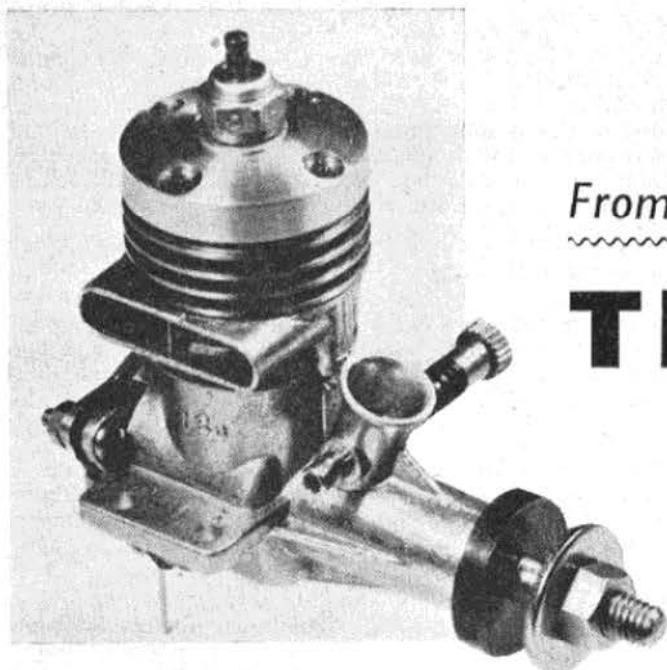


*From Japan*

The O.S. PET

1.627 c.c. Glowplug motor***"casting is excellent, internal fits and finishes are unimpaired and nothing is skimped"***

THE first description of the O.S. Pet 0.099 cu. in. glowplug engine appeared in MODEL AIRCRAFT just a year ago, coinciding with the release of this then new engine from the Ogawa factory in Japan. Since that time, the Pet has been exported to a number of overseas markets, including the U.S.A., Australia and West Germany and has been well received. In the United States, H. S. Briggs, the well-known model car racing enthusiast of Pontiac, Michigan, has set up a new class record of 74 m.p.h., using a Pet, which is no mean achievement.

By the time these words appear in print, the Pet engine should start becoming available in England through Keilkraft stockists. These imports will be of the latest improved model Pet, now dealt with in this

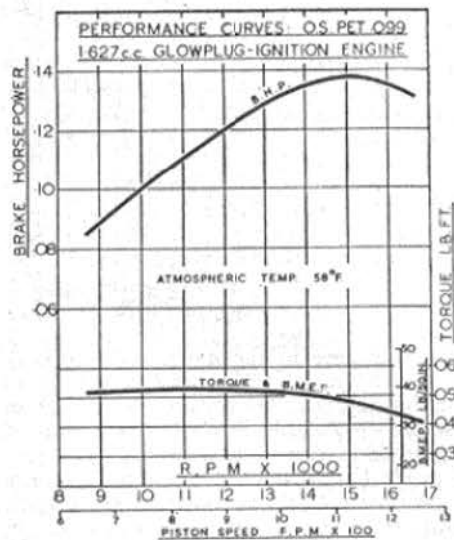
report. The British retail price is not yet known, but, unlike the majority of imports, it is likely to be quite low. When the Pet was designed, it was the makers' intention to attract, mainly, beginners and modellers other than those interested in the contest sphere, who, of course, are already catered for by the O.S. Max series of high-quality engines. Although a low selling price and easy handling were essential, however, it was realised that these should not be achieved at the expense of a reduction in the standards of quality and performance for which O.S. have justly become noted. The result is a clever compromise in which the whole design has been evolved with an eye to production. Much less machining is involved than on the Max model and the construction has been generally simplified, particularly as regards details, but quality remains: the casting is excellent, internal fits and finishes are unimpaired and nothing is skimped.

As already stated, the current Pet shows a number of improvements over the original type marketed overseas during the spring and summer of last year. First, a new and much heavier cylinder design is used, having integral fins and an alloy head held down by two extra screws, instead of the plain liner and combined barrel-head unit previously employed. Secondly, the top of the crankcase, and the recessed seating which forms the joint with the cylinder flange, are both machined.

Thirdly, the pressed-in spraybar is now provided with a short "splined" section where it enters the casting to resist any tendency to work loose with usage. Finally, a new back cover is used, having a tapped centre spigot, presumably for the fitting of a back-plate tank where desired, but which, incidentally, would also be useful, drilled through, as a low pressure outlet for a pressurised fuel system.

As a result of the cylinder modifications, the weight of the Pet is now increased from 2½ to 3 oz., including plug. This, although slightly less than the average weight of diesels of similar capacity, is not particularly light for a glowplug motor. The reason is to be found, mainly, in the exceptionally robust crankshaft and cylinder units. The shaft has a journal diameter of 8 mm. (over 5/16 in.) which is even bigger than current diesel practice, and the cylinder wall thickness is equally unusual at 0.058 in.—both features desirable in the interests of performance and longevity.

The Pet is, of course, a shaft-valve, loop-scavenged engine. A rectangular valve port, ¼ in. long, fed from a circular bearing aperture, gives a 180 deg. induction period, timing being approximately 30 deg. after dead centres. The shaft is bored 5.5 mm.—i.e. just under 7/32 in. for the induction passage. Cylinder port timing is quite conservative, the exhaust and transfer periods being approximately 125 and 90 deg. respectively. The transfer port, in-



cidentally, is placed much lower in the cylinder than is usual, in consequence of its being located below the base flange, whereas the exhaust port is above it. To maintain an adequate transfer period, the piston has a step type deflector on the transfer side.

The general appearance of the Pet is very pleasing, being one of clean, bright metal with no coloured trimmings, yet nicely proportioned. It will be observed that the engine is suitable for either beam or radial mounting.

Specification

Type: Single-cylinder, air-cooled, loop-scavenged two-stroke cycle, glowplug ignition. Crankshaft type rotary-valve induction. No sub-piston supplementary air induction. Flat top piston with step deflector. Central ignition plug.

Bore: 0.530 in. Stroke: 0.450 in. Swept Volume: 0.0993 cu. in. (1.627 c.c.).

Stroke/Bore Ratio: 0.849 : 1.

Compression Ratio: 9 : 1 (approx.)

Weight: 3 oz.

General Structural Data

Pressure die-cast aluminium alloy crankcase unit with plain main bearing. Hardened steel crankshaft with plain disc web, 8 mm. dia. journal and 4 mm. solid crankpin. Plain blued-steel drive washer, taper fitted to shaft. Machined steel cylinder with integral cooling fins. Machined alloy cylinder head with recessed gasket and secured with four Phillips screws, two of which pass through cylinder fins to tie complete cylinder assembly to crankcase. Cast iron piston with 3 mm. solid, fully-floating gudgeon pin. Diecast aluminium alloy connecting rod, bronze bushed at lower end. Pressed-in spraybar type needle-valve assembly. Beam mounting lugs; also provision for 3-point radial mounting via backplate screw holes.

Test Engine Data

Running time prior to test: 1 hour.

Fuel used: Blend of two parts Keilkraft Record Methanex and one part Record Super-Nitrex. (Straight Methanex used for running-in.) Ignition plug used: O.S. No. 3. (Platinum filament, medium heat range, 1.5 volts.)

Performance

The performance of the Pet makes an interesting comparison with that

Component parts of the "Pet" showing the revised cylinder design.



of the earlier O.S. 099 glowplug engine which was in production during 1951/55. An Engine Test on this latter—the first test report on a Japanese engine to be published in Britain—was printed in our August, 1954 issue. This earlier engine, which was of the reverse-flow scavenged type, earned full marks for exceptional quick starting qualities. The Pet is not, perhaps, so foolproof in this respect, but the improvement in power is quite outstanding. Our test of the earlier 099 revealed an output of 0.091 b.h.p. at a shade under 12,000 r.p.m., whereas the present model delivered 0.138 b.h.p. at 15,000 r.p.m., an improvement of over 50 per cent.

This is not the whole story, however, because, for our current test, we used an economical two-to-one mixture of two fuels supplied by Keilkraft, one containing 3 per cent., and the other 30 per cent., nitromethane, so that the final nitro content was 12

per cent. to achieve the performance recorded. In contrast, 28 per cent. nitromethane was needed to get the earlier engine up to the published output.

Actual maximum torque is not greatly increased and, as is usual with glow engines in the smaller capacities, is rather less than with a good diesel of similar size, but the torque curve is very flat, so that appreciable extra power is liberated at speeds above 12,000 r.p.m. or so. To get the best from the Pet, a prop of not larger than 7/4 is recommended, reducing to nearer 7/3 if it is desired to utilise the peak power of the engine.

In all, the Pet is a likeable little motor and, with the increasing interest now being shown in glowplug motors again, should win many new friends.

Power/Weight Ratio (as tested): 0.74 b.h.p./lb.

Specific Output (as tested): 85 b.h.p./litre.

