

VRLA RB BATTERY RACKS ASSEMBLY INSTRUCTIONS

(READ ALL INSTRUCTIONS PRIOR TO INSTALLATION)



For All Standard And Seismic Models Including Retrofitting
Standard Models To Meet Seismic Requirements

Safety



Installation of VRLA batteries should only be performed and supervised by trained personnel knowledgeable of lead acid batteries and the required personal and equipment safety precautions. Keep unauthorized personnel away from the batteries and assembly activity.

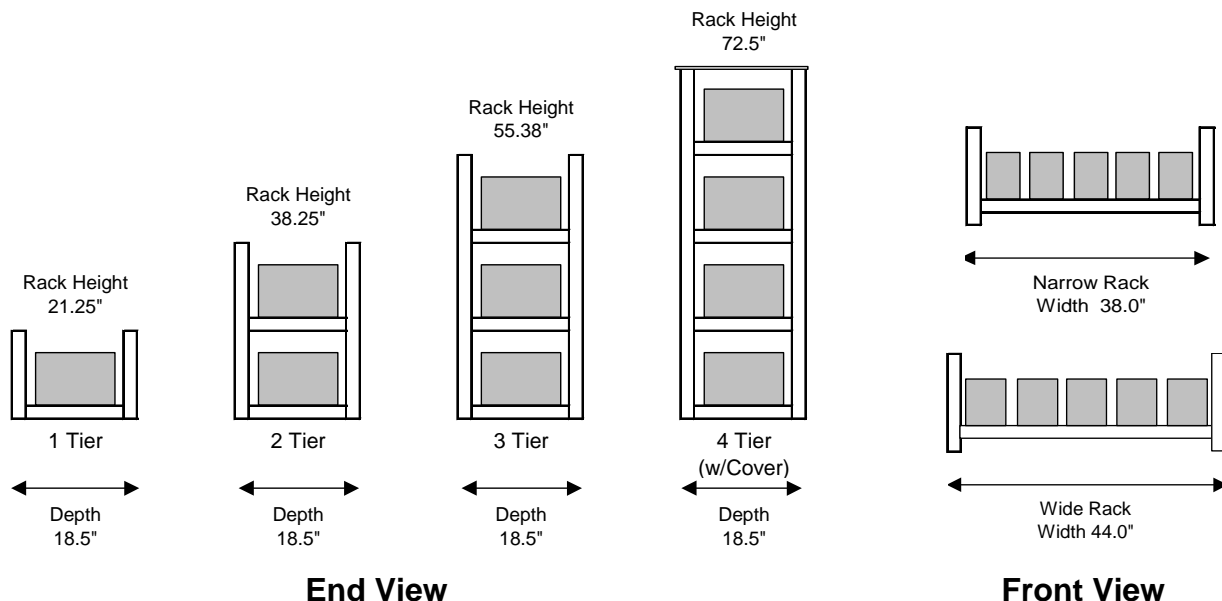
Observe battery safety procedures. Use insulated tools, gloves, safety glasses, and remove all jewelry etc.. Special care should always be taken to avoid short circuiting any battery connection.
Wash hands after any contact with lead or electrolyte.

Rack Configurations



Racks are available in single or multiple tiers. Rack components must be assembled and secured on-site in accordance with these C&D assembly instructions, rack drawings and applicable codes. Because EQ Racks meet Seismic requirements, they may NOT be mechanically secured together.

A minimum distance of 3" must be allowed between racks and between racks and the building structure.



Tools for RB Rack Assembly



The following items will assist you to properly assemble rack materials. **Insulated** tools are strongly recommended for safety purposes.

9/16" socket wrench	Torque wrench to 46ft-lbs	Tape measure
9/16" open-end wrench	Needle nose pliers	Knife
Chalk and line to mark floor	Bubble level	Square
Power drop cord	Drill & concrete bit (for floor anchors)	

Required Materials Supplied by Installer



Seismic Qualified floor anchor bolts (4 per rack)

1/8" thick (X) 2 3/8" wide (X) 3 3/8" long metal shims with 15/16" centered cutout (length wise).
Quantity of shims depends on floor surface.

Rack Location



Locate racks in a clean, cool, dry environment to avoid exposing the batteries to sources of radiant heat, such as sunshine, heating units, radiators, and steam pipes etc. Top rows of batteries in multiple-tier configurations tend to operate at a slightly higher temperature than batteries on lower tiers. Always provide adequate ceiling clearance for ventilation and maintenance.

Anchoring



Seismic racks must be securely anchored to the floor and in accordance with applicable codes and regulations. Four 15/16" diameter mounting holes are provided in the rack base. Seismic racks must be secured to the floor using **ALL** anchor bolt locations.

Anchor mounting hardware must be capable of withstanding foundation allowable loads of 4,000-lbs. pullout and 576-lbs. shear. Anchor spacing based upon the mounting holes in the RB Rack is 12.5". You must allow a minimum of 3" between racks and between racks and the building structure to allow for drift.

To properly select anchoring system hardware, the concrete floor strength in psi must be determined.

Grounding



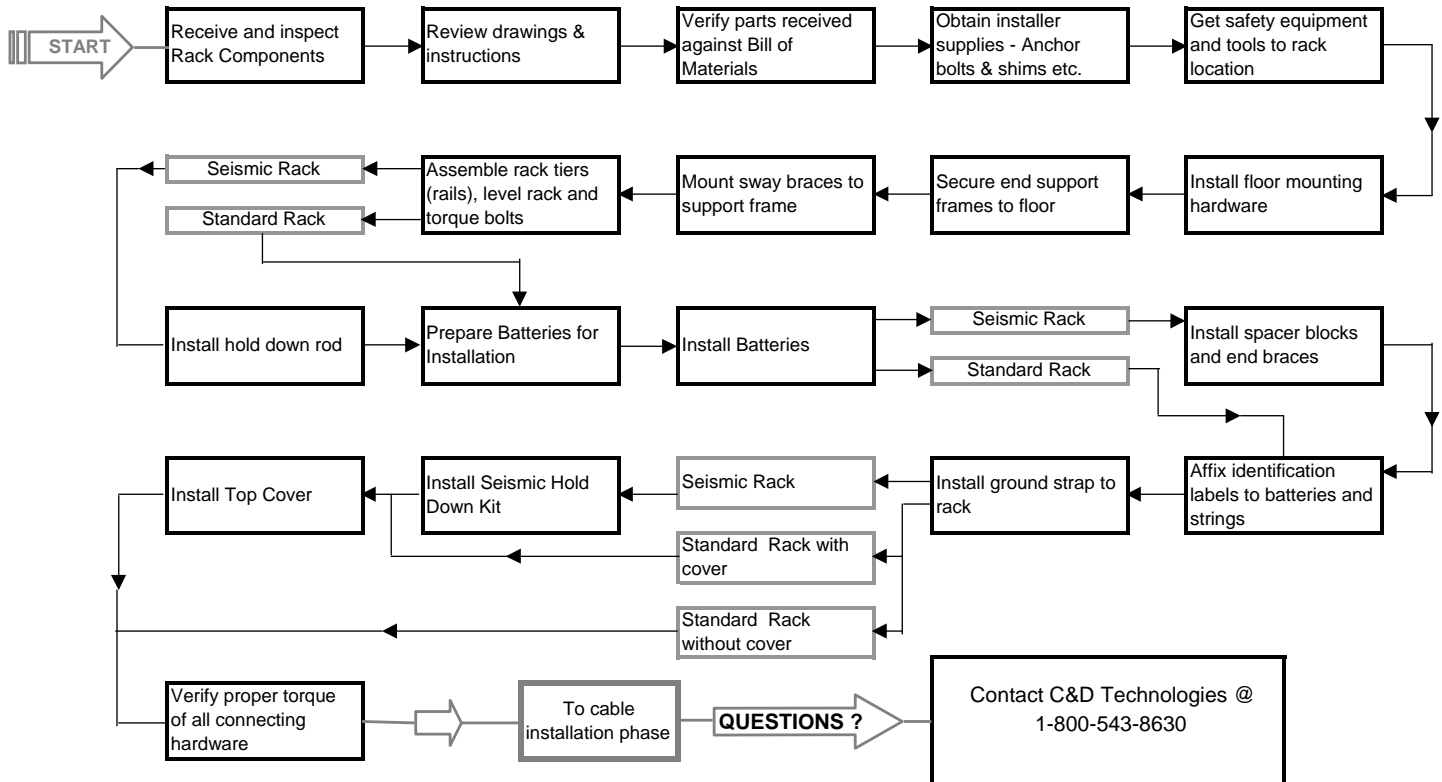
Each rack has grounding strap provisions. Two 15/32" diameter mounting holes are located on each vertical frame and accept single hole or dual hole lugs on 1" centers. The surfaces surrounding the holes are free of powder coat to allow electrical contact.

Standard and Seismic Rack Comparison



EQ series Seismic Zone 4 racks are similar to standard racks, but with the addition of hold down struts, battery end brackets, spacers, and covers for Seismic racks. Frames are the same for both Standard and EQ series racks. EQ series Seismic racks are certified to the 1997 Uniform Building Code.

VRLA RB Battery Rack Assembly - Task Flow Chart



1. Receive and inspect rack components

Upon receipt of the RB Rack materials, inspect and document any damage to these materials.

Damage claims must be filed promptly with the carrier.

2. Review drawings and instructions

3. Verify Parts Received Against Bill of Materials

Standard RB Series Rack components are shipped in 2 boxes. If an optional cover was ordered, there will be one additional box.

Seismic RB Series Racks are shipped in 3 boxes plus one additional box for each tier.

Before assembly, verify that all rack materials are present against the detailed bill of materials shown on the RB Rack Assembly Drawing (RB__T) or (RB__TEQ).

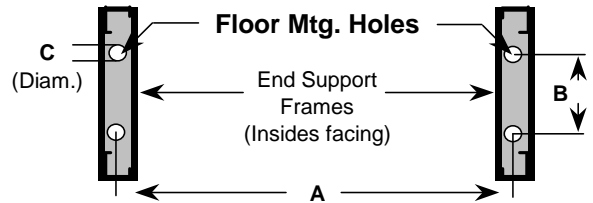
4. Obtain installer supplies (listed on page 2)

5. Get safety equipment and tools (listed on page 2) to rack installation location

6. Install floor-mounting hardware (supplied by installer)

Locate the rack's general position, considering boundary and aisle clearances.
Locate floor-mounting locations.
Mark the floor for drilling floor anchor holes using dimensions shown below.

	<u>Ref.</u>	<u>Dim.</u>
Narrow Rack	A	36.0"
Narrow Rack	B	12.5"
Both Racks	C	15/16" diam.
Wide Rack	A	42.0"
Wide Rack	B	12.5"



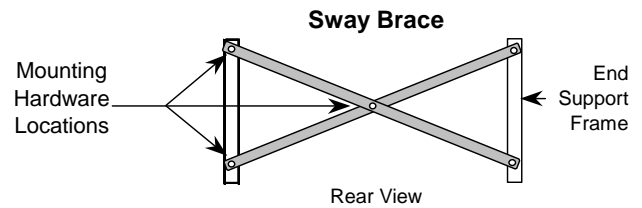
7. Secure end-support frames to floor finger tight.

Depending on the installation method, sway braces can be installed per step 8 before securing end support frames to the floor.

8. Install 2 sway braces to 2 end support frames and braces to themselves at their centers

Mounting hardware starting at outer rack surface – finger tight

- 1.25" (x) 3/8" – 16 Hex Bolt
- 3/8" Flat Washer
(materials being joined together)
- 3/8" Flat Washer
- 3/8" Star Washer
- 3/8" – 16 Hex nut



9. Assemble rack tiers (LOWEST first), level rack and torque bolts

Adjust distance between rails to accommodate length of batteries to be installed.

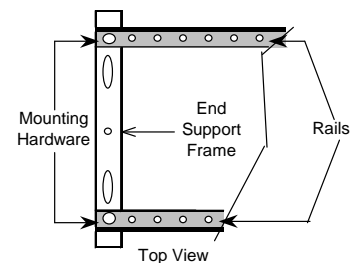
Do NOT install batteries at this time.

After assembling:

- a) Place one KYDEX insulating strip onto each battery support angle
- b) Level and square all rack materials installed to this point using installer supplied shims
- c) Torque all mounting hardware to 46 ft lbs. Torque floor anchors per manufacturer's specification.

Mounting hardware starting at top of rack surface – finger tight

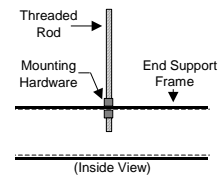
- 1.0" (x) 3/8" – 16 Hex Bolt
- 3/8" Flat Washer
(materials being joined together)
- 3/8" Flat Washer
- 3/8" Star Washer
- 3/8" – 16 Hex nut



10. Seismic Racks – Install hold down rod on each tier’s end support frame

Mounting hardware starting at top of end-frame surface
Torque to 46 ft lbs

13 ¾" long Threaded rod 3/8" – 16	(End support frame)
3/8" Hex nut	3/8" Flat washer
3/8" Flat washer	3/8" – 16 Hex nut



11. Prepare Battery Terminals

Remove any pre-existing grease then lightly brush terminal contact surfaces with a brass brush or Scotch Brite type pad. Coat terminals with anti-oxidant NO-OX-ID type grease or equivalent.

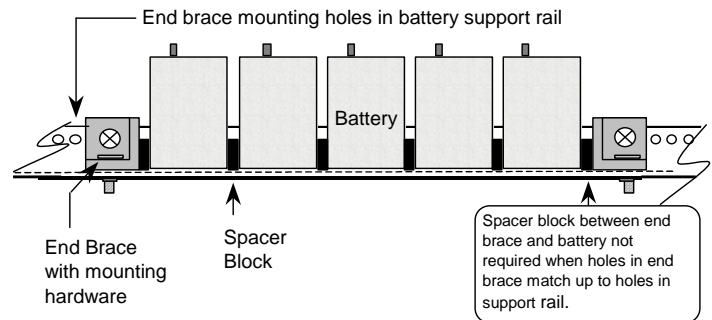
12. Install Batteries

Center KYDEX insulators on each battery support angle. Starting at the center of the LOWEST tier, install batteries working out to each end. Leave a **MIMUM of 0.5"** between batteries for required ventilation. Pay particular attention that each tier of batteries is oriented the same direction.

13. Seismic Racks – Install spacer blocks and secure end braces to battery support rail

End Brace
Mounting Hardware – torque to 46 ft lbs

3/8" – 16 Hex bolt	3/8" Flat washer
3/8" Flat washer	3/8" Star washer
Bracing Bracket	3/8" Hex nut
Support Rail	



Support Rail Assembly with Batteries, Spacers, and End Braces

14. Affix identification labels to batteries and racks

Refer to the system wiring schematic.

The battery having the positive output for the string should be labeled as #1. Continue labeling the remaining batteries in this string in ascending sequential order as they are connected in series from the #1 battery. The battery at the negative output for this string will be the highest numbered battery.

Battery numbering sets are available through your C&D Dynasty Distributor. Individual strings that are connected in parallel should be uniquely identified as "A", "B" and "C".

15. Install Ground Strap (supplied by installer) to Rack

Each vertical member of the end-support frame has 2 each 15/32" holes on 1.0" centers. They accommodate a single hole or a 2-hole lug. The National Electrical Code 150-166 specifies conductor size will not be smaller than the largest system conductor and in any case not smaller than #8 copper (#6 aluminum). The end of the ground strap not attached to the rack should be connected in accordance with applicable codes.

16. Seismic Rack – Install Hold Down Kit

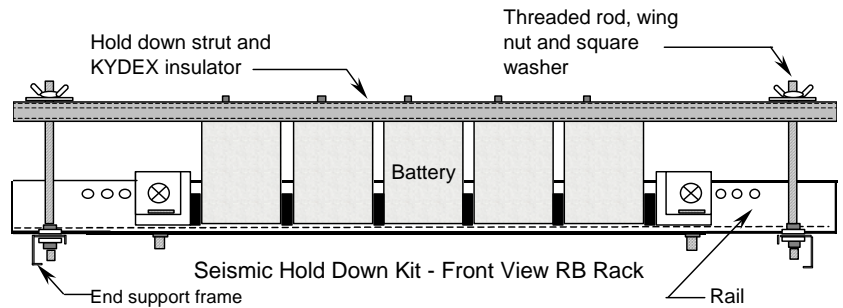


CAUTION – Avoid shorting battery terminals against hold down strut!!

Place a KYDEX insulator over a hold down strut.

Mounting Hardware

- Square washer
- 3/8” – 16 Wing nut

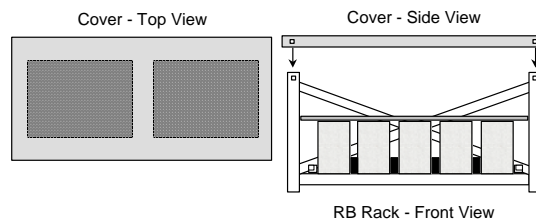


Turn these parts over to form a “U” – Place the hold down assembly over the two threaded rods and connect the hardware – ¼ turn past finger tight.

17. Install Top Cover (Seismic and Standard Rack as option)

Mounting Hardware starting at outer cover surface– torque to 46 ft lbs

- ¾” L Carriage bolt #3/8 – 16 (Top cover)
- 3/8 Flat washer
- 3/8 Lock washer
- 3/8 – 16 Hex nut



18. Verify proper torque of all connecting hardware

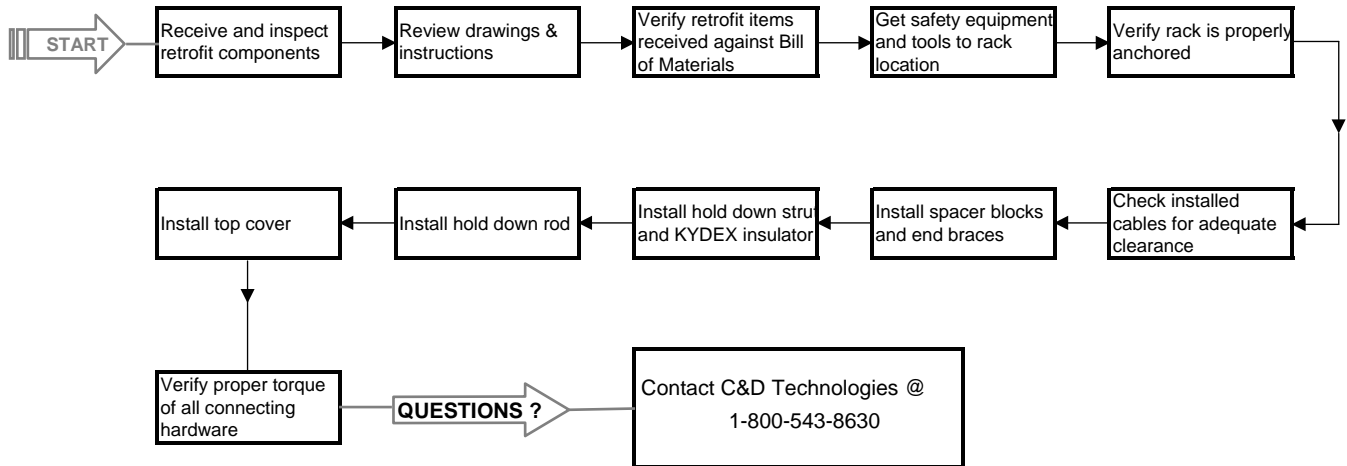
**Retrofitting Standard RB Racks
To Seismic Zone 4 Requirements**

RB Rack Retrofit Materials Required

To retrofit an installed standard RB Rack to seismic Zone 4 standards, the C&D Dynasty retrofit options listed below are required. For each part ordered, you will receive one box marked with the indicated part number shown. If a quantity of 4 items is ordered, you will receive 4 separate boxes.

Part Description	Quantity Required	Part No. – Narrow Rack	Part No. – Wide Rack
Top Cover	1	SMF101N	SMF101W
Seismic Hold Down Kit	1 for each tier	SMF105N	SMF105W

VRLA RB Battery Rack Retrofit - Task Flow Chart



R-1. Receive and inspect rack components

Upon receipt of the RB Rack materials, inspect and document any damage to these materials. Damage claims must be filed promptly with the carrier.

R-2. Review drawings and instructions

R-3. Verify Parts Received Against Bill of Materials

Before assembly, verify that all rack materials are present against the detailed bill of materials shown on the RB Rack Assembly Drawing (RB_ _TEQ).

R-4. Get safety equipment and tools to rack installation location

Safety equipment as described on page 1 of this publication.

Tools - The following items will assist you to properly install RB Rack retrofit materials.

Insulated tools are strongly recommended for safety purposes.

9/16" Socket wrench
9/16" Open-end wrench

Torque wrench to 46ft-lbs
Needle nose pliers

Tape measure
Knife

R-5. Anchoring

It is very important that the rack is securely anchored to the floor using **ALL** four 15/16" diameter mounting holes provided in the rack's base.

It is the responsibility of the installer to verify that the rack is anchored in accordance with allowable floor loading, applicable codes and regulations. Under normal conditions, this should have been done with the initial installation of the rack. If not, it needs to be done prior to performing the following procedures.

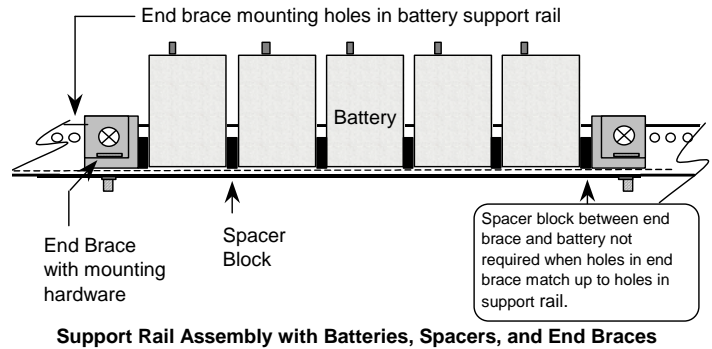
R-6. Check installed cables for adequate clearance

One inch clearance is required between the underside of inter-connecting cables and the top of all battery cases across each tier to accommodate the P3300 hold down strut and KYDEX insulating channel.

If this space is not available due to insufficient cable lengths, new cables of the correct length must be installed. This situation will require replacing existing cables before going to the next assembly operation.

R-7. Seismic Racks – Install spacer blocks and secure end braces to battery support rail

	End Brace
Mounting Hardware – torque to 46 ft lbs	
3/8" – 16 Hex bolt	3/8" Flat washer
3/8" Flat washer	3/8" Star washer
Bracing Bracket	3/8" Hex nut
Support Rail	



R-8. Install Seismic hold down strut and KYDEX insulator

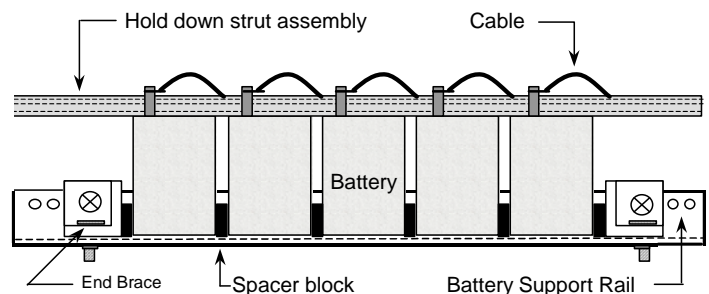


CAUTION – Avoid shorting battery terminals against hold down strut !!

Place the “U” shaped KYDEX insulating channel over the “U” shaped Hold down strut.

Position this assembly so it looks like a “U”. The KYDEX insulator will now be on the bottom.

Starting on the lowest tier, at either end of the rack, slide the hold down strut/insulator assembly under the inter-cell cables so that the flat side of the strut assembly rests **CENTERED** on top of the battery cases.

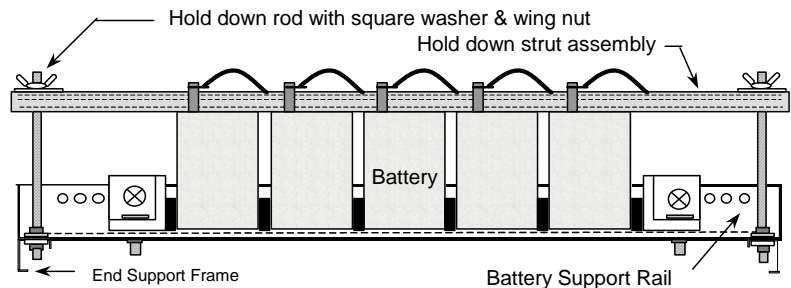


Repeat this step for each tier.

R-9. Install hold down rod

Attach a rod to each end support frame starting with the lowest tier -
Mounting Hardware – torque to 46 ft lbs

- 13 ¾" long threaded rod 3/8" – 16
- 3.8" hex nut
- 3/8" flat washer
- end support frame
- 3/8" flat washer
- 3/8" – 16 hex nut



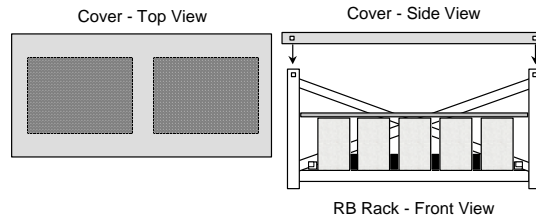
Then secure the rod to the hold down strut
Mounting hardware – ¼ turn past finger tight

- Square washer
- 3/8" wing nut – **DO NOT OVER TORQUE** wing nut

R-10. Install Top Cover

Mounting Hardware starting at outer cover surface– torque to 46 ft lbs

- ¾" L Carriage bolt #3/8 – 16
(Top cover)
- 3/8 Flat washer
- 3/8 Lock washer
- 3/8 – 16 Hex nut



R-11. Verify proper torque of all hardware

REMEMBER, the wing nut on top of the hold down strut is only tightened ¼ turn past finger tight.

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