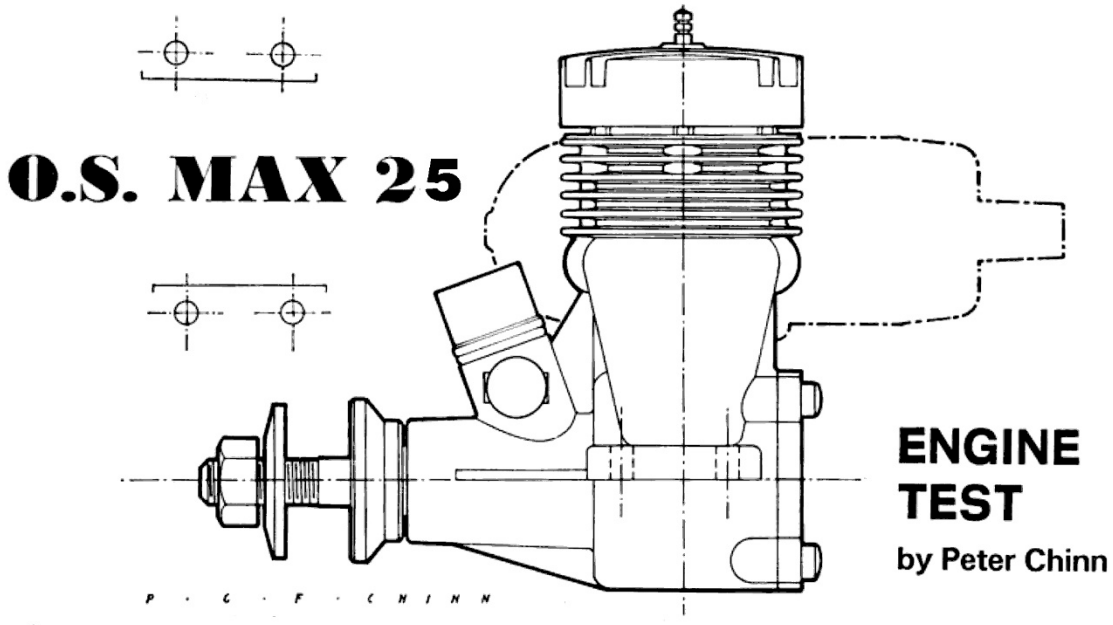
O.S Max .25S



Production of the O.S. Max-25 engine started at the beginning of last year, following the successful launching of its smaller brother, the Max-20. Outwardly, these two motors look almost identical. In fact, apart from the '25' stamped on the crankcase casting, the only external difference is the slightly taller cylinder head of the larger displacement model.

The differences in the internal parts of the two engines are mainly attributable to the increased bore and stroke of the 25. Cylinder bore is 18.0 mm. instead of 16.8 mm. and piston stroke is 16.0 mm. compared with 14.6 mm. for the 20. The result is a 25.8 per cent increase in swept volume, from 3.236 c.c. to 4.071 c.c., accompanied by a slightly higher stroke/bore ratio. The weight of the 25 is no greater: indeed it is fractionally lighter, due mainly to its slightly thinner cylinder liner wall.

Like the 20, the 25 is boxed complete with OS-703 silencer and an optional, larger venturi insert. The standard (or 'S' type) venturi insert fitted to the engine is intended primarily for C/L stunt use and offers an effective choke area of 10 sq. mm. to ensure plenty of fuel suction. The alternative 'L' type venturi has a larger throat (6.9 mm. bore) which, after allowing for the spray-bar, gives an effective choke area of approximately 17 sq. mm. This larger choke size is for use in competition free flight and other installations where more power is desirable and where some reduction in fuel suction can be tolerated. As an optional extra, the factory also offers a still larger venturi (7.6 mm. throat and 23 sq. mm. effective choke area) plus a back-plate nipple for fuel tank pressurisation. This setup is favoured in Japan when the motor is employed in the C/L combat and R/C combat classes flown there. At the moment, these fittings do not appear to be available from Keil Kraft, the U.K. O.S. distributors, and our tests on the Max 25 were therefore carried out with the small and large venturi inserts only.

The silencer supplied with the 25 is the OS-702 type expansion chamber. Since it was introduced for the 15, 19 and 20 engines, the OS-702 has had its tailpipe size increased from 5 mm. i.d. to 6 mm. i d.

Like all the other O.S. Max engines, the 25 is a well designed and finely engineered motor of excellent finish. It is a versatile engine that can be used equally well for control-line (including stunt work) or free flight, or it can be converted to radio-control use by fitting the appropriate O.S. Type 21 carburettor.

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O.S Max .25S

SPECIFICATION

Type: Single cylinder, air cooled, glowplug ignition two-stroke with crankshaft rotary-valve and bushed main bearing,
Bore: 18.0 mm. (0.7086 in.)
Stroke: 16.0 mm. (0.6299 in.)
Swept Volume: 4.071 c.c. (0.2485 cu. in.)
Stroke/Bore Ratio: 0.889:1
Checked Weights: 155 grammes 5.47 oz, (less silencer) 192 grammes 6.77 oz. (with OS-702 silencer)

GENERAL STRUCTURAL DATA

Pressure diecast aluminium alloy crankcase/cylinder-casing/front housing unit, with phosphor-bronze bushed mam bearing and detachable rear cover secured with four Phillips screws. Case hardened Steel counter-balanced crankshaft with 10.5 mm. dia. main journal, 7.6 mm. bore gas passage and 5 mm. o.d, hollow crankpin. Machined aluminium alloy prop driver keyed to Hat on shaft Lapped Meehanite c.i. piston with straight baffle and two 5 mm id. skirt transfer ports, Fully-floating case-hardened 4 mm. dia. tubular gudgeon-pin with brass pads. Machined duralumin connecting-rod with oil hole at lower end. Steel cylinder liner closely fitted to main casting, located by flange at top and secured by cylinder head. Pressure diecast and machined aluminium alloy cylinder head with cast-in brass thread insert for glowplug, recessed soft aluminium gasket and fitted to cylinder casting with six Phillips screws. Machined aluminium alloy interchangeable carburettor venturi inserts retained by plated brass spraybar assembly with flexible needle-valve extension. Beam mounting lugs.

EXTRAS INCLUDED

(i) Large choke venture
(ii) O.S. OS-703 Expansion chamber silencer with 6 mm. i.d. (28 sq. mm.) outlet, weight 36 8 gr. (1.30 oz.).

OPTIONAL EQUIPMENT

(i) Extra large (7.6 mm. i.d.) venturi.
(ii) Crankcase outlet nipple for pressurised fuel supply for use with above.
(iii) O.S. Type 21 throttle carburettor.

TEST CONDITIONS

Running time prior to test: 1 hour
Fuel used: (i) 25 per cent Duckhams Racing Castor oil, 75 per cent methanol (running in), (ii) 5 per cent pure nitromethane, 20 per cent Duckhams Racing Castor-oil, 75 per cent methanol (tests).
Glowplug used: O S. No. 7 platinum filament.
Air temperature: 18 deg. C (65 deg. F). Barometric pressure: 30 25 in.Hg.
Silencer: OS-703 as supplied.

Performance

Two examples of the Max 25 were received for test. They were given a preliminary running-in period of twenty minutes and then checked on a 9x4 prop. Performance at this stage was very evenly matched; one engine proving to be just about 1 per cent faster.

This motor was given a further 40 minutes running time and set aside for testing.

Like many imported engines, the Max 25 is sold in the U.K, without a glowplug. The recommended O.S. glowplugs for the Max 25 are the No. 3 and No. 9 plugs, or, in the case of the throttle equipped version of the engine, the No. 7 or No. 9. The No. 3 plug is not at present obtainable in the U.K., the distributor offering only the No. 7 or No. 9. We tried the No. 9 which has been found to offer excellent performance and long life in the larger O.S. motors and in a number of other engines, but we found this plug to be a little too cool under the prevailing conditions for the Max 25, especially on straight methanol/castor fuel. It resulted in a slightly sensitive needle and a tendency for the engine to reach its full performance only after half a minute or so of warming up. Any attempt to lean the mixture out for higher speed immediately after starting would cause the 25 to cut. We therefore changed to the No. 7 plug. The 25 was clearly much happier on this: the needle valve sensitivity was completely eliminated: the engine started from cold on its running setting and was about 200 r.p.m. faster.

The 25 was first tested with its standard (stunt) venturi and the OS-703 silencer (see curves marked (1) on the graph).

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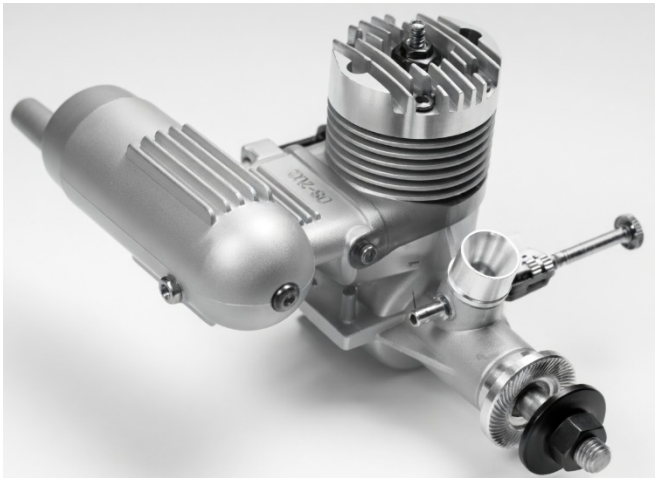

Next, the larger venturi was installed and a further series of tests (2) were run. Finally, the silencer was removed and readings (3) were taken to determine the engine's gross output. As will be noted from the performance curves the respective power output figures for these three con¬ditions were just on 0.34 b.h.p. at 12,000 r.p.m., 0.38 b.h.p. at 14,000 r.p.m. and 0.44 b.h.p. at 15,000 r.p.m.

These are very good figures and exceptionally so for an engine which, at 5 ½ oz. bare weight, is lighter than most 19's. There is, of course, still more power to be had, should the user need it. We would expect the gross output to be pushed well over the 0.50 b.h.p. mark with fuels containing 25-30 per cent nitromethane and even higher with the optional extra large choke venturi and pressure feed. However, for the majority of users, the engine in stock condition on mild fuel has more than adequate power. The Max-25's appeal, in fact, is that for the weight and overall dimensions of a typical glow 19 (or even a 2.5 c.c. diesel) it offers a substantial bonus in power without having to resort to expensive or hard-to-get high-nitro fuels. Thus, the Max-25 with an effective silencer, gives a power output that is equal to, or better than, most good .19 class engines without silencers.

In its mildest form i.e. with the small (10 sq. mm.) stunt venturi fitted, plus silencer and running on 5 per cent nitro fuel, the Max 25 turned up 9,400 r.p.m. on a 10x5 Super glass-nylon, 9,900 r.p.m. on a 9x6 Taipan glass nylon, 11,300 on a 10x3 ½ Top Flite wood, 11,700 on a 9x4 Keil Kraft nylon, 12,000 on a 9x4 Top Flite nylon and 12,800 on an 8x6 Power Prop standard wood. By using the larger (17 sq. mm.) venturi and removing the silencer, these figures were raised by 500 to 1300 r.p.m.

As regards prop sizes, we would suggest a 9x5 or 9x4 as being reasonably well matched to the 25's peak output when using the silencer and stunt venturi. With the larger venturi, the engine will, of course, turn these props faster, but, to take full advantage of the extra power then available at still higher speeds, it may be better to try slightly smaller dimensions, e.g. 9x4, 81x5 or 8x6. The 25 will, nevertheless, turn a wide variety of prop sizes at useful speeds and can quite happily cope with a 10x5 or even 11x5, if such should be required for a large lightweight model.

The general handling and running qualities of the Max 25 left little cause for complaint. Cold starting was very easy and warm restarts were only slightly less immediate. In spite of having over 25 per cent greater cylinder swept volume for the same bulk and weight as the Max 20, vibration levels did not appear to be markedly increased.

Power/Weight Ratio (5 per cent nitromethane fuel): 0.80 b.h.p./lb. with silencer and small venturi. 1.28 b.h.p./lb. less silencer, with large venturi.

Specific Output (5 per cent nitromethane fuel):

83 b.h.p./litre with silencer and small venturi.
107 b.h.p./litre less silencer, with large venturi.

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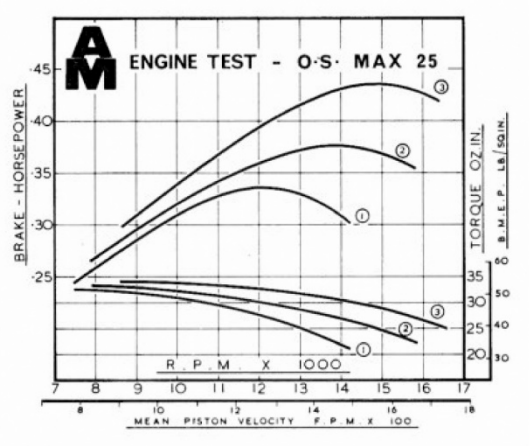
AM
ENGINE TEST - O·S· MAX 25
BRAKE - HORSEPOWER
TORQUE OZ IN.
B.M.E.P. LBS/SQ IN
R.P.M. X 1000
MEAN PISTON VELOCITY F.P.M. X 100


MAX
0.5