

INSTALLATION INSTRUCTIONS

and PERIODIC MAINTENANCE

20G

***Rotator & Rotator with
Bin Retainer***

Manual Number 6905856-R1

**cascade[®]
corporation**

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IMPORTANT: Field alterations may impair performance or capability and could result in loss of warranty. Consult Cascade for any required modifications.


INTRODUCTION

This manual provides installation instructions and periodic maintenance requirements for Cascade 20G Rotators and Rotators with Bin Retainer.

In any communication about the attachment refer to the product catalog and serial numbers stamped on the nameplate, as shown. If the nameplate is missing, the numbers can be found stamped on the left front side of the faceplate between the fork bars.

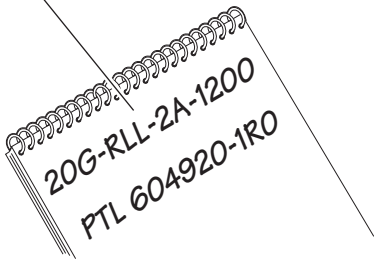
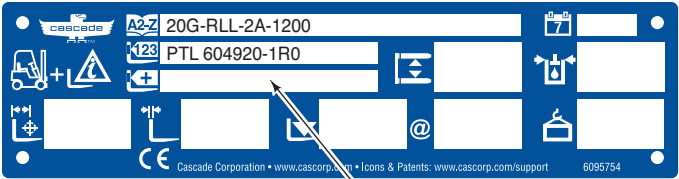
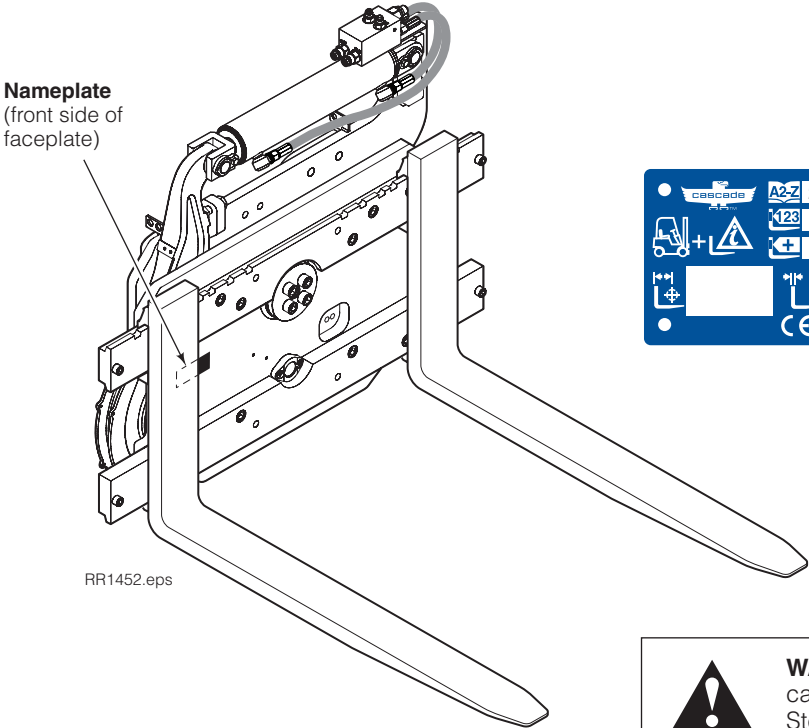
IMPORTANT: All hoses, tubes and fittings on 20G Rotators are JIC.


NOTE: Specifications are shown in both US and (Metric) units. All fasteners have a torque value range of $\pm 10\%$ of stated value.



WARNING: Rated capacity of the truck/attachment combination is a responsibility of the original truck manufacturer and may be less than shown on the attachment nameplate. Consult the truck nameplate.

WARNING: Do not operate this attachment unless you are a trained and authorized lift truck driver.





WARNING: Fork size affects attachment capacity. Refer to Installation Section, Step 12. Verify capacity for truck nameplate.

SPECIAL DEFINITIONS

The statements shown below 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 special information that is useful when servicing the attachment.



WARNING - A statement preceded by a 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 the job easier.

RESIDUAL HAZARDS

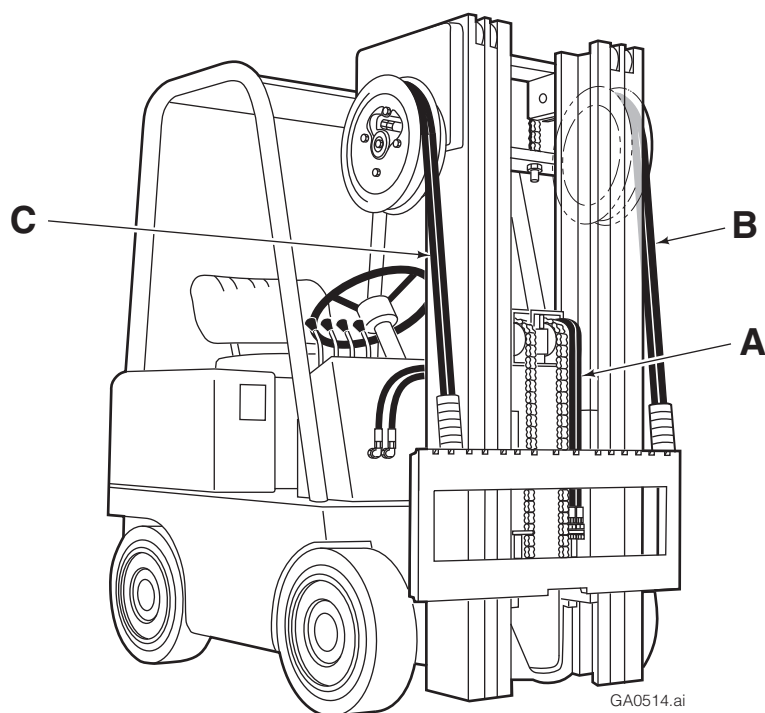
The attachment has been designed to prevent risks during the movement, installation and operation. There are, however, some residual hazards:

- Hazard of crushing between the truck's front structure and the mast when completely tilted backwards.
- Hazard of shearing between the truck's front structure and mast components that move vertically with the mast completely tilted backwards.
- Hazard of shearing between the attachment frame and forks.
- Hazard of crushing during fork service procedures.
- Hazard of crushing during cylinder service procedures.
- Hazard of crushing during installation and maintenance operations.

HYDRAULIC SUPPLY

20G Rotators provide the best performance with one of the hydraulic supply arrangements shown. Refer to *Cascade Hose and Cable Reel Selection Guide*, Part No. 212199, to select the correct hose reel for the mast and truck.

The hose and fitting requirements are No. 6 with .28 in. (7 mm) minimum ID



Standard

A LH Single Internal Hose Reeving Group

OR

B LH THINLINE™ 2-Port Hose Reel Group

Sequence Valve Equipped

C RH THINLINE™ 2-Port Hose Reel Group

OR

B LH THINLINE™ 2-Port Hose Reel Group

TRUCK REQUIREMENTS

Truck Relief Setting

2600 psi (180 bar) Maximum

Truck Flow Volume ^①

	Min. ^②	Recommended	Max. ^③
20G	4 GPM (15 L/min)	5 GPM (19 L/min)	8 GPM (30 L/min)

① Cascade Rotators 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 a rotate speed less than 2 RPM.

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

Hoses and Fittings

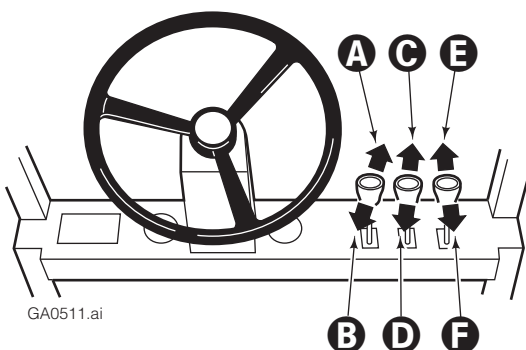
No. 6 with .28 in. (7 mm) minimum ID

A	Carriage Mount Dimension (A) ANSI (ISO)	
	Minimum	Maximum
Class II	14.94 in. (380.0 mm)	15.00 in. (381.0 mm)
Class III	18.68 in. (474.5 mm)	18.74 in. (476.0 mm)

Carriage – Clean and inspect carriage bars for damage and smoothness. Repair any protruding welds or damaged notches.

Auxiliary Valve Functions

Check for compliance with ANSI (ISO) standards.



Main Functions

A Hoist Down

B Hoist Up

C Tilt Forward

D Tilt Back

Auxiliary Functions - Standard

E Rotate CCW

F Rotate CW

Auxiliary Functions - Sequence Valve Equipped

E Rotate CCW then Release Bin

F Clamp Bin then Rotate CW



WARNING: Truck control handle and attachment function activation shown here conforms to ANSI/ITSDF B56.1 (ISO 3691) recommended practices. Failure to follow these practices may lead to serious bodily injury or property damage. End user, dealer and OEMs should review any deviation from the practices for safe operation.

INSTALLATION

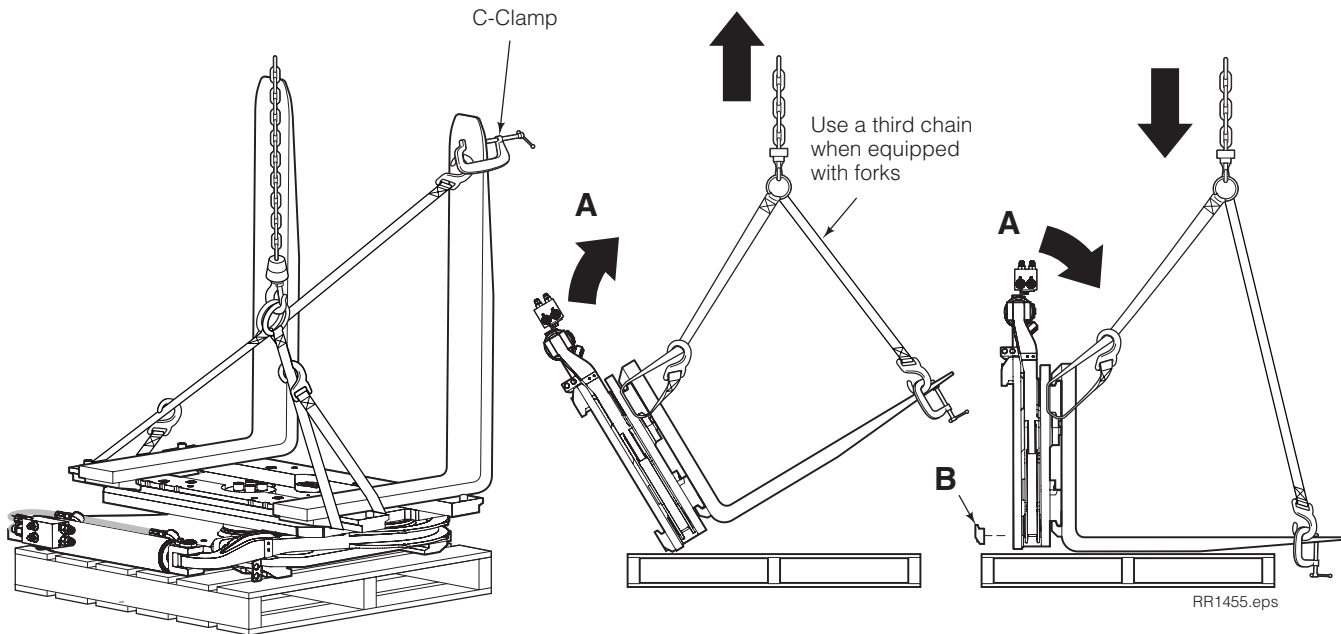
Follow the steps shown to install the attachment on the truck.
Read and understand all **WARNING** statements. If you don't understand a procedure, ask your supervisor or call the nearest Cascade Service Department for assistance.

1 Attach overhead hoist, remove bolt-on lower hooks

- A** Remove banding, set attachment upright on pallet.
- B** Remove bolt-on lower mounting hooks (if equipped).

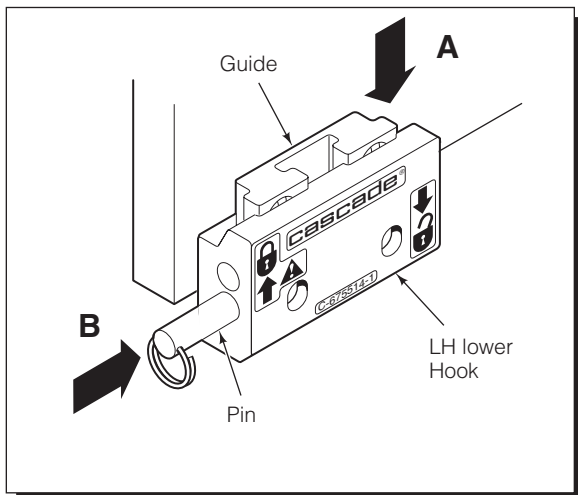


WARNING: Verify that the overhead hoist and chains or straps are rated for the weight of the attachment. Refer to nameplate for attachment weight.

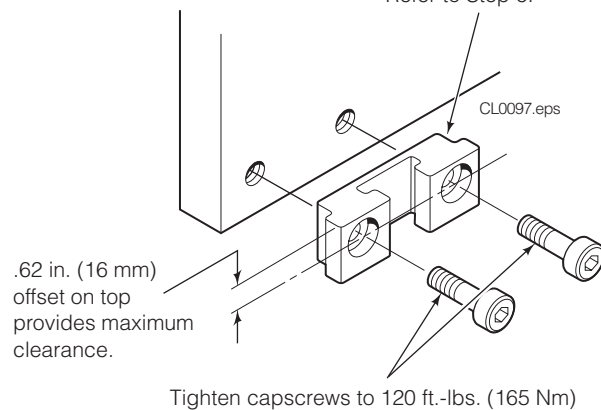


2 Unlock Quick-Change lower mounting hooks (if equipped)

- A** Move hooks into unlocked position.
- B** Reinstall pin in lower hole.



NOTE: Guides can be reversed to change hook to carriage clearance. Refer to Step 6.



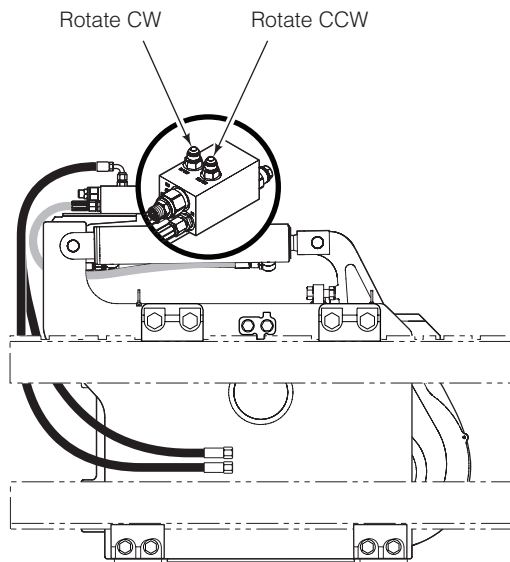
3 Prepare Hoses

- A** Position truck carriage behind attachment.
- B** Determine hose lengths required.
- C** Cut hoses to length and install end fittings.

IMPORTANT: Flush hoses (Step 4) before operating attachment.

CAUTION: Hoses should be 2600 psi (180 bar) working pressure rated.

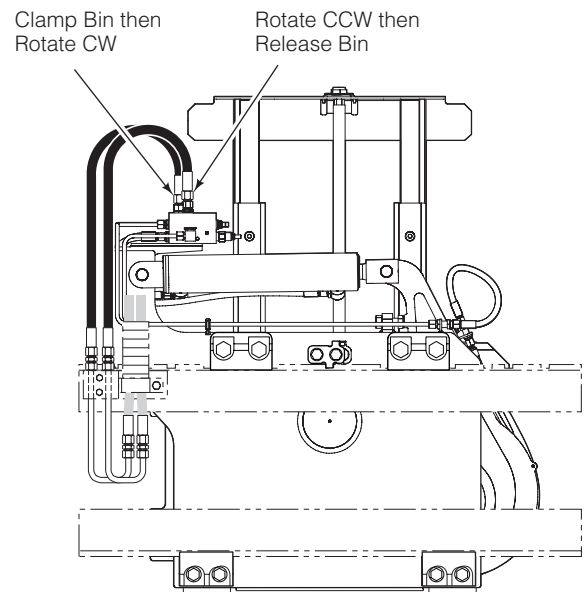
INTERNAL HOSE REEVING



180° Rotator

RR1429.eps

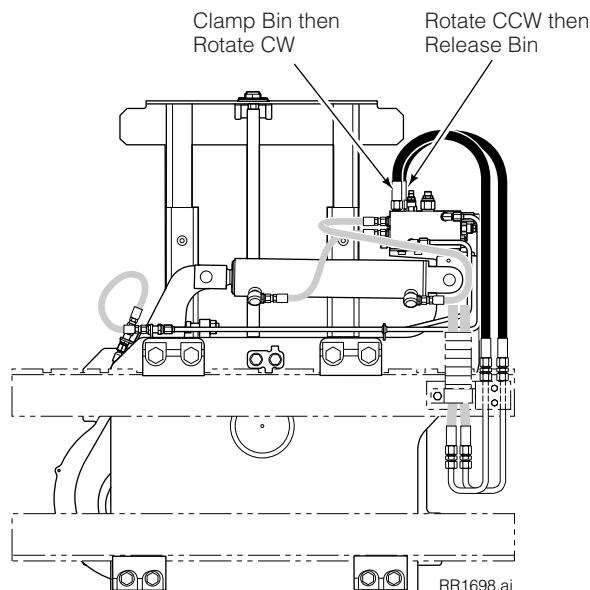
LH 2-PORT THINLINE™ HOSE REEL



180° Rotator with Bin Retainer

RR1428.eps

RH 2-PORT THINLINE™ HOSE REEL

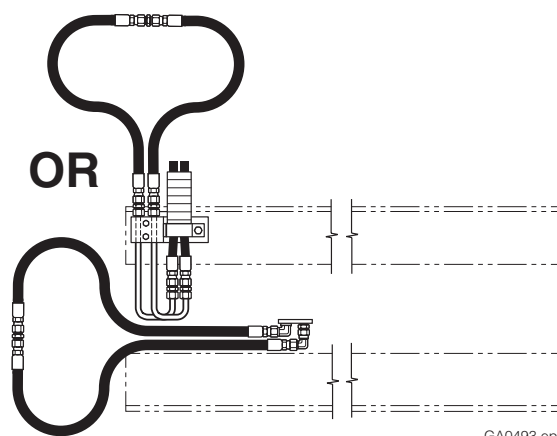


180° Rotator with Bin Retainer

RR1698.ai

4 Flush hydraulic supply hoses

- A** Install hoses with union fitting.
- B** Operate auxiliary valves for 30 sec.
- C** Remove union fittings.

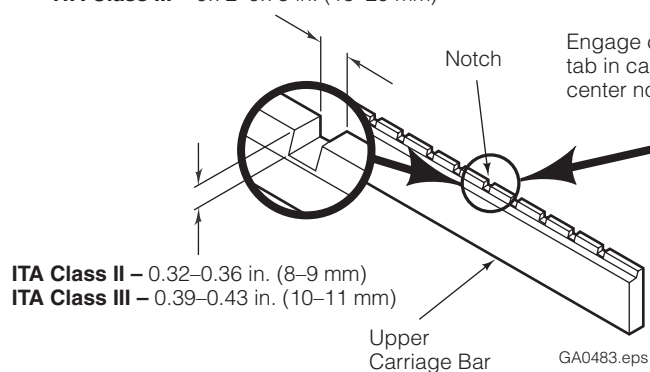


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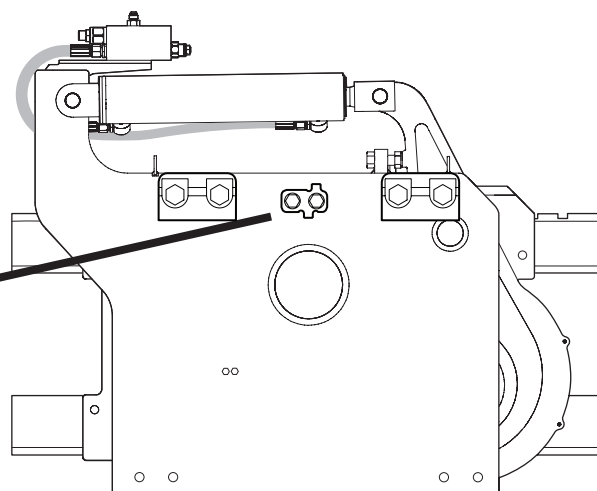
5 Mount attachment on truck carriage

- A** Center truck behind attachment.
- B** Tilt forward and raise carriage into position.
- C** Engage top mounting hooks with carriage. Make sure center locator tab engages the center notch on top carriage bar.
- D** Lift attachment 2 in. (5 cm) off pallet.

ITA Class II – 0.60–0.66 in. (15–17 mm)
ITA Class III – 0.72–0.78 in. (18–20 mm)



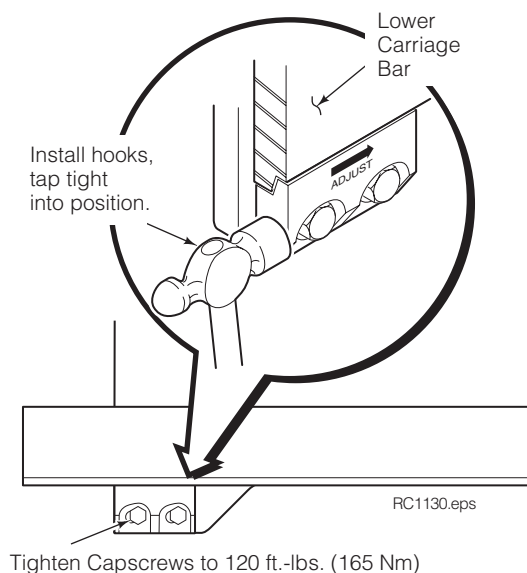
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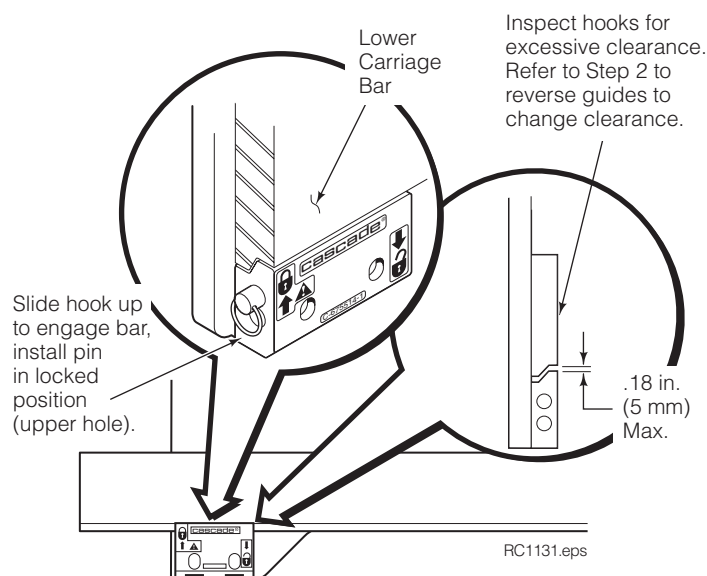
RR1430.eps

6 Install and engage lower hooks

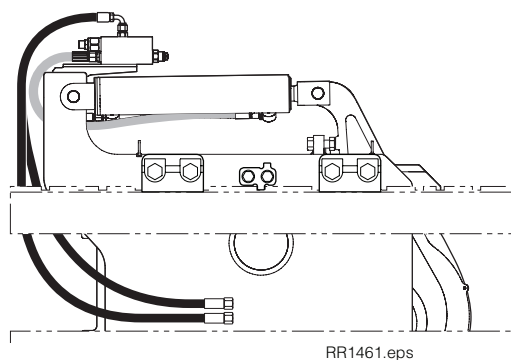
BOLT-ON TYPE



QUICK-CHANGE TYPE



7 Connect hoses to hose terminal fittings as shown in Step 3



Internal Hose Reeving shown

8 Cycle attachment functions

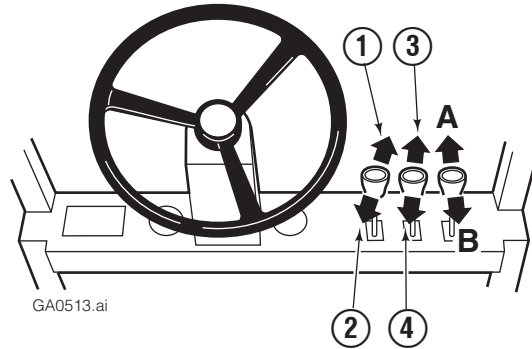


WARNING: Make sure all personnel are clear of the attachment during testing.

- With no load, cycle rotation function several times.
- Check functions for operation in accordance with ANSI (ISO) standards.
- Pick up a maximum load and rotate. Check for smoothness and normal rotation.
- Check for leaks at hoses, fittings and rotator drive.

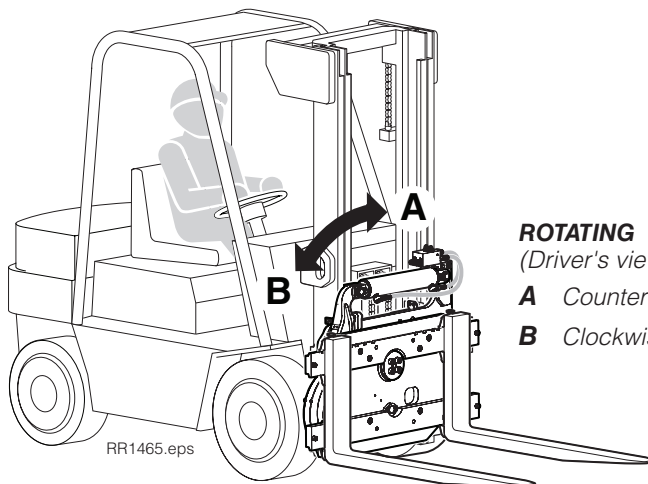


WARNING: Truck control handle and attachment function activation shown here conforms to ANSI/ITSDF B56.1 (ISO 3691) recommended practices. Failure to follow these practices may lead to serious bodily injury or property damage. End user, dealer and OEMs should review any deviation from the practices for safe operation.



Main Valve Functions

- | | |
|--------------|----------------|
| ① Hoist Down | ③ Tilt Forward |
| ② Hoist Up | ④ Tilt Back |

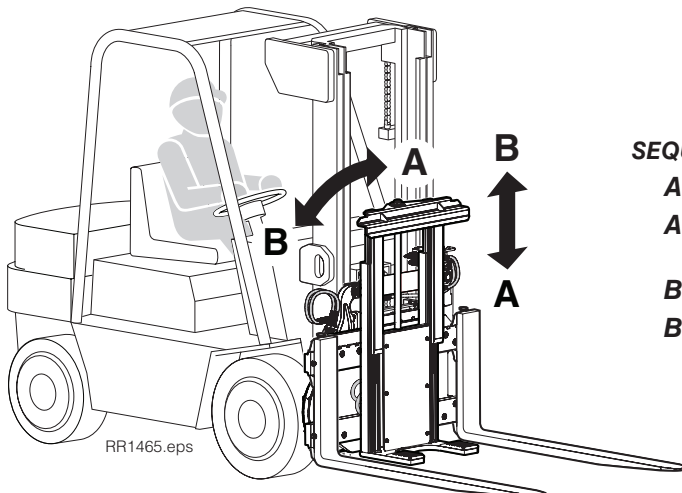


ROTATING

(Driver's view)

A Counterclockwise (CCW)

B Clockwise (CW)



SEQUENCE VALVE EQUIPPED ATTACHMENT

- A** Clamp Bin
- A** Rotate Clockwise (CW)
(after complete clamp)
- B** Rotate Counterclockwise (CCW)
- B** Release Bin
(after complete rotation)

9 Sequence Valve Adjustments

The attachment should clamp the bin and then rotate. The bin retainer should hold down without creasing/bending the bin. After attachment installation, adjust cartridge as follows:

A Confirm that TRUCK pressure delivered to the attachment valve is within the range shown on the attachment nameplate.

B To adjust the pressure the bin retainer holds the bin. This cartridge is set above maximum pressure.

- If the bin retainer is crushing or bending the bin, adjust the cartridge by turning counterclockwise (CCW) to reduce the pressure. Test the bin retainer.

C The dumping (rotate CW) operation, should clamp the bin first, then rotate CW to dump the load.

- If attachment begins to rotate before the hold down is engaged, turn the cartridge clockwise (CW) to increase the pressure.

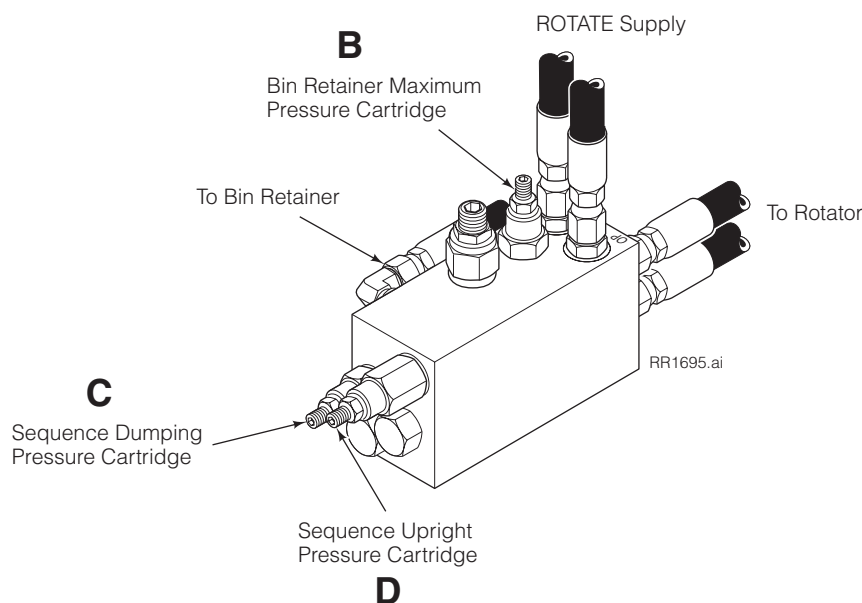
NOTE: This cartridge needs to be reset after each adjustment. To reset, operate the attachment in the opposite direction before checking the new adjustment.

D The upright (rotate CCW) operation, should rotate CCW to upright the bin first, then release the bin.

- If attachment hold down disengages before the fully upright, turn the cartridge clockwise (CW) to increase the pressure.




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



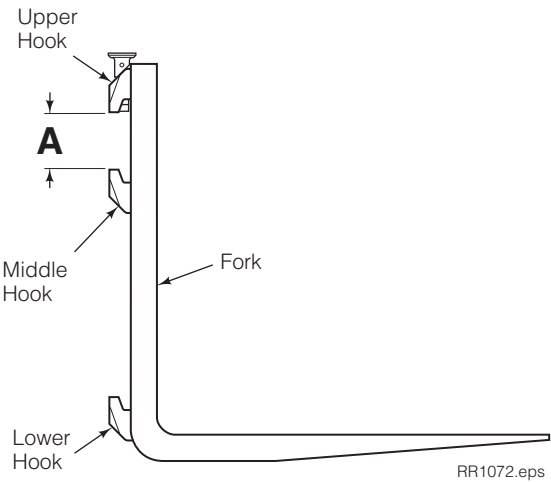
10 Fork Welding Preparation
(forks without middle hook installed)

- A** Clean all surfaces to be welded. Remove paint, oil, grease and other contaminants.
- B** Position the middle hook using the dimensions shown. Mark the hook position on the fork.
- C** Tack the hook in four places with .25 in. (6 mm) long welds. Recheck dimensions.

Rotator Model	Hook Spacing Dimension 'A'
20G	3.05 +.06 -0 in. (77.5 +1.0 -0 mm)



WARNING: Each fork must have three hooks. Cascade forks for rotators are equipped with a middle hook. If the attachment is supplied without forks, middle hooks are provided. They must be welded using the following procedures.



11 Fork Middle Hook Welding

A Preheat weld area (full fork width and 6 in. above and below hook) to 500° F (260° C) minimum, 600° F (315° C) maximum before welding. Maximum interpass temperature should not exceed 700° F (370° C).

B Finish weld middle hook to fork. Apply welds in the hook weld prep areas using the lower hook as an example of the welds required. Note the 'B' no weld area. Use the following weld method:

Attach ground clamp to the fork upright. Weld using FCAW (Flux Core Arc Welding). AWS E100T1-K3 electrode, .06 in. (1.5 mm) diameter with 100% CO₂ or 75% Ar/ 25% CO₂ @ 30-45 CFH. Apply fillet and groove welds using stringer bead technique. Minimum weld pass width .25 in. (6.3 mm), maximum weld pass thickness .50 in. (12.5 mm). DCRP welding current, 230-300 amps, 29-31 volts. Travel speed 8-12 IPM. Completely remove slag between passes. Slow cool, by covering with insulating blanket, to 150° F (65° C).

C Inspect welds to ensure no undercut, overlap, cracks of any kind (including crater cracks) or porosity.

D Clean weld area and repaint.

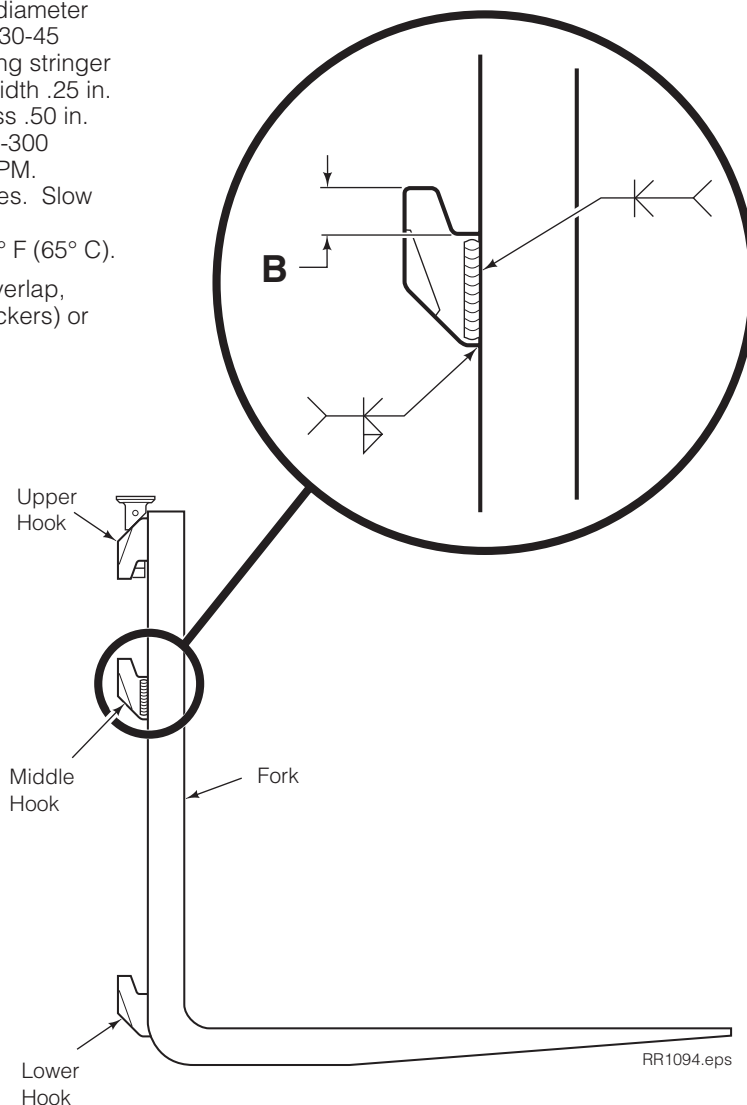
Rotator Model	No-Weld Dimension 'B'
20G	.62 in. (16 mm)

Reference: S-22588, S-22566, S-23847, CWS 38, CWS 69.



WARNING: Applications that hold a load inverted with a 50% or more capacity, must use Cascade rotator forks.

Applications that dump a load when the attachment is rotated at 45° from vertical, can use pallet forks with the installed middle hook.



12 Install forks

Make sure forks are rated for the loads being handled. Fork size chosen may reduce attachment rating (see next page).

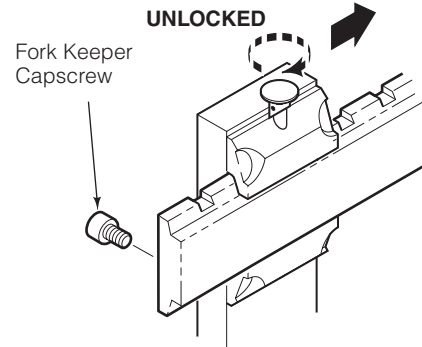


WARNING: Forks must have **three hooks**. Cascade forks for rotators are already equipped with a middle hook. If the attachment is supplied without forks, middle hooks are provided. See Step 10 for middle hook installation procedure.

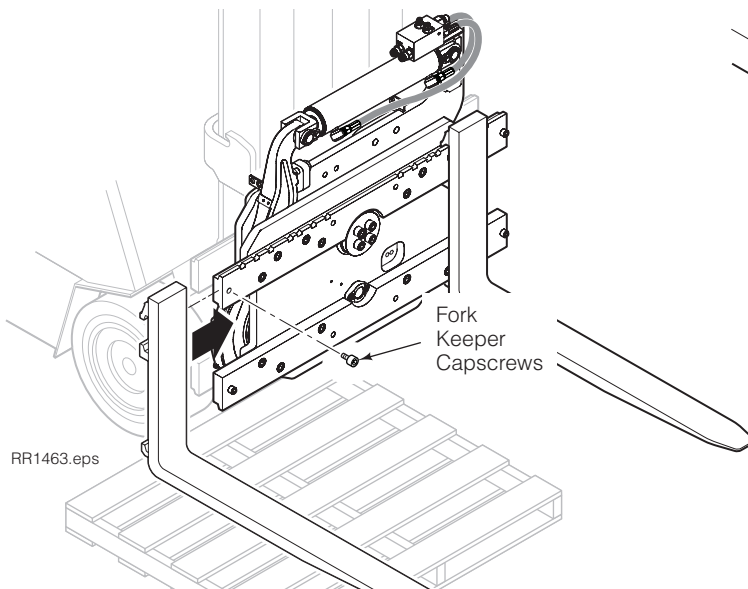
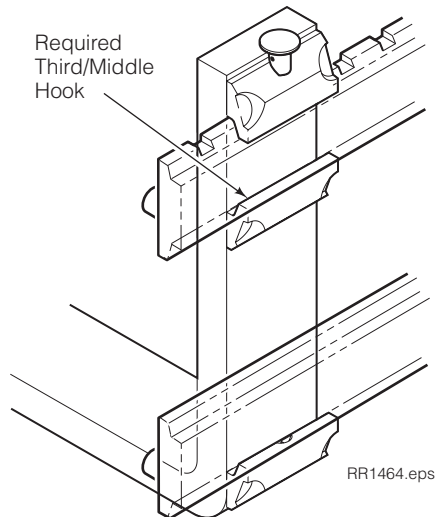
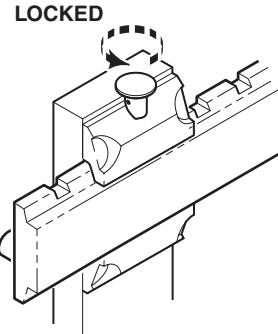
- A** Rotate the carriage to the horizontal position. Remove the fork keeper capscrews from the upper carriage bar.
- B** Release the fork locks on top of the forks.
- C** Slide the forks into position on the carriage bars.
NOTE: If the fork middle hook fit up is too tight, grind the mating surfaces to fit.
- D** Lock each fork in place by engaging the fork lock in a carriage bar notch. Shake forks to make sure the pin is fully engaged in a carriage bar notch.
- E** Reinstall the fork keeper capscrews. Tighten the capscrews to a torque of 75 ft.-lbs. (100 Nm).
- F** Reverse the above procedures for removal.



WARNING: When installing or removing forks, rotate carriage to **horizontal position**. Use pallets or blocks to raise forks to installation height. Keep feet clear of forks when installing. **Fork keeper capscrews must be in place at all times during attachment operation.**



Twist Type Fork Lock



INSTALLATION

CAUTION: Attachment and fork capacity are dependant on fork size.
Shaded area indicates maximum rating fork size.

ROTATOR & FORK CAPACITY at 24 in. (600 mm) Load Center									
Model	Fork Class	Fork Size (Width x Thickness)							
		4 x 1.25 in.	100 x 35 mm	4 x 1.5 in.	100 x 40 mm	5 x 1.5 in.	122 x 40 mm	5 x 1.75 in.	122 x 45 mm
20G	II	3,700 lbs.	1,700 kg	3,700 lbs.	1,700 kg	3,700 lbs.	1,700 kg	3,700 lbs.	1,700 kg

PERIODIC MAINTENANCE

Daily Inspection

At the beginning of each operational shift, complete the following inspections:

- Check for loose or missing bolts, worn or damaged hoses, and hydraulic leaks.
- Check that fork locking pins and carriage fork stops are installed and functional.
- Check decals and nameplate for legibility.



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

1000-Hour Maintenance

After each 1000 hours of truck operation, in addition to the daily inspections, perform the following procedures:

- Tighten lower mounting hook capscrews to a torque of 120 ft.-lbs. (165 Nm)
- Lubricate the center rotation bearing grease fitting and crank arm pivot grease fitting with chassis grease. Rotate the faceplate to 45° to access the crank arm pivot.

2000-Hour Maintenance

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

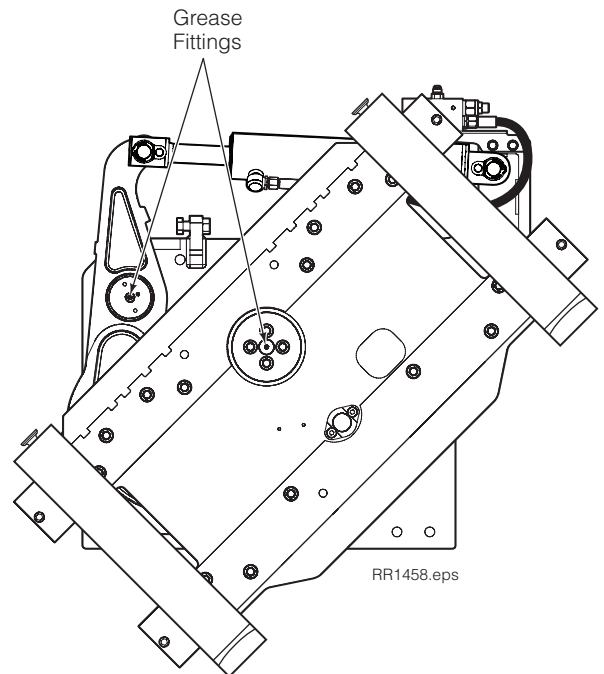
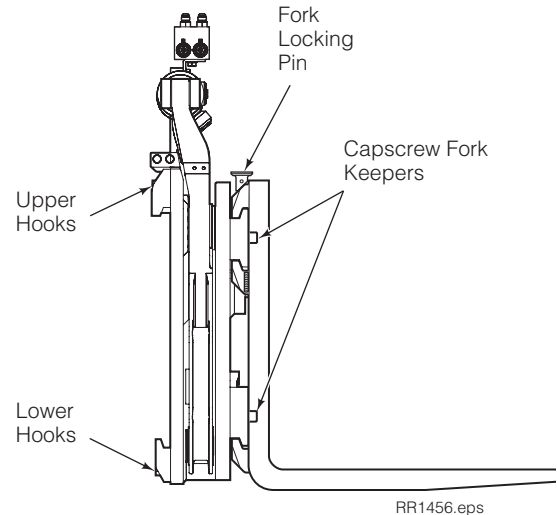
- After 2000 hours of truck operation, forks in use shall be inspected at intervals of not more than 12 months (for single shift operations) or whenever any defect or permanent deformation is detected. Severe applications will require more frequent inspection.

Fork inspection shall be carried out by trained personnel to detect any damage that might impair safe use. Any fork that is defective shall be removed from service. Reference ANSI B56.1-2005 (ISO 5057).

Inspect for the following defects:

- Surface cracks
- Straightness of blade and shank
- Fork angle
- Difference in height of fork tips
- Positioning lock
- Wear on fork blade and shank
- Wear on fork hooks
- Legibility of marking

NOTE: Fork Safety Kit 3014162 contains wear calipers, inspection sheets and safety poster. Also available is fork hook & carriage wear gauge 209560 (Class II), 209561 (Class III) and 6105257 (Class IV).



BLANK

Do you have questions you need answered right now?

Call your nearest Cascade Service Department.

Visit us online at www.cascorp.com

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