

HONDA

CHARGING SYSTEM TROUBLESHOOTING

Identify the system to be tested.

Charge coil – used to charge the battery to operate the starter motor and other DC loads.

Lamp coil – used to power loads without the need for a battery.

Use the engine's model *and* type information and the parts catalog to determine the engine's charging system rated capacity.

Charging coil system typically contains:

- Battery (OEM)
- Switch (Honda or OEM)
- Fuse or circuit protection (Honda or OEM)
- Charge coil (Honda)
- Rectifier/regulator (Honda)
- Load(s) (OEM)

CHARGING SYSTEM INSPECTION

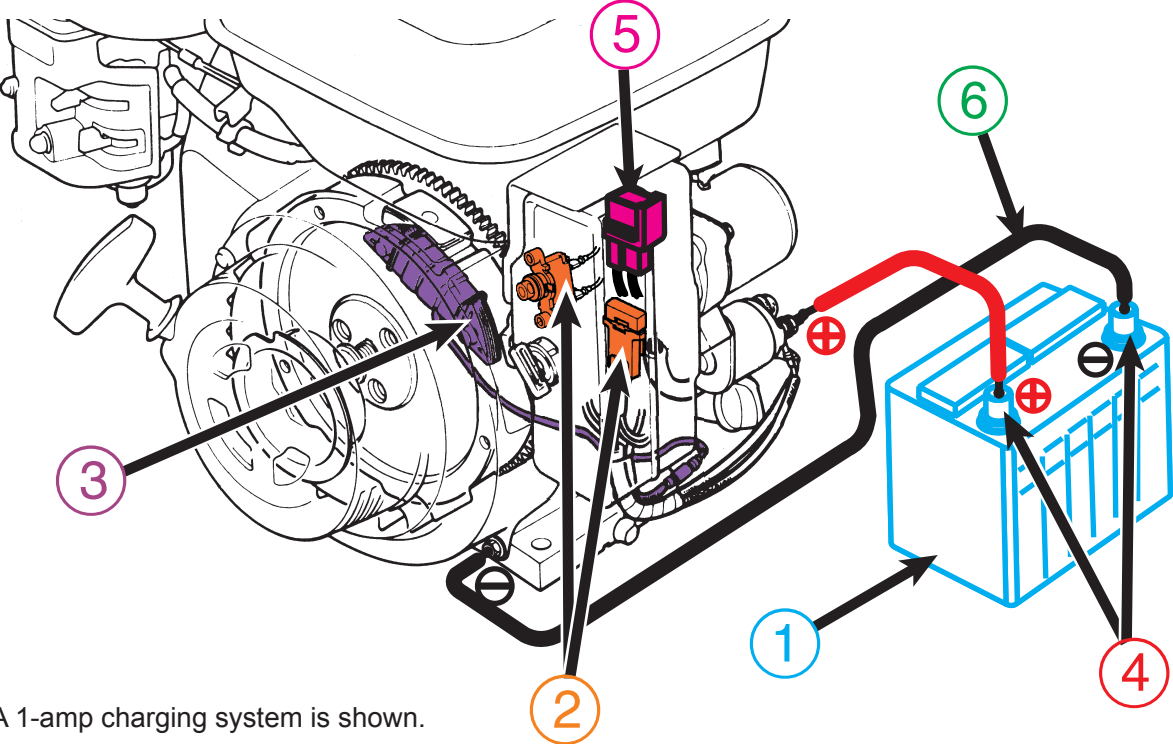
1. Isolate all loads from the battery before testing the charging system.
2. Perform steps ① ~ ⑥.

Lamp coil system typically contains:

- Lamp coil (Honda)
- Rectifier (OEM)
- Load(s) (OEM)

LAMP COIL SYSTEM INSPECTION

1. Perform only step ③ to verify that the lamp coil is functioning properly.
2. If OK, the problem is in the OEM's system.

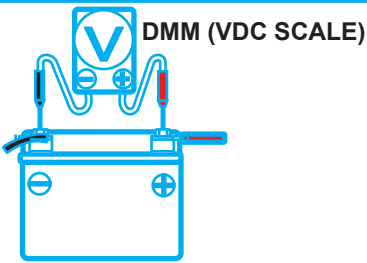


Charge Coil Specifications			Lamp Coil Specifications		
System	Resistance ()	VAC output (3,600 rpm)	System	Resistance ()	VAC Output (3,600 rpm)
1 Amp	3.0 ~ 4.0	58 ~ 62	6V/15W	0.21 ~ 0.27	7 ~ 8
3 Amp	0.20 ~ 0.93	24 ~ 28	6V/25W	0.09 ~ 0.15	7 ~ 8
7 Amp	0.10 ~ 0.20	28 ~ 32	12V/15W	1.24 ~ 1.44	14 ~ 16
10 Amp	0.16 ~ 0.24	24 ~ 28	12V/25W	0.36 ~ 0.46	14 ~ 16
18 Amp	0.12 ~ 0.16	26 ~ 30	12V/50W	0.18 ~ 0.23	14 ~ 16
20 Amp	0.08 ~ 0.12	34 ~ 38			

These readings were obtained using a Fluke® 88 DMM (Digital MultiMeter). Understand how to use your meter before conducting these tests.

① BATTERY TESTING

Begin with a fully charged 12-volt battery. Connect a DMM (Digital MultiMeter) as shown. With the meter set to measure DC volts, record the battery voltage.

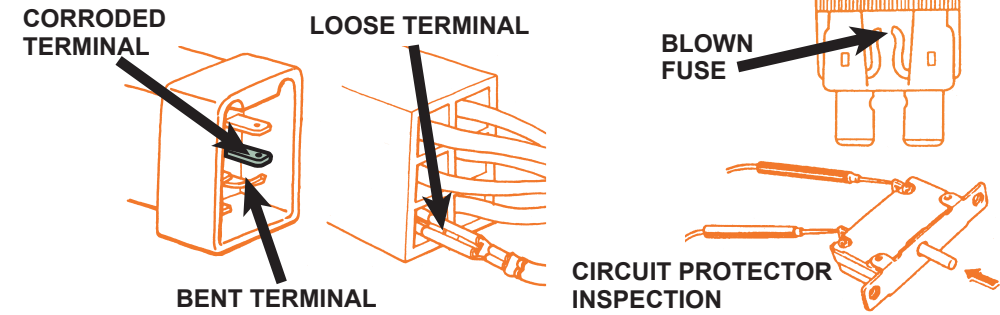


② VISUAL INSPECTION

Always check the easy things first. Check for problems on both the engine and the product powered by the engine.

- Check for broken, bent, or loose terminals.
- Check for corroded wires, connectors, or terminals.
- Check for a pinched, cut, or damaged wire harness.
- Check for a blown fuse or a defective circuit protector (always replace the fuse with the correct size).

If the new fuse blows after replacement, troubleshoot for a short circuit in the system.



③ CHARGE COIL OR LAMP COIL INSPECTION

The illustrations demonstrate charge coil inspection.

a. Locate and disconnect the coil (charge coil or lamp coil) wire connector(s).

b. Connect a DMM (set to measure AC volts) across the coil wires, or across the single coil wire and engine ground.

c. Start the engine and slowly raise the throttle to its normal maximum operating position while observing the voltage.

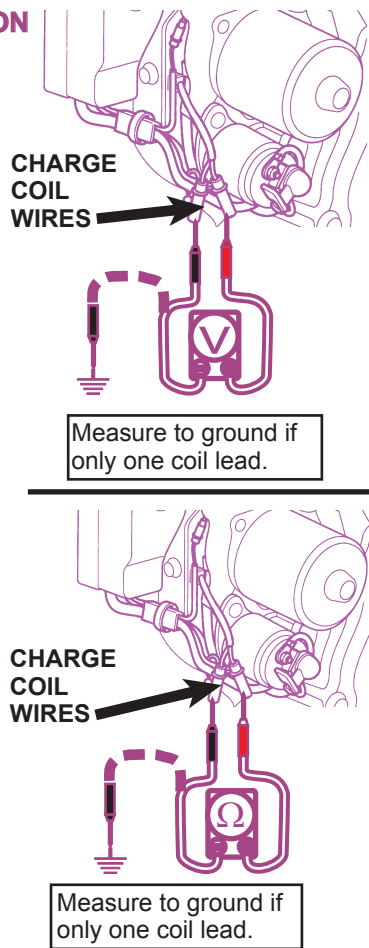
- The output voltage should start low at idle, then rise and level off at full throttle (see the table in the center column). If this is the case, the coil is functioning properly. Reconnect the wires and proceed to step ④.

• If the measured output voltage is low (or zero) and does not rise at full throttle, proceed to step "d."

d. Stop the engine. Use a DMM (set to measure ohms) and check the resistance of the coil (see the table in the center column).

- If the resistance is good but the output voltage is low, inspect the flywheel. If OK, replace the coil, reconnect the wires, and proceed to step ④.

• If the resistance is not normal and the output voltage is low or zero, replace the coil, reconnect the wires, and proceed to step ④.



④ OUTPUT TEST

a. Connect a DMM (set to measure DC volts) between the battery terminals as shown in step ①.

b. Start the engine and run at the maximum throttle position while observing the DC voltage.

c. With the engine still running, disconnect the DMM. Set the DMM to measure DC amps and connect the DMM to the battery as shown in step ⑥. Use a shunt if the system you are testing produces more current than your meter's DC amps rating.

d. Run the engine at its maximum throttle while observing the charging DC amperage output on your meter.

e. Check that the battery voltage and charging current meet the following specifications:

Units with a rectifier only:

- The battery voltage should rise above 13.0 VDC.
- Charging current should remain constant.

Units with a regulator/rectifier:

- The battery voltage should start low, then quickly rise and level off at approximately 14.5 VDC.
- Charging current should start high, and then begin to lower as the voltage approaches 14.5 VDC.

– If the above results are obtained, the charging system is OK and the problem is the battery. Replace the battery and perform step ④ again.

– If the above results are not obtained, proceed to step ⑤.

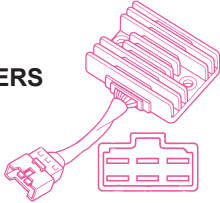
⑤ REGULATOR/RECTIFIER TESTING

• Inspect the rectifier by checking continuity following the inspection chart in the appropriate shop manual. Replace the rectifier if necessary and retest the system starting at step ④.

• Regulator/rectifiers have resistance tests in the appropriate shop manual. These tests are somewhat inconclusive because of the electronic regulation mechanism. If all other tests and inspections are made with no problems found, replace the regulator/rectifier with a known good one and retest the system starting at step ④.

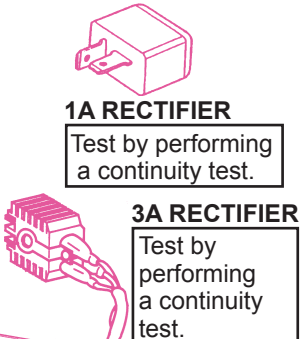
18A and 20A REGULATOR/RECTIFIERS

Install a known good regulator/rectifier and retest the system.



7A and 10A REGULATOR/RECTIFIERS

Install a known good regulator/rectifier and retest the system.



⑥ LOAD TEST

The following tests are performed when the charging system is operating normally but the battery discharges, either while the engine is running or while the engine is off.

a. Turn OFF the ignition switch, and connect a DMM (set to measure DC amps) as shown. Use a shunt if the system you are testing draws more current than your meter's DC amps rating.

b. Turn the engine switch ON and activate loads one at a time. Record the current draw of each load.

– If the total current draw of all the loads is less than the engine's rated charging capacity, the charging system can maintain the battery.

– If the total current draw of all the loads is more than the engine's rated charging capacity, the charging system cannot maintain the battery. Repair or replace the loads as needed.

c. With the ignition switch OFF, check for any parasitic current draw on the battery. A small amount of parasitic current draw (less than 0.02 mA) is normal.

If an abnormal parasitic draw is measured, disconnect loads one at a time while monitoring the parasitic draw. Repair as necessary.

d. Reconnect the negative (-) battery cable to the negative (-) battery terminal and perform the Output Test (step ④). If OK, return the equipment to the customer.

DMM (DCA SCALE)

