Hi Performance Electric Vehicle Systems

620 Magnolia Avenue
Suite B
Ontario, CA 91762
(909) 923-1973

INSTALLATION INSTRUCTION

Stock Club Car Precedent Lithium Battery Pack Installation

REVISION: B

Date: 5-23-19

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.

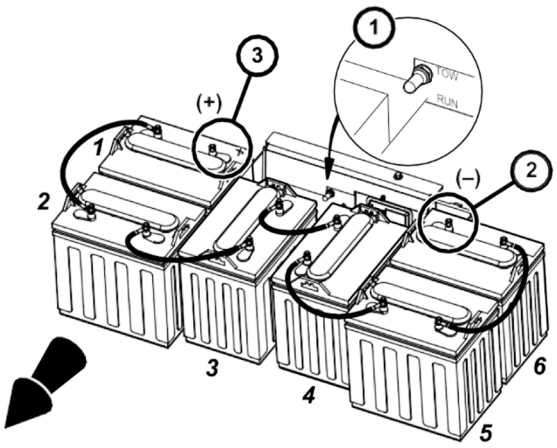
CAUTION: DO NOT HANDLE THE ELECTRICAL CONNECTORS WHEN THE SYSTEM IS ENERGIZED. DOUBLE CHECK THE VOLTAGE POTENTIAL WITH A VOLTAGE METER PRIOR TO HANDLING MAKING SURE VOLTAGE IS AT 0V. FAILURE TO DO SO WILL RESULT IN INJURY OR DEATH!

SCOPE: This instruction set is given as a detailed guide to install HPEVS complete lithium battery pack into a stock Club Car Precedent. Included in this lithium battery pack are 16 CALB 100Ahr batteries, one Orion Jr. BMS and one delta-Q battery charger. Included in this documentation are instructions on installing the lithium battery pack and wiring.

TABLE OF CONTENTS

STOCK LEAD ACID BATTERY REMOVAL

1. **Set the park brake.**
2. **Turn ON/OFF Switch to OFF position and remove key from key switch.**
3. **If equipped, place the Run/Tow switch into the Tow position.**
4. **Disconnect the stock lead acid battery cables based on (Fig. 1)**



(Viewed from driver side of vehicle)

1. Place TOW/RUN Switch in TOW before disconnecting or connecting battery cables.
2. Remove negative battery cable.
3. Remove positive battery cable.

Fig. 1

5. **Remove all battery hold downs.**
6. **Remove all battery cables from the stock batteries.**
7. **Remove all batteries from the stock battery tray/tub.**

Battery Tray/Tub Modifications

Minor modifications need to be performed to the battery tray/tub so that the new lithium battery tray kit can be installed into this position.

There are three areas in the tray/tub that needs to be modified to allow for 1) the lithium battery pack to sit flush in the tray/tub; 2) allowing for the routing of the stock wiring harness through the tub/tray so that it reaches the back area of the vehicle where the controller is located.

1. **For reference, here is a stock battery tray/tub that is out of a Club Car Precedent looking into the battery tray area. (Fig.4)**

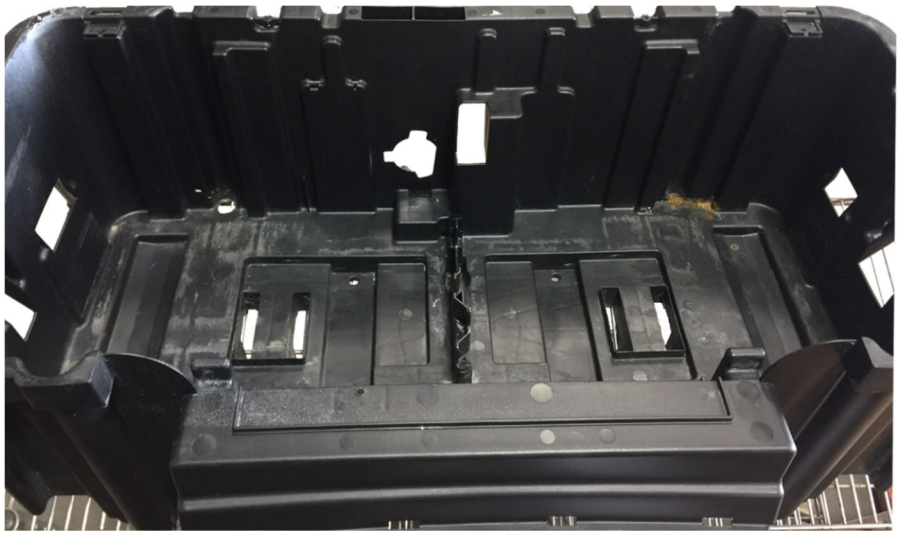


Fig. 4 Looking from the rear of cart forward

2. **To ensure that the lithium battery tray sits flush within the battery tray/tub, there is a section of raised plastic that needs to be removed. (Fig. 5)**

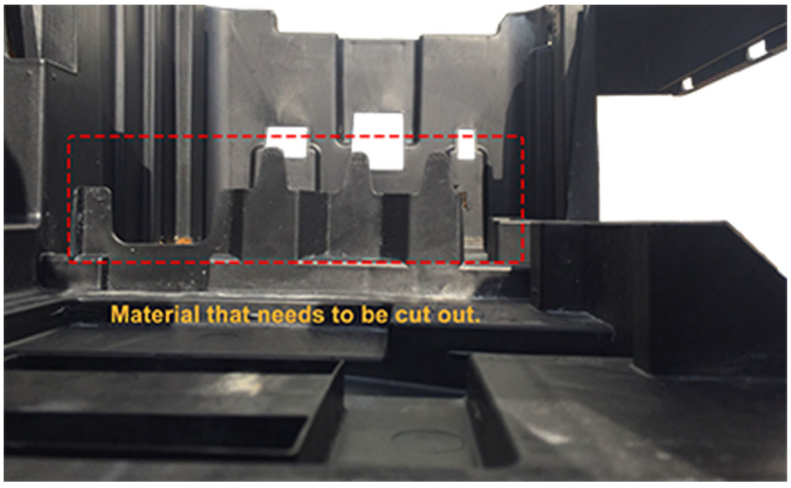


Fig. 5

3. **Using a saw or cutoff wheel (pneumatic saw is highly recommended), cut the peak raised plastic material flush to the base from which this plastic material is located. (Fig. 6)**

Fig. 6- Raised material removed.

Plastic material removed for wiring harness routing

Next, there is a small piece of plastic located on the bottom of the tray/tub that needs to me removed to allow for proper routing of the stock golf car wiring harness underneath the new lithium battery tray.

1. **The piece is located towards the front of the tray/tub on the bottom along the lines of the previous cut. (Fig. 7)**
2. **The piece needs to be fully cutout and should end up being flush with the surrounding plastic material area.(Fig. 8)**

Fig. 7

Fig. 8- Finished cut

3. **Cut away plastic along the front side of the battery tub/tray to allow for a slot so that the stock wiring harness can be routed away from the existing access hole. The harness will need to lay as flat as possible along the bottom surface of the battery tray/tub. (Fig. 9, Fig. 10)**

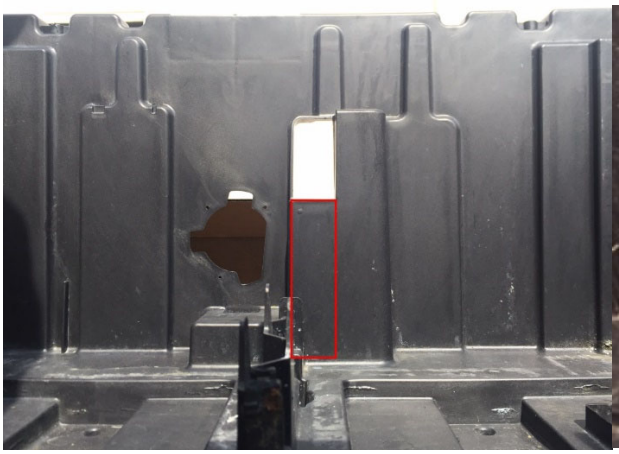


Fig. 9 **Fig. 10**

4. **Next, a through hole needs to be drilled in the plastic to allow for the wiring harness to exit out of the battery tray/tub into the motor/controller area located in the back of the car. Using a 1 ¾" hole saw, proceed to drill the hole on the rear driver side of the floor. Note that the hole has to be close as possible as the bottom surface of the battery tub/tray. (Fig. 11)**

Fig. 11

5. **Proceed to route the OEM harness through the battery tray/tub as shown then carefully feed the connector/harness though the hole. (Fig. 12)**

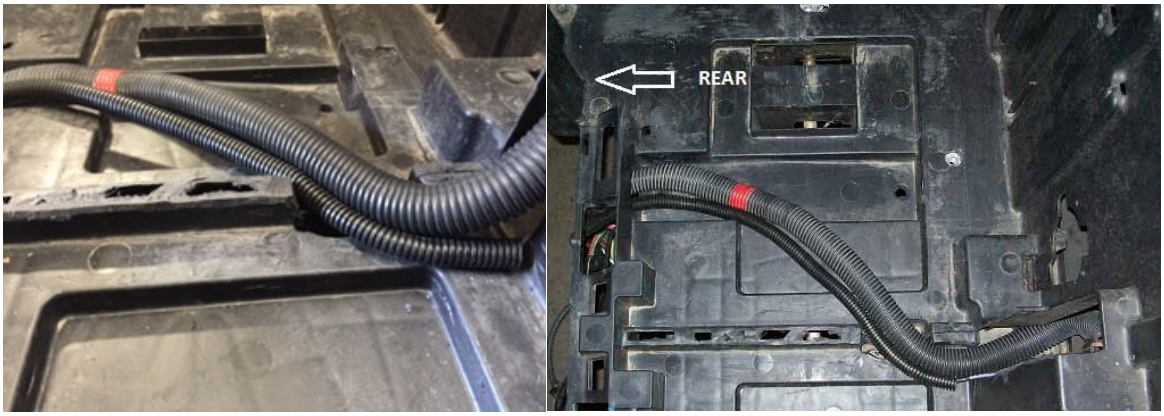


Fig. 12- OEM wiring harness routing

BATTERY PACK INSTALLATION

Installation of the HPEVS Lithium Battery Pack into the vehicle will require two people to set the pack into the battery tray/tub safely.

1. **Install the lithium battery pack with the delta-Q charger located on the driver side of the vehicle. It is very important that the battery pack is located as far back as possible against the rear wall of the vehicle's battery tray/tub. (Fig. 1)**

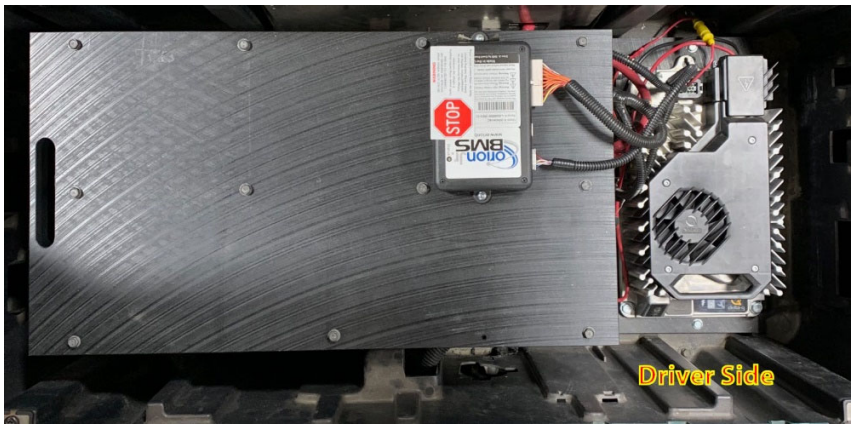


Fig. 1-Lithium battery pack installed into golf car

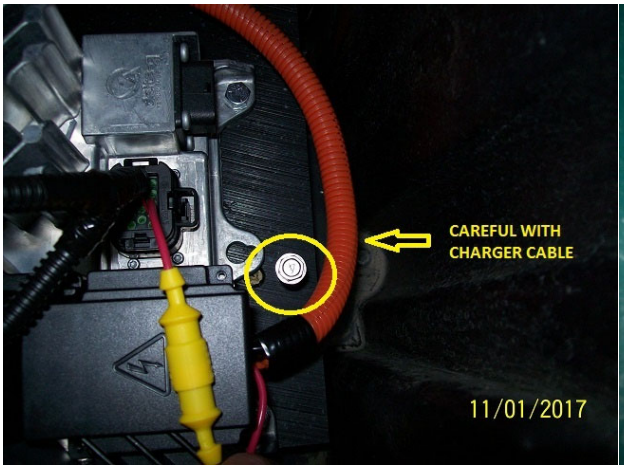
2. **Using the supplied (4) ¼" x 4" stainless self-tapping; self-drilling screws (Fig. 2), secure the lithium battery pack to the vehicle's frame. There are four predrilled holes located in the bottom piece of the lithium battery pack tray. An impact driver is highly recommended in the process of drilling these screws into the frame.**

Fig. 2- Self-tapping screws

3. **There are four locations that need to be secured.**

Front passenger side

Front Driver side



Rear Driver side

Rear Passenger side

4. **Make sure that all four mounting screws are tight and secure.**

BATTERY CONNECTIONS

1. **Carefully feed the power cables; both the black pack negative (B- cable) and the red pack positive cables, beneath the controller plate and into the motor/controller area at the back of the vehicle. (Fig. 1)**

Fig. 1- Cable routing from battery pack

2. **Remove the electrical tape off of the pack positive cable lug install the lug onto the contactor. (Fig. 2)**

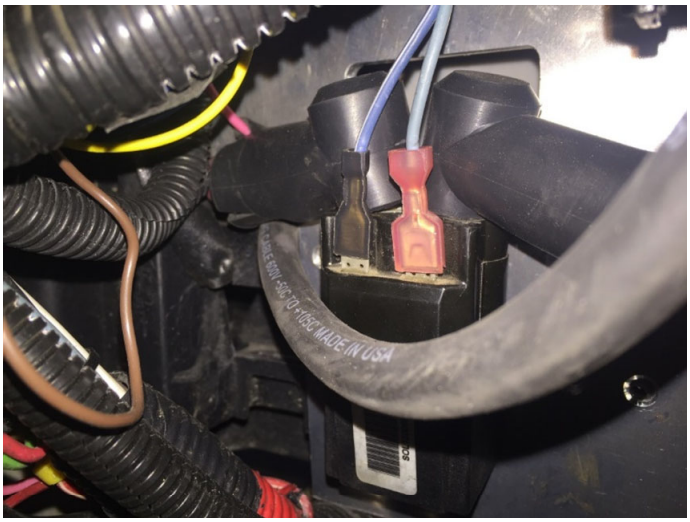


Fig. 2- Install pack positive cable onto contactor

3. **Remove the electrical tape off of the pack negative (B- cable) and install the lug onto the B- terminal located on the controller. (Fig. 3)**

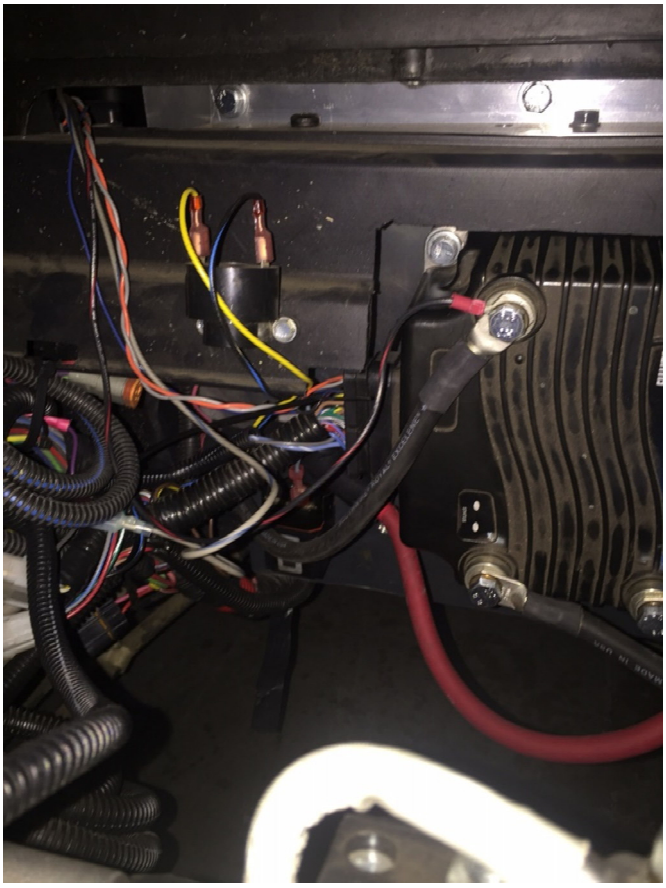


Fig. 3- Connect pack negative to B- on the motor controller

ELECTRICAL CONNECTIONS

STATE OF CHARGE METER

1. **A state of charge meter is used to display the state of charge of the lithium batteries. The EZGO analog meter, part number 612314 is the meter that has been sourced for this setup. (Fig. 1)**

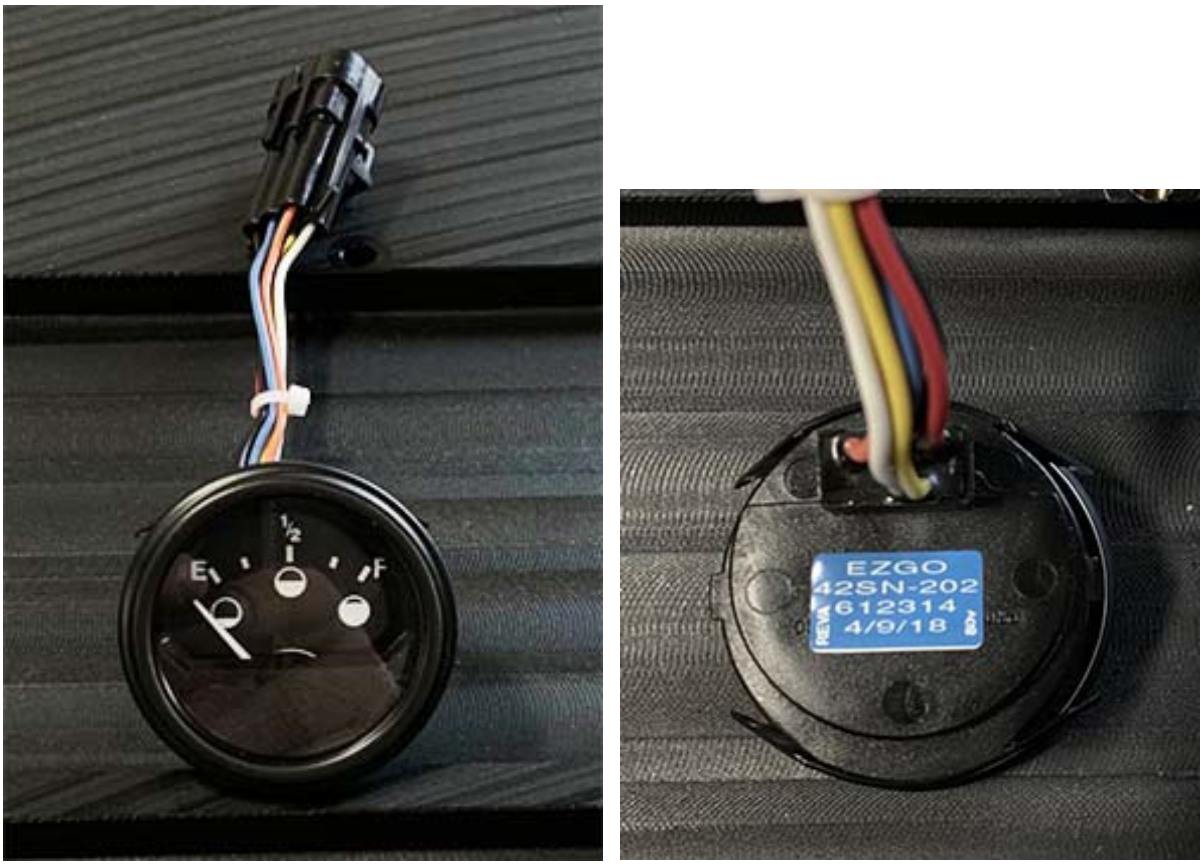


Fig. 1

2. **There are three wires from the state of charge meter that will need to be tied into the stock drive system. (See attached schematic for details)**
    a. **Black wire from the meter that ties into battery negative. Battery negative can be found on the black wire at the programming port in the dash.**
    b. **Red wire from the meter can be tied into the keyswitch; switch side which is typically a blue wire.**
    c. **Blue wire needs to be connected to the gray wire that comes from the lithium battery pack wiring harness.**

BMS HARNESS CONNECTIONS

1. **There are three wires from the lithium battery pack that will need to be tied into the stock drive system. (See attached schematic for details)**
    a. **Blue wire from the lithium battery pack taps into Pin# 10 at the motor controller. Typically, the color of the wire leading to pin# 10 is Tan.**
    b. **Green wire from the lithium battery pack will need to connect into PIN C on the speed sensor connector (Deutsch DT 3-pin connector). (Fig. 2)**

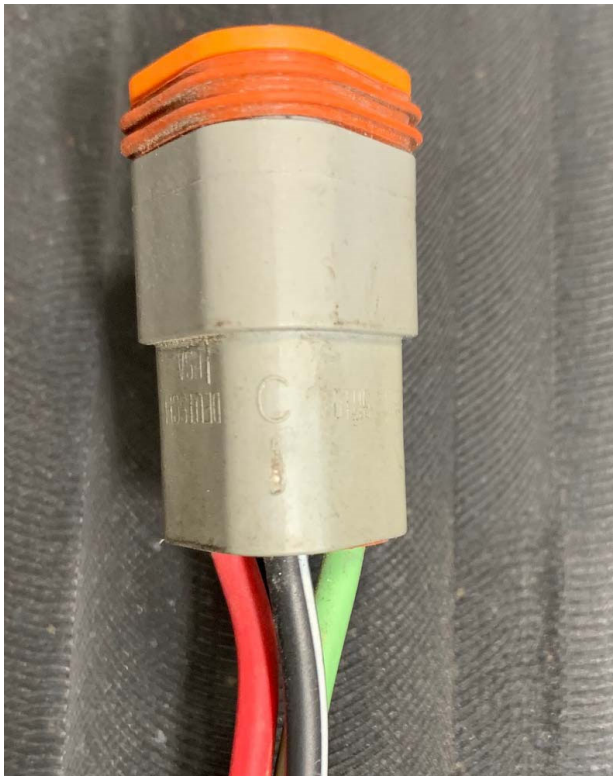


Fig. 2

    c. **The gray wire from the battery pack needs to be connected to the blue wire that comes from the State of Charge Meter.**

BYPASSING ON-BOARD COMPUTER FOR YEARS 2014 AND OLDER

1. For precedent golf cars that are 2014 or older the on-board computer (OBC) will need to stay with the car but, but it will need to be fooled.
2. Locate the 6-pin Deutsch connector coming out of the OBC. **(Fig. 1)**

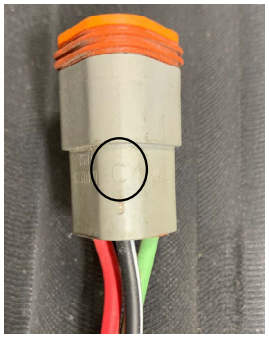
Fig. 1

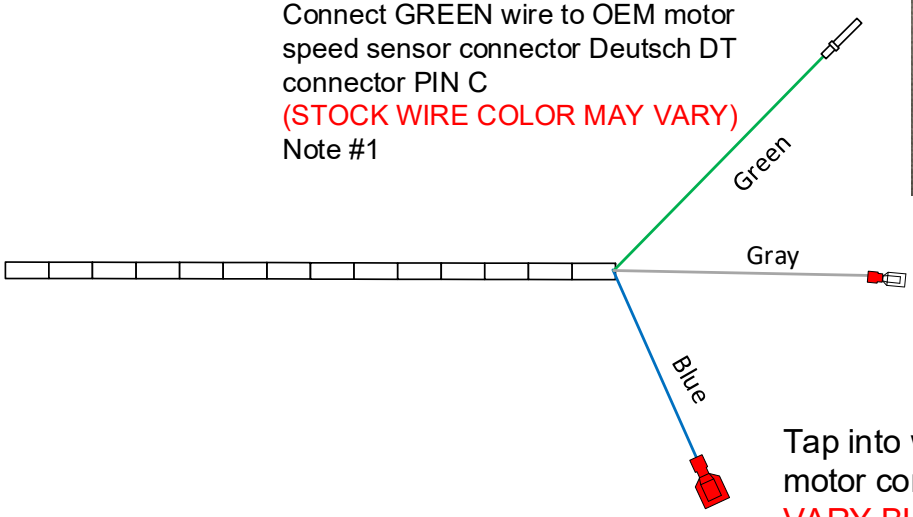
3. Cut or remove the red wire (Pin #2) and light blue wire (Pin #6) from the connector.
4. Splice these two wires (red and light blue) together.

REVISIONS		
REV	DESCRIPTION	APPROVED
A	Initial Release	9/28/2016

WIRING FROM BATTERY PACK WIRING HARNESS AND STATE OF CHARGE WIRING DIAGRAM

Connect GREEN wire to OEM motor speed sensor connector Deutsch DT connector PIN C
(STOCK WIRE COLOR MAY VARY)
Note #1





Connect Gray wire from battery pack to BLUE wire located on the State of Charge meter

Note:
1. Club car has changed the wire coloring over the years. The colors called out in this document might not match the wire colors in the car you are working on.

Tap into wire on PIN#10 at the motor controller (COLOR MAY VARY BUT TYPICALLY TAN)
Note# 1

Meter Part Number:
612314

Connect red wire to keyswitch switched side (Typically Blue wire) Note #1

Red wire = Pin F

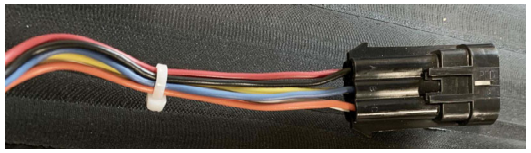
Connect black wire to to B- on the controller

Black wire = Pin A

SOC METER

Blue wire = Pin B

Connect Blue wire to Gray Wire From Lithium Battery Pack



Meter Connector

State of Charge Meter

CAD TYPE VISIO	APPLICABLE SOFTWARE	VER 2.5	
UNIT NONE	DRAWING	1010-CA100-HP	
DRW SIZE A	TITLE	FOR PRECEDENT OEM CONTROLLER	
DATE 1/10/19			
SUPPLIER PART			
SCALE none	SHEET 1 OF 1	REVISION A	HPEVS

Notes

1. **For those carts that have accessories such as a stereo or auxiliary lighting that require 12 volts power, a DC-DC convertor will be needed.**
2. **The EZGO State of Charge meter called out in this document can be found through eBay or Amazon.com. (EZGO part# 612314)**
3. FOR 2014 AND EARLIER CLUB CAR PRECEDENT CARS, THE ON-BOARD COMPUTER (OBC) WILL NEED TO BE LEFT IN THE CAR.

REVISIONS:

Rev Number	Description	Date	Approved
A	Initial Release	**1-9-19**	**SCF**
B	Included information on how to bypass OBC for vehicles so equipped	**5-23-19**	**SCF**