

Batteries and Alternators



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



Batteries

A battery test should always be done by a qualified battery dealer who has the proper equipment. (Never use the hydraulics to test a battery. It can not produce enough of a load!!!)
Minimum battery voltage required for testing is 12.5 volts.
Batteries can not be tested unless they are fully charged.



Batteries

The battery must be the recommended rating and construction for the sawmill.



Batteries

Not all batteries are the same. When choosing a battery, for a Super/LT50 or LT70 DC mill, you can not go by the biggest battery with the highest Cold Cranking Amps (CCA) that will fit in the battery box.



Batteries

A 1200 CCA battery, with a smaller case and lighter weight than the one we use, will not last as long. There is less surface area and less acid storage area and the plates will be the wrong size.

Both are very important for high-output use. The less surface area, the less reserve capacity will be available, and more heat will be generated as the battery is charged and discharged. Heat buildup is a battery's worst enemy.



Batteries

The climatic conditions in your area dictate the minimum CCA rating necessary for proper operation.

If you live in a warm temperate region, a 950 CCA battery may be adequate for a Super Hydraulic Mill with a diesel engine. But the same mill in a cold temperature region would require a 1200 CCA battery.



Batteries

A Standard non-hydraulic sawmill requires a deep cycle battery 650 CCA or higher.

A Standard hydraulic sawmill requires a heavy duty deep cycle battery 875 CCA or higher.



Batteries

LT70 DC, LT50 and Super hydraulic sawmills require commercial batteries 1100 CCA or higher.



Batteries

There are very few battery companies that make these commercial batteries.

Here are the ones we know of:

- Deka 1231 MF or 1231 MP
- Carquest 31HDP30. (This battery is made by Deka.)
- Napa NBR7237 or NBR 7236.
- Interstate 31P-MHD.



Batteries

These are the only batteries that will work on LT70, LT50 and Super sawmills. They will weigh approximately 45 to 55 lbs.



Battery Testing

The batteries on non-hydraulic sawmills can be tested the with the same procedures as a car or truck battery. The batteries on hydraulic mills are tested a different way.



Battery Testing

These batteries are to be load tested 1/2 of their CCA rating for 10 seconds. The battery voltage should not drop below 9.5 vdc.

Example: 1260 CCA is tested at 630 amp load.

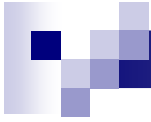
The battery should refresh to 12.6 volts fairly quickly. If it does not the reserve capacity is weak.



The hydraulics on the sawmill run directly off the battery.

The alternator only comes into play after the hydraulics stop running.

It replaces what you have taken out.



If the battery loses its reserve capacity the hydraulics pull the battery down quickly.

When this happens you may see other functions falter or quit running.



Batteries

When a battery loses its reserve capacity, it causes additional strain on the alternator and shortens it's life. On average, a hydraulic sawmill that is used 4 or more days a week will require a battery every 12 to 16 months depending on the load it is handling.



Batteries

The logs should be positioned as fast as possible to allow the alternator to replace what has been used.

Custom sawyers will wear out batteries faster. They are always looking for the best face and quite often flip the log 2 or 3 times and then only make one cut.



Batteries

This does not allow the alternator to replace what has been used and puts additional strain on the battery and alternator. Life spans are shorter.



Alternator

The alternator requires a good battery to function properly.

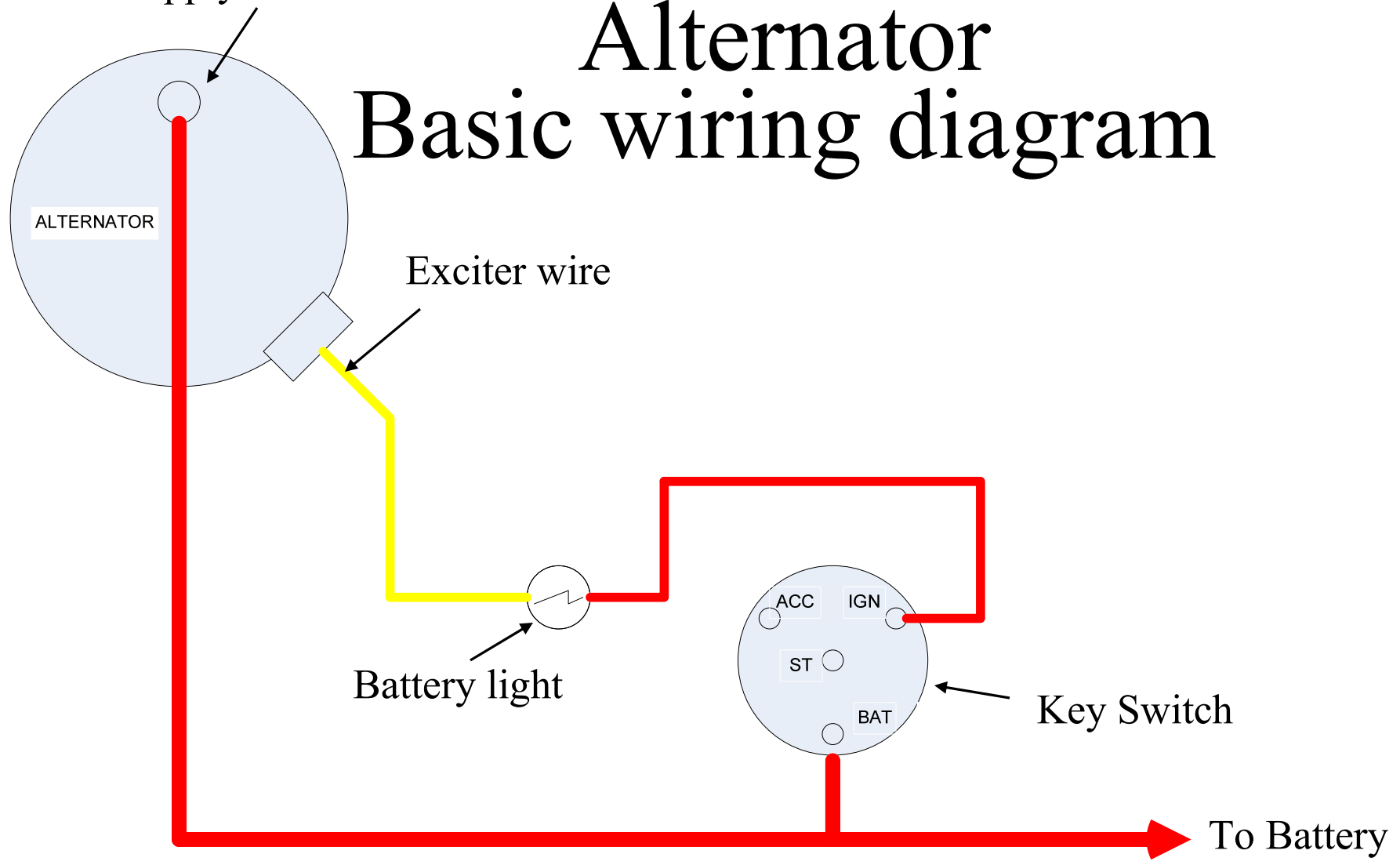
A bad battery will cause you to fail an alternator when in fact it may be just fine.

(Never remove the battery cables while the engine is running to test the alternator. Damage to the alternator can occur!!!!)

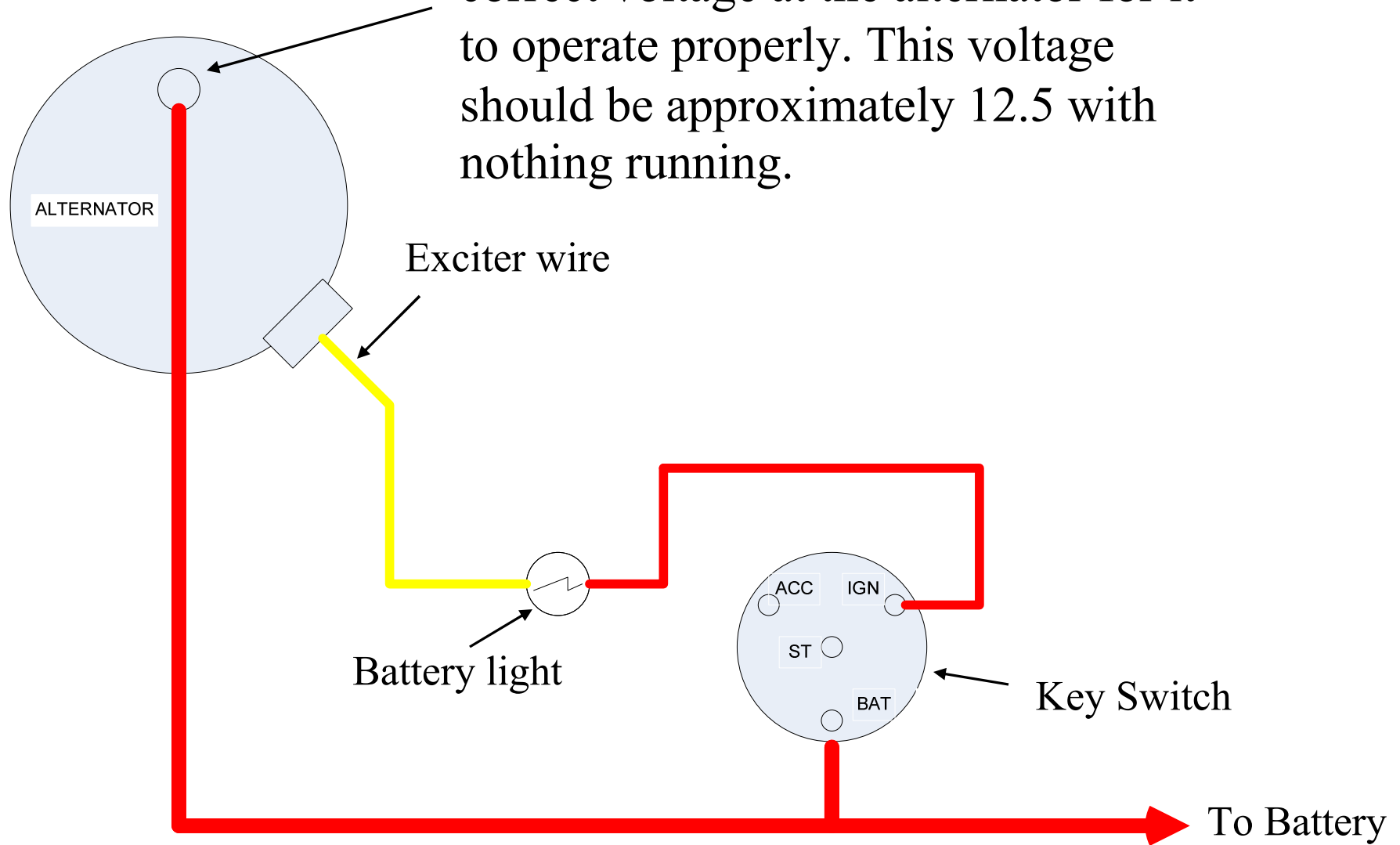


12vdc supply to the alternator

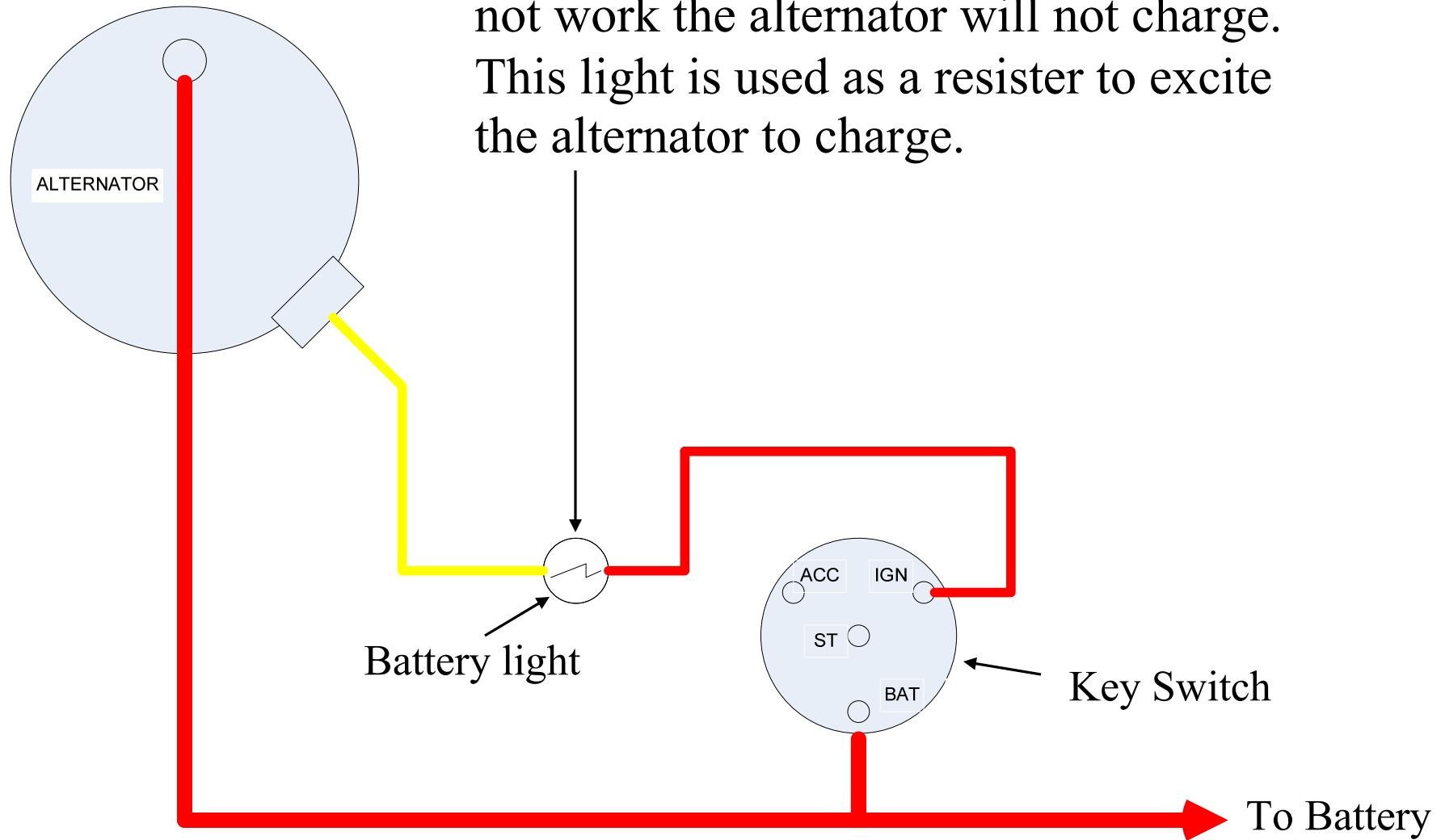
Alternator Basic wiring diagram

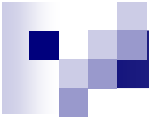


As mentioned before we need the correct voltage at the alternator for it to operate properly. This voltage should be approximately 12.5 with nothing running.

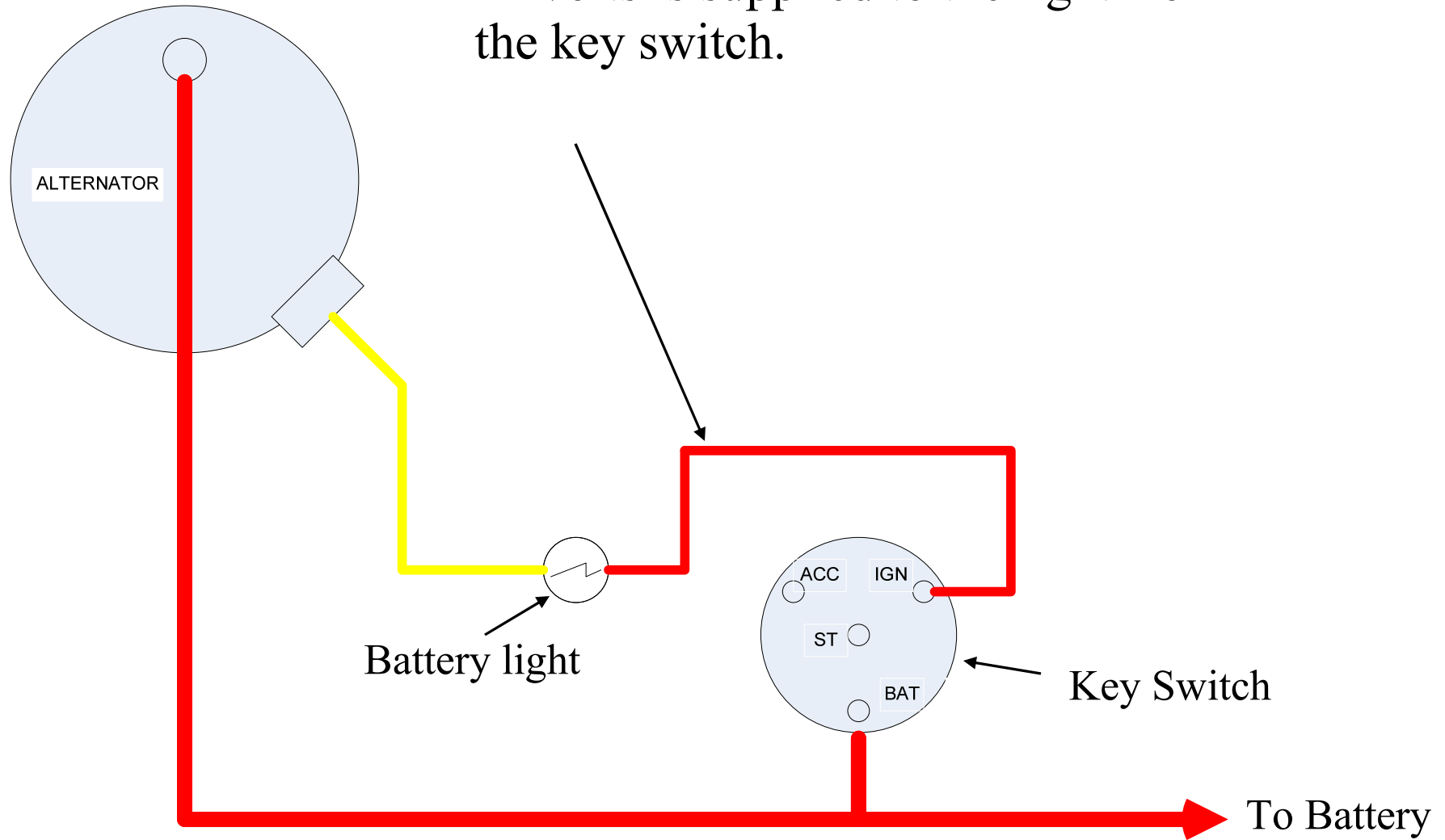


The battery light is critical for alternator operation. If this light does not work the alternator will not charge. This light is used as a resistor to excite the alternator to charge.

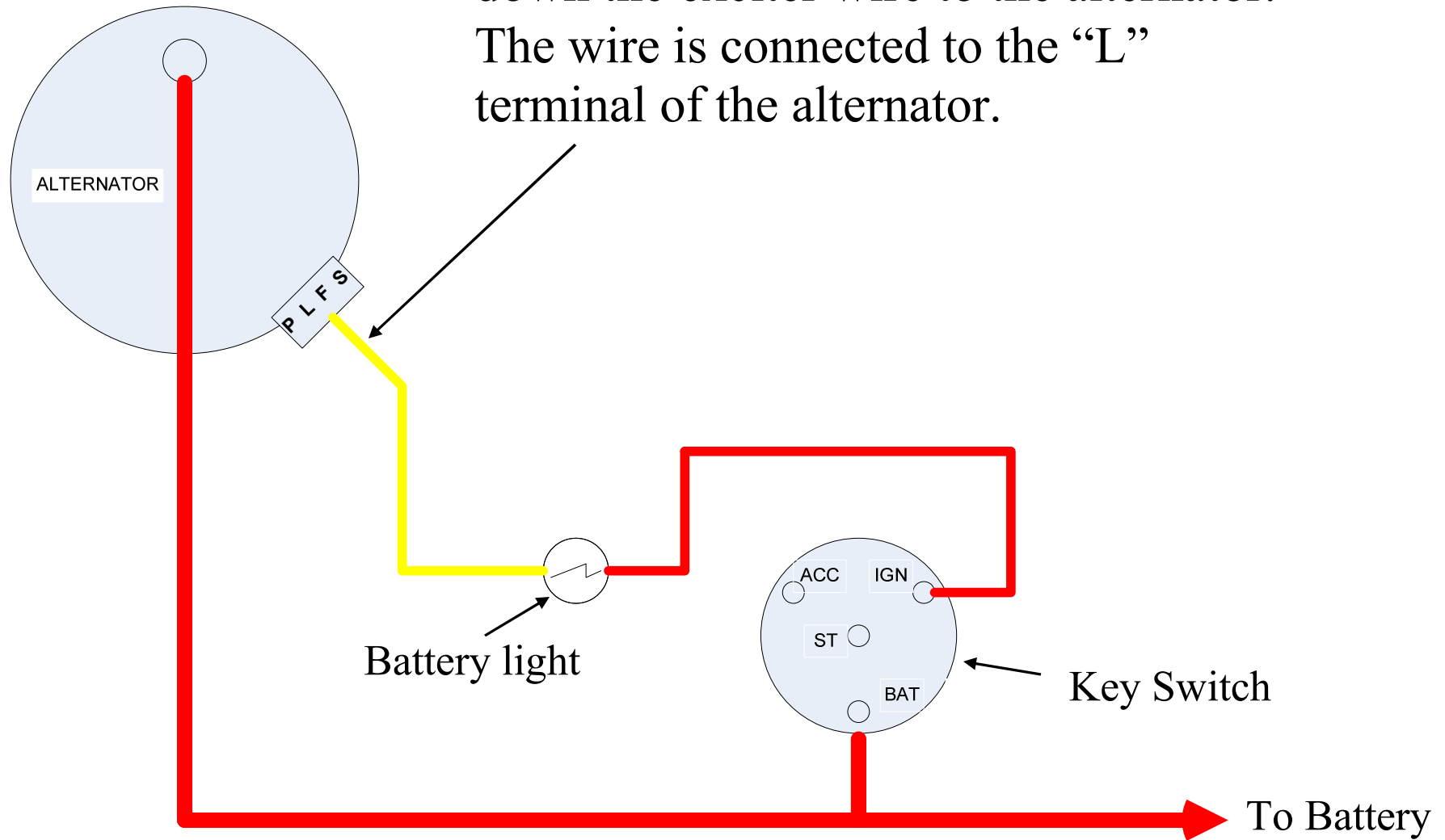




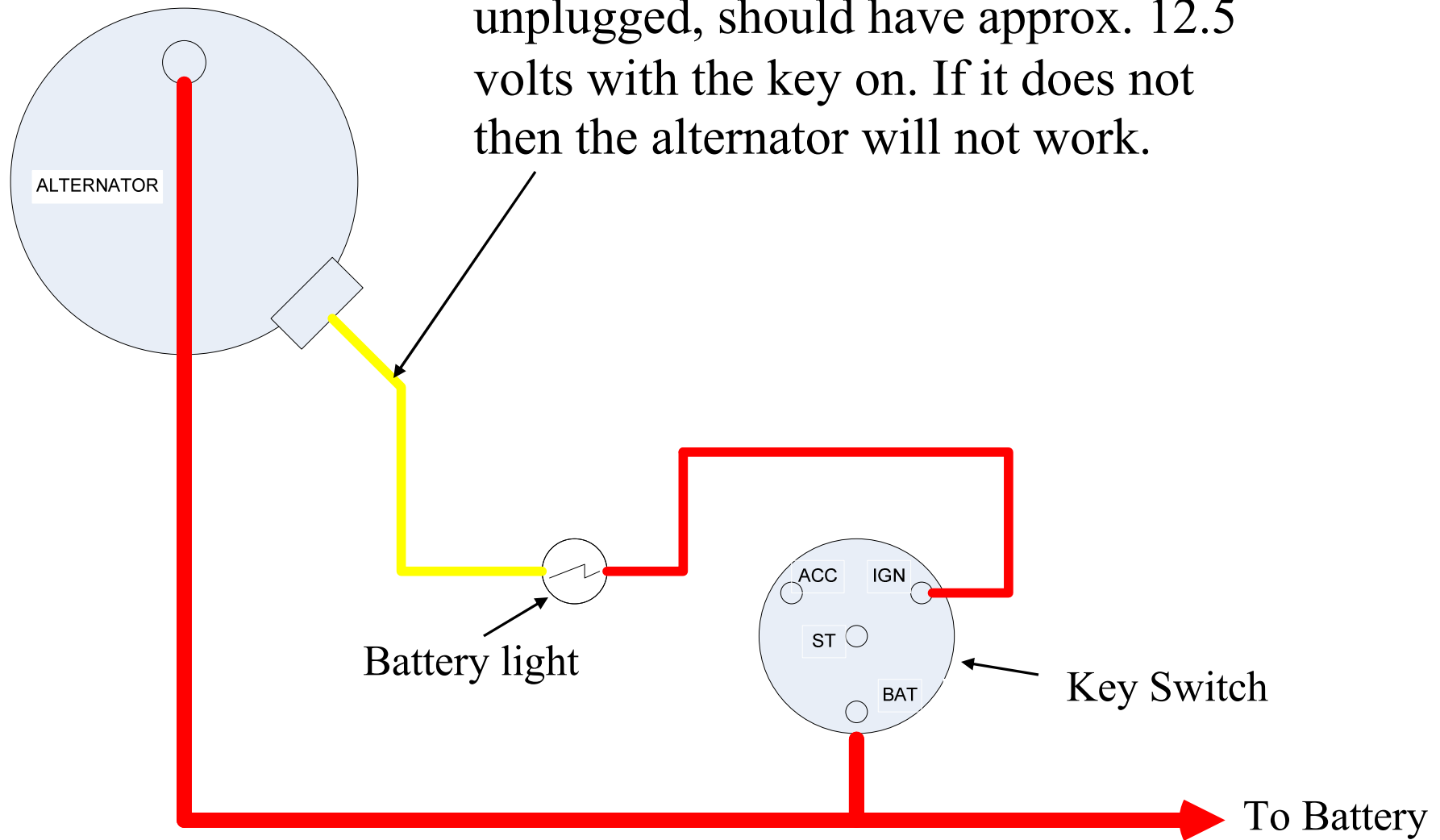
12 volts is supplied to the light from the key switch.



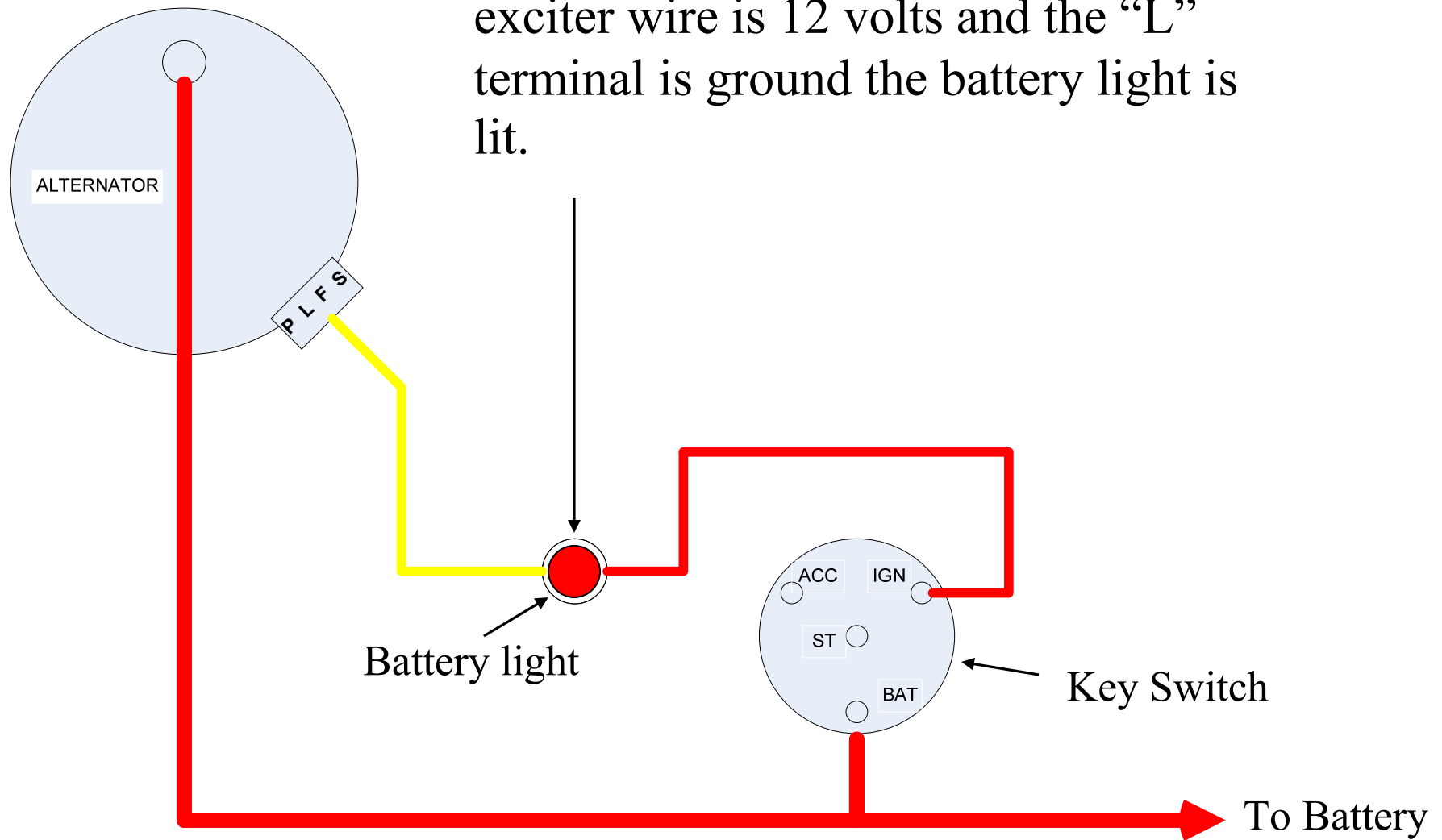
Voltage goes through the light and down the exciter wire to the alternator. The wire is connected to the “L” terminal of the alternator.



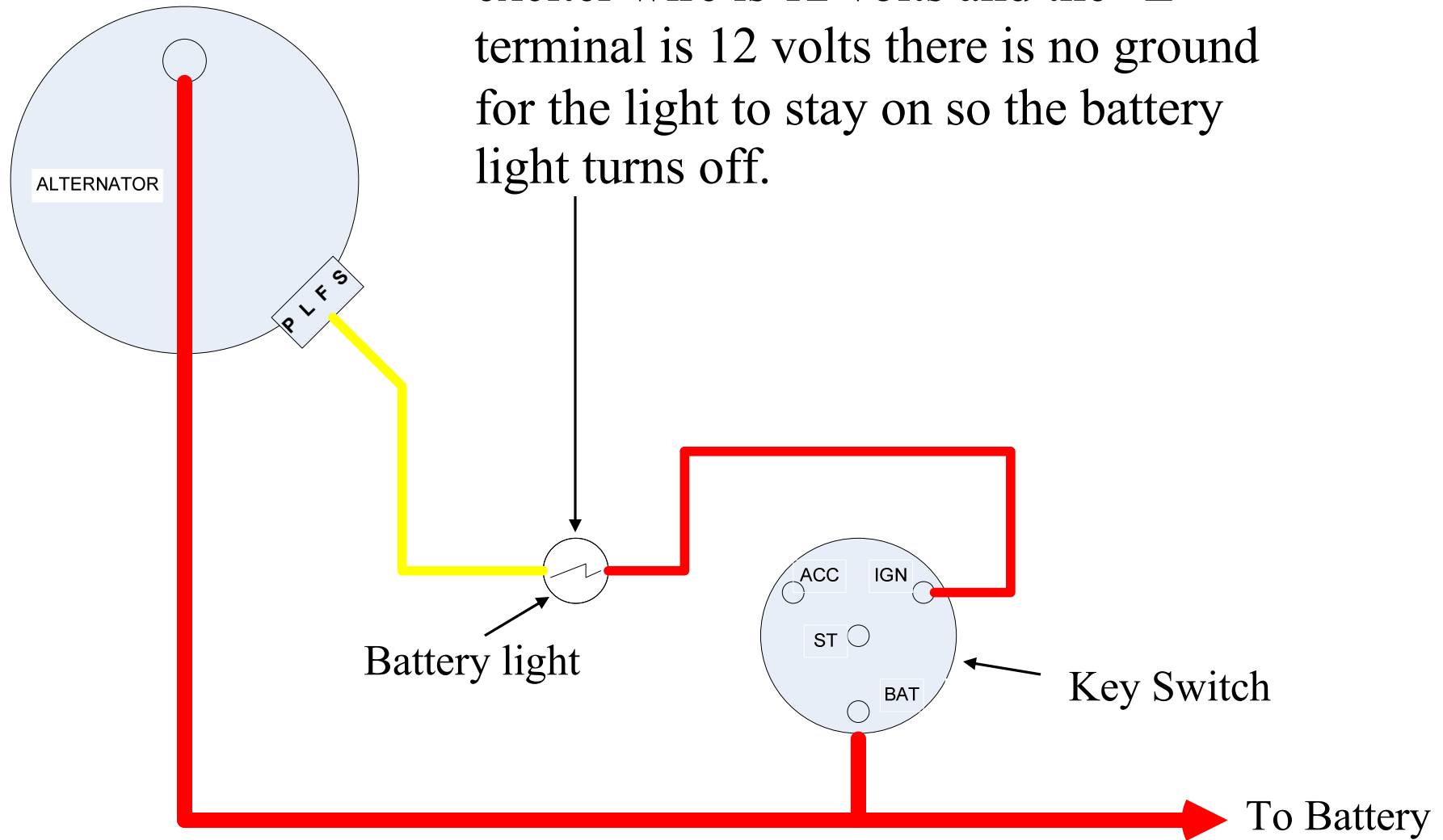
The exciter wire is used to turn on the voltage regulator. This wire, when unplugged, should have approx. 12.5 volts with the key on. If it does not then the alternator will not work.



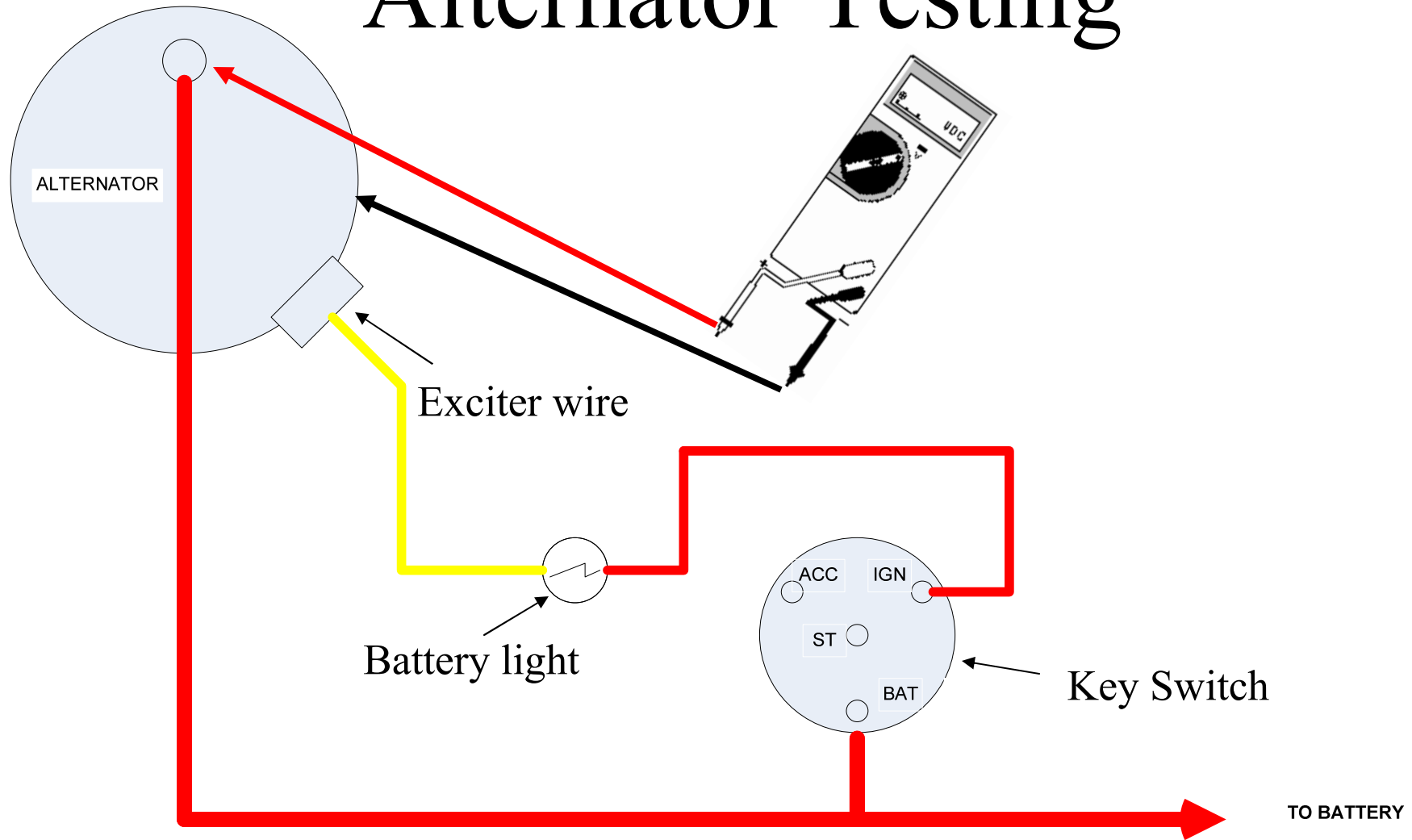
When the alternator is not charging the “L” terminal is grounded. Since the exciter wire is 12 volts and the “L” terminal is ground the battery light is lit.



When the alternator is charging the “L” terminal is now 12 volts. Since the exciter wire is 12 volts and the “L” terminal is 12 volts there is no ground for the light to stay on so the battery light turns off.



Alternator Testing





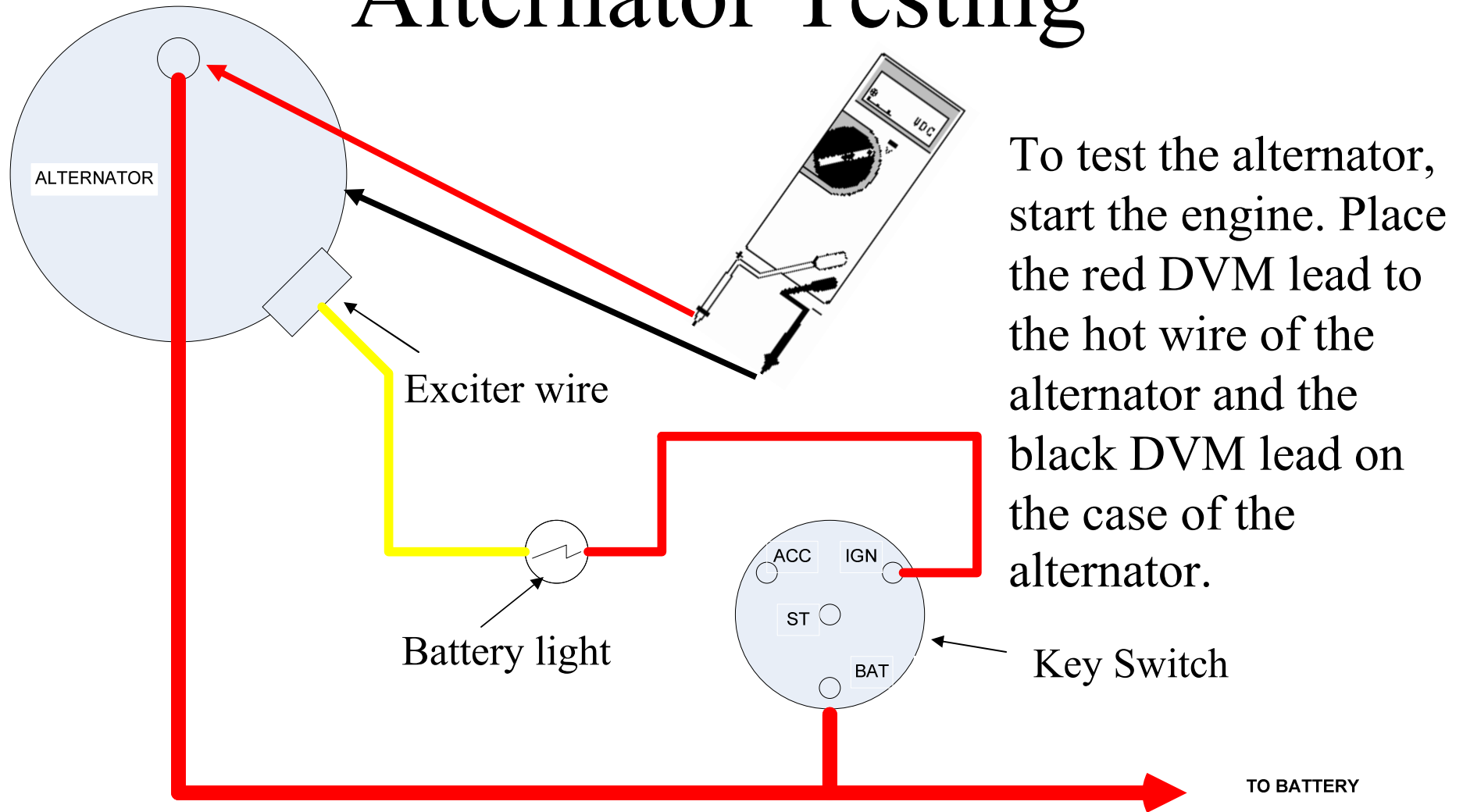
Alternator Testing

The alternator outputs approximately 14.5 to 14.9 vdc. It does not increase with a faster engine speed.

If you are under 14.5 vdc at idle but within specs at high rpm you need to check the idle speed. It is set to low.

If you are within specs at idle but the voltage drops at high rpm then check the alternator belt for slippage.

Alternator Testing



To test the alternator, start the engine. Place the red DVM lead to the hot wire of the alternator and the black DVM lead on the case of the alternator.



Alternator Testing

We use the case of the alternator so that we can verify the alternator is grounded.



Alternator Testing

You should have a reading of approximately 14.5 to 14.9 vdc. If not, unplug the exciter wire and verify you have 12 vdc at the wire plug. If good, remove the plug from the exciter wire and plug it directly to the alternator “L” terminal. If now good, replace the exciter wire pigtail.

If you still do not have a reading of approximately 14.5 to 14.9, replace the alternator and the exciter wire pigtail.



Alternator Testing

If the alternator checks good, take a voltage reading at the battery. You should have within approximately 1/2 a volt of the alternator output at the battery.

If you are more than 1/2 volt difference, then check the connections between the alternator and the battery.



Alternator

Some alternator tips to consider:

- Never use a pressure washer on the alternator
- Watch hydraulic operation :
(Longer than normal run times lower the reserve of the battery and create larger loads on the alternator. The larger the load the shorter the alternator lifespan.)