MACFLY user manual

Update : 12/04/2023

Congratulations on the purchase of your MACFLY Paramotor.

This paramotor is the result of 25 years of experience in the paramotor discipline, both in national and international competition, as well as on the field in school training with students of all sizes and all experiences.

Our frames are constantly evolving to provide the best equipment nowadays.

It is very important that you read this manual before using your paramotor for the first time. The manual will help you get the most out of your equipment, it will give you information on its design as well as advice and tips on how to use it and keep it in good condition for as long as possible.

We hope you will find the same pleasure in flying with our machines, that we have had to experience them during these years

Good flights!
The MACFLY team

Table of contents :

1 – Caution / regulations

The training curriculum is quite flexible in most countries, and the ways of teaching the quite different disciplines from one training center to another.
The specific regulations in each country must be carefully studied before flying, it is for this reason that the company Macfly does not engage its responsibility in the event of an accident on a bad use of the GMP, and we strongly advise you to follow the recommendations of this manual.

WARNING: MACFLY recognizes that there are risks associated with handling and flying a paramotor.
By purchasing and using this product, the user acknowledges, accepts, and assumes all risks associated with its use.

Improper use and/or poor maintenance of your equipment increases these risks.
Macfly paramotors are suitable for qualified pilots as well as in training. Under no circumstances can the manufacturer, importer or sellers be held responsible about the use of this product.
We advise you to do your training in competent schools
Continue to train regularly to follow the evolution of our sport, driving techniques and equipment
Your equipment must not have been modified in any way and must be in good condition and regularly reviewed
A pre-flight inspection of all your equipment - and this before each flight - is essential. Never try to fly with equipment that is damaged or not suitable for your experience.
Always fly equipped with a helmet, suitable shoes and gloves
Absolutely avoid flying in rain, snow, in strong winds, in turbulent conditions and in clouds.

1.1 Licence certificate and insurances

Depending on the country and state, the paramotor may or may not be subject to specific regulations. The passage of a patent, or a license specific to each country must be obtained before flying with your GMP. Similarly, some countries require compulsory insurance.
All pilots must demonstrate that they have the required level of training and experience and must - depending on the country - have taken out at least civil liability insurance.

1.2 Identification/ registration

In some countries or states, the paramotor is considered as a means of transport, or even a vehicle, and it requires an identification or a specific registration.
Get some information at your ministry or federation before flying with your paramotor

1.3 Wing connection

There are different types of wings more or less adapted to the practice of paramotoring.
Some haven't been designed specifically for this sport but rather for paragliding.
Ask for the manufacturer's advice before trying a non-validated assembly.
Check the compatibility with powered paragliding in the user manual.

2 - Characteristics of the different engines on the Macfly frame

We currently assemble 3 different brands of engines on our frames :

- **POLINI ENGINES**
Thor 80 / Thor 130 EVO / Thor 200 HF / Thor 202 / Thor 303
https://www.polinithor.com/fr/

- **VITTORAZI ENGINES**
Moster 185 / Atom 80 / Moster 185 Factory-R
https://vittorazi.com/en/services/

- **EOS ENGINE**
EOS 150
https://www.eos-engine.com/index.php?lang=3&hID=1

The maintenance and user manuals for the 3 different brands of engines that we offer are on their respective websites above.

We recommend that you follow their instructions for use and maintenance, and regularly read their service bulletin for any updates to be made. If in doubt, contact your dealer for advice.

We recommend having your equipment serviced and checked regularly by a professional.

3 - Handling of the Macfly powered-paraglider

3.1 Présentation of the frame / cage, assembly and disassembly

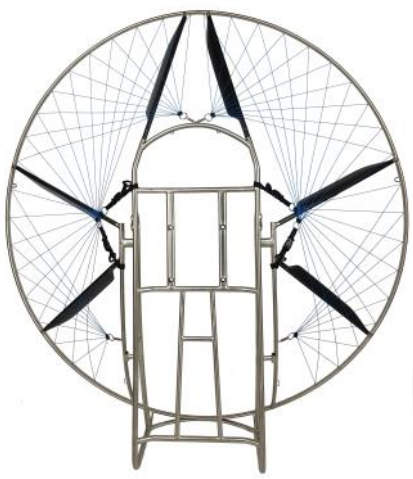
The Macfly frame is made of titanium material which combines the lightness of aluminium and the resistance of stainless steel. Grade 2 titanium was chosen in order to be TIG welded if needed. Nevertheless, you'll have to equip with a special welding rod that Macfly can provide you.

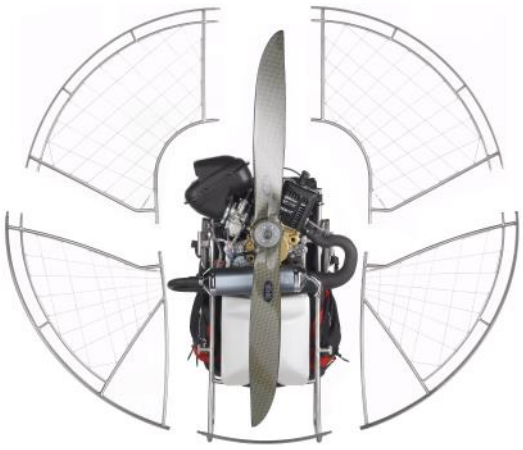
The visual inspection of the net is to be done at each pre-flight. The replacement of the net is recommended every 100 hours of flight, or as soon as the fraying of the net appears - the first of the two -. In the event of abnormal motor vibration, the net can be unsheathed quickly. Please carefully check each passage of the net through the cage attachment rings during your pre-flight.

TRAVEL CAGE FOLDABLE CAGE STANDARD CAGE

We currently offer 3 models of cages:
- Standard cage: 138cm
- Foldable cage: 138 and 150cm,
- Travel Cage: 138 and 150cm,
Titanium and Carbon shrouds

Explanations for Assembly / Disassembly of Foldable, Travel and Standard cages are available on the website : https://www.macflyparamotors.com/montage-utilisation_en.html





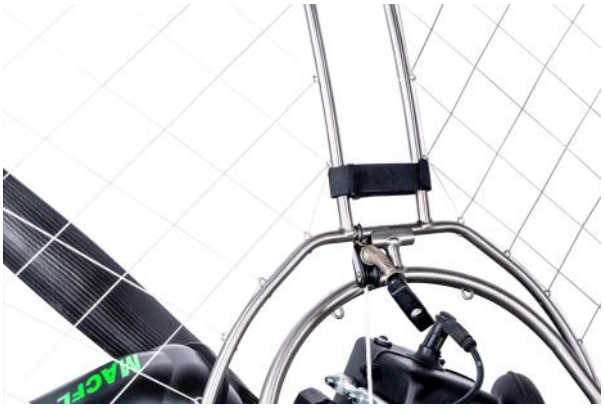
3.1 Présentation of the frame / cage, assembly and disassembly—next

STANDARD CAGE

Your cage is composed of 4 parts, fixed on the frame. Begin the assembly with the 2 quarters of the lower cage, assemble the parts and fasten the velcro straps (2 for each lower cage quarter)

Set up the supporting arch of the upper frame, then the 2 quarters of the upper cage, without forgetting the hand starter shackle on the upper part, between the 2 cages. You can also fix this shackle to the titanium buckles welded on the upper part of the frame.

Then, finish fastening the Velcro straps. There is an additional Velcro strap on the side of the throttle handle, to prevent it from getting through the 2 cages and to avoid contact with the propeller.



Proceed in reverse order for the disassembly.

3.2 - Movable arms, adjustments and disassembly.

The "gooseneck "movable arms will enable you to have both comfort and harness reactivity. Neither too high nor too low.

The two movable arms have a slight torsion on the left , to reduce motor torque when propeller rotation is clockwise ; and a slight torsion on the right for propeller rotation counter-clockwise

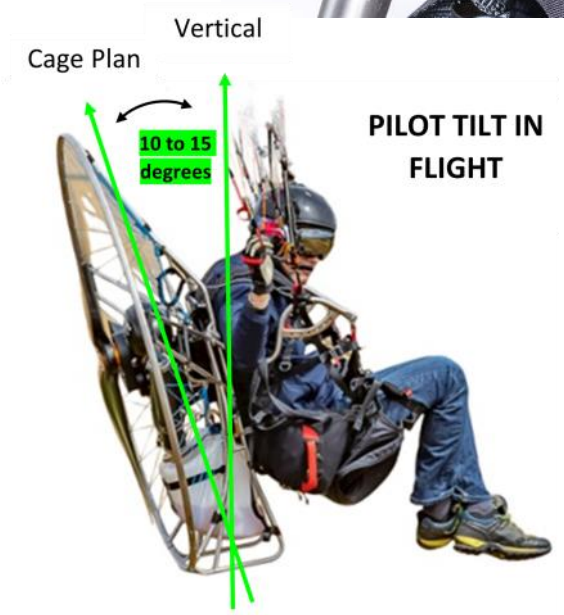
The movable arms are delivered with the manufacturer's standard adjustment.

The attachment point of the left and right ring is slightly different (difference
between 1 and 2 cm). This setting adjusts the effects of engine torque

You may have to change this adjustment slightly for different reasons such as comfort, pilot's weight, tandem flight or trike installation, which could slightly change your flight position or also to adjust your engine torque.

To do that, proceed as follows :

A - Adjustment of the Cage plan, or propeller / Pilot inclination:



The cage must be inclined from about 10 to 15 degrees backward from the vertical of the level flight.

If you are rather at zero degrees (you are **too upright),** you'll have to **move the two rings forward** according to the standard adjustment. (according to the table "*Ring settings based on pilot weight*")

If you go beyond the 15 degrees (you are **too backward**), you'll have to **move the two rings backward** according to the standard adjustment.

Here is a small non-exhaustive table to give you an idea of what your setting could be, your setting.

Note that this is very customizable.

It is to be adapted according to your height, weight, morphology, and that you must hang you on a gantry to validate your adjustment.

RINGS SETTINGS BASED ON PILOT WEIGHT	
Pilot weight	Setting
50 kg to 60 kg	- 1 cm to - 2 cm
60 kg to 70 kg	- 0,5 cm to - 1 cm
70 kg to 80 kg	Standard
80 kg to 100 kg	+ 1 cm to + 2 cm
100 kg and more	+ 2 cm to + 3 cm

B - Adjustment of the anti-torque :

Once your adjustment of the propeller thrust axis is correct, you can fine-tune and accentuate your anti-torque.

To do that :

*** if the propeller turns clockwise**

move the ring **of the left movable arm** from 10 to 20 millimeters forward.

*** if the propeller turns counterclockwise**

move the ring **of the right movable arm** from 10 to 20 millimeters forward.

Be careful, when you increase your anti-torque, the position will be more comfortable at full throttle but you'll feel a slight torque on the other side when you'll reduce throttle.

The "standard" adjustment seems to be the best compromise.

You can disassemble these movable arms to save storage space during a trip for example.

Durind the reassembly, take care not to fully tighten the nut on the axle.
Be careful to leave a slight play on the spring.
It is recommended to change this kit (Screw + spring + washer + nut) every 100 flight hours or every 2 years)

WARNING: The self-locking Nylstop nut is for single use only, and must be replaced after each disassembly

3.3 Presentation of the harness and setting up on the frame.

The comfortable harness was specially designed for paramotoring. It includes different adjustments that we'll explain in detail later in the chapter "harness adjustments". It is equipped with two removable side pockets. (You may replace one side pocket by a specific pocket to install a pocket with a reserve parachute).

Attachment points of the harness on the frame :

- On the upper part of the frame, with two straps. ->

- On the lower part of the frame, with two straps.
These straps are used for the lateral stability of the frame on the back, particularly during take off when torque is more perceptible during the acceleration phase.
The straps must be properly tightened.

- With 2 quick release buckles on the lower part of the frame. These straps are carrying straps and provide a backpack comfort, the frame doesn't slide anymore on the lower back and it is well carried on the shoulders.

On the two moveable arms to fix the risers.
It is the centering axis of the machine.

At the end of the moveable arms, this is where the pilot's weight is mainly spread to the frame.
(See the assembly in the pictures)

WARNING : It is recommended by the harness manufacturer to change the carabiners every 5 years or after 500 hours of use

SUPAIR harness manual: http://www.supair.com/document/notices/PARAMOTEUR_EVO_FR_2015.pdf

SOL harness manuel : https://www.solparagliders.com.br/userfiles/files/manuais/evolution2_br.pdf

3.4 Setting up the reserve parachute

WARNING: Rescue parachute manufacturers recommend repacking your rescue parachute every 6 months, refer to its user manual.

We recommend you having your rescue parachute bended and installed by a professional

There are different types of rescue parachutes with their own peculiarities concerning packing, ripcord and deployment.
Please refer to the brand user manual to pack it and fine-tune the assembly, but especially to know how it works in case you need it one day!

Remove the harness side pocket (preferably on the side opposite your throttle)
Replace the pocket with the container holding the parachute.
Place the parachute risers along the harness, then at the top of the harness and **outside the moving bars**
Connect the risers to the shoulder straps, on the loop provided for this purpose.
Use a “square link” specific to reserve parachutes.
It should be noted that installing a reserve parachute requires further attention during the pre-flight checks : check that your parachute container is properly closed.

At the end of the assembly, carry out an extraction test on a gantry, in order to check that the parachute is way out, then reassemble in the same way.

SUPAIR harness manual: http://www.supair.com/document/notices/PARAMOTEUR_EVO_FR_2015.pdf

SOL harness manual: https://www.solparagliders.com.br/userfiles/files/manuais/evolution2_br.pdf

WARNING: Aerobatic flights and extreme maneuvers are not recommended, the equipment has been tested for school, leisure, and competition flights. But has not been tested / proven for aerobatic flight with the structural constraints, and the forces associated with it.

3.5 Handling and moving on the ground

You can carry your paramotor with your hands on the frame between the two cages, facing the harness. For a long distance on foot, we advise you to carry it on your back, with the two shoulder straps to prevent the premature wear of one carrying strap.

3.6 Storage

Avoid running the engine with mixed petrol that is older than one month.
In that case, empty the old mixture and replace it with some new one.
We advise you to disconnect your PPG battery (if equipped), as well as the spark plug noise suppressor when you move or store your PPG.

4 – Pre-flight checks 1/2

WARNING : We strongly recommend a careful and thorough pre-flight before each flight. In case of suspicion of an anomaly, however small, DO NOT FLY WITH IT, contact your dealer.

Each engine is different in use and maintenance. Follow the recommendations of the engine manufacturers concerning the mechanical parts (manuals available and updated on the websites of each engine manufacturer)

Harness

- Pockets closed (pilot's pockets too)
- Straps in good condition
- Attachment points of the upper harness / lower harness / movable arms.
- The rescue parachute container is closed properly. Straps properly positioned, attachment point.
- Verification and control of the planchette

Frame

- No deformation, sufficient propeller passage between the cage and propeller tips
- Check the tightness of the arms
- Cages assembly
- Velcro straps
- Condition and tension of the net
- Check the flash starter shackle and pulley
- Rubber mounts attachments toward the engine

See the video on : macflyparamotors.com

4 – Pre-flight checks 2/2

Engine

(follow the fuel lines)

- Check the fuel level, add more if necessary
- Check the general condition of the tank
- Check the attachment of the tank to the frame
- Tighten the tank cap sufficiently to prevent possible leaks.
- Condition of the hoses, no leaks, away from hot parts
- Carburetor and air box well fixed, unobstructed, secure and condition of the rubber flanges not cracked
- Well fitted interference suppressor, screwed spark plug
- Verification of the ignition coil attachment + condition of the electrical terminals
- Verification that there are no leaks in the engine block (no traces of oil seepage)
- Engine cover fixing
- Exhaust and silencer, no cracks, no leaks, spring tension, silent blocks in good condition
- Reducer check: No play in the screws, no excessive seepage at the decompression valve
- Propeller, shaft screw, no play or suspicious noise on its shafts, general condition and in particular of the leading edge
- Check the gas control: maximum travel, and which returns well and frankly to the initial position
- Check the fixing of the pulley and the condition of the starter rope. Without pulling on it so as not to start involuntarily
- State of fatigue and attention of the pilot: no illness, no particular state of nervousness, no emotional loss

5 – Engine starting

WARNING : We strongly recommend that you do not start your engine on the ground.

We insist on the fact that a start on the back is much less risky.

Starting process on the back

During a cold start, turn ON the choke. (depending on engine model)

Straps closed, take the throttle handle in your right hand, and tighten properly the velcro strap on the back of your hand.

Incline the engine slightly on the right, to take easily the flash starter handle.

Take the flash starter handle between the thumb and the forefinger of your right hand. You can use your ringfinger or little finger to accelerate slightly during starting. With your left hand, grasp the spring on the flash starter cord

WARNING : Don't pull the flash starter without having the handle in a good position, with the stop button immediately accessible.

Pull the starter cord slowly until you feel resistance, until you find compression stroke, then pull quickly straight ahead. Your two arms must be stretched. After the compression stroke, your engine should start. After starting the engine, don't let the flash starter cord shoot back abruptly but let if rewind slowly.
If you let go the flash starter handle abruptly, it might damage the flash starter mechanism.

If you have chosen the option "left hand handle", proceed as described with the opposite hand.

After starting the engine, you can move the choke lever to the “OFF” position after a few seconds.
Don’t take off with the choke in the “ON” position !

In order to reduce the risks of accidents, you shouldn’t completely warm up your engine with full gaz when you are not in flight.

Ground warming up aims at identifying any potential engine malfunctions (noise, vibration)

Each engine has its "little character", learn to tame it to start it at best.

In case you can not start your engine on your back :

(example: diaphragm carburetor too primed, engine flooded),

We recommend disassembling the propeller, to start the engine on the ground.

WARNING : Be careful never to mount it in RPM without propeller, it will damage the engine.

Once started, turn off the engine and reassemble the propeller.

WARNING : For your safety, we strongly advise against starting the engine on the ground with the propeller mounted.

Place your left hand as indicated in the photo, holding
vertical and the throttle handle as indicated.
No throttle during the first engine start attempts.
Pay particular attention to the position of your thumb near the stop button.

Your thumb mustn’t be stuck in the throttle handle strap.
Don’t pull the flash starter without having the handle
in a good position, with the stop button immediately accessible.

6 – Installation and adjustment of the harness

Get down on your knees or crouch to place the 2 shoulder straps. Get back on your feet carefully, without I nclining too much the engine forward to avoid fuel going up through the overflow fuel line.

Adjust your shoulder straps symmetrically and comfortably (the PPG must be carried comfortably on your back and not on your lower back).

Fasten your leg straps and check that the seat board extension isn't turned under the harness, then fasten your chest strap. The adjustment of your chest strap will have an effect on your piloting through your weight shift (turning by shifting your weight), as well as the transfer of information wing/pilot.
More concretely, if you loosen the chest strap, you will control the harness more easily, but you will be more "shaken" in case of turbulence.

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There is a small strap above the chest strap that must be closed, it only aims at preventing shoulder straps slipping during take-off and landing phases.

We advise you to tighten the leg straps pulling them down towards your knees (bring them down by leaning you slightly forward) in order to sit more easily after take off

SUPAIR harness manual: http://www.supair.com/document/notices/PARAMOTEUR_EVO_FR_2015.pdf

SOL harness manual: https://www.solparagliders.com.br/userfiles/files/manuais/evolution2_br.pdf

7 – Check list / Vital actions

You are ready for take-off. One last check is necessary to forget nothing :

Windsock visible from the place of inflation
Choice of inflation technique, front or back to the wing

Check wing, risers, lines.
Engine start after environment check

- Thigh, chest, pectoral and helmet straps attached
- Carabiners principals closed
- Front risers in hand, no twists
- Brakes in hand, no knots and direct passage through the pulley
- Radio, volume and frequency set
- Last engine warm-up avoiding blowing the sail or sucking up a line
- Current weather and aerology, wind strength and direction
- Clearance of airspace in front and behind
- Inflation without engine, or slight help of the propeller (maximum 5% engine power)

HAVE A NICE FLIGHT !