ROTARY UNION ARM

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Vektek LLC reserves the right to change specifications without notice in an ongoing product improvement process.

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Section 1. Introduction

1.01 Vektek Rotary Union Arm

The Vektek Rotary Union Arm is a productivity device in our hydraulic rotary union family. It is intended to provide anti-rotation torque to individual, live hydraulic fixtures on horizontal machining centers.

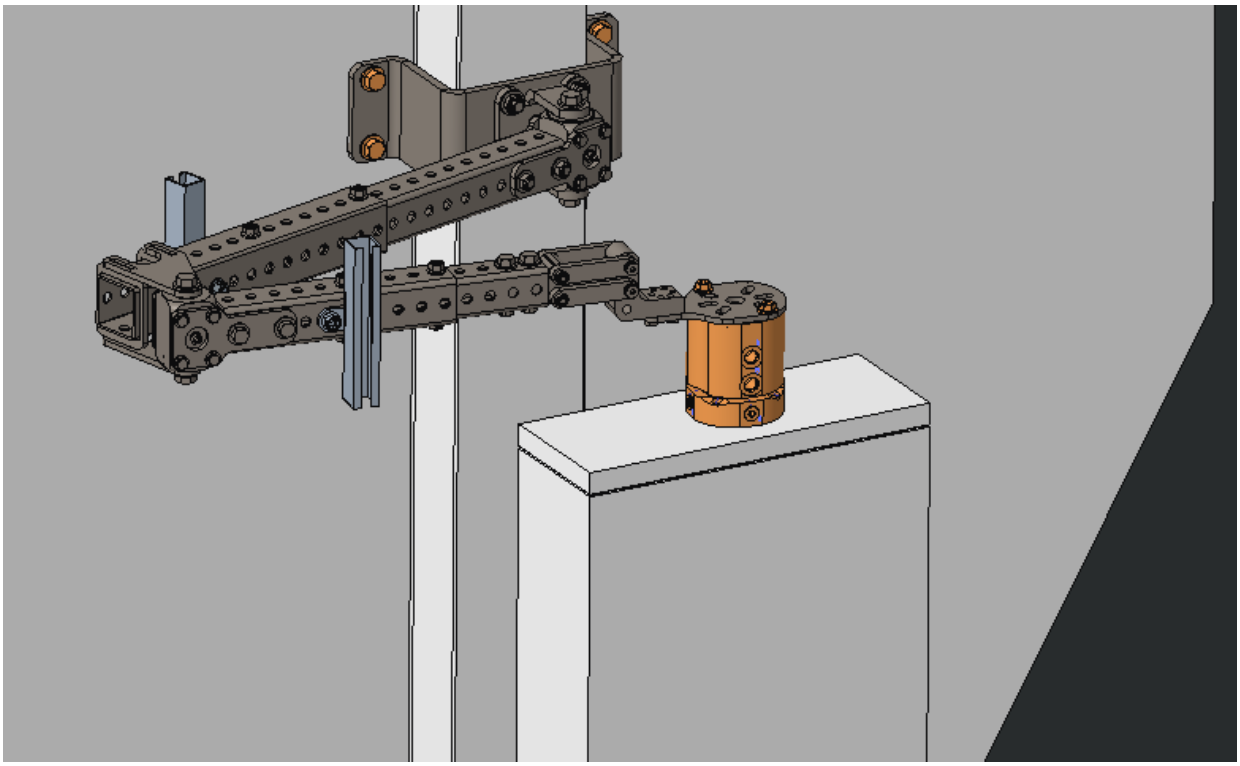


Figure 1 - Rotary Union Arm render in horizontal machining center

Hydraulic rotary unions require torque to allow the two halves to rotate independently. This torque increases with pressure and the number of paths in a rotary union. Hoses alone should never be used to control the movement of a rotary union. In some cases, such as on indexers, a simple plate of steel can be used to ensure rotation. When a rotary union is used on a horizontal machining center, applying this anti-rotation torque requires a specialized articulating arm.

Section 2. Required Equipment

2.01 Live Hydraulics

The rotary union arm is used with live hydraulics – or continuously supplying hydraulic pressure to a fixture while being machined. This requires the use of rotary unions and hoses.

2.02 Machine Requirements

The rotary union arm is intended to be used on dual pallet horizontal machining centers where the fixture only travels in one axis perpendicular to the pallet changer wall. Other applications may be possible, but modification is likely necessary. The machine must be outfitted for live hydraulics. Live hydraulics require a hydraulic pump, valve bank, a main rotary union, two rotary union arms, and two fixture level rotary unions. The main rotary union is located on top of the pallet changer door. This supplies hydraulic pressure to both pallets and continuous pressure during a pallet change.

2.03 Machine Size and Travel Restrictions

The rotary union arm is sized for 400-500mm or 630-800mm pallet horizontal machining centers. It can accommodate a maximum z-axis travel of 48 or 60 inches. Maximum reach of the standard arm is 59.19 or 71.83 inches. Maximum reach is the distance from the rotary union mount to max possible extension in the z-axis. If your machine is within the max z- axis travel but beyond the max reach, a custom bracket may be used to extend the reach. If your machine extends beyond the max z-axis travel, consult the factory. See Figure 2 below for additional details.

2.04 Tool and hardware list

(1) Tape measure
(2) Inch end wrench set
(3) Inch socket set
(4) Adjustable torque wrench
(5) 3/16” hex driver or allen wrench
(6) Level
(7) 17/32” drill bit
(8) Pilot drill bit
(9) Medium strength Loctite
(10) ½-13 bolts, washers and nuts for mounting to machine.
(11) Hardware to attach to rotary union (refer to rotary union spec)
(12) Bearing grease for periodic maintenance
(13) Appropriate hose clamps

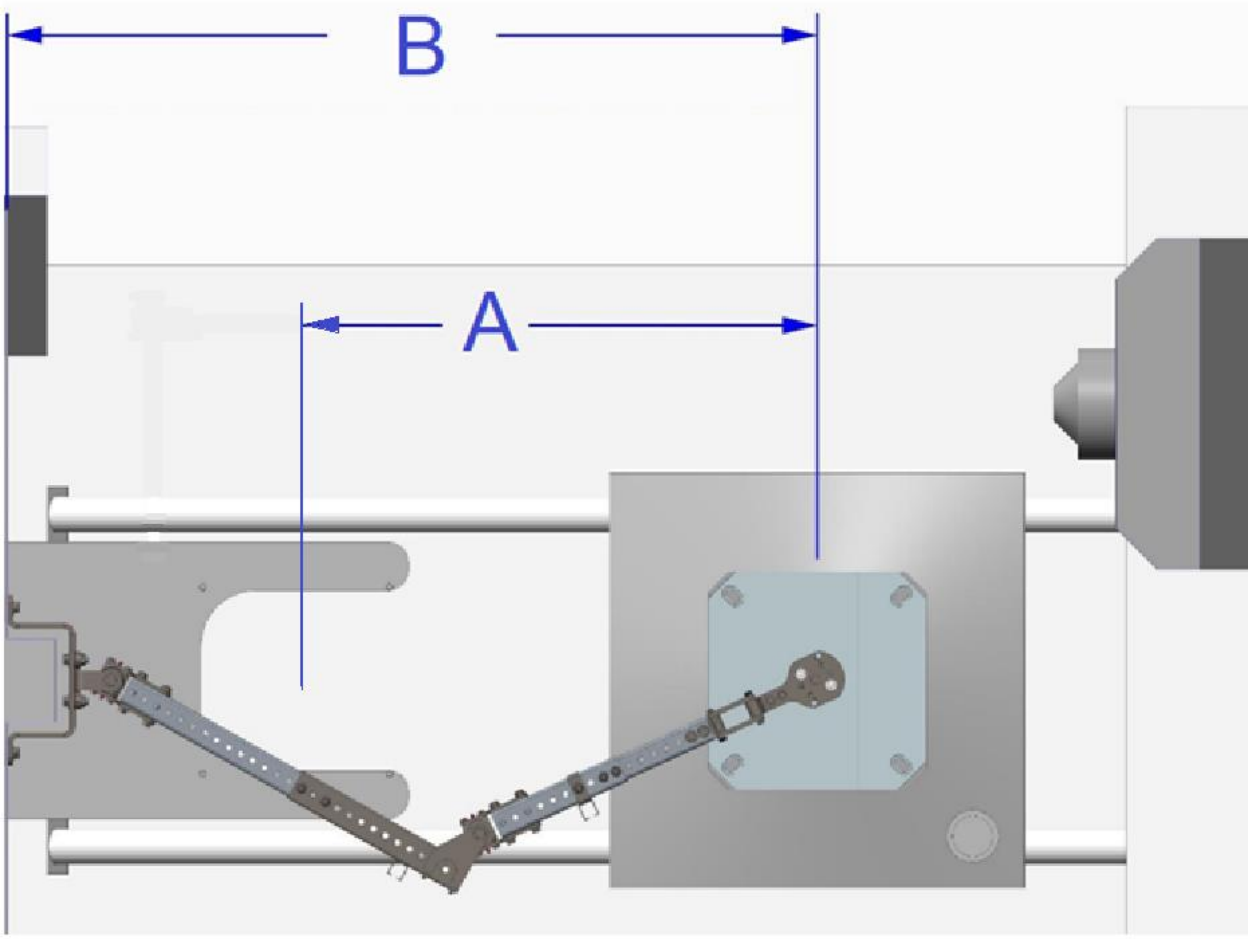


Figure 2 - Maximum travels of the standard rotary union arm

PALLET SIZE	A MAX REACH OF ARM	B MAX Z-AXIS TRAVEL
400-500mm	48	59.19
630-800mm	60	71.83

See rotary union section in catalog or download CAD file on Vektek's website. Go to www.vektek.com and search for the product part number.

Section 3. Operation

3.01 Intended use of Device

The Rotary Union Arm provides anti-rotation to fixture level rotary unions on horizontal machining centers. It is intended to be used in pairs, back to back, in dual-pallet horizontal machining centers. Various provisions have been made for the arm to be universal, allowing it to be installed on almost any machine within the size range. Tubing used to extend the arm is perforated and telescoping, allowing customers to install the arm and then adjust it according to machine clearances and travels. The arm comes standard with an extension bracket installed, but this can be easily removed to provide additional mounting options. Each joint contains opposing tapered roller bearings, providing a robust, reliable and limited maintenance mechanism. Each arm comes standard with two hose clamp mounting rails. Hose clamps are available from Vektek. The arm has a floating fixture interface, this mechanism isolates the fixture rotary union from damaging side loads and allows for the vertical movement of the fixture during pallet change and machining. The fixture interface has numerous configurations allowing for more flexibility or compensating for installation misalignments. The fixture interface plate will fit all Vektek Inch hydraulic rotary unions. The plate also orients the rotary union ports to be 90-degree offset from arm (must use side ports).

3.02 Rotary Union Arm shipping specifications

A Rotary Union Arm is shipped in three main pieces: the machine interface, the elbow, fixture interface (w/hardware). Two hose clamp rails, two, optional sandwich plates and extension hardware are also shipped loose. The Arm is shipped in pieces for ease of shipping, handling, and installation. The pieces can be easily assembled by sliding them together and tightening provided hardware. See figures 3A and 3B,along with Table 1, below for what to expect.

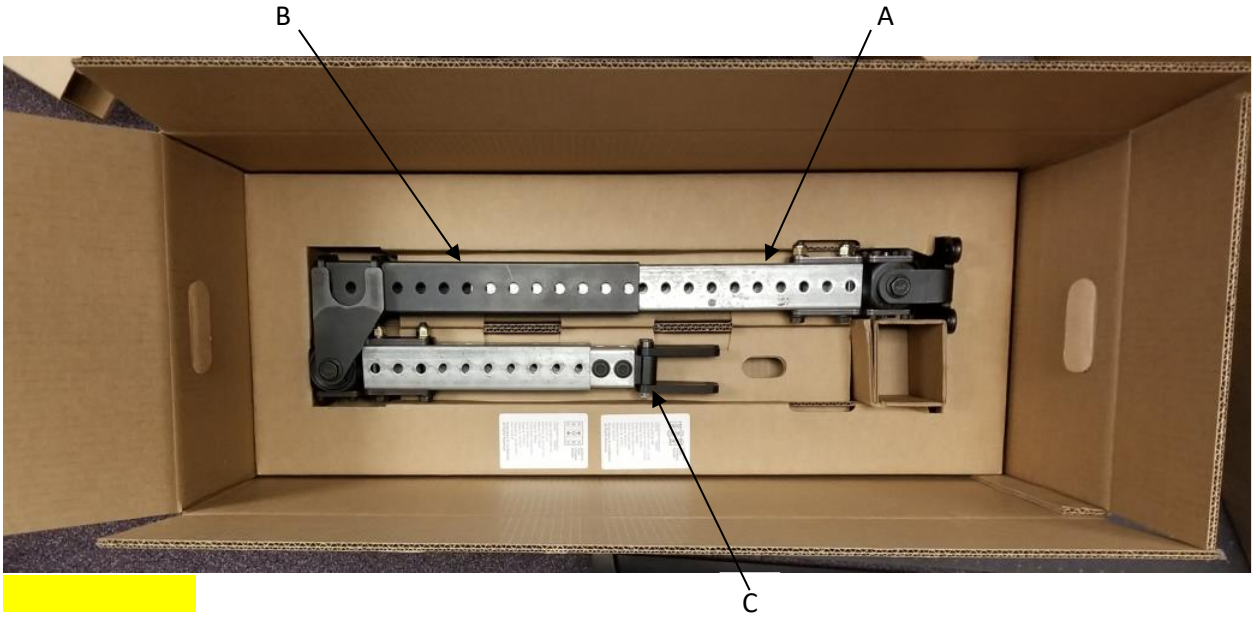


Figure 3A - As shipped: Bottom level (box layout)

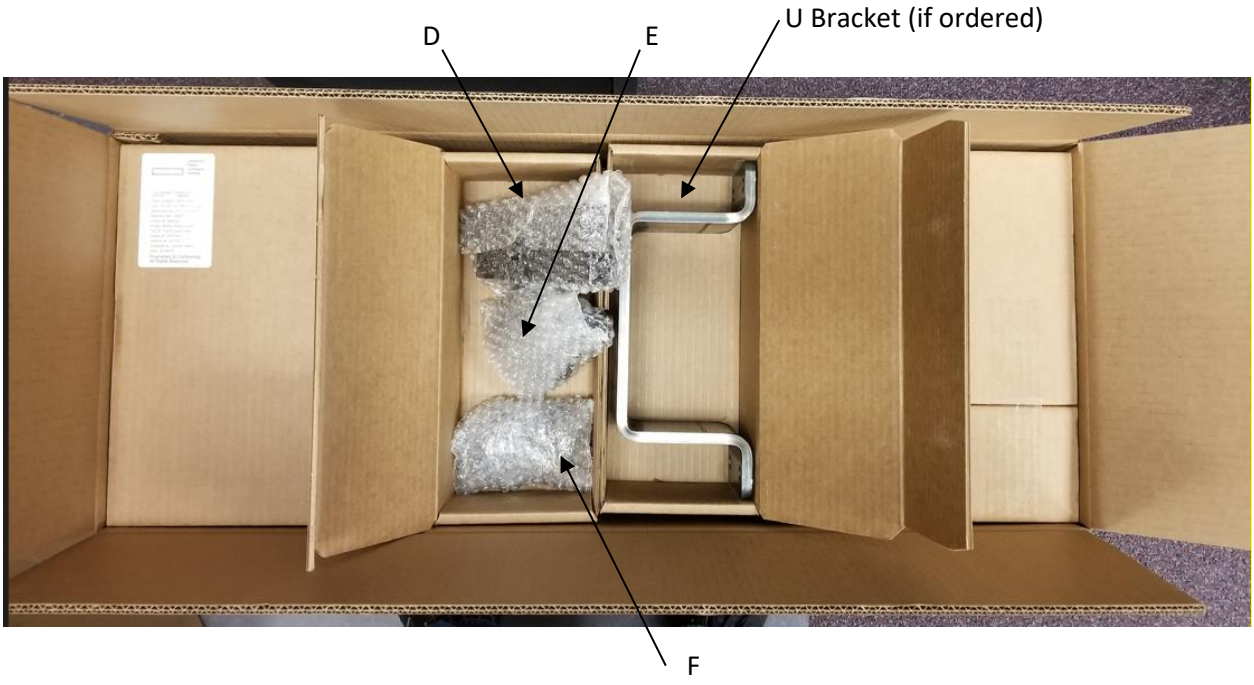
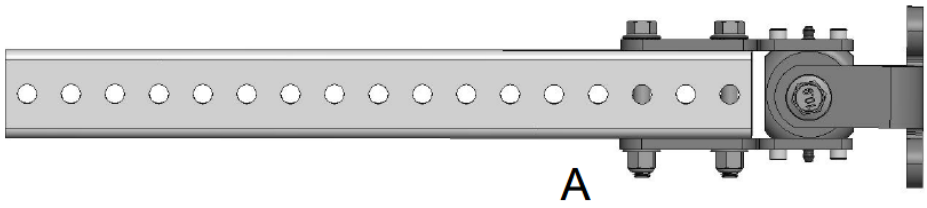
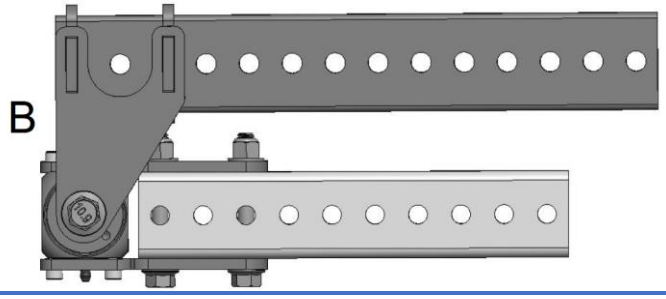
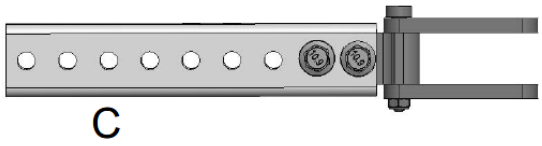
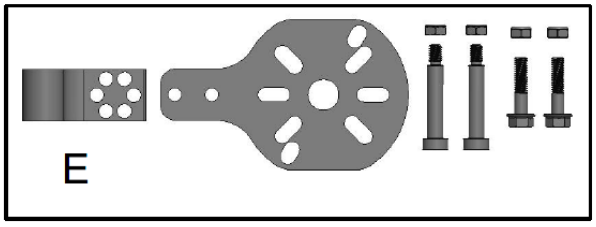
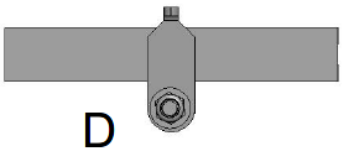
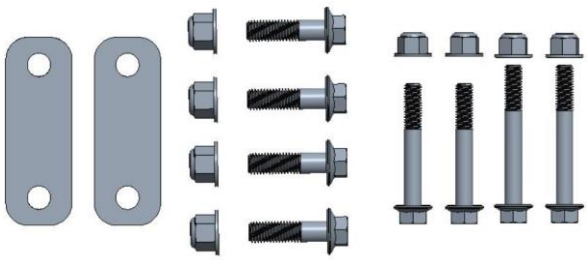


Figure 3B – As shipped: Top level (box layout

Table 1 - Rotary Union Arm Components and Labels

Machine Interface	
Elbow	
Fixture Interface w/hardware	 
Hose Clamp Rail	
Sandwich Plates w/machine interface hardware &extension hardware	

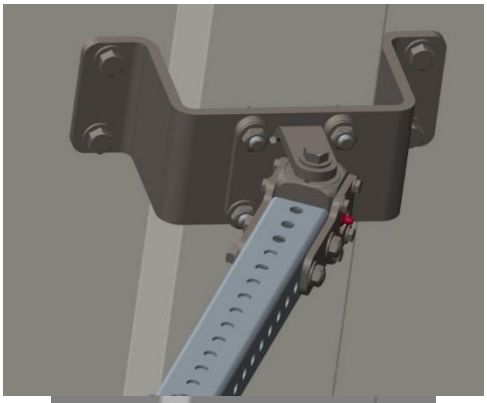
Section 4. Installation

4.01 Steps to Install Device

(1) Determine what brackets you will use to ensure the correct travel.

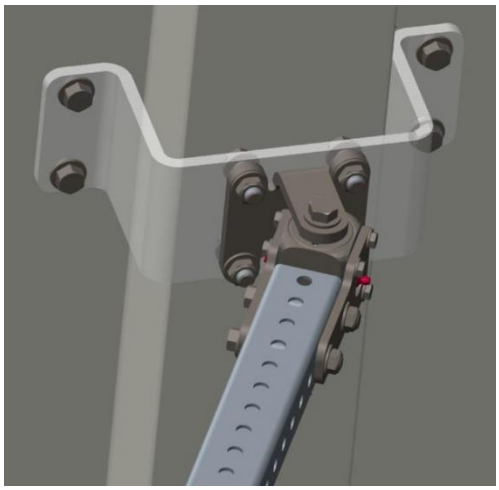
(a) The arm can be mounted with the standard extension bracket, the standard base bracket or a custom bracket bolted to the base bracket.

Standard extension bracket



Standard base bracket

Custom bracket (supplied by customer) with base bracket



(2) Locate where to mount the arm on the machine pallet wall.

(a) Mount the rotary union arm such that the base is centered with the z-axis of the machine. This is not required but it maximizes the range of the arm and allows you to put two back to back.

(b) The height of the arm on the pallet wall should correspond to the location of the rotary union on the fixture. The arm is designed with up to 7.94 inches of configurable range. As long as the vertical travel of the fixture is within this range the arm will function properly.

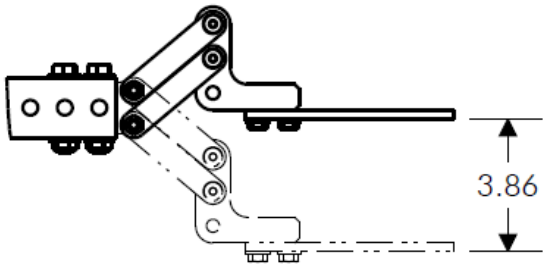


Figure 4 - Vertical Movement Range

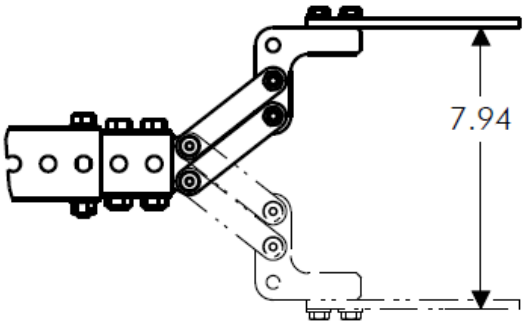


Figure 5 - Configurable vertical range

(c) Mount directly to sheet metal. If your machine has a window do not use any surface of the window for mounting.

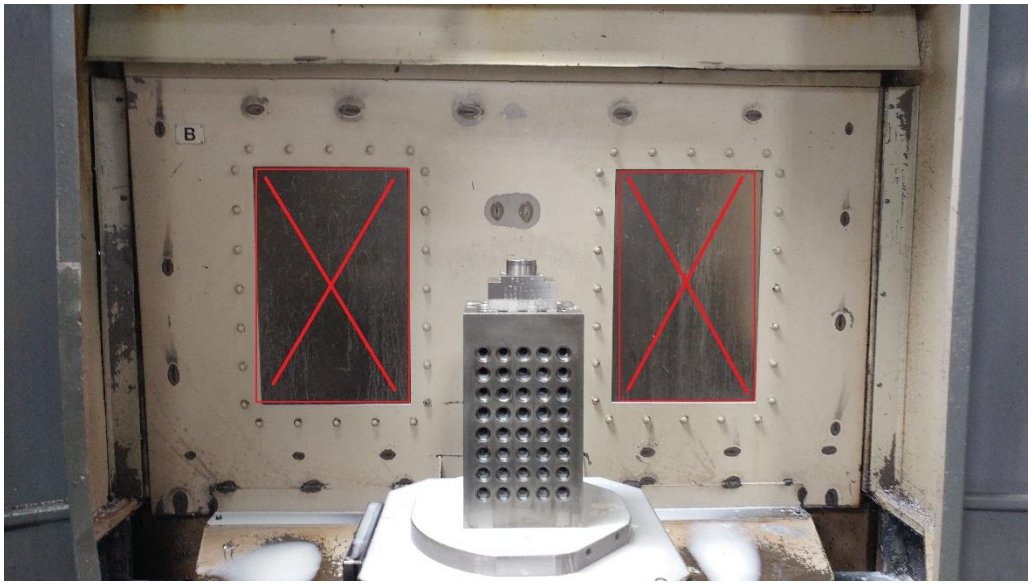


Figure 6 - Do not mount on pallet door windows.

(d) The Rotary Union Arm was intended to be used in pairs. Whenever possible, mount arms back to back such that sheet metal is sandwiched between the two brackets.

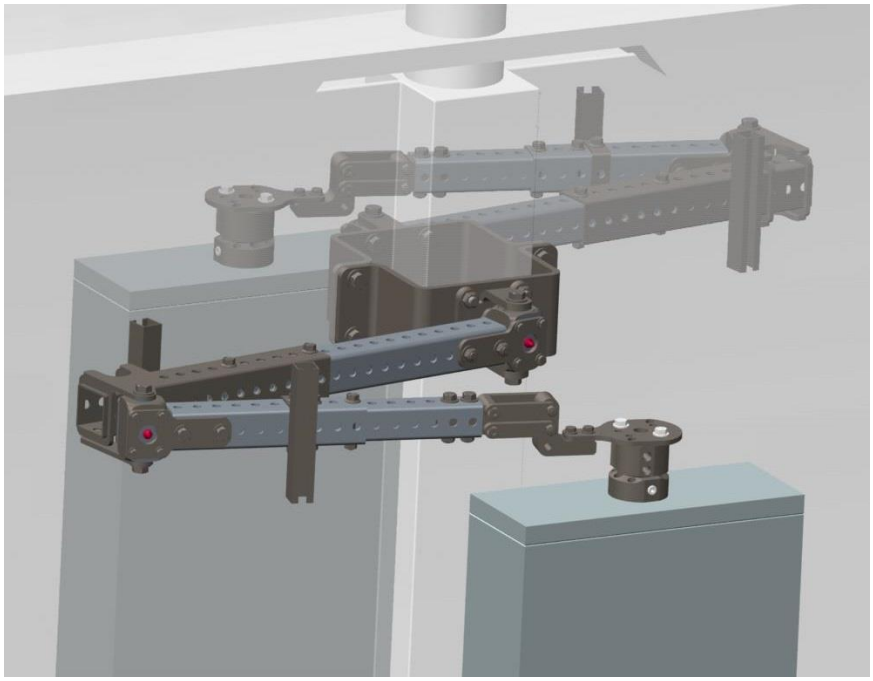


Figure 7 - Two arms mounted back-to-back in a Horizontal Machining Center

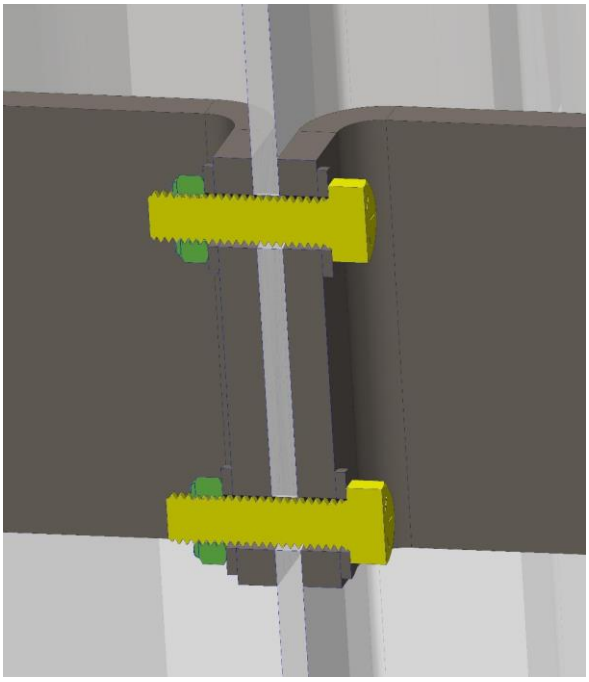


Figure 8 - Two extension brackets bolted back-to-back with pallet wall door in middle.

(e) If this is not possible, arms are shipped with sandwich plates that must be used on the opposite side of the pallet wall. This reinforces the joint and prevents tear out of the sheet metal. The sandwich plates can also be used with the base bracket.

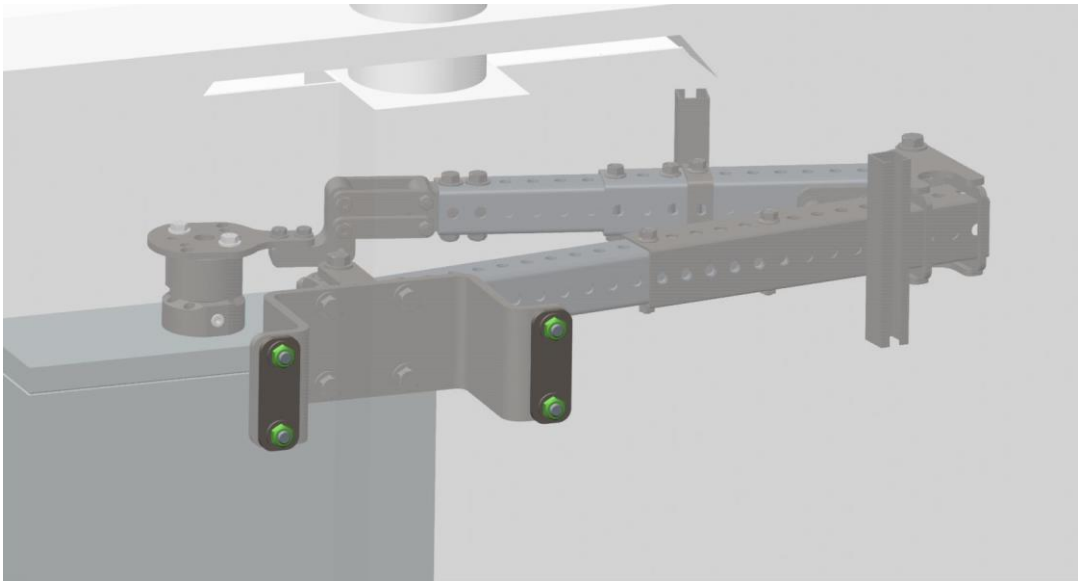


Figure 9 - Single rotary union arm mounted with sandwich plates

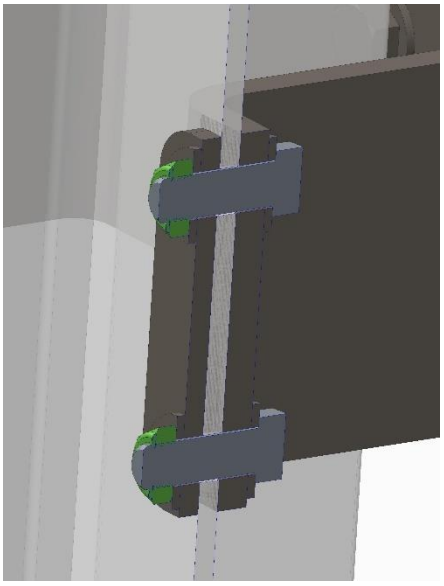


Figure 10 - Bracket mounted to pallet wall door with sandwich plate on opposite side.

(3) Drill holes into pallet wall.

(a) Depending on which bracket was used. Use ½ inch hardware for standard and custom bracketry. Bracket mounting holes should be no larger than 17/32 (.5313)". Mounting hardware is not included with the arm. Standard bracket hole patterns can be found on product CAD File on Vektek's website. Go to www.vektek.com and search for the product part number.

*(b) **It is important to drill holes so that the bracket will be sitting level.** Misalignment may lead to a poorly functioning arm.*

(4) Attach the machine interface segment of the Rotary Union Arm using the holes in the pallet wall.

(a) The standard extension bracket is pre-installed onto the base bracket. If you are only using the base bracket or a custom bracket, first remove the standard extension bracket.

(b) Mounting hardware is not included.

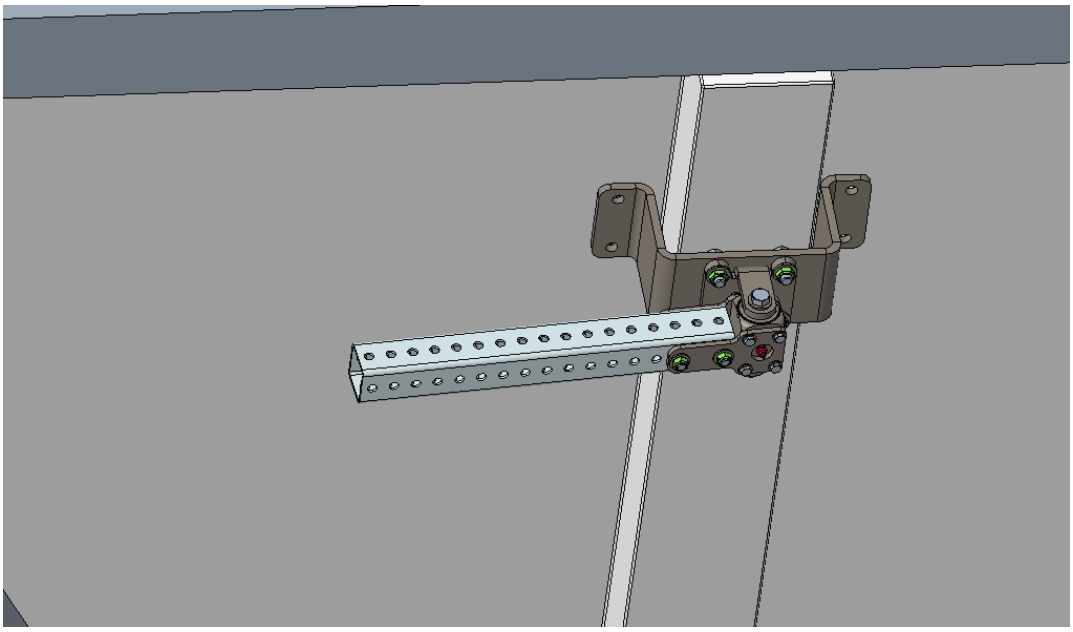


Figure 11 - Machine interface installed onto pallet wall.

(5) Assemble the elbow onto the machine interface by sliding the black tubing of the elbow over the galvanized tubing of the machine interface.

(a) Once these components are assembled, add hardware and thread the nuts on finger tight only. Please note there are two lengths of bolts. The longer of the two must be used between the machine interface and elbow.

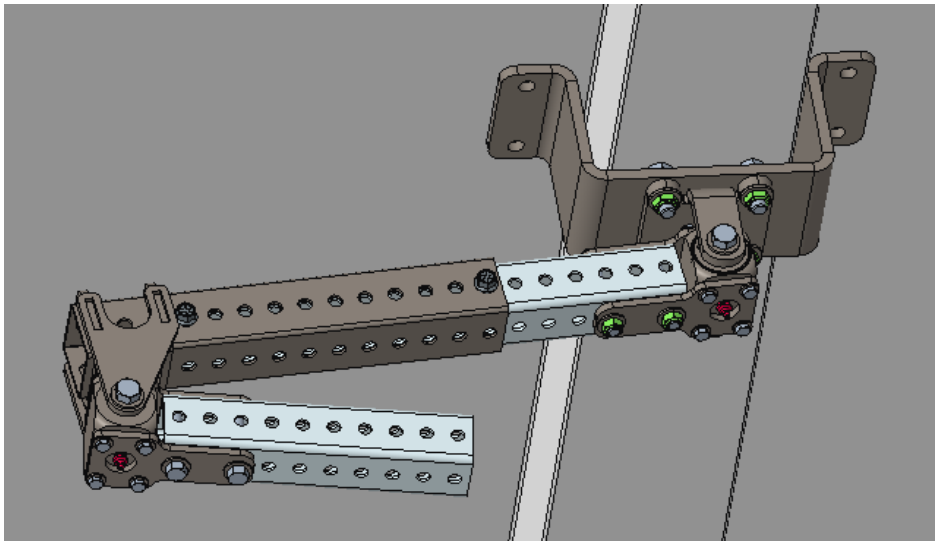
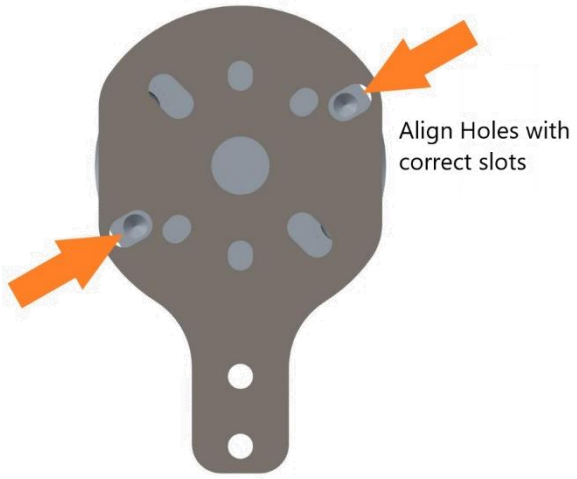


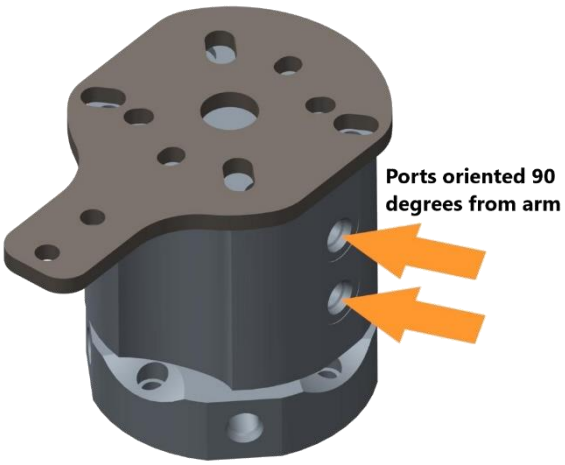
Figure 12 - Install elbow onto machine interface as shown.

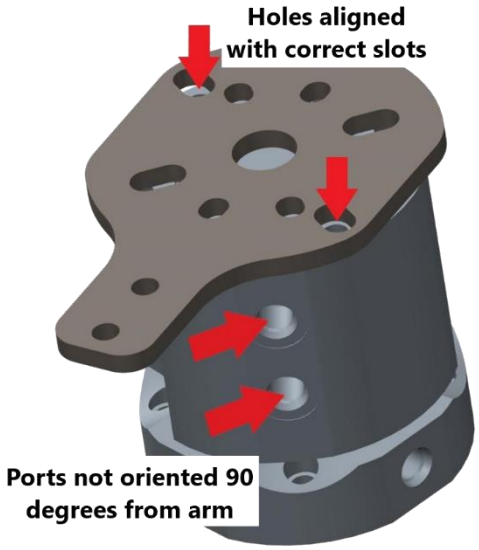
(6) Determine the correct orientation of the fixture interface plate. The fixture interface plate is shipped loose. Once the correct orientation is determined the plate should be attached to the arm with medium-strength thread locker and the proper torque. See Parts List PL6401 or PL6402.

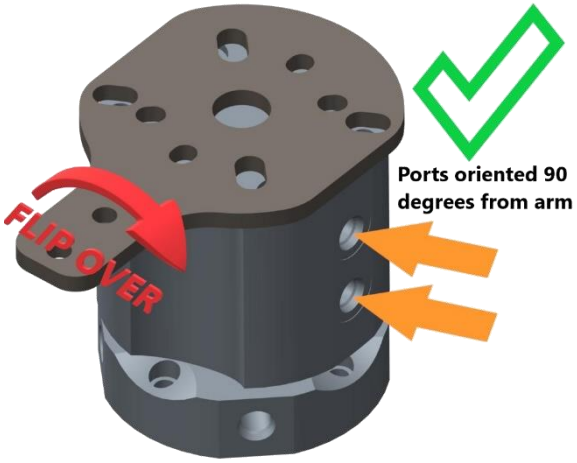
(a) The fixture interface plate is designed to connect to all Vektek inch hydraulic rotary unions. The slots in the plate will align the side ports of the rotary union such that the ports are perpendicular to the arm.

(b) If you are connecting to a single path, 2 path or 4 path rotary union, the interface plate may need to be flipped over to correctly orient the ports. Once you align the mounting holes with the corresponding slots, check how the ports are aligned.









(c) For rotary unions that are 6 path and above, the rotary union can simply be rotated 90 degrees.

(d) See Parts List PL6401 or PL6402 for assembly and torque specifications when replacing the fixture interface plate.

(7) Attach plate to L-bracket with hardware. Torque to 35 ft-lbs.

(8) Position linkages inline with holes in L-bracket and secure with shoulder bolts and nuts. Torque to 16 ft-lbs.

(9) Place the fixture interface onto the elbow.

(a) Once these components are assembled attach hardware and thread the nuts on finger tight. Please note there are two lengths of bolts. The longer of the two must be used between the machine interface and elbow.

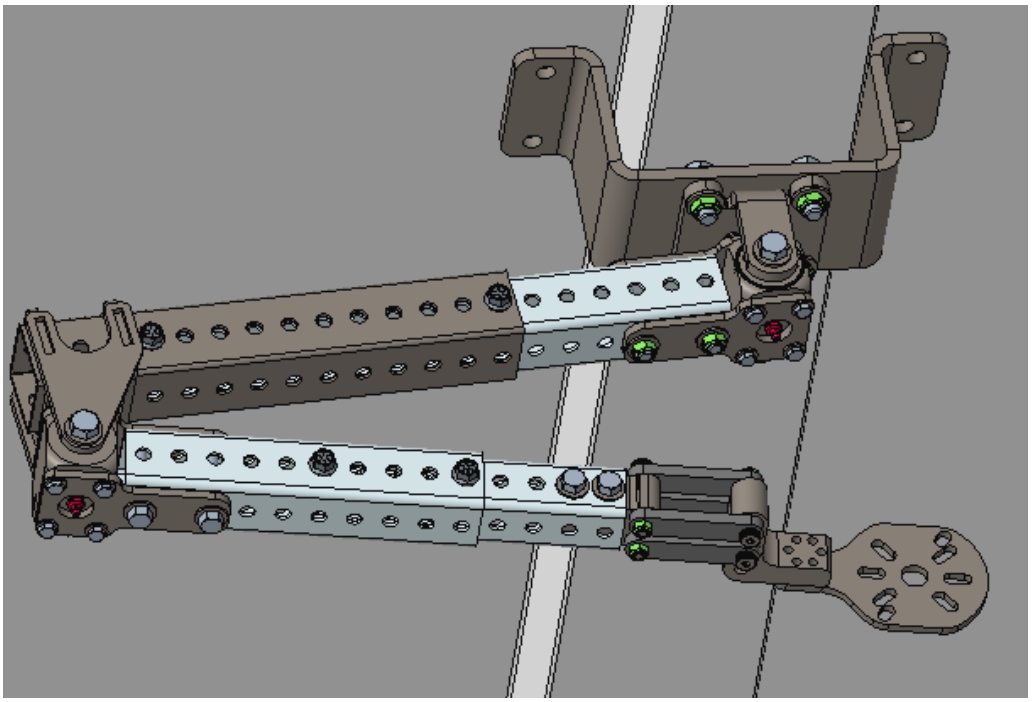


Figure 13 – Install fixture interface

(10) Set telescoping length of the arm.

(a) At this point the arm is free to extend. Use a tape measure to simulate the travel of the fixture in the machine and set the telescoping length.

(b) Be careful not to overextend the arm. To adjust the telescoping length of the arm, the hardware must be removed and there is nothing holding the elbow and fixture interface from sliding off of the machine interface and falling.

(c) Once a length is established place the hardware into the appropriate holes and torque the bolts to 30 ft-lbs.

i) Each telescoping pair has two bolts, one bolt should be in the last hole of each telescoping member. The bolts should be as far apart as possible while still having two bolts in each piece of tubing. Refer to product CAD File on Vektek's website for minimum bolt spacing. Go to www.vektek.com and search for the product part number.

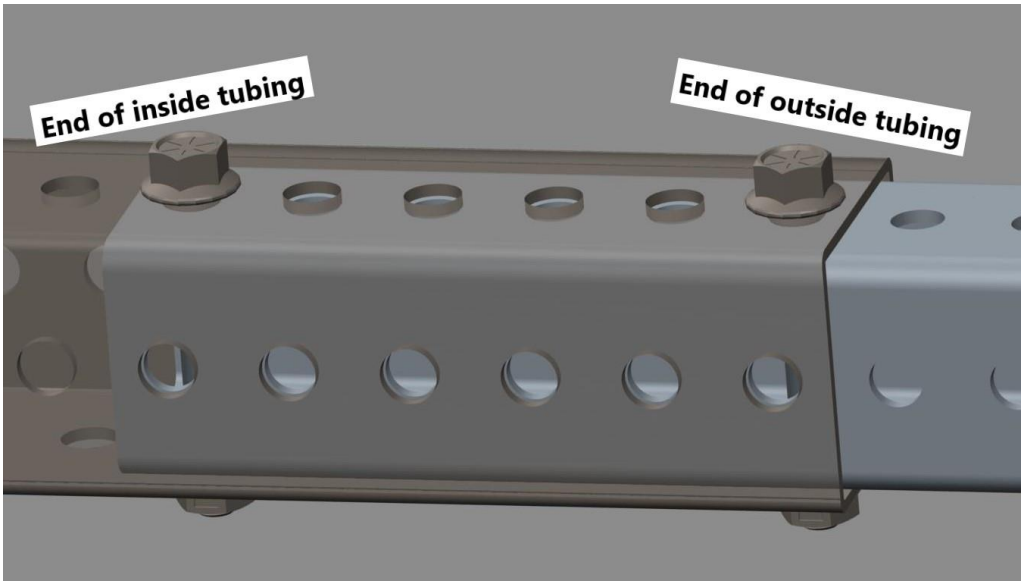


Figure 14 - Telescoping pair showing how bolts are located at the end of each the inside and outside tubing

ii) The locknuts are deformed thread and retain their locking after use. There must be 1-1/2 full threads protruding from the nut for the locking to be effective.

(d) Careful consideration of the machine clearances must be taken into account while setting the length. Every machine is different. Be sure that the arm clears the machine during a pallet change and throughout the machining cycle.

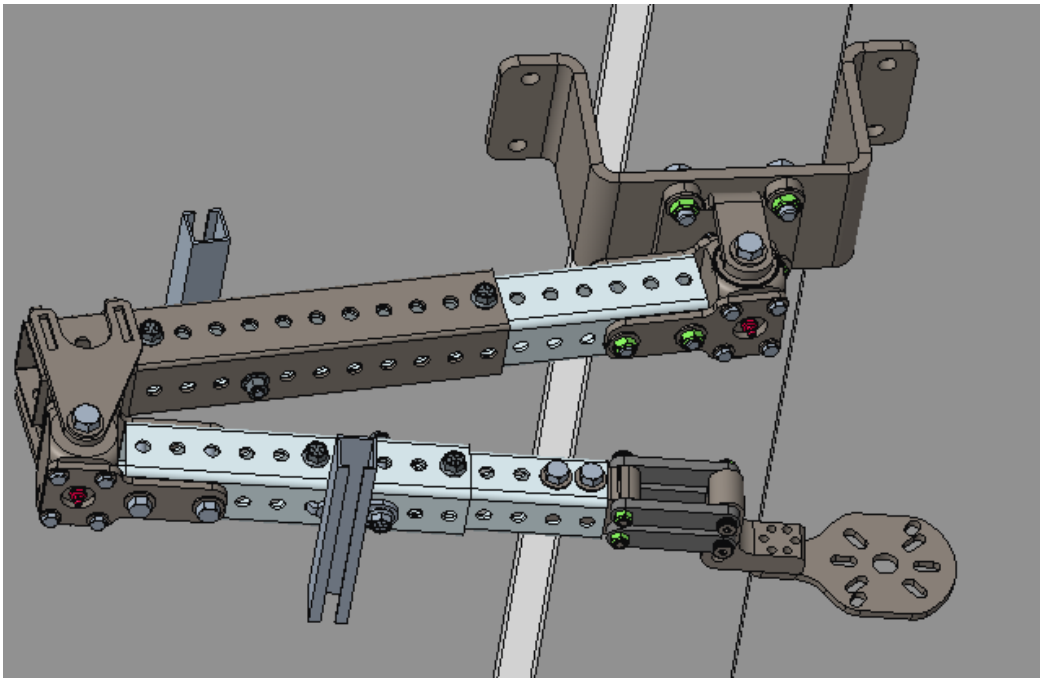


Figure 15 – Install hose clamp rails

(11) Place the hose clamp rails onto the tubing in two locations.

(a) It is recomended these be attached at this time as they may go thru two tubes.

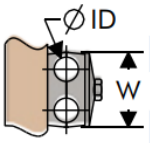
(12) Attach fixture interface plate to fixture rotary union

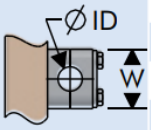
(a) Use appropriate hardware (not provided with arm) for the rotary union.

(13) Slowly test clearances of the rotary union arm by executing a pallet change and fully extending the arm with the fixture.

(14) Once arm clearances are verified, install hoses and check again.

(a) Each arm comes with two hose clamp mounts. These are compatible with industry standard t-slot rail nut hose clamps. Vektek conveniently offers single and twin hose clamps that are compatible with the Rotary Union Arm and in common hydraulic hose sizes.





Model No.	ID	Hose OD	W
35-2003-01	.39	.36 - .43	.42
35-2004-01	.50	.47 - .54	2.09
35-2005-01	.55	.52 - .59	
35-2006-02	.68	.65 - .72	
35-2003-03	.39	.36 - .43	.46
35-2004-03	.50	.47 - .54	1.65
35-2005-03	.55	.52 - .59	
35-2006-05	.68	.65 - .72	

Other clamp sizes available. Contact factory.

(15) Double check all fasteners torque specs.

BOLT TORQUE TABLE	
WRENCH	TORQUE(FT-LBS)
5/16	35
3/8	16
7/16	30
1/2	55

Section 5. Maintenance

5.01 Periodic

Grease each bearing once annually or during regularly scheduled machine maintenance. Pump until grease protrudes from wipers around shaft.

Use bearing grease, preferably a grease with moly additive.

Check fasteners/ retorque them

Section 6. Safety and Disclaimer

6.01 Safety Cautions

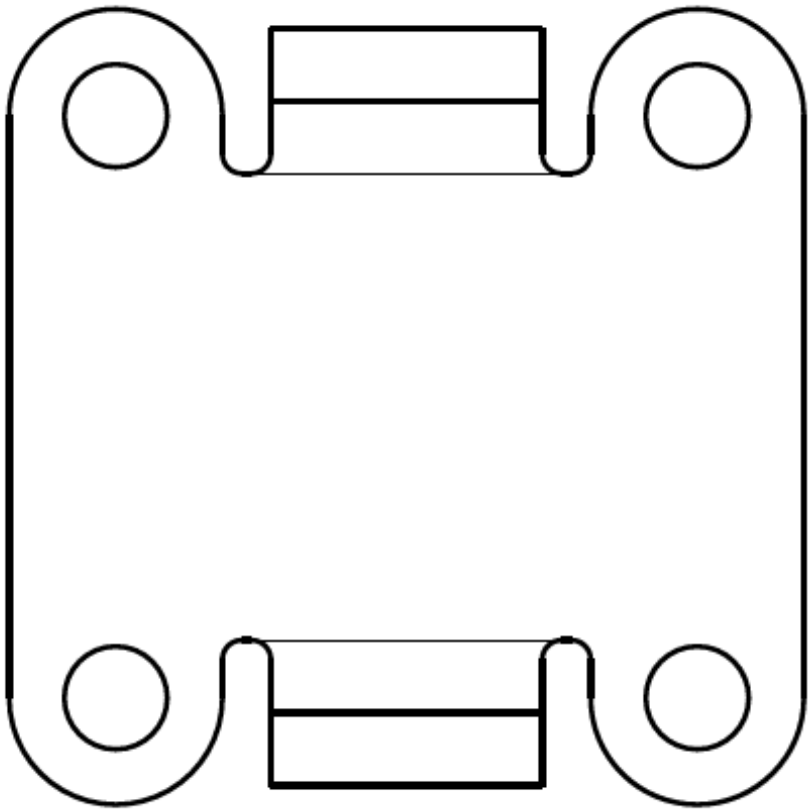
The Rotary Union Arm will generally be installed overhead, take great care when working and exercise appropriate safety practices.

All fasteners must be installed to the torque specified in PL6401 and PL6402, or as defined in this document, prior to moving the pallet with the rotary union arm attached.

6.02 Disclaimer

Customer is responsible to verify machine integration requirements or hydraulic machine interface options with machine manufacturer. Some machines may require additional structural support or hydraulic equipment to support Rotary Union Arm operation. Contact Vektek for additional assistance.

Section 7. Full size mounting patten



Section 8. Notes