

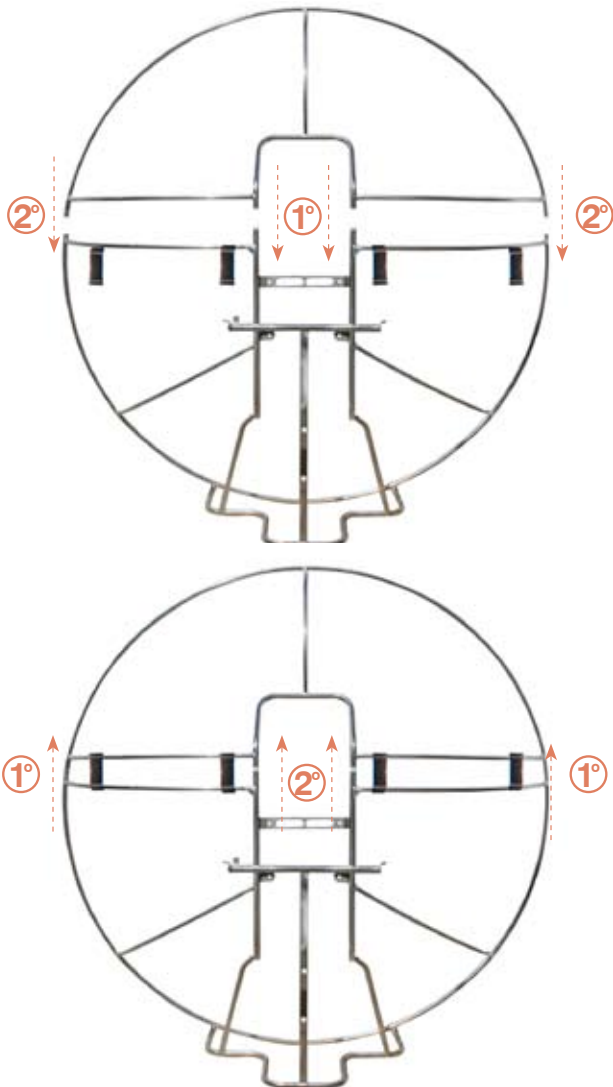


USE AND MAINTENANCE MANUAL

Thank you for purchasing a PAP machine and trusting in our experience. This will let you achieve and experience flight in a very simplistic form and let those childhood dreams of flight become a reality. If you do not want this dream to become a nightmare then please read and understand fully the following recommendations about its operation and use. Enjoy your machine and always respect the flight rules

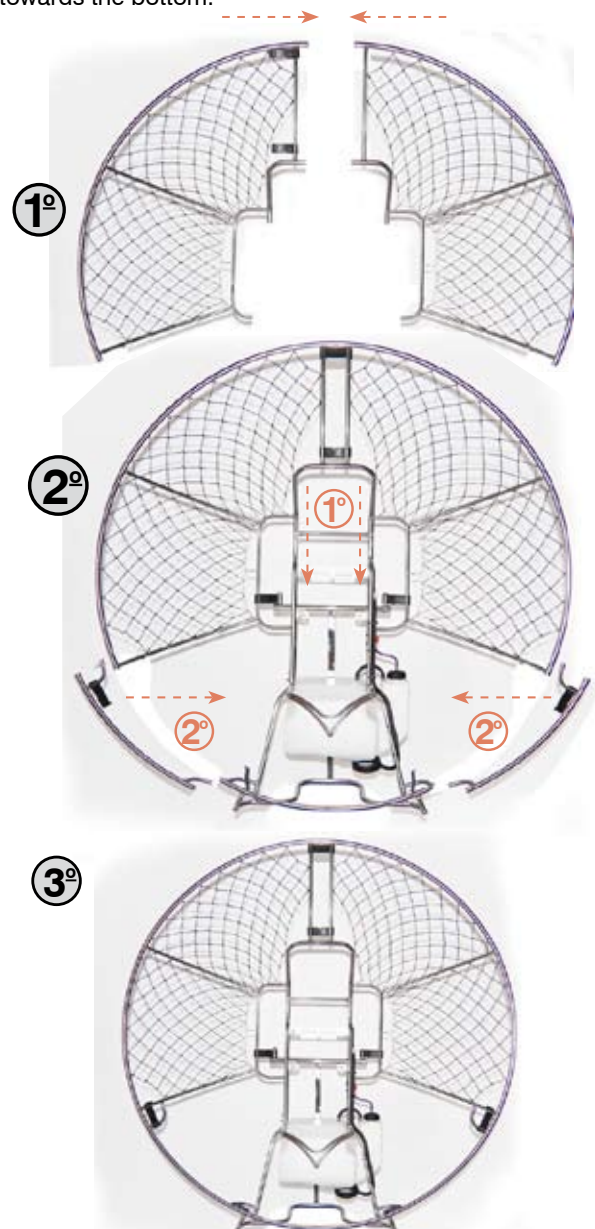
DISMANTLED CHASSIS INTO 2 PARTS

In order to assemble the top part of the chassis, you first should position the central part nylon pegs and then, the sides. Be sure that all parts to fit are properly cleaned. It is important to properly place the clips checking they press correctly. To dismantle, start with the sides and then the centre. The structure should not be forced when assembling and dismantling. When chassis is dismantled, H.R.S. system (as long as it is installed on the structure) remains attached to the top part of the bottom half of the chassis, over the harness



DISMANTLED CHASSIS INTO 3 PARTS

Start by assembling the 2 cage halves, place the partly assembled cage halves onto the pegs located on the central part off the chassis, then bring the frame together starting at the top and working towards the bottom.



CHASSIS AND ACTIVE SYSTEM ARMS

The active system arms connect the harness to the chassis. Carabiners are located on the harness where the paraglider risers are attached. The active arm connections points on the active arms work on a scale from A-F. Before your first flight on the PAP machine it is necessary to find your ideal static balance when seated in the harness in the normal flight position, wearing your flight suit and equipment. This is best achieved by suspending yourself & the machine from a static frame. Moving the attachment points on the active arms forwards and backwards equally (A, B, C, D, E or F), you can find the optimum tilting angle off the propeller to the ground. For lighter pilots move the shackles backwards and for heavier pilot's move forwards.



A = +/- 50 Kg.
B = +/- 60 Kg.
C = +/- 70 Kg.
D = +/- 80 Kg.
E = +/- 100 Kg.
F = + 140 kg.

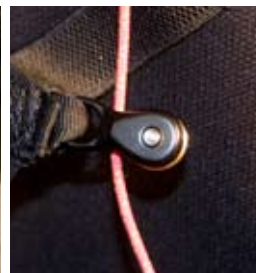


WITH THE MOSTER185 THOSE CALCULATIONS CHANGE ONE POSITION FORWARDS (A PILOT OF 80 KILOS WILL GO TO THE E POSITION)

HARNESS



The harness is a Sup' Air harness designed specially for PAP and will give provide optimum comfort during flights. Included: carabiners and automatic clips with safety closing. External articulate extension board for additional leg support. Pulleys for speedbar system. Large Neoprene side pockets. Emergency Parachute and Engine Rev Counter mounting system.



Even though all parts of the engine have gone through quality checks before being sent, we recommend to check that the seat is correctly fixed to the frame, also check that the automatic buckles and accelerator pulley are working properly.

PROPELLER

If you do not have a torque wrench just tighten the bolts slightly more than the maximum pressure.

Never Start The Engine Without Propeller Or Gearbox Fitted.

Its very important to check the propeller tracking. This is the difference between the tips of the propeller on its path during rotation. If the tracking of the propeller is occurs it means that the propeller bolts may have been tightened asymmetrically. On engines without clutch: Take away the spark plug so that the propeller can turn easily. Turn the propeller, and make sure the tips of the propeller pass through the same axis during rotation.

IMPORTANT: every time the propeller is fitted it is necessary too tighten the bolts before the next flight. Check that the propeller is not damaged fixed properly and turns correctly and smoothly. Listen for any unusual noises that might come from the engine or the gearbox.

SAFETY: always treat the propeller as if the engine was running..



Torque setting 1,1 Kgm (11 Nm)



Torque setting 0,8 Kgm (8 Nm)

THROTTLE




Before turning over the engine using the electric starter, always check that the safety switch is off and only turn it on just before starting with the start-up handle (2).

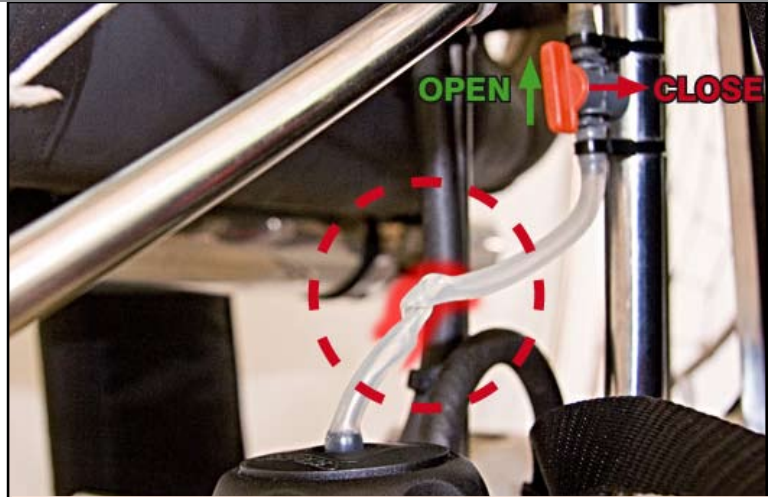
On the throttle handle check that the cruise control screw is loose and the throttle handle is returned to the closed position (1)..



The Engine STOP button is located on top of the hand throttle (3). The accelerator cable is passed over the forearm for optimum control and comfort.

SECURITY ON THE GROUND

- **THE BIGGEST DANGER IS ON GROUND** so it is very important to get into a good habit of checking the surrounding area is clear to avoid incidents/accidents:
- Moving the engine: Always lift the machine using the strongest and most stable part of the chassis. **DO NOT LIFT OR MOVE USING THE CAGE.**
- **NEVER START WITHOUT THE PROPELLER OR GEAR BOX.**
- Follow the manufacturer's instructions for running in using the correct % of oil mix, and always filter the fuel when filling the tank.
- Only close the breather line valve when transporting the machine to prevent fuel spillage. Otherwise this valve must be in the open position for flight.
- Open – when the handle of the valve is inline with the pipe.
Closed- When handle of valve is 90° to pipe.
- Make sure that there is nothing or no one around the area of the propeller during starting and that you have placed the engine on a level surface and a mat to avoid contact between the propeller and loose items on the ground. i.e small stones or sand. 
- Never turn the engine towards people, animal's, paragliders



DO NOT TWIST THE FUEL TUBE

Take care closing the fuel tank cap in order to do not twist the tube. **If the fuel tank does not "breathe" the engine will stop.**

SECURITY TAPE TO LOCK THE PROPELLER IN THE COLD START. ONLY FOR ENGINES WITH CLUTCH

A new security measure to avoid the possibility of the engine falling towards us when starting in cold giving gas.

We start with the covers of the propellers on, as the tape has been stitched on to the covers and its function is to block the propeller should we not give enough gas when the engine of transmission with centrifugal clutch. Has already started.

ATTENTION: DO NOT USE THIS TECHNIQUE TO WARM UP THE ENGINE

This security measure is intended above all to minimize risk and nerves of those who are new to the paraengine and aren't familiar with the manual startup.

It is a good option to get used to using this system which would also block the propeller in case we do not notice that the roulette of the gas lever is blocked photo(1) or that the gas lever does not return correctly (**remember that it is very high importance to methodically perform these checks before starting**)

We must fix the Ribbon on the principal outside ring of the frame so that the propeller moves as little as possible See photo. Remind you that all engines with centrifugal pivoted clutch turn to the right depending on the position of flight.

There are other techniques that exist in the world of the paramotor for long time for this purpose. We have incorporated it as simple and efficient without using other elements.



BEFORE STARTING IT IS IMPORTANT TO DO A **PRE FLIGHT CHECK**

Check the tightness of all bolts and screws on the engine.

Nothing should be loose in flight as it can come off and go through the propeller causing extensive damage.

Check the welding especially where the engine is fixed

Check that the safety net is fastened tightly, and that the paragliders speed trim system does not have spare lines hanging, as these can get into the propeller.

Check the condition the anti-vibe rubber mounts

After flying, clean the engine and the propeller with a cloth (it's the best way to find anomalies)

At this point on electric start machines always ensure the main engine ignition switch is OFF so as to protect yourself from accidental restart.

STARTING OF THE ENGINE

If the gasoline circuit is empty we will notice this right away because the knob (Fig. 13) offers little resistance and therefore we will have to pump up the gasoline until the knob hardens. If we pay attention we can hear the gasoline reach the carburetor and as so the gasoline circuit filled.

If your engine does not have the knob (fig. 13) it means that the primer system will be done by the "Primer", to see how this works go to the section Engine starting with Primer.

STARTING IN COLD WITH THE GASOLINE CIRCUIT FULL:

Once checked that it is full we press the Primer of the carburetor (Fig. 14) and while we are pressing this we will act on the knob (Fig. 13) by pressing this just a few millimeters and as a result the flow of enough necessary fuel will fill the carburetor. We can also see the small gasoline filter which is under the carburetor being filled.

Give full throttle during the first pull of the starter rope. Like this the engine will start immediately without unnecessary drowning.

If we priming the engine too much, this will drown the engine and it will have difficulties too start and having to give several pulls on the starter rope. The same applies if we stay short. As a visual reference to know is when the small petrol filter is full. With practice we will easily know the fair amount (just a few millimeters of pressure on the knob (fig. 13) with the pear of the carburetor (fig. 14) pressed).

HOT START:

NO action on the supply of fuel is needed.

It is not necessary to use the throttle of the starter; otherwise you will drown the propulsion hopelessly.



ATTENTION: before you start, verify that the gas cable is not blocked. To verify this a few gas actions are sufficient.

When starting and accelerating it is very important not letting the engine get too many RPM as it can push you too the sides. Do not forget to use the security tape to block the propeller when the engine has clutch.

If you prime in excess, a drop of fuel can fall on the exhaust. Do not clean until the fuel has evaporated if not the paint of the exhaust will come off (only for painted exhaust).

STARTING TECHNIQUE

1º) Prime the carburetor with fuel (see cold start); if the engine is already warm we won't need to prime it.

2º) Pulling the starter cable, unfold the whole cable gently, and then let it go back to its initial position. Repeat this action 2 or 3 times.

3º) Give a dry pull on the starter cable, it must never be a progressive pull but just the opposite. An example would be given as "backwards punch" or a "poke in the air".

■ **NEVER start without the PROPELLER or reduction.**

■ Take the gas throttle with the left hand, checking that the bolt that holds the gas is open, and when pressing it down completely the gas lever returns to its initial position. Do not leave your starter cable on the other side of the frame or lying on the ground.

■ Hold the upper area of the frame where the seat and parachute is located with your left forearm.

■ Place your left foot on the curve at the bottom of the frame next to the fuel tank, and look for a good support for your right foot so that you do not lose your balance while starting the engine.

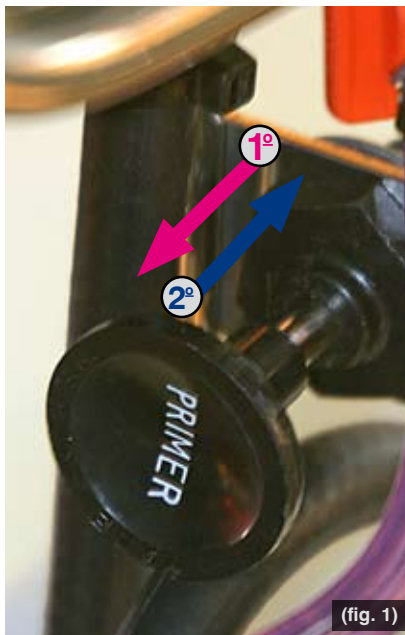
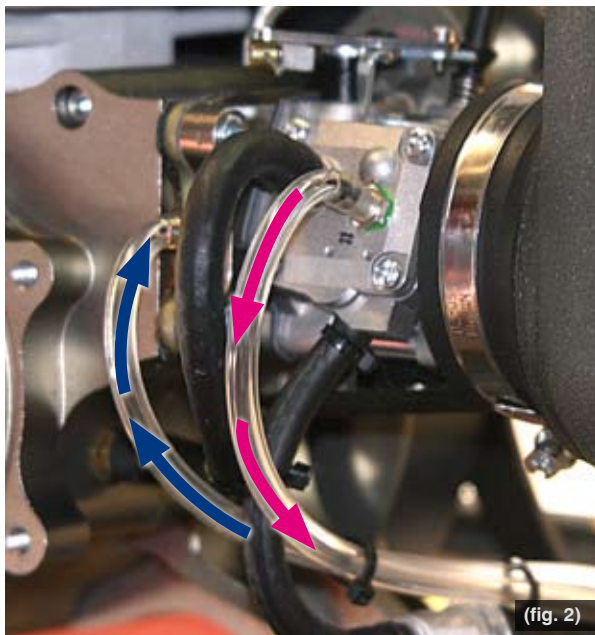
■ During the first seconds the engine can be a bit rich of gasoline while on low revs if you prime in excess.

■ Insist on your support, not to lose the balance.



Examples of incorrect ways of manipulating the paraengine, during starting and warming up phases.

STARTER WITH PRIMER SYSTEM



In this paraengine model we have introduced a 'primer' which is a system which facilitates the pump action to make the starting of engine easier. Its use is simple and consists of pulling the primer extending it all the way and after pushing it back introducing the rod completely.

This Act provides enough gasoline flow to the carburetor and reed valve replacing the manual pump pear and the carburetor pump action.

It is positioned in the cage as seen on the picture and its access is easy during flight, making it simple to start if the pilot wants to turn off the engine during flight and to restart it after a few minutes when the engine has been able to cool down.

FOOT STARTING SYSTEM

A foot strap is used to start PAP machines with manual start only. This system allows you to turn off the engine during flight, and be able to restart using the foot strap fitted on the left foot:

Place the strap on the left foot ensuring the loop is protruding behind your heel.

With the engine on the back, you will need support (ex. A person or car)

SAFETY ADVICE: Without support you could fall causing physical injury to yourself or damage to the machine.

Support yourself adequately, then move your foot downwards and forwards in a constant kicking motion, once started release the starter handle from the foot strap and allow it to retract back to its initial position.

During flight, with sufficient altitude, you can practice stopping & restarting the engine (this will be easier to do as there is no balancing required).



INFLATING THE GLIDER WITH ENGINE

The frames are prepared to resist the pressure of the lines on the outer ring when taking off. We advise to use between 30 and 50% of power before the glider is on top of pilot. When the glider is up and stable we can use all the power necessary to take off (this power always depends on atmospheric conditions, weight, glider, power off engine etc).

Another important factor to keep in mind is the inclination of the back of the pilot when tacking off forwards, because if we lean forwards the lines will give longer pressure to the ring.

Also take care when heating up the engine as the lines are not tense they could be aspired by the propeller with the consequence that this could have. It is important that the lines are far away from the frame during the process.

It is also important that the rest of the brake line is not longer than 10cm. when inflating this could be aspired by the propeller and pull our hand backwards.

RUNNING IN OF THE ENGINE

Each client receives his paraengine with approx. 15-20 min. Of having been run in on the ground, where each unit is regulated and carbureted at sea level. Also checked is that the propeller is perfectly balanced, as well as all the components of the engine (clutch, redactor, etc.)

Before running in we recommend that it should be warmed up for 15 minutes. Above 5000 RPM. Before you begin to fly with it (do not leave the engine in LOW REVS too much time because it GREASES IN EXCESS THE EXHAUST AND SILENCER WHICH WILL PRODUCE MORE NOISE AND DRENCH THE FIBER OF THE INSIDE OF THE SILENCER (This is the reason why the engine expels smoke in excess when having it in slow revs a few minutes and then accelerating. During the first hours we should not abuse to a maximum RPM of the engine. The entire running in is considered after 10 hours of use of the engine (on ground and during flight).


Respecting the first 15 minutes, please do the rest of the hours flying. In the case of heavy pilots they are advised to do, at least 1 hour on the ground before flying.

The optimal regime for good running in is to keep the engine between 6,000 to 7,500 RPM. From time to time rising above the 7,500 RPM for a few seconds. The regime must vary frequently and in progressive increase. Not giving full gas blows continuously, since the centrifugal clutch will be exposed to abnormal loads.


It is important, that after 1 or 2 hours of flight, we check the clamping screws of the cylinder head which must be tightened using a wrench (see the table of corresponding wrench tightness). Usually when the cylinder head loosens we can hear deaf 'shotgun' noises (heard when starting up the engine) or oil stains can be seen in its Union with the cylinder.

Revisions and checks during this phase are detailed in the maintenance section, (10 hours). If you notice symptoms of power loss, it may be caused by a poor engine fuel due to the regulation or that the filter has been dirtied. It is always more desirable an engine with rich engine fuel than poor; at least we exclude risks of gripe...With the following table we can check visually if the mixture (we refer to gasoline - air, not oil-gasoline) is poor or rich in function of the color of the spark plug.






COLOR OF SPARK PLUG	YELLOW / GREY	COFFEE WITH MILK	BROWN / BLACK
MOTOR FUEL	POOR	FAIR	RICH

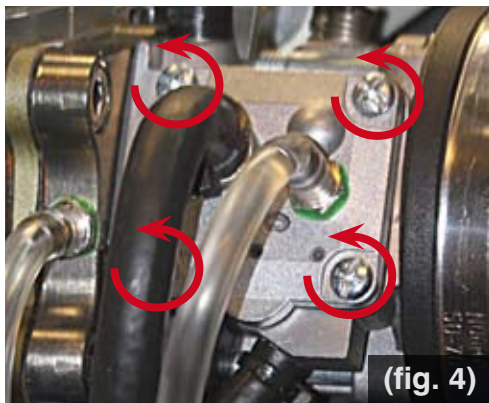
 **THE PERCENTAGE OF OIL IN THE MIX WILL NEVER VARY AND IT WILL ALWAYS BE INDICATED ACCORDING TO THE MODEL OF ENGINE, NEVER ADD MORE OIL AS INDICATED IN THIS TABLE NEITHER DURING THE PHASE OF RUNNING IN.** We recommend Castrol Power 1 Racing.

ENGINES	Gasoline	Synthetic oil
RM80	Unleaded 95 octane	2 per cent (100 ml per five liters of petrol)
PA125	Unleaded 95 octane	2.5% (125 ml every 5 liters of gasoline)
MOSTER125	Unleaded 95 octane	2.5% (125 ml every 5 liters of gasoline)
FLY200	Unleaded 95 octane	2.5% (125 ml every 5 liters of gasoline)

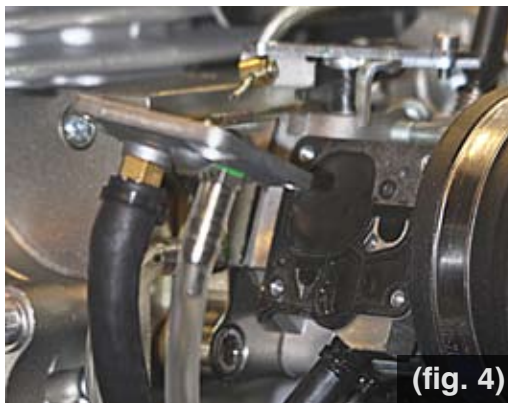
 **A well run in engine can increase life 100% and minimize the mechanical problems that you may have. Otherwise you have high probability of significant damage in its first hours, which will be irreversible for their useful life.**

BASIC RECOMMENDED CHECKS

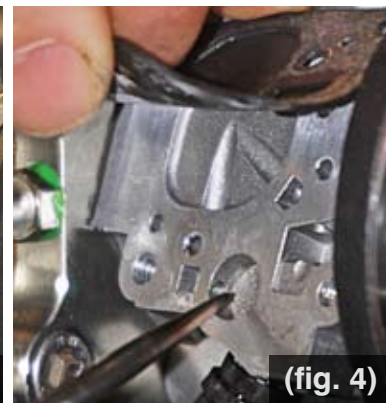
-  **IMPORTANT: IS ESSENTIAL TO TIGHT THE HEAD CYLINDER AFTER THE FIRST FLIGHT HOUR**
It is necessary to tight the head cylinder nuts after the first flight hour accorded with the table of pairs of tightens and using for it a dynamometric key.
For the **RM80** the head cylinder pair of tightens is of **0.9 KGM/9 NM** and **1.6 KGM/16 NM** for the **PA125**.
-  **IMPORTANT: IS ESSENTIAL TO TIGHT THE 5 SCREWS ø6 OF THE REDUCTOR AFTER THE FIRST FLIGHT HOUR.** The pair of tightens for the 5 screws ø6 is of **1 KGM/10 NM**.
-  **SPECIAL ATTENTION BEFORE THE FIRST USE:**
It is necessary to have a special care when you pump the gasoline before the first use to prevent some gasoline does not fall on the exhaust pipe. If there is some fuel on the exhaust you have to leave it dried before passing a rag (**only for painted exhaust**).
-  **WE RECOMMEND TO ALWAYS FILTER THE FUEL WHEN YOU FILL THE DEPOSIT.**
-  **TAKE OFF THE CARBURETTOR INNER FILTER. ONLY FOR RM80 AND PA125 ENGINES** (fig. 4)



(fig. 4)



(fig. 4)



(fig. 4)

First 10 Hrs (running-in)	Every 50 Hrs	Every 100 Hrs	Every 150 Hrs	Every 200 Hrs
<ol style="list-style-type: none"> 1. Check torque of all screws and nuts of the engine, exhaust, frame, and cylinder head; with a cold engine too avoid malformation. 2. Check the sparkplug, the inner part should be a brown light colour and have a 0.5mm. 3. On engines with pulley check the correct belt tension. 4. Check the small fuel filter. 5. Take off the carburettor inner filter. 	<ol style="list-style-type: none"> 1. Replace sparkplug and check contact between spark plug cable and cap. 2. Replace membrane kit. 3. Check thickness of clutch del ferodo. 4. Piston rings. 5. Clean carbon residue from clutch and exhaust manifold, piston head cylinder manifold. Check needle-bearing set by vertically moving the piston. 6. Replace cylinder gasket and and cylinder head gasket. 	<ol style="list-style-type: none"> 1. Replace reduction gear oil and check the state of all engine membranes and replace if necessary. 2. Replace piston rings and membranes. 3. Exhaust and engine antivibes. 	<ol style="list-style-type: none"> 1. Change piston 	<ol style="list-style-type: none"> 1. Check the state of all engine bearings and change if necessary. 2. Replace piston and engine membranes. 3. Replace throttle cable and sleeve if necessary. 4. Check general state of electric elements and engine dampers and petrol circuit and replace if necessary. 5 Replace main petrol tube. 6. Check general state of reed valve sheets and replace those that are worn or not elastic.

REDUCTOR GEAR AND TRANSMISSION

The reductor gear leaning in oil bath is quite efficient and reliable, and has a very low noise production. Its ratio is 3,65 / 1. Almost no maintenance and adjustments are necessary, except check every 100 hours that oil level and state of the clutch are correct.

The transmission from the crankshaft to the reductor gear is connected by means of a dry centrifugal clutch that allows the propeller to be not moving when idle. No maintenance is required.

The amount of oil to apply is: **20 ml. 75W – 90.**

⚠ IMPORTANT
This screw is used to change the oil but not to check the level.



GUARANTEE

Following the instructions and advice of the PAP manual, the PAP paraengines have a limited guarantee for 1 year. The shipment fees to the workshop will be for the client's costs. We will explain, here below, the details for the limits of guarantee.

Excluding the responsibility of guarantee:

1.- The use of propellers which are not supplied by PAP or repaired by particulars or professionals who are not the manufacturers who supply the propellers to PAP, will mean the cancellation of all guarantee rights. (This norm is due to the vibration produced by propellers which do not correspond to the engine model or unbalanced due to an incorrect reparation, all this can produce imperfection on the engine or frame, which in no way are imperfections from the manufacturer.)

2.- The guarantee does not contemplate the seize-up of the cylinder. (Mechanically this is understood as the engine goes through a quality control at the manufacturer and the tests done at the PAP workshop., it should never seize-up unless there is not enough oil in the mixture or that the mix of air and gasoline is disproportioned, due to dirt in the carburettor, a defective joint or a sparkplug not tightened properly. Resuming, due to the loss of stagnation on the engine blocks, factors which can always be avoided following the recommendations and most important of all revising periodically the engine).

MOUNTING THE HEAD RESCUE SYSTEM



Install your Emergency Parachute in the container provided by PAP. To install the HRS container, remove the top screws on the main chassis frame too pass the 2 loops of the container onto the same bar that secures the harness. Refit the screws and tighten. Finally connect the Y bridle with two maillons onto the shoulder pads of the harness underneath the velcro flap are fixed on top circling the steel tube. Always check that the two security loops have

