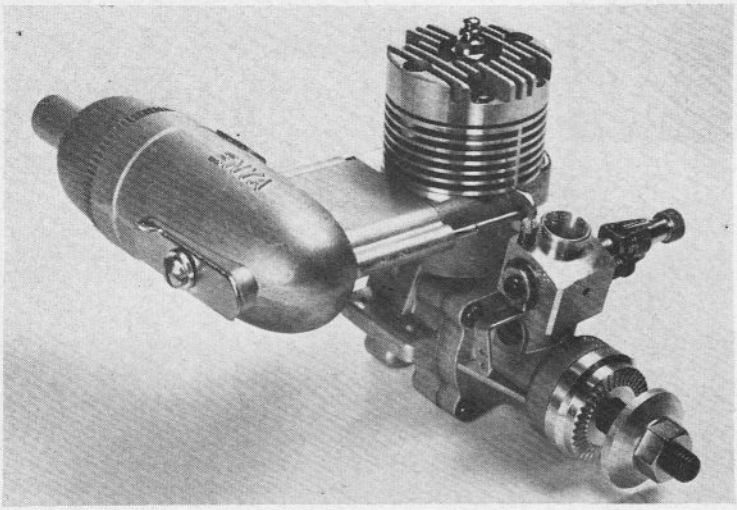


PETER CHINN *tests the* ENYA 40

"easy to handle, powerful —good throttle response"

ALTHOUGH supplies of this new engine have been slow to reach Europe, it was introduced to the Japanese market in the summer of 1974 and has been available in the U.S. since early this year, so it should not be long, now, before Ripmax Ltd., the British Enya distributors, begin offering it in the U.K.

Outwardly, the Enya 40 closely follows the appearance and structural layout of other Enya engines in the medium to large capacity groups and it is conventional in that it is a shaft rotary-valve unit with crossflow scavenging. Most manufacturers of high performance R/C engines are now switching to Schnuerle scavenging for their .40-.60cu.in. engines but for this new 40, Enya have chosen, instead, to endeavour to extract a little more power via the induction system, leaving the scavenging system unchanged. To this end, the Enya has an extra large diameter crankshaft.

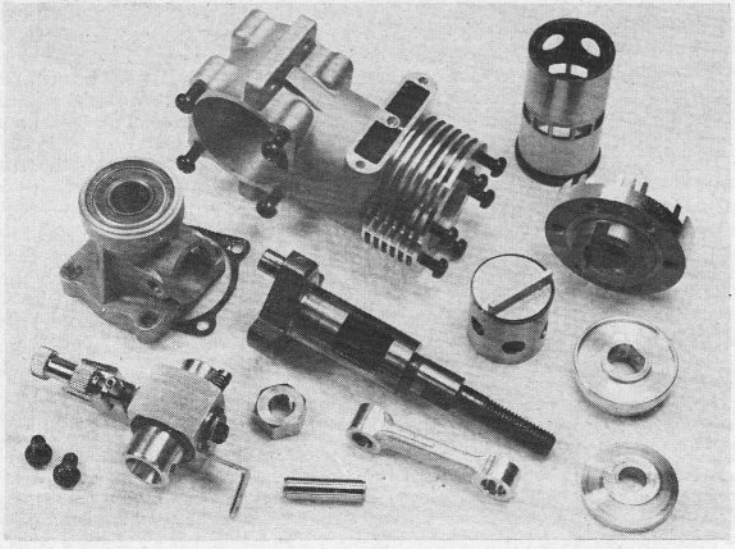
This, with a 15mm. o.d. main journal, is the same size as the most commonly used (and, currently, largest) .60cu.in. engine shafts and has permitted the use of an even larger shaft bore (11.5mm.) which gives the Enya 40 by far the biggest gas passage of any 40 manufactured to date.

A glance at the illustration will show that the new 40 holds fast to Enya's familiar "styling" as regards external finish. This consists of smooth matt castings, setting off bright turned fin edges, cylinder head sides and prop driver and a machined carburettor body.

Design and construction summary

Main casting. This comprises the crankcase with integral backplate and full length cylinder casing in pressure diecast aluminium alloy. It includes beam mounting lugs and a short exhaust duct on the right side.

Cylinder liner. Closely fitted to main casting. Five exhaust ports timed to open and close at 69 deg. each side of BDC. Four transfer ports timed to open and close at 59 deg. each side of BDC. Two 6.5 mm.dia. skirt transfer ports.

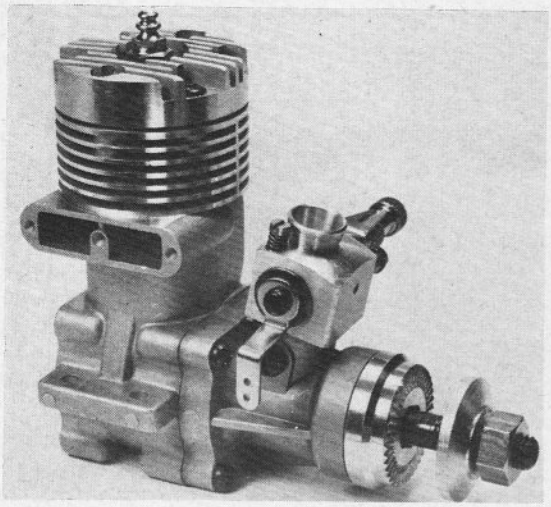


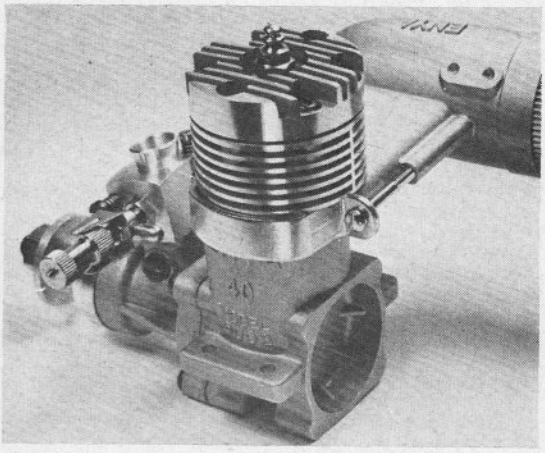
Crankshaft and prop drive assembly. Counterbalanced hardened crankshaft having 15mm. o.d. main journal, ⅜in. o.d. front journal and 6mm. o.d. solid crankpin on 7.5mm. thick crankweb. Rectangular valve port timed to open at 36 deg. ABDC and close at 50 deg. ATDC and admitting gas to 11.5mm. i.d. gas passage through main journal. Machined aluminium alloy prop driver located by parallel flats on shaft. Aluminium prop retaining washer and steel hexagon nut.

Front housing and bearings. Pressure diecast aluminium alloy main bearing housing with intake boss for carburettor and containing one 15 × 28mm. NSK 10-ball steel-caged ball journal bearing at inner end and one ⅜ × ⅝in. NSK 7-ball steel caged shielded ball journal bearing at outer end. Housing secured to crankcase via substantial mounting flange with four Phillips screws and gasket between joint faces.

Piston and connecting-rod assembly. Piston machined from aluminium alloy bar stock with flat crown, straight baffle and two 6mm.dia. skirt ports. Single Dykes type piston ring. Forged aluminium alloy connecting-rod bronze-bushed at both ends. Fully-floating 5.5mm. o.d. tubular gudgeon-pin with brass pads.

Cylinder head. Pressure diecast aluminium alloy finned cylinder head with brass-bushed plug-hole. Bowl shaped combustion chamber surrounded by 3.5mm. wide squish-band slotted on transfer side for piston baffle clearance. Head secured





The motor is shown at left without silencer and above with Enya M-200 type. Note strap fixing and substantial lugs on silencer casting.

to cylinder casting with six Phillips screws. No head gasket.

Carburettor. Enya barrel-throttle type carburettor with airbleed idling mixture control. Machined aluminium alloy body. Steel throttle barrel with adjustable throttle arm on right-side. Spring-loaded adjusting screws for throttle-stop and low-speed mixture control. Needle-valve and jet assembly mounted in left side of carburettor body and adjustable to vary effective choke area. Nominal effective choke area with jet located as factory assembled: 21sq.mm.

Silencer. The silencer supplied with the engine by the factory for our tests was an Enya M-200 type. This also fits other current engines in the medium capacity (.29-.45 cu.in.) group. Like previous Enya silencers, it is of the conventional non-baffled expansion-chamber type, of two piece diecast aluminium construction, but is bigger than the earlier 29-45 size and has its exit nozzle increased to 8.5mm. i.d. for an outlet area of 57sq.mm. The silencer is attached to the engine by a plated steel strap and two screws and has the usual Enya pivoted external plate to give access to the exhaust port for priming.

Performance

Two examples of the Enya 40 TV were submitted for test. They were carefully run-in on straight methanol/castor-oil fuel and were found to be closely matched as regards performance. One engine was then selected for the tests, all of which were carried out on our standard R/C test fuel containing 5 per cent. pure nitromethane, 20 per cent. Duckams Racing Castor-Oil and 75 per cent. methanol.

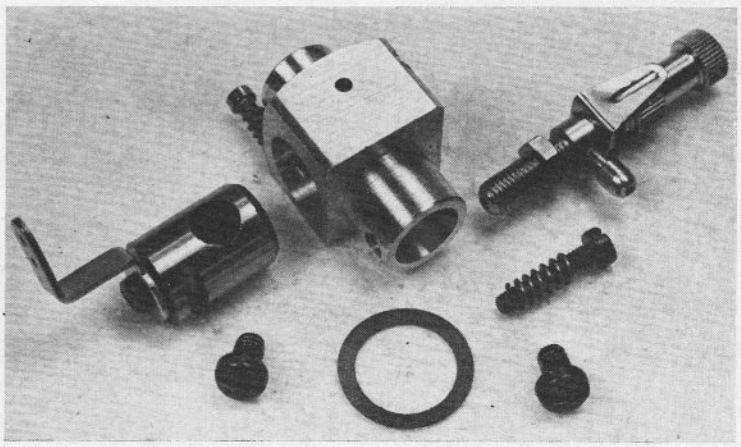
Enya engines imported into the U.K. are sold without glowplugs. For our tests, we used the recommended Enya No. 4 and No. 5 glowplugs. These are medium-reach unshielded plugs with platinum-rhodium elements. Atmospheric temperature at the time of testing was 13 deg. C (56 deg. F) and barometric pressure was 1015 mb (29.97 in.Hg.).

Starting and Running. Hand starting, in general, was fairly good; not, perhaps, quite so rapid as with the Enya 60-IIIB model dealt with last year in this series, but improving as the ring became bedded-in. Running qualities were also good. We gained the impression that vibration was just a trifle above the lowest levels encountered in the .40 class, but the Enya ran very steadily on a wide variety of prop sizes and on both the 5 per cent. nitro test fuel and on straight methanol/castor-oil fuel.

Power—less silencer. A gross power output of 0.87 bhp at 16,000 rpm was determined for the 40-TV on the test fuel, which is outstandingly good for a crossflow scavenged .40 fitted with a standard R/C carburettor of normal choke area and operating on ordinary suction feed.

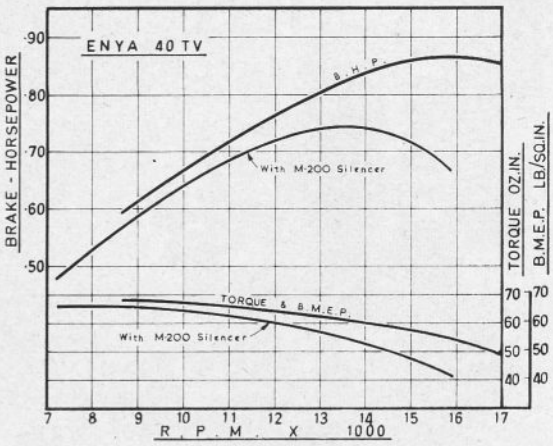
Typical prop rpm recorded included 10,800 rpm on an 11 × 6 Top-Flite maple, 11,600 on an 11 × 6 Power-Prop maple, 12,500 on an 11 × 5 Power-Prop standard, 12,800 on a 10 × 6 Top Flite maple, 13,400 on a 10 × 6 Taipan and 14,200 on a 9 × 6 Top Flite maple.

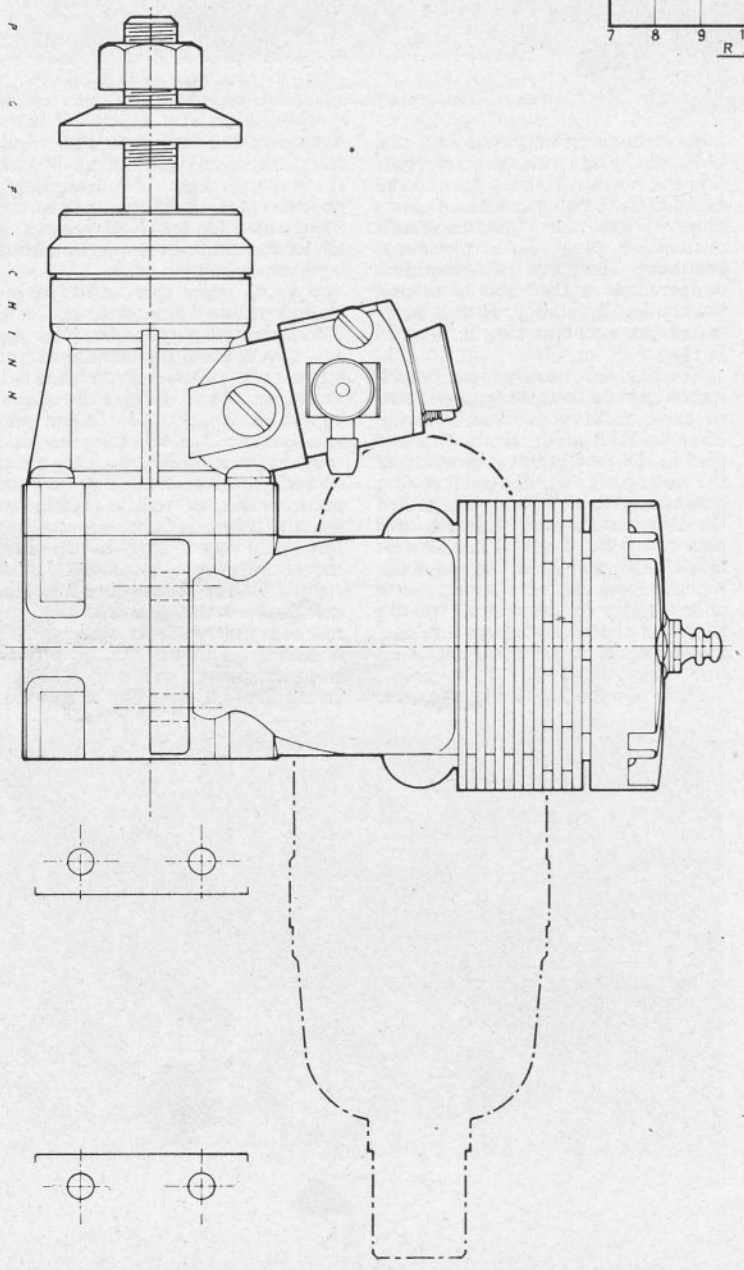
Power—with silencer. The effect on performance of the Enya M-200 silencer was to reduce maximum torque (determined at about 8,000 rpm) only very slightly but to cause the torque curve to decline more rapidly as load was reduced so that the peak of the power curve was reached nearly 2,500 rpm earlier. Actual output, with silencer, plotted from the torque and rpm readings, gave a figure of 0.74 bhp at approxi-



GENERAL INFORMATION

Manufacturer: Enya Metal Products Company Ltd., Nerimaku, Tokyo, Japan.
U.K. Distribution and Service: Ripmax Ltd., Green Street, Enfield, Middlesex.
Type: Throttle-equipped shaft rotary-valve glowplug engine with twin ball-bearings and ringed aluminium piston.
Bore and Stroke: 20.9 : 19.0 mm. (0.8228 x 0.7480 in.)
Stroke/Bore Ratio: 0.909:1
Measured Nominal Compression-Ratio: 9.4:1
Displacement: 6.518 c.c.—0.3978 cu.in.
Checked Weights:
(i) 302 grammes—10.7 oz. (less silencer)
(ii) 365 grammes—12.9 oz. (with Enya M-200 silencer)
Optional Equipment: Enya M-200 expansion chamber type silencer.





mately 13,600 rpm—a power loss of 15 per cent.

In terms of prop rpm this means only a very small loss on the biggest prop sizes that one might conceivably use—for example, on a scale model of high wing loading. Thus, on a 12 × 4 Power Prop, we obtained 10,350 rpm (a loss of only 200 rpm) and on a 12 × 6 Top Flite, the speed drop was only 150 rpm at approximately 9,050 rpm. In contrast, on 10 × 6 props more commonly used for 40 powered aerobatic models, the rpm loss was of the order of 500-600 rpm.

In practice, of course, the power of the Enya is such that the losses caused by the silencer are well within acceptable limits. As regards its effectiveness in attenuating noise levels, the M-200, with its much larger outlet, is not quite so quiet as some of the more restrictive silencers used on 40's (we are thinking here of the O.S. Max 40 R/C with OS-703 silencer) but it is very much better than the noisy open-fronted types.

Throttling. Although the Enya 40 throttle, unlike that fitted to the Enya 60 TV engine, is not an automatic fuel metering type, it worked very well, especially when the M-200 silencer was fitted. Safe idling at around 2,400 rpm was obtained on 10 × 6 props, with reliable pick-up and good mid-range response.

Comment

Although the Enya brothers have, over the past twenty-five years, made engines in almost every popular displacement class from .049 cu.in. to .63cu.in., this is their very first "40". They have, nevertheless, succeeded in producing a motor that appears to be highly competitive. It is well made, easy to handle, powerful and has good throttle response.