



Solid State Regulator Rectifier RR6V-1

The Lucas 6 volt alternator with 3 wires is un-regulated and needs a very large battery to soak up all the excess power, often boiling away acid at a fast rate as a result. Fitting a 6 volt regulator stops the battery being charged excessively and allows safe use of smaller AGM batteries. The most suitable alternators for use with a regulator are the RM15, RM18 & RM19 as well as the modern standard output (10A) stator from Lucas. Older RM12 & 14 hexagonal stators may not produce enough power to use a solid state regulator. This unit is suitable for all lead acid type batteries, sealed, wet or AGM. Do not use with lithium batteries.

Fitting a 6 volt regulator will allow the safe use of AGM or sealed batteries and electronic ignitions.

If your alternator has failed or proves to be too low powered we also stock a complete 6 volt alternator set with the correct stator, rotor and solid state regulator. Our order number: ALT-SET-3.

Fitting instructions

Fitting is straightforward providing you follow some basic guidelines. In all cases you remove the old rectifier and connect the new solid state unit between the alternator and battery. The the best method of connection will depend on the system you have.

On original 3-wire 6V systems first two wires are joined to leave two output wires and often the most convenient place to connect the new solid state regulator rectifier is at the old rectifier wires. This ensures the ammeter (if fitted) reads in the correct sense.

None of the lighting wiring or switches need to be altered.

Warning: Incorrectly connecting the new solid state unit to the battery will destroy it in a second. Units returned with burnt out rectifiers caused by incorrect polarity connection or short circuiting will not be replaced as defective under warranty. Basic precautions and thorough checks are your friends here.

The red wire is positive. The green wire is negative.

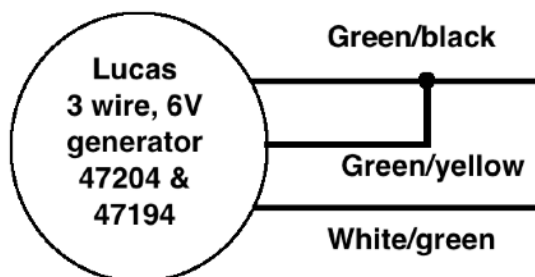
Can be used on either positive or negative earth vehicles provided this polarity is observed.

1. Disconnect and remove the battery while working on the machine. Now is a good time to confirm the earth polarity, IE which terminal is connected to the frame. Many times it will be found that a previous owner has changed the vehicle's earth connection, so check for yourself - do not assume.
2. Start with the alternator wiring, where a 3 wire 6V, stator is being converted for use with this regulator the green/yellow and green/black wires are first joined to give two wires. The new rectifier regulator is supplied with a double connector for this purpose.

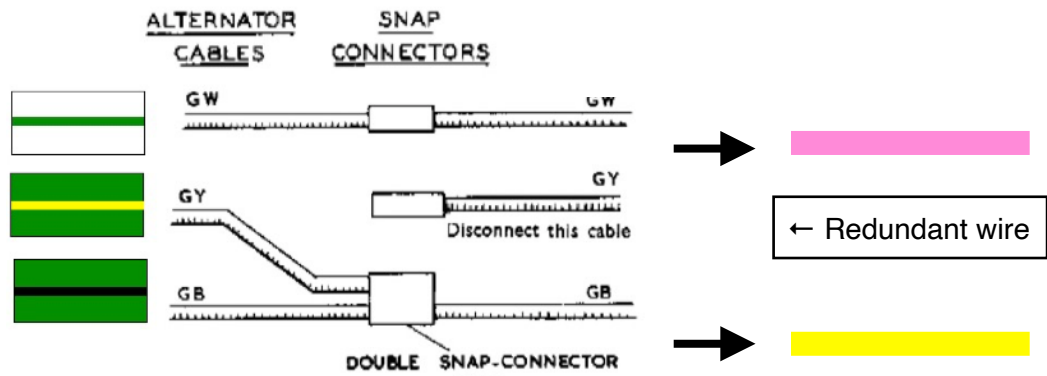
The old 6 volt system relied on the lighting switch to switch in and out windings to reduce or increase output as the lights were switched on or off. The solid state unit requires the full output and regulates it depending on the load it senses on the system.

Earlier colours used by Lucas: light green, mid green & dark green wires. Join the mid and dark green wires and connect to the AC wires from the regulator rectifier unit (pink & yellow).

Wipac: These had orange, light green & white wires. Join the light green and orange and connect to the AC wires from the regulator rectifier unit (pink & yellow).

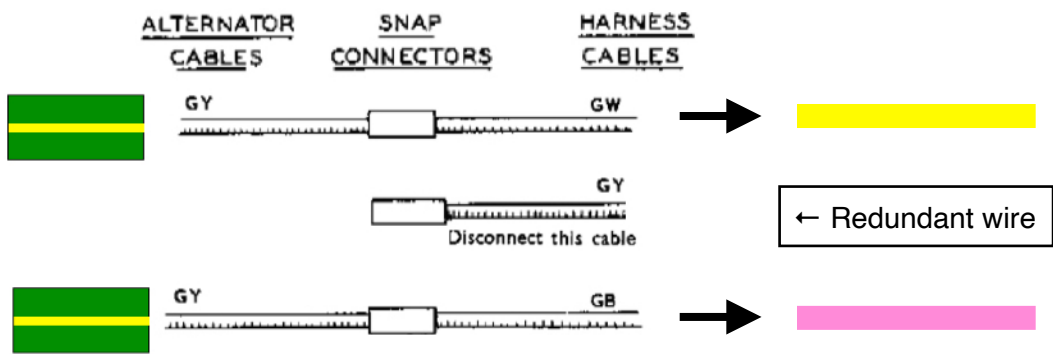


Original 6 volt wiring



AC wires
It does not matter which way these are connected to the alternator wires

Connection to modern Lucas 2 wire alternator (ALT-SET-3)



AC wires
It does not matter which way these are connected to the alternator wires

Method 1: Once connection to the alternator has been made, connect the DC wires directly to the battery as shown in the basic wiring diagrams

Method 2: The alternator wires must first be joined (see above), however they are plugged back into the wiring loom. The old rectifier is removed. The alternator output feeds directly to the rectifier connections. Connect the AC connections to the new regulator rectifier.

Make the DC connections at the rectifier DC connections. If the machine has an ammeter, making the connections here ensures that the ammeter reads in the correct sense.

If your vehicle is positive earth the red wire from the solid state unit can be attached to the frame at the rectifier stud mounting position.

The green is connected to the negative DC wire from the old (now removed) rectifier.

If the vehicle is negative earth the green is attached to the frame. The red is connected to the positive wire that would have been connected to the rectifier

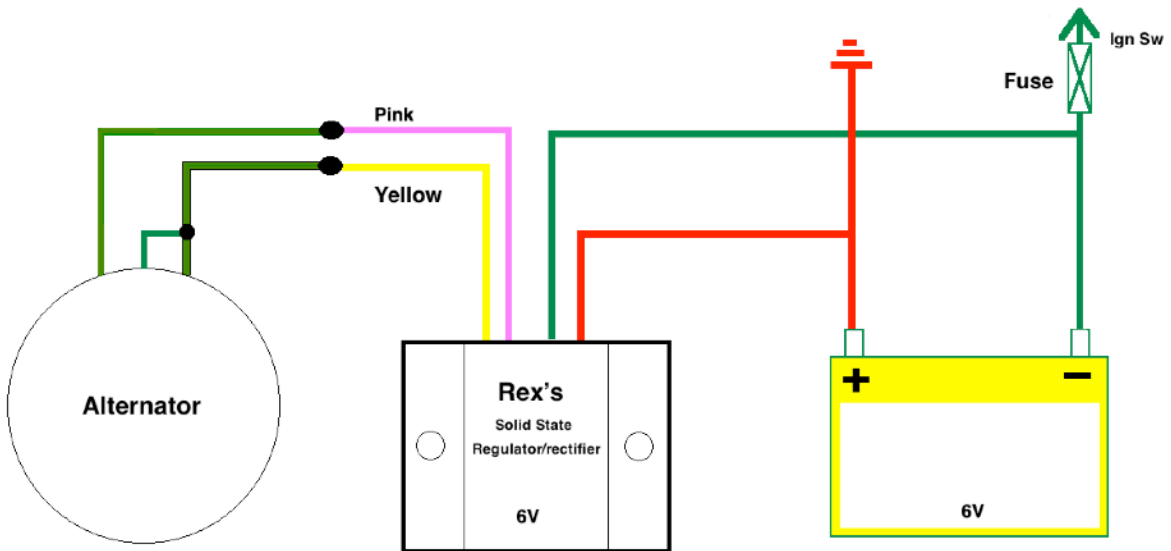
Double check you have made these connections correctly before connecting the battery.

Please ensure you have access to the bike's wiring diagram or shop manual to look up wire colours or other information. We do not hold a library for the hundreds of different bikes made.

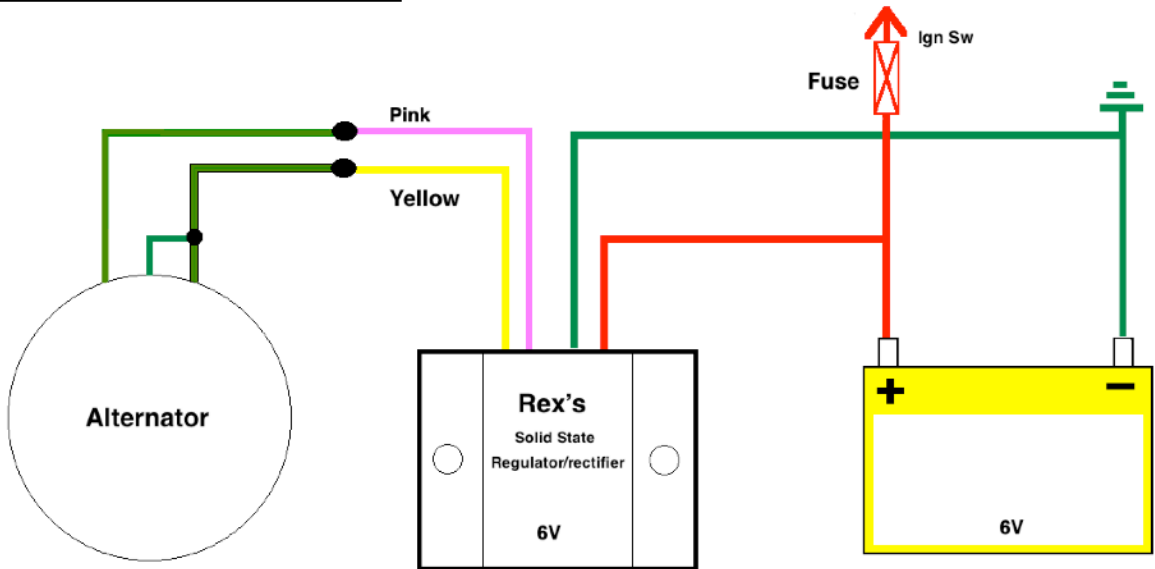
Wiring must be done to high standards and using the correct tooling for forming any crimped connections. Nothing in this guide overrides any safety precautions or standard practises given in the shop manual.



Typical 6V wire colour - check your bike's manual to find which colours are used on it



Basic wiring diagram - Positive earth



Basic wiring diagram - Negative earth

4. Testing

Before testing, make sure you have refitted the battery. To test the system is working correctly simply measure the battery voltage using a suitable multimeter with the engine running.

The voltage should rise above the battery's terminal voltage and settle between 6.8 and 7.4 volts.

An ideal figure is 7.0 to 7.2 volts +/- 0.5V.

The exact figure will depend on the alternator's power output, the load on the system. The condition and state of battery charge are also very important and will effect these readings.

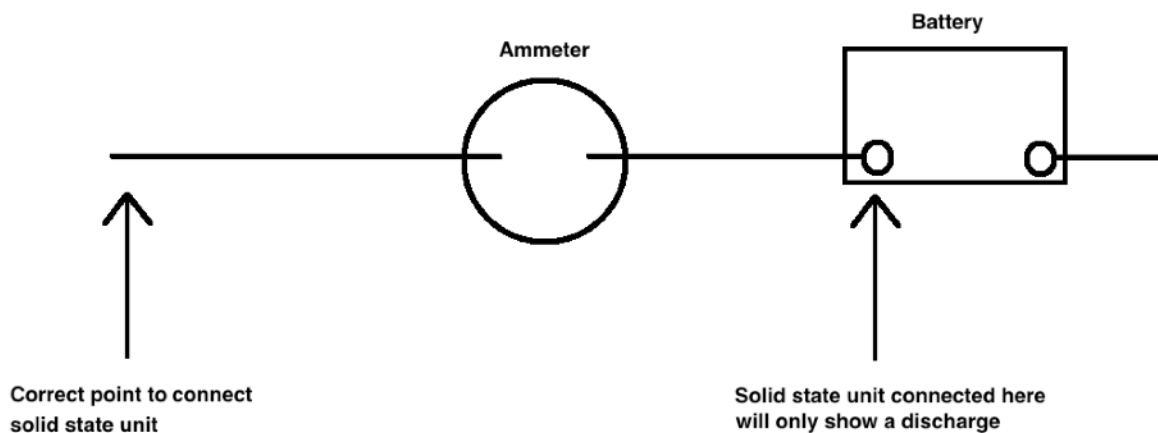
Excessive charging is over 7.6 volts. Under charging is below 6.8 volts.

Note: A slight drift away from ideal is never caused by a faulty solid state unit. You will see a marked departure from the nominal value if there is a fault. Alternator output, battery state of charge or load on the system causes small variations in observed voltage readings. A multimeter that has been calibrated and is within certification date is required before declaring a fault. Reported faults will have to be verified by our technicians.

Running with a battery eliminator and no battery will cause higher readings. This is because the capacitor stores peak surges caused by the piston accelerating on the power stroke.

Ammeter shows the system is discharging.

Before seeking technical support conduct the tests above to confirm if the battery voltage shows the system is charging. If the battery voltage rises but the ammeter is showing a discharge the likely cause is that the new unit is connected to the wrong side of the ammeter.



Tips

-NEVER interrupt the DC connections between the solid state unit and the battery while the engine is turning. This will damage the regulator circuit inside the unit.

-Fit a fuse of 15 to 20 amps as shown in the basic wiring diagrams. This will protect your electrical system in the event of a fault developing.

-Use a quality battery such as the yellow Motobatt or a Cyclon cell. A 6 amp Motobatt can safely be used in place of the large 11amp wet battery needed when there was no regulator in the circuit. Both brands receive very positive feedback from customers year after year. Normal motorcycle battery chargers can be used on both types.

- Avoid lithium batteries. Your solid state regulator/rectifier is not designed to for them.