

Milestone #9 – Electrical Fabrication

DUE: 20 April (After the holiday weekend)

DESCRIPTION:

You are in the final stages of completing your vehicle! What should be left at this point is fabricating your electrical system. Using the plan of power-side wiring you made last week, please assemble your power electrical system consisting of the batteries, main/auxiliary switches, motor controllers, and motor. Ask questions if you need it – this high-power work can potentially damage your motor controller and battery if wired incorrectly.

DO NOT POWER ON YOUR VEHICLE UNTIL I HAVE CHECKED YOUR POWER HOOKUP! Even though your battery has a fast fuse, it only takes a split second of reversed-polarity (“plugging it in backwards”) to permanently damage motor controllers. I will also check for proper insulation/termination of wires so there are no chances for shorting or sparking.

Please make the **signal side** wiring diagram for your vehicle. The procedure is similar to the power side diagram you have made already – indicate what connections to components need to be made, using which method (soldering, 0.1” header terminals, etc). The “signal side” is defined as any component which does not directly interface with battery or motor. This includes throttles/other rider input methods, Hall sensors for the motor, any intervening circuitry such as microcontrollers, etc.

- Indicate which pins/connections signals must be routed to (e.g. “Kelly THR pin”) and its “pin number” if applicable.
- Any additional switches and buttons needed (e.g. reverse) should be included and connected to the correct places.
- If you are using an Arduino microcontroller, indicate which pins your signals are being connected to. In pseudocode or flowcharts, describe the operation of your program (No executable code is required at this time)

FORMAT OF DELIVERABLE:

- 1-2 pages documenting your progress with electricals – pictures are encouraged!
- Your vehicle’s **signal** electrical system plan.

OTHER ACTIVITY: Office hours on Wednesday the 18th will focus on throttle/signal hookup as well as sensor board mounting.

RESOURCES:

For students using Kelly controllers, refer to the Kelly Controller user manual for an example hookup diagram: <http://kellycontroller.com/mot/downloads/KellyKBSUserManual.pdf>

Note that the example is not directly applicable to our vehicles – it will be clear if you just copied the example diagrams without understanding which parts are required!