

SAITO

# FG-120TS Instruction Manual

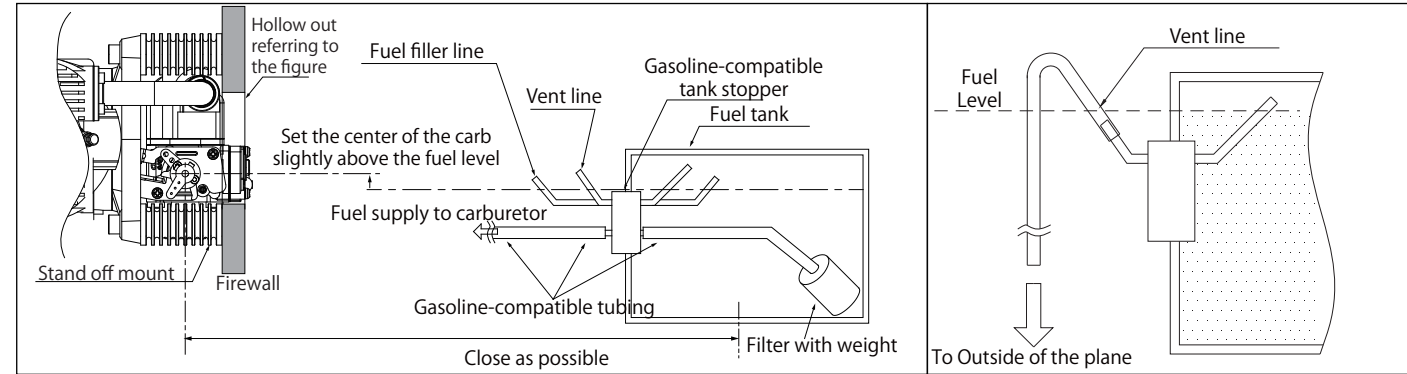
ver. Jan, 2025

## Specifications

Bore	Φ48.0mm x 2	Stroke	33.6mm x 2	Disp.	121.6cc	Applications	Acro-2st 70cc class Scale-2st 70cc-100cc class
Weight (Approx.)	Main body : 4,030 g / Mufflers : 180g / Ignition : 160g			RPM range	Approx.1,000-6,000rpm	Max on ground	Approx. 5,500-6,000rpm
Propeller	27" x 12" ~28" x 12"	Plug	CM-6	Battery for ignition system	6-9V, greater than1,000mA (2S Lipo 25C or less, 2S Life, 5S NiMH)		
Standard accessories	• Limit gauge (0.1t) for tappet adjustment 1pc • Spark plug[CM-6](Attached to the engine) 2pcs • Ignition system (w/sensor) 1set			• Wrench for tappet adjusting lock nut 1pc • Muffler set 1set • Muffler bracket 1set			• Choke & Carburetor adjustment bar 1pc • Hexagonal wrench 1pc • Stand off mount 1set
Optional parts	• Filter with weight [G36-154] • Tappet adjusting kit [120S-161]			• Durable tube for Gasoline (1m) [G36-155] • Digital tachometer [G17-167]			

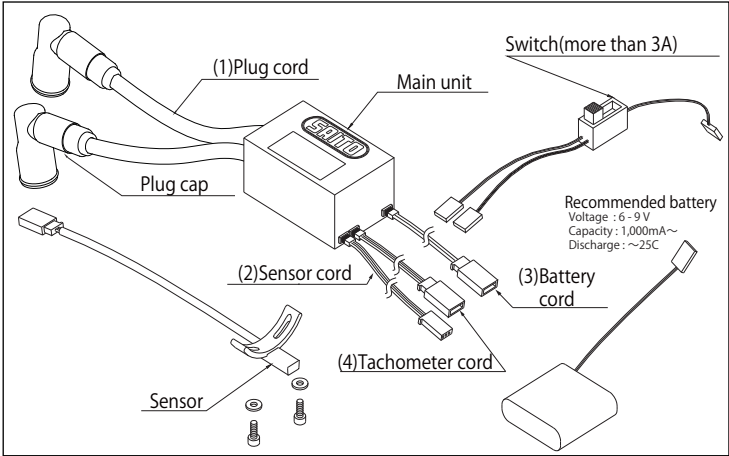
## 1. Fuel

- The fuel is a mixture of regular gasoline or high-octane gasoline and high-quality 2-stroke engine oil.
- [Example of oil recommendation]
  - Castrol POWER1 RACING 2T • Deluxe Materials PowerModel 2T-S • Klotz KL-200 Original Techniplate 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 ).
- 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.



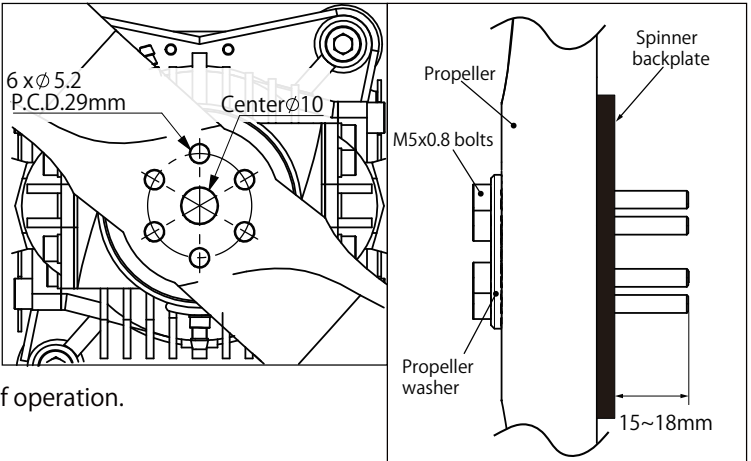
## 2. Ignition

- Ignition arrangement- Place the main unit as far from other electrical devices 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. (6-9V, greater than1000mA, 25C or less). 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

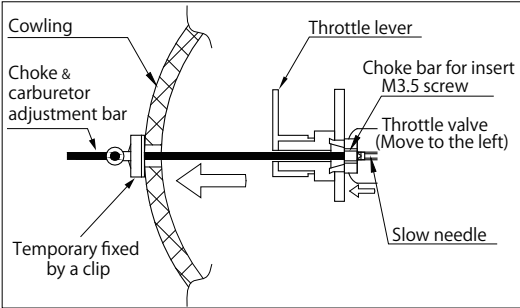
- Recommended propeller is Mejzlik 27 x 12 which brings approx. 5,300rpm (or Falcon D27"xP12" brings approx. 5,000rpm).
- Use a well-balanced one. Never use the propeller that has been scratched or damaged even if slightly.
- Open a hole exactly in propeller hub (boss) in advance as shown in the right figure using drilling tool and propeller washer.
- Pass the propeller through the shaft and tighten the six bolts inserting the propeller washer in the order of diagonal. ※The appropriate length of the bolts may be different depending on the thickness of the propeller hub (boss). Depending on the propeller and spinner backplate you use, use M5 x 0.8 bolts with length that protrude 15~18mm. (Screw length of standard accessory is 55mm)
- As the propeller is compressed slightly, tighten the 6 bolts every hour of operation.



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

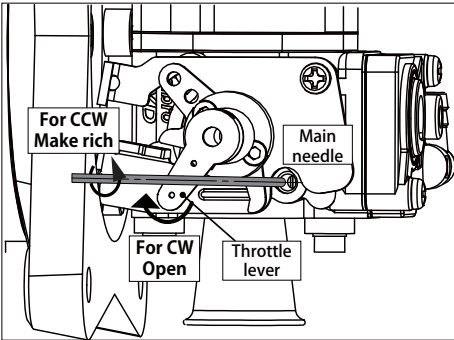
- ※Choking is the means by which fuel is fed to the engine when you start it by hand flipping. Thus it is unnecessary when using starter. Starting with a electric starter is recommended for safety.
- In advance, make a thin hole in the cowling to insert the Choke & carburetor adjustment bar, slow needle adjustment bar.
- During choking, be sure to turn off the ignition switch.

- As shown in the fig, pass the Choke & carburetor adjustment 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 & carburetor adjustment 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 & carburetor adjustment 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.



## 5. Break-in MOST IMPORTANT!!

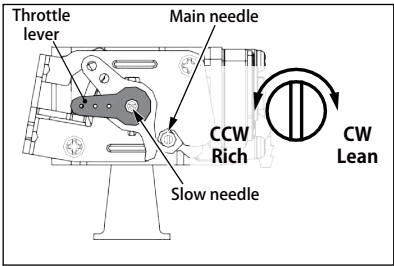
- Before starting the engine, inject a suitable amount ( approx. 20cc ) of engine oil into the lubrication nipple on the crankcase using a syringe or pump while turning the propeller by hand. After that, plug this nipple. As excess is discharged from the breather nipple, attach a tube to the breather nipple.
- Prop-recommendation : 27x12.
- 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 open (CCW) from fully closed.
- Start the engine (using a starter is recommended for safety).
- Soon after starting, open the throttle and main needle at the same time. In the meantime open the main needle CCW more than 2 turns, **Keep the throttle at 60-90%.**
- Soon after that open the slow needle CCW until RPM drops significantly.
- At this stage, single-cylinder operation (where one of the cylinders is misfiring) is acceptable.
- Run in this very rich condition for 1 liter of fuel.
- Now “initial” break-in is done.



## 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

- 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.)

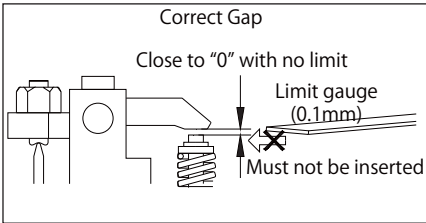
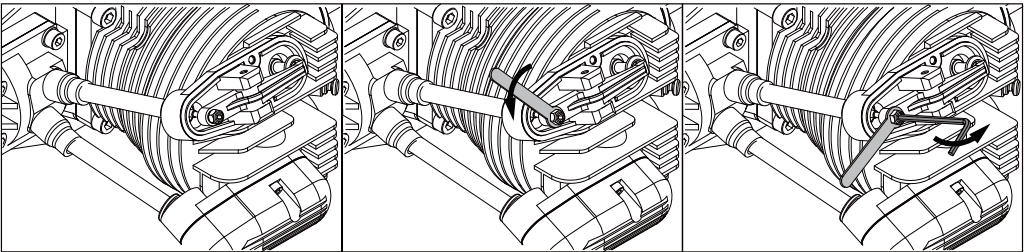
### ◇Pre-flight / Flight adjustment

- 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 time after two hours while the engine is cold. Before adjusting tappet gaps, tighten up 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 for both of intake & exhaust.
3. Once the gap is set, tighten the lock nut and attach the plug and covers. Then do the same adjustment for the other cylinder.
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.





### 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.
- 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. SAITO SEISAKUSHO CO., LTD. is exempt from any responsibilities.

## Warranty:

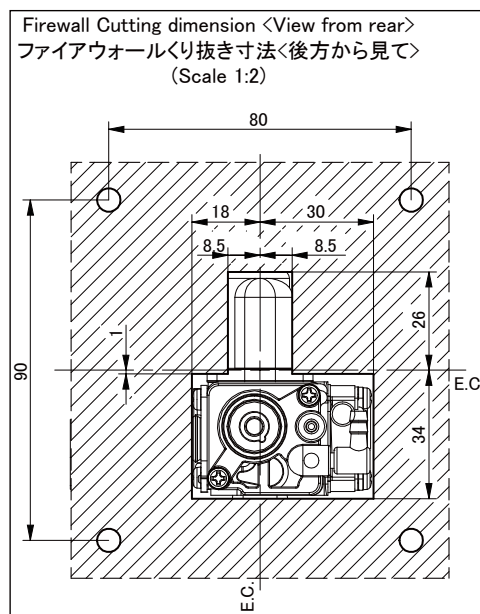
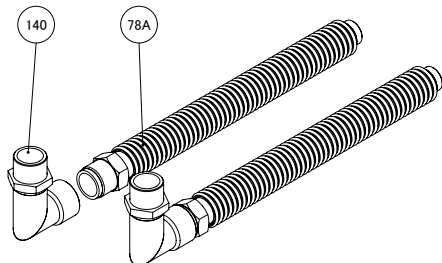
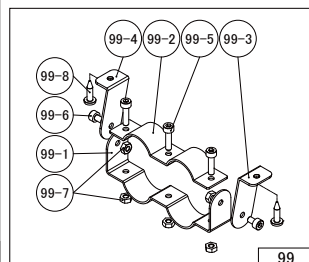
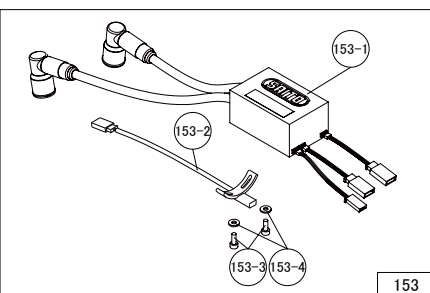
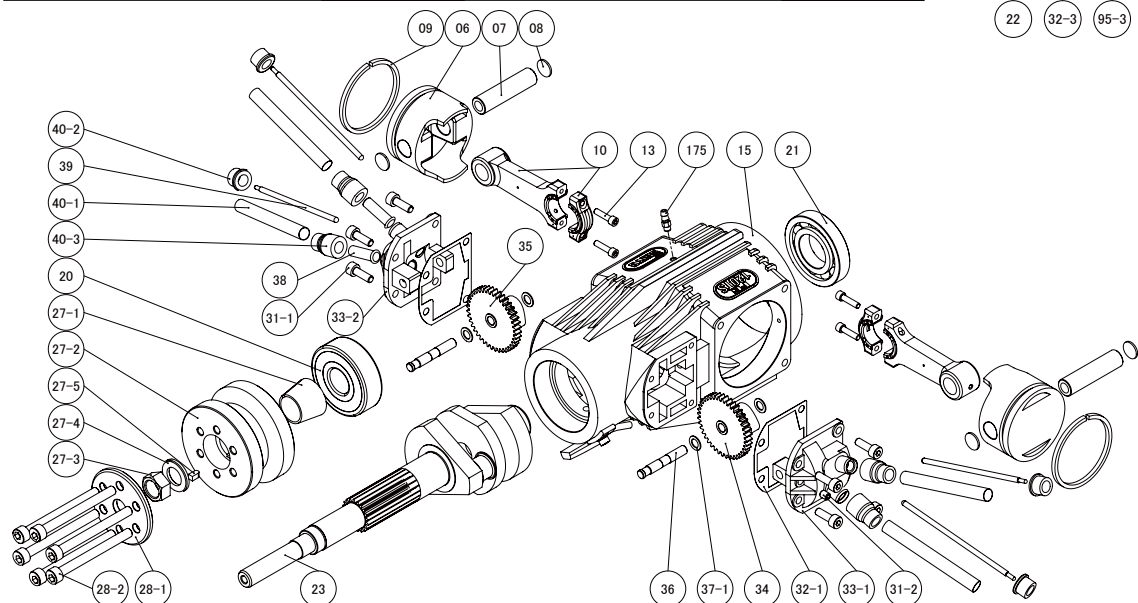
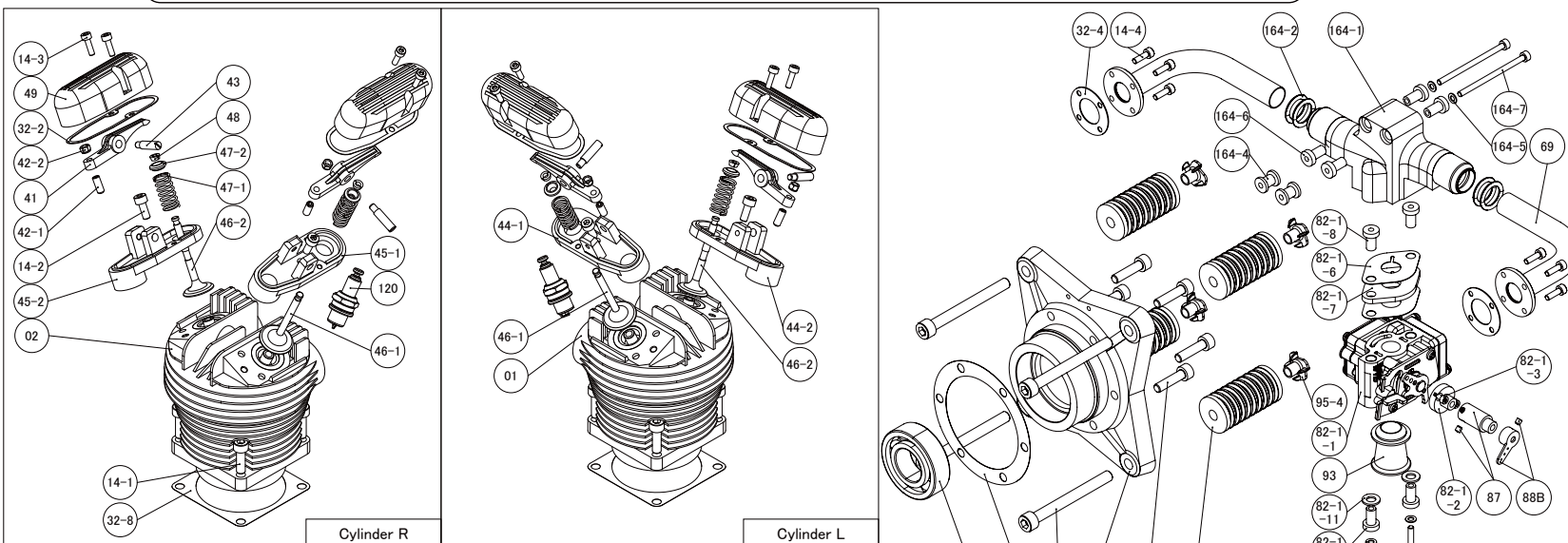
- If there is any deficiency from the factory concerning manufacture, please consult with the shop or distributor you bought from. Our company will be responsible for repair. However, any failure or trouble caused by unnecessary disassembly, modification, or other uses than those provided in the instruction 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 designs are subject to change without notice.

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No.	PART NAME	Required 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	Connecting Rod ( Conrod)	2
13	Conrod Screw	4
14	Cylinder Screw Set 14-1,-2,-3,-4	1set
15	Crankcase	1
19	Breather Nipple	1
20	Front Bearing	1
21	Main Bearing	1
22	Rear Bearing	1
23	Crankshaft	1
27	Taper Collet & Drive Flange 27-1,-2	1set
27-3	Drive Flange Nut	1
27-4	Drive Flange Washer	1
27-5	Parallel Key	1
28	Prop Washer & Screw Set 28-1,-2	1set
31	Crankcase Screw Set 31-1,-2,-3	1set
32	Engine Gasket Set 32-1,-2,-3,-4,-8	1set
33-1	Cam Gear Housing for Cylinder (Left)	1
33-2	Cam Gear Housing for Cylinder (Right)	1
34	Cam Gear for Cylinder (Left)	1
35	Cam Gear for Cylinder (Right)	1
36	Cam Gear Shaft	2
37	Steel Washer	2
38	Tappet(Valve Lifter)	4
39	Pushrod	4
40	Pushrod Cover & Rubber Seal 40-1,-2,-3	2set
41	Rocker Arm	4

No.	PART NAME	Required Q'TY
42	Rocker Arm Screw & Nut 42-1,-2	2set
43	Rocker Arm Pin	4
44-1	Intake Rocker Arm Bracket for Cylinder (Left)	1
44-2	Exhaust Rocker Arm Bracket for Cylinder (Left)	1
45-1	Intake Rocker Arm Bracket for Cylinder (Right)	1
45-2	Exhaust Rocker Arm Bracket for Cylinder (Right)	1
46-1	Intake Valve	2
46-2	Exhaust Valve	2
47	Valve Spring, Retainer, Cotter 47-1,-2,48	2set
48	Cotter(Valve Spring retainer)	4
49	Rocker Arm Cover	4
69	Intake Pipe	2
78A	Flexible Muffler	2
82-1	Carburetor Complete 82-1-1,-1-2,-1-3,-1-6,-1-7,-1-8, -1-9,-1-11,-1-12,87,88,93	1set
83-1	Carburetor Body Assembly 82-1-1,-1-2,-1-3,88	1set
87	Throttle Lever Extension Adapter	1
88B	Throttle Lever	1
90	Carburetor Screw Set 82-1-9,-1-11,-1-12	1set
91	Carburetor Gasket Set 82-1-6,-1-7,-1-8	1set
93	Air Funnel	1
95	Engine Mount Set 95-2,-3,-4	1set
99	Muffler Bracket Set 99-1,-2,-3,-4,-5,-6,-7,-8	1set
119	Rear Cover Mount	1
120	Spark Plug(NGK CM-6)	2
140	Muffler right angle adopter / nut	2
153	Electronic Ignition System 153-1,-2,-3,-4	1set
164	Intake Manifold 164-1,-2,-4,-5,-6,-7	1set
175	Initial Lube Nipple	1

