TEST DESCRIPTION

This test is intended to force a failure of the fuse as proof that it can protect the rest of the system. To do this, we used an experimental setup with different resistive loads to increase the current drawn from the pack, and eventually short-circuited the battery terminals. A vice was used to hold the wires connected to the pack, and different configurations of four 1 Ω resistors constituted the resistive load. The short circuit test was accomplished using an insulated screwdriver across the wires held in the vice.

PRE CONDITIONS

A fresh fuse should be used during the test, and as of this writing, the short circuit portion should not be performed with the current sensor (reference designation: U4) in place. The batteries should be reasonably charged, with a total pack voltage of greater than 13 V.

TEST

1. Secure the bare ends of the wires to be connected to the pack in the vice. Connect the other end (which should be terminated with an Anderson connector) to the pack.

2. Using only one resistor, connect the bare wires to the resistor using alligator clipped wires. Observe the non-failure of the system, then disconnect the alligator clipped wires.

3. Use more alligator clipped wires to arrange two resistors in parallel, and then connect the pack to the resistors. Observe the non-failure of the system, then disconnect the wires.

4. Similarly, arrange three resistors in parallel and connect the pack. The fuse may not break, since the equivalent resistance may not actually be 1/3 Ω.

5. Finally, disconnect all remaining wires, and carefully short the bare leads with an insulated screwdriver. If the current sensor is not present, the fuse should break.

ACCEPTANCE CRITERIA

The test is passed if, upon replacing the fuse, the system can function normally after a blown fuse.