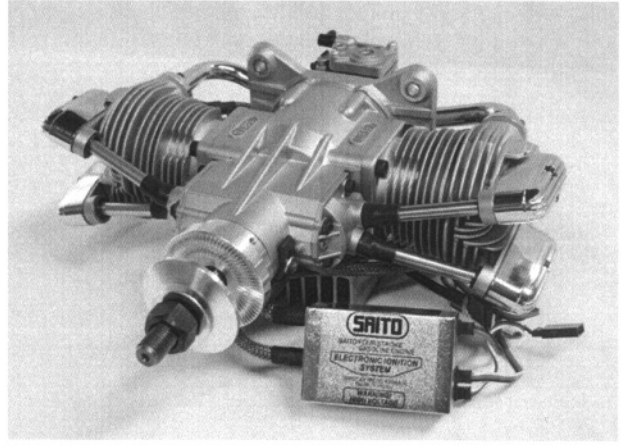




SAITO FG-57TS

4-Stroke Gasoline twin Engine Operating instructions

Thanks for buying SAITO FG-57TS 4-stroke gas-engine exclusively for model airplanes.
 In order to avoid misuse, please be sure to read well this instruction manual carefully. 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 manual 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-57TS is the updated model exclusively for Acrobatic flight based on FG-57T which has been gotten good reputations from many scale flyers. The standard equipments such as stand-off mount and heatsink make installation easier and bring it durability against heat during your active flight. Of course, its reliability and beautiful twin sound have been taken from FG-57T.

Notification about treatment of 4-stroke model gas-engine

- ◎ Since valve timing is designed to get high power and high speed, the overlap range is relatively wide. So sometimes fuel get flown back from the carburetor. (It may spatter in the engine room.)
- ◎ Since the oil for lubrication is mixed in the fuel, waste oil from the breather nipple is dirty. Depending on treatment of waste oil, it can be spattered on the plane. (Ref. chapter 9)
- ◎ Since lubrication is through breather, sometimes the oil oozes from each joint or commissure however it's no problem on performance.
- ◎ Depending on the quality of the oil, sometimes there can be rust inside the crankcase. But it's no problem on performance as long as there are no abnormal noise or backlash.

Specifications

Bore	Ø36.0mm x 2	Stroke	28.0mm x 2	Disp.	57.0cc
Weight	Body: 2,090g / Muffler: 90g / Ignition system: 170g Engine mount: 80g (20g x 4)				
Practical speed	Approx. 1,500-7,000rpm	Max on Gnd	Approx. 6,000~7,000rpm		
Propeller	D21"x23"~P10"x11"	Static thrust	Approx. 6~8kgf (Depend on prop)		
Fuel	Regular gasoline: Oil=20:1 (Volume ratio)	Applications	Gas-engine 50cc class		
Fuel consumption	Approx. 35cc/min (At full throttle 6,500rpm) *Fuel flow varies depends upon prop load. More fuel flow with larger load and less fuel flow with smaller load.				
Battery for ignition system	Voltage: 6-9V higher than 1,000mA is recommended				
Standard accessories	Engine mount set (Stand-off 35mm)	4pcs	Aluminum prop washer (w/steel washer)	1set	
	Ignition system (w/ sensor)	1set	Spanner 19mm	1pc	
	Spark plug [NGK CM-6] (Attached to engine)	2pcs	Limit gauge (0.1t) for tappet adjustment	1pc	
	Muffler set (2 Flexible mufflers & Bracket)	1set	Spanner for tappet adjusting lock nut	1pc	
	Carburetor adjustment bar	1pc	Hexagonal wrench set	1set	
	Choke bar	1pc	Plug wrench	1pc	

1. Propeller

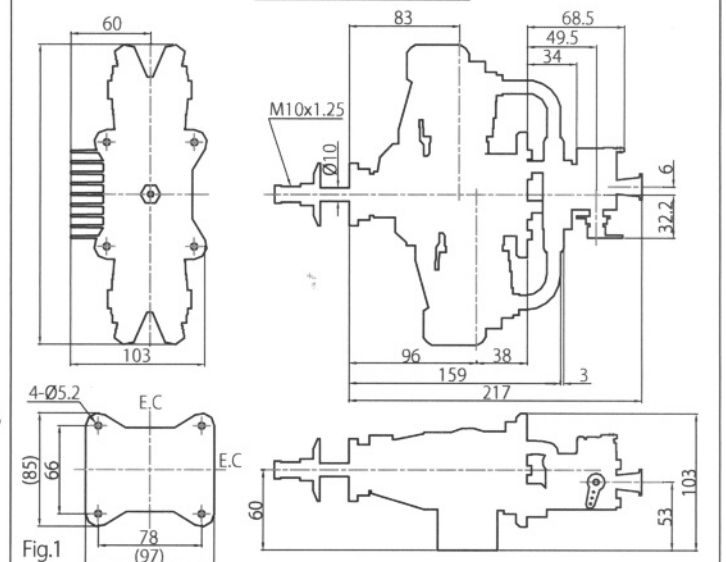
Depending on the airframe, please adopt the standard size in the data and use a reliable product which is generally on the market. (Carbon prop is recommended)
 Since a large-diameter prop is used, please maintain sufficient balance. Since an imbalanced prop is vibratory and dangerous with lowered performance, please maintain balance with a balancer. Moreover, a cracked prop is dangerous. Make sure to check any time and replace it with a new one if it's cracked.

*Prop and fuel consumption

If the load is large (the diameter & pitch of the prop is large) for the engine characteristics, the air-fuel mixture should be rich. Thus the main needle has to be opened. That is, even if the revolution is low, the fuel consumption is high. Conversely, when the load is small and the revolution is high, the fuel consumption is lowered because the main needle can be 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, an airframe which can only deliver performance in fully open condition will suffer worsening fuel consumption and life.

Outside dimensions



2. Fuel

The fuel is mixture of commercial regular gasoline and reliable oil for 2-stroke. (Unleaded high-octane gasoline is not necessarily required for SAITO engine.)

[Example of oil]

- POWER LUBE (KLOTZ ORIGINAL TECHNIPLATE)
- KLOTZ GS RC model LUBE
- CASTROL POWER1 TTS Racing, etc.

For the mixture ratio, please be sure to use "gasoline : oil = 20 : 1" or richer by volume ratio. (ex. 1000ml of gasoline should be mixed with more than 50ml of oil).

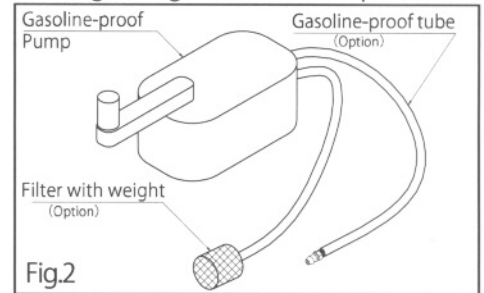
Any damage caused by the fuel used, in which the oil ratio is lower than 20:1 ratio, is not warranted.

Since gasoline is dangerous material, be careful of its storage, use, and transport enough. (The evaporative emission and exhaust smoke of gasoline have a harmful effect on a human body. Also, if gasoline is leaked, there is danger of fire etc.) Please note that we take no responsibility for accidents, health damages, etc which occur during storage, use and transport of gasoline.

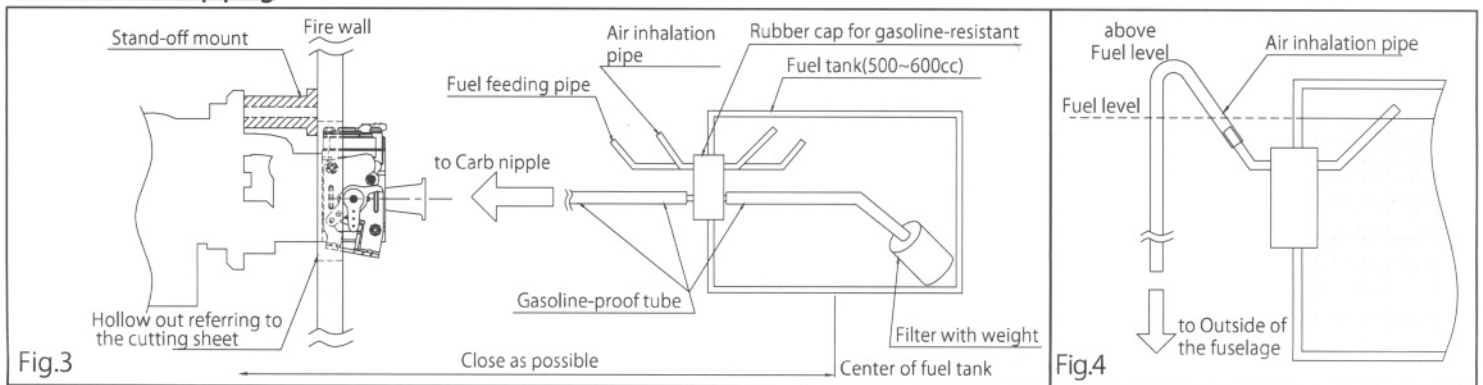
3. Fuel Filter and fuel pump

Since commercial gasoline has many impurities, please be sure to use a reliable filter for the admission port of the gasoline-proof fuel pump (Fig.2), and in the fuel tank as well (Fig.3). Without using a filter, the performance of the carburetor is not delivered, resulting in failures.

Using optional part "Filter with weight" is highly recommended.



4. Fuel tank and piping



For the capacity (about 500cc-600cc), refer to the data and select the best of commercial product. Please be sure to use a filter with weight. To avoid entrain any impurities to the carb, piping with "Fuel feeding pipe" and "Air inhalation pipe" (Fig.3) is recommended.

*Please be sure to use "gasoline-proof" products for the tank lid rubber, piping, and tubing. Some of the products for glow fuel can't be used for gasoline. Please check carefully if there're any crack on the piping, tubing, connection, and tank.

All of the connection parts should be bound by thin Nylon strap or wire to avoid fuel leakage or air induction to the fuel line. (If there are any leakages, the performance of the engine decreases dramatically.)

*When performing an acrobat with a large change in fuel level or that requiring an excessive movement of throttle, the tank must be placed at a position close to the engine as much as possible.

*When provide "Air inhalation pipe" as Fig.3, arranging the tube above the fuel level (Fig.4) is the effective way of fuel leakage prevention.

*The carburetor of FG-57TS comes out from the back of the firewall. Sometimes fuel get flown back from carburetor and may spatter inside the firewall. For that case, make sure to cover the batteries, R/C equipments and all the foam members with gasoline-proof material.

5. Spark plug

NGK CM-6 spark plug is the standard equipment. Dimensions are as follows;

Hexagon width: 14mm Screw size: 10mm Reach: 8.5mm Spark-gap: 0.7-0.8mm

For replacement, please replace with a reliable product as NGK CM-6.

Since SAITO 4-stroke engine uses mixed gasoline, please decide the numbers of flights by yourself to clean the spark plug. Please replace, when it is degraded. (Consider the plug as consumable.)

6. Ignition system

***Be careful of possibility of electrical shock as it generates high voltage.**

*The unit includes a plastic clip to hold the connectors and spiral tube to protect each wire.

The ignition system is designed to match SAITO 4-stroke gas-engines with automatic advancing system.

However this ignition system is designed to be an anti-noise product, please isolate it completely from the receiver, servo, and battery to avoid a radio-interference trouble. Moreover, it is desirable to utilize a noise filter (line filter). Especially, each switch (for Ignition and for Receiver) should be isolated and set far from each ones.

Caution: A gas-engine generates a noise which has an adverse effect on RC adjustment. Please be sure to carry out a noise check each time while the engine is running before flight. 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 method, after starting engine you can check by removing the antenna of the transmitter and operate it about 50m away from the airplane. If there is no malfunction, it is normal.

The function of each cord:

(1) Plug cord (meshed high tension cord)

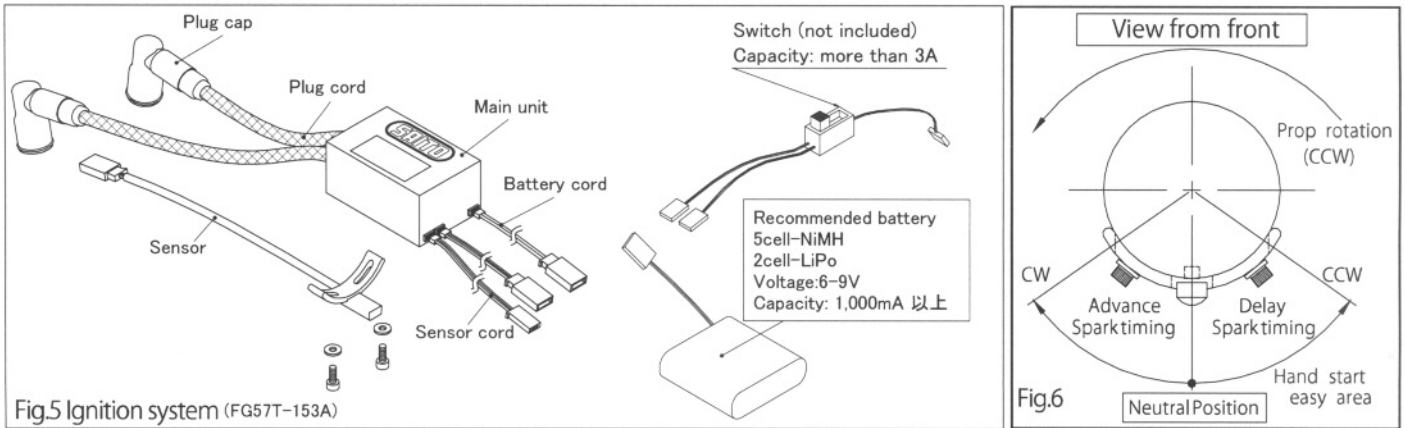
As Fig.5 shows there are two cords available for two cylinders. When you put on the plug cap, insert it to the plug until you can hear clicky sound to avoid coming off during flight. And then pull the plug cap to make sure that it won't come off.

(2) Sensor cord (black /red/white cord)

Connect with the cord from the sensor attached to the engine.

(3) Battery cord (black/red cord)

Please use the fully charged battery that has adequate spec. (6-9V, more than 1000mA is recommended.). Between the battery and main unit, make sure to set an ignition switch whose capacity is higher than 3A.



7. Sensor position and Power / Starting easiness;

The ignition sensor can be moved to CW (advance the spark timing) or CCW (delay the timing) as Fig.6 shows.

At the factory default the sensor is fixed on the center (neutral) position. The reason is related to the methods of engine starting.

•With an electric starter-You can start wherever the sensor is fixed.

So you can set the sensor as the rpm reaches maximum speed.

•By hand flip (Manual start)-Starting easiness depends on the sensor position.

The factory default is set as you can start by hand flip and also get highest rpm in that range as possible.

If you prefer easiness of hand starting, move the sensor to CCW direction to delay the spark timing. But then the maximum rpm will slightly decline.

If you prefer power (highest rpm), move the sensor to CW direction. But then you can't start by hand flip but only with starter.

In addition by the feature of the ignition system, it heats up with engine running. When you restart the engine by hand flip, you should open the throttle valve slightly while it's hot. And it's better to enlarge the choke without wetting the plug.

For safety we recommend to use an electric starter.

8. Carburetor

Equipped with a suitable carburetor by technical cooperation with "Walbro" that provides highly reliable carburetors for other gas-engines. Please refer to Fig.9 and Chapter 13 regarding adjustment of the carb.

Note: 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 you stop the engine, stop it with fuel cut and see that the fuel does not remain in the carburetor.

The carburetor for a gas-engine is elaborate and delicate. Please never disassemble it. If it's out of condition, please consult the shop you bought from.

9. Engine mounting, muffler attachment, and breather waste disposal (Fig.7)

FG-57TS can be installed flexible in the axial direction by varying the length of stand-off mounts. As the carb comes out from back of the firewall, hollow out the firewall as possible as minimum referring to the cutting sheet included. Make the firewall robust enough because this part has to endure vibration and torque caused by prop rotation. Especially with a low load prop, engine tend to generate large vibration that is very dangerous.

It is preferable to apply some adhesives (such as screw lock) on the tip of each cap screw to avoid looseness when you install the engine.

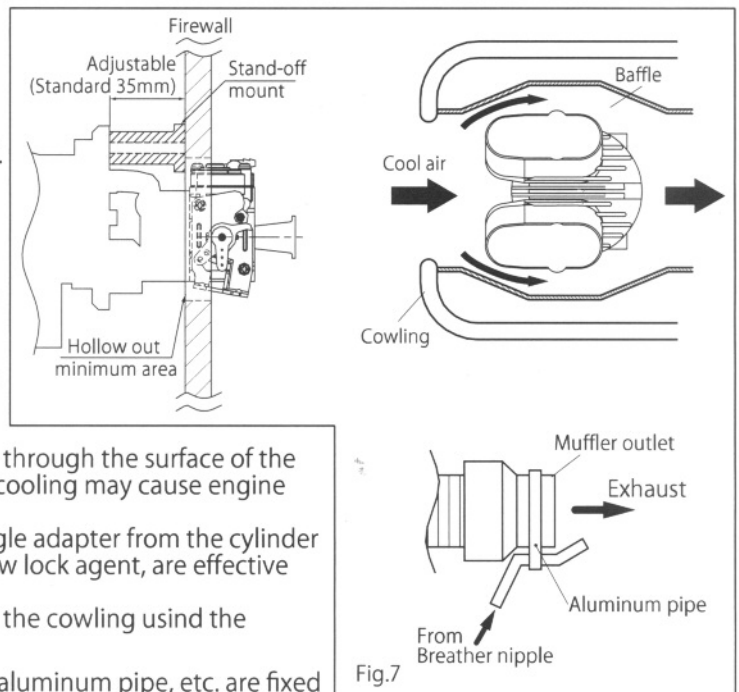
To ensure that cooling wind passes through the engine, the cowling should be devised. Also make the air flow outlet larger than the inlet.

Building some baffles inside the cowling to flow the cool air through the surface of the engine effectively that is highly recommended. Insufficient cooling may cause engine trouble such as overheat or muffler looseness.

The mufflers should be securely inserted deeply into the angle adapter from the cylinder and tightened up using spanners. (Adhesives, such as a screw lock agent, are effective against looseness and leakage.)

Make sure to fix the outlet of the flexible mufflers outside of the cowling used the bracket included.

For breather treatment, there is also a method in which the aluminum pipe, etc. are fixed at the muffler outlet to diffuse the hot air together with exhaust gas into the air. (Breather may function by simply ejecting the tube from the engine).



10. Preparation for engine start (assuming break-in)

- (1) Mount the engine on a robust and parallelized test bench or on the fuselage. (Either way, the engine should be fixed and immobile.)
- (2) Check whether the throttle valve becomes fully closed and opened certainly.
- (3) Check whether each code of the ignition system is connected certainly.
- (4) Use 500-600cc tank for the test bench, or a tank which has appropriate capacity for the fuselage.
- (5) For piping, only connecting the carburetor with the tank is needed. (Make sure there're no leakage at all the connections.)
- (6) For fuel, prepare a mixed gasoline with a volume ratio of "gasoline : oil" = "20 : 1" or richer than that.
- (7) Prepare a well balanced 22"x 10" carbon-made prop (Mejzlik is recommended).

*Prop attachment position

Since SAITO 4-stroke gas-engine can be manually started in forward direction of the rotation, fix the prop in the position which facilitates vigorous cranking.

Note: Please tighten up the prop regularly at least once in ten flights. Especially for a wooden prop, it tends to compressed so that the nuts are rather easy to be loosen so please confirm carefully that the nuts are tightened adequately.

- (8) When starting with an electric starter, also attach a spinner. (This way of start is recommended for safety.)
- (9) As it is difficult to judge clearly the peak condition of 4-stroke engines, prepare a tachometer to prevent over-throttling or overheat.
- (10) Prepare a fuel pump for gasoline. (Be sure to attach a filter to the intake 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) Prepare a battery for the electric starter and the bar for carb adjustment & choking (standard accessory).

Caution: If there's anyone stand in front of the engine, be sure to have them move behind the airplane before starting the engine. Also keep in mind that the exhaust smoke is harmful for health. Keep away one of your arm holding the airplane away from the prop. Once the engine starts, move behind the airplane. Make needle adjustment or other control from rear. If the airplane cannot be fixed, ask your assistant to hold the airplane for safety.

11. Method of starting the engine

The following is the procedure with the engine mounted on the airplane. Fill up the tank with fuel. (Be sure to turn off the switch of the ignition system until just before trying to start up the engine.)

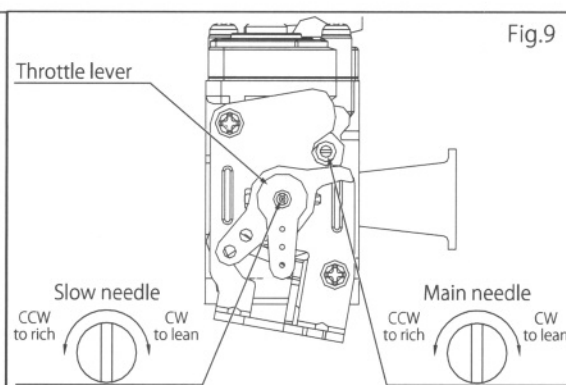
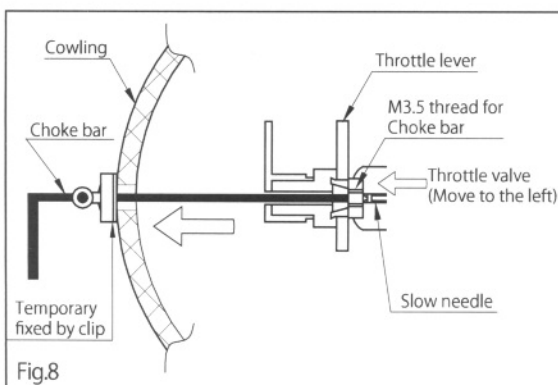
(A) Starting method with a starter (Recommended)

- (1) After confirm that the throttle stick is located at the full-close position, turn on the transmitter switch. Then turn on the receiver switch to check throttle valve and other operation. After that, fully close the throttle valve.
- (2) Power on the ignition system.
- (3) Open the throttle valve about 1/4 from the full close position by using the throttle stick. (Starting with excessively opened throttle is dangerous since the airplane jumps forward.)
- (4) Apply the starter to the prop and activate for about 5 seconds to start the engine.

(B) Manual starting method (For safety, wear gloves and use a safety stick)

- (1) Same as (1) noted above. (The throttle valve must be fully closed. Otherwise, the fuel cannot be manually introduced.)
- (2) As shown in Fig.8, pass the choke bar (with M3.5 thread on its tip) thorough the hole in the cowling. Then turn the bar to insert into the M3.5 internal thread at the center of the throttle lever.
- (3) Pull the choke bar and fix it by using a clip or clamp as shown in Fig.8 so that it may not go back to the previous position.
- (4) Grasp the prop by hand and turn it to the forward direction (CCW) for several times, until the carburetor generates hissing-like sounds.
- (5) After hearing this sound for about 5 times, quickly flick the prop by cranking it some 10 times. Then choking is completed.
- (6) Remove the choke bar.
- (7) Power on the ignition system and open the throttle valve about 1/4 from the full close position by using the throttle stick. (Starting with excessively opened throttle is dangerous since the airplane jumps forward.)
- (8) Flick the prop quickly and engine will start. If the engine doesn't start, repeat the choking procedure (1) to (7).

*After starting, run the engine for 10 to 20 sec to fill up inside the carb with fuel enough before opening the throttle.



Standard value for the needles

In case such like follows, reset the needle to the Standard value (SDV).
•After break-in
•When adjustment can't be done correctly.
•When by failure, turning the needle too much.
To set SDV, first fully close the needle. (DO NOT close too tightly. The needles can be torn easily).
After that open the needle to SDV as follows. Throttle valve should be fully closed during setting to SDV.

SDV for Main needle:
2 turn open from full close

SDV for Slow needle:
4.5 turn open from full close

12. Break-in

As Break-in is an important procedure to pull out the maximum performance of the engine, it must be cautiously done. The purpose of break-in is initial lubrication and adjusting of the mobile parts under the condition with rich fuel mixture. Never make the fuel mixture lean. Lean fuel mixture could cause seizure even during idling or low speed running. There's no need to adjust the slow needle at this step as it's already set adequately, so you will adjust only the main needle during break-in.

Procedure;

- (1) After filling up the fuel tank, start the engine as described in the above Chapter 11 and run it for 10 sec in low speed.

- (2) Open the main needle 2 turns from that state and use the throttle stick to fully open the throttle valve. If rich air-fuel mixture can't be obtained, open the main needle additionally. Then continue running for more than 1 tank. During this initial operation, contact of each part inside the engine will be matched. So make the fuel mixture rich as much as the engine doesn't stop. Do not care about running smoothness at this step.
 - (3) Refill the tank and run the engine with the main needle to achieve peak and less speed (richer) alternately about 5 times. And then maintain the peak condition long gradually. When it gets stable, then operate the throttle stick to vary slow speed to high speed several times to check the response. After that run it for 1 tank keeping high speed.
 - (4) When it comes to run smoothly at peak, break-in on the ground is completed. Then perform tappet adjusting referring to Chapter 14 and adjust the carburetor referring to Chapter 13. After that, fly it for about 20 times in rich condition to finish break-in in the air.
- Also after break-in, please run the engine in rich condition as long as it doesn't affect to the flight.

Note: During early stage of flights, take the height high enough to land safely in case the engine stop in the air suddenly. It will reduce the risk of crash or landing accident.

13. Adjustment of carburetor

Since a gas-engine has narrow range of air-fuel ratio, adjustment of the needles is stricter than a glow-engine. And both needles are interfered slightly from each other so confirm the balance of peak and response after adjustment.

In principle, the carburetor should first achieve peak by adjusting the main needle. Then performing idling with the throttle valve and the slow needle. (Unless the peak is certainly achieved, idle adjustment will be difficult and not stabilized.)

*The slow needle is set as to keep around 1,500~1,800rpm at idling at factory default.

- (1) After filling up the fuel tank, start the engine as described in Chapter 11 and run it for 1 minutes in rich condition. Then fully open the throttle valve with the throttle stick.
- (2) By turning the main needle with the adjustment bar observing tachometer and exhaust sound, achieve peak carefully.

Caution: Too much throttling the main needle is very dangerous because it might cause knocking and the prop nut might be came off. Once you notice abnormal vibration or sound during throttling the main needle, just return to open the needle immediately.

- (3) Next, close the throttle valve until the engine runs stably with an idling rotation around 1,500rpm by adjusting the slow needle with the adjustment bar carefully. (During flight, it's rather stable with slightly high adjusted at idling.)

*The best richness of the air-fuel mixture at slow speed is depend on the flight style. Generally, Scale flight requires stability in low speed so slightly lean condition is preferable. On the other hand Acrobatic flight requires quick response from low through high, so slightly rich condition is preferable.

- (4) Once the idling is set, get the throttle valve fully opened gradually. If the revolution becomes slow or goes up suddenly, adjust the slow needle carefully until rpm raises linearly from idling to peak by fine-tuning.
- (5) After adjustment of (4) is completed, perform the process from idling to peak quickly. If revolution gets delayed to achieve peak even if the throttle valve is fully opened, fine-tune the main needle and perform the same process. Repeat this fine-tune and response check carefully until the response improves.

A tip for carb adjustment is to set the slow needle slightly lean as long as the engine doesn't stop when open the throttle valve quickly from low to high.

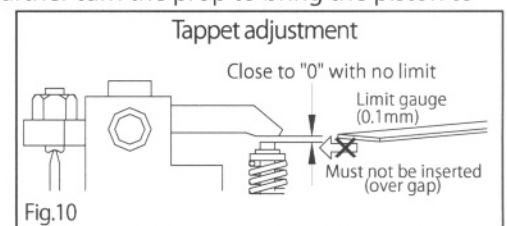
For the main needle, rich condition as far as it doesn't affect to the flight is a knack to increase the engine life.

The best tune varies depending on many factors such as weather, quality of the oil, prop, and so on.

During your flights, please perform fine-tune so that low-middle-high speed matches best with the airplane.

14. Normal operation, maintenance, and additional information

- (1) After completing ground break-in or operating the engine for 1 hour, adjust tappet gaps (valve clearances) by following procedure to compensate initial wearing, while the engine is cold (Fig.10). To perform it first, either cylinder is OK.
 - (a) Remove the plug and rocker covers from the cylinder.
 - (b) Turn the prop slowly forward by hand until the rocker arm of intake stops. Further turn the prop to bring the piston to the TDC (Top Dead Center) of compression stroke.
 - (c) Use the attached wrench and hexagonal wrench to adjust the gaps indefinitely close to zero within the range compression exists. If the gap is lower than 0, the valve has to be opened at all phases so the compression doesn't occur (then, loosen the screw to reset).
After adjustment, put on the spark plug and turn the prop forward to check if the compression is enough.
 - (d) On checking the gap, securely tighten (but not excessively) the lock nut.
 - (e) Do the same adjustment for the other cylinder.

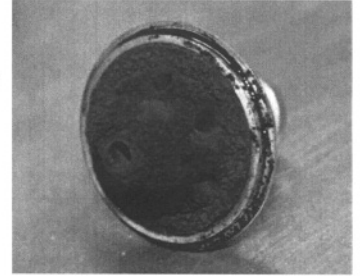


* In the case of the engines for vehicle, small gap is given to tappets to absorb valve elongation. However for SAITO engines, gap becomes larger during operations due to thermal expansion of the cylinder (made of aluminum). Therefore set the gap indefinitely close to zero when the engine is cold.

Note: Occasionally check tappet gap by those procedure. When the attached gauge (limit gauge, t=0.1mm) comes to be inserted, gap has been enlarged beyond the allowable limit. Make an adjustment to lessen the gap. Tappet gap is one of the most important factors in the maintenance of 4-stroke engines. Operating the engine with the tappet gap enlarged excessively will cause poor performance or troubles.

- (2) Just after start up the engine, perform warm up running in rich condition for about 1 minute, and just before stop run it at idling for 1 minute to cool down as well.
- (3) When stop the engine after the final flight of the day, be sure to stop by cutting the fuel to remove fuel from the carburetor. And remove the fuel from the tank and reserve it with special care.
- (4) Since the fuel contains more than 5% of oil, sometimes the exhaust valve gets dull by carbon or sludge especially in cold atmosphere. Then turn off the ignition switch and rotate the prop by electric starter. After dilute the oil content by this way, remove the fuel from inside the carb and the engine. It helps the valve to move smoothly.
Or, remove the rocker cover and applying some anti-rust spray to the exhaust valve is effective as well.

- (5) 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 piston. Therefore the engine life is affected by the property of the fuel oil. Please use reliable oil.
- (6) Charge the battery for the ignition system and RC device fully. (Since the ignition system generates high tension, be careful of electrical shock.)
- (7) Since over closing the main needle causes overheating, adjust a little more rich than peak. Over closing leads to knocking or overheat and has an adverse effect on the connecting rod and cam gear. Where the airplane achieves peak completely at the time of ascent should be a proper peak of the engine during flight.
- (8) When connecting the exhaust pipe to the cylinder or attaching the prop nut, apply thin coat of silicon rubber (not excessively) or adhesive on the thread section before tightening. This prevents leakage or loosening.
- (9) Because all of SAITO gas-engines use oil-fuel mixture, there tend to be carbon buildup inside the muffler as shown in the picture (single engine's).
It causes some problems on the exhaust outlet and consequently reduces the power. Therefore cleaning/removing carbon every about 50 flights is recommended. Using a parts cleaning spray is effective way. Actually, it depends on the quality of the oil so when you feel the power loss, please check inside the muffler.
In the case of the picture which had been done more than 70 flights, by removing the carbon buildup, the smoothness of the engine improved dramatically.
- (10) Occasionally tighten the prop nut and exhaust nut (while it is hot).
- (11) Please notice that our guarantee will not cover any breakage or trouble on the engine caused by user's disassembling or modification.
- (12) Notes for purchasing parts:
Please give orders to the shop you purchased from with a sheet with engine name, part name or number, and marking (alphabet on the lower face of rear cover).
- (13) Take an extreme care for safety when operating the engine or flying the model airplane not to bother others.
- (14) An engine for a model airplane is not a toy. Handle it with an extreme care.



All specifications and models are subject to change without notice.



<http://www.saito-mfg.com>

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SAITO FG-57TS Parts List

No.	Qty	Item	Qty
01	1	Cylinder (Left)	1
02	1	Cylinder (Right)	1
06	2	Piston	2
07	2	Piston pin	2
08	4	Piston pin retainer	4
09	2	Piston ring	2
10	2	Connecting rod	2
13	4	Connecting rod screw	4
14	1set	Cylinder screw set 14-1,-2,-3,-4	1set
15	1	Crankcase	1
17	1	Rear cover (Back plate)	1
19	1	Breather nipple	1
20	1	Front ball bearing	1
21	1	Main ball bearing	1
22	1	Rear ball bearing	1
23	1	Crankshaft	1
27	1set	Taper collet & Drive flange 27-1,-2	1set
28	1set	Prop washer & Nut 28-1,-2,-3	1set
31	1set	Crankcase screw set 31-1,-2,-3,-4	1set
32	1set	Engine gasket set 32-1,-2,-3,-4,-8,-9	1set
33-1	1	Cam gear housing (Left)	1
33-2	1	Cam gear housing (Right)	1
34	1	Cam gear (Left)	1
35	1	Cam gear (Right)	1
36	1	Cam gear shaft	1
37	1set	Steel washer set 37-1,-2	1set
38	4	Tappet	4
39	4	Push rod	4
40	1set	Pushrod cover & Rubber seal 40-1,-2,-3	1set
41	4	Rocker arm	4
42	1set	Rocker arm screw & Nut 42-1,-2	1set
43	4	Rocker arm pin	4
44	2	Rocker arm bracket (left)	2
45	2	Rocker arm bracket (right)	2
46	4	Valve set (In & Ex)	4
47	1set	Valve spring & Keeper & Retainer 47-1,-2,48	1set
48	4	Valve retainer (Cottrier)	4
49	4	Rocker arm cover	4
69	1	Intake pipe (Left)	1
70	1	Intake pipe (Right)	1
73	2	Flexible muffler	2
80	4	Muffler nut	4
82-1	1set	Carburetor complete 82-1-1,-1-2,-1-3,-1-6,-1-7,-1-8, -1-9,-1-10,-1-11,-1-12,88,93	1set
83-1	1set	Carburetor body assembly 83-1	1set
88	1	Throttle lever	1
90	1set	Carburetor screw & spring set 90	1set
91	1set	Carburetor gasket set 91	1set
93	1	Intake velocity stack (air funnel)	1
95	1set	Engine mount set 95-1,-2,-3,-4,-5	1set
99	1set	Muffler bracket set 99-1,-2,-3,-4,-5,-6,-7,-8	1set
110	1	Anti loosening nut	1
120	2	Spark plug (NGK CM-6)	2
140	2	Muffler right angle adapter	2
152	1	Screw-pin (For drive flange setting)	1
153	1set	Electronic ignition system 153-1,-2,-3,-4	1set
164	1set	Intake manifold assembly 164-1,-2,-3,-4,-5,-6,-7	1set

