



THUNDER TIGER CORPORATION

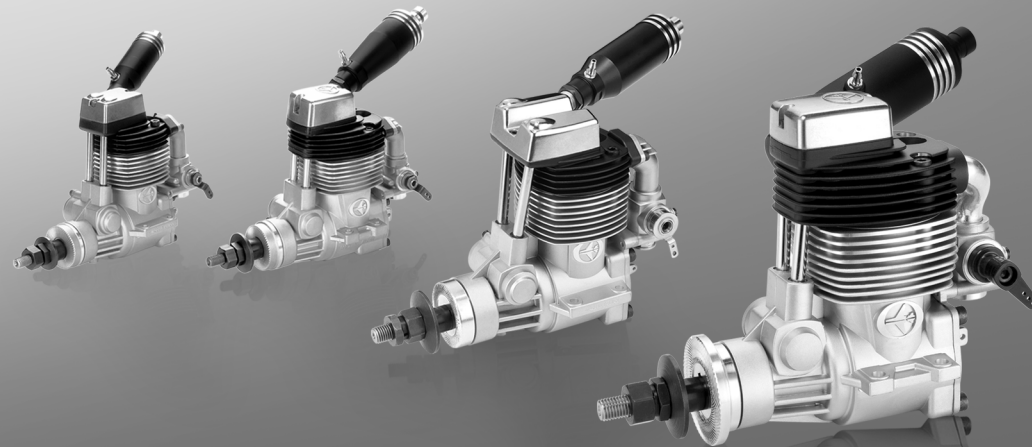
<http://www.thundertiger.com>

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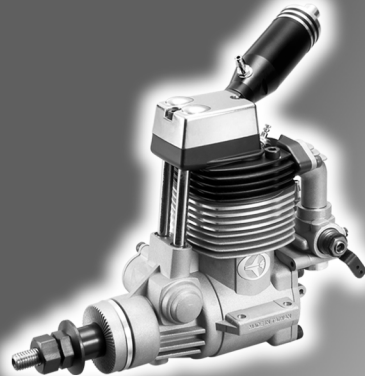


4-STROKE

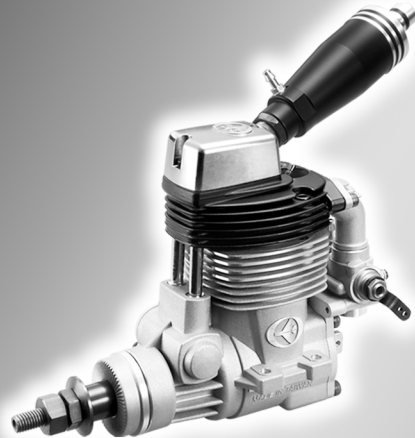
AIRCRAFT ENGINE INSTRUCTIONS



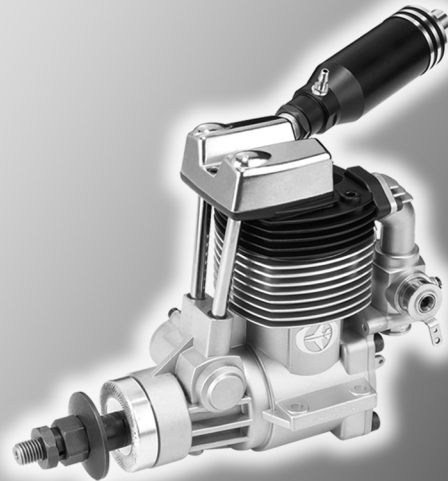
4-STROKE AIRCRAFT ENGINES SERIES



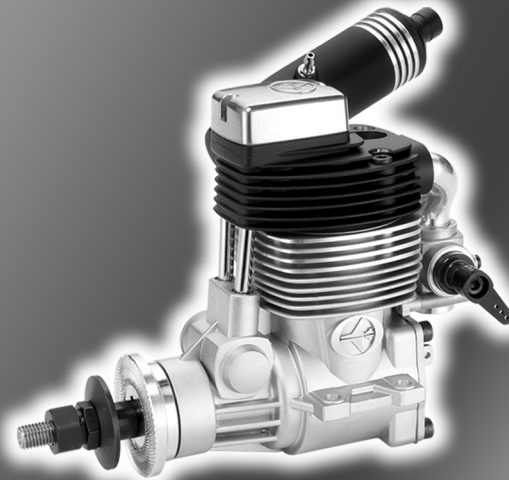
No.9803 F-54S



No.9802 F-75S



No.9804 F-91S



No.9813 F-130S

INTRODUCTION

Congratulations on your purchase of a Thunder Tiger Four-stroke model engine. These engines represent the latest in Thunder Tiger design and manufacturing techniques employing advanced CAD design and CNC manufacturing. All major components of Thunder Tiger engines are machined from the highest quality materials in our state-of-the-art manufacturing plant. Engines are then subjected to rigorous quality control checks to ensure that your engine will provide years of trouble-free use.

The F series powerhouse engines are the ultimate in four-stroke performance: the ability to swing a large prop, increased torque, reduced noise and improved fuel economy. Featuring a twin-needle updraft carburetor, black anodized cylinder head, oversized valves, and a high-performance silencer for best power-to-weight ratio. Precision air bleed carburetor makes adjustments simple, and efficient mufflers keep things quiet at the field. Perfect for the pilot looking for the authentic aircraft sound.

IMPORTANT

- This engine will provide you with years of safe use, provided that you carefully follow these safety instructions:
1. This model engine IS NOT A TOY, but a powerful miniature engine that is capable of inflicting damage to both people and property if misused.
 2. Always mount the engine securely in a test stand or high-quality engine mount. Never, ever attempt to clamp your engine in a vise.
 3. When operating your engine keep all spectators at least 20 feet away.
 4. Make sure that you use the correct propeller for your engine. Specific recommendations are listed in this manual.
 5. Make sure that the propeller nut is securely fastened before each flight.
 6. Keep yourself away from the path of the propeller when running your engine.

7. Keep your hands away from the propeller. Always use a “ Chicken Stick” or electric starter to start your engine.
8. Make all adjustments to the engine and carburetor from behind the propeller.
9. Never use your hands or any other part of your body to stop the propeller. Do not throw any object into the propeller to stop the engine. Cut off the fuel supply by removing the fuel line, pinching it closed, or closing the throttle barrel completely.
10. Never use a propeller that is cracked, nicked or damaged in any way.
11. It is recommended that you wear safety glassed when operating any model engine.
12. Do not run your engine around dirt, sand or loose gravel. Such material can be thrown into your eyes by the propeller. In addition, the engine can be damaged by these materials entering the carburetor.
13. Take care to keep all loose clothing, rags, tools, etc. away from the propeller.
14. Keep all fuel lines, glow clips, etc. away from the propeller.
15. Take care when handling your engine after running. Model engines get very hot during operation!
16. Always operate your engine with proper ventilation. Model engines produce toxic fumes when run in a closed room or confined area.

SPECIFICATIONS

Engine/Item No.	F-54S/ 9803	F-75S/ 9802	F-91S/ 9804	F-130S/ 9813
Displacement (cc/cu.in)	8.87 / .541	12.33 / .752	14.97 / .914	21.28/ 1.298
Bore (mm/in)	24 / 0.945	28.3 / 1.114	28.3 / 1.114	33.6 / 1.323
Stroke (mm/in)	19.6 / 0.772	19.6 / 0.772	23.8 /0.937	24 / 0.945
Practical R.P.M. (rpm)	2,200 ~ 13,000	2,300 ~ 12,000	2,000 ~12,000	2,000 ~ 12,000
Output power (HP/RPM)	0.8 / 12,000	1.2 / 11,000	1.6/11,000	2.2 / 11,000
Weight (w/muffler) (g/oz)	419.6 / 14.80	457.2 / 16.13	742.8 /26.20	822.5 / 29.01

NECESSARY ACCESSORIES

The following items are necessary for operating your engine, and are available from your local hobby supplier.

Fuel

A good quality, commercially available fuel containing 20% oil and 10-15% nitro is recommended for use in Thunder Tiger four-stroke engine. Fuels containing a blend of both castor and synthetic oils is best. Fuels containing only castor oil are not recommended! (during breaking-in period, it is recommended to use fuel containing at least 20% lubrication oil.)

Glow Plug

Four-stroke engines produce one explosion for every two revolutions. A specific type of glow plug is required for your four-stroke engine. The type and quality of glow plug used in your engine can affect overall performance and reliability. For Thunder Tiger four-stroke engine, we strongly recommend Thunder Tiger's new Red Line RF high-performance glow plug #9776. Other brands of glow plug such as O.S.:Type F, Saito:P-I, Hangar9 #3010 and McCoy MC-4C are also suitable for your Thunder Tiger four-stroke engine.

Glow Starter

1.2~1.5V power source for heating the glow plug during engine start up. Thunder Tiger offers a series of rechargeable glow starters to suit your power requirements.

Plug Wrench

Used for tightening the glow plug as well as the propeller nut. A Thunder Tiger #1102 4-way wrench is recommended.

Fuel Pump or Bottle

Required to fill the fuel tank on your model. A Thunder Tiger hand-crank pump (#1645) or 12V electric pump (#1658) are available from your hobby dealer.



Glow Plug



Glow Starter



Plug Wrench



Fuel pump

Chicken Stick / Safety Stick

Used to flip the propeller when starting the engine by hand. Never use your fingers to start a model engine!

Electric Starter

Most engines can be started quickly with an electric starter. Used with a 12 volt battery, it is the safest and most convenient method.



Electric Starter

Propeller

Suggested propeller sizes are shown in the table below, with allowances for different type of aircraft and performance goals. Factors such as aircraft weight, size, flying style will affect your choice of props. After break-in, select the optimum prop size and test-fly. Begin your tests with suggested propeller sizes in the table below:

Engine	Breaking - in	Stunt/Aerobatic	Scale
F-54S	11x5	10x9,11x10,11x5,11x6, 11x7	11x8,12x7,12x8
F-75S	11x8	11x8,11x9,12x7, 12x8,12.5x6	13.5x8,14x7,11x7(3blade)
F-91S	11x10	11x10,11x11,12x10,12x11, 13x9	14x7, 15x6, 16x6,12x8(3-blade)
F-130S	14x10	13x11~13,14x10~11	15x8,16x6~8,18x5~6

Caution

It is very important to use a well-balanced propeller and spinner. An unbalanced propeller or spinner can cause substantial damage to both the aircraft and engine.

Fuel Tank

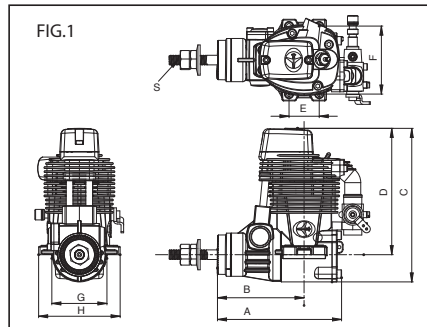
Choose a proper fuel tank as recommended by the manufacturer of your airplane kit. Thunder Tiger offers a series of fuel tanks that are available at your hobby dealer.

Fuel Line

Choose a high quality, silicone fuel line for use with your Thunder Tiger engine.

INSTALLATION OF THE ENGINE

Mount your engine securely to rigid hardwood rails (e.g. maple) or a radial engine mount of metal or glass-filled nylon composite. The top surfaces of the motor mount must be absolutely flat and parallel to avoid crankcase distortion and stress. Ensure that only the highest quality mounting hardware such as hardened steel screws, etc are used to secure your engine. In order to reduce engine noise and vibrations, a dampening engine mount can also be used. Please refer the FIG.1 and the table for these engines external dimensions.



Item	A(mm/in.)	B(mm/in.)	C(mm/in.)	D(mm/in.)	E(mm/in.)	F(mm/in.)	G(mm/in.)	H(mm/in.)	S(thread)
F-54S	79.0/3.11	57.0/2.24	99.8/3.93	81.5/3.21	20.0/0.79	44.0/1.73	35.6/1.40	51.0/2.01	1/4-28
F-75S	81.9/3.22	57.4/2.26	101.3/3.99	83.0/3.27	20.0/0.79	45.0/1.77	36.5/1.44	54.0/1.13	1/4-28
F-91S	92.5/3.64	66.5/2.62	117.7/4.63	95.7/3.77	25.0/0.98	52.0/2.05	43.0/1.69	60.0/2.36	5/16-24
F-130S	96.2/3.79	68.5/2.70	121.8/4.80	99.3/3.91	25.0 /0.98	58.0/2.28	46.0/1.81	67.0/2.64	5/16-24

Fuel Tank Installation

The fuel tank should be mounted as close to the engine as possible. Ideally, the center line of the fuel tank should be level with the needle valve. The design of your aircraft will determine actual tank location, but use the above instruction as a general guideline for best performance. Fuel tank location can affect overall engine performance.

Ensure your fuel system is sealed and well-constructed to avoid eventual fuel or air leakages. If possible, wrap your fuel tank with high quality foam rubber to reduce fuel foaming from airframe vibration.

Glow Plug Installation

Use a 4-way wrench to insert the glow plug into your engine. Be careful not to use excessive force, ensure the plug is tight and the copper washer is properly sealed beneath the glow plug.

Muffler Installation

After the engine is mounted on your model or test stand, secure the muffler to the exhaust pipe. Screw the exhaust pipe into the cylinder head at the desired angle and secure with the jam nut.

Propeller Installation

Mount a suitable propeller securely to your engine. If using a spinner, ensure the cut-out area for the propeller blades offer adequate clearance so that no part of the prop is touching the spinner.

Caution

If a four-stroke engine is run too lean or under excessive loads, pre-ignition occurs in the combustion chamber (called “ knocking” or “detonation”). This condition will cause unusual vibrations and could possibly damage the engine! The biggest danger, however, is that these vibrations often loosen the prop nut and send the propeller flying off the engine. Please ensure the prop nut is always fastened securely!

ENGINE BREAK-IN

Proper break-in is critical to the life of any model engine. During this period, the precision metal parts of the engine are properly mated and worn in. It is critical that the engine be run in an area free from excessive dirt and sand. Your engine may be broken-in on a test bench or mounted on your model. Both methods are fine, however, a test bench allows you to keep the engine away from dirt as well as making adjustments easier.

■ Break-in checklist

- (A) Use the proper fuel and glow plug as described in NECESSARY ACCESSORIES.
- (B) Select the proper propeller as recommended in the propeller chart.
- (C) Ensure the high-speed needle valve is opened 2-3/4~ 3 turns.
- (D) We strongly recommend the use of a tachometer when tuning a four-stroke engine. Although the carburetor adjustments are the same, four-stroke engines cannot be tuned by sound like a 2-stroke. Use of a tachometer will eliminate the risk of damaging your engine by running it too lean.

■ Starting the engine

- (A) Ensure the glow plug and propeller are installed and properly tightened.
- (B) Ensure the fuel lines are properly connected, with the fuel pick-up connected to the carburetor and the pressure line connected to the muffler pressure nipple.
- (C) Ensure the muffler is properly installed.
- (D) Fill the fuel tank.
- (E) Prime the engine using the following steps (ensure the glow plug igniter is NOT connected!)
 - 1. Open the carburetor to full throttle.
 - 2. Apply the starter and rotate the propeller for 5~6sec, or until you notice fuel draining from the carb.
- (F) Adjust the throttle to 25% open.
- (G) Rotate the prop clockwise until you feel the prop hits compression stroke.
- (H) Connect the glow plug igniter.
- (I) Start the engine counterclockwise using an electric starter or "Chicken Stick".

Caution

When using an electric starter, never attempt to start a flooded engine. Although the electric starter may turn the engine over, it can damage the connecting rod and/or other components. If the engine is flooded, simply remove the glow plug, turn the engine over and spin the propeller with electric starter or "Chicken-Stick". The excess fuel will be forced out the glow plug hole.

■ During Break-in

- (A) Do not exceed 5,000 R.P.M. during the first five minutes of operation.
- (B) Because of the extremely rich needle setting used during breaking-in, you may be required to keep the glow plug igniter attached.
- (C) After consuming the first tank of fuel, allow the engine to cool. You can then re-start the engine and gradually lean the needle setting during the next few tanks.
- (D) During the third fuel tank, lean the needle valve for optimum R.P.M. using a tachometer, then enrich mixture until a drop of 200-300 R.P.M. occurs.

CARBURETOR ADJUSTMENTS

The low speed needle valve is located inside the throttle barrel body on the right side of the carburetor when viewed from the engine front. This needle valve controls the idle and midrange mixture of the engine.

- (A) After the high-speed needle valve has been set, keep running the engine at full throttle for about 10 seconds, then abruptly close the throttle to idle speed. Run at idle for about 5 seconds, then quickly open the throttle.
- (B) If the engine hesitates before picking up speed and abundant smoke and unburned fuel come out of the exhaust, the low speed mixture is too rich. Screw in (clockwise) the low speed needle about 1/8 turn at a time until the transition from idle to high speed is satisfactory.
- (C) Similarly, if the engine rapidly speeds up before quitting, the mixture is too lean. Turn the needle counter-clockwise until the transition improves.
- (D) If the throttle transition is difficult for you to observe, try allowing the engine to idle slightly longer before opening the throttle. Then repeat the above procedures until you are satisfied with the transition.

ENGINE CARE

Always keep the outside of your engine clean. Using clean, fresh fuel can keep your fuel tank, pump, and fueling system free from dirt particles. Install a fresh filter between the fuel tank and carburetor, and between your fuel pump and filling line to prevent any dirt from entering your engine.

Model fuel contains alcohol, which is hygroscopic (it attracts moisture from the atmosphere). This can cause corrosion to the internal engine parts. After each flying session, run all the fuel out from the engine and disconnecting the fuel line from the carburetor. Put 4 or 5 drops of after-run oil (Marvel Mystery Oil, Prather, Pacer, etc.) into the carburetor and turn the engine over several times by hand to protect the engine bearing and internal parts from corrosion.

The use of after-run oil is also important during periods of prolonged storage (such as winter).

We suggest removing the engine from the model, liberally applying oil into the carburetor and glow plug hole, and wrap your engine in a soft cloth and store in a sealed plastic bag.

If you choose to store your engine on the airplane, make sure to store the model with engine down so as to keep the bearings lubricated.

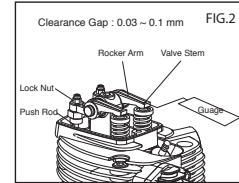
Do not dismantle your engine unnecessarily, as this may upset precision fits such as piston/cylinder and valve/tappet assemblies. If it is necessary to completely clean your engine, remove only the carburetor (do not disassemble), muffler and exhaust pipe. Flush the entire engine with fresh fuel and reassemble.

■ Valve Clearance Adjustment

The valve clearances on your engine are factory set and will seldom require adjustment. However, after a considerable amount of running time if you detect a power loss, or if the engine must be disassembled after a crash, the valve clearances should be checked and adjusted. The valve adjusting kit, containing two gauges and one wrench, are enclosed in the box.

Note: Valve clearances MUST be checked when the engine is cold.

- (A) Remove the rocker arm cover.
- (B) Turn the propeller until you feel compression, then turn it an additional 1/4 turn and stop. Both valves should be closed now.
- (C) The required valve clearances is .03mm-0.10mm(.0012-.004) measured between the valve stem and rocker arm. A .03mm shim should pass through the gap, 0.10 mm should not. (Refer to FIG.2)

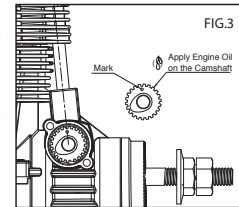


Caution: Incorrect valve clearances can cause difficult starting, erratic operation and loss of power.

■ Installation of the Camshaft

The position of the camshaft determines the timing of your engine. An improper camshaft position will cause serious engine damage or your engine may not even start. It is strongly suggested that you DO NOT dismantle the camshaft. If for some reasons, you need to disassemble or change the camshaft, please follow proper procedures for re-installing the camshaft:

- (A) Turn the crankshaft to the T.D.C. (top dead center). There is a T.D.C. mark on drive washer, set this mark on the top position.
- (B) Apply some light oil (3-in-1, Mystery oil. Etc.) to the camshaft.
- (C) Note that there is a mark on the side surface of the gear. When re-installing the camshaft, the mark must be aligned with the line on the push rod cover tube (Refer to FIG. 3.).
- (D) Install the cam cover and properly secure the two screws.
- (E) Rotate the crankshaft several revolutions to insure the camshaft is properly seated, then reassemble the remaining parts of the engine.



THUNDER TIGER 3 YEARS LIMITED WARRANTY

Your engine is guaranteed to be free from defects in materials and workmanship for a period of 3 years from the date of purchase when returned for service accompanied by proof of purchase (register receipt, credit card invoice, etc.). Crash damage or problems caused by improper use are not covered under this warranty. Damage caused by customer disassembly, use of improper accessories (such as propellers, glow plug, etc.) or any use of products other than its specific intended use will automatically void this warranty.

SERVICE PROCEDURES

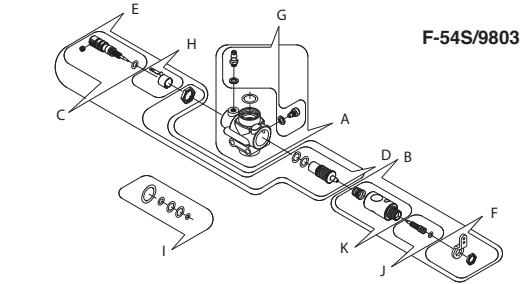
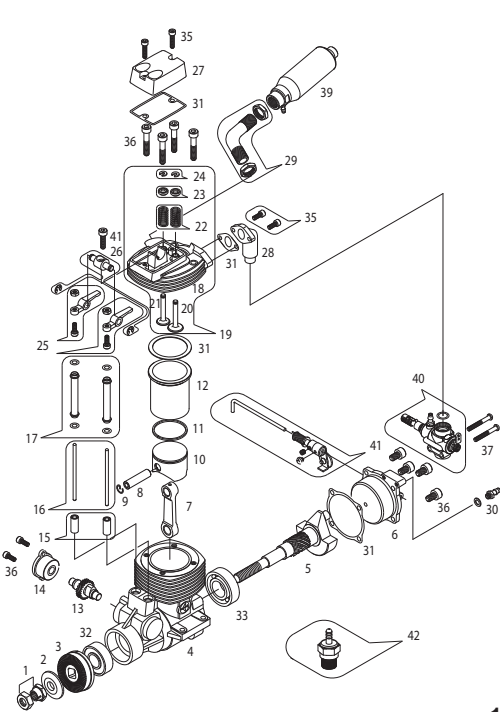
This 4-stroke engine was produced by Thunder Tiger Corp., a guarantee for high quality, services, and hours of trouble-free operation.
Thunder Tiger products are sold worldwide through authorized distributors supported directly by Thunder Tiger. To receive the latest product information and enjoy full technical support, please contact your nearest hobby shop or Thunder Tiger authorized distributor.

TROUBLE SHOOTING GUIDE

SYMPTOM	CAUSE	CORRECTIVE ACTION
Engine will not start.	Low votage or discharged starting battery. Bad glow plug. Insufficient prime. Engine flooded.	Replace/recharge starting battery. Install new glow plug. Repeat priming procedure. Disconnect battery, remove plug and rotate prop to remove excess fuel.
Engine starts but will not run.	Over primed. Incorrect glow plug.	Disconnect battery and rotate prop several times to clear engine. Verify plug type.
Engine starts but slows down then stops.	Mixture too rich.	Close needle valve 1/4 turn until engine runs smoothly.
Engine starts, speeds up, then stops.	Mixture too lean.	Open needle valve 1/4 turn until engine runs smoothly.
Engine quits when starter battery is removed.	Mixture too rich. Incorrect glow plug. Improper or bad fuel.	Close needle valve 1/4 turn and restart. Change glow plug. Change fuel.

F-54S/9803 PARTS LIST / ENGINE

NO	DESCRIPTION	PART #	NO	DESCRIPTION	PART #
1	PROP LOCKNUT SET	PN0144	26	ROCKER ARM SUPPORT SET	PN0154
2	PROP WASHER	AA0026B	27	ROCKER ARM COVER	AA0453
3	DRIVE WASHER	AA2230	28	INLET PIPE	AA0476
4	CRANKCASE	AA2274	29	EXHAUST PIPE SET	PN0155
5	CRANKSHAFT	AA2275	30	BREATHER NIPPLE	PN0131
6	BACKPLATE	AA2276	31	GASKET SET	PN0156
7	CONNECTING ROD	AN0458	32	CRANKSHAFT BEARINGS(FRONT)	AMV608Z
8	WEIST PIN ASSEMBLY	AA0459	33	CRANKSHAFT BEARINGS(REAR)	AMV6001LU
9	CIRCLIP	AA0327	35	HEAD SCREWS SET	PN0157
10	PISTON	AA0456	36	CRANKCASE SCREWS SET	PN0158
11	PISTON RING	AA0457	37	CARBURETOR BOLTS SET	PN0159
12	CYLINDER	AA0455	39	MUFFLER ASSEMBLY	9220
13	CAMSHAFT	AA2277	40	CARBURETOR ASSEMBLY	9290N
14	CAMSHAFT COVER SET	AN2278	42	GLOW PLUG.RF	9776
15	CAM FOLLOWER SET	PN0146			
16	PUSH ROD SET	PN0147			
17	PUSH ROD COVER ASSEMBLY	PN0148			
18	CYLINDER HEAD	AN0452			
19	CYLINDER HEAD(W/VALVE ASSEMBLY)	PN0149			
20	INLET VALVE	AA0474			
21	EXHAUST VALVE	AA0475			
22	VALVE SPRING SET	PN0150			
23	SPRING RETAINER SET	PN0151			
24	SPRING HOLD COLLARS	PN0152			
25	ROCKER ARM SET	PN0153			



F-54S/9803

OPTION PARTS

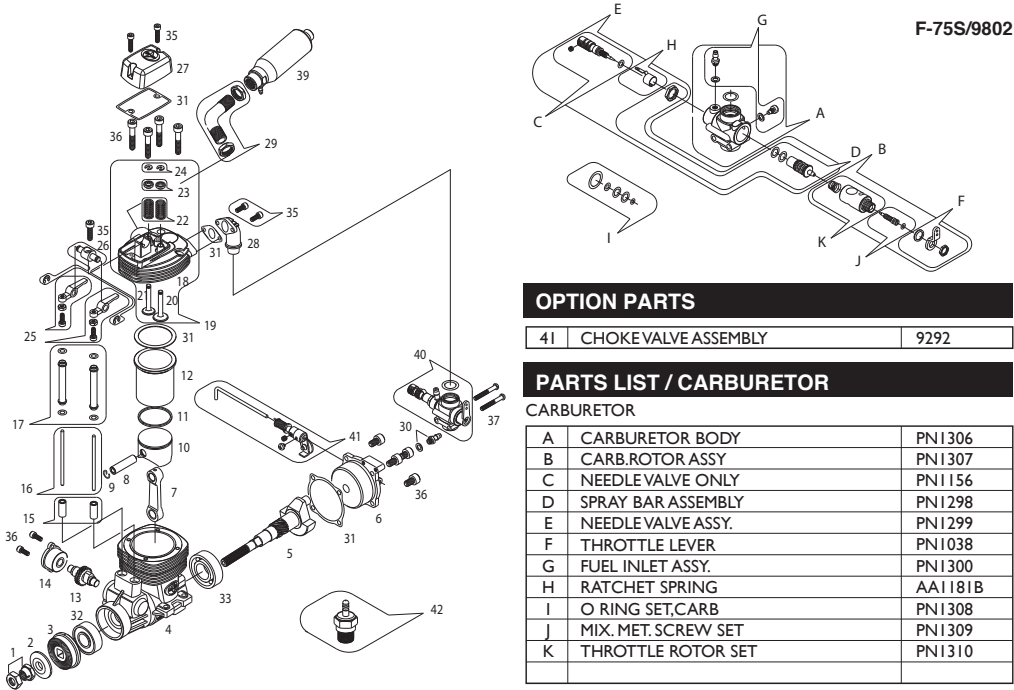
41	CHOKEVALVE ASSEMBLY	9292
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PARTS LIST / CARBURETOR

CARBURETOR		
A	CARBURETOR BODY	PN1296
B	CARB.ROTOR ASSY	PN1297
C	NEEDLE VALVE ONLY	PN1156
D	SPRAY BAR ASSEMBLY	PN1298
E	NEEDLE VALVE ASSY.	PN1299
F	THROTTLE LEVER	PN1038
G	FUEL INLET ASSY.	PN1300
H	RATCHET SPRING	AA1181B
I	O RING SET,CARB	PN1301
J	MIX.MET.SCREW SET	PN1193
K	THROTTLE ROTOR SET	PN1302

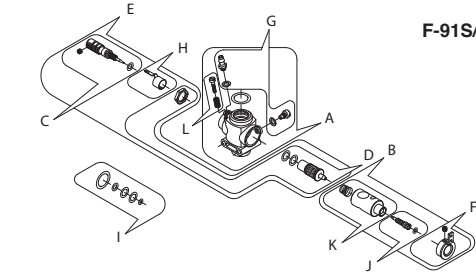
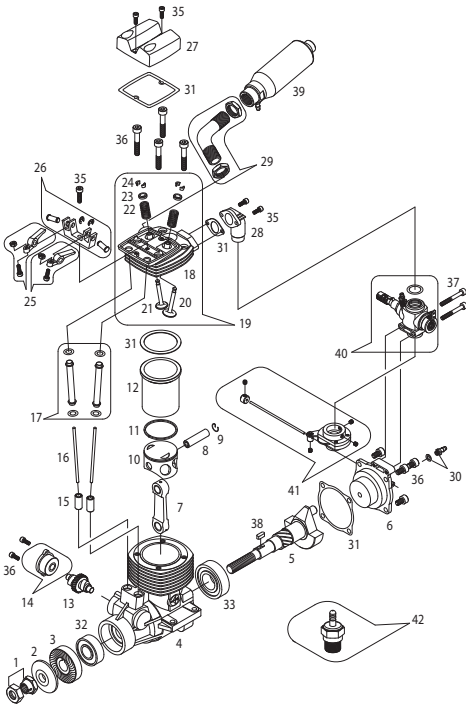
F-75S/9802 PARTS LIST / ENGINE

NO	DESCRIPTION	PART #	NO	DESCRIPTION	PART #
1	PROP LOCKNUT SET	PN0144	26	ROCKER ARM SUPPORT SET	PN0283
2	PROP WASHER	AA2184B	27	ROCKER ARM COVER	AA2159
3	DRIVE WASHER	AA2162	28	INLET PIPE	AA2161
4	CRANKCASE	AN2140	29	EXHAUST PIPE SET	PN0130
5	CRANKSHAFT	AA2141	30	BREATHER NIPPLE	PN0131
6	BACKPLATE	AA2142	31	GASKET SET	PN0284
7	CONNECTING ROD	AN2147	32	CRANKSHAFT BEARINGS(FRONT)	AMV609Z
8	WRIST PIN	AA2151	33	CRANKSHAFT BEARINGS(REAR)	AMV6001LU
9	CIRCLIP	AA0513	35	HEAD SCREWS SET	PN0285
10	PISTON	AA2146	36	CRANKCASE SCREWS SET	PN0286
11	PISTON RING	AA0487	37	CARBURETOR BOLTS SET	PN0159
12	CYLINDER	AA2145	39	MUFFLER ASSEMBLY	9777
13	CAMSHAFT	AA2144	40	CARBURETOR ASSEMBLY	9778
14	CAMSHAFT COVER SET	AN2152	42	GLOW PLUG.RF	9776
15	CAM FOLLOWER SET	PN0146			
16	PUSH ROD SET	PN0147			
17	PUSH ROD COVER ASSEMBLY	PN0277			
18	CYLINDER HEAD	AA2143			
19	CYLINDER HEAD (W/VALVE ASSEMBLY)	AN2143			
20	INLET VALVE	AA2153			
21	EXHAUST VALVE	AA2154			
22	VALVE SPRING SET	PN0279			
23	SPRING RETAINER SET	PN0282			
24	SPRING HOLD COLLARS	PN0152			
25	ROCKER ARM SET	PN0153			



F-91S/9804 PARTS LIST / ENGINE

NO	DESCRIPTION	PART #	NO	DESCRIPTION	PART #
1	PROP LOCKNUT SET	PN0119	26	ROCKER ARM SUPPORT SET	PN0129
2	PROP WASHER	AA0512	27	ROCKER ARM COVER	AA0483
3	DRIVE WASHER	AA0507	28	INLET PIPE	AA0506
4	CRANKCASE	AN2299	29	EXHAUST PIPE SET	PN0130
5	CRANKSHAFT	AA0484	30	BREATHER NIPPLE	PN0131
6	BACKPLATE	AA2300	31	GASKET SET	PN0132
7	CONNECTING ROD	AN0488	32	CRANKSHAFT BEARINGS(FRONT)	AMV6000Z
8	WRIST PIN	AA0489	33	CRANKSHAFT BEARINGS(REAR)	AMV6002LU
9	CIRCLIP	AA0513	35	HEAD SCREWS SET	PN0133
10	PISTON	AA0486	36	CRANKCASE SCREWS SET	PN0134
11	PISTON RING	AA0487	37	CARBURETOR BOLTS SET	PN0135
12	CYLINDER	AA0485	38	CRANKSHAFT KEY SET	PN0136
13	CAMSHAFT	AA2349	39	MUFFLER ASSEMBLY	9737
14	CAMSHAFT COVER SET	AN2348	40	CARBURETOR ASSEMBLY	9291
15	CAM FOLLOWER SET	PN0121	42	GLOW PLUG.RF	9776
16	PUSH ROD SET	PN0122			
17	PUSH ROD COVER ASSEMBLY	PN0123			
18	CYLINDER HEAD	AA2247			
19	CYLINDER HEAD(W/VALVE ASSEMBLY)	PN0308			
20	INLET VALVE	AA0504			
21	EXHAUST VALVE	AA0505			
22	VALVE SPRING SET	PN0125			
23	SPRING RETAINER SET	PN0126			
24	SPRING HOLD COLLARS	PN0127			
25	ROCKER ARM SET	PN0128			



OPTION PARTS

41	CHOKEVALVE ASSEMBLY	9293
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PARTS LIST / CARBURETOR

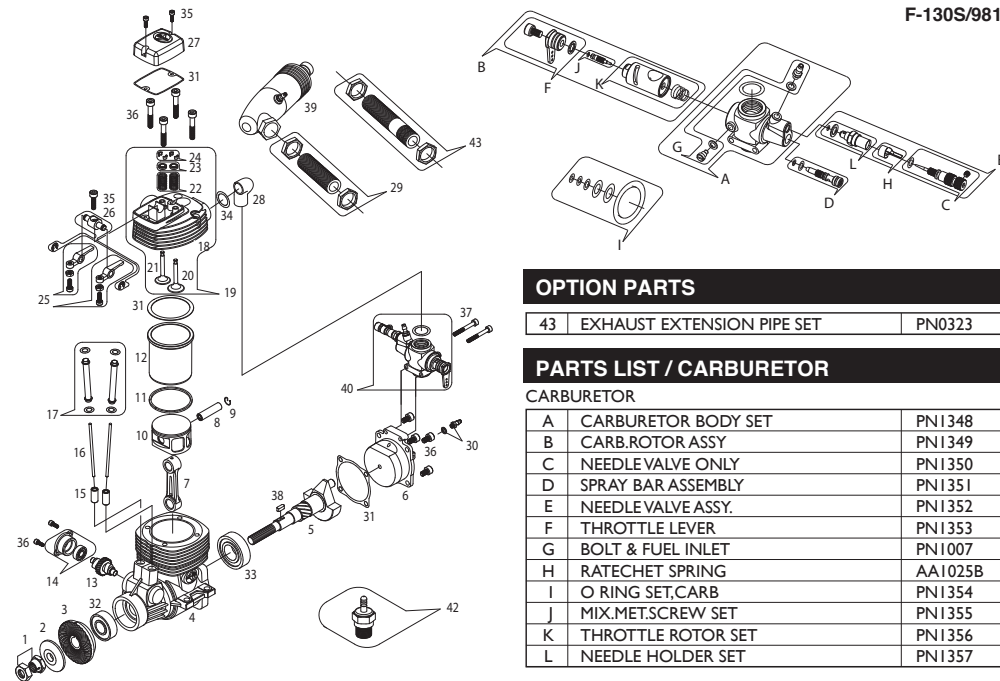
CARBURETOR		
A	CARBURETOR BODY	PN1089
B	CARB.ROTOR ASSY	PN1090
C	NEEDLE VALVE ONLY	PN1091
D	SPRAY BAR ASSEMBLY	PN1092
E	NEEDLE VALVE ASSY.	PN1093
F	THROTTLE LEVER	PN1006
G	BOLT & FUEL INLET ASSY.	PN1007
H	RATCHET SPRING	AA1025B
I	O RING SET,CARB	PN1094
J	MIX.MET.SCREW SET	PN1095
K	THROTTLE ROTOR SET	PN1096
L	IDLE ADJUSTING SCREW	PN1097

F-130S/9813 PARTS LIST / ENGINE

NO	DESCRIPTION	PART #
1	PROP LOCKNUT SET	PN0119
2	PROP WASHER	AA0512
3	DRIVE WASHER	AA2325
4	CRANKCASE	AN2340
5	CRANKSHAFT	AA2327
6	BACKPLATE	AA2338
7	CONNECTING ROD	AN2341
8	WRIST PIN	AA2324
9	CIRCLIP	AA2323
10	PISTON	AA2330
11	PISTON RING	AA2331
12	CYLINDER	AA2329
13	CAMSHAFT	AA2328
14	CAMSHAFT COVER SET	PN0312
15	CAM FOLLOWER SET	PN0121
16	PUSH ROD SET	PN0313
17	PUSH ROD COVER ASSEMBLY	PN0314
18	CYLINDER HEAD	AA2342
19	CYLINDER HEAD (W/VALVE ASSEMBLY)	PN0315
20	INLET VALVE	AA2343
21	EXHAUST VALVE	AA2344
22	VALVE SPRING SET	PN0316
23	SPRING RETAINER SET	PN0126
24	SPRING HOLD COLLARS	PN0127
25	ROCKER ARM SET	PN0317

[illegible]

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OPTION PARTS

43	EXHAUST EXTENSION PIPE SET	PN0323
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PARTS LIST / CARBURETOR

CARBURETOR

A	CARBURETOR BODY SET	PN1348
B	CARB.ROTOR ASSY	PN1349
C	NEEDLE VALVE ONLY	PN1350
D	SPRAY BAR ASSEMBLY	PN1351
E	NEEDLE VALVE ASSY.	PN1352
F	THROTTLE LEVER	PN1353
G	BOLT & FUEL INLET	PN1007
H	RATECHET SPRING	AA1025B
I	O RING SET,CARB	PN1354
J	MIX.MET.SCREW SET	PN1355
K	THROTTLE ROTOR SET	PN1356
L	NEEDLE HOLDER SET	PN1357