INSTRUCTION LEAFLET FOR FUJI ENGINES (099-25)

CONGRATULATIONS

You have just purchased a high quality engine, designed and built to give maximum performance and durability. All Fuji Engines are precision engineered to top quality standards and made from carfully selected materials being quality controlled through all stages of manufacture. Before leaving our factory every engine is checked, and, tuned for maximum performance.

1) All Engines

The engines bodies are die-cast using a specially formulated aluminium alloy, cylinder liners and pistons are cast in alloy, machined and polished. The minimum standard for crankshafts, all of which have counter balanced flywheels, is carbon steel, where ball bearings are not fitted all crankshaft bearings are phosphor bronze except for 19's and 25's which have gunmetal bearings.

2) Schnuerle Engines (I.B.S.)

On engines which use the Schnuerle scavenging system to give increased power, the 'PORTING' used is unique, having been designed by Fuji engineers and is known as I.B.S. (Inner By-pass System). The Schnuerle engine can be expected to produce between 30%—50% additional power, dependant upon the fuel used and temperature etc.

THE INITIAL STARTING AND "RUNNING-IN" OF YOUR ENGINE

To obtain maximum performance and long life from your engine the following instructions **must be caretully followed.**

PREPARATION

1) Mount the engine securely on a strong test bench. This is essential as even small engines develop high power to weight ratios.
2) Place a fuel tank behind the engine so that the fuel level is at the same height or slightly lower than the carburettor.
3) Connect the fuel line to the carburettor and ensure that fuel and fuel lines are free from dust and water.
4) Install the correct propeller and glow plug in the engine (see propeller and glow plug table).
5) **Check that glow plug, propeller, fuel line, engine and test bench connections are tight and secure.**

STARTING THE ENGINE

Fuji Engines start easily when the following procedure is used.

1) Fill the fuel tank. Use only the mixture specified for "Running-In" (See Table)
2) Screw in the needle valve until it is fully closed.
3) Open the needle valve as follows according to the engine size.

099 engine	-	Full turns
15		
19	" -	$2\frac{1}{2}$ "
25		
B.B. type engine	-	3 "

4) Squirt a few drops of fuel into the carburettor air intake and the engine exhaust port.
5) Place the throttle in the 1/2 open position.
6) Crank the engine by the propeller 2 or 3 times anti-clockwise and check that fuel is being drawn up the fuel line and into the engine. This can be assisted by choking the carburettor by placing the finger tip over the carburettor air intake.
7) Connect a new 1.5V battery, using a glow plug clip, to the glow plug. This will cause the platinum element of the glow plug to heat up and become red hot. **The engine is now ready to start.**
8) Flip the propeller strongly anti-clockwise. Repeated flips will cause the engine start. If the engine fires but does not continue to revolve it is usually because the air/fuel mixture is either too weak or too rich. The needle valve should be screwed out or in until the correct mixture is obtained. Usually 1/2 a turn either way is sufficient.
9) When the engine is running, its speed should be increased by **screwing in** the needle valve. At approx 6000 RPM the glow plug clip can be removed.
10) It is most important that the correct Fuji glow plug is used in your engine. (See glow plug table)

RUNNING-IN

1) Using the correct propeller and glow plug, start the engine and open the throttle.
2) Adjust the needle valve to produce maximum speed. Remove the glow plug clip.
3) **Open** the needle valve 1/2 a turn. (This will give a slightly rich mixture to slow the engine down and stop it over-heating during running-in). Run the engine like this for 20 to 30 minutes.
   If the engine stops when the glow plug clip is removed, restart the engine and leave the glow plug clip in position for 2 or 3 minutes until the engine is warmed up.

4) Next, screw in the needle valve to obtain maximum speed (R.P.M.) and run for 10 minutes.
5) Next, again screw in the needle valve to obtain an even higher speed and run for 10 minutes. The engine is now "Run-In" and will run at a stable, even, high speed.
6) **Do not attempt to use a larger propeller during running-in. This will damage your engine.**

PROPELLER SIZE FOR RUNNING-IN (Diameter x Pitch/Inch)

099	15S	15S BB	19S	19S BB	25S	25S BB	30	35	40
8x3	8x4	8x4	10x4	9x4	10x4	9x5	10x5	10x5	10x6.5

FUEL

In your Fuji Engine you can use any good quality commercial glow fuel which is made in your own country, or imported. You can mix your own fuel but the castor oil content must be over 20%. If the fuel you use contains synthetic oil (Mobil oil) add an additional 5% castor oil. This will ensure that your engine runs evenly at all speeds. In your own mixture always use methyl alcohol which does not include water. Also always use pure nitro-methane. A table of suggested formulae is included on this leaflet.

STANDARD FUEL FORMULATIONS (By Volume)

	RUNNING-IN	GENERAL	STUNT R/C RADIO CONTROL	SPEED & FREE FLIGHT
Methyl Alcohol	70%	75%	70 – 60%	30%
Nitro Benzol			5 – 10%	10%
Nitr Methane (Nitro Propane)			5 – 10%	40%
Castor Oil	30%	25%	20%	20%

GLOW PLUGS

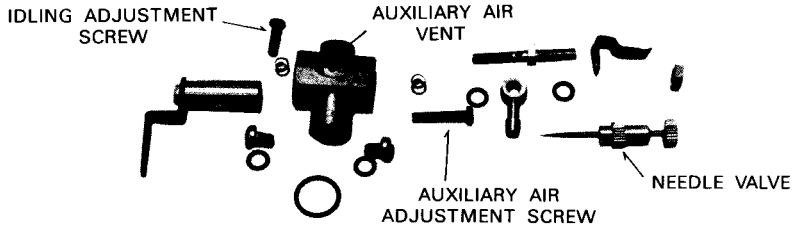
The type and quality of the glow plug used in your engine will affect its performance. Use one of the following Fuji Plugs which has been specially designed for your engine.

No 3 Plug (Hot). 1.5V Platinum Element.
This is for general and R/C use.
No 4 Plug (Semi-Cold). 1.5V Platinum Element.
This plug is best used with sports planes, boats and cars, where high RPM is necessary.
No 5 Plug (Cold) 1.5V Platinum Element.
This plug is very durable and best used for pylon and speed planes where maximum RPM is necessary.

CARBURETTOR ADJUSTMENT

All Fuji carburettors are factory tuned. Due to the fuel used, plugs and atmospheric pressure, some further fine-tuning **may** be necessary.
If fine-tuning is necessary:-

1) Start the engine, fully open the throttle and adjust the needle valve for maximum R.P.M.
2) Next tune the carburettor for its best 'idling position'. With the engine running, close the throttle and adjust the 'idling adjustment screw' until the air intake rotor is open approx. 1.5mm. If the engine does not 'idle' evenly then the mixture is incorrect and a further small adjustment is necessary.
   a) With the engine 'idling' unevenly with the throttle closed to 1.5mm. Screw the needle valve gently in or out. If the engine runs **evenly when the needle valve is screwed in, open** the auxiliary air adjustment screw slightly and return the needle valve to its original position. Repeat this dual adjustment until the engine 'idles' evenly at about 2,500 R.P.M.
   b) If the engine idles **better as you screw the needle valve out,** then adjust the auxiliary air adjustment screw in the opposite way as described in a) above.



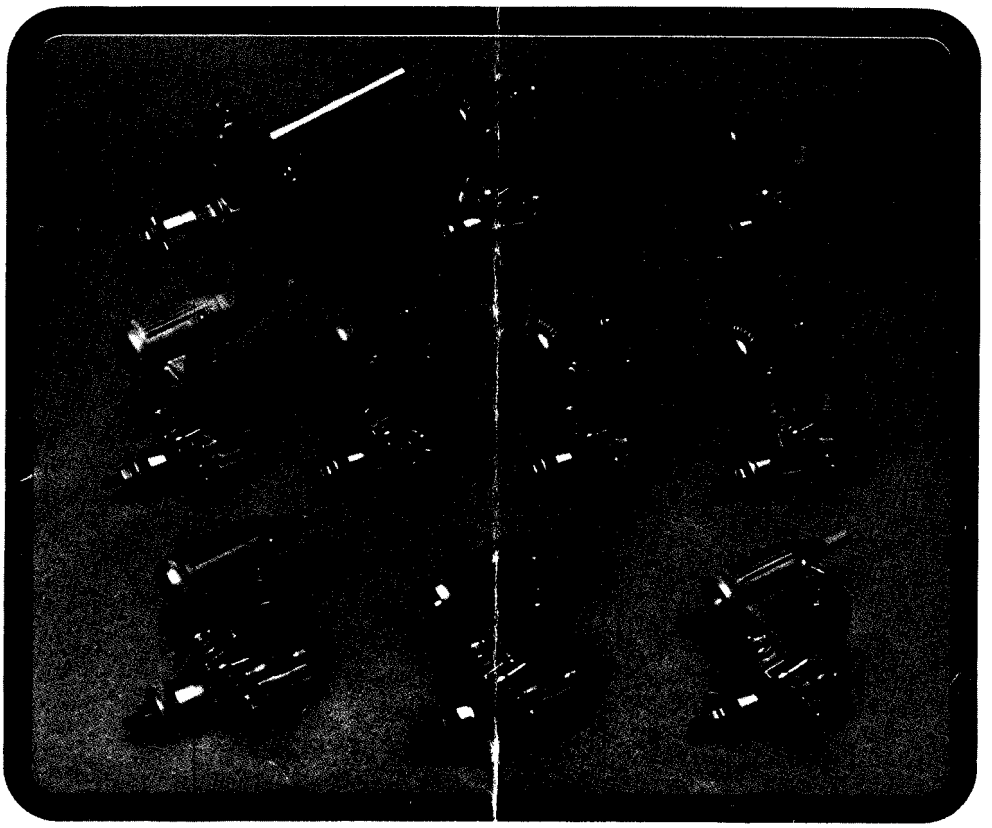
ENGINE INSTALLATION

The engine must be installed on a hardwood or metal engine mount of size suited to the engine.

SUITABLE PROPELLER SIZE FOR DIFFERENT ENGINES (Diameter x Pich/Inch)

	099	15S	15S BB	19S	19S BB	25S	25S BB	30	35	40
U Control Stunt	7x5	8x5	8x5	8x6	8x6	9x6	9x6	10x5	10x6	10x6
Radio Control	7x5	8x5	8x5	9x4	9x4	9x6	9x6	10x5	10x6	10x6
Free Flight	7x4	8x4	8x4	9x4	9x4	10x5	10x5	9x7	10x6	10x6

The above are standard comination, it may vary in accordance with fuels or some other factors.



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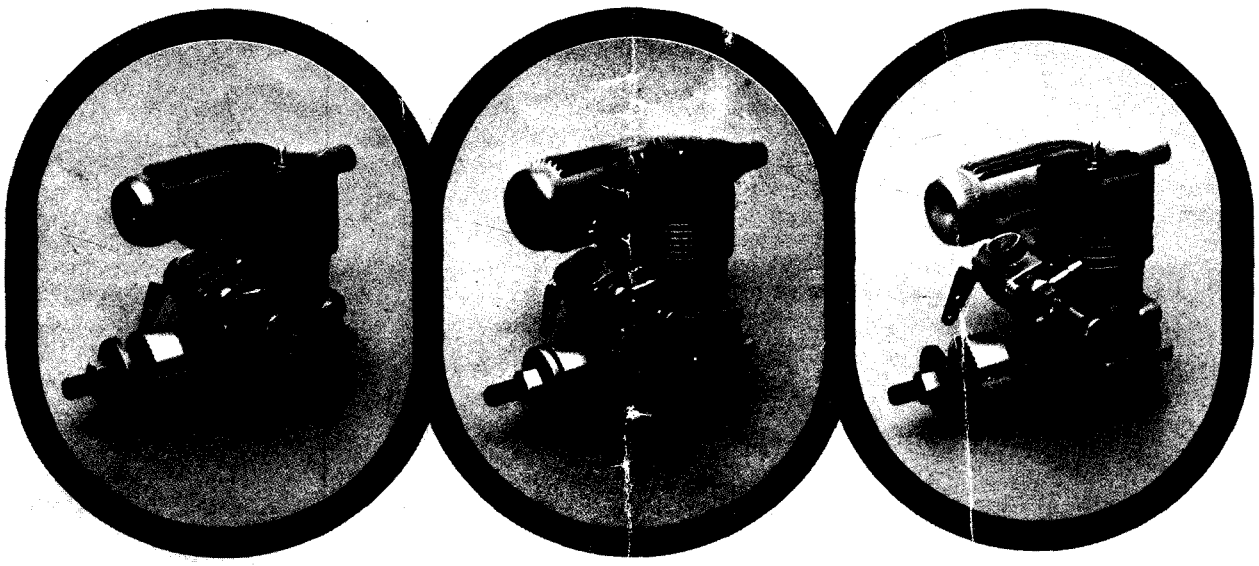
SPECIFICATION OF FUJI ENGINES

Engines FUJI	Bore×Stroke Displacement		Main Bearing	Compression Ratio	Type
	mm	cc			
099S-II	12.7×12.7	1.60	Phospho Bronz	5.5 : 1	Glow Shaft Rotary Valve
099-SR	13.6×12.36	1.79	Phospho Bronz	7.7 : 1	Glow Shaft Rotary Valve
11S RBB ABC	13.6×12.36	1.79	2 Ball Bearings	7.7 : 1	Glow Shaft Rotary Valve
15-IVS	15.0×14.0	2.47	Phospho Bronz	7.7 : 1	Glow Shaft Rotary Valve
15-IVS BB	15.0×14.0	2.47	2 Ball Bearings	8.7 : 1	Glow Shaft Rotary Valve
19-IVS	16.0×16.0	3.21	Bronze	7.0 : 1	Glow Shaft Rotary Valve
19-IVS BB	16.0×16.0	3.21	2 Ball Bearings	7.0 : 1	Glow Shaft Rotary Valve
21SS ABC	16.68×16.0	3.5	2 Ball Bearings	8.5 : 1	Glow Shaft Rotary Valve
25-S	17.0×18.0	4.08	Bronze	9.5 : 1	Glow Shaft Rotary Valve
25-S BB	17.0×18.0	4.08	2 Ball Bearings	9.5 : 1	Glow Shaft Rotary Valve
35-S ABC	19.4×19.4	5.73	Bronze	8.3 : 1	Glow Shaft Rotary Valve
40-SS ABC	20.28×20.28	6.55	2 Ball Bearings	6.6 : 1	Glow Shaft Rotary Valve

FUJI

High Performance - Easy Starting Glow Model Engines

I.B.S.
INNER BYPASS SCHNEURLE



Fuji offers the modeler an exciting line of Glow model engines. They have engines from .099 to .25, ball bearing and plain bearing, and even an outboard R/C. These engines are precision built, strong running and long lasting. No matter what your needs are in engines from .099 to .25, Fuji has one that is perfect for you now! plus a new 40S.S. (ABC—IBS)

Weight (GR)		Max Power (H.P)		R. P. M.		Size Props dia×pitch. in		
STD Type	R/C Type	STD Type	R/C Type	STD Type	R/C Type	U/C	R/C	F/Flight
112	122	0.22	0.16	11000 14000	2500 12500	7×5	7×5	7×4
115	130	0.28	0.22	15000–17000	2500–16000	8×5	8×5	8×4
115	130	0.28	0.22	17000–19000	2500–18000	8×5	8×5	8×4
145	160	0.41	0.35	11000–16000	2500–15000	8×5	8×5	8×4
163	180	0.45	0.37	11000–18000	2500–16000	8×5	8×5	8×4
180	190	0.58	0.52	11000–15000	2500–14000	8×6	9×4	9×4
196	215	0.63	0.55	11000–16000	2500–15000	8×6	9×4	9×4
190	210				2500–18500		9×5	
180	190	0.60	0.53	9000–15000	2500–14000	9×6	9×6	10×5
205	214	0.67	0.60	9000–16000	2500–15000	9×6	9×6	10×5
	310				2500–14000	10×6	10×6	10×6
	312		1.50		2500–15000	10×6	10×6	10×6