

# **INSTALLATION INSTRUCTIONS** *and PERIODIC MAINTENANCE*

## ***Layer Picker***

***Swing, Stationary Side  
Mount, Carriage Mount,  
and Fork Mount Models***

***Manual Number 222964-R9***

**cascade<sup>®</sup>  
corporation**

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<u>Overview</u>	<u>1</u>
<u>Recommended Hydraulic Supply</u>	<u>5</u>
<u>Swing and Stationary Side Mount Models</u>	<u>5</u>
<u>Carriage Mount &amp; Fork Mount Models</u>	<u>6</u>
<u>Truck Requirements</u>	<u>7</u>
<u>Swing and Stationary Side Mount Models</u>	<u>7</u>
<u>Carriage Mount &amp; Fork Mount Models</u>	<u>8</u>
<u>Truck Preparation</u>	<u>9</u>
<u>Installation</u>	<u>14</u>
<u>Swing and Stationary Side Mount Models</u>	<u>14</u>
<u>Carriage Mount &amp; Fork Mount Models</u>	<u>25</u>
<u>Load Troubleshooting</u>	<u>31</u>
<u>Contact Pad Chamber Adjustment</u>	<u>32</u>
<u>Periodic Maintenance</u>	<u>33</u>

This manual provides instructions for installing Cascade Layer Picker models on lift trucks.

Follow the suggested installation procedures for best results. If you have any questions or need more information, contact your nearest Cascade Service Department. Refer to back cover.

Read the **WARNING** Statements placed throughout this manual to emphasize safety during installation.

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

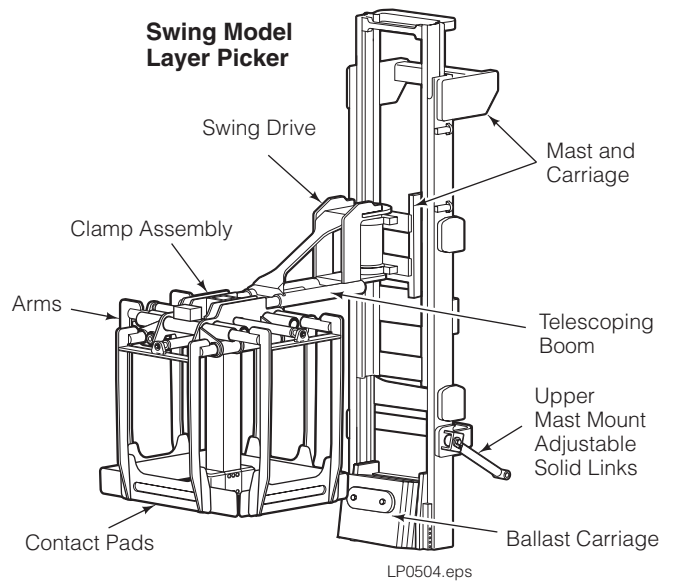
## Layer Picker Descriptions

**Swing Model Layer Picker** – A mast-mounted sliding arm clamp with four contact pad surfaces. The clamp assembly is mounted on a telescoping boom that extends, retracts and swings from side-to-side. A heavy-duty mast and carriage are specifically designed for side loading. The unit is designed to pick layers/tiers of most case/carton product to build specific mixed loads. Side-to-side swing capability provides the ability to handle loads on both sides of a pick line. An optional lower carriage enables pallet loads to be built directly on the unit (HOIST function minimum of 12 GPM or 45 L/min.). The layer picker uses the truck main valves for the HOIST and SWING functions and two auxiliary valves for the CLAMP and REACH functions. The truck/attachment combination is designed to operate most productively within a floor mounted guide rail pick line.

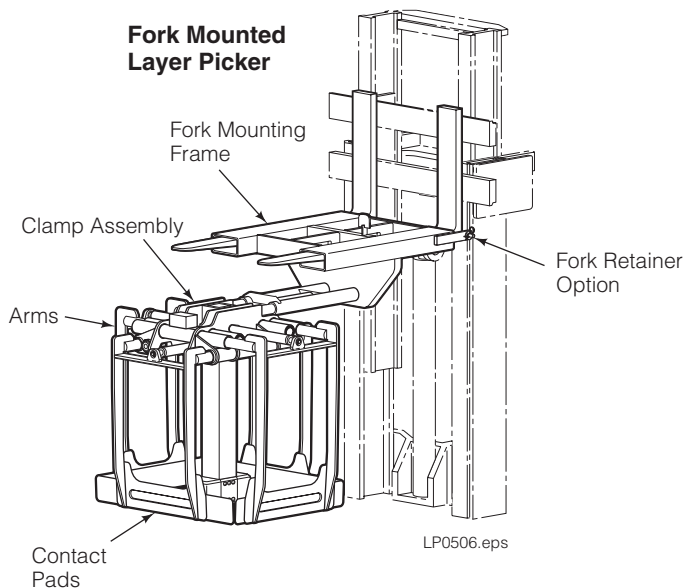
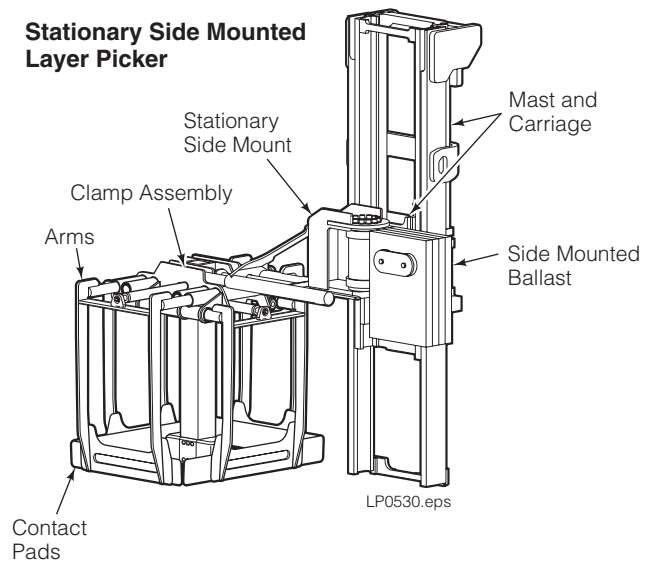
**Stationary Side Mounted Layer Picker** – A mast-side-mounted sliding arm clamp with four contact pad surfaces. The clamp assembly is mounted on a telescoping boom that extends and retracts. A heavy-duty mast and carriage are designed for fixed side loading. The layer picker uses main valve HOIST and two auxiliary valves for CLAMP and REACH functions. The truck/attachment combination is designed to operate independently or within a floor mounted guide rail pick line.

**Carriage Mounted Layer Picker** – A carriage-mounted clamp with four contact pad surfaces. The layer picking clamp assembly is mounted on a telescoping boom that extends and retracts. A heavy-duty mast and carriage are designed for fixed side loading. The layer picker uses main valve HOIST and two auxiliary valves CLAMP and REACH functions. The truck/attachment combination is designed to operate independently or within a floor mounted guide rail pick line.

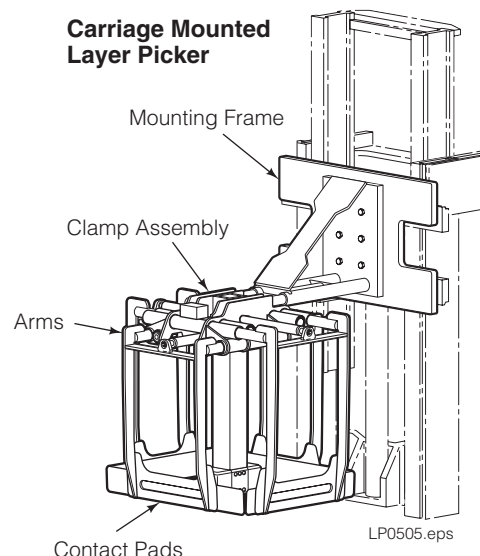
**Fork Mounted Layer Picker** – A fixed front clamp with four contact pad surfaces. The layer picker is designed to slip onto existing forks. The layer picker uses one auxiliary valve for CLAMP function. The layer picker can be mounted on a sideshifter or single double. The truck/attachment combination does not require a floor mounted guide rail pick line or special mast.



**Stationary Side Mounted Layer Picker**



**Carriage Mounted Layer Picker**

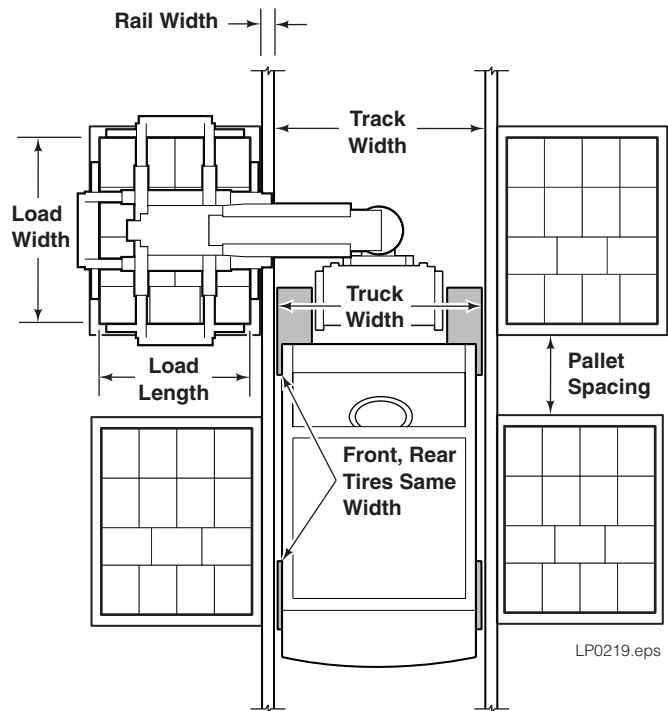


## Special Requirements for Dealers, Users

Cascade Layer Picker installation requires the following:

- Typical lift truck capacity 6000 lbs (2720 Kg).
- Consideration of floor-mounted guide rail pick line, as shown.
- **Prior to delivering truck and sizing the pick line width, insure that the steer tires are pressed out to the same outer width as the drive tires. Insure that the steel rim of the tire contacts the rail, not the rubber.**
- Consideration of mast mounting (if equipped) type: axle or pin. The Swing Model Layer Picker is integral with heavy-duty mast designed for side loading.
- Installation of adjustable solid links replacing tilt cylinders (no tilt function on Swing Model Layer Picker).
- Installation of tilt control kit (carriage mount and fork mount models).
- Truck hydraulic supply. Refer to page 7 for swing model or page 8 for carriage mount and fork mount models.
- Flow/Pressure Control Valve to provide 3.5 GPM (SWING function) and 7.0 GPM (CLAMP and REACH functions). An alternative is truck main and auxiliary valves equipped with flow and pressure adjustments.
- Four-position Pressure Selection Valve for correct clamp force for type of case product and number of layers/tiers being picked and handled.
- Dedicated return-to-tank lines for above valves.

**IMPORTANT: Layer Pickers with Cascade Mast –** After the Layer Picker has operated the initial 50 hours, perform the 50 Hour Maintenance as described in Technical Bulletin TB 339, Layer Picker Initial 50 Hour Inspection and Adjustment. These maintenance steps will ensure the Layer Picker is properly adjusted and operating correctly. After the maintenance steps are complete, file a Warranty Claim to be reimbursed for time and travel.



Top View - Truck / Layer Picker in Pick Line

## Load Considerations

- For proper Layer Picker integration, type of case or carton, case weight, tier size, tier weight, and type of stacking must be considered. Different clamp forces are required for different types of product and case or carton construction.
- Before production use, testing must be done with actual case loads being handled to determine correct clamp force pressure settings (see page 22, Step E).
- Driver-selectable clamp force is required when picking a different number of layers/tiers.
- Layers/tiers must be clamped properly to prevent product damage. See Cascade Operator's Guide 222225 for recommended and safe handling procedures.
- Contact pad size and surface must be selected for the case and product type being handled.

## Swing Model – Major Components

**Mast and Carriage** – Two stage heavy-duty mast and carriage specifically designed with extra side thrust bearings for side loading when loads are swung from side-to-side. **Optional Lower Carriage** with forks to build loads directly on Layer Picker.

**Double IHR and Hose Reel** – Mast equipped with double IHR for REACH and CLAMP functions, RH hose reel for SWING function.

**Adjustable Solid Link Upper Mast Mounts** – Adjustable solid links replace mast tilt cylinders, providing 0 degrees of mast tilt. No tilt function on Layer Picker.

**Clamp Assembly** – Four-arm, sliding-arm type clamp hangs in a level attitude providing even clamping for all types of case loads. Clamp swings through 180 degrees for use with a two-rail double-sided pick line.

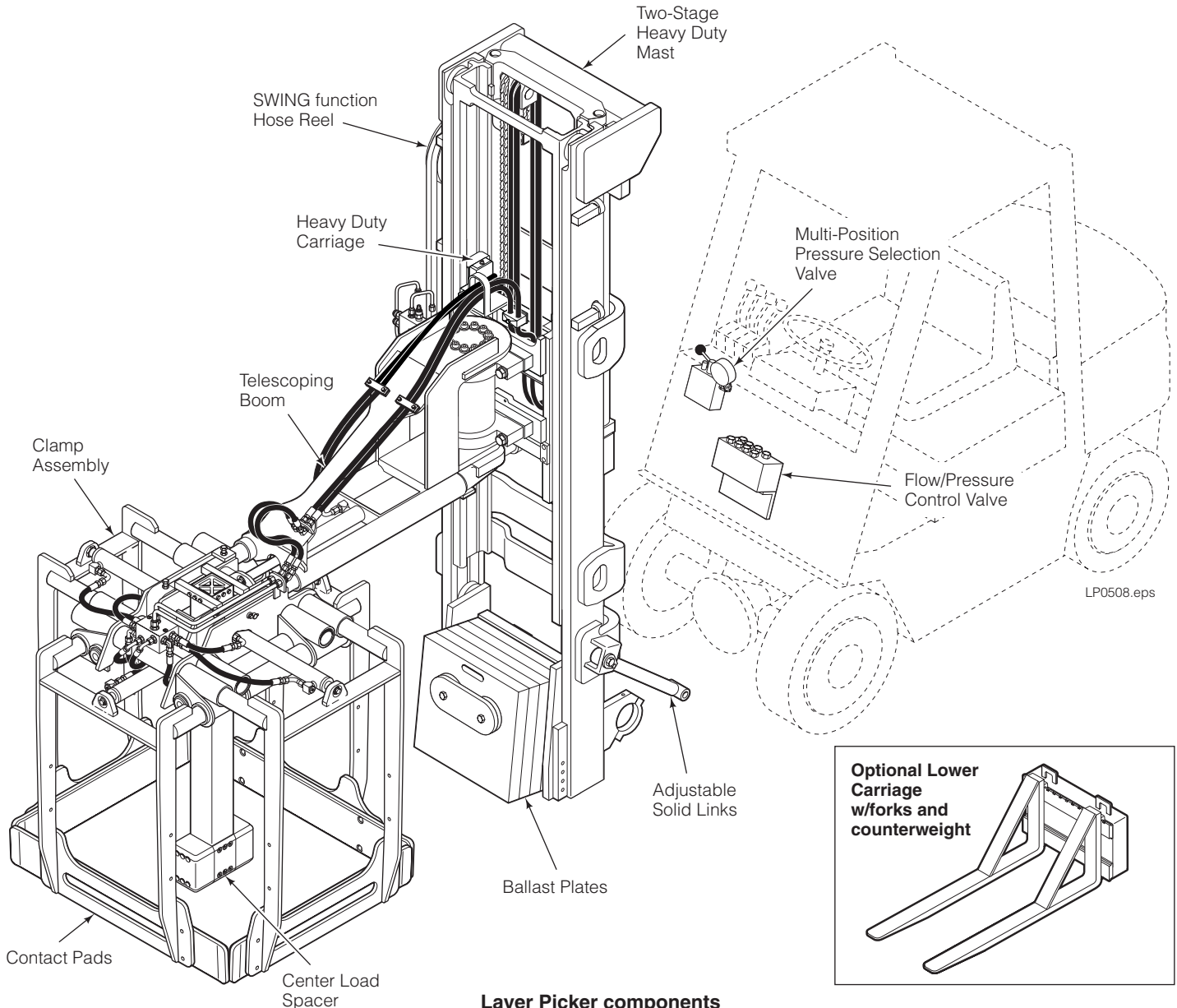
**Telescoping Boom** – Extending and retracting boom enables clamp assembly to be exactly centered over tier or load.

**Center Load Spacer (Core Probe)** – Provides proper clamping characteristics for chimneyed case loads. Square-section spacer floats in center of clamp frame against flat bearings on walls.

**Flow/Pressure Control Valve** – Provides correct hydraulic supply to Layer Picker regardless of truck supply.

**Multi-Position Pressure Selection Valve** – Enables selection of correct clamp force for product case type and number of tiers.

**Ballast Plates (on Ballast Carriage)** – For proper front truck tire loading when swinging loads, use provided ballast plates. Required number of ballast plates is determined by truck type and intended loads.



Layer Picker components

## Operational Characteristics

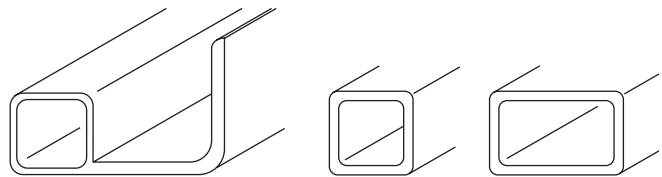
Following are some general operational characteristics of the Layer Picker and operating environment. Dimensions are recommendations only, typical for various installations. It is important that the guide rail system be configured for the type of truck and product being handled.

- 1 Floor-Mounted Guide Rails** – A floor-mounted guide rail system and an organized pick line enables the Layer Picker to provide maximum productivity.

Guide rail layout is typically a straight section of parallel guide rails, mounted on the floor. With the proper track clearance, the truck can travel from one end to the other with minimal steering required. Rails have been constructed of L-section, hollow square-section, or hollow rectangular-section steel, fastened to the floor with anchor bolts. Cased loads on pallets or slipsheets are stacked alongside the pick line against either side of the rail. The Layer Picker is swung from side-to-side, picking tiers from one load and depositing onto another. Completed loads ready for unitizing and loading into trailers are then handled in the normal way, and new product is introduced to the pick line. Loads can also be built up directly on the Layer Picker when an optional lower fork carriage is installed. Finished loads are then delivered to the sides or end of the pick line. Rail guide followers are available for single and double rail systems. These are attached to the truck frame to provide truck guidance without operator steering.

- 2 Unequal Clamp Arm Movement** – Unequal clamp arm movement enables all four pads to contact the load without moving cases prior to clamping.
- 3 Center Load Spacer (Core Probe)** – A center load spacer is available for certain applications to improve clamping characteristics with chimneyed loads. The spacer is inserted or removed through the top of the clamp frame as required.
- 4 Ballast Carriage** – Mast mounted ballast carriage is required for proper truck front tire loading when swinging loads. Ballast plates are mounted on a fixed lower carriage, or optional fork carriage, with weight determined by the truck weight and load weight handled.
- 5 Clamp Force Selection** – Selectable clamp force is required for different product types, cases and weights. Case creasing or slippage may result if clamp force is not controlled, or if pressures are not set correctly. Pressure settings must be verified through testing. Refer to Step 8, page 20).
- 6 Flow and Pressure Control** – Flow and pressure control is required for proper operating speeds. A Flow/Pressure Control Valve is supplied with the Layer Picker. An acceptable alternative is a truck equipped with flow and pressure control adjustments in the truck main and auxiliary valve sections.
- 7 Electronic Swing Control (ESC)** – Swing control is required to properly slow the swing of the load at the proper stopping points. All swing models are equipped with a swing control device to cushion the stopping motion at 0° and 180° or at 0° - 90° - 180° depending on the swing unit configuration.

### Typical Rail Types

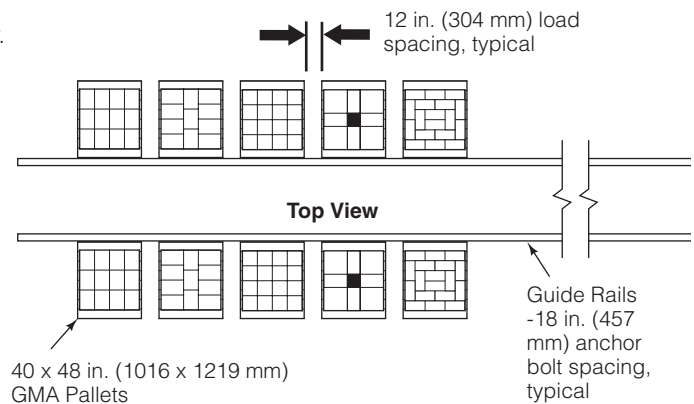


**Bumper with welded L-Section**  
2 x 2 in. (50 x 50 mm) Bumper  
6 x 6 in. (152 x 152 mm),  
.75 in (19 mm) thick L-Section

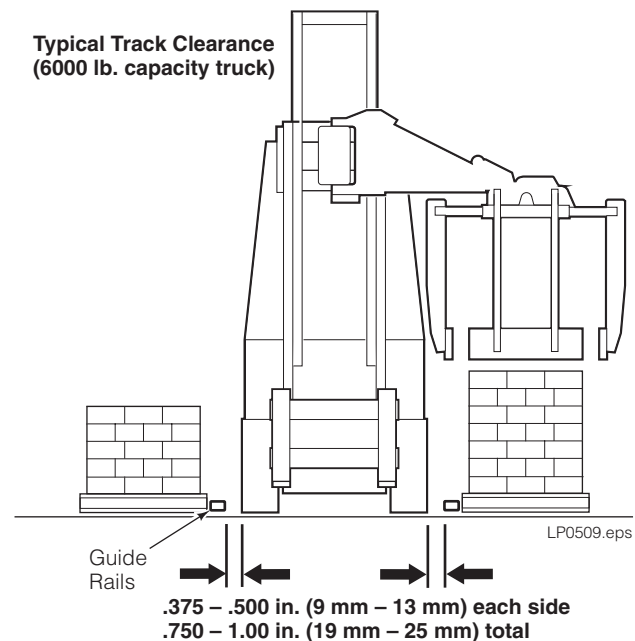
**Square Bumper**  
5 x 5 in.  
(127 x 127 mm)  
hollow tube

**Rectangular Bumper**  
5 x 8 in.  
(127 x 203 mm)  
hollow tube

### Typical 200-Ft. Pick Line



### Typical Track Clearance (6000 lb. capacity truck)



# **R**ECOMMENDED HYDRAULIC SUPPLY

## SWING & STATIONARY SIDE MOUNT MODELS

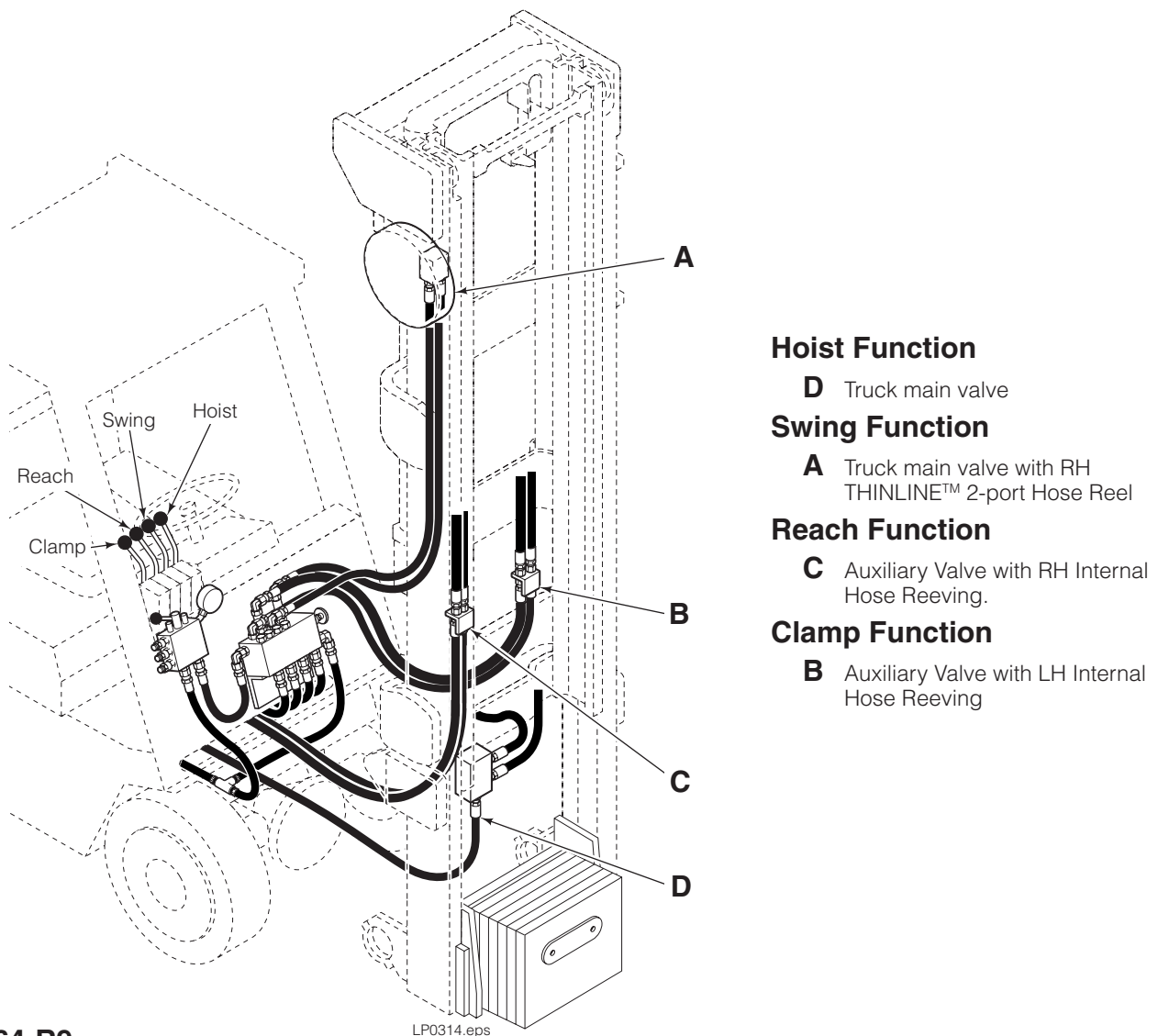
**NOTE:** Swing function does not apply to Stationary Side Mount models.

**Hydraulic Functions** – Swing Model Layer Picker installation requires four hydraulic functions as shown below. Four control levers – two auxiliary valves in addition to the two truck main valves are recommended. The Layer Picker mast provides double IHR for the CLAMP and REACH circuits and a RH hose reel for the SWING circuit (if equipped). A solenoid operated valve mounted on the mast is provided if the Layer Picker is equipped with the optional lower fork carriage.

**No Tilt Function** – Truck tilt function is changed to operate the SWING function (if equipped). Layer Picker operation requires a fixed mast with 0 degrees of tilt.

**Flow and Pressure Control** – Layer Picker hydraulic circuits for the CLAMP and SWING functions require flow and pressure control for proper operation. Cascade provides a flow and pressure control valve with the Layer Picker, or a suitable alternative is adjustable flow and pressure controls on the truck main and auxiliary valve sections.

**Optional Lower Carriage with Forks** – A second, lower carriage with forks (if equipped) is controlled with an additional mast-mounted, solenoid-operated auxiliary valve in the HOIST circuit.





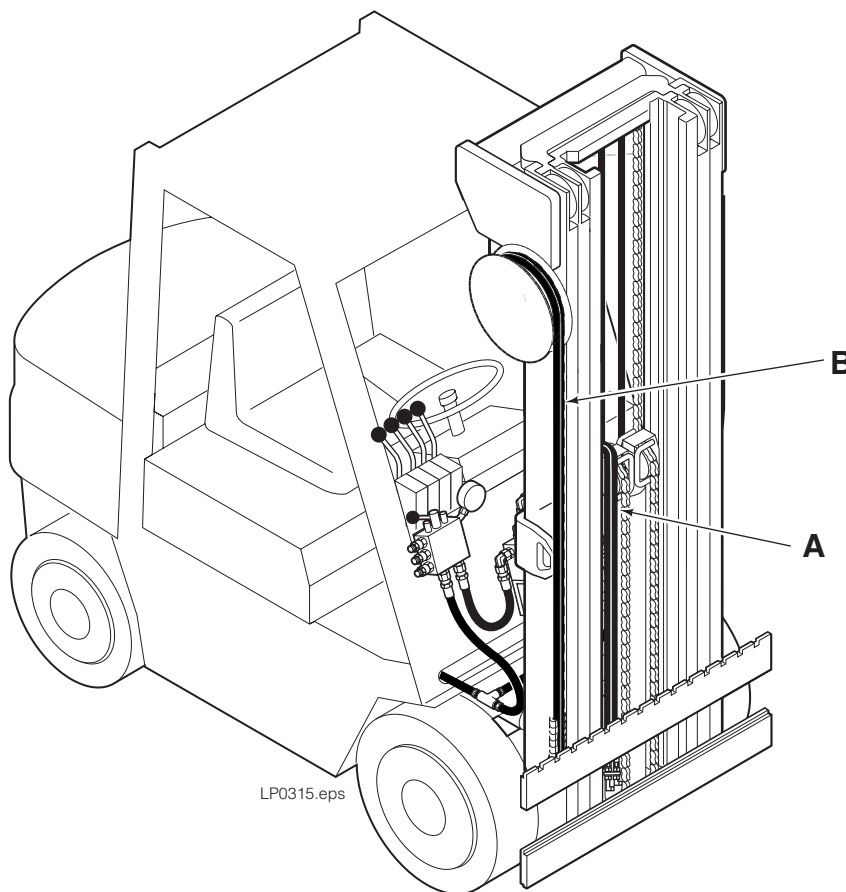
### Options

**Carriage Mounted Hydraulic Functions** – Carriage Mounted Layer Picker installation requires one auxiliary valve (CLAMP) in addition to the truck main valves. If installing with Sideshifter, additional auxiliary valves required.

**Fork Mounted Hydraulic Functions** – Fork Mounted Layer Picker installation requires one auxiliary valve (CLAMP) in addition to the truck main valves. If installing with Sideshifter or Single Double, additional auxiliary valves required.

**Optional Tilt Control** – For proper vertical clamping Cascade recommends installing tilt control. There are two options available - single direction and dual direction. Contact Cascade to select the appropriate tilt control kit.

**Optional Flow and Pressure Control** – Layer Picker hydraulic circuits for the CLAMP and SWING functions require flow and pressure control for proper operation. Cascade provides a flow and pressure control valve with the Layer Picker, or a suitable alternative is adjustable flow and pressure controls on the truck main and auxiliary valve sections.



### Clamp Function

**A** Internal Hose Reeving

**OR**

**B** RH THINLINE™ 2-Port Hose Reel





# TRUCK REQUIREMENTS

## SWING & STATIONARY SIDE MOUNT MODELS

### Truck Relief Settings

**Reach,**  
**Clamp,** 2000 psi (138 bar) Recommended  
**Swing,** 2300 psi (160 bar) Maximum  
**Hoist**

### Truck Flow Volume <sup>①</sup>

30A & 30B	Min. <sup>②</sup>	Recommended	Max. <sup>③</sup>
Reach, Clamp	5 GPM (18 L/min.)	7 GPM (37 L/min.)	10 GPM (56 L/min.)
Swing	2 GPM (18 L/min.)	3.5 GPM (13 L/min.)	5 GPM (13 L/min.)
Hoist	7 GPM (26 L/min.)	11 GPM (42 L/min.)	15 GPM (57 L/min.)

① Cascade Layer Pickers 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 will result in slower than normal operating speed.

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

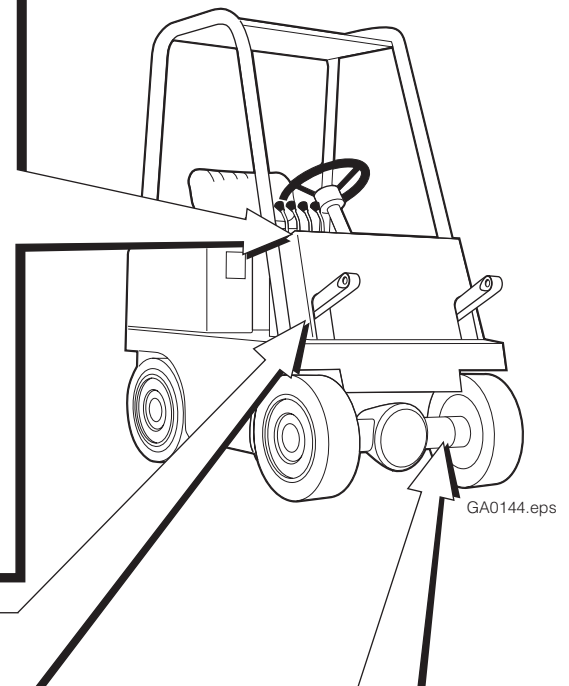
### Hoses and Fittings

- **Hoist Function** – Hoses and fittings for the HOIST function should be No. 8 with .400 in. (10 mm) minimum ID.
- **Clamp, Reach, Swing Functions** – Hoses and fittings for the CLAMP, REACH and SWING functions should be No. 6 with .250 in. (7 mm) minimum ID.



**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.

**NOTE:** Swing function does not apply to Stationary Side Mount models.



### Upper Mast Mounts (tilt cylinders)

No tilt function on the Layer Picker. Mast tilt cylinders are replaced with adjustable links to provide a fixed, mast-vertical configuration for all operations. If adjustable links are not provided, contact OEM for cylinder lockout/immobilization.

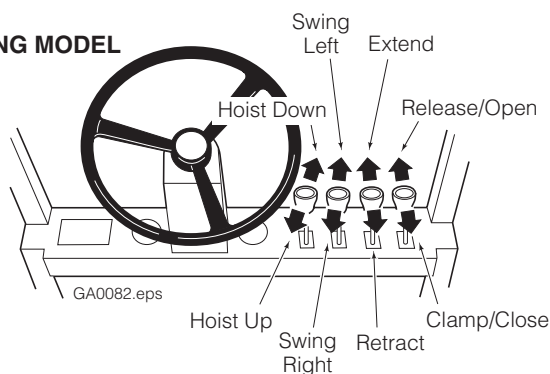
### Lower Mast Mounts

Clean truck axle or pin mounts and inspect for damage. Repair as necessary.

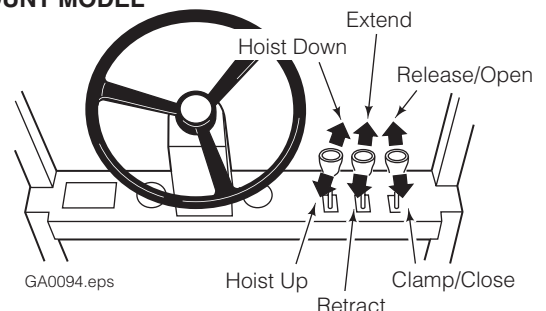
### Auxiliary Valve Functions

Check that lever movement is in compliance with ANSI standards (B56.1):

#### SWING MODEL



#### STATIONARY SIDE MOUNT MODEL



**NOTE:** Swing function replaces Tilt function (second control lever) on Swing Model Layer Picker.

# T RUCK REQUIREMENTS

## CARRIAGE MOUNT & FORK MOUNT MODELS



**WARNING:** Rated capacity of the truck/attachment/fork 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 Settings

2000 psi (138 bar) Recommended  
2300 psi (160 bar) Maximum

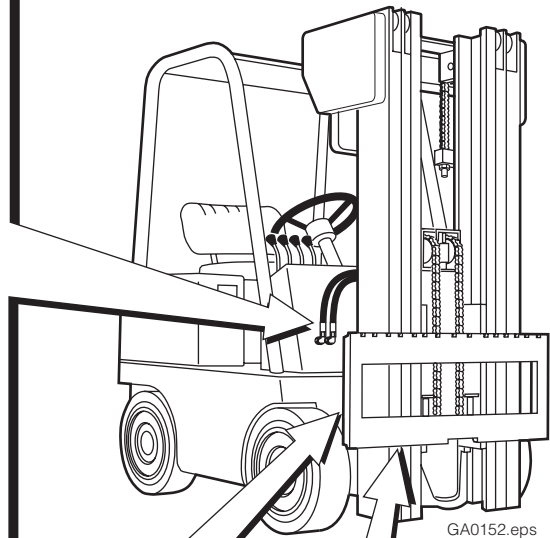
### Truck Flow Volume ①

	Min. ②	Recommended	Max. ③
<b>30A &amp; 30B</b>	5 GPM (18 L/min.)	7 GPM (37 L/min.)	10 GPM (56 L/min.)

- ① Cascade Layer Pickers 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 will result in slower than normal operating speed.
- 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 CLAMP function should be No. 6 with .250 in. (7 mm) minimum ID.



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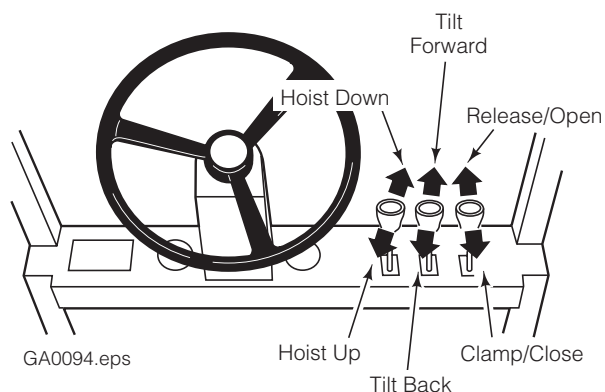
### Carriage Mount Dimension (A) ITA (ISO)

	Minimum	Maximum
<b>Class II</b>	14.94 in. (380.0 mm)	15.00 in. (381.0 mm)
<b>Class III</b>	18.68 in. (474.5 mm)	18.74 in. (476.0 mm)

Clean and inspect carriage bars. Make sure bars are parallel and ends are flush. Repair any damaged notches.

### Auxiliary Valve Functions

Check for compliance with ANSI (ISO) Standards:



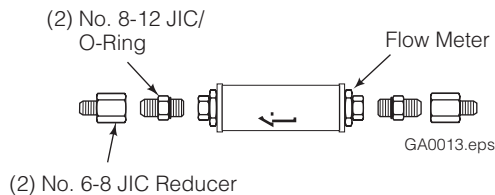
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## Tools Required

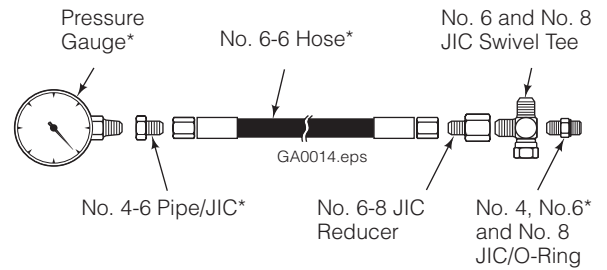
In addition to a normal selection of mechanic's hand tools, the following are required:

- 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.
- Assortment of fittings and hose.
- Magnetic Protractor/Level for vertical and horizontal adjustments.
- Pallet hand truck to install clamp assembly on mast.
- Overhead hoisting capability of 4000 lbs. (1815 kg).
- Metric allen wrench set to adjust pressure reliefs.

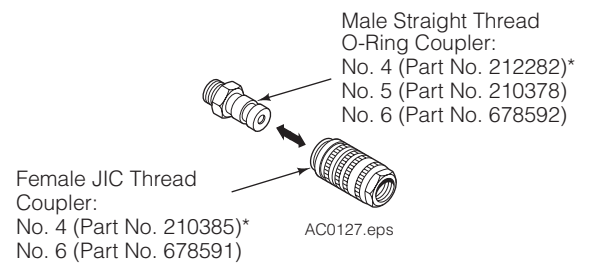
**Flow Meter Kit: 671476** (10 GPM - 37 L/min)  
**671477** (20 GPM - 75 L/min)



## Pressure Gauge Kit 671212



## Quick-Disconnects



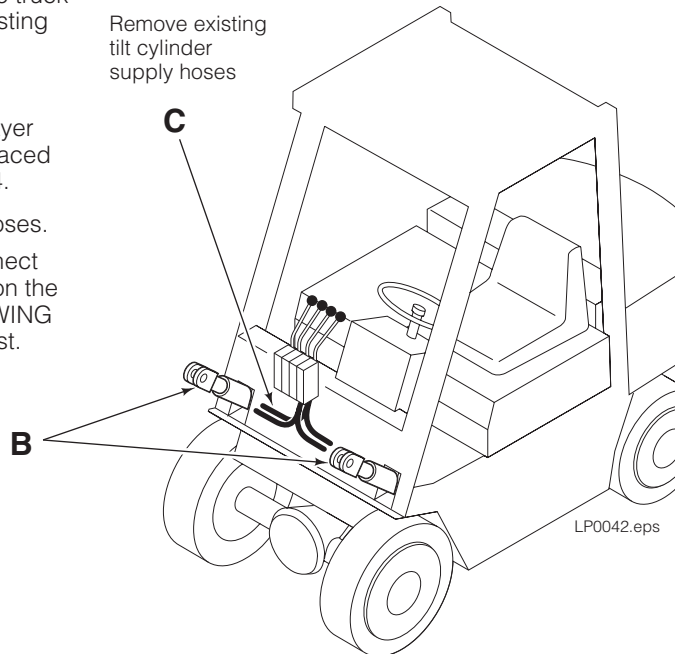
**\* NOTE: Diagnostics Kit 394382 includes items marked.**

## 1 Prepare truck for Layer Picker mast (Swing and Stationary Side Mount Models)

- Raise and block the front end of the truck 12 in. (30 cm) per ANSI B56.1, or drive the truck over a service pit. If required, remove existing mast. Clean and inspect mounting areas.
- Remove the existing tilt cylinders.  
**NOTE:** No tilt function is used with the Layer Picker. Existing tilt cylinders must be replaced with solid adjustable links. Refer to step 4.
- Remove the existing tilt cylinder supply hoses.  
**NOTE:** Longer hoses are required to connect between the original TILT control section on the truck main valve and, if applicable, the SWING function hose reel on the Layer Picker mast.

Remove existing tilt cylinder supply hoses

Remove tilt cylinders



**WARNING:** Cap all open hydraulic supply ports and secure the truck against operation.

## 2 Install pressure selection and flow control valves (if equipped)

**A Multi-Position Pressure Selection Valve** – Locate valve within safe reach and view of driver. For adjustments see page 22, Step E.

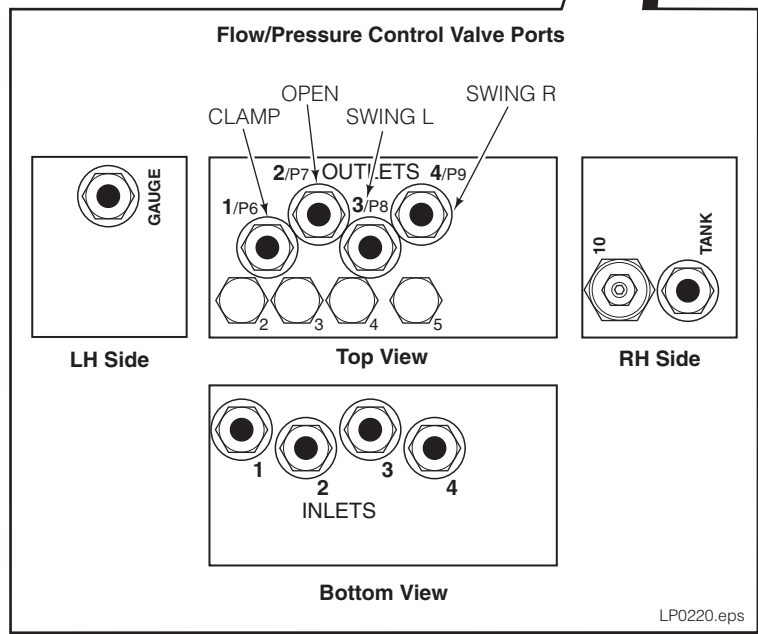
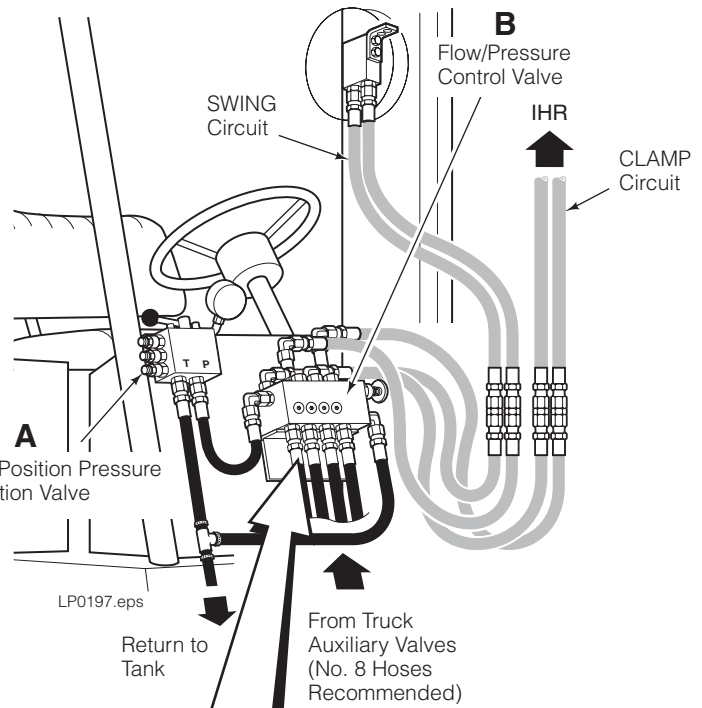
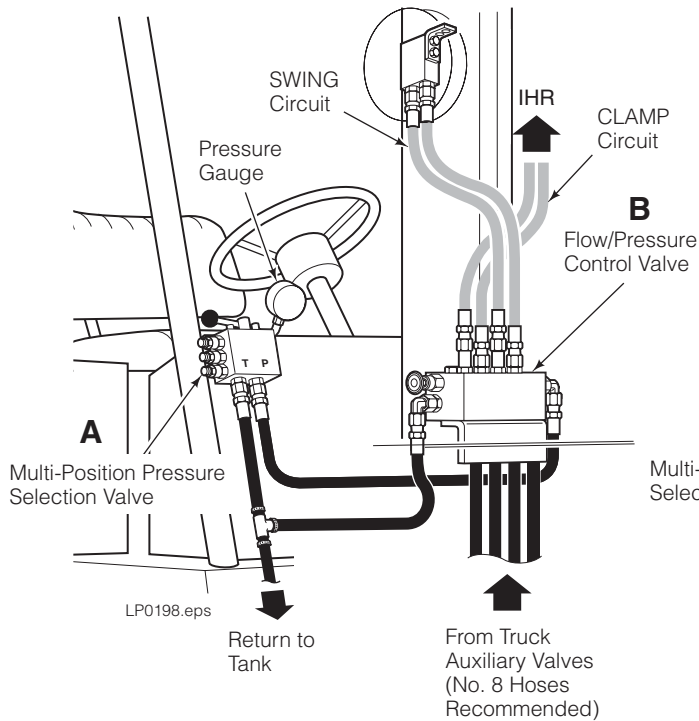
**B Flow/Pressure Control Valve** – Determine location to mount valve. Preferred location is on mast crossmember to enable use of straight fittings and short hose lengths. For adjustments see page 22, Step E.

**IMPORTANT:** For trucks are equipped with a flow control equivalent, a Cascade flow control is not required.

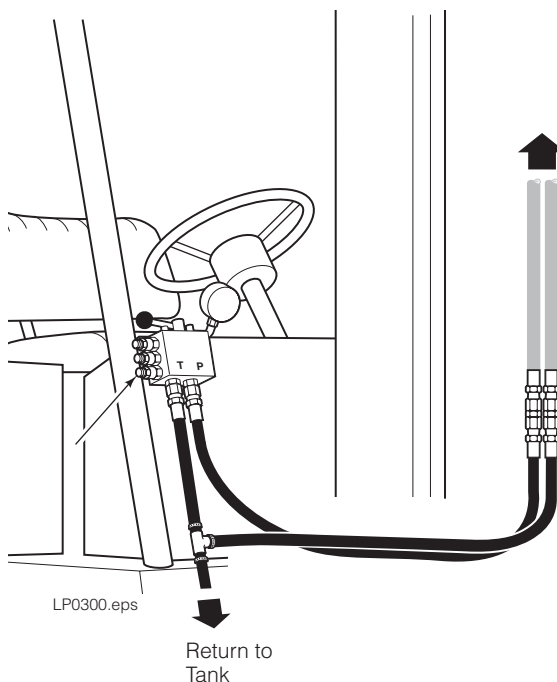
**NOTE:** Swing function does not apply to Stationary Side Mount models.

### SWING SIDE MOUNT MODELS INSTALLATION ON MAST (Preferred)

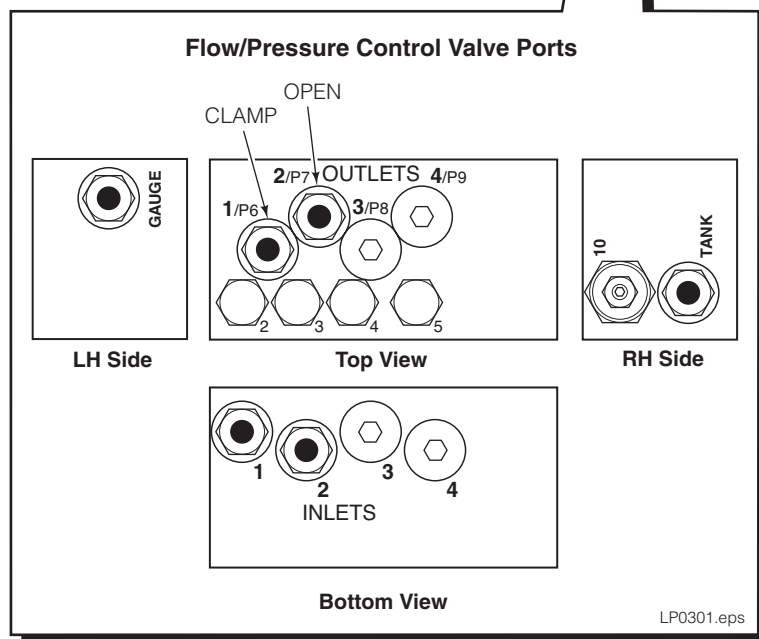
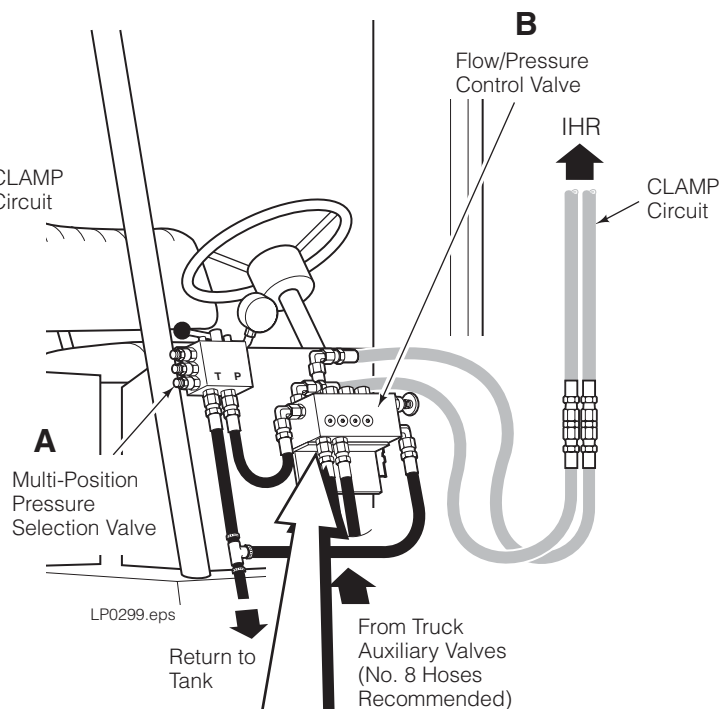
### SWING MOUNT MODELS INSTALLATION ON COWL



## STATIONARY SIDE MOUNT MODELS, CARRIAGE AND FORK MOUNT INSTALLATION WITHOUT FLOW/ PRESSURE CONTROL VALVE

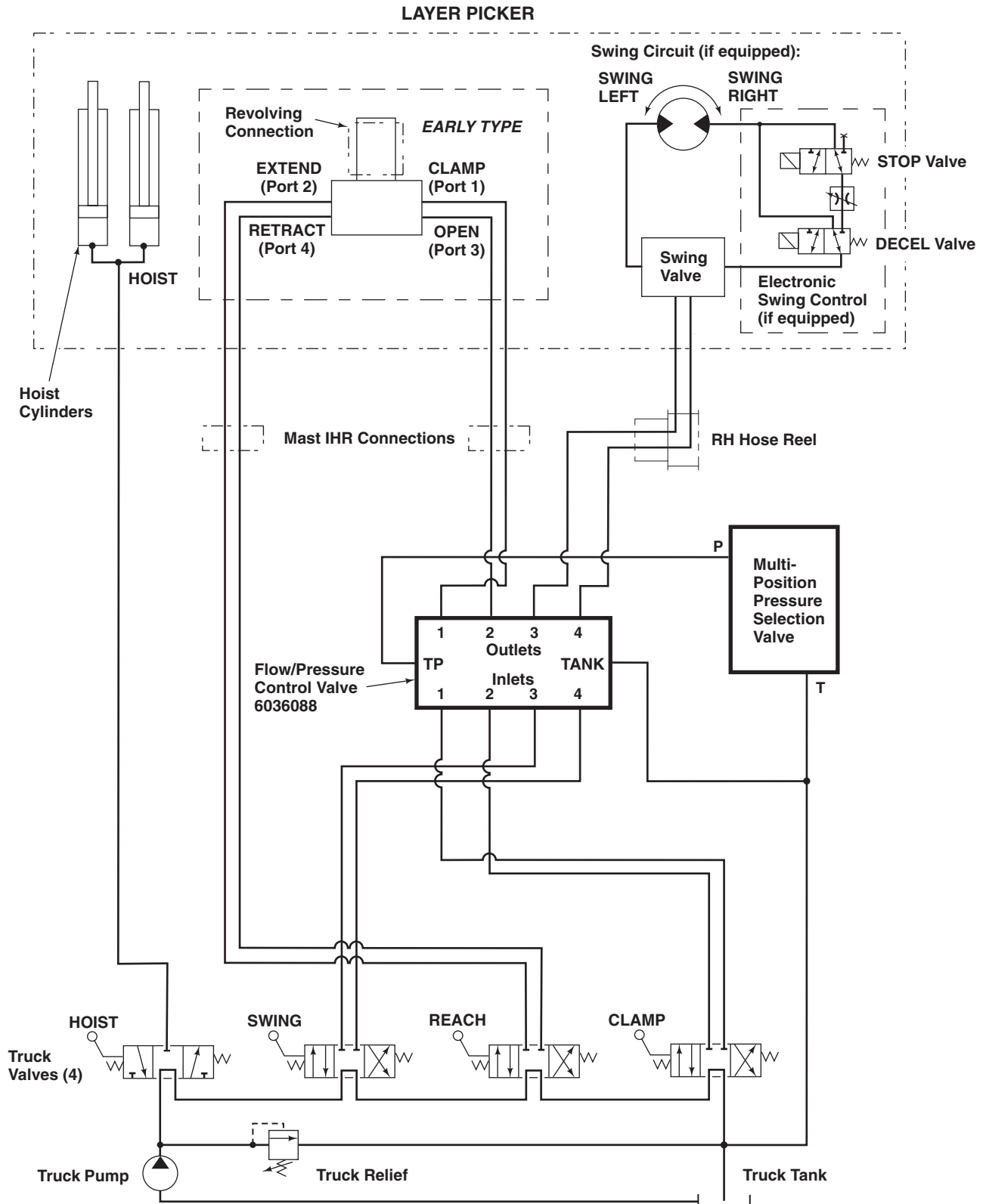


## STATIONARY SIDE MOUNT MODELS, CARRIAGE AND FORK MOUNT INSTALLATION WITH FLOW/ PRESSURE CONTROL VALVE



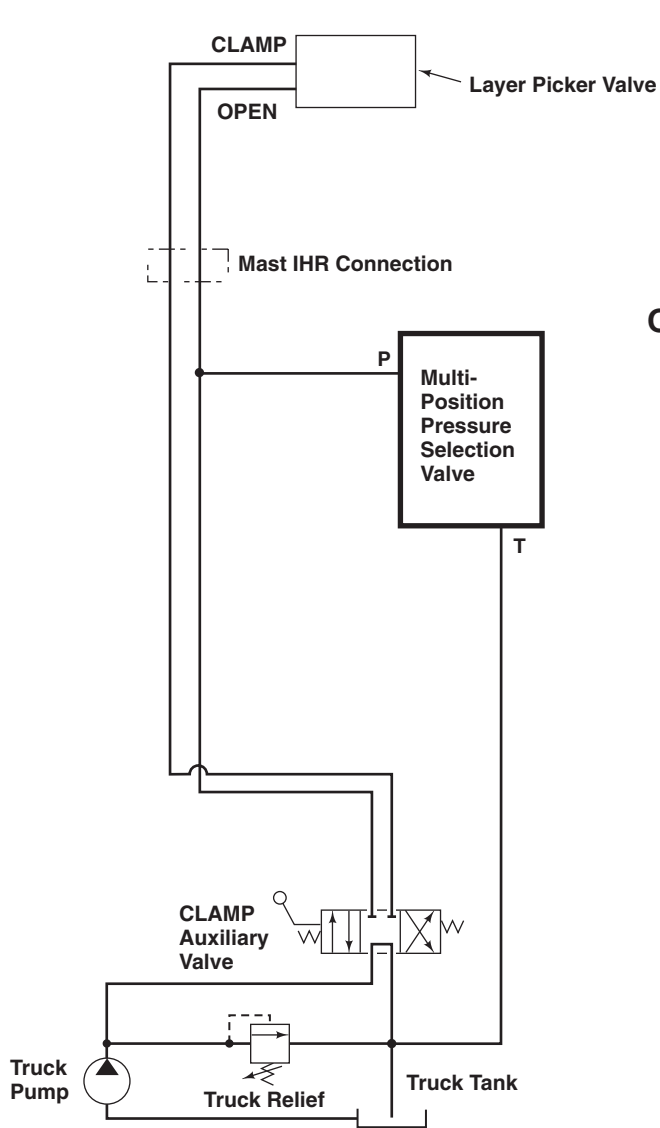
## Swing and Stationary Side Mount Models Hydraulic Connections

**NOTE:** Swing function does not apply to Stationary Side Mount models.

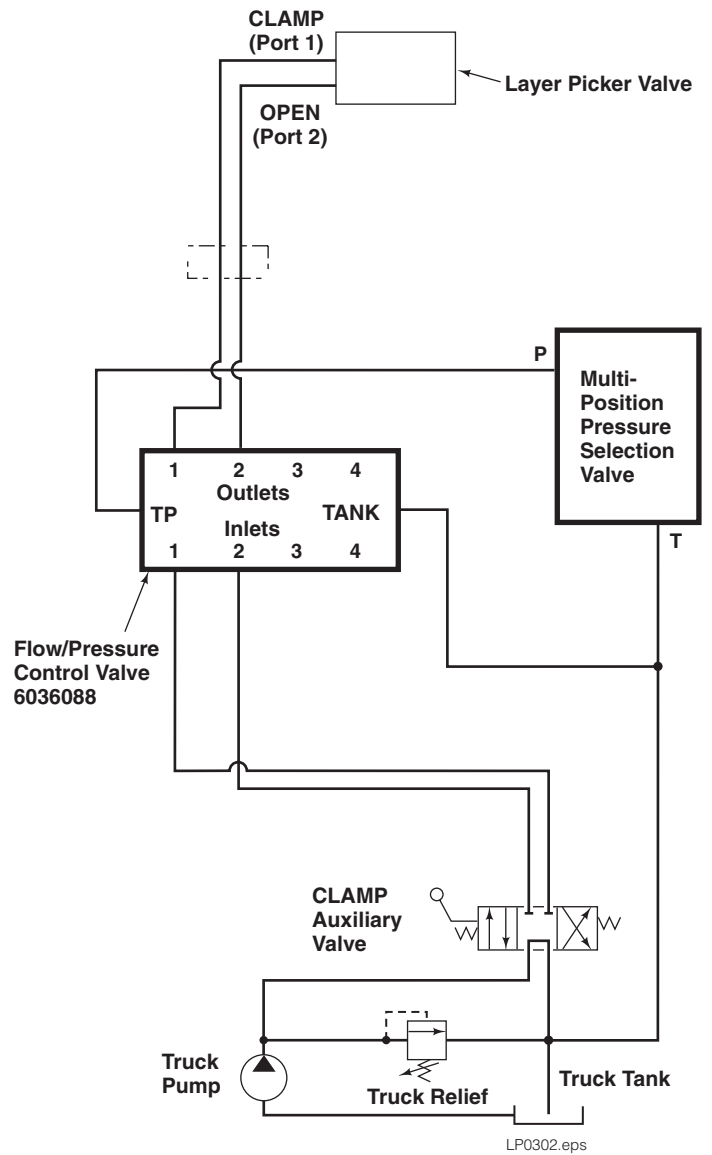


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## Carriage and Fork Mount Hydraulic Connections



OR



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# INSTALLATION

## SWING & STATIONARY SIDE MOUNT MODELS

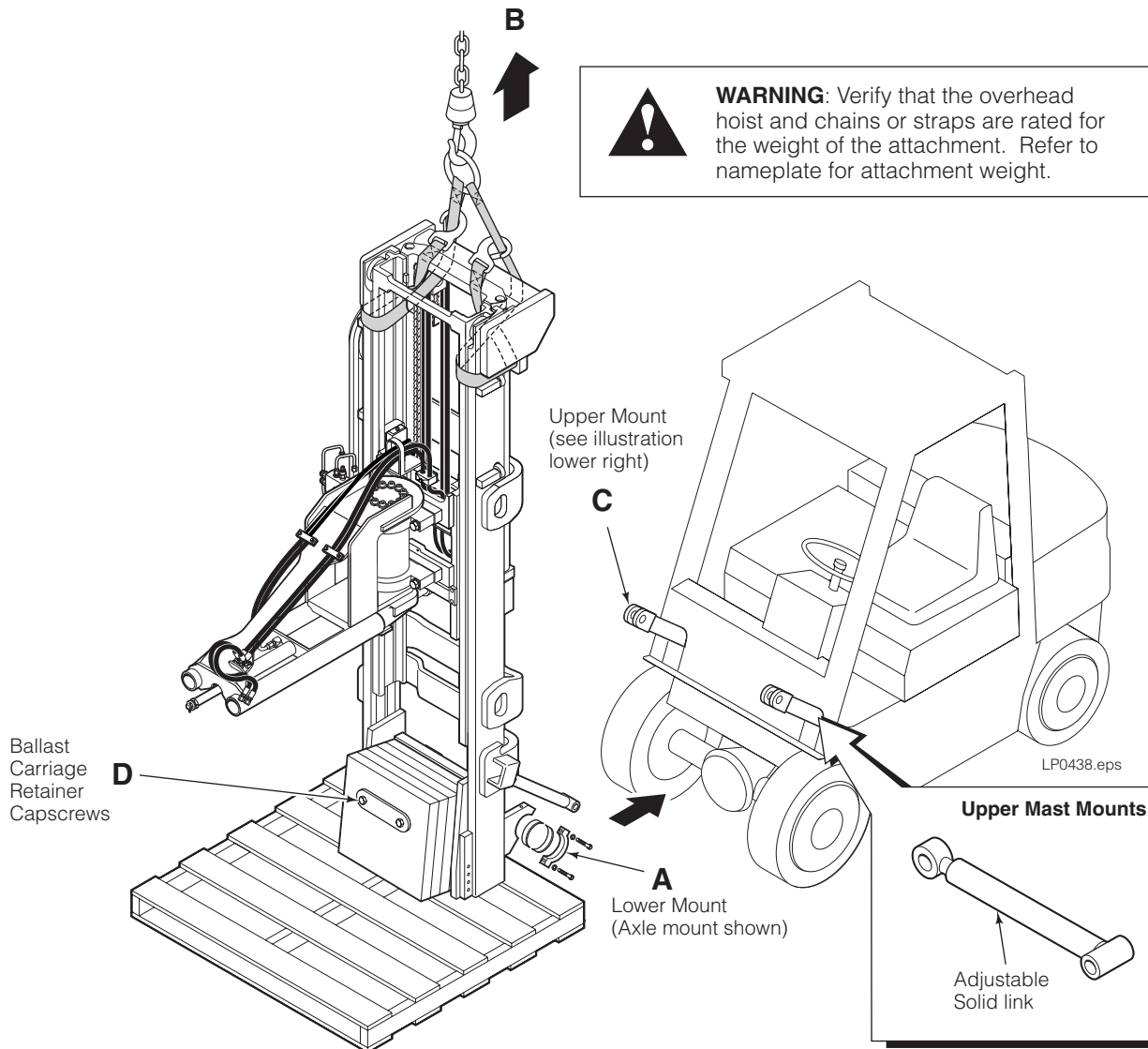
### 1 Install Layer Picker Mast Assembly

- A** Install the bearings in the mast lower axle or pin mounts. Lubricate the bearing surfaces with chassis grease.
- B** Install the mast on the truck. Tighten mounting capscrews using the truck manufacturer's torque specifications.
- C** Install upper mount adjustable links. Using a magnetic protractor/level, adjust the mast for 0-degree tilt during normal operation.
- D** Check that ballast carriage retainer capscrews are tightened to 165 ft.-lbs. (225 Nm).
- E** Check mast anchor chains for proper tension.

**NOTE:** Chains are factory adjusted for correct tension and carriage position. If adjustment is necessary, refer to Step 8, page 20. (Also see Service Manual 230444, Layer Picker Mast section).



**WARNING:** Mast modifications and additions which affect mast capacity and safe operation shall not be performed by the dealer, customer or user without manufacturer's prior written approval. Capacity, operation and maintenance instruction plates, tags or decals shall be changed accordingly per OSHA regulations 1910.178.



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

# I INSTALLATION

## SWING & STATIONARY SIDE MOUNT MODELS

### 2 Install Clamp Assembly

**IMPORTANT:** Keep clamp assembly banded on pallet until securely mounted on Layer Picker boom.

**A** Remove cotter pin, lock tab and spherical retainer nut from reach cylinder's rod end.

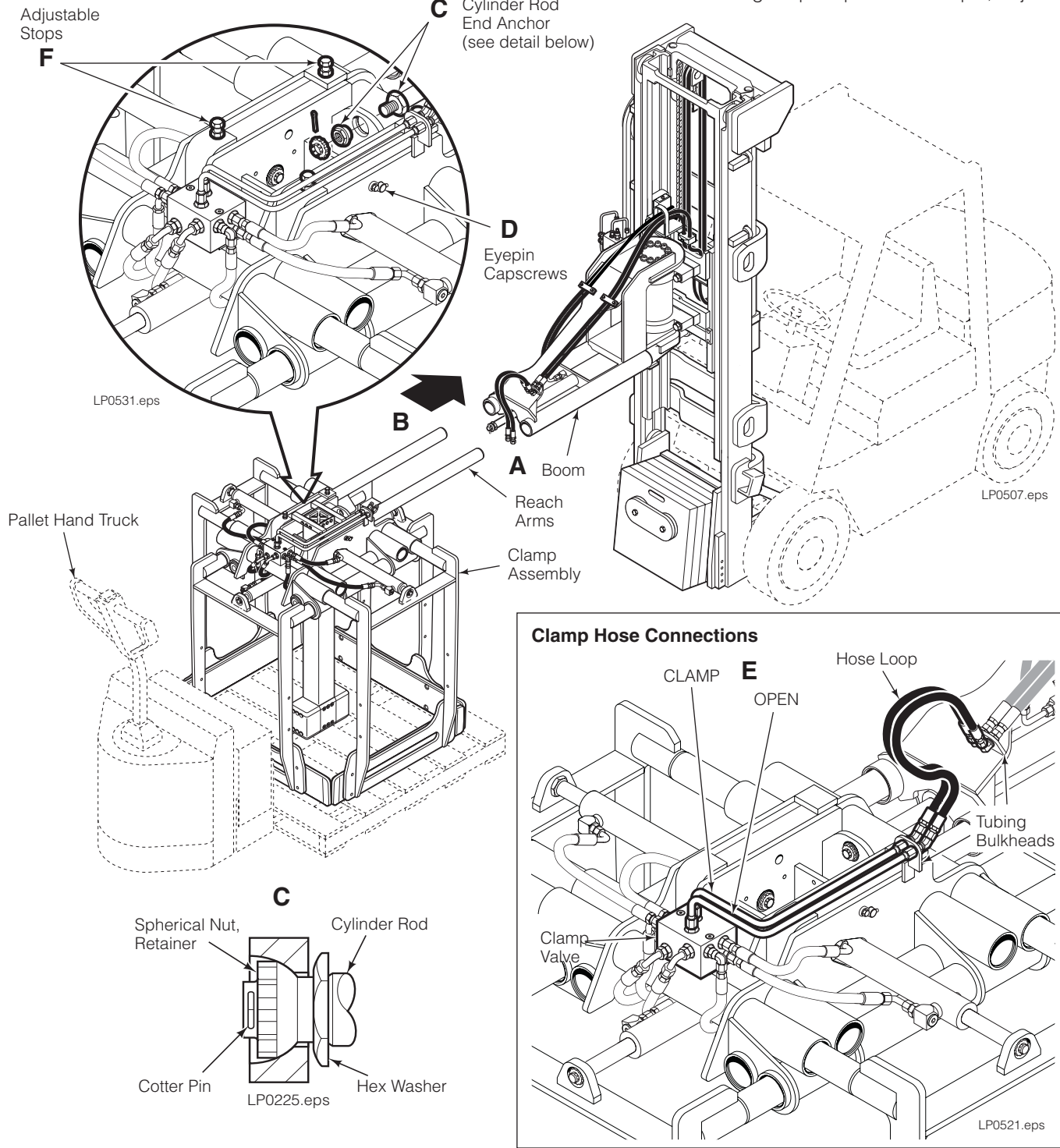
**B** Engage clamp assembly with boom. Lubricate reach arm bearings with grease (for food industry: DuBois FGG-2; for general products: general-purpose chassis lube.

**C** Connect reach cylinder rod end to clamp assembly bulkhead. Hold hex washer and tighten spherical nut to a torque of 165 ft.-lbs. (225 Nm). **NOTE:** Joint operates with a loose clearance.

**D** Check that pivot pins and eyepin retainers are in place. Tighten eyepin capscrews to 20 ft.-lbs. (30 Nm).

**E** Connect CLAMP function hoses to valve or tubing. Make sure hoses form a loop to allow for boom telescoping movement. **CAUTION:** Do not twist hoses.

**F** Adjust stops so that clamp assembly can hang in a level attitude during tier pickup. Refer to Step 8, Adjustments.



# INSTALLATION

## SWING & STATIONARY SIDE MOUNT MODELS

### 3 Prepare and connect supply hoses

Determine hose lengths required for A, B, C and D below.

**NOTE:** For HOIST circuit use No. 8 hose and fittings with a minimum ID of .400 in. (10 mm).

For SWING, REACH and CLAMP circuits use No. 6 hose and fittings with a minimum ID of .250 in. (7 mm). Cut hoses to length and install hose fittings.

**A** Hoist – Mast hoist valve to truck main valve (1st control lever).

**B** Swing – RH Hose reel to flow/pressure control valve ports 3 and 4 (3.5 GPM).

**NOTE:** Swing function does not apply to Stationary Side Mount models.

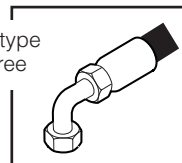
**C** Reach – RH internal hose reeving to truck auxiliary valve (3rd control lever).

**D** Clamp – LH internal hose reeving to flow/pressure control valve ports 1 and 2 (7.5 GPM).

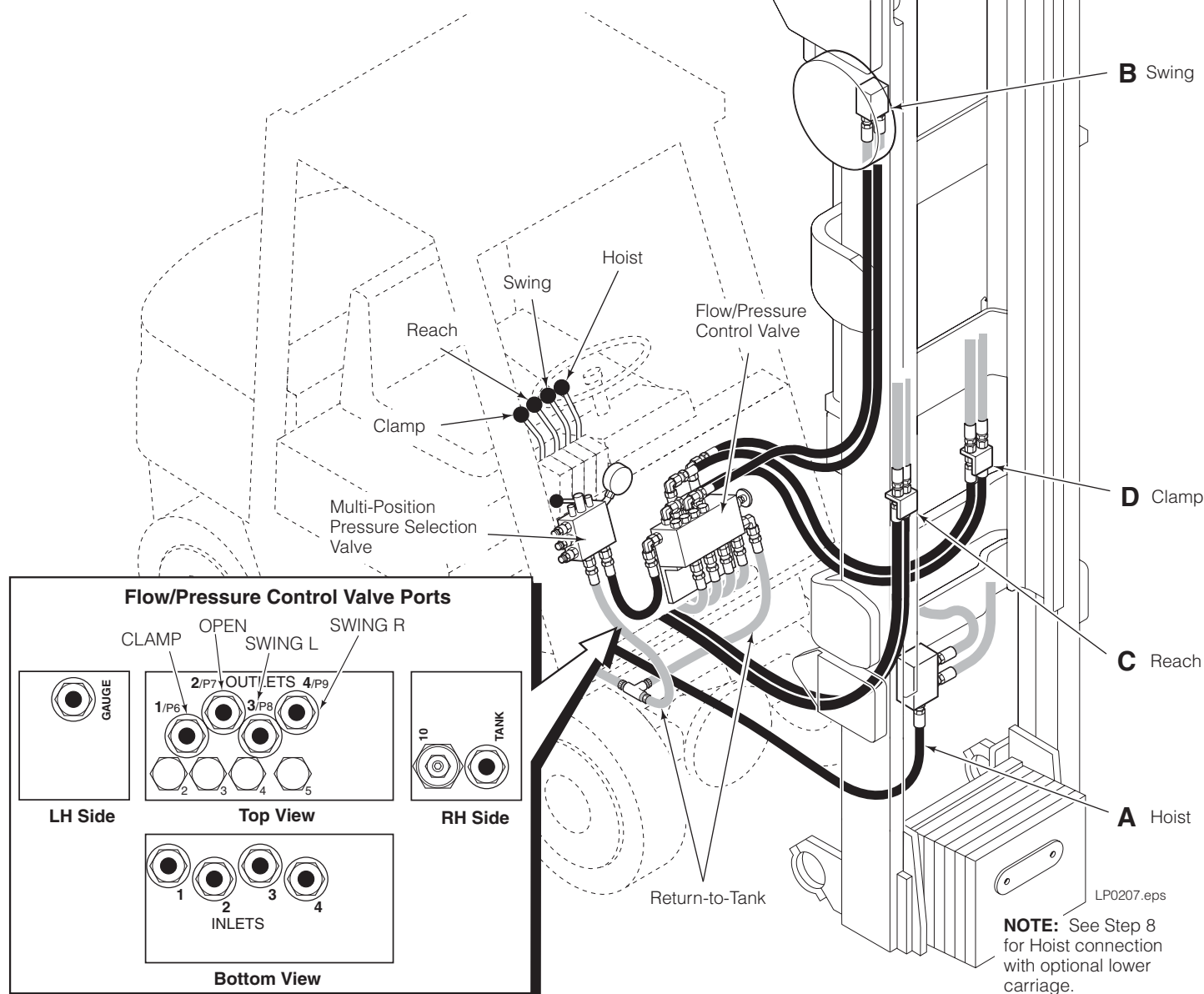
**IMPORTANT:** Use straight or 45 degree fittings wherever possible. Avoid sharp bends or pinch points. Use as few fittings as possible and keep hose lengths to a minimum.

If 90 degree connections are required, use tubing type hose end fittings (see illustration) for least flow restriction.

Tubing type  
90 degree  
fittings



LP0200.eps

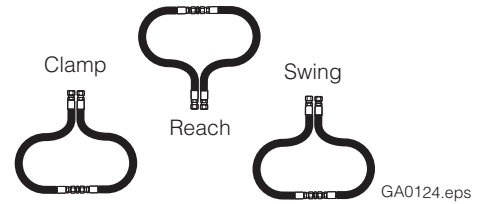


LP0207.eps

**NOTE:** See Step 8 for Hoist connection with optional lower carriage.

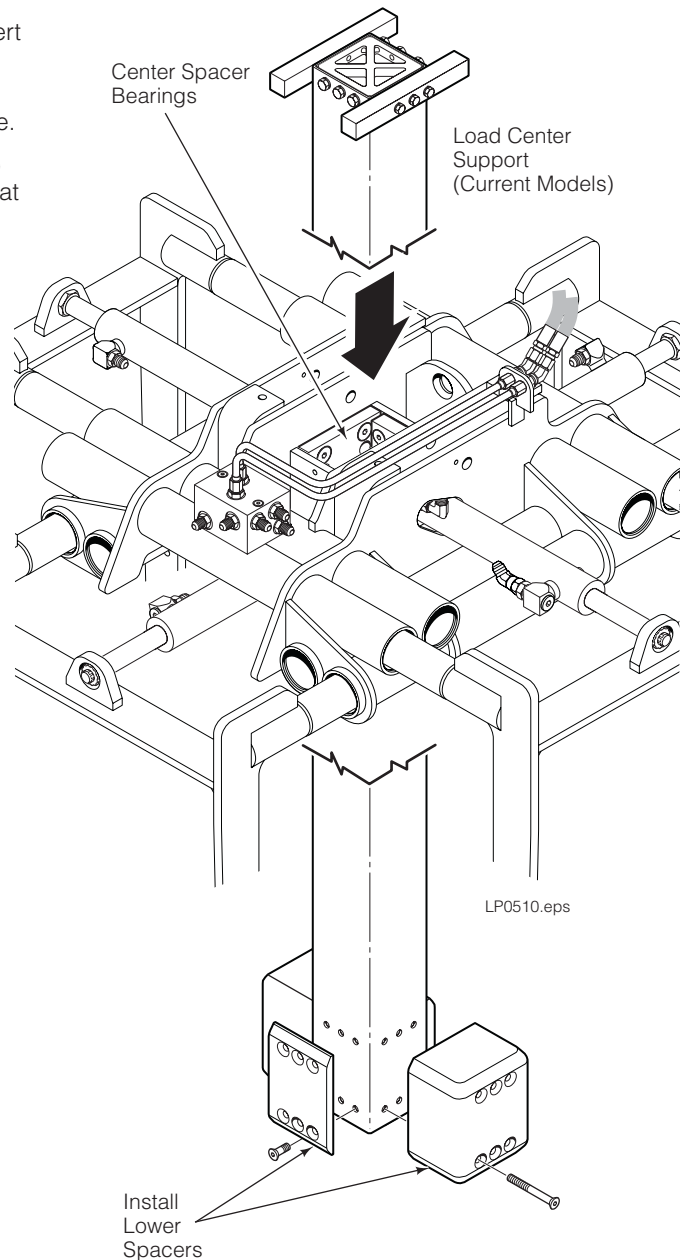
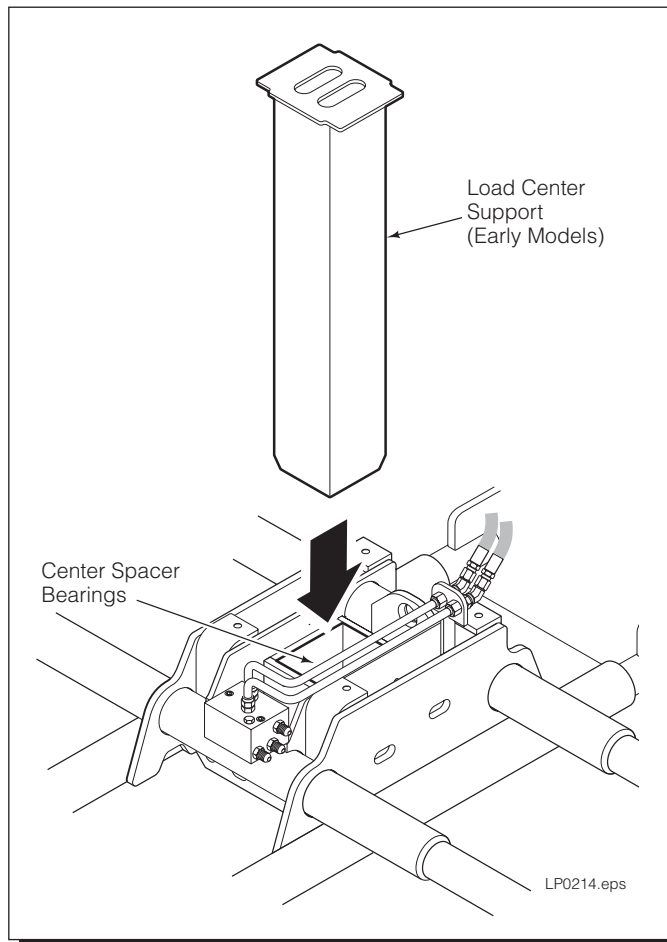
### 4 Flush supply hoses

- A** Install hoses to truck auxiliary valves. Temporarily connect the other ends together using union fittings.
- B** Operate auxiliary valves for 30 sec.
- C** Remove union fittings.



### 5 Install optional load center support (if equipped)

- A** Remove lower spacers from support tube. Insert the tube into the opening on top of the frame.
- NOTE:** Support tube rests in the opening and floats during use. It is not fastened to the frame.
- B** Maximum side-to-side clearance should be no more than 1/8 in. (3.2 mm) at the top. Verify that center spacer bearings are in place.
- C** Install lower spacers onto the support tube.



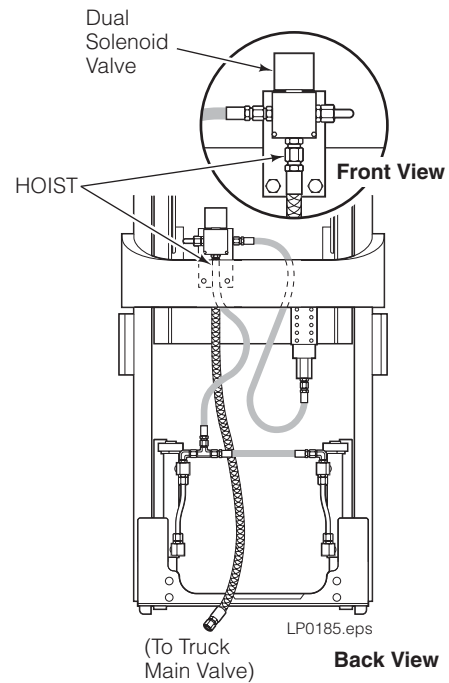
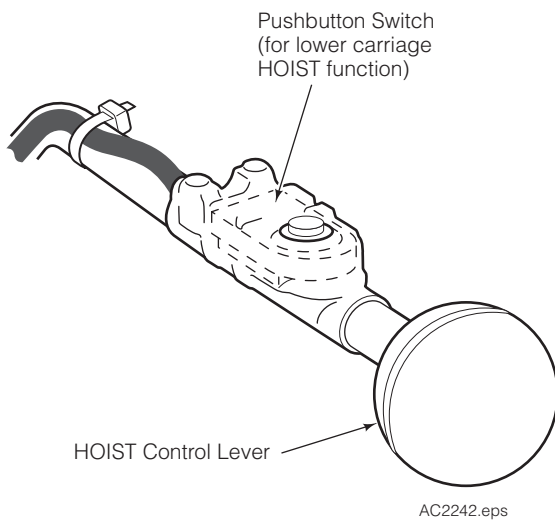
### 6

#### Optional Lower Carriage, Solenoid

Use the illustrations shown to connect the hoist hydraulic supply to the mast-mounted dual solenoid valve, and to install a push-button switch on the HOIST control lever.

##### A) Connect hoist hydraulic supply

Connect the hoist supply line to the dual solenoid valve mounted on the mast crossmember. Refer to opposite illustration.

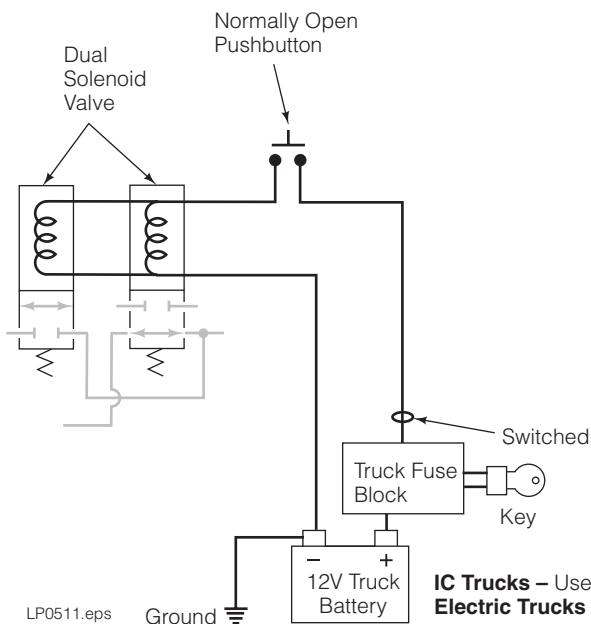


##### B) Install pushbutton switch, connect wiring

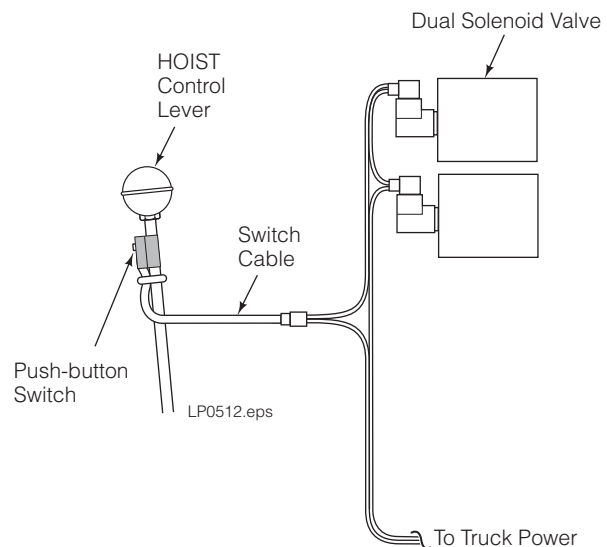
Install the pushbutton switch assembly to the HOIST function control lever. Refer to Installation Instructions 6822725, included with the switch, for complete installation procedure.

**IMPORTANT:** Care must be taken to avoid interference with other control levers and control surfaces.

#### ELECTRICAL SCHEMATIC AND DIAGRAM



**IC Trucks** – Use chassis ground.  
**Electric Trucks** – Use battery ground.



**Recommended Wire Sizes (user-supplied):**  
Power – 12 AWG  
Key, Pushbutton – 18 AWG



# INSTALLATION

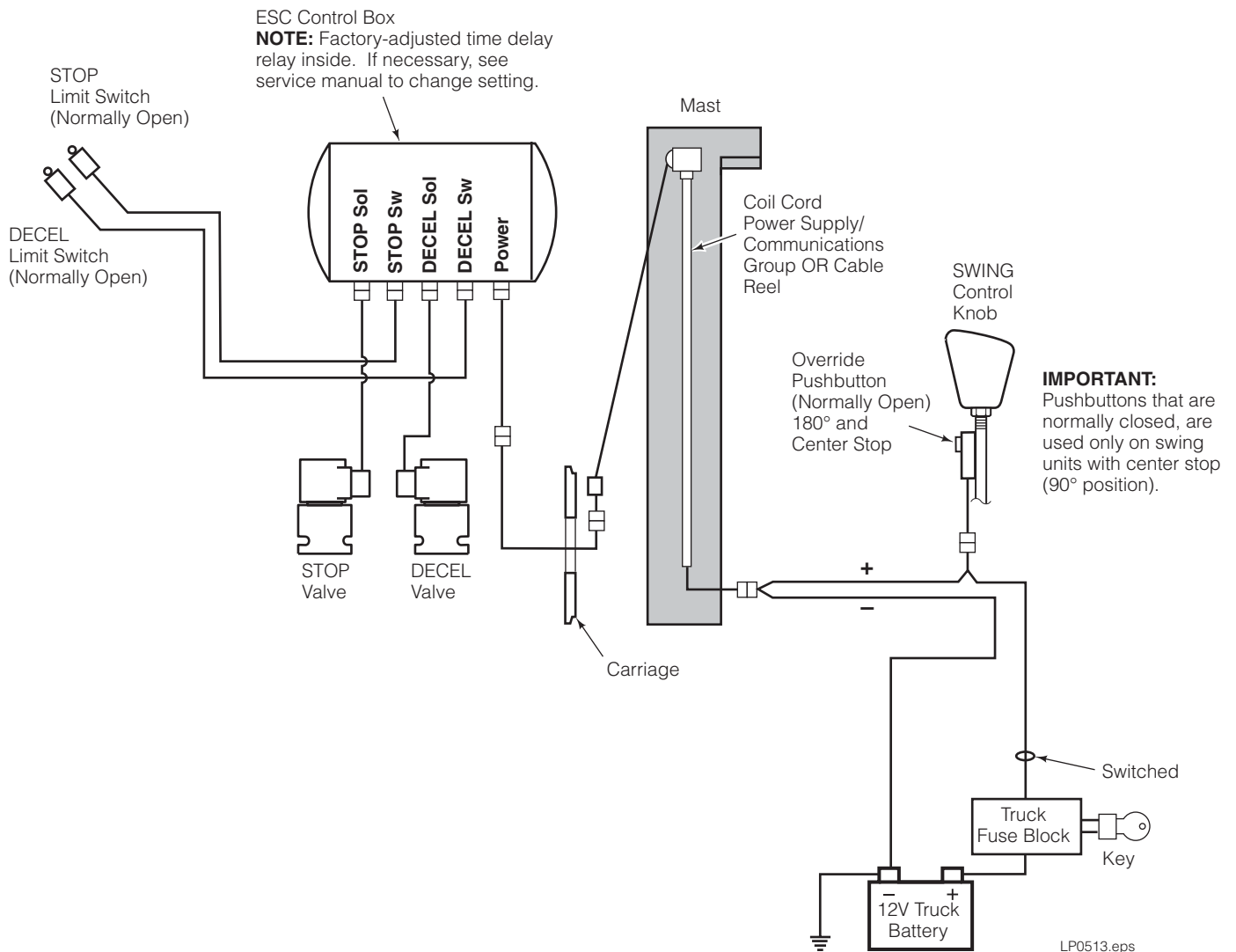
## SWING & STATIONARY SIDE MOUNT MODELS

### 7

#### Electronic Swing Control, if equipped

Use the illustration shown to connect the electrical components to the truck power supply. Refer to Installation Instructions 6158507 for operation and adjustment.

**NOTE:** All cables should be 2-conductor with Deutsch-type connectors.



**IC Trucks** – Use chassis ground.  
**Electric Trucks** – Use battery ground.



### 8 Adjustments

Accomplish the following adjustments in the order listed below:

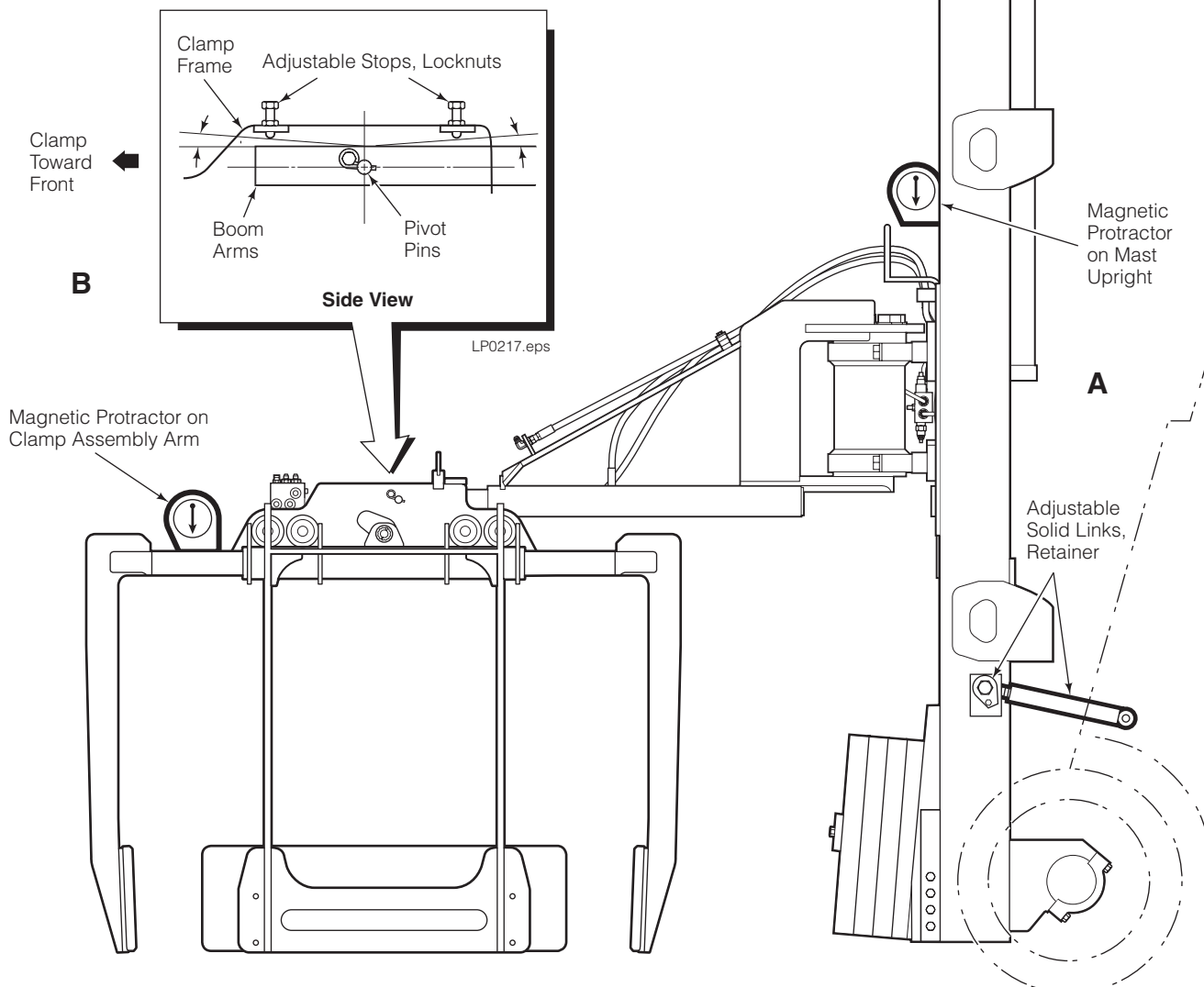
**A MAST AT ZERO-DEGREES TILT** – Place a magnetic protractor/level on the front or rear of the mast outer upright. Adjust the adjustable links to provide 0 degrees of tilt. Install retainers and tighten capscrew to 20 ft.-lbs. (30 Nm).

**IMPORTANT:** Make sure the solid adjustable link connections to the mast are tightened properly using truck manufacturer's torque specifications.

**B CLAMP LEVEL** – Swing the clamp assembly straight ahead. Place a magnetic protractor/level on the clamp frame or arm as shown. Unscrew the four stops until the clamp hangs freely. Screw the stops down until they contact the boom tubes then back off each 1/2 turn. Tighten locknuts.

**CAUTION:** Boom cylinder and rod end anchor will be damaged if stops are not adjusted properly. Stops must prevent the clamp assembly from rocking too far forward and backward during load handling.

**IMPORTANT:** Final adjustments must be accomplished at time of delivery to end user, in the location where the Layer Picker will be used, and with actual product loads.







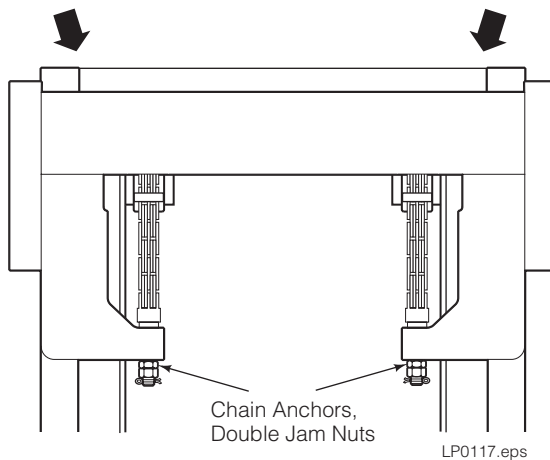
# INSTALLATION

## SWING & STATIONARY SIDE MOUNT MODELS

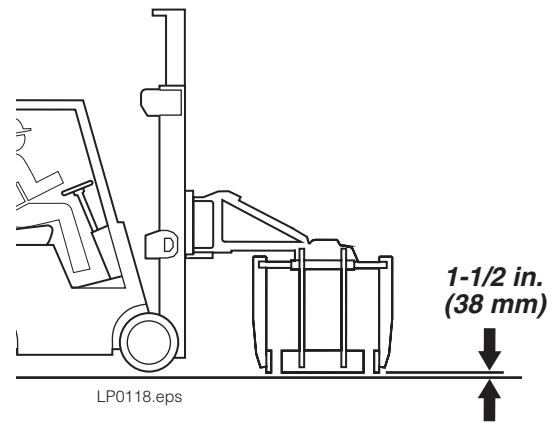
### Adjustments (Continued)

**C CONTACT PAD HEIGHT ABOVE FLOOR:** Adjust the mast chain anchors equally to provide a recommended clearance of 1.5 in. (38 mm) above the floor with the Layer Picker fully lowered.

**IMPORTANT:** When making this adjustment make sure that the mast inner upright does not contact the upper stops on the mast outer upright (arrows).



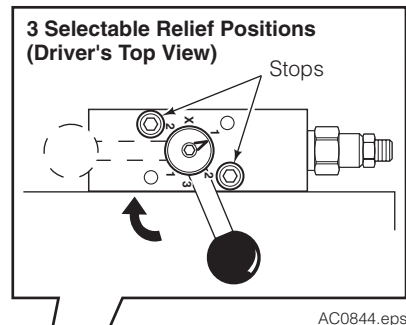
### RECOMMENDED CLAMP UNDERCLEARANCE



**D PRESSURE ADJUSTMENTS (if equipped):** Adjust the pressure reliefs in the following valves in the order shown:

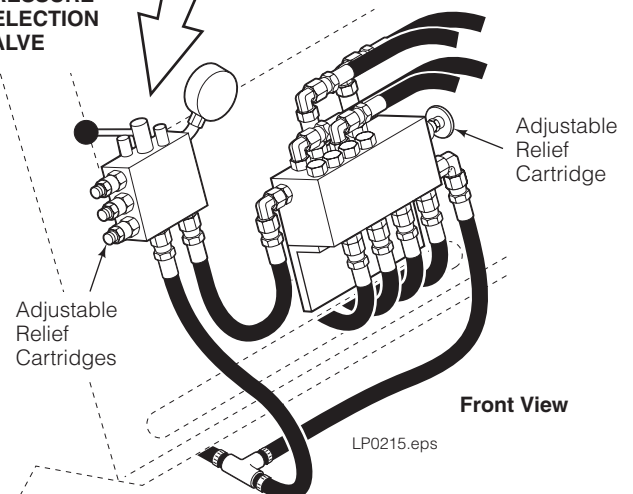
- **Truck Valves** – Adjust main HOIST valve relief on truck to 2600 psi (180 bar). Adjust Auxiliary control valve reliefs to 2300 psi (158 bar).
- **Pressure/Flow Control Valve** – Adjust the valve relief to 2000 psi (138 bar). Flow control is fixed with internal orifices.
- **Multi-Position Pressure Selection Valve** – Adjust the relief cartridges to 750 psi (52 bar) for low setting, 1000 psi (69 bar) for medium setting, and 1200 psi (83 bar) for high setting. Position the stops to block the lever from reaching the "X" valve block-out position (see illustration).

**IMPORTANT: Pressure settings are a starting point only. Verify by testing with actual loads.** Test by picking up a single layer/tier of the load to be handled and look for slippage or creasing. Adjust the low setting if required. Pick up multiple layers/tiers and look for slippage or creasing. Adjust the medium setting if required. Pick up a maximum number of layers/tiers and look for slippage or creasing. Adjust the high setting, if required.



### MULTI-POSITION PRESSURE SELECTION VALVE

### PRESSURE / FLOW CONTROL VALVE

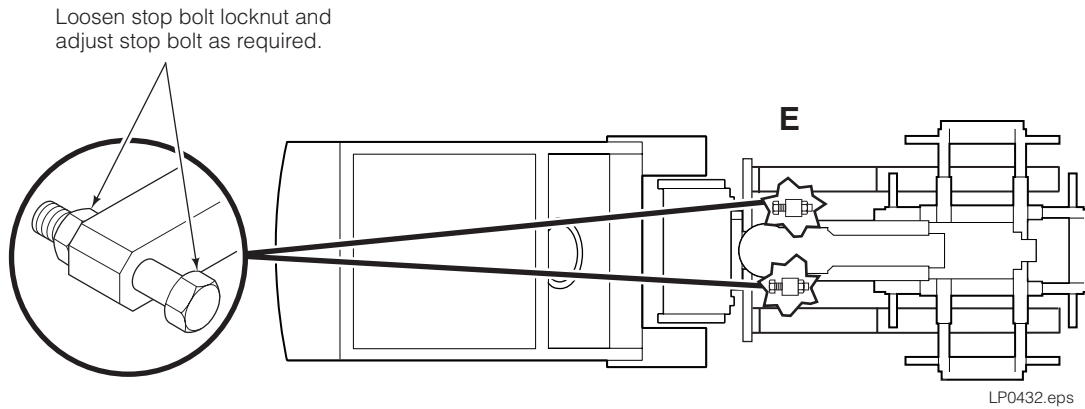


### Adjustments (Continued)

#### **E HYDRAULIC STOP POSITION ADJUSTMENT** (Early Models, if equipped):

Swing the boom in each direction. Verify that the swing stops are in the proper horizontal position.

- If the stops need to be adjusted, loosen the stop bolt locknut and adjust the stop bolt as required. Tighten the locknut.





# INSTALLATION

## SWING & STATIONARY SIDE MOUNT MODELS

### Adjustments (Continued)

#### F ELECTRONIC STOP POSITION ADJUSTMENT (if equipped):

- 1 When swinging, the attachment boom should stop at the left, middle and right positions (some units are left and right positions only). Wait 3 seconds to swing after stopping OR press the swing override button to continue swinging. **NOTE:** A full swing should be 7 to 8 seconds.

- If boom **stops** at middle position, continue with step 2.
- If boom **stops momentarily and then continues** at the middle position:

**A** Reduce the hydraulic input pressure for the swing function.

#### OR

**B** Adjust both swing valve side counterbalance cartridges CCW in 1/2 turn increments until boom stops at the middle position.

- If boom **does not stop** at the middle position:

**A** Inspect the wiring. Look for loose connection or pinched cables.

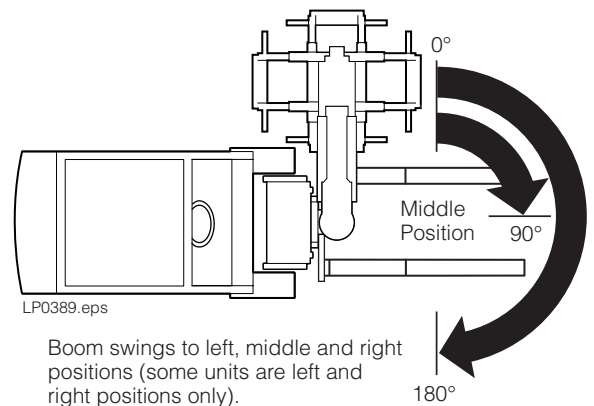
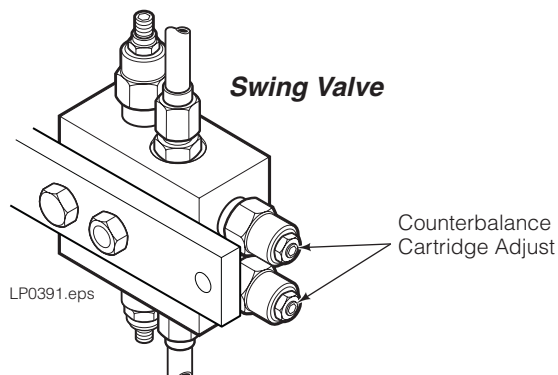
**B** The limit switch end rollers are not fully engaging the deceleration ramp in the middle position. Adjust the limit switch actuators to engage the ramp. The ramp can also be adjusted for precision of the stop position.

**NOTE:** The limit switch plungers must be fully depressed.

- 2 To continue swing, wait 3 seconds after stopping or press the swing override button to continue swinging the boom.

To swing boom without stopping in the middle position, press the override button.

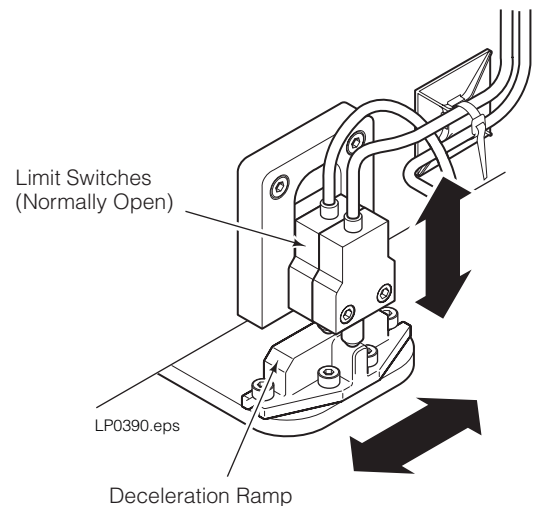
- If the boom **does not move off the ramp**, switch the positive and negative wire connections to the truck power. The timer is polarity sensitive, not the solenoids.
- If boom **swings too fast**, adjust the restrictor on the STOP Solenoid Valve. Adjust the screw until three threads show past the jam nut. Swing the boom and back out the screw 1/4 turn. Repeat backing the screw 1/4 turn with each swing until the boom slows. The swing boom should gently come to a rest against the mast.



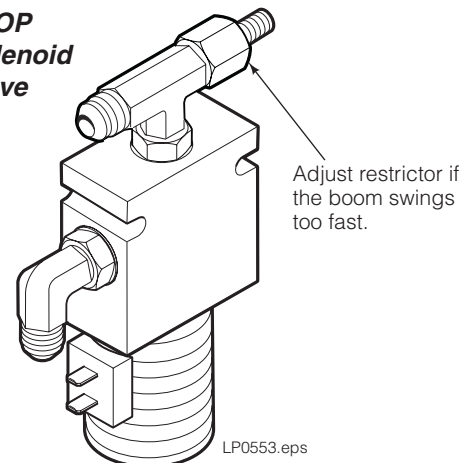
Boom swings to left, middle and right positions (some units are left and right positions only).

Pressing the override switch allows continuous swing.

Wait 3 seconds or press the override button to continue swinging.



#### STOP Solenoid Valve



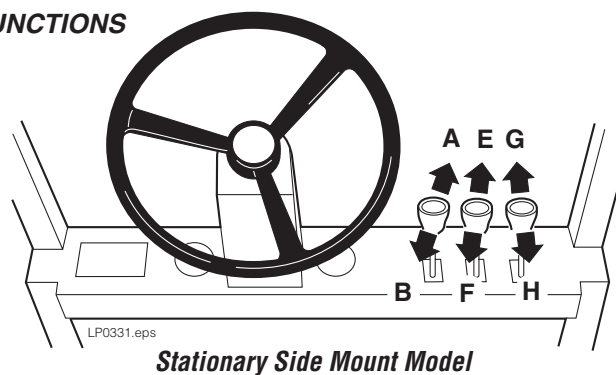
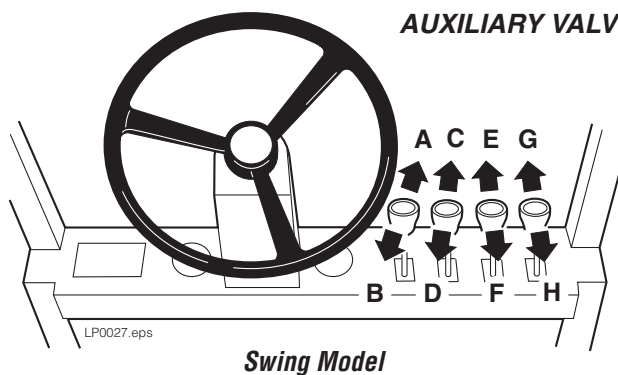
# INSTALLATION

## SWING & STATIONARY SIDE MOUNT MODELS

### 9 Cycle Layer Picker functions

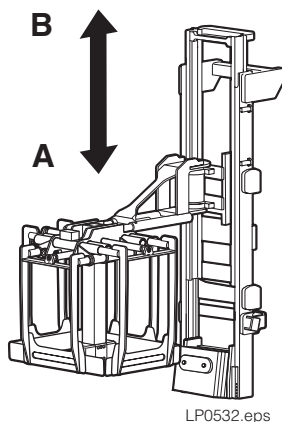
- Check for leaks at fittings, valves and cylinders.
- With no load, cycle through all Layer Picker functions several times.
- Check for control lever function in accordance with ANSI standards (Ref. ANSI B56.1, "Lever or Handle-Type Controls").
- Pick up and cycle a maximum load, check for proper speeds and smoothness of operation.

**IMPORTANT: Layer Pickers with Cascade Mast** – After installation is complete and the Layer Picker has operated the initial 50 hours, perform the 50 Hour Maintenance as described in Technical Bulletin TB 339, Layer Picker Initial 50 Hour Inspection and Adjustment. These maintenance steps will ensure the Layer Picker is properly adjusted and operating correctly. After the maintenance steps are complete, file a Warranty Claim to be reimbursed for time and travel.



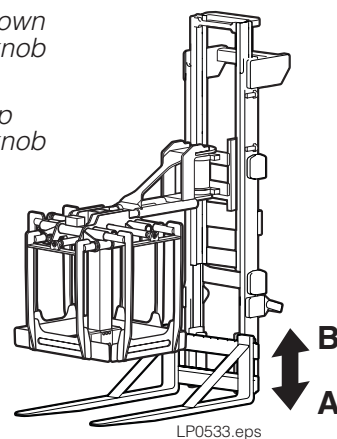
#### HOIST

- A** Lower Clamp
- B** Raise Clamp



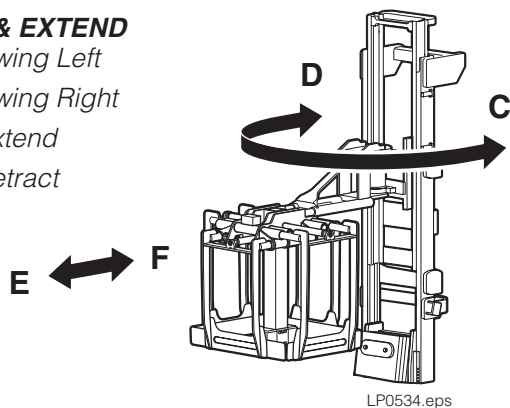
#### LOWER CARRIAGE (optional)

- A** Forks Down (press knob button)
- B** Forks Up (press knob button)



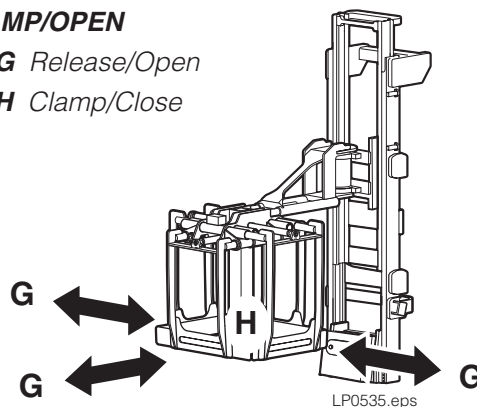
#### SWING & EXTEND

- C** Swing Left
- D** Swing Right
- E** Extend
- F** Retract



#### CLAMP/OPEN

- G** Release/Open
- H** Clamp/Close



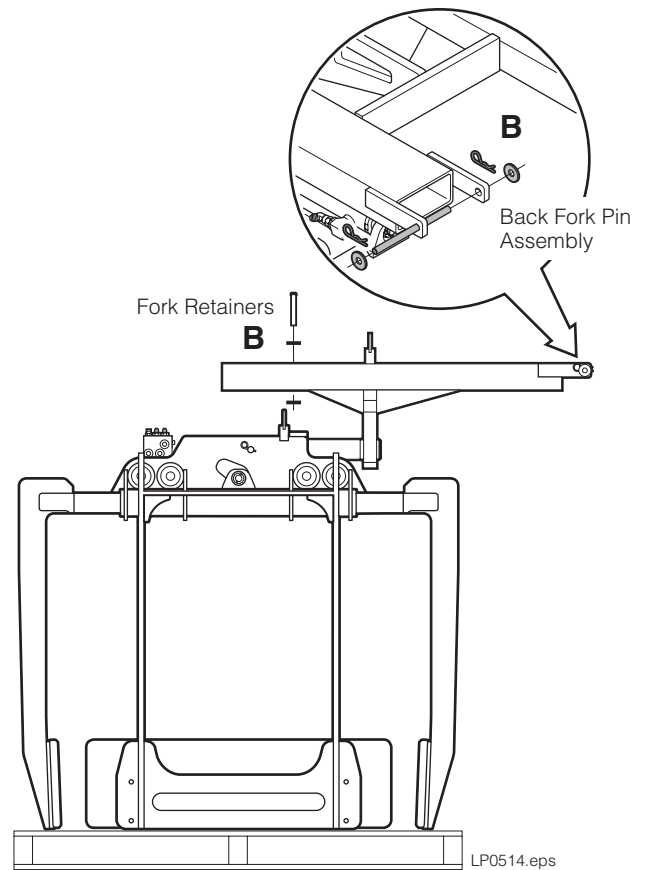
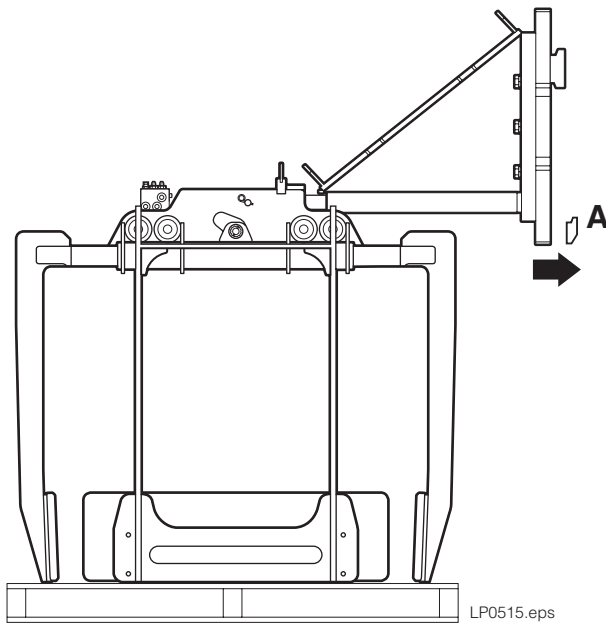
# INSTALLATION

## CARRIAGE MOUNT & FORK MOUNT MODELS

### 1 Remove Mounting Components

**A Carriage Mounted** – Remove bolt-on lower hooks, if equipped.

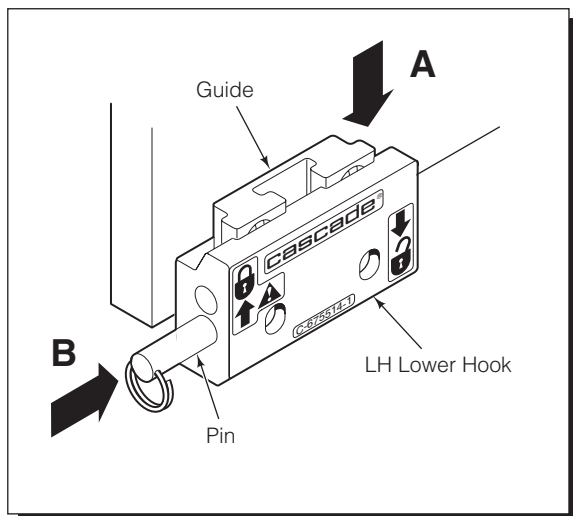
**B Fork Mounted** – Remove fork retainers and/or back fork pin assembly, if equipped.



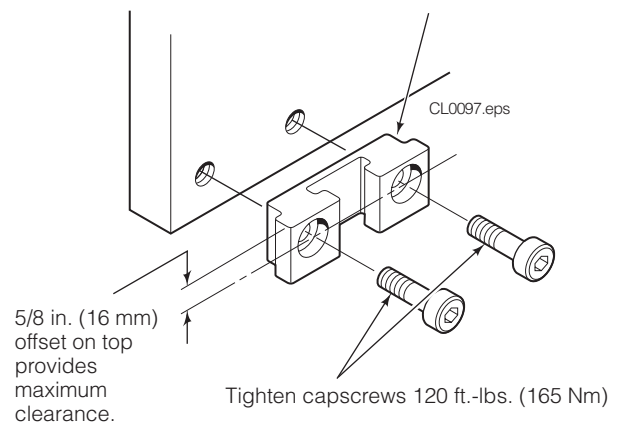
### 2 Unlock Quick-Change mounting hooks, if equipped

**A** Move hooks into unlocked position.

**B** Reinstall pin in lower holes.



**NOTE:** Guides can be reversed to change hook to carriage clearance. Refer to Step 5.

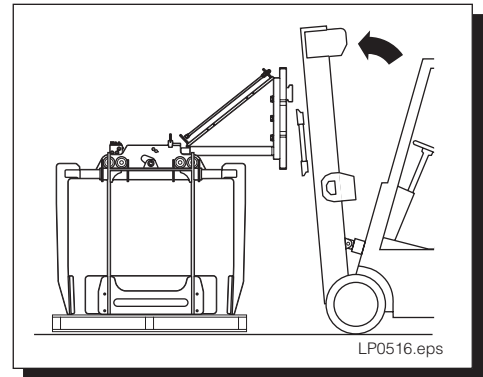


### 3

#### Mount the Carriage Mount Layer Picker Assembly, if applicable

**IMPORTANT:** Keep layer picker assembly banded on pallet until securely mounted on the truck carriage.

- A** Center truck behind layer picker assembly.
- B** Tilt forward and raise carriage in position.
- C** Engage top mounting hooks with carriage. Make sure key plate engages center notch on top carriage bar.
- D** Lift layer picker assembly 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)

ITA Class II – 0.32-0.36 in. (8-9 mm)  
ITA Class III – 0.39-0.43 in. (10-11 mm)

Truck Carriage

Notch

Engage Tab

GA0035.eps

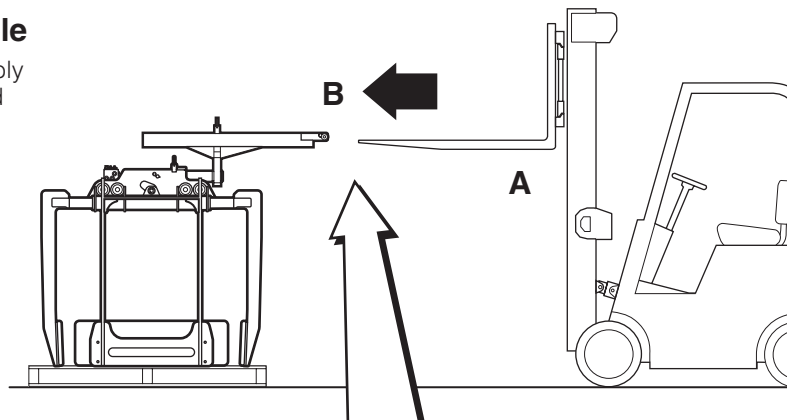
LP0306.eps

### 4

#### Mount the Fork Mount Layer Picker Assembly, if applicable

**IMPORTANT:** Keep layer picker assembly banded on pallet until securely mounted on the forks.

- A** Position forks to layer picker's fork mount assembly.
- B** Drive forks into layer picker fork mount slots.
- C** Install fork retainers, if required.



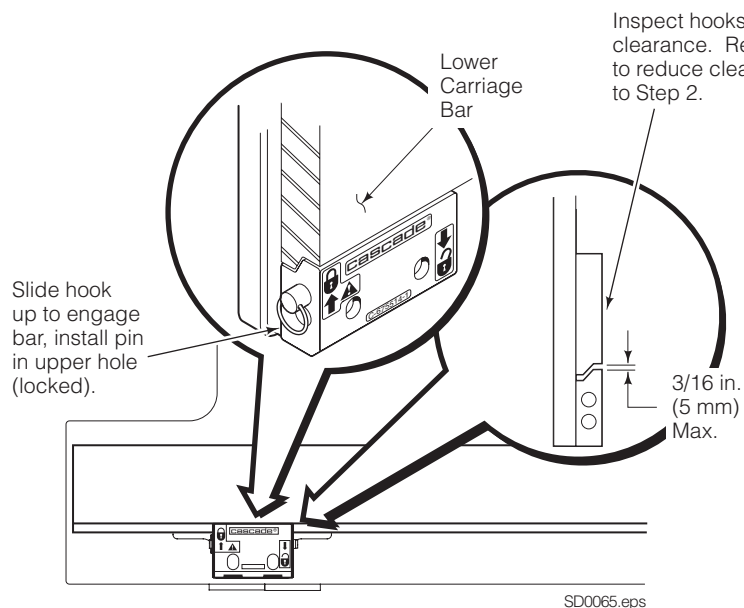
Top View

A

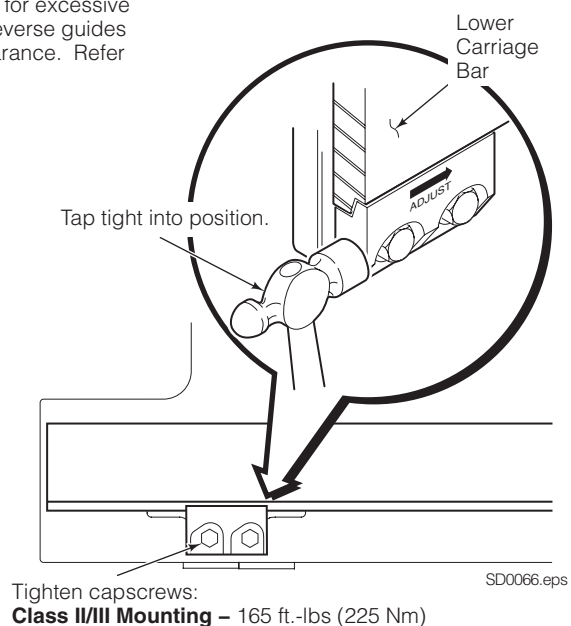
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### 5 Install and engage lower hook(s), if equipped.

#### QUICK-CHANGE TYPE



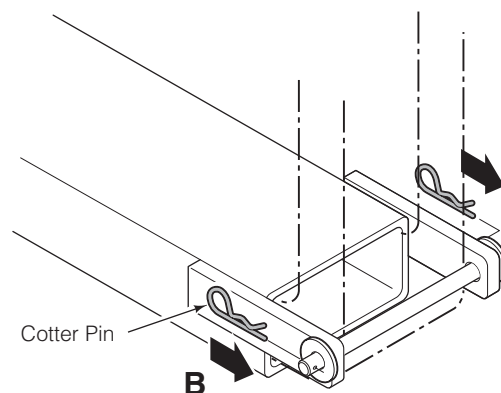
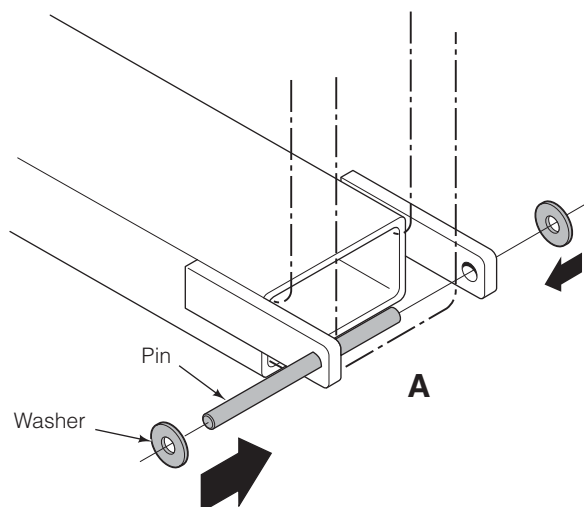
#### BOLT-ON TYPE



### 6 Install back fork pin assembly (if equipped)

**A** Install pins and washers.

**B** Install cotter pins.



LP0309.eps



# INSTALLATION

## CARRIAGE MOUNT & FORK MOUNT MODELS

### 7 Prepare and connect hoses

- A** Connect attachment CLAMP function hoses (2) to clamp valve or tubing.

**CAUTION:** Do not twist hoses.

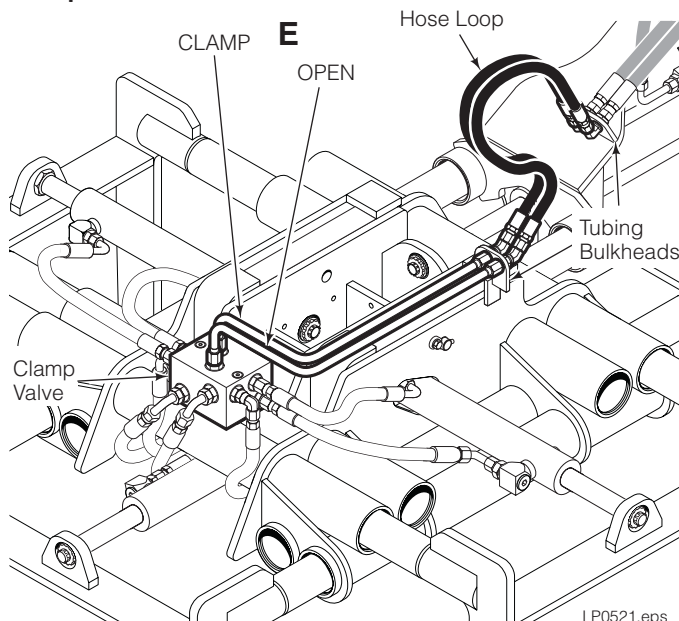
- B** Determine hose lengths required for CLAMP supply hoses.

**NOTE:** The CLAMP circuit uses No. 6 hose and fittings with a minimum ID of .25 in. (7 mm). Cut hoses to length and install hose fittings.

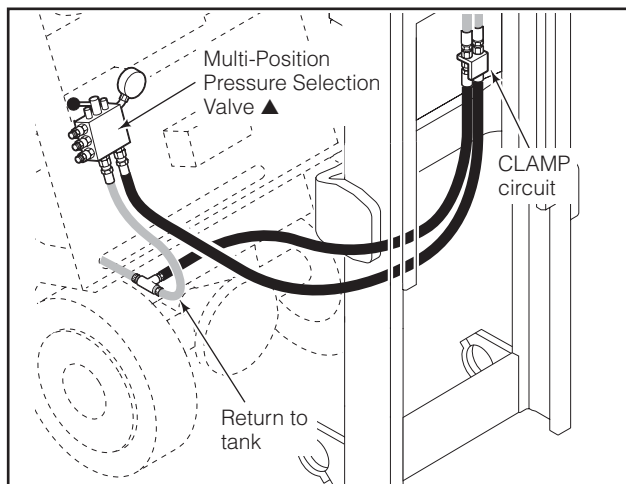
**IMPORTANT:** Use straight or 45 degree fittings. Avoid sharp bends or pinch points. Use few fittings and keep hose lengths at minimum.

- C** Install CLAMP supply hoses to LH internal hose reeving to Multi-Selection Pressure Selection Valve or to Flow/Pressure Control Valve ports 1 and 2.

#### Clamp Hose Connections

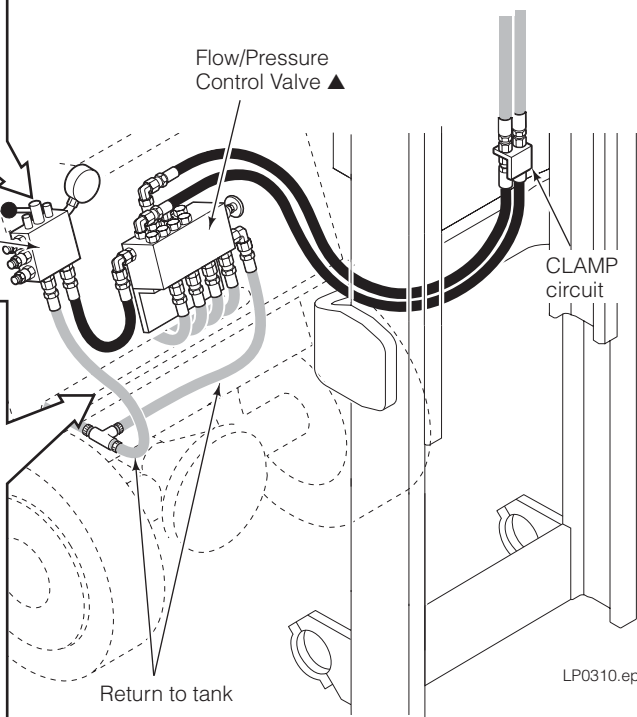


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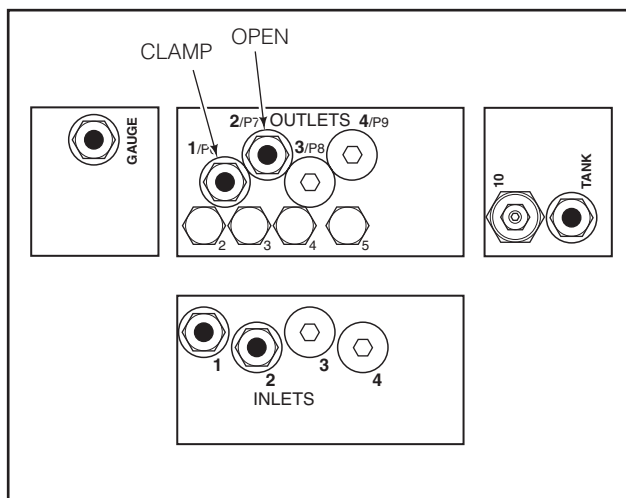


▲ Refer to page 22, step E for pressure adjustments

#### CLAMP Supply Hoses



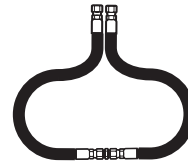
LP0310.eps



# 8

### Flush supply hoses

- A** Install hoses to truck auxiliary valves. Temporarily connect the other ends together using union fittings
- B** Operate auxiliary valves for 30 seconds.
- C** Remove union fittings.



GA0124.eps

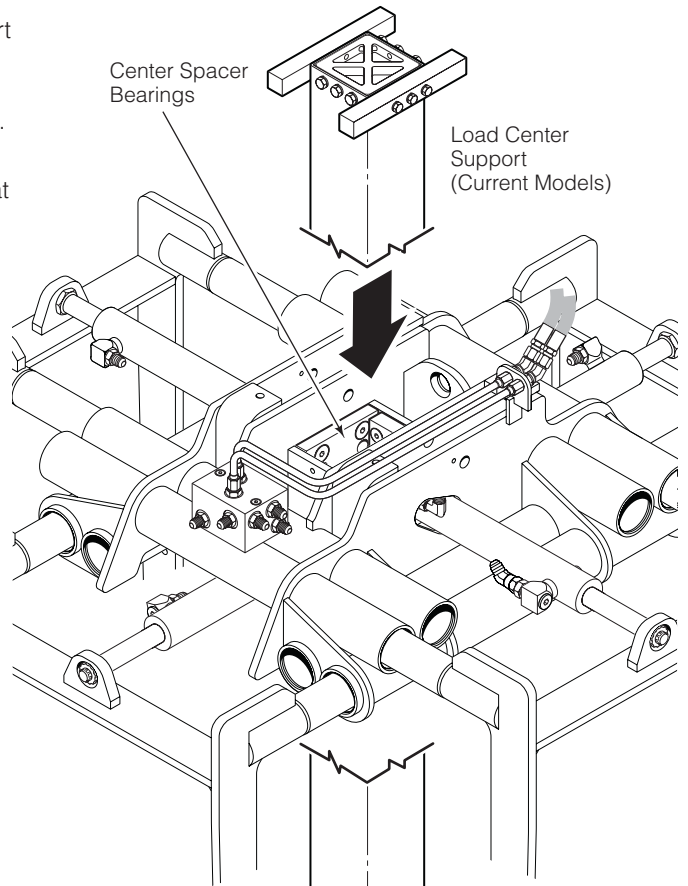
# 9

### Install optional load center support (if equipped)

- A** Remove lower spacers from support tube. Insert the tube into the opening on top of the frame.
- NOTE:** Support tube rests in the opening and floats during use. It is not fastened to the frame.
- B** Maximum side-to-side clearance should be no more than 1/8 in. (3.2 mm) at the top. Verify that center spacer bearings are in place.
  - C** Install lower spacers onto the support tube.

Center Spacer Bearings

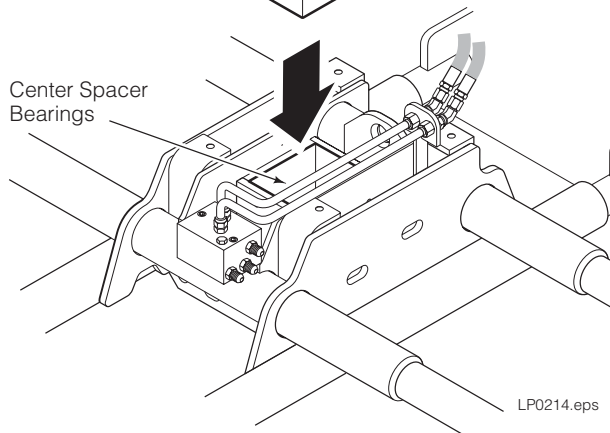
Load Center Support (Current Models)



LP0510.eps

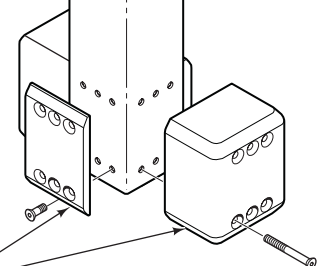
Load Center Support (Early Models)

Center Spacer Bearings



LP0214.eps

Install Lower Spacers

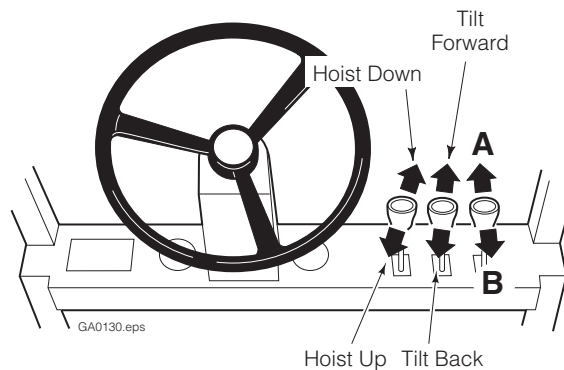


# 10

### Cycle Layer Picker functions

- Check for leaks at fittings, valves and cylinders.
- With no load, cycle through all Layer Picker functions several times.
- Check for control lever function in accordance with ANSI standards (Ref. ANSI B56.1, "Lever or Handle-Type Controls").
- Pick up and cycle a maximum load, check for proper speeds and smoothness of operation.

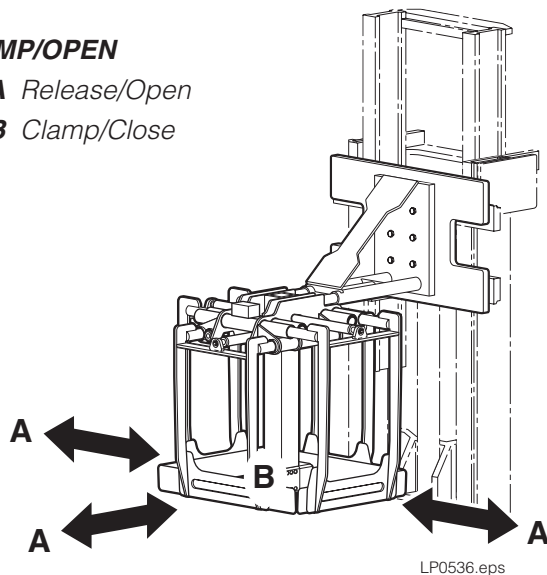
### Auxiliary valve Functions



### Carriage Mount Models

#### CLAMP/OPEN

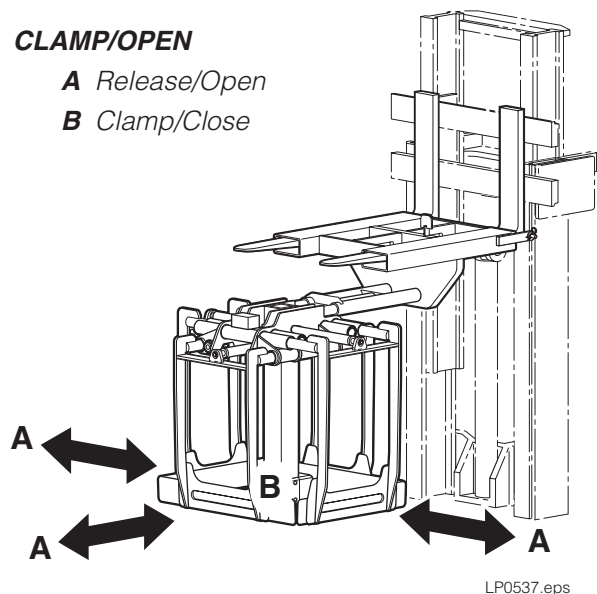
- A** Release/Open
- B** Clamp/Close



### Fork Mount Models

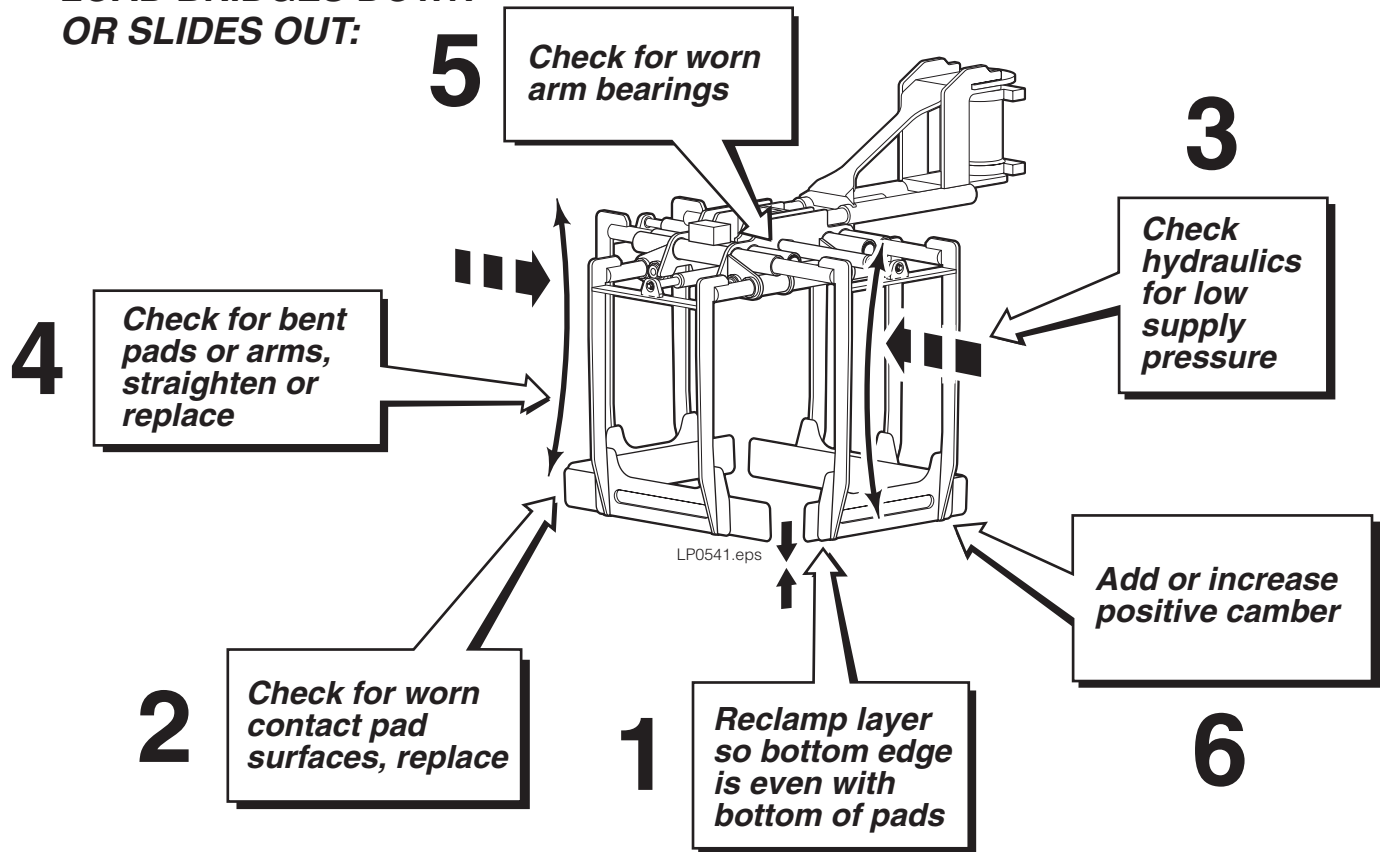
#### CLAMP/OPEN

- A** Release/Open
- B** Clamp/Close

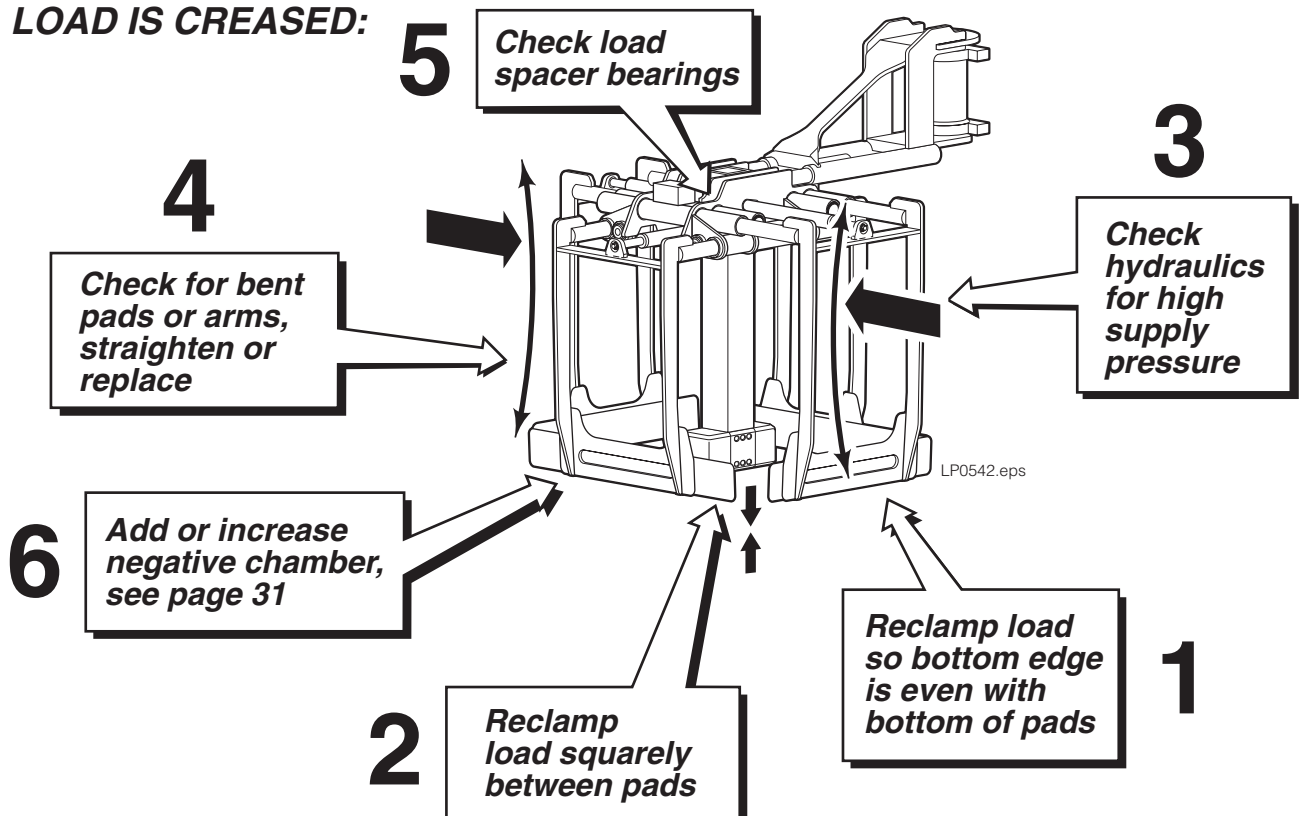


# **L**OAD TROUBLESHOOTING

**IF LOWER TIER OF  
LOAD BRIDGES DOWN  
OR SLIDES OUT:**



**IF LOWER TIER OF  
LOAD IS CREASED:**

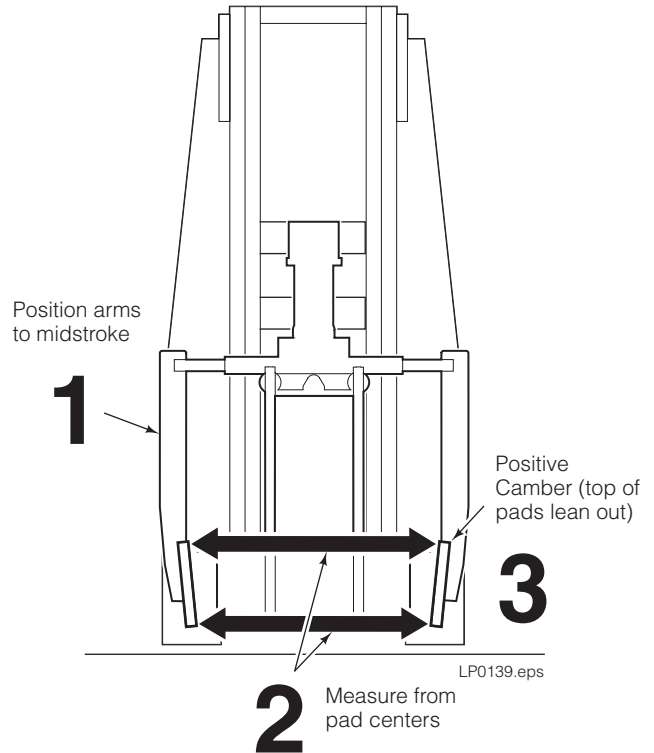


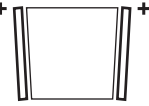

# C ONTACT PAD CAMBER ADJUSTMENT

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

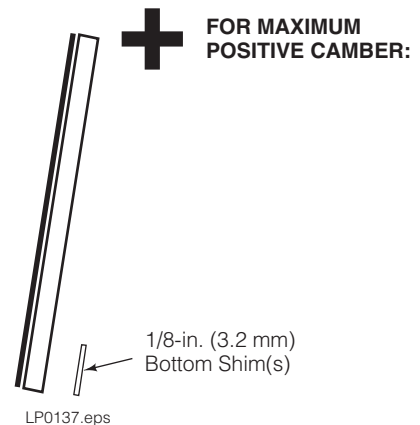
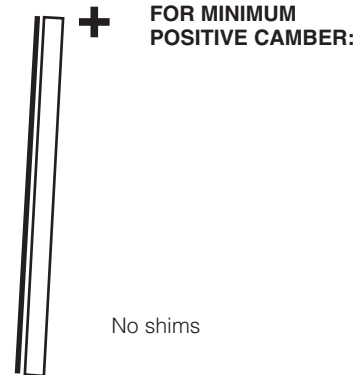
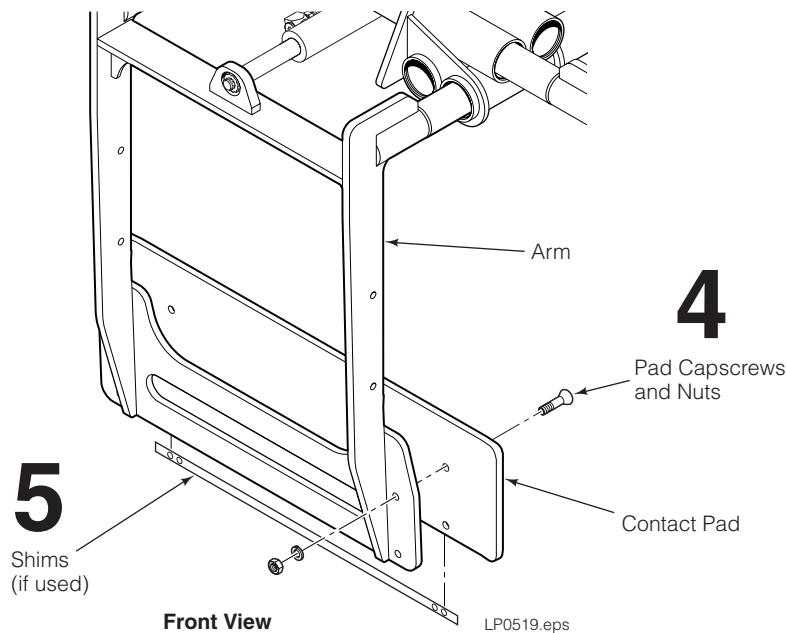
- 1 Extend the arms to midstroke. The clamp should not rest directly on the floor or pallet.
- 2 Measure the distance between the pads at the top and bottom. The difference between the two measurements is the pad camber.
- 3 Determine the camber adjustment required. Refer to recommended starting points in the table below.
- 4 Loosen the capscrews and nuts fastening the contact pad to the arm base. For reassembly, tighten the capscrews to 65 ft.-lbs. (90 Nm).
- 5 Install shims included in shim kit 6155363, as required. Installing shims at the bottom of the pad provides *positive* camber (top of pad leans out).

**CAUTION:** Use an equal number of shims on each contact pad. Pad camber must be the same on all pads for proper load handling.



Load	Opposite Pads - Lower Tier
<b>CANNED / BOTTLED / DENSE CASE GOODS</b>	<b>Neutral-to-Positive</b> +  +
<b>BOXED LIGHT CASE GOODS</b>	<b>Neutral</b> 0  0

LP0136.eps



**IMPORTANT:** Shim all four pads equally.

## Initial 50-Hour Maintenance

**IMPORTANT: Layer Pickers with Cascade Mast** – After the Layer Picker has operated the initial 50 hours, perform the 50 Hour Maintenance as described in Technical Bulletin TB 339, Layer Picker Initial 50 Hour Inspection and Adjustment. These maintenance steps will ensure the Layer Picker is properly adjusted and operating correctly. After the maintenance steps are complete, file a Warranty Claim to be reimbursed for time and travel.

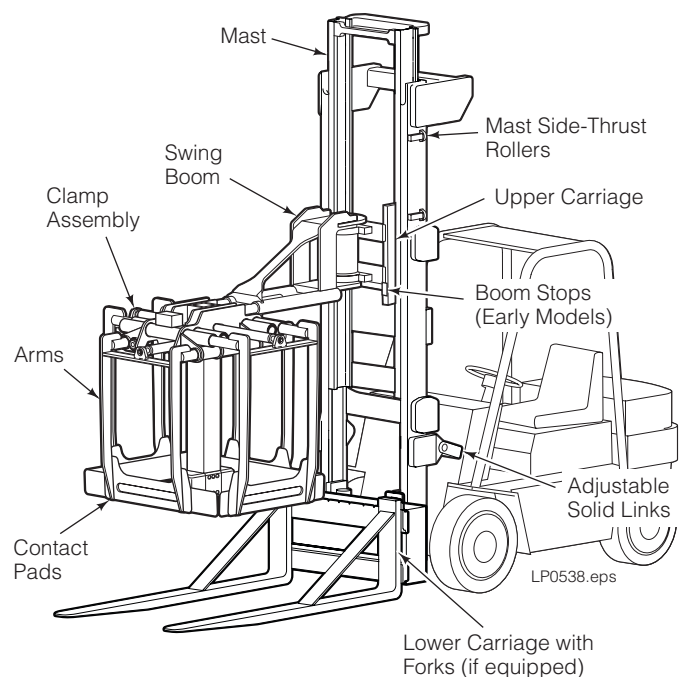
## 100-Hour Maintenance

Every time the lift truck is serviced or every 100 hours of truck operation, whichever comes first, complete the following maintenance on the layer picker:

- Check for loose or missing bolts, damaged or worn hoses and hydraulic leaks.
- Inspect contact pads, arms, and forks for damage or wear. Replace as necessary.
- Inspect clamp and boom cylinder anchor nuts for proper connection and tightness. If necessary tighten to 160 ft.-lbs. (220 Nm).
- Check swinging boom stops for damage. Replace as necessary.
- Check that mast is vertical and clamp assembly is level during normal operation. Adjust as necessary.
- Lubricate mast upright rails. Cascade approved lubricant:

Power Punch MPG White Lithium Multi-Purpose Grease

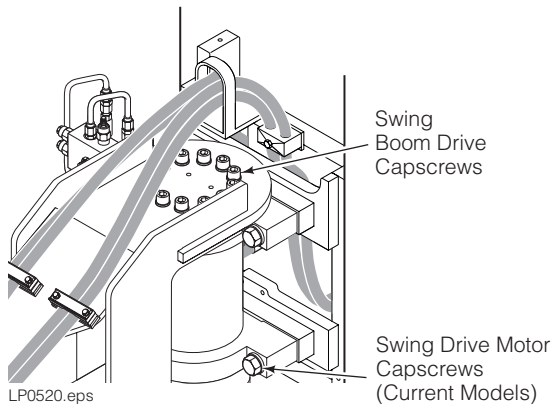
**IMPORTANT:** Regular application of Cascade approved lube will prevent premature mast rail, roller (if equipped) and thrust block wear.



## 500-Hour Maintenance

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

- Inspect chains for proper tension and adjustment. Refer to Service Manual 230444.
- Lubricate full length of mast chains with chain lube (Cascade Part No. 200867).
- Check torque value on mast lower mounts and adjustable solid links.
- Check torque value on swing boom-to-drive top capscrews. Refer to illustration below. Use cross-pattern and tighten to 160 ft.-lbs. (215 Nm).



- Check torque value on motor-to-carriage capscrews. Refer to illustration opposite. Use cross-pattern and double-torque to 450 ft.-lbs. (610 Nm).

- Check the clearance between the lower mounting hooks and the truck carriage bar:

**Quick-Change Hooks** – 3/16 in. (4.8 mm) maximum

**Bolt-On Hooks** – 3/32 in. (2.4 mm) minimum and 3/16 in. (4.8 mm) maximum.

If adjustment is necessary, refer to Installation page 26, step 5. Tighten the lower hook capscrews to 125 ft.-lbs. (170 Nm).

- Inspect and adjust (if necessary) the thrust bearing side-to-side clearance in mast upright and carriage. Check carriage alignment and verify that the total side-to-side clearance is 1/16 in. (1.5 mm) maximum at the tightest point throughout the travel of the carriage.

### Thrust Bearings with Shim Adjustment –

Shim behind the thrust bearings for required side-to-side clearance.

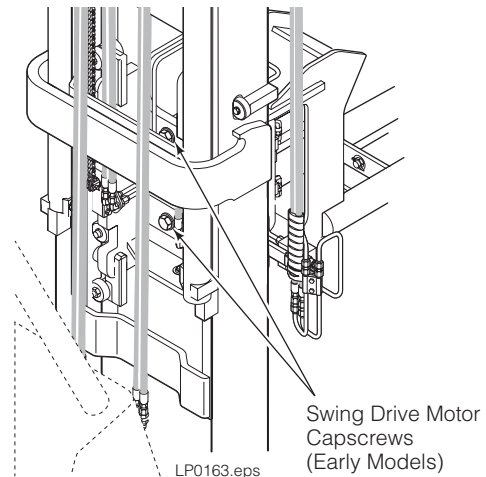
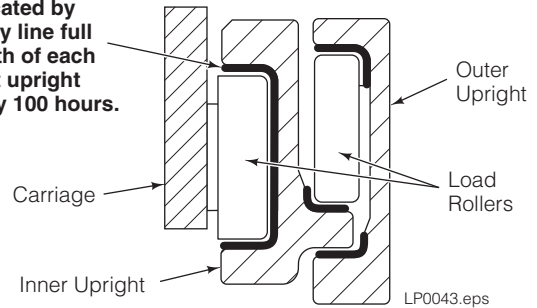
### Thrust Bearings with Capscrew Adjustment –

Remove retainer and M12 capscrews from M24 capscrew. Turn capscrew until bearing touches the mast. Back off the capscrew 1/2 turn. Install retainer, tightening the capscrews to 48 ft.-lbs. (65 Nm). Verify side-to-side clearance.

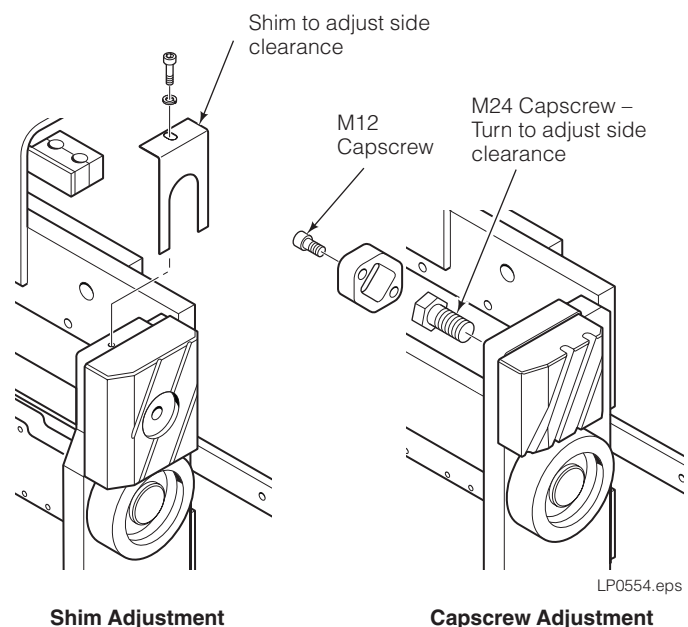


**WARNING:** Failure to lubricate uprights properly may result in flaking material that can get into the operator's eyes and cause personal injury.

Lubricate areas indicated by heavy line full length of each mast upright every 100 hours.



## Thrust Bearings

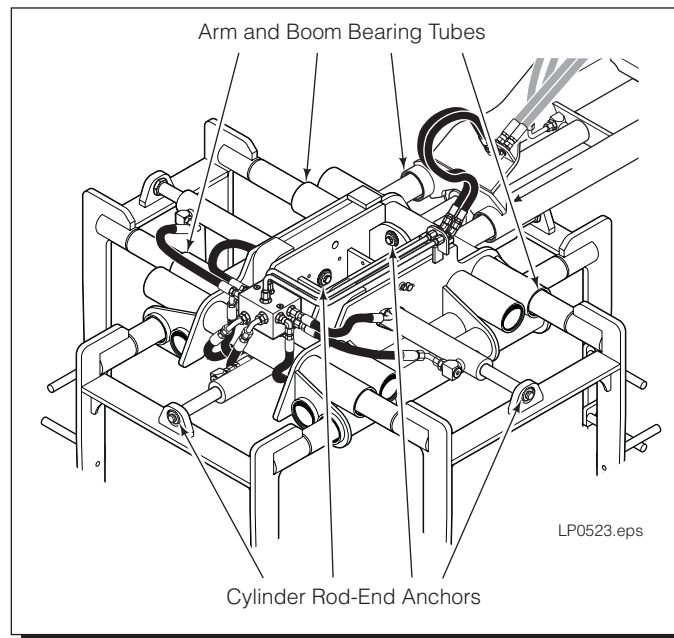




## 1000-Hour Maintenance

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

- Inspect clamp arm, boom arm and center spacer bearings for wear. Replace as necessary.



## 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 center spacer bearings.
- Replace clamp arm and boom arm bearings. Refer to Service Manual 230444.
- If equipped, replace load rollers and thrust bearings in mast and carriage. Refer to Service Manual 230444.
- **Fork Inspection** – 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.

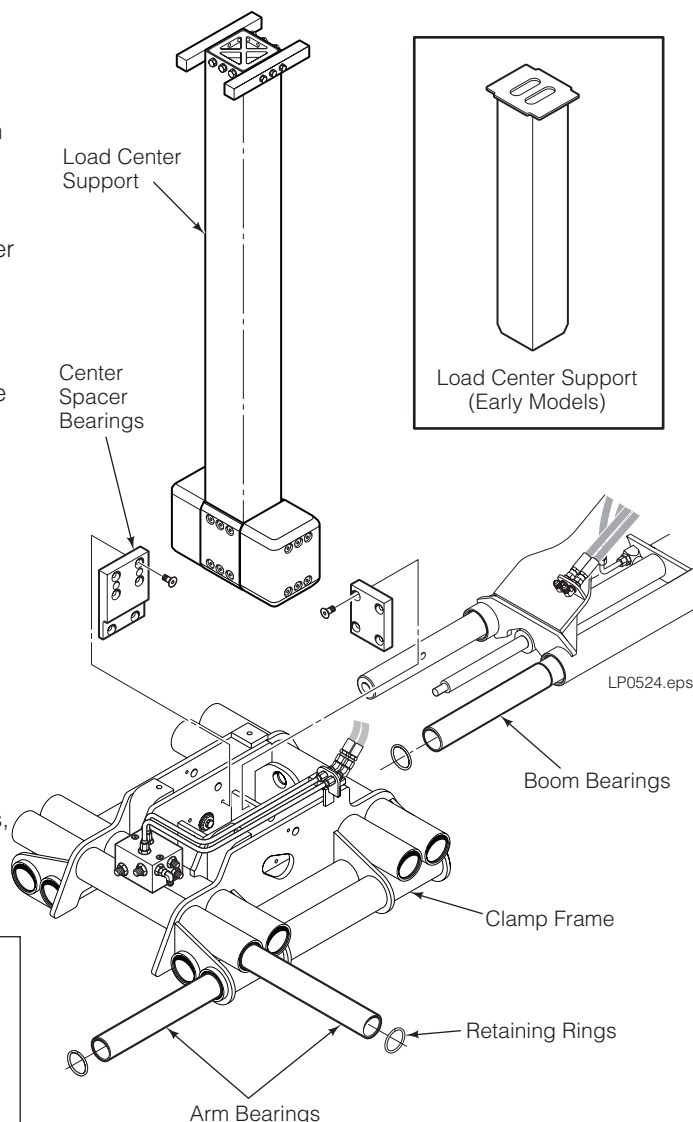
Inspect for the following defects:

- 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).



**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 Layer Picker operates correctly before returning it to the job.



**Do you have questions you need**

**answered right now?** Call your nearest Cascade Service Department.

Visit us online at [www.cascorp.com](http://www.cascorp.com)

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