Service Notes

SERVICE NOTES SUBJECT	ISSUE DATE	NOTE #
How to Add Turn Signal Indicators	09/09/19	SUP002
APPLICABLE TO	**ONYX CONTACT INFO**	
All RCR Models without Turn Signal Indicators	support@onyxmotorbikes	

IMPORTANT NOTE: PLEASE READ THIS AND THE ENTIRE DOCUMENT FIRST BEFORE PROCEEDING. SAFETY of the rider and surrounding people are PRIORITY ONE! The information in this Service Notes document is intended to be used by skilled motorbike technicians with reasonable knowledge and experience servicing bicycles and motorbikes. If any terminology, step, or process in this procedure is not clearly understood, DO NOT ATTEMPT the procedure, and contact ONYX Motorbikes immediately for help!

Background

The original RCR Motorbike does not come with turn signals (indicators) on the front or rear, but it does have a switch and the requisite wiring pre-installed. However, the turn indicator connector on the wiring harness may not conform to some ONYX's wiring schematics, so it can be tricky to get all the wiring right if you're a novice at electrical work or just don't have much experience with a multimeter.

This Service Note lays out instructions for a typical way to get turn indicators working on the ONYX RCR Motorbike in a way that does not require any relay, soldering, or permanent modification of the bike. It does not assume the reader has any background in electronics, and it does not discuss what is happening from a technical standpoint.

Figure 1: Front Turn Indicators and Installation Example

Figure 2: Rear Turn Indicators and Installation Example

Materials & Tools

To complete this project, you will need the following items and materials to complete the following typical installation. Suggested examples are provided under each item to copy and paste or enter into an online retailer such as Amazon.com. However, please note that installation may vary depending on the style of turn signal indicators, materials, and tools that are available and chosen:

1. Front and Back 12V LED or Standard Filament Turn Signal Indicators
   Justech Universal Flowing Waterproof Motorbike LED Turn Signal ($14.95)
2. If Necessary, Mounting Brackets Turn Indicators (Front Fork Mount Example)
   2 pcs/pair Motorbike Turn Signal Mount Bracket, Black ($5.57)
3. 2.8mm 6-pin Male Automotive Connector
   Swpeet 700Pcs Automotive Electrical Wire Connectors Kit, 2.8mm 2 3 4 6 9 Pin ($16.63)
4. (3) 5-Port Lever Nuts
   222-412 (20) 222-413 (20) 222-415 (20) Lever Nuts, 60 Pack Assortment ($16.99)
5. 6’ 22g Yellow Wire
   Hook up Wire Kit (Solid Wire Kit) 22 Guage, 6 Colors ($15.99)
6. 6’ 22g Blue Wire
   (see 5. above)
7. 1’ 22g Green Wire
   (see 5. above)

8. 1’ 22g White Wire
   (see 5. above)
9. 5.5’ 22g Black Wire
   (see 5. above)
10. 22g #10 Spade Crimp Connector
11. (4 pcs) 22g 1/4” Female Crimp Connector
    Neiko 50413A Terminals and Connectors with 3-in-1 Tool ($12.59)
12. (2 pcs) 5A ATC-Type Automotive Fuses
    Bussmann ATC 5 Amp Fast-Acting Automotive Blade Fuses (5-Pack) ($3.97)

You will also need the following tools:

a. Wire Crimping Tool
   Neiko 50413A Terminals and Connectors with 3-in-1 Tool ($12.59)
b. Wire Cutters
   (see a. above)
c. (2) Pliers
   Stalwart 75-HT3004 Utility Slip Joint Plier Set ($17.16)
d. 3mm Allen Wrench (Hex Keys)
   Bondhus 10946 Set of 6 Balldriver L-wrenches, sizes 1.5-5mm ($5.92)
e. Ratchet Socket Wrench
   Egofine 1/4 Inch Ratchet Set with 4-13mm and Extension Bar ($14.99)
f. 10mm Drive Deep Socket
   (see e. above)
g. 4” or Longer Socket Extension
   (see e. above)

Procedure

The following procedure provides basic information as a guide for installing typical turn indicators on an RCR Motorbike.

1) Remove the Battery Cover and Battery

Remove the Battery Cover, turn off your battery ON/OFF switch, physically disconnect its red connector, turn on your dash display to drain any stored currents, and then turn it off. Always leave the battery disconnected until you are all done.

2) Install the Turn Indicators – Front, External Mount (non-Bar-End Style)

If applicable, install the mounts mounts on the front fork according to the mount instructions or as otherwise appropriate. If using a different style of mount and mounting location, select a mounting method and location that will allow the turn indicators to be visible and will allow the wires to be accessible for connecting them to the main wiring harness in the center of the RCR Motorbike behind the side Body Panels.

Thread the chosen turn indicators through the fork and mounts, and bolt them on using the hardware provided with the turn indicators and/or mounts.

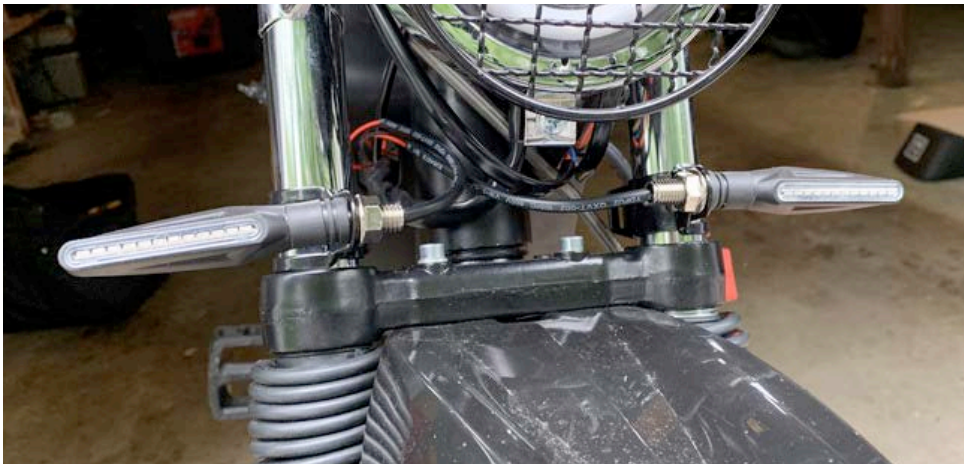


Figure 3: Front Turn Indicator Installation with Brackets on Fork

Figure 4: Front Turn Indicator Installation Example - Top View

3) Install the Turn Indicators – Rear

If equipped with the optional Rear Fender, mount the rear turn indicators using the two holes in the side of the rear fender near the brake light. If your RCR Motorbike is not equipped with the Rear Fender, select a mounting method and location that will allow the turn indicators to be visible and will allow the wires to be accessible for connecting them to the main wiring harness in the center of the RCR Motorbike behind the side Body Panels.

Thread the turn indicators through the holes, and secure them using the hardware provided with the turn indicators and/or mounts.

Figure 5: Rear Turn Signal Installation Example - Optional Rear Fender Shown

4) Build the New Turn Indicator Wire Harness

You will be building a male end of the new wire 2.8mm 6-pin Male Automotive Connector harness that will plug into the exisiting unconnected main RCR Motorbike 2.8mm 6-pin Female Automotive Connector that is a part of the existing main RCR wiring harness. The new harness will consist of four distinctly colored wires, each 1' (12 inches) in length:

- YELLOW: Connects to +12v input of right-turn signal LED on the LED Dash Display. Strip 1/4" of the insulation from the opposite end, and leave 1/4" bare wire.
- BLUE: Connects to +12v input of left- turn signal LED on the LED Dash Display. Strip 1/4" of the insulation from the opposite end, and leave 1/4" bare wire.
- GREEN: Receives +12v when right turn signal is active. Crimp far end to a 22g 1/4" female connector.
- WHITE: Receives +12v when left turn signal is active. Crimp far end to a 22g 1/4" female connector.

When you crimp a connector plug to a wire, it should look like this:

Figure 6: Crimped Male Wire Connector Plug Example

After crimping the four connections for the harness, insert each of the connectors into the 2.8mm 6-pin Male Automotive Connector so that the wires match the layout shown in Figure 7. When you are looking at the side of the connector with the wires, and the latch is on the top, the top row will be blue-white-blank and the bottom row will be yellow-green-blank.

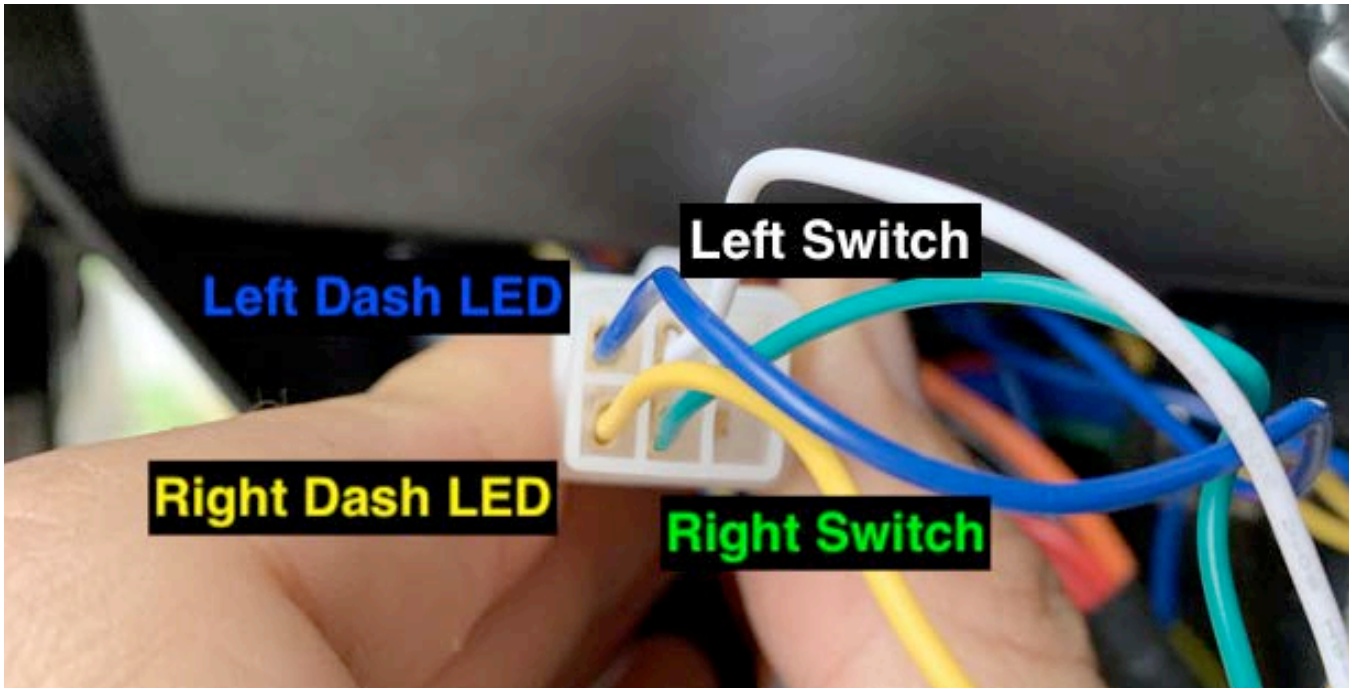


Figure 7: New Wire Harness Connector Wire Configuration

Connector Wire Color Position (latch on top)		
BLUE	WHITE	(BLANK)
YELLOW	GREEN	(BLANK)

IMPORTANT NOTE: In mid-July 2019, Onyx began shipping a new wiring harness. It no longer matches the color or pinout in these instructions. If you have the new harness (yellow/pink/red/thin green/thick green wires on the signal port), you need to line up the wires on your plug so that they connect to the harness wires according to the following table. If any terminology, step, or process in this step is not clearly understood, DO NOT ATTEMPT the procedure, and contact ONYX Motorbikes immediately for help!

Pre-Mid-July 2019 Motorbike Wiring Harness	Post-Mid-July 2019 Motorbike Wiring Harness	Your Plug
BLUE	THIN GREEN	YELLOW
ORANGE	YELLOW	BLUE
GREEN	THICK GREEN	GREEN
PINK	PINK	WHITE

5) Remove the Body Panels and Seat

Using a 10mm deep socket and ratchet wrench, remove the seat by removing the four (4) hex nuts underneath the seat. A 4" socket extension bar is also very helpful for this step.

Using a 3mm allen wrench, take off each aluminum side Body Panels by removing the five (5) tapered screws for each Body Panel. Your RCR should now look like this:

Figure 8: RCR with Body Panel and Seat Removed for Access

6) Install the Harness

Locate the unconnected 2.8mm 6-pin Female Automotive Connector that is part of the main RCR wiring harness.

Figure 9: Existing 6-Pin Connector in Main Wiring Harness

Insert the new male 6-pin connector that you built into the factory-provided 2.8mm 6-pin Female Automotive Connector so that it looks like the following figure when inserted:

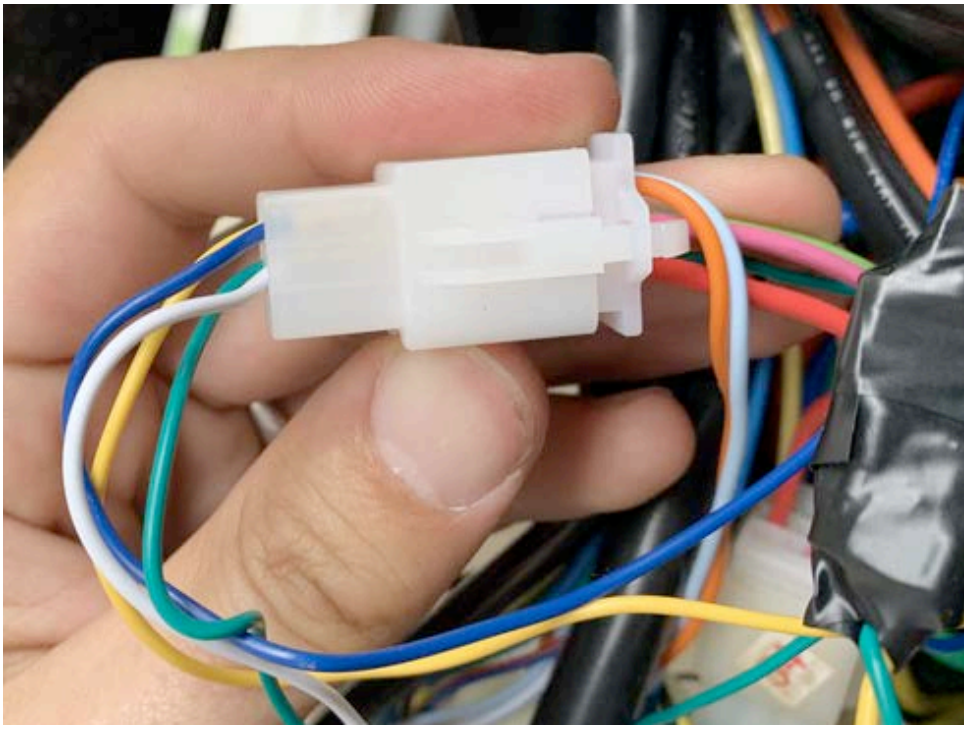


Figure 10: Connected 6-Pin Connectors

7) Make a Ground Connection

Locate the ground lug that you need to access that is toward the front of the bike on the bottom of the mounted plastic piece:

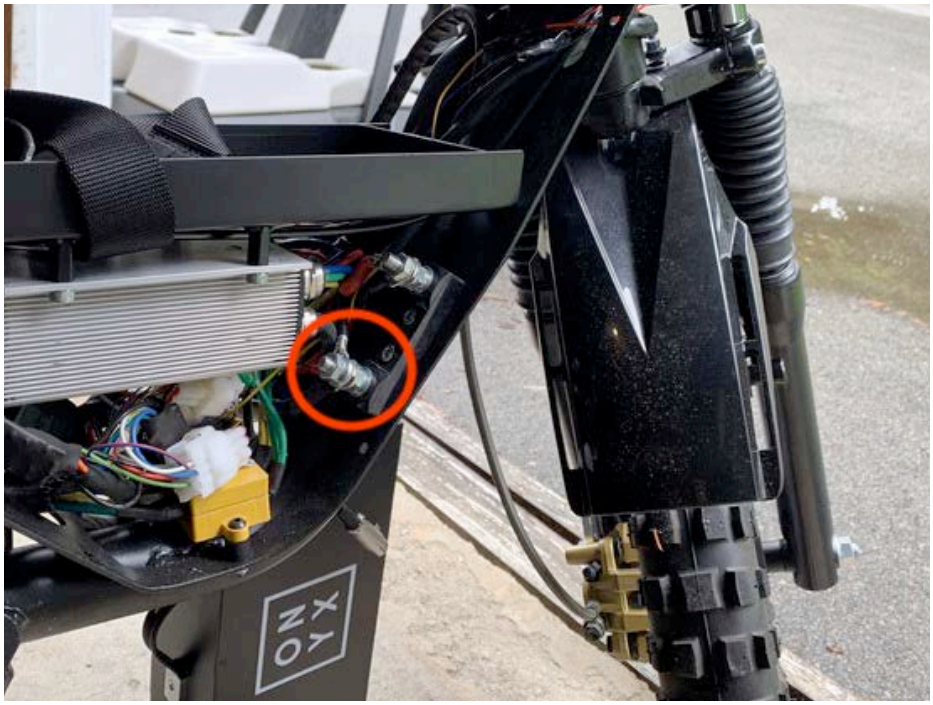


Figure 11: Ground Lug Location

Crimp a 22 gauge #10 spade terminal connector to a 1’ piece of black wire. Using pliers, stretch the spade terminal so that it can go all the way around the ground screw:

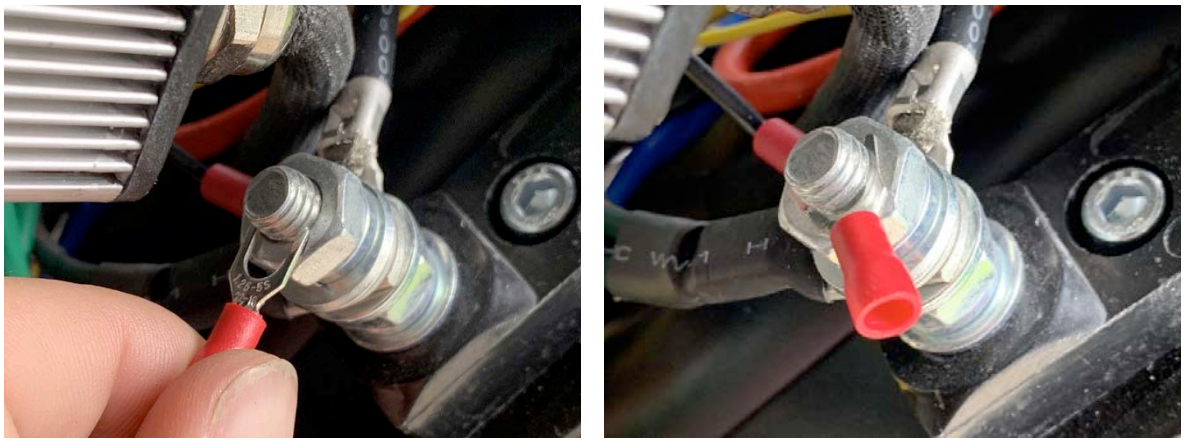


Figure 12: Ground Lug Connector - Before and After

Using one pliers to hold the bottom hex bolt, and another to loosen the top one, create just enough space to insert your spade terminal into the ground connection array. Tighten the hex bolts when you're done.

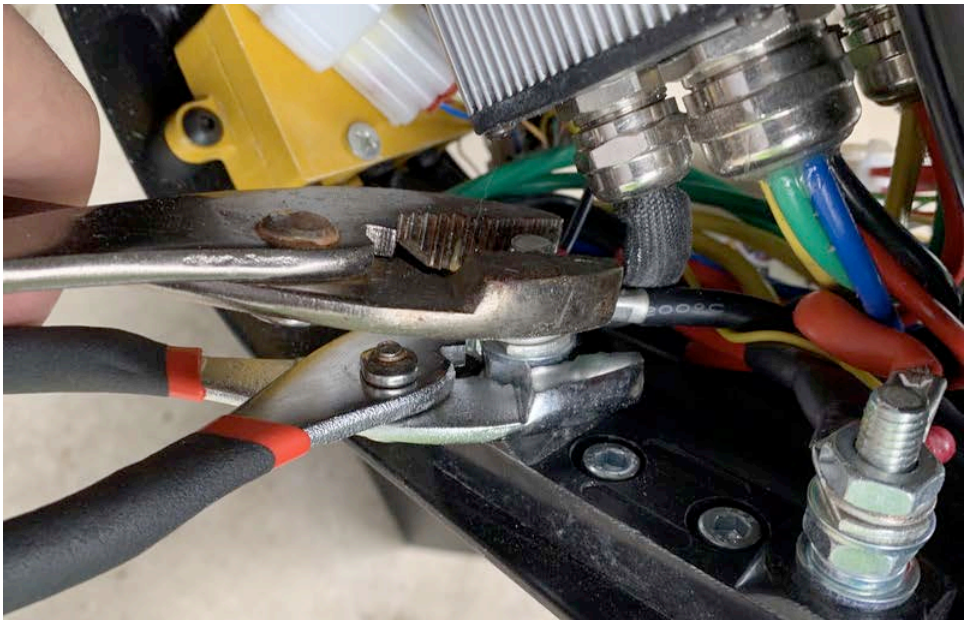


Figure 13: Loosening Ground Lug Nuts for Spade Connection

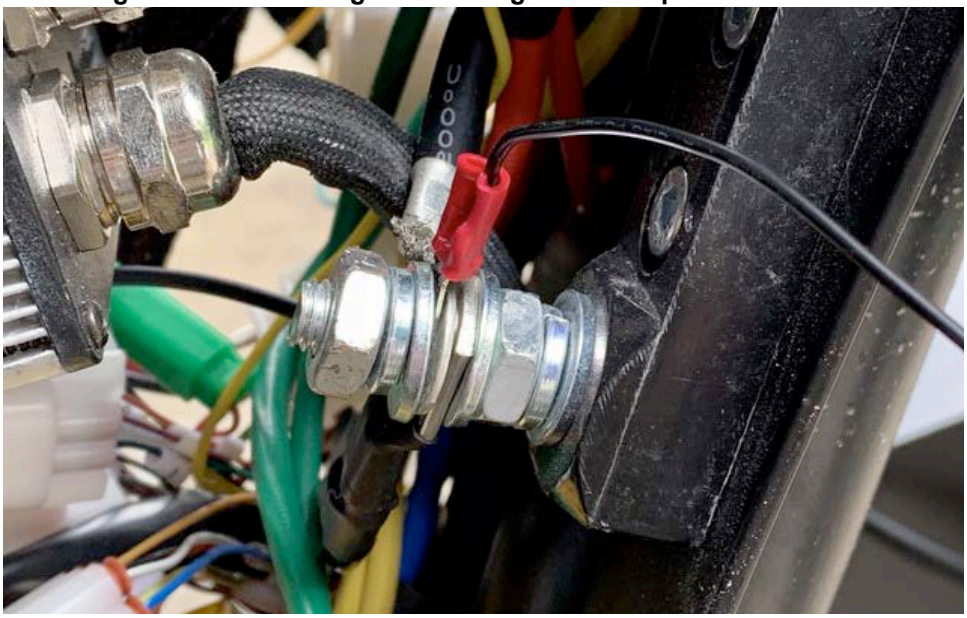


Figure 14: Inserted Ground Lug Connection

Feed your ground wire to the left side of the bike above the loose cabling, but below the enclosed wires:

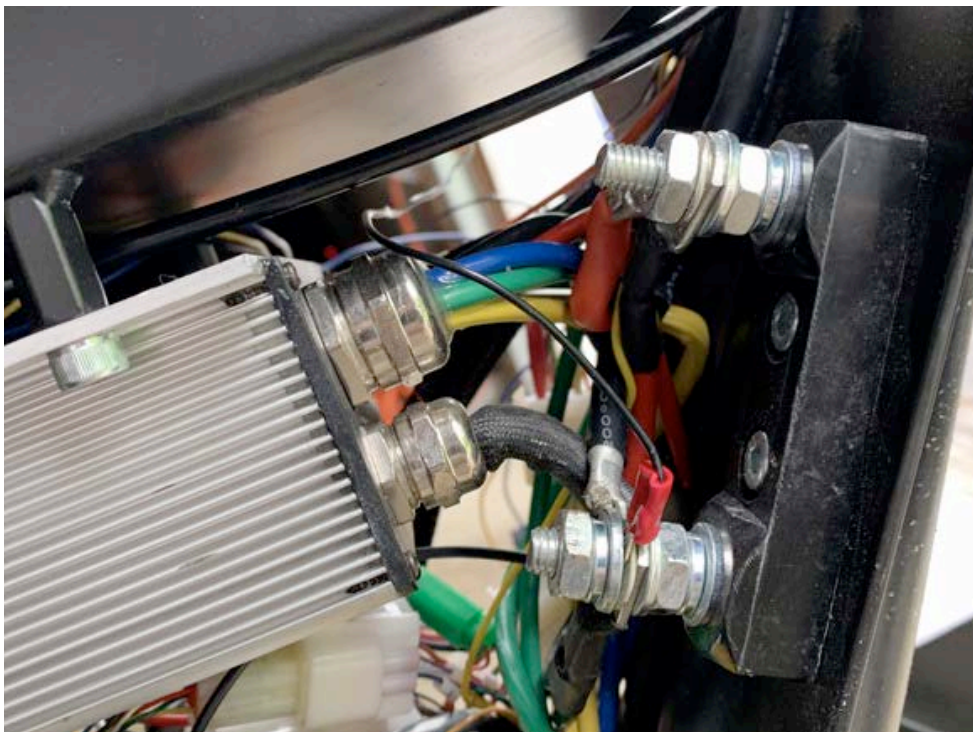


Figure 15: Ground Wire Routing

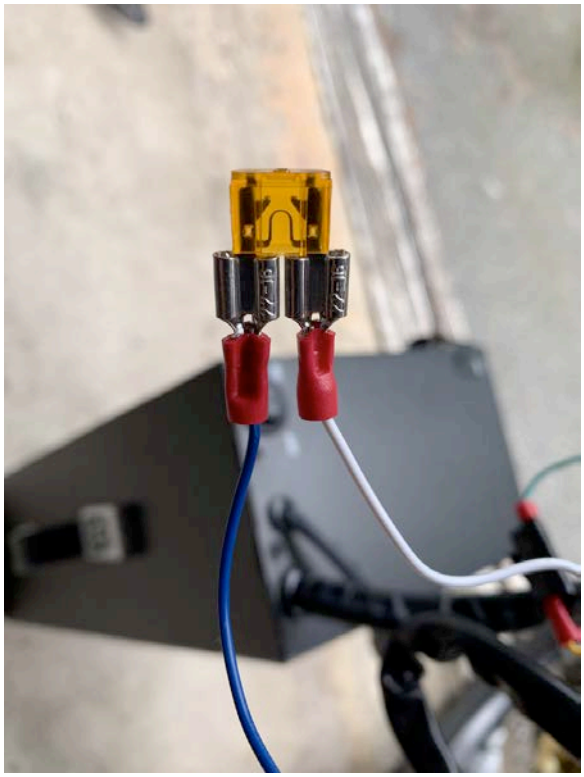
8) Build the Fuse Assemblies

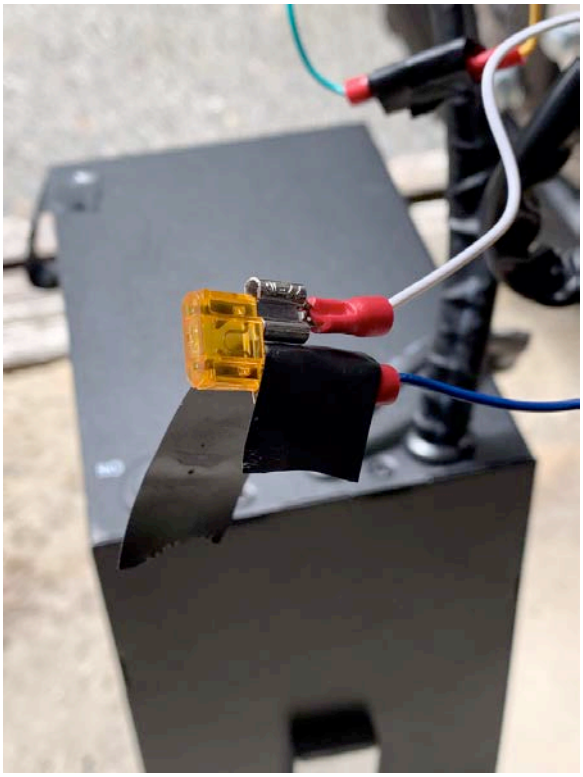
Left Indicator Fuse Assembly

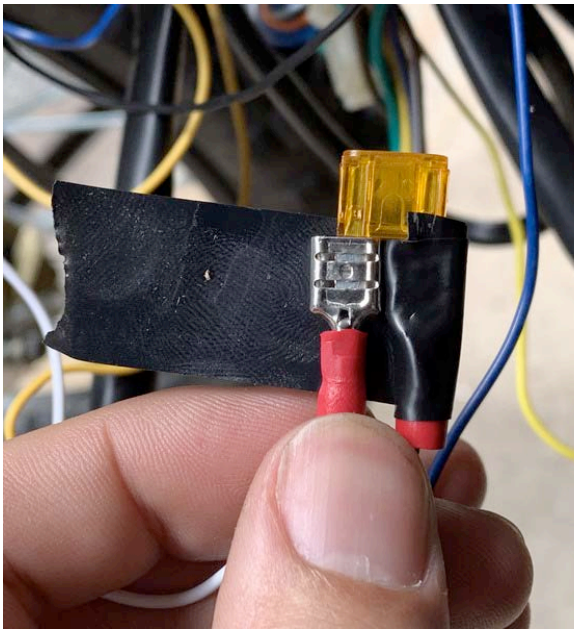
Cut a 1’ piece of BLUE wire. Strip one end, and crimp the other end to a 22g 1/4” female connector.

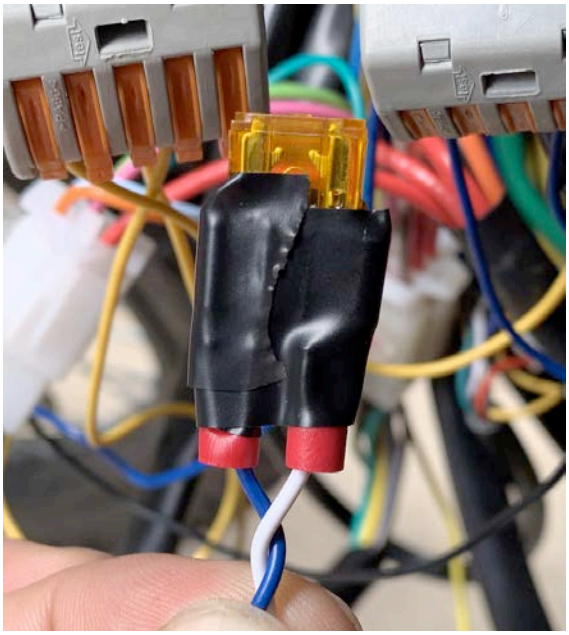
Take a 5A fuse, and connect the BLUE wire you just made to it using the female connector on the wire.
On the other side of the fuse, connect the WHITE wire from the new harness you made.

Using electrical tape, carefully insulate the two connections so they can never touch, and seal any exposed area around the wires.









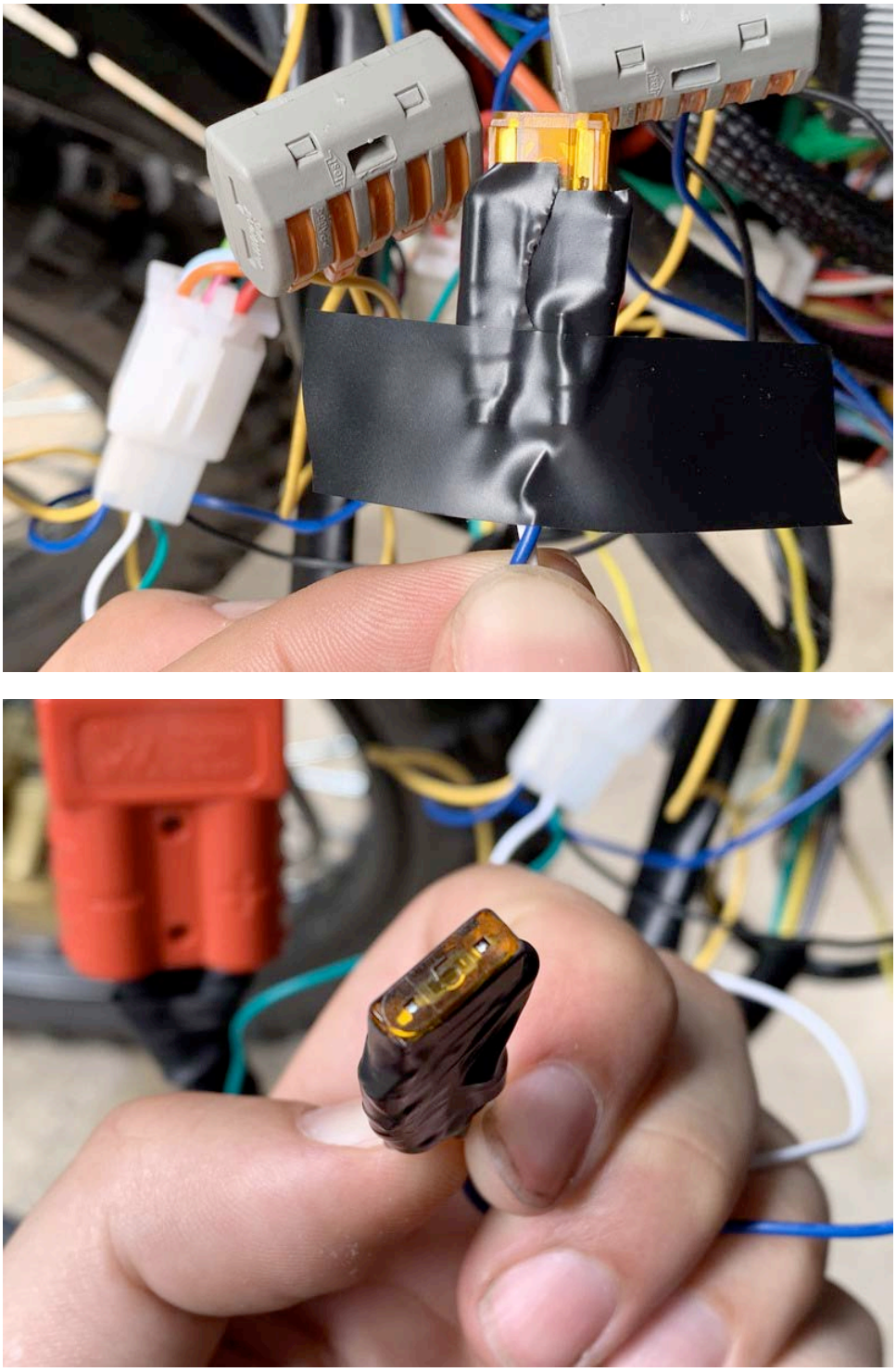


Figure 16: Protected Fuse Assembly – Left Indicator Fuse Assembly Shown

Right Indicator Fuse Assembly

Cut a 1’ piece of YELLOW wire. Strip one end, and crimp the other end to a 22g 1/4” female connector.

Take a 5A fuse, and connect the YELLOW wire you just made to it using the female connector on the wire. On the other side of the fuse, connect the GREEN wire from the new harness you made.

Using electrical tape, carefully insulate the two connections so they can never touch, and seal any exposed area around the wires.

You now have both your fuse assemblies complete:

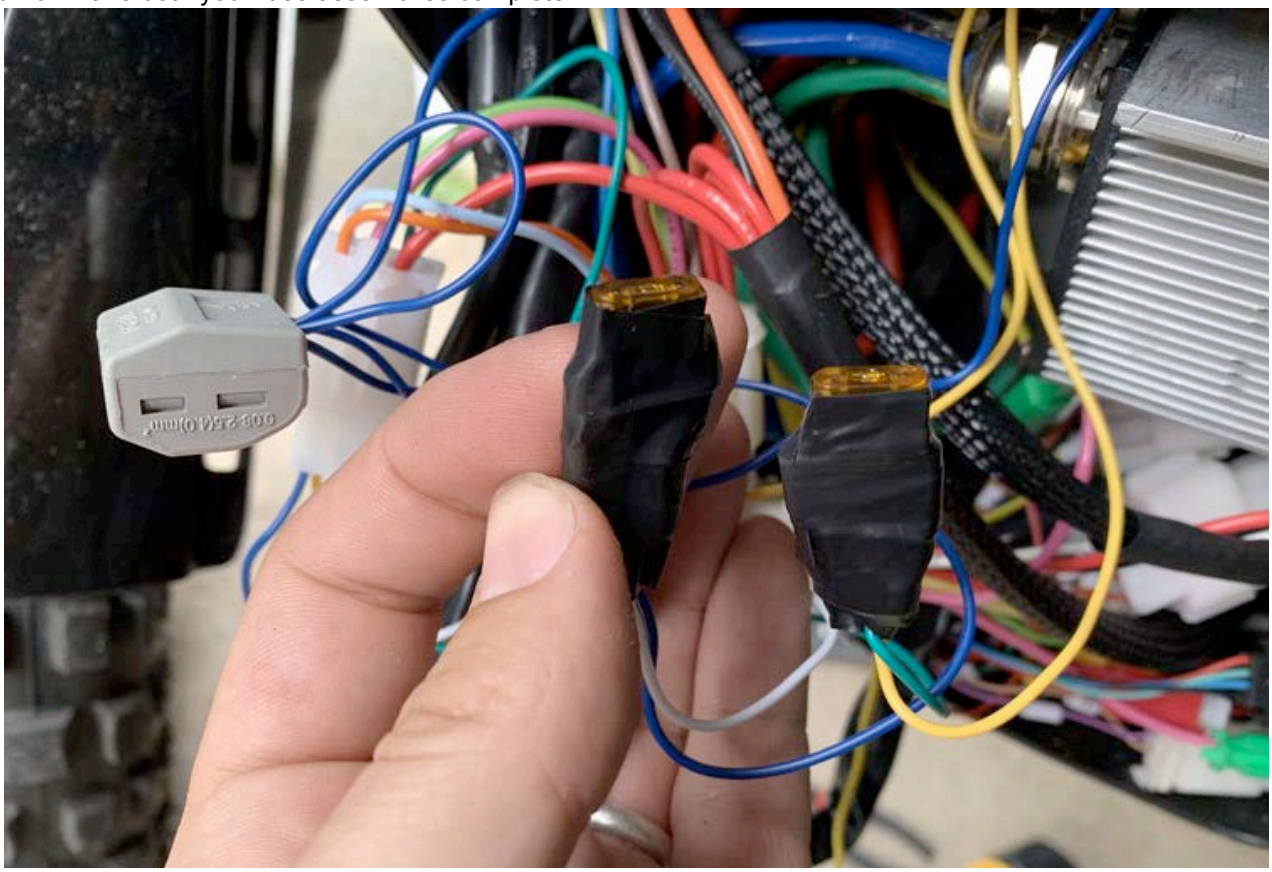


Figure 17: Completed Right and Left Turn Indicator Fuse Assemblies

9) Run Wires to Your Front Turn Indicators

Cut 1’ of YELLOW wire, 1’ of BLUE wire, 1’ of BLACK wire, and 3” of BLACK wire.

Using Wago Lever Nuts or other suitable connection method, connect the RED wire from the Right Front Turn Indicator to the new YELLOW wire.

Using Wago Lever Nuts or other suitable connection method, connect the RED wire from the Left Front Turn Indicator to the new BLUE wire.

Using Wago Lever Nuts or other suitable connection method, connect both the 1’ and the 3” BLACK wires to the BLACK wire from the Left Front Turn Indicator.

Using Wago Lever Nuts or other suitable connection method, connect the other end of the 3” BLACK wire to the BLACK wire from the Right Front Turn Indicator.

Carefully wrap and cover all Front Turn Indicator connections with enough electrical tape to make them water tight.

You now have 1’ wires of YELLOW, BLUE, and BLACK. Run them into the enclosed compartment, and down below the battery.

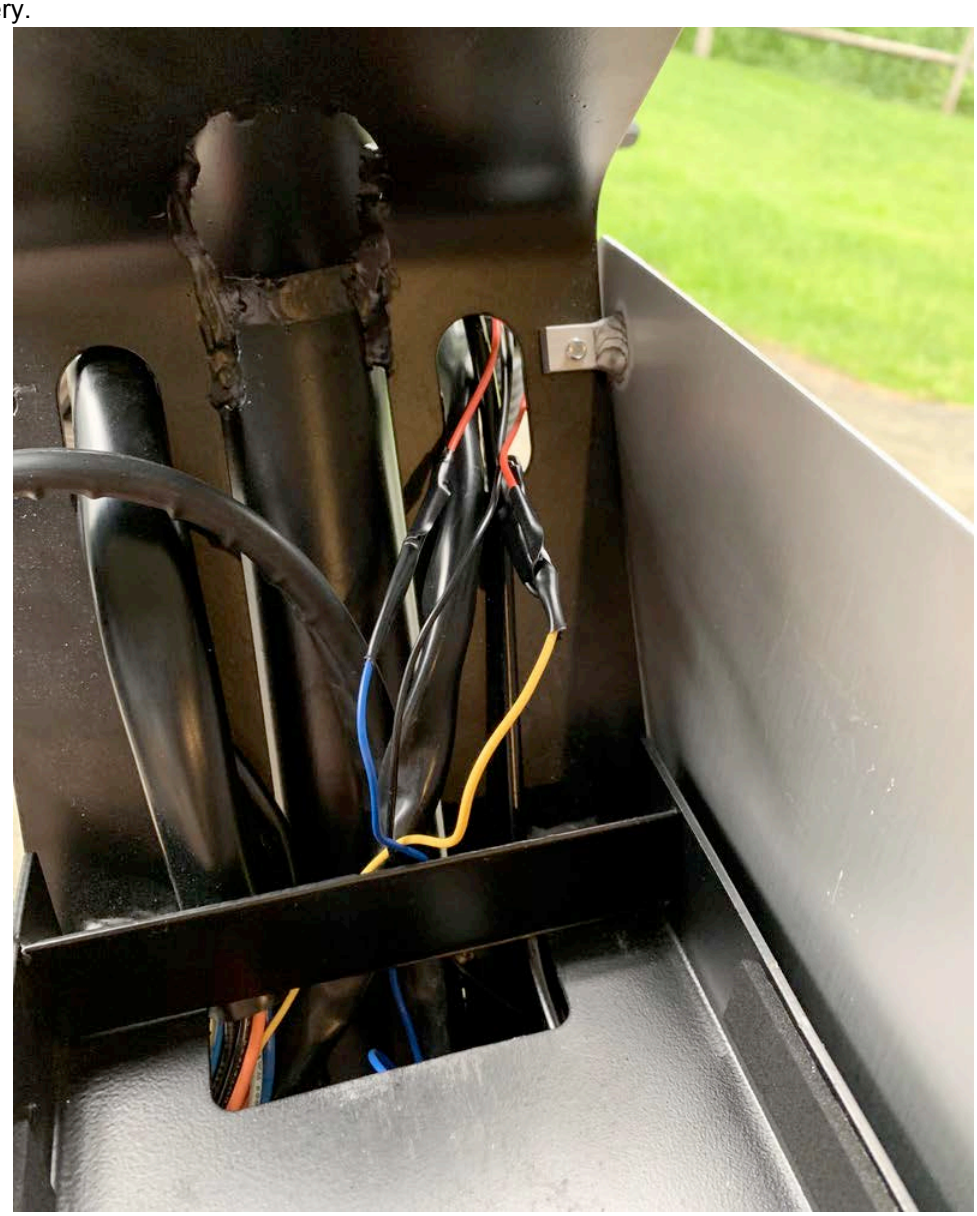


Figure 18: Front Turn Indicator Wire Routing

Turn the front handlebars fully from side to side in order to make sure that none of the wires are being pinched or pulled on the wires. Adjust the wires if necessary.

10) Run Wires to Your Rear Turn Indicators

Cut 3’ (36”) of YELLOW wire, 3’ of BLUE wire, 3’ of BLACK wire, and 3” of BLACK wire.

Using Wago Lever Nuts or other suitable connection method, connect the RED wire from the Right Rear Turn Indicator to the new YELLOW wire.

Using Wago Lever Nuts or other suitable connection method, connect the RED wire from the Left Rear Turn Indicator to the new BLUE wire.

Using Wago Lever Nuts or other suitable connection method, connect both the 1’ and the 3” BLACK wires to the BLACK wire from the Left Rear Turn Indicator.

Using Wago Lever Nuts or other suitable connection method, connect the other end of the 3” BLACK wire to the BLACK wire from the Right Rear Turn Indicator.

Carefully wrap and cover all Rear Turn Indicator connections with enough electrical tape to make them water tight.

You now have 3’ wires of YELLOW, BLUE, and BLACK.

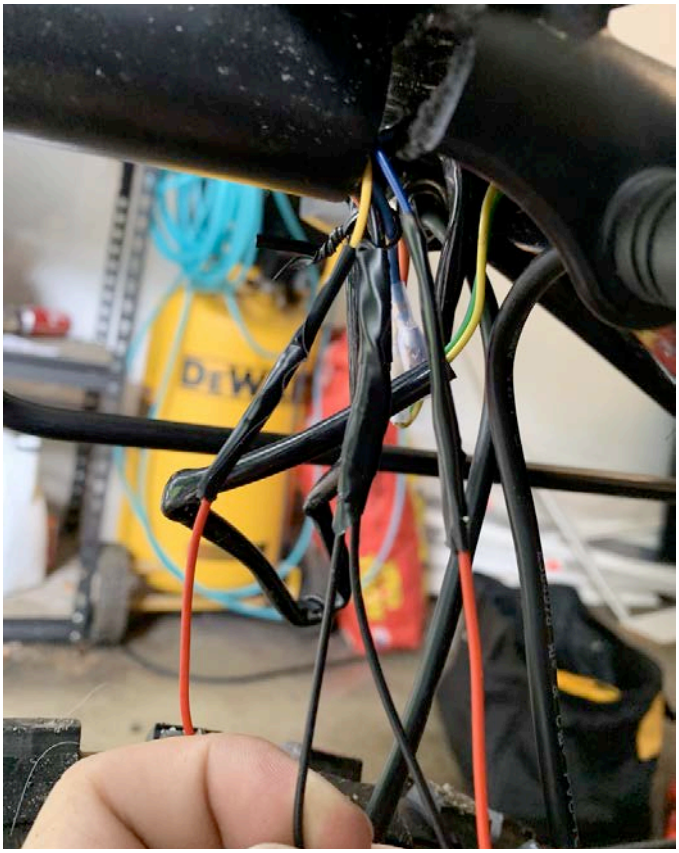


Figure 19: New Rear Turn Indicator Wires

Gently remove the excess brake light wiring from the tube frame that runs from the back of the bike to the main wiring compartment.

Thread your new 3’ YELLOW, BLUE, and BLACK wires down the tube and into the compartment. It may help to tape them all together so that they come through as one unit rather than three distinct wires. Insert the excess brake lighting back into the tube frame assembly.

Run your three wires into the main wiring compartment.

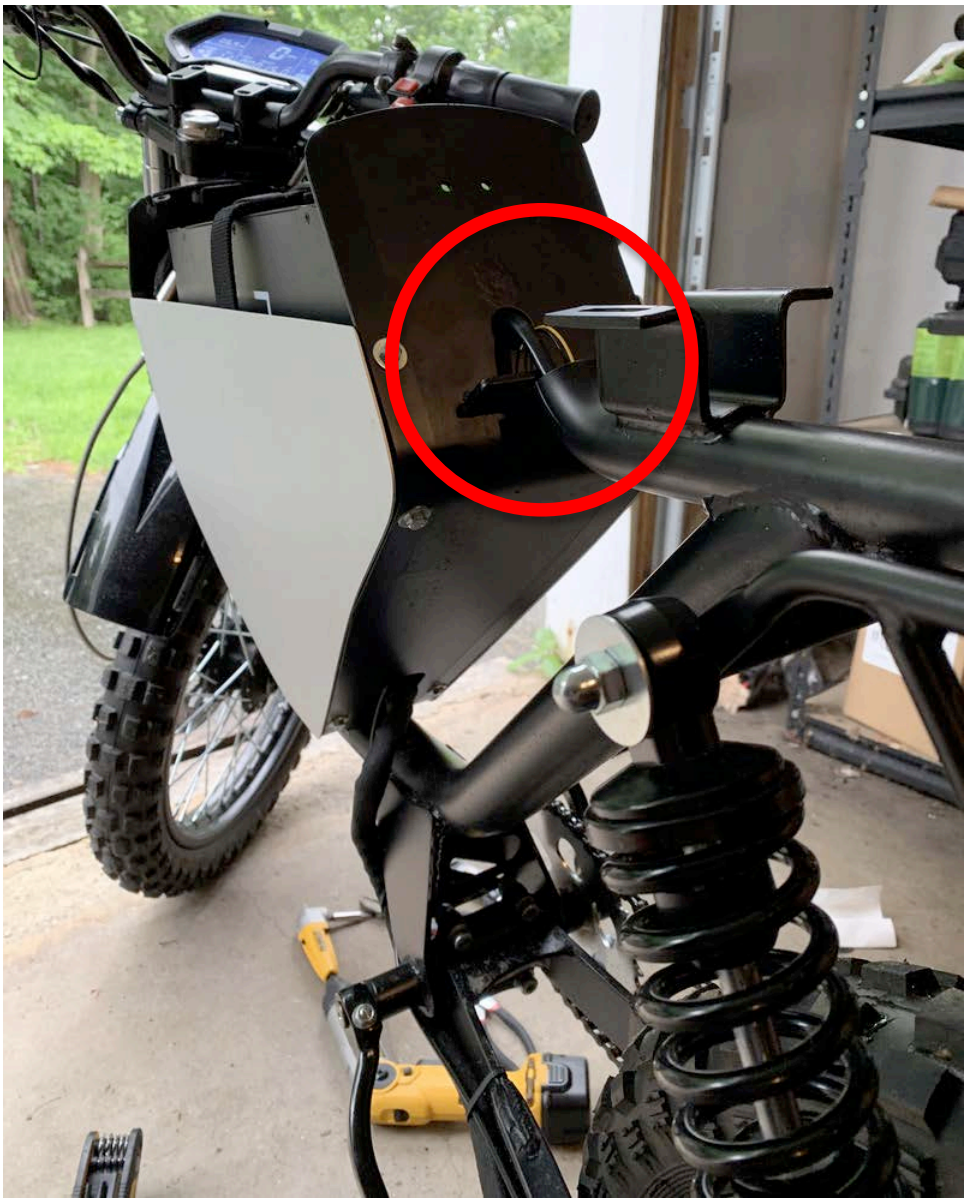


Figure 20: Rear Turn Indicator Wiring Routing

Route your wires along the top of the enclosure, above the DC-DC converter and controller, toward the ones from the front.

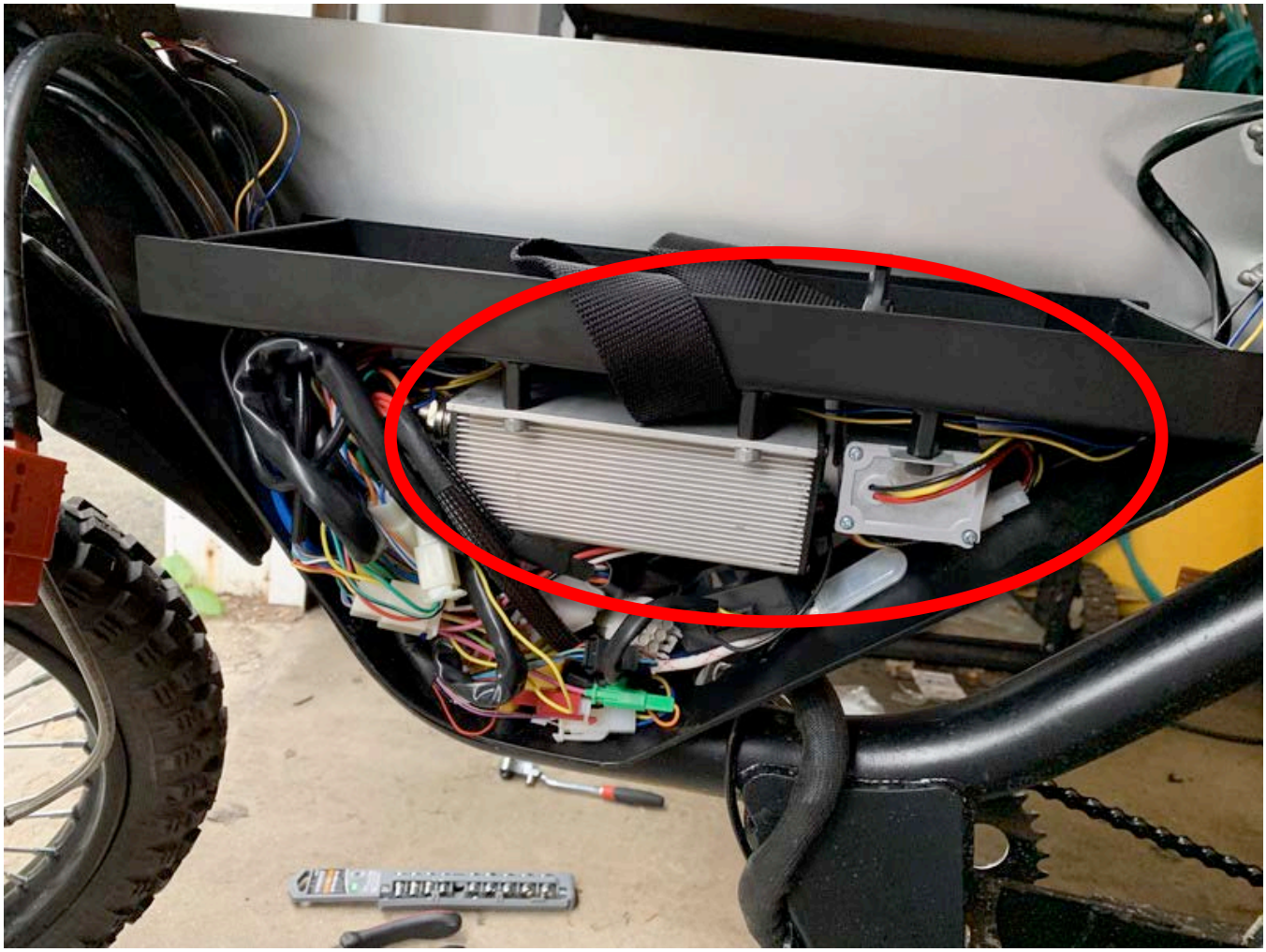


Figure 21: Turn Indicator Wire Routing in Main Compartment

11) Connect the Front and Rear Turn Indicator Wires Together

Connect all wires of like colors together using Wago lever nuts:

First, connect the four (4) YELLOW wires (front blinker, rear blinker, harness, fuse assembly).

Next, connect the four (4) BLUE wires (front blinker, rear blinker, harness, fuse assembly).

Finally, connect the three (3) BLACK wires (front blinker, rear blinker, ground screw).

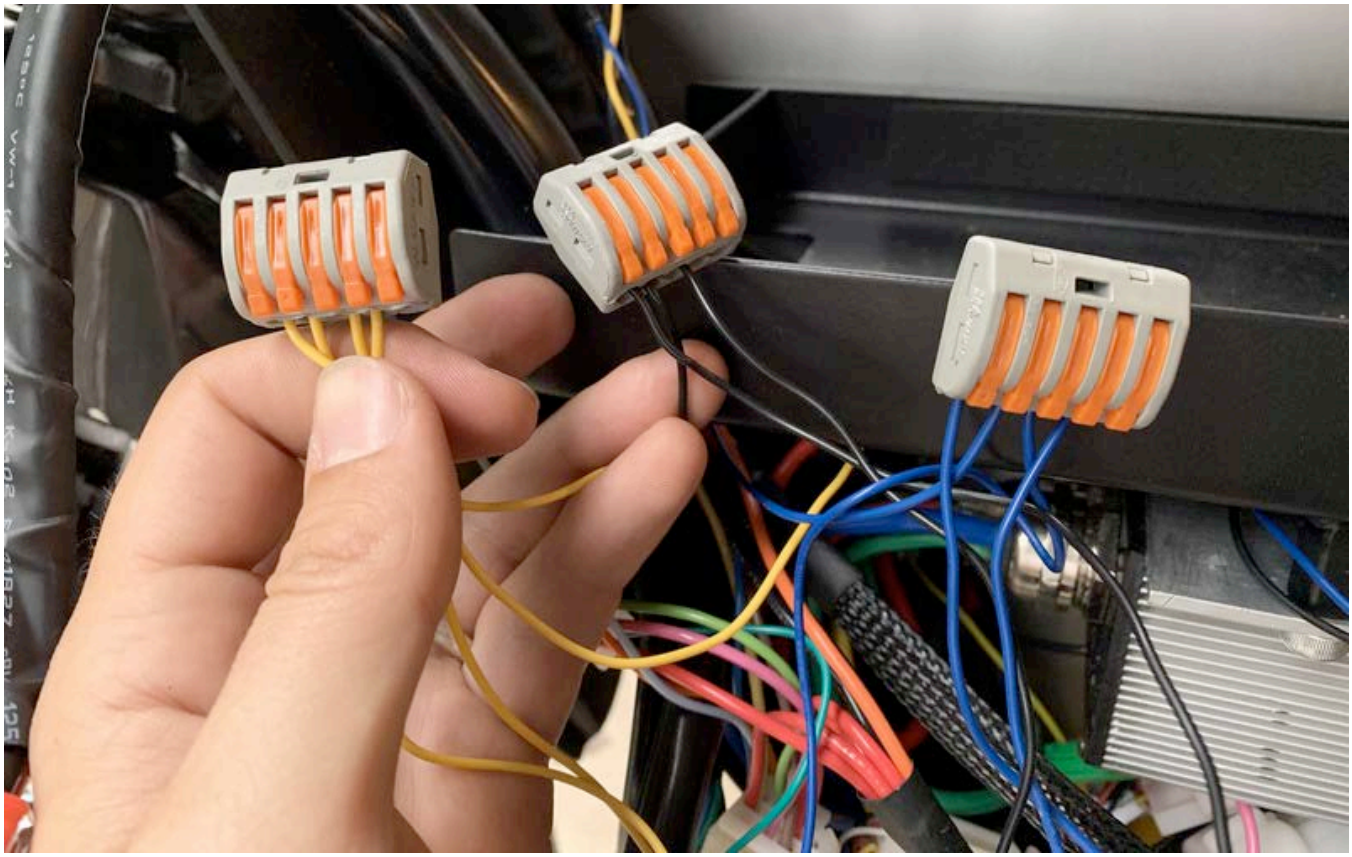


Figure 22: Connected Yellow, Blue, and Black Wires

12) First Test

At this point, everything should work. It is recommended that you temporarily connect the battery, turn the battery on, turn the bike on using the key fob, and test your new turn indicators using the switch on the handlebars. If things work, great! Disconnect the battery and proceed to the next step.

If any turn indicators do not work, retrace your steps and fix any mistakes.

13) Put Everything Back Together

Push all of your wiring – fuses, lever nuts, harness up into the free space at the top of the bottom compartment. Push all other wires back into the compartment.

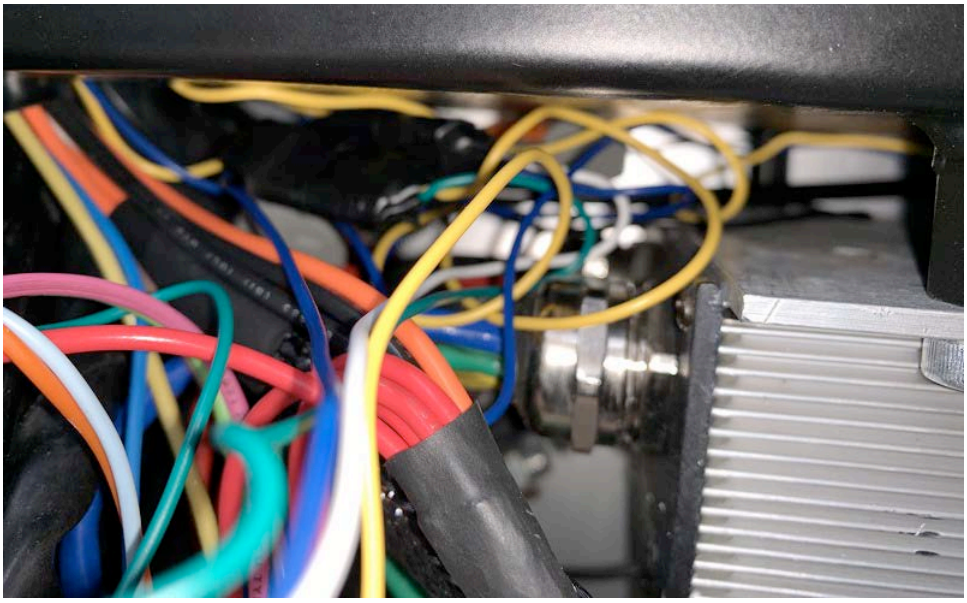


Figure 23: Completed and Tucked Wiring

Replace the aluminum Body Panel sides, being careful not to pinch any wires, and secure using the fixe (5) screws while being careful to not strip any threads.

Install and plug in your Battery, turn on the battery ON/OFF switch, install the Battery Cover, and power on your bike using the key fob.

Be sure to check the operation of the turn indicators again before venturing out onto the open streets.

Go for a ride, and show other drivers where you're going!

Tips & Final Notes

Procedure originally photographed and developed by Robby Grossman (email: robby@freerobby.com).