MAST SERVICE MANUAL

SM150_E SERIES MT
E SERIES MT FULL FREE LIFT 3-STAGE MAST for
BBX50 SERIES ELECTRIC FORKLIFT TRUCKS - S/N 090001A~

E40/E50/E60/E65 MASTS
EV40/EV50/EV60/E65 MASTS

E SERIES
MT MAST

WARNING

Read and observe all warnings on this unit before operating it.
DO NOT operate this equipment unless all factory installed guards and shields are properly secured in place.

Komatsu Forflift USA, Inc.

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Section 1 Introduction

1.1 Introduction

This manual provides the installation instruction, periodic maintenance, troubleshooting and service procedures for the E-Series roller masts.

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

WARNING: Do not install a Mast on a truck with a capacity greater than the truck rated capacities shown below

TRUCK CAPACITY AT 24IN. (610 mm) LOAD CENTER		
EV40 E40	**EV50 E50**	**EV60 E60**
4000 lbs. (1814 kg)	5000 lbs. (2268 kg)	6000 lbs. (2718 kg)

Modifications and additions which affect capacity or safe operation shall not be performed without prior written approval from your O.E.M. per ANSI B56. 1.

1.2 Special Definitions

WARNING

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

CAUTION

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

IMPORTANT

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

NOTE

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

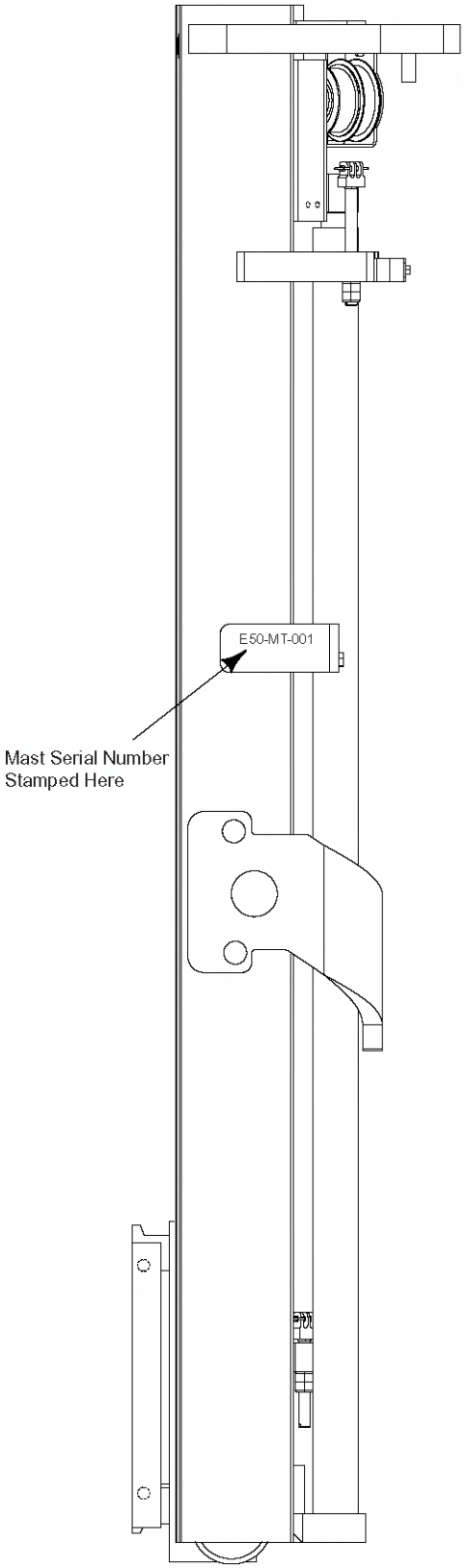


Figure 1. Mast Serial Number Location

Section 2 Installation Instructions

2.1 Truck System Requirements

To achieve 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 fitting size to use between the truck control valve and masts valve.

Mast	Relief Pressure	Hose Size	Fitting* Size
EV/E-40/50/60	2600 psi	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. Contact the truck manufacturer.

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

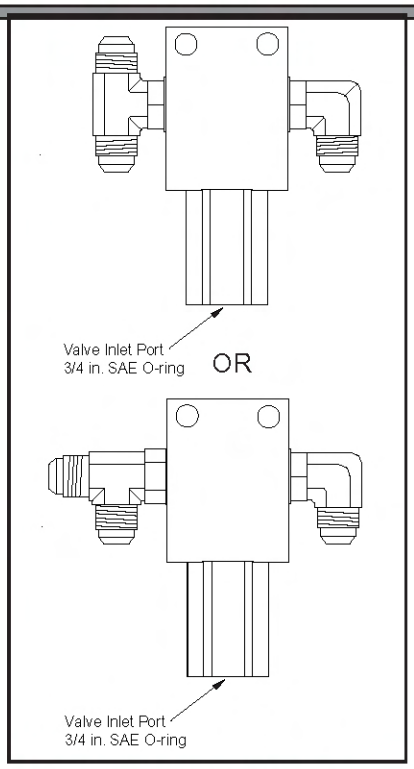


Figure 2. Valve inlet Port.

2.2 Mounting Bracket Installation

If it is necessary to install mounting brackets and cross-members to fit your lift truck, consult with the nearest authorized dealer.

You must supply dimensions **A** through **F** shown in Figure 3. Failure to install the correct brackets and cross-members can result in mast structural failure, bodily injury and loss of warranty.

WARNING: Failure to install the correct brackets and crossmembers can result in mast structural failure, bodily injury and loss of warranty.

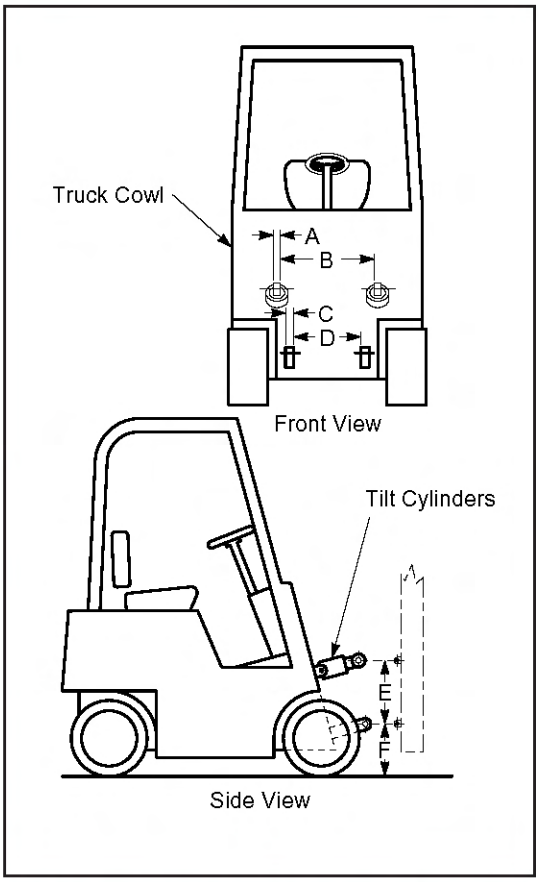


Figure 3. Determining Mounting Bracket Location.

2.3 Mast Installation

The following instructions and illustrations are typical for most trucks. If your truck does not match, contact your authorized dealer/distributor.

1. **Raise** and block the front end of the truck 1ft. (30 cm) per ANSI B56.1 or drive the truck over a service pit.

2. Install the bearings to the lower the axle mounts.

3. Lubricate the bearing surfaces of lower axle and tilt cylinder mounting brackets with chassis grease.

4. Lift the mast using an overhead hoist with a lifting strap attached under all of the upper crossmembers. Position the mast by lowering the axle mounts onto the truck axle. Install the mounting 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 lift truck 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 and 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.

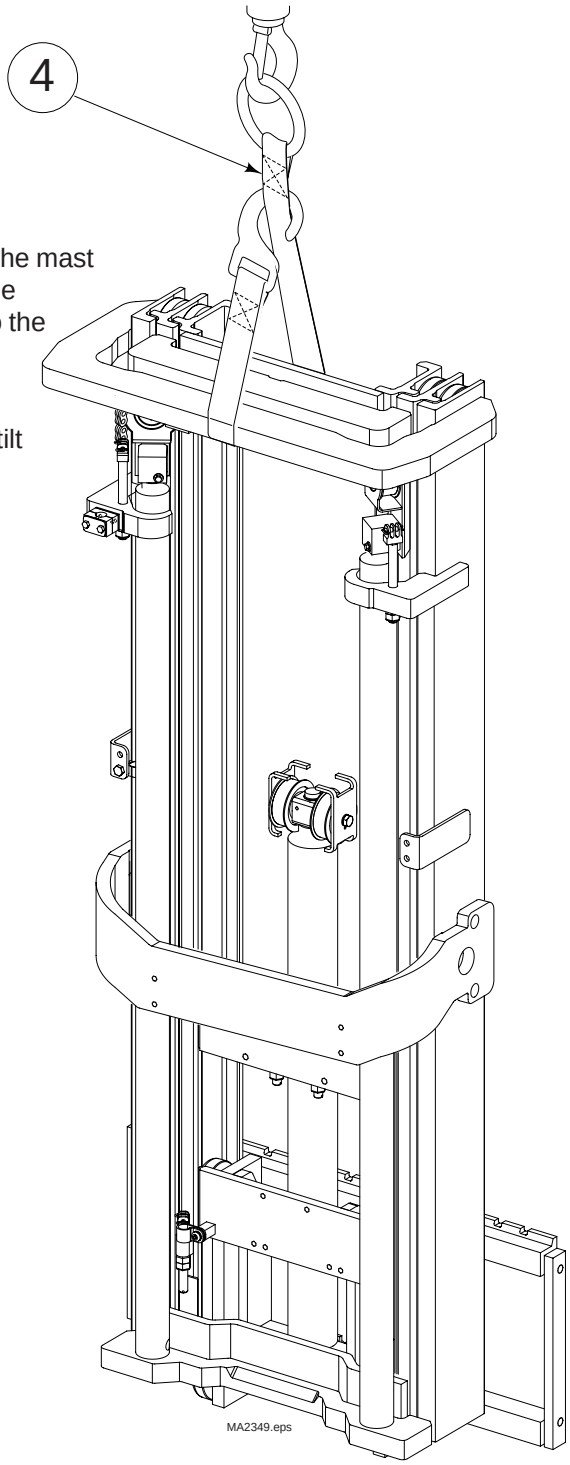


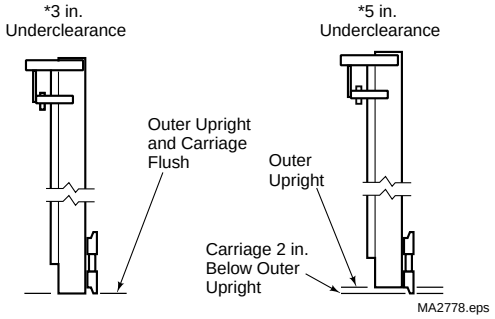
Figure 4. Mast Installation.

2.4 Inspection and Adjustments

2.4-1 Chain Inspection and Tension

The hoist 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 internal 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, preform the hoist chain adjustments described in Sections 5.6-3 and 5.6-4.



***NOTE:** Underclearance is based on mast production series. Actual mast underclearance may vary by truck.

Figure 5. Upright and Carriage Position.

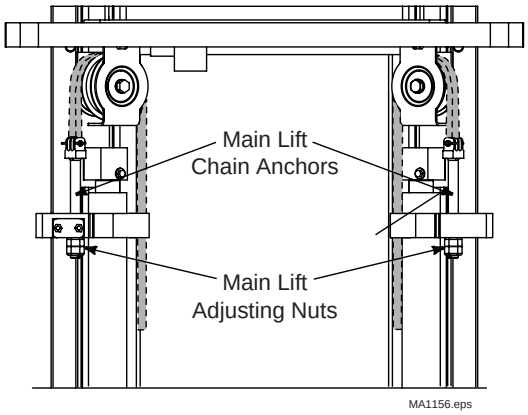


Figure 6. Main Lift Chains.

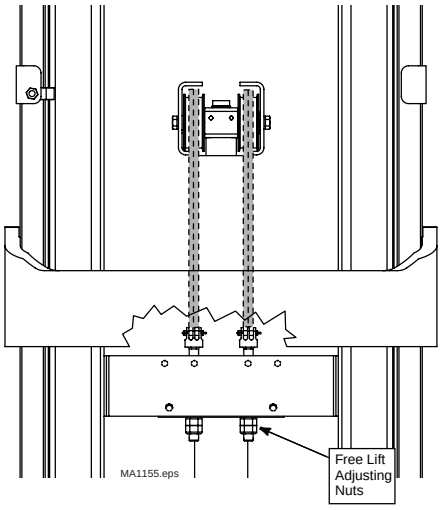


Figure 7. Free Lift Chains.

2.4-4 Free lift Cylinder Supply Hose Tracking Adjustment

Make sure the cylinder supply hose is not twisted and travels evenly in the hose sheave. Check the hose to be sure it is not scuffing. Adjust the hose by loosening the hose clamp on the outer upright as shown in figure 8 and twisting the hose. Tighten the clamp while holding the hose in place. Tension on the hose can be adjusted by sliding the hose through the loosened clamp as required.

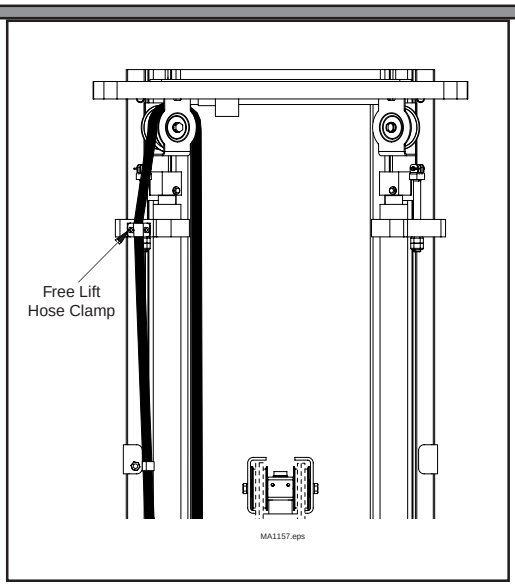


Figure 8. Free Lift Cylinder Supply Hose Adjustment.

2.4-5 Upright Rail Lubrication

Lubricate the full length of each upright rail with chassis lube or Kendall SR-12X as shown in Figure 9.

2.4-6 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. **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 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.

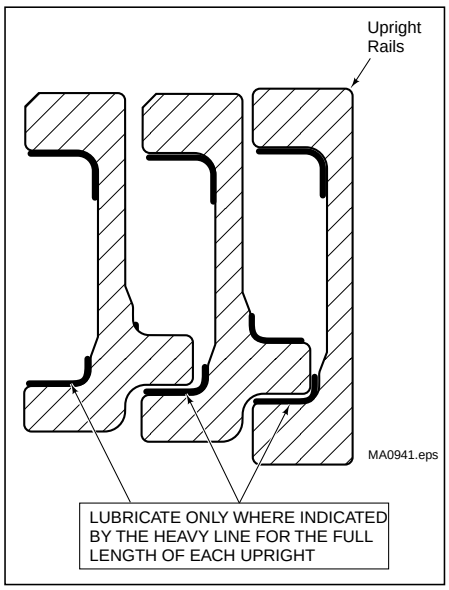


Figure 9. Channel lubrication.

2.4-7 Mast Skewing

Check for mast skewing as described in Section 5.5-6.

2.5 Single Function Internal Reeving Installation

1. Install fittings and caps to the carriage termination bracket and install bracket to carriage as shown.

2. Assemble crosshead sheaves and new chain guards as shown.

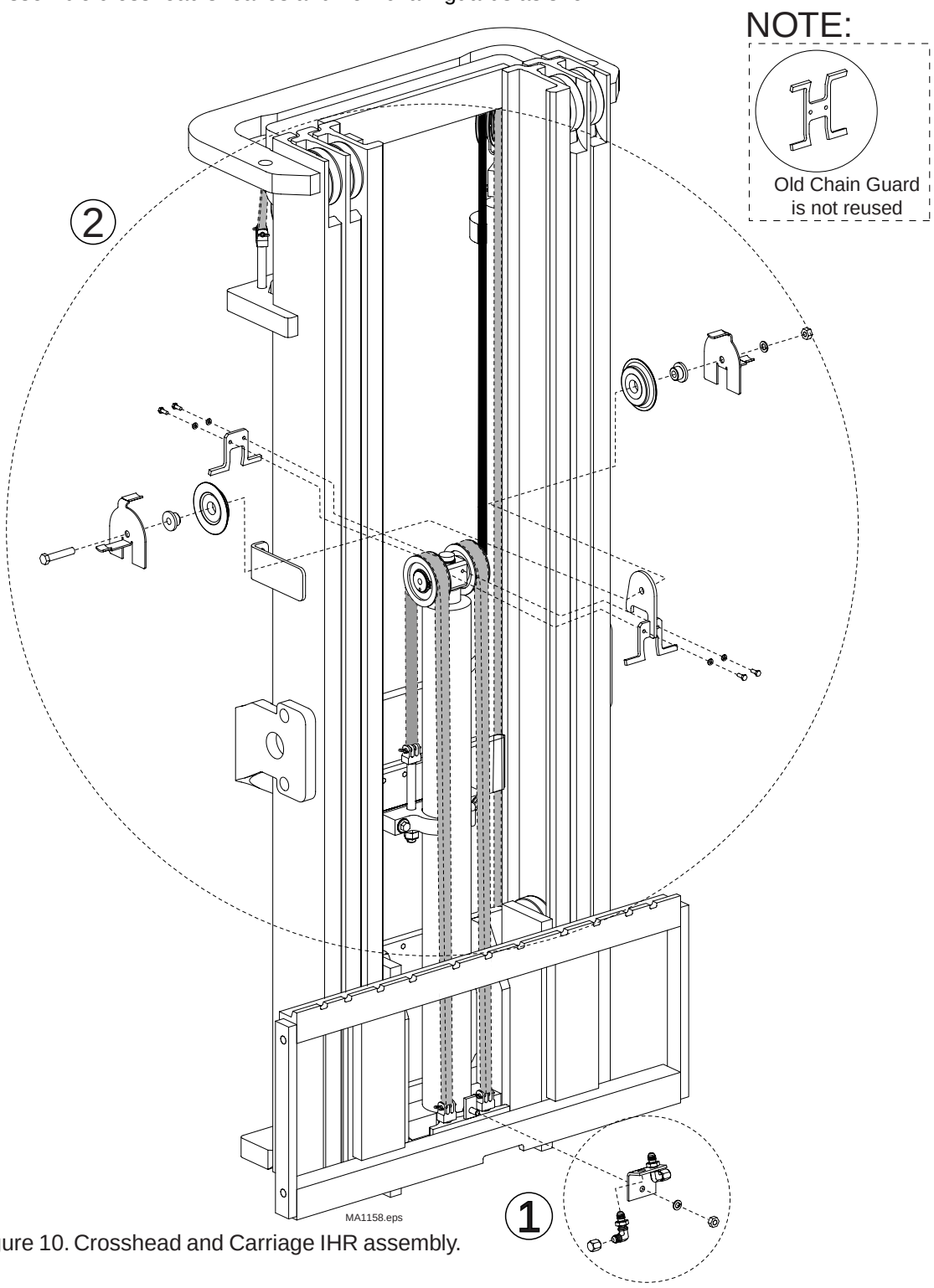


Figure 10. Crosshead and Carriage IHR assembly.

2.5 Single Function Internal Reeving Installation (Continued)

3. Install bracket on middle inner crossmember (E-Series Only).

4. Install upper bracket and one clamp piece on lower inner crossmember as shown.

5. Install lower bracket and one clamp piece on lower inner crossmember as shown.

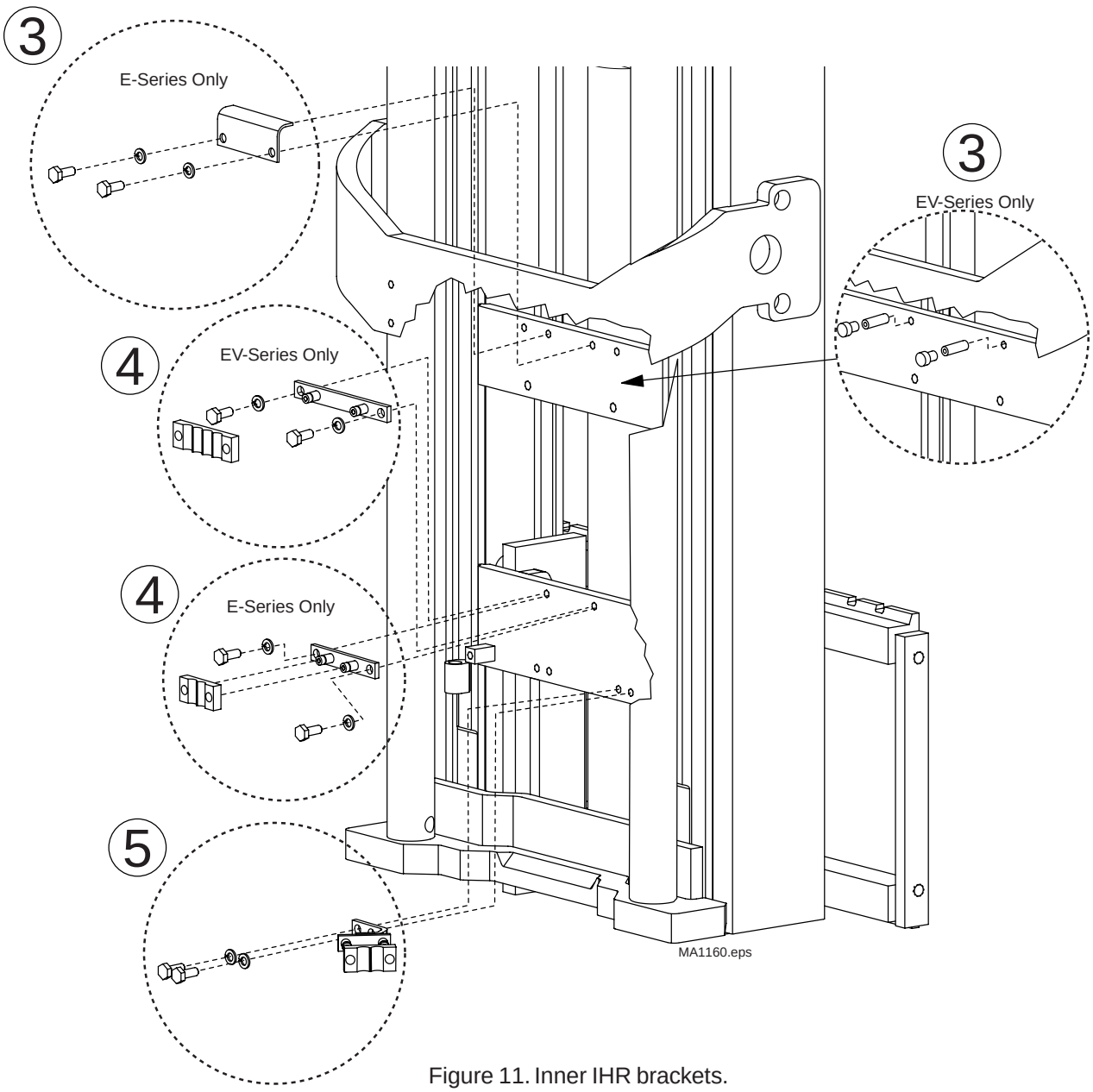


Figure 11. Inner IHR brackets.

2.5 Single Function Internal Reeving Installation (Continued)

6. Install guard and sheave onto upper intermediate stubshaft as shown.

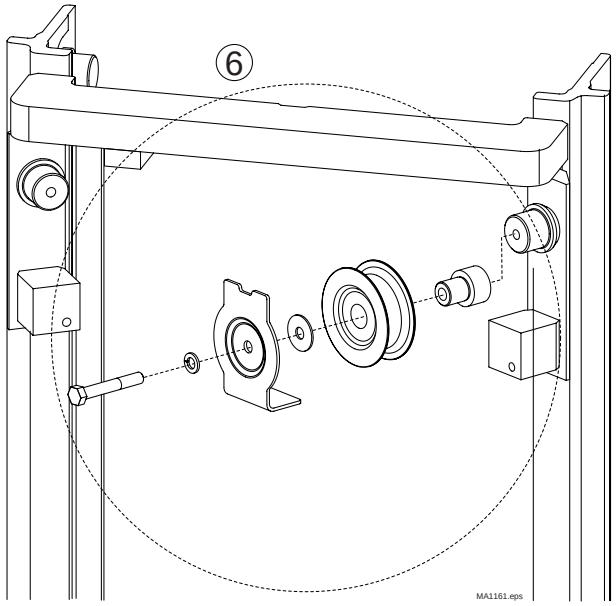


Figure 12. Upper intermediate sheave.

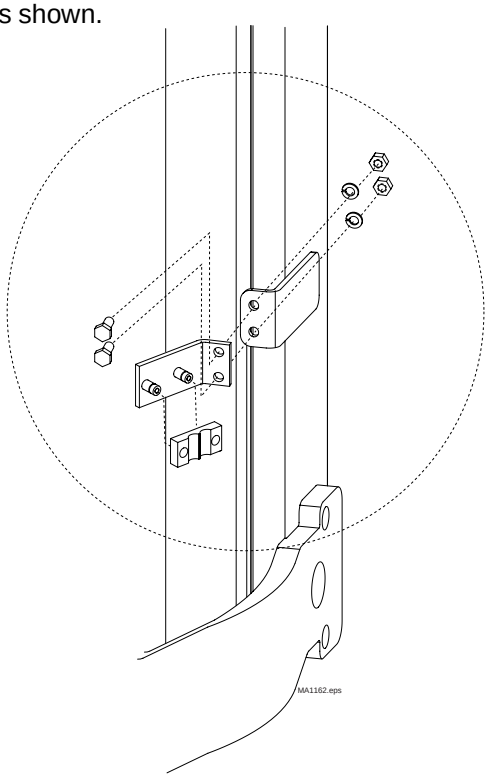


Figure 13. Outer tab.

7. Install bracket and one clamp piece on outer tab as shown.

8. Install guide bracket to middle crossmember as shown.

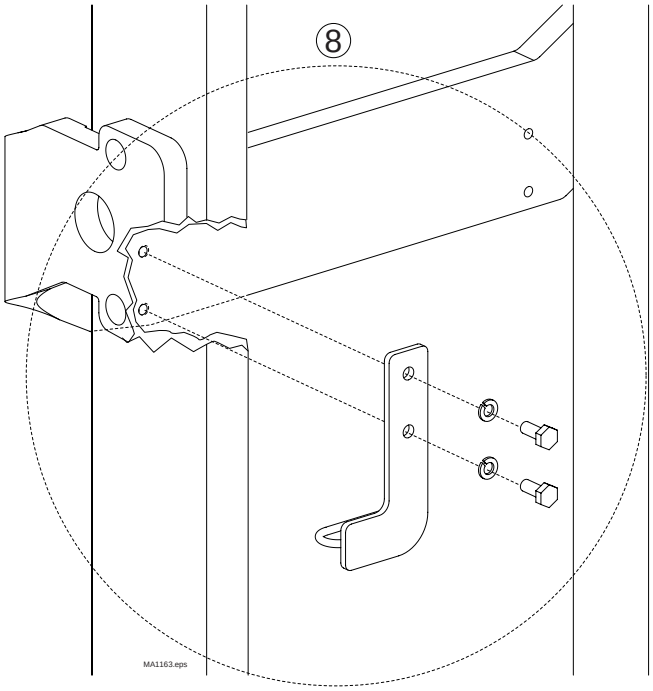


Figure 14. Outer guide bracket.

2.5 Single Function Internal Reeving Installation (Continued)

9. Attach hoses to fittings on carriage termination bracket.

10. Route hoses over crosshead and down over the middle crossmember guard.

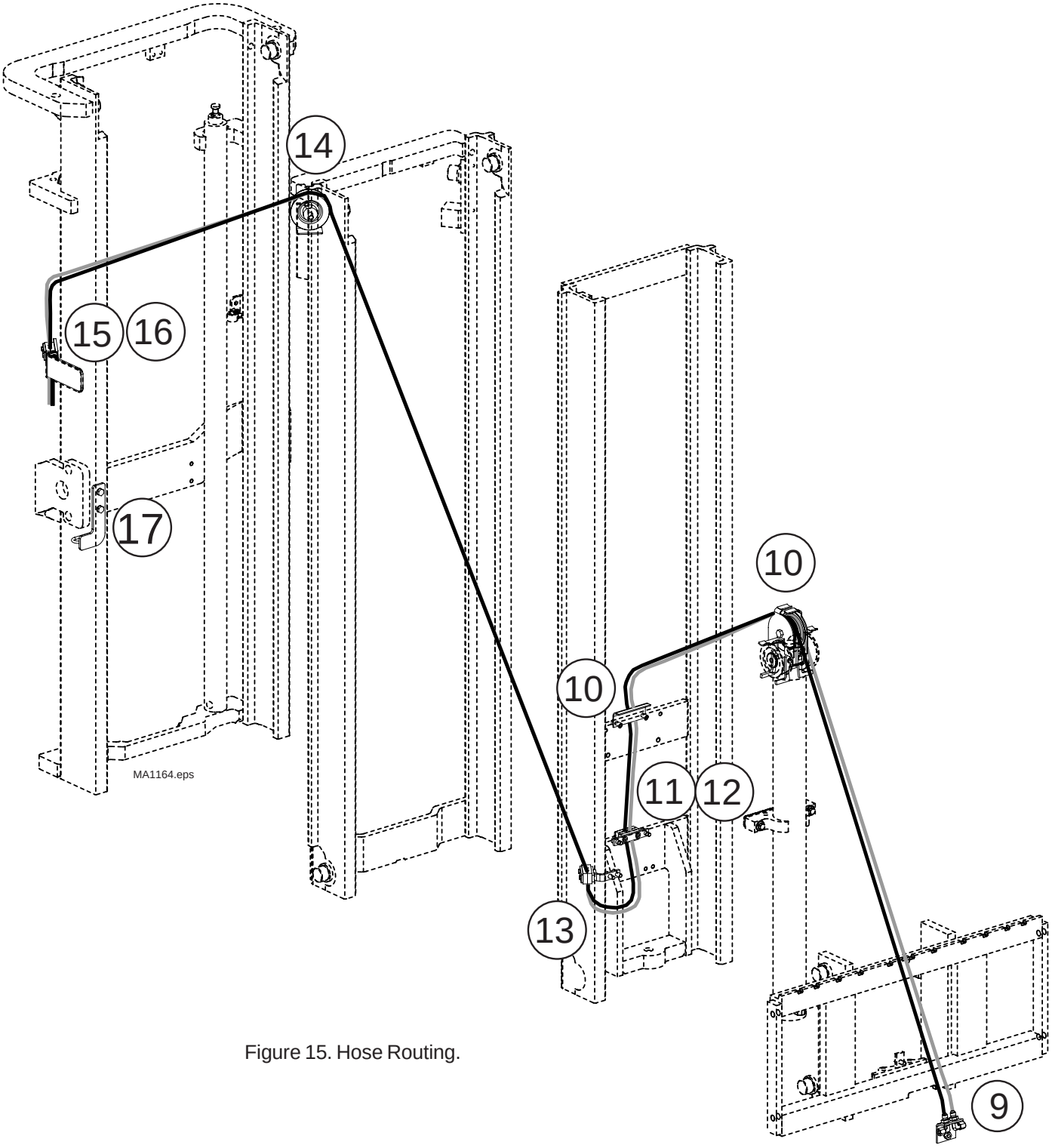


Figure 15. Hose Routing.

2.5 Single Function Internal Reeving Installation (Continued)

11. Route hoses through clamp piece on top lower inner bracket and install second clamp piece, coverplate and bolts loosely.

12. Pull hoses to proper tension and tighten clamp bolt.

13. Route hoses to second bracket on lower inner (right hose to outboard slot on clamp piece and left hose to inboard slot on clamp piece) with gentle loop and install second clamp piece, coverplate and bolt tightly.

14. Route hoses up through sheave on upper intermediate.

15. Route hoses through clamp piece on outer bracket and install second clamp piece.

16. Pull hoses to proper tension and tighten clamp bolts.

17. Route truck IHR supply hoses through lower outer bracket and attach to mast IHR hoses.