Introduction / Comments:

1.5kW, 2kW Inverter Kit for Ford Transit Connect

Please Note:

1. Read all instructions prior to installation. Review the Adrian Steel **GENERAL PRECAUTIONS PAGES (56638)** before attempting installation. Only personnel familiar with using electrical best practices should perform this install. Reference **ELECTRICAL BEST PRACTICES MANUAL (54479)** before attempting installation.
2. Review order drawings to determine inverter placement.
3. Also if any power strip kits will need to be installed also and their placement.
4. Not all applications will use all the components listed.
5. **These instructions cover Transit Connect with 1 and 2 Auxiliary (AUX) Batteries.**

For All Ford Transit Connects

1500W

2000W

[66715]

1.5kW, 2kW Inverter Kit for Ford Transit Connect

Section 1: Table of Contents

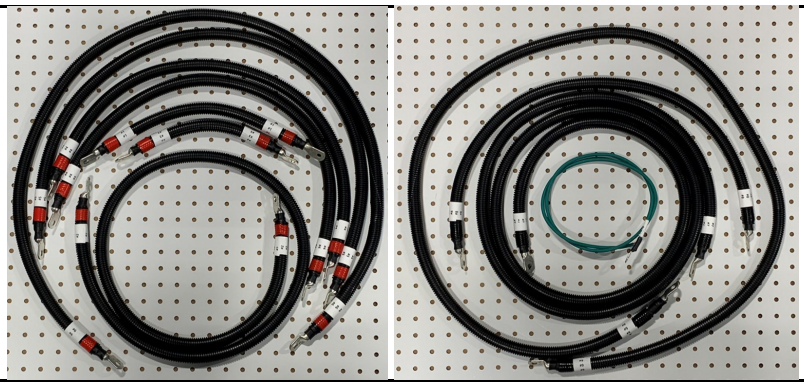
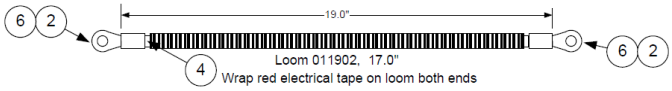
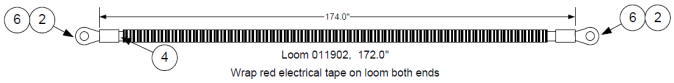
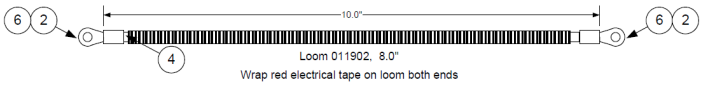
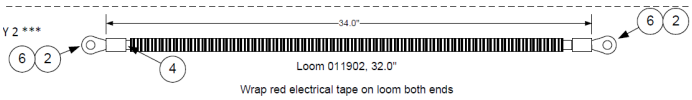
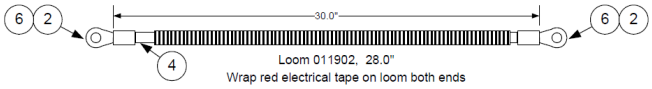
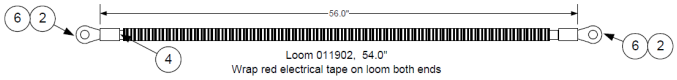
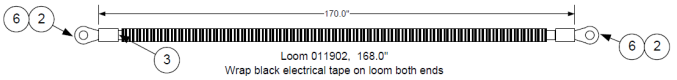
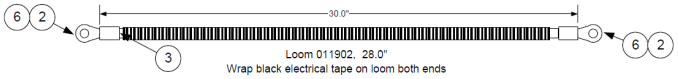
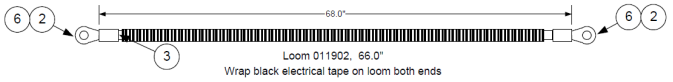
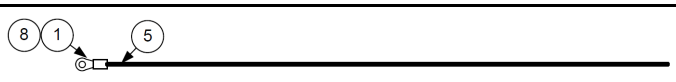
Table of Contents:
[1.5kW & 2kW Inverter Kit for Ford Transit]

Section 1: Table of Contents

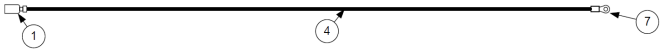
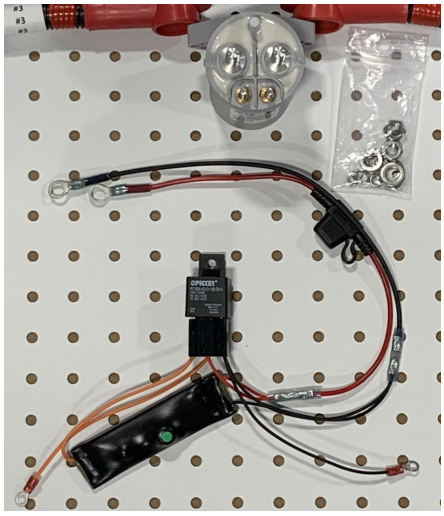
These symbols are used in the document to warn installer to make sure there is understanding beyond general precautions used when working on electrical installations.

	ANSI Z535.6-2006 refers to the use of blue when “addresses practices not related to personal injury”.
	Yellow labelling level of personal injury = could result in minor injury.
	Red labelling level of personal injury = could/ will result in death

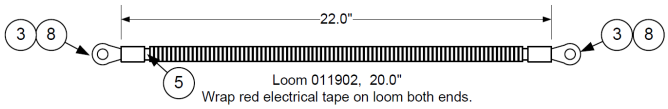
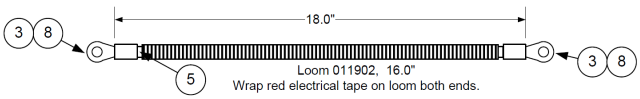
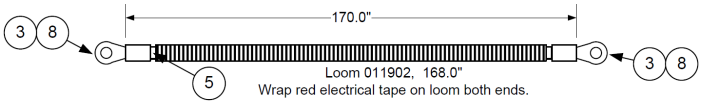
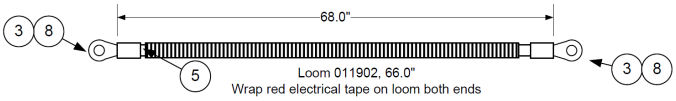
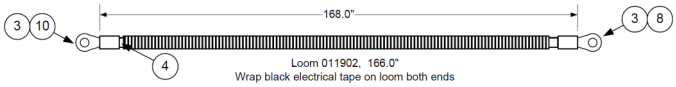
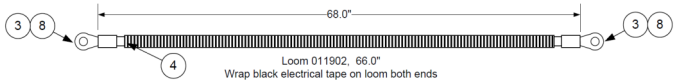
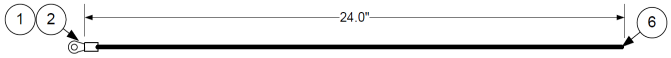
Section 2: Cable Kit Part Identification:

Part Description & Label	Part Photo/Diagram
Kit PPDS Photo [Example: **61697**: 2kW (CONT/2AUX)]: • Harness wires #1-#13, • Fuses, • Fuse holders, • Fuse holder Bracket, • Switch Harness Kit • Misc. Wire ties and fasteners • Contactor & VSS-VC Harness • Warning Lables	
OEM Battery POSITIVE to FUSE, **"WIRE #1"-** 19", RED, Black Corrugate, POSITIVE	**WIRE #1** 
FUSE to CONTACTOR, **"WIRE #2"-** 174", RED, Black Corrugate, POSITIVE	**WIRE #2** 
CONTACTOR to AUX FUSE, **"WIRE #3"-** 10", RED, Black Corrugate, POSITIVE	**WIRE #3** 
AUX FUSE to AUX 1 Battery POSITIVE & AUX 1 Battery POSITIVE to INVERTER, FUSE **"WIRE #4"-** 34", RED, Black Corrugate, POSITIVE	**WIRE #4 Two PCS** 
AUX 1 Battery POSITIVE to AUX 2 Battery POSITIVE, **"WIRE #5"-** 30" RED wire, Black Corrugate, POSITIVE	**WIRE #5** 
INVERTER FUSE to INVERTER, **"WIRE #6"-** 56", RED, Black Corrugate, POSITIVE	**WIRE #6** 
OEM Battery NEGATIVE cable to AUX 1 Battery NEGATIVE,**"WIRE #7"-** 170", BLACK, Black Corrugate, NEGATIVE	**WIRE #7** 
AUX 1 Battery NEGATIVE to AUX 2 Battery NEGATIVE, **"WIRE #8"-** 30" BLACK wire, Black Corrugate, NEGATIVE	**WIRE #8** 
AUX 2 Battery NEGATIVE to INVERTER, **"WIRE #9"-** 68", BLACK, Black Corrugate, NEGATIVE	**WIRE #9** 
INVERTER GROUNDING WIRE to Chassis, **"WIRE #10"-** 24", GREEN wire, GROUND	**WIRE #10** 

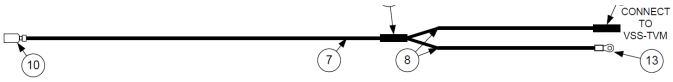
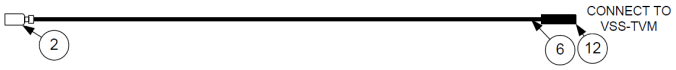
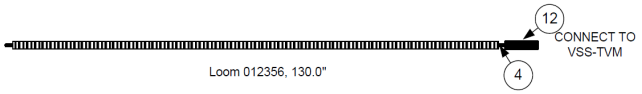
Section 2: Cable Kit Part Identification [Continued]:

Part Description & Label	Part Photo/Diagram
Kit PPDS Photo [Example: **61697**: 2kW (CONT/2AUX)]: Remote SW [Example: D919705]: • QTY 1, #012992 FUSE HOLDER • QTY 2, #D018361 FUSE HOLDER • QTY 2, #013916 250A FUSE • QTY 1, #013918 400A FUSE • QTY 1, #016813 RELAY • QTY 1, #VSS-VC • QTY 10, #013131 CABLE TY • QTY 1, #016869 CABLE CLAMP • QTY 2, #013011 2AWG TERMINAL COVER • QTY 1, #D019548 TC SWITCH KIT	
ADD-A-FUSE WIRE to SWITCH, **"WIRE #11"- 56"** RED wire, Black Corrugate, HAAT	**WIRE #11** 
GROUND WIRE to SWITCH, **"WIRE # 12" - 56"** BLACK wire, GROUND	**WIRE #12** 
SWITCH to INVERTER, **"WIRE # 13" - 184"** ORANGE wire, Black Corrugate, Remote Signal	**WIRE #13** 
VSS-VC Harness [Preassembled] and CONTACTOR with Terminal covers	
Vanner Remote Switch (Red Rocker Switch)	

Section 2: Cable Kit Part Identification [Continued]:

Part Description & Label	Part Photo/Diagram
Kit [Example: **62886:** 1.5kW (1AUX)] PPDS Photo • Harness wires #1-#7+, • Fuses, • Fuse holders, • Fuse holder Bracket, • Switch Harness Kit • Misc. Wire ties and fasteners • Contactor & VSS-VC Harness • Warning Labels	
OEM Battery POSITIVE to CB FUSE, **"WIRE #1"-** 22", RED, Black Corrugate, POSITIVE	**WIRE #1** 
CB FUSE to AUX FUSE, **"WIRE #2"-** 18", RED, Black Corrugate, POSITIVE **Two PIECES**	**WIRE #2** **Two PCS** 
AUX FUSE to AUX 1 Battery POSITIVE & AUX 1 Battery POSITIVE, **"WIRE #3"-** 170", RED, Black Corrugate, POSITIVE	**WIRE #3** 
INV FUSE to INVERTER **"WIRE #4"-** 68", RED, Black Corrugate, POSITIVE	**WIRE #4** 
OEM Battery NEGATIVE cable to AUX 1 Battery NEGATIVE, **"WIRE #5"-** 168", BLACK, Black Corrugate, NEGATIVE	**WIRE #5** 
AUX 1 Battery NEGATIVE to INVERTER, **"WIRE #6"-** 68", BLACK, Black Corrugate, NEGATIVE	**WIRE #6** 
INVERTER GROUNDING WIRE to Chassis, **"WIRE #7"-** 24", GREEN wire, GROUND	**WIRE #7** 

Section 2: Cable Kit Part Identification [Continued]:

Part Description & Label	Part Photo/Diagram
Kit [Example: **62886:** 1.5kW]: PPDS Remote SW Photo [Example: D919211]: • QTY 1, #012992 FUSE HOLDER • QTY 3, #013914 200A FUSE • QTY 10, #013131 CABLE TY • QTY 1, #016869 CABLE CLAMP • QTY 2, #D018361 MOLDED FUSE HOLDER • QTY 1, #D019211 TIMER KIT TC	
ADD-A-FUSE WIRE to SWITCH and TIMER, **"WIRE #8"- ~52",** RED wire, Black Corrugate, HAAT	**WIRE #8** 
GROUND WIRE to SWITCH and TIMER, **"WIRE # 9" -~52",** BLACK wire, GROUND	**WIRE #9** 
REMOTE SWITCH to TIMER **"WIRE # 10" -** WHITE wire, Black Corrugate, Switch Signal	**WIRE #10** 
TIMER to INVERTER **"WIRE # 11**" - ~130", ORANGE wire, Black Corrugate, Remote Signal	**WIRE #11** 
Vanner Remote Switch and Timing circuit included in the kit above	 

Section 3: Tools Needed & Fastener ID/Torque Table:

1) Insulated Splice Crimper
2) Wire Strippers
3) Diagonal Cutters
4) Plastic Trim Tool
5) Drill driver
6) Measuring tape
7) Phillips Bit with Bit holder
8) 3/4” Hole or Step Drill (Unibit)
9) Medium and Small (-) Screwdriver
10) Large #3 Phillips (+) Screwdriver
11) Sockets:
    - 8mm,10mm,13mm
    - 5/16”,3/8”,7/16”,1/2”
    - Socket driver and extensions
12) Torque Wrench [~8-20Nm range]
13) Tin Snips
14) #3 Philips (+) & Medium slotted torque socket
15) Marker [Not Shown]
16) Plusnut gun
17) Drill Bits:
    - 1/4”,5/16”, 3/8", 1/2"
    - 1 –3/16" hole saw (if applicable)
18) Fish tape
19) Vinyl Electrical Tape

Figure 3-1: Tools Needed for Installation

Section 3: Kit Fasteners and Torque Table

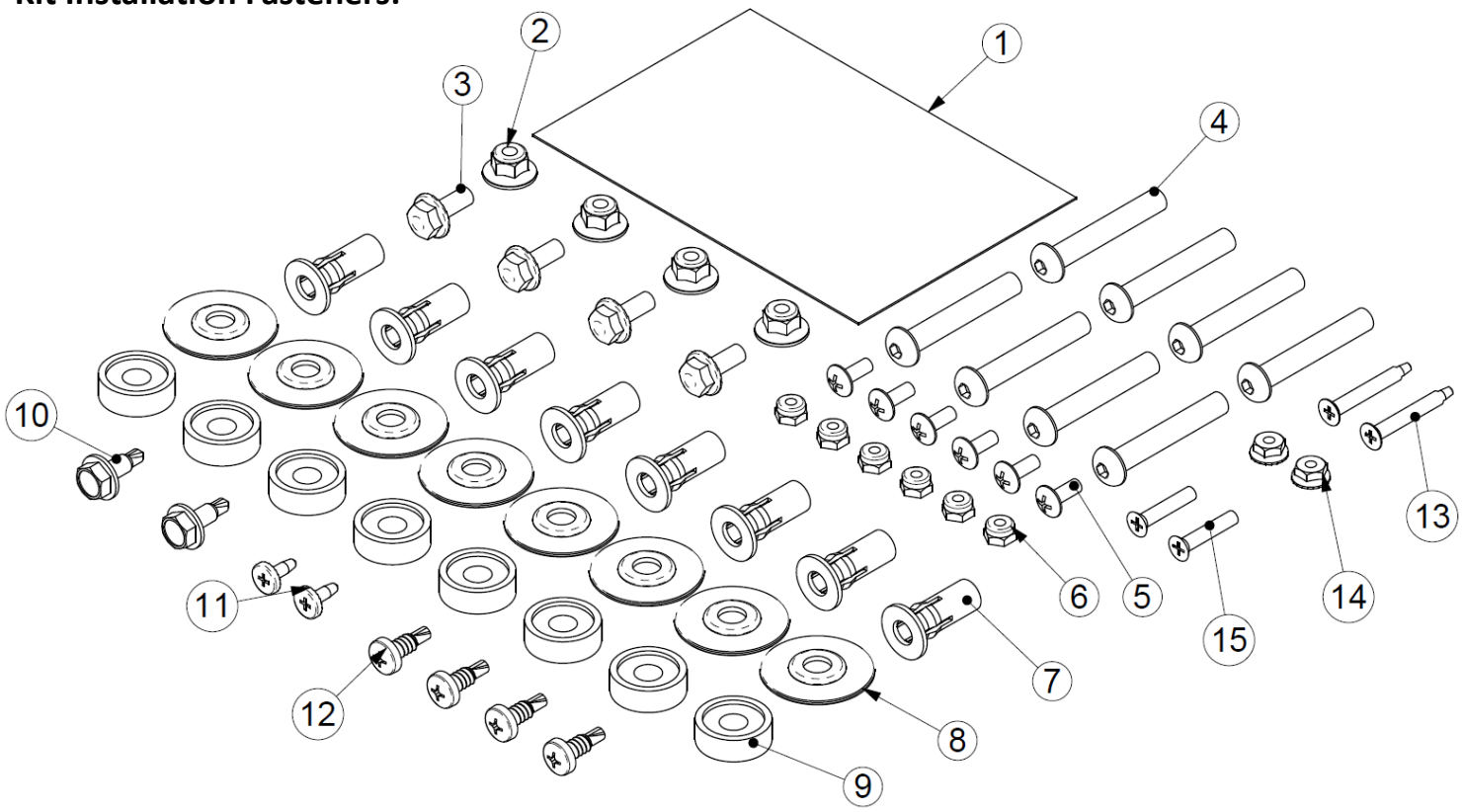
Torque Table:

ITEM NO.	ASC PN	Description	PCS	Torque Range	Use Wrench or Size
1	BAG0406-A	4" x 6" 3MIL AUTOBAG	1	--	
2	FAS0055	Nut, Hex Flange, Nylock 1/4-20	4	12Nm [+/- 1.8Nm] (106lb.in).	7/16"
3	FAS0018	SCREW,HH SFLNG 1/4-20X.62 ZP	4	12Nm [+/- 1.8Nm] (106lb.in).	7/16"
4	FAS0048	Screw, Button Hd Hex Soc, 5/16-18X2, ZN	8	15Nm [+/- 1.8Nm] (132lb.in).	3/8" Allen
5	FAS0025	Screw, Truss Hd. Ph, #10-24x0.50	6	3Nm [+/- 0.5Nm] (27lb.in).	#2 Phillips
6	FAS0029	NUT,HEX NLK 10-24 ZP	6	3Nm [+/- 0.5Nm] (27lb.in).	3/8”
7	FAS0091	Plusnut, 5/16	8	--	--
8	FAS0833	WASHER, CUP FLANGED 1.5"	8	--	--
9	03927-1	SPACER,FLR,1010,11/32 ZP	8	--	--
10	FAS0641	SCREW,HH TEK 1/4-20X.7 ZP	2	12Nm [+/- 1.8Nm] (106lb.in).	7/16"
11	FAS0148	Screw, Self Drill/Tap, Pan Ph. Hd., #10x0.5, NI-ZN	1	3Nm [+/- 0.5Nm] (27lb.in).	#2 Phillips
12	FAS0360	SCREW,ST,THP 14-10X.75 SS	4	3Nm [+/- 0.5Nm] (27lb.in).	#2 Phillips
13	FAS0629	Screw, Self Drill/Tap, Wafer Ph. Hd., #10x1.5 NI-ZN	2	3Nm [+/- 0.5Nm] (27lb.in).	#2 Phillips
14	FAS0020	Nut, Hex Flange, #10-24	2	3Nm [+/- 0.5Nm] (27lb.in).	3/8”
15	FAS0032	Screw, Flat Phillips Hd, #10-24x1.0	2	3Nm [+/- 0.5Nm] (27lb.in).	#2 Phillips

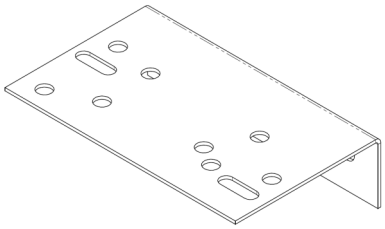
Please NOTE: Certain fasteners or hardware may <u>not</u> be used for certain kits.

BAG66633

Kit Installation Fasteners:



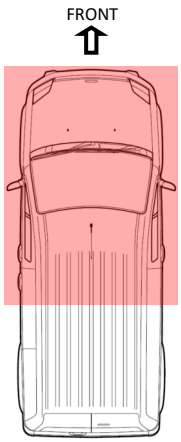
Section 3: Kit Fasteners and Torque Table

Ref. NO.	ASC PN/Function	Description	PCS	Torque Range	Use Wrench or Size
16	44918-B BRACKET, FUSE HOLDER, F150		1		
17	Cables to VANNER & Bussman Fuse Holders		4	12Nm [+/- 1.8Nm] (106lb.in).	1/2"
18	Inverter +/- Terminals	Phillips and slotted screws	Three (3) Posi-tions	12.3Nm [+/- 0.7Nm] (9.5 lb.ft).	#3 Phillips and 1/4" Standard driver bits
19	Contactor Mains		2	10.2Nm [+/- 1.1Nm] (~90 lb.in).	1/2"
20	Contactor coil		2	2.5 Nm [+/- 0.9 Nm] (~22.5 lb.in).	3/8"
Other Fasteners in Vehicle					
21	CB Positive Battery Post Bus Bar	—	1	8Nm [+/- 1.2Nm] (71 lb.in).	10mm NUT
22	CB Negative Battery Cable to Chassis	—	1	22Nm [+/- 1 Nm] **(16 lb.ft).**	13mm Nut
23	AUX Battery positive and negative terminal fasteners	—	2 or 4	8Nm [+/- 1.2Nm] (71 lb.in).	1/2" Nut
24	Hood cowling fastener for CB Fuse Holder Bracket	—	1	2.5 Nm [+/- 0.9 Nm] (~22.5 lb.in).	8mm Screw

Please NOTE: Certain fasteners or hardware may <u>not</u> be used for certain kits.

Section 4: General Vehicle Layout [KIT 61697]:

- **Use sales order drawing to place all equipment.**



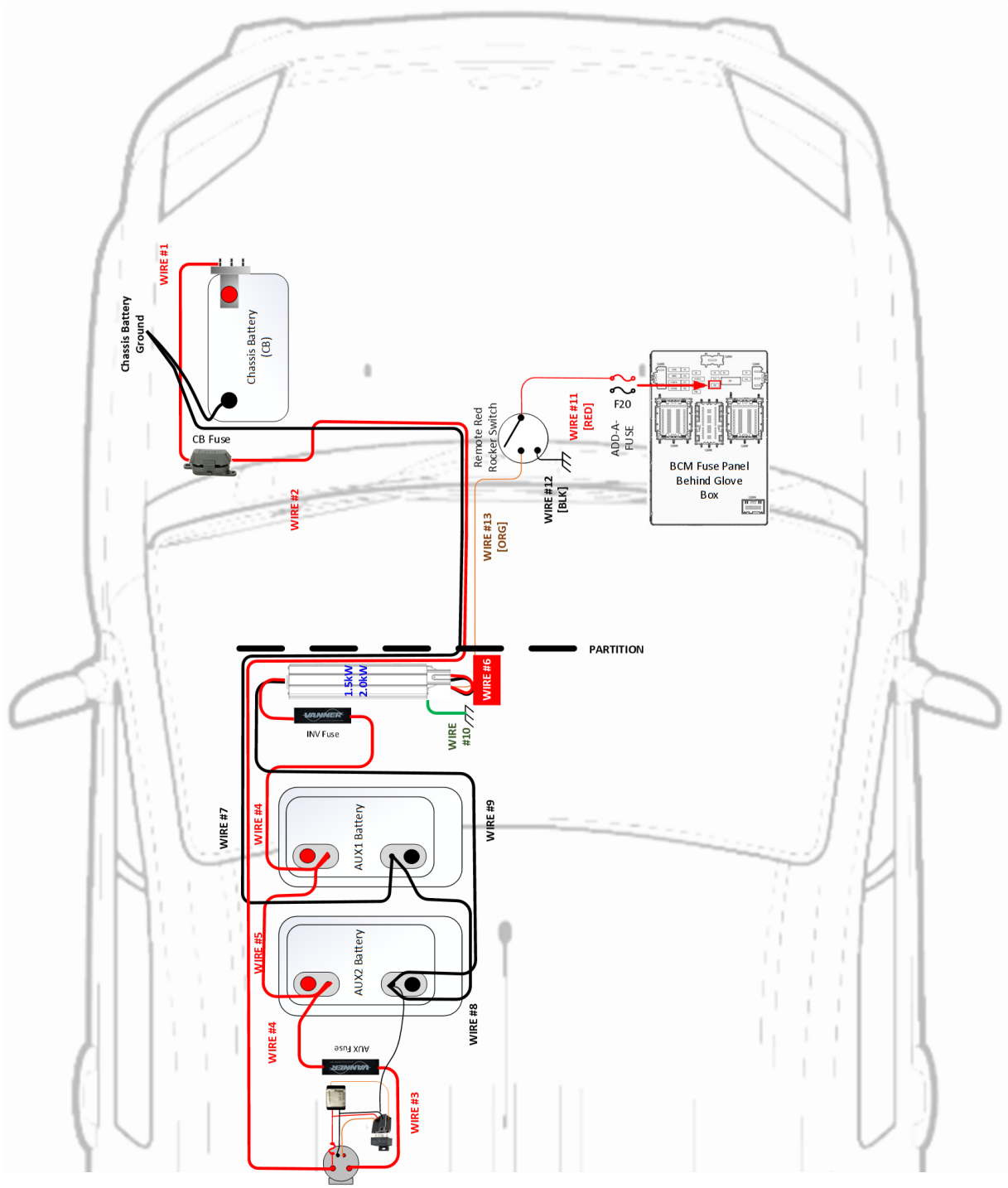
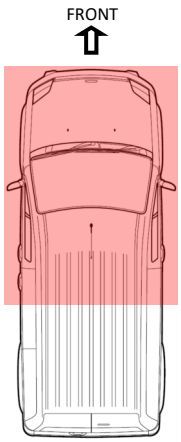


Figure 4-1: 2 AUX 2000W Kit 61697 Diagram

Section 4: General Vehicle Layout [KIT 62886]:

- **Use sales order drawing to place all equipment.**



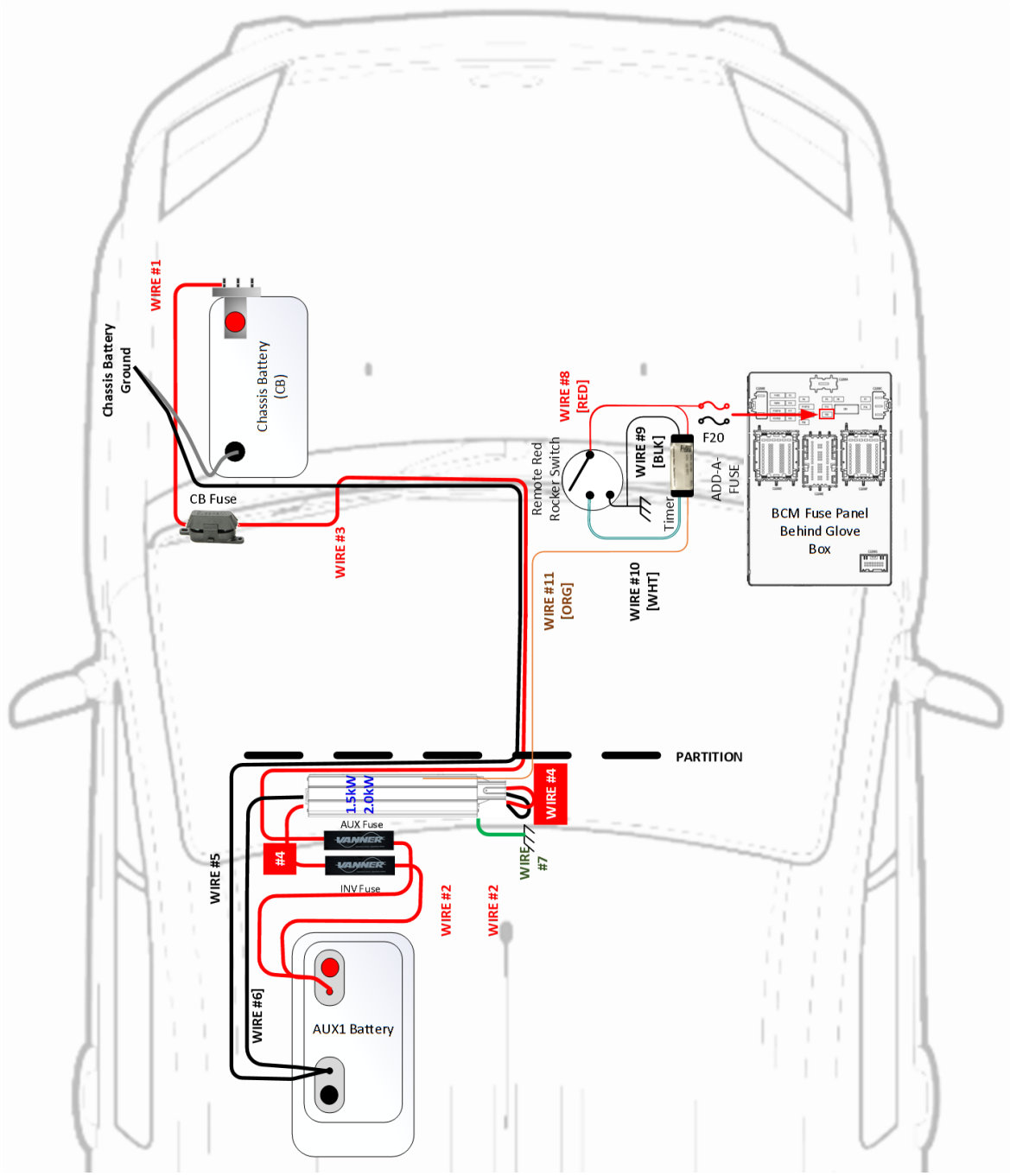
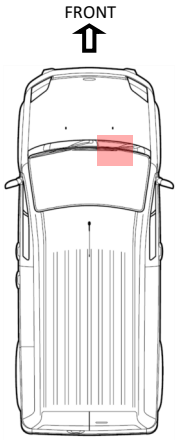


Figure 4-2: 1 AUX 1500W Kit 62886 Diagram

Section 5: General Wiring Diagrams:

BCM Fuse Panel: Add-A-Fuse location:



- The BCM Fuse Panel is located behind the glovebox and can be accessed after glove box removal step.

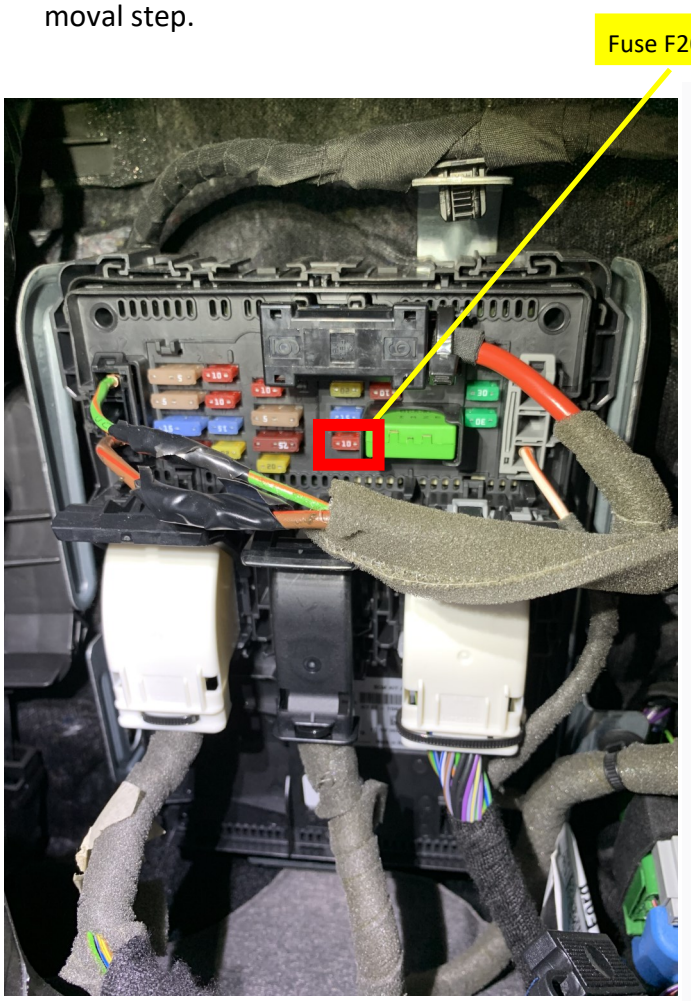


Figure 5-1: BCM Fuse Panel Photo

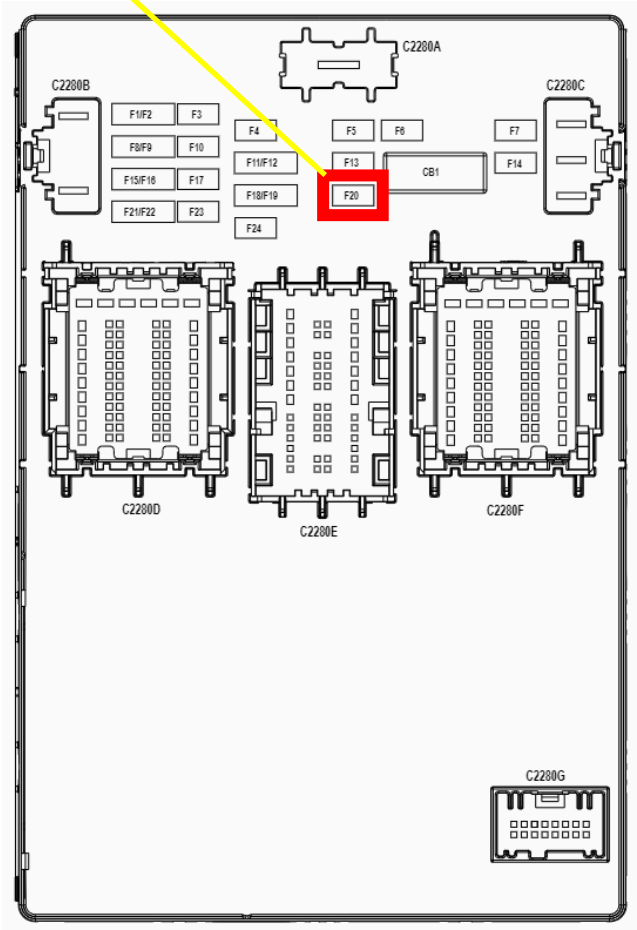


Figure 5-2: BCM Fuse Panel Diagram

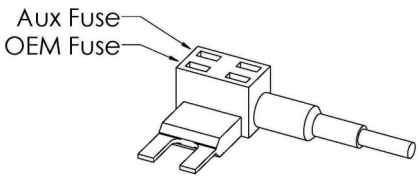


Figure 5-3: Close up of Add-A-Fuse

Section 5: General Wiring Diagrams:

Two AUX Batteries + Contactor (KIT 61697)

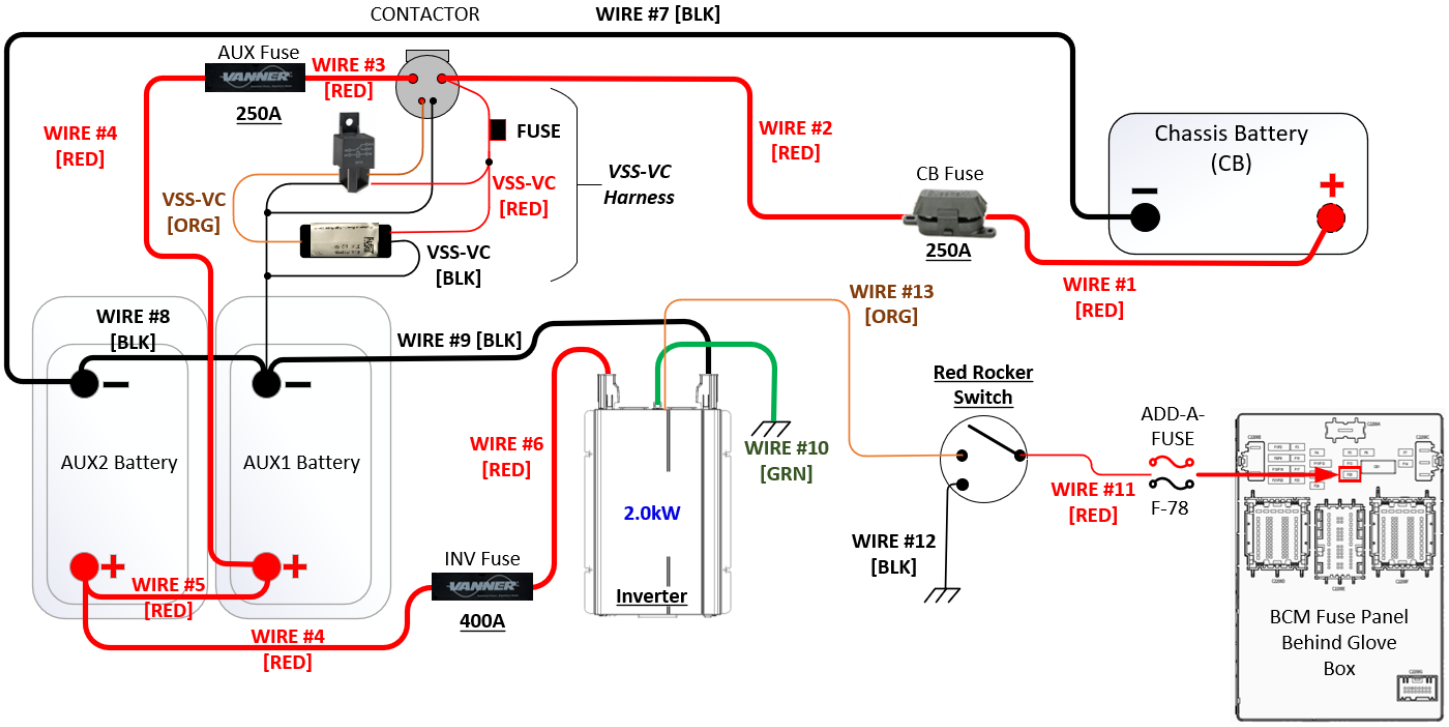


Figure 5-1: Complete Wiring Diagram for kit with a Contactor

One AUX Battery + Timer (Kit 62886) :

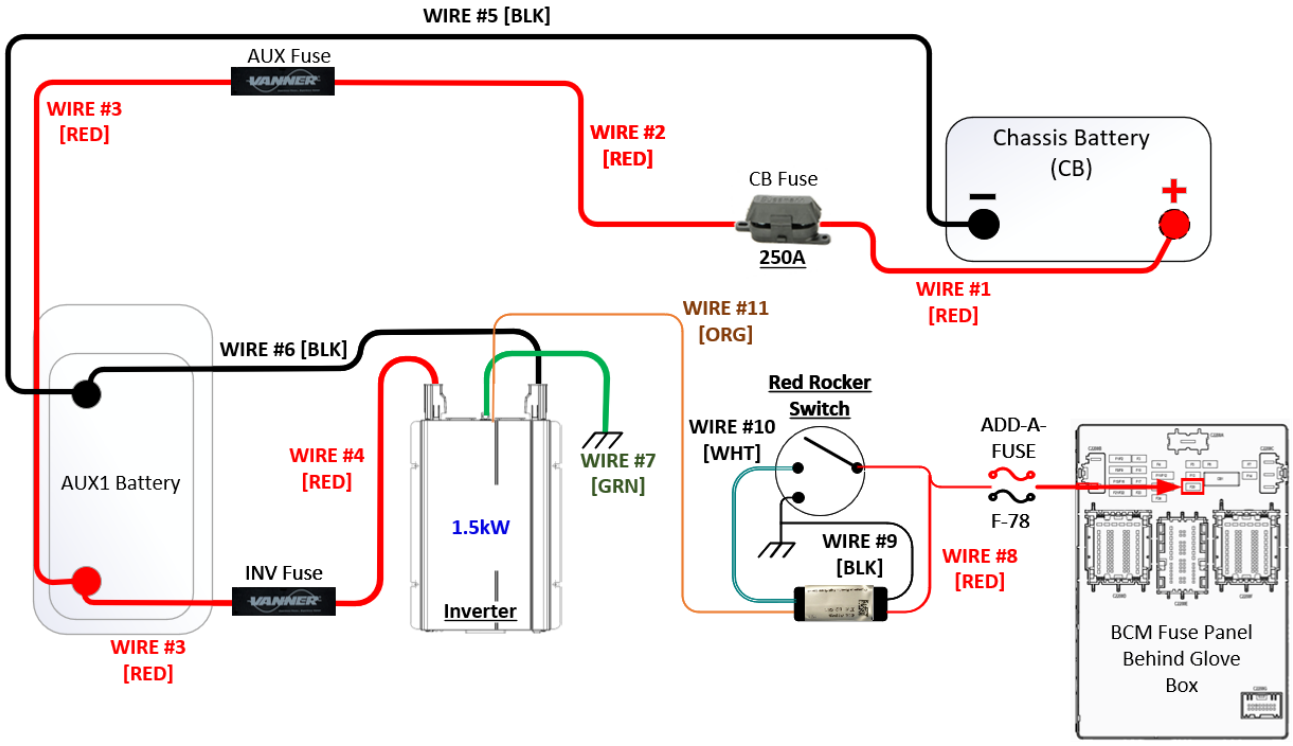
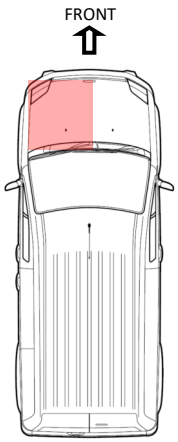
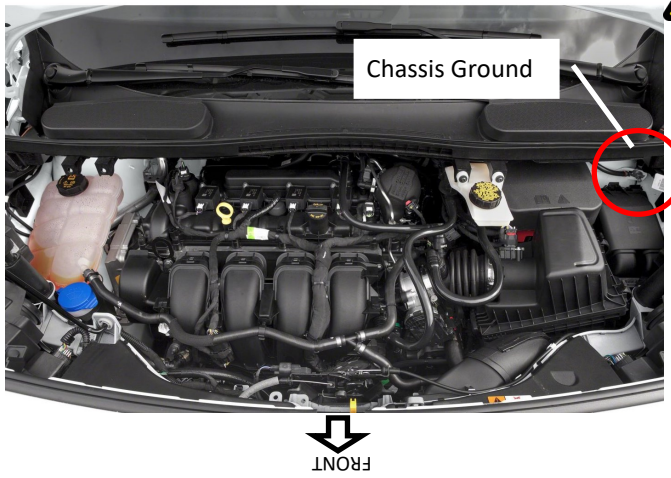


Figure 5-2: Complete Wiring Diagram for kit with a timer switch

Section 6: Chassis Battery (CB) Access:

Step 6-1. Engine Area Layout

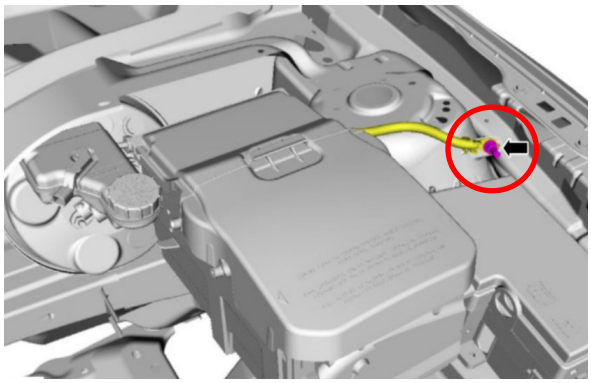




Caution: Remove the ground from the chassis to prevent shorts while working on the battery

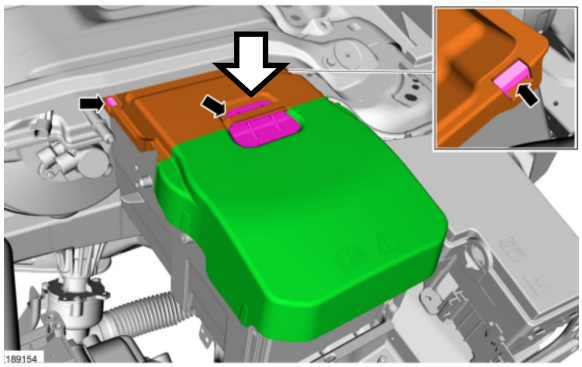
- Locate the chassis ground to battery negative fastening point.

Step 6-2. Remove Ground and Battery Cover



- Disconnect the Negative Battery Cable from the chassis connection (See Red Circle) and tape off the end to protect lug from hitting any chassis metal.
- This will require a 1/2” deep well socket with an extension .

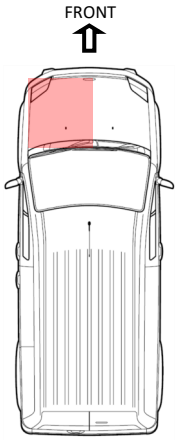
Step 6-3. Removing Battery Cover

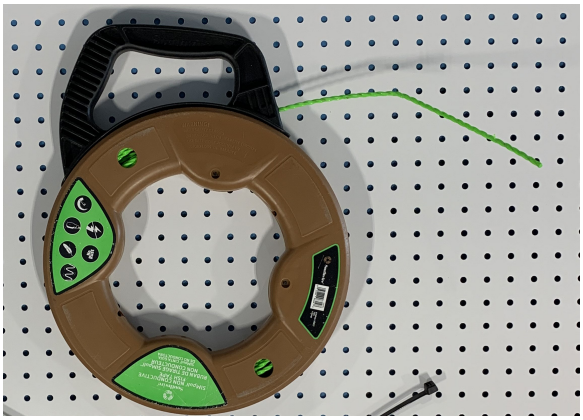


- Remove the battery compartment cover.
- Remove top clip (White Arrow) retaining the plastic cover and remove to gain access to the positive battery terminals.

Section 6: Chassis Battery (CB) CABLE Routing to CB Fuse holder

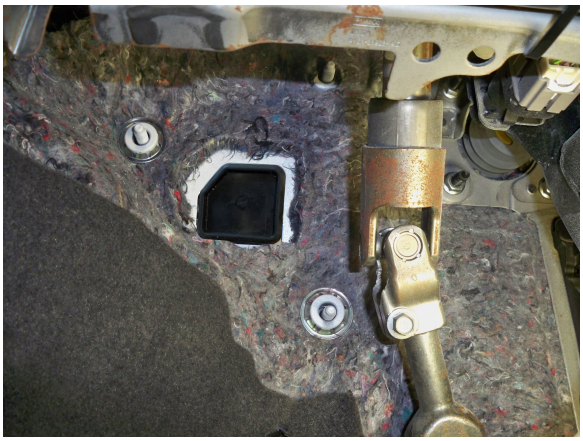
Step 6-4. Utilize Fish Tape





- Utilize fish tape wire pulling tool for next procedure.

Step 6-5. Find Clutch pedal cutout



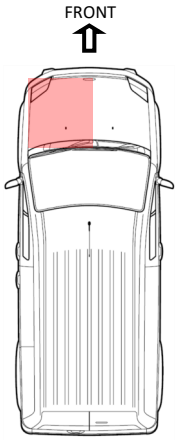
- Access hole with seal present
- Under the steering wheel and knee bolster area , a black grommet sealing plug can be removed from a square hole in the sheet-metal.

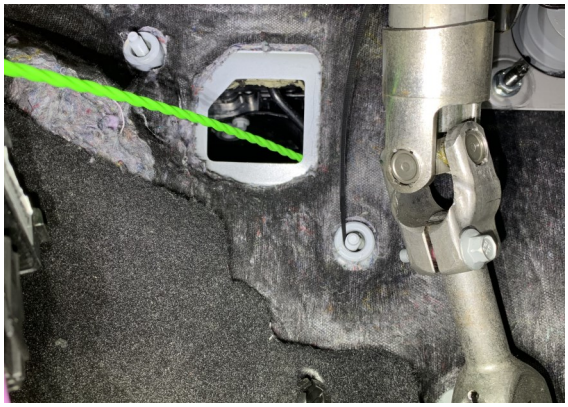
Step 6-6. Remove seal

- In the photo to the left, the hole can be seen with seal removed (keep the seal for replacement)
- The **WIRES #2 and #7(5)** will be routed through this.

Section 6: Chassis Battery (CB) CABLE Routing to CB Fuse holder

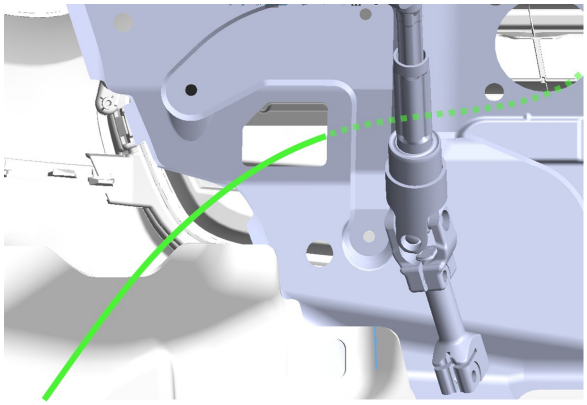
Step 6-7. Routing the fish tape through the clutch pedal cutout





- Bring the fish tape to the opening.
- It should come into the right and route towards the passenger's side of the vehicle immediately.

Step 6-8. Routing the fish tape



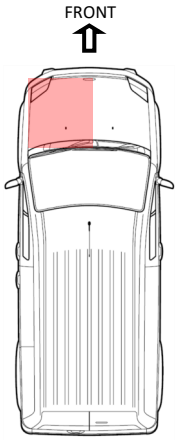
- Keep feeding the tape to the right until a person looking into the engine compartment can see it and begin pulling from the engine bay.

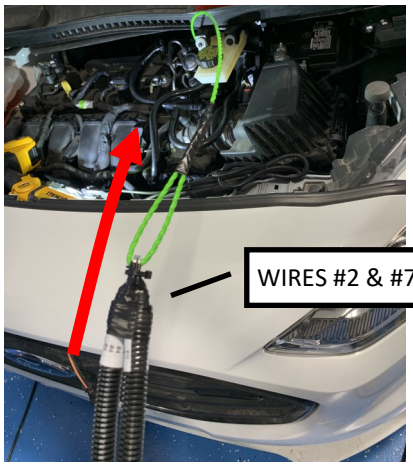
Step 6-9. Fish tape in the engine compartment

- Have second person retrieve fish tape from behind the brake master cylinder reservoir.
- Keep pulling the fish tape out to the front of the vehicle.
- Make sure to route between the tubing so that nothing interferes with the cables as they are pulled back in.

Section 6: Chassis Battery (CB) CABLE Routing to CB Fuse holder

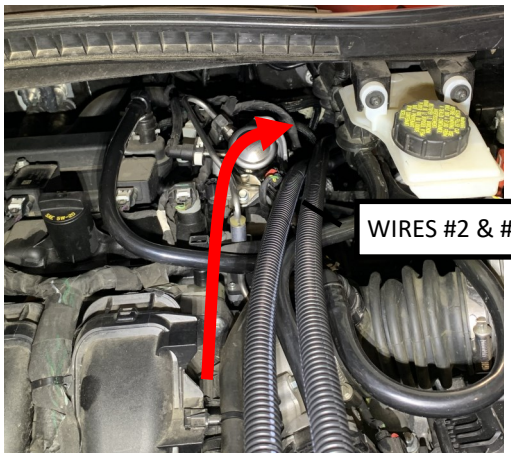
Step 6-10. Connect WIRE #2 and #7 (or #5)





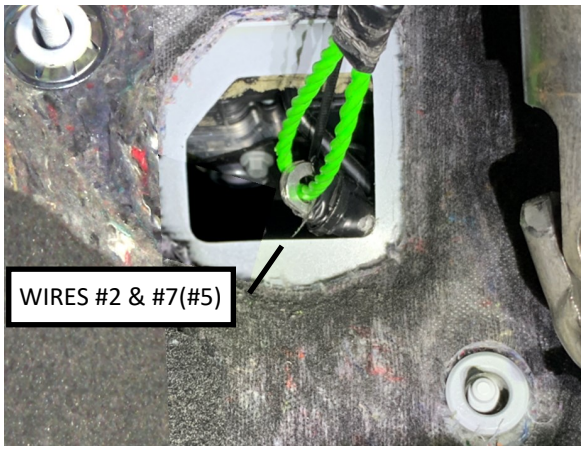
- Begin to pull the two mains back through- Bring WIRE #2 and WIRE #7 (or #5) together and loop the fish tape into the holes of the cable lugs.
- Use tape to hold the fish tape loop for pulling back past the engine and back through the access hole.

Step 6-11. Pull back the wires with fish tape



- Have another person guide the wires as they are pulled into vehicle.

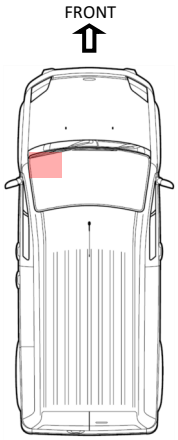
Step 6-12. Wires reaching the clutch pedal cutout



- The wires will be pulled in under the dash through the access hole.

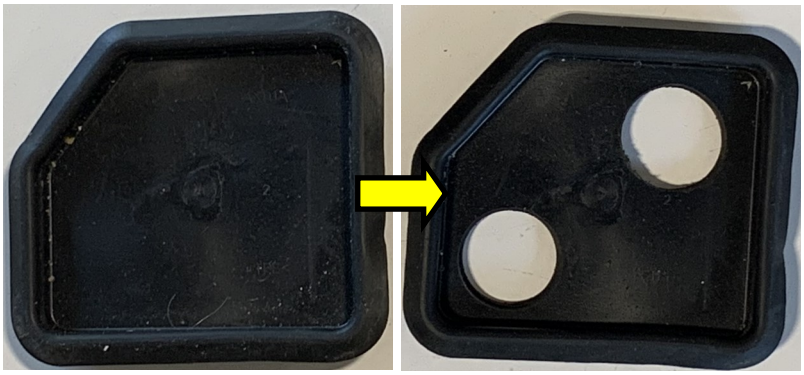
Section 6: Chassis Battery (CB) CABLE Routing to CB Fuse holder

Step 6-13. Pull WIRE #2 and #7 (or #5) into cabin



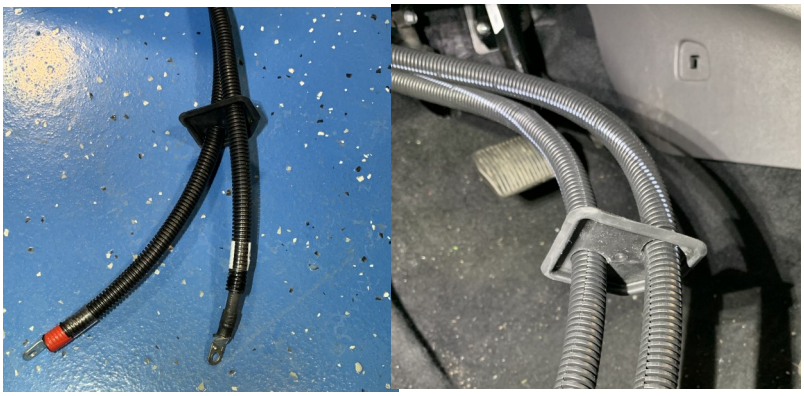
- Continue to pull the wires from the engine compartment with the fish tape.
- If corrugate snags try pulling it to help the cables slide.
- Remove the fish tape from the wires

Step 6-14. Put holes into hole seal



- The hole through the bulkhead for the cables has a rubber grommet seal.
- Use a Step Drill (Unibit) and put two 5/8” holes in the seal similar to the picture on the right.

Step 6-15. Apply seal to wires

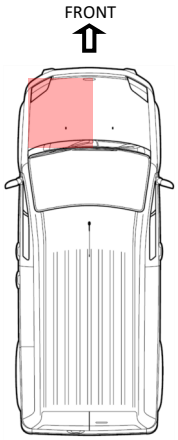


Note: This seal is very important to stop water ingress.

- Slide the rubber seal up the cable to the bulkhead.
- This seal is very important to stop water ingress.

Section 6: Chassis Battery (CB) CABLE Routing to CB Fuse holder

Step 6-16. Routing WIRE #2 and #7 (or #5)



NOTE: The cables are thick and will pull out the seal if they are repositioned. Fasten them down before sealing.

- Do not completely push in the seal until routing and clipping steps for the cables are completed later in the installation.

Step 6-17. Pull loom from Engine compartment

- On the other end of the cables in the engine compartment: the wires should be long enough to reach to battery ground area.

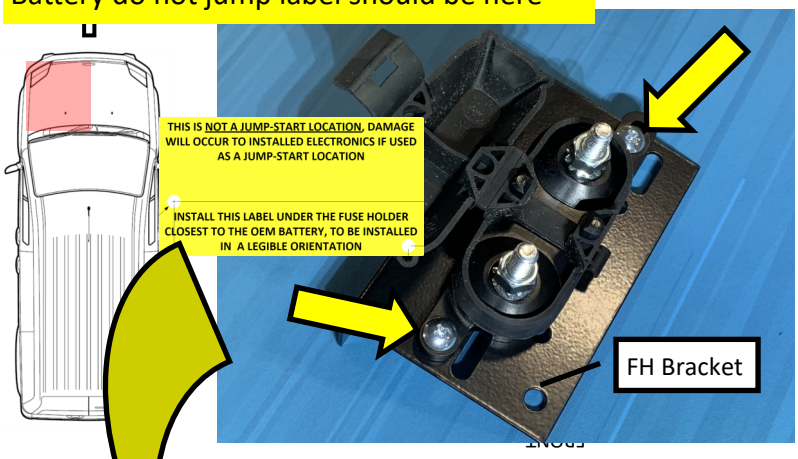
Step 6-18. Wire lengths in engine compartment

- Bring the wire over to the approximate location on the right side of the battery.
- Route the wires beneath the brake reservoir and tubing in that area.
- After connection, the extra slack will be re-moved during routing and clipping.

Section 6: Chassis Battery (CB) CABLE Routing to CB Fuse holder

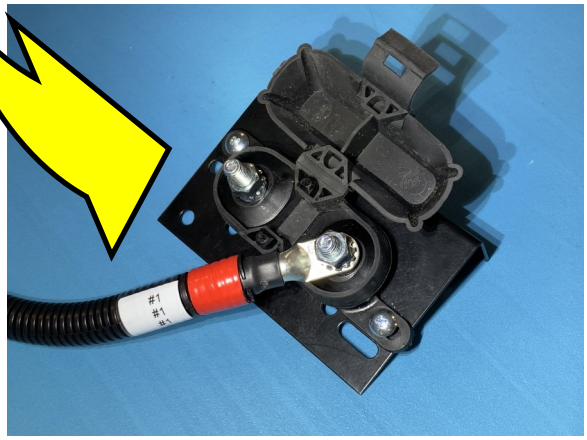
Step 6-19. Attach Chassis Battery Fuse (CB Fuse holder) to bracket

Battery do not jump label should be here



- Attach the Bussman Fuse Holder to the 44918-B BRACKET, FUSE HOLDER (Ref. NO.: 16)- with the jump start label positioned behind.
- Utilize pre-positioned holes located near the mid-line of the flat surface ot the bracket (Shown to the left.
- Attach the fuse holder with FAS0025 and FAS0029 fasteners and torque to 3Nm [+/- 0.5Nm] (27lb.in). with a #2 Phillips and 3/8" wrench.

Step 6-20. Attach WIRE #1 to CB Fuse holder



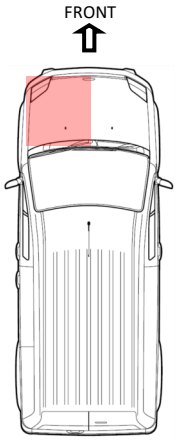
- Connect one end of **WIRE #1** to the right-most terminal of the Bussman fuse holder as shown in photo to the left.

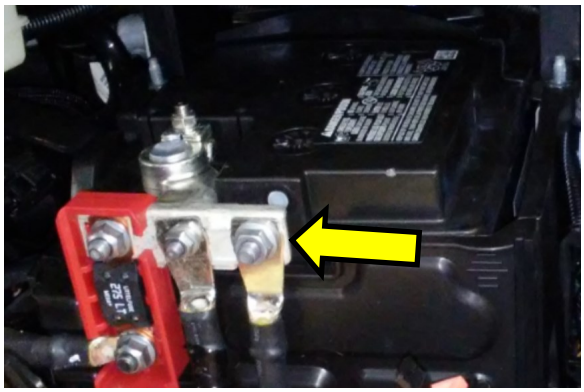
Step 6-21. Positive Battery Bus cover

- Remove the positive battery cable cover at this time (See Yellow Arrow).
- It releases with the finger tab on top and slides straight up on a channel.

Section 6: Chassis Battery (CB) CABLE Routing to CB Fuse holder

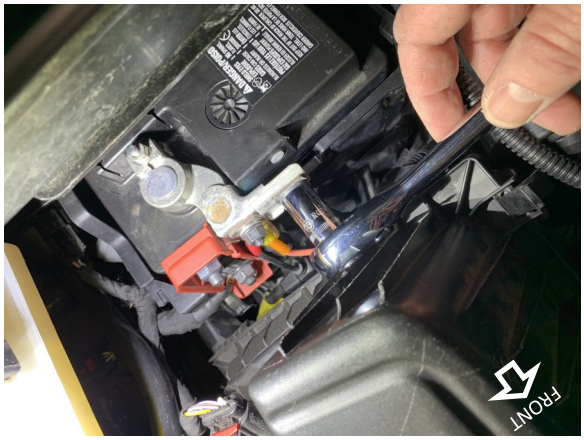
Step 6-22. CB Connection for Inverter





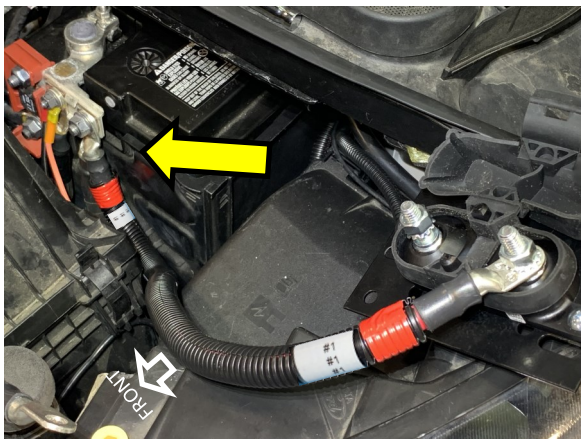
- Inverter Voltage will be obtained from this battery bus terminal.

Step 6-23. Remove Battery bus fastener



- Remove the fastener from the rightmost terminal on the positive battery bus.

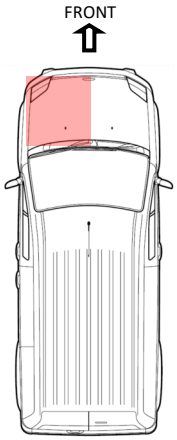
Step 6-24. Connect WIRE # 1

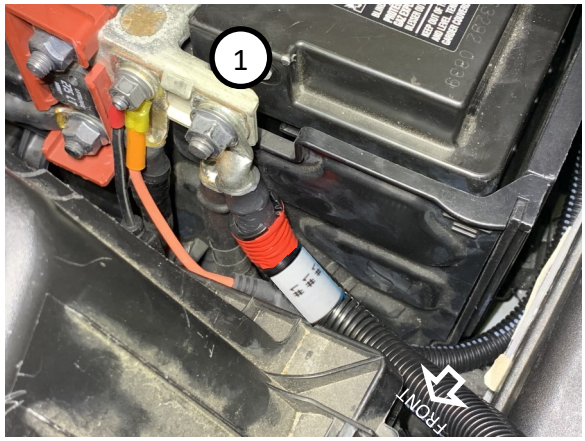


- Take the Bussman Fuse holder for the Chassis battery with **WIRE #**1 already installed and connect the other end of **WIRE #1** to the positive battery terminal.

Section 6: Chassis Battery (CB) CABLE Routing to CB Fuse holder

Step 6-25. Arrange WIRE #1 for best fit

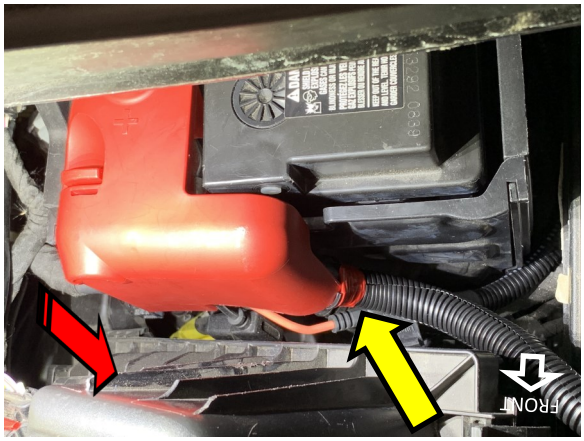




- Before tightening down cable lug on **WIRE #1** , rotate and push it downward so that it leaves the terminal vertically along the other cable connected to that terminal

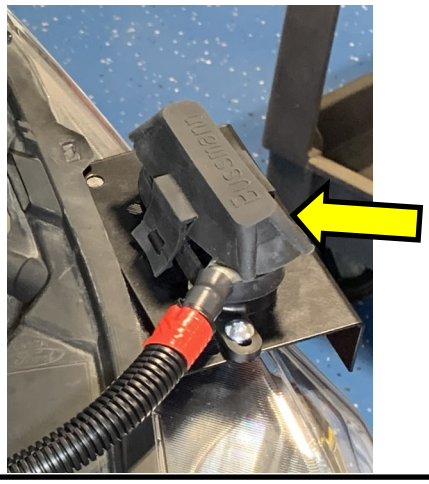
(1) Torque the 13mm nut back onto the terminal -*Torque*: 10Nm (89 lb.in)

Step 6-26. Replace Positive Battery bus cover



- Replace the positive battery terminal cover. Slide it down along the channel and push the **WIRE #1** cable so that it exit out of the bottom of the cover.

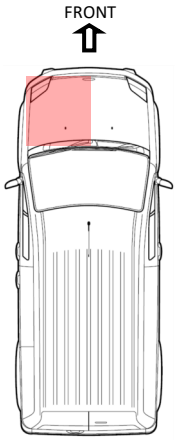
Step 6-27. Apply CB Fuse holder cover

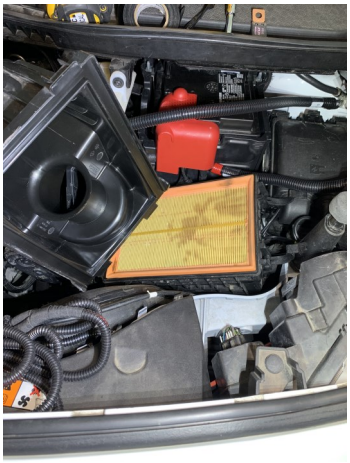


- For cautionary measure, put the rubber Busman Fuse holder cover in place so that this positive cable will not be able to touch ground when the chassis is re-grounded.

Section 6: Chassis Battery (CB) CABLE Routing to CB Fuse holder

Step 6-28. Remove Intake Air filter cover





- Remove the air cleaner box clips and push it out of the way.
- This will allow for installation of the battery cover.

Step 6-29. Replace Battery cover

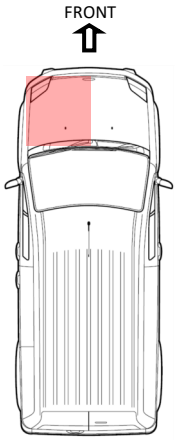
- The battery cover slides over the top of the battery and fits back into the clip on the rear half of the battery cover.
- This can be difficult if the back cover is not affixed properly on the rear of the battery.

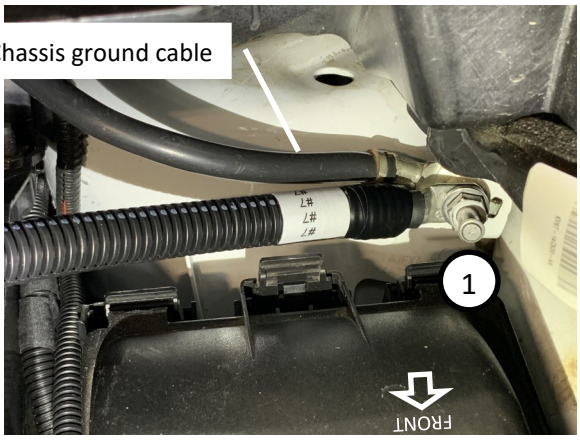
Step 6-30. Replace Air Filter cover

- Replace the air filter cover and begin routing the ground **WIRE #7 or #5** under the master cylinder reservoir and over the battery cover.

Section 6: Chassis Battery (CB) CABLE Routing to CB Fuse holder

Step 6-31. Re-attach Chassis ground & inverter ground



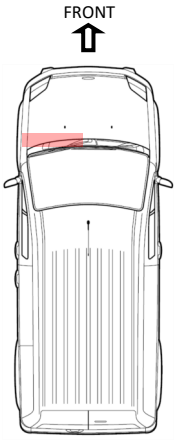


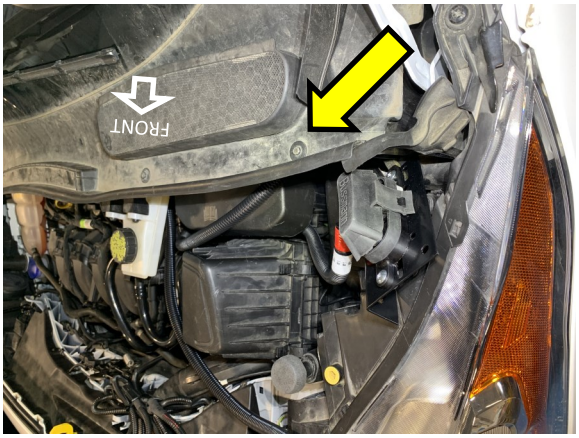
Note: It may be difficult hand threading the grounding bolt back into the threaded hole with two larger AWG cables attached.

- The Ground **WIRE #7 or #5 (recall position from STEP:6-18)** can now be joined with the chassis ground cable and connected back to the chassis ground point (ref: Step 6-2)
- Tighten fastener with a 1/2" deep well socket and an extension

(1) *Torque*: 16 lb.ft (22 Nm)

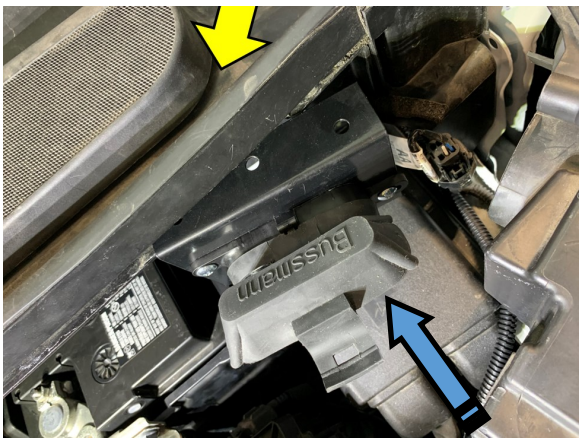
Step 6-32. Cowling screw location





- The Chassis Battery Fuse (CB Fuse holder) will be installed onto the OEM Cowling at this screw identified by yellow arrow.
- Remove this screw with an 8mm socket wrench

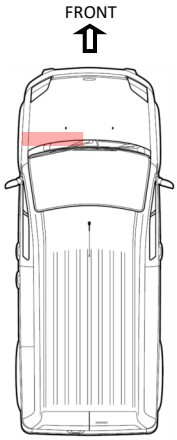
Step 6-33. Remove fastener & insert Fuse holder bracket

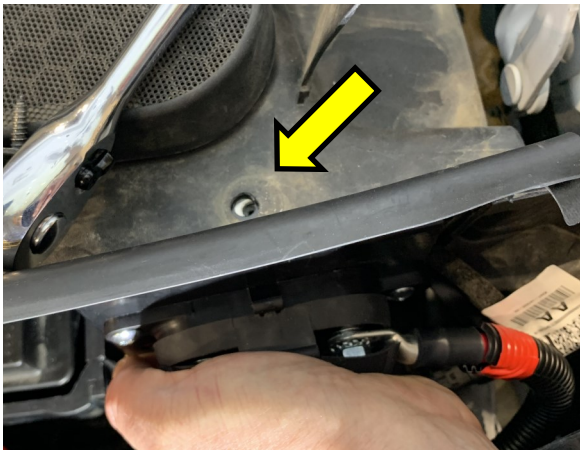


- The CB fuse holder bracket will slide between the plastic cowling and the vehicle sheet metal body at this point (See Blue Arrow).

Section 6: Chassis Battery (CB) CABLE Routing to CB Fuse holder

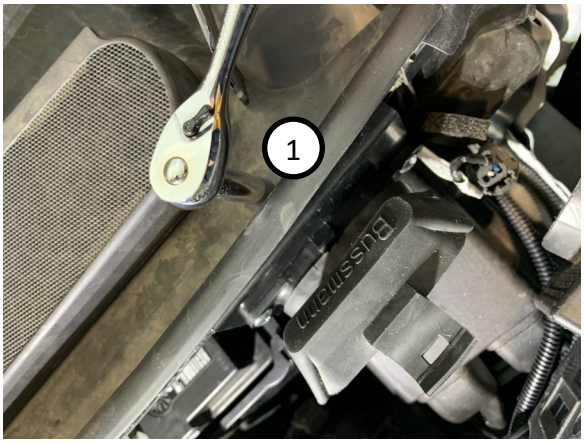
Step 6-34. Replace cowling fastener through FH bracket hole





- Align the CB Fuse holder Bracket hole with the hole in the cowling.
- Make sure the bracket is below the plastic cowling and above the painted metal chassis so that the screw may clamp it properly.

Step 6-35. Replace cowling Fastener through FH bracket hole



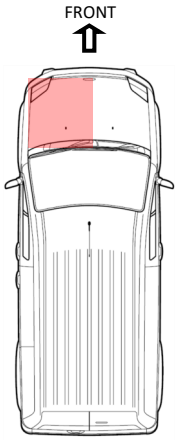
1 Use 8mm nut driver and re-torque the screw to 3Nm [+/- 0.5Nm] (27lb.in).

Step 6-36. Installed Fuse holder

- The CB Fuse holder should look like this after completion of previous step.
- The **WIRE #1** cable will have a tight radius bend in it and be shaped like a hook when exiting the fuse holder and going to the positive battery terminal.

Section 6: Chassis Battery (CB) CABLE Routing to CB Fuse holder

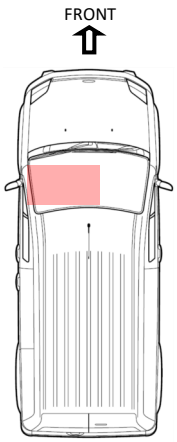
Step 6-37. Connect Wire #2 to CB Fuse holder



- Bring **WIRE #2** across the battery and onto the leftmost terminal of the CB Fuse holder.
- Use the fastener to hold the cable [finger tight (do not include fuse at this time)]
- At this point both of the main cables going to the Auxiliary battery(ies) in the cargo area will be ready for the final installation steps.

Section 6: Cabin Cable Routing to Cargo Area

Step 6-38. Cables entry under steering wheel



Stay clear of the pedals and steering mechanism Tie wrap cleanly out of the way.

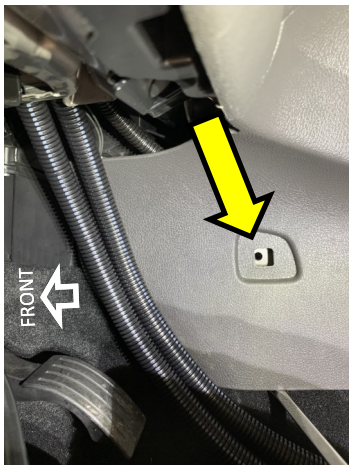
- Return to WIRE #2 and WIRE #7 (#5) underneath the steering wheel.
- Extra cable in the engine compartment should be pulled through, but allow a little length for a drip loop before it enters the passenger compartment.
- Push in and complete the seal at the bulkhead.
- Because of the construction of the seal, tight fastening of the wires and use of silicone sealant around the edges is recommended.

Step 6-39. Chassis battery cables under wheel routing

Stay clear of the pedals and steering mechanism Tie wrap cleanly out of the way.

- Begin to route the cables along the front steel structure .
- The cables will be brought in front of the steering shaft and above the brake.
- This is an important area to make sure there is solid fastening of the cables to the steel frame structure.

Step 6-40. Center console fastener removal

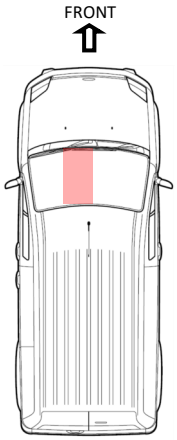


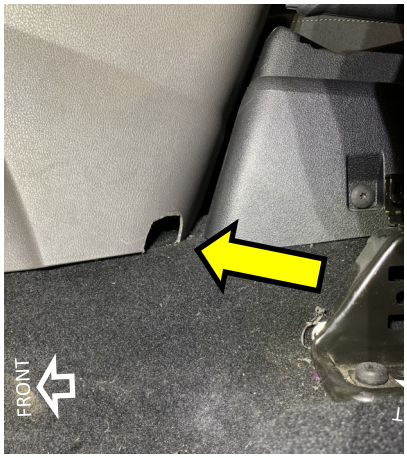
Stay clear of the pedals and steering mechanism Tie wrap cleanly out of the way.

- As the cables reach the end of the steel subframe, they will be ready to guide behind the side of the center console.
- Remove the console fastener (Yellow Arrow) so that the cables may be brought beneath and pushed up into the cavity behind the side of the console.
- Alternatively, the console can be removed from its support structure and cables can be routed through in a controlled manner within its subframe (not covered here).

Section 6: Cabin Cable Routing to Cargo Area

Step 6-41. Small cutout on console



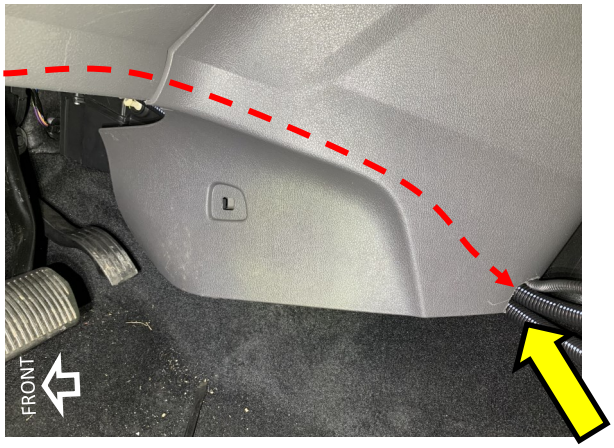


- The center console needs a cutout with the approximate dimensions 2” Wide and 1” tall for both WIRE #2 and WIRE #7 (#5) route along to the cargo area.
- This can be achieved by marking the cutout and using tin snips to cut the plastic.

Step 6-42. Cabling is pushed behind console cover

- Cabling is pushed behind console cover and pushed high to enable the cover to be brought back to its normal position and the fastener to be returned to the hole.

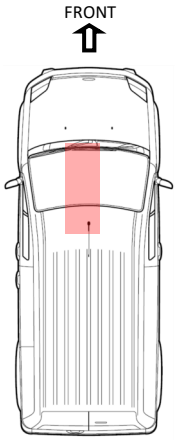
Step 6-43. Approximate routing of the cabling

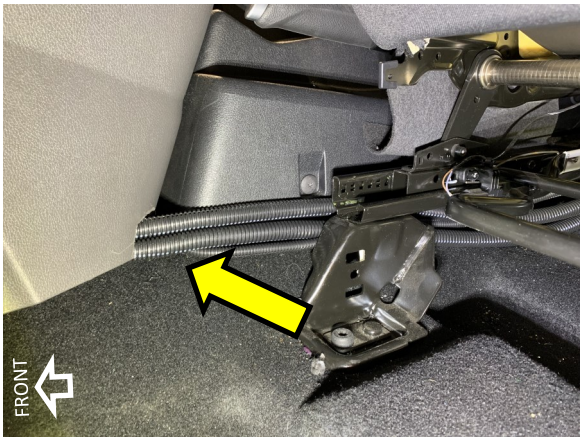


- The red dashed line shows approximate position of the cabling and the routing path to the cutout at the floor.

Section 6: Cabin Cable Routing to Cargo Area

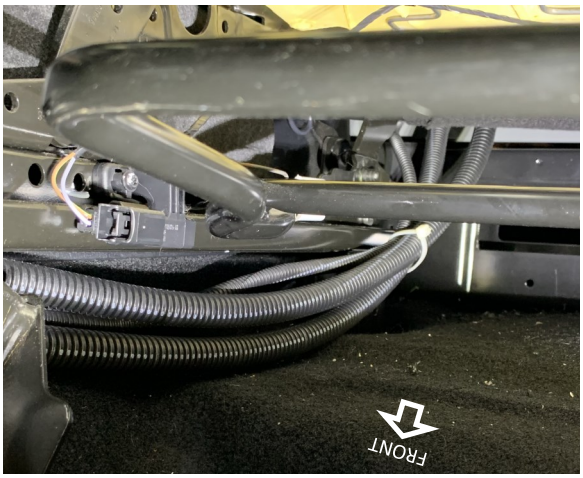
Step 6-44. Route cable outside of first seat bracket





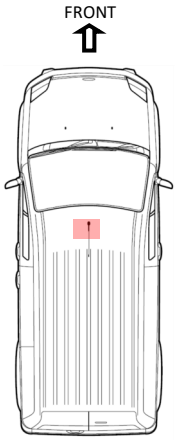
- Cable joins the orange remote WIRE #13 (#11) at this cutout.
- Route WIRE #2 and WIRE #7(#5) from the center console on the outside of the seat bracket and then cross over under the seat between the front and rear bracket.
- This prevents interference with the seat belt and the center console.

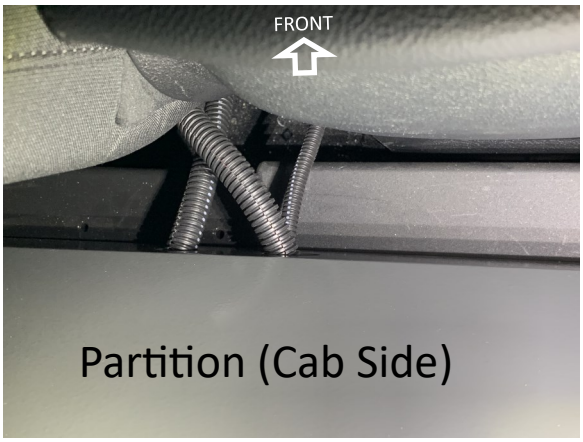
Step 6-45. Cross routing between seat brackets



- The cables are bundled together and routed under the seat before exiting out behind the seat to the partition
- Cable ties beneath the seat will keep the bundle neat.

Step 6-46. Cables exiting behind the seat

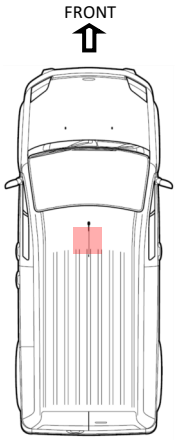


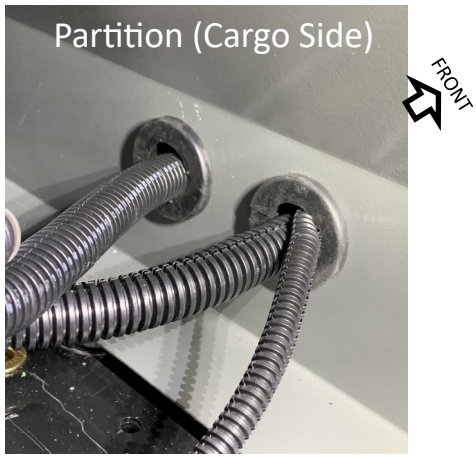


- Here the cables and the orange wire cross through the partition.
- Wire extra wear protection, use the grommets in the holes provided with the partition.

Section 6: Cabin Cable Routing to Cargo Area

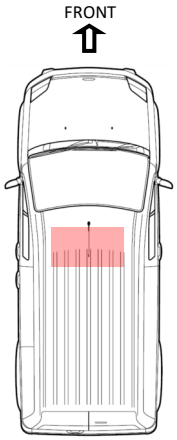
Step 6-47. Cables shown on cargo side of partition

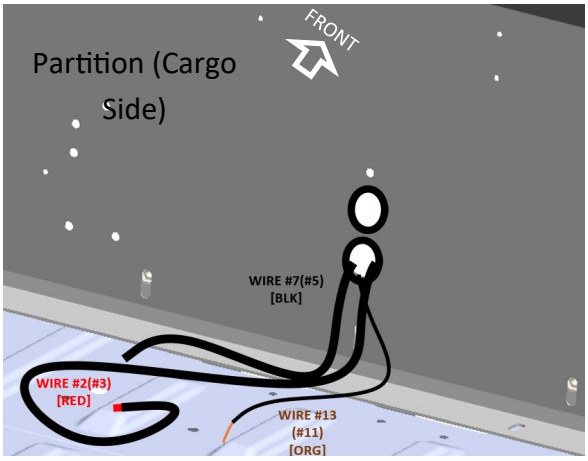




- The wires enter the cargo area for connection to the Auxiliary Batteries.

Step 6-48. Model depiction of partition and cables





- This is a modeled representation of the partition and wires for diagrams in later pages.
- The through holes are of a common partition that is used. The orientation of the holes are not significant for procedure.
- Please ensure through hole grommets are used.

Section 7A: Vehicle Interface - Remote Switch Harness Layout [KIT 61697]

Step 7A-1. 61697 PRE-ASSEMBLED Remote Harness

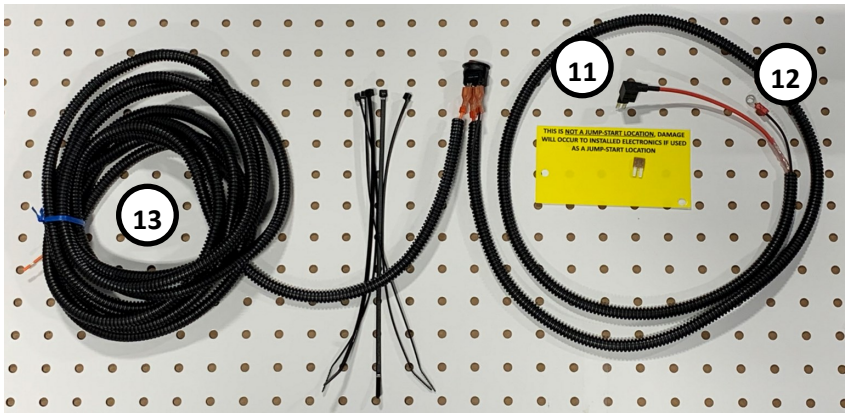


Diagram 7A-1: Remote Switch Harness Kit

Be aware that the switch will not be connected until after the harness is installed and the knee panel is

11 ADD-A-FUSE WIRE to SWITCH, **"WIRE #11"**- RED wire, Black Corrugate, HAAT

12 GROUND WIRE to SWITCH,**"WIRE #12"** - BLACK wire, Ground

13 TIMER to INVERTER ,**"WIRE #13"** - ORANGE wire, Black Corrugate, Remote Signal

DIAGRAM 7A-2: The 61697 Remote Switch Harness Diagram.

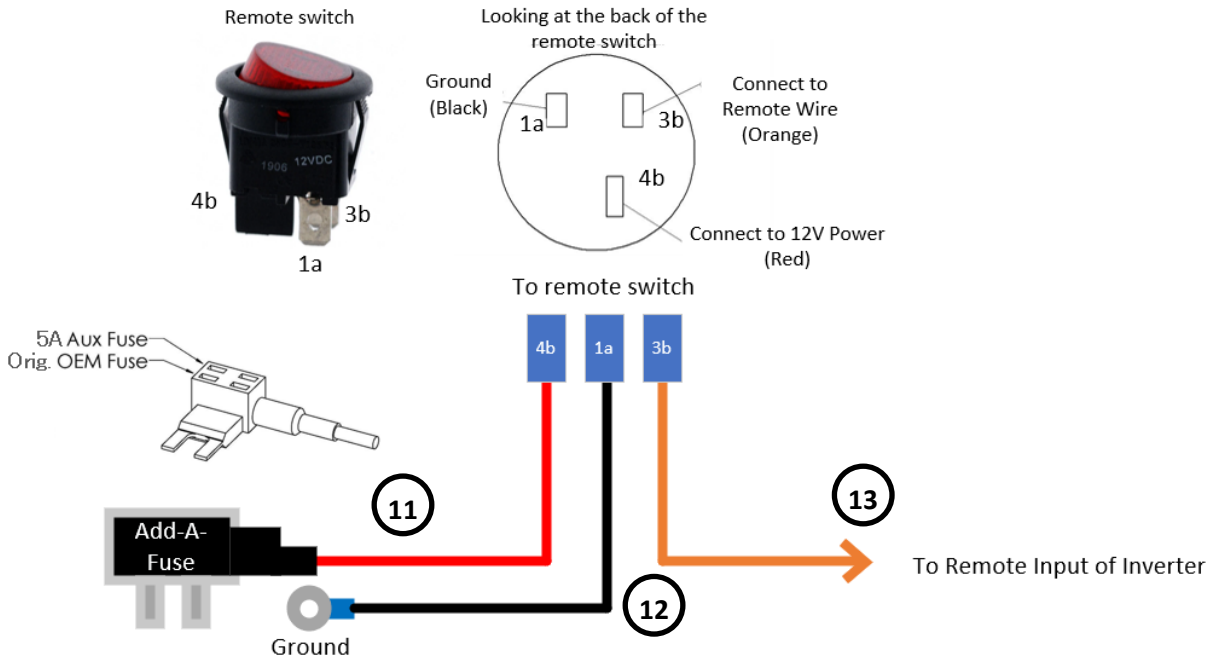


Diagram 7A-2: Remote Switch Harness Kit Schematic

- A diagram of the remote switch harness assembly is shown in image above.
- It is pre-assembled excluding the switch, which is separate.
- The remote switch will be installed in the shift lever bezel as shown in Step **7-19.**
- The three spade connectors attached to color coded wire will be attached to the terminals of the switch after pulling them through the hole made in the knee bolster as shown above.

Section 7A: Vehicle Interface - Remote Switch Harness Layout [KIT 61697]

Step 7A-3. Preparation to Connect 61697 Remote Switch

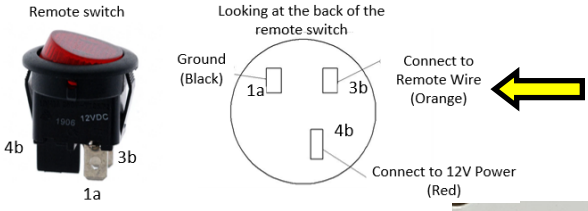


Diagram 7A-3: KIT 61697 Remote Switch Connections

- The crimped on spade terminals of **WIRES #11, #12, and #13** will be pushed firmly onto the stakes of the provided switch (according to Diagram 7A-2) ***after*** being pulled through the switch hole drilled earlier in the shift bezel.

Section 7B: Vehicle Interface - Remote Switch Harness Layout [KIT 62886]

Step 7B-1. PRE-ASSEMBLED 62886 Timer Harness Layout

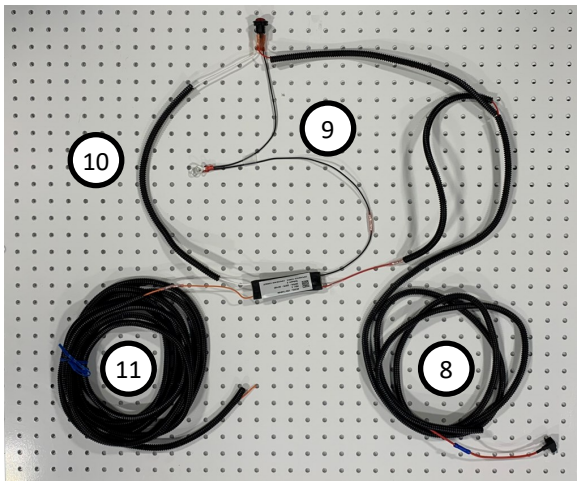


Diagram 7B-1: Remote Harness Layout

Be aware that the switch will not be connected until after the harness is installed and the knee panel is

8 ADD-A-FUSE WIRE to SWITCH and TIMER, **"WIRE # 8"-** RED wire, Black Corrugate, HAAT

9 GROUND WIRE to SWITCH and TIMER, **"WIRE # 9"** - BLACK wire, Ground

10 REMOTE SWITCH to TIMER **"WIRE # 10" -** WHITE wire, Black Corrugate, Switch Signal

11 TIMER to INVERTER **"WIRE # 11"** - ORANGE wire, Black Corrugate, Remote Signal

DIAGRAM 7B-2: The 62886 Remote Switch Harness Diagram.

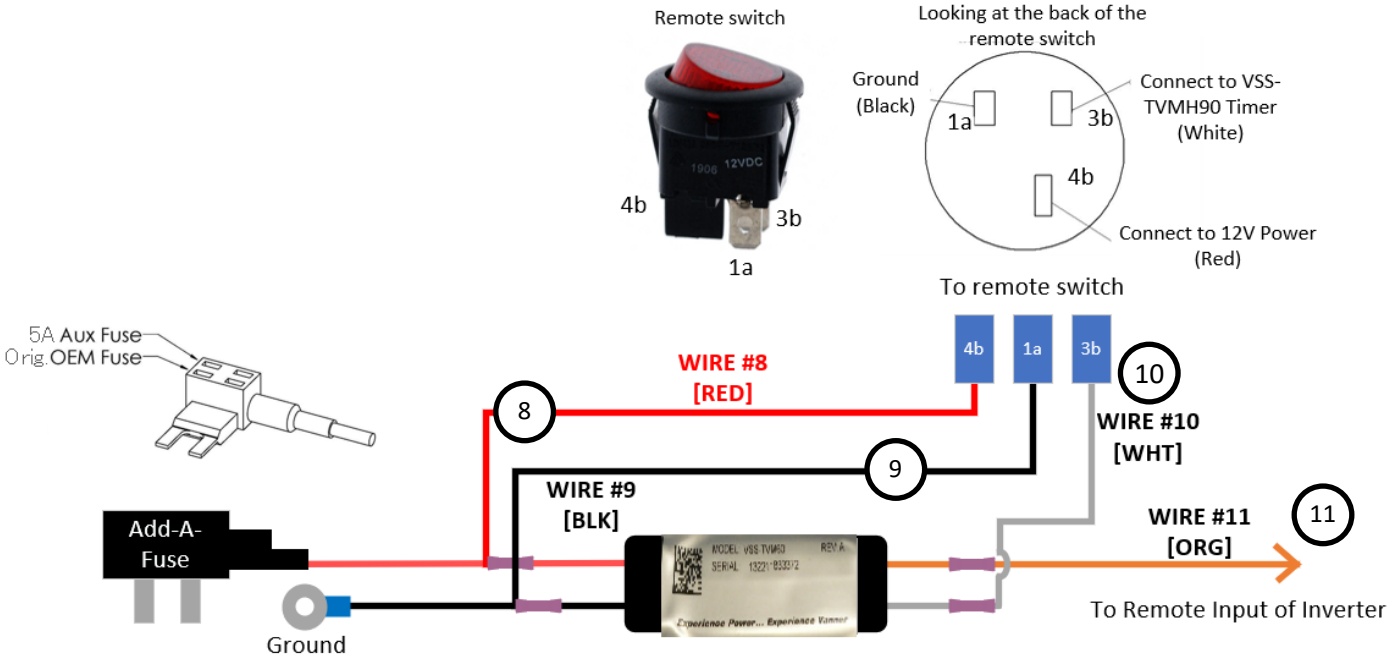
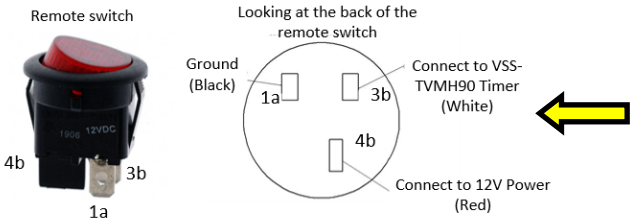


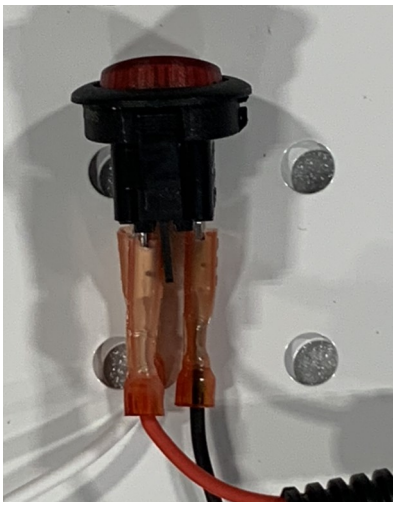
Diagram 7B-2: Remote Switch & Timer Harness Kit

- A diagram of the remote switch and timer harness assembly is shown in image above.
- It is pre-assembled excluding the switch, which is separate.
- The remote switch will be installed in the shift lever bezel as shown in Step **7-19**.
- The three spade connectors attached to color coded wire will be attached to the terminals of the switch after pulling them through the hole made in the knee bolster as shown above.

Section 7B: Vehicle Interface - Remote Switch Harness Layout [KIT 62886]

Step 7B-3. Preparation to Connect 62886 Remote Switch



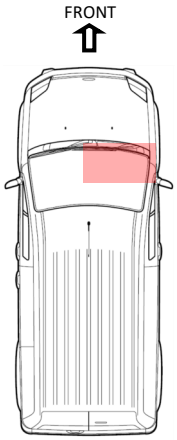


- The crimped on spade terminals of **WIRES #8, #9, and #10** will be pushed firmly onto the stakes of the provided switch (according to Diagram 7B-2) ***after*** being pulled through the switch hole drilled earlier in the shift bezel.

Diagram 7B-3: KIT 62886 Remote Switch Connections

Section 7: Vehicle Interface - Remote Wiring Routing:

Step 7-1. Locate fuse panel behind glove box



- The Ford Transit Connect inverter remote control kit utilizes some of the existing electrical circuitry in the vehicle.
- The circuitry (fuse box) behind the glove box access door.
- The passenger door will need to be opened.

Step 7-2. Glove box Removal

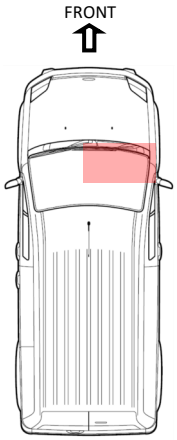
- Empty the glove box.
- There are release latches/stops on both sides of the glovebox back surface (see arrows).
- Press these stops inward to release the glove box so that it drops toward the floor.

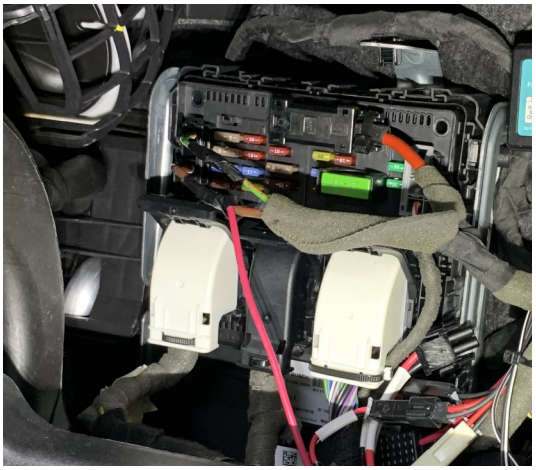
Step 7-3. Fuse panel in glove box cavity

- Unclip the bottom clips of the glove box carefully and remove it completely.
- Moving the passenger's seat back may be necessary.

Section 7: Vehicle Interface - Remote Wiring Routing:

Step 7-4. Accessing the fuse panel Behind Glovebox



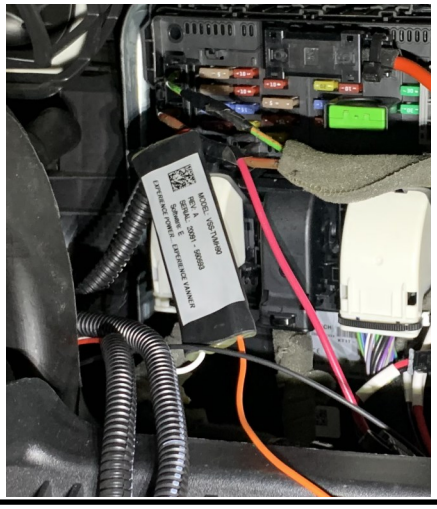


- As seen in figures 5-3 and 5-4, the BCM fuse panel is located on the wall between the engine and the cabin.

Step 7-5. Begin routing wire looms

- For KIT 61697– Only run single (Red and Black wire only) loom, Orange wire will be added later)
- For Kit 62886– Run switch wire loom and Orange remote wire loom
- Feed the switch and orange remote wire looms in through the glovebox cavity and down through the opening below the dash area.

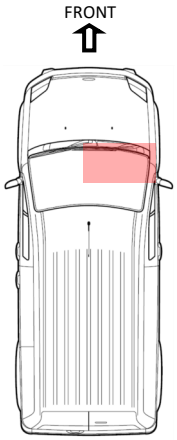
Step 7-6. Prepare to make connections onto Fuse panel

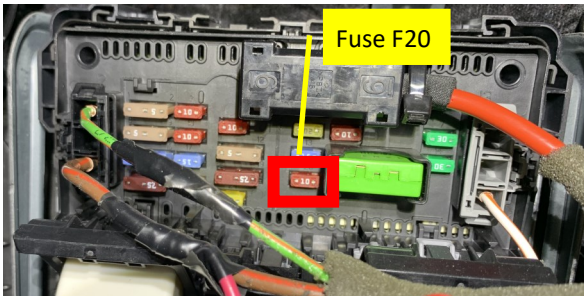


- Bring the whole harness into the glove box cavity to begin connections.
- For KIT 61697– Red and Black wires will be connected only– one loom will feed through to switch in shift bezel.
- For Kit 62886– The timer module *along with* Red and Black wires will be connected to the panel— two looms will feed through to switch in shift bezel.

Section 7: Vehicle Interface - Remote Wiring Routing:

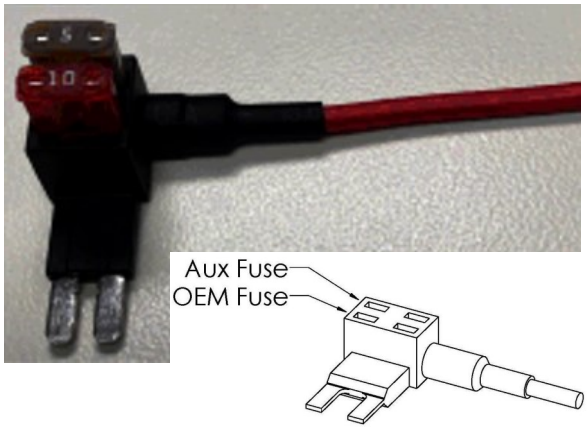
Step 7-7. Remove Existing Fuse





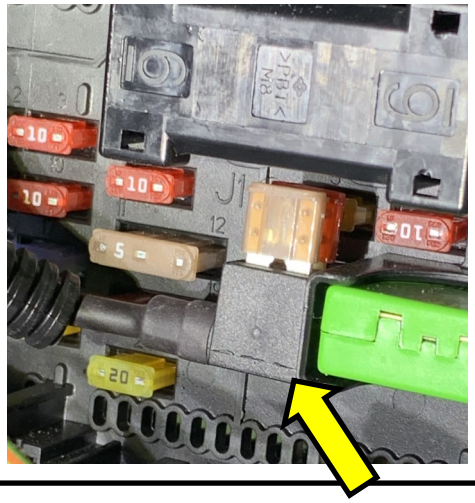
- Remove Fuse #20's Fuse and put it into the Add-A-Fuse holder as shown below [10A Red].

Step 7-8. Insert the Add-A-Fuse into Panel



- The 5A AUX Fuse piggyback fuse is for the inverter's remote switch. It is the red wire previously mentioned..

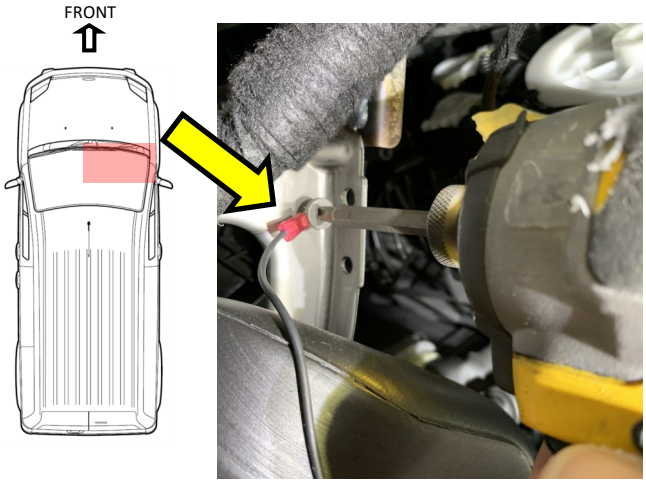
Step 7-9. Add-A-Fuse fitment into fuse panel



- The Add-A-Fuse is shown to the left (See Yellow arrow) inserted firmly into FUSE #20's location.

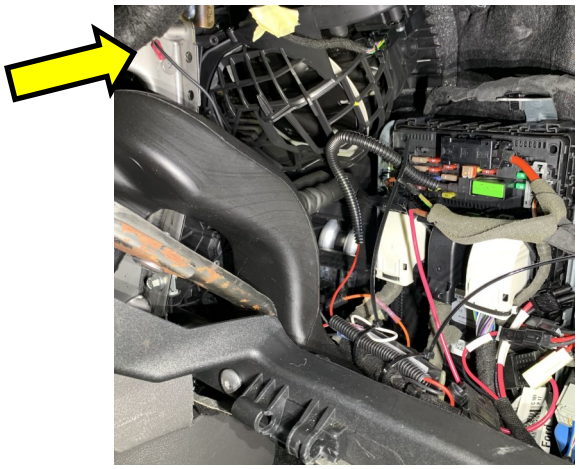
Section 7: Vehicle Interface - Remote Wiring Routing:

Step 7-10. Fastening ground ring terminal



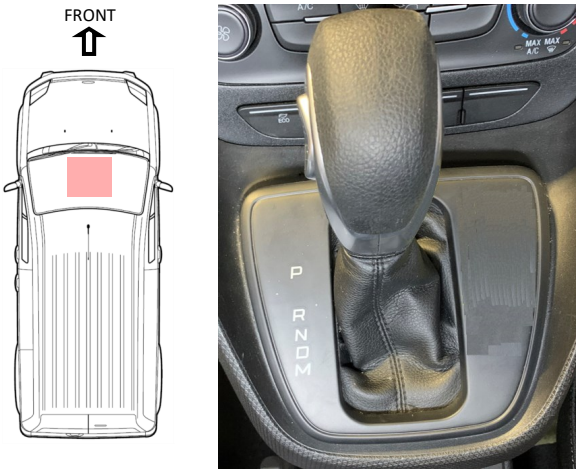
- The ground ring terminal on ground **WIRE #12 [#9]** is fastened to the steel sub-structure to the left of the glove box opening using a self-tapping screw (Tek screw Ref. NO.:11).
- Location chosen here (Yellow Arrow) allows easy fastening.

Step 7-11. Ground ring terminal fitment in glove box cavity



- The timer and/or the harnessing is carefully wire tied to another existing harness in order not to interfere with the opening or closing of the glovebox.
- Finish pulling through the two looms (Orange wire + Red, BLK, WHT) for Kit 62886 OR RED and BLK single loom for KIT 61697—**as started in Step 7-8.**

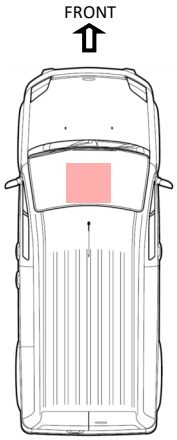
Step 7-12. Preparation for the Remote Switch



- This bezel cover can be carefully pried and detached using a trim tool.
- The bezel is captured by the shift lever, so it cannot be completely removed.

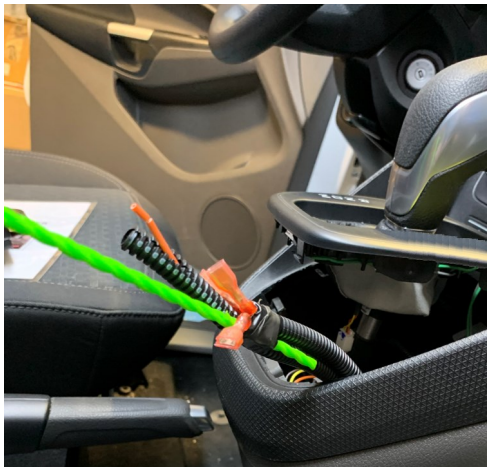
Section 7: Vehicle Interface - Remote Switch Wiring

Step 7-13. Pulling the switch and remote wires to the shift bezel



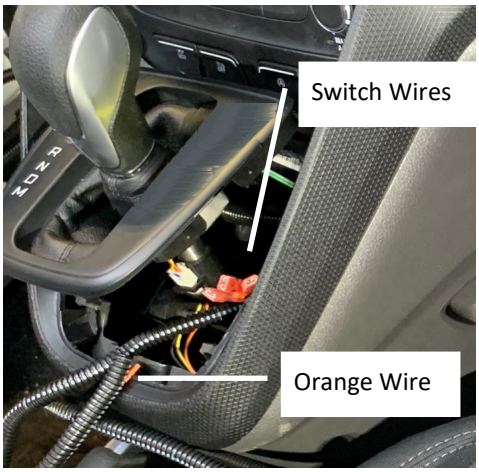
- After bezel is unclipped, feed wire fish tape down through the shift console to the passengers floor below the glove box.
- Tape the switch and the orange looms Kit 62886 or the RED and BLK single loom KIT 61697 to the fish tape and pull out through shift console in the switch area.

Step 7-14. Switch Harness and orange wire pulled through



- Be careful to avoid the shift mechanism area (stay to the right).
- When fish tape is pulled through, detach the wires and prepare to connect the switch.

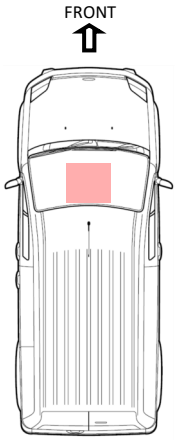
Step 7-15. Continue to pull through Orange wire (*Kit 62886 only*)

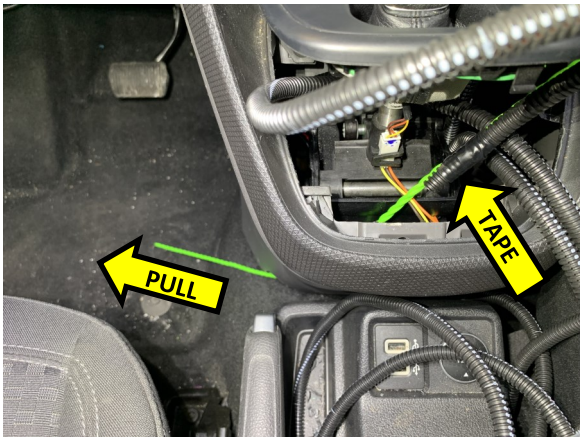


- After un-taping the fish tape, continue to pull **all** of the extra length the Orange wire through (*Kit 62886 only*).

Section 7: Vehicle Interface - Remote Switch Wiring

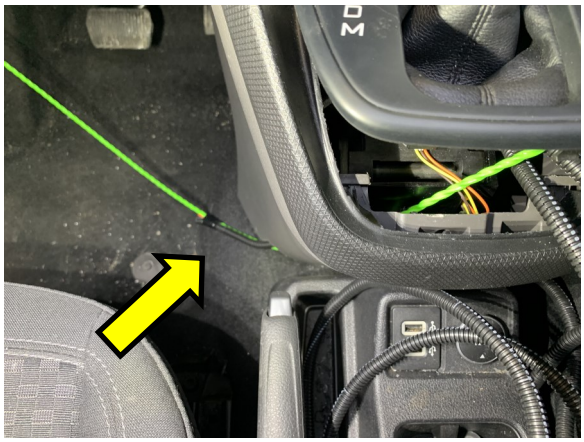
Step 7-16. Route the fish tape down console





- Again take the fish tape and route down the driver's side of the center console to the floor.
- Tape the orange wire to the fish tape at the portion above the shift lever (See Yellow Arrow).
- <u>The orange wire is pulled through for either kit in this step.</u>

Step 7-17. Pull down the orange wire (Both Kits)



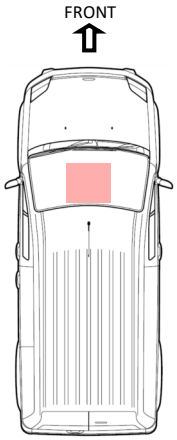
- Continue pulling the fish tape downwards so that the orange wire is guided to the floor on the driver's side (See Yellow Arrow).
- Stop pulling while there is still about a foot of orange wire in the shift lever area...

Step 7-18. The coil of orange wire ready for further routing

- The coil of orange wire will be routed with the cables towards the cargo area of the vehicle.

Section 7: Vehicle Interface - Switch Installation

Step 7-19. Switch Installation



- The switch will be installed for both kits in the gearshift enclosure on the center console.
- The location of the 3/4" diameter hole will be at the location 1 –1/2" down from top and 1" from the right edge of the cover.
- The drilling will be carefully done in a protected position utilizing a Unibit step drill.
- The yellow label will be installed in Section 16.

Step 7-20. Pull remote wires through bezel hole

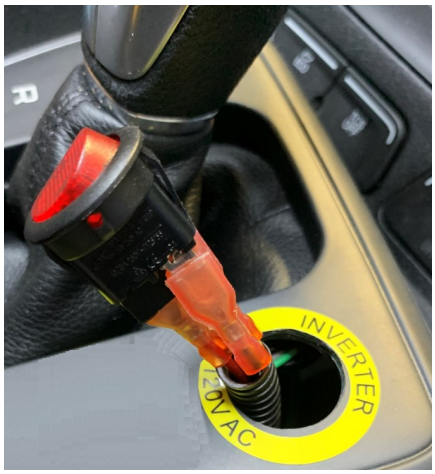
The remote switch wire will be:

- For Kit 62886: one loom with three terminals

OR

- For KIT 61697: Two Looms—one with two terminals (back and red) and one loom with an orange wire with terminal
- Pull out the wires through the switch hole in the shift console bezel as shown to the left.

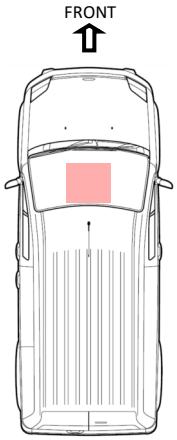
Step 7-21. Connect the switch to wires

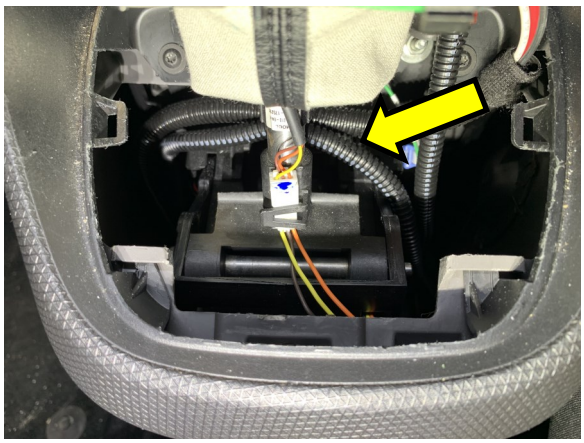


- Kit 61697: Connect according to wire color and stake diagram [1a (Black),3b (Orange) , 4b (Red)]. See Diagram 7A-2 for reference.
- Kit 62886: Connect according to wire color and stake diagram [1a (Black),3b (White) , 4b (Red)]. See Diagram 7B-2 for reference.

Section 7: Vehicle Interface - Switch Installation

Step 7-22. Routing under the shift bezel





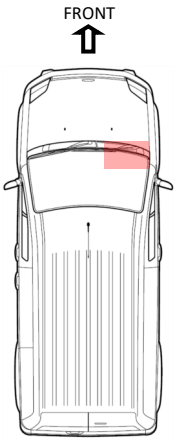
Ensure that the wiring does not impede the shifting action of the lever. Tie wrap cleanly out of the way.

- Make sure before pulling the remaining orange wire through to the floor on the driver's side that the loom is routed behind or above the shift lever towards the front of the vehicle (See Yellow Arrow).

Step 7-23. Replace the shift bezel

- The switch can now be snapped into position just before installing the bezel.
- The switch should have power from the installation of the Add-A –Fuse and ground in earlier steps.
- Make sure the switch is rotated so that when it is on and illuminated it is pushed forward to the front of the vehicle.
- The shift lever bezel can be snapped back into position

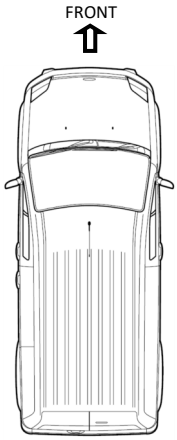
Step 7-24. Routing and Clipping in glovebox cavity



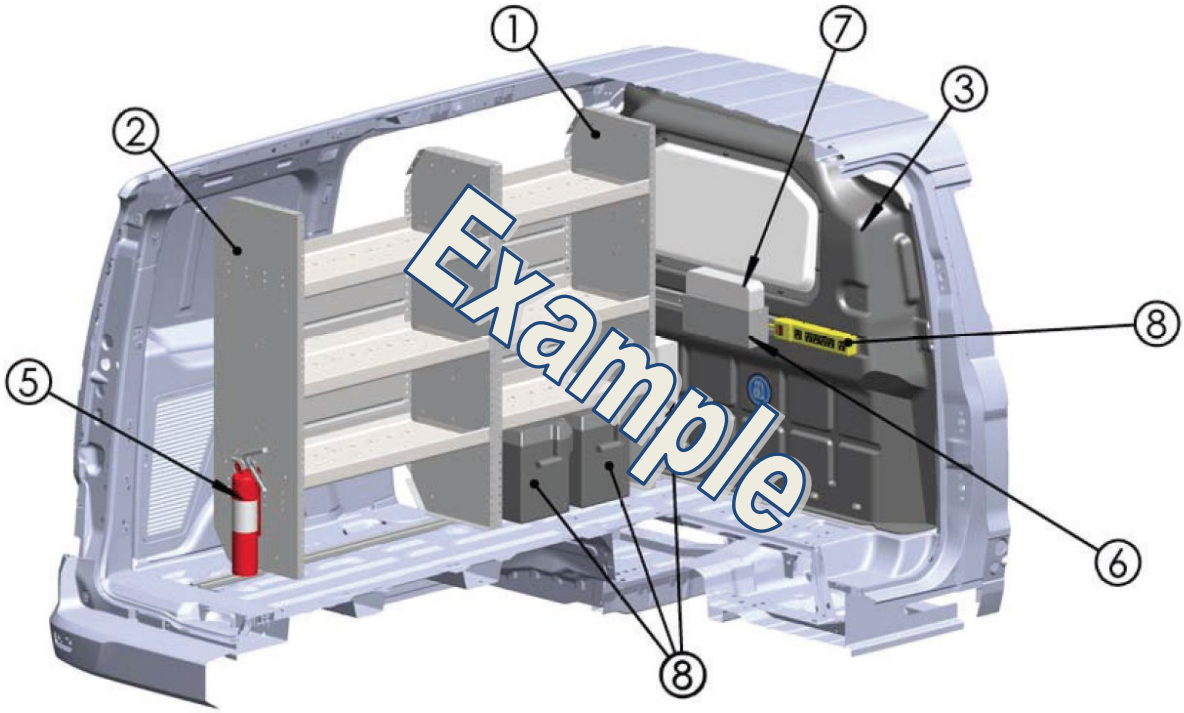
- Replace glove box after all wire is tied up and out of the way.

Section 8: Sales Order Drawing Discussion:

One or Two Auxiliary Battery Installation



Sales Order Drawing :



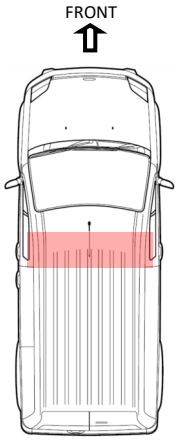
Important:

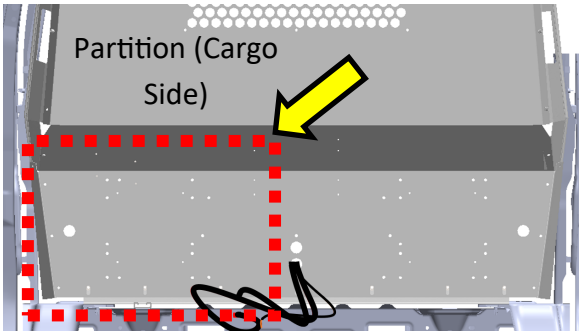
1) **The Sales order drawing, in accompaniment with this instruction, is necessary to determine placement of the inverter and the auxiliary batteries within the limits of the cabling and out of zones prohibited due to safety considerations (Fuel, HV, etc.).**
2) **This installation document covers the steps of installation and suggested locations, but cannot cover exact placement of key components like the contactors, fuses and auxiliary batteries due to specific customization of the structures (shelves, cabinets, etc.) in the cargo area.**
3) **The instructions herein show approximate placement, which is mainly dictated by the length of the cables. Variations are OK as long as :**
   - **Proposed placement does not place components directly in area where objects may fall on the inverter or any of the cable terminals, *and***
   - **There is full coverage of all connections and proper fitment of batteries and other components mounted to the vehicle, *and***
   - **Fastening guidelines are followed with proper hardware appropriate for mounting of components without environmental or vibration damage.**

- **SUMMARY: Usually the Sales order drawing does not give specific locations of some of the key components for the inverter system, but installer is still responsible for proper installation with the proper location and safety considerations, mounting hardware and tightening torques when required.**

Section 9: Inverter Installation onto Partition

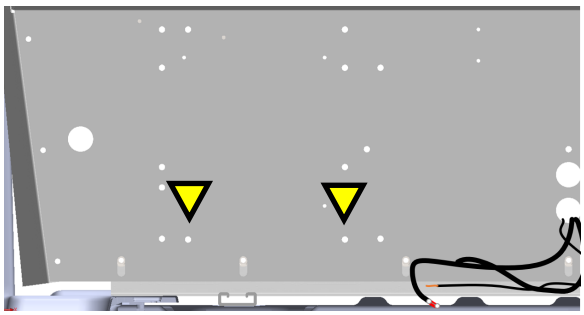
Step 9-1. Inverter mounting area on partition





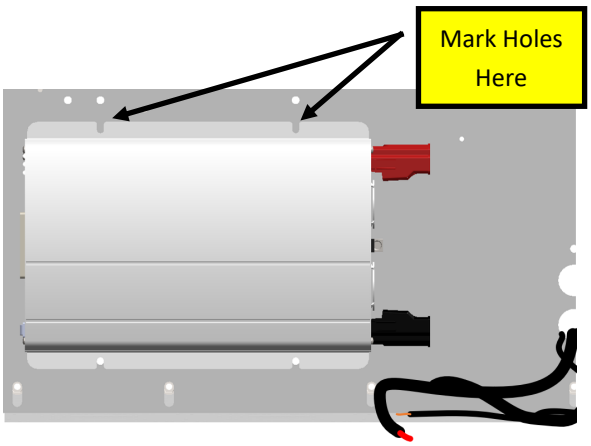
- Looking into the partition from the cargo area, several hole patterns can be seen across the bottom panel.
- We will focus on the holes demarked by the red box in the diagram to the left.

Step 9-2. Inverter mounting area on partition



- On the partition there are two holes near the bottom that are 7.7 inches apart.
- While supporting the inverter, align these holes with the bottom mounting slots on the inverter. It may help to install the inverter mounting screws FAS0055 (Ref. NO: 2) and FAS0018 Nuts (Ref. NO: 3) to hold the BOT-TOM of the inverter to the partition.

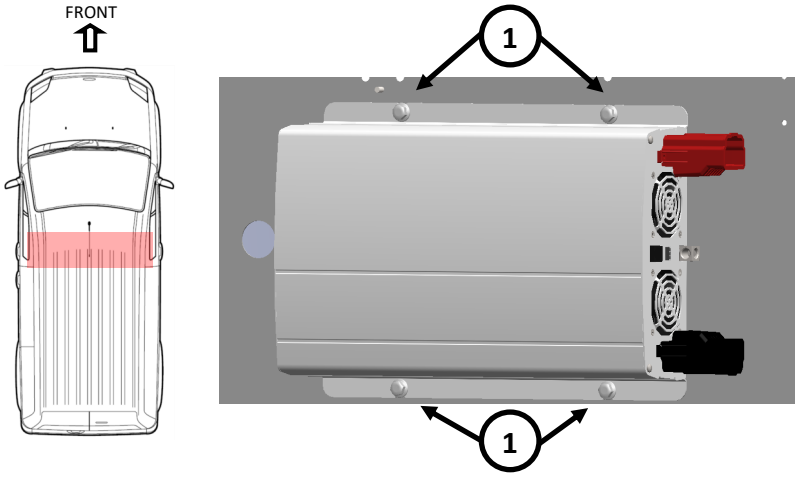
Step 9-3. Marking holes and fastening inverter



- Utilizing the inverter as a template- mark the top two hole positions from the mount slots on the inverter.
- The hole diameter or drill size should be 5/16”.
- The inverter mounting screws FAS0055 (Ref. NO: 2) and FAS0018 Nuts (Ref. NO: 3) will also be used here.

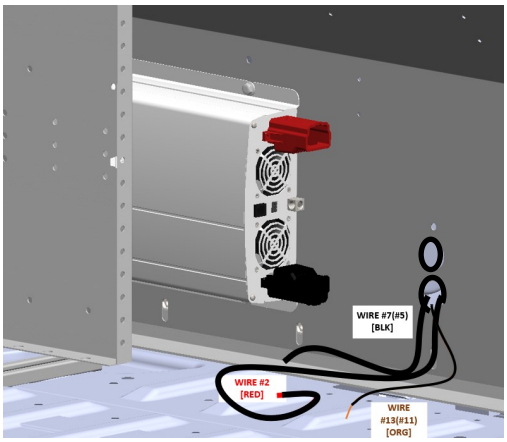
Section 9: Inverter Installation onto Partition

Step 9-4. Inverter fastener torque



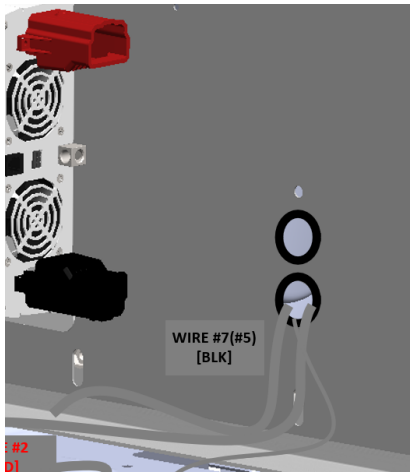
1 Torque mounting screws FAS0055 (Ref. NO: 2) and FAS0018 Nuts (Ref. NO: 3) to 12Nm [+/- 1.8Nm] (106lb.in).

Step 9-5. Ready to connect



- The next section will describe connections of the cables and wires to the inverter.

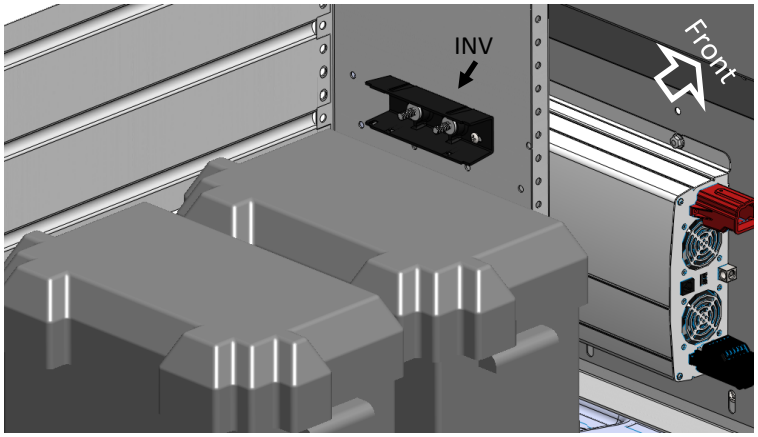
Step 9-6. Grommet installation



- Make sure the grommets are installed in the partition to reduce the chance of wear over time.

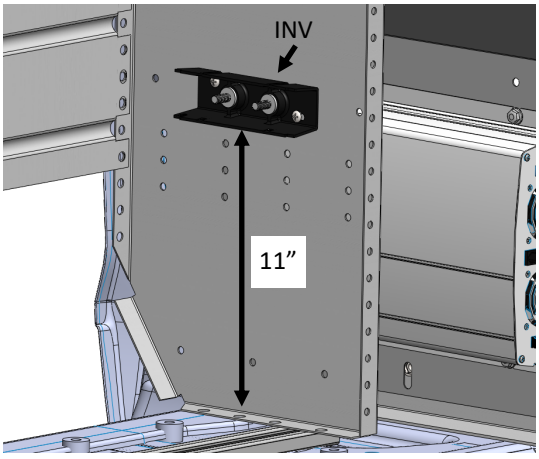
Section 10A: Mount Circuit Protection - Contactor/Voltage Controller [KIT 61697]

Step 10A-1. INV Fuse Holder mounting



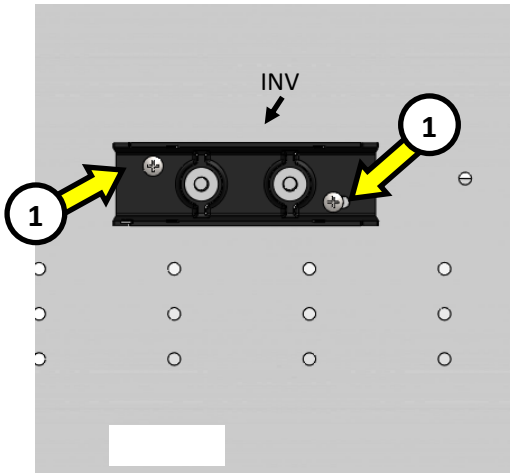
- Place the cover on the battery box temporarily.
- Locate the AUX Fuse holder and INV fuseholder on a surface near the battery post.
- Keep in mind the length of all wires going between the battery and the fuse holders in order to make sure distances are minimized

Step 10A-2. INV Fuse Holder mounting



- The INV fuse holder should be set at 11” above the bottom of the shelf tab. This is the INV Fuse holder.
- Hold the fuse holder in position and mark the holes with a marker and remove the fuse holder.

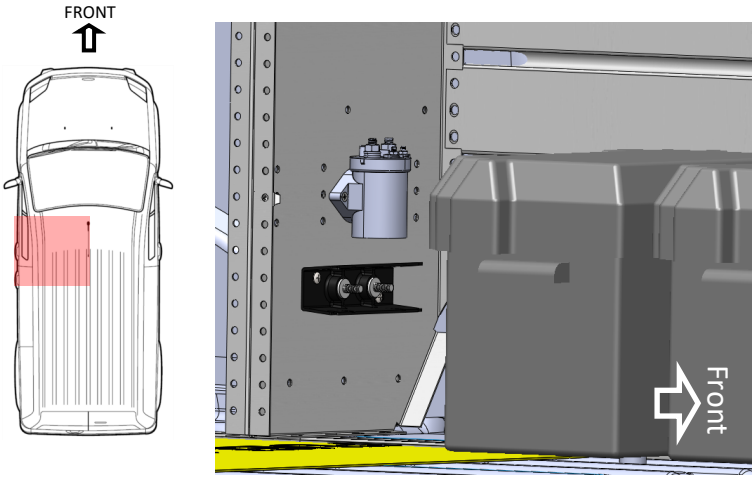
Step 10A-3. Fuse holder mounting holes and install



- If you have access to both sides of the surface: mark and drill 1/4” holes through the surface at the marks.
- (1) The AUX Fuse holder will be fastened to the side of the shelving by utilizing FAS0025 (Ref. NO:5) and FAS0029 (Re. NO: 6) torqued to: 3Nm [+/- 0.5Nm] (27lb.in).
- Alternately– if attaching to sheet metal with no access for a nut– use self tapping screws FAS0360 (Ref. NO: 12) after Marking hole positions.

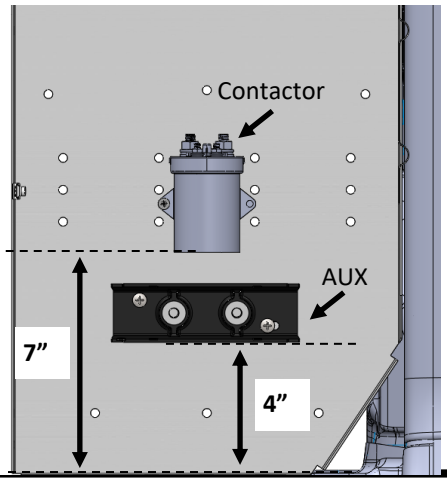
Section 10A: Mount Circuit Protection - Contactor/Voltage Controller [KIT 61697]

Step 10A-4. Contactor & AUX Fuse Holder mounting



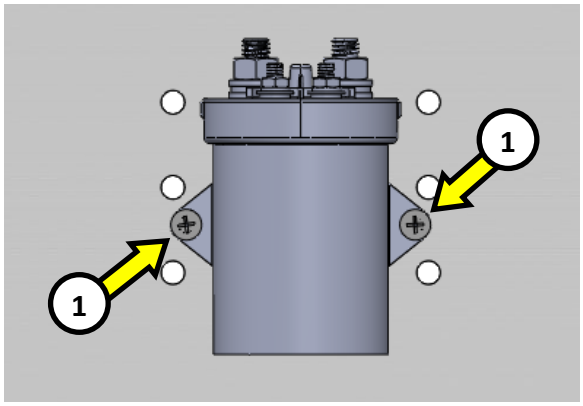
- Locate the Contactor and AUX Fuse holder on **opposite surface of the shelving** from the INV fuse holder.
- Keep in mind the length of all wires going between the battery and the fuse holders in order to make sure distances are minimized

Step 10A-5. Mounting dimensions



- The Contactor should be centered 7” above the bottom tab of the shelf.
- The AUX fuse holder should be centered at 4” above the bottom of the side of the shelf tab.
- Mark through the four mount holes with a marker (example position in yellow circle) onto the surface.

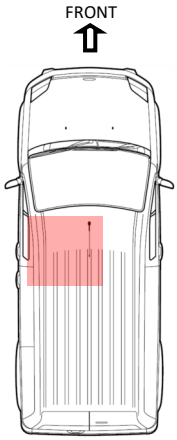
Step 10A-6. Contactor installation

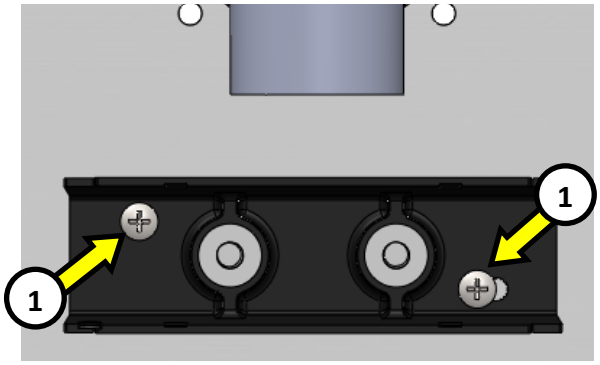


1. If you have access to both sides of the surface: and drill 1/4” holes through the surface at the marks.
- The Contactor will be fastened to the side of the shelving by utilizing FAS0020 (Ref. NO:14) and FAS0032 (Ref. NO:14) fasteners torqued to: 3Nm [+/- 0.5Nm] (27lb.in).
- Alternately– if attaching to sheet metal with no access for a nut– use self tapping screws FAS0629 (Ref. NO: 13)

Section 10A: Mount Circuit Protection - Contactor/Voltage Controller [KIT 61697]

Step 10A-7. Installation of fuse holder





Caution: Fuses will be put in at the end of the procedure for safety.

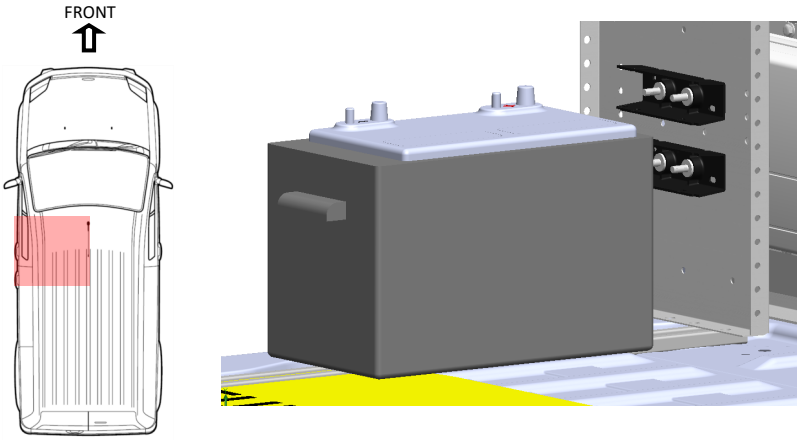
- If you have access to both sides of the surface: mark and drill 1/4" holes through the surface at the marks.

1 The fuse holders will be fastened to the side of the shelving by utilizing FAS0025 (Ref. NO:5) and FAS0029 (Re. NO: 6) torqued to: 3Nm [+/- 0.5Nm] (27lb.in).

- Alternately– if attaching to sheet metal with no access for a nut– use self tapping screws FAS0360 (Ref. NO: 12) torqued to: 3Nm [+/- 0.5Nm] (27lb.in).

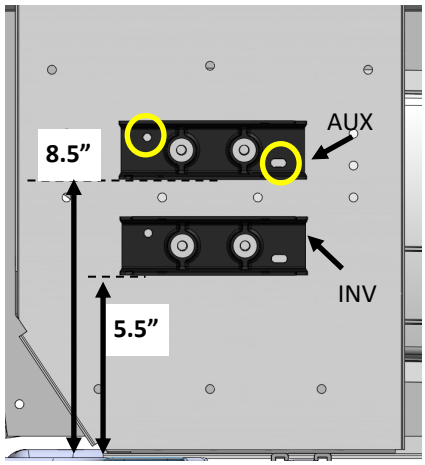
Section 10B: Mount Circuit Protection - Fuse Holders [KIT 62886]

Step 10B-1. AUX & INV Fuse Holder mounting



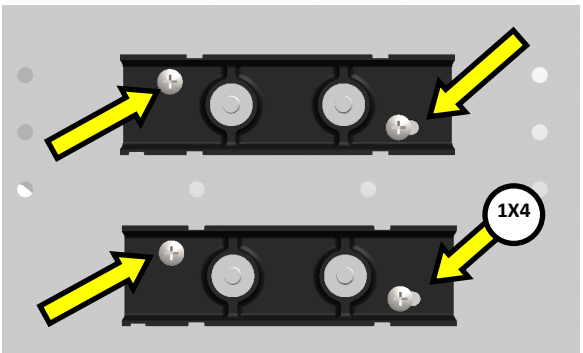
- Locate the AUX Fuse holder and INV Fuse-holder on a surface near the positive battery post.
- Keep in mind the length of all wires going between the battery and the fuse holders in order to make sure distances are mini-mized.

Step 10B-2. Mounting on side near partition



- The lower fuse holder should be centered *and* at about 5.5” above the bottom flange of the shelf. This is the INV Fuse holder.
- The AUX fuse should be centered at about 8.5” above the bottom flange of the shelf. This is the INV Fuse holder.
- Mark through the four mount holes with a marker (example position in yellow circle) on-to the surface.

Step 10B-3. Fastening the fuse holders



1

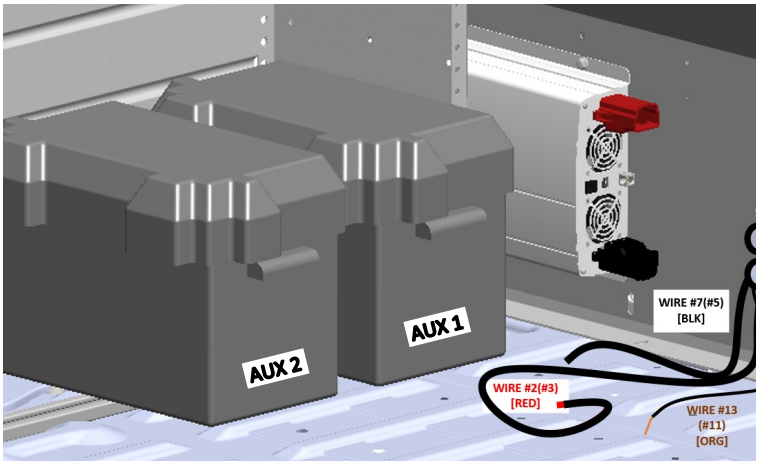
- If you have access to both sides of the surface: mark and drill 1/4” holes through the surface at the marks.

The fuse holders will be fastened to the side of the shelving by utilizing FAS0025 (Ref. NO:5) and FAS0029 (Re. NO: 6) torqued to: 3Nm [+/- 0.5Nm] (27lb.in).

- Alternately– if attaching to sheet metal with no access for a nut– use self tapping screws FAS0360 (Ref. NO: 12) torqued to: 3Nm [+/- 0.5Nm] (27lb.in).
- The fuseholders are ready for cable connections.

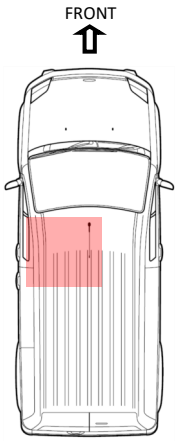
Section 11A: Install/mount Dual AUX battery [Kit 61697]

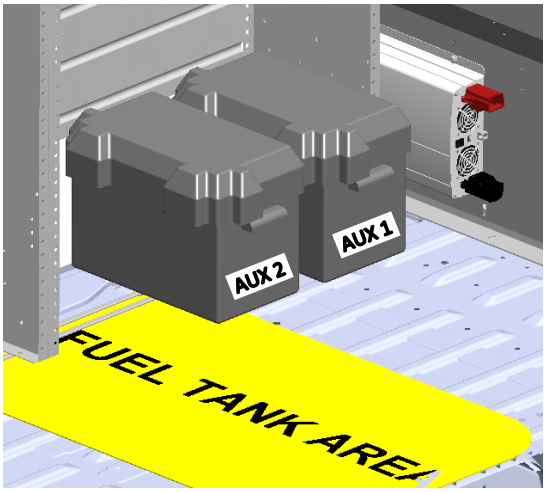
Step 11A-1. Battery Box positioning



- The dual AUX Battery Boxes are mounted in this orientation behind the partition in the cargo area.
- They will straddle the rail if it is present.
- Be sure the location of the system is near enough to the inverter and ensures optimal placement next to the fuse holders.

Step 11A-2. Position discussion of battery box

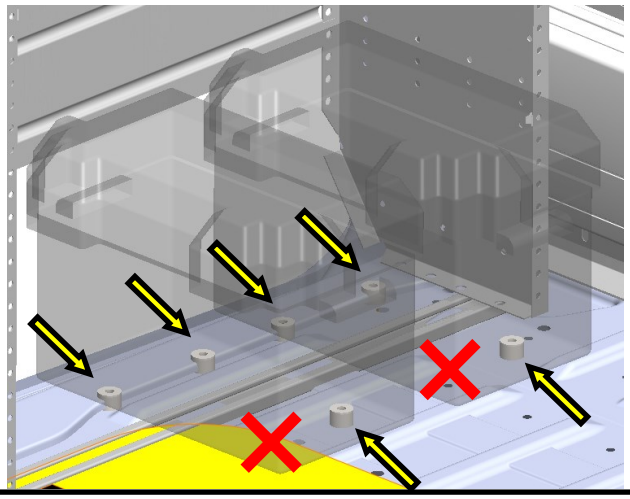




Caution: The fuel tank approaches the mounting area for the battery

- The battery boxes will be near the fuel tank area keep-out.
- A three point mount will be used.
- There cannot be drilling into the fuel tank keep out area.

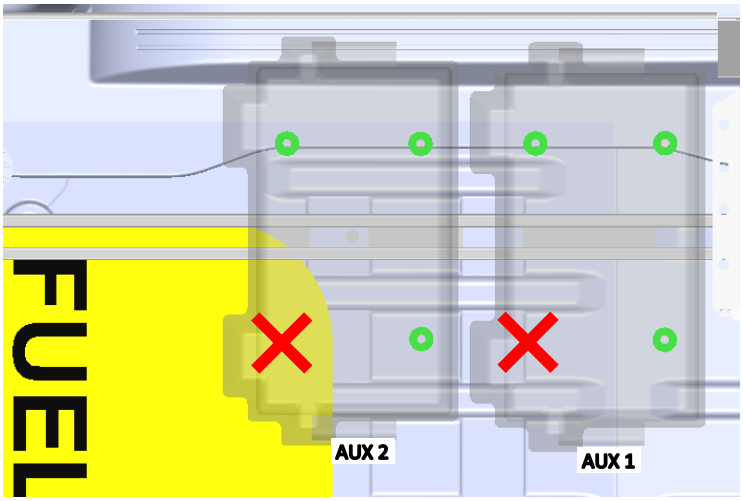
Step 11A-3. Safe hole positions for mounting



- The mounting points are shown through the transparent battery box in the diagram (See Yellow Arrows).
- There will not be a mounting hole at the red “X”s.
- The pattern is followed for both boxes so that there can be more confidence in the install.

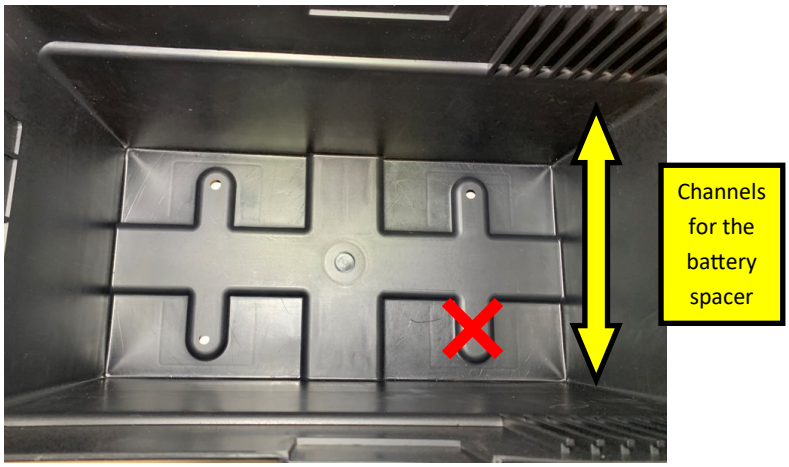
Section 11A: Install/mount Dual AUX battery [Kit 61697]

Step 11A-4. Battery Box positioning under shelf



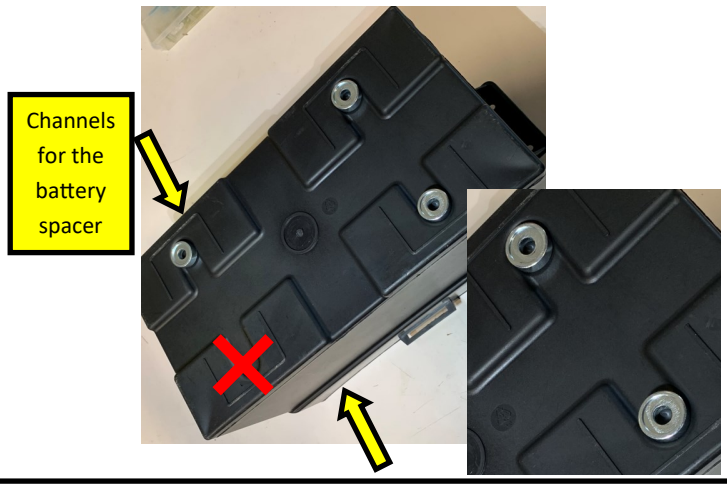
- The mounts will be placed in this position using the following steps:
  - Mark hole positions on battery box
  - Drill the battery box
  - Use the battery box as a template
  - Mark the hole locations on the floor of the vehicle

Step 11A-5. Marking and drilling holes



- Be mindful of the channels or ridges in the battery boxes.
- They are meant to secure the battery from sliding within the box.
- These channels will be toward the center of the vehicle.
- The no-drill “X” will be located towards this feature.

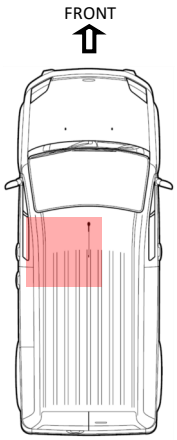
Step 11A-6. Mark hole positions on battery box

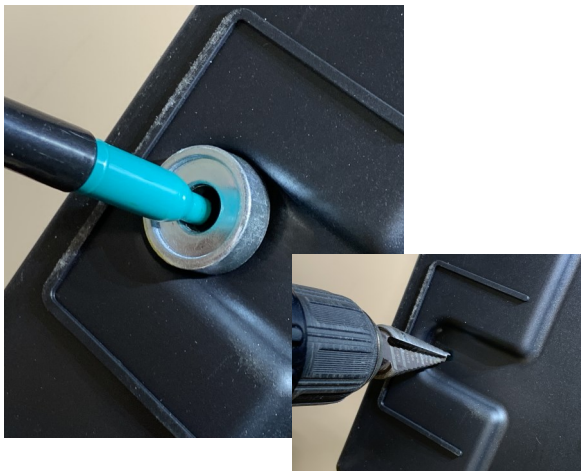


- The battery box should be turned over
- Take three of the spacers (Ref. NO: 9) and place them within the ends of the rounded channels for marking.
- Do not mark a hole for a spacer at the red “X” Position

Section 11A: Install/mount Dual AUX battery [Kit 61697]

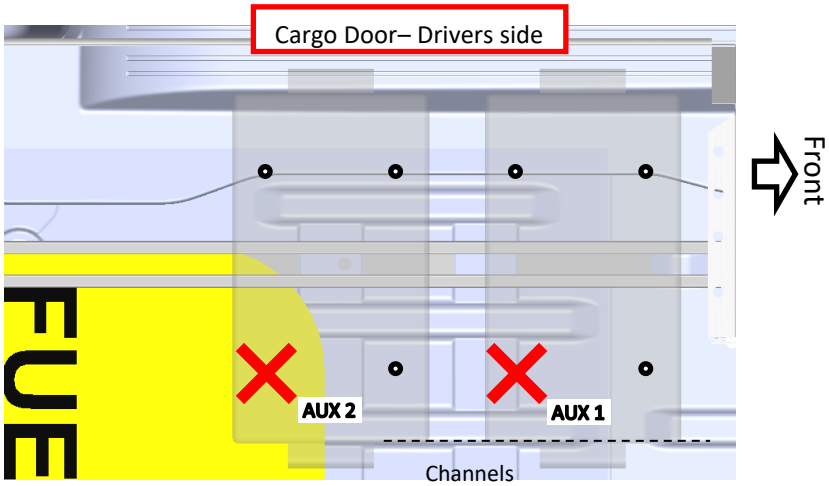
Step 11A-7. Marking and drilling holes





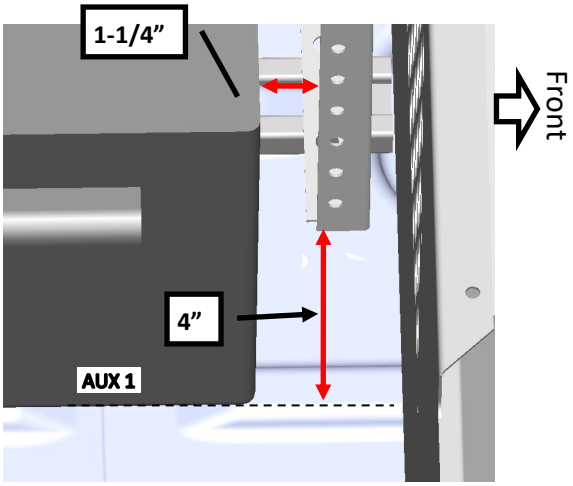
- Mark the center hole locations of each spacer.
- After the hole locations are marked, the box is put onto a safe drilling surface and a 1/2” hole is drilled at three locations on each box.

Step 11A-8. Planning box position on ridge



- The diagram to the left shows the boxes in their approximate placement.
- In the next step the distances should be followed in order to make sure the battery boxes are not too far over...

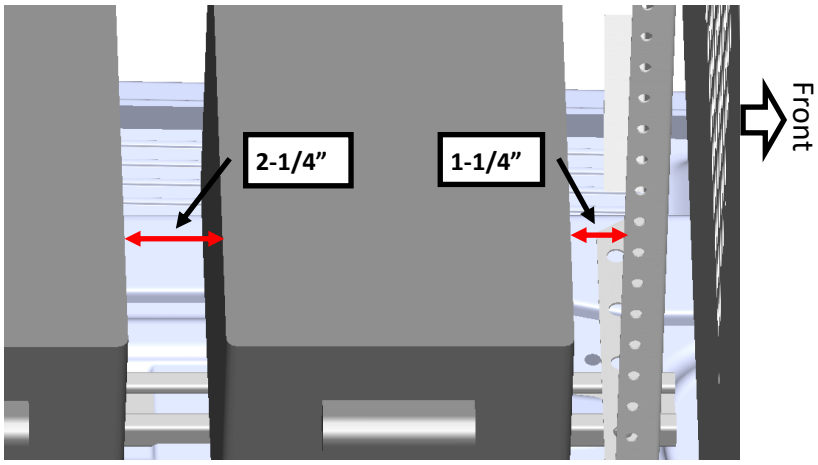
Step 11A-9. Reference positioning of AUX 1 Box



- The AUX 1 box will set approximately 4” forward of the front edge of the shelf.
- It will align with the edge of the floor ridge that it sets on (the edge nearer to the center of the vehicle). (See dotted line to the left and above).

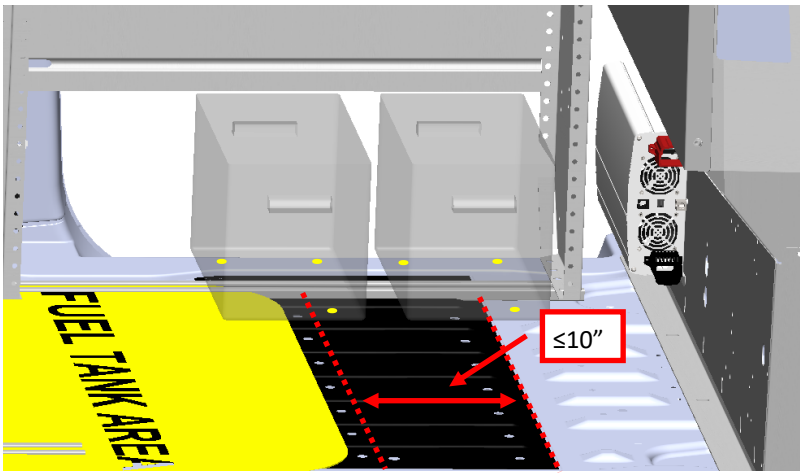
Section 11A: Install/mount Dual AUX battery [Kit 61697]

Step 11A-10. Reference position of AUX 2 Box



- The following distances should be observed to ensure adequate space and wire length:
  - From forward AUX 1 Box (no lid) edge to inside edge of shelf: 1-1/4”
  - Distance between Aux 2 Box and Aux 1 Box (With no lids): 2-1/4”

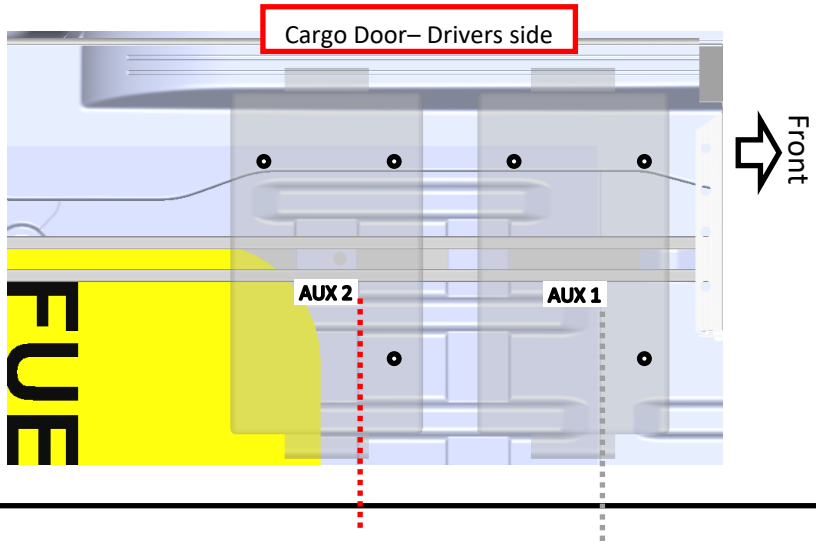
Step 11A-11. Checking against floor plate



Caution: The fuel tank approaches the mounting area for the battery

- As a check: Using the forward edge of the black plate floor covering, be sure there are no holes to be drilled into the floor for the battery boxes.
- If the leading edge of the plate cannot be seen, the cab drop down behind the partion in this picture can be used as a reference for 22”

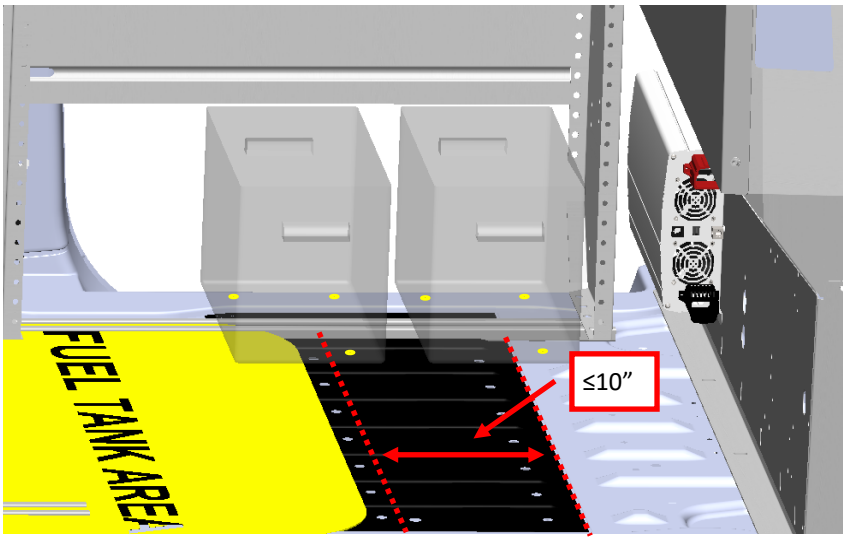
Step 11A-12. Transfer marking the holes onto floor



- The box is now placed in its intended position and the positions of the drilling points are marked through the holes in the bottom of the battery box (be sure to read Section 9 about position planning of the boxes).
- After the hole locations are marked, set the box aside
- The markings for the holes will be transferred to the vehicle floor.

Section 11A: Install/mount Dual AUX battery [Kit 61697]

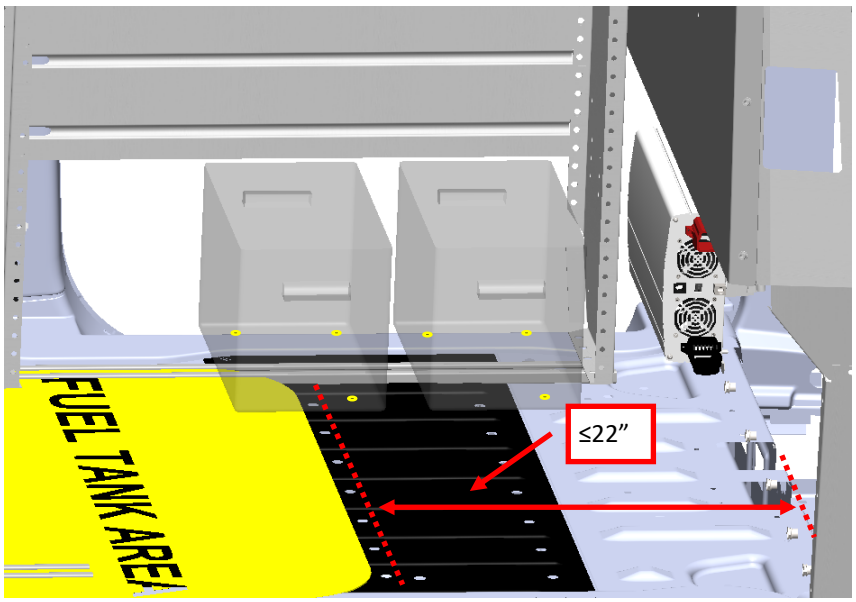
Step 11A-13. Limit line for drilling holes in floor



Caution: The fuel tank approaches the mounting area for the battery– it is best to stay forward of this line.

- As a final check: Using the forward edge of the black plate floor covering to measure rearwards. There are no holes to be drilled into the floor for the battery boxes beyond 10” from this edge.

Step 11A-14. Alternate Limit line for drilling holes in floor

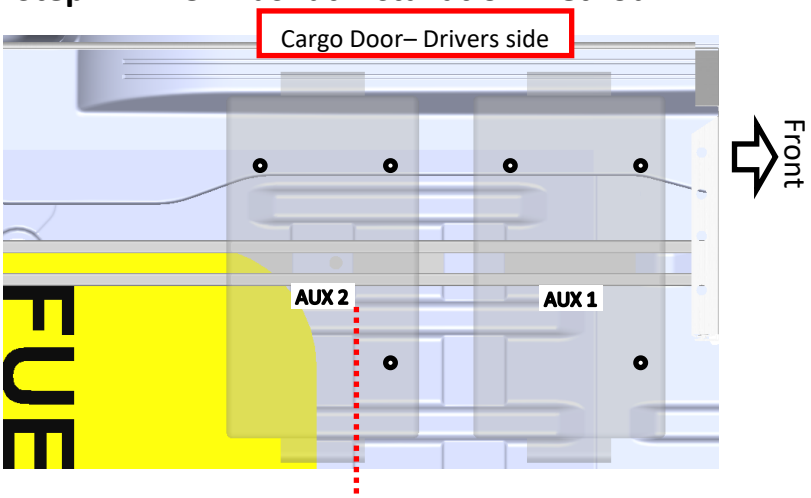


Caution: The fuel tank approaches the mounting area for the battery– it is best to stay forward of this line.

- If the leading edge of the plate cannot be seen (perhaps due to floor covering, the drop down between the cargo and cabin areas (behind the partition) in this picture can be used as a reference for 22”.
- There are no holes to be drilled into the floor for the battery boxes beyond 22” from this edge.

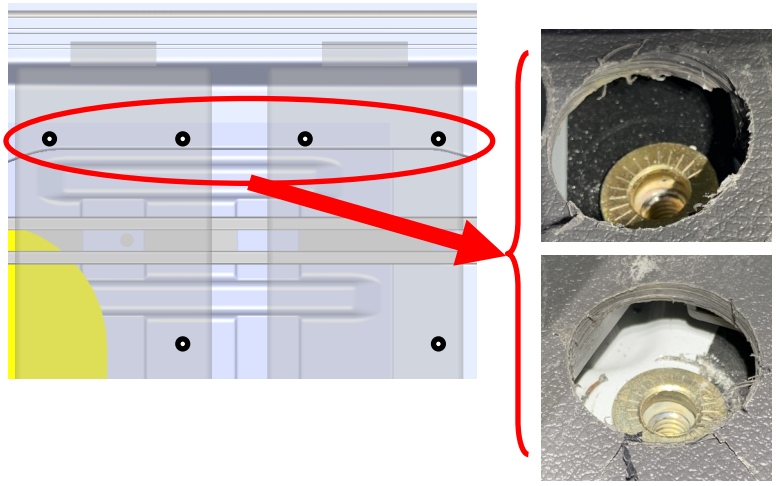
Section 11A: Install/mount Dual AUX battery [Kit 61697]

Step 11A-15. Plusnut installation method



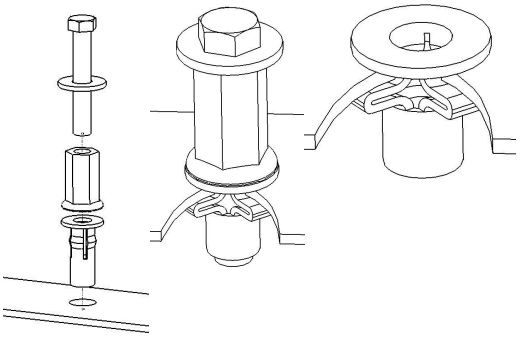
- Utilize a 1/2” drill with a depth stop of ~3/4” at the six (6) marked locations.
- If necessary, the depth of the drill can be deeper on the street side 4 holes, as there is not a fuel tank in that area.

Step 11A-16. Clearing holes and plusnut installation



- After drilling the four (4) primary holes for the plusnuts on the cargo door side, utilize a **1-3/16”** hole drill to take away the plastic trim material around the hole (see Red circle).
- If the vehicle has a flooring mat, this will also be necessary to do on the other two-holes.

Step 11A-17. Plusnut installation example



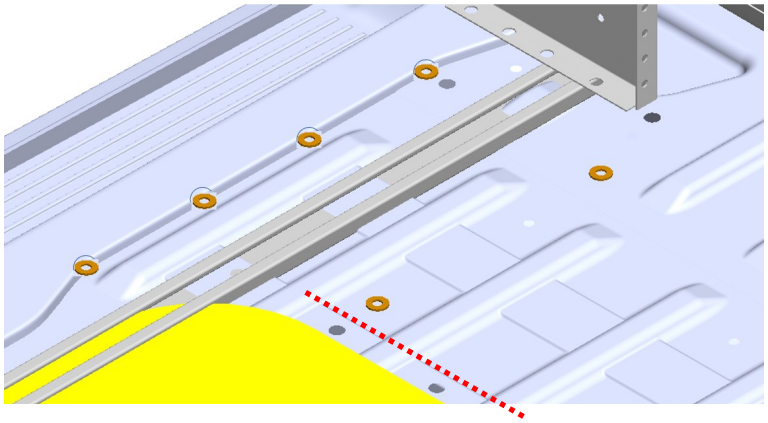
- After the hole locations are drilled, the plusnuts will be installed into the floor.
- NOTE: For more detailed plusnut installation instructions– See Appendix 18-B: Plusnut Installation Guide

Section 11A: Install/mount Dual AUX battery [Kit 61697]

Step 11A-18. Plusnut installation method

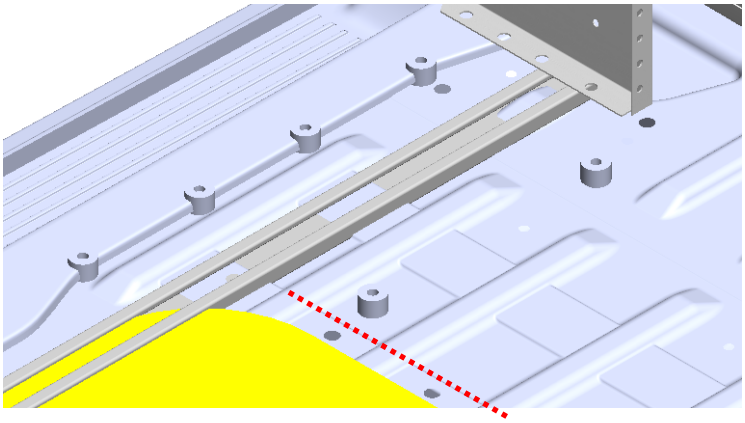
- After using a 1/2” drill to put holes into the floor to receive the plusnuts (Ref.NO:7).
- If there is a floor covering, 1-3/16” holes will need to be put into just the floor covering to allow for the plusnut to be installed flush to the floor surface.
- Utilize the plus nut gun to install the plus nuts (installation instructions are not supplied in this instruction– please use plusnut gun manufacturer’s instructions).

Step 11A-19. Battery Box mounting holes and plusnut installation



- The plusnuts are shown installed securely into the floor.
- NOTE: For more detailed plusnut installation instructions– See Appendix 18-B: Plusnut Installation Guide

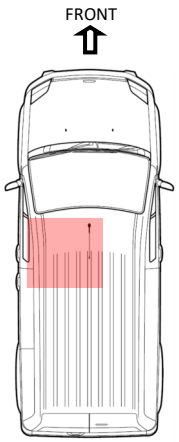
Step 11A-20. Mounting spacers

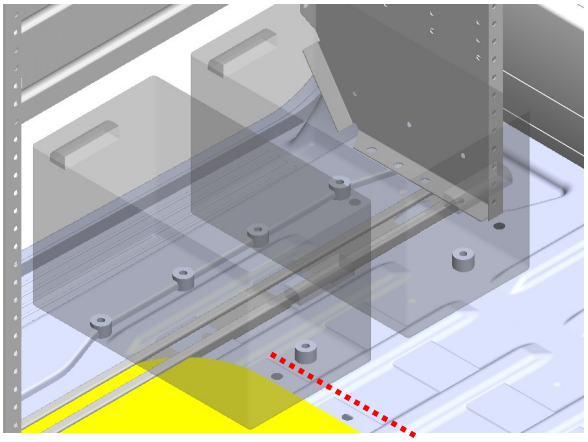


- Place 03927-2 spacers (Ref.:NO 9) over each plus nut (indent down). This gives the battery box stability, allowing solid mounting while straddling the ridges in the floor.

Section 11A: Install/mount Dual AUX battery [Kit 61697]

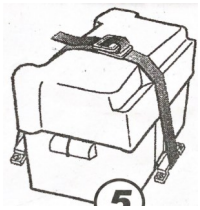
Step 11A-21. Placing battery boxes



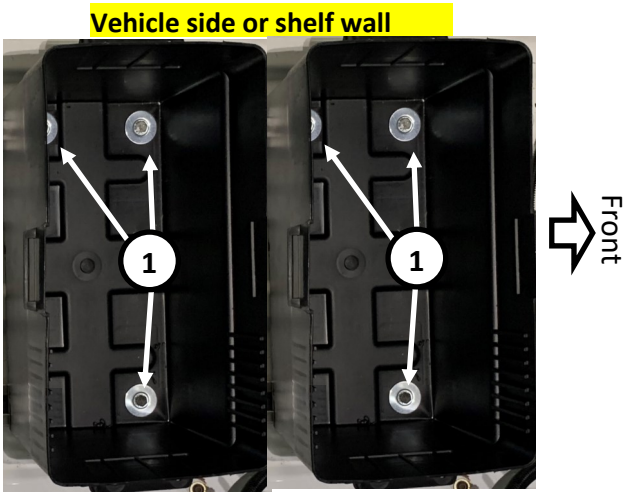


NOTE: The battery box straps are important to install to ensure safety .

- The boxes are now placed on top of the spacers and ready for fastening.
- Be sure to apply straps under the boxes to prevent having to pull them through later.



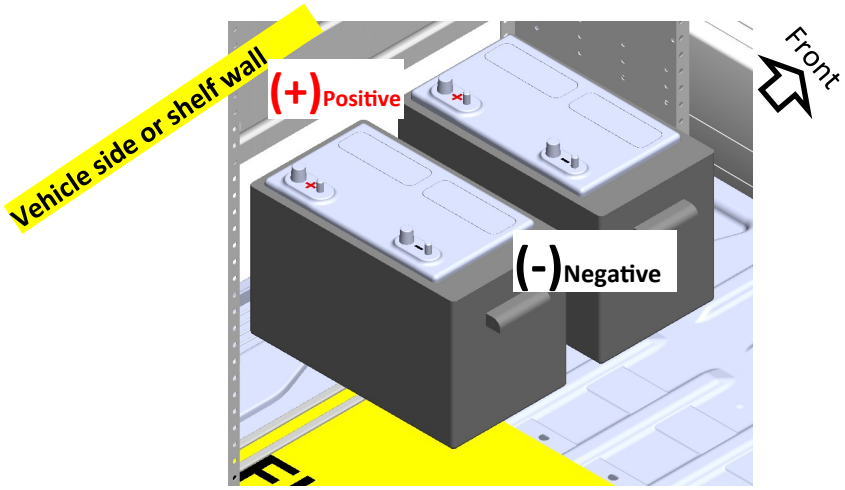
Step 11A-22. Battery box mounting to floor



- Be sure the Nylon straps are under the box.
- Mount the boxes with three (3) 5/16”-18 x 2” screws FAS0048 (Ref. NO.:4) and three (3) cup flanged washers FAS0833 (Ref. NO.:9) as shown in photo.
- These three screws will be driven into the plusnuts already installed in the vehicle floor using a 3/8" Allen driver

(1) Torque the screws down to 15Nm [+/- 1.8Nm] (132lb.in).

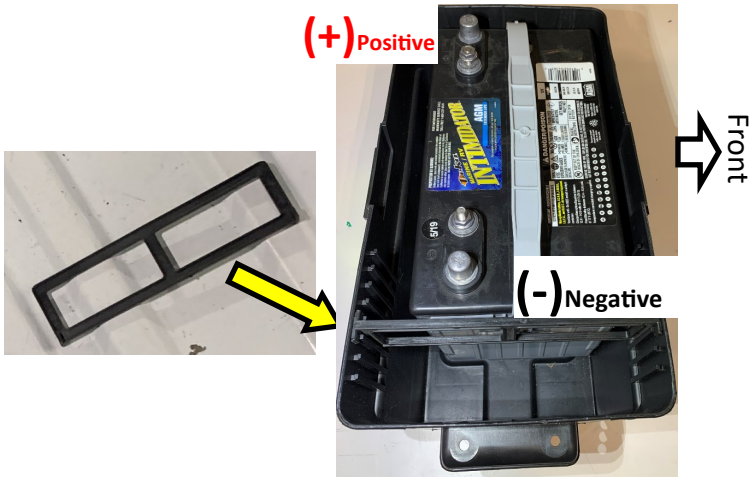
Step 11A-23. Battery installation into box



- The battery is placed into the box with the POSITIVE terminal closest to the side of the vehicle’s side wall
- The battery carry strap may be tucked flat or removed from each battery and stored in extra space of battery box (they are not shown in the diagram to the left).

Section 11A: Install/mount Dual AUX battery [Kit 61697]

Step 11A-24. Battery box adjustment bracket



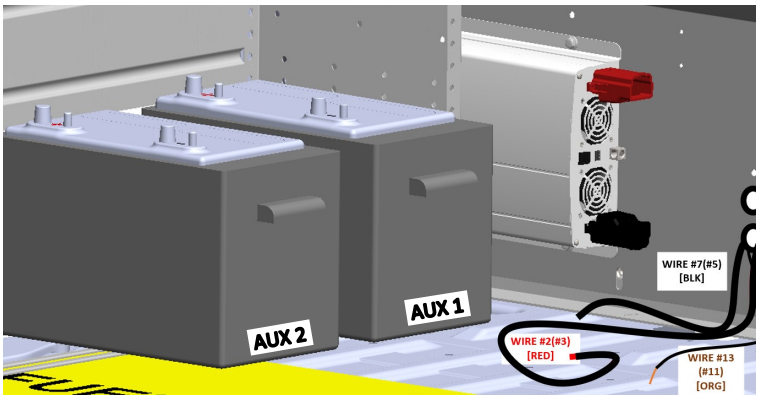
- The adjustment bracket will need to be placed in the ribs on the top inside portion of the opening in the box. This bracket keeps the battery from sliding within the oversized box.

Note: Either battery may be used with

38352

OR

Step 11A-25. Dual AUX battery box positioning



- The next steps will be installing the fuse holders and contactor in Section 12A.

Please Note: There may be several different batteries provided for this install. For batteries 70038 and crown battery 79382 use the normal instructions on how to connect the inverter wires. For the Full River Battery (79381) please follow the next 2 pages on how to install the inverter wires to the aux battery.

Product Communication Bulletin – Inverter Cables to Battery

Dear valued partners,

This bulletin follows Deviation-1285 (due to supply shortages of Discover battery). To preempt any confusion, we want to bring awareness to you concerning the attachment points on the blue Full River battery. This communication is because the instructions for the kits have not been changed to account for the differences in terminal posts. Instruction change is a work in progress. There are four points of clarification for this deviation:

1. The Full River battery comes with brass automotive posts and M8 bolts and hardware in the battery's box. When shipped there are no fasteners on the battery.
2. Instead of fastening the cable lugs onto the threaded marine terminals of the Discover batteries, the technician will fasten the cable lug to the battery by putting the bolt through the lugs and then fastening onto the battery.
3. There is a specific order in applying the washers onto the bolt before affixing it through the lug (See instructions).
4. Do not exceed the recommended torque or under tighten these bolts, as both conditions can lead to potential failure mode of the system.

Impact:

The different battery terminals (compared to kit instructions) may result in uncertainty of technicians installing the auxiliary batteries, and possible improper assembly of the lugs to the battery.

Resolution:

Please review the instruction addendum and take appropriate steps to make sure we continue a high-quality installation when attaching these batteries.

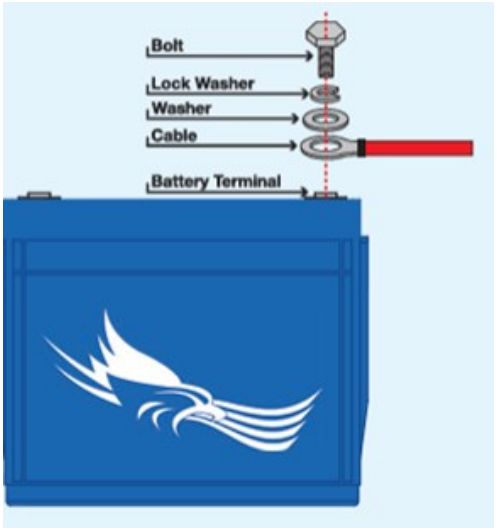
INSTRUCTION ADDENDUM:

1.The Full River battery comes with brass automotive posts and M8 bolts and hardware bagged in the battery's box. When shipped there are no fasteners installed on the battery.

INSTRUCTION ADDENDUM (continued):

2. Instead of fastening the cable lugs onto the threaded marine terminals of the Discover batteries (like on the left), the technician will fasten the cable lug to the battery by putting the bolt and washers through the lug and then fastening onto the battery.

3. There is a specific order in applying the washers onto the bolt before affixing it through the lug.

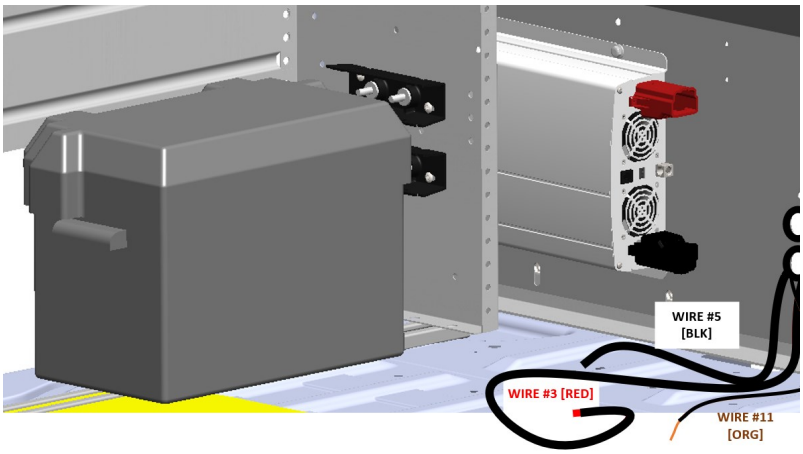


4. Do not exceed the recommended torque or under tighten these bolts, as both conditions can lead to potential failure mode of the system.

Torque the M8 bolts to 7Nm on the Full River Battery.

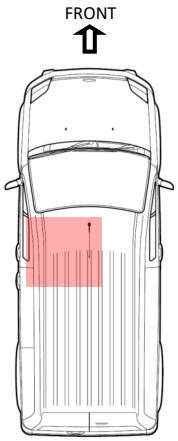
Section 11B: Install/mount 1 AUX battery [Kit 62886]

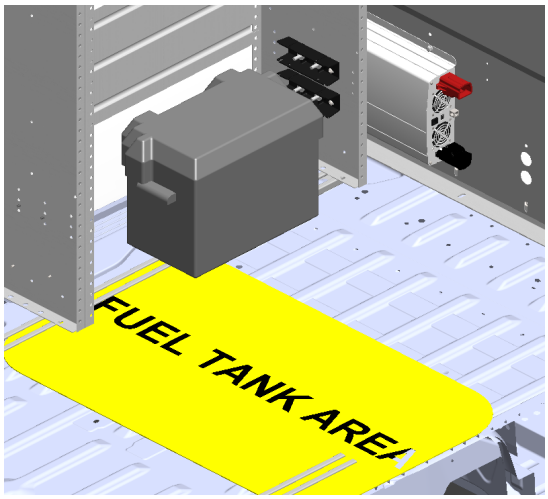
Step 11B-1. Single Battery Box positioning



- The single Battery Box is mounted in this orientation.
- It will straddle the rail if it is present.
- Be sure the location of the system is near enough to the inverter and ensures optimal placement next to the fuse holders.
- Center the box on the floor ridges

Step 11B-2. Position discussion of battery box

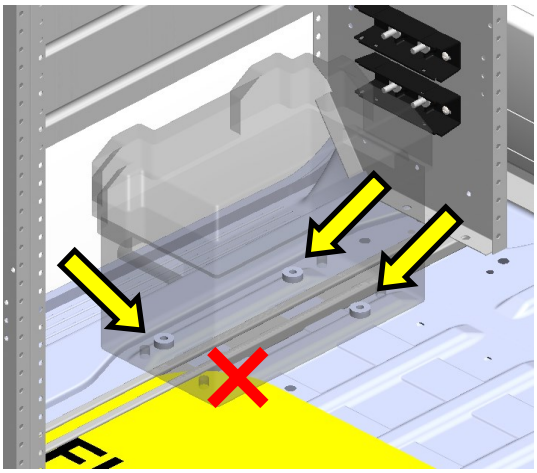




Caution: The fuel tank approaches the mounting area for the battery

- The battery box will be near the fuel tank area keep-out
- A three point mount will be used.
- There cannot be drilling over the fuel tank keepout area.

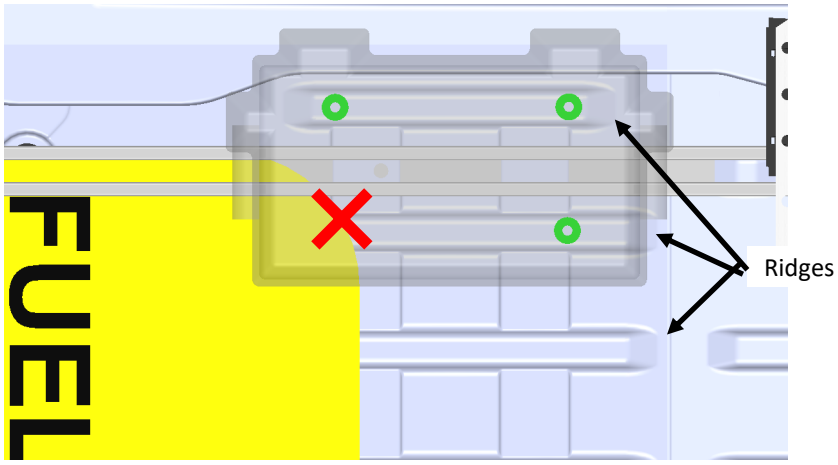
Step 11B-3. Safe hole positions for mounting



- The mounting points are shown through the transparent battery box in the diagram (See Yellow Arrows).
- There will not be a mounting hole at the red "X"

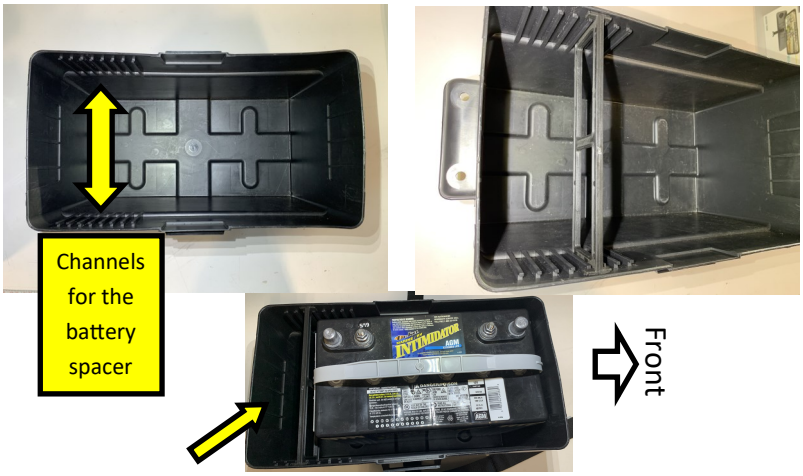
Section 11B: Install/mount 1 AUX battery [Kit 62886]

Step 11B-4. Battery Box positioning on floor ridges



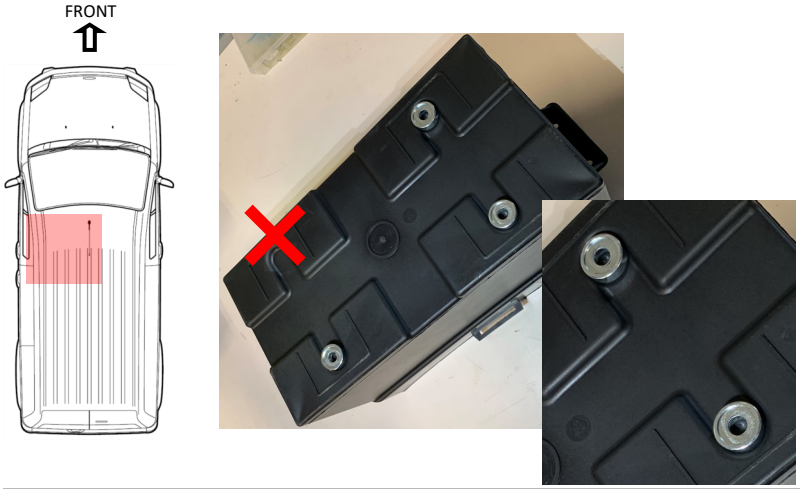
- The mounts will be placed in this position using the following steps below [outlined here]:
  - Mark hole positions on battery box
  - Drill the battery box
  - Use the battery box as a template
  - Mark the hole locations on the ridges on floor of the vehicle

Step 11B-5. Note adjustment bracket in battery box



- There is and adjustment bracket that will need to be placed in the channels on the top inside portion of the opening in the box.
- This bracket keeps the battery from sliding within the oversized box.
- This bracket goes to the rear of the vehicle.
- Note this when preparing to drill holes so that it is located correctly.

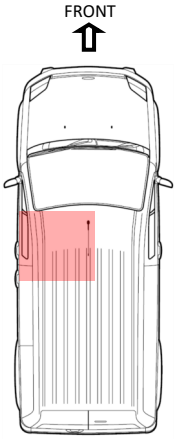
Step 11B-6. Mark hole positions on battery box

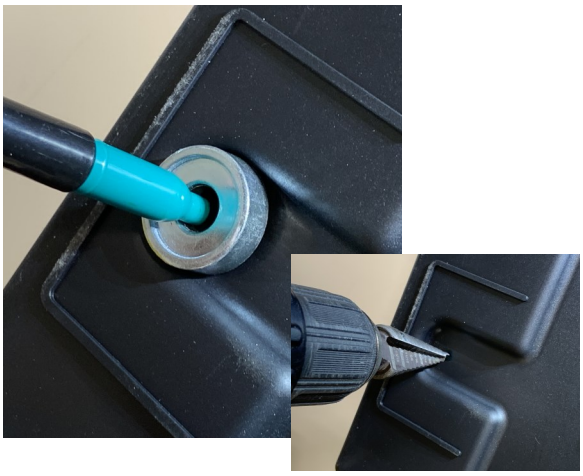


- The battery box should be turned over
- Take three of the spacers (Ref. NO: 9) and place them within the ends of the rounded channels for marking.
- Do not mark a hole for a spacer at the red "X" Position

Section 11B: Install/mount 1 AUX battery [Kit 62886]

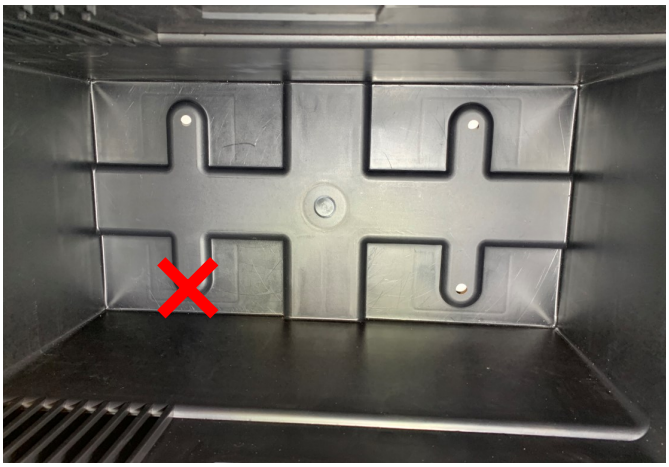
Step 11B-7. Marking and drilling holes





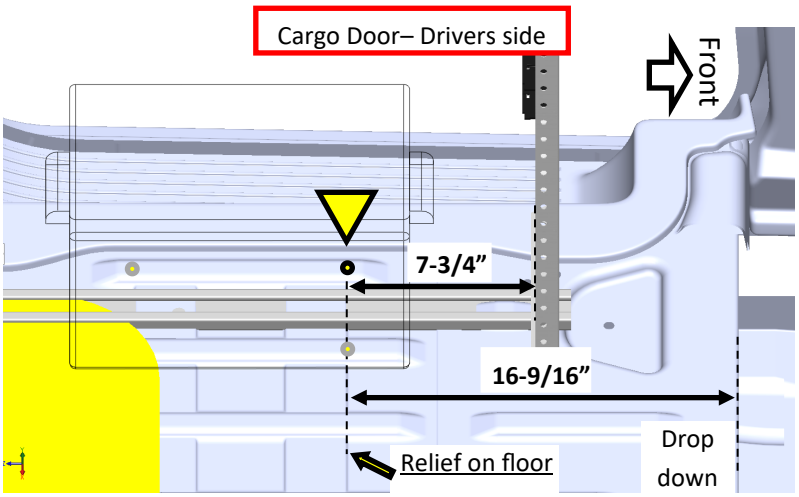
- Mark the center hole locations of each spacer.
- After the hole locations are marked, the box is put onto a safe drilling surface and a 1/2” hole is drilled at three locations on the box.

Step 11B-8. Battery Box now as template



- The box is again placed in its normal upright position.
- Its holes will be used to mark the holes on the vehicle floor.

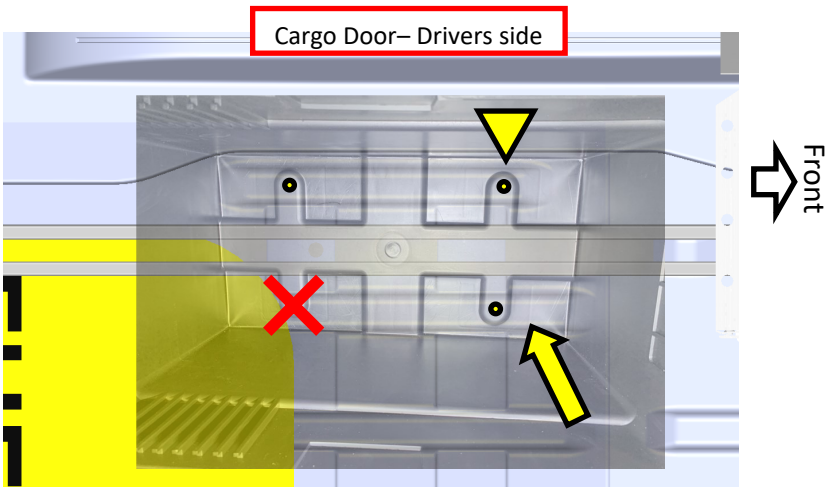
Step 11B-9. Planning box position



- The yellow pointer shows the approximate position of reference drill hole for the battery box mounting.
- Approximate alignment of the hole with the floor detail shown in diagram to the left as a dotted line:
  - If no floor covering, align with intersection of line extended from relief on floor.
  - 7-3/4” From inside of shelf floor flange
  - 16-9/16” from the drop down between the cargo and cabin areas (behind the partition) in this picture can be used as a reference for 22”

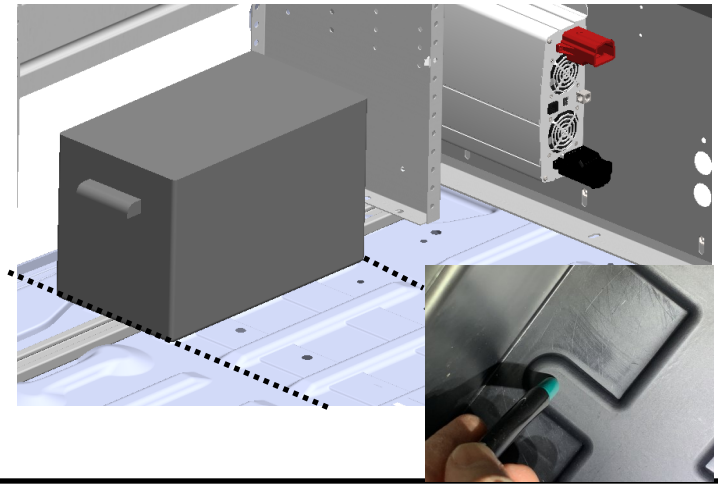
Section 11B: Install/mount 1 AUX battery [Kit 62886]

Step 11B-10. Mark hole positions on vehicle floor



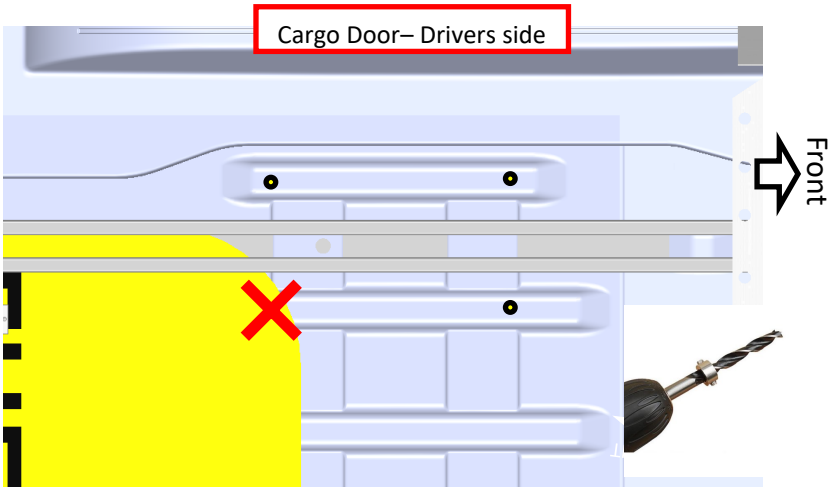
- The box is now placed in its intended position and the positions of the drilling points are marked through the holes in the bottom of the battery box onto the raised ridge in the floor (be sure to read Section 9 about position planning of the boxes).

Step 11B-11. Positioning and marking of box



- Place the battery box squarely on these ridges and mark the holes onto the floor of the vehicle.
- Mark the center hole locations of each hole on the vehicle floor.
- Do not mark or drill a hole at the previously mentioned red “X” Position

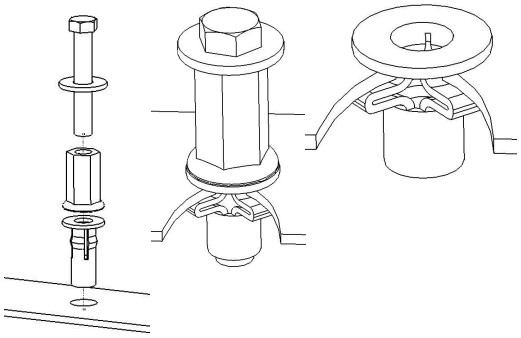
Step 11B-12. Drilling holes in vehicle floor



- After the hole locations are marked, set the box aside
- The markings for the holes will be transferred to the vehicle floor.
- Utilize a 1/2” drill with a depth stop at the three marked locations.

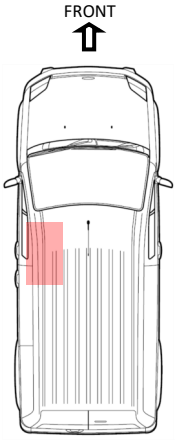
Section 11B: Install/mount 1 AUX battery [Kit 62886]

Step 11B-13. Plusnut installation example



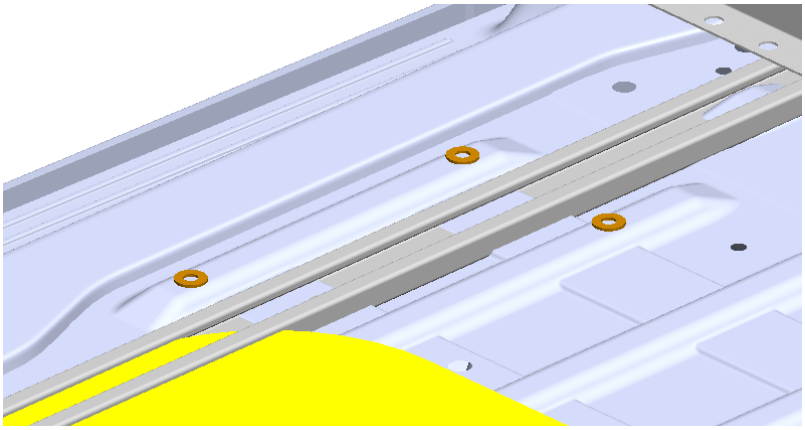
- After the hole locations are drilled, the plusnuts will be installed into the floor.

Step 11B-14. Plusnut installation method



- After using a 1/2” drill to put holes into the floor to receive the plusnuts (Ref.NO:7).
- If there is a floor covering, 1-3/16” holes will need to be put into just the floor covering to allow for the plusnut to be installed flush to the floor surface.
- Utilize the plus nut gun to install the plus nuts (installation instructions are not supplied in this instruction– please use plusnut gun manufacturer’s instructions).

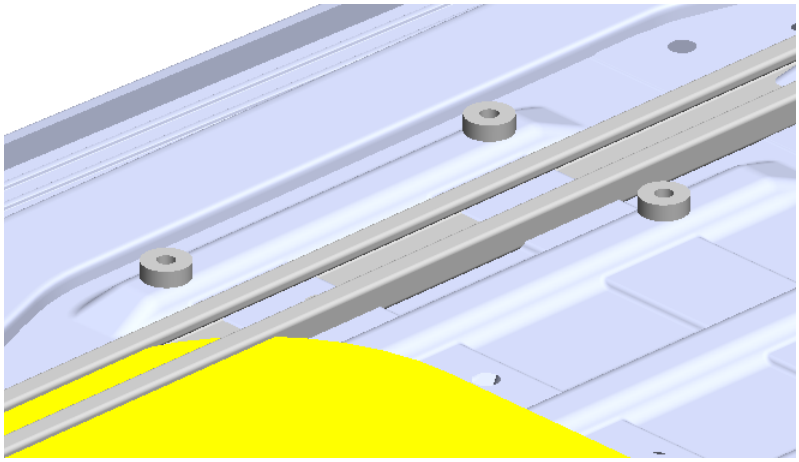
Step 11B-15. Battery Box mounting holes and plusnut installation



- The plusnuts installed securely into the floor ridges
- NOTE: For more detailed plusnut installation instructions– See Appendix 18-B: Plusnut Installation Guide

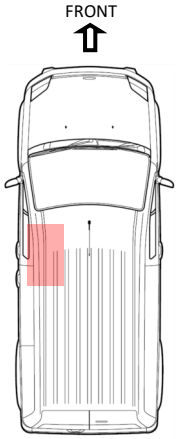
Section 11B: Install/mount 1 AUX battery [Kit 62886]

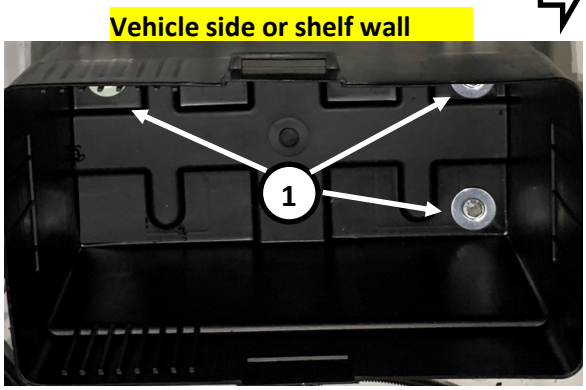
Step 11B-16. Mounting spacers



- Place 03927-1 spacers (Ref.:NO 9) over each plus nut (indent down). This gives the battery box stability, allowing solid mounting while straddling the ridges in the floor.

Step 11B-17. Battery box mounting to floor



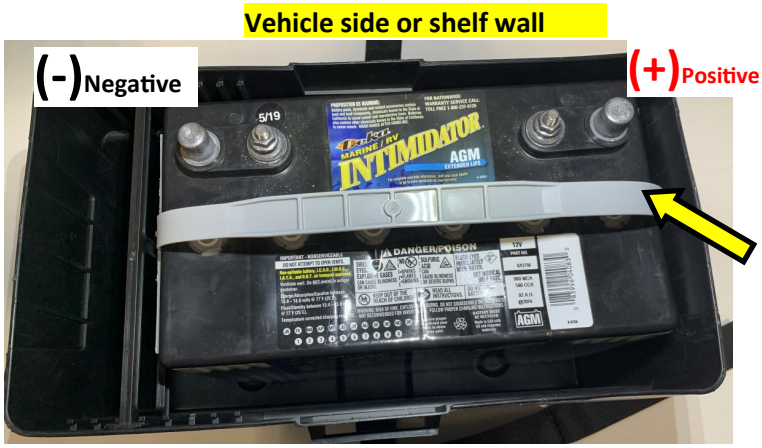


NOTE: The battery box straps are important to install to ensure safety .

- Set the battery box in its location. Be sure the Nylon strap is under the box.
- Mount the boxes with three (3) 5/16”-18 x 2” screws FAS0048 (Ref. NO.:4) and three (3) cup flanged washers FAS0833 (Ref. NO.:9) as shown in photo.
- These three screws will be driven into the plusnuts already installed in the vehicle floor using a 3/8" Allen.

(1) Torque the screws down to 15Nm [+/- 1.8Nm] (132lb.in).

Step 11B-18. Battery installation into box



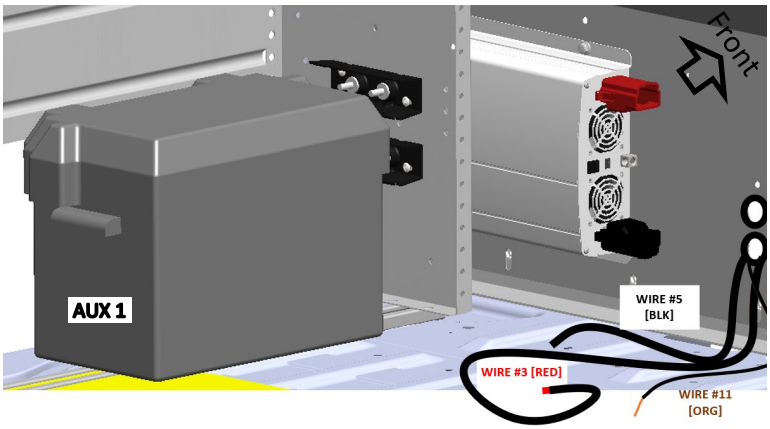
- The battery is placed into the box with the positive terminal closest to the front of the vehicle.
- The battery carry strap (gray handle in photo to the left) may be tucked flat or removed from each battery and stored in extra space of battery box .

Section 11B: Install/mount 1 AUX battery [Kit 62886]

Step 11B-19. Battery Box adjustment bracket

- The adjustment bracket will need to be placed in the ribs on the top inside portion of the opening in the box. This bracket keeps the battery from sliding within the oversized box.
- The straps will be applied around the out-side of the battery box in a later step.

Step 11B-20. Ready for Cable connections

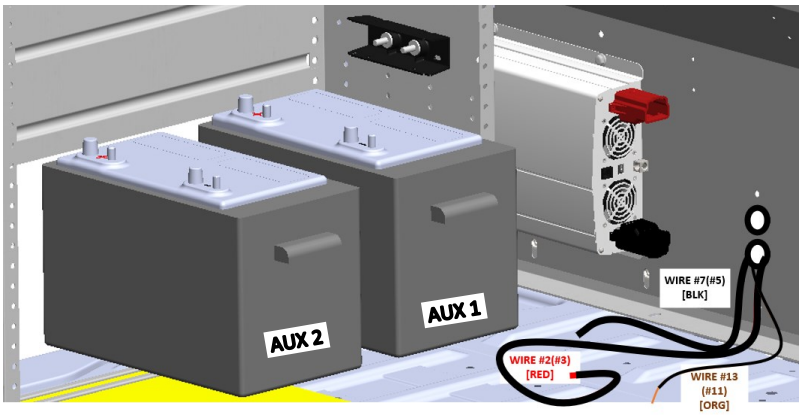


NOTE: The battery box straps are important to install to ensure safety .

- The next step will be installing the cables in Section 12B.

Section 12A: Routing from CB to 2 AUX Batteries [KIT 61697]

Step 12A-1. As left from Step 11A-25



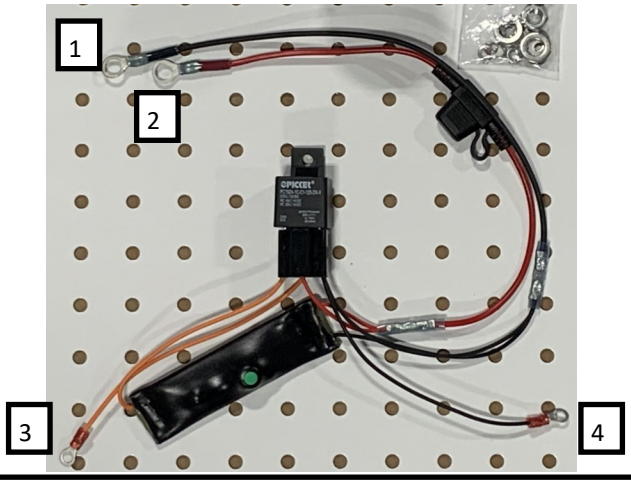
- Recall from Section 11A that the cables are routed and sitting at the partition.

Step 12A-2. Install WIRE #2 Terminal Insulator

Caution: The Terminal insulators are important to install to avoid accidental connections to contactor terminals.

- Please push **WIRE #2** into the RED TERMINAL INSULATOR.

Step 12A-3. Prepare VSS-VC Harness

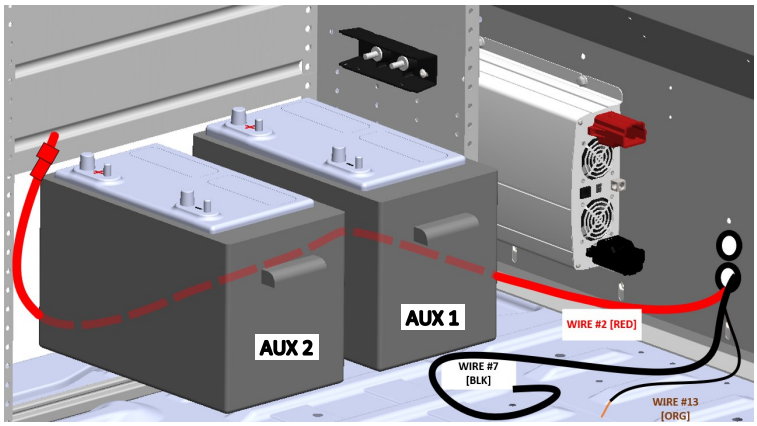


The VSS-VC Harness (Ref. Section 2, page 5) consists of:

1. Negative AUX 1 Battery wire (BLK - Ring Terminal)
2. Positive Contactor wire (RED - Ring Terminal)
3. Contactor Coil (+) wire (ORG- Small Terminal)
4. Contactor Coil (-) wire (BLK - Small Ring Terminal)

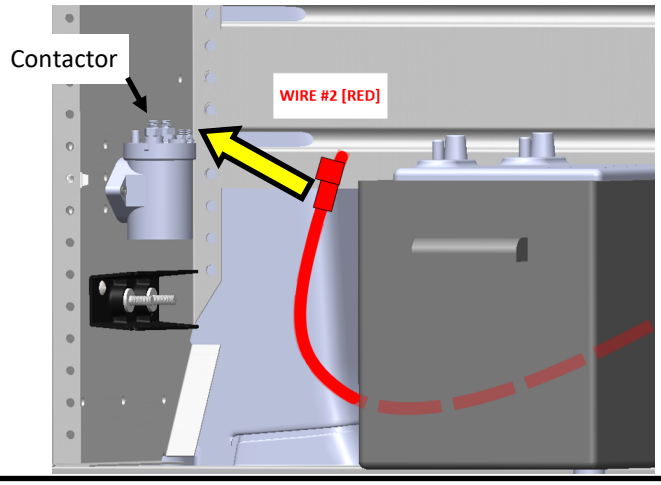
Section 12A: Routing from CB to 2 AUX Batteries [KIT 61697]

Step 12A-4. Routing WIRE #2 around back of batteries



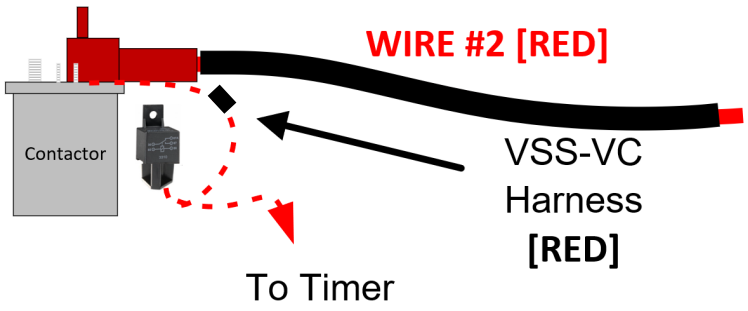
- Bring **WIRE #2** from the hole in the partition around the back of the batteries over to the Contactor.

Step 12A-5. Connecting WIRE #2 to the contactor



- **WIRE #2** will go to the right side of the Contactor.

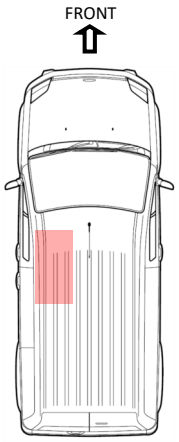
Step 12A-6. WIRE #2 and VSS-VC Red Wire Routing



- Along with **WIRE #2**, the **VSS-VC RED** (Ring Terminal wire) will be connected to the same contactor terminal as shown in the diagram to the left (or see diagram 5-1).

Section 12A: Routing from CB to 2 AUX Batteries [KIT 61697]

Step 12A-7. WIRE #2 Routing to contactor

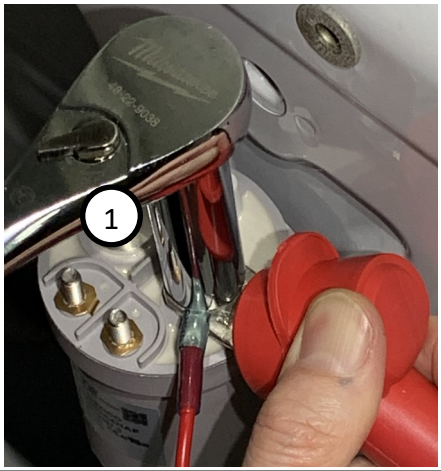


- Pull back the RED TERMINAL INSULATOR on **WIRE #2** and place the lug onto the CONTACTOR Post.

Step 12A-8. Wire #2 and VSS-VC Red Wire Routing

- Install the VSS-VC Harness red wire 5/16 Ring terminal (See diagram in Step 9-7) on top of **WIRE #2** on the CONTACTOR terminal.

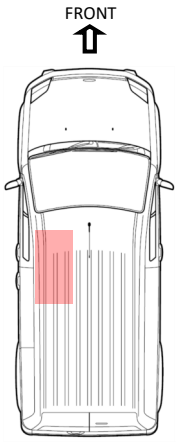
Step 12A-9. Fasten Wire #2 and VSS-VC Red Wire

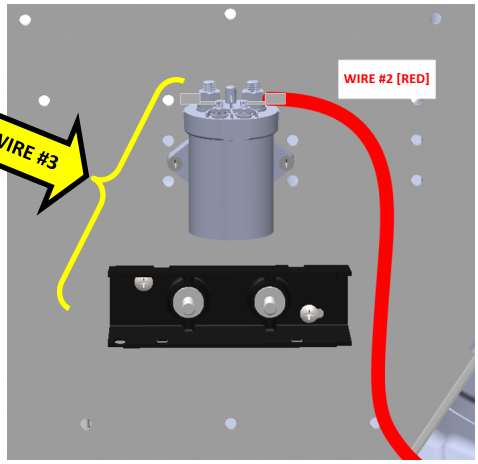


1 Fasten the washers and nut (Ref. NO.:19). The torque will be: 10.2Nm [+/- 1.1Nm] (~90 lb.in).

Section 12A: Routing from CB to 2 AUX Batteries [KIT 61697]

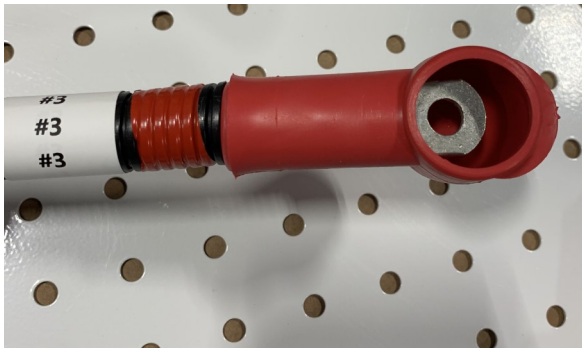
Step 12A-10. Routing from Contactor to AUX Fuse Holders





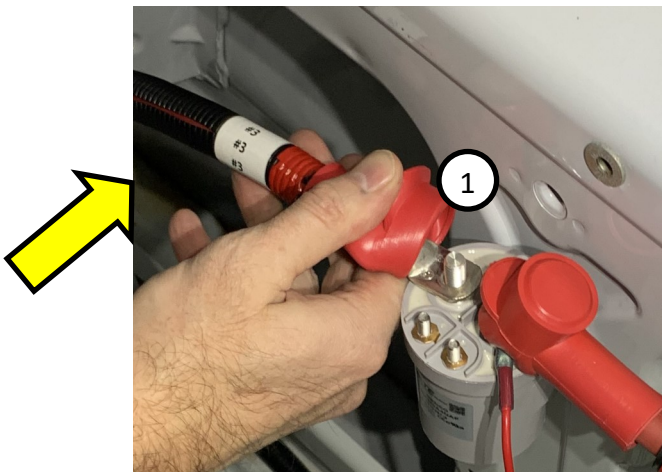
- NOTE: Red wire for VSS-VC is not shown in figure on the left.
- Below or nearby the contactor, the AUX Fuse will be mounted.
- **WIRE #3** (See Yellow Arrow) is very short, forcing the mounting location of the AUX fuse holder very near to the contactor.

Step 12A-11. Preparing WIRE #3 with Red Terminal Insulator



- Push the RED TERMINAL INSULATOR onto an end of **WIRE #3**

Step 12A-12. Installing and fastening WIRE #3

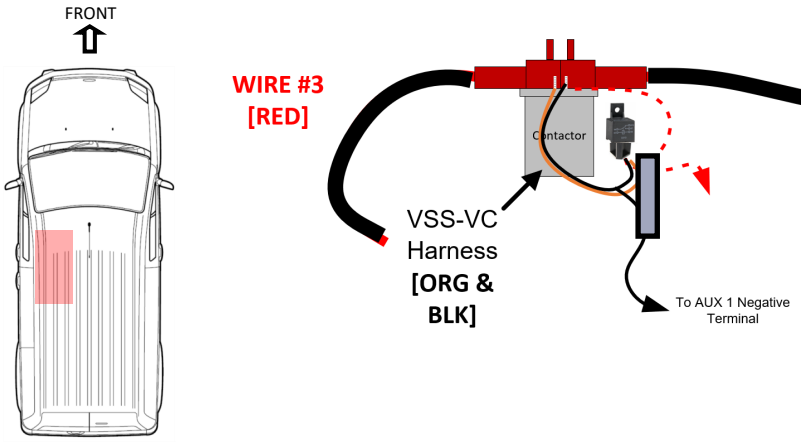


- Install **WIRE#3** onto the left-most post of the contactor.
- Fasten the washers and nut (Ref. NO.:19).

(1) The torque will be: 10.2Nm [+/- 1.1Nm] (~90 lb.in).

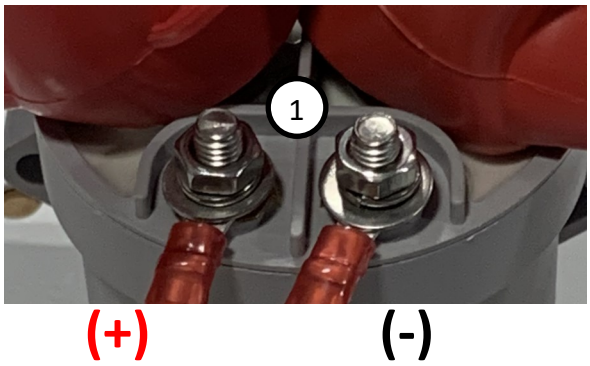
Section 12A: Routing from CB to 2 AUX Batteries [KIT 61697]

Step 12A-13. Attaching VSS-VC Harnessing to Contactor



- Fasten the ORANGE VSS-VC Wire with "#10" Ring Terminal to the contactor's positive *coil (left)* terminal.
- Fasten the "#10" BLACK VSS-VC ring terminal to the contactor's negative *coil* (Right) terminal.
- See more below...

Step 12A-14. Attaching VSS-VC Harnessing to Contactor



- Fasten the washers and nut (Ref. NO:20) with a 3/8" driver.

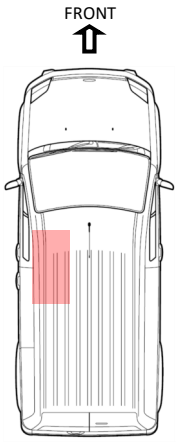
(1) The torque will be: 2.5Nm [+/- 0.8Nm] (~22.5 lb.in).

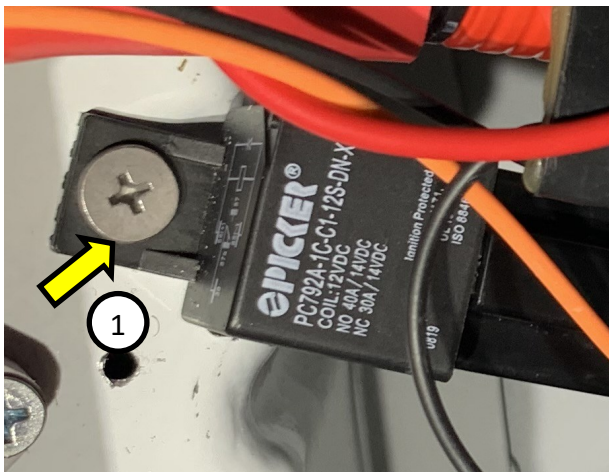
Step 12A-15. VSS-VC relay ready to be mounted

- The VSS-VC Voltage controlled relay for the contactor is now connected to the contactor.
- It needs to be fastened nearby to the contactor.

Section 12A: Routing from CB to 2 AUX Batteries [KIT 61697]

Step 12A-16. VSS-VC relay mounting



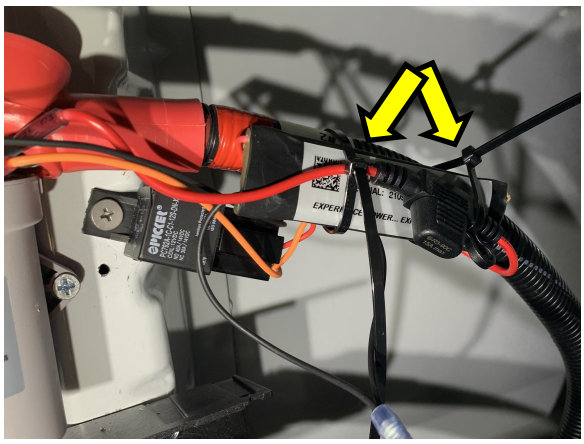


- If you have access to both sides of the mounting surface: drill a 1/4" hole through the surface for mounting small relay.

1 The relay will be fastened to the side of the shelving by utilizing FAS0025 (Ref. NO:5) and FAS0029 (Re. NO: 6) torqued to: 3Nm [+/- 0.5Nm] (27lb.in).

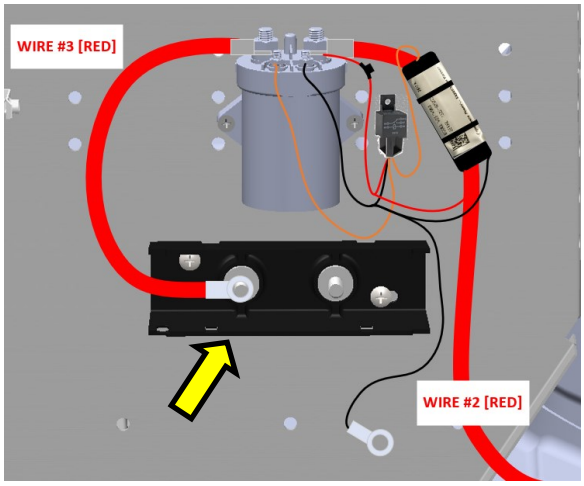
- Alternately– if attaching to sheet metal with no access for a nut– Use self tapping screw FAS0148 (Ref. NO.:11) and lightly torque to 3Nm [+/- 0.5Nm] (27lb.in).

Step 12A-17. VSS-VC controller fastening to cable



- In this example, the relay is mounted next to the Contactor and the VCC-VS harnessing is wire tied to the **WIRE # 2** [see Yellow Arrows]

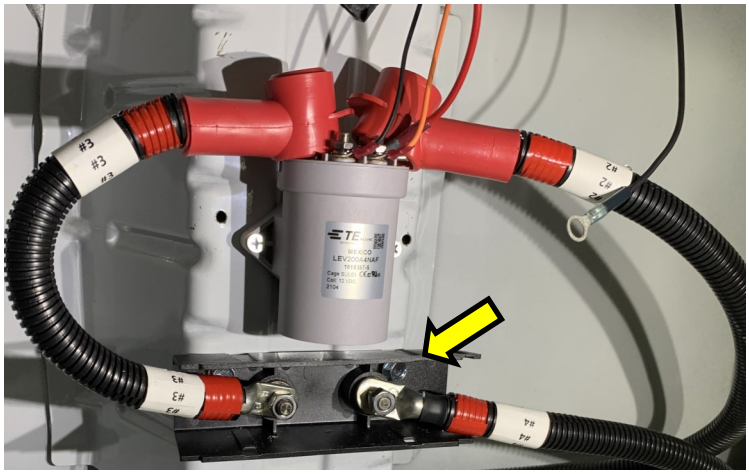
Step 12A-18. Connect AUX Fuse Holder to Contactor



- The other end of **WIRE #3** can reach the Fuse holder terminal from its attachment on the contactor.
- Connect **WIRE #3** and finger tighten the lug to the terminal with the 1/2" nut and washers.
- The fuse will be put in near the end of the procedure for safety.

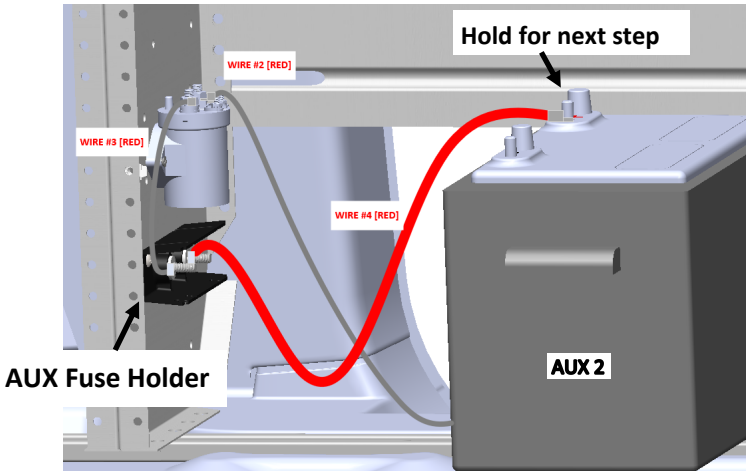
Section 12A: Routing from CB to 2 AUX Batteries [KIT 61697]

Step 12A-19. Routing Wire #4 From AUX FH to AUX 2 Battery



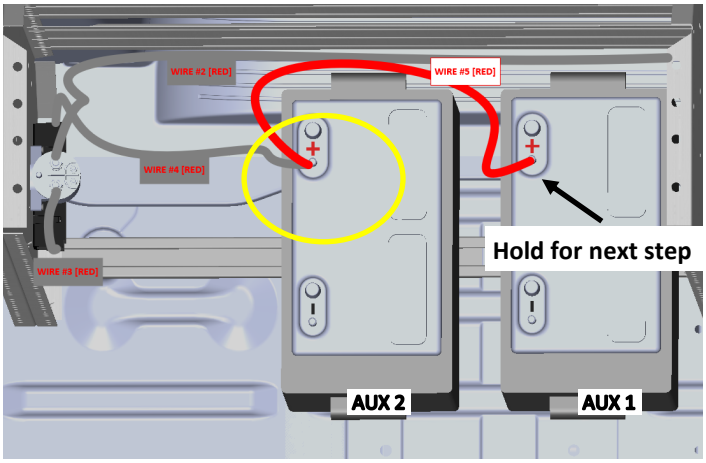
- **NOTE:** VSS-VC harness is pulled out of the way for picture clarity.
- **WIRE #4 (1 of 2)** Can be fastened onto the other terminal of the AUX Fuse holder (See Yellow Arrow) and the fastener finger tightened (Ref. NO.: 18).
- **WIRE #4 (1 of 2)** will go to an AUX 2 Battery Terminal as shown in Diagram 5-1.

Step 12A-20. Installation of WIRE #4 (1 of 2)



- Route the red **WIRE #4 (1 of 2)** as shown from the right side terminal on the AUX fuse holder to the AUX 2 Battery Positive Terminal.
- Finger tighten the fastener and washers onto the AUX fuse holder terminal to hold the wire.
- Hold onto the wire connected to the AUX 2 Positive Battery terminal.

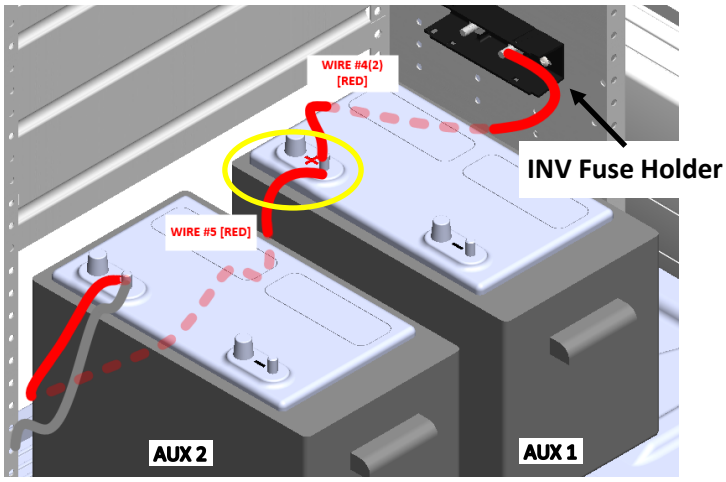
Step 12A-21. Installation of WIRE #5 between AUX 1 & 2



- While holding the **WIRE #4 (1 of 2) lug on the AUX 2 Battery positive terminal,** also stack on end of **WIRE #5** onto this same AUX 2 positive battery terminal (noted by yellow circle to the left)
- Finger tighten the fastener and washers onto that terminal to hold both wires.
- Connect the other end of **WIRE # 5** directly between the positive terminals on AUX 2 to AUX1 Batteries.
- Hold the cable on the AUX1 Battery positive terminal while connecting the next wire.

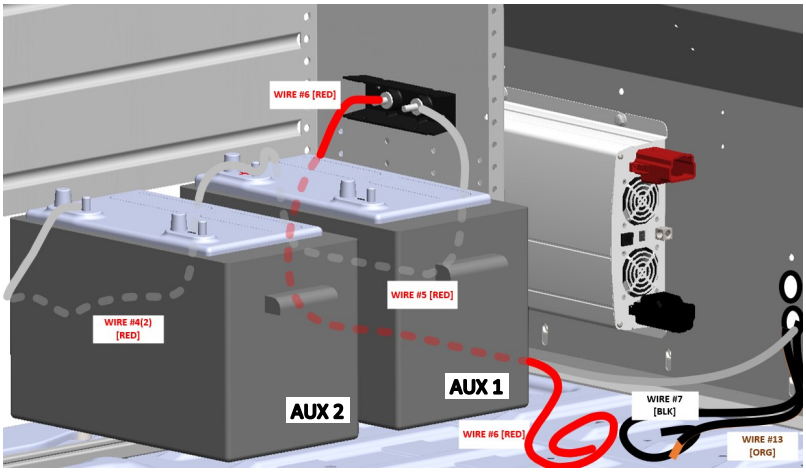
Section 12A: Routing from CB to 2 AUX Batteries [KIT 61697]

Step 12A-22. Connect WIRE #4 (2 of 2) to INV Fuse holder



- While holding the **WIRE #5** on the AUX 1 positive battery terminal, also stack one end of **WIRE #4 (2 of 2)** onto this same AUX 1 terminal (noted by yellow circle to the left)
- Finger tighten the fastener and washers onto that terminal to hold both wires.
- Connect the other end of **WIRE #4 (2 of 2)** to the right side of the INV fuse holder 5/16" terminal.
- Finger tighten the fastener and washers onto that terminal to hold both wires. The fuse will not be present at this time.

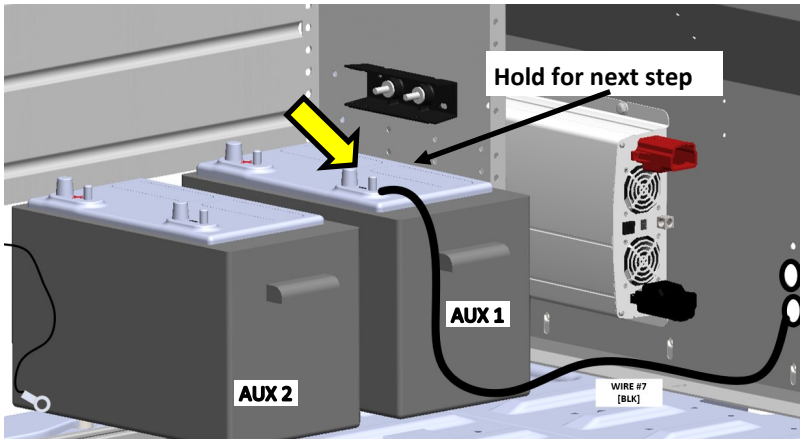
Step 12A-23. Installation of WIRE #6 from INV fuse holder



Caution: Fuses will be put in at the end of the procedure for safety.

- Connect **WIRE #6** to the left side of the INV fuse holder.
- Screw down fastener finger tight to hold the cable.
- Bring **WIRE #6** back and around the side of the shelving and then toward the inverter
- Connections to the inverter happen on later steps.

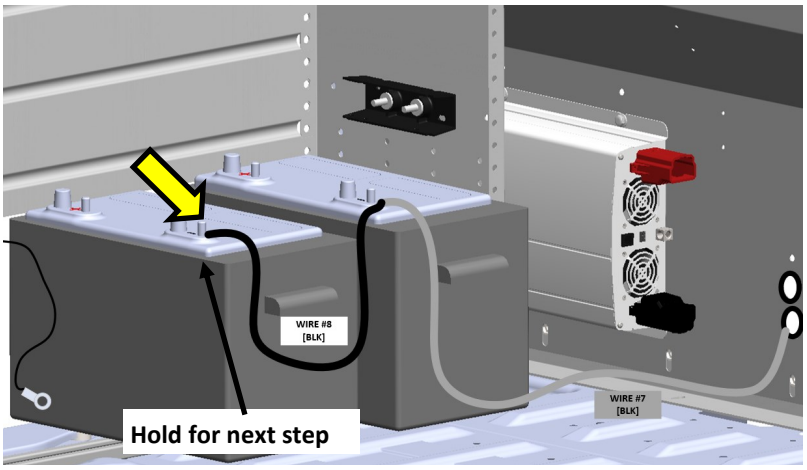
Step 12A-24. Connecting WIRE #7 to Negative AUX 1 Battery Terminal



- NOTE: Positive wires are not shown for clarity in the negative connection diagrams.
- **WIRE #7** will go from the partition feedthrough to the Battery Negative terminal on AUX 1.
- Hold the lug on the terminal...

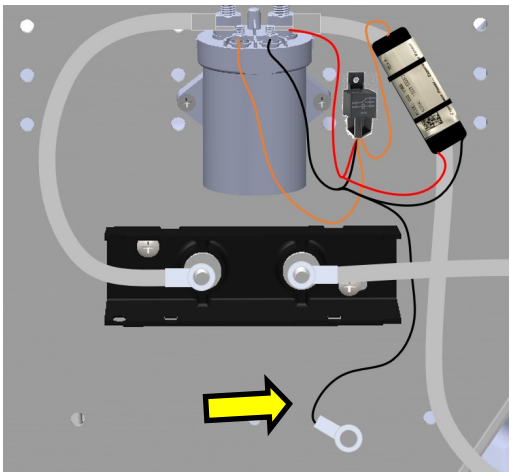
Section 12A: Routing from CB to 2 AUX Batteries [KIT 61697]

Step 12A-25. Routing from AUX 1(-) to AUX 2 (-)



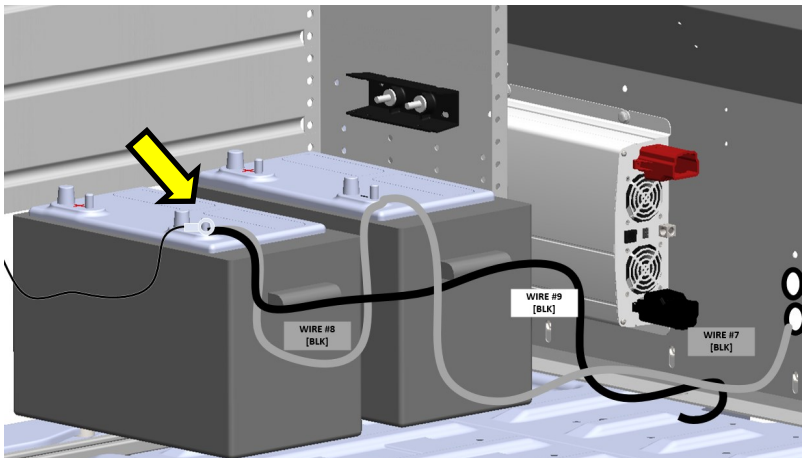
- Route **WIRE # 8** as shown between AUX 1 and AUX 2 negative battery terminals.
- Screw down fastener finger tight to hold the cables to AUX 1 battery.
- Hold the lug on the AUX 2 terminal...

Step 12A-26. Review ground wire from contactor VSS-VC



- Recall from previous step in this section there is a black ground wire from the VSS-VC harness that needs to be connected.

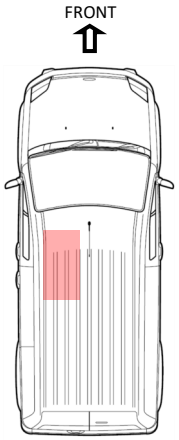
Step 12A-27. Connect WIRE #9 and VSS-VC ground to AUX 2 Battery

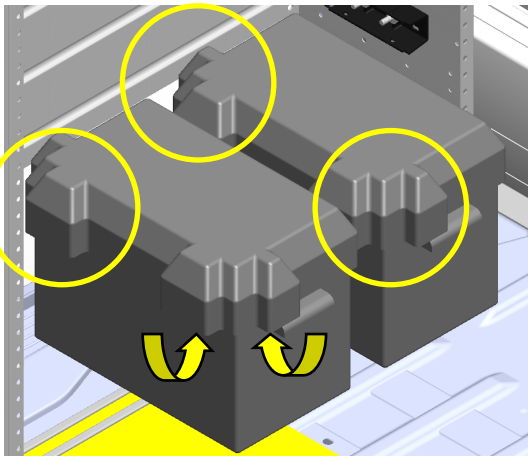


- Connect **WIRE #9** to the negative terminal of the AUX 2 battery and bring the VSS-VC ground wire with ring terminal from the contactor to this terminal.
- Finally, route **WIRE # 9** as shown from the negative battery terminal back to the inverter.
- Leave the other end of **WIRE #9** disconnected from the inverter at this point.

Section 12A: Routing from CB to 2 AUX Batteries [KIT 61697]

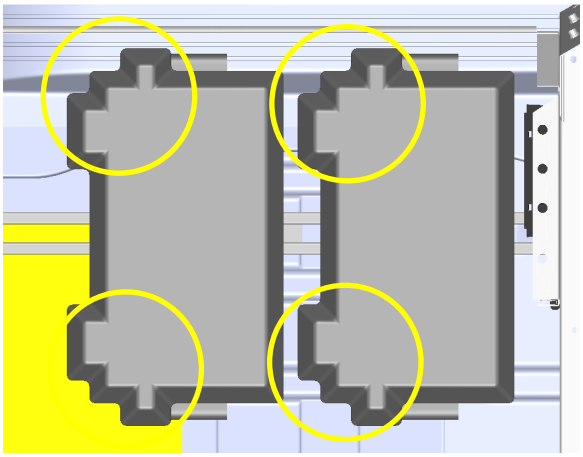
Step 12A-28. Review battery box covers





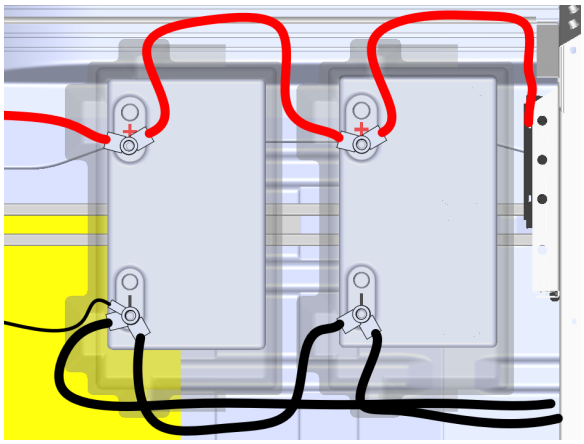
- Recall that the battery box covers are to be fitted with the entry points near the battery terminals.

Step 12A-29. The covers have entry points for cables



- The entry points are located to allow the battery cover to go over the cables connected to the battery.

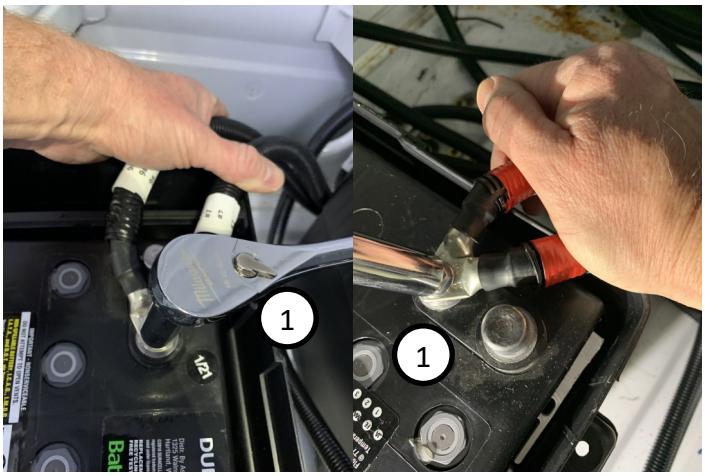
Step 12A-30. Overhead routing of cables for lid fitment



- The cables and wire will be tightened down to allow the cables to be routed out of the boxes through these entry points.
- This requires the installer to hold the cables as they are torqued down.

Section 12A: Routing from CB to 2 AUX Batteries [KIT 61697]

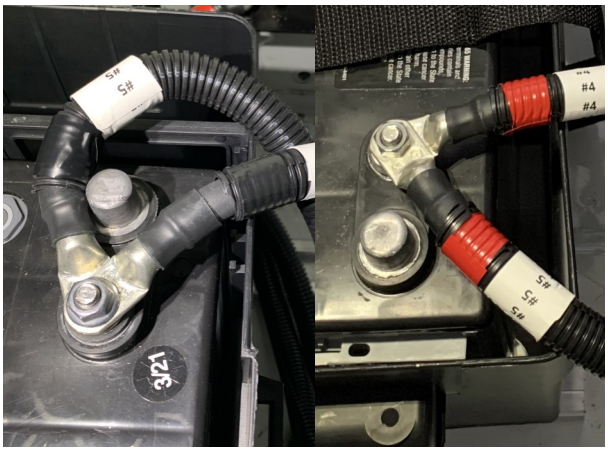
Step 12A-31. Holding Torquing the battery cables



- As the terminals are tightened, hold them into alignment for the openings in the tops of the battery boxes.

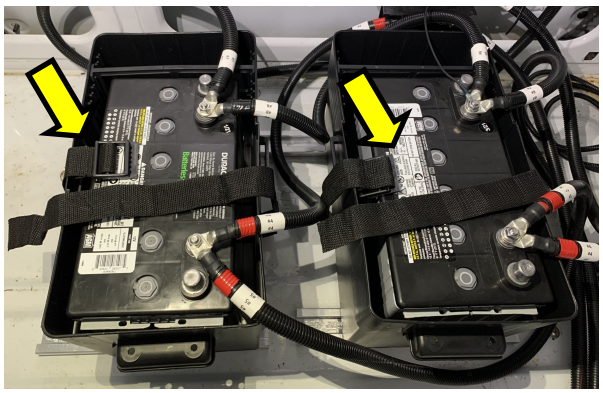
(1) ALL **FOUR** Auxiliary battery terminal fastener nuts (Ref. NO.:23). will be torqued down to **8Nm [+/- 1.2Nm] (71 lb.in)** with a 1/2" socket.

Step 12A-31. The battery cables positions for easy exit from battery boxes



- The wires will be properly torqued down and be routed out of the battery box via the box cover exits.

Step 12A-32. Make sure straps are in position for lids



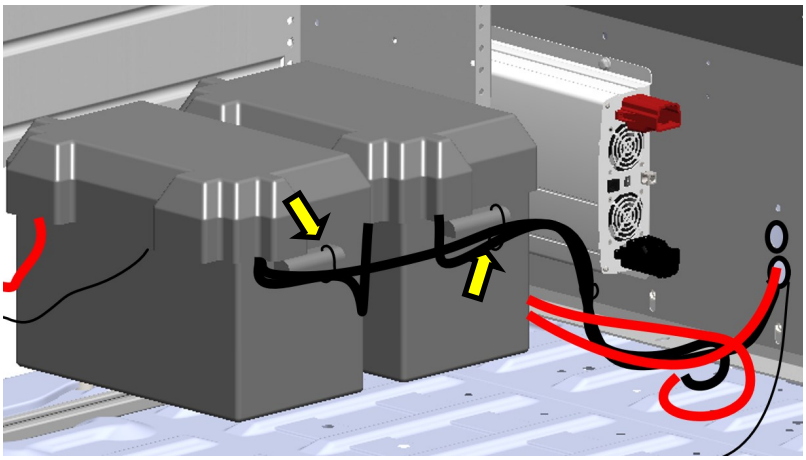
- Ensure the battery straps are positioned under the battery boxes (here they are routed underneath and the ends are overlapped onto the top of the batteries temporarily).
- NOTE: Picture is from another application– ignore wiring.

Section 12A: Routing from CB to 2 AUX Batteries [KIT 61697]

Step 12A-33. Installing covers and guiding cables

- As the battery box covers are put on , guide the cables for easier fitment of the box covers.
- The tops of the boxes are to be snapped on and the battery straps should be tightened around each box.
- NOTE: Picture is from another application– ignore wiring.

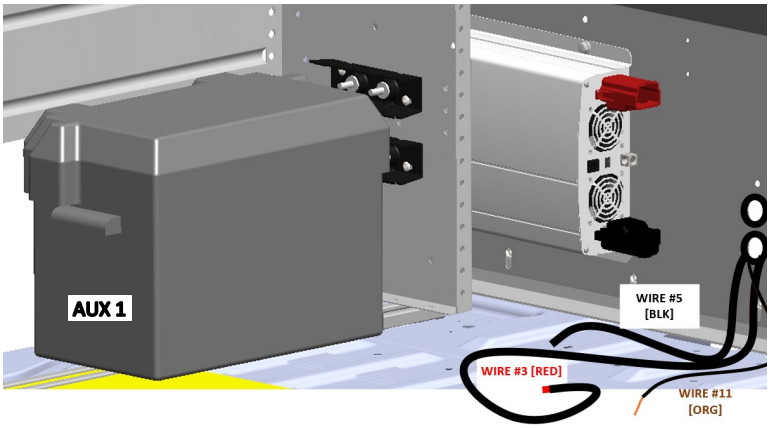
Step 12A-34. Ground cable routing and fastening



- It is also helpful to put the cable up against the battery box handles and cable tie them through the holes in the handle for neater routing.
- This prevents the loop from lying on the floor possibly as a trip hazard.
- The inverter is ready to be connected. See Section 13.

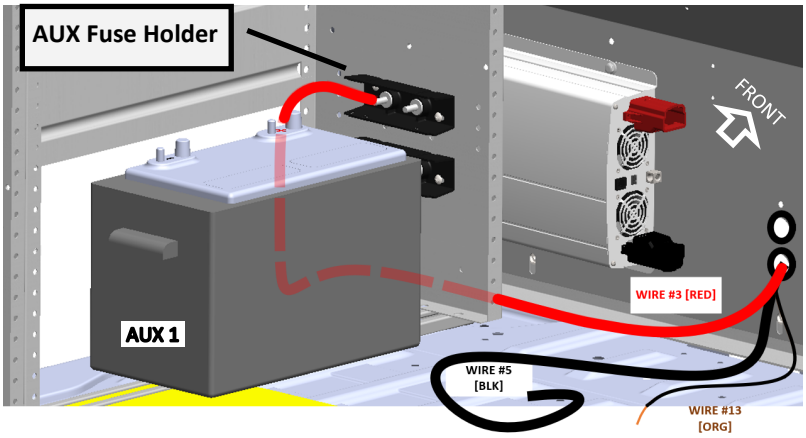
Section 12B: Routing from CB to 1 AUX Battery [KIT 62886]

Step 12B-1. As left from Step 11B-20



- Recall from Section 11B-20 that the cables are routed and sitting at the partition.

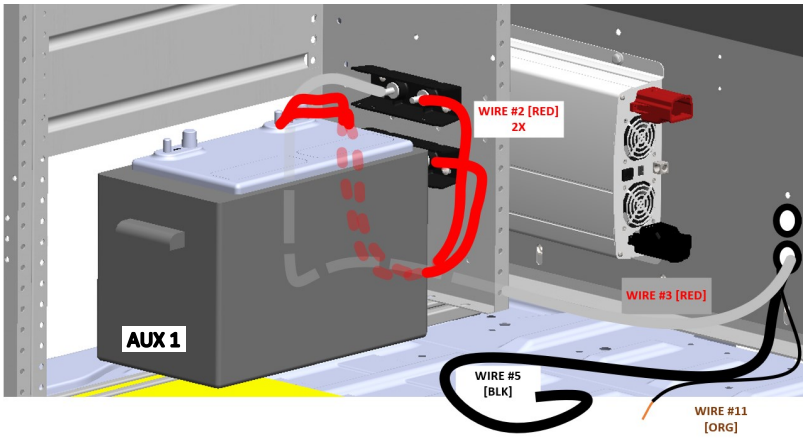
Step 12B-2. Installation of WIRE #2



Caution: Fuses will be put in at the end of the procedure for safety.

- Bring **WIRE #3** from the hole in the partition around the back of the shelf to the installed fuse holders from Section 11-B.
- **WIRE #3** will go to the left side of the top fuse holder (AUX Fuse Holder).
- Connect **WIRE #3** and finger tighten the lug to the terminal with the 1/2” nut and washers.
- The fuse will be put in near the end of the procedure for safety.

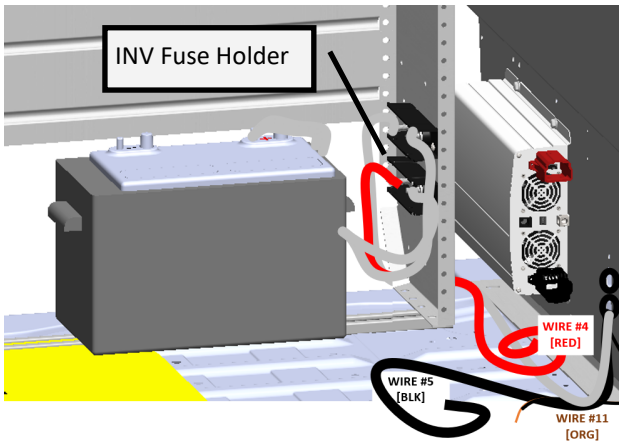
Step 12B-3. WIRE #2 to the battery and fuse holders



- **Both WIRE #2’s** will be connected from the positive terminal of the battery to the right hand side of each of the fuseholders.
- Finger tighten the lug to the battery and fuse holder terminals with the 1/2” nuts and washers. *They are different , so please return the nuts and washers to their proper terminal.*
- Torques will be covered in a moment before the battery cover is put on.

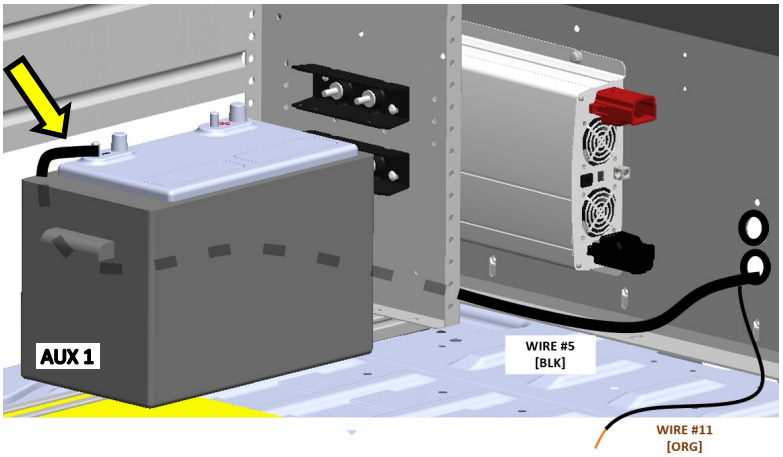
Section 12B: Routing from CB to 1 AUX Battery [KIT 62886]

Step 12B-4. Wire #4 Routing



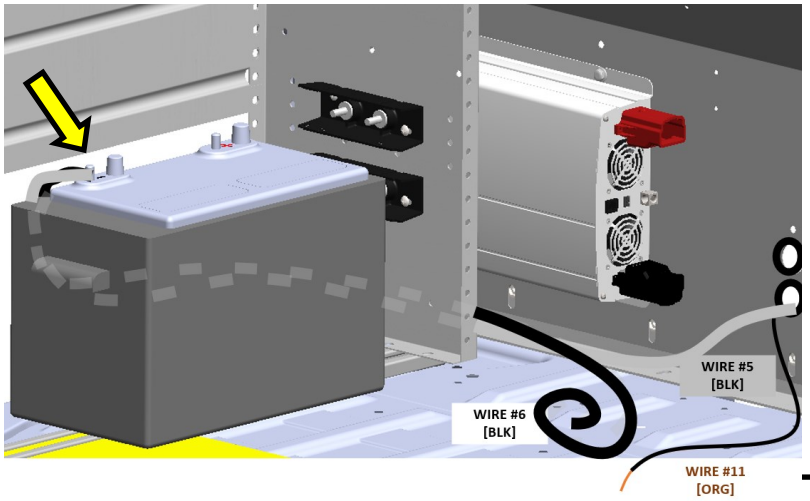
- **WIRE #4** will be connected to the left side terminal of the INV fuse holder as shown in the diagram to the left.
- Finger tighten the lug to the terminal with the 1/2” nut and washers.
- This cable will be brought around the back of the shelf and will be connected to the inverter in a later step.

Step 12B-5. Installation of WIRE #5 CB Ground



- NOTE: Positive wires are not shown for clarity in the negative connection diagrams.
- **WIRE #5** will be routed behind the shelf.
- Connect **WIRE #5** directly to the negative 5/16” terminal on the AUX Battery.
- Hold the cable on the terminal while connecting the next wire.

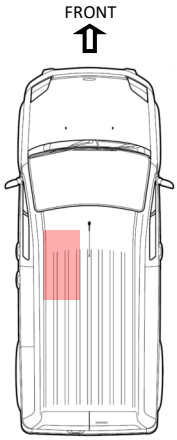
Step 12B-6. Installation of Ground WIRE #6 back to inverter

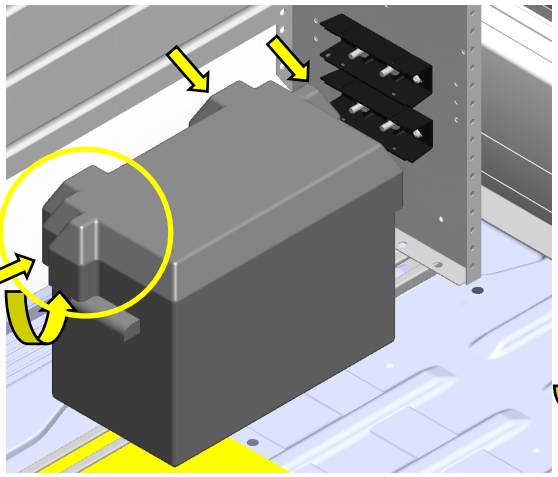


- Connect **WIRE #6** directly to the negative 5/16” terminal on the AUX Battery **(on top of WIRE #5).**
- Finger tighten the lug to the terminal with the 1/2” nut and washers.
- Torques will be covered in a moment before the battery cover is put on.

Section 12B: Routing from CB to 1 AUX Battery [KIT 62886]

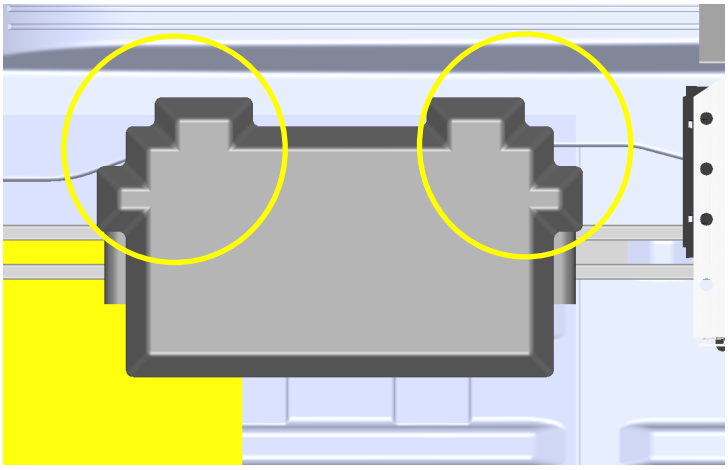
Step 12B-7. Review battery box covers





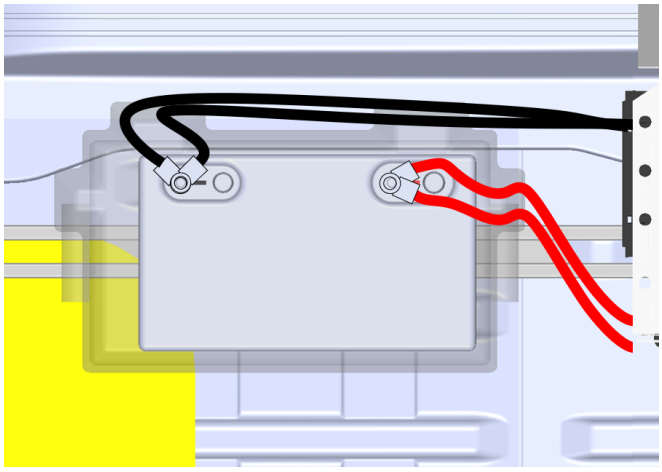
- Recall that the battery box cover is to be fitted with the entry points near the battery terminals.

Step 12B-8. The covers have entry points for cables



- The entry points are located to allow the battery cover to go over the cables connected to the battery.

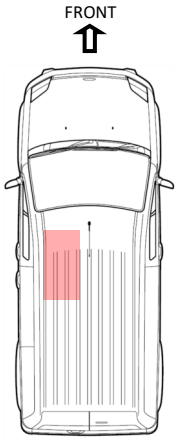
Step 12B-9. Overhead routing of cables for lid fitment

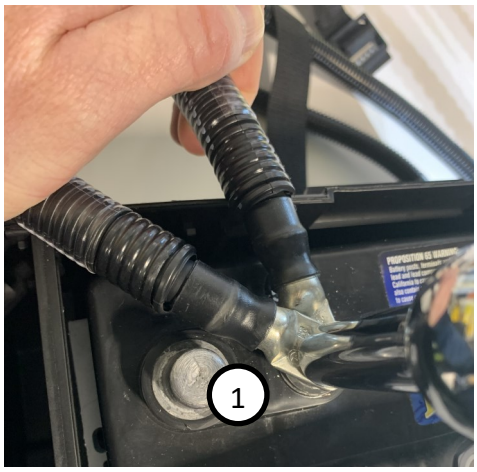


- The cables and wire will be tightened down to allow the cables to be routed out of the boxes through these entry points.
- This requires the installer to hold the cables as they are torqued down.

Section 12B: Routing from CB to 1 AUX Battery [KIT 62886]

Step 12B-10. Tighten the negative terminal nut

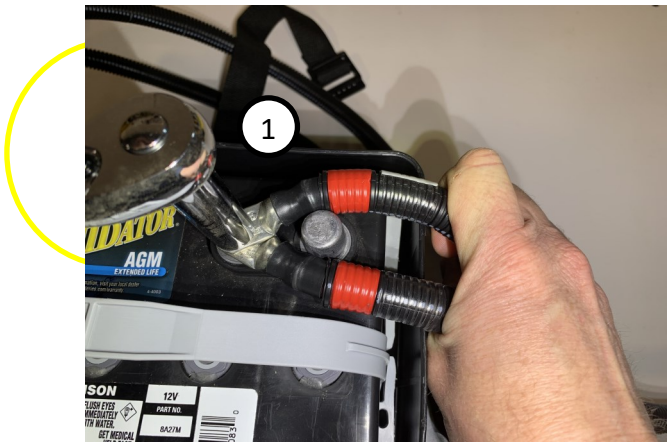




- As the nut is tightened, hold cables into alignment for the openings in the top of the battery box.

1 Auxiliary battery terminal fastener nuts (Ref. NO.:23) will be torqued down to **8Nm [+/- 1.2Nm] (71 lb.in)** with a 1/2” socket.

Step 12B-11. Tighten the positive terminal nut



- As the nut is tightened, hold cables into alignment for the openings in the top of the battery box.

1 Auxiliary battery terminal fastener nuts (Ref. NO.:23) will be torqued down to **8Nm [+/- 1.2Nm] (71 lb.in)** with a 1/2” socket.

Step 12B-12. Overhead routing of cables for lid fitment

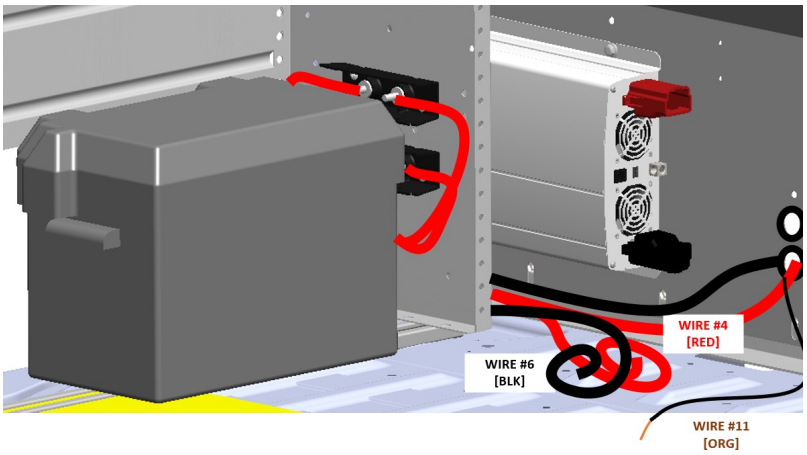
- The cables and wire will be tightened down to allow the cables to be routed out of the boxes through these entry points.

Section 12B: Routing from CB to 1 AUX Battery [KIT 62886]

Step 12B-13. Installing covers and guiding cables

- As the battery box cover is put on , guide the cables for easier fitment of the box co-vers.
- The tops of the boxes are to be snapped on and the battery straps should be tightened around each box.
- Observe the case strap now installed on the battery box (directions come with strap).

Step 12A-14. Ground cable routing and fastening



- The inverter is ready to be connected. See Section 13.

Section 13: Inverter Connection-Wiring and Cabling:

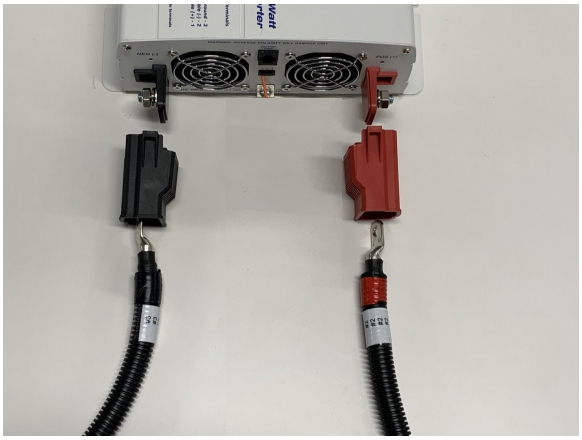
Step 13-1. 1.5 & 2kW Inverter Preparation

- Before mounting inverter to the partition, there will likely be limited space to connect the wiring. It is advised that the connections are made before installation, depending on the access.
- Loosen the 1/2” nut and washers on terminals and remove them for a moment.

Step 13-2. Terminal Covers

- The terminal covers are important to include when installing the wires to the Inverter.
- The screws will hold them over the terminals.

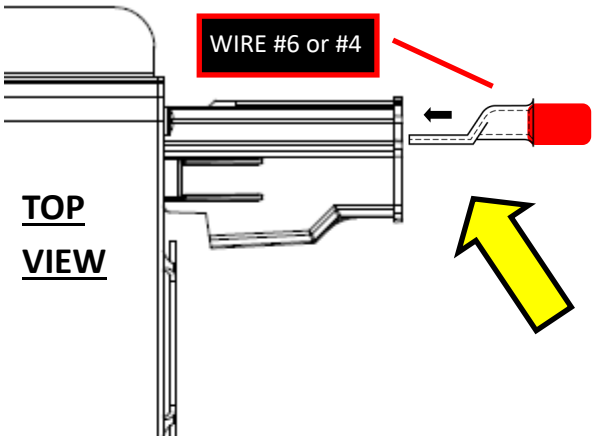
Step 13-3. Inverter Cable Setup



- Put the terminal covers on the cables in the proper direction before installing.
- Loosen the 1/2” nut washers on terminals and remove.

Section 13: Inverter Connection-Wiring and Cabling:

Step 13-4. Orientation of Cables into Inverter

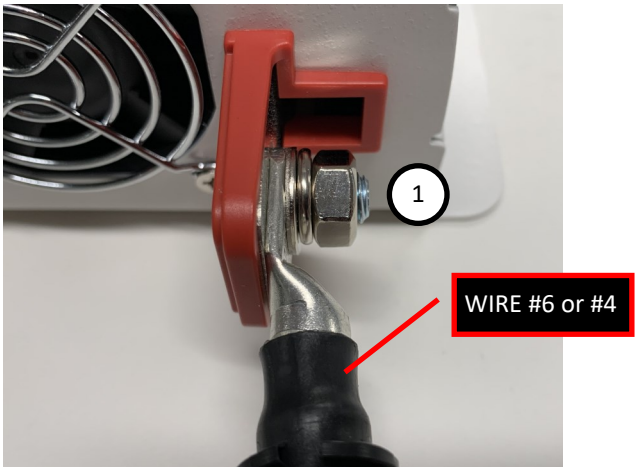


The lugs should fit squarely into the terminal covers and sit flat upon the terminal surface. They may

- Bring the cables from the AUX Battery(ies) neatly to the terminals on the inverter.
- Be sure to orient [see Yellow Arrow] the cable lug so that it fits squarely onto the inverter terminal (flat side towards the terminal).

TOP VIEW

Step 13-5. Fastening Cables to Terminals



Caution: All DC connections should be tightened to proper torque to avoid loosening during time in

1 These Positive and Negative connections shall be torqued to 12.4Nm [+/- 0.7Nm] (110 lb.in).

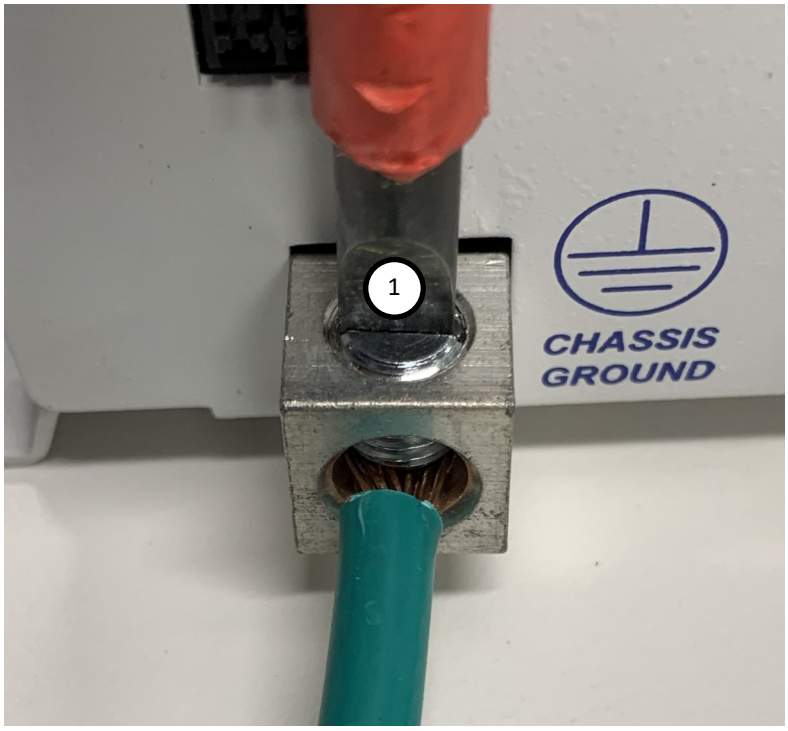
Step 13-6. Installation of Covers over Terminals

- Bring the terminal covers over the torqued cable lugs and use screws to snugly fastener them (they will only fit in one orientation.

Section 13: Inverter Connection-Wiring and Cabling:

Step 13-7. Inverter Chassis Ground Installation

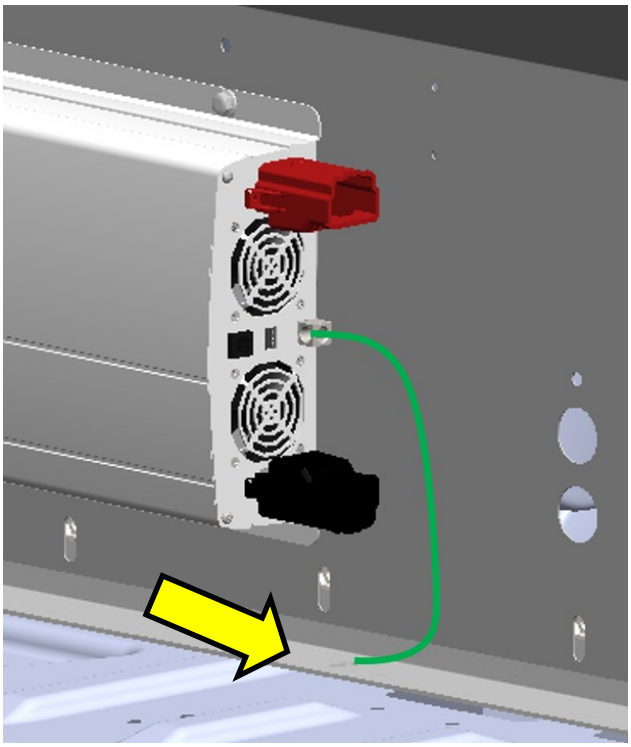
Caution: All DC connections should be tightened to proper torque to avoid loosening during time in



- The 8AWG GREEN Inverter ground **WIRE #10(#7)** has an end with the insulation pre-cut
- Remove the insulation and clamp into the Chassis Ground terminal.

1 This connection shall be torqued to 12.4Nm [+/- 0.7Nm] (110 lb.in).

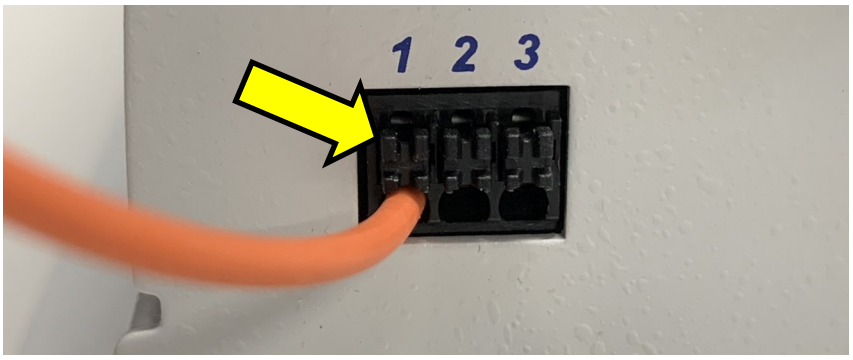
Step 13-8. Inverter Ground Wire

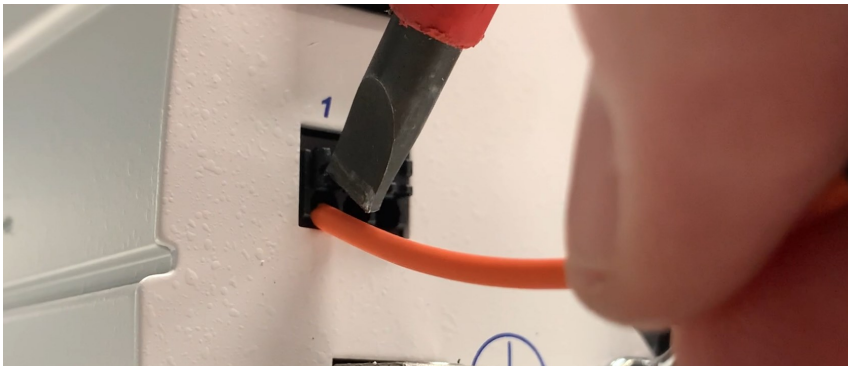


- The other end of the green inverter ground **WIRE #10 (or 7)** will have a ring terminal that must be fastened to a local chassis ground.
- The partition hold down fastener near the inverter holding the partition to the floor is recommended.
- Utilize torque specification found for that fastener in the partition installation kit.

Section 13: Inverter Connection-Wiring and Cabling:

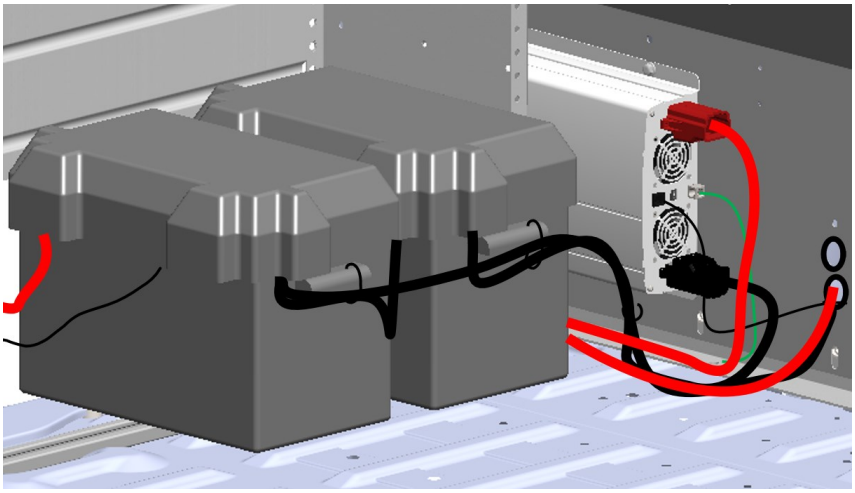
Step 13-9. Remote Wire Connection to Inverter





- The remote Orange **WIRE #13(#11)** installed earlier is length adjusted so there is not excessive extra length. It can also be coiled and fastened with wire tie.
- The Orange **WIRE #13(#11)** is stripped about 3/8" , twisted to avoid strays, and pushed into the #1 terminal in the black remote control header.
- If it must be released for any reason, push the square button above the terminal hole *and hold* to disengage the spring clamp, then pull the wire out.

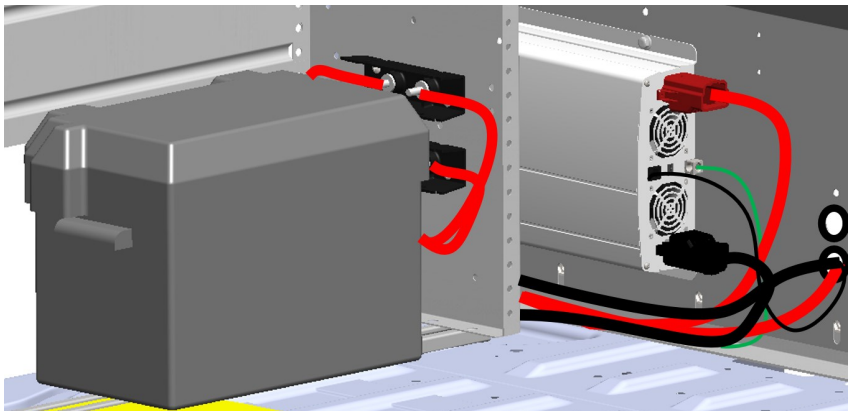
Step 13-10A. Inverter system installation for KIT 61697 almost complete



- At this point the system is ready for setup (Section 14) and fuses to be inserted (Section 15).

Section 13: Inverter Connection-Wiring and Cabling:

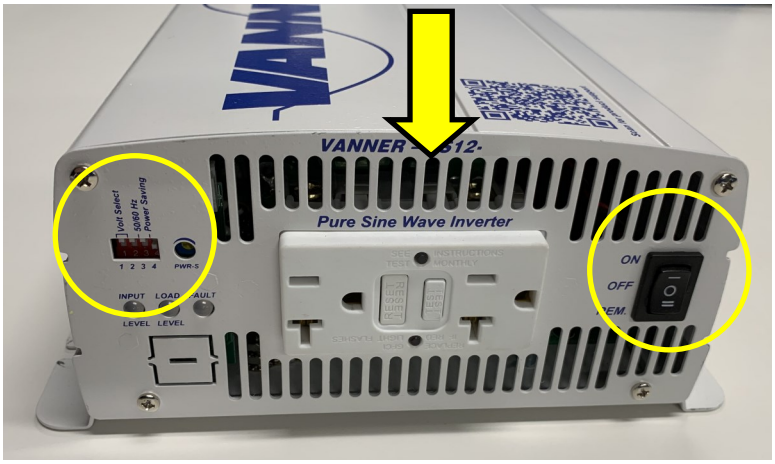
Step 13-10B. Inverter system installation for KIT 61697 almost complete



- At this point the system is ready for setup (Section 14) and fuses to be inserted (Section 15).

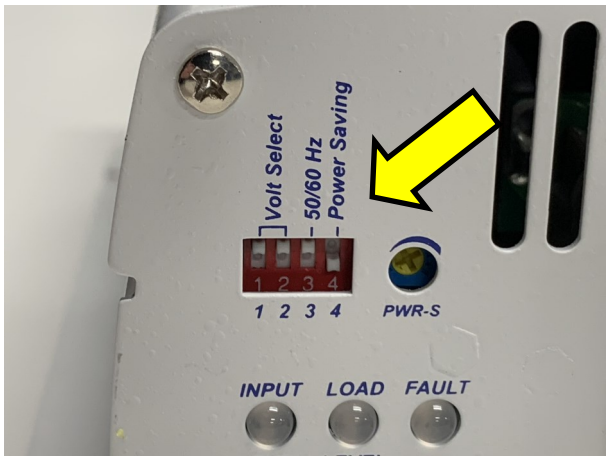
Section 14: Inverter Settings:

Step 14-1. Inverter Front Face



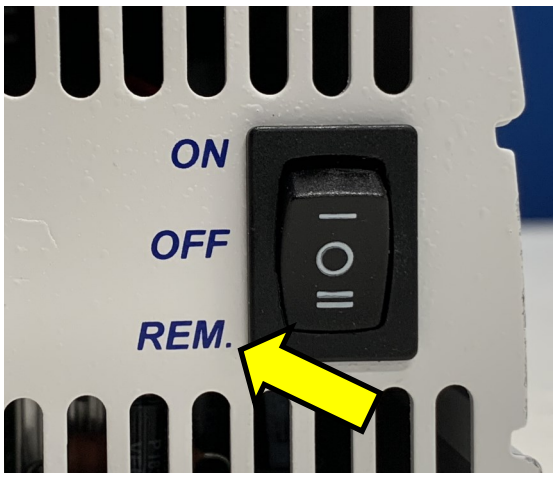
- This side of the inverter will face the streetside of the vehicle.
- On the front side of the inverter, insure the setting switches are correct...

Step 14-2. Function Switches



- The inverter function switches should be set to:
- 1-UP/2-UP/3-UP/4-Down [120V, 60Hz, with power saving OFF].

Step 14-3. Remote Switch Confirmation

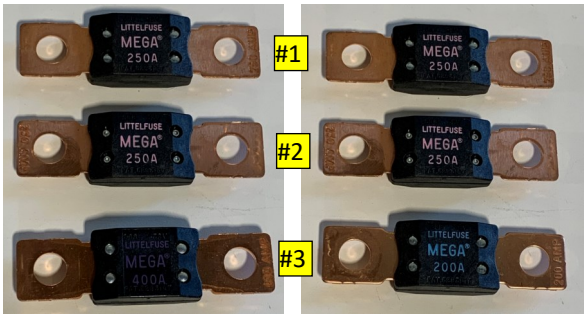


- The Inverter switch must be switched to “REM.” (remote) to avoid inadvertent discharge of the battery(ies).

Section 15: Fuse Installation:

Step 15-1. Fuse Size Reference

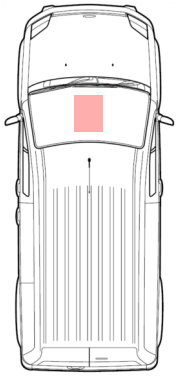
2AUX KIT (61697) 1AUX Kit (62886)



- For Reference, the fuses sized to each kit are here.
- Do not use a fuse exceeding the rating of the system.
- KIT 61697: #1:250, #2:250, #3:400A
- KIT 62886: #1:250, #2:250, #3:200A

Step 15-2. Check remote switch and inverter switches

FRONT

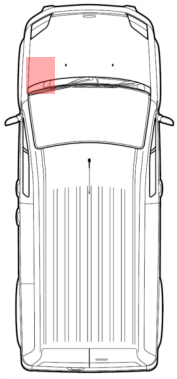


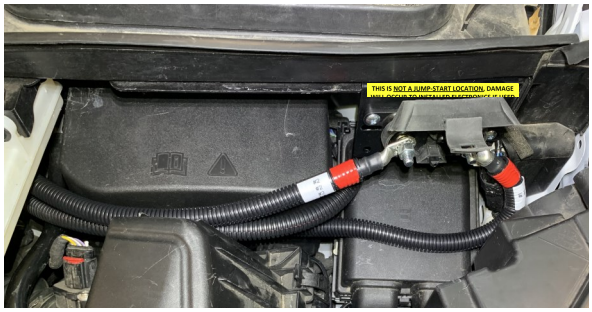
- Make sure inverter switch is in “REM” position on inverter (Section 14)
- Make Sure Red Rocker Switch is in off position. [Yellow switch label will be applied in Section 16].

Step 15-3. Locate CB Fuse holder in engine bay

Caution: The WIRE #1 is a live wire. It needs to be controlled while adding fuse.

FRONT

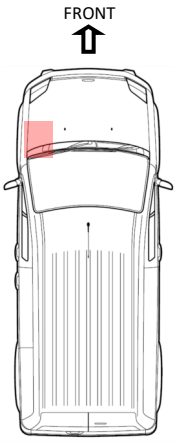




- Go to the chassis battery (CB) Fuse holder and unsnap the rubber cover that is over the fuse holder terminals.

Section 15: Fuse Installation:

Step 15-4. Remove fasteners on CB fuse holder



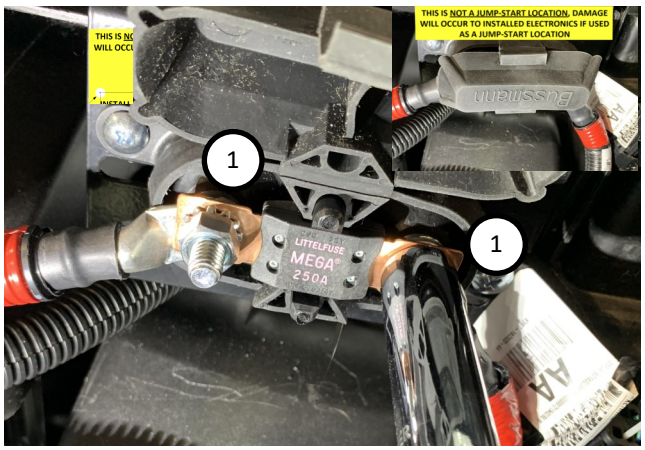
Caution: The WIRE #1 is a live wire. It needs to be controlled while adding fuse.

- Carefully unscrew and remove the nuts/ washers from the inverter systems chassis battery (CB) fuse terminals while holding the **WIRE #1** and **WIRE #2** down on the posts.

Step 15-5. Insert Fuse #1 into CB fuse holder

- Place the **#1 Fuse** (in Step 15-1 above) across the terminals and fasten the nut on **WIRE #1 first**.

Step 15-6. Torque CB fuse holder fasteners



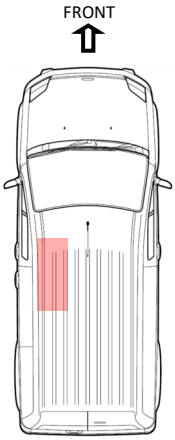
Caution: Use caution with the wrench, be sure it will not touch or swivel to ground while tightening nuts on fuse.

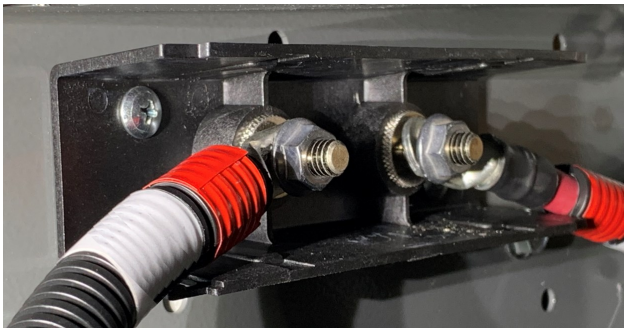
1 Both fuse fasteners should be torqued to 12Nm (106lb-in) with 1/2" socket.

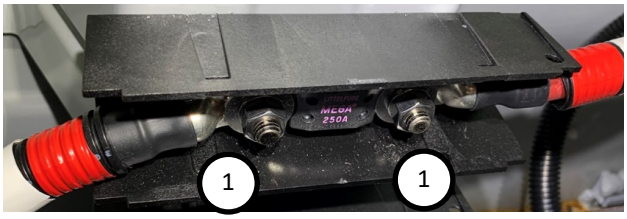
- Insert the rubber cover and snap on the latch into place [inset].

Section 15: Fuse Installation:

Step 15-7. Insert MEGA Fuse #2 into AUX Fuse Holder







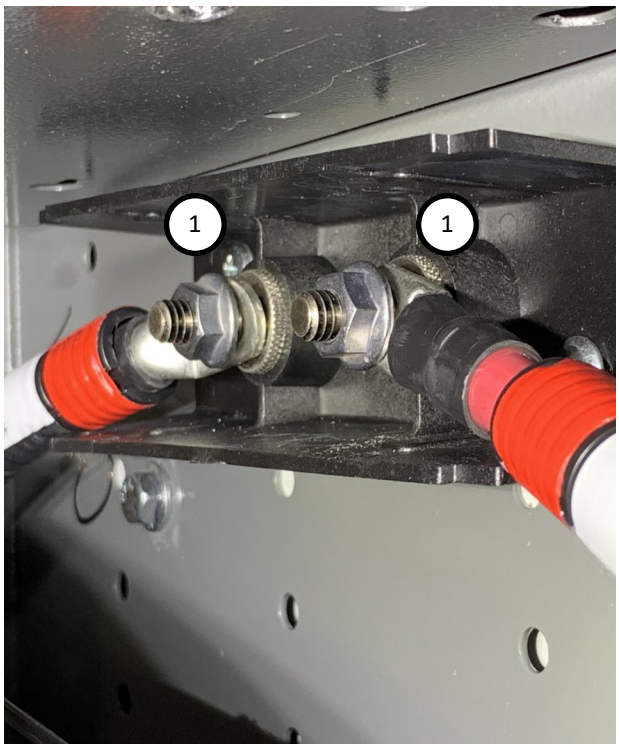
Caution: Both AUX Fuse wires are live wires. They need to be controlled while adding fuse.

Caution: During torquing be aware of touching other grounded metal parts!

- Hold wires to ensure they stay on the terminals until fuse is installed.
- Remove fasteners and washers from the AUX Battery fuse holder.
- Insert the **#2 Fuse** (in Step 15-1 above) over the terminals in the fuse holder and re-fasten washers and nuts.

(1) Both fuse fasteners should be torqued to 12Nm (106lb-in) with 1/2" socket.

Step 15-8. Insert MEGA Fuse #3 into INV Fuse Holder



Caution: The INV Fuse terminal from AUX 1Battery is a live wire. It needs to be controlled while adding fuse.

Caution: During torquing be aware of touching other grounded metal parts!

- Hold wires to ensure they stay on the terminals until fuse is installed.
- Remove fasteners and washers from the INV Battery fuse holder.
- Insert the **#3 Fuse** (in Step 15-1 above) over the terminals in the fuse holder and re-fasten washers and nuts.

(1) Both fuse fasteners should be torqued to 12Nm (106lb-in) with 1/2" socket.

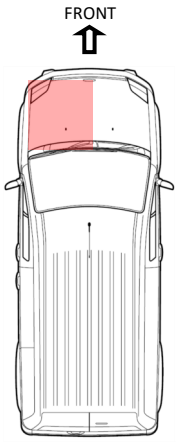
Section 15: Fuse Installation:

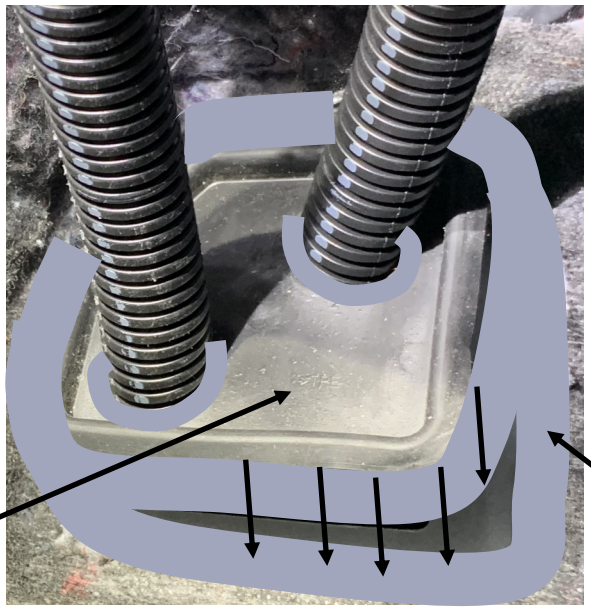
Step 15-9. Install the safety covers onto fuse holders

Safety covers on the fuses keep from incidental contacts with items in the cargo area.

- Install the safety cover onto the fuse holder and assure that it snaps in place.
- Use a cable tie to secure the safety cover. There are holes in the corner of the cover and plastic body of the holder (see Yellow Arrow) to feed through a cable tie and cinch & clip.

Step 15-10. Final sealing of the IP pass-through





Push into place after applying silicone

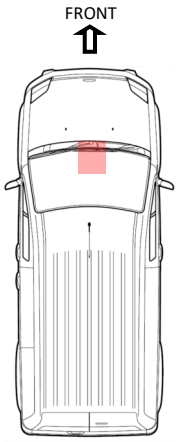
Silicone sealant apply generously

NOTE: The cables are thick and will pull out the seal if they are repositioned. Fasten them down before sealing.

- At this point all the cables should be in thier final positions. Upon successfully checking for proper operation, apply the silicone sealant at the engine compartment pass-through and push in grommet.
- This area should be undisturbed until silicone is cured.

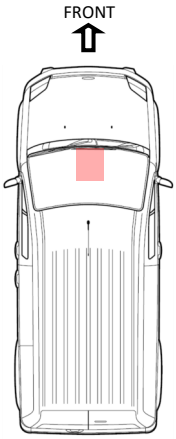
Section 16: Important Labeling

Step 16-1. Apply Remote Inverter Switch Label



- Install the circular “INVERTER 120V AC” label at the red remote switch on the shift bezel.

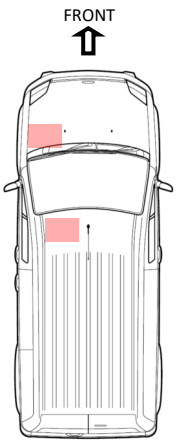
Step 16-2. Apply Remote Inverter Switch Label

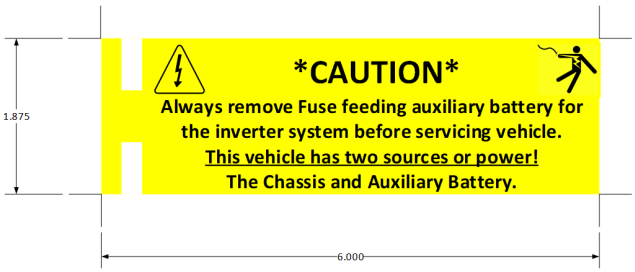


- Install the Blue Notice Label on the side of the inverter that is facing up after installation.

NOTICE
The power switch on this unit MUST be left in the REM (REMOTE) position to ensure correct operation of the inverter system. Changing the position of the switch can deplete the OEM batteries and require a jumpstart.

Step 16-3. Apply Auxiliary Battery Caution Labels

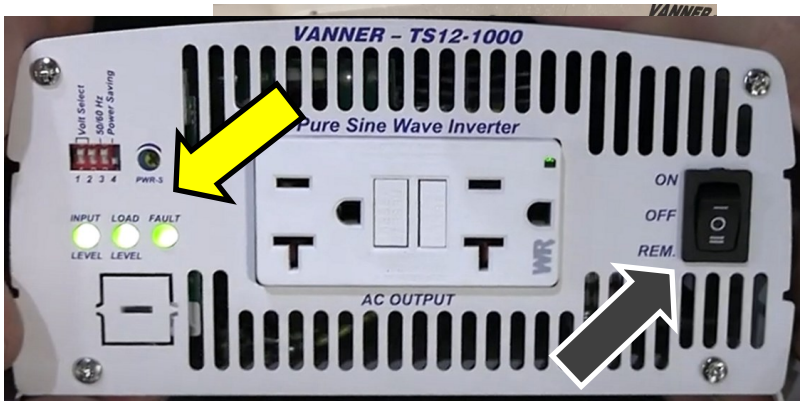




- Install the Yellow tag with Zip Tie to battery cables at OEM Battery and AUX 1 Battery.

Section 17: Test and Check

Step 1-71. Test the inverter function



Warning: Make sure all AC connections are made appropriately before power up.

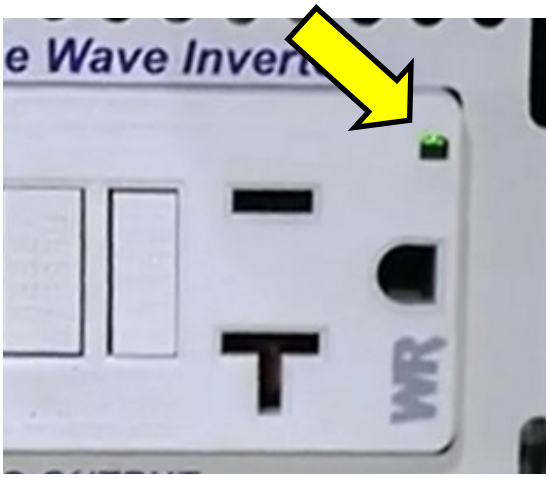
Test: Verify Inverter Powers Up

- Ensure the INVERTER power switch is set to "REMOTE" [Grey Arrow]
- Start the engine or turn ignition to "ON" position.
- Turn on the RED remote inverter switch in the dash.

What to expect:

- Verify all three round green LEDs light up green with nothing plugged in [See Yellow Arrow].
- If any of the LEDs are not Green, turn off the system and check all wiring.

Step 17-2. Check GFCI operation



Test: Verify GFCI Light is Green.

- While the inverter is powered, confirm the GFCI green light is on. Again-nothing should be plugged in.

What to expect:

- If the light is Green, go to the next step
- If the light is red, push the GFCI RESET button. This should reset the device to green.

Step 17-3. Test the inverter power output

Test: Insert Inverter Output Tester.

- **Plug in** any accessories such as power strips included with the installation.
- Utilize an extension cord with the Voltage meter/ GFCI Tester into one of the outlets on the inverter.

What to expect:

- The power output should be at correct voltage and polarity. A reading of 114Vac – 122Vac is expected.
- GFCI should indicate "Correct" or OK.
- If voltage is not in that range please STOP and notify Team Lead.

Section 17: Finish & Test:

Step 17-4. Routing and Clipping

- Turn off dash switch for transportation and leave the black inverter mounted switch in “REM”.
- Using the supplied wire ties make sure all wiring is secured and clear of sharp objects, moving parts, and heat sources.
- Ensure all trim removed in previous steps is secure and neat.

Installation Instructions Have Finished

Section 18-A: Fleet Appendix-Wiring Diagrams

Two AUX Batteries + Contactor (KIT 61697)

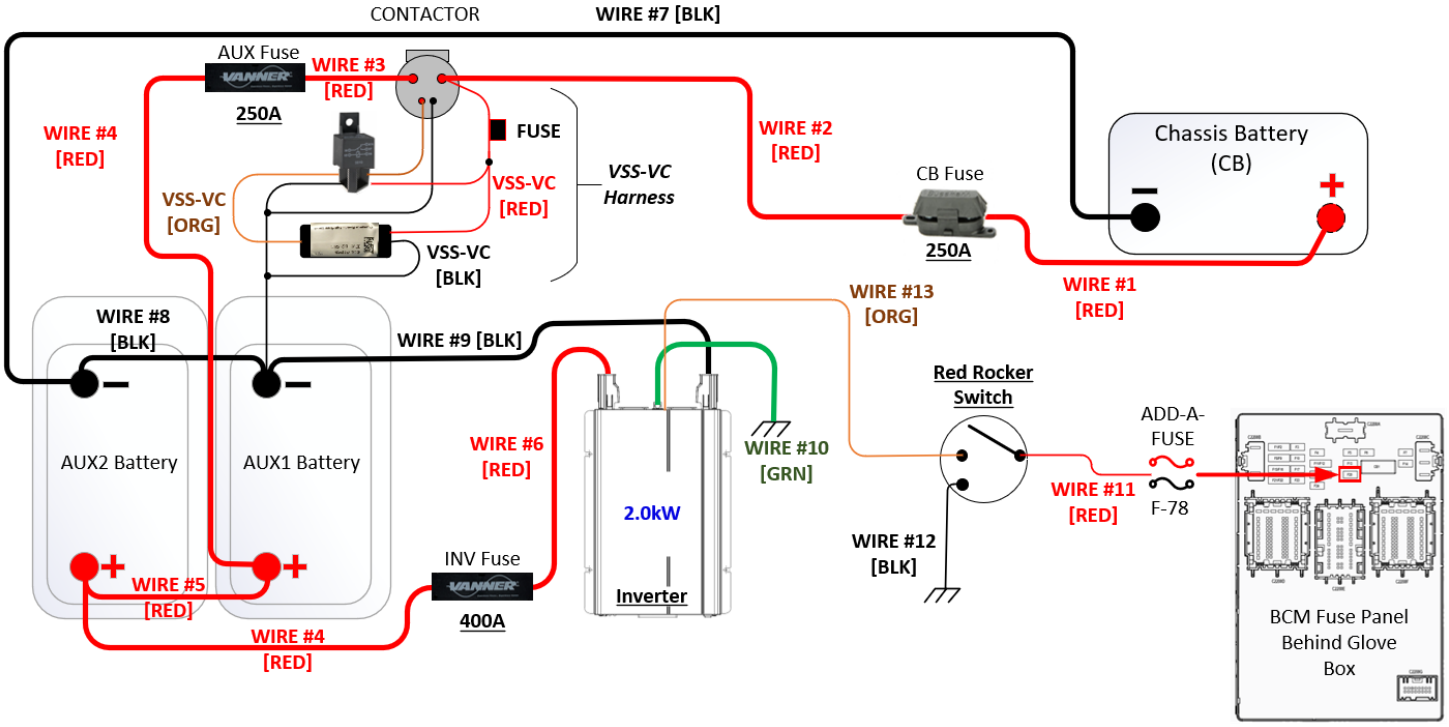


Figure 18A-1: Complete Wiring Diagram for kit with a Contactor

One AUX Battery + Timer (Kit 62886) :

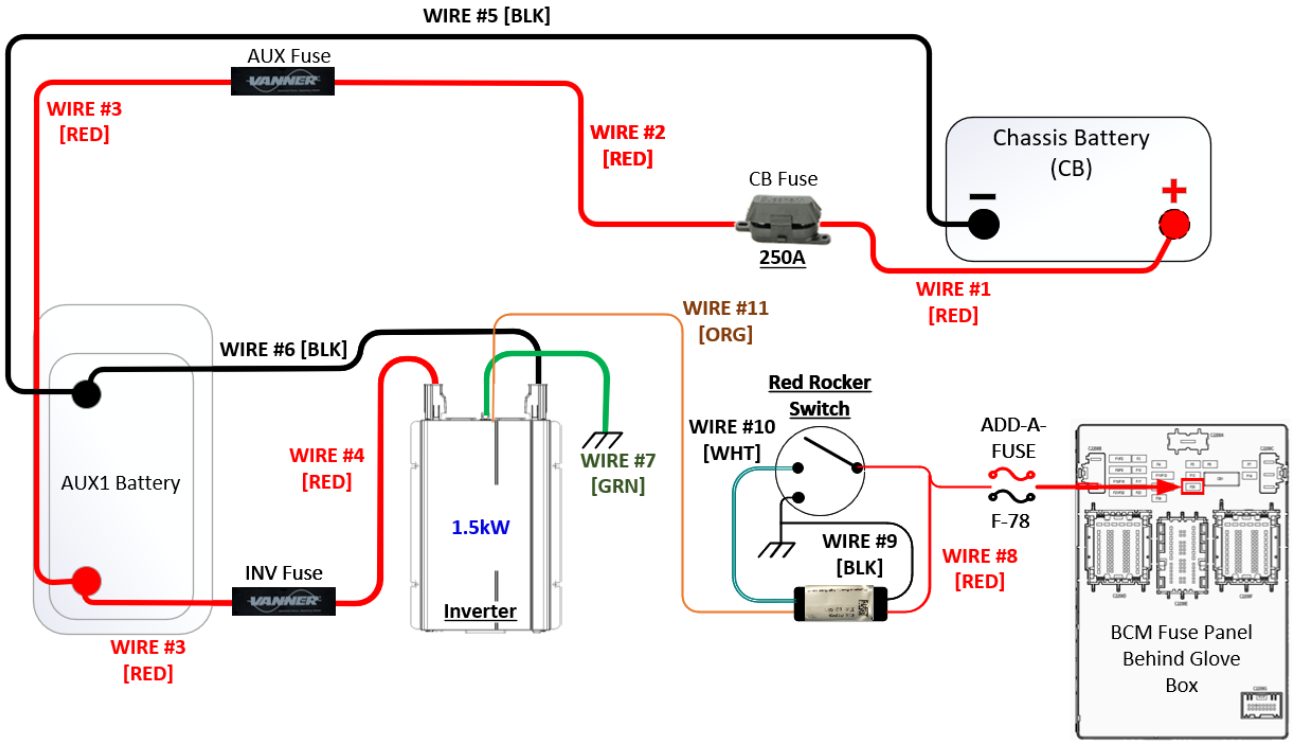


Figure 18A-2: Complete Wiring Diagram for kit with a timer switch

Section 18-A: Fleet Appendix-Tools Needed & Fastener ID/Torque Table:

1) Insulated Splice Crimper
2) Wire Strippers
3) Diagonal Cutters
4) Plastic Trim Tool
5) Drill driver
6) Measuring tape
7) Phillips Bit with Bit holder
8) 3/4” Hole or Step Drill (Unibit)
9) Medium and Small (-) Screwdriver
10) Large #3 Phillips (+) Screwdriver
11) Sockets:
    - 8mm,10mm,13mm
    - 5/16”,3/8”,7/16”,1/2”
    - Socket driver and extensions
12) Torque Wrench [~8-20Nm range]
13) Tin Snips
14) #3 Philips (+) & Medium slotted torque socket
15) Marker [Not Shown]
16) Plusnut gun
17) Drill Bits:
    - 1/4”,5/16”, 3/8", 1/2"
    - 1 –3/16" hole saw (if applicable)
18) Fish tape
19) Vinyl Electrical Tape

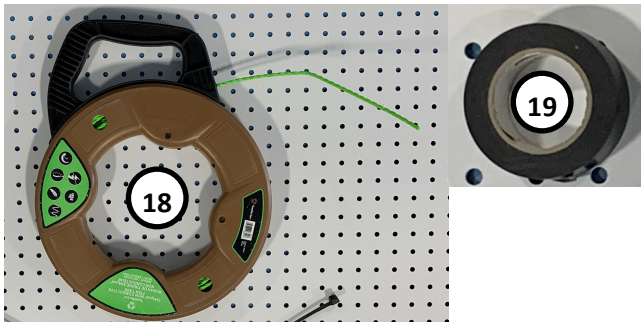


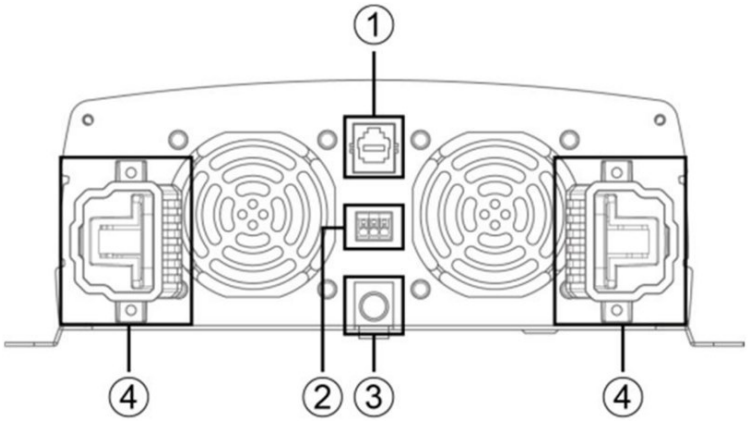
Figure 3-1: Tools Needed for Installation

Section 18-A: Fleet Appendix– Additional Notes

NOTES:

- Battery Negative disconnected during application of cables is generally recommended by Ford BBS.
- Only insert large MEGA fusing when ready to check functionality of the system after is installed.
- Be sure the MEGA fuse is correct size according to Inverter Cabling Kit PPDS.
- Installing on a Composite Partition requires extra procedure of installing accessory brackets.
- When installing on cargo side of partition, be sure cables are fed through the holes with grommets installed.
- The Green 8AWG WIRE [#10 for KIT 61697 & #7 for KIT 62886] may need to be installed on mounting fastener of the inverter or other location if the partition does not have grounded fasteners holding it to chassis.

DC Input Side Panel Wiring Diagram:



TS-1500W and TS-2000W

Model	TS Series
①	Factory Port
②	Remote control black terminal
③	Chassis ground
④	DC input connector

Section 18-A: Fleet Appendix- Kit Fasteners and Torque Table

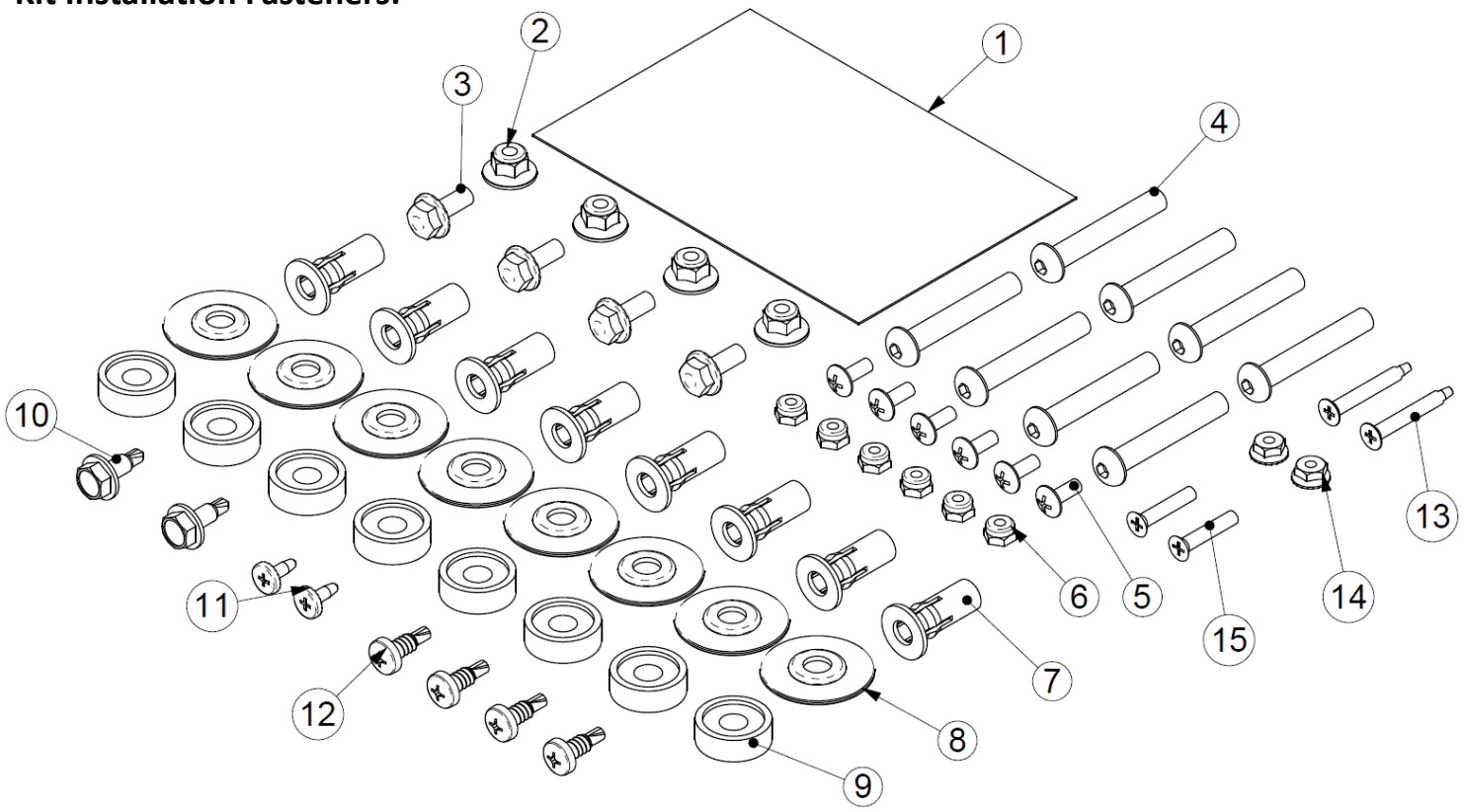
Torque Table:

ITEM NO.	ASC PN	Description	PCS	Torque Range	Use Wrench or Size
1	BAG0406-A	4" x 6" 3MIL AUTOBAG	1	--	
2	FAS0055	Nut, Hex Flange, Nylock 1/4-20	4	12Nm [+/- 1.8Nm] (106lb.in).	7/16"
3	FAS0018	SCREW,HH SFLNG 1/4-20X.62 ZP	4	12Nm [+/- 1.8Nm] (106lb.in).	7/16"
4	FAS0048	Screw, Button Hd Hex Soc, 5/16-18X2, ZN	8	15Nm [+/- 1.8Nm] (132lb.in).	3/8" Allen
5	FAS0025	Screw, Truss Hd. Ph, #10-24x0.50	6	3Nm [+/- 0.5Nm] (27lb.in).	#2 Phillips
6	FAS0029	NUT,HEX NLK 10-24 ZP	6	3Nm [+/- 0.5Nm] (27lb.in).	3/8”
7	FAS0091	Plusnut, 5/16	8	--	--
8	FAS0833	WASHER, CUP FLANGED 1.5"	8	--	--
9	03927-1	SPACER,FLR,1010,11/32 ZP	8	--	--
10	FAS0641	SCREW,HH TEK 1/4-20X.7 ZP	2	12Nm [+/- 1.8Nm] (106lb.in).	7/16"
11	FAS0148	Screw, Self Drill/Tap, Pan Ph. Hd., #10x0.5, NI-ZN	1	3Nm [+/- 0.5Nm] (27lb.in).	#2 Phillips
12	FAS0360	SCREW,ST,THP 14-10X.75 SS	4	3Nm [+/- 0.5Nm] (27lb.in).	#2 Phillips
13	FAS0629	Screw, Self Drill/Tap, Wafer Ph. Hd., #10x1.5 NI-ZN	2	3Nm [+/- 0.5Nm] (27lb.in).	#2 Phillips
14	FAS0020	Nut, Hex Flange, #10-24	2	3Nm [+/- 0.5Nm] (27lb.in).	3/8”
15	FAS0032	Screw, Flat Phillips Hd, #10-24x1.0	2	3Nm [+/- 0.5Nm] (27lb.in).	#2 Phillips

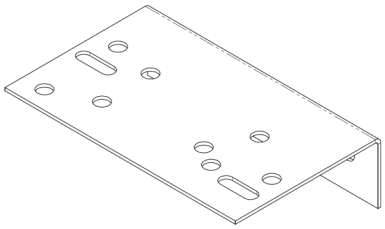
Please NOTE: Certain fasteners or hardware may not be used for certain kits.

BAG66633

Kit Installation Fasteners:



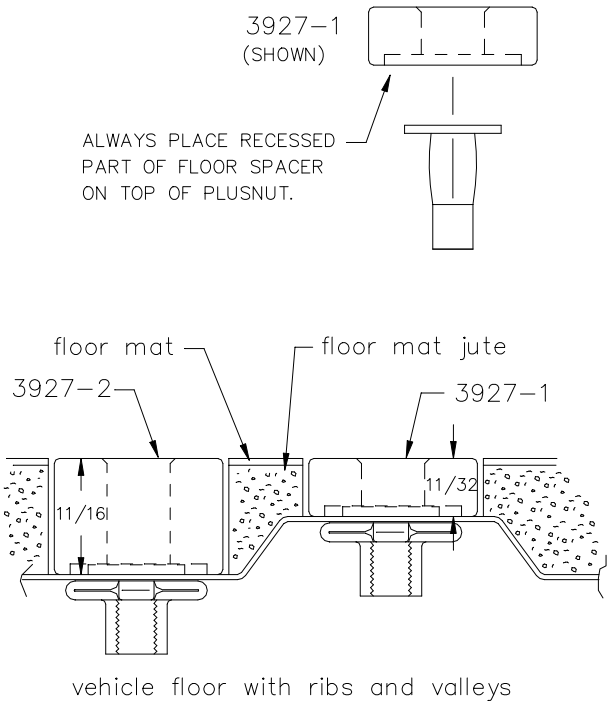
Section 18-A: Fleet Appendix- Kit Fasteners and Torque Table

Ref. NO.	ASC PN/Function	Description	PCS	Torque Range	Use Wrench or Size
16	44918-B BRACKET, FUSE HOLDER, F150		1		
17	Cables to VANNER & Bussman Fuse Holders		4	12Nm [+/- 1.8Nm] (106lb.in).	1/2"
18	Inverter +/- Terminals	Phillips and slotted screws	Three (3) Posi-tions	12.3Nm [+/- 0.7Nm] (9.5 lb.ft).	#3 Phillips and 1/4" Standard driver bits
19	Contactor Mains		2	10.2Nm [+/- 1.1Nm] (~90 lb.in).	1/2"
20	Contactor coil		2	2.5 Nm [+/- 0.9 Nm] (~22.5 lb.in).	3/8"
Other Fasteners in Vehicle					
21	CB Positive Battery Post Bus Bar	—	1	8Nm [+/- 1.2Nm] (71 lb.in).	10mm NUT
22	CB Negative Battery Cable to Chassis	—	1	22Nm [+/- 1 Nm] **(16 lb.ft).**	13mm Nut
23	AUX Battery positive and negative terminal fasteners	—	2 or 4	8Nm [+/- 1.2Nm] (71 lb.in).	1/2" Nut
24	Hood cowling fastener for CB Fuse Holder Bracket	—	1	2.5 Nm [+/- 0.9 Nm] (~22.5 lb.in).	8mm Screw

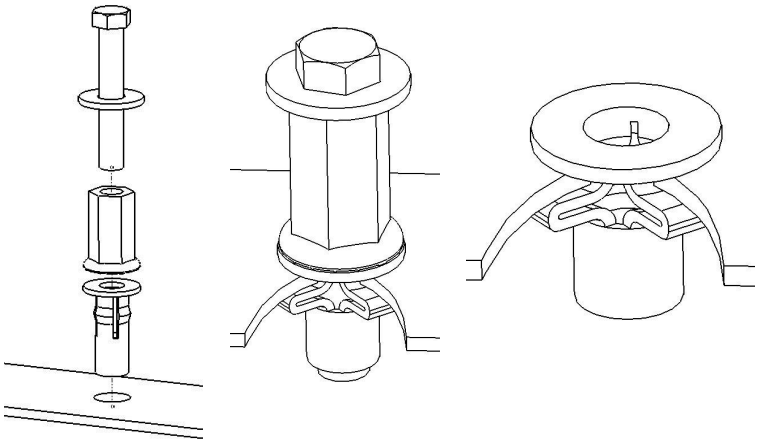
Please NOTE: Certain fasteners or hardware may <u>not</u> be used for certain kits.

Section 18-B: Plusnut Appendix

Installation of Plusnut mounting hardware



- If your vehicle contains carpet or a rubber floor mat you will need to prepare the mounting location.
- Position the product to be installed into the vehicle and once your are satisfied with the mounting locations, mark the mounting locations. Using a 1-3/16” diameter carpet cutter (P/N: 31183-0). Select the appropriate floor spacers as shown in the illustration. Set those aside for use later into the installation process.
- Using the correct drill bit size for the selected plusnut, drill the mounting holes in the vehicle sheet metal to prepare for installing the plusnuts.
- Once you have drilled the holes into the vehicle, the raw metal edges should be sealed using a self-etching primer to resist corrosion and potential fastener point



- A PLUSNUT (RIVNUT) SETTING TOOL IS REQUIRED FOR PLUSNUT (RIVNUT) INSTALLATION . PLUS NUT SETTING TOOL CAN BE ORDERED THROUGH ADRIAN STEEL, OR USE AN AIR POWERED PLUSNUT SETTING GUN.

- 5/16-18UNC Plusnut (FAS0091) Use 1/2” dia. drill w/stop
  - FAS0095 SCREW, HXHD, 5/16-18UNCx2.00”, G8
  - FAS0086 WASHER, FLAT, 5/16”ID
  - 22200-0 PLUSNUT TOOL

- Place barrel of the plusnut body in sheet metal thru hole until flange is flush with sheet metal.
- Using a 9/16” combination wrench of plusnut tool body and a second hand wrench, ratchet, or air tool, rotate the hex bolt head CW to draw plus nut flanges up (set the plusnut).