

# Ekko 12v battery system update – Gen 3 & 4:

## Tools required-

1. Torque wrench capable of Ft/Lbs. and In/Lbs.
2. Sockets – 3/8", 9/16, 5/8, 3/4, 11/16, 10mm, 13mm, 17mm & 17mm deep well.
3. 3/8 ratchet and misc. extensions.
4. 1/2", 9/16" & thin 17mm wrench. Ratchet wrenches are preferred due to the tight spaces
5. Wire stripper and crimper.
6. Scraper/Putty knife.
7. Serpentine belt tensioner release tool with 14mm socket.
8. Screw gun with #2 Philips.
9. Flashlight.
10. Wire Brush.
11. Scissors.
12. Cell Phone with Lithionics App.
13. 120V Outlet checker.



# Ekko 12v battery system update – Gen 3 & 4:

## Parts required:

**Recall Kit #RC7909-23-774 Gen 3**

**Recall Kit #RC7913-23-774 Gen 4**

1. Battery Cap Kit (2)
2. Buss Bar Panel Asm
3. 2.5" Clamp
4. 2" Cap (2)
5. 15" Cable Tie (15)
6. Battery Cables - 2/0 Red (2)
7. Battery Cables - 2/0 Black (2)
8. Balmar 1070 Alternator Harness – Gen 3 only
9. Screws – #8-18 x ½", 8-18 x ¾" Self-Drilling
10. Loctite 243
11. Orange Cross Check Torque Paint
12. Sealant, Manus (3)
13. Terminal Cover (2)
14. 3" Grommet
15. Edge Cover (2')
16. Large P clamps (4)
17. Cavity Seals (3) - Gen 4 only
18. Winnebago Breaker Control Harness
19. Balmar 1061 Battery Temp Sensor Harness
20. Balmar replacement alternator w/temp sensor.
21. Balmar 1063 Temp Y-Harness – Gen 4 only.



# Step 1 – Disconnect all Power sources from the coach.

1. Make sure the lithium batteries are not fully charged. If they are, drain the battery/batteries to under 90%. This will allow you to properly test the system after this work is completed.
2. Disconnect the 110v power cord from the coach – See Image 1.
3. Turn off the house disconnect switch – See Image 2.
4. Turn off the 12v battery 250-Amp main Breaker/Breakers – See Image 3.
5. Turn off the inverter disconnect – See Image 4.
6. Unplug the solar panels from the roof connection port – See Image 5.
7. Turn off the 12v house battery/batteries by holding down the power button on the top of the battery/batteries for 3 seconds. Make sure the blue LED lights are off - See Image 6.
8. Under the hood of the chassis, disconnect the “Purple” coded Winnebago chassis power cable from the Ford jump post left of the fuse box –See Image 7.

Image 7



Image 1



Image 2



Image 3



Image 4



Image 5

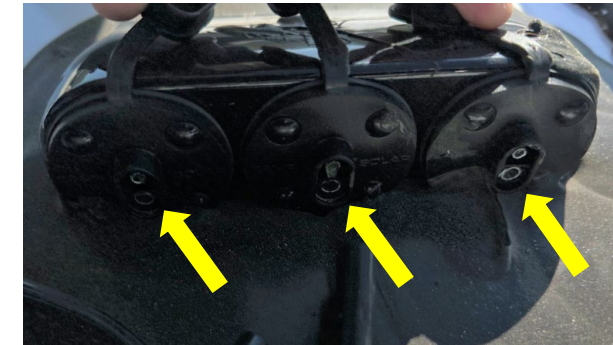


Image 6



# Step 2 – Battery removal.

1. Remove the closeout panel from the lower section of the compartment by removing (6) screws with the drill and #2 Philips bit – See Image 1, Yellow arrows.
2. Remove the 8-pin control connector from the top of the main battery - See Image 2, Green arrow for location.
3. Using a ½” wrench, remove all battery hold down fasteners - See Image 2, Blue arrows - and pull the bolts down through the compartment.
4. Using a 13mm Socket and ratchet (Some coaches may require 13mm gear wrench with pivot head) remove all battery cables from the battery posts – See Image 2, Red arrows.
5. Slide the batteries out of the battery compartment and set aside.
6. Remove all battery cables and harnesses from the battery compartment by pulling them through the existing rubber grommets in the right rear corner. See Image 2, Yellow arrows. When completed, the battery compartment should be empty.

Image 1



Image 2 – Shown with floor removed for clarity



# Step 3 – Chassis Ground Bar.

1. Locate the chassis ground bar that is welded to the upper floor tube behind the Drivers Side #2 compartment (without Generator), or behind the generator. Note: It may be necessary to lower the generator to gain proper access to the ground bar.
2. Remove the Inverter 3/0 ground cable, the 3/0 Alternator ground cable, the 3/0 main battery ground, and the 12 Awg Balmar black ground wire from the ground bar. Untangle the circuits and route all 4 cables into the compartment rearward of the battery compartment removing as much slack as possible.
- 3. Verify that the ground bar isn't painted, and the surface is free of all oxidation. Clean the buss bar with a wire brush as necessary.**
4. Inspect all ring terminals for excessive heat shrink or damage. If the heat shrink is overlapping the ring terminal as shown in Image 1, trim the heat shrink back as shown in Image 2 to insure a proper electrical connection. If the ring terminal is damaged, replace the cable or replace the damaged ring terminal. If replacing ring terminal, pull-test connection by hand to ensure proper crimp.
5. Reconnect the main battery ground to an open slot on the ground bar. Make sure it is the only terminal connected at that slot.
6. Using the 1/2" socket and backer wrench, torque all the existing ground bolts to 230 In/Lbs.

Image 1- Bad



Image 2 - Good



**1/16" Ground Bolts are used for all General grounds. Using a 1/2" socket and backer wrench, torque all ground bolts to - 230 In-Lbs.**



# Step 4 – Cable cleanup – Gen 3:

1. Locate the Balmar regulator located under the hood, on front passenger wheel well – See Image 1. Remove the Balmar regulator, control wiring and pipe insulation from that area and discard. Continue to remove the Balmar control harness all the way back to the battery compartment. This harness is being replaced.
2. Plug the holes in the back corner of the battery compartment with 2" caps – See image 2. You may need to use the scraper to clean up the existing sealant to allow the new plug to snap into place. Cap seal the plugs with sealant.
3. Clean and straighten up the cabling in the compartment rearward of the batteries as much as possible.
4. Locate the battery 8-Pin connector harness branch, cut and reconnect the KE/Brown wire on the new Balmar harness from the Recall Kit - See Image 3. Peel back the 8 Awg green HT circuit as you tuck the KE/Brown circuit into the convoluted tubing to create a 30" long, single 8-Pin connector. Route the Balmar 4-Pin connector and alternator temp sensor out the back of the compartment.

Image 1

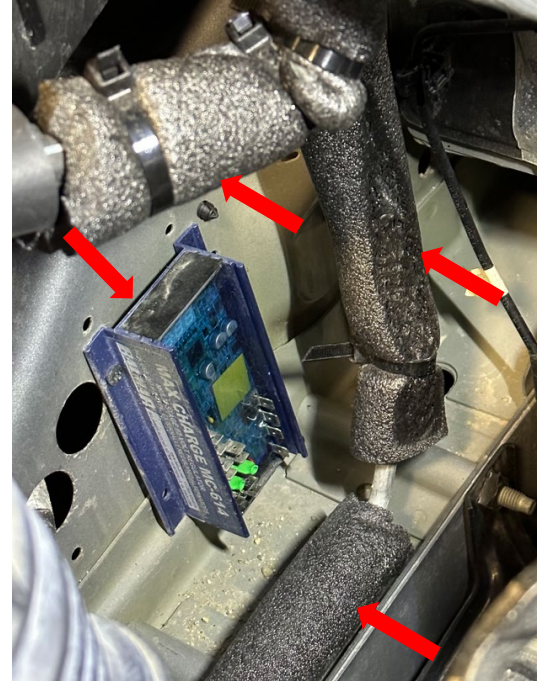
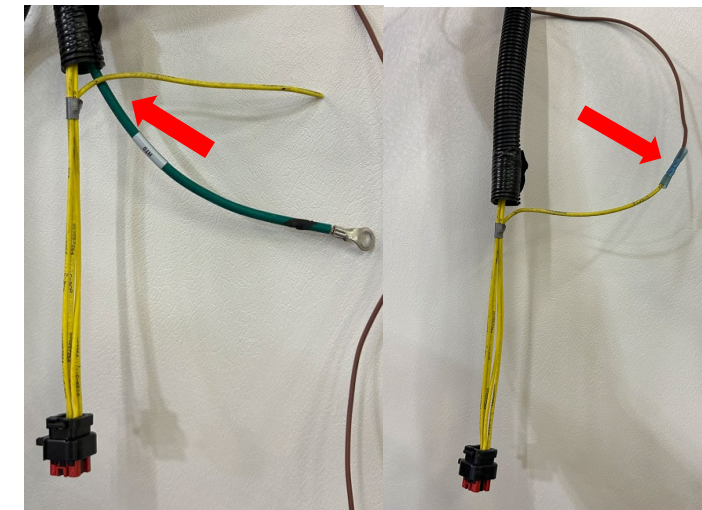


Image 2



Image 3



# Step 4 – Cable cleanup – Gen 4:

Image 1



Image 2



1. Plug the holes in the back corner of the battery compartment with 2" caps – See image 2. You may need to use the scraper to clean up the existing sealant to allow the new plug to snap into place. Cap seal the plugs with sealant.
2. Disconnect the Balmar alternator controller and route all cables and harnesses to the compartment rearward of the battery compartment. Untangle or straighten out the harnesses and cables as much as possible – See Image 2.
3. On the battery 8-Pin connector harness branch, cut the Brown Balmar to KE circuit so it can be untangled, then reconnect the KE/Brown - See Image 3. Peel back the 8 Awg green HT circuit as you tuck the KE/Brown circuit into the convoluted tubing to create a 30" long, single 8-Pin connector drop.
4. Locate the Balmar harness branch where the Black, Brown and Lt gray Temp sensor harness exit -See Image 4. Cut the Lt gray Temp sensor harness and discard at this point. Tuck the blunt end into the convoluted tubing.

Image 3

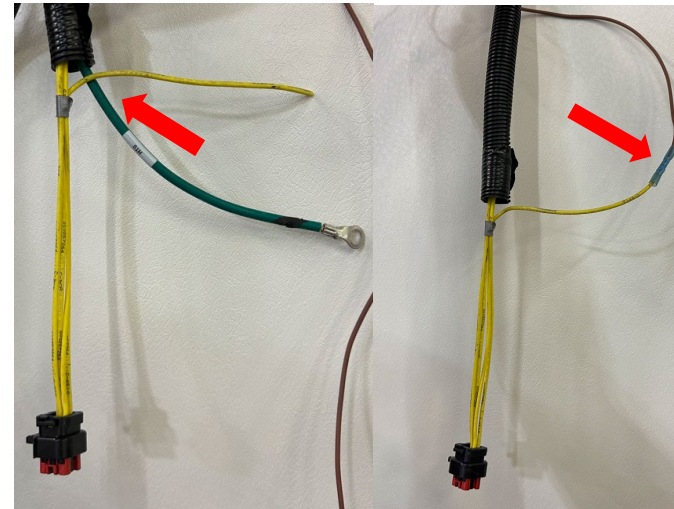
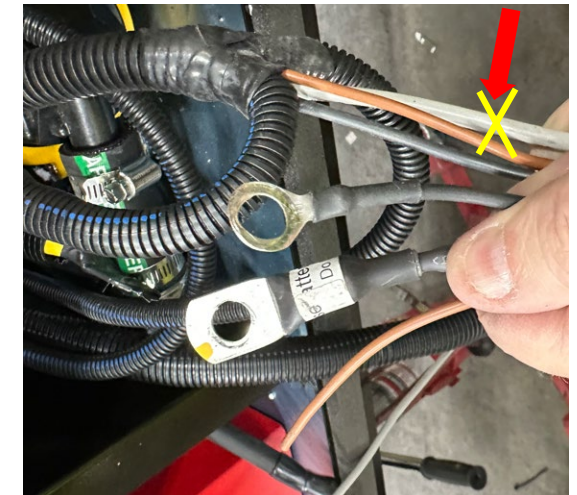


Image 4



# Step 5 – Alternator rework.

1. Using the serpentine belt tool, remove the drive belt from the alternator and remove the (2) M10 alternator mounting bolts so the alternator can be lowered for proper access. Remove additional connections in order to remove alternator. The original alternator will be discarded. Note: The Ford splash guard can be removed for better access.
2. Remove all cable ties and clamps attaching the alternator battery cables and control harness from the chassis so it can move freely.
3. Locate the new alternator and follow the alternator assembly and torque procedure shown on the following page. **Never let the alternator hang by the positive post and always support the alternator throughout this process. Use a thin 17mm backer wrench on the base of the 3/0 12v positive connection to connect the positive cable.**
4. After completing the alternator assembly and torque procedure the cable orientation should resemble Image 1. Note: Image is shown looking from the ground up and the cables are routed horizontally toward the driver's side of the coach.
5. Mark all connections and bolts with orange torque paint. Torque paint should be applied across the entire connection point as shown in Image 2.

Image 1

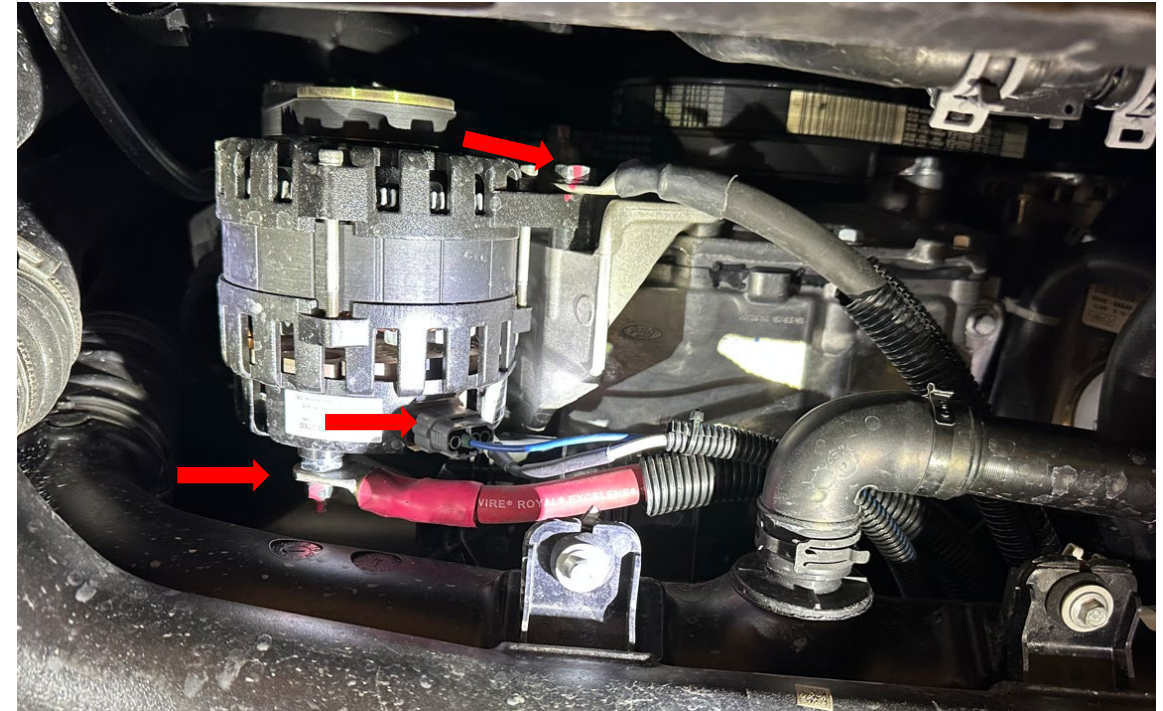


Image 2



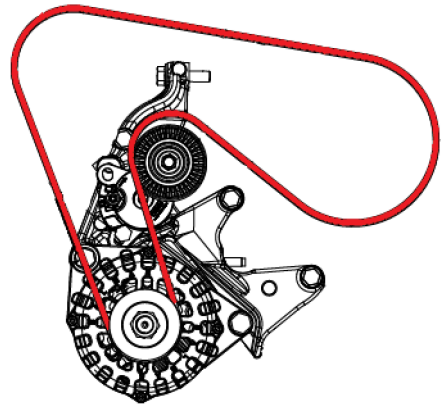


# Black Alternator Assembly and Torque Procedure

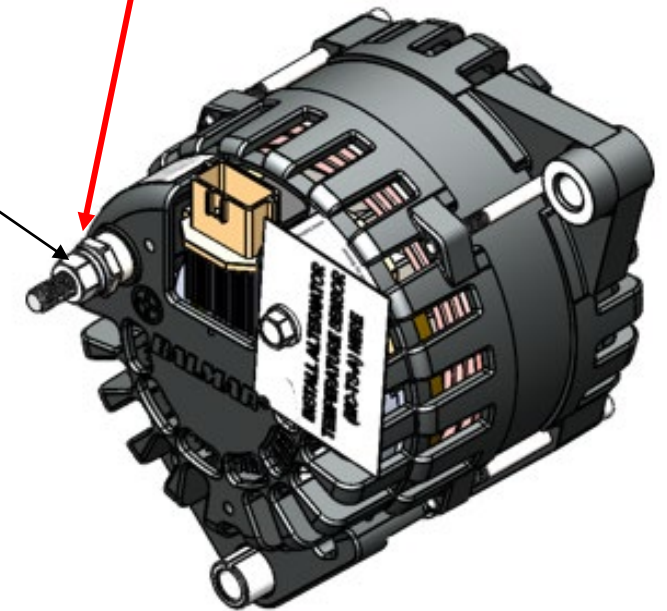
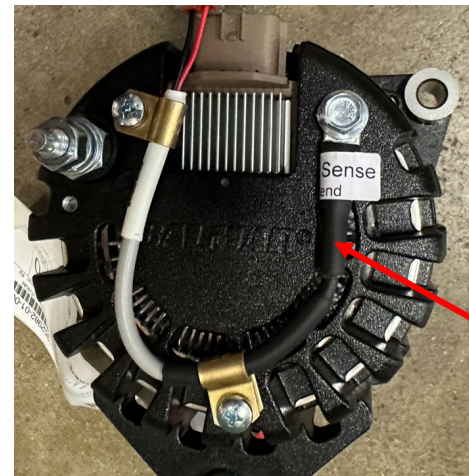
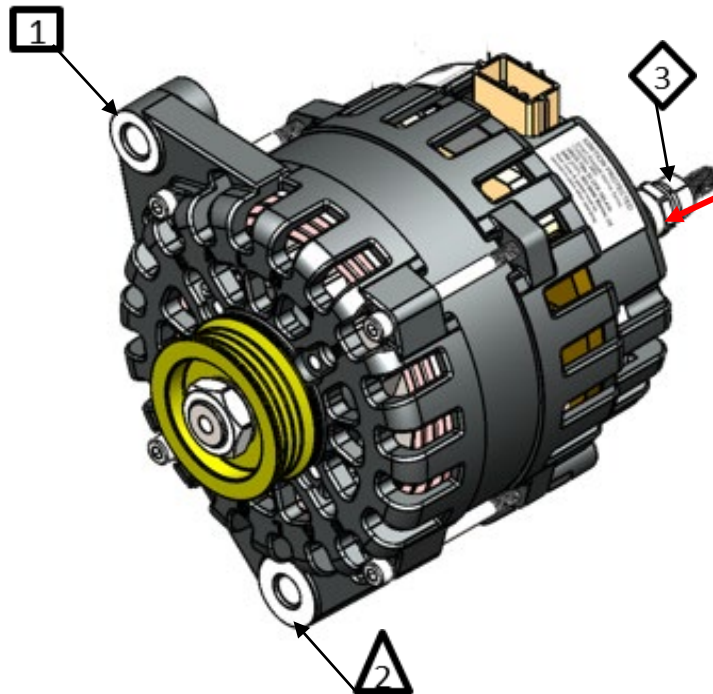
**Note: To avoid damaging the alternator, never hang the alternator by the cables and always use a thin 17mm backer wrench to remove or torque the positive 3/0 cable. Damage to the rectifier will occur if this process is not followed**

- 1 Install ground cable to front of alternator. Torque M10-1.5x45, 17mm head bolt to 45 ft-lb. Apply thread locker.
- 2 Install M10-1.5x140, 17mm head bolt, torque to 35 ft-lb. Apply thread locker.
- 3 Install B+ cable and torque M8-1.25, 13mm head nut to 14 ft-lb. Apply thread locker. Stack - Terminal, washer, lock washer, Nut.

Terminal/cable orientation shown below with red arrows. Cables need to be attached and be aligned with the 4-pin connector. Rotate all 3 cables 20 Deg toward the 4-pin connector so that all 4 cables can be bundled together approximately 6-12" down stream. Ensure terminals and or cables does not interfere with other components that would affect proper torquing.



Belt Routing



Use thin 17mm backer wrench on the base of this stud.

Alternator temp sensor harness is pre attached to alternator.

# Step 5 – Alternator rework (Continued).

1. Securely tie the alternator cables up to the engine harness carrier with two ties as shown in Image 1 – Yellow lines. This will keep the cables away from all ridged chassis components. The red arrows represent the path of the alternator harness and battery cables.
2. (Gen 4 only) Add cavity seals to the 3 open ports on the 4-Pin wire connector – See Image 1. Inspect the terminal in the alternator for corrosion and clean as necessary.

Image 2

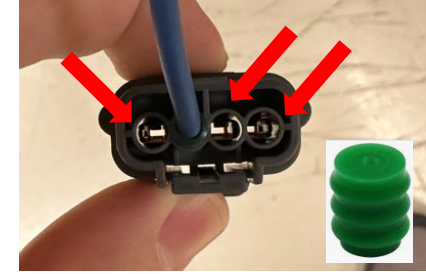
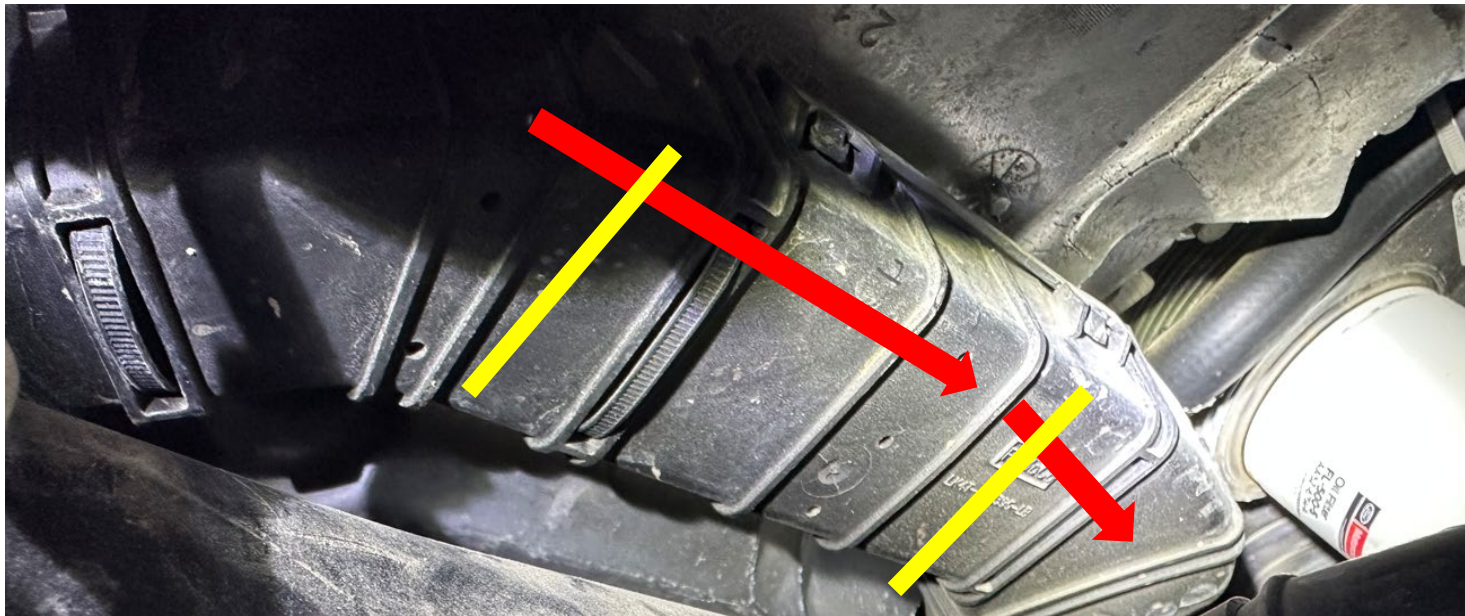


Image 1



# Step 6 – Cable support and routing.

1. Remove the Ford supplied 10mm bolt directly above the driver's side drive axle, on the inside of the frame rail – See Image 1.
2. Group the 3 cables from the alternator and the 2 Winnebago chassis power cables together and route them all through the 2.5" clamp at the point the 10mm fastener was removed in Image 1.
3. Using the original 10mm fastener attach the 2.5" clamp above the drive axle into the original threaded position – See Image 2, Red arrow. All 5 cables should be captured by the clamp and be safely mounted away from all moving objects.
4. Just rearward of the new 2.5" clamp and right after the engine harness carrier, bundle all 3 alternator cables together and tie them up using the Ford factory engine harness carrier and Cable tie from the Recall Kit – See Image 3.

Image 1

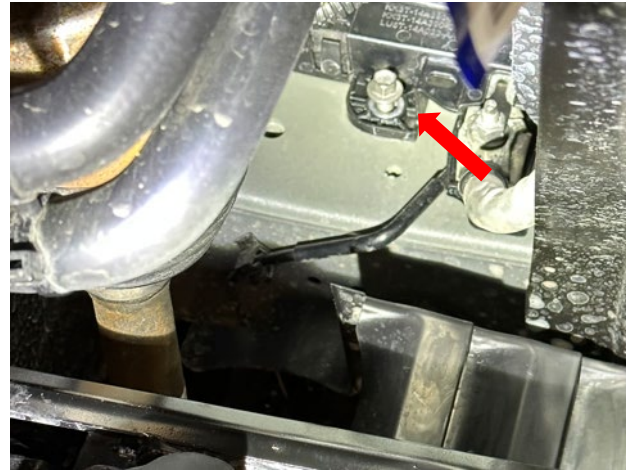


Image 2

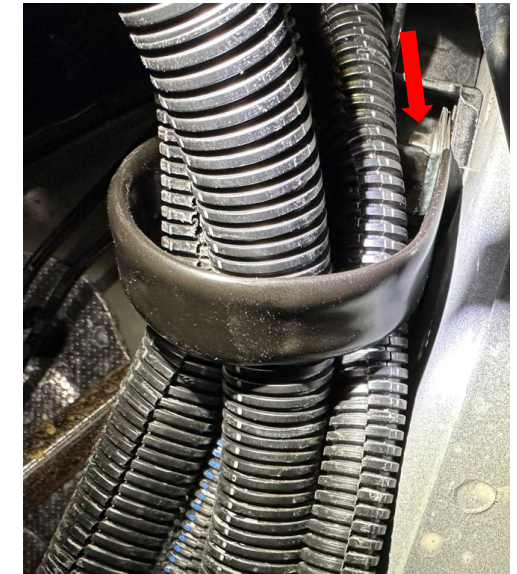


Image 3



# Step 6 - Cable support and routing (Continued).

Image 1

1. From the alternator rearward, use cable ties to bundle all Winnebago cables together every 12" away from all heat producing and moving objects. Be sure to add ties in the following areas-
  - a) Away from the exhaust heat shield just behind the front right drive axle – See image 1. Blue arrow is showing the heat shield and the red arrow is showing the harness tied up and away from the heat shield
  - b) Through body mount holes in front of the fuel fill. See image 2 – Yellow arrow is the same location in both images.
  - c) At each support tube behind the battery box. See image 2 – red arrows.

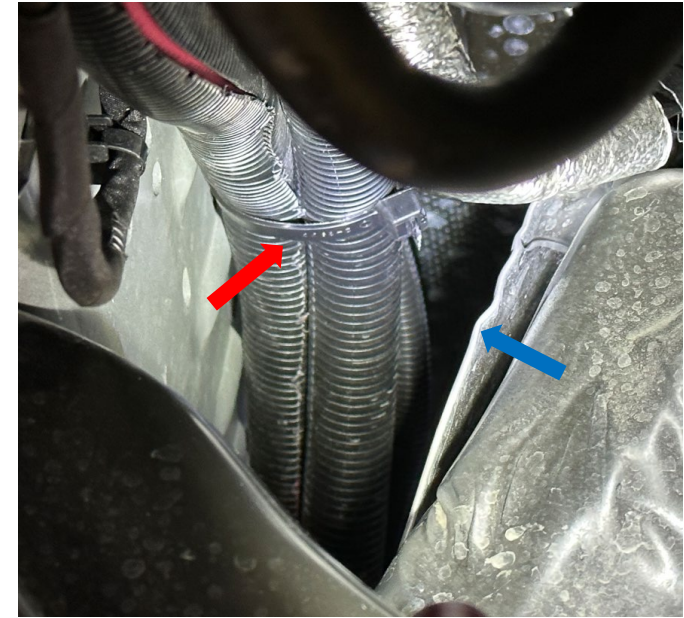


Image 2

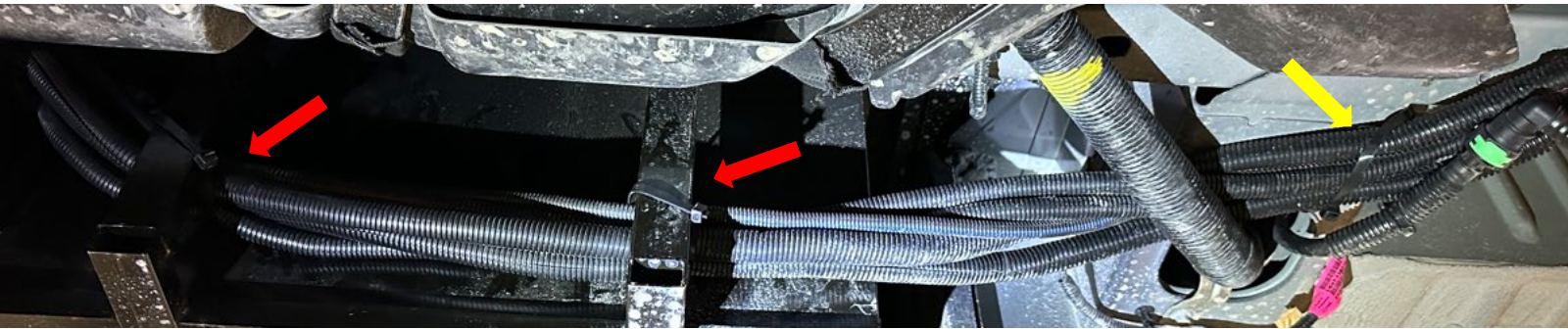


Image 2 Continued



# Step 7 – Prep the Batteries.

1. Locate the Battery cap kit in the Recall Kit - See Image 1. One kit for option 22N (Single Battery) and two with option 22A (Dual Battery)
2. Apply Loctite to the M8 x 14mm fasteners – See Image 2.
3. Attach 3' battery cables 2/0 “Red” and 2/0 “Black” to the matching color battery posts. Orientate the cables as shown in Image 3.
4. Make sure the cables and fasteners are stacked as shown in Image 4.
5. Note: Only one battery (main) requires a temperature sensor. Attach the temperature sensor to the main battery positive post. Position the temp sensor between the lock washer and main battery cable and rotate it 90 deg from the battery ring terminal as shown in Image 5.
6. Torque each battery terminal to 132 In/Lbs. and mark each terminal with orange torque paint as shown in Image 5.

Image 1

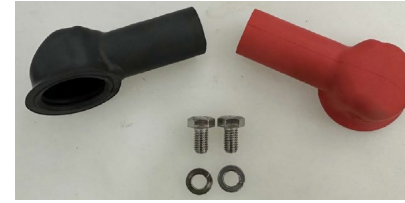


Image 2



Image 3



Option 22N or 22A –  
Main battery  
includes temp  
sensor

Option 22A –  
Aux battery. No  
temp sensor

Image 4

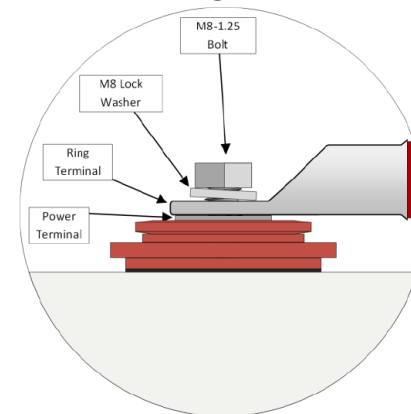
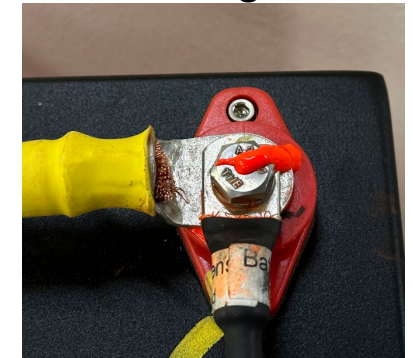


Image 5



# Step 8 – Prep the Batteries (Continued).

1. Note: Protect all exposed battery terminal ends using terminal covers to cover the ring terminal. See Image 4. This will protect the battery during installation and cable routing.
2. You need to notch the main battery positive boot to clear the temp sensor. Mark a  $\frac{1}{2}$ " x  $\frac{5}{8}$ " rectangle on the side of the battery boot as shown in Image 1. Use a scissors and cut out the rectangle and slide it over the positive battery cable.
3. Slide the protective boots over the battery posts and snap them into place as shown in Image 2.
4. The notched protective boot should cover all the exposed terminals as shown in Image 3.

Image 1



Image 2



Image 3



Image 4



# Step 9 – Battery Installation.

1. Reinstall battery (batteries if equipped) back into battery compartment. Note: The batteries will not fit into the compartment when vertical therefore follow the procedure listed below. With a two-battery unit – Option 22A, insert the Aux battery, or the battery without the temperature sensor first.
  - a) Elevate the battery, center it in the opening and rest it against the compartment approximately 2”- 4” lower. See Image 1.
  - b) Tip the battery into the compartment and lift it straight up, so the terminal boots clear the inside flange of the compartment door. See Image 2.
  - c) Rotate the bottom of the battery into the compartment and push the battery into place. See Image 3.
  - d) Route the battery cables through the 3” grommet and reattach the batteries to the units with the original hardware.

Image 1



Image 2



Image 3



# Step 10 – Buss bar installation.

1. Locate Buss Panel Assembly from the parts kit - See Image 1.
2. Install the panel in the coach, on the divider wall just rearward of the battery compartment. The panel should be positioned as high as possible in the compartment and flush with the outer flange - See Image 2.
3. Remove the protective boots from the battery cables and connect the battery cables as shown in Image 3. Torque each terminal to 190 In/Lbs. and mark with orange torque paint as shown.

Image 3

2/0 Positive from Inside Battery

2/0 Positive to 250A Breaker

2/0 Positive from outside Battery  
- Option 22A only

2/0 Negative from Inside Battery

3/0 Negative from Alternator

3/0 Negative from Inverter

4 stacked ring terminals - 2/0 Negative from Chassis Ground bar, 12 Awg from Balmar harness, 6 Awg HT from solar panel control and 14 AWG wht from Breaker control.

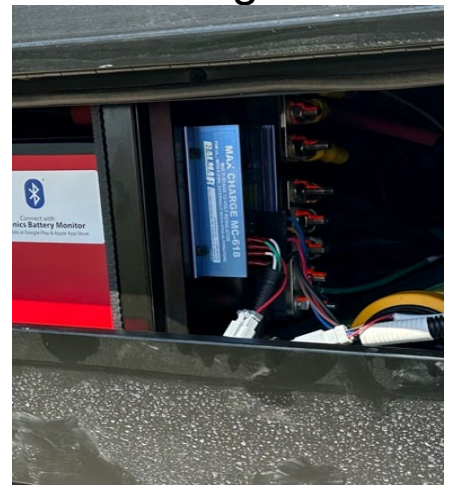
2/0 Negative from outside Battery  
- Option 22A only



Image 1



Image 2





# Step 10 – (Continued). Adding Breaker control harness.

1. Locate the 8-Pin Lithionics battery connector. Pull back the convoluted tubing 24" and cut all 4 circuits – BCA, BCB, KE5 and KE10. KE5 (Run only trigger) is the only circuit you will be using. – Remove and discard circuits BCA, BCB and KE10 from the original Winnebago harness – see Image 1.
2. Take circuit KE5 that was previously connected to the 8-Pin battery connector and splice it to the new circuit “KE” on the Breaker control harness with the provided butt splice. Next, locate the brown wire on the new Balmar regulator harness, and the “BRN” circuit on the Breaker control harness. Connect these circuits together with the provided butt splice - See image 2
3. Locate the 250 A breaker and remove circuits BCA and BCB from the back of the breaker and remove these circuits from the original Winnebago harness - They are being replaced by new BCA and BCB circuits from the Breaker control harness – See Image 3. Connect the new BCA and BCB circuits to the breaker and torque the terminals to 12 In/Lbs.
4. Locate new circuit “LOC” on the Breaker control harness. Connect this circuit to pin 16 on the Balmar regulator - See image 4

Image 1



**WINNEBAGO**  
INDUSTRIES

Image 2



Image 3

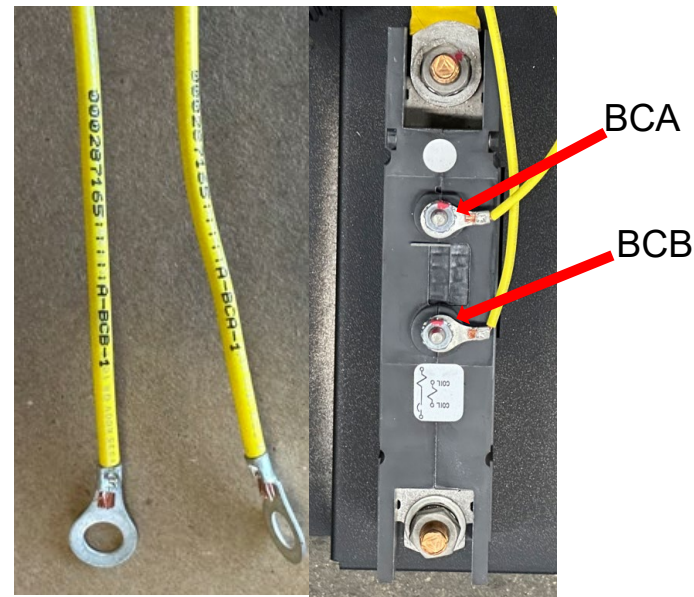
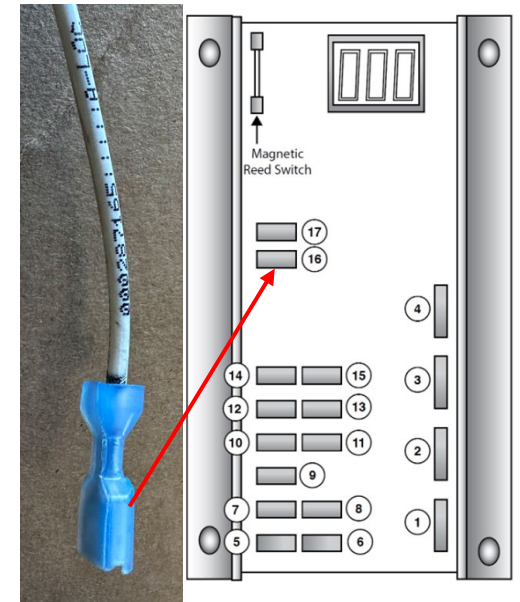


Image 4



Note: the 3/8" ground ring terminal connects to the 5-position ground bar, see previous slide and the 3/8" positive ring terminal connects to the 3-position positive buss bar under the seat, see step 12.

# Step 11 – Retorque connections under 3-Point seat

1. To remove the rear passenger seats, start by grabbing in the front of the seat base, carefully pull up ensuring you do not damage the retaining clips. The seat will pop out of the retainer clip and then lift out – See Image 1. Repeat process for the second seating position.
2. Using a white paint marker, make alignment marks on the seat frame for reinstallation of the seats – See Image 2.
3. Remove the front cabinet face to access the seat attachment bolts.
  - a) Remove the (6) screws that attach it to the base cabinet.
  - b) Pull the cabinet face away from the base cabinet to disconnect the heat register and set the cabinet face aside.
4. Using a  $\frac{3}{4}$ " socket, remove the 8 nuts and washers holding the 4 U-bolts - See Image 3. Set the seat hardware aside for reinstallation – See Image 4.

Image 1



Image 2

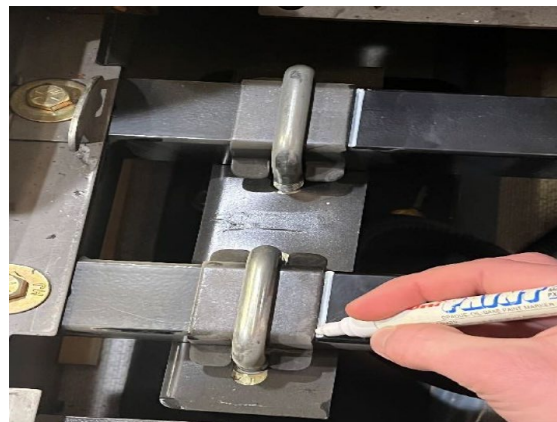


Image 4



Image 3



# Step 12 – Retorque connections under 3-Point seat Cont.-

1. The seat backs and cross members should now lift off the dinette cabinet - See Image 1.
2. Locate and retorque the following electrical connections under the seat.
  - a) Inverter Disconnect- 9/16" Socket, Torque - 120 In-Lbs. x2 – See Image 2.
  - b) Coach Battery Breaker-5/8" Socket, Torque - 230 In-Lbs. x 2 – See Image 2. Note: This is also where the new BCA and BCB circuits connect – See red arrows and torque the terminals to 12 In/Lbs.
  - c) 3 position Buss bar-17mm Socket Torque – 190 In-Lbs. x 3 – See Image 3. Note: Add new 14 AWG yel (POS) circuit from Breaker control harness to far-right terminal, yellow arrow location and make sure the Balmar "Red, Voltage sense" and "Red, Regulator Power" connect to this buss bar.
  - d) Visually check all other battery cables/connections and correct, as necessary.
3. Mark all torqued points with orange paint.
4. Set the seat backs and cross members back on the dinette frame and align the seat so that the previously made alignment marks are realigned – See Image 4, Yellow arrows.
5. Using a 3/4 inch socket, install the previously removed seat hardware. Using a torque wrench, torque the nuts to 57 +/-3.5 NM (42 +/- 3 Ft-lbs.) shown with the red arrow (8-Places) in "Image 4".
6. Reinstall the seat cushions by aligning the slots/pins and pushing down on the front edge.

Image 1



Image 2

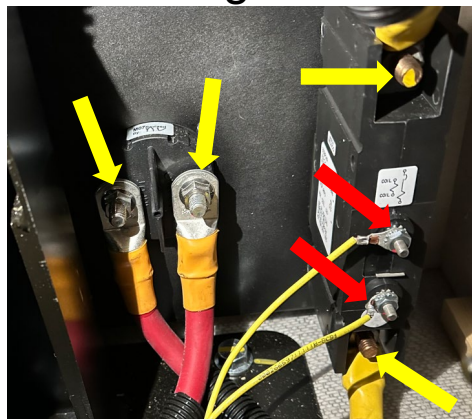
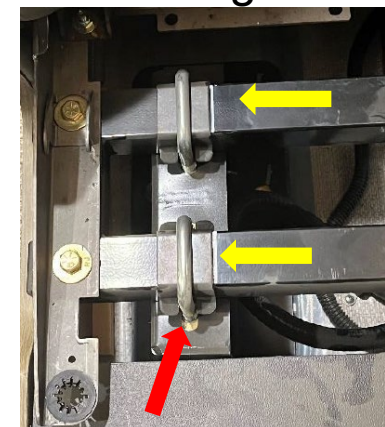


Image 3



Image 4



# Step 13 – Wrapping up the work.

1. Reattach the closeout panel from the lower section of the compartment with the (6) screws previously removed and the drill with #2 Philips bit - See Image 1.
2. Make the three connections to Balmar Controller.
3. Seal up all cable grommets with sealant.
4. Reconnect the 8-Pin battery control connector back into the Main battery or the battery with the temp sensor – See Image 2.

Image 1



Image 2



# Step – 14 wire connection Validation – Breaker control

1. With the 8-Pin battery control connector now connected to the Main battery, hold down the power button on the top of the battery/batteries. Make sure the blue LED/LED's are lit and turn on the 250 A Breaker – See Image 1.
2. From your mobile device, download "Lithionics Battery Monitor" from Google play or Apple app store and Open the Lithionics Battery Monitor application. Connect to the main battery through the App – Note: The battery serial number is on the side of the battery, select the correct serial number listed on the app – See Image 2.
3. Select the "Settings" gear icon in the upper right corner of the application – See Image 3.
4. Select "Terminal Console" - See Image 4
5. With the terminal console open, type "BT" in the command line and hit "done" - See Image 5.
6. Once you hit the "done", the 250-amp breaker should open. "BT" is the command for breaker test. If the breaker opened, proceed to step 7. If not, verify all wiring connections with the diagram included on the last page of this document.
7. Turn on the inverter disconnect but leave the 250-amp breaker off.

Image 1



Image 2

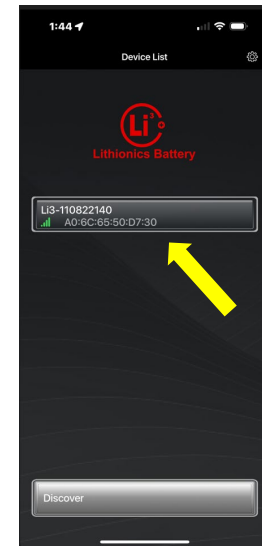


Image 3

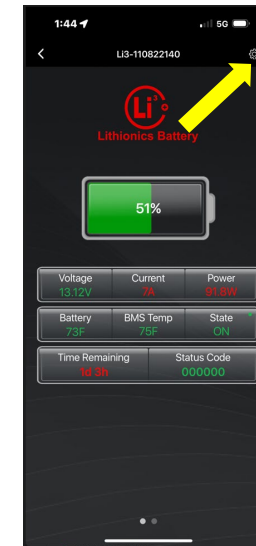


Image 4

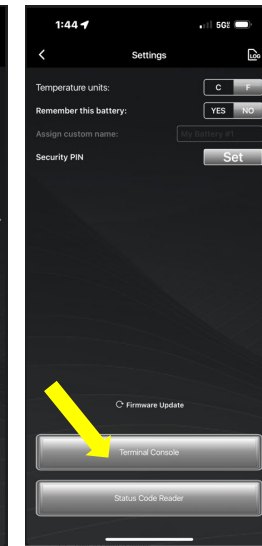
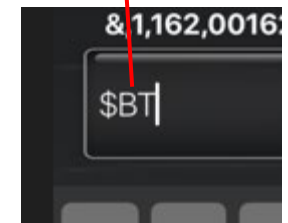
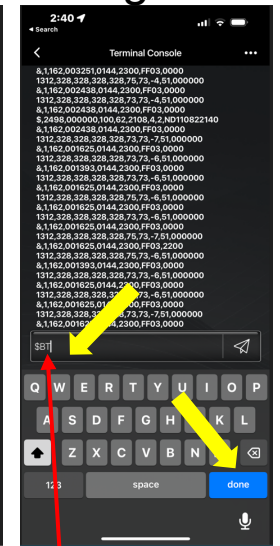


Image 5



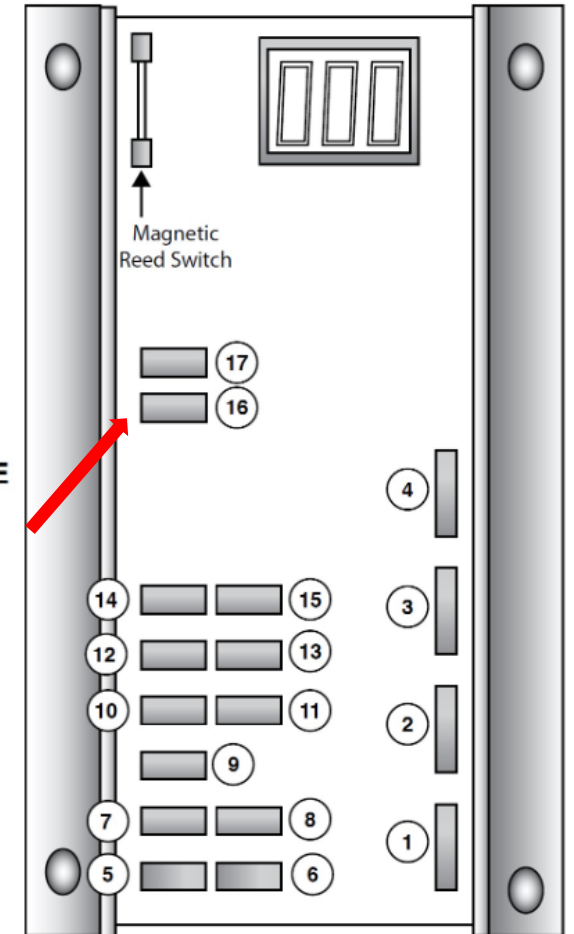
# Step 15 – System Validation and Testing - Alternator.

**Initial test and startup procedure.** Make sure coach battery is on (Blue LED is lit), Engine is off, and the 250-Amp breaker is off/open. Check the voltages at the following regulator terminals to ensure the wiring is correct. Use a hand-held multi-meter and test the following terminals for voltage: See Image 1 for terminal location.

1. TEST # 1: Engine/Ignition Off - Regulator is unpowered - LED display should be dark or off)
  - a) Terminal 2 - RED Power Wire – under 1 Vdc.
  - b) Terminal 9 - Positive Voltage Sense Wire - under 1 Vdc.
  - c) Terminal 3 - BROWN Ignition Wire - 0 Vdc.
  - d) Terminal 4 - BLUE Field Wire - 0 Vdc.
2. TEST # 2: Engine/Ignition Off, turn on the 250-amp breaker. Regulator is powered - LED display should be dark or off)
  - a) Terminal 2 - Primary RED Power Wire - 12 -14.5 Vdc.
  - b) Terminal 9 - Positive Voltage Sense Wire - 12 -14.5 Vdc.
  - c) Terminal 3 - BROWN Ignition Wire - 0 Vdc.
  - d) Terminal 4 - Primary BLUE Field Wire - 0 Vdc.
3. TEST # 3: Engine Off, chassis in accessory mode (If equipped push the Start button without pressing the brake pedal). Regulator is powered - LED display should be dark or off)
  - a) Terminal 2 - Primary RED Power Wire - 12 -14.5 Vdc.
  - b) Terminal 9 - Positive Voltage Sense Wire - 12 -14.5 Vdc.
  - c) Terminal 3 - BROWN Ignition Wire - 0 Vdc.
  - d) Terminal 4 - Primary BLUE Field Wire - 0 Vdc.

Image 1

1. GROUND INPUT
2. POWER INPUT
3. IGNITION INPUT
4. FIELD OUTPUT
5. ALT. TEMP. (-)
6. ALT. TEMP. (+)
7. BAT. TEMP. #1 (-)
8. BAT. TEMP. #1 (+)
9. POSITIVE VOLTAGE SENSE
10. SmartLink™ TX
11. SmartLink™ RX
12. STATOR IN
13. TACHOMETER OUT
14. BAT. #2 TEMP. (-)
15. BAT. #2 TEMP. (+)
16. AUX. #1 LAMP
17. DASH LAMP













Pin 16 is the alternator fault lockout trigger circuit

# Step 14 – System validation and testing continued.

Image 1

4. TEST # 4: Start the engine - Engine on - Regulator is powered – Data showing on LED display.
  - a) Terminal 2 - RED Power Wire - 12 -14.5 Vdc.
  - b) Terminal 9 - Positive Voltage Sense Wire - 12 -14.5 Vdc.
  - c) Terminal 3 - BROWN Ignition Wire - 12 -14.5 Vdc.
  - d) Terminal 4 - BLUE Field Wire – 4- 14.5 Vdc.
  - e) LED Display will be rolling through and displaying the following information in sequential order. See “Image 1” for additional info.
    - 1) BAL
    - 2) 618
    - 3) CFP
    - 4) -b-
    - 5) bv – Then it will display the actual battery voltage.
    - 6) Cv - Then it will display calculated target battery voltage.
    - 7) b1 - Then it will display the battery temperature.
    - 8) AL - Then it will display the alternator temperature. If the temp is not displayed correctly, it will display N/C and the temp sensor on the alternator will need to be replaced with P/N 356896-01-000. Contact Technical Assistance at 1-866-653-4329.
    - 9) b2 - Then it will display NC since only one battery temp sensor is used.

	<b>BAL</b> Indicates Balmar
	<b>618</b> Indicates MaxCharge model, such as MC-618
	<b>CFP</b> Indicates Regulators Custom factory Program – The Winnebago program
	<b>F-0</b> Indicates the Regulator’s Max Field Percentage (Belt Load Manager) . Ranges from F-0 to F-9
	<b>-b-</b> Indicates stage of charge. “b-” indicates bulk. “A-” indicates absorption. “F-” indicates float. “r-” indicates ramp.
	<b>bv</b> Indicates system battery voltage. Followed by actual voltage reading.
	<b>Cv</b> Indicates Calculated Voltage (Target voltage based on preset program levels). Followed by voltage reading.
	<b>b1</b> Indicates Battery #1 Temperature. Followed by NC (not connected), or temperature in Celsius.
	<b>AL</b> Indicates Alternator #1 Temperature. Followed by NC (not connected), or temperature in Celsius.
	<b>b2</b> Indicates Battery #2 Temperature. Followed by NC (not connected), or temperature in Celsius.

6. Open the Lithionics Battery Monitor application again.
  - a) Connect to the main battery through the App –  
Note: The battery serial number is on the side of the battery, select the correct serial number listed on the app.
  - b) On the main screen. Locate the Cell “C.” – Current.
  - c) With the engine running at 2000RPM, the display in cell “C.” should be green and displaying a reading of 160-170A. If two batteries are connected to the coach, the current is distributed equally to each battery. In this case, you need to log into each battery and add the cell “C.” values together and the total should be 160-170A.
7. Testing is now complete.

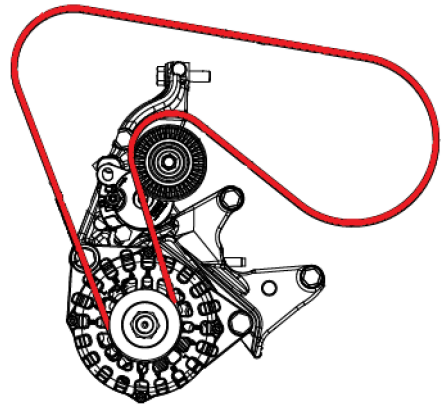
# Blank Slide-



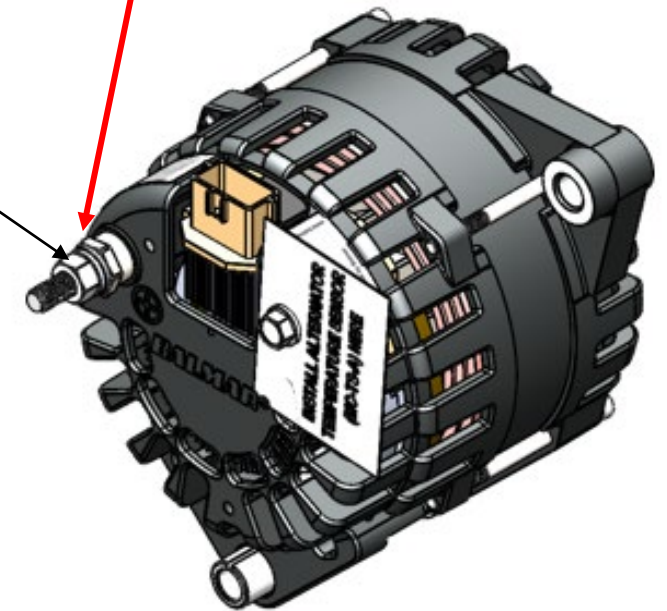
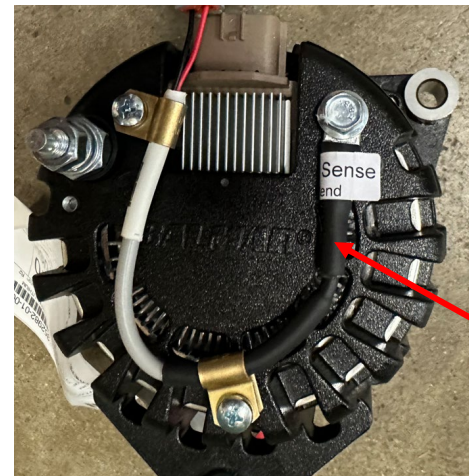
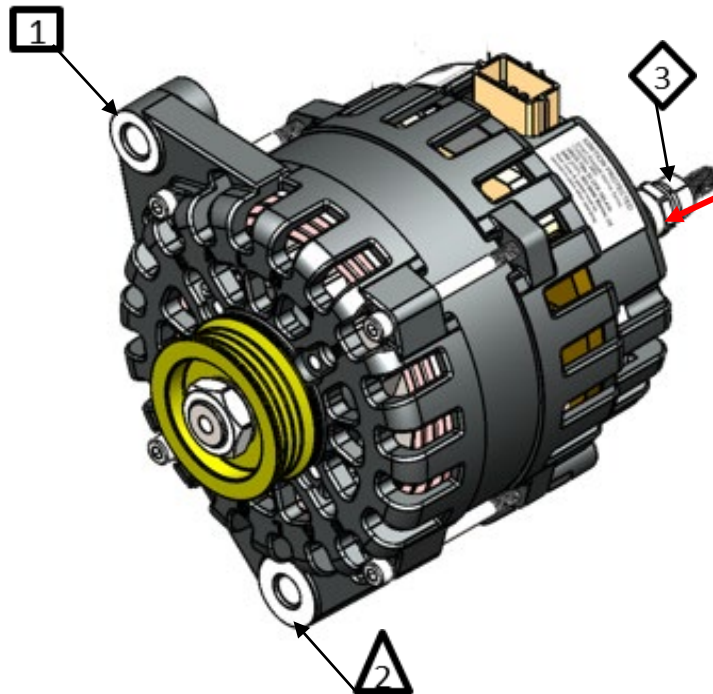
# Black Alternator Assembly and Torque Procedure

**Note: To avoid damaging the alternator, never hang the alternator by the cables and always use a thin 17mm backer wrench to remove or torque the positive 3/0 cable. Damage to the rectifier will occur if this process is not followed**

- 1 Install ground cable to front of alternator. Torque M10-1.5x45, 17mm head bolt to 45 ft-lb. Apply thread locker.
  - 2 Install M10-1.5x140, 17mm head bolt, torque to 35 ft-lb. Apply thread locker.
  - 3 Install B+ cable and torque M8-1.25, 13mm head nut to 14 ft-lb. Apply thread locker. Stack - Terminal, washer, lock washer, Nut.
- Terminal/cable orientation shown below with red arrows. Cables need to be attached and be aligned with the 4-pin connector. Rotate all 3 cables 20 Deg toward the 4-pin connector so that all 4 cables can be bundled together approximately 6-12" down stream. Ensure terminals and or cables does not interfere with other components that would affect proper torquing.



Belt Routing



**Use thin 17mm backer wrench on the base of this stud.**

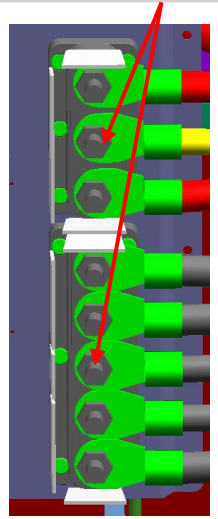
Alternator temp sensor harness is pre attached to alternator.

# Torque values-

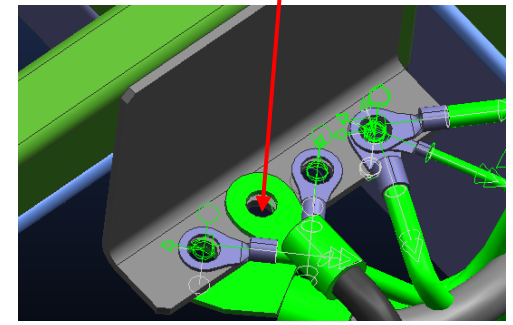
**Lithionics battery-**  
**347028-01-000**  
**13mm Socket**  
**Torque - 132 In-Lbs. x2**



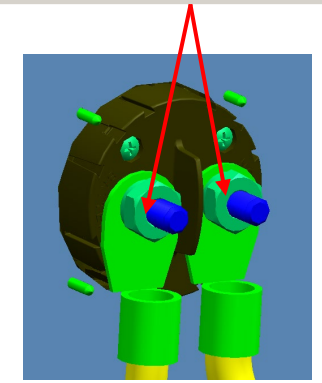
**3 or 5-way buss bar**  
**325348-01-000 3-Way**  
**355972-01-000 5-Way**  
**17mm Deep well Socket**  
**Torque - 190 In-Lbs. x All**



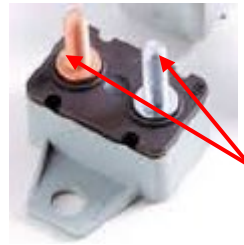
**5/16" Ground Bolt.**  
**All General grounds**  
**1/2" socket and backer wrench.**  
**Torque - 230 In-Lbs. x All**



**Inverter Disconnect-**  
**183904-01-000**  
**9/16" Socket**  
**Torque - 120 In-Lbs. x2**



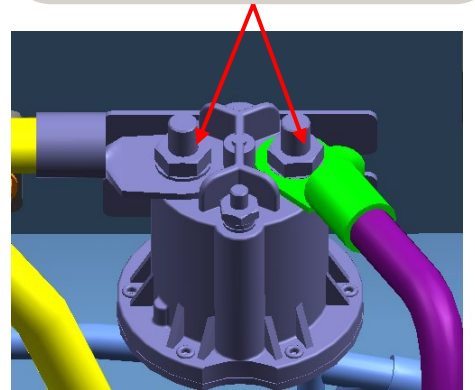
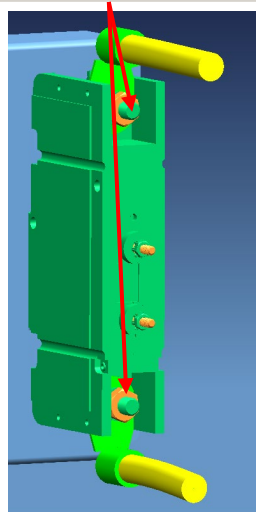
**Xantrex Inverter-**  
**328076-01-000**  
**13mm Socket**  
**Torque - 88 In-Lbs. x2**



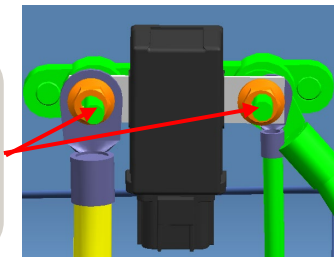
**40A Breaker**  
**333588-01-000**  
**3/8" Socket**  
**Torque - 24 In-Lbs. x2**

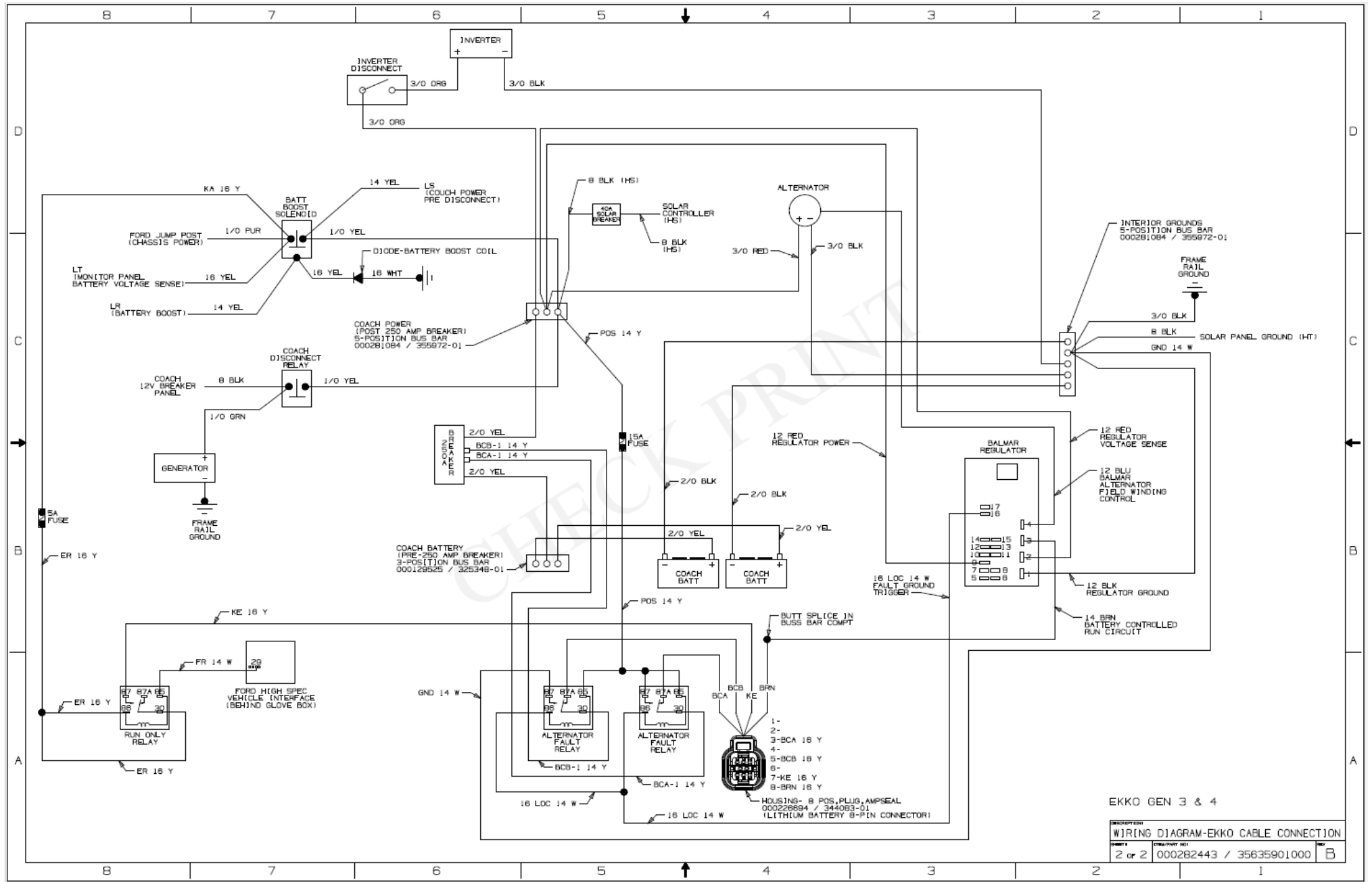
**Coach Battery 250-Amp Breaker**  
**347029-01-000**  
**5/8" Socket - Torque - 230 In-Lbs. x2**  
**3/8" socket - Torque - 12 In-Lbs. x2**

**Engine run solenoid**  
**335753-01-000**  
**1/2" Socket-**  
**Torque - 190 In-Lbs. x2**  
**3/8" socket-**  
**Torque - 15 In-Lbs.**



**Coach Battery Disconnect-**  
**180722-01-000**  
**9/16" Socket**  
**Torque - 190 In-Lbs. x2**





EKKO GEN 3 & 4

DESCRIPTION  
**WIRING DIAGRAM-EKKO CABLE CONNECTION**  
 PART 2 of 2 000282443 / 35635901000