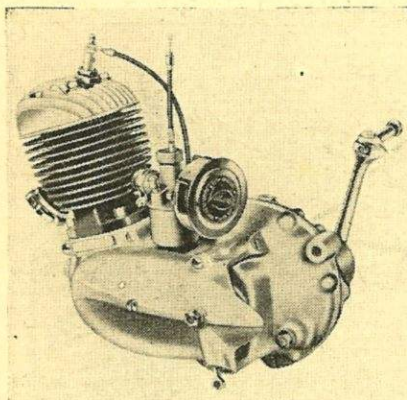
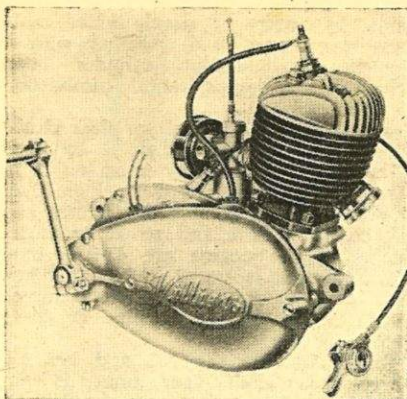


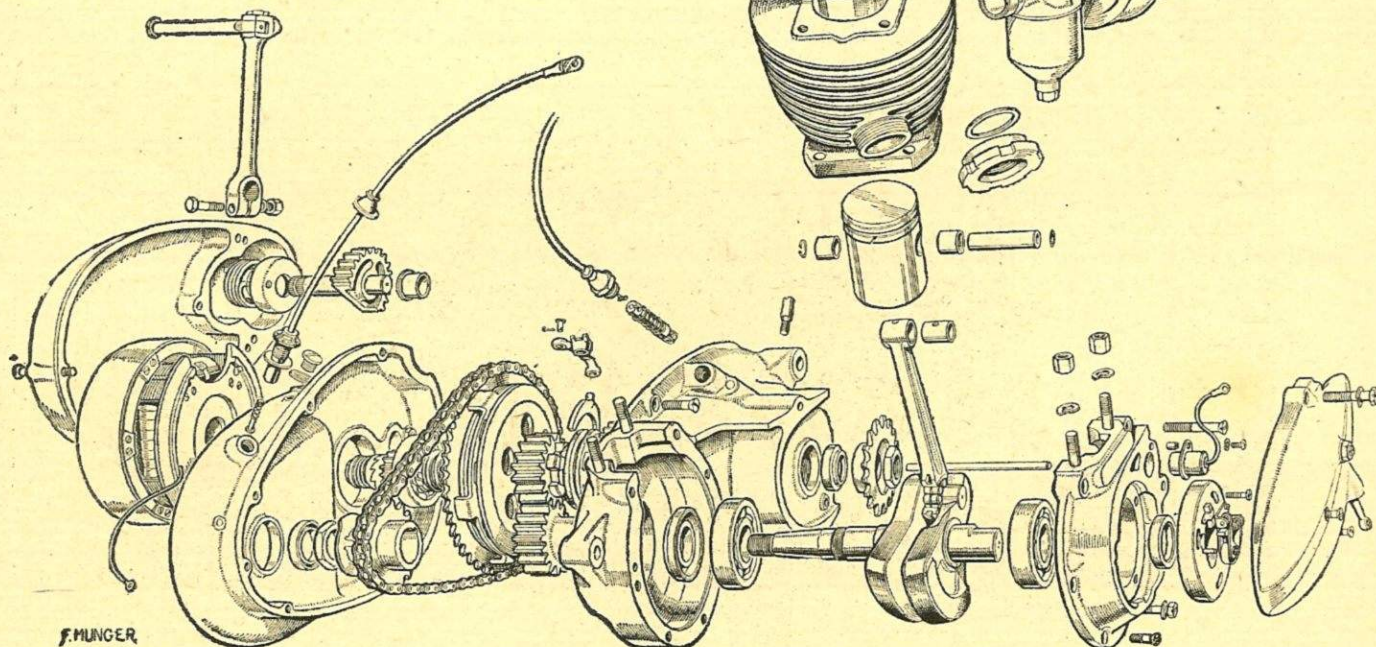
New Villiers Engine

A Shapely, Two-speed Unit with Enclosed Flywheel Mag-generator



Above: Right and left sides of the new 98 c.c. power unit

Constructional details of the 98 c.c. Mark 4F Villiers engine. The flywheel generator is completely enclosed by the crankcase cover



F. MUNGER

AN addition to the range of Villiers two-stroke engine-gear units is announced by the manufacturers. Given the prefix Mark 4F, the new model, of 98 c.c., is a development of the well-tried 98 c.c. Mark IF two-speed unit; it employs newly styled engine and gear-box castings and the ignition system has been modified. The Mark IF unit is to continue in production in its present form.

On the new engine, the flywheel mag-generator is fully enclosed. This has necessitated a reduction of 1 in in flywheel diameter, but the change has not resulted in any loss of output. The flywheel is fitted to the engine shaft by means of a taper and key. An extractor-type retaining nut is employed though it is not necessary to loosen the flywheel for ignition timing purposes; the contact-breaker assembly has been transferred to the left side of the engine.

With the revised mag-generator, the H.T. pick-up remains unaltered but the lead carrying the lighting current is taken to a neat, two-pin plug-socket incorporated in the crankcase casting.

Hence, the lighting cable can be disconnected from the generator merely by removing the plug; the latter employs pins of two different diameters, so that it is impossible to replace the plug the wrong way round.

The low-tension lead is led via a tunnel through the forward part of the engine castings to the contact-breaker assembly. This is mounted beneath a cover on the left side of the crankcase and is operated by a cam lobe formed on the end of the mainshaft, which latter has been extended in length by approximately one inch. The contact-breaker assembly is mounted on a circular plate (a die-casting in light alloy) which is retained by three set screws. Screw slots are provided in the plate so that the whole assembly can be rotated slightly to obtain the correct final adjustment of the ignition timing.

A synthetic rubber oil and compression seal is incorporated in the plate. By loosening one fixing screw, the straight contact-breaker arm can be pivoted to obtain adjustment of the points gap (normal setting is 0.015 in). Tufnol is

used for the operating heel on the breaker arm, and a felt lubricating pad is provided for the cam lobe. A cylindrical condenser is housed separately in a deep recess in the crankcase casting.

Though the aluminium-alloy engine and gear-box castings have been redesigned to create a much more streamlined appearance, the locations of the main attachment points remain unaltered. The two crankcase halves, as on the Mark IF, also form the gear-box shell. A single, streamlined cover, retained by four screws, encloses both the flywheel magneto and the kick-starter pinions.

On the left side of the engine, a single, oval cover encases the contact-breaker assembly and enshrouds the final-drive sprocket. This cover also houses the clutch-operating arm and the hexagonal screw adjuster for the clutch push rod.

A slight modification to the two-speed gear box, which, of course, is operated from a handlebar control, is that the peg on the gear striker lever—the function of which is to move the sliding dogs—has been replaced by a shoe-plate on which the load is more evenly distributed. In addition, a synthetic rubber oil-seal has been fitted to ensure that no oil escapes from the gear box past the final-drive sprocket.

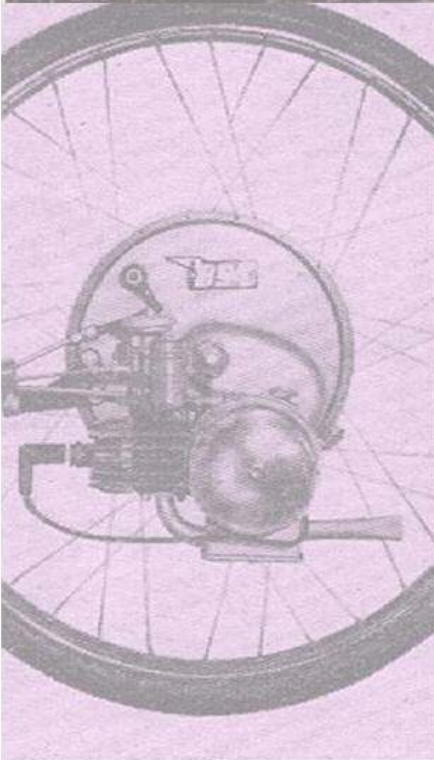
No alterations have been made to the main engine or gear box parts. The forged-steel crankshaft is carried on two large-diameter ball bearings. Also a steel forging, the connecting rod employs a double-row roller big-end bearing, and a plain bronze bush at the small-end eye. The aluminium-alloy, flat-top piston carries two compression rings; the gudgeon pin is fully floating and is re-

tained by circlips. A deeply finned, cast-iron cylinder is used, together with a detachable, light-alloy cylinder head which has a hemispherical combustion chamber.

Primary drive to the two-plate clutch on the gear box mainshaft is by non-adjustable chain running in an oil bath. The carburettor is a Villiers single-lever instrument with combined air filter and air control. Bore and stroke measurements of the engine are 47×57 mm. Power output is stated to be 2.8 b.h.p. at 4,000 r.p.m.—usually sufficient to propel a lightweight machine at 40–45 m.p.h.

No change to the 122 and 197 c.c. three-speed engine-gear units is announced. The makers are the Villiers Engineering Co., Ltd., Marston Road, Wolverhampton.

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