

Engine Test

By Peter Chinn

ENYA 15-III

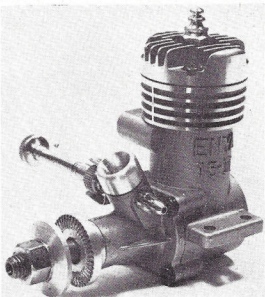
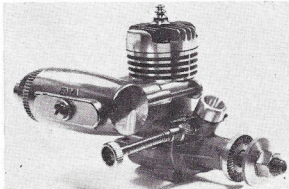
A versatile 2.5cc glow plug engine that can be adapted for throttle Control.

THIS newest model Enya 2.5 c.c. engine is similar in general design and construction to the 1.6 c.c. Enya 09-III model featured in the June 1966 *Aero Modeller* Engine Test report. It will be obtainable through Keil-Kraft stockists in the near future.

Since the 2.5 c.c. class includes three World Championship categories, namely, F.A.I. Free-Flight Power, C/L Speed and Team-racing, each of which has led, during recent years, to the development of specialised 2.5 c.c. motors of extremely high performance, it should be remarked that one would not claim that the Enya belongs to this group. The 15-III is a well made glowplug engine that is capable of reaching a level of performance in excess of that of the average general purpose 2.5 c.c. motor, but which is still appreciably below the extremely high outputs at very high r.p.m. now being realised with more expensive racing type motors, as now used for competition free-flight as well as for control-line speed.

The Enya 15-III is the sort of motor that one could recommend with confidence to any modeller who wishes for a 2.5 c.c. engine adaptable to several different types of model. For instance, as supplied, with small bore venturi insert fitted and running on a mild fuel, it should make a very good small C/L stunt engine. Equally, one could use it to good effect in any "sports" or scale type free-flight or control-line model of appropriate size. If more power is needed, running the engine on a fuel containing a higher percentage of nitromethane and using the alternative large-bore venturi insert, will liberate a substantial increase in b.h.p., sufficient to

The standard type Enya silencer fits the 15-III using an external strap fitting.



give suitably sized power-duration models a quite respectable climb—good enough perhaps for average club competition work, at least. Finally, if, at some future date, one wishes to use the engine for radio-control, the 15-III can be equipped with speed control by fitting the 15-III TV type carburettor unit.

The standard small size Enya silencer fits the new 15-III. However, whereas, on the 15-II one could either use the external strap method of fixing or (by drilling and tapping points provided on the exhaust duct) use a rather neater internal two-point screw fitting, the latter provision is omitted on the latest model and the external fitting has to be employed. This does, however, make a very secure assembly. Enya silencers are of a straightforward expansion chamber type and are of diecast aluminium construction. A single diecasting comprises the extension duct and body of the silencer. The rear end of the chamber, with outlet nozzle, is a separate screw-in component and enables the silencer to be taken apart for cleaning. On the side of the body, opposite the exhaust port, is a steel plate which can be swivelled to uncover two large diameter holes. These are for screwdriver access to the internal fixing screws (when used) and to allow easy priming into the exhaust port when this is required for a cold start.

Performance

All our tests were carried out with the silencer fitted. The engine was run without the silencer only to determine the approximate power loss attributable to it. In terms of reduced r.p.m. on various props., this loss ranged from only 150 r.p.m. on a 10×4 to 500 r.p.m. on an 8×4.

No elaborate running-in procedure is necessary with the 15-III. We followed our usual procedure of a series of short runs, starting off with a rich four-stroke and gradually weakening the mixture to a normal two-stroke as running-in proceeded. A nominal one hour of running-in was given although, in fact, the 15-III could have been considered as adequately run-in within half this time.

Starting qualities of the 15-III were good. It may come as a surprise to some modellers to know that, in these days, when most model engines are easy to handle, there are still some reluctant starters being made. We had one for test only a day or two before the Enya and it was a real pleasure to get back to a motor that started first or second flick of the prop. Only when props smaller than 8×4 were tried, did the Enya's starting deteriorate and, since such a prop size would take r.p.m. beyond the b.h.p. peaking speed, this is of academic interest only.

SPECIFICATION

Type: Single cylinder, air-cooled, loop-scavenged two-stroke cycle, glowplug ignition. Crankshaft type rotary-valve induction. Bronze bushed main bearing.

Bore: 15 mm. (0.5905 in.) **Stroke:** 14 mm. (0.5512 in.)

Swept Volume: 2.474 c.c. (0.1510 cu. in.)

Stroke/Bore Ratio: 0.933 : 1

Weight: 5 oz. (5.5 oz. with silencer)

General Structural Data

Pressure diecast aluminum alloy crankcase/cylinder block with drop-in steel cylinder-liner. Pressure diecast aluminum alloy detachable front housing with cast-in phosphor-bronze main bearing. Hardened, counterbalanced crankshaft with 8.5 mm. dia. journal, 6.2 mm. bore gas passage and 4.5 mm. crankpin. Lapped cast-iron piston with fence type baffle and fully-floating 4 mm. hardened tubular gudgeon pin with brass pads. Pressure diecast aluminum alloy connecting-rod with cast-in bronze big-end bush. Pressure diecast aluminum alloy finned cylinder head with machined joint face and cast-in bronze thread insert for glowplug. No cylinder-head gasket. Machined aluminum alloy prop driver fitted to matching taper on crankshaft. Nickel plated spraybar assembly with two interchangeable machined aluminum alloy venturi inserts. Beam mounting lugs.

TEST CONDITIONS

Running time prior to test: 1 hour.

Fuels used: (Test 1) 5 per cent pure nitromethane, 25 per cent Duckham's Racing Castor-Oil, 70 per cent I.C.I. methanol. (Test 2) 30 per cent pure nitromethane, 25 per cent Duckham's Racing Castor-Oil, 45 per cent I.C.I. methanol.

Glowplug used: Enya No. 3 platinum-iridium filament, 1.5 volt, 3/16in. reach.

Air Temperature: 57 deg. F. (14 deg. C.)

Barometer: 29.8 in. Hg.

Silencer type: Enya expansion chamber.

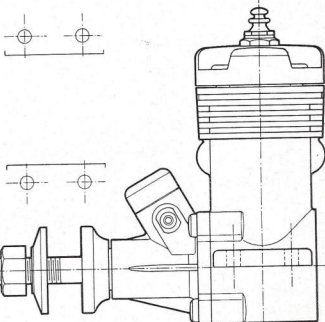
Our first series of tests were carried out with the small "stunt" venturi fitted and running on a mild fuel containing 5 per cent nitromethane. A maximum torque of 19.5 oz. in. was recorded and peak b.h.p. was a little over 0.22 in the region of 12,400 r.p.m.

For the second set of tests, a fuel containing 30 per cent pure nitromethane was substituted and the small venturi was replaced by the large one. This latter has approximately 17 per cent greater cross-sectional area, but, taking into account the 4 mm. dia. spraybar that passes through the venturi, the actual effective increase in choke area is about 40 per cent.

Not surprisingly, these two changes made a substantial difference to the performance of the 15-III. Maximum torque was increased to over 23 oz. in. and the horsepower curve raised to 0.29 b.h.p., flattening out at around 14,500 r.p.m.

Typical prop speeds obtained in the second tests included 9,300 on a 10 x 4 Tornado nylon, 10,700 on a 9 x 4 Top-Flite nylon, 13,200 on an 8 x 4 Top-Flite nylon and 14,700 on an 8 x 3 1/2 Top-Flite wood. The latter figure represents an increase of some 1,400 r.p.m. on that obtained on the first test.

Heading photo above shows: the outward similarity to the Enya 15-II that it replaces, the 15-III is in fact, a completely redesigned engine. Below, all the parts are made and nicely finished.



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No troubles of any kind were encountered with the 15-III and, on dismantling it after testing, all parts were found to be in excellent condition. For a quantity-produced engine, the Enya's standards of fits and finishes are, in fact, commendably high and past experience of earlier Enya models suggests that owners of 15-III's can expect long and trouble-free service from them.

Power/Weight Ratio (with silencer)

0.55 b.h.p./lb. as tested on 5 per cent nitromethane with small venturi.

0.72 b.h.p./lb. as tested on 30 per cent nitromethane with small venturi.

Specific Output (with silencer)

90 b.h.p./litre as tested on 5 per cent nitromethane with small venturi.

118 b.h.p./litre as tested on 30 per cent nitromethane with large venturi.

