

# FAULT-FINDING CHART FOR MOTORCYCLE CHARGING-SYSTEMS

COPYRIGHT © ELECTREX USA 1999

START

## VERY IMPORTANT :

This fault-finding chart 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 her/him check the charging-system on the bike. The use of this fault-finding chart 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 fault-finding chart.

Fully charge the battery. If the battery is not fully charged you may get wrong results using this fault-finding chart. You could just replace it with a battery off another motorcycle that has a good functioning charging-system.  
Use an accurate digital multimeter! RR means Regulator/Rectifier. This whole fault-finding chart only works if you have a bike with a combined regulator and rectifier (= regulator/rectifier) in a single case

## TAKE NOTICE OF THE FOLLOWING :

Suzuki used on the older GS models three different colours for the three output-wires of the stator. They were the only manufacturer doing this. The only reason for this can be to cause confusion, because the output of all the three wires is the same. The colours on the wires from the stator are : Yellow, White/blue and White/green. On the Suzuki RR for these models we're talking : Yellow, White/blue and White/red. JUST THINK THEM ALL BEING YELLOW, and then go on with the tests below

Switch the multimeter to DC Volts (DCV or Vdc)  
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

Higher than  
13.5 V

Rev the engine up to  
5000 rpm. Check the  
reading on the meter.

Lower than  
14.8 V

Charging system perfectly OK.  
You could still disconnect most of  
the connections on the bike and  
spray them with contact cleaner  
or WD40. This could prevent  
problems in the future.

Lower than  
13.5 V

Higher than  
14.8 V

Count the # of different wire-COLOURS emerging from the RR. If there's a yellow wire on a Yamaha RR, don't count it (it is a special output-wire for switching the lights on and off)

More than 4  
Or if there is no RR on the  
bike at all

Goto  
**D**

4 or  
less

You've got a permanent magnet alternator system. Let the engine idle, and connect the black multimeter-lead up to the battery(+). Connect the red multimeter-lead up to the red (or white-red = Kawasaki) output wire of the RR. Leave the RR connected up to the bike. Check the reading on the meter. Leave the engine idling !

more than 0.2 V

Bad connection in the positive lead from RR to battery(+). Check the whole lead (suspect the connectors as well as the fuse-box and fuses). Good connections are extremely important in this high current lead. Solve the problem and return to START

Less than  
0.2 V

Connect the red multimeter-lead up to the battery(-). Connect the black multimeter-lead up to the negative output of the RR (Honda : Green, Suzuki : Black-white, Yamaha : Black, Kawasaki : black, other brands normally use a black wire). If you can't find a negative output-wire, then the casing of the RR is normally the negative lead to the frame. Check the reading on the meter. Leave the engine idling !

more than 0.2 V

Bad connection in the negative lead from RR to battery(-). Check the whole lead to the battery(-). If the RR doesn't have an output-lead but uses the case as connection to the frame, clean the area where it is bolted and use new screws. Also check the connection between battery(-) and frame. Also suspect the plate on which the RR is mounted (sometimes it is rubbermounted and uses an extra cable from this plate to the battery(-) or frame). Disconnect all suspect terminals and clean. Best solution : connect the RR straight up to the battery(-) with an extra lead. Solve the problem and return to START

less than  
0.2 V

Goto  
**B**

**ELECTREX** USA  
charging systems for motorcycles

**B**

If you have an RR with 4 different wire-COLOURS 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.

more than 0.2 V

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 solved the problem, return to START

Reading is lower  
than 0.2 V

You have LESS than  
4 different wire-  
COLOURS

Stop the engine. Disconnect the wires emerging 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.

One of the readings is lower than  
0.5 Ohms or higher than 2 Ohms

All readings are  
within 0.5 to  
2.0 Ohms

Connect one of the multimeter-leads up to one of the three yellow (or white = Yamaha) wires. Connect the other multimeter-lead up to the engine-casing. Check the reading on the meter. Make sure the connection to the casing is a good one !

You have any reading between 100 Ohms and zero Ohms  
(= 0 Ohms = no resistance !)

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

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 emerging 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.

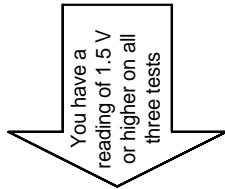
The three readings are not equal,  
or one of them is below 50 Volts  
(AC)

Three equal  
readings, all  
higher than 50  
Volts (AC)

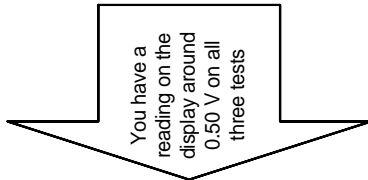
Goto  
**C**



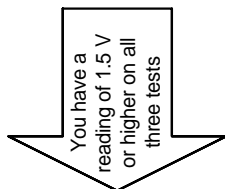
Disconnect the RR from the bike. Switch the multimeter to the DIODE-TEST function. (The reading on the display will be in VOLTS now, not in Ohms!) Connect the RED multimeter-lead to the RED (or white/red = Kawasaki) output wire of the RR. Connect the BLACK multimeter-lead to one yellow (or white = Yamaha) wire. Check the reading. Repeat this procedure for the two other yellow wires.



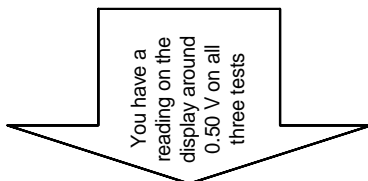
Connect the BLACK multimeter-lead to the red (or white/red = Kawasaki) output wire of the RR. Connect the RED multimeter-lead to one yellow (or white = Yamaha) wire. Check the reading. Repeat this procedure for the two other yellow wires.



Connect the BLACK multimeter-lead to the negative output wire of the RR (Kawasaki : BLACK, Yamaha : BLACK, Honda : GREEN, Suzuki : BLACK/WHITE). If there is no output wire, connect the black multimeter-lead to the RR-case. Connect the RED multimeter-lead to one yellow (or white = Yamaha) wire. Check the reading. Repeat this procedure for the two other yellow wires.



Connect the RED multimeter-lead to the negative output wire of the RR (Kawasaki: BLACK, Yamaha : BLACK, Honda : GREEN, Suzuki : BLACK/WHITE ). If there is no output wire, connect the black multimeter-lead to the RR-case. Connect the BLACK 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 another fully charged one and return to START

You have a reading of 1.00 V or lower on one of the three tests.

You have a reading below 0.2 V or above 1.0 V on one of the three tests

You have a reading of 1.00 V or lower on one of the three tests.

You have a reading below 0.2 V or above 1.0 V on one of the three tests

RR is at fault, replace it with a new one and return to START

