

THE MOTOR CYCLE

46th Year of Publication

Vol. 81 No. 2376
OCTOBER 21st, 1948

Editor ARTHUR B. BOURNE
Assistant Editor H. W. LOUIS

Villiers 98 c.c. Two-speed Unit

A FOURTH power unit has been added to the Villiers range. In addition to the three engines described in *The Motor Cycle* on September 30th, there is now announced a 98 c.c. two-speed engine-gear unit for motor cycles known as the Mark 1F. Power output is 2.8 b.h.p. at 4,000 r.p.m. Bore and stroke are 47×57mm.

A one-piece aluminium-alloy casting forms the major or right-hand portion of the crankcase, the inner half of the primary chaincase, which is also on the right, and the gear-box shell. A ball race in this casting supports the right-hand 20mm-diameter mainshaft. After passing through this bearing, the shaft carries the engine sprocket, and on the taper at the end of the shaft is fitted the flywheel magneto.

New Engine-gear Unit for Small Motor Cycles : Rectifier for Battery Charging

On the left-hand side is fitted a shallow casting in which is mounted a ball race supporting a 20 mm-diameter crankshaft stub; sealing the outside of the bearing boss is a plate retained by four screws. Nickel-molybdenum steel is used for the stamped crank webs with their integral shafts.

A solid crankpin of $\frac{5}{16}$ in dia. throughout, is an interference fit in the crank webs. Uncaged $\frac{3}{8}$ × $\frac{1}{2}$ in rollers are em-

ployed in two rows for the big-end bearing. These rollers run direct in the hardened and ground big-end eye of the stamped connecting rod.

At the small-end the connecting rod is bushed. The parallel-bored gudgeon pin in carbon steel has a diameter of 0.366in and is fully floating in the small-end bush and the bushes in the piston bosses; spring circlips retain the gudgeon pin. The die-cast aluminium-alloy piston has a flat crown and two pegged compression rings.

Porting in the cast-iron cylinder is similar to that on other 1949 Villiers engines. That is, there is a single exhaust port at the front, an inlet port at the rear, and the transfer passages are positioned one on each side. These transfer

VILLIERS 98 c.c. TWO-SPEED UNIT

passages give a rearward and upward swirl to the gases reaching the combustion chamber.

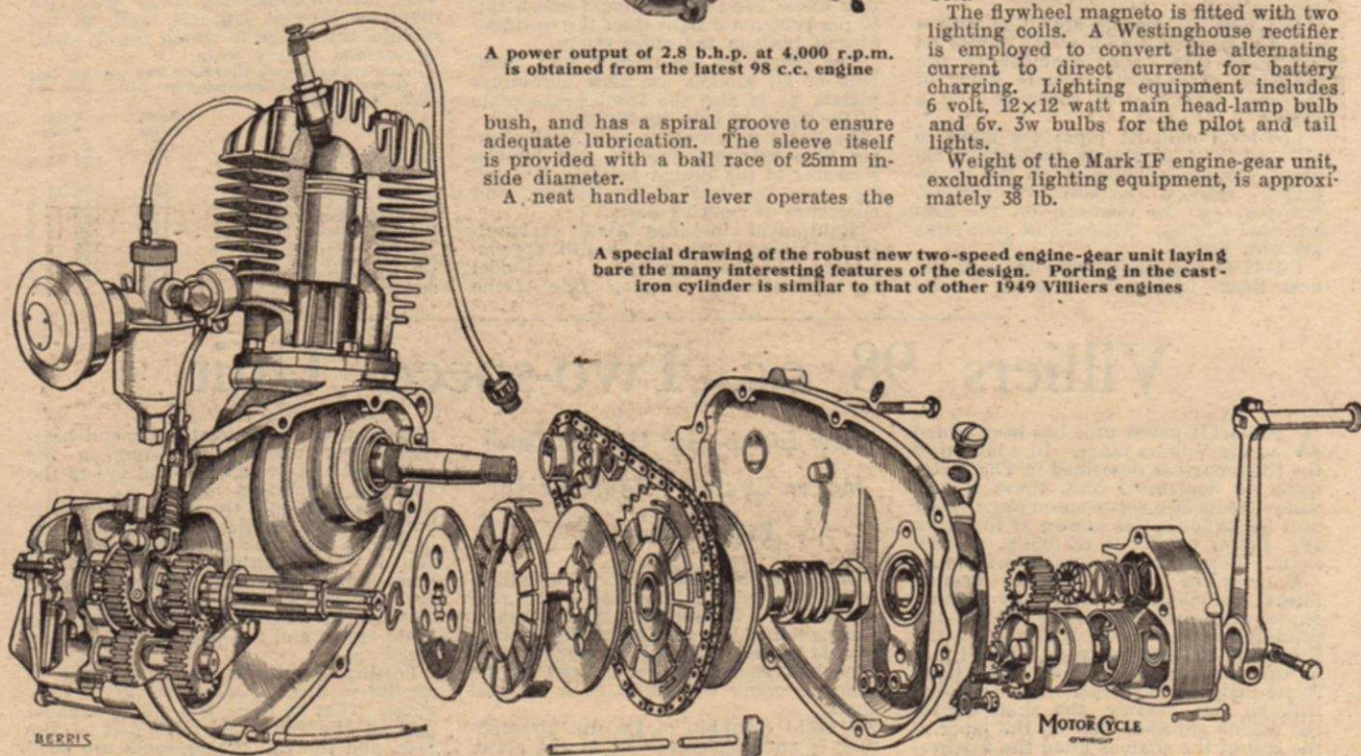
Four bolts retain the light-alloy cylinder head; the combustion chamber is hemispherical in shape and the sparking plug positioned toward the rear. No compression-release valve is fitted. The carburettor is the Villiers "Junior" single-lever type fitted with filter and strangler.

A $\frac{3}{4}$ in pitch endless chain is employed for the drive from the engine sprocket to the two-friction-plate clutch; cork friction inserts are used and operate in oil. The clutch thrust lever is carried in the sprocket cover on the left-hand side. This lever is located in a channel in the cover casting and has a pivot pin which also provides the means of thrust-rod adjustment. Reduction between engine and gear box is 1 to 2.47.

Sturdy Gear Box

The gear box is a sturdy, constant-mesh type especially attractive for its simplicity. Pinions are case-hardened. The two pinions on the lay shaft are formed as an integral "cluster" which has two internal bushes to provide the bearings on the fixed layshaft. This shaft is pressed in the gear-box casing on the left-hand side and supported at the other end by a plate.

The noticeably robust mainshaft is much longer and, apart from carrying the sliding dogs and bottom gear pinion, supports the clutch and, at the right-hand end, the kick-starter ratchet pinion. At this end the mainshaft runs in a ball race; in the top gear sleeve the shaft operates direct in the sleeve, without a

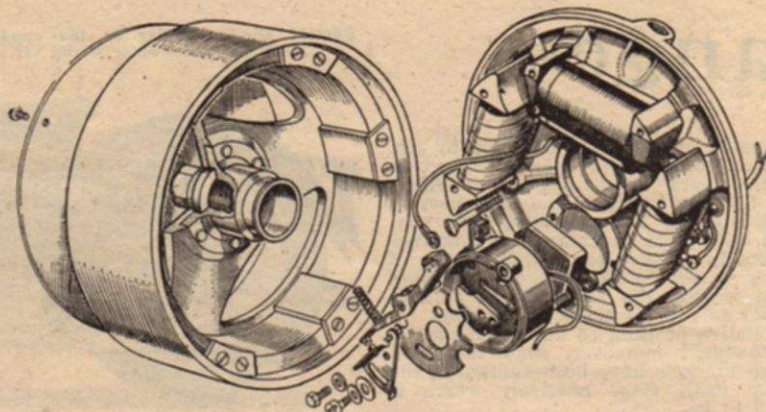


A power output of 2.8 b.h.p. at 4,000 r.p.m. is obtained from the latest 98 c.c. engine

bush, and has a spiral groove to ensure adequate lubrication. The sleeve itself is provided with a ball race of 25mm inside diameter.

A neat handlebar lever operates the

A special drawing of the robust new two-speed engine-gear unit laying bare the many interesting features of the design. Porting in the cast-iron cylinder is similar to that of other 1949 Villiers engines



Detail arrangement of the latest flywheel mag-generator. The new contact-breaker design will be noticed

gear change through a normal control cable. A coil spring reacting on the striker fork bell crank in the gear box engages top gear; neutral and bottom gear are obtained by operating the lever against the spring pressure, the friction in the lever mechanism being sufficient to retain the position required. Gear box reduction for the bottom ratio is 1.54 to 1; top is, of course, direct.

The Kick-starter

Mounted in a cover on the outer half of the primary-chain case is the kick-starter mechanism. This takes the form of a segment engaging with a ratchet pinion on the gear-box mainshaft. The ratchet splined to the mainshaft, is loaded by a light coil spring. The kick-starter pedal can be swivelled inward when not in use. The crank is splined to its spindle and clamped by a pinch bolt.

The flywheel magneto is fitted with two lighting coils. A Westinghouse rectifier is employed to convert the alternating current to direct current for battery charging. Lighting equipment includes 6 volt, 12x12 watt main head-lamp bulb and 6v. 3w bulbs for the pilot and tail lights.

Weight of the Mark IF engine-gear unit, excluding lighting equipment, is approximately 38 lb.