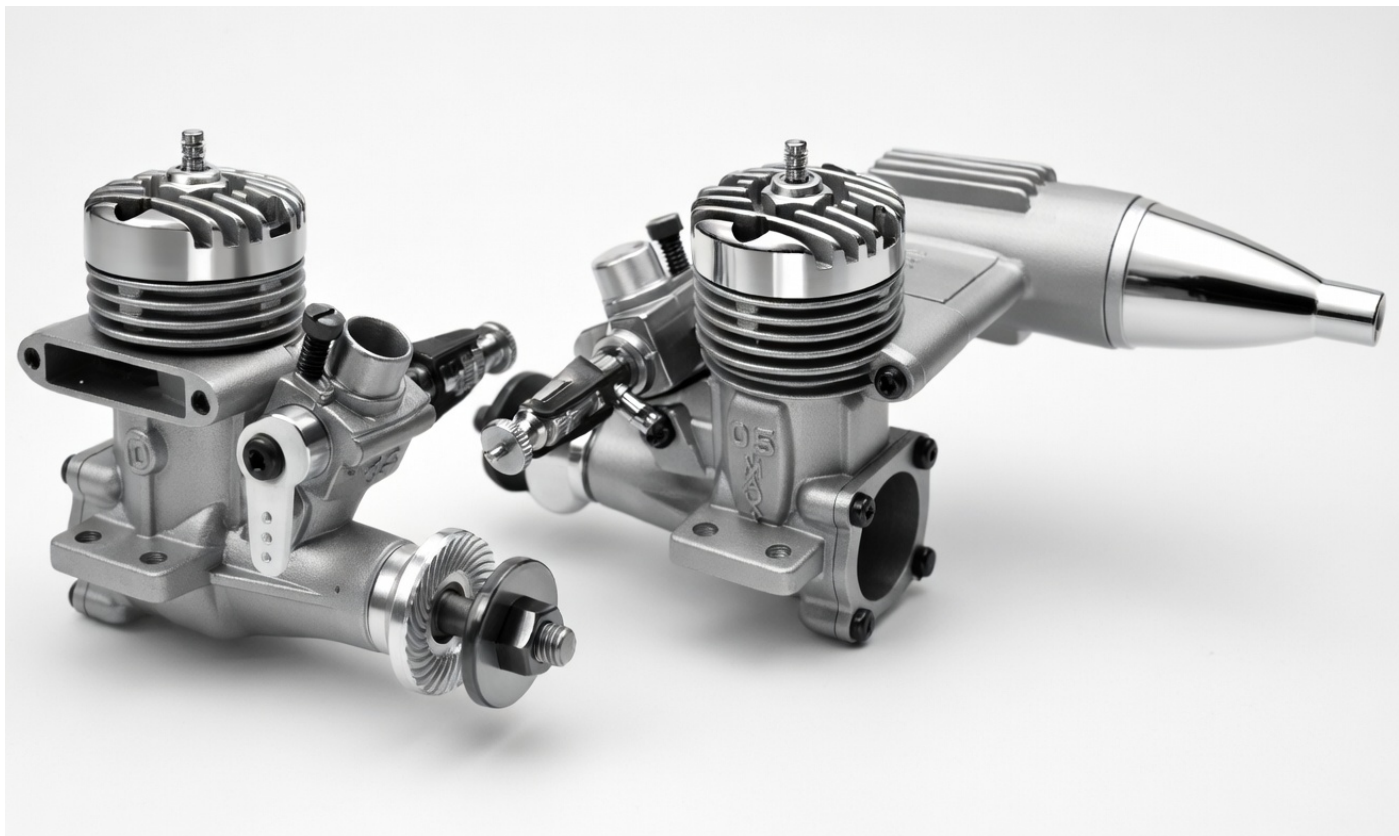


O.S Max .10FSR-RC



Smallest engine in the extensive O.S. engine range (replacing the popular Max 10 R/C) is the Schnuerle scavenged Max 10FSR of 1.76cc.

Max 10FSR with OS 761 silencer as supplied. On test it developed almost 60% higher brake horsepower than the old crossflow Max 10 R/C with Jetstream S silencer.

As has been said before, it is almost impossible, in a monthly column intended to cover all makes of motors, to keep track of all the developments taking place in such very large and constantly changing engine ranges as those of Super Tigre and O.S. and. from time to time, obvious candidates for a write up are apt to be over looked for a while.

O.S. 10FSR tested

One such motor is the Schnuerle scavenged O.S. Max 10FSR which has now been on the U.K. market for nearly two years (having replaced the ten year old Max 10 R/C) but has not previously been mentioned in these columns.

Compared with the popular crossflow-scavenged Max 10, the 10FSR is a more interesting design technically and is very much more powerful. Despite its lively performance, however, it is an easy-starting and pleasant handling little motor that will suit the beginner as well as the more experienced modeler looking for a high performance engine for a small R/C power model or to lift a larger motor assisted glider. Incidentally, if, for the latter type application, the user does not require throttle control, he may also buy the engine in its 10FSR-S version with standard venturi insert and spray-bar assembly, at a saving of about £4. Alternatively, for marine use, the 10FSR is available in a water-cooled R/C version. All three versions of the engine come complete with OS 761 silencer.

The suffix letters "FSR" as applied to current O.S. engines, indicates a front rotary valve unit with Schnuerle scavenging. As one might expect of an engine of only 1.76cc capacity, however, the 10FSR is of simpler construction than its bigger brothers.

O.S Max .10FSR-RC

It has, for example, a phosphor bronze main bearing instead of the twin-ball races of all the other O.S. Schnuerle scavenged engines. Also it has a thick walled investment cast steel cylinder liner with ports cast in, thereby eliminating the need for transfer passages formed in the surrounding casting.

Like the 21 FSR and 25FSR models, the 10FSR has the cylinder liner rotated in the surrounding main casting to relocate the ports in such a way as to leave an uninterrupted cylinder bore surface against which the piston's fully-floating gudgeon pin can bear by means of PTFE pads. The liner is not, incidentally, located by the usual top flange: instead it is axially clamped between the cylinder head and a narrow annular seat in the lower part of the surrounding casing. The head has a wide squish band, an 8thou. aluminium gasket and is tapped for an O.S. medium-reach glow-plug, the O.S. No. 8 being recommended.

The maker's recommended fuels for the Max-10FSR include a 3-to-1 methanol/castor-oil mixture for running-in, a 72/23/5 mixture of methanol, castor-oil and nitromethane for general use and a 37/23/40 methanol/castor-oil/nitro blend for maximum power.

After running-in, our test motor recorded the following rpm figures:

| | | |
|---------|--------------------------------|---------------------|
| 8 x 4 | Robbe glassfibre-nylon | 11,400 rpm (11,600) |
| 8 x 4 | Cox glassfibre-nylon | 12,400 rpm (12,600) |
| 7½ x 4 | Zinger maple | 12,500 rpm (12,800) |
| 7 x 4 | Zinger maple | 13,200 rpm (13,500) |
| 7½ x 3¾ | Bartels glassfibre-epoxy | 15,000 rpm (15,200) |
| 7 x 3½ | Bartels glassfibre-epoxy | 16,500 rpm (16,700) |
| 7 x 3 | Top Flite wood | 17,900 rpm (18,100) |

All the above rpm were obtained on standard 5 per cent nitro-methane fuel. The figures in parenthesis relate to the performance with the silencer removed, from which it will be noted that, although the OS-761 silencer is quite effective, it absorbs very little power.

Since small engines are so much more economical on fuel, thereby making the use of more expensive mixtures more acceptable than in the case of big motors, it was decided to run some checks on the 40 per cent nitro mixture as well. Prop revs on this, less silencer, included the following:

| | | |
|---------|--------------------------------|------------|
| 8 x 4 | Robbe glassfibre-nylon | 12,400 rpm |
| 8 x 4 | Cox glassfibre-nylon | 13,500 rpm |
| 7½ x 4 | Zinger maple | 13,750 rpm |
| 7½ x 3¾ | Bartels glassfibre epoxy | 16,200 rpm |
| 7 x 3½ | Bartels glassfibre epoxy | 17,600 rpm |
| 7 x 3 | Top Flite wood | 19,000 rpm |

Dynamometer tests indicated that the 10FSR peaks at between 17,500 rpm (with silencer) and 18,000 rpm (less silencer) and, allowing for un-loading in the air, the props most likely to extract maximum power from the engine are in the "fast" 8 x 3 -- 7 x 4 group. Small props tend to vary a great deal in power absorption characteristics, however. It is not uncommon, for example, to find that, on the same engine, one make of (nominal) 8x4 will turn 2,000 rpm faster than another make, due to variations in blade shape, thickness and pitch, and discrepancies can be even greater in the 7 inch diameters. Therefore, where maximum performance is required, it may be worthwhile to try a variety of props. Obviously it is necessary to choose a diameter and pitch combination that is also reasonably well suited to the aircraft. In the case of the 10FSR, this would mean a 7 x 4 for a small high speed model but an 8 x 3 in the case of larger slower models, including motor gliders.



Below: parts of the Max 10FSR. Note unusual porting in its investment cast cylinder. (Also shown here is needle-valve assembly for conversion to non-throttle use).

The 10FSR's handling and running qualities were very good. From cold, a small prime (not too much) and

O.S Max .10FSR-RC

the needle opened up slightly from the running setting, provided a quick hand start. Warm restarts, we found, were virtually first flick with the throttle on the idle setting, provided that the fuel line was full. Restarts with the throttle open required one choked flick of the prop prior to starting. A single O.S. No. 8 glow-plug survived running in and testing including speeds exceeding 20,000rpm on 40 per cent nitro.

Although the carburettor fitted to the Max 10FSR is a simple barrel throttle type without provision for adjusting the idling mixture, it works very well indeed with safe idling at around 3,000rpm and a good midrange. This has been achieved by opening up the carb i.d. an extra 0.7mm above the barrel to provide a measure of automatic mixture compensation by admitting extra air as the throttle approaches the idling position.

The Max 10FSR has a bore and stroke of 13.44x 12.40mm, giving a swept volume of 1.759cc or 0.1073cu.in. Checked weight of the test engine was 4.28oz (121g) or 5.25oz (149g) with silencer.

