Alternator Testing

***Al Osborne (who advertises in* The Jampot) *is frequently asked how one might determine the viability of old alternators before digging deep in the pockets for replacements. He has produced the following guide of simple testing practices.* CR**

THE Lucas alternator has been with us since the late '50s with only one major change. In the early 60's the rotor went to 74mm outside diameter whilst the centre crank hole standardised at 19mm.

Early RMs had 70mm rotors and these parts are not interchangeable for any worthwhile results. In the early 70's the welded rotor (commonly 54212298) was introduced which overcame the earlier problem of rotors (commonly 54212006) which simply came apart through vibration and heat.

Check points for a good Rotor:

Is the centre steel tube coming loose? Is there 'throw' of grey powder from the centre? Are the magnets coming proud? How is the fit on the crank/woodruff key?

Finally, what state are the magnets in? Without a specific magnetism measuring device there is a crude rule of thumb that you can apply. Does each magnet hold the rotor's weight on a moderate sized spanner or screwdriver held horizontally? If this test fails, it's time for a new rotor.

Age and use contribute towards any loss of magnetism but in some cases, if the rotor is mechanically sound, it might be worth re-magnetising (phone AO Services for details).

The Stator:

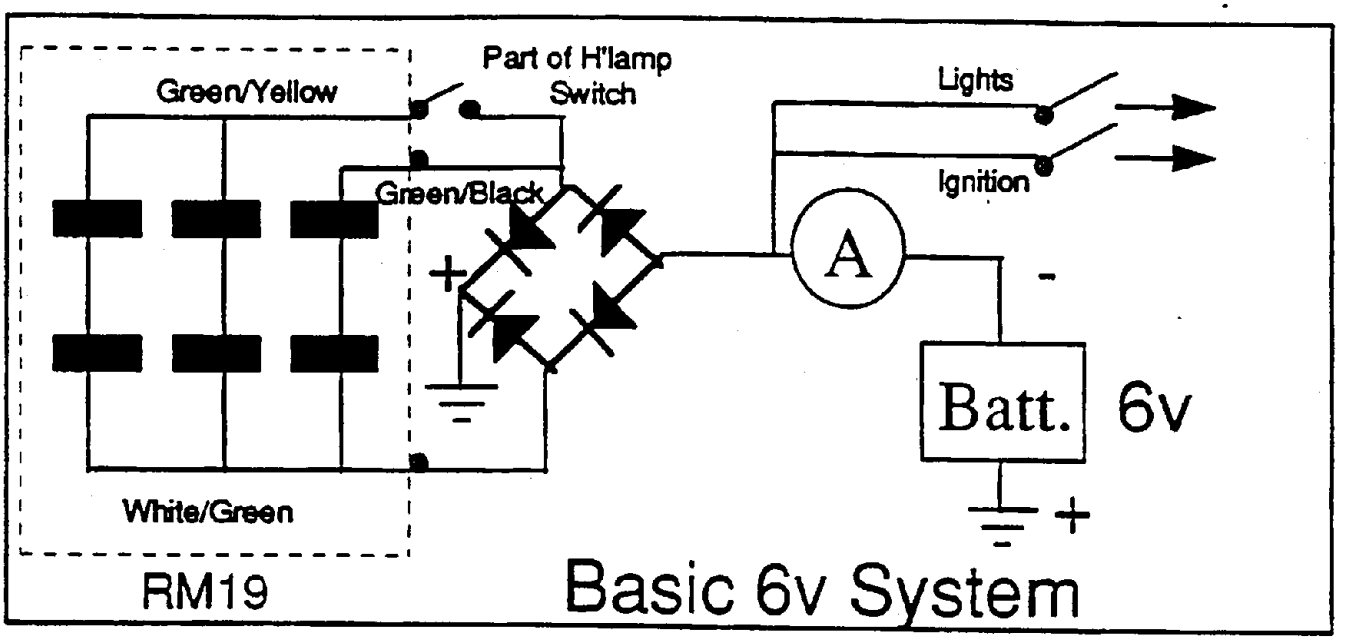
These are all basically interchangeable with the same three stud fixing but with differing outputs. The RM18s and earlier had outputs of 60-80 Watts while the RM19 (47204) produced in the order of 100 Watts.

The 47204 is the only currently available 6v unit (which will convert to 12v). The most common RM21 (47205) produces at least 110 Watts. The RM23 is a high output 180 Watt while the RM24 moves to three phase and the 47- - - part number will alter to produce different outputs.

To Test the Stator:

The same basic tests cover the whole range. Using a multimeter set to resistance (Ohms) and with the alternator wires disconnected from any wires on the bike, there should be a very low resistance (i.e. less than 1 Ohm) between any and all of the wires.

Between any wire and the metal work of the stator, or the engine if still in the bike, there should be NO circuit (i.e. test on high Ohms).



If you haven't got a multimeter and the alternator is still in the bike, disconnect ALL wires from the bike and then connect a headlamp bulb across any two wires.

Start the engine and let it tick-over when the bulb should glow brightly. Warning - if you blip the throttle you might blow the bulb.

Try all combinations of wires; there should be output on all but giving different levels of brightness. Then connect the lamp between any/all wires and the metal work where there should be NO illumination.

This test will sort out the basic function. If you suspect a low output problem you will have to use a meter to test for full output as follows. (Note that there is no need to find 100 Watt resistors or to attempt to measure the AC output from the stator).

Output Test:

Disconnect the output terminal of the rectifier (i.e. negative, if positive earth) which is often BROWN or BRN/BLU. Connect a multimeter with a 10 Amp DC range between the rectifier terminal and the previously removed connector. Try the lights; there should be NO current flowing.

Start the bike and you should now register current being generated. Switch on all the lights and rev the engine to approximately 3000 rpm when you should see about 9 Amps (RM19/21) if all is well.

Any lower figure could be failed stator windings or low rotor magnetism. High output alternators should pass 10 Amps before 3000 rpm.

NB: Whenever fitting rotors and stators, there MUST always be a MINIMUM of 0.008ð (8 thou) clearance between the two AT ALL POINTS. Failure to comply with this rule causes huge damage and expense.