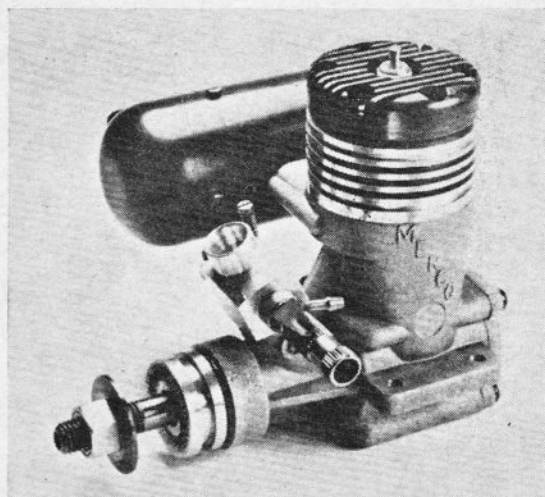


Peter Chinn tests

A new MERCO 61

"Still the No. 1
British R/C Motor"



THE Merco Mk. IV, introduced this summer, is the latest version of a design that had its origins in the Merco of 1961-2 and which, twelve years ago, set a standard of excellence that was unsurpassed in the R/C motor field. Since then, improvements have been incorporated, and although the basic layout, including the "small" (for a shaft-valve 100 c.c.) half-inch crankshaft journal remains unchanged, the current Merco is by no means outclassed by more recent designs. In two respects, at least, the Merco 61 now enjoys an advantage: it is both lighter in weight and lower in price than most of its rivals.

Design and Construction Summary

Main Casting. This comprises the crankcase, front housing and lower cylinder casing in pressure diecast aluminium alloy. It includes beam mounting lugs, a short exhaust duct on the right side and a round bore intake port.

Cylinder. Cylinder-liner of hardened steel with separate machined aluminium alloy finned cooling jacket. Four exhaust ports, timed to remain open for 140 degrees of crank angle. Four transfer ports, timed to remain open for 120 degrees of crank angle. Two $\frac{1}{4}$ in. dia. skirt transfer ports.

Crankshaft and Prop Drive Assembly. Counterbalanced hardened steel crankshaft having $\frac{1}{2}$ in. (12.7 mm.) dia. main journal, 8 mm. dia. front journal and $\frac{5}{16}$ in. UNF propshaft thread. Integral $\frac{1}{2}$ in. o.d. hollow crankpin. Rectangular valve port timed to remain open for 220 degrees of crank angle, closing at approx. 68 degrees ATDC and admitting gas to a $\frac{3}{8}$ in. (9.5 mm.) bore gas passage through main journal. Shaft supported in one FBC (UK) $\frac{1}{2} \times 1 \frac{1}{2} \times \frac{1}{4}$ in. 8-ball steel caged ball journal bearing at rear and one Fafnir (UK) 8 \times 22 \times 7 mm. 7-ball steel caged ball journal bearing at front. Machined aluminium alloy prop driver fitted to steel split taper collet on shaft.

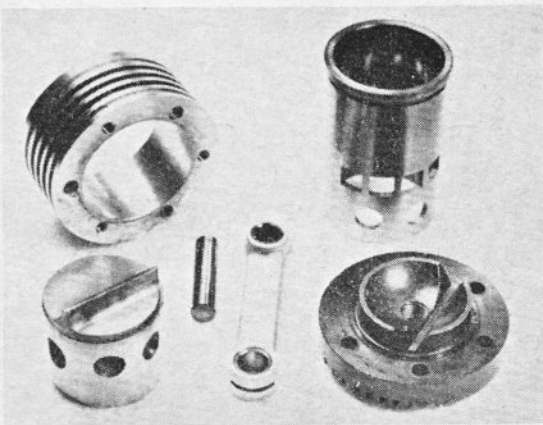
Piston and Connecting-rod Assembly. Piston machined from aluminium alloy bar and fitted with bronze-bushes for gudgeon-pin. Piston has flat crown, straight baffle and two 6 mm. dia. skirt transfer ports and is fitted with single conventional compression ring. Forged aluminium alloy connecting-rod with bronze bushes and oil slits at both ends. Fully floating $\frac{3}{8}$ in. o.d. tubular gudgeon-pin with brass pads.

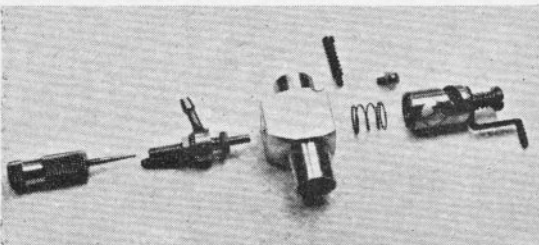
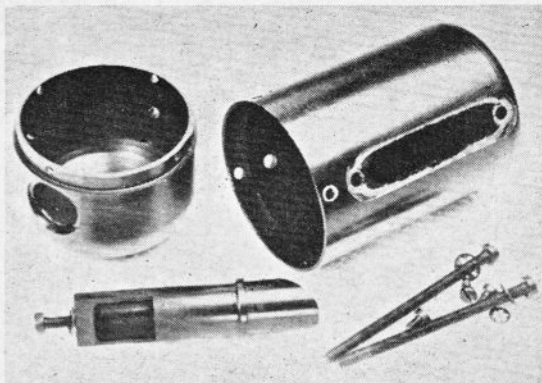
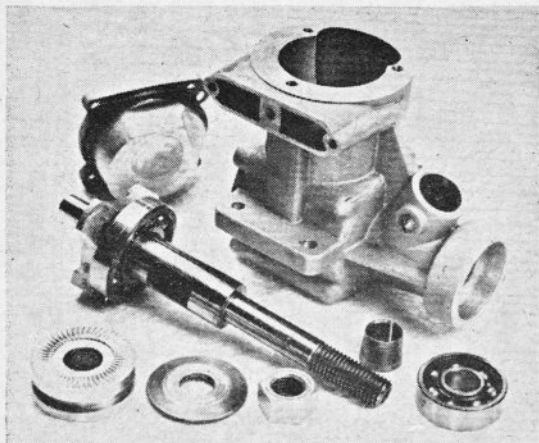
Cylinder-Head. Machined from aluminium alloy bar, finned, with black anodized finish. Hemispherical combustion chamber (interrupted by slot for piston baffle clearance) and central ignition plug. Six "Pozi-driv" head screws, three extra long and passing through cylinder jacket to secure complete cylinder assembly to crankcase. Paper gasket between cylinder jacket and crankcase. No head gasket.

Backplate. Pressure diecast aluminium alloy fixed to crankcase with four "Pozi-driv" screws. Paper gasket.

Carburettor. Merco barrel-throttle type with separate adjustable idle needle installed in throttle barrel on right side and providing automatic fuel metering according to throttle position. Main needle-valve with fuel inlet tee on left side. Machined aluminium alloy carburettor body with $\frac{3}{16}$ in. spigot dia. Ground steel throttle barrel with fixed throttle arm and $\frac{5}{16}$ in. i.d. choke. Effective choke area approximately 36 sq. mm.

Silencer. The recommended silencer for this engine is the Merco "Peak Power" type as originally introduced in 1968 for the Merco 61 Mk. III. This is of machined construction and is a large volume cylindrical expansion chamber that fits directly onto the exhaust duct with two screws. It is intended to be installed with the outlet forward so that there is no rear overhang but can, if more convenient, be fitted back to front. For use with inverted or side mounted installations, the outlet can, if





series, we used our standard 5 per cent nitromethane content R/C fuel for the performance tests. Incidentally, castor-oil lubricant was used at all times. The manufacturer would prefer owners not to use fuels containing only synthetic oils as there have been numerous cases of Merco engines severely overheating when such lubricants are employed.

Glowplugs used were standard Merco platinum filament long-reach (non-shielded) type as fitted. Atmospheric temperature at the time of testing was 25.5deg.C (78deg.F) and barometric pressure was 1024 mm. (30.20in.Hg.)

Starting and Running. We cannot recall ever having had a Merco that was hard to start and the Mk. IV was no exception to this rule. As one usually finds, cold starting with the help of a cylinder prime, was always good. Hot restarts were less immediate but improved as the engine became run-in. No provision is made for port priming the cylinder when the Merco silencer is used. Our method is to remove the plug and prime through the plug hole when the engine is cold. No priming is necessary if the motor is restarted warm.

Running qualities were generally good. The first engine proved to be a little heavy on glowplugs initially and consumed three during the first fifteen minutes or so of running-in. Anxious not to run out of Merco plugs before the tests could be completed, we continued the running-in on a Fox LR bar type and an O.S. No. 9, both of which survived and seemed to suit the engine quite well. The second engine was less hard on plugs and only when revs were pushed up beyond 14,000 rpm did its original plug finally give up the struggle. This engine, incidentally, was a little less smooth than the first one, when revs were pushed above 14,000 but both motors were commendably even running at normal speeds.

Power—Less Silencer. A gross power output of 1.2 bhp at 14,000 rpm was determined following torque tests, which makes this the most powerful Merco to date but more important is the level of performance obtainable on normal prop sizes. Prop rpm recorded included 8,900 on a 14 x 6 Top Flite maple, 11,200 on a 12 x 6 Top Flite maple, 11,000 on an 11 x 8 Top Flite maple, 11,800 on an 11 x 7 Top Flite maple, 12,800 on an 11 x 6 Top Flite maple and 13,500 on and 11 x 6 Power Prop maple. These figures—especially those recorded on the four larger sized props—are very good and compare favourably with the level of performance obtainable with some of the quite highly regarded imported engines.

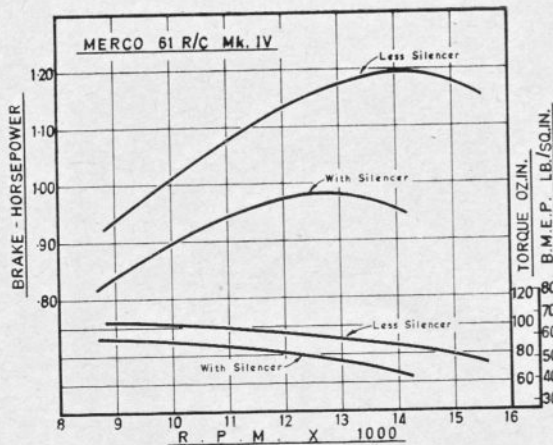
Power—With Silencer. Fitted with the relatively quiet Merco silencer, the peak output of the Mk. IV was reduced to slightly less than 1.0 bhp at between 12,500

necessary, be relocated at 90 degrees. Outlet i.d. is 3/8 in., giving an exit area of 71 sq.mm.

Performance

Tests were undertaken on an early production model Mk. IV and, subsequently, on a second example submitted by the manufacturer. Performances were closely matched except for a slight improvement in output when the second engine was loaded for speeds above 13,000 rpm. This is not too important since 10c.c. R/C motors are most commonly propped for speeds in the 11,000-12,000 rpm bracket.

Running-in was carried out, as usual, on a 75/25 mixture of methanol and castor-oil. The Merco runs quite well on a straight mixture but, in order to give a fair comparison with other motors dealt with in this





GENERAL INFORMATION

Manufacturer: D. J. Allen Engineering Ltd., 30 Lea Valley Trading Estate, Angel Road, Edmonton, London N.18.

U.K. Distribution:

- (i) E. Keil & Co. Ltd., Russell Gardens, Wick Lane, Wickford, Essex.
- (ii) Irvine Engines, Unit 8, Alston Works, Alston Road, High Barnet, Herts.
- (iii) Ripmax Ltd., Ripmax Corner, Green St., Enfield, Middx.

Type: Throttle equipped, shaft rotary-valve, Desaxe-cylinder glowplug engine with twin ball-bearings and ringed aluminium piston.

Bore and Stroke: 0.940 x 0.875 in. (23.88 x 22.22 mm.).

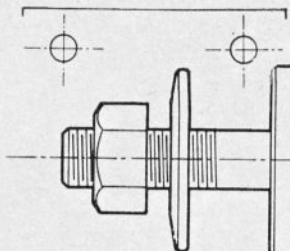
Stroke/Bore Ratio: 0.931 : 1.

Displacement: 0.6072 cu. in.—9.951 c.c.

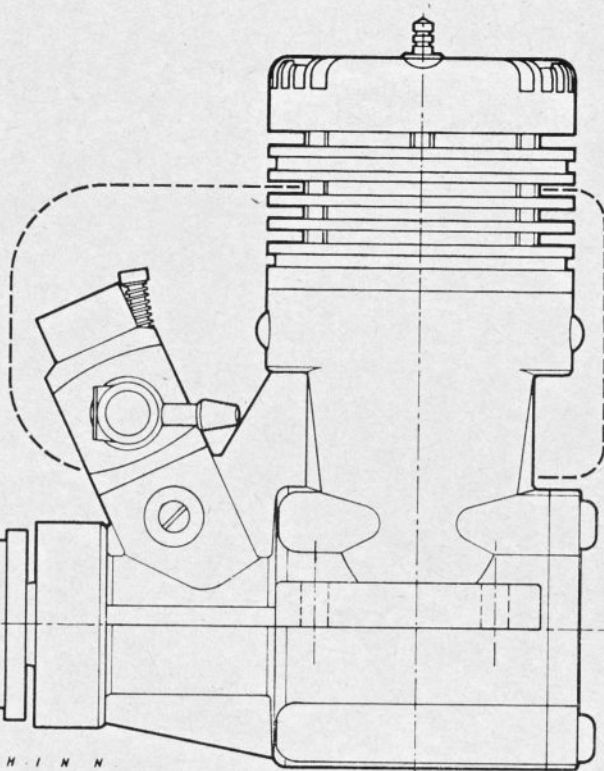
Checked Weights:

- (i) 388 grammes—13.7 oz. (less silencer).
- (ii) 460 grammes—16.2 oz. (with "Peak Power" silencer).

Recommended Retail Price: £21.95 inc. VAT. (Merco Peak Power silencer: £3.50 extra.)



P · G · F · C · H · I · N · N



and 13,000 rpm, putting it at a disadvantage when compared with the products of some other manufacturers whose concern has been only to maintain maximum power with little or no regard for reducing noise level. Until such time as governing bodies do something positive to bring the present farcical "silencer" situation under control, Merco users might be forgiven for using one of the proprietary "no-loss" options, but it is good to see that the manufacturer of the Merco remains public spirited enough to continue to offer a tolerably effective silencer, despite the fact that this means a loss of around 700 rpm on standard size props. In practice, the Mk. IV has a sufficient margin of power to enable this loss to be tolerated for all except contest use.

Throttling. The throttle was easy to adjust and worked well with steady idling, good mid-range control and quick recovery to full power. The main needle-valve control was easy and comfortable to adjust and not in the least critical. The idle needle, which is spring loaded enabling it to be adjusted while the engine is idling, is somewhat obscured when the silencer is fitted but can be reached from below with a screwdriver if one is careful.

Comment

Still the No. 1 British R/C motor. Well made, durable and with good all-round performance. Easy to handle, good throttle, powerful. Below average weight and very competitively priced.

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