

# YS 60 SET-UP

The English language set-up words for the YS 60

We have received a number of enquiries concerning setting-up the Yamada 60 helicopter engine — the early instructions being in Japanese. We prevailed on John Wallington for elucidation and have been presented with a set of English language instruction which we are reprinting with permission of the UK distributors: J. Perkins (Distribution) Ltd.

## Operator's Manual

**YS 60 FS-H** (Side exhaust/Part no. YS0050-60FSH)

**YS 60 FR-H** (Rear exhaust/Part no. YS0060-60FRH)

## Specifications

Bore: 24.0mm  
Stroke: 22.0mm  
Displacement: 9.5cc  
Weight: 500g  
Practical rpm: 2,000–18,000 rpm

## Features

The YS 60FS-H and 60FR-H are class 60 engines designed specifically for radio controlled helicopters.

These engines feature superior fuel delivery incorporating the YS fuel pressurisation system, butterfly type throttle and new carburettor design. The carburettor uses simplified construction that does not require adjustment other than the familiar needle valve.

With the YS pressure system the 60F-H engines are unaffected by tank position. Perfor-

mance remains consistent during loops, rolls and inverted flight. The system also varies the amount of fuel relative to the throttle opening. This provides superior throttle response by hovering and reduces the possibility of flooding.

## Troubleshooting

Problem	Cause	Solution
Unstable high speed	1. Needle valve set too lean	Readjust peak position
	2. Foreign material in carburettor or filter	Clean each
	3. Low tank pressure	(See below)
	4. Inappropriate glow plug or fuel	
Unstable low speed	1. Incorrect fuel/air ratio	Readjust diaphragm
	2. Low tank pressure	(See below)
	3. Check valve malfunction	Clean
	4. Foreign material in the carburettor	Clean
	5. Incorrect glow plug or fuel	
Low tank pressure	1. Bent or damaged fuel line	Check each tube
	2. Damage to the tank or pressure leakage	Inspect
Weak mixture	1. Foreign material in the throttle	Clean
	2. Foreign material in the filter	Clean
	3. Foreign material in the carburettor	Clean
	4. Low tank pressure	(See above)
	5. Bent or damage tube	Check each tube
Fuel flows after stopping	1. Check valve malfunction	Clean
	2. Foreign material in the carburettor	Clean
	3. Loosened valve adjustment screw	Readjust



## Glow Plug

Select the most appropriate glow plug from those designed specifically for R/C operation. The selection of glow plug greatly affects the maximum engine output and low flying stability. If rpm's decrease or stop when the booster cord is removed, replace the plug.

## 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. Use a fuel filter in the fuel line. We recommend the YS filter.
3. Match the direction of the check valve arrow to fig.1.

## Start-up

1. Remove tube (B) from the filter, remove tube (A) from the check valve, then fill the tank. (CAUTION: If tank is filled, remove tube (A) first; then tube (B). Fuel will eject if tube (B) is removed first while the tank is pressurised.)
2. Open the needle valve three

turns from the fully closed position.

3. Open the throttle slightly. Connect the glow plug booster cord and start the engine with the starter.

Note: The engine should start and be puffing white smoke. This is because the needle valve setting usually creates a rich mixture.

**Break-in**

This engine requires no break-in period. It can be mounted directly to the helicopter. We recommend high quality fuels with a minimum of 10-15% nitromethane for optimum performance.

**High Speed Adjustment (Needle Valve)**

1. Adjustment of the needle valve is done by operation response of the throttle during hovering. If white smoke is generated and the helicopter does not fly smoothly, the needle valve setting is too rich. Lean mixture by tightening the needle valve in 1/4 turn increments.
2. Should there be no smoke and the engine stops, open the needle valve one more turn. When hovering is stabilised, test high throttle flying and readjust. The needle valve can be set either during hovering or full throttle.

**Low Speed Adjustment**

Carburettor adjustment for low speed is factory pre-set. Use this procedure if necessary.

1. Adjustment of low speed revolution is done by the diaphragm/regulator valve screw. When the diaphragm is turned clockwise, the mixture is leaned. When it is turned counterclockwise the mixture is richened. (For reference: the engine is assembled with the head of the diaphragm valve screw flush with the regulator body. Adjustments should be made in 1/8 to 1/4 turn increments.)
2. The diaphragm valve can be set after the high speed needle valve has been set. Close the throttle gradually, then fully open the throttle just before the engine stops. The adjustment condition is satisfactory at low speed if revolution is smooth at this time. Set the idle with the throttle barrel limit screw. If the throttle is quickly opened and the mixture is too rich, turn the diaphragm

adjustment screw clockwise 1/8 to 1/4 turn at a time to achieve smooth throttle response. If the mixture is too rich it is possible to stop the engine (flooding) when the throttle is opened.

3. When the revolution is stabilised, close the throttle further and repeat the above adjustment to idle evenly at 2,500 rpm or less.

**Diaphragm and Check Valve Disassembly**

Diaphragm:

1. Remove the adjustment screw of the valve, and then remove the inside valve and spring.
2. Clean the inside with alcohol or appropriate cleaner. Readjust.

Check valve:

1. Open the valve by rotating the body counterclockwise.
2. Reassemble the check valve carefully.

**IMPORTANT!** Silicone rubber is used in many parts of the YS engine. Use only glow fuel or methanol for cleaning. Gasoline and other volatile solutions will damage the silicone if used.

**Warranty**

Strictly quality control is implemented by our factory in all phases, from parts manufacturing to final assembly. If performance deteriorates or a part fails due to a manufacturing error, YS will repair or replace the engine at no charge.

Should the engine be modified, incorrectly assembled or abused there will be a nominal charge for parts and labour.

**Special Notes for YS 60FH Helicopter Engines**

Although these engines are manufactured for high durability, please note the following when installing in helicopters.

1. Abnormal over-rotation may occur in the following cases:
  - a) When the clutch slips or is broken
  - b) When the reduction gear is damaged
  - c) When the rotor pitch becomes abnormally low
  - d) When the rotor is damaged or removed due to a crash and the engine continues to rotate.
  - e) When the engine load becomes abnormally low. When abnormal over-rotation occurs, damage to the piston may result. Also, damage to the piston, ring, cylinder liner or bearings

The specifications may be changed without prior notice

**Parts List YS 60FS-H**

#	Part #	Description	Qty
1	YS0250-60FS	Throttle body	1
2	YS0255-60FS	Throttle gasket	1
3	YS0260-60FS	Throttle barrel	1
4	YS0265-60FS	Rear ball bearing	1
5	YS0475-60H	Piston & liner side	1
6	YS0445-60H	Piston side exhaust	1
7	YS0450-60H	Liner side exhaust	1
8	YS0275-60FS	Throttle reg mounting screws	1
9	YS0280-60FS	Cylinder head	1
10	YS0285-60FS	Cylinder head gasket	1
11	YS0290-60FS	Back plate gasket	1
12	YS0295-60FS	Back plate	1
13	YS0300-60FS	Wrist pin	1
14	YS0305-60FS	Con rod	1
15	YS0310-60FS	Back plate screws	6
16	YS0315-60FS	Mixture control (not pictured)	1
17	YS0320-60FS	Crank case	1
18	YS0325-60FS	Regulator body	1
19	YS0330-60FS	Throttle set (complete carburetor)	1
20	YS0335-60FS	Spinner (not pictured)	1
21	YS0340-60FS	Gasket set (all gaskets)	1
22	YS0470-60H	Regulator adjustment screw	1
23	YS0350-60FS	Regulator plunger	1
24	YS0355-60FS	Plunger spring	1
25	YS0360-60FS	Cylinder head screws	6
26	YS0365-60FS	Needle socket	1
27	YS0455-60H	Crankshaft	1
28	YS0375-60FS	Throttle arm/screw set	1
29	YS0380-60FS	Throttle barrel retainer screw	1
30	YS0385-60FS	Needle valve detente spring	1
31	YS0390-60FS	Drive washer set	1
32	YS0395-60FS	Throttle stop screw/spring set	1
33	YS0490-60H	Prop nut	1
34	YS0405-60FS	Check valve	1
35	YS0410-60FS	Diaphragm	1
36	YS0415-60FS	Needle valve	1
37	YS0420-60FS	Fuel nipples/washers set	1
38	YS0425-60FS	Prop washer	1
39	YS0430-60FS	O ring set	1
40	YS0435-60FS	Wrist pin retainer	1
41	YS0440-60FS	Front ball bearing	1
42	YS0465-60H	Piston ring (not pictured)	1

**YS 60 FR-H**

43	YS0480-60H	Piston & liner rear	1
44	YS0485-60H	Piston rear exhaust	1
45	YS0245-60FR	Crankcase	1
46	YS0450-60H	Linear rear exhaust	1

2. To reduce the possibility of bearing rust, care must be taken so exhaust oil does not flow back into the engine after rotation stops. Also, when low speeds are maintained for a long period, increase the rpms briefly before stopping the engine.
3. When the piston approaches top dead centre you will

notice that it is difficult to turn the crankshaft by hand. This is normal for ABC engines. You also may notice some play in the crankshaft at this position. This is also normal and should not be modified.

Photograph by Mike Billinton. Full review of the YS60 in Issue 1.