

121 -2 BATTERY, STARTER, ALTERNATOR

To check static current draw

If the battery discharges over time, there may be a constant drain or current draw on the battery. A small static drain on the battery is normal, but a large drain will cause the battery to quickly discharge. Make a static current draw test as the first step when experiencing battery discharge.

1. Make sure ignition and all electrical accessories are switched off.
2. Disconnect battery negative (-) cable.
3. Connect a digital ammeter between battery negative post and negative battery cable to measure current. See Fig. 1.

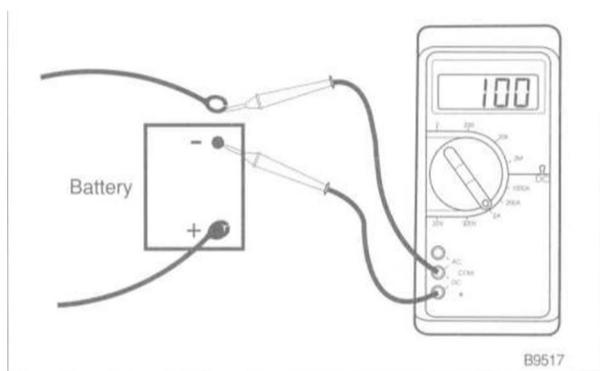


Fig. 1. Electrical system static current draw being measured.

A range of about 0 to 100 milliamps is normal, depending on the number of accessories that need constant power. A current of 500 milliamps (0.5 amp) or more may indicate a problem. To determine the circuit or component causing the problem, remove one fuse at a time until the current drops to a normal range.

Battery Open-Circuit Voltage Test

Before making the test, load the battery with 15 amps for one minute with a battery load-tester or turn on the headlights for about one minute without the engine running. Then disconnect the battery negative (-) cable and connect a digital voltmeter across the battery terminals. Open-circuit voltage levels are given in Table a.

If the open-circuit voltage is OK but the battery still lacks power for starting, make a load voltage test. If the open-circuit voltage is below 12.4 volts, recharge the battery and retest.

Table a. Open-Circuit Voltage and Battery Charge

Open-circuit voltage	State of charge
12.6V or more	Fully charged
12.4 V	75% charged
12.2 V	50% charged
12.0 V	25% charged
11.7 V or less	Fully discharged

Battery Load Voltage Test

A battery load tester is required for a load voltage test. The test is made by applying a high resistive load to the battery terminals and then measuring battery voltage. The battery should be fully charged for the most accurate results. Disconnect the battery cables when making the test. If the voltage is below that listed in Table b. the battery should be replaced.

WARNING —
Always wear protective goggles and clothing when performing a load test.

Table b. Battery Load Test-Minimum Voltage
(apply 200 amp load for 15 seconds)

Ambient temperature	Voltage
80°F (27°C)	9.6 V
60°F (16°C)	9.5 V
40°F (4°C)	9.3 V
20°F (-7°C)	8.9 V
0°F (-18°C)	8.5 V

STARTER TROUBLESHOOTING

If the starter fails to operate when the ignition is in the start position, check the starter wires, terminals, and ground connections for good contact. To make the most accurate check of the battery cables and starter wiring, make a voltage drop test on the cables and wiring as described in 600 Electrical System—General.

NOTE —
Repeat starter motor failure may be caused by a faulty ignition switch. A faulty switch can cause the starter to continue to run after the key is released.

Check for battery voltage at terminal 50 of the starter motor with the key in the start position. See Fig. 2. If voltage is not present, check the wiring between the ignition switch and the starter terminal. If voltage is present and no other visible wiring faults can be found, the problem is most likely internal in the starter motor.