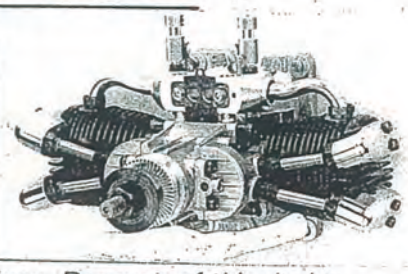
SAITO FA-100T(AAC) 4 Stroke Engine

Thank you for your purchase of the Saito FA-100T engine. We feel that you have made a wise purchase and one that will last for an extended period of time through hard usage. Please read and become familiar with these instructions prior to operation of the engine. Follow closely the break-in procedures and maintenance instructions while we will repair this engine without any cost, if you have a manufacturing defect.



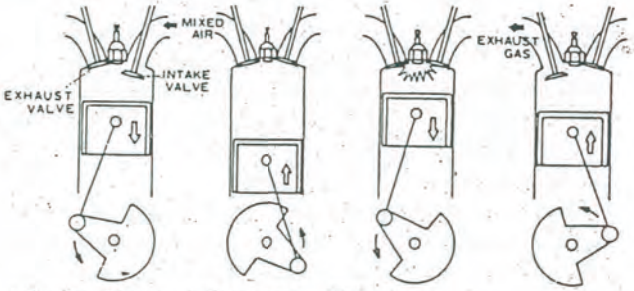
The FA100T engine utilizes a single throw crank shaft, like all full sized radial engines. Because of this design, the engine is simple in construction, light in weight, and highly efficient. To maintain a positive crankcase pressure, and eliminate harmful blowby gasses, and to ensure complete and smooth lubrication throughout the engine, and protect from inside rust,

Cylinder : Direct hard chrome plated for better cool running and light weight
Piston : High silicon content aluminum
Crankshaft : Twin ball bearing supported
Cylinder Head : Hemispherical for increased power
Cam Gear : Forward placed twin cams for light weight
Valves : Large diameter for power and efficiency
Carburetor : Twin carburetor

FA-100T (16.4c.c.) Specifications

Bore : 23.4mm × 2
Stroke : 19mm × 2
Maximum RPM : 10,000
Useful RPM Range : 2,500~10,000r.p.m.
Fuel Flow : Full throttle/1 minute. Approx. 14cc fuel. 10~20% Nitro
Weight : 820 grams approx.

Explanation of AAC 4 Stroke Cycle Engine

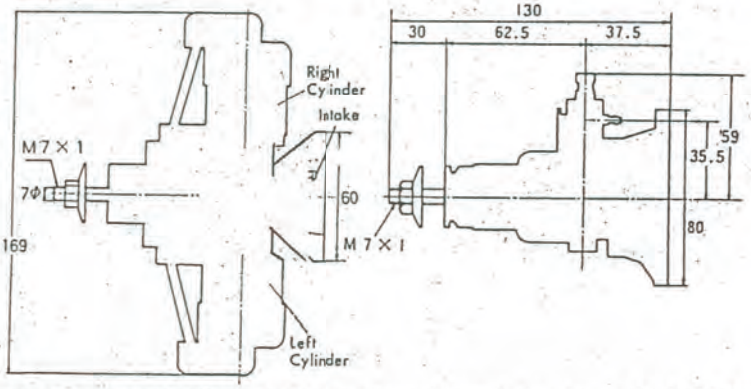


1.Suction Stroke 2.Compression Stroke
3.Expansion Stroke 4.Exhaust Stroke

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.

Supplied standard accessories

1.	Spanner for tappet adjusting screw	1
2.	Screwdriver for airneedle adjustment	1
3.	Tappet adjusting screw gap gauge (0.1t)	1
4.	Hexagonal spanner (wrench) (3, 2.5, 2, 1.5)	1 each
5.	Box wrench for glow plug	1
7.	Engine mount bolt ⊕ M4x25 & washer M4	4 each
8.	Blind nut for mounting bolt M4	4
9.	Needle valve extension bar	2
10.	Opening & closing bar for choke valve	1
11.	Knob for bar	3
12.	Fuel branch pipe	1
13.	Linkage rod	1
14.	Connector for plug	1 set
15.	Exhaust pipe (R & L) w/gasket	1 set
16.	Glow plug fitted in the engine	2



Ⓐ Fuel : It is important for engine to use high quality fuel containing 10~20% nitro. For consistent performance and ong 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.**

Ⓑ Plugs : The Saito P-8S plug is recommended. Due to the operation of 4 stroke engines (1 explosion for 2 revolutions), plug selection is critical for efficient operation.

Ⓒ Propeller : Standard for this engine is the 12" × 10" (APC)

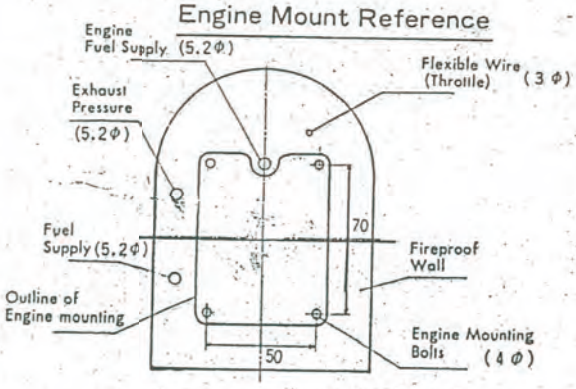
Ⓓ Engine Mounting : Use at least 10mm or greater thickness of plywood for mounting the radial engine mount as a fireproof wall and strengthen with triangle wood stock. Use attached parts for fixing. (See diagram)

Ⓔ Fuel Tank : Use a 350 ~ 400cc fuel tank. It is the best that fuel in the fuel tank has the same level as the needle valve.

TWIN CARBURETOR

(1) An optimum fuel-air mixture for efficient combustion to the right

Engine Mount Reference



and left cylinders can be individually adjusted by the needle valve.

(2) Improved output

(3) Improved performance without plug heat in idle mode (approx. 2500 rpm).

Ⓕ Carburetor Adjustment:

Operating Choke Valve

Forcibly give 2 or 3 forward turns to the propeller with the throttle valve fully opened (test in advance since the number of turns varies with the fuel level in the fuel tank).

- Do not crank the engine any more if it shows dull run due to over intake of fuel. Alternately and gently turn the propeller rightward and leftward until it allows smooth run, and then restart the engine.
- Otherwise, the linkage rod will be damaged.
- Operate the choke valve with the throttle valve opened all the way. The choke valve cannot be operated with the throttle valve set to the low or medium position since air enters the carburetor from the idle air bleed hole.

Adjusting Main Needle Valve

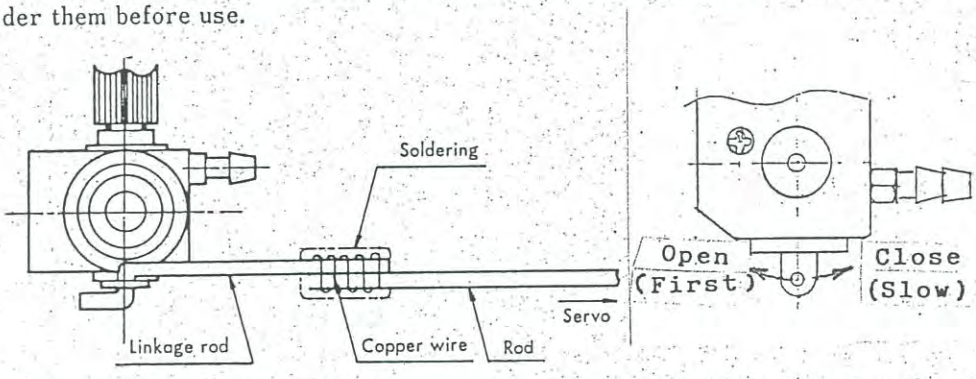
Open the main needle valve about 3 times depending upon the plugs used and a type of fuel. Choke the throttle valve. Set the throttle lever to the low-speed position to set plug heat. Forcibly give forward turns to the propeller. When the engine starts operation, set the throttle lever to the maximum-speed position. Either right or left needle valve may be adjusted first. Explanation proceeds with adjustment of the left needle valve. Loosen the needle valve to a 1/2 turn to enrich a fuel-air mixture. Gradually, throttle it until the peak value is obtained. Take the same procedure for the right needle valve as for the left one until the peak value can be obtained. Adjust the right and left needle valves once more until the peak value can be obtained. After that, loosen both needle valves 1 or 2 divisions (knurled heads). Finely, adjust the right and left needle valves repeating the above operation 2 or 3 times.

Adjusting slow Needle Valve

Adjust the slow needle valve to a speed from 2300 to 2500 rpm without setting plug heat. Open the slow needle valve about 7 times. Run the engine to the maximum rpm. Gradually, decrease speed to approx. 3500 rpm. Under that condition, adjust the slow needle valve. Check the right and left carburetors for the outlet mixture at that time. Gradually, loosen the throw needle valve, for example, if the outlet mixture is richer (air-rich). Also adjust the right slow needle valve in the same way as stated above. When explosion (power) is stopped during adjustment, set plug heat and adjust the slow needle valve until engine operation is stabilized. Be careful of outlet mixture sound when adjusting this needle valve as well as adjusting the main needle valve. Closing the slow needle valve enriches the outlet mixture and opening the slow needle valve leans it.

Linkage

Since the section of the throttle lever is restricted, wind a copper wire on the linkage rod furnished along with the rod to the servo and solder them before use.



Ⓖ Engine Starting : A point of starting is that you have to choke rather overly. In case of 2 cycle engine, the mixed gas, charged in the crankcase, will be supplied continuously. 4 cycle engine is concerned, the mixed gas will be sucked into the cylinder inside directly from the carburetor so that it is short supplied at low revolutions of starting. Power source parts right and left, and a large dry battery in capacity (1.5V FM-(3H)) is used for each of them. It is not a good way to plug a right jack and a left jack from one battery, because this way will reduce voltage of the battery. Moreover, use an electric wire (0.5 VSF low resistance wire) or bigger ones. Unless you use it, electric current is short and a battery is wasted for start troubles. Make sure to start the both cylinders together while one side start is strictly prohibited.

Using Electric Starter : First of all, open the throttle valve to its full width. Secondly, pull the choke valve, and crank up quickly a few times by hand to have fuel inhaled.

Note: Do not over choke, as a fuel lock could develop whereby you could damage the con rods. Apply plug heat to both plugs. Make sure that the starter is rotating in the proper direction. Engine rotates counter clockwise when facing it. Start engine.

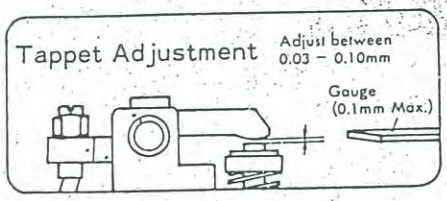
Engine Lubrication: During engine running, oil is swept into the crank case by the piston movement. This oil provides the lubricant for the crankshaft, con rods, bearings, valve train, rocker arms, etc.

Hand Starting : In this engine, you will observe during hand cranking, a compression stroke, followed by another compression stroke, followed by a complete revolution without compression. Adjust the propeller so that it is vertical when at the first compression stroke, and for the best results always start at the first compression stroke. Start quickly without any anxiety.

Ⓗ 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. For the first 30 minutes of running, you will have the needle valve set at the slightly rich setting (About 4,000 RPM). . Next is to lean out the mixture to achieve the highest RPM for about 30 seconds, then richen it up again to about 6,000 RPM. Repeat this procedure every three minutes or so. For about the first 10 flights, you should not fly at peak RPM as the engine is still wearing in. After about an hour of running, tighten up the exhaust and intake manifold nuts, check the valves for proper clearance, etc. The engine should now be broken in and function smoothly at all settings.

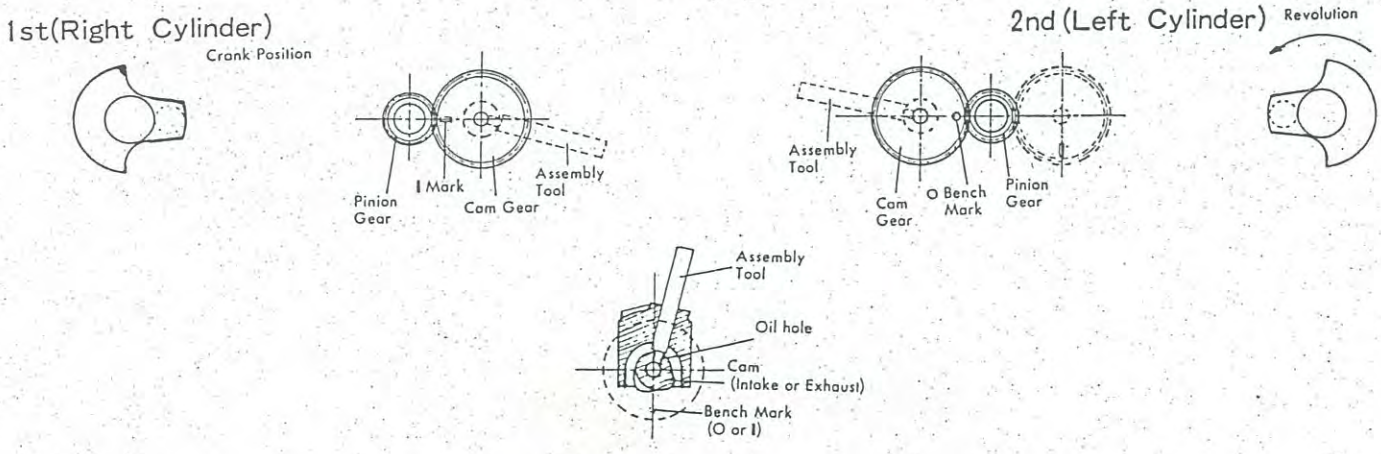
Ⓘ General Running & Maintenance Procedures :

1. Too lean of a needle valve setting will cause the engine to run hotter than normal.
2. 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 tighten up the lock nut. When you have the valve cover off of the engine, it is good practice to give each of the bearing points a drop of high quality silicon content motor oil (Same as the 40 weight used in automobiles). This will keep wear to a minimum. (See diagram)



Ⓙ Engine Disassmbly : Avoid as much as possible the complete disassembly of this engine. If necessary, follow these instructions exactly.

1. Cylinder Heads. Do not unscrew all of the head bolts at the same time. Alternate removal of the screws to avoid any warp.
2. Assemble in reverse order, and use a drop of engine oil on the threads prior to screwing in.
3. Cam Gears Replacement. When facing engine, assemble the right cam gear first as follows:



1st (Right Cylinder)
Crank throw at right cylinder top dead center. Insert cam shaft assembly tool into the exhaust pushrod bushing, and rotate camshaft until tool falls into oil hole in camshaft. With camshaft in position and crank at TDC, the gears will mesh at the proper timing point. Bench marks are located on the gears for reference.

2nd (Left Cylinder)
Rotate crankshaft 180 degrees to the arrow mark. Insert timing tool into the intake side of the pushrod opening. Rotate cam gear until the tool enters the oil hole of the camshaft. Gears are now lined up with the bench marks. Study diagrams carefully.

When reassembling your engine, it is very important that the same pistons, rods, valves, etc., all go into their original positions. Clean all parts well, and then oil with clean engine oil. Alternate the tightening of screws and do not overtighten.

Ⓚ Overall Precautions : When stopping the engine, run at high RPM for about 10 seconds, then cut off fuel supply. This will rid the engine of unburnt fuel which could cause rusting if stored for long periods.

- When engine is to be stored, remove rear cover mount, plugs and valve covers.
- Wash well in kerosene, and then blow out remaining kerosene with a compressor and lubricate well with engine oil, and store in a sealed vinyl bag.
- To protect the engine during periods between flying, cover the engine with a cloth.
- After engine start, make all adjustments from behind the propeller for safety.
- MaKe sure that propeller nut and other screws (Mounting Bolts, etc.) are tight.
- Use an electric starter, or gloves when hand starting. Make safety in your flying first and foremost.
- Make sure that your propeller is properly balanced prior to installation, as a big caliber propeller is used.

※ 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.

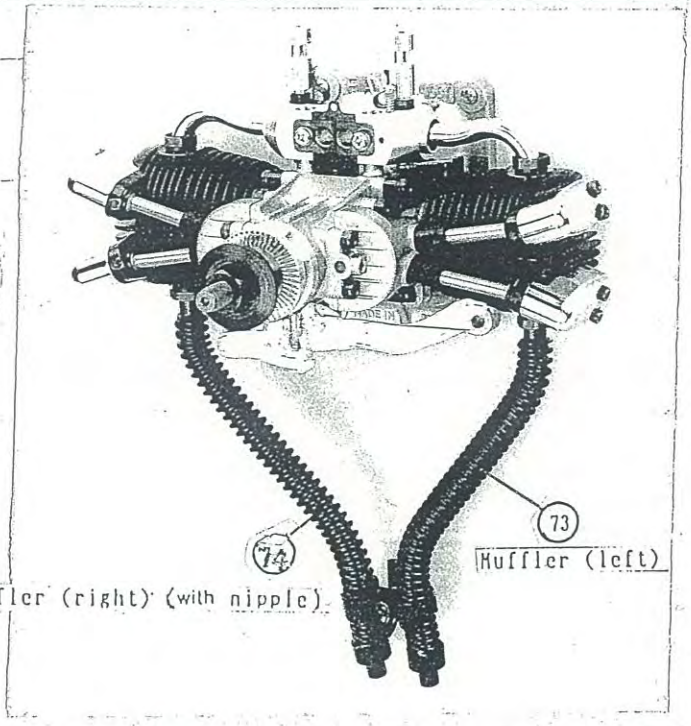
Propeller

12" × 10"w	9,400 RPM	APC (W)
12" × 8"	10,600 RPM	〃 〃
13" × 6"	10,800 RPM	MK

Engine Useage

Useable for all .60 sized 2 stroke aircrafts.

Type	Wing Area	Weight(kgs.)	Flying	Airfoil
Scale	50 dm²	4	Simple aerobatic	Symmetrical
Sport	47 dm²	3.7	Stunt	Symmetrical
Large, light scale, etc.	80 dm²	4-4.5	Prototypical flight maneuvers	Clark Y and semi-symmetrical

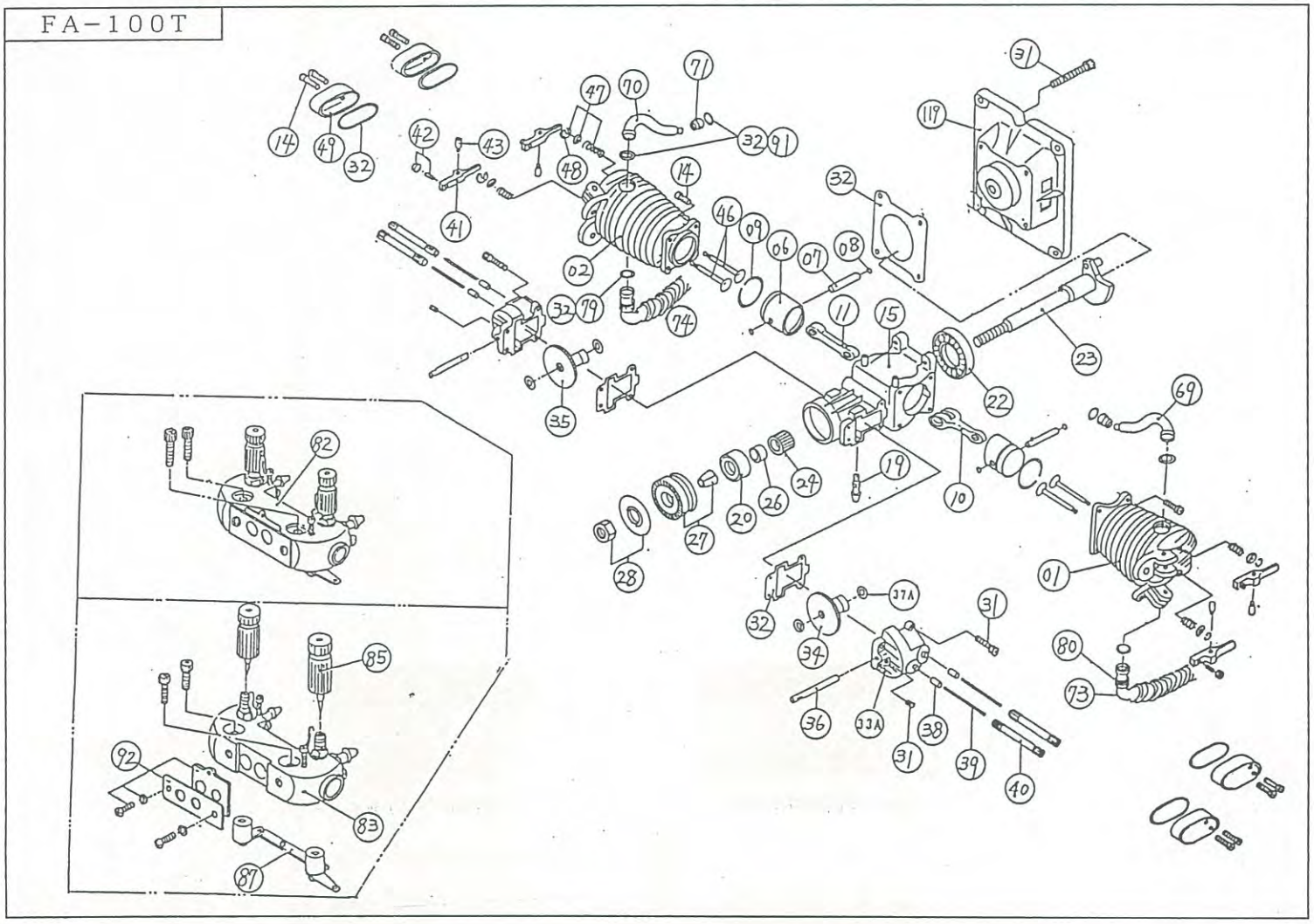


All specifications and models subject to change without notice.

SAITO SEISAKUSHO, CO., LTD.
22-7, Tokagi, 3-chome Ichikawa-Shi, Chiba Prefecture, Japan.
Telephone No. 047-378-4156 FAX No. 047-378-4155
Home Page Address=http://www.saito-mfg.com

Saito FA-100T Parts List

NO	Description	Q'ty
01	Cylinder (left)	1
02	Cylinder (right)	1
06	Piston	2
07	Piston pin	2
08	Piston pin retainar	4
09	Piston ring	2
10	Connecting rod	1
11	Linked conrod	1
14	Cylinder screw set	2set
15	Crankcase	1
19	Breather nipple	1
20	Front bearing	1
22	Rear bearing	1
23	Crankshaft	1
24	Pinion(crankshaft)	1
26	Collar(crankshaft)	1
27	Taper collet & Drive flange	1ea.
28	Prop washer & Nut	1ea.
31	Crankcase screw set	1set
32	Engine gasket set	1set
33	Cam gear housing	2
34	Cam gear (left)	1
35	Cam gear (right)	1
36	Cam gear shaft	2

NO	Description	Q'ty
37	Teflon & Washer set	1set
38	Tappet	4
39	Pushrod	4
40	Pushrod cover & Rubber seal	4ea.
41	Rocker arm	4
42	Rocker arm screw & Nut	4ea.
43	Rocker arm pin	4
46	Valve (in & out)	4
47	Valve spring & Keeper & Retainer	4ea.
48	Valve retainer	/
49	Rocker arm cover	4
69	Intake manifold (left)	1
70	Intake manifold (right)	1
71	Intake manifold nut	2
73	Muffler (left)	1
74	Muffler (right) (with nipple)	1
79	Muffler gasket	2
80	Muffler nut	2
82	Carburetor complete	1set
83	Carburetor body assembly	1set
85	Full throttle needle	2
87	Throttle barrel assembly	1set
92	Choke valve assembly	1set
119	Rear cover & engine mount in one	1

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