

MAXIMUM ACCEPTABLE VOLTAGE DROPS

Voltage drops are a direct result of the circuit's resistance to high current passing through the part of the circuit between the DVOM (digital volt ohmmeter) test leads. The higher the resistance, the higher the voltage drop present.

When measuring circuit connections and cables for a voltage drop certain voltage drops are acceptable. It therefore becomes necessary to establish what is an acceptable voltage drop, and what is not.

The Society for Automotive Engineers (S.A.E.) recommends maximum voltage drops in SAE J541A. This is accepted by the Truck Maintenance Council (T.M.C.) in RP 105A-3. The T.M.C. limits apply to truck and heavy duty equipment, and list the voltage drop per 100 amps of current. A detailed listing of voltage drops is available from those two reports.

The following table list maximum voltage drops for both 12 and 24 volt systems that reflect maximum values given in SAE and TMC specs. This will simplify using voltage drops to distinguish between a good and excessive voltage drop reading. The readings given are in hundredths of a volt (0.00v) which is possible with most DVOMS.

Recommended Maximum Voltage Drops

12 volt systems

- 0.09** volts for small wire connections
- 0.12** volts for high current grounds (0.12v per 100 amps)
- 0.15** volts for battery/starter cables (0.075v per 100 amps)
- 0.30** volts for switches and solenoid contacts
- 0.06** volts -- super heavy duty (0.06v per 100 amps)

24 volt systems

- 0.09** volts for small wire connections
- 0.24** volts high current grounds (0.20v per 100 amps)
- 0.40** volts for battery/starter cables (0.20v per 100 amps)
- 0.60** volts for switches and solenoid contacts

Indicating Voltage Drops In Diagrams

When maximum voltage drops are indicated, both 12 volt and 24 volt system levels are usually listed.

The maximum 12 volt level is given first, followed by a / (slash) and the maximum 24 volt level.

Example: "(max)0.1v/0.2v". The first voltage is 0.1 volt and refers to the maximum voltage drop for a 12 volt system followed by the slash and 0.2 volts maximum for the 24 volt system.