Airstream Service Bulletin

Bulletin Number: #186
Product Line: Airstream Atlas, Interstate 19, Interstate 24 with Lithium Batteries
Subject: Magnum 1000W Inverter/Charger Settings, Cable Inspection and Fuse Replacement, Diode Removal, & Victron Charger and Battery Minder Settings

Operation Code: TCSBR8384079

Labor rate will be: 2 hours: excluding Magnum Inverter/Charger install
4 hours: when installing new "L" series Magnum Inverter/Charger

RANGE OF VEHICLES INVOLVED:

Atlas MY 2021
Interstate 19 MY 2021
Interstate 24 MY 2021

Airstream has discovered that early 2021 Model Year units were shipped with Magnum MMS1012-G Inverter/Charger's designed for AGM batteries, instead of the proper "L" series inverters designed for use with lithium batteries.

While the incorrect inverters are not harmful to the lithium batteries, the affected vehicles would not be getting maximum charging to the batteries. This procedure is set up to make sure the proper MMS1012-G "L" Series inverters are installed, and if not, it outlines the process for swapping out the inverter.

Components Needed:

Magnum MMS1012-G "L" Series Inverter/Charger

Step 1:

1. Unplug the coach from shore power and turn off the battery disconnect switch. Make sure no one plugs in or turns on the battery disconnect switch while the unit is being worked on.

2. Locate the 1000W Magnum Inverter/Charger. In the Atlas, this inverter will be in the electronics cabinet, behind the passenger's seat. For the Interstate 19's and 24's, the inverter is located under the front passenger's seat.

3. For inverters located under the front passenger's seat.

WARNING: do not disconnect any wiring to the seat and start the engine! If you do, the unit will need to go to a Mercedes dealer to reset the safety belt warning on the dash. (Special Equipment is needed)

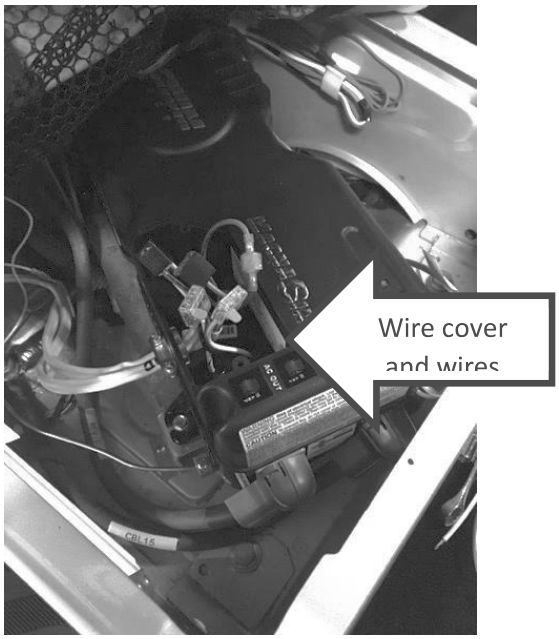
   a. Remove the two seat bolts toward the passenger's door.
      i. Seat rotation and shifting is required to get to bolts.
   b. Remove the two bolts on the other side, if fully removing the seat. If tilting the seat, loosen these two bolts.
   c. Full seat removal is recommended for optimal space, but if you do not want to fully remove the seat, prop the seat at an angle and move the skirt out of the way.
      i. Be sure the flooring and seating material are fully protected.

4. Inspect the Magnum Inverter/Charger label, located near the positive battery terminal, for "L" series. The correct label will read "Lithium Compatible." If this label is present, no further action is required, proceed to step 2. If the label is not present, the inverter will need to be replaced. Contact the Airstream Customer Service Department to have a new Magnum kit shipped to you, at no charge. Please package the old Magnum Inverter/Charger into the box and use the provided return label to ship it back to Airstream.

5. Remove the wiring cover (2 Philips screws) on top of the Magnum Inverter/Charger.

6. Check the 110v wires coming into the Magnum wiring compartment, for "in" and "out" labels. If they are not labeled already, you should label them now. The wires connected to the red and white/black wires, coming out of the magnum, will be the "out" wires.

7. Disconnect the “in”, “out”, and ground lines (hot, neutral, and ground) and cut the orange and yellow wires (on the colored side of the connector) coming from the RIBU1C box (grey box on the side of the magnum). Cut the wires long enough so they can be easily reconnected after the new Magnum is installed. Pull all of the wires out of the hole in the side of the Magnum.



8. Disconnect the case ground on the Magnum near the 12v connections.

9. Disconnect the red and black 12v wires at the end of the Magnum.

10. Unplug the display and battery temp sensor wires from the same end of the Magnum. Note the label affixed to the BTS (battery temperature sensor) and which port it plugs into.

11. Unscrew the four mounting bolts/screws, in the feet, supporting the inverter as you do so to prevent it from falling.

12. The pre-scored hole will need to be drilled out in the side of the new Magnum Inverter to accommodate the wire inlet and the RIBU1C box properly.

13. Transfer the RIBU1C box from the old inverter to the new inverter.

NOTE: If installing in an Atlas unit the magnum mounting feet will need to be drilled out with a 1/4” drill bit to fit the mounting bolts

14. Repeat the process in reverse to install the new Magnum Inverter/Charger.

15. When reconnecting the wiring, note that the white/black wire coming from the RIBU1C box will be connected to the “IN” 110v hot wire. The white/yellow wire connects to the “IN” 110v neutral wire.

16. While holding up the seat, move the skirt back into place and return the seat to its original position. The seat bolts are easy to cross thread, so hand start the bolts first then tighten with a wrench. Use a torque wrench to tighten the seat bolts to 29 ft-lbs. (39 nm).

If the Touring Coach was manufactured with the correct “L” series Magnum Inverter/Charger you will need to verify the display settings are correct. If you replaced the Magnum Inverter/Charger you will need to install the new ME-RC display included with the kit.

While the incorrect settings are not harmful to the lithium batteries, the affected units would not be getting maximum charge capacity. The following steps are to make sure the lithium battery charging is maximized by ensuring the correct settings are used.

Step 2:
Locate the display for the 1000W Magnum Inverter/Charger. In the Atlas, this is in the electronics cabinet behind the passenger’s seat. In the Interstate 24’s, it is in the overhead compartment behind the driver’s seat. In the Interstate 19, it is in the rear overhead compartment, to the left of the CZONE display.

1. Press the “Setup” button. This will display the settings individually, starting with “01 Search Watts.”

2. To verify each setting, press the dial in. This will show the current setting, indicated by an arrow pointing to it. If the setting is wrong, turn the dial until you reach the correct setting and then push the dial in. This will save the setting.

Correct Settings:

01 Search Watts	5w
02 LowBattCutOut	11.5 VDC
03 Absorb Time	1.0
04 Battery Type	LFP
05 Charge Rate	80% (Atlas); 50% (Interstates)
06 VAC Drop Out	80 VAC
07 Power Save	ON
08 Screen Set Up	Contrast 100% Brightness 50%
09 Final Charge	LFP Controlled
10 Pwr Up Always	NO
11 Bulk Always	OFF

NOTE: The Charge Rate for an Atlas is 80% as opposed to 50% for the Interstates. This is because the diesel generator system on an Atlas can provide a higher charge current as opposed to the LP generator system on Interstates.

3. For the final step, 3 more settings need to be verified. Press the SHORE button to verify “30A” is the current setting. Airstream does not utilize the AGS and the METER settings from the Magnum Inverter/Charger so you will need to verify both settings are set to “OFF.” Press the AGS button to verify “OFF” is displayed and press the METER button to verify it too, is set to “OFF.” After verifying all display settings, the Magnum Inverter/Charger install is complete.

It has also been discovered that if the 1000W Magnum Inverter/Charger is put into an overload condition, for a sustained period, there is a chance that one of the 90A fuses located near the battery's terminal can blow without the customer knowing. This would reduce the battery capacity down to a single battery. There are also instances in which the battery cables are wired incorrectly, possibly causing one of the 90A fuses to blow as well.

By replacing the 90A fuse with a 100A fuse on both batteries, and inspecting the battery wiring, an inverter overload condition would allow the inverter to shut down prior to blowing a fuse.

Step 3:
Obtain two new 100A fuses (P/N 512660-100). Remove the Mercedes ground, located behind a plastic cover next to the foot pedals. Push the red button in while pulling the ground cable out, to disconnect.

NOTE: Use extreme caution when performing these steps to prevent shorting the batteries to ground. For units with metal battery covers, removal of the covers should be performed.

Step 4:
If available, place the vehicle on a vehicle lift for easy access. Remove the black ground cable from both house batteries before proceeding further.

Step 5:

- Locate the CS battery and remove the cross-car cable from the positive battery post with the 90A fuse.
- Remove the 90A fuse and replace it with a 100A fuse. Reinstall the cross-car cable and torque the battery terminal nut to 75 inch-lbs.
- Locate the RS battery and remove the cross-car cable and cable #14 (cable #9 on Interstate 24's) from the positive battery post with the 90A fuse.
- Remove the 90A fuse and replace it with a 100A fuse. Reinstall the cross-car cable and cable #14 (cable #9 on Interstate 24's), and torque the battery terminal nut to 75 inch-lbs.
- Locate the cable from the DC-DC converter, going up towards the driver's seat, and ensure it is connected to the 50A fuse in the fuse block, located under the driver's seat.

NOTE: the 100A fuse must be closer to the battery terminal than the 50A fuse since it is of a higher rating.

Step 6:

Locate the cable from the generator and ensure it is connected to the 200A fuse (150A fuse for I-19's) in the fuse block.

NOTE: On I-19's, ensure a 150A fuse (orange) is used and not a 200A fuse (blue). In all cases, ensure the 150A or 200A fuse is the one closest to the battery terminal, as they are both of higher ratings than the 100A fuse.

Step 7:

Reconnect the ground cables to the house batteries, torquing the nuts to 108 inch-lbs (9 ft-lbs). Remember to put the fuse covers back on and lower the vehicle to the ground.

The lithium battery heater and Wi-Fi key switches are tied to the engine run signal to provide power when the engine is running, and the key switches are in the “OFF” position. This was done as a convenience to the customer in the event they forgot to turn on the key switches, prior to travelling.

Through additional testing, we have found that if the lithium house battery voltage drops approximately 2 volts or more, compared to the chassis battery voltage, and if one or both the key switches are in the “ON” position, the diodes will allow power to pass through. This causes the engine run signal to activate the DC-DC Buck Converter, draining the chassis battery. This causes the DC-DC converter to turn on for approximately 2 – 20 seconds, every minute, causing the chassis battery to bleed current to the house batteries, in an attempt to charge them.

Therefore, it was determined that removing the engine run circuit from the battery heater and Wi-Fi switches will prevent unwanted draining of the chassis battery.

Components Needed:

3 - 14 AWG Butt Splice Connectors

Step 8:

Tilt the driver’s seat base to access the DC-DC Buck Converter and wiring underneath.

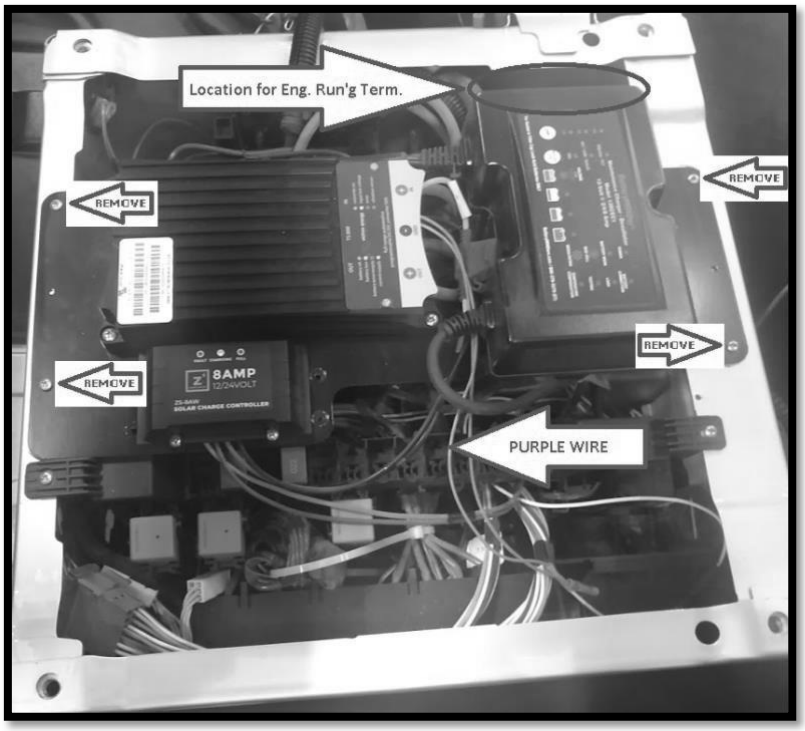
WARNING: do not disconnect any wiring to the seat and start the engine! If you do, the unit will need to go to a Mercedes dealer to reset the safety belt warning on the dash. (Special Equipment is needed)

a. Remove the two seat bolts toward the driver’s door.
    i. Seat rotation and shifting is required to get to the bolts.
b. Remove the two bolts on the other side, if fully removing the seat. If tilting the seat, loosen these two bolts.
c. Full seat removal is recommended for optimal space, but if you do not want to fully remove the seat, prop the seat at an angle and move the skirt out of the way.
    i. Be sure the flooring and seating material are fully protected.

Step 9:

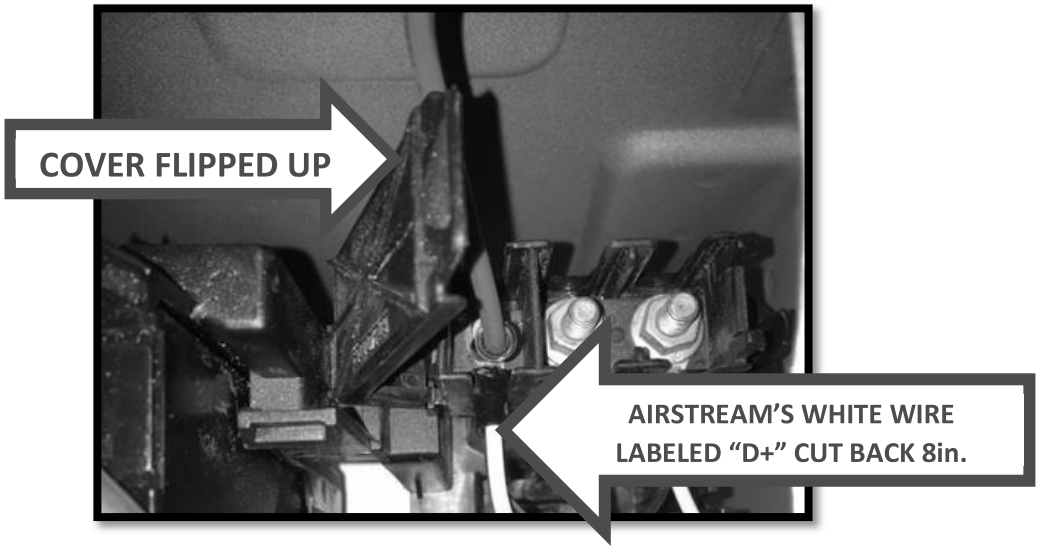
The Location of the Engine Running Terminal, purple wire, and the DC-DC mounting plate screws are shown in the picture below. Remove the DC-DC mounting plate screws to access the terminal block. The Engine Running Terminal, and two other terminals are located, on this block, under the flip up cover in the location shown below. The smallest, and closest to the front of the vehicle, is the Engine Running Terminal.

NOTE: The seat is removed in the picture below to show the components clearer. Remember to not start the engine if the seat wire connections are removed or a Mercedes visit will be required.



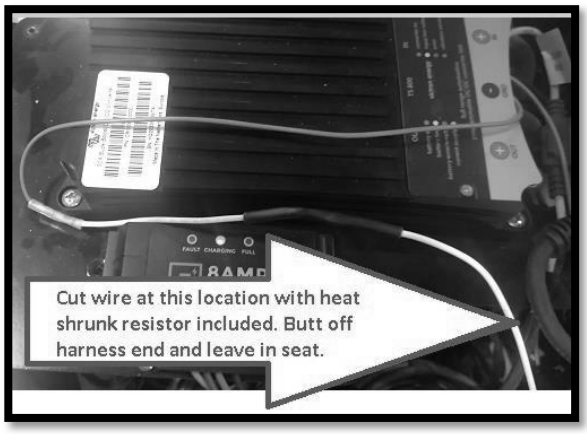
Step 10:

Next, locate the white “D+” wire and cut it about 8” from the terminal. Cap the wire that comes from the harness using a 14 AWG butt splice. Use electrical tape over the capped end to protect the cap and store the wire in the seat compartment. The other end that is connected to the terminal will need connected in the next step.



Step 11:

From the DC-DC convertor, locate the purple wire exiting from underneath the cover. Follow the purple wire back until it changes to white and goes into a heat shrunk resistor. Cut the white wire on the other side of the heat shrink. Use a 14 AWG butt splice to cap the wire that comes from the harness. Use electrical tape over the capped end to protect the cap and store the wire in the seat compartment. Next, connect the purple+white heat shrunk wire to the white "D+" wire left connected to the Engine Running Terminal, using a 14 AWG butt splice.



Step 12:

Resecure the flip up terminal cover over the terminal block and place the DC-DC convertor back in place.

Step 13:

With the driver's seat still removed, locate the BatteryMINDer to verify its settings.

1. Plug the unit in to shore power. This will power the BatteryMINDer and show what settings it is currently set to.

2. Verify the settings are correct as per the picture below. The correct settings should show the "8A" and the "WET/AGM/SEALED" lights illuminated.

3. If the settings are not correct, press the "AMP" button until the light for "8A" is illuminated. Press the "BATTERY TYPE" button until the light for "WET/AGM/SEALED" is illuminated.

Step 14:

1. If you completely remove the driver's seat, place the seat back into position and resecure.
2. If you tilted the seat, while holding the seat up, move the skirt back into place and return the seat to its original position.
3. The seat bolts are easy to cross thread, so hand start the bolts first, then tighten with a wrench. Use a torque wrench to tighten the seat bolts to 29 ft-lbs. (39 nm).

The final process in enhancing the Lithium and chassis battery power systems is to verify the Victron solar charge controllers setting. The issue is that some controllers remained set at their default position #2, while the correct set point should be #7.

The voltage difference between the charging set points is very minimal, and is in no way harmful to the batteries. For example, “Absorption” voltage at setting “2” is 14.4VDC, while at “7” it is 14.2VDC. Likewise, “Float” voltage at setting “2” is 13.8VDC, while at setting “7” it is 13.5VDC. The voltage difference is insignificant, but Airstream wants to maintain consistency between all products shipped.

The following procedure shows how to check and adjust the setting for the Victron MPPT Solar Charge Controller for the house lithium batteries.

Components Needed:

Small, Flat-Head Screwdriver
Phillips-Head Screwdriver
Flat-Head Screwdriver

Step 15:

Locate the Victron solar controller.

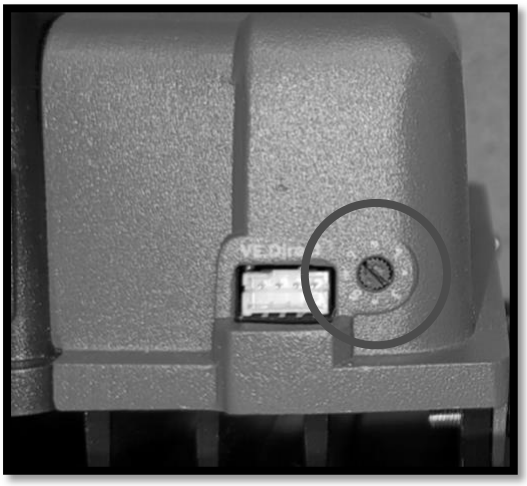
1. On the Atlas, the solar controller is in the inverter cabinet, behind the passenger’s seat. A Flat-head screwdriver will be needed to remove the solar controller, to access the setting dial.

2. On Interstate 24’s, the solar controller is behind the display in the overhead compartment, behind the driver’s seat. You will need to remove 4, Philips-head screws, holding the panel of displays in place (shown in the image below).

3. On the Interstate 19, the solar controller is mounted behind the battery disconnect enclosure, under the rear roadside seat, and is accessible from the rear doors. Remove the felt covered closeout and then remove the 2 Phillip screws holding the battery disconnect enclosure in place.

Step 16:

To verify the settings, make sure the arrow in the dial is pointed at "7." This will ensure the proper setting for the Lithium batteries. A small, flat-head screwdriver will be needed to turn the dial. Once completed, the solar controller can be put back in place, and the corresponding compartments put back together.



Step 17:

The last step is to verify the Victron Solar Control is set to the correct setting, as well. To do so, enter the settings menu by pressing and holding the "Setup" button for 2 seconds. Press the "up" or "down" arrow to navigate to the "01 LOCK SETUP" menu. Press the "Select" button and the display will start blinking. Press the "up" or "down" arrow to change the setting to "OFF," then press "Select" to save the setting. Once the display is unlocked, navigate to the "03 BATTERY TYPE" menu by pressing the "Setup" button and using the arrows. Press select and the screen will blink. Press the "up" or "down" arrow to change the setting to "FIXED," then press "Select" to save the setting. The display should show "TYPE 7," corresponding to the setting set on the solar controller. When you are finished, be sure to go back to the "01 LOCK SETUP" menu and reset the lock to "ON."

NOTE: If the solar controller was not properly set to setting "7" prior to changing the display, the screen will show something other than "TYPE 7."