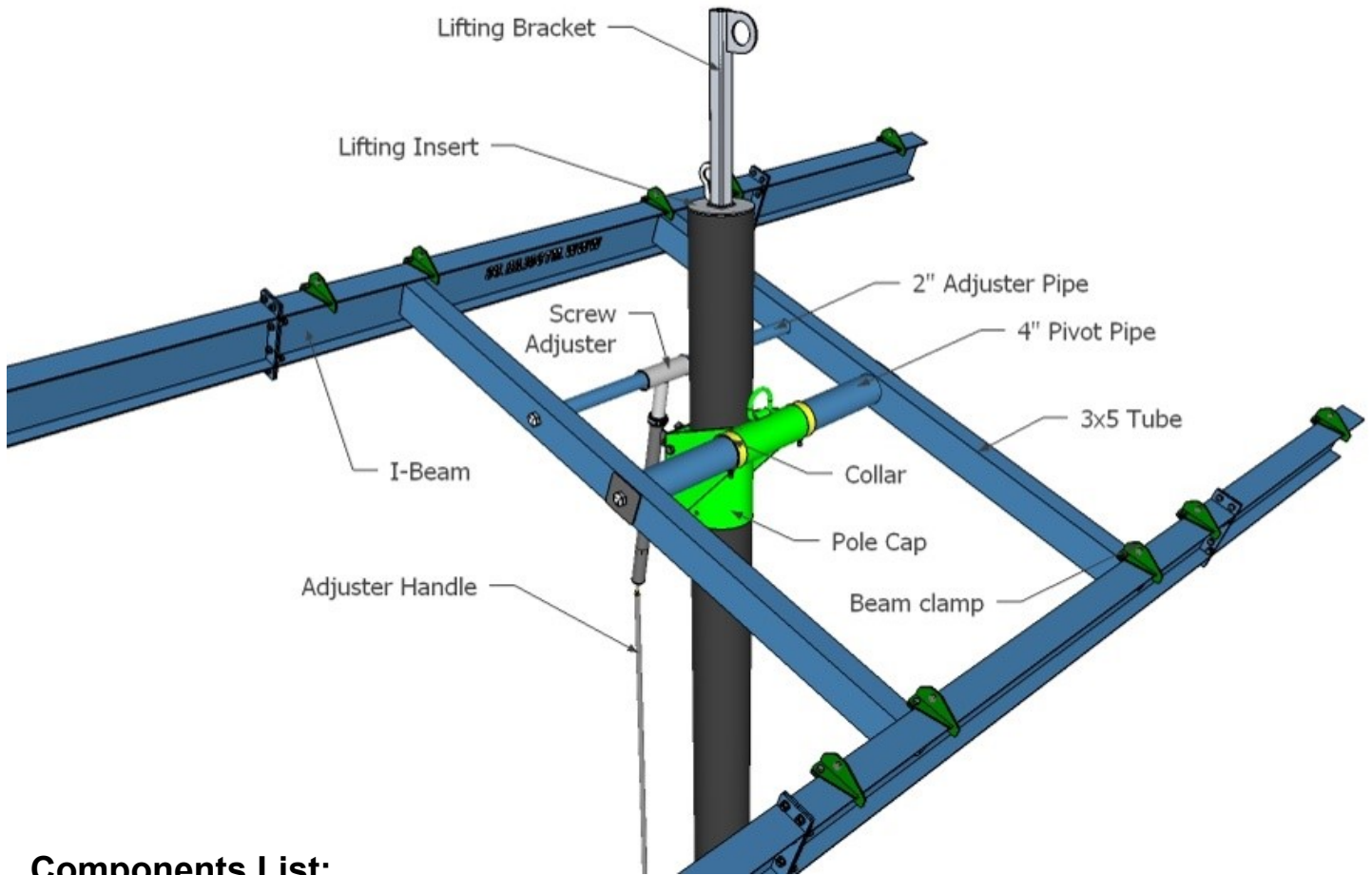


Installation Manual

Beam Series Top of Pole Mount

www.mtsolar.us
844-MT-SOLAR (687-6527)

Beam Series TPM Components



Components List:

Qty	Description
2	Center I-Beams, 90 Inches Long
4	Wing I-Beams, Lengths Vary
2	3x5 Tubes, 90 Inches Long
1	4.5" Pipe
1	2" Pipe
1	U Bracket / Pole Cap
1	Adjuster
1	Adjuster Handle (only available with screw adjuster)
1	Back Plate
**	Beam Clamps
2	Locking Collars
1	Lifting Insert Cap (located in Bolt Kit)
1	Lifting Insert
1	Bolt Kit Beam Series
	Installers Package (Optional)
1	Chain Fall Hoist
1	Lifting Bracket

Tools Required:

- 1 1/8" Socket
- 3/4" Socket
- 9/16" Socket
- Crescent Wrench
- Torque Wrench
- Tape Measure
- Angle Finder
- Compass
- Ladder

** Varies depending on the number, size and layout of modules.

See packing list for Quantity.

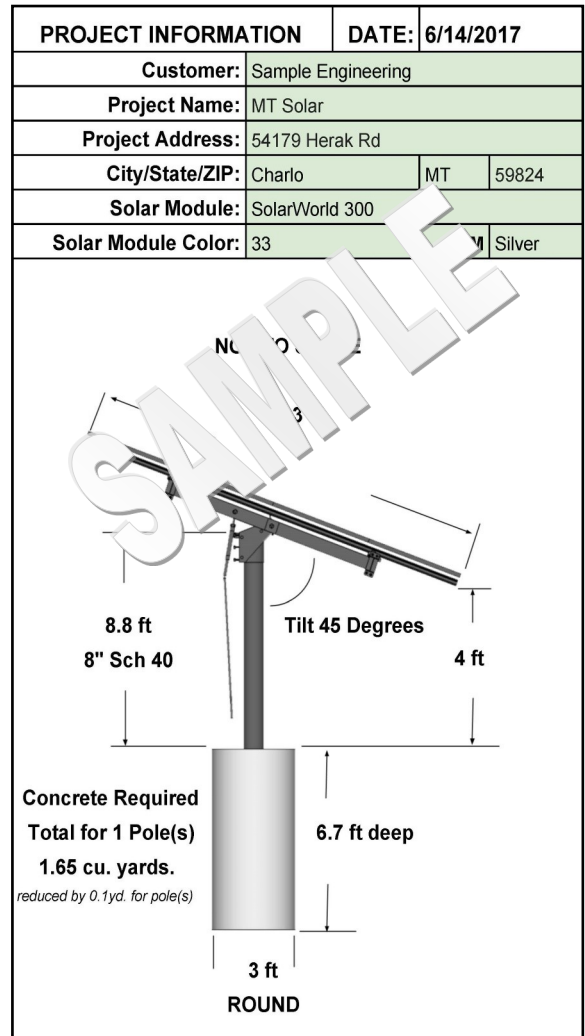
Thank you for choosing MT Solar Pole Mounts.

It is the installer's responsibility to determine the foundation parameters based on local site conditions, such as wind speed, snow load, soil type, exposure category, etc. Installations also must comply with local building regulations and permitting requirements.

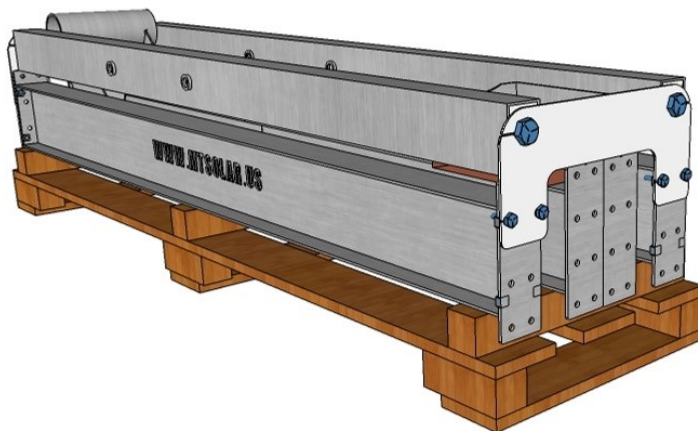
We recommend consulting a licensed engineer to determine appropriate foundation dimensions and pipe size and thickness. MT Solar can also provide a stamped drawing engineered for site-specific requirements for an additional fee. Please contact us to find out more.

Tips for Conventional Pipe Installation:

- Dig hole according to recommended depth & diameter.
- Set pipe in hole and use a level to ensure it is plumb and vertical to the ground.
- If installing multiple poles, use a string to line up pipes.
- Build rebar cage according to specification.
- Brace pipe 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.



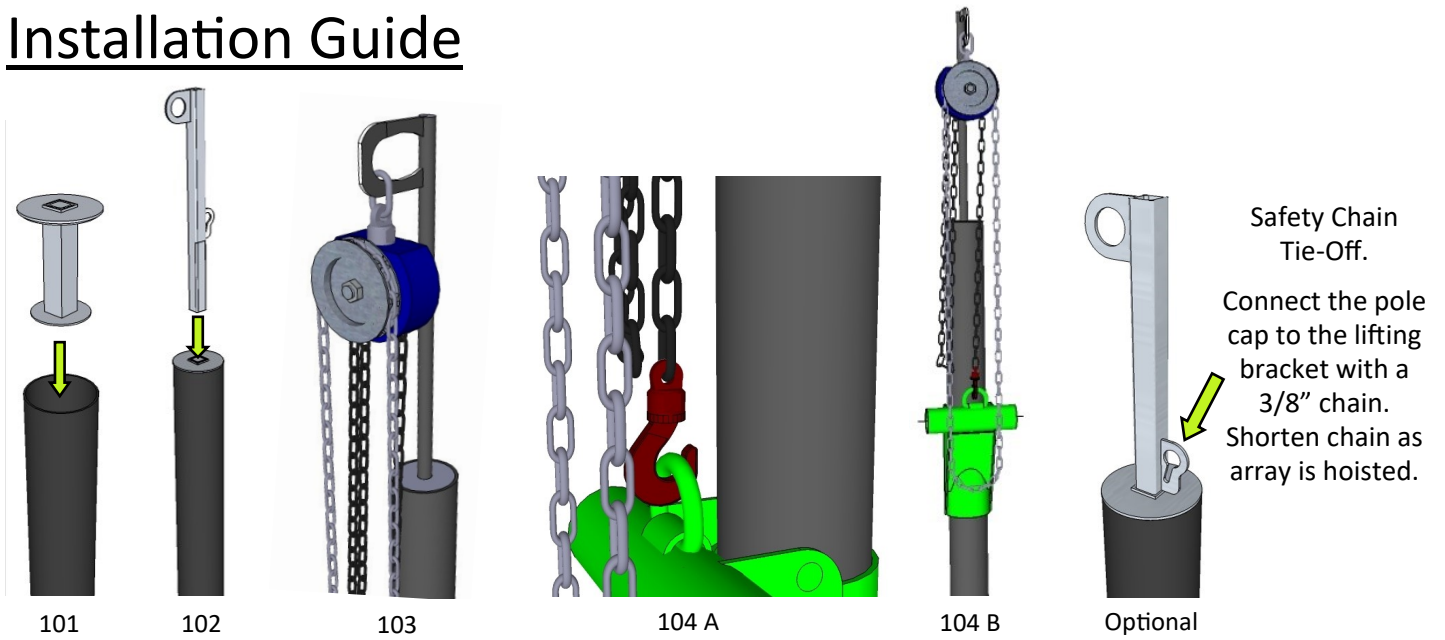
Un-packaging your mount...



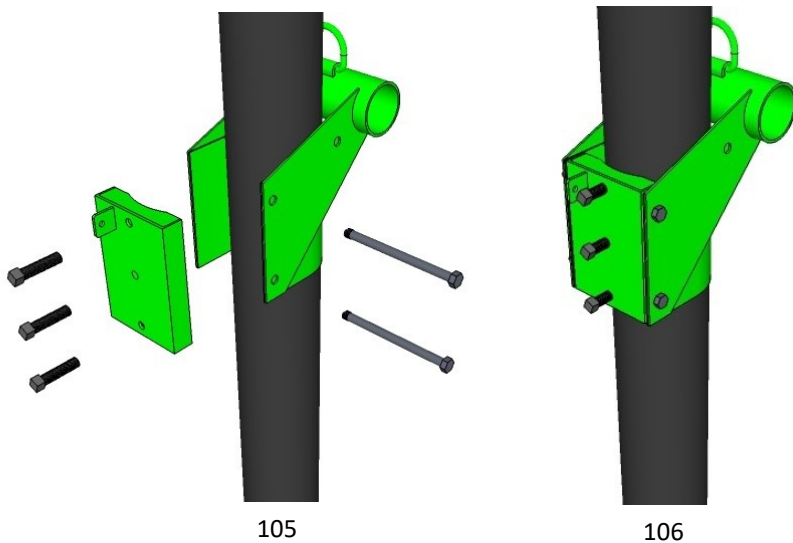
Remove steel plates on both ends of pallet to begin unpacking parts. You will not need the plates or hardware for the assembly of the mount.



Installation Guide



- 101:** With the vertical steel support pipe installed in the ground, place the lifting insert into the top of the pipe until it sits flush with the top.
- 102:** Place the lifting bracket into the lifting insert with the eye facing south.
- 103:** Hang a 1 ton or greater chain fall hoist from the lifting eye.
- 104:** Hang the U-Bracket Assembly on the Chain Hoist. Attach safety chain (provided locally) if desired.



Nominal Pole Size	3/4" Bolt Length
6 Inch	9 Inch
8 Inch	11 Inch
10 Inch	13 Inch

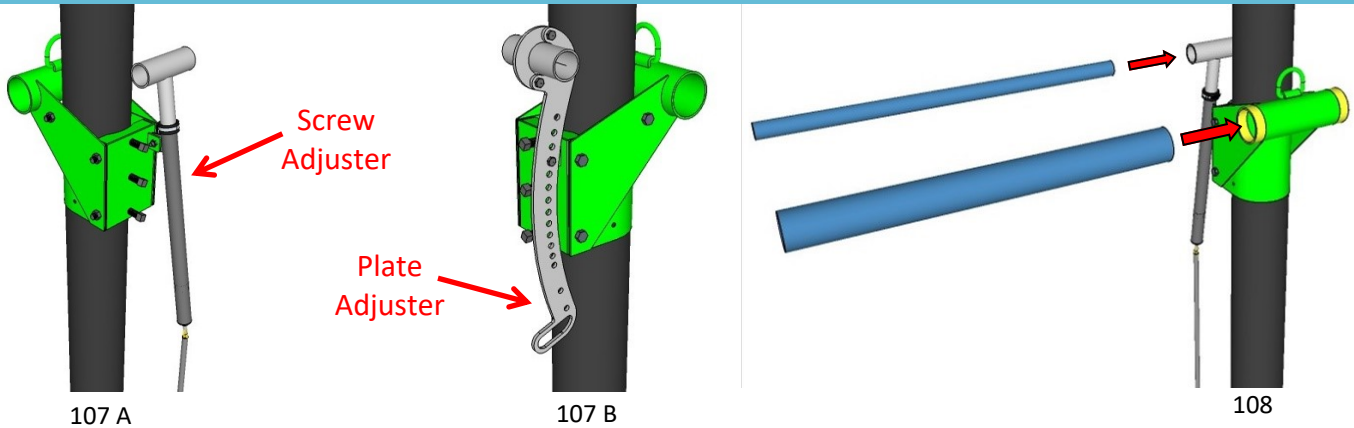
Use hardware labeled STEP 1 in the Bolt Kit

105: While holding the U-Bracket around the pole, insert 2 of the 3/4" long bolts (see table above for length) through the holes in the back of the U-bracket and through the holes on the Back Plate with 3/4" flat washers on both sides and 3/4" nuts, but do not tighten.

106: Insert three 3/4" x 3" Set Bolts in Back Plate, but do not tighten if leaving chain fall hoist connected.

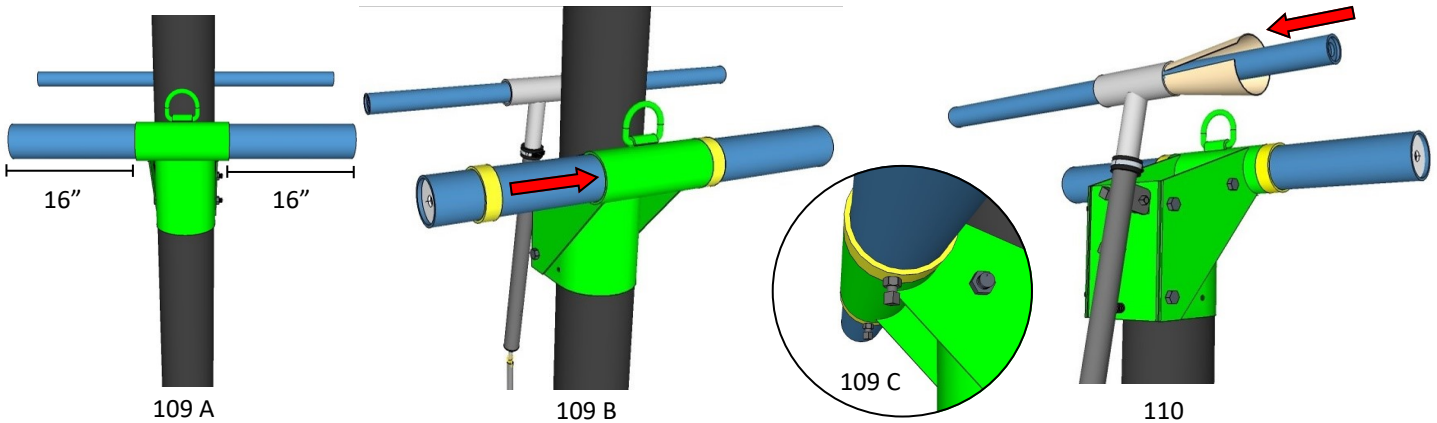
Note: If installing multiple mounts with a single hoist, bolt the pole cap on the pole at the desired working height. Tighten 3/4" bolts and 3/4" set screws. Assemble rack, rails and modules. Then, move lifting assembly and hoist to pole when ready to lift. Attach to pole cap and loosen bolts. Continue with raising the array for wiring or completing the installation.

Use hardware labeled **STEP 2** in the Bolt Kit



107: Attach the Screw Adjuster to the tab on the Back Plate with the 1/2" x 1 1/2" Bolt. If using the Manual Plate Adjuster, attach it with the 1/2" x 1 1/2" Bolt and 1/2" flange nut. Make sure the bolt is snug tight, but do not over-tighten to allow for some movement of the adjuster tab.

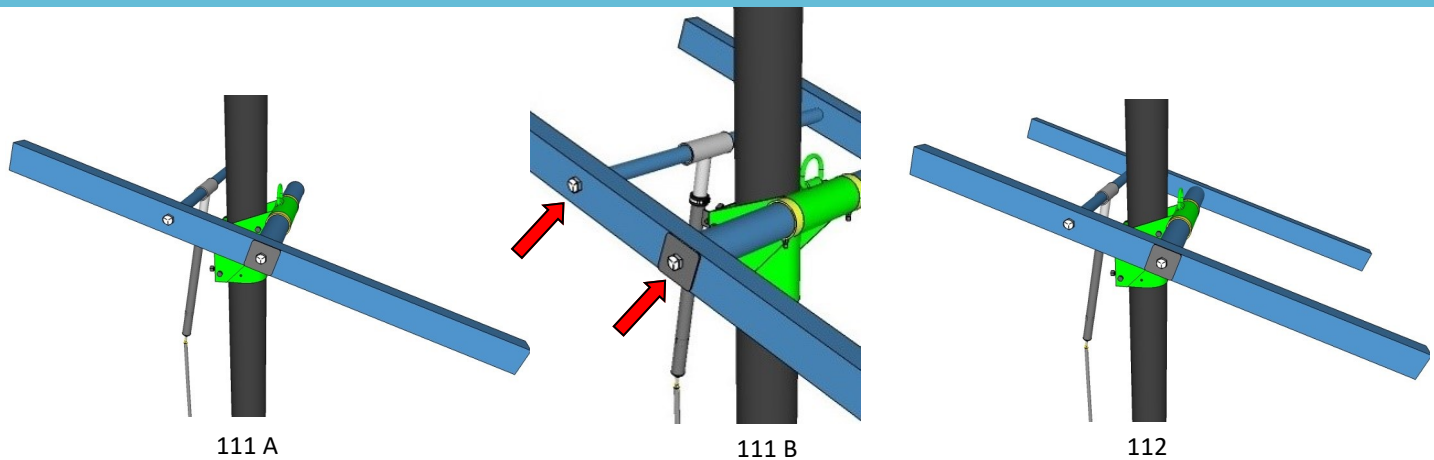
108: Slide the 2.5" pipe through the screw adjuster sleeve & slide the 4.5" pipe through the U Bracket sleeve.



109: Center pipes so there is approximately 16" on either side of the sleeve. Slide collars on 4.5" pipe and tighten 1/2" x 1" square head set bolts to 45 ft lbs. Hold collar firmly against the sleeve when tightening.

110: If needed, slide plastic shim between 2.5" pipe and adjuster sleeve to reduce movement.

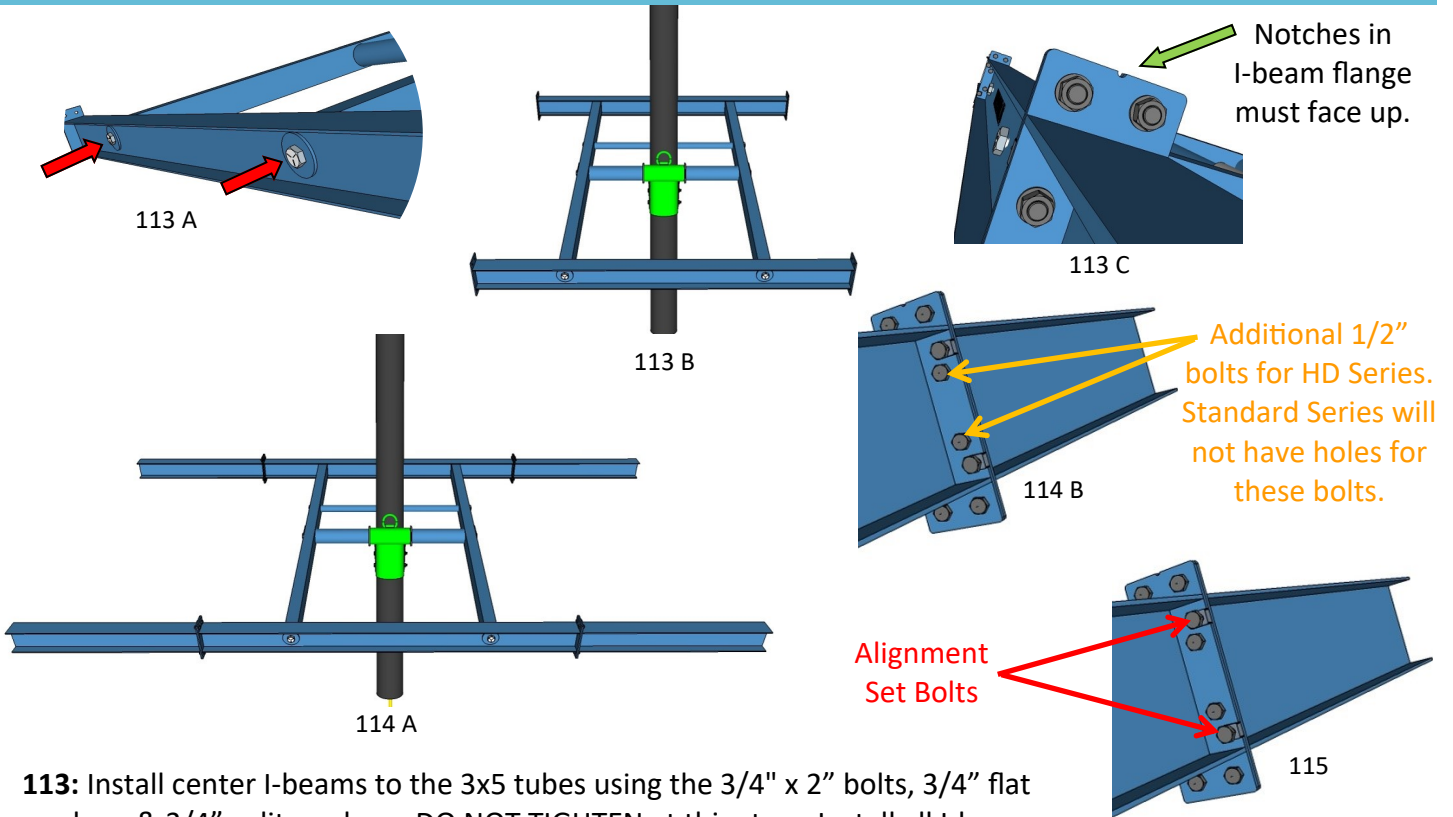
Use hardware labeled **STEP 3** in the Bolt Kit



111: Attach the 3x5 rectangular tubes to the 4.5" pipe using the 3/4" x 5" bolts, 5" square washers & 3/4" split washers. Attach tubes to the 2.5" pipe using the 1/2" x 4 1/2" bolts, 1/2" flat washers & split washers.

112: Install the remaining 3x5 rectangular tube. Snug up all 4 bolts, but leave loose enough to allow for some play when installing I-beams. Adjust as necessary to level the mount.

Use hardware labeled **STEP 4** in the Bolt Kit

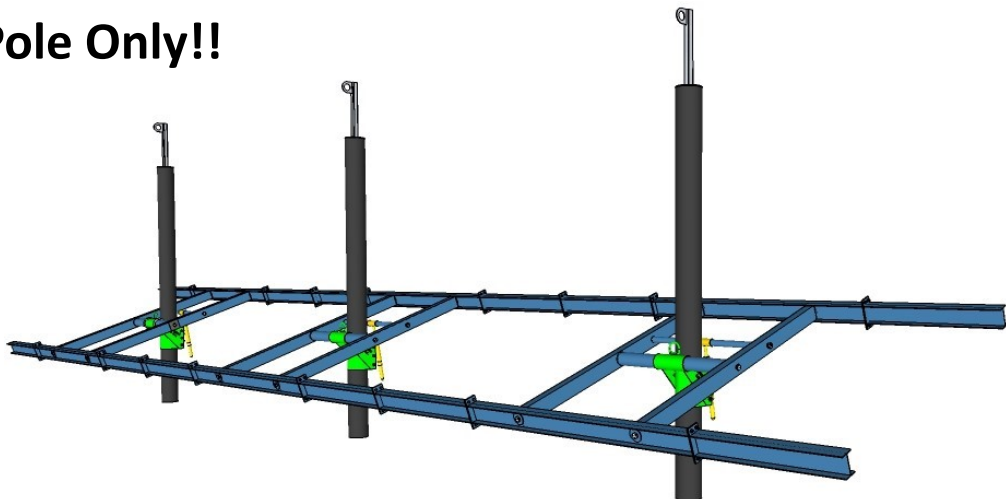


113: Install center I-beams to the 3x5 tubes using the 3/4" x 2" bolts, 3/4" flat washers & 3/4" split washers. DO NOT TIGHTEN at this step. Install all I-beams with notches in the flange facing up.

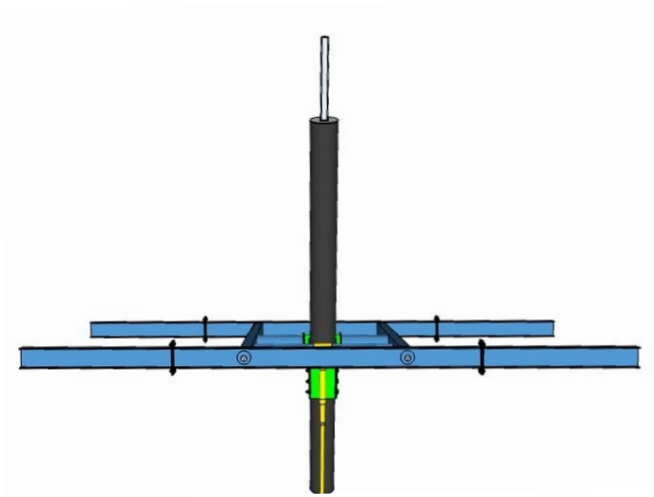
114: Attach the two I-beam wings on the ends of the center beam using the 1/2" x 1 1/4" bolts and 1/2" flange nuts. There will be 4 bolts per wing on the standard series and 8 bolts per wing on the HD Series. The XHD Series utilizes 4 of the 3/4" x 2" bolts per wing instead.

115: The Alignment Set Bolts may be used to align the I-Beam Center piece to the I-Beam Wings, if necessary. Once I-beams are level, make sure all alignment set screws are touching the plate of the I-Beam wing and tighten the 1/2" bolts to 45 ft lbs.

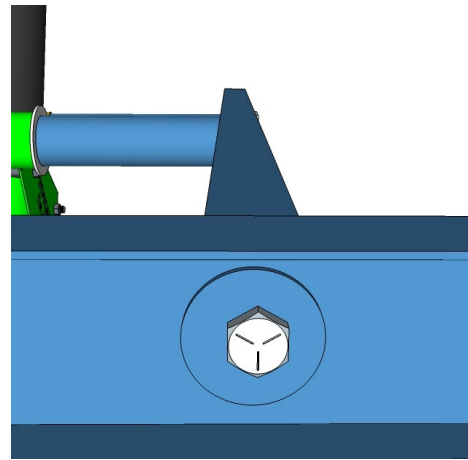
Multi-Pole Only!!



Multi-pole: If installing a multi-pole, splice center beam sections together and splice wings on the ends. Use the same hardware and torque values listed in 114 and 115 above. In addition, use hardware labeled "Splice Bolt Kits" and "Alignment Set Bolt Kits" located in the Bolt Kit.



116 A



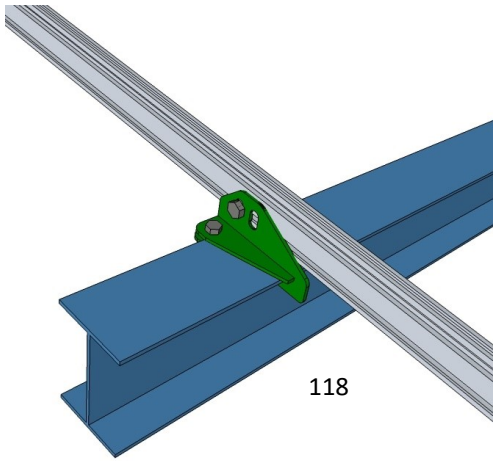
116 B

116: Standing on the North Side of the array with the Tube to Beam bolts started but not tightened, sight the beams to ensure they are parallel. If not, twist the array until they are. Then tighten all the 3/4" bolts between the Pipe and Rectangular Tubes and the Tubes and the I-Beams to 100 ft lbs.

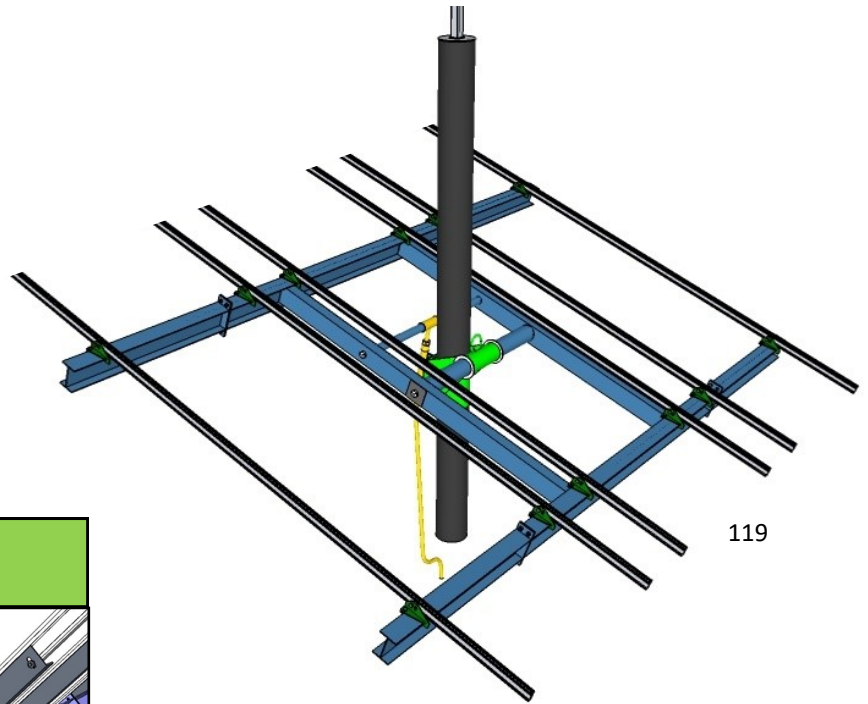
Standard Beam Clamps	OR	Long Beam Clamps for 204" Rails
<p data-bbox="467 1564 535 1591">117 A</p>		<p data-bbox="1393 1564 1461 1591">117 B</p>

117: Plan the layout of your rails according to your module manufacturer's recommendation. Install the Beam Clamps on the I-beam using the 3/8" x 1 1/4" carriage bolts and 3/8" flange nuts. Tighten to 20 ft lbs. Mounts with 204 inch rails require a 4 ft. long angle-shaped clamp to give extra support to the span and cantilever. Attach angle using the square plates provided and the 3/8" x 1 1/4" carriage bolts and 3/8" flange nuts.

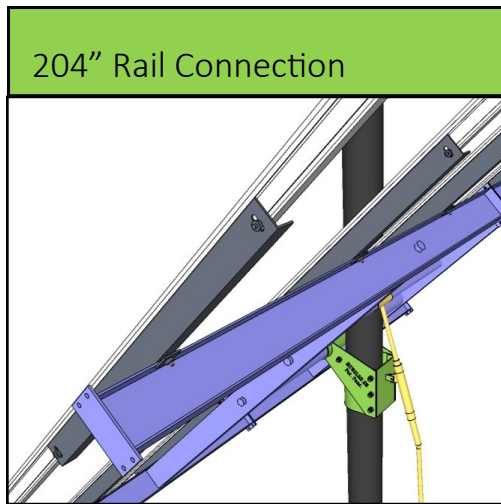
*For standard single pole array configurations, see last page.



118



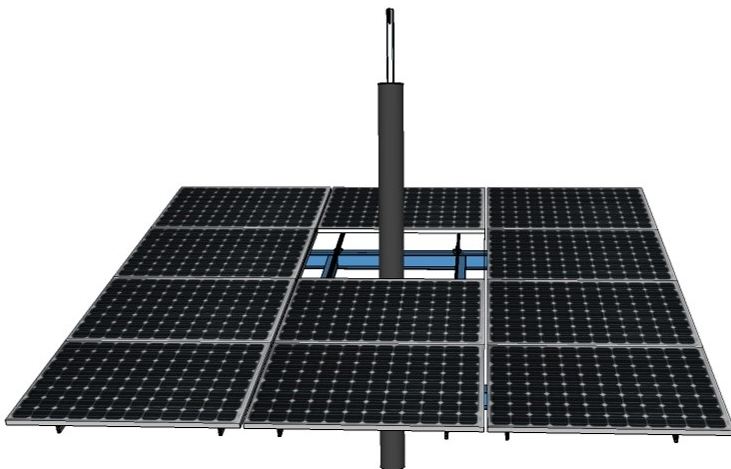
119



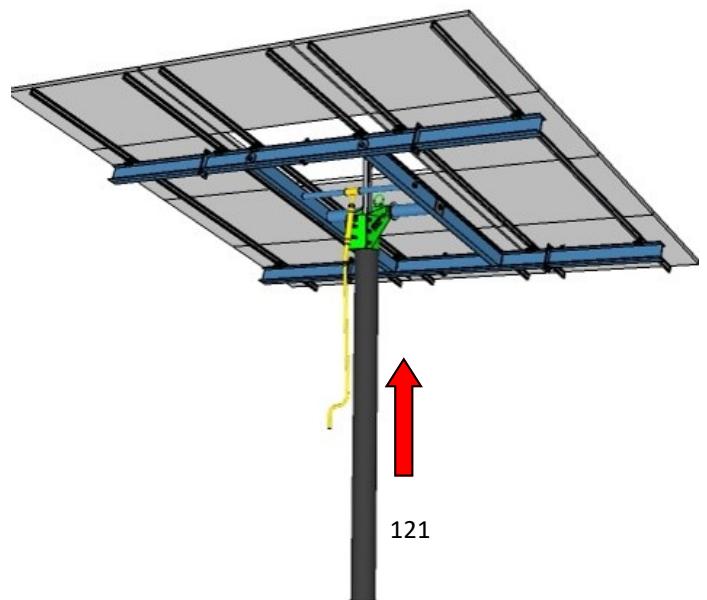
118: Install the Mounting Rail into the beam clamp slot as per Mounting Rail instructions. Use 3/8" x 1" stainless steel bolts and 3/8" serrated flange nuts.

119: Center rails over I-beams, keeping equal length of rail off the end of each beam. Tighten to 17 ft lbs.

Install Solar Modules as per Mounting Rail and module manufacturer instructions. See last page of manual for Iron Ridge Rail and Clamp instructions.



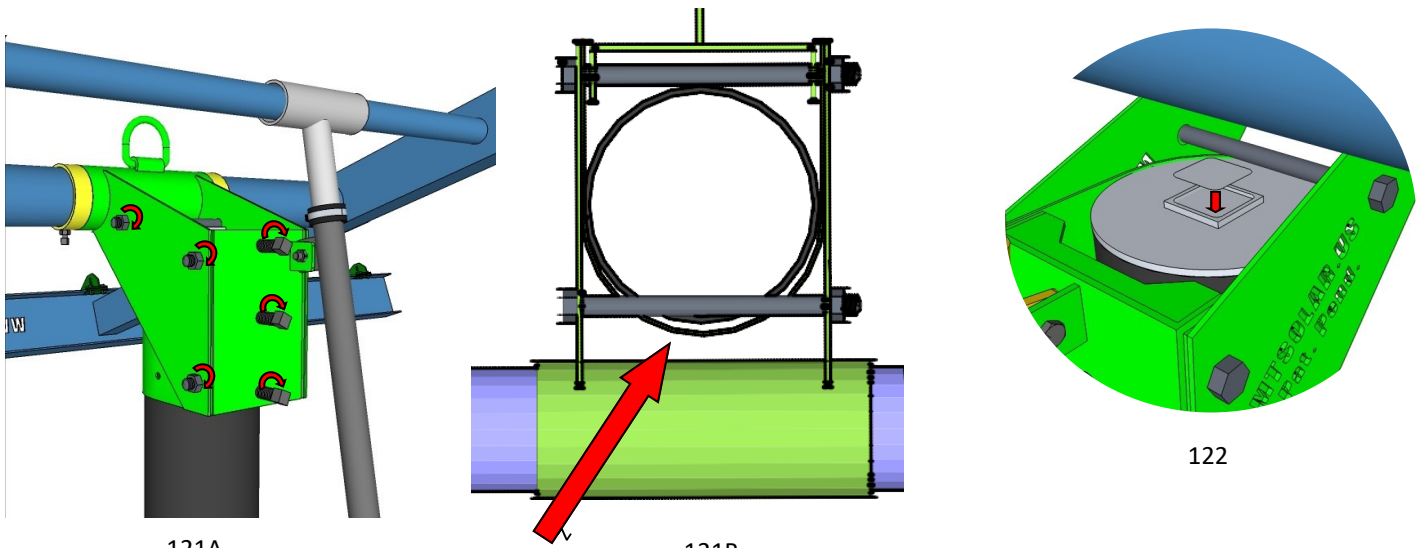
120



121

120: Leave out the appropriate module(s) to allow for the 8" pipe. It is ok to install the top and bottom modules of the center row(s) with just 2 clamps until the array is lifted to the top. Raise and or tilt the array to facilitate module installation and/or module wiring and wire management as needed.

121: When wiring is completed, raise the array to the top of the pole.



NO GAP!!

*Remove the gap by tightening the square set bolts until the front of the U-Bracket is snug against pipe, then make one more full rotation of the bolt.

121A: With the mount hanging free on the hoist, **FIRST** tighten the square-headed set bolts in the back mounting plate. **Remove the gap** by tightening the set bolts until the front of the U-Bracket is snug against pipe, then make one more full rotation of the bolt. **SECOND**, tighten both long 3/4" bolts in back mounting plate to 100 ft-lb. Insert the last long 3/4" bolt over the top of the pole with the 3/4" flat washers and 3/4" nut. Tighten to 20 ft lbs.

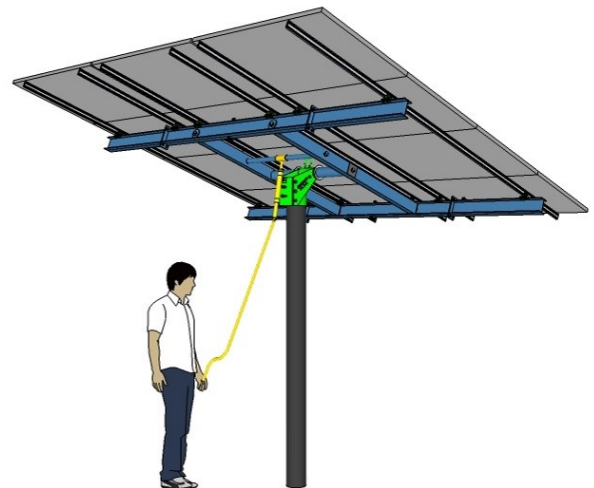
122: Remove the chain hoist and lifting bracket and place the 2" square cap in place.

SINGLE POLE SPIN PREVENTION

For large mounts, please see the Spin Prevention Addendum at the end of this manual. This provides a field-drilled bolt-through option for extra security of the U-bracket to the support pipe.



123



124

123: Place the final module in the empty space. It may be advantageous to fully extend the Screw Adjuster to make this easier.

125: Attach adjuster handle using the set screw. You may cut the handle to length depending on pole height and site conditions. We recommend occasional greasing of the threaded rod. Using an angle finder, adjust array to proper tilt.

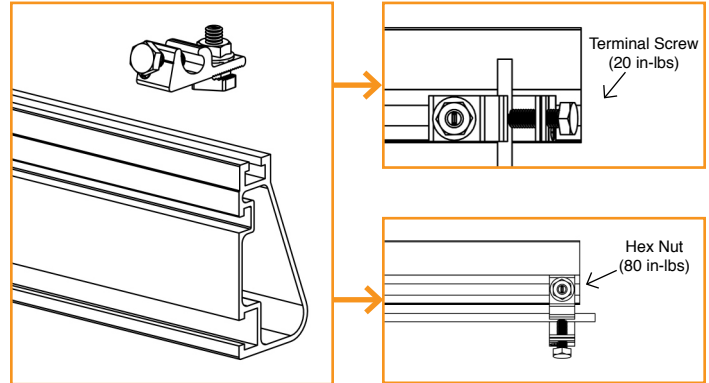
3. SECURE LUGS

Insert T-bolt in top rail slot and torque hex nut to **80 in-lbs**. Install a minimum 10 AWG solid copper or stranded grounding wire. Torque terminal screw to **20 in-lbs**.

💡 Grounding Lugs are only needed on one rail per row of modules (unless frameless modules are being used, see [Page 8](#)).

💡 If using Enphase microinverters, Grounding Lugs may not be needed. See [Page 8](#) for more information.

💡 Grounding Lugs can be installed anywhere along the rail and in either orientation shown.



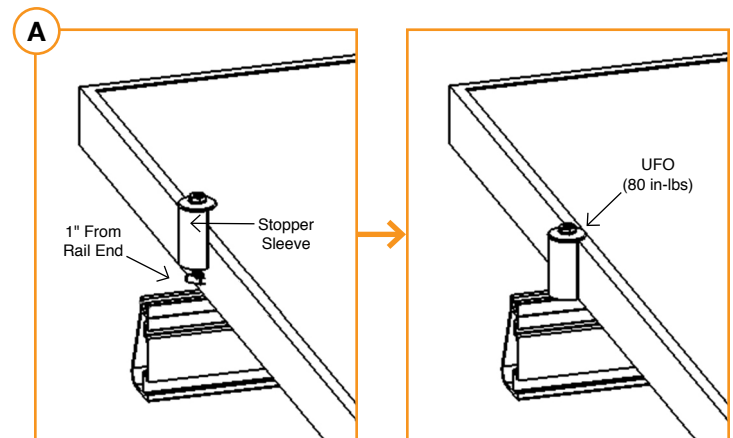
4. SECURE MODULES

A. SECURE FIRST END

Place first module in position on rails, a minimum of 1" from rail ends. Snap Stopper Sleeves onto UFO. Fasten module to rail using the UFO, ensuring that the UFO is hooked over the top of the module. Torque to **80 in-lbs**.

💡 Ensure rails are square before placing modules.

💡 Hold Stopper Sleeves on end while torquing to prevent rotation.

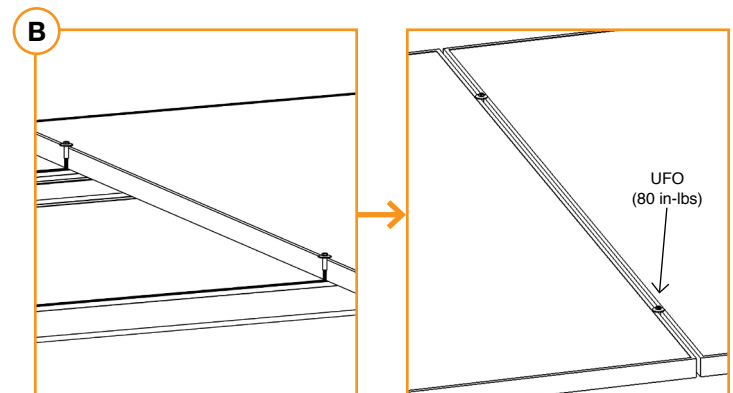


B. SECURE NEXT MODULES

Place UFO into each rail, placing them flush against first module. Slide second module against UFO. Torque to **80 in-lbs**. Repeat for each following module.

💡 When reinstalling UFO, move modules a minimum of 1/16" so UFOs are in contact with a new section of module frame.

💡 If using Wire Clips, refer to [Page 7](#).

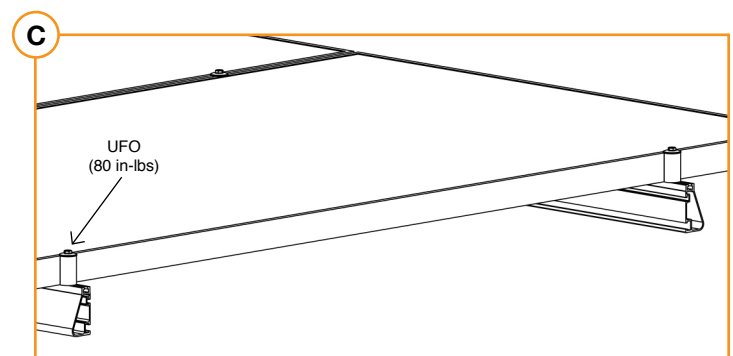


C. SECURE LAST END

Place last module in position on rails, a minimum of 1" from rail ends. Snap Stopper Sleeves onto UFO. Secure UFO Clamps on rails, ensuring they are hooked over top of module. Torque to **80 in-lbs**.

💡 Hold Stopper Sleeves on end while torquing to prevent rotation.

💡 Repeat all steps for each following row of modules.

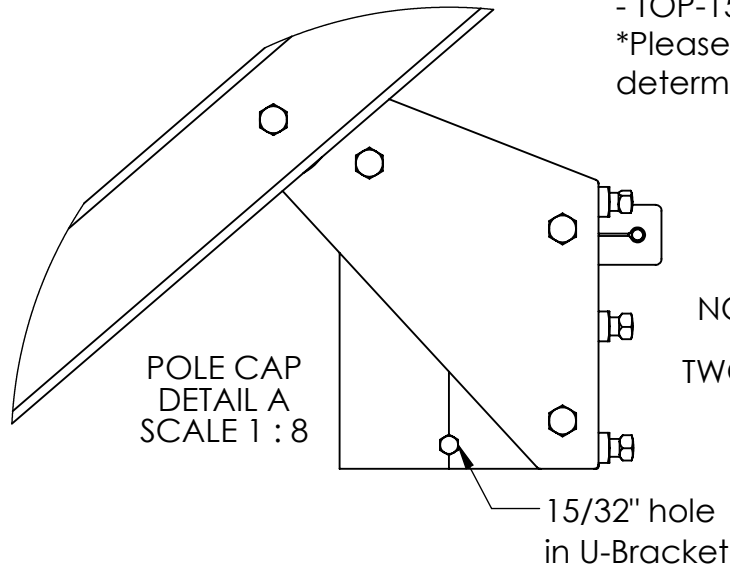


SPIN PREVENTION ADDENDUM

The bolt-through option may be required if your array meets the following criteria:

- TOP-12 or larger, > 45 degree tilt, Exp C
- TOP-15 or larger, > 45 degree tilt, Exp B or C

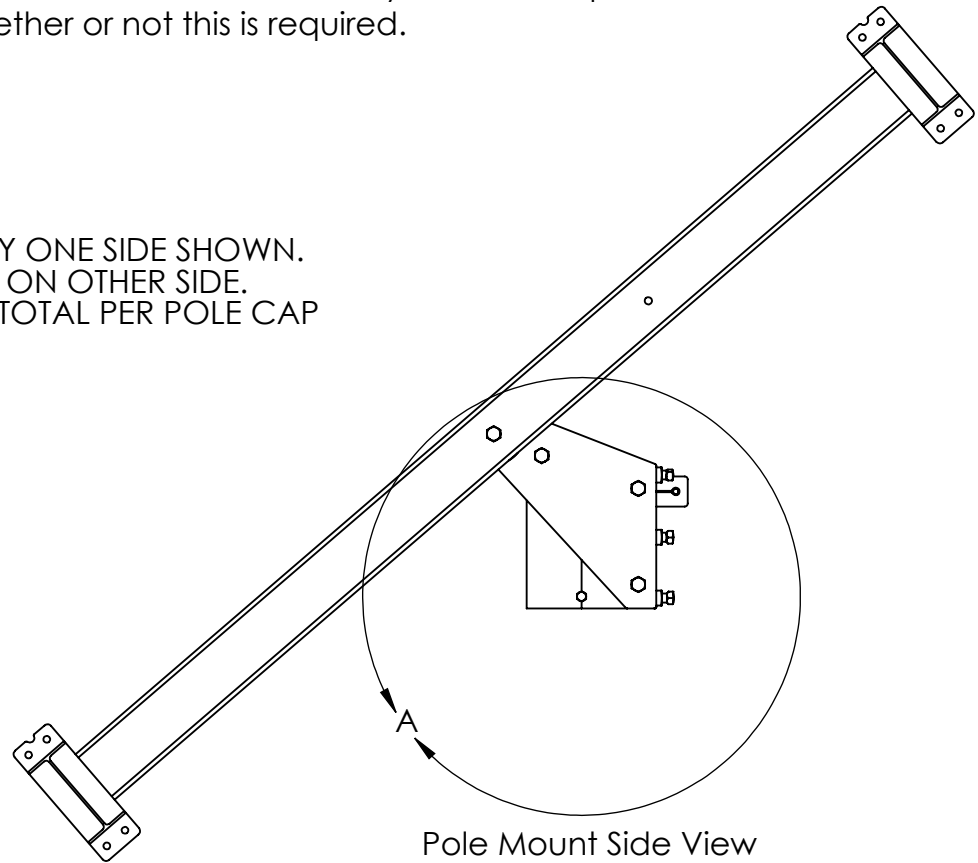
*Please visit www.mtsolar.us/calculator if you need help determining whether or not this is required.



NOTE: ONLY ONE SIDE SHOWN.
REPEAT ON OTHER SIDE.
TWO BOLTS TOTAL PER POLE CAP

Instructions:

This is the final step in the installation, to be done once array is installed, hoisted into place, and the set bolts are tightened. Use the drill bit provided by MT Solar to drill through the existing 15/32" holes in the U-bracket and through the support pipe on both sides. Thread in the 1/2" x 1" bolt through the pole cap and support pipe. Number of through bolts required can be determined by the calculator found at www.mtsolar.us/calculator.

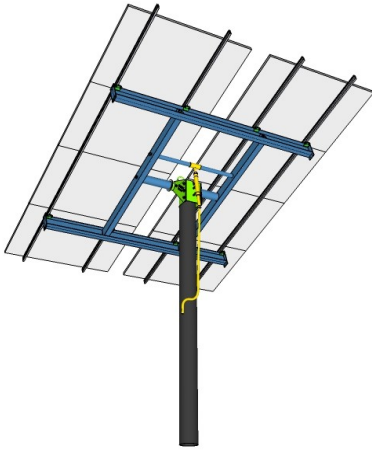


Note: Adjuster and Support Pole Omitted for Clarity



<p style="text-align: center; font-weight: bold; font-size: small;">PROPRIETARY AND CONFIDENTIAL</p> <p style="font-size: x-small;">THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF MT SOLAR LLC. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF MT SOLAR LLC IS PROHIBITED.</p>		NAME TJ	DATE 3/30/17	TITLE: A	DWG. NO. High Tilt/High Wind Additional Bolt Detail	REV
DRAWN						
CHECKED						
ENG APPR.						
MFG APPR.						
SCALE: 1:16					SHEET 1 OF 1	

8 Module Configuration



9 Module Configuration



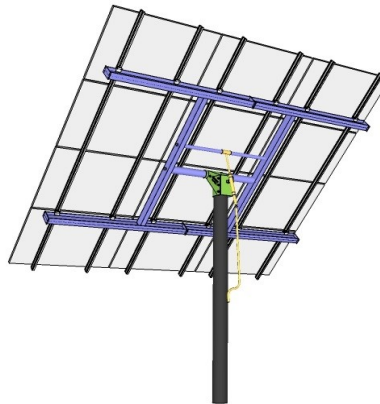
10 Module Configuration



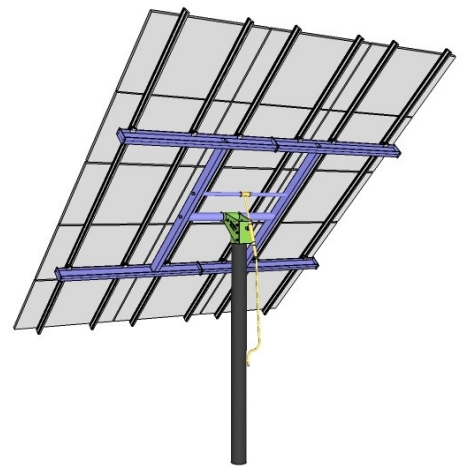
10-TALL Configuration



12 Module Configuration



15 Module Configuration



16 Module Configuration



20 Module Configuration



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