FA-300T is fitted with a choke valve which is very useful device for scale airplanes, etc.

Instructions for FA-300T-AAC 4 Stroke Cycle Engine

Let us express our sincere thanks for your favouring Saito Seisakusho, Ltd., particularly for your purchase of the "Saito FA-300T Engine". This is your engine you bought. please read our instructions carefully and treat your engine with loving care. If you have a manufacturing defect, we are in a position to repair it without any cost.
The large-sized model airplanes such as a quarter scale one are having a popularity. More realistic and dynamic flying is attractive to flyers. However, as the matter of fact, there is no large-sized four cycle engine for model airplanes, so that modellers and flyers have no alternative but to use an engine for the industrial purpose. It is the FA-300T flat twin cylinders four cycle engine that complies with their wishes.

USE	RC Large Stunt Airplane RC Large Scale Airplane	(Set up a standard)	Wing area : 80~150 dm² Weight : 7~12kgs

FA-300T Features

- A roar of its exhaust is realistic.
- Alternative explosion results low vibration level.
- The carburetor is installed in the rear and upper part of the crank case to secure an operator against a large-sized propeller. This is easy to handle and adjust the engine, and will scarecely inhale a dust from the ground.
- Cylinder ·····Hard-chrome plated bore increases a durability of the engine.
  The cylinder and head consist of a single unit, which results nondistortion of the cylinder bore, and increase heat dissipation.
- Piston ·····High silicone aluminum piston with a compression ring increases efficiency of the engine.
- Crank Shaft ·····Made of a solid chrome molybden steel, which is supported by three ball bearings.
- Carburetor with choke valve
  ·····We first developed this device in the model four cycle engine world. The operator is able to hold his airplane by one hand, and rotate the propeller by the other hand for easy choking.
  The carburetor has a unique interlocking device.
- Breather nipple
  ·····Drains waste oil efficiently (In case of long nipple tube, waste oil goes back and forth in the tube, and is scarcely drained. This unique design solved the problem as above)
- Prevention of loosening a prop. Safety design. The propeller nut hardly loosens.
- Front mounted camshaft results in light weight.
- Semi-spherical combustion chamber increases combustion efficiency.

FA-300T (50cc) Specifications

Bore ····· 34mm x 2
Stroke ····· 28mm x 2
Practical Rev ····· 1,600~8,000 rmp.
Fuel flow ····· 70 cc per a minute. Full throttle, caster oil system with 10% nitro.
20 x10 glass-nylon prpeller.
Weight ····· Approx. 1,750 grs.

Explanation of 4 Stroke Cycle Engine

1. Suction Stroke 2. Compression Stroke 3. Expansion Stroke 4. Exhaust Stroke

4 Stroke Cycle engine consists of 4 strokes as illustrated above. Stroke means that piston is moved from the upper dead point to the lower dead point. In case of 4 Stroke cycle engine, gas condition in cylinder, variation, valve motion, etc., are 4 strokes (2 both ways) of piston. After all, 1 cycle is finished every 2 revolutions of crankshaft and returns to the original condition.

ACCESSORIES FOR FA-300T

1.	Spanner for tappet adjusting screw	1
2.	Tappet adjusting screw gap gauge (0.1t)	1
3.	Hexagonal spanner (wrench) (3. 2.5, 2, 1.5)	1 each
6.	Opening & closing bar for choke valve	1
7.	Needle valve extension bar	1
8.	Glow plug fitted in the engine	2
9.	Connector for plug	1 set
10.	Muffler (R & L) w/gasket·bracket	1 set
11.	Leather washer	2
12.	Engine mount bolt M5x25 & washer M5	4 each
13.	Blind nut for mounting bolt M5	4
14.	Knob for bar	1
15.	Prop nut for spinner	1
16.	Engine mount spacer (washer) M5	4
17.	Screwdriver for idle needle adjustment	1

A. Fuel

It is very important for engine to use high quality fuel containing 5~15% nitro. For consistent performance and long engine life, use fuel containing **AT LEAST 20%** lubricant by volume.**(DO NOT USE LOW OIL FUEL)** Since the 4-cycle engine has high exhaust temperature and carbon is apt to accumulate when caster oil type lubricants are used. The fuel filter is to be installed and SAITO F-1 is designed for this model engines. **SAITO fuel filter "F-1" exhibits highest performance.**

B. Plug.

The Saito P-2 plug is recommendable. Due to the operation of 4 stroke engines (1 explosion for 2 revolutions), plug selection is important for efficient operation. An unsuitable plug causes the engine a trouble.

C. Propeller **Use of SAITO "SAI GP01" (SS) Glow Plug is recommended.**

The standard propeller sizes are 20 x 8 ~ 20 x 10 .
Select your propeller size according to the aircraft type.
Use only high quality propellers for peak, safe performance.
Since unbalanced props cause vibration and decrease performance
... always balance your propellers.

Choke Valve Setting. Refer to the right illustration.

- Rotate the main needle about three turns to open.
- Start the engine by opening the throttle valve about one-fourth
- Full open the throttle and ajust the main needle for best high speed rotation.
- Close the throttle slowly and adjust idling.

a) The mixture is too rich.
When the throttle is fully opened too quickly from the Slowest Speed, the carburator issues white smoke and dul noise, and revolution increases intermittently.

Turn the idling adjustment valve clockwise with the small driver.

b) The mixture is too lean.
The engine stops when the throttle is set at Slowest Speed Or, the engine stops when the throttle is fully opened too quickly or it issures dry noise and revolution increases belatedly.

Turn the idling adjustment valve counter-clockwise.

- Do the above-mentioned adjustment untill the engine revolution prompty responds to operation of the throttle valve.

How to Operate and Adjust the Carburetor.

The idle needle that is installed on your Saito engine is pre-adjusted at the factory, for best performance. Re-adjustment may be necessary according to the propeller used, the installation of the engine, type of fuel or atomospheric conditions.

Fuel Tank

g. Be careful not to choke too much to avoid knocking. The first time, use the castor oil system with 10 % nitro content, and a fuel tank with a capacity of over 500 cc. It will be well enough to install the fuel tank direct in the airplane because of low vibration.

Use 20"x10" propeller made from glass-nylon, and fit it vertically on the drive flange at the portion where the compression has built up.

a) Engine Start.

Let's carry out the following procedure.(Use always muffler pressure.)

*Open the throttle valve to full open position.
*Open a needle valve by $2\frac{2}{3}$ rotation turns.
*Close a chock valve.

* Rotate forcibly the propeller toward counter-clockwise direction about two turns to absorb fuel.(When choking, open the throttle to full open position. Keep choking till the fuel flows out from the exhaust pipe.)
* Open the choke valve.
* In the event of flooding, there may be some possibility of the rod broken by fuel compression. Confirm by manual turn that fuel compression has not built up.
* Open the throttle valve a little bit more than low speed.(Be careful not to open the throttle too much to avoid jack rabbit start)
* Rotate the propeller toward the counter-clockwise direction till compression has built up, plug and heat.(If a battery is small in capacity, heat the right and the left separately)
* Flick the propeller toward the clockwise direction, and the engine will turn reversely, then will explode and start running toward the normal direction. (This is a safety way to start the engine without kicking back. It might be better to put on gloves. After the engine starts, disconnect the power supply. Make the needle adjustment from behind the engine. When starting, keep spectators away to behind the engine. Secure all persons against danger)

b) Adjustment of engine response by the throttle valve

When opening the throttle valve quickly to full open position from engine idling speed:

a. Quick response is normal.

	Conditions	Causes	(slow adjustment) and counterplans to.
b	• Response is intermittent. • Thick gas comes out from the exhaust pipe. • Revolution is slow or instable.	Caused by rich mixture.	Turn the idling adjustment valve clockwise.
c	• Engine stops when the throttle is opened from low to high speed. • Engine stops when the throttle is set at the slowest. • Rovolution increases belatedly and suddenly.	Mixture gas is too light.	Turn the idling adjustment valve counter-clockwise.
d	If the idling dose not continue.	Neither plug nor fuel fits the engine.	Recommend a plug with thick filament

When the idle needle's standard position is not found with many turns, it is the standard position where the idle needle is rotated one turn clockwise by a driver from the throttle lever stadard level (see fig)

※Do not take the carburetor apart unless absolutely neccessary. When dismantling the carburetor, if dirt or any hard object comes into, this may probably cause the carburetor a trouble.

F. Break-In

The break-in procedures for all engines should be followed carefully as a proper break-in will achieve the best, long lasting performance. During the "break-in" period, a fuel with castor oil system should be used. After a start according to the procedure (E), move the throttle gradually and set it around 4.000 rpm.(It is recommendable to use a dynamometer) It is unnecessary to rev up, because the break-in is made mainly for the connecting rods and gears. It is enough to do the break-in about for twenty minutes. Open the throttle to full open position. Adjust it to gain rather richer than mixture gas at the peak position. Rotate the needle by five turns toward the loosened position. If mixture gas is still light, rotate the needle body toward the left, and mixture gas will become rich.

If the engine is installed in an airplane, the operator will be able to do the break-in during its flying, high up in the air as high as possible at middle speed. If the engine keeps running on the ground for a long time, the engine may probably inhale a dust from the ground. The break-in will be completed after about five flights. After the break-in, the carburetor should be regularly adjusted.

* First, open the throttle to full open position.
* After reaching the peak by the main needle, loosen it by two – three roulette turns.
* Move the throttle to the middle speed running position, and adjust the needle body to gain a little rich mixture gas.
* Move the throttle toward the low speed running position, and set it at 1,500 – 1,700 rpm.
* Accelerate from low speed running to high speed running by the throttle lever.(If the mixture gas between low speed and middle speed is light, the engine will stall. Rotate the needle body, as shown in the illustration, toward the counter-clockwise and adjust it.
* When the engine is running at the high speed, the operator has to readjust the needle.(If the operator adjusted the needle body, it is necessary to readjust the main needle and a screw for the low speed adjustment)

G. General Running & Maintenance Procedures

1. Too lean of a needle valve setting will cause the engine to run hotter than normal.(It will cause the engine stalling and has a bad influence on the connecting rod and the cam gear.)
2. After running for about the first one hour period, tappet clearance will have to be adjusted periodically due to wear in of the moving parts. If the supplied gauge will fit, the tappets need to be adjusted for proper spaces. After adjustment make sure to tigten up the lock nut. This will keep wear to a minimum.(See diagram)

*Internal Lubrication in Engine Inside and Waste Oil Drain

Oil contained in fuel from between a piston and a cylinder comes into the inside will lubricate piston, bearing, cam and gear etc. For draining waste oil, fit a silicone tube into a breather nipple on the lower part of a crank case, and connect the other tube side with a nipple on a muffler as shown in the right illustration.

3. Rocker arm and valve should be lubricated as occasion demands on inspection.

How to use the breather nipple

H. Do not take the engine apart unless necessary.

※ WARNING

Safety is the most important thing to remember when operating model engines.
After starting, make sure everybody is behind the propeller and away from the side arc.
These are the danger areas if the propeller were to come loose.
Tighten the propeller screws regularly.
Always use a pair of gloves when starting a model engine along with a good pair of safety glasses.

When tightening bolts, put washers between engine mount and fire wall to minimize depression on fire wall, and for reinforcement.

* When screwing a muffler in a cylinder, oil both an external screw on the muffler and an internal one on the cylinder side.

All specifications snd models are subject to change without notice.

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OUTSIDE DIMENSIONS(mm)

PART NO. 110 PROPELLER NUT ANTI-LOOSENING SYSTEM

Your SAITO FA-300T(L) or FA-300TT-DP engine features a unique propeller mounting system which is designed to prevent the loosening of propellers.

To utilize the Anti-loosening system, please follow the procedure below:

(1) Using the 17mm off-set wrench (supplied), tighten the propeller nut (A).
(2) Place the anti-loosening nut (B) onto the crankshaft.
Note: Ensure that the tapered portion is towards the crankcase.
(3) Securely tighten the anti-loosening nut (B) with the 17mm off-set wrench.

Note: The outer nut portion of the anti-loosening nut (C) is threaded -4mm- for the easy installation of spinners.

Saito FA-300TL Parts List

NO.	DESCRIPTION (q'ty per pack)	Q'TY	NO.	DESCRIPTION (q'ty per pack)	Q'TY
01	Cylinder (left)	1	39	Pushrod	4
02	Cylinder (right)	1	40	Pushrod cover & rubber seal (4 each)	4
06A	Piston	2	41	Rocker arm	4
07	Piston pin	2	42	Rocker arm screw & nut (4 each)	4
08	Piston pin retainer	4	43	Rocker arm pin	4
09A	Piston ring	2	44	Rocker arm bracket (left)	2
10B	Connecting rod	2	45	Rocker arm bracket (right)	2
13	Conrod screw	4	46	Valve (in & out pair)	4
14	Cylinder screw set (2 sets)	2	47	Valve spring, keeper, retainer (4 sets)	4
15	Crankcase	1	49	Rocker arm cover	4
17	Rear cover	1	69A	Intake manifold (left)	1
19	Breather nipple	1	70B	Intake manifold (right)	1
20	Front bearing	1	71	Intake manifold nut	2
21	Main bearing	1	73B	Muffler (left) w/nut & gasket	1
22	Rear bearing	1	74B	Muffler (right) w/nut & gasket	1
23B	Crankshaft	1	82A	Carburetor complete (1 set)	1
27A	Taper collet & drive flange (1 each)	1	83A	Carburetor body assembly (1 set)	1
28B	Prop washer & nut & lock nut (1 set)	1	85	Full throttle needle	1
31	Crankcase screw (1 set)	1	87A	Throttle barrel assembly (1 set)	1
32A	Engine gasket set (1 set)	1	91A	Carburetor gasket set (1 set)	1
33	Cam gear housing	2	92A	Choke valve assembly	1
34	Cam gear (left)	1	93A	Intake velocity stack	1
35	Cam gear (right)	1	95B	Engine mount (1 set)	1
36	Cam gear shaft	2	99A	Muffler bracket (1 set)	1
37	Steel washer set (1 set)	1	107	Carburetor bracket (1 set)	1
38	Tappet	4	110	Anti-loosening nut	1