

## CHECKING 1965 MODEL 12-VOLT SYSTEMS

Using Sun Or Weidenhoff Individual Test Instruments

The 1965 Electra-Glide, Sportster and Servi-Car models all have a 12-volt generator and lighting system. This means that the regulator setting specifications and test information are different from the 6-volt system and new test procedures are necessary.

This bulletin gives testing instructions for using individual equipment components to test the 12-volt system. Test equipment, consists of a voltmeter, ammeter, 1/4 and 1-1/2 ohm fixed resistance, and a 25 watt variable field resistor. This type equipment which was formerly manufactured by the Weidenhoff Corporation and sold by Harley-Davidson, is now available from the Sun Electric Corporation.

To trouble shoot the electrical system, four basic tests are required:

1. Test the generating system to determine whether the generator or regulator is at fault.
2. Test the cut-out unit closing voltage.
3. Test the voltage control unit setting.
4. Test the current control unit setting.

Use the following procedures for specific 1965 models listed.

### 1965 ELECTRA-GLIDE AND SERVI-CAR

(Delco-Remy Regulators)

#### A. TESTING THE GENERATING SYSTEM (SEE FIG. 1)

1. Disconnect battery wire from regulator "BAT" terminal and connect this wire to the negative lead of an ammeter (0-30 amperes). Connect positive ammeter lead to regulator "BAT" terminal.
2. Connect the positive lead of a voltmeter (0-20 volts) to the regulator "GEN" terminal. Connect voltmeter negative lead to ground on motorcycle.
3. Disconnect the wire from the regulator "F" terminal and connect this wire to a lead of a field control variable resistor. Connect other lead of field control variable resistor to ground on motorcycle. Set field control knob to open position.
4. Operate engine at 2000 RPM (approximately 40 MPH).
5. Slowly turn field control knob toward direct position until the ammeter reads 10 amperes.

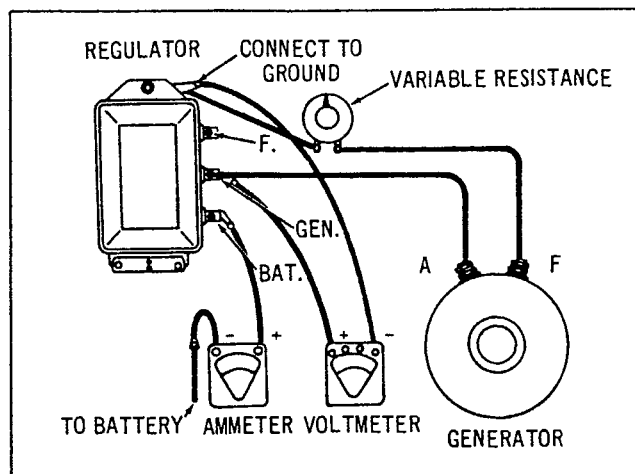


Figure 1.

If ammeter reading is as specified, generator is not faulty and difficulty is in regulator. Make regulator tests B, C and D.

6. If there is no ammeter reading or reading is low, observe voltmeter reading. If voltmeter reading is below 12 volts, generator requires service.

7. If voltmeter reading is high, over 15 volts, the cutout relay is not closing. Make tests B, C and D.

#### B. TESTING CUTOUT RELAY UNIT CLOSING VOLTAGE (THE SAME CONNECTIONS ARE USED AS IN TEST A (FIG. 1))

1. Turn field control variable resistor to open position.
2. Operate engine at 1500 RPM (approximately 30 MPH).
3. Slowly turn Field Control knob toward direct position to decrease resistance in field circuit. Voltmeter reading will increase slowly until cutout points close. Closing voltage will be highest voltmeter reading before meter pointer "kicks" to read battery voltage. After cutout points close, ammeter will indicate a current flow.

If closing voltage is not within 11.8 to 13.0 volts, adjust setting to 12.4 volts according to Delco Remy Service Bulletin No. 1R-119A.

### C. TESTING VOLTAGE CONTROL UNIT SETTING (FIG. 2)

1. Remove battery wire from regulator battery "BAT" terminal. Connect a 1/4 ohm resistor (not less than 25 watts) in series with the removed battery wire and the regulator battery "BAT" terminal.
2. Connect the positive lead of a voltmeter (0-15 volts) to the regulator "BAT" terminal, connect the negative lead to ground.
3. Remove wire from regulator field "F" terminal and connect a 25 watt variable resistance Field Control in series with the removed wire and the regulator field "F" terminal, turn control knob to direct position (no resistance).

Operate engine at 2000 RPM (approximately 40 MPH). Turn field control resistor knob to "Open" position then to "Direct" position to cycle regulator. Check voltmeter reading. Reading indicated on voltmeter is the voltage regulator setting of the upper contacts (shorting contacts). Voltmeter reading should be between 13.9 and 14.5 volts. Maintain engine speed, slowly rotate field control resistor toward "Open" position to increase resistance until voltmeter reading drops slightly and then remains steady. This indicates the voltage setting of the lower contacts (series contacts). The voltage reading on lower set of contacts should be 0.1 to 0.3 volts lower.

If voltage readings are not within specifications, replace regulator or service and adjust voltage unit setting to 14.3 volts according to Delco Remy Service Bulletin No. 1R-119A.

**IMPORTANT:** All final readings must be taken after regulator has reached operating temperature and with regulator cover in place.

### CAUTION

Never ground the 12 volt generator or regulator field terminal while these two units are connected and operating. This will burn up the upper set (shorting set) of contacts of the voltage control unit.

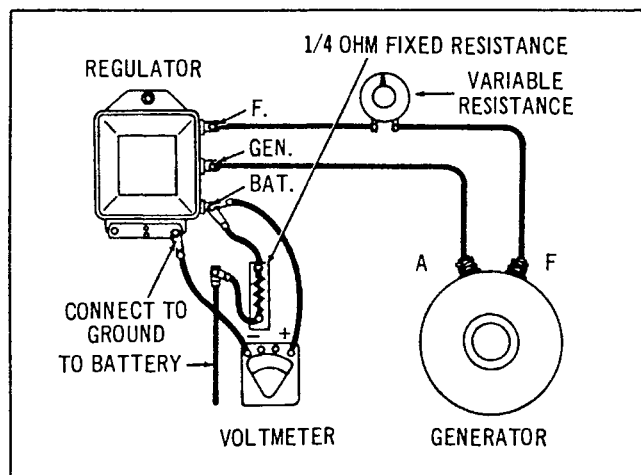


Figure 2.

### D. TESTING CURRENT CONTROL UNIT SETTING ON 3 UNIT REGULATORS (FIG. 3)

1. Remove battery wire from regulator "BAT" terminal and connect to negative lead of ammeter (0-30 amps). Connect positive lead of ammeter to regulator "BAT" terminal.
2. Connect positive lead of voltmeter to regulator battery "BAT" terminal and negative voltmeter lead to ground.
3. Turn on light and connect additional load to the battery to drop the voltmeter reading to one volt below voltage regulator setting.
4. Operate engine at 2000 RPM (approximately 40 MPH) and note reading on ammeter. If reading is not within 9.0 to 11.0 amperes, replace regulator or adjust to 10.0 amperes according to Delco Remy Bulletin No. 1R-119A.

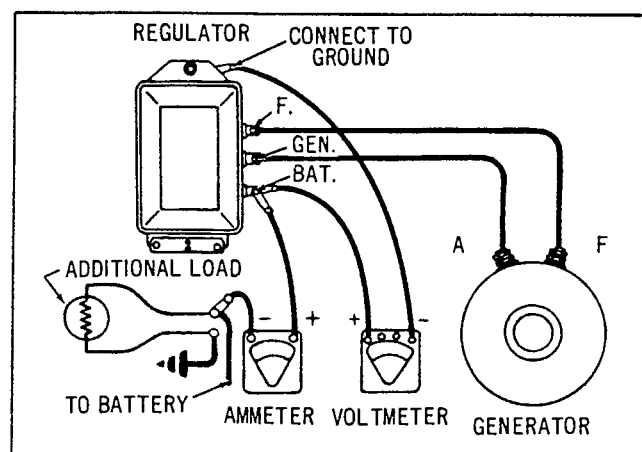


Figure 3.

### 1965 SPORTSTERS (Bosch Regulator)

#### A. TESTING GENERATING SYSTEM (FIG. 4)

1. Disconnect wire or wires from regulator battery terminal "B+". On XLH models, connect these wires together.
2. Connect one lead from 1-1/2 ohm resistor (not less than 100 watt rating) to the regulator "B+" terminal. Connect the other lead from the resistor to the Positive terminal of an ammeter (0-15 amp). Connect the negative ammeter lead to ground on motorcycle.
3. Connect the Positive lead of a voltmeter (0-15 volts) to regulator generator "D+" terminal, connect the negative lead to ground on chassis.
4. Disconnect wire from regulator field "DF" terminal and connect this wire to one lead of a field control variable resistor, connect other lead of the field control to ground on motorcycle chassis. Turn field control to "Open" position.

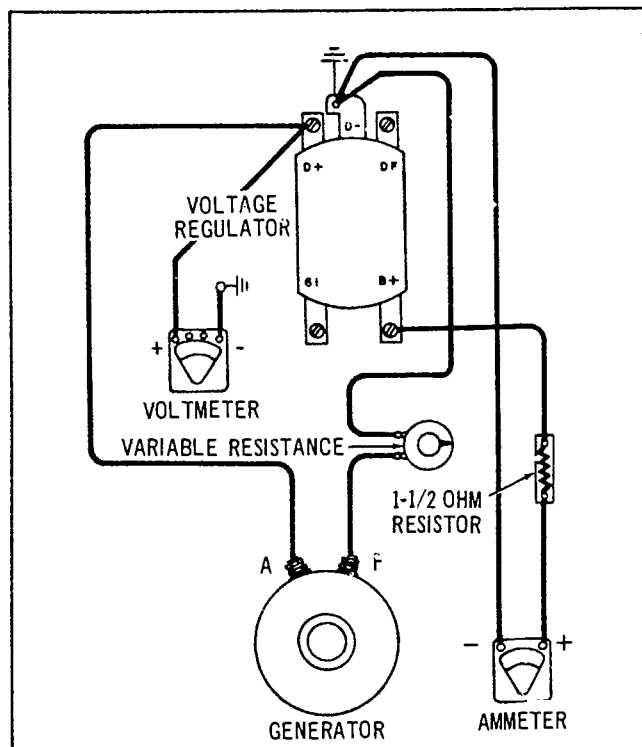


Figure 4.

5. Operate engine at 2700 RPM - (approximately 45 MPH).

6. Slowly rotate field control resistor knob toward the "Direct" position until ammeter reads 10 amperes, then immediately turn the control knob to "Open" position. If a reading of 10 amperes is obtained, generator is O.K. and any difficulty in the charging circuit is caused by a faulty regulator or defective wiring. Inspect wiring and make regulator test B and C. If a reading of 10 amperes cannot be obtained and voltmeter reading is below 12 volts, generator is in need of service.

If no reading is obtained on ammeter but voltmeter reading is 15 volts or higher, cutout relay is defective and regulator should be replaced.

#### B. TESTING CUTOUT RELAY UNIT CLOSING VOLTAGE - SAME CONNECTIONS ARE USED AS IN TEST A (FIG. 4)

1. Turn field control resistor knob to "Open" position.

2. Operate engine at 2000 RPM (approximately 35 MPH).

3. Slowly turn field control toward "Direct" position. As the resistance is decreased, the voltmeter reading will increase. Note the highest reading on the voltmeter before the pointer "kicks". This will be the relay closing voltage. Repeat operation a few times, each time returning the field control resistor to "Open" position. If the closing voltage is not within 12.4 to 13.1 volts, replace regulator.

#### C. TESTING VOLTAGE CONTROL UNIT SETTING (FIG. 5)

Two tests are required:

1. Testing regulator voltage setting under load.
2. Testing regulator voltage setting under no load.

##### Testing Voltage Setting Under Load

1. Make same connections as used to make previous Test B, except move positive voltmeter lead to regulator "B+" terminal. See Fig. 5.

2. Turn field control resistor to "Direct" position (no resistance in field circuit).

3. Operate engine at 2700 RPM (approximately 45 MPH) and note reading on voltmeter. This reading will be the voltage under load and should be from 12.7 to 14.5 volts at 10 amperes load.

##### Testing Voltage Setting Under No Load

1. Remove 1-1/2 ohm resistor used in previous load test from circuit by disconnecting grounded ammeter lead. Place field control resistor in Direct position (no resistance).

2. With engine running at 2700 RPM, note voltmeter reading. This reading will be the voltage at no load and should be from 13.8 to 15.4 volts.

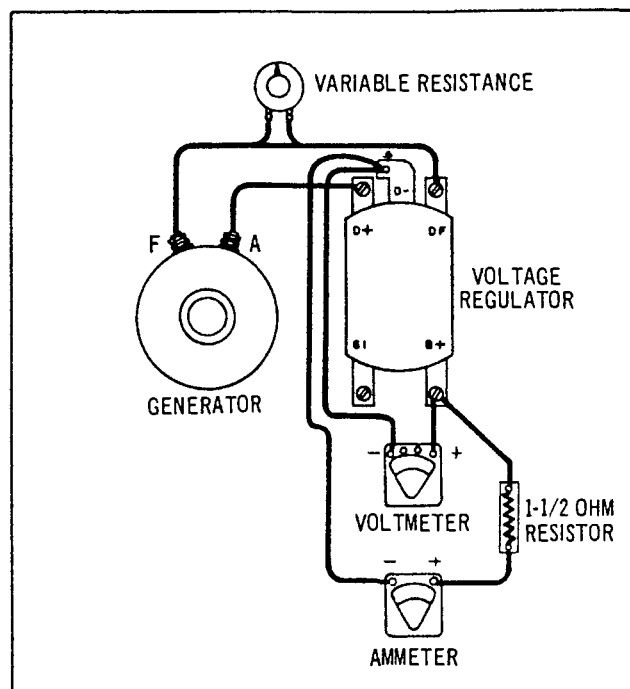


Figure 5.

Readings taken in Load and No Load tests must be within specifications or regulator should be replaced.

### **CAUTION**

It is advisable to "flash" field coils whenever wires have been removed from generator regulator; or after generator or battery has been removed and is reinstalled. This is done to make sure generator has correct polarity. If polarity of generator is reversed, relay points will vibrate and burn.

On battery systems, "flash" field coils by momentarily touching a jumper wire between "BAT" terminal and "GEN" terminal on regulator, after all wires have been properly connected and before starting engine.

On systems without battery, connect negative lead of outside battery to generator frame and flash positive lead to generator "A" terminal. The momentary surge of current from battery to generator will correctly polarize generator.

### SERVICING REGULATORS

#### Delco Remy Regulator

Faulty operation of Delco Remy regulators may be due to one or more of the following conditions:

1. Contact points dirty, oxidized or pitted.

After cleaning contacts, the air gaps and contact spacing must be adjusted. Information on the voltage regulator and cutout relay air gap and contact opening setting is contained in the Service Manual.

2. Ground wire broken (short braided wire between regulator base and mounting bracket).
3. Defective fuse (in holder near regulator).
4. Corrosion contamination on regulator internal parts.

After any faults have been corrected, regulating units must be adjusted according to Delco Remy Service Bulletin No. 1R-119A.

### BOSCH REGULATOR

Service or adjustment to internal parts of Bosch regulators is not recommended since contact spacing and air gaps are factory set. If tests indicate that the regulator is defective, it should be replaced and checked out in operation on the motorcycle.

#### NOTE:

Testing and service information on 6-volt electrical systems using the test equipment in this bulletin can be found in the 1965 Service Manuals.