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TESTING the A & A 1 Amp Smart Charger, Model 150

This charger has a "CHARGE ENABLE" function. If you connect a battery that has less than 6 V, the charger assumes there is a defect in the battery and it will not attempt to charge. **Likewise if you turn the charger on without a battery connected, the charger will not output any voltage/current.**

Every A & A Smart Charger is shipped with a copy of our schematic and component layout. Refer to these documents while performing the following tests.

If you built the KIT, first thing to do is a visual inspection. Check that all diodes, electrolytic capacitors and the bridge rectifier are polarized properly. Check all solder joints. Construction is such that, if required, you can unmount the pass transistor (Q1) and the circuit board and inspect all the connections **without having to disconnect any wires.** Check that you have installed the required **jumpers** on the board. Check that the proper fuse is installed in the proper holder. If you install the 1/2 A input fuse in the output holder, it will pop!

If all above seem proper, continue with the following:

1) With the **chip removed** and nothing connected to the charger output, apply input AC. Turn the rocker switch on, verify that the rocker neon bulb is energized. If it does not energized, check the input fuse, a 1/2 A fast blow 3AG fuse. For the KIT builder, check the wiring to the input fuse holder and the AC switch.

Next measure the voltage across C1, the main filter capacitor. This should be about 25 VDC. To measure the voltage across C1, connect your test meter from the NEG output lead to any connection at RS. RS is such a low value resistor that it won't effect this voltage reading. This checks the AC cord, AC switch, input fuse, power transformer, bridge rectifier, filter cap. If the voltage is much lower than 25V, you may have a problem with any of the above items. If the voltage is okay, proceed with the following.

2) With the chip still out, measure the output voltage. Connect your meter from output POS to NEG. Under these condition, the output should be near **zero volts**, the pass transistor (Q1) **should not be turned on**. If you measure any output, the pass transistor may be shorted. For the KIT builder - Q1 may be wired improperly.

FOR NEWER VERSIONS - REVISION G and higher circuit board, use step **3A**

3A) With the chip still out, and monitoring the output, connect pin 15 to pin 16 of U1. This will turn on the pass transistor. You should be able to turn the pass transistor ON/OFF by connecting/removing the connection between pin 15 & 16. The output should switch from 0 to about 25VDC. This checks Q1, D1, output fuse F2, D2 and the output cable/clips.

If you do not get the 25VDC out, go to **THINGS TO CHECK** below.

FOR OLDER VERSIONS - REVISION A through F circuit board, use step **3B**

3B) With the chip still out, and monitoring the output, connect a 10 K ohm resistor from the base of the pass transistor Q1 to ground, this will turn on the pass transistor. The base is available at either side of R6, the 10 ohm base resistor. You should be able to turn the pass transistor ON/OFF by grounding and ungrounding via the 10 K ohm. The output should switch from 0 to about 25VDC. This checks Q1, D1, output fuse F2, D2 and the output cable/clips.

If you do not get the 25VDC out, go to **THINGS TO CHECK** below.

THINGS TO CHECK

A) pass transistor Q1 may be defective (KIT Builder - maybe wired wrong)
B) series diode D1 may be open or reversed
C) output fuse F2 (2A fast blow 3AG) may be open
D) reverse polarity diode D2 may be shorted (KIT Builder - maybe reversed)
E) output cable / clips (KIT Builder - maybe reversed)

With the pass transistor turned on, and about 25VDC at the output, **(NO CHIP - STILL TESTING)** you should measure the following:

4) Voltage at pin 12 to ground of the IC should be about 12VDC. R1 and R2 form a 2 to 1 voltage divider which drops the 25VDC down to about 12VDC.

5) Voltage at pin 13 to ground of the IC should be about 4VDC. RA and RB form a 6 to 1 voltage divider which drops the 25VDC down to about 4VDC

6) Voltage at pin 10 to ground of the IC should be about 3VDC. RA and RB form a 6 to 1 voltage divider and RC should not disturb this reading.

Turn Q1 off (remove pin 15 to 16 jumper or 10K test resistor)

7) To check the GREEN CHARGING LED, ground pin 1 or 8, the LED should light. For a problem here check R7 and the polarity and wiring to the LED.

8) To check the RED FINAL CHARGE LED, ground pin 9, the LED should light. For a problem here check R4 and the polarity and wiring to the LED.

9) If all above are okay, then we would suspect the chip has problems. There is no simple test other than changing it.

The UC3906N chip is available from many commercial and/or industrial electronic component suppliers. Or you may order the chip from A & A Engineering. Cost is $7.50 plus $2.50 mailing, TOTAL of $10.00

Lastly, we do service and repair. For a flat fee of $20.00 plus return shipping we will repair / refurbish any model 150 Smart Charger. Shipping cost to US 48 is $11.50. Shipping to Alaska or Hawaii is $14.50.

If you decide to send your charger in for repair, please include check, money order or PayPal account email address along with a daytime phone number and/or email address so we can contact you if needed. You must return the unit freight prepaid along with payment information

If your 150-ASY is less than 3 months old (90 days), and has not be abused, we will repair / replace the unit at no cost to you. We will pay shipping both ways. Call or email (orderaaengr@aol.com) for return details.

Sorry but this 90 day offer **DOES NOT** apply to KITs.

Hope this helps get your charger back up and running properly!

Stas A

Stas, W6UCM