

Installation Instructions

D-Series Masts

Introduction

This manual provides the installation instructions and adjustment procedures for Lift Tek D-Series roller masts.

These masts provide exceptional visibility for the lift truck driver. The mast carriage and upright channels are all roller mounted providing smooth operation and long service life.

In any communication about the mast refer to the mast serial number stamped on the nameplate. If the nameplate is missing, these numbers are also stamped on the left-hand side upper cheekplate. See Figure 1.



WARNING: Modifications and additions which affect capacity and safe operation shall not be performed by the customer or user without manufacturers prior written approval. Capacity, operation and maintenance instruction plates, tags or decals shall be changed accordingly per OSHA regulations 1910.178.

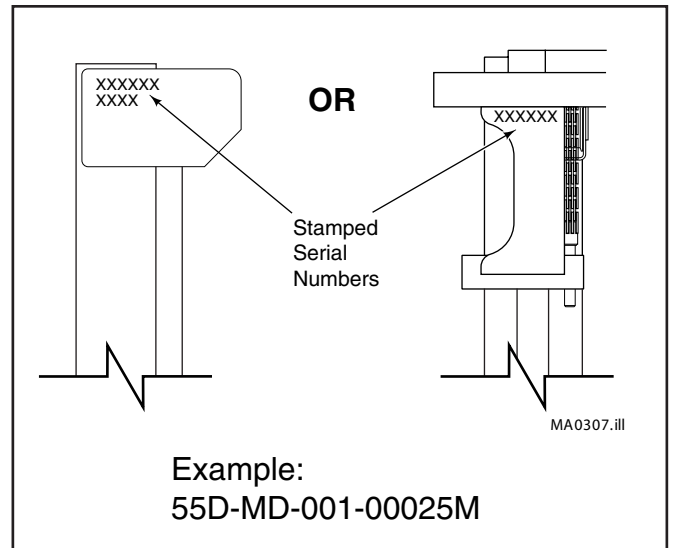


Figure 1. Mast Serial Number.

Truck System Requirements

To achieve the maximum lifting capacity of the mast, the truck relief valve should be set to relieve at the pressure indicated in the chart below. This chart also indicates the hose and fitting size to use between the truck control valve and mast valve.

Cascade D-Series Mast	Relief Pressure	Hose Size	Fitting * Size
35D/40D/45D 50D/55D/60D	2000 or 2600 psi	No. 8 min.	No. 8 min. 13/32 in. Orifice

*Valve inlet port is 3/4 in. SAE O-ring. See Figure 2.



WARNING: For proper truck stability or to prevent interference, tilt restriction may be required. **NOTE:** To achieve the proper tilt restriction, contact the truck manufacturer or your truck service manual.

IMPORTANT: Lift Tek masts are compatible with SAE 10W petroleum base oil per Mil. Spec. MIL-0-5606 or MIL-0-2104B only. Use of synthetic or aqueous base hydraulic oil is not recommended. If fire resistant hydraulic oil must be used, contact Lift Tek.

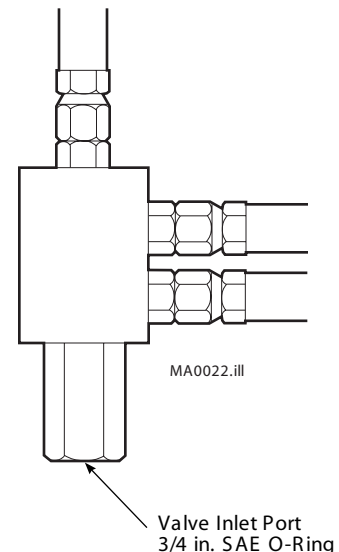


Figure 2. Valve Inlet Port.

Part No. 686595-R5

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or

Write: Lift Technologies, 7040 South Highway 11, Westminster, S.C. 29693



LIFT-TEK®

Mast Installation

- 1 Raise and block front end of the truck up 1 ft. (30 cm) per ANSI B56.1 or drive the truck over a service pit.
- 2 Install the bearings to the mast lower axle mounts.
- 3 Lubricate the bearing surfaces of the lower axle and tilt cylinder mounting brackets with chassis grease.
- 4 Lift the mast using an overhead hoist and a nylon sling wrapped around the upper crossmembers. Position the mast lower axle mounts on the truck axle. Install the mount caps and capscrews. Tighten the capscrews to the truck manufacturer's torque specifications.

IMPORTANT: Prior to connecting the tilt cylinders to the mast, make sure the cylinders "bottom" evenly. Adjust the tilt cylinders to prevent the mast from "racking" during tilting. Refer to your truck service manual for procedures.

- 5 Connect the truck supply hose to the mast valve.
- 6 Connect the tilt cylinders to the mast anchor brackets. Tighten the pin capscrews to the truck manufacturer's torque specifications.

NOTE: Use as few fittings as possible. Always use 45° fittings instead of 90° fittings. Keep the hose lengths to a minimum. Avoid sharp bends or pinch points when routing the hose.

- 7 Check the oil level in the truck hydraulic tank when the mast is fully lowered. Fill if required.

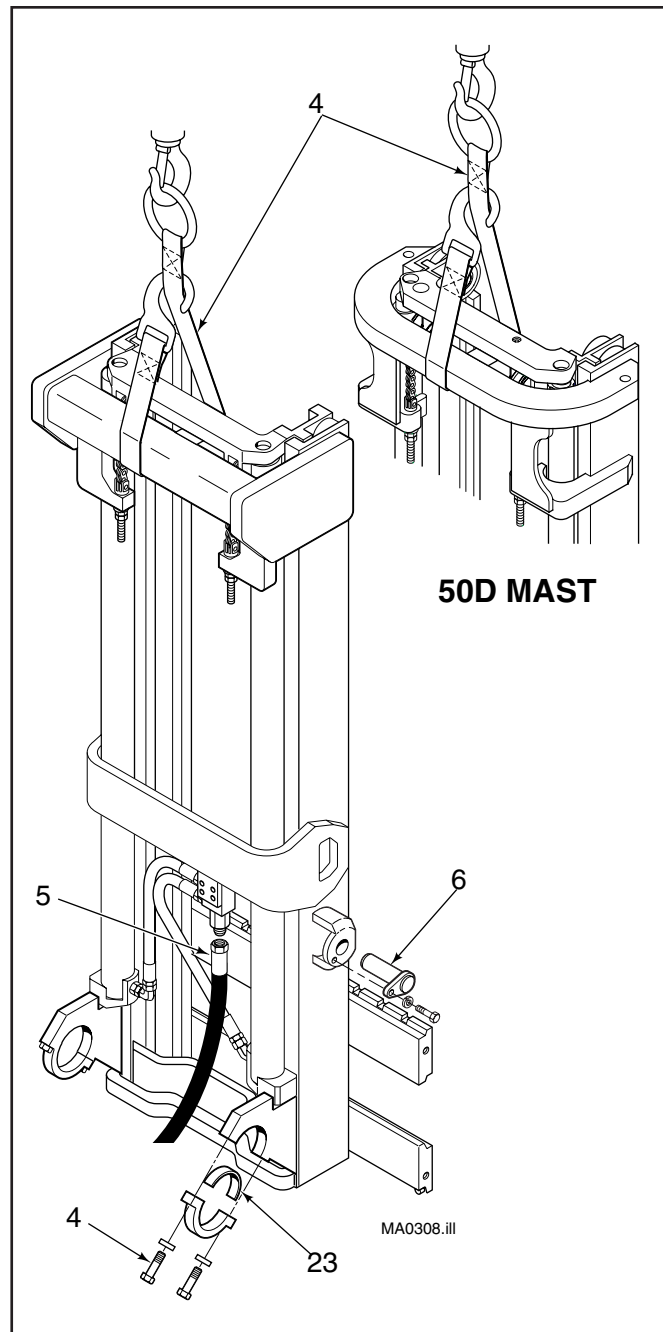


Figure 3. Mast Installation.

Operational Inspection and Adjustments

CAUTION: The factory set adjustments may not be correct for your truck. Check each of the following before using the mast for the first time.

- * Inspect the chains and check chain tension.
- * Check the main lift chains for proper adjustment.
- * Check the free lift chain adjustment (if equipped).
- * Check the free lift cylinder supply hose tracking and tension (if equipped).

Chain Inspection and Tension

The main and free lift chains have been factory lubricated using heat and pressure to force the lubricant thoroughly into the chain links. Avoid removal or contamination of this factory applied lubricant. **Do not wash, sand blast, etch, steam clean, or paint the chains for initial mast installation.**

The chains must be adjusted with equal tension to ensure proper load distribution and mast operation. To determine equal tension, extend the unloaded mast to put the chains under tension. Press the center of a strand of chain with your thumb. Then press at the same place on the other chain of the pair. Each chain in a pair should have equal "give". If they do not have equal tension, perform the Main Lift and Free Lift chain adjustments described below.

Main Lift Chain Adjustment

The main lift chains should be adjusted so that when the unloaded mast is fully lowered, the carriage is positioned as shown in Figure 4.

- 1 Adjust one chain to achieve the correct carriage position when fully lowered, see Figure 4 and 5.
- 2 Adjust the other chain to achieve equal chain tension. Tighten the nuts together to a torque of 50-70 ft.-lbs. (68-95 Nm).
- 3 Raise and lower the mast several times to confirm the adjustments.

Full Free Lift Masts - Free Lift Chain Adjustment

The free lift chains should be adjusted so that when the unloaded mast is fully lowered, the carriage is positioned as shown in Figure 4.

- 1 Locate the threaded chain anchors on the front side of the inner upright crossmember on each side of the cylinder.
- 2 Adjust one chain to achieve the correct upright and carriage position when lowered. See Figure 4 and 5.
- 3 Adjust the other chain to achieve equal chain tension. Tighten the nuts together to a torque of 50-70 ft.-lbs. (68-95 Nm).
- 4 Raise and lower the mast several times to confirm the adjustments.

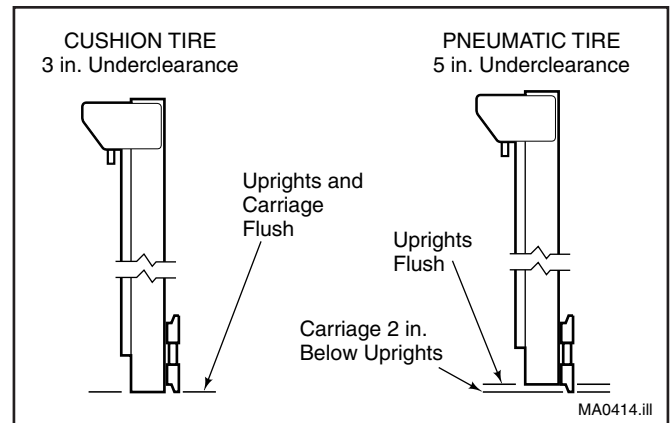


Figure 4. Upright and Carriage Position.

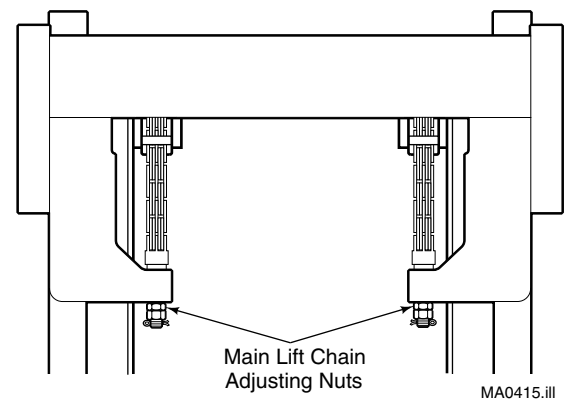


Figure 5. Main Lift Chains.

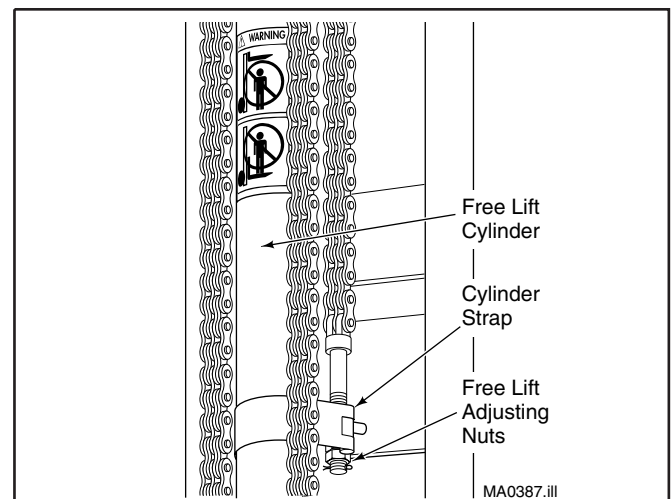


Figure 6. Free Lift Chains.

Operational Inspection and Adjustments (Continued)

Triple & Quad Masts - Free Lift Cylinder Supply Hose Tracking Adjustment

Make sure the free lift cylinder supply hose is not twisted and travels smoothly in the hose sheave. Check the hose to be sure it is not scuffing. Adjust the hose by loosening the hose end connection at the valve and twisting the hose. Tighten the hose end while holding the hose in place. See Figure 7. Tension on the hose can be adjusted by using a different set of bracket holes. Use the holes that place a small amount of tension on the hose.

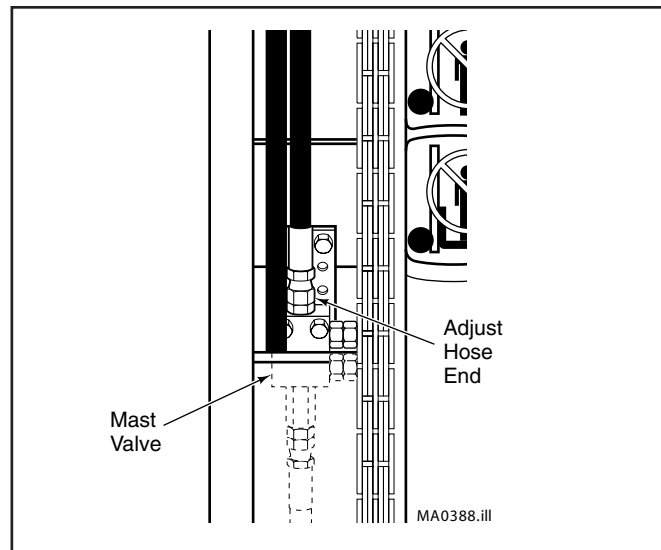


Figure 7. Free Lift Cylinder Supply Hose Adjustment.

Upright Channel Lubrication

Lubricate the full length of each upright channel with chassis lube or Kendall SR-8X as shown. See Figure 8.

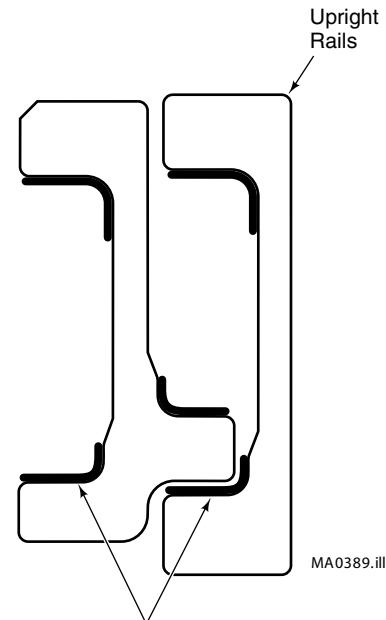
Cylinder Bleeding



WARNING: The cylinders must be bled to remove air. Air in the cylinders will compress on the first extension which could rupture the cylinders causing serious bodily injury and property damage.

When new or after repair, the cylinders may have air trapped in them that must be removed. To bleed air do the following:

- 1 **Limited Free Lift Masts - Without a load** extend the main lift cylinders to 90% of full stroke. Retract the cylinders completely. Repeat **three** times.
Full Free Lift Masts - Without a load extend the free lift cylinder and continue to extend the main lift cylinders to 90% of full stroke. Retract all cylinders completely. Repeat **three** times.
- 2 Extend the cylinders **without a load** at 50% full engine speed then build full system pressure at the end of the main lift cylinder stroke. **Electric trucks** - limit the control valve movement to achieve the 50% speed. Retract all cylinders. Repeat **four** times.
- 3 Cycle the mast with a **half load** (50% mast rated capacity) through full cylinder extension several times. The cylinders should extend smoothly. Repeat the steps if cylinder extension is not smooth.



LUBRICATE ONLY WHERE INDICATED BY THE HEAVY LINE FOR THE FULL LENGTH OF EACH UPRIGHT

Figure 8. Channel Lubrication.

Operational Inspection and Adjustments (Continued)

Mast Skewing

- 1 Extend the mast to full lift height. See Figure 9.
 - * If the mast bends to the right at full extension, a shim(s) need to be installed to the right hand main lift cylinder rod.
 - * If the mast bends to the left at full extension, a shim(s) need to be installed to the left hand main lift cylinder rod.



WARNING: The upright must be supported by an angle iron to avoid possible injury

- 2 Place a 6 in. (15 cm) long, 2 X 2 in. (5 X 5 cm) angle iron between the top of the main lift cylinder and the crossmember. See Figure 10. Avoid contacting the cylinder rod seal. Lower the crossmember onto the angle iron.
 - 3 **Two Stage Masts** - Remove the snap ring from the cylinder to be adjusted. Open the truck valve to allow the cylinder to retract. Tap the main lift cylinder rod down past the crossmember to install the shim. Install shim(s) part no. 683797 to the cylinder rod below the inner upright crossmember. See Figure 10.
- Three Stage Masts** - Remove the snap ring from the cylinder to be adjusted. Open the truck valve to allow the center (free lift) cylinder to fully retract. Tap the main lift cylinder rod down past the crossmember to install the shim. Install shim(s) part no. 683797 to the cylinder rod below the intermediate upright crossmember. See Figure 11.
- 4 Repeat steps 1 through 3 until skewing has been removed.

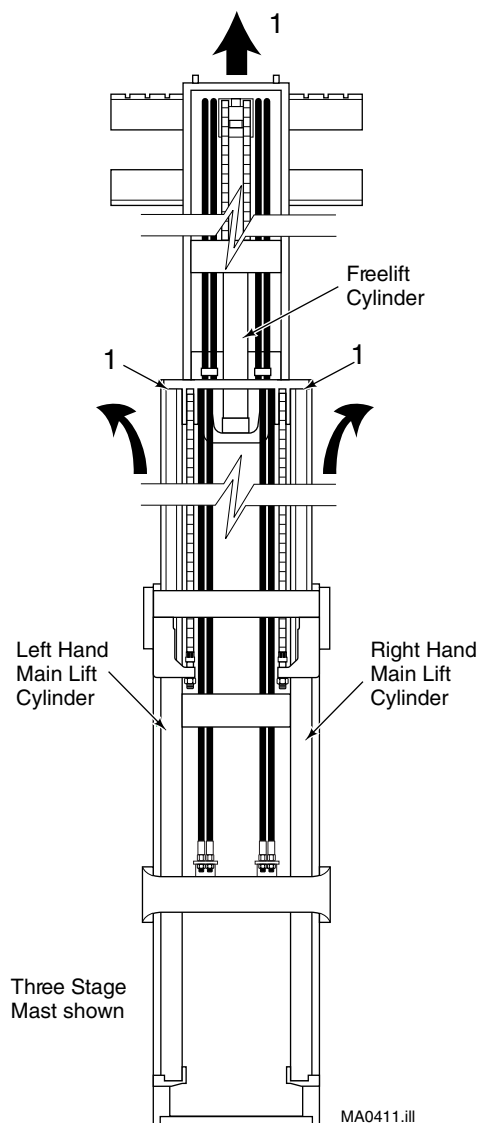


Figure 9. Extending Upright.

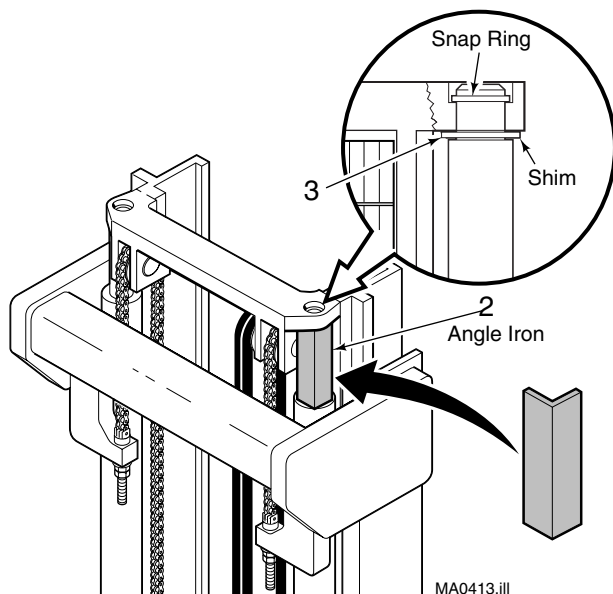


Figure 10. Two Stage Mast.

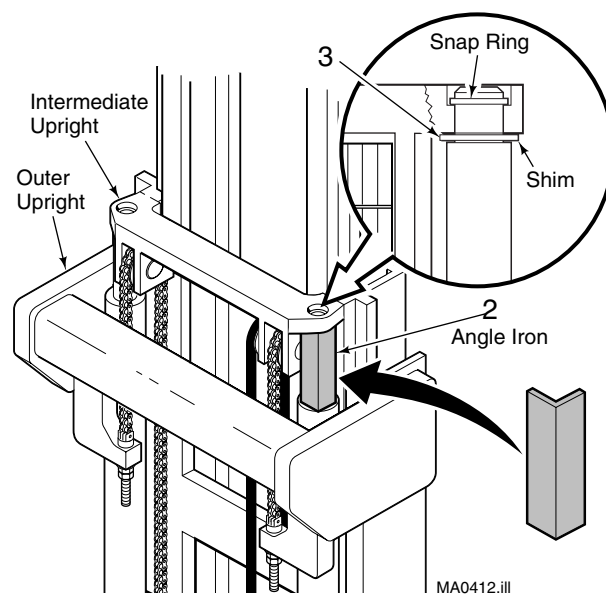


Figure 11. Three Stage Mast.

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Lift Technologies Service Department

Lift Technologies Inc.
Westminster Mast Plant
7040 South Highway 11
Westminster, SC 29693
USA
Tel: +1(864) 647-1119
Fax: +1(864) 647-5406
Customer Service (Toll Free) 1-888-946-3330