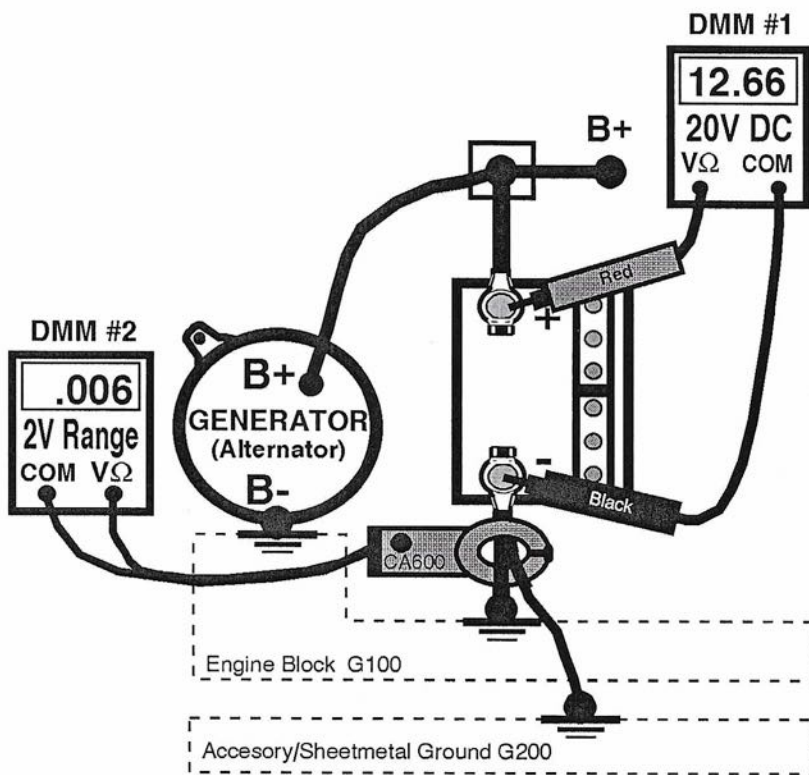


Electrical System Parameters



1. The Heart and Soul of Electrical System

A crucial symbiotic relationship exists between the vehicle battery and the vehicle generator (alternator). This is important to understand for a vehicle's reliable performance and trouble-free operation over time.

This Schemation illustrates wiring and electrical current paths between the battery and generator. These connections become crucial paths for electron current to flow between the battery and generator. Some paths use a connecting wire or cable and others use connections to the engine block. Some connect to sheet metal and are referred to as ground connections. Trace each electron path as was covered in Page #1.

The positive terminal of the battery, (B+), connects the generator positive terminals (B+) through a heavy duty cable. Battery negative terminal (B-) connects to the engine block with a heavy duty ground battery cable. Generator negative terminal connects to the engine block through its mounting bracket bolt. A negative cable is not needed. The engine block is a great ground electron path.

2. Voltage and Electron Current

Every vehicle circuit has voltage in units of volts or millivolts and electron current in units of amps and milliamps. Known good volts and amps values are called **circuit parameters**. Good parameters must be known to determine if a circuit is working properly or has a problem. Testing the volts and amps in a circuit and comparing readings with known good parameters, identifies problems when readings are too high or too low from normal.

Three Electrical Modes of Vehicle Operation

The **1st mode** occurs when vehicle is parked.

The **2nd mode** occurs cranking the engine.

The **3rd mode** occurs during engine run.

What are acceptable voltage and current parameters for each mode? Veejer provides training that explains these parameters. (See **SHORTCUTS**)

I began to discover what these parameters back in 1968 by running quick electrical tests on vehicles I just repaired and knew they were in good electrical shape. In those early days I could not find parameters I needed were published anywhere. So I started to learn and record them for myself and now have recorded them in my training programs now available. In other words:

"CHECK KNOWN GOOD CIRCUITS!"
YOU DO THE SAME TO LEARN PARAMETERS!

3. DMM #1 Measuring System Voltage

Every vehicle circuit has specific parameters for each mode to indicate good, bad, borderline, too high or too low which indicates a problem.

Parked: Battery State of Charge (DMM#1)

Cranking: Battery Cranking Voltage (DMM#1)

Engine Run: Charging Voltage (DMM #1)

Each parameter if too low or too high creates problems with vehicle performance and causes "repair comebacks" which costs time and money.

4. DMM #2 Measuring System Electron Current

IMPORTANT: Place the Current Clamp as to **surround all wires and cables** connected to the battery negative post. No wire or cable is left out during this test. Current clamp will algebraically add all currents flowing through the wires (DMM#2).

Parked: Only key-off drain is in this reading but should be too low to provide a reading.

Cranking: Cranking amps reflects cranking circuit condition. If too high it indicates mechanical problems with starter circuit. Low parameter shows a weak battery, too high OK if very cold.

Engine Run: Indicates the charging voltage from generator. Normal range, too low - too high varies between make and model. Test every vehicle for charging voltage to learn proper parameters.

Veejer's book "**Vehicle Electrical Troubleshooting SHORTCUTS**" covers these topics and more. Explains parameters, too high - too low - how to test and troubleshoot these circuits. **Order at www.veejer.com**

Figure 06-2026 Electrical System Parameters

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