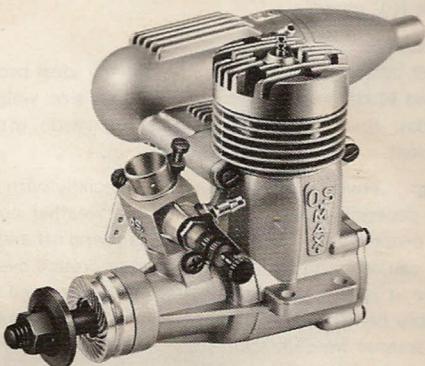
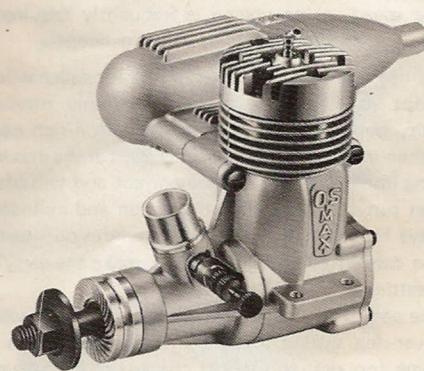


# INSTRUCTIONS FOR O.S. MAX-25FSR & 25FSR-S ENGINE



MAX-25FSR



MAX-25FSR-S

The MAX 25FSR is a new high-performance engine that has features previously found only in certain of the larger displacement O.S. engines, notably the very successful MAX 40FSR and 60FSR models. It incorporates Schnuerle scavenging, twin ball-bearings and the new O.S. Type 2B carburettor with automatic mixture control. It is intended for all types of radio-controlled models where performance and durability are of paramount importance and the special requirements of small sized helicopters were given particular attention during the engine's design and development period.

The MAX 25FSR-S is the standard (non-throttling) version of the 25FSR and, in place of the Type 2B carburettor, is equipped with a conventional intake venturi and needle-valve assembly for control-line models.

Like all O.S. engines, the MAX 25FSR and MAX 25FSR-S are manufactured to standards of skilled craftsmanship that have been developed through 40 years of O.S. engine production history. Modern precision machinery and carefully selected top quality materials are employed to ensure consistent performance and long life.

## RUNNING-IN ("Breaking-in")

For long life and high-performance, every engine needs to be properly "run-in", or "broken-in", before being put to full use. The procedure is as follows:

### For Conventional (fixed wing) Models

(Note for Beginners: Before installing the engine in a model, beginners are recommended to follow the test-bench running-in procedure as explained later for helicopter models.)

1. Install the engine in your model and fit a suitable propeller (for example: a 9 x 5 or 10 x 4 depending on the type of model). Use mild fuel (e.g. not more than 5% nitromethane) containing not less than 20% castor-oil.
2. Open the needle-valve between 3 and 4 turns from the fully closed position and prime and start in the usual way. For the first few minutes, leave the needle-valve on a very rich setting so that, with the throttle fully open, the engine is "four-cycling". Then gradually screw in the needle-valve until the engine just breaks into rich two-cycle operation. Leave the needle-valve at this point and let the engine run until the tank is empty. (Do not run the engine in dusty or gritty surroundings. Such foreign matter sucked into the engine can ruin it in a few seconds.)
3. Now, with the same needle-valve setting, make two or three flights. Although the engine will still be running rich and not delivering its full power, revolutions should be quite sufficient unless the model itself is too large or too heavy or an attempt is made to fly in weather that is too windy.
4. It sometimes happens that, due to the tank position in the model, the mixture becomes weaker in flight. If this should happen, close the throttle, land the model and open the needle-valve slightly before taking off again.
5. For the next three or four flights, the needle-valve can be gradually closed to give more power, but always keep the setting richer than the full-power setting. During these early flights, avoid manoeuvres such as the "stall turn" or "top hat" which require the model to fly vertically upwards. Loops, however, are helpful to running-in as they allow the engine to briefly speed up and then run rich again. In running-in an engine, it is important that the mixture should become rich again immediately after running lean.
6. After six to ten flights, it should be possible to run the engine continuously on its optimum needle-valve setting. This setting is with the needle valve adjustment  $\frac{1}{4}$  to  $\frac{1}{2}$  turn on the rich side of the position at which the engine reaches its very highest speed. Your engine can be said to have completed its running-in period when it holds a steady speed at this optimum setting.

## 要 目 SPECIFICATIONS

		MAX-25FSR	MAX-25FSR-S
行 程 体 積	Displacement	4.07cc. (0.248cu.in.)	
ボア	Bore	18.00mm. (0.708in.)	
ストローク	Stroke	16.00mm. (0.630in.)	
実用回転数	Practical R.P.M.	2,500~17,000r.p.m.	8,000~18,000r.p.m.
重量 サイレンサー なし 付	Weight less silencer With silencer	210g (7.4oz.) 258g (9.1oz.)	193g (6.8oz.) 241g (8.5oz.)

mum setting. Never attempt to gain a few more r.p.m. by running the engine on a lean setting: it will run hotter and may eventually become damaged by over-heating.

### For Helicopter Models

1. Install the engine in a suitable bench mount. Use a 9 x 5 or 10 x 4 propeller and run the engine for approximately 10 minutes with the throttle fully open but with the needle-valve adjusted for rich, slow, "four-cycle" operation.
2. Now close the needle-valve until the engine speeds up to "two-cycle" operation. Allow it to run like this for about 30 seconds only, then re-open the needle-valve to bring the engine back to four-cycle operation and run it for a further two minutes.
3. Repeat this procedure, alternately running the engine fast and slow by means of the needle-valve, but gradually extending the short periods of high-speed running until a total of at least 30 minutes running time has been accumulated. At a two-cycle setting, an engine runs hot, whereas, at a four-cycle setting, it runs cool. It is very helpful to induce such changes of temperature within the engine during the running-in period.
4. Now gradually close the needle-valve until the engine reaches its maximum r.p.m., then re-open the needle-valve very slightly as a safety margin. If, at this stage, the engine holds a steady speed, the initial running-in is complete. If it does not, extend the running-in period as necessary.
5. After running-in, and before installing the engine in your helicopter, it is advisable to check carburettor adjustment. Refer to the separate Carburettor Instructions sheet. Use a 9 x 6 propeller. Open the needle-valve by  $\frac{1}{4}$  to  $\frac{1}{2}$  turn from the maximum r.p.m. setting and adjust the idling speed in accordance with the advice given in the Carburettor Instructions. Although minor readjustments to the carburettor may be required after installing the engine in the helicopter, it is advisable to make provisional adjustments while the engine is still on the bench.

6. It should be noted that the carburettor should show good response at around the middle-speed range, rather than at idling speed, as an engine is frequently required to run at medium revolutions when used in a helicopter.

**Warning:** It has been observed that a modeller will sometimes attempt to run-in his engine by simply running it for a lengthy period on a bench mount with a rich needle setting and then install it in a model and fly it at the maximum r.p.m. setting immediately. This is incorrect and will often result in a lean run that may ruin the piston and cylinder assembly. Always follow the running-in procedures outlined above and, in the case of fixed wing aircraft, make the early flights on a rich setting.

In the case of helicopters, however, it is inadvisable to fly on an over-rich setting because this may cause the mixture to become too rich to support combustion at reduced throttle openings. When an engine is used in a helicopter, therefore, the engine should be adequately run-in on the bench so that the needle-valve can be safely adjusted to the optimum setting before any flights are undertaken.

#### INSTALLATION

Mount the engine securely on rigid hardwood mounts with steel screws and locknuts and suitable washers. Make sure that the mounting beams are parallel and that their top surfaces are in the same plane. Poor installation may cause vibration, erratic running and loss of performance. Make sure that the mounting holes are accurately aligned with those in the engine mounting lugs. Forcing screw through badly aligned holes may deform the engine casting.

#### FUEL

Use a good quality commercial fuel or one of the blends shown in the table. Fuel "A" is for ordinary use. Fuel "B" is for use where higher output is required. Use only castor-oil and methanol of the highest available purity.

Synthetic lubricants are less tolerant of a "lean rub" than castor oil. If, therefore, a synthetic is employed in the fuel, the needle-valve should be re-adjusted to a richer setting, as an additional safety measure, in case the mixture runs too lean in the air.

In helicopter installations, it may be helpful to experiment with different fuels and glowplugs to obtain optimum mid-range performance.

Whatever fuel is used, the engine should be checked out to make sure that it is sufficiently run-in to operate satisfactorily on that particular fuel. Do not use fuels containing less than a 20% lubricant content.

#### GLOWPLUGS

The type of glowplug used can have a considerable effect of performance and reliability. The recommended glowplug for use with mild fuels (0 - 5% nitromethane) is the O.S. No.8 plug. For

use with fuels of higher nitrocontent, use the O.S. No.8 or the one found to give the most satisfactory results after tests of available R/C plugs.

#### PROPELLER

Use well balanced propellers only. As the ideal prop diameter, pitch and blade area vary according to the size, weight and type of model, final prop selection can be made after practical experiment.

**Warning:** There is always a danger, especially with nylon props and depending on engine speed and weather conditions, of the propeller fracturing and a blade flying off and, obviously, this can cause injury. Therefore, never crouch over the engine when it is running and keep all onlookers well back — preferably behind the model. If a spinner is used, make sure that the spinner notches are large enough to clear the prop blades and so do not cut into and weaken the blade roots.

	Dia x Pitch
C/L Stunt	9 x 6 , 10 x 5
R/C Stunt (High speed)	9 x 5
R/C Stunt (Low speed)	10 x 5 , 10 x 4
R/C Sport	9 x 5 ~ 6 , 10 x 4

#### NEEDLE-VALVE

These engines are fitted with a short tubular seal between the needle and body to prevent air leakage into, or fuel leakage from, the needle-valve. When the seal becomes worn or damaged after a long period of use, replace with the spare seal provided, or cut a short piece of silicone fuel tubing as a replacement.



#### CARBURETTOR

As previously noted, the MAX 25FSR is fitted with the new O.S. Type 2B carburettor, please follow the advice given in the separate Carburettor Instructions leaflet.

#### MAINTENANCE

1. Avoid unnecessary dismantling of your engine.
2. Note the spraybar for the MAX 25FSR-S should be installed in such a way that the jet hole points towards the crankshaft and is not visible when one looks into the air intake.
3. Always keep your engine clean and do not let dirt or dust enter through the intake or exhaust. Fuel should be filtered. Use a fuel filter on your fuel container and another filter in the fuel line to the carburettor.
4. If the engine is to be fitted with a flywheel instead of an aircraft propeller, do not allow it to run at peak revolutions, without adequate provision for cooling.

#### 部品表

#### PARTS LIST

品名コード Code No.	品名 Description	品名コード Code No.	品名 Description
22601002	クランクケース Crankcase	○22612009	ベンチュリー Venturi
22602019	クランクシャフト Crankshaft	22613006	スクリューセット Screw Set
22603007	シリンダーピストン式 Cylinder & Piston Assembly	22614003	ガスケットセット Gasket Set
22604004	シリンダーヘッド Cylinder Head	21015001	キャブレーターパッキン Carburetor Gasket
22405013	コントロッド Connecting Rod	22620003	スラストワッシャー <sup>1</sup> Thrust Washer
22606009	ピストンピン Piston Pin	22625019	OS-762サイレンサー OS-762 Silencer
22607006	カバーブレート Cover Plate	22630002	ボールベアリング(後) Ball Bearing (Rear)
22608003	ドライブワッシャー <sup>2</sup> Drive Washer	22631019	ボールベアリング(前) Ball Bearing (Front)
23009006	プロペラワッシャー <sup>3</sup> Propeller Washer	▲22681005	キャブレーター式(2B型) Carburetor Complete
23210007	プロペラナット Propeller Nut	▲22681908	R/C ニードルバルブ式 R/C Needle Valve Assembly
○22611001	ニードルバルブ式 Needle Valve Assembly	*23024008	スピナーナット Spinner Nut

\*印特別付属品 Optional Part

○印25FSR-S専用 Only

▲印25FSR専用 Only

The specification is subject to alteration for improvement without notice.

**O.S. ENGINES MFG.CO.,LTD.**

6-15 3-chome Imagawa Higashisumiyoshi-ku  
Osaka 546, Japan. TEL. Osaka (06) 702-0225