

IRON HORSE SPARES

300 Watt Ariel Square Four Alternator Conversion WIRING INSTRUCTIONS

Introduction

Connection to the 300W alternator is by just two wires:

BLACK: Regulated and rectified output to battery +ve (via ammeter)

RED: Switch supply to field coil and battery sense.

Preparation for 12v system with –ve earth

Before the alternator is fitted the bike must be wired for **12volts and negative earth**. On a standard bike this is a very simple two step operation.

- Replace all light bulbs with 12v
- Reverse the connections to the battery. Since this will mean the red wire from the original loom will connect to battery –ve it is recommended that you label both the battery connections very clearly. A –ve earth warning sticker is included in the fitting kit.
- Replace the ignition coil. You will need a 12v un-ballasted coil with a primary resistance of 3ohms
- Reverse the connections to the ammeter.

Remove the dynamo regulator

The regulator (electro-mechanical or modern solid state) is no longer required and can be removed completely. Since the yellow(dynamo) and green(field) wires from the dynamo to the regulator have no other connection into the loom* they can be used to neatly connect to the alternator output and pass the outputs up to the original regulator location where final connections to the loom can be made.

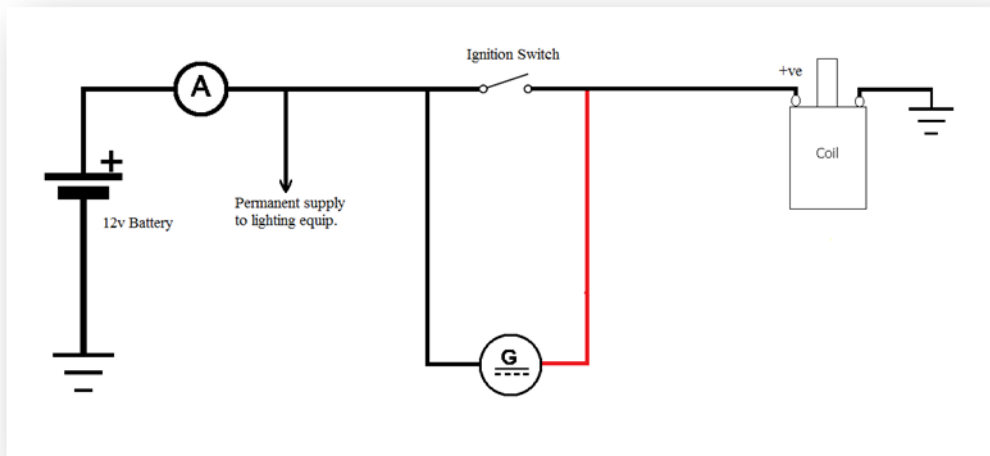
**The yellow wire also connects to the tell tale on red spot ammeters. This will not work with the alternator. We are looking at ways to drive it and will release as a service bulletin!! In the mean time: remove the bulb!*

Fuse protection

It is good practice to protect the motorcycle wiring with at least a main fuse to the battery supply. In addition to the main battery fuse it is also advisable to fit an additional fuse in line with the output from the alternator (black wire). Dead shorts in the loom may not blow the main battery fuse under certain circumstances. If the alternator is run into a dead short it can overheat and burn out the windings.

A suitable fuse and quality fuse holder are supplied with the kit and it should be fitted. Although some people are averse to fitting fuses as they are non-original or sometimes viewed as an unnecessary source of trouble they could save you a great deal of money in the long run.

Simple Wiring diagram:



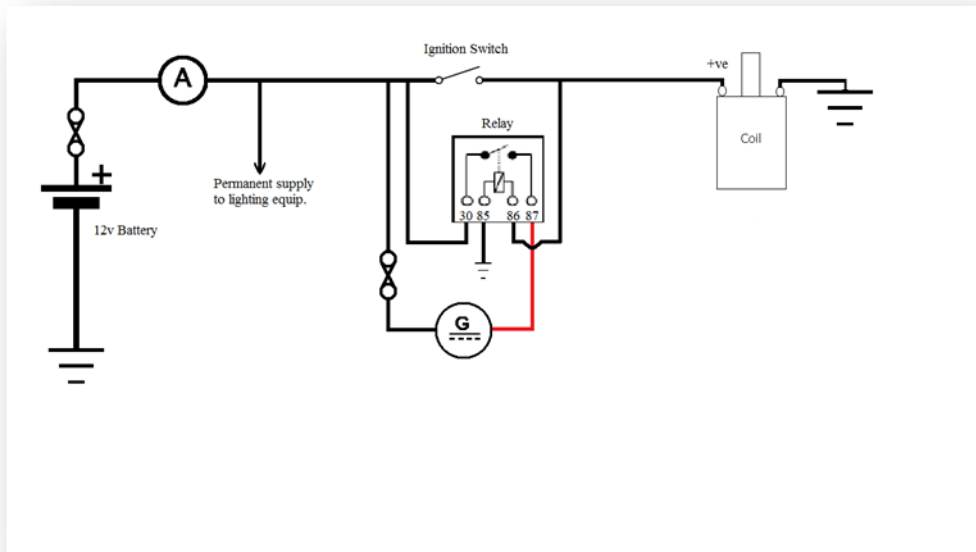
This simplified diagram is not intended to be used as an instruction for connecting the alternator. Rather it is to demonstrate the function of the two wires from the alternator.

As can be seen the output from the alternator is permanently connected to the battery via the black wire. Since it is via the inbuilt rectifier there will be no current drain.

When the ignition is switched on the supply to the alternator field coil is connected via the red wire. This gives a current drain of approx 3 amps. When the engine is running the regulated output via the black wire will charge the battery and power any lights etc.

NOTE: Once the engine is running the alternator will use the voltage present on the red wire to regulate the output. It is important that all connections are sound and the ignition switch is in good condition. If there is any resistance in the circuit the alternator will overcharge. For this reason it is recommended that a relay is used as per the following circuit diagrams. The relay directly connects the red and black wires together when the ignition is on and so any contact resistance in the ignition switch will not affect the regulator.

Wiring diagram with relay & fuses:



In this circuit a relay is used to connect the red field coil/battery sense wire to the system +ve. When the ignition switch is closed the relay coil is energised and the contacts in the relay close. The connection from pin 30 on the relay will probably be best joined into the loom at the same point as the generator output wire.

If you are using a standard loom either original or as supplied by Draganfly (other Ariel spare parts dealer may exist!) then the connections can be made extremely neatly. The wiring diagram and pictures below illustrate the method I used on my Mk1 Sq. The relay could be hidden inside an old regulator box to good effect.

Fuses are shown in both the main battery connection and the black output wire for the alternator. As a bare minimum the battery connection should be fused but even with this in place there is a possibility that a dead short or very low resistance fault in the loom could overload the alternator. It is highly recommended to run both fuses as shown.

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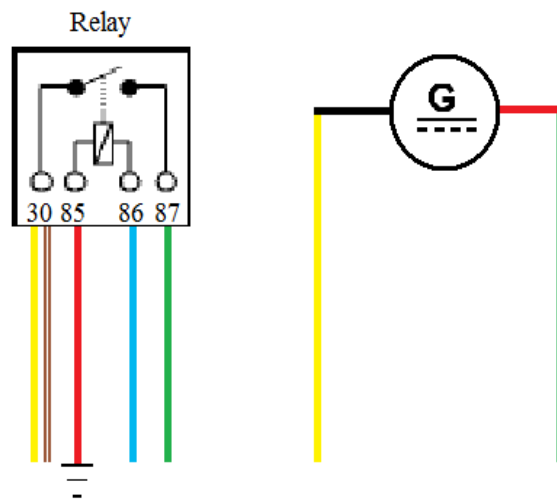
Wiring diagram with relay for bikes using standard loom:



The black output wire connects to the yellow dynamo wire in the loom. The red alternator battery sense and field coil wire connects to the green dynamo field coil wire in the loom.



The regulator is removed and all the wires are connected to the relay as per the diagram below. An additional feed is taken from the ignition switch to energise the relay.



In the diagram above the wires to relay are the ones removed from the regulator except for the blue wire which is a feed from the switched side of the ignition switch to energise the relay. The yellow and brown/wire are connected together at terminal 30 (put them both into a single female spade terminal) this takes the output from the alternator to the battery.

NOTE: If you have a red spot ammeter you will need to remove the bulb from the ammeter.