VOLTAGE DROPS IN CABLES

A heavy duty cable is shown in Figure 1 with a break in the individual wires of the cable. Notice several strands are not making contact but the break is covered by the insulation. The break greatly reduces the high curtent-handling capability of the cable because there are less paths for current to pass through the cable.

Figure 1

Only two strands are left to pass the high current The interrupted paths, represented by the broken wires, force the current to flow through the remaining strands. This presents substantial resistance to high current levels passing through the remaining cable strands.

An ohmmeter cannot detect these broken wires because either of the two remaining strands can easily pass the ohmmeter test current. The ohmmeter will read 0.0 ohms. This shows another reason why the ohmmeter is not a valid test to look for cable resistance that would produce voltage drops.

In Figure 2 the cable problem is illustrated electrically as it appears to high current flowing through the cable.

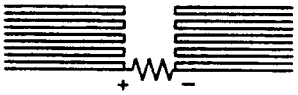

Figure 2

The resistance offered by the two remaining strands to the high current develops a voltage drop. It can be detected by a DVOM, as long as, the normal high current of the circuit is flowing when the voltage drop measurement is made.

If the DVOM is placed across the section of cable with the brake the DVOM reveals a voltage drop directly proportional to the current and resistance present in the cable. This is shown in the electrically equivalent diagram of Figure 3.

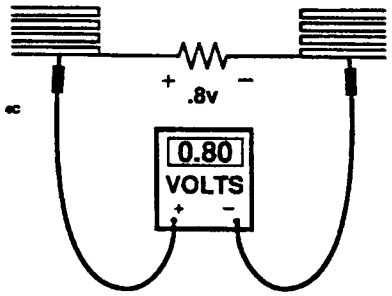

Figure 3