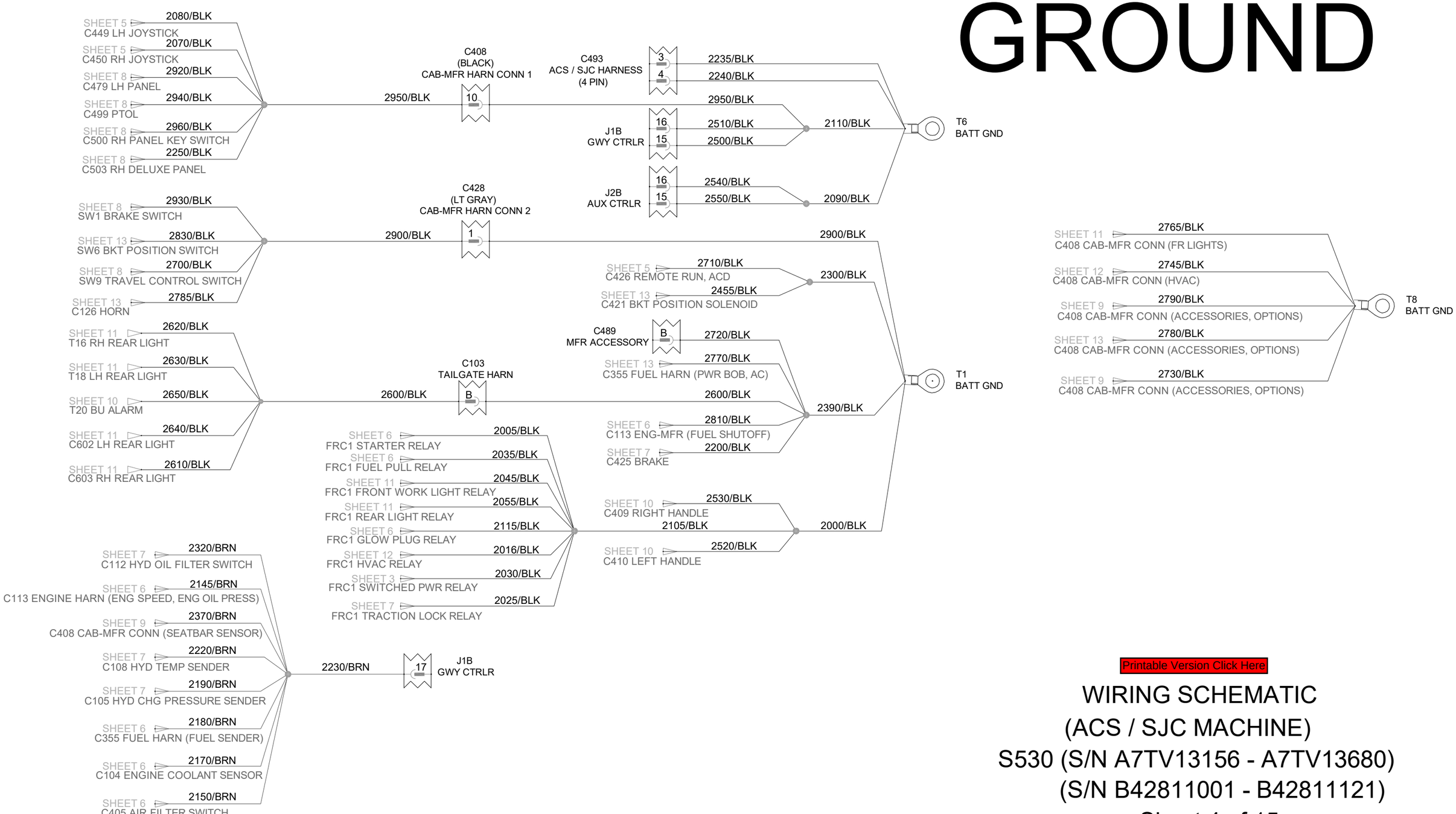
WIRING SCHEMATIC
(ACS / SJC MACHINE)
S530 (S/N A7TV12598 - A7TV13155)

Sheet 8 of 15

(PRINTED NOVEMBER 2016)
7210761 (C)

Printed In U.S.A.

GROUND



Printable Version Click Here

WIRING SCHEMATIC
(ACS / SJC MACHINE)
S530 (S/N A7TV13156 - A7TV13680)
(S/N B42811001 - B42811121)
Sheet 4 of 15

(PRINTED NOVEMBER 2017)

7254448 (A)

Printed In U.S.A.

SJC CONTROLS

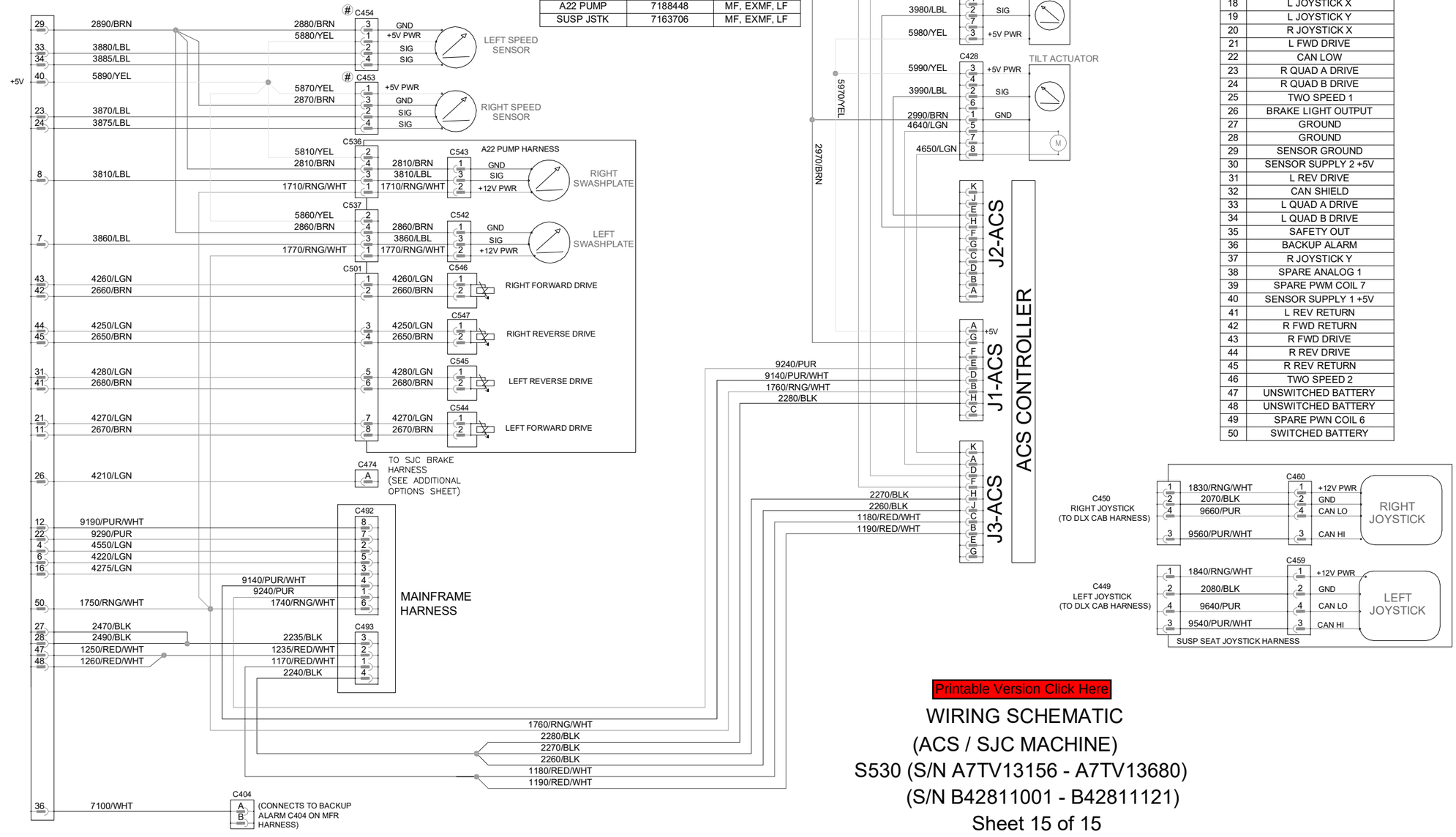
(#) HARNESSES 7159325, 7159458 ONLY

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

HARNESS PART NUMBER		
SJC WHEEL	7210503	EXMF, LF
SJC TRACK	7210504	EXMF, LF
SJC WHEEL	7159325	EXMF, LF
SJC TRACK	7159458	EXMF, LF
SJC WHL,TRK	7210505	MF
A22 PUMP	7188448	MF, EXMF, LF
SUSP JSTK	7163706	MF, EXMF, LF

J5 DRIVE CONTROLLER	
PIN	FUNCTION
1	SAFETY IN
2	TWO SPEED SWITCH
3	SPARE DIGITAL INPUT 2
4	H PAT SWITCH
5	ISO PAT SWITCH
6	ISO LITE
7	L SWASH PLATE ANGLE
8	R SWASH PLATE ANGLE
9	SPARE ANALOG 4
10	SPARE ANALOG 5
11	L FWD RETURN
12	CAN HIGH
13	LF ANGLE
14	RF ANGLE
15	LR ANGLE
16	H PAT LITE
17	RR ANGLE
18	L JOYSTICK X
19	L JOYSTICK Y
20	R JOYSTICK X
21	L FWD DRIVE
22	CAN LOW
23	R QUAD A DRIVE
24	R QUAD B DRIVE
25	TWO SPEED 1
26	BRAKE LIGHT OUTPUT
27	GROUND
28	GROUND
29	SENSOR GROUND
30	SENSOR SUPPLY 2 +5V
31	L REV DRIVE
32	CAN SHIELD
33	L QUAD A DRIVE
34	L QUAD B DRIVE
35	SAFETY OUT
36	BACKUP ALARM
37	R JOYSTICK Y
38	SPARE ANALOG 1
39	SPARE PWM COIL 7
40	SENSOR SUPPLY 1 +5V
41	L REV RETURN
42	R FWD RETURN
43	R FWD DRIVE
44	R REV DRIVE
45	R REV RETURN
46	TWO SPEED 2
47	UNSWITCHED BATTERY
48	UNSWITCHED BATTERY
49	SPARE PWN COIL 6
50	SWITCHED BATTERY

J5 - DRIVE CONTROLLER



Printable Version Click Here

WIRING SCHEMATIC

(ACS / SJC MACHINE)

S530 (S/N A7TV13156 - A7TV13680)

(S/N B42811001 - B42811121)

Sheet 15 of 15

(PRINTED NOVEMBER 2017)

7254448 (A)

Printed In U.S.A.

LIGHTS

SHT4/E3

C408
MFR HARN CONN 1 (BLACK)
2765 BLK — 9 — 9 — 2765 BLK

SP14

6100 PNK → C434-1 SIG A
2735 BLK → GND B
2750 BLK → GND B
6110 PNK → SIG A
C434-2
37 WATT
50 WATT
LEFT FRONT WORKLIGHT

6000 PNK — 8 — 8 — 6000 PNK

SP15

6120 PNK → C435-1 SIG A
2760 BLK → GND B
6130 PNK → SIG A
2705 BLK → GND B
C435-2
37 WATT
50 WATT
RIGHT FRONT WORK LIGHT

FRC1
FRONT WORK LIGHTS RELAY - B

SHT2/D1 — 1330 RED/WHT — D1
SHT4/C8 — 2045 BLK — D2
FRC1
D4 — 6340 PNK
D5
FRC1

SP10

C103
TAILGATE HARN
6310 PNK — A — A — 6310 PNK

SP49

SHT4/D8 — 2610 BLK → GND 2
6320 PNK → SIG 1
C603
RIGHT REAR TAIL LIGHT

6330 PNK → SIG 1
SHT4/D8 — 2640 BLK → GND 2
C602
LEFT REAR TAIL LIGHT

GWY CTRLR
MRKR LIGHT PWR RELAY SIGNAL — 5 — 6320 PNK
MRKR LIGHT PWR RELAY FEEDBACK — 31 — 3460 LBL
REAR LIGHT RELAY SIGNAL — 17 — 6210 PNK
REAR LIGHT RELAY FEEDBACK — 28 — 3440 LBL
J1A

FRC1
REAR LIGHT RELAY - C

SHT2/C1 — 1320 RED/WHT — C1
SHT4/C8 — 2055 BLK — C2
FRC1
30 — 87 — C4
85 — C5
86
FRC1

6200 PNK

H — H — 6200 PNK

SP96

SHT4/E8 — 2620 BLK → GND 1
T16 TERMINAL (-)
6210 PNK → SIG 1
T15 TERMINAL (+)
RIGHT REAR WORK LIGHT

T17 TERMINAL (+)
6220 PNK → SIG 1
SHT4/D8 — 2630 BLK → GND 1
T18 TERMINAL (-)
LEFT REAR WORK LIGHT

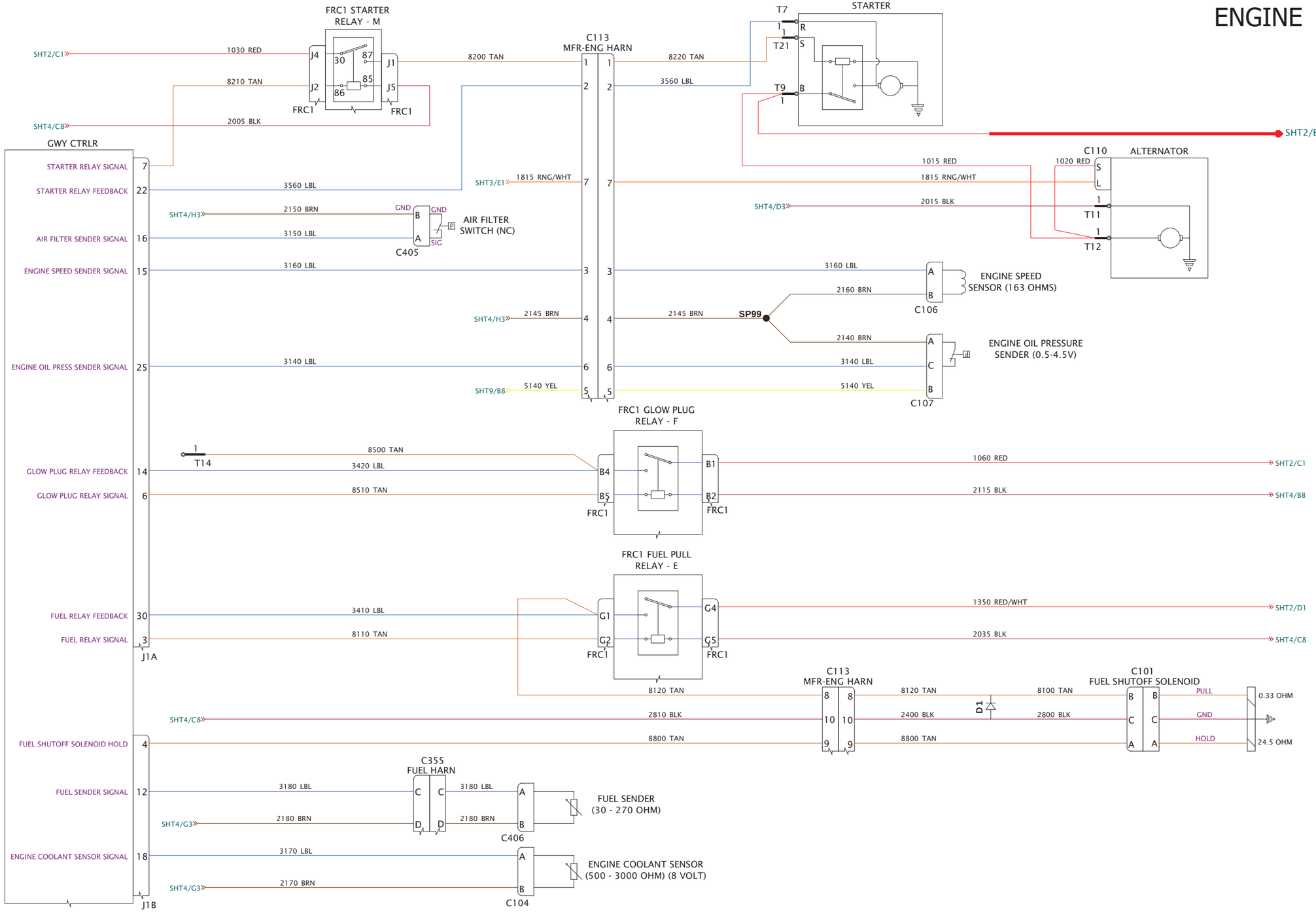
Wiring Schematic **S530**
ACS / SJC Machine

S/N A7TV13681 & Above
S/N B42811122 through B42812000

Printed On November 2018
7307213

Printable Version Click Here

ENGINE



Wiring Schematic **S530** S/N B42812001 through B42813000

ACS / SJC Machine

Printed On August 2020

7331094 (0)

Sheet 6 of 16

Printable Version Click Here

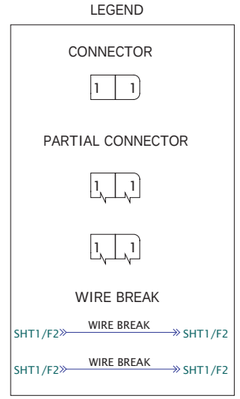
Index	Diagram
1	SH01 - INDEX
2	SH02 - UNSWITCHED BATT POWER
3	SH03 - SWITCHED POWER
4	SH04 - GROUND
5	SH05 - CAN BUS
6	SH06 - ENGINE
7	SH07 - HYDRAULICS
8	SH08 - CAB DISPLAY
9	SH09 - CAB
10	SH10 - MANUAL CONTROLS
11	SH11 - LIGHTS
12	SH12 - HVAC
13	SH13 - OPTIONS 1
14	SH14 - OPTIONS 2

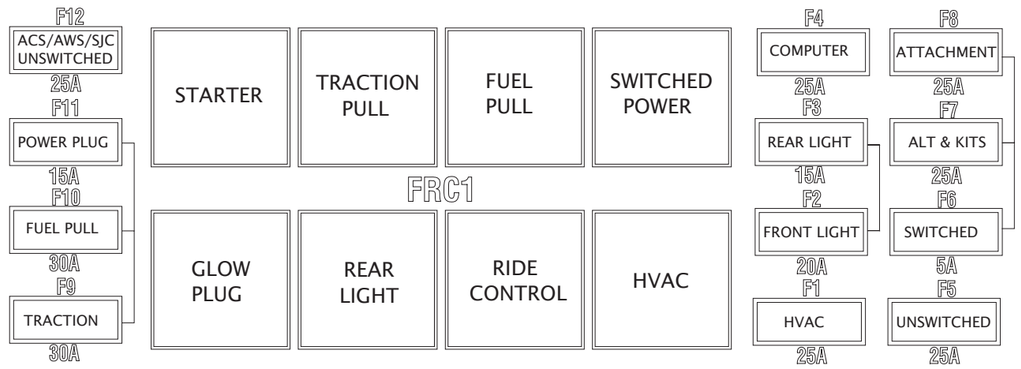
HARNESS PART NUMBER	
MFR CTRL	7367801
STD CAB	7367798
DLX CAB	7367799
STD FUEL	7149219
ENG 2403	7181036
ENG 2607	7181037
TAILGATE DOM	7217484
TRK BRAKE ADP	7165061
SUSP JSTK	7163706

WIRE CATEGORIES FOR COLORS AND NUMBER RANGE

GROUP DESCRIPTION	GROUP NUMBER RANGE	WIRE COLOR	COLOR CODE
BATT FEED, GENERAL	1000 THROUGH 1499	RED	RED
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	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

Click Here for Interactive PDF

S530

S/N B42813001 & Above

Printed On August 2020
7367943 (0)
Sheet 1 of 16

Printable Version Click Here

HVAC

(*) DLX CAB HARN ONLY
(NOT IN STD CAB HARN)
(*) DLX FUEL HARN 7266824 ONLY
(NOT IN STD FUEL HARN 7149219)

HVAC DUCT FAN
2440 BLK
GND
7440 WHT
SIG
C610

POTENTIOMETER (TEMP CONTROL SWITCH)
2560 BLK
7420 WHT
7425 WHT
C483

HEATER VALVE
7425 WHT
2130 BLK
7430 WHT
C635

SP48

FRC1
HVAC RELAY-B
SHT2/G1
1140 RED/WHT
SHT4/C8
2016 BLK
SHT3/D1
1790 RNG/WHT
SHT3/C6
3450 LBL

C438
MFR HARN CONN 3
(DK GRAY)
1500 RNG/WHT

SW10
BLOWER SWITCH
1500 RNG/WHT
7530 WHT
7520 WHT
7510 WHT
7400 WHT
7410 WHT

BLOWER MOTOR
HIGH
MED
LOW
C611

SHT4/F3
2745 BLK
2745 BLK
SP16
2580 BLK
2100 BLK

GWY CTRLR
AC SIGNAL MONITOR
J1A
7021 WHT
SP40
7020 WHT

THERMOSTAT
7020 WHT
2570 BLK
7015 WHT
C630

SW11
AC SWITCH

AC EVAPORATOR SWITCH
7023 WHT
7024 WHT
C350

C355
FUEL HARN
7024 WHT

D4

SHT13/H7
2290 BLK
7025 WHT
2280 BLK
C486

MAGNET CLUTCH
(COMPRESSOR)

Wiring Schematic
ACS / SJC Machine

S530

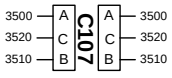
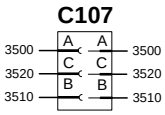
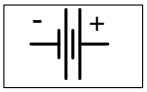
S/N B42813001 & Above

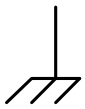
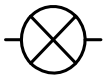
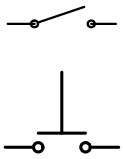
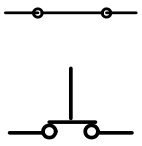
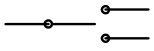
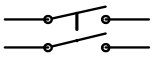
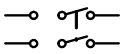
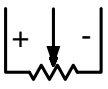
Printed On August 2020
7367943 (0)
Sheet 12 of 16

Printable Version Click Here

ELECTRICAL SYSTEM INFORMATION

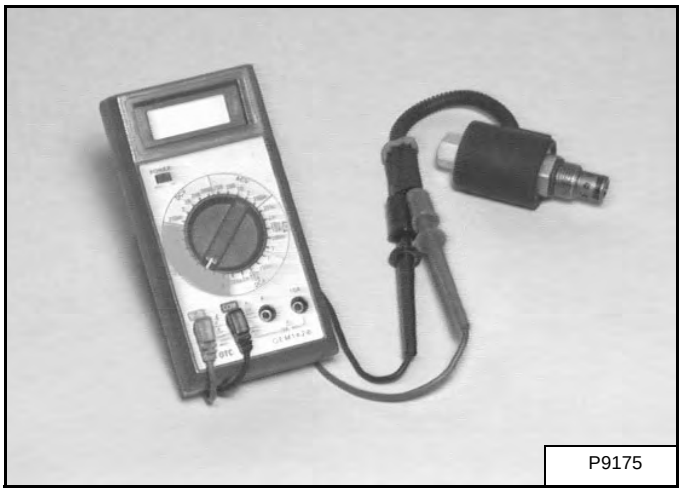
Glossary Of Electrical Symbols

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

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

Solenoid Testing

Figure 60-10-6



Use a test meter to measure coil resistance. Solenoid coil wires do not have polarity. Correct resistance for the pressure relief (small) coil is 7 - 10 ohm and the other coils 5 - 8 ohm **[Figure 60-10-6]**.

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

STARTER

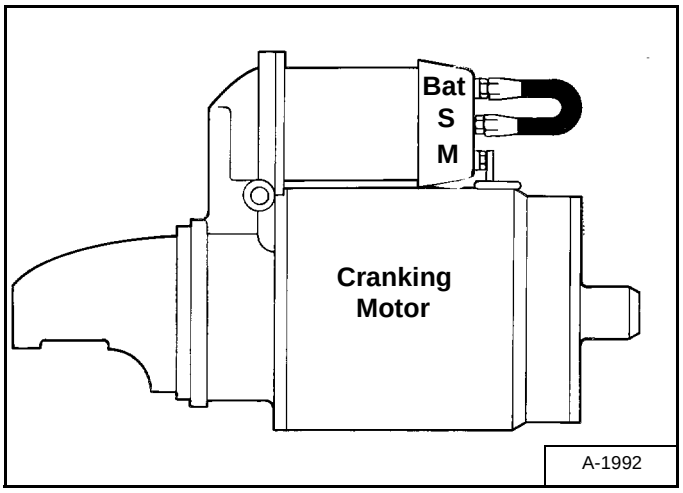
Testing

The key switch must be in the OFF position.

The battery must be at full charge.

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

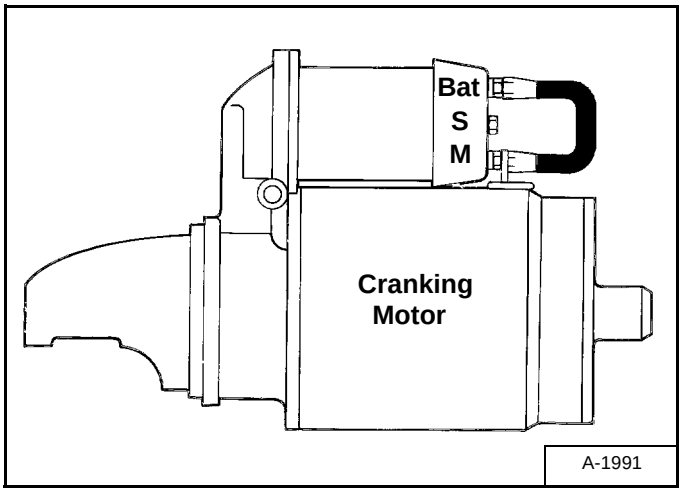
Figure 60-40-1



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

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

Figure 60-40-2



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

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

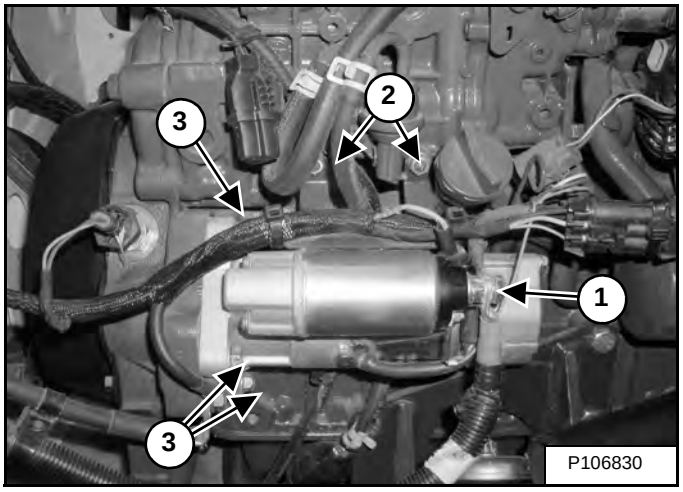
If the starter does not turn, the starter is defective.

Removal And Installation

Open the rear door.

Disconnect the negative (-) cable from the battery.

Figure 60-40-3



Remove the wires and positive (+) cable (Item 1) **[Figure 60-40-3]** from the starter solenoid.

Installation: Tighten the nut to 14,7 - 16,7 N•m (10.8 - 12.3 ft-lb) torque.

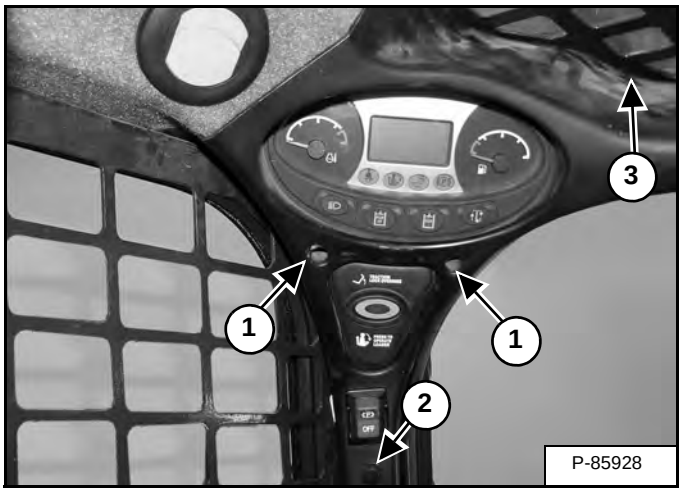
Remove the nuts (Item 2) **[Figure 60-40-3]** and reposition the wire harness.

Remove the three bolts (Item 3) **[Figure 60-40-3]**.

Remove the starter from the engine.

Left Panel Removal And Installation

Figure 60-50-11

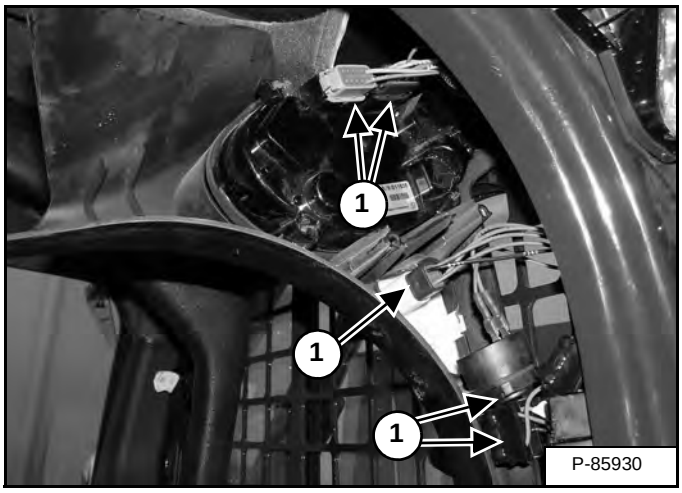


Remove the two bolts (Item 1) and the fastener (Item 2) **[Figure 60-50-11]**.

Installation: Tighten the panel screws to 3 - 4 N•m (25 - 35 in-lb) torque.

NOTE: Inspect and replace the seal as needed (Item 3) [Figure 60-50-11].

Figure 60-50-12

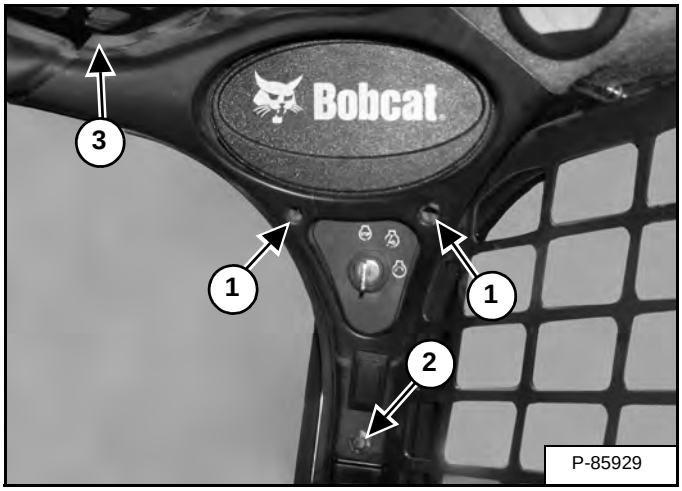


Pull the left instrument panel down and disconnect the wire harness (Item 1) **[Figure 60-50-12]** from the panel.

Remove the panel from the loader cab.

Right Panel (Standard Key Panel) Removal And Installation

Figure 60-50-13

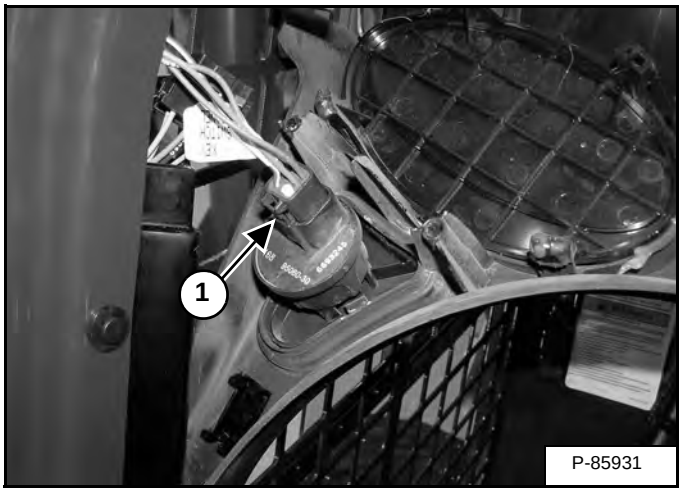


Remove the two bolts (Item 1) and the fastener (Item 2) **[Figure 60-50-13]**.

Installation: Tighten the panel screws to 3 - 4 N•m (25 - 35 in-lb) torque.

NOTE: Inspect and replace the seal as needed (Item 3) [Figure 60-50-13].

Figure 60-50-14

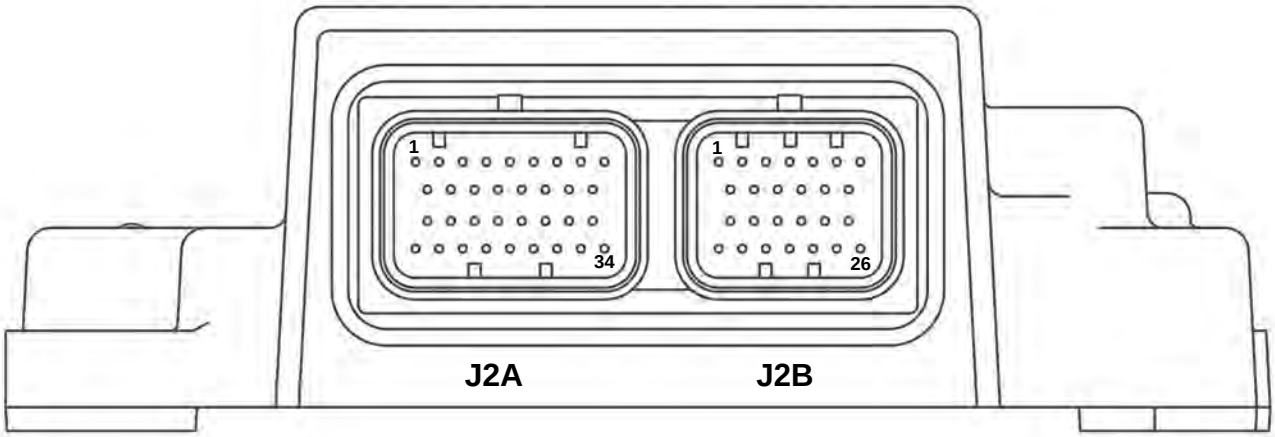


Pull the right instrument panel down and disconnect the wire harness (Item 1) **[Figure 60-50-14]**.

Remove the panel from the loader cab.

Connector Identification (Cont'd)

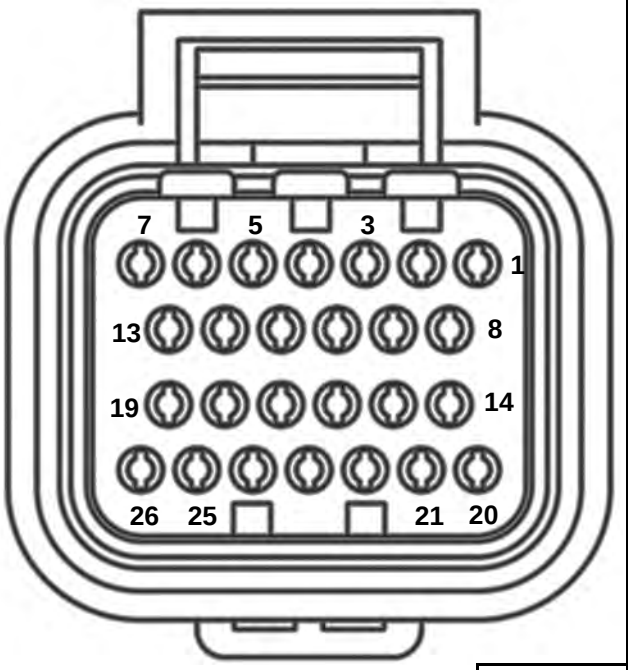
Auxiliary Controller



Harness Connector View

J2A

Harness Connector View



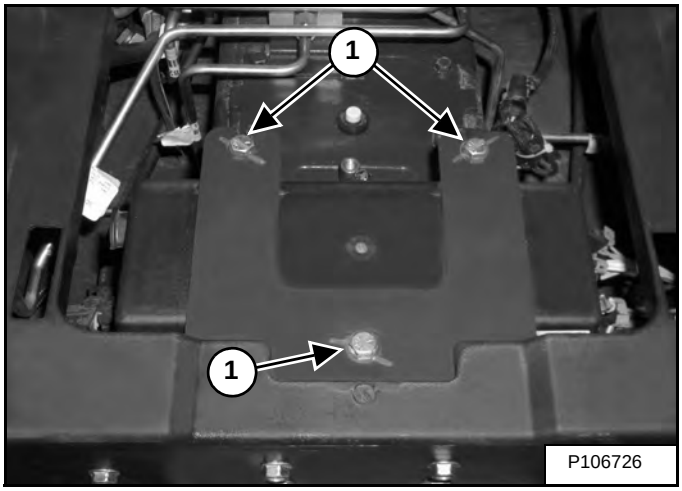
J2B

P-76647
P-76646
P-76645

Removal And Installation

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

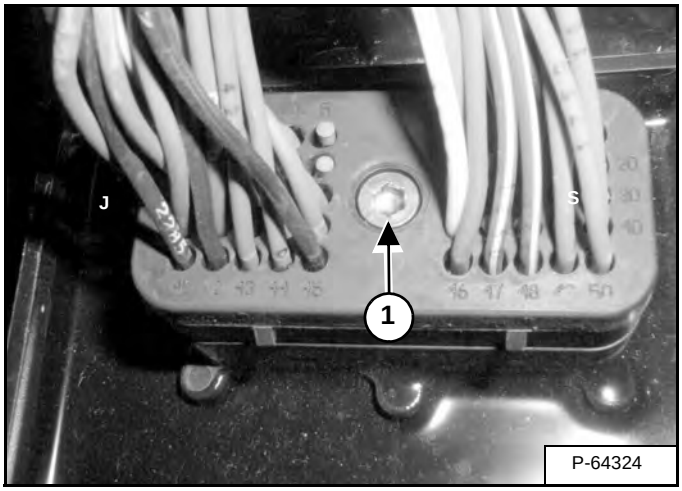
Figure 60-72-1



Remove the three bolts (Item 1) **[Figure 60-72-1]**.

Installation: Tighten the bolts to 16 - 19 N•m (12 - 14 ft-lb) torque.

Figure 60-72-2



Remove the screw and wire harness (Item 1) **[Figure 60-72-2]**.

Installation: Tighten the connector screw to 3,39 - 3,96 N•m (30 - 35 in-lb) torque.

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

Remove the drive controller.

Troubleshooting

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

WARNING

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

W-2004-1285

PROBLEM	SOLUTION#
All indicator lights flashing.	5
One of the indicator lights flashing.	1
Intermittent indicator lights.	2, 3, 4

SOLUTION SUGGESTIONS	
	1. Refer to BICS™ troubleshooting chart.
	2. Inspect wire connections on Bobcat controller to make sure connectors are locked into place.
	3. Inspect pins in connectors for pins pushed back or bent.
	4. Use seatbar sensor tester MEL1428 to isolate problem between sensor and controller and wiring.
	5. Possible low or high voltage.

Troubleshooting

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

WARNING

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

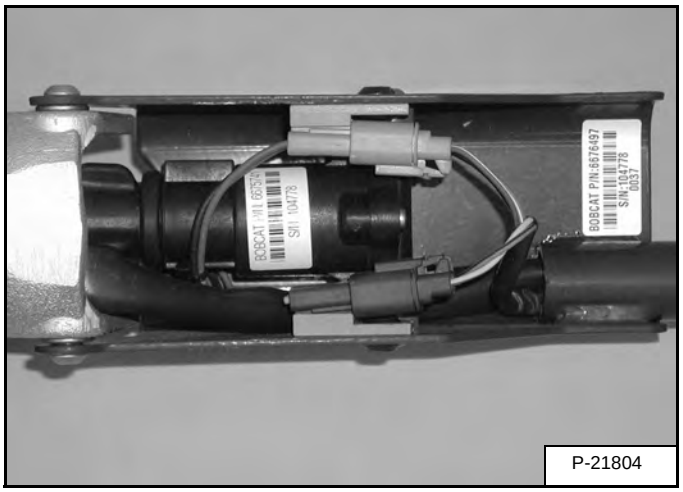
W-2004-1285

PROBLEM	SOLUTION #
Brake stays engaged.	1, 2, 3, 4, 5, 6, 7,11
Intermittent activation of brake.	8, 9, 10,11

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

Switch Handle Installation (Cont'd)

Figure 60-120-21

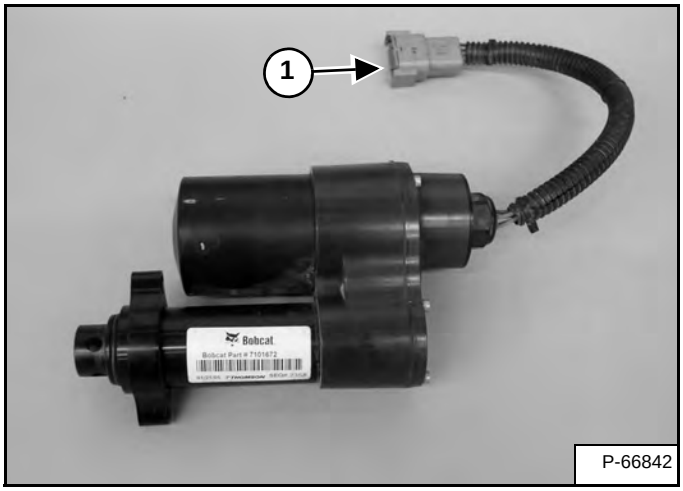


Connect the handle harness connectors to the sensor and lock solenoid connectors **[Figure 60-120-21]**.

Actuator Connector Disassembly And Assembly

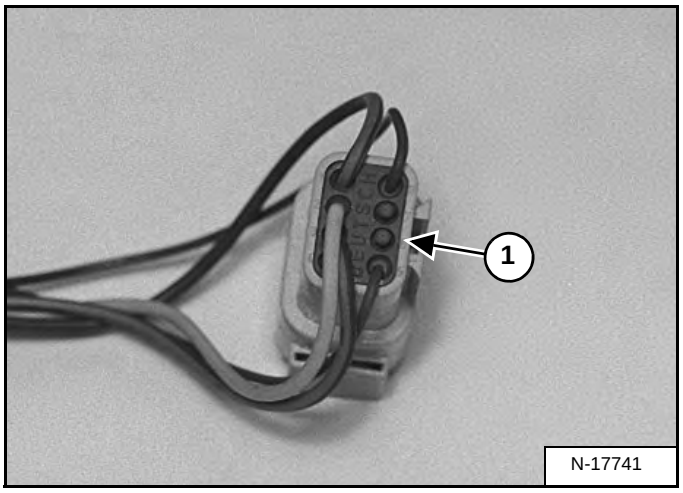
NOTE: Actuator shown removed for photo clarity.

Figure 60-120-22



Inspect the actuator wiring harness connector (Item 1) **[Figure 60-120-22]** and replace if broken.

Figure 60-120-23



Installation: Install the wires into the connector as listed below. The terminal numbers are written on the back of the connector (Item 1) **[Figure 60-120-23]**.

Lift And Tilt Actuator

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

Description

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

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

Group 0 = No Jumpers

Group 1 = Pins K, L

Group 2 = Pins K, P

Group 3 = Pins C, D

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

SERVICE PC (LAPTOP COMPUTER)

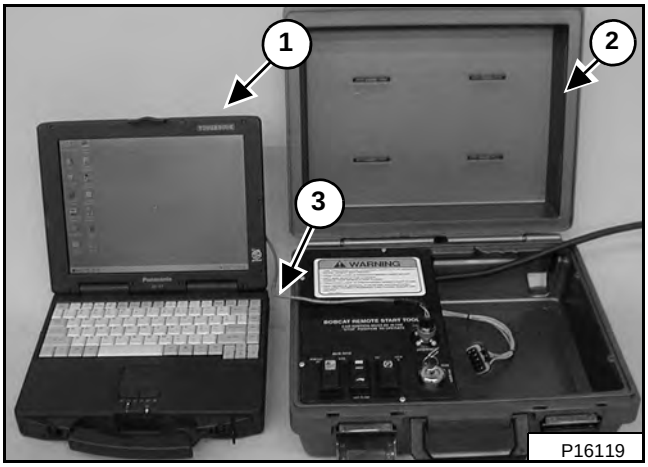
Connecting Remote Start Tool

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

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

NOTE: Make all connections with the key in the OFF position.

Figure 60-140-1



The Service PC (Item 1) with the Remote Start Tool (Item 2).

[Figure 60-140-1]. When connected to the loader, the Service PC is used to monitor, conduct diagnostics, and upgrade software.

Connect the Service Tool Harness Communicator (MEL1566) (Item 3) **[Figure 60-140-1]** to the designated serial port on the Service PC.

NOTE: The recommended serial cable length should not exceed 4,6 m (15 ft). A serial cable longer than 4,6 m (15 ft) will create a degraded signal causing communication errors.

Connect the other end to the connector on the Remote Start Tool.

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

NOTE: Refer to BobcatDealerNET.com for PC requirements and the latest Service Analyzer software.

Connecting Remote Start Tool (Service Tool)

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

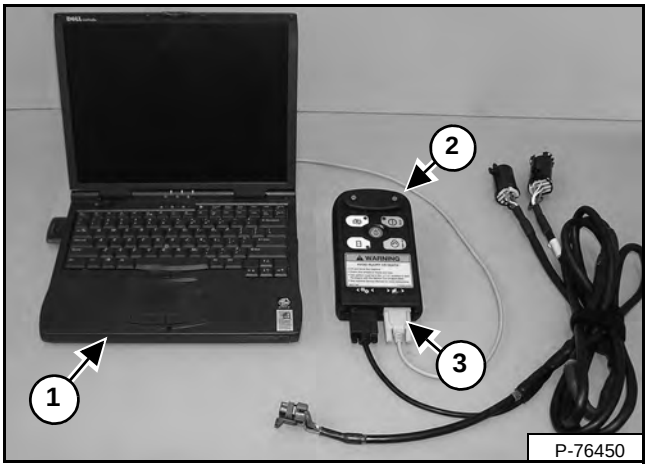
Order from Bobcat Parts P/N: 7217666 - Remote Start Tool (Service Tool) Kit

Kit Includes:

7022042 - Remote Start Tool (Service Tool)
6689747 - Loader Service Tool Harness
6689746 - Computer Service Tool Harness
6689745 - BOSS® Service Tool Harness

NOTE: Make all connections with the key in the OFF position.

Figure 60-140-2



The Service PC (Item 1) with the Remote Start Tool (Service Tool) (Item 2) **[Figure 60-140-2]**. When connected to the loader, the Service PC is used to monitor, conduct diagnostics, and upgrade software.

Connect the Remote Start Tool (Service Tool) Computer Service Tool Harness (Item 3) **[Figure 60-140-2]** to the designated serial port on the Service PC.

NOTE: The recommended serial cable length should not exceed 4,6 m (15 ft). A serial cable longer than 4,6 m (15 ft) will create a degraded signal causing communication errors.

Connect the other end to the connector on the Remote Start Tool (Service Tool).

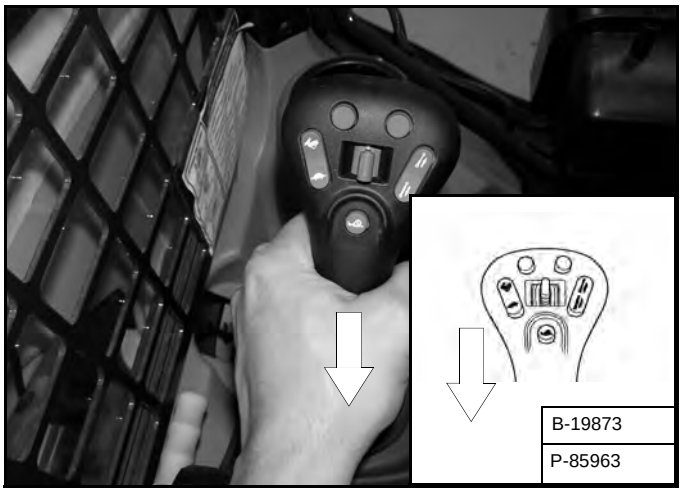
Connect the Remote Start Tool (Service Tool) to the loader. (See REMOTE START TOOL (SERVICE TOOL) KIT - 7217666 on Page 10-61-1.)

NOTE: Refer to BobcatDealerNET.com for PC requirements and the latest Service Analyzer software.

CALIBRATION (CONT'D)

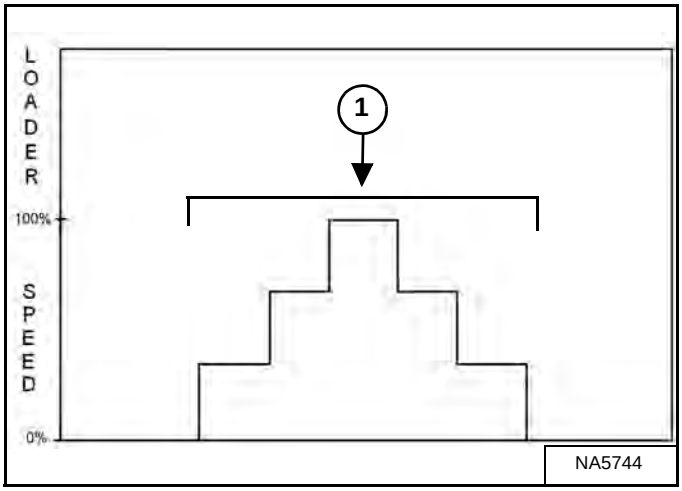
Hydrostatic Pump Calibration (SJC) (Cont'd)

Figure 60-150-21



Move and hold the left joystick to the REVERSE position **[Figure 60-150-21]** until the reverse calibration is completed.

Figure 60-150-22



The loader tires or tracks will **momentarily reverse** then rotate in reverse and “stair step” the speed (Item 1) **[Figure 60-150-22]** until it reaches full speed and then “stair step” down and come to a stop.

Continue to hold the left joystick in the REVERSE position until the loader wheels or tracks come to a stop and an audible beep is heard.

Reverse calibration is complete.

NOTE: If the wheels or tracks do not stop moving in Full Speed Reverse in 2 minutes or less, there was an error in the calibration procedure. The operator must shut the loader OFF, and start the calibration procedure from the beginning.

There will be an audible beep, the PRESS TO OPERATE LOADER button light will remain on. The TRACTION light will illuminate, the SEAT BAR, and LIFT AND TILT lights will be off. The D7598 error code will clear. There should be no other codes in the display area.

Allow the joystick to go to the NEUTRAL position.

Once the calibration procedure is complete the Steering Drift Compensation values will be reset to [S----] or neutral.

Press the PRESS TO OPERATE LOADER button. Move the left joystick to FORWARD position **[Figure 60-150-19]** and check for normal forward wheel or track rotation.

Move the left joystick to the REVERSE position **[Figure 60-150-21]** and check for normal reverse wheel or track rotation.

Stop the engine, and remove the loader from jackstands.

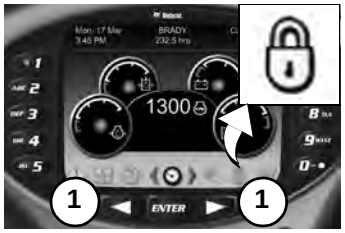
The calibration procedure is completed.

After calibration is complete, use Steering Drift Compensation for fine tuning or if an acceptable line of drift cannot be achieved. (See STEERING DRIFT COMPENSATION (OPERATOR MODE) on Page 60-160-1.)

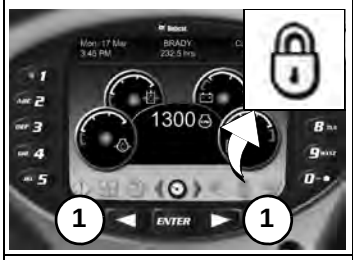
If loader does not maintain a desired travel path with Steering Drift Compensation at maximum setting [S-R10] or [S-L10], see the electrical and hydrostatic troubleshooting. (See Troubleshooting on Page 30-10-2.) or (See Troubleshooting on Page 60-10-9.)

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

Job Clock Reset

	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 **[1. USER SETTINGS]**.
	Select user.
	Select **[3. RESET JOB STATISTICS]**.
	Press **[9]** to reset job statistics. Press left scroll button or **[0]** to exit without saving.

Machine Lockouts

	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.


Bobcat®

MACHINE IQ

Description

This machine may be equipped with Machine IQ.

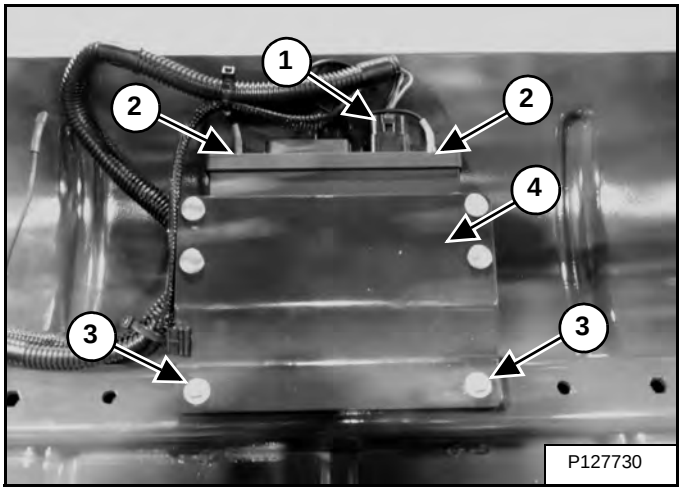
Machine IQ enables dealers to track machine location and receive notifications when the machine codes or is due for scheduled maintenance.

A factory installed Machine IQ module is located under the headliner above the rear window. For aftermarket kit installation location see the kit installation instructions.

Removal And Installation

Remove the headliner. (See Removal And Installation on Page 50-180-1.)

Figure 60-230-1



Remove the electrical connector (Item 1) and the two antenna connections (Item 2) **[Figure 60-230-1]**.

Remove the two bolts (Item 3) and remove the Machine IQ module assembly (Item 4) **[Figure 60-230-1]** from the loader.

Installation: Tighten the two antenna connections (Item 2) **[Figure 60-230-1]** to 0,9 N•m (8 in-lb) torque.

Figure 60-230-2

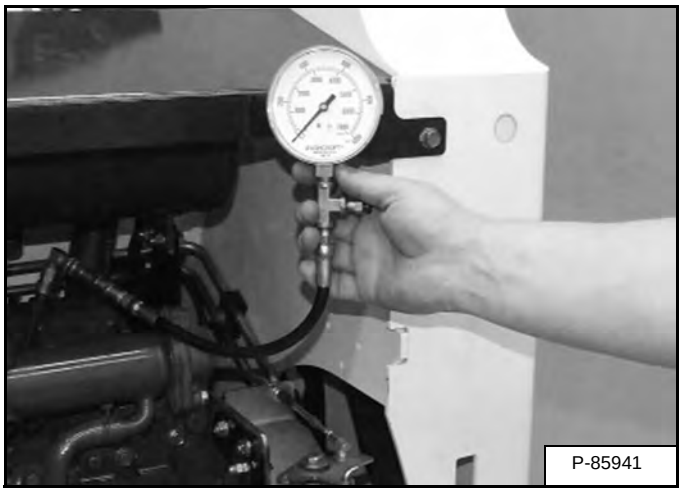
Remove the four nuts and bolts (Item 1) and remove the Machine IQ module (Item 2) from the mounting plate (Item 3) **[Figure 60-230-2]**.

Troubleshooting (Cont'd)

KEY TO CORRECT THE CAUSE	
1. Alternator belt is loose or damaged.	28. Worn valve and seats.
2. Bad electrical connections.	29. Broken or worn piston rings.
3. Faulty starter motor.	30. Worn valve stems or guides.
4. Incorrect grade of oil.	31. Worn or damaged bearings.
5. Low cranking speed.	32. Not enough oil in the crankcase.
6. Fuel tank empty.	33. Switch / sensor is defective.
7. Faulty stop control operation.	34. Oil pump worn.
8. Plugged fuel line.	35. Relief valve is sticking open.
9. Plugged fuel filter.	36. Relief valve is sticking closed.
10. Restriction in the air cleaner.	37. Broken relief valve spring.
11. Air in the fuel system.	38. Faulty suction pipe.
12. Faulty fuel injection pump.	39. Plugged oil filter.
13. Faulty fuel injectors.	40. Piston seizure.
14. Broken injection pump drive.	41. Incorrect piston height.
15. Incorrect injection pump timing.	42. Faulty engine mounting.
16. Incorrect valve timing.	43. Incorrect flywheel alignment.
17. Poor compression.	44. Faulty thermostat.
18. Plugged fuel tank vent.	45. Restriction in water jacket.
19. Incorrect grade of fuel.	46. Loose alternator belt.
20. Exhaust pipe restriction.	47. Plugged radiator.
21. Cylinder head gasket leaking.	48. Faulty water pump.
22. Overheating.	49. Plugged breather pipe.
23. Cold running.	50. Damaged valve stem deflectors.
24. Incorrect tappet adjustment.	51. Coolant level to low.
25. Sticking valves.	52. Plugged oil pump pipe strainer.
26. Incorrect fuel lines.	53. Broken valve spring.
27. Worn cylinder bores.	54. Damaged Battery

Compression - Testing (Cont'd)

Figure 70-10-36



Connect the compression gauge to the adapter **[Figure 70-10-36]**.

The engine speed control must be fully backward (engine idle).

Disconnect the fuel stop solenoid.

Figure 70-10-37

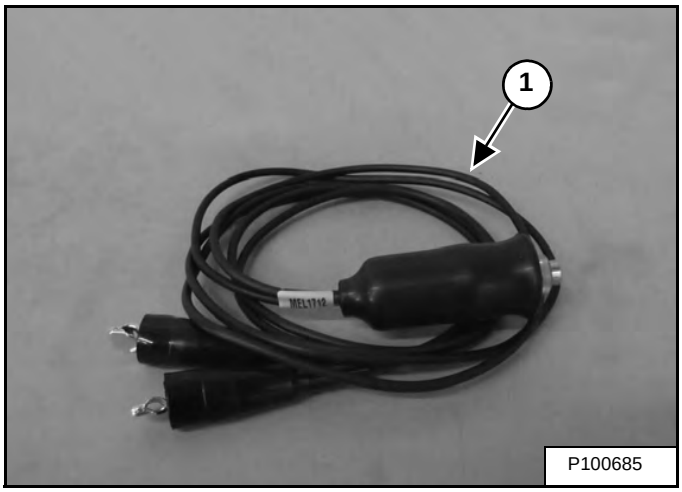
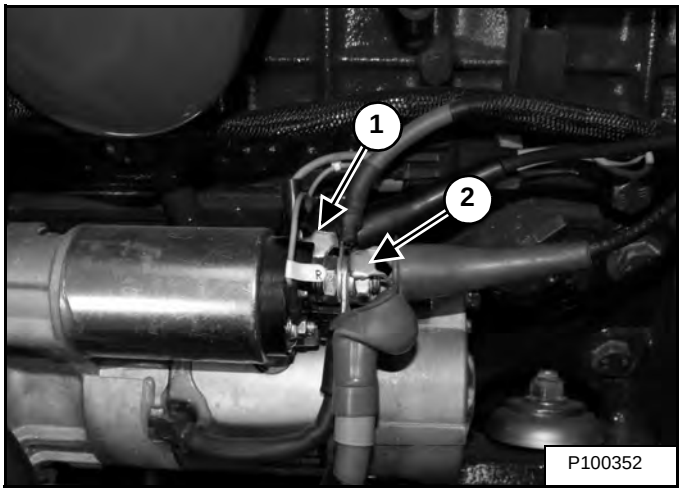


Figure 70-10-38



Attach a push button starter switch (MEL1712) (Item 1) **[Figure 70-10-37]** to the starter terminal S (Item 1) and the positive battery cable (Item 2) **[Figure 70-10-38]**. Engage the starter 7 - 10 seconds until a maximum compression reading is obtained.

Repeat this procedure multiple times per cylinder until an average compression reading is recorded.

If the measurement is below the allowable limit, inspect the cylinder, piston ring, top clearance, valve, and cylinder head.

Compression Pressure should be 2944 - 3234 kPa (29,4 - 32,3 bar) (427 - 469 psi)

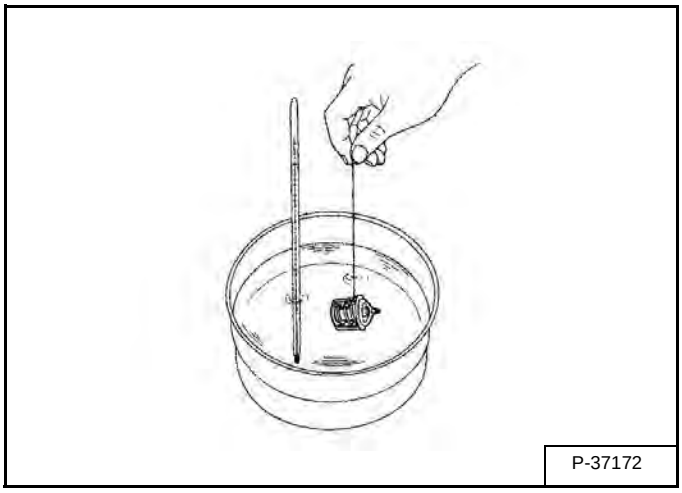
Allowable Limit (minimum) is 2351 kPa (23,5 bar) (341 psi)

No more than 10% variance among cylinders.


Bobcat®

Thermostat - Testing

Figure 70-50-25



Push down the thermostat valve and insert a string between the valve and the valve seat.

Place the thermostat and a thermometer in a container with water and gradually heat the water **[Figure 70-50-25]**.

Hold the string to suspend the thermostat in the water. When the water temperature rises, the thermostat valve will open, allowing it to fall down from the string.

Continue heating the water and read the temperature when the valve has risen by about 8 mm (0.315 in).

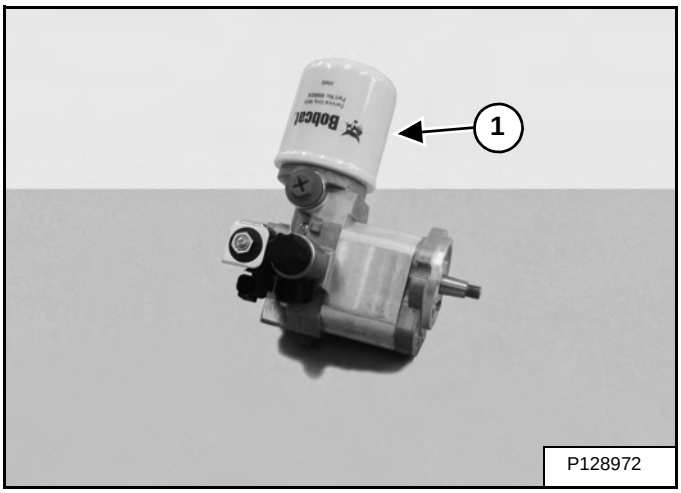
If the measurement is not acceptable, replace the thermostat.

Thermostat's valve opening temperature	Factory spec.	80 - 84°C (176 - 183°F)
Temperature at which thermostat completely opens	Factory spec.	95°C (203°F)

Hydraulic Fan Motor Disassembly And Assembly (Cont'd)

Reversing Model

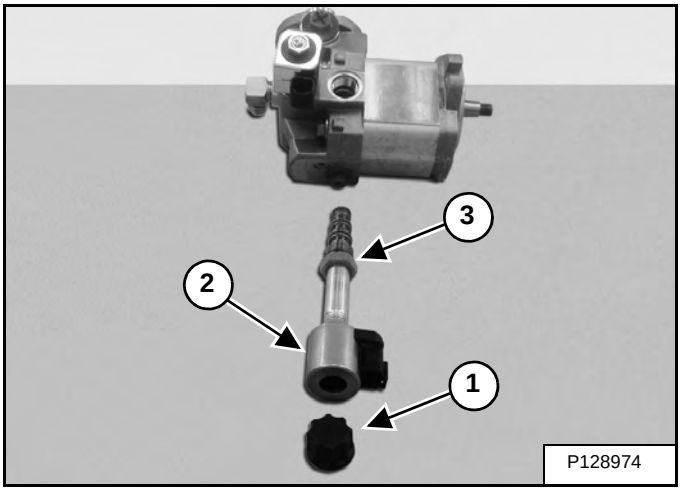
Figure 70-51-31



Remove the filter (Item 1) **[Figure 70-51-31]**.

Installation: Lubricate threads and filter O-ring prior to installation. Tighten the filter to 37 - 45 N•m (27 - 33 ft-lb) torque.

Figure 70-51-32

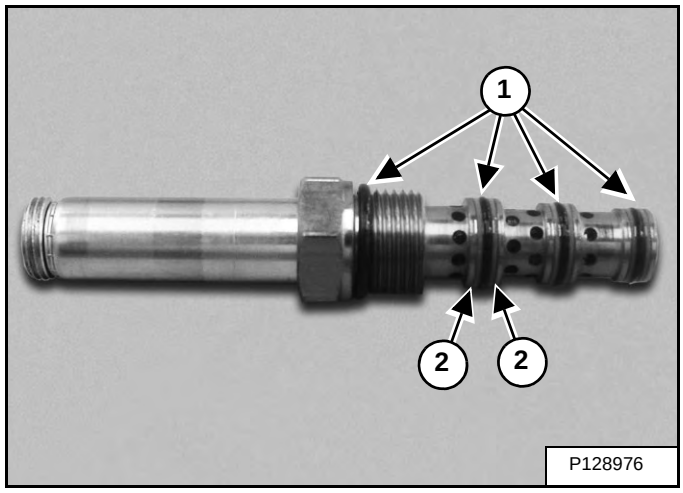


Remove coil mounting nut (Item 1), the coil (Item 2), and the reversing valve (Item 3) **[Figure 70-51-32]**.

Installation: Tighten the reversing valve (Item 3) **[Figure 70-51-32]** to 41 - 50 N•m (30 - 37 ft-lb) torque.

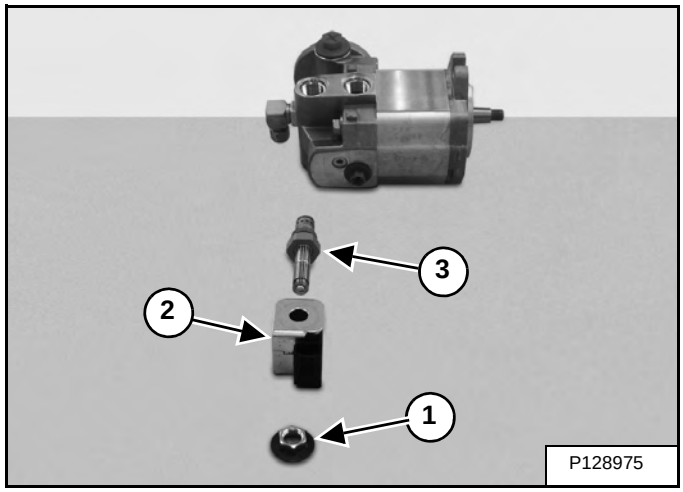
Installation: Tighten the coil mounting nut (Item 1) **[Figure 70-51-32]** to 4 N•m (3 ft-lb) torque.

Figure 70-51-33



Replace the four O-rings (Item 1) and six back-up rings (Item 2) **[Figure 70-51-33]**.

Figure 70-51-34



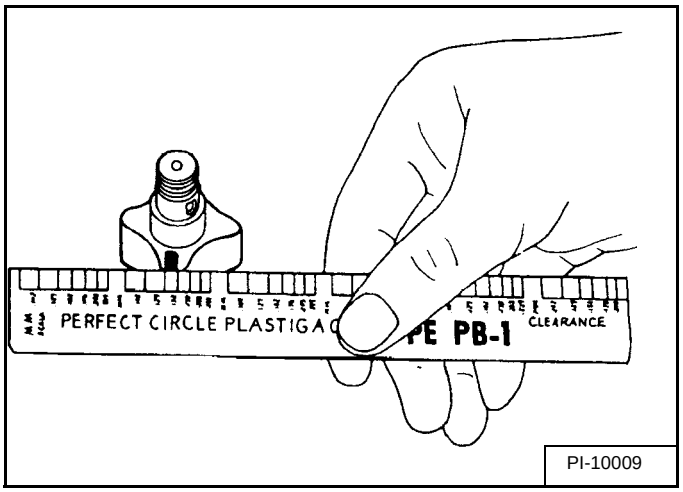
Remove coil mounting nut (Item 1), the coil (Item 2), and the proportional valve (Item 3) **[Figure 70-51-34]**.

Installation: Tighten the proportional valve (Item 3) **[Figure 70-51-34]** to 28 - 34 N•m (21 - 25 ft-lb) torque.

Installation: Tighten the coil mounting nut (Item 1) **[Figure 70-51-34]** to 7 N•m (5 ft-lb) torque.

Oil Pump Inspection (Cont'd)

Figure 70-60-7



Put a piece of press gauge on the rotor face **[Figure 70-60-7]**.

Install the cover and tighten the bolts.

Remove the cover carefully. Measure the width of the press gauge **[Figure 70-60-7]**.

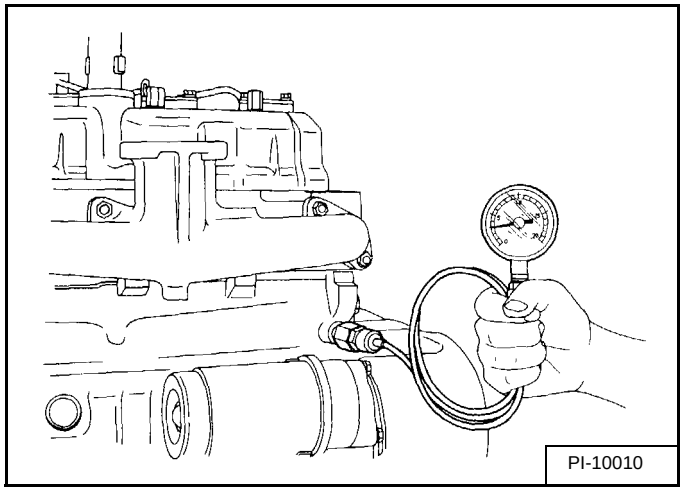
If the clearance exceeds the allowable limit replace the oil pump.

End Clearance	0,11 - 0,15 mm (0.0041 - 0.0059 in)

Engine Oil Pressure - Testing

Remove the oil pressure sender.

Figure 70-60-8



Install a pressure gauge **[Figure 70-60-8]**.

Start the engine and run until it is at operating temperature.

If the oil pressure is less than the allowable limit, check the following items:

* Engine Oil Level Low
* Oil Pump Defective
* Oil Galley Plugged
* Oil Strainer Plugged
* Excessive Clearance at the Rod And Main Bearings
* Oil Pump Relief Valve Stuck Open
* Weak or Defective Relief Valve Spring

At Idle Speed Allowable Limit	48,3 kPa (0,48 bar) (7 psi)
At Rated Speed	290 - 441 kPa (2,9 - 4,4 bar) (42 - 64 psi)
Allowable Limit	248 kPa (2,5 bar) (36 psi)

Fuel Injector Removal And Installation

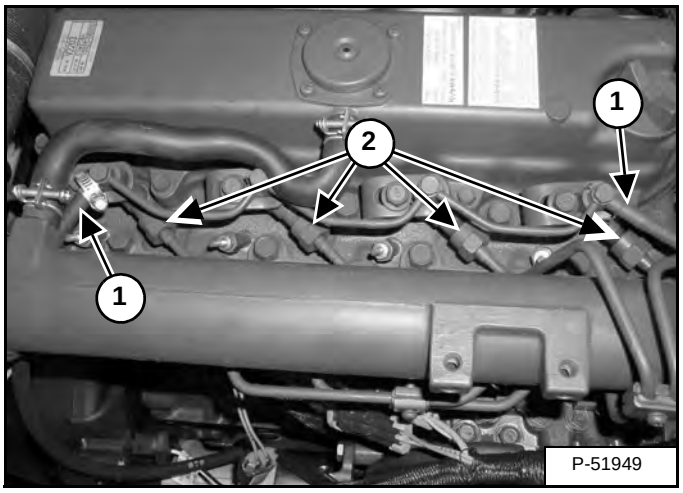
⚠ WARNING

AVOID INJURY OR DEATH

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

W-2072-0807

Figure 70-70-26



The following are some problems caused by faulty injectors:

- -Engine is hard to start or will not start
- -Rough engine operation and idle
- -Engine will not have full power
- -Excessive exhaust smoke

Disconnect the fuel return hoses (Item 1) **[Figure 70-70-26]** from the injectors.

Disconnect the high pressure fuel lines (Item 2) **[Figure 70-70-26]** from the fuel injectors and from the injection pump.

Remove the high pressure fuel lines from the engine.

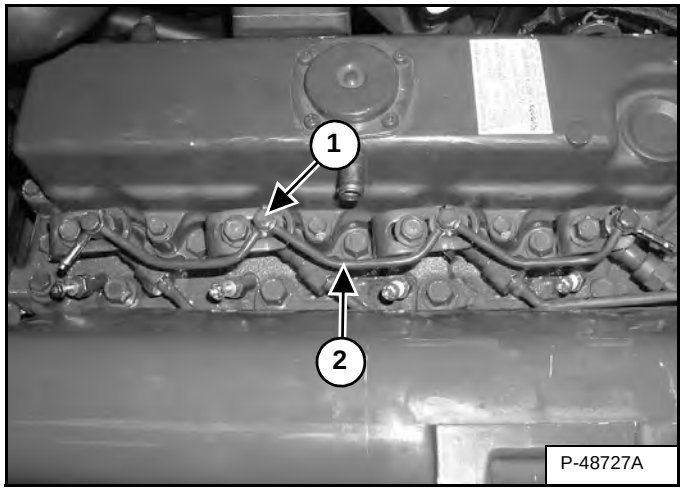
Installation: Tighten the injection pipe retaining nuts to 23 - 36 N•m (17 - 26 ft-lb).

IMPORTANT

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

I-2029-0289

Figure 70-70-27



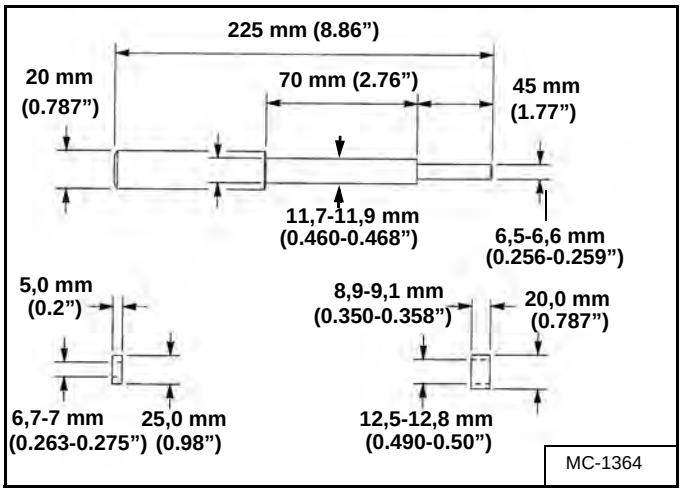
Remove the four retainer bolts from the top of the fuel injectors (Item 1) **[Figure 70-70-27]**.

Remove the fuel return tube (Item 2) **[Figure 70-70-27]** from the fuel injectors.

Installation: Tighten retainers and fuel return tubes to 10 - 11 N•m (7.25 - 8.25 ft-lb).

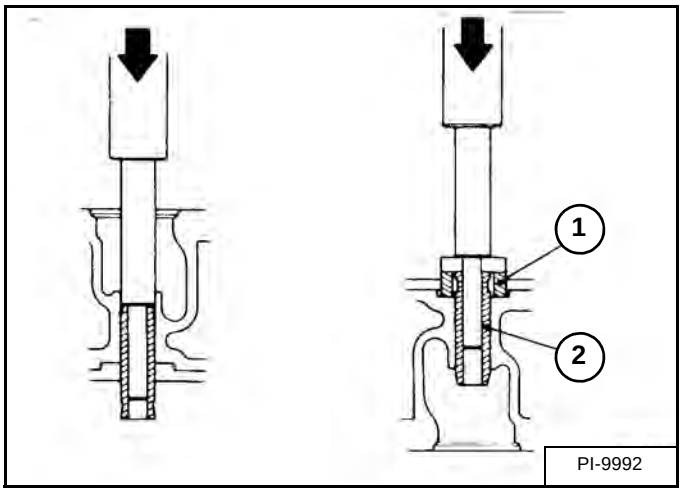
Valve Guide Removal And Installation

Figure 70-80-27



To remove and replace the valve guide, make the driver tool as shown in figure **[Figure 70-80-27]**.

Figure 70-80-28



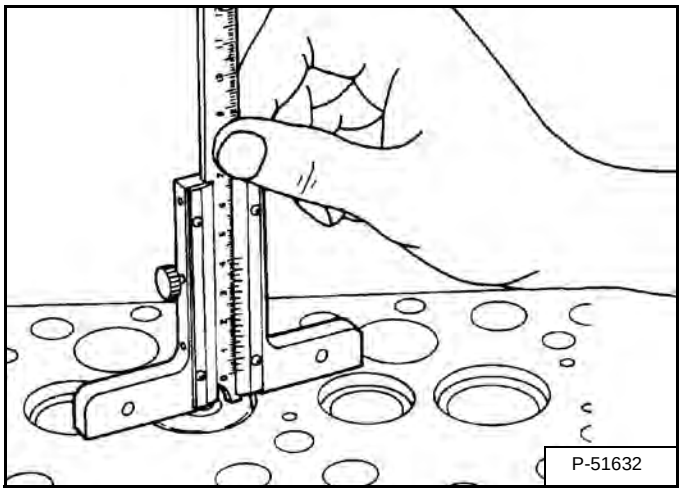
Press the used valve guide out of the cylinder head using the special driver tool **[Figure 70-80-28]**.

Put oil on the outside diameter of the new valve guide. Press the new valve guide into the cylinder head from the top side. Use the special driver tools (Items 1 and 2) **[Figure 70-80-28]**, press the new guide until the tool contacts the cylinder head.

Ream the valve guide to the correct specifications.

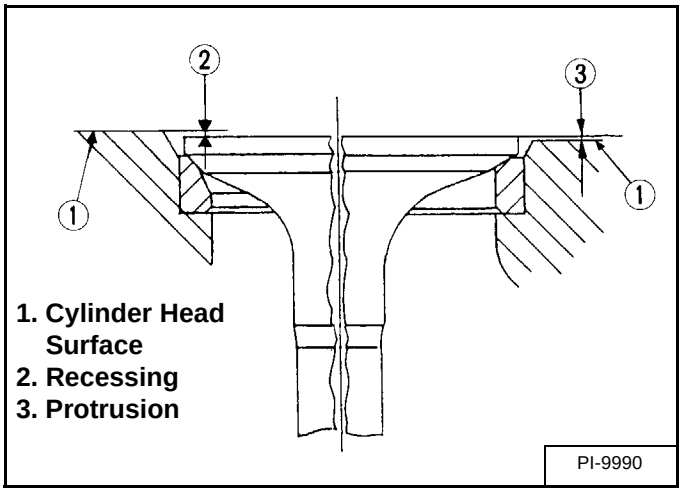
Reconditioning The Valve And Valve Seat

Figure 70-80-29



Install the valve into the guide. Measure the valve recessing or protrusion with a depth gauge **[Figure 70-80-29]**.

Figure 70-80-30



If the measurement exceeds the allowable limit, replace the valve or cylinder head **[Figure 70-80-30]**.

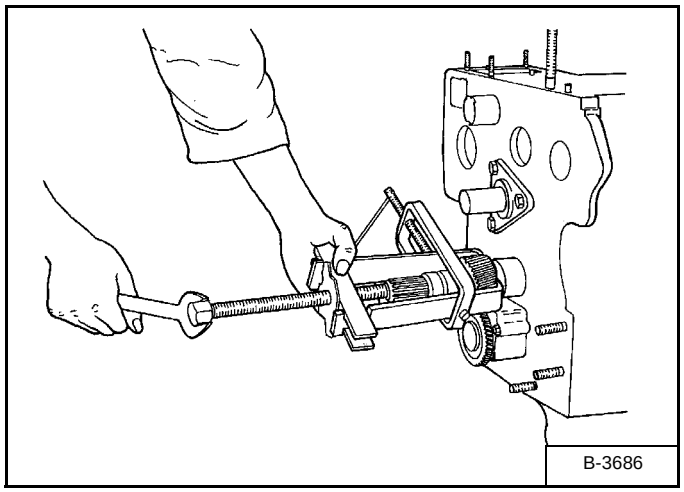
Protrusion	0,5 mm (0.002 in)
Recessing	0,15 mm (0.006 in)
Allowable Limit (Recessing)	0,4 mm (0.016 in)

Crankshaft Gear Removal And Installation

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

Remove the idler gear. (See Idler Gear And Camshaft Removal And Installation on Page 70-100-4.)

Figure 70-90-15



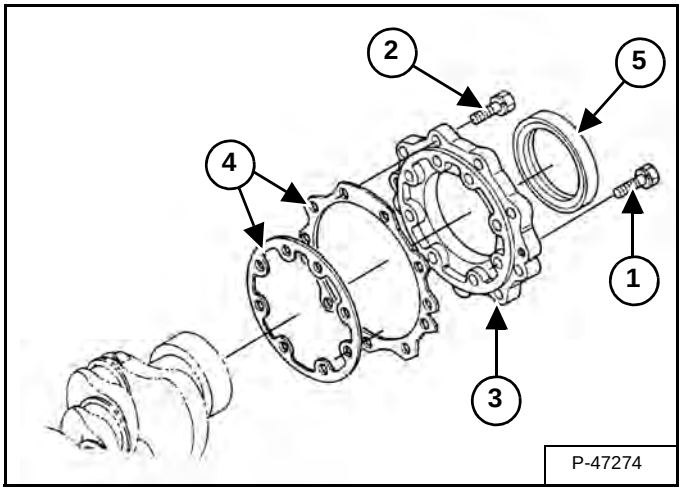
Remove the crankshaft gear with a puller **[Figure 70-90-15]**.

Remove the crankshaft key.

Crankshaft And Bearings Removal And Installation

Remove the piston and connecting rod assemblies. (See Piston And Connecting Rod Removal And Installation on Page 70-90-1.)

Figure 70-90-16



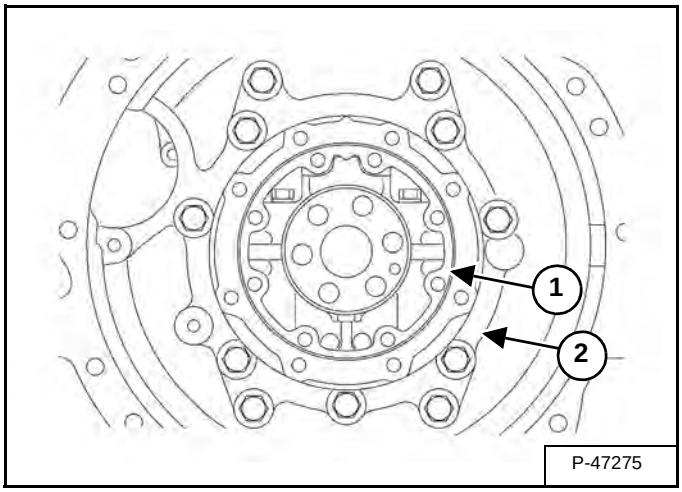
Mark and remove the inside screws (Item 1) first, then remove the outside screws (Item 2) **[Figure 70-90-16]**.

NOTE: The inside bolts are different length than the outside bolts.

Install two screws in the bearing case cover and remove the cover (Item 3) **[Figure 70-90-16]**.

Remove the two gaskets (Item 4) and oil seal (Item 5) **[Figure 70-90-16]** from the cover.

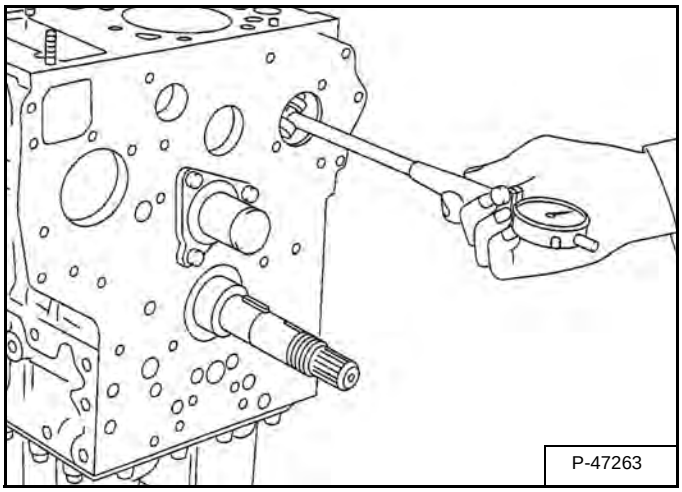
Figure 70-90-17



Installation: Install the gaskets (Item 1) and (Item 2) **[Figure 70-90-17]** as shown.

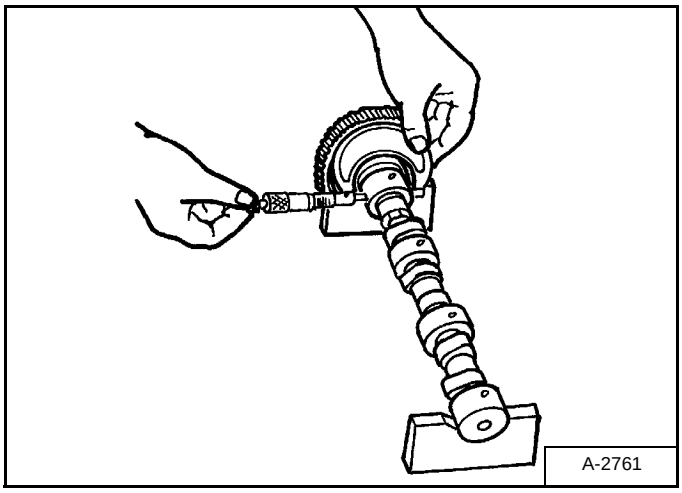
Camshaft - Servicing

Figure 70-100-15



Measure the cylinder block bore in the engine block **[Figure 70-100-15]**.

Figure 70-100-16

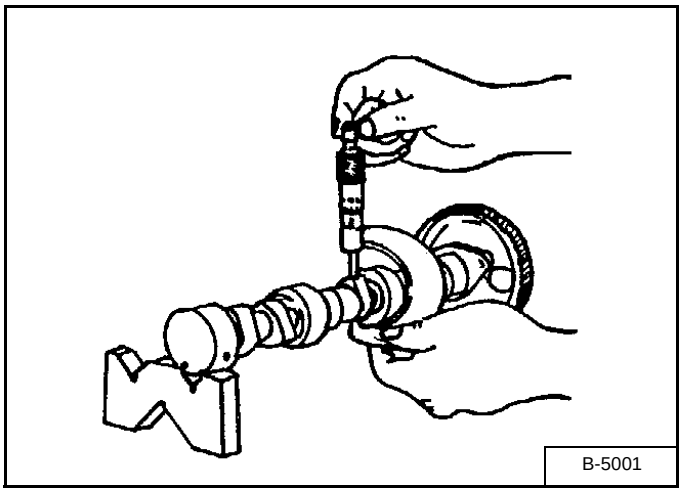


Measure the camshaft journal **[Figure 70-100-16]**.

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

Cylinder Block Bore I.D.	40,0 - 40,025 mm (1.575 - 1.576 in)
Journal O.D.	39,93 - 39,95 mm (1.572 - 1.573 in)
Oil Clearance of Camshaft Journal	0,05 - 0,091 mm (0.002 - 0.0035 in)
Allowable Limit	0,15 mm (0.0059 in)

Figure 70-100-17

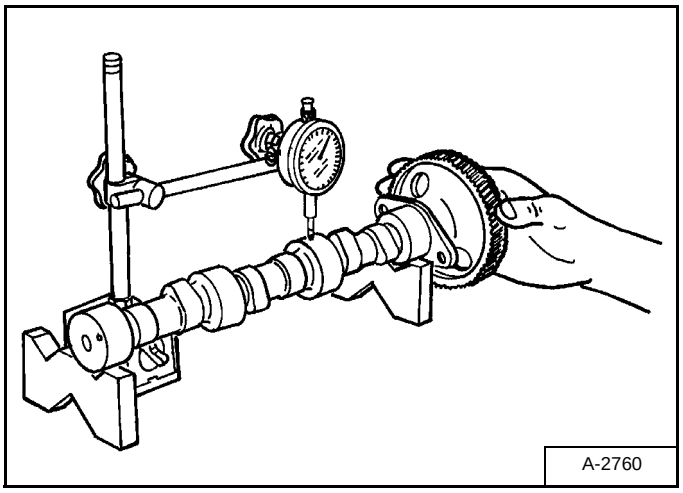


Measure the cam lobes at their highest point **[Figure 70-100-17]**.

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

Cam Lobe Height	33,9 mm (1.3346 in)
Allowable Limit	33,85 mm (1.3327 in)

Figure 70-100-18



Put the camshaft in V-blocks. Install a dial indicator **[Figure 70-100-18]**.

Turn the camshaft at a slow rate. If the misalignment exceeds the allowable limit, replace the camshaft.

Camshaft Alignment Allowable Limit	0,01 mm (0.0004 in)


Bobcat®

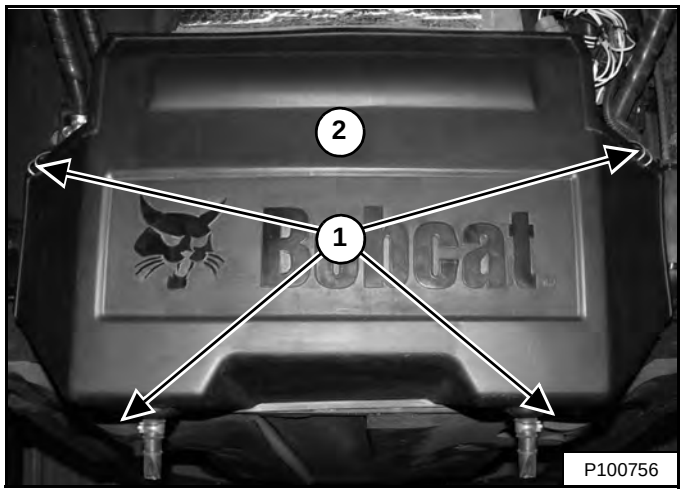
HEATER COIL

Removal And Installation

Remove the heater valve. (See HEATER VALVE on Page 80-60-1.)

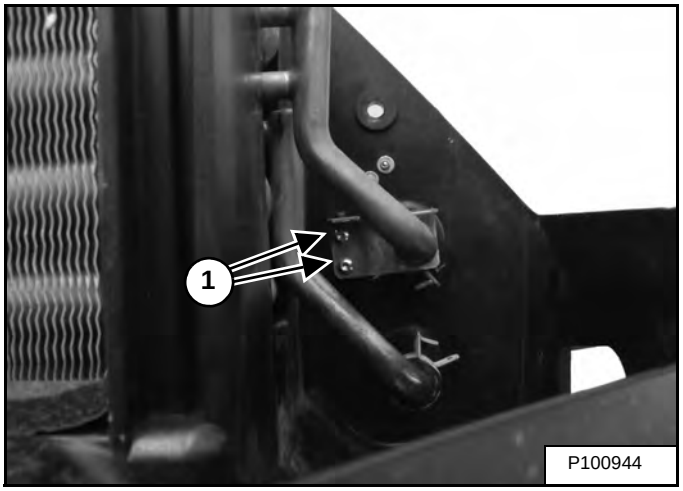
NOTE: The heater unit is removed for photo clarity.

Figure 80-40-1



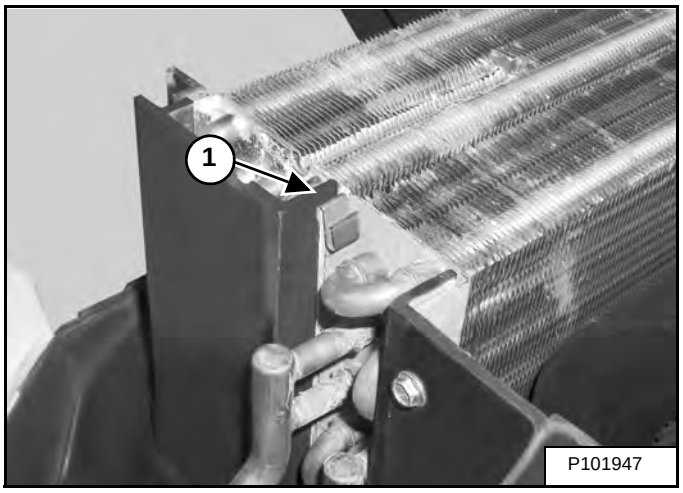
Release the four latches (Item 1) and remove the cover (Item 2) **[Figure 80-40-1]**.

Figure 80-40-2



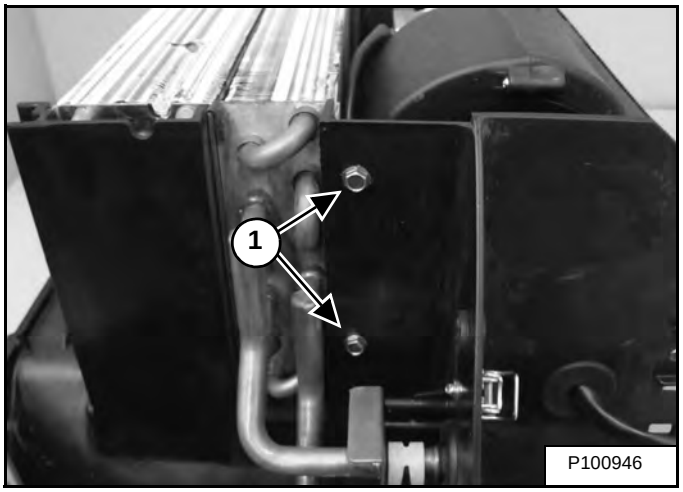
Remove the two screws (Item 1) **[Figure 80-40-2]**.

Figure 80-40-3



Remove the retainer clips (Item 1) **[Figure 80-40-3]** from both sides.

Figure 80-40-4



Remove the two screws (Item 1) **[Figure 80-40-4]**.


Bobcat®