FAULT FINDING FLOW CHART FOR MOTORCYCLE CHARGING SYSTEMS

START

NOTE:
Suzuki used on the older GS models three different colors for the three output wires of the stator. They were the only manufacturer doing this. 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 Suzuki RR these colors are: YELLOW, WHITE/BLUE and WHITE/RED. JUST THINK OF THEM ALL BEING YELLOW !!!

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If you have an RR with 4 different wire COLORS emerging from it find the switched +12V supply input. (Normally Honda : BLACK, Suzuki : ORANGE, Yamaha : BROWN, Kawasaki : BROWN, otherwise check the wiring-diagram for the extra wire coming from the ignition-switch). Connect the red multimeter-lead to the battery(+) and the black multimeter-lead to the switched +12V input-wire (the one you just found). Leave the RR fully connected up to the bike and let the engine idle. Switch on the lights. Check the reading on the meter.

Reading is lower than 0.2 V

You have LESS than 4 different wire COLORS

Stop the engine. Disconnect the wires coming from the stator. These are usually three YELLOW (or WHITE = Yamaha) wires. Switch the multimeter to Ohms, the lowest range on the meter. Measure the resistance between all three wires coming from the stator, so you need to take three readings.

All readings are within 0.5 to 2.0 Ohms

You have no reading at all, or OL in the display

Switch the multimeter AC-Voltage (Range at least to 100 Vac). Make sure you DON'T switch it to DC-Voltage (=DCV or Vdc). Connect the multimeter leads between two of the three YELLOW (or WHITE = Yamaha) wires coming from the stator. Start the engine and rev it up to app. 5000rpm. Check the reading on the meter. Switch one of the multimeter leads to another YELLOW (or WHITE) wire and check the reading again. Switch the other multimeter-lead to another YELLOW (or WHITE) wire, and check the reading again.

The three readings are not equal, or one of them is below 50 Volts (AC)

You have any reading lower than 100 Ohms

Check the display, your meter might be showing kilo Ohms or Mega Ohms. (0.1k Ohms is 100 Ohms, 0.45M Ohms is 450 k Ohms is 450,000 Ohms.)

Stator is at fault. Replace the stator and return to START

You have any reading lower than 0.5 Ohms or higher than 2 Ohms

Bad connection from the battery(+) through the ignition switch to the switched +12V supply-input on the RR. Check the whole electrical circuit. This is one of the most difficult faults to find. Suspect the ignition-switch itself, the fuse-box and its connections. The RR thinks the battery-voltage is too low while the actual voltage is correct or too high. Disconnect all terminals and clean them with contact-cleaner. If you have fixed the problem, return to START.
Disconnect the RR 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 (or WHITE/RED = Kawasaki) output wire of the RR. Connect the BLACK multimeter-lead to one YELLOW (or WHITE = Yamaha) wire. Check the reading. Repeat this procedure for the two other YELLOW wires.

Connect the BLACK multimeter-lead to the red (or white/red = Kawasaki) output wire of the RR. Connect the RED multimeter-lead to one YELLOW (or WHITE = Yamaha) wire. Check the reading. Repeat this procedure for the two other YELLOW wires.

As this was the last test, the only thing that can be at fault is the battery itself. Replace it with a known good fully charged battery and return to START.
Is there an RR on the bike? (somewhere on the frame under the bodywork)

Yes

Switch the multimeter to DC-Voltage (DCV or Vdc) Range 20 or 50V. Connect the multimeter-leads to the battery-terminals. Start the engine and rev it up to app. 5000 rpm. Check the voltage-reading.

Higher than 14.8 V

Stop the engine. Disconnect the blockconnector to the generator closest to the engine. This connector must have at least three YELLOW (or WHITE = Yamaha) wires in it and one or two extra ones. Switch the multimeter to the lowest Ohms-range. Measure the resistance between the two other wires, or between the single extra one (apart from the YELLOW ones) and the engine-casing.

You have a reading lower than 3 Ohms or higher than 10 Ohms

The fieldwinding in the generator or the brushes to the rotor are at fault. If there are any brushes inside the generator, disconnect them and measure the resistance between the two copper sliprings on the rotor. These are the rings on which the brushes run.

(If there are no brushes inside the generator, replace the fieldwinding or if that is not possible separately, replace the whole stator and return to START)

Rotor at fault. Replace it with a new one, and return to START

Resistance lower than 3.6 Ohms or higher than 6 Ohms

Wiring to the brushes or the brushes themselves at fault. Replace the brushes, check the wiring to the brushes and return to START

Stator at fault. Replace stator and return to START

The three readings are not equal, or they are below 50 Volts (AC)

Stop the engine. Switch the multimeter to DC-Voltage (DCV or Vdc). With the block-connector disconnected as above, connect the multimeter-leads up to the two extra wires in this connector (apart from the three YELLOW wires), in the connector-block emerging from the wiring-loom, not the other side going to the generator. If there's only one extra wire, connect it to one multimeter-lead and connect the other multimeter-lead to the engine-casing. When you switch on the ignition, check the reading on the display.

No reading or a reading lower than 10 V (DC)

RR at fault. Replace it with a new one and return to START

Goto C

You have an integrated generator (car-type, with built in regulator and rectifier). Most of the problems with this kind of generator are bad connections, from generator to battery (battery doesn't charge), or a burned out regulator (battery-voltage too high). Sometimes the generator itself is at fault. You could check the resistance of the fieldwinding (around 5 Ohms) and the state the brushes are in. Otherwise leave it to an expert. After solving the problem, return to START.