



# Top-of-Pole Mount for 3 Kaneka Modules (TPM3) One over Two

ASSEMBLY INSTRUCTIONS

**step-by-step  
assembly and installation**

## Top-of-Pole Mount for 3 Modules (TPM3) One over Two

### *A few words about the product*

The TPM3 One over Two is designed to mount on 4 inch SCH40/80 galvanized steel pipe (installer supplied).

Pipe size and foundation requirements are based on several factors including the array surface area, maximum design wind speed, exposure category, soil type, steepest expected tilt angle, and above-ground clearance.

For foundation and pipe size recommendations on a specific installation, please contact us at:

Phone: 800-260-3792

Email: [info@plpsolar.com](mailto:info@plpsolar.com)

### *About these Assembly Instructions*

#### *These instructions...*

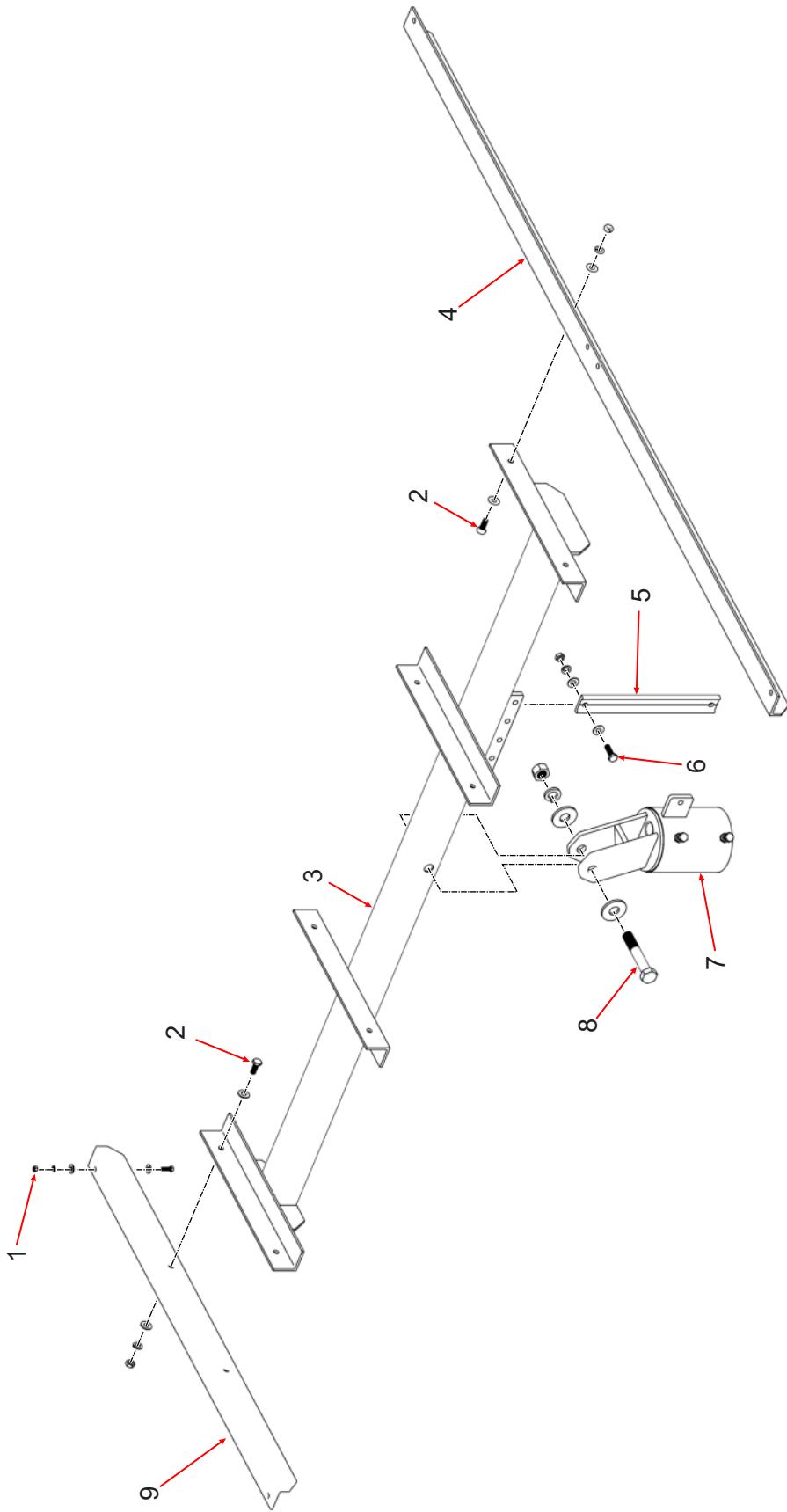
- Are intended to be used by individuals with sufficient technical skills for the task. Knowledge and use of hand tools, measuring devices and torque values are also required.
- Include various precautions in the forms of Notes, Cautions, and Warnings. These are to assist in the assembly process and/or to draw attention to the fact that certain assembly steps may be dangerous and could cause serious personal injury and/or damage to components. Following the step-by-step procedures and these precautions should minimize the risk of any personal injury or damage to components while making the installation an efficient process.

#### **WARNING:**

Follow the procedures and precautions in these instructions carefully.

### *Required Tools*

- 7/16 inch wrench or socket for 1/4 inch module hardware
- 9/16 inch wrench or socket for 3/8 inch hardware
- 1-1/8 inch wrench or socket for 3/4 inch hardware
- Torque wrench
- Ratchet wrench
- Ratchet extension bar
- 3 to 6 foot level
- Tape Measure
- Square



Item	Description	Qty
1	1/4" x 3/4" Bolt, nut, lock & flat washers (2 flat washers)	12 sets
2	3/8" x 1" Bolt, nut, lock & flat washers (2 flat washers)	8 sets
3	Strongback	1
4	Module Rail (Two Module)	2
5	Support Bar	1
6	3/8" x 1" Bolt, nut, lock & flat washers (2 flat washers)	2 sets
7	Mounting Sleeve	1
8	3/4" x 4-1/2" Pivot Bolt, nut, lock & flat washers (2 flat washers)	1 set
9	Module Rail (One Module)	2

**Top-of-Pole Mount for 3 Modules One over Two, Parts Identification**

## Step 1: Install the Mounting Sleeve on Vertical Pipe

Before installing the Mounting Sleeve, verify that the Mounting Pole is plumb to the ground and hasn't shifted or leaned while the concrete footing has cured.

The Mounting Sleeve slips on top of the Mounting Pole and has three 3/8" Set Bolts which are used to secure it to the Mounting Pole. (See Figure 1-1)

- Slip the Mounting Sleeve on top of Mounting Pole and slide it down until it rests/bottoms out on top of Mounting Pole.
- Rotate the Mounting Sleeve so the Support Bar Pivot Tab is pointing north and the Strongback Vertical Towers are leaning south.
- Secure the Mounting Sleeve by tightening the three 3/8" Set Bolts. **Torque each Set Bolt to 32-34 ft.-lbs.**

### CAUTION:

Use care while working around the structure during assembly. There could be components that create hazards or obstruct free movement causing serious bodily injury. Many are at head/eye level. Move slowly and with care around the work area.

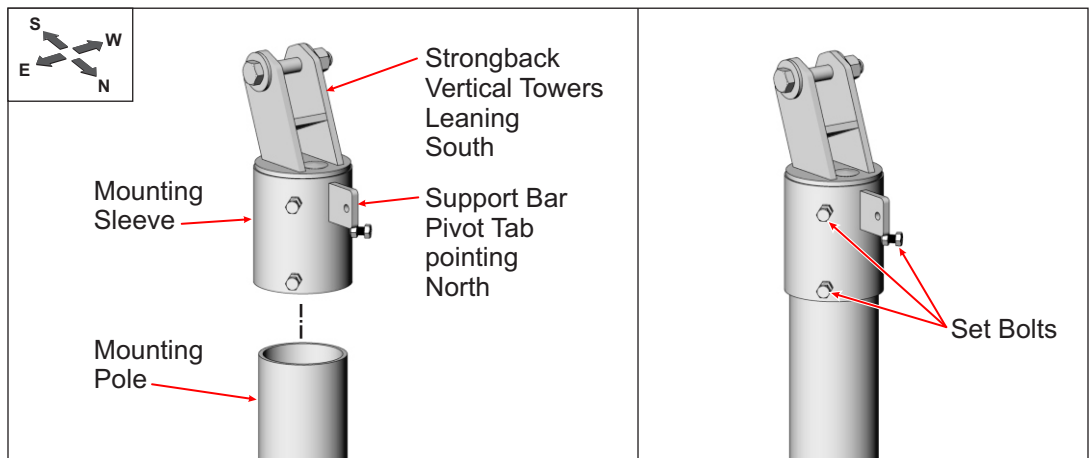


Figure 1-1: Installing the Mounting Sleeve

## Step 2: Install the Strongback to the Mounting Sleeve

The Strongback is attached to the Mounting Sleeve using the Pivot Bolt that passes through its two Vertical Towers and the Support Bar. The Support Bar is attached to the Strongback on one end and the Support Bar Pivot Tab of the Mounting Sleeve on the other end using 3/8" hardware.

- Remove the Support Bar from the Strongback and re-install in the 15° elevation set point. Secure with the 3/8" hardware and finger tighten. (See Figure 2-1)

### NOTE:

Although this system offers six elevation set points, for ease of assembly, set the angle to its lowest setting of 15-degrees. Optimum tilt setting of the rack will take place later in these instructions.

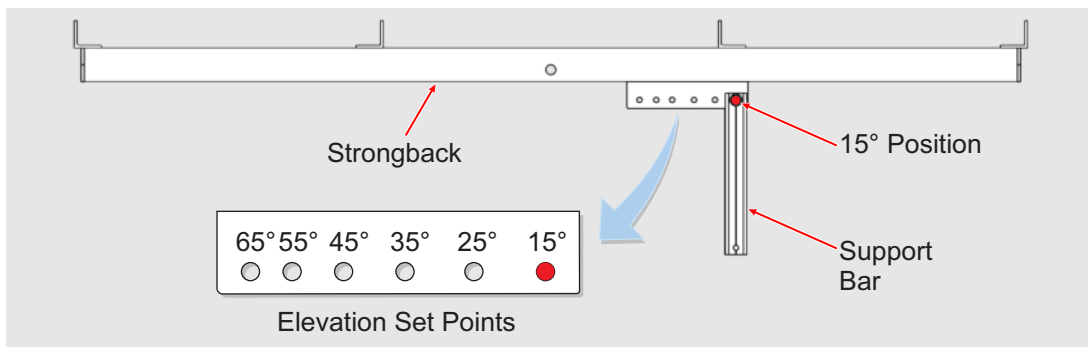


Figure 2-1: Positioning Support Bar

**CAUTION:**

This is a two person activity. The Strongback must be held in place by one person while the second person aligns it and secures it to the Mounting Sleeve using the Pivot Bolt and the 1/2" hardware. Failure to do so could lead to serious personal injury.

- B. Remove the Pivot Bolt from the Mounting Sleeve and also collect the 3/8" x 1-1/4" bolt, nut, flat washers and lock washer needed to secure the Support Bar to its Pivot Tab on the Mounting Sleeve. (See Figure 2-2)
- C. Orient the Strongback to the Mounting Sleeve with its Lower Support Bar positioned on the same side of the Mounting Sleeve as the Support Bar Pivot Tab.
- D. Slide the Strongback between the two vertical mounting tabs, aligning the thru-hole of the Strongback with the holes of the two Vertical Towers.
- E. Insert the Pivot Bolt along with one flat washer through the one Vertical Tower and the Strongback exiting the second Vertical Tower on the opposite side. Secure with the remaining flat washer, lock washer and hex nut. For now, finger tighten only to allow movement for the next step.

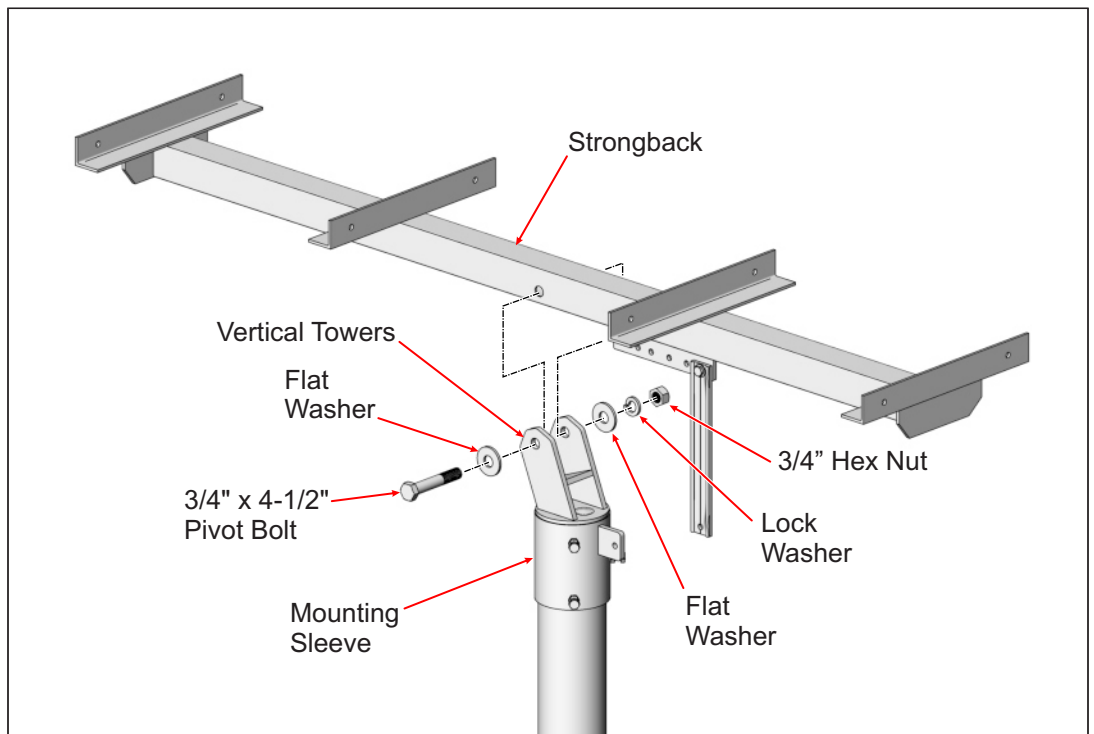


Figure 2-2: Installing the Strongback

- F. Pivot the Strongback and the Support Bar to align the mounting holes of the Support Bar with the Pivot Tab on the Mounting Sleeve. Insert the 3/8" x 1-1/4" bolt and one flat washer thru the Support Bar and Mounting Tab and secure it with the remaining flat washer, lock washer and hex nut. **Torque hardware on both ends of Support Bar at 32-34 ft.-lbs.** (See Figure 2-3)

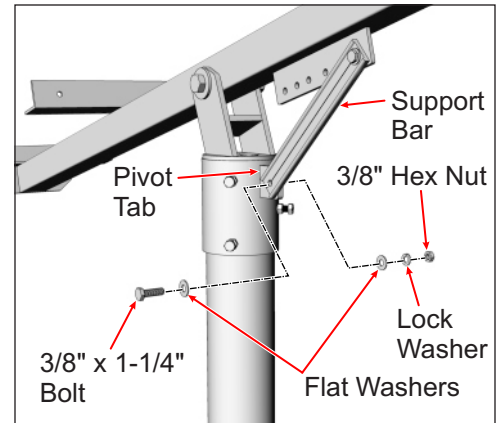


Figure 2-3: Securing Support Bar to Mounting Sleeve

- G. Return and tighten the Pivot Bolt. The Pivot Bolt cannot be left loose - the Mounting Sleeve Vertical Towers must be firmly clamped to the sides of the Strongback eliminating any gaps between the Vertical Towers and the Strongback. **Torque to 125-150 ft.-lbs.** (See Figure 2-4)

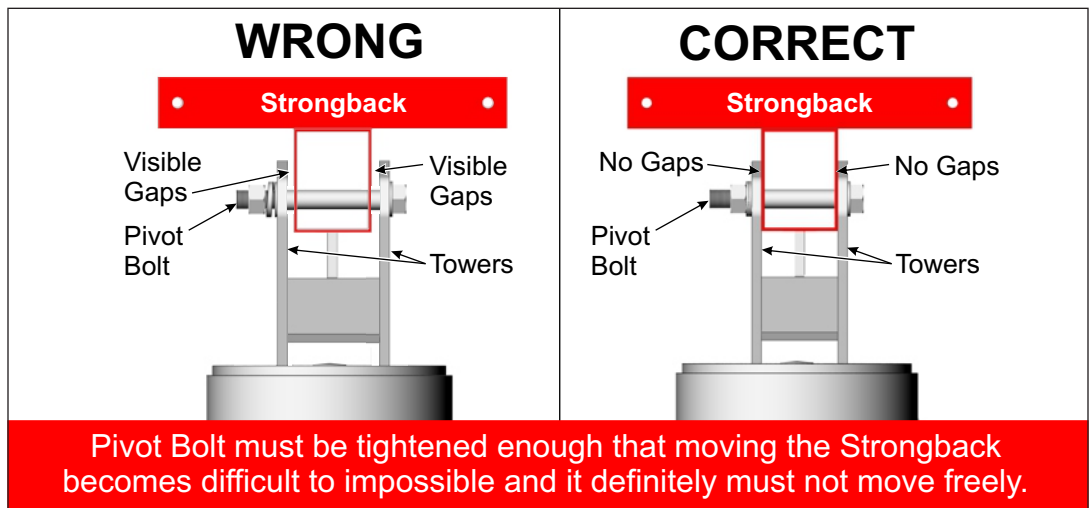


Figure 2-4: Tighten and Torque the Pivot Bolt

### Step 3: Attach the Module Rails to the Mounting Angles

**CAUTION:**

This is a two person activity. Module Rails are unstable before they are fully secured to the Support Angles. Module Rails must be held in place by one person while the second person aligns and secures them to the Support Angles. Failure to do so could lead to serious personal injury.

There are two sets of Module Rails; a short set and a long set. The short set mounts on the upper or northern end of the Strongback and holds one Module. The longer set mounts on the southern or lower end of the Strongback and holds two Modules. These Rails run east-to-west and are secured to the Mounting Angles of the Strongback using 3/8" x 1" bolts and hardware. (See Figure 3-1)

Module Rails do not nest into the Mounting Angles; rather they attach to the outside of the Mounting Angles as shown in Figure 3-2.

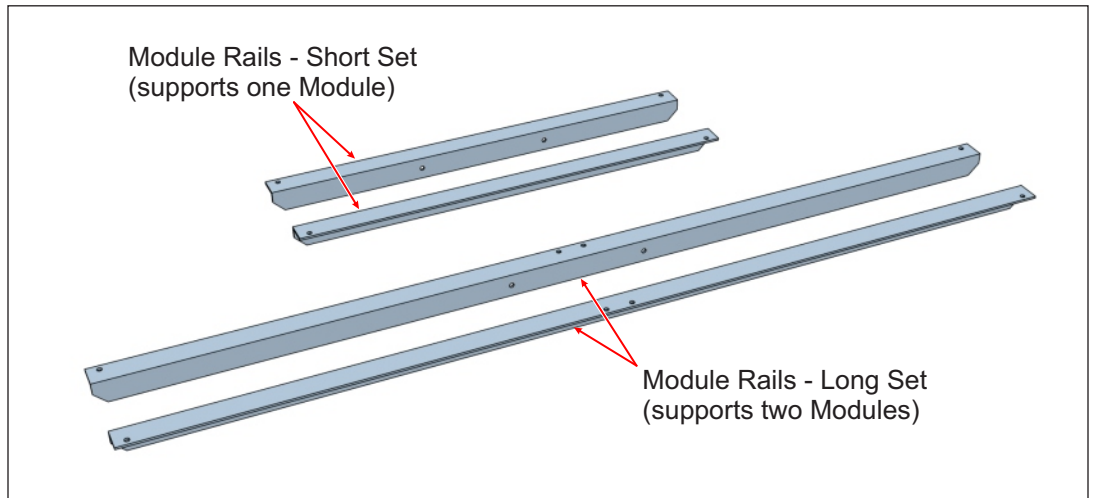


Figure 3-1: The two lengths of Module Rail Sets

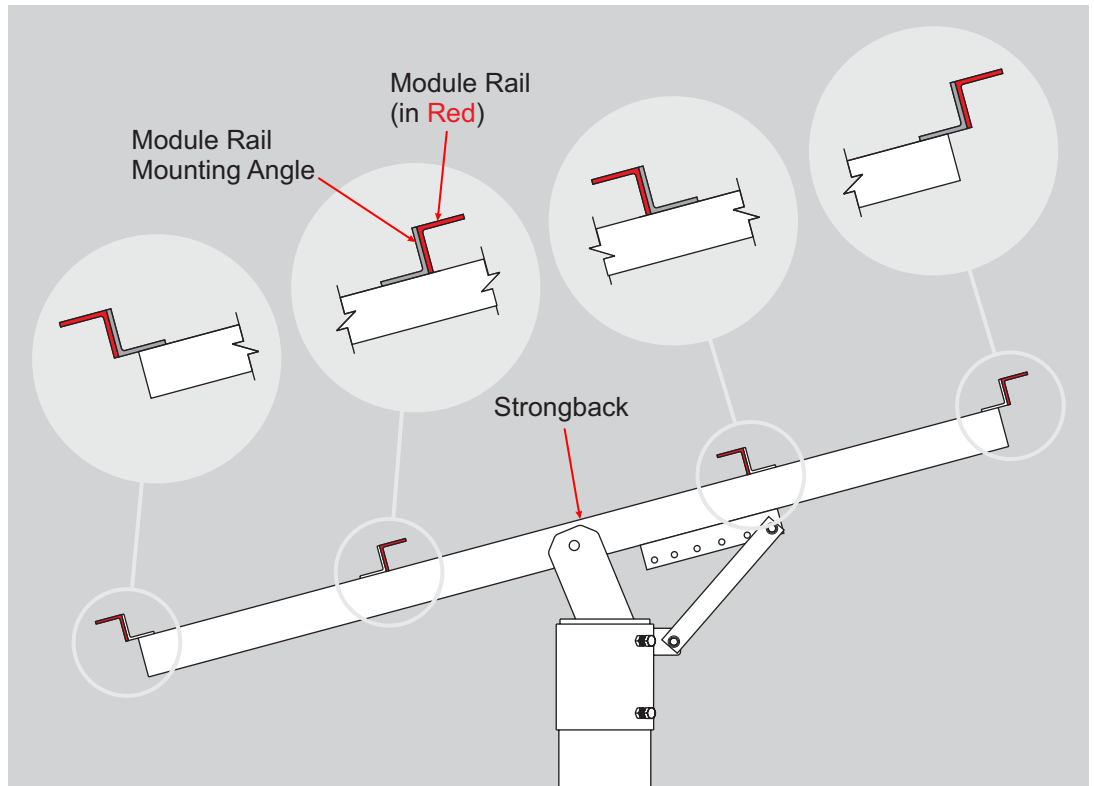
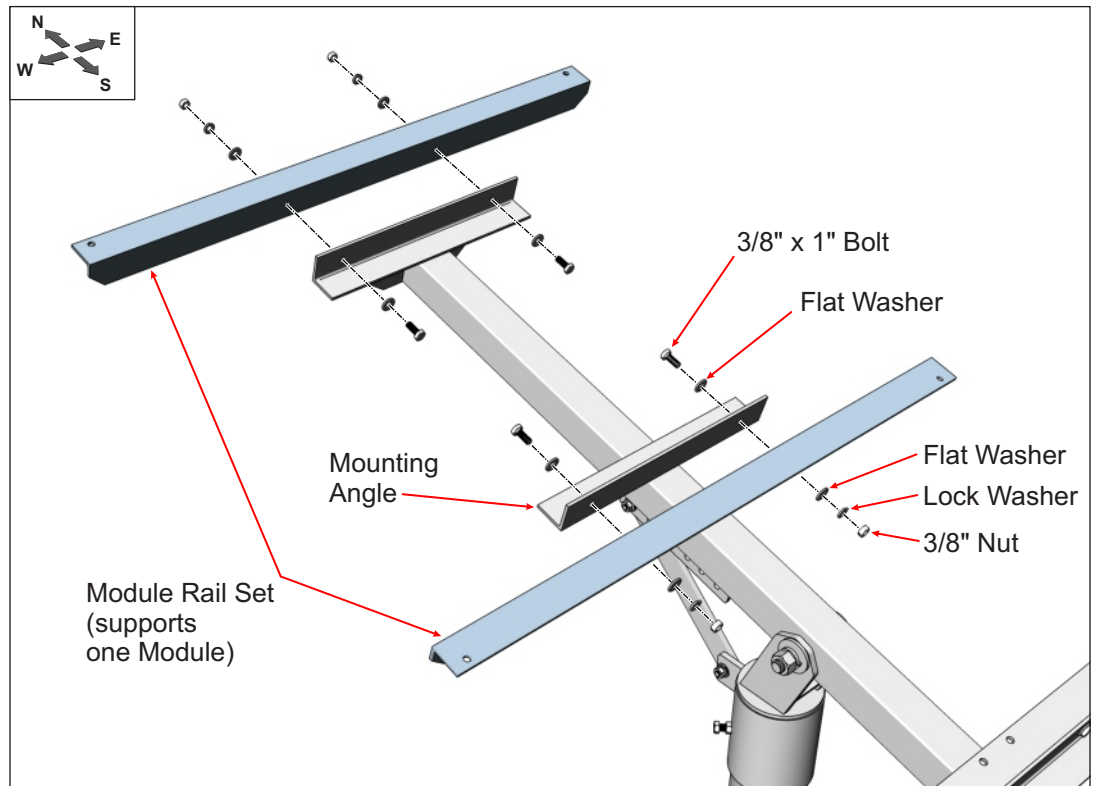


Figure 3-2: Module Rail Positioning relative to Mounting Angles

**First, install the short set of Module Rails at the northern end of the Strongback**

- A. Align the short Module Rail mounting holes with the holes of the Mounting Angle and secure with 3/8" x 1" bolts and hardware. Finger-tighten for now. (See Figure 3-3)
- B. Continue in this manner and install the remaining short Module Rail.

**NOTE:**  
Finger-tighten the Module Rails to the Strongback while installing. After PV Modules are installed, re-tighten to specified torque values.



*Figure 3-3: Installing the Short Set of Module Rails*

**Next, install the long set of Module Rails at the southern end of the Strongback**

- A. Align the first long Module Rail mounting holes with the holes of the Mounting Angle and secure with 3/8" x 1" bolts and hardware. Finger-tighten for now. (See Figure 3-4)
- B. Continue in this manner and install the remaining long Module Rail.



**NOTE:**  
Finger-tighten the Module Rails to the Mounting Angles while installing. After the Modules are installed, re-tighten to specified torque values.

**CAUTION:**  
This is a two person activity. PV Modules are heavy and unstable before they are fully secured to the Module Rails. PV Modules must be held in place by one person while the second person aligns and secures them to the Module Rails. Failure to do so could lead to serious personal injury and damaged components.

**CAUTION:**  
Be certain to re-tighten all Module Rail and PV Module mounting hardware and torque to the specified values. Failure to do so could lead to structural failure, damaged components and/or serious personal injury.

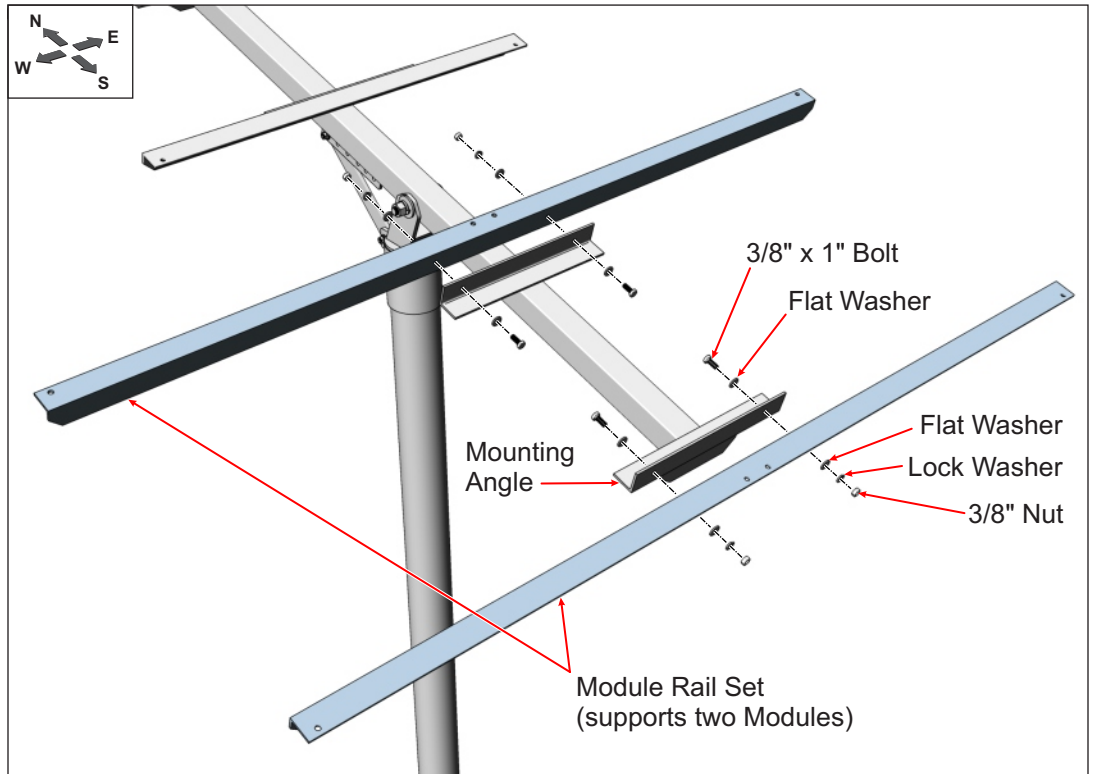


Figure 3-4: Installing the Long Set of Module Rails

### Step 4: Installing PV Modules to Module Rails

PV Modules are secured to the Module Rails using 1/4" x 3/4" bolts and hardware. Install the northern Module first, followed by the two southern Modules last.

- A. Place the PV Module on the Module Rails. Align the mounting holes and secure with 1/4" x 3/4" bolts and hardware. Each Module has four attachment points. Finger-tighten for now. (See Figure 4-1)
- B. Continue in this manner and install the two remaining PV Modules.

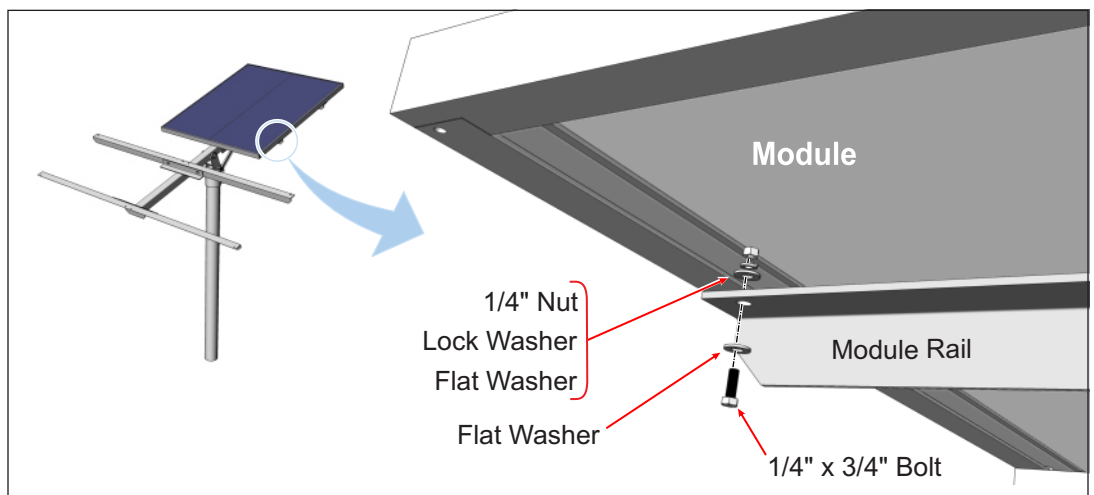


Figure 4-1: Installing PV Modules to Module Rails

### Step 5: Now return and tighten mounting hardware.

- A. Return and tighten each set of the 3/8" mounting hardware, securing the Module Rails to the Support Angles. **Torque all at 32-34 ft.-lbs.**
- B. Return and tighten each set of 1/4" mounting hardware, securing the PV Modules to the Module rails. **Torque all at 6-8 ft.-lbs.**

### Step 6: Adjust the Tilt Angle of the Rack

To adjust the tilt angle, loosen the Pivot Bolt hardware and remove the Support Arm upper hardware attaching the Support Arm to the Strongback. Use great care in this procedure as it can be dangerous if the procedure is not completed as described with a minimum of two people. (See Figure 6-1)

- A. While one person holds the south edge of rack, the other loosens the Pivot Bolt and removes the upper 3/8" hardware attaching the Support Bar to the Strongback.
- B. Tilt the rack to the desired elevation angle (15°, 25°, 35°, 45°, 55° or 65°) and re-attach the Support Bar to the Strongback, placing the 3/8" hardware in the appropriate hole matching the desired elevation. **Torque to 32-34 ft.-lbs.** (See Figure 6-2)

**CAUTION:**  
Do not attempt to remove the Pivot Bolt during tilt adjustments! Removal could lead to serious personal injury or death. Adjustments are made with the Pivot Bolt hardware loosened but in place.

**CAUTION:**  
This is a two person activity. As the Pivot Bolt is loosened and the Support Bar hardware is removed, the rack is heavy and unstable. It must be held in place by one person while the second person loosens and removes the hardware and then re-installs/tightens the hardware back in place. Failure to do so could lead to serious personal injury and damaged components.

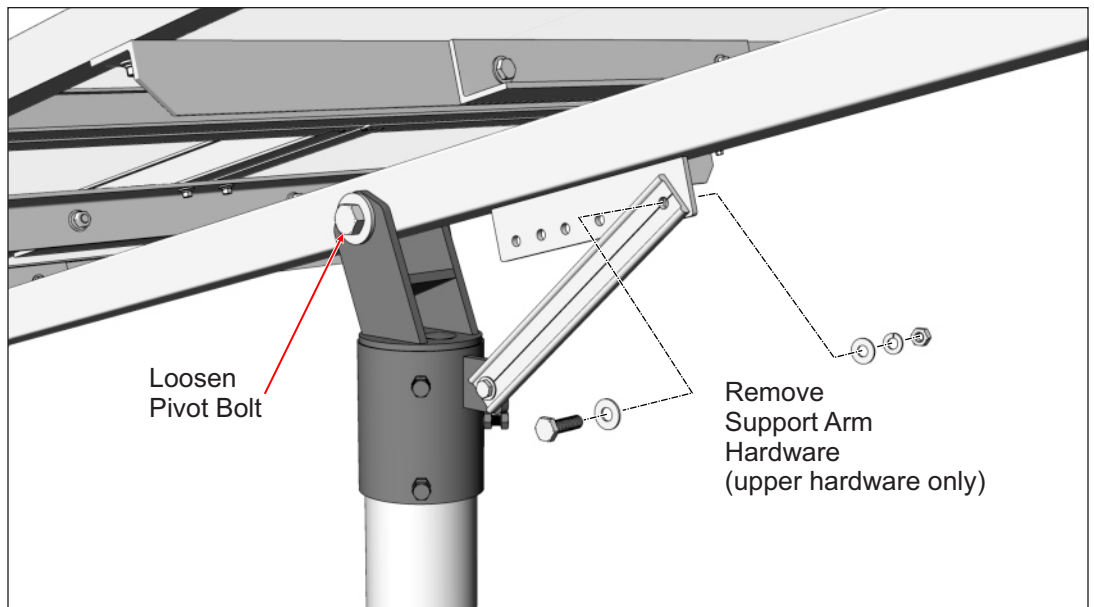


Figure 6-1: Preparing to Adjust the Tilt Angle

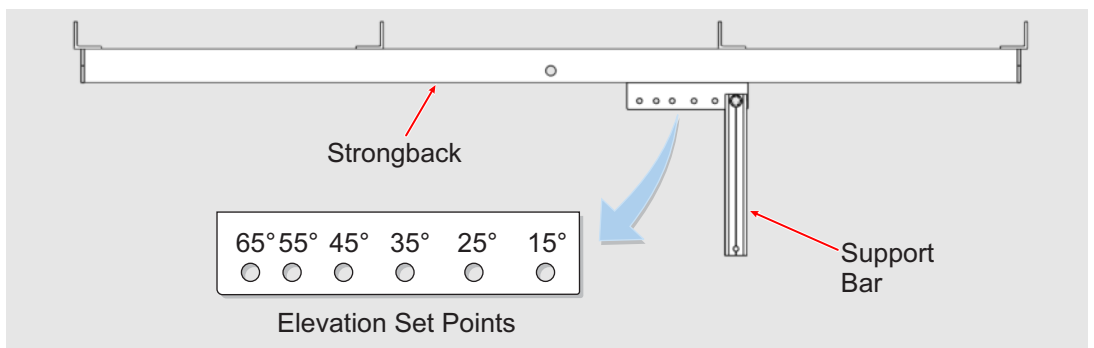


Figure 6-2: Positioning Support Bar

- C. Re-tighten the Pivot Bolt. After changing the tilt angle and tightening the Support Bar hardware, the Pivot Bolt must be re-tightened. The Pivot Bolt cannot be left loose - the Mounting Sleeve Vertical Towers must be firmly clamped to the sides of the Strongback eliminating any gaps between the Vertical Towers and the Strongback. **Torque to 125-150 ft.-lbs.** (See Figure 6-3)

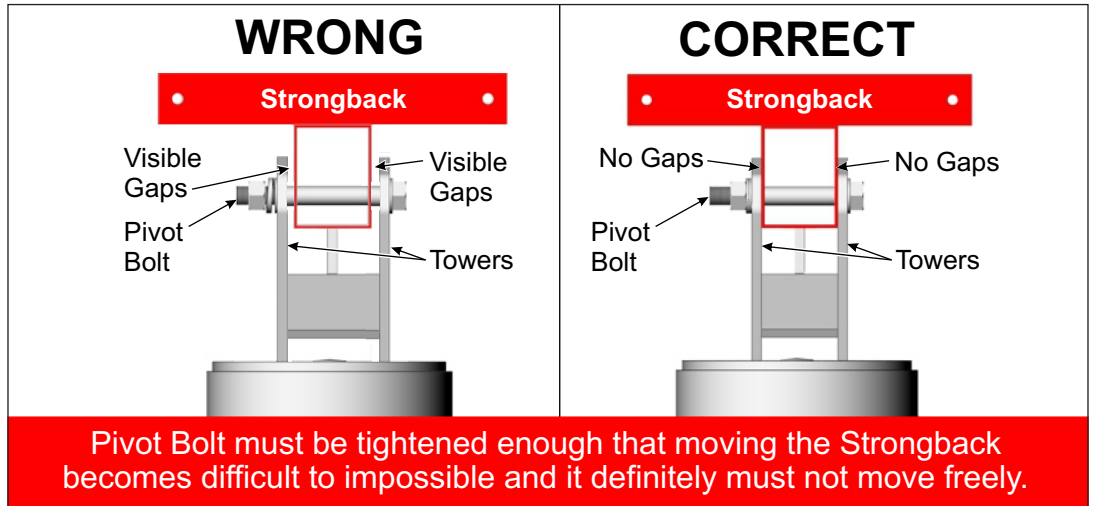


Figure 6-3: Tighten and Torque the Pivot Bolt



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