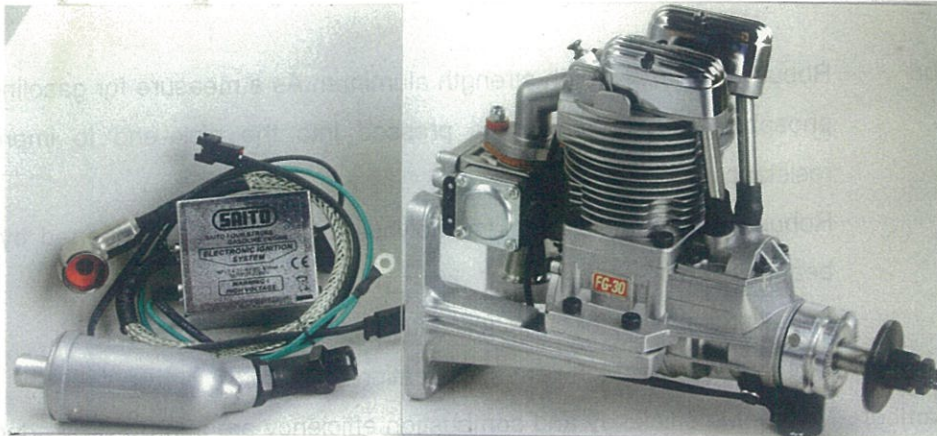




SAITO FG-30 (AAC)



Instruction Manual for 4-cycle Gasoline Engine



Thanks for buying SAITO FG-30 four cycle gasoline engine exclusively for model airplanes.

In order to avoid misuse, please be sure to read well the "Operation Manual," attached "Precautions for use of model plane engine", the "Warranty", and the operation manual of RC device.

If there should be any deficiency, inconvenience, etc. concerning the manufacture, our company will repair them with responsibility. Any failure or trouble caused by unnecessary disassembly, modification, or other uses than those provided in the instruction manuals is not subject to the warranty, however.

Moreover, all responsibilities for the use of the engine, and other obligations and responsibilities based on laws, regulations, etc. are borne by the purchaser and the user, and SAITO SEISAKUSHO CO., LTD. is exempt from any responsibilities.

SAITO FG-30 is a four cycle gasoline engine exclusively for model airplanes which is designed with emphasis on high performance, durability, and weight saving and whose parts are modified to adapt to the gasoline engine based on FA-180 glow engine, equipped with four cycle gasoline engine carburetor and ignition system matched to our engine.

Features of the gasoline engine

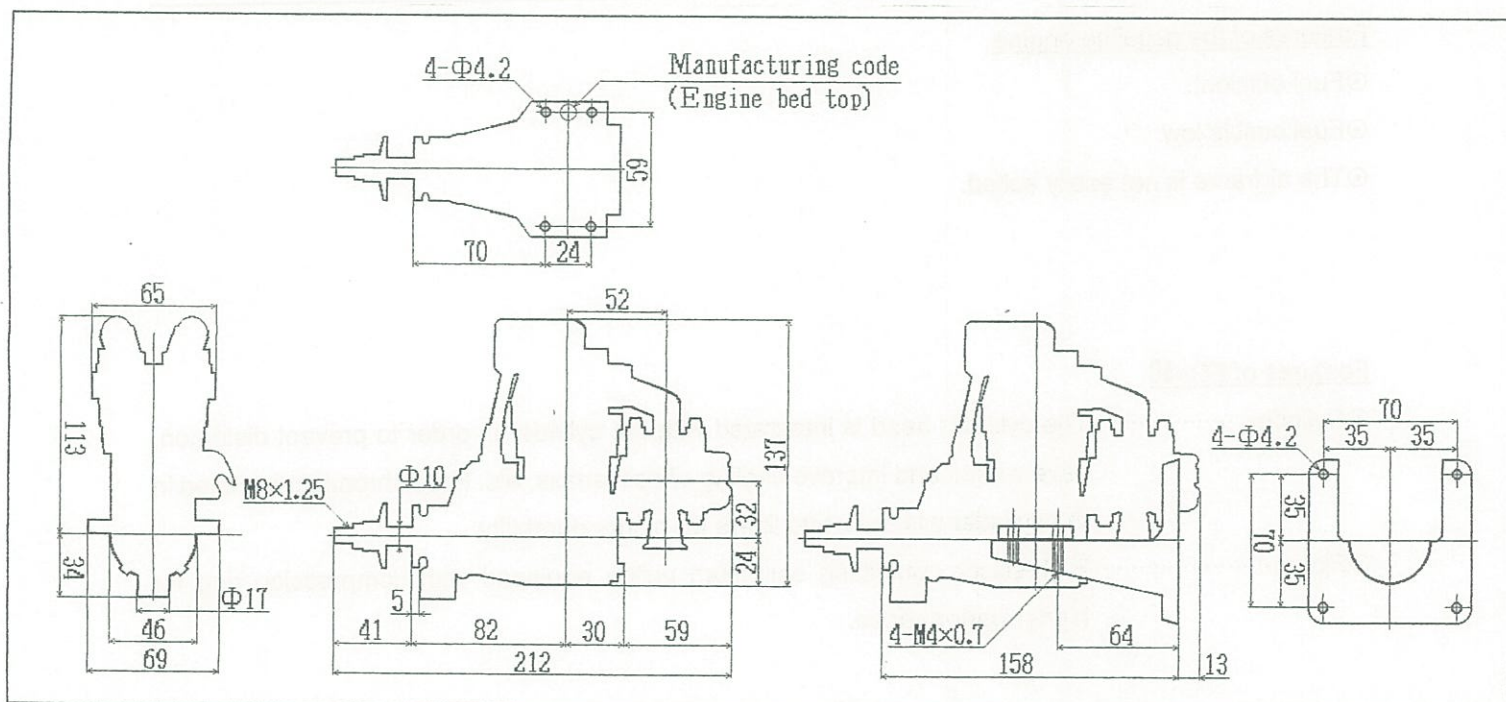
- ⊙Fuel efficient.
- ⊙Fuel cost is low.
- ⊙The airframe is not easily soiled.

Features of FG-30

- ⊙Cylinder The cylinder head is integrated with the cylinder in order to prevent distortion, save weight and improve cooling effectiveness, etc. Hard chromium is plated in the cylinder without using liners for higher durability.
- ⊙Piston..... High-silicon-containing aluminum piston equipped with compression ring for higher performance.

- ⊙Connecting rod Robust with forged high-strength aluminum. As a measure for gasoline engine, phosphor bronze bushing is pressed into the pick end to improve heat resistance.
- ⊙Crankshaft Robust with forged chromium molybdenum steel and supported by two ball bearings
- Cam gear Placed in the front for compactification.
- Cam High output type, high cam specification
- Combustion chamber... Volumetric efficiency and combustion efficiency are improved by adoption of a vent roof type combustion chamber.
- Propeller nut Double nut of drop-off preventing safety design
- Exhaust sound Sound quality similar to the exhaust sound of the real machine
- Carburetor Carburetor exclusively for four cycle gasoline engine. (Due to diaphragm pump type, the fuel tank can be located anywhere.)
- Ignition system Exclusively for our four cycle gasoline engines using the battery type electronic ignition and the electronic spark advance system.
- Start method Normal rotation can be manually started due to automatic spark advance (Please use the starter for safety.).
- Fuel With the same composite fuel as two cycle, handling is easy.
- Flight pattern Since there are no worries about the inclination of oil, all acrobatic flights are possible.

FG-30 major dimensional drawing, various data, etc.



Bore	36.0mm	Stroke	28.0mm	Cylinder capacity	29.11cc
Weight	Main body: Approx 1,055g , Muffler: Approx.85g, Mount: Approx 190g , Ignition system: Approx 158g				
Practical engine speed	Approx.1,700"x ~9,000"rpm	Airframe target		Four cycle 120" 180class	
Propeller (Target)	16" × 8" 16" × 10" 17" × 6" 17" × 8"				
Static thrust (Target)	APC 16" × 8" 5.0kg APC 16" × 10" 5.3kg APC 17" × 6" 5.8kg APC 17" × 8" 5.3kg				
Fuel	Gasoline: Oil=20:1 30:1 (20:1 is standard.) (Capacity ratio)				
Fuel consumption (Target)	Approx. 25cc / 1 min (Full throttle, Approx 8,500 rpm) Fuel consumption depends on the load of the propeller. Load is large.(Diameter & pitch is large.)=>High, Load is small.>Low (During actual flight, fuel consumption worsens a little.)				
Electrical usage of ignition system	Approx. 790mAh for 60min				
Accessories	Limit gauge for tappet adjustment [0.1T]: 1 pc Plug wrench: 1 pc Spanner for tappet adjustment: 1 pc Muffler set: 1 set NGK-CM-6Spark plug (attached): 1 pc Hexagonal wrench set: 1 set Mount set: 1 set Ignition system (with sensor attached): 1 set				

1. Propeller

Depending on the airframe, please adopt the standard size in the data and use a reliable product which is generally marketed.

(The product made from "carbon" is recommended.)

Since a large-diameter propeller is used, please maintain sufficient balance. Since an imbalanced propeller is vibratory and dangerous with lowered performance, please maintain balance with a balancer. Moreover, a cracked or propeller is dangerous. Please be sure to replace it with a brand-new.

* In addition, at first use a propeller with a lighter load for the engine characteristics. If it is successful, please replace with a larger load propeller.

(Please use an 18 x 8 or 19 x 8 carbon product between the initial break-in and about 20 flights.)

If a high load propeller is used from the beginning, the cylinder, piston, piston ring, crankshaft, bearing, connecting rod, gear, etc. are easily worn away.

* Propeller and fuel consumption

If the load is large (the diameter & pitch of the propeller is large) for the engine characteristics, the air-fuel mixture has to be rich. Then, the main needle tends to be opened. That is, even if the revolution is low, the fuel consumption is high. Conversely, when the load is small, the revolution is high, but the fuel consumption is lowered because the main needle is closed. In order to decrease the fuel consumption and prolong the engine life, a propeller should be used whose revolution is maximized when the throttle-valve is fully opened, while using an airframe which enables all flights with about 90% of the output of the propeller. In this case, the throttle valve will be further throttled during horizontal flight. On the contrary, such an airframe as can only deliver performance in fully open condition will suffer worsening fuel consumption and life.

2. Fuel

The fuel which is a mixture of commercial regular gasoline and a reliable oil for two cycle is used.

(In addition, unleaded high-octane gasoline is not necessarily required for our engine.)

For the mixture ratio, please be sure to use "gasoline: oil =20:1" by capacity ratio between the break-in and some 20 flights. Then, depending on the condition of the engine, "gasoline: oil =30:1" can be used.

However, since gasoline is a dangerous material, be careful of its storage, use, and transport enough.

(The evaporative emission and exhaust smoke of gasoline have a harmful effect on the human body.

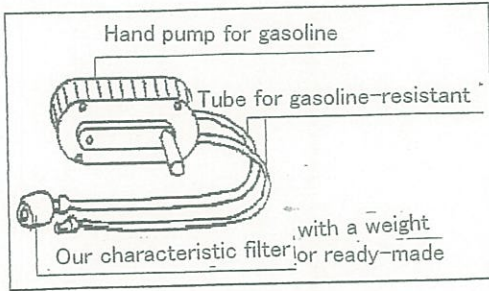
Also, if gasoline is leaked, there is danger of a fire etc. **Handling should be used with a metal container and be carefully performed.**) In addition, our company takes no responsibility for accidents, health damages, etc. which occur during storage, use, and transport of gasoline.

3. Fuel filter and fuel pump

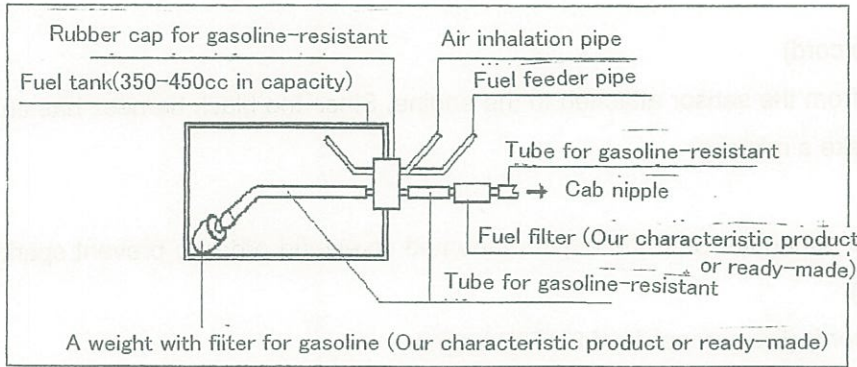
Since commercial gasoline has many impurities, please be sure to use a reliable filter for the admission port of the gasoline fuel pump or the spindle in the fuel tank.

If an engine is used without using a filter, the performance of the carburetor is not delivered, resulting in failures.

Our "fuel filter" and "filtered spindle" are recommended.



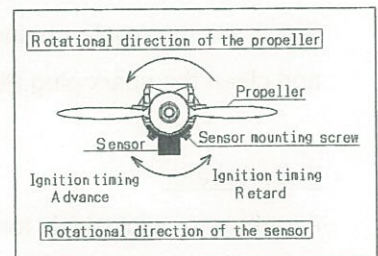
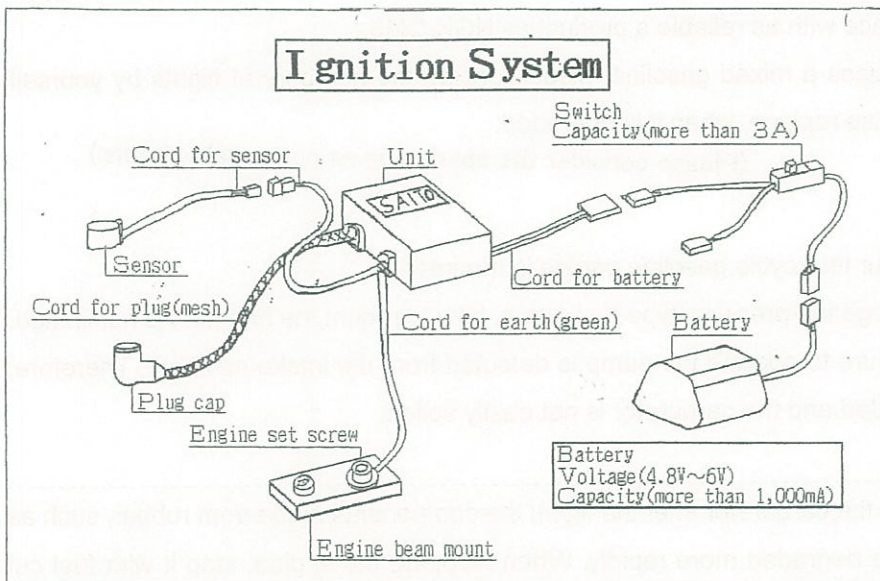
4. Fuel tank and piping



For the capacity (about **300cc-400cc**), refer to the data and select the best of commercial products. Please be sure to use a spindle with a reliable filter for the fuel intake. Moreover, it is more convenient to use a fuel feeding pipe and an air intake pipe, as shown in the drawing. Please be sure to use "gasoline-proof" products as the tank lid rubber, piping, and tubing. (These are available as an option) Products for glow cannot be used. It is dangerous if a product for glow is used by mistake.

* Please check well for any crack of the piping, tubing, connection, etc. Please replace, if there is a crack.

5. Ignition system You can change the lighting timing somewhat by sliding the sensor as shown in the figure.



The ignition system is a dedicated system developed to be suited to the characteristics of

* Explanation on the cord (Refer to the drawing).

(1) Plug cord (high tension cord) (meshed cord)

The cord is inserted so that the engine spark plug may be covered. Press it in securely until it sounds a "click."

(2) Sensor cord (black and white cord)

It is connected with the cord from the sensor attached to the engine. Since the black harness has an orientation, please do not make a mistake.

(3) Earth wire (green)

It is a green single wire to be connected with the engine-mounted screw. (In order to prevent spark noise, please connect firmly.)

(4) Battery cord (black and red cord) (the harness is of FUTABA type)

A commercial battery (more than 4.8 to 6V, 1000mA is recommended) is connected. In addition, this ignition system is an antinoise product, but please isolate it completely from the airframe operating receiver, the servo, and the battery or set apart to avoid mounting trouble.

Moreover, it is desirable to utilize a noise filter (line filter) etc.

* Since high tension is generated, be careful of electrification enough.

For safety concern, it is preferable to keep more capacity than 6V-1,000mA.

6. Spark plug

Dimensions:

Hexagon width-across-flat => 14mm, Screw diameter =>10mm, Reach => 8.5mm, Spark-gap => 0.7-0.8mm

NGK-CM6 is equipped standardly.

For replacement, please replace with as reliable a product as NGK-CM6.

Since our four cycle engine uses a mixed gasoline, please decide the numbers of flights by yourself and clean the spark plug. Please replace, when it is degraded.

(Please consider the spark plug as consumable items.)

7. Carburetor

A carburetor exclusively for our four cycle gasoline engine is mounted.

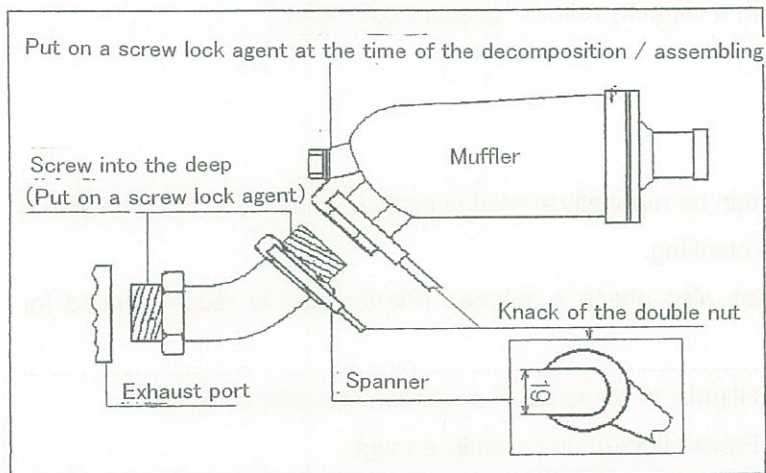
Since this carburetor has a negative-pressure type fuel pump, how to mount the fuel tank is not limited. Moreover, the negative pressure to operate the pump is detected from the intake manifold. Therefore, superfluous piping is not needed and the carburetor is not easily soiled.

Caution: If the fuel remains in the carburetor after the flight, the components made from rubber, such as a diaphragm, will be degraded more rapidly. When stopping the engine, stop it with fuel cut and see that the fuel does not remain in the carburetor.

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The gasoline engine carburetor is elaborate and delicate. Please never disassemble it, not to mention purification of the gasoline to be used. If out of condition, please be sure to send it to our service.

8. Engine mounting and muffler attachment



Although FG-30 is normally mounted in an inverted position, it can be upright or side mounted. When mounting the engine, please be sure to use the attached mount. If a mount with low radiating effect or a low-strength mount is used, its performance cannot be delivered. The fire wall to which to attach the engine mount should be also strongly built. (A wall with insufficient strength may cause vibration, preventing the engine performance. Such a wall is also dangerous because it may cause destruction.)

When mounting the engine, it is preferable to apply some screw lock agent on the tip of M4 cap screw to avoid looseness.

To ensure that cooling wind passes through the engine and muffler, the cowling should be devised.

Insufficient cooling may cause engine trouble or muffler looseness.

When attaching the muffler, please screw the exhaust pipe into the engine exhaust port and the muffler as far as its thread part will go.

As shown in the drawing, the muffler should be securely tightened with a screw lock agent etc. in the procedure to tighten up a double nut using two spanners.

(Adhesives, such as a screw lock agent, are effective against looseness and leakage.)

9. Preparation before engine start (assuming break-in)

- (1) Please mount the engine on a robust and parallelized test bench or on the airframe. (In either case, the engine should be fixed and immobile.)
- (2) Check whether the throttle valve becomes fully closed and fully opened certainly.
(If not fully closed, it will be difficult to introduce the fuel at the time of manual start.)
- (3) Check whether each wiring of the ignition system is connected certainly.
- (4) Use a 350-450cc tank for the test bench. In the case of the airframe, use the mounted tank.
- (5) For piping, only connect the carburetor with the tank.
- (6) For fuel, prepare a mixed gasoline with a capacity ratio of "gasoline: oil =20:1."
- (7) Prepare an **16×8 APC** x8 propeller

* Propeller attachment location

Since our four cycle gasoline engine can be manually started in positive rotation, fix the propeller in the location which facilitates vigorous clanking.

- (8) When starting with the starting motor, also attach a spinner. (Starter start is recommended for safety.)

Note: Please tighten up once in about 10 flights. In particular, if a wooden propeller is used, compression can loosen the nuts. Please tighten up carefully enough.

- (9) It is hard to know the peak condition of a four cycle engine unlike two cycle engines. In order to prevent overthrottling or overheating, it is recommendable to use a rotating meter.
- (10) Prepare a gasoline fuel pump. (Be sure to attach a filter to the admission port. It is available as an option.)
- (11) In order to check discharge of the breather, attach a heat-proof and gasoline-proof transparent tube.
- (12) In starting with a starter, prepare a starter and a battery.

Warning: If an onlooker is in front, be sure to move the person behind. (Please keep clear of exhaust smoke for health)

Be careful of the propeller for one arm holding the airframe. When the engine starts, be sure to go behind to adjust the engine. If the airframe can be fixed, it is safe to make the assistant hold the airframe. Since the airframe is large, pay enough attention to safety.

10. Method of starting the engine

The following procedure is based on the assumption of mounting the engine in the airframe. Moreover, the tank is filled up.

(The switch of the ignition system is turned ON when starting the engine. It is turned OFF when

introducing the fuel or in normal times.)

Start by the starter (for safety, this method is recommended.)

(1) Turn ON SW of the transmitter first, then turn ON

SW of the receiver, and check the operation of the throttle and others. Then, position the throttle stick in full open.

(2) Next, power on the ignition system.

(3) Open the throttle valve about 1/4 from full close with the throttle stick.

(Start with the throttle overopened is dangerous because the airframe will jump out).

(4) By revolving the propeller for about 5 seconds with the starter, it will start.

11. Break-in of engine (Please confirm the main needle valve and the low speed needle valve by the diagram.)

Break-in must be performed with great care as it is an important process to allow engines to exhibit their highest performance. In this process, it is vital to distribute lubrication oil to each part of the engine, to confirm contacts on moving parts and to ensure stabilized peak load operation. Thus, overall stability should be maintained after carburetor adjustment is completed.

* Since the slow needle for the carburetor is set nearly at an appropriate value, break-in operation can be performed only by adjusting the main needle. However if a sufficient concentration can not be obtained by turning back the main needle, turn back the slow needle, too. Then, reset the needle at a target value before carburetor was adjusted.

(1) After filling the fuel tank, start the engine according to the procedure in Item "10" above, and maintain it operating for about five seconds.

(2) Gradually turn the main needle back further while keeping the throttle valve fully open, and perform low speed operation using at least two tanks of fuel with such a concentration as to avoid engine stall (when a sufficient concentration can not be obtained, turn back the slow needle too, as mentioned above).

(3) Again after filling the fuel tank, and with the throttle valve fully open and the main needle closed, start operation at an intermediate speed before reaching the peak value, using half tank of fuel.

(4) From the operating condition in Item (3) above, narrow down the main needle to obtain the peak, and then perform 10 times of low speed operations with a high concentration for two to three seconds, then obtaining the peak.

(5) While keeping the peak in the operating condition in Item (4) above, perform 10 times of response tests for a speed range from low to high speeds by adjusting the throttle valve this time, so as to gradually extend the time interval for high speed operation. And when a stabilized peak operation is maintained for about one minute, initial break-in is completed.

(6) After re-fastening of each screw of the engine prior to carburetor adjustment, perform tappet gap adjustment as per the procedure in Item (13) E (when the slow needle is turned back, reset to the standard value).

(7) After adjusting the carburetor according to the following procedure, perform about 20 flights to complete the break-in flight. (To the extent of not affecting the flight, supply little more fuel, but not like a glow engine.)

* The above break-in procedure is an example, on the basis of which, users may develop their appropriate method to their own satisfaction.

Caution for flight: At first, select a distance to enable to return to the airfield in the case of an engine failure, face the wind and take a high altitude.
 If flight is performed at a low altitude from the beginning, the airframe may be broken during an emergency landing due to an engine trouble.

12. Adjustment of carburetor

* The low speed needle is set so that idling rotation may be 1800rpm to 2100rpm at the time of shipment.

In principle, a carburetor is adjusted by first achieving peak (the highest revolution) with the main needle valve and then performing idling (low speed revolution) with the throttle valve and the low speed needle valve. (Unless the peak is certainly achieved, idling adjustment will be difficult and not stabilized.)

- (1) After filling up the fuel tank, start the engine in the manner of Section I and then fully open the throttle valve with the throttle stick.
- (2) By turning the main needle valve with the carburetor adjustment bar depending on the rotating meter and the exhaust sound, achieve peak carefully.

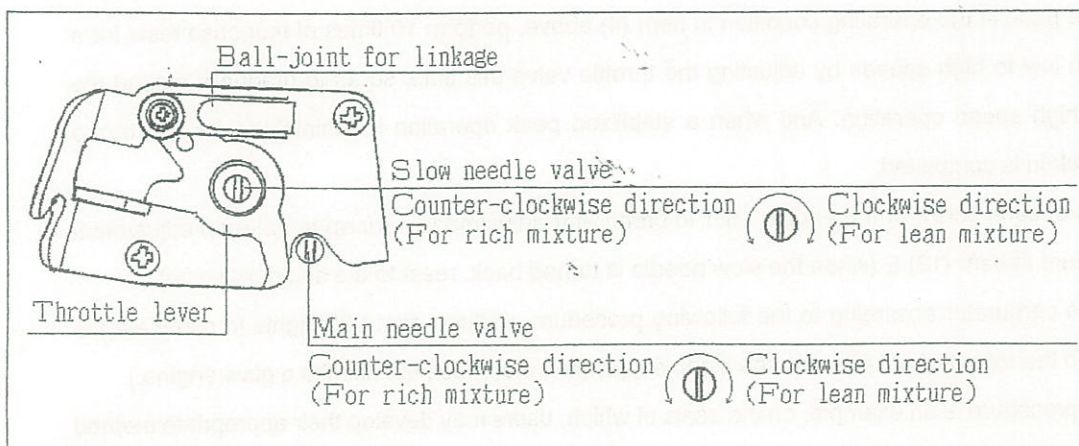
Warning: Overclosing the main needle valve is very dangerous because it may cause knocking and propeller nut loosening. Immediately, turn the main needle valve counterclockwise to loosen it a little.

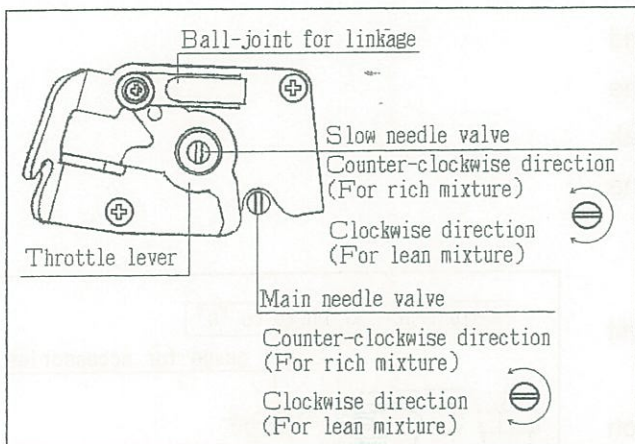
- (3) Next, close the throttle valve until the engine operates stably with an idling rotation of around 1,700rpm, and adjust the low speed needle valve with the carburetor adjustment bar and the opening of the throttle valve with the throttle stick carefully.
- (4) After the idling is determined, get the throttle valve slowly fully opened. If the revolution becomes slow or goes up suddenly, adjust carefully until it changes linearly from idling to peak, by fine-tuning with the low speed needle valve.
- (5) After the above-mentioned adjustment is completed, perform the process from idling to peak quickly. If the revolution does not achieve peak but get delayed as the throttle valve is fully opened, fine-tune the main needle valve and perform the process from idling to peak quickly. Repeat this carefully until the response improves.

* Giving a leeway to the engine without eventually affecting the flight is a knack to increase the engine life.

Adjustment is needed depending on the engine attachment direction, the propeller, the fuel, the plug, the climate condition, etc.

During the flight, please fine-tune so that low speed, medium speed, and high speed match best with the airframe.





* The target value of carburetor adjustment (throttle-valve fully closed)
(When fully closing, do not tighten too strongly.)

If adjustment of the main needle and the low speed needle does not do well, please conform to the following target value and then adjust again.

- ⊙ Main needle valve: Turn back from full close by approx. 2 and 1/3 revolutions.
- ⊙ Low speed needle valve: Turn back from full close by approx 4¹/₅ revolutions.

13. Noise check (required)

A gasoline engine generates a noise which has an adverse effect on RC adjustment unlike a glow engine. Please be sure to carry out a noise check each time before the flight after engine start.

Since a noise which occurs during flight may lead to a large-scale accident, please carry out a noise check without fail.

As a simple noise check, after engine start, remove the antenna of the transmitter and operate it about 50m away from the airframe. If there is no malfunction, it is normal.

Moreover, it is preferable to obtain advice from an expert of gasoline units.

14. Normal operation, maintenance, and additional information

- (1) Please charge the battery of the ignition system and RC device enough.
(Since an ignition system generates high tension, please be careful of electrification.)
- (2) For discharge of the waste oil (breather), connect a heat-proof and gasoline-proof tube to the breather nipple to eject the waste oil, or diffuse it together with exhaust.
- (3) Lubrication for piston, connecting rod, bearing or cam gear is a blow-by lubrication in which the oil in the fuel goes into the crankcase from the clearance between the cylinder and the piston. Therefore, the engine life is affected by the property of the fuel oil. Please use a reliable oil.
- (4) Since overclosing the main needle valve causes overheating, adjust a little more loosely than peak.

(Overclosing leads to knocking or engine failure and has an adverse effect on the connecting rod and the cam gear.) The case where the airframe achieves peak completely at the time of ascent is a proper peak of the engine during flight.

(5) Adjustment of tappet gap (see the drawing)

When the break-in on the ground is completed, adjust the tappet gap (valve clearance). (Subsequently, determine the frequency of flight or the hour of use on one's own and adjust the tappet gap periodically.)

Adjustment of the tappet gap is performed when the engine has got cold.

How to adjust: remove the plug and the locker arm cover and revolve the propeller slowly in the direction of positive rotation by hand.

The intake side rocker arm stops, and by turning it, the piston achieve the compression top dead center.

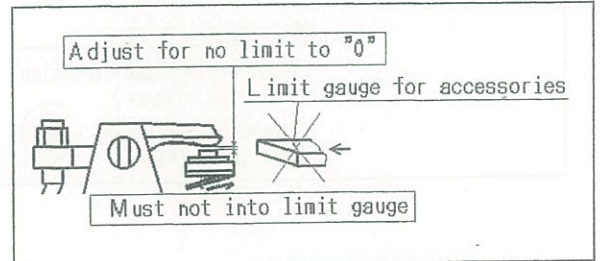
In that position, adjust with the attached spanner and hexagonal wrench so that it may be set to almost zero in the presence of compression.

After the gap is checked, tighten the lock nut securely.

(Don't tighten too strongly.)

* A little clearance is given supposing the elongation of the valve in the case of the engine of a real vehicle. In the case of our engine, however, during operation, the cylinder (aluminum die casting) elongates more than the valve, and the clearance is larger. Therefore, in cold condition, it is necessary to bring the clearance close to zero.

Subsequently, sometimes inspect it in the above-mentioned procedure, and, if the attached gage (a limit gauge with 0.1mm of thickness) can enter, the clearance is the maximum, needing adjustment. The tappet gap is the most important factor in the maintenance of four cycle engines, and operation with an excessive clearance will degrade performance. In particular, a large gap aggravates abrasion of the tappet and the cam and also increases the unusual sound.



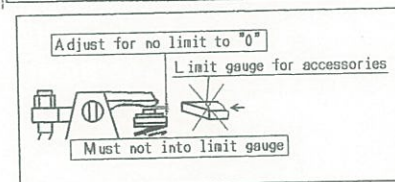
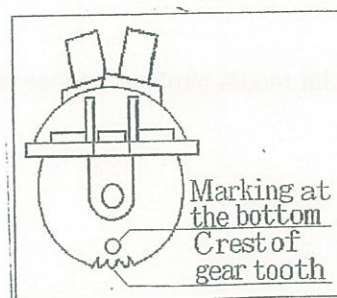
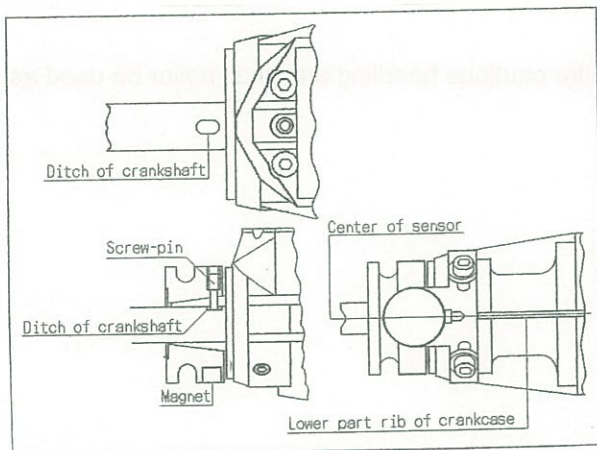
- (1) When mounting an exhaust vibrator or propeller nuts to the cylinder, apply a small amount of screw lock on screws in advance to prevent leakage or loosening.
- (2) Propeller nuts and exhaust nuts (when hot) should be re-fastened from time to time.
- (3) Before operating the engine, be sure to perform warm-up for about one minute with a high concentration, while it should be stopped after cold operation also with a high concentration. This practice will extend the service life of your engines. It is also recommended to shutdown fuel supply to engines when stopping them after final flight of the day, so that no fuel remains in the carburetor. Be sure also to drain fuel from the tank after finishing the flight, so that there will be no fuel left during storage.
- (4) Engines shall be adequately cooled down after operation.
- (5) Fine adjustment of the main needle and the slow needle for each operation will improve stability.
- (6) Periodic re-fastening of each screw of engines is recommended to ensure safe operation as it is liable to get loosened due to high temperatures of gasoline engines during operation.
- (7) Pay due attention to prevent accidents during storage of batteries and fuels.
- (8) If not used for a long time, remove plugs, rear cover and head cover of the engine, and adequately clean them with alcohol together with lubrication, then assemble them as in the original condition and store the engine covered with a vinyl sheet.
- (9) Take adequate care to ensure safety and also not to cause inconvenience to others such as noise or exhaust air.
- (10) Although intended for model airplanes, these engines require cautious handling and shall never be used as a toy.

15. Cautions on disassembling and assembling the engine

It is not recommendable to disassemble or assemble the engine, however, if you try it, please conduct the work carefully paying attention to the following points.

In addition, never disassemble the carburetor and ignition system.

- ① When disassembling, check the direction of every part, put a match mark for each part in your own way (using a felt pen), and proceed the work in good order. In addition, every part must be cleaned up. Particularly, pay attention to valve's timing, valve's inlet and exhaust, piston direction, con rod direction, etc.
- ② Loosen cylinder screws at opposite sides in about 3 times, not loosening one screw at once. (loosing a screw at once may cause the distortion.)
- ③ Perform the assembling work in the way reversal to disassembling work. At this time, apply oil at the tip of screws and tighten them... (Note that if screws are tightened in the dry state, female screws may be easily damaged. Screws are also required to be lubricated.)
- ④ For cam gear, put a match mark at right under (keeping a gear tooth at the crest), and match the top dead center of the crankshaft (The gear tooth on the extension of the crank pin must be kept at the root position).
- ⑤ For the best result, mount piston, con rod, locker arm, pins, bush rod, tappet, etc. at their original position. (A pressure mark is provided for each common part.) At the time of assembling, apply oil on each part, and assemble the engine in good order, checking each match mark and direction, not tightening too much.
- ⑥ When setting the drive flange on the crank shaft, be sure to check before fastening that positioning pins are properly set on the crank shaft groove. Also ensure that the center of sensors is placed on the elongation of the rib beneath the crank case.



Three principles of assembly

- 1) Clean up every part
- 2) Apply oil on every part
- 3) Tighten screws at opposite sides evenly (do not tighten too much)

Three principles of disassembly

- 1) Put a match mark on every part
- 2) Do not make a mistake in a direction
- 3) Loosen screws at opposite sides evenly

SAITO FG-30 Parts List

NO	Description	Q'ty
01	Cylinder (left)	1
06	Piston	1
07	Piston pin	1
08	Piston pin retainar	2
09	Piston ring	1
10	Connecting rod	1
14	Cylinder screw set (14-1, 14-2, 14-3, 14-4)	1set
15	Crankcase	1
17	Rear cover	1
19	Breather nipple	1
20A	Front bearing	1
22	Rear bearing	1
23	Crankshaft	1
27	Taper collet & Drive flange (27-1, 27-2)	1ea.
28	Prop washer & Nut (28-1, 28-2)	1ea.
31	Crankcase screw set (31-1, 31-2, 31-3)	1set
32	Engine gasket set (32-1, 32-2, 32-3, 32-4, 32-8, 32-9)	1set
33	Cam gear housing	1
35	Cam gear	1
36A	Cam gear shaft	1
37	Steel & Washer set (37-1, 37-2)	1set
38	Tappet	2
39	Pushrod	2
40	Pushrod cover & Rubber seal (40-1, 40-2, 40-3)	2ea.
41	Rocker arm	2

NO	Description	Q'ty
42	Rocker arm screw & Nut (42-1, 42-2)	2ea.
43	Rocker arm pin	2
44	Rocker arm bracket (left)	1
45	Rocker arm bracket (right)	1
46	Valve (in & out)	2
47	Valve spring & Keeper & Retainer (47-1, 47-2, 48)	2ea.
48	Valve retainer (Cotter)	4
49	Rocker arm cover	2
69	Intake manifold	1
74	Muffler	1
75	Muffler manifold (75-1, 80)	1
80	Muffler nut	2
82-1	Carburetor complete	1set
83-1	Carburetor body assembly	1set
	82-1-1, 82-1-2, 82-1-3, 82-1-4, 82-1-5, 82-1-13	
90	Carburetor screw & spring set	1set
	82-1-9, 82-1-10, 82-1-11, 82-1-12	
91	CaCarburetor gasket set (82-1-6, 82-1-7, 82-1-8)	1set
93	Intake velocity stack	1
95	Engine mount set (95-1, 95-2, 95-3, 95-4, 95-5)	1set
110	Anti loosening nut	1
152	Screw-pin (For drive flange setting)	1
153	Electronic ignition system	1set
	153-1, 153-2, 153-3, 153-4	

