



SM  
NXT

# TILT LEGS INSTALLATION GUIDE



## UNIRAC Code-Compliant Installation Addendum

© 2023 by Unirac, Inc. All rights reserved.



SM  
NXT

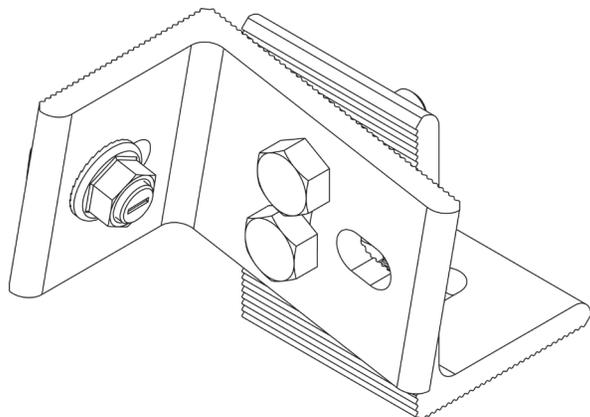
# TILT LEGS INSTALLATION GUIDE

---

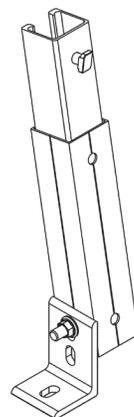
## TABLE OF CONTENTS

SYSTEM COMPONENTS.....	1
TILT LEG SPECIFICATIONS .....	2
TORQUE SPECIFICATIONS .....	3
TILT LEG ORIENTATIONS.....	4
ROOF ATTACHMENT .....	5
ROOF ATTACHMENT .....	6
SM RAIL INSTALLATION .....	7
NXT RAIL INSTALLATION .....	8
THERMAL BREAK .....	9
MECHANICAL LOAD TEST .....	10

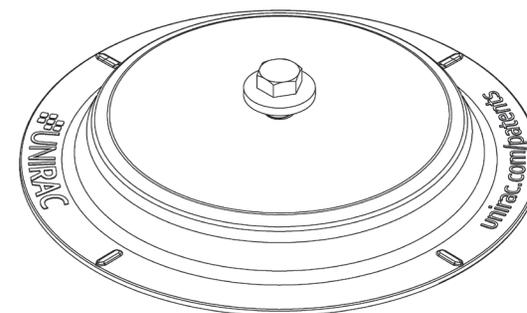
**INTRODUCTION:** This manual is an addendum to the SOLAR MOUNT and NXT UMOUNT installation manuals and outlines the installation procedures to install Tilt Legs for these systems. For installers to install SM or NXT Tilt Legs, it is imperative to thoroughly review and have a clear understanding of the installation procedures outlined in the SOLAR MOUNT installation manual, the NXT UMOUNT installation manual, and this installation manual. This will ensure that the SM & NXT Tilt Leg System is installed correctly and meet all regulatory requirements.



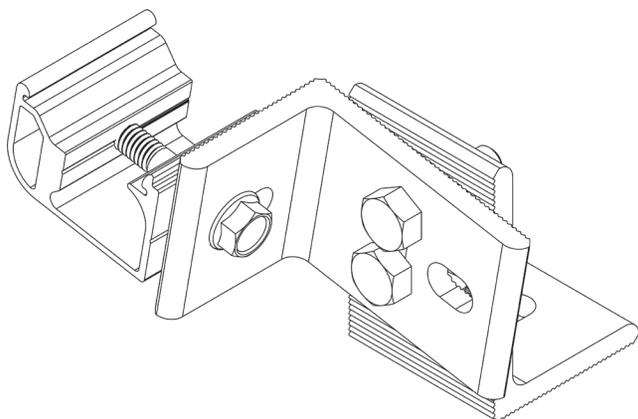
**SM FRONT ROW TILT FOOT**  
(P/N: SMFOOTTILT)



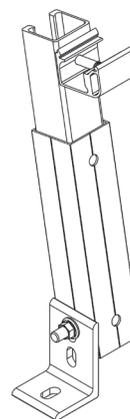
**SM ADJUSTABLE TILT LEG**  
(P/N: SMTILTLEG12/SMTILTLEG30)



**FLASHLOC RM KIT**  
(P/N: 310999)



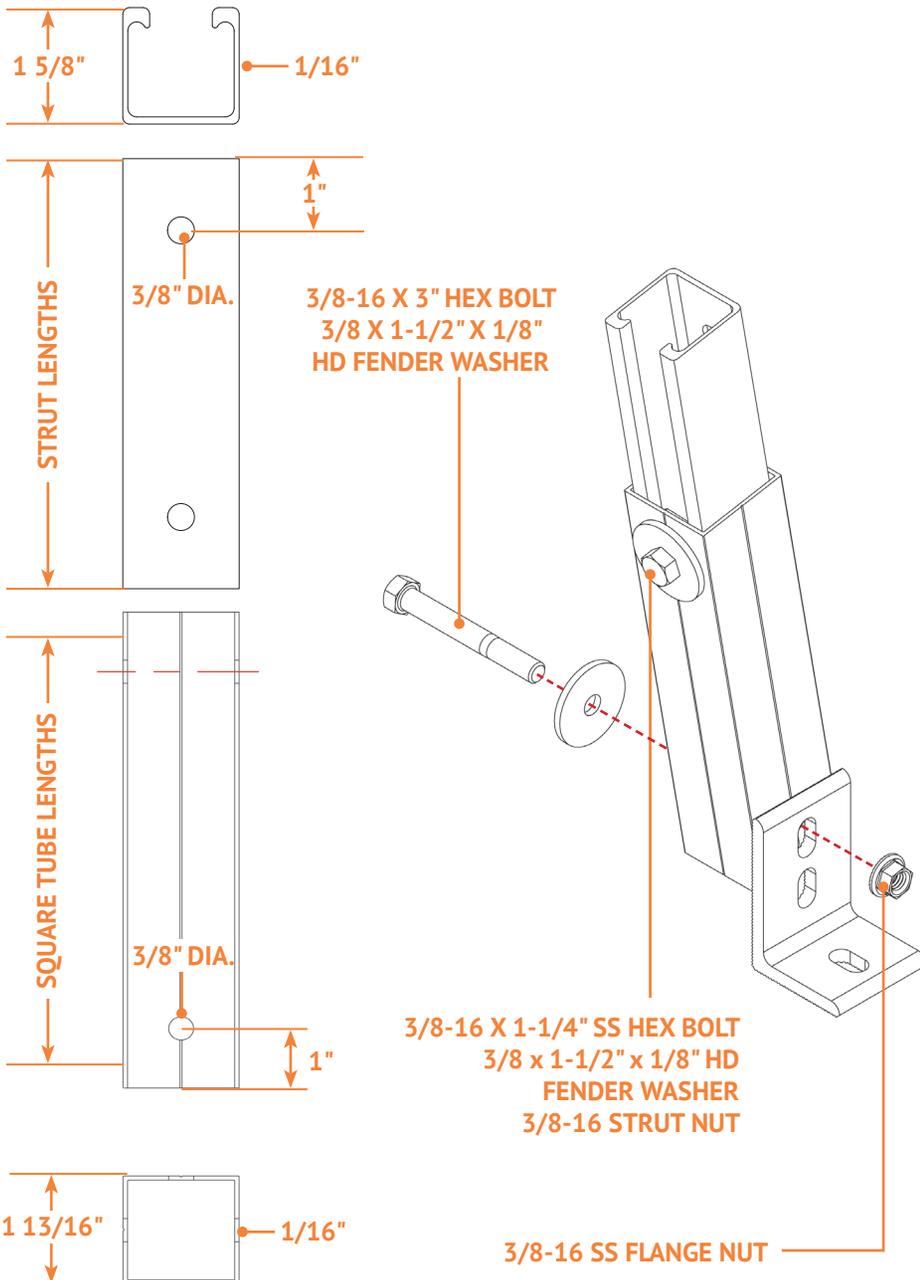
**NXT UMOUNT FRONT ROW TILT FOOT**  
(P/N: NUFOOTTILT)



**NXT UMOUNT ADJUSTABLE TILT LEG**  
(P/N: NUTILTLEG12/NUTILTLEG30)

**NOTE:** Refer to **NXT UMOUNT** and **SOLAR MOUNT** installation manuals for complete list of system components.

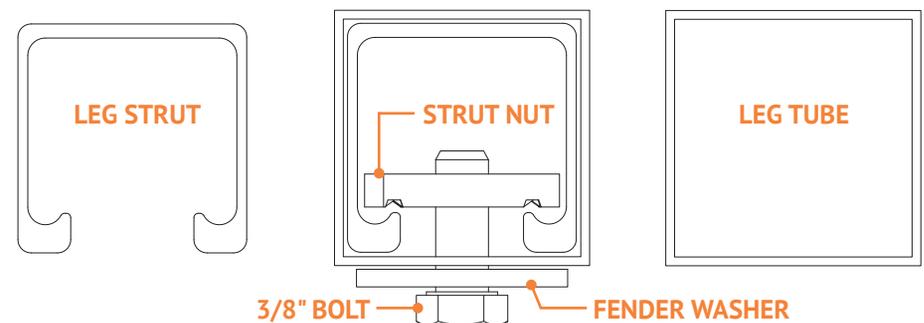
P/N stands for Part Number

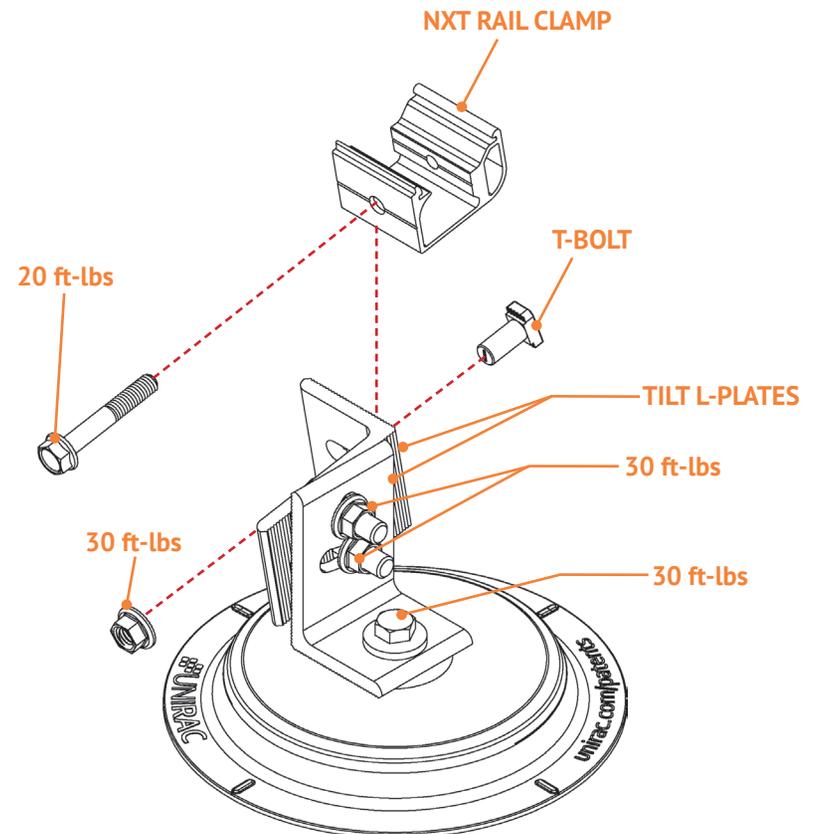
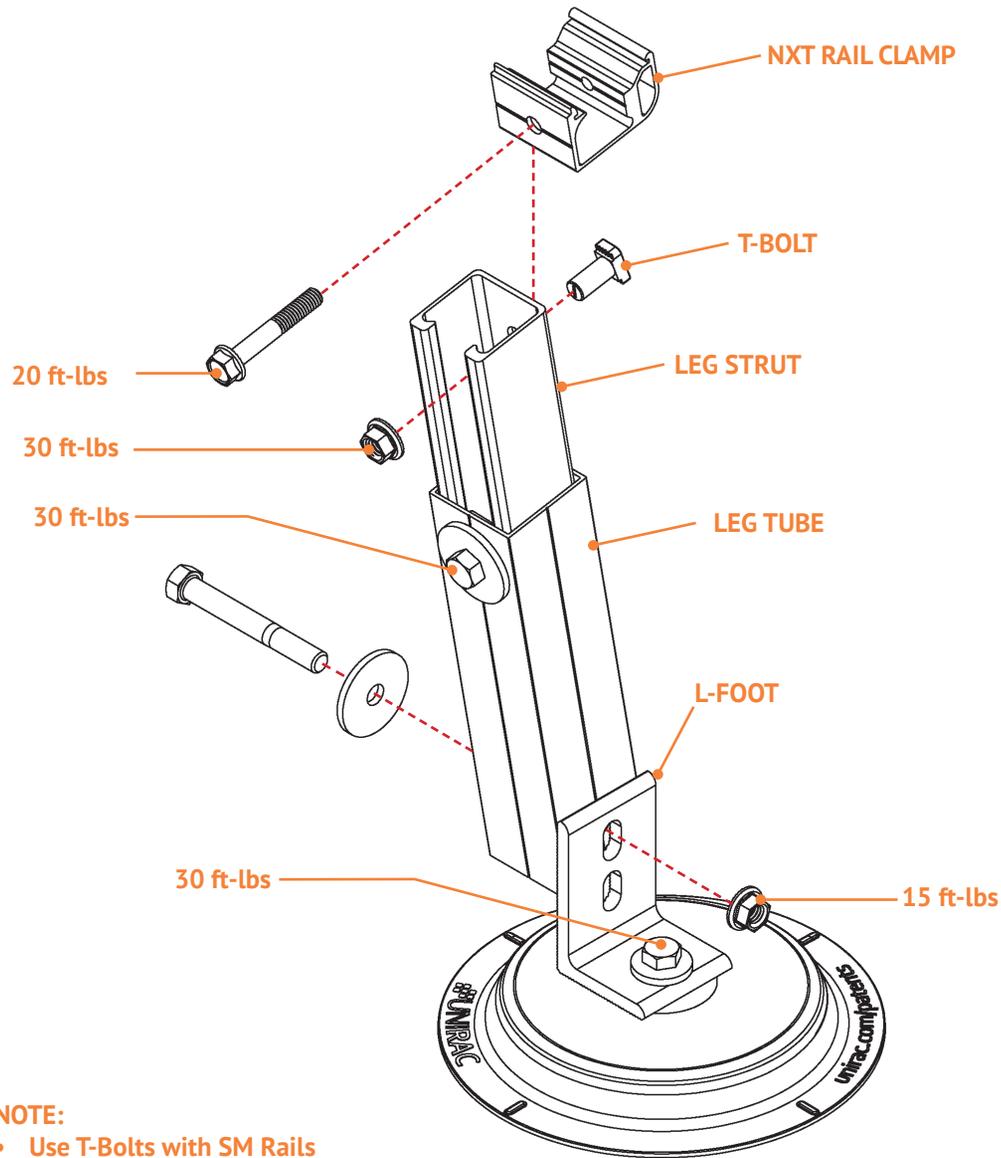


TILT LEG LENGTHS		
Total Adjustable Lengths	Square Tube	Strut
8" to 12"	8"	8"
18" to 30"	18"	18"

Properties	Tilt Leg Strut Channel	Square Tilt Leg Tube	Units
Area	0.515	0.4884	in <sup>2</sup>
Weight	0.57	0.56	plf
Width	1.625	1.82	in
Height	1.625	1.82	in
Section Modulus (X-axis)	0.236	0.275	in <sup>3</sup>
Section Modulus (Y-axis)	0.261	0.275	in <sup>3</sup>
Moment of Inertia (X-axis)	0.201	0.2498	in <sup>4</sup>
Moment of Inertia (Y-axis)	0.213	0.2498	in <sup>4</sup>
Radius of Gyration (X-axis)	0.625	0.7152	in
Radius of Gyration (Y-axis)	0.643	0.7152	in

Wrenches and Torque	Wrench Size	Recommended Torque
3/8" Hardware	9/16"	Refer to page 3

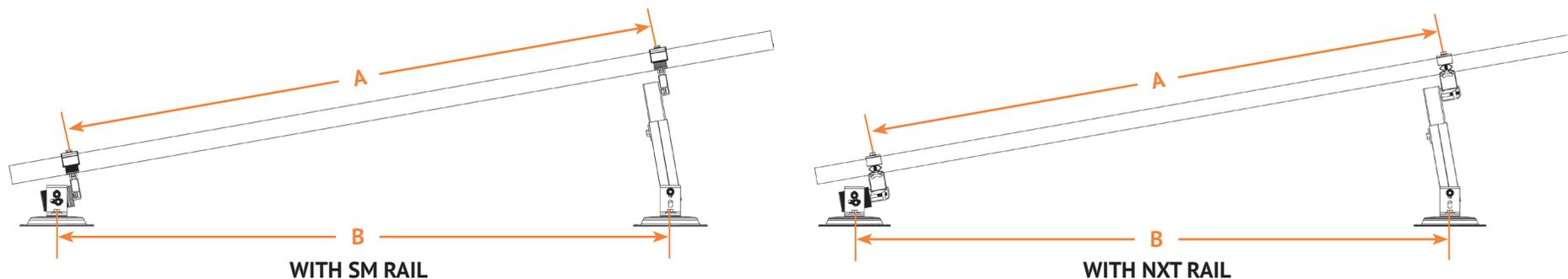




**NOTE:**

- Use T-Bolts with SM Rails
- Use NXT Rail Clamps with NXT Rails

## CORRECT TILT LEG ORIENTATION

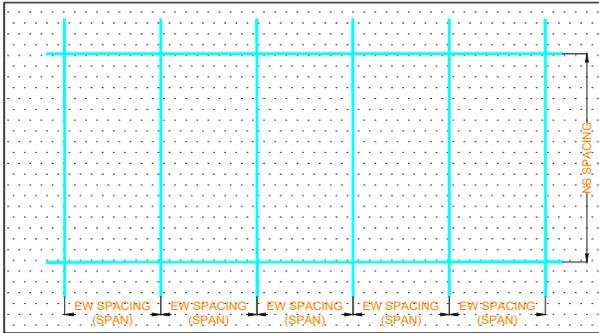


North/South distance along the attachment surface (B) can be obtained using Unirac's U-Builder design & layout tool. It is approximately equal to the distance (A) between Tilt Foot Rail and Tilt Leg Rail

### PRO TIP

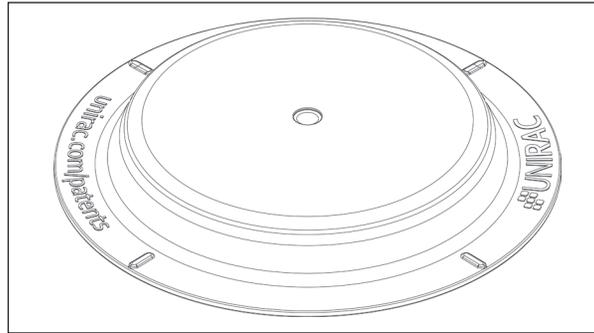
Experienced installers have been very successful with SOLARMOUNT Tilt by utilizing an easily made brace during installation. The brace is comprised of a beam (supplied by others such as a piece of strut, but could also be a piece of SOLARMOUNT rail) and four (4) L-feet. The purpose of the brace is to temporarily, but firmly, position rails perpendicular to module frame and parallel to each other at the desired tilt angle. Once modules have been properly fastened to the SOLARMOUNT rail top slot, the braces can be removed. This saves time by keeping rails positioned correctly as module installation begins.

For more information on module placement please refer to the SOLARMOUNT & NXT UMount installation guide. Remember to comply with module manufacturer clamping requirements



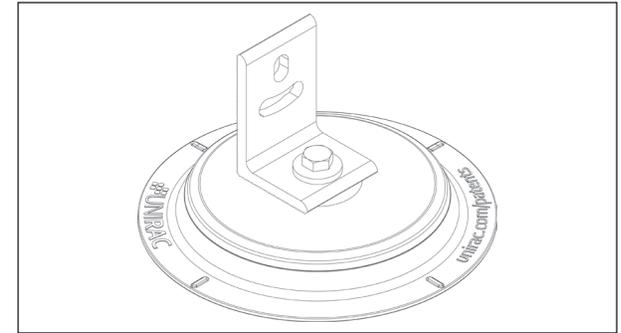
### ARRAY LAYOUT

Refer to the U-Builder report for details of EW span and NS spacing. Mark the locations for the FLASHLOC RM attachments.



### INSTALL FLASHLOC RM

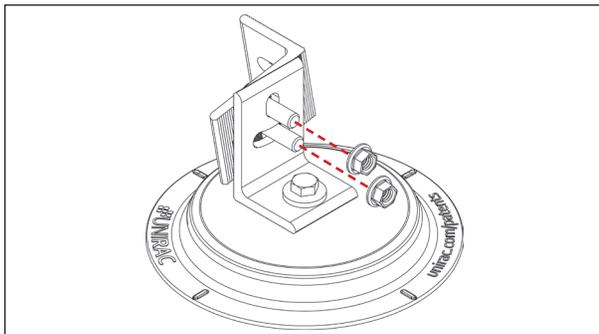
Follow the instructions mentioned in FLASHLOC RM installation guide to install the FLASHLOC RM attachment.



### INSTALL TILT L-PLATE TO FLASHLOC RM

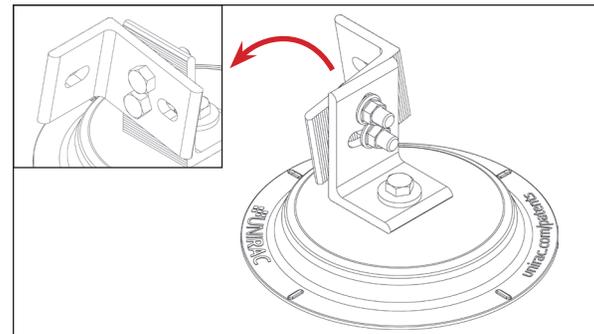
Place Tilt L-plate on the FLASHLOC RM attachment and secure it with the 3/8" bolt and washer included in the FLASHLOC RM kit.

**Torque Value: 30 ft-lbs.**



### INSTALL TILT L-PLATE FOR FRONT TILT CONNECTION

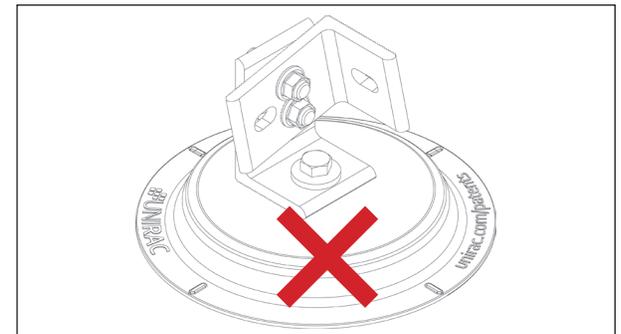
Place the second Tilt L-Plate against the first Tilt L-Plate to mate the serrations.



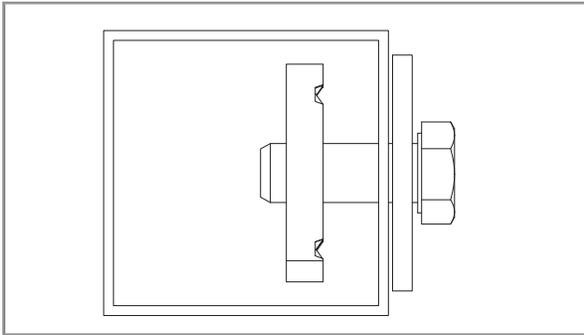
### SECURE TILT L-PLATES

Insert two 3/8"-16 bolts provided with kit in each slot as shown above and align second Tilt L-Plate to required tilt angle. Secure second Tilt L-Plate to first Tilt L-Plate using 3/8" flange nut.

**Torque Value: 30 ft-lbs.**

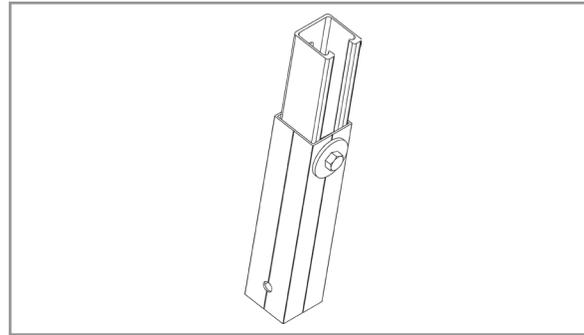


**Do not install Tilt L-Plate as shown above.**



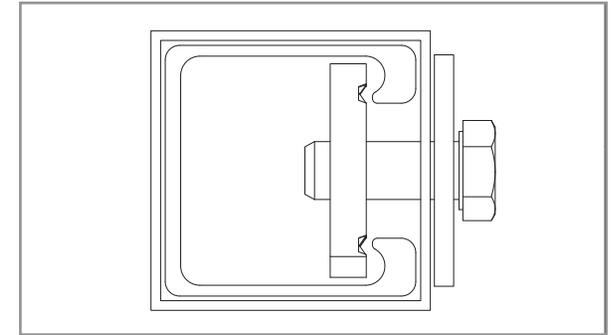
#### ASSEMBLE TILT LEG:

- 1) Place fender washer on 3/8" bolt
- 2) Loosely attach strut nut to bolt

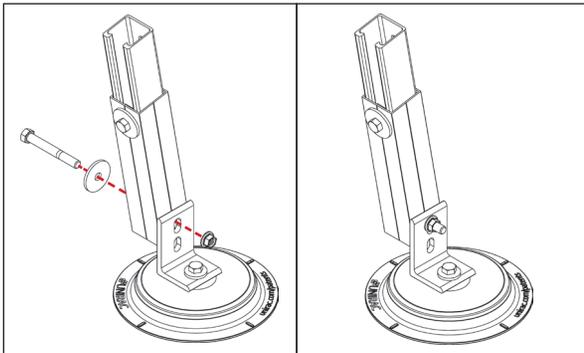


#### ASSEMBLE TILT LEG (CONT):

- 3) Slide strut into tube with nut positioned as shown
- 4) Tighten bolt at desired leg length



**Torque Value: 30 ft-lbs.**



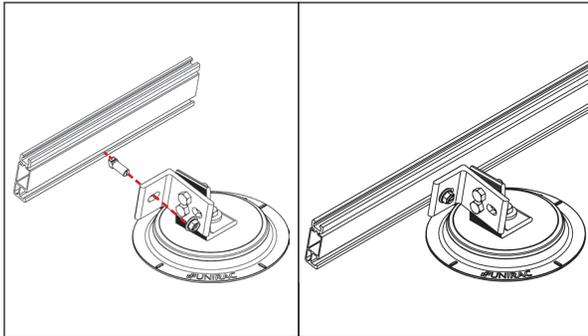
#### ATTACH TILT LEG TO L-FOOT:

Insert 3" hex bolt with a fender washer in the bottom hole of the square tube and secure it to the L-foot at the required tilt angle.

#### TORQUE VALUE EXCEPTION:

**3/8" nut to 15 ft-lbs**

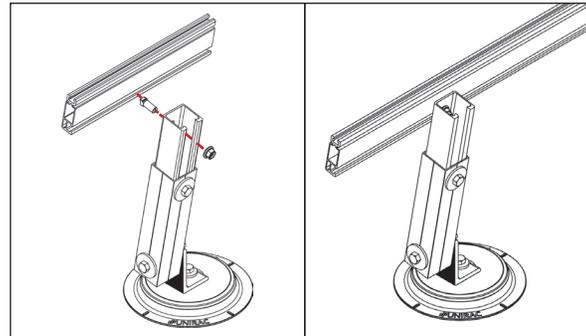
**(Lower torque required to avoid crushing tube)**



### STEP-1: SECURE SM RAIL TO FRONT TILT L-PLATE

Secure SM Rail to Tilt L-Plate as shown above using 3/8" T-bolt and flange nut.

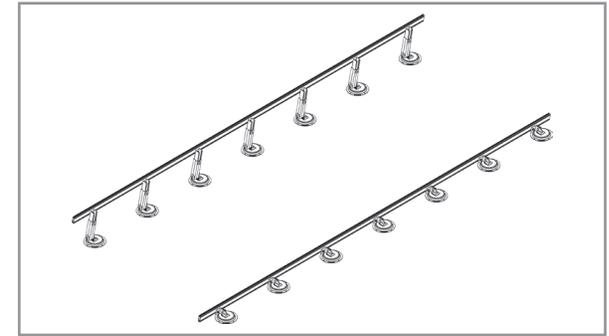
**Torque Value: 30 ft-lbs.**



### STEP-2: SECURE SM RAIL TO REAR TILT LEG

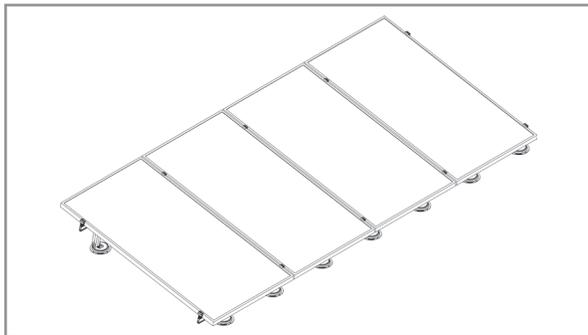
Secure SM Rail to the strut as shown above using 3/8" T-bolt and flange nut.

**Torque Value: 30 ft-lbs.**



### COMPLETE RAIL INSTALLATION

- Complete the whole system rails installation by repeating STEP-1 and STEP-2.
- In the case of using splices to attach rails, refer to the Splice Installation section of SOLAR MOUNT installation manual.

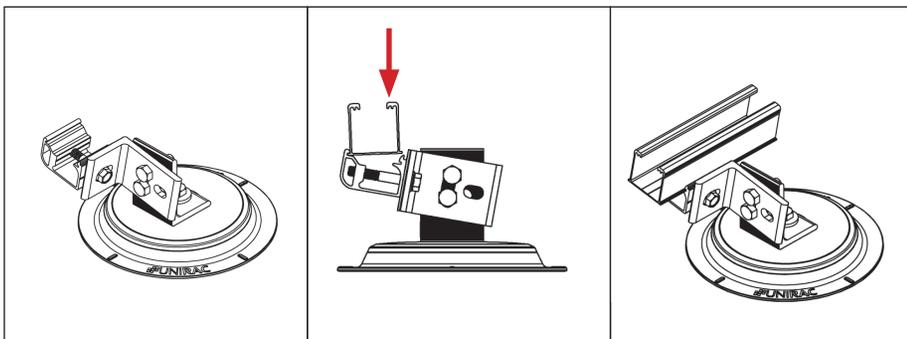


### FINISH INSTALLATION

Follow instructions mentioned in SOLAR MOUNT installation manual to finish system installation.

### NOTE

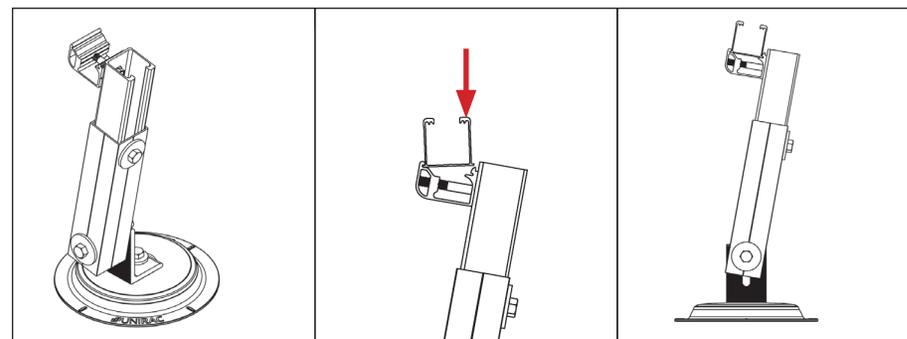
Refer to the SOLAR MOUNT installation manual available on website <https://unirac.com/tech-support-pitched-roof/> for compatible module list, system grounding and fire classification data.



### STEP-1: SECURE NXT RAIL TO FRONT TILT L-PLATE

- A Loosely attach rail clamp to Tilt L-Plate with the hex bolt provided in kit
- B Position NXT rail in rail clamp
  - Insert the rail flange on one side of the clamp groove.
  - Then click-in the other side of the rail into the clamp groove.
- C Tighten hex bolt to secure NXT Rail and Rail clamp to Tilt L-Plate.

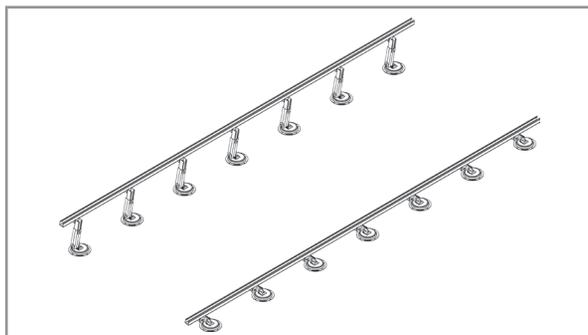
**Torque Value: 20 ft-lbs.**



### STEP-2: SECURE NXT RAIL TO REAR TILT LEG

- A Attach rail clamp to Tilt Leg with the hex bolt provided in kit
- B Position NXT rail in rail clamp
  - Insert the rail flange on one side of the clamp groove.
  - Then click-in the other side of the rail into the clamp groove.
- C Tighten hex bolt to secure NXT Rail and Rail clamp to Tilt Leg.

**Torque Value: 20 ft-lbs.**

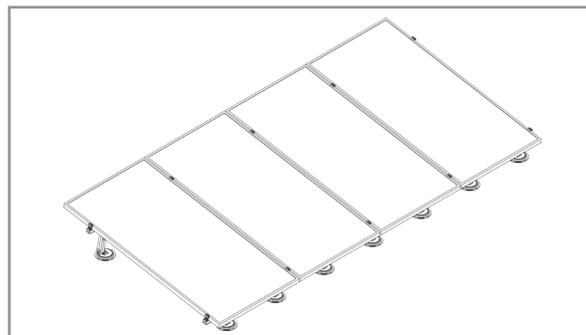


### COMPLETE RAIL INSTALLATION

- Complete the whole system rails installation by repeating STEP-1 and STEP-2.
- In the case of using splices to attach rails, refer to the Splice Installation section of NXT UMOUNT installation manual.

### NOTE

Refer to the NXT UMOUNT installation manual available on website <https://unirac.com/tech-support-pitched-roof/> for compatible module list, system grounding and fire classification data.



### FINISH INSTALLATION

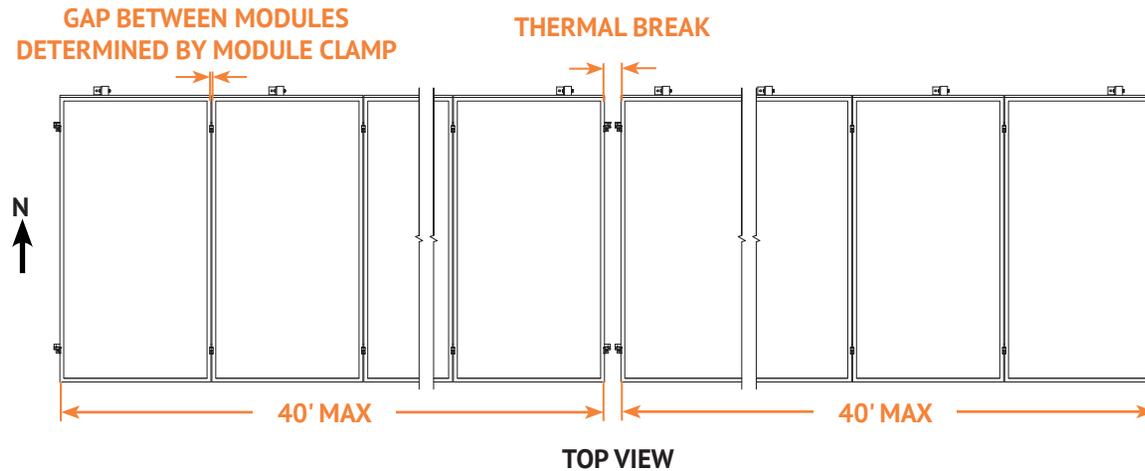
Follow instructions mentioned in NXT UMOUNT installation manual to install modules and finish system installation



# SM NXT TILT LEGS

A thermal break prevents buckling of rails, system connection failure, and module damage due to thermal expansion and contraction. Determine where thermal breaks are necessary prior to the installation of roof attachments and rails.

Thermal break is required when the continuous length of spliced rails exceeds 40 feet in East-West direction, including the additional space between modules determined by module clamps. To create the thermal breaks, provide a sufficient gap between rails for proper installation of end clamps and tooling (see image below).



### MECHANICAL LOAD TESTING

The tests performed covers module frame thicknesses greater than or equal to 1.0 mm, single and double wall frame profiles (some complex frame profiles could require further analysis to determine applicability), and clear and dark anodized aluminum frames. PV modules may have a reduced load rating, independent of the SM & NXT TILT LEGS system rating. Please consult the PV module manufacturer's installation guide for more information.

SYSTEM	MODULE	AREA (sq ft)	Design Load Ratings
SM TILT LEG	Hyundai HiS-SxxxT1	21.05	Down: 50.53 psf, Up: 44.33 psf, Downslope: 10.93 psf
NXT TILT LEG			Down: 51 psf, Up: 32.23 psf, Downslope: 10.93 psf

**NOTE:** Design loads are equal to tested loads with 1.5 safety factor applied.