



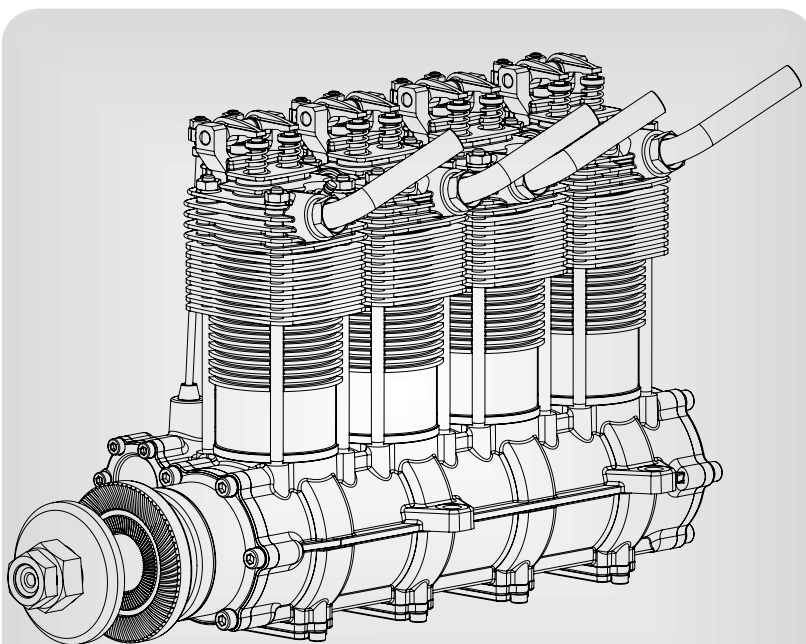
## IL-300

*<Dial Star>*

### 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 2-4 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 aircraft, radio control equipment, etc., are accessible for checking at the same time.



Inline four-cylinder overhead-valve four-stroke-cycle engine

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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 or abused. 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 propeller and do not crouch over the engine when it is running.



- A weakened or loose propeller may disintegrate or be thrown off and, since propeller tip speeds with powerful engines may exceed 600 feet (180 metres) per second, it will be understood that such a failure could result in serious injury, (see 'NOTES' section relating to propeller safety).

- 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 an 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.



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## NOTES

- This engine was designed for model aircraft. 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.
- If you remove the glowplug from the engine and check its condition by connecting the battery leads to it, do not hold the plug with bare fingers. Use an appropriate tool or a folded piece of cloth.
- Install a top-quality propeller of the diameter and pitch specified for the engine and aircraft. Locate the propeller on the shaft so that the curved face of the blades faces forward-i.e. in the direction of flight. Firmly tighten the propeller nut, using the correct size wrench.
- Always check the tightness of the propeller nut and retighten it, if necessary, before restarting the engine, particularly in the case of four-stroke-cycle engines. If a safety locknut assembly is provided with your engine, always use it. This will prevent the propeller from flying off in the event of a "backfire", even if it loosens. Also, check the tightness of all the screws and nuts before restarting the engine.
- If you install a spinner, make sure that it is a precision made product and that the slots for the propeller blades do not cut into the blade roots and weaken them.
- Discard any propeller which has become split, cracked, nicked or otherwise rendered unsafe. Never attempt to repair such a propeller: destroy it. Do not modify a propeller in any way, unless you are highly experienced in tuning propellers for specialized competition work such as pylon-racing.
- Use an electric starter for this engine. The wearing of safety glasses is also strongly recommended.

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# ! NOTES

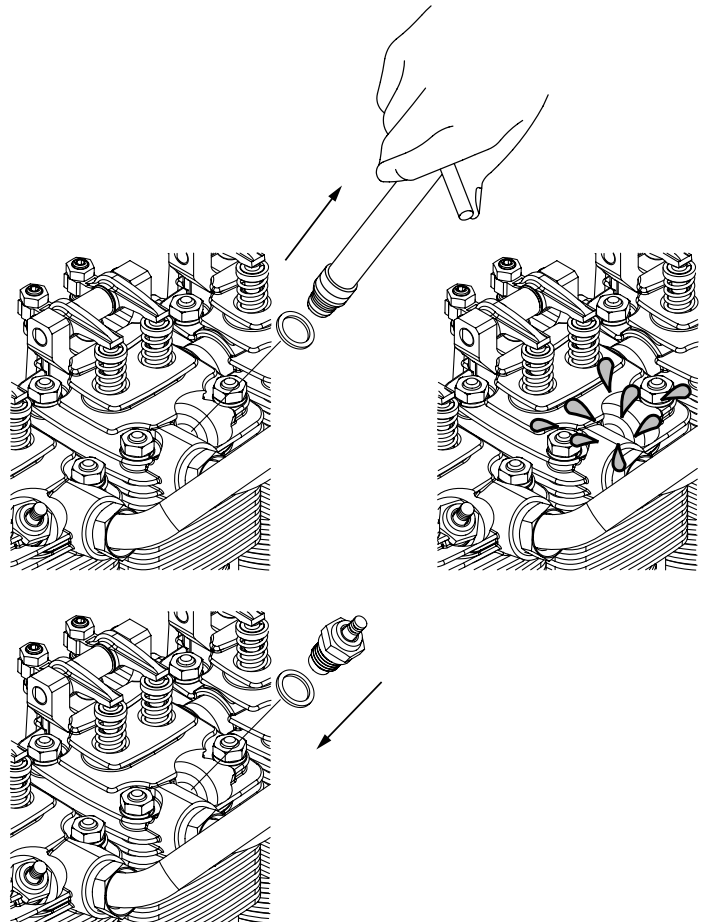
- Take care that the glow plug clip or battery leads do not come into contact with the propeller. Also check the linkage to the throttle arm. A disconnected linkage could also foul the propeller.
- After starting the engine, carry out any needle-valve readjustments from a safe position behind the rotating propeller. Stop the engine before attempting to make other adjustments to the carburetor.
- 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.
- Take care that loose clothing (ties, shirt sleeves, scarves, etc.) do not come into contact with the propeller. Do not carry loose objects (such as pencils, screwdrivers, etc.) in a shirt pocket from where they could fall through the propeller arc.
- Do not start your engine in an area containing loose gravel or sand. The propeller may throw such material in your face and eyes and cause injury.
- For their safety, keep all onlookers (especially small children) well back (at least 20 feet or 6 meters) 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. Keep the propeller pointed away from you and walk 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 abruptly restart if the propeller is casually flipped over compression **WITHOUT** the glowplug battery being reconnected. Remember this if you wish to avoid the risk of a painfully rapped knuckle!

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## NOTES WHEN APPLYING AN ELECTRIC STARTER

Do not over-prime. This could cause a hydraulic lock and damage the engine on application of the electric starter.

If over-primed, remove glowplug, close needle-valve and apply starter to pump out surplus fuel. Cover the head with a rag to prevent pumped out fuel from getting into your eyes.



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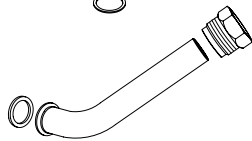
The O.S. IL-300 (Dia-Star) is a four-cylinder inline overhead-valve four-stroke-cycle engine of 50cc displacement. The engine maintains the same features of stress free starting, super smooth idling and high torque power which is always the hallmark of O.S. large size multi-cylinder engines. With it's finely detailed design and outstanding scale appearance, the engine's quality is second to none.

**STANDARD ACCESSORIES**

- Glow Plug Type F (4pcs.)  
(installed on the engine)



- Exhaust Pipe Assembly
  - Exhaust Pipe
  - Exhaust Pipe Lock Nut
  - Exhaust Gasket



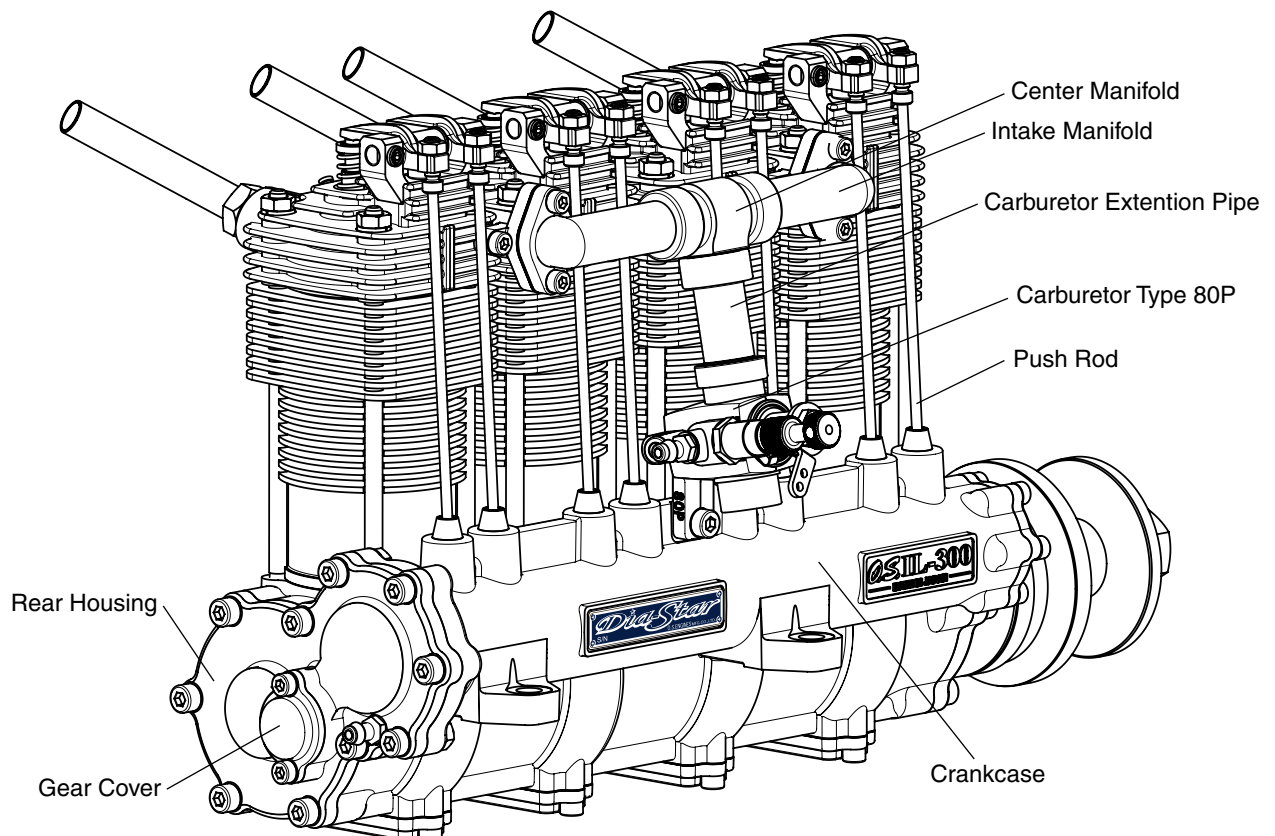
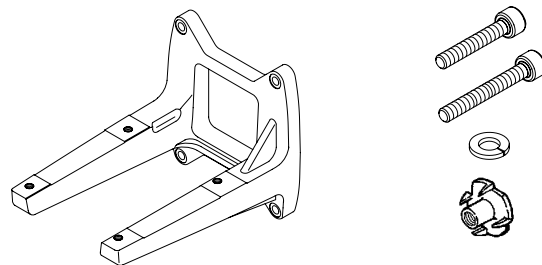
- Valve adjusting tool kit
  - Feeler gauge 0.04mm
  - Feeler gauge 0.1mm
  - Hex. key 1.5mm
  - Wrench 5mm

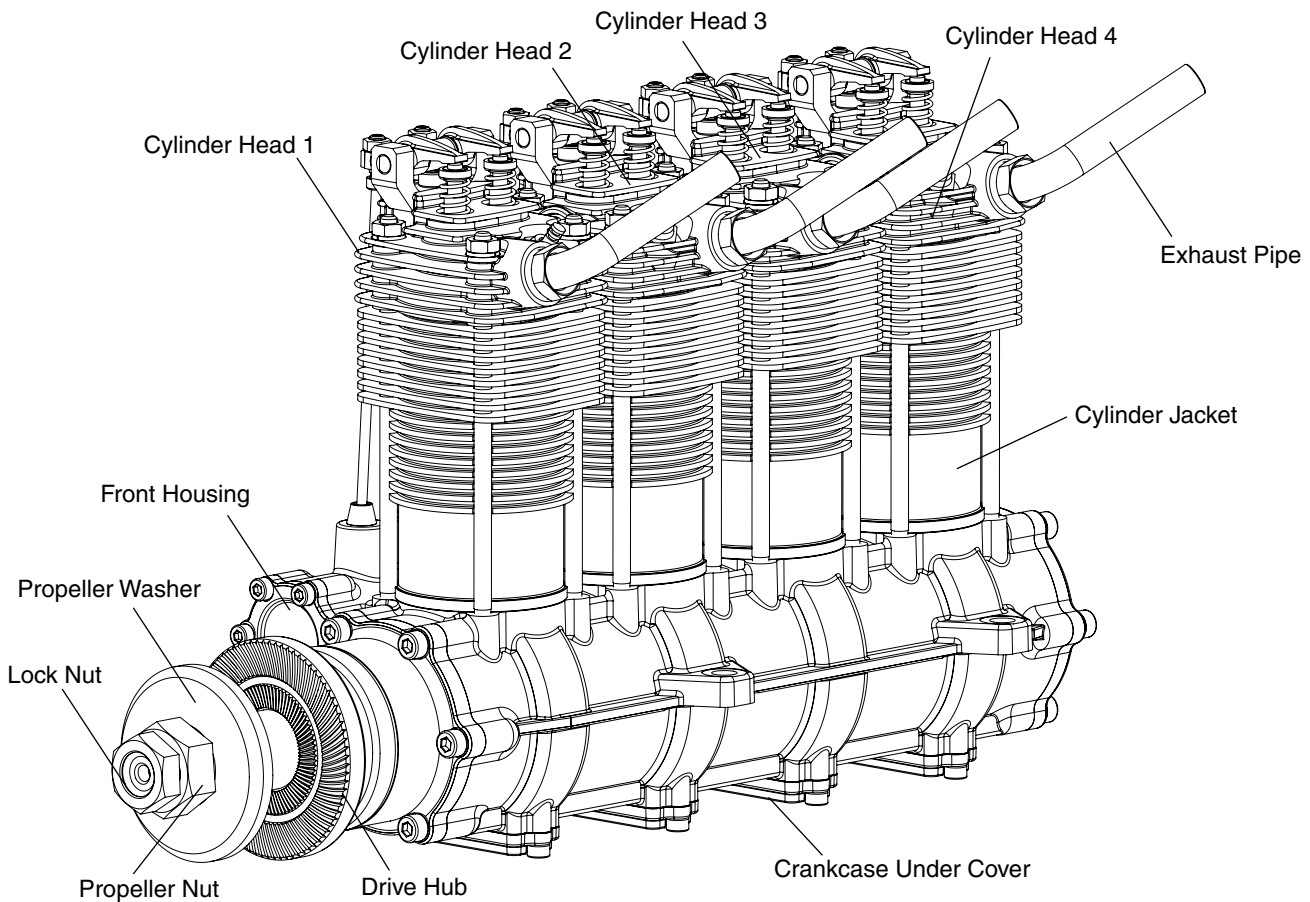


- Booster Cable Set
  - Leads for glow plug with clip (4pcs.)
  - Lead for earth (ground) (1pc.)



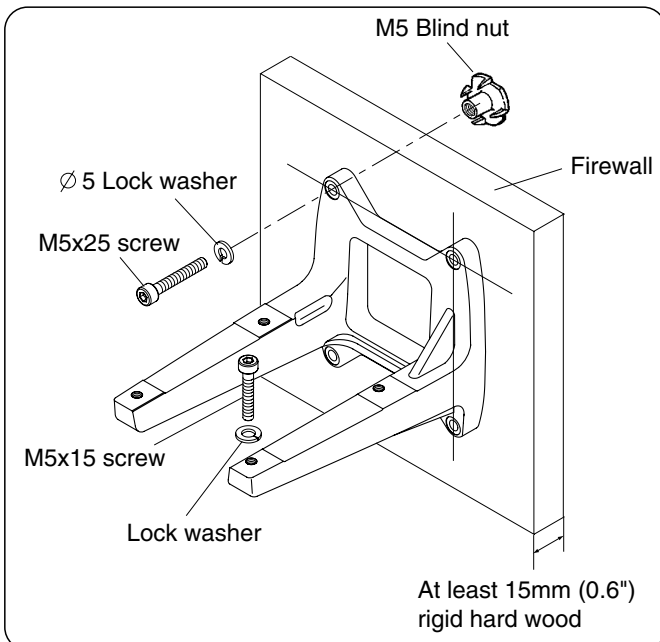
- Radial Motor Mount Set
  - Mount attachment Screws (4pcs.)
  - Engine mounting screws (M5X25) (4pcs.)
  - Lock washers (ø5) (4pcs.)
  - Blind nuts (M5) (4pcs.)





**INSTALLATION**

- It is essential that the firewall is strong and rigid (e.g. at least 15mm thick) and firmly integrated with the structure of the aircraft.
- It is suggested to install the engine upright.
- It is suggested to use Lock Washers (available as an optional extra) with engine installing screws or apply LOCTITE to the screws to prevent them from loosening.

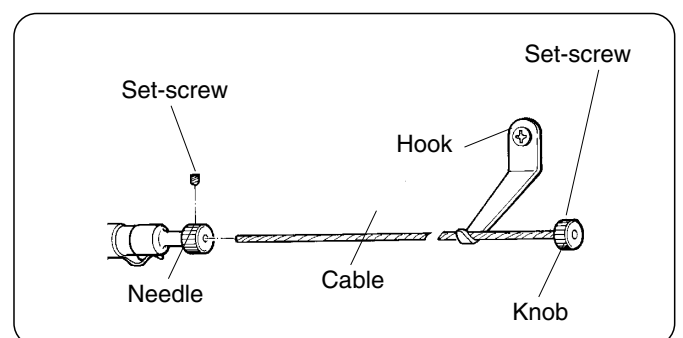


**Needle-valve extension**

- The needle-valve with this engine is designed to incorporate an extension so that, when the engine is enclosed within the fuselage, the needle-valve may be adjusted from the outside. An L-shaped rod, of 1.6-1.8mm dia. and appropriate length, should be inserted into the needle's center hole and secured by tightening the set-screw in the needle-valve knob with a small Allen key. If a longer extension cable is required it is suggested that one be fabricated as per the illustration.

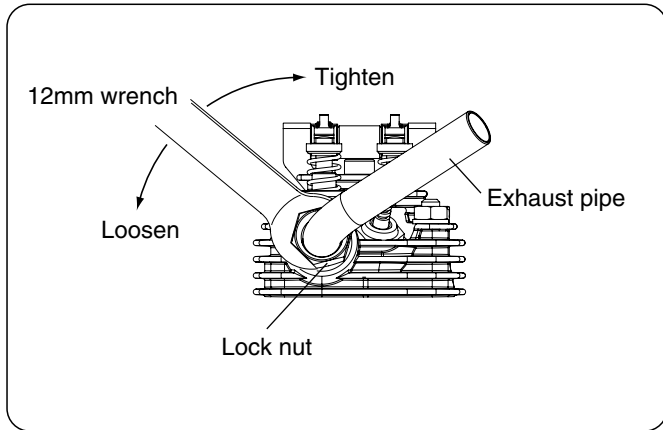
**NOTE:**  
**O.S. does not offer the extension cable as an accessory item.**

- Do not use an excessively long unsupported extension as this may vibrate and cause the needle-valve setting to vary or even damage the needle-valve thread. Always provide a suitable support at the outer end.



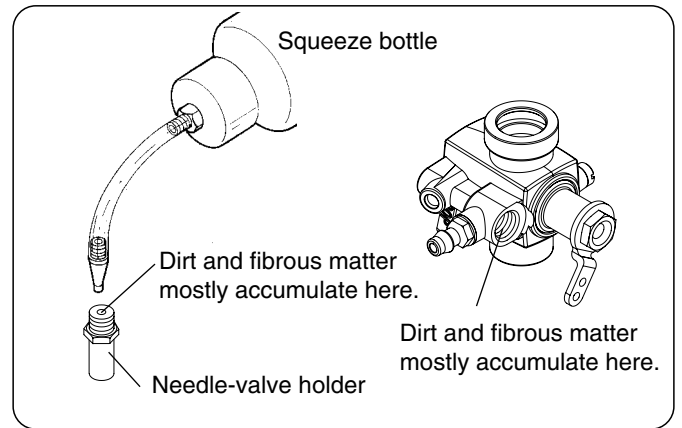
■ **Exhaust pipe adjustment**

- The direction of the exhaust pipes may be altered in accordance with individual installation requirements. The angle is easily adjusted by loosening the nut that secures the exhaust pipe to the cylinder head. Use a 12mm wrench.



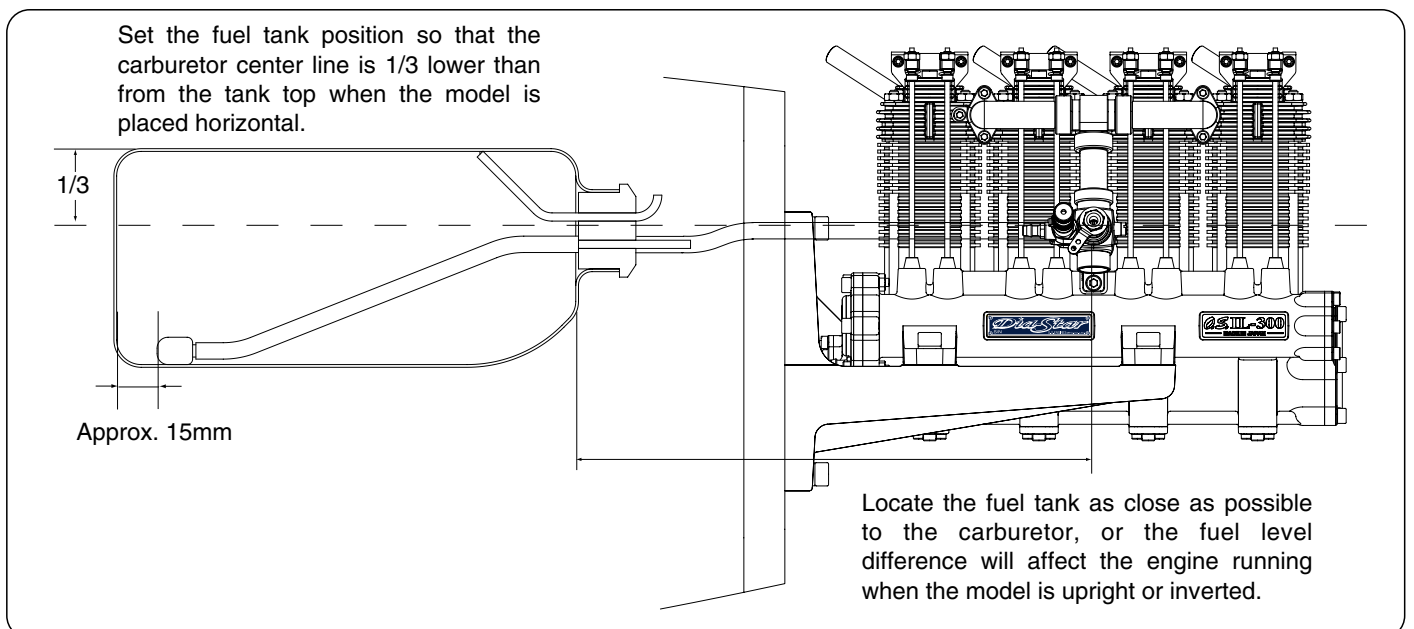
■ **Carburetor cleanliness**

- It is recommended that the 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 carburetor.
- Occasionally remove the needle-valve holder from the carburetor and rinse out the locations shown below with methanol or fuel. Be careful not to lose the gasket when removing the needle-valve holder from the carburetor.



**FUEL TANK & LINES**

- Make sure that the tank is well rinsed out with methanol or glow fuel before installation and that the pickup weight is well clear of the bottom of the tank when held vertically.
- Be sure to follow the instructions concerning the relationship between fuel tank and carburetor position, or the expected stable idle running will not be obtained even with adequate carburetor adjustment.
- For plumbing, use heavy duty silicone tube of 2.5mm inner dia and 5mm outer dia.





Since the compatibility of the glowplug and fuel may have a marked effect on performance and reliability, it is suggested to use the O.S. Type F plug when it is necessary to replace. 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 items. However, plug life can be extended and engine performance maintained by careful use, i.e.:

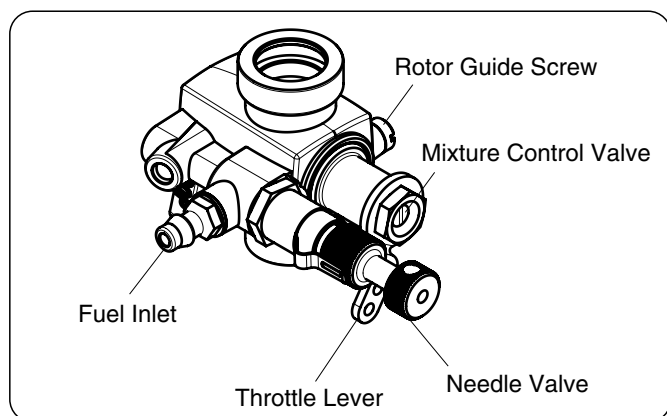
- Install a plug suitable for the engine.
- Use fuel containing a moderate percentage of nitromethane.
- Do not run the engine too lean and do not leave the battery connected while adjusting the needle.

### 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.

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**Two mixture 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. The correct mixture is then maintained by the carburetor's built-in automatic mixture control system to cover the engine's requirements at reduced throttle settings.

#### •The Mixture Control Valve

This meters fuel flow at part-throttle and idling speeds to ensure reliable operation as the throttle is opened and closed. The Mixture Control Valve is factory set for the approximate best result. First run the engine as received and readjust the Mixture Control Screw only if necessary.

Mixture Control Valve of the carburetor is set at basic position ( a little on the rich side) at the factory. However, minor readjustment will be required for a fuel used, atmospheric conditions and a model. When a good result is not obtained with the factory setting, readjust it according to the MIXTURE CONTROL VALVE ADJUSTMENT section. Please note during a running-in period flights should be made with a slightly rich needle setting. Therefore, during a running-in period proper carburetor responses will not be obtained. Adjust it for optimum position after the running-in is completed.

#### ■ THROTTLE LINKAGE

Before connecting the throttle to its servo, make sure that the throttle arm and linkage safely clear any adjacent part of the airframe structure, etc., as the throttle is opened and closed. Connect the linkage so that the throttle is fully closed when the transmitter throttle stick and its trim lever are at their lowest settings and fully open when the throttle stick is in its fully-open position. Carefully align the appropriate holes in the throttle arm and servo horn so that they move symmetrically and smoothly through their full travel.

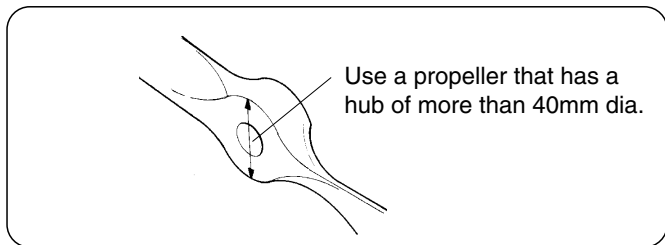
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The choice of propeller depends on the design and weight of the aircraft and on the type of flying in which you will be engaged. Determine the best size and type after practical experimentation. As a starting point, refer to the props listed in the accompanying table. Slightly larger, or even slightly smaller, props than those shown in the table may be used, but remember that propeller noise will increase if blade tip velocity is raised, due to higher rpm or if a larger-diameter / lower-pitch prop is used.

**Warning:**

**Make sure that the propeller is well balanced. An unbalanced propeller and / or spinner can cause serious vibration which may weaken parts of the airframe or affect the safety of the radio-control system. DO NOT forget the WARNINGS and NOTES on propeller and spinner safety given on pages 2,3 and 4.**

Type	Size (DxP)
Sport/Scale	18x10-12, 20x8-10, 22x8

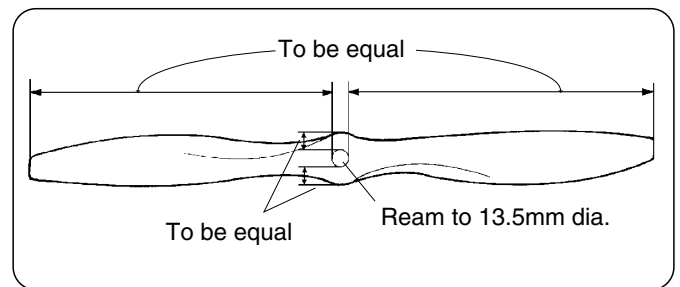


**PROPELLER & SPINNER ATTACHMENT**

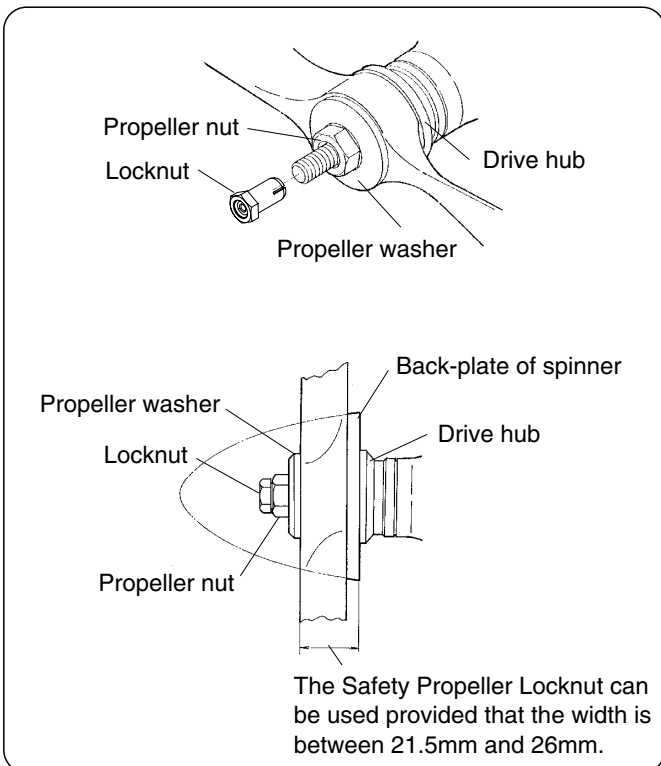
There is a risk, particularly with powerful four-stroke engines, of the propeller flying off if the prop nut loosens due to detonation ("knocking") in the combustion chamber when the engine is operated too lean, or under an excessively heavy load.

Obviously, this can be very hazardous. To eliminate such dangers, the O.S. Safety Locknut Assembly was devised. Install this as follows:

1. Ream the propeller shaft hole to 13.5mm bore with an appropriate reamer, checking that the hole is exactly centered.
2. Install the prop to the engine shaft, followed by the retaining washer and prop nut and tighten firmly with a 17mm wrench. (not supplied).



3. Add the special tapered and slotted locknut and secure with a 14mm wrench while holding the prop nut with the 17mm wrench. (not supplied).



**NOTE:**

**Make a habit of always checking the tightness of the propeller before starting the engine. Remember that, especially with wooden propellers, there is a tendency for the material to shrink, or for it to be reduced by the serrated face of the drive hub. Retighten the propeller nut if necessary after loosening the Safety Propeller Locknut. The locknut should be tightened firmly after retightening the propeller nut.**



■ Glowplug battery

It is necessary to use a glowplug battery of fairly large capacity (10Ah or more) as this is required to heat four glowplugs simultaneously.

A heavy-duty 1.5-volt dry battery or (preferably) 1.2-volt Ni-Cd battery may be used.

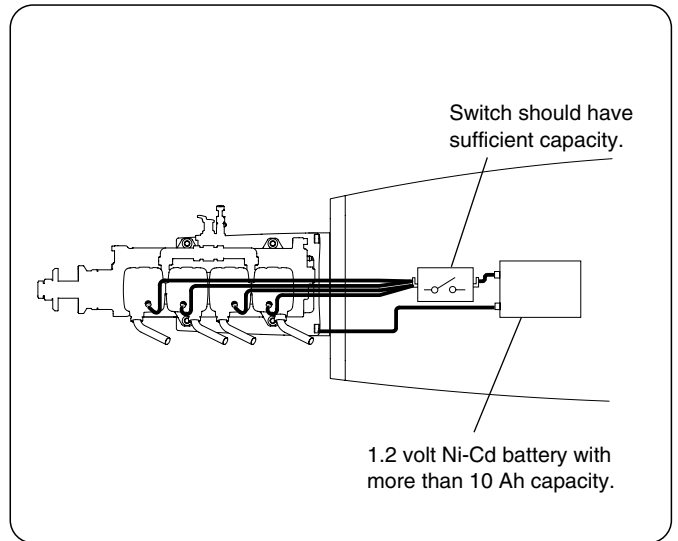
● Ni-Cd (nickel-cadmium) 1.2-volt rechargeable battery

Use a 10-Ah cell, or 4 to 5 2.0-Ah cells (as commonly used for electric-powered R/C cars) wired in parallel and with short heavy leads (to minimize voltage drop) to the connection point on the fuselage.

■ Glowplug leads

- The plug leads are fitted with special snap-on connectors that ensure firm contact with O.S. plug. They are a "click" fit and are not suitable for use with most other makes of glowplug.
- The earth (ground) lead is fitted with a plug terminal which should be connected to the engine by means of one of the mounting screws.
- Make sure that no part of the wiring touches the cylinder head or cooling fins.
- Keep wiring away from the fuel tank where it might cause a fire in the event of a short-circuit.

1. Install Ni-Cd battery in the fuselage, and switch on or off by means of transmitter. (On-board battery)

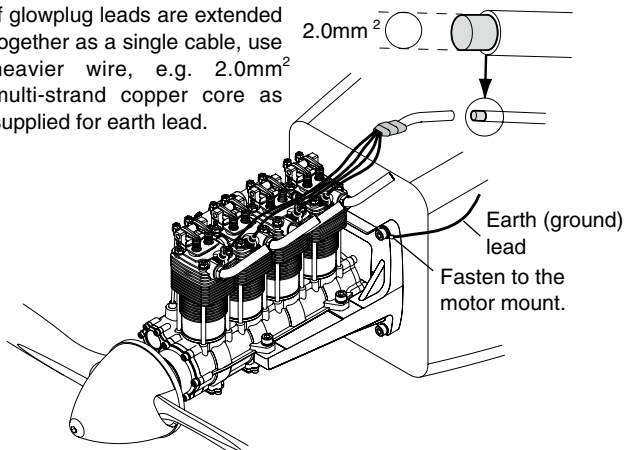


A commercially available glowplug heating source will enable you to turn the current on or off by using a transmitter auxiliary channel establishing a more reliable idle.

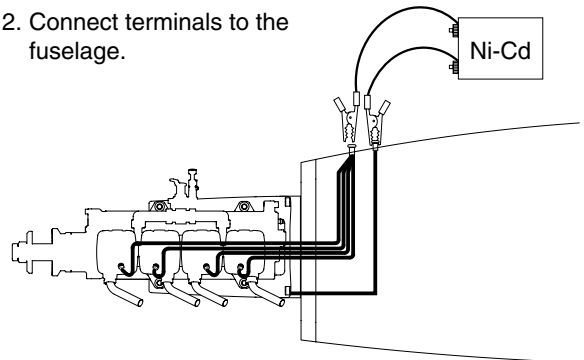
■ Glowplug re-heat

Under normal conditions, the engine will idle sufficiently slowly with the throttle closed to permit a safe landing approach. However, if conditions (atmospheric, fuel, tank location etc.) are unfavorable, there may be a tendency for one cylinder to cease firing if the engine is throttled down to a very low idling speed. This can be prevented by installing a small on-board Ni-Cd battery which will automatically re-heat the glowplugs when the engine is throttled down to idling speed. A suitable switch should be installed so that it is actuated by the throttle servo only when the engine is throttled down.

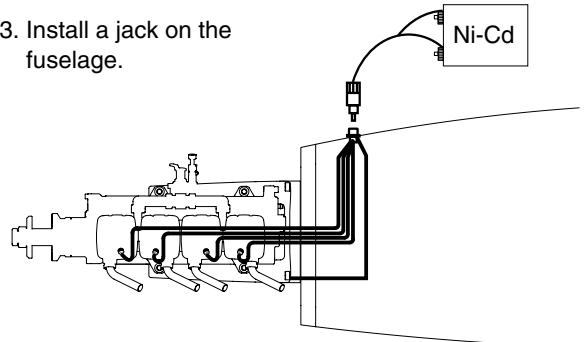
If glowplug leads are extended together as a single cable, use heavier wire, e.g. 2.0mm<sup>2</sup> multi-strand copper core as supplied for earth lead.



2. Connect terminals to the fuselage.



3. Install a jack on the fuselage.



■ Fuel

The IL-300 should be operated on a methanol based fuel containing not less than 18% (volumetric) castor oil, or a top quality synthetic lubricant (or a mixture of both), plus a small percentage (5-20%) of nitromethane for improved flexibility and power.

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.



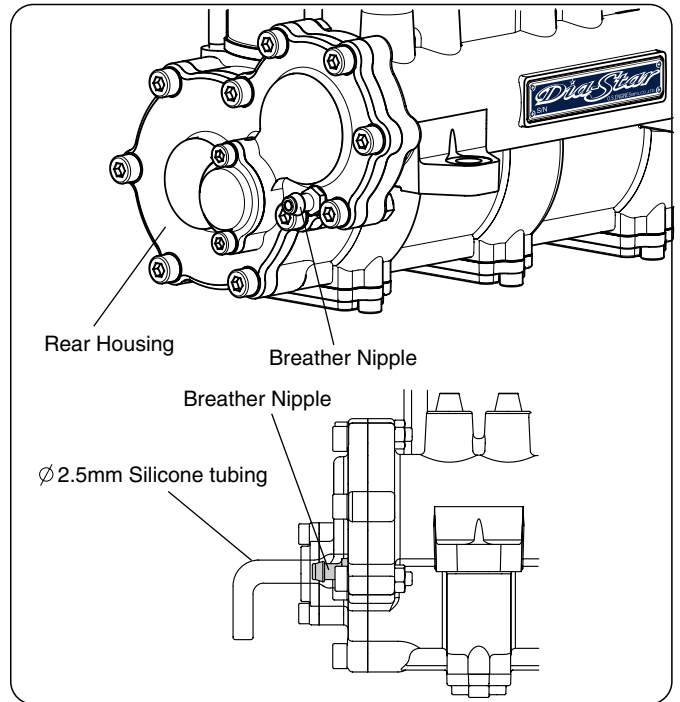
Model engine fuel is also highly flammable. Keep it away from open flame, excessive heat, sources of sparks, or anything else which might ignite it. Do not smoke, or allow anyone else to smoke, near to it.

■ Lubrication

All parts of the IL-300 are automatically lubricated by the oil content of the fuel mixture. It is suggested, however, to apply small amount of machine oil or grease to moving parts of the rocker arms before starting the engine.

- The crankcase breather hole is located at the back of the engine and is fitted with a brass nipple. Fit a length of silicone tubing of approx. 2.5mm I.D. to this nipple to conduct away the small amount of oil that escapes through the breather.

- Make a habit of draining out the excess oil in the crankcase at the end of each flying session. Leaving contaminated oil in the crankcase for a long time will cause rust. Also, residual castor oil will tend to solidify and lock the engine. Inject corrosion-inhibiting oil into the crankcase to neutralize the effects of any remaining contaminants.



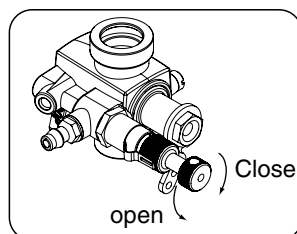
■ Precautions

For safety, please observe the following instructions before starting the engine.

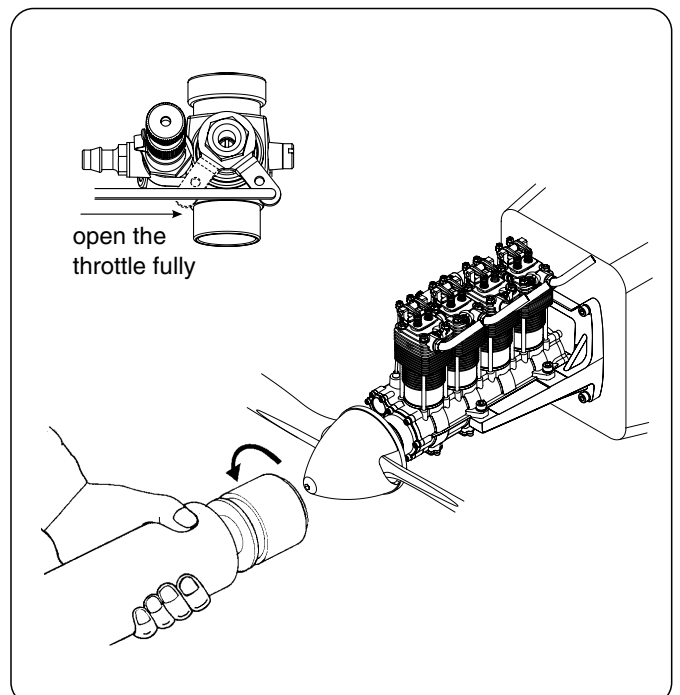
- Start the engine by turning the propeller counter-clockwise (i.e. normal running direction).
- Do not start the engine with the throttle fully opened, otherwise the model will tend to move forward suddenly due to the strong thrust of the propeller. Hold both wings of the model when starting the engine.
- Do not carry out carburetor adjustments (except needle-valve adjustment) while engine is running.
- Use a high-torque electric starter.

■ Starting procedure is as follows:

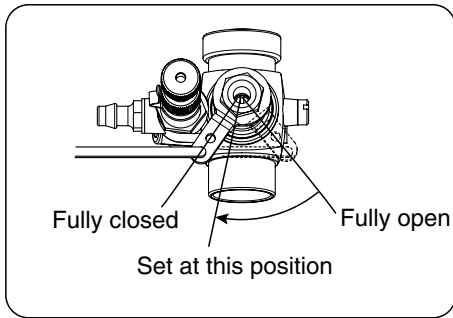
1. Open the needle-valve 2 to 3 turns from the fully closed position.



2. Make sure that glowplugs are not connected to the battery. Do not heat the glowplugs while priming.
3. Open the throttle fully and apply an electric starter for 5-6 seconds to prime the engine.



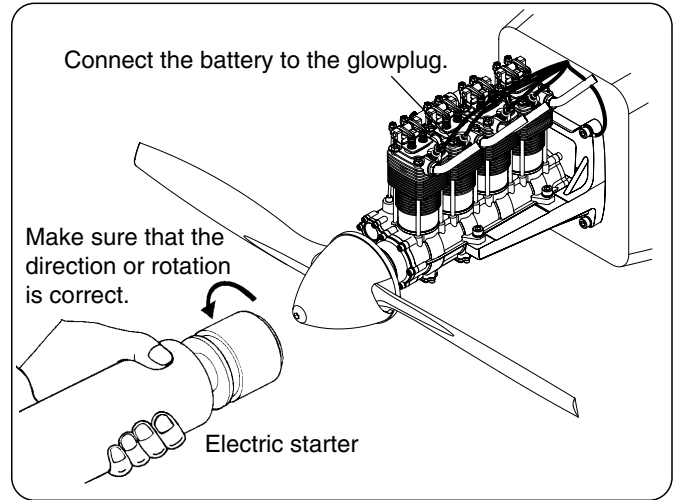
4. Set the throttle valve approximately 1/4 open from the fully closed position.



Position the throttle stick at 2-3 scales advanced from the fully pulled down position. Turn the prop "backwards" (clockwise) by hand until it is against compression. This is to enable the kinetic energy of the prop to subsequently assist the starter through the compression stroke to start the engine.

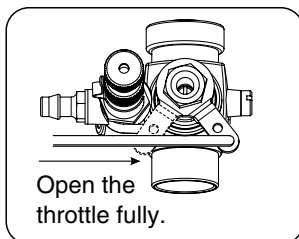
5. Starting with an electric starter.

- Make sure that the direction of rotation of the starter is correct.
- Connect the glowplug battery.
- Apply the electric starter.



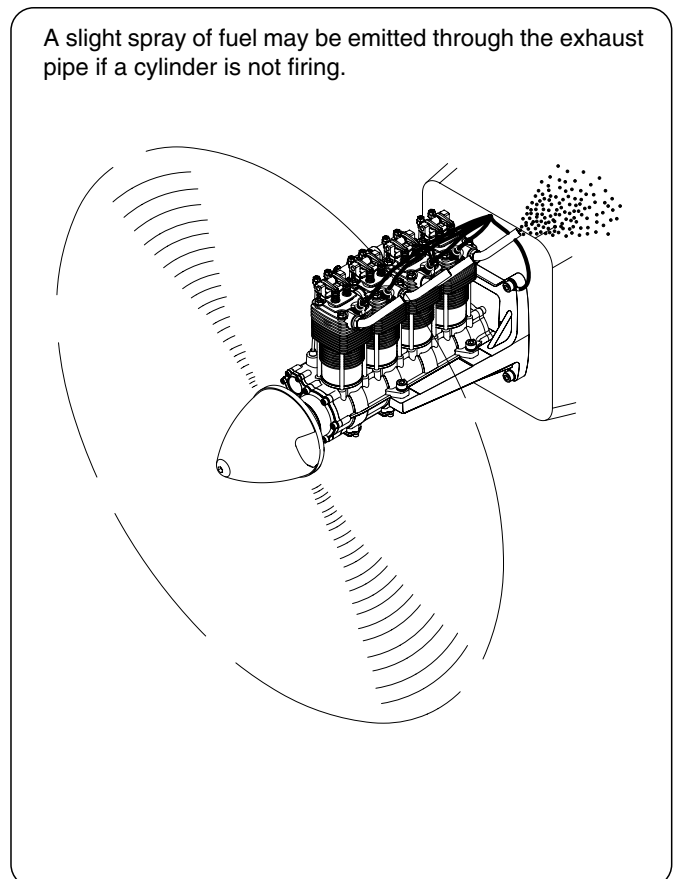
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6. When the engine starts, open the throttle valve fully and keep it running initially (approx. 10 seconds), with original needle-valve setting.



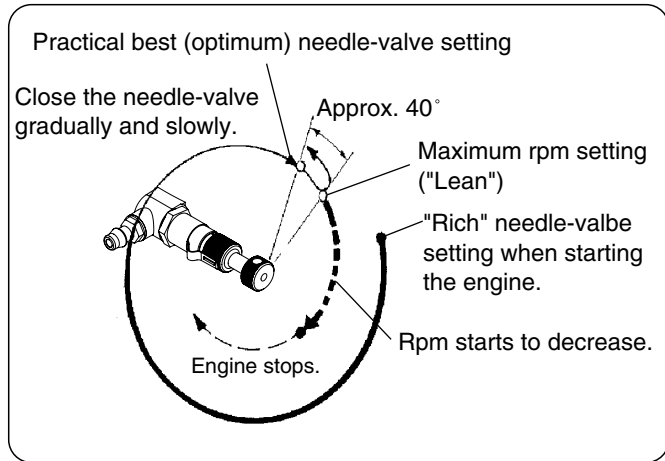
7. Make sure that all four cylinders are firing

- The engine is running properly if white smoke is emitted through all four exhaust pipes. A slight spray of fuel will be discharged through the exhaust pipe of any cylinder that is not firing.
- If a cylinder ceases firing, reduce the throttle setting to approximately 1/4 open from the fully closed position and re-connect the glowplug battery. The rpm will increase when all cylinders are firing steadily.



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8. Now disconnect the glowplug battery.
9. Adjust the needle-valve
  - Abrupt adjustment of the needle-valve may cause the engine to stop, especially when it is new and insufficiently run-in.
  - As the speed of the engine does not instantly change with needle-valve readjustment, small movements, with pauses between, are necessary to arrive at the optimum setting.



**How to stop the engine**

Pull down the throttle lever and trim lever on the transmitter fully.

**Note:**

**Make sure that the throttle linkage is made so that the throttle is fully closed when the throttle lever as well as trim lever on the transmitter are fully pulled down.**

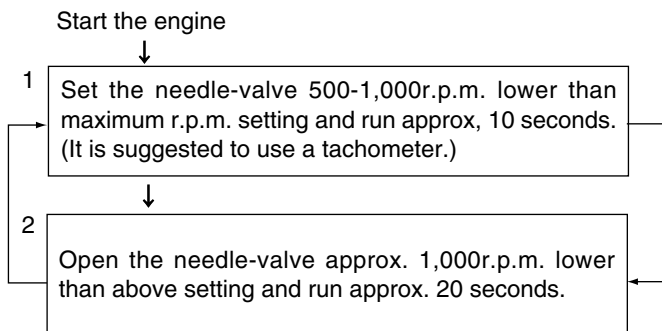
**Re-starting the engine when warm**

To re-start the engine when warm, simply re-energise the plugs and reapply the starter with the throttle in the idling position. If the engine does not start, disconnect the battery from the glowplugs and re-prime. Initially, the high temperature inside the combustion chambers may turn the liquid fuel into gas and emit it through the exhaust pipes. Therefore, repeat the priming procedure once or twice until the cylinders become cool enough for restarting.

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

Obtain an 18x12 or 20x8 propeller for running-in.

**1. Running-in on the ground**

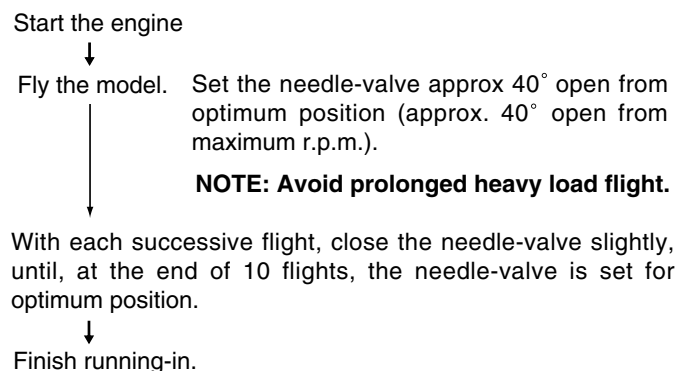


Repeat above procedure, i.e., richening and leaning the mixture until the engine has approx. 10 minutes of running time.

**NOTE:**

**Keep the throttle fully open, using only the needle-valve to change r.p.m. Prolonged running-in on the ground is not suggested because the purpose is just initial running-in to increase engine temperature gradually close to that of maximum r.p.m.**

**2. Running-in in the air**



The carburetor can now be adjusted for optimum throttle performance following the instructions given in the next section.

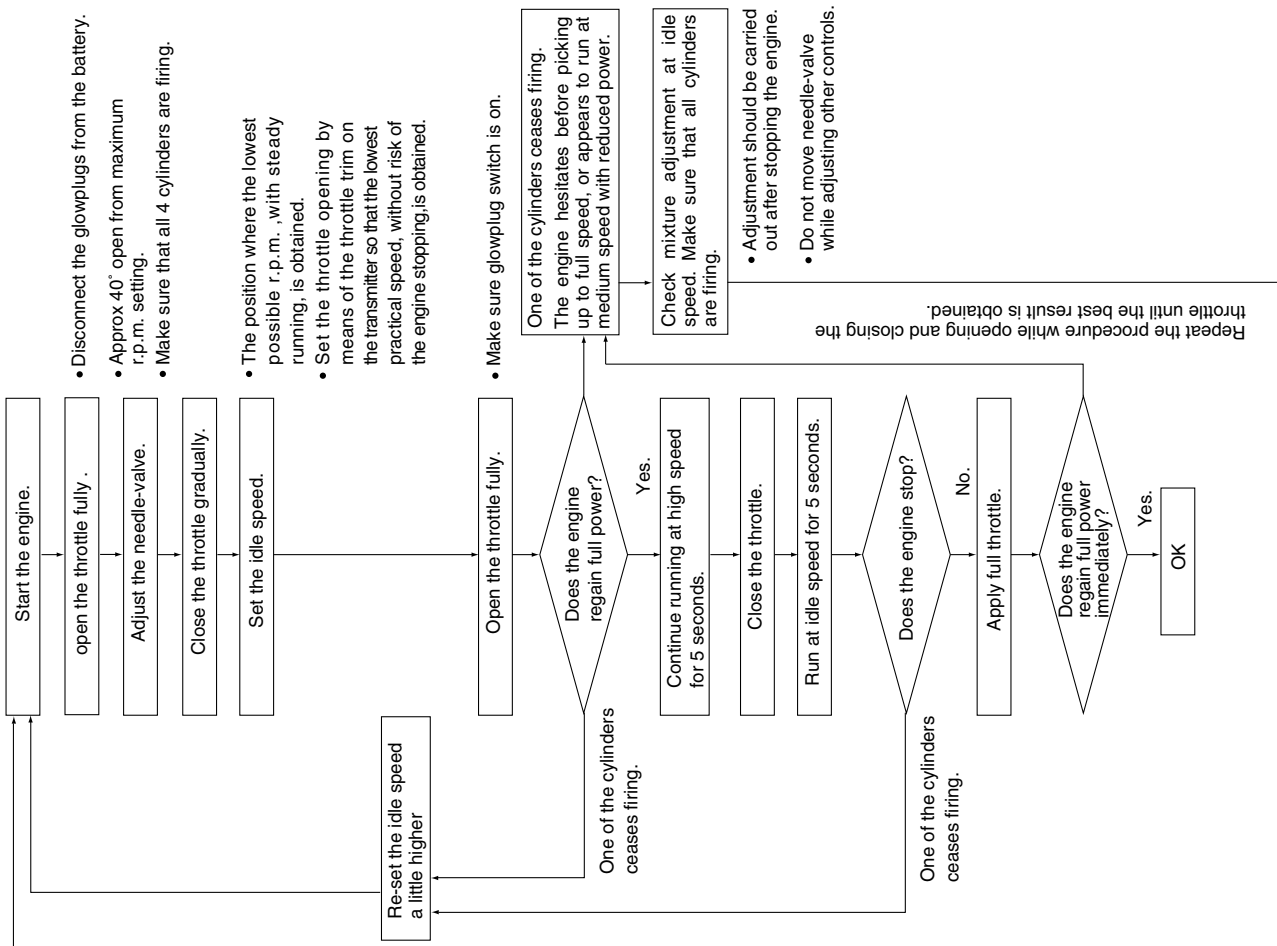
■ **Needle-valve adjustment**

Adjust the needle-valve following the instructions given in STARTING section.

■ **Mixture control valve adjustment**

The carburetor of your IL-300 has been factory set for the approximate best result with the fuel tank located in the normal position (i.e. close to the back of the engine and where the level of the needle-valve is at 1/3 height of the tank), but the setting may, in some cases, vary slightly in accordance with fuel and climatic conditions.

After running-in is completed and the needle-valve is set at optimum position (approx 40° open from maximum r.p.m. position), check the idle speed and adjust only when necessary.

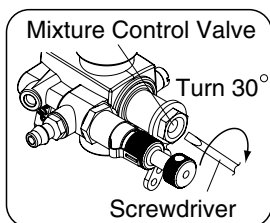


Attention: Do not leave the battery connected while adjusting the carburetor.

■ **Adjusting the mixture control valve**

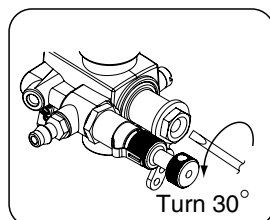
1. If the engine hesitates, puffing out a good deal of smoke, before picking up to full speed, it is probable that the idle mixture is too rich.

In this case, it will be necessary to turn the Mixture Control Valve clockwise to lean the mixture. About 1/12 turn (30°) should be sufficient.



2. Alternatively, if the engine stops or is slow to pick up speed, without smoking or a strong exhaust note, it is probable that the idle mixture is too lean.

In this case, it will be necessary to turn the Mixture Control Valve counter-clockwise approximately 1/12 turn (30°).



3. Thirdly, if the rpm increase but the engine appears to run with reduced power, it is probable that one of the cylinders has ceased firing. You may detect this by the difference in exhaust note and rpm compared with previous full-throttle running. The cutting out of the cylinder may be caused by the idle speed being set too low or the idle mixture being too rich.

In the case of the idle speed being too low, re-set the idle position a little higher by means of the throttle trim on the transmitter. In the case of the idle mixture being too rich, turn the Mixture Control Valve clockwise about 1/12 turn (30°). Normal safe idle speeds are in the region of 2,000 r.p.m..

**NOTE:**

**As this is four-cylinder four-stroke-cycle engine, firing strokes occur every half revolution (180°), that is, two firings take place every one complete revolution. Therefore, at first you may have an impression that the engine is idling at higher r.p.m. than actual running r.p.m. It is recommended to check the engine r.p.m. with a tachometer.**

**Changing the make of glowplug or fuel may sometimes require re-adjustment of carburetor throttle.**

**Realignment of mixture control valve**

In the course of making carburetor adjustments, it is just possible that the Mixture Control Valve setting may be upset. Its basic setting can be re-established as follows: Turn the Mixture Control Valve counter-clockwise until it stops, then screw it out 3 turns. This is the basic position.

**NOTE:**

**If an on-board glowplug re-heat system is installed, mixture adjustment at idle speed should be carried out with this in operation.**

■ **Checking before flight**

- Make sure that all four cylinders are firing.
- Make sure that engine runs steadily at idle speed.
- Make sure that engine is fully warmed up.
- It is necessary to warm up the engine as with a full-size aircraft or automobile. Do not attempt to take-off immediately after the engine has been started. Allow the engine to run at full throttle for at least 10 seconds before releasing the model.

■ **Care and Maintenance**

**Please pay attention to the matters described below to ensure that your engine serves you well in regard to performance, reliability and long life.**

- As previously mentioned, it is vitally important to avoid operating the engine in conditions where dust, disturbed by the propeller, may be deposited on the engine and enter its working parts.
- Remember to keep your fuel container closed to prevent foreign matter from contaminating the fuel.
- Install a fuel filter to prevent dirt and dust in the fuel container from entering the fuel tank. O.S. Super Filters (L) is available as an optional extra.
- Install an in-line fuel filter between the tank and carburetor to prevent foreign matter in the tank from entering the carburetor.
- Clean these filters periodically.
- If these precautions are neglected, restriction of fuel flow may cause the engine to cut out, or the fuel/air mixture to become too lean causing the engine to overheat.

- The use of modern high-performance alcohol based model engine fuels, while promoting cooler running, improved anti-detonation combustion and increased power, have the disadvantage of causing corrosion due to the acid by-products of combustion. The use of nitromethane in the fuel can also contribute to the problem.
- Do not close the needle-valve and mixture control valve too far as this will cause a lean setting and over heating of the engine. This can, in turn, create nitromethane oxide leading to internal rusting of the engine. Always adjust the needlevalve slightly on the rich side of peak rpm.
- Do not leave unused fuel in the engine at the conclusion of a day's flying. Accepted practice is to cut off the fuel supply while the engine is still running at full throttle, then expel as much fuel residue as possible by turning the engine over 20-30 seconds with the electric starter. Finally, inject some after-run oil through the glowplug hole and turn the engine over several times with the electric starter.
- When the engine is not to be used for some months (for example, as between flying seasons), a worthwhile precaution is to remove it from the airframe and, after washing off the exterior with alcohol (not gasoline nor kerosene), remove carefully the carburetor with intake pipe, glow plug and all silicone tubing and put them safely aside. Then, immerse the engine in a container of alcohol. Rotate the crankshaft while the engine is immersed. If foreign matter is visible in the alcohol, rinse the engine again in clean alcohol. Finally, shake off and dry the alcohol, and inject some after-run oil in the glowplug hole and rotate the crankshaft several times by hand. Reinstall the carburetor with intake pipe and glowplug on the engine and keep it in a dry place after putting in a vinyl bag.

ALL O.S. four-stroke engines have their valve (tappet) clearances correctly set before they leave the factory. However, if, after many hours of running time have been logged, a loss of power is detected, or if the engine has to be disassembled or repaired as a result of an accident, valve clearances should be checked and readjusted, as necessary, with the aid of the O.S. Valve Adjusting Tool Kit.

**Note:**

Valve clearances of all O.S. four-stroke-cycle engines must be checked and reset **ONLY WHEN THE ENGINE IS COLD**. Procedure is as follows:

**(I)**

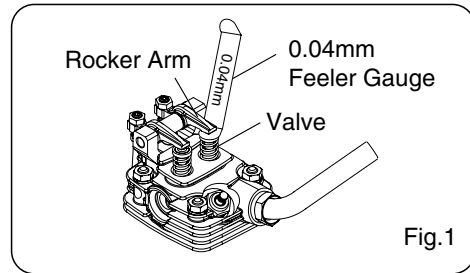
1. Remove all the glowplugs except the one installed in the cylinder that you want to check.

**Note:**

Each glowplug should be re-installed in to the original cylinder. You may start to check and adjust with any cylinder.

2. Turn the propeller counter-clockwise until compression is first felt, then turn it further a quarter turn. At this point, both valves should be closed. (If the prop driver ('drive hub') of your engine is engraved with a letter 'T', this mark should now be at the top.)

3. The standard valve clearance, on both inlet and exhaust valves, is between 0.04mm and 0.1mm(0.0015-0.004 inch), measured between valve stem and rocker arm. Use the 0.04mm and 0.1mm feeler gauges to check clearances. (See Fig.1)



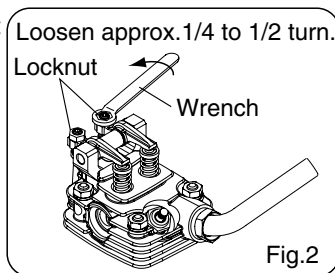
**Note:**

If the gap is found to be less than 0.04mm, it is not necessary to readjust the clearance if the engine has good compression and starts easily. Equally, if the gap exceeds 0.1mm but is not more than 0.14mm (i.e. the thickness of both feeler gauges inserted together), it is not necessary to readjust the clearance if the engine runs satisfactorily.

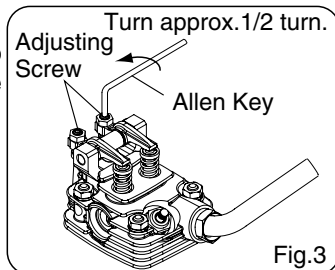
**(II)**

If a clearance is found to be outside either of these limits, it should be reset as follows.

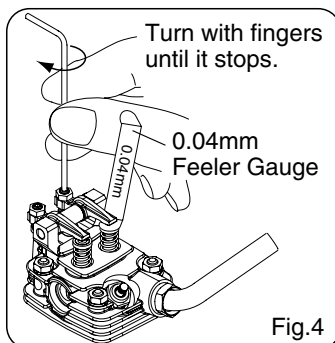
1. Carefully loosen the locknut on rocker-arm 1/4-1/2 turn with 5mm wrench. (Fig.2)



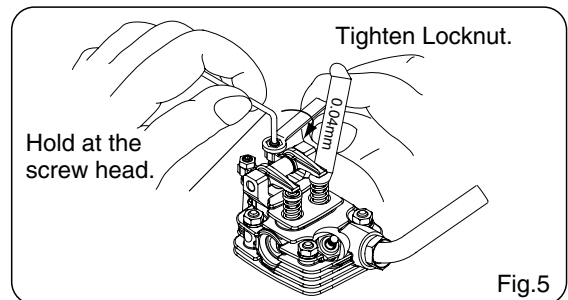
2. Turn adjusting-screw approx. 1/2 turn counter-clockwise to open gap, using appropriate tool-i.e. Allen hex key. (Fig.3)



3. Insert 0.04mm feeler gauge between valve stem and rocker-arm and gently turn adjusting screw clockwise until it stops. (Fig.4)



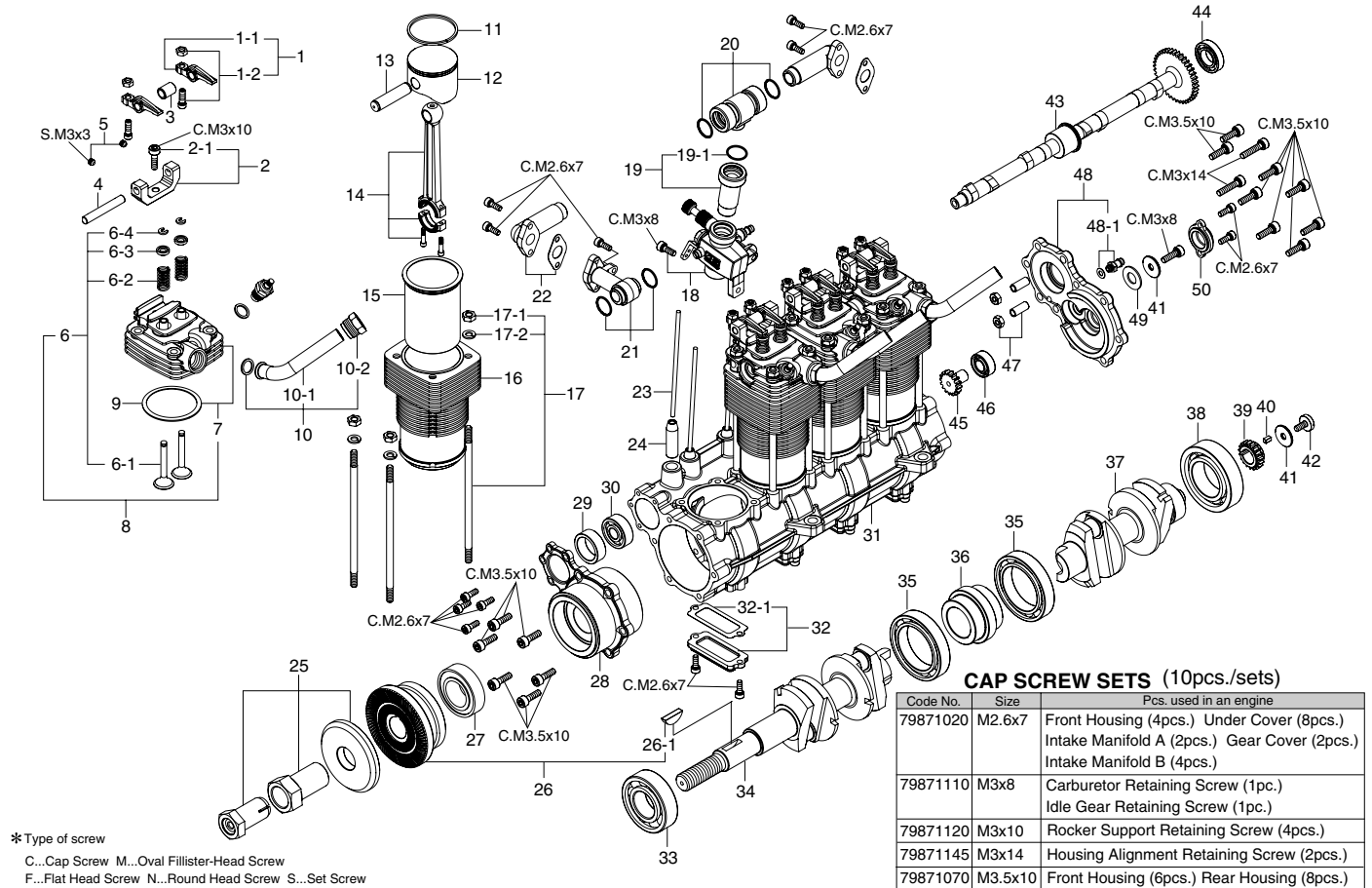
4. Re-tighten locknut while holding adjusting screw stationary. (Fig.5)



5. Remove 0.04mm feeler, rotate prop through two revolutions and recheck gap.
6. If clearance is correct, loosen the locknut on the other rocker-arm and repeat steps 1 to 5 above.

**Remember:**

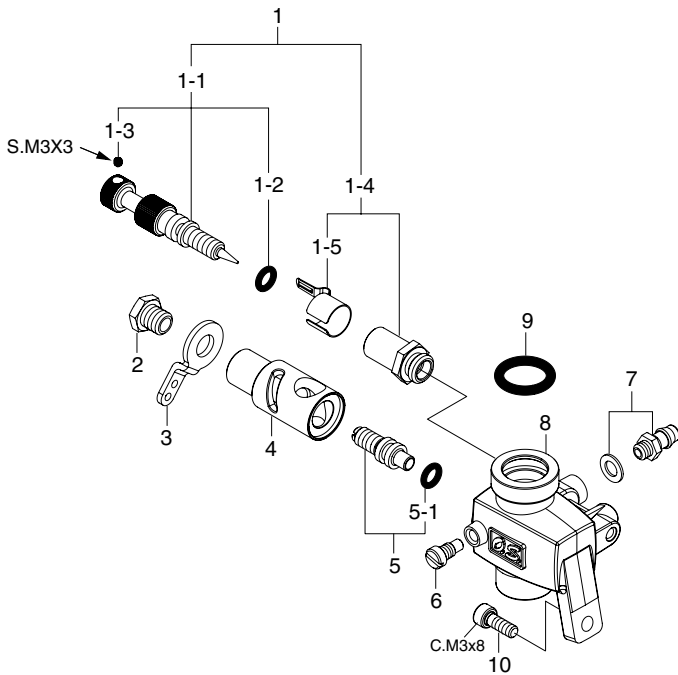
Excessive valve clearance will cause loss of power, due to valve (s) not opening sufficiently. On the other hand, a total loss of clearance may cause difficult starting due to valves not closing properly, resulting in loss of compression.



No.	Code No.	Description
1	46504300	Rocker Arm Assembly (1pair)
1-1	46504310	Rocker Arm (1pc.)
1-2	45061202	Tappet Adjusting Screw
2	46504410	Rocker Support Assembly
2-1	79871120	Rocker Support Retaining Screw (10pcs.)
3	45461610	Rocker Arm Spacer
4	45461510	Rocker Arm Shaft
5	26381501	Rocker Arm Shaft Retaining Screw
6	46160000	Valve Assembly (1pair)
6-1	46160100	Valve (1pc.)
6-2	45460200	Valve Spring (1pc.)
6-3	45060309	Valve Spring Seat (1pc.)
6-4	46160400	Valve Spring Retainer (2pcs.)
7	46504110	Cylinder Head 1&3
	46504210	Cylinder Head 2&4
8	46504100	Cylinder Head 1&3 (W/Valve Assembly)
	46504200	Cylinder Head 2&4 (W/Valve Assembly)
9	44014010	Head Gasket
10	45269000	Exhaust Pipe Assembly (1pair)
10-1	45269100	Exhaust Pipe
10-2	45069200	Exhaust Pipe Lock Nut
11	44003400	Piston Ring
12	44003200	Piston
13	44006000	Piston Pin
14	46505000	Connecting Rod Assembly
15	44003100	Cylinder Liner
16	46503300	Cylinder Jacket
17	46503400	Cylinder Holding Volt Set
17-1	23325340	Nut (2pcs.)
17-2	79872035	Spring Washer (20pcs.)
18	46581000	Carburetor Complete (Type 80P)
19	46568300	Carburetor Extension Pipe
19-1	45515000	"O" Ring (1pc.)
20	46568000	Center Manifold Assembly
21	46568100	Intake Manifold A Assembly
22	46568200	Intake Manifold B Assembly

No.	Code No.	Description
23	45566000	Push Rod (2pcs.)
24	46564000	Cam Follower (1pc.)
25	46210100	Lock Nut Set
26	46208010	Drive Hub
26-1	29208200	Woodruff Key
27	46231000	Crankshaft Bearing F
28	46501600	Front Housing
29	46562100	Camshaft Bearing Spacer
30	46031005	Camshaft Bearing F
31	46501000	Crankcase
32	46501500	Crankcase Under Cover (1pc.)
32-1	46514300	Under Cover Gasket (4pcs.)
33	26530008	Crankshaft Bearing FR
34	46502100	Crankshaft F
35	46514000	Coupling Bearing
36	46502300	Crankshaft Coupling
37	46502200	Crankshaft R
38	46030008	Crankshaft Bearing R
39	46512000	Drive Gear
40	45587180	Drive Gear Key
41	46513200	Idle Gear Washer (2pcs.)
42	45067319	Drive Gear Retaining Screw
43	46562000	Camshaft
44	22631019	Camshaft Bearing R
45	46513000	Idle Gear
46	46515000	Idle Gear Bearing
47	46501816	Rear Housing Assembly Pipe (W/Screw & Nut)
48	46501800	Rear Housing
48-1	22681953	Breather Nipple (No.1)
49	46513100	Idle Gear Thrust Washer
50	46501700	Gear Cover
	71910100	Radial Motor Mount Set
	79870050	Blind Nut M5 (10pcs.)
	71615009	Glow Plug Type F
	72200071	Booster Cable Set
	72200060	Valve Adjusting Kit





No.	Code No.	Description
1	27681900	Needle-valve Assembly
1-1	27681970	Needle Assembly
1-2	24981837	"O" Ring (2pcs.)
1-3	26381501	Set Screw
1-4	27381940	Needle-valve Holder Assembly
1-5	26711305	Ratchet Spring
2	22781420	Throttle Lever Retaining Screw
3	22781411	Throttle Lever
4	46581200	Carburetor Rotor
5	26781309	Mixture Control Valve Assembly
5-1	24881824	"O" Ring (2pcs.)
6	45581820	Roter Guide Screw
7	22681953	Fuel Inlet (Nipple No.1)
8	46581100	Carburetor Body
9	45515000	Carburetor Rubber Gasket
10	79871110	Carburetor Retaining Screw (10pcs.)

The specifications are subject to alteration for improvement without notice.

\*Type of screw  
 C...Cap Screw M...Oval Fillister-Head Screw  
 F...Flat Head Screw N...Round Head Screw S...Set Screw

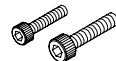
■ BOOSTER TERMINAL KIT  
 (72200130)



■ PROPELLER LOCKNUT SET FOR 4C SPINNER  
 3/8"-M5 (L) (46210300)

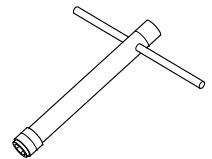


■ CAP SCREW SET (10pcs.)



- M2.6x7 (79871010)
- M3x8 (79871110)
- M3x10 (79871120)
- M3x14 (79871145)
- M3.5x10 (79871070)

■ LONG SOCKET WRENCH WITH PLUG GRIP  
 (71521000)



■ NON-BUBBLE WEIGHT  
 (71531000)



■ SUPER FILTER (L)  
 (72403050)



■ NON-BUBBLE WEIGHT  
 (71531010)



■ COLLECTOR EXHAUST PIPE  
 (46569000)



■ BLIND NUT (10pcs.)

M5  
 (79870050)



■ LOCK WASHER (10sets)

M5  
 (55500004)

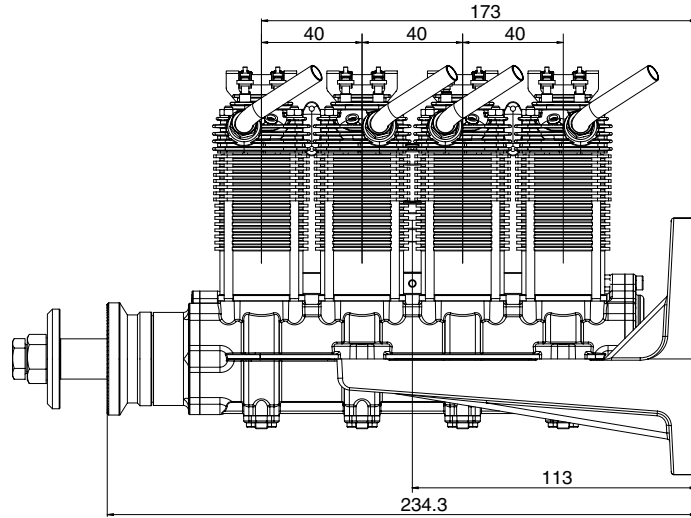
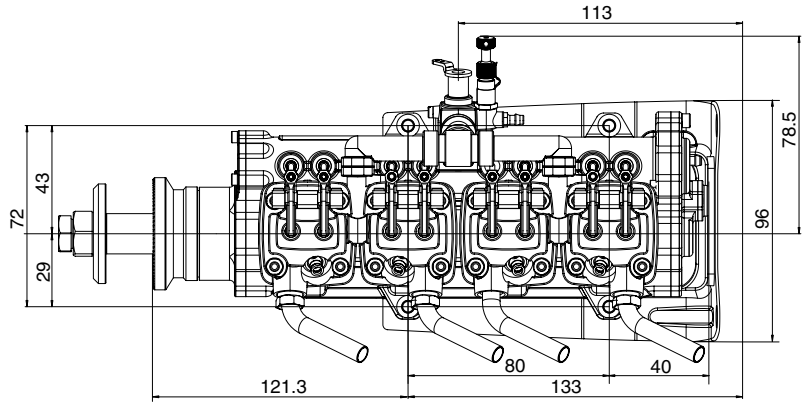
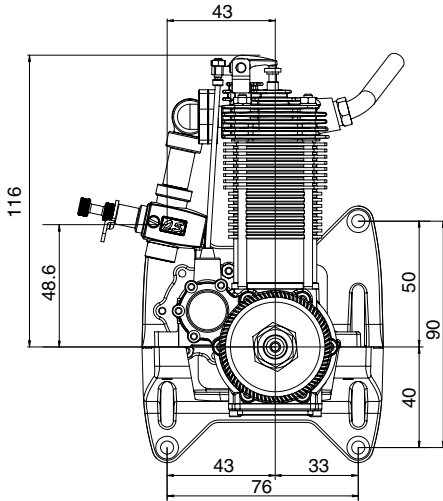


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**Specifications**

■ Displacement	12.5 cc x 4 / 0.765 cu.in. x 4
■ Bore	25.8 mm / 1.02 in.
■ Stroke	24.0 mm / 0.94 in.
■ Practical R.P.M.	1,800-8,000r.p.m.
■ Output	
■ Weight	2,350 g / 82 oz.

**Dimensions (mm)**



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