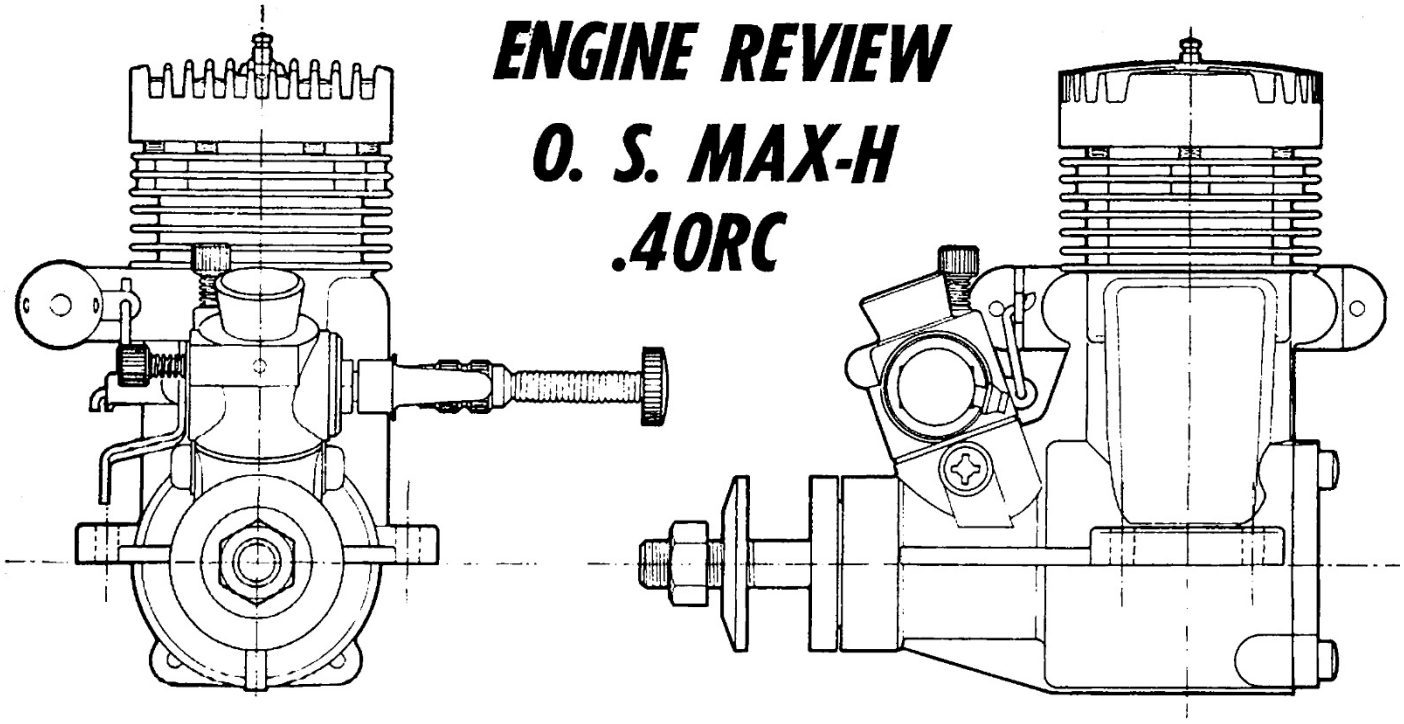
# O.S Max-H 40 R/C




**LATEST, HIGH-PERFORMANCE R/C 40 ENGINE LOOKS LIKE A GOOD CHOICE FOR THE NEW GOODYEAR PYLON RACING MACHINES. By P. G. F. CHINN.**

► By the time these words get into print, a couple of months after they are written, someone may have announced a new R/C 40 that is more powerful than the O.S. Max-H 40R/C. If not, then it seems fair to comment that this new' O.S. appears to be the hottest throttle- equipped 40 offered to date.

Prototypes of the Max-H 40R/C were produced as far back as the summer of 1963 which, quite fortuitously, seems to have been rather a good move on the part of the manufacturer: by the time the 40R/C got into production, the National Miniature Pylon Racing Association had been formed, following Jerry Nelson's experiments with “Goodyear” type pylon racers. The NMPRA rules call for the use of unmodified series-production, throttle-equipped engines of not more than .40 cu.in. displacement. Throttles must be effective enough to allow a taxiing speed below that of a fast walk. The Max-H 40R/C conforms exactly with these requirements and has the added, all-important advantage of offering the sort of power that modelers will be looking for in this new pylon racing class.

In displacement and weight, the Max-H 40R/C comes almost exactly between the Max-S 30R/C and Max-50R/C. In performance, however, it is very much closer to the 50 than to the 30. With the phasing out of the Max-III 35R/C, there will now be quite a sizable gap between the 30 and 40, although the S 35R/C, specially assembled for the U.S. market, will help to bridge the gap. Actually, this all fits in reasonably well with current demands and O.S. have the R/C market pretty well blanketed from single-channel (Pet-09R/C, Max-10R/C, Max-15R/C), through intermediate and trainer multi (Max-19R/C, Max-S 30R/C, Max-S 35R/C) and scale pylon racing (Max-H 40R/C), to full house multi (Max-50R/C and the forthcoming Max- 58R/C and Max-R 60R/C).
Unlike the Max-S series engines, in which the O.S. designers deliberately sacrificed some power in the interests of greater flexibility and light weight, the new Max-H series have been developed with high performance as the primary consideration.

Model Airplane News Magazine August 1965 by Hlsat

# O.S Max-H 40 R/C

**New Max-H 40R/C is powerful and hot good throttling. Type of exhaust valve shown is standard fitting for U.S. imports by World Engines, Inc.**

**Parts of .40R/C reveal good design and quality construction. Engine features ball-bearing shaft. Special muffler also available is required.**

These engines, which include a racing 29, a combat 35 and a rat racing 40, all feature big 13 mm diameter crankshafts carried in ball-bearings (2 BB in the case of the 29, single BB plus bronze outer bush on 35 and 40), vast intake passages and a hefty one-piece main casting with big bypass. The 40R/C is, in fact, an R/C version of the rat racing 40 (40RR), although, in addition to the throttle assembly, it does have some subtle modifications' to make it more suitable for R/C use. These include somewhat smaller cylinder port areas, a more "cooking" grade of port timing and. in place of the 40RR's wedge type combustion chamber, a hemispherical head of slightly lower compression ratio.

For a decade now. O.S. engines have been recognized as being among the better imported motors and the quality of their construction has, in fact, steadily improved over the years. This latest series has many nice touches and impresses as being a product in which nothing has been skimped just to save a few cents in production costs.

The body of the 40R/C is a well-produced pressure die-casting comprising crankcase and front housing with integral cylinder-block.
The casting is for a production engine, quite extensively machined, including the undersurfaces of the beam mounting lugs and the recessed seating for the carburetor sealing ring.

The counterbalanced crank shaft is of case hardened steel with finely ground journal and crankpin and runs in one 13 x 28 mm 8-ball journal bearing, supplemented by a bronze bush cast in the front housing. It has a rectangular valve port (which registers with a parallel side port in the main bearing) and an exceptionally large gas passage (9.8 mm) which is actually bigger than that on the Max-50 engine. The crankpin is 14-in. dia. and drilled out to aid counterbalance.

The lightweight piston is of Meehanite, has a straight baffle and an internal annular rib immediately above the wrist-pin bosses, which latter carry a full-floating case-hardened tubular pin with brass end pads. The piston does not have a relieved skirt but is relieved approximately .002 in. on diameter around the piston head, where maximum expansion takes place.
The cylinder sleeve is of hardened steel, has a wall thickness of .056 in. and is located in the usual way by a flange at the top. A machined 24ST3 aluminum alloy conrod is used, unbushed, with two lubricating holes at the big end. The cylinder head, machine finished from a pressure die-casting, has a central plug hole with cast- in brass thread bushing and recessed.025 in. soft aluminum gasket and is secured with six Phillips screws.

Port timing is as follows: rotary-valve opens 45 deg. ABDC, closes 45 deg. ATDC, exhaust opens

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66.5 deg. BBDC, closes 66.5 deg. ABDC, bypass port opens 55 deg. BBDC, closes 55 deg. ABDC.

The carburetor is identical with that fitted to the Max-50R/C except for a smaller choke diameter. It has a die-cast aluminum body, seating on a synthetic rubber seal in the intake boss and is securely held in place by two screws. To ensure a smooth working throttle, free from leakage, the brass throttle barrel has a ground finish and rotates in a honed bearing surface. There is the normal stop-screw for setting the idling speed and the usual O.S. air-bleed screw for adjusting the idling mixture. The needle valve, complete with tee- fitting fuel inlet, is amounted on the left side of the engine and docs not rotate with the throttle.

As supplied to the order of the U.S. distributors, the Max-H 40R/C has the same coupled exhaust throttle unit as the American imported version of the Max-50RC model. This consists of a semi-rotary steel sleeve within a pressure cast housing attached to the exhaust stack. When the throttle is open, spent gas is free to pass straight through slots in the sleeve and housing. When the throttle is closed, gas has to escape via two small (3 mm. dia.) holes in the front and rear of the unit. Our tests were carried out with this type of exhaust unit fitted and were then repeated with it replaced by an O.S. Jetstream Type RC-L muffler. This looks the same as the regular 29 - 50 size O.S. muffler, but has an internal butterfly valve which can be coupled to the carburetor throttle.

All our tests on the Max-H 40R/C were carried out on our standard R/C type test fuel, which contains 5 percent nitromethane, and using the 3/16 in. reach O.S. No. 7 bar type glow-plug. If you use a 7/32 in. reach plug, it may be desirable to add an extra plug washer.

As received, our two test engines each required a couple of hours break-in. Almost straight out of the box, both engines could be leaned out without risk of hardening to a stop, but they did lose two or three hundred rpm between cold and hot and this persisted during the first two hours. At first, we thought that hot restarting qualities were not so good, but after a while, we suddenly realized that we were restarting the engines first or second flip. Normally, only ringed motors show a marked improvement in starting qualities as they become broken-in. However, if the 40 was stopped in the closed-throttle position (i.e. rather than by letting the engine run flat out until it ran the tank, and itself, dry) restarting was instantaneous, throttle open or closed, and without choking or priming. If allowed a few minutes to cool, choking the intake for a couple of flips provided the necessary rich mix for starting.

Most of the Max range of R/C engines are noted for their good idling and despite its lively performance, the 40RC was no exception, idling down to as low as a continuous 2.000 - 2.200 on the larger size props where full-throttle rpm were below 10.000. Safe, in-the-air, idling speeds will probably be 500 rpm higher than this. We found that the idling speed was very sensitive to the last fraction of a turn on the idling screw, so a servo to throttle linkage with no backlash would seem to be essential. To obtain the correct mixture for a low idle, we found it necessary to run the engine with the air-bleed hole almost fully open.

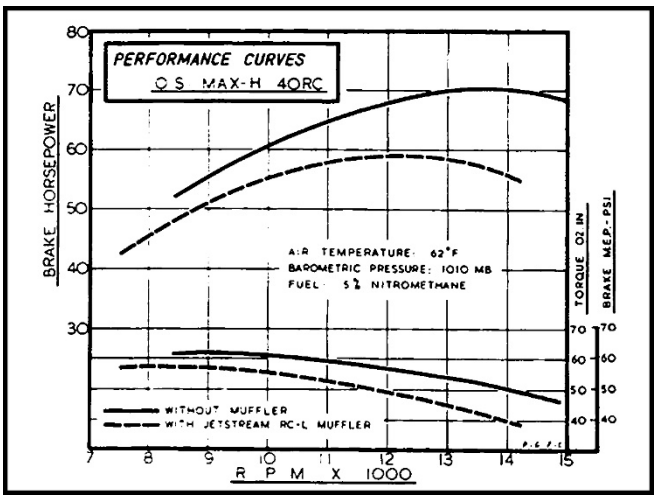
Typical prop speeds recorded included 10.100 rpm on 12 x 5 Power Prop and 11 x 6 Top Flite wood props, 11.200 on a Top Flite 11 x 5, 11.600 on a Power 11 x 5, 12.600 on a Top Flite 11 x 4, 11.900 on a Top Flite 10 x 6 and 12.500 on a Top Flite 10 x 5 With the muffler fitted, the average rpm drop was around 4 percent on most prop size, but rather more when the engine was dropped for a speed near the peak of the power curve. On a 10 x 5 prop, drop was 600 rpm.

On test, using the 5 percent nitro test fuel, the Max-H recorded a best figure of just 0.70 bhp at approximately 13.700 rpm. With the muffler fitted, peak output was 0.59 bhp at about 12.400 rpm. Needless to say, these figures are extremely good and are not only the best we have recorded to date for a .40 cu.in. R/C engine, but also exceed the peak outputs of many R/C .45 -.40 class engines.

# O.S Max-H 40 R/C

## Summary of Data

**Type:** Loop scavenged two stroke cycle with shaft rotary valve induction and single ball-bearing. Throttle type carburetor and coupled exhaust throttle.
**Weight:** 9.9 oz (10.6 with Jetstream RC-L. muffler).
**Displacement:** 6.499 c.c. - 0.3966 cu.in**.**
**Bore:** 20.6 mm (0.8110 in.)
**Stroke:** 19.5 mm. (0.7677 in.)
**Stroke/Bore Ratio:** 0.947:1
**Specific Output (as tested):**
1.76 bhp/cu.in. (without muffler).
1.49 bhp/cu.in. (with muffler).
**Power/Weight Ratio (as tested):**
1.13 bhp/ib. (without muffler).
0.89 bhp/lb. (with muffler).
**Price in U.S.A.:** $22.98
**U.S. Distributor:** World Engines Inc.. 8206 Blue Ash Road, Cincinnati 36, Ohio.



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