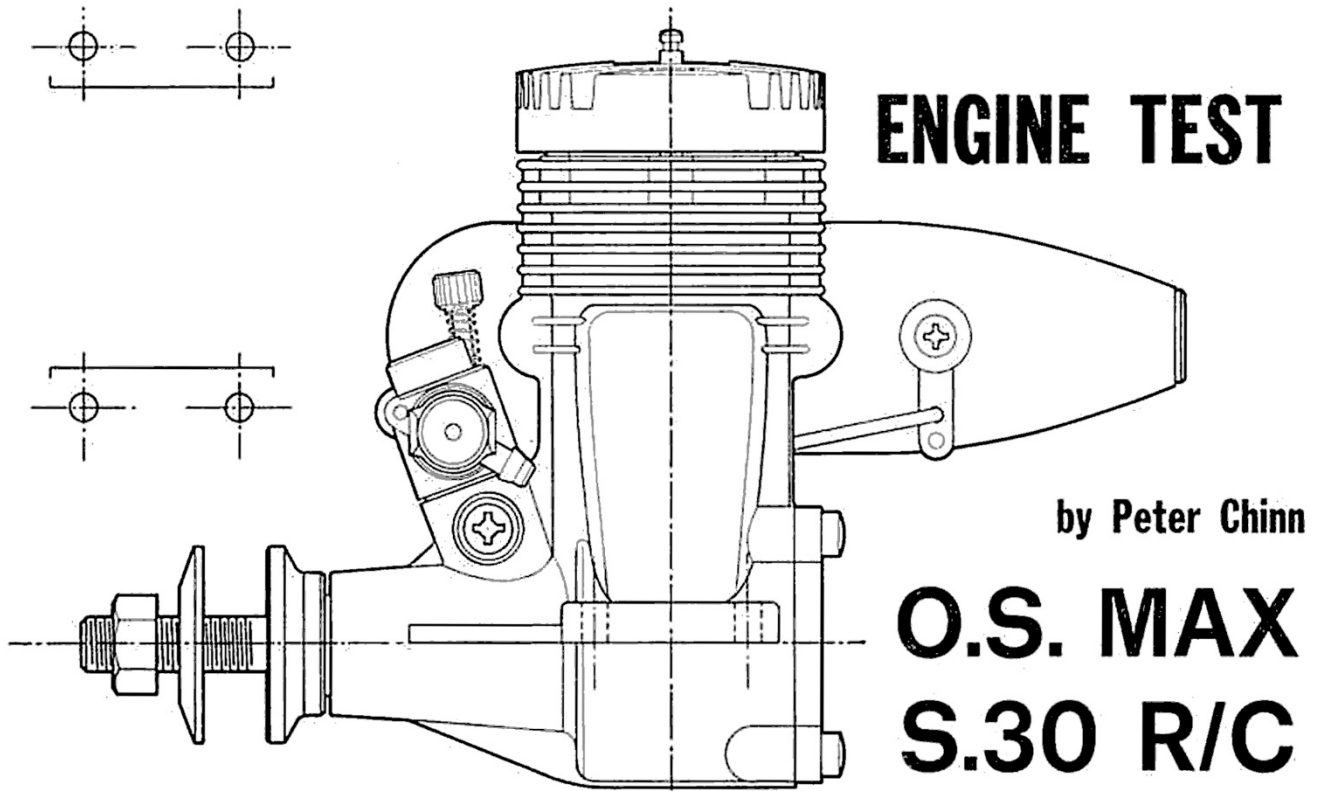


O.S Max S - .30RC



This is a 'by request' report on an engine that has become recognised as one of the best of its kind on the market.

The O.S. company introduced the Max S.30 R/C just over five years ago after a study of the various requirements of multi trainer type power units. Being modellers themselves, the O.S. design staff knew that the best sort of aircraft with which to learn multi-channel radio-control flying, was a reasonably stable model of sufficiently large area to keep wing-loading at a moderate level and thus ensure fairly docile handling: in other words, the sort of model which has been typified by the Keil Kraft Super 60 in the U.K. and by other high wing models of what one might call 'vintage free flight' lineage. Admittedly, some kit models advertised as 'multi trainers' do not fit into this category. Smaller, with higher wing loadings and, sometimes, bi convex wing sections and with little inherent stability, they can be rather a handful for the newcomer to R/C, yet if underpowered, can be more tricky than when overpowered, especially near the ground.

In evolving a 'multi-trainer' engine, it therefore seemed better, on both counts, to aim for a slightly higher performance than that offered by the .19 cu. in. and 3.5 c.c. engines commonly recommended for R/C trainer use, particularly as, with the then new trend towards the use of silencers, the power of a .19 could be marginal in anything except a light model. O.S. decided (that the solution lay in an engine of 5 c.c. (.30 cu. in.) nominal swept volume, moderately ported and lightly stressed. Such an engine would deliver ample power without resort to small props and excessively high r.p.m., would still be reasonably light in weight and could be made easy to handle, with reliable wide range throttling.

The end result of this decision, the Max-S.30 R/C has proved very successful. Compact and only about 8 oz. heavier than the average .19 class R/C motor, it offers up to 50 per cent more usable power yet is very easy to handle and has almost foolproof throttle control. (We know of several of the engines which have flown straight out of the box on the factory throttle settings). It is reasonably economical, runs well on inexpensive fuel and wears slowly.

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Basically, the Max-S.30 R/C has remained unchanged since its introduction. One obvious modification, however, has been the replacement of the original 'turnstile' type coupled exhaust valve by the ordinary pivoted plate type restrictor. This change was made (at the request of the U.S. distributor) to facilitate easy screwdriver access to the beam mounting screws. It is of little moment to the average U.K. user since either type is normally replaced by a silencer. Two types of O.S. Jetstream silencers are available for use with the 30 R/C, namely the Type *L* or Type 'R/C-L'. The difference is that the latter incorporates a brass baffle valve that can be coupled to the throttle in place of the standard restrictor. Our tests on the 30 R/C were carried out with this type fitted, but for actual flying we have used the standard (and slightly cheaper) Type 'L' which gives almost as low an idling speed, quite safely, with the advantage of simpler installation and a slight reduction in weight.

Also available as an optional extra is a neat machined alloy spinner nut.

Essentially, the Max-S.30 R/C is a bronze bearing glowplug motor with lapped piston and shaft rotary-valve induction. The rotary-valve is conservatively timed to close at 40 deg. after top dead centre, following a ISO degree induction period. The exhaust and transfer periods are also quite moderate at 124 deg. and 108 deg. respectively. The piston is machined from Meehanite with a straight baffle and is relieved approximately .0015 in. around the crown, where maximum expansion takes place, to aid running in and

subsequent piston seal. Internally, the piston has an annular rib to help maintain piston roundness. The cylinder head is of a shallow hemispherical form. Crankcase volume has been kept small to increase pumping efficiency and assist fuel draw and gas transfer. The carburettor is of the barrel throttle type with a quite modest choke area a further aid to non-critical throttle control.

Performance.

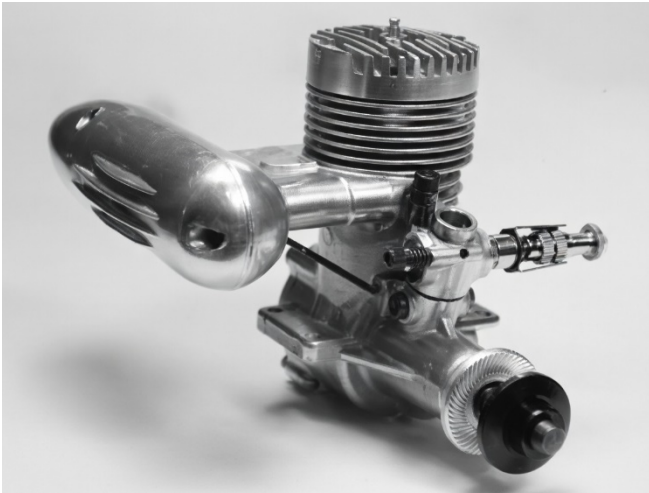
Our test engine was, for all practical purposes, run-in after about half-an-hour of accumulated running time. We found it very easy to start right from new, using the normal preliminaries of priming through the exhaust when cold and choking the intake when warm. Performance tests were carried out on our standard R/C test fuel containing 5 per cent nitromethane but of interest to those who wish to use the cheapest practical fuel mixtures, will be the fact that the 30 R/C also started, ran and throttled just as well on a straight methanol and castor-oil blend, the only discernible difference being an r.p.m. loss of about two percent on most props.

Carburettor controls were not at all critical and with the needle-valve adjusted for maximum full-throttle power, very little adjustment of the original factory settings of the air-bleed or throttle stop was called for to obtain a low idling speed and a good intermediate range. Typical maximum minimum speeds obtained on various props included 7,800/2,000 r.p.m. on a 12 x4 Power Prop. 8,600/2,100 on an 11x5 Top Flite wood, 9,300/2,200 on a 10 x 6 Tornado nylon, 9,800/2,200 on an 11x4 Top Flite wood, and 10,700/2,400 on a 10x4 Tornado nylon. All these figures were obtained with the R/C-L silencer installed.

The performance curves determined with our test sample, showing (on five per cent nitromethane fuel) a maximum b.h.p. of just over 0.40 at 12,500 r.p.m. less silencer, and 0.34 b.h.p. at 11,500 r.p.m. with silencer, may possibly be a little on the conservative side. Other independent test reports have claimed up to 0.47 b.h.p. at 12,000 (on 10 per cent nitro) with silencer, although we feel this to be just a trifle over optimistic even for an abnormally 'good' example.



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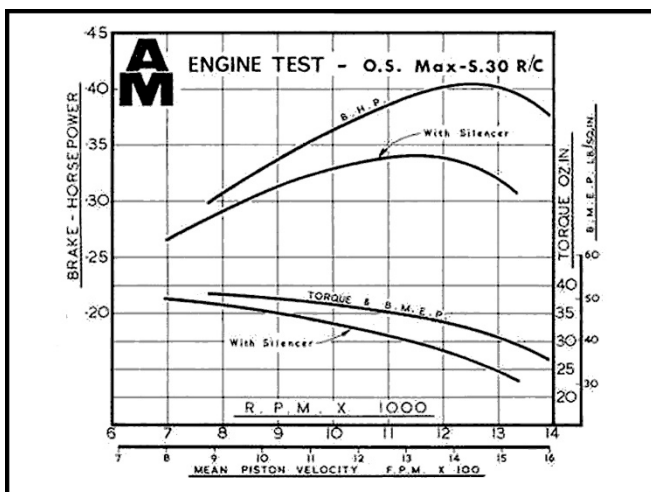
(The factory makes no claim to high b.h.p. for the Max-S.30 R C but offers, instead, the high-output Mux-11 series 35 and 40 R C engines for those who require fully aerobatic contest levels of performance in the medium capacity group). It is, perhaps, sufficient to remark that our test motor, silencer equipped and now with about 25 hours total running time, flies a 41 lb., 600 sq. in. trainer with ease and has proved entirely trouble-free.

Power Weight Ratio (as tested):

0.63 b.h.p. lb. (with silencer): 0.83 b.h.p. lb. (less silencer).

Specific Output (as tested):

70 b.h.p. litre!with silencer): 84 b.h.p. litre (less silencer).



SPECIFICATION.

Type: Single cylinder air-cooled glow-plug ignition two stroke with throttle control. Crankshaft type rotary-valve induction and bronze bushed main bearing.

Bore: 18.8 mm (0.7402 in.)

Stroke: 17.5 mm. (0.6890 in.)

Swept Volume: 4.858 c.c. (0.2964 cu. in.)

Stroke/Bore Ratio: 0.931:1

Weight: 7.8 oz. (8.7 oz. with R/C-L silencer)

General Structural Data.

Pressure diecast aluminium alloy crankcase/ cylinder/ main-bearing housing with cast-in phosphor bronze main bearing bush. One-piece counter-balanced casehardened steel crankshaft with 11 mm. dia. Journal, 7.8 mm gas passage and 6.35 mm. tubular crankpin. Meehanite c.i. piston with flat crown, straight baffle and with internal annular stiffening rib above bosses. Machined 24ST3 aluminium alloy connecting-rod with two lubrication holes at big end. Fully-floating case-hardened steel gudgeon-pin with brass pads. Leaded- steel ground and lapped cylinder-liner, located by top flange. Pressure diecast and machined aluminium alloy cylinder-head with cast-in brass thread insert for glow-plug and recessed soft aluminium gasket. Head secured to cylinder casting with six Phillips screws. Machined duralumin prop driver keyed to fiat on crankshaft. Pressure diecast aluminium alloy carburettor body with ground brass throttle barrel and stationary needle-valve assembly. Separate idling and air-bleed adjustment screws. Coupled centrally pivoted steel exhaust restrictor valve interchangeable with O.S Type L or Type R/C-L silencers. Beam mounting lugs.

TEST CONDITIONS.

Running time prior to test: 1 hour

Fuels used: (i) 70 per cent ICI methanol, 30 per cent Duckhams racing castor-oil (running in)

(II) 5 per cent pure nitromethane. 70 per cent ICI methanol. 25 per cent Duckhams racing castor-oil (performance tests)

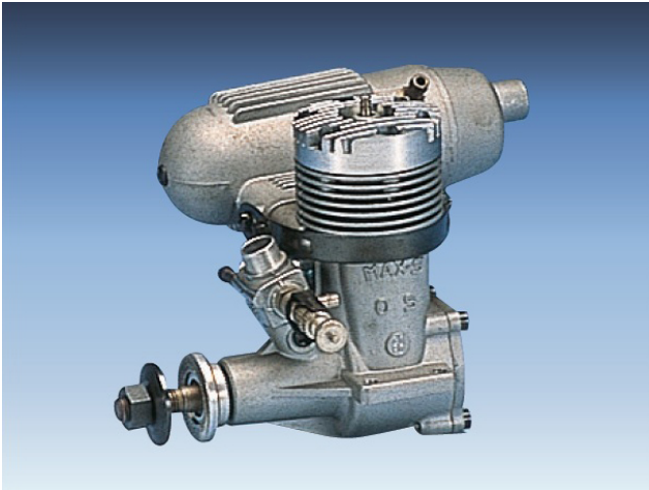
Glow-plug used: OS. No 7 bar type, platinum filament.

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Air Temperature: 46 deg.F

Barometer: 30.60 in Hg.

Silencer: O.S Jetstream Type R/C-L



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