

TOP 80 USER'S MANUAL ENGINE

CARBURATION

CARBURETTOR

The motor carburettor is adjusted for best performance at the factory in Italy, however due to the numerous variations associated with different geographical locations it would be prudent for the engine to be tuned at its final destination or main flying location. Please ensure that this operation is done by the Miniplane distributor from whom you purchased. Alternatively it is possible (but not preferable) for a qualified mechanic who is experienced with 2 stroke motors. It should be noted that this situation is not preferable as most 2 stroke experienced persons/mechanics are not experienced in high HP, high performance 2 stroke engines, and through ignorance may cause more problems than cure.

Engine "RICH MIXTURE" will cause excessive fuel consumption and engine vibration.

Engine "LEAN MIXTURE" will cause the motor to run hotter than normal, and may under severe conditions cause, the piston to seize in the bore. Lean carburettor mixtures have also been associated with: Holing of the piston and "softening" of the pistons crown which leads to its collapse due to the extreme heat generated by the lean mixture.

Run the engine for about 10 min. at 75% + power, this will cause the spark plug to be coated in fuel combustion gas deposits. This is the Ultimate way to verify the correct fuel mixture ratio. The correct acceptable colour of which is, anywhere from light coffee colour to dark a chocolate colour.

The spark plug colour range is:	Grey	Tan / Clean centre	Dark Brown / Black
Therefore carburettor screw is :	Lean (lean, insufficient fuel) screwed IN to far	correct	Rich (too much fuel) screwed OUT to far

PLEASE NOTE : on 2002 in Europe was introduced the "green" unleaded gasoline, after that the plug colour don't guarantee the correct carburation !

other solution for a correct setting are in our web catalog www.miniplane.net/shop : EGT (exhaust) temperature, CHT under plug temperature, or a special instrument that analyze the oxigene concentration, but before all a lot of experience, please contact the nearest dealer.

Carburettor diaphragm

To work correctly the carburettor diaphragms should be maintained in a sealed wet state. After numerous hours of operation of or where it is believed that the diaphragms have been in a dry carburettor

for a substantial period – it is recommended that a diaphragm repair kit M10V5 or full kit M10V5K be installed to ensure optimum performance. Contact your dealer if in doubt. After long period of inactivity it is possible that the diaphragm has dried out due to fuel evaporation, this in itself is enough reason alone to change the diaphragms

The replacement of the diaphragm is recommended annually. As with all things - they wear. Associated with wear of the diaphragm is a decrease in pump performance, which in turn affects fuel mixture ratio. The failure to replace the diaphragm will cause a degrading of pump performance, and a leaning out of the mixture ratio, resulting in possible engine seizure.

Changes to the mixture setting may also be necessary due to season changes / altitude variation (+ - 500 m from previous location). This may be performed by persons comfortable with the function of the engines operation or alternatively by you dealer.

Symptoms of a RICH 'high' screw & or a LEAN 'low' fuel mixture screws

"L" screw set to lean: (screwed in to far)	It may idle well BUT will not accelerate. Acceleration causes the engine to die.
"H" screw to rich : (screwed out to far)	If left to idle for 2-3 minutes - engine "loads up" with excessively "wet" (rich) mixture and dies. Fuel pools at the bottom of the engine cases, when accelerating the engine in this state – you will get a rumbling sound and excessive smoke as engine attempts to clear pooled fuel.

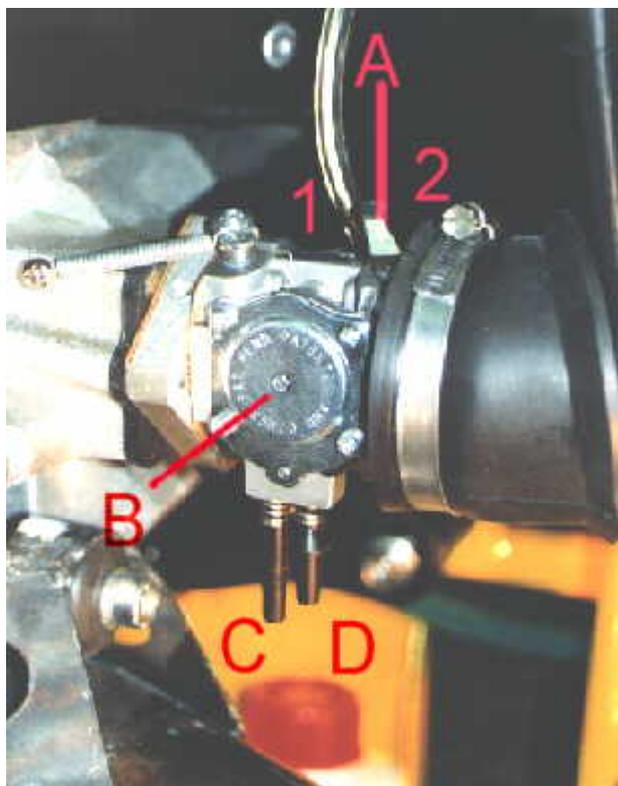
VALBRO

The Valbro carburettor used has a cold start function (choke) for cold climate, and initial start procedure.

Lever 'A" in position 2 for starting, in position 1 for normal operation.

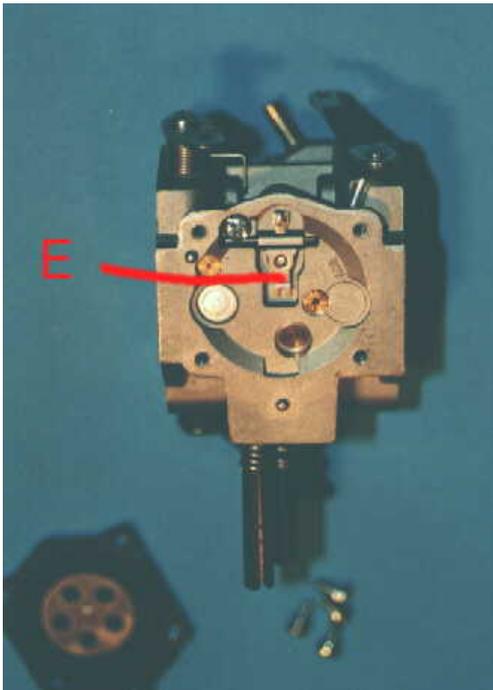
On MINIPLANE delivered after august 2008 there is a remote choke control: position pushed down is for starting 2 , pulled up is position 1 for normal operation .

The carburettor has an idle adjustment screw ('D') which has a tapered base. This tapered base acts upon the carburettors butterfly valve. Adjustment of the engines idle speed is made by rotation of this screw 'D'. Turning the screw into the carburettor will open the butterfly valve inside the carburettor – increasing the engines idle speed. Screw ('C') is the high RPM fuel mixture screw and is responsible for engine fuel mixture at engines speeds from around 6,000 rpm and above. Turning this screw ('C') OUT of the carburettor enriches the mixture. The optimum setting for this screw is between 1 and 2 + 1/2 turns from closed.



NOTE – when closing the fuel screws do so gently – DO NOT seat the screws hard into the carburettor body, or you will damage the fuel passage that the screws locate into

The screw **D** (idle speed screw) has no effect upon carburettor fuel settings.



Behind cover B is located the fuel metering mechanism – the fuel spring, **THIS IS THE ENGINES MAIN FUEL CONTROL MECHANISM**. When the cover is removed you will see the lever (**E**) beneath which is located the fuel spring. The ideal length of this spring is between 14-15mm. This length can be obtained by gently squeezing the spring between your fingers. A new miracle spring is now available giving better mid range fuel delivery.

This fuel spring length should give you a “Pop Off Pressure” of 0.9/1 Bar. As an indication of the importance of this calibration – a specific tool is available (you see photograph under) for measuring the point at which the pop off pressure is achieved. The tool is available from the Miniplane shop.

The height of the lever upon which the spring acts, is also critical and should be 0.5 -0.7 mm above the body of the carburettor.

The adjustment of the fuel lever and fuel spring is a very delicate operation, involving fragile components and should only be undertaken by an expert.

The carburettors fuel filter is also located here, and can become blocked with “rubbish” causing a loss of power which is especially prevalent at high rpm’s

more information on Walbro page :

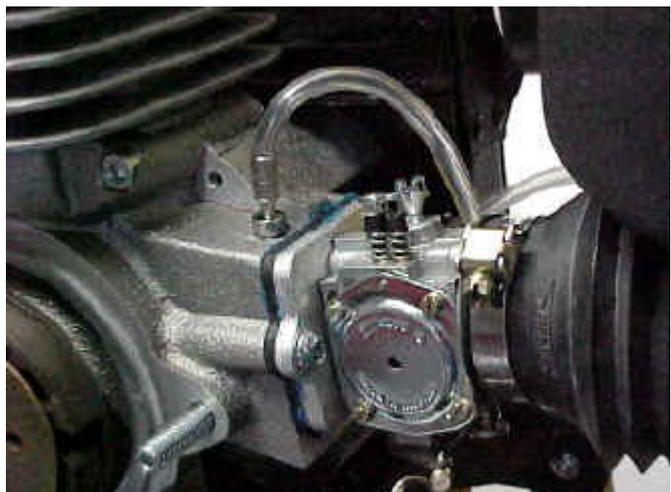
[valbro.htm](http://www.valbro.com/valbro.htm)

<http://www.wind-drifter.com/technical/WalbroServiceManual.pdf>

TILLOTSON

The basic setting of Tillotson carburator is :

2,5 rev on L screw (at left on picture) for the idle setting and 1 1/4 rev. on H screw (at right on picture) per il regime di massimo.



! pay attention please

The diaphragm carburettor "pumps" thanks to the variable pressure inside the crank case.

The pressure comes to carburettor through a small hole on the reed valves, we suggest you to control and clean that hole and the nearest gaskets.

You can use a 2,5mm drill bit, clean the back side of the hole.

The typical symptom of this defect is an engine that "haul" in the final part of the throttle control (means that the carburetor is unable to pump enough fuel at high rpm)



related topics at [carburetor maintenance](#)

float-type carburetor.

The basic carburetion is for sea-level flight, the altitude may compel you to adjust it.

height m	full revs. nozzle	needle notch
0 - 1000	75/65	3
1000 - 2000	70/62	2
above 2000		2

Minor **adjustments** for the steadiness of the idling can be done by the side screw on the carburetor.

TROUBLESHOOTING

RUNNING-IN

You must run-in the engine before flying.

Do not rev up for five minutes while running-in.

The running-in is over after consuming 10 liters of gas.

The lifespan of your engine can double with a proper running-in, while with a bad one you may damage it since the very first hours of working.

In the first phase of the running-in the engine must be switched on for increasing time starting from few minutes and off for the time necessary to cool.

While on, the engine must be gently set at different revs, starting from the lowest up to the higher.

Repeated revvings are unsuitable, the clutch may be surcharged.

After each switching off, do carefully check all the mechanic parts, bolts and knots.

After at least 10 minutes of work you can fly, gently, avoiding high revs. for too a long time.

A heavy pilot requests more power to fly, in such a case is better to run the engine on the ground for at least 1 hour.

After the first 30 minutes of run, do check all the bolts, knots and screws, particularly those of the engine and the prop as well. Those of the engine (bolts and knots) must be checked every 5 hours of flight.

Engine overheating may occur while running-in, you can recognize it by a loss of power.

In this case is very dangerous to keep it on, it is better shutting off and let cooling, OR, AT LEAST SLOW DOWN BELOW 5000 RPM before applying more power

A loss of power may occur because a mixture too lean, following a wrong carburetor setting or dirty in the filter, do check for such possibilities before restarting the engine

In case of overheating it is advisable to check the head screws to verify the seal of the motor head, see [locking torques](#). Usually a loss of seal can be perceived by dull strokes at starting or by oil leakage, once the air conveyer is removed.



NEVER LET A RUNNING ENGINE ALONE ON THE GROUND



PREPARE the starting on the ground only with starter in start position (the engine can't turn fast)

after the firts explosion of the engine open the choke and start the engine again **ONLY AFTER YOU PUT IT ON YOUR SHOULDERS**

it is the only way you have to control the thrust generated by the propeller