FG-41TS Instruction Manual

ver. June, 2022

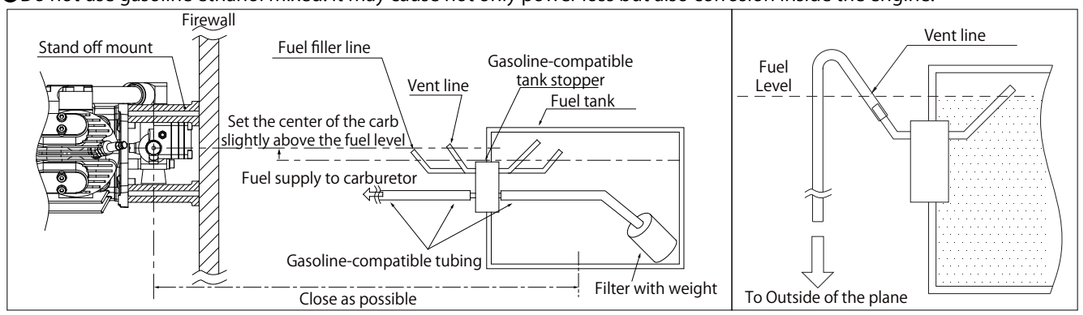
Specifications

Bore	Φ32mm x 2	Stroke	25.4mm x 2	Disp.	40.9cc	Applications	Gasoline 30cc class
Weight (Approx.)	Main body: 1,350g / Muffler: 100g / Ignition: 150g			Practical speed	Approx.1,300-8,000rpm	Max on ground	Approx. 6,600-8,000rpm
Propeller	18"x10"~20"x8"	Plug	SP-2 or SP-1	Battery for ignition system	Voltage:6-12V, greater than 1,000mA ※		
Standard accessories	・Limit gauge (0.1t) for tappet adjustment 1pc ・Spark plug[SP-2](Attached to the engine) 2pcs ・Ignition system（w/sensor） 1set			・Wrench for tappet adjusting lock nut 1pc ・Plug wrench 1pc ・Stand off mount 1set		・Hexagonal wrench 1pc ・Muffler set 1set ・Anti-loosening nut 1pc	
Optional parts	・Filter with weight [G36-154] ・Durable tube for Gasoline (1m) [G36-155] ・Aluminum spinner nut [120S-30] ・Tappet adjusting kit [30S-161] ・Digital tachometer [G17-167]						

※If you use a Li-Po, we recommend the spec less than 2,500mA capacity and less than 30C discharge rate

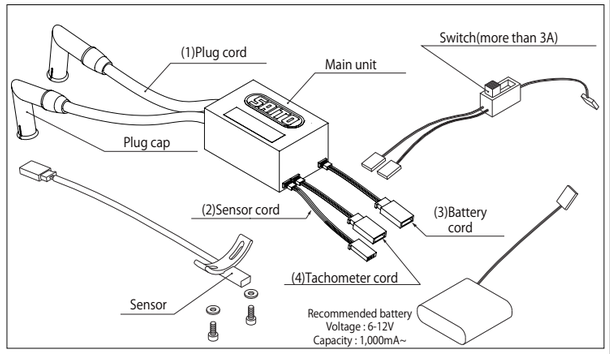
1. Fuel

●The fuel is a mixture of commercial regular gasoline and reliable oil for 2-stroke engines.
●[Example of oil recommendation]
・Klotz KL-200 Original Techniplate ・Deluxe Materials PowerModel 2T-S ・ENEOS RACING SPEC PRO-2T (SAITO STANDARD) etc.
If such oils are not available in your country, then please ask the official SAITO distributor in your country for an alternative.
●Be sure to use the mixture "gasoline : oil =15~20 : 1" by volume ratio. (Ex. 1000ml of gasoline should be mixed with more than 50ml of oil).
●In Break-in process, **use 15:1 mixed fuel** to ensure the best lubrication for initial run.
●Any damage caused by the fuel used, in which the oil ratio is lower than 20:1 ratio, is not warranted.
●Do not use gasoline ethanol mixed. It may cause not only power loss but also corrosion inside the engine.



2. Ignition

●Place the main unit as far from other electrical devices as possible.
●Place the two switches of the ignition and the RC receiver as far from each other as possible.
(1) Plug cord(meshed high tension cord)
2 cords compatible for left/right cylinder. Insert the cap deeply onto the plug to make sure it will not come off.
(2) Sensor cord
Connect with the cord from the sensor attached to the engine.
(3) Battery cord (black / red cord)
Use a fully charged battery that has adequate spec. (6-12V, more than 1000mA is recommended.). Between the battery and main unit, make sure to install a heavy duty switch whose capacity is higher than 3A.
(4)Tachometer cord (optional)
Connect the digital tachometer (Option). Otherwise the connector is normally vacant.

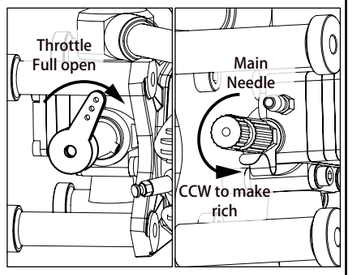


3. Propeller

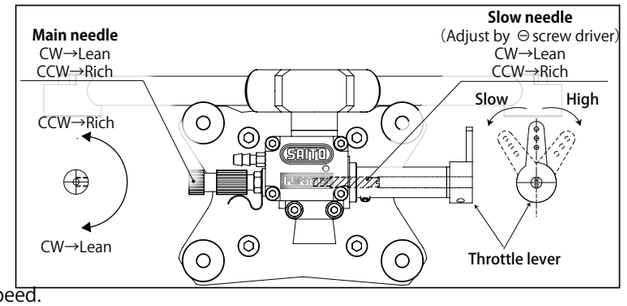
●The Standard prop is Mejzlik 20"x8" which brings approx. 7,000rpm (or Falcon 20"x8" brings approx. 6,600rpm) . Larger size or greater pitch can cause engine broken due to overload.
●According to the plane, use a reliable prop which brings 6,600~8,000rpm max at ground.
●Use a well-balanced one. Never use the propeller that has been scratched or damaged even if slightly.
●As the propeller is compressed slightly, tighten the propeller nut every hour of operation.

4. Break-in MOST IMPORTANT!!

●Before starting the engine, inject a suitable amount (approx. 20～30cc) of engine oil into the lubrication nipple on the crankcase using a syringe or pump while turning the propeller by hand. After that, plug this nipple. As excess is discharged from the breather nipple, attach a tube to the breather nipple.
●Prop-recommendation : Mejzlik 19"x8"
●Use 15:1 fuel:oil ratio for break-in
●**Never make the fuel mixture lean during Break-in.** It could cause seizure even during idling or low speed running.
●Before starting the engine, open the main needle Approx. 1.5~2 turns open (CCW) from fully closed.
●Start the engine (using a starter is recommended for safety).
●Soon after starting, Continue to turn the main needle CCW to drop RPMs until just before engine stops **keeping the throttle opened fully.**
●If opening main needle doesn't drop RPM, then open the slow needle too.
●Run in this very rich condition for 1 liter of fuel.
●Now "initial" break-in is done.



5. Adjustment of carburetor after initial break-in.



◇Needle reference position (Set after initial break-in)
●Start the engine after adjusting the needle to the following reference value.
●Main needle：Approx. 1.5-2 turn CCW from fully closed
●Slow needle：Approx. 3.5~4 turns CCW from fully closed (Then throttle valve should be fully closed)
●Actually, the best position of the needles vary depending on the prop, temperature, humidity and so on. Please adjust as necessary after observing the engine performance during flight.

◇Peak adjustment
●After starting the engine, warm up for approx. 30 seconds at low speed.
●Achieve the peak at full throttle.
→Turn the main needle CW gradually to the position where the RPM is greatest (the peak). Continuing to turn the needle CW past the peak could lead to seizure so turn it slowly and carefully. If the RPM suddenly decreases after passing the peak, **instantly turn the main needle CCW** to again increase the RPM. Otherwise it could damage the engine seriously.
●Once achieving peak RPM, return the throttle to low speed. Make a note of the position of main needle at the peak at that time. (How many turns you did CW based on the reference value.)

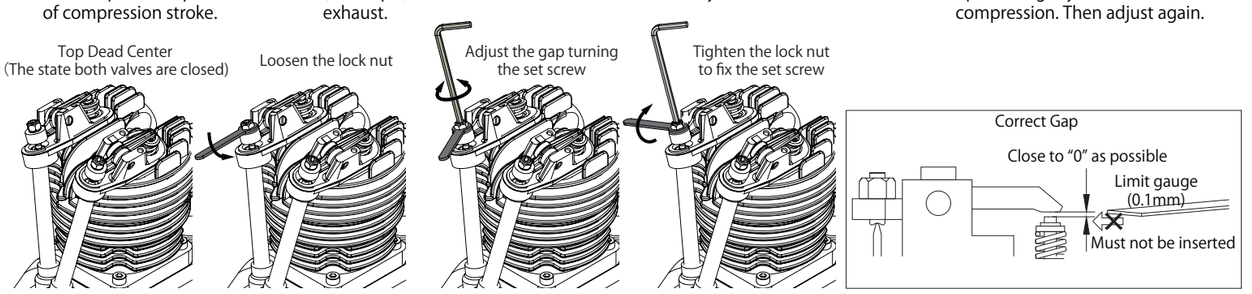
◇Slow needle Adjustment
●After starting the engine, achieve the peak RPM referring to the procedure above. DO NOT move the main needle from the peak position at this stage.
●After achieving peak RPM, next is slow needle adjustment. Open the throttle from low RPM to full throttle quickly.
●If the engine hesitates for a moment or stalls before the engine reaches max RPM, It's because the mixture is too lean. Then turn the slow needle CCW slightly.
●If the engine is slow to reach peak RPM (full throttle set), it's because the mixture is too rich. Then turn the slow needle CW slightly.
●Adjust the slow needle as above until the RPM follows the throttle movement smoothly. The important point is to adjust the slow needle AFTER the main needle has been adjusted to its peak.
●Now break-in at ground level is done. Adjust tappets by the method described later.

◇Pre-flight / Flight adjustment
●When the slow needle adjustment is done, check the response by revving up from low speed to full throttle quickly several times.
●Open the throttle fully and turn the main needle CCW approx. 60～90 degrees from the peak position. This is to make the fuel mixture richer in the air where the RPM get higher than on the ground.
●After all adjustments are made, fly your aircraft and fine tune the engine according to the situation. Basically tuning should be done with the main needle. Readjustment of the slow needle is rarely needed if the first adjustment of the slow needle has been done successfully.

6. Tappet adjustment

The valve clearance should be checked and adjusted after break-in and every time after two hours while the engine is cold. Before adjusting tappet gaps, tighten the screws around cylinders etc.

1. Remove the spark plug and rocker arm covers of a cylinder. Then turn the prop CCW by hand to place the piston at TDC of compression stroke.
2. Loosen the lock nut and adjust the gap by hexagonal wrench until you get the correct gap (below pic) for both of intake & exhaust.
3. Once the gap is set, tighten the lock nut and attach the plug and covers. Do the same adjustment for the another cylinder in order.
4. Turn the prop by hand to check if the compression is enough. If the gap is less than 0, the valve is always opened slightly and will lose compression. Then adjust again.



Notes:

●**Bundle the flexible mufflers with wires, and take some measure to release vibration from the flexible mufflers** such as fixing them to the airframe. Leaving the mufflers free reduces life of the flexible mufflers rapidly and makes it easier to break by vibration.
●As it uses oil-mixed fuel, the plane may sometimes get dirty from the exhaust.
●Use a reliable and well-balanced prop. Otherwise it may cause an abnormal vibration and could result in a serious accident.
●●During operation, all engine screws can loosen due to metal heat expansion. Check and tighten occasionally especially prop nut, exhaust nuts, and cylinder screws.
●When the exhaust valve gets dull by carbon or sludge especially in cold atmosphere, remove the rocker cover and apply some anti-rust spray to the exhaust valve to help the valve to move smoothly. Apply lubricant to allow the valve springs return smoothly. You can check it by your fingers.
●Pay attention to the surroundings so as not to disturb others by noise and exhaust.
●Always keep spectators behind the engine when operating the engine.
●As exhaust smoke is harmful, be careful not to breathe in or otherwise expose yourself to its harmful effects.
●Pay attention not to touch the rotating propeller when starting engine, and move to rear side of the aircraft once the engine is started.
●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.

Warranty:

- If there is any deficiency from the factory concerning manufacture, please consult with the shop or distributor you bought from. Our company will be responsible for repair. However, any failure or trouble caused by unnecessary disassembly, modification, or other uses than those provided in the instruction manual is not subject to warranty.
- Ignition system is subject to the warranty only for initial failure. Once the system has been activated successfully, it will no longer be subject to warranty.

All specifications and models are subject to change without notice.

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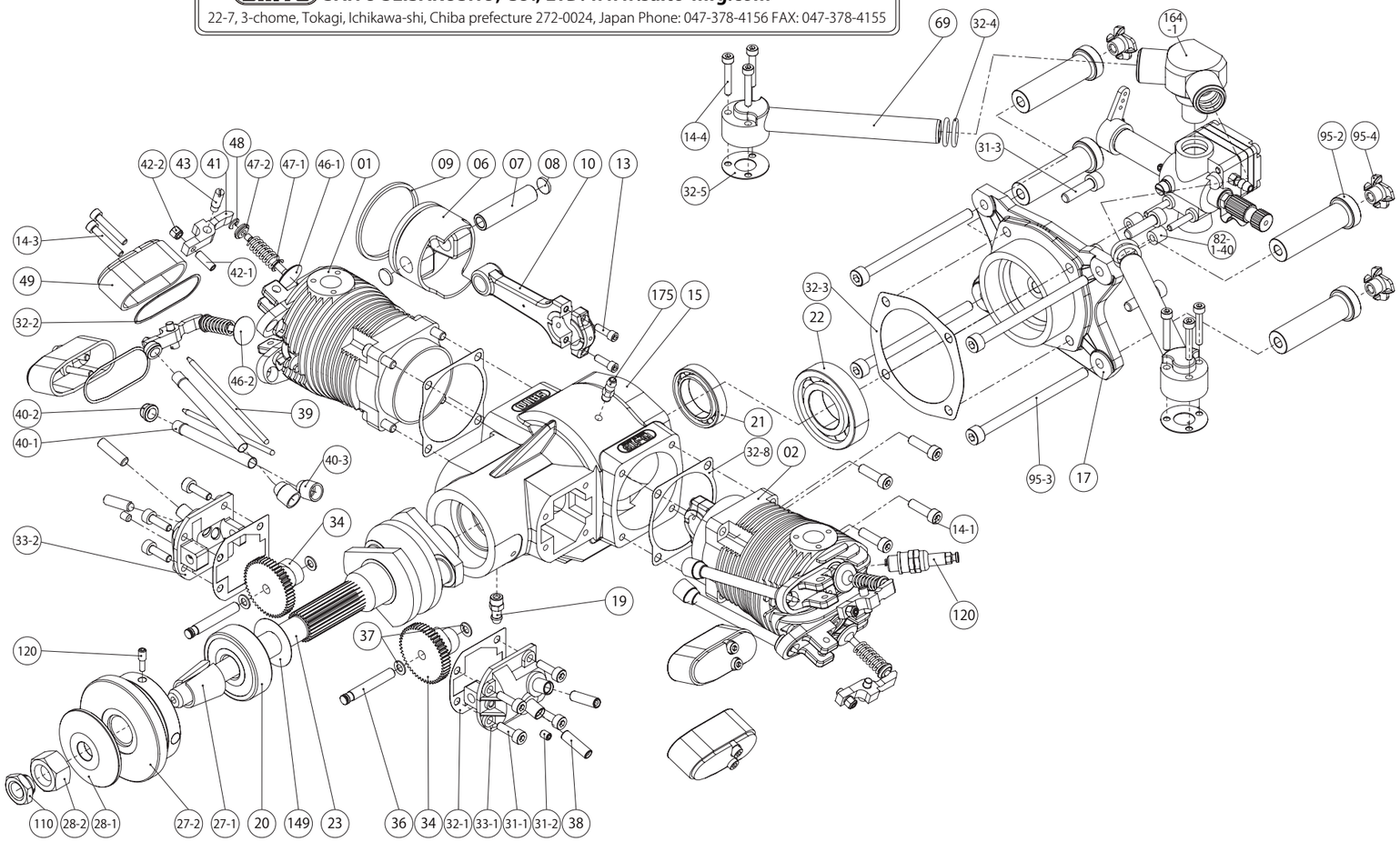

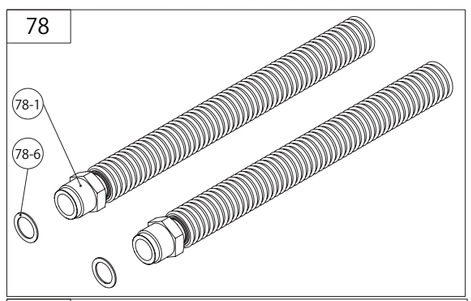

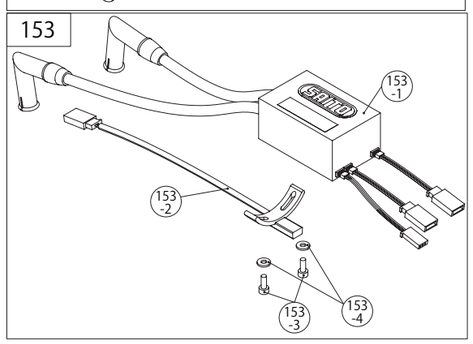

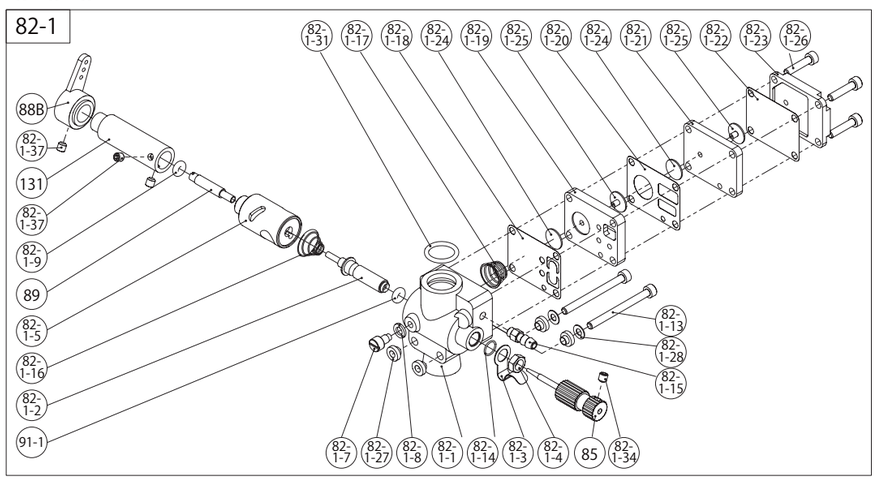

No.	Item	Qty
01	Cylinder (Left)	1
02	Cylinder (Right)	1
06	Piston	2
07	Piston pin	2
08	Piston pin retainer	4
09	Piston ring	2
10	Connectin rod (Conrod)	2
13	Conrod screw	4
14	Cylinder screw set 14-1,-3,-4	2set
15	Crank case	1
17	Rearcover mount	1
19	Breather nipple	1
20	Front bearing	1
21	Main bearing	1
22	Rear bearing	1
23	Crank shaft	1
27	Taper collet & Drive flange 27-1,-2	1set
28	Prop washer & nut 28-1,-2	1set
31	Crank case screw set 31-1,-2,-3,-4	1set
32	Engine gasket set 32-1,-2,-3,-4,-5,-8	1set
33-1	Cam gear housing (Left)	1
33-2	Cam gear housing (Right)	1
34	Cam gear (Left)	1
35	Cam gear (Right)	1
36	Cam gear shaft	2
37	Steel washer set	2set
38	Tappet (Valve lifter)	4
39	Push rod	4
40	Push rod cover & rubber seal 40-1,-2,-3	2set
41	Rocker arm	4
42	Rocker arm screw & nut 42-1,-2	2set

No.	Item	Qty
43	Rocker arm pin	4
46	Valve set (Intake & Exhaust) 46-1,-2	2set
47	Valve spring & Keeper & Retainer 47-1,-2,48	2set
48	Cotter (Valve spring retainer lock)	4
49	Rocker arm cover	4
69	Intake pipe	2
78	Flexible muffler 78-1,78-6	1set
82-1	Carburetor complete 82-1-1,-1-2,-1-3,-1-4,-1-5,-1-7,-1-8,-1-9,-1-13, -1-14,-1-15,-1-16,-1-17,-1-18,-1-19,-1-20, -1-21,-1-22,-1-23,-1-24,-1-25,-1-26,-1-27,-1-28, -1-31,-1-34,-1-40,85,88,89,91-1,131	1set
83-1	Carburetor body assembly 82-1-1,-1-2,-1-3,-1-4,-1-7,-1-8,-1-13,-1-14,-1-15 -1-27,-1-28,-1-31	1 set
85	Main needle	1
88	Throttle lever	1
89	Slow needle	1
95	Engine mount set 95-2,-3,-4	1set
110	Anti loosening nut	1set
120	Spark plug (SP-2)	2
149	Oil slinger	1
152	Screw-pin	1
153	Electronic ignition system 3-1,-2,-3,-4	1set
160	Pump assembly 82-1-17,-1-18,-1-19,-1-20,-1-21,-1-22,-1-23, -1-24,-1-25,-1-26	1set
164	Inlet manifold assembly 164-1,-2	1set
175	Initial lube nipple	1