

Don't Ruin 'Perfectly Good' CS Generators

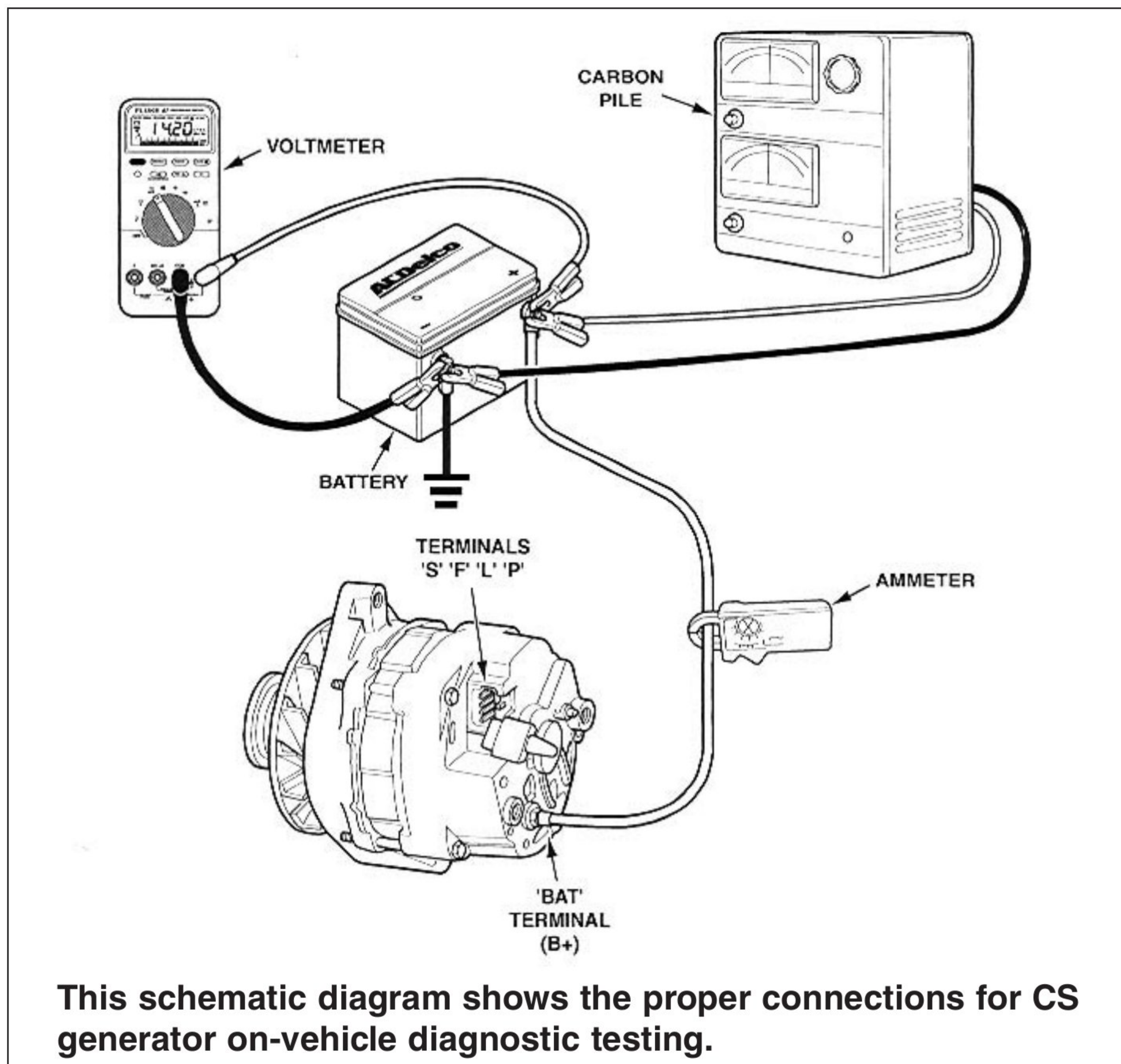
Courtesy AC Delco

Imagine this scenario: A technician is faced with a no-charge condition on a 2000 Aurora, equipped with a CS-series generator. After finding very low voltage and current output at the generator, he feeds full battery voltage directly into the L-terminal. The generator begins to charge for a few seconds then suddenly stops. The technician concludes that the generator is bad and installs a replacement unit. Case closed. Or is it?

Here is the plain and ugly truth: the generator was indeed ruined but not because it was defective—the technician killed it. Many CS-series generators returned for warranty are “dead on arrival” as a result of the improper practice of feeding battery voltage directly to the generator L-terminal. This practice typically will ruin a perfectly good CS-series generator almost instantly.

Some CS generators are equipped with a new all-silicone voltage regulator (ASVR). The ASVR regulator is actually a computer chip. Computer components run on very low voltage and they are quite sensitive to abnormally high loads. The ASVR was designed to work with various lamp bulb loads or computer interfaces. As a result, methods and techniques of external testing of the CS generators have changed dramatically and are extremely important to revise old practices.

Because it is important to understand proper charging system operation, always refer to the appropriate vehicle service manual when diagnosing a charging system concern. On most late model vehicle applications, the powertrain control module (PCM) is in control of the voltage regulator. If the PCM detects a fault in another vehicle system, the PCM may be calibrated to shut down the generator operation. This result can, in fact, be a perfectly normal condition. The correct approach would be to use a scan tool to determine whether the PCM has disabled the generator operation. Consult service



information and repair procedures for the vehicle being repaired.

On-Vehicle Testing

The following checklist provides a consistent, comprehensive procedure for on-vehicle CS generator testing. The procedure will prevent misdiagnosis and accidental damage to the voltage regulator or generator.

All Vehicles

Visual Inspection

- Check related wiring for poor connection, which may cause a short, ground or open condition.
- Check for a loose generator belt.
- Check the battery's state of charge and open circuit voltage greater than 12.2 volts.

Vehicles w/Charge Indicator Lights (Except Those with PCM or BCM Control Features)

Switch ON, engine OFF, light OFF

1. With the ignition switch on, disconnect the harness connector at the generator.
2. Attach J-41450-B CS generator tester harness to the generator and the battery per directions supplied with tester. Start the engine and run at 2,000 to 2,500 rpm.
 - If the generator produces more

than 50 percent of the rated output, the generator is working as designed. Verify the battery state of charge and continue with vehicle circuit operation in step 3.

- If the generator does not produce sufficient output, replace the generator per existing policy and replacement procedures and verify vehicle circuit operation in step 3.
 - Stop the engine, turn the ignition key off.
3. Vehicle circuit operation—
- Detach harness connector from generator.
 - Ground the “L” terminal circuit of the harness connector with a 5-amp fused jumper lead.
 - If light comes on, repair or replace the generator per existing policy and replacement procedures.
 - If light remains off, the circuit between the terminal and ignition switch is open—the open may be the bulb itself or other related harness connections.

Engine running at 2,000 to 2,500 rpm, light ON

1. Stop the engine, turn switch to ‘run’ position.

2. Detach the wiring connector at the generator.

- If light stays on, check for a grounded “L” terminal circuit in the harness. After correcting any problem found in the wiring harness, recheck generator output.
- If light goes off, repair or replace the generator per existing policy and replacement procedures.

Vehicles Without Charge Indicator Lights (And Those with PCM or BCM Controlled Generators)

1. Install scan tool and start engine.
 - Locate generator control parameter on scan tool data list.

If generator command is ‘off’ or ‘disable,’ refer to vehicle service information. (Note: PCM has disabled generator operation, determine possible fault in nongenerator-related systems or circuit.)

If generator command is ‘on’ or ‘enabled,’ continue with step 2.

2. Detach the wiring connector from the generator.
3. With switch on, engine off, connect voltmeter from the ground to “L” terminal (if present) and to “I” terminals (if present).

- Reading should be close to battery voltage.
- A zero reading indicates an open or grounded circuit. After correcting any problem found in the wiring harness, recheck generator output.

Vehicles in Which the Charging System Seems to be Operating Normally or Overcharging (With or Without Body Module)

1. Connect an ammeter to the generator output terminal (or inductive probe) and a voltmeter at the battery.
2. With the generator connector attached, run the engine at 2,000 to 2,500 rpm and measure voltage across the battery.
 - If the reading is above 16 volts, repair or replace the generator per existing policy.
3. At 2,000 to 2,500 rpm, turn on electrical accessories and load the battery with a carbon pile tester to obtain maximum amperes output. Maintain voltage at 12.5 to 13 volts.
 - If output is within 15 amps of generator output, the generator is good.

- If not, repair or replace the generator per existing policy and replacement procedures.
- If output is still not within 15 amps of generator output, recharge or replace battery and recheck.

