



## Flight Manual Doppelseater



# X-Light F 23

Assembly

Operation

Maintenance

## INTRODUCTION

This manual has been prepared to provide pilots and instructors information to contribute safe and efficient operation of this paramotor trike.

It contains important legal information, additional information from the manufacturer of the trike.

To fly this aircraft a license for paramotor trike is required and the authorization for two-seater flying when a passenger is on board. In addition, may be started and ended only on approved courses. Flights inside the controlled flight space require a permit, the most requested on radio and is issued. Other legal requirements, such as third party liability insurance must be observed.

The pilot must become familiar with the aircraft prior to the first flight

It is mandatory to read the manuals and operating instructions.

## FLIGHT OPERATIONS

Legal basis for the operation of UL –Paramotor Trikes are regulated in the air right

Details are given in the relevant regulations. Every country has its own laws

Regulations and requirements must be observed when operating.

## ADMISSION

The trike is registered with the DGAC and thus legal to operate in Germany.

The legal basis shall be the: **§ 11 LuftGerPV**,

*(1) Bei Luftsportgerät nach § 1 Absatz 4 Nummer 1 der [Luftverkehrs-Zulassungs-Ordnung](#) hat der Hersteller vor der Auslieferung an den Kunden eine Prüfung, ob das Muster mit den anwendbaren Lufttüchtigkeitsforderungen übereinstimmt, in einer Inspektionsstelle oder einer Prüfstation durchführen und die Übereinstimmung bescheinigen zu lassen, die akkreditiert ist nach der [Verordnung \(EG\) Nr. 765/2008](#) des Europäischen Parlaments und des Rates vom 9. Juli 2008 über die Vorschriften für die Akkreditierung und Marktüberwachung im Zusammenhang mit der Vermarktung von Produkten und zur Aufhebung der [Verordnung \(EWG\) Nr. 339/93](#) des Rates (ABl. L 218 vom 13.8.2008, S. 30) gemäß ISO/IEC 17020 oder ISO/IEC 17025 Standard. Bei Luftfahrtgerät mit einem Motor ist hierbei auch die Einhaltung der Lärmemissionsgrenzwerte zu prüfen.*

*(2) Die Stückprüfung hat der Hersteller vor Auslieferung des Luftfahrtgeräts an den Kunden entsprechend § 10 Absatz 3 Satz 1 durchzuführen. Er hat dem Halter die Betriebsanweisungen bei Auslieferung des Luftfahrtgeräts sowie die zur Mängelbehebung erforderlichen Anweisungen spätestens fünf Tage nach Feststellung des Mangels zur Verfügung zu stellen.*

*(3) Als Hersteller gilt auch, wer Luftfahrtgerät nach Absatz 1 in die Bundesrepublik Deutschland einführt.*

***(4) Muster- oder Gerätezulassungen eines Mitgliedstaates der Europäischen Union oder eines Vertragsstaates des Abkommens über den Europäischen Wirtschaftsraum sind unmittelbar gültig und ersetzen die Prüfungen nach den Absätzen 1 und 2.***

## **1.1 WARNINGS, PRECAUTIONS**

The following definitions are used in this guide for warnings, precautions and remarks. The meaning and their meanings are explained below.

### **WARNING:**

The following definitions are used in this guide for warnings, precautions and remarks. Meaning and significance explained below.

### **CAUTION:**

Means that missing or failure for non-observance procedure reduce the durability of aviation safety.

### **NOTE:**

Emphasizes attention to specific issues which are not directly concerning

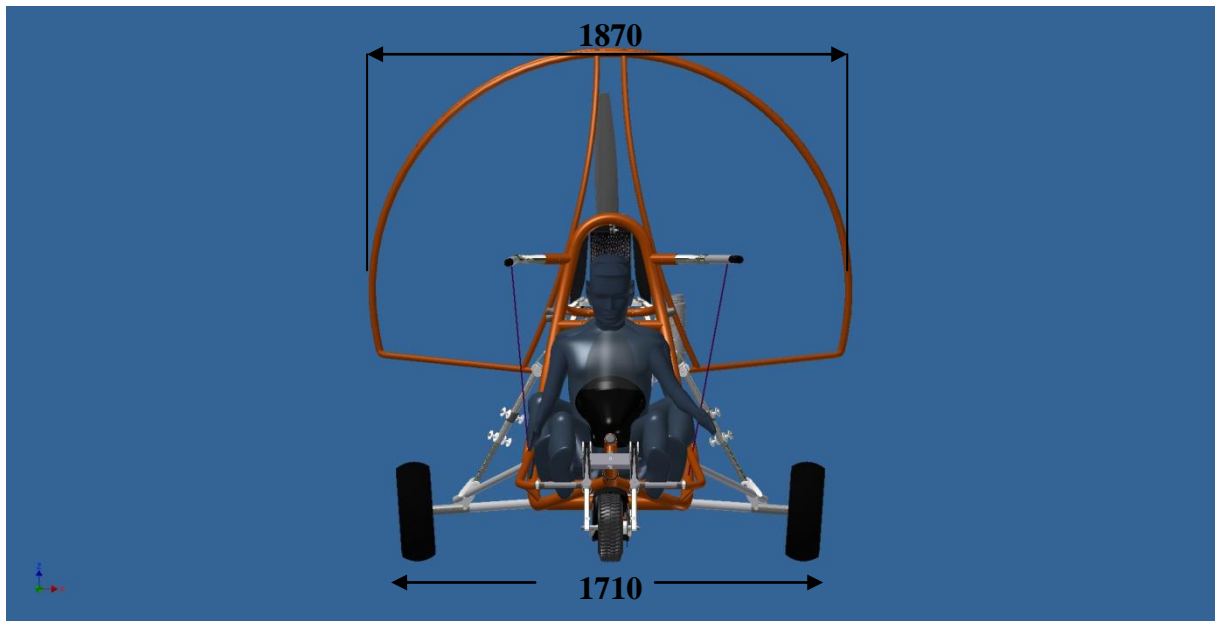
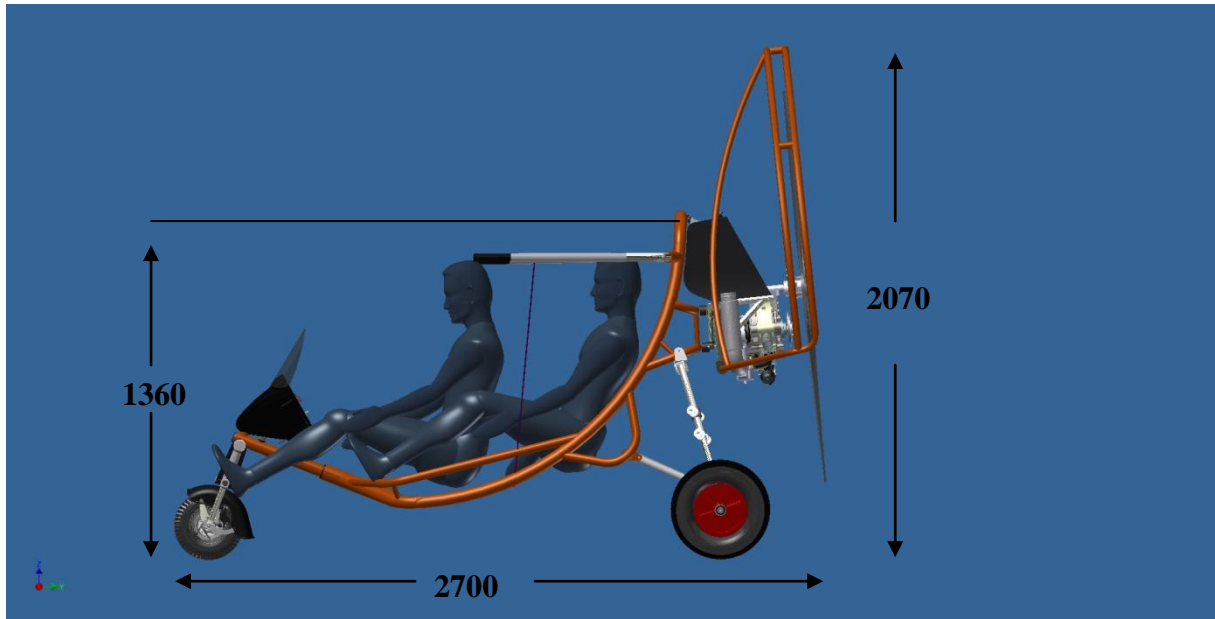
### **PRECAUTION:**

Read the flight safety messages in various publications

Do not perform any flights in turbulent weather condition. A paraglider is shaped by the internal pressure. This can only be maintained when the glider is flown from the front.

Find out about low-flying military aircraft zones and avoid those.

# Warning



# Dimension

## Operating limits

Following in the manual you'll find information for the safe operation and mandatory limits Even for the Trike,engine, glider and standard systems.  
It contains the during flight testing practically flown operating limits.Calculated and verified by experiments limits.

The X-Light is like all Ultralight not approved for aerobatics. Curves with angle of more than 60 ° are not allowed. Flights in icing conditions are not permitted.

No flight operation in gusty wind or wind speeds greater than 20 km / h = set 5.6 m/s , as well in the rain.

## Engine

- Typ: 2-stroke Boxer engine
- Power: 36,7 kW / 6500 /min
- Stroke: 64 mm (2,52 in)
- Bore: 72 mm (2,83 in)
- Carburettor: 2 x WB 37
- Weight trike : 103 kg ( No glider, no rescue)
- Weight engine without exhaust: 22 kg
- Propeller: 3 blade 175 cm (68“) Counter-clockwise
- Torc: 53Nm at 6300/min
- Chamber volume.: 521cm<sup>3</sup>
- RPM: 6300 1/min
- Gas: Oil/Gas 1:50
- Fuel consumption: ~ 10 Liter 2 x 80 kg Pilot/Passenger
- Centrifugal clutch: No
- Gearbox 1:3,08 with Poly-V-Belt 813 PK
- Ignition: Digital, Batterie with Generator 250W
- Motor housing: Aluminium
- Time before overhaul all moving parts: 1000 h

# Operation Limits

## Technical Dates

The maximum take-off weight of the X-LIGHT is 330 kg ( 2 x 100 kg Pilot/Passenger). This means empty weight plus mass pilot plus fuel and plus baggage. Shall subsequently equipment installed which increase the empty weight, the load must be reduced. The pilot is responsible for compliance with the maximum takeoff weight.

<b>Caution</b>	<b>!</b>	<b>Maximum Take-Off Weight</b>	<b>300 kg! at Relax 25</b>
<b>Caution</b>	<b>!</b>	<b>Maximum Take Off Weight</b>	<b>437 kg! at X-Wing EVO 28 RS</b>

The maximum allowable CG positions must not be exceeded. If the trike is flown single seat, the front seat must be used. The pilot weight must be minimum 45 kg up to 100 kg. The rear seat is rated for a minimum of 0 kg up to 100 kg.

The UL Paratrike is designed in strength for maneuver in which loads only between the "Safe load factor" of +4 G and a minimum load of + 0.5G occur .

#### **WARNING**

- All aerobatic maneuvers are FORBIDDEN!
- Turning flight angles greater than 60 ° is also FORBIDDEN !!

Use minimum 95 Octane  
This engine is a 2 stroker and  
need fuel with oil mixture 2%.  
Or in other word 1:50

**Please use only full synthetic  
oil.**

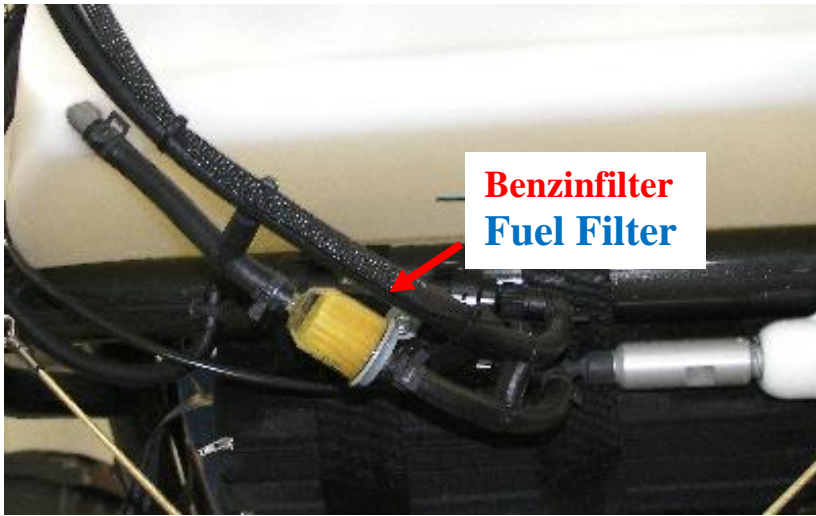
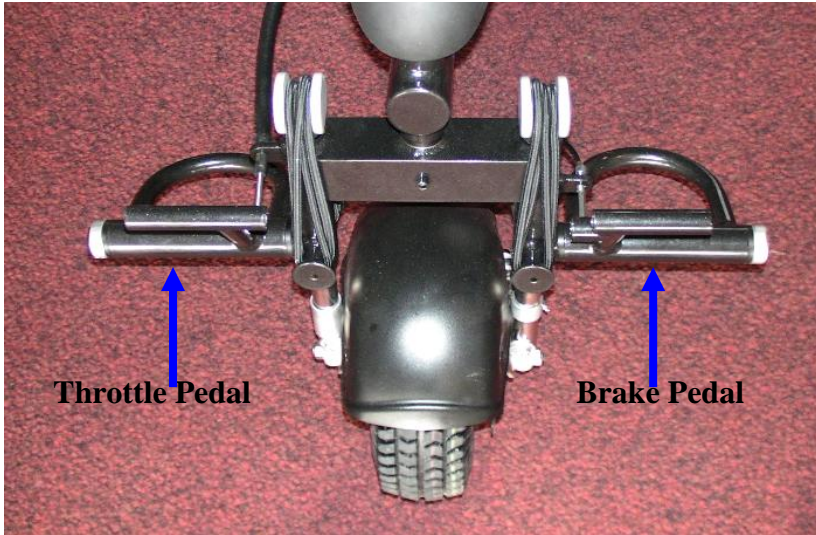
**Our Special Blue with it's  
specification: API,ISO-L-EGD is  
blue colored.**

**You can always see if the  
gasoline is mixed with oil**

**Made in Germany**

The F 23 has no liquid cooling  
fluid

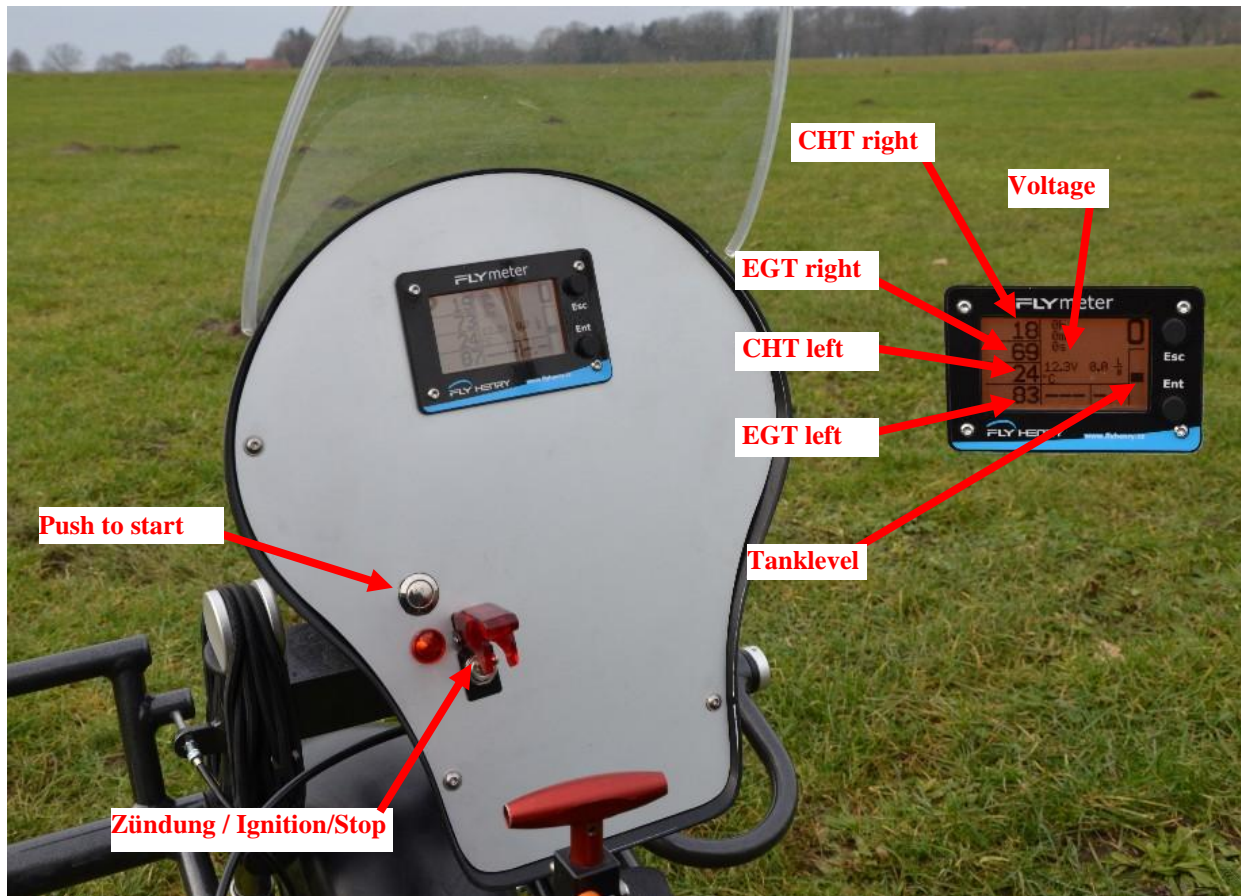




# Controls



## Cockpit



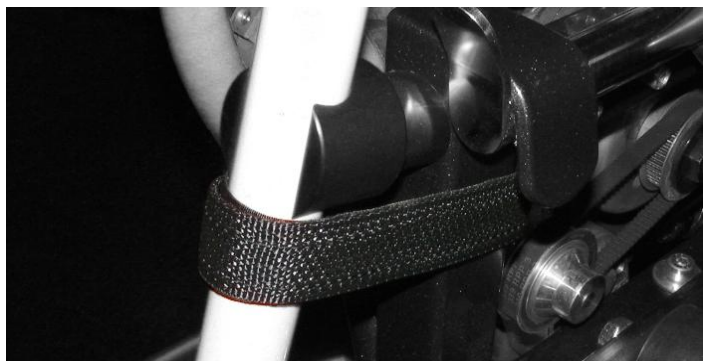
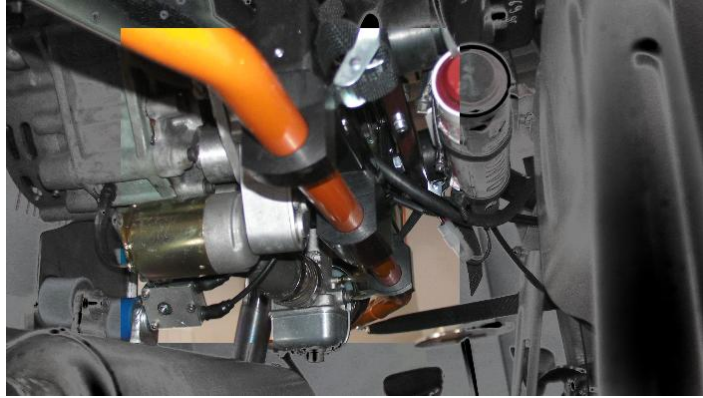
- The maximum **Cylinder Head Temperature (CHT)** is 235 ° C. The head temperature does not have to be the same on both sides.
- Die The **Exhaust Gas Temperature (EGT)** is ~600° C.
- Die maximale Motor rpm is ~ 6300 1/min
- The Voltage of the alternator is ~14 Volt

When a maximum value is exceeded, the display starts to flash.

The propeller cage separates into 2 halves for easy transport.  
The mounts are located under the engine and

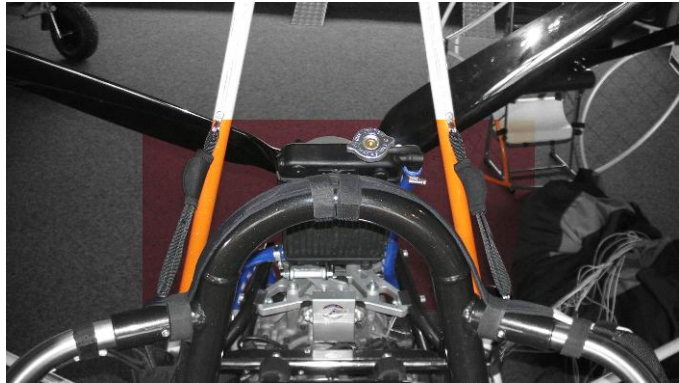
right and left sides of the motor sustain.

The cage halves are secured with Velcro.



# Propellercage

The cage is additionally secured even with 4 straps. This must always be pulled tight.



An additional pipe is designed to protect the cage lines at start and landing. After installation of the cage they must hanging in the hub of the rear wheels.

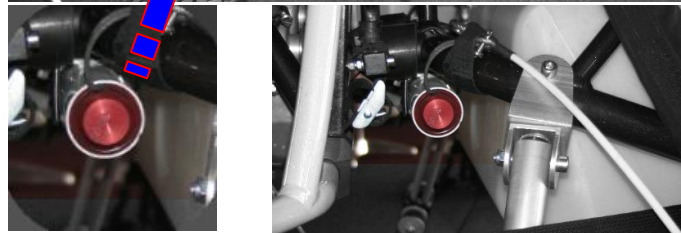


# Propellercage

We recommend the rockets rescue system Magnum 250.  
In case of emergency the rescue opens very fast. The survival chance is greatly increased  
The container is mounted laterally on the trike



The shooting direction also takes place to the side.



**WARNING**  
The trigger handle is equipped with a cotter pin and secured against accidental release.

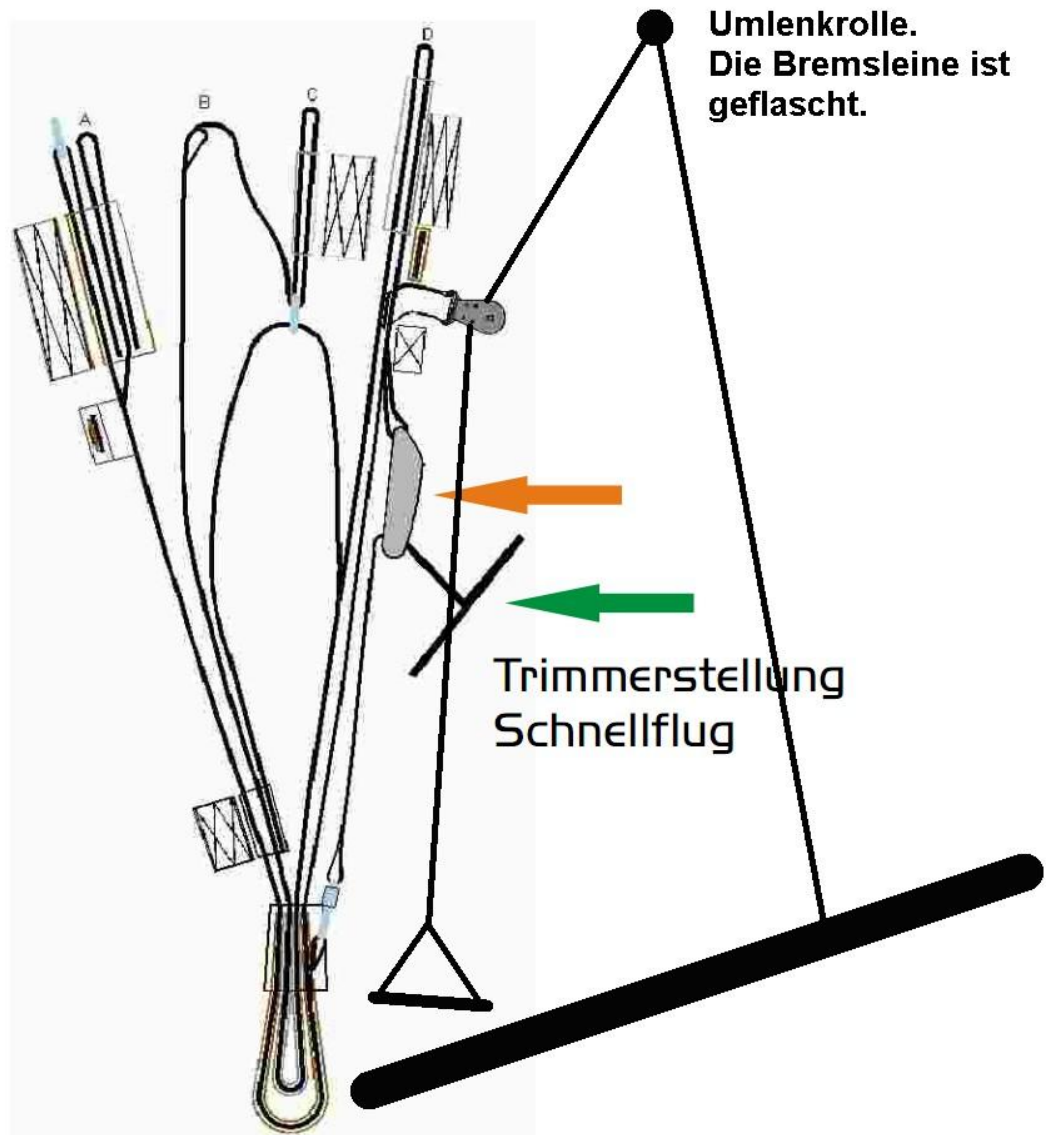
Before your start remove this pin.



The laying of the V-line can be seen in the picture.



# Rescue System

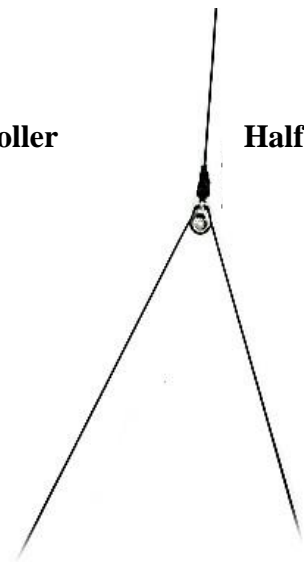


In order to reduce the braking forces, the brake line is deflected around a roller.  
**!So the force is half but the way is double!**

# Glider X-WING EVO 28 RS

**Brake Line with roller**

**Half Force- Double Way**

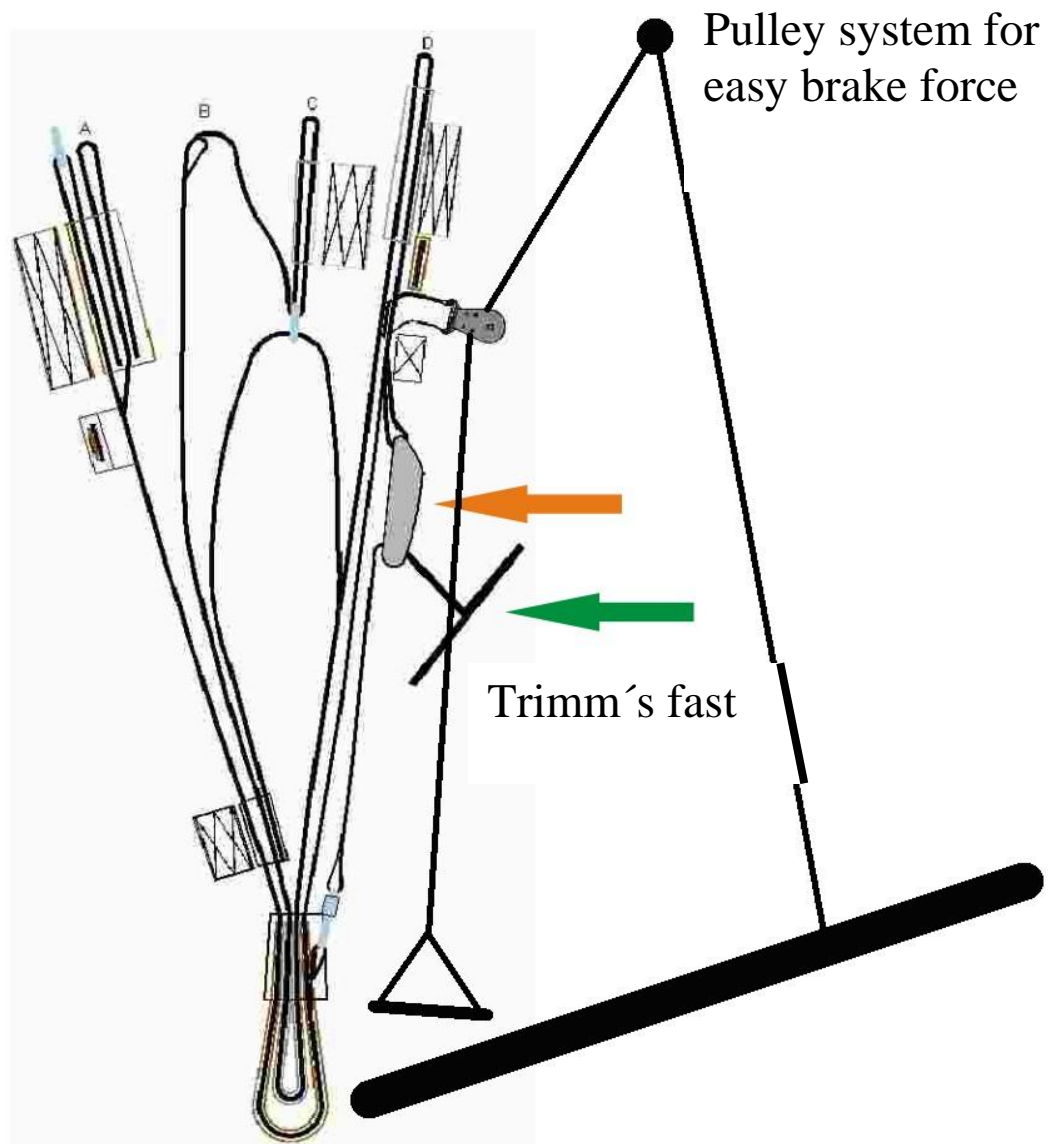


**Trim Lever**

**Trimmer Belt**

**Brake Handle**

# Trims X-Wing Evo 28 RS



In order to reduce the braking forces, the brake line is equipped with a pulley system

# Glider Relax/X-WING

## **OPERATION AND FLYING**

### **PARAGLIDER UNFOLD AND PRE FLIGHT CHECK**

#### Unfold

Place the paraglider with the top surface to the bottom and spread so that the leading edge is draped in a big curve

Carefully separate all the lines and make sure that no lines are underneath the canopy, tangled or somewhere to hang.

#### Pre Flight Check

Always check carefully before starting :.

- Are there any cracks or other damage to the sail?
- All lines clear?
- Are the brake lines clear and tightly connected to the handle?
- Are the brake lines properly adjusted?
- Are the shackle to the suspension lines and the belts firmly closed and secured?
- Is the canopy dry
- Are the risers and seams in good condition?
- Is the rescue handle correctly unlocked?



## **6-POINT CHECK**

Just before the start we recommend the 6-point check:

- 1) Is the canopy arranged in a half round, and all entry ports are open?
- 2) Are all the lines untangled there are no lines under the canopy?
- 3) Are the clothes and the helmet closed , the seat belt is applied  
ist die Lehne des vorderen Sitzes gesichert?
- 4) Trimm´s closed, Brake handle ready to hand?
- 5) Wind strength and direction in order for safe flight?
- 6) Are the airspace and launch area clear?

## **First Flight**

### **Note!**

Perform your first flights only in calm weather and on a well-known place.

Make the first flight without hard maneuvers

### **Accident risk!**

Do not overestimate yourself. Do not be misled of other pilots to reckless behavior.

# First Flight

## Adjusting Brake Lines

### Note!

The main brake lines must be checked by an expert before the first test of the paraglider.

### Correct Adjust

Properly installed brake lines have almost no flow. This means you have to pull the brakes down a little until the trailing edge of the canopy starts to move downwards and start braking. This is the manufacturer's setting. Basically this paraglider has a very long brake.

### To Long Set

If the brake lines are too long, the paraglider reacts slowly and is difficult to land. However, you can wrap during the flight the brake lines around your hands to reduce the problem. After landing the brake lines should adjusted to the correct length.

#### **Recommendation:**

After touch down we recommend the brake lines again to wrap around the hand. When approaching use the brakes as less as possible, so the speed is not to low. Flair the glider evenly with both brake lines. After the flight the glider should fall behind the trike.

### Accident risk!

If the brake lines are too short, the following risks:

A stall can occur to early

The paraglider does not launch well and there is a constant stall risk.

The glider can makes a dangerous extreme flight behavior.

# Brake Lines

## TRIMMS

### Accident risk!

With increased speed disorders (collapses) affect more drastic than in unaccelerated flight. In turbulent weather conditions do not fly close to the ground when the trim's are open. The trim's are operated by the lever

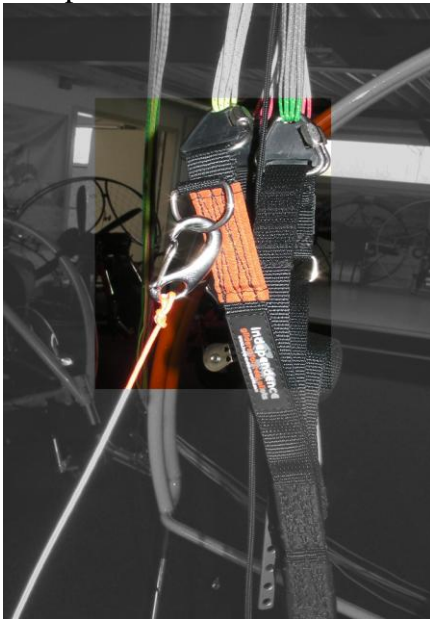


The trim's should be adjusted so that the X-Light in cruise flies straight.

### Start Up Device

The glider starts easier when the start up device is activated. The red wire should sag slightly when the strap is vertically upwards.

**Danger:** A tight rope in flight pulls the A-riser down and increases the risk of a front collapse.



# Adjust Riser

## **ROLL**

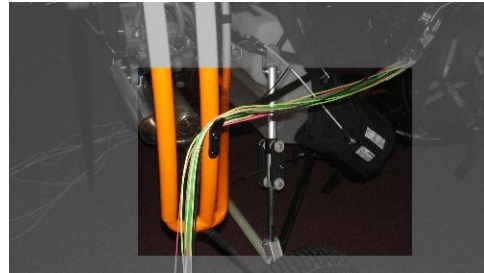
The nose wheel steering is easy to learn. Do some taxi tests at yourself. Get familiar before your first flight. When rolling get control by means of pedals. If the glider is in the air, you have the control coordinates as well by using the brake lines.

## **START AND CLIMBING**

Start against the wind. The maximum crosswind component at startup is 5 km/h.

Unfold the glider behind the trike against the wind direction.

The lines rest in the holder.



Check all lines in the correct position (parallel and without knots).

Climb in -Buckle - and pull safety belt tight.

## **Danger**

At the rear seat are ALWAYS close all 3 buckles - the seat belt and the two straps which support the front seat back to the front.

Hold trim's at the start closed. The paraglider otherwise tends to overshoot.

Check wind direction and position from the glider

Take brake handles in the hands

Start the engine

Release the foot brake,

Increase the engine speed depend of the windspeed. Round about 50 %

Keep rolling direction with the feet.

Once the glider takes off, control it with the brakes and let rise as clean centrally above the trike. The glider may never too far forward .Hold back with the brakes. Always keep the glider directly above the trike. If necessary, roll with the trike under the center of the glider.

If the glider is stable over the trike speed up the engine.

Depending on load the trike will take off at different rates.

# Take off

## **CRUISE**

The torque effect can be compensated by means of the trimmer (Pic. Page 13 ).

Speed control maintains the travel speed constant ((Pic. Page 8 ).

## **LANDING**

The landing should always be against the wind.

Close the trims and reduce the engine speed. Take the brake handles, Start with the braking in 5-8 m height If the brakes started too early can be landed with engine support  
The glider should after landing fall behind the Trike

## **PARK**

Idle running.

Stop the engine (Main Switch „Off“).

Leave the trike only when the propeller not turning any more

## **GROUNDHANDLING**

For maneuvering at the bottom of the trike may only be lifted over the front wheel

The cage easily tempted to this, but is not designed for this load. Deformations would result

## FLIGHTS UNDER SPECIAL CONDITIONS

### Rain

Basically belongs to every conscientious flight preparation the look of the weather situation, so that "really" no flights in rain should be necessary.

Nevertheless, each pilot can fall into worse unpredictable weather conditions.

**In general: No flights in the rain, as soon as possible to land!**

In very light rain the flight can be continued at first. The increasingly becoming wet glider is correspondingly heavier and therefore must flown faster to generate the necessary lift. The stall speed increases accordingly. A stall is possible!

Therefore: Cautious flying, avoid abrupt maneuvers, do not fly too slow for landing. In heavy rain always land, perform if need a safety landing.

Store away the glider only dry , they rot otherwise. A wet glider also starts slower and worse!

WIND: Generally, each start and each landing must be performed whenever possible into the wind. The glider will always turn into the wind. Must be rolled diagonally to the wind, use the leeward brake line slightly to hold the glider in the right direction.

Must be landed in strong winds use the foot pedal brake. It prevent a back pulling effect of the trike. After touch down turn the brake line one time around your hand. You will get a more efficiency brake.

In turbulence do not fly at maximum speed. The reduced angle of attack allow a collapse of the glider in case of wind gusts.

Close the trim's

Flights are not permitted at snowfall and must be stopped if necessary.

Extreme temperatures: Restrictions in "normal" temperatures between -10 and +35 ° C does not exist. "START PILOT" could simplify at low temperatures to start the engine. However, the cooling water must be mixed according to the manufacturer's instructions of the engine with antifreeze. In warm weather please have special attention to the engine temperatures. The power consumption and flight speed increases in result for longer take off and landing roll distancen

## **Start,Flight,Landing:**

Here are some supplements that goes beyond the description of the first flight

If the glider falls too far on the side, do not continue the take off procedure.

It is better to cancel two times the start than one time to get up side down.

If the glider is already collapsed while pulling up try to get clear by pumping the brake lines.

Take off only with a complete open glider

Experienced pilots can ride with in no wind a full circles with less than 50 m diameter.

The glider is herwith over the pilot

## **FLYING UNDER TURBULENT CONDITIONS**

### **Note!**

Take care crossing your own vortices!

Though the tendency to collapse is significantly reduced due to the high wing load of the X-LIGHT, in turbulent air you should fly it with the trim system set to slow. The stabilizing effect of the increased pressure inside the wing at higher speeds is more than counteracted by the smaller angle of attack.

Use both brake lines in turbulent air and keep them slightly pulled down (20%), and keep the canopy above you and centred with active work at the brake lines. This reduces the risk of a collapse.

If the canopy collapses anyway on one side, keep the direction with the brake lines (and, if necessary, fly away from any obstacles). Only if you fly stable “pump” the brake on the collapsed side to re-open the wing quicker. You may have to do it forcefully due to the high wing load.

If you fly into very thermal conditions fly slowly but don't pull the brake too much to stay away from a dynamic stall. If you leave such a thermal area pull the brake lines to avoid a forward shooting canopy and the potential risk of a front collapse. You may give more gas as well to increase the angle of attack.

### **Note!**

If the canopy collapses on one side brake the other side until the X-LIGHT is flying straight forward. But better use less than too much brake input!



## LANDING WITH ENGINE SHUT OFF

In principle landing with the engine shut off is the same as if it is still running – always facing the wind. But the speed should be kept up high enough for a prop flaring. So hold the brake lines up until you are roughly 2 m high. You should win them 1x around your hand to have more brake travel. In 2m altitude start to app brake continuously. Just at touch down the brake lines should be completely pul down.

If due to wind the canopy doesn't fall down behind the trike you may release the brake for a moment, wind them 1x more around the hand and pull it again. You may repeat this procedure until the glider comes down.

If the canopy pulls too much to the side the trike may finally roll over. Therefore keep the canopy centered as good as possible behind the trike.

If the wind is quite strong at may help to get the canopy down by not braking too much with the front wheel. Then the trike may roll back with the wind a little bit.

## LANDING WITH THE HELP OF THE ENGINE

As the wing load of the X-LIGHT is quite high compared with a backpack motor, the RelaX should not be flown too slow prior to touch down. We recommend to keep the brake wide open until you reach roughly 2 m, and then pull it continuously down until you touch the ground. At this time the brake should be fully applied.

Please make sure that the brake line is perfectly adjusted to your X-LIGHT so you don't loose brake travel when landing.

You may use the engine to adjust the descent rate. Control altitude and speed with brake lines and gas.

Caution! Accident risk!

Being close to the ground watch your air speed carefully, don't fly too slow: Always much faster than your stall speed!

## **RAPID DESCENTS**

There are many situations when you need to lose altitude rapidly to avoid potential dangers e.g. pulled up from a cumulus cloud, an approaching cold front, a storm front etc. Below we explain various ways to make a rapid descent which can be carried out safely with the X-LIGHT if the pilot has the necessary knowledge and if they are correctly executed.

### **NOTE!**

With all rapid descent methods, the trim system should be completely set to slow and the rpm's reduced to idle.

All of the manoeuvres are more dynamic than when you fly with a backpack system or even without a motor due to the high wing load.

## **DEEP SPIRAL**

The spiral dive is the classic method for making a rapid descent with a sink rate of up to 14 m/s in normal flight situations, and up to 20 m/s in extreme flight situations. It is particularly suitable where there is a high ascent rate and little wind. Spiral dives with a sink rate above 14 m/s are not tested on certification; this exceeds the manufacturer's limits.

### **STARTING THE MANOEUVRE**

Whilst flying at full speed, start to apply the brake on one side. This will steer the paraglider into a turn with a strong bank. You can tell that you are in a spiral dive if you are being pressed hard against your seat (high centrifugal force).

When you are in a spiral dive, you should steer very carefully because the paraglider will react immediately. Banking and rate of turn increase if braking efficiency increases. Look down before and during a spiral dive so that you always know how far you are away from the ground!

### **RECOVERY**

Recover from the spiral dive slowly and carefully. If you release the brakes too quickly, the increased speed can cause the wing to climb, become unsettled, or partly collapse.

Due to the reduced possibility when flying in a trike to use weight-shifting, you must always recover actively from the spiral dive with the outside brake.

### **Caution! Accident risk!**

Very high turn speeds can be reached with spiral dives, with high G-loads. So be careful when you try this!

Do not continue the spiral dive too long; you could lose consciousness.

Never attempt this with less than 150 to 200 meters ground-clearance.

Spiral dives combined with other methods like B-stall or "big ears" are not possible with the X-LIGHT without any changes and are not allowed at all.

## **INSTRUCTIONS FOR EXTREME FLYING AND DANGEROUS SITUATIONS**

### **DANGEROUS SITUATIONS**

Extreme flying with a motor trike 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.

#### **Note!**

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. This will prevent accidents caused by over-loading the glider.

#### **DEEP STALL**

Various things can cause a paraglider to deep stall, e.g. shrinkage of the C and D lines as a result of dampness or flying in the rain. The airflow from the front of the glider gradually breaks away towards the back and the canopy sags, with the glider remaining upright. Paragliders are particularly susceptible to deep stalls if the wing loading is too low. C and D lines which are too short, for example, can often be recognised because launch behaviour deteriorates. You can recognise a deep stall because there is less flight noise than normal. In addition, your sink rate will increase (6-8 m/s).

#### **Recovery**

The XWing couldn't be deep-stalled at all during our test flights. The usual recovery procedure would be to decrease the angle of attack by shortening the A- and B-lines. But this would require huge forces at the X-LIGHT. Better would be to decrease the angle of attack by pulling both trim levers back.

Caution! Accident risk!

A wet canopy or flying in the rain increases the weight of the canopy and may cause a stall. You are not allowed to fly under these circumstances.

#### **FRONTSTALL**

Strong turbulence can cause part or all of the leading edge of the glider to fold or tuck under. Normally the RelaX will immediately recover into its normal flight position.

#### **RECOVERY**

If the XWing does 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 much outside the allowed and safe weather conditions. If you get into such weather land as soon as possible a continue not before the weather got quieter!

#### **ASYMMETRICAL TUCKS**

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

During test flights the RelaX self-recovered on release of the A-risers which were pulled down to initiate the collapse. It turned less than 90° and stabilised itself.

#### **Recovery**

- Counter-brake slightly on the side of the paraglider 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.

Caution! Accident risk!

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

### **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. The result is an almost vertical descent with a sink rate of about 8-12m/s.

#### **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.

Caution! Accident risk!

If the canopy has gone backwards, you must hold the brakes down, or the canopy can surge forward and, in an extreme case, end up underneath the pilot. Hold the brakes down until the canopy is above you again.

### **SPIN**

Spins occur when one side of the canopy stalls. The other side still continues to fly forward, while the stalled side turns in the opposite direction.

### **RECOVERY**

Quickly release the brakes.

#### **Note!**

If the spin does not stop:

1. Check whether you have released the brakes fully.
2. If the spin still doesn't stop, use your recovery system.

Caution! Accident risk!

In strong turbulence, always keep far enough away from rock faces and other obstacles. You need time and enough height to recover from extreme situations.

## Break-In Phase

The engine should no longer run at full load for the first 2 hours of operation.

## Revolution

The engine is set so that the maximum engine speed is 6300 rpm.

If the maximum speed is higher or lower, this can be adjusted via the pitch on the propeller.

The higher the pitch, the lower the maximum speed. With decreasing speed also the performance of the engine decreases.

## Cylinder Head temperature. CHT

The engine F23 has enlarged cooling heads and air baffles. The baffles must always be free in flight. The inlet opening must under no circumstances be reduced or even closed. The head temperatures should not exceed a value of 235 °

If this value is reached or exceeded, the display in the cockpit starts to flash.

If the maximum temperature is reached, the temperature can be lowered quickly by reducing the speed.

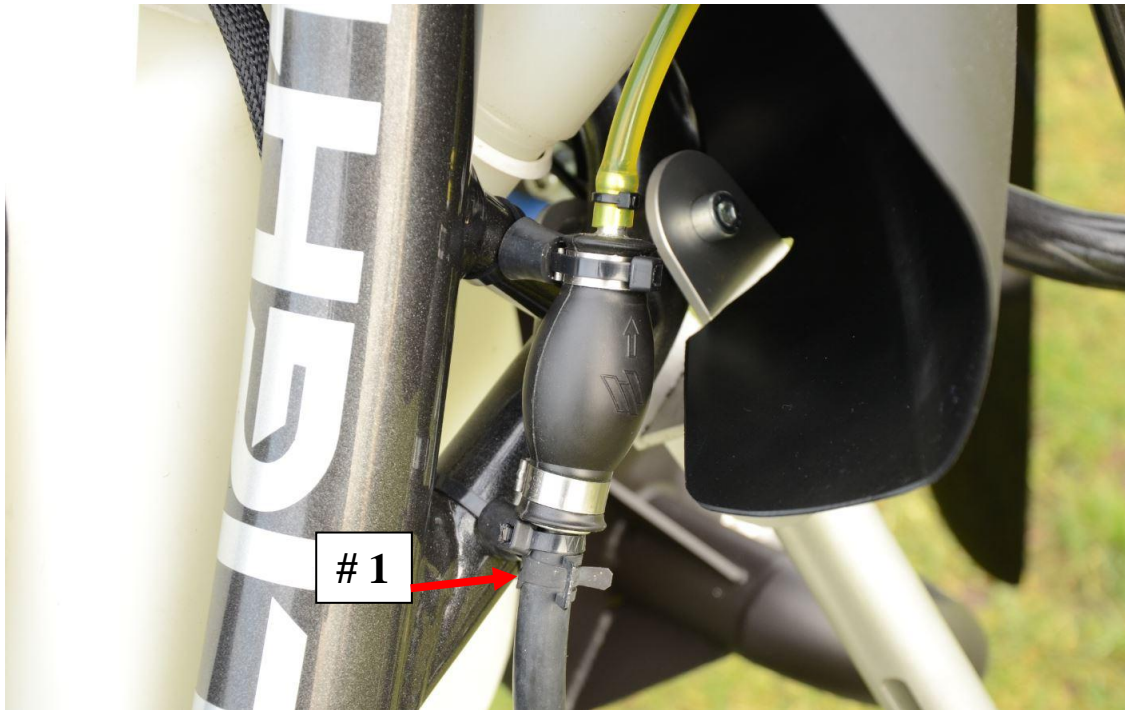
## Exhaust gas temperature. EGT.

The engine F23 has enlarged cooling heads and air baffles. The baffles must always be free in flight. The inlet opening must under no circumstances be reduced or even closed. The head temperatures should not exceed a value of 235 °

If this value is reached or exceeded, the display in the cockpit starts to flash.

If the maximum temperature is reached, the temperature can be lowered quickly by reducing the speed..

Engine	2 Cylinder 2 Stroke Boxer
Cooling	Air Colled
Engine Housing	Aluminiumguss
Cylinder	Aluminiumguss mit nikasilbeschichteter Laufbuchse
Bore / Stroke	72 / 64 mm
Volume	521 ccm
Power	36,7 kw bei 1/min
Cylinder Head	Maximo
Mixed Lubrication	1:50 / 2 % Oil
Ignition	Digitale Magnet Ignition
Sparr Plug	NGK BR8 HS
Carburettor	2 x Membran Carb WB 37
Gear Box	Poly-V Drive/Belt 815 13 PK
Engine Weight^	
Total Weight	107 kg Without Glider



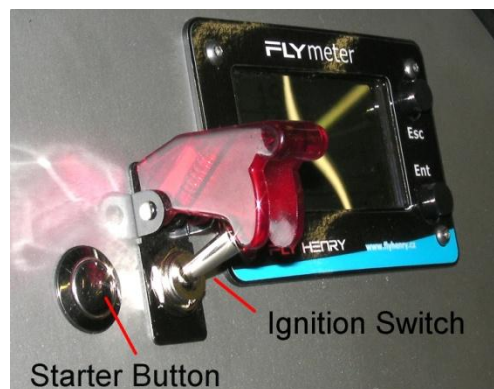
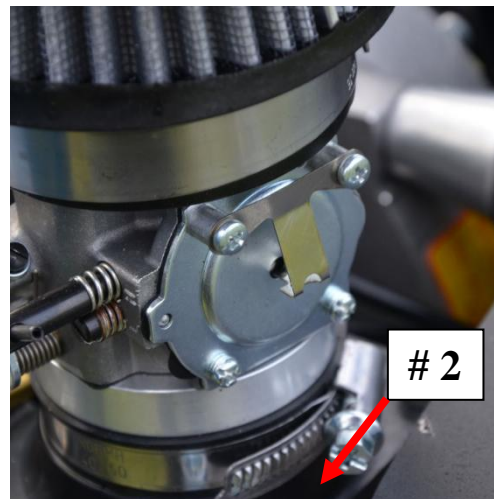
Before the engine can be started, the ball pump # 1 must be used to pump gasoline from the tank to the carburettor.

At the same time the tipper # 2 is pressed on the carburettor. Pump each per carburetor for one second.

Immediately before starting, switch on the ignition.

Now sit in the trike, activate the Ignition Switch and start the engine by means of electric starter with the starter button with no throttle. If necessary, repeat this procedure.

In case you have pumped to much fuel into the carb, start the engine with 1/3 throttle.



# X-Light

## Choke

## **DAILY INSPECTION**

The safety of an aircraft depends on his regular, diligent inspection and maintenance.

1. Engine: Pay attention to leaks
2. Check propeller for tightness and damage.
3. Check the frame and cage for cracking, paying particular attention to the areas of the belt and the engine mount.
4. Springs on the exhaust
5. Brake Lines
6. Electrical connections, spark plug, throttle cables.
7. Check Paraglider - All lines without knots or damage.  
No deformation, cracks or visible external damage
8. Check the gear box belt for tightness and condition

NOTE: A turning the engine by hand on the propeller for testing purposes is possible.

**The ignition must be switched off!!!**

8. Check the entire pilot suspension
9. Check chassis for damage and rubber parts of the suspension
10. Check front brake and tire
11. Pedals free and cable o.k
12. Check seat boards and belts for strength and damage
13. Tires and air pressure ( frontwheel 1,5 bar , Rear wheel
14. Rear Axle: Check for damages
15. Cable on Rear Stainless Steel Axle o.k.?
16. Trailer Hook

## Periodic Tests

Before commencing flight operations and before each flight, the pilot in charge must carry out a visual inspection of the entire trike.

The necessary expertise is provided during the pilot training, special details also in the device briefing.

### Each 25 hours

- Visual inspection of all fittings
- Control on play and free movement of all moving parts, especially the
- Wheel suspensions, spring elements etc.
- Lubricate these parts: metal on metal: machine oil,
- Metal on plastic: silicone spray
- Checking the wheel brake
- Checking the throttle cables
- Checking all straps and belt buckles and pulleys
- Check (visual inspection) of all welds for cracking
- Check all rubber-metal connectors (silent blocks) for cracking or fissures
- Checking the gasoline filter
- Check the tightness of the engine

### Each 100 hours

- Change of spark plugs and connector
- Change of gasoline filter.
- Check Intake rubber manifold

-

### Each 300 hours

- Replace the carb membrane

### Each 500 hours

- Replace Needle bearing from the piston
- Replace piston rings

-

### Each 1000 hours

- Every moving part should should are replaced.

### Every Year

Complete check at Fresh Breeze or partner

**WITHOUT THESE CHECK'S NO WARRENTY OR OTHER CLAIMS!  
PLEASE USE ONLY FRESH BREEZE GENUINE SPARPARTS.THIS WILL TAKEN POSSESSION  
ALL SAFETY AND STIFFNESS WHICH IS REQUIERED FROM DULV.**

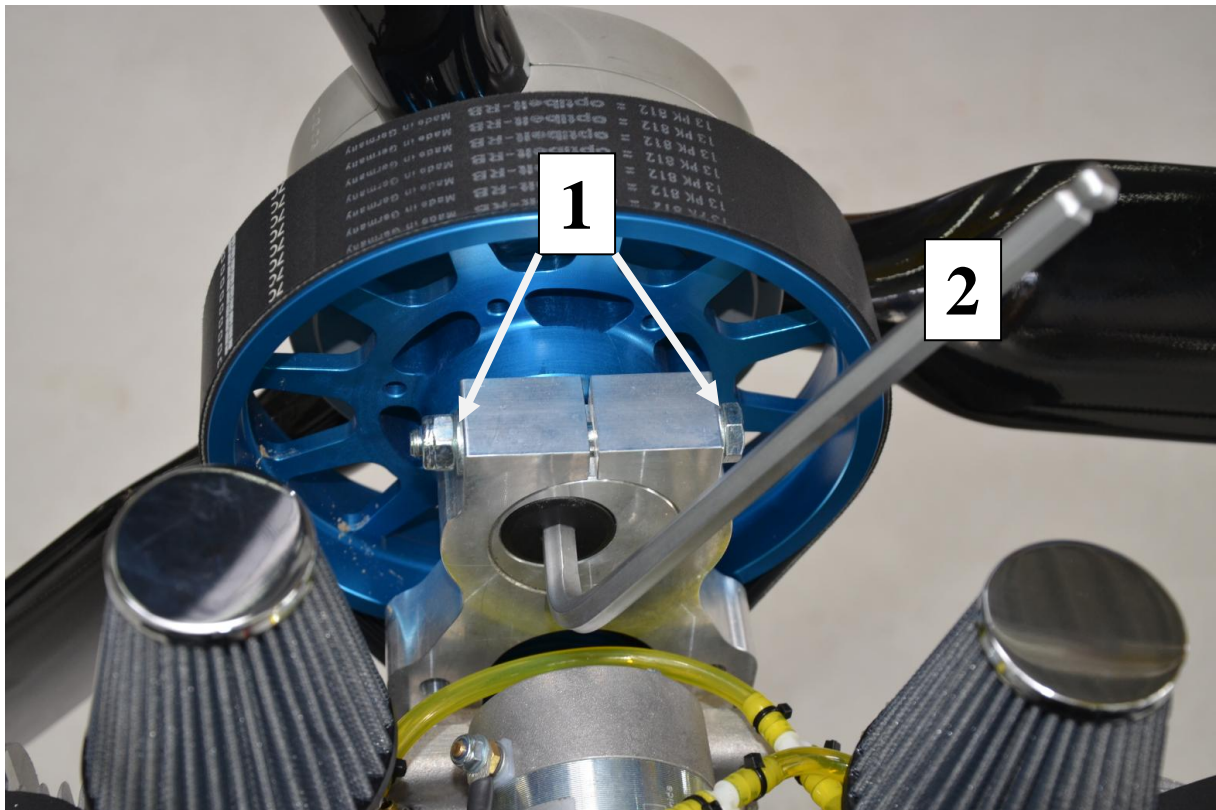
**!!!**

**BE SURE TO FOLLOW THIS SAFETY ADVICE EVERY TIME YOU USE  
FRESH BREEZE MOTORS !**

- USE YOUR ENGINE CAREFULLY. DISREGARDING ANY SAFETY ADVICES AND INCAUTIOUS BEHAVIOUR MAY LEAD TO SERIOUS INJURIES.
- NEVER COME CLOSE OR GRAP INTO THE SPINNING PROPELLER. HIGH RISK OF SERIOUS INJURIES.

# Periodic Test's





The belt is tensioned by an eccentric cam which varying the distance from crankshaft to hub shaft.

Here first the screw (1) must be loosened.

With a hexagon socket (2) (12 mm), the eccentric is twisted and tightened or loosened the belt.

# Belt Tension



The Boxer is equipped with 2 diaphragm carburetors WB 37. The carburetors do not need to be synchronized because both cylinders are seated on a non-separated crankcase. Nevertheless, the adjusting screws 1, 2 and 3 should be as synchronous as possible.

1 = Throttle valve stop for idle adjustment

2 = partial setting (basic setting 1 turn)

3 = full setting (basic setting 1 turn)

The idle speed is about 1800 1 / min

Full load EGT approx. 600 ° + C. If the value is significantly higher, the adjusting screw 3 must be turned out ¼ turn to grease the mixture. Possibly. repeat after test flight.

Should the engine stutter somewhat at 4000 rpm in the partial load range, screw in the adjusting screws 2 approximately 1/8 turn. The engine is thereby adjusted leaner.

Should the engine stutter at full throttle turn in screw 3 for 1/8 turn.

**The basic setting:**

H = 1 complete turn

L = 1 complete turn