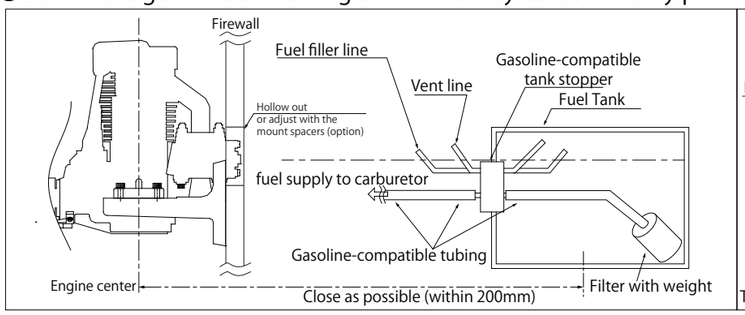
FG-40 Instruction Manual

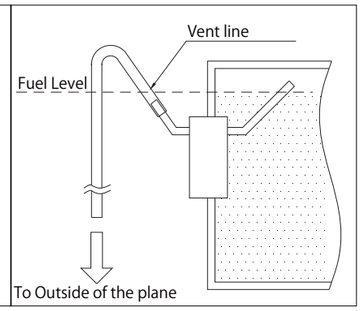
Specifications

Bore	Φ40.0mm	Stroke	32.0mm	Disp.	40.2cc	Applications	4-stroke glow 200 class
Weight (Approx.)	Main body : 1,260g / Muffler : 90g / Ignition : 100g			RPM Range	Approx.2,000-8,000rpm	Max on ground	Approx. 6,500-7,500rpm
Propeller	19″x10″~ 21″x8″	Plug	CM-6	Battery for ignition system	6-9V, greater than1,000mA (2S Lipo 25C or less, 2S Life, 5S NiMH)		
Standard accessories	・Engine mount set 1set ・Hexagonal wrench 1set ・Anti-loosening nut 1pc ・Ignition system(w/sensor) 1set		・Limit gauge (0.1t) for tappet adjustment 1pc ・Spanner for tappet adjusting lock nut 1pc ・Carburetor adjustment bar 1pc ・Spark plug[CM-6](Attached to the engine) 1pc		・Choke bar 1pc ・Muffler set 1set		
Optional parts	・Filter with weight [G36-154] ・Aluminum spinner nut [120S-30]		・Durable tube for Gasoline (1m) [G36-155] ・Tappet adjusting kit [120S-161]		・Mount spacer [G40-169] ・Digital tachometer [G17-167]		

1. Fuel

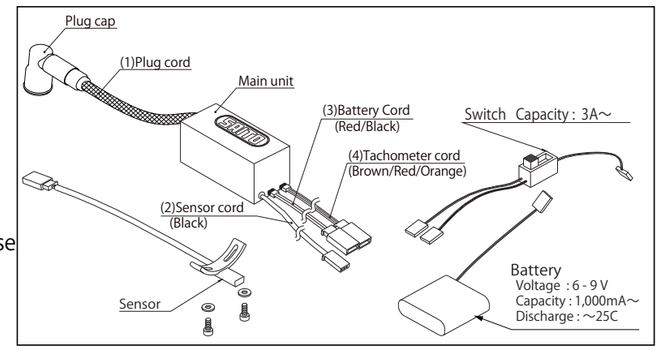
●The fuel is mixture of regular gasoline and high-quality 2-stroke engine oil.
●[Example of oil recommendation]
・Klotz KL-200 Original Techniplate
・Deluxe Materials PowerModel 2T-S etc.
●Be sure to use the mixture “gasoline : oil =15~20 : 1” by volume ratio. (Ex. 1000ml of gasoline should be mixed with more than 50ml of oil).
●During the break in process, **use 15:1 mixed fuel** to ensure the best lubrication for initial running.
●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 containing ethanol. It may cause not only power loss but also corrosion inside the engine.





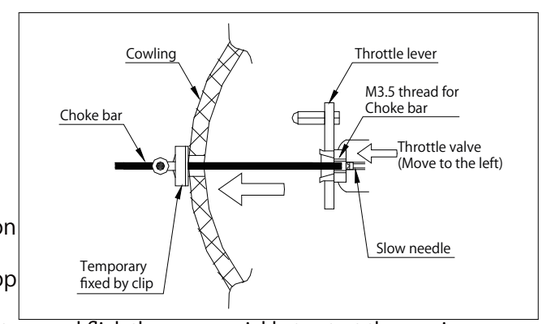
2. Ignition

●Ignition arrangement- Place the main unit as far from other electrical devices as possible.
(1) Plug cord (meshed high tension cord)
Insert the plug cap of the plug cord deeply into the plug attached to the cylinder 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. (6-9V, greater than1000mA, 25C or less). Between the battery and main unit, make sure to set a heavy duty switch whose capacity is higher than 3A.
(4)Tachometer cord
Connect the digital tachometer (Option). Otherwise the connector is normally vacant.



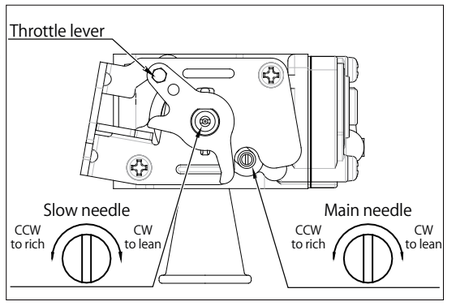
3. Method of choke (No need when you use starter)

●In advance, make a thin hole on the cowling to insert the choke bar / slow needle adjustment bar.
●During choking, be sure to turn off the switch of the ignition system.
●As shown in the fig, pass the choke bar (with M3.5 thread on its tip) through the hole on the cowling. Then turn the bar to insert into the M3.5 internal thread at the center of the throttle lever.
●Pull the choke bar and fix it with a clip or clamp with full throttle as shown in the fig so that it may not go back to the previous position.
●Grasp the prop by hand and turn it in the direction of normal operation (CCW) for several times, until the carburetor generates hissing-like sound. After hearing this sound for about 5 times, quickly flick the prop approximately 10 times.
●After that, remove the choke bar. After that, power on the ignition system and flick the prop quickly to start the engine. If the engine doesn’t start, repeat the choking procedure.



4. Break-in MOST IMPORTANT!!

●Prop-recommendation : a well balanced Mejzlik 20”x 8” carbon-made prop for break in.
●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 running at low-speed.**
●Before starting the engine, open the main needle **Approx. 3 turns** and the slow needle **Approx. 5 turns CCW** each from full close.
●Start the engine (using a starter is recommended for safety).
●Run for about 5 seconds at low speed to warm up.
●Open throttle gradually up to full open, in the meantime turn the main needle CCW. Continue to turn the main needle CCW until the RPM declines (to approx 4,000rpm), keeping the throttle fully opened.
●If RPM doesn’t drop, **turn the slow needle CCW** to make mixture much richer.
●Run in this very rich condition for 1 liter of fuel.



5. Adjustment of carburetor after initial break-in.

Recommend adjusting with the tank filled to 1/3 of its capacity.
Provides a needle position close to actual flight condition.
This helps prevent the mixture from becoming too lean during flight.

●Peak adjustment
◇After the initial break-in, keeping the main needle unchanged, **open the slow needle Approx. 5 turns CCW from fully closed (Then throttle should be fully closed).**
◇Start the engine (using a starter is recommended for safety).
◇Achieve the peak **at full throttle.** →Turn the main needle CW gradually to the position where the RPM is greatest (the peak). Turning over the needle CW past the peak could lead to seizure so turn it slowly and carefully. Once the peak is passed, the RPM will drop suddenly. In that case immediately return (CCW) the main needle.
◇Once achieving peak RPM, return the throttle to low speed. Adjust the slow needle following next chapter.

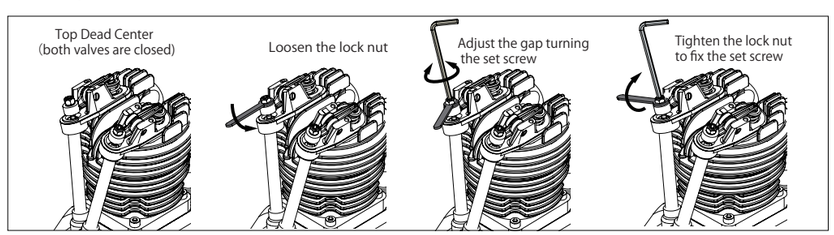
●Slow needle Adjustment *Please be careful **not to press the slow needle too forcefully** during adjustments, as this may cause the engine to stop.
◇After achieving peak, open the throttle from idle to full open quickly several times to check responce.
◇If the engine hesitates for a moment or stalls before the engine reaches max RPM, the mixture is too lean. Then turn the slow needle CCW slightly.
◇If the engine is slow to reach max RPM, the mixture is too rich. Then turn the slow needle CW slightly.
◇Adjust the slow needle in above way until RPM follows the throttle movement smoothly. **The important point is to adjust the slow needle in the condition where the main needle has been adjusted to its peak.**
◇After the slow needle is adjusted, stop the engine and make a note of the main needle position at the peak. (So that you can refer to how many turns CCW from fully closed position when you lost right position.)

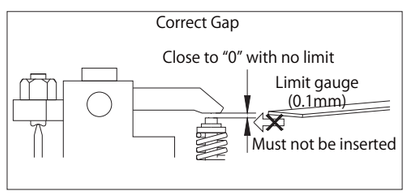
●Pre-flight / Flight adjustment
◇**Before flight open the main needle CCW approx.1/6 to 1/4 turn from the peak position.** This is to make the fuel mixture richer in the air where the RPM get higher than on the ground.
◇After all adjustments are made, fly your aircraft and fine tune the engine according to the situation. Basically tuning should be done with the main needle. The slow needle also requires fine tune when there is a large temperature difference, such as in summer and winter.
◇The break-in process and needle adjustment are done now. Proceed with the tappet adjustment using the following steps.
◇The best tune depends on various factors such as propeller, temperature, humidity, etc., so please adjust the needles according to the situation.

6. Tappet adjustment

The valve clearance should be checked and adjusted after Break-in and every after 2 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 from the 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.
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 sightly and lose compression. Then adjust again.





Note:

- As the fuel contains oil, the exhaust will produce some residue on the airplane.
- Use reliable and well balanced prop, otherwise it can cause abnormal vibration and may result in serious accident.
- During operation, the screws all over the engine can be loosen by heat expansion of metal. Tighten them up occasionally.
- 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.
- Do not use our products for passenger vehicle.
- 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 the shop or distributor you purchased from, so that 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.

All specifications and models are subject to change without notice.

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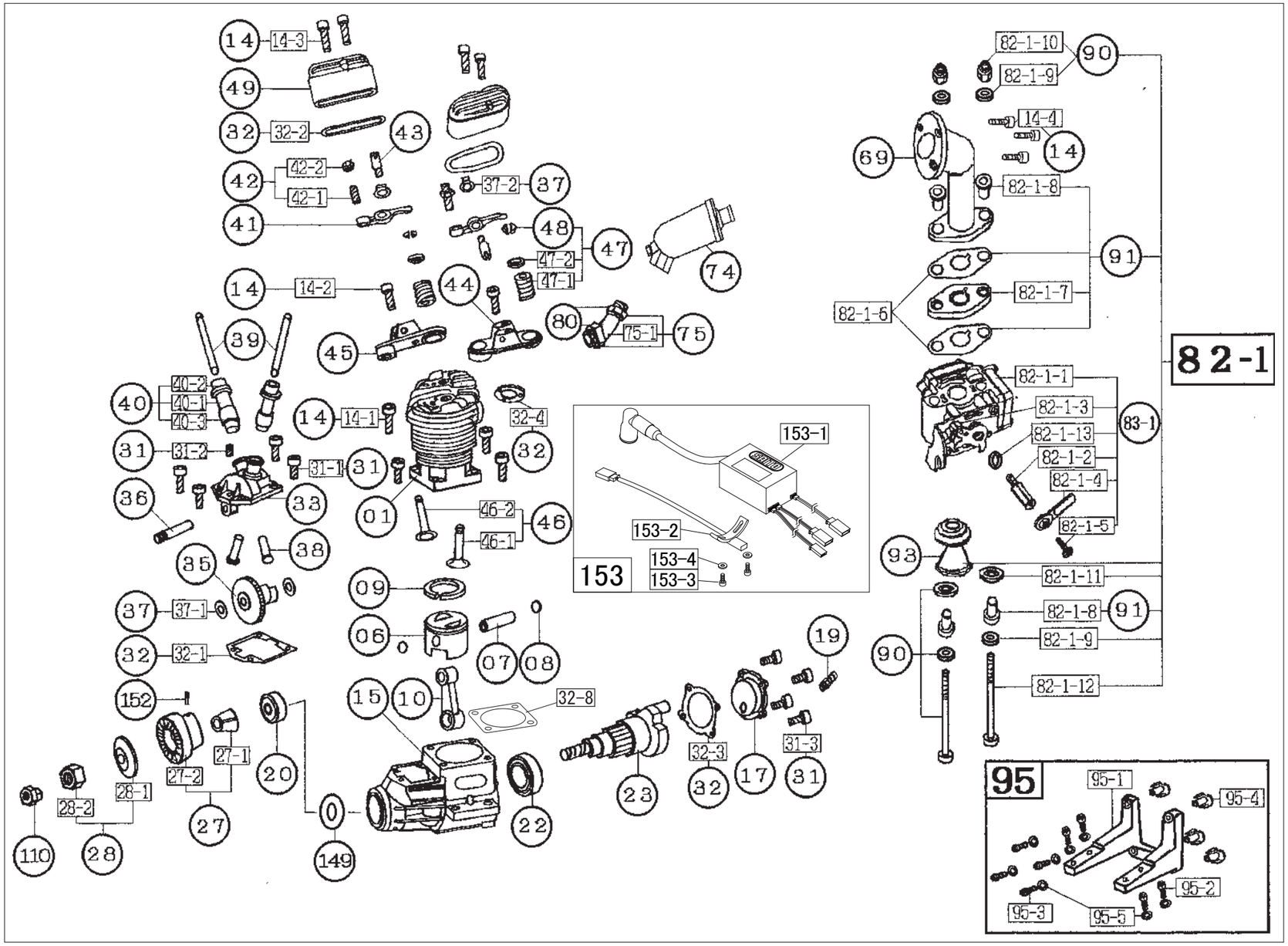

FG-40 Parts List

No.	Item	Qty	No.	Item	Qty
01	Cylinder	1	42	Rocker arm screw & Nut	2ea.
06	Piston	1		42-1,42-2	
07	Piston pin	1	43	Rocker arm pin	2
08	Piston pin retainer	2	44	Rocker arm bracket (left)	1
09	Piston ring	1	45	Rocker arm bracket (right)	1
10	Connecting rod	1	46	Valve set (In & Ex)	1set
14	Cylinder screw set	1set		46-1,-2	
	14-1,-2,-3,-4		47	Valve spring & Keeper & Retainer	2ea.
15	Crankcase	1		47-1,-2,48	
17	Rear cover (Back plate)	1	48	Valve retainer	2
19	Breather nipple	1	49	Rocker arm cover	2
20	Front ball bearing	1	69	Intake manifold (Intake pipe)	1
22	Rear ball bearing	1	74	Muffler	1
23	Crankshaft	1	75	Muffler manifold set	1set
27	Taper collet & Drive flange	1ea.		75-1,80	
	27-1,-2		80	Muffler nut	2
28	Prop washer & Nut	1ea.	82-1	Carburetor complete	1set
	28-1,-2		83-1	Carburetor body assembly	1set
31	Crankcase screw set	1set		82-1-1,-1-2,-1-3,-1-4,-1-5,-1-13	
	31-1,-2,-3		90	Carburetor screw & spring set	1set
32	Engine gasket set	1set		82-1-9,-1-10,-1-11,-1-12	
	32-1,-2,-3,-4,-8		91	Carburetor gasket set	1set
33	Cam gear housing	1		82-1-6,-1-7,-1-8,	
35	Cam gear	1	93	Intake velocity stack (air funnel)	1
36	Cam gear shaft	1	95	Engine mount set	1set
37	Steel washer set	1set		95-1,-2,-3,-4,-5	
38	Tappet	1	96	Tool set	1
39	Pushrod	1	110	Anti loosening nut	1
40	Pushrod cover & Rubber seal	2ea.	149	Oil slinger	1
	40-1,-2,-3		152	Screw-pin (For drive flange setting)	1
41	Rocker arm	1	153	Electronic ignition system	1set
				153-1,-2,-3,-4,-5	

Outside dimensions