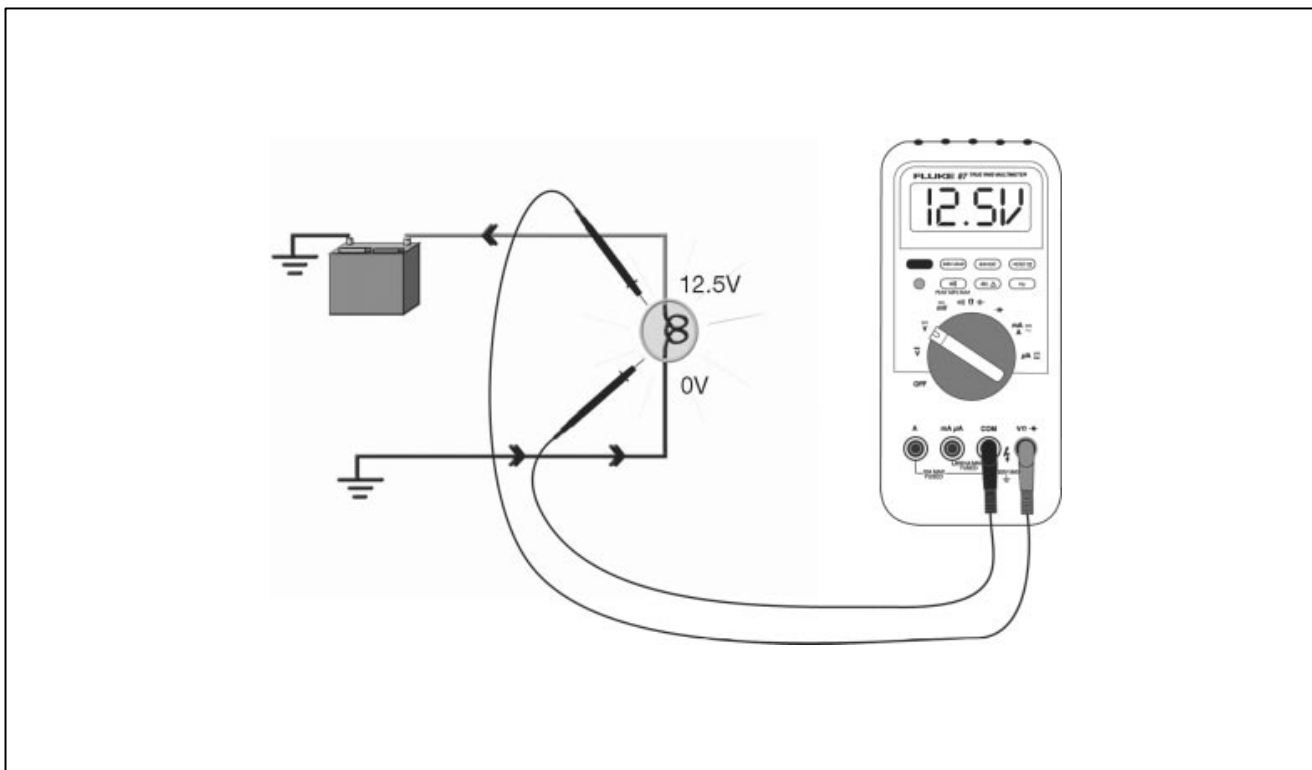


Section 1

Electrical Circuit Theory



- Learning Objectives:**
1. Review the basic electrical concepts of voltage, amperage, and resistance.
 2. Review the components of a basic automotive electrical circuit.
 3. Introduce basic wiring diagram symbols.
 4. Review the characteristics of voltage, amperage, and resistance in series and parallel circuits, showing how they are used when diagnosing electrical problems.
 5. Show how series-parallel circuits are used on the vehicle.
 6. Introduce the basic electrical diagnostic tools.



Notes

Introduction The first step in being able to effectively diagnose electrical problems is to have a good understanding of basic electrical principles. These concepts were covered in depth in the L623 course. In this course, we will be reviewing each of them with emphasis to their on-car applications and how these concepts are applied when you are diagnosing an electrical problem.

Electrical Circuit Diagnosis Course L623

Course L623 covered the "basics" of electrical. This course will expand on those concepts and apply them directly to the on-car diagnostic process.

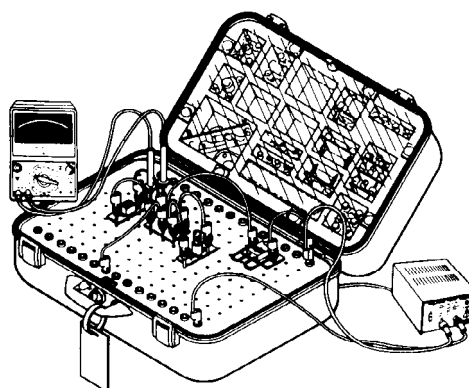


Fig. 1-1
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Voltage Simply put, think of voltage as **electrical pressure** or pressure differential. The difference in pressure that makes any hydraulic pump work is virtually the same for electrons. The pressure differential provided by the positive and negative terminals of the battery causes the electrons in a conductor to move when the two terminals are connected together.

This movement or flow of electrons is used to perform useful work. Whenever work is done, pressure is used up. We can measure where work is done in an electrical circuit by measuring where voltage is used up.

Voltage as Pressure

Like the pressure/suction that a pump provides a fluid, a battery or alternator provides for an electrical circuit.

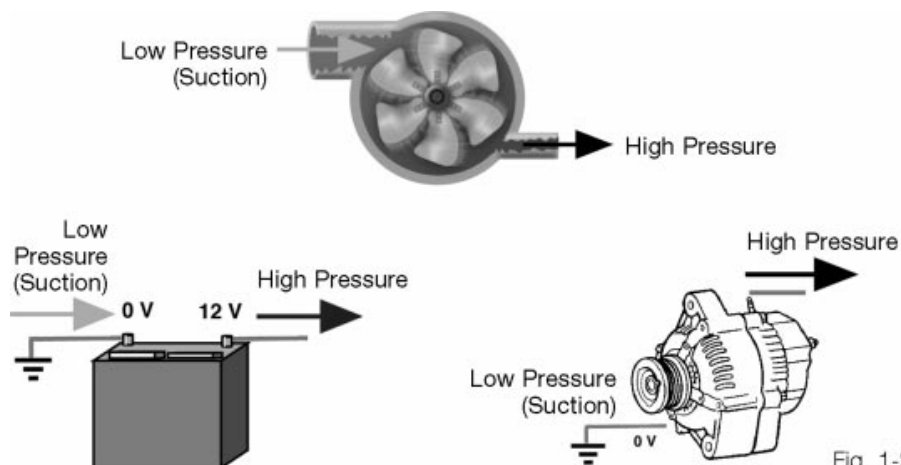


Fig. 1-2
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