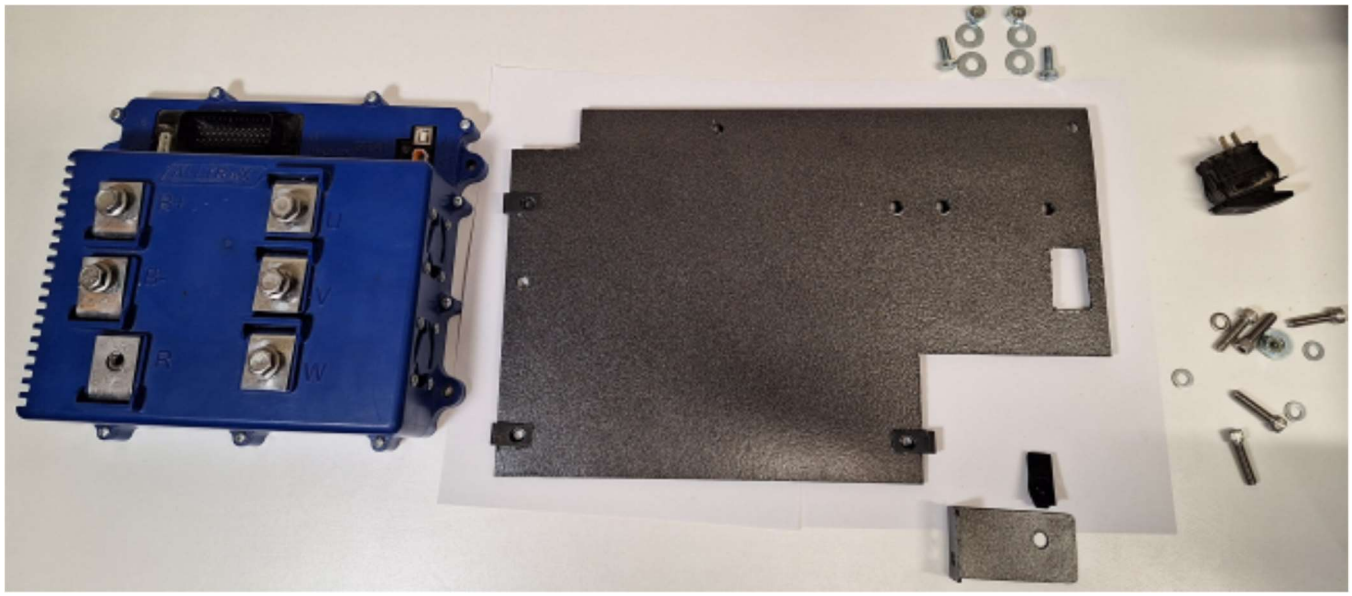
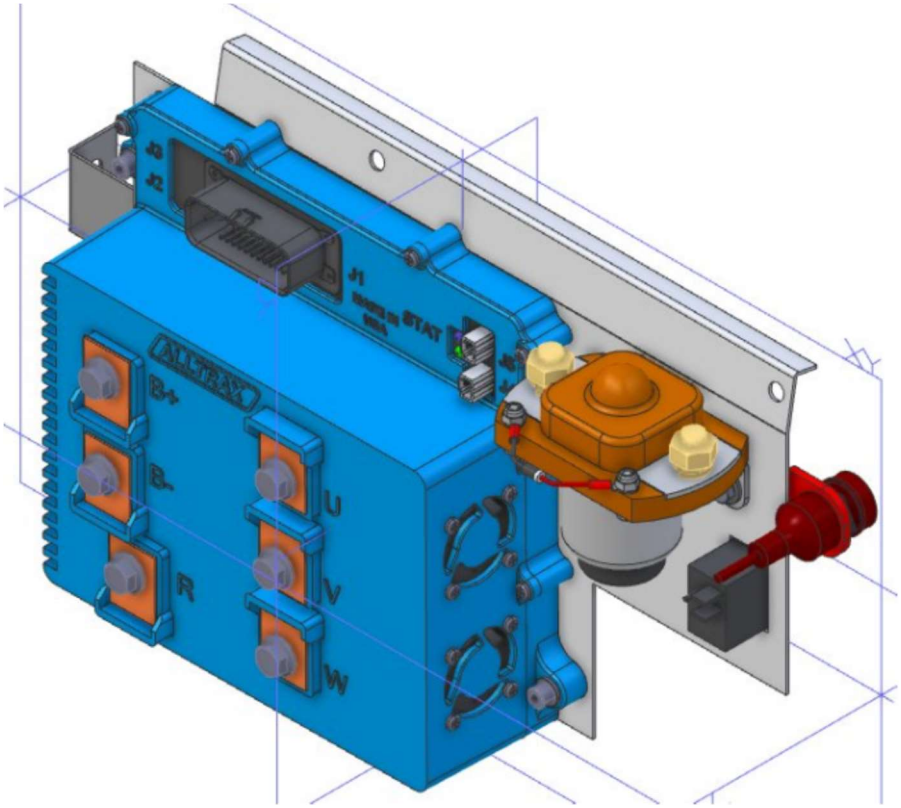
YDRE-DRIVE2-AC
ALLTRAX AC1 CONVERSION

FACTORY 2017+ NEOS 23-pin AC Controller Replacement



COMPLETE KIT:
>Controller AC1
>Panel & Hardware
>AC Motor Ground wire
>Rear support bracket
>Batt cable to Solenoid
>Batt cable to BATT NEG
>USB Extension cable
(Solenoid not included)
....(Fuse not included)



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1. Document Scope

WARNING: Follow all safety and warning recommendations in the GENERAL WARNINGS SECTION in the AC1 Operators Manual.

It is the installers responsibility to utilize proper safety glasses and other PPE safety gear using tools, equipment, or working on or around batteries and energy sources.

2. Document History

- 8/23/2023, REV A, Initial release AC1 for NEOS Conversion, EC-8252023

3. Tools Required:

A suggested list of tools to install this kit. Not all tools may be listed.

- Socket set 3/8” drive (Metric and SAE)
- Socket set 1/4” drive with 4” extension
- SAE Allen wrench set
- Box wrench set
- Phillips screwdriver
- Flat blade screw driver
- Power Drill
- Safety glasses and PPE working on and around lead acid batteries, drilling, etc.

3.1. Parts Required (not supplied)

The conversion requires other components to complete the project, the items are not supplied but required:

- NEW SOLENOID – See AC1 Operators manual CONTACTORS (SOLENDOIS) Section for ratings and type.
- BATTERY FUSE, see AC1 operators manual FUSE section for ratings
- BATTERY CABLES, see AC1 operators manual WIRING section for gauge and type

4. YDRE-DRIVE 2 NEOS AC Models:

The YDRE-DRIVE 2 with Factory AC option, 2017-2023.

4.1. NEOS – YDRE Drive 2 OEM AC version:

The panel is form fitted to the NEOS controller and will be replaced with a panel to mount the ALLTRAX AC1 controller.

5. Conversion Procedures:

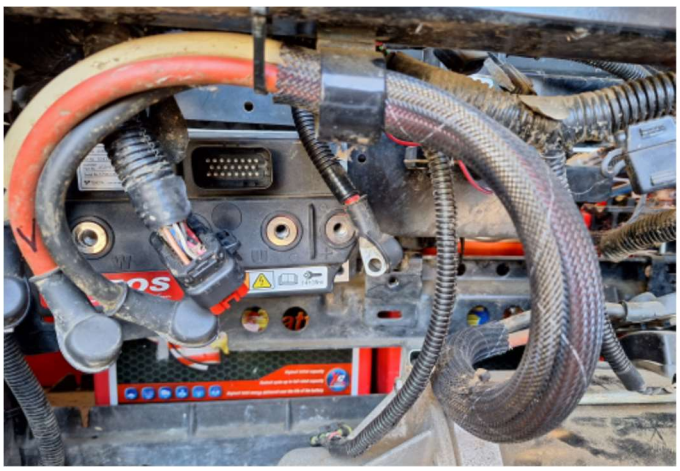
The conversion requires removing the entire NEOS panel, remove TOW/RUN switch (which will be reused) and Solenoid. A new properly rated solenoid is required to maintain the ALLTRAX warranty. See AC1 Operators manual for more information.

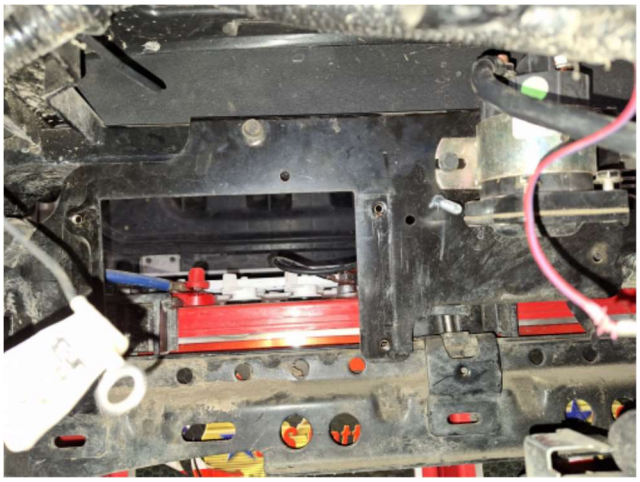
5.1. NEOS M-TYPE mounting panel removal:

The NEOS panel shown below, this entire panel will be removed.

1. **SET KEY-SWITCH AND TOW/RUN SWITCH TO OFF**
2. **DISCONNECT THE BATTERY CABLE**
3. Remove Solenoid and wires from assembly, note the FUSED 18AWG wire assembly to the INPUT to the solenoid. It will be replaced onto the new solenoid.

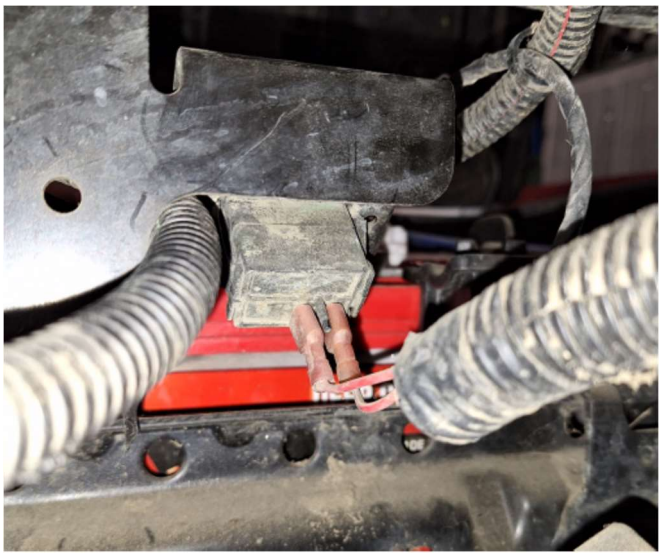
4. Remove wires and unplug wire harness, then remove the bolts holding the motor controller heatsink assembly. Remove from car:





REMOVE PANEL CONTINUED:

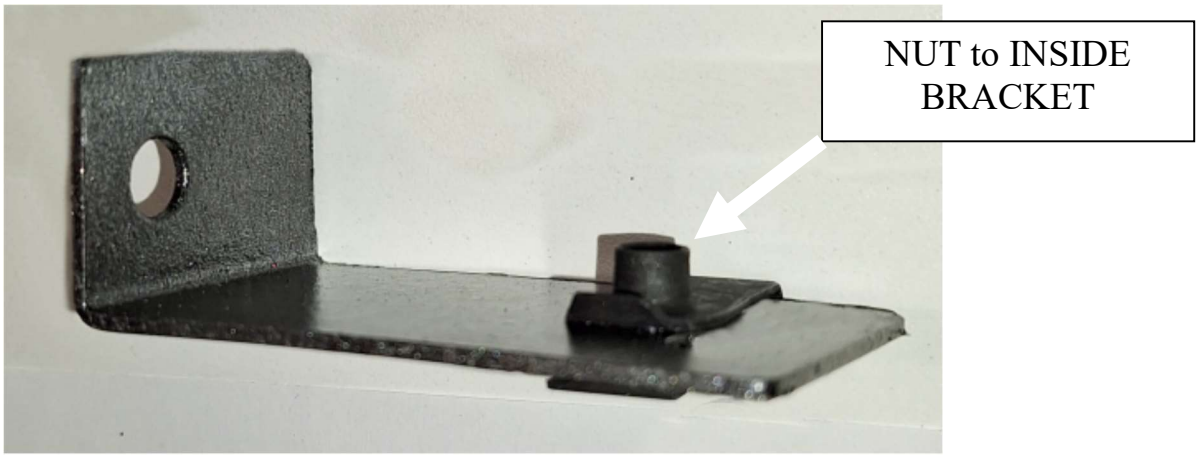
5. Remove the TOW/RUN wires form the TOW/RUN switch. The TOW/RUN switch will be removed and will be installed onto the new AC1 panel.
6. Remove the two top bolts from panel top and the side mount 1-3/4” bolt (drivers’ side) which may be accessed from the battery compartment. SAVE THE TOP TWO BOLTS – they will be reused.
7. Push the two tabs on the TOW/RUN switch and remove from panel.



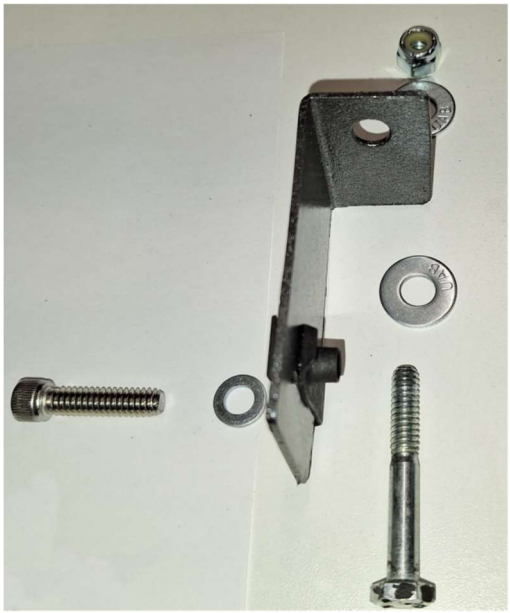
6. AC1 Panel Installation:

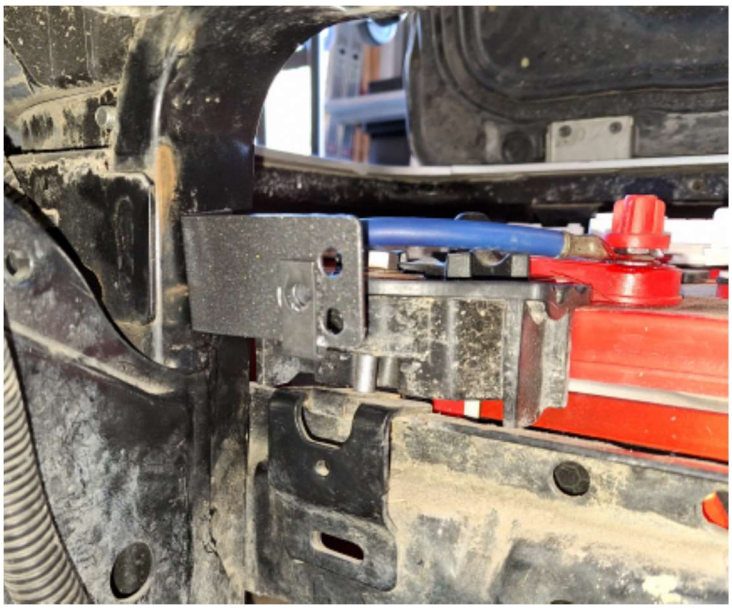
The AC1 Panel Installation is formed to mount the TOW/RUN switch, USB Extension cable, and Solenoid (any solenoid with 2.5” bolt spacing). The MZJ-400AMP solenoid is recommended for the AC1-48650 controller.

1. Install the REAR SUPPORT BRACKET:
    1. Locate the (1x) 1/4-20x1” SOCKET HEAD CAP SCREW and (1x) SMALL DIAMETER 6mm FLAT WASHER.
    2. Locate the (1x) 1” U-SPEED CLIP, place the speed clip on the bracket as shown.

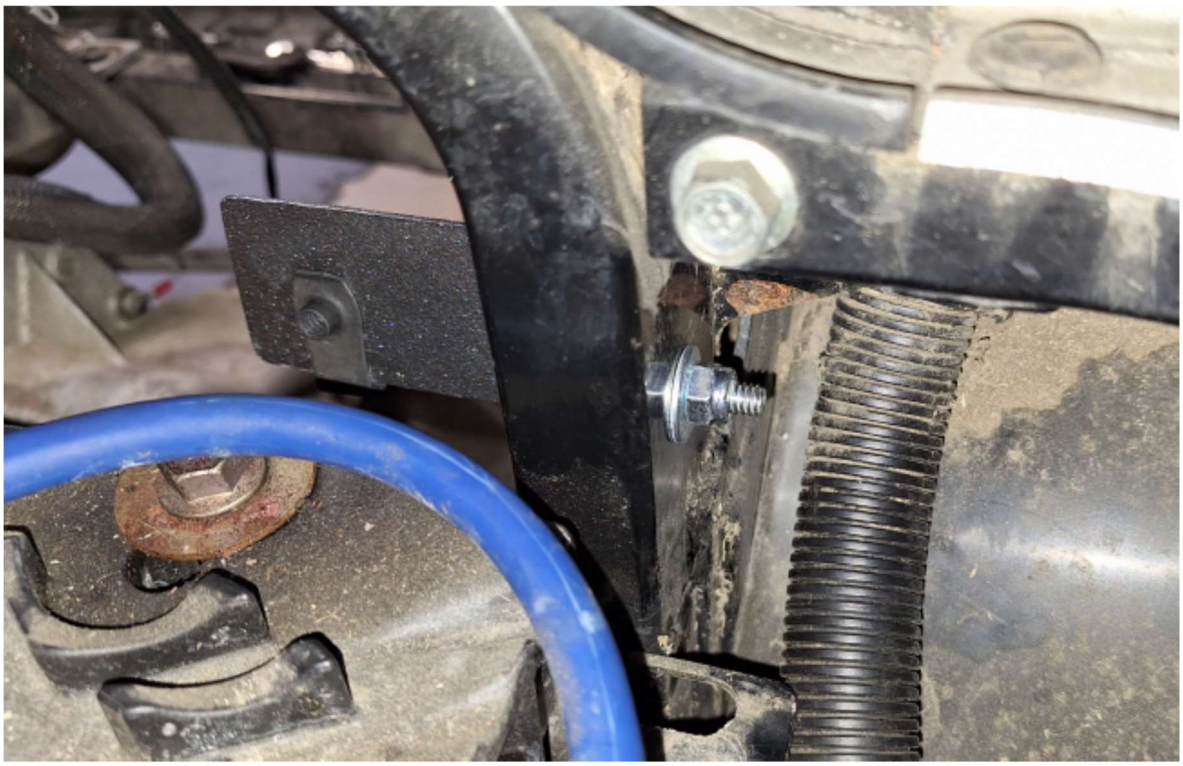


3. Locate the (1x) 1/4'-20x1-3/4” HEX HEAD BOLT, 2x FLAT 1/4” washers, (1x) 1/4” NYLOC nut.
4. Insert 1/4-20x1-3/4” BOLT through FLAT washer – through bracket and into the Drivers side frame support hole shown below. The FLAT side faces the REAR of the car which will support the back of the AC1 main panel.

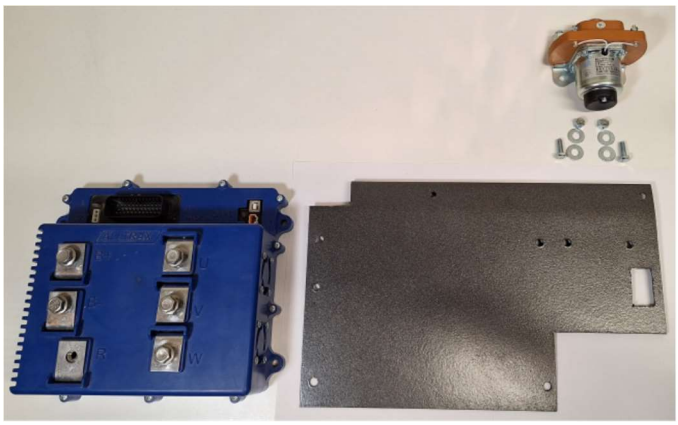


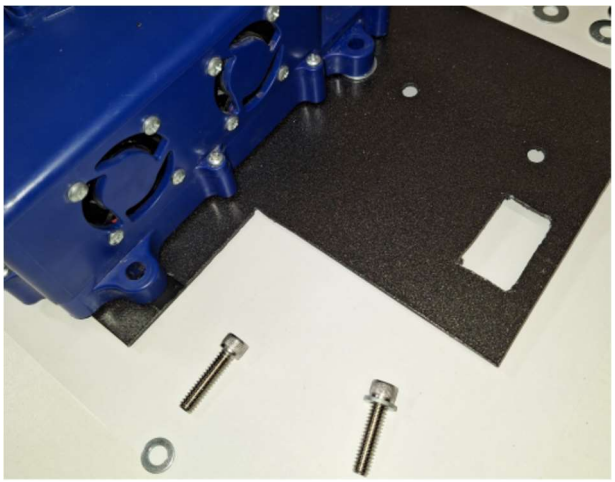


BATTERY COMPARTMENT VIEW:

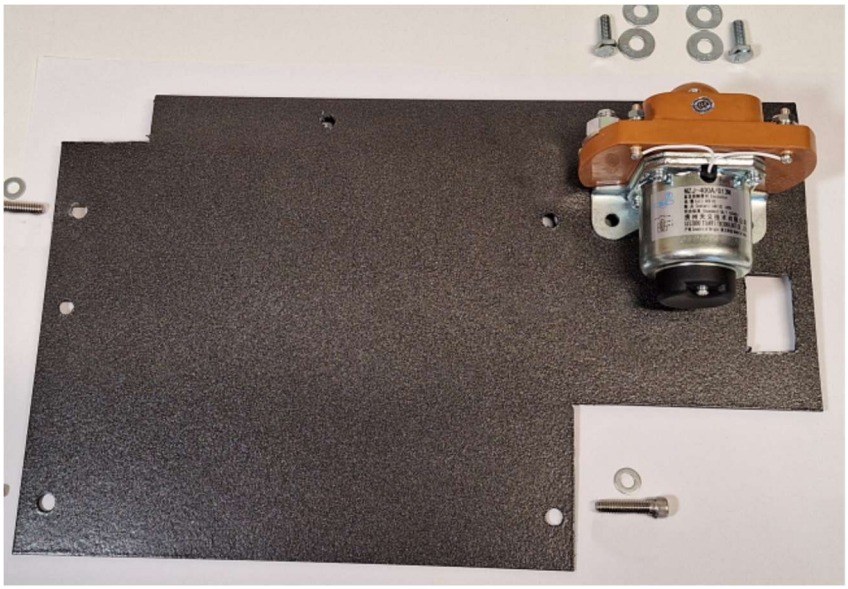


5. Mount AC1 Motor controller with CONNECTORS FACING UP towards the two mounting holes as shown.
6. Install the (4x) 1/4-20x1” SOCKET HEAD CAP SCREWS with SMALL OD 6mm FLAT Washers into the 4 controller mounting tabs. Do not over tighten.



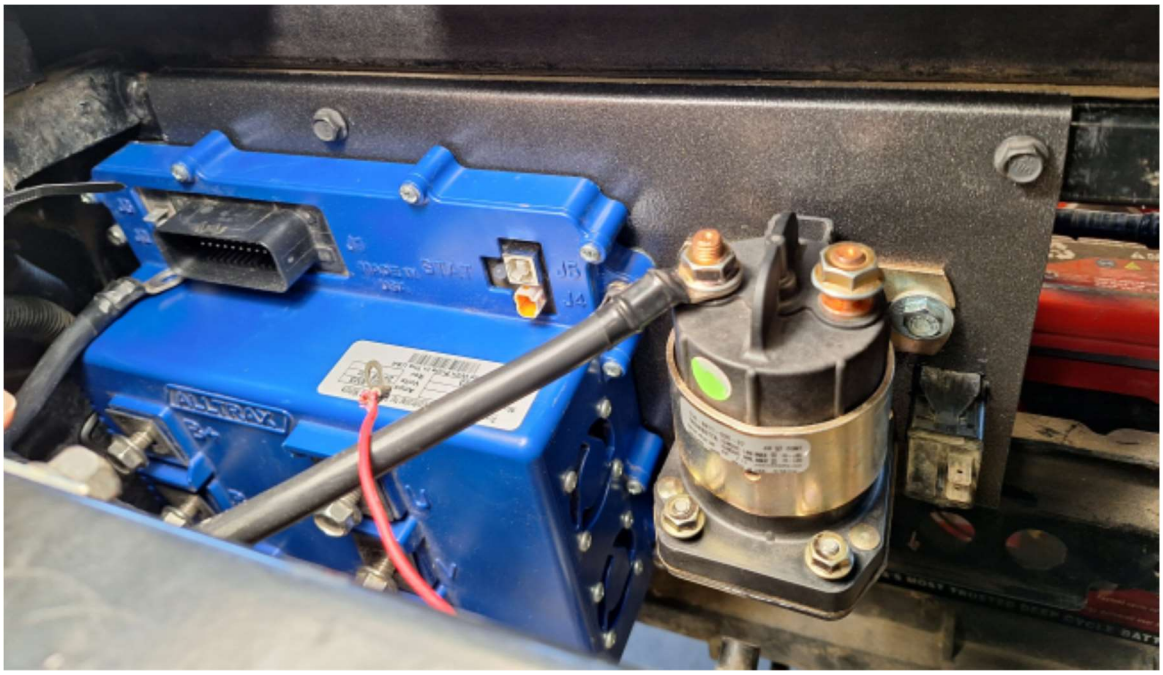


7. Install the new Solenoid with the terminals facing up using the two 1/4-20x1” HEX HEAD bolts with 1/4” FLAT Washers.



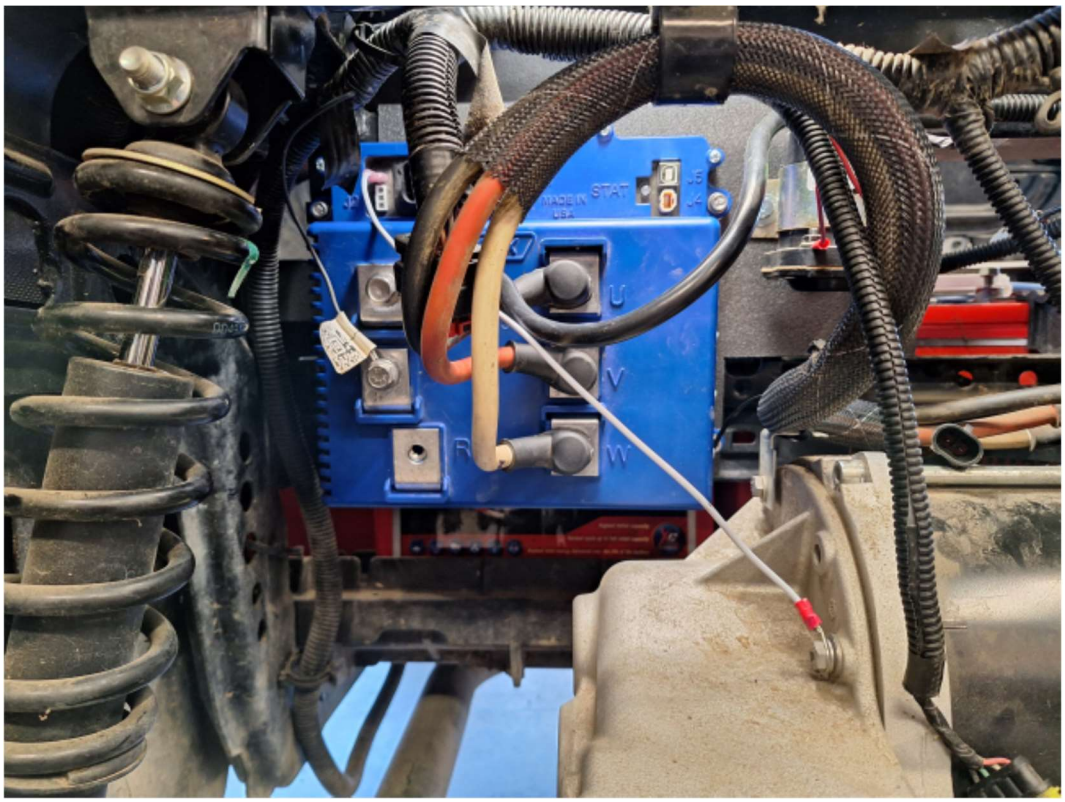
8. For STOCK non-lifted vehicles, put the car onto FRAME jack stands, the axle will drop providing space to install the assembled panel into place.
9. Install panel with CONNECTOR facing rear, tilt DOWN and hang panel on top the rear upper support bar. NOTE: It WILL BE A TIGHT FIT. You may have to push the wires and cables out of the way.
10. Insert the two OEM bolts removed from the old panel – **LEAVE LOOSE**.

- NOTE: The STOCK solenoid is shown, please install new MZJ-400A solenoid.



11. Install (1x) 1/4-20x1” SOCKET HEAD CAP SCREW with SMALL OD 6mm FLAT washer into the left side REAR SUPPORT bracket.
12. Tighten the REAR SUPPORT BRACKET and TOP TWO PANEL mounting bolts.

13. Install and connect the 3-phase motor wires as shown with U, V, W going to the correct terminals. U=BLK–TOP / V=RED-CENTER / W=WHT-BOTTOM. Torque bolts to specs on AC1 Manual **SPECIFICATIONS SECTION**. ZIP Tie the cable assembly using the OEM ring support shown above the motor.



14. Insert the TOW/RUN switch with TOW on top, connect the wires removed earlier.

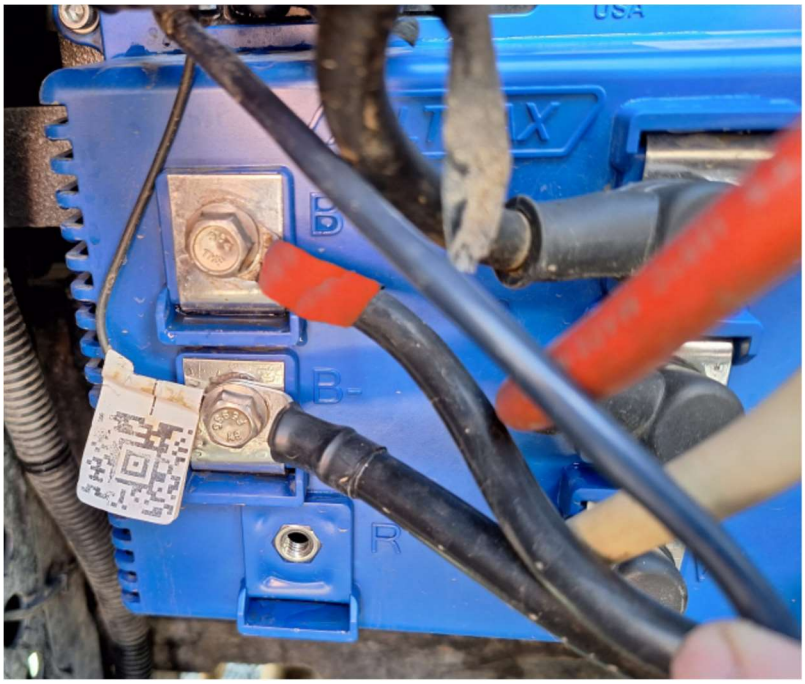
6.1. Battery and Solenoid Cables:

1. A battery fuse is required (Not supplied) an example fuse holder shown below for reference installed in a suitable location. (See AC1 controller operators manual FUSE SECTION for fuse size ratings). Connect BATTERY POSITIVE to the fuse holder.

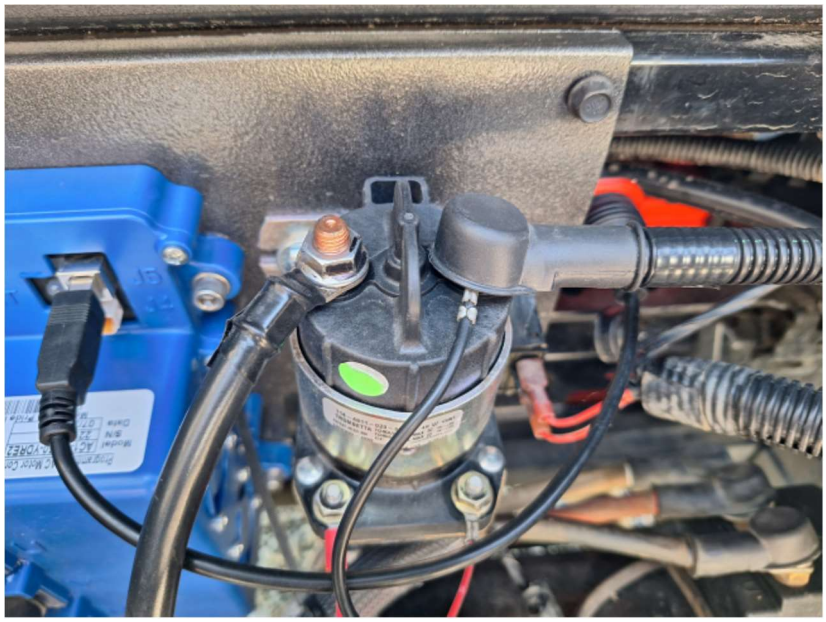
CAUTION: DO NOT INSTALL THE FUSE YET!

2. Connect cable 5/16” ring to the fuse, the 3/8” ring to the 400amp solenoid.

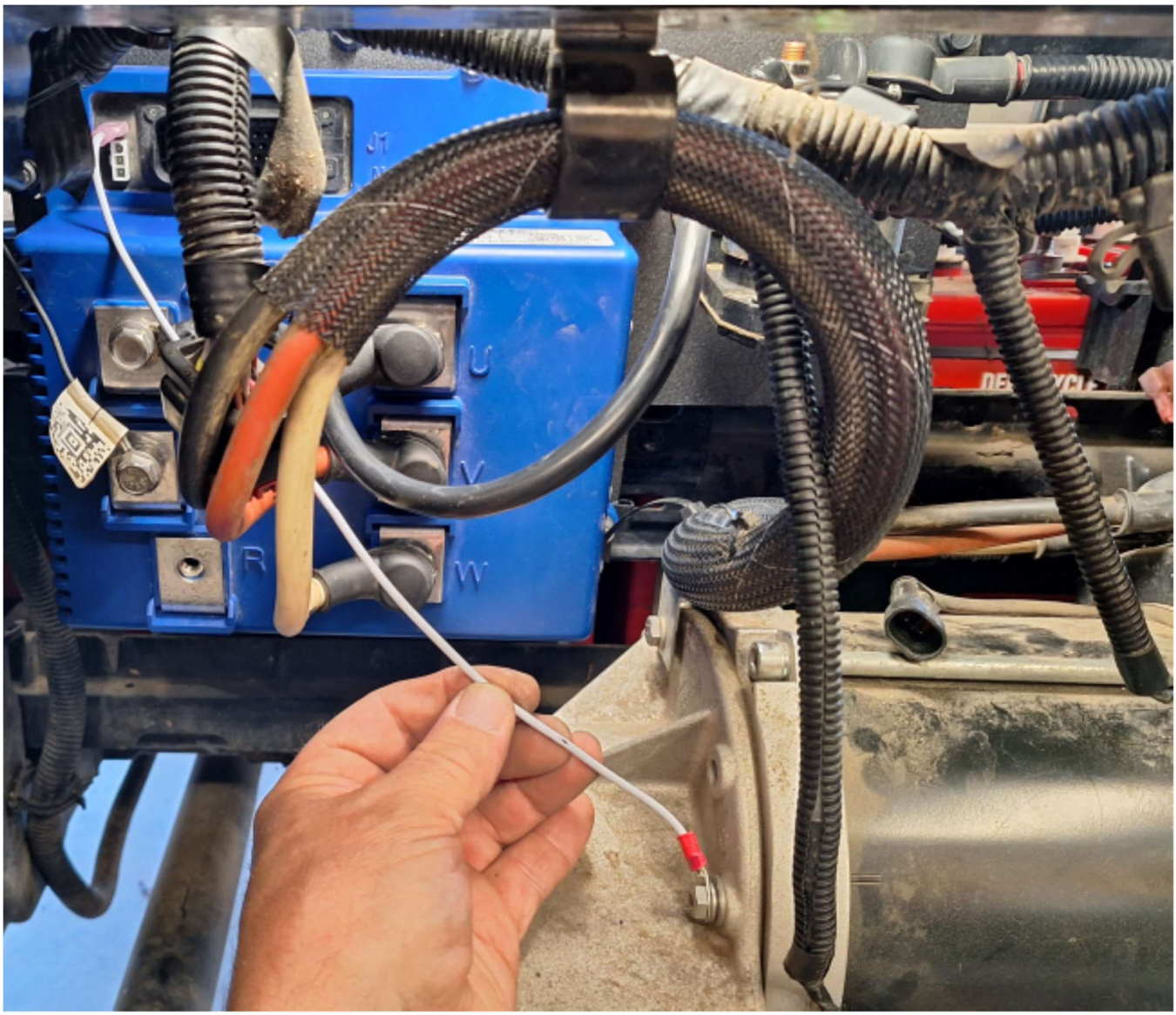
3. Connect the 3/8” ring to 400amp Solenoid to the AC1 motor controller **B-POS** terminal.
4. Connect the NEW supplied **BATTERY NEGATIVE** 2AWG x 34” to the AC1 motor controller **B-NEG terminal** and rout the NEG BATTERY TERMINAL. Connect the CAR system NEG wire that was removed earlier with tag to the BATT NEG as shown.



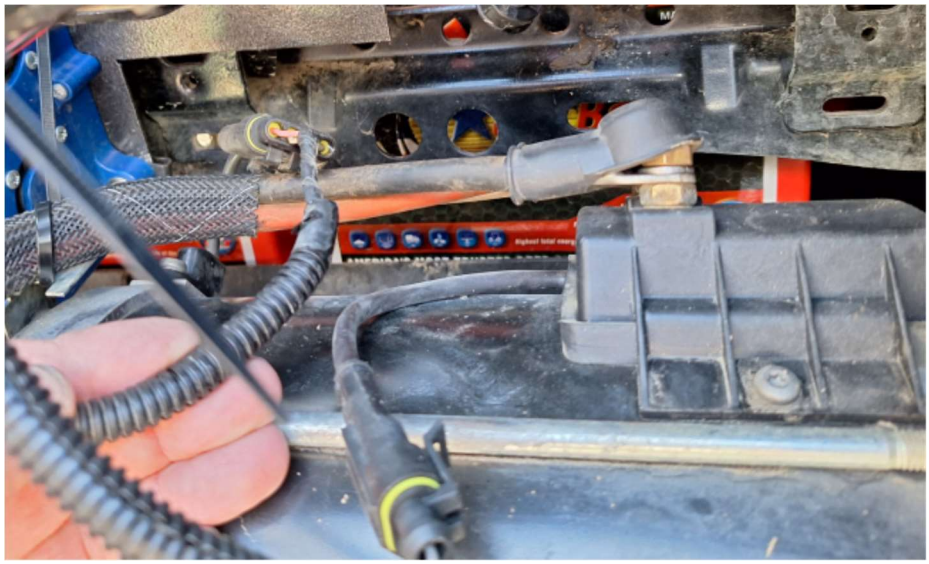
5. Connect the SOLENOID COIL wires as shown.
6. The BLACK 18AWG fuse wire feeds power to the Key switch is on the **BATTERY INPUT** side of the solenoid. (i.e. wire energized all the time)
    - NOTE: The STOCK Solenoid is shown, it required to replace the solenoid with a 400amp version, MZJ-400A.



7. Connect the **AC ground wire** to the AC motor controller GND faston (next to the 3-pin connector) and route to the AC motor and use a motor mounting bolt to connect the AC ground wire.



8. Connect the two sensor cables, the 4 pin speed sensor and 2 pin temp sensor.

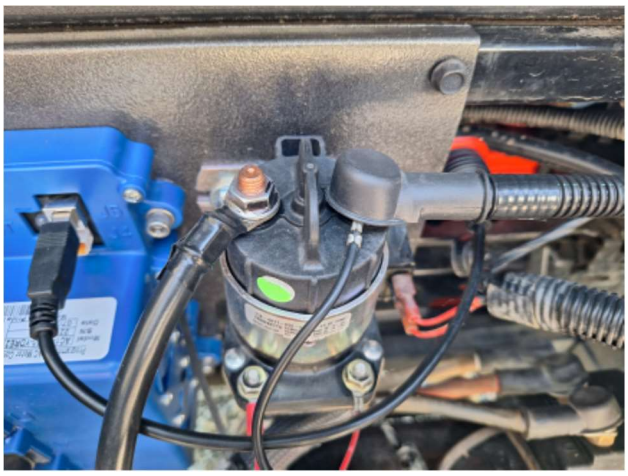


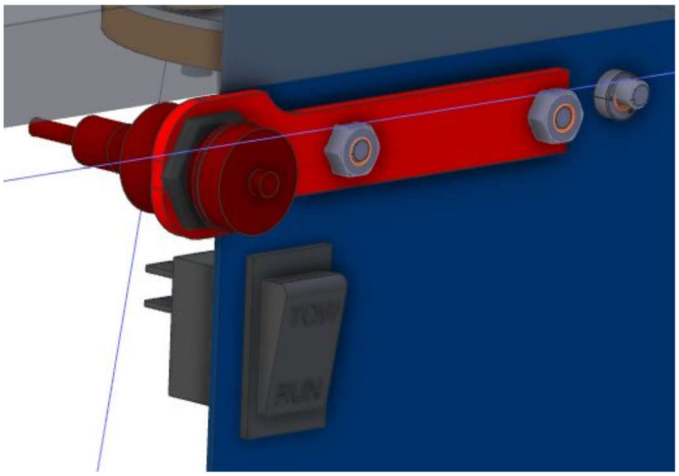
9. Install the proper ANN Fuse into the fuse holder. (See AC1 operators manual)
10. Measure voltages at the solenoid positive and controller B-NEG and **verify the correct voltage and polarity is available**.
11. Turn on TOW / RUN switch to RUN.
12. It is recommended to do a first test on a jack to determine direction is correct. Do not over-rev the axle, just enough to verify Forward and Reverse direction is correct.

7. Accessories:

7.1. USB Extension Cable:

The controller is programmed, monitored, or upgraded through USB or Bluetooth. If Bluetooth option is not available (or enabled) the USB is difficult to reach on the 2017+ YDRE with factory rear cover. A 3D printed USB-B cable extension kit is included to mount to the rear SOLENOID BOLTS as shown above the TOW/RUN switch. The CAP should be on at all times to keep battery acid out of the connector.





7.2. FN-KEY Personality Switch Box:

The FN-KEY (on left) included in your kit (with optional dash mount FN-DM-KEY shown on right) provides 3 personality functions: Golf Mode (10-14MPH), Street Mode (14-20MPH) or Go-Fast Mode (depending on safe operation and tire size, do not exceed manufacturers RPM limits or braking function). **See the included FN manual for more information.**

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It was really all he asked for in his lab journal. He said what he designed was for the future, and he hoped we would remember him and his contribution.

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