

Operating Instructions



RETROMOTORYcz

Operating instructions for H80 BOMBUS engine

Before use the engine, read following instructions.

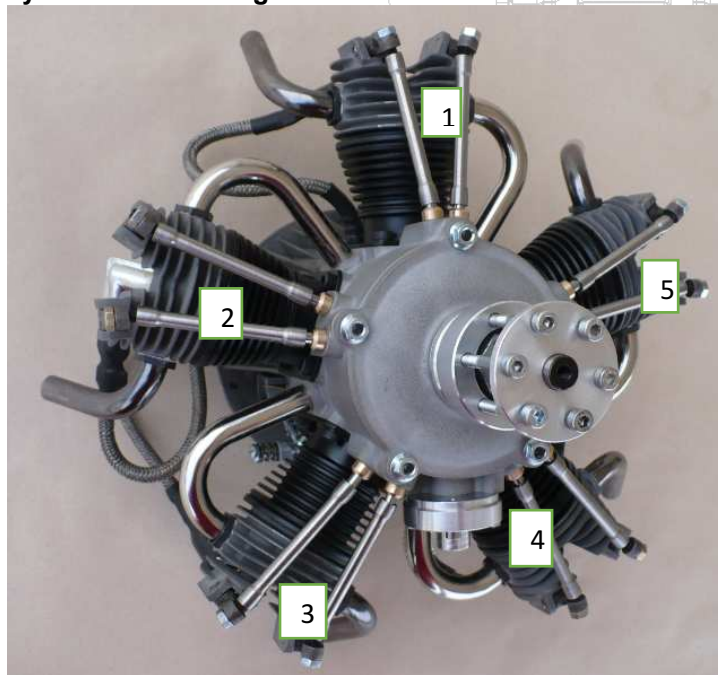
A for-stroke radial gas engine H80 BOMBUS has been designed for propulsion of radio controlled aircraft models, particularly semimaquettes and maquettes.

All instructions, warranty and other documents can be changed in connection with improvement and development of the product according to decision of corporation **RETROMOTORY.cz**. Therefore visit www.retromotory.cz and follow the support for this product.

Technical specifications

Bore 29 mm
Speed range 700 – 5500 rpm
Mass of complete engine including integrated ignition 3200 g
Fuel unleaded gasoline min. 95 octans
Lubrication mixture of oil and gasoline 1:50

Cylinders numbering



Safety instructions

- 1) Never use the engine for propulsion of any appliance with human crew.
- 2) When operating the models, always comply with the rules and laws valid in country where You use the engine.
- 3) The producer does not bear any responsibility for possible damages caused by operation of models and appliances powered by the H80 BOMBUS engine.
- 4) Use only original spare parts.
- 5) Never modify the engine design.
- 6) Take heed to tightening and condition of all propeller screws. If You use a propeller hub, always follow the instruction for its installation.
- 7) Regularly check the attachment to engine bed. Never start up loose engine!
- 8) Use only well balanced propellers! Damaged propellers immediately replace!
- 9) Never stand in the plane of rotating propeller.
- 10) When operating the engine, never wear flapping clothes (ties, scarfs, etc.)
- 11) Stop the engine by switching off the ignition switch or full closing the throttle valve or choke.
- 12) At starting up the engine, carefully ensure the model against moving.
- 13) The fuel is an inflammable matter and is necessary to keep it in a closed vessel in safe distance from running engine.
- 14) When preparing the fuel, follow the producer or vendor instructions.
- 15) Keep small items in safe distance from running engine. Never throw any things to rotating propeller.
- 16) Carefully choose the place for starting engine. Avoid dusty or sandy areas.
- 17) Never start up the engine in closed spaces.
- 18) At starting up the engine, ensure that possible byholders, especially children are far away at least 10 m.

19) The engine output enables to operate big models. Operation of those appliances can cause property damages due to operating error. Do not operate models with H80 BOMBUS engine until You have a sufficient skill in models control.

Parts needed to assembly

- propeller
- ignition battery (4-9V, recommended source 5cell NiMH or 2cell LiPo)
- fuel hose (cca 3,2 mm)
- ignition switch
- 3 screws M5, length according to engine mount thickness
- gasoline min. 95 octans
- oil for two-stroke engines

Suitable propeller selection

In order to best utilization of engine power, the diagram of propeller required power and the engine performance diagram (speed/power) should intersect in the area of maximum engine power. Nevertheless no producer of propellers does give such information to his products. Also the engine performance diagram is variable in dependence on atmosphere properties (temperature, barometric pressure).

Recommended dimensions of propellers:

Two - blade propeller min. 26/12 and higher, or three - blade propeller 24/12 and more.

The H80 BOMBUS engine has been designed so that its maximum of performance diagram is at speed 4500 - 5000 rpm. If You want fully utilize the maximum of power, use the propeller with which the engine on ground reaches the above mentioned speed, eventually 100 – 200 rpm lower, with respect to propeller unloading in dependence on speed of flight.

We do not recommend to use propellers with which the engine on ground reaches more than 5000 rpm.

At propeller installation tighten the screws on circumference of propeller washer crosswise several times.

Exhaust system

Use original annular exhaust collector which is engine equipment. The engine can be used without this collector, only with sleeves leading the exhaust gases away to free space. In this case the engine must be installed in model without cowling. The producer does not bear any responsibility for damages due to using inadequate exhaust system.

Fuel

Use only gasoline min. 95 octans mixed in volume ratio 50 units of gasoline to 1 unit of **high-quality oil for two-stroke engines**.

The producer does not bear any responsibility for engine damage due to using fuel of poor quality.

Keep the fuel in proper vessels.

Installation

Install the engine into airframe with cylinder Nr.1 on top (12:00). For engine mounting use three screws M5 passing through borings in flange of rear housing. Fasten the engine directly on engine bulkhead without rubber silentblocks. Lock the screws against release in the appropriate manner and check periodically their condition and tightness.

The engine is aircooled, so it is necessary to provide sufficient stream of cooling air not only around cylinders but also around the rear housing, containing ignition electronics, and around the exhaust collector. Cylinders, rear housing and exhaust collector are ribbed for perfect cooling. **Never forget the outlet of warm air behind the engine and around rear housing, which must be greater than inlet.** Also provide inlet of air to engine intake. Suction of warm air from inside of engine cowling can cause decrease of engine power.

Caution! During installation the engine to the model, prevent pollution of engine inside with sawdust, abrasive, etc. Clean up the internal space of fuselage from which the engine will suck up the air and properly fasten all parts so that they cannot be sucked into the engine.

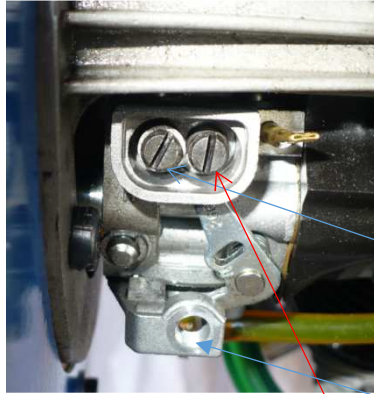
Start up the engine

Never turn the engine with ignition switched on, if there are not spark plugs in terminals, it can cause ignition damage!

1) Switch the ignition on, close the choke valve, set idling throttle and turn the engine rapidly. After several turns (in case of dry carburettor after ten or more) You will hear a hint of starting up. Open the choke valve and start up the engine by turning the propeller.

2) After starting up let the engine run for sometime at increased idling mode. Change the speed from idling to maximum value. If there is all right, You can make the first take-off. Take heed to sufficient idling at least 1000 rpm. It is possible to set very low idling on the engine (till 600 rpm). However we do not recommend such low idling for flying. By reason of engine reliability set the idling speed within the range 1000 to 1200 rpm. It is not necessary to warm up the cold engine for a long time, several short accelerations is sufficient.

The carburetter setting



Basic setting: adjusting **screw L** for lower speed range 1,25 turn, adjusting **screw H** for upper speed range 1,75 turn.

The new engine has factory setting to basic adjustment, with which make the first start up! Caution! Never tighten the adjusting screws by force so as not to damage their seating surfaces. This way damaged carburetter no more can be properly adjusted.

Caution!!! All carburetter settings make very carefully, from behind the propeller or stop the engine.

In accordance with the applied throttle control it is possible to mount on the enclosed **idling stop screw** with spring. We recommend to retain the retracting spring of throttle valve, otherwise the throttle valve shaft can be worn out owing to engine vibration and consequently the carburetter function deteriorates.

Note: Four stroke engine usually has a slower acceleration than two stroke engine. During the long flight in back position may the engine drop power so you can eliminate this by reducing the throttle.

Valve clearance setting

At new engine the valves have factory setting. After first two hours of run they have to be rechecked and reset. Be sure the ignition is switched-off. Turn the propeller in normal direction and watch the rocker arms of cylinder Nr. 1. At first will move the rocker arm of exhaust valve, next the rocker arm of intake valve. At the moment when the rocker arm of intake valve returns to lower position, turn the propeller next about 10 degrees. In this position of propeller, loosen the nuts on rocker arms and by means of hex key wrench set the clearance between rocker arm and valve shank to 0 to 0,1 mm (0" to 0,004") on both valves. Tighten the nuts again. The same procedure perform step by step at all cylinders (cylinder Nr. 2 to Nr. 5). The next check of valve clearance is sufficient once a year.

Valve mechanism lubrication

Only rocker arms require minimal lubrication. Once a year we recommend to lubricate the rocker arms with lubricant MOTUL Chain Lube Off Road, or similar with thermal resistance to 120°C, through the lubrication hole. Note: Fuel mixture leaking around the valve shanks is not a fault.

Ignition

The engine H80 BOMBUS has a unique, microprocessor controlled ignition, which is integrated to rear housing of crank case. Just connect the ignition battery to a connector sticking out from rear housing. Always keep the proper polarity, prevent from reversed polarity. To damaged ignition due to reversed polarity, the warranty does not apply! The ignition cables to spark plugs have been connected from the manufacturer. At replacing or inspection the spark plugs, always observe the cables sequence, otherwise it is impossible to start up the engine. For the ignition use a battery 4-9V (recommended source 5-cell NiMH or 2-cell LiPo) and suitable switch.

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