

# Bypass (the AVR) Test

This test is used in place of the Power Head Tester (P/N 6398), or to verify its results.

This process is explained in better detail, on pgs. 27 thru 37, in the Air-cooled Standby Generator Troubleshooting and Repair Manual (P/N 80019677), which can be downloaded from:

[www.thepowerportal.com](http://www.thepowerportal.com)

## Getting Started

- a. A set of jumper wires (min. 16 AWG) with alligator clips on one side and male spade connectors on the other. If working with a half-wave AVR you will need 1 male and 1 female bullet connector, instead of spade.
- b. A way to test DC Amperage (Clamp style or DMM with known good fuse in it).
- c. When measuring for resistance, you must use resistance ( $\Omega$ ), not continuity.
- d. All results should be documented. When you call in, you will be asked for specific values.
- e. All measurements will be taken from the wires unplugged from Automatic Voltage Regulator (AVR) unless stated otherwise.
- f. 11a-22a is used on half-wave AVRs (Fig. 1), 11a-44a is used on full-wave AVRs (Fig. 2), there are no sense wires (11a/22a or 44a) on Mark 1 AVR (Fig. 3).

**\*All Testing will be done on the wires going to the alternator, not on the AVR itself.**

## Process (record results on next page)

1. Find resistance between wires 1-4 (red and black pair), then measure each to GND (they should measure open to GND).
  - a. If 1-4 show open, rotor, brushes, or brush wires are faulty. Check resistance on brush rings with brushes removed to verify.
  - b. If resistance is high, above  $30\Omega$ , touch wires 1-4 reverse polarity (red wire to negative, black wire to positive) to battery and quickly remove, then measure resistance again.
2. Measure resistance between wires 2-6, then measure each to GND (they should measure open to GND).
  - a. If 2 to 6 are open or there is a short to GND, stator is faulty.
3. Using the jumper wires, attach the brush wires to the battery. Black wire to negative post of the battery, red wire to positive post of the battery.
  - a. Start unit and measure AC voltage between wires 2-6.
    - i. 2-6 should near or above 200VAC on half-wave AVR, or near 95VAC on full-wave/Mark 1 AVR.
  - b. Start unit and measure AC voltage at the line-side of the breaker.  
Or, if applicable
  - c. Start unit and measure AC voltage between wires 11a-22a/44a.
4. Measure DC Amperage Draw (Fig. 4) on wire 1 static and when running should be less than a 0.3A change (use Ohm's Law, found on the page 3)
  - a. If seeing 0 Amps, verify fuse in meter is good. And measure resistance of rotor (wires 1-4) when it is spinning.
5. Remove Neutral to Transfer switch, open main breaker or remove L1 and L2.
  - a. Measure resistance across L1 and L2
  - b. Measure each to N
  - c. Measure each to GND (they should measure open to GND).
6. Call in with results

# Results

- |    |                                 |       |      |
|----|---------------------------------|-------|------|
| 1. | 1-4                             | _____ | Ω    |
|    | 1-GND                           | _____ | Ω    |
|    | 4-GND                           | _____ | Ω    |
| 2. | 2-6                             | _____ | Ω    |
|    | 2-GND                           | _____ | Ω    |
|    | 6-GND                           | _____ | Ω    |
| 3. | 2-6                             | _____ | VAC  |
|    | 11-44(L1-L2)                    | _____ | VAC  |
|    | and/or                          |       |      |
|    | 11a-44a/22a                     | _____ | VAC  |
| 4. | DC Amp Draw Static              | _____ | Amps |
|    | DC Amp Draw Running             | _____ | Amps |
|    | Resistance when Unit is running | _____ | Ω    |
| 5. | L1-L2                           | _____ | Ω    |
|    | L1-N                            | _____ | Ω    |
|    | L2-N                            | _____ | Ω    |
|    | L1-GND                          | _____ | Ω    |
|    | L2-GND                          | _____ | Ω    |

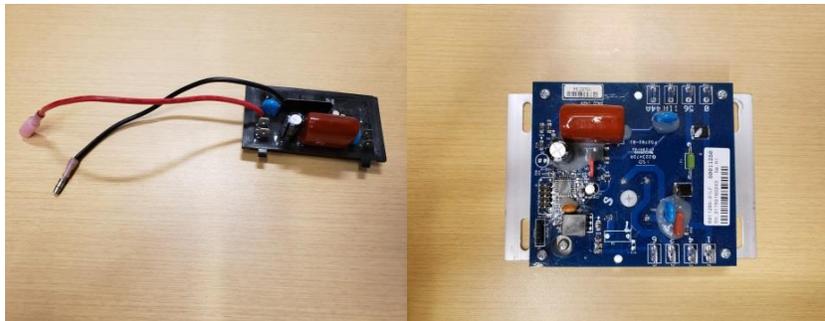


Fig. 1

Fig. 2



Fig. 3

