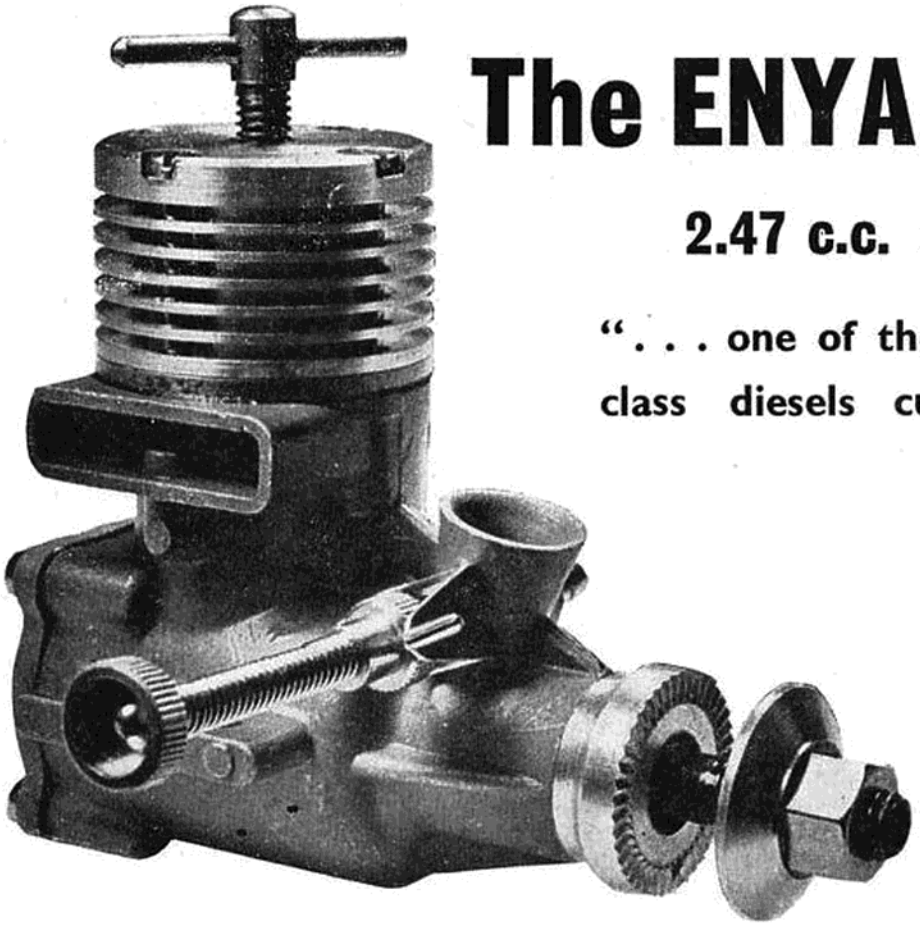
The ENYA 15-D Mk. II

2.47 c.c. Diesel motor

". . . one of the best F.A.I. contest class diesels currently available."



FOLLOWING the same original and distinctive basic design of the Enya 15-D Mk. I, the Mk. II model is, nevertheless, an entirely new engine and none of its major parts is interchangeable with the corresponding Mk. I component.

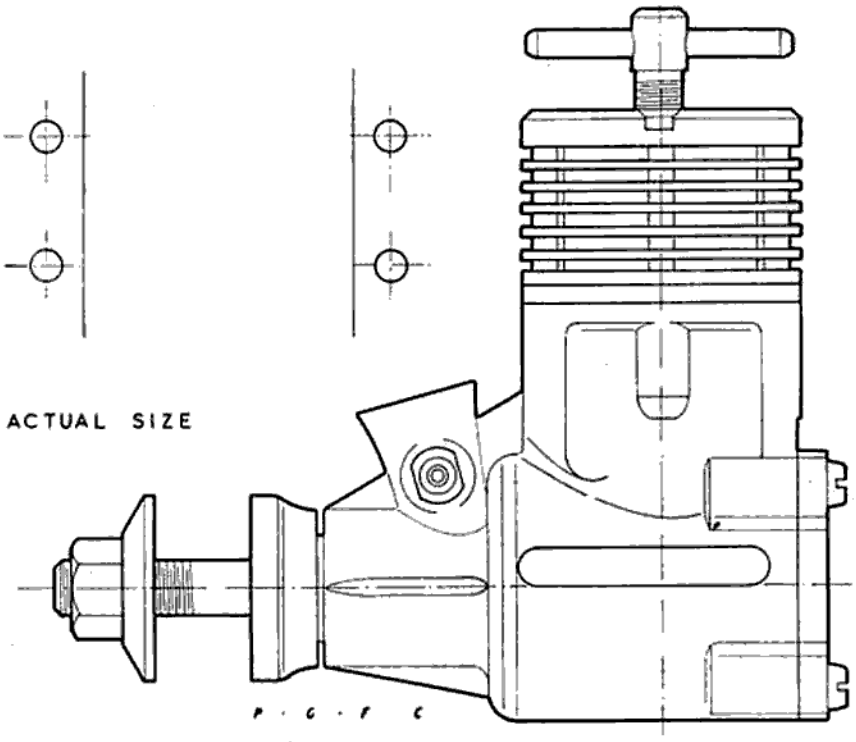
Features that set the original 15-D apart from other diesel 2.5's, on its introduction in 1956, were its loop-scavenged cylinder and oversize (10 mm.) crankshaft. Despite this generous shaft diameter and two subsequent material changes, however, the Mk. I was never entirely free from the trouble often experienced with other high-performance diesel 2.5's; namely, shaft fracture through the main journal. One reason for this may well have been the rigidity of the piston and rod assembly. This, which is continued in the Mk. II, comprises a very large diameter, well supported gudgeon-pin, a very stiff connecting-rod and a robust crankpin and crankweb. While such rugged construction is admirable and contributes to both performance and durability of the parts concerned, it does appear that the stresses so transmitted to the journal were sometimes more than even the Mk. I's shaft could endure. Designer Saburo Enya did not, however, yield to the temptation to use a more "whippy" gudgeon-pin and rod, but set about redesigning the whole engine around a new 11.5 mm. (0.453 in.) shaft which would also allow porting to be opened up for still greater power. This, incidentally, is the largest size journal used on any ball-bearing 2.5 to date.

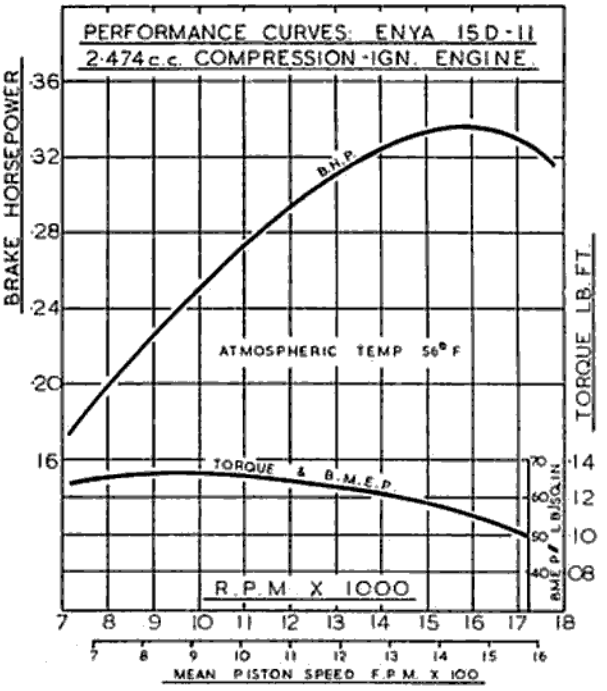
This move also gave the opportunity to incorporate a number of other improvements. These include a new cylinder with thicker wall and chromed bore, a strengthened crankcase with longer mounting lugs and several minor alterations. All the earlier models' refinements are retained. The engine has a single eight-ball journal bearing supporting the crankshaft, supplemented by a bronze outer bush. The shaft is counterbalanced for rotating mass by a machined-in crescent counterweight and has a 0.256 in. dia. gas passage. The valve porting gives an induction timing of 50 deg. ABDC to 50 deg. ATDC. The cylinder liner, flanged above port level and accurately fitted to both crankcase and cooling barrel, gives fairly moderate port timing that may well have contributed to the very good specific fuel consumption shown by the test engine. The measured exhaust period is 124 deg. and the transfer period 100 deg. As on the earlier model, the piston skirt is cut away on the transfer side to aid smooth charge transfer from the crankcase.

The new crankcase casting is a very substantial unit, neatly cast and accurately machined. The carburettor intake is now shorter and, in place of the optional twin needle system of the older model, the Mk. II can be fitted with a special Enya barrel throttle that is exceptionally efficient. The cylinder assembly is secured to the main casting with four screws. As on the Mk. I, the cylinder head is fitted with a steel thread insert for the compression screw but is now also provided with an optional locking lever on the screw to lock the adjustment against any tendency to run back at high speeds.

The 15-D Mk. II is an extremely well-built motor. Internal fits and finishes on our test example could not be faulted in any way. Externally the engine is nicely finished without being

ENYA 15-D MK. II.





gaudy: the matt grey of the crankcase contrasting neatly with the machined alloy cylinder head and fins, prop driver, etc.

Specification

Type: Single-cylinder, air-cooled, loop scavenged two-stroke cycle, compression ignition. Crankshaft type rotary-valve induction. No sub-piston supplementary air induction. Also available with throttle control.

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

Swept Volume: 2.474 c.c. (0.151 cu. in.).

Stroke/Bore Ratio: 0.933: 1.

Weight: 6.25 oz.

General Structural Data

Pressure diecast aluminium alloy crankcase with integral main bearing housing, exhaust and transfer ducts, carburettor intake and beam mounting lugs. Pressure diecast flange-fitting rear cover secured with four screws. Counterbalanced, hardened alloy steel crankshaft with 11.5 mm. dia. journal, 6.3 mm. dia. hollow crankpin and 6 mm. dia. propshaft section and running-in one ball journal bearing supplemented by bronze outer bush. Heavily proportioned diecast connecting-rod bronze-bushed at both ends. Lightweight piston with 5 mm. dia. fully-floating tubular gudgeon-pin having brass end pads. Unhardened steel cylinder with hard-chromed bore surface. One-piece cylinder head and cooling-barrel of machined duralumin with steel compression screw insert. Duralumin prop driver fitted to taper on crankshaft. Nickel-plated brass needle-valve assembly with spring ratchet device and flexible control stem. Optional locking lever on compression screw.

Test Engine Data

Running time prior to test: 3 hours.

Fuel used: Record "Powerplus" Diesel.

Standard venturi insert retained for all tests.

Performance

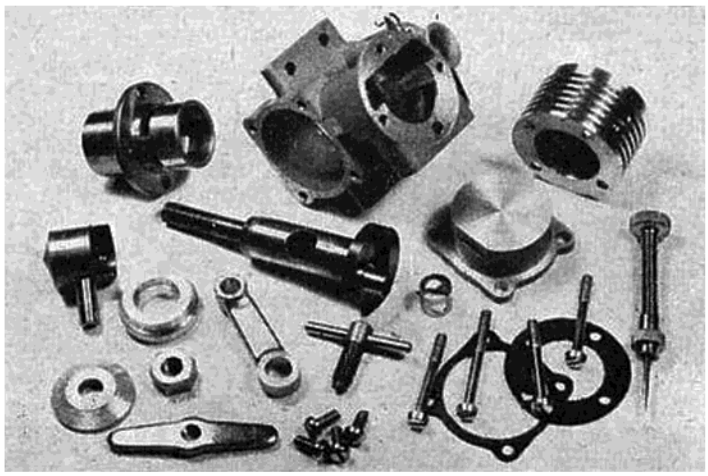
Starting the 15-D Mk. II was found easy on all props although a little caution was needed on sizes smaller than 8 × 4 to avoid the risk of rapped fingers. Port priming was not found to be necessary and running at all times was notably steady, except for the usual warming-up power loss at low speeds. Controls were easy to adjust (the standard Enya needle-valve—used on most Enya engines—is always a delight to handle) but the compression locking lever was found to be necessary at speeds above 16,000.

Maximum torque developed by the Enya, 0.133 lb. ft. or 25.5 oz. in. at between 9,000 and 10,000 r.p.m. (and equivalent to a b.m.e.p. of nearly 67 lb./sq. in.) was the best yet recorded for a 2.5 diesel. The engine had quite remarkable flexibility. It proved capable of driving a 14 × 6 in. Top-Flite prop at 5,450 r.p.m., while a Power-Prop of half that diameter—7 × 4—was turned at 17,700 r.p.m. A Top-Flite 10 × 3½ was turned at 10,300 r.p.m., an 8 × 4 Top-Flite at 14,800 and an 8 × 3½ at 15,700 r.p.m. This latter figure was, incidentally, close to the peaking speed of the test Enya. Actual maximum b.h.p. recorded was 0.337 which is, of course, quite outstanding.

In all respects, it seems fair to say that the Enya 15-D Mk. II deserves recognition as one of the best F.A.I. contest class diesels currently available. It is imported into the U.K. by E. Keil & Co. Ltd.

Power/Weight Ratio (as tested): 0.864 b.h.p./lb.

Specific Output (as tested): 136.2 b.h.p./litre.



The component parts of the Enya 15D Mk II