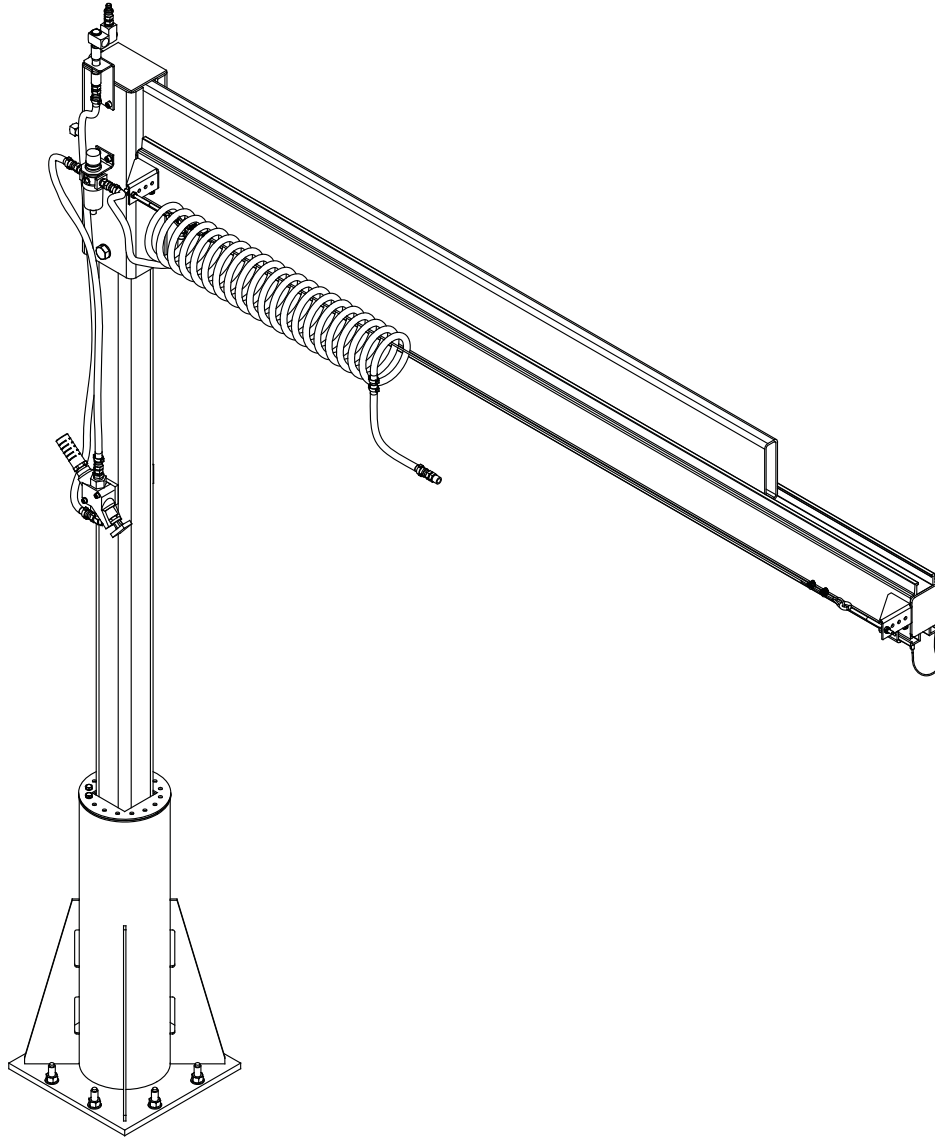




JIB CRANE SERIES



Operation, Installation and Maintenance Manual for:

**Jib Crane Models: MJBA2700, MJBA2600,
MJBA2300, MJBA2200, MJBA2100, AND MJBA2050**

THIS MANUAL CONTAINS IMPORTANT INFORMATION REGARDING INSTALLATION, SAFETY, MAINTENANCE, AND OPERATION OF KNIGHT GLOBAL JIB CRANES AND SHOULD BE AVAILABLE TO ALL PERSONNEL RESPONSIBLE FOR USING THE JIB CRANE.


KNIGHT JIB CRANE OPERATION, INSTALLATION, AND MAINTENANCE MANUAL


This manual provides important information for all personnel involved in the installation, operation and maintenance of the Knight Global Jib Crane. All personnel must read this document before operating the equipment.


Every effort has been made to provide complete and accurate product information in this manual. However, due to product improvements and changes, discrepancies and omissions may be present. Visit our website at www.knightglobal.com for updated information on all our products.

It is the responsibility of the end user to exercise common sense and judgment when performing the tasks described in this manual. If any procedure seems inaccurate, incomplete or unsafe please put the equipment in a safe condition and contact Knight Global service department for assistance.


Throughout this manual there are steps and procedures that if not performed correctly can result in personal injury or equipment damage. The following signal words are used to identify the level of potential hazard.

	WARNING
	Indicates a hazard which will cause severe injury, death or substantial equipment damage.

	CAUTION
	Indicates a hazard which can or will cause injury or equipment damage.

	NOTE
	Notifies personnel of installation, operation or maintenance information which is important but not hazard related.

Prior to installation, visually inspect the jib crane for signs of damage.

	CAUTION
	Prior to placing this unit into service the owners and users are advised to examine specific local and/or other regulations, including ANSI and OSHA regulations that may apply to the use of this product.

- Follow all procedures for installation and set-up of the jib crane.
- Retain all product information supplied with the jib crane for future reference.
- Foundation requirements are based on data such as soil pressure, surrounding footings/pilings, etc. and should be determined by a registered engineer in your state/country.

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1. SAFETY

Knight Global recognizes that most companies have a safety program in place at their facility. The Safety Section, Notes, Cautions and Warnings in this manual are intended to supplement and not supersede any existing plant, governmental or company safety guidelines or regulations.

Knight Global cannot be aware of or provide for all the procedures by which the jib crane operations or repairs may be conducted and the hazards which may result from each method. If operation or maintenance not specifically recommended by Knight Global is conducted, it must be ensured that product or personnel safety is not endangered by these actions. Personnel should place the jib crane in a safe condition and contact a supervisor and/or Knight Global's service department for technical support if they are not sure of an operation, maintenance procedure, or step.

ANY SAFETY FEATURES AND DEVICES BUILT-IN OR INCLUDED WITH THE JIB CRANE BY KNIGHT GLOBAL ARE REQUIRED FOR THE SAFE OPERATION OF THE JIB CRANE. DO NOT REMOVE, ALTER OR DISABLE SAFETY DEVICES OR FEATURES PROVIDED BY KNIGHT GLOBAL FOR SAFE OPERATION OF THE CRANE. ANY REMOVAL, IMPAIRMENT OR DISABLING OF ANY SUCH SAFETY DEVICES IMMEDIATELY VOIDS ANY AND ALL EXPRESS AND IMPLIED WARRANTIES OF ANY KIND OR NATURE.

General Safety Precautions

	<p style="text-align: center;">NOTE</p> <p>Do not operate jib crane before reading this technical manual.</p>
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- Only allow personnel trained in safety and operation of this jib crane to operate.
- If the jib crane is locked out or a "DO NOT OPERATE" sign is on the jib crane, do not operate the jib crane until the lock or sign is removed by designated personnel.
- Before each shift or prior to use, inspect the jib crane in accordance with the procedures defined in the maintenance section of this manual.
- Pay attention to the load at all times when operating the jib crane.
- Ensure no personnel are in the path of the load.
- Do not lift a load over personnel.
- Never use a jib crane for lifting, lowering or transporting people.
- Do not allow anyone to stand on a suspended load.
- Never leave a suspended load on the jib crane unattended.
- Never cut or weld a suspended load.
- Do not operate jib crane when damaged or malfunctioning.
- Ensure that the end stop is in place.
- Ensure that the festooning cannot be entangled or pinched during operation of the jib crane.
- Do not field modify jib crane in any way. Any modifications without the written consent of Knight Global will void all warranties.

2. INSTALLATION



NOTE

Ensure to paint mark all fasteners after tightening.

UNCRATING

The Knight Jib cranes are delivered as two separate assemblies: The mast and the boom. The optional Hose Management Kit and/or the 360° Rotate Attachment are pre-assembled prior to delivery if ordered with the Jib Crane.

- Step 1. Place Jib Crane in general area to be mounted via fork truck.
- Step 2. Cut shipping bands and remove bands and packaging material from Jib Crane.
- Step 3. Remove Jib Crane mast and boom from skid.

ANCHORING THE BASE

Foundation requirements for anchoring jib cranes are based on data such as soil pressure, surrounding footings/pilings, etc. and should be determined by a registered professional engineer. This is required to ensure local building codes and laws, possible seismic loading considerations and variance in concrete and soil conditions are addressed.



NOTE

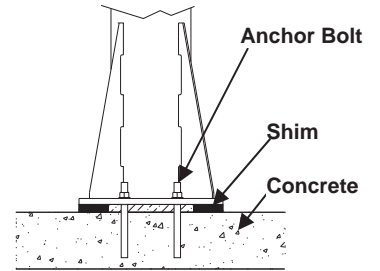
The following two methods for anchoring jib cranes are recommendations only. Jib crane foundation recommendations are based on soil pressure of 2500# per square foot. Concrete pressure recommended for jib crane foundation is 3000# per square inch of compressive force.

Model	Base Plate Table			
	X	Y	W	Z (dia)
MJBA2050	16 in. (40.64cm)	14 in. (35.56cm)	1 in. (2.54cm)	2 ¹ / ₃₂ in. (1.68cm)
MJBA2100	12 in. (30.48cm)	5 in. [x2] (12.7cm)	1 in. (2.54cm)	2 ¹ / ₃₂ in. (1.68cm)
MJBA2200 MJBA2300	18 in. (45.72cm)	6 ⁵ / ₈ in. (16.82cm)	5 ¹¹ / ₁₆ in. (14.45cm)	1 in. (2.54cm)
MJBA2600	24 in. (60.96cm)	9 ¹ / ₈ in. (23.18cm)	7 ⁷ / ₁₆ in. (18.89cm)	1 in. (2.54cm)
MJBA2700	30 in. (76.20cm)	14 in. (35.56cm)	8 in. (20.32cm)	1 in. (2.54cm)

Table 1

Threaded Retaining Rods


- Step 1. Dig a hole to size determined from using the Base Plate Table on page 2-1 and Table 2 below.
- Step 2. Prepare threaded retaining rods (by others). Rod length should be half the hole depth plus 3 in. (76.2mm) (for above floor protrusion).
- Step 3. Pour concrete to half of hole depth. Perform steps 4 and 5 BEFORE concrete sets.
- Step 4. Use pattern (see Base Plate Table on page 2-1) to determine location of threaded retaining rods.
- Step 5. Rods should be held in position while filling balance of hole with concrete. Make sure that the threaded ends of the retaining rods protrude above floor level.
- Step 6. After concrete has hardened, lower base and mast assembly over anchor bolts and thread nuts and washers down hand tight.
- Step 7. Place a level on the face of the mast and plumb vertical by loosening anchor bolt nuts as necessary and placing metal shims (supplied by others) under the base plate on the side of the mast as needed.
- Step 8. Repeat Step 7 on an adjacent side.
- Step 9. Recheck the side of the mast plumbed in Step 7 and repeat Steps 7 and 8 until both sides are plumb.
- Step 10. Tighten anchor bolts.



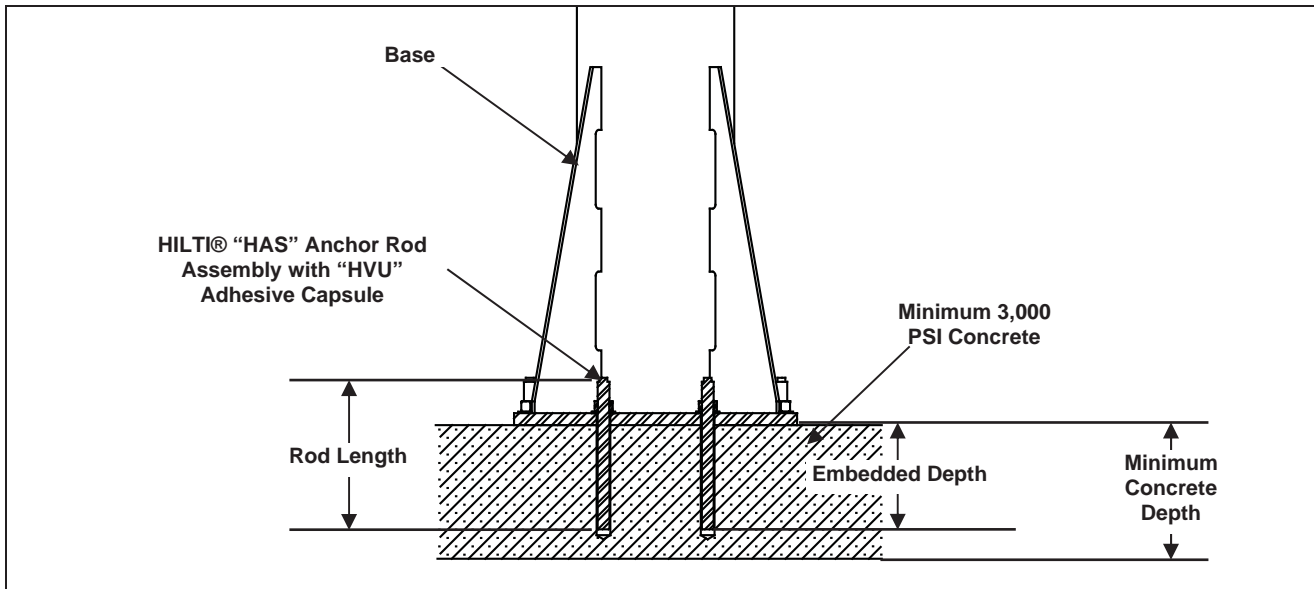
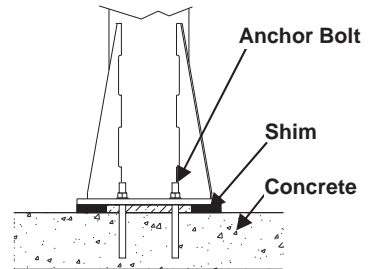
Hole Formula	Hole Diagram	(Structural Grade 8) Retaining Rod
Base Plate size = X Size of Hole A = X + 1/4 X Depth of Hole B = 2/3 A		

Table 2

Chemical Anchor Rods

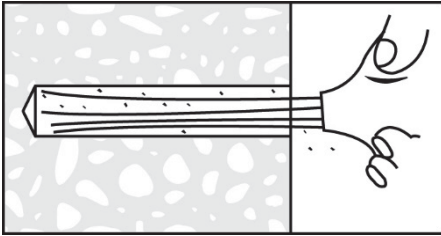
	<p>NOTE</p> <p>Knight Global recommends the use of Hilti® “HAS” Anchor Rod Assembly with Hilti® “HVU” Adhesive Capsule. Refer to pages 2-4 and 2-5 for HILTI® anchor installation instructions, recommended HAS Rods, HVU adhesive Capsules, and HVA Allowable and Ultimate Bond/Concrete Capacity for HAS Rods table. Visit (http://www.hilti.com) for a complete list of HILTI® anchors and up-to-date installation procedures.</p>
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- Step 1. Ensure concrete floor meets the minimum specifications according to Hilti® installation directions.
- Step 2. Drill holes in concrete using a drill bit size recommended by anchor bolt manufacturer. Use the pre-drilled holes in base plate as a guide or by the Base Plate Table on page 2-1.
- Step 3. Install anchor bolts and rod assemblies according to manufacturer’s installation instructions.
- Step 4. Lower base and mast assembly over anchor rods and thread nuts and washers down hand tight.
- Step 5. Place a level on the face of the mast and plumb vertical by loosening anchor bolt nuts as necessary and placing metal shims (supplied by others) under the base plate on the side of the mast as needed.
- Step 6. Repeat Step 5 on an adjacent side.
- Step 7. Recheck the side of the mast plumbed in Step 5 and repeat Steps 5 and 6 until both sides are plumb.
- Step 8. Tighten anchor bolts.



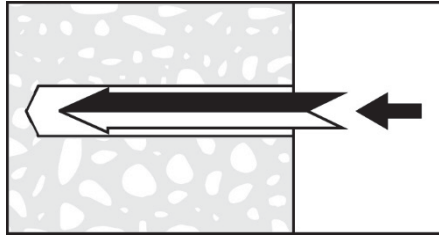
Excerpts from Hilti Product Technical Guide: HVA Capsule Adhesive Anchors

HAS Rods Installation Instructions



1. Set the drill depth gauge and drill a hole to the required hole depth.

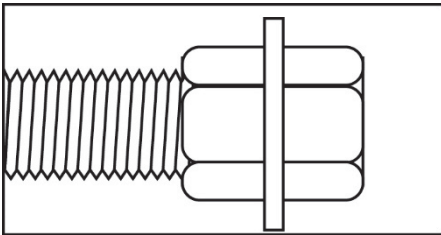
Important: Clean out dust and debris. Use compressed air or vacuum at bottom of the hole. When using a Hilti matched tolerance diamond core bit, immediately remove standing water.



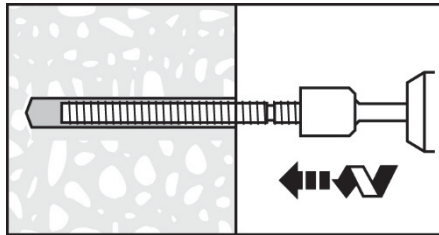
2. Insert appropriate diameter HVU adhesive capsule* into pre-drilled hole in base material.

* Capsule length is longer than standard embedded depth and will protrude from the hole.

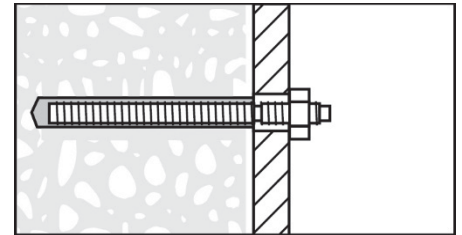
Note: The best method for setting multiple capsules is to crush the first capsule(s) into the hole and then insert the next capsule. DO NOT cut off capsules partially protruding from the hole.



3. Thread a HAS nut on the HAS rod. Place a washer on top of the first nut and then thread a black setting nut down on top of the washer. Tighten the two nuts together "locking" the washer between them. The top nut should be flush with the top of the rod.



4. Insert a square drive shaft into the hammer drill and attach the proper impact socket. At the rotary hammer drill setting, engage the top nut of the HAS rod assembly with the socket and drive the rod down through the capsule(s). **Stop drill rotation immediately upon reaching bottom of hole.**



5. Do not disturb or load the set anchor before the specified curing time elapses.

HVA Allowable and Ultimate Bond/Concrete Capacity for HAS Rods in Normal Weight Concrete ^{1,2}										
Rod Diameter In. (mm)	Embedment Depth ³ In. (mm)	Adhesive Capsule(s) Required	HVU Allowable Bond/Concrete Capacity				HVU Ultimate Bond/Concrete Capacity			
			Tensile		Shear		Tensile		Shear	
			F _c =2000psi (13.8 MPa) lb (kN)	F _c =4000psi (27.6 MPa) lb (kN)	F _c =2000psi (13.8 MPa) lb (kN)	F _c =4000psi (27.6 MPa) lb (kN)	F _c =2000psi (13.8 MPa) lb (kN)	F _c =4000psi (27.6 MPa) lb (kN)	F _c =2000psi (13.8 MPa) lb (kN)	F _c =4000psi (27.6 MPa) lb (kN)
5/8 (15.9)	5 (127)	(1) 5/8x5	3970 (17.7)	5245 (23.3)	7350 (32.7)	10390 (46.2)	15890 (70.7)	20970 (93.3)	22040 (98.0)	31160 (138.6)
	7-1/2 (184)	(1) 5/8x5 & (1) 1/2x4-1/4	5770 (25.7)	10465 (46.6)	13495 (60.0)	19080 (84.9)	23080 (102.7)	41865 (186.2)	44080 (195.2)	57240 (276.1)
	10 (254)	(2) 5/8x5	11700 (52.0)	12835 (57.1)	20775 (92.4)	29375 (130.7)	46795 (208.2)	51340 (228.4)	62320 (318.4)	88120 (450.3)
3/4 (19.1)	6-5/8 (168)	(1) 3/4x6-5/8	6080 (27.0)	8615 (38.3)	12270 (54.6)	17355 (77.2)	24330 (108.2)	34470 (153.3)	36800 (167.0)	52060 (236.2)
	10 (254)	(1) 3/4x6-5/8 & (1) 1/2x4-1/4	9110 (40.5)	14835 (66.0)	22755 (101.2)	32180 (143.1)	36445 (162.1)	59350 (264.0)	68260 (336.3)	96540 (475.6)
	13-1/4 (337)	(2) 3/4x6-5/8	15220 (67.7)	15310 (68.1)	34700 (154.4)	49080 (218.3)	60875 (270.8)	61230 (272.4)	104100 (542.6)	147240 (767.4)

¹ Influence factors for spacing and/or edge distance are applied to concrete/bond values above, and then compared to the steel value. The lesser of the values is to be used for the design.

² Average ultimate concrete shear capacity based on Concrete Capacity Design (CCD) method.

³ Hilti does not recommend the use of alternate embedment other than those tested and listed above.

Excerpts from Hilti Product Technical Guide: HVA Capsule Adhesive Anchors

Allowable Steel Strength for HAS Rods ¹						
Rod Diameter In. (mm)	HAS-E Standard ISO 898 Class 5.8		HAS Super ASTM A 193 B7		HAS SS AISI 304/316 SS	
	Tensile lb (kN)	Shear lb (kN)	Tensile lb (kN)	Shear lb (kN)	Tensile lb (kN)	Shear lb (kN)
5/8 (15.9)	7340 (32.7)	3780 (16.8)	12655 (56.3)	6520 (29.0)	10125 (45.0)	5215 (23.2)
3/4 (19.1)	10570 (47.0)	5445 (24.2)	18225 (81.1)	9390 (41.8)	12390 (55.1)	6385 (28.4)

¹ Steel Strength as defined in AISC Manual of Steel Construction (ASD):
 Tensile = 0.33 x F_u x Nominal Area
 Shear = 0.17 x F_u x Nominal Area


Ultimate Steel Strength for HAS Rods ¹									
Rod Diameter In. (mm)	HAS-E Standard ISO 898 Class 5.8			HAS Super ASTM A 193 B7			HAS SS AISI 304/316 SS		
	Yield lb (kN)	Tensile lb (kN)	Shear lb (kN)	Yield lb (kN)	Tensile lb (kN)	Shear lb (kN)	Yield lb (kN)	Tensile lb (kN)	Shear lb (kN)
5/8 (15.9)	13110 (58.3)	16680 (74.2)	10010 (44.5)	23730 (105.6)	28760 (125.7)	17260 (76.8)	14690 (65.3)	23010 (102.4)	13805 (61.4)
3/4 (19.1)	19400 (86.3)	24020 (106.9)	14415 (64.1)	35120 (156.2)	41420 (185.7)	24850 (110.5)	15050 (66.9)	28165 (125.3)	16800 (75.2)

¹ Steel Strength as defined in AISC Manual of Steel Construction 2nd Ed. (LRFD):
 Yield = F_y x Tensile Stress Area
 Tensile = 0.75 x F_u x Nominal Area
 Shear = 0.45 x F_u x Nominal Area

HVU Adhesive Capsules, Carbon Steel HAS Rods/Stainless HAS Rods									
HVU Adhesive Capsules		HAS-E Rods 5.8		HAS-Super A193 B7 ¹		HAS-Rods 304 SS		HAS-Rods 316 SS	
Description	Hilti Item#	Description	Hilti Item#	Description	Hilti Item#	Description	Hilti Item#	Description	Hilti Item#
1/2"x4/1/4" (M12)	256693	1/2"x6-1/2"	333190	1/2"x6-1/2"	68658	3/8"x8"	333170	1/2"x6-1/2"	3024336
1/2"x4/1/4" (M12)		1/2"x8"	333191			1/2"x6-1/2"	333171		
1/2"x4/1/4" (M12)		1/2"x10"	333192			1/2"x8"	333172		
5/8"x5" (M16)	256694	5/8"x8"	333194	5/8"x7-5/8"	333783	1/2" x 10"	333173	5/8"x7-5/8"	333781
5/8"x5" (M16)		5/8"x9"	333197			5/8"x7-5/8"	333175	5/8"x9"	3024338
5/8"x5" (M16)		5/8"x12"	333195			5/8"x10"	333174	5/8"x12"	3024339
3/4"x6-5/8"	256702	3/4"x10"	333201	3/4"x 9-5/8"	68660	3/4" x 9-5/8"	333177	3/4" x 9-5/8"	3024340
3/4"x6-5/8"		3/4"x11"	333198			3/4" x 12"	333178		
3/4"x6-5/8"		3/4"x12"	333202						
3/4"x6-5/8"		3/4"x14"	333203			3/4" x 14"	3006083		

MJBA2300, MJBA2600, and MJBA2700 Installation Instructions

Prior to installation, visually inspect the jib crane for signs of damage.

	⚠ WARNING
	Base and Mast are pre-assembled prior to delivery. DO NOT SEPARATE BASE FROM MAST.

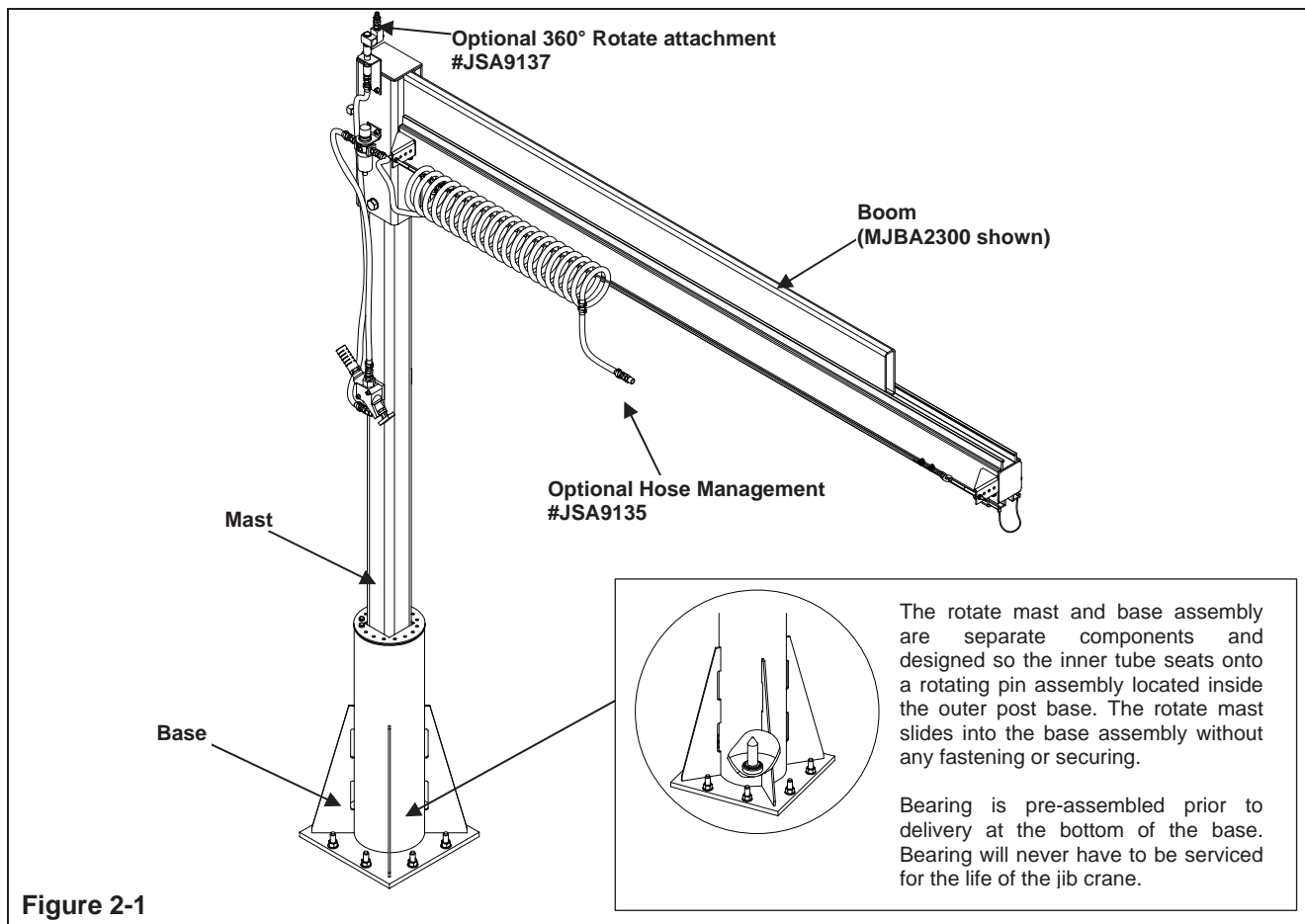


Figure 2-1

Step 1. Boom Installation



CAUTION

Ensure that the Base is anchored securely to the floor before continuing. Refer to page 2-1, Anchoring the Base, for recommended anchoring methods.

- Step 1. Remove M24x200mm HHCS bolt, washers and nut from boom. See Figure 2-2
- Step 2. Remove M24x100mm Square Head Bolt (SHB) and jam nut from boom. See Figure 2-2
- Step 3. Lower boom carefully onto mast and align holes. See Figure 2-2
- Step 4. Secure boom to mast with M24x200mm HHCS bolt, washers and nut. **Tighten until bolt(s) are snug + ¼ turn.** Do not over tighten. See Figure 2-2.

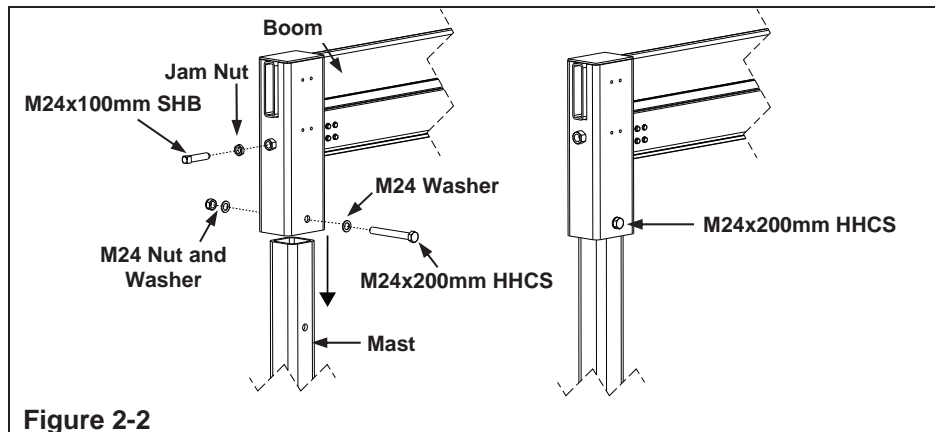


Figure 2-2

- Step 5. Install M24x100mm Square Head Bolt and jam nut. See Figure 2-3.
- Step 6. Level boom by turning the M24x100mm Square Head bolt either clockwise or counter clockwise until level. Once level, tighten M24 jam nut. See Figure 2-3.

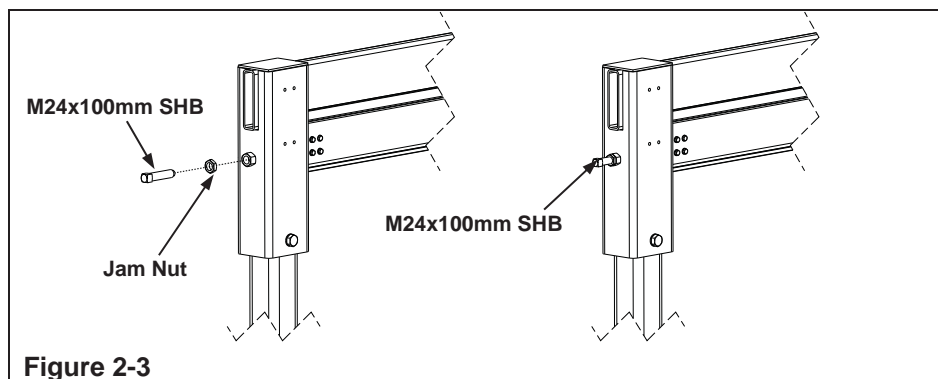


Figure 2-3

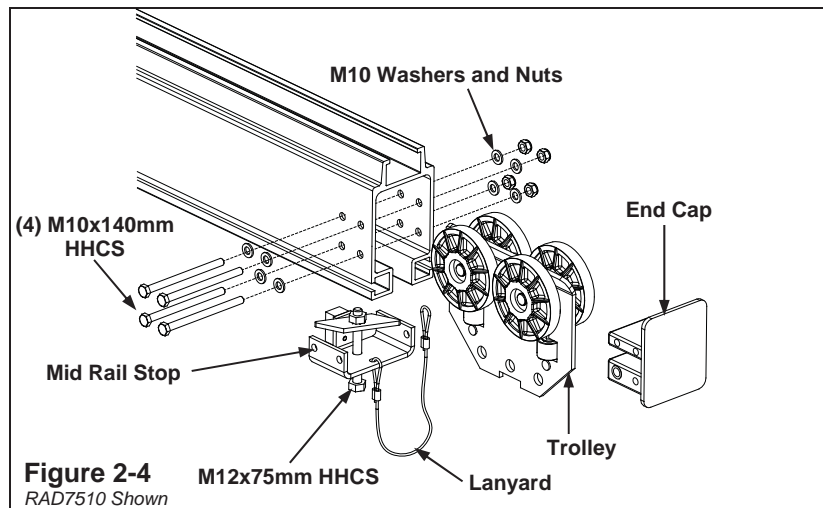


NOTE

After applying load, repeating Step 6 may be needed for desired movements.

Step 3. Trolley Installation

- Step 1. Remove (4) M10x140mm HHCS bolts, washers, nuts and lanyard from end cap. Remove end cap. See Figure 2-4.
- Step 2. Loosen M12x75mm HHCS bolt and lock washer on the bottom of mid rail stop and slide stop from bottom of the rail. See Figure 2-4.
- Step 3. Install load trolley into rail. If you have festoon trolleys, they must be installed before load trolleys. Ensure that trolley(s) rolls freely in rail. See Figure 2-4.
- Step 4. Install end cap and tighten (4) M10x140mm HHCS bolts, washers, and nuts. Attach mid rail stop lanyard to one of the M10 bolts. See Figure 2-4.
- Step 5. Install mid rail stop and tighten M12x75mm HHCS bolt and lock washer. **Tighten until bolt(s) are snug + ¼ turn.** Do not over tighten. See Figure 2-4.



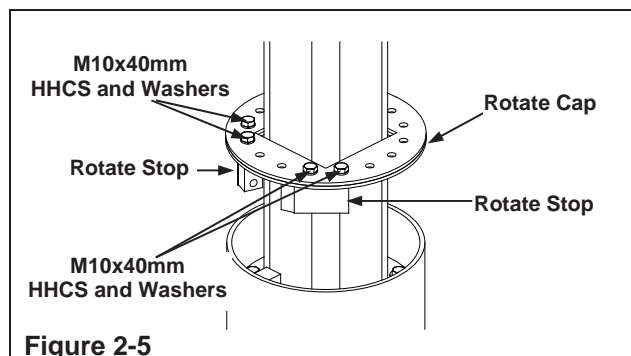
Step 4. Rotate Adjustments



NOTE

Jib Crane is shipped in the locked position.

- Step 1. Lift rotate cap located on base. See Figure 2-5.
- Step 2. Remove the (4) M10x40mm HHCS and lock washers. Adjust stops on the rotate cap until desired rotation is achieved. If 360° rotation is needed, remove both stops. See Figure 2-5.
- Step 3. Replace the (4) M10x40mm HHCS bolts and lock washers and tighten. **Tighten until bolt(s) are snug + ¼ turn.** Do not over tighten.



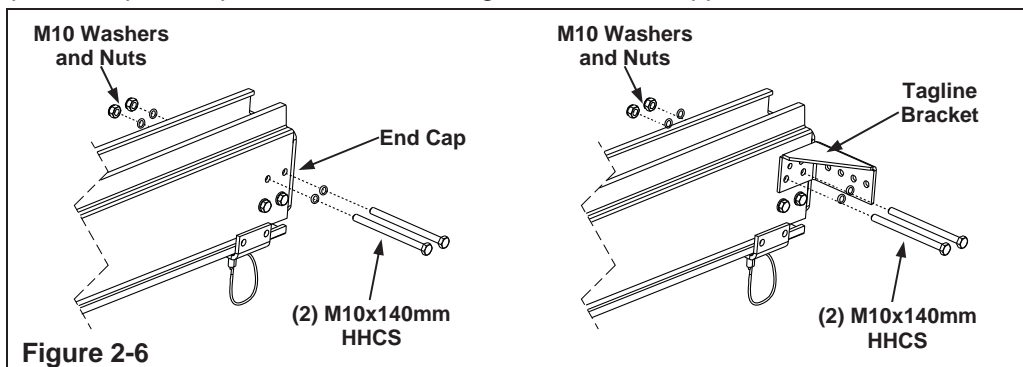
JSA9135 Hose Management Kit (Optional)



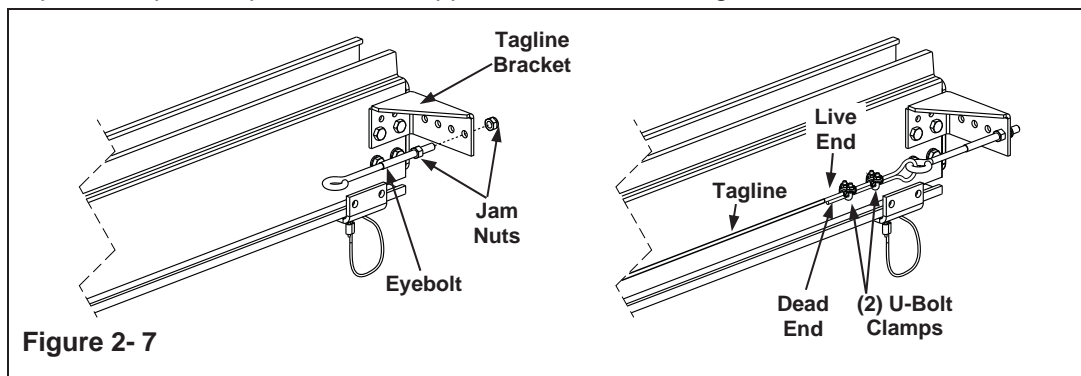
NOTE

JSA9135 Hose Management Kit is preassembled when ordered with the Jib Crane.

- Step 1. Remove top (2) M10x140mm HHCS bolts, washers, and nuts on each end cap of the rail. See Figure 2-6.
- Step 2. Place tagline bracket on one end of the rail, aligning the (2) bottom holes on the bracket with the (2) top holes of the end cap. See Figure 2-6.
- Step 3. Install the (2) M10x140mm HHCS bolts through the bracket and rail. Tighten the M10x140mm bolts, washers, and nuts. **Tighten until bolt(s) are snug + ¼ turn.** Do not over tighten. See Figure 2-6.
- Step 4. Repeat steps 2 and 3 for other tagline bracket on opposite side of rail.




- Step 5. Insert an eyebolt through the tagline bracket and tighten jam nuts. See Figure 2-7.
- Step 6. Strip approximately 12 in. (304.8mm) of plastic off the end of the tagline.
- Step 7. Loop one end of the cable through an eyebolt and overlap “dead end” a minimum of 6 in. (152.4mm)
- Step 8. Use (2) cable U-bolt clamps to secure cable. Apply U-bolts over dead end of tagline and have the live end of tagline rest in the saddles. Use torque wrench to tighten evenly, alternating from one nut to the other until reaching the recommended torque of 4.5 ft-lbf (6.1Nm). See Figure 2-7.
- Step 9. If using coiled hose, slide tagline through coiled hose before assembling opposite end of tagline.
- Step 10. Repeat steps 5 thru 8 for opposite end of rail for tagline.

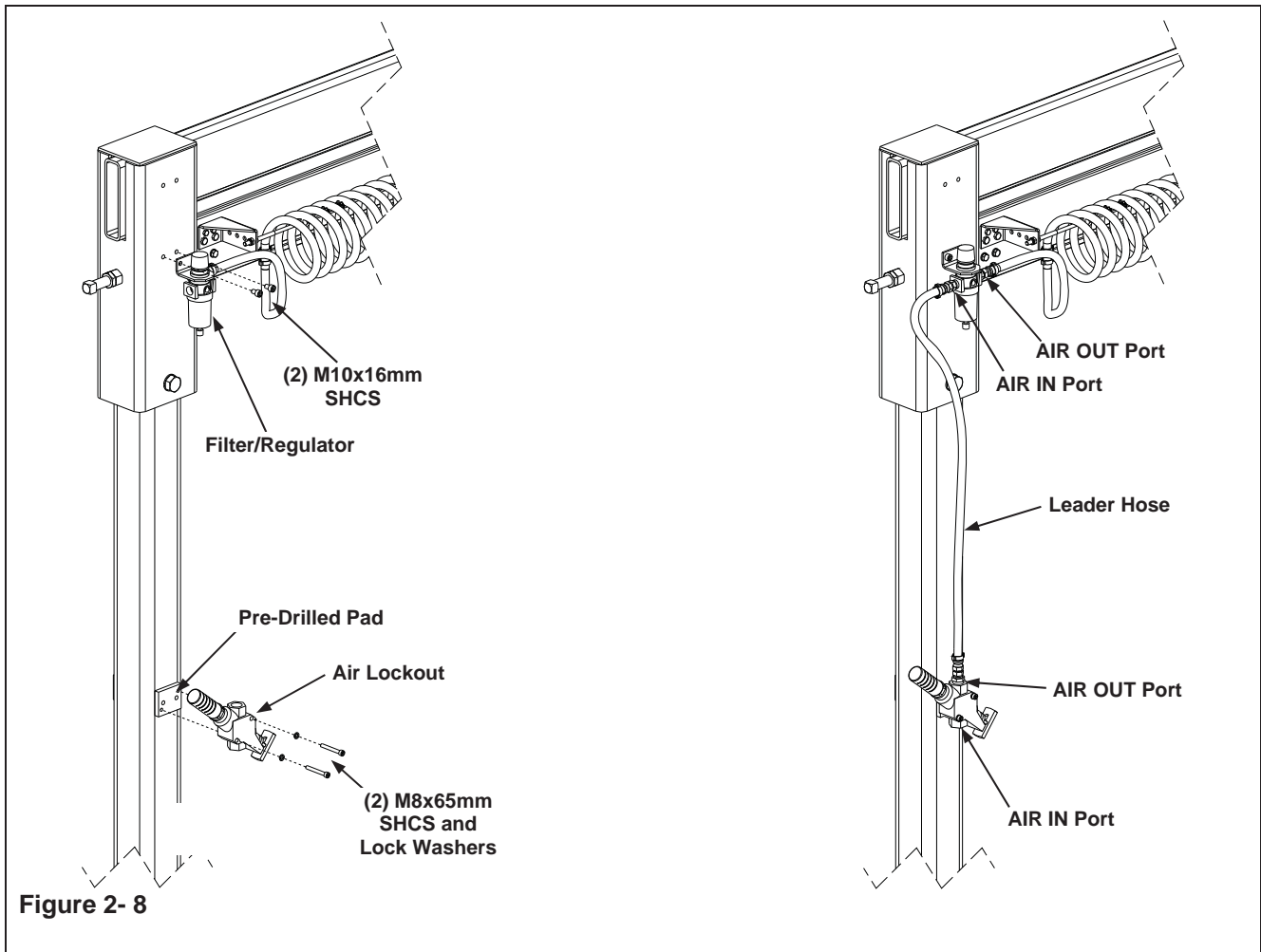


Continued on next page

- Step 11. Position lockout valve onto one of the two pre-drilled pads located on the mast and install the (2) M8x65mm SHCS bolts and lock washers. **Tighten until bolt(s) are snug + ¼ turn.** Do not over tighten. See Figure 2-8
- Step 12. Install the regulator onto the lower pre-drilled holes located on the boom head using the (2) M10x16mm SHCS bolts and lock washers. **Tighten until bolt(s) are snug + ¼ turn.** Do not over tighten. See Figure 2-8


	CAUTION
	Ensure Air Lockout is closed prior to energizing system.

- Step 13. Install air hose from lockout AIR OUT port to the IN port on the regulator. See Figure 2-8
- Step 14. Install plant supplied air into the AIR IN port on the lockout. See Figure 2-8

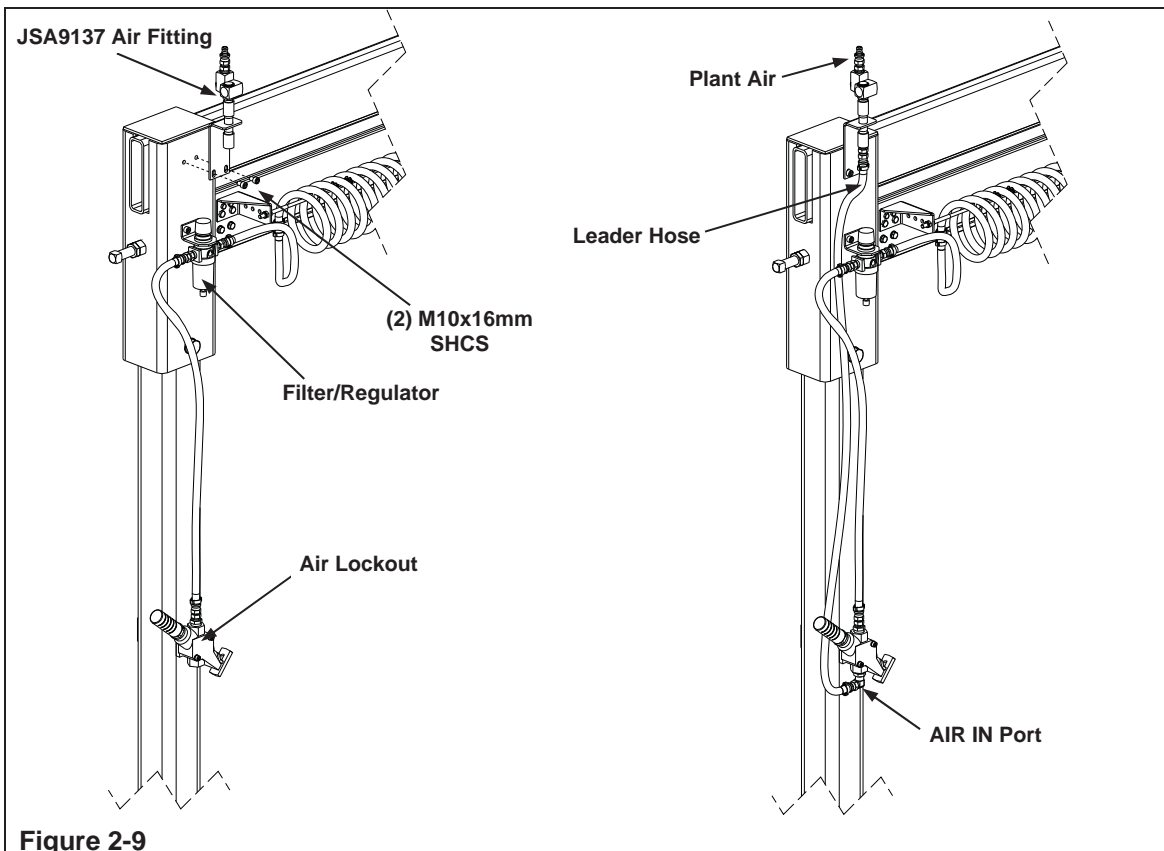


JSA9137 360° Rotate Air Fitting Kit (Optional)

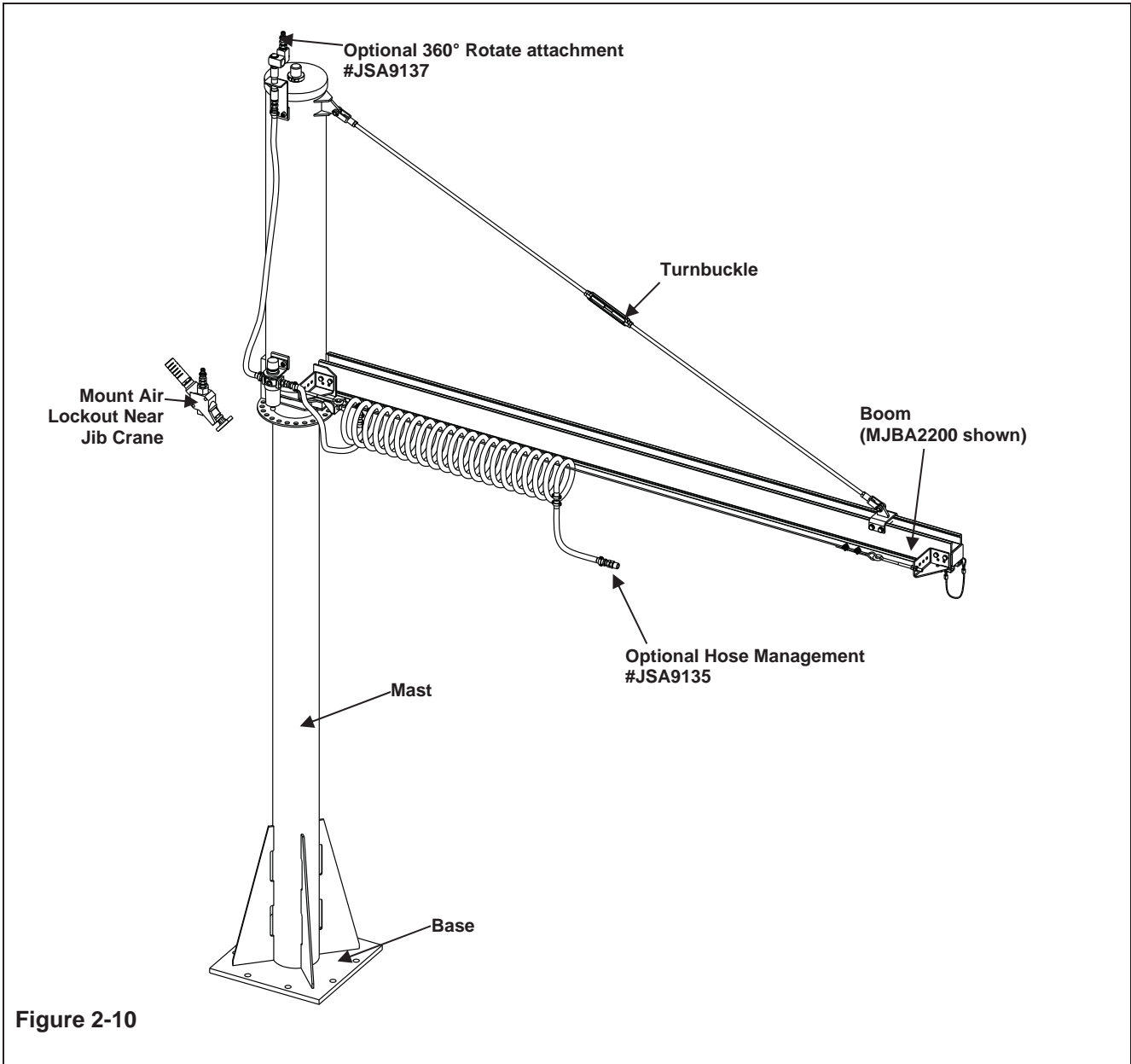
	NOTE
<p>JSA9137 360° Rotate Air Fitting Kit is preassembled when ordered with the Jib Crane.</p>	

	CAUTION
<p>Ensure Air Lockout is closed prior to energizing system.</p>	

- Step 1. Install the (2) M10x16mm SHCS bolts through the bracket for the air fitting on the same side that the lockout and regulator are located. **Tighten until bolt(s) are snug + ¼ turn.** Do not over tighten. See Figure 2-9
- Step 2. Install leader hose from the bottom of the JSA9137 fitting to the AIR IN port on the air lockout. See Figure 2-9
- Step 3. Install plant supplied air into the top of the JSA9137 fitting. See Figure 2-9



MJBA2100 and MJBA2200 Installation Instructions



Step 1. Boom Installation



CAUTION

Ensure that the Base is anchored securely to the floor before continuing. Refer to page 2-1, Anchoring the Base, for recommended anchoring methods.

- Step 1. Remove the (2) M10x120mm HHCS bolts, washers, and nuts from boom bracket. See Figure 2-11.
- Step 2. Lift boom and align boom into boom bracket and secure the (2) M10x120mm HHCS bolts and nuts. **Tighten until bolt(s) are snug + ¼ turn.** Do not over tighten. See Figure 2-11.

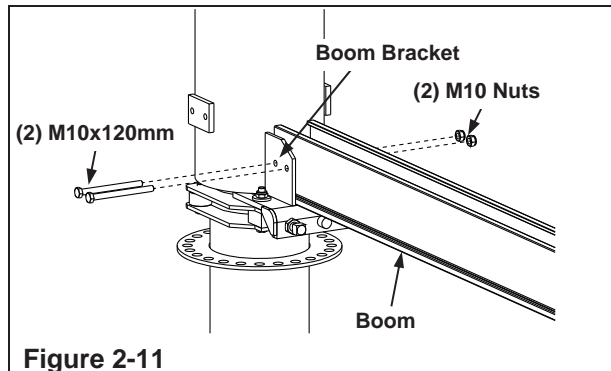


Figure 2-11

- Step 3. Remove the ½"x1 ¼" shoulder bolt from the clevis of the threaded rod that is not attached to the rail. See Figure 2-12
- Step 4. Align clevis with Tie Bar bracket at the top of the mast. See Figure 2-12
- Step 5. Install the ½"x1 ¼" shoulder bolt through the clevis and bracket. See Figure 2-12.
- Step 6. Tighten jam nuts on threaded rods until Tie Bar is taut. See Figure 2-12
- Step 7. The (2) M16x70mm square head bolts are used to adjust the position of the roller assembly to the mast and level the boom. These bolts are factory set and should not need adjustment. See Figure 2-12.
- Step 8. Level the rail by loosening the jam nuts and adjusting the turnbuckle. Once level, tighten jam nuts. See Figure 2-12.

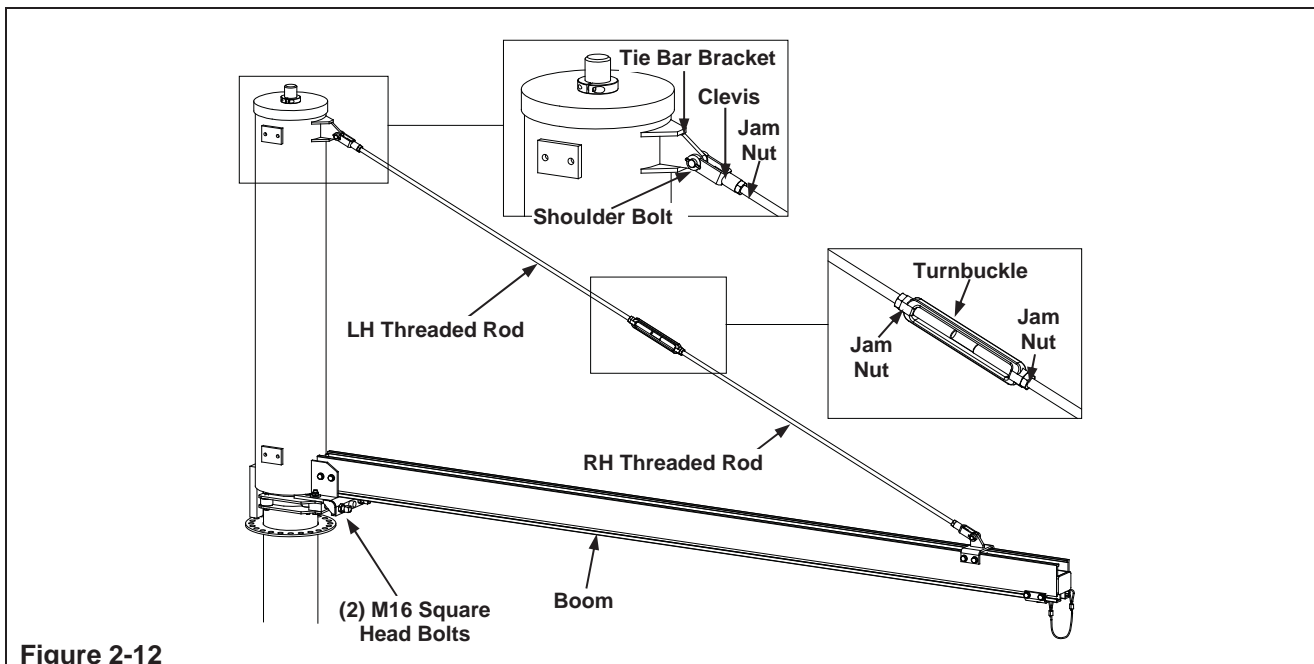
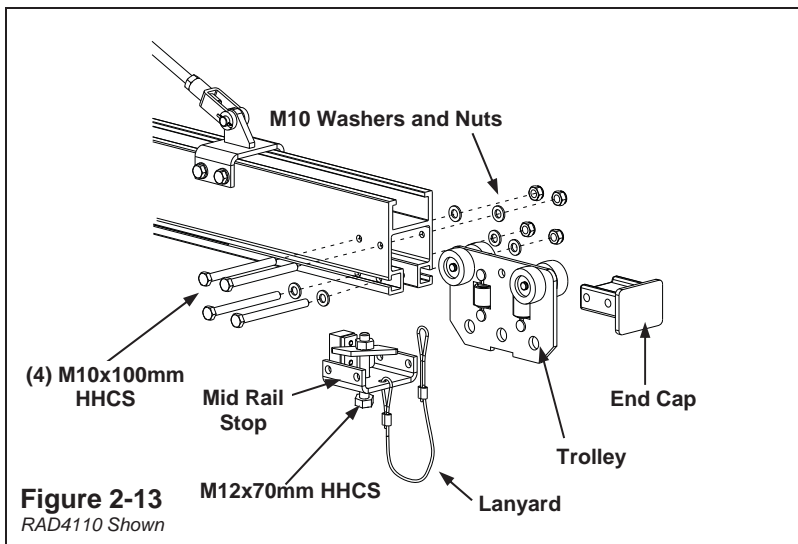


Figure 2-12

Step 2. Trolley Installation

- Step 1. Remove (4) M10x100mm HHCS bolts, washers, nuts and lanyard from end cap. Remove end cap. See Figure 2-13.
- Step 2. Loosen M12x70mm HHCS bolt and lock washer on the bottom of mid rail stop and slide stop from bottom of the rail. See Figure 2-13.
- Step 3. Install load trolley into rail. If you have festoon trolleys, they must be installed before load trolleys. Ensure that trolley(s) rolls freely in rail. See Figure 2-13.
- Step 4. Install end cap and tighten (4) M10x100mm HHCS bolts, washers, and nuts. Attach mid rail stop lanyard to one of the M10x100mm HHCS bolts on the end cap. Tighten until bolt(s) are snug + ¼ turn. Do not over tighten.
- Step 5. Install mid rail stop and tighten M12x70mm HHCS bolt and lock washer. **Tighten until bolt(s) are snug + ¼ turn.** Do not over tighten.



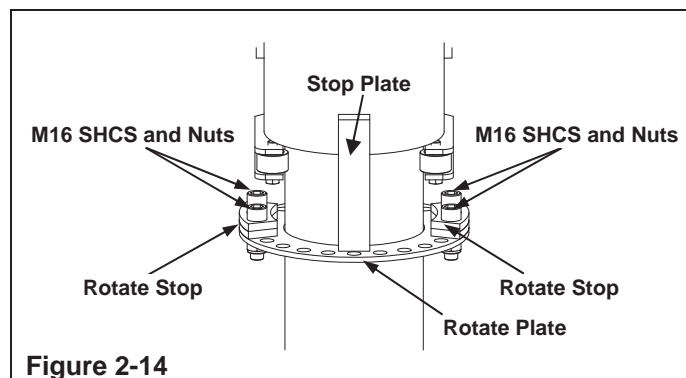
Step 3. Rotate Adjustments



NOTE

Jib Crane is shipped in the locked position.

- Step 1. Remove the (4) M16x50mm SHCS and nuts. See Figure 2-14.
- Step 2. Adjust stops on the rotate plate until desired rotation is achieved. If 360° rotation is needed, remove both stops. See Figure 2-14.
- Step 3. Replace the M16x50mm SHCS bolts and nuts and tighten. **Tighten until bolt(s) are snug + ¼ turn.** Do not over tighten. See Figure 2-14.



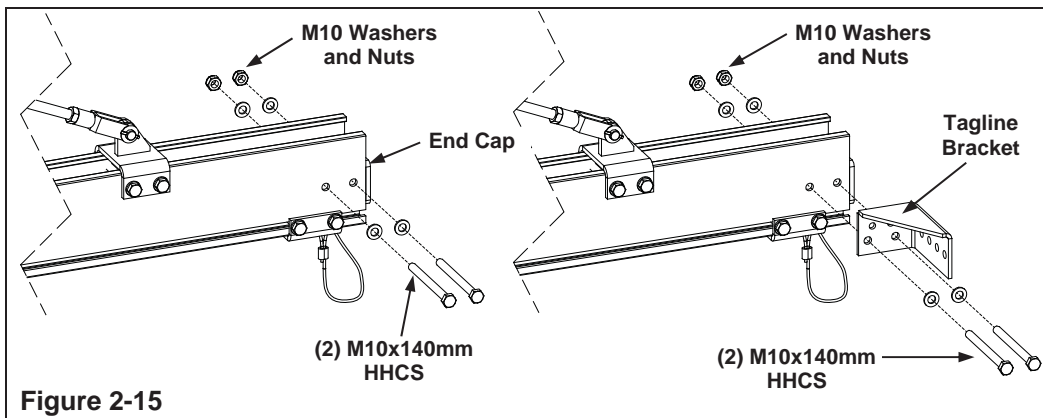
JSA9135 Hose Management Kit (Optional)



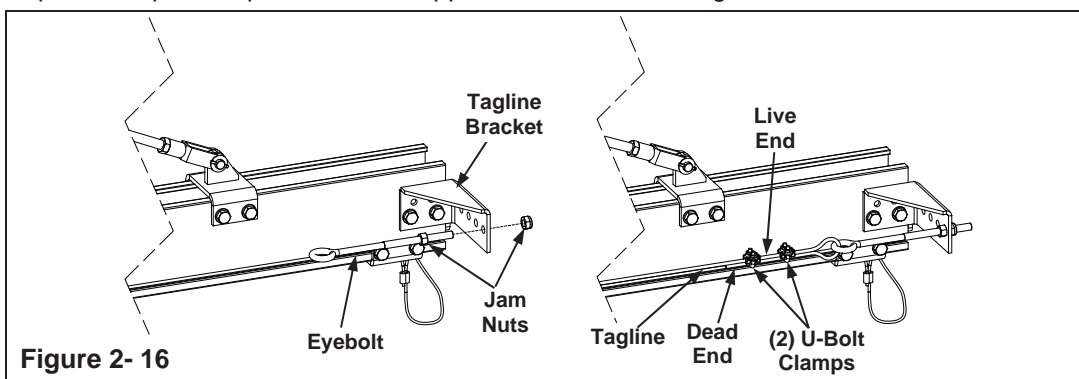
NOTE

JSA9137 360° Rotate Air Fitting Kit is preassembled when ordered with the Jib Crane.

- Step 1. Remove (2) M10x140mm HHCS bolts, washers, and nuts on each end cap of the rail. See Figure 2-15.
- Step 2. Place tagline bracket on one end of the rail, aligning the (2) holes on the bracket with the (2) holes of the end cap. See Figure 2-15.
- Step 3. Install the (2) M10x140mm HHCS bolts through the bracket and rail. Tighten the M10 bolts, washers, and nuts. **Tighten until bolt(s) are snug + ¼ turn.** Do not over tighten.
- Step 4. Repeat steps 2 and 3 for other tagline bracket.




- Step 5. Insert an eyebolt through the tagline bracket and tighten nut. See Figure 2-16
- Step 6. Strip approximately 12 in. (304.8mm) of plastic off the end of the tagline.
- Step 7. Loop one end of the cable through an eyebolt and overlap a minimum of 6 in. (152.4mm). See Figure 2-16.
- Step 8. Use (2) two cable U-bolt clamps to secure cable. Apply U-bolts over dead end of tagline and have the live end of tagline rest in the saddles. Use torque wrench to tighten evenly, alternating from one nut to the other until reaching the recommended torque of 4.5 ft-lbf (6.1Nm). See Figure 2-16.
- Step 9. If using coiled hose, slide tagline through coiled hose before assembling opposite end of tagline.
- Step 10. Repeat steps 5 thru 8 for opposite end of rail for tagline.



Continued on next page

Step 11. Using the (2) M10x16mm SHCS and lock washers, install the regulator on the lower pad using the pre-drilled holes located on the mast. **Tighten until bolt(s) are snug + ¼ turn.** Do not over tighten. See Figure 2-17.

Step 12. Mount Air Lockout Assembly according to layout (if provided) or near jib crane.

	<p style="text-align: center;">CAUTION</p> <p style="text-align: center;">Ensure Air Lockout is closed prior to energizing system.</p>
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Step 13. Install air hose from lockout AIR OUT port to the IN port on the regulator. See Figure 2-17.

Step 14. Install plant supplied air into the AIR IN port on the lockout. See Figure 2-17.

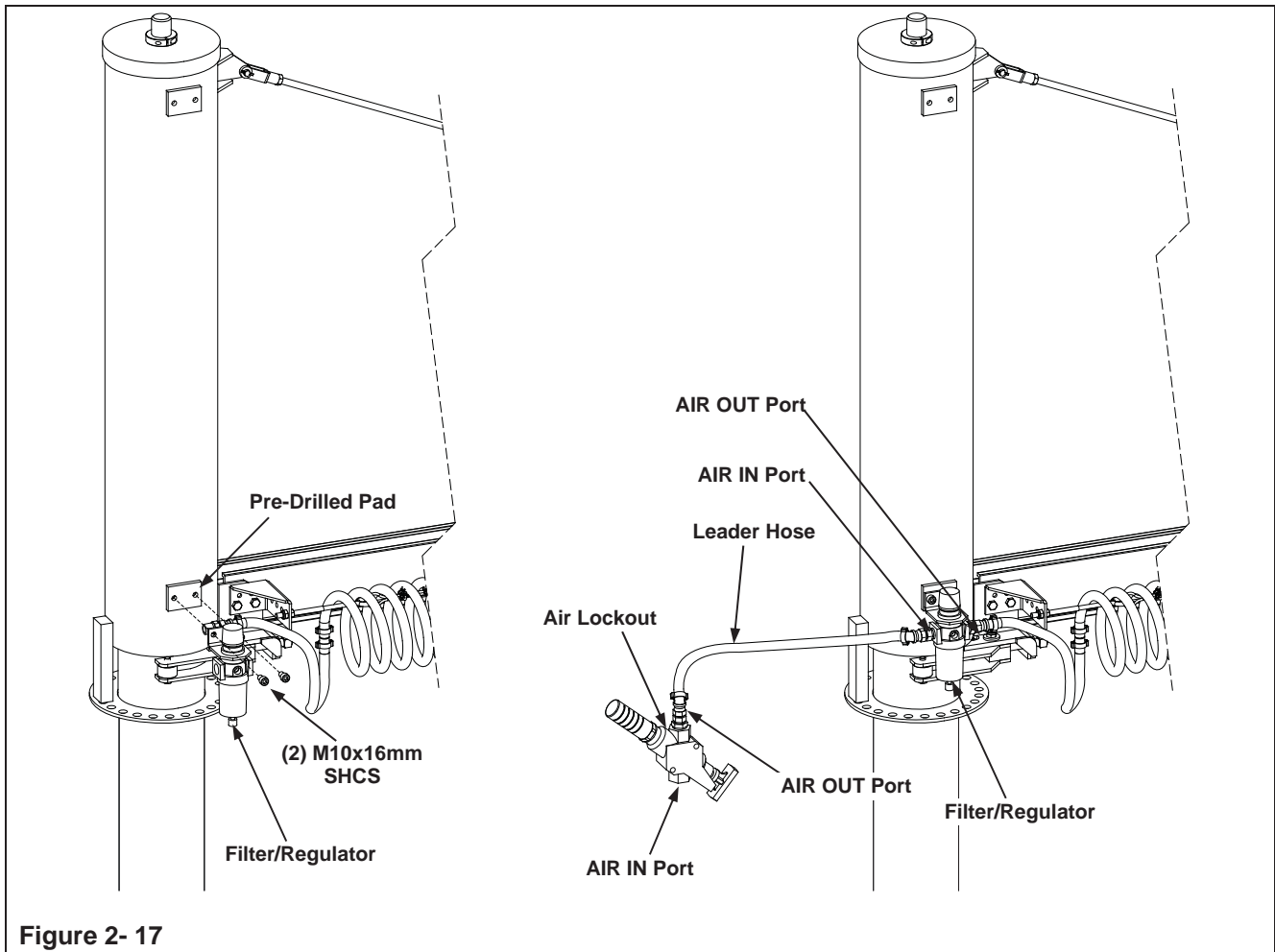


Figure 2- 17

JSA9137 360° Rotate Air Fitting Kit (Optional)



NOTE

JSA9137 360° Rotate Air Fitting Kit is preassembled when ordered with the Jib Crane.



CAUTION

Ensure Air Lockout is closed prior to energizing system.

- Step 1. Install the (2) M10x16mm SHCS through the mounting bracket for the air fitting on the same side that the regulator is located. **Tighten until bolt(s) are snug + ¼ turn.** Do not over tighten. See Figure 2-18
- Step 2. Install air hose from the bottom of the JSA9137 fitting to the AIR IN port on the regulator. See Figure 2-18
- Step 3. Install air hose from the top of the JSA9137 fitting to the AIR OUT port on the air lockout assembly. See Figure 2-18
- Step 4. Install plant supplied air into the AIR IN port on the air lockout valve. See Figure 2-18.

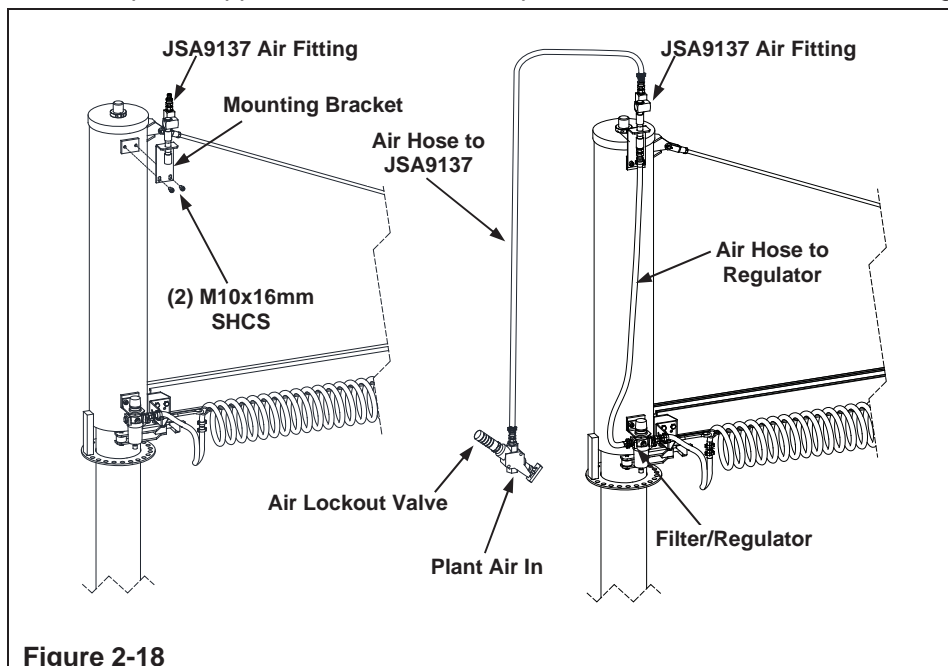
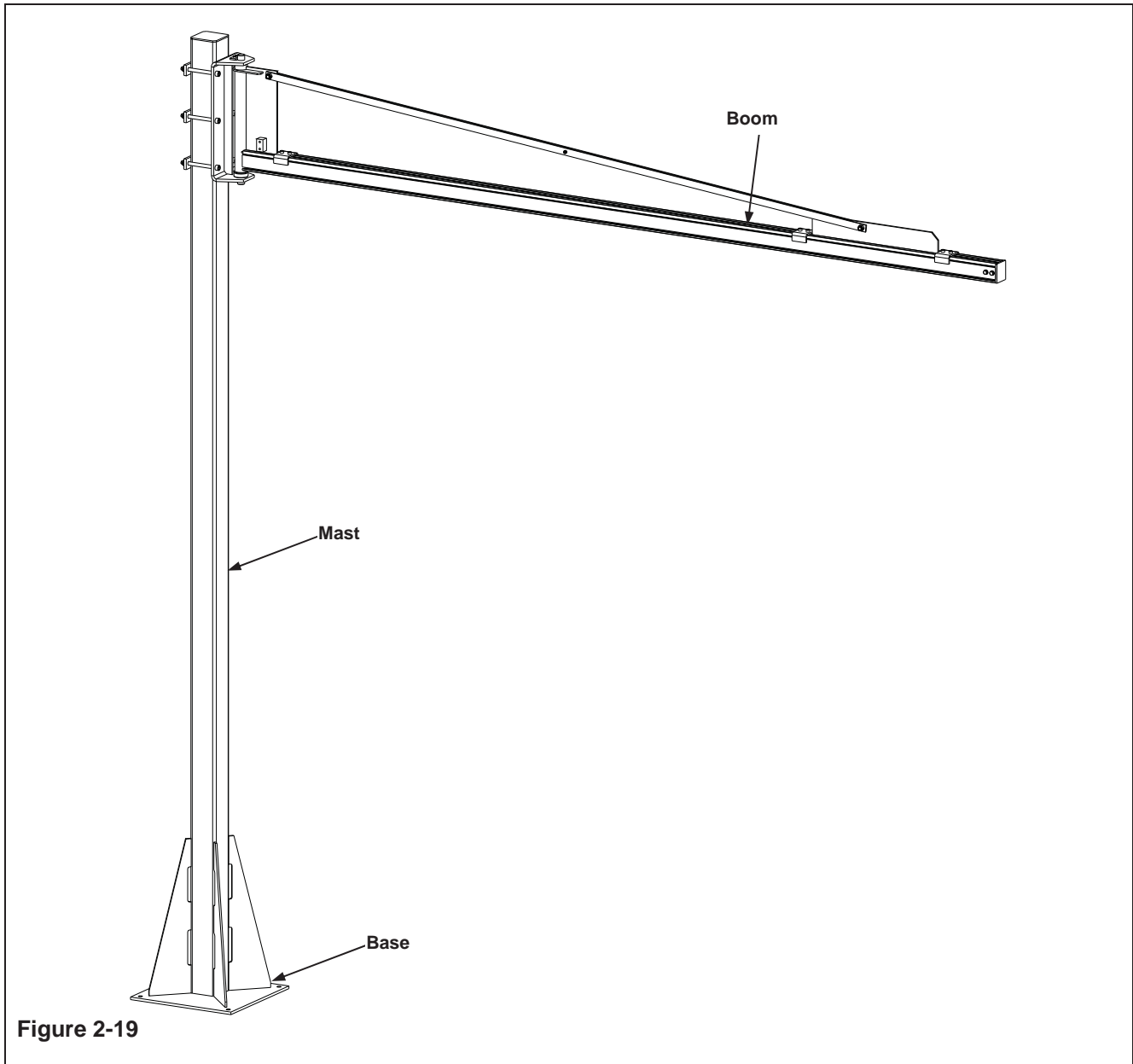


Figure 2-18

MJBA2050 Installation Instructions



Step 1. Boom Installation



CAUTION

Ensure that the Base is anchored securely to the floor before continuing. Refer to page 2-1, Anchoring the Base, for recommended anchoring methods.

- Step 1. Remove the (6) M12x140mm SHCS bolts, nuts, and (3) back plates from the boom bracket. See Figure 2-20.
- Step 2. Lift boom to specified height according to layout.
- Step 3. Align top back plate with the top mounting holes on the boom bracket and tighten the (2) M12x140mm HHCS bolts and nuts. **Tighten until bolt(s) are snug + ¼ turn.** Do not over tighten. See Figure 2-20.
- Step 4. Repeat Step 3 for the middle and lower back plates. See Figure 2-20.

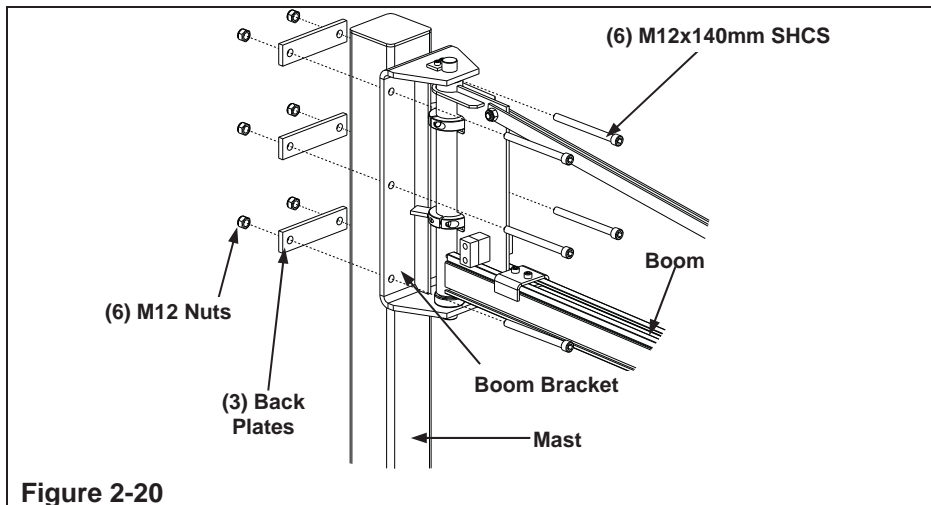


Figure 2-20

Step 2. Trolley Installation

- Step 1. Remove (2) M8x80mm HHCS bolts, washers, nuts and lanyard from end cap. Remove end cap. See Figure 2-21.
- Step 2. Install load trolley into rail. If you have festoon trolleys, they must be installed before load trolleys. Ensure that trolley(s) rolls freely in rail.
- Step 3. Install end cap and tighten M8x80mm HHCS bolts, washers, and nuts. **Tighten until bolt(s) are snug + ¼ turn.** Do not over tighten. See Figure 2-21.

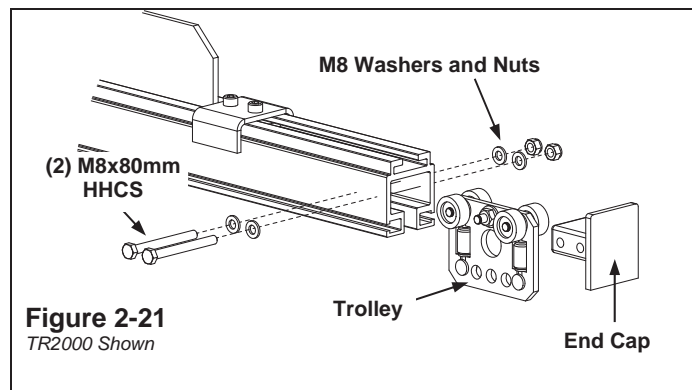


Figure 2-21
TR2000 Shown

3. OPERATION

Operating Recommendations

The following recommendations are for safe and efficient operation of a Knight Global Jib crane.

- Move the crane smoothly and gradually to avoid abrupt, sudden movements of the load.
- Center the crane over the load before starting the hoist to avoid swinging the load as the lift is started. Loads should not be swung by the crane to reach areas not under the crane.
- Ensure everyone in the immediate area is clear of the load and aware that a load is being moved.
- Do not make lifts beyond the rated load capacity of the crane.
- Check to ensure that the load is lifted to a height that clears all obstructions when moving the boom or trolley.
- At no time should a load be left suspended from the crane unattended.
- All slings or cables should be removed from the crane hooks when not in use (dangling cables or hooks hung in sling rings can inadvertently snag other objects when the crane is moving).
- Operators shall not carry loads over personnel.
- Whenever the operator leaves the crane the following procedure should be followed:
 - Raise all hooks or lifting devices to an intermediate position.
 - Park the crane at an approved designated location.
 - Place all controls in the “off” position.
 - Make visual check before leaving the crane.
- In case of emergency or during inspection, repairing, cleaning or lubrication, a warning sign or signal should be displayed and the main shut-off should be locked in the “off” position. This should be done whether the work is being done by the crane operator or by others.
- Contact with rotation stops or trolley end stops shall be made with extreme caution. The operator should do so with particular care for the safety of persons below the crane, and only after making certain that any persons on the other cranes are aware of what is being done.

4. MAINTENANCE

Preventative Maintenance

Inspection Record Requirements

Duty Rating

Inspection frequency should be determined by a qualified person and is based on a duty service as defined below. Each jib crane should be rated individually and inspections performed in accordance with rating.

Inspections should be performed by qualified personnel.

Duty Service

Normal - Operation with uniform loads less than 65% of rated load for not more than 25% of the time.

Heavy - Operation within the rated load limit, which exceeds normal service.

Severe - Service that involves normal or heavy service with abnormal conditions.

Frequency of Documentation

Frequent Inspection (Non-Documented):


- Normal Service - monthly.
- Heavy Service - weekly.
- Severe Service - daily.

Periodic Inspection (Documented):

- Normal Service - annually.
- Heavy Service – semi-annually.
- Severe Service - quarterly.

Documentation should be made available to personnel for review.

Inspections

	<p>⚠ WARNING</p> <p>Never perform maintenance on the jib crane while it is supporting a load.</p>
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Frequent Inspections

If any of the conditions listed below are evident, the jib crane should be placed out of service. A detailed inspection and appropriate corrective actions should be taken.

Additionally, the operator should check the system continually during operation to ensure that no malfunctions are occurring.

Jib Crane:

- Visually inspect the jib crane, ensure that it is in good general working order. Repair or replace any broken or missing parts.
- Check all fasteners, ensure they are intact and properly tightened.
- Check for rotational movement of jib crane. Movement should be smooth with no binding.
- Check trolley travel along rail. Movement should be smooth with no hesitations.

Air System (as applicable):

- Inspect the system for air leaks. Repair any leaks that are found.
- Check the filter to ensure that it is clean. Replace the filter as required.

Periodic Inspection (Documented)

Perform the items listed in the Frequent Inspection section in addition to the items listed below. All findings from this inspection should be recorded.

If any of the conditions listed below are evident, the jib crane should be placed out of service and corrective actions taken.

Base and Mast:

- Check for distortion, wear and continued ability to support the load.
- Check the foundation for fracturing and evidence of stress failure.
- Check security of base plate anchor bolts, verify proper torque, and paint mark bolts when properly torqued.

Boom:

- Check all fasteners, ensure they are intact and properly tightened.
- Inspect turnbuckle, threaded rod, termination brackets, and clevis for wear and security. (as applicable)
- Ensure mid rail stop is secured to end cap and both are intact. Replace bumpers on mid rail stop as needed.
- Ensure rail is free from debris. Use a clean dry rag to wipe down the inside of the rail.

Rotational Stops:

- Check rotational stop bumpers for wear and security. Replace bumpers as needed.

Tags and Labels:

- Ensure capacity label is intact and visible.

Rail Trolley (as applicable):

- Ensure wheels and side rollers run smoothly and are not excessively worn. Replace the wheels as necessary.
- Check all fasteners, ensure they are intact and properly tightened.

Air System:

- Inspect hoses and hardware for wear. Replace as necessary.

5. TROUBLESHOOTING

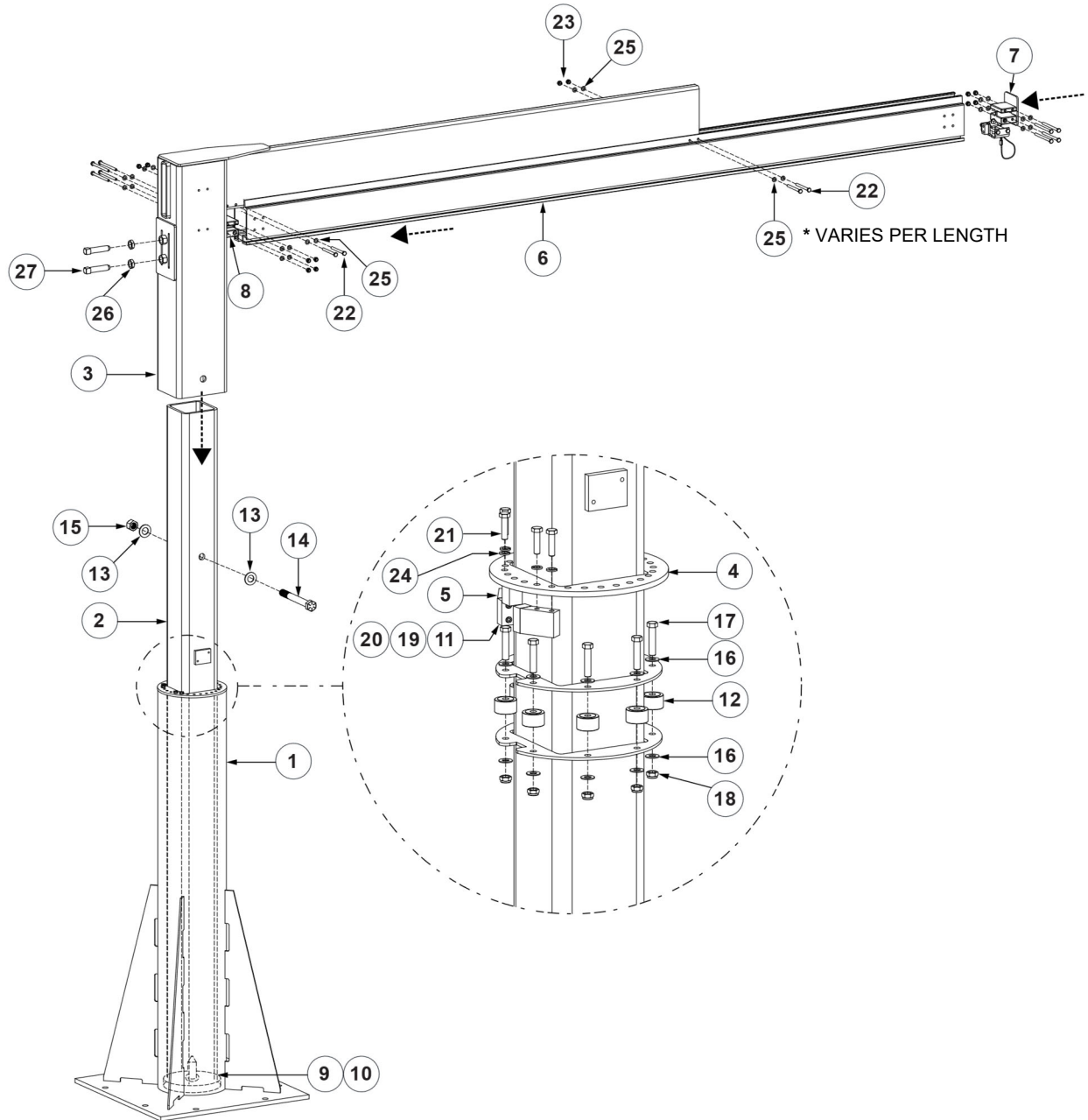
Jib Crane operation may be affected by various factors. If your jib crane is not performing as well as expected, contact the Knight Service Department at 248-377-4950 ext. 162 or via e-mail at service@knightglobal.com.

The following table is for Jib Crane specific problems. This section provides basic troubleshooting information. Determination of specific causes to problems are best identified by thorough inspections performed by personnel instructed in safety, operation and maintenance of this equipment. The chart below provides a brief guide to common problems, probable causes and solutions. Refer to manufacturer's manual for specific lifting device troubleshooting.

Problem	Possible Cause	Solution
Jib Crane movement is stiff.	Boom/Mast assembly binds.	Replace Cam Rollers and Bearing
Change in rolling effort or irregular operation.	Dirt or obstruction in rail.	Clean all parts with a clean dry rag and inspect for wear. <i>NOTE: Do not lubricate the running surfaces or trolley bearings. Lubrication will attract airborne particles and will increase the rolling resistance.</i> Do not use substances such as WD40®, silicone sprays, oil or grease.
	Damaged or bent rail.	Inspect rail and replace if damaged or bent.
	Broken trolley guide roller and/or wheel.	Inspect trolley and replace if damaged.
Load drifting.	Boom not level.	Level components according to instructions
	Jib Crane overloaded.	Reduce load to within the rated capacity.

6. BILL OF MATERIALS

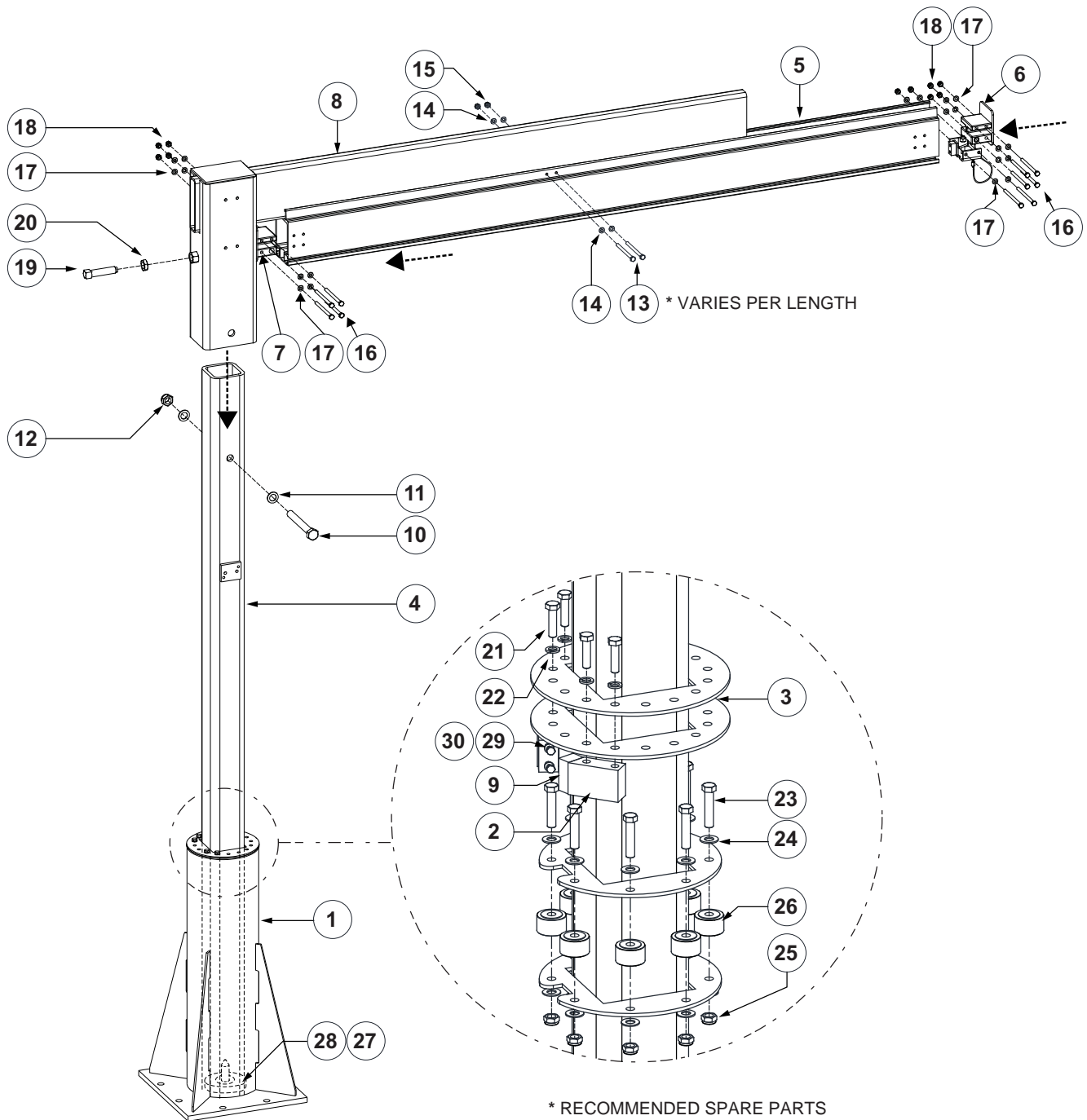
MJBA2700 Bill Of Materials



* RECOMMENDED SPARE PARTS

* DET	QTY	PART NUMBER	DESCRIPTION	* DET	QTY	PART NUMBER	DESCRIPTION
1	1	JBD2701.001	HD BASE	15	1	1 1/8-7	NYLOK NUT
2	1	JBD2702-120	HD POST	16	16	7/16	SAE WASHER
3	1	JBD2703-120	HD RAIL SUPPORT	17	8	7/16-14 x 2 1/4 LG	HHCS
4	1	JBD2704.001	COVER PLATE	18	8	7/16-14	NYLOCK NUT
* 5	2	JBD2705.001	STOP	19	4	M6 x 12mm LG.	SHCS
6	1	JSD9112- xx (LENGTH)	JIB BOOM RAIL	20	4	M6 NOM	HIGH COLLAR LOCK WASHER
7	1	MRAS7533.001	REDUNDANT END CAP	21	4	M10 x 40mm LG.	HHCS
8	1	MRAA4804.001	END CAP	22	10	M10 x 110mm LG.	HHCS
* 9	1	TIM-2788	BEARING	23	20	M10 NOM	FLAT WASHER
* 10	1	TIM-2720	OUTER RACE	24	4	M10	LOCK WASHER
* 11	2	RB-1175	BUMPER	25	10	M10	NYLOK NUT
* 12	8	CYR-1.5	CAMROL BEARING	26	2	M24 X 2.0	JAMNUT
13	2	1 1/8	SAE WASHER	27	2	M24 X 100mm LG.	SQ. HEAD BOLT
14	1	1 1/8-7 X 10" LG.	HHCS				

MJBA2600 / MJBA2300 Bill Of Materials

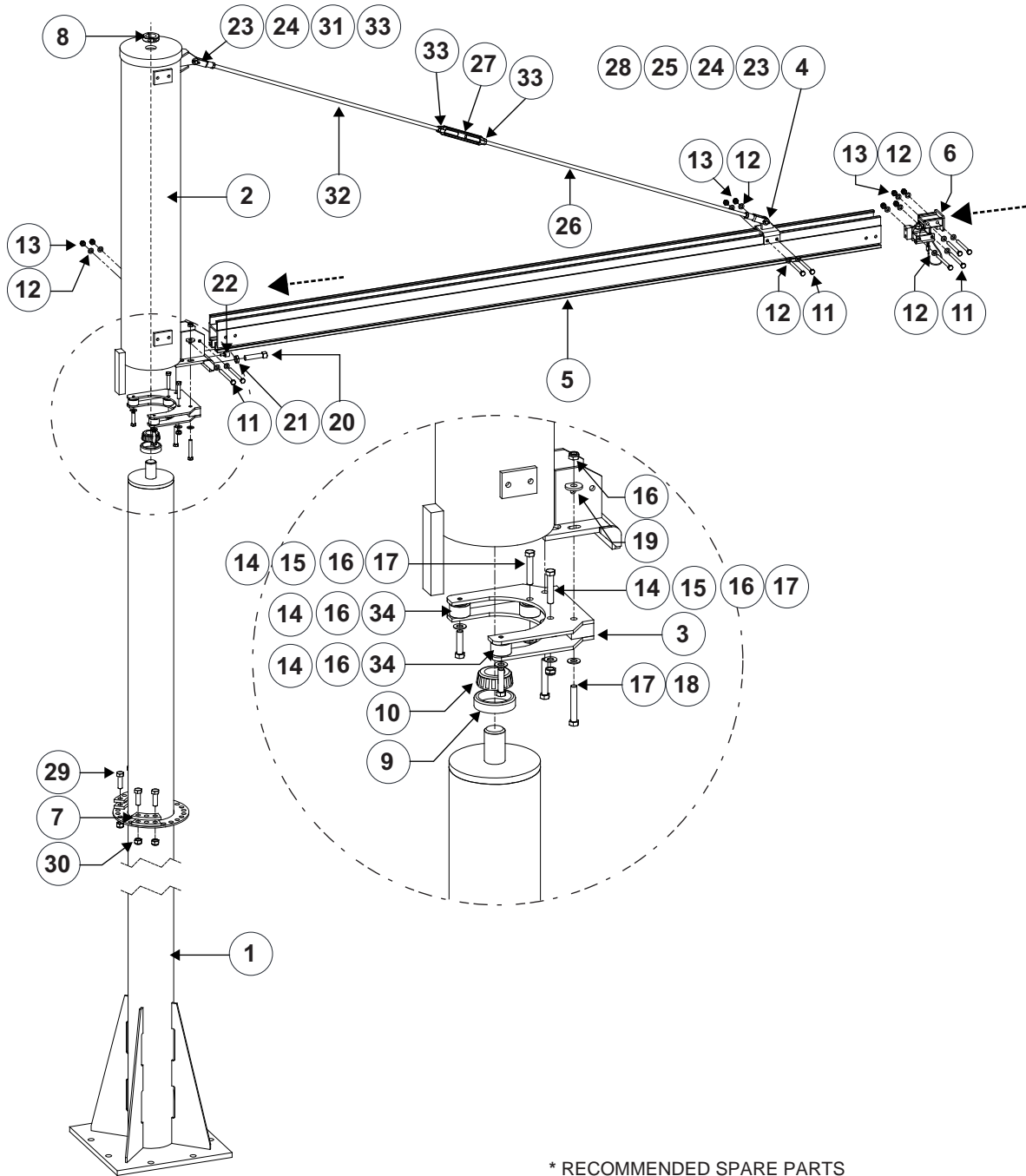


* RECOMMENDED SPARE PARTS

* DET	QTY	PART NUMBER	DESCRIPTION
1	1	JBD2301	BASE
* 2	2	MJSD9101	STOP
3	2	JSD9102	COVER PLATE
4	1	JBD2302-xx (HEIGHT)	MAST
5	1	JSD9112- xx (LENGTH)	JIB BOOM RAIL
6	1	MRAS7533	REDUNDANT END CAP
7	1	JSD9105	END CAP
8	1	MJSD9100-xx (LENGTH)	RAIL SUPPORT
* 9	2	RB1175	BUMPER
10	1	M24 x 200 mm LG.	H.H.C.S.
11	2	M24	WASHER
12	1	M24	NYLOCK NUT
13	VPL	M10 x 110 mm LG.	H.H.C.S.
14	VPL	M10	WASHER
15	VPL	M10	NYLOCK NUT

* DET	QTY	PART NUMBER	DESCRIPTION
16	12	M10 x 140 mm LG.	H.H.C.S.
17	12	M10	WASHER
18	12	M10	NYLOCK NUT
19	1	M24 x 100 mm LG.	SQUARE HEAD BOLT
20	1	M24	JAM NUT
21	4	M10 x 40 mm LG.	H.H.C.S.
22	4	M10	SPLIT LOCK WASHER
23	8	7/16-14 X 2"	H.H.C.S.
24	16	7/16	SAE WASHER
25	8	7/16-14	NYLOCK NUT
* 26	8	CYR11/2S	CAMYOKE
27	1	TIM-2788	BEARING
28	1	TIM-2720	INNER RACE
29	2	M6 x 16 mm LG.	S.H.C.S.
30	2	M6	HIGH COLLAR LOCK WASHER

MJBA2200 / MJBA2100 Bill Of Materials

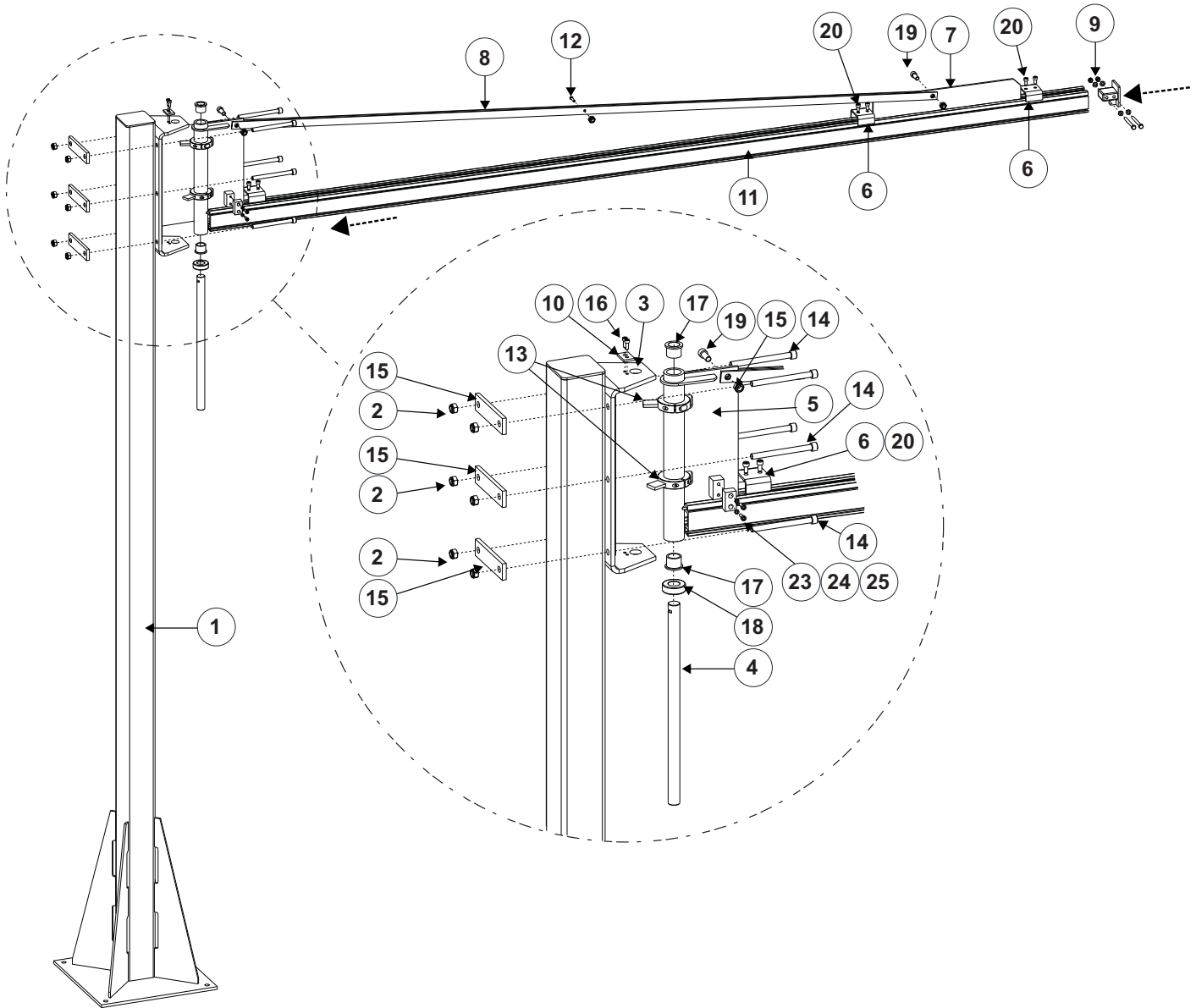


*** RECOMMENDED SPARE PARTS**

* DET	QTY	PART NUMBER	DESCRIPTION
1	1	JBD2210 -xx (HEIGHT)	MAST
2	1	JBD2211	ROTATE POST
3	1	JBD2212	BEARING BRACKET
4	1	JBD2213	THRD ROD BRACKET
5	1	JBD2215 (MJB2200)	ALTERED RAD4110 RAIL
5	1	JBD2215 (MJB2100)	ALTERED TR2000 RAIL
6	1	MRAS4454 (MJB2200)	REDUNDANT END CAP
6	1	MRAS4454 (MJB2100)	REDUNDANT END CAP
7	4	JBD2214	STOP PLATE
8	1	CCI-150	1 1/2" SPLIT COLLAR
*	9	2720	OUTER RACE
*	10	2788	TAPERED BEARING
11	6	M10 x 120mm LG.	H.H.C.S.
12	6	M10	NYLOCK NUT
13	12	M10	WASHER
*	14	CRY11/2S	BEARING
15	2	7/16-14 X 2 1/4 LG.	H.H.C.S.
16	6	7/16-14	NYLOCK NUT

* DET	QTY	PART NUMBER	DESCRIPTION
17	6	7/16	WASHER
18	2	7/16-14 X 2 3/4 LG.	H.H.C.S.
19	2	M12	WELD WASHER
20	2	M16 x 70 mm LG.	SQ. HEAD BOLT
21	2	M16	JAM NUT
22	1	9546K118	BUMPER
23	2	1/2 X 1 1/4 LG.	SHOULDER BOLT
24	2	3/8-16	NYLOCK NUT
25	1	YA008000-0003F	1/2-13 R.H. YOKE END
26	1	1/2-13 X "A" LG.	R.H. THREADED ROD
27	1	2995T17	TURNBUCKLE
28	2	1/2-13	R.H. JAM NUT
29	4	M16 x 50 mm LG.	S.H.C.S.
30	4	M16	NYLOCK NUT
31	2	1/2-13	L.H. JAM NUT
32	1	1/2-13 X "A" LG.	L.H. THREADED ROD
33	1	YA008000-0003F	1/2-13 L.H. YOKE END
34	2	7/16-14 X 1 3/4 LG.	H.H.C.S.

MJBA2050 Bill Of Materials

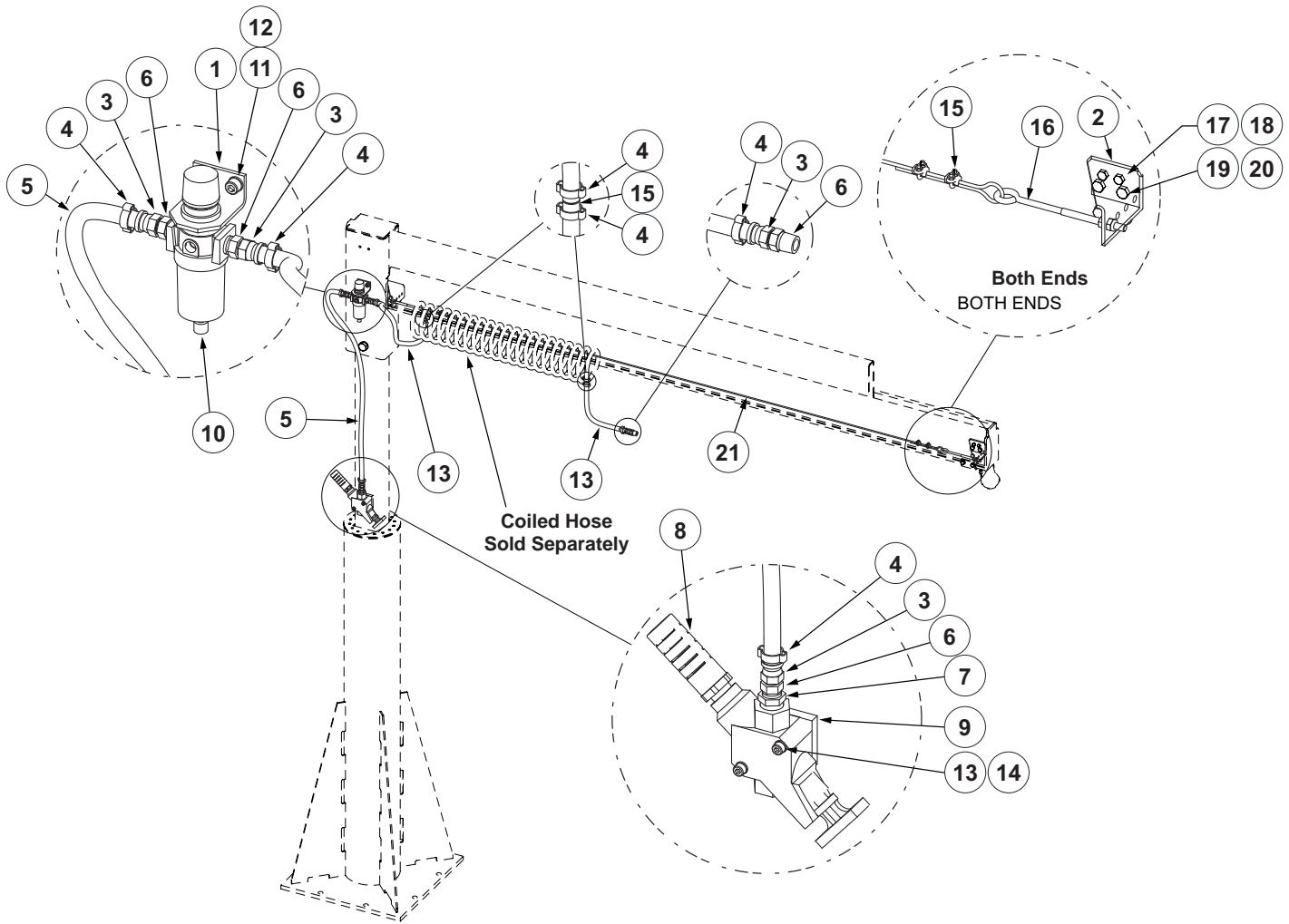


*** RECOMMENDED SPARE PARTS**

* DET	QTY	PART NUMBER	DESCRIPTION
1	1	JBD2060	MAST
2	1	JBD2065	SECURE PLATE
3	1	JBD2061	PIVOT BRACKET
4	1	JBD2066	PIVOT SHAFT
5	1	JBD2062	PIVOT BRACKET SUPPORT
6	1	JBD2064	CLAMP BRACKET
7	1	JBD2063	FRONT PIVOT BRACKET
8	1	JBD2067	RAIL SUPPORT PLATE
9	1	TRN2016	END CAP
10	1	KKD1100	KEEPER
11	1	TR2000	2" ALUMINUM RAIL
12	1	JBD2068	SPACER
13	6	JBD2069	STOP COLLAR

* DET	QTY	PART NUMBER	DESCRIPTION
14	6	M12 x 140 mm LG.	S.H.C.S.
15	12	M12	NYLOCK NUT
16	4	M6 x 16 mm LG.	S.H.C.S.
* 17	2	FL102-8	FLANGE BUSHING
* 18	6	D9	THRUST BEARING
19	6	M12 x 30 mm LG.	S.H.C.S.
20	2	M8 x 16 mm LG.	S.H.C.S.
21	2	M6 x 25 mm LG.	S.H.C.S.
22	2	M6	NYLOCK NUT
23	2	ERB-1175	BUMPER
24	1	M6 x 16 mm LG.	S.H.C.S.
25	2	M6	HIGH COLLAR LOCK WASHER

JSA9135 Coiled Half Inch (1/2") Hose Management Bill Of Materials

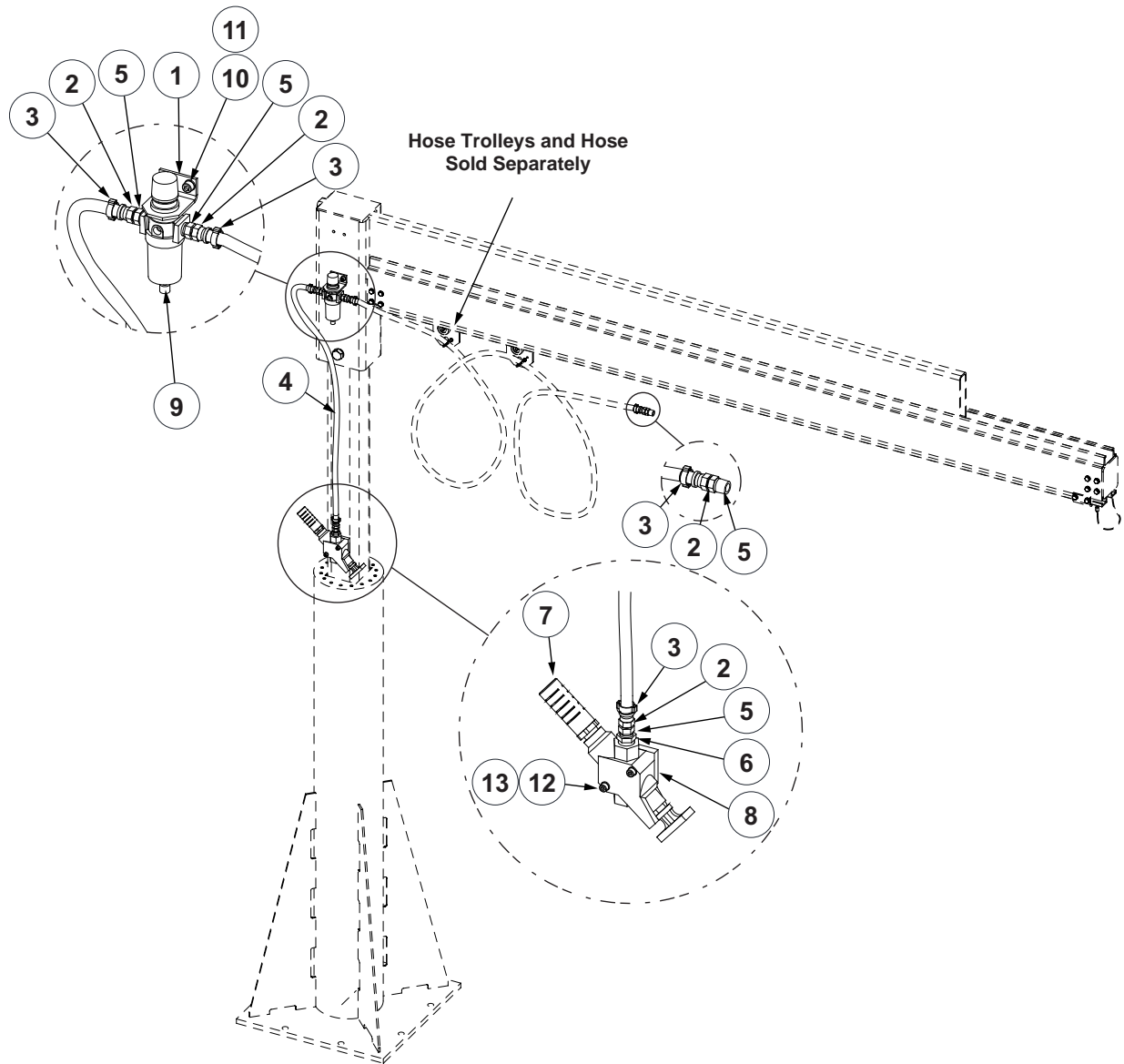


* DET	QTY	PART NUMBER	DESCRIPTION
1	1	JSD9121	FILTER REGULATOR BRACKET
2	2	JSD9136	EYE BOLT BRACKET
3	4	119-08-08B	1/2 NPT HOSE BARB
4	8	1922	13/16" OTEIKER CLAMP
* 5	1	7212-501BL	1/2" BLUE HOSE 60" LG.
6	4	2404-08-08	1/2" NPT 1/2 JIC MALE CON.
7	1	3220-12-8	3/4-1/2" RED. BUSHING
8	1	NA750MB-N	3/4 NPT MUFFLER
9	1	Y1523C5012	3/4 NPT LOCK OUT
10	1	BCFR60-4P	FILTER REGULATOR

* RECOMMENDED SPARE PARTS

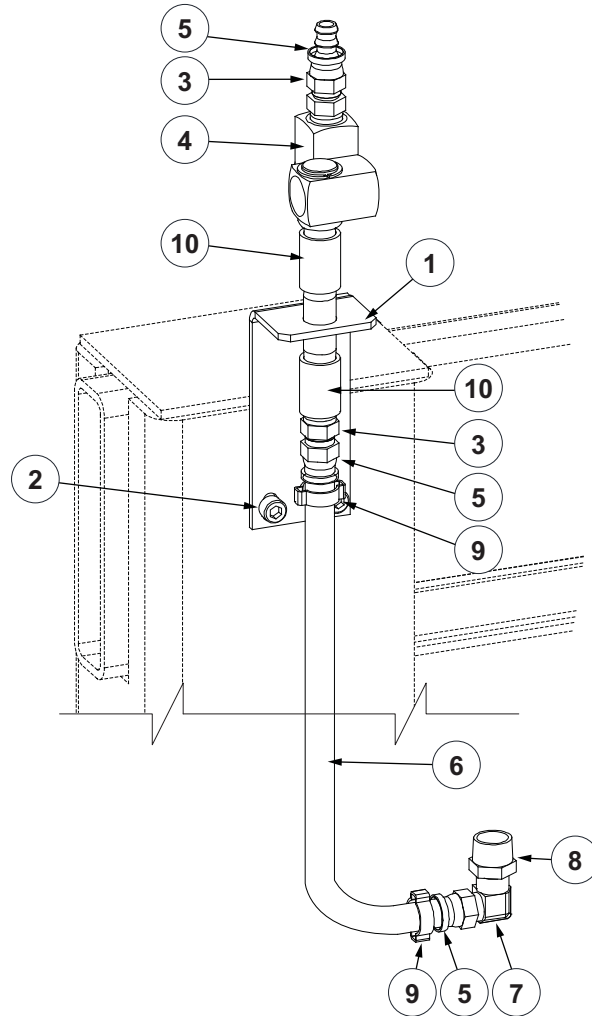
* DET	QTY	PART NUMBER	DESCRIPTION
11	2	M10 x 16 mm LG.	S.H.C.S.
12	2	M10	SPLIT LOCK WASHER
* 13	2	7212-501BL	1/2" BLUE HOSE 36" LG.
14	4	1010015	CROSBY CLAMPS
15	2	HU8	1/2" HOSE MENDER
16	2	EBE-.37166.00SZ	3/8-16 EYE BOLT
17	4	M8 x 90 mm LG.	H.H.C.S.
18	4	M8	NYLOCK NUT
19	4	M10 x 140 mm LG.	H.H.C.S.
20	4	M10	NYLOCK NUT
21	1	20500781	28' 3/16" COATED CABLE

JSA9140 Festooned Half Inch (1/2") Hose Management Bill Of Materials



*	DET	QTY	PART NUMBER	DESCRIPTION
	1	1	JSD9121	FILTER REGULATOR BRACKET
	2	4	PLS88	1/2" NPT HOSE BARB
	3	4	1922	13/16" OTEIKER CLAMP
*	4	1	7212-501BL (5' LONG)	1/2" I.D. 3/4 O.D. BLUE HOSE
	5	4	2404-08-08	1/2" NPT 1/2 JIC MALE CONNECTOR
	6	1	3220-12-8	3/4-1/2" REDUCING BUSHING
	7	1	ES75MB	3/4" NPT MUFFLER
	8	1	Y1523C5012	3/4" NPT LOCK OUT
	9	1	BCFR60-4P	FILTER REGULATOR
	10	2	M10 x 16 mm LG.	S.H.C.S.
	11	2	M10	SPLIT LOCK WASHER
	12	2	M8 x 65 mm LG.	S.H.C.S.
	13	2	M8	NYLOCK NUT

JSA9137 360° Rotate Air Fitting




* RECOMMENDED SPARE PARTS

* DET	QTY	PART NUMBER	DESCRIPTION
1	1	JSD9138	AIR PLATE
2	2	M10 x 16 mm LG.	M10 x 16 mm LG.
3	2	2404-08-08	1/2 JIC-1/2 NPT CONNECTOR
4	1	95462	1/2 NPT DYNA SWIVEL
5	3	940-8-8	1/2 JIC FEMALE HOSE BARB
*	6	7212-501BL (9' LONG)	1/2" I.D. 3/4 O.D. BLUE HOSE
7	1	2501-08-08-FG	1/2 JIC-1/2 NPT ELBOW
8	1	3220-12-8	3/4 NPT-1/2 NPT BUSHING
9	2	1922	13/16" OETIKER CLAMP
10	2	CPL-050-M	1/2" COUPLING

7. DECOMMISSIONING OF JIB CRANE

Knight Jib Cranes contain various materials which, at the end of the service life, must be disposed of or recycled (where appropriate), in accordance with statutory regulations.

Decommissioning:

	CAUTION
	Knight Jib Cranes must only be decommissioned by qualified personnel.

MJBA2300, MJBA2600, and MJBA2700 Disassembly Instructions

(Refer to page 6-1 for MJBA2700, MJBA2600, and MJBA2300)

- Step 1. Ensure there is not a load on the jib crane.
- Step 2. Turn off all power to lifting device and disconnect power source.
- Step 3. Remove lifting device from load trolley.
- Step 4. Support the weight of the boom and remove M24x200mm HHCS bolt, washers, and nut.
- Step 5. Lift boom from mast and carefully lower boom to floor.
- Step 6. Remove nuts from anchor bolts on the base plate and lift mast off anchor bolts. Carefully lower mast to floor.

MJBA2100 and MJBA2200 Disassembly Instructions

(Refer to page 6-2 for MJBA2200 and MJBA2100)

- Step 1. Ensure there is not a load on the jib crane.
- Step 2. Turn off all power to lifting device and disconnect power source.
- Step 3. Remove lifting device from load trolley.
- Step 4. Loosen jam nut on threaded rod near the top clevis assembly.
- Step 5. Support the weight of the boom and remove the shoulder bolt and nut from the clevis at the top of the mast.
- Step 6. Lower threaded rod down and rest it inside the top rail channel. Replace shoulder bolt and nut back through clevis assembly.
- Step 7. Remove the (2) M10x120mm HHCS bolts, washers, and nuts from boom bracket. Carefully lower boom to the floor.
- Step 8. Remove nuts from anchor bolts on the base plate and lift mast off anchor bolts. Carefully lower mast to floor.

MJBA2050 Disassembly Instructions

(Refer to page 6-3 for MJBA2050)

- Step 1. Ensure there is not a load on the jib crane.
- Step 2. Turn off all power to lifting device and disconnect power source.
- Step 3. Remove lifting device from load trolley.
- Step 4. Support the weight of the boom and remove the (6) M12x140mm HHCS bolts, nuts, and (3) back plates from the boom bracket. Carefully lower the boom to the floor.
- Step 5. Remove nuts from anchor bolts on the base plate and lift mast off anchor bolts. Carefully lower mast to floor.

8. KNIGHT'S PERFORMANCE WARRANTY

Knight warrants that its products and parts shall meet all applicable specifications, performance requirements, and be free from defects in material and workmanship for one year, (Servo Systems for two years), from the date of invoice, unless otherwise noted. One exclusion would include any purchased components not manufactured by Knight and their specific individual warranties. Paint defects, scratches and marring from shipping are also excluded.

This warranty shall not cover failure or defective operation caused by inadequate training provided by customer regarding the operation and / or maintenance of the tool, misuse, negligence, misadjustment, or alteration not approved by Knight. Knight's obligation is limited to the replacement or repair of Knight's products at a location designated by Knight. Buyer is responsible for all associated internal removal and reinstallation costs as well as freight charges to and from Knight Industries. Knight's maximum liability shall not in any case exceed the contract price for the products claimed to be defective.

On a design & build job, the customer is the owner of the equipment once they authorize shipment. The equipment cannot be returned for reimbursement or credit.

Knight warranties servo hoists, servo balancers, and servo tractors to be free from defects in material or workmanship for a period of two years or 6000 hours use from date of shipment.

Knight distributors/agents are not authorized to circumvent any of the terms and conditions of this warranty unless approved in writing by Knight Management. Statements made by Knight distributors/agents do not constitute warranties.

Unauthorized changes to any of Knight's products voids our performance warranty and any potential liabilities. If changes are necessary, please contact Knight for authorization to continue.

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