

## RITA ELECTRONIC IGNITION SERVICING INSTRUCTIONS

### PART A

#### FAILURE OF ENGINE TO RUN

Check h.t. leads are clean and dry, and connections are tight.

Check l.t. connections to ignition coils, RITA unit, ballast resistor, pick-up, isolating diodes (where appropriate), and ignition switch, and in-line and earth connections are tight.

Check pick-up coil is not loose on pick-up poles, and that pick-up assembly is secured rigidly to the base plate.

Check reluctor rotates when engine is cranked and that the air gap is correctly set.

Remove spark plugs, clean, set gaps and replace, or renew plugs if necessary. Disconnect any rev. counter connections to the ignition coil circuit.

#### 1 Check battery terminal voltage

Connect a voltmeter (0-20V) across the battery. A reading of 12V or more should be indicated.

#### 2 Check supply to RITA unit

(a) Connect a voltmeter (0-20V) to RITA unit black (negative) and red/black (positive) leads without breaking their circuit connections. Switch on the ignition and check voltmeter indicates the battery voltage measured in test 1. If the same reading is obtained and the machine is fitted with a starter motor proceed to test 2(c), but if no motor is fitted proceed to test 3(a). If a different voltmeter reading is obtained proceed to test 2(b).

(b) Disconnect in turn each run of cable between the RITA unit black and red/black supply leads and the battery, and check its continuity by connecting an ohmmeter to each cable end. Also check the ignition switch is closed in the 'on' position. Rectify faulty wiring, connections or ignition switch.

(c) Keeping the same voltmeter connections as in test 2(a) switch on the ignition, operate the starter motor, and

observe the voltmeter reading. Switch off the ignition. If the voltmeter indicates less than 9V during cranking, check the battery-to-earth lead and its connections to the battery and machine frame. Otherwise proceed to test 3(a).

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Check ignition coil l.t. circuit

(a) Remove the spark plugs and, with h.t. leads still connected, rest the plugs on the cylinder head. Disconnect the RITA unit white/black lead from the '-' terminal of the appropriate coil or, on systems which have parallel coils, from the isolating diodes heat sink. Short the same coil '-' terminal or the isolating diodes heat sink whichever is appropriate either to earth (negative earth systems) or to the battery negative terminal (positive earth systems). Alternate the ignition switch between the 'on' and 'off' positions (negative earth systems) or make and break a number of times the shorting lead connection to the battery negative terminal (positive earth systems). Check sparks occur at all plugs each time the ignition is switched off or the shorting lead connection is broken.

If sparks are not obtained at all plugs proceed to test 3(b). Otherwise reconnect white/black lead, and on machines with series connected ignition coil systems proceed to test 4(a): where parallel-connected coils are fitted proceed first to test 3(d) and then, if no diode faults are discovered, to test 4(a).

(b) Where the positive supply to the ignition coil(s), ballast resistor and RITA unit is wired exactly as shown in the wiring diagrams, check either the continuity of the coil link cables and their terminations (series-connected coils) or the fly-lead terminations of each coil (parallel-connected coils).

Where the positive supply to the ignition (coil(s) etc. is wired other than shown, the following tests are also required. On series-connected coil systems check the continuity of the wiring between the '+' terminal of the

Appropriate coil and either the ignition switch (negative earth systems) or earth (positive earth systems). On parallel-connected coil systems check the continuity of the supply cable between the positive common coil connection and the ignition switch.

Rectify any faulty wiring or connections. If checks were satisfactory, proceed to test 3(c).

- (c) Disconnect the l.t. connections or fly-leads of each ignition coil in turn and connect an ohmmeter across the l.t. terminals ('+' and '-') or fly-leads (double-ended coils). If no continuity exists, the coil primary winding is open-circuit and the coil must be renewed.

Should continuity be obtained, connect the ohmmeter between the coil can or fixing bracket and either l.t. terminal or lead. Any continuity that may be registered indicates the coil primary winding is shorted to the can. In which case renew the faulty coil.

In the case of a machine having an ignition system which incorporates parallel connected double-ended coils, and where the cause of failure to operate has not been discovered in tests 2(b) or 3(c), proceed to test 3(d).

- (d) Check that the isolating diode mounting bracket (heat-sink) is not touching the machine frame, and that each diode is securely fixed to the mounting bracket. Check in turn each of the isolating diodes and its fly-lead as follows.

Disconnect the fly-lead of the diode to be tested from its associated in-line connector. Connect an ohmmeter across the diode fly-lead and check continuity is obtained. If continuity is not obtained renew faulty fly-lead or termination, otherwise proceed as follows.

Connect a 1.5W bulb and a 12V d.c. supply in series with the diode and fly-lead, and then repeat the test with the connections to the diode and fly-lead reversed. A faulty diode will cause the bulb in both tests either to light or to remain extinguished. In this event the complete isolating diode must be renewed. Reconnect diode after

test. Alternatively each diode may be checked using a battery-powered ohmmeter, but since the forward resistance of a diode varies with the voltage applied, no definite meter readings can be quoted. However, a faulty diode will produce either infinite readings or near-zero readings in both directions.

Note: Ohmmeters of the type incorporating a hand-driven generator must never be used to check a diode.

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Check ballast resistor circuit and RITA unit

- (a) With the ignition switch in the 'on' position, alternately disconnect and reconnect the RITA unit white/blue lead at the ballast resistor.

Note: On positive earth systems, take care not to let white/blue lead short to earth.

Check whether sparks occur at all plugs each time this connection is broken. Switch off the ignition and remake the connection. If sparks were obtained at all plugs proceed to test 4(d). If sparks were not obtained at all plugs then proceed either to test 4(c) if the positive supply to the ignition coil, ballast resistor and RITA unit is wired exactly as shown in the wiring diagrams: or to test 4(b) if the positive supply to these units is wired differently.

- (b) Check the terminations and continuity of cable runs between the ballast resistor and earth (positive earth systems) or ignition switch (negative earth systems) with an ohmmeter.

If the terminations and wiring are in order proceed to test 4(c), otherwise renew faulty termination or wiring.

- (c) Disconnect the ballast resistor and check the continuity or resistance (9.5  $\Omega$ ) of the resistor with an ohmmeter. If continuity or a resistance reading of 9.5  $\Omega$  is obtained the RITA unit is faulty. Verify by substituting a new unit.

- (d) Disconnect RITA unit white/brown lead and switch on the ignition. Connect the RITA unit white/brown lead to a

good earth point (negative earth systems) or the battery negative supply line (positive earth systems) and check sparks occur at all plugs each time connection is made.

If no sparks are obtained at the plugs, renew RITA unit. If sparks are obtained, leave the RITA unit white/brown lead disconnected and proceed to test 5

### 5 Check pick-up circuit.

Disconnect RITA unit brown lead and check continuity of cable runs between points at which RITA unit leads (brown and brown/white) were connected and the corresponding pick-up lead terminations. If continuity is obtained and the pick-up lead terminations are in order then the pick-up is faulty and should be renewed.

## PART B

### MISFIRE CONDITIONS

#### 1 Irregular misfire

Proceed as for failure of engine to run, Part A.

#### 2 Regular misfire

(a) Remove the spark plugs and, with h.t. leads still connected, rest the plugs on the cylinder head. Operate the ignition switch and observe plug(s) not sparking. Check h.t. leads of plug(s) not firing are clean and dry, and connections are tight. Clean and reset gap(s) of plugs not firing or renew if necessary. If plug(s) still misfire when ignition switch is operated once more, proceed either to test 2(b) (series-connected ignition coil circuits) or to test 2(c) (parallel-connected ignition coil circuits).

(b) Remove leads from ignition coil associated with plug(s) not sparking. Connect an ohmmeter between coil can and either the '+' or '-' terminal. Any continuity indicates the primary winding is shorting to the can, and the faulty coil must be renewed.

(c) When misfiring occurs on machines having parallel-connected ignition coils, it is necessary to check both parallel l.t. circuits.

Disconnect both l.t. fly-leads of each ignition coil and

check terminations.

Connect an ohmmeter between the l.t. fly-leads of each coil and check for continuity. If no continuity exists, the primary winding is open-circuit and the coil must be renewed.

If continuity is obtained, check for no continuity between either l.t. fly-load and the fixing bracket of each coil. Any continuity indicates the primary winding is shorted to the coil can, and the coil must be renewed.

If no continuity exists and both isolating diodes are securely fixed to their mounting bracket, then one of the isolating diodes or its fly-lead is faulty. Check in turn each diode and fly-lead as in Part A test 3(d).

Please note that all amplifiers have a standard production number - ~~48016~~ - and that any 'specials' will carry a colour code on the side of the box.

For example the only change to date is on the BMW 90/s, all other BMW's and other makes of road going machines are standard. Some racing machines are colour coded and must be adhered to.

#### COLOUR CODE

##### Road Machines

BMW 90/s - Green Panel. *DUCATI 750 & TRIUMPH TWIN. YELLOW PANEL.*

##### Racing Machines (ONLY)

Norton Racer. Twin Cylinder - Black box with yellow panel

Weelake Twin Cylinder - Natural die cast box with yellow panel

RACING AND COMPETITIONS DEPARTMENT