STUDENT WORK SHEET **WS 24**

Measuring electrical values, Chapter 14

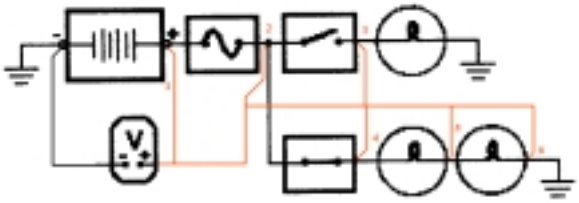
Student name **KEY**

Measuring voltage: Voltage measurements can be made at any point in the circuit, but it should be remembered that the voltage drops as current passes through the components so that all the voltage is used up. The voltage at the start of a circuit will be source or battery voltage; the voltage at the end of the circuit will be 0, zero.

A voltmeter has two leads to connect to the circuit. The negative (-), lead is normally connected to ground, the - terminal of the battery, or the most negative side of a component when checking voltage drop. The positive (+), lead is connected to the + terminal of the battery or various points along the circuit.

Connect the voltmeter leads to the circuit using a red line for + and a black line for -. Number the lines for each check as indicated. Do not open or close the switches.

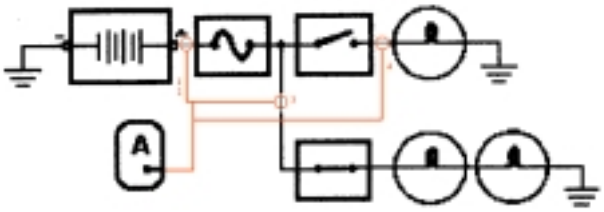
1. Measure battery voltage; it should near _12.5_ V.
2. Check fuse, the reading should be _12.5_ V.
3. Check upper switch, the reading should be _12.5_ V(Bat. Side) & _0_V (light side).
4. Check lower switch, the reading should be _12.5_ V(Bat. Side) & _12.5_V (light side).
5. Check voltage drop across the light, lower left, the reading should be _6_ V.
6. Check voltage drop across the light, lower right, the reading should be __0___ V.



Measuring current: The simplest current measurements are made using an induction ammeter that is either clipped around the wire or placed onto the wire. Current flow is the same through any part of a series circuit. It divides into the branches of a parallel circuit with each branch having the same current flow all along that part of the circuit.

Connect the induction ammeter to the circuit by drawing a circle at the point where the measurement should be made, and numbering the circle for each check as indicated. Assume that each light has the same resistance and draws 2 amps. Do not open or close the switches.

1. Current flow from the battery; it should be _4____ A. If the upper switch was closed, it should be __6___A.
2. Current flow from the fuse; it should be __6___ A.
3. Current flow through the upper light; it should be __0___ A.



4. Current flow through the lower lights; it should be __4___ A.

Measuring resistance: Resistance measurements are made using an ohmmeter, but they must never be connected to a circuit with electrical power. The two leads from the ohmmeter are connected to the two ends of the circuit being tested.

1. Connect the ohmmeter to measure the resistance of the clutch coil. Let's say this coil has a resistance of 4 Ω, and the specification is 2 to 5 Ω. **(B)**
This coil should be good/bad (select one)
2. Connect the ohmmeter to check for a ground. **(A) The** reading should be __0/infinite