

# Inspection Report

ECE 492 - Spring 2015

## Abstract

This document is to accompany the Acceptance Test Plan (D004) and Acceptance Test Report (D005). It will document the inspections necessary to comply with the Acceptance Test Plan and Acceptance Test Report.

Revision 1.0.0  
Stephen Mazich

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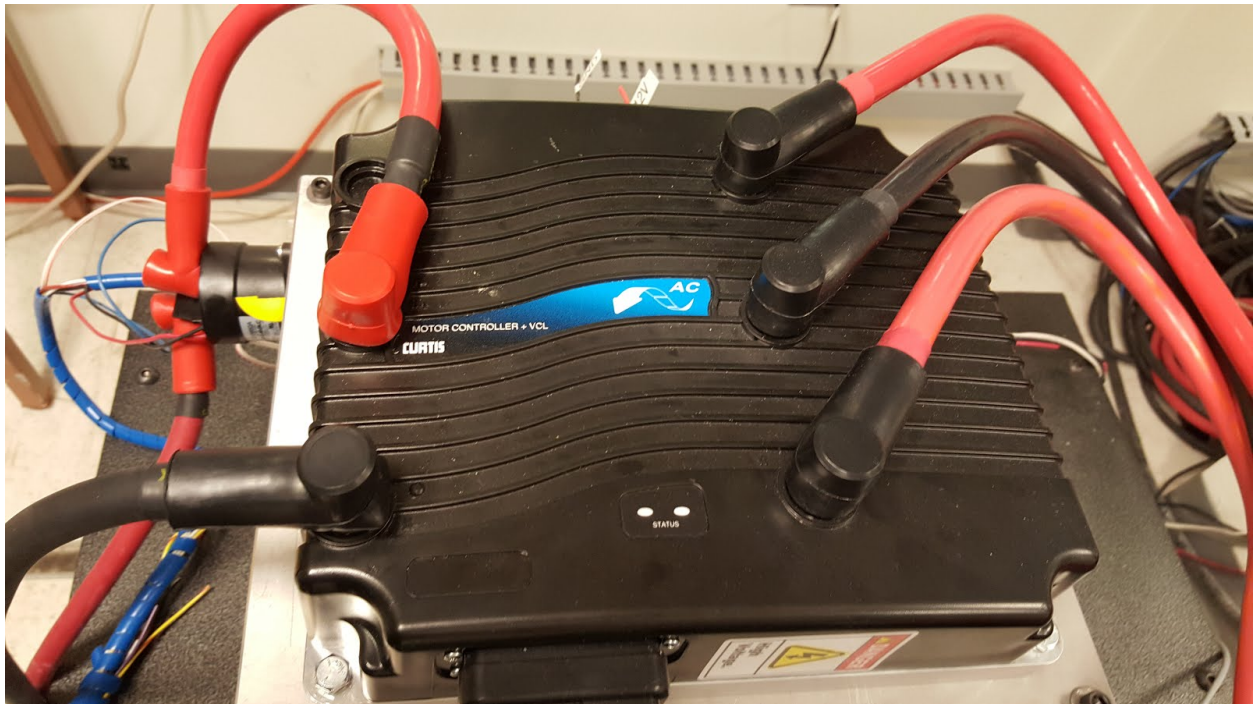
# Cabling Inspections

## R000 - EV 4.5.1

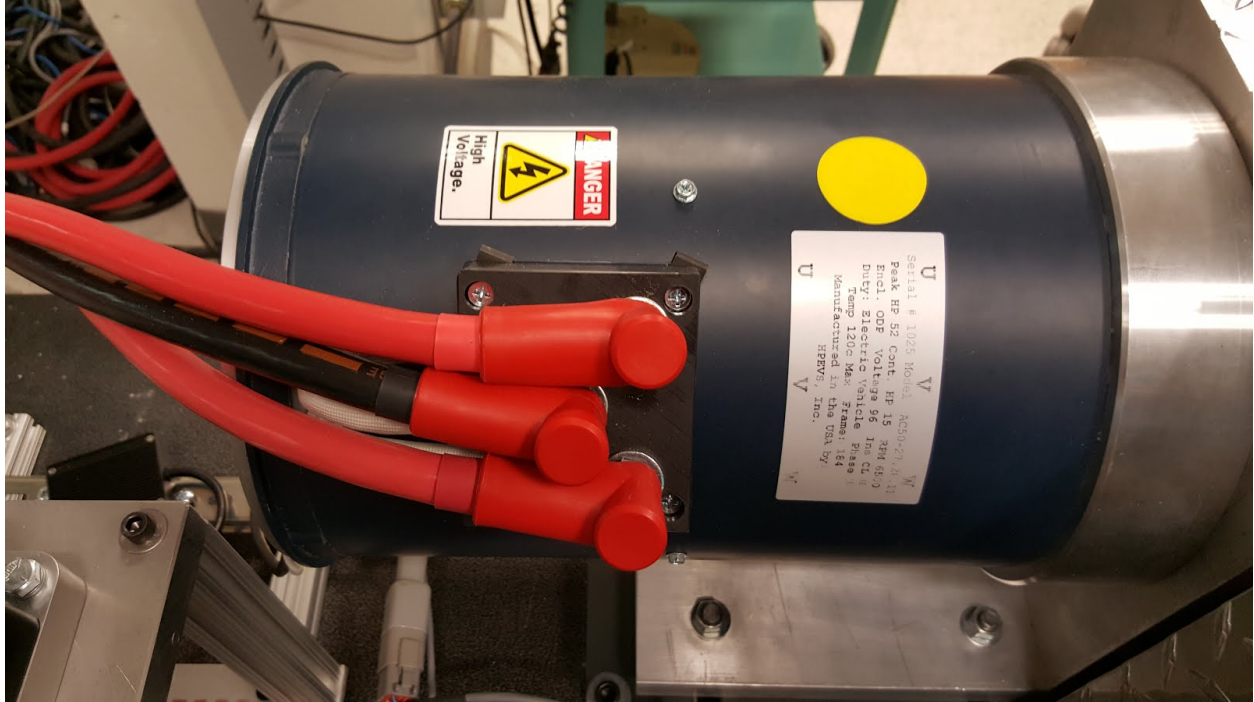
All parts, especially live wires, contacts, etc. of the tractive system need to be isolated by non-conductive material or covers to be protected from being touched. In order to achieve this, it must not be possible to touch any tractive system connections with a 10 cm long, 0.6 cm diameter insulated test probe when the tractive system enclosures are in place.

## R000 - EV 4.5.2

Non-conductive covers must prevent inadvertent human contact with any tractive system circuit. EV4.5.2 This must include crew members working on or inside the vehicle. Covers must be secure and adequately rigid. Body panels that must be removed to access other components, etc. are not a substitute for enclosing tractive system connections.



*Rubber covers to prevent contact with terminals on the motor controller.*



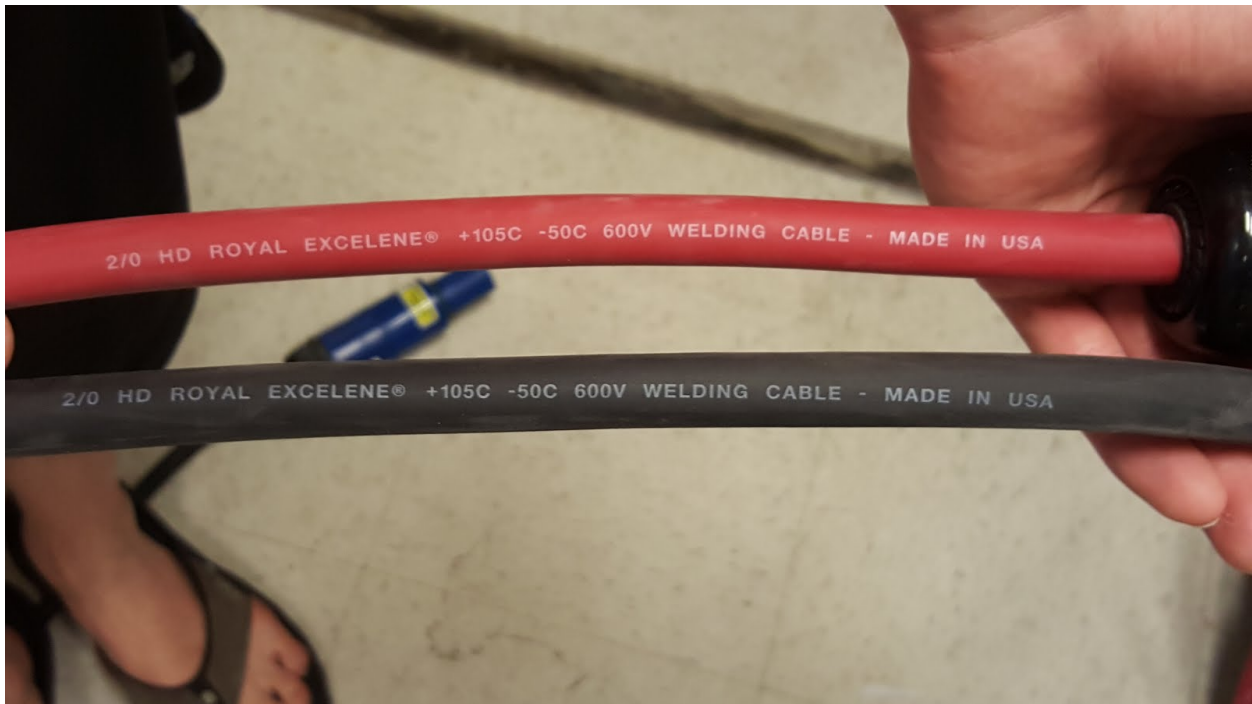
*Rubber covers to prevent contact with terminals on the motor. A high voltage sticker and heat activated sticker are also applied to the motor.*

### **R000 - EV 4.5.6**

All wires and terminals and other conductors used in the tractive system must be sized appropriately for the continuous rating of the fuse which protects them. Wires must be marked with wire gauge, temperature rating and insulation voltage rating. Alternatively a manufacturers part number printed on the wire is sufficient if this can be referenced to a manufacturers data sheet.

The minimum acceptable temperature rating for TSV cables is 90°C.

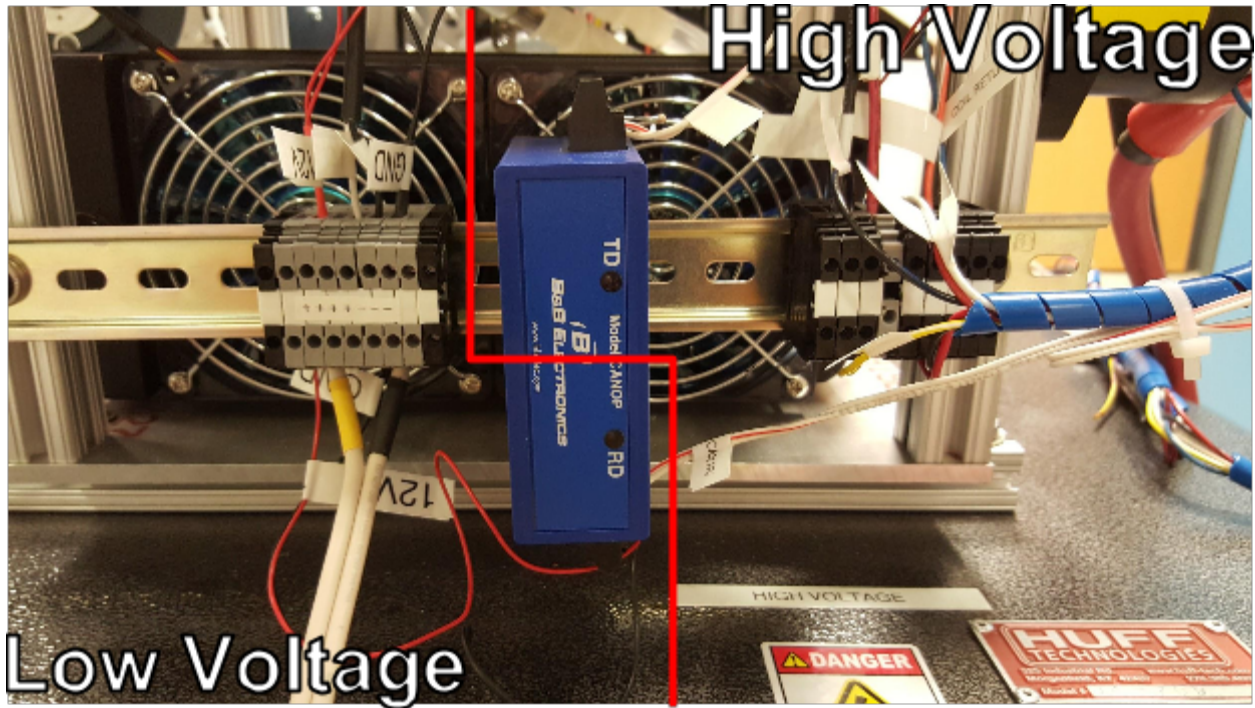
Note: Many high current fuses can allow significant overcurrent conditions which may be adequate to cover the peak power requirements and allow resizing of fusing and wiring according to continuous or RMS needs.



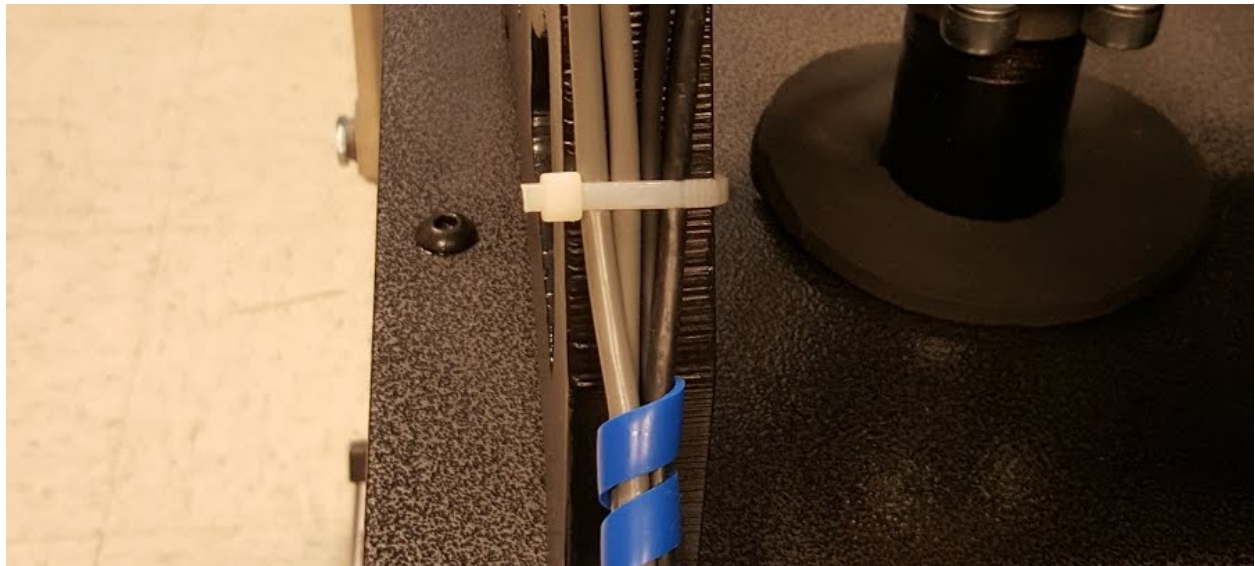
*The wires running from the power supply to the motor controller. The wire awg is 2/0 rated for 600V and -50°C to 105 °C.*

### **R000 - EV 4.5.7**

All tractive system wiring must be done to professional standards with appropriately sized conductors and terminals and with adequate strain relief and protection from loosening due to vibration etc. Conductors and terminals cannot be modified from their original size/shape and must be appropriate for the connection being made.



The DIN rail with labeled wire connections and the high voltage area labeled. The blue CAN isolating repeater separates the high and low voltage portions of the DIN rail.



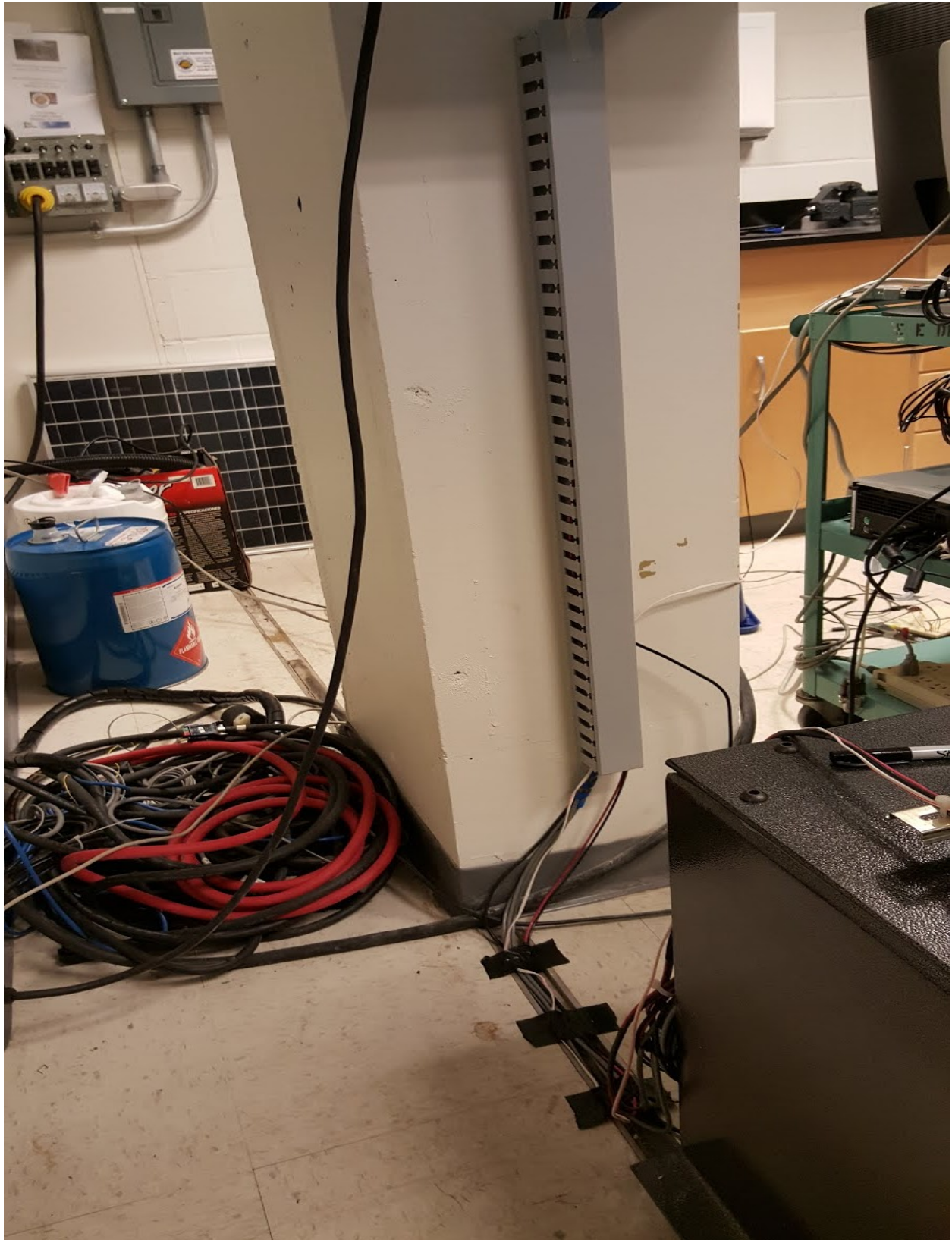
Mechanical strain relief for the sensor wires.



*Mechanical strain relief for the sensor wires.*

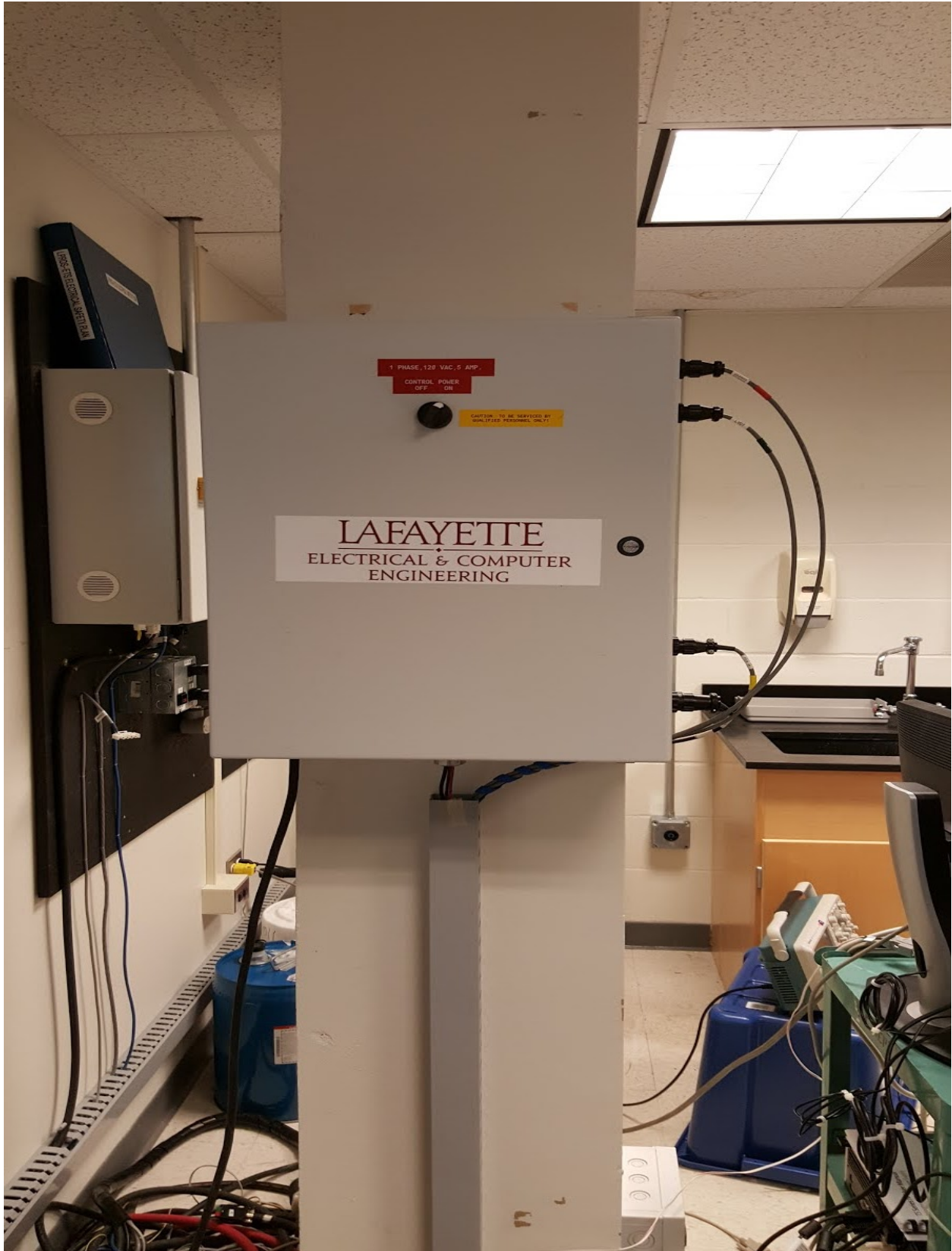


*The sensor wire excess bundled before running to the Huff Box.*

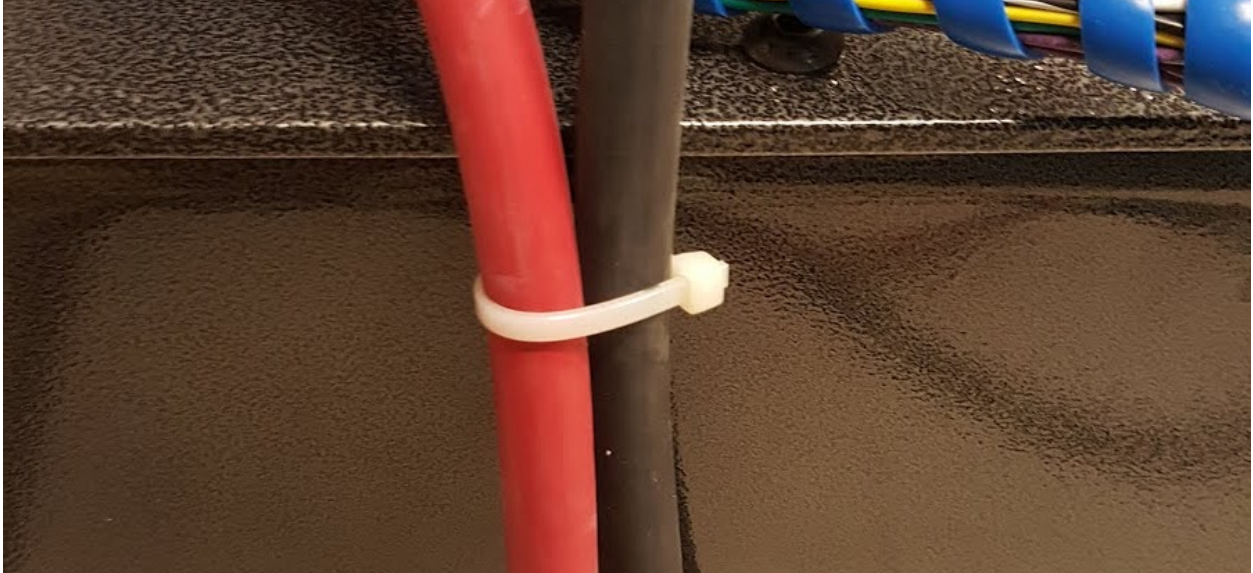


*The wiring guide used to route the sensor wires to the Huff Box.*





*The Huff Box with the sensor wires attached.*



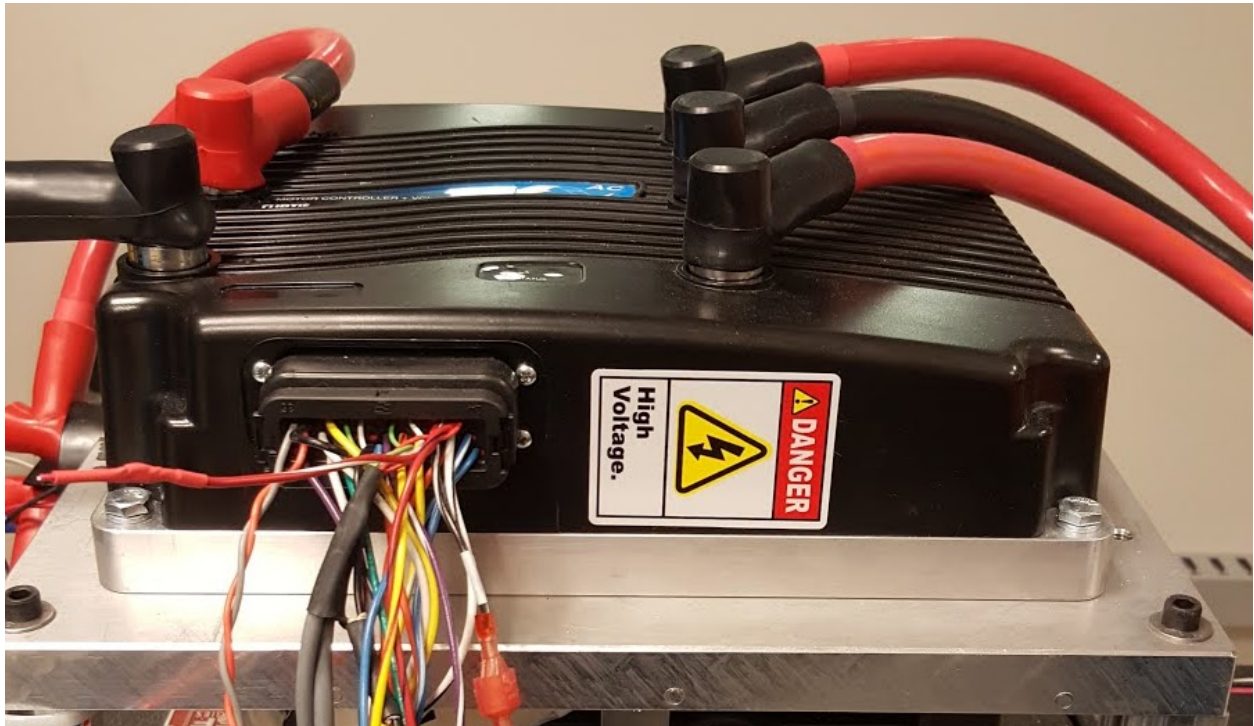
*Mechanical strain relief of the motor controller wires.*



*Mechanical securing of motor controller wiring harness.*

### R000 - EV 4.6.1

Every housing or enclosure containing parts of the tractive system except motor housings must be labeled with sticker(s) (minimum 4 x 4 cm) with a red or black lightning bolt on yellow background or red lightning bolt on white background. The sticker must also contain the text "High Voltage" or something similar if the voltage is more than 30 VDC or 25 VAC.



*High voltage warning sticker on the motor controller.*



*The high voltage warning sticker on the Magna Power power supply.*

## R005 0

A motor, controller, and dynamometer shall be assembled together along with all necessary mechanical parts, couplings, plumbing, fasteners, TSV and GLV cabling, cooling equipment, sensors, interlocks, safety shields, and cable dress per GPR005, and any other necessary item to create an integrated Motor Controller System (MCS) Test Stand.

## R005 8

It must be possible to switch between the power supply and battery packs as the source of TSV power without exposure to uninsulated TSV conductors or terminals.



*The pictured twist lock connectors allow for the safe handling of wires without exposure to conductive materials.*



*The mounting receptacles for the twist lock connectors. Each is labeled and only matching colors allow for a full connect. The hole to the right of the mounting receptacles needs to be covered over.*