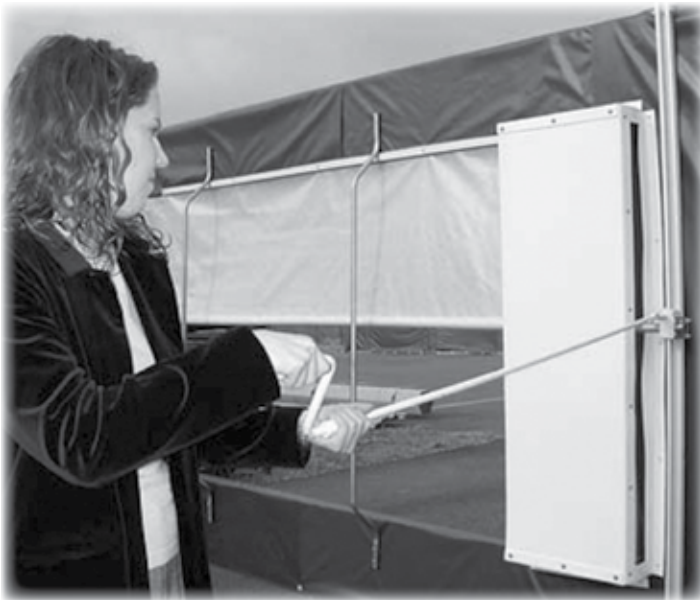




## Twist-of-the-Wrist Assembly Instructions



Flat-Wall for Curtain Application

Curved-Wall for Roll-Up Side



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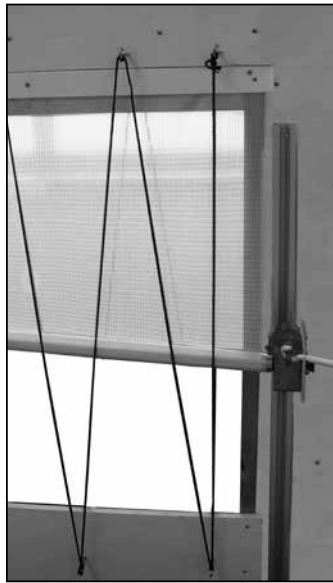


WARNING: Cancer and Reproductive Toxicity - P65Warnings.ca.gov

Revision date: 10.23.08

STK#	DESCRIPTION
102724	8' Aluminum Rail
106428	16' Aluminum Rail

# CLEARSPAN™ CURTAIN ACCESSORIES



Example above shows curtain mounted to a flat wall. Photo to the right shows roll-up side panel on a curved wall.

## General Information and Overview

In addition to other uses, the Twist-of-the-Wrist assembly allows the operator to "roll up" a window curtain, the side of a cover (shown above) or the end panel door of a shelter. The assembly can also raise and lower curtains of different lengths. These instructions describe the basic Twist-of-the-Wrist components and how to assemble those components.

### IMPORTANT!

Additional purchase is required for many Twist-of-the-Wrist components shown on the following pages. Contact your sales representative if you have any questions regarding the purchase of parts, or the parts contained in any Twist-of-the-Wrist hardware kit or curtain kit you may have ordered.

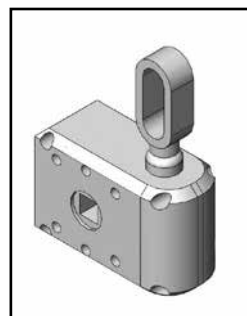
These steps provide general information to help with the installation of the Twist-of-the-Wrist components. *Review these instructions and skip the sections that do not apply.*

## ITEMIZED PARTS AND DESCRIPTIONS

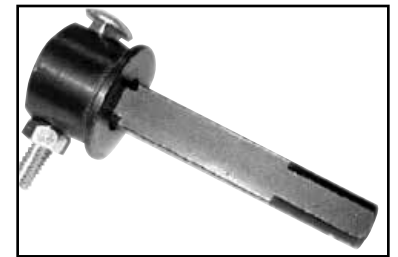
102724 8' ALUMINUM RAIL & MOUNTING HARDWARE		
Item	Description	Qty.
AR5010	Chain Section	1
FALF15B	Locknut (1/4"-20)	3
FAG106B	Hex Cap (1/4" x 1-1/2" Zinc)	1
AS2200	Quick Link (1/8" Zinc Plated)	1
FA2087	Eyebolt (3/8" x 8" Zinc)	1
FALB04B	Nut (3/8"-16 Zinc)	2
FAME08B	Flat Washer (3/8" Zinc)	2
FA2160	Eye Screw (5/16" x 4" Zinc)	1
FAG108B	Hex Cap (1/4" x 1/2" Zinc)	2
102570	8' Aluminum Channel	1

106428 16' ALUMINUM RAIL & MOUNTING HARDWARE		
Item	Description	Qty.
AR5010	Chain Section	1
FALF15B	Locknut (1/4"-20)	3
FAG106B	Hex Cap (1/4" x 1-1/2" Zinc)	1
AS2200	Quick Link (1/8" Zinc Plated)	1
FA2087	Eyebolt (3/8" x 8" Zinc)	1
FALB04B	Nut (3/8"-16 Zinc)	2
FAME08B	Flat Washer (3/8" Zinc)	2
FA2160	Eye Screw (5/16" x 4" Zinc)	1
FAG108B	Hex Cap (1/4" x 1/2" Zinc)	2
106427	16' Aluminum Channel	1

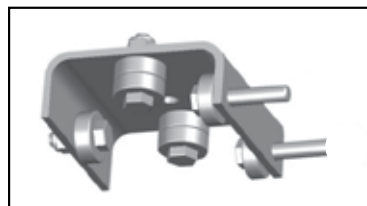
Additional Twist-of-the-Wrist Components  
(Additional purchase is required.)



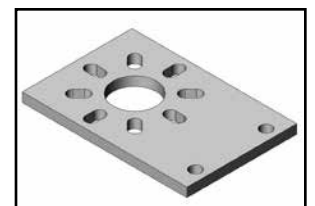
Gearbox



Adaptor and Drive Shaft



Bearing Assembly



Mounting Plate

**GENERAL INFORMATION AND OVERVIEW FOR ATTACHING A WINDOW CURTAIN TO A FLAT SURFACE (May not apply to all applications.)**

**NOTE:** Depending on the application, some hardware included with hardware kit (if purchased) may not be needed. *Photos show some components that require an additional purchase.*

Gather the parts:

- Aluminum channel
- Curtain (additional purchase or customer-supplied)
- Fasteners (additional purchase or customer-supplied)
- Conduit (additional purchase or customer supplied)

This procedure describes an overview of the flat-wall window curtain installation. Refer to the remaining instructions for further details and the curved-wall example.

Different applications require different installation procedures. *It is the customer's responsibility to determine the best way to install a curtain.* Operation of Twist-of-the-Wrist assembly (additional purchase required) is the same regardless of the application.

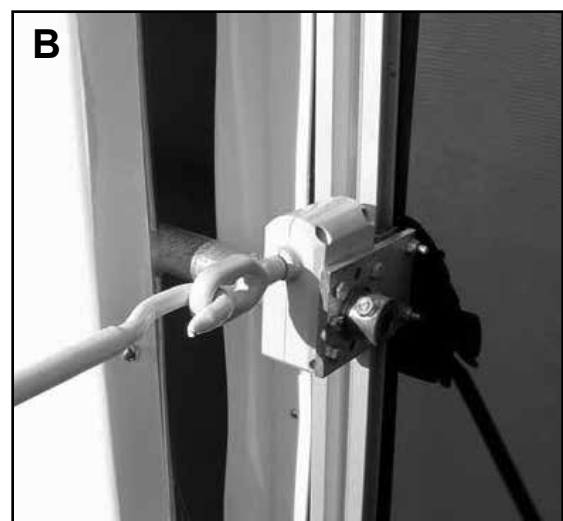
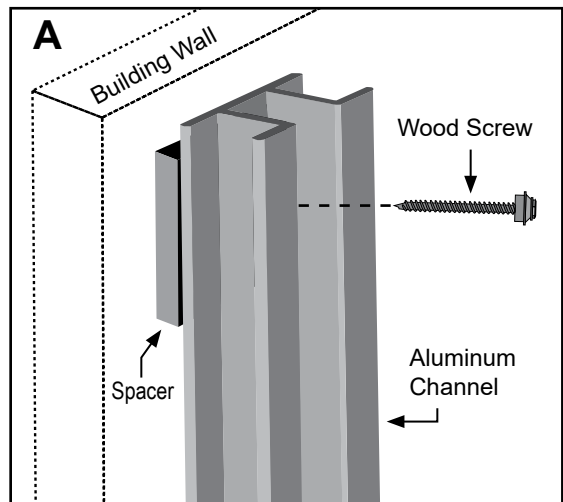
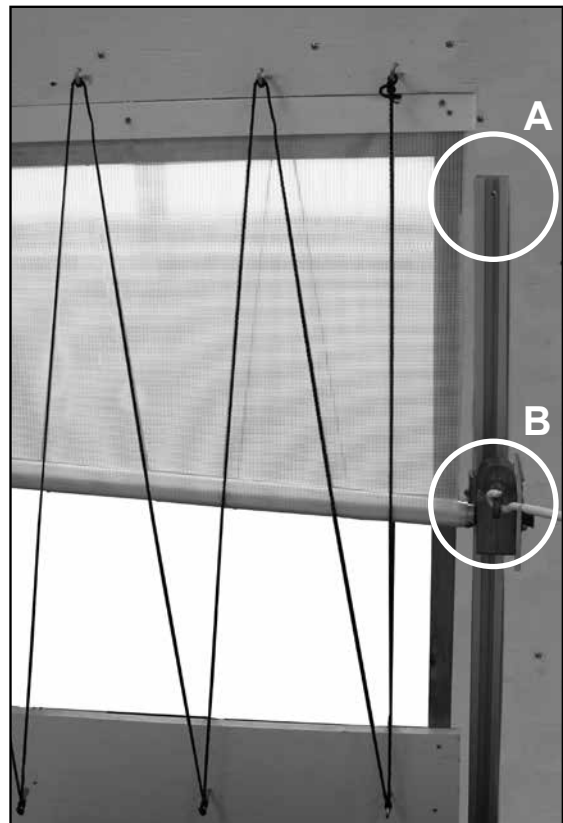
Complete these steps if applicable:

1. After assembling the conduit, attach the top of the curtain to the building using customer-supplied fasteners. (See Pages 4-5 for specific procedures.)
2. Attach assembled conduit to the bottom of the curtain using customer-supplied fabric clips or Tek screws. (See Page 5 for additional details.)
3. Attach the aluminum channel to the flat wall using customer-supplied fasteners, or bolts included with the hardware kit (if purchased).

**Diagrams A & B (flat wall-wood):** Using wood screws and spacers, attach the top and lower end of the aluminum channel to the wall. Pre-drill fastener holes in the aluminum track if needed. Use additional fasteners as needed.

Place a spacer under each fastener and between the channel and the building to allow the Twist-of-the-Wrist gearbox to freely move up and down the channel. A continuous spacer as long as the track can also be used. Minimum spacer thickness is 1/4".

4. Continue with the Twist-of-the-Wrist Assembly procedure that follows in these instructions.



## CLEARSPAN™ CURTAIN ACCESSORIES

### TWIST-OF-THE-WRIST: GENERAL INSTRUCTIONS

The instructions below describe how to assemble and install a single Twist-of-the-Wrist assembly. The procedure is repeated for additional assemblies (if applicable). A curtain is used in the example. These steps can be easily adapted to other applications such as a main cover or end panel. (The purchase of additional parts may be required.)

The basic procedures to assemble and install the Twist-of-the-Wrist include the following:

1. Assemble the roll-up conduit. (Additional purchase may be required.)
2. Attach the curtain to the shelter or building frame (if applicable).
3. Attach the roll-up conduit to the curtain or panel.
4. Assemble and attach the Twist-of-the-Wrist.
5. Install the Anti-Billow Rope system. (Additional purchase is required.)
6. Test the operation of the Twist-of-the-Wrist.

### ASSEMBLE THE ROLL-UP CONDUIT

The roll-up conduit runs the length of the curtain or cover and serves as the center pipe that the curtain or cover wraps around when opened. Skip this section if it does not apply to your application.

Gather the parts:

- Pipe and Tek screws (additional purchase or customer-supplied)

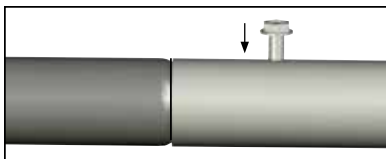
Complete these steps to assemble the roll-up conduit:

1. Locate all sections of pipe.
2. Insert the swaged end of one pipe into the plain end of another pipe until the conduit is assembled.

**NOTE:** For easier handling, assemble longer conduits (40' and longer) in short sections.

3. Secure each pipe joint using a Tek screw.
4. Place the assembled conduit at the base of the shelter or frame where the curtain is located or will be installed.

**NOTE:** Tape over the Tek screws and joints using heavy duct tape (supplied by customer) to prevent curtain wear.



5. Continue with the procedure that follows to attach the curtain to the shelter or frame.

### ATTACH CURTAIN (May not apply to all applications.)

Gather the parts:

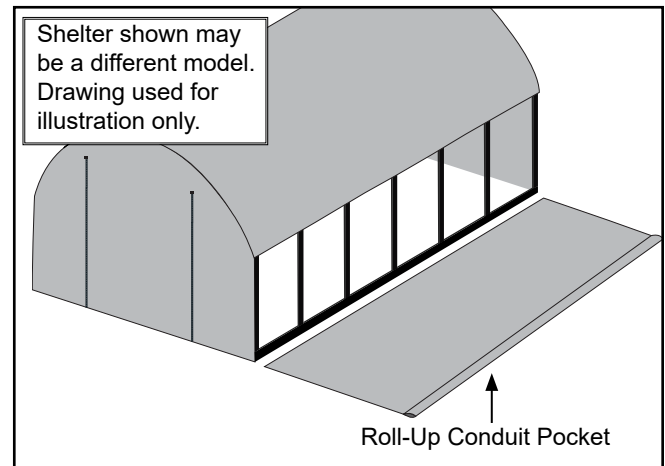
- Curtain (additional purchase or customer-supplied)
- Tek Screws and washers (additional purchase)

This procedure describes loosening the main cover of a building similar to what is shown and attaching a curtain under the edge of the main cover. The main cover is then reattached over the top edge of the roll-up curtain to allow for proper water drainage.

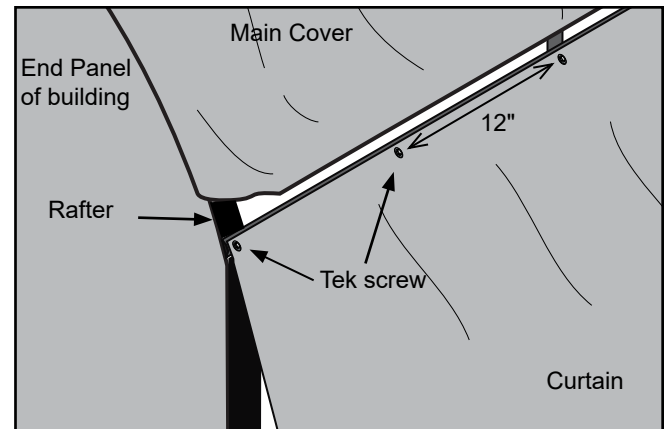
Different applications require different installation procedures. *It is the customer's responsibility to determine the best way to install a curtain.* For some buildings, a portion of the main cover can be used for the roll-up side.

Complete these steps if applicable:

1. After assembling the conduit, take the curtain and unfold it on a clean, smooth surface near the frame.



2. Loosen the edge of the main cover if needed and attach the top of curtain to the frame using Tek screws and Fender washers. Evenly space the Tek screws every 12" for best results as shown below.



**NOTE:** If frame is wood, use wood screws.

3. Position the main cover over the top edge of the curtain and secure as needed.



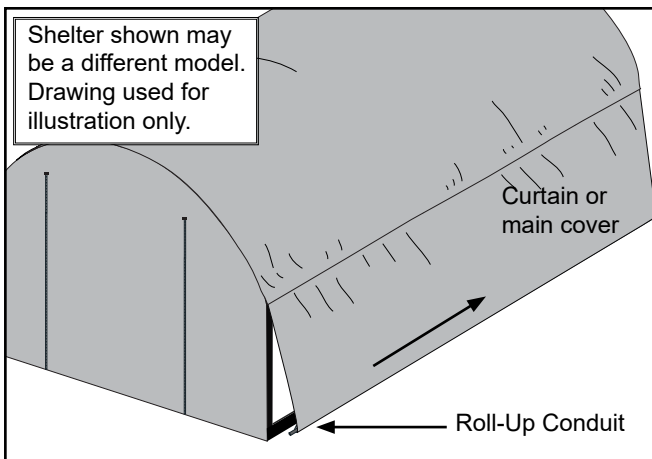
**ATTACH CONDUIT TO CURTAIN OR COVER PANEL**

To this point, the top edge of the curtain is secured to the frame; the remainder of the curtain will hang down along the side of the building or frame.

Gather the parts: Assembled conduit, Fabric clips, and Tek screws (additional purchase or customer-supplied).

1. Unfold the lower portion of the curtain or cover (if needed) and evenly stretch it out along the frame.
2. Slide the assembled roll-up conduit into the pocket of the curtain if a pocket exists.

**NOTE:** If using film for cover, wrap the lower edge of the film around the roll-up conduit. You may secure with a few pieces of duct tape. Some kits provide clips used to secure the panel to the roll-up conduit. (Additional purchase required.) See Step 18 of the next procedure.



**IMPORTANT:** Insert the conduit into the pocket so *the plain (non-tapered) end of the conduit* is at the end of the shelter where the gearbox will be installed. Allow the excess conduit length to extend beyond the curtain or panel at both ends *with most at the end where the Twist-of-the-Wrist assembly will be positioned*. The conduit is trimmed to length after the gearbox assembly is installed.

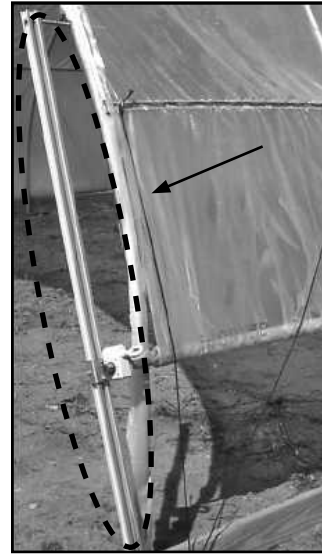
3. Continue with the Twist-of-the-Wrist Assembly procedure.

**TWIST-OF-THE-WRIST ASSEMBLY**

Gather the parts:

- Aluminum channel
- Gearbox and gearbox drive
- Mounting plate and roller bearing
- 3/8" eyebolt or 5/16" eye screw (depending on the shelter and frame material)
- 3/8" nuts and washers

The Twist-of-the-Wrist assembly is designed to raise and lower the curtain or a portion of the main cover. These steps describe the Twist-of-the-Wrist assembly and its installation.



**ATTENTION:** These procedures describe the basic steps needed to assemble and attach the Twist-of-the-Wrist assembly. Additional modifications and components (purchased locally) may be required if none of the following suggestions work for your application.

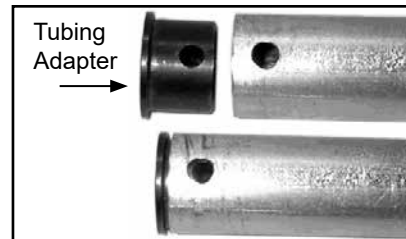
*The customer and those installing this assembly are responsible for determining the best way to install the curtain and all related components.*

*The photo above shows the Twist-of-the-Wrist assembly as attached to a greenhouse. Photo is for illustration purposes only. Actual building and application will vary.*

**Chain Link Installation (if applicable)**

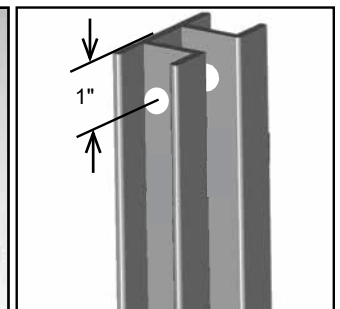
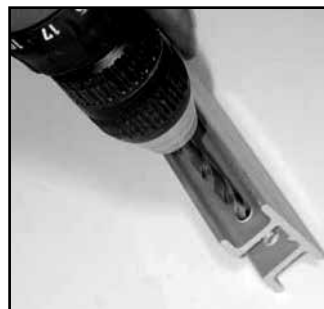
The following procedure describes using the supplied chain and eyebolt (or eye screw) to attach the upper end of the aluminum channel to the building or frame.

1. Drill a 5/16" hole through the roll-up conduit 1/2" from the end of the conduit.
2. Insert a tubing adapter (from the drive set) into the conduit and align the holes of the adapter with the drilled holes in the conduit.



Curtain is not shown in the diagram. Slide the curtain out of the way if needed when drilling the mounting hole in the conduit.

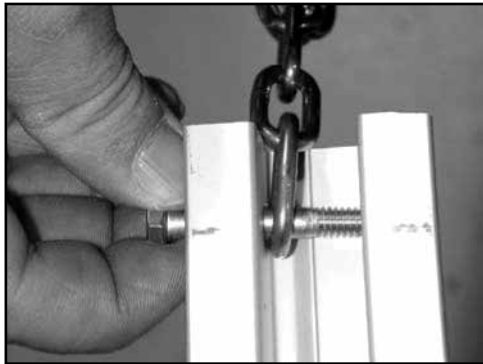
3. Select the aluminum channel and drill a 5/16" hole through the center of the channel approximately 1" from the end. (See the diagrams below.)



# CLEARSPAN™ CURTAIN ACCESSORIES

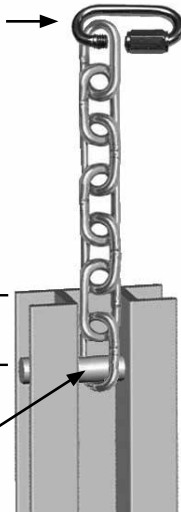
## TWIST-OF-THE-WRIST ASSEMBLY (CONTINUED)

4. Insert the 1/4" x 1-1/2" bolt through the channel, a link of the chain, and out through the other side of the channel.



5. Secure the bolt to the channel using a 1/4" locknut. Chain should slide freely on the 1/4" bolt.
6. Determine the desired height of the channel and install the eyebolt (for metal) or eye screw (for wood).

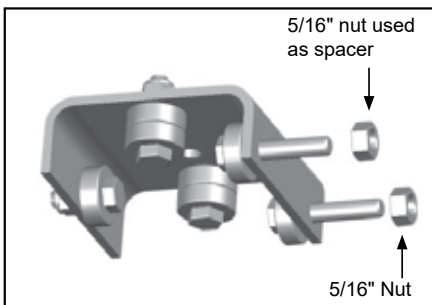
Attach to frame using an eyebolt or eye screw and the AS2200 quick link.



**NOTE:** Verify that the lower end of the channel is slightly off the ground to allow it to move freely when the curtain or panel is raised and lowered.

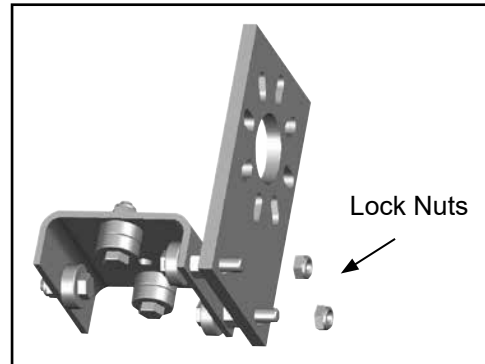
Adjust the height of the channel by repositioning the mounting eyebolt or eye screw on the frame, or by inserting the quick link through a different position on the chain.

7. Attach the chain to the fastener (previous step) using the AS2200 quick link. The channel will hang down from the fastener and chain.
8. Select the bearing bracket and attach the bearings as needed. (If the bearing component is assembled, continue with Step 9.) Assemble as follows if needed

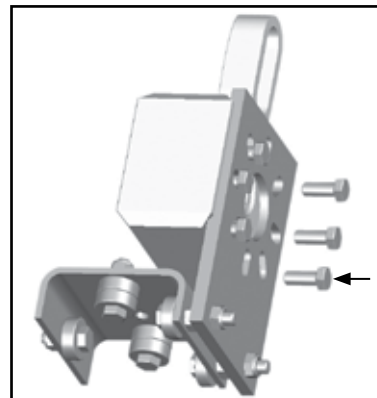


Single bearings are attached to the sides of the bracket and double bearings to the middle portion of the bracket. Use 1/4" hex bolts and locknuts as needed. *Install a flat washer on both sides of each bearing to insure proper operation of bearings and the assembly.* Install the longer bolts with bearings on the side of the bracket that has the two holes. Install these *before* installing the double bearing assemblies. For the spacers on the long bolts, insert a 5/16" nut over each bolt. *These nuts are used as spacers only. See previous diagram for details.*

9. Slide the Twist-of-the-Wrist mounting plate over the long bolts and secure the plate with two locknuts.

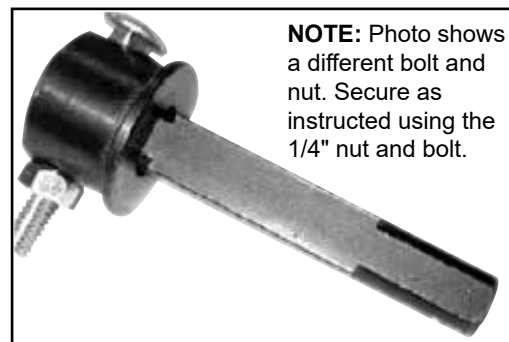


10. Attach the Twist-of-the-Wrist gearbox to the mounting plate using hex head bolts included with the plate.



**NOTE:** The number of bolts used to secure the gearbox to the mounting plate may differ from what is shown in the diagram.

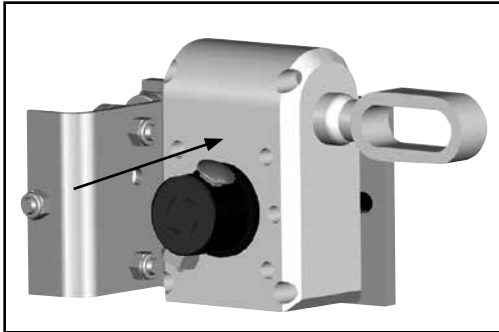
11. Using a 1/4" x 2" bolt and 1/4" locknut, attach the square shaft to a tubing adapter.



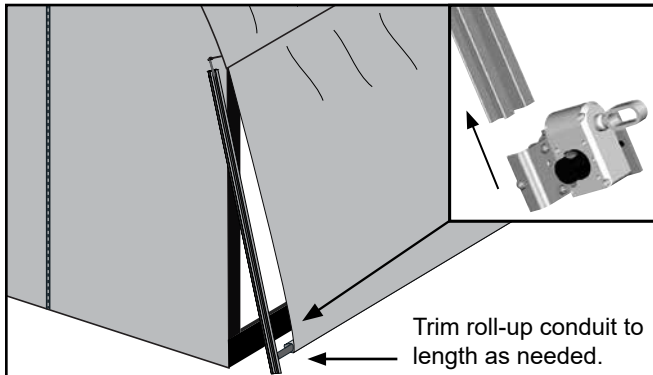
**NOTE:** Photo shows a different bolt and nut. Secure as instructed using the 1/4" nut and bolt.

**TWIST-OF-THE-WRIST ASSEMBLY (CONTINUED)**

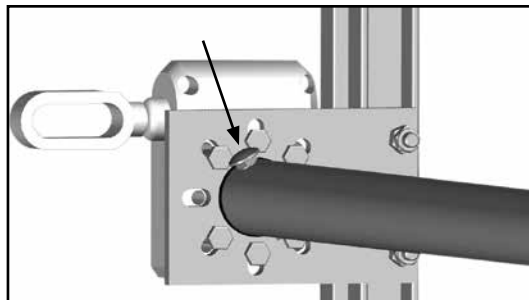
- Slide the square shaft through the Twist-of-the-Wrist gearbox.



- Slide the Twist-of-the-Wrist assembly onto the aluminum channel from the ground end. (This is the free end of the channel.)

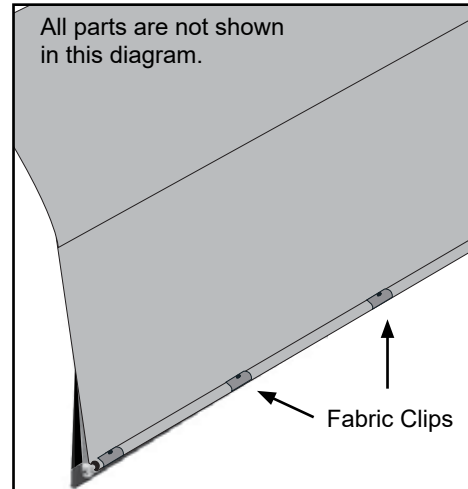


- Align the roll-up conduit with the gearbox and trim roll-up conduit to length as needed.
- Check clearance between channel and the structure that the channel is attached to. Adjust if needed.
- Attach the roll-up conduit to the square shaft of the assembly by inserting a 1/4" x 2" bolt through the hole in the conduit and tubing adapter. Tighten the locknut.

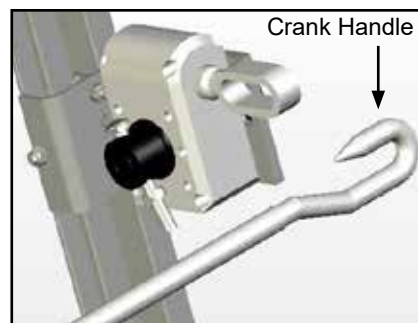


- Straighten the curtain and center it along the shelter or building side as needed.

- Use Tek screws and fabric clips (customer-supplied) to secure the curtain to the conduit. *Space the fabric clips evenly along the conduit for best results. May not apply to all applications. Additional purchase necessary.*



- Attach the crank handle to the Twist-of-the-Wrist assembly. (Curtain is not shown in the diagram below.)

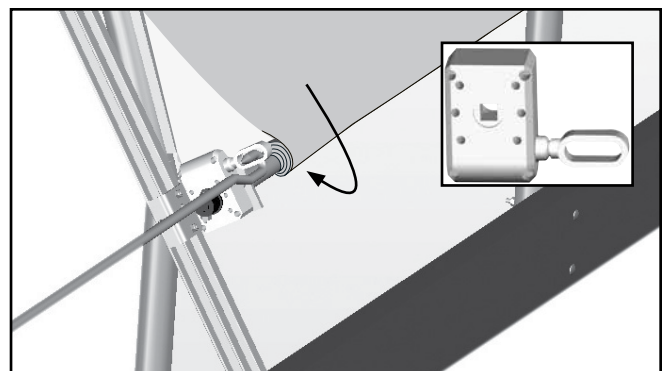


*Crank Handle sold separately.*

*Roll-up conduit is not shown in the diagram.*

Drawing may show a different but similar application; the same operation technique is used.

- Test the operation of the Twist-of-the-Wrist assembly.



**NOTE:** If the curtain rolls in the desired direction, but you want to turn the crank in the opposite direction for the same result, unbolt, reposition the gearbox, and remount it *on the same side of the mounting bracket.*

Verify that the curtain rolls in a direction that allows water to drain off of it as shown in the example above.

- Continue by installing the anti-billow rope.

## CLEARSPAN™ CURTAIN ACCESSORIES

### INSTALL ANTI-BILLOW ROPES (ADDITIONAL PURCHASE REQUIRED)

Gather the parts:

- Anti-billow rope
- Tek screws or wood screws
- Fender washers

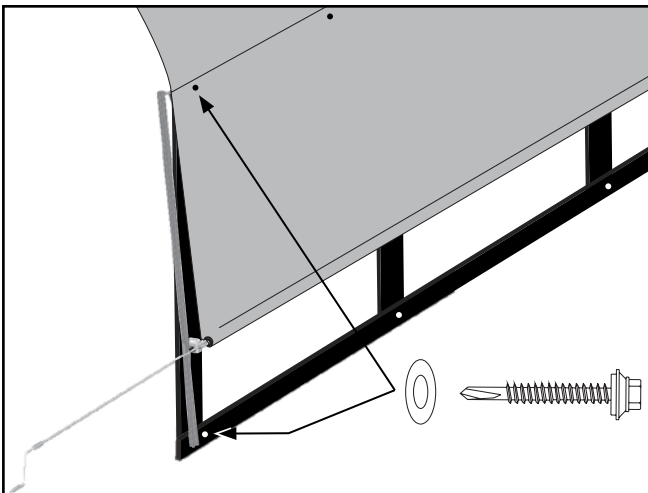
Anti-billow ropes secure the roll-up curtain when it is in the down position. The procedure that follows describes using Tek screws (or wood screws) and Fender washers to wrap the rope around. The screws are installed into the frame or pony wall.

If this type of installation does not work for the application, *additional parts may be required and must be supplied by the customer.*

Complete the following steps to install the anti-billow ropes.

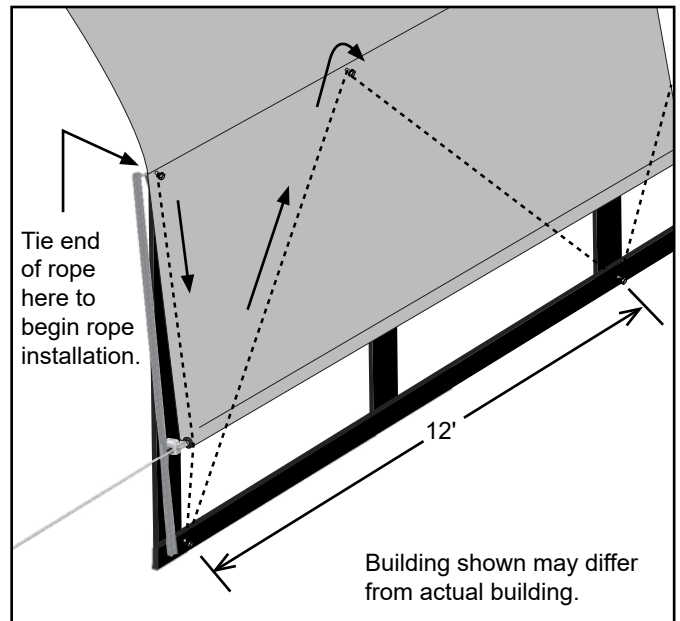
1. Using the Twist-of-the-Wrist assembly, roll up the curtain or cover panel a few inches above the ground.
2. Install the first screw and Fender washer into the building frame at the base of the end rafter where the Twist-of-the-Wrist assembly is located.
3. Move up the same end rafter or frame support and install another screw and washer.

**NOTE:** Do not fully tighten the screw and washer against the frame or rafter. Allow space for the anti-billow rope to remain between the washer and the frame that the screw is attached to.



The diagram above shows the screw locations on a building where the anti-billow rope will be installed.

4. Attach the remaining screws and washers using the diagram below as a suggested guide.



**NOTE:** For the best results, the maximum distance between the screws must not exceed 12'.

5. Once all screws with washers are installed, grasp the end of the anti-billow rope and tie it to one of the upper screws at either end of the building or frame. See the pattern and arrows above.
6. Weave the rope between each screw and washer as shown and work to the other end. Temporarily hold or tie the rope to keep it in place.
7. Using the Twist-of-the-Wrist assembly, roll up the curtain or cover panel up to its highest position.
8. Move to the end of the frame where the rope has been temporarily secured and pull the anti-billow rope tight to remove excess slack.
9. Tie the rope to the screw to complete the weaving of the anti-billow rope and cut it to length.
10. Lower the curtain to check the operation.
11. Repeat all of the above procedures to install any additional curtain packages.





Space below is reserved for customer notes.