

# O.S. MAX-II 15

## 2.5 c.c. Glowplug Motor

“ . . . highest (output) recorded by a 2.5 c.c. glowplug engine in this series ”

WHEN Britain's Ron Draper won the World (F/F) Power Championships in 1956 using an O.S. Max-I 15 glowplug engine, he focused attention on a fact that had been known to a few of us for some time; namely that the Japanese model engine industry was now a force to be reckoned with and that its leading products were of a performance and quality comparable with some of the best available in the western hemisphere.

The O.S. Max-I 15 was first tested by MODEL AIRCRAFT soon after its appearance in 1955, an "Engine Test" report on the motor appearing in our December issue of that year. Since that time, many thousands of

Max-I 15's have been exported from the O.S. factory, particularly to the United States and Australia, and have gained many enthusiastic supporters.

Recently, a new version of the Max 15 was put into production and now that stocks of the earlier type engine have been disposed of, the new model, known as the Max-II 15, is now being released. The engine is of the same nominal 2.5 c.c. capacity (the "15" in this case stands for 0.15 cu. in., of course) and is of the same basic loop-scavenged, shaft valve type, but is otherwise an entirely new engine.

Externally, it will be noted, the Max-II 15 is of more squat appearance. This is mainly due to a reduction

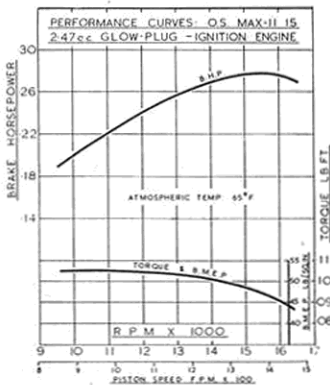
in overall height and a wider exhaust duct. Internally the engine shows many changes and none of the major components, excepting the connecting-rod and backplate, is common to both engines, although it is possible to fit a new Max-II cylinder and piston assembly to the old type crankcase and crankshaft or, alternatively, to use a new case and shaft in conjunction with an old cylinder and piston assembly. In other words, even when supplies of spare parts for the Max-I are no longer obtainable, owners of this earlier engine need not be unduly concerned as it will still be possible to deal with a crashed or otherwise unserviceable engine by

replacing either the complete top or bottom end assemblies as appropriate.

The new crankcase casting differs, in addition to the larger exhaust stack mentioned, in having a bigger carburetor intake and a larger diameter and slightly shorter length main bearing. The maximum possible carburetor throat diameter (i.e., with choke removed and for use with a bladder tank) is now 9 mm. instead of 6.5 mm. For normal use with suction feed, a venturi insert is fitted to reduce choke diameter to 6 mm. Another feature of the induction system is the use of a squared aperture in the bearing to give more rapid opening and closing.

The crankshaft of the Max-II 15 is also appreciably different from the earlier type. It now has a journal diameter of 9 mm. (0.354 in.) compared with 8 mm. (0.315 in.) and the diameter of the induction passage through the shaft has, accordingly, been increased from 5.5 to 6.5 mm. The rectangular valve port is considerably lengthened and is now 10 mm. long. When we reviewed the earlier Max 15, we expressed the hope that the method of keying on the prop driver might, in due course, give way to the taper drive system. The latter is, in fact, the system now adopted, while a blued steel prop retaining washer replaces the aluminium one fitted hitherto.

The cylinder and piston are basically similar to those of the Max-I, but are now equipped with two circular skirt transfer ports, like the bigger Max 29 and 35 engines. In addition, the cylinder now has one less cooling fin and its top rim



is recessed into the alloy cylinder head, trapping the gasket to form a "blow-out-proof" head joint and thereby reducing the external cylinder height by about  $3/32$  in.

Internally, this new O.S. Max is soundly built and accurately fitted. Externally it is of attractive and purposeful appearance and is very nicely finished.

#### Specification

Type: Single cylinder, air-cooled, loop-scavenged two-stroke cycle. Glowplug ignition. Crankshaft rotary-valve induction. Baffle piston. Central ignition plug.

Bore: 0.598 in. Stroke: 0.537 in. Swept Volume: 0.1508 cu. in. (2.472 c.c.).

Stroke/Bore Ratio: 0.898 : 1.

Compression Ratio: 9 : 1.

Weight 3.5 oz.

#### General Structural Data

Pressure diecast aluminium alloy crankcase unit with bronzed bushed main bearing and sandblasted finish. Hardened alloy steel crankshaft with 9 mm. journal, 4 mm. tubular crankpin and crescent counterbalance to balance rotating mass. One-piece cylinder with blue non-corrosive external finish. Diecast sandblasted and machined alloy cylinder-head with brass insert for glowplug. Six Phillips cylinder head screws, two extra long and securing complete cylinder assembly to crankcase. Lightweight cast-iron piston with 3.5 mm. dia. full-floating gudgeon pin with brass endpads. Alloy connecting-rod with bronze big-end bush. Plated brass spray bar assembly with removable venturi insert and flexible needle extension. Beam mounting lugs.

#### Test Engine Data

Running time prior to test:  $1\frac{1}{2}$  hours.

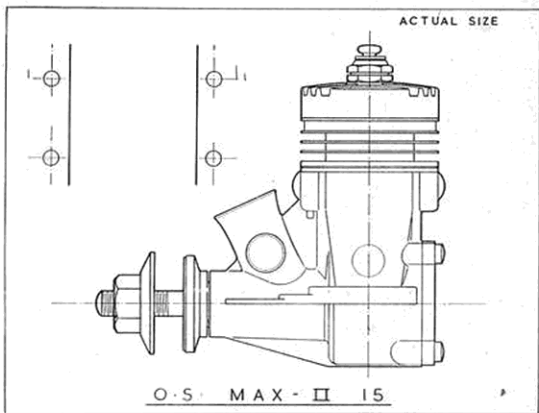
Fuel used: 50 per cent. Blending Methanol, 25 per cent. B.D.H. Nitromethane, 25 per cent. Duckham's Racing Castor Oil (70/30 Methanol and castor oil used for running-in.)

Ignition plug used: O.S. No. 5 ( $1\frac{1}{2}$  volt platinum filament, cold rating, short reach).

Venturi choke retained for all tests.

#### Performance

The Max-I 15 is noted for its ease of handling and the new model seems to be every bit as good in this respect and perhaps even better. Our test engine started very quickly



at all times and when warm, the procedure was simply a matter of giving the prop one preliminary choked turn, after which the engine would generally start on the next flick.

The previous model tested also proved to be non-critical to fuel mixture and our Max-II was again not at all fussy in this respect. Considerable improvement in power output, however, was apparent on nitroparaffin doped fuels as compared with straight methanol and castor oil and up to 1,000 extra r.p.m. could be found with the 25 per cent. nitromethane content fuel used for the tests.

Compared with the results obtained in our test of the Max-I the Max-II 15 developed a slightly lower maximum torque (on the same fuel) but the curve was flattened and its decline delayed so that the peak

b.h.p. was rather greater.

The improvement in performance, as indicated by our tests, was not, perhaps, quite so marked as had been anticipated, but it must be remembered that the original 15 already has an exceptionally fine performance and that, in any case, the output indicated for the new model is, in fact, one of the very highest recorded by a 2.5 c.c. glow-plug engine in this series. Actually, the makers' claimed performance is for 0.30 b.h.p. and it is very probable that, with the choke insert removed and pressure feed, plus a more heavily doped fuel, this could be equalled or even exceeded. On a power-to-weight basis, the performance is, of course, exceptional.

Power/Weight Ratio (as tested): 1.27 b.h.p./lb.

Specific Output (as tested): 112 b.h.p./litre.

The rectangular crankshaft part and two circular skirt transfer ports are clearly shown in this photo.

