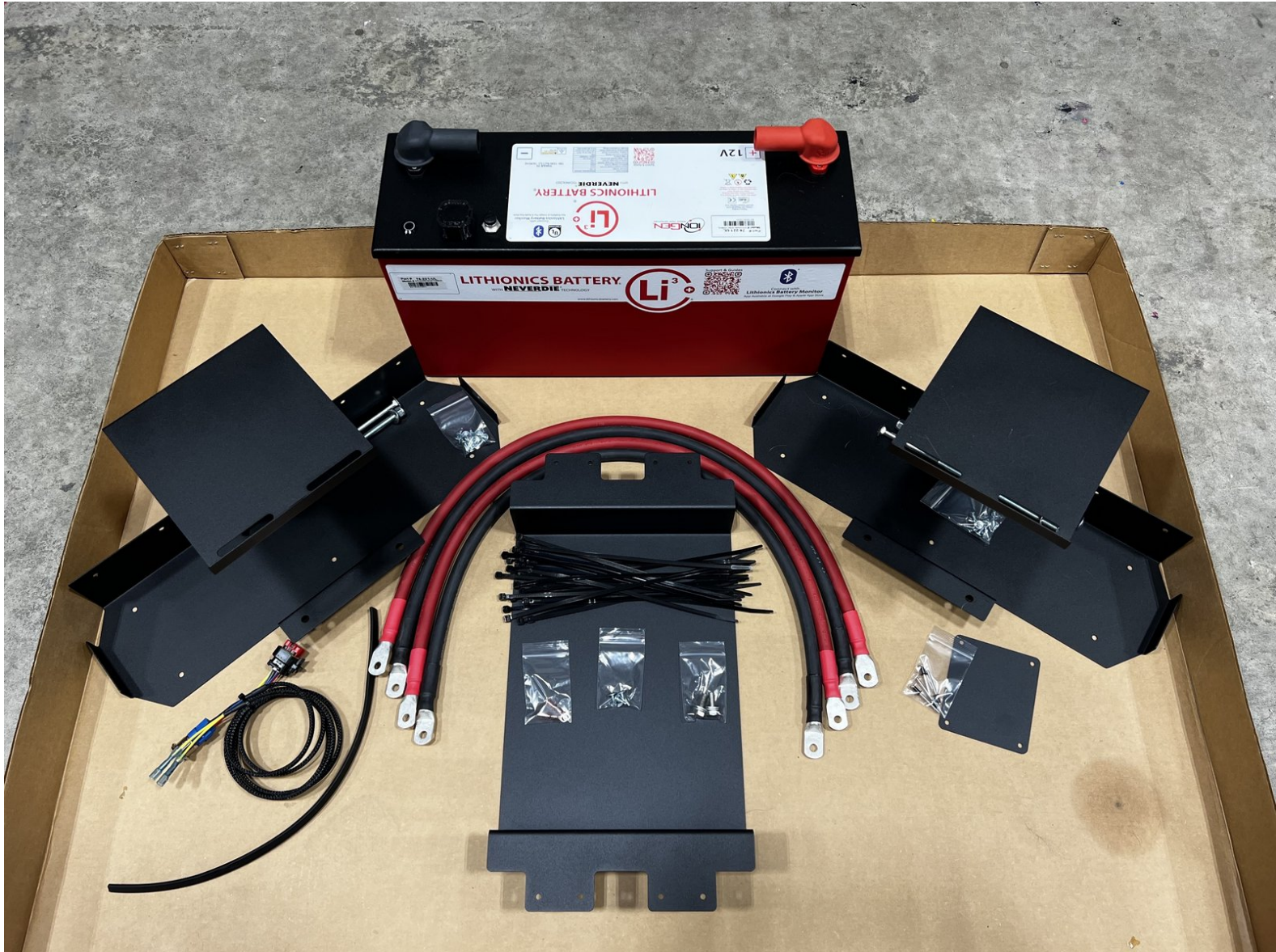




3rd Gen Revel - 2nd 320aH Battery Kit Install

Written By: John Kronuch



INTRODUCTION

In this guide we will show you how to install the 2nd 320aH battery kit in your compatible 3rd Generation Revel.

ENSURE THE BATTERIES ARE OFF BEFORE HANDLING THE BATTERY OR MAKING ANY CONNECTIONS! IF YOU SHORT THE BATTERY THE BATTERY WILL NEED TO BE SENT TO LITHIONICS FOR REPAIR. THIS IS NOT COVERED UNDER THE BATTERY WARRANTY!!!!!!!!

Step 1 — Battery Shut Down



- Remove the battery compartment cover
- Press and hold the On/Off button on the battery. Depress the button for 5 seconds until the battery is shut down.
- ⓘ Ensure the blue ring LED is off on the button. If the light is flashing, steady lit, or anything besides being off the battery is NOT off. Press and hold the button again until the LED is off.
- ⚠ Ensure the van is not connected to shore power. If performing the work outside ensure the solar panels are covered or disconnected.

Step 2 — Battery Compartment Cover Disassembly



- Remove the screws securing the screen to the battery compartment cover.
- Slice the velcro that runs between the two halves of the plastic covers as shown.
- Remove the 4 screws that secure the inverter disconnect switch to the cover. Remove the two power leads from the disconnect switch. You can discard the disconnect switch as it will not be reused.

Step 3 — Battery Compartment Cover Disassembly



- Remove the screw covers and remove the screws from the perimeter of the battery compartment cover.
- Remove the outlet cover by just prying it off, and loosen the two screws that secure the outlet to the battery compartment cover. Do not fully unscrew them, as the plastic wing will fall off. Tuck the outlet behind the cover.
- Remove the screw covers and screws from the upper wall cover.
- Remove the 3 screws from the top of the battery compartment cover.

Step 4 — Battery Compartment Cover Disassembly



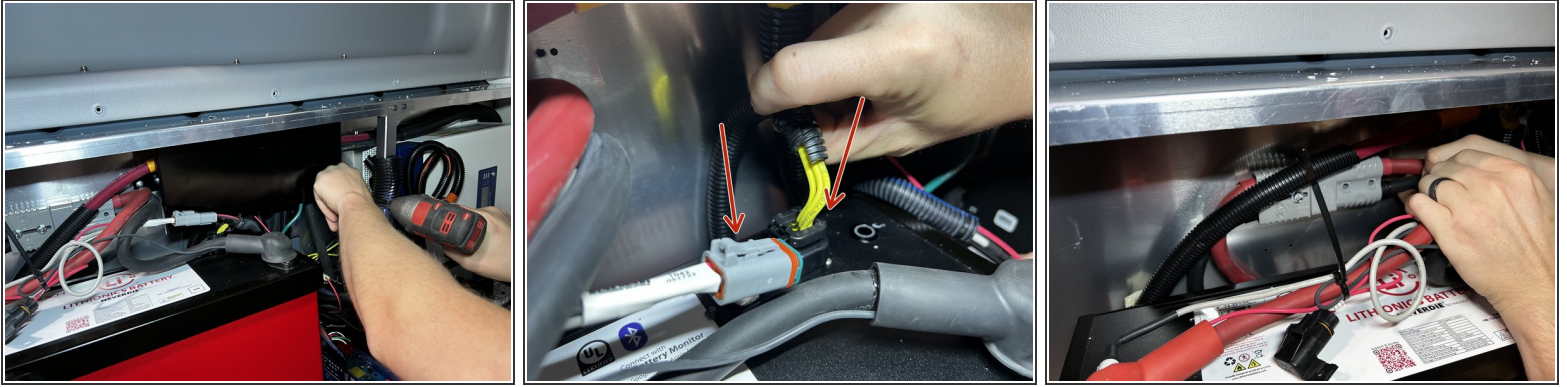
- Use an oscillating tool to cut the battery compartment cover as shown. We are cutting the lip that goes up behind the upper wall cover. Keep the blade of the tool flush to the bottom edge of the upper wall cover.
- Tilt the battery compartment forward and remove the cut strip as shown.
- ⓘ When you are close to the shower wall you may have to pull the battery compartment cover out to get the tool in position to cut the remaining material on the cover.

Step 5 — Battery Compartment Cover Disassembly



- Tilt the battery compartment cover out and hang from the rear door. We use a bungee cord and a clamp.

Step 6 — Battery Compartment Disassembly



⚠ ENSURE THE BATTERY IS OFF!! If you short the battery across the terminals, the battery will need to be sent to Lithionics for complete disassembly to repair! This is not covered under the battery warranty!!

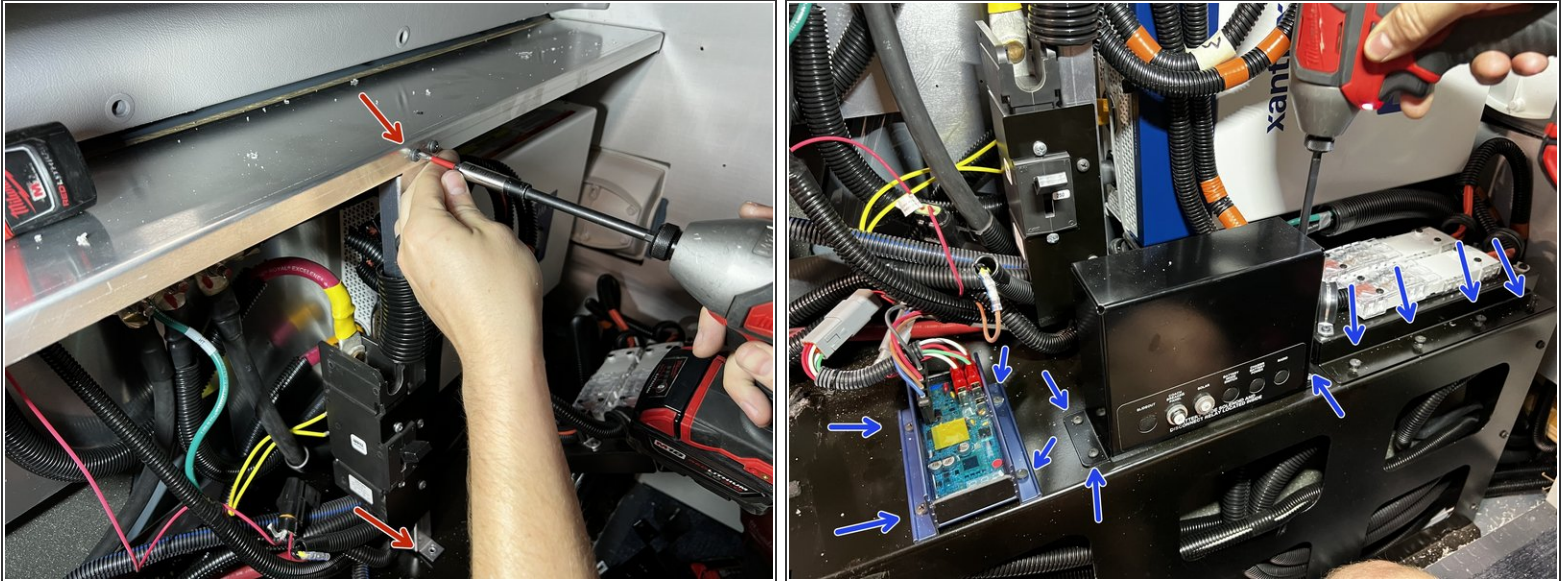
- Remove the metal bus bar cover and discard as it will not be reused.
- Disconnect the electrical harness connections to the battery for the CAN control and temperature sensors.
- Unplug the Anderson connector for the battery.

Step 7 — Battery Compartment Disassembly



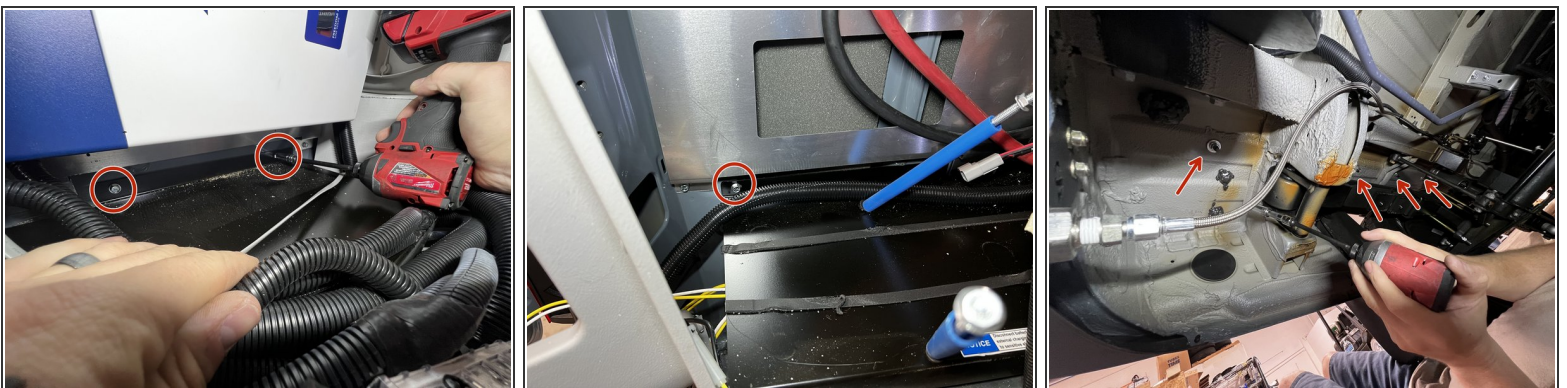
- Remove the nuts securing the battery hold downs.
- Lift the upper battery hold down off the battery, and then remove the battery from the shelf. Set the battery aside for now.

Step 8 — Battery Compartment Disassembly



- ① Make sure to note the location of the hardware used to secure the following items as they will be reused.
- Remove the hardware securing the breaker mount to the compartment.
- Remove the screws securing the inverter 120V connections, the breaker panel, and the Balmar regulator.

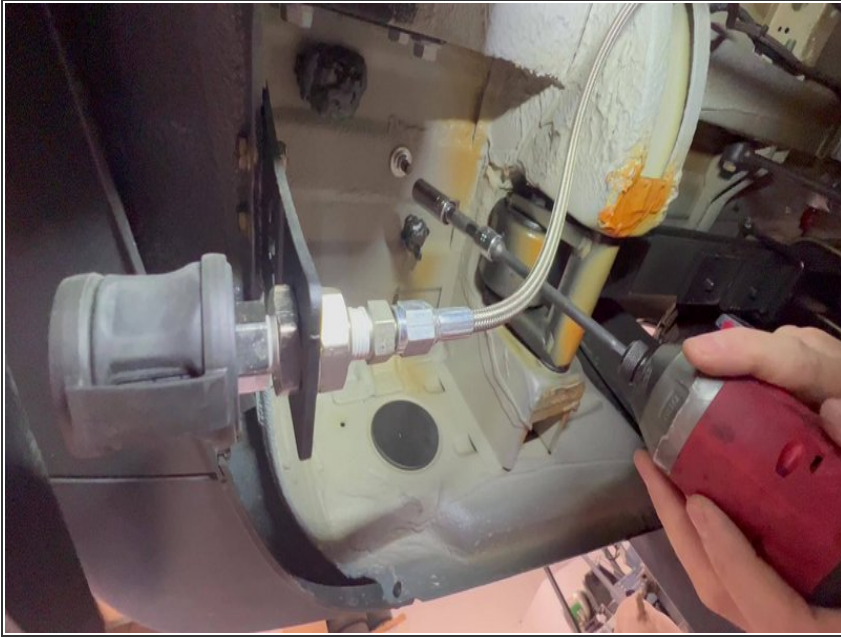
Step 9 — Battery Shelf Removal



- Remove the screws securing the battery shelf to the wall of the van. There are typically 4.
- Remove the 4 nuts securing the shelf from underneath the van. These are located inline above the leaf spring.

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Step 10 — Battery Shelf Removal



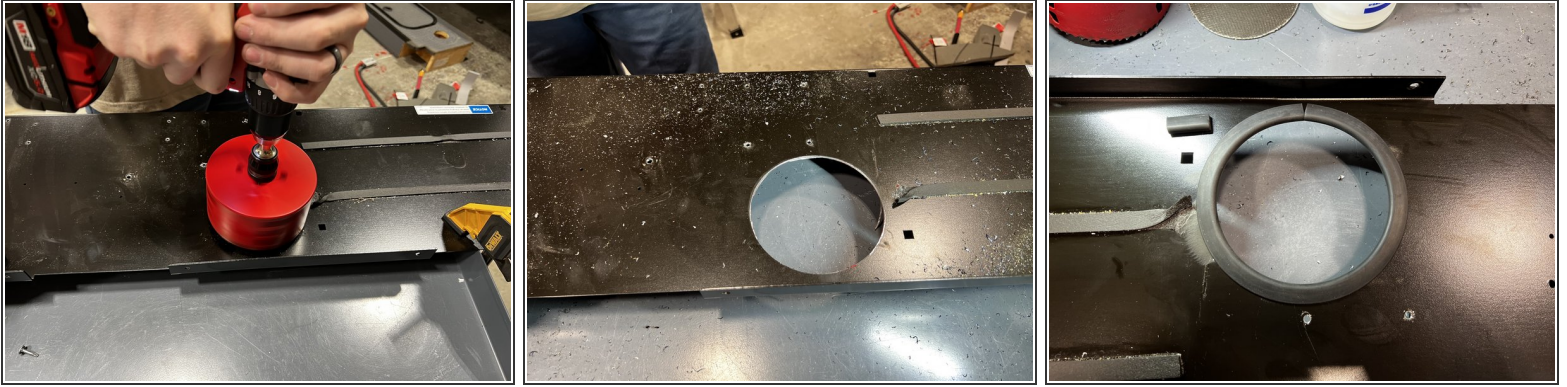
- Once the nut is loosened, you can tap the back of the tool you are using to push the fastener up. There is some adhesive on the top side of the fastener that can make the bolt tough to remove from the top side, so this will aid in bolt removal.
- Once all the nuts are removed and the bolts are pushed up, you can remove the bolts from the top side.

Step 11 — Battery Shelf Removal



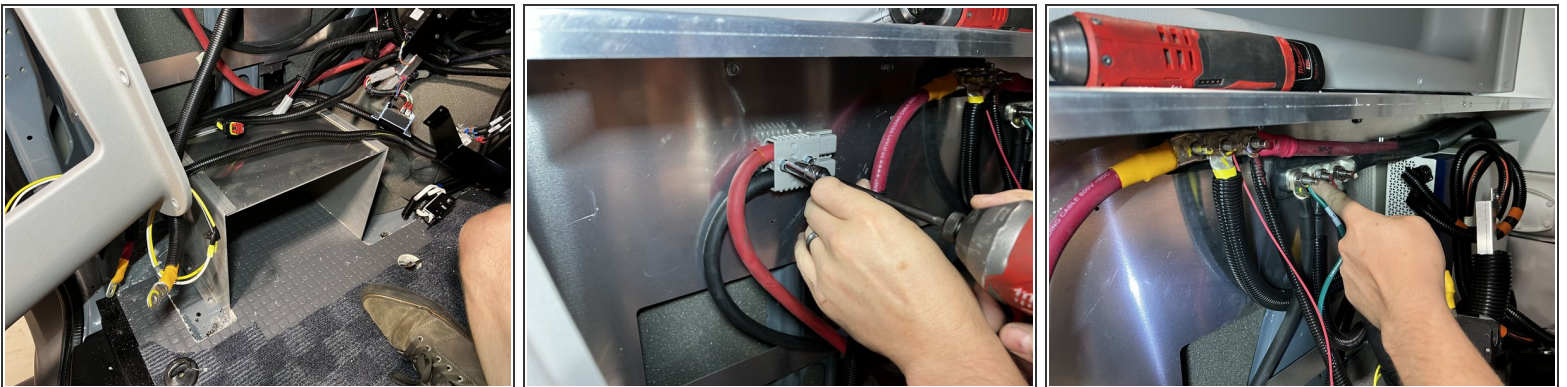
- With all the fasteners removed, you can remove the battery shelf. Tilt the shelf towards you while moving the wiring and components off the shelf as you tilt the shelf towards the floor.
- Once the shelf is free, set the shelf outside the van. Remove the battery hold down bolts from the shelf.

Step 12 — Battery Shelf Modification



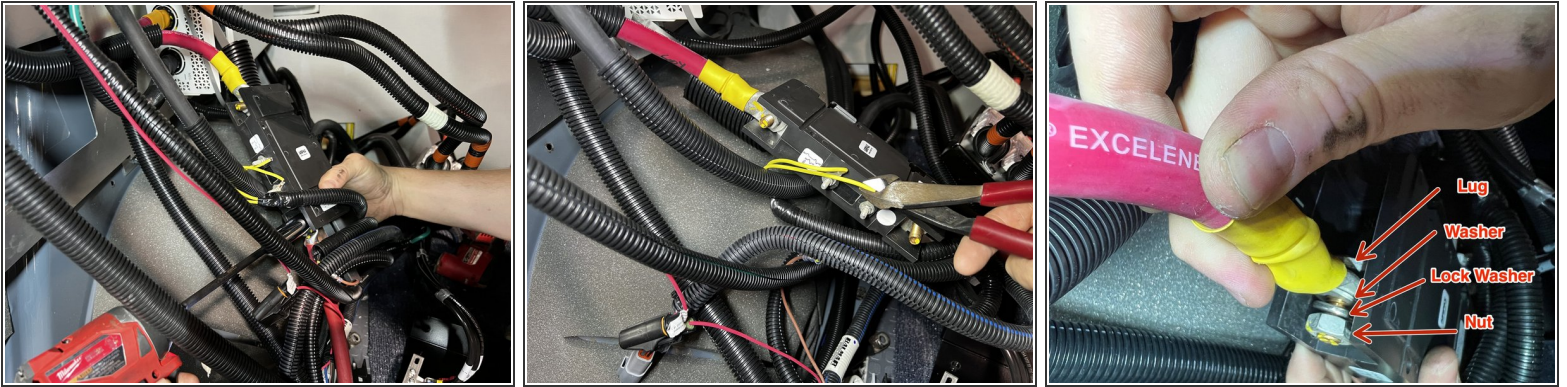
- With the shelf removed, mark the center of the shelf from left to right. Typically this is around 23-1/2" to 24". Measure 3 inches down from the rear of the shelf to the center line.
- Using a 5" holesaw drill a hole in the marked position. Deburr the hole, and install the provided edge guard trim onto the hole.
- The shelf will be reinstalled in a later step.

Step 13 — Battery Compartment Wiring Disassembly



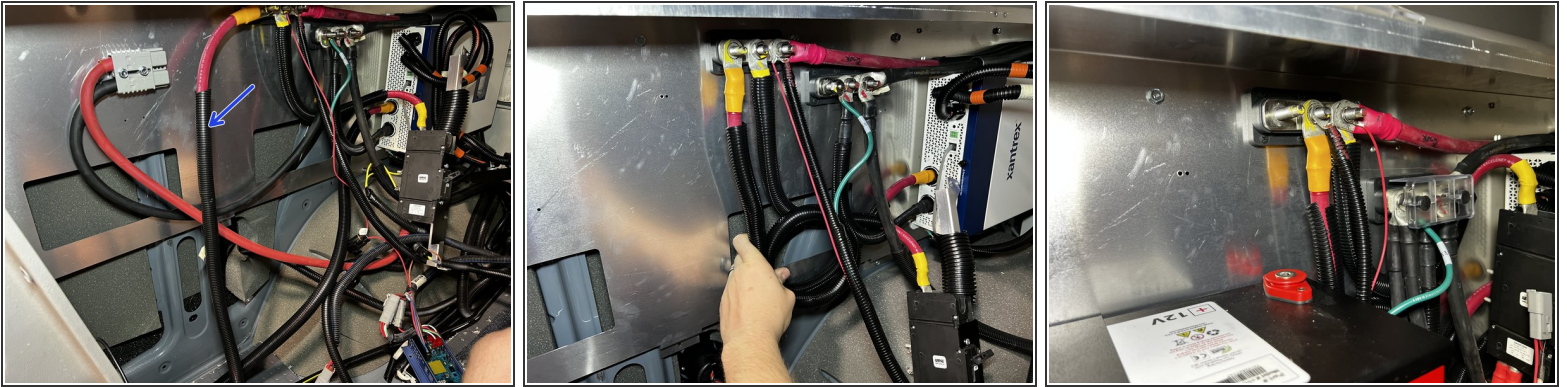
- Remove the storage cubby from the van and discard. This will not be reused.
- Unscrew the Anderson connector from the wall. Remove the negative wire for the Anderson connector from the bus bar.

Step 14 — Breaker Wire Removal



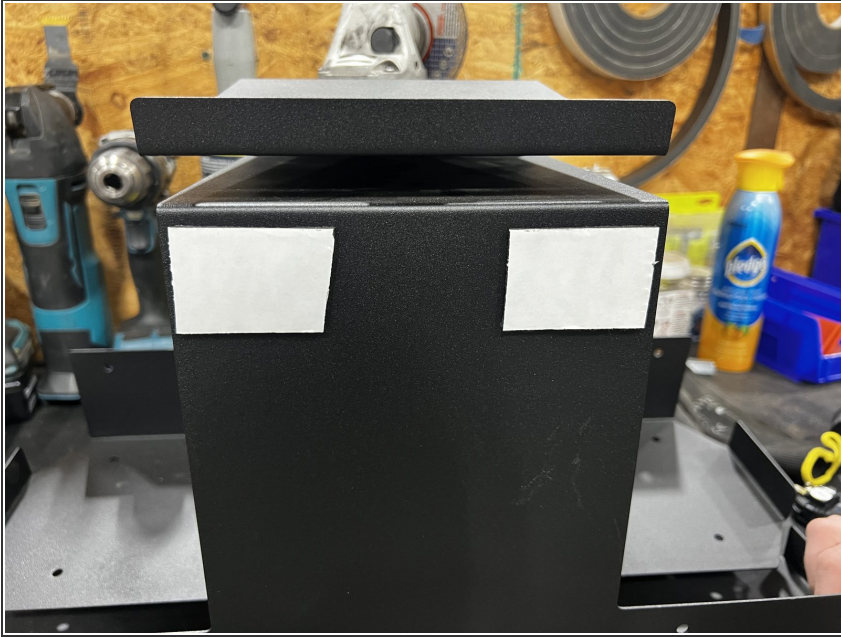
- Remove the positive side of the Anderson connector from the lower mount on the breaker. Set the hardware from the breaker aside as it will be reused.
 - Once the positive wire from the Anderson connector is removed from the breaker, you can discard the Anderson connector as it will not be reused.
 - Cut the two yellow wires at their ring terminal from the back of the breaker. We will reinstall higher quality ring terminals on the wires at a later step.
- ⚠ On some vans we have found the hardware to be installed incorrectly from the factory. It is best to check the upper breaker wire connection and ensure the hardware is installed correctly. It should be wire lug, flat washer, lock washer, and nut.

Step 15 — Battery Compartment Wiring Disassembly



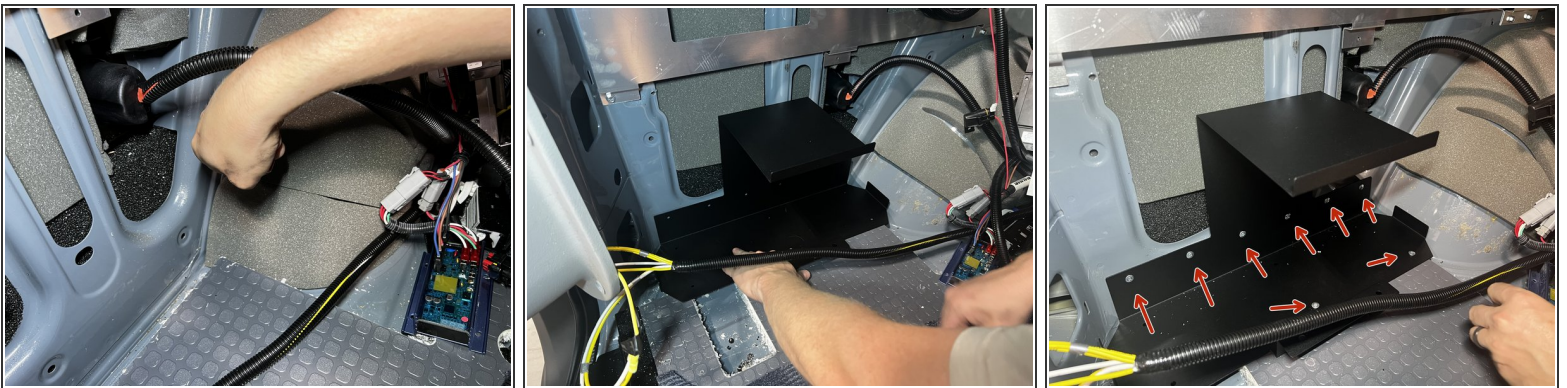
- Remove the wire that went from the bus bar to the inverter disconnect switch. This is the red positive wire. This can be discarded as it will not be reused.
- Take the positive wire that ran from the inverter to the inverter disconnect switch. Coil the excess wire up and secure using a zip tie. Route this wire to the positive bus bar. We will secure it to the middle post on the bus bar.
- In the third image the positive wires need to be arranged as shown. The left most post of the positive bus bar needs to be empty to allow enough room for the battery to fit on the shelf.
- ⓘ Ensure the positive wires are stacked properly on the bus bar. Large wire lugs first, then the smaller wires. You may need to "flip" the lug orientation of the wires to get them to lay flat against each other. This is critical to avoid high resistance due to poor contact on the bus bar.

Step 16 — Battery Tray Foam



- Make sure the foam strips are still on the battery tray, and they did not fall off during shipping.

Step 17 — Lower Battery Tray Installation



- Cut and remove the lower section of foam on the wheel well.
- Place the battery tray into position. It should be slid all the way forward against the wheel well, and flat against the wall of the van.
- Secure the battery tray using the washer head self drilling screws provided. You will use all the screw holes on the rear of the tray into the van wall, and only two of the holes on the base that line up onto the floor of the van. In total you will use 8 screws.

Step 18 — Battery Foam Strips



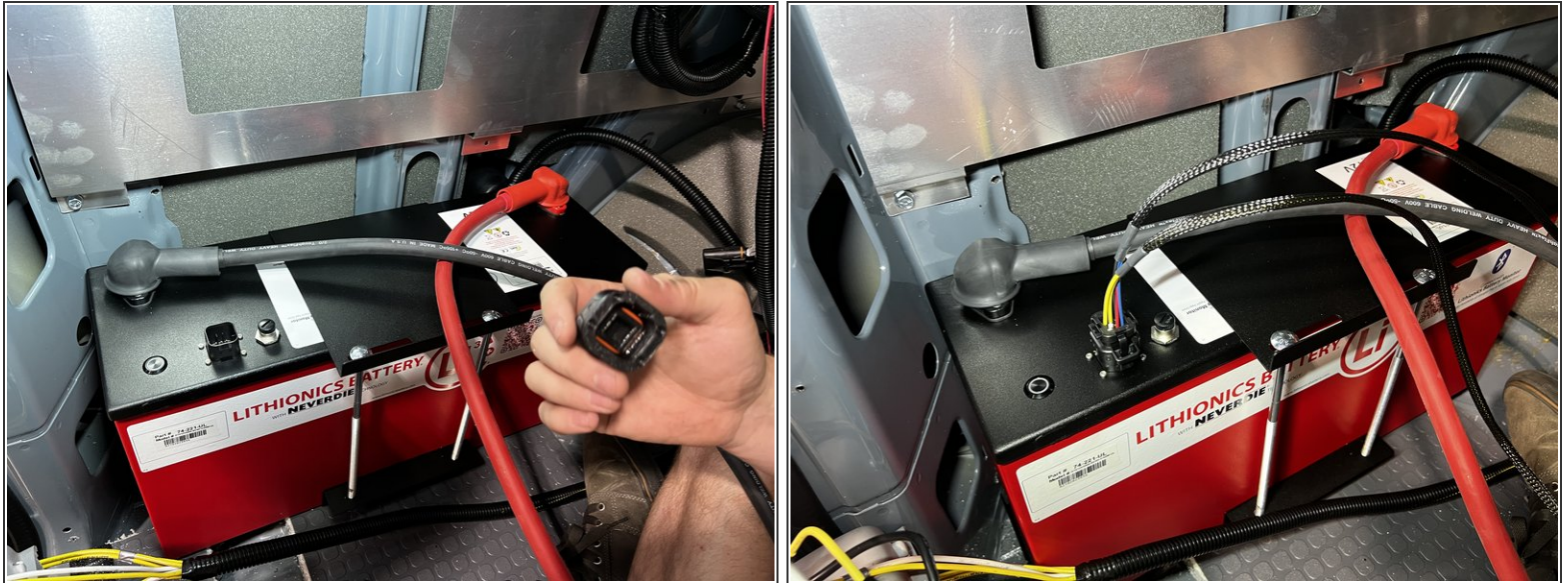
- Before installing the battery, install the provided foam tape strips to the battery as shown in the first image. This is to prevent any noise from occurring from the battery and the tray.

Step 19 — Lower Battery Installation



- Unbox the 2nd battery provided.
- Place the battery into the tray at the angle shown. Then rotate the battery up into position. The upper part of the battery tray is made to have enough flex to allow the battery to rotate into position,
- With the battery fully seated into the tray, secure the battery using the provided long carriage bolts. Tighten the nuts using a box wrench. Ensure the bolts are tight and the battery can not shift in the tray.
- ⓘ Take care as to not over tighten battery mounting bolts. They just need to be snug enough to secure the battery,.
- ⚠ **ENSURE THE BATTERY IS OFF!!** If you short the battery across the terminals, the battery will need to be sent to Lithionics for complete disassembly to repair! This is not covered under the battery warranty!!

Step 20 — Lower Battery Cable Installation

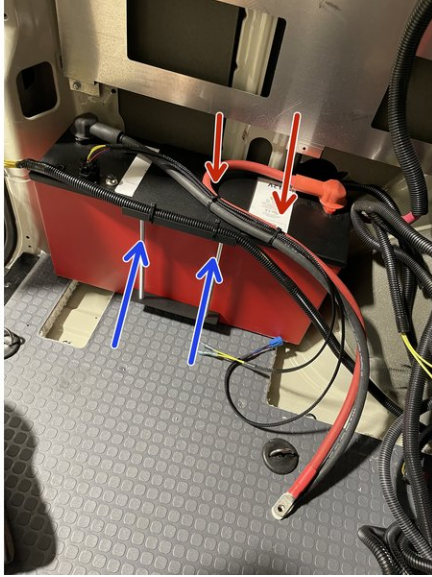


⚠ ENSURE THE BATTERY IS OFF!! If you short the battery across the terminals, the battery will need to be sent to Lithionics for complete disassembly to repair! This is not covered under the battery warranty!!

- Install the battery boots onto their respective cables. There are two different sized lugs on the provided cables. The smaller diameter hole goes on the battery terminal. Install the cables onto the battery. Ensure the bolts are tight, and the protective boots are properly seated onto the battery terminal.
- Remove the black cover on the CAN connector. Plug in the provided CAN communication harness. This harness contains the ON/OFF switch for the battery.

⚠ REMOVE THE BATTERY ON/OFF SWITCH FROM THE HARNESS BEFORE PLUGGING THE CONNECTOR IN!! THIS IS TO ENSURE YOU DO NOT ACCIDENTALLY POWER THE BATTERY ON VIA THE SWITCH!!!! SET THE SWITCH ASIDE!

Step 21 — Lower Battery Cable Installation



⚠ ENSURE THE BATTERY IS OFF!! If you short the battery across the terminals, the battery will need to be sent to Lithionics for complete disassembly to repair! This is not covered under the battery warranty!!

- Secure the wires as shown using the provided zip ties.
- Ensure the two yellow wires on the CAN harness are secured as shown. These will not be needed in this install, but may be needed in the future if the customer decides to upgrade further. This way the wires are accessible **WITHOUT** having to remove the shelf again!
- Secure the OEM wire harness that goes to the plastic battery compartment cover onto the flange of the installed battery tray using the slots for the bolts. Do not over tighten the zip ties, as we want the harness to be able to slide on the slots if needed.

Step 22 — Battery Shelf Installation



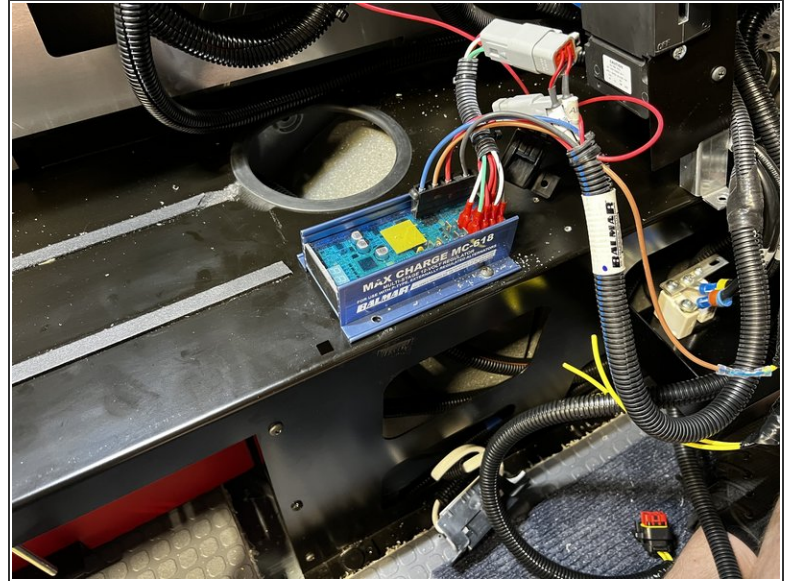
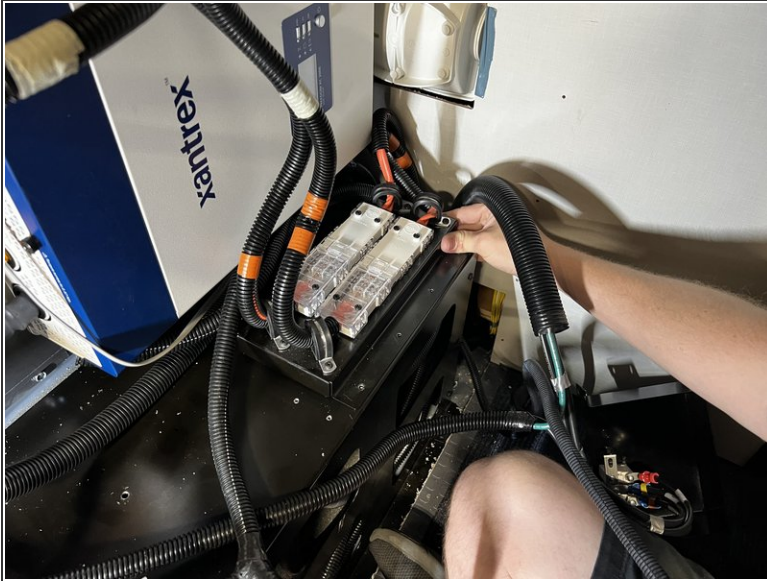
- Place the battery shelf back into the van face down as shown.
- Begin tilting the shelf back into place while holding the wiring and components up and over the shelf.
- Place the battery shelf back into its original position. Ensure the lower bolt holes line up with the holes in the floor.
- Some patience is needed as you install the battery shelf. Ensure no wires are being pinched or crushed, and just carefully move components out of the way as needed.

Step 23 — Battery Shelf Installation



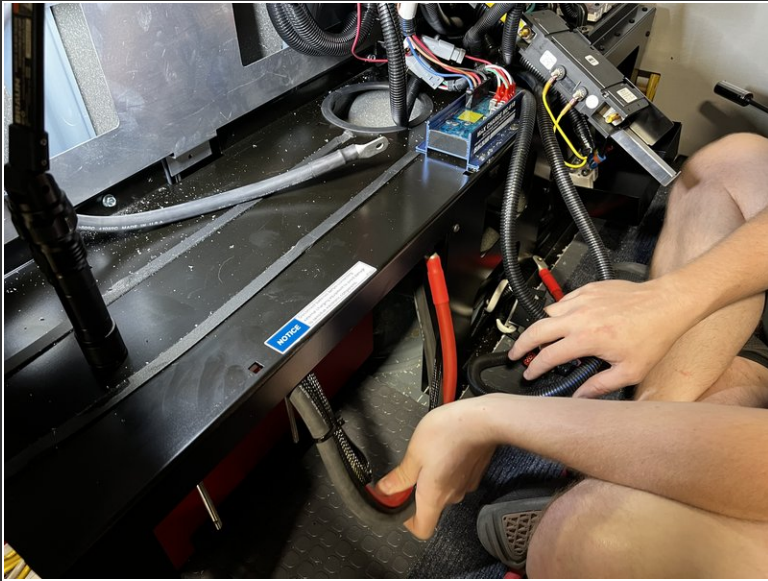
- Place the lower mounting bolts into place. Then go under the van and tighten the nuts.
- In most cases the factory holes on the rear of the shelf are stripped out. Just move the self drilling screw slightly over to make a new hole.
- ⓘ Make sure the new hole goes into the supports for the van wall, not just the sheet metal aluminium back wall plate.
- Ensure all the fasteners that were removed are reinstalled securing the shelf.

Step 24 — Electrical Component Reinstall



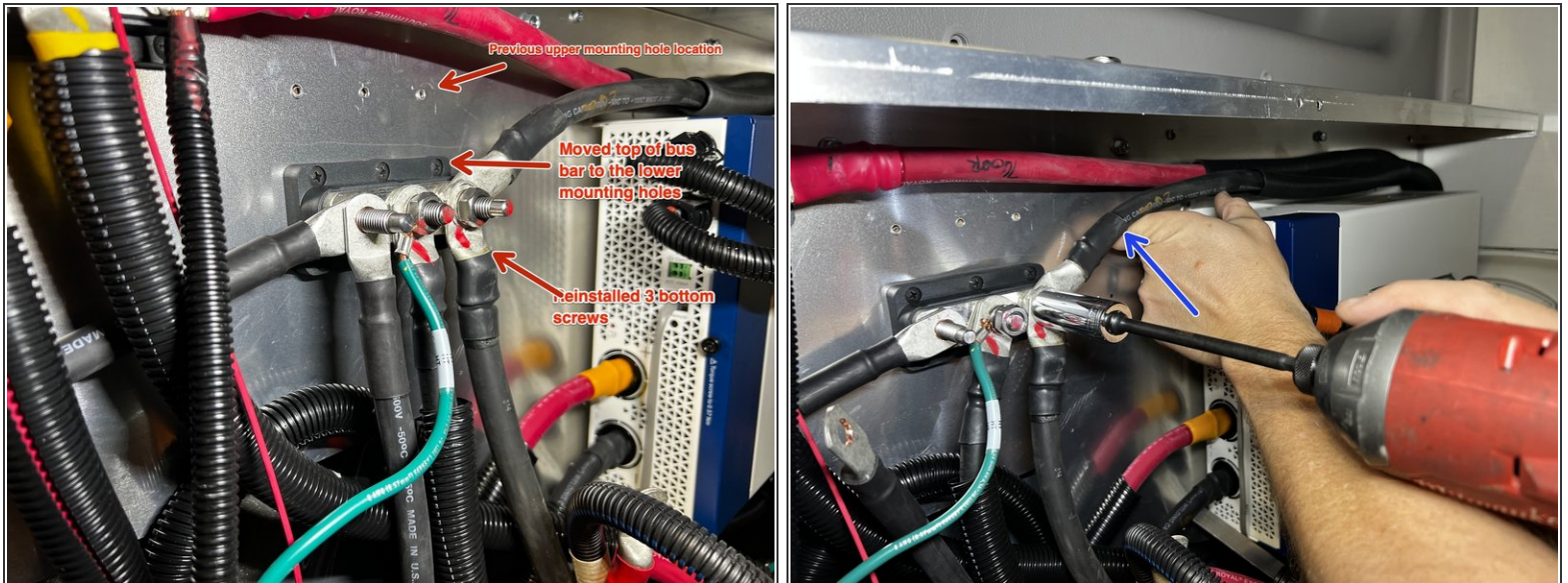
- Place the 120v connectors back into place and reinstall the screws that were previously removed.
- Orient the Balmar regulator horizontally as shown. Secure to the shelf using the screws previously removed.
- Leave the breaker panel box (the small metal box that was next to the 120v connectors) off for now as we will be installing the battery switch there in a later step.
- ⓘ You may have to play with rotating/arranging the wire bundles similar as to how they were removed in order to get them to flow into place.

Step 25 — 2nd Battery Wire Routing



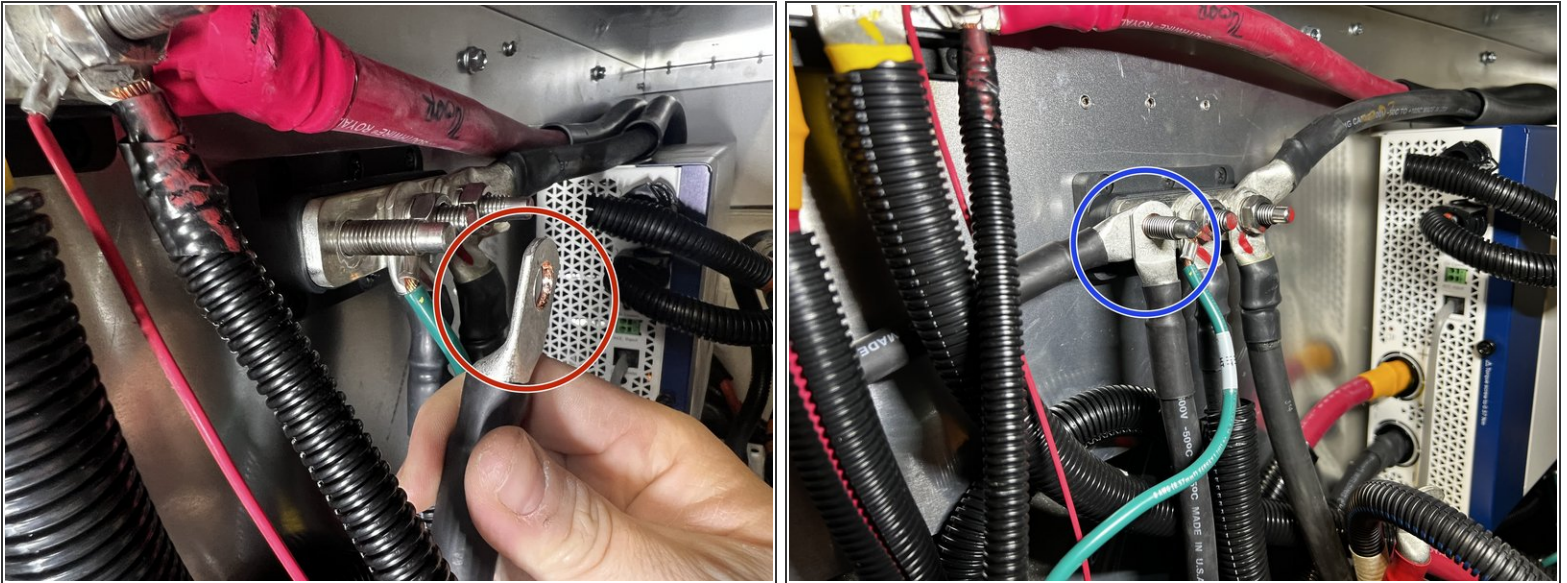
- Route the 2nd battery cables up through the hole in the shelf. Ensure the CAN connector harness is routed up with the battery cables as well.

Step 26 — Negative Bus Bar Relocation



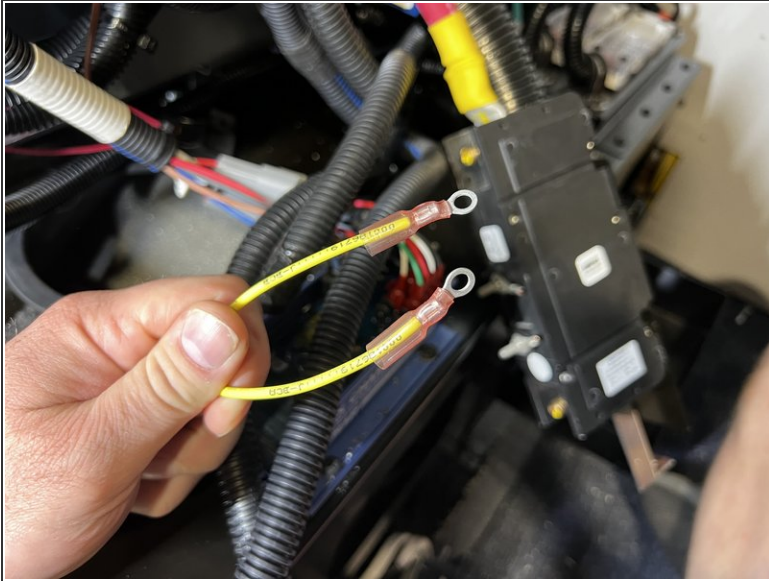
- In order for the lower battery negative cable to reach the bus bar, the bus bar needs to be moved downwards.
- Remove the six screws securing the bus bar to the rear wall. You may need to loosen the wire connections to gain access to the screws.
- Lower the bus bar down so the top 3 screws line up with what were the lower 3 screw holes. This is shown in the first image. Reinstall the lower 3 screws in the bus bar and into the rear wall.
- Align the negative cable that goes over top the inverter as shown.

Step 27 — Negative Cable Installation



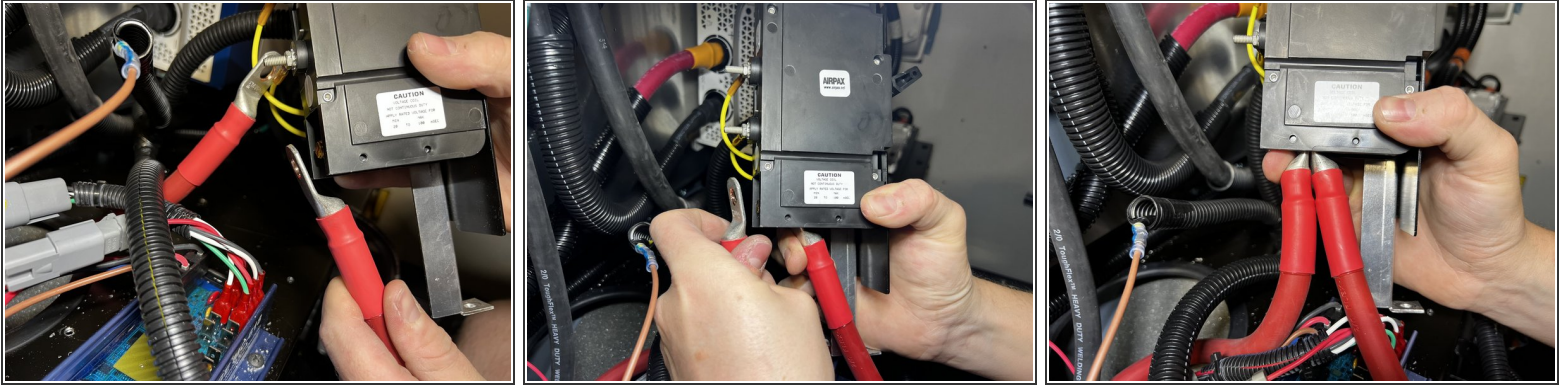
- Place the new negative cable that was provided for the original battery on top of the shelf first onto the bus bar. Ensure the cable is oriented as shown in the image.
- Place the negative cable for the lower battery onto the same stud. Note the orientation of the lugs on the cable ends. They are sitting flat together.
- Tighten the nut on bus bar. Ensure all the nuts are tight and secure.

Step 28 — 250A Breaker Control Wire Installation



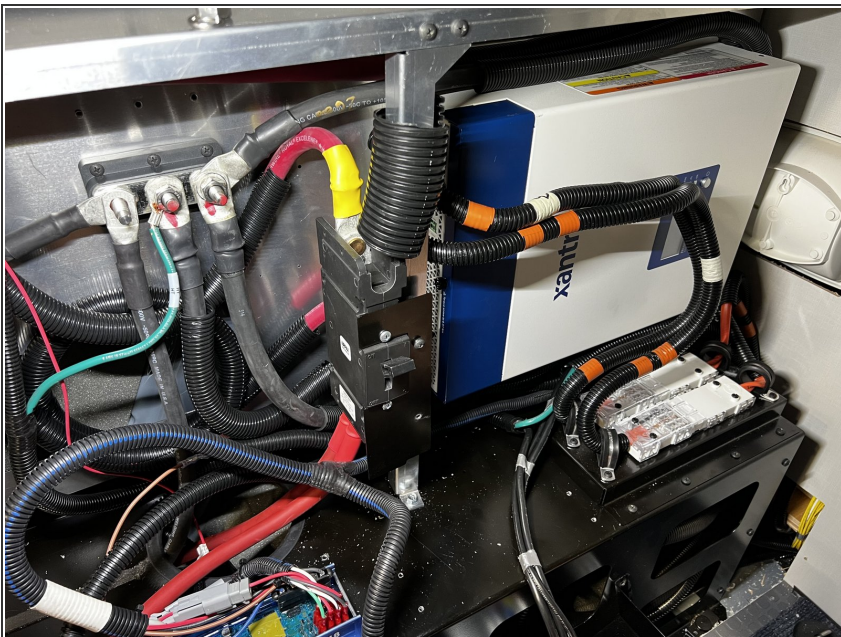
- Remove the nuts from the breaker control studs on the rear of the breaker. Discard the cut ring terminal ends.
- Strip the yellow control wires previously cut and crimp on the new provided ring terminals. Use a heat gun/torch to shrink the heat shrink.
- Place the wires onto the studs and tighten the nuts. The location of each wire does not matter. Take care not to over tighten the nuts and damage the studs!

Step 29 — Positive Cable Installation



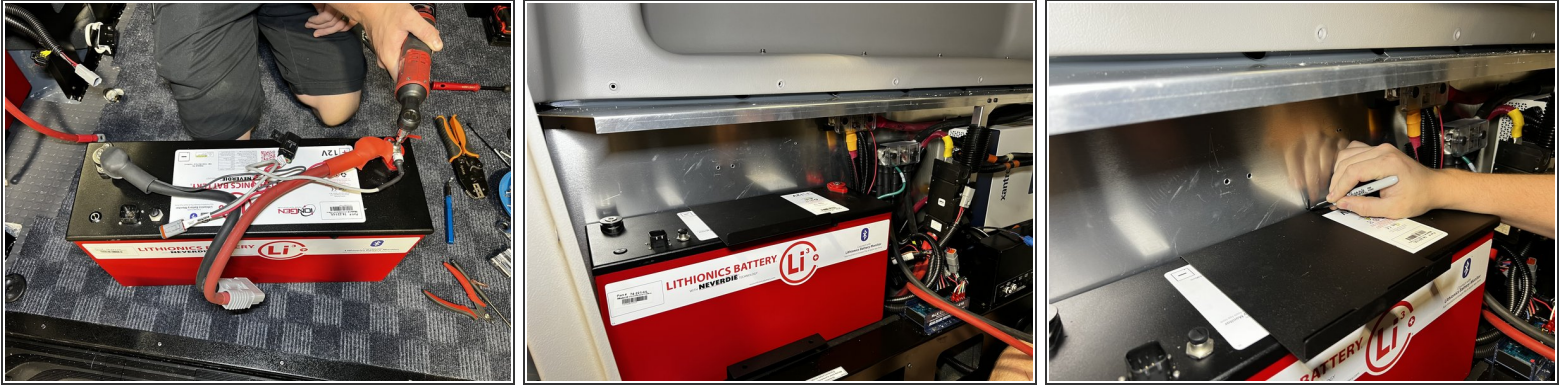
- Place the new positive cable for the original battery located on the upper shelf onto the breaker as shown. Note the orientation of the lug.
- Place the positive cable from the lower battery onto the breaker as shown. Note the orientation of the lug.
- Place the washer, lock washer, and nut onto the breaker in that order and tighten the nut.

Step 30 — Mounting 250A Breaker



- Reinstall the 250a breaker into the original position it was removed from using the hardware previously removed.
- ⓘ Note the upper part of the breaker mount goes **BEHIND** the flange on the upper rear wall shelf.
- Install the plastic bus bar covers back onto the positive and negative bus bars.

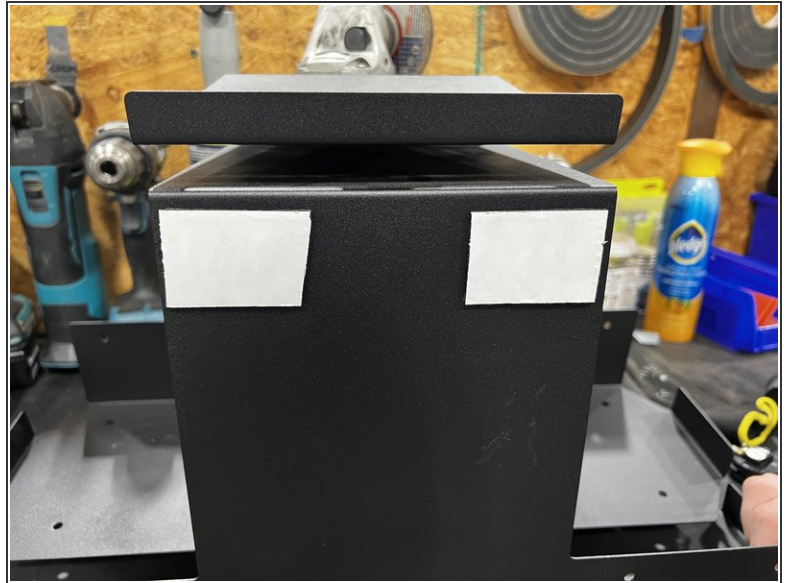
Step 31 — OEM Battery Reinstallation Prep



⚠ **ENSURE THE BATTERY IS OFF!!** If you short the battery across the terminals, the battery will need to be sent to Lithionics for complete disassembly to repair! This is not covered under the battery warranty!!

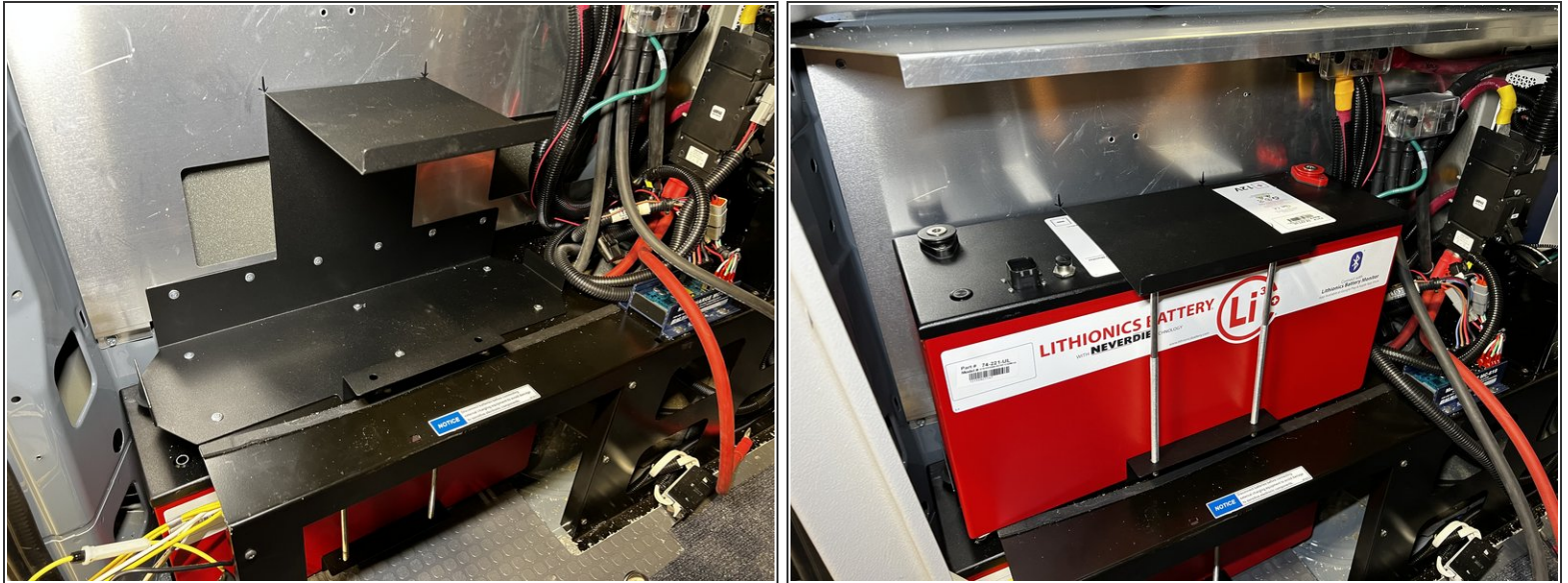
- Remove the OEM wires from the battery. The Anderson connector can be discarded, but the temp sensor and regulator wiring will be reused.
- Place the new battery tray on the shelf. Place the battery into the tray and adjust the tray as far forward as possible. Make sure no wires are crushed/pinched/strained.
- Now is a good time to test fit the plastic battery compartment cover to ensure there is adequate clearance against the upper battery.
- Once you have everything in position, mark the location of the battery tray using a marker. Remove the battery from the tray.

Step 32 — Battery and Battery Tray Foam Strips



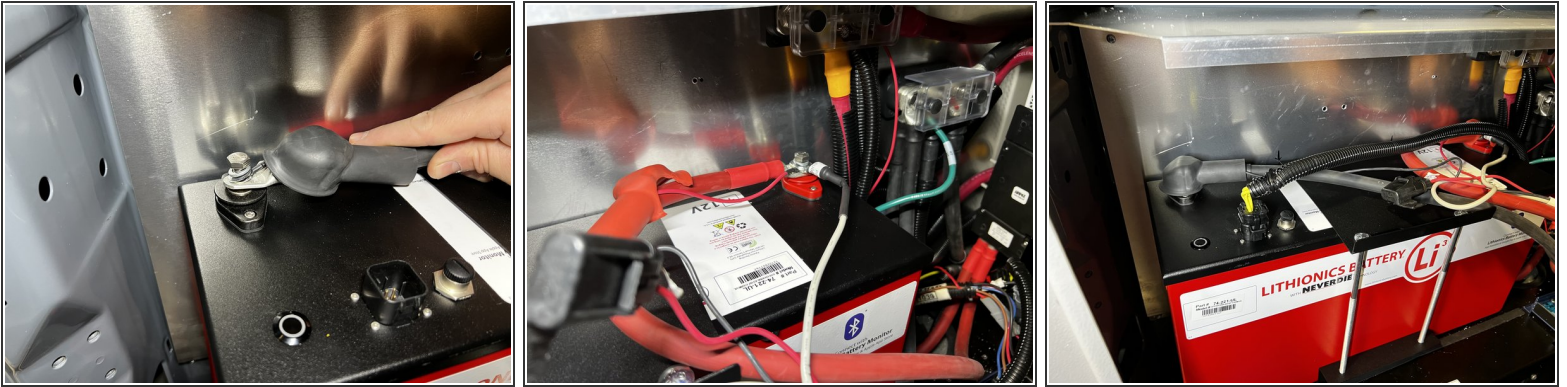
- Before installing the battery, install the provided foam tape strips to the battery as shown in the first image. This is to prevent any noise from occurring from the battery and the tray.
- Make sure the foam strips are still on the battery tray, and they did not fall off during shipping.

Step 33 — Upper Battery Tray Installation



- With the tray in the marked position, install the washer head screws to secure the tray. All screw hole positions will be used.
- Place the battery into the tray, and secure using the provided long carriage bolts. Tighten the bolts snug,
- ⓘ Orientation of the battery does not matter, but if installed with the sticker facing out as shown the serial number is easier to read when the battery is installed.

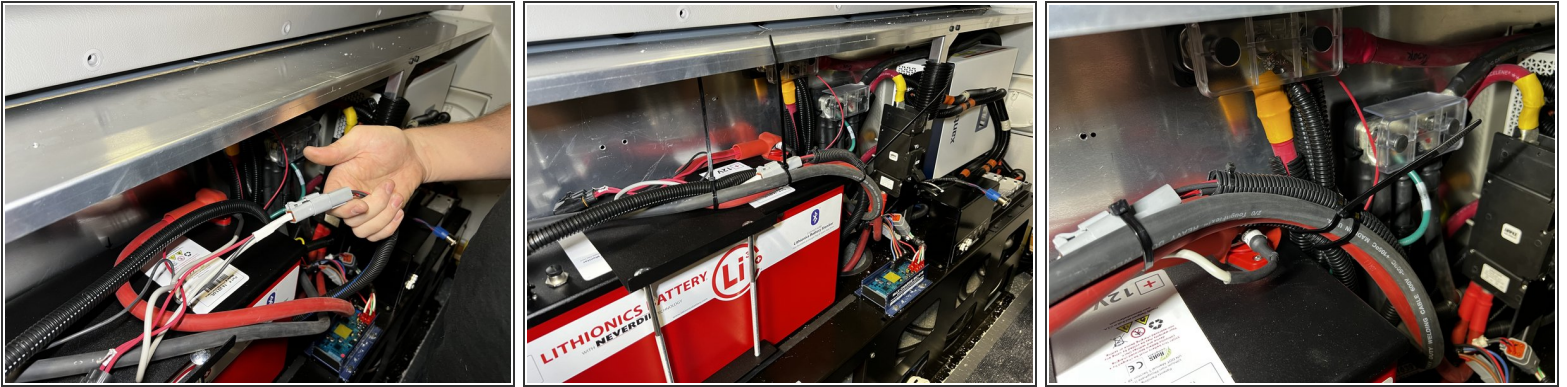
Step 34 — Upper Battery Cable Connections



- Slide the boots onto the new cables as shown. Install the regulator harness and temp sensor back onto their respective locations on the battery.
- Plug the CAN communication connector back into the battery.
- Ensure the protective boots are properly seated onto the battery terminals.

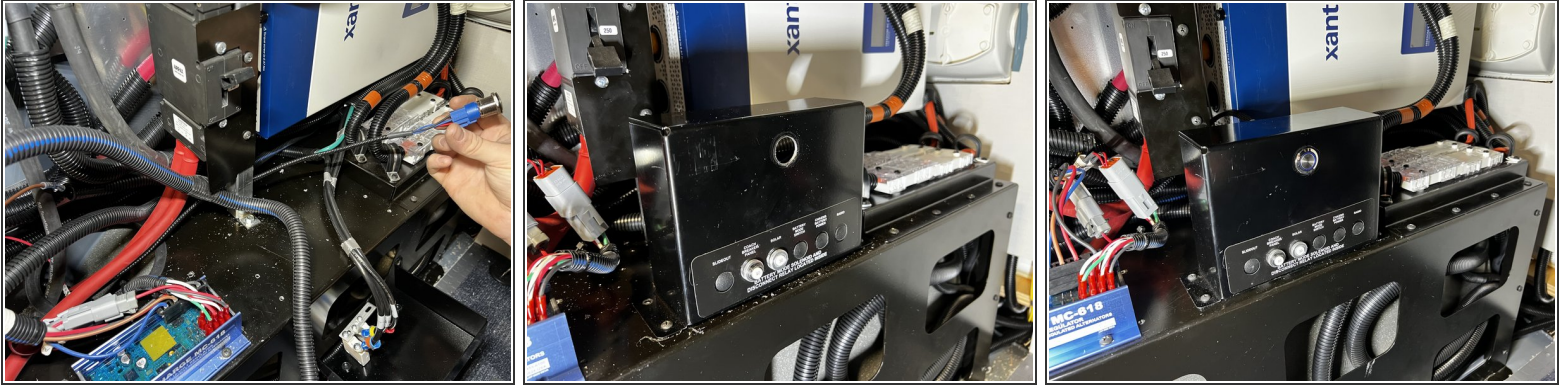
⚠ ENSURE THE BATTERY IS OFF!! If you short the battery across the terminals, the battery will need to be sent to Lithionics for complete disassembly to repair! This is not covered under the battery warranty!!

Step 35 — Upper Battery Cable Routing



- Connect the regulator harness together
- Using the provided zip ties secure the positive, negative, CAN harness, and regulator harness together.
- Secure the bundle of wires to the wires for the positive bus bar as shown to ensure the battery cables do not rub on the battery.

Step 36 — Lower Battery ON/OFF Switch Installation



⚠ MAKE SURE YOU REMOVE THE BATTERY ON/OFF SWITCH FROM THE HARNESS!! THIS IS TO ENSURE YOU DO NOT ACCIDENTALLY POWER THE BATTERY ON VIA THE SWITCH!!!!

- Route the lower battery ON/OFF switch behind the breaker mount as shown.
- Drill a 3/4" hole in the center of the breaker box as shown.
- ⓘ To make drilling the hole easier the breaker box was secured to the shelf in the same position it was removed from.
- Insert the switch into the hole, and tighten the nut on the back side using a 7/8" wrench. Plug the switch connector back into the switch.
- ⓘ Clean up any metal shavings using a vacuum/compressed air.

Step 37 — Lower Cubby Install



- Place the new cubby into position. Ensure the cubby is centered onto the floor properly, so there is not a gap on either side between the plastic floor and the sheet metal van floor
- Use the provided washer head screws to secure the cubby to the sheet metal of the shelf.

Step 38 — Final Assembly



- With the batteries installed, ensure all the connections are secure, the plastic bus bar covers are in place, and all wires are properly secured/routed.

Step 39 — Inverter Disconnect Block Off Plate Install



- Place the plastic compartment cover back into position.
- Use a 9/64" drill bit to ream out the holes in the plastic cover and metal backing plate behind the cover.
- Use a rivet tool to install the 5/32" rivets securing the block off plate to the plastic cover.

Step 40 — Battery Compartment Cover Reinstallation



- Reinstall the plastic battery compartment cover and secure using the screws removed. Place the screw covers back into place.
- Reinstall the outlet and the outlet cover.
- The screws along the bottom edge of the upper wall covering will not be used, since the material was cut. Just place the screw covers back into place.
- Reinstall the screen back into position using the screws previously removed.