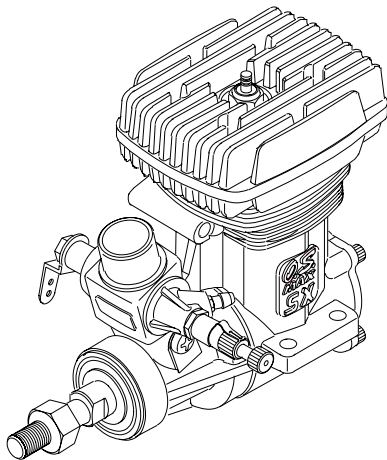

O.S. ENGINE O.S. MAX-32SX-H SERIES ENGINES

OWNER'S INSTRUCTION MANUAL

It is of vital importance, before attempting to operate your engine, to read the general **'SAFETY INSTRUCTIONS AND WARNINGS'** section on pages 2-5 of this booklet and to strictly adhere to the advice contained therein.

- Also, please study the entire contents of this instruction manual, so as to familiarize yourself with the controls and other features of the engine.
- Keep these instructions in a safe place so that you may readily refer to them whenever necessary.
- It is suggested that any instructions supplied with the model, radio control equipment, etc., are accessible for checking at the same time.



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SAFETY INSTRUCTIONS AND WARNINGS ABOUT YOUR O.S. ENGINE

Remember that your engine is not a "toy", but a highly efficient internal-combustion machine whose power is capable of harming you, or others, if it is misused.

As owner, you, alone, are responsible for the safe operation of your engine, so act with discretion and care at all times.

If at some future date, your O.S. engine is acquired by another person, we would respectfully request that these instructions are also passed on to its new owner.

- The advice which follows is grouped under two headings according to the degree of damage or danger which might arise through misuse or neglect.



WARNINGS

These cover events which might involve serious (in extreme circumstances, even fatal) injury.



NOTES

These cover the many other possibilities, generally less obvious sources of danger, but which, under certain circumstances, may also cause damage or injury.



WARNINGS

- Never touch, or allow any object to come into contact with, the rotating parts.



- Model engine fuel is poisonous. Do not allow it to come into contact with the eyes or mouth. Always store it in a clearly marked container and out of the reach of children.



- Model engine fuel is also highly flammable. Keep it away from open flame, excessive heat, sources of sparks, or anything else which might ignite it. Do not smoke or allow anyone else to smoke, near to it.



- Never operate your engine in an enclosed space. Model engines, like automobile engines, exhaust deadly carbon-monoxide. Run your engine only in an open area.

- Model engines generate considerable heat. Do not touch any part of your engine until it has cooled. Contact with the muffler (silencer), cylinder head or exhaust header pipe, in particular, may result in a serious burn.





NOTES

- These engine were designed for model helicopters. Do not attempt to use it for any other purpose.
- Mount the engine in your model securely, following the manufacturers' recommendations, using appropriate screws and locknuts.
- Install an effective silencer (muffler). Frequent close exposure to a noisy exhaust (especially in the case of the more powerful high-speed engines) may eventually impair your hearing and such noise is also likely to cause annoyance to others over a wide area.
- Check the linkage to the throttle arm before each flight.
- Avoid sudden high r.p.m. immediately after the engine is started, as the clutch will engage and you may be struck by the rotor.
- After starting the engine, carry out any needle-valve readjustments after stopping the rotor by closing the throttle to the lowest r.p.m.. Stop the engine before attempting to make other adjustments to the carburettor.
- Use an electric starter. The wearing of safety glasses is also strongly recommended. Press the rotor head down securely.
- Take care that the glow plug clip or battery leads do not come into contact with rotating parts.
- Adjust the throttle linkage so that the engine stops when the throttle stick and trim lever on the transmitter are fully retarded. Alternatively, the engine may be stopped by cutting off the fuel supply. Never try to stop the engine physically.



NOTES

- Take care that loose clothing (ties, shirt sleeves, scarves etc.) do not come into contact with the rotor. Do not carry loose objects (such as pencils, screwdrivers, etc.) in a shirt pocket from where they could fall through the rotor disc.
- For their safety, keep all onlookers (especially small children) well back (at least 20 feet or 6 metres) when preparing your model for flight. If you have to carry the model to the take-off point with the engine running, be especially cautious. Hold the rotor securely and keep well clear of spectators.
- Warning! Immediately after a glowplug-ignition engine has been run and is still warm, conditions sometimes exist whereby it is just possible for the engine to restart when turned over WITHOUT the glowplug battery being reconnected. Remember this if you wish to avoid the risk of accidents.
- Do not attempt to disassemble the recoil starter (if fitted). If you do so, the very strong spring inside will be suddenly ejected. This can be very dangerous.
- Do not extend the starter cord more than 45cm (18"). Do not abruptly release the operating handle. Allow the cord to rewind smoothly while still holding the handle.
- Pull the operating handle straight out when starting the engine, so that the cord does not rub against the helicopter structure or engine. This will help prevent the cord from being damaged by abrasion or engine heat.

INTRODUCTION

These engines are produced by the world's oldest and largest model engine manufacturing company ; a company that has designed and manufactured all types of engines, large and small : two-stroke, four-stroke, Wankel-rotary, supercharged, twin nand multi-cylinder four-strokes and has also produced more helicopter units than any other maker worldwide.

Highperformance motors, designed for small-sized radio-controlled helicopters, the MAX-32SX-H Series is available in a choice of three versions. The standard 32SX-H features ABC cylinder/piston construction, whereas the 32SX-H Ring employs a compression-ring equipped piston, while the 32SX-HX Ring has the addition of an O.S. Recoil Starting System to eliminate the need for a separate electric starter and battery.

The close-fitting ringless piston of the standard 32SX-H will feel tight at the top of its stroke when the engine is cold.

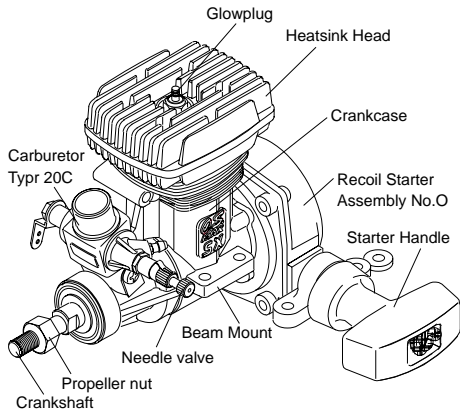
This is normal. The piston and cylinder are designed to achieve a perfect running clearance when they reach their normal running temperature.

Note:

Because of this initial tightness, a standard electric starter may have difficulty in rotating the engine when cold, before it has been adequately run-in. In this case, use a high-torque type starter. DO NOT, however, confuse tightness with the symptoms of hydraulic lock caused by an excess of fuel within the cylinder - often the result of over-priming.

Attempting to force the engine to turn over in this condition may cause internal damage. Instead, remove the glowplug, invert the engine and eject surplus fuel from the combustion-chamber.

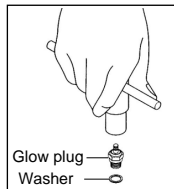
BASIC ENGINE PARTS



MAX-32SX-HX

INSTALLING THE GLOWPLUG

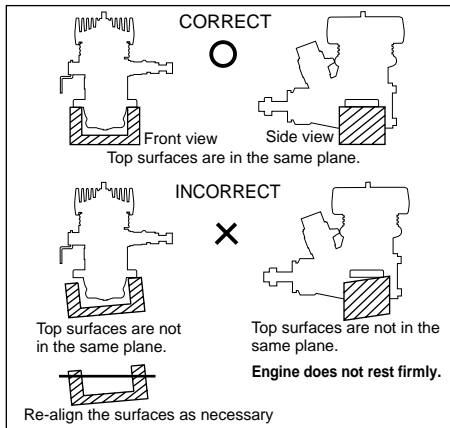
Install washer on glowplug and insert carefully into cylinder-head, making sure that it is not cross-threaded before tightening firmly.



INSTALLATION

The under-surfaces of all O.S. engine beam mounting lugs are precision machined flat and exactly parallel to the engine's horizontal axis. It is essential that the engine mounts in the model are also accurately made and aligned. If they are not, they will cause stress and distortion within the engine itself, probably resulting in loss of performance and internal damage.

The recommended screws for securing the engine to the engine mounts in the model are 3mm or 4-40 steel Allen type. It is also advisable to use lock washers or LOCTITE to prevent nuts from loosening.



NOTES CONCERNING THE RECOIL STARTER (32SX-HX ONLY)

Warning!

Do not attempt to disassemble the recoil starter: the very strong spring inside will spring out, which is very dangerous.

Note:

1. As the recoil starter is of unit construction, replacement parts are not available. Replacement recoil starters are obtainable only as complete units.
2. Do not pull the starter cord more than 50cm (20 in.). Do not abruptly release the starter knob. Allow the cord to rewind slowly by holding on to the knob.
3. Pull the knob straight so that the cord does not touch the helicopter body, etc.

BEFORE STARTING

Tools, accessories, etc.

The following items are necessary for operating the engine.

1 Fuel

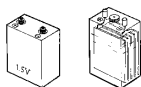
Model glowplug engine fuel of good quality, preferably containing a small percentage of nitromethane.

2 Glowplug

O.S. A3 glowplug is installed in the engine.

3 Glowplug battery

The power source for heating the glowplug may be either a large heavy-duty 1.5volt dry cell, or preferably, a 2-volt rechargeable lead-acid cell.

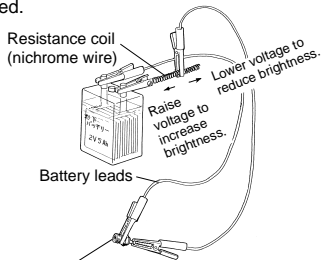


1.5 volt heavy-duty dry battery or 2 volt rechargeable lead-acid cell (at least 5Ah)

If a 2-volt cell is employed, use a resistance wire, as shown, to reduce applied voltage, otherwise element will overheat and burn out.

Warning (Very hot)

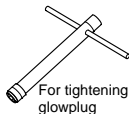
Never touch the nichrome wire while the battery is connected.



Adjust applied voltage by changing the position of clip on resistance coil until glowplug element is glowing bright red.

4 Plug wrench

Used for tightening glowplug. The O.S. long plug wrench is available as an optional accessory.



For tightening glowplug

5 Battery leads

These are used to conduct current from the battery to the glowplug. Basically, two leads, with clips, are required, but, for greater convenience, twin leads with special glowplug connectors, as shown on the right, are commercially available.



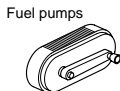
Battery leads

6 Fuel bottle or pump

For filling the fuel tank, a simple, polyethylene "squeeze" bottle, with a suitable spout, is all that is required. Alternatively, one of the purpose-made manual or electric fuel pumps may be used to transfer fuel directly from your fuel container to the fuel tank.

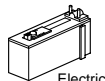


Fuel bulb



Fuel pumps

Manual



Electric

7 Fuel container filter

Install a filter on the outlet tube of your refuelling container to prevent entry of foreign matter into the fuel tank

8 Silicone tubing

This is required for the connection between the fuel tank and engine.

9 Hexagon starting shaft

This shaft mounted on an electric starting motor is driven into the main body of a helicopter to turn the engine.

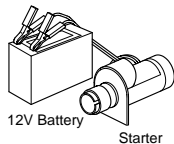
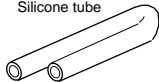
10 Electric starter and starter battery

An electric starter is recommended for starting.

Fuel Can Filter



Silicone tube



FACTS ABOUT GLOWPLUGS

Since the compatibility of glowplug and fuel may have a marked effect on performance and reliability, it may be worthwhile to choose the R/C type plug found most suitable after tests. Recommended O.S. plugs are No.8, A5 and A3. Carefully install plug finger-tight, before final tightening with the correct size plug wrench.

The role of the glowplug

With a glowplug engine, ignition is initiated by the application of a 1.5-volt power source. When the battery is disconnected, the heat retained within the combustion chamber remains sufficient to keep the plug filament glowing, thereby continuing to keep the engine running. Ignition timing is 'automatic': under reduced load, allowing higher rpm, the plug becomes hotter and, appropriately, fires the fuel/air charge earlier; conversely, at reduced rpm, the plug become cooler and ignition is retarded.

Glowplug life

Particularly in the case of very high performance engines, glowplugs must be regarded as expendable

However, plug life can be extended and engine performance maintained by careful use, i.e.:

- Install a plug suitable for the engine.
- Use fuel containing a moderate percentage of nitromethane.
- Do not run the engine too lean and do not leave the battery connected while adjusting the needle.

When to replace the glowplug

Apart from when actually burned out, a plug may need to be replaced because it no longer delivers its best performance, such as when:

- Filament surface has roughened and turned white.
- Filament coil has become distorted.
- Foreign matter has adhered to filament or plug body has corroded.
- Engine tends to cut out when idling.
- Starting qualities deteriorate.

FUEL

Select, by practical tests, the most suitable fuel from among the best quality fuels available in your country for helicopter use. For the best throttle response, a fuel containing 10% to 30% nitromethane is preferable. Lubricants may be either castor-oil or a suitable synthetic oil (or a blend of both) provided that they are always of top quality. For consistent performance and long engine life, it is essential to use fuel containing AT LEAST 18% lubricant by volume. Some fuels containing coloring additives tend to deteriorate and may adversely affect running qualities. Select by practical tests when using such fuels.

Reminder!



Model engine fuel is poisonous. Do not allow it to come into contact with the eyes or mouth. Always store it in a clearly marked container and out of the reach of children.



Model engine fuel is also highly flammable. Keep it away from open flame, excessive heat, sources of sparks, or anything else which might ignite it. Do not smoke, or allow anyone else to smoke, near to it.

CARBURETOR CONTROLS

With a fixed-wing model, power failure is rarely a serious threat to the safety of the aircraft since it can usually glide down to a safe landing. In a helicopter, on the other hand, it is vitally important that the engine keeps running and that there is a quick and reliable response to the throttle in order to ensure safe ascent and descent of the model.

Two adjustable controls are provided on this carburetor.

● **The Needle Valve:**

When set to produce maximum power at full throttle, this establishes the basic fuel/air mixture strength. This is then maintained by the carburetor's automatic mixture control system to cover the engine's requirements at reduced throttle settings.

● **The Mixture Control Valve (Mixture Control Screw):**

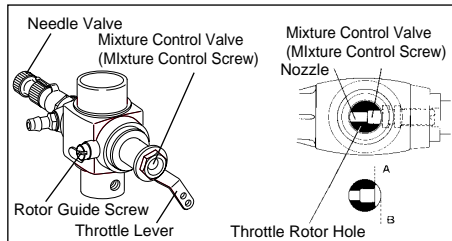
For adjusting the mixture strength at part-throttle and idling speeds, to obtain steady idling and smooth acceleration to medium speeds. The Mixture Control Valve has been factory set for the approximate best result. First, run the engine as received, and re-adjust the Mixture Control Valve only when necessary.

REALIGNMENT OF MIXTURE CONTROL VALVE

In the course of making carburetor adjustments, it is just possible that the Mixture Control Valve may be inadvertently screwed in or out too far and thereby moved beyond its effective adjustment range.

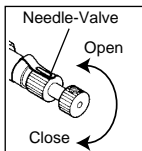
Its basic setting can be reestablished as follows :

The basic (factory) setting is as shown in the main sketch, i. e. with the shoulder portion 'A' exactly at a tangent to the throttle rotor hole. To return the Mixture Control Valve to its original position, first screw in the Mixture Control Valve, while looking into the rotor hole. Then gradually unscrew the Mixture Control Valve until 'A' is precisely tangential to the rotor hole (i.e. so that 'A' and 'B' are superimposed) as in the main sketch.



STARTING (32SX-H / SX-H RING)

1. Be sure to use a muffler pressurized fuel feed. Use the same fuel as you intend to employ for actual operation of your model. Open the needle-valve 1- 1/2 turns.
2. Open the throttle fully, and turn the engine using an electric starter until the fuel is seen to reach the carburetor. Fuel may be drawn to the carburetor more quickly by choking the exhaust outlet with a finger, while operating the starter.
3. Do not continue to choke the exhaust after fuel has reached the carburetor.
4. Now reset the transmitter throttle stick to the closed position, keeping the throttle trim lever set at the advanced (i.e. idle) position.
5. Hold the rotor head by hand so that the rotor cannot rotate when the engine is started. Also, steady the model with a foot on the landing-gear skid.
6. Connect the battery to the glowplug and start the engine by applying an electric starter.



STARTING (32SX-HX RING)

1. Be sure to use a muffler pressurized fuel feed. Use the same fuel as you intend to employ for actual operation of your model. Open the needle-valve 1- 1/2 turns.
 2. Open the throttle fully, and pull the recoil starter knob until the fuel is seen to reach the carburetor. Fuel may be drawn to the carburetor more quickly by choking the exhaust outlet with a finger, while operating the starter.
 3. After fuel reaches the carburetor, pull the starter knob two or three times so that fuel may be drawn well into the engine.
- NOTE: Do not choke the exhaust at this time.**
4. Now reset that the transmitter throttle stick to the closed position, keeping the throttle trim lever in the advanced (i.e. idle) position.
 5. Hold the rotor head by hand so that the rotor cannot rotate when the engine is started. Also, steady the model with a foot on the landing-gear skid.

6. Connect the battery to the glowplug and pull the start knob smartly.

NOTE:

If the throttle response is poor or the engine stops due to a temporarily over-rich mixture immediately after the engine is started, pinch the fuel line for one or two seconds until the engine r.p.m. increase and the engine runs steadily.

Reminder!



Never touch, or allow any object to come into contact with, the rotating rotor.

RUNNING-IN ("Breaking-in")

All internal-combustion engines benefit, to some degree, from extra care when they are run for the first few times — known as running-in or breaking-in.

This allows the working parts to mate together under load at operating temperature.

However, because O.S. engines are made with the aid of the finest modern precision machinery and from the best and most suitable materials, only a very short

short and simple running-in procedure is required and can be carried out with the engine installed in the modle. For the first few flights with a new engine — i.e. while the engine is being run-in — set the needle-valve for a slightly rich mixture — not excessively rich as this may result in poor throttle response and cause the engine to stope. About one-half turn open from the normal setting will usually suffice.

ADJUSTMENT

The following adjustments are approximately correct when using a fuel containing 25% lubricant and 10-30% nitromethane.

Bear in mind that fuels containing relatively large percentages of power-boosting nitromethane operate at richer mixture settings than are needed for mild fuels and will, therefore, require the Needle Valve to be readjusted accordingly. The type and percentage of lubricant used is also a factor here, as noted later in these instructions.

Ⓐ **This carburetor is not fitted with a throttle stop screw. Instead, idling speed is adjusted by means of the throttle trim lever on the transmitter.**

This enables the full r.p.m. range, from idling to full power, to be controlled by the throttle stick, and then allows the engine to be stopped, from the transmitter, by closing the throttle completely with the trim lever.

Set up the throttle linkage as follows:

With the transmitter throttle trim lever fully retarded, adjust the throttle servo linkage so that the throttle rotor is (a) fully open when the transmitter throttle stick is fully advanced and (b) fully closed (i.e. engine stopped) when the stick is fully retarded. The idling speed is then set by advancing the throttle trim lever to the point where the engine runs, steadily and reliably, at the desired idling speed.

- Ⓑ As a safety measure, first check the transmitter controls, including the throttle stick and trim lever positions, and hold the main rotor securely before starting the engine. (Refer to page 13.)
- Ⓒ Warm the engine by allowing it to idle for about 30 seconds. If the engine stops, advance the throttle trim lever slightly to increase the idling rpm. Then open the throttle sufficiently to 'float' the model above the ground.

- Ⓓ If, at this time, the engine is slow to pick up and produces an excess of exhaust smoke, the mixture is too rich. Correct this condition by turning the Mixture Control Screw clockwise. If the mixture is extremely rich, engine rpm will become unstable : opening the throttle will produce a great deal of smoke and rpm may drop suddenly or the engine may stop. This condition may also be initiated by an excessively prolonged warming-up period.
- Ⓔ If, on the other hand, the mixture is too lean, this will be indicated by a marked lack of exhaust smoke and a tendency for the engine to cut out when the throttle is opened. In this case, turn the Mixture Control Screw counter-clockwise to enrich the mixture.
- Ⓕ Turn the Mixture Control Screw 30 degrees at a time.
- Ⓖ Having provisionally set the idle mixture, the next step is to adjust the mixture for hovering flight.

- Ⓜ Hover the model and actuate the throttle to observe response over the medium speed range. If the engine smokes excessively and throttle response is poor, the mixture is too rich ; in which case, land the model and turn the Needle Valve clockwise. Do not close the Needle Valve too much, keeping it a little on the rich side at this stage.
- Ⓜ If, on the other hand, hovering is not stable and response to the throttle is over-sensitive, or if the engine tends to overheat, this indicates that the mixture is too lean and should be corrected by turning the Needle Valve counter-clockwise.
- Ⓜ When satisfactory hovering flight has been achieved, land the model again and re-check the engine's idling qualities.
- Ⓜ After about 10 seconds of idling, open the throttle to 'float' the model. If the transition is smooth, the idle mixture is O.K. If the symptoms of either rich or lean running are observed, readjust the Mixture Control Screw accordingly.
- Ⓜ Now adjust the Needle Valve to achieve the best performance when the model is flying at full throttle. If, at full throttle, acceleration is poor, the

exhaust unduly smoky and the model fails to reach expected straight line speed, the mixture is too rich and the Needle Valve setting will need to be reduced. If, however, after smoothly accelerating to satisfactory high-speed straight and level flight, power is lost when the model is pulled up into a climb, the mixture is too lean. In this case, land the model immediately and readjust Needle Valve to a richer setting.

- Ⓜ Now re-check hovering performance and, if necessary, fine-tune the mixture for hovering flight.
- Ⓜ For helicopters, good throttle response at medium r.p.m. (e.g.hovering speeds) is most important, since this is a power range widely used in helicopter flight. The optimum fuel/air mixture strength at medium speeds is dependent on obtaining balanced adjustment of both the Needle Valve and the Mixture Control of both the Needle Valve and the Mixture Control Valve. If both controls are already at their optimum setting, some modification to these settings may be necessary to achieve satisfactory mid-range throttle response, but such readjustments should only be made within the range where idling reliability and high-speed performance are not unduly compromised.

Readjustments should therefore be carried out as follows:

- ⓐ If the mid-range throttle response is not rapid and positive (indicating a rich mid-range mixture), turn the Needle Valve 2 or 3 clicks clockwise, or turn the Mixture Control Screw 10-20 degrees clockwise.
- ⓑ If, on the other hand, the response to mid-range throttle movement is too sensitive (indicating a lean mid-range mixture), turn the Needle Valve 2 or 3 clicks counter-clockwise or turn the Mixture Control Screw 10-20 degrees counter-clockwise.
- ⓒ Throttle response at hovering speeds is also affected by the relationship of the main rotor pitch angle to throttle opening. If the optimum mid-range throttle response cannot be obtained by the carburettor adjustments described above, try adjusting the helicopter's pitch control characteristics.

SUBSEQUENT READJUSTMENTS

Once the engine has been run-in and the carburetor controls properly set up, it should be unnecessary to alter the mixture settings, except to make minor adjustments to the Needle Valve occasionally, to take account of variations in climatic conditions.

The use of a different fuel, however, particularly one containing more, or less, nitromethane and / or a different type or proportion of lubricating oil, is likely to call for some readjustment of the Needle-Valve.

Remember that, as a safety measure, it is advisable to increase the Needle Valve opening by an extra half-turn counter-clockwise, prior to establishing a new setting. The same applies if the silencer type is changed. A different silencer may alter the exhaust pressure applied to the fuel feed and call for a revised Needle-Valve setting.

The use of a different glowplug, or changes to the mainrotor and its pitch angles may also require compensating carburettor readjustments.

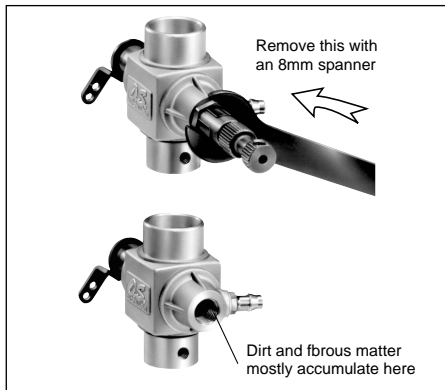
CARBURETOR CLEANLINESS

The correct functioning of the carburetor depends on its small fuel orifices remaining clear.

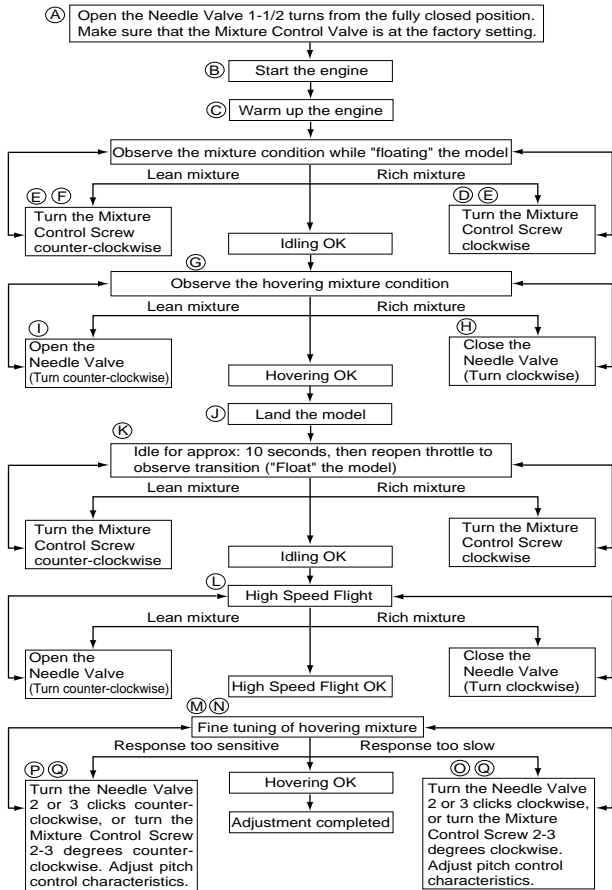
The minute particles of foreign matter that are present in any fuel can easily partially obstruct these orifices and upset mixture strength so that engine performance becomes erratic and unreliable.

It is recommended that fuel is passed through a filter when the tank is filled and that a good in-line filter is installed between the fuel tank and carburettor and, furthermore, that this filter is frequently cleaned to remove dirt and lint that accumulates on the filter screen.

Finally, occasionally remove the needle-valve holder from the carburetor as shown in Photo and extract any remaining foreign matter that may have lodged in the location shown in Photo, right.

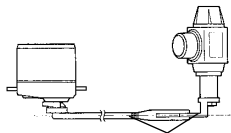


ADJUSTING CHART



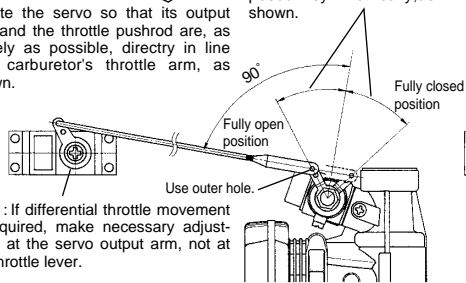
INSTALLATION OF THROTTLE SERVO

After the engine in the helicopter, please observe the following recommendations when linking the throttle servo to the carburettor.



CORRECT-Throttle lever movement should be disposed symmetrically, as shown.

Locate the servo so that its output arm and the throttle pushrod are, as closely as possible, directly in line with carburetor's throttle arm, as shown.

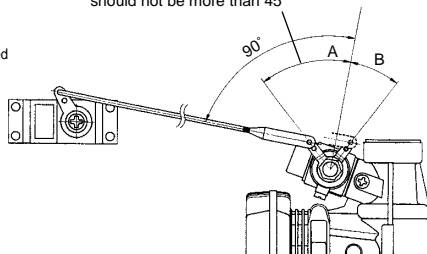


Note : If differential throttle movement is required, make necessary adjustment at the servo output arm, not at the throttle lever.

When the throttle is fully open or fully closed, the throttle lever angle should not be more than 45° either side of the mid-point of its travel (and where it is at a 90° angle to the pushrod), otherwise throttle rotor movement may become inhibited or may even lock up. Also, some lubricants may affect the throttle rotor movement.

Please note that the throttle lever angles of the O.S. Type 20C carburettor are well within these limits-requiring only 75° from the fully open to fully closed positions.

INCORRECT-One-way throttle lever movement should not be more than 45°



CARE AND MAINTENANCE

1. The minute particles of foreign matter, that are present in any fuel may, by accumulating and partially obstructing fuel flow, cause engine performance to become erratic and unreliable.

O.S. 'Super-Filters' (large and small) are available, as optional extras, to deal with this problem. One of these filters, installed on the outlet tube inside your refueling container, will prevent the entry of foreign material into the fuel tank. It is also recommended that a good in-line filter be installed between the tank and carburetor.

2. Do not forget to clean the filters regularly to remove dirt and lint that accumulate on the filter screens.

Also, clean the carburetor itself occasionally.

3. At the end of each operating session, drain out any fuel that may remain in the fuel tank. Next, energize the glowplug and try to restart the engine to burn off any fuel that may remain inside the engine.

Repeat this procedure until the engine fails to fire.

Remove the glowplug and eject any remaining fuel/oil residue by rotating the engine with an electric starter for 4 to 5 seconds while the engine is still warm.

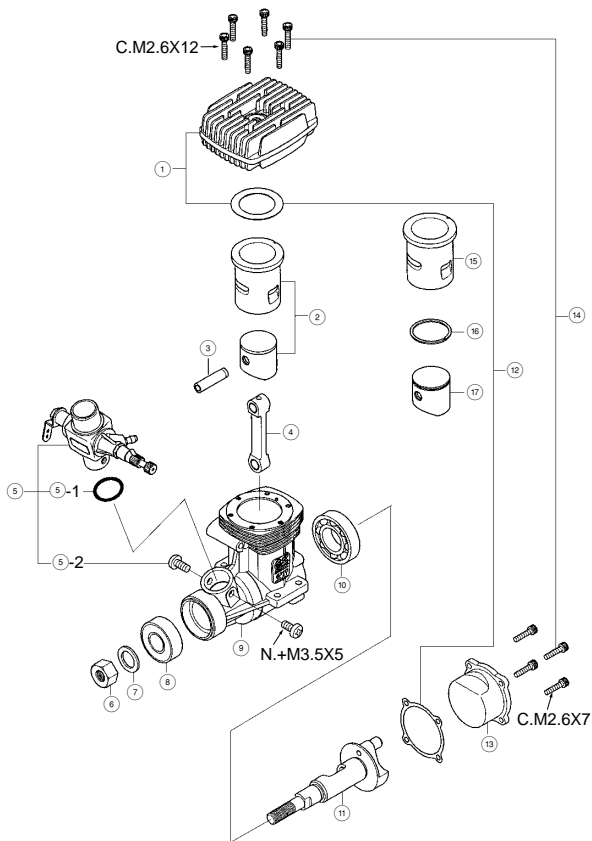
4. Finally, inject some after-run oil into the engine. Rotate the engine a few times by hand, to make sure that it is free, and then with an electric starter for 4 to 5 seconds to distribute the oil to all the working parts.

Note:

Do not inject after-run oil into the carburetor as this may cause the O-rings inside the carburetor to deteriorate.

These procedures will reduce the risk of starting difficulties and of internal corrosion after a period of storage.

EXPLODED VIEW (MAX-32SX-H / 32SX-H RING)



—22—

* Type of screw

C···Cap Screw M···Oval Fillister-Head Screw

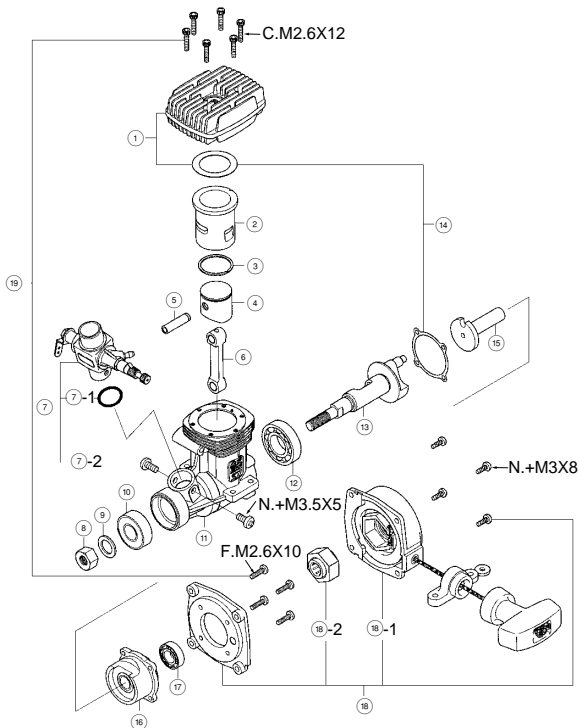
F···Flat Head Screw N···Round Head Screw S···Set Screw

ENGINE PARTS LIST (MAX-32SX-H / 32SX-HRING)

No.	Code No.	Description
①	23404000	Heatsink Head
②	23403000	Cylinder & Piston Assembly(For 32SX-H)
③	23406000	Piston Pin
④	23405000	Connecting Rod
⑤	23481000	Carburetor Complete(Type 20C)
⑤-1	22615000	Carburetor Rubber Gasket
⑤-2	23081706	Carburetor Retaining Screw(2pcs.)
⑥	23210007	Propeller Nut
⑦	22620003	Thrust Washer
⑧	22831000	Crankshaft Ball Bearing(Front)
⑨	23401000	Crankcase
⑩	23430000	Crankshaft Ball Bearing(Rear)
⑪	23402000	Crankshaft
⑫	23414000	Gasket Set
⑬	22907000	Cover Plate
⑭	22413009	Screw Set
⑮	23403100	Cylinder Liner(For 32SX-HRING)
⑯	22903400	Piston Ring(For 32SX-HRING)
⑰	23403200	Piston(For 32SX-HRING)
	71605300	Glowplug A3

The specifications are subject to alteration for improvement without notice.

EXPLODED VIEW (MAX-32SX-HXRING)



* Type of screw

C···Cap Screw M···Oval Fillister-Head Screw

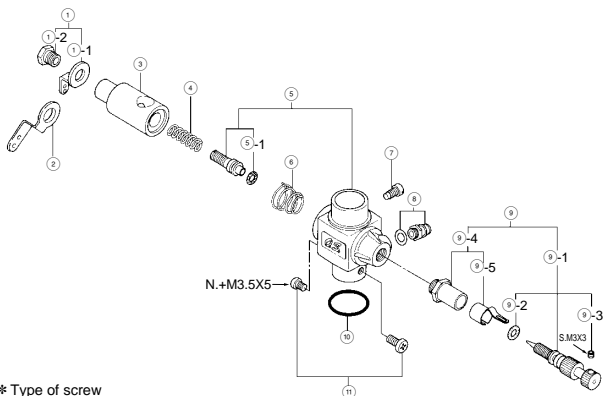
F···Flat Head Screw N···Round Head Screw S···Set Screw

ENGINE PARTS LIST (MAX- 32SX-HXRING)

No.	Code No.	Description
①	23404000	Heatsink Head
②	23403100	Cylinder Liner
③	22903400	Piston Ring
④	23403200	Piston
⑤	23406000	Piston Pin
⑥	23405000	Connecting Rod
⑦	23481000	Carburetor Complete(20C)
⑦-1	22615000	Carburetor Rubber Gasket
⑦-2	23081706	Carburetor Retaining Screw(2pcs.)
⑧	23210007	Propeller Nut
⑨	22620003	Thrust Washer
⑩	22831000	Crankshaft Ball Bearing(Front)
⑪	23401000	Crankcase
⑫	23430000	Crankshaft Ball Bearing(Rear)
⑬	23402010	Crankshaft
⑭	23414000	Gasket Set
⑮	22921210	Starting Shaft
⑯	22921110	Rear Housing
⑰	27381210	Starting Shaft Bearing
⑱	72801000	Recoil Starter Assembly No.0
⑱-1	72801100	No.0 Recoil Starter Body
⑱-2	72801102	No.0 One-way Clutch
⑲	22913010	Screw Set
	71605300	Glowplug A3
	72405000	Landing Gear Mounting Plate
	22781411	Throttle Lever

The specifications are subject to alteration for improvement without notice.

CARBURETTOER PARTS LIST & EXPLODED VIEW



* Type of screw

C...Cap Screw M...Oval Fillister-Head Screw

F...Flat Head Screw N...Round Head Screw S...Set Screw

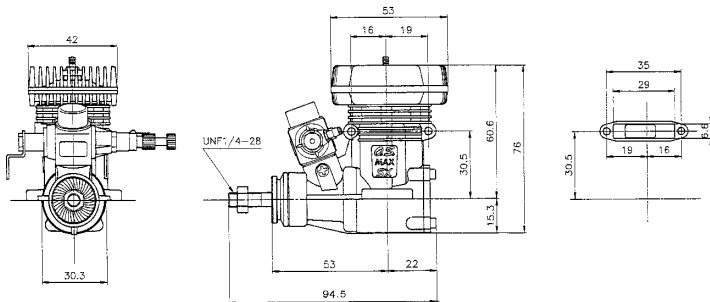
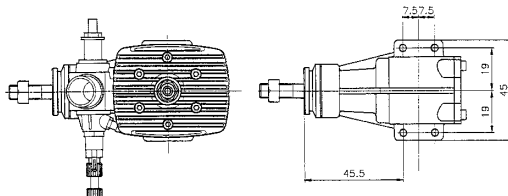
No.	Code No.	Description
①	23481400	Throttle Lever Assembly
①-1	22781410	Throttle Lever
①-2	22781420	Throttle Lever Retaining Screw
②	22781411	Throttle Lever
③	23481200	Carburetor Rotor
④	23481650	Mixture Control Valve Spring
⑤	23481100	Carburetor Body
⑤-1	24881824	"O"Ring (2pcs.)
⑥	26781506	Rotor Spring
⑦	45581820	Rotor Guide Screw
⑧	22681953	Fuel Inlet
⑨	27681900	Needle Valve Assembly
⑨-1	27681970	Needle
⑨-2	24981837	"O"Ring (2pcs.)
⑨-3	26381501	Set Screw
⑨-4	27381940	Needle Valve Holder
⑨-5	26711305	Ratchet Spring
⑩	22615000	Carburetor Rubber Gasket
⑪	23081706	Carburetor Retaining Screw

The specifications are subject to alteration for improvement without notice.

MAX-32SX-H/32SX-HRING THREE VIEW DRAWING Dimensions(mm)

SPECIFICATIONS

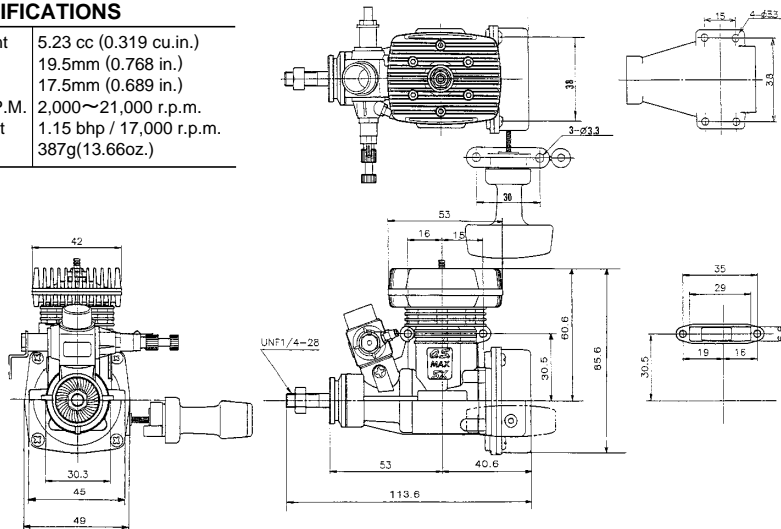
■ Displacement	5.23 cc (0.319 cu.in.)
■ Bore	19.5mm (0.768 in.)
■ Stroke	17.5mm (0.689 in.)
■ Practical R.P.M.	2,000~22,000 r.p.m.
■ Power output	1.2 bhp / 18,000 r.p.m.
■ Weight	290g(10.23oz.) SX-H 285g(10.06oz.) SX-H RING



MAX-32SX-HXRING THREE VIEW DRAWING Dimensions(mm)

SPECIFICATIONS

■ Displacement	5.23 cc (0.319 cu.in.)
■ Bore	19.5mm (0.768 in.)
■ Stroke	17.5mm (0.689 in.)
■ Practical R.P.M.	2,000~21,000 r.p.m.
■ Power output	1.15 bhp / 17,000 r.p.m.
■ Weight	387g(13.66oz.)



O.S. GENUINE PARTS & ACCESSORIES

- **DRIVE HUB**
(23408000)

- **E-3030 SILENCER**
(23325020)

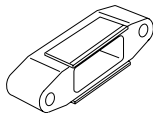
- **BOOSTER TERMINAL KIT
FOR 'SHUTTLE'**
(72200160)

- **O.S. GLOW PLUGS**

No.8 (71608001) A5 (71605100)



- **843 SILENCER
EXTENSION ADAPTOR**
(23325100)



- **EXHAUST
ADAPTORS 90 degree**
(22625508)

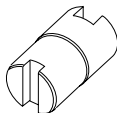


- **SUPER FILTER**

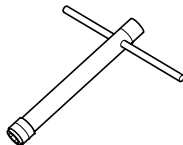
(L) (72403050)



- **CRANKSHAFT CLAMP**
3261 (For 32F-H, SX-H, 61SX-H,RX-H)
(71530300)
3246 (For 32SX-H, 46FX-H)
(71530400)



- **LONG SOCKET WRENCH
WITH PLUG GRIP**
(71521000)



MEMO



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