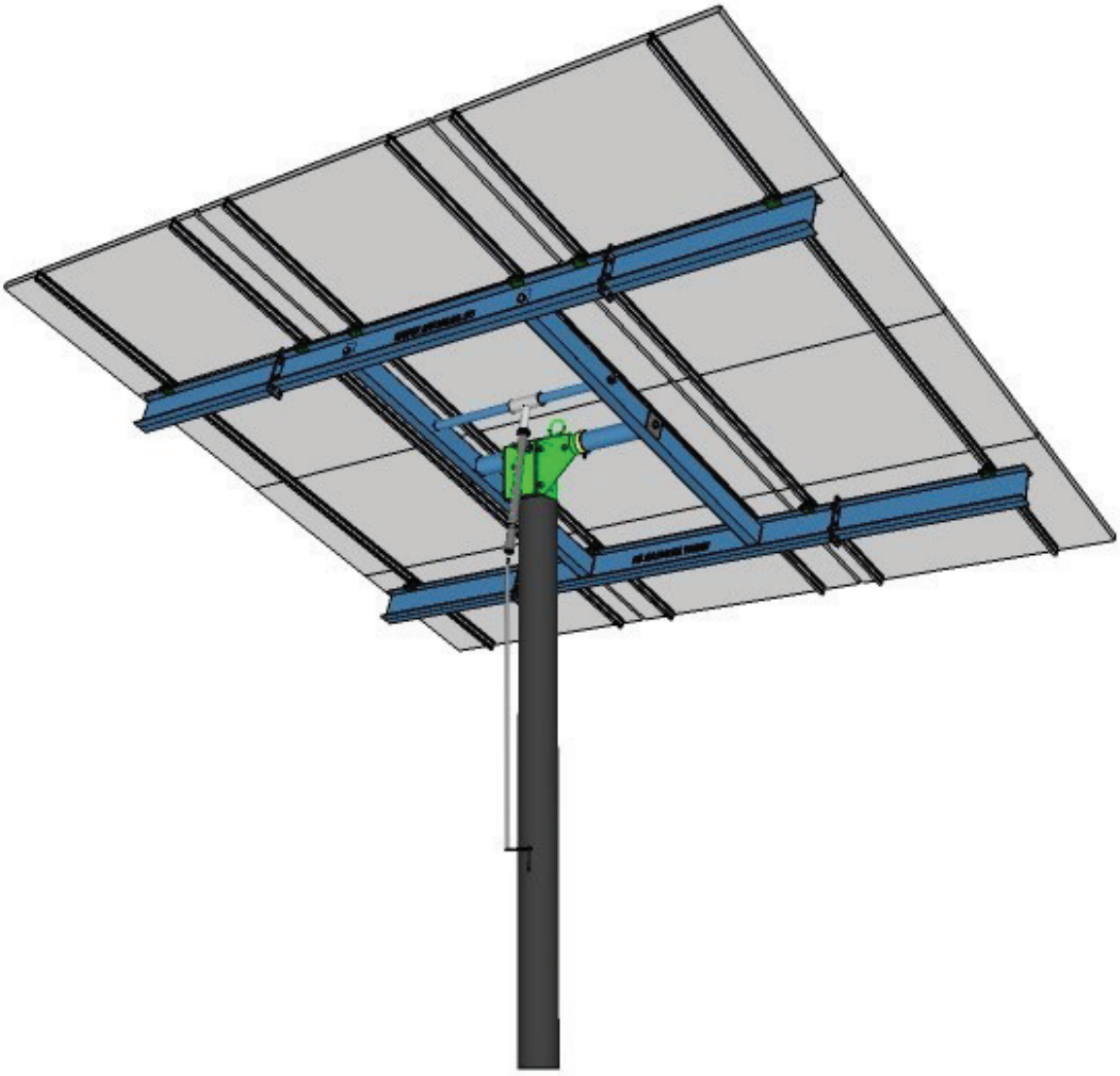
MADE IN MONTANA, USA



Installation Manual

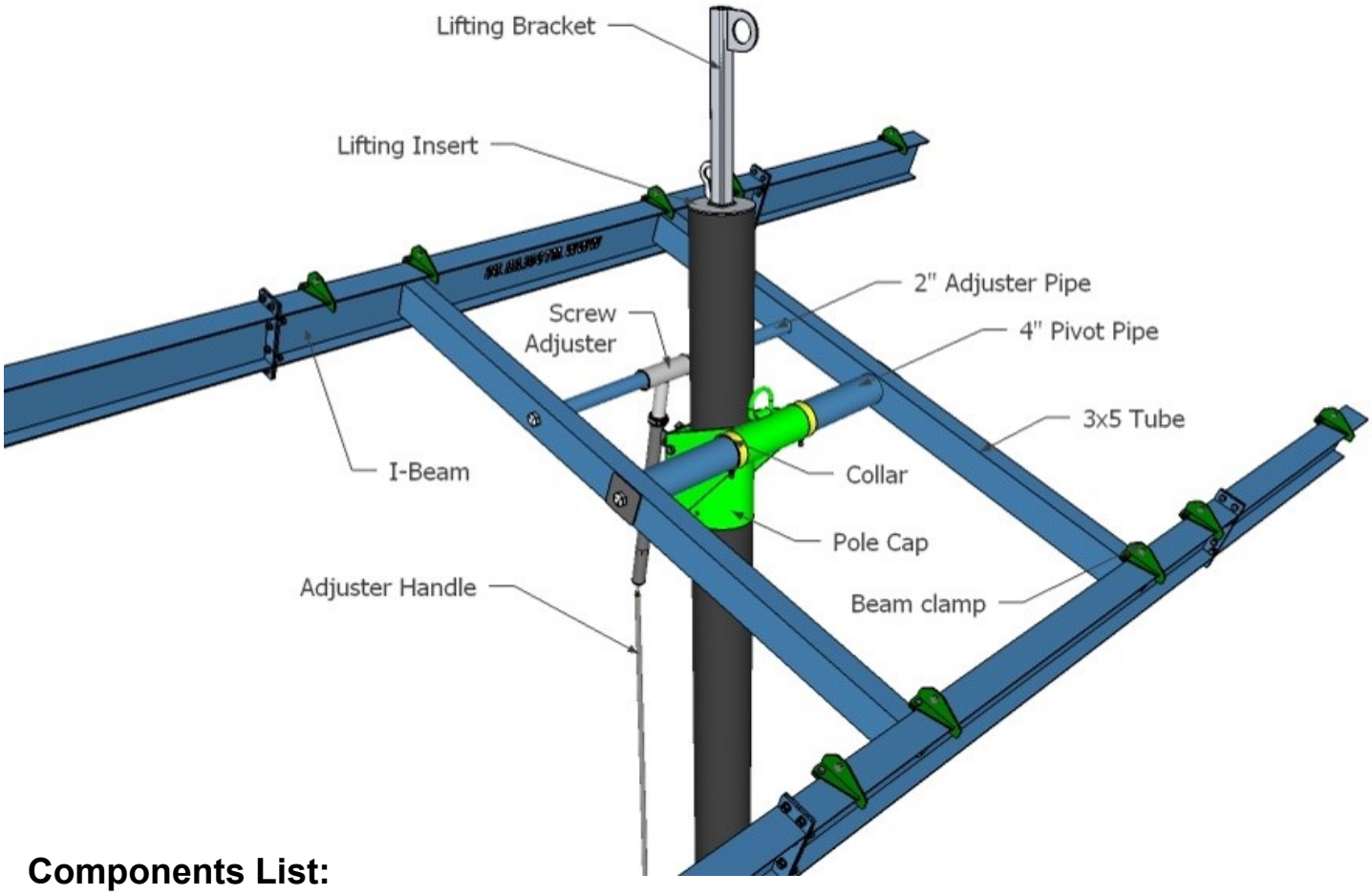
Beam Series Top of Pole Mount

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

2021 V4.3

Page intentionally left blank.

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" Pivot Pipe
1	2" Adjuster 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	Square 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.

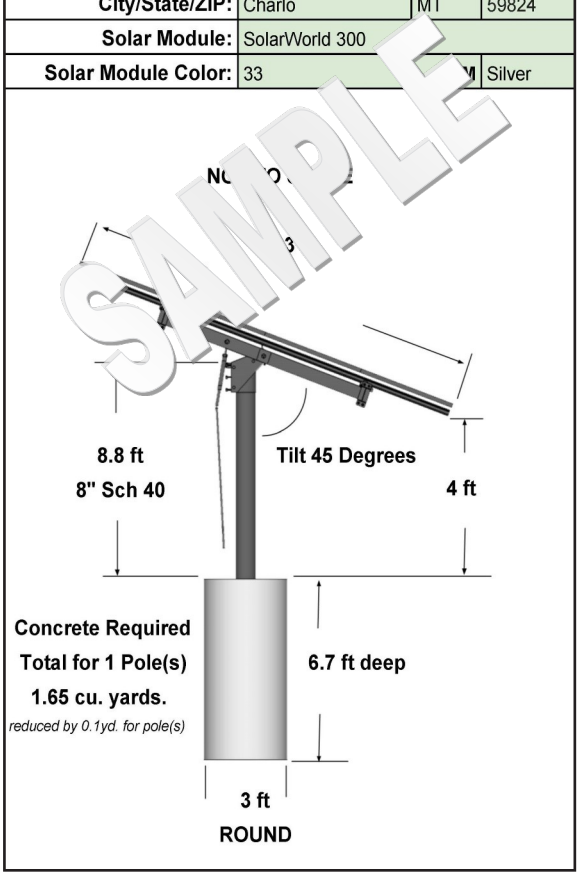
See packing list for Quantity.

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.

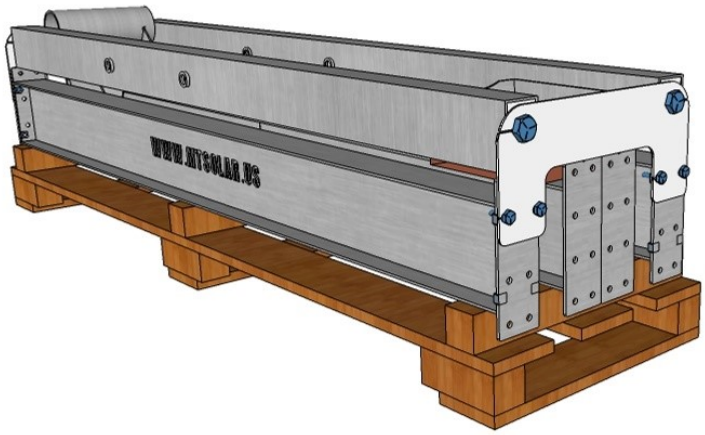
PROJECT INFORMATION		DATE:	6/14/2017
Customer:	Sample Engineering		
Project Name:	MT Solar		
Project Address:	54179 Herak Rd		
City/State/ZIP:	Charlo	MT	59824
Solar Module:	SolarWorld 300		
Solar Module Color:	33		Silver



Tips for Conventional Pipe Installation:

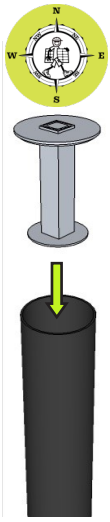
- Dig hole according to recommended depth & diameter.
- Set pipe in hole and use a level to ensure it is plumb and vertical to the ground.
- If installing multiple poles, use a string to line up pipes.
- Build rebar cage according to specification.
- Brace pipe to prevent movement while pouring concrete.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

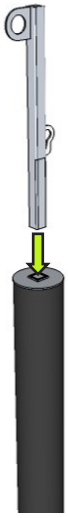


Remove steel plates on both ends of pallet to begin unpacking parts. You will not need the plates or hardware for the assembly of the mount.

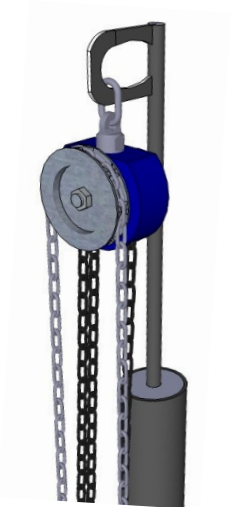
Installation Guide



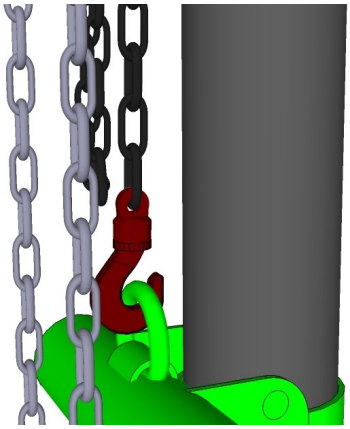
101



102

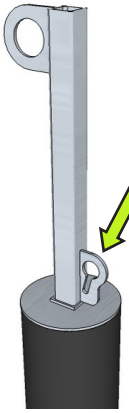


103



104 A

104 B



Optional

Safety Chain Tie-Off.

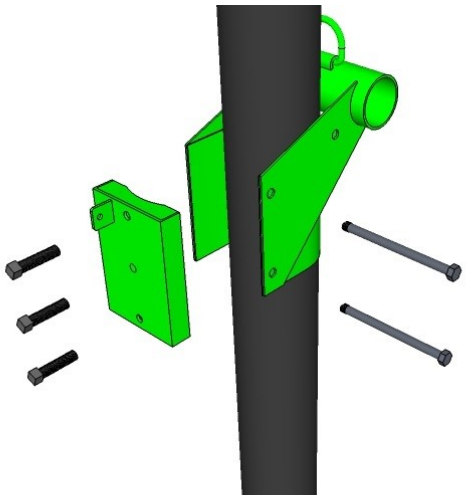
Connect the pole cap to the lifting bracket with a 3/8” chain. Shorten chain as array is hoisted.

101: With the vertical steel support pole installed in the ground, orient the compass to the north and place the lifting insert into the pole until it sits flush with the top.

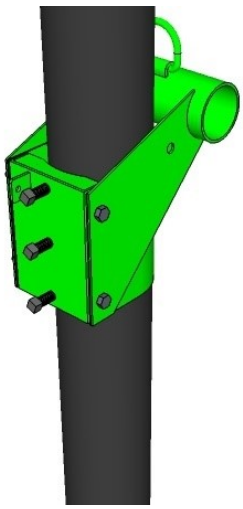
102: Place the lifting bracket into the lifting insert with the eye facing south.

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.



105



106

Nominal	3/4” Bolt
6 Inch	9 Inch
8 Inch	11 Inch
10 Inch	13 Inch

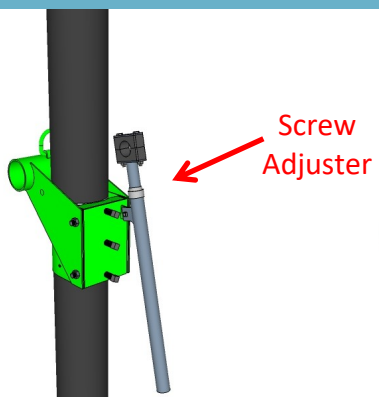
Use hardware labeled STEP 1 in the Bolt Kit

105: While holding the U Bracket around the pole, insert 2 of the 3/4" 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 and 3/4” flange nuts, but do not tighten.

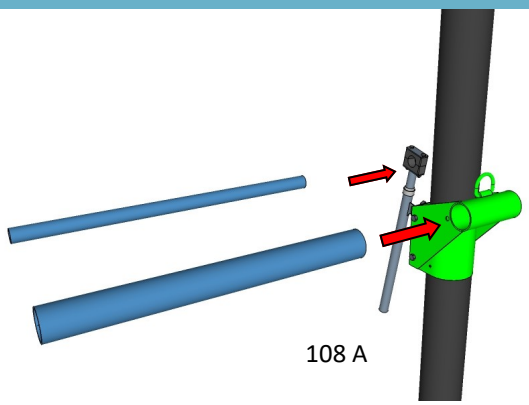
106: Insert three 3/4” x 3” set bolts in the back plate, but do not tighten if leaving chain fall hoist connected.

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.

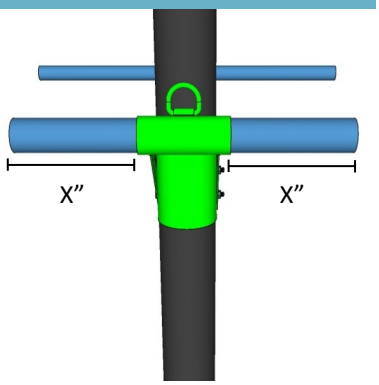
Use hardware labeled STEP 2 in the Bolt Kit



107



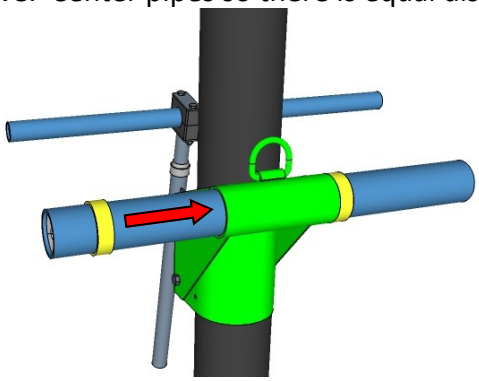
108 A



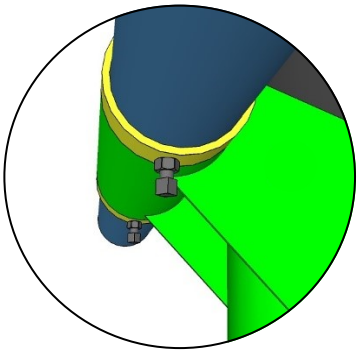
108 B

107: Attach the Screw Adjuster to the tab on the Back Plate with the 1/2” x 1 1/2” bolt, 1/2” flat washers, 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.

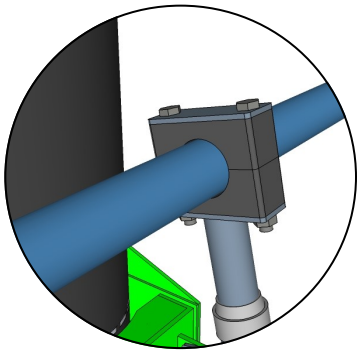
108: Slide the 2” pipe through the adjuster handle pipe clamp & slide the 4.5" pipe through the U Bracket sleeve. Center pipes so there is equal distance on either side of the sleeve.



109 A



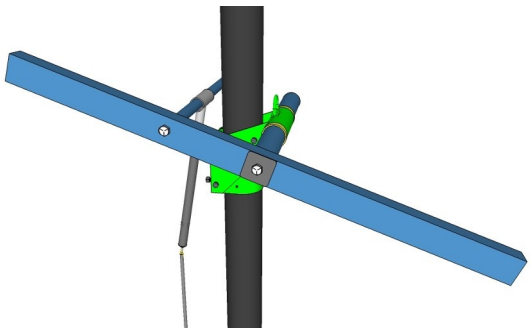
109 B



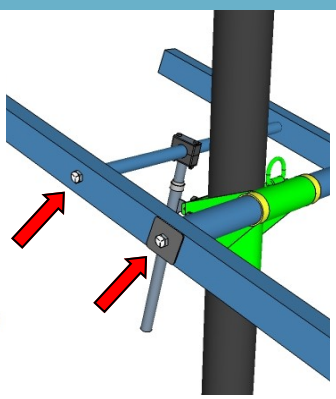
109 C

109: 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. Insert 1/2” x 4 3/4” bolts in the adjuster handle pipe clamp around the 2” pipe and tighten to 20 ft-lbs.

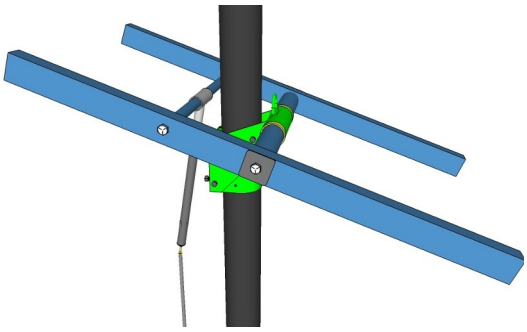
Use hardware labeled STEP 3 in the Bolt Kit



110 A



110 B

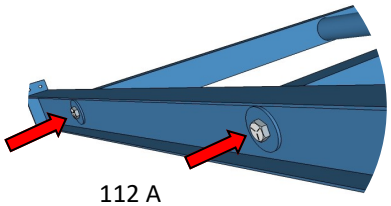


111

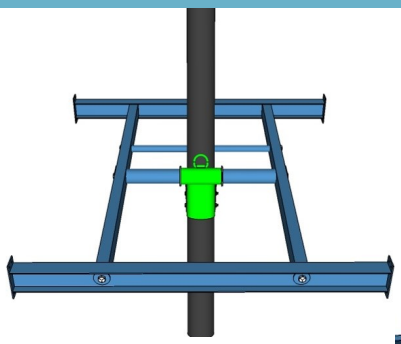
110: Attach the 5x3 rectangular tubes to the 4.5” pipe using the 3/4” x 5” bolts, 5”x5” square washers and 3/4” split washers. Attach the tubes to the 2” pipe using the 1/2” x 4 1/2” bolts, 1/2” flat washers and 1/2” split washers.

111: Install the remaining 5x3 rectangular tube. Tighten all four bolts, but leave loose enough to allow for some play when installing I-beams. Adjust as necessary to level the mount.

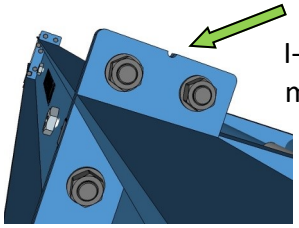
Use hardware labeled STEP 4 in the Bolt Kit



112 A

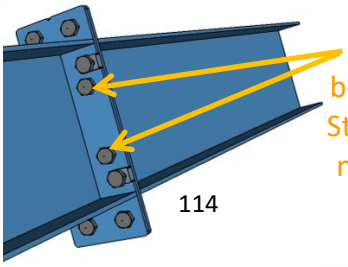


112 B



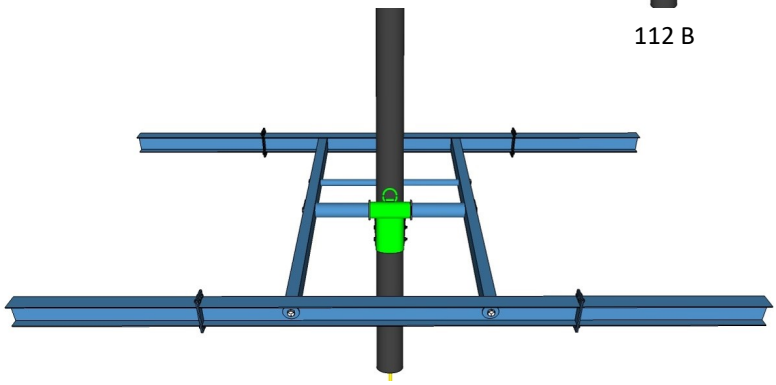
Notches in I-beam flange must face up.

112 C

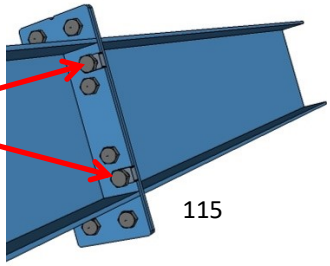


Additional 1/2" bolts for HD Series. Standard Series will not have holes for these bolts.

114



113



Alignment Set Bolts

115

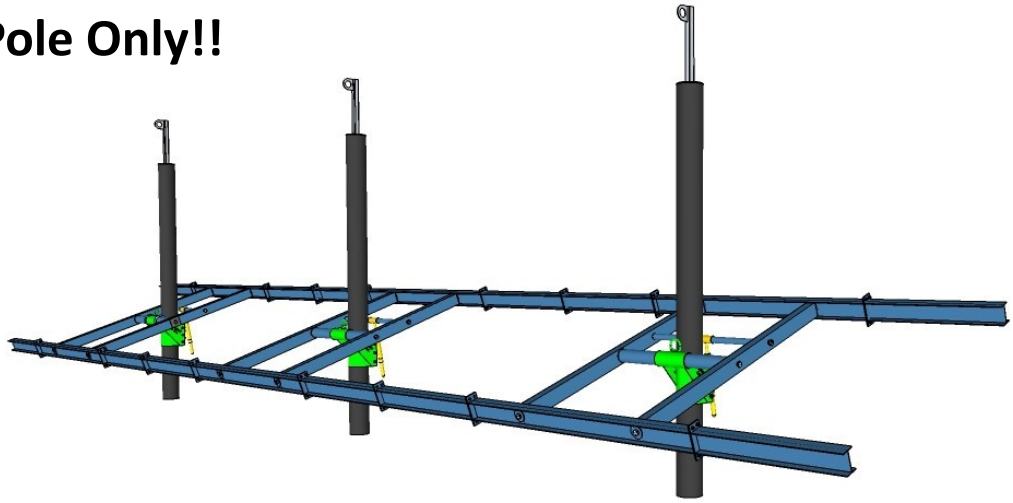
112: Install center I-beams to the 5x3 tubes using the 3/4" x 2" bolts, 3/4" flat washers and 3/4" split washers. DO NOT TIGHTEN at this step. Install all I-beams with notches in the flange facing up.

113: Attach the two wing I-beams on the ends of the center I-beam using the 1/2" x 1 1/4" bolts and 1/2" flange nuts.

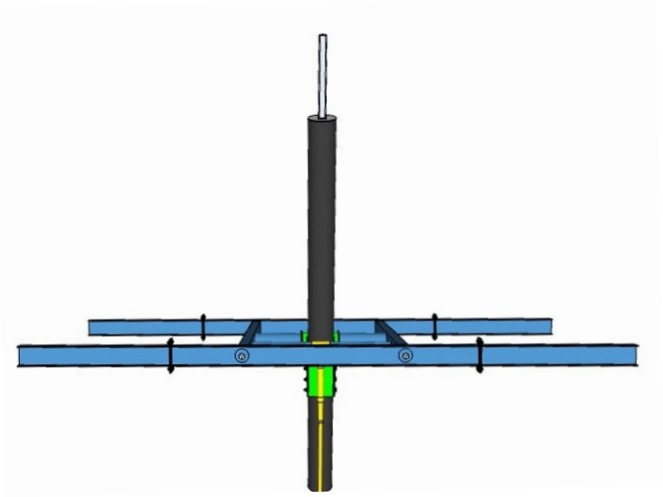
114: There are four bolts per wing on the standard series and eight bolts per wing on the heavy duty (HD) Series. The Extra Heavy Duty (XHD) Series utilizes four of the 3/4" x 2" bolts per wing instead.

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

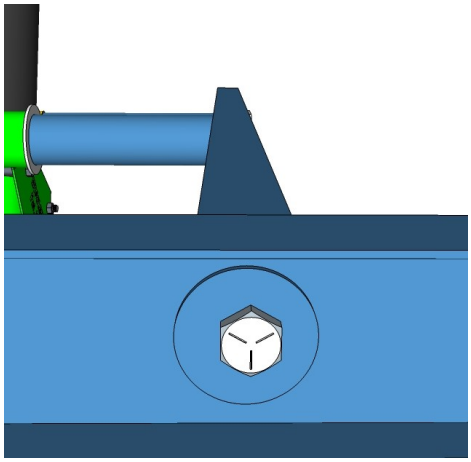
Multi-Pole Only!!



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.



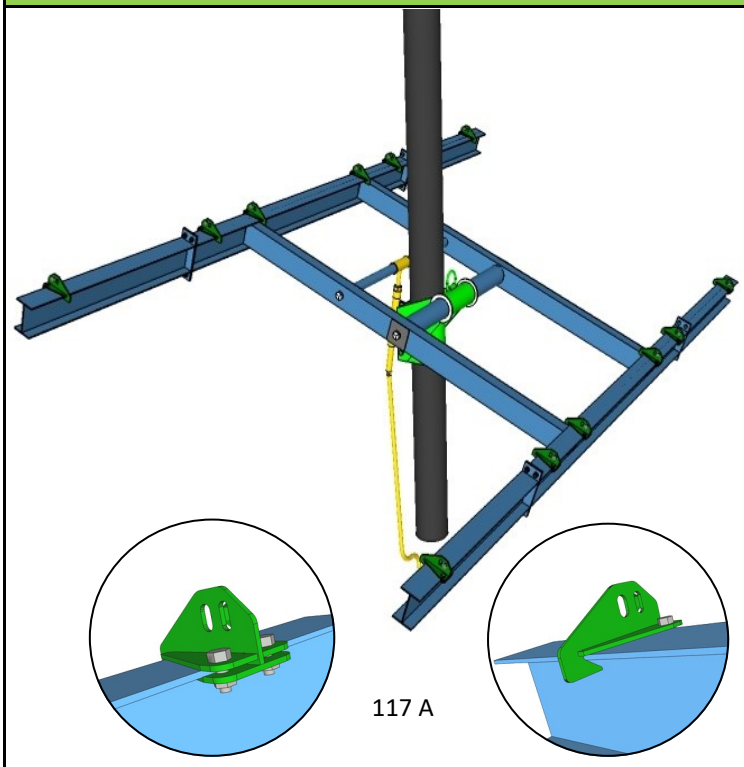
116 A



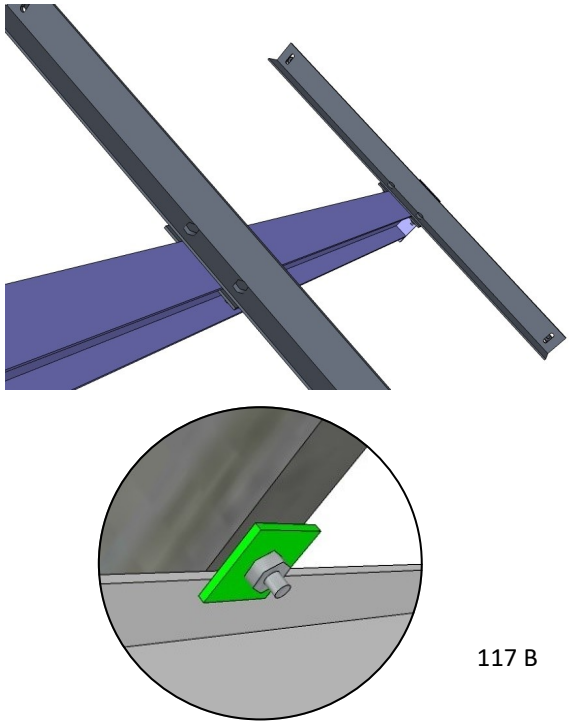
116 B

116: Standing on the North side of the array with the 5x3 tube to center I-Beam bolts started but not tightened, sight the beams to ensure they are parallel. If not, twist the array until they are. Then tighten the 3/4" bolts between the 4.5" Pipe and 5x3 tubes to 100 ft-lbs. Tighten then 3/4" bolts between the 5x3 tubes and center I-Beams to 100 ft-lbs.

Standard Beam Clamps	OR	Long Beam Clamps for 204" Rails



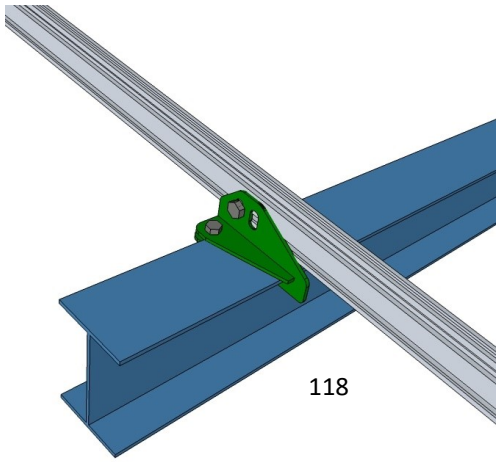
117 A



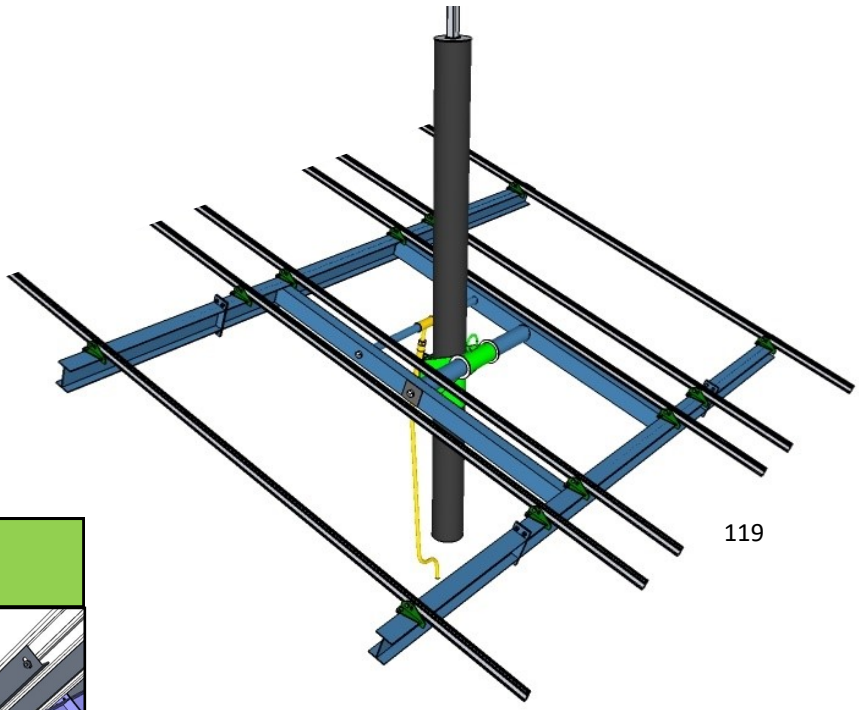
117 B

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" 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.

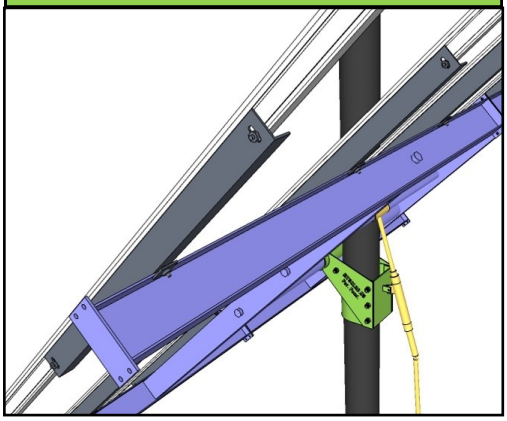


118



119

204” Rail Connection

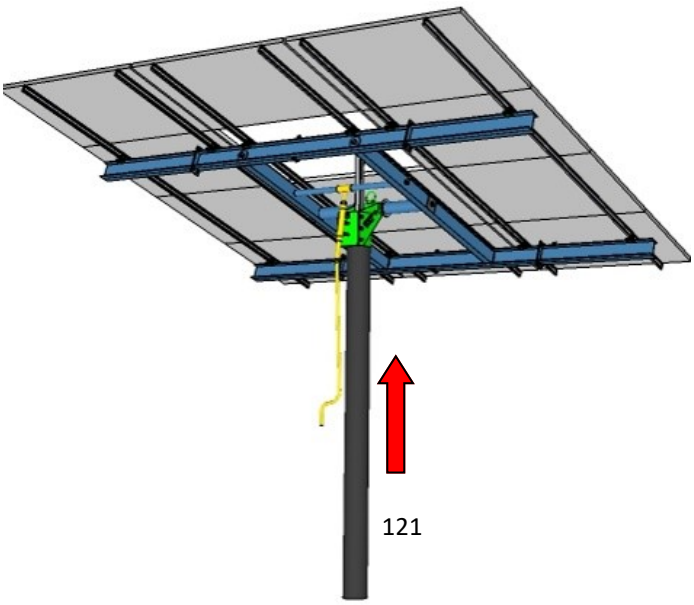


118: Install the Mounting Rail into the beam clamps slot as per Mounting Rail instructions. Use 3/8” x 1” stainless steel bolts and 3/8” serrated flange nuts.

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.

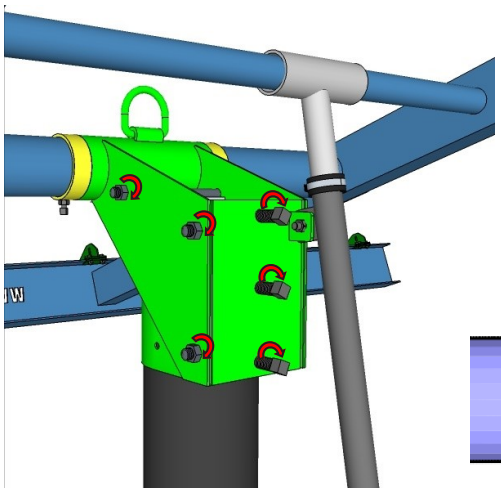
120



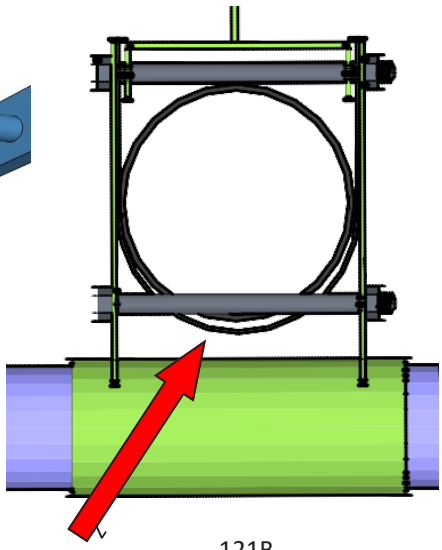
121

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.



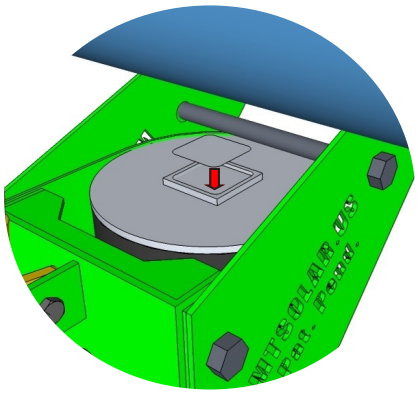
121A



NO GAP!!

121B

*Remove the gap by tightening the square set bolts until the front of the U-Bracket is snug against pipe, then make 3 more full rotations of the bolt on a single pole or one full rotation on a multi-pole.



122

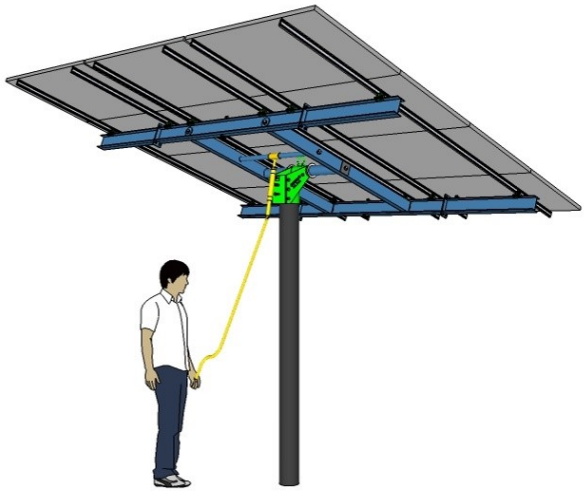
121A: With the mount hanging free on the hoist, FIRST tighten the square-headed set bolts in the back mounting plate. Remove the gap by tightening the set bolts until the front of the U-Bracket is snug against pipe, then make one more full rotation of the bolt. SECOND, tighten both long 3/4” bolts in back mounting plate to 100 ft-lbs. 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. Add spin prevention bolts as needed.

SINGLE POLE SPIN PREVENTION

For 12 panel mounts & larger, 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

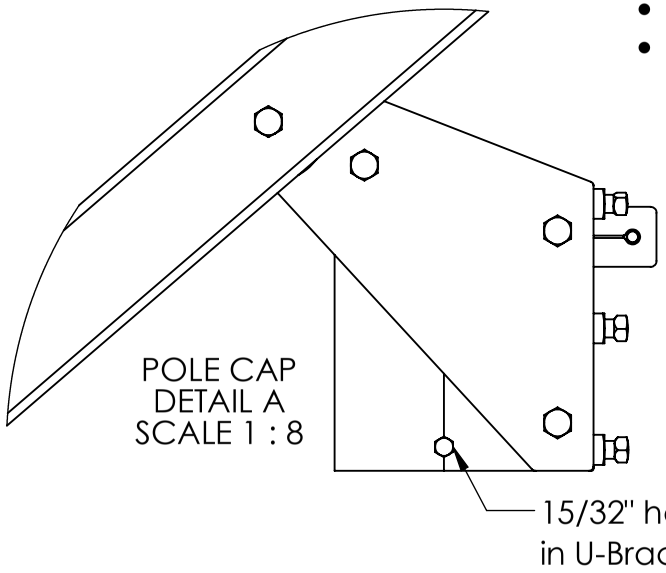
123: Place the final module in the empty space. It may be advantageous to fully extend the Screw Adjuster to make this easier.

124: 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.

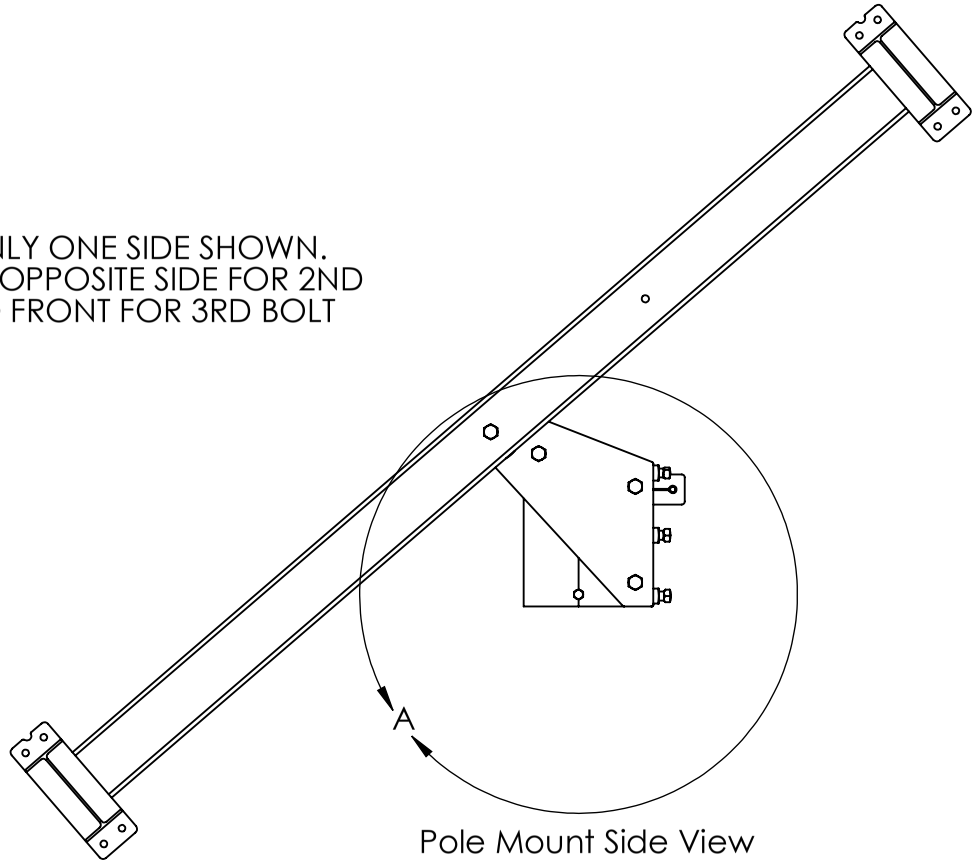
SPIN PREVENTION ADDENDUM

Through-bolts are required for the following sizes:

- TOP-12 or larger, 60C & 72C = 2 BOLTS
- TOP-15-TALL-72C = 3 BOLTS
- TOP-20-TALL-60C = 3 BOLTS



NOTE: ONLY ONE SIDE SHOWN.
REPEAT ON OPOSITE SIDE FOR 2ND
BOLT AND FRONT FOR 3RD BOLT



Pole Mount Side View
Note: Adjuster and Support Pole Omitted for Clarity

Instructions:

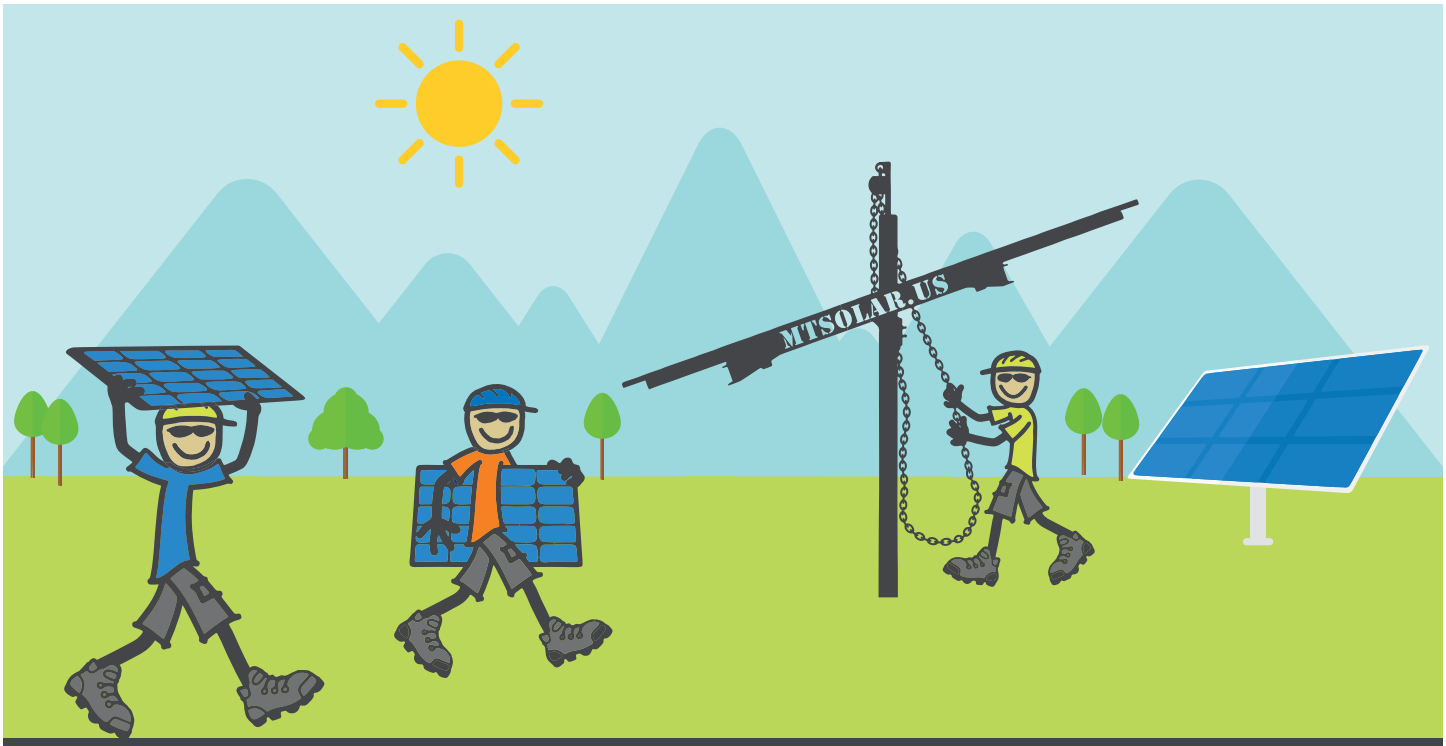
This is the final step in the installation, to be done once array is installed, hoisted into place, and the set bolts are tightened. Use the drill bit provided by MT Solar to drill through the existing 15/32" holes in the U-bracket and through the support pipe on both sides and front. Thread in the 1/2"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

	NAME	DATE
DRAWN	TJ	3/30/17
CHECKED		
ENG APPR.		
MFG APPR.		

TITLE: High Tilt/High Wind Additional Bolt Detail

SIZE: A | DWG. NO. | REV

SCALE: 1:16 | SHEET 1 OF 1



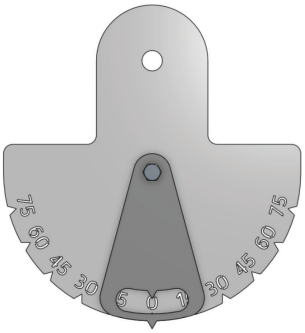
THANK YOU FOR CHOOSING MT SOLAR

MT Solar's mission is to provide an exceptional solar installation experience. We strive to exceed expectations at every turn, from the planning and purchasing process to the final end-user adjustments. We are a customer-service driven company, with a reputation built on the attention and responsiveness given to our customers and their projects.

ALSO AVAILABLE AT MTSOLAR.US

GROUND MOUNT
Cost effective, complete packages

APPAREL
Show off your solar installer pride



TILT-ANGLE INDICATOR
Easy visual for manual tracking

1-844-MT-SOLAR • MTSOLAR.US • P.O. BOX 190, CHARLO, MT 59824

MTSOLAR