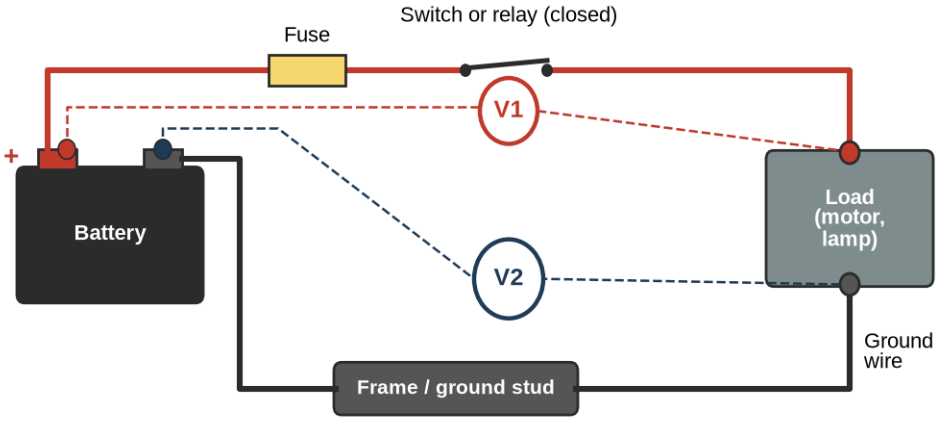
Voltage Drop Testing Cheat Sheet

Loaded tests of the power and ground sides of any circuit. Values are typical only; the OEM service information governs.

Voltage drop test points, power side and ground side



V1 Power side

Battery + post to the load + terminal, circuit ON and carrying current

V2 Ground side

Load ground terminal to the battery negative post, circuit ON

Red lead on the side nearer battery +. Normal reading is near 0 V. Move leads junction by junction to split.

The meter reads the voltage lost across whatever is between its leads. With the circuit working, a good wire or connection reads close to 0 V.

Tools needed

- Digital multimeter with min/max record (a 2 V or auto-range setting reads tenths and hundredths)
- Test leads long enough to reach from the battery to the load
- Back-probe pins; battery charger or tester
- Original equipment manufacturer (OEM) service information: wiring diagram, circuit current, drop limits

Safety

The circuit must be on and carrying current. With no current flowing, even a broken connection reads 0 V drop.

Batteries vent hydrogen. No sparks; wear eye protection. Keep leads away from belts, fans and the starter.

For cranking tests, disable fuel per OEM so the engine does not start.

Do not pierce insulation to back-probe.

Step-by-step procedure

1. **Start with a good battery.** Charge and test it. A weak battery hides or adds drops.
2. **Turn the circuit on.** Load it the way it fails (motor running, lamps on, engine cranking).
3. **Read voltage at the load.** Across the load terminals, compare to battery voltage. A big gap means resistance on the power side, the ground side or both.
4. **Power side (V1).** Red lead on battery +, black on the load + terminal.
5. **Ground side (V2).** Red lead on the load ground terminal, black on battery negative.
6. **Split the high side.** Move the leads across each junction in turn: fuse, relay contacts, connector, splice, ground stud. The high reading sits across the bad part.
7. **Repair and retest** under the same load. Clean, tighten or replace the terminal or cable.

Typical limits (rules of thumb)

Across	Typical good	Notes
One connection or terminal	About 0.1 V or less	Many good joints read a few millivolts
Switch or relay contacts	About 0.2 to 0.3 V	Higher: burnt contacts
Small circuit ground side	About 0.2 V or less	Lamps, motors, modules
Cranking, each side	Under about 0.5 V	Battery + to starter battery positive (B+); housing to battery negative
Sensor and engine control module (ECM) grounds	Under about 0.1 V, good ones under 0.05 V	Low current, so small drops matter

Why an ohmmeter misses it

- An ohmmeter pushes only milliamps. One strand of wire or a corroded terminal can read near 0 ohms and still fail to carry the amps the load needs.
- Small resistance costs volts under load: 0.05 ohm at 10 A loses 0.5 V, and at 200 A cranking it loses 10 V. Most meters cannot resolve 0.05 ohm reliably.
- A voltage drop test runs the circuit live, in place, without unplugging anything.
- A negative reading only means the leads are reversed. Read the number.
- 24 V systems: use the OEM limits.

Always verify against the OEM wiring diagram and service information for the vehicle.
Learn a structured diagnostic process with Mechanic Mindset training.