Tamarack
Solar Products

Tamarack Side-of-Pole Mount

Model: UNI-SP/03X

Introduction

The Side of Pole Mount is a simple and universal pole mounting solution for photovoltaic modules. The UNI-SP/03X model is designed for mounting two PV modules in landscape orientation, with a maximum combined module width of 89-inches. These mounts can be installed on a 4-inch Schedule 40 pipe with provided band clamps, or a 4-inch to 6-1/2-inch OD pole with user-supplied U-bolts, lag bolts (flat surfaces), or on a 25G ROHN tower frame. User-adjustable angle settings from 40 to 66 degrees.

Disclaimer

This manual describes proper installation procedures and provides necessary standards required for product reliability. Warranty details are available on our website. www.tamaracksolar.com
All installers must thoroughly read this manual and have a clear understanding of the installation procedures prior to installation. Failure to follow these guidelines may result in property damage, bodily injury or even death.

Customer Support

Tamarack Solar makes every effort to ensure your mounting kit is easy to install. If you need assistance at any point in your installation or have suggestions on how we can improve your experience, call technical support at 1-800-819-7236 Ext 556 or email us at support@tamaracksolar.com.

Torque Settings

Torque values are “dry” threads on stainless-steel hardware.
Deduct 15% if using anti-seize lubricant. (Recommended).

Bolt Size	Socket Size	Inch-Pounds	Foot-Pounds
5/16 inch	1/2 inch	144	12
1/4 inch	7/16 inch	84	7
Band Clamp	5/16 inch	35	

Installer Responsibilities

- Follow all applicable local or national building and fire codes, including any that may supersede this manual.
- Electrical installation should be conducted by a licensed and bonded electrician or solar contractor.
- Ensure all products used are appropriate for the installation and array under the site’s loading conditions.
- Use only Tamarack parts or parts approved by Tamarack; substituting parts may void any applicable warranty.
- If loose components or loose fasteners are found during periodic inspection, retighten immediately. If corrosion is found, replace affected components immediately.
- Review module manufacturer’s documentation to ensure compatibility and compliance with warranty terms and conditions.

Components List

The following parts are used in the 3-Bucket SOP Mount model:

SP/03X Mount Parts List		
PART#	**DESCRIPTION OF PART**	**QTY INCLUDED**
51-3517-242 Rev E	Bucket, 35.6"	3
51-3517-243 Rev E	Clip, left	3
51-3517-244 Rev E	Clip, Right	3
51-0590-011	Module Rail, 90"	2
51-0519-000	Support Rail, Center, 19", Outer	2
51-0519-001	Support Rail, Center, 19", Inner	2
51-3029-000	Support Rail, Bottom, 29", Outer	2
51-3029-001	Support Rail, Bottom, 29", Inner	2
27-5000-010	Hose Clamp 5"	6

HARDWARE		
29-5000-000	**Module Mounting Hardware Set 1/4"**	**3 Bags/Sets**
23-2520-050	Bolt, 1/4-20 x .75 SS	4
25-2502-000	Washer, flat 1/4 SS	8
25-2501-000	Washer, lock 1/4" SS	4
24-2520-440	Nut, 1/4-20 Fin Hex SS	4

29-5001-000	**Mount Assembly Hardware Set 5/16"**	**5 Bags/Sets**
23-3118-021	Bolt 5/16-18x3/4 Hex SS	8
24-3118-440	Nut, 5/16-18 Hex SS	8
25-3101-000	Washer, lock 5/16 Med Split SS	8
25-3102-000	Washer, flat 5/16 SS	16

29-5002-000	Spare Hardware 1/4 + 5/16 x 3/4	2

See the following page for images of these parts.

Bucket

Clips - Left & Right

Module Rail

Support Rails

Optional Components (not included)

Depending on mounting surface:

Pole Mounting option for high wind:

- 1/2” - 13 x 2”, 3”, 4” or 6” U-Bolts to match pole size with Flat and Lock Washers and Nuts - 1 per bucket

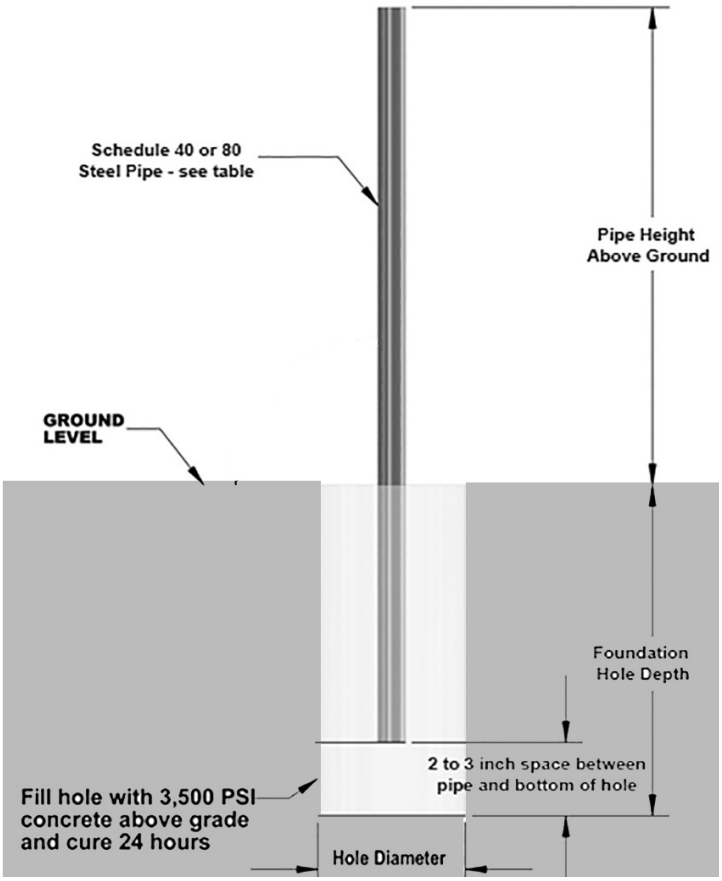
Note: Square U-bolts can be used for square posts.

-OR-

Wall or Wood Post Mounting:

- 1/2-inch lag bolts and washers

Foundation Hole and Pole Guidelines



- The suggestions below are recommendations only. It is the installer's responsibility to validate foundation parameters prior to installation, a local geotechnical report may be required to assess soil conditions. We recommend consulting with a local engineer familiar with local regulations and build site requirements, including soil conditions, terrain, and load criteria (wind, snow, seismic). All of these parameters may impact foundation requirements.
- If you are planning to make seasonal adjustments to the solar array angle, use the steepest angle that you plan to use for foundation and pole pipe sizing to insure that the pole and foundation are strong enough to support the array, and that the desired minimum ground clearance is maintained at all projected angles.
- Dig hole according to recommended depth and diameter. Remove or properly compact any loose material at the bottom of the hole.
- The pole length listed in the following tables are based on having the pole installed 2-3 inches from the bottom of the dug holes. Use a brick, concrete block, tiles, or other non-organic solid material at the bottom of the hole to support the pole on, allowing it to be raised above the bottom of the hole and allowing the concrete to fully encapsulate the pipe pole. If using a thicker material, be sure to allow for the added thickness when calculating the above-ground and total pole lengths.
- Set pole in hole and use a level to insure that it is straight and plumb in all directions.
- Brace pole to prevent movement while pouring concrete. Pouring so that concrete is in direct contact with the soil is recommended. If forming or using sonotube, properly compact backfill. Allow concrete to cure for recommended length of time.

Soil Classifications

- Class 3 - Dense compacted soils or sandy gravel and gravely soils. Lateral Bearing Pressure - 200 lbs/sq ft at one ft below natural grade.
- Class 4 - Looser semi-compacted soils or sand, silty sand, clayey sand, silty gravel and clayey gravel soils. Lateral Bearing Pressure - 150 lbs/sq ft at one ft below natural grade
- Class 5 - Loose uncompacted soils or clay, sandy clay, silty clay, clayey silt, silt and sandy silt soils. Lateral Bearing Pressure - 100 lbs/sq ft at one ft below natural grade

Step 1. Measure PV Panel Mounting Hole Distance

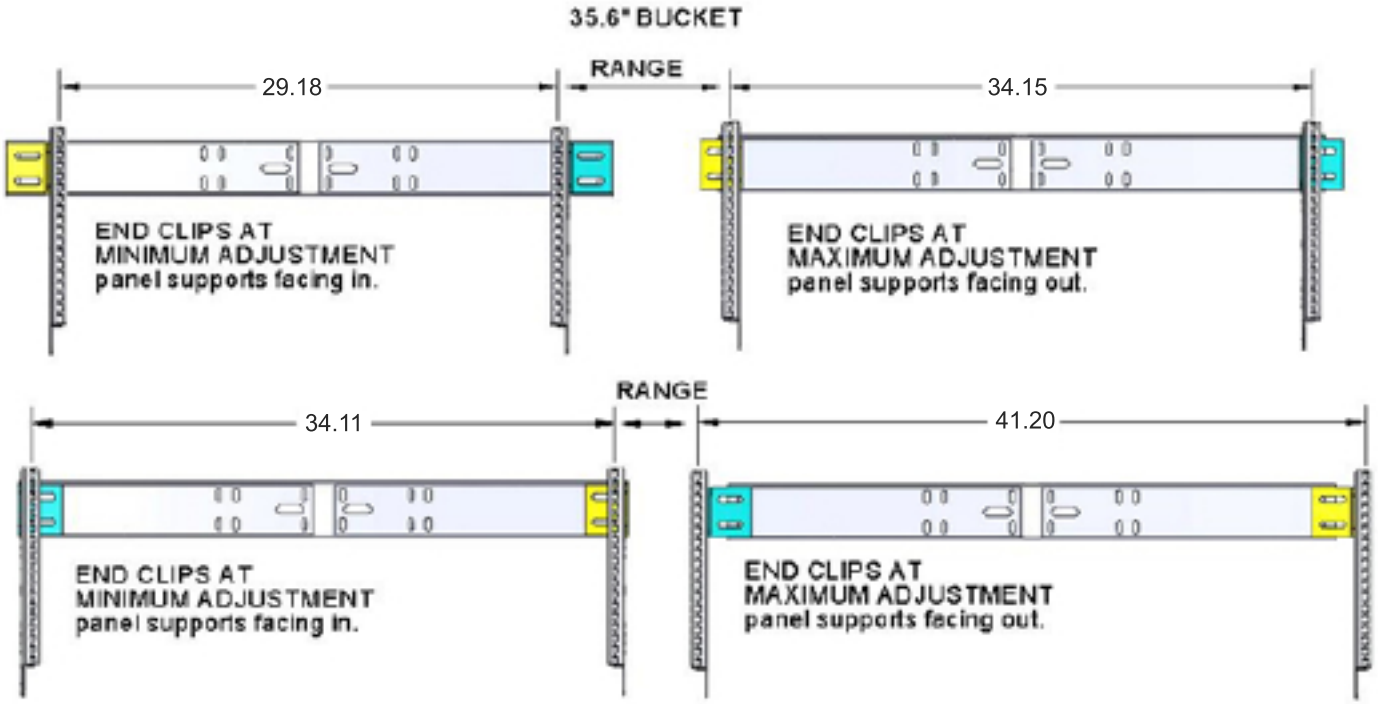
A. Lay module(s) face down on a protected surface in desired orientation. Leave approximately 1/4” or more space between modules if more than one.

B. Measure center-to-center distance between mounting holes on back of module, as shown, and make a note of distance. (Measure across the panel frame if mounting one module in portrait.)

Step 2. Mounting Rail Supports on PV Panel

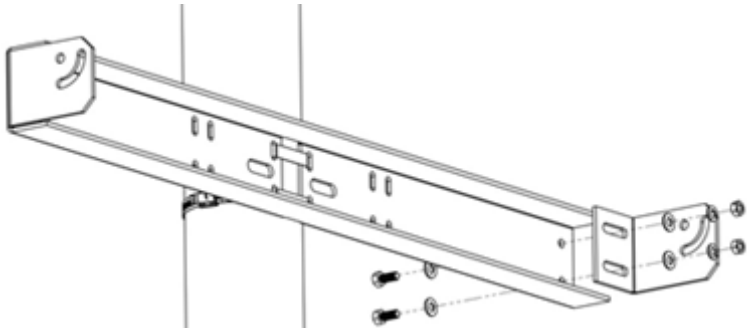
A. Review reference diagrams to determine orientation of module support rails and end clips, based on the center-to-center range of your module(s).

B. Determine the spacing between the two PV modules and secure the two 90-inch mounting rails to the module frames with a 1/4-20 x 3/4” bolt, lock washer, and hex nut in each mounting hole (4 on each panel). Tighten bolts to 84 in-lbs.

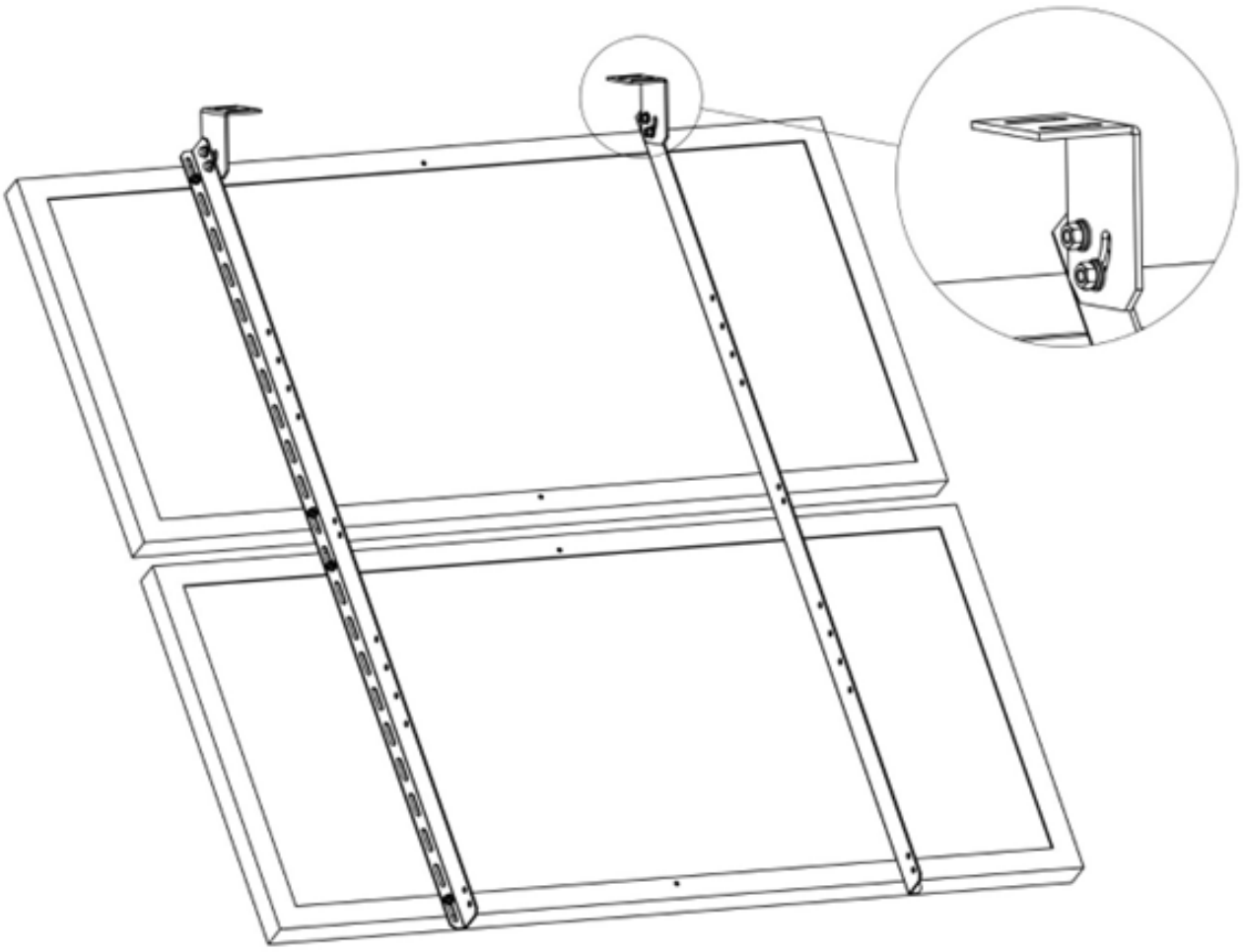


Step 3. Attaching Clips to Rails

A. Attach Clips to the Module Support Rails as determined by the bucket range diagrams. (Shown in previous step). Example shown at right has clips facing in on inside of rails that are facing out. (Note the orientation of the curved slots in the diagram to the right. Make sure that you place the correct clips on their correct sides)



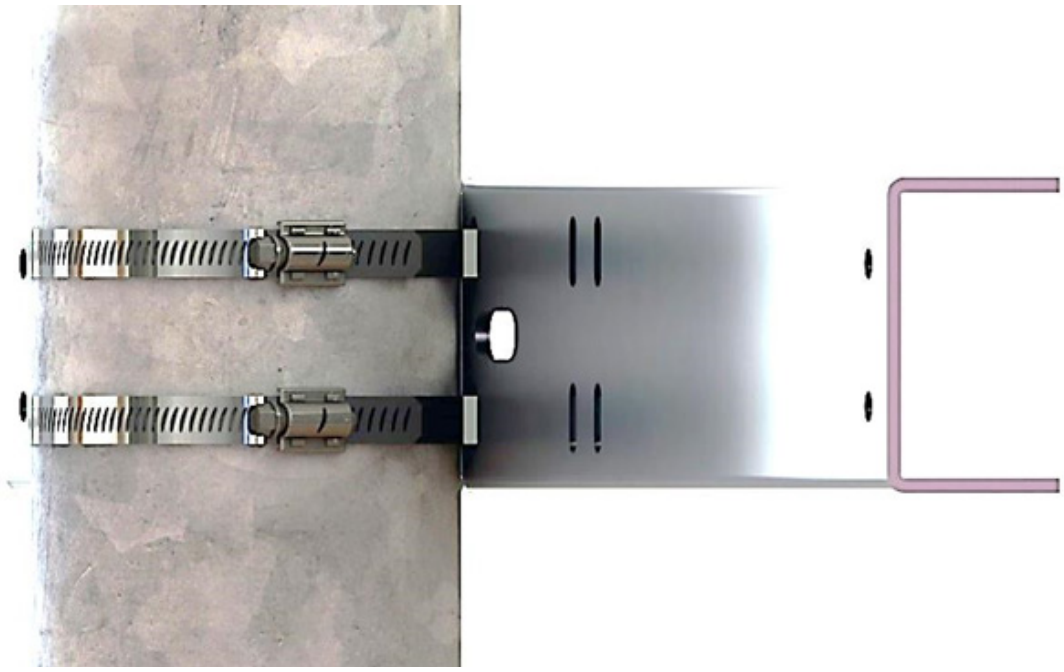
B. In each Clip mounting hole, use a 5/16-18 x 3/4” bolt and flat washer on one side and a flat washer, lock washer and nut on the other. Tighten bolts finger tight only at this time (these will torque to 144 in-lbs. after assembly is finished and tilt angle is final.)



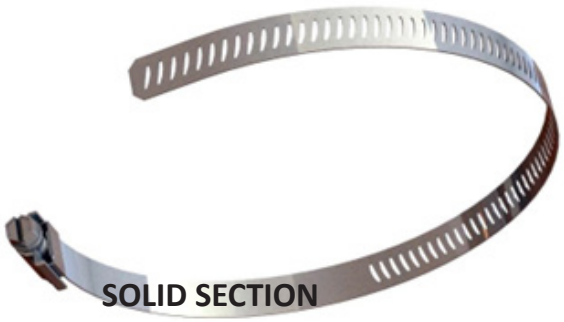
Step 4. Attaching Top Bucket to the Pole

A. Unscrew hose clamp to release end. Thread each hose clamp through the sets of narrow center slots in the upper Bucket as shown. Place at the desired location on the pole.

NOTE: KEEP SOLID SECTION OF CLAMP CROSSING OVER BOTH SLOTS.

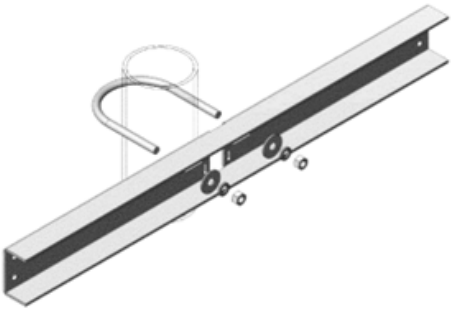


B. Once upper bucket is in desired position, tighten hose clamp screws to 35 in-lbs.
Note: Always re-check torque on hose clamps after exposure to windy conditions.



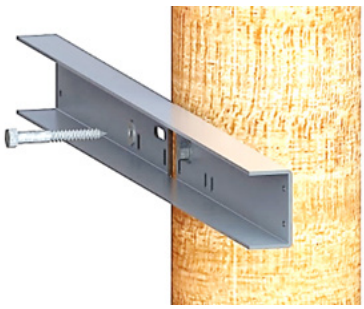
Optional Mounting Methods

Installer must supply additional hardware



High Wind U-bolt

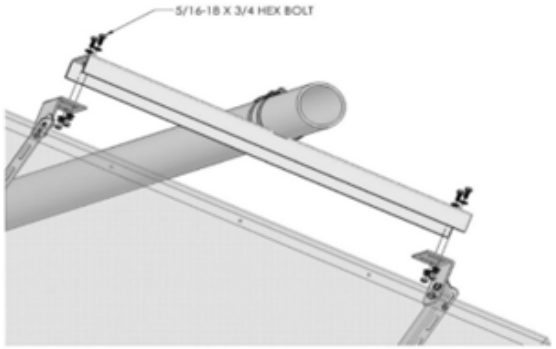
In high wind loading conditions, in conjunction with hose clamps, use a 1/2-13 U-Bolt on each Bucket, as appropriate for the pipe size being used. Tighten securely taking care not to deform the Bucket.



Lag Bolt to Wood Post or Flat Surface

Use two lag bolts for each bucket, using the horizontal slots, not the center slot in the bucket. Use 1/2” lag bolts as appropriate for the wooden structure being mounted to (telephone pole, post or flat wall). Tighten securely taking care not to deform the Bucket.

Step 5. Mounting PV Module Assembly on Pole



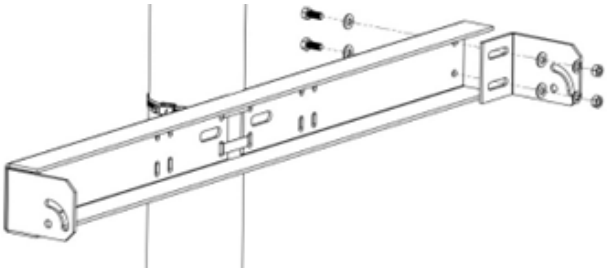
A. Place PV modules and Module Support rail assembly so holes on clips line up with holes in inside of upper bucket. Depending on size of panel and location of mounting holes, your assembly may look different than the picture at right. Clips and rails may be facing in opposite direction.

B. Attach clips to Bucket. In each of the 4 mounting holes, use a 5/16-18 x 3/4” bolt and flat washer on one side and a washer, lock washer and nut on the other. Tighten bolts to 144 in-lbs.

C. Prop up array to desired angle and tighten bolts to 144 in-lbs. Leave prop in place while installing second Bucket and Brace Rails. See table below for approximate Bucket spacing and Brace Rail length for desired panel tilt angle.

D. Install Lower Bucket loosely to pole allowing it to be moved up or down for adjustment to install Brace Rails. Use table on page 11 to determine location of Lower Bucket.

E. Loosely install left and right Clips to Center Bucket and to Lower Bucket facing same direction as clips on Upper Bucket. Note position of curved slots in clips as shown in diagram.

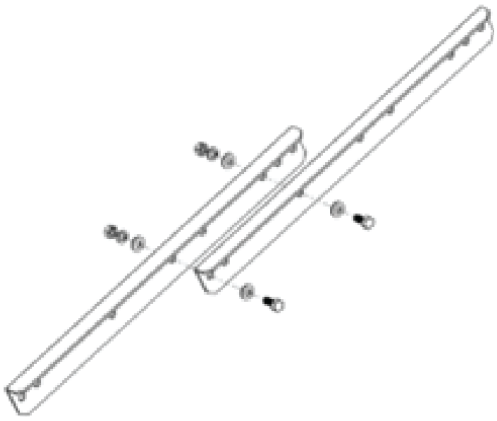


F. Install Center Bucket loosely to pole so it can be moved up or down for adjustment to install Brace Rails. Use table on page 11 to determine location of Center Bucket.

Step 6: Assembling Brace Rails

A. Use table on page 11 to determine assembled length of Center Brace Rails and Bottom Brace Rails, based on desired tilt angle.

B. Lay out the inner and outer Brace Rails so they overlap and equal the length determined in step A. Find the two holes that line up while maintaining the total rail length. If more than 2 holes line up, use holes that are farthest apart. See diagram at right.

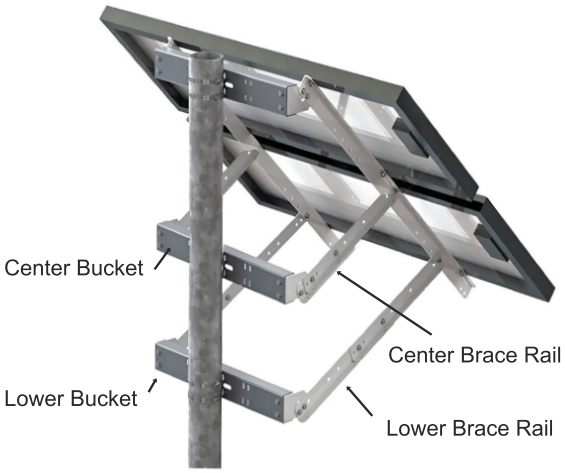


C. Bolt rails together using 5/16-18 x 3/4" bolt and flat washer on one side, and flat washer, lock washer and nut on the other. Tighten bolts to 144 in-lbs. Repeat with second set of Brace Rails.

Step 7: Attaching Lower Brace Rails

A. Determine desired tilt angle between 40° and 66° from horizontal.

Use Assembly Dimension table on Page 11 to find Brace Rail length.



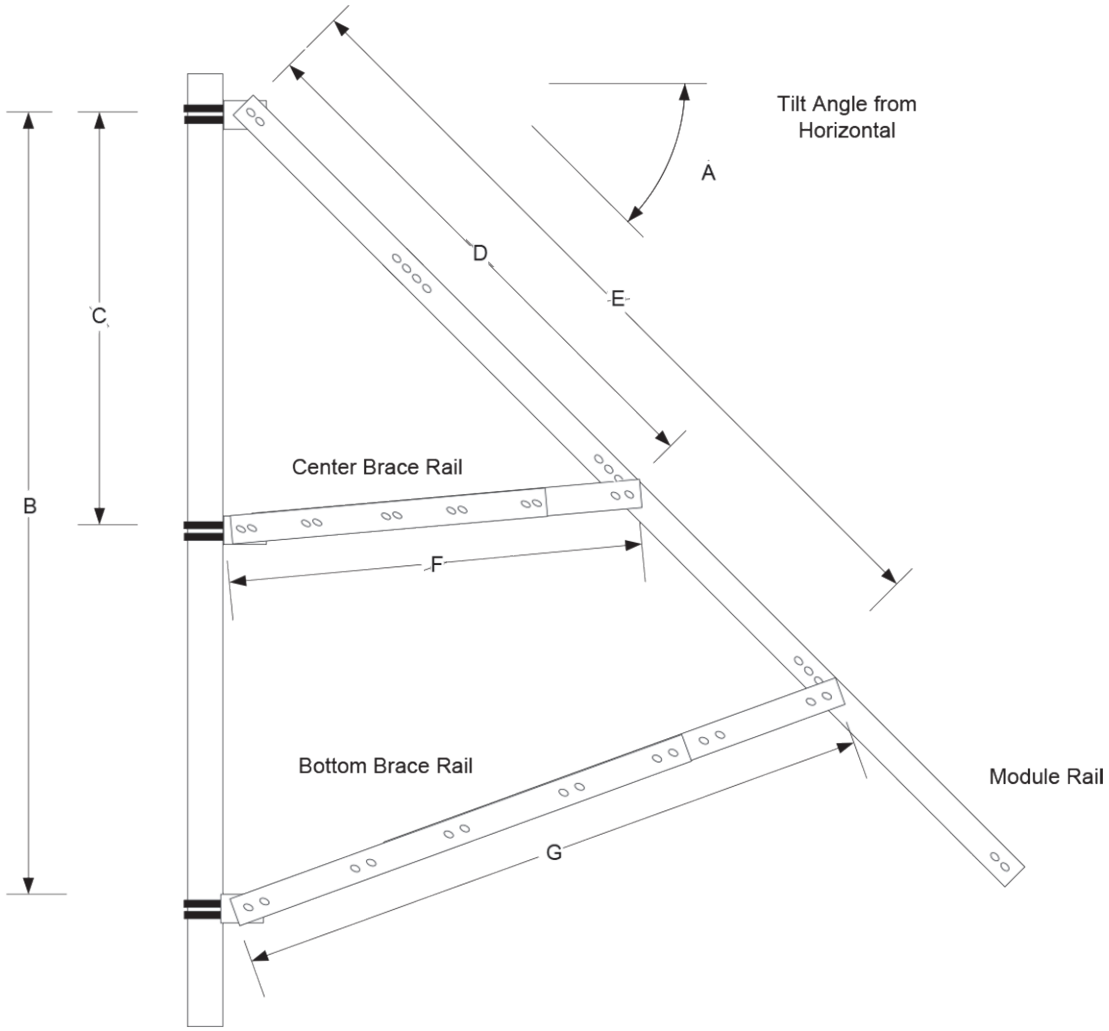
B. For each of two pre-assembled Lower Brace Rails, loosely bolt one end of each rail to a Panel Support and other end to corresponding Bucket Clip, (move lower bucket up or down for alignment) using 5/16-18 x 3/4" bolts, flat washer, lock washer and hex nut, torque to 144 in-lbs. Torque hose clamps to 35 in-lbs on Lower Bucket. Remove prop that is holding the desired angle. Do final check to ensure all hardware is torqued to specifications.

Step 8: Attaching Center Brace Rails

A. For each of the two pre-assembled Center Brace Rails, loosely bolt one end of rail to Panel Supports and other end to corresponding Clip, using two 5/16-18 x 3/4" bolts, flat washers, lock washers, and hex nuts. Hand-tighten bolts so Brace Rail angle can be changed.

B. Slide Center Bucket up or down pole until it supports Module Rail. Torque bolts to 144 in-lbs. Torque hose clamps to 35 in-lbs on Center Bucket.

Assembly Dimensions

Use table below to determine approximate location of Buckets on pole, length of Center Brace Rails and Bottom Brace Rails based on the desired tilt angle. Find desired tilt angle in column A.

Assembly Dimensions in Inches - Tilt Degrees from Horizontal						
Module Rail Tilt Angle Degrees from Horizontal	**Top Bucket to Bottom Bucket Spacing**	**Top Bucket to Center Bucket Spacing**	**Center Brace Attachment on Module Rail**	**Bottom Brace Attachment on Module Rail**	**Center Brace Rail**	**Bottom Brace Rail**
A	**B**	**C**	**D**	**E**	**F**	**G**
40	49	34	45	70	36	56
50	84	54	45	70	36	56
60	84	57	45	70	31	45
66	84	48	45	70	21	38