

Thunderstruck VCU Troubleshooting – August 2021

Perform tests in the following sequence if there is intermittent or no motor response. Please refer to the online manual at this location: [thunderstruck-ev.com/Home/Controllers/VCU for Nissan Leaf, UQM or Coda Motors](http://thunderstruck-ev.com/Home/Controllers/VCU%20for%20Nissan%20Leaf,%20UQM%20or%20Coda%20Motors)

1. Verify all high voltage and low voltage connections per the VCU manual. If being run on a test bench, secure the motor to a sturdy surface. *If UQM, configure inverter per VCU manual before tests.*
2. Use power wires and terminal ends of adequate current capacity and voltage insulation.
3. Connect power and phase wires correctly per manual and manufacturer information.
4. Review the startup procedure. Verify each startup step in sequence.
 - a. 12v power always on connections – see online manual
 - b. Keyswitch activation
 - c. VCU Tests throttle voltage – fails if above **thw1off**.
 - i. If fail, enter **me thw1**, set thw1off and thw1max to the min and max voltages shown.
 - d. VCU starts the precharge cycle – activates 12v precharge output. Verify precharge relay coil draws less than 400 ma current.
 - e. VCU communicates with inverter and waits for reported voltage to reach **prechgminv**.
 - i. If never reached, check battery voltage and change **prechgminv** setting to the expected minimum pack voltage.
 - f. VCU powers main contactor coil.
 - i. If not then verify 12v reaches contactor coil. Verify contactor coil -12v connection.
 - g. System operational when all tests have passed
 - h. Place the FNR switch in the desired position and test the throttle response
5. If the motor still does not run, check configuration:
 - a. Enter **show config**
 - i. **set inverter** [inverter type] – this is either leaf, leafgen1, uqm, coda
 - b. Enter **show**
 - i. Check for errors, look for voltage listed in the list. If zero then either canbus has failed, there are bad high voltage connections, or the precharge process failed.
 - c. Check canbus HI LO connections. Note Leaf HI is blue and VCU HI is green.
 - d. Enter **tr canbus**
 - i. send results to Thunderstruck with **show config** and **show** report results.
 - e. Enter **tr off** (this stops the trace), then enter **tr uc**. IF the motor is not spinning, run the throttle through its full range and note the results.
 - i. record results and send to Thunderstruck.
 - ii. note the rpm entry near the left of each trace, and the throttle voltage information.
 1. If zero percent throttle, then check throttle connections. Stop the trace and run **me thw1** and record voltage range.
 - iii. if you see the letters “FB” (this means Forward/Brake) or “RB” in the left column then the brake circuit is activated. Disconnect brake wires from the VCU and test functionality.
 - iv. If you see “N” listed in the left column, and you have positioned the switch in F or R, then stop the trace and run the **me fnr** report and select each of 3 positions and send results.
 - v. enter **tr off** to stop the trace
6. Include as many of the above reports as possible in support emails to TSM - start with **show config** and **show**. Send pictures of the inverter, VCU and precharge wiring if possible.

Thunderstruck Support: connect@thunderstruck-ev.com