

## TESTING (Continued)

**Battery Drain Test****With Clamp-On DC Ammeter****Test Procedure**

1. Turn the ignition to the OFF position and make sure there are no electrical loads. After determining that the underhood lamp is turning off properly, disconnect the bulb.
2. Clamp the meter clip securely around positive or negative battery cable (all cables if two or more lead to post).

NOTE: Do not start vehicle with clip on cable.

**Test Conclusion**

The current reading (current drain) should be less than 0.05 amp. If it exceeds 0.05 it indicates a constant current drain which could cause a discharged battery. Possible sources of current drain are vehicle lamps (underhood, glove compartment, luggage compartment, etc.) that do not shut off properly.

If the drain is not caused by a vehicle lamp, remove fuses from the fuse panel, one at a time, until the cause of the drain is located. If drain is still undetermined, remove fusible links one at a time at the power distribution box to find the problem circuit.

**With Voltmeter**

This test requires a digital volt-ohmmeter with an appropriate low voltage scale such as Rotunda Digital Volt-Ohmmeter 007-00001 or equivalent. The meter must read within 0.01 millivolt. Also required is a shunt assembly similar to that shown in the illustration.

**Test Procedure**

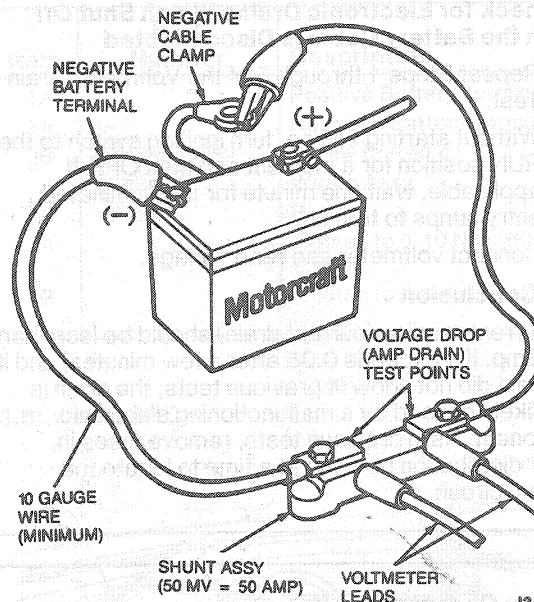
1. Turn ignition switch to the OFF position and make sure there are no electrical loads. After determining the underhood lamp is turning off properly, disconnect the bulb.
2. Check battery voltage. If voltage is under 11.5 volts, charge the battery to above 11.5.
3. Disconnect negative battery cable.

NOTE: When the battery is disconnected and reconnected, some abnormal drive symptoms may occur while the powertrain control module (PCM) relearns its adaptive strategy. The vehicle may need to be driven 10 miles or more to relearn the strategy.

4. Connect shunt assembly as shown.

**CAUTION: Do not crank the engine, it could destroy the shunt. Also do not use the shunt to measure starting currents.**

5. Set volt-ohmmeter to 200 or 300 mv scale for an accurate reading (must be within 0.01 millivolt).
6. Connect meter leads to shunt as shown. With this size shunt (50 mv = 50 amps) and meter, a direct current drain measurement can be made.

**Test Conclusion**

The current reading (current drain) should be less than 0.05 amp. If the reading is between 0.2 and 0.9 a possible drain may be a vehicle lamp (glove compartment, underhood, luggage compartment, etc.) that does not turn off. If the problem is not a lamp, remove the fuses from the fuse panel one at a time until the cause of the drain is located. If drain is still undetermined, remove fuses one at a time at the power distribution box to find the problem circuit.

**To Test Vehicles with Major Key-Off Loads such as Air Suspension or Load Leveling**

Vehicles equipped with these features will have temporary current drains that may last up to 70 minutes after ignition is switched OFF. These drains can range from 0.1 to 20 amps if the compressor is cycling. This action can often mask a problem and must be considered when evaluating test results. To test for this kind of drain proceed as follows.

1. Repeat Steps 1 through 5 of the battery drain test.
2. Turn ignition to RUN for a moment and then OFF again.
3. Disconnect major key-off load circuits.
4. Make sure illuminated entry is off, if applicable.

**Test Conclusion**

The current reading (current drain) should be less than 0.05 amp. If it is higher, disconnect fuses and fusible links as in the previous test to locate the problem circuit.

If the drain is less than 0.05 amps, reconnect the major key-off load circuits, turn ignition to RUN and then OFF, and wait 70 minutes to make sure they shut off properly. If current drain is still greater than 0.05 amps after 70 minutes, disconnect each of the components one at a time until the cause of the current drain is located.