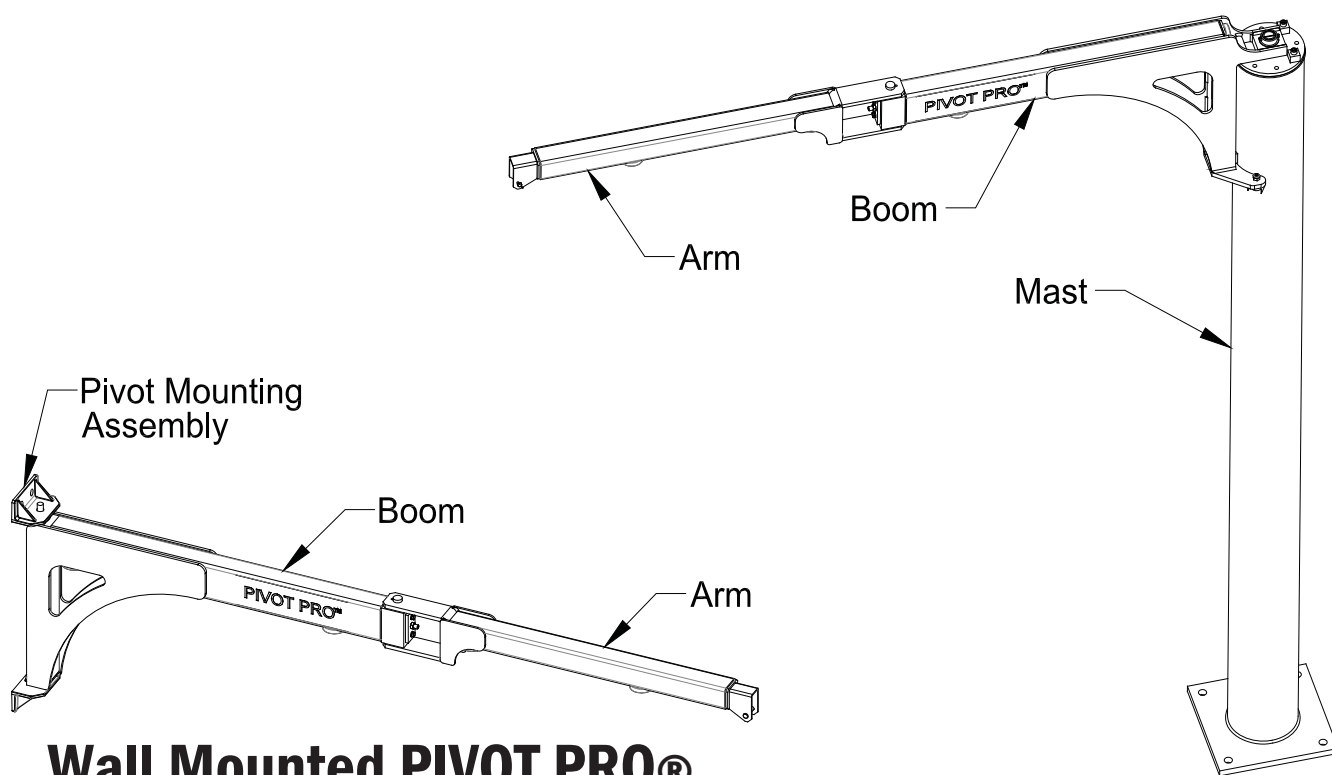


# Installation, Operation, & Maintenance Manual



**Wall Mounted PIVOT PRO®**

**Free Standing PIVOT PRO®**

**IMPORTANT!  
DO NOT DESTROY**

## **PIVOT PRO® Articulating Jib Crane**

Gorbel® Customer Order No. / Serial No. \_\_\_\_\_

Gorbel® Dealer \_\_\_\_\_

Date \_\_\_\_\_  
Month Year

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Questions? Concerns? Comments? Please call (314) 869-7200.

# INTRODUCTION

Thank you for choosing a Gorbel® PIVOT PRO® Light Duty Articulating Jib Crane to solve your material handling needs. The innovative design and heavy duty construction of a Gorbel® PIVOT PRO® will provide a superior quality product that will offer years of long term value. The Gorbel® PIVOT PRO® jib crane is pre-engineered for vacuum lift operation. The lift tube weight allowance is 40 pounds (for example, a jib crane rated for 150 pounds allows for a 150 pound live weight plus 40 pounds for the weight of the lift tube). There is also an allowance of 50% of the crane capacity for impact caused by vacuum use. A Gorbel® PIVOT PRO® will provide many years of dependable service by following the installation and maintenance procedures described herein.

***Dimensions contained in this installation manual are for reference only and may differ for your particular application. Please refer to the enclosed General Arrangement Drawing for actual dimensions.***

**Normal safety precautions:** These include, but are not limited to:

- Checking for obstructions in crane rotation
- Checking that all bolts are tight and have lock washers
- Making sure that rotation limits are in place
- Making sure that vacuum hose or festooning cannot be snagged or pinched.

For additional safety precautions see pages 2 & 3.

## WARNING

Only qualified personnel familiar with standard fabrication practices should be employed to assemble these cranes because of the necessity of properly interpreting these instructions. Gorbel is not responsible for the quality of workmanship employed in the installation of a crane according to these instructions. Contact Gorbel, Inc., at 600 Fishers Run, P.O. Box 593, Fishers, New York 14453-0593, for additional information if necessary.

## WARNING

Equipment described herein is not designed for, and should not be used for lifting, supporting or transporting humans. Failure to comply with any one of the limitations noted herein can result in serious bodily injury and/or property damage. Check Federal, State and Local regulations for any additional requirements.

## WARNING

Consult a qualified structural engineer to determine if your support structure is adequate to support the loads generated by thrust and pull (wall/column mounted), or anchor bolt force, overturning moment, or axial load (free standing) of your crane.

## WARNING

Crane cannot be utilized as a ground: A separate ground wire is required. For example, systems with 3 phase power require 3 conductors plus one ground wire.

## WARNING

Reference American Institute of Steel Construction (AISC) Manual of Steel Construction, Specifications and Codes, Specification for Structural Joints using ASTM A325 or A490 Bolts for proper procedures to follow when using any torque tightening method.

## WARNING

Do not field modify crane in any way. Any modifications without the written consent of Gorbel, Inc., will void warranty.

# CRANE OPERATOR INSTRUCTIONS

Overhead cranes and jib cranes generally handle materials over working areas where there are personnel. Therefore, it is important for the Crane Operator to be instructed in the use of the crane and to understand the severe consequences of careless operation. It is not intended that these suggestions take precedence over existing plant safety rules and regulations or OSHA regulations. However, a thorough study of the following information should provide a better understanding of safe operation and afford a greater margin of safety for people and machinery on the plant floor. It must be recognized that these are suggestions for the Crane Operator's use. It is the responsibility of the owner to make personnel aware of all federal, state and local rules and codes, and to make certain operators are properly trained.

## Qualifications

Crane operation, to be safe and efficient, requires skill: the exercise of extreme care and good judgment, alertness and concentration, and rigid adherence to proven safety rules and practices as outlined in applicable and current ANSI and OSHA safety standards. In general practice, no person should be permitted to operate a crane:

- Who cannot speak the appropriate language or read and understand the printed instructions.
- Who is not of legal age to operate this type of equipment.
- Whose hearing or eyesight is impaired (unless suitably corrected with good depth perception).
- Who may be suffering from heart or other ailments which might interfere with the operator's safe performance.
- Unless the operator has carefully read and studied this operation manual.
- Unless the operator has been properly instructed.
- Unless the operator has demonstrated his instructions through practical operation.
- Unless the operator is familiar with hitching equipment and safe hitching equipment practices.

## Handling the Jib Boom Motion

Before using the boom of the jib crane, the operator should be sure the hook or lift tube is high enough to clear any obstruction. Before a load is handled by the crane, the jib boom should be brought into position so that it is directly over the load. Start the jib boom slowly and bring it up to speed gradually. Approaching the place where it is desired to stop the jib, reduce the boom speed.

## Handling the Hoist or Vacuum Lifter Motion

Refer to the lifting equipment's operating instructions.

# GENERAL SUGGESTIONS

## Know Your Crane

Crane operators should be familiar with the principal parts of a crane and have a thorough knowledge of crane control functions and movements. The crane operator should be required to know the location and proper operation of the main conductor disconnecting means for all power to the attachments on the crane.

## Responsibility

Each crane operator should be held directly responsible for the safe operation of the crane. Whenever there is any doubt as to SAFETY, the crane operator should stop the crane and refuse to handle loads until: (1) safety has been assured or (2) the operator has been ordered to proceed by the supervisor, who then assumes all responsibility for the SAFETY of the lift.

Do not permit **ANYONE** to ride on the hook, lift tube, or load.

## Inspection

Test the crane movement and any attachments on the crane at the beginning of each shift. Whenever the operator finds anything wrong or apparently wrong, the problem should be reported immediately to the proper supervisor and appropriate corrective action taken.

## Operating Suggestions

One measure of a good crane operator is the smoothness of the crane operation. The good crane operator should know and follow these proven suggestions for safe, efficient crane handling.

1. The crane should be moved smoothly and gradually to avoid abrupt, jerky movements of the load. Slack must be removed from the sling and hoisting ropes before the load is lifted.
2. Center the crane over the load before starting the hoist or vacuum lifter 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.
3. Crane-hoisting ropes or lift tubes should be kept vertical. Cranes shall not be used for side pulls.
4. Be sure everyone in the immediate area is clear of the load and aware that a load is being moved.
5. Do not make lifts beyond the rated load capacity of the crane, vacuum lifter, sling chains, rope slings, etc.
6. Make certain that before moving the load, load slings, load chains, or other lifting devices are fully seated in the saddle of the hook with the hook latch closed (if equipped with hook latch), or verify that the vacuum head is completely sealed on the center of the load surface.
7. Check to be sure that the load and/or bottom block is lifted high enough to clear all obstructions when moving boom.
8. At no time should a load be left suspended and unattended.
9. Do not lift loads with sling hooks hanging loose. If all sling hooks are not needed, they should be properly stored, or use a different sling.
10. 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).
11. Operators shall not carry loads and/or empty bottom blocks over personnel. Particular additional caution should be practiced when using magnet or vacuum devices. Loads, or parts of loads, held magnetically could drop. Failure of power to magnets or vacuum devices can result in dropping the load. Extra precaution should be exercised when handling molten metal in the proximity of personnel.
12. Whenever the operator leaves the crane the following procedure should be followed:
  - Raise all hooks to an intermediate position.
  - Spot the crane at an approved designated location.
  - Place all controls in the "off" position.
  - Open the main switch to the "off" position.
  - Make visual check before leaving the crane.
13. In case of emergency or during inspection, repairing, cleaning or lubrication, a warning sign or signal should be displayed and the main switch should be locked in the "off" position. This should be done whether the work is being done by the crane operator or by others.
14. 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.
15. ANY SAFETY FEATURES AND MECHANISMS BUILT-IN OR OTHERWISE PROVIDED WITH THE CRANE BY GORBEL ARE REQUIRED FOR THE SAFE OPERATION OF THE CRANE. DO NOT, UNDER ANY CIRCUMSTANCES, REMOVE OR OTHERWISE IMPAIR OR DISABLE THE PROPER FUNCTIONING OF ANY CRANE SAFETY MECHANISMS OR FEATURES BUILT-IN OR OTHERWISE PROVIDED BY GORBEL FOR SAFE OPERATION OF THE CRANE. ANY REMOVAL, IMPAIRMENT OR DISABLING OF ANY SUCH SAFETY MECHANISMS OR FEATURES OR OTHER USE OR OPERATION OF THE CRANE WITHOUT THE COMPLETE AND PROPER FUNCTIONING OF ANY SUCH SAFETY MECHANISMS OR FEATURES AUTOMATICALLY AND IMMEDIATELY VOIDS ANY AND ALL EXPRESS AND IMPLIED WARRANTIES OF ANY KIND OR NATURE.

# SAFE HOIST & VACUUM LIFTER OPERATING GUIDELINES

## General

There is no one single factor that is more important for minimizing the possibility of personal injury to the operator and those working in the area, or damage to property, equipment, or material than being familiar with the equipment and using Safe Operating Practices.

Hoists and vacuum lifters are designed for lifting and transporting of material only. Under no circumstances, either during initial installation or in any other use, should the hoist or vacuum lifter be used for lifting or transporting personnel.

No operator should be permitted to use the equipment that is not familiar with its operation, is not physically or mentally fit, or has not been schooled in safe operating practices. The misuse of hoists or vacuum lifters can lead to certain hazards which cannot be protected against by mechanical means; hazards which can only be avoided by the exercise of intelligence, care, and common sense.

Safe Operating Practices also involve a program of periodic inspection and preventative maintenance (covered in a separate section). Part of the operator's training should be an awareness of potential malfunctions/hazards requiring adjustments or repairs, and bringing these to the attention of supervision for corrective action.

Supervision and management also have an important role to play in any safety program by ensuring that a maintenance schedule is adhered to, and that the equipment provided for the operators is suitable for the job intended without violation of one or more of the rules covering safe operating practices and good common sense.

The Safe Operating Practices shown are taken in part from the following publications:

- American National Standard Institute (ANSI)
- Safety Standards for Cranes, Derricks, Hoists
- ANSI B30.2 - Overhead and Gantry Cranes
- ANSI B30.16 - Overhead Hoists

## Do's and Don'ts (Safe Operation of Hoists & Vacuum Lifters)

The following are Do's and Don'ts for safe operation of overhead hoists and vacuum lifters. A few minutes spent reading these rules can make an operator aware of dangerous practices to avoid and precautions to take for his own safety and the safety of others. Frequent examinations and periodic inspections of the equipment as well as a conscientious observance of safety rules may save lives as well as time and money.

## DON'TS - HOISTS & VACUUM LIFTERS

1. Never lift or transport a load until all personnel are clear and do not transport the load over personnel.
2. Do not allow any unqualified personnel to operate hoist or vacuum lifter.
3. Never pick up a load beyond the capacity rating appearing on the hoist or vacuum lifter. Overloading can be caused by jerking as well as by static overload.
4. Never carry personnel on the hook, the lift tube, or the load.
5. Do not operate hoist or vacuum lifter if you are not physically fit.

6. Do not tamper with or adjust any parts of the hoist or vacuum lifter unless specifically authorized to do so.
7. Do not divert attention from load while operating hoist or vacuum lifter.
8. Never leave a suspended load unattended.
9. Never operate a hoist or vacuum lifter that has an inherent or suspected mechanical or electrical defect.
10. Do not jog controls unnecessarily.
11. Do not operate hoist or vacuum lifter if load is not centered under hoist or lift tube.
12. Do not operate hoist or vacuum lifter if cable chain or lift tube is twisted, kinked, or damaged.
13. Do not remove or obscure warning labels.

## DO'S - HOISTS & VACUUM LIFTERS

1. Read and follow manufacturer's instruction, installation, and maintenance manuals. When repairing or maintaining a hoist or vacuum lifter, use only manufacturer's recommended parts and materials.
2. Read and follow all instruction and warning information on or attached to a hoist or vacuum lifter.
3. Remove the hoist or vacuum lifter from service and thoroughly inspect and repair, as necessary, if unusual performance or visual defects (such as peculiar noise, jerky operations, travel in improper direction, or obviously damaged parts) are noticed.
4. Establish a regular schedule of inspection and maintain records for all hoists and vacuum lifters.
6. Never lift loads over people, etc.
7. Check for damaged hooks, load cables, and lift tubes.
10. Make sure a load clears neighboring stockpiles, machinery, or other obstructions when raising, lowering, or traveling the load.
11. Center hoist or lift tube over the load before operating.
12. Avoid swinging of load when pivoting the jib.
14. Pull in a straight line, so that neither hoist body nor lift tube are angled around an object.
16. Know the hand signals for hoisting, cross travel, and crane travel if working with cab-operated hoists or cranes. Operators should accept signals of only those persons authorized to give them.

# INSTALLATION

## STEP 1 - PRE-ASSEMBLY

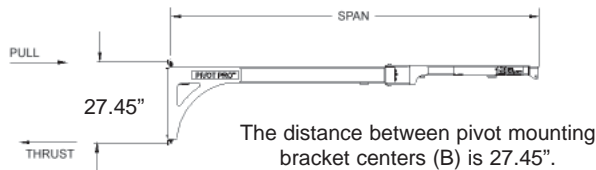
➡ **TIP:** Packing list can be found in plastic pocket inside hardware box: General Arrangement Drawing can be found inserted in this installation manual.

- 1.1 Read entire manual **before** installing the PIVOT PRO®.
- 1.2 Check packing list to ensure no parts have been lost prior to initiating assembly of crane.
- 1.3 Tools and materials (by others) typically needed to assemble crane:
  - Torque wrench
  - Ladders/man lifts
  - Hand tools
  - Heavy duty drill
  - Allen wrenches (1/4", 3/16", 3/8")
  - Steel shims
  - Lifting device to lift heavy masts and booms
  - Teflon® tape
  - Leveling tools (plumb bob, plumb fixture-pg. 9)
  - PPRO-FS anchor bolts (by others, Grade 5 or better), refer to page 5 for specifications
  - PPRO-WM mounting bolts (by others, Ø 5/8" Grade 5 or better)
  - Grout (Non-Shrink Precision Grout for PPRO-FS)

### WARNING

Consult a qualified structural engineer to determine that your support structure is adequate to support the loads generated by thrust and pull (wall mounted) or anchor bolt force, overturning moment, or axial load (free standing) of your PIVOT PRO®.

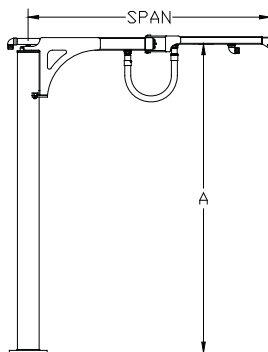
- 1.4 Identify crane type:  
**Wall/Column Mounted PIVOT PRO® (diagram 1A)**  
 Refer to **Chart 1A** to determine thrust and pull, then proceed to **Step 2**, page 6.



**Diagram 1A.** Wall/Column Mounted PIVOT PRO®.

### **Free Standing PIVOT PRO® (diagram 1B)**

Refer to **Chart 1B**, on page 5, to determine anchor bolt load. Refer to **Diagram 3B** on page 8 to determine footer width and depth, then proceed to **Step 3**, page 8.



**Diagram 1B.** Free Standing PIVOT PRO®.

Capacity	Span	Model Number T = Top hose connection B = Bottom hose connection	Thrust & Pull
50#	8'	PPRO-WM-50-8-T PPRO-WM-50-8-B	584#
	10'	PPRO-WM-50-10-T PPRO-WM-50-10-B	756#
	12'	PPRO-WM-50-12-T PPRO-WM-50-12-B	941#
75#	8'	PPRO-WM-75-8-T PPRO-WM-75-8-B	717#
	10'	PPRO-WM-75-10-T PPRO-WM-75-10-B	921#
	12'	PPRO-WM-75-12-T PPRO-WM-75-12-B	1139#
100#	8'	PPRO-WM-100-8-T PPRO-WM-100-8-B	849#
	10'	PPRO-WM-100-10-T PPRO-WM-100-10-B	1086#
	12'	PPRO-WM-100-12-T PPRO-WM-100-12-B	1337#
150#	8'	PPRO-WM-150-8-T PPRO-WM-150-8-B	1114#
	10'	PPRO-WM-150-10-T PPRO-WM-150-10-B	1417#
	12'	PPRO-WM-150-12-T PPRO-WM-150-12-B	1732#

**Chart 1A.** Chart for determining thrust and pull of Wall Mounted PIVOT PRO®.

**Note:** This is based on a lift tube or hoist weight of 40 lbs and a 50% impact factor.

Capacity	A	Span	Model Number T =Top hose connection B= Back hose connection	Anchor Bolt Load
50#	10'	8'	PPRO-FS-50-10-8-T PPRO-FS-50-10-8-B	528#
		10'	PPRO-FS-50-10-10-T PPRO-FS-50-10-10-B	720#
		12'	PPRO-FS-50-10-12-T PPRO-FS-50-10-12-B	927#
	12'	8'	PPRO-FS-50-12-8-T PPRO-FS-50-12-8-B	517#
		10'	PPRO-FS-50-12-10-T PPRO-FS-50-12-10-B	709#
		12'	PPRO-FS-50-12-12-T PPRO-FS-50-12-12-B	916#
75#	10'	8'	PPRO-FS-75-10-8-T PPRO-FS-75-10-8-B	668#
		10'	PPRO-FS-75-10-10-T PPRO-FS-75-10-10-B	897#
		12'	PPRO-FS-75-10-12-T PPRO-FS-75-10-12-B	1142#
	12'	8'	PPRO-FS-75-12-8-T PPRO-FS-75-12-8-B	656#
		10'	PPRO-FS-75-12-10-T PPRO-FS-75-12-10-B	886#
		12'	PPRO-FS-75-12-12-T PPRO-FS-75-12-12-B	1131#
100#	10'	8'	PPRO-FS-100-10-8-T PPRO-FS-100-10-8-B	807#
		10'	PPRO-FS-100-10-10-T PPRO-FS-100-10-10-B	1074#
		12'	PPRO-FS-100-10-12-T PPRO-FS-100-10-12-B	1356#
	12'	8'	PPRO-FS-100-12-8-T PPRO-FS-100-12-8-B	796#
		10'	PPRO-FS-100-12-10-T PPRO-FS-100-12-10-B	1063#
		12'	PPRO-FS-100-12-12-T PPRO-FS-100-12-12-B	1345#
150#	10'	8'	PPRO-FS-150-10-8-T PPRO-FS-150-10-8-B	1086#
		10'	PPRO-FS-150-10-10-T PPRO-FS-150-10-10-B	1428#
		12'	PPRO-FS-150-10-12-T PPRO-FS-150-10-12-B	1785#
	12'	8'	PPRO-FS-150-12-8-T PPRO-FS-150-12-8-B	1075#
		10'	PPRO-FS-150-12-10-T PPRO-FS-150-12-10-B	1417#
		12'	PPRO-FS-150-12-12-T PPRO-FS-150-12-12-B	1774#

**Chart 1B.** Chart for determining anchor bolt load of Free Standing PIVOT PRO®.

**Note:** Loads are based on a 50% impact factor and a maximum lift tube weight of 40 lbs.

## WARNING

Consult a qualified structural engineer if you deviate from the recommended dimensions provided in this manual. Gorbels, Inc. is not responsible for any deviation from these foundation recommendations.



## STEP 2 - PIVOT PRO® (WALL/COLUMN MOUNTED) BOOM INSTALLATION

### STOP!

Do not proceed if your support structure does not meet the loading requirements determined in **Step 1.4**.

- 2.1 Determine position of upper pivot mounting assembly on support structure, and drill bolt holes. **Temporarily** bolt upper pivot mounting assembly to support structure (do not use lock washers).
- 2.2 Determine position of **lower** pivot mounting assembly by dropping plumb bob (by others) through pivot holes (**diagram 2B**).
- 2.3 Drill bolt holes and bolt **lower** pivot mounting assembly to support structure. **Do not** torque bolts until boom weldment is installed.
- 2.4 Remove upper pivot mounting assembly from support structure.
- 2.5 Clean pivot pins with clean, dry cloth. Slide bearings on pivot pins. Be sure to orient bearings correctly (**diagram 2C**).
- 2.6 Lift boom weldment up and insert lower pivot pin into **lower** pivot mounting assembly (**diagram 2D**).

➔ **TIP:** Retain boom and arm together to ease lifting assembly onto mounting brackets.

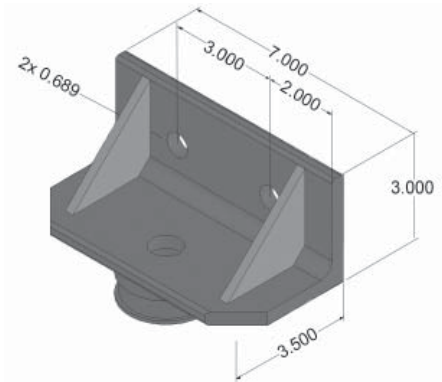


Diagram 2A. Bracket dimensions

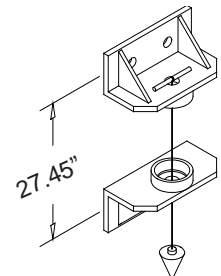


Diagram 2B. Plumbing pivot mounting assemblies.

- 2.7 Place **upper** pivot mounting assembly on upper pivot pin of boom weldment (**diagram 2E**). Bolt **upper** pivot mounting assembly to support structure.

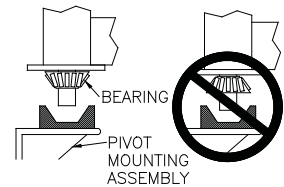


Diagram 2C. Orienting bearing.

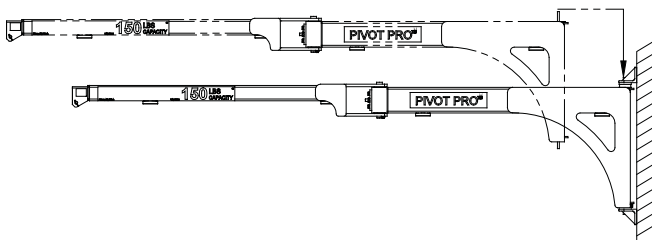


Diagram 2D. Installing boom weldment.

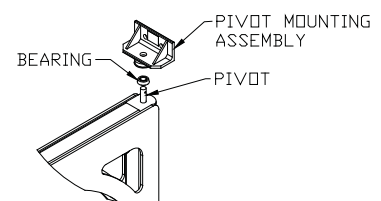
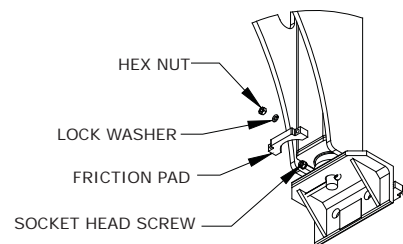


Diagram 2E. Installing upper pivot mounting assembly.



## STEP 2 - PIVOT PRO® (WALL/COLUMN MOUNTED) BOOM INSTALLATION (CONT.)

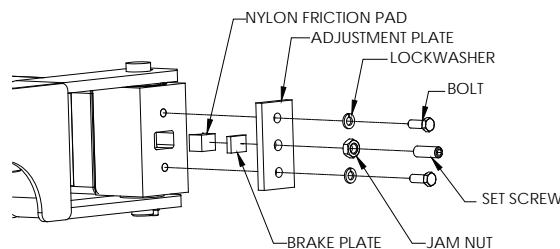
- 2.8** At 45° intervals, check that **pivot pins** of crane are plumb. Shimming of upper and/or lower pivot mounting assembly may be required (shims included).
- 2.9** Once pins are plumb and shimmed, tighten all mounting bolts to manufacturer's specifications.
- 2.10** Carefully swing boom through entire travel to ensure boom is clear of obstructions and does not drift. **If boom drifts**, support structure may be inadequate and/or pivot mounting assemblies may not be aligned (refer to **Step 2.2** for pivot mounting assembly alignment).
- 2.11** Attach two brake pads to the lower pivot mounting assembly using two 1/4" socket head cap screws, lock washers, and lock nuts (**diagram 2F**).
- 2.12** Adjust brake by tightening two lock nuts to achieve desired rotational resistance of the primary arm.



**Diagram 2F.** Installing friction brakes on Wall Mounted PIVOT PRO®.

**WARNING**  
Do not exceed Maximum torque of 25 in-lb.

- 2.13** Adjust as often as required.
- 2.14** To adjust the secondary arm (**diagram 2G**), loosen the set screw and jam nut.
- 2.15** Adjust set screw for desired rotational resistance.
- 2.16** Tighten the jam nut.



**Diagram 2G.** Adjusting the secondary arm on the Wall Mounted PIVOT PRO®.

## STEP 3 - PIVOT PRO® (FREE STANDING) MAST INSTALLATION

### STOP!

Do not proceed if your support structure does not meet the loading requirements determined in **Step 1.4**.

### 3.1 INSTALLING ANCHOR BOLTS

#### 3.1.1 Square Base Plates (4-bolt pattern):

A) Anchor bolts (by others) for base plates must:

- be 3/4" in diameter.
- be embedded at least 4" into floor, not to exceed 3/4 of floor depth (see **diagram 3A**).

**Note:** A minimum 6" thick reinforced concrete floor is required (see **diagram 3B**).

- have **minimum** of two threads above nut after installation

**Note:** PIVOT PRO® foundation requirements 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, with no cracks or seams in a 48" square area around center of mast.

**Note:** Chemical (epoxy) anchor bolts are recommended because of their ability to withstand the vibrating loads caused by the rapid raising or lowering of the load.

B) Drill holes in concrete floor using pre-drilled holes in base plate or **diagram 3C** as a guide (use drill bit size recommended by anchor bolt manufacturer).

C) Install anchor bolts (Grade 5 or better) and hardware (by others) according to manufacturer's installation directions and requirements.

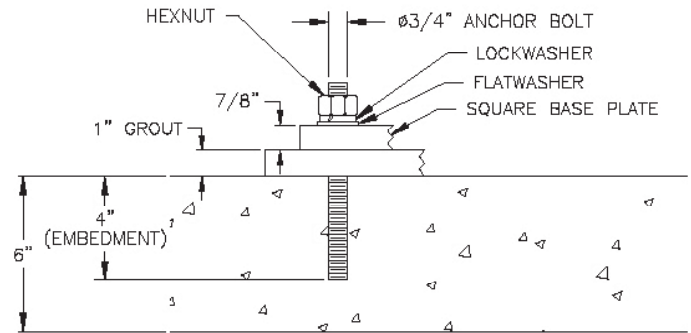


Diagram 3A. Typical square base plate anchor bolt embedment.

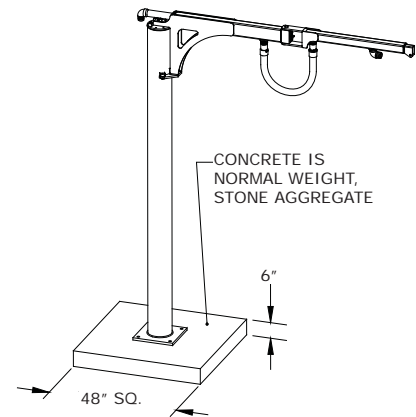


Diagram 3B. Foundation Requirements.

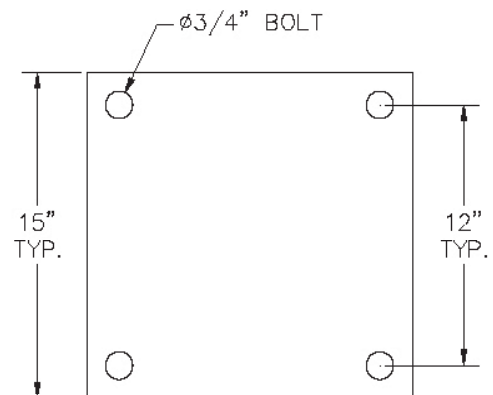


Diagram 3C. Square base plate pattern.

## STEP 3 - PIVOT PRO® (FREE STANDING) MAST INSTALLATION (CONTINUED)

### WARNING

Mast must be plumb to prevent boom from drifting.

### 3.2 INSTALLING AND PLUMBING MAST

- A) Cover entire base plate area with one inch of non-shrink precision grout.
  - B) Set mast into place and make sure that the base plate is completely seated in the grout.
  - C) Drop plumb line (not included) from top of mast, using fixture (not included) or equivalent (**diagram 3D**).
  - D) At point "A", one (1") inch below top mast plate, set plumb line a distance of three (3") inches from surface of mast pipe (**diagram 3E**).
  - E) At point "B", eighteen (18) inches below top mast plate (approximately where cam followers will contact mast pipe), distance between plumb line and face of mast should also be three (3") inches.
  - F) Repeat steps D & E every 60° around the mast to ensure that the mast is plumb throughout.
- Note:** Be sure to fasten plumb line securely to plumb fixture so that it will not move. Movement will result in an inaccurate plumb measurement.
- G) Once mast is plumb **and grout has cured**, fully tighten anchor bolt hardware.

**Note:** If Gorbel is the supplier of the anchor bolts, tighten to full compression of the lock washer.

- H) Verify mast is still plumb.

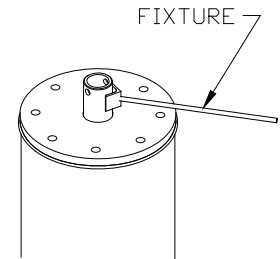


Diagram 3D. Plumbing fixture.

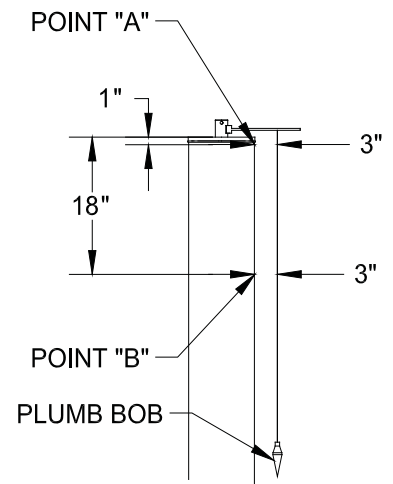
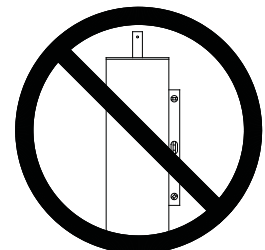


Diagram 3E. Plumbing the mast.

**DO NOT USE  
A LEVEL  
TO PLUMB MAST**

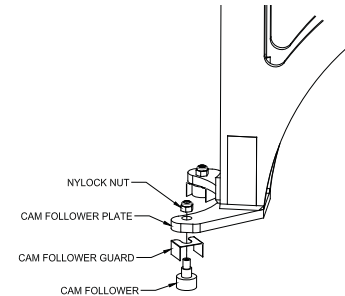


## STEP 4 - PIVOT PRO® (FREE STANDING) BOOM INSTALLATION

➡ **TIP:** Unloaded boom will tilt slightly upward.

- 4.1** Install cam followers onto cam follower plate at bottom of boom assembly (**diagram 4A**).

Position and align cam guards as shown making sure they do not protrude past inside edge of cam follower plate. Tighten nylock nuts until snug. Nuts will need to be tightened to 30 ft-lbs after eccentric cam follower is best oriented to prevent boom drift, see Step 4.4.

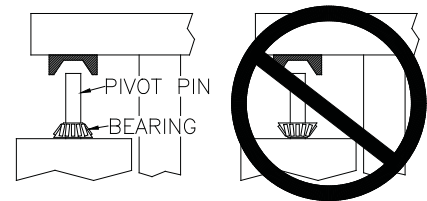


**Diagram 4A.** Installing cam followers.

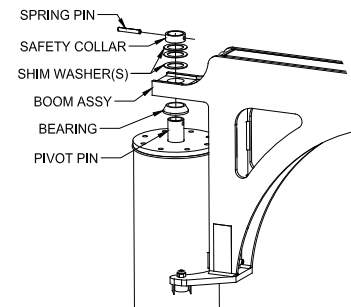
### WARNING

If nylock nut is removed, it must be replaced.

- 4.2** Place and orient pivot bearing on mast pivot pin (**diagram 4B**).
- 4.3** Place boom assembly over pivot pin on mast. Fold secondary arm so that it is close to mast. Stack shim washer(s) and safety collar on pivot pin (**diagram 4C**). (3) 0.048" thick and (1) 0.075" thick shim washers are supplied. Use one or more of these washers as required to minimize the gap between the boom assembly and the safety collar. The safety collar pin hole is slightly offset. This collar may be installed in one of two ways (flipped) to act as a 0.025" thick shim. When properly shimmed, the holes on safety collar and pivot pin will be aligned. Using hammer, tap spring pin until it protrudes equally from either side of safety collar.



**Diagram 4B.** Orienting bearing.



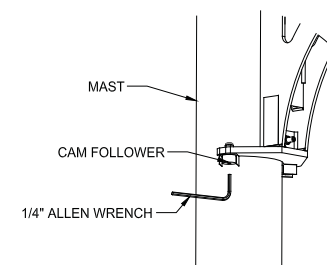
**Diagram 4C.** Installing boom weldment.

➡ **TIP:** Retain boom and arm together to ease lifting assembly onto mounting brackets.

- 4.4** Level boom by evenly adjusting eccentric cam followers with an allen wrench (**diagram 4D**). Once leveled, tighten nylock nuts to 30 ft-lbs.
- 4.5** Check to make sure that both rollers have full face contact with mast pipe.

Carefully swing boom through entire travel to ensure boom is clear of obstructions and does not drift.

**If boom drifts**, make sure that cam followers are evenly adjusted and/or mast is plumb.



**Diagram 4D.** Adjusting eccentric cam followers.

## STEP 5 - PIVOT PRO® (FREE STANDING) BOOM INSTALLATION (CONT.)

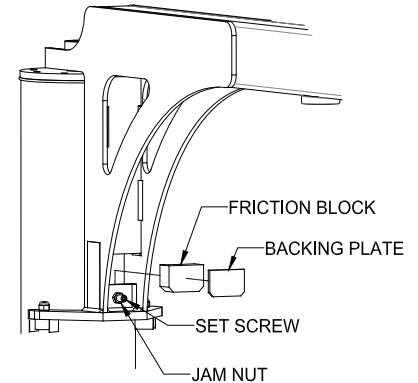
### 4.6 INSTALLING FRICTION BRAKES ON FREE STANDING PIVOT PRO® (diagram 4E)

#### Primary Arm

- A) Loosen set screw and jam nut.
- B) Place friction block and backing plate between mast and boom as shown. Bottom of block and plate should rest squarely on top of cam follower plate.
- C) Adjust set screw for desired rotational resistance.  
DO NOT adjust such that cam followers are no longer in contact with mast.
- D) Tighten jam nut.

#### Secondary Arm Adjustment (diagram 4F)

- E) Loosen set screw and jam nut.
- F) Adjust set screw to desired rotational resistance
- G) Tighten jam nut.

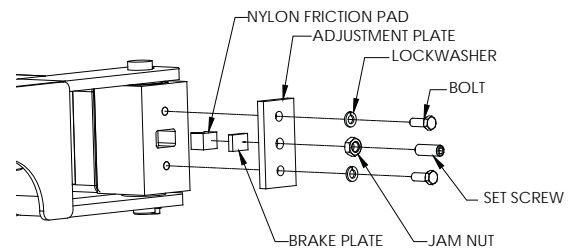


**Diagram 4E.** Installing friction brakes on the Free Standing PIVOT PRO®.

### 4.7 INSTALLING ROTATION STOPS ON FREE STANDING PIVOT PRO® (diagram 4G)

Eight rotation limit holes are located on the top plate of the mast allowing for 45° adjustment increments.

Two rotation limits are supplied with the Free Standing PIVOT PRO®.

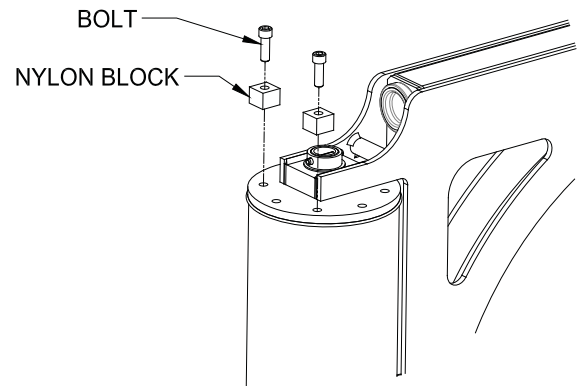


**Diagram 4F.** Adjusting the secondary arm on the Free Standing PIVOT PRO®.

### WARNING

At least one rotation stop must be installed to prevent tangling and tugging of vacuum, air, or electric hoses.

- A) Swing boom to maximum rotation in one direction.
- B) Back off boom rotation until first available hole in top plate is exposed.
- C) Install nylon block. Orient block such that block diagonal is radial to pivot pin center.
- D) Gently swing boom until boom sideplate is in full contact with nylon block.
- E) Tighten block with 3/8" allen wrench until nylon material is slightly compressed.



**Diagram 4G.** Installing rotation stops on the Free Standing PIVOT PRO®.

### WARNING

Rotation Stops are meant to limit rotation, not stop rotation.

## STEP 5 - VACUUM HOSE INSTALLATION

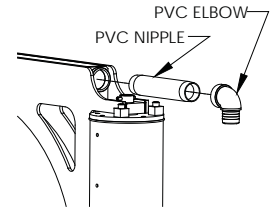
The Wall Mounted and Free Standing PIVOT PRO® units come with vacuum-ready hose kits. The kit includes four PVC fittings, two hose clamps, and a pivoting hose assembly. The hose assembly consists of four feet of 2" commercial grade vacuum hose with a poly-welded cuff on one end. The other end has a replaceable screw-on swivel cuff.

Different fittings are supplied for Back, Top, or Bottom entry (**diagrams 5A, 5B, and 5C**). Typically, the Vacuum Lifter Dealer will supply any additional hose and fittings required to mate with the 2" barbed fittings supplied by Gorbelt.

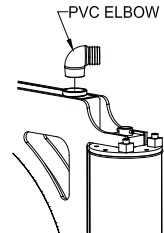
Optional additional hose and fittings (**diagram 5D**) are also available through Gorbelt.

- 5.1 Remove protective plastic pipe plugs from the boom openings.
- 5.2 Wrap threads of PVC fittings with Teflon® tape.
- 5.3 Install fittings into 2"NPT couplings of boom. Do NOT over tighten. PVC fittings should not be tightened more than 2 turns past finger tight.
- 5.4 Place hose clamp over hose end, push hose end over barbed fitting, and tighten hose clamp (**diagram 5E**).
- 5.5 Install other adapters, fittings and hoses as required. Make sure hose has enough slack and is properly positioned to provide unrestricted pivoting at mast or wall.

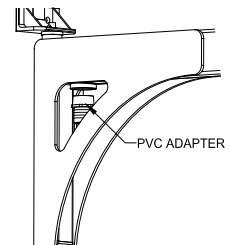
Please refer to the instructions that came with your Vacuum Lifter (supplied by others) for installation of all other vacuum components.



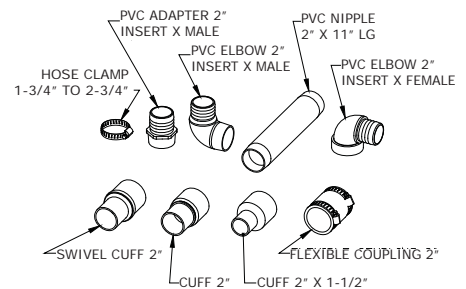
**Diagram 5A.** Example of Back Hose Entry



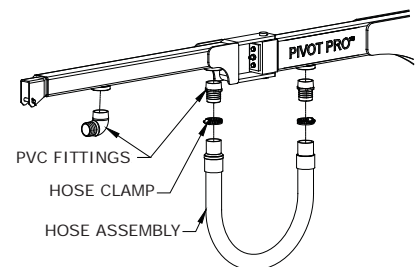
**Diagram 5B.** Example of Top Hose Entry



**Diagram 5C.** Example of Bottom Hose Entry



**Diagram 5D.** Additional hose and fittings



**Diagram 5E.** Installing vacuum hose

## STEP 6 - ACCESSORIES (OPTIONAL) INSTALLATION

### WARNING

NEVER place base on an uneven surface.

### WARNING

ALWAYS remove load and secure boom prior to moving base.

### WARNING

When moving, NEVER elevate portable base more than a few inches above the floor or ground surface.

### WARNING

NEVER lift loads greater than specified for the base/jib combination (table 6.1).

### 6.1 INSTALLING PORTABLE BASE (*diagram 6A*)

- A) Verify the portable base is the correct size for the span and capacity PIVOT PRO®. Measure the base square width and thickness and refer to (**table 6.1, page 14**) for allowable capacities and corresponding spans. **NEVER use the optional portable base for a PIVOT PRO® with a higher capacity and corresponding span.** Derated capacity labels are available from Gorbelt.
- B) Place portable base on an even surface capable of supporting the combined weight of the base, jib, and load.
- C) Level base using adjustment feet by loosening top nut and raising or lowering bottom nut. Repeat this for each foot until base is level. The base **MUST BE** supported by all four adjustable feet and **NOT** by the fork pockets. Tighten jam top nut.
- D) Secure boom (or assemble mast to base prior to boom assembly).
- E) Lower mast onto protruding bolts of base.
- F) Assemble flat washers, lock washers and nuts as shown. Tighten to 175 ft-lbs. Check for boom drift and adjust feet as required.
- G) When moving base and jib, make sure pallet jack or fork truck has sufficient capacity to lift load.
- H) Always use fork pockets in base to squarely position forks of pallet jack or fork truck.
- I) Do not tilt base while lifting and moving.

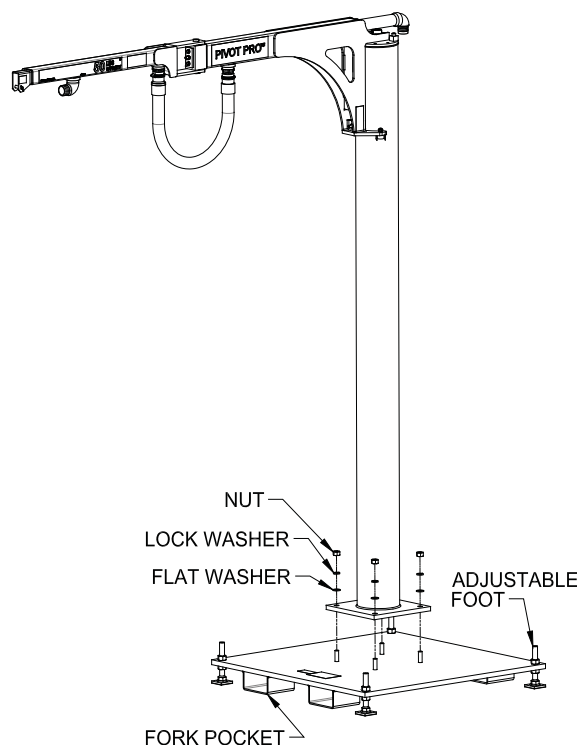


Diagram 6A. Installing portable base



## STEP 6 - ACCESSORIES (OPTIONAL) INSTALLATION

SPAN	CAPACITY	50#	75#	100#	150#
8'	Model Number	PB-48-10	PB-48-10	PB-48-12	PB-54-12
	Square Length	48"	48"	48"	54"
	Thickness	1"	1"	1.25"	1.25"
	Shipping Weight	696#	696#	858#	1098#
10'	Model Number	PB-48-10	PB-48-12	PB-54-12	PB-60-12
	Square Length	48"	48"	54"	60"
	Thickness	1"	1.25"	1.25"	1.25"
	Shipping Weight	696#	858#	1098#	1363#
12'	Model Number	PB-48-12	PB-54-12	PB-60-12	PB-60-15
	Square Length	48"	54"	60"	60"
	Thickness	1.25"	1.25"	1.25"	1.5"
	Shipping Weight	858#	1098#	1363#	1617#

Table 6.1. Portable Base & Jib compatibility

### 6.2 INSTALLING BLOWER PLATFORM (diagram 6B)

- Transfer blower mounting pattern to the blower platform. Allow room for hose connections. Verify blower mounting hole locations are far enough away from blower platform verticals to allow for mounting hardware.
- Drill top of platform for blower mounting.
- Position blower platform on mast and align 3/8"-16 tapped holes in mast with countersunk holes in blower platform verticals. Note, two strap slots are provided in the platform to assist in positioning.
- Install 3/8"-16 x 3/4" long flat head cap screws with 7/32" allen wrench. Tighten to 20 ft-lbs.
- Position blower onto platform and continue connections as required per blower manufacturer's instructions.

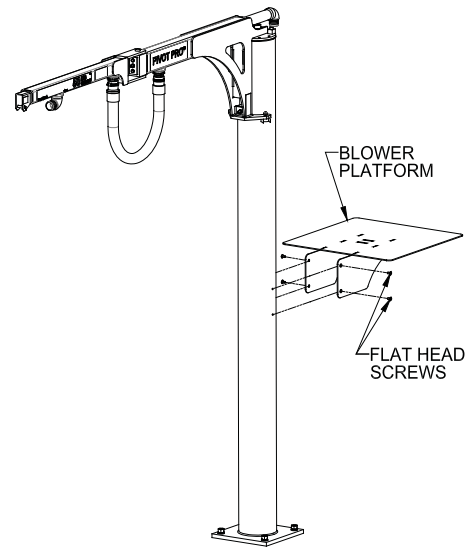


Diagram 6B. Installing blower platform

### 6.3 INSTALLING FILTER BRACKET (diagram 6C)

The filter bracket allows for weld-free mounting of the blower filter. Review the filter manufacturer's instructions for proper filter orientation. The filter bracket can be mounted vertically or horizontally depending on the filter's bolt hole locations.

- Transfer filter mounting pattern to the filter bracket.
- Drill filter bracket for filter mounting.
- Position filter bracket on mast and align 3/8"-16 tapped hole in mast with countersunk hole in filter bracket.
- Install 3/8"-16 x 1-1/2" long flat head cap screws with 7/32" allen wrench. Tighten to 20 ft-lbs.
- Position filter on bracket and continue connections as required per filter manufacturer's instructions.

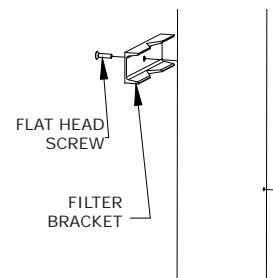


Diagram 6C. Installing filter bracket

## STEP 6 - ACCESSORIES (OPTIONAL) (CONTINUED)

### 6.4 INSTALLING SMART HOOK (diagram 6D)

Smart Hook provides a convenient location to place your lift tube controls and head when not in use.

- A) Position Smart Hook on mast and align 5/16"-18 tapped hole in mast with hole in filter bracket.
- B) Install 5/16"-18 x 3/4" long hex head cap screw. Tighten to 15 ft-lbs.
- C) Position your lifter tube controls onto the smart hook.

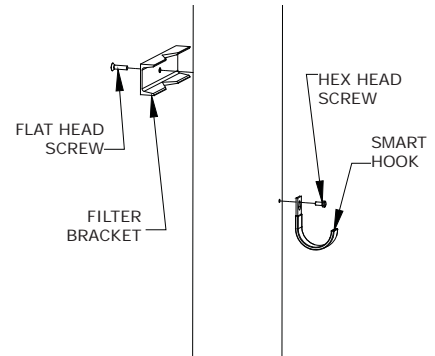


Diagram 6D. Installing Smart Hook

### 6.5 INSTALLING ROTATION STOPS ON WALL MOUNTED PIVOT PRO® (diagram 6E)

#### WARNING

Rotation Stops are meant to limit rotation, not stop rotation.

Contact Gorbel® Customer Service at 800-821-0086 for further instructions.

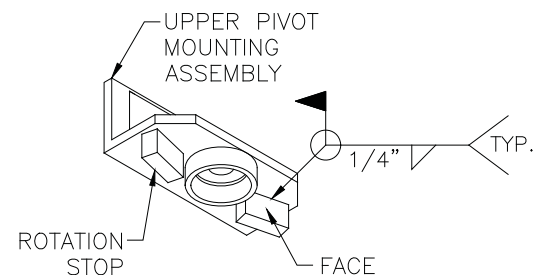


Diagram 6E. Welding rotation stops on the Wall Mounted PIVOT PRO™

## STEP 7 - FINAL STEPS

➡ **TIP:** Do not throw away this manual: maintenance schedule is on back cover.

- 7.1 Check to make sure all bolts are tight and lock washers are compressed.
- 7.2 If necessary, touch up crane with paint provided.
- 7.3 Keep Packing List, Installation Manual, General Arrangement Drawing, and any other inserts filed together in a safe place.

## LIMITED WARRANTY

It is agreed that the equipment purchased hereunder is subject to the following LIMITED warranty and no other. Gorbel Incorporated ("Gorbel") warrants the manual push-pull Work Station Cranes, Jib Crane, and Gantry Crane products to be free from defects in material or workmanship for a period of ten years or 20,000 hours use from date of shipment. Gorbel warrants the Motorized Work Station Cranes and Jib Crane products to be free from defects in material or workmanship for a period of two years or 4,000 hours use from the date of shipment. Gorbel warrants the G-Force® and Easy Arm™ products to be free from defects in material or workmanship for a period of one year or 2,000 hours use from the date of shipment. This warranty does not cover Gantry Crane wheels. This warranty shall not cover failure or defective operation caused by operation in excess of recommended capacities, misuses, negligence or accident, and alteration or repair not authorized by Gorbel. No system shall be field modified after manufacture without the written authorization of Gorbel, Inc. Any field modification made to the system without the written authorization of Gorbel, Inc. shall void Gorbel's warranty obligation. OTHER THAN AS SET FORTH HEREIN, NO OTHER EXPRESS WARRANTIES, AND NO IMPLIED WARRANTIES, ORAL OR WRITTEN, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, ARE MADE BY GORBEL WITH RESPECT TO ITS PRODUCTS AND ALL SUCH WARRANTIES ARE HEREBY SPECIFICALLY DISCLAIMED. GORBEL SHALL NOT BE LIABLE UNDER ANY CIRCUMSTANCES FOR ANY INCIDENTAL, SPECIAL AND/OR CONSEQUENTIAL DAMAGES WHATSOEVER, WHETHER OR NOT FORESEEABLE, INCLUDING BUT NOT LIMITED TO DAMAGES FOR LOST PROFITS AND ALL SUCH INCIDENTAL, SPECIAL AND/OR CONSEQUENTIAL DAMAGES ARE HEREBY ALSO SPECIFICALLY DISCLAIMED. Gorbel's obligation and Purchaser's or end user's sole remedy under this warranty is limited to the replacement or repair of Gorbel's products at the factory, or at the discretion of Gorbel, at a location designated by Gorbel. Purchaser or end user shall be solely responsible for all freight and transportation costs incurred in connection with any warranty work provided by Gorbel hereunder. Gorbel will not be liable for any loss, injury or damage to persons or property, nor for damages of any kind resulting from failure or defective operation of any materials or equipment furnished hereunder. Components and accessories not manufactured by Gorbel are not included in this warranty. Purchaser's or end user's remedy for components and accessories not manufactured by Gorbel is limited to and determined by the terms and conditions of the warranty provided by the respective manufacturers of such components and accessories.

**A) DISCLAIMER OF IMPLIED WARRANTY OF MERCHANTABILITY**

Gorbel and Purchaser agree that the implied warranty of merchantability is excluded from this transaction and shall not apply to the goods involved in this transaction.

**B) DISCLAIMER OF IMPLIED WARRANTY OF FITNESS FOR PARTICULAR PURPOSE**

Gorbel and Purchaser agree that the implied warranty of fitness for particular purpose is excluded from this transaction and shall not apply to the goods involved in this transaction.

**C) DISCLAIMER OF EXPRESS WARRANTY**

Gorbel's agents, or dealer's agents, or distributor's agents may have made oral statements about the machinery and equipment described in this transaction. Such statements do not constitute warranties, and Purchaser agrees not to rely on such statements. Purchaser also agrees that such statements are not part of this transaction.

**D) DISCLAIMER OF SPECIAL, INCIDENTAL AND CONSEQUENTIAL DAMAGES**

Gorbel and Purchaser agree that any claim made by Purchaser which is inconsistent with Gorbel's obligations and the warranty remedies provided with Gorbel's products, and in particular, special, incidental and consequential damages, are expressly excluded.

**E) DEALER OR DISTRIBUTOR NOT AN AGENT**

Gorbel and Purchaser agree that Purchaser has been put on notice that dealer or distributor is not Gorbel's agent in any respect for any reason. Gorbel and Purchaser also agree that Purchaser has been put on notice that dealer or distributor is not authorized to incur any obligations or to make any representations or warranties on Gorbel's behalf other than those specifically set forth in Gorbel's warranty provided in connection with its product.

**F) MERGER**

This warranty agreement constitutes a final and complete written expression of all the terms and conditions of this warranty and is a complete and exclusive statement of those terms.

**G) PAINTING**

Every crane (excluding components) receives a quality paint job before leaving the factory. Unfortunately, no paint will protect against the abuses received during the transportation process via common carrier. We have included at least one (1) twelve ounce spray can for touchup with each crane ordered (unless special paint was specified). If additional paint is required, contact a Gorbel® Customer Service Representative at 1-800-821-0086 or 1-585-924-6262.

### Title and Ownership:

Title to the machinery and equipment described in the foregoing proposal shall remain with Gorbel and shall not pass to the Purchaser until the full amount herein agreed to be paid has been fully paid in cash.

### Claims and Damages:

Unless expressly stated in writing, goods and equipment shall be at Purchaser's risk on and after Seller's delivery in good shipping order to the Carrier. Gorbel shall in no event be held responsible for materials furnished or work performed by any person other than it or its authorized representative or agent.

### Cancellations:

If it becomes necessary for the purchaser to cancel this order wholly or in part, he shall at once so advise Gorbel in writing. Upon receipt of such written notice all work will stop immediately. If the order entails only stock items, a flat restocking charge of 15% of the purchase price will become due and payable by Purchaser to Gorbel. Items purchased specifically for the canceled order shall be charged for in accordance with the cancellation charges of our supplier plus 15% for handling in our factory. The cost of material and/or labor expended in general fabrication for the order shall be charged for on the basis of total costs to Gorbel up to the time of cancellation plus 15%.

### Returns:

No equipment, materials or parts may be returned to Gorbel without express permission in writing to do so.

Extra Charge Delay: If Purchaser delays or interrupts progress of Seller's performance, or causes changes to be made, Purchaser agrees to reimburse Gorbel for expense, if any, incident to such delay.

### Changes and Alterations:

Gorbel reserves the right to make changes in the details of construction of the equipment, as in its judgment, will be in the interest of the Purchaser; will make any changes in or additions to the equipment which may be agreed upon in writing by the Purchaser; and Gorbel is not obligated to make such changes in products previously sold any customer.

### Third Party Action:

Should Gorbel have to resort to third party action to collect any amount due after thirty (30) days from date of invoice, the Purchaser agrees to pay collection costs, reasonable attorney's fees, court costs and legal interest.

### OSHA Responsibilities:

Gorbel agrees to fully cooperate with Purchaser in the design, manufacture or procurement of safety features or devices that comply with OSHA regulations. In the event additional equipment or labor shall be furnished by Gorbel, it will be at prices and standard rates then in effect, or as may be mutually agreed upon at the time of the additional installation.

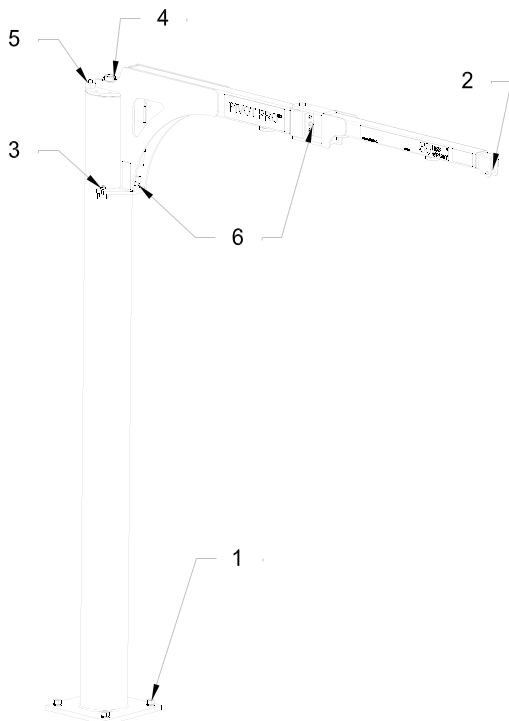
### Equal Employment Opportunity:

Gorbel agrees to take affirmative action to ensure equal employment opportunity for all job applicants and employees without regard to race, color, age, religion, sex, national origin, handicap, veteran, or marital status. Gorbel agrees to maintain non-segregated work facilities and comply with rules and regulations of the Secretary of Labor or as otherwise provided by law or Executive Order.

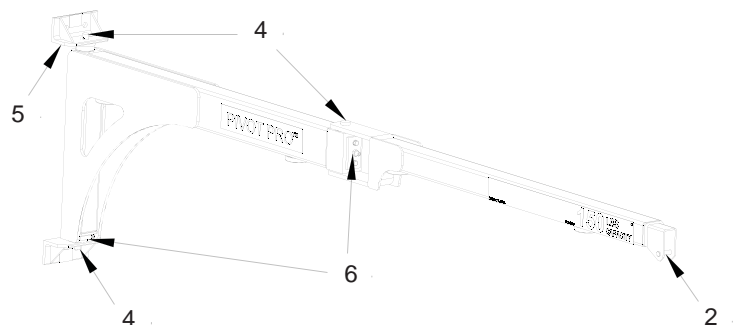
# INSPECTION AND MAINTENANCE SCHEDULE

GORBEL® PIVOT PRO® INSPECTION AND MAINTENANCE SCHEDULE			
ITEM	COMPONENT	MAINTENANCE	FREQUENCY*
1	Mounting Bolts and Anchor Bolts	Check that lock washers are compressed and nuts tightened to manufacturer's specifications.	Every 500 hours or 3 months
2	Clevis Pin	Check that cotter pin is properly installed. Check that clevis pin is not deformed.	Every 2000 hours or yearly
3	Cam Followers	Check to make sure both rollers have full face contact with pipe. Make sure nylock nuts are tight.	Every 1000 hours or 6 months
4	Pivot Pins	Check that cotter pin, spring pin, and square washer are properly installed so that boom cannot dislodge.	Every 2000 hours or yearly
5	Rotation Limits	Check for deformation. Make sure that bolt is tightened. Replace block if deformed.	Every 1000 hours or 6 months
6	Arm Rotation	Adjust friction brakes to achieve desired rotational resistance.	Every 1000 hours or 6 months
7	Accessory Items	Conduct a general inspection of all accessory items.	Every 1000 hours or 6 months
8	Gorbel® Crane	Conduct a visual inspection of the crane overall.	Every 1000 hours or 6 months
9	Vacuum Tube Lifter	Conduct a visual inspection of the vacuum tube lifter overall.	According to Manufacturer's Requirements

\*Federal, state and local codes may require inspection and maintenance checks more often. Please check the federal, state and local code manuals in your area.



**FREE STANDING  
PIVOT PRO®**



**WALL MOUNTED  
PIVOT PRO®**

**GORBEL®**  
A CLASS ABOVE

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