

The stator generated e.m.f. is basically proportional to the speed of rotation of the field, as is also the frequency of the generated e.m.f. When the road speed of the bicycle increases, the voltage applied to the lamps and the current through them hence tends to rise.

The complete dynamo lighting set is however designed so that the main factor controlling the magnitude of the alternator output current is, at speeds above say 8 m.p.h. or so, the inductive reactance of the stator circuit. When generated e.m.f. and frequency increase, so does the reactance. The terminal voltage of the alternator is arranged to rise only to 7-7.5 volts on load even at 30 m.p.h.

Forty years ago the Philips concern designed a new cycle dynamo with an 8-pole rotating magnet, an excellent effort, and published an article about it in the *Philips Technical Review* which explained the principles of design involved. Since then I would have thought that nobody could be in doubt about cycle dynamos. Those curious should measure the open-circuit output voltage with an Avometer while riding the bicycle at various speeds on the road.

Mr Pollard says that the typical output of "a bicycle dynamo" is "around 4.5V r.m.s." The usual reason for low output voltage is that investigation by an inexperienced person has reduced the magnetism of the rotating field magnet. To bring the output voltage up by putting series capacitance in the output circuit, thus vitiating the voltage regulation built into the original design, is quite absurd.

P. Short
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Mr Pollard replies:

I wonder if Mr Short rides a bicycle with a dynamo, as I do, or better still, has taken the trouble to notice the almost uniformly poor efficiency of dynamo-driven cycle lighting, particularly at city-centre speeds of around 10 m.p.h.

I have owned two bicycle dynamos, both manufactured by H. Miller & Co. of Motherwell. The first, purchased 18 years ago, produced an output which rose inexorably with increasing speed and regularly burnt out the tail lamp at speeds of over 20 m.p.h. The second, purchased a year ago, is much better behaved. Its rated output seems a little uncertain: the instruction book quotes 5 volts 3.6 watts, while on the dynamo itself is stamped just "6V". The lamps supplied are 6V 0.5A and 6V 0.04A.

The actual output voltage of this second model (into the correct load), measured with an Avo at various road speeds is shown in the accompanying graph and compared with that obtained when the series capacitor is in

BICYCLE DYNAMOS

The "Circuit Idea" of Mr B. J. Pollard in the June issue entitled "Standby battery for dynamo lighting" gives a quite remarkable idea of the common bicycle dynamo.

These devices are variable-speed single phase alternators with rotating permanent-magnet field systems, output being taken from a stationary coil system. The output rating is typically 6 volts 0.5 amp.

