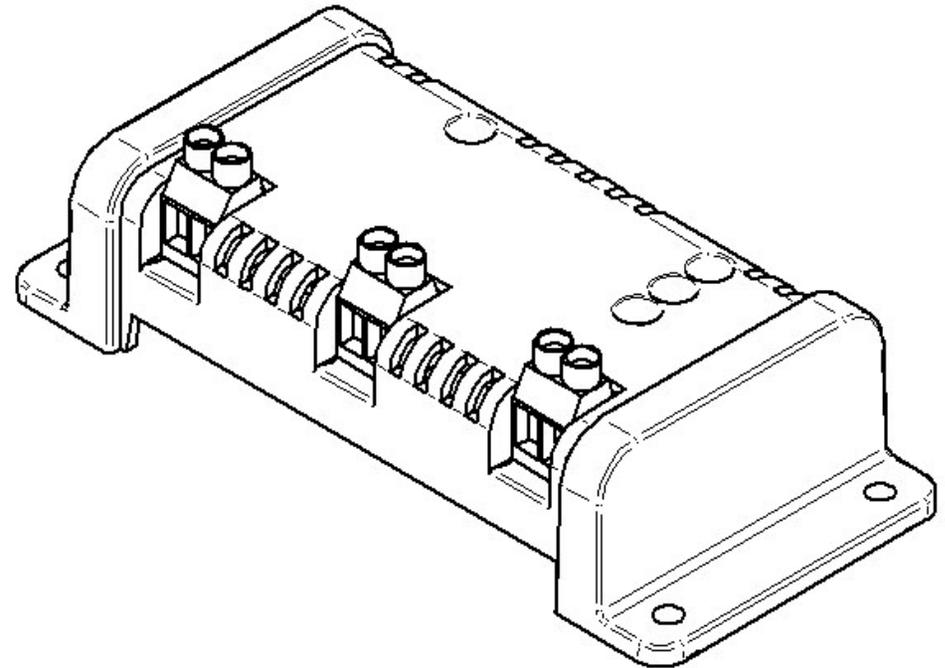
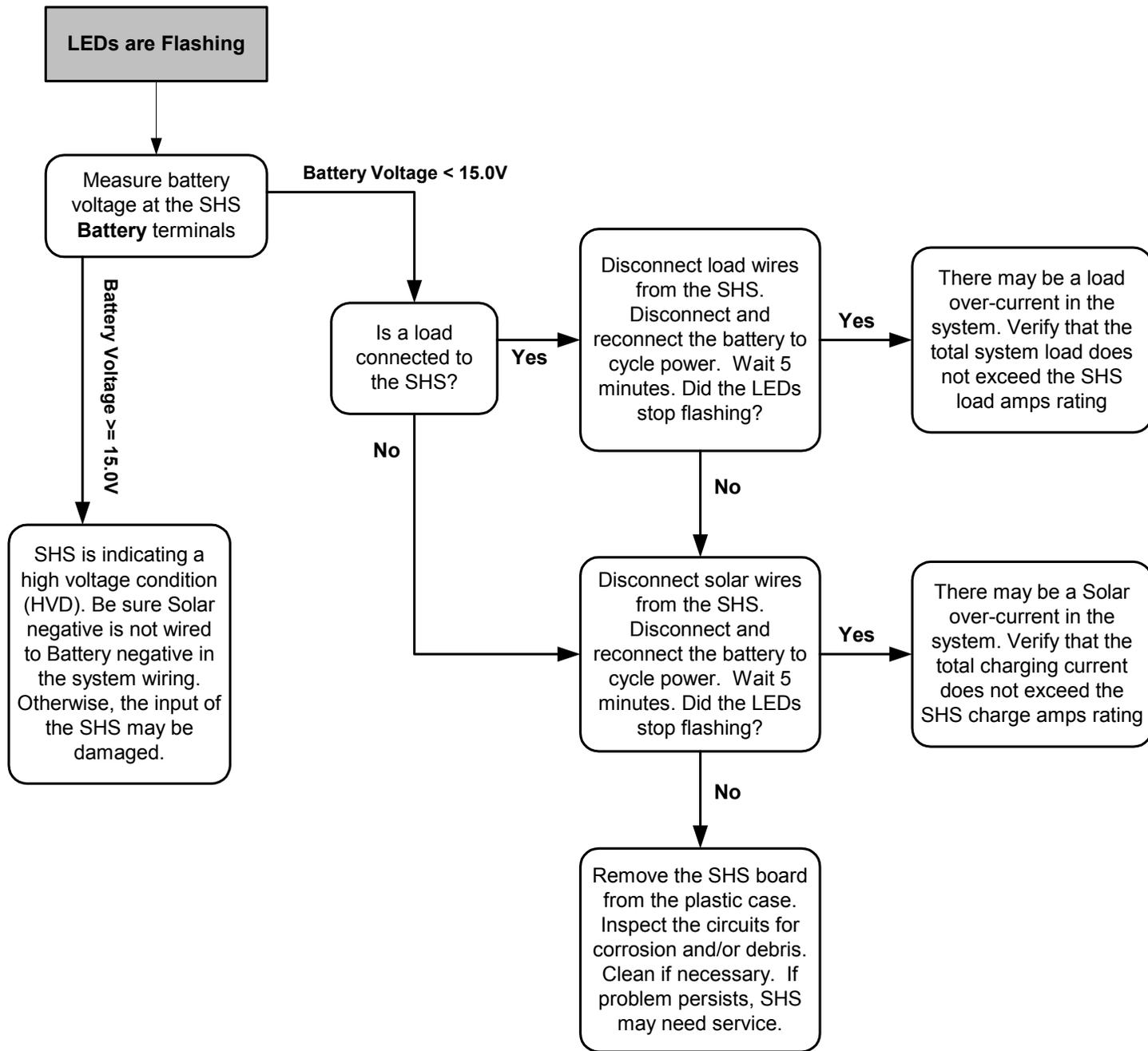


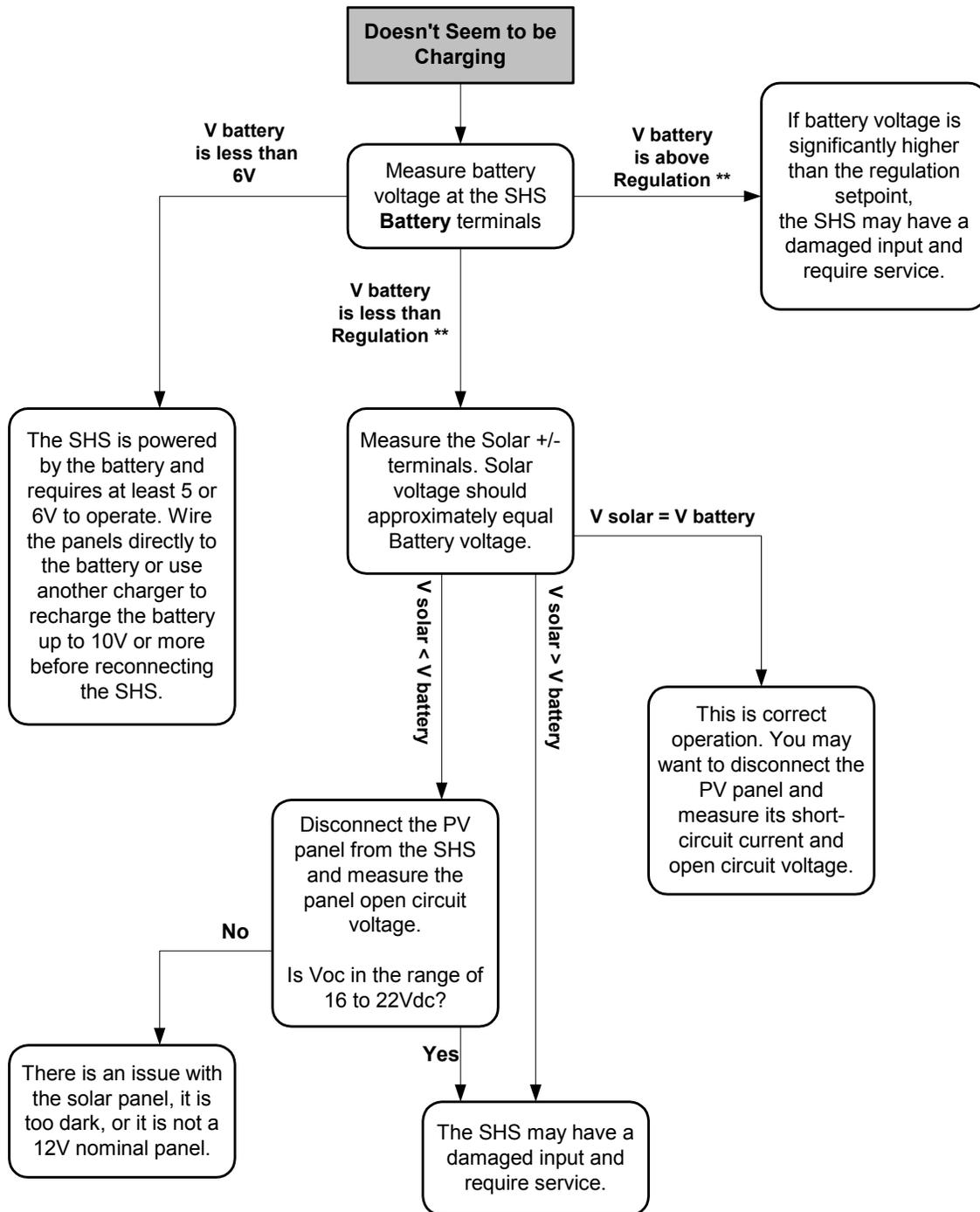
The SHS Field Testing Document allows the user to troubleshoot a Morningstar SHS-6 or SHS-10 charge controller installed in a system. The user will need a Multimeter capable of measuring DC voltage. The following pages contain flow charts for troubleshooting a fault indication, charging problems, and load control issues.

**Check these items first before troubleshooting:**

- ✓ Check system fuses and circuit-breakers
- ✓ Check wiring for breaks and shorts
- ✓ Test with a healthy battery. Swap a known good battery into the system for testing if necessary
- ✓ Verify that PV panels are exposed to natural sunlight without shading
- ✓ Test the system loads. Wire them directly to the battery to verify correct operation if necessary.
- ✓ Check grounding points and common bus bars. The SHS switches in the negative leg. Grounding more than one negative terminal will bypass the load and/or charging functions.







**\*\* Regulation Voltage:**

Regulation voltage changes with ambient temperature.

At 25C, Vreg = 14.3 Vdc. Below are some sample voltages at various temperatures. Match the approximate ambient temperature of the SHS with the chart below to find the Regulation Voltage.

|      |         |
|------|---------|
| 0 C  | 15.00 V |
| 10 C | 14.75 V |
| 20 C | 14.45 V |
| 25 C | 14.30 V |
| 30 C | 14.15 V |
| 40 C | 13.85 V |
| 50 C | 13.55 V |

