

POSITIVE CIRCUIT CHECK FOR PROPER OPERATING VOLTAGE

To check the positive side of the circuit, two factors must be considered when checking operating voltage. The operating voltage for vehicle systems varies depending on whether it is a 12 or 24 volt system and the mode of operation the vehicle is in (engine off or engine run).

VOLTAGE WITH ENGINE NOT RUNNING:

If the engine is not running and the key is ON, the operating voltage available to vehicle systems is battery voltage, either 12.6 volts (12 volt battery system) or 25.2 volts (24 volt battery system). If the key remains ON and vehicle systems operate off the batteries, the battery voltage will begin to drop as the batteries discharge. If this condition is allowed to continue the batteries discharge to the point they cannot start the vehicle. When checking operating voltage during a troubleshooting procedure and finding low voltage, such as 12.2 volts (24.4 volts) or less, recognize that the batteries are getting so low that a no start condition could exist.

PROTECT BATTERIES WITH ENGINE OFF:

To continue troubleshooting with the engine not running connect a 5 amp battery charger to the battery terminals. This will power up vehicle circuits, trickle charge the batteries preventing further discharging.

VOLTAGE WITH ENGINE RUNNING:

The charging voltage becomes the operating voltage for the vehicle. The operating voltage will rise to about 13.8-14.5 volts for 12 volt systems and to about 27.6-29.0 volts for 24 volt systems.

Follow these guidelines when checking operating voltage. Refer to Figure 1.

1. Use a high quality DVOM (digital voltmeter) to measure amplitude of operating voltage where it enters the circuit or component.
2. Confirm that the DVOM has a good ground connection. If the DVOM is not properly grounded the voltage reading will be lower than normal causing a false indication of true circuit voltage. The best point to ground the DVOM is at the negative terminal of the battery pack using an extended ground cable connected to the COMM jack on the DVOM.

3. Be sure the circuit to be tested is in the operating mode so that excessive voltage drops in the operating side of the circuit can be detected.

4. Do not rely on test lights to check operating voltage. They won't verify proper voltage amplitude and will not reveal voltage drops in the operating voltage side of the circuit. A test light can't tell the difference between 12.6 or 14.5 volts and may even damage sensitive electronic circuits containing solid-state components.

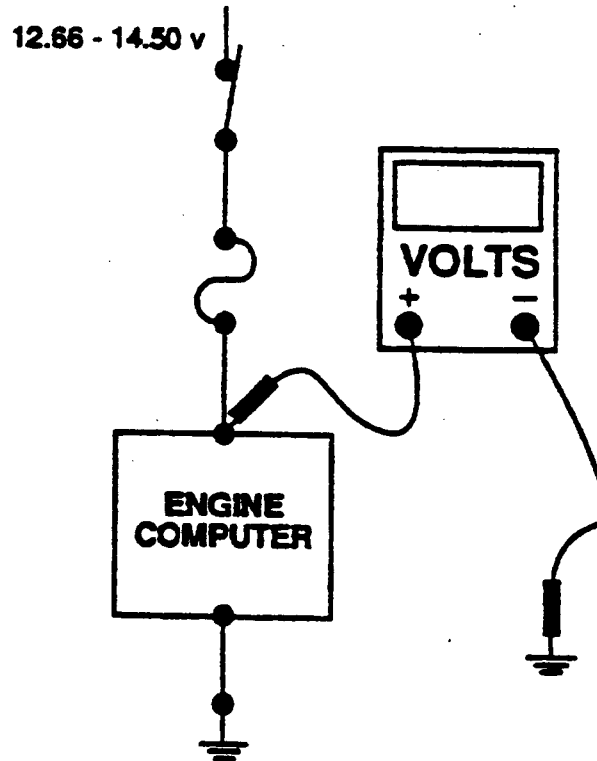


Fig. 1