



3-Phase Solid State Regulator Rectifier RR12V-8 **Guidance on fitting to British Motorcycles**

Rex's are electrical specialists, our solid state regulator/rectifier is designed and correctly rated to reliably control 3-Phase, 3 wire Lucas alternators. These type can be identified as they have 9 pole pieces whereas 6 volt units (which were single phase) have 6 poles. Both have 3 wires!

Rex's solid state regulator rectifier allows the use of modern AGM and sealed type batteries as well as traditional wet batteries. You must ensure you use the correct battery type. Lithium batteries must not be used with this regulator-rectifier (RR12V-8). Owners report a very high number of unsatisfactory results and failures of lithium batteries on Classic motorcycles.

Fitting guide

Fitting is straightforward providing you follow some basic guidelines. In all cases you remove the old rectifier and connection to the zener diode(s) and connect the new solid state unit between the alternator and battery. There are different ways of achieving this, the best one for your application will depend on the system you have. None of the lighting wiring or switches are altered. Wiring must be done to high standards using the correct tooling for forming any crimped connections. Nothing in this guide overrides any safety precautions given in the shop manual.

Warning: Incorrectly connecting your 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 black wire is negative.

Suitable for use on either positive or negative earth vehicles provided the polarity is observed.

1. Disconnect and remove the battery while working on the machine. This is a great time to determine if your system is positive or negative earth if you are unsure. Many times it will be found that a previous owner has changed the vehicle's earth connection, so check for yourself - don't assume.

2. You should identify the wiring coming from the stator and decide where you wish to mount the solid state unit.

The (Lucas 3-phase) stator has yellow/green, white/green & green wires, these connect to the three yellow wires from the solid state regulator unit.

The three yellow wires from the solid state unit connect in any order to the alternator wires.

Once connection to the alternator stator has been made, connect the DC wires as shown in the basic wiring diagrams.

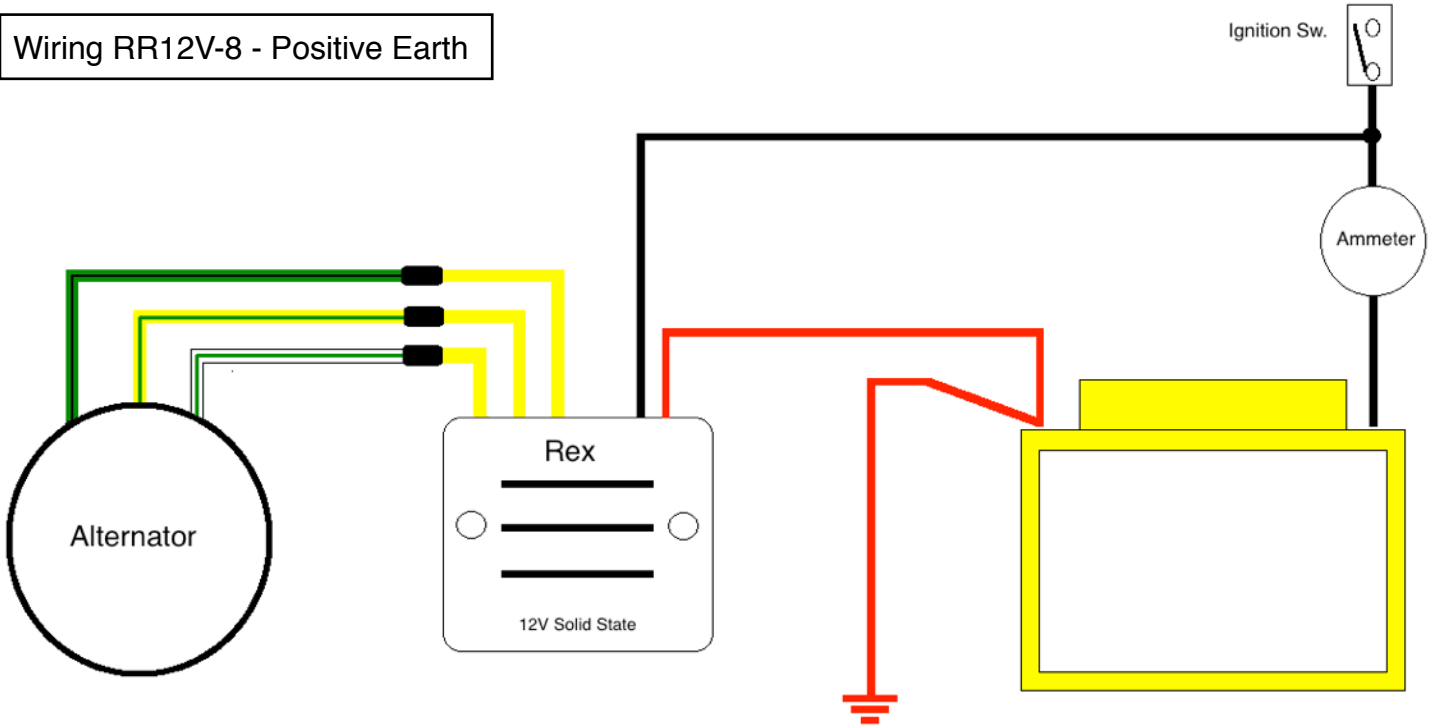
The red wire is connected to positive. The black wire is connected to negative. Double check you have made these connections correctly before re-connecting the battery.

Please ensure you have access to the bike's wiring diagram or shop manual to look up wire colours. We do not hold a library for the hundreds of different bikes made - although we do have some wiring plans for machines using Lucas equipment - these can be found free of charge on our Technical support page.

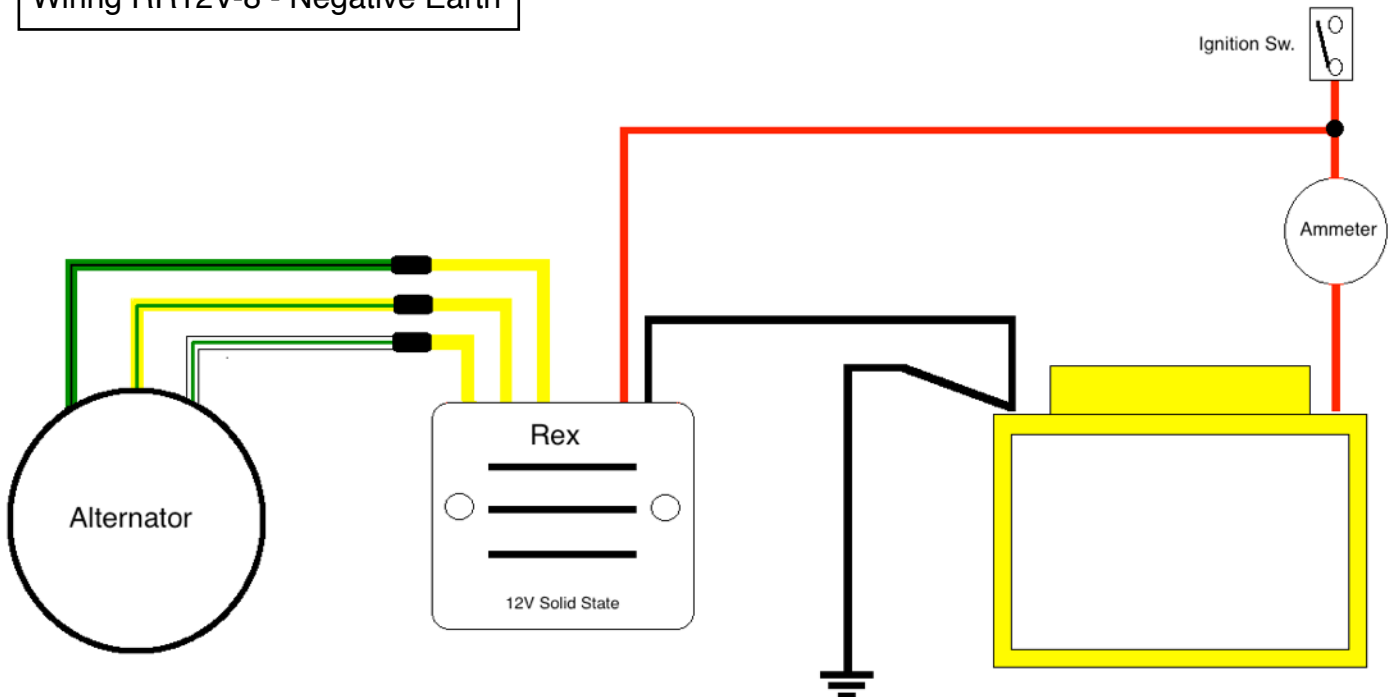
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Wiring RR12V-8 - Positive Earth



Wiring RR12V-8 - Negative Earth



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Testing

Refit the battery. To test the system is working correctly simply measure the battery voltage at its terminals, with the engine running, using a suitable multimeter. The voltage should be observed to rise above the battery's terminal voltage and settle between 13.8 and 14.7 volts.

An ideal figure is 14.2 volts +/- 0.5V. The exact figure will depend on the alternator's power output, the load on the system, the condition and state of charge of the battery.

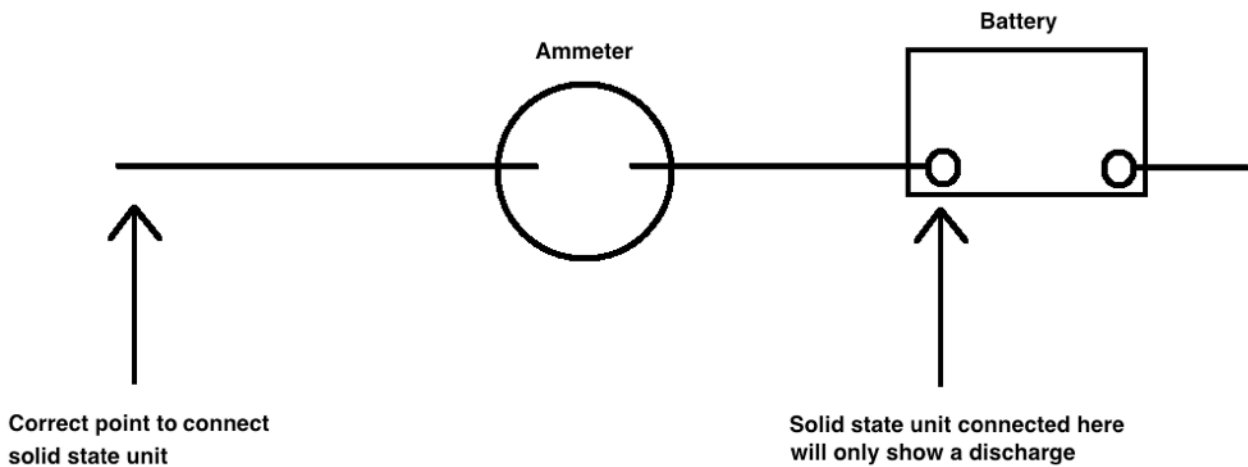
Excessive charging is over 14.7 volts. Under charging is below 13.8 volts.

Running with a battery eliminator (capacitor) and no battery will cause higher readings, 15 volts with the lights off is not uncommon. This is because the capacitor stores surges caused by the piston accelerating on the power stroke. There is little that can be done about this other than putting a load on the system to reduce this figure, putting the lights on is the most obvious and commonly employed solution.

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 charge state or load on the system causes variations in observed voltage readings. Defective or low quality wiring is also a cause of many system problems.

Common Problem - Ammeter shows the system is discharging.

If you have conducted the tests above with a multimeter and seen that the system is charging yet the ammeter shows 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 between the battery and ignition switch. 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 of between 5 -14 A/Hr capacity. These brands receive very positive feedback from customers year after year. Both have a long life when not used, provided correctly maintained. A normal motorcycle charger can be used to charge both types.

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

For further advice email: tech@rexs-speedshop.com