

# Electrical Training

## Voltage Drops and Drains



# Voltage Drops and Drains

Electrical troubleshooting relies on the fact that the battery and alternator are in working order



# Voltage Drops and Drains

There are a few common mistakes made when troubleshooting electrical circuits.



# Voltage Drops and Drains

One is we forget to check the ground for the circuit we are diagnosing. We have a tendency to use any ground we can find when in fact, we need to use the ground for that circuit.



# Voltage Drops and Drains

The second is we do not load the circuit to see if we have a voltage drop.



# Voltage Drops and Drains

If you use a volt meter to measure across a heavily corroded 12 volt or ground connection it may read good voltage but it may not have the ability handle a load.



# Voltage Drop and Drains

So how do you find these kinds of problems? You do a voltage drop test.



# Voltage Drops

The voltage drop test is the most effective way to find bad connections in electrical circuits. It's a quick and easy test that doesn't require any disassembly and will quickly show you whether or not you have a good connection or a bad one.





# Voltage Drops

To do a voltage drop test, you create a load in the circuit that's being tested. You then use a digital volt meter (DVM) to measure the voltage drop across the connection while it is under a load.



# Voltage Drops

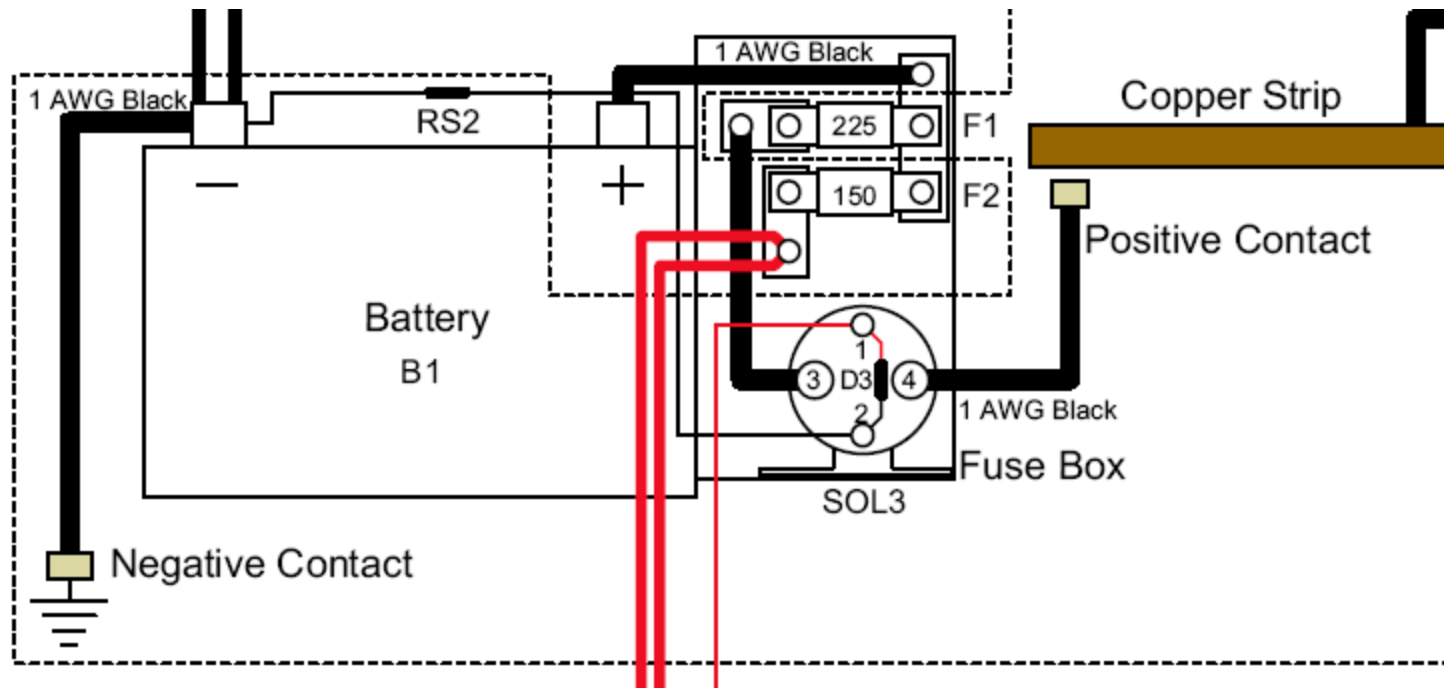
If a connection is good, you should find little or no voltage drop. If you find a voltage drop of more than 1 volt then the connection is bad.



# Voltage Drops

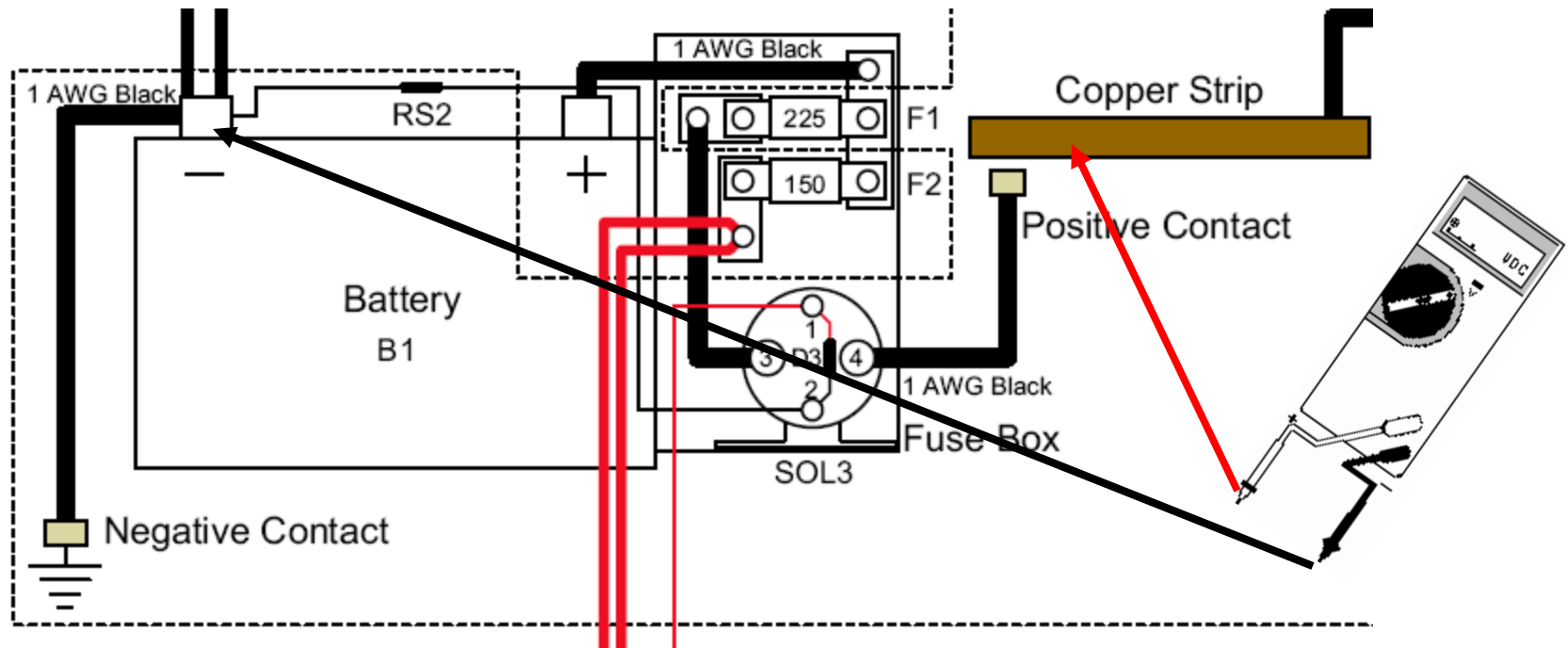
We will test the hydraulic connections as an example.

# Voltage Drops



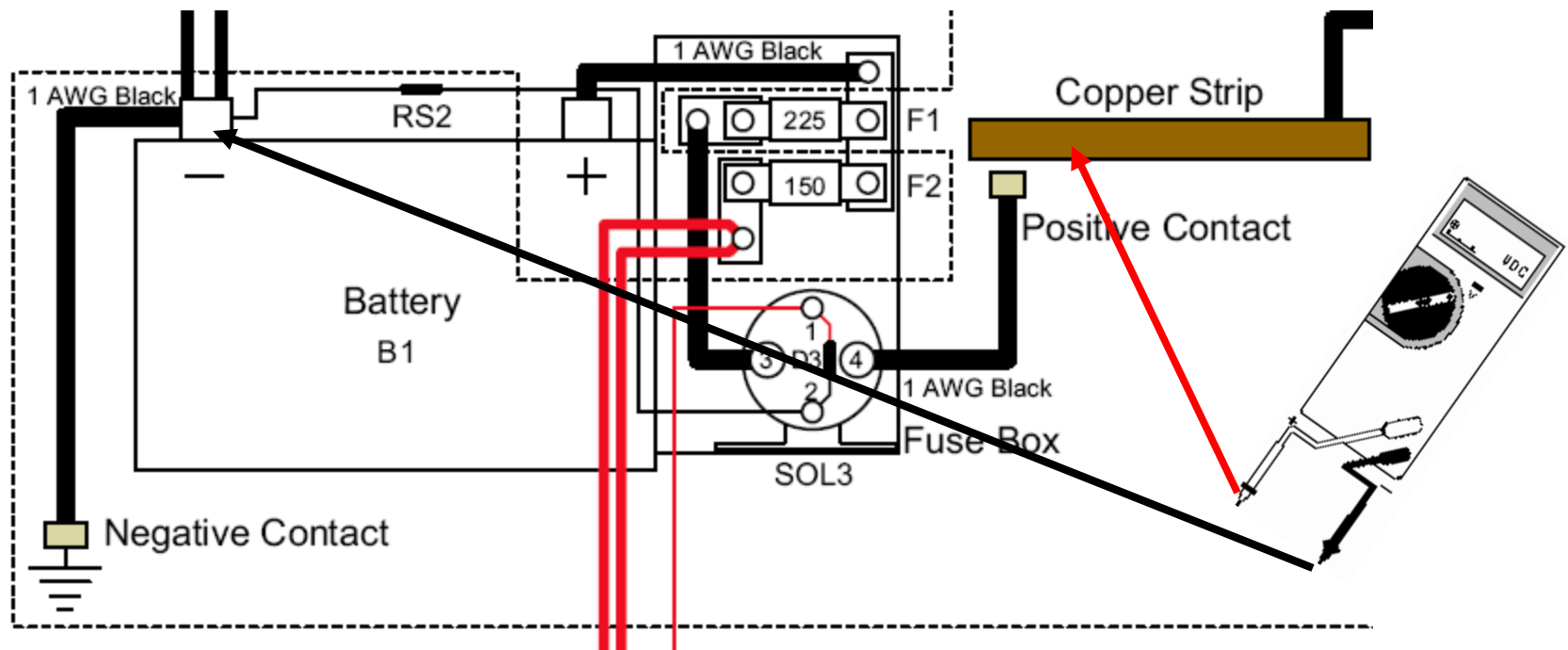
When checking the power strip you need to remember to run the hydraulics during the testing.

# Voltage Drops



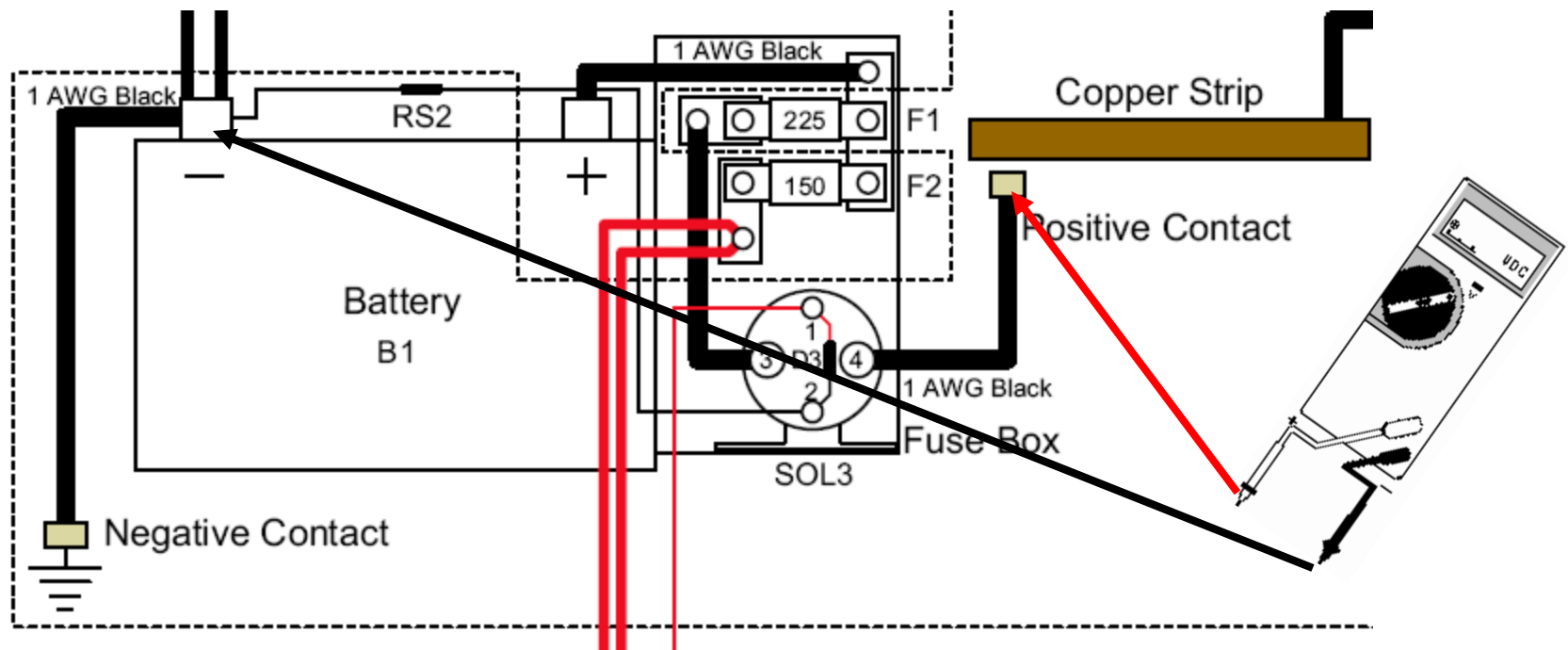
Place one lead of the DVM on the strip and the other on battery ground. You should have a reading of approximately 12 volts.

# Voltage Drops



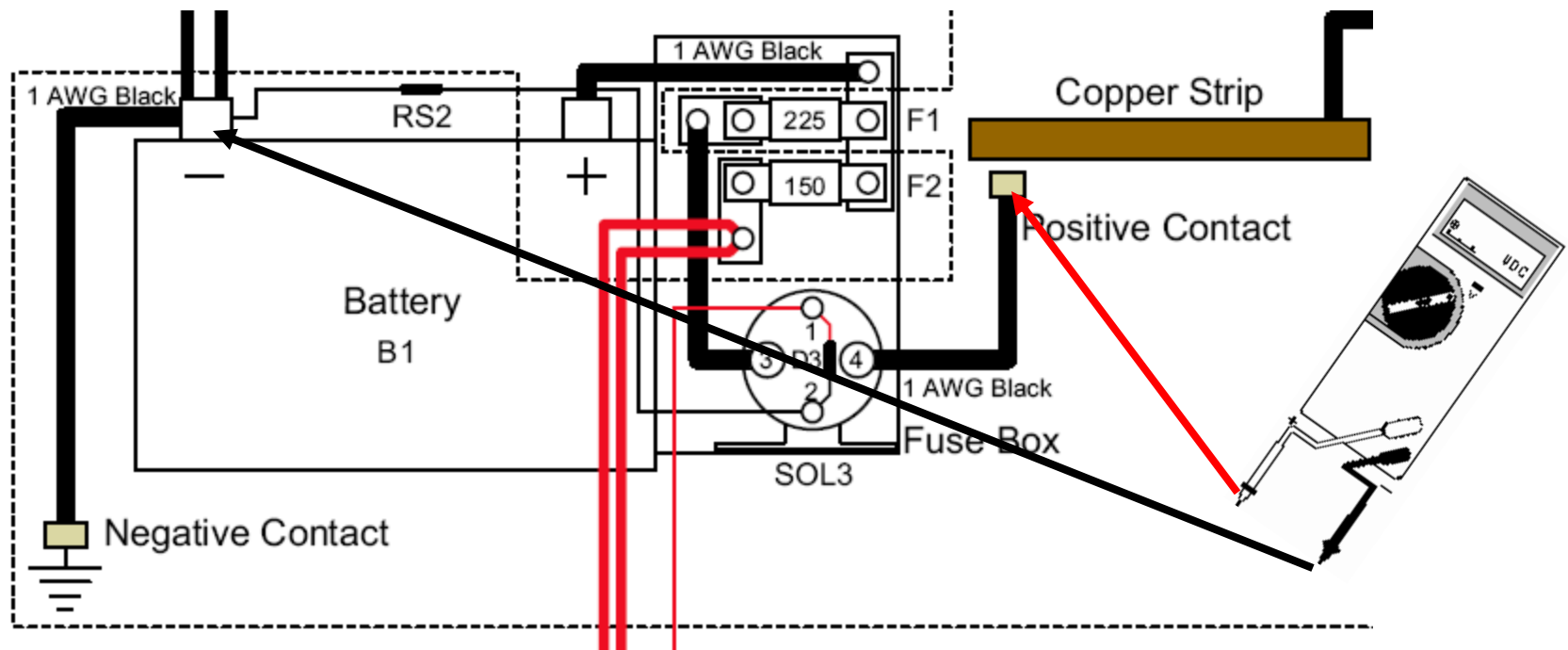
Now operate the hydraulics. If the voltage drops off move your test lead to the contact block.

# Voltage Drops



Place one lead of the DVM on the block and the other on battery ground. You should have a reading of approximately 12 volts.

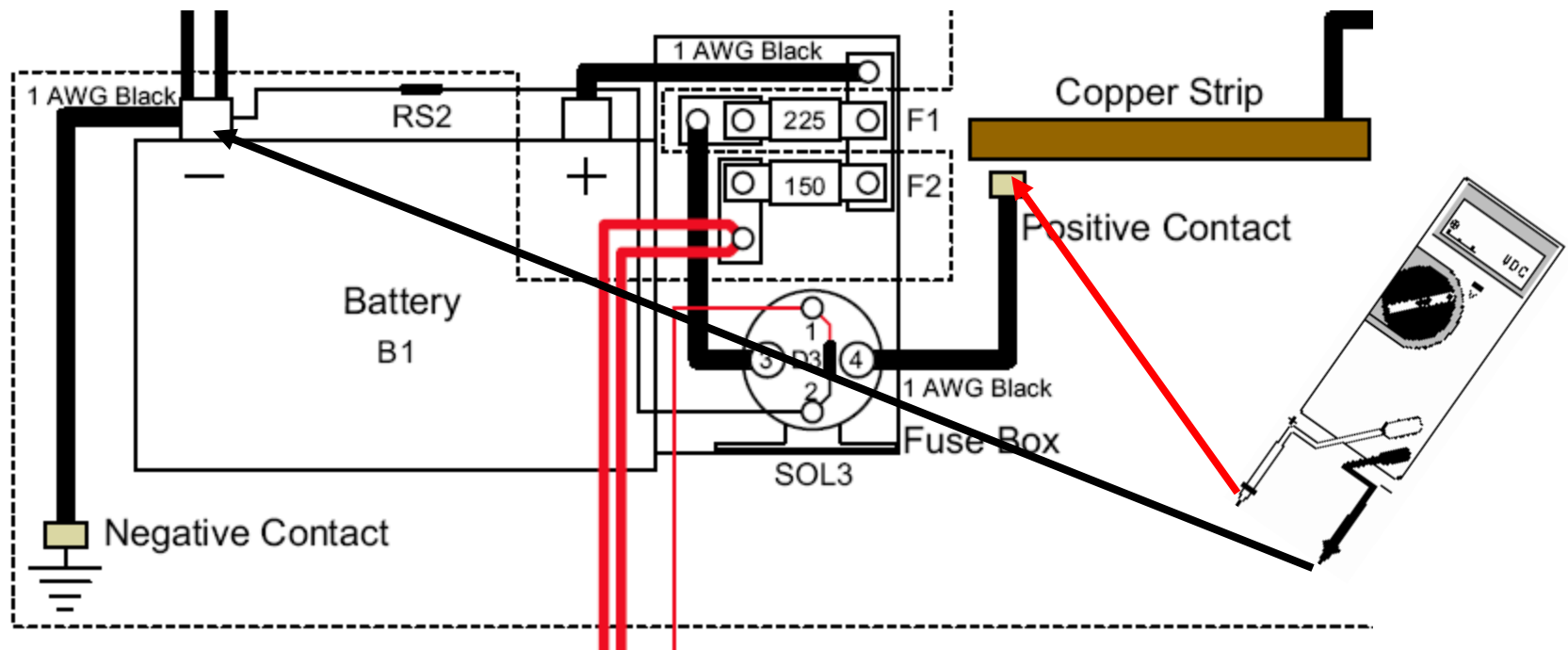
# Voltage Drops



Now operate the hydraulics. If the voltage falls off continue the testing toward the battery.



# Voltage Drops



If the voltage is good, you have a bad connection between the strip and the block.



# Voltage Drops

Now test for the ground block.



# Electrical Training

## Voltage Drops

Since ground will search for a good connection we want to do a test to look for difference in potential. Faulty ground connections will cause the sawmill to ground where ever it can.

If you have ever noticed sparks from the cam follower bearings or a hot or glowing power feed chain, this is an indication of a faulty ground.

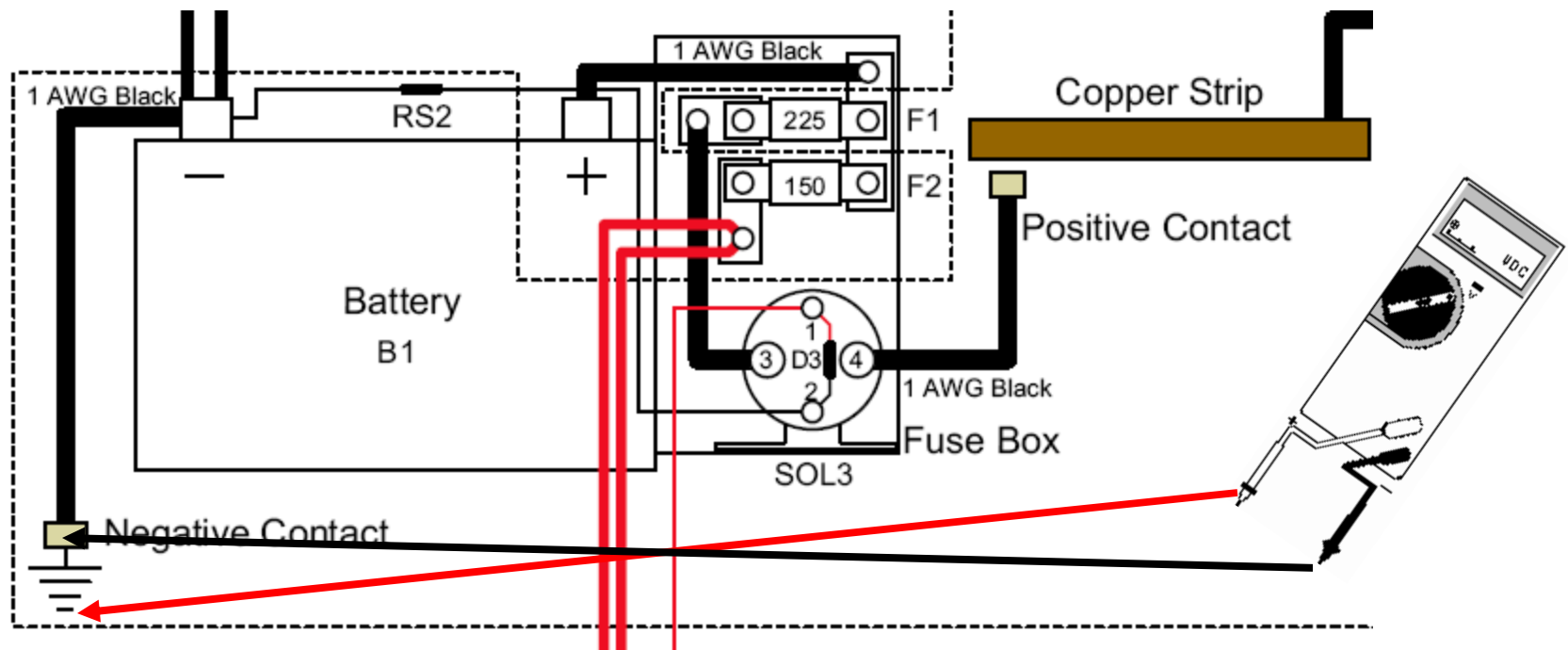


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## Voltage Drops

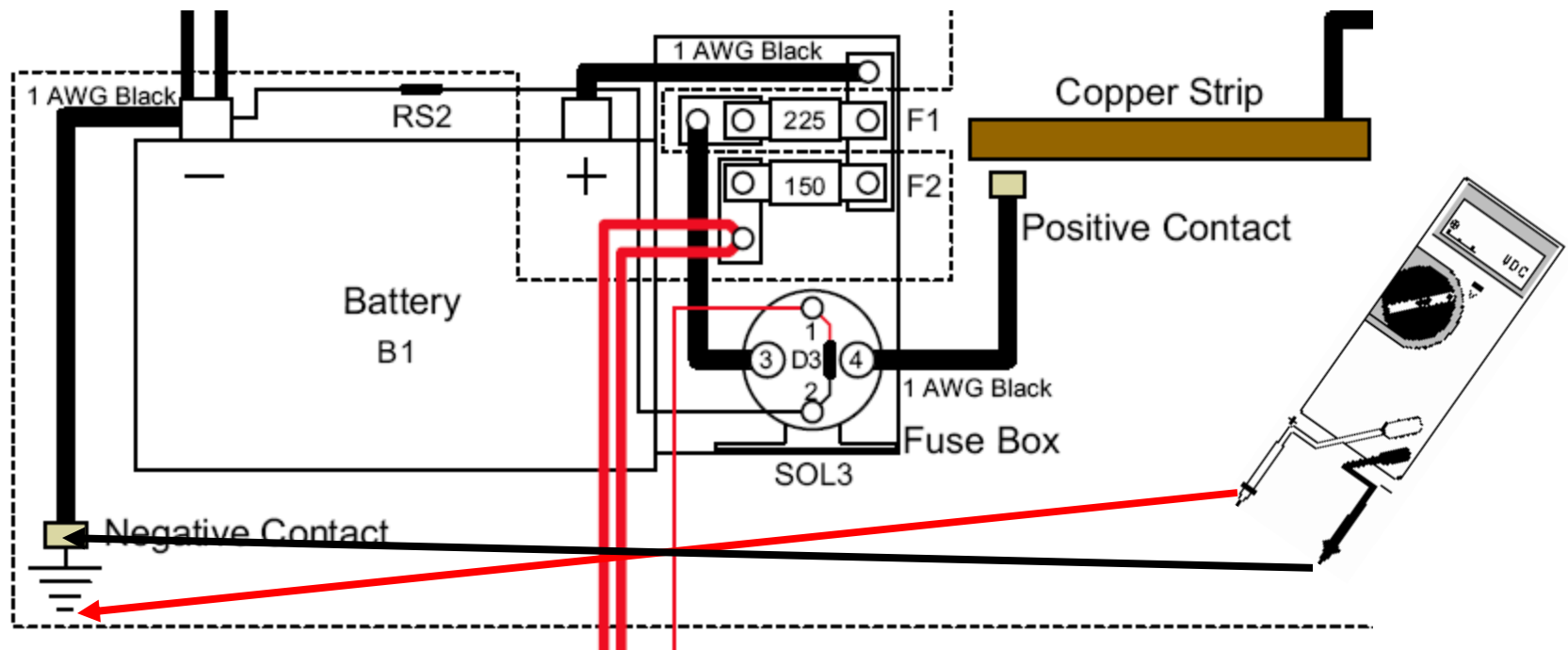
If left alone, it will damage the cam followers and weaken the power feed chain.

# Voltage Drops



Place one lead of the DVM on the block and the other on hardened welded rod. You should have a reading of approximately 0.00 volts.

# Voltage Drops



Operate the hydraulics. You should have a reading of no more than approximately .75 volts. A higher reading indicates a faulty ground connection.



# Voltage Drains

There are two main reasons a battery will drain overnight.

One is an internal short within the battery.

The second are parasitic drains.



# Voltage Drains

What is parasitic drain?





# Voltage Drains

It is a drain on the battery that causes it to run down while sitting. These drains can be caused by a component not turning off or battery acid and wet sawdust laying on top of the battery. The battery should be kept clean.

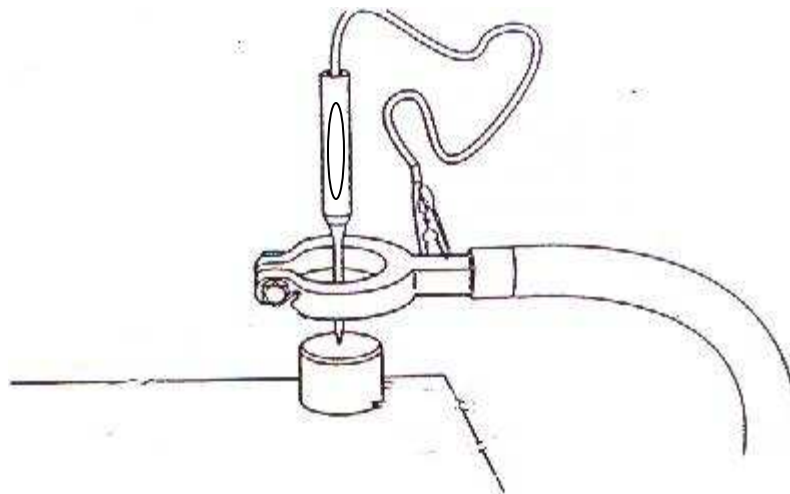


# Voltage Drains

Here is a procedure we use to isolate a parasitic drain.

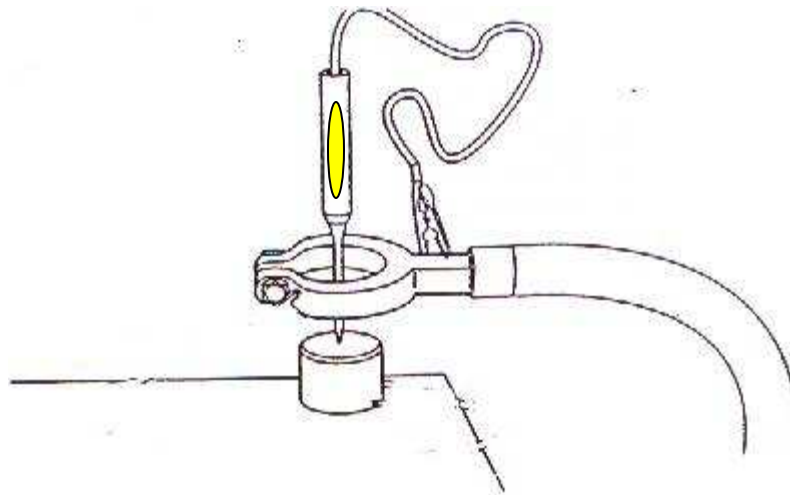
# Voltage Drains

With the key off, remove the negative battery cable from the battery. Using a 12-volt test light hook one end to the negative battery post and the other end to the negative battery cable.



# Voltage Drains

The test light will be lit if there is a drain.





# Voltage Drains

Remember that the drain will only be on circuits that have voltage when the key is off. Your wiring diagram will guide you.