

CHARGING SYSTEM CHECKS

All you need is a \$20 voltmeter

Nothing is more aggravating than being all psyched up to go riding and finding out the bike's battery is dead. This happened to me one morning not too long ago when I wanted to take the Shovel out for a spin. As the starter made a feeble attempt to spin the engine, I found myself threatening to dismember the bike and turn it into a moped. Of course, this didn't make the engine start. What was needed was a healthy supply of 12-volt power from the battery.

When an owner finds the battery dead, the knee-jerk reaction is to either pop a charger onto the battery or just yank it and swap it for a new one. While these two options may fix most bikes temporarily, it will not fix some of them permanently. That's because sometimes the problem is not the battery, but a component of the charging system. Charging the battery or swapping it out will work only until the fresh electrical charge is depleted, seeing nothing new is being added as you tool on down the highway.

CHECKING THE SYSTEM

All you'll need to check the charging system is a cheap voltmeter (photo 1), which you can get at a Radio Shack or discount catalog company, and the manual for your bike. We did this check on my old Shovelhead, which has a 32-amp charging system.



1 All you need is a cheap voltmeter, which you can get at a Radio Shack or discount catalog company.



2 Attach the voltmeter, set to read DC voltage, to the bike's battery. The voltage read 12.70 volts when the bike was off and 12.38 volts when the engine was running. Not a good sign.

Start by recharging the battery. Once that is done, attach the voltmeter, set to read DC voltage, to the bike's battery with the bike's ignition switch off. The voltage should read above 12 volts. Ours read 12.70 volts.

Now fire off the engine and let the idle stabilize. Then bring the revs up to about 2000 rpm and read the voltmeter. If the charging system is working correctly, the voltmeter will indicate about 14 volts. If, however, there is a problem, the reading will be around 12 volts, or less. Ours was 12.38 volts (photo 2).

If your reading was low, the next step is to see if the culprit is the alternator or regulator (sometimes it's both). Pull the regulator plug from the engine's case (photo 3) so you can hook up your voltmeter, set to read AC voltage. (The alternator puts out alternating voltage, not DC voltage.) Be very careful not to let the voltmeter clips touch the metal of the engine case or each other. Slip the clip's plastic insulating boots over the clips to prevent this from happening as you rev the engine.

On my Shovel, the unregulated alternator should put out about 45 volts at 2000 rpm. The voltmeter showed 44.1, which was good (photo 4). That meant the alternator was good and the regulator was the problem. If, however, the voltage output was lower than what the manual called for, the alternator would have to be pulled, checked, and the stator or rotor (or both) replaced, which involves removing the entire primary system.

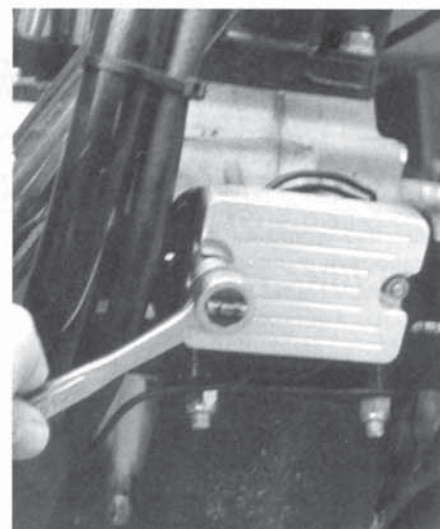
Thankfully, changing out a regulator is a simple affair. On the Shovel, it's mounted right in front of the engine on its own bracket. In fact, it took longer to thread the new regulator's power wire to the battery than to swap out the regulator. We used a new polished Compu-Fire Elite 1 regulator (photo 5) for 32-amp charging systems. This unit bolts right to the stock



3 The next step is to see if the culprit is the alternator or the regulator. Pull the regulator plug from the engine's case so you can hook up your voltmeter, set to read AC voltage.



4 Our voltmeter is reading 44.1 volts, which is what the bike's manual says it should be at 2000 rpm. That means the regulator is the bad component.



5 We used a new Compu-Fire Elite 1 regulator for 32-amp charging systems. This unit bolts right to the stock mounting location and looks much better than the stock regulator.

mounting location and looks much better than the stock regulator. Compu-Fire makes Elite 1 regulators for all alternator-equipped H-Ds.

Once the regulator was in place, we ran the test again to make sure the proper voltage was being sent to the battery. If you had to change something on the alternator, retest the system to see if the regulator is working properly. A bad regulator may have burned out the alternator by pulling too much power from it, which would be indicated by a very high voltage reading at the battery when the engine is running. A regulator that's bad this way will also kill a battery. **AIM**

Battery Don'ts

Resist the urge to jumpstart the bike with your car's battery. The higher amperage of your car battery will probably damage the bike's battery.

Contrary to popular belief, a bike's charging system will not replenish the battery as you ride. It will only put a surface charge in the battery, which will quickly disappear with some extended cranking during a hot start. The only way to get a full charge into the battery is with a battery charger. ■

Regulators

There is a difference between Compu-Fire regulators and conventional units. A conventional shunt circuitry regulator grounds the alternator's stator output at full battery charge. This creates unnecessary heat and engine drag.

The Compu-Fire line of voltage regulators features series-type circuitry, which unloads (turns off) the alternator's stator output when the battery is charged. These regulators are calibrated at the factory to .01-volt accuracy, and the output matches the charging requirements of maintenance-free batteries. ■

SOURCES

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