

SERVICE MANUAL

150H Fork Positioner

Manual Number 219473 R-1

**cascade[®]
corporation**

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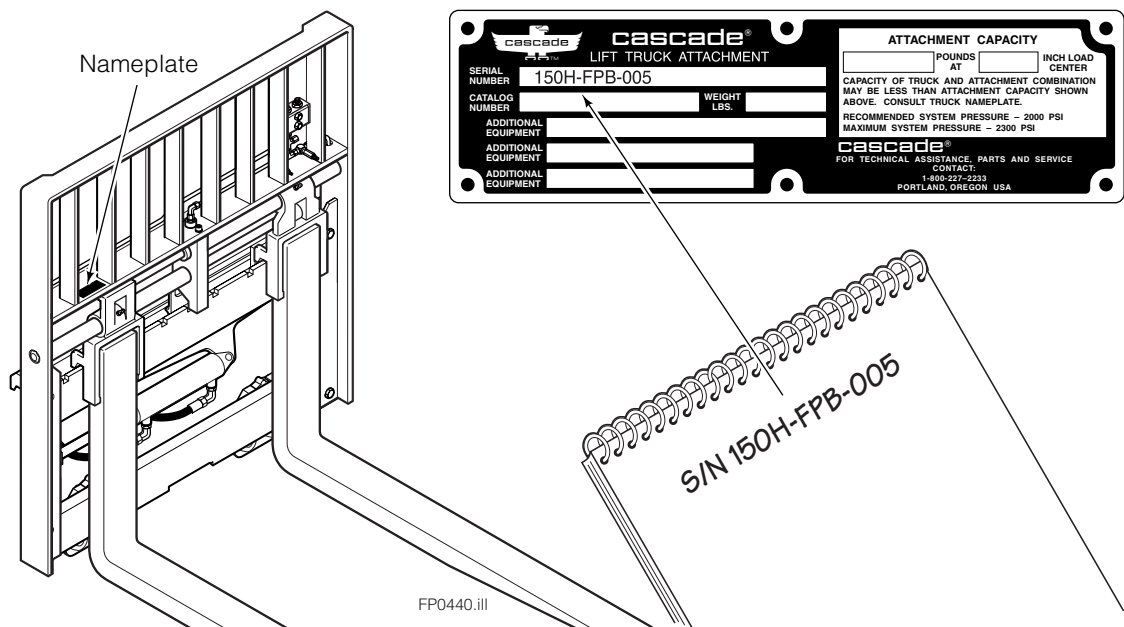
1.1 Introduction

This Manual provides the Installation, Periodic Maintenance, Troubleshooting, Service and Specifications for Cascade 150H Fork Positioner with D-Series Sideshifter.

In any communication about the Fork Positioner, refer to the product I.D. number stamped on the nameplate as shown. If the nameplate is missing, the numbers can be found stamped on the back of the baseplate.

IMPORTANT: All hoses, tubes and fittings on H-Series Fork Positioners are JIC.

NOTE: Specifications are shown in both U.S. and (Metric) units.



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 the job easier.

2.1

Truck System Requirements

The 150H Fork Positioner will provide maximum operating capability when the following requirements are met.



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

Truck Relief Setting

2300 psi (160 bar) Recommended
2600 psi (180 bar) Maximum

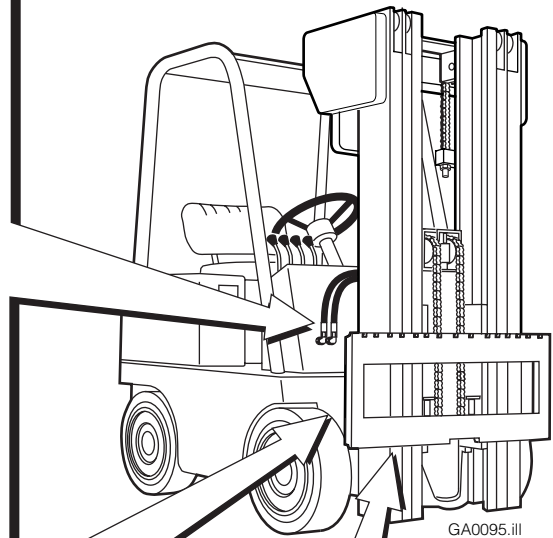
Truck Flow Volume ^①

150H	Min. ^②	Recommended	Max. ^③
Fork Position	3 GPM (11 L/min.)	4 GPM (15 L/min.)	5 GPM (19 L/min.)
Sideshift	1 GPM (4 L/min.)	6 GPM (23 L/min.)	12 GPM (45 L/min.)

① Cascade H-Series Fork Positioners are compatible with SAE 10W petroleum base hydraulic fluid meeting Mil. Spec. MIL-O-5606 or MIL-O-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 can result in slow and unequal fork movement.

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



Carriage Mount Dimension (A) ITA (ISO)

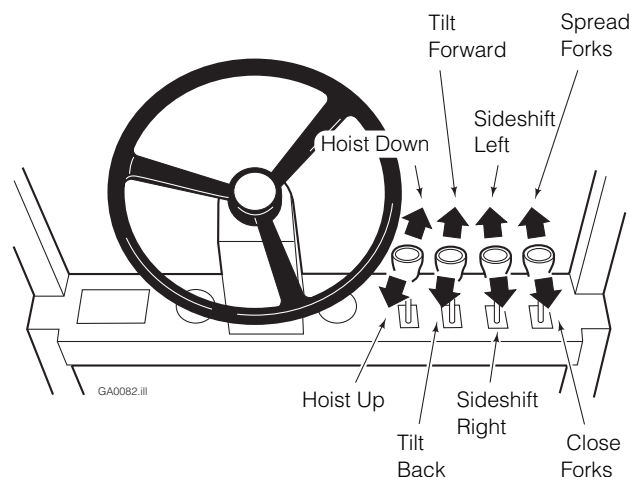
	Minimum	Maximum
Class IV	23.44 in. (595.5 mm)	23.50 in. (597.0 mm)

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Carriage – Clean and inspect carriage bars. Assure that bars are parallel and ends are flush. Grind smooth any protruding welds that may affect Sideshifter lower bearings. Repair any damaged notches.

Auxiliary Valve Functions

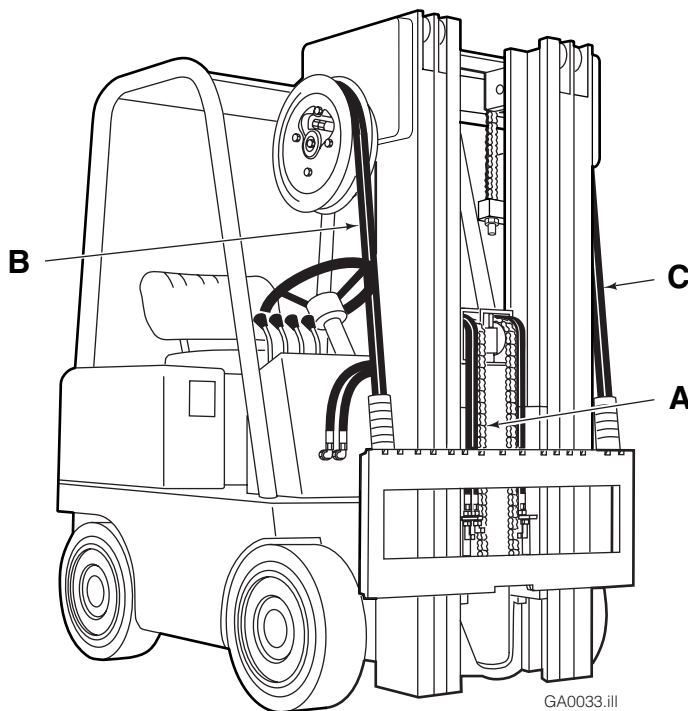
Check for compliance with ANSI standards:



2.2 Recommended Hydraulic Supply Options

H-Series Fork Positioners can be operated with any of the hydraulic supply arrangements shown below. Refer to *Cascade Hose and Cable Reel Selection Guide*, Part No. 212119, to select the correct hose reel for the mast and truck. Hose and fitting requirements are as follows:

- All hoses and fittings for the fork-positioning and sideshifting (if equipped) functions should be No. 6 with 9/32 in. (7 mm) minimum I.D.



Non-Sideshifting

- A Mast Single Internal Reaving
- OR
- C LH THINLINE™ 2-Port Hose Reel Group

Sideshifting

- A Mast Double Internal Reaving
- OR
- A and C Mast Single Internal Reaving and LH THINLINE™ 2-Port Hose Reel Group
- OR
- B and C RH and LH THINLINE™ 2-Port Hose Reel Groups

Solenoid Adaption

- A and B Mast Single Internal Reaving and RH Cable Reel Group
- OR
- B RH 6-N-1 Cable/Hose Reel Group

2.3

Installation Procedure

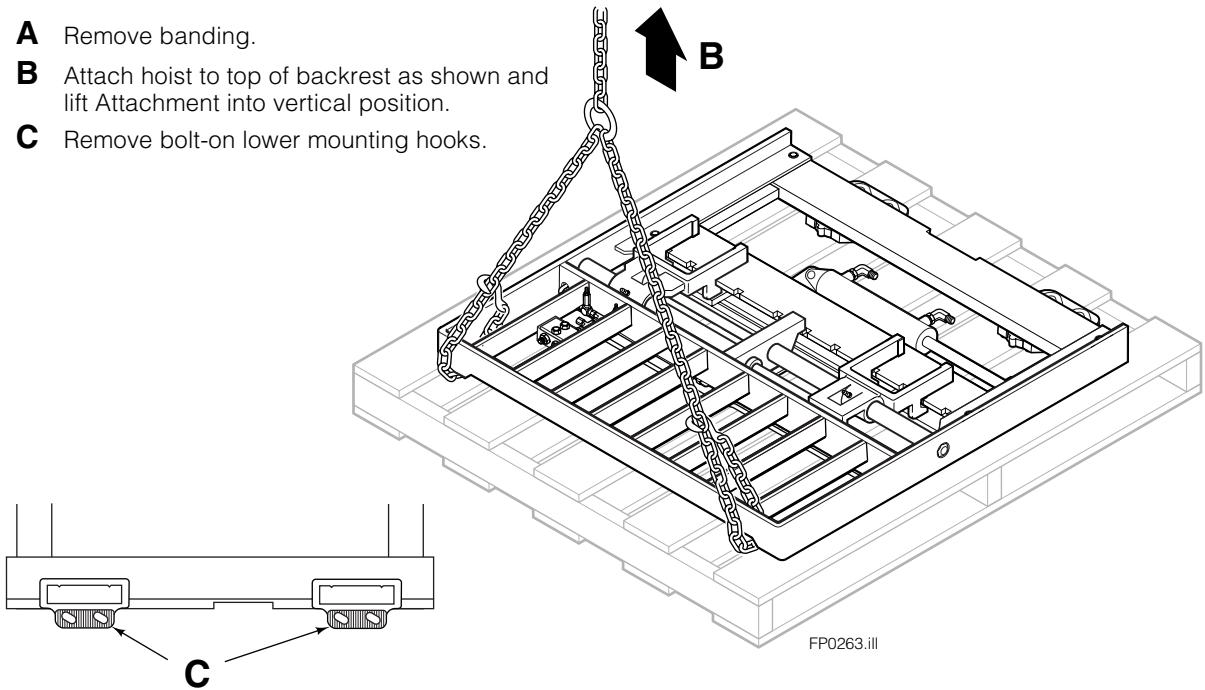
Follow the steps shown to install the Fork Positioner on the truck. Read and understand all **WARNINGS** and **CAUTION** statements. If you don't understand a procedure, ask your supervisor, or call the nearest Cascade Service Department for assistance.



WARNING: Make sure overhead hoist has a rated capacity of at least 2000 lbs. (910 kg.)

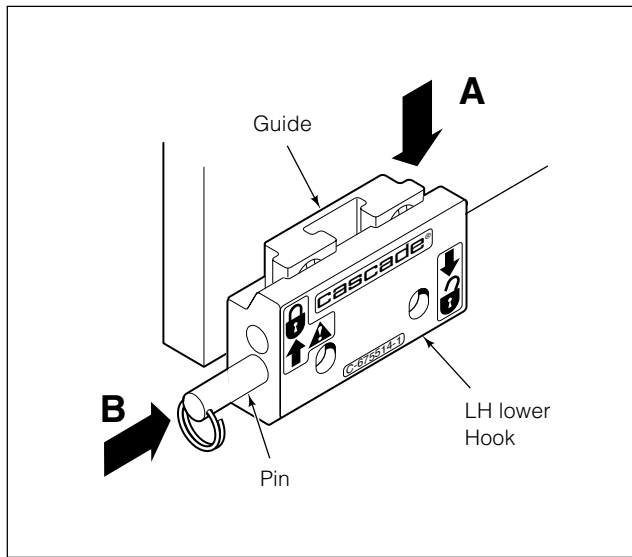
1 Attach overhead hoist

- A** Remove banding.
- B** Attach hoist to top of backrest as shown and lift Attachment into vertical position.
- C** Remove bolt-on lower mounting hooks.

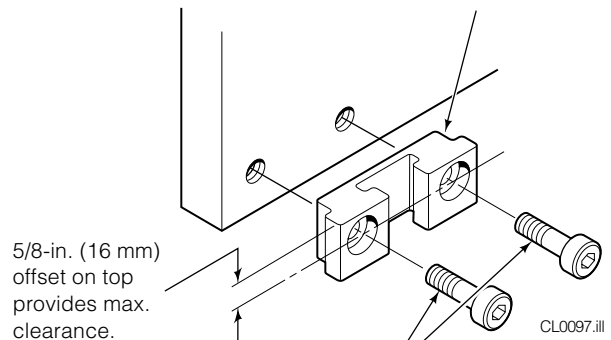


2 Unlock quick-change lower mounting hooks (if equipped)

- A** Remove pin and drop hooks into unlocked position.
- B** Reinstall pin in lower hole.



NOTE: Guides can be reversed to change hook-to-carriage clearance (See lower hook installation, Step 4).



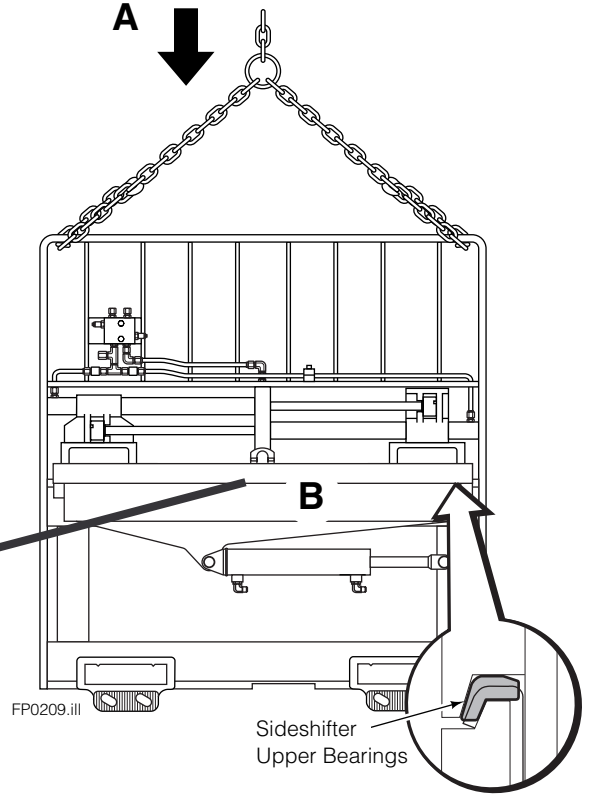
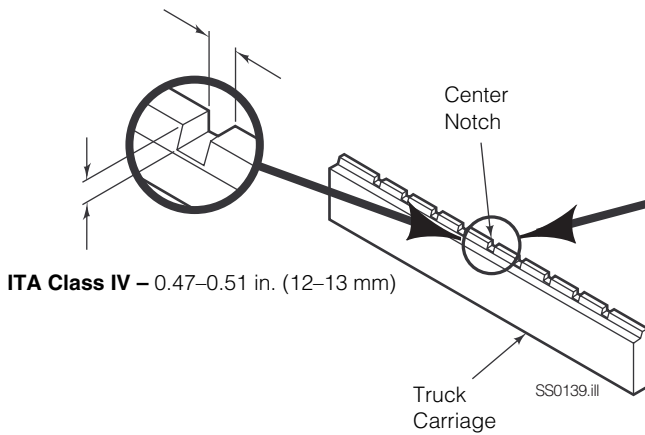
Tighten Capscrews:
Class II, III Mounting – 165 ft.-lbs. (225 Nm)
Class IV Mounting – 190 ft.-lbs. (255 Nm)

3 Mount Fork Positioner on truck

- A** Lower Attachment onto truck carriage.
- B** Engage upper mounting hooks. If sidsifter equipped (shown), make sure bearings are in place and centering tab engages center notch on truck carriage.

ITA Class IV – 0.72–0.78 in. (18–20 mm)

ITA Class IV – 0.47–0.51 in. (12–13 mm)

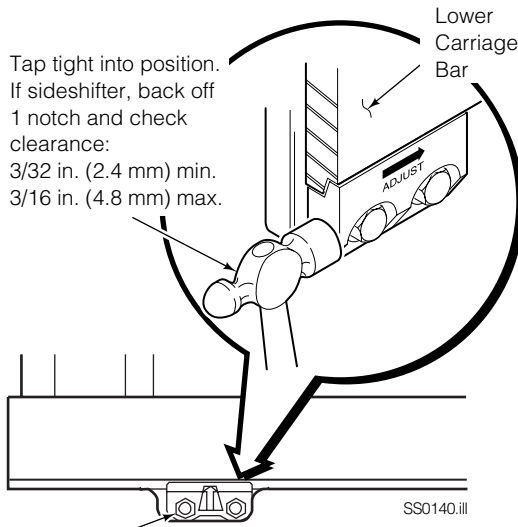


Back (Driver's View)

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4 Install or engage lower hooks

BOLT-ON TYPE

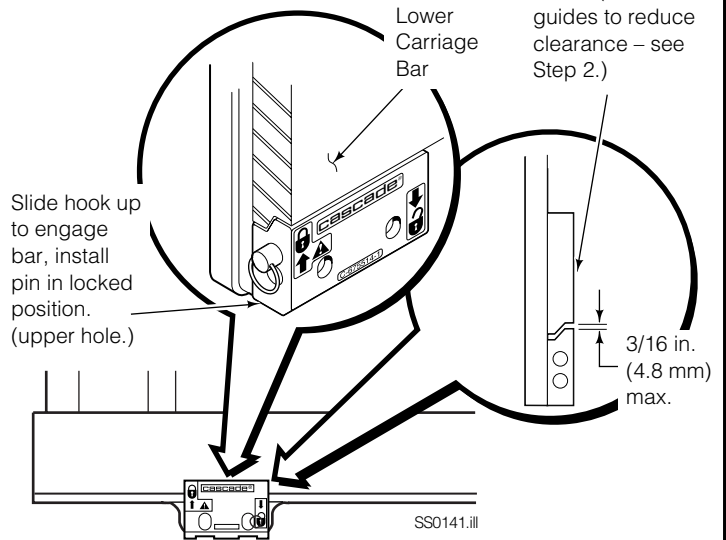


Tap tight into position. If sidsifter, back off 1 notch and check clearance:
 3/32 in. (2.4 mm) min.
 3/16 in. (4.8 mm) max.

Tighten Capscrews:
Class IV Mounting – 190 ft.-lbs. (255 Nm)

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QUICK-CHANGE TYPE (optional)



Slide hook up to engage bar, install pin in locked position. (upper hole.)

Inspect hooks for excessive clearance. (Reverse guides to reduce clearance – see Step 2.)

3/16 in. (4.8 mm) max.

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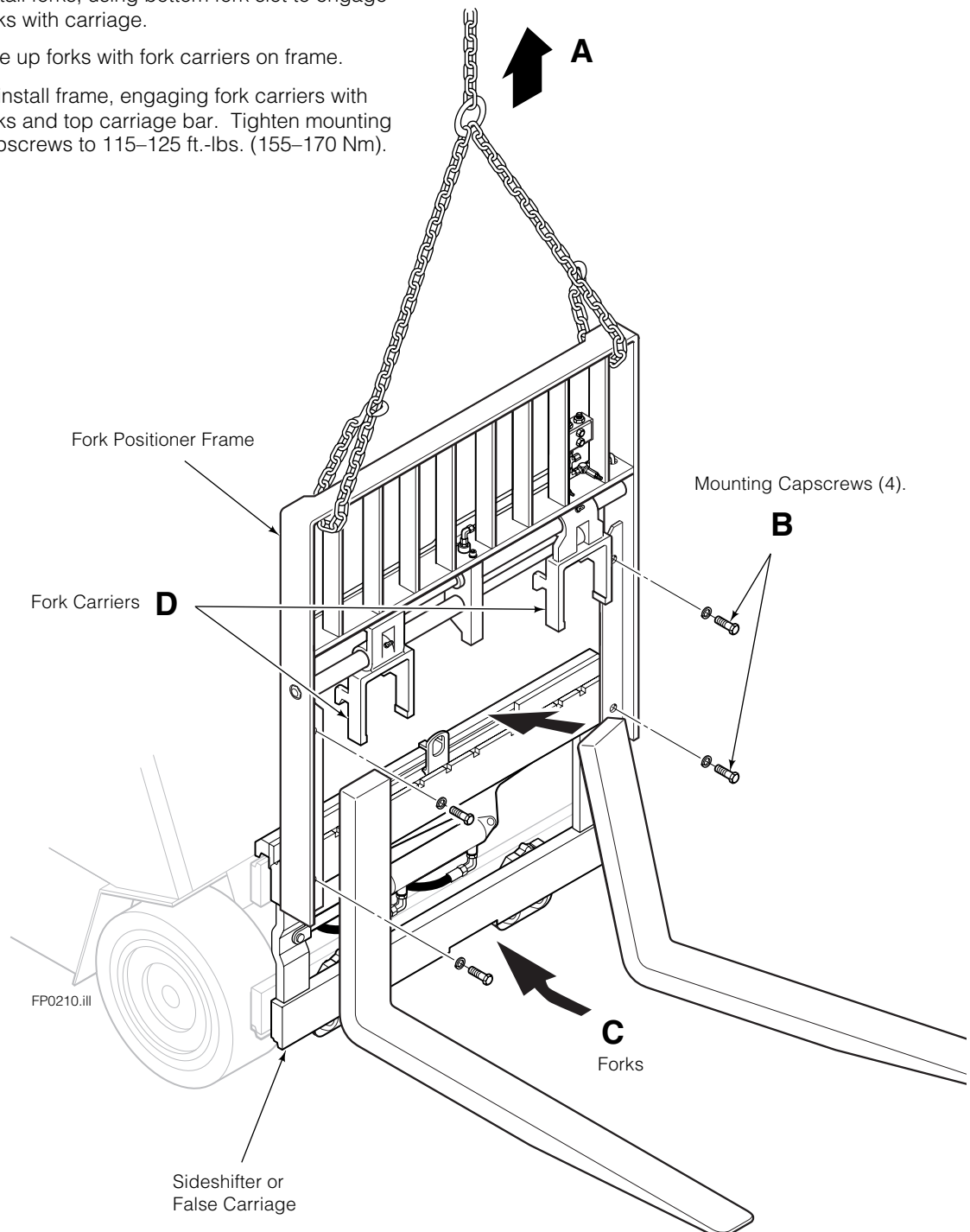
5 Install Forks

- A** Attach overhead hoist to backrest as shown.
- B** Remove capscrews fastening Fork Positioner frame to sidsifter or false carriage. Raise frame to install forks.



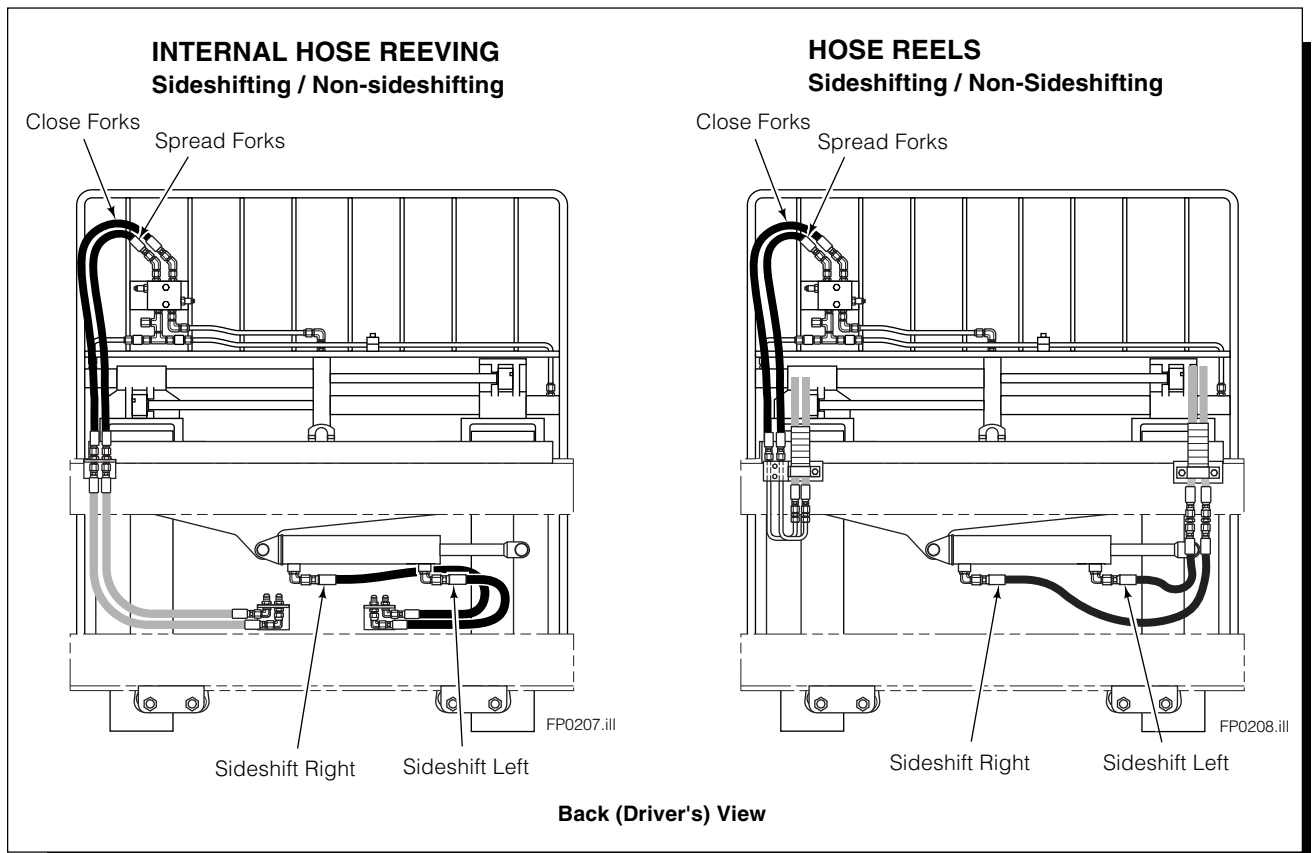
WARNING: Assure locking pins are removed from forks. Forks must slide freely on carriage bars.

- C** Install forks, using bottom fork slot to engage forks with carriage.
- D** Line up forks with fork carriers on frame.
- E** Reinstall frame, engaging fork carriers with forks and top carriage bar. Tighten mounting capscrews to 115–125 ft.-lbs. (155–170 Nm).



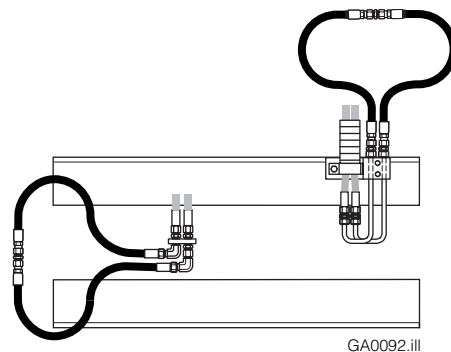
6 Prepare hoses

- A** Determine hose lengths required for hydraulic supply configuration of truck.
- B** Cut hoses to length and install end fittings or quick-disconnect kits.

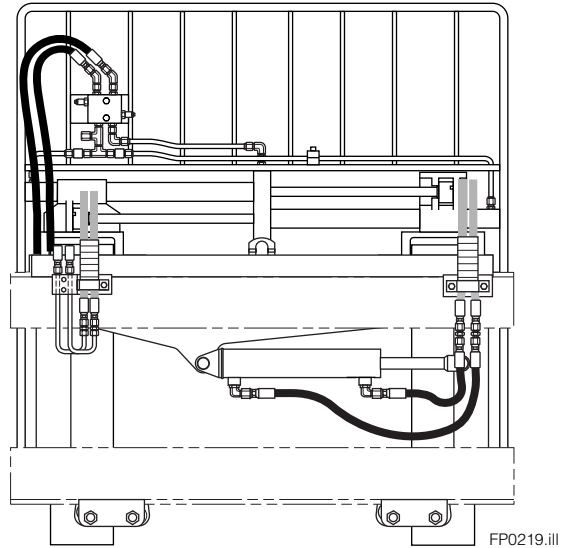


7 Flush hydraulic supply hoses

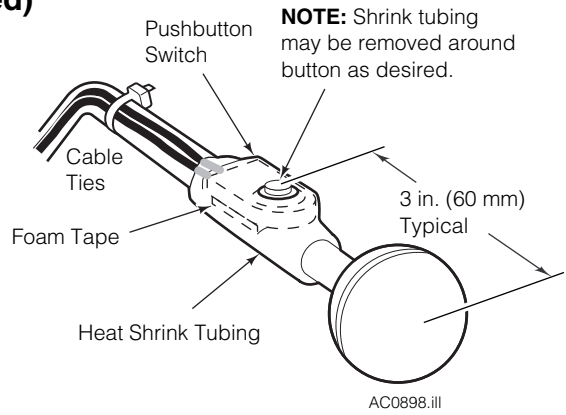
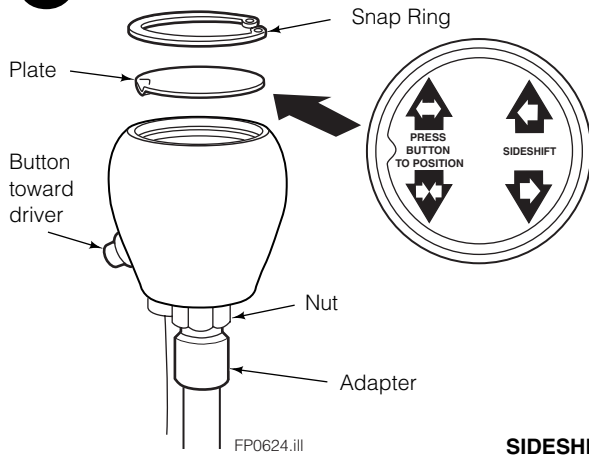
- A** Install hoses to hose terminals on carriage. Connect together using union fittings.
- B** Operate auxiliary valves for 30 sec.
- C** Remove union fittings.



8 Connect hoses prepared in Step 6 to Attachment fittings

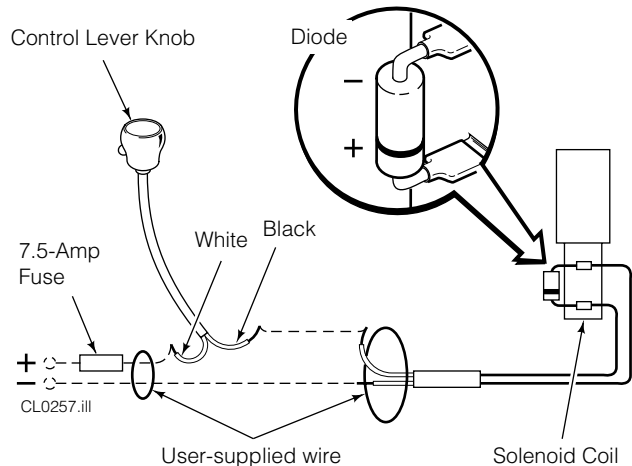
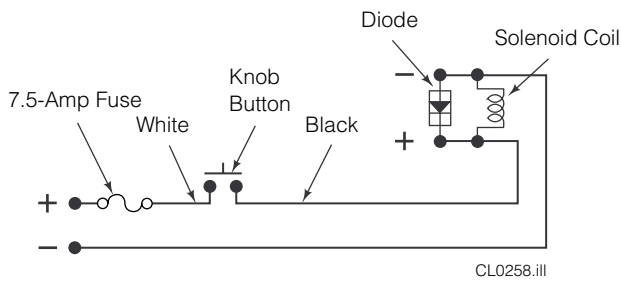


9 Install solenoid control knob or pushbutton switch (solenoid equipped)



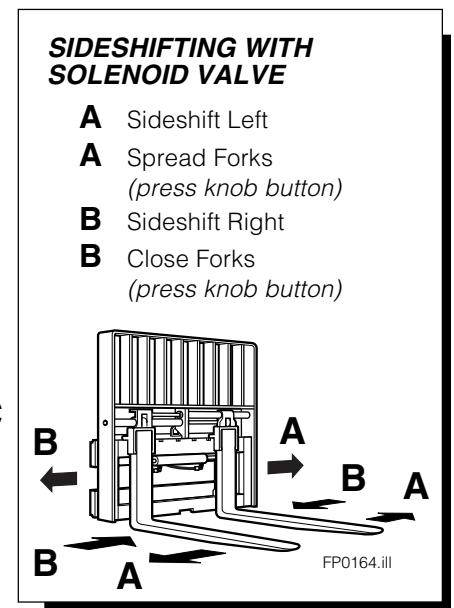
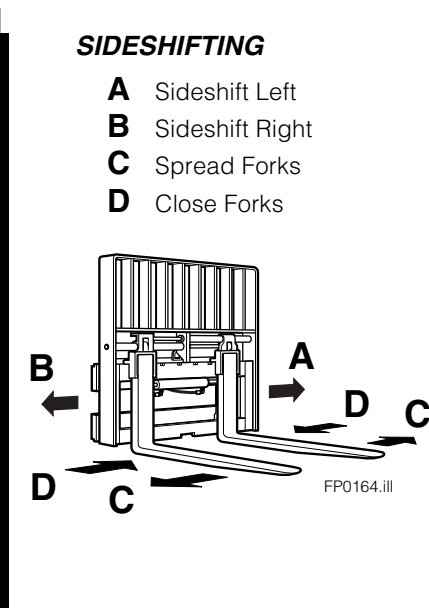
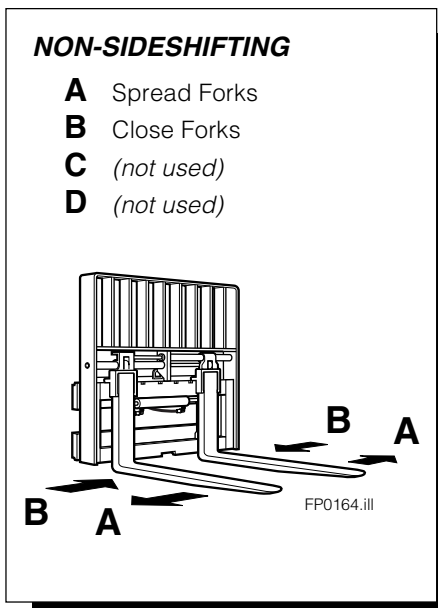
SIDESHIFT Control Lever

10 Install wiring – (Solenoid equipped units)

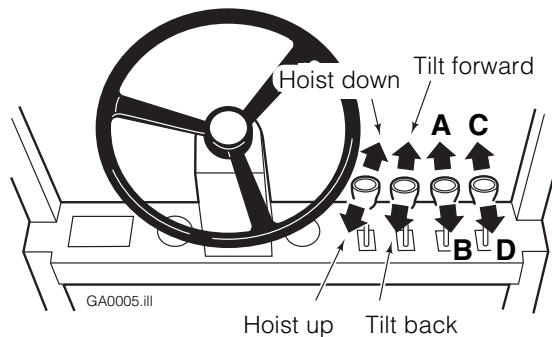


11 Cycle Fork Positioner functions

- Spread forks and close forks several times. Sideshift (if equipped) left and right. Check for smoothness and equal movement.
- Check for operation in accordance with ITA (ISO) standards.
- Check for leaks at fittings, valve, cylinders.



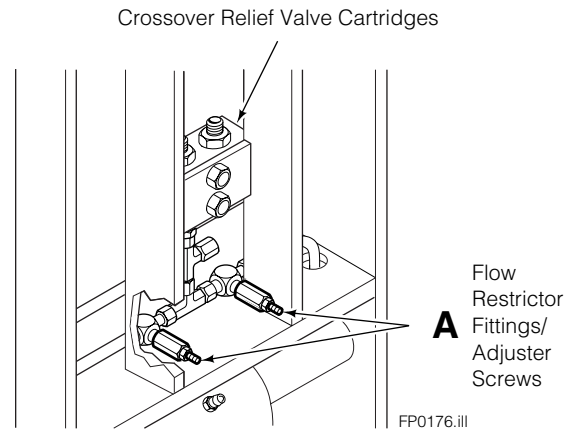
AUXILIARY VALVE FUNCTIONS



12 Adjust forks for equal movement (if required)

NOTE: Attachment is Factory-adjusted for equal fork movement when operated at recommended pressure and flow rate at normal operating temperature.

- A** Locate the flow restrictor fittings below the valve. Loosen jam nuts and screw both flow restrictors in until they bottom. Screw each restrictor out (CCW) three turns.
- B** Cycle forks open and closed five (5) times to warm up hydraulic system. Look for unequal fork movement.
- C** On faster fork (one that bottoms first), screw flow restrictor in (CW) 1/2-turn.
- D** Repeat Steps B and C until fork movement is equal. Tighten jam nuts.

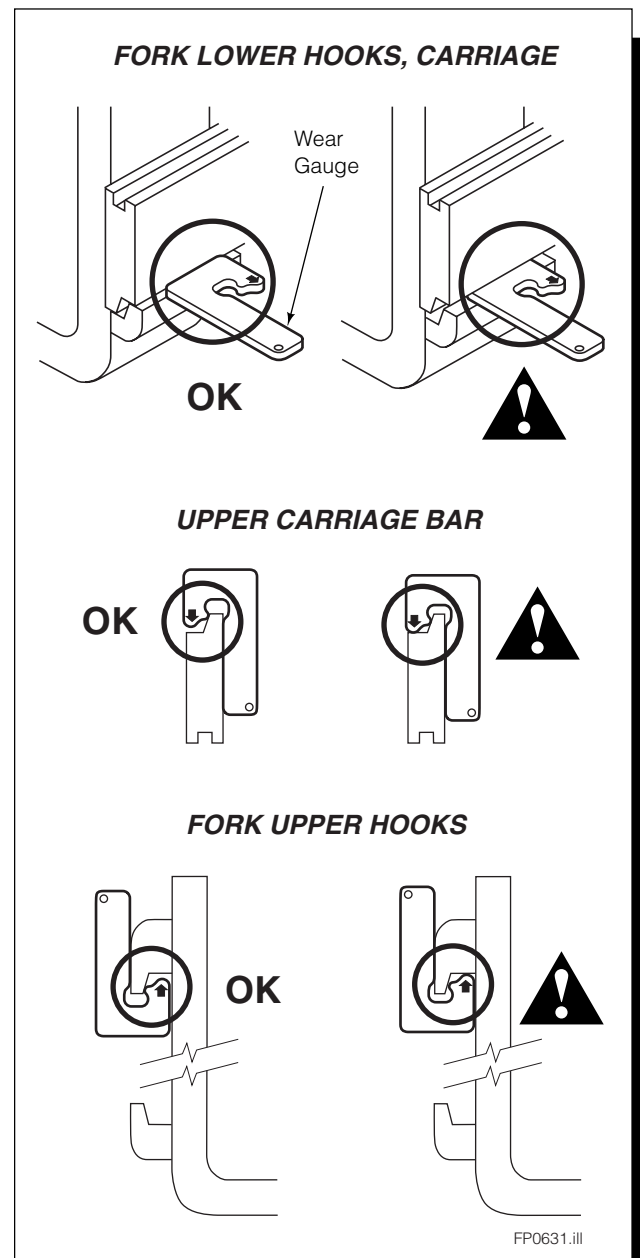


Front View

13 Inspect fork hooks and carriage bar clearance

NOTE: Use go/no-go Wear Gauge Part No. 209560 (Class II) or 209561 (Class III).

- A** Inspect the fork lower hooks and carriage bar. If the gauge fits between the carriage bar and lower hook, repair or replacement is needed.
- B** Inspect the upper carriage bar. If the gauge arrow touches the carriage bar, repair or replacement is needed.
- C** Inspect the fork upper hooks. If the gauge arrow touches the hook, repair or replacement is needed.





WARNING: After completing any service procedure, always test each function through five complete cycles. First test with no load, then test with a load to make sure the attachment operates correctly before returning it to the job.

3.1 100-Hour Maintenance

Every time the lift truck is serviced or every 100 hours of truck operation, whichever comes first, perform the following maintenance procedures:

- Check for loose or missing bolts, worn or damaged hoses and hydraulic leaks.

3.2 500-Hour Maintenance

After each 500 hours of truck operation, in addition to the 100-hour maintenance, perform the following procedures:

- Tighten frame mounting capscrews (4) to 110 ft.-lbs. (145 Nm).
- Tighten lower hook capscrews as follows:
 - Class IV Mounting** – 190 ft.-lbs. (255 Nm)
- Apply a molybdenum disulfide grease ('Molykote GN' or equivalent) to fork carrier grease fittings (2).
- Apply chassis grease to cylinder rod anchors (2).
- Apply chassis grease to sideshifter (if equipped) upper bearing grease fittings (2), and lower flat bearings (2).
- Check fork hooks and carriage bars for wear using a wear gauge (Cascade Part No. 209560 for Class II, 209661 for Class III). Refer to Section 2, Step 13.

3.3 1000-Hour Maintenance

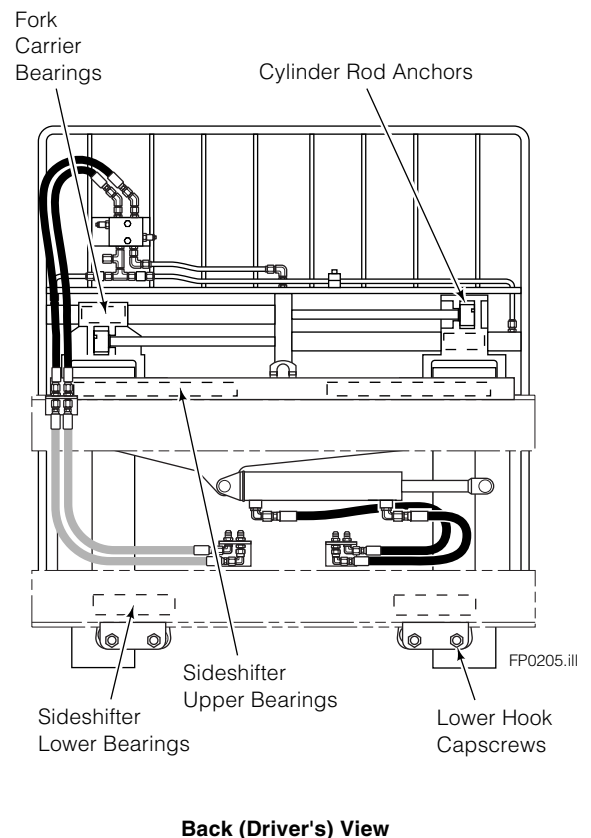
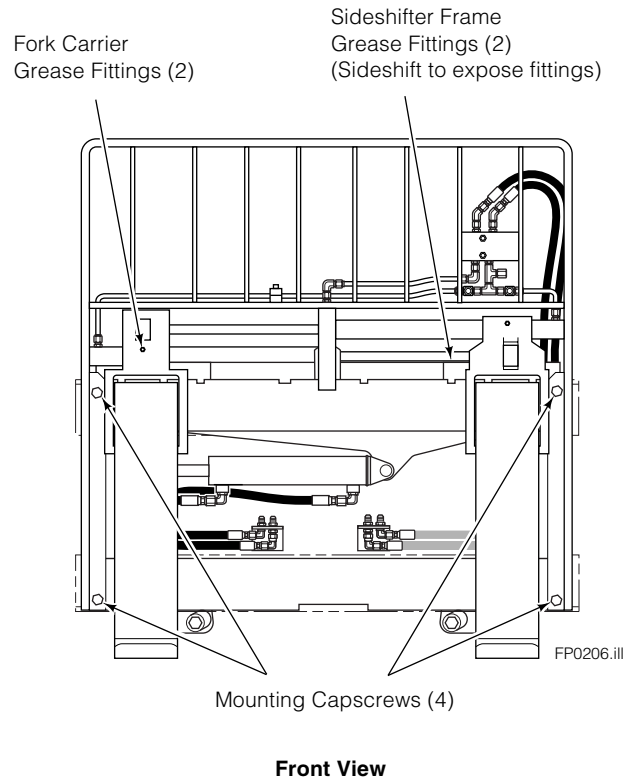
After each 1000 hours of truck operation, in addition to the 100 and 500-hour maintenance, perform the following procedures:

- Inspect fork carrier bearings for wear and replace if necessary.
- Inspect fork-positioning cylinder rod anchors for wear and replace if necessary.
- Inspect thickness of sideshifter (if equipped) upper bearing sets. If any bearing segment is worn to less than 1/16-in (1.5 mm) thick, replace all bearings.
- Inspect exposed thickness of lower sideshifter (if equipped) bearings. If any bearing shows less than 1/16-in. (1.5 mm), replace all bearings.

3.4 2000-Hour Maintenance

After each 2000 hours of truck operation, in addition to the 100, 500, and 1000-hour maintenance, perform the following procedures:

- Replace fork carrier bearings.



4.1 General Procedures

4.1-1 Truck System Requirements

- Truck hydraulic pressure should be within the pressure range as shown in Section 6.1. **PRESSURE MUST NOT EXCEED 2600 psi (180 bar).**
- Truck hydraulic flow should be within the volume range as shown in Section 6.1 .
- Truck hydraulic fluid supplied to the Attachment must meet the specifications as shown in Section 6.1.

4.1-2 Tools Required (Metric)

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

- InLine Flow Meter Kit:
10 GPM (37 L/min.) – Cascade Part No. 671476.
20 GPM (75 L/min.) – Cascade Part No. 671477.
- Pressure Gauge Kit:
5000 psi (345 bar) – Cascade Part No. 671212
- Assorted fittings, lines, drain hoses and quick-couplers as required.

4.1-3 Troubleshooting Chart – 150H Fork Positioner

Determine All The Facts – It is important to gather all the facts about the problem before beginning any service procedures. The first step is to talk to the equipment operator. Ask for a complete description of the malfunction. Guidelines below can then be used as a starting point to begin troubleshooting.

- Forks open and close unevenly.
 - Forks will not open or close.
- To correct these problems, see Section 4.3.
- Attachment sideshifts too fast or too slow
 - Attachment will not sideshift.
- To correct these problems, see Section 4.4.

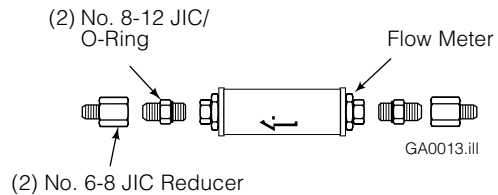


WARNING: Before servicing any hydraulic component, relieve pressure in the system. Turn the truck off and move the truck auxiliary control valves several times in both directions.

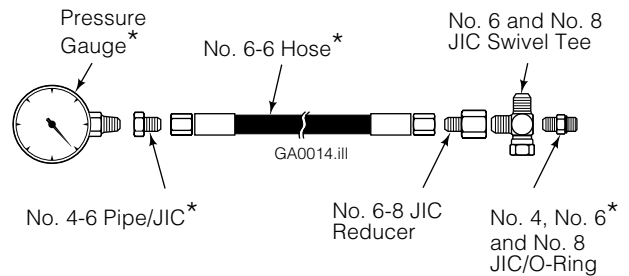
After completing any service procedure, always test the Attachment through several cycles. First test the Attachment empty to bleed any air trapped in the system to the truck tank. Then test the Attachment with a load to be sure it operates correctly before returning to the job.

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

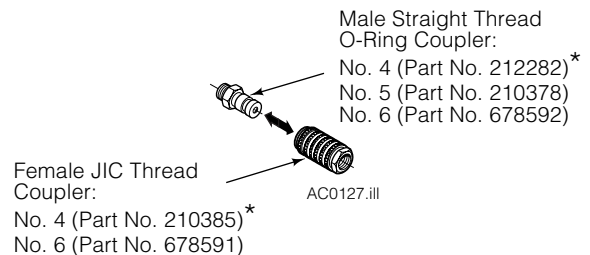
Flow Meter Kit: 671476 (10 GPM - 37 L/min) 671477 (20 GPM - 75 L/min)



Pressure Gauge Kit 671212



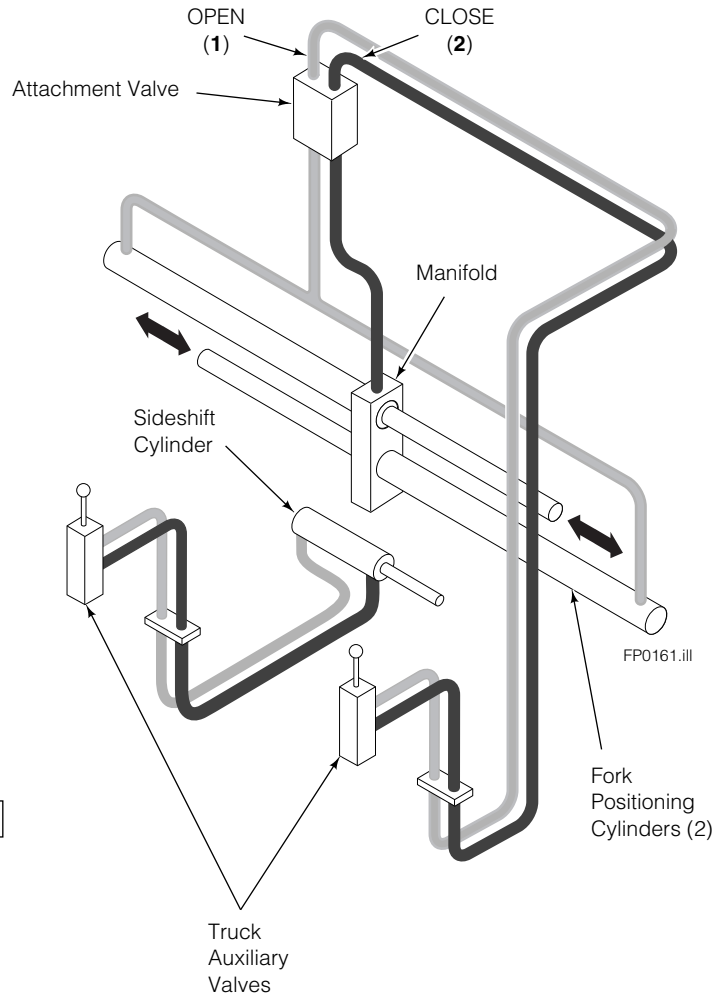
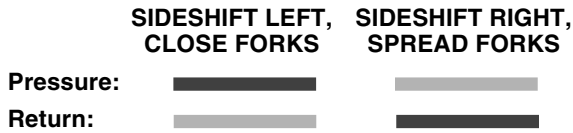
Quick-Disconnects



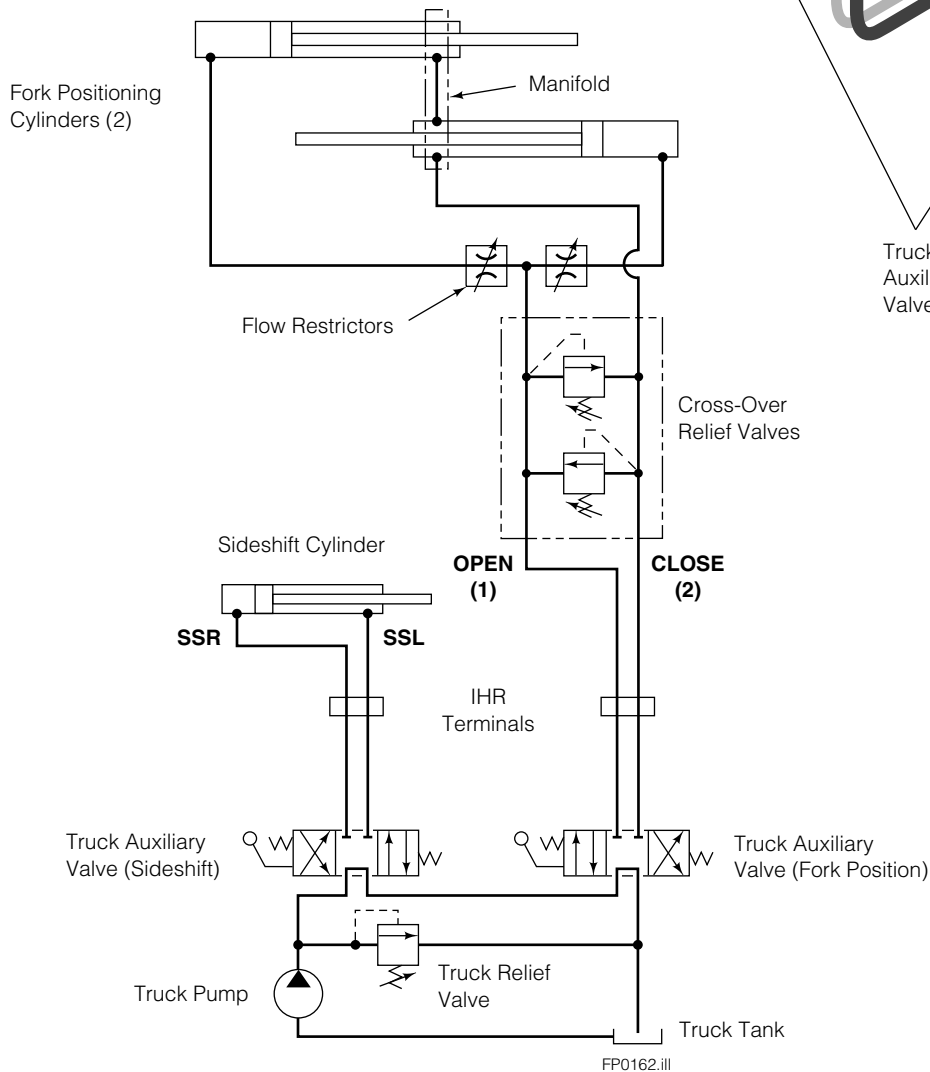
* **NOTE: Diagnostics Kit 394382 includes items marked.**

4.2 Plumbing

4.2-1 Hosing Diagram



4.2-2 Hydraulic Schematic



4.3 Fork Position Function

There are five potential problems that could affect the fork positioning function:

- Forks or fork carriers binding in carriage grooves.
- Incorrect hydraulic pressure or flow to the Attachment.
- External leaks.
- Loose electrical connections or defective solenoid coil or valve (if equipped).
- Worn/defective cartridge valves or cylinder seals.

4.3-1 Supply Circuit Test

- 1 Check the truck pressure at the carriage hose terminal. Pressure must be within 100 psi (7 bar) of that specified in the truck service manual. TRUCK PRESSURE MUST NOT EXCEED 2600 PSI (180 BAR). See Section 6.1 for recommended operating pressure.
- 2 Check the flow volume at the carriage hose terminal. See Section 6.1 for recommended flow volume.
- 3 Spread the forks fully and hold the lever in the OPEN position for 2 seconds. Release the lever and check for external leaks at fittings, hoses, valve and manifold.

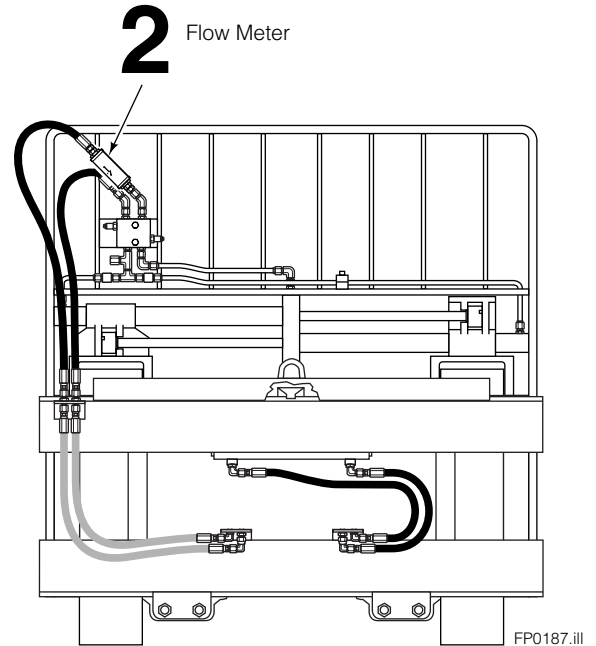
4.3-2 Fork Position Circuit Test

- 1 Press the solenoid button (if equipped) and listen for a 'click' at the solenoid valve. If no sound is heard, check the fuse, wiring and coil (see Section 4.5).

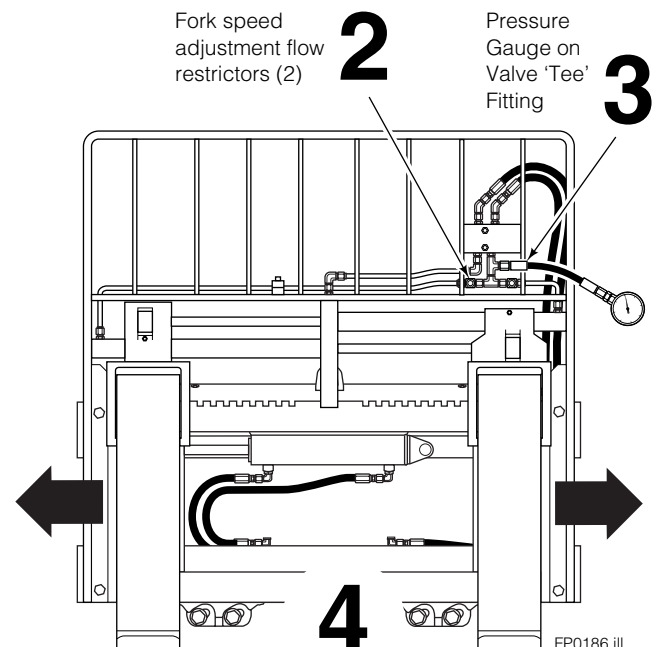
IMPORTANT: Solenoid-operated valves must be plumbed so that the solenoid is **energized** during the fork-positioning function.
- 2 Open and close the forks fully. If the forks move at different speeds, adjust the flow restrictors for equal fork speed (see Section 2, Installation Instructions, Step 12 for procedure).
- 3 Turn the truck off and connect a 5000 psi (345 bar) pressure gauge to the 'tee' fitting below the valve.
- 4 Start the truck and spread the forks fully. Hold the lever in the OPEN position for a few seconds.
- 5 Release the lever and watch the pressure gauge:
 - If the pressure drop **is less** than 150 psi (10 bar) initially, and additional drop does not exceed 25 psi (2 bar) per minute, the problem is not hydraulic (see Section 4.3 above).
 - If the pressure drop **is more** than above, one of the cross-over relief cartridges may be faulty. Replace both cartridges.
- 6 Close the forks fully and hold the lever in the OPEN position for a few seconds. If the pressure still drops as before, the cylinders are at fault and must be serviced (see Section 5.3).



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.



Rear (Driver's) View



Front View

4.4 Sideshift Function

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

- Inadequate sideshifter lubrication or worn bearings. (see Periodic Maintenance, Section 3).
- Incorrect hydraulic pressure or flow to sideshifter.
- External leaks.
- Lower mounting hooks installed incorrectly (see Installation Instructions, Section 2, Step 4).
- Worn or defective cylinder seals.

4.4-1 Supply Circuit Test

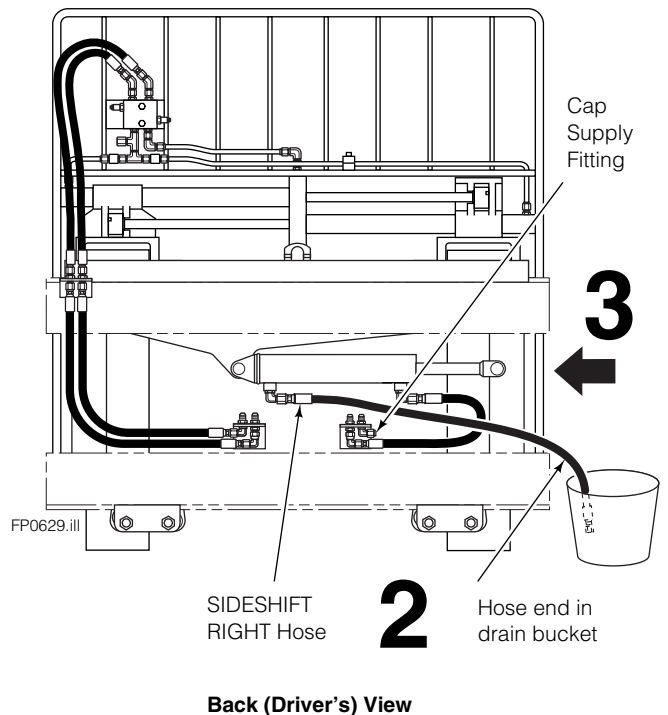
- 1 Check the pressure supplied by the truck at the carriage hose terminal. Pressure must be within the range shown in Specifications, Section 6.1. **PRESSURE TO THE FORK POSITIONER MUST NOT EXCEED 2600 psi (180 bar).**
- 2 Check the flow volume at the carriage hose terminal. Flow must be within the range shown in Specifications, Section 6.1.
- 3 Sideshift left and right fully, holding the lever in each SIDESHIFT position for a few seconds. Release the lever and check for external leaks at fittings, hoses, valve and cylinders.

4.4-2 Sideshift Circuit Test

- 1 Press the solenoid button (if equipped) and listen for a 'click' at the solenoid valve. If no sound is heard, check the fuse, wiring, and coil (see Section 4.5).
IMPORTANT: Solenoid-operated valves must be plumbed so that the solenoid is **not energized** during the sideshifting function.
- 2 Turn the truck off and relieve system pressure. Disconnect the SIDESHIFT RIGHT supply hose from the internal reeving or hose terminal fitting. Cap the supply fitting and place the hose end in a drain bucket.
- 3 Start the truck and actuate the SIDESHIFT LEFT lever for 5 seconds:
 - If there is **substantial hydraulic flow** out of the drain hose, the sideshift cylinder is faulty and requires service.
 - If there is **no hydraulic flow** out of the hose, the problem is not hydraulic (see Section 4.4 above).



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.



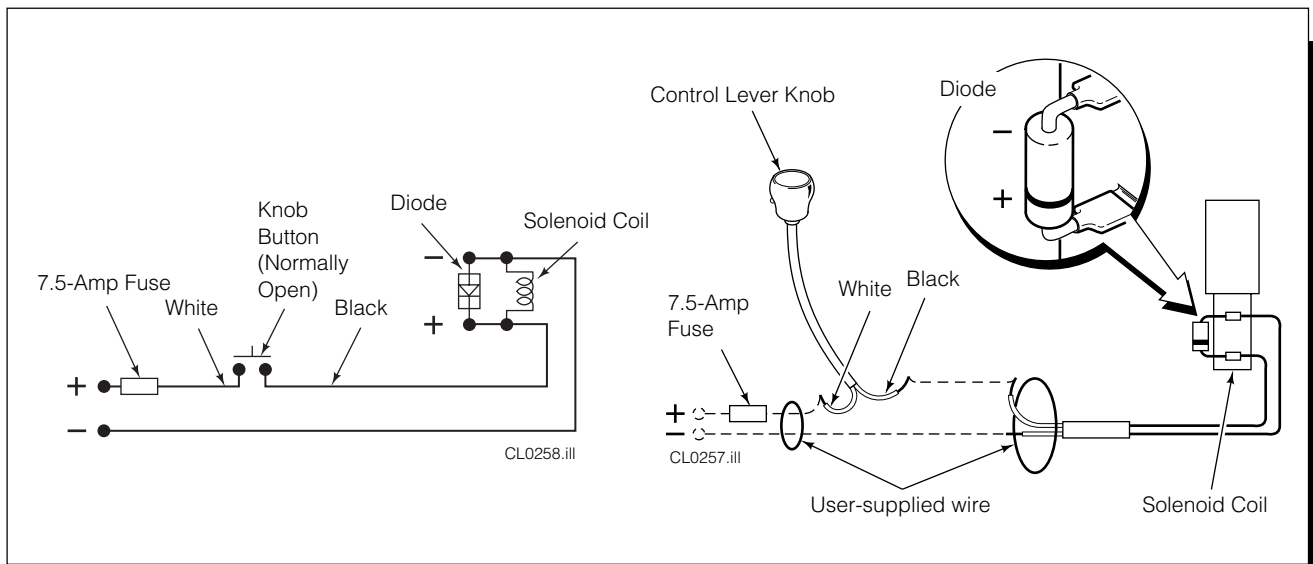
4.5 Electrical Circuit (Solenoid-equipped Attachments)

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 connect to the positive (+) side of the coil and wiring as shown.

- 4 Disconnect the electrical leads from the solenoid coil terminals. Use a voltmeter to determine if voltage is present at the electrical leads when the button is depressed.
 - If there is **no current** to the solenoid, troubleshoot the electrical circuit for shorts.
 - If there is **current** to the solenoid, test for coil continuity.
- 5 Test for 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 depressed, the solenoid cartridge may be jammed.
 - If there is no ohmmeter reading, the coil is defective and should be replaced.




5.1 Fork Positioner Removal

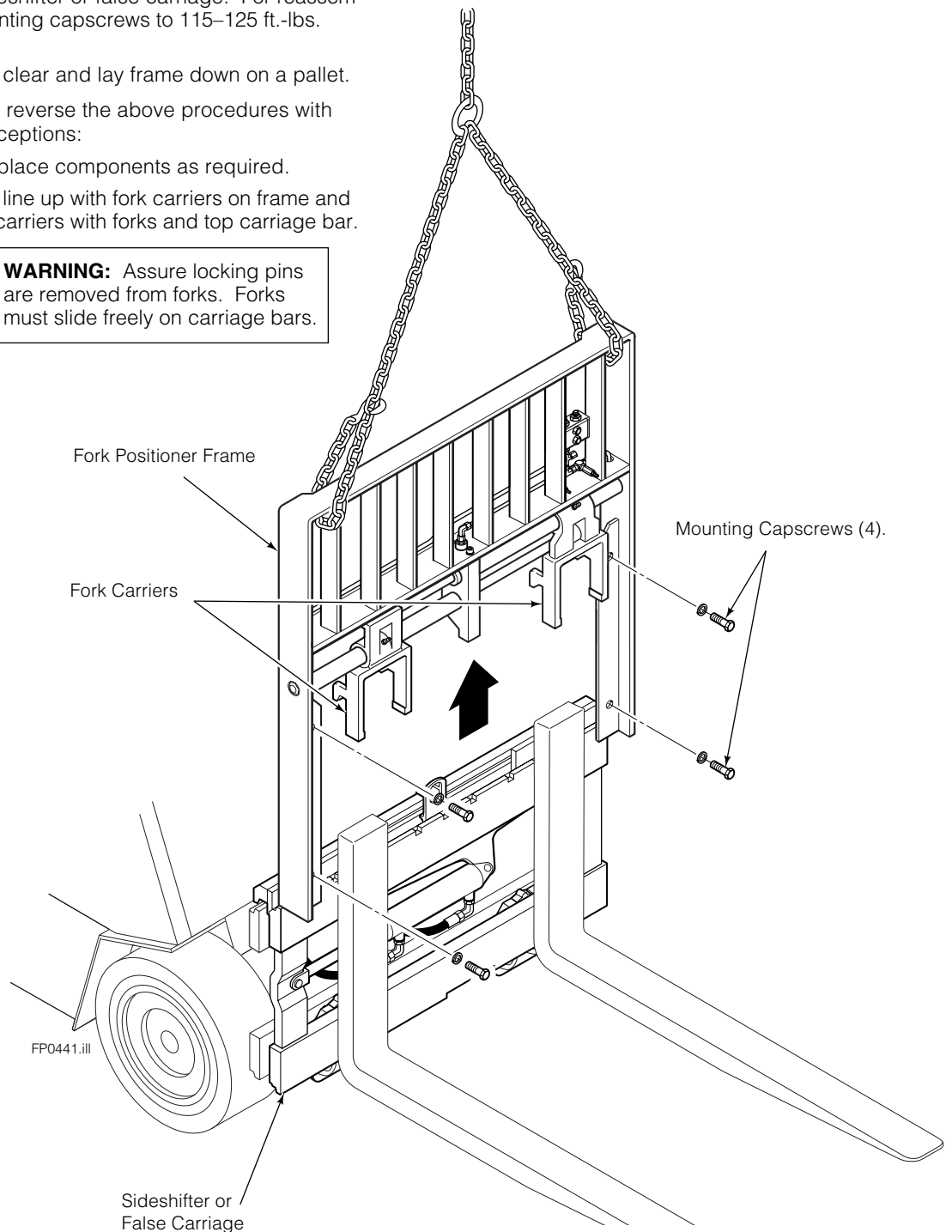
NOTE: To remove the Fork Positioner from the sidsifter unit or false carriage, accomplish the following Steps:

- 1 Attach an overhead hoist to the backrest as shown.
- 2 Disconnect the hoses from the valve. Tag hoses for reassembly.
- 3 Remove the capscrews fastening the Fork Positioner frame to the sidsifter or false carriage. For reassembly, tighten mounting capscrews to 115–125 ft.-lbs. (155–170 Nm).
- 4 Raise the frame clear and lay frame down on a pallet.
- 5 For reassembly, reverse the above procedures with the following exceptions:
 - Service or replace components as required.
 - Slide forks to line up with fork carriers on frame and engage fork carriers with forks and top carriage bar.



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

 **WARNING:** Assure locking pins are removed from forks. Forks must slide freely on carriage bars.



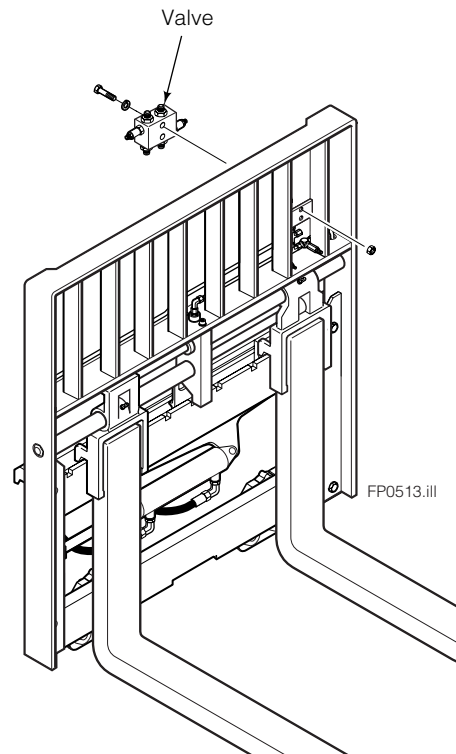
5.2 Valve

5.2-1 Valve Removal



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.

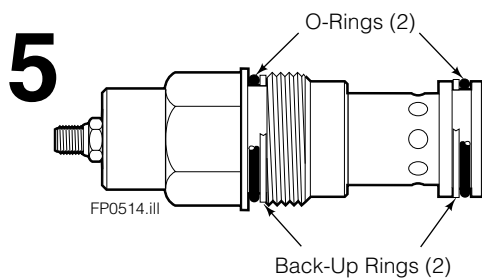
- 1 Disconnect the hoses from the valve. Tag hoses for reassembly.
- 2 Disconnect the tubing at the bottom of the valve. Plug the tubing ends.
- 3 Remove the capscrews fastening the valve to the frame and remove the valve. For reassembly, tighten the capscrews to 15 ft.-lbs. (22 Nm).
- 4 For reassembly, reverse the above procedures with the following exceptions:
 - Service the valve as described in Section 5.2-2.



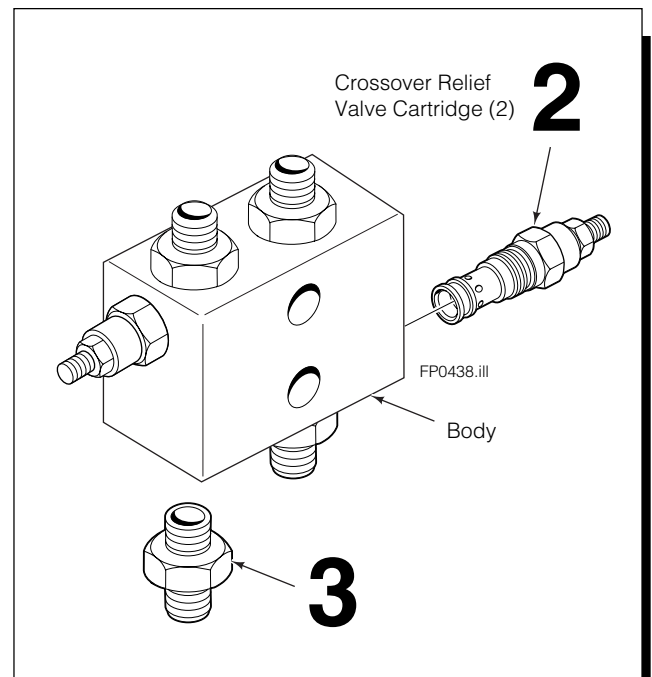
5.2-2 Valve Service

IMPORTANT: Service the valve in a clean work area.

- 1 Remove the valve from the Fork Positioner as described in Section 5.2.1.
- 2 Remove the crossover relief valve cartridges from the valve. Remove the O-rings and back-up rings from the cartridges.
- 3 Remove the fittings from the valve.
- 4 Clean all parts with solvent.
- 5 For reassembly, reverse the above procedures with the following exceptions:
 - Replace O-rings and back-up rings on relief valve cartridges as shown.



CROSSOVER RELIEF CARTRIDGE



5.3 Cylinders

5.3-1 Cylinder Removal

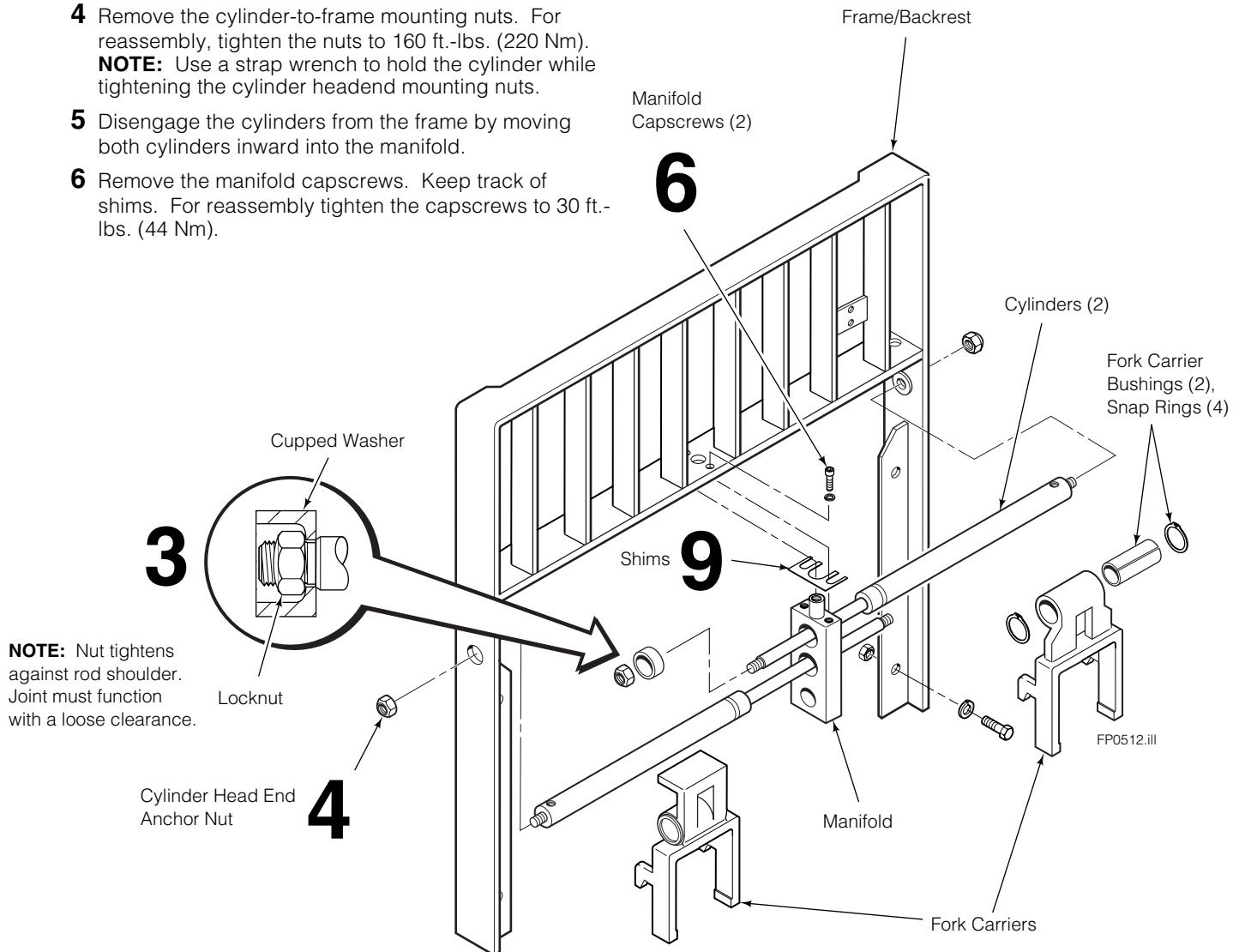
The cylinder/manifold assembly can be removed with the Fork Positioner mounted on the truck.



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.

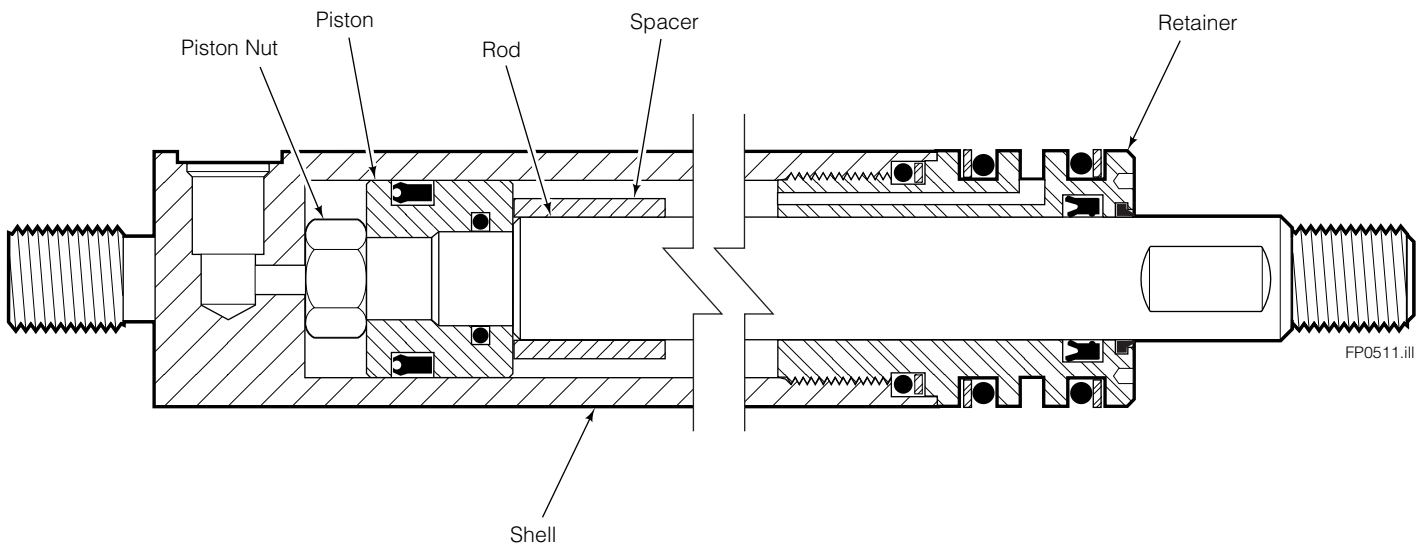
- 1 Close forks completely.
- 2 Disconnect the tubing at the cylinders and manifold. Plug the tubing ends.
- 3 Disconnect the cylinder rod-end anchors. For reassembly, insert the cupped washer into the middle of the fork carrier mount and engage the cylinder rod end. Tighten the nut and cupped washer against the rod to 160 ft.-lbs. (220 Nm). **NOTE:** Joint functions with a loose clearance. Lubricate with chassis grease.
- 4 Remove the cylinder-to-frame mounting nuts. For reassembly, tighten the nuts to 160 ft.-lbs. (220 Nm). **NOTE:** Use a strap wrench to hold the cylinder while tightening the cylinder headend mounting nuts.
- 5 Disengage the cylinders from the frame by moving both cylinders inward into the manifold.
- 6 Remove the manifold capscrews. Keep track of shims. For reassembly tighten the capscrews to 30 ft.-lbs. (44 Nm).

- 7 Remove the cylinders, manifold, and fork carriers as an assembly from the frame and forks.
- 8 Slide the fork carriers off the cylinders and disengage the cylinders from the manifold.
- 9 For reassembly, reverse the above procedures with the following exceptions:
 - Apply O-ring lube or petroleum jelly to the exterior O-rings on the cylinders before installing the cylinders into the manifold.
 - Use the appropriate number of shims to fill the gap between the top of the cylinder manifold and the frame bar. Shims are 1 mm thick. Tighten capscrews to 30 ft.-lbs. (44 Nm).



5.3-2 Cylinder Disassembly

- 1 Hold the cylinder with a strap wrench.
- 2 Remove the cylinder rod retainer by unscrewing with a pin-type spanner wrench.
- 3 Remove the piston, rod and retainer as an assembly from the cylinder shell.
- 4 Slide the retainer from the cylinder rod. Remove all seals and O-rings. Pry seals up with a brass seal removal tool and cut to remove. **CAUTION:** Do not scratch the seal grooves.
- 5 Using a soft-jawed vise, clamp on the flats of the cylinder rod and remove the piston nut and piston.
- 6 Remove all seals from the piston. Pry seals up with a brass seal removal tool and cut to remove.

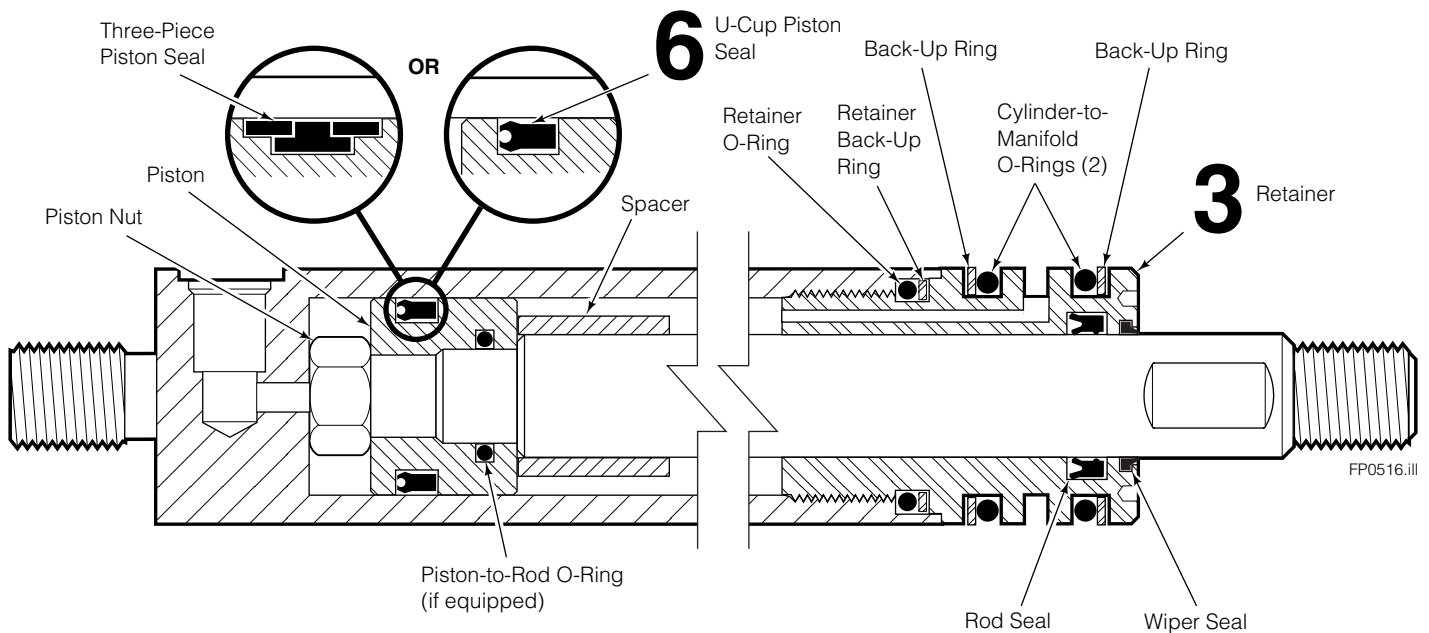


5.3-3 Cylinder Inspection

- Inspect the rod, piston and retainer for nicks or burrs. Minor nicks or burrs can be removed with 400-grit emery cloth. If they cannot be removed, replace the part.
- Inspect the cylinder shell bore and remove any minor nicks or burrs with a butterfly. If nicks or burrs cannot be removed, replace the part.
- Inspect the outside of the shell bearing surface for any damage, deformities or cuts that could impare performance or cause leaks under pressure. If necessary, replace the part.

5.3-4 Cylinder Reassembly

- 1 Lubricate new seals and O-rings with petroleum jelly.
- 2 Polish the piston and retainer chamfer angles with 400-grit emery cloth to ease seal installation.
- 3 Install a new rod seal, wiper seal, O-rings and back-up rings on the retainer (see illustration below).
- 4 Using a soft-jawed vise, clamp the cylinder rod on the flats at the end. **CAUTION:** Do not clamp on the cylinder rod sealing surface.
- 5 Install the piston on the rod. Apply Loctite 242 (Blue) and tighten the piston nut to 55 ft.-lbs. (75 Nm).
- 6 Install a new pressure seal on the piston. **NOTE:** Two types used (see illustration below).
- 7 Apply petroleum jelly to the ID of the retainer and slide the retainer onto the cylinder rod. Use a piston/seal loader as required to prevent damage to the seals.
- 8 Apply petroleum jelly to the cylinder shell and piston OD and install the rod assembly into the cylinder shell. Use a piston/seal loader as required to prevent damage to the seals.
- 9 Apply anti-seize compound to the retainer threads and screw the retainer into the shell. Using a pin wrench tighten the retainer to 55 ft.-lbs. (75 Nm).



5.4 Fork Carrier

5.4-1 Fork Carrier Bushing Service

The fork carrier bushings can be replaced with the fork carriers in place. No disassembly is required. Refer to illustration in Section 5.3-1.

- 1 Remove the grease fitting and snap rings from the bushing ends.
- 2 Spread the new split bushings and install on the cylinder OD. Displace the old bushing in the fork carrier with the new bushing.
- 3 Reinstall the snap rings.

6.1 Specifications

6.1-1 Hydraulics

Truck Relief Setting

2300 psi (160 bar) Recommended
2600 psi (180 bar) Maximum

Truck Flow Volume ^①

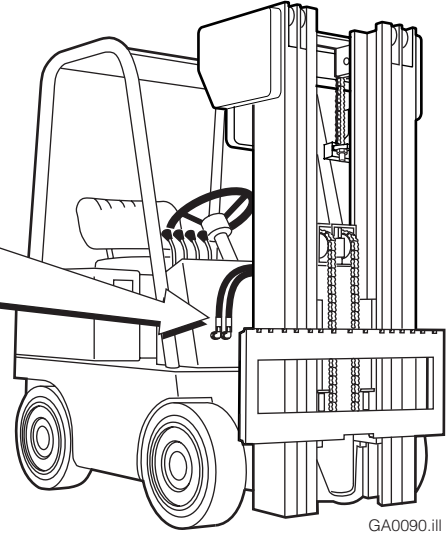
150H	Min. ^②	Recommended	Max. ^③
Fork Position	3 GPM (11 L/min.)	4 GPM (15 L/min.)	5 GPM (19 L/min.)
Sideshift	1 GPM 4 L/min.)	6 GPM 23 L/min.)	12 GPM 45 L/min.)

- ① Cascade H-Series Fork Positioners 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 slower fork-positioning and sideshifting speeds.
- ③ Flow greater than maximum can result in excessive heating, reduced system performance and short hydraulic system life.

Hoses and Fittings

All supply hoses must be at least No. 6 minimum.

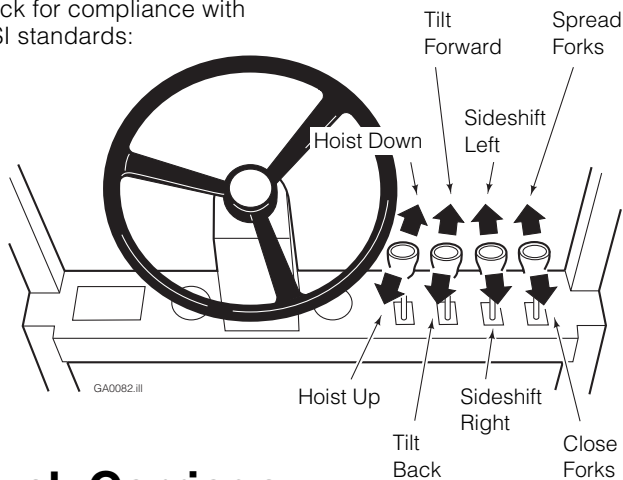
All fittings must have an orifice size of 9/32 in. (7 mm) minimum.



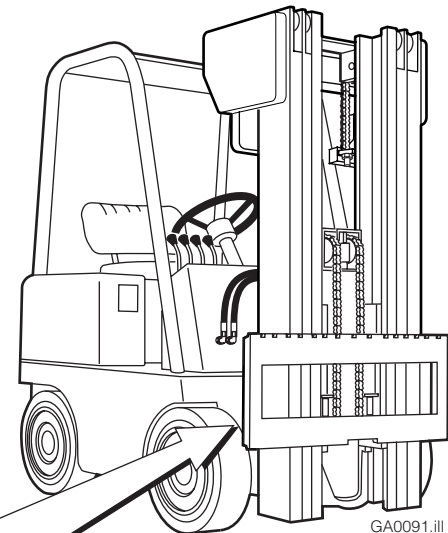
GA0090.ill

6.1-2 Auxiliary Valve Functions

Check for compliance with ANSI standards:



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6.1-3 Truck Carriage



Carriage Mount Dimension (A) ITA (ISO)

	Minimum	Maximum
Class IV	23.44 in. (595.5 mm)	23.50 in. (597.0 mm)

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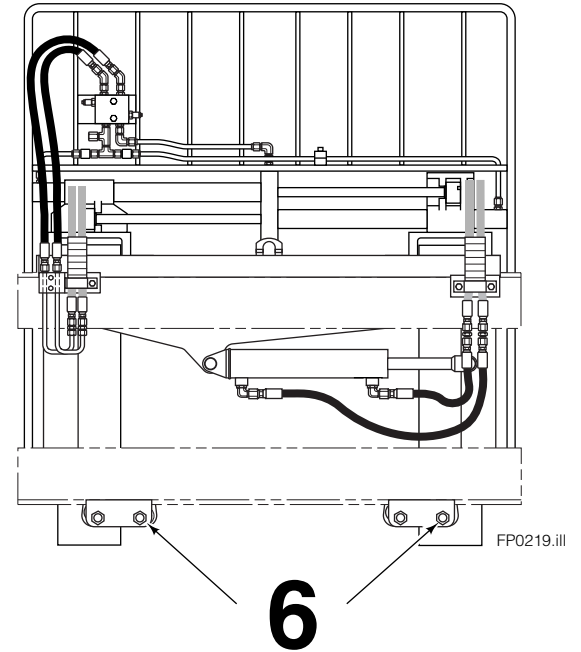
6.1-4 Torque Values

Fastener torque values for the 150H Fork Positioner are shown in the table below in both U.S. and Metric units. All torque values are also called out in each specific service procedure section throughout the Manual.

Ref.	Fastener	Size	Ft.-lbs.	Nm
1	Frame-to-carriage or sidershifter (4)	.5625 in.	110	145
2	Cylinder-to-frame (2)	.750 in.	160	220
3	Cylinder rod-end anchor (2)	.750 in	160	220
4	Valve-to-frame (2)	M-8	16	22
5	Manifold-to-frame (2)	M-10	33	44
6	SS Lower Hooks (4)	M-16	40	50
7	Cylinder Piston		55	75 ■
8	Cylinder Retainer		55	75 ▲

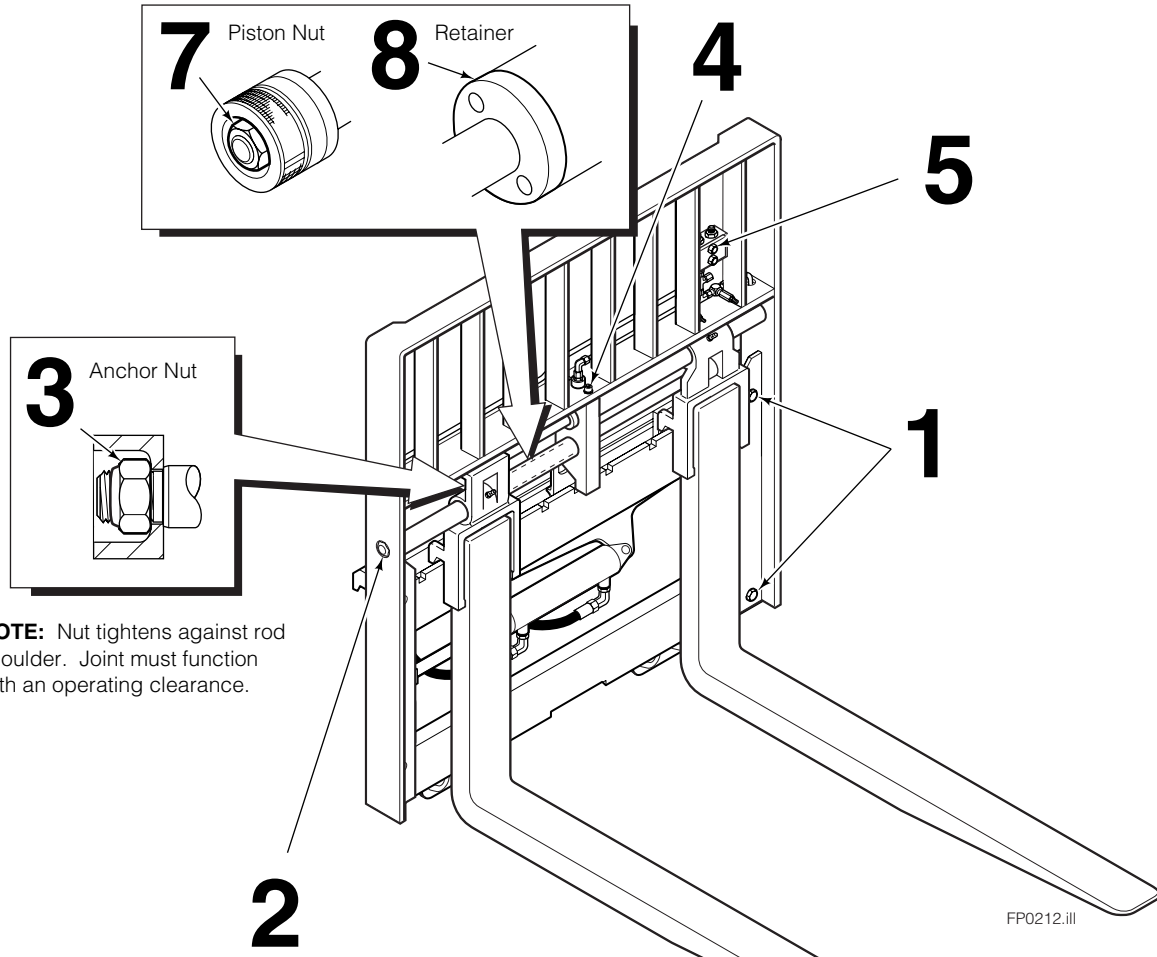
■ Use Loctite 242 (Blue)

▲ Use Anti-Seize Compound



Back (Driver's View)

(Fork Positioner shown mounted on Sidershifter)



NOTE: Nut tightens against rod shoulder. Joint must function with an operating clearance.

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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