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INSTALLATION INSTRUCTION

E-Z-GO 2 FIVE Controller and Wiring Installation

REVISION: A

Date: 2-9-18

Disclaimer: HPEVS assumes that the installer possesses appropriate knowledge and skill to perform the installation of our drive system into any vehicle. If you feel that you DO NOT have the appropriate knowledge and skill to perform the installation, seek help from a professional installer.

IMPORTANT DISCLAIMER: IF THE VEHICLE IS GOING TO BE STORED FOR A LONG PERIOD OF TIME, **THE VEHICLE NEEDS TO BE PLUGGED IN TO CHARGING POWER AT ALL TIMES AND 12 VOLT CONVERTOR SHOULD BE DISCONNECTED.** FAILURE TO FOLLOW THIS PROCEDURE WILL DRAIN THE LITHIUM BATTERIES DOWN TO A POINT WHERE THE BATTERIES WILL BE DAMAGED. **IF THE BATTERIES ARE DAMAGED FOR NOT FOLLOWING THIS PROCEDURE WILL VOID ANY IMPLIED WARRANTY.**



CAUTION: DO NOT HANDLE THE ELECTRICAL CONNECTORS WHEN THE SYSTEM IS ENERGIZED. DOUBLE CHECK THE VOLTAGE POTENTIAL WITH A VOLTAGE METER PRIOR TO HANDLING MAKING SURE VOLTAGE IS AT 0V. FAILURE TO DO SO WILL RESULT IN INJURY OR DEATH!

SCOPE: This instruction set is given as a detailed guide to install a HPEVS drive system into a E-Z-GO 2Five golf car as well as any modifications. The drive system includes the motor and controller. Modifications include the wiring harness and the controller mounting brackets. Please read the instructions thoroughly prior to doing the install.

CABLE AND CONTROLLER REMOVAL

1. Set the park brake.
2. Make sure the ON/OFF key switch to OFF position and remove key from key switch.
3. If equipped, place the Run/Tow switch into the Tow position.
4. Remove the controller splash shield and set it aside.
5. Using a 13mm socket or wrench, disconnect the battery pack positive cable from the battery and contactor and set the cable aside. (Fig. 1)



Fig. 1

6. Disconnect the remaining cabling from the contactor. The smaller nuts on the contactor can be loosened by either a 10mm or 3/8" wrench or socket.
7. Loosen and remove the bolt holding the relay in place depicted in Fig. 2. Use a 10mm socket or wrench to do this process. Disconnect the relay from the plug and set the relay aside.



Fig. 2

8. Remove the contactor from the mounting plate that is holding the contactor in place. The contactor will be reused.

9. Remove 35-pin AMP connector from the controller. To do so, find the holding tab on the connector (Fig.3). Using a small screw driver or something small that can be located under the tab (Fig.4), lift the tab and at the same time lift the connector away from the plugin receptacle (Fig.5).



Fig. 3



Fig. 4



Fig. 5

10. Remove the remaining cabling; pack negative cable and the three motor cables from the controller and move them up and out of the way.

STOCK CONTROLLER REMOVAL

1. To remove the stock controller plate, locate the two-black screws (Torx T-45), one each for each controller mounting brackets, located at the bottom of the arms. They are screwed into the battery tray tub. (Fig. 6)



Fig. 6

2. Loosen and remove both these bolts to remove the controller/mounting bracket assembly.
3. Loosen and remove the bolts holding the mounting brackets to the controller.

CONTROLLER MOUNTING BRACKETS MODIFICATIONS

To accommodate the new controller, the mounting brackets WILL need to be modified. The new controller is slightly longer in length and a little bit wider compared to the old controller. The following steps will direct the technician in what modifications will need to be done.

1. For reference, please refer to the picture in (Fig. 7). The front of the controller as depicted is facing towards the front of the golf car. The right controller mounting bracket, which is on the right in the photo, is longer than the other arm and for reference is located towards the driver side of the car.



Fig. 7

2. Working on the left-side controller mounting bracket, grinding will need to take place at the inside radius of the arm nearest the mounting feet (Fig. 8). A belt sander would be the best tool to accomplish the job, but a grinding wheel or a file will do the job. Grind enough material off so that the controller and controller mounting plate will clear this area and allow for the screws to be inserted into the mounting holes for the controller, controller mounting plate and controller holding brackets.



Fig. 8

3. The same needs to be done for the right-side controller mounting bracket (Fig. 9). In addition, the area located next to the hole for the mounting bolt needs to be shaved back as well (Fig. 10 and Fig. 11). This procedure allows for the mounting holes of the brackets to align with the mounting holes that are located in the battery tray of the golf car.



Fig. 9



Fig. 10



Fig. 11

BUILDING NEW CONTROLLER MOUNTING PLATE

The new controller mounting plate that comes with the kit provides mounting holes for the new controller, new fuse holder and for the remounting of the existing contactor.

1. With the plate resting on a flat surface as shown, mount the fuse holder onto the controller mounting plate as shown with the provided Phillips flat head screws.



2. Working on a flat surface, orient the controller as shown in Fig. 12.



Fig. 12

3. Lay the controller flat on the surface with the front face lying face down on the surface with the orientation as described in the previous step (Fig. 13).



Fig. 13

4. Lay the controller mounting plate with the fuse holder onto the controller (Fig. 14_).



Fig. 14

NEW CONTROLLER MOUNTING

Now that the controller mounting brackets are now modified to accept the new controller and controller mounting plate, the following steps will show how to assemble these pieces.

1. Mount the two mounting brackets to the controller mounting plate as depicted (Fig. 15).

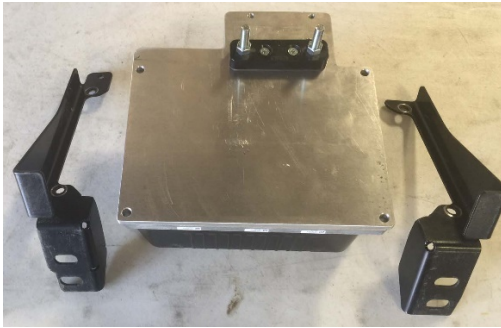
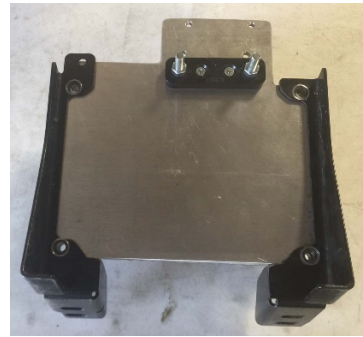


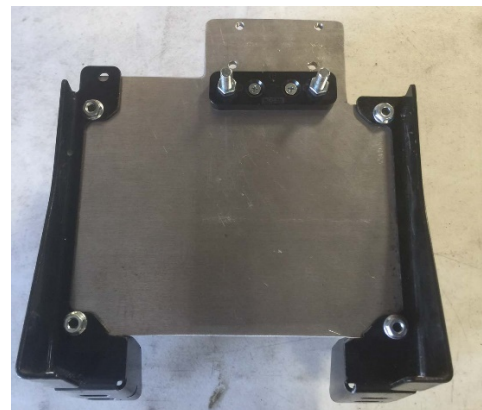
Fig. 15



2. Using the provided bolts and nuts, bolt the controller mounting arms to the controller mounting plate (Fig. 16). Do not fully tighten the nuts/bolts at this point. There will need to be a little movement in the arms to fully mount the controller assembly to the original mounting point.



Fig. 16



3. Mount the red power cables provided to the fuse terminal block (Fig. 17). As looking down on the backside of the controller mounting plate assembly, attach the longer red power cable to left side of the fuse terminal block. Attach the shorter red power cable to the right side of the fuse terminal block



Fig. 17

4. Mount the fuse to the fuse terminal block. Add the flat washers and nuts then tightened the nuts to 12 ft. lbs. each (Fig.18).

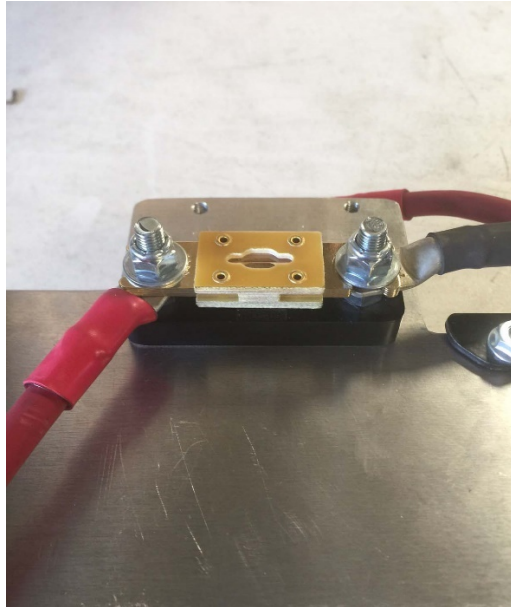


Fig. 18

5. Stand the controller mounting plate assembly upright at this time (Fig. 19).



Fig. 19

6. With the supplied hardware, remount the stock contactor and stock relay to the controller plate assembly. Also, at this time, attach the long red cable to the B+ post of the controller; making sure that the red power cable runs underneath the controller mounting plate as shown (Fig. 20.)

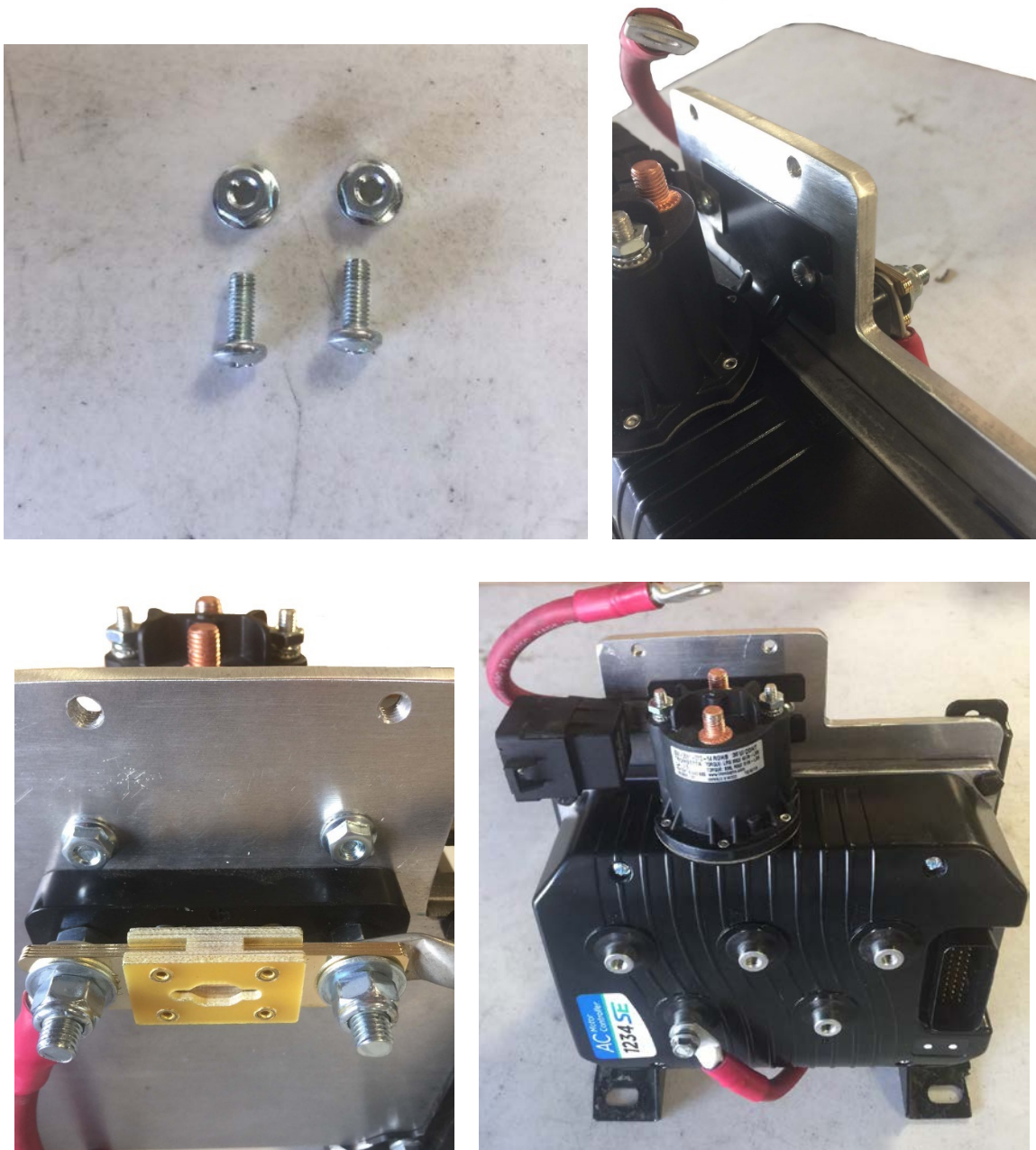


Fig. 20

7. reinstall the controller mounting plate assembly back into the cart.

WIRING HARNESS CHANGES

The stock harness will need to be modified with the included wiring. Stock connector pins will need to be removed and the wires with this kit will need to be added to the 35 pin Ampseal connector

1. Using a small blade screwdriver, or a similar tool, place the blade of the tool between the black body latch of the plug and the red colored body of the plug as shown in the pictures. (Fig. 1 and Fig. 2)



Fig. 1



Fig. 2

2. With the blade of the screwdriver in place at this point, slightly twist the screwdriver to pry the black colored tab on the body of the plug away from the red colored pin capture body of the plug. (Fig. 3 and Fig. 4)



Fig 3



Fig. 4

3. While prying the black plastic tab away from red plastic pin capture portion of the plug, press the red piece up and away from the body of the plug. There will be a single click when the red plastic plug piece is lifted. This is an indication that the pin capture piece is in the correct orientation. (Fig. 5) Do this procedure for both sides of the plug.

MAKE SURE THAT THE RED PLASTIC PIN CAPTURE PIECE ONLY CLICKS ONCE AND NO MORE!

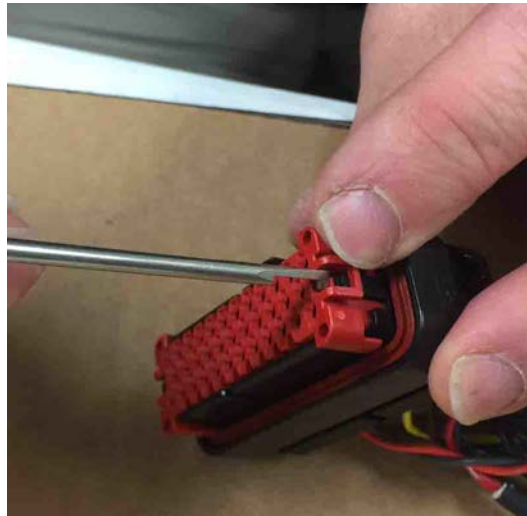


Fig. 5

4. Once completed the plug should look like the following. (Fig. 6) Note the red plastic pin capture piece is not attached to the black plastic tab.



Fig. 6

5. Remove the ORANGE wires from Pins 15 & 26
6. Remove the BLACK wire from Pin 18
7. Remove the GREEN/WHITE wire from Pin 34
8. DO THE FOLLOWING TWO IF LITHIUM BATTERIES ARE INSTALLED
 - a. Remove the RED/WHITE wire from Pin 23
 - b. Remove the ORANGE/RED wire from Pin 35
9. Cut the terminals off of the wire from above wires.
10. Strip and crimp to corresponding wires on adapter harnesses.
11. Insert Orange wire terminal on adapter harness identified as #26 in to Pin 26 on the controller connector. Crimp wires pulled from pins 15 & 26 into butt splices. Used for +5 volts to Throttle and Encoder (Fig. 7).

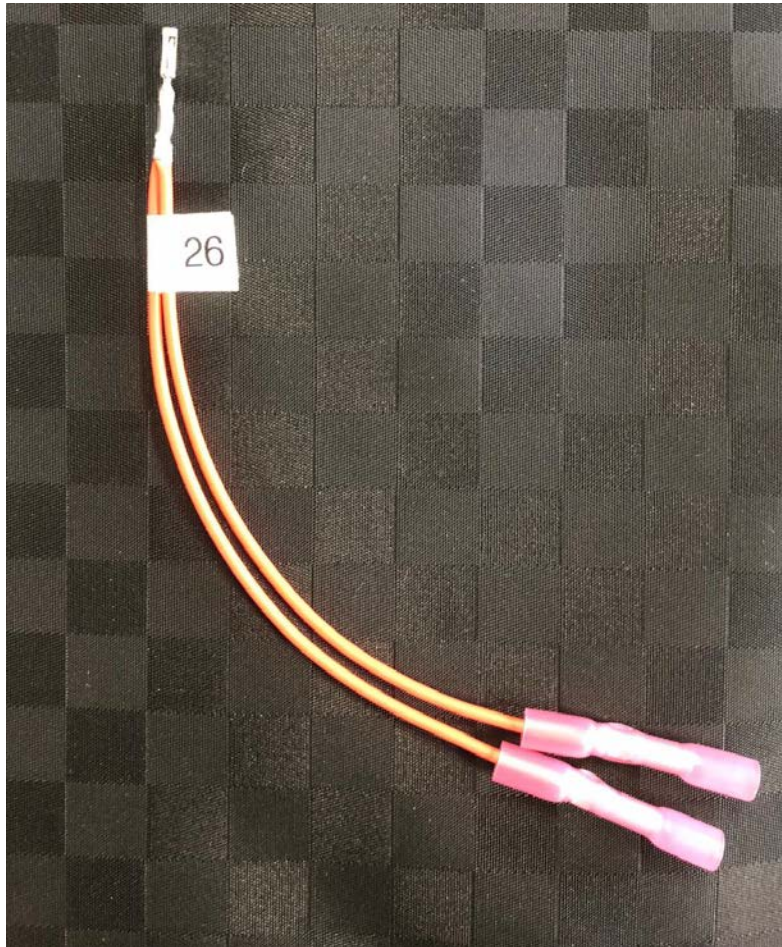


Fig. 7

12. Connect ¼" fork terminal with Black & Green/White wires to the B- battery terminal on the controller. Splice original Black for pin 18 and Green/White from pin 34. Used for Ground to the programming port, throttle and brake sensors (Fig. 8).

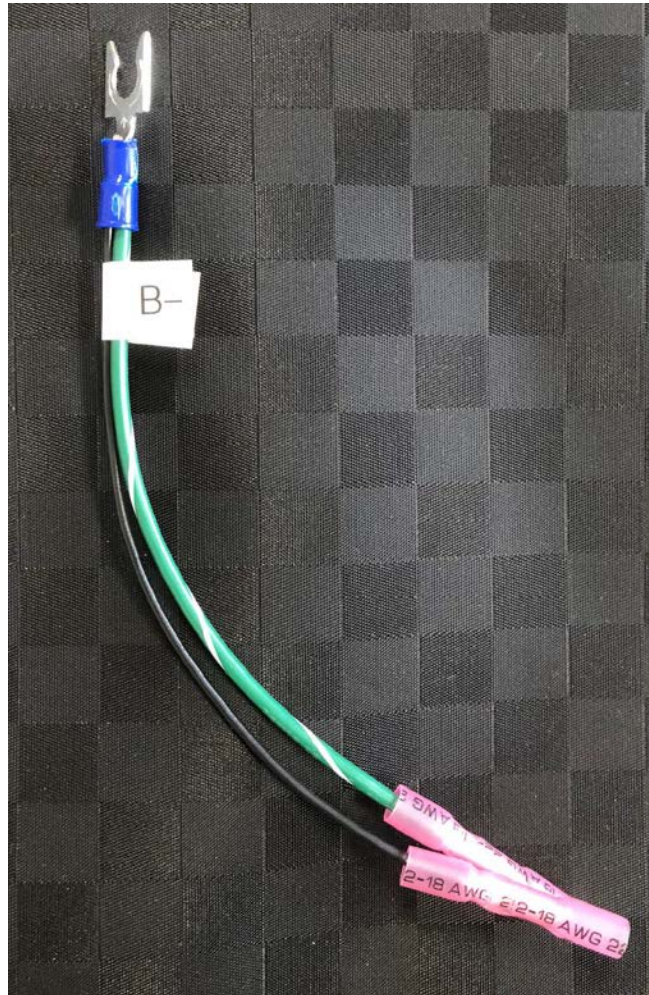


Fig. 8

IF HPEVS LITHIUM BATTERY PACK IS INSTALLED

If the cart will be utilizing or already has a lithium battery pack from HPEVS, the following connections will need to be done to insure functionality.

1. Insert Red/White wire pin into pin 23 and the Orange/White wire pin into pin 35 of the Ampseal connector. Then strip and splice in the corresponding wires into the butt connectors. The Deutsch connector will then need to be tied into the Deutsch connector from the battery pack (Fig. 1).

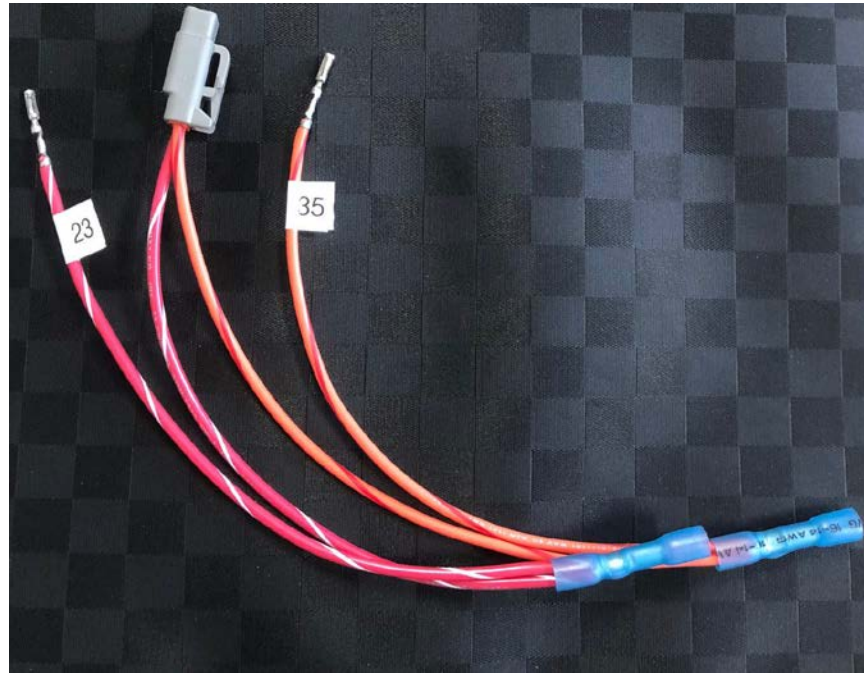


Fig. 1

2. The blue wire from BMS will need to be tapped in to Pin 1 (Red wire) from the Motor Controller. This powers the BMS when the key is ON.

NOTE

In some cases, the Reverse buzzer will buzz slightly when NOT in reverse. If this is an issue, you can pull the black wire from Pin 2 and disable the reverse buzzer.