

AIMCO Manufacturing Safety Manual



Sales & Service:

BARNES & ASSOCIATES
Ergonomic Workplace Solutions

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1.1 GENERAL INSTALLATION INSTRUCTIONS

All AIMCO lift assist equipment and associated tooling is assembled and tested at the factory.

2 ARTICULATED JIB CRANE REQUIREMENTS

Your articulated jib crane should be installed where it is not subject to radical changes in temperature or temperatures outside of the limits listed below (1.3). Temperatures outside of the recommended limits may cause problems with bearings, pneumatic systems, moving parts and tooling.

1.3 TEMPERATURE LIMITS

Unless otherwise specified, AIMCO equipment is designed for indoor use only.

- Minimum Temperature –40 degrees Fahrenheit
- Maximum Temperature +140 degrees Fahrenheit

1.4 AIR SUPPLY

This equipment is designed for a 1"-2" diameter vacuum pathflow. The air should be clean, dry, and non-lubricated.

1.5 SHIPMENT

The pedestal mounted articulated jib crane is shipped as follows:

Skid #1: Assembled Articulated Jib Boom Complete, Box of assembly hardware. Skid #2: Floor Support Pedestal

1.6 MOUNTING INSTRUCTIONS:

1.6.1 Mount the pedestal on a level, appropriately sized concrete foundation. The pedestal should be leveled prior to securing to the floor. Level across the top mounting plate. Shim stock beneath the pedestal may be used to aid leveling the pedestal.

Anchor bolts must:

- be 3/4” in diameter.
- be grade 5 or better.
- be embedded **at least** 4” into floor, not to exceed 3/4 of floor depth (***diagram 1A***).

Note: **A minimum 6”-thick reinforced concrete floor is required.**

- have a **minimum** of two threads above nut.

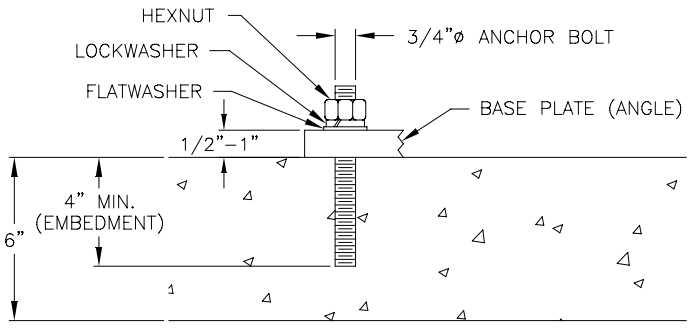


Diagram 1A. *Typical anchor bolt embedment.*

- **Foundation must be 6” - 8” thick reinforced concrete.**
- **Concrete must be in sound condition devoid of any cracks, spalling, deterioration, etc.**

1.6.2A
Assure the 1"-2" vacuum hose is long enough to connect the bottom of the primary bearing assembly on the articulated arm boom to the vacuum pump.

1.6.2B Route the vacuum hose down the center of the pedestal, and through the un-capped hole located on the side of the pedestal. The hose should have at least 12" of slack in it.

1.7 MOUNTING THE ARMS:

1.7.1
Prior to mounting the arms, assure the pedestal is level and securely lagged to the floor.

1.7.2 Fold back the secondary arm beneath the primary arm (condition as shipped). Tie the two arms together so that they will not unfold during lifting. Using a forklift, spread the forks and place them between the primary and secondary arm so that the load is lifted from the bottom side of the primary arm. Secure the arms to the forks with “C’ Clamps prior to lifting overhead. Lift the arm assembly until the main rotation bearing mounting plate is about 6-12”.

1.7.3
Connect the vacuum hose to the male nipple at the bottom of the primary bearing assembly. To avoid placing hands and arms between the suspended arm assembly and the pedestal,be sure to keep the arm assembly off center from the pedestal until the hose is secured; Once the hose is attached, align the primary bearing assembly directly above the pedestal.

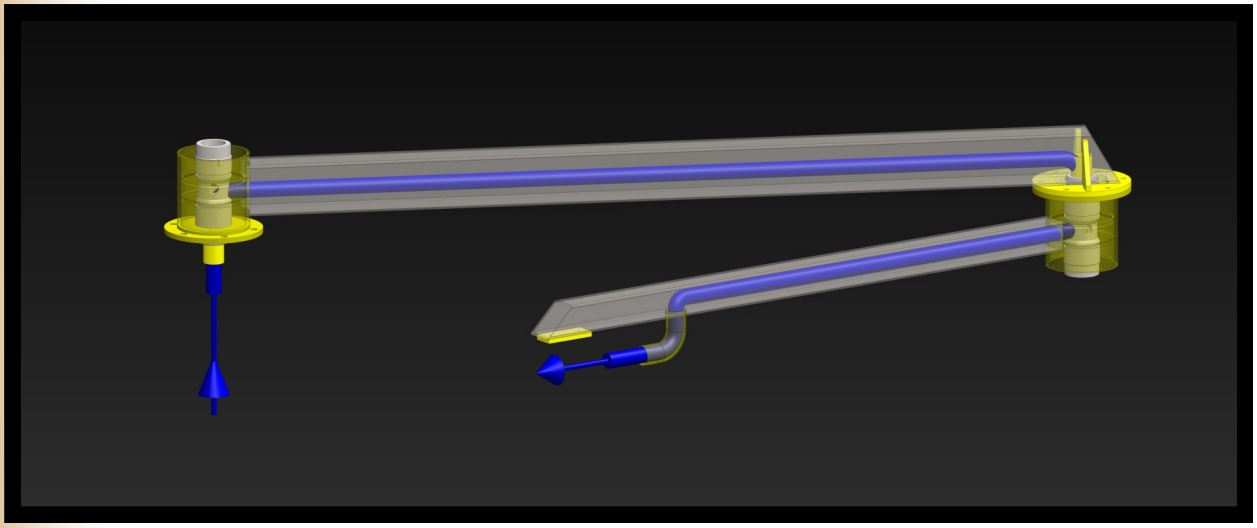
1.7.4
Slowly lower the arms onto the top of the pedestal, aligning the boltholes. Secure the arms to the pedestal with the six (6) 5/8-11 SHCS & (6) 5/8-11 Hex Nuts from the accessory box. It is recommended that LocTite thread sealant be used for this connection. Recommended bolt torque is 175 ft. lbs.

1.8 COMPLETING AIR CIRCUITRY:

1.8.1
Connect the vacuum hose to vacuum pump. See pump manufacturer's preferred installation methods & specifications.

NOTE: It is recommended that a filter be mounted between the vacuum pump and the AIMCO system to assure clean, dry, oil-free air.

1.8.2
Connect the nipple at the end of the secondary arm to vacuum tube-lifter.



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SAFETY PRECAUTIONS

You must be checked out by a supervisor before operating this machine for the first time. Operate slowly until you are familiar with the controls. Be safe and never attempt to lift a person or ride on this machine!

REPORT ANY DAMAGE OR ERRATIC OPERATION TO MAINTENANCE IMMEDIATELY.

CAUTION - Adjust regulator to 0psi before hooking up the air supply line to prevent unexpected movement. The operator should hold onto the control handle while a maintenance person hooks up the plant air line. Gradually adjust regulator up to 85-100 psi.

CAUTION - Never place your fingers or hand between the grab and the item you are lifting to prevent injury.

CAUTION - Never allow your face or body to be over the grab when it is loaded to prevent injury from the arm jumping up in case of an unexpected load drop.

CAUTION - Be aware of others working near the machine. Do not swing the unit into other people in the area.

Park the unit when not in use. If drifting is a problem and it is not equipped with parking brakes, use a strap, magnet or saddle to prevent unexpected movement or drifting. Also, if drifting is a problem, the machine should be re-leveled.

If air supply is lost, immediately lower the lift to prevent an unintentional drop should the air supply be out for an extended period. Aimco uses check valves throughout the entire system to hold the part in place for a specific amount of time after air loss. This will not hold the part indefinitely. Lower part down as soon as air pressure is lost.

OPERATING CONDITIONS

1. Unless otherwise specified, Aimco equipment is intended for indoor use only.
2. Minimum operating temperature: 25°F.
3. Maximum operating temperature: 140°F.
4. Read and understand the operating manual before using this machine.
5. Stay clear of the suspended load.
6. Do not lift more than the rated load.
7. Do not use a damaged machine or a machine that is not working properly.
8. Do not allow air lines to become twisted or kinked.
9. Do not operate the machine too fast.
10. Do not allow the machine to come into contact with electric lines or equipment.
11. Do not lift people.
12. Do not suspend loads above people.
13. Do not lift loads higher than necessary.
14. Do not operate if the machine anchors or any bolts or fasteners are loose.
15. Do not remove or obscure the warning labels on the machine.
16. Do not adjust or repair the machine unless qualified to do so.
17. Do not leave loads suspended unattended - set the load down.
18. Do not operate if guards are damaged or have been removed.
19. Do not operate when the vacuum indicator shows inadequate vacuum.
20. Do not operate when the vacuum pads are not spaced for equal loading.

Preventative Maintenance Schedule

Service Check	Method	Monthly Visual [Note 1]	Semiannually Record [Note 2]	Action
Deformation, cracks, or excessive wear of any part of the lifter	Visual	X	X	Correct if there is an issue
Loose or missing guards, fasteners, covers, stops, or nameplates	Visual	X	X	Replace as necessary
Check all pneumatic and vacuum hoses for cuts, kinks, or collasped areas	Visual	X	X	Replace as necessary
All pneumatic and vacuum fittings and connections for leakage	Auditory	X	X	Trim 1/4" from hose end and refit, tighten or replace fitting
All vacuum pad seals for cuts, tears, excessive wear, and foreign matter	Visual	X	X	Wipe pad with cloth or replace as necessary
Lifting magnet face for debris and smoothness.	Visual	X	X	Wipe magnet with cloth or replace as necessary
Loose bolts and fasteners	Function		X	Retorque as necessary
Cracked or worn gears, pulleys, sheaves, sprockets, bearings, chains, and belts	Function		X	Replace as necessary
Excessive wear of friction pads, linkages, and other mechanical parts	Function		X	Correct if there is an issue
Do load test of 125% of the rated capacity of End Effector. Lift and release test load 3 times. (Fiction style grippers only)	Function		X	If test fails, check gripper pads for wear. Check air pressure.
Excessive wear at hoist hooking points and load support clevises or pins	Function		X	Replace as necessary
Check rod ends on cylinders and tie rods for signs of wear. Check rod ends to ensure that they are tight but not seized.	Function		X	Replace rod end immediately if they are worn, loose, or seized
Check bearings with greasezerks	Function		X	Add grease as necessary
Air Filter Regulator	Function		X	Replace 12 to 24 months

NOTES:

(1) By operator or designated person with records not required.

(2) Visual inspection by designated person making records of apparent external conditions, unless conditions indicate that disassembly should be done to permit detailed inspection.

Daily Operator Inspection

1. Inspect air fittings and air lines on tooling for wear or leaks.
2. Inspect any electrical connections for loose wires.
3. Inspect paint marks on tooling fasteners to be sure they have not moved. If there are no paint marks, look for any loose fasteners.
4. Inspect gripper pads for extreme wear (rubber worn through & flaking off or cracked UHMW, if applicable).
5. Inspect vacuum cups for rips or tears (if applicable).
6. Wipe vacuum cups down with clean rag (if applicable).
7. Inspect magnet surface for debris (if applicable).
8. Check air pressure to the machine to make sure that it meets the minimum recommended pressure shown on the label by the main regulator.
9. Cycle tooling on and off to confirm operation. For torque arms, if the tooling operation also engages a discrete brake, check for proper brake engagement.
10. Move machine up and down to confirm operation.

Lockout/Tagout Procedures

1. Lower tooling to its lowest position.
2. Turn main regulator and balancer regulator (if applicable) pressures to zero psi.
3. Disconnect air supply.
4. Follow air dump procedures in the manual. Typical air dump procedures include cycling tooling controls on and off, or tilt up and down until tooling response stops. This will dump the air out of the tooling, for machines with thumb lever controls it is also necessary to hold both up and down thumb levers down until all remaining air is exhausted.
5. Attach lockout tag if lockout point is available.

Restart Procedures

1. Remove lockout tag if applicable.
2. Slowly apply air to machine and turn regulator up to operating pressure (90 psi).
3. Audibly check for air leaks at fitting connection points. Please note, sensitive regulators normally exhaust air when pressurized.
4. Operate machine per operating instructions to verify proper operation.
5. Recheck air pressure.

Recommended Torques for Common Bolts

Bolt Size	Torque Grade 8 (IN-LBS)		Torque Grade 5 (IN-LBS)	
10-24	Dry 60	Lube 45	Dry 43	Lube 32

Bolt Size	Torque Grade 8 (FT-LBS)		Torque Grade 5 (FT-LBS)	
1/4-20	Dry 12	Lube 9	Dry 8	Lube 6
5/16-18	25	18	17	13
3/8-16	45	35	30	23
1/2-13	110	80	75	55
5/8-11	230	170	150	110
3/4-10	380	280	360	200
1-8	900	680	580	440

*Fastener sizes not listed to be torqued to bolt standards

Bolt torques should be checked after initial installation and periodically thereafter.

Torque Exception Note: Fasteners that act as a pivot point and have nylock nuts in use do not need to be torqued, be sure nylock is engaged.

Airline Ratings

OD (in) TYPE	Working Pressure at 75 F	Burst Pressure at 75 F
0.125 Polyurethane	115 psi	380 psi
0.25 Polyurethane	115 psi	310 psi
0.375 Polyurethane	115 psi	300 psi
ID (in)		
0.375 Neoprene	300 psi	1200 psi

Factors Known to Affect Vacuum Lifters

1. Load Rigidity – Rigidity may cause uneven loading of the End Effector.
2. Load Strength – Stress caused by the load and the vacuum cups may damage the load.
3. Load Surface Conditions – Rough and uneven surfaces can affect the vacuum pad's attachment or seal.
4. Load Overhang – Large overhangs may cause the load to deflect and peel away from the vacuum cup, causing load damage.
5. Angle of the Load – The effect of the coefficient of friction between the load and vacuum pad is more important when the load is not horizontal.
6. Number of Pads Attached to the Load – Lifter capacity varies based on the number of attached pads.
7. Load Temperature – Higher temperatures can damage the pads or affect their function.
8. Elevation – Higher elevations can reduce the level of vacuum under the cups.

Factors Known to Affect Magnet Lifters

1. Load Thickness – Lifting capacity increases with load thickness.
2. Load Alloy – Many alloys do not accept magnetic flux easily, only lift approved materials.
3. Load Surface Conditions – Small air gaps between the load and magnet can be created by burrs, paper, paint and other surface imperfections can reduce magnet capacity.
4. Load Length or Width – Large overhangs may cause the load to deflect and peel away from the magnet face, causing air gaps which reduce magnet capacity.
5. Angle of the Load - The effect of the coefficient of friction between the load and magnet face is more important when the load is not horizontal.
6. Portion of Lifting Magnet Face in Contact With Load – Partial contact of load with magnet face decreases lifting magnet capacity.
7. Load temperature – Higher temperatures affect the magnetic properties of the load, decreasing lifting magnet capacity.

AIMCO WARRANTY

AIMCO Warrants its products to be free of defects in material and/or workmanship in accordance with agreed upon specifications and for ordinary applications. Such defects must be reported in writing within one year of shipment from the factory or 2000 operating hours, whichever come first. The warranty is limited to repairing or replacing, at AIMCO's option, FOB, AIMCO'S factory, any part, which upon AIMCO's inspection, is found to have a defect in material and/or workmanship. AIMCO in no event shall be liable for indirect or consequential damages arising out of the use of AIMCO's products.

Components purchased by AIMCO from others for inclusion by AIMCO shall be warranted only to the extent set out above and/or to the guarantee or warranty, if any, made by the supplier of said component.

Any and all warranties shall be construed and enforced under the laws of the state of Ohio.

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