

# <THESE INSTRUCTIONS MUST BE GIVEN TO THE END USER>



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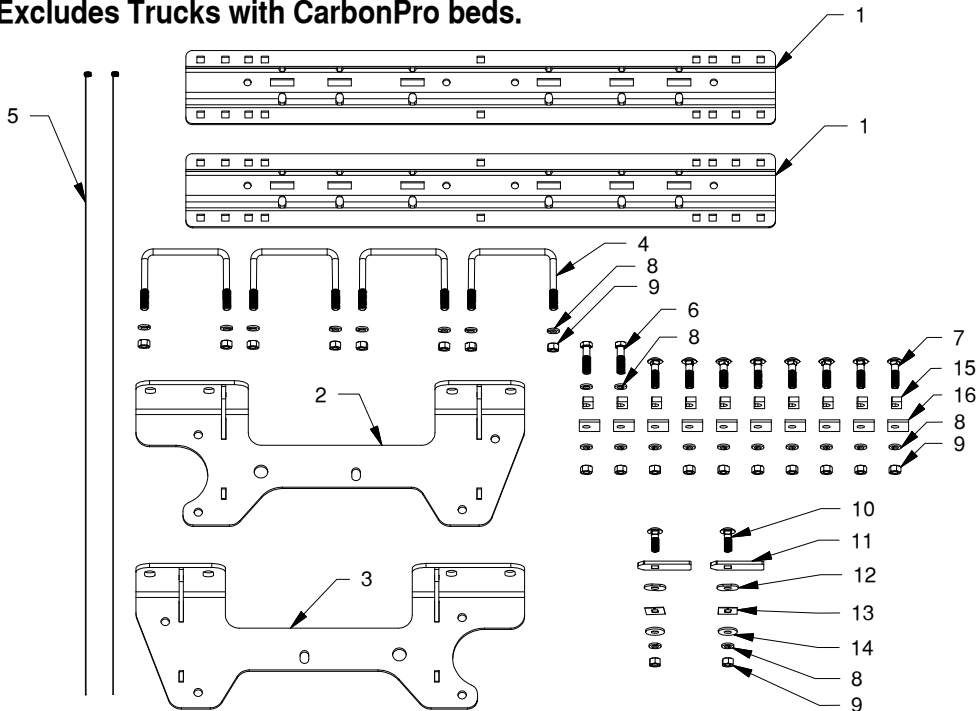
Call or Email us for  
 Installation Support  
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## Custom 5th Wheel Hitch Mounting Rail Installation Instructions

# MODEL 2504

2019 - 2023 CHEVROLET & GMC 1500 Trucks  
 Excludes 2019 Chevy LD & GMC Limited 1500 Trucks.  
 Excludes Trucks with CarbonPro beds.

See Limited Lifetime Warranty at  
[bwtrailerhitches.com/warranty](http://bwtrailerhitches.com/warranty)



Patriot Rail Box (RVR3210)		
ITEM	DESCRIPTION	QTY
1	Mounting Rail	2

Bracket Set Box (RVR2504)		
ITEM	DESCRIPTION	QTY
2	Side Plate - Passenger	1
3	Side Plate - Driver	1
4	1/2" X 5-1/2" X 4-1/4" U-Bolt	4
5	Fish Wire	2

Bracket Set Bolt Bag #1		
ITEM	DESCRIPTION	QTY
6	1/2" X 2" Cap Screw	2
7	1/2" X 2" Carriage Bolt	8
8	1/2" Lock Washer	22
9	1/2" Finish Nut	20
10	1/2" X 1-1/2" Carriage Bolt	2
11	Locking Strap	2
12	Frame Spacer	2
13	1/2" Bolt Retainer	2
14	1/2" Flat Washer	2

Bracket Set Bolt Bag #2		
ITEM	DESCRIPTION	QTY
15	3/8" U-Shaped Spacer	10
16	Offset Rectangular Washer	10

### **⚠ WARNING** Failure to comply with the safety information in these instructions could result in serious injury or death.

- ⚠** Read all installation and operating instructions along with all labels before using this product.
- ⚠** Adding components to the chassis of any vehicle can be hazardous. There is potential for damage to vehicle, injury from tool usage and many other hazards. This installation must be completed by someone who is aware of the hazards involved. This person must be knowledgeable of proper safety procedures for a vehicle installation of this nature, and for usage of the equipment required to perform the installation.
- ⚠** Without proper knowledge, towing can be a dangerous activity. Understand all the risks involved with towing before proceeding. For information on towing safety, see "The Trailer Handbook: A Guide to Understanding Trailer and Towing Safety" from the National Association of Trailer Manufacturers, [www.NATM.com](http://www.NATM.com) and your trailer manufacturer's owner's manual.
- ⚠** Do not exceed tow or tongue rating of coupler, tow or tongue rating of hitch, or tow or weight ratings of truck or trailer. See vehicle and trailer manufacturer information for ratings. Exceeding these ratings may cause damage to towing components or loss of attachment between the trailer and truck.
- ⚠** Additional caution must be used when towing a wedge car trailer. Towing stability greatly depends on keeping the center of gravity as low as possible. Load heavy cars over the axles. Never tow with a single car on the front of the trailer. When towing a wedge car trailer, never exceed speeds that are reasonable for the roadway conditions (e.g. turns, going around a curve, etc.). Failure to account for proper trailer center of gravity and speeds that are reasonable for the roadway conditions may cause damage to the truck, trailer, towing components, and loss of attachment between the truck and trailer.
- ⚠** Do not modify this product in any manner. Doing so could alter its integrity and lead to a loss of attachment between the trailer and the tow vehicle.
- ⚠** A visual inspection of the hitch should be performed before each time you tow. Regularly check that all pinned connections are secure, and that all bolted connections are at the correct torque specification. Check for cracks or damage to the hitch. Do not tow with the hitch if cracks or damage outside of normal wear is found. Towing with a hitch that has cracks or damage could result in damage to the tow vehicle, trailer, towing components and loss of attachment between the tow vehicle and trailer.

# PREPARING TO INSTALL

**NOTICE:** It may be necessary to remove the spare tire before installation. Removing rear tires may aid in installation.

**NOTICE:** If truck is equipped with a removable bed liner or mat it should be removed, or it must be cut to allow the mounting rails to connect directly with the bed. It is acceptable to install the mounting rails over a spray-in bed liner.

**NOTE:** Remove all parts from the packaging and familiarize yourself with all the parts and tools required. Use the parts list on the front page to verify that all parts and hardware are present.

Installation of the mounting rails requires several common tools and a few specialized tools. Below is a listing of equipment used during a typical installation.

- Impact Wrench or Ratchet with 3/4" & 10mm Sockets
- 3/4" & 10mm Box End Wrench
- Drill and 1/8" & 9/16" Drill Bits
- Screwdriver with T15 Torx Bit
- Patriot 5th Wheel or Slider Base
- Hammer
- Flashlight
- Tape Measure
- Ear & Eye Protection
- Torque Wrench
- Center Punch Tool

1. **Detach brake line bracket.** Using a 10mm socket or wrench detach the bracket holding two brake lines on the inside of the driver side frame just behind the rear axle, see Figure A1.

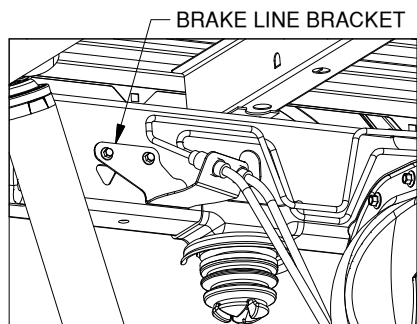


Figure A1: Looking inside driver side frame.

2. **Detach wheel well liners.** If flexible wheel well liners are present, three T15 Torx screws will need to be removed so the liners can be folded up to allow the side plates to be installed. See Figure A2. Remove the screw retainer from the forward most hole using a screw driver. It will be replaced after the hitch is installed.

T15 TORX SCREWS      SCREW RETAINER LOCATION

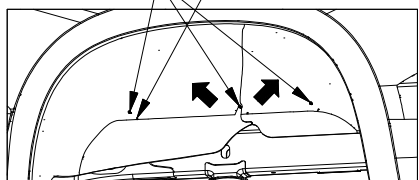


Figure A2: View looking into driver side wheel well.

3. **Disconnect wiring harness.** Locate the wiring harness running along the top of the passenger side frame rail above the rear axle. Detach the plastic connector closest to the shock bracket from the frame. Pull the wiring down off the top of the frame, towards the inside, to make room for the side plate and U-bolt on top of the frame.

## DRILL REAR MOUNTING HOLES

1. **Layout the rear mounting rail.** Place a mounting rail onto the bed of the truck. Hook a tape measure over the rear edge of the bed (not on any part of the tailgate), measure the location for the mounting rail, as shown in Figure B1. Next, center the mounting rail in the bed by measuring the distance on either side from the edge of the rail to the sides of the bed. The rail will be centered when both measurements on either side of the rail are the same.

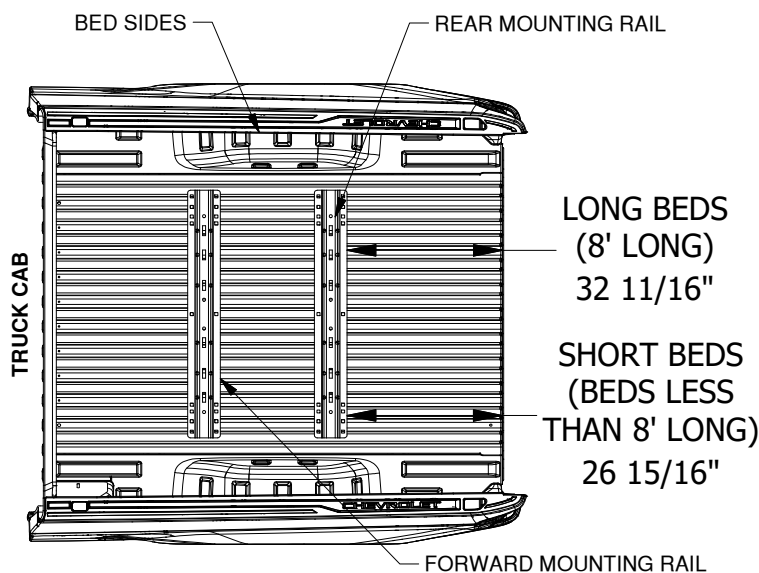
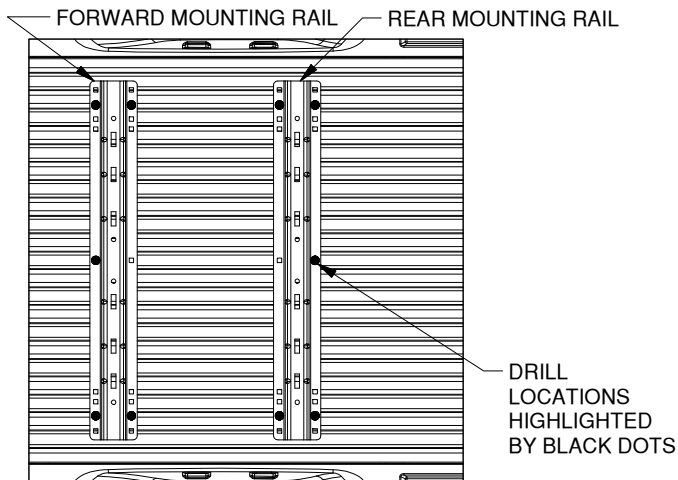


Figure B1: View over bed.

**IMPORTANT:** If your truck has a spray-in bed liner you will need to take this into account when you are measuring, and add the thickness of the applied liner that has been sprayed over the end of the bed.

**IMPORTANT:** The mounting rail is designed to install only at the described location. Failure to place the mounting rail precisely may result in added difficulty during installation and/or property damage.

- 2. Mark hole locations.** While carefully ensuring the mounting rail does not move, use a center punch tool to mark the 5 drill locations on the rear rail. See Figure B2 for hole marking locations for this installation (forward rails will install in a later step). Once all 5 rear rail locations are clearly marked, move the bed rail out of the way and drill each location with an 1/8" drill bit.

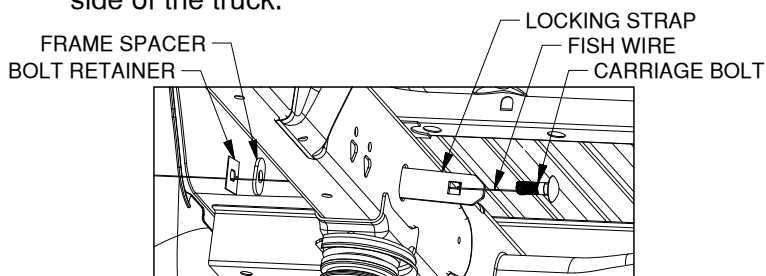


**Figure B2:** Detail view over bed, showing drill locations for the forward and rear mounting rails.

- ⚠ WARNING:** The fuel tank of the truck may be directly below the area of the bed which needs to be drilled. Always carefully examine the area under the truck where drilling will occur before drilling. Make certain that the tank, or other equipment, is not damaged during drilling. Damage to the tank may result in property damage, serious injury, or death.

## INSTALL SIDE PLATES

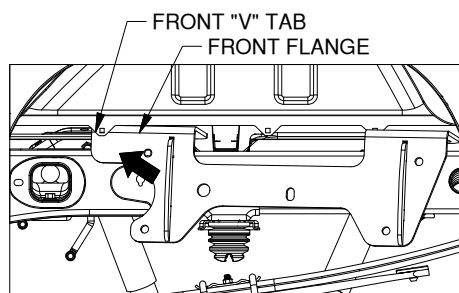
- 1. Install carriage bolts.** Locate the oval hole on the outside of the frame directly over the center line of the axle. To begin, place a 1/2" x 1-1/2" carriage bolt through a locking strap. Next, thread a fish wire onto the end of the carriage bolt. From the inside of the frame pass the fish wire through the oval hole located earlier. While holding the fish wire on the outside of the frame push the locking strap and carriage bolt into the frame, see Figure C1. Continue pulling on the fish wire until the threaded portion of the bolt is sticking out of the frame. Turn the carriage bolt until the square shoulder engages the square hole of strap. Before removing the fish wire, thread the oval frame spacer on the carriage bolt and into the oval slot. Remove the fish wire and thread a bolt retainer on the carriage bolt to hold the bolt in plate. Repeat this step on the other side of the truck.



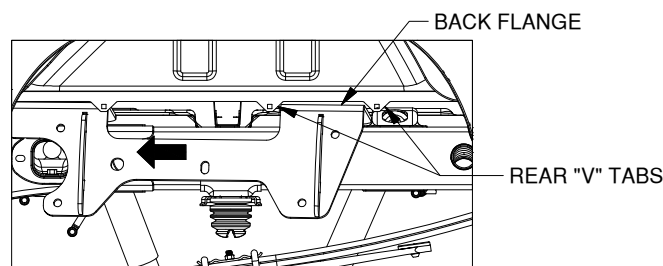
**Figure C1:** View looking at driver side frame.

- 2a. (Short bed) Install driver side plate.** Angle the side plate so the front flange can go behind the front "V" tab of the bed flange, see Figure C2. Move the side plate forward, so the back flange can go between the two rear "V" tabs, as shown in Figure C3. Push the side plate rearward, and rotate onto the installed carriage bolt, see Figure C4. Attach side plate with a flat washer, lock washer, and finish nut. See Figure C5. Hand tighten hardware only at this time.

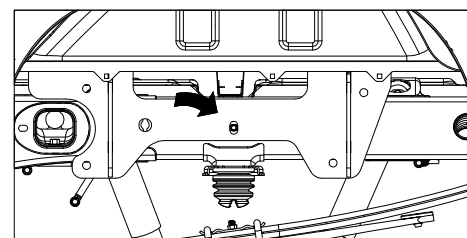
- 2b. (Long bed) Install driver side plate.** Angle the side plate so the front flange can go behind the front "V" tab of the bed flange, see Figure C2. Move the side plate rearward, so the back flange can go behind the rear "V" tab. Push the side plate forward, and rotate onto the installed carriage bolt, see Figure C4. Attach side plate with a flat washer, lock washer, and finish nut. See Figure C5. Hand tighten hardware only at this time.



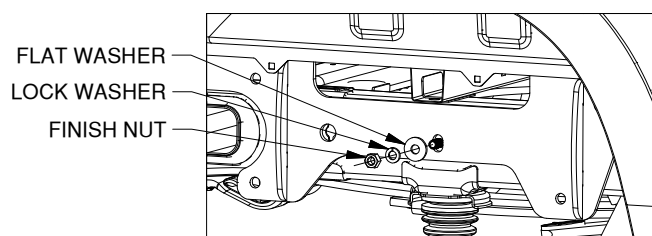
**Figure C2:** Angle front flange behind "V" tab.



**Figure C3:** Move side plate forward. (Long bed goes rearward.)

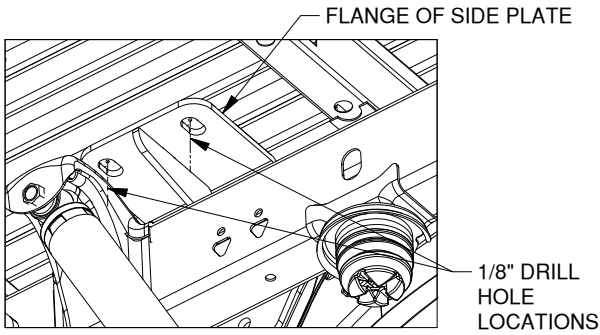


**Figure C4:** Center the side plate & rotate onto carriage bolt.



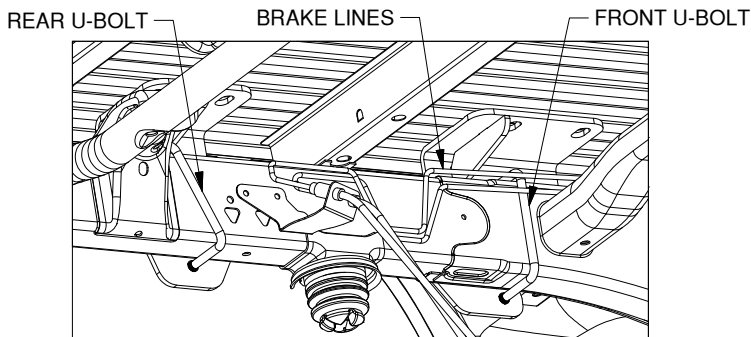
**Figure C5:** Attach side plate with hardware.

- 3. Enlarge the holes.** Check that the 1/8" holes are centered within the slots in the side plate, see Figure C6. If the 1/8" drilled holes are not centered, re-drill the 1/8" holes until the side plates and the drilled holes are aligned. Using the 1/8" holes as pilots, drill out each hole with a 9/16" bit.



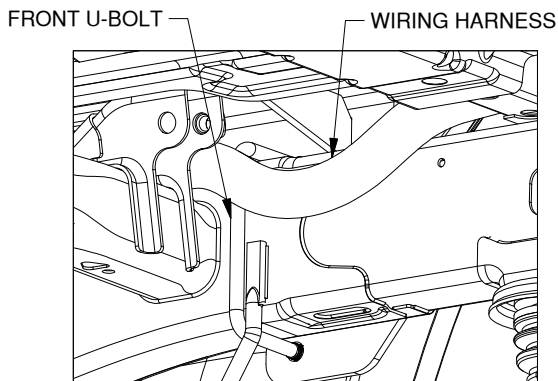
**Figure C6:** View under bed looking up at drilled area & side plate.

- 4. Attach the U-bolts.** Each side plate will utilize two U-bolts for attachment to the frame. The driver side front U-bolt will need to be passed under the brake lines on the inside of the frame, see Figure C7. Push U-bolts through holes in side plate. Install lock washers and finish nuts on U-bolts. Hand tighten hardware only at this time.



**Figure C7:** View looking at driver side frame. (Fuel tank not shown.)

- 5. Install the passenger side plate.** Repeat this process for the passenger side plate. The passenger side front U-bolt will need to be positioned under the wiring harness that runs over the top of the frame, see Figure C8.

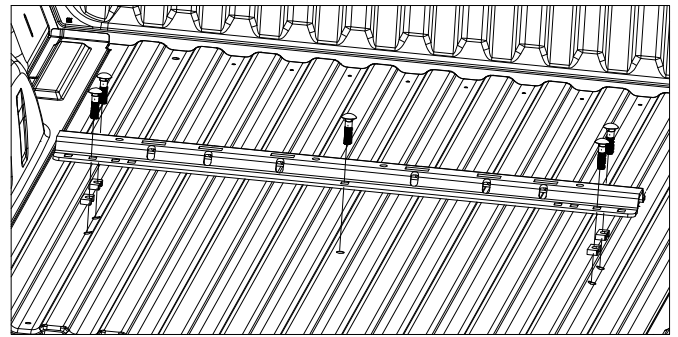


**Figure C8:** View looking at passenger side of frame.

## INSTALL MOUNTING RAILS

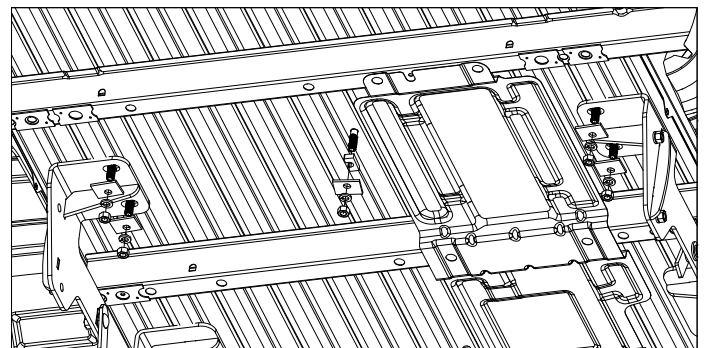
**NOTICE:** Due to the corrugation in the truck bed, U-shaped spacers are provided to function as space fillers between the mounting rails and the kit attachment hardware. Always place a U-shaped spacer in the gap either above the bed (between the mounting rail and the bed) or below the bed (between the bed and the side plates). Failure to use U-shaped spacers will result in property damage when hardware is tightened.

- 1. Install the rear mounting rail.** Reposition the rear mounting rail over the drilled 9/16" holes in the bed. Install a 1/2" x 2" carriage bolt through the mounting rail into each of the five drilled holes, as shown in Figure D1. Position the U-shaped spacers.



**Figure D1:** View looking into truck bed from rear of truck.

- 2. Install hardware on rear mounting rail.** Under the bed install an offset square washer, 1/2" lock washer, and 1/2" finish nut on each of the carriage bolts. See Figure D2. Place the U-shaped spacer. Hand tighten hardware.



**Figure D2:** View under bed from rear of truck. (Frame & U-bolts not shown.)

- 3. Position the forward mounting rail.** For this step the base which will be used in the mounting rails is required. Place a mounting rail into the truck bed in front of the rear mounting rail. Place the base over the rail attachment points and carefully lower it until the pin tabs pass through the attachment points on the rear mounting rail. Attach the forward mounting rail to the forward mounting points on the base. The base should rest flat against the top of the rails. See Figure D3. With the base still attached ensure that the forward rail is centered in the truck bed.

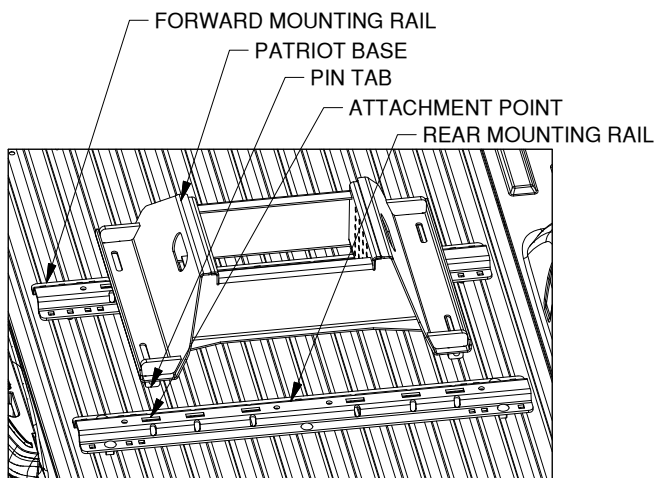


Figure D3: View looking into truck bed from tailgate.

**IMPORTANT:** Before drilling forward mounting holes pull the RV base towards the rear of the truck and push the forward rail towards the cab of the truck to correctly space the mounting rails, see Figure D4.

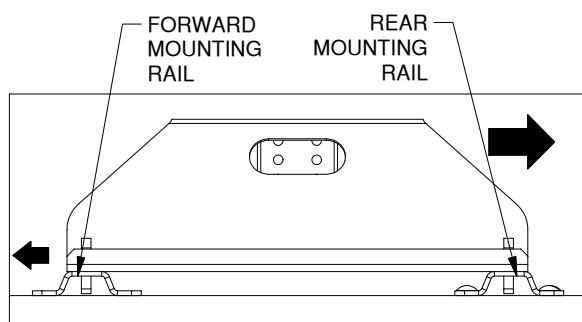


Figure D4: Side view of RV base and mounting rails.

- 4. Drill forward mounting holes.** Using the same methods as used for the rear mounting rail, mark, drill, check, and enlarge the holes for the forward mounting rail. Start at "DRILL REAR MOUNTING HOLES" section, Step 2, on a previous page. Notice that the hole locations are slightly different than the rear rail, see Figure B2 (on the third page).

- 5. Install forward mounting rail.** Reposition the forward mounting rail over the drilled 9/16" holes in the bed. Install a 1/2" x 2" cap screw with lock washer through the two holes on the driver side of the rail, and a 1/2" x 2" carriage bolt through the remaining three holes, as shown in Figure D5. Position the U-shaped spacers.

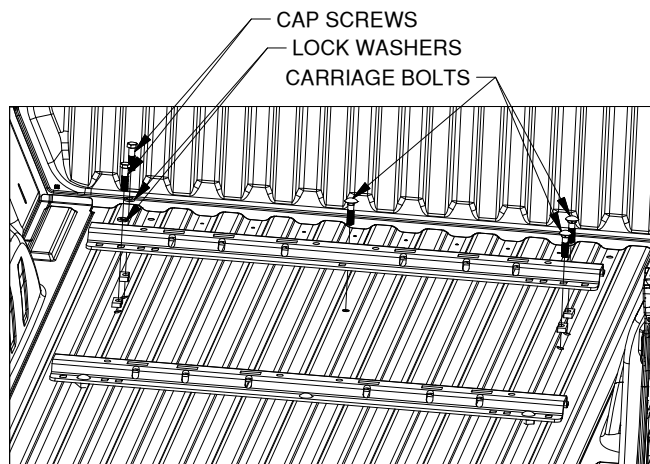


Figure D5: View looking into truck bed from rear of truck.

- 6. Install hardware on forward mounting rail.** Under the bed install an offset square washer, 1/2" lock washer, and 1/2" finish nut on each of the bolts, see Figure D6. Place the U-shaped spacer. Hand tighten hardware.

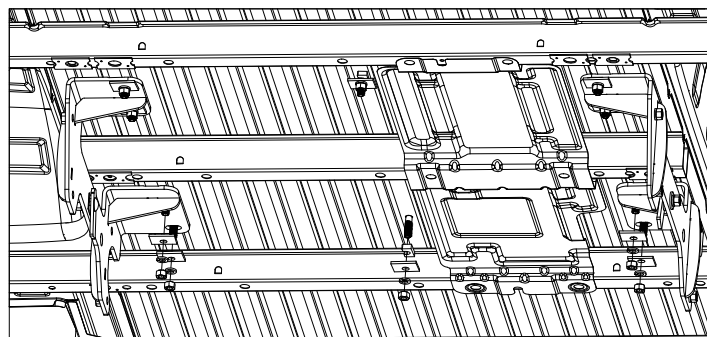


Figure D6: View under bed from rear of truck. (Frame & U-bolts not shown.)

- 7. Tighten hardware.** Using a torque wrench, first torque all the 1/2" nuts in the mounting rails to 80 ft-lbs. Second, torque the 1/2" nuts in the side plates to 80 ft-lbs. Third, tighten the U-Bolts. Tighten the U-bolts slowly; alternating between the top and bottom legs of the U-bolt until equally tightened to a maximum of 40-ft. lbs.
- 8. Reinstall truck components.** Reinstall the brake line bracket and wiring harness on passenger side. If wheel well liners were present, reinstall the T15 Torx screws and screw retainer that were removed earlier.