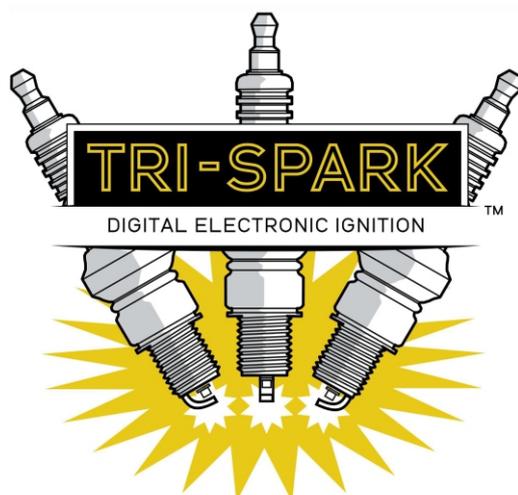


Tri-Spark Installation Guide

Alternator kit – KIT-0003 - KIT-0001 and KIT-0016



Thank you for purchasing a Tri-Spark alternator kit for your machine. Your kit consists of a Lucas stator coil and a Tri-Spark 20 amp MOSFET voltage regulator.

For your own safety, we strongly recommend that you engage a qualified technician to install your new parts. The following information is provided as guidance to assist them in the installation and setup.

Please note: The MOSFET regulator may be connected to positive OR negative earth (ground) machines as the housing is isolated from the wiring. The RED wire is always positive and the BLACK negative regardless of the earthing (ground) of the bike.



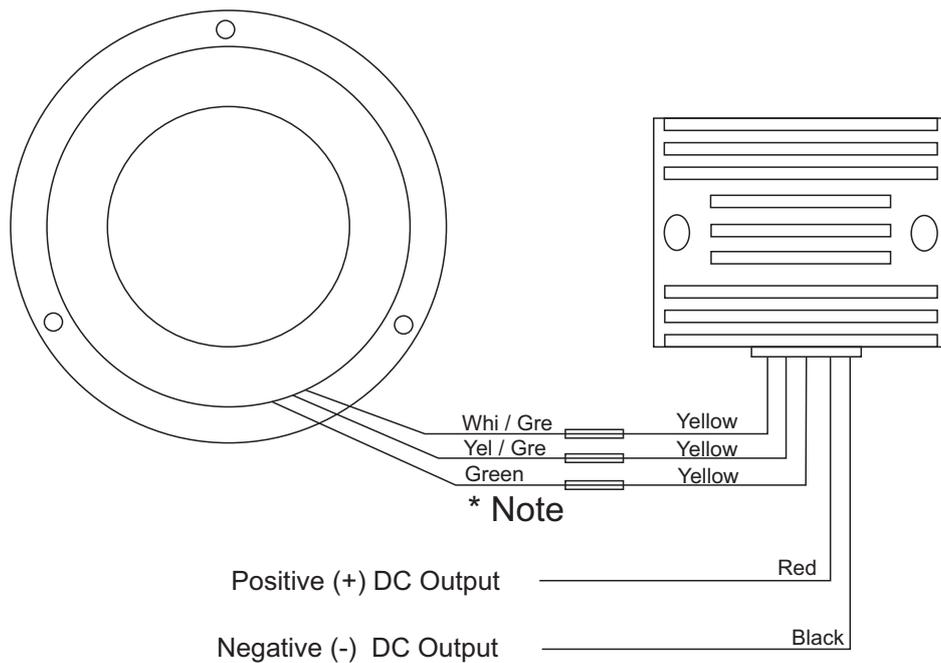
Installing the new stator involves opening the engine cases and replacing the existing unit. This should be done in accordance with the instructions given in your workshop manual for the engine. The complete installation may require tab washers, seals and gaskets not supplied with the kit and may be purchased from your parts supplier. Once the existing stator is removed it may be evident that the rotor is in poor condition - please contact us for a replacement.

Important: when the new stator is installed check for clearance in the gap between the rotor and metal poles of the stator. A brass shim or stainless gauge may be inserted in the gap to check the clearance.

The voltage regulator should be installed where there is some air flow as it will get warm in normal operation. Under the battery tray or behind the side cover may be suitable locations on some bikes. The three yellow wires on the regulator are interchangeable and may be connected to any one of the stator wires.

The Tri-Spark Voltage regulator replaces the rectifier and zener diode - these components should be disconnected and removed as part of the installation.

Please see page 2 for a suggested wiring diagram - refer to the wiring diagram for your machine for specific details of the wiring and connections.



Note: If installing a 2 wire stator leave one yellow wire unconnected
 You may wish to cut it shorter and always insulate the unused wire

Always disconnect the battery when working on the wiring

Suitable connection points for the MOSFET regulator's BLACK and RED wires are usually found where the original Lucas rectifier was connected to the bikes wiring. RED goes to the positive connection and BLACK to negative. On some machines with positive earth wiring the BLACK wire connects to the Brown / Blue wire found at the rectifier location and the RED wire to a good earth. For more details check the wiring diagram for your machine.

Connecting the regulator's RED and BLACK wires directly to the battery is not recommended as this would bypass the fuse in the wiring loom. A better installation method uses the connection point where the original rectifier was connected to the loom. On many bikes this is the Brown / Blue wire.

A 15A fuse may be connected inline with the regulator's RED wire for added protection if connection directly to the battery is required.

The voltage regulator should maintain a maximum of 14.0 to 14.5 volts for battery charging. Voltage readings will vary depending on the engine speed and load on the battery. Cheap digital voltmeters will not read the battery voltage correctly when the engine is running due to electrical interference from the ignition system. Using an old analog voltmeter (with a pointer) will give better results.

WARNINGS - Reversing the polarity of the regulator WILL damage the unit. Always check the polarity carefully when connecting the battery.

Our experience with these kits tells us that most of the units get installed correctly however in some cases there are issues relating to clearance around the rotor. These notes are intended to help you avoid these issues.

The clearance between the rotor and inside of the stator is dependent on the installation – it is not a straight bolt on assembly. The clearance must be checked with a feeler gauge all the way around. If the clearance is less on one side then the stator must be moved accordingly on the mounts. The clearance should be 8-10 thou all the way around. If not, it should be fully investigated and corrected.

The rotor may also exhibit run-out depending on the crank mounting due to pre-existing damage to the crank or faulty items such as mounting bolts. The rotor should be checked for run-out with a dial gauge prior to fitting the stator. If this is not available the clearance should be fully checked around the stator as the crank is rotated through 360 degrees. Check this several times.

Also, the stator and rotor components were changed several times in production by Lucas and it is possible that the items we supplied are not suitable for your engine. You should have an expert assess the parts prior to any attempt at installation to ensure that they will be suitable.

The available space for the nuts that hold in the stator to its mounts is reduced with the 3 phase stators. Special thin wall nuts should be used – we have stock of them or you can source them from your parts dealer. Also, a long reach thin wall socket is required to tighten the nuts. They should not be over tightened – damage to the laminations will result. Use appropriate washers to spread the pressure from the nuts to the surrounding laminations.

In some engines the stator fits inside a machined ring for location. Do not force the stator into the ring. If it is a tight fit it may be necessary to file down the laminations a small amount to achieve a good fit. The stator should slide into position. **DO NOT FORCE** the stator onto the studs - this will damage the laminations.

Once the engine is started and warmed up the clearance can be checked again. If the rotor touches the stator while running it will ruin both parts very quickly. The stator will turn blue and the epoxy will melt from around the coils. The rotor may demagnetise or break up into pieces.

We highly recommend getting expert help with fitting the stator as it can be problematic. It is not a bolt on system for every bike. It must be checked for suitability and installed with great care – some modifications may be required to get a perfect fit.

Also check the recommendations in your service manuals relating to the rotor and stator installation. Note the recommended routing of the wire from the stator through the engine cases.

Contact between the rotor and stator WILL result in damage as shown here. Please ensure that the stator to rotor clearance is checked and adjusted to be even all the way around. A minimum clearance of 8 thou or as per your workshop manual should be achieved.

This damage is the result of rubbing - not an electrical fault or manufacturing fault and is not covered by warranty. Please refer the installation to an expert if you are in doubt.

We will not entertain any claim relating to these parts if there has been contact between the rotor and stator or any evidence whatsoever of mishandling. You must assess the situation for your engine. Care must be taken with the installation and minute adjustments may be required to get a perfect result.



We hope that these notes assist in the successful installation of the parts.

Here at Tri-Spark we have an ongoing commitment to monitor and improve our methods wherever possible to achieve the highest standards for our products. Your feedback is welcome and needed to assess our standards and methods.

The Tri-Spark Team

Testing the MOSFET regulator - refer testing to an auto electrician

Apparent problems with the charging system are often simply caused by a dead battery. Have the battery load tested if in doubt.

With the engine running measure the voltage at the battery with a voltmeter. The battery voltage should increase as the revs are increased. The voltage should not increase above 14.5 volts as this is the regulation limit. A higher voltage indicates overcharging.

If the battery voltage does not increase when the revs are increased it is not charging. Check the stator connections and test its output.

With the stator disconnected from the regulator check the stator output voltage with an AC voltmeter. It should develop around 30 volts AC across the output wires at 3000 RPM.