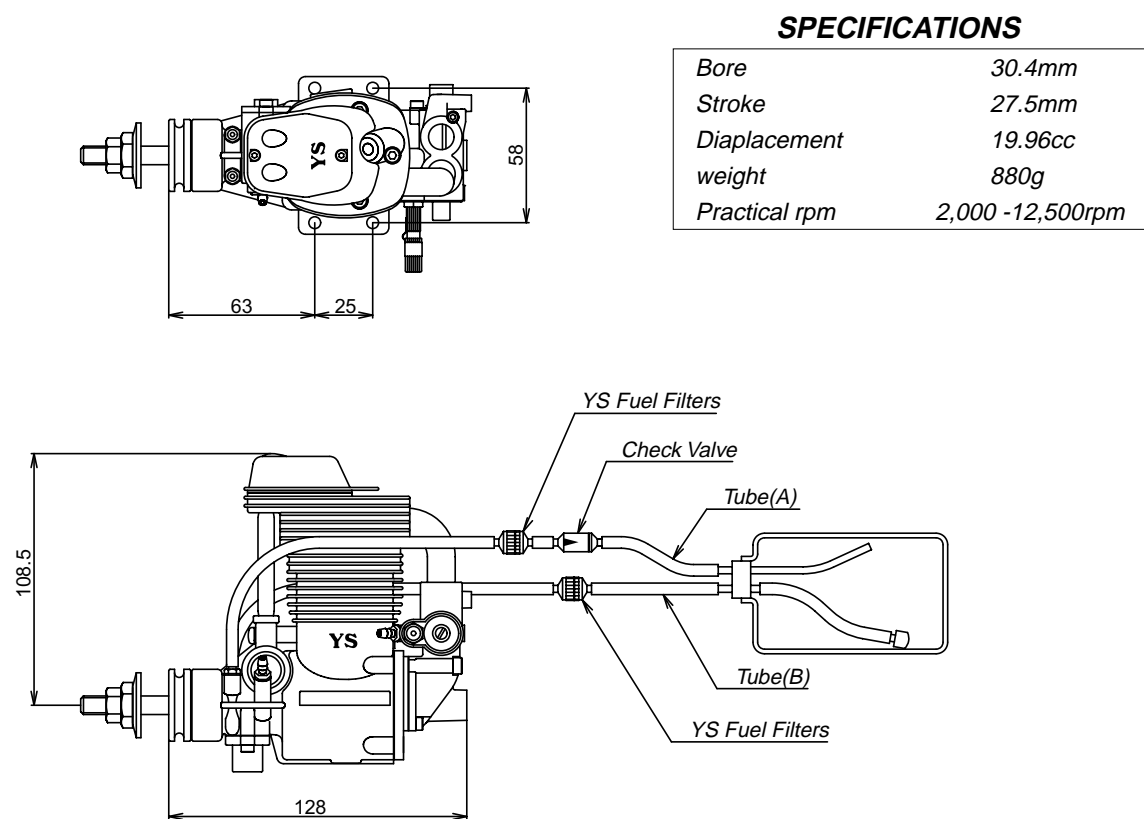


OPERATOR'S MANUAL

FZ120 Supercharged

fig.1



FEATURES

The FZ120 was designed for the pattern competition, scale and large sports models. As aircraft increases in size, so does the need for power. With a few modifications internally, YS was able to generate more power in the same 120 case. The YS 4 cycles are so unique, almost every square inch is used in some way to produce power.

- * Supercharged
- * Fuel Injected
- * Regulated and Pressurized Fuel System
- * High and Low Speed Adjustments

GLOW PLUG

Select the most appropriate glow plug from those designed specifically for 4 cycle engines. Glow plug selection greatly affects the maximum engine output and low idle. If RPM's decrease or stop when the booster cord is removed, replace the plug. We recommend the OS Type F plug for maximum performance.

INSTALLATION

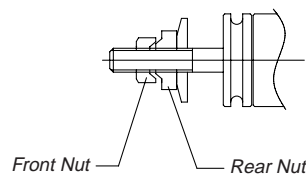
1. Connect the engine to the tank as shown in fig.1. Since high pressure is applied to the tank, tighten all connections carefully. Care must be taken to prevent pressure leakage due to undertightening of the check valve or by kinking the fuel lines.
2. Always use a fuel filter. We recommend YS filter.
3. Match the direction of the check valve arrow in fig.1, with the arrow facing towards the tank.

PROPELLER INSTALLATION

Due to the high torque of the 120 engine, we have equipped it with a double locknut system for safety.

1. Mount the propeller and tighten the rear nut. Next, tighten the front nut as shown in fig.2. The rear nut has an offset shoulder so the front nut will secure itself to the rear nut.
2. Select a good quality propeller that will allow the engine to run at maximum speed between 8,000 to 9,000rpm range. We recommend sizes 14x12-14, 15x10-12, 16x8-10.

fig.2



START UP

1. Remove tube A from the check valve, (CAUTION) Tank pressure must be released first before tube B is opened. Remove tube B and begin to fill fuel tank.
2. Open the high speed needle 2 1/2 turns from the closed position.
3. Open the throttle fully and slowly turn the propeller 10 times. This will prime the engine and pressurize the fuel tank.
4. Close the throttle to the idle position and connect the glow driver. The engine is now ready for starting.

DO NOT ATTEMPT TO START ENGINE AT FULL THROTTLE, AS THIS IS VERY DANGEROUS. ALWAYS USE EXTREME CAUTION WHEN ENGINE IS RUNNING.

BREAK-IN

To maximum engine performance and increase durability, please follow this break-in procedure.

1. Use the same size (or slightly smaller) propeller than you intend to use in flying.
2. Use a good quality fuel which contains 15-30% nitromethane and an oil content of Low Viscosity oil 20-24% oil. Synthetic or castor oil can be used, or a combination of both.
DO NOT USE FOUR CYCLE FUEL DUE TO LOW OIL CONTENT.
3. After the engine has started, slowly bring the throttle up to full. Set high speed needle so it is running at a good rich setting without the glow driver. Run engine at this setting for approximately 20 minutes with the throttle moving from low to high speed.
4. After the initial 20 minute break-in, mount the engine in the aircraft and set the high speed to a richer than normal setting for the first 10 flights. This will help to lubricate all moving parts.

HIGH SPEED NEEDLE ADJUSTMENT

1. Adjustment of the high speed is done by the carburetor needle valve. When the needle valve is turned clockwise, the mixture is leaner. When it is turned counterclockwise, the mixture is richer. A good starting position for the high speed needle valve is 2 1/2 turns open from the fully closed position.
2. When the engine is started, open the throttle gradually. Next, find the peak position (highest RPM) by adjusting the needle valve. Then the needle valve should be opened approximately 1/8-1/4 turns from full RPM to achieve best performance. **The engine may stop if the throttle is opened to full immediately after starting. Wait until the engine has warmed up and pressure has developed in the tank.**

LOW SPEED ADJUSTMENT

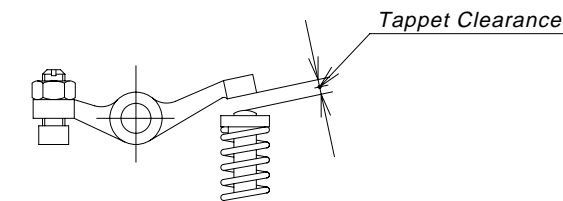
This engine is equipped with a new low speed needle valve to adjust the mixture from low to mid throttle. See fig.1 for location.

1. Factory starting position is 1 1/2 turns open from the fully closed position. The low speed needle should be set after the high speed needle has been adjusted.
2. Close the throttle gradually to an idle (approximately 2,000rpm). Let it idle for 15-20 seconds and then slowly advance the throttle. The adjustment is set when low to high speed has a smooth transition.
3. If the engine is running rough at idle or too rich, turn the low speed needle counterclockwise to lean out the low end.
4. If the engine speeds up at idle, the low speed mixture is too lean. Turn the low speed needle clockwise to richen the mixture.
5. If the engine is too lean on the low end, it can detonate and stop when transition from low to high RPM.

REGULATOR ADJUSTMENT

The regulator is preset at the factory. The top of the brass adjusting screw is flush with the top of the regulator housing. Turning the regulator screw will not change the pressure the engine develops. The adjustment screw is used to adjust the amount of fuel to the carburetor. Turning the screw in will decrease the amount of fuel and turning the screw out will increase the amount of fuel to the carburetor.

fig.3



TAPPET ADJUSTMENT

Tappet clearance is preset at the factory. Adjustment if needed should be checked after the initial break-in. For maximum performance, valves should be checked as normal maintenance.

1. Clearance adjustment should be done when the engine is cool.
2. The proper clearance should be set 0.04-0.1mm or 0.002-0.004 in. The adjustment is achieved by losing the locknut (fig.3) and turning the adjustment screw. The engine must be at top dead center on the compression stroke before any adjustments are made.

CAM GEAR TIMING

If for some reason you have to disassemble your engine, please follow these important steps on reassembling the cam gear.

1. Remove the carburetor and backplate assembly. Notice the impression mark or dot opposite the rod journal on the crankshaft. This mark is to point straight down or lined up with the outer case seam line at the bottom.
2. Reinstall the cam with the dot facing you and is pointing slightly to the left. This will allow the cam to turn to the right when properly installed. The dot should be pointing starting up when cam is fully installed. Reinstall cam cover and timing is now set.

DIAPHRAGM AND CHECK VALVE DISASSEMBLY

Diaphragm;

1. Remove the regulator assembly by removing the two allen head screws.
2. Disassemble the regulator and clean with alcohol or appropriate cleaner.
3. When reinstalling the regulator, use a new gasket and note that the small casting tab on the regulator goes towards the propeller.

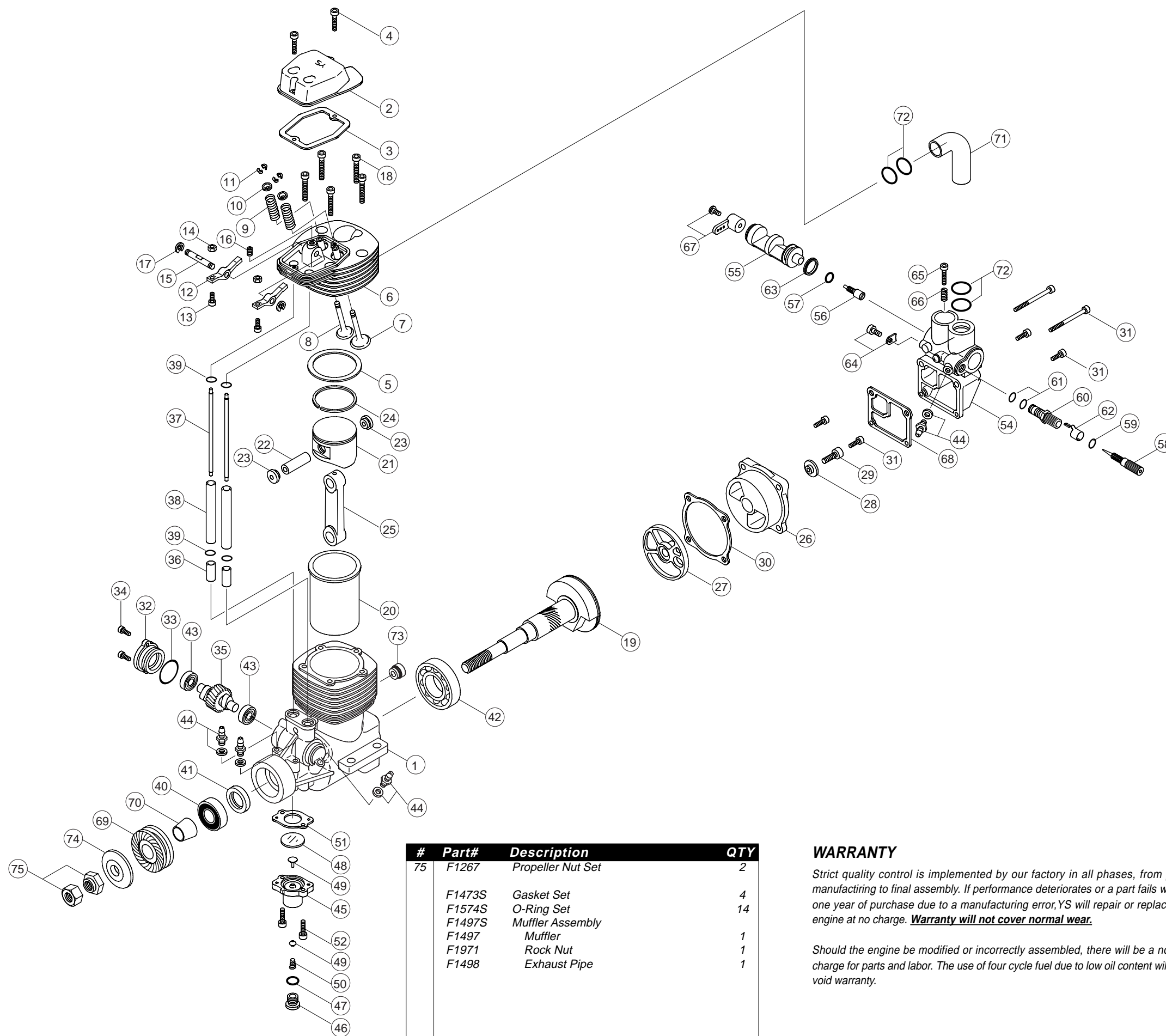
Check Valve;

1. Open the check valve by rotating the body counterclockwise. Note the small clear silicone disc. **DO NOT LOSE.**
2. Clean and reassemble. Check to make sure air will only pass through the check valve one way.

IMPORTANT! Silicone rubber is used in the YS engine. Only use glow fuel or methanol for cleaning. Gasoline and other volatile solutions will damage the silicone if used. Do not use petroleum based oils as after run lubricants.

FZ120 Parts LIST

#	Part#	Description	QTY
1	F1801	Crankcase	1
	F1202S	Head Cover Set	
2	F1202	Head Cover	1
3	F1203	Head Cover Gasket	1
4	F1204	Valve Cover Screw Set	2
5	F1205	Head Gasket	1
	F1806A	Head Assembly	
6	F1806	Cylinder Head	1
7	F1407	Intake Valve	1
8	F1408	Exhaust valve	1
9	F1409	Valve Spring Set	2
10	F1410	Spring Retainer Set	2
11	F1411	Valve Spring Retainer Clips	4
12	F1212	Rocker Arm Set	2
13	F1213	Tappet Adjusting Screw Set	2
14	F1214	Tappet Adjusting Rock Nuts	2
15	F1215	Rocker Arm Shaft	1
16	F1216	Rocker Arm Shaft Screw	1
17	F1217	E Ring Set	2
18	F1218	Head Screws	5
19	F1919	Crankshaft	1
20	F1520	Cylinder Liner	1
21	F1421	Piston	1
22	F1222	Wrist Piston	1
23	F1323	Wrist Pin Retainer Set	2
24	F1224	Piston Ring	1
25	F1225	Connecting Rod	1
	F1826A	Back Plate Assembly	
26	F1826	Back Plate	1
27	F1427	Disc valve	1
28	F1492	Rear Disc Valve Retainer	1
29	F1429	Retainer Screw	1
30	F1230	Back Plate Gasket	6
32	F1232	Cam Gear Cover	1
33	F1233	Cam Gear Cover O-Ring	1
34	F1234	Cam Gear Cover Screw	2
35	F1535	Cam gear	1
36	F1236	Cam Followers Set	2
37	F1237	Push Rod Set	2
38	F1238	Push Rod Cover Set	2
39	F1239	Push Rod Cover O-Ring	4
40	F1240	Front Bearing	1
41	F9122	Front Bearing Oil Seal	1
42	F1341	Rear Bearing	1
43	F1242	Cam Gear Bearing Set	2
44	F1243	Fuel Nipples Set With Washers	6
	F1244A	Regulator Assembly	
45	F1244	Regulator Body	1
46	F1245	Regulator Adjusting Screw	1
47	F1246	Regulator Adjusting Screw O-Ring	1
48	F1247	Diaphragm	1
49	F1248	Regulator Plunger	1
50	F1249	Plunger Spring	1
51	F1250	Regulator Gasket	1
52	F1251	Regulator Screw Set	2
	F1752A	Carburetor Assenbly	
54	F1752	Carburetor Body	1
55	F1753	Throttle Barrel	1
56	F9156	Low Speed Needle Valve	1
57	F9157	Low Speed Needle Valve O-Ring	1
	F1545S	Needle Valve Assembly	
58	F1545	High Speed Needle Valve	1
59	F1546	High Speed Needle Valve O-Ring	1
60	F1555	High Speed Needle Valve Seat	1
61	F1556	Needle Valve Socket O-Ring Set	2
62	F1557	Needle Valve Detent	1
63	F1483	Throttle Barrel Seal	1
64	R6124	Throttle Barrel Retainer	1
65	F1258	Throttle Stop Screw	1
66	F1259	Throttle Stop Spring	1
67	F1260S	Throttle Arm Set	1
68	F1463	Carburetor Gasket	1
69	F1564	Drive Washer	1
70	F1565	Drive Washer Retainer	1
71	F1268	Intake Pipe	1
72	F1269	Intake Pipe O-Ring	4
73	F1382	Wrist Pin Access Plug	1
74	F1266	Propeller Washer	1



#	Part#	Description	QTY
75	F1267	Propeller Nut Set	2
	F1473S	Gasket Set	4
	F1574S	O-Ring Set	14
	F1497S	Muffler Assembly	
	F1497	Muffler	1
	F1971	Rock Nut	1
	F1498	Exhaust Pipe	1

WARRANTY

Strict quality control is implemented by our factory in all phases, from parts manufacturing to final assembly. If performance deteriorates or a part fails within one year of purchase due to a manufacturing error, YS will repair or replace the engine at no charge. **Warranty will not cover normal wear.**

Should the engine be modified or incorrectly assembled, there will be a normal charge for parts and labor. The use of four cycle fuel due to low oil content will also void warranty.



YAMADA MFG.CO.,LTD
67 Tsuchitori Inuyama Aichi 484-0917 JAPAN
TEL: 0568 67 0265 FAX: 0568 67 7801