

# **SERVICE MANUAL SUPPLEMENT**

## ***D & G-Series***

### ***Hydraulic Bin Retainer***

**NOTE:** This manual covers Hydraulic Bin Retainer components only. For servicing the drive group, drive motor, check valve and base unit, refer to one of the following standard Service Manuals based on nameplate model number and/or serial number:

- D-Series 360° Rotators Service Manual, part number 672946
- 30G, 40G 360° Rotators Service Manual, part number 6089468
- 45G-100G 360° Rotators Service Manual, part number 6073955

***Manual Number 6893916***

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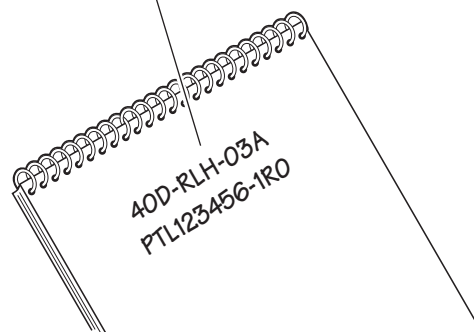
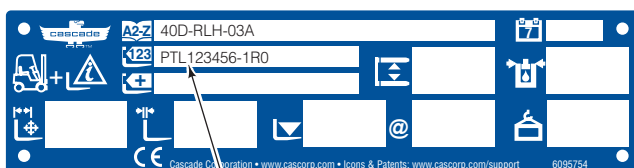
# INTRODUCTION

## 1.1 Introduction

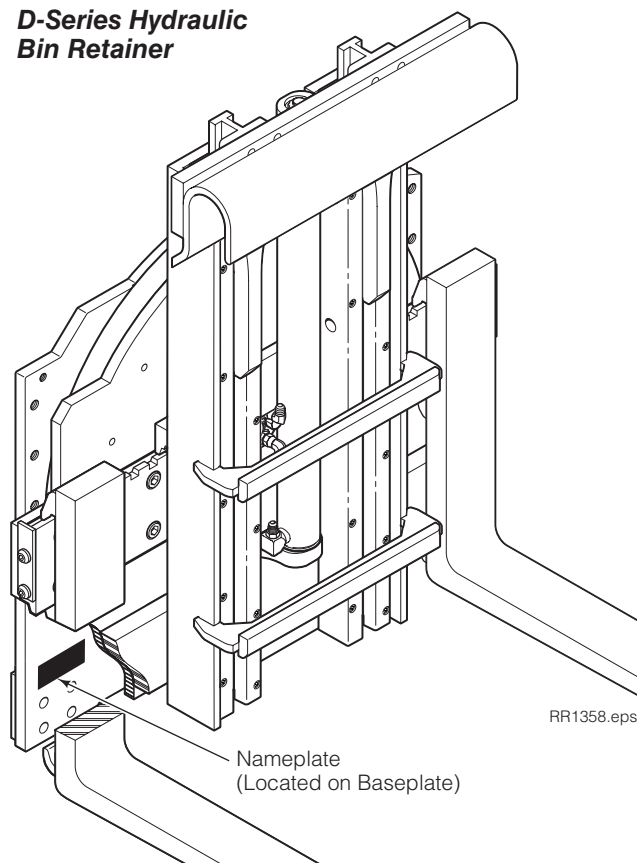
This manual provides the Periodic Maintenance, Troubleshooting, Service and Specifications for Cascade attachments with Hydraulic Bin Retainers.

In any communication about the attachment, refer to the product catalog and serial numbers stamped on the nameplate. If the nameplate is missing, the numbers can be found stamped on the frame where the plate was mounted.

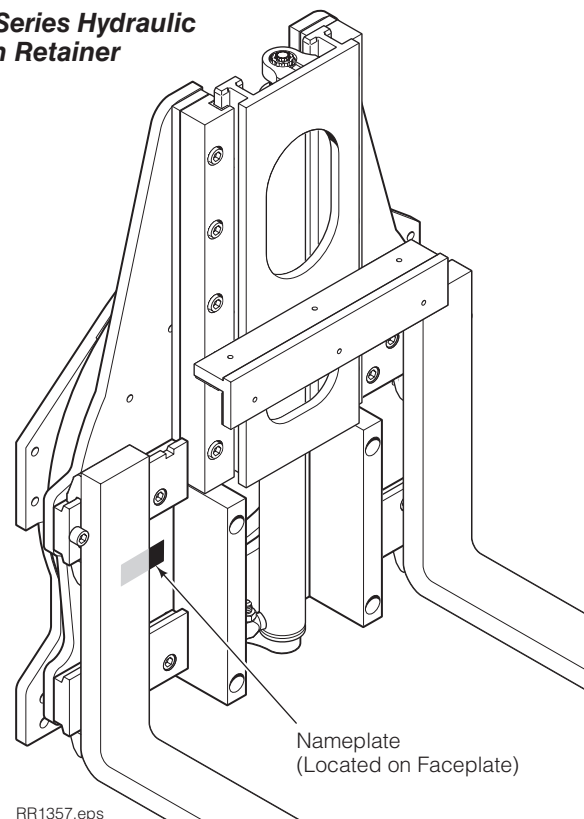
**IMPORTANT:** Tubing connection and supply fitting types vary depending on end-user. Specifications are shown in US and (metric) units. All fasteners have a torque value range of  $\pm 10\%$  of stated value.



### D-Series Hydraulic Bin Retainer



### G-Series Hydraulic Bin Retainer



## 1.2 Special Definitions

The statements shown appear throughout this manual where special emphasis is required. Read all **WARNINGS** and **CAUTIONS** before proceeding with any work. Statements labeled **IMPORTANT** and **NOTE** are provided as additional information of special significance or to make the job easier.



**WARNING** - A statement preceded by **WARNING** is information that should be acted upon to prevent **bodily injury**. A **WARNING** is always inside a ruled box.

**CAUTION** - A statement preceded by **CAUTION** is information that should be acted upon to prevent machine damage.

**IMPORTANT** - A statement preceded by **IMPORTANT** is information that possesses special significance.

**NOTE** - A statement preceded by **NOTE** is information that is handy to know and may make your job easier.

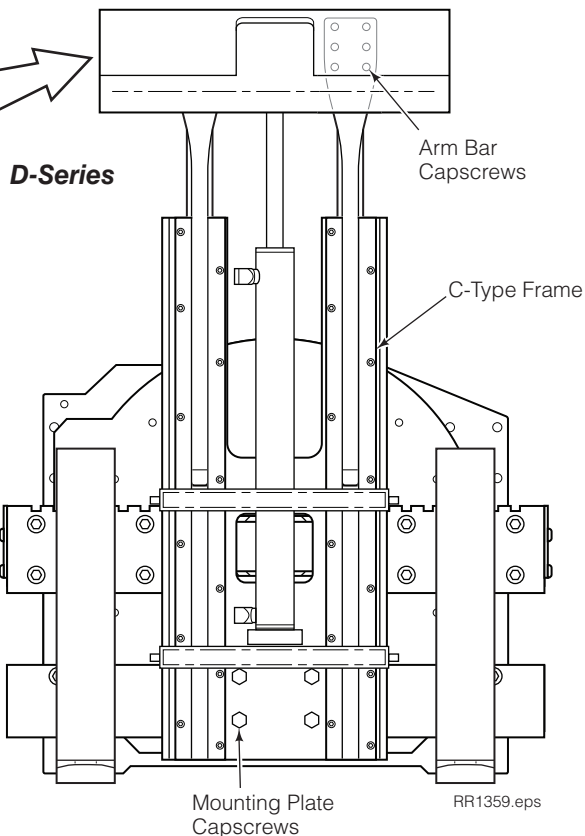
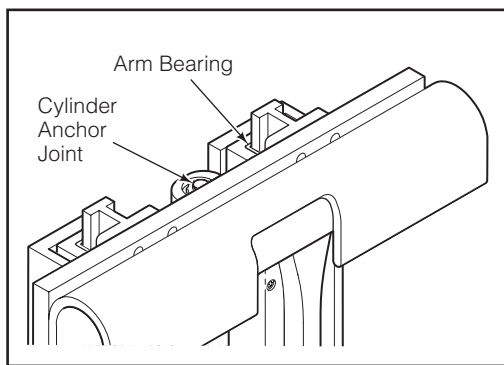
# PERIODIC MAINTENANCE

**NOTE:** This section covers periodic maintenance to the Bin Retaining components. In addition to the periodic maintenance below, perform the periodic maintenance found in one of the following standard Service Manuals based on nameplate model number and/or serial number:

- D-Series 360° Rotators Service Manual, part no. 672946
- 30G, 40G 360° Rotators Service Manual, part no. 6089468
- 45G-100G 360° Rotators Service Manual, part no. 6073955



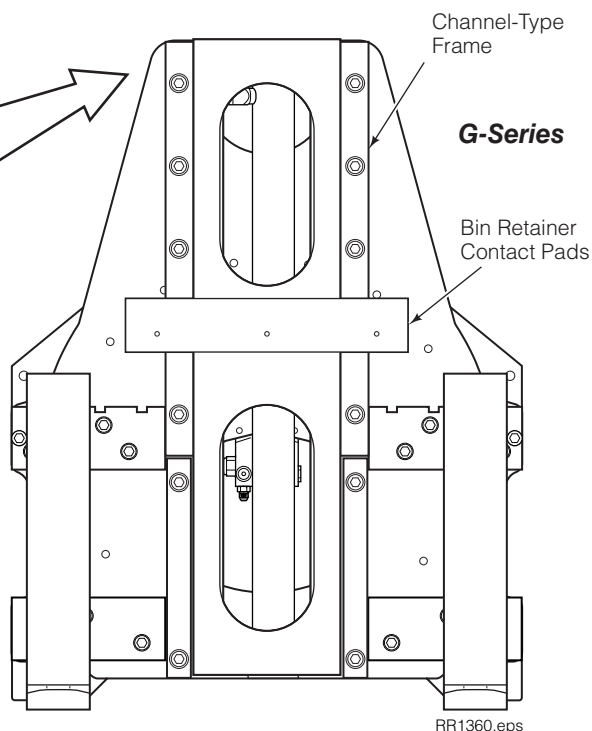
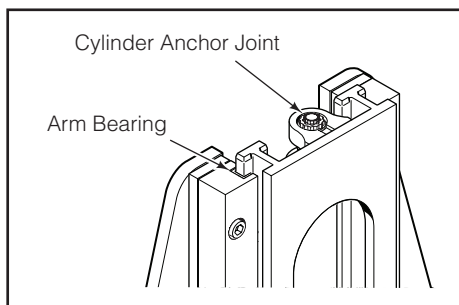
**WARNING:** After completing any service procedure, always test the attachment through five complete cycles. First test empty, then test with load to make sure attachment operates correctly before returning it to the job.



## 2.1 Daily Inspection

Prior to each shift of truck operation, complete the following procedures:

- Check for loose or missing capscrews, worn or damaged supply hoses and hydraulic leaks.
- Inspect the cylinder rod anchor joint for wear. Anchor joint operates with a loose clearance and requires no lubrication.
- If equipped, inspect bin retainer contact pads for wear or damage.
- Check decals and nameplate for legibility.



## 2.2 1000-Hour Maintenance

Every time the lift truck is serviced or every 1000 hours of truck operation, complete the following maintenance procedures:

- Tighten arm bar capscrews to the torque value of 320 ft.-lbs. (430 Nm).
- Inspect frame bearings for wear or damage. If bearings are worn in any area to less than 0.06 in. (1.5 mm) thickness, replace bearings. Refer to Service Section 4.6-2.

## 2.3 2000-Hour Maintenance

After each 2000 hours of truck operation, in addition to the 1000-hour maintenance, perform the following procedures:

- Tighten frame and mounting plate (if equipped) capscrews to the following torque value:

**Channel-Type Frame, 30G,40G** – 200 ft.-lbs. (275 Nm)

**Channel-Type Frame, 45G-100G** – 250 ft.-lbs. (340 Nm)

**C-Type Frame** – 13 ft.-lbs. (18 Nm)

**Mounting Plate** – 113 ft.-lbs. (153 Nm)

## 3.1 General Procedures

### 3.1-1 Truck System Requirements

- Truck hydraulic pressure should be within the range shown in Specifications, Section 5.1. **PRESSURE TO THE ATTACHMENT MUST NOT EXCEED 2300 psi (160 bar).**
- Truck hydraulic flow should be within the range shown in Specifications, Section 5.1.
- Hydraulic fluid supplied to the attachment must meet the requirements shown in Specifications, Section 5.1.

### 3.1-2 Tools Required

In addition to a normal selection of mechanic's hand tools, the following are required:

- In-line Flow Meter Kit:  
10 GPM (37 L/min) – Cascade Part No. 671476
- Pressure Gauge Kit:  
5000 psi (345 bar) – Cascade Part No. 671212
- Assorted fittings, hoses, and quick-disconnect couplers as required.

### 3.1-3 Troubleshooting Chart

**Determine All The Facts** – It is important that all the facts regarding the problem are gathered before beginning service procedures. The first step is to talk to the equipment operator. Ask for a complete description of the malfunction. Guidelines below and on the following pages can then be used as a starting point to begin troubleshooting.

#### Stabilize Circuit

- Bin Retainer does not close or hold bin properly.
- To correct these problems, refer to Section 3.3.

**IMPORTANT:** Troubleshooting the ROTATE circuit can be found in one of the following Service Manuals based on the nameplate model number and/or serial number:

- D-Series 360° Rotators Service Manual, part no. 672946
- 30G, 40G 360° Rotators Service Manual, part no. 6089468
- 45G–100G 360° Rotators Service Manual, part no. 6073955



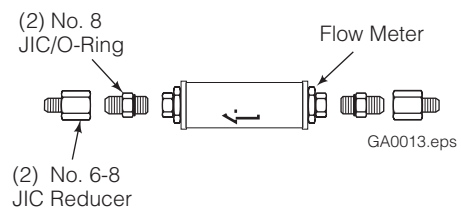
**WARNING:** Before servicing any hydraulic component, relieve pressure in the system. Turn the truck off and move the truck auxiliary control valves several times in both directions.

After completing any service procedure, test the attachment through several cycles. First test the attachment empty to bleed any air trapped in the system to the truck tank. Then test the attachment with a load to be sure it operates correctly before returning to the job.

Stay clear of the load while testing. Do not raise the load more than 4 in. (10 cm) off the floor while testing.

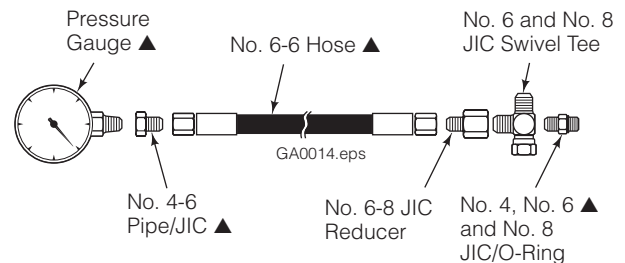
#### Flow Meter Kit:

671476 – 10 GPM (37 L/min)

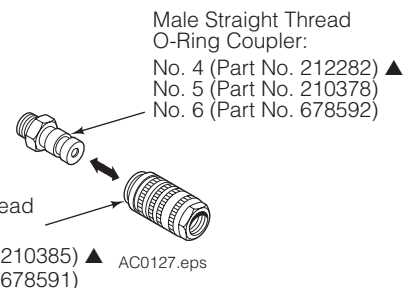


#### Pressure Gauge Kit:

671212



#### Quick-Disconnect Couplers



▲ **NOTE:** Diagnostics Kit 394382 includes items marked.

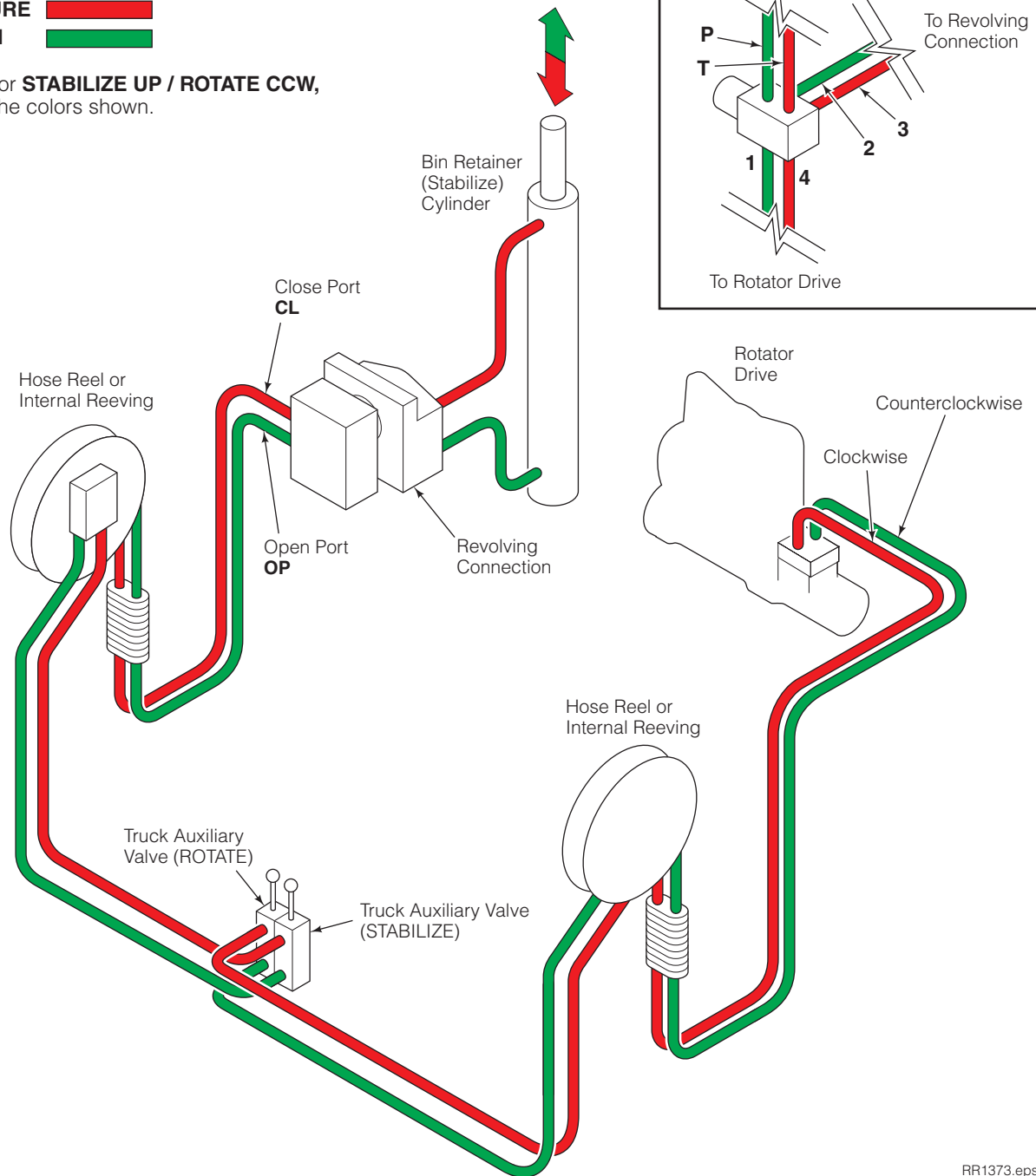
## 3.2 Plumbing

### 3.2-1 Hosing Diagram

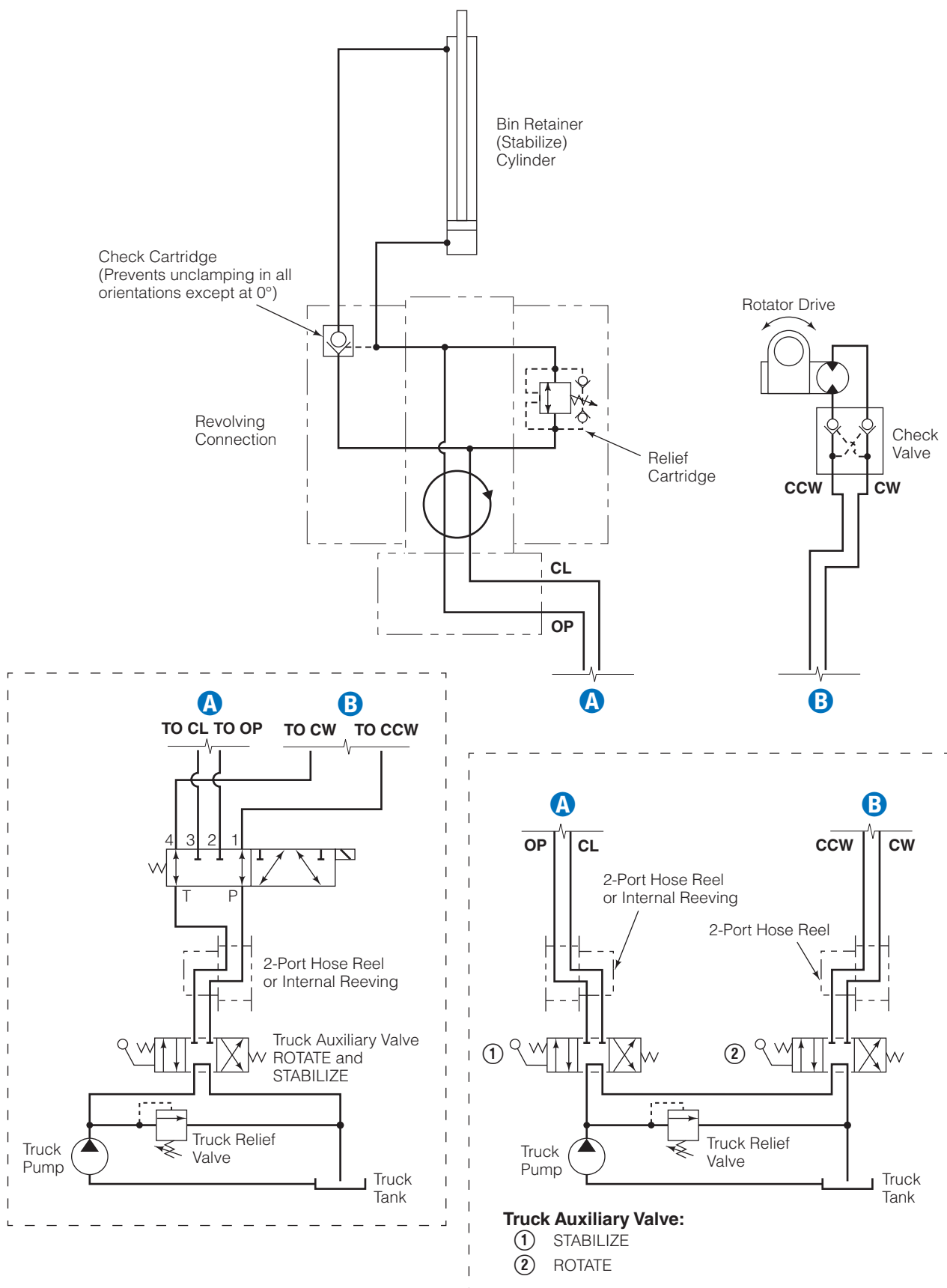
**STABILIZE DOWN / ROTATE CW**

**PRESSURE** █  
**RETURN** █

**NOTE:** For **STABILIZE UP / ROTATE CCW**, reverse the colors shown.



## 3.2-2 Hydraulic Circuit, D-Series

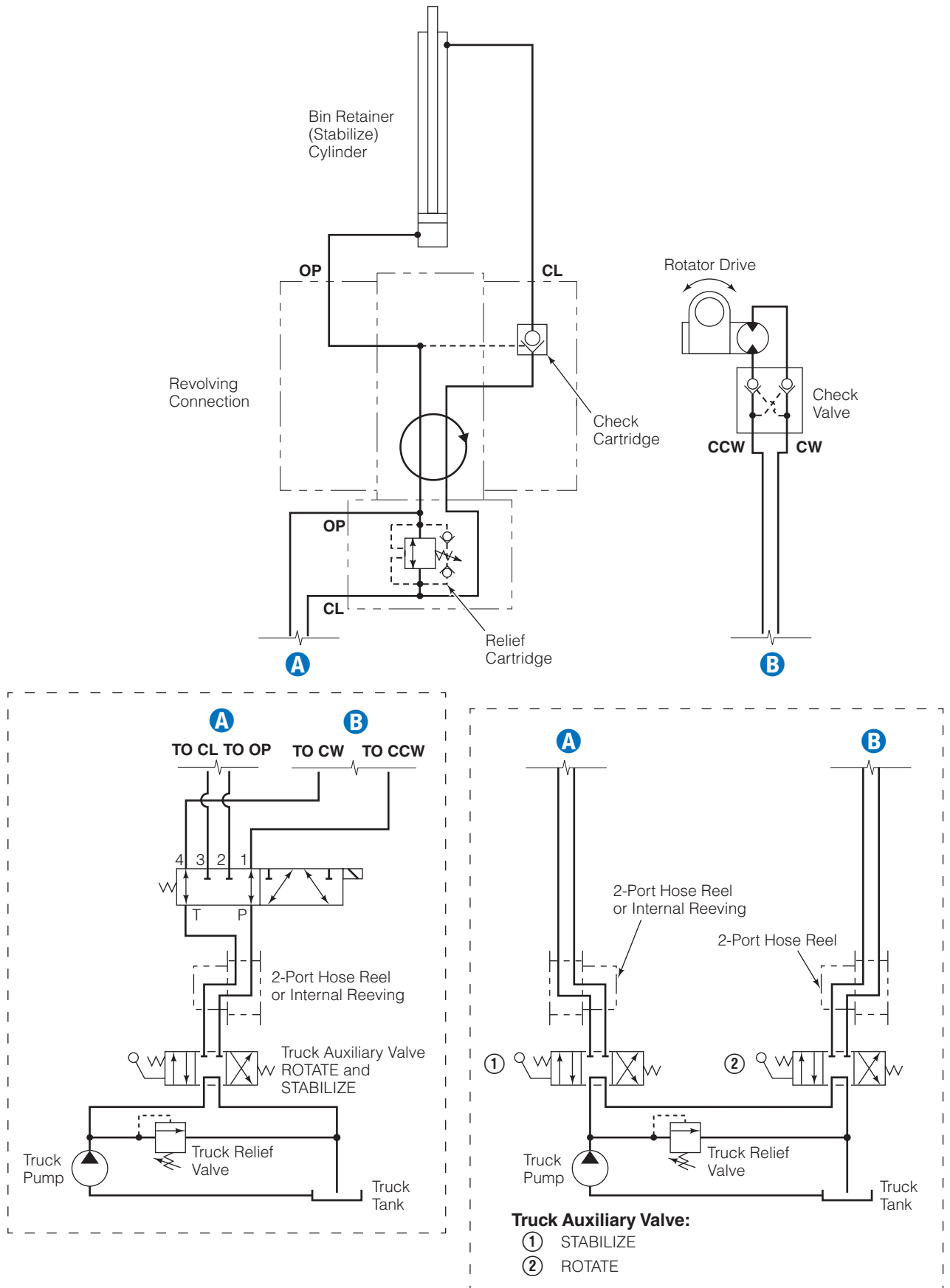


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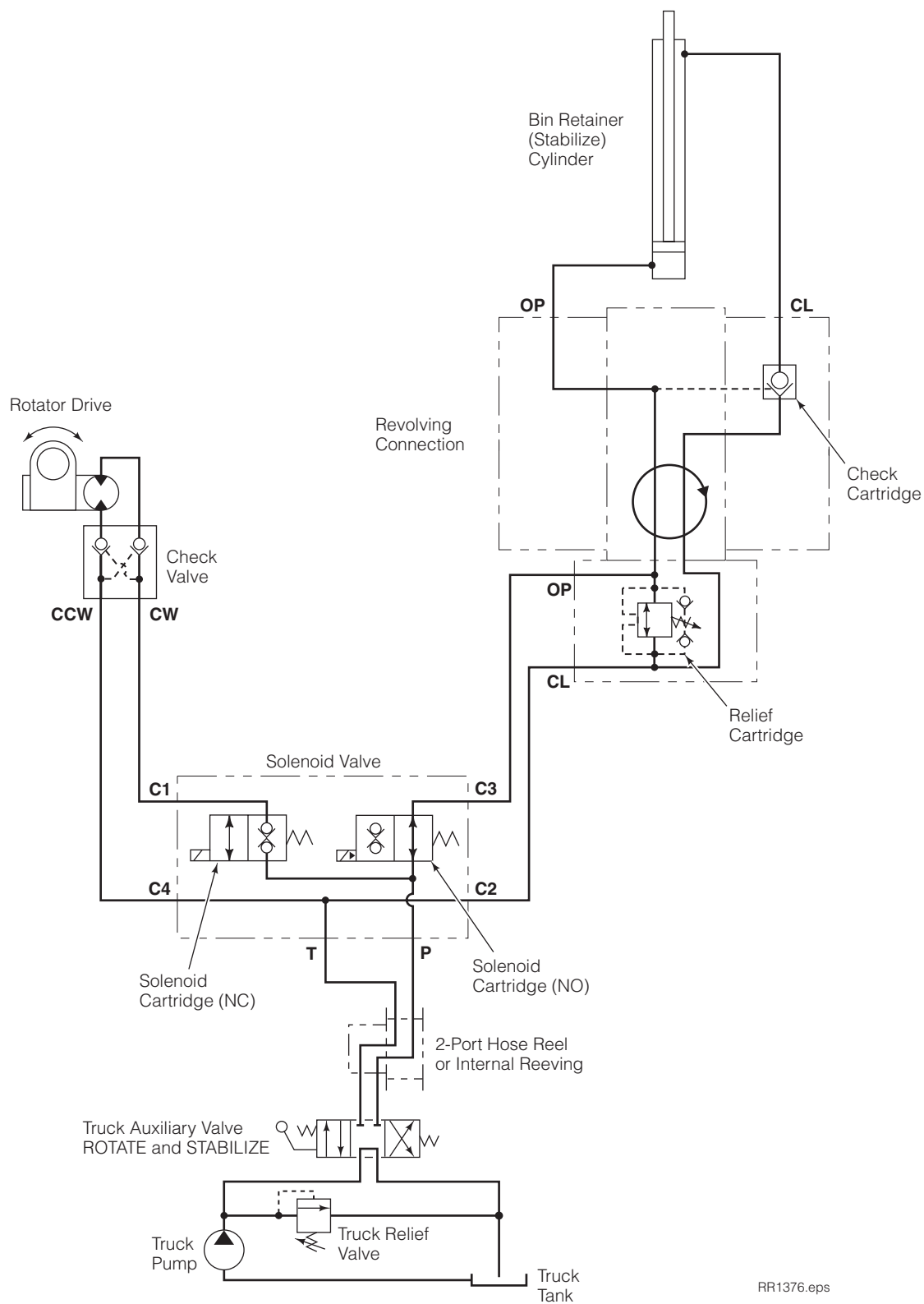


# TROUBLESHOOTING

## 3.2-3 Hydraulic Circuit, G-Series



## 3.2-4 Hydraulic Circuit, G-Series with Cartridge Solenoids



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## 3.2-5 Hosing Diagram, Sequence Valve

### STABILIZE DOWN

**PRESSURE**   
**RETURN** 

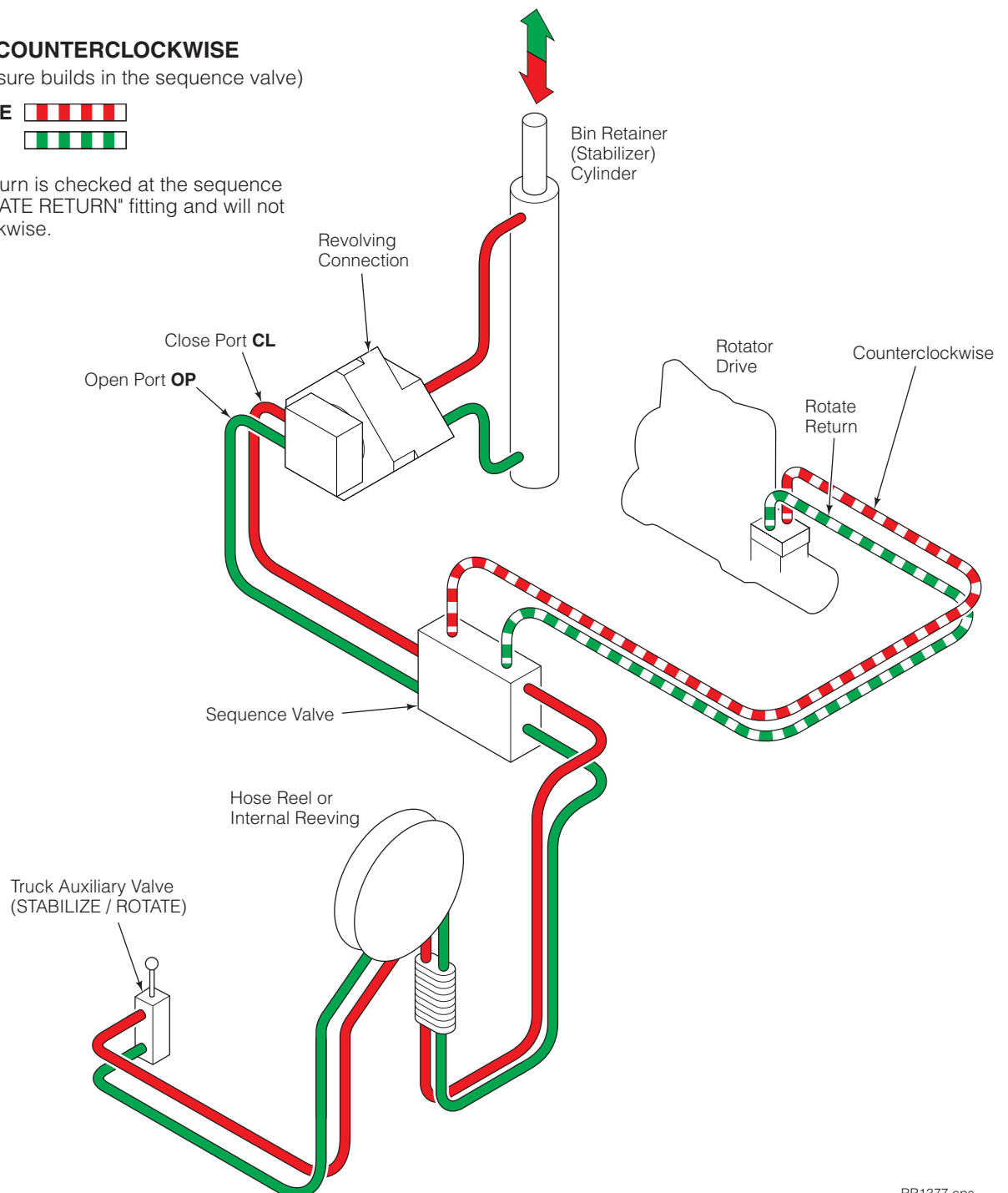
**NOTE:** For **STABILIZE UP** reverse the colors shown.

### ROTATE COUNTERCLOCKWISE

(After pressure builds in the sequence valve)

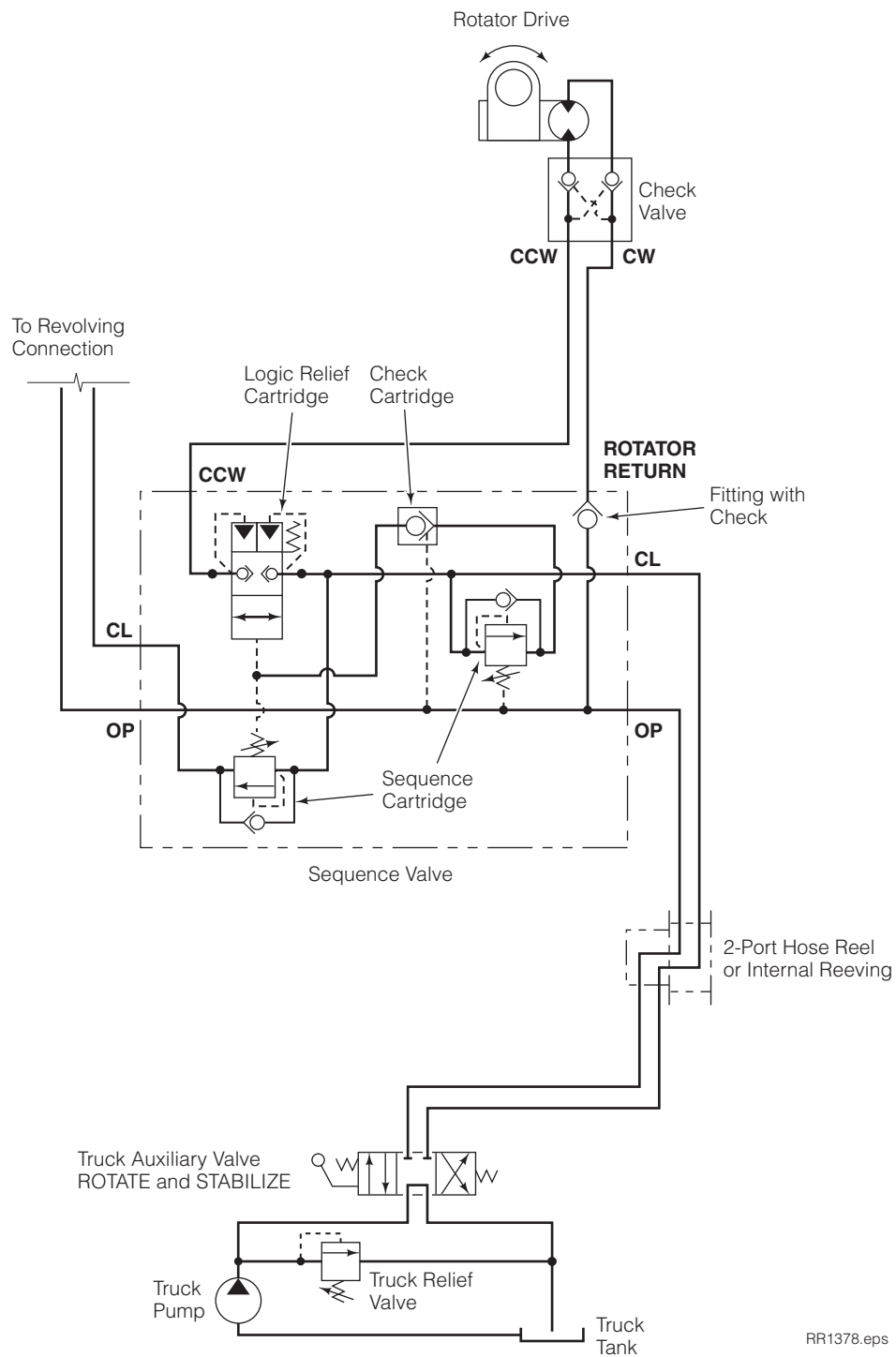
**PRESSURE**   
**RETURN** 

**NOTE:** Return is checked at the sequence valve "ROTATE RETURN" fitting and will not rotate clockwise.



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## 3.2-6 Hydraulic Circuit, Sequence Valve



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## 3.3 Stabilize Function

There are five potential problems that could affect the STABILIZE function:

- Incorrect hydraulic pressure or flow from the lift truck.
- External leaks.
- Physically jammed arm.
- Defective solenoid coil or valve (if equipped).
- Worn or defective cartridge valves or cylinder seals.

### 3.3-1 Supply Circuit Test

- 1 Check the pressure supplied by the truck at the carriage hose terminal. Pressure must be within the range shown in Specifications, Section 5.1. See nameplate on the attachment and sticker on valve. **PRESSURE TO THE ATTACHMENT MUST NOT EXCEED 2300 psi (160 bar).**
- 2 Check the flow volume at the carriage hose terminal. Flow must be within the range shown in Specifications, Section 5.1.
- 3 Fully close the stabilizer, holding the lever in the down position for a few seconds. Release the lever and check for external leaks at fittings, hoses and valve.

### 3.3-2 Stabilize Circuit Test

- 1 **Solenoid equipped** – Press the solenoid button. Listen for a 'click' at the solenoid valve. If no sound is heard, first check the fuse, wiring and coil. Make sure that the valve is not jammed. To service, refer to Section 4.9 or 4.10.

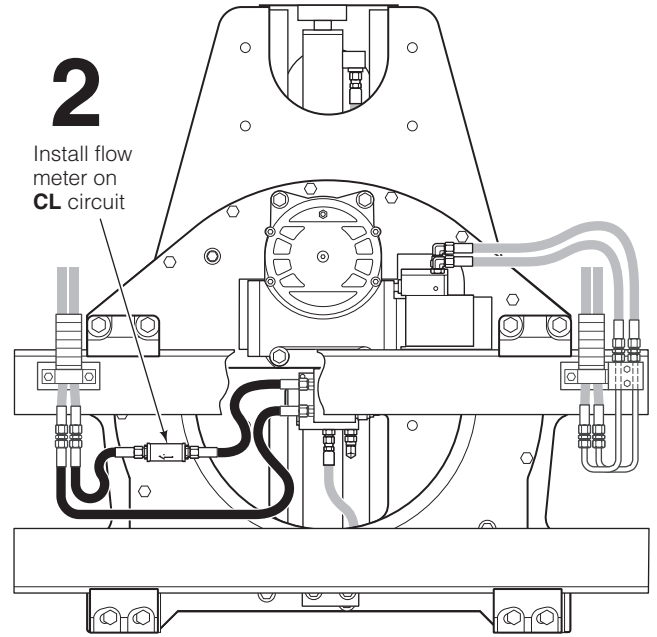
**IMPORTANT:** Solenoid-operated valves must be plumbed so that the solenoid is **energized** during the DOWN/UP function.

**IMPORTANT:** Valves with solenoid cartridges may be plumbed differently and electrical connections may initiate differently.

- 2 Raise and lower stabilizer fully. If the arm carrier moves slowly or not at all, the relief cartridge in the revolving connection may be faulty or require adjustment.
- 3 Position the stabilizer mid stroke. Turn the truck off. Install a pressure gauge to the cylinder rod end test tee fitting.
- 4 Retract cylinder and hold the handle in the DOWN position a few seconds to develop full truck system pressure. Watch the gauge pressure reading.
  - If the gauge pressure drops more than 100 psi (7 bar) initially, and an additional drop exceeds 25 psi (2 bar) per minute, the revolving connection check cartridge may be faulty. Replace the cartridge.
  - If the gauge pressure drops less than 100 psi (7 bar) initially, and additional drop does not exceed 25 psi (2 bar) per minute, the problem is not hydraulic. Refer to Section 3.3.
- 5 Close the stabilizer fully and hold the handle in the DOWN position a few seconds. If the pressure still drops, the cylinder may be faulty and must be serviced. Refer to Section 4.7.

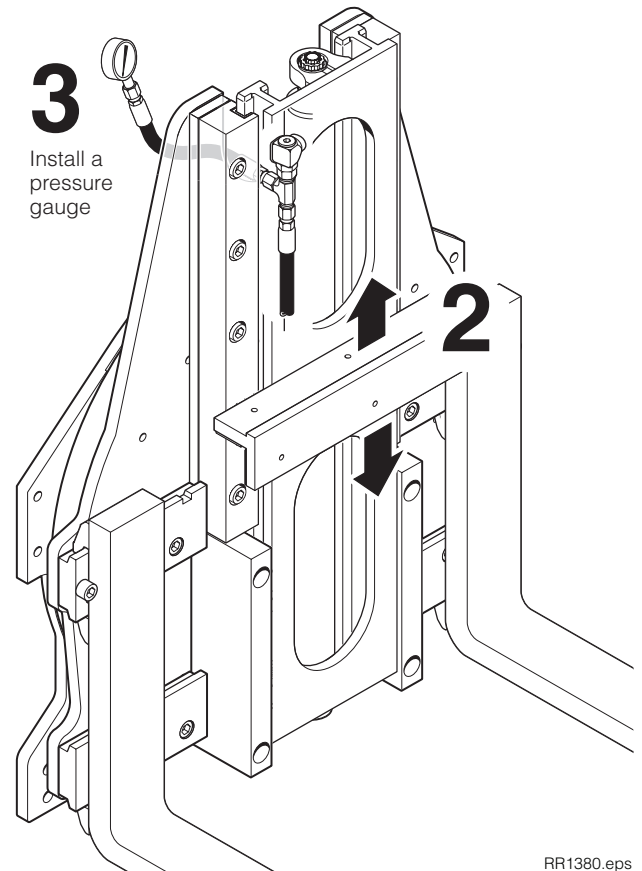


**WARNING:** Before removing hydraulic lines or components, relieve pressure in the hydraulic system. Turn truck off and open the truck auxiliary control valve(s) several times in both directions.



Back (Driver's View)

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## 3.4 Electrical Circuit (Solenoid-equipped attachments)

Use the electrical schematic and diagram shown and follow the steps below:

- 1 Check the control knob circuit fuse. Replace if necessary.
- 2 Check for loose electrical connections at the truck ignition switch, control knob button, solenoid coil terminals and diode.
- 3 Remove the diode from the solenoid coil terminal. Test with an ohmmeter for high resistance in one direction and no resistance in the other direction. If there is no resistance in both directions, replace the diode.

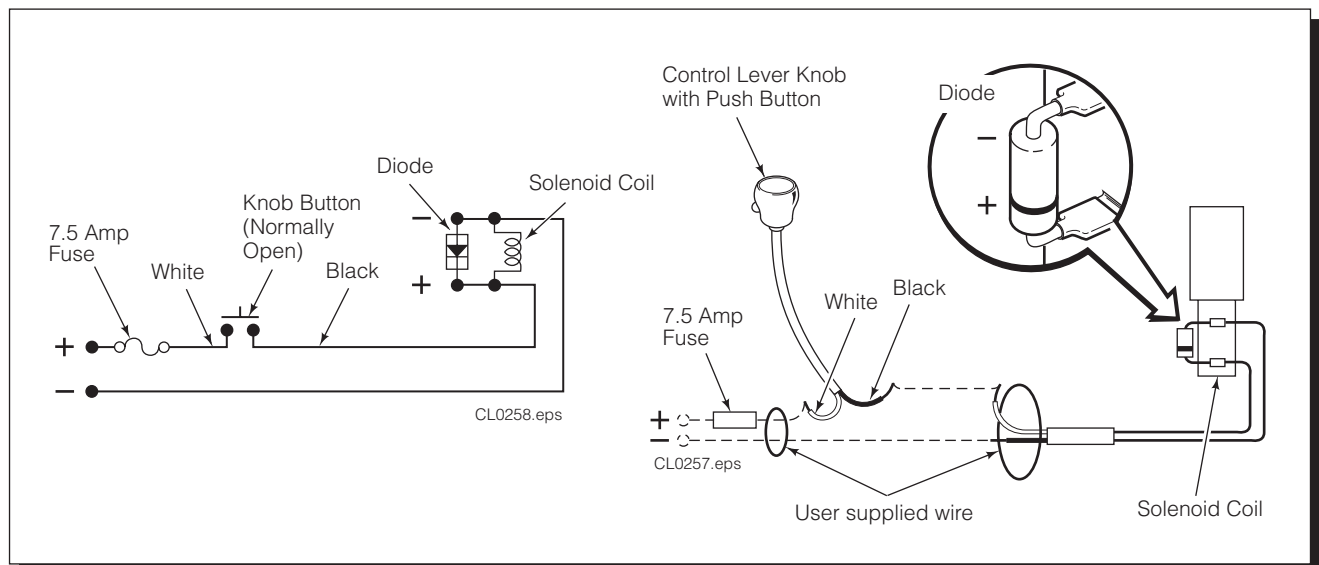
**NOTE:** When replacing the diode, the banded (+) end must be connected to the coil and wiring as shown.

- 4 Use a voltmeter to determine if correct voltage is present at the electrical leads when the button is pressed.
  - If there is **no** voltage to the solenoid, troubleshoot the electrical circuit for shorts or open circuits.
  - If there is **insufficient** voltage to the solenoid, check the circuit for excessive voltage drop.
  - If there is **sufficient** voltage to the solenoid, test for coil continuity. Continue to Step 5.
- 5 Test the coil continuity by placing an ohmmeter test lead on each solenoid coil terminal (ohmmeter on Rx1 scale).
  - If there is an ohmmeter reading, the coil is good.
  - If the coil is good, but the solenoid does not 'click' when the control knob button is pressed, the internal solenoid cartridge may be jammed. To service, refer to Section 4.10.

**NOTE:** For attachments equipped with cartridge type solenoids. Refer to Section 4.9.

- If there is no ohmmeter reading, the coil is defective and should be replaced. To service, refer to Section 4.10.

**NOTE:** For attachments equipped with cartridge type solenoids. Refer to Section 4.9.



## 4.1 Attachment Removal

- 1 Rotate the attachment to position the forks parallel to the ground.



**WARNING:** Before removing hydraulic lines, relieve pressure in the hydraulic system. Turn the truck off and open the truck auxiliary control valves several times in both directions.

- 2 Disconnect and plug the hydraulic supply hoses to the attachment. Tag hoses for reassembly.

- 3 Disconnect the lower hooks:

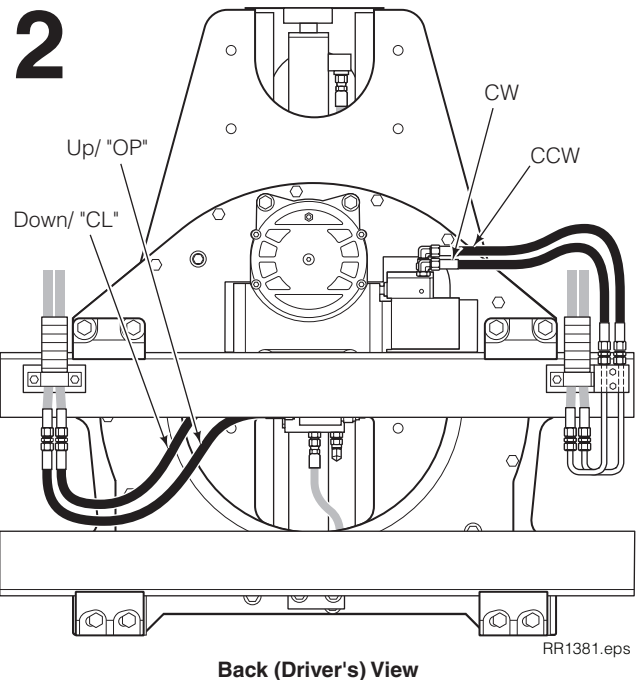
**Quick-Change Hooks** – Remove the locking pins and drop the hooks into the unlocked position. Replace the pins in the lower holes. For reassembly, remove the pins and slide the hooks up to the locked position. Replace the pins in the top holes.

**Bolt-On Hooks** – Remove the capscrews and mounting hooks. For reassembly, tap the hooks tight against the carriage bar and tighten the capscrews to 120 ft.-lbs. (165 Nm).



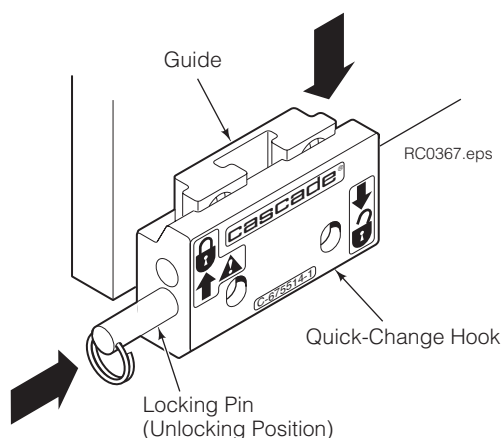
**WARNING:** Verify that the overhead hoist and chains or straps are rated for the weight of the attachment. Refer to nameplate for attachment weight.

- 4 Attach a suitable overhead hoist to the upper fork bar. Remove the attachment from the truck.
- 5 For installation, reverse the above procedures.

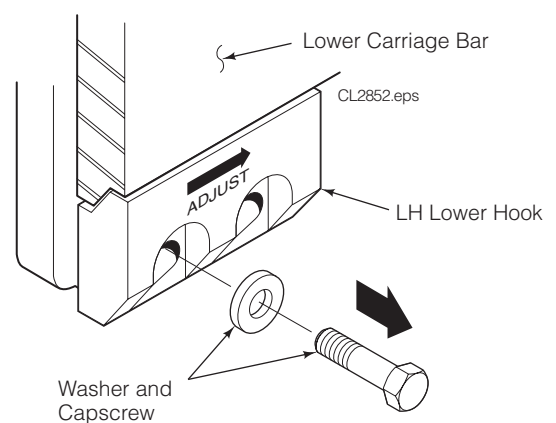


### 3

#### Quick-Change Lower Hook



#### Bolt-On Lower Hooks



**NOTE:** Manuals are available at [www.cascorp.com](http://www.cascorp.com) under the support tab, "Technical Support Manuals" link.

## 4.2 Rotator Drive Group

To service the drive group, refer to one of the following service manual based on nameplate model number and/or serial number:

- D-Series 360° Rotators Service Manual, part no. 672946
- 30G, 40G 360° Rotators Service Manual, part no. 6089468
- 45G–100G 360° Rotators Service Manual, part no. 6073955

## 4.3 Rotator Drive Motor

To service the drive motor, refer to one of the following service manual based on nameplate model number and/or serial number:

- D-Series 360° Rotators Service Manual, part no. 672946
- 30G, 40G 360° Rotators Service Manual, part no. 6089468
- 45G–100G 360° Rotators Service Manual, part no. 6073955

## 4.4 Rotator Drive Check Valve

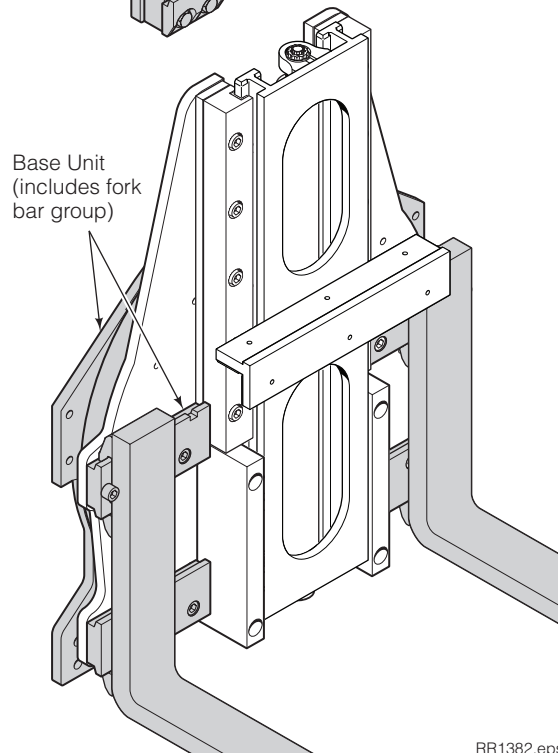
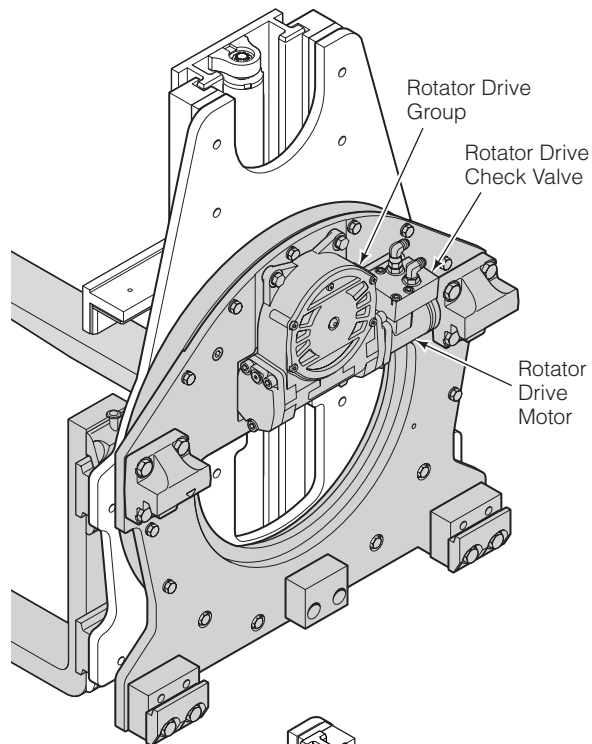
To service the rotator drive check valve, refer to one of the following service manual based on nameplate model number and/or serial number:

- D-Series 360° Rotators Service Manual, part no. 672946
- 30G, 40G 360° Rotators Service Manual, part no. 6089468
- 45G–100G 360° Rotators Service Manual, part no. 6073955

## 4.5 Base Unit

To service the base unit, refer to one of the following service manual based on nameplate model number and/or serial number:

- D-Series 360° Rotators Service Manual, part no. 672946
- 30G, 40G 360° Rotators Service Manual, part no. 6089468
- 45G–100G 360° Rotators Service Manual, part no. 6073955



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## 4.6 Bin Retainer Assembly

### 4.6-1 Arm Carrier Removal

The following procedures can be performed with the attachment mounted on the truck.

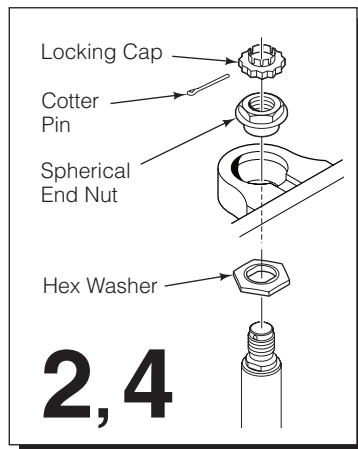


**WARNING:** Verify that the overhead hoist and chains or straps are rated for the weight of the attachment. Refer to nameplate for attachment weight.

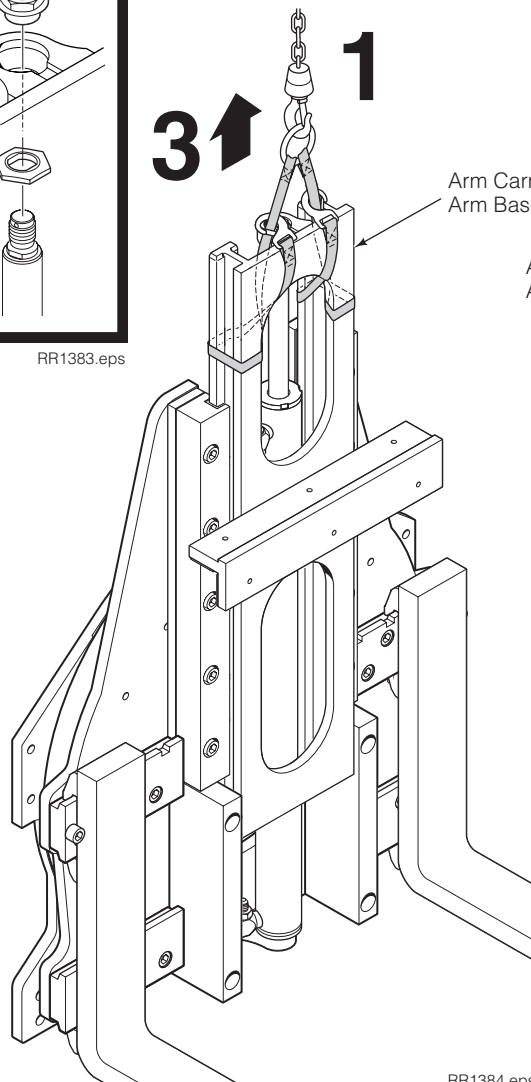
- 1 Attach an overhead hoist to the arm carrier. Take up slack in the chain.
- 2 Remove the cotter pin, locking cap and spherical end nut from the cylinder rod and arm carrier lug.
- 3 Remove the arm carrier through the top of the frame.

- 4 For reassembly, reverse the above procedure with the following exceptions:

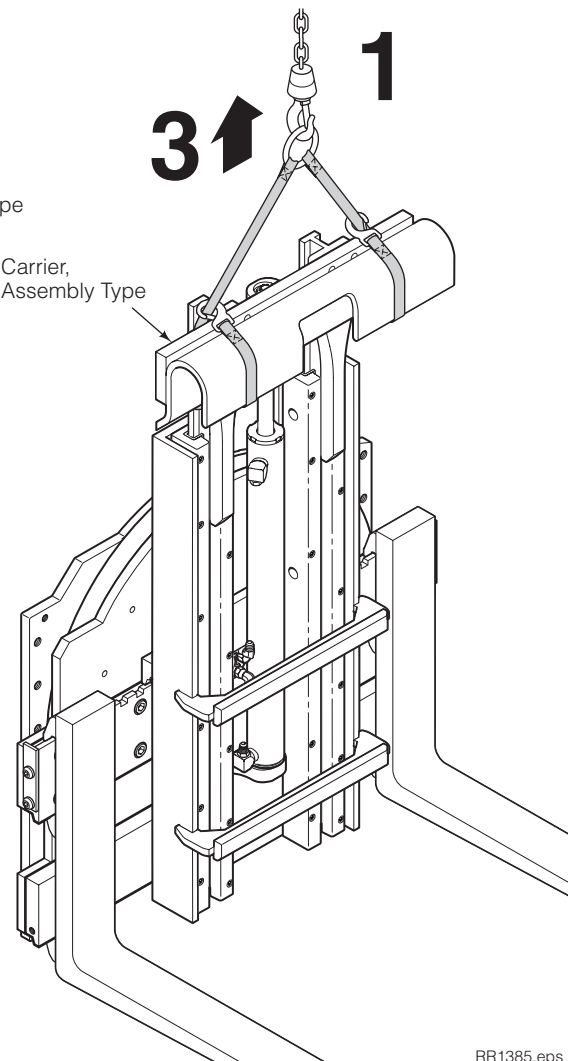
- Inspect bearings for wear. Bearing thickness should not be less than 0.125 in. (3 mm) on any part of the bearing. Install new bearing(s) as required.
- Install hex beveled washer on the rod end with the beveled side facing the arm carrier lug.
- Lubricate the cylinder rod threads, nut threads and spherical portion of the nut with wheel bearing grease.
- Tighten spherical nut to 200 ft.-lbs. (270 Nm). The nut will not be tight against the arm lug.
- Install locking caps with new cotter pins.



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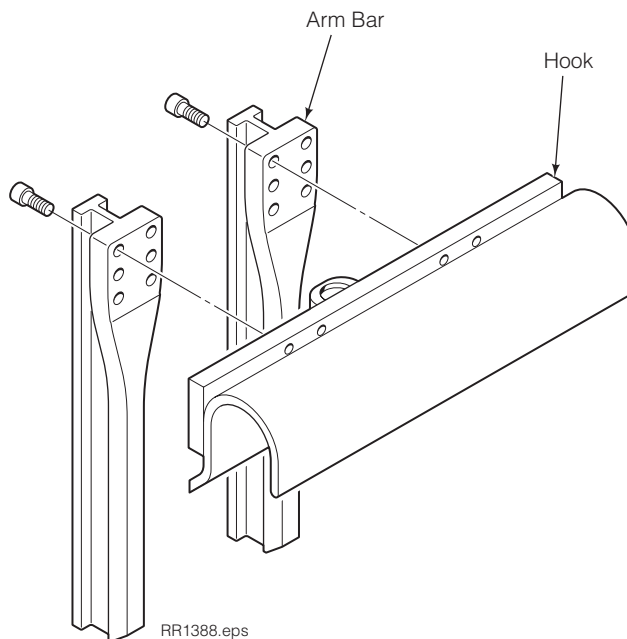
## 4.6-2 Arm Carrier Service

- 1 Remove the arm carrier from the attachment as described in Section 4.6-1.
- 2 Perform one or all of all following procedures as necessary.

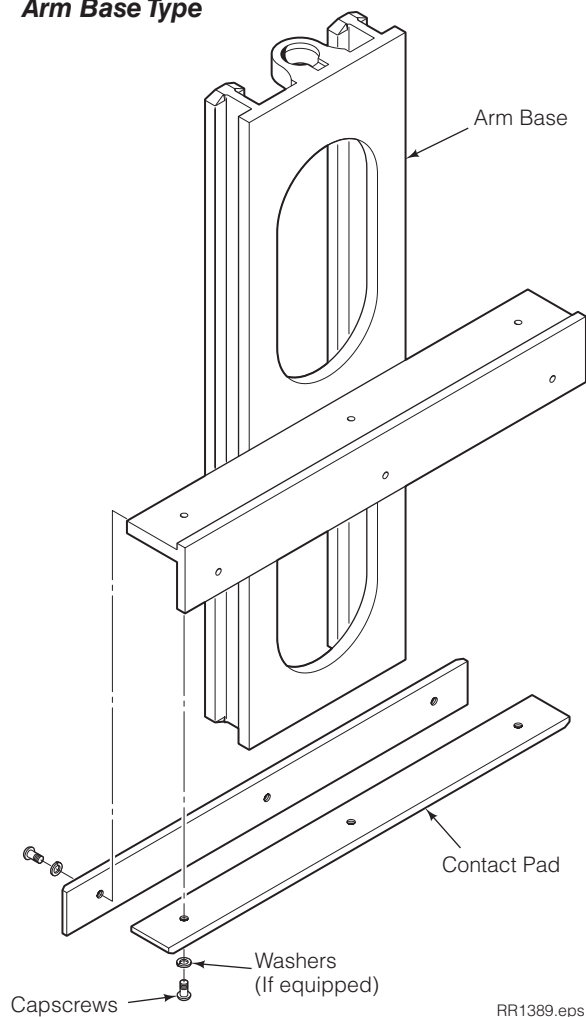
**Arm Assembly Service** – Remove the capscrews fastening the arm bars to the hook. For reassembly, tighten the capscrew to a torque of 320 ft.-lbs. (430 Nm).

**Contact Pad Service** – Remove the hardware fastening the contact pad to the arm base. Remove the contact pad (or pads). Install a new contact pad (or pads). Tighten capscrews to 14 ft.-lbs. (19 Nm).

**Arm Assembly Type**



**Arm Base Type**



## 4.6-3 Frame Bearing Removal and Installation

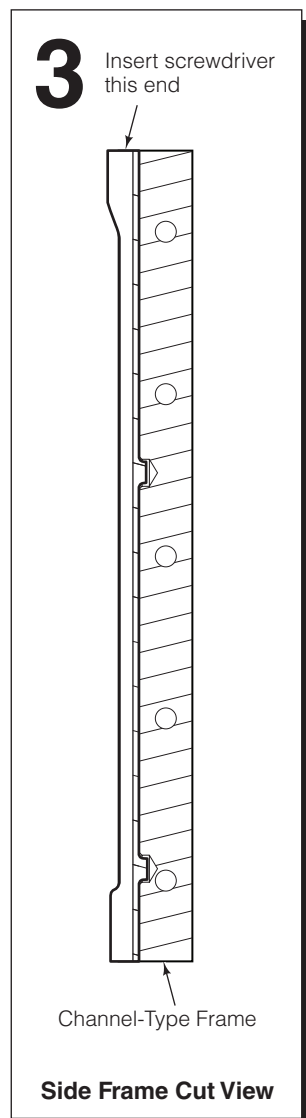
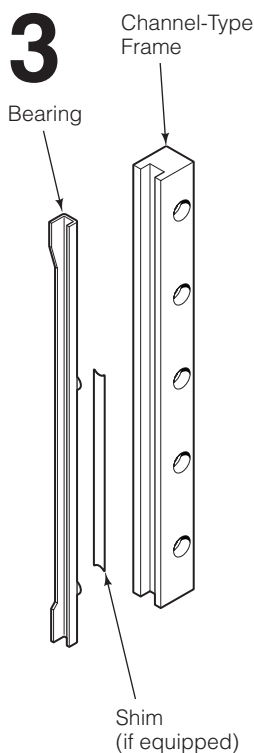
- 1 Remove the arm carrier as described in Section 4.6-1.
- 2 If equipped, remove the bearing spacer located between the bearings in the arm carrier slot.
- 3 Pry the bearing (or bearings) out of the frame with a screwdriver and slide outward.

**CAUTION:** Do not gouge frame surfaces.

**NOTE:** If equipped with multiple bearings, to ease removal of the first bearing from the frame, push the innermost boss out of its hole.

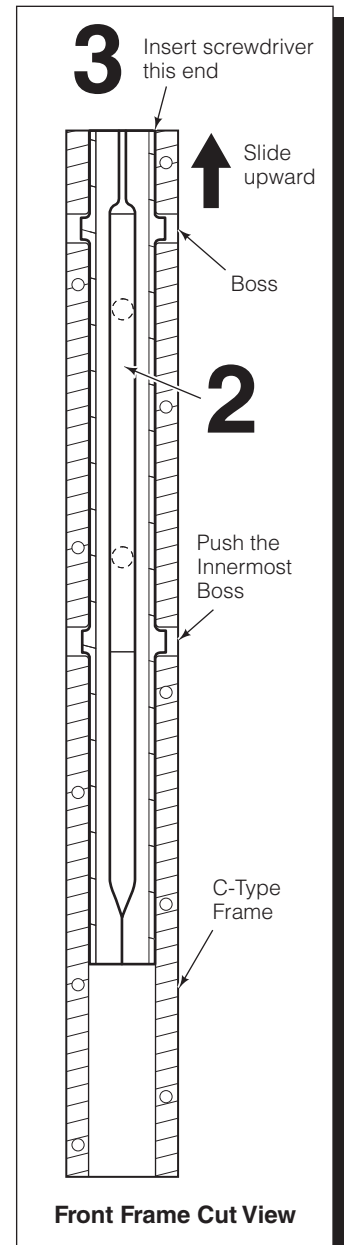
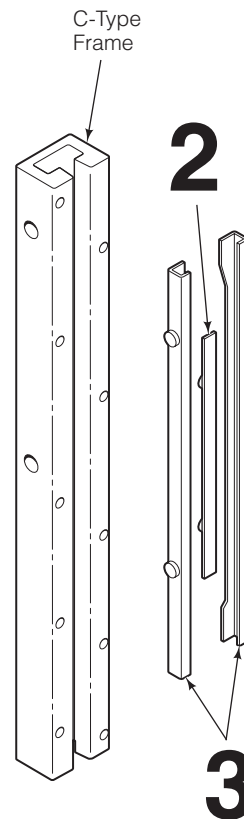
- 4 For reassembly, reverse the above procedures.

### Channel-Type Frame



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### C-Type Frame



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## 4.7 Bin Retainer Cylinder

### 4.7-1 Cylinder Removal

The following procedures can be performed with the attachment mounted on the truck.

- 1 Raise the arm assembly or arm base about half way.



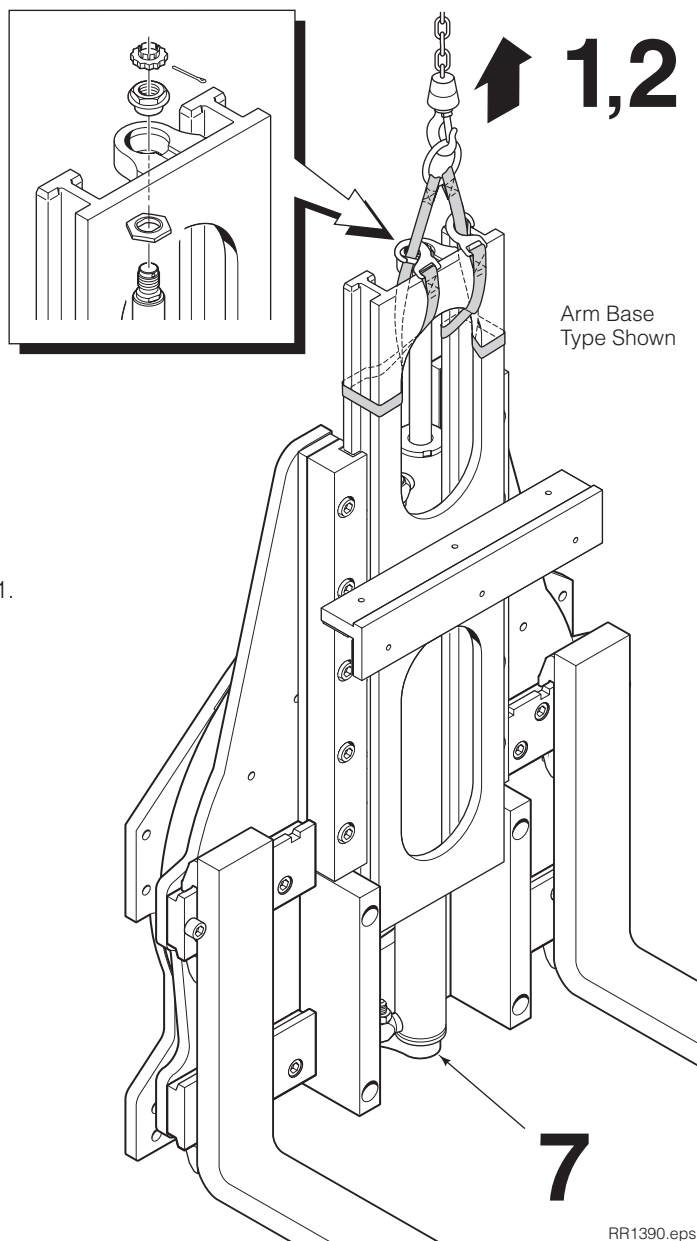
**WARNING:** Verify that the overhead hoist and chains or straps are rated for the weight of the attachment. Refer to nameplate for attachment weight.

- 2 Attach an overhead hoist to the arm carrier. Take up slack in the chain.
- 3 Remove the cotter pin, locking cap and spherical end nut from the cylinder rod and arm carrier lug.
- 4 If required, remove arm carrier to gain access to the cylinder. For arm carrier removal, refer to Section 4.6-1.
- 5 Fully retract the cylinder rod.

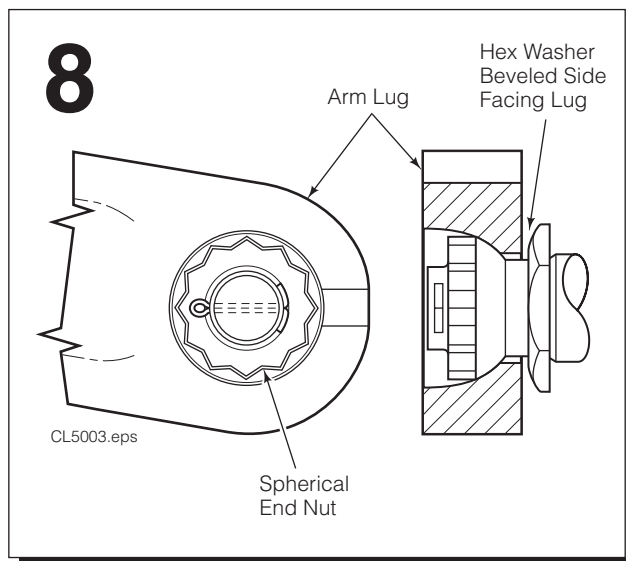


**WARNING:** Before removing hydraulic lines, relieve pressure in the hydraulic system. Turn the truck off and open the truck auxiliary control valves several times in both directions.

- 6 Disconnect and plug the hoses connected to the bin retainer cylinder. Tag hoses for reassembly.
- 7 Disconnect the cylinder base end. Remove the cotter pin, locking cap and spherical nut from the cylinder base and faceplate lug. Lift away from the frame.
- 8 For reassembly, reverse the above procedure with the following exceptions:
  - Lubricate the cylinder rod threads, nut threads and spherical portion of the nut with wheel bearing grease.
  - Install hex beveled washer on the rod end with beveled side facing the arm lug.
  - Tighten spherical nut to 250 ft.-lbs. (340 Nm). Tighten against hex washer. The nut will not be tight against the arm lug.
  - Install locking caps with new cotter pins.
  - Make sure anti-roll pin is installed in cylinder base end.

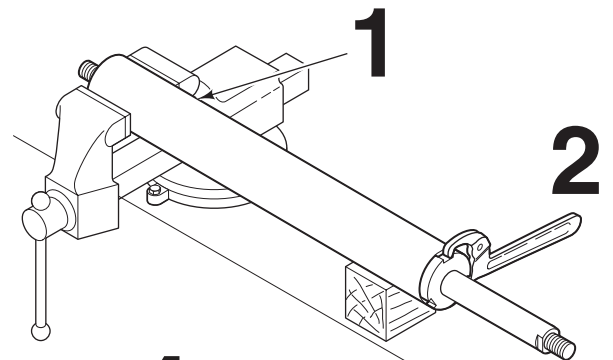


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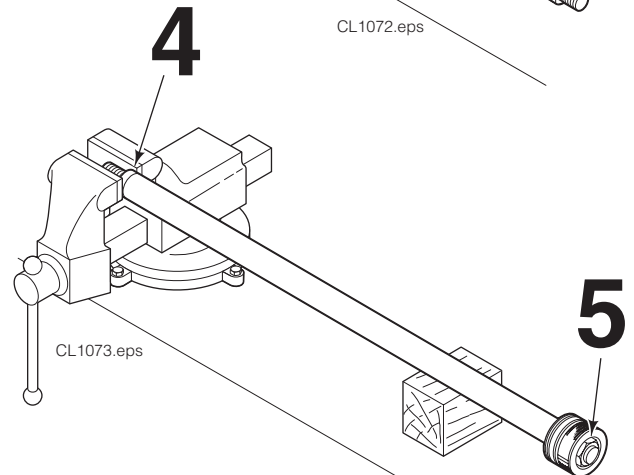


## 4.7-2 Cylinder Disassembly

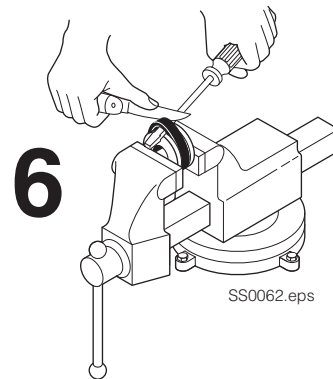
- 1 Clamp the cylinder in the soft-jawed vise at the extreme head end only. Do not clamp on the shell.
- 2 Remove the retainer using a claw-type spanner wrench (Cascade Part No. 678598), as shown.
- 3 Remove the rod/piston assembly from the cylinder.
- 4 To remove the piston, clamp the rod assembly in a vise on the wrench flats, as shown. **CAUTION:** Do not clamp on the cylinder rod sealing surface.
- 5 Remove the piston nut and remove the piston from the cylinder rod.
- 6 Place the piston or retainer in a soft-jawed vise to remove seals. Pry the seals or O-rings up with a brass seal removal tool (Cascade Part No. 674424) and cut the seals to remove them. **CAUTION:** Do not scratch seal grooves.



CL1072.eps



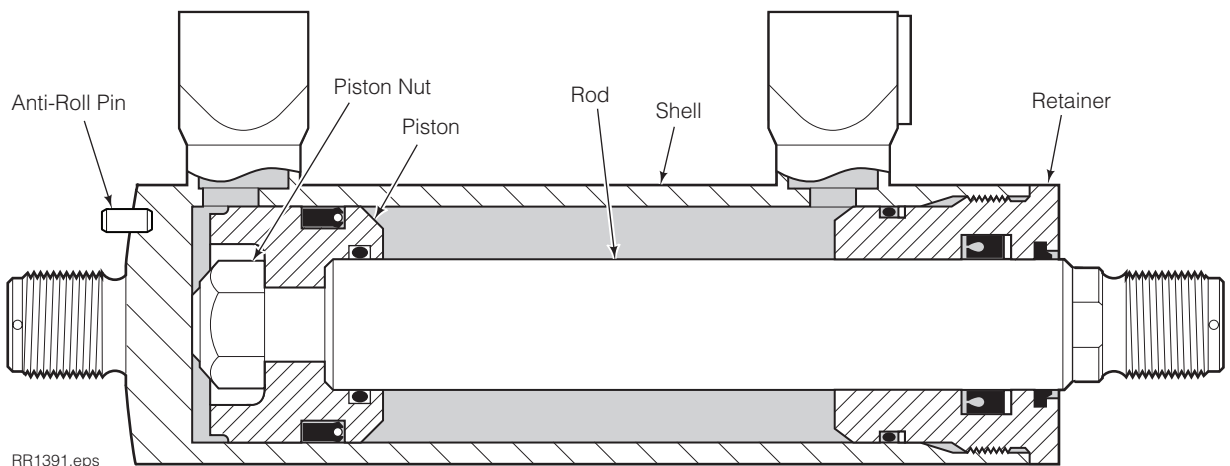
CL1073.eps



SS0062.eps

## 4.7-3 Cylinder Inspection

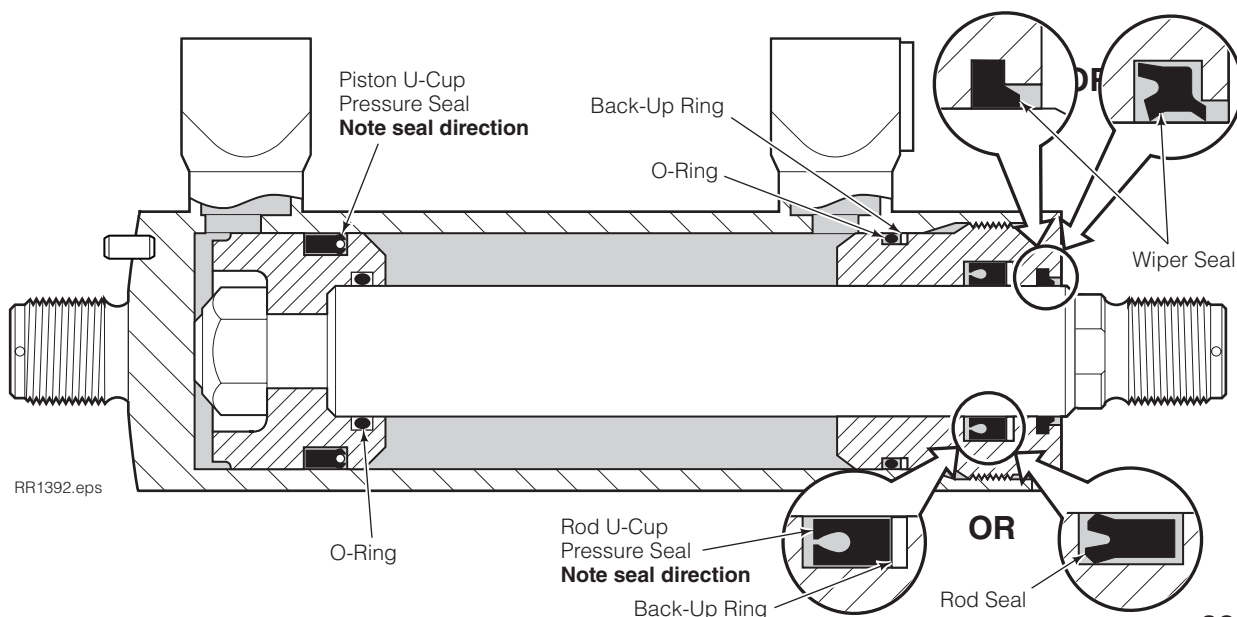
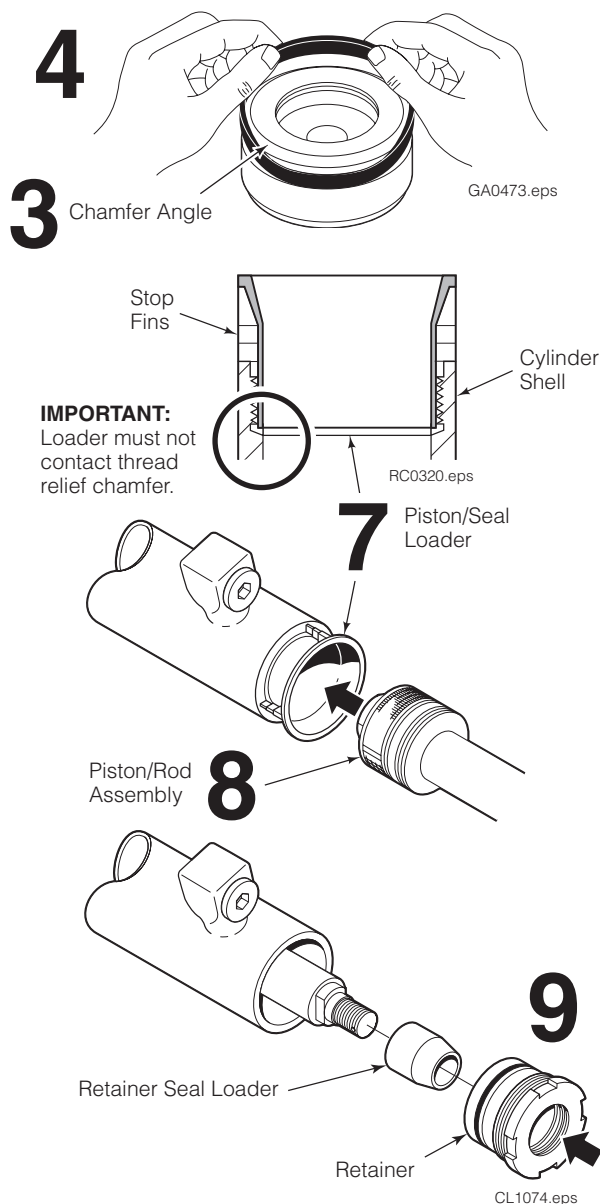
- Inspect the rod, piston and retainer for nicks or burrs. Minor nicks or burrs may be removed with 400-grit emery cloth. If they cannot be removed, replace the parts.
- Inspect the cylinder bore and remove any minor nicks or burrs with a butterfly hone. If they can not be removed, replace the part.
- Inspect the outside of the shell for any deformities or damage that could impair performance or cause leaks under pressure. If necessary, replace the part.
- Inspect the rod end anchor parts for wear and replace as necessary.
- Inspect anti-roll pin for wear or looseness and replace as necessary.



RR1391.eps

## 4.7-4 Cylinder Reassembly

- 1 Lubricate all new seals and O-rings with petroleum jelly.
- 2 Note the direction of the U-cup seals. Pressure seals must be installed with the lip toward the high pressure side of the cylinder.
- 3 Polish the piston and retainer chamfer angles with 400-grit emery cloth to ease seal installation.
- 4 Install a new seal and O-ring on the piston. Install the piston seal from the rod end side of the piston by hooking one side into the groove and carefully working the seal over the piston as shown.
- 5 Install a new rod seal, back-up ring (if equipped), and wiper seal in the retainer ID, and a new O-ring and back-up ring on the retainer OD, as shown. **NOTE:** Use internal seal installation tool (Cascade Part No. 599512) to ease seal installation. If installing by hand, form the seal into a 'kidney' shape and position into the internal groove. Use finger pressure to smooth the seal into the groove.
- 6 Apply petroleum jelly to the piston internal O-ring and install the piston on the rod. Tighten the nut to 52 ft.-lbs. (70 Nm).
- 7 Place the piston loader into the cylinder shell.  
**IMPORTANT:** The loader must cover all of the shell threads but not contact the thread relief chamfer. If necessary, trim the stop fins for a correct fit. The piston will not enter the shell if the loader contacts the thread relief chamfer.
- 8 Apply a thick film of petroleum jelly to the piston, shell and loader. Using a rubber mallet, tap the piston/rod assembly into the cylinder shell.
- 9 Place the retainer loader over the rod end threads. Apply petroleum jelly to the retainer ID and slide it onto the rod. Remove the loader and screw the retainer into the shell. Tighten the retainer to 92 ft.-lbs. (125 Nm).



## 4.8 Revolving Connection

### 4.8-1 Removal and Installation

- 1 Remove the attachment from the lift truck as described in Section 4.1.



**WARNING:** Before removing hydraulic lines, relieve pressure in the hydraulic system. Turn the truck off and open the truck auxiliary control valves several times in both directions.

- 2 Disconnect the hoses from the body and end block of the revolving connection. Tag the hoses for reassembly.
- 3 If equipped, remove the bracket supporting the end block on the rear of the revolving connection. For reassembly, tighten the capscrews to one of the following torque values:

**Flange, Type 1 only** – 14 ft.-lbs. (19 Nm)

**Bracket Pin** – 31 ft.-lbs. (42 Nm)

- 4 Remove the capscrews fastening the revolving connection to the faceplate. For reassembly, tighten the capscrews to one of the following torque values:

**Flange Type** – 14 ft.-lbs. (19 Nm)

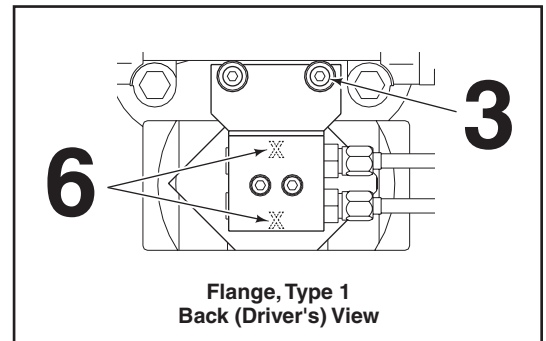
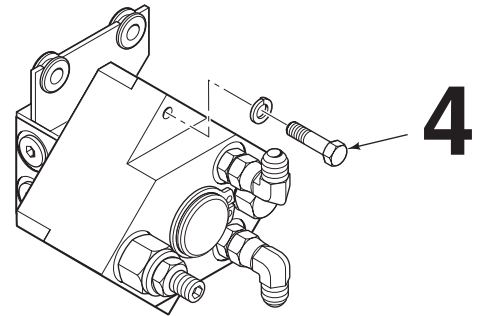
**Bracket Pin** – 31 ft.-lbs. (42 Nm)

- 5 Note the orientation and position of hydraulic connections of the revolving connection body and the end block (note x). Remove the revolving connection from the backside of the attachment.

- 6 For reassembly, reverse the above procedures except as follows:

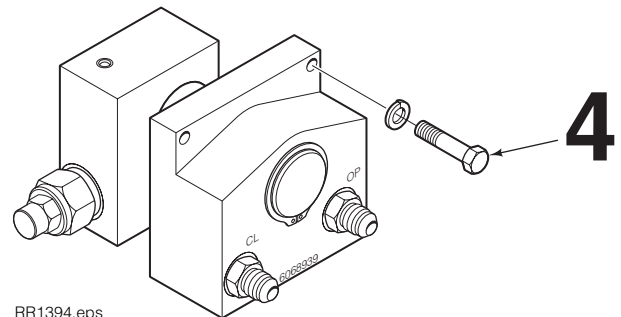
- If the end block has an "X", install the "X" in original position.

**FLANGE, TYPE 1**



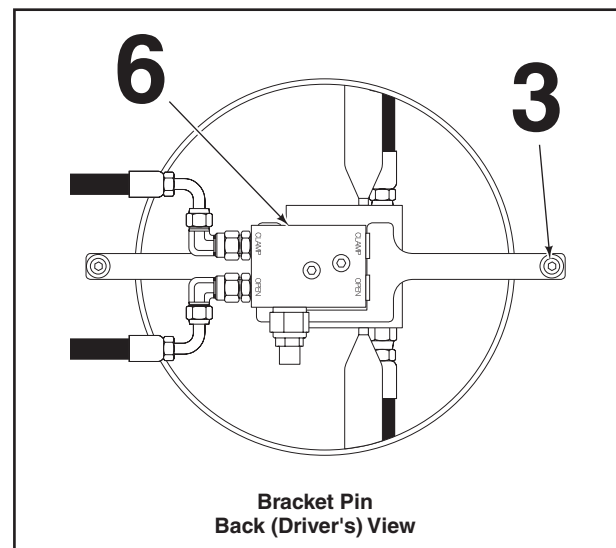
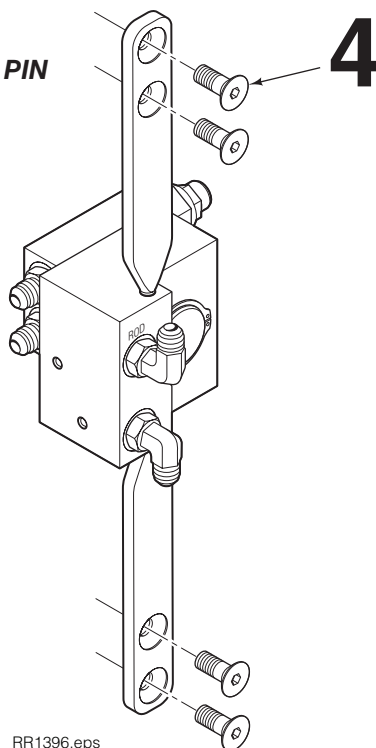
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**FLANGE, TYPE 2**



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**BRACKET PIN**



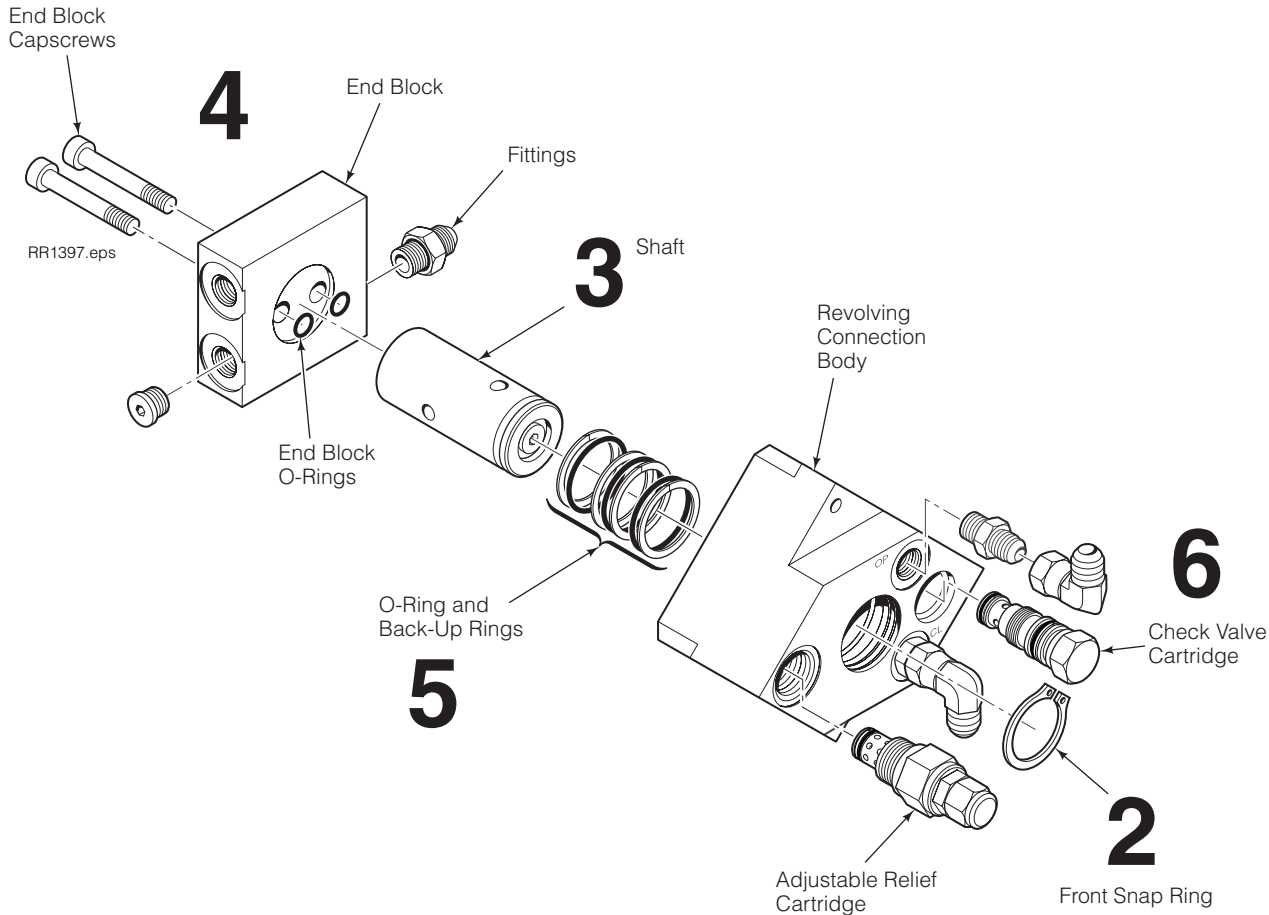
## 4.8-2 Revolving Connection Service

- 1 Remove the revolving connection from the attachment as described in Section 4.8-1.
- 2 Remove the snap ring from the front of the shaft.
 

**CAUTION:** Remove all burrs and paint from exposed shaft surface prior to removal from the body. **Burrs or paint chips pulled through the bore will permanently destroy the valve body.**
- 3 Remove the shaft from the body.
- 4 Remove the end block from the shaft and remove the relief cartridge (if equipped). For reassembly, use O-ring lube or petroleum jelly to hold the O-rings in place between the shaft and end block. Tighten the capscrews to a torque of 15 ft.-lbs. (20 Nm).
- 5 Remove the two-piece seals or O-rings and back-up rings from the revolving connection body using brass hook-type tool (Cascade part no. 674424) or a small flat blade screwdriver.
 

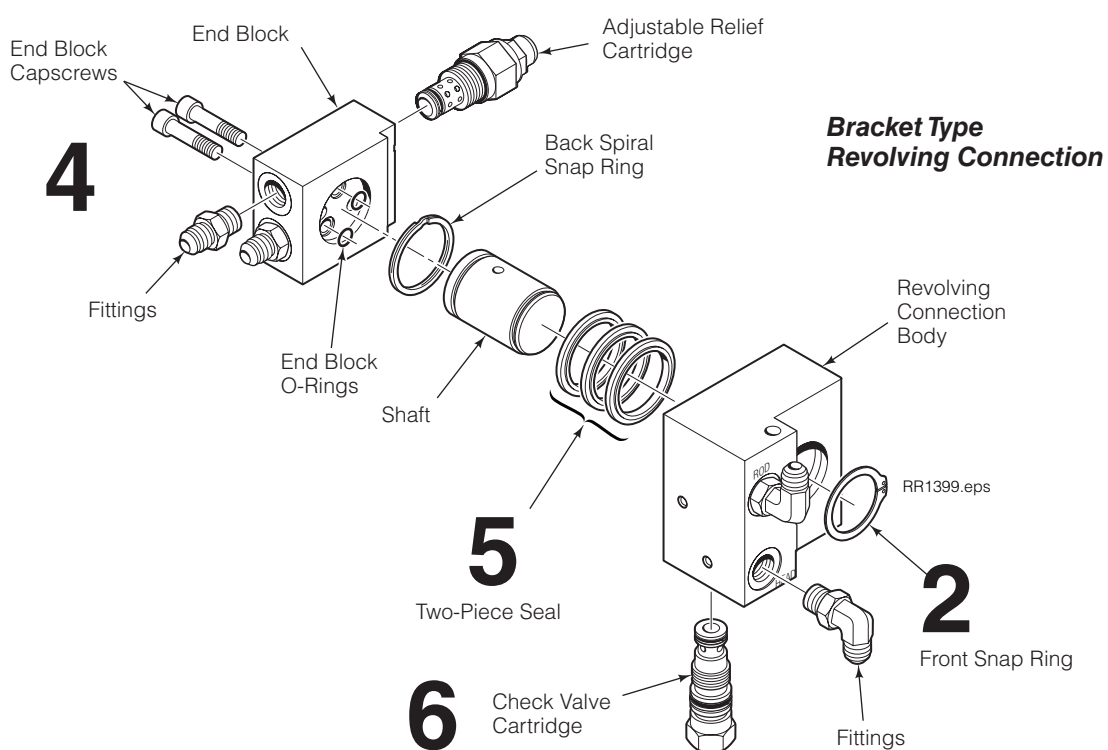
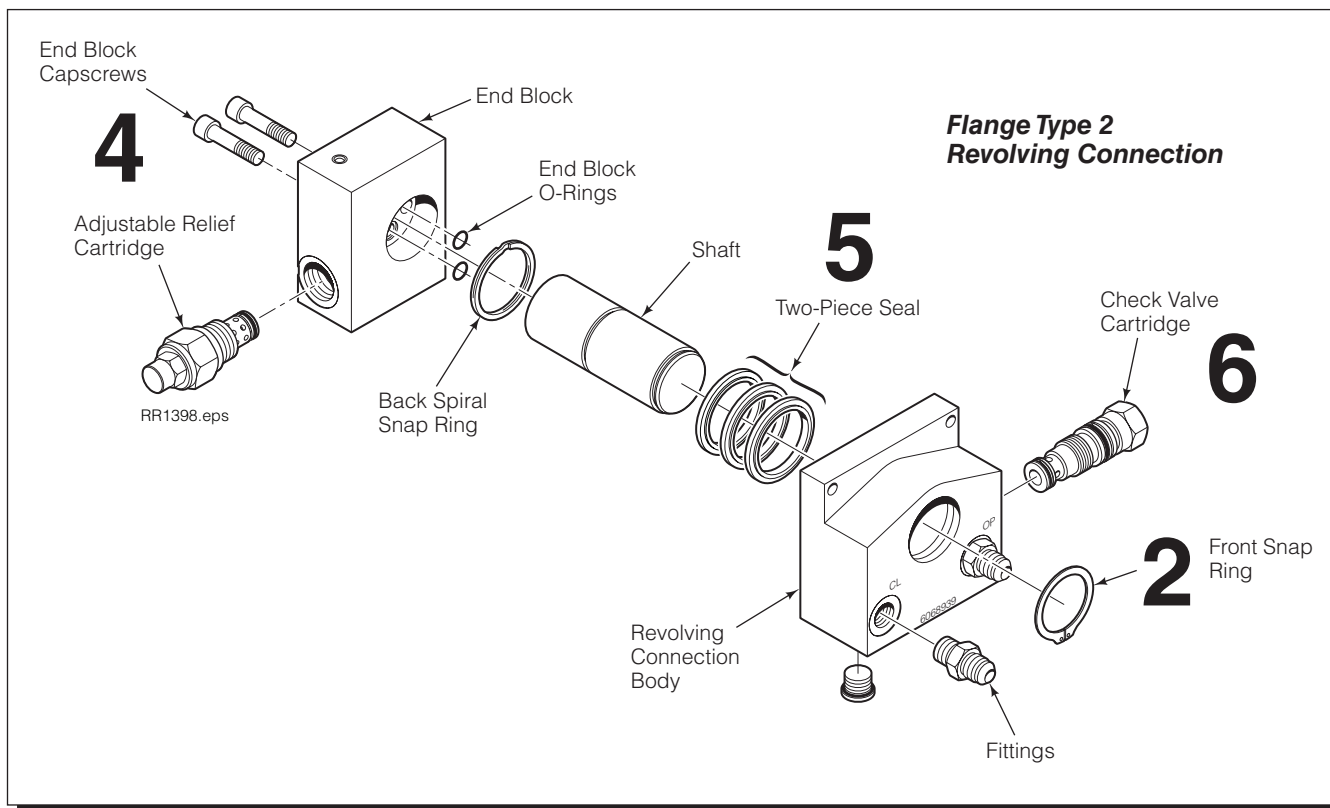
**NOTE:** Do not scratch or damage groove surfaces.
- 6 Remove the cartridges from the revolving connection body.
- 7 Remove the cartridge O-rings and back-up rings.
- 8 Clean all parts with clean solvent and inspect the following areas:
  - Check the sealing surface of the shaft for minor surface imperfections. Remove with 320-grit emery paper. Sand the shaft radially (around), not along the length. Break the edges on the outer end of the shaft and the snap ring grooves with 320-grit emery paper. If severely worn, replace the shaft.
  - Check the seal grooves in the body for sharp nicks or projections. Remove minor imperfections with 320-grit emery paper. If severely worn, replace the body.

### Flange Type 1 Revolving Connection





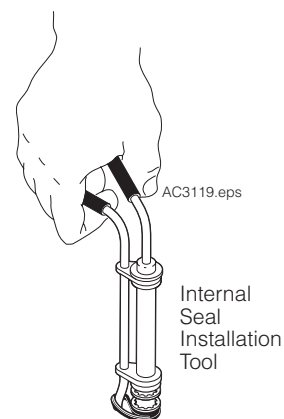
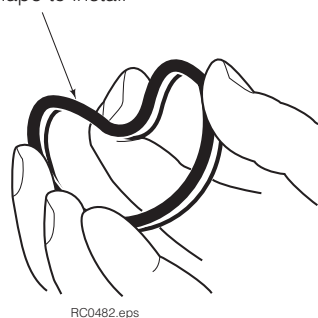
## 4.8-2 Revolving Connection Service (Continued)



## 4.8-2 Revolving Connection Service (Continued)

- 9 For reassembly, reverse the previous procedures with the following exceptions:
- Clean all traces of oil and moisture from the seal grooves inside the revolving connection body using a non-petroleum based cleaner. Example: electronic contact cleaner.
  - Clean hands thoroughly to remove all traces of oil and moisture prior to seal installation.
  - For body equipped with O-Ring and Back-Up Ring: Install new back-up rings and O-rings, as shown.
  - For body equipped with 2-Piece Seal:
    - A) Install the square rubber rings into the revolving connection body grooves.
    - B) Install the Teflon rings on top of the rubber rings.
- IMPORTANT:** Form the seals into a 'kidney' shape as shown to install. Avoid sharp bends. Press the seals into the grooves using finger pressure.
- Lubricate the shaft and body with hydraulic fluid prior to reassembly.
  - Rotate the body and apply gentle pressure when installing the shaft to prevent damage to the seals.
  - Install new O-rings and back-up rings on the cartridges, as shown.

Form seals into 'kidney' shape to install



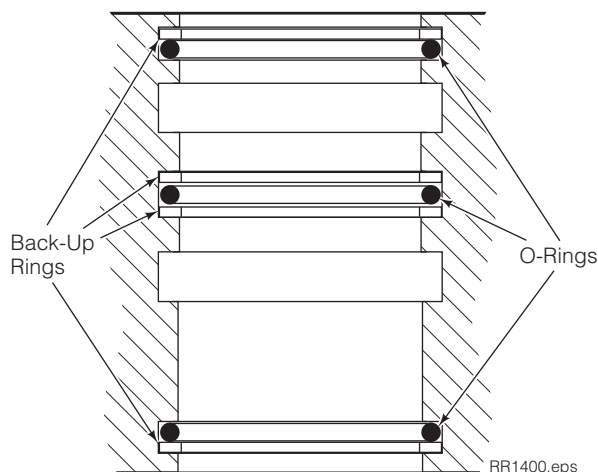
**CAUTION:** Two-piece shaft seals must be installed dry to work properly.

**Clean all traces of hydraulic fluid and moisture from the seal grooves inside the revolving connection body using a non-petroleum based electronics contact cleaner.**

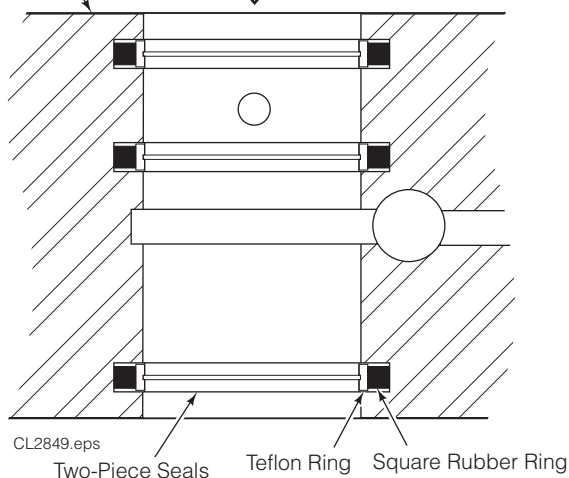
Clean hands thoroughly.

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Revolving Connection Body

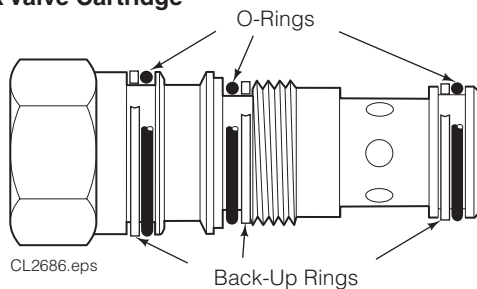


Body equipped with O-Ring and Back-Up Ring

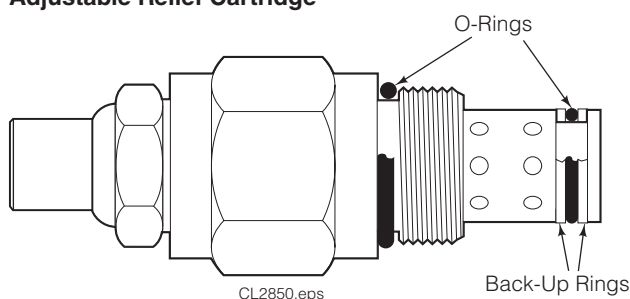


Body equipped with 2-Piece Seal

### Check Valve Cartridge



### Adjustable Relief Cartridge



## 4.9 Valves

### 4.9-1 Valve Removal



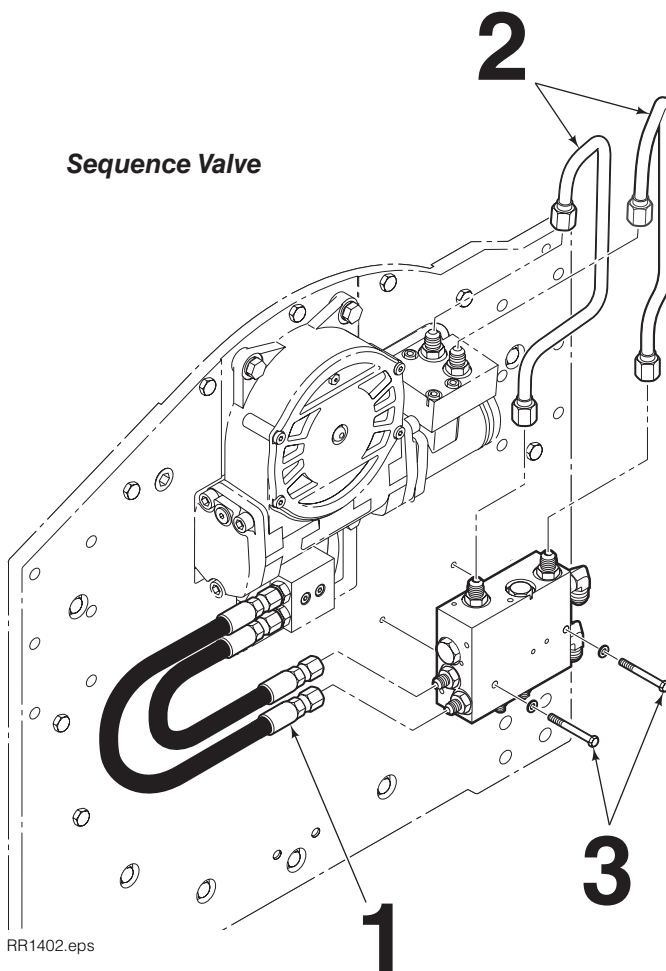
**WARNING:** Before removing hydraulic lines, relieve pressure in the hydraulic system. Turn the truck off and open the truck auxiliary control valves several times in both directions.

- 1** Disconnect the hydraulic hoses to the valve. Tag hoses for reassembly.
- 2** Disconnect the tubes to the drive box valve and valve. Tag for reassembly.
- 3** Remove the hardware fastening the valve to the rotator baseplate. For reassembly, tighten the capscrews to one of the following torque values:

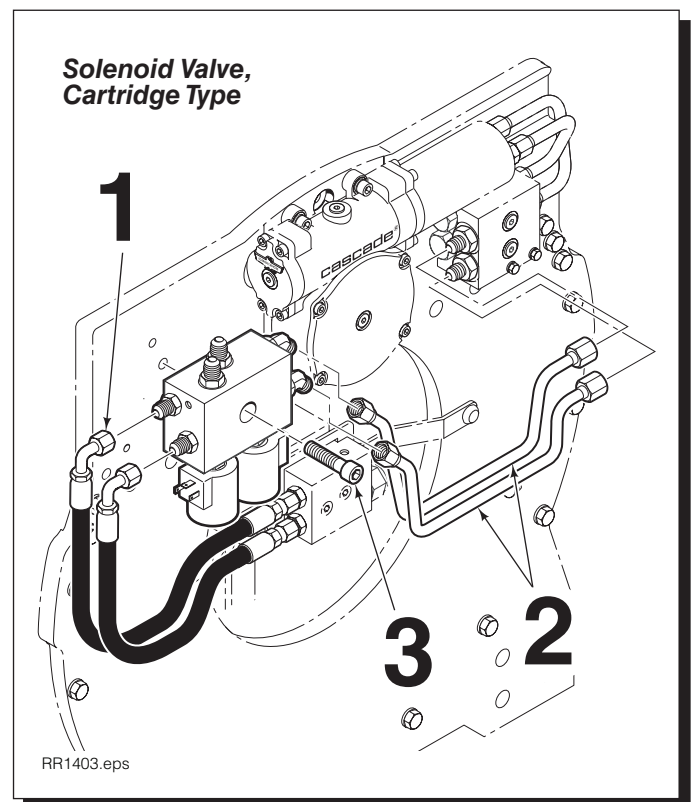
**Sequence Valve** – 6 ft.-lbs. (8 Nm)

**Solenoid Valve** – 30 ft.-lbs. (40 Nm)

**Sequence Valve**

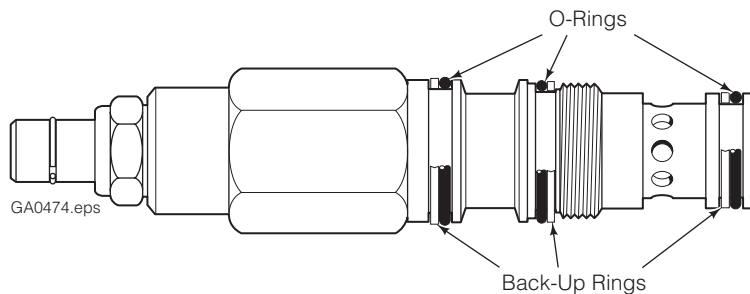
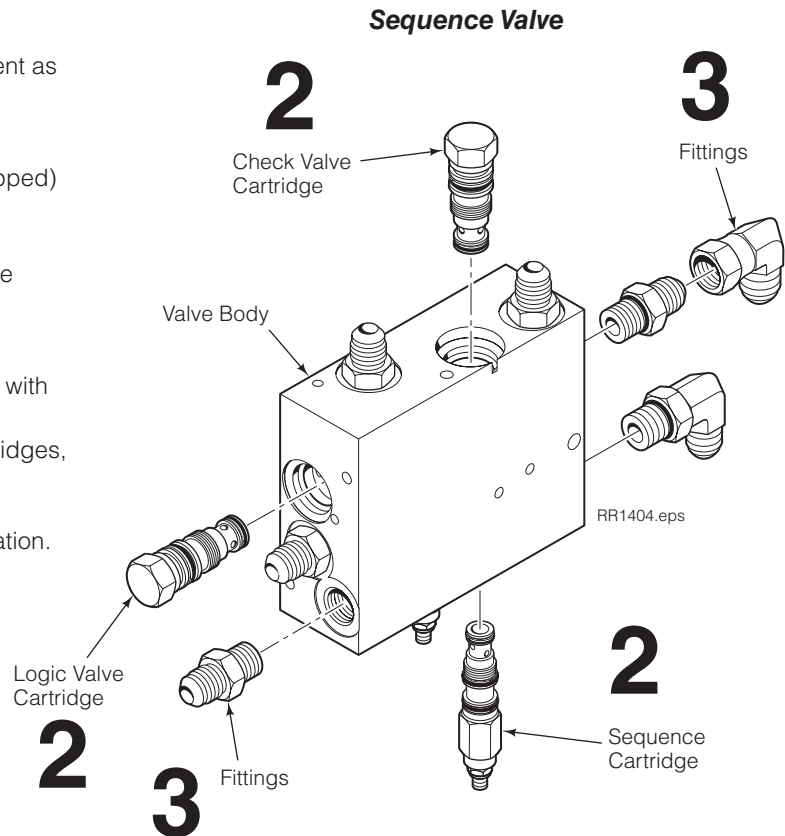


**Solenoid Valve,  
Cartridge Type**

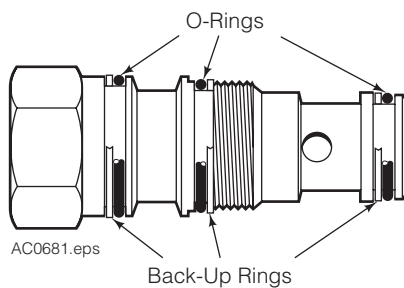


## 4.9-2 Valve Service

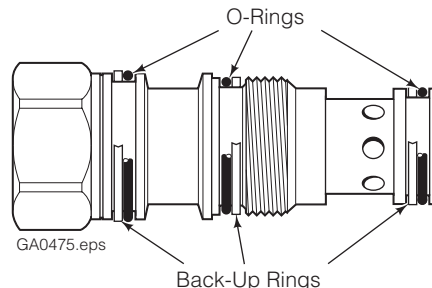
- 1** Remove the sequence valve from the attachment as described in Section 4.9-1.
- 2** Remove the cartridges from the valve.
- 3** Remove the remaining threaded plugs (if equipped) and fittings. Valve body must be completely stripped for proper cleaning.
- 4** Remove the O-rings and back-up rings from the cartridges.
- 5** Clean all parts with cleaning solvent.
- 6** For reassembly, reverse the above procedures with the following exceptions:
  - Replace O-rings and back-up rings on cartridges, as shown.
  - Lubricate cartridges, fittings and plugs with O-ring lube or petroleum jelly prior to installation.



**Sequence Cartridge**



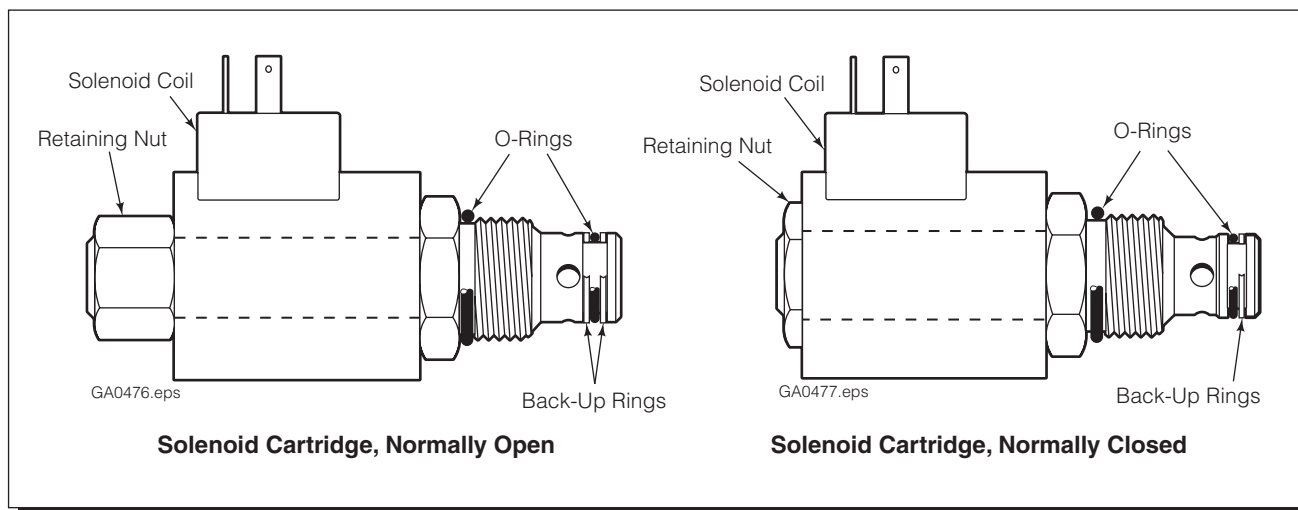
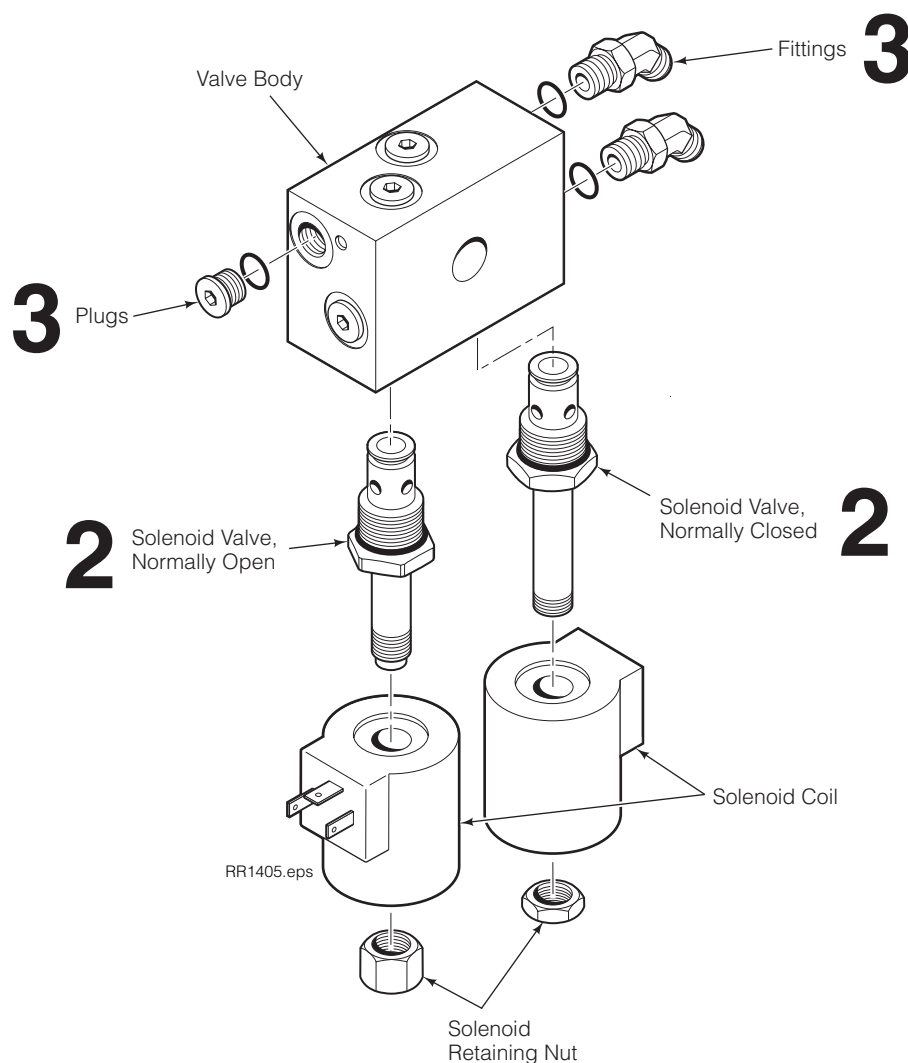
**Check Valve Cartridge**



**Logic Valve Cartridge**

## 4.9-2 Valve Service (Continued)

### Solenoid Valve, Cartridge Type



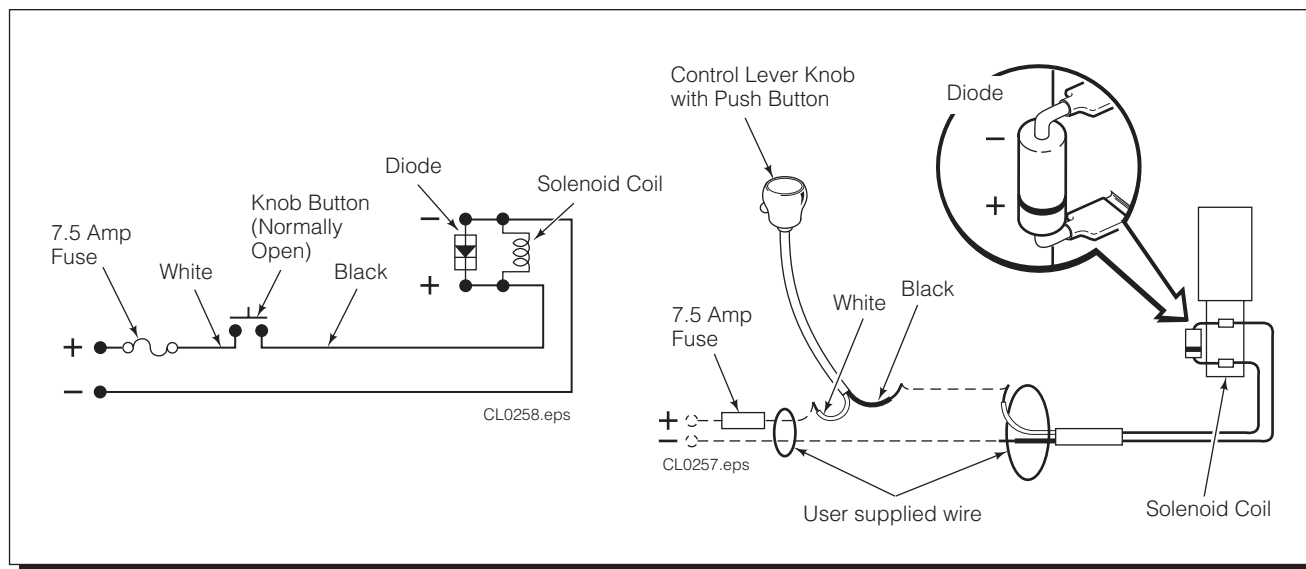
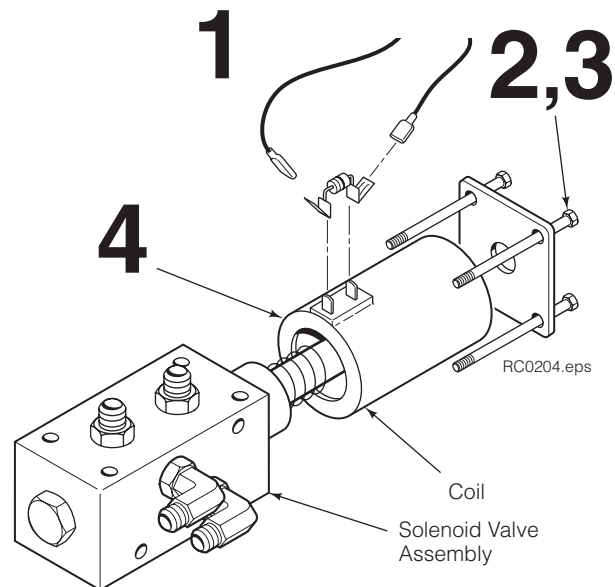
## 4.10 Solenoid

### 4.10-1 Coil Service

- 1 Disconnect the wires and diode from the coil terminals.
- 2 Remove the end cover capscrews. Remove the end cover and coil.
- 3 Install the new coil and end cover. Make sure that the terminals are positioned correctly.
- 4 For reassembly, reverse the above procedures except as follows:
  - Refer to the electrical schematic below for correct wire and diode installation.

### 4.10-2 Valve Service

- Check the plunger within the valve body for freedom of movement. Press end button on coil to assure that valve is not jammed or damaged. If problems are found, replace the solenoid valve as a complete assembly.



## 5.1 Specifications

For ROTATE function and truck carriage Specifications, refer to one of the following Service Manuals based on nameplate model number and/or serial number:

- D-Series 360° Rotators Service Manual 672946
- 30G, 40G 360° Rotators Service Manual 6089468
- 45G–100G 360° Rotators Service Manual 6073955

### 5.1-1 Hydraulics

#### Truck Relief Setting

2300 psi (160 bar) Maximum

#### Truck Flow Volume<sup>①</sup>

D & G-Series	Min. <sup>②</sup>	Recommended	Max. <sup>③</sup>
<b>Stabilize</b>	1 GPM (4 L/min.)	2 GPM (8 L/min.)	4 GPM (16 L/min.)

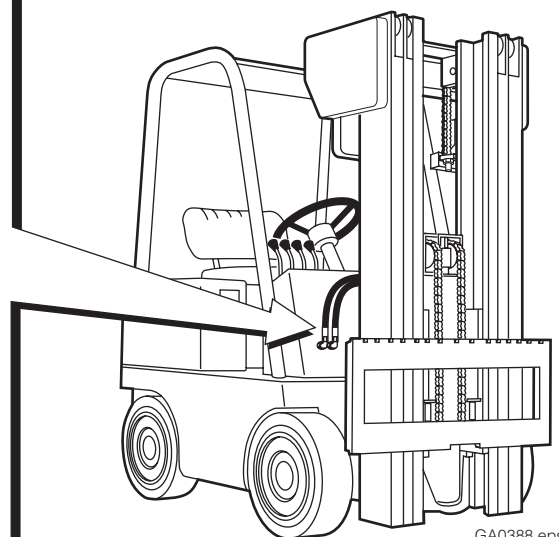
① Cascade Hydraulic Bin Retainers are compatible with SAE 10W petroleum base hydraulic fluid meeting Mil. Spec. MIL-0-5606 or MIL-0-2104B. Use of synthetic or aqueous base hydraulic fluid is not recommended. If fire resistant hydraulic fluid is required, special seals must be used. Contact Cascade.

② Flow less than recommended will result in reduced system performance.

③ Flow greater than maximum can result in excessive heating, reduced system performance and short hydraulic system life.

#### Hoses and Fittings

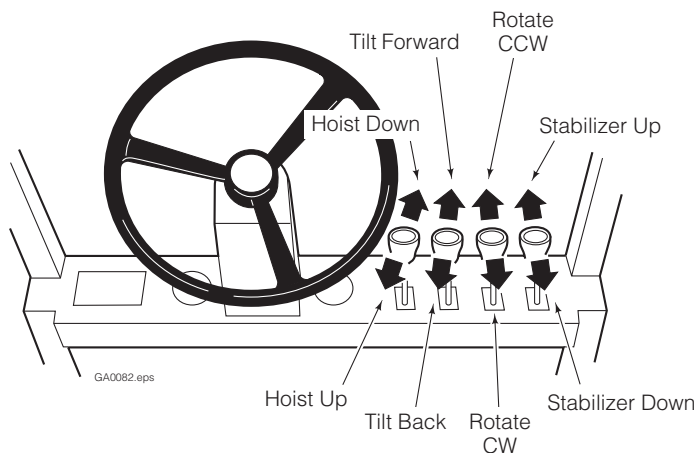
Hoses and fittings for the STABILIZE function must be No. 8 minimum with a 13/32 in. (10 mm) minimum ID.



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### 5.1-2 Auxiliary Valve Functions

Check for compliance with ANSI/ITSDF (ISO) standards:



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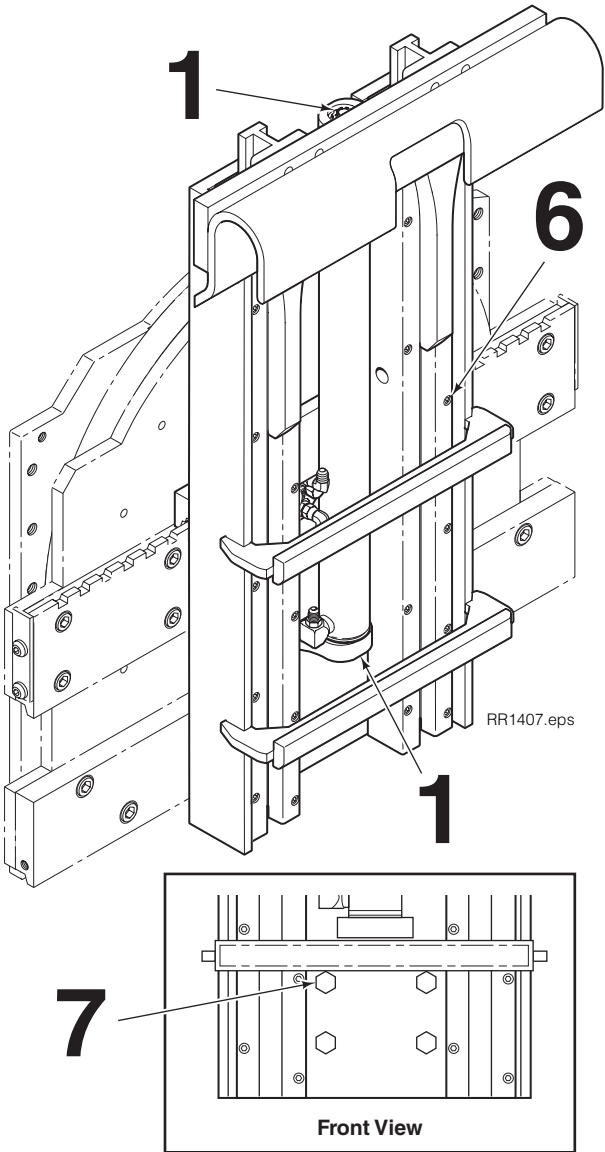
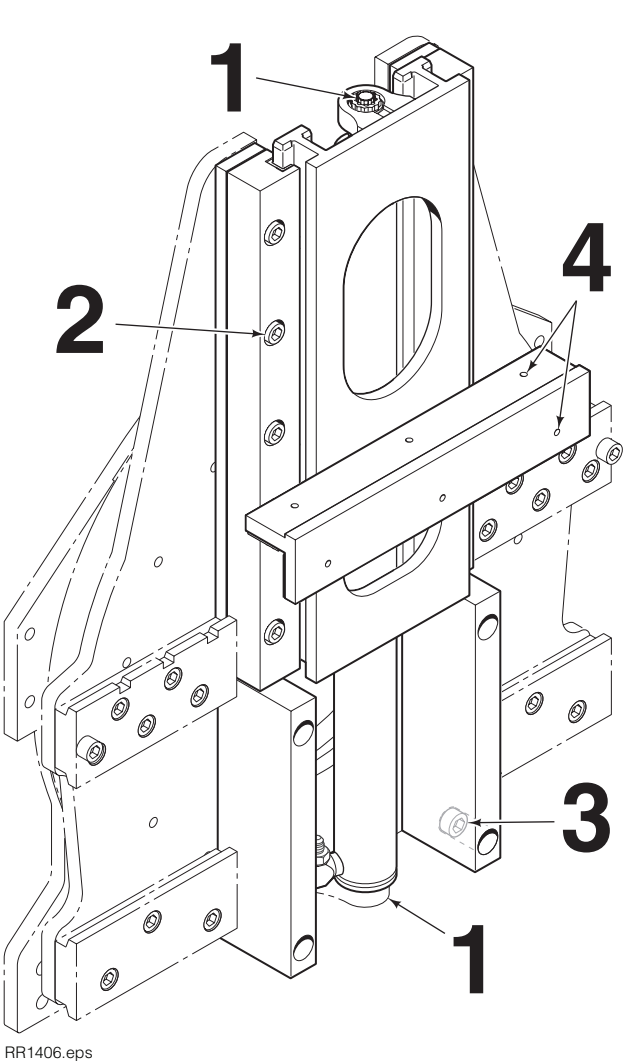
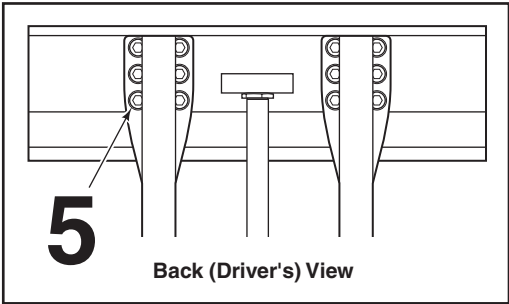
# SPECIFICATIONS

## 5.1-3 Torque Values

Fastener torque values for Cascade Hydraulic Bin Retainers are shown in the table below in US and metric units. All torque values are also called out in each specific service procedure section through out the manual.

**NOTE:** All fasteners have a torque value range of  $\pm 10\%$  of stated value.

Ref	Fastener Location		Size	ft.-lbs.	Nm
1	Cylinder End Nut		—	250	340
2	Channel-Type Frame Capscrews	30G, 40G	M16	200	275
		45G-100G	M16	250	340
3	Bumper Capscrews		M16	250	340
4	Contact Pad Capscrews		M8	14	19
5	Arm Bar Capscrews		5/8	320	430
6	C-Type Frame Capscrews		5/16	13	18
7	Mounting Plate Capscrews, D-Series		5/8	113	153





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