

LUCAS RITA IGNITION

GENERAL INFORMATION ON LUCAS RITA IGNITION

1. There are currently two basic amplifiers. Type AB5 (part No. 48016) which is identified by an external ballast resistor and type AB11 (part No. 48022) which has no external. There are variations made for certain applications and these variations are identified by colour coding on the side of the amplifier. It is advisable to have the recommended amplifier for the job and if in doubt please ask.

Identification

- Yellow panel — Bistable amplifier for some total loss battery applications and Triumph and Ducati twins.
- Green panel — Advance curve modified for BMW R90S, RS100 and S100 (may be used on all BMW models).
- Black case — (with or without yellow panel) — Advance curve modified for Norton twins with 4S cams.
- Blue panel — Radio suppression for some police applications.

2. It is most important to adhere to the colour codes shown on the diagram. The systems are supplied to run on Fixed Ignition on some models and Automatic Advance/Retard on others; therefore the Pickup to Amplifier connections must be made as shown on the diagram supplied with the kit. The timing positions for the two methods are approximately 20° different and engine damage can occur if the connections are transposed. If in doubt use a Stroboscope to check.
3. There are three Pickups in use and these are identified as follows:
 - (i) 2 P.U. Type. Basically hexagonal in shape and full encapsulated. Normally only used on racing machines.
 - (ii) The standard 'C' type used on Trident and Suzuki three-cylinder.
 - (iii) The low 'C' type used on most other road machines.
 - (iv) The 5 P.U. Pickup and Reluctor used on Triumph twins when the AB11 amplifier is used. This Pickup is also compatible with the AB5 amplifier.
4. The shape of the triggering poles on the retractor are different for Fixed Ignition and Automatic Advance/Retard. It should therefore be noted that a four stroke Reluctor will not run a two-stroke satisfactorily on Fixed Ignition as at 3. Please ask our Technical Department if considering a non-standard application.
5. The "560" type in-line connectors are supplied for ease of fitting in situ. However, they can be trouble in the long term if vibration gradually wears the contact area between the copper wire and the bridge inside the connector. We recommend crimping on alternative connectors, giving a larger contact area, if you have the facilities.
6. Krober electronic rev. counters can be used with RITA and the triggering point is the spare coil spade (-) where the white-black wire from the RITA Unit is connected. Follow the instructions supplied with the rev. counter regarding the difference in connecting to positive or negative earth ignition systems. When ordering the instrument, point out the number of sparks produced at any one spark plug, by the RITA Ignition per engine revolution, i.e. Suzuki 750 — three sparks per revolution; Trident — three sparks per two revolutions, etc.

7. For machines running with RITA ignition and no battery there are various suitable alternator parts and control circuits available. For racing use, without a lighting requirement, and where a Lucas alternator is used originally, then the low output Daytona Stator with a Welded Rotor and half-wave Control Box should be obtained. (Prices on application.) In all other cases, i.e. road machines, endurance racers and where an alternator other than Lucas is to be employed, please contact our Technical Department before proceeding.
8. Applications of RITA to engines running on methanol type fuels can run into trouble with the idle sparks igniting the mixture. It is not a problem with the idle spark at 360° to the working spark as on a Norton Twin, but is known to be unsatisfactory at 180° to the working spark.
9. On racing applications where an electric petrol pump is fitted it is possible for the pump operation to trigger the ignition and cause misfiring. Suggested remedies are:
1. Run the pump from a separate battery.
 2. Fit a Bendix electronic pump or a mechanically actuated pump.
 3. In the case of a two stroke, a crankcase pressure actuated pump can be employed.
10. Spark rate requirements in the range 20-60,000 sparks per minute may require battery voltage in excess of 12 volts, depending on the coils employed and the state of tune of the engine. Again, our Technical Department will advise.
11. RITA amplifiers from October 1976 have a plug and socket breaking the wiring harness 150mm from the amplifier. If a spare amplifier is required for a unit supplied prior to this date please state that a wiring harness is also required.
12. **FAULT FINDING.** A simplified description of the operation of the system may be found helpful before looking for a fault.

1. The Magnetic Pickup is a generator and a small output voltage is produced by the Reluctor passing close to the centre pole of the Pickup and cutting the lines of magnetic force. The Pickup is tested for resistance across the terminals and satisfactory readings are:
 - (a) 'C' and low 'C' type ÷ 200-450 ohms.
 - (b) 2 PU type ÷ 1500-2000 ohms.
 - (c) 5 PU type ÷ 600-700 ohms.
2. The output voltage is fed to the Amplifier triggering circuit, via the Brown and White-Brown leads, where the internal circuitry amplifies the signal and switches the coil feed current off to produce H.T. voltage from the coil. The coils are normally "on" until switched off for a short period by the Pickup signal. They then revert to the "on" position until the next signal. The same effect can be produced by switching off the ignition switch or cutout switch. Therefore to test the Amplifier lay a spark plug on the cylinder head and carry out the following procedure:
 - (a) Switch the ignition on and off. If sparks are produced the main power circuit is o.k.
 - (b) Leave the ignition on and unplug the White-Brown (AB5 amplifier) or White-Purple (AB11 amplifier). Touch this to earth on a negative earth machine or to the negative battery terminal on a positive earth machine. If sparks are produced the triggering circuit is o.k.

The above tests make the assumption that the coils are in good working order and that all the wires and wiring connectors are making good contact. Therefore examine all the connections in the ignition circuit and check that the earth screw is tight.

Examine the terminal post insulation sleeve which can be cut through by some of the smaller Japanese eyelets. If faulty, replace or repair the sleeve and spread the eyelets wider. If a test meter is available test between the eyelets and earth with the terminal post assembled and the nuts tightened.

It is also advisable to check that all the pins are correctly assembled in the 5-way plug and socket of the amplifier and to seal the cable entries with R.T.V. or similar material.

Another fault which is sometimes noticed by customers is continuous sparking at the plug. This is caused by high resistance in the circuit which may be due to a flat battery, a bad earth connection, or corroded contacts in the ignition switch or cutout button.

On four cylinder models it may be necessary to check the diodes if one pair of cylinders is not running correctly. To do this, disconnect the diodes from the coils and test one at a time. They can be left on their bracket and the White-Black can be left connected. Connect a 12 volt bulb in circuit with a fly lead and use this to connect the diode lead to battery +. Use another fly lead to connect the aluminium diode bracket to battery —. The bulb should light. Now reverse the two fly lead connections at the battery and the bulb should not light. Repeat for the other diode. If the bulb lights on both polarities or does not light on either polarity, then the diode is faulty.

A final note on plug caps: The cheaper types of suppressed caps are prone to causing ignition problems. If this trouble is suspected, try connecting the H.T. cable direct to the top of the plug or use a rubber insulated non-suppressed cap for a trial run.

If the RITA unit is off the motorcycle, it can be wired up on the bench with a battery, coils and spark plugs connected to a common earth. It can then be operated by passing a screwdriver rapidly over the centre pole of the Pickup. For auto electricians and service engineers a comprehensive set of service sheets is available.

- 13. The greatest care is taken in manufacture and testing and we believe that ~~this~~ is the most reliable electronic ignition system available for motorcycles. Even so, there is the possibility of a component failure during the early service life of the units and any faulty items will be replaced free of charge.**