

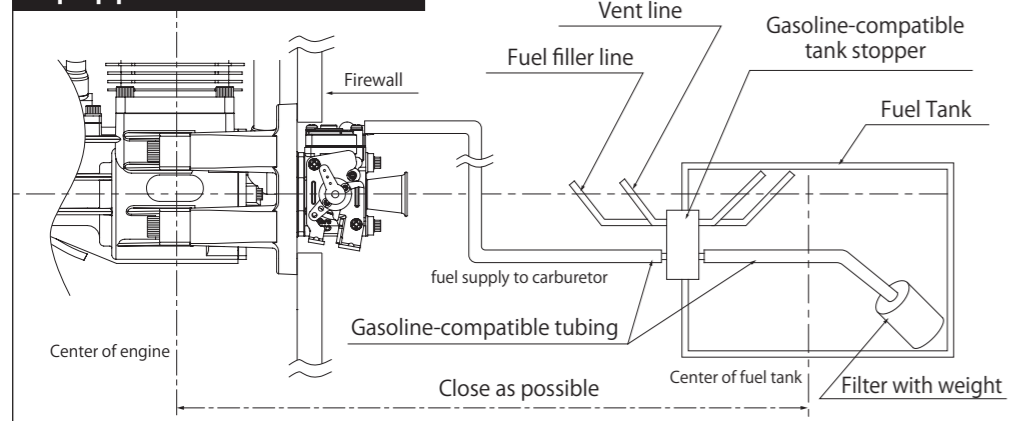
## Specifications

Bore	Ø43.6mm	Stroke	33.6mm	Disp.	50.2cc	Applications	Acrobatics -2st 30cc class Scale -2st 30~50cc class
Weight (Approx.)	Main body : 2,253g / Muffler : 62g / Ignition : 125g (including engine mount)			RPM Range (Approx.)	1,800 - 7,000rpm	Max on ground (Approx.)	6,000 - 7,000 rpm
Propeller	20" × 12"~22" × 8"	Plug	CM-6	Battery for ignition system	6 - 12V, greater than 1,000mA (2-3S Lipo or LiFe) *Recommend 2S Lipo 20~25C		
Standard accessories	• Spark plug[CM-6] (Attached to the engine) 1pc • Ignition system (w/sensor) 1set • Choke and carburetor adjustment bar 1pc	• Muffler 1pc • Plug wrench 1pc	• Tappet adjustment tool 1set [Hexagonal wrench (2.0mm) for Tappet adjustment spanner for Tappet adjustment Limit gauge (0.1t) for Tappet adjustment]				
Optional parts	• Filter with weight [G36-154] • Tappet adjusting kit [120S-161]	• Durable tube for Gasoline (1m) [G36-155] • Digital tachometer [G17-167]					

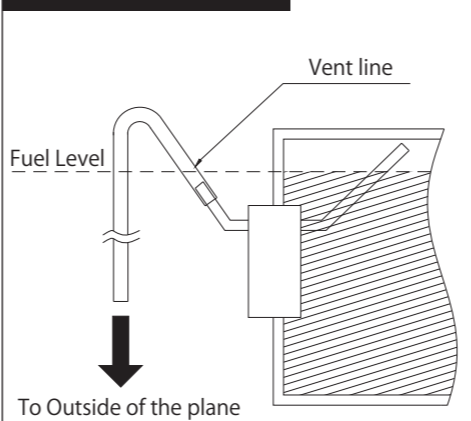
## 1. Fuel

- The fuel is a mixture of regular gasoline or high-octane gasoline and high-quality 2-stroke engine oil.
- [Example of oil recommendation]
  - Klotz KL-200 Original Techniplat • Deluxe Materials PowerModel 2T-S • Castrol POWER1 RACING 2T etc.
 If such oils are not available in your country, then ask the official SAITO distributor in your country for an high-quality synthetic oil specifically formulated for 2-stroke engine fuel mixtures.
- 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 will not be covered by warranty.
- Do not use gasoline containing ethanol. It may cause not only power loss but also corrosion inside the engine.

## Equipped with fuel tank



## Vent line details

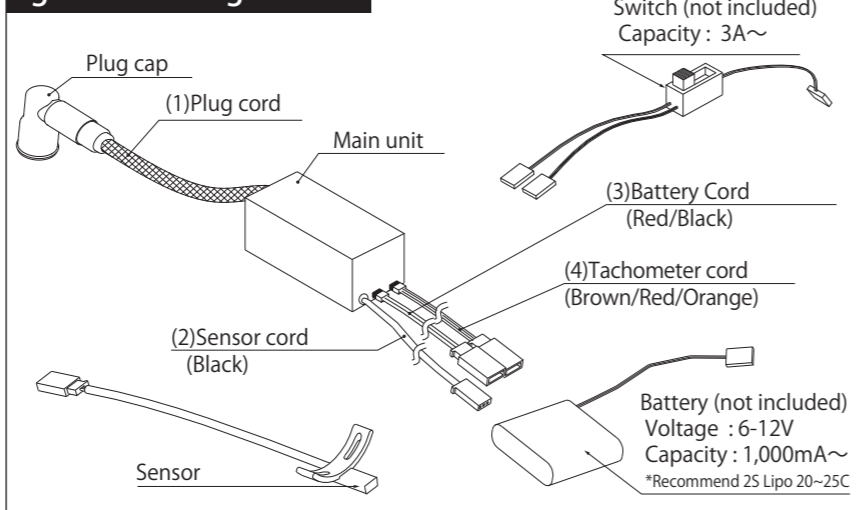


## 2. Ignition

- 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. (6-12V, more than 1000mA is recommended). 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.

## Ignition configuration



## 3. Propeller

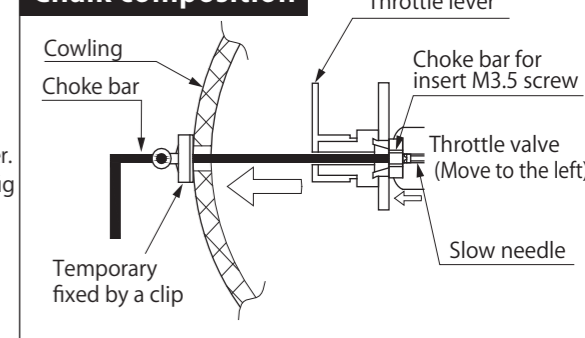
- Recommended propellers are Falcon 21"x10"~22"x8" (carbon propeller).
- Choose a reliable propeller that brings maximum rotation speed of 6,000 to 7,000 rpm on the ground. The propeller must match the airplane.
- Use a well-balanced one. Never use the propeller that has been scratched or damaged even if slightly.
- Do not use propellers that are either too small or too large in load, as this can lead to engine failure.
- After use, regularly check for any looseness in the propeller nut and tighten if it is loose. Pay special attention to wooden propellers as they are prone to compression.

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

※Choking is the means by which fuel is fed to the engine when you start it by hand flipping. Thus it is unnecessary when using starter. Starting with a electric starter is recommended for safety.

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

## Chalk composition

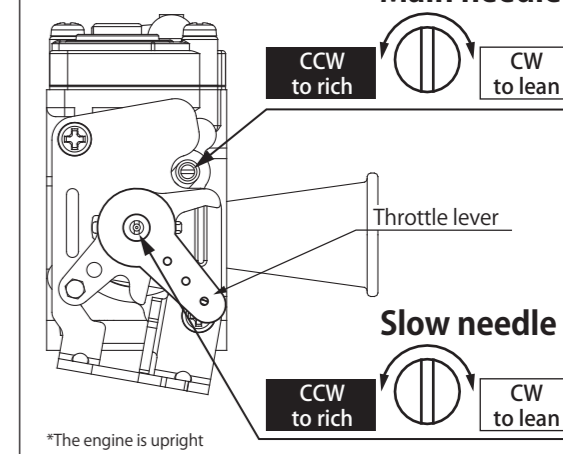


## 5. Break-in

- Prop-recommendation : 21"x10"~22"x8" carbon
- 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. 3 turns and the slow needle Approx. 5 turns CCW each from fully close.
- Start the engine (using a starter is recommended for safety).
- Soon after starting, 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.
- Now "initial" break-in is done.

**MOST IMPORTANT!!**

## Carburetor adjustment

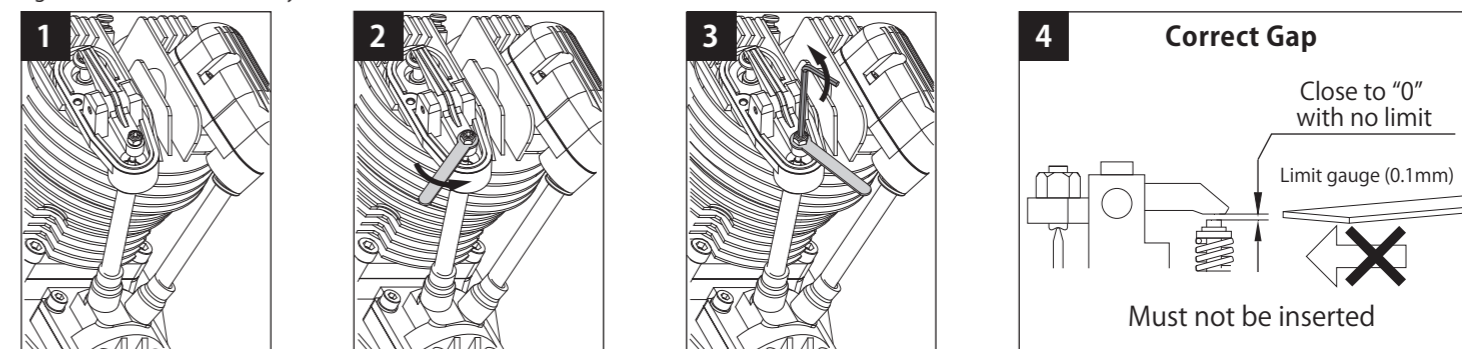


## 6. Adjustment of carburetor after initial break-in.

- **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 response.
  - ◇ 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 more than a half turn from the peak position. (At least open the main needle 3 turns CCW from the position fully closed.) 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.

## 7. 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 of a cylinder.
2. Loosen the lock nut and adjust the gap by hexagonal wrench until you get the correct gap 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 slightly and lose compression. Then adjust again.

**Note:**

- Because it uses oil mixed gasoline, the aircraft may become dirty due to exhaust smoke.
- 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.
- 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. Then push and return several times to help the valve to move smoothly.
- 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.
- Exhaust smoke is harmful, so be careful not to inhale or expose yourself to it as much as possible. Otherwise, it may harm your health.
- 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. 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.

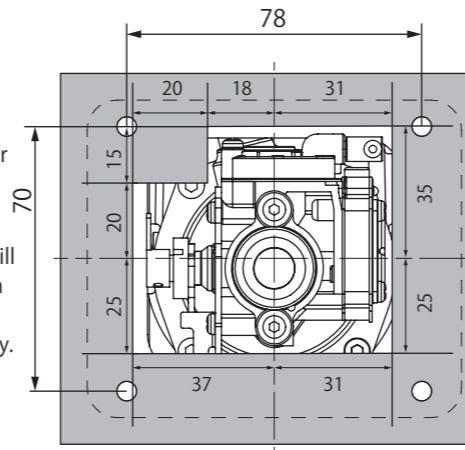
All specifications and models are subject to change without notice.

**SAITO** SAITO SEISAKUSHO, CO., LTD. [www.saito-mfg.com](http://www.saito-mfg.com)

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**Firewall Cutting dimension**  
<View from rear>

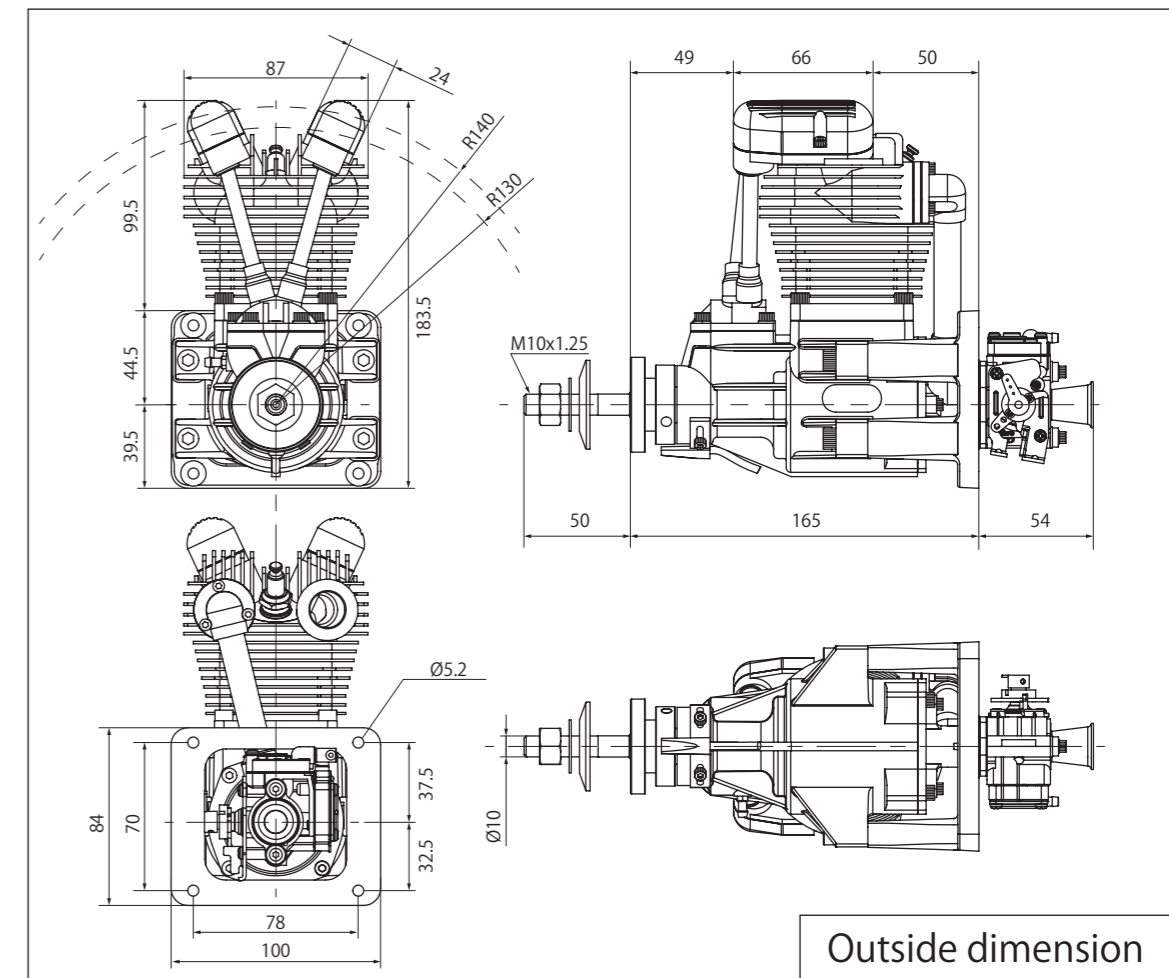
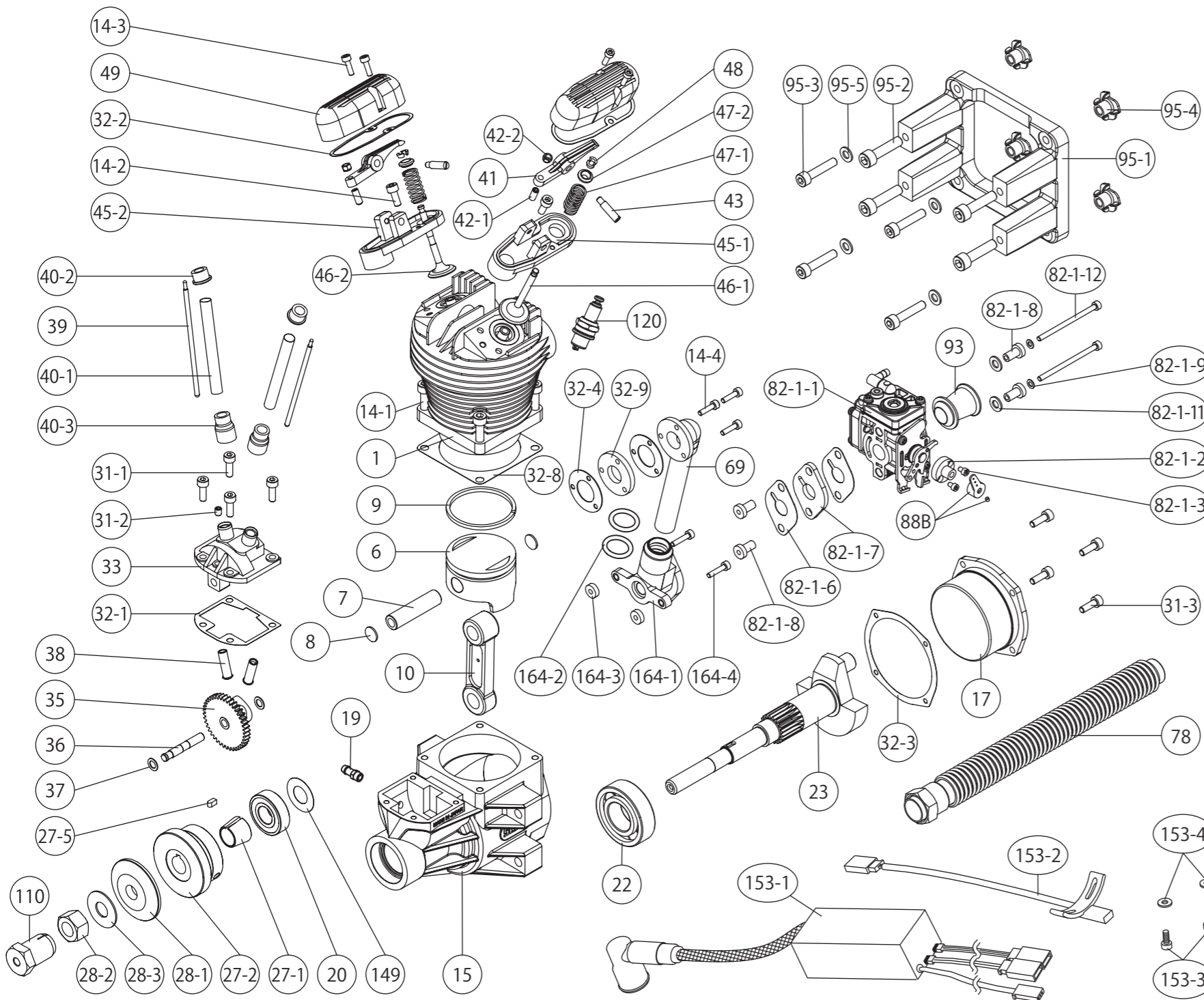
Please refer to the engine installation



Scale 1:2

**FG-50 Parts List**

No.	PART NAME	Qty	No.	PART NAME	Qty
01	Cylinder	1	42	Rocker arm screw & Nut	2set
06	Piston	1	42-1,2		
07	Piston pin	1	43	Rocker arm pin	2
08	Piston pin retainer	2	45-1	Intake Rocker Arm Bracket for Cylinder	1
09	Piston ring	1	45-2	Exhaust Rocker Arm Bracket for Cylinder	1
10	Connecting rod	1	46-1	Intake Valve	1
14	Cylinder screw set	1set	46-2	Exhaust Valve	1
14-1,-2,-3,-4			47	Valve Spring, Retainer, Cotter	2set
15	Crankcase	1	47-1,-2,48		
17	Rear cover	1	48	Cotter(Valve Spring retainer)	2
19	Breather nipple	1	49	Rocker Arm Cover	2
20	Front ball bearing	1	69	Intake Pipe	1
22	Rear ball bearing	1	78	Flexible Muffler	1
23	Crankshaft	1	82-1	Carburetor Complete	1set
27	Taper collet & Drive flange & Parallel Key	1set	82-1-1,-1-2,-1-3,-1-6,-1-7,-1-8,-1-9,-1-11,-1-12,88,93		
27-1,-2,-5			83-1	Carburetor Body Assembly	1set
28	Prop washer & Nut	1set	82-1-1,-1-2,-1-3,88		
28-1,-2,-3			88B	Throttle Lever	1
31	Crankcase screw set	1set	90	Carburetor Screw Set	1set
31-1,-2,-3			82-1-9,-1-11,-1-12		
32	Engine gasket set	1set	91	Carburetor Gasket Set	1set
32-1,-2,-3,-4,-8,-9			82-1-6,-1-7,-1-8		
33	Cam gear housing	1	93	Air Funnel	1
35	Cam gear	1	95	Engine Mount Set	1set
36	Cam gear shaft	1	95-1,-2,-3,-4,-5		
37	Steel washer	2	110	Anti loosening nut	1
38	Tappet	2	120	Spark Plug (NGK CM-6)	1
39	Pushrod	2	149	Oil slinger	1
40	Pushrod cover & Rubber seal	2set	153	Electronic ignition system	1set
40-1,-2,-3			153-1,-2,-3,-4		
41	Rocker arm	2	164	Intake Manifold Assembly	1set
			164-1,-2,-3,-4,		



Outside dimension