

Service Manual



RC-100

Rubber Track Loader

- Safety Overview
- Technical Specifications
- System Diagrams
- Disassembly and Assembly Instructions
- Troubleshooting
- Maintenance
- Hydraulic Pressure Check & Adjustment

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1. Product Safety

Chapter Overview

This chapter contains product safety information for PT-100 Rubber Track Loaders. Read this chapter and understand all safety messages and information messages before attempting to service the machine.

Safety Messages

Safety messages are provided in this document and on the machine. If these hazard warnings are not heeded, bodily injury or death could occur to you or other persons.

Hazards are identified by the Safety Alert Symbols **!DANGER! ... !WARNING!....!CAUTION!**.

The meaning of these safety alerts is as follows:

Attention! Become Alert! Your Safety is Involved.

The message that appears under a Safety Alert Symbol explains the hazard and can be either written or pictorially presented.

! DANGER !

This symbol is used to alert service personnel of an imminently hazardous situation that will result in serious injury or death.

! WARNING !

This symbol is used to alert service personnel of a potentially hazardous situation that could result in serious injury or death.

! CAUTION !

This symbol is used to alert service personnel of an unsafe practice that could result in injury.

Information Messages

Information messages are provided in this document and on the machine. These messages are identified by the labels **NOTICE....Note**.

NOTICE

This label is used to alert service personnel to the possibility of damaging the equipment.

Note: This label is used to provide important additional information, comments, explanations or amplification of the accompanying subject matter.

The person servicing the Rubber Track Loader may be unfamiliar with many of the systems on the machine. This makes it important to use caution when performing service work. Knowledge of the system and/or components is important before the removal or disassembly of any component.

It is not possible to anticipate every circumstance that might involve a potential hazard. The safety messages in this document and on the product are, therefore, not all inclusive. If you use a tool, procedure, work method or operating technique that is not specifically recommended by the manufacturer, you must satisfy yourself that it is safe for you and for others. You should also ensure that the product will not be damaged or be made unsafe by the operation, lubrication, maintenance or repair procedures that you choose.

Basic Precautions

! WARNING !

Improper operation, lubrication, maintenance or repair of this product can be dangerous and could result in injury or death.

Do not operate or perform any lubrication, maintenance or repair on this product until you have read and understood the operation, lubrication, maintenance and repair information.

Following is a list of basic precautions that should always be observed.

Safety Signs

Read and understand all "Safety" signs on the product before operating, lubricating or repairing this product. Replace any damaged, illegible or missing safety plates, signs or decals.

1. Product Safety

Protective Equipment

Always wear a hard hat, protective glasses, protective shoes and other protective equipment as required by job conditions when working around this product. In particular, wear protective glasses when pounding on any part of the product or its attachment with a hammer or sledge. Use welders gloves, hood/goggles, apron and other protective clothing appropriate to the welding job being performed. Do not wear loose clothing or jewelry that can catch on parts of the product.

Mounting and Dismounting

Use steps and handholds when mounting or dismounting a machine. Clean any mud or debris from steps or work platforms before using them. Always face the machine when using steps and handholds. When it is not possible to use the designed access system, provide ladders, scaffolds, or work platforms to perform safe repair operations.

Lifting

Use a hoist when lifting components that weigh 23 kg (50 lb) or more, to avoid back injury. Make sure all chains, hooks, slings, etc., are in good condition and are of the correct capacity. Be sure hooks are positioned correctly and equipped with a spring latch. Lifting eyes are not to be side loaded during a lifting operation.

Hot Fluids and Parts

To avoid burns, be alert for hot parts on machines that have just been stopped and hot fluids in lines, tubes and compartments.

Be careful when removing fill caps, breathers and plugs on the machine. Hold a rag over the cap or plug to prevent being sprayed or splashed by liquids under pressure. The danger is even greater if the machine has just been stopped because fluids can be hot.

Corrosion Inhibitor

Corrosion inhibitor contains alkali. Avoid contact with eyes. Avoid prolonged or repeated contact with skin. Do not take internally. In case of contact, wash skin immediately with soap and water. For eyes, flush with large amounts of water for at least 15 minutes.

Call Physician. Keep out of reach of children.

Batteries

Do not smoke when inspecting the battery electrolyte level. Never disconnect any charging unit circuit or battery circuit cable from the battery when the charging unit is operating. A spark can cause an explosion from the flammable vapor mixture of hydrogen and oxygen that is released from the electrolyte through the battery outlets. Do not let electrolyte solution make contact with skin or eyes. Electrolyte solution is an acid. In case of contact, immediately wash skin with soap and water. For eyes, flush with large amounts of water for at least 15 minutes. **Call Physician. Keep out of reach of children.**

Pressurized Items

1. Always use a board or a piece of cardboard when you check for a leak. Leaking fluid under pressure can penetrate body tissue. Fluid penetration can cause serious injury and possible death. A pin hole leak can cause severe injury. If fluid is injected into your skin, get treatment immediately. Seek treatment from a doctor that is familiar with this type of injury.
2. Relieve all pressure in air, oil or water systems before disconnecting or removing any lines, fittings or related items. Always make sure all raised components are blocked correctly and be alert for possible pressure when disconnecting any device from a system that utilizes pressure.
3. Lower the bucket, blade, or other attachment to the ground before performing any work on the machine. If this cannot be done, make sure the bucket, blade, or other attachment is blocked correctly to prevent it from dropping unexpectedly.
4. Loose or damaged fuel, lubricant and hydraulic lines, tubes and hoses can cause fires. Do not bend or strike high-pressure lines or install ones that have been bent or damaged. Check lines, tubes and hoses carefully. Do not use your bare hand to check for leaks.
5. Pressurized air or water can cause personal injury. When pressurized air or water is used for cleaning, wear a protective face shield, protective clothing, and protective shoes. The maximum air pressure for cleaning purposes must be below 205 kPa (30 psi). When using a pressure washer, keep in mind that nozzle pressures are very high, generally pressures are well above 13790 kPa (2000 psi). Follow all recommended practices provided by the pressure washer manufacturer.

Repair

! WARNING !

Accidental machine starting can cause injury or death to personnel working on the machine.

To avoid accidental machine starting, disconnect the battery cables from the battery and tape the battery clamps and remove the key.

Place a "Do Not Operate" tag prominently on the machine to inform personnel that the machine is being worked on.

1. Disconnect battery and discharge any capacitor before starting to work on the product. Attach a **Do Not Operate** tag in the Operator's Compartment.
2. If possible, make all repairs with the machine parked on a level, hard surface. Block the machine to prevent it from rolling while working on or under the machine.
3. Do not work on any machine that is supported only by lift jacks or a hoist. Always use blocks or jack stands to support the machine before performing any service or disassembly.
4. Make sure the work area around the product is made safe and be aware of hazardous conditions that may exist. If an engine is started inside an enclosure, make sure that the engine's exhaust is properly vented.
5. Be sure all protective devices including guards and shields are properly installed and functioning correctly before starting a repair. If a guard or shield must be removed to perform the repair work, use extra caution.
6. Always use tools that are in good condition and be sure you understand how to use them before performing any service work.
7. Replace all fasteners with the same part number. Do not use a lesser quality fastener if replacements are necessary.
8. Be prepared to stop an engine if it has been recently overhauled or the fuel system has been recently worked on. If the engine has not been assembled correctly, or if the fuel settings are not correct, the engine can possibly overspeed and cause bodily injury, death or property damage. Be prepared to shut off the fuel and air supply to the engine in order to stop the engine.
9. Be careful when removing cover plates. Gradually back off the last two bolts or nuts located at opposite ends of the cover or device. Then, pry the cover loose to relieve any spring or other pressure before removing the last two nuts or bolts completely.
10. Repairs requiring welding should be performed only with the benefit of the appropriate reference information and by personnel adequately trained and knowledgeable in welding procedures. Determine the type of metal being welded and select the correct welding procedures and electrodes, rods or wire to provide a weld metal equivalent at least to that of the parent weld.
11. Do not damage wiring during removal operations. Reinstall the wiring so it is not damaged during installation or operation by contacting sharp corners or by rubbing against some object or hot surface.
12. Always use lift arm supports to keep lift arms raised. Keep the attachment tilted down and assure that all hydraulic pressure has been relieved for maintenance or repair work that requires the lift arms to be in the raised position.
13. Tighten connections to the correct torque. Make sure that all heat shields, clamps and guards are installed correctly to avoid excessive heat, vibration or rubbing against other parts during operation. Shields that protect against oil spray onto hot exhaust components in event of a line, tube or seal failure must be installed correctly.
14. Do not operate a machine if any rotating part is damaged or contacts another part during operation. Any high-speed rotating component that has been damaged or altered should be checked for balance before reusing. Make sure all protective devices, including guards and shields, are properly installed and functioning correctly before starting the engine or operating the machine.

Attachments

Only use attachments that are recommended by the manufacturer of the machine.

Make sure that all necessary guarding is in place on the host machine and on the attachment.

Wear protective glasses and protective equipment as required by conditions or as recommended in the attachment's operation manual.

1. Product Safety

Ensure that all personnel are far enough away from the work area so they will not be struck by flying objects.

Stay clear of the cutting edges, pinching surfaces or crushing surfaces of the attachment while performing any attachment maintenance, testing or adjustments.

Asbestos Information

Equipment and replacement parts shipped from the manufacturer are asbestos free. When replacement parts are required, use only genuine manufacturer's replacement parts

Use caution when handling replacement parts from another supplier if these parts contain asbestos. Avoid inhaling dust that might be generated when handling these components or when handling asbestos debris. Inhaling this dust can be hazardous to your health.

The components that may contain asbestos fibers are lining material, and some gaskets. The asbestos that is used in these components is usually encased in a resin or sealed in some way. Normal handling is not hazardous unless airborne dust containing asbestos is generated.

If dust that may contain asbestos is present, there are several guidelines that should be followed.

1. Never use compressed air for cleaning. Avoid brushing or grinding materials that contain asbestos. Use a wet method to clean up asbestos debris. A vacuum that is equipped with the high-efficiency particulate air filter (HEPA filter) can also be used.
2. Use exhaust ventilation on permanent machining jobs.
3. Wear an approved respirator if there is no other way to control the dust.
4. Comply with applicable rules and regulations for the work place. In the USA, use Occupational Safety and Health Administration requirements. These OSHA requirements can be found in 29 CFR 1910.1001.
5. Obey environmental regulations for disposal of asbestos.
6. Stay away from areas that might have asbestos particles in the air.

! WARNING !

When replacement parts are required for this product, use only genuine manufacturer's replacement parts or parts with equivalent specifications including, but not limited to physical dimensions, type, strength and material.

Failure to heed this warning can lead to premature failures, product damage, personal injury or death.

Machine Labels and Decals

Labels and decals placed on the machine provide safety information and operating instructions. Make sure you know the location of these labels and understand their significance.

Product ID Number

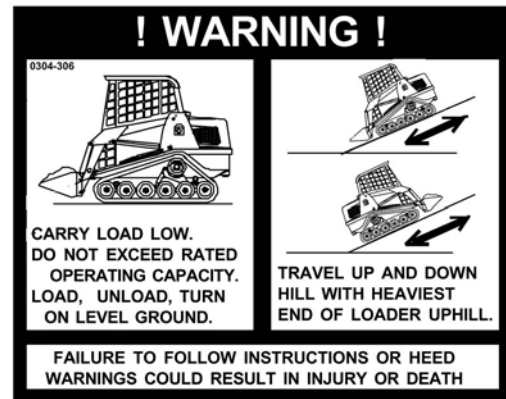
The product ID number (PIN) is located on the left side of the firewall (Figure 1-1). Always provide the PIN when contacting the dealer about parts, service, warranty or accessories. No warranty claims will be processed unless the PIN is provided.



Figure 1-1

Machine Label and Decal Examples

Examples of the labels and decals placed on the machine are shown on this page.



2. Technical Specifications

PT-100 Specifications

Engine

- Model: Perkins 1104C-44T (Turbo)
- Displacement: 4.4 liter
- Gross horsepower: 99.5 hp (74 kW)
- Torque: 304 lb-ft. (412 Nm)
- Idle rpm: 925 (low idle), 2300 (high idle)
- Hot water temperature sender: 217°F, 102.7°C
- Average water /thermostat temperature: 190°F, 87.8°C

Transmission

- Model: A22VG45 tandem (Rexroth)

Drive pumps

- Displacement: 2.745 in³/rev (45 cc/rev)
- Relief pressure: 5500 psi, 380 bar
- Flow: 27.33 gpm (103.5 lpm) @ 2300 rpm

Charge pump

- Displacement: 1.587 in³/rev (26 cc/rev)
- Relief pressure: 400-450 psi (650 to 700 psi at filter test port)

Drive Motors

- Model: Rexroth MCR 5 (2-speed)
- Displacement Low: 50 in³/rev (820 cc/rev)
- Displacement High: 25 in³/rev (410 cc/rev)

Control Handles

- Model: 4TH6 (Rexroth)

Auxiliary Pump

- Make: Rexroth
- Type: Axial Piston, Variable Load Sense
- Displacement: 3.844 in³/rev (63 cc/rev)
- Max Flow: 38 gpm (143 lpm) @ 2300 rpm
- Relief pressure: 3300 psi (22,752 kPa)
- Marginal Pressure: 362 psi (2,495 kPa)
- Cooling/filtering: Oil is filtered and cooled at all times. In auxiliary mode, the oil is filtered after the attachment to protect the machine if the attachment motor fails or contaminants are introduced from the quick couplers.

Loader Valve

- Make: Husko
- Type: Load Sense

Cooler

- Operating pressure: 150 psi (1034 kPa)
- Bypass relief pressure: 80 psi (689 kPa)
- Hot oil sending unit: 225°F (107.2°C)

Critical Torque Specs

- Transmission Mounting Bolts
 - o 85 ft-lb. w/Blue Loctite
- Drive Sprocket Drive Teeth Bolts
 - o 62 ft-lb. -Dry
- Bogie Wheel Retaining Nuts (10")
 - o 37 ft-lb. -Dry
- Bogie Wheel Retaining Nuts (14")
 - o 88 ft-lb. -Dry
- Drive Sprocket Lug Nuts
 - o 177 ft-lb. -Dry
- Drive Motor Mounting Bolts
 - o 177 ft-lbs. -Dry

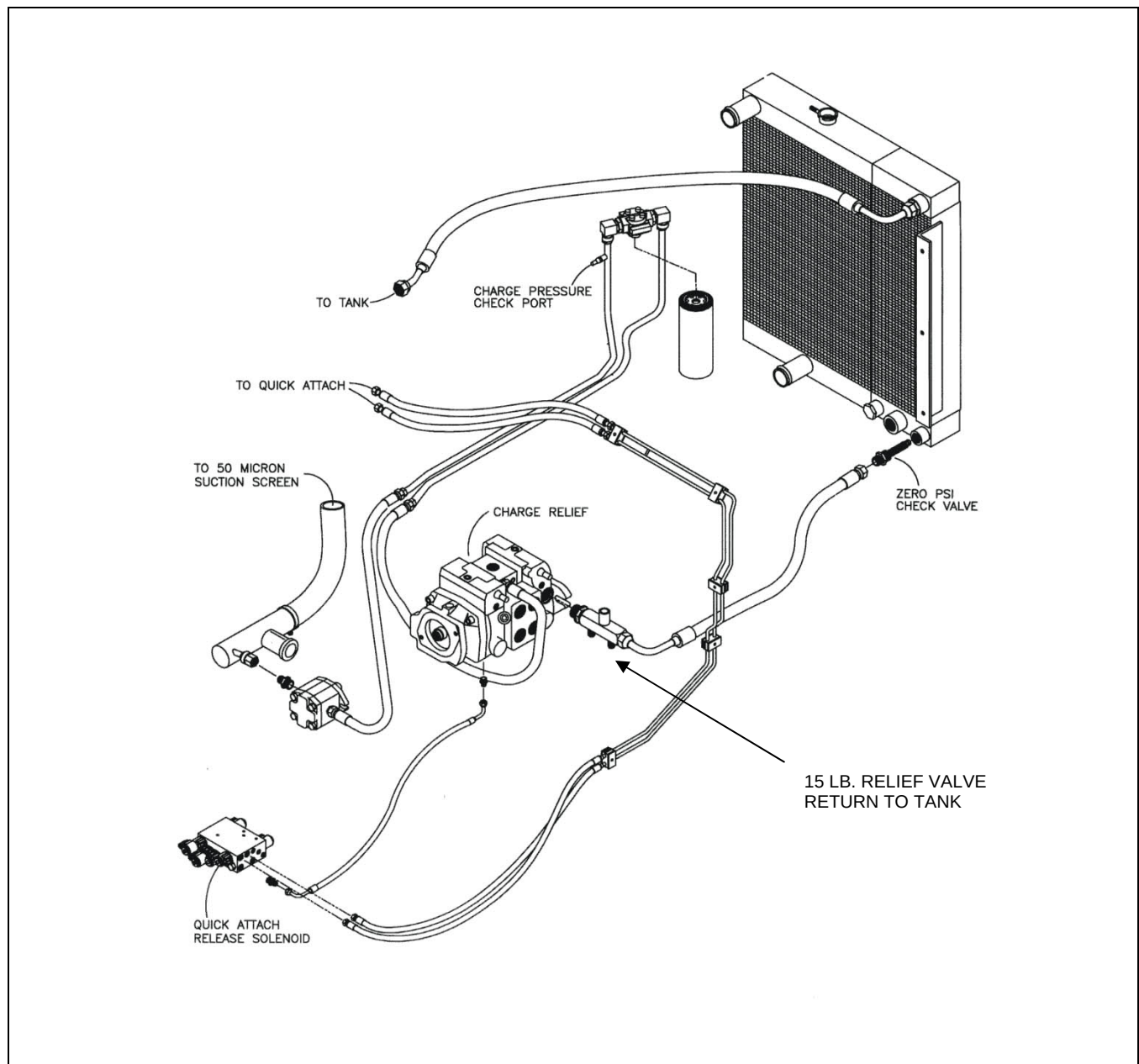
3. System Diagrams

Chapter Overview

This chapter contains diagrams for the following PT-100 systems: hydraulic charge system, auxiliary circuit system, drive loop system, loader valve, solenoid block, and electrical attachment outlet

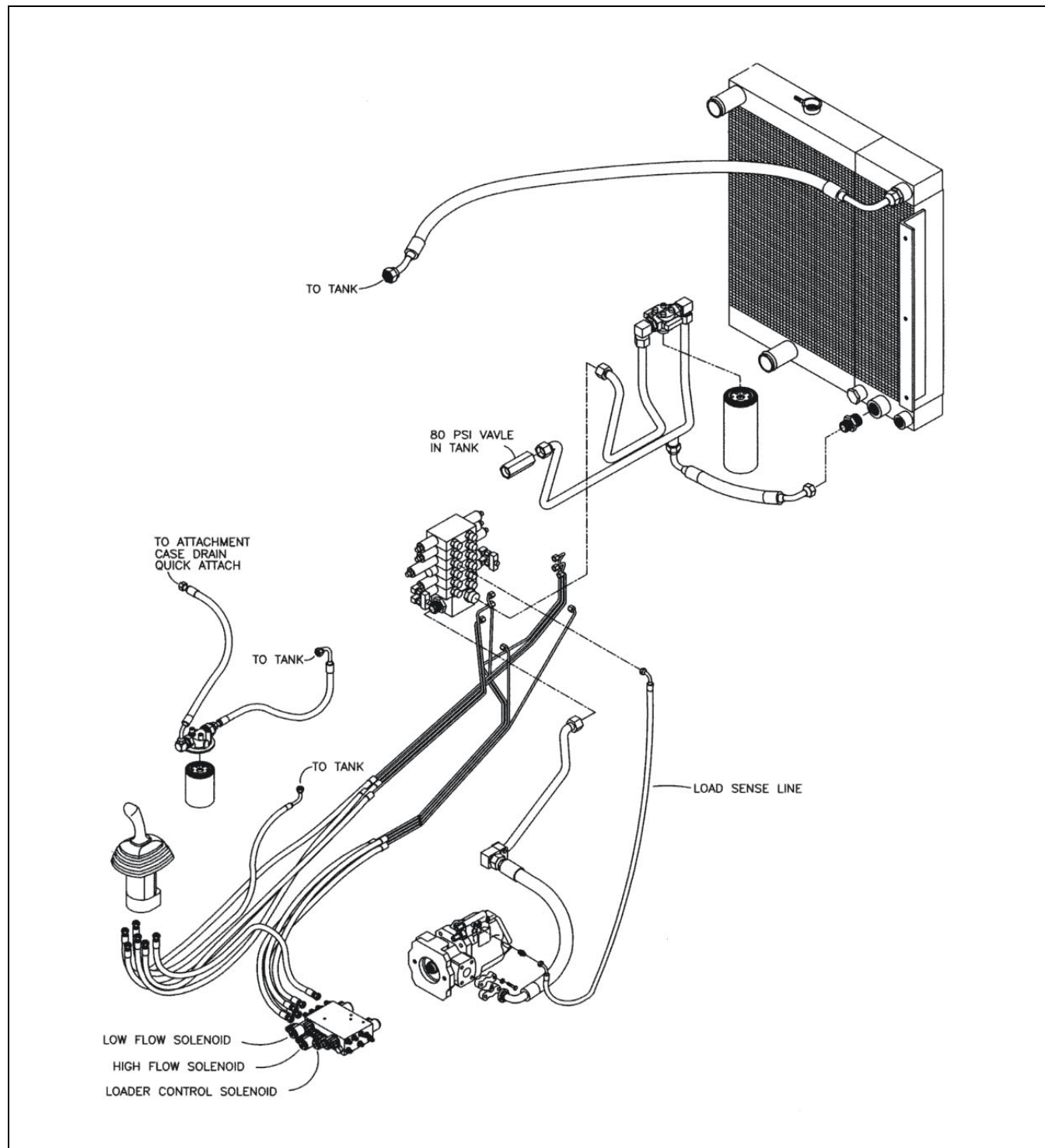
Hydraulic Charge System

Figure 3-1 PT-100 Hydraulic Charge System



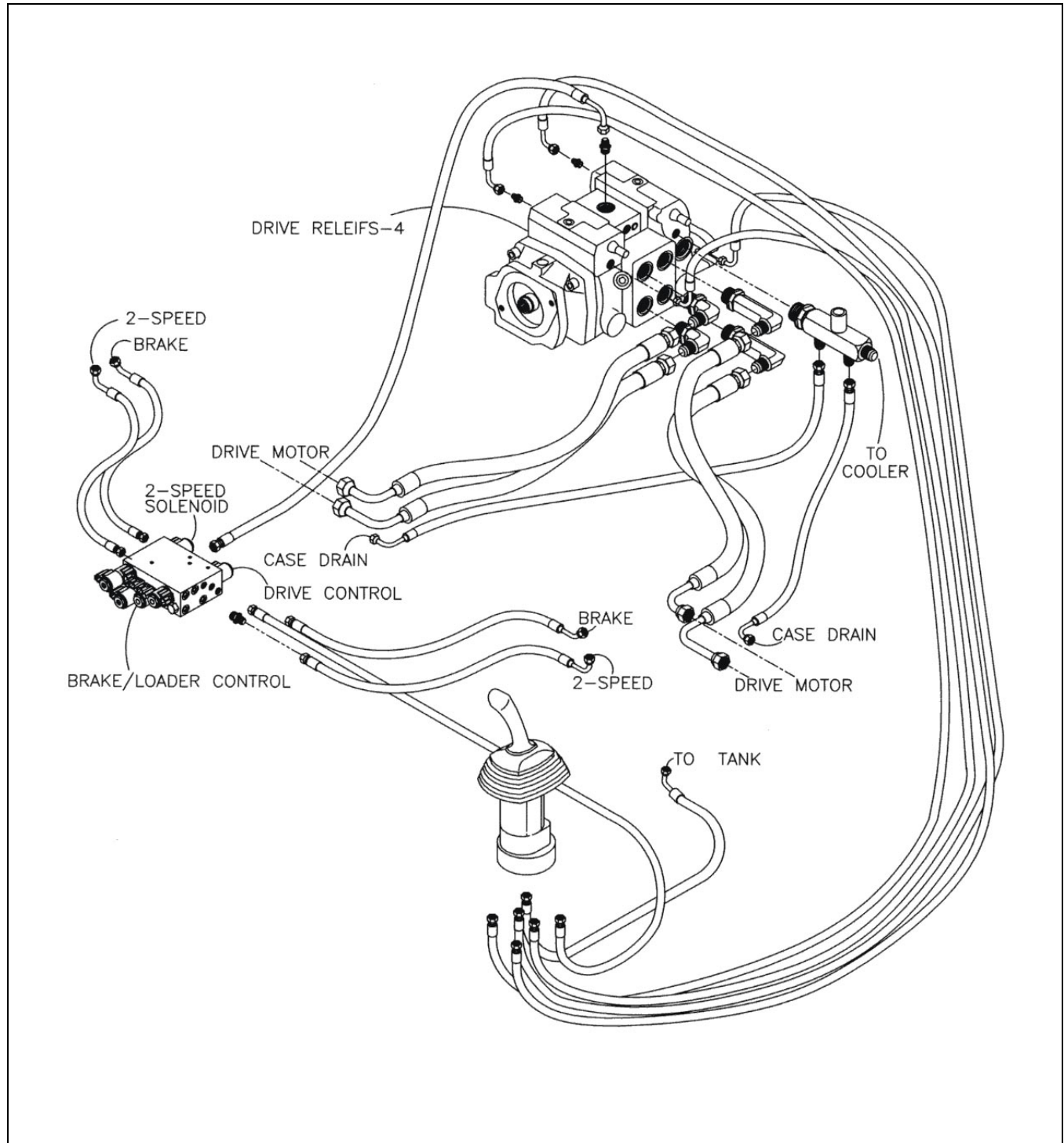
Auxiliary Circuit System

Figure 3-2 PT-100 Auxiliary Circuit System



Drive Loop System

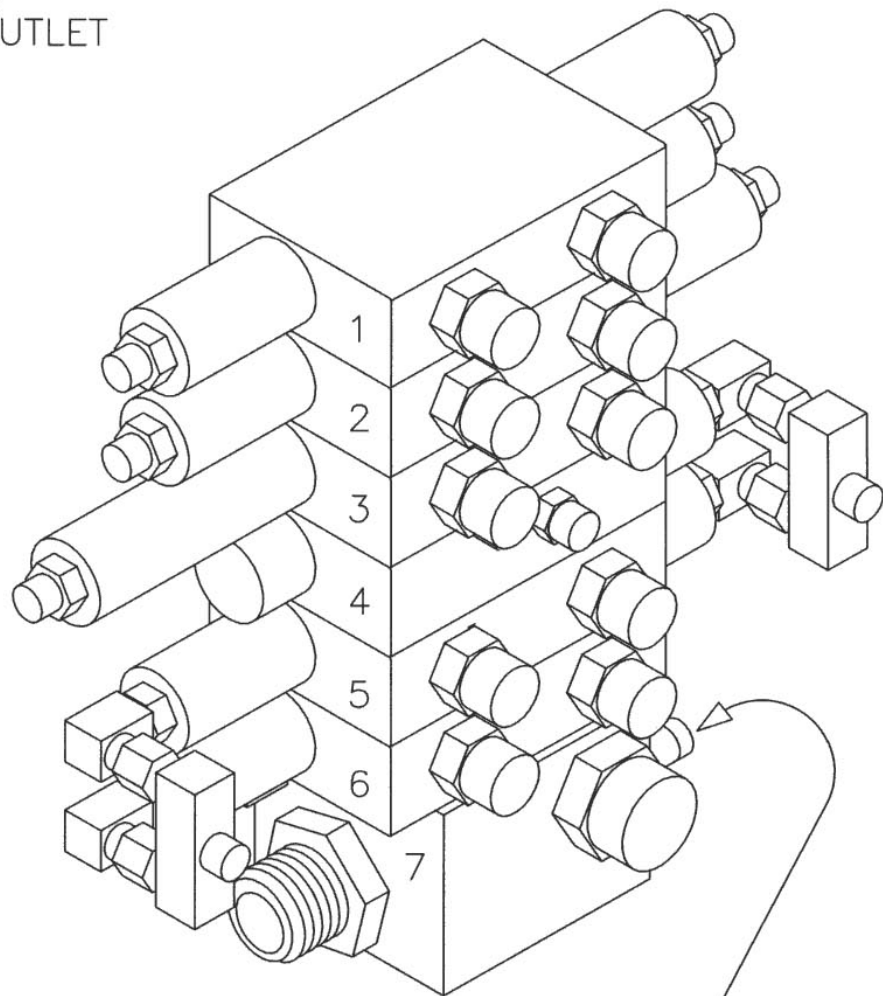
Figure 3-3 PT-100 Drive Loop System



Loader Valve

Figure 3-4 PT-100 Loader Valve

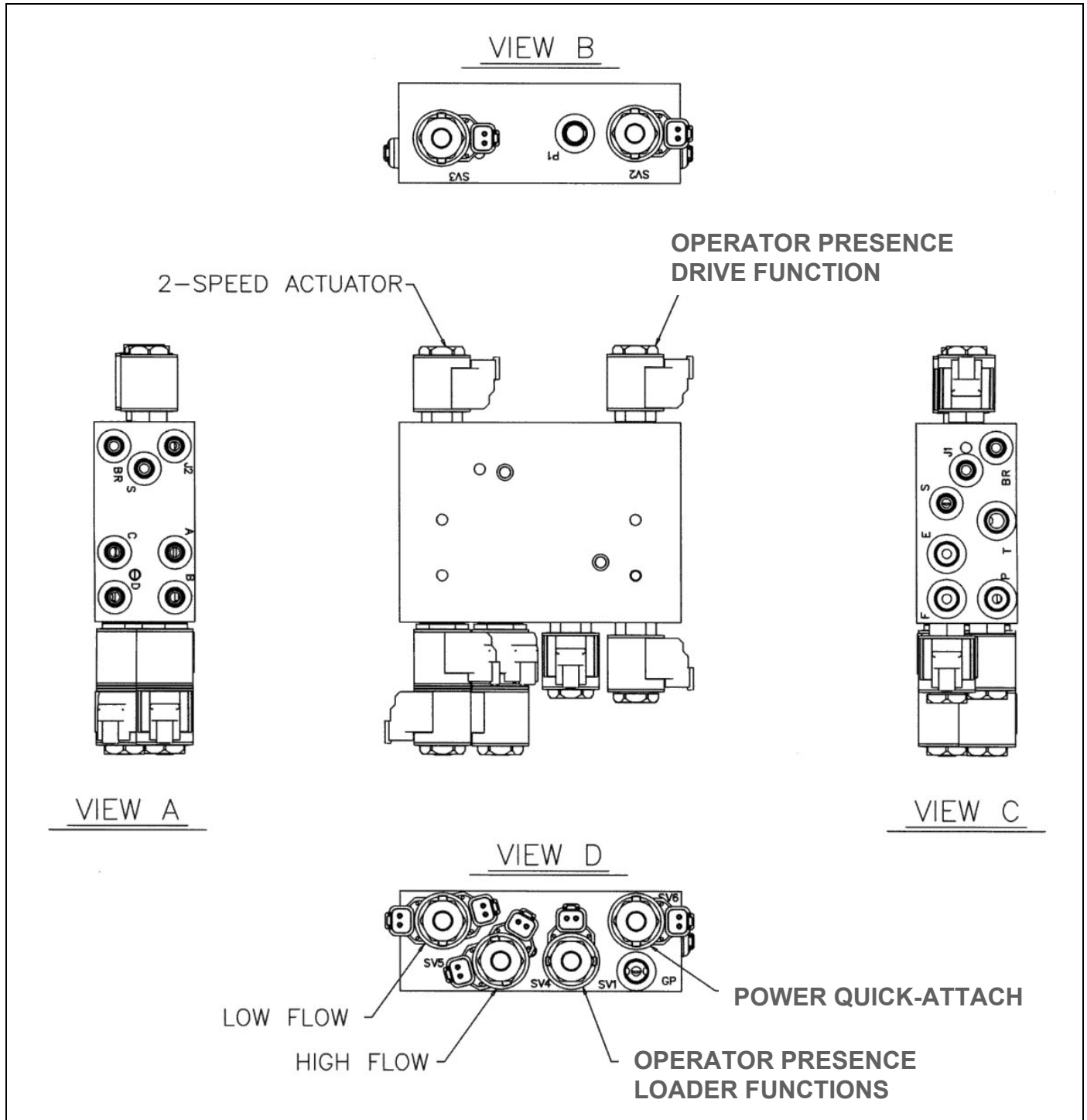
1. LOW FLOW
2. BUCKET
3. LOADER
4. LOAD SENSE / HIGH & LOW DIVIDER
5. HIGH FLOW
6. HIGH FLOW
7. INLET / OUTLET



1/4" FLAT FACE
QUICK COUPLER
PRESSURE CHECK PORT

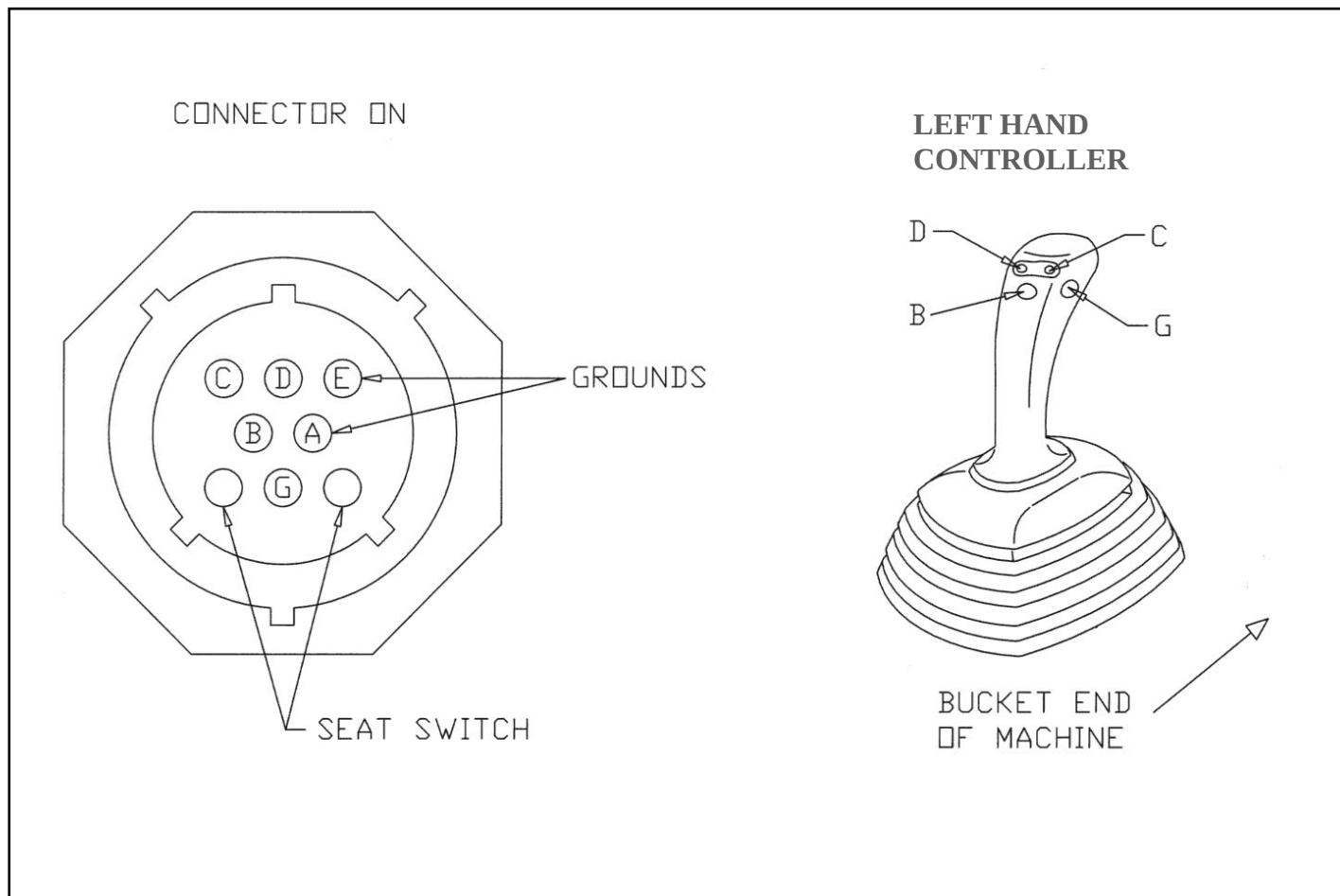
Solenoid Block

Figure 3-5 PT-100 Solenoid Block



Electrical Attachment Outlet

Figure 3-6 PT-100 Electrical Attachment Outlet



4. Machine Controls and Instrumentation

Chapter Overview

This chapter contains an overview of the machine controls and instrumentation. For further information regarding machine controls, instrumentation or operation, refer to the operation and maintenance manual for the PT-100 machines. Included here are illustrations of the following controls and instrumentation components and a description of their functions.

- Machine Controls
- Instrument Location and Function
- Switch Location and Function

Machine Controls (fig. 4-1)

There are three primary machine controls: loader control (1), drive control (2) and throttle (3).

Loader Control

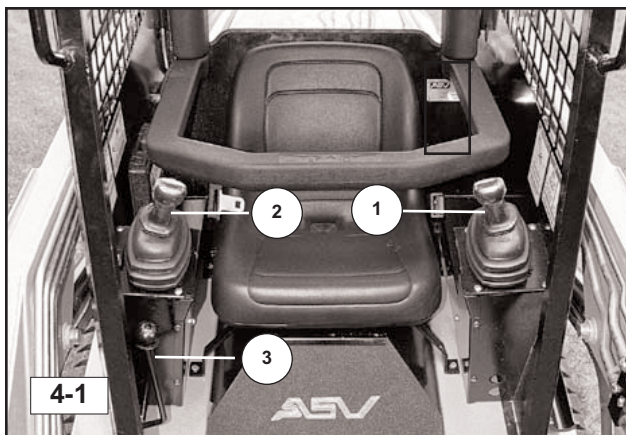
The loader control (1) is a pilot operated joystick that allows the operator to raise or lower the loader and dump or curl the quick attach mechanism.

Drive Control

The drive control (2) is also a pilot operated joystick. It allows the operator to change the direction and speed of the machine.

Throttle

The foot throttle (3) controls engine rpm.

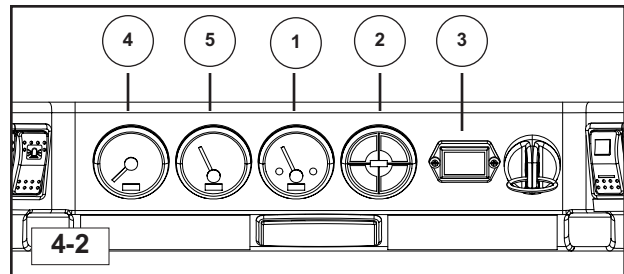


Note: The PT-100 machines are also equipped with a foot throttle mechanism. To use, simply press the pedal until the desired RPM is reached. To hold that RPM, pivot the hand lever forward until it contacts the pedal, then release. Pull back on hand lever to decrease RPM.

Instrumentation

The Instruments (Figure 4-2) are positioned in the overhead dash panel for ease of access and visibility when seated inside the operator enclosure. Instruments include the following components.

- (1) Fuel Level Gauge
- (2) Warning Indicator Display
 - Engine Oil Pressure Warning Light
 - Engine Temperature Warning Light
 - Hydraulic Oil Temperature Warning Light
 - Battery Voltage Warning Light
- (3) Hour Meter
- (4) Tachometer
- (5) Engine Temperature Gauge



NOTICE

Should the engine temperature gauge read excessive temperatures or should the oil pressure or hydraulic oil temperature lights illuminate during normal machine operation, shut the machine down immediately (in a safe location). Diagnose the problem and make any necessary repairs before resuming normal operation.

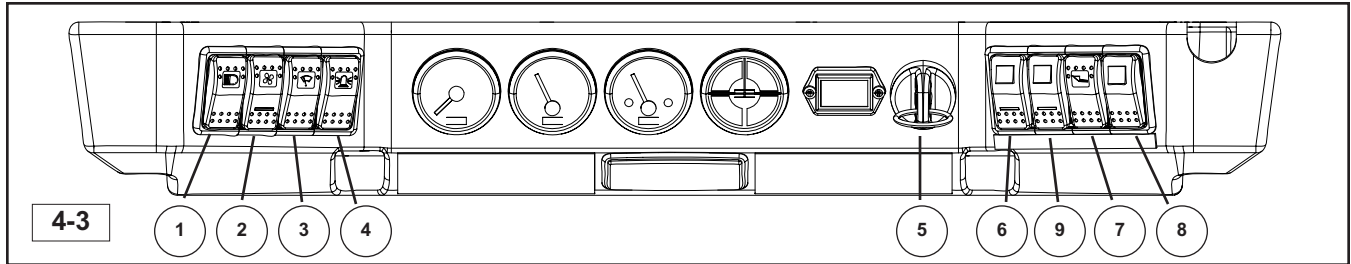
NOTICE

If the battery low-voltage light should illuminate during operation, drive the machine to a suitable location and shut the engine off. Diagnose the problem and make any needed repairs before resuming operation.

The glow plug operation light illuminates only when the key switch is turned to engine pre-heat, showing normal operation.

4. Machine Controls and Instrumentation

Switches



The various switches (Figure 4-3) are positioned to provide good access and visibility. The standard and optional switches are listed below.

- (1) Lights (front and rear)
- (2) Heater Fan (optional)
- (3) Wiper (optional)
- (4) Beacon (optional)
- (5) Ignition, glow plug (pre-heat)
- (6) Low Flow Auxiliary Hydraulics
- (7) Bucket Positioning
- (8) Power Quick Attach
- (9) High Flow Auxiliary Hydraulics

Chapter Overview

This chapter provides disassembly and assembly procedures for the operator enclosure assembly.

Personal Safety

! WARNING !

Improper operation, lubrication, maintenance or repair of this product can be dangerous and could result in injury or death.

Do not operate or perform any lubrication, maintenance or repair on this product until you have read and understood the operation, lubrication, maintenance and repair information.

Before starting any disassembly or assembly procedures, refer to *Chapter 1. Product Safety – Basic Precautions* for personal safety information.

Machine Preparation

! WARNING !

Accidental machine starting can cause injury or death to personnel working on the machine.

To avoid accidental machine starting, disconnect the battery cables from the battery and tape the battery clamps and remove the key.

Place a “Do Not Operate” tag prominently on the machine to inform personnel that the machine is being worked on.

Before starting any disassembly or assembly procedures, refer to *Chapter 1. Product Safety – Repair* for machine preparation information.

Preliminary Checkout

If troubleshooting is required prior to disassembly or assembly, refer to *Chapter 13. Troubleshooting*.

5. Operator Enclosure Disassembly and Assembly

Operator Enclosure Disassembly and Assembly Procedures

Disassembly and assembly procedures are provided for the following operator enclosure components.

- Light Bar
- Ignition Switch
- Gauges
- Lap Bar Gas Assist Spring

Note: Procedures are provided for only those operator enclosure components listed above. However, information for removal and installation of other operator enclosure components can be obtained from the Rubber Track Loader Parts manual.

Light Bar Removal and Installation

The tools required for light bar console removal and installation are listed in Table 5-1. Use manufacturer-recommended tools whenever possible.

Table 5-1

Required Tools
Combination Wrench

Light Bar Removal



Figure 5-1

5-001

1. Loosen the two capscrews that attach the light bar to the cab frame.



Figure 5-2

5-002

2. Carefully lower the light bar with the wire harness attached.



Figure 5-3

5-003

3. View of light bar interior components. Interior components are now accessible for servicing.



Figure 5-4

5-004

4. View of dome light. If removal is required, simply insert a lever (blade-type screw driver) at opposite end of switch in pry-pocket, and gently pry the light assembly out of the light bar.

Light Bar Installation



Figure 5-5

5-005

1. Carefully position the light bar, without pinching the wiring harness against the cab roof.



Figure 5-6

5-006

2. Secure the light bar to the cab roof with the two capscrews

Ignition Switch Removal and Installation

The tools required for ignition switch removal and installation are listed in Table 5-2. Use manufacturer-recommended tools whenever possible.

Table 5-2

Required Tools
Combination Wrench

Ignition Switch Removal

1. Lower the light bar. Refer to *Chapter 5. Light Bar Removal* procedure.

5. Operator Enclosure Disassembly and Assembly



Figure 5-7

5-007

2. Remove the nut that secures the ignition switch to the dash panel.



Figure 5-8

5-008

3. Pull the ignition switch out from the rear of the dash panel.



Figure 5-9

5-009

4. Unplug the ignition switch connector.

Ignition Switch Installation



Figure 5-10

5-010

1. Insert the ignition switch from the rear of the dash panel.



Figure 5-11

5-011

2. Install the nut that secures the ignition switch to the dash panel.



Figure 5-12

5-012

3. Plug in the ignition switch connector.

4. Install the light bar. Refer to *Chapter 5. Light Bar Installation* procedure.

Gauge Removal and Installation

The tools required for gauge removal and installation are listed in Table 5-3. Use manufacturer-recommended tools whenever possible.

Table 5-3

Required Tools
Combination wrench

Gauge Removal

1. Lower the light bar. Refer to *Chapter 5. Light Bar Removal* procedure.



Figure 5-13

5-013

2. Disconnect the connector from the gauge.



Figure 5-14

5-014

3. Remove the two nuts that secure the gauge to the retaining bracket.



Figure 5-15

5-015

4. Pull the gauge out from the front of the dash panel.

Gauge Installation



Figure 5-16

5-016

1. Insert the gauge from the front of the dash panel.



Figure 5-17

5-017

2. Install the two nuts that secure the gauge to the retaining bracket.

5. Operator Enclosure Disassembly and Assembly

Figure 5-18

5-018

3. Reconnect the gauge connector.
4. Install the light bar. Refer to *Chapter 5. Light Bar Installation* procedure.

Lap Bar Gas Assist Spring Removal and Installation

The tools required for gas assist spring removal and installation are listed in Table 5-4. Use manufacturer-recommended tools whenever possible.

Table 5-4

Required Tools
Screwdriver

Lap Bar Gas Assist Spring Removal

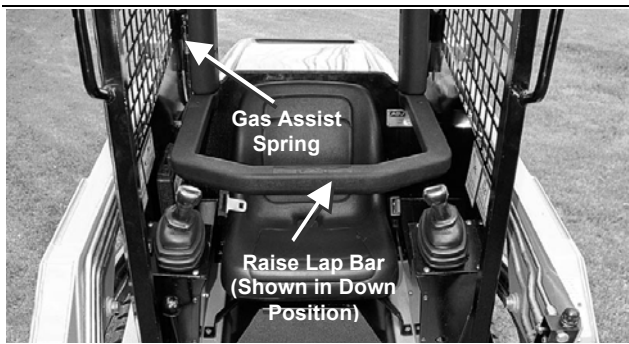


Figure 5-19

5-019

1. Put the lap bar in the UP position to relieve tension on the lap bar gas assist spring.

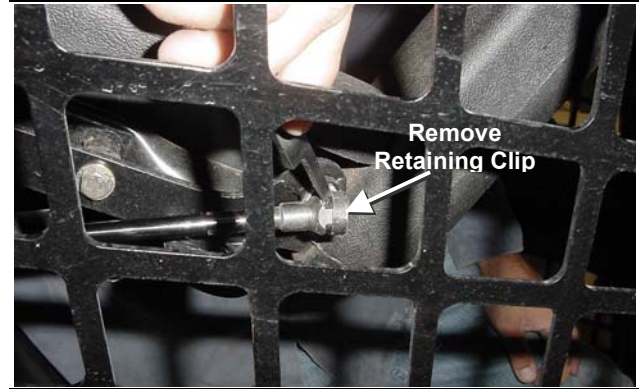


Figure 5-20

5-020

2. Using a small screwdriver, remove the retaining clip from each end of the gas assist spring.



Figure 5-21

5-021

3. Remove the gas assist spring by pulling both ends out from the ball joints.

Lap Bar Gas Assist Spring Installation

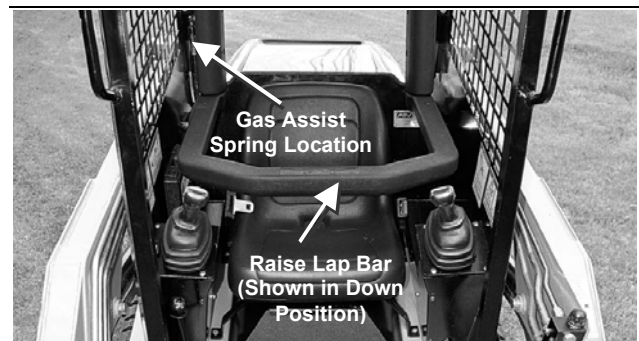


Figure 5-22

5-022

1. Put the lap bar in the UP position to minimize tension on the lap bar gas assist spring during installation.

Rubber Track Loader

5. Operator Enclosure Disassembly and Assembly

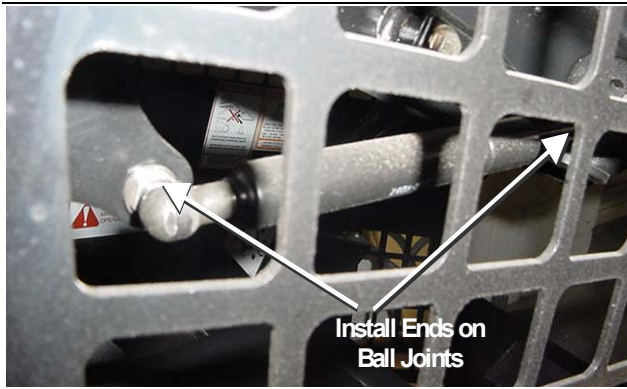


Figure 5-23

5-023

2. Install the ends of the lap bar gas assist spring onto the ball joints.

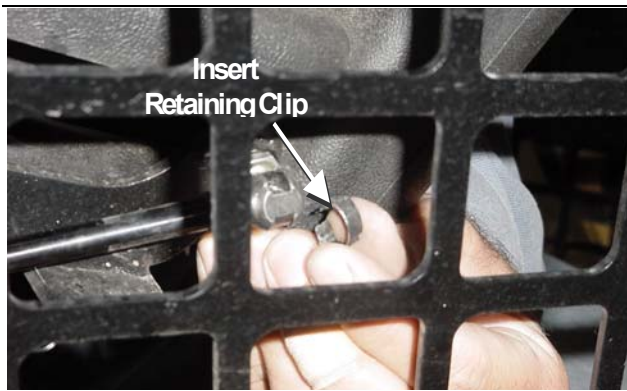


Figure 5-24

5-024

3. Slide the retaining clip on to each end of the gas assist spring.

6. Fuel Tank Disassembly and Assembly

Chapter Overview

This chapter provides disassembly and assembly procedures for the chassis assembly.

Personal Safety

! WARNING !

Improper operation, lubrication, maintenance or repair of this product can be dangerous and could result in injury or death.

Do not operate or perform any lubrication, maintenance or repair on this product until you have read and understood the operation, lubrication, maintenance and repair information.

Before starting any disassembly or assembly procedures, refer to *Chapter 1. Product Safety – Basic Precautions* for personal safety information.

Machine Preparation

! WARNING !

Accidental machine starting can cause injury or death to personnel working on the machine.

To avoid accidental machine starting, disconnect the battery cables from the battery and tape the battery clamps and remove the key.

Place a “Do Not Operate” tag prominently on the machine to inform personnel that the machine is being worked on.

Before starting any disassembly or assembly procedures, refer to *Chapter 1. Product Safety – Repair* for machine preparation information.

Preliminary Checkout

If troubleshooting is required prior to disassembly or assembly, refer to *Chapter 13. Troubleshooting*.

Disassembly and Assembly Procedures

Disassembly and assembly procedures are provided for the following chassis components.

- Fuel Sending Unit
- Cross-over Tube
- Fuel Tanks

Note: Procedures are provided for only those chassis components listed above. However, information for removal and installation of other chassis components can be obtained from the exploded view illustration provided in the Rubber Track Loader Parts manual.

Fuel Sending Unit Removal

The tools required for fuel sending unit removal and installation are listed in Table 6-1. Use manufacturer-recommended tools whenever possible.

Table 6-1

Required Tools
Screwdriver
Combination Wrench
Socket Wrench

Fuel Sending Unit Removal

1. Remove the rear engine skid plate and locate the fuel drain plug in the cross-over tube. Drain fuel from the tank until there is no fuel remaining above the sending unit.

NOTICE

Collect and contain liquids in a suitable container. Dispose of all liquids according to local regulations and mandates.

6. Chassis Disassembly and Assembly

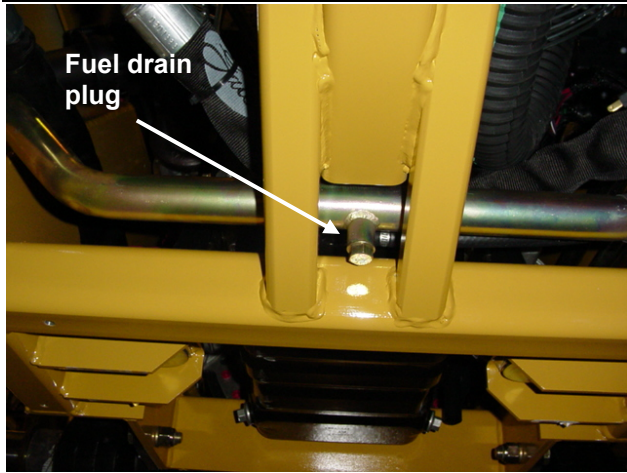


Figure 6-1

2. Remove fuel/water separator to gain access to the fuel sender.

Note: If the fuel sending unit wires are crossed, the fuel gauge will not work.

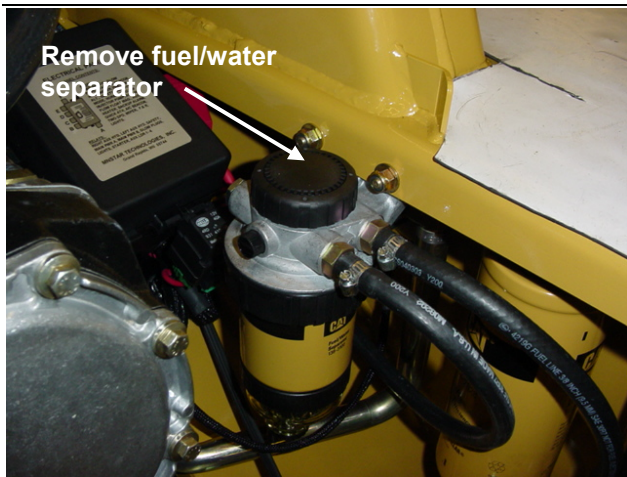


Figure 6-2

3. Remove the fuel sending unit. Be careful not to damage the float mechanism when pulling it through the opening in the fuel tank.

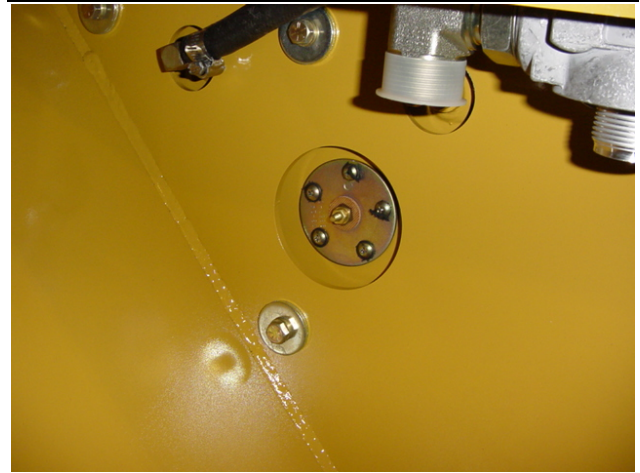


Figure 6-3



Figure 6-4

Fuel Tank Removal

The PT-100 has two fuel tanks that are connected by a cross over tube, the procedure is basically the same for each tank.

1. Drain the fuel tanks.
2. With the engine cold, remove the exhaust pipe, and loosen the muffler. The muffler does not need to be removed, but having it loose will enable access to some fuel tank mounting bolts.

6. Chassis Disassembly and Assembly

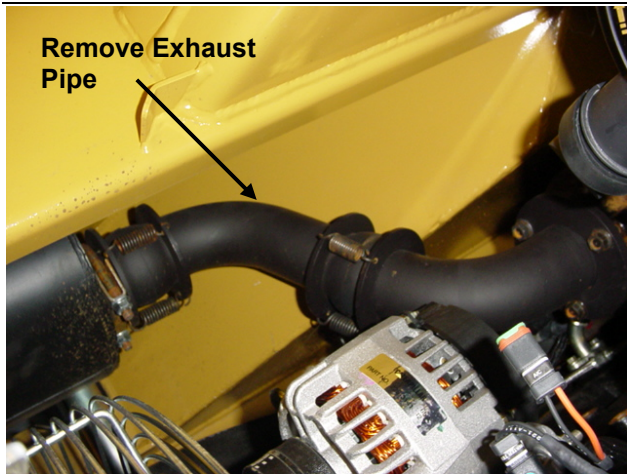


Figure 6-5

3. Loosen up the cross over tube on both ends, where it enters each fuel tank.

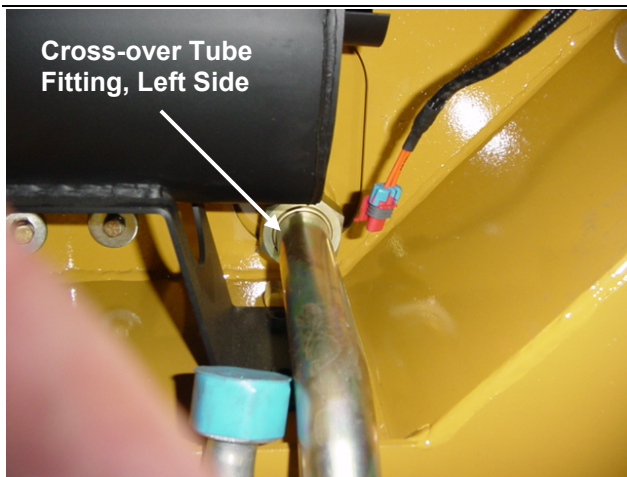


Figure 6-6



Figure 6-7

4. Disconnect the wire to the fuel sending unit on the right side tank.

5. Remove the fuel tank mounting bolts, vent and return hoses on each tank, then use a floor jack to lower the tanks slowly and remove.

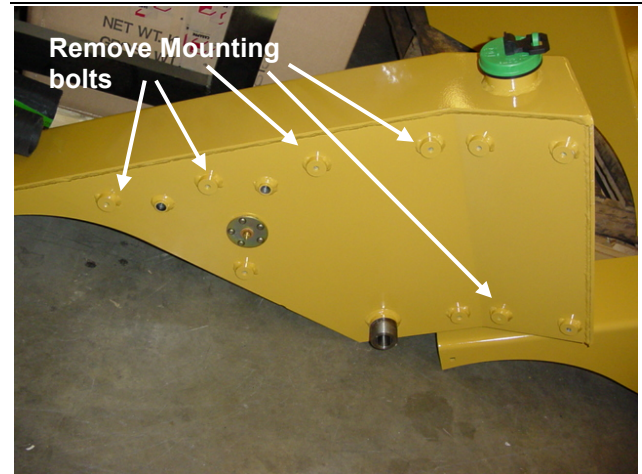


Figure 6-8

6. Once a fuel tank has been removed, the cross over tube can be removed from a hole on either side of the frame.

7. Radiator/Oil Cooler Disassembly and Assembly

Chapter Overview

This chapter provides disassembly and assembly procedures for the radiator/oil cooler assembly.

Personal Safety

! WARNING !

Improper operation, lubrication, maintenance or repair of this product can be dangerous and could result in injury or death.

Do not operate or perform any lubrication, maintenance or repair on this product until you have read and understood the operation, lubrication, maintenance and repair information.

Before starting any disassembly or assembly procedures, refer to *Chapter 1. Product Safety – Basic Precautions* for personal safety information.

Machine Preparation

! WARNING !

Accidental machine starting can cause injury or death to personnel working on the machine.

To avoid accidental machine starting, disconnect the battery cables from the battery and tape the battery clamps and remove the key.

Place a “Do Not Operate” tag prominently on the machine to inform personnel that the machine is being worked on.

Before starting any disassembly or assembly procedures, refer to *Chapter 1. Product Safety – Repair* for machine preparation information.

Preliminary Checkout

If troubleshooting is required prior to disassembly or assembly, refer to *Chapter 13. Troubleshooting*.

Radiator/Oil Cooler Disassembly and Assembly Procedures

Disassembly and assembly procedures are provided for the following radiator/oil cooler components.

- Fan Guard
- Fan
- Air Conditioning Condenser (if equipped)
- Radiator/Oil Cooler

Note: Procedures are provided for only those radiator/oil cooler components listed above. However, information for removal and installation of other radiator/oil cooler components can be obtained from the Rubber Track Loader Parts List manual.

Note: Refer to Figure 3-1 for an overview of the filtering and cooling system.

Fan Guard Removal and Installation

The tools required for fan guard removal and installations are listed below. Use manufacturer-recommended tools whenever possible.

Required Tools
Combination Wrench

7. Radiator/Oil Cooler Disassembly and Assembly

Fan Guard Removal

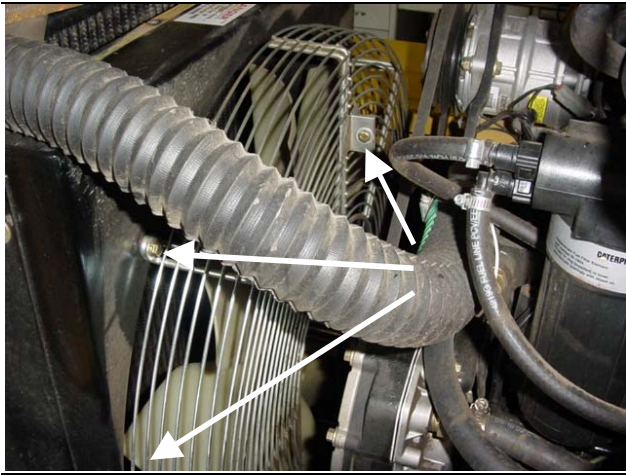


Figure 7-1

1. Remove the bolts that secure the fan guard to the fan shroud.
2. Remove the fan guard from the engine compartment.

Fan Guard Installation

1. Position the fan guard over the fan and against the fan shroud.
2. Install the capscrews that secure the fan guard to the fan guard mounts.
3. Make sure there is proper clearance between the fan guard and the fan.

Fan Removal

The tools required for radiator/cooler removal and installations are listed below. Use manufacturer-recommended tools whenever possible.

Required Tools

Combination Wrench
Socket Wrench
Screwdriver

1. Remove the fan guard as described above.
2. Remove the bolts securing the fan to the spacer.
3. Carefully lift and remove the fan from the machine as shown.



Figure 7-5



Figure 7-6



Figure 7-7

Radiator/Cooler Removal

! WARNING !

Hot oil can cause personal injury. Make sure the oil is cool before removing any components or lines.

Remove the oil filler cap only when the engine is stopped and the machine has been allowed to cool thoroughly.

7. Radiator/Oil Cooler Disassembly and Assembly**! WARNING !**

Personal injury can result from hot coolant, steam and alkali.

At operating temperature, engine coolant is hot and under pressure. The radiator and all lines to the heaters and the engine contain hot coolant and steam. Contact can cause severe burns.

Remove the filler cap slowly to relieve pressure only when the engine is stopped and the machine has been allowed to cool thoroughly.

Do not attempt to tighten the hose connections when the coolant is hot. The hose can come off and cause burns.

Cooling system conditioner contains alkali. Avoid contact with skin and eyes.

NOTICE

Collect and contain liquids in a suitable container. Dispose of all liquids according to local regulations and mandates.

The tools required for radiator/cooler removal and installations are listed below. Use manufacturer-recommended tools whenever possible.

Required Tools

Combination Wrench
Socket Wrench
Screwdriver
Hydraulic caps and plugs

1. Drain the hydraulic fluid. Refer to *Chapter 11. Hydraulic Fluid and Filter Change*.



Figure 7-8

2. Drain the coolant using the petcock on the bottom of the radiator.



Figure 7-9

3. Remove the upper radiator hose.

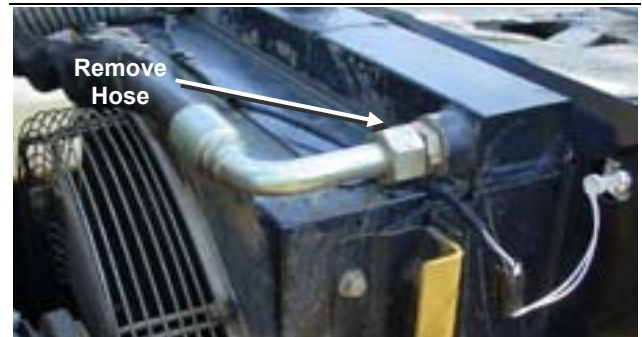


Figure 7-10

4. Remove the upper hydraulic oil cooler hose from the oil cooler section. Cap the hose and fitting.



Figure 7-11

5. Remove rear engine skid plate from the machine. This will give you access to the bottom radiator hose and bottom hydraulic hoses.

Rubber Track Loader

7. Radiator/Oil Cooler Disassembly and Assembly



Figure 7-12

6. Remove the lower radiator hose from the radiator section.



Figure 7-14

8. Remove the three bolts on each side of the Radiator/Cooler, which fasten it to the frame.



Figure 7-13

7. Remove the two bottom hydraulic oil cooler hoses. Cap and plug the fittings and hoses.



Figure 7-15

9. Pull the radiator/cooler straight up. It may be necessary to move the fan shroud out of the way for the radiator/cooler to clear.

8. Loader/Transmission Controls Disassembly and Assembly

Chapter Overview

This chapter provides disassembly and assembly procedures for the loader/transmission controls assembly.

Personal Safety

! WARNING !

Improper operation, lubrication, maintenance or repair of this product can be dangerous and could result in injury or death.

Do not operate or perform any lubrication, maintenance or repair on this product until you have read and understood the operation, lubrication, maintenance and repair information.

Before starting any disassembly or assembly procedures, refer to *Chapter 1. Product Safety – Basic Precautions* for personal safety information.

Machine Preparation

! WARNING !

Accidental machine starting can cause injury or death to personnel working on the machine.

To avoid accidental machine starting, disconnect the battery cables from the battery and tape the battery clamps and remove the key.

Place a “Do Not Operate” tag prominently on the machine to inform personnel that the machine is being worked on.

Before starting any disassembly or assembly procedures, refer to *Chapter 1. Product Safety – Repair* for machine preparation information.

Preliminary Checkout

If troubleshooting is required prior to disassembly or assembly, refer to *Chapter 13. Troubleshooting*.

Loader/Transmission Controls Disassembly and Assembly Procedures

Disassembly and assembly procedures are provided for the following loader/transmission control components.

- Left Control Joystick
- Right Control Joystick
- Loader Float Magnet

Note: Procedures are provided for only those loader/transmission control components listed above. However, information for removal and installation of other loader/transmission control components can be obtained from the Rubber Track Loader Parts List manual.

Note: Refer to Chapter 3 for an overview of the auxiliary circuit system and drive loop system.

Joystick Removal and Installation

There are two joysticks that control the operation of the machine.

Required Tools

Screwdriver
Open End Wrench

Right Joystick Removal

Note: Since the procedures for removing both joystick controls are identical, only the right control joystick procedure is described below.

Note: During disassembly, cap all hoses and fittings to prevent fluid loss and contamination of the system fluids.

8. Loader/Transmission Controls Disassembly and Assembly

! WARNING !

Lower all attachments and make sure the machine has been allowed to cool thoroughly before proceeding. Hot oil can cause personal injury.

1. Lower the lift arms to the ground.
2. Turn the engine switch to the OFF position, and disconnect the battery.
3. Remove the throttle linkage from the throttle handle.



Figure 8-1



Figure 8-2



Figure 8-3

4. Remove mounting screws from the plastic console.

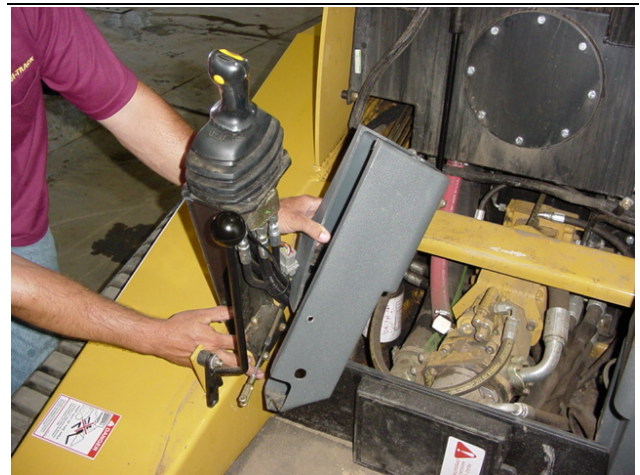


Figure 8-4



Figure 8-5

8. Loader/Transmission Controls Disassembly and Assembly

5. Make sure the hoses are labeled before removing to aid in reinstalling. Remove the hoses and disconnect the wiring harness from the joystick
6. Unbolt the joystick from the joystick tower and remove.

Loader Float Magnet Removal and Installation

The tools required for loader float magnet removal and installations are listed in Table 8-1. Use manufacturer-recommended tools whenever possible.

Table 8-1

Required Tools
Screwdriver
Open End Wrench
Allen Wrench

Loader Float Magnet Removal

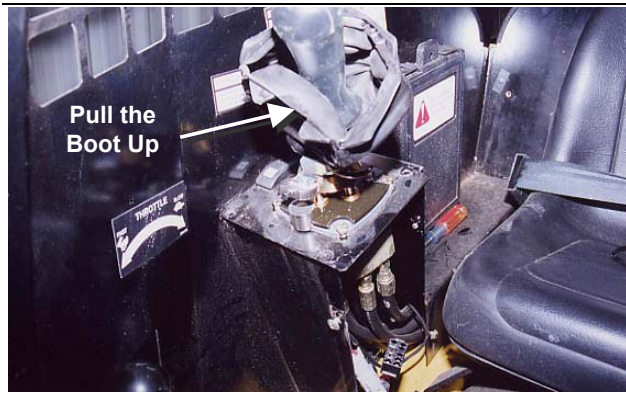


Figure 8-8

7. Remove the rubber boot from the base of the joystick and pull the boot up.



Figure 8-9

8. Locate the loader float magnet at the front of the control.



Figure 8-10

9. The loader float magnet is held in place by an allen screw at the bottom of the magnet. Remove this screw.

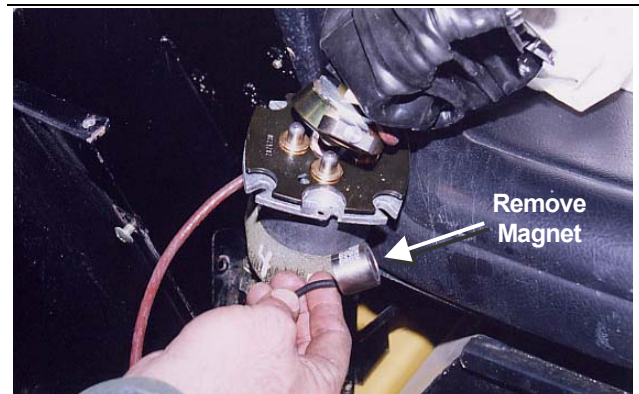


Figure 8-11

14. Remove the loader float magnet.

Loader Float Magnet Installation

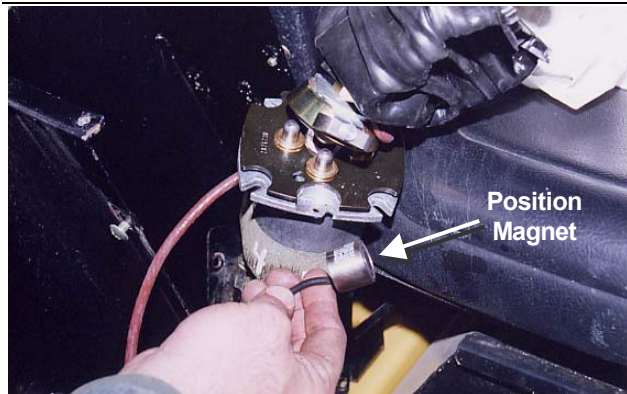


Figure 8-12

1. Position the loader float magnet at the front of the control.

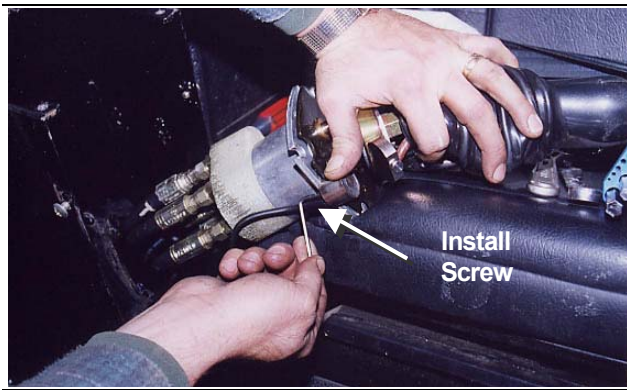


Figure 8-13

2. The loader float magnet is held in place by an allen screw at the bottom of the magnet. Install this screw.



Figure 8-14

3. With the loader float magnet installed, the control is ready to mount in the console.
4. Position the control on the console and pull the rubber boot down over the base of the joystick.
5. Re-attach the plastic console.

9. Hydrostatic and Aux. Pump Disassembly and Assembly

Chapter Overview

This chapter provides disassembly and assembly procedures for the hydrostatic and auxiliary pump.

Personal Safety

! WARNING !

Improper operation, lubrication, maintenance or repair of this product can be dangerous and could result in injury or death.

Do not operate or perform any lubrication, maintenance or repair on this product until you have read and understood the operation, lubrication, maintenance and repair information.

Before starting any disassembly or assembly procedures, refer to *Chapter 1. Product Safety – Basic Precautions* for personal safety information.

Machine Preparation

! WARNING !

Accidental machine starting can cause injury or death to personnel working on the machine.

To avoid accidental machine starting, disconnect the battery cables from the battery and tape the battery clamps and remove the key.

Place a “Do Not Operate” tag prominently on the machine to inform personnel that the machine is being worked on.

Before starting any disassembly or assembly procedures, refer to *Chapter 1. Product Safety – Repair* for machine preparation information.

Preliminary Checkout

If troubleshooting is required prior to disassembly or assembly, refer to *Chapter 13. Troubleshooting*.

Hydrostatic and Hydraulic Pump Disassembly and Assembly Procedures

Disassembly and assembly procedures are provided for the following transmission and drive components.

- Charge Pump
- Auxiliary Piston Pump
- Tandem Pump

Note: Procedures are provided for only those transmission and drive components listed above. However, information for removal and installation of other transmission and drive components can be obtained from the Rubber Track Loader Parts Manual.

Note: Refer to Figure 3-2 for an overview of the auxiliary circuit system and Figure 3-3 for an overview of the drive loop system.

Charge Pump Removal

The tools required for auxiliary gear pump removal and installation are listed in Table 0-1. Use manufacturer-recommended tools whenever possible.

Table 0-1

Required Tools
Screwdriver
Combination Wrench
Socket Wrench

Charge Pump Removal

! WARNING !

Hot oil can cause personal injury. Lower all attachments and allow the machine to cool thoroughly before removing any components or lines.

Remove the oil filler cap only when the engine is stopped and the machine has been allowed to cool thoroughly.

9. Transmission and Drive Disassembly and Assembly

NOTICE

Collect and contain liquids in a suitable container. Dispose of all liquids according to local regulations and mandates.

Note: During disassembly, cap all hoses and fittings to prevent fluid loss and contamination of the system fluids.

1. Lower the lift arms to the ground.
2. Turn the ignition switch to the OFF position.
3. Relieve hydraulic pressure from the auxiliary circuit.
4. Drain the hydraulic fluid. Refer to *Chapter 11. Hydraulic Fluid and Filter Change*.
5. Remove the Operators Manual compartment.



Figure 9-1



Figure 9-2

6. Remove the heel plate directly under the seat.



Figure 9-3

7. Remove the floor plate. You will have to remove the plastic consoles, and the hand/foot throttle mechanisms in order to remove the floor plate.



Figure 9-4



Figure 9-5

8. Disconnect the two hoses attached to charge pump.

9. Transmission and Drive Disassembly and Assembly



Figure 9-6

9. Remove the split flange and lay the inlet tube aside. Remove the 2 bolts that mount the charge pump to the auxiliary pump, then remove the charge pump as shown below.

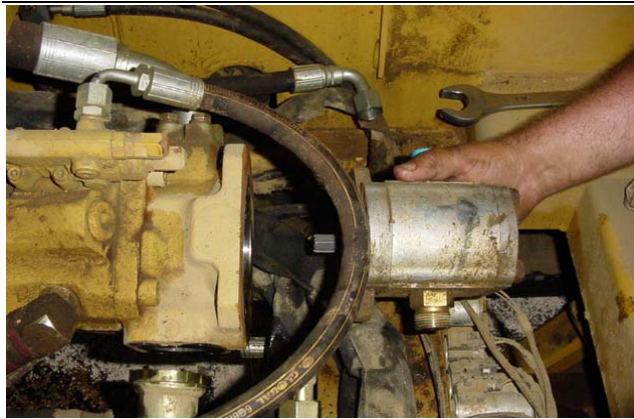


Figure 9-7

Auxiliary Pump Removal

1. Disconnect all hoses from auxiliary pump.



Figure 9-8

2. Loosen (remove) the pump support bolt. You must first loosen the jam nut near the engine in order to do so.

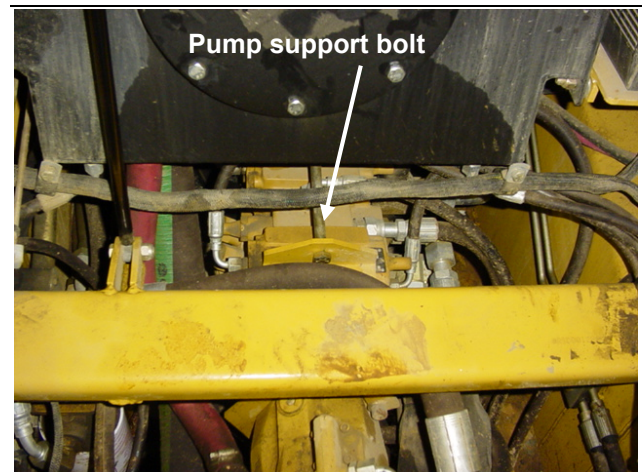


Figure 9-9

3. Remove the two bolts that mount the auxiliary pump to the tandem drive pump, then remove the pump as shown in figure 9-10.



Figure 9-10

Tandem Pump Removal

The tools required for tandem pump removal and installation are listed in Table 0-2. Use manufacturer-recommended tools whenever possible.

Table 0-2

Required Tools
Screwdriver
Combination Wrench
Socket Wrench

Tandem Pump Removal

! WARNING !

Hot oil can cause personal injury. Lower all attachments and allow the machine to cool thoroughly before removing any components or lines.

Remove the oil filler cap only when the engine is stopped and the machine has been allowed to cool thoroughly.

NOTICE

Collect and contain liquids in a suitable container. Dispose of all liquids according to local regulations and mandates.

Note: During disassembly, cap all hoses and fittings to prevent fluid loss and contamination of the system fluids.

1. Remove the charge pump and the auxiliary pump.
2. Label and remove all the hoses and tubes from the tandem hydrostatic pump. Be sure to cap all hoses and fittings.

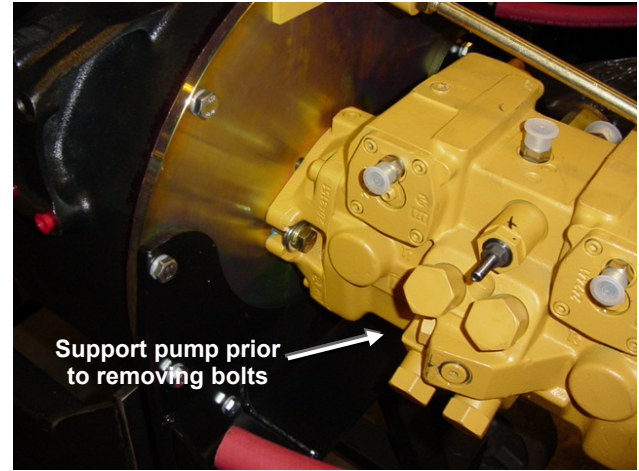


Figure 9-11

3. Secure the pump by chain or floor jack to prevent it from falling once mounting bolts are removed.

4. Remove the mounting bolts (with spring lock washer and flat washer) from either side of the tandem pump. You will need to slide the pump away from the engine mounting plate as you loosen the bolts to prevent the bolt heads from bottoming out on the pump case.

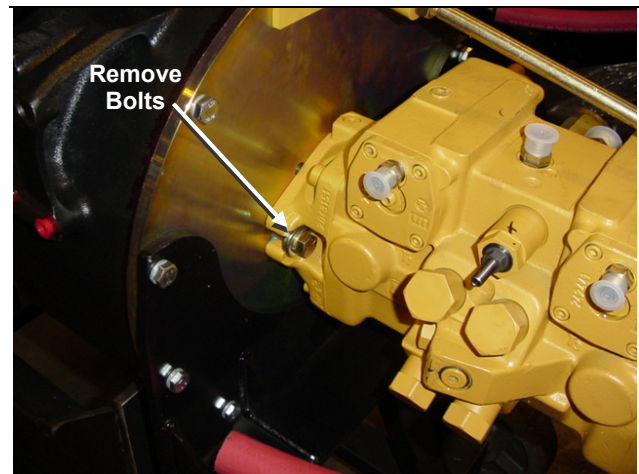


Figure 9-12

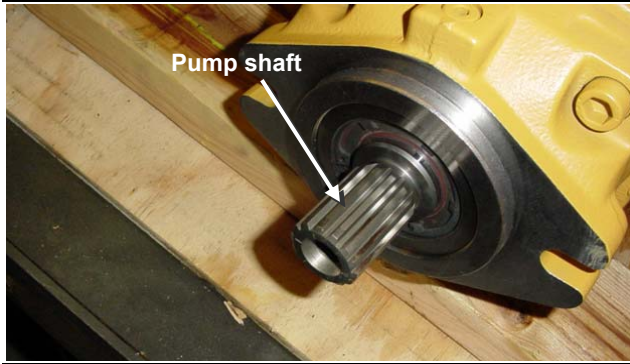


Figure 9-13

Tandem Pump Installation

1. Install the mounting bolts (with spring lock washer and flat washer) on the tandem pump, at 85 ft.-lb. with blue loctite.

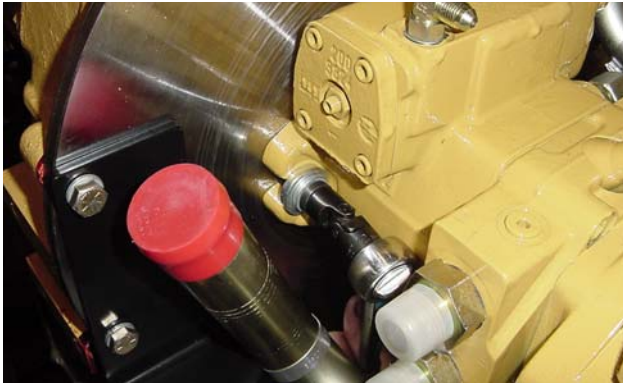


Figure 9-14

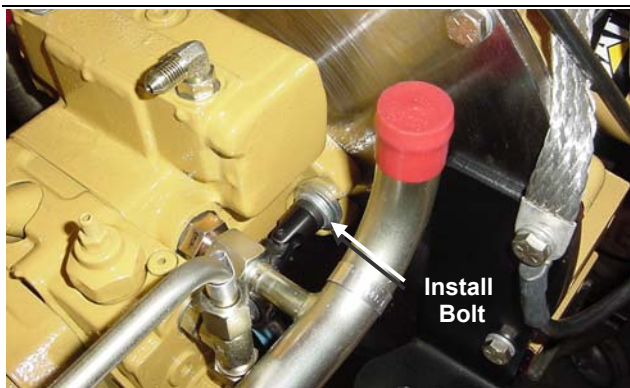


Figure 9-15

2. Install the hoses and tubes on the tandem pump.

Hydraulic Reservoir Clean-out

If there has been a pump failure it is necessary to clean out the hydraulic reservoir, as well as hoses, tubes and hydraulic lines.



Figure 9-16

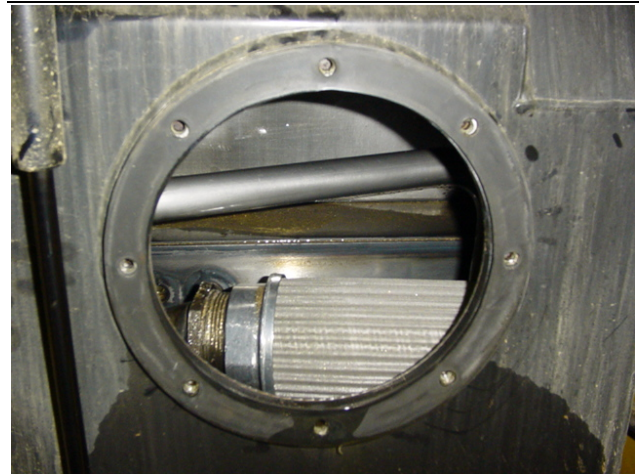


Figure 9-17

10. Undercarriage Disassembly and Assembly

Chapter Overview

This chapter provides disassembly and assembly procedures for the undercarriage assemblies.

Personal Safety

! WARNING !

Improper operation, lubrication, maintenance or repair of this product can be dangerous and could result in injury or death.

Do not operate or perform any lubrication, maintenance or repair on this product until you have read and understood the operation, lubrication, maintenance, and repair information.

Before starting any disassembly or assembly procedures, refer to *Chapter 1. Product Safety – Basic Precautions* for personal safety information.

Machine Preparation

! WARNING !

Accidental machine starting can cause injury or death to personnel working on the machine.

To avoid accidental machine starting, disconnect the battery cables from the battery, tape the clamps, and remove the key.

Place a “Do Not Operate” tag prominently on the machine to inform personnel that the machine is being worked on.

Before starting any disassembly or assembly procedures, refer to *Chapter 1. Product Safety – Repair* for machine preparation information.

Preliminary Checkout

If troubleshooting is required prior to disassembly or assembly, refer to *Chapter 13. Troubleshooting*.

Undercarriage Disassembly and Assembly Procedures

Disassembly and assembly procedures are provided for the following undercarriage components.

- Drive Sprocket
- Drive Motor
- Wheel Replacement
- Track removal and installation (see Ch. 11)

Note: Procedures are provided for only those undercarriage components listed above. However, other helpful information can be obtained from the Rubber Track Loader Parts Manual.

Sprocket Removal and Installation

The tools required for sprocket removal and installation are listed in Table 0-1. Use manufacturer-recommended tools whenever possible.

Table 0-1

Required Tools
Socket Wrench
Combination Wrench

Sprocket Removal

1. Remove the 7 bolts that fasten the bearing plate to the drive table.

Rubber Track Loader

10. Undercarriage Disassembly and Assembly



Figure 10-18



Figure 10-19

2. Pry the bearing plate off.



Figure 10-20



Figure 10-21



Figure 10-22

2. Remove the soft plug from the end of bearing flange and remove the snap ring on the shaft. The plug may be either metal or rubber depending on the manufacture date of the machine.

Note: To remove the metal plug, Tap around the perimeter of the plug to loosen it and remove.

Note: To remove the rubber plug, tap a blade type screwdriver in at the edge of the cap and pry out. The rubber cap must be replaced upon removal.

10. Undercarriage Disassembly and Assembly



Figure 10-23

4. Using a puller, remove the bearing and bearing housing from the shaft.



Figure 10-24

5. Remove the bolts that fasten that fasten the sprocket to the drive motor, then remove the sprocket.



Figure 10-25



Figure 10-26

Drive Motor Removal

1. Drain the hydraulic fluid, see chapter 11. Remove the bolts which fasten the drive motor to the drive table.



Figure 10-27

2. Disconnect all hoses from the drive motor.



Figure 10-28



Figure 10-29



Figure 10-30



Figure 10-31

3. Pull the drive motor free from the drive table housing.

Wheel Replacement

1. Remove the bolts which fasten the wheel tube to the frame rail, there are two on the inside and 2 on the out side.



Figure 10-32

2. Remove the wheel shaft keeper plates from both ends of the shaft.

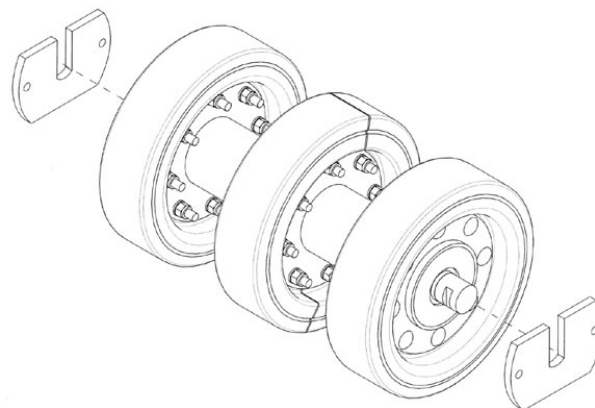


Figure 10-33

3. Unbolt the wheels from the tube and replace (the center wheel is split for easy removal and installation).



Figure 10-34

14" Wheel Keeper Plates

The 14" Wheels on each end can be spaced out 1/4" each for a total of 1/2". This can be done if the track has stretched to the point where the standard adjustment holes are not enough.

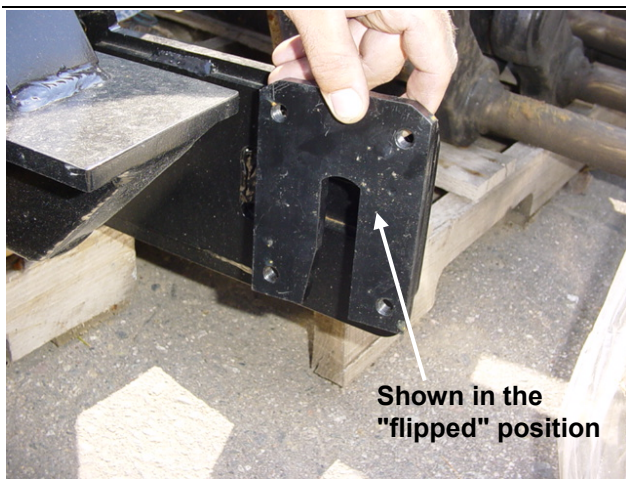


Figure 10-35

1. Flip both the inside and outside keeper plates on the end 14" wheels to increase the length. The 14" wheel scrapers may need to be adjusted after this is performed.

11. Maintenance

Chapter Overview

This chapter provides information on general maintenance procedures for the PT-100. If there is an issue that requires troubleshooting, refer to Chapter 13, Troubleshooting.

Personal Safety

!WARNING!

Improper or incomplete maintenance/repair of a Rubber Track Loader can be dangerous and may result in machine damage, injury or even death.

Do not attempt to perform any type of repair or maintenance on a Rubber Track Loader until you have read and fully understood the information in this manual.

Refer to the Operation and Maintenance manual for instructions regarding proper machine operation techniques before operating any Rubber Track Loader.

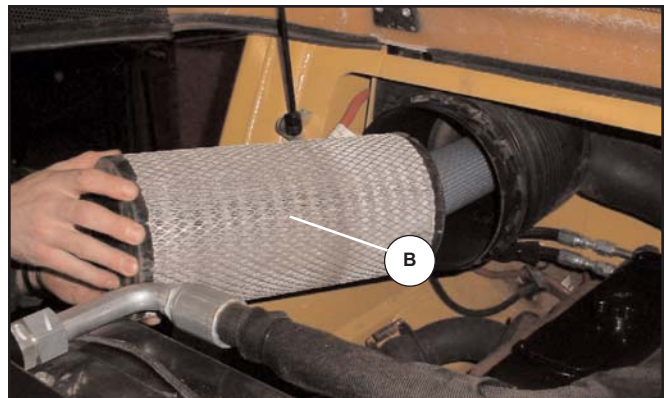
Prior to performing any type of service work on a Rubber Track Loader, read and understand Chapter 1 (Product Safety) for personal safety information.

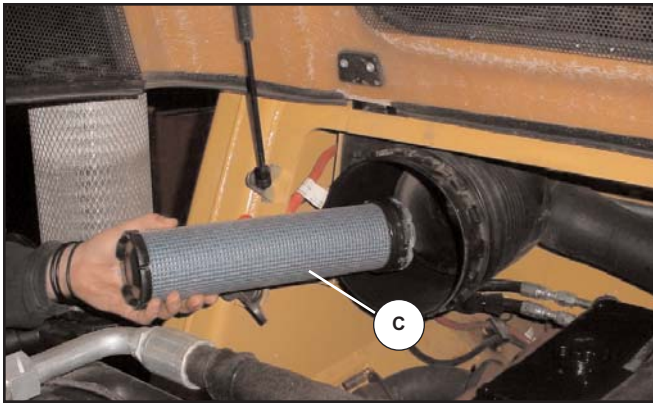
Air Cleaner

Your PT-100 rubber track loader is equipped with two air filter elements to remove contaminants from the air your engine uses for combustion. Regular inspection and replacement of the filter elements is necessary to ensure proper performance and to prolong engine life.

To remove and inspect your air cleaner elements:

1. Turn the engine off.
2. Open the hood at the rear of the PT-100 to gain access to the engine compartment.
3. Locate the black plastic air cleaner enclosure near the top left of the engine compartment (when viewed from the rear).
4. Remove the cover by pulling out on the yellow slide-lock (A) located near the top of the air cleaner enclosure. Then rotate the cover counter-clockwise approximately 1/8 turn and remove. The primary element (B) should be exposed.



11. Maintenance

5. Remove the primary element and inspect it. If it appears damaged in any way, replace it. If the element is heavily soiled, replace it. If it appears to be in good condition, clean if necessary and re-install.
6. Once the primary element has been removed, the secondary element (C) should be visible. Remove and inspect it. If the element is damaged or heavily soiled replace it.

Note: The secondary element is not serviceable. It should be replaced after every three cleanings of the primary filter.

Note: The primary element may be cleaned and reused up to five times if properly maintained, but should be replaced at least once a year.

7. Once the inspection has been performed, install the new secondary filter element into the enclosure as found upon disassembly.
8. To ease installation, insert the primary element into the cover and then install the cover/primary element assembly by sliding it into place in the enclosure as found upon disassembly.



9. Then secure the cover by turning it clockwise approximately 1/8 turn and pushing the yellow slide lock in until flush with the outside of the cover.

To clean your primary filter element:

1. Remove loose dirt from the filter element with compressed air or water hose.
 - Compressed air: 100 P.S.I. max. 1/8" diameter nozzle at least 2" away from filter.
 - Water: 40 P.S.I. max. without nozzle.
2. Soak the filter in a non-sudsing detergent solution for at least 15 minutes moving it gently through the solution to further clean the element. (Never soak for more than 24 hours.)
3. Rinse the filter thoroughly with a gentle stream of water to remove all dirt and remaining detergent.
4. **Allow the filter to dry completely** before re-installing it into the PT-100.

NOTICE

Do not use any heat source other than warm air at less than 160°F to dry the filter.

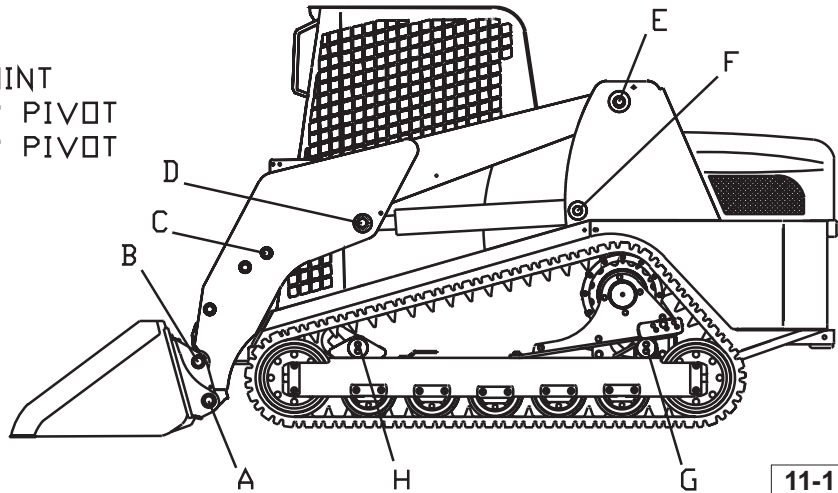
NOTICE

Do not clean air filter elements while engine warranty is in effect. During the warranty period, ASV recommends replacing air filter elements instead of cleaning them. Heavy-duty air filter manufacturers will not warrant the air filter once it has been cleaned.

GREASE FITTING LOCATIONS

A-QUICK-ATTACH HINGE POINT
 B-QUICK-ATTACH CYLINDER PIVOT
 C-QUICK-ATTACH CYLINDER PIVOT
 D-LIFT CYLINDER PIVOT
 E-LIFT ARM HINGE POINT
 F-LIFT CYLINDER PIVOT
 G-REAR AXLE PIVOT
 H-FRONT AXLE PIVOT

GREASE DAILY



11-1

Grease Fittings

The PT-100 is equipped with grease fittings at pivot points throughout the machine. The illustration above shows the location of all fittings on the left side of the machine. An identical fitting exists on the right side of the machine for each identified in the illustration. Lubricate all fittings daily or after every 10 hours of operation to ensure proper operation and maximize component life. (fig. 11-1)

Undercarriages

The undercarriage assemblies in the PT-100 typically operate in harsh working conditions. They work in mud, gravel, debris and various other abrasive materials during operation. ASV recommends a daily inspection of the undercarriage assemblies and cleaning if necessary.

Materials that are particularly sticky or abrasive like clay, mud, or gravel should be cleaned from the undercarriages more often to minimize component wear. A pressure washer works well for cleaning materials from the undercarriages. At times when a pressure washer is not available, use a bar, shovel or similar device to remove foreign materials.

When cleaning, pay particular attention to the drive motors/sprockets and the front and rear wheels where debris is likely to accumulate. If working in scrap or debris, inspect more often and remove foreign objects that may wrap around or lodge themselves between components causing premature wear and damage.

Operating the PT-100 in loamy sand or on turf or other finished surfaces may require less frequent cleaning, but daily inspection is still advised.

Track Tension

Proper track tension must be maintained for optimal performance and track/undercarriage life. Running a track that is too loose may cause the track to misfeed possibly causing damage to the track and or undercarriage components. Running a track that is too tight may cause track stretch, premature bearing failure, or other preventable damage to the machine. As a rule, a track should only be tightened to the point where there is no visible sag. Never tighten the tracks beyond this point.

Note: During the first 50 hours of operation the tracks will "break-in" and will most likely require adjustment.

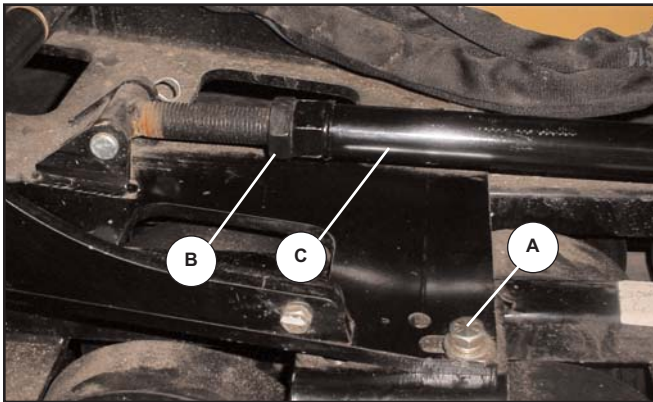
To check track tension:

1. Drive the machine forward 5 feet to remove any slack from the lower and rearward portions of the track.
2. Lay a straight edge along the top of the track bridging the drive sprocket and front idler wheel.
3. Apply 90 lbs. of down force to the track by either placing weight on top or hanging it using rope or wire midway between the drive sprocket and front idler.
4. Measure from the bottom of the straight edge to the lug surface (top) of the track. The deflection should measure between $\frac{3}{4}$ " and 1" if properly adjusted. (fig. 11-2)

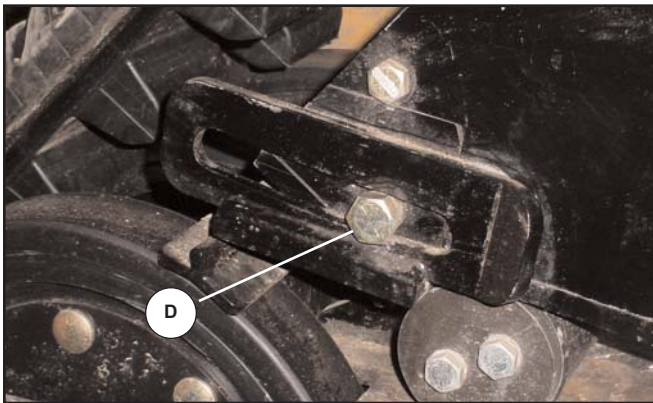


3. Once proper tension has been achieved, tighten the turnbuckle lock nut and the two bolts securing the front of the drive table to complete the procedure.
4. Repeat the adjustment procedure on the other side of the machine if necessary.

Note: The two bolts (D) securing the rear of the drive table do not need to be loosened to adjust track tension. They support the rear of the drive table via bushings that follow their respective slots as the track is tightened or loosened.



Note: Tensioning can also be performed during track installation prior to installing the turnbuckle. Do this by pushing the drive table (all four bolts installed, but front two loose) backward with a port-a-power until proper track tension is achieved. Once in place, measure the track deflection to check tension and then install the turnbuckle, turning as needed to align mounting sleeves and bracket holes. Install pins and clips to secure the turnbuckle in place and then tighten the turnbuckle lock nut and the two front drive table bolts. Repeat on the other side of the machine if necessary.



Drive Sprocket Rollers

ASV rubber track loaders utilize rollers on the drive sprockets to drive the track. These rollers help minimize friction between the track and the drive sprocket to prolong track life.

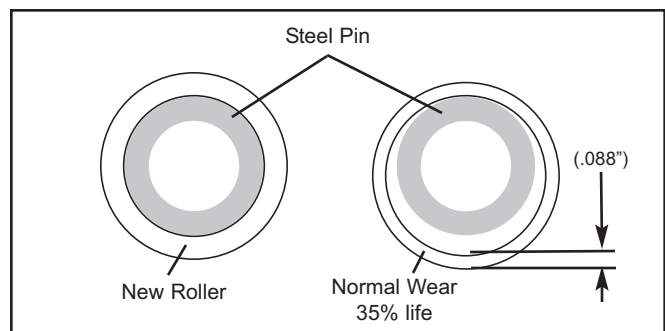
The rollers rotate around hardened steel pins and usually wear on their inside surfaces. As they wear, the rollers become thinner, but will continue to function as long as they rotate freely around the pins. Sprocket rollers should be inspected every 50 hours of operation and replaced if cracked or worn to less than 35% of original thickness. (.088")

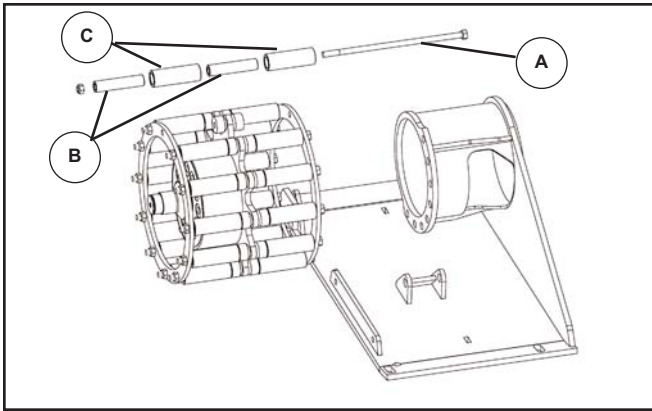
To adjust track tension:

1. Loosen the two bolts (A) securing the front of the drive table.

Note: If the mounting slots in the drive table do not provide enough adjustment to achieve proper track tension, the bolts may be relocated to one of three pairs of threaded mounting holes located in the undercarriage directly beneath the drive table.

2. Once these bolts have been loosened or relocated, loosen the lock nut (B) on the turnbuckle (C) and adjust by turning the turnbuckle itself.



**!WARNING!**

Turn the engine off, remove the key from the ignition and disconnect battery prior to performing this procedure.

To replace worn rollers:

1. With the machine turned off and parked in a safe working area, follow steps 5-11 in the track removal procedure on page 11-8 to expose the sprocket for roller replacement.
2. Remove the bolt (A) holding the steel pins (B) and rollers (C) in place. The pins and rollers will then fall free from the sprocket.
3. Install the new rollers over the pins.
4. Slide the bolt back through the sprocket and pins and tighten.
5. Repeat this procedure as necessary throughout the sprocket.
6. Follow steps 10-14 in the track installation procedure on page 11-10 to re-install the drive table and prepare the machine for track tension adjustment.
7. Repeat steps 1-6 of this procedure on the other side of the machine if necessary.
8. Perform the track tension adjustment procedure on page 11-4 to complete the procedure.

Note: ASV recommends replacing external rollers as a set to simplify inspection and maintain proper sprocket function.

Note: Internal pins should be inspected when replacing rollers. Internal pins do not rotate during operation and may experience uneven wear. If when replacing external rollers, internal pins are worn on one side only and appear to be in good condition otherwise, they may be rotated 180 degrees from their original position and reused. Replace if worn to less than 35% of original thickness.

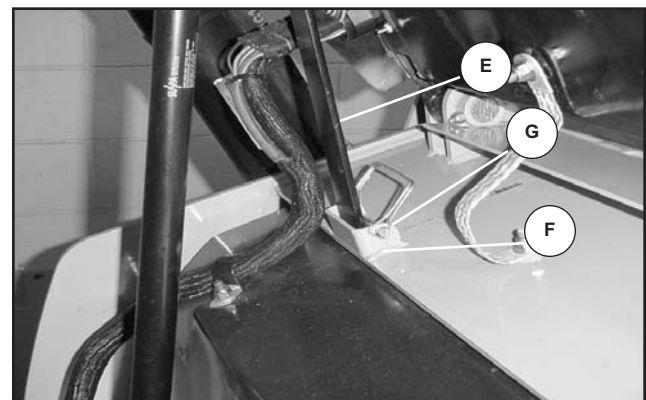
Tilt-Up Canopy

The ROPS/FOPS approved canopy (D) tilts up to allow easier access while performing service work. It features a gas spring assist and a brace mechanism to hold it in place while tilted.

To raise the canopy:

1. Remove any attachments that may be fastened to the machine.
2. Raise the lift arms and secure them with the lift arm brace. (see page 11-7)
3. Remove the four bolts that fasten the canopy to the frame. They are located along the lower edge of the canopy, two on each side.
4. Once the bolts have been removed, tilt the canopy slowly upwards. The canopy brace (E) should fall against the bracket (F) located directly below the canopy.
5. Remove the pin (G) from its stowed position.
6. Install the pin into the bracket behind the brace to lock the brace in position.

The canopy is now secure.



11. Maintenance

To lower the canopy:

1. Remove the locking pin to free the brace from the bracket.
2. Push the brace back against the bottom of the canopy and restow the pin in the sleeve for later use.
3. Keep pressure on the brace and pull the canopy down until the brace is angled back enough to slide and allow the canopy to be lowered.
4. Lower the canopy completely and then fasten it to the chassis with the four bolts removed previously. Tighten to specification.

Jacking Procedure

Occasionally, your machine may need to be suspended off of the ground to perform maintenance. Use extreme caution when jacking your PT-100. Always use a jack that is capable of safely lifting your machine and support its weight with ASV approved jack stands while suspended. Never work on a machine supported only by a jack.

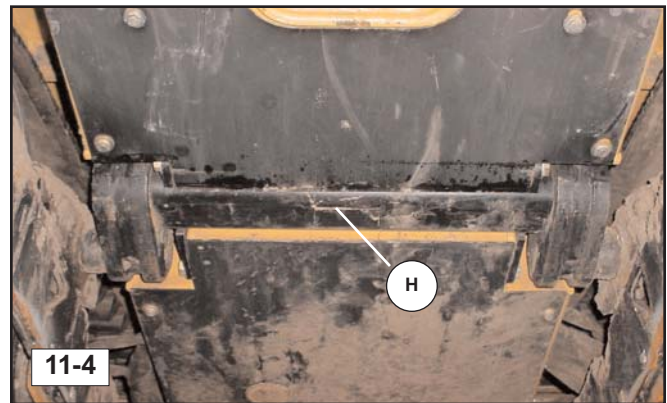
To safely jack your PT-100:

1. Remove any attachments that may be fastened to the machine and raise the lift arms.
2. Install the lift arm brace as directed on page 11-7.
3. Once the lift arms are secured, carefully exit the machine.
4. Roll or slide your jack under the front of the PT-100 and center the lifting pad directly under the middle of the front torsion axle (H). (fig. 11-3,11-4)
5. Once in place, jack the machine upward making sure it remains stable until it has reached sufficient height to install an ASV jack stand beneath the machine.
6. Slide the jack stand into place making sure it is centered under the machine (left to right when viewed from the front) and far enough back for the machine to remain stable when the jack is lowered and the front of the machine rests on the stand. (fig. 11-5)
7. Once the stand is in place, slowly lower the machine onto the stand and then remove the jack.

Repeat steps 11-7 of this procedure at the rear of the machine should both ends of the loader need to be off of the ground for service.

!CAUTION!

Lift the PT-100 under the torsion axles only! Jacking the machine in any other place will cause machine damage.



Lift Arm Brace

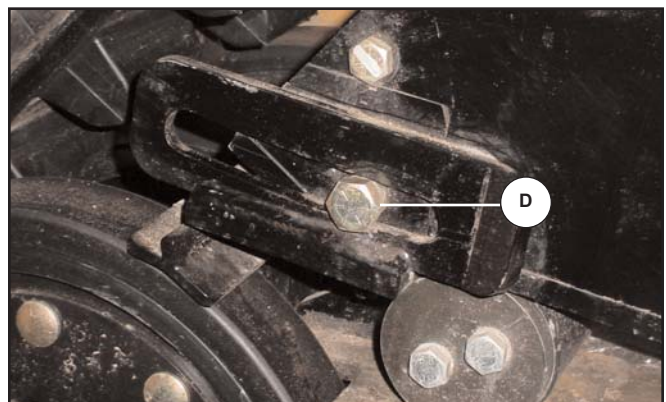
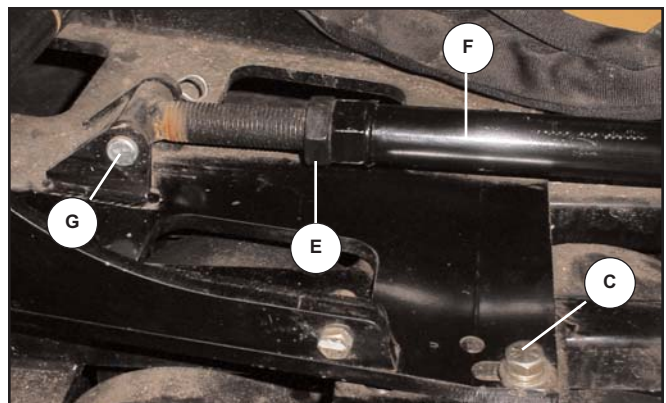
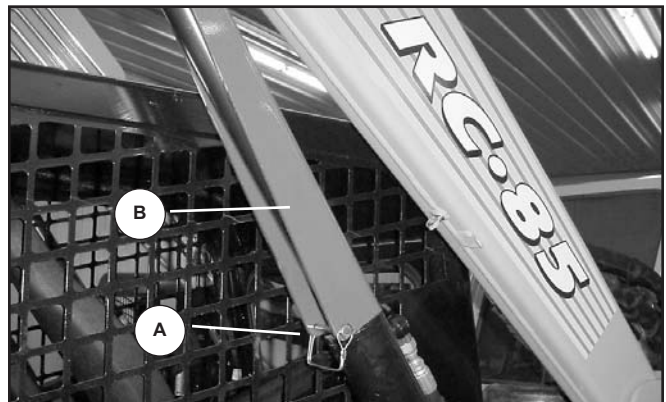
The lift arm brace (A) is intended to keep service personnel safe when it is necessary to work on a machine with the lift arms in the raised position. It is not safe to rely on the hydraulic system to hold the lift arms in the raised position just as it is not safe to crawl under a machine supported only by a jack. The lift arm brace is used to support the weight of the lift arms much like jack stands are used to mechanically support vehicle weight. Do not work on or near the PT-100 with the lift arms in the raised position unless the lift arm brace has been correctly installed.

To install the lift arm braces:

1. Park the PT-100 on level ground in a safe area for performing service work.
2. Remove any attachments that may be fastened to the quick attach.
3. Have an assistant remove the retaining pins (A) securing the lift arm brace (B) to the chassis.
4. Make sure bystanders are clear of the lift arms, then raise them to the upper limit. .
5. Have an assistant install the brace around the cylinder rod and secure as shown with retaining pins.
6. Lower the lift arms slowly until they come to rest on the brace.
7. It is now safe to shut the engine off and exit the machine.

To remove the lift arm brace:

1. Start the machine and raise the lift arms until they are clear of the brace.
2. Once clear, have an assistant remove the brace and attach it to the fender as found prior to installation.
3. Once the brace has been stowed and the assistant is clear of the lift arms, lower the arms to the ground and shut the engine off to complete the procedure.



11. Maintenance**Tracks**

Tracks may need to be removed periodically to inspect undercarriage components or for replacement if worn or damaged. This section covers the procedure to remove and install a track on your PT-100.

Required Tools

Socket/Impact Wrench
Ratchet Strap
Heavy Duty Hydraulic Jack
Combination wrench
Long Pry Bar(s)
ASV Approved Jack Stands (2)
Spray Lubricant
Hammer
Punch
Port-A-Power
Track Installation Tool (P/N: 0703-138)

To remove the tracks: (see page 11-7 for steps 5-8)

1. Remove any attachments that may be fastened to the machine and raise the lift arms.
2. Install the lift arm braces as directed on page 11-7 to secure the lift arms in the raised position.
3. Once the lift arms are secured, carefully exit the machine.
4. Jack the machine following the jacking procedure on page 11-6 to allow clearance for track removal.
5. Remove the two bolts (C) that fasten the drive table to the undercarriage frame rail.
6. Remove the two drive table alignment bolts (D) located on both sides of the rear of the drive table.
7. Loosen the lock nut (E) on the turnbuckle (F) and relieve tension on the turnbuckle mounting pins by turning (loosening) the turnbuckle slightly.
8. Remove the two mounting pins (G) securing the turnbuckle to the undercarriage frame and drive table and then remove the turnbuckle.
9. Now that the drive table is unfastened, attach a ratchet strap to the drive sprocket and undercarriage frame and carefully pull the drive table forward until the pivot hole in the outer front corner is directly beneath the hole in the drive table pivot bracket. (fig. 11-6)
10. Once the drive table is in position, insert a long bolt through the pivot bracket, drive table pivot hole and frame rail. (fig. 11-7)



11. Once the bolt is in place, insert a pry bar between the drive sprocket and track and lift the track drive lugs clear of the sprocket. Then use a second bar to pivot the drive table out from underneath the track until it is perpendicular (90°) to the undercarriage. (fig. 11-8, 11-11)



12. Now that the drive table is clear of the track, lubricate the front and rear most idler wheels with a spray lubricant to aid in sliding the track over them during removal.
13. Working from the inside of the track, wedge a pry bar under the upper portion of the track and over the top of the inside front idler wheel and peel the track over each wheel towards the outside of the machine. (figure 11-9, 11-10)

Note: It may be helpful to have an assistant take up the slack beneath the undercarriage by lifting or prying it up to the idler wheels. This will create more slack in the front of the machine to help the track clear the idler wheels.

14. Once the track has been pulled clear of the front idler wheels it should easily clear the rest of the undercarriage. Remove the track from the machine. (fig. 11-11)

To install the tracks:

1. Lift the top portion of the track over the drive table and sprocket towards the undercarriage then slide the rest of the track up to the undercarriage.
2. Once in position, remove the two wheel shaft keeper bolts retaining the second wheel assembly from the front. These two bolt holes will be the mounting locations for the track installation tool. (figure 11-12)
3. Install the track installation tool pivot base by placing it against the outer side of the wheel plate. Then install the two long bolts supplied with the tool through the wheel plate and into the threaded wheel shaft keeper plate. (figure 11-13)

Note: The wheel shaft keeper plate may fall out from between the wheel and outer wheel plate when the bolts are removed. If this occurs, reinstall it, holding it in place and lift up under the wheel to aid in aligning the holes when installing the pivot base.

Note: The mounting holes on the track installation tool pivot base are slotted. This allows the technician to angle the base slightly upward to achieve the proper angle for the track lugs to clear the idler wheels during installation.



11. Maintenance

4. Lubricate the front and rear most idler wheels with a spray lubricant. You may also want to lubricate the inside of the track drive lugs to make installation easier. (fig. 11-14)
5. Install the half moon and lever portion of the installation tool with the supplied bolt and nut.
6. Set the half moon inside of the track and pull on the lever until the lugs clear the wheel and the track slips over. (fig. 11-15)

Note: If you are having difficulty, check to see if the drive lugs are contacting the idler wheels on either the top or bottom when you are prying with the lever. If they are, you may need to adjust the angle of the pivot base to help ease the track over.

7. Once the first set of drive lugs in the front are over the idler wheel, remove the track installation tool from the front of the machine and repeat steps 2,3,5 and 6 at the rear of the machine to work the rear portion of the track over the idlers. (fig. 11-16)

Note: The track installation tool is reversible and mounts similarly on either end of the undercarriage.

8. At this point the track is about half way on. Remove the track installation tool once again and reinstall it in the front following steps 2,3,5 and 6 to finish working the front of the track into place.
9. Once the front of the track is completely on, remove the track installation tool and reinstall it in the rear. Follow steps 2,3,5 and 6 once again to finish working the rear of the track into place.
10. Now that the track is in place, use a pry bar to pivot the drive table up to the point that it will enter the track.
11. Insert a second pry bar between the top of the drive sprocket and the inside of the track to lift the drive lugs clear of the sprocket. Then resume pivoting the drive table into place. (fig. 11-17)



12. Once the drive table is in place under the track, remove the pivot bolt and push the drive table back to its operating position using a port-a-power. You may have to reposition the port-a-power several times to accomplish this. (fig. 11-18)
13. Now that the drive table is in its operating position, install the rear drive table alignment bolts and the front mounting bolts to secure the drive table in place. Do not tighten the front mounting bolts completely to allow for the track adjustment procedure.
14. At this point you are ready to reinstall the turnbuckle. Do this by aligning the turnbuckle mounting sleeves with the brackets in the undercarriage and installing the mounting pins and retaining clips. (fig. 11-19)

If the other track needs to be installed, repeat this process on that side of the machine. Once both tracks are installed and ready for tension adjustment, perform the track tension adjustment procedure on page 11-4. (See note in the track tension adjustment procedure for the quickest tensioning method while installing the tracks.)



Engine Oil and Filter

Regular oil changes are necessary to maintain a strong running engine. ASV recommends a normal oil change interval of 250 hours or every six months. This recommendation has been made to help ensure proper lubrication during operation and to prolong engine life under typical operating conditions.

To change the oil and filter:

1. Start and run the engine for a few minutes to warm the oil. Then turn the engine off before proceeding.
2. Place a suitable container under the engine oil drain plug to catch the used oil as it drains.
3. Remove the access hole cover in the belly pan beneath the engine. (fig. 11-20)
4. Then remove the drain plug from the oil pan and allow the used oil to drain completely from the engine. Make sure to use the correct size combination/socket wrench to keep the drain plug in reusable condition. (fig. 11-21)
5. Remove the engine oil filter by hand or with strap if necessary. (fig. 11-22)



11. Maintenance**NOTICE**

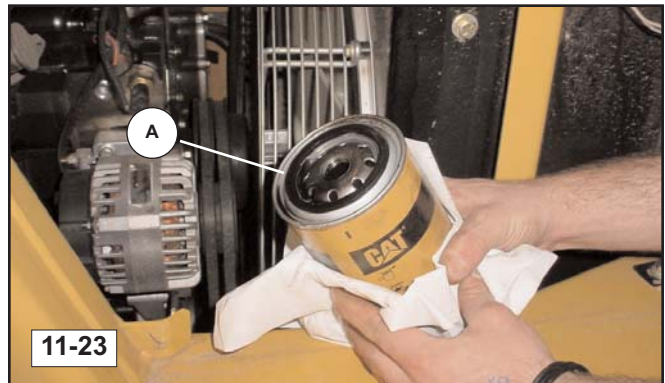
If the old filter gasket (A) is not removed from the filter head and the new filter is installed on top of it, an oil leak will result when the engine is started. If this leak goes unnoticed, the engine can run itself out of oil causing engine failure.

6. Once the filter has been removed, check to make sure the rubber gasket has come off of the filter head with the old filter. If it is not on the old filter, check the filter head. If it is still on the filter head, remove it prior to installing the new filter. (fig. 11-23)
7. Prepare new filter for installation by rubbing fresh oil on the exposed surface of the filter gasket.
8. Thread the new filter onto the filter head. Tighten the filter by hand as instructed by the label located on the filter or filter box.
9. Re-install the oil drain plug into the pan and tighten to 50 +/- 10 lb ft.
10. Remove the oil filler cap and fill the engine crankcase with ASV 10W-30 Heavy Duty Engine Oil (capacity: 8.5 U.S. quarts including filter). (fig. 11-24)
11. Install the oil filler cap and hand tighten.
12. Perform a visual inspection to make sure the drain plug, filter and oil filler cap are in place and tight.
13. Start the engine and watch the oil pressure indicator light located on the display panel. It should illuminate when the key is turned to the on position and go out shortly after the engine is started. If it stays on, turn the engine off immediately and look for any problems. If it goes out as expected, oil pressure has been achieved.

14. Once the engine is running, perform a visual inspection to make sure there are no leaks or other visible problems.
15. If everything looks like it should, shut the engine down and exit the machine.

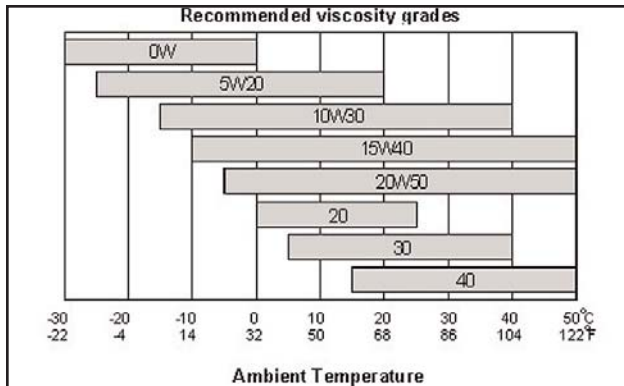
16. Reinstall the access hole cover.

17. Perform the oil level check procedure on p. 11-13.



Engine Oil Specifications

Use ASV 10W-30 Heavy Duty Engine Oil for most conditions (if available). In the event of an alternate working environment, the following chart may be used as a guide to oil viscosity grades (see below).

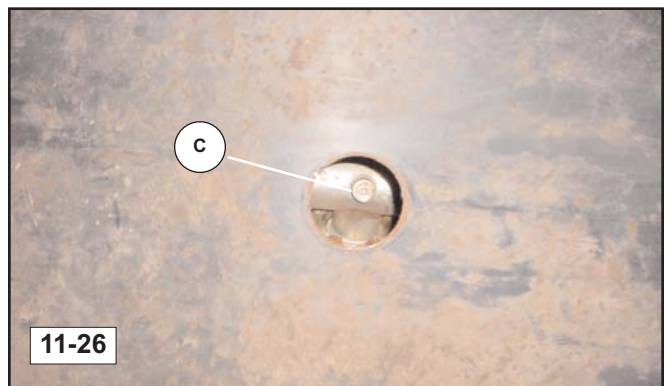
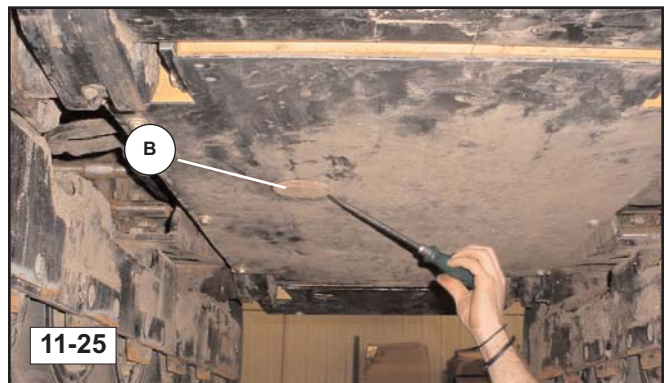
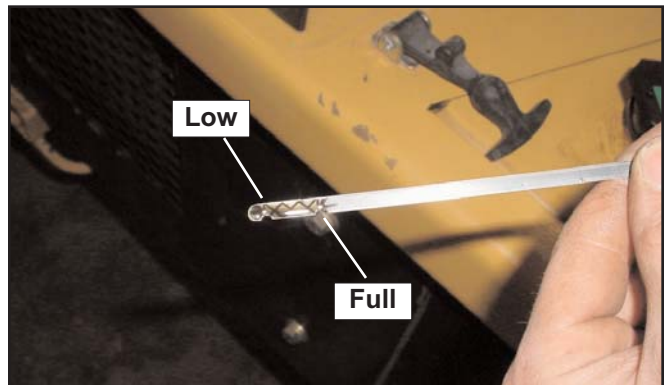
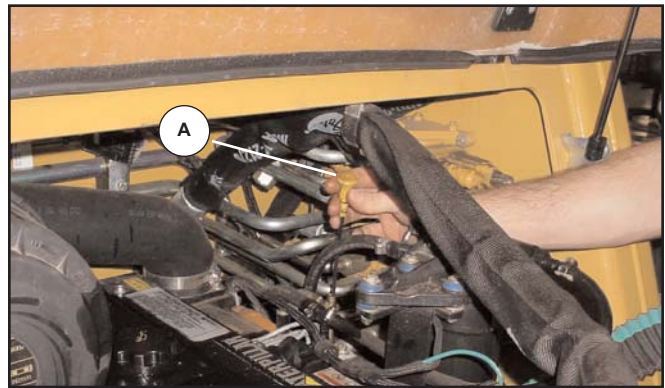


You may also use a quality engine oil substitute meeting the following minimum specification:

- API CH-4 multigrade engine oil.

To check the oil level:

1. Park the PT-100 on level ground.
2. Open the hood to gain access to the engine compartment.
3. Locate and remove the engine oil dipstick (A) from its tube.
4. Wipe the dipstick with a clean shop cloth and reinsert it into the tube until it comes to rest in its seated position.
5. Remove the dipstick once again and inspect the end for oil on the level indicator.
6. Oil should be present on the dipstick up to, but not over the upper (full) level indicator notch. If the level is correct, reinstall the dipstick and then close and latch the hood to complete the procedure.
7. If the level is low, add the proper grade and viscosity engine oil and recheck as necessary until the proper level has been achieved. Then reinstall the dipstick and filler cap and close and latch the hood to complete the procedure.



11. Maintenance**Hydraulic Fluid/Filter Change**

Hydrostatic components require extremely clean oil in order to have a long service life. Use extreme caution when changing the hydraulic oil. Introducing dirt or debris could be detrimental to the hydraulic system. ASV recommends service intervals of 500 hours for hydraulic fluid and 250 hours for hydraulic fluid filters.

To change the hydraulic fluid:

1. Remove the small cover (B) from the access hole located in the belly pan near the front of the PT-100 with a screwdriver. (fig. 11-25)
2. Remove the drain plug (C) using the correct size allen type wrench or allen socket to avoid damaging the drain plug. (fig. 11-26)
3. Drain the hydraulic fluid into a suitable catch container.
4. Locate the two hydraulic filters in the right rear corner of the engine compartment. (fig. 11-27)
5. Thoroughly clean around the filters to prevent dirt or debris from entering the system and remove the filters by hand or with a strap as required.
6. Check to make sure the filter gaskets are still present on the old filters. If not, check the filter heads to make sure they are free from old gasket material prior to installing the new filters.
7. Prepare the new filters by rubbing a small amount of fresh hydraulic oil onto the filter gasket surface and then threading them onto their respective filter heads. Tighten filters by hand as instructed by label located on the filter or filter box.
8. Install the hydraulic system drain plug and tighten.
9. Install the access hole cover into the belly pan.
10. Remove the hydraulic reservoir filler cap and fill the hydraulic system with ASV Premium All Season MV Hydraulic Oil or equivalent until the full mark on the hydraulic fluid sight gauge has been reached. (fig. 11-28, 11-29)
11. Install the hydraulic reservoir filler cap and tighten.
12. Start the PT-100 and operate all hydraulic circuits to work any trapped air out of the system.
 - Drive the PT-100 forward and backward.
 - Raise and lower the lift arms (unloaded).
 - Dump and curl bucket/quick attach.
13. Once you have purged the air from the system, check the level on the hydraulic fluid level sight gauge. If the level is low repeat step 10 and 11 to complete the procedure.

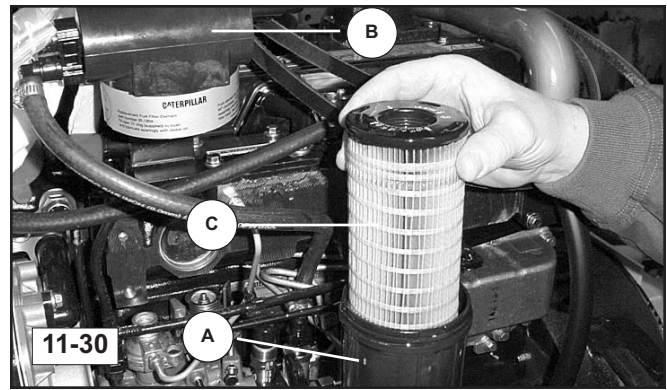


Fuel Filter

The fuel filter removes contaminants from the fuel as it enters the engine for combustion. Over time the filter can become plugged and cause the engine to lose power, run roughly or fail to start. The fuel filter should be changed every 500 hours or more often if needed to prevent these conditions from occurring.

To change the fuel filter:

1. Clean the outside of the filter housing (A) thoroughly to reduce the chances of contaminants being introduced into the fuel system.
2. Twist the housing counter clockwise (when viewed from the bottom) and remove it from the fuel pump (B).
3. Then remove the filter element (C) from the housing by holding the housing firmly in one hand and pushing down on the filter element while turning it counter clockwise within the housing. Turn approximately 90° and then remove the filter from the housing. (fig. 11-30)
4. Once removal is complete, insert a new filter element into the housing. Press down on the element and turn it clockwise approximately 90° to seat it.
5. Reinstall the filter/housing assembly onto the filter head by threading it onto the head until the housing shoulder contacts the head. Then turn ¼ turn (90°) past this point to seat the housing.

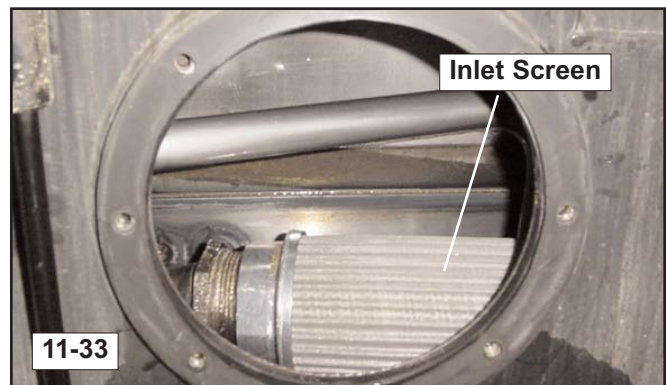


Case Drain Filter

The PT-100 is also equipped with a filter in the auxiliary circuit case drain line. It protects the main hydraulic system in the event of catastrophic failure in an attachment. This filter is designed to last the life of the vehicle **unless running high flow attachments**. Change this filter every 250 hours of operation if using high flow attachments (ex: brushcutter). (fig. 11-31)

Hydraulic Reservoir (cleaning)

If a pump failure occurs, it is necessary to clean/flush the hydraulic reservoir, hoses, tubes and hydraulic lines to remove any debris present in the hydraulic system. The 50 micron inlet screen should also be removed, and thoroughly cleaned with parts cleaning solution, then allowed to dry thoroughly prior to reinstallation. (fig. 11-32, 11-33)



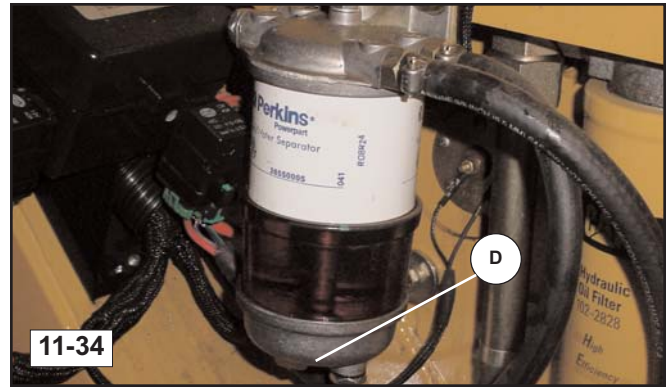
11. Maintenance

Water Separator

The water separator removes water from the fuel supply as the engine runs. It collects the water in a bowl equipped with a drain valve. Drain the bowl daily to maintain proper function.

To drain the water separator:

1. Twist the drain valve (D) located at the bottom of the water separator counter clockwise (when viewed from the bottom) to allow the collected water to drain. (fig. 11-34)
2. Once all of the water in the bowl has been drained, twist the drain valve clockwise to close it.



11-34

Fuse Panel

The electrical system in the PT-100 is equipped with fuses that protect the electrical components from damage. They are located in the fuse panel on the right side of the engine compartment. (fig. 11-35)

In the event of an electrical malfunction, the most logical place to start is at the fuse panel. Check the fuse related to the problem you are having and inspect it. If the fuse appears black and burned, it needs to be replaced. Replace fuses with the correct amperage replacement fuse only. Replacing a fuse with one of a lower amperage rating may lead to premature fuse failure. Replacing a fuse with one of a higher amperage rating may burn out the electrical component the fuse was meant to protect. See the troubleshooting section in this manual for an additional resource to aid in tracking suspected electrical problems.



11-35

Drive Belts

Drive belts typically stretch and wear during their service life. The fan and A/C belts should be checked for tension, condition and presence daily prior to operating your machine.

To check fan and A/C belt tension:

1. With the engine cold and off, remove the key from the ignition to avoid accidental start.
2. Lift the hood at the rear of the machine and check to make sure the fan belts are present on the pulleys.
3. Lay a straight edge across the alternator and crank pulleys and apply a force of 10 lbs midway between the pulleys. (fig. 11-36)
4. Measure the distance from the bottom of the straight edge to the top surface of each belt (deflection). Belt deflection should measure (.39") if properly tensioned.
5. If the belts are too loose or too tight, adjust the tension until correct.
6. Also visually inspect the belts. If they appear excessively worn, or cracked, replace them.

Note: Replace the belts as a pair.

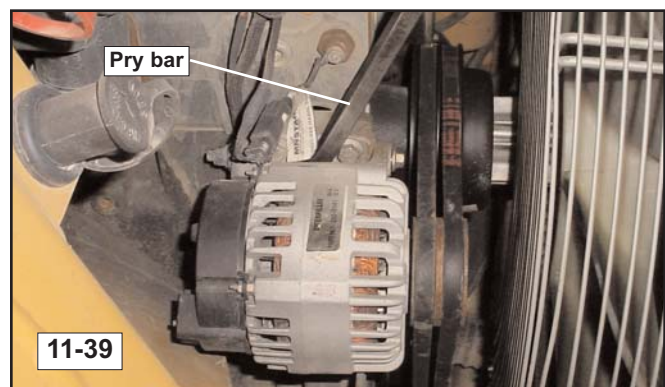
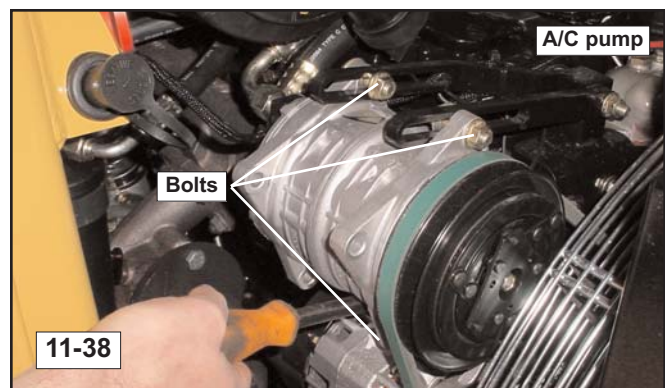
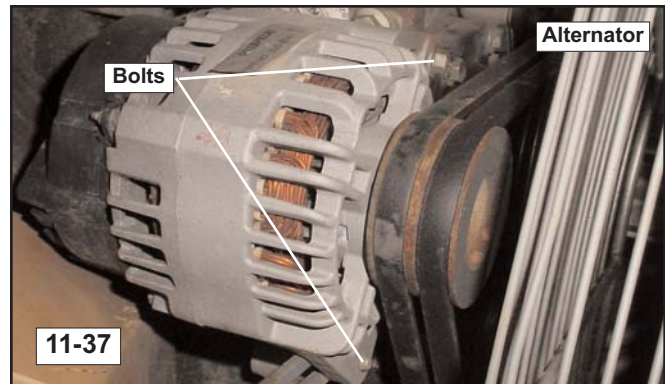


To adjust fan or A/C belt tension:

1. Make sure the engine is cold, off, and the key has been removed from the ignition to avoid accidental start.
2. Lift the hood at the rear of the machine and loosen the bolts securing the alternator or A/C pump slightly to allow the alternator or A/C pump to pivot. (fig. 11-37, 11-38)
3. Once loose, use a small pry bar as a lever to force

the alternator or A/C pump against the belt(s) to increase belt tension to the appropriate level, then tighten bolts to specification. (fig. 11-38, 11-39)

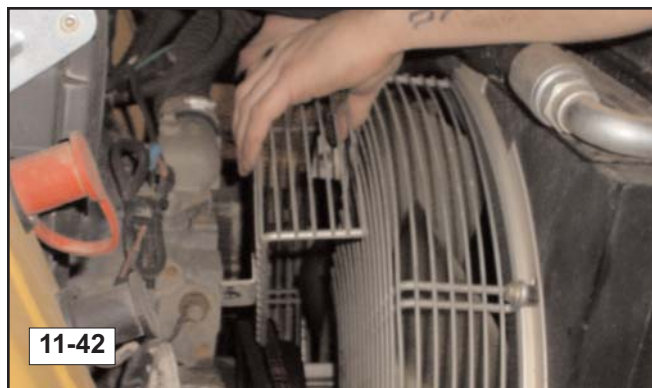
4. Check the tension by following the procedure listed previously on this page.
5. Readjust belt tension as necessary until tension is correct.



11. Maintenance

To remove the fan or A/C belt:

1. Follow steps 1 and 2 of the belt adjustment procedure on page 11-17.
2. Once loose, pivot the alternator or A/C pump towards the engine to increase the slack in the belts.
3. Then, remove the three bolts securing one of the the fan cage halves to the chassis and remove the cage. This will expose the fan and allow the belts to be removed. (fig. 11-40, 11-41 and 11-42)
4. Slip the belts off of the engine pulleys one at a time and work them around the fan. Slide them in and out of the fan blades until they are clear of the fan. (fig. 11-43, 11-44)



To Install the fan or A/C belt:

1. Installation is the reverse of the removal procedure.

Radiator/Oil Cooler

The radiator and oil cooler must be clean to ensure proper operation. Engine and hydraulic system overheating, damage and even failure can result if the radiator/oil cooler is not kept clean. A pressure washer or compressed air nozzle work well to blow debris clear of the fins in the oil cooler and radiator.

Note: If hydraulic oil or engine coolant temperature lights illuminate during operation, increase cleaning intervals.

Note: In brush cutting applications check and clean the coolers and chassis often to avoid overheating and prevent fires.

To clean radiator and oil cooler:

1. Make sure engine is off, and **COOL** during radiator/oil cooler cleaning procedure.
2. Clean radiator/oil cooler by directing spray forward through cooling fins as shown. (fig. 11-45, 11-46)

Note: Make sure water nozzle is at least 12" (8" for air) from the cooler and that the spray is directed straight through the cooler or the cooling fins may be damaged (bent over) which will decrease cooling performance.



Chassis and Engine

Periodic cleaning of the chassis area beneath the cab and engine compartment are also necessary to maintain safe operation. Clean as necessary. (fig. 11-47)

To clean the chassis and engine compartment:

1. Remove the belly pans on the underside of the machine.
2. Tilt the ROPS canopy up and raise the hood at the rear of the machine.
3. Pressure wash any debris from the engine compartment and chassis area out through the lower opening.
4. Reinstall the pans, close the hood and lower and secure the canopy.

Note: See tilt-up canopy procedure on page 11-5 for additional information.



11. Maintenance**Extreme Operating Conditions**

PT-100 machines are often used in conditions that are less than ideal. The machines are used in hot, dusty/dirty environments under heavy loads for long periods of time. One prime example is brushcutting. It is very important that the machines be properly maintained for use in conditions such as these and that maintenance practices and schedules adapt to the rigors of such extreme use.

Recommendations:

1. Air flow test the radiator. ASV has available an Anemometer, ASV part #0403-112, which allows you to see the volume of air through the cooling package. It is important this be tested to assure internal radiator condition. You cannot see the entire cooler in the machine. This airflow test will tell you what you can't see, feel, or hear. The attached graphic and instructions outline how to test the package. This is the single most important step to proper cooling and avoiding machine overheating. This step should be repeated with regular scheduled maintenance.
2. Remove belly pans, tilt cab, and thoroughly clean.
3. Inspect the pulleys and fan for wear and alignment. Check water pump weep hole to assure no leaks. Install new belts. ASV factory belts are highly recommended. The high volume ASV fan requires a very high quality belt.
4. Check and clean breathers. Check all hose clamps (waterlines and air intake tubes, etc).
5. Repair any oil leaks (engine and hydraulic). Oil leaks will plug the radiator in a matter of minutes and can produce a film on the cooling fins reducing cooling efficiency. Radiator and oil cooler should be cleaned with an all purpose cleaner/degreaser such as simple green any time a leak is noted.
6. A/C condenser, evaporator, heater core, and A/C filter should be thoroughly cleaned. Dust, dirt, and debris will limit cab cooling.
7. Change all fluids. Use the proper fluids. Fluid types can greatly affect machine performance. Test coolant for 50% mix. Using lower mixture or pure water will reduce boiling point and cause overheating. They must use diesel coolant with anti-cavitation properties to avoid overheating, liner wear, or water pump damage. ASV has a full line of coolant, engine oil, and hydraulic oils to suit Posi-Track loaders. Any substitutes chosen must meet specifications. See TIB016 and owners manual for specifications.
8. Replace all filters. Air filter maintenance is critical. Clean daily in brushcutting applications.

Radiator/Oil Cooler Air Flow Test Procedure

Testing the air flow through the radiator/oil cooler of a machine is an excellent way to determine if the cooling system is operating at its intended efficiency. It is also a good way to indicate if maintenance or repair is required to maximize machine service life.

Test Requirements**Required Tools**

Anemometer (ASV Part #: 0403-112)
--

This procedure must be followed exactly. Deviating in any way will give inaccurate data and will not provide sufficient information to properly monitor your cooling system performance.

This procedure is to be performed on a standard machine with all belly pans in place and with the fiberglass hood closed and latched (no additional screens or guards may surround the engine area). All forestry package doors/hoods (if equipped) are to be open to obtain accurate readings.

During testing the engine should be running at full throttle and all auxiliary hydraulic circuits should be turned off. The Anemometer must be held flat against the factory radiator screen and held in the positions indicated in the picture on page II.

Note: When you look through the factory screening at the radiator you will see that the radiator is slightly smaller than the screening. Hold the anemometer directly in front and 1" in from each edge of the core as indicated by the test points. You may have to move the meter around in a ½" (approx.) circle to get accurate readings. Record the highest readings in each position and then compare them with the listed specifications. Readings within 10% +/- of the indicated specification are to be considered normal.

! WARNING !

Brush cutting, mowing, or other operations, that can cause flying debris, can be a fire hazard. With the engine off and cool, inspect and clean engine compartment, and other areas where there may be hot or rotating parts. This should be performed as often as needed to prevent combustion of this debris. Failure to do so could result in a fire, causing injury, death or severe machine damage.

0201-265



Air flow Specifications

(measured in "knots")

Test Points

A. 20.1
B. 18.6
C. 20.1
D. 21.3
E. 28.1

F. 16.9
G. 21.1
H. 27.7
I. 27.8
J. 29.3

K. 30.1
L. 19.4
M. 23.1
N. 28.9
O. 23.9

P. 10.5
Q. 27.2
R. 26.8
S. 24.8
T. 28.5

If your readings are less than specified:

1. Clean radiator and intake screening on the hood.
2. Remove belly pans, tilt and secure the ROPS, then clean the engine compartment from top to bottom.
3. Check the fan belts for proper tension/condition and be sure the belts ride high in the pulleys. ASV factory belts are recommended if replacement is necessary.
4. Check the fan for any damage and make sure that all fan shrouding is in place and in good condition.
5. If the airflow readings are still not within specification, remove the radiator for internal/external inspection and thorough cleaning. Upon removal, inspect the outside perimeter (4 inches) of the core area (fins). This area must be kept clean to maintain proper airflow and debris will most likely collect in these areas.
6. If radiator removal is required for inspection and cleaning, it is recommended that the daily maintenance intervals be increased.
 - Clean the core more often. Keep the intake screens on the hood clean and free of debris.
 - Keep the engine compartment free of any debris that the fan may pick up and blow through the radiator. If debris is allowed to accumulate in this area, accelerated wear on accessory belts, engine pulleys, cooling fan and radiator/cooler will result.

Note: Even the simplest aftermarket screening and guarding can affect the airflow through the radiator. To ensure proper performance, use only the original guarding and screening tested and approved by ASV.

11. Maintenance**Maintenance Schedule**

<u>Maintenance Item</u>	<u>Service required</u>	<u>Interval</u>	<u>Notes</u>	<u>Service Capacity</u>
Grease fittings	Lubricate	Daily	Grease often.	
Fluid levels	Check	Daily	Adjust levels as necessary.	
Fan-A/C belt tension	Check	Daily	Adjust tension as necessary.	
Fan-A/C belt condition	Inspect	Daily	Replace as a pair if worn or damaged.	
Water separator	Drain	Daily		
Track condition	Inspect	Daily	Replace if severely damaged.	
Track tension	Inspect	Daily	Adjust tension as necessary.	
Air cleaners	Inspect	Daily	Replace if damaged or heavily soiled.	
Radiator/oil cooler	Inspect	Daily	Clean often (as necessary).	
Undercarriages	Inspect	Daily	Clean often (as necessary).	
Engine compartment	Inspect	Daily	Clean often (as necessary).	
Drive sprocket rollers	Inspect	50 hr.	Replace if damaged or worn. (35% min.)	
Engine oil and filter	Replace	250 hr. or 6 Mo.		8.5 qt.
Hydraulic filters	Replace	250 hr.		
Hydraulic oil	Replace	500 hr.		20 gal.
Water separator-fuel filter	Replace	500 hr.	Replace fuel filter element.	
Radiator coolant	Replace	1000 hr.	Coolant with SCA additive required.	

12. Lubricant & Fuel Specifications

Chapter Overview

When replacing or replenishing the fluids and lubricants in the PT-100 Rubber Track Loader, use ASV products. This ensures that the new fluids and lubricants match those originally installed when the machine left the ASV factory. ASV products were developed for, tested and approved by ASV to assure optimum life and performance in all ASV Rubber Track Equipment, when used as recommended.

Fluids

Engine Oil

- ASV Heavy Duty Engine Oil, 10W-30
Capacity: 8.5 U.S. quarts (including filter)
P/N: 0300-767 1 quart
P/N: 0402-838 12 quarts
P/N: 0402-839 1 gallon
P/N: 0402-840 6 gallons

Engine Anti-freeze/Coolant

- ASV Long-Life 50/50 Antifreeze/Coolant
Capacity: 3.125 U.S. gallons
P/N: 0300-766 1 gallon
P/N: 0402-841 6 gallons

Hydraulic Oil

- ASV Premium All Season MV Hydraulic Oil
Capacity: 20 U.S. gallons (including filters)
P/N: 0400-253 5 gallons
P/N: 0402-833 55 gallons

Grease (general-use)

- ASV Multi-Purpose EP Lithium Grease
P/N: 0300-769 1 tube
P/N: 0402-844 10 tubes
P/N: 0402-834 40 tubes

Grease (undercarriage wheel bearing)

- ASV Undercarriage wheel bearing lube
P/N: 0402-842 1 bottle
P/N: 0402-843 10 bottles

If ASV products are not available, use high quality substitutions that meet or exceed factory installed fluid specifications.

Fuel Specifications

In North America, diesel fuel, distilled from crude oil, identified as No. 1-D or No. 2-D in "ASTM D975" generally meet machine requirements.

13. Troubleshooting

Chapter Overview

This chapter contains basic troubleshooting procedures for the Rubber Track Loader.

Additional troubleshooting aids are provided in *Chapter 3. System Diagrams* and in those chapters containing disassembly and assembly procedures for the appropriate component or assembly.

Personal Safety

! WARNING !

Improper operation, lubrication, maintenance or repair of this product can be dangerous and could result in injury or death.

Do not operate or perform any lubrication, maintenance or repair on this product until you have read and understood the operation, lubrication, maintenance and repair information.

Before starting any troubleshooting procedures, refer to *Chapter 1. Product Safety – Basic Precautions* for personal safety information.

Machine Preparation

! WARNING !

Accidental machine starting can cause injury or death to personnel working on the machine.

To avoid accidental machine starting, disconnect the battery cables from the battery, tape the clamps and remove the key.

Place a “Do Not Operate” tag prominently on the machine to inform personnel that the machine is being worked on.

Before starting any troubleshooting procedures, refer to *Chapter 1. Product Safety – Repair* for machine preparation information.

Preliminary Checkout

A simple visual inspection and operational check can identify many problems without the need for extensive troubleshooting. If these checks indicate a problem that requires further analysis, proceed to *Troubleshooting* in this section.

Visual Inspection

Prior to troubleshooting, do a walk-around and perform a visual inspection of the machine. Look for missing, loose or worn parts. Perform the following visual checks.

- Track tension
- Fluid levels
- Fan belt tension and condition
- Hoses (no visible sign of wear)
- Fittings (no leaks)
- Battery cables
- Fuse box (fuses in place and operational)
- Controls (for neutral)

Rubber Track Loader

13. Troubleshooting

Troubleshooting

This section identifies selected problems and suggests probable causes.

Problem 1

Machine will not crank over.

Probable cause

1. Continuous high flow switch activated.
2. Continuous low flow switch activated.
3. Power quick-attach in the unlocked position.
4. Weak or dead battery.
5. Faulty continuous hyd. flow switch
6. Battery cables loose or corroded.
7. Ignition fuse blown.
8. Main starter fuse blown.
9. Starter relay malfunctioning.
10. Bad ignition switch.
11. Bad starter.
12. Poor wire connections at key, relay, or starter.

Problem 2

Machine cranks but will not start.

Probable cause

1. Injection pump fuse blown.
2. Main power fuse B blown.
3. Main power relay B not activating.
4. Poor wire connection at injection pump or fuse.
5. Glow plugs not heating. (Will see black smoke.)
 - a) Main glow plug fuse blown.
 - b) Glow plug relay not activating.
 - c) Poor wire connections at ignition switch, relay, or glow plug strip.
 - d) Failed glow plugs.
 - e) Bad ignition switch.

Problem 3

Machine starts but hydraulics will not operate.

Probable cause

1. Lap bar must be in down position, operator must be seated in seat, and front door (if installed) must be closed.
2. Safety fuse blown.
3. Faulty operator presence switch.
 - a) Test continuity through seat, lap bar, and door switch. Adjust or replace as necessary. Lap bar and door switch are magnetic switches and should be adjusted to approximately 1/16 inch away from steel pickup bracket.
4. Poor ground (check ground wires on left side of chassis beneath the battery).
5. Safety relay is not activating.

6. Faulty safety solenoid or safety solenoid spool.
7. Poor wire connections on fuse, relay, or safety solenoid.
8. Low charge pressure.

Problem 4

Lift arms operate but tracks will not move.

Probable cause

1. Leak in feed line to pilot control.
2. Bad wire connection to DA Control Solenoid.
3. Pilot control malfunctioning.
4. Low charge pressure.

Problem 5

Tracks operate but lift arms will not operate.

Probable cause

1. Continuous hyd. flow switch activated, sending oil over relief.
2. Check to see if auxiliary flow works. (If auxiliary flow works, skip to number 5).
3. Main auxiliary relief malfunction.
4. Auxiliary pump bad.
5. Leak in feed line to loader control pilot.
6. Loader control pilot malfunctioning.
7. Loader valve malfunctioning.

Problem 6

Low or high auxiliary flow does not work. Lift arms do work.

Probable cause

1. Auxiliary hydraulic fuse blown.
2. Faulty ground wire.
3. Auxiliary hydraulic switch failure.
4. Poor wire connections at fuse, auxiliary hyd. switch, or pin connector P17.
5. Auxiliary hydraulic pilot generation spool stuck.
6. Bad or not fully connected Quick-Coupler.
7. Quick coupler block pressure release button stuck in the down position.

Problem 7

No power to numerous auxiliary functions or accessories in ON or RUN position.

Probable cause

1. Main power relay A or B fuse blown.
2. Main relay A or B faulty.
3. Ignition switch malfunction.
4. Poor wire connections at ignition switch, fuse, or relay.

Problem 8

Battery will not charge and/or battery goes dead.

Probable cause

1. Alternator fuse blown.
2. Alternator diode bad.
3. Alternator resistor behind fuse panel bad.
4. Poor wire connections at battery, alternator, diode, or fuse.
5. Excessive draw in off position.
 - a) Fuel gauge and hour meter should draw only 0.01 amps in off position.
6. Bad battery.
7. Bad alternator.

Problem 9

Loader control will not lock in float position.

Probable cause

1. Float magnet fuse blown.
2. Poor wire connections at fuse, float detent magnet, or pin connector P18.
3. Faulty float detent magnet.

Problem 10

Loader will not float; labors engine and has down pressure when detented into float.

Probable cause

1. Engine RPM too low.
2. Low charge pressure.
3. Pilot control malfunction.
4. Loader valve malfunction.

Problem 11

Hot oil light illuminates; hydraulic system operating hot.

Probable cause

1. Auxiliary hydraulic switch activated sending oil over relief.
2. Low oil level.
3. Debris plugging oil cooler, limiting airflow.
4. Debris plugging A/C condenser, limiting air flow.
5. Broken fan blades.
6. Loose fan belt.
7. Improper attachment.
 - a) Attachment must be rated machines flow capabilities.
 - b) Attachment hose size must be a minimum of 1/2 inch for low flow and 3/4 inch for high flow.
 - c) Low flow attachment hooked to high flow circuit.
 - d) Faulty hot oil sending unit.
 - e) Hot oil light should illuminate at 225°F.
8. Faulty quick coupler.
9. Cooler bypass relief.
 - a) Cooler bypass relief should open at 80 PSI.

Problem 12

Hot coolant light illuminates; engine operating hot.

Probable cause

1. Low coolant level.
2. Debris plugging radiator, limiting airflow.
3. Debris plugging A/C condenser, limiting air flow
4. Broken fan blades.
5. Loose fan belt.
10. Faulty hot engine coolant sending unit.

14. Hydraulic Pressure

Chapter Overview

This chapter provides hydraulic pressure check, adjustment and troubleshooting procedures.

Personal Safety

!WARNING!

Improper or incomplete maintenance/repair of a Rubber Track Loader can be dangerous and may result in machine damage, injury or even death.

Do not attempt to perform any type of repair or maintenance on a Rubber Track Loader until you have read and fully understood the information in this manual.

Refer to the Operation and Maintenance manual for instructions regarding proper machine operation techniques before operating any Rubber Track Loader.

Prior to performing any type of service work on a Rubber Track Loader, read and understand Chapter 1 (Product Safety) for personal safety information.

Hydraulic Pressure Check & Troubleshooting Procedures

Test and troubleshooting procedures are provided for the following Hydraulic system components.

- Charge Pressure Check & Adjustment
- Auxiliary Valve Pressure Check & Adjustment
- Lift Arm Pressure Check & Troubleshooting
- Drive Pressure Check & Troubleshooting

When checking hydraulic system pressures, you are essentially reading the relief valve settings of each circuit tested. If your hydraulic system and components are functioning properly, your readings should match those specified. If they differ, adjustment and or repair may be required to restore proper function.

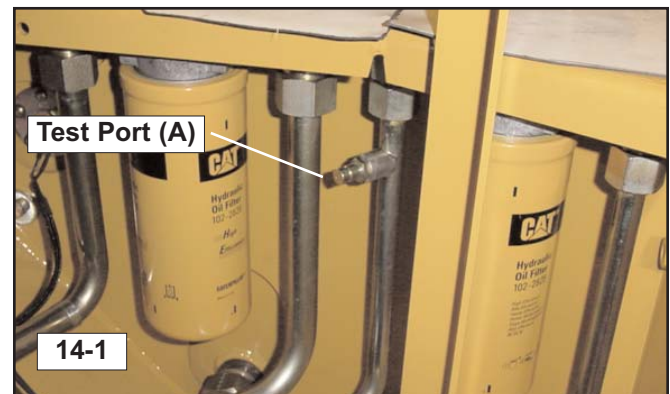
The procedures in this section are listed in the order they are to be performed. When a pressure issue is suspected, perform these procedures to help diagnose and or repair the problem.

Charge Pressure Check

Charge pressure is used to prime the various circuits, including the joysticks, with hydraulic oil for operation. Low charge pressure could lead to sluggish operation of any and all functions.

Required Tools

Pressure Gauge 0-1000p.s.i.

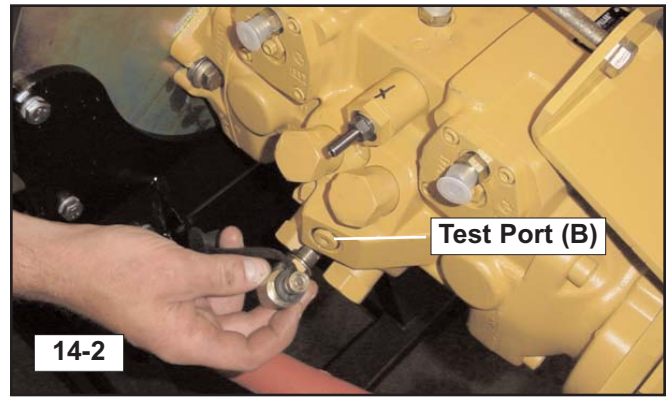


Note: The quick coupler (test port A) located in-line near the hydraulic filters can be used for general pressure checks and troubleshooting. Port (A) will typically read higher than port (B) due to the restrictions placed upon hydraulic oil flow by the in-line filters.

1. Attach the gauge to test port A. (fig. 14-1) Route the gauge so that you or an assistant can read it during testing.
2. Make sure any bystanders are clear of moving components, then start the engine.
3. Allow the engine to warm up to operating temperature, then with the engine at wide open throttle, check the charge pressure. Record your reading. It should read 700 +/- 50 psi (500 +/- 50 psi at idle) at this test port. If the reading at port (A) is lower than specified, check the pressure reading at the pump test port (B) prior to adjustment. If the reading at port (A) is higher than specified, change the hydraulic filters and re-check. If reading is still higher, check the pressure at port (B) prior to adjustment.

Note: To check pressure at test port B, remove the plug in port B and install a quick coupler fitting similar to the one installed in port A. If one is not available, swap the positions of the plug in (B) and the coupler in (A) to test port B.

4. The charge pressure at the pump should read 440 +/- 30 psi. This can be checked at test port (B) shown in figure 14-2. If your reading differs, adjustment is necessary.
5. If necessary, adjust the charge relief pressure.
To adjust:
 - a) Remove the relief valve from the side of the pump as shown in figure 14-3.
 - b) Add shims to increase the pressure setting, or remove shims to decrease the setting until within specification. (figure 14-4)



Auxiliary Pressure Check

Required Tools

Pressure Gauge 0-6000 p.s.i.

Auxiliary pressure is used to drive flow style attachments. Low auxiliary pressure can produce poor performance in attachments while high pressure can cause component damage/failure in the machine or the attachment being utilized.

Note: Make sure charge pressure is set correctly prior to testing this function.

1. Attach a hydraulic gauge to test port (C) on the bottom of the valve. Route the gauge so that you or an assistant can read the gauge while performing the test procedures. (figure 14-5, 14-6)
2. Activate the low or high flow auxiliary hydraulics with no auxiliary attachment fastened to the quick couplers. This action will send oil over relief and you will read the actual pressures required to activate the relief valve for each circuit. Do this for both the high and low flow circuits in both directions. Record the pressure readings.

Check your readings against those stated below. If your readings differ, an adjustment and or repair may be required.

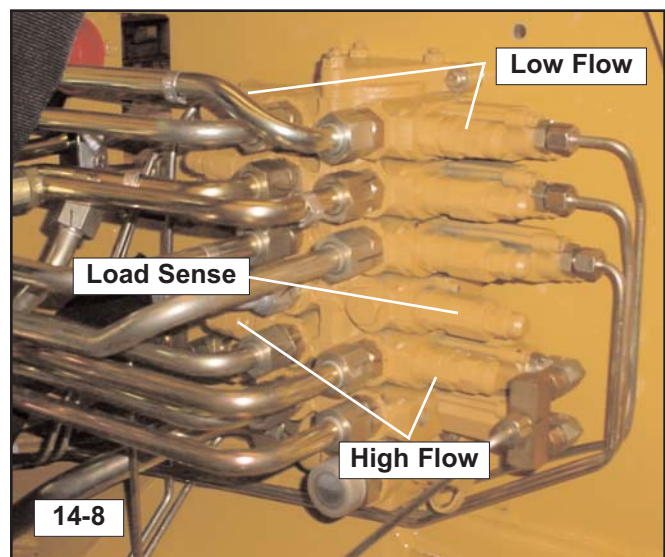
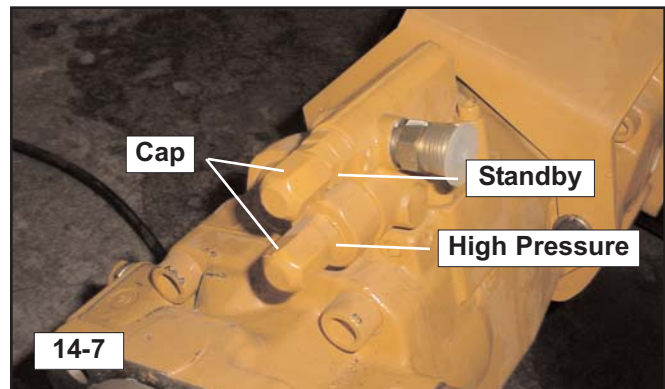
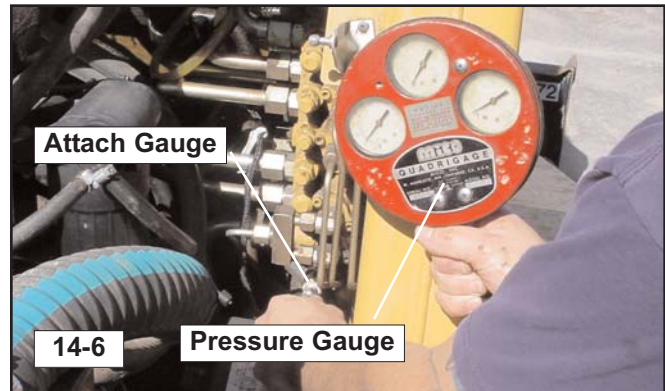
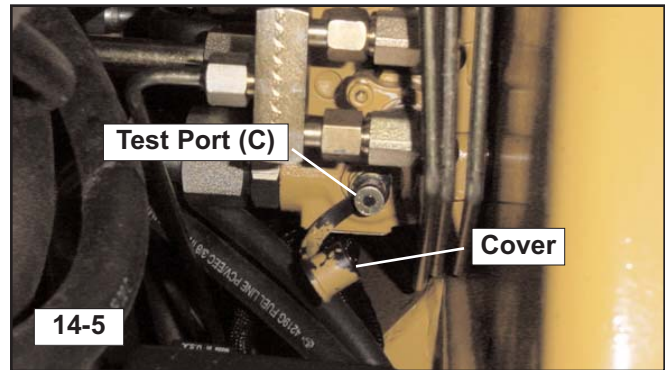
Pressures should read: (at test port C)

- 362 +/- 10 PSI when the system is relaxed (**standby**).
- 3300 +/- 100 PSI when the Low Flow Auxiliary circuit is activated.
- 3650 +/- 100 PSI when the High Flow Auxiliary circuit is activated.

3. If necessary, adjust the relief settings on the auxiliary standby or high pressure valves. (figure 14-7)

To adjust:

- a) Remove the cap covering the affected relief valve.
- b) Using an allen wrench, turn the adjustment screw clockwise to increase the setting or counter-clock wise to reduce it until within specification.



High flow auxiliary troubleshooting:

4. If both high and low flow readings are low, adjust the high pressure relief setting at the pump. (see step 3).
5. If the low flow readings are ok, and the high are between 3300 and 3550 psi, adjust the high pressure relief setting at the pump. (see step 3).
6. If the high flow readings are less than the low flow readings, reverse high flow direction and recheck. If reading is within spec. in that direction, replace the opposing high flow relief valve. (figure 14-8)

Note: Refer to page 3-4 for information regarding relief valve location.

Note: High flow reliefs are set at 4650. It is not possible to test this value because the pump is equipped with a load sense function that will not allow it to exceed 3650psi in this circuit. Do not attempt to adjust these reliefs. If one is found to be defective, replace it.

Low flow auxiliary troubleshooting:

7. If the low flow readings are low, check the lift arm function readings as well. If both functions read low, adjust the load sense relief valve as shown in figure 14-8.
8. If the low flow circuit (only) reads low, reverse low flow direction and recheck. If reading is within spec. in that direction, replace the opposing low flow relief valve. (figure 14-8)

To adjust the load sense relief setting at the hydraulic control (loader) valve: (figure 3-4, 14-8)

- a) Remove the cap covering the affected side of the relief valve.
- b) Using an allen wrench, turn the screw clock wise to increase the setting or counter-clock wise to reduce it until within specification.

Note: Low flow reliefs are set at 3625 psi. It is not possible to test this value because the pump is equipped with a load sense function that will not allow it to exceed 3300psi in this circuit. Do not attempt to adjust these reliefs. If one is found to be defective, replace it.

Lift Arm Pressure Check

Required Tools

Pressure Gauge 0-6000 p.s.i.

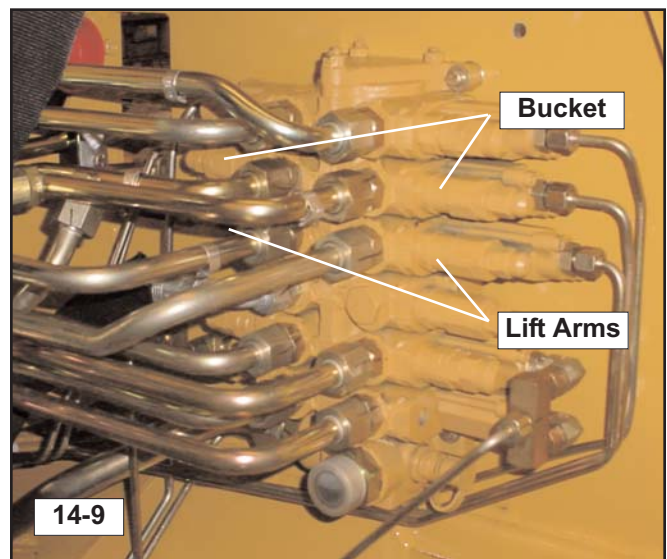
Lift arm pressure is used to lift loads or “break-out”. Low lift arm pressure can produce a weak lift arm function while high lift arm pressure can damage lift arm and hydraulic components.

Note: Make sure auxiliary circuit pressures are set correctly prior to testing this function.

1. Attach a hydraulic gauge to test port C. Route the gauge so that you or an assistant can read the gauge while testing these functions. (figure 14-6)
2. Raise the lift arms all the way up and continue holding the joystick even when the lift arms stop. Record the pressure readings. Then lower the lift arms to the stops and continue holding the joystick. Record the pressure readings. Repeat this process with the bucket dump/curl functions.
3. Check your readings against those stated below. If your readings differ, adjustment or repair may be necessary. (figure 14-9)

Pressures should read: (at test port C)

- 3300 +/- 100 PSI when the lift arms or bucket are in the up/curl position.
 - 3300 +/- 100 PSI when the lift arms or bucket are in the down/dump position.
4. If any of the readings are low, reverse the function and recheck. If reading is within specification in that direction, replace the opposing relief valve.



Drive Pressure Check

Required Tools

Pressure Gauge 0-6000 p.s.i.

!WARNING!

This procedure should only be performed if you suspect a drive pump or drive motor is faulty. The procedure is difficult and in performing it, you risk contaminating your hydraulic system if your equipment and working environment is not clean.

Make certain all couplers, fittings and hoses used during this process are clean and free of contaminants that may potentially cause damage to the hydraulic pump and or system components!

Drive pressure is used to turn the drive motors that power your tracks. Low pressure can cause decreased drive motor performance resulting in sluggish maneuvering, decreased speed and or uneven forward or reverse motion.

1. Remove the plug from the port you would like to test and insert a quick coupler similar to port A.
2. Attach the hydraulic gauge to the port(s) you are trying to test and route the gauge so you or an assistant can read the gauge during testing.
3. Position the machine so that the lift arms are resting against the chassis stops and the front edge of the bucket is facing, centered on and in contact with an **IMMOVABLE** object.
4. Move the drive control fully forward in an attempt to drive the machine forward. This will force oil over the relief valve and give you a reading for the circuit you are tapped into.
5. Attach a heavy-duty chain capable of restraining the machine securely to the bucket and an **IMMOVABLE** object.
6. Move the drive control fully rearward in an attempt to drive the machine in reverse. This will force oil over the relief valve and give you a reading for the circuit you are tapped into.
7. Check all four ports in this same manner and record your readings.

Note: There are 4 drive pump test ports. The upper ports are shown in figure 14-11 and the lower ports are located on the bottom of the pump directly beneath the drive ports they test.

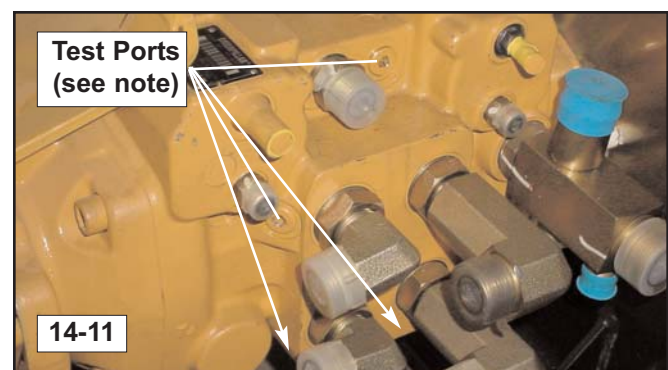
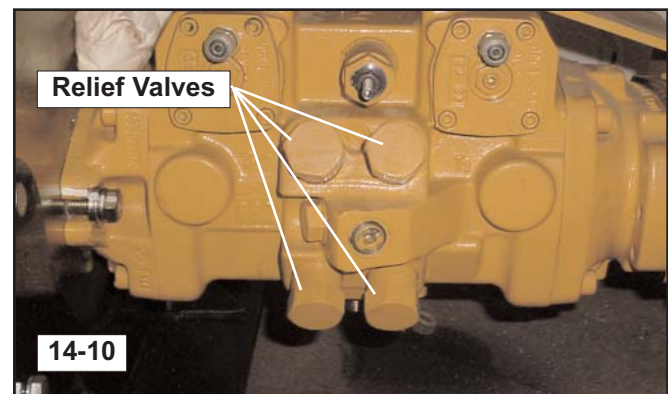
Check your readings against that stated below. If your readings differ, relief replacement and or component repair may be required.

Pressures should read:

- 5500 PSI when the relief is reached in attempted forward or reverse motion.

Drive pressure troubleshooting:

8. If one reading is low, swap the relief valve with a similar one and recheck. If the reading improves, replace the faulty relief valve.
9. If two readings are low, but on different circuits (pumps), perform step 8 for both.
10. If both readings are low on one pump, disconnect the drive hoses from the suspected ports and plug them at the pump. Cap the hoses to prevent contamination and then recheck the pressures at those ports. If the reading improves, the drive motor is at fault. If the reading does not improve, one pump (in the tandem assembly) is at fault.
11. If all 4 readings are low, it is unlikely that all four relief valves are faulty. The tandem pumps are most likely not working properly.



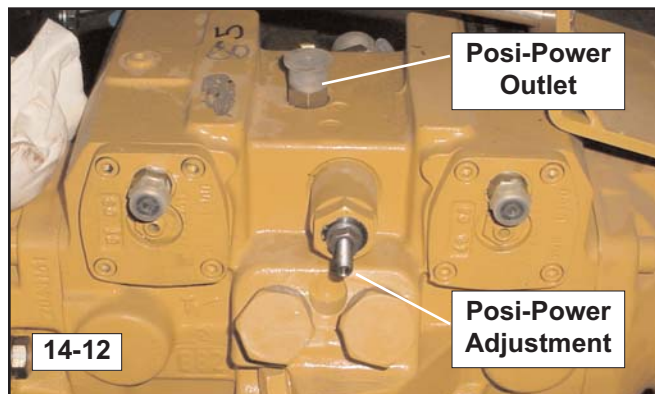
Posi-Power Pressure Check

Posi-power is a function of the tandem drive pump assembly. The posi-power control reads charge flow (which is directly related to engine rpm) and adjusts drive pump flow to maximize torque and prevent engine stall during high load conditions.

!WARNING!

This procedure should only be performed if you suspect that the Posi-Power relief valve is faulty. In performing this procedure you risk contaminating your hydraulic system if your equipment and working environment is not clean.

Make certain all couplers, fittings and hoses used during this process are clean and free of contaminants that may potentially cause damage to the hydraulic pump and or system components!



To check Posi-Power pressure:

1. With the engine off and cool, disconnect and cap the posi-power outlet hose from the port on the top of the drive pump assembly. (figure 14-12)
2. Remove the fitting from the pump assembly and install a quick coupler similar to the one installed in test port A in its place.
3. Attach a gauge to the quick coupler and route it so that you or an assistant can read the gauge during operation.
4. Make sure all bystanders are clear of moving parts and start the engine.
5. At low rpm, posi-power pressure should read 460 +/- 40 psi. (510 +/- 40 at high rpm)

6. If your reading is low, remove the cap and loosen the jam nut on the posi-power adjustment screw and turn it counter clockwise until it stops then retighten the jam nut. (figure 14-12)
 - a) If the screw was already turned completely out and pressure reads lower than specified, the posi-power relief valve is faulty and should be replaced.
 - b) If you were able to turn the screw out, recheck posi-power pressure to see if the reading is now within specification. If it is, the system should function properly. If it did not improve, the posi-power relief valve is faulty and should be replaced.

To Adjust Posi-Power:

1. Loosen the jam nut and then turn the screw to adjust for more or less posi-power function. (figure 14 -12)
 - a) Turn the screw clockwise to increase function and limit pump flow during high load conditions. (less likely to stall)
 - b) Turn counter-clockwise to decrease function and maximize pump flow during high load conditions. (more likely to stall)
2. Tighten the jam nut while holding the set screw in place to keep desired setting.

15. Hydraulic Cylinder & Loader Valve

Chapter Overview

This chapter provides information on inspection, disassembly, assembly and resealing hydraulic cylinders.

Personal Safety

!WARNING!

Improper or incomplete maintenance/repair of a Rubber Track Loader can be dangerous and may result in machine damage, injury or even death.

Do not attempt to perform any type of repair or maintenance on a Rubber Track Loader until you have read and fully understood the information in this manual.

Refer to the Operation and Maintenance manual for instructions regarding proper machine operation techniques before operating any Rubber Track Loader.

Prior to performing any type of service work on a Rubber Track Loader, read and understand Chapter 1 (Product Safety) for personal safety information.

Disassembly & Assembly

Disassembly and assembly procedures are provided for the following components:

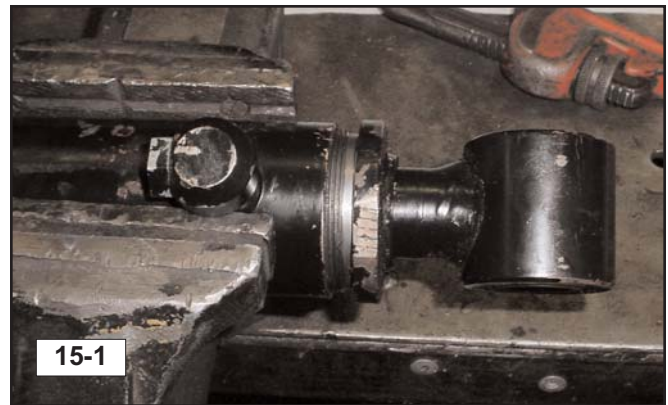
- Hydraulic Cylinders
- Loader Valve

Note: Procedures are provided for only those hydraulic components listed above. However, exploded parts diagrams exist in the PT-100 Parts manual to serve as visual aids in the assembly and disassembly of other system components.

Hydraulic Cylinder Disassembly

Required Tools

Bench Vise
Pipe Wrench
Socket or Impact Wrench
Screwdriver (blade type)
Rubber or Dead Blow Hammer
Small Pry Bar



1. With machine off and cool and with hydraulic actuators relaxed, disconnect and cap hoses from the cylinder(s) to be serviced.

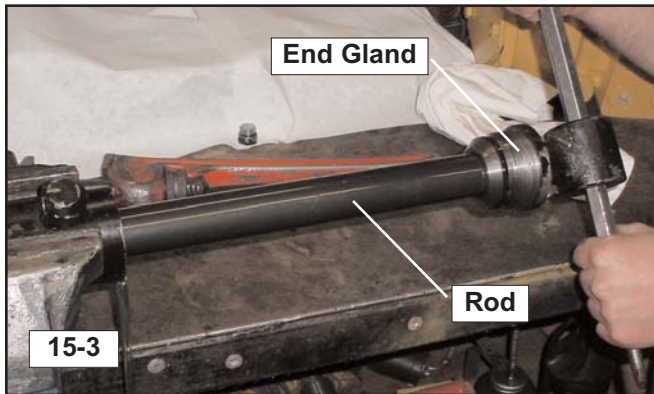
Note: When servicing cylinders, the attached components must be supported in a manner that allows the cylinders to be safely removed and installed. (lift arms & quick attach)

2. Remove the cylinder(s) and secure it in a bench vise to aid in disassembly. (figure 15-1)
3. Place a suitable catch container beneath the rod end of the cylinder to catch any hydraulic oil that may leak out upon disassembly.

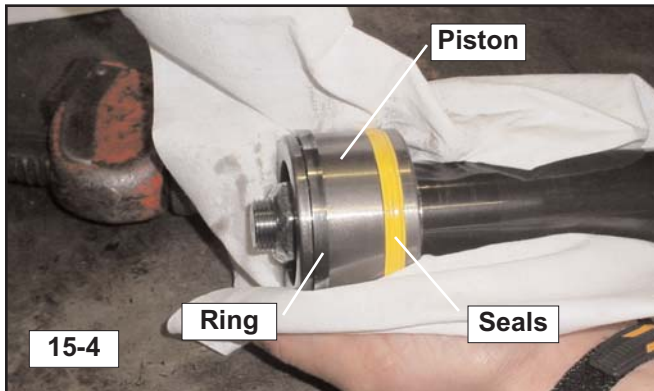
15. Hydraulic Cylinder & Loader Valve



4. Use a open end or pipe wrench to turn and remove the end gland. (figure 15-2)



5. Use a pry bar or similar device to pull the rod and piston from the cylinder. (figure 15-3)



6. Inspect the piston surface, seals and ring for wear or damage. If any component appears to be damaged in any way, replace it. When inspecting the piston surface, look for scratches. If any are present that are deep enough to catch with your fingernail, the piston should be replaced. (figure 15-4)

Note: Seal imperfections or scratches on the piston, bore or rod or will cause internal/external leakage and impaired function. Defective components must be repaired or replaced.



7. With the piston and rod removed from the cylinder, inspect the cylinder bore for scratches or other damage. If any are present that are deep enough to catch with your fingernail, the cylinder tube weldment should be replaced. (figure 15-5)



8. Remove the nut from the rod end. (figure 15-6)



9. Support the piston loosely from the underside (figure 15-7), thread the nut partially on to protect the threads and tap the rod end with a rubber or dead blow hammer to free the piston from the rod.

10. Once loose, remove the nut and piston from the rod.

15. Hydraulic Cylinder & Loader Valve**15-8****15-11****15-9**

- 11.** Remove the seals and piston ring taking care not to scratch the piston. Also, pay close attention to seal and ring orientation and position to aid when installing new parts. (figures 15-8, 15-9)

**15-12**

- 13.** Remove the tandem seals from the end gland paying close attention to the order of removal to aid during installation of the new seals. (fig. 15-11)

- 14.** Remove the inner seal from the end gland. Pay attention to the seal orientation upon removal to aid during installation of the new seal. (fig. 15-12)

- 15.** Remove the end gland outer seal from the end gland. (figure 15-10)

- 16.** Thoroughly clean all parts to prevent contamination of hydraulic oil when reinstalled.

**15-10**

- 12.** Gently tap the end gland off of the cylinder rod. (figure 15-10)

Assembly

1. Install new seals and components in place of the originals paying close attention to orientation and location to ensure proper operation.
2. Lubricate the piston, ring, and seals with fresh hydraulic oil prior to assembly to avoid damage.
3. Reassemble components by reversing the disassembly process.
4. Perform steps 10-13 of the hydraulic fluid change procedure on page 11-14.

Note: During reassembly, use an impact wrench to tighten the piston retaining lock nut. Make sure the nut is tight and that there is no independent movement between the piston and rod before reassembling.

15. Hydraulic Cylinder & Loader Valve

Loader Valve Disassembly

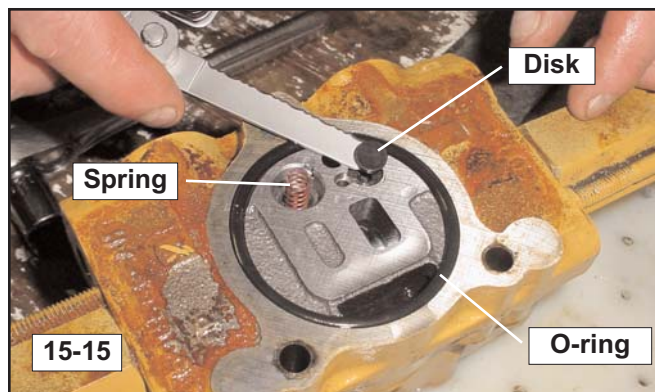
Required Tools

Socket Wrench
Combination Wrench
Screwdriver (blade type)
Pliers

1. With machine off and cool and with hydraulic actuators relaxed, disconnect and cap all lines from the loader valve. Plug all ports on the valve.



2. Remove the loader valve and place it on a bench in a clean work area.
3. Remove the nuts holding the valve stack together. (figure 15-13, 15-14)



4. Remove each valve section and inspect the seals for damage, replace if necessary. (figure 15-15)

Note: Take care not to lose springs or disks when removing sections. These parts are not available individually.



5. Remove the inlet port assemblies and inspect the seals for damage, replace if necessary. (figure 15-16, 15-17)
6. Thoroughly clean all components to avoid hydraulic system contamination during installation.

Assembly

1. Install new seals and components in place of the originals paying close attention to orientation and location to ensure proper operation.
2. Reassemble components by reversing the disassembly process.
3. Perform steps 10-13 of the hydraulic fluid change procedure on page 11-14.

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