

## SUZUKI GS500E CHARGING CIRCUIT TEST

Electrical testing assumes that the user has knowledge of the basics of electricity (Voltage, current, resistance, etc.), and about electrical systems on motorcycles in general. If you do not have this knowledge/experience, find someone that has and let him/her check the charging-system on the bike.

The use of this test procedure is entirely at the risk of the user. The author cannot be held responsible for any damage that could arise from the use of this procedure.

You must have a good, fully charged battery. If the battery is not fully charged you will get incorrect results. The most reliable way to test the battery is with a hydrometer.

Use an accurate digital multimeter that has a diode test function. If the meter has not been calibrated recently or cannot be calibrated, then it may not be accurate enough for these tests.

### OVERALL TEST

**1. MINIMUM VOLTAGE.** Switch the multimeter to DC Volts (DCV or Vdc). If you don't have an auto ranging voltmeter switch the range to 20 or 50 V. Connect the multimeter leads to the battery terminals. Start and rev the engine up to 2500 rpm. Check the battery voltage

If higher than 13.5 V (good) go to 2.  
If lower than 13.5 V (bad) go to 4.

**2. MAXIMUM VOLTAGE.** Rev the engine up to 5000 rpm. Check the reading on the meter.

If lower than 15.5 V (good) go to 3.  
If higher than 15.5 V (bad) go to 4.

### 3. CHARGING SYSTEM PERFECTLY OK.

Just for insurance, you might disconnect most of the connections on the bike and spray them with contact cleaner then apply a liberal amount of dielectric paste to all the contacts inside the connectors. This could prevent problems in the future.

### BATTERY CABLE TEST

**4. POSITIVE CABLE.** Let the engine idle and connect the black multimeter-lead to the battery (+). Connect the RED multimeter lead to the RED output wire of the RR. Leave the RR connected to the bike. You can access the electrical contact from the back of the connector where the wire enters. Check the reading on the meter.

If more than 0.2 V (bad) go to 5.  
If less than 0.2 V (good) go to 6.

**5. Bad connection** in the positive lead from RR to battery (+). Check this connection all the way through the START relay and the FUSE. Clean the connections and spray them with contact cleaner then apply a liberal amount of dielectric paste to all the contacts and return to 1.

**6. NEGATIVE CABLE.** Let the engine idle and connect the RED multimeter lead to the battery (-). Connect the BLACK multimeter lead to the negative output of the RR (BLACK/WHITE wire). Check the reading on the meter.

If more than 0.2 V (bad) go to 7.

If less than 0.2 V (good) stop the engine and go to 8.

**7. Bad connection** in the negative lead from RR to battery (-). Check this connection all the way to the battery (-). Also check the connection between battery (-) and frame. Also suspect the plate on which the RR is mounted (it may be rubber mounted and have an extra wire from this plate to the battery (-) or frame). Clean the connections and spray them with contact cleaner then apply a liberal amount of dielectric paste to all the contacts and return to 1.

### STATOR TEST

Older GS models have three different colors for the three output wires of the stator. This has caused a lot of unnecessary confusion, because the output of all the three wires is the same. The colors on the wires from the stator are: YELLOW, WHITE/BLUE and WHITE/GREEN. On the RR all the wires are YELLOW. IN THE FOLLOWING PROCEDURES JUST THINK OF THE STATOR WIRES AS ALL BEING YELLOW.

**8. CONTINUITY.** Stop the engine. Disconnect the wires coming from the stator. Switch the multimeter to Ohms, the lowest range on the meter. Measure the resistance between all three combinations of two wires coming from the stator, so you need to take three readings.

If one of the readings is lower than 0.5 Ohms or higher than 2 Ohms (bad) go to 9.

If all readings are within 0.5 to 2.0 Ohms (good) go to 10.

**9. Stator is faulty.** Replace the stator and return to 8.

**10. ISOLATION.** Connect one of the multimeter-leads up to one of the three YELLOW wires. Connect the other multimeter lead up to the engine-case. Check the reading on the meter. Make sure the connection to the engine case is a good one!

If you have any reading lower than 100 Ohms (bad) go to 11.

If you have no reading at all or OL on the display (good) go to 12.

**11. Stator is at fault.** Replace the stator and return to 8.

**12. AC OUTPUT.** Switch the multimeter to AC-Voltage (Range at least to 100 Vac). Make sure you DON'T switch it to DC-Voltage (=DCV or Vdc). Start the engine and rev it up to about 5000rpm. Measure the voltage between all three combinations of two wires coming from the stator, so you need to take three readings. These terminals are very close together. Slip small cardboard strips in between the terminals so they don't short to each other while attaching the test clips. Stop the engine.

If the three readings are not equal, or one of them is below 75 Volts (AC) (bad) go to 13.

## SUZUKI GS500E CHARGING CIRCUIT TEST

If three equal readings, all higher than 75 Volts AC, the stator is good, go to 14.

**13. Stator is at fault.** Replace the stator and return to 8.

### RECTIFIER/REGULATOR (R/R) TEST

#### POSITIVE SWING DIODE CHECK

**14. REVERSE BIAS CHECK.** Disconnect the RR red and black-white wires from the bike. Switch the multimeter to the DIODE-TEST function. (The reading on the display will be in VOLTS now, not in Ohms!) Connect the RED multimeter-lead to the RED output wire of the RR.

Connect the BLACK multimeter-lead to one YELLOW wire. Check the reading. Repeat this procedure for the two other YELLOW wires.

If the meter shows 1.00 V or lower (bad) on any of the three tests go to 15.

If the meter displays OL or a voltage above 1.5 V on all three tests (good) go to 16.

**15. RR is at fault. Replace the RR and return to 14.**

**16. FORWARD BIAS CHECK.** Connect the BLACK multimeter-lead to the RED output wire of the RR. Connect the RED multimeter-lead to one YELLOW wire. Check the reading. Repeat this procedure for the two other YELLOW wires.

If the meter shows lower than 0.2 V or higher than 1.0 V on any of the three tests (bad) go to 17.

If the meter displays around 0.5 V on all three tests (good) go to 18.

**17. RR is at fault. Replace the RR and return to 14.**

#### NEGATIVE SWING DIODE CHECK

**18. REVERSE BIAS CHECK.** Connect the BLACK multimeter-lead to the negative BLACK/WHITE output wire of the RR). Connect the RED multimeter lead to one YELLOW wire. Check the reading. Repeat this procedure for the two other YELLOW wires.

If the meter shows 1.00 V or lower on any of the three tests (bad) go to 19.

If the meter displays OL or a voltage above 1.5 on all three tests (good) go to 20.

**19. RR is at fault, replace it with a new one and return to 14.**

**20. FORWARD BIAS CHECK.** Connect the RED multimeter-lead to the negative BLACK/WHITE output wire of the RR. Connect the BLACK multimeter-lead to one YELLOW wire. Check the reading. Repeat this procedure for the two other YELLOW wires.

If the meter shows lower than 0.2 V or higher than 1.0 V on any of the three tests (bad) go to 21.

If the meter displays around 0.5 V on all three tests (good) go to 22.

**21. RR is at fault, replace it with a new one and return to 14.**

**22. The charging circuit is ok.**