

Extraction of 12 volts from a '6 volt' dynamo.

Al Osborn, a Club member and past advertiser of his services in Jampot (see p.40 No 566) writes on this topic of perennial interest to owners of 'classic' (i.e. those old and British) bikes. This article does not provide the definitive solution, but enough gen to permit informed choices to be made.

The problem:

The motorcycle world has abounded with rumour and 'fact' on this vexed subject for over 20 years, the extraction of 12 volts from a humble 6 volt dynamo, as used on the majority of British motorcycles (and a few foreigners).

The general consensus seems to be that "yes" it can be done, BUT, there are reservations. What might at first appear to be the answer to a maiden's (or youth's) prayer, has several precautions to be observed in its application.

Principle:

The basic concept is to take a dynamo (Lucas E3 type or similar Miller) and fit a suitable Regulator to produce 12 volts (or more precisely, the voltage required to charge a 12v battery, 14.7v). The current produced by the dynamo would stay the same (10 amps from an E3 which produces 60W at 6v) therefore the Power produced would, theoretically, double to 120 Watts.

Dynamo Output:

What actually happens? In general terms it works as above, the Lucas E3, or Miller equivalent, do produce enough power to charge a 12v battery, but only at about 90 Watts as there are inherent losses in the system. However there is potentially a most serious snag in that the 14v is not available at low revs. More revs are required than when the dynamo was only required to produce 6v to maintain battery charge/lights etc. So, if a magneto ignition is retained and there is a fully pre-charged battery, with minimal use of the lighting system it will suffice, just. However, if you want a coil or electronic ignition system and use of the lights at night, you will not get away with it, unless you also rewind the dynamo specifically for 12v. This would involve an armature and field coil, each wound with sufficient windings to give 12v at the same revs as the original produced 6v.

Regulators:

As far as the previously-mentioned Regulator is concerned, some of the 'mechanical' 12v types from Lucas will serve the purpose. A more reliable course is to use a modern solid-state (electronic) which will do the regulating job with ease whether the dynamo is rewound for 12v or not, but they will not manufacture electricity that is not being produced from source and will not overcome the problems above. Electronic controls are very reliable and the faults encountered by the writer have usually been down to faulty fitting or a dynamo that is not up to par. In such cases the 'electronic death throes' are over very quickly and often without any visual signs. So don't guess, be sure and take no liberties with electricity!

Battery capacity:

A point often overlooked is the effect of battery capacity - Amp.Hours.

The minimum for any British motorcycle system in normal use is 5 amp hours. Be aware that there has never been any control of charge current in the typical regulator/dynamo systems except by virtue of the capacity of the battery being ample for the usually very moderate output. If you feel that you "haven't got room" and fit anything with smaller capacity, you risk 'melt-down' in due course.

Al Osborne 1999