



# RACE-C



# OWNER'S MANUAL

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# 1.0 INTRODUCTION AND GENERAL INFORMATION

## Safety first!

Powered Para Gliding (PPG) is the most exciting, least expensive, safest, and most accessible form of aviation available! However, it is still aviation, and it brings with it all the inherent potential dangers of aviation. People can, and do, get hurt, and even killed, in any form of aviation, including PPG. For that reason it is imperative that all PPG pilots receive proper training from qualified instructors, offer PPG the respect all aviation deserves, respect weather and conditions, and realize that in the end, it is the pilot himself that is responsible for his own safety and the safety of fellow pilots and bystanders.

Powered Paragliding is an extremely demanding sport that requires exceptional levels of attention, judgment, maturity, self-discipline, and attention to detail. It is unlikely that you will be able to participate in it safely unless you make a conscious and continual commitment to your own safety. Due to the inherent risks in flying this or any PPG, no warranty of any kind can be made against accidents, bodily injury, equipment failure, and/or death.

**This PPG is not covered by product liability insurance. Do not start it or fly it unless you are willing to assume all risks inherent in the sport of Powered Paragliding and all responsibility for any property damage, injury, or death which may result from the use of this product.**

Enjoy PPGing to the fullest, and welcome to the sport!

Please read and be sure you thoroughly understand this Operator’s Manual before starting or flying your “RACE-C” It contains information critical to the safe operation of the Powered Para Glider.

## Notation used

Certain special terms (*NOTE*, *CAUTION*, *WARNING*) will be used throughout this manual. Their usage is defined below.

A **NOTE** provides supplemental information to help clarify a point being made in the text. Generally, a “*note*” is provided to help assembly, use, or maintenance of the product. Disregarding a “*note*” could cause inconvenience, but would not cause damage or personal injury.

A **CAUTION** provides supplemental information to help clarify an area where equipment damage could occur. Disregarding a “*caution*” could result in permanent and significant mechanical damage, however personal injury is unlikely.

A **WARNING** provides supplemental information to help clarify an area where personal injury or death could occur from negligence. Disregarding a “*warning*” could result in serious injury or death.

## Congratulations on your new “RACE-C”

The “RACE-C” is Fly Products latest design built for easy and compact transportation using a new fully detachable frame. With a new cage construction, incorporating a simple to use attachment method, the The “RACE-C” is truly compact. The Fly 100 Evo engine has proven to have an excellent weight-to-thrust ratio matched with low noise level and efficient fuel consumption.

## “RACE-C” features

- Easy assembly and disassembly
- Electric Starter and /or Manual Starter
- Power Ignition
- Mechanic reduction drive
- Centrifugal clutch
- Tuned Pipe
- Extremely quiet
- In-flight Restarting
- Very good fuel economy and duration.

## Diagram of Components



Fig. 1 - Rear View of unit

- 1 – External cage
- 2 – Multifunction throttle handgrip
- 3 – Silenced air filter
- 4 – Muffler/tuned pipe
- 5 – Fuel Tank
- 6 – External base frame

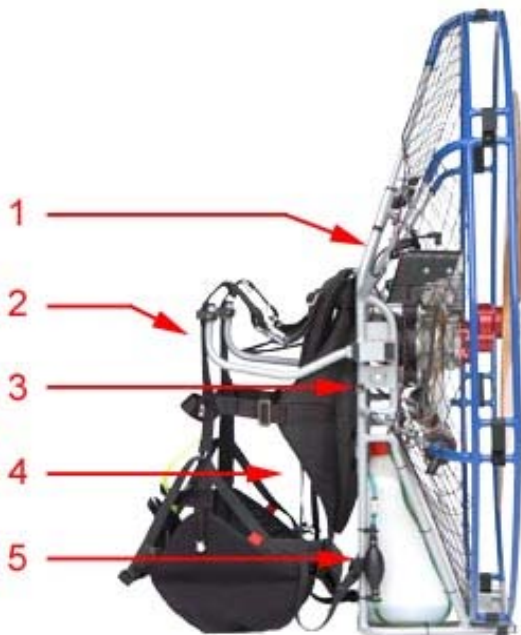


Fig. 2 – Side view:

- 1 – Manual pull starter
- 2 – Distance bar
- 3 – Main on/off security switch
- 4 – Harness
- 5 – Fuel pump

## 2.0 UNPACKING AND ASSEMBLING “RACE-C”

### Frame Assembly

#### Step 1 : Assembling outer frames

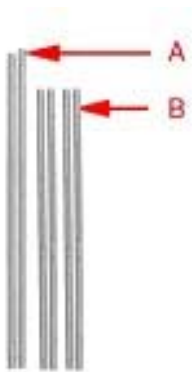


Fig. 3 supports



Fig.4- starter pulley section



Fig. 5 – Tube supports mounting

Tube supports (fig.3) are in pairs in two different lengths. Prepare the “A” tube supports into the start pulley support before connect them into their seats.

Mount the external cage supports as shown in fig.5.

**NOTE:** You might want to add that assembling the cage in this order is the easiest way.

#### Step 2 : Assembling upper frames

Insert the two upper supports “A” into their seating as in fig. 6.



Fig. 6 – Mount the cage into the upper supports



Fig. 7 – upper side connection

**Step 3 : Assembling right hand side outer frame**

Insert the two upper-side pins into their seating.  
Mount the left hand side outer frame.

Insert the two lower-side pins of the frame into their seating.  
Mount the other lower-side outer frame repeating the same operation.

**Step 4 : Assembling lower outer frame**

Insert the two lower pins of the frame into their seating.  
Mount the other lower outer frame repeating the same operation.

**Step 5 : Attach the velcro straps.**

Once the frame is properly connected, it is best to immediately attach the velcro straps.



Fig. 8 – Attach the upper



Fig. 9 – Attach the sides

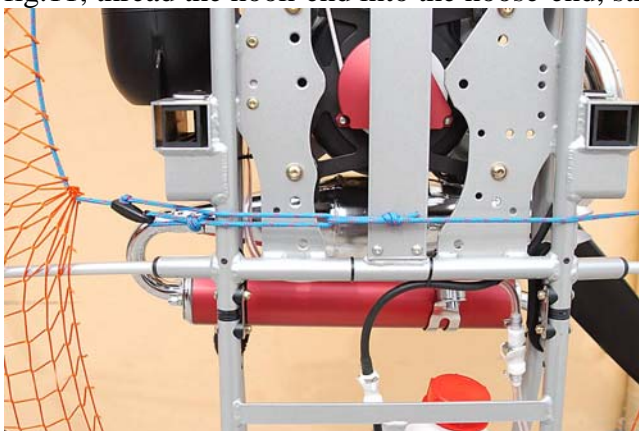


Fig. 10 – Attach the lowers

**NOTE!** When finished, check all velcro straps Attachments.

**Step 6 : Net stretching.**

Final operation is the net stretching and locking. Thread the stretching string ends as shown in fig.11, thread the hook-end into the noose-end, stretch the string and hook back to the "flying" loop.



**This completes the assembly of the external cage.**

## Harness mounting

The harness mounts to the central frame with six attachment points. They are: the top harness triangular carabiners, the ground handling straps, and the distance bars.

Fig. 12 – upper hooks harness attachment

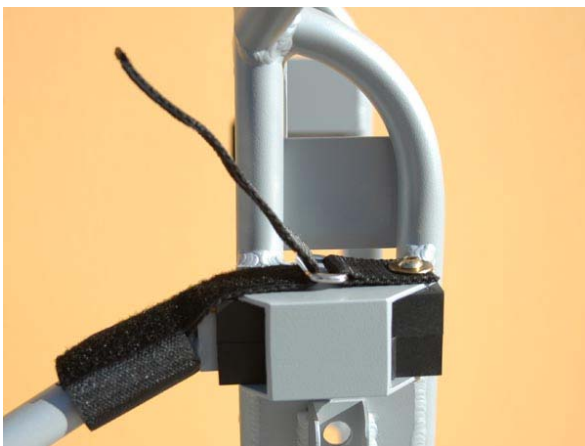


### Step 1:

First engage the harness to the central unit by hooking the two triangular carabiners to the eyelets bolts as shown in fig. 12.

### CAUTION

Close the carabiners immediately in order to avoid forgetting them later.



### Step 2:

insert the two distance bars into their frame seats as shown in Fig. 13

Fig. 13 – distance bar attachment to the central frame



Fig. 14 – front harness webbing attachment

### Step 3:

Ensure that the harness is attached correctly to the distance bars and the web straps can freely slide into their seats as shown in fig 14.



Fig. 15 - Lower harness attachment



Fig. 16 – Coupler close-up

**Step 4:** Next, attach the two bottom harness straps as shown in Fig. 15 - 16. Fasten these belts securely as shown in close up detail. Do this for the left and right sides. Leave these straps at their loosest setting for now, we’ll adjust them later.

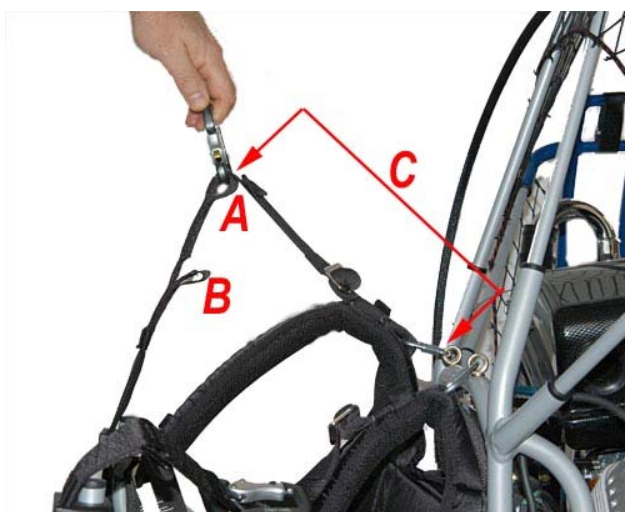


Fig. 17 – Upper harness attachment



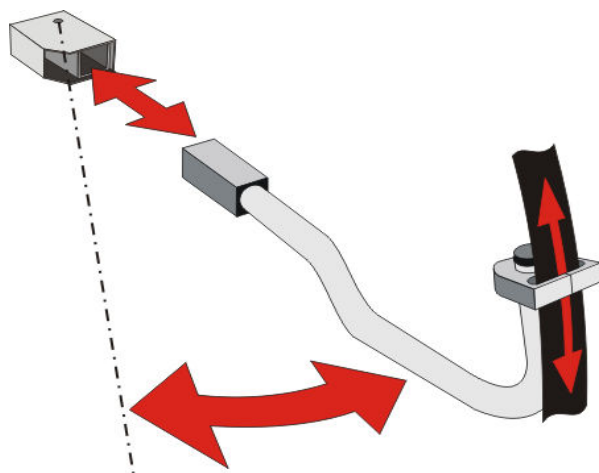
Fig. 18 – Seat set-up

The harness has 2 attach position, use the “A” position for paramotor use and “B” for trike operation. As shown in fig. 17, the “C” distance can be regulated from 28 to 32 cm.

You can also regulate the harness-seat keeping closed or opened the seat zipper as shown in fig. 18.

**This completes the harness mounting. Double check your work to ensure that everything is OK. MENTION ON DISTANCE BARS:**

These distance bars are extremely easy to mount and dismount since they slide easily into the central frame. The end of the distance bars are made of a square aluminum profile that does not allow them to rotate. Due to the compression of the harness, the distance bars can not slide out of their fittings during flight.



**ANTI-TORQUE SISTEM**

The distance bars are designed to allow the sliding of the front harness webbing so that the pilot finds the proper angle with the paraglider. With this system the force of the propeller torque onto the risers is avoided.

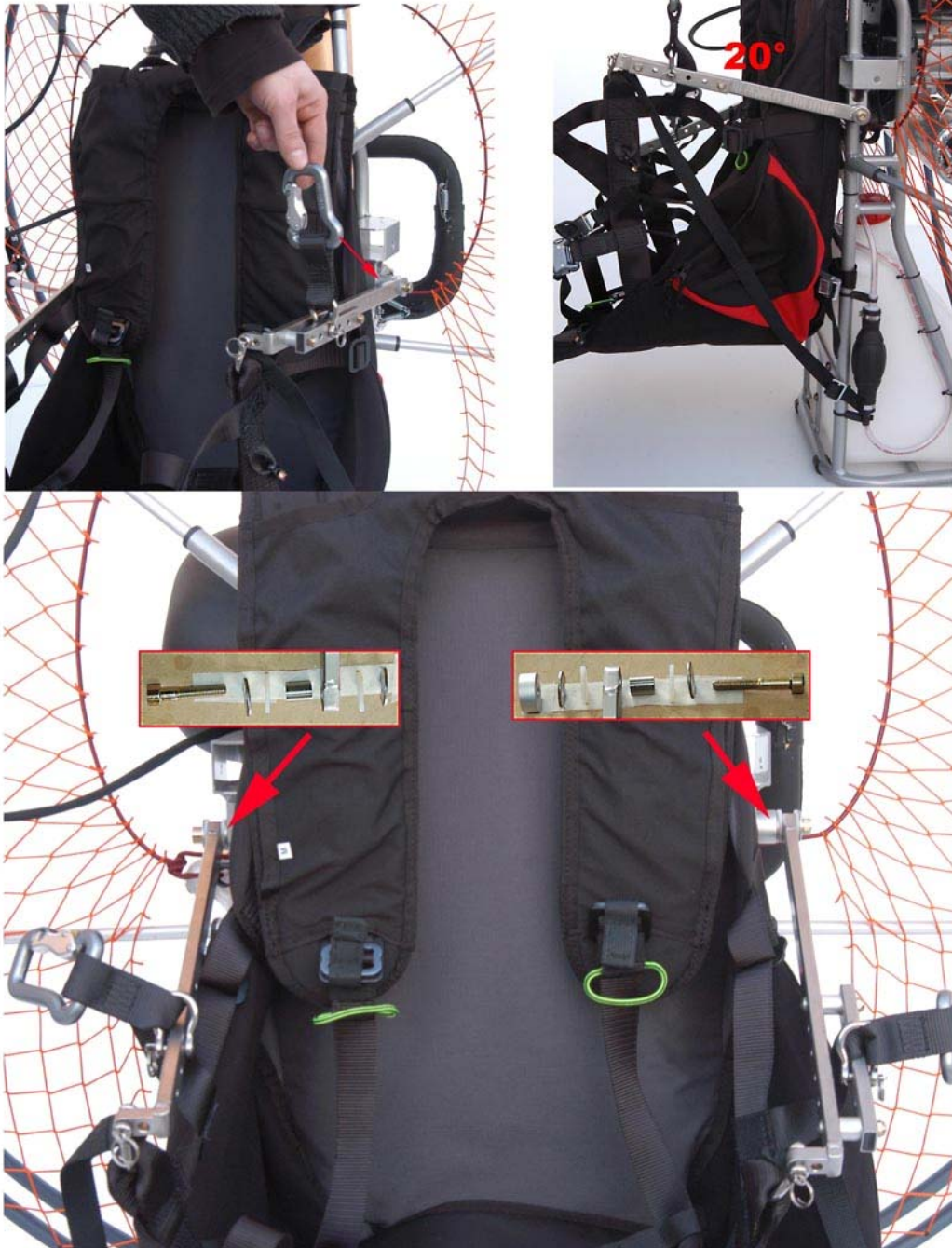
Fig. 19 - Distance bar system.

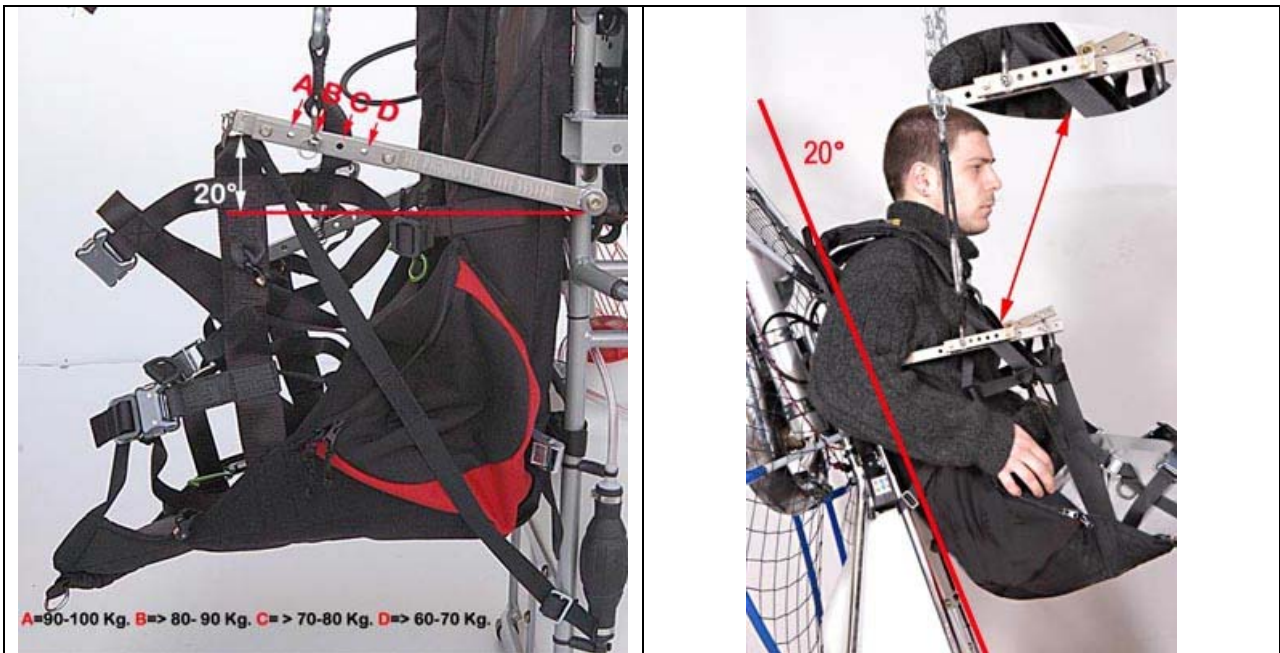
**LATERAL MOVEMENT OF DISTANCE BARS.**

The distance bars allow a lateral movement which is useful for the pilot to enter easily into the harness.

## Low connections

**Fitting of low hang points for engines with mechanic drive**





## Prop mounting

**NOTE:** Here is some terminology we’ll use in this section.

The “front” is the direction the pilot faces while flying, the “rear” is the opposite direction. The “front” of the prop can be identified by the thick side of the prop blades (leading edge). The “rear” side of the prop can be identified by the thin side of the prop blades (trailing edge) as the upper blade section shown in fig. 20.

Mounting the prop is quick and easy.

Place the rear prop flange on the rear side of the prop. Insert the six (6) prop bolts through the rear prop flange and prop.

Place the front thickness flange between the propeller and the reduction taking attention to fit the little centering hole in the prop.

Screw the bolts to the reduction drive and tighten them evenly.

The correct torque to use is 50-inch lbs. MAX.

A more practical “field method” of torquing is to tighten the bolts snugly and evenly, but not enough to begin to crush the wood of the prop.

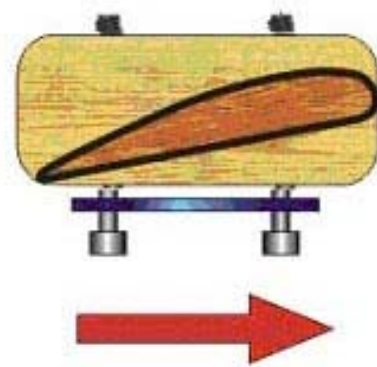


Fig.20 – mounting the prop, the red arrow indicate the direction of propeller rotation

## Spark plug

Set the spark plug gap to 0.025” (0.635mm). Install the spark plug and torque to specifications (120-inch lbs. or 10 ft-lbs.).

## Assembly inspection

It is critical to fully inspect the assembly of the “RACE-C” to find and remedy any potential problem areas before proceeding.

The inspection should contain, at a minimum, the following items:

- **Review each assembly step above**
- **Examine all nuts, bolts, and fasteners for security**
- **Check the harness for correct mounting, that all straps are secure, that there are no twists on any straps**
- **Examine prop cage for correct assembly, that it is strong, the netting is tight and on the correct side**
- **Check that nothing can get in the prop. The prop should clear the cage by same distance at all points.**
- **Check the fuel tank and fuel delivery system.**
- **Check for correct mounting of prop, and correct torque of prop bolts.**

## 3.0 PREPARING FOR YOUR FIRST FLIGHT

### Fuel and Oil

FLY PRODUCTS recommends the use super gasoline and synthetic oil at 2%.

Mix fresh gas and oil before each flying session.

Store your fuel/oil mixture in an approved, sealed container. Dispose of fuel/oil mixture that is older than 2 weeks.

Use only fresh fuel and oil, and use clean containers, funnels, hoses, etc.

To fill the fuel tank, remove the fuel tank by unscrewing the fuel tank cap . Take care not to get dirt, dust, etc. onto the fuel pickup.

It is recommended that the fuel be poured into the tank using a straining-type of funnel.

Fill the tank with the desired amount of fuel.. Tighten the fuel cap securely.

**CAUTION:** Wipe up any spilled fuel immediately, as the fuel/oil mixture is highly flammable, and an in-flight fire would be catastrophic.

Also, the oil will leave a residue, which will attract and retain dust and dirt.

**WARNING!** Use common sense when refueling. Do not refuel a hot or running engine, do not smoke or allow on-lookers to smoke while refueling. Do not refuel near heat or open flame

### Before Starting the Engine

Before starting the engine on the ground, ensure that the unit is in an area free from dirt, rocks, dust, etc. that could be sucked up and thrown around by the propeller.

Check assembly of the unit, and especially check any and all nuts, bolts, and screws, that could be loose. Also check all parts of the prop cage for looseness. The prop produces a significant amount of thrust, and can suck things into it from a surprising distance.

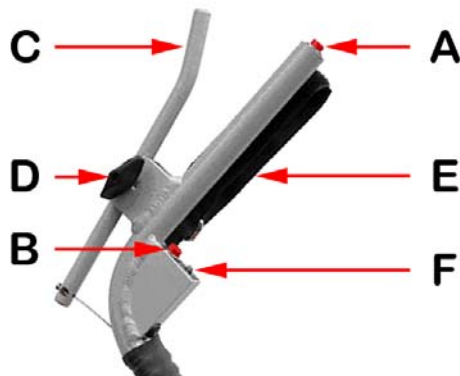
**WARNING!** Ensure that no bystanders or onlookers are close by when starting the motor. The most dangerous place to stand is in the plane of the propeller. This is where dust, dirt, rocks, nuts, bolts, etc. will be thrown if they are picked up by the prop.

At full RPM, the prop tips are moving in excess of 370mph, and pushing the air rearward at over 70mph. This amount of force can pick up anything loose in the area and throw it around like a bullet. Not only can it severely injure you or bystanders, even small items like dirt can inflict significant damage to the prop

## Starting and stopping engine

### Stopping the engine

Before of proceed it's better to learn the function of the handgrip:



- A – “STOP” button
- B – “START” button
- C – Throttle lever
- D – Cruise control setup
- E – Velcro strap
- F – LED light for low fuel indication

Fig. 21 – Multifunction handgrip

Since it’s important to know how to stop the engine once it’s started, let’s cover “Stopping the Engine” first. To stop the engine, simply depress the “STOP” button (A - fig. 21) and hold it until the engine comes to a complete stop.

**CAUTION:** It is important to be aware of some other engine stopping techniques, should the stop switch not function correctly.

The stop switch may not function correctly due to

- 1) faulty switch,
- 2) broken wires,
- 3) bad connections to any part of the stop switch circuitry

For this reason, the following emergency stop procedures are available:

To stop the engine if the stop switch doesn’t function correctly, you can

- Unplug the electric cap of the spark plug  
(there is a big risk to take an electric-shock, not dangerous but unpleasant...)
- Squeeze the fuel line  
(requires an aggressive squeeze, and takes about two minutes to stop the motor).

### Starting the engine

Now that we’ve covered stopping the motor, let’s start the engine!

Check that the fuel tube is full. If it isn't, use the designated fuel pump to fill it up.

Be careful to not pump more than necessary to avoid engine flooding.

To start the cold engine it's necessary to inject fuel into the cylinder, to do this, squeeze the pump only once while holding the accelerator completely open until you hear the fuel squirt from the carburetor into the cylinder.

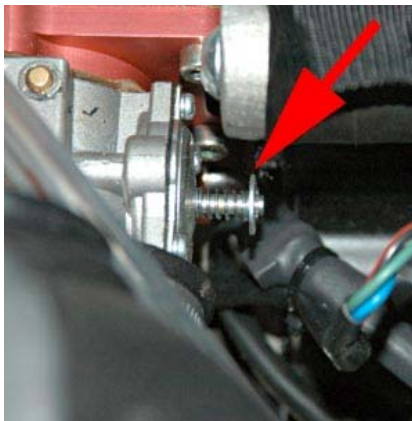


Fig. 22 – Fuel primer push button



Push the spring button as in fig. 22 for to fuel primer before start the engine.

Allow a certain quantity of fuel to enter the carburetor but not enough to allow it to go out of the air filter, if this happens, this means that the engine could be flooded and will hesitate to start .



If everything is ready and well done, flip the main ignition switch (security switch) to the “ON” position (Fig. 23)

Fig. 23 – Main security switch

There are three different positions that can be used to start the engine. These positions are:

- **Standing in front of the unit, holding the unit on the ground.**
- **Strapped into the unit, standing on the ground**
- **In flight.**

We’ll cover each of these starting options in turn.

**- Standing in front of the unit, holding the unit on the ground**

**WARNING!** The method of holding the throttle handle is important in this position. Hold the throttle handle such that you can easily reach the stop button, but not so that you can inadvertently squeeze the throttle (do not strap your hand to throttle at this point).

A common accident can happen where you hold the throttle in the same hand that you hold the motor unit, and if you squeeze the throttle a little, the thrust of the machine will push the throttle onto your hand, causing you to squeeze the throttle even more.

Make sure that you CANNOT inadvertently squeeze the throttle handle when starting in this position.

- Stand in front of the unit, and place your left hand on the top of the central frame tube. Hold the throttle in your right hand , noting the **warning** above.
- Depress the START button until the engine starts. The engine should start after a few propeller turns.

**- Strapped into the unit, standing on the ground**

Just depress the START button once you are ready, strapped and standing on the ground.

**- In flight:**

One very valuable feature of the “RACE-C” series is its ability to be started while in flight. This feature allows the pilot the freedom to turn-off the engine and glide silently, to enjoy the exhilaration of thermal soaring, and then when he gets low, re-start the engine depressing the START button and climb back up to do it again.

**WARNING!** It's very important that immediately after landing, or when the equipment is not in use on the ground, to turn the main security switch (Fig. 17) to the OFF position to avoid an accidental starting of the engine!

## **The fuel system**

The fuel system consists of the fuel tank, lines, manual pump, and carburator.

When starting engine cold, the carburator must be primed, this is simply done by pressing the diaphragm of the carburator while squeezing the hand pump.

This forces fuel to travel from the tank to the carburator float chamber.

As soon as you hear the fuel reach the carburator stop squeezing the pump so as not to flood the system.

**Fuel:**

Used super gasoline and synthetic oil at 2.5 - 3 %. Oil synthetic recommend Motul 600 at 3 %, Motul 800 at 2.5 %, Castrol TTS at 3 %.

You avoid of use mixture already prepared from the distributor. A mixture prepared from much time could remove performances and damage your motor. If prepared possible your mixture and use you it in the time of two weeks.

We suggest to avoid fuel v-power or fuel that improve the number of octane.

**Carburetor Adjusting**

**Standard carburetor setting**

When purchased, the motor has a standard carburetor setting and testing. To modify, this one must adjust the two screws of the carburetor. The screw on the right marked with a **L** (low) regulates the entrance of fuel at the low speed (the range of the accelerator from zero to half).

The screw on the left marked **H** (high) regulates the air fuel mix higher speeds.

It is extremely important to both maximum engine efficiency and engine life, to understand and keep in tune your carburetor setting.

There are two fuel to air carb setting which function in the following manner:

**L** screw adjust: rotate (clockwise until completely closed).

Now carefully open the screw counter clockwise between **1/3** and **1/2** turn (turning the screw out in the counter clockwise direction enrich the mix/fuel to air ratio). This is the standard factory setting for **L**.

With the **H** (meaning High rpm) screw follow the same procedure and turn it clockwise until full closed.

Now paying close-attention, open the **H** screw between **1** and **1 +1/4** turn to arrive at the standard factory setting.

Keep in mind that these setting are extremely sensitive and the total sum of all adjustment you make to the screw should not exceed  $\frac{1}{4}$  of a turn. Increments of  $\frac{1}{10}^{\text{th}}$  of a turn are already sufficient to change engine performance.

In particular be careful not to run your machine at the “too poor” of a fuel to air-mixture, as this can result in possible overheating and engine damage due to lack of cylinder lubrication.

Pay much attention to the carburator setting at the maximum since if this mixture is too poor, it can result in engine damage. No damage is done if the setting is too rich. Therefore, when in doubt, it is better to have carburation, at the maximum rpm, somewhat more on the rich side.

A verification of carburation can be done after the engine has run 20-30 minutes checking of the colour of the spark plug electrode. If the electrode is brown the carburation is correct. If is grey, its poor and if its is black its rich.

Attention: If the carburation should happen to be difficult to adjust by listening to engine runs, this means that the fuel tube is absorbing air from the pump (in this case is better to change it) or else from the connections between the tank and the carburator. The air bubbles are easily seen, while the engine is running they are seen passing through the tube.

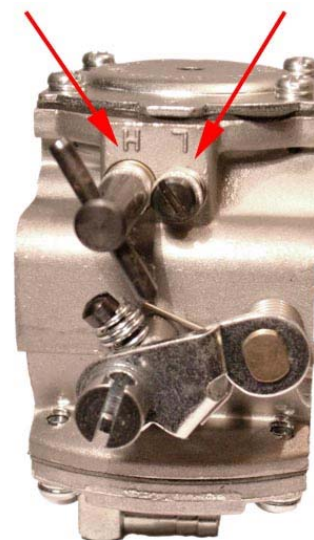


Fig. 24 – H / L screws settings

## Engine break-in

The engine run in completed after 8 - 10 hour of normal use.  
Use the follow safety advice.

- A - To regulate rich the carburization of the High screw at 1+1/4 turn (screw H).
- B – ONLY for Break-in use fuel with oil until at 3 – 3.5 % synthetic oil for return after break-in to 2% at normal use
- C - Do not stay accelerated totally if not the time tightly necessary.
- D - Check every times (each 15 - 20 minutes) when the motor is not warm up, the fix of all the screws.
- E - Absolutely avoid the run of motor without propeller.

## Harness Adjustment.

The harness consists of two separate strapping systems, one used to comfortably support the paramotor assembly unit on the pilot’s back while on the ground, and the other is used to support the paramotor and pilot while flying. This system also correctly aligns the thrust angle of the prop.

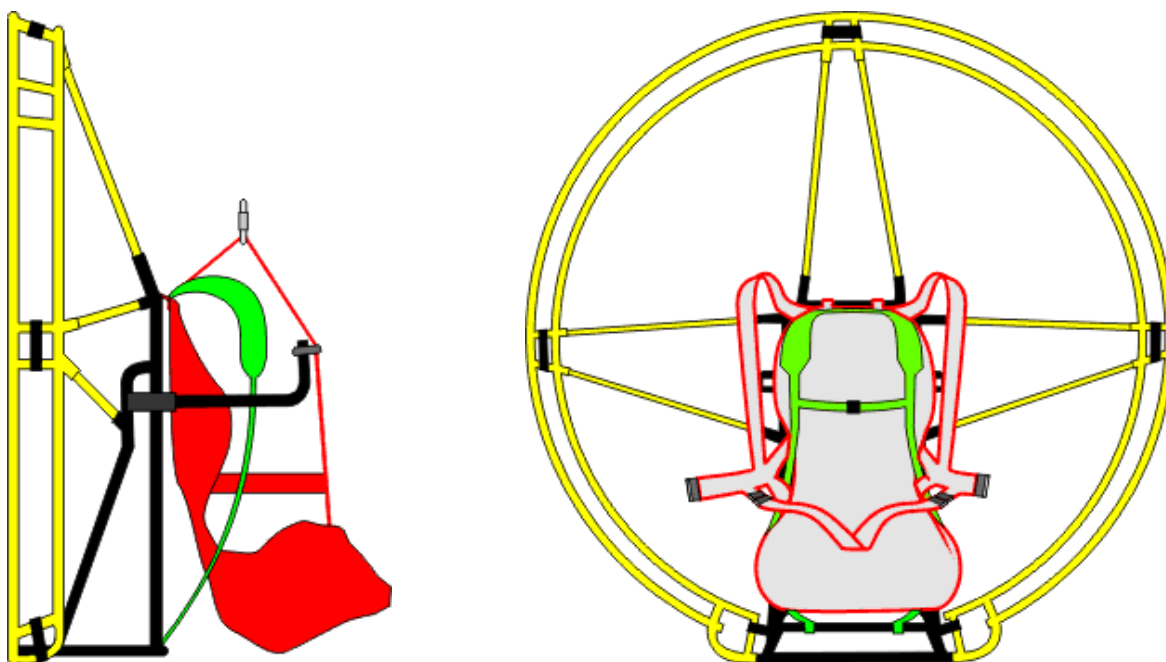


Fig. 25 Side and Front Views of Ground Handling Straps and the flight straps

Fig.25 - Front and Side views of ground handling straps (GREEN)and the flight straps(RED)

The two systems have separate purposes, and are adjusted separately

## Ground Handling Straps

The ground handling straps as shown above are best adjusted standing on the ground, with the “RACE-C” on the pilot’s back.

The purpose of the shoulder straps and shoulder pads is to carry the weight of the “RACE-C” while on the ground.

The purpose of the ground handling chest strap is to keep the shoulder pads from sliding off the pilot’s shoulders when ground handling.

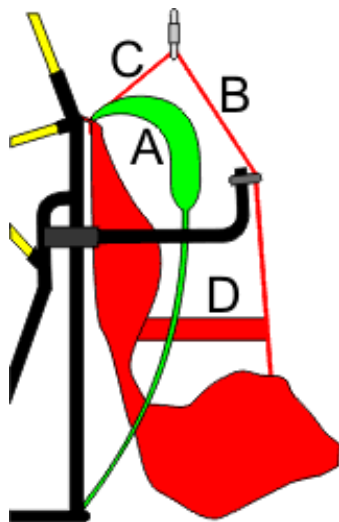
The adjustment procedure for the ground handling straps is as follows:

- Strap into the paramotor and stand up.
- Adjust the Shoulder Straps until the shoulder pads are carrying the weight of the paramotor.
- Attach snug the ground handling chest strap .
- Adjust the thigh straps, the tightness of the thigh straps will determine how easily you can slide into the seat after takeoff , allowing the width of your hand between the strap and your leg is generally a good setting.

The ground handling straps are adjusted correctly if:

- The weight of the paramotor is on the shoulder pads
- The shoulder pads/straps won’t fall off the shoulders
- The seat can be moved out from under the buttocks easily
- You can slide easily in and out the seat
- You can run easily and the seat and thigh straps don’t interfere with your ability to run.

## Flight Straps



The purpose of each flight strap ( in fig. 26. are shown in red ) is as follows:

- Length “B” determines the carabiner height. Higher accommodates larger pilots. Lower accommodates smaller pilots and provides more weight shift capability. This length has a variable adjustment locations.
- Length “C” is adjusted by buckle, and it sets the thrust angle. Adjust it so the thrust angle is five to ten degrees below horizontal. This must be done in a simulator. See “Hang Test in a Simulator” below.
- Length "D", is used to adjust the back of pilot's distance from the PPG.
- **Proceed to final adjusting of the harness in the simulator..**

Fig. 26 Set-up of flight straps

## Hang-test in a Simulator

It is imperative that you perform a hang-test in a simulator before the initial flight of the “**RACE-C**”, and every time you make a harness adjustment thereafter. A simulator can consist of two ropes tied to a horizontal (and strong) tree limb, two ropes tied to rafters in your garage or basement, etc.

Once you have made your initial adjustments, strap into the “**RACE-C**” and clip the carabiners into the simulator. Gently lift your feet and slide into the harness.

Continue to adjust the harness until the following criteria are met:

- The ground-handling straps should be loose and comfortable
- The ground handling chest strap should be loose (still buckled, but loose)
- No part of the harness should hamper free movement of your arms and the throttle cable.  
Make sure you can reach your arms up very high with no strain or interference from the harness
- The angle of the paramotor in flight (or in simulator) must be approximately 5, and no more than 10, degrees below horizontal

## **4.0**

## **FLYING YOUR “RACE-C”**

### **Pre-flight Inspection**

Before your first flight, and before every flight, it is absolutely essential to perform a pre-flight inspection on your aircraft.

**WARNING!** Failure to perform a sufficient preflight has been a contributing factor to accidents in all kinds of aircraft. Equipment damage, bodily injury, even death can occur due to equipment problems not caught in a preflight inspection.

As the saying goes, “Preflight as if your life depends on it, because it does!”

The essential items to check are:

- **PARAGLIDER** – this PPG was homologated with the SWING “Powerplay Sting140” model which has a 29,5 m<sup>2</sup> surface, check the lines and canopy integrity.
- **ENGINE** – check everything is ok , the silent-block integrity and gasoline mixture level.
- **PROPELLER** – blades integrity, bolts clamping.
- **RECOVERY SYSTEM** (if there is) – ready and safety catch off.
- **CAGE ASSEMBLY** – check all the Velcro straps and all blockings.

**NOTE!** Example of pre-flight checklists can be found at the end of this manual.

It is highly recommended that you use one of the examples, or create your own, print it out, laminate it, and use it whenever you fly.

Also note that these Checklists are examples only, FLY PRODUCTS is not responsible for their use or for their completeness.

### **Pre-Flight Checklist Examples**

The following checklists are provided only as EXAMPLES.

It is recommended to produce one tailored to your own needs, print it and laminate it, and carry it with you.

## **Pre-Flight Checklist Example 1**

### **Site/Conditions**

- Current weather
- Long-range (next few hours) forecast
- Winds aloft
- Takeoff/landing direction
- Obstructions (especially Power lines)

### **Wing**

- Lay wing out into wind
- Lines straight and clear
- Riser/Line condition
- Quick-links tight (hand tighten only)
- Correct brake length

### **Paramotor and/or Harness**

- Tank vent is open
- Webbing and straps for stress
- Prop Guard for alignment/stress/wear
- All fasteners tight
- Carabiners condition
- Radio secured
- Sufficient fuel

### **Strap In, Hook Up**

- Buckles secure
- Chest strap tight
- Harness adjusted properly
- Reserve parachute attachment
- Reserve parachute deployment pin
- Reserve parachute handle in sight - Deploy in 3 sec., rehearse procedure
- Risers hooked up correctly
- Carabiners locked
- Nothing loose to get in prop
- Radio for volume, clearness
- Helmet on, tight, fastened
- Tuck in hood on hooded sweatshirt

### **Startup and Launch**

- Brake lines/risers held correctly, no tangles
- Kickbar tucked out of way
- Engine run-up to correct RPM
- Kill switch working (briefly push)
- Look UP during run!

## **Pre-Flight Checklist Example 2**

### **ENGINE PRE-START**

- 1) CAGE SECURE
- 2) CAGE MESH OK
- 3) GAS AMOUNT AND QUALITY OK
- 4) GAS CAP ON AND SECURE
- 5) TANK VENT OPEN
- 6) THROTTLE CABLE FREE AND FULL
- 7) PROP NUTS TIGHT
- 8) PROP CONDITION
- 9) SHAKE TEST MUFFLER
- 10) SHAKE TEST CARBURETOR
- 11) FUEL LINES OPEN NO KINKS

### **PRE-FLIGHT**

- 1) WEATHER TREND CHECK
- 2) POCKET CHECK (NO LOOSE OBJECTS)
- 3) SPEEDBAR QUICK LINKS AND PULLEYS OK
- 4) HARNESS POCKETS ZIPPED CLOSED
- 5) PARAMOTOR/HARNESS CONNECTS SECURE
- 6) EARPLUGS IN
- 7) HELMET ON AND SECURE
- 8) RISERS/BRAKES/LINES FREE AND CORRECT
- 9) 3 HARNESS BUCKLES GOOD
- 10) LEG STRAPS TIGHT
- 11) SPEED SYSTEM SLACK AND CLEAR
- 12) SET UP ALTIMETER AND GPS
- 13) CHECK RESERVE PARACHUTE PINS
- 14) PRIME CARBURETOR

### **RUN-UP**

- 1) ENGINE SECURE
- 2) CHECK THROTTLE CABLE FREE
- 3) CLEAR PROP! START
- 4) CHECK CUT OFF
- 5) FULL MAX CHECK, VIBRATION OK
- 6) IDLE CHECK
- 7) WARM UP AND KILL

### **TAKEOFF**

- 1) LINES/BRAKES TAUT AND CORRECT
- 2) WING ORIENTATION TO WIND
- 3) START
- 4) THROTTLE CUT-OFF CHECK
- 5) FULL POWER CHECK, IDLE OK
- 6) WIND, CHECK FOR CHANGE
- 7) CHECK TRAFFIC
- 8) CLEAR

## Flights under special conditions

Even though you must know these information learned in your license-flight , we wont remember you some important flight information:

### **RAIN:**

In principle no flights under rainy conditions should become necessary. Anyway, every pilot may get into unforeseeable worse weather conditions. And so if the rain is only very light, the flight may be continued for a certain time, but the wet canopy will get heavier. Therefore flight speed will increase, causing a higher stall speed as well.

With a wet wing fly carefully, avoid sudden manoeuvres and don't be excessively slow when landing.

If the rain gets stronger land! No flights in strong rain!

### **WIND:**

If under strong wind conditions land immediately and once touch down turn quickly to control the wing with the “B” elevators avoiding to be dragged away.

### **FLIGHTS IN SNOWY CONDITIONS:**

They are not permitted at all. In case it starts to snow during flight land soon as possible!

### **EXTREME TEMPERATURES:**

Remember that flight parameters changes in different temperature levels.

At high temperatures the required power and the required flight speed increases, so that the take off distance gets longer than in winter. This is similar to flights in high altitudes.

## Dangerous situation

Extreme flying with a PPG and full gas are extremely dangerous and therefore cannot be tested. They must be avoided at all costs. Problems do not arise during a normal flight. However, pilot error during the flight or extreme wind conditions may force the wing into an unusual flying position. This may require the pilot to make corrections during flight to which he may not be used to.

In this section we explain how to correct extreme situations if they do arise. The manoeuvres described below are based on the legal -take-off weight as described in the technical data section.

These instructions do not replace safety training or specialised literature. We recommend that you undertake special safety training which will prepare you for extreme situations.

Always keep within the recommended limits. Do not perform aerobatics or extreme flying manoeuvres.

### **FRONT STALL**

Strong turbulence can cause part or all of the leading edge of the glider to fold or tuck under.

Normally the “Powerplay sting 140” wing will immediately recover into its normal flight position.

#### **- Recovery**

If the wing not immediately recover from a frontal tuck, brake quickly and strongly with both steering-lines (brake lines) to re-inflate the glider.

Any weather condition which causes a front stall is dangerous. If you get into such weather land as soon as possible and do not continue before the weather got quieter!

### **FULL STALL**

A full stall could occur if full brake is applied during the flight. The paraglider slows down, surges backwards and deflates. If the brakes are held down, the canopy comes up over the pilot again.

#### **- Recovery**

Fully release the brakes within 3 seconds. If you release the brakes too slowly, the paraglider may spin. The spin stops automatically when the brakes are released completely.

### **ASYMMETRICAL TUCKS**

In turbulent air, one side of the paraglider may collapse. Some of the cells deflate and the wing may collapse or spin.

During test flights the “Powerplay sting 140” wing self-recovered it turned less than 90° and stabilised itself.

#### **- Recovery**

- Counter-brake slightly on the side of the paraglide that is still inflated to stop it turning away and to stabilise it.
- Counter-brake just enough that the paraglider continues to fly straight ahead.
- If the wing has not yet self-recovered, pump with the brake on the side that has collapsed in order to open it, making use of the full brake travel.

**WARNING!** Counter-braking too strongly can result in a stall on the inflated side.

## **5.0 OPTIONAL ACCESSORIES**

### **Tool Kit**

It is highly recommended that a tool kit be assembled and carried in one of the harness pouches. The following tools, at a minimum, are suggested for the tool kit:

- Spark plug wrench (13/16”)
- Metric Allen wrenches
- Vice Grips
- Combination wrenches (10mm, 13mm)
- Screwdrivers (both Phillips and Straight)

### **Reserve Parachute**

A reserve parachute can be fitted to the “**RACE-C**”, and is a highly recommended safety item. Many different mounting locations and methods are possible and acceptable, and the one you choose depends on many things such as which hand you want to deploy with, what type of reserve you have, where you prefer to mount it (front, left or right side), etc. For this reason, FLY PRODUCTS cannot make a generalized statement of what the best mounting configuration is for you. It is highly recommend that you seek assistance from your PPG instructor on the mounting of your reserve parachute. It is also highly recommended that you receive training (a reserve parachute clinic) covering topics reserve deployment topics such as reserve re-packing and parachute care, performing a PLF (Parachute Landing Fall), and when to make the decision to deploy your reserve.

**WARNING!** A reserve parachute is a life-saving backup system, to be used in life-threatening emergencies only. A reserve parachute should never be deployed “for fun” or to “see what it’s like”. A reserve parachute deployment is an extremely dangerous event. You surrender control over your aircraft, you have no choice as to your landing location and could land on rocks, roads, Power lines, etc. Even with a correctly deployed parachute, your impact speed with the ground is significant. Also, reserve parachutes are not guaranteed to deploy correctly. Remember the expression, “A reserve parachute isn’t your second chance, it’s your last chance.” Carry a reserve parachute, and deploy it only if it is absolutely necessary.

## **Speed Bar**

A speed bar can be mounted to the “RACE-C” harness. Optional pulleys can be added to the harness to facilitate the application and routing of the speed-bar.

These pulleys can be obtained from your “RACE-C” dealer.

# **6.0 PACKING YOUR “RACE-C” FOR TRAVEL**

## **Disassembling for local travel**

For local travel in a car, only partial disassembly is necessary. This disassembly includes removing the prop cage and prop.

## **Disassembling and packing for long-distance travel**

Disassembly and packing for long-distance or airline travel requires complete disassembly of the “RACE-C”, and then packing into a suitably padded and protected box for travel.

### **Fuel Tank drain**

For airline travel, make sure you completely drain the tank, and wipe the inside dry by inserting a paper towel and thoroughly drying tank.

**NOTE!** Make sure you check, and comply with FAA regulations as well as regulations of the specific airline that you are traveling before taking the machine aboard an airliner.

### **Draining All Fuel**

With the fuel tank completely drained, start the engine and allow it to idle until it stops running. At this point, all of the fuel will have been removed from the carburetor and fuel lines.

### **Removing The Harness**

Unlock the top two harness triangular carabiners .  
Remove the distance bars from their seating .  
Remove the ground handling straps by threading the lower straps up through the buckles.  
This completes the harness removal.

### **Cage Disassembly**

**Remove the cage in the inverse order as described before.**

# 7.0 MAINTENANCE

Periodic maintenance is required in order to keep your “RACE-C” in top operating condition. The following chart provides the suggested maintenance schedule.

After 5 minutes of operation	Stop the engine and wait that for it to cool. Check all bolts are tight.
After 30 minutes of operation	Repeat the nut and bolt check. Verify the carburetion by the colour of spark plug.
After 5 hours of operation	Repeat all previous check every 5 hours.
After 25 hours of operation	Replace spark plug with one of the same specification.
After 50 hours of operation	Only for the version Easy pull starting: verify the correct operation of the mechanical parts of the starting.
After 100 hours of operation	Replace: engine block oil seals , piston rings, spark plug. Check: correct operation of the silent-blocks, internal passages of carburetor.
After 200 hours of operation	Repeat the replacement of all the pieces after the 100 hours maintenance.

**Remember...**

...that YOU are ultimately responsible for your motor and it’s proper care, *FLY PRODUCTS and it’s dealers assume NO responsibility for any engine problem resulting from improper use!*

Before leaving the factory each motor has been tested for up to 30 minutes to insure that it is in proper running order and all FLY PRODUCTS units are guaranteed up to twelve months after purchase.

The extraordinary maintenance or repairs will do only by authorized personal.

FLY PRODUCTS will replace any defective engine parts during the six months period after purchase.

Note that any electric parts that are damaged for improper use or modified in any way which could cause an engine malfunction are not guaranteed.

**Regular checks obligation.**

In Germany the PPG (only with empty mass less than 120 Kg.) must not be checked once a year, it depends on the manufacturer. Most of them declare: must be checked once a year by a qualified person. We too align with this behaviour and recommend you to check it once a year!



## **Cleaning**

Clean your “RACE-C” with clean water and a mild soap. Dust and dirt can be brushed off, or removed with water and mild soap. Grease and oil can be removed with a good water-based degreaser such as “Simple Green”.

## **Prop Care**

### **Avoiding Prop Damage**

It is very easy to damage the propeller by sucking up dirt or rocks when running the motor on the ground. To avoid this, either place the unit on a sheet of plywood or something similar, or use a nice clean area such as a nicely mowed yard. An alternative is to strap the motor on and start it in the standing position.

### **Prop Balancing**

Balancing of the propeller is very critical. The prop blades are subjected to accelerations as high as 2000 G’s! Therefore, a weight difference of only 1 gram can cause forces as high as 2kg. This force will cause a vibration at the speed of the propeller RPM, and can cause enough vibration to break welds or tubes of the frame. Therefore, correct prop balance is of the utmost importance.

### **Keeping the Prop Clean**

Wipe all dirt and oil from the prop when finished flying. Oil, if left on the prop for long periods of time, can seep into the wood and cause an imbalance.

### **Store the Prop Horizontally**

When storing the paramotor, rotate the prop to a horizontal position. This is because if the prop is stored vertically, moisture and oils in and on the prop can migrate downward and cause prop imbalance. This phenomenon can only happen on wood props.

## **Spark Plug**

The recommended spark plug for the “RACE-C” motor is the NGK BR9ES or NGK BR10ES . Spark plug gap is 0.025” (0.635mm). Recommended cleaning and gapping interval is every 25 hours. Recommended replacement interval is every 50 hours.

## **Repairs**

Minor repairs can be performed on the prop, cage, cage guard, and harness.

Major repairs should be performed by a trained service technician, or by FLY PRODUCTS.

**CAUTION:** Repairs to the harness or any stress-carrying areas of the “RACE-C” should only be performed by a certified parachute rigger.

## **Long Term Storage**

Long Term Storage is defined as anything longer than 3 months. The long-term storage procedure is as follows:

- Fuel tank drain completely.
- Start and run engine at idle until it stops from fuel starvation. This is to remove all fuel from the carburetor and lines.
- Remove spark plug. Inject 4 teaspoons of 2-cycle oil into the spark plug hole. Gently pull the starter rope a few times to distribute the oil, then reinstall the plug.
- Clean the prop of any dirt and/or oil.

- Clean the cage, harness, etc. so that it is free from dirt and/or oil.
- Cover the machine with a sheet or light cloth.
- Store in a clean, dry place.

## **Paraglider**

### **Cleaning**

Clean the paraglider only with a soft sponge and clean water.

Harsh chemical substances, high-pressure cleaners or steamers will destroy the surface layer.

Clean the paraglider only if it is absolutely necessary.

### **Repairs**

Repairs should only be carried out by the factory or a specialist recommended by the manufacturer.

You can repair small tears in the wing yourself using the material recommended by the manufacturer, as long as they are in areas which do not bear heavy loads and they are not bigger than 3 cm.

**WARNING!** Always replace lines that are damaged with only original parts or parts that have been authorised by the manufacturer.

## **Paraglider inspections**

### **General**

Failure to observe the inspection periods will invalidate the warranty and certification.

A properly completed logbook will help you to comply with the periods.

### **Inspection periods**

The SWING “Powerplay STING 140” glider must be inspected as follows:

- Gliders used by schools and commercially used gliders must be inspected (as for the 2-yearly check) every 12 months from the purchase date.
- Gliders for personal use (not used commercially) must be inspected at least every 2 years from the purchase date.
- The paraglider must be inspected after 150 hours of use (including ground handling) if this occurs prior to the periods of 1 year or 2 years as above.

**CAUTION :** Ground handling time must be at least doubled when working out the total hours of use because of the increased wear and tear on the glider.

### **Inspection validity**

All inspections must be carried out by Fly Products, by SWING, or another inspection agent authorised by Fly Products. The documentation and the result of the inspection must be clearly identifiable by the inspector (date and place / name of inspector) and be entered near the glider information/certification sticker.

# 8.0 TROUBLESHOOTING

## Diagnosing and starting a flooded engine

A flooded engine can be identified by the smell of unburned gasoline coming from the exhaust pipe, or by periodic weak firing and puffs of black smoke during starting attempts. If you have a flooded engine, follow the procedure below:

- Remove the spark plug and thoroughly dry it. (Note another indication of a flooded engine is a spark plug that is dripping with gas).
- With the spark plug removed push the starter button for a few seconds while holding the throttle in the full-open position. This will remove excess fuel from the engine.
- Install the dry spark plug, and start using the normal procedure.

**WARNING!** Ensure you have placed the spark plug cap away from all fuel sources before pulling the starter cord or a fire could occur!

**WARNING!** Do not use a flooded engine procedure whereby you hold the throttle wide-open and then attempt to start the engine.

If the engine were to start, the prop would rapidly spin to full RPM and damage or injury would most likely occur!

## Troubleshooting Chart

SYMPTOM	POSSIBLE CAUSES	SOLUTIONS
<b>Engine does not start</b>	No fuel in tank	Fill tank per fueling instructions
	Fuel pickup does not reach all the way to bottom of tank	Inspect fuel pickup and ensure that it reaches the bottom
	Spark Plug cap not in place	Ensure spark plug cap is installed
	Insufficient battery power	Recharge battery
	Fouled Spark Plug	Inspect plug, clean and re-gap, or replace with a new plug
	Incorrect Spark Plug Gap	Gap the plug to 0.025” (0.635mm)
<b>Engine starts, but does not continue to run</b>	Engine is flooded	Follow procedure outlined in section 8.1
<b>Excessive Vibration</b>	Prop out of balance	See section 7.2
	Loose fasteners mounts or attachments	Check and tighten engine mounting bolts, muffler bolts, prop bolts, etc.

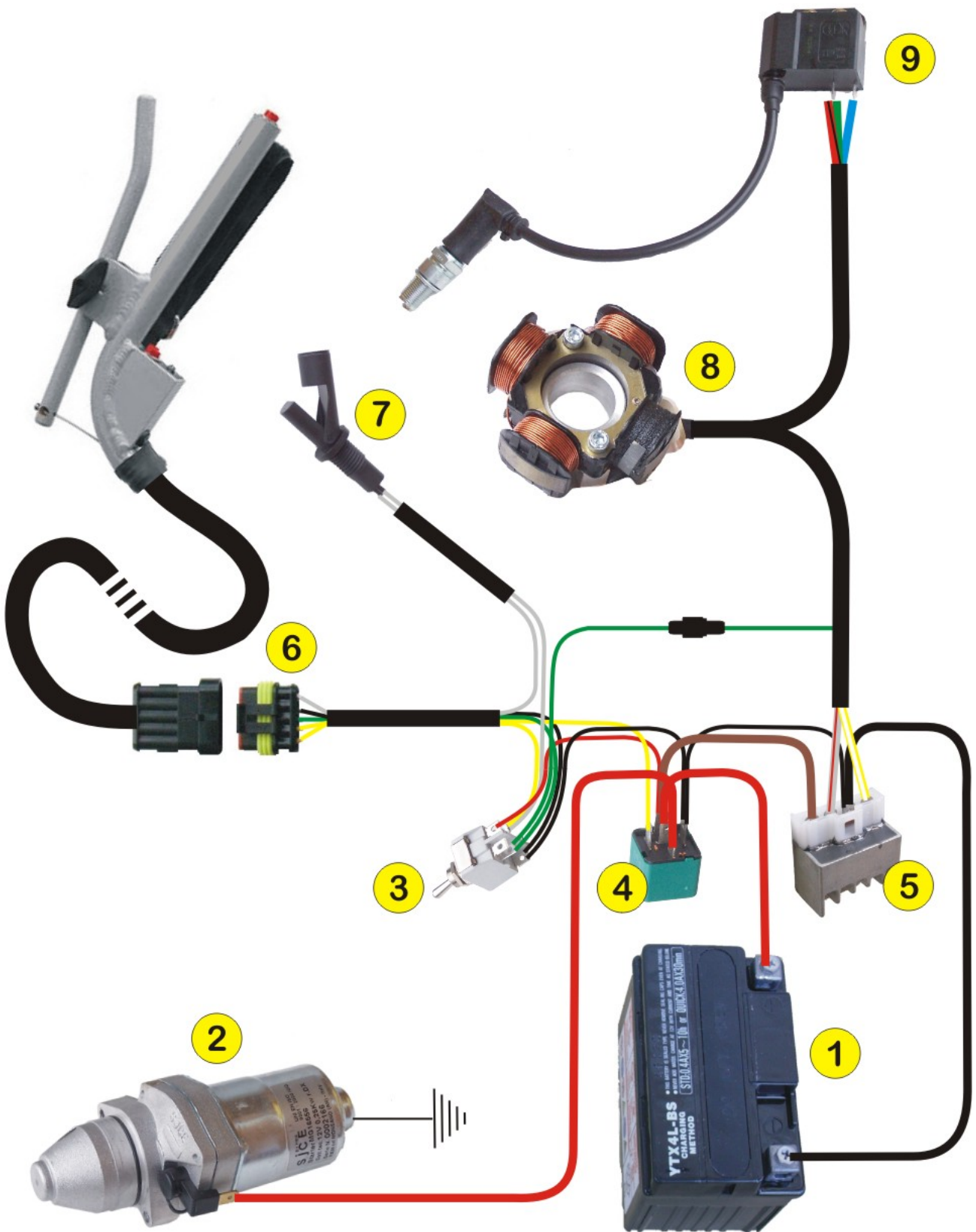
## 9.0 SPECIFICATIONS AND PERFORMANCE

### Specification and Performance Summary Chart


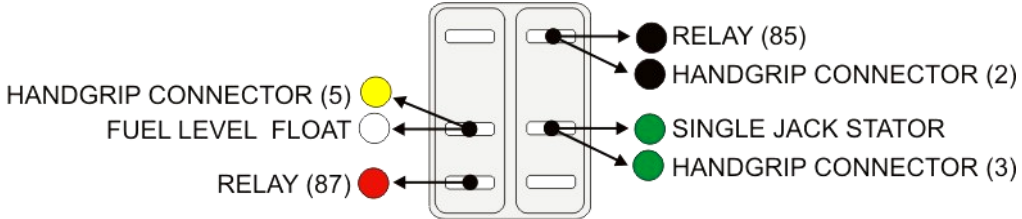

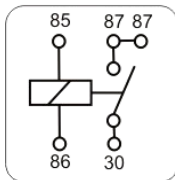
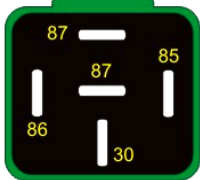

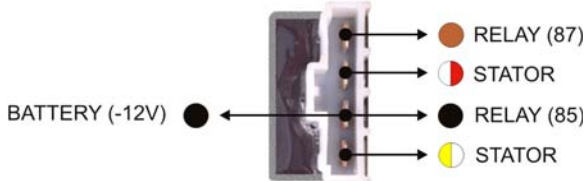

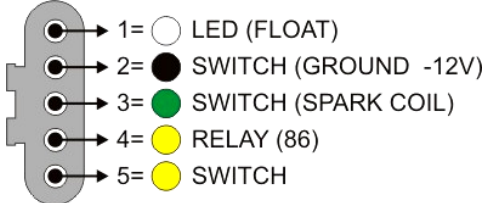


ITEM	SPECIFICATION
Engine Make and Model	Fly 100
Engine Type	2 stroke - Single cylinder, air cooled
Displacements / Bore x Stroke	100 cc
HP / RPM	18 HP / 9400 rpm
Carburetor	Walbro
Rotation Direction	Clockwise rotation
Air Cleaner	Silenced air-box
Spark plug	NGK BR9ES
Fuel	mixture of premium petrol 98 octane and oil at 2%
Oil	synthetic top-quality oil for 2-strokes engines
Starting System	Electric or manual starter
Ignition	Electronic CDI with battery charger
Propeller	122 cm - 2 blades
Climb rate	300 – 700 ft./min. with a DHV 1-2 wing
Frame	Aluminum, aircraft tubing
Harness	Rip-stop nylon
Clutch	Yes
Fuel Tank Capacity	4.5 gallon
Estimated fuel consumption	2,5 - 3 Liters / hour. (Load+speed depending)
Dry Weight	51 lbs. (23 kg)
Max engine RPM.	9400 RPM
Reduction system / Reduction ratio	Mechanic

# Electric system

Following table shows the Fly 100 ‘s electric connections :



**Electric connections table:**

<p><b>1</b> - 12V. battery</p>	
<p><b>2</b> - Electric starter</p>	
<p><b>3</b> – Main switch</p> 	 <p>HANDGRIP CONNECTOR (5) ●          FUEL LEVEL FLOAT ○          RELAY (87) ●</p> <p>RELAY (85) ●          HANDGRIP CONNECTOR (2) ●          SINGLE JACK STATOR ●          HANDGRIP CONNECTOR (3) ●</p>
<p><b>4</b> - Relay</p> 	  <p>87= ● SWITCH / ● BATTERY CHARGER          87= ● +12V BATTERY          85= ● BATTERY CHARGER / SWITCH          86= ● HANDGRIP CONNECTOR (4)          30= ● ELECTRIC STARTER</p>
<p><b>5</b> – Battery charger</p> 	 <p>BATTERY (-12V) ●</p> <p>RELAY (87) ●          STATOR ●          RELAY (85) ●          STATOR ●</p>
<p><b>6</b> – Handgrip plug</p> 	 <p>1= ○ LED (FLOAT)          2= ● SWITCH (GROUND -12V)          3= ● SWITCH (SPARK COIL)          4= ● RELAY (86)          5= ● SWITCH</p>
<p><b>7</b> - Low fuel level float</p>	
<p><b>8</b> – Stator</p>	
<p><b>9</b> - Spark coil</p> 	 <p>STATOR ●          STATOR ●</p> <p>SPARK PLUG</p>

## 10.0 MISCELLANEOUS

### Warranty

FLY PRODUCTS will warrant their product to be free from defects in materials and workmanship for a period of Twelve (12) months from the date of purchase. This warranty applies to the product in normal usage situations only. The dealer, from whom you purchased the product, or FLY PRODUCTS, will repair the product free-of-charge.

To obtain warranty service, please contact your dealer or FLY PRODUCTS, and then either bring the product in or have it shipped. Shipping charges are the responsibility of the purchaser. This warranty does not apply even during the warranty period, and the purchaser shall pay repair or replacement charges if:

- **The cause of malfunction is due to misuse, neglect, negligence, etc. This includes seize of the engine due by an improper carburetor adjustment or improper fuel/oil mix.**
- **The malfunction is caused by incorrect pilot operation, i.e. a crash, whack, dork, bang, splat, ding, prong, bend, tweak, trip, fall, bounce, or any other piloting eventuality.**
- **The malfunction is caused by lack of normal maintenance, or modification, i.e. loose parts falling off and breaking the prop.**
- **The malfunction is caused by an Act of God, including but not limited to fire, earthquake, hurricane, flood, or other natural calamity.**

## **Internet info and upgrade**

For information, more details and news see our internet site: **www.flyproducts.com**  
For safety information , data and rules you can visit the DULV website: **www.dulv.de**

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