

FREE-FORCE 3

AFS
AUTOMATIC FLIGHT STABILIZATION
PPN
PRECISION PROFILE NOSE®



U-TURN

your airline...

- Manual - English Rev. 1.2

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All technical details in this manual have been carefully checked by U-Turn. However we like to mention that we don't take any liability for possible mistakes, neither in legal responsibility, nor in liability cases that derive from mistakable details. We preserve the right to change this manual in any way to achieve technical improvements.

You`ve got the stuff to fly!

The U-Turn team would like to congratulate you on the purchase of your new U-Turn paraglider. You have made an excellent choice. We wish you long and enjoyable flights and many happy landings with your U-Turn FREE FORCE 3.

The research and Development team at U-Turn can proudly look back at many successful years in the flight sport industry. Our own concepts not only meet but exceed industry standards. The combination between the latest computer based technology and the know-how of experienced test pilots and professional competition pilots provides an excellent basis for quality. We certainly keep our customers need in mind, and always appreciate your input and constructive criticism. Should any questions occur, please don't hesitate to ask your U-Turn dealer or the U-Turn team.

In order to provide you with the latest information on technical development and innovations at U-Turn, we ask you to complete the questionnaire attached. Please mail it to the following address:



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Please read the entire handbook carefully before using your U-Turn FREE FORCE 3 for the first time. We composed this handbook, in order to make the handling of your new U-Turn FREE FORCE 3 as safe and easy for you as possible.



Business Replay Card

U-Turn GmbH
Im Neuneck 1
D- 78609 Tuningen



Name : _____

First name: _____

Street: _____

Zip code/ City: _____

Telephone: _____

E-Mail: _____

Paraglider type: _____

Serial number: _____

Date of purchase: _____

DealershipP: _____

Tested by: _____

Flying hours: _____

Paraglider since: _____

Miscellaneous: _____

Yes, I would like to get the newsletter by E-Mail



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Introduction

U-Turn paragliders are in a class of their own. U-Turn doesn't compromise on safety, and uses the best quality components and hallmark flight characteristics. Congratulations on your purchase of U-Turn glider, as it is the brand for those who appreciate the difference.

The laws of physics are well defined. We aspire to achieve to the possible within the framework of its laws. We admit this is ambitious but you will always find U-Turn at the cutting edge of technology. As Oscar Wilde once said in this very British understatement: "His taste is very basic; only always the best is good enough." The U-Turn team embodies this attitude; "We always want to deliver the best possible glider." Nothing more and most certainly nothing less.

U-Turn staff takes notice of its customers' wishes, so we appreciate any comments or feedback! Please feel free to contact your competence center or U-Turn directly for any advice or direction.

IMPORTANT:

Having the necessary level of experience can never substitute the need to familiarize yourself with the glider before leaving the ground. Please carefully read the handbook and take advantage of the support from your flight school, or U-Turn directly for that matter.

Please always remember that aviation can be potentially dangerous and your safety is in your own hands. We strongly encourage you to fly conservatively; this includes the judgement concerning conditions as well as the choices you make in flight.

The FREE FORCE of U-Turn is established as the perfect wing to begin acrobatic paragliding. Now the wing is upgraded: The FREE FORCE 3 got features like the Precision Profile Nose (PPN-system) which improves the start and flight characteristic. More than ever the FREE FORCE is the wing to enter the world of the cool acrobatic tricks- the genes of the reference wing THRILLER are obvious in every trick.

The FREE FORCE 3 got like the THRILLER compared to the in its time revolutionary G-FORCE a reduced aspect ratio. Because of the modern and high efficiency profile this is possible without lost in dynamics. With the AFS and the PPN-system features the FREE FORCE 3 is suited for daily use on EN B level, where most of the ratings are even better.

"The FREE FORCE 3 stands for dynamic flight fun on a high safety level. Because of the THRILLER-like manoeuvrability and agility combined with the safety reserves of the AFS, it is the perfect wing to all who want to begin acrobatic paragliding" points out chief designer Ernst Strobl the rage of use. At same time the FREE FORCE 3 got many friends in the XC pilots as well. Despite its relatively small sail, it is eager to gain altitude in thermals. With a max speed of 56km/h (fully loaded) the wing is quite fast. And the AFS cares with many small corrections for the maximum altitude when FREE FORCE pilots go for XC.

The use of the PPN technology and the abdication of the heavy nose mylar reduce the weight of the FREE FORCE 3. This more in dynamics is clear to feel in flight. Another advantage coming from the PPN is the improved starting ability. With the PPN nothing is deforming the leading edge anymore and the FREE FORCE 3 offers consistent performance for a long lifetime.

The AFS feature in a wing made for ambitious pilots- discussed after presentation of the first FREE FORCE. But the system is proven now in praxis as expected. So it is used in the FREE FORCE 3 again. The AFS in its latest version got only advantages. Dynamic figures are just easy to do and the performance reserves get in action if needed. "In dynamic manoeuvres the AFS is not active because the high internal pressure prevents interaction" says Strobl.

On the other side in tricks like the MacTwist, when the pilot mistakes the time to break the AFS breaks automatically and prevents the wing from overshooting too far in a potential dangerous level. "By the very sporty design of the profile I could increase the sail tension in the FREE FORCE 3 significant compared to an EN-A wing" announces Strobl. The increase of this effect is clear to notice. Anyhow the system is not preventing the pilot learning the tricks: The one who is breaking correct will not notice the AFS. Naturally this is not only valid for the MacTwist, for all other tricks too.

"All 44 cells of the FREE FORCE 3 are featured by the AFS", Strobl points out. "The collapse resistance isn't the main issue but the prevention of overshooting." Conclusion: The one who searches a wing to get into the acrobatic flying like the pros, but wants to have a forgiving wing will find the perfect match in the FREE FORCE 3.

The total result: The use of the PPN-system together with the AFS pushes fun and dynamic. FREE FORCE 3 is THE more fun and performance with the extra portion safety.

Topic XC: Despite the small flat area the wing is eager in thermals. Gaining altitude is the mission of the FREE FORCE 3. Once on top the wing rewards with a minimum sink of 1,1m/s. While going for XC the wing benefits from AFS too. The system smoothes out minor turbulences by breaking automatically. This results in gaining altitude each time. In theory this is a trade off in speed, but still rests a trim of 38-39km/h and 53 to 56 km/h (full loaded) accelerated. The wing can't hide its roots in the mega dynamic G-FORCE and THRILLER. Fly fast, high and safe! Thats the message of the FREE FORCE 3. And the one who wants to discover the tardiness no problem for the FREE FORCE 3- the average minimum speed is 23 km/h.

PPN description

2 systems, one purpose:
Highest safety by AFS and PPN

The U-Turn FREE FORCE 3 opens a new safety chapter in paragliding: The combination of the PPN system (Precision Profile Nose) with the unique system of automatic flight stabilization (AFS) takes care for the so far unreached resistance against collapses.

The U-Turn FREE FORCE 3 defines the new safety standard in the DHV/LTF 1-2 gliders.

PPN technology provides unprecedented stability, superior take-off behavior, and ideal flying qualities. For several years, now synthetic rods have served as a replacement to the Mylar panels in the cell walls of the wing at the leading edge. This reinforces the shape of the nose. U-Turn has taken this a step further in teaming this technology up with AFS and work together in concert.

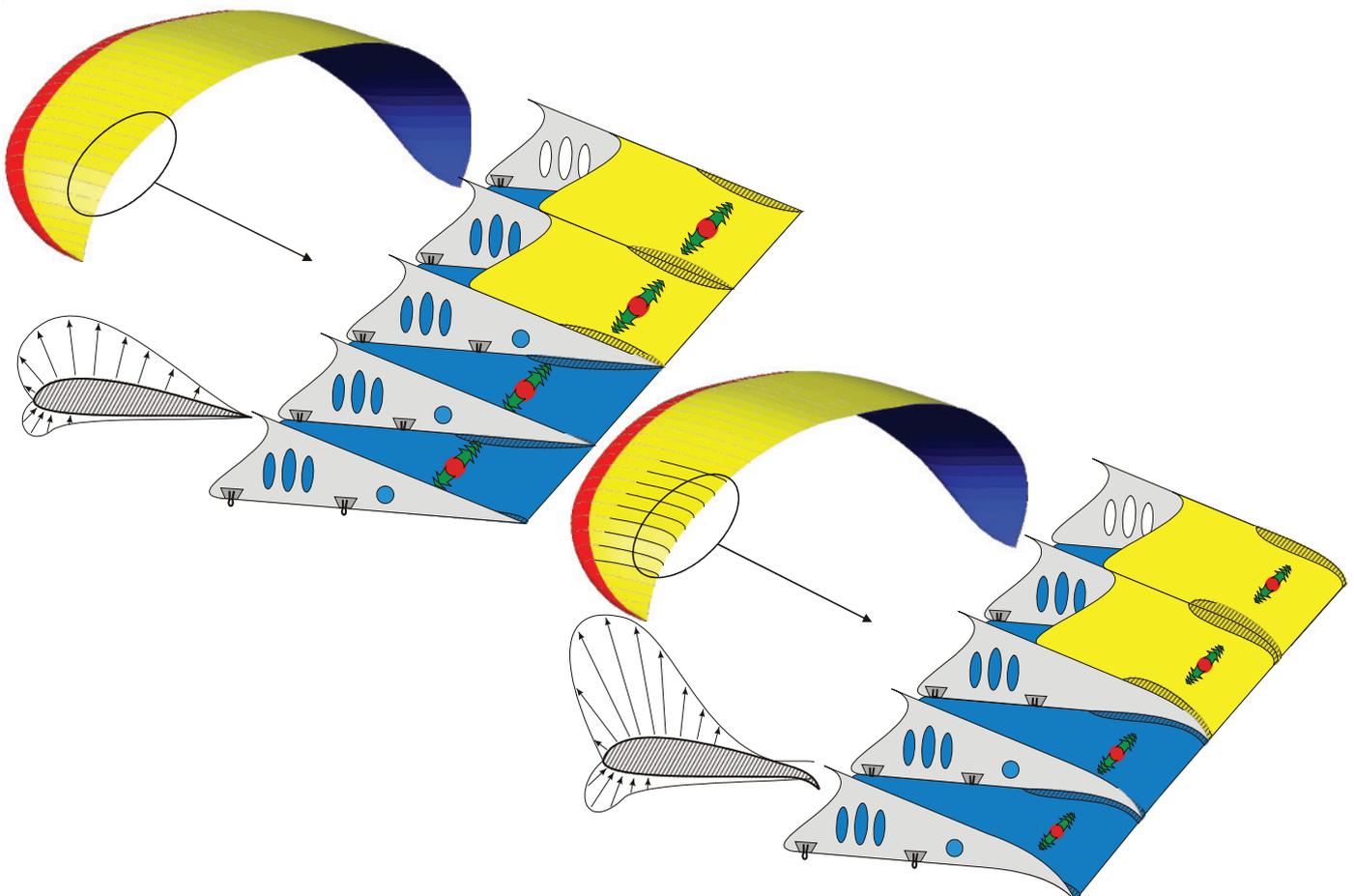
The synthetic rods in the seams of the leading edge sustain the shape of the nose, optimizing the airflow along the profile. Even under extreme flying conditions the small PPN rods keep the cells at the leading edge open in a way Mylar would not be able to do. These characteristics give the glider an unmatched stability. Internal pressure is maintained noticeably longer and the shape of the nose is held up. Even if the internal pressure diminishes, the AFS kicks in by equalizing with the providing the necessary sail tension. The complimentary interaction of these two systems provide this line of gliders with an unparalleled collapse-resistance.

Unlike Mylar, if handled carefully PPN technology will retain the shape of the nose for the entire lifetime of the glider. In order to provide the greatest possible protection when folding the glider, U-Turn recommends the optional U-Turn Tubebag. This inner packsack enables you to fold and store the FREE FORCE 3 with ease in accordion fold, even on windy days and/or by yourself. The Tubebag preserves the excellent take-off and flight qualities of the glider, thus favorably influencing its resale value. PPN technology also means that the canopy is lighter weight than with Mylar reinforcement. This reduced canopy weight made possible by the PPN technology increases the performance and improves the handling of the glider. The Tubebag itself is produced with the workmanship you would expect from U-Turn and lives up to the highest demands in use. It features many functional details and ensures that the FREE FORCE 3 preserves the launch and flight qualities for many years to come - an advantage that can increase the resale value. The glider has become lighter ever since abandoning the use of Mylar in the cell openings and replacing them with synthetic rods. Its handling advantages and increased performance can be also attributed to PPN technology.

To fly safely means to fly actively

- the system employed on the U-Turn FREE FORCE 3 allows this to happen automatically to a certain level. The secret of the AFS-system is based on a pre-tensioning principle. In the area of the brake attachment points the undersurface is pre-tensioned. Whilst the sail is gliding through smooth air, there is enough pressure inside and the pre-tensioning is neutralized: The effect of internal pressure is more powerful than the pre-tensioning and the trailing edge stays aerodynamically perfect in the air like a conventional glider. When entering turbulent air with the FREE FORCE 3 the system adjusts immediately, even the slightest drop of internal pressure allows the system to react. The pre-tensioning at the trailing edge is effectively like pulling the brakes.

Ernst Strobl recalls the fine-tuning: "Our computer-based calculations were impressively confirmed during our tests". The system is extremely responsive so that a top-quality manufacturing is key. U-Turn Co-founder Thomas Vosseler adds: "We guarantee a strongly supervised manufacturing process". The AFS works like the Electronic Stability Programs known in the automotive industry, you could call it an "ESP for the air". It intervenes for the benefit of safety when an inexperienced pilot, or a pilot in trouble, enters turbulence and is unable to fly actively. Experienced flight-instructors confirm: "This is a major step as far as safety is concerned. The main reason for accidents, the full collapse of the canopy, is minimized dramatically". Even without AFS the U-Turn FREE FORCE 3 would be a very safe glider says Strobl. Due to the extremely pulled down wingtips and the resulting spread of the wingloading the U-Turn FREE FORCE 3 has far more than average resistance to collapses. The FREE FORCE 3 gliders stably ahead even after an accelerated asymmetric collapse, a situation that may happen after leaving a thermal, even with 50% of the wing area collapsed. This is unprecedented. The computer optimised wing layout leads to very good thermal lift and maximizes the stall characteristics, both improving safety.



Linesystem

In the U-Turn FREE FORCE 3 we use 0,9/ 1,1/ 1,3 /1,6 /1,9 und 2,3mm and Technora by TAE-GU Lines Weaving Inc. and Lyros Dyneema Lines, with a special waved Dyneema core. This stretch resistance prevents changes in flight characteristics caused by different stretching after a short time of use. An optimum of safety and strength in proportion to drag is achieved by the use of different line diameters. The whole line system consists of single elements that are sewn and looped on both ends. All suspension and brake lines are forked in the upper cascade. The different color of the lines guarantee ease of handling and control. All suspension lines are looped separately in maillons and connected to the risers. The maillons have clips built in to prevent slipping of the lines. The main brake line is looped through a pulley at the D-riser with a color marking where a brake toggle has to be tied off.

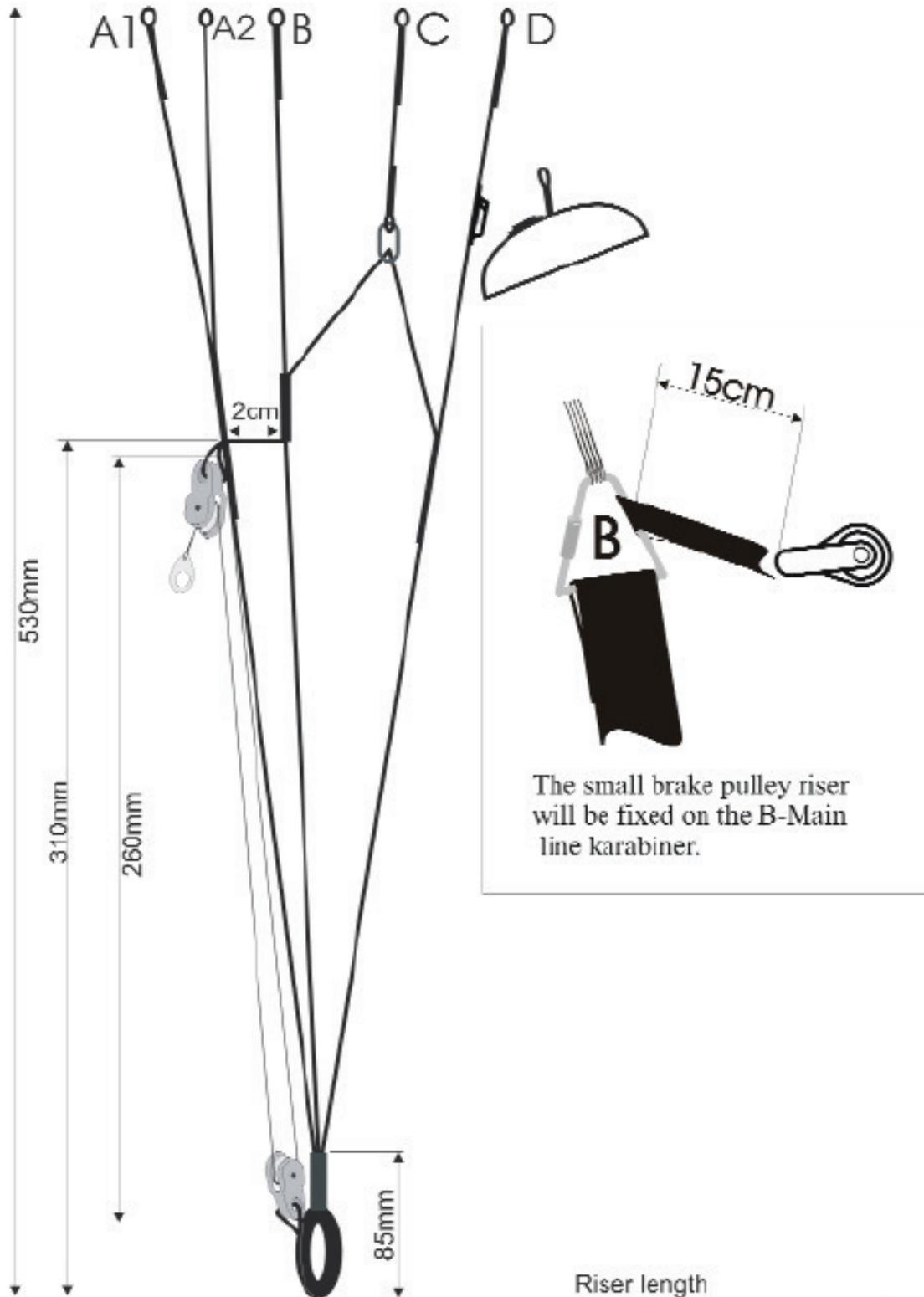
The manufacturer settings is 0 travel plus 5 cm. Shortening more than 5 cm is not allowed and results in a "brake" condition in flight which is extremely dangerous for takeoff, flight and landing. The factory settings provides sufficient brake travel on landing and in extreme flight conditions, as well as a comfortable arm position on trim speed.

Please note that with the height of the harness mounting also the relative distance changes. When adjusting the setting, both sides have to be symmetric and a permanent knot has to be used. Optimum solution is the so called "Spierenstich" knot which doesn't slip or affect the lines adversely.

Riser

The A- and B-risers have a different colour to ensure positive identification at take off and during a B-stall descent. The length of all risers has been chosen in a way to get easy access to all lineshacksles in flight for special manoeuvres. Made of rigid and stretch resistant Polyester-webbing, the FREE FORCE 3 risers guarantee a long term, stable trim.

FREE-FORCE 3



The small brake pulley riser will be fixed on the B-Main line karabiner.

Riser length

Riser A:	Riser B:	Riser C:	Riser D:
normal: 530 mm	normal: 530 mm	normal: 530 mm	normal: 530 mm
acceleration: 360 mm	acceleration: 380 mm	acceleration: 450 mm	acceleration: 530 mm

Speed System

The U-Turn FREE FORCE 3 is equipped with a very effective leg-actuated speedsystem that increases the speed btw. 13 and 17 km/h depending on model and pilots weight area load respectively. During extreme manoeuvres the speedsystem should not be activated, when entering an extreme manoeuvres it should be immediately deactivated. All extreme manoeuvres (i.e. stalls...) get more dynamically at higher speed.

Because the maximal adjustment of the accelerator is related to the safety characteristics of the canopy it may happen, that - using certain harnesses - the broad accelerator adjustment is not available.

Suitable Harness

All officially approved harness systems with mounting about the breast height are suitable for the FREE FORCE 3 (they have to be LTF and DHV rated GH). The lower the mounting, the better is the steering by shifting of the bodyweight. U-Turn recommends the new IQ4 harness for its highest level of safety and convenience. The positioning of the mounting also changes the relative brakedistance. If you have any questions about the usage of your harness with the FREE FORCE 3, ask your U-Turn dealer or directly contact U-Turn. We assist you in any possible way.

Suitable Rescue System

It is required by law and absolutely necessary for safe operation of your paraglider that you always carry a rescue system with you. When choosing a rescue system, watch out that it is approved and suitable for the intended takeoff weight. With the innovative rescue systems of the SECURE-series by U-Turn light-weight, convenient and safe reserves are available. The SECURE rescues offer extremely short opening times and low sink-rates.

Operation

This instruction manual only pays attention to those points of flying technique which are important for the FREE FORCE 3. It is not meant to substitute a basic flying education in an approved flying school! If a flying education and the appropriate experience is missing, paragliding is dangerous to life.

Range of Operation

The FREE FORCE 3 has been developed and tested for ordinary takeoffs, winching, and is also well suitable for motoized operations. An unauthorized or unapproved use of the FREE FORCE 3, or operation out of its operational limits is improper and dangerous.

Aerobatics

Aerobatics are illegal and dangerous. There is a danger of unpredictable flight conditions that could result in overstressing both material and pilot.

Motorised Paragliding

The U-Turn FREE FORCE 3 is suitable due to its outstanding launching characteristics, its wide weight range and its unproblematic handling particularly well for the motorized paragliding. Please note that for the motorized use its own permission of the combination is necessary for engine unit and glider. If you intend to operate the EMOTION 2 motorized, please contact the motor manufacturer, U-Turn and the DULV (Deutscher Ultraleichtflug Verband) for official approval. Use only approved motor / glider combinations and adhere to the regulations as well as the training requirements.

Preflight Check

A careful pre flightcheck is absolutely mandatory. Double-check everything when you don't fly yourself and make sure the person flying your FREE FORCE 3 does the same. Also ensure that the pilot flying your FREE FORCE 3, knows its operational limits and has the required license.

All lines, risers and the canopy have to be carefully checked for damage before every takeoff. Even in case of minor damages takeoff is not an option. After the glider is unpacked and layed on the ground in a halfcircle-shape, check following items:

- Lay down the canopy to draw on the middle line before the outer lines, when pulling up the glider with the A risers, to get an easy and stable takeoff.
- Set yourself up into the wind to get a symmetrical load on both sides when pulling up the canopy
- The risers may not be twisted to enable smooth looping of the brakelines.
- Make sure no lines are under the canopy to avoid a dangerous situation on takeoff.
- Preflight all other equipment after the check of the glider carefully.

Take off

It is important to evenly lay out the canopy with care. The middle of the glider is determined by the U-Turn FREE FORCE 3 logo at the leading edge. It is sufficient to only hold the A-main harnesses. Being that the U-Turn FREE FORCE 3 shows no tendencies to overshoot forward it only needs to be slowed down minimally in the takeoff phase. Necessary corection in direction using the brakes should only be performed once the canopy is above the pilot, otherwise the glide might fall back due to excessive braking.

The remaining risers should not be held during takeoff. The canopy will fill up with evenly distributed pull but altogether very light startimpulse. Unlike other gliders it is not necessary to fill the U-Turn FREE FORCE 3 with strong inflation motion or even several fast steps. This is also true for very little wind and even zero wind. The easiest and safest way to start the U-Turn FREE FORCE 3 is moderate inflate. Once the pilot ensures that the canopy is fully opened above him, the final decision for take off can be made. After several forceful steps they take off.

Turning

The U-Turn FREE FORCE 3 has a normal agility and reacts directly and instantly to steering inputs. You can fly flat turns with little altitude loss by shifting of bodyweight. A combination of appropriate pull on the inner brakeline and shift of bodyweight is the best way for a coordinated turn. The Turn radius depends on the amount of pull on the brakeline. At about 75% of brakeline travel, the FREE FORCE 3 increases bank significantly and performs a fast steep turn that can be continued to a diving spiral. The diving spiral has to be initiated and terminated slowly. The bank angle is controlled by increasing and decreasing the pull on the inner brakeline.

Warning: A rapid pull on the the brakeline may cause a spin.

Active Flying

The U-Turn FREE FORCE 3 should be flown with light braking on both sides when there is turbulent air. An increase in angle of attack provides better stability. When entering heavy thermals or strong turbulences be mindful of that the canopy does not get behind the pilot. To avoid that, release the brakes a bit to get an increase in speed when entering the updraft.

If the canopy gets in front of the pilot when leaving a updraft or entering a downdraft the brakes have to be applied to counter that. Accelerated flight however is advisable when flying through a downdraft zone. The FREE FORCE 3 is very stable overall, never the less is active flying a big flight safety factor. Collapsing and deforming of the canopy can be avoided by active flying (as above mentioned) in turbulent air.

Landing

Start your landing preparation at sufficient altitude. Due to its excellent flaring characteristics, the FREE FORCE 3 is very easy to land. Glider in fairly normal to a straight- in final against the wind and get up in the harness early enough. According to the wind, the brakes have to be pulled firmly and dynamically, about one meter above ground, beyond the stalling point. If there is a strong headwind, be careful with the amount of braking. Don't perform landings out of steep turns and big directional changes short prior landing, to avoid PLF.

Warning: During a strong wind takeoff attempt, ground handling and landing the leading edge can hit the ground with high speed. Avoid this! Otherwise the ribs, the sewings or the fabric can be damaged.

Winching

Because of its excellent starting characteristics, the U-Turn FREE FORCE 3 is well suitable for winching operations. Take the following points into account:

- maximum line tension for winching is 100kp.
- if not operating at your usual winch, get acquainted with the local procedures and get a good briefing by a local pilot.
- body position and pulling up the canopy does not differ from a normal takeoff. The canopy has to be completely over the pilot at takeoff. No early steering inputs to avoid falling back of the canopy or being pulled off with a non flyable glider. Never give the takeoff -command before you have total control over your glider. Don't turn too much during the takeoff -phase and before reaching the minimum safe altitude.

- never winch the FREE FORCE 3 with loads outside the allowable weight range
- all involved persons, machines and accessories have to have the appropriate licenses, approvals, certifications for winching.

Advanced Handling

Even with its high stability and good flight characteristics it is possible that the FREE FORCE 3 gets into an extreme flight condition due to pilot mistakes or turbulent air. To be prepared for such situations and able to handle them in a calm and superior manner it is best to take part in a flight safety course.

Advanced manoeuvres may only be flown at sufficient altitude, in calm air and with professional supervision (i.e. during a safety course). Once again we mention that a rescuesystem is required by the law.

The following extreme manoeuvres can be either caused intentionally, by pilots mistakes or by bad weather conditions. Every pilot can get in such a situation! All mentioned extreme manoeuvres are dangerous if they are performed without the appropriate knowledge or enough altitude or the necessary introduction. A wrong execution of these manoeuvres may have fatal consequences!

Wingovers

The pilot has to perform right and left turns with increasing bank until the desired angle is reached. Appropriate brake pressure during up or down swing will prevent the wing tips from folding. Collapsing is only a factor.

Full Frontal

A negative AoA caused by turbulences or the simultaneous pulldown of the A-risers by the pilot, results in a frontal collapse of the leading edge. The FREE FORCE 3 normally comes out of a frontstall by itself very quickly. Smooth and symmetric applying of the brakes assists the opening of the canopy positively.

Deep Stall

The FREE FORCE 3 is not stall sensitive. If in a stall, caused by overpulling on the brakes, the rear risers or a delayed B-stall exit, the release of the brakes or the rear risers, recovers the stall. Should the stall be caused by an extreme flight condition or configuration (i.e. takeoff weight to low), a symmetric forward push on the A-risers or step the speed system recovers the stall.

Warning: Practicing stalls should be done with enough safe altitude. Never apply asymmetric brakes during a stall, it could cause a spin.

Fullstall

To enter a fullstall pull both brakes full travel (ensure no twisted or wrapped lines). The canopy has to be stabilized before recovering the fullstall. Rise both brakes slowly and symmetrically to recover. If done right, the canopy overshoots a little forward without collapsing. Avoid an asymmetric recovery by all means. The dynamic forces drive the canopy to overreact and a collapse could occur.

Warning: Never release the brakes at the beginning of the recovery when the canopy tilts forward, the canopy may accelerate forward in a way that makes contact or even falling into the canopy possible.

The fullstall is a dangerous manoeuvre and should not be performed intentionally except during a flight safety course.

Emergency Piloting

In any situation where normal steering with the brakelines is not possible, the FREE FORCE 3 can be steered with the back risers easily.

Negativ Turn

To enter a spin the pilot has to fully and quickly pull one of the brakelines when he is near the stallpoint. The glider rotates fast around its center while the inner wingtip flies backwards. For recovery just release the applied brake to let the glider accelerate.

Warning: The spin is a dangerous manoeuvres and should not be performed intentionally except during a flight safety course.

Collapses

Even with its high stability and very responds well in turbulence, strong turbulences can cause the FREE FORCE 3 to collapse. That situation is not really dangerous and clears itself automatically, without any further input required. To support the recovery, firmly apply brakes on the affected side and simultaneously steer opposite on the open side. When a large part of the canopy is collapsed be careful and smooth when applying opposite steering to avoid a complete disruption of airflow and entering a fullstall.

How to avoid collapses

Single side collapses close to the ground are the number one reason for accidents with paragliders. To avoid them, or how to handle the situation when it happened, some tips and tricks from U-Turn test- and competition pilot Ernst Strobl:

The best way to avoid collapses upfront is the right choice of the paraglider. A lot of pilots fly a glider that is a little too hot to handle for them. So why don't you get a glider with a lower rating but in the end fly better and higher in the updrafts and have a lot more fun and by the way be safer, too. To optimize the feeling for your glider on the ground, try the following:

Practise on the ground with the right wind at a suitable location. Slowly pull up the canopy and try to hold it up as long as possible without looking towards it. That is a good way to improve the feeling for your glider and is a prerequisite for „active flying“ (the key to avoid collapses). Very important is also a close look at the terrain. Watch for obstacles that could cause turbulences (buildings, trees, ...). On certain days, for example a freshly mowed madow as landing field, could cause a lot of thermal activity.

Fly very alert on a thermal active day. Watch your canopy, collapses most of the time, announce themselves. Light braking in turbulences mostly avoids a collapse. You should have already practised that on the ground. Should a collapse occur close to the ground don't always try to prevent a turn away. There is a danger when the braking on the open side is too strong, to lose the airflow on this side and stall the glider. Rather use the turn away motion to try to open the collapsed side.

Apply smooth braking on the open side, depending on the size of the collapse, and maybe a little pumping action. Some canopies open a lot better when the brakes are fully applied once on the according side, but that depends on the brakeline adjustment and your armlength. Wrapped lines are cleared by braking the opposite side at enough altitude and pumping the affected side a couple of times. Watch out for a possible stall. If that does not clear the situation, try to pull down the outer line as much as possible. If you are too low for that, stabilize the canopy on the opposite side to avoid turning away, and leave the lines like they are. Instead of any -risky manoeuvres rather concentrate on the landing. In the end one more advice in order to have all kinds of situations under control.

Visit a safety-training above water. There is no better way to practice the right behaviour than simulating a dangerous situation. Don't get caught off guard by your first collapse. In addition, during safety-training you can familiarize yourself with the particulars of your equipment and you gain confidence in your glider as well as your own abilities.

Thus far the experts advise concerning collapses,

by Ernst Strobl

Rapid Descent

In any situation where you have to get down ASAP for different reasons (weather, extreme updraft, or other dangers,) there are a couple of techniques that are described in this chapter.

Warning: The described manoeuvres stress you paraglider more than normal and should only be performed for practise or in a real emergency!

B-Stall

Another very efficient descent method is the B-Stall. It allows for a rate of descent of 6 to over 9 meters per second. Check the airspace under and behind you prior to initiating a B-Stall. To initiate it you hold the two B-risers above the lines carabiner. While you hold the brakes in your hands at all times, pull them down progressively and symmetrically. Hold this position. Your sail will stop flying forward, partially empty, and stabilize itself above your head. Exit B-stall flight by returning the risers symmetrically into their original position.

We recommend not to simply let the risers snap shut as this puts a lot of pressure on the material. In the paragraph titled "advanced handling" you can read what to do if you get caught unexpectedly in a stall.

Spiral Dive

Like a normal turn, it is very easy to get the FREE FORCE 3 into a spiral dive. The spiral dive gets you a descent rate up to 20 m/s. To prepare oneself in case of, practise it in optimum conditions. The diving spiral gets the pilot down faster than other techniques and is therefore best suited for an emergency descent. They move down vertically within the airmass. Don't forget the G-forces when diving down, and take that into consideration before initiating a rapid descent.

WARNING: If initiation is too fast there is a danger of a spin, in this case release the brake and try a smoother initiation.

WARNING: Never fly a spiral dive while "big earing" the glider. It is illegal aerobatics and may over stress the both pilot and material.

Big Ears

Pull both on the outer A-risers one after the other (grab the line shackles) about 15-20cm to fold the wingtips. Whilst holding the bracketoggles together with the A-risers. The glider stays fully steerable and descends with 4-7m/s straight forward. If you release the A-risers, the folded wingtips open automatically. Should there be any problem with the re-opening, you may pump the brakes gently. „Big earing“ is due to the high wingload a very stable flight condition and well suited for turbulent air.

Be aware that you reduce the trimspeed, but that can be compensated by accelerating with your legs.

WARNING: Don't fly extreme manoeuvres in this configuration, it is dangerous due to the danger of overstressing your glider. Fullstalls and spins are dangerous for a rapid descent because a wrong termination could have fatal consequences no matter what glidertype you are flying.

ALL KINDS OF RAPID DESCENTS SHOULD BE PRACTISED IN SMOOTH AIR AND WITH ENOUGH ALTITUDE TO BE PREPARED FOR EXTREME SITUATIONS WHEN YOU NEED THEM!



Maintenace and Care

Because U-Turn only uses high quality materials, your FREE FORCE 3 will be airworthy for many years if you take good care. The aging of your FREE FORCE 3 depends on the total flying time, the conditions you fly in, the amount of UV radiation it is exposed to and the intensity and quality of care. A couple of tips for maintenance and care:

Long lasting exposure to UV radiation and normal use stress the material.

- Don't expose your glider to the sun when there is no need to.
- Consider the choice of terrain where you lay out the glider for takeoff! .
- Assymmetrical and changing folding patterns prolong the lifetime of the material especially in the middle section.

Please take following points into consideration:

- regular checks for damage
- no unnecessary bending
- lines after overloads (tree landings, water landings, etc.) for its strength and correct length to be checked and exchanged if necessary.
- in case of changing in flight handling characteristics, the lines have to be checked for their correct length
- don't tie the brakelines on the grips if not needed, it weakens the lines

To clean the canopy use warm water and a soft sponge.

If you use a detergent for hard stains, make sure that you rinse intensively afterwards. Never apply any chemicals for cleaning, they weaken the material and damage the coating. Store your glider at a dry and dark location away from any chemicals. After two years or 300 flight hours, whichever occurs first, your FREE FORCE 3 has to be inspected by the manufacturer, in case of extreme use we are glad to do that earlier. Only you know about the condition of your glider. Should there be a need for any repairs they are to be done by the manufacturer.



U-Turn cannot be hold responsible for any 2-year inspection and any repairs not performed by U-Turn or an U-Turn authorized dealer. Any checking or repairing performed by people not authorized by U-Turn will cause denial of any warranty!



Safety Advices and Liability

This glider complies with EAPR, AFNOR (SHV and ACPUL) regulations, for the tested type, at time of delivery (see appendix).

The operation of the glider is at your own risk. The manufacturer and the dealer don't take any liability for accidents and follow on damages. Please consider all safety notes, cautions and warnings for safe flying. Further, we assume that the pilot has the necessary certifications and that the legal limitations are being followed. Use of the equipment is at your own risk. Follow the safety instructions for a safe flight. Special emphasis on following points:



- stick to the rules and regs of the country you fly in
- required licenses and actual experience
- use only suitable, approved and certified accessories (helmet, harness, safety systems...)
- appropriate weather condition
- suitable terrain
- all required checks done and airworthiness of the glider
- personal shape of the pilot
- know your manual and stay within the published limits

Nature and environment friendly behaviour

We ask you to perform our sport in a manner, that impacts nature and environment with minimum intensity. Please do not walk beside marked paths, don't leave any waste, please be not noisy and respect the sensitive biological equilibrium in the mountains. Especially at starting areas maximum care for nature is necessary.

Removal

The synthetic materials your U-Turn glider is build must be depolluted appropriately. Please send your U-Turn glider at the end of its life-cycle back to U-Turn. We will take care for recycling and removal.



Flächenbelastungstabelle / Table of area loading



Startgewicht / Take off weight (kg)	50	55	60	65	70	75	80	85	90	95	100	105	110	115	120	125	130
Free Force3 22	2,2	2,4	2,7	2,9	3,1	3,3	3,6	3,8	4,0	4,2	4,4	4,7	4,9	5,1	5,3		
Free Force3 24			2,4	2,7	2,9	3,1	3,3	3,5	3,7	3,9	4,1	4,3	4,5	4,7	4,9	5,1	

Materialliste

Bezeichnung der Verwendung im Gesamtsystem	Herstellerbezeichnung	technische Maße / Dimension Gewicht / Festigkeit	Lieferant / DIN Nr.
Aufhängungsschlaufen	Nylon	7,2 g/m / Bruchlast 110kg / 13mm Breite	Kolon Industrial Co. Korea
Beschleunigerleine	Nylon	Ø 4,0mm = Bruchlast 350 daN	Gin Gliders Korea
Beschleuniger- Bremsrolle	GIN Rolle		Gin Gliders Korea
Beschleunigerschloß	Brummelhook		Kolon Industrial Co. Korea
Bremsaufhängungen	Nylon	7,2 g/m / Bruchlast 110kg / 13mm Breite	Techni Sangles, France
Bremsgriff	High Tonacity Polyester Yarn 22mm	25 g/m / 1000 kg Bruchlast	Techni Sangles, France
Bremsgriffaufhängung	High Tonacity Polyester Yarn 22mm	25 g/m / 1000 kg Bruchlast	Gin Gliders Korea
Bremsgriffbefestigung	Magnet		Liros
Bremsstammlleine 2,3mm Ø	TSL 380	2,3mm = 260daN	Rosenberger Tauwerke Germany
Leinen, DSL70, TSL 140, 190, 220, 280, 380	Liros lines		Ansung Precision CO. Korea
Gurtumlenkungen	Stainless Steel	8g / Ø 3,8mm / Bruchlast 800kg	Ansung Precision CO. Korea
Leinenschlösser	Stainless Steel	12g / Ø 4,3mm / Bruchlast 1000kg	Parcher Marine, NCV, France
Obersegl Vorne / hinten	9017 €77A / DOKDO-30DMF	40 g/m² - 40 g/m² - 40 g/m² (PA 6.6 HT)	Paratex, Germany
V-Tape	RS3	40 g/m² (PA 6.6 HT)	Dimension-Polyant, Germany
Profilnase Verstärkung	P 260	283 g/m²	Paratex, Germany
Rippen, Profile	RS3	40 g/m² (PA 6.6 HT)	Techni Sangles, France
Tragegurt	High Tonacity Polyester Yarn 22mm	25 g/m / 1000 kg Bruchlast	Parcher Marine, NCV, France
Untersegel	DOKDO-30DFM	40 g/m² (PA 6.6 HT)	Parcher Marine, NCV, France
Verstärkung Anlenkpunkte B/C/D	W 420	180 g/m²	Amann & Söhne GmbH, Germany
Nähfadens Koppe	High Tonacity Polyester Yarn 150D/3	0,05 g/m² / 2,9 kg Bruchlast	Amann & Söhne GmbH, Germany
Nähfadens Leinen	High Tonacity Polyester Yarn 150D/3	0,083 g/m² / 3,2 kg Bruchlast	Amann & Söhne GmbH, Germany



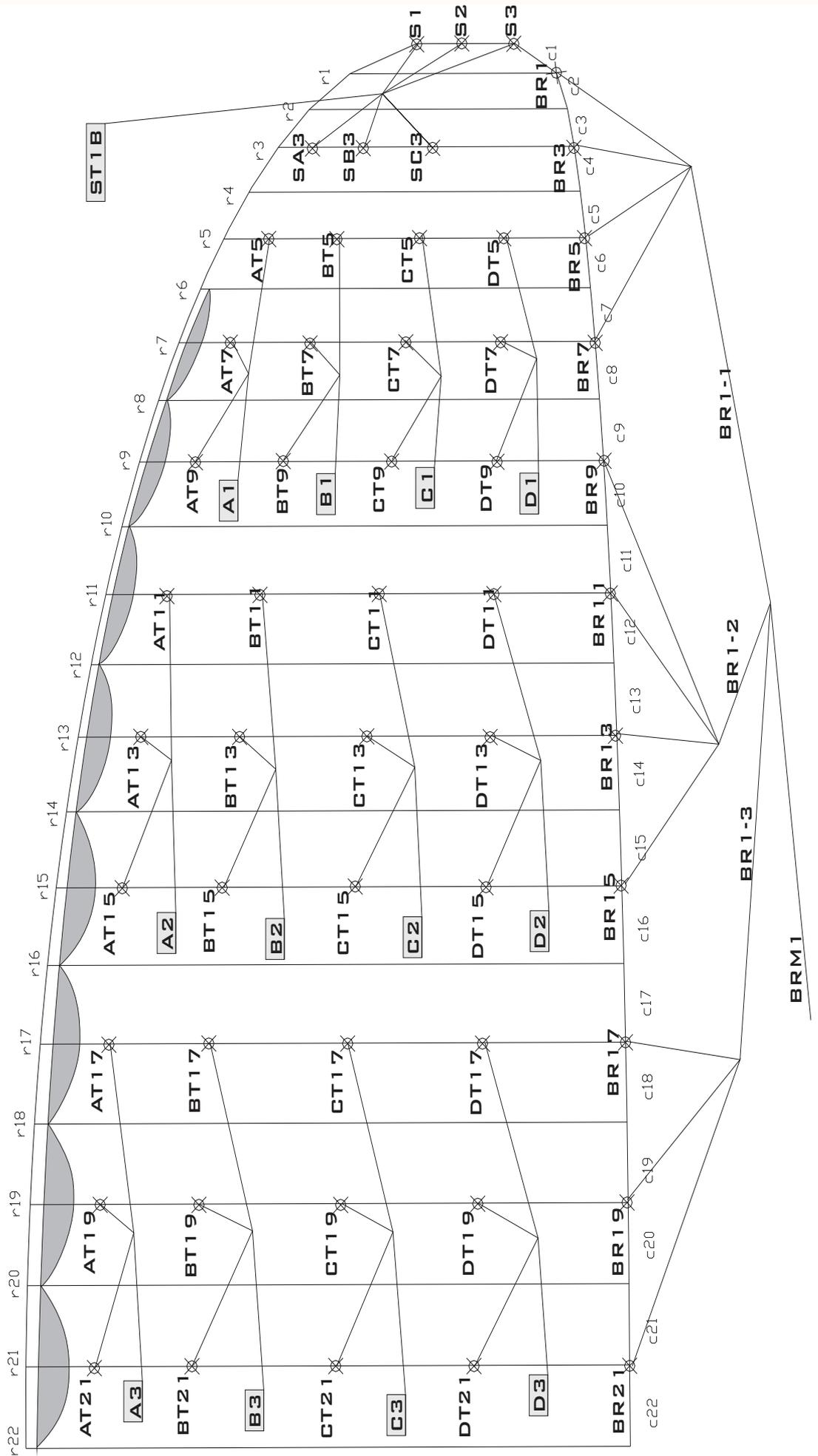
FREE-FORCE 3 <small>AFS PPN</small>	22			24			26					
	Take of weight	55 - 95 kg	70 - 105 KG	85 - 125 kg	Wing area flat	24 m ²	26,5 m ²	29 m ²	Wing area project	22,5 m ²	24,5 m ²	26,5 m ²
Wing span flat	11,28 m	11,86 m	12,4 m	Wing span project	9,8 m	10,2 m	10,6 m	Aspect ratio flat	5,3	5,3	5,3	
Aspect ratio flat project	4,2	4,2	4,2	Number of chambers	44	44	44	V-Trim	39-40 Km/h	39-40 Km/h	39-40 Km/h	
V-Min	22-25 Km/h	22-25 Km/h	22-25 Km/h	V-Max	~53-56 Km/h	~53-56 Km/h	~53-56 Km/h	Features	AFS, V-Tapes, PPN, Tension Stripes	AFS, V-Tapes, PPN, Tension Stripes	AFS, V-Tapes, PPN, Tension Stripes	
Number of risers	5	A-Riser	A-Riser	Number of line storeys	2	2	2	Accelerator / Trimmer	Accelerator	Accelerator	Accelerator	
Glider weight	5,8 kg	6,1 kg	6,4 kg	Certification								

You will find further details regarding the construction and measurement of the U-Turn FREE FORCE 3 in the "Typenkennblatt" or, in case of equipment with example registration, in the "Luftsportgerätekenblatt" in accordance with paragraph four of the "Luftverkehrszulassung". (See attachments)

You can find possible technical changes in the attachment to this manual.

Important: any self inflicted changes to the construction that go beyond the allowed adjustment options, void the operating license and are potentially life threatening. Use of this paraglider is at your own risk. The producer and distributor cannot be held liable.

U-TURN *your airline...* FREE-FACE 3





Leinenplan / Lineplan



Free Force 3 lineconfig. 05.10.2011			
A-Leihen		B-Leihen	
AT9	TSL 190	BT9	TSL 190
AT8	TSL 380	BT8	TSL 190
AT7	TSL 190	BT7	TSL 190
AT6	TSL 140	BT6	TSL 140
AT5	TSL 140	BT5	TSL 140
AT4	TSL 140	BT4	TSL 140
AT3	DSL 70	BT3	DSL 70
AT2	DSL 70	BT2	DSL 70
AT1	DSL 70	BT1	DSL 70
SA1	DSL 70	SB1	DSL 70
S1	DSL 70	S2	DSL 70
C-Leihen		D-Leihen	
CT9	TSL 140	DT9	DSL 70
CT8	TSL 140	DT8	DSL 70
CT7	TSL 140	DT7	DSL 70
CT6	DSL 70	DT6	DSL 70
CT5	DSL 70	DT5	DSL 70
CT4	DSL 70	DT4	DSL 70
CT3	DSL 70	DT3	DSL 70
CT2	DSL 70	DT2	DSL 70
CT1	DSL 70	DT1	DSL 70
SC1	DSL 70	BR21	DSL 70
S3	DSL 70	BR10	DSL 70
Bremseleihen		BR9	DSL 70
BR11	DSL 70	BR8	DSL 70
BR10	TSL 140	BR7	DSL 70
BR9	DSL 70	BR6	DSL 70
BR8	DSL 70	BR5	DSL 70
BR7	DSL 70	BR4	DSL 70
BR6	DSL 70	BR3	DSL 70
BR5	DSL 70	BR2	DSL 70
BR4	DSL 70	BR1	DSL 70
BR3	DSL 70		
BR2	DSL 70		
BR1	DSL 70		

Free Force 3 26 rev4 05.10.11				Check Length
A-Leihen		B-Leihen		Final EAPR
AT21	2880	BT21	2895	7505
AT19	2800	BT19	2800	7410
AT17	2820	BT17	2820	7430
AT15	2680	BT15	2680	7390
AT13	2600	BT13	2600	7310
AT11	2610	BT11	2615	7325
AT9	2200	BT9	2190	7298
AT7	2100	BT7	2100	7206
AT5	2020	BT5	2020	7123
SA3	1430	SB3	1340	6980
S1	1010	S2	1000	6639
C-Leihen		D-Leihen		
CT21	2890	DT21	2700	7522
CT19	2800	DT19	2800	7432
CT17	2825	DT17	2630	7457
CT15	2675	DT15	2490	7440
CT13	2600	DT13	2400	7365
CT11	2620	DT11	2420	7385
CT9	2185	DT9	2185	7344
CT7	2100	DT7	2100	7256
CT5	2020	DT5	2020	7179
SC3	1330	SC3	1330	6970
S3	1050	S3	1050	6686
Bremseleihen		DT21	2700	7687
BR21	3170	BR19	2925	7586
BR19	2925	BR17	2775	7616
BR17	2775	BR15	2940	7564
BR15	2940	BR13	2785	7474
BR13	2785	BR11	2715	7494
BR11	2715	BR9	2765	7489
BR9	2765	BR7	2225	7459
BR7	2225	BR5	2140	7332
BR5	2140	BR3	2035	7242
BR3	2035	BR1	1925	8388
BR1	1925			8147
				7997
				7923
				7768
				7698
				7765
				7685
				7612
				7505
				7397

Free Force 3 24 rev4 05.10.11				Check Length
A-Leihen		B-Leihen		Final EAPR
AT21	2814	BT21	2819	7305
AT19	2727	BT19	2727	7215
AT17	2746	BT17	2746	7234
AT15	2620	BT15	2610	7194
AT13	2532	BT13	2532	7115
AT11	2542	BT11	2546	7131
AT9	2142	BT9	2133	7106
AT7	2045	BT7	2045	7018
AT5	1967	BT5	1967	6937
SA3	1393	SB3	1305	6792
S1	984	S2	974	6461
C-Leihen		D-Leihen		
CT21	2814	DT21	2629	7321
CT19	2727	DT19	2532	7234
CT17	2751	DT17	2561	7255
CT15	2605	DT15	2425	7231
CT13	2532	DT13	2337	7158
CT11	2551	DT11	2357	7177
CT9	2128	DT9	1962	7145
CT7	2045	DT7	1763	7062
CT5	1967	DT5	1850	6983
SC3	1295	SC3	1295	6800
S3	1022	S3	1022	6510
Bremseleihen		DT21	2629	7479
BR21	3087	BR19	2848	7386
BR19	2848	BR17	2702	7414
BR17	2702	BR15	2863	7359
BR15	2863	BR13	2712	7289
BR13	2712	BR11	2644	7287
BR11	2644	BR9	2693	7239
BR9	2693	BR7	2167	7195
BR7	2167	BR5	2084	7050
BR5	2084	BR3	1982	8162
BR3	1982	BR1	1875	7924
BR1	1875			7776
				7713
				7560
				7494
				7580
				7487
				7404
				7302
				7195

Free Force 3 22 rev4 05.10.11				Check Length
A-Leihen		B-Leihen		Final EAPR
AT21	2629	BT21	2634	6859
AT19	2547	BT19	2547	6774
AT17	2565	BT17	2565	6791
AT15	2477	BT15	2438	6768
AT13	2365	BT13	2365	6688
AT11	2374	BT11	2379	6696
AT9	2001	BT9	1982	6677
AT7	1910	BT7	1910	6587
AT5	1838	BT5	1838	6513
SA3	1301	SB3	1219	6427
S1	919	S2	910	6045
C-Leihen		D-Leihen		
CT21	2629	DT21	2466	6823
CT19	2547	DT19	2365	6740
CT17	2570	DT17	2393	6764
CT15	2433	DT15	2265	6750
CT13	2365	DT13	2183	6682
CT11	2383	DT11	2202	6699
CT9	1988	DT9	1824	6669
CT7	1910	DT7	1728	6586
CT5	1838	DT5	1647	6515
SC3	1210	SC3	1210	6335
S3	955	S3	955	6079
Bremseleihen		DT21	2466	6987
BR21	2884	BR19	2661	6899
BR19	2661	BR17	2524	6926
BR17	2524	BR15	2675	6875
BR15	2675	BR13	2534	6792
BR13	2534	BR11	2470	6712
BR11	2470	BR9	2515	6684
BR9	2515	BR7	2024	6612
BR7	2024	BR5	1947	6759
BR5	1947	BR3	1851	6658
BR3	1851	BR1	1751	6577
BR1	1751			7543
				7326
				7190
				7127
				6984
				6917
				7001
				6920
				6643
				6747
				6646



Erklärung über Bauausführung und Leistung (EBL)

Declaration of Design and Performance (DDP)

02.10.2011



EBL-GS-DB - Stand 01.11.2010 - V4

Gleitsegel - Paraglider

Musterprüfung / Type testing

EAPR-GS-7466/

Gerätemuster / Test sample

Free Force 3-22

Musterprüfinhaber / Type Testing Holder

**U-Turn GmbH
Esslinger Straße 23
78609 Tuningen
Deutschland**

Datum der Musterprüfbescheinigung / Date of type testing certification	
Art der Prüfung / Type of testing	vereinfacht
Bezug / reference	7419

Nachgewiesene Normen und Verfahren <i>Certified standards and procedures</i>	LTF 91/09 EN 926-1 & 926-2
---	---

Gerätgewicht ohne Packsack / System weight without bag - kg	6,1 kg
Zulässiges min. Anhängelast / Allowable min. payload	60 kg
Zulässiges max. Anhängelast / Allowable max. payload	95 kg
Anzahl der Sitze / Number of seats	1
Klassifizierung / Classification	C
Fußbeschleuniger / Foot accelerator	ja / yes
Trimmer (von Hand zu bedienen) / Trim device (hand operated)	nein / no
Schulungstauglich (Herstellerangabe) / suitable for training	Nein / no

Tragegurtlängen mm/ Riser lenght mm	A	A2	B	C	D	E
Offen-normal / open-normal	560	560	560	560	560	0
Beschleunigt / Accelerated	380	380	400	480	560	0
Geschlossen / closed	0	0	0	0	0	0

Erklärung über Bauausführung und Leistung (EBL)

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EBL-GS-DB - Stand 01.11.2010 - V4

Gleitsegel - Paraglider

Musterprüfung / Type testing

EAPR-GS-7466/

Gerätemuster / Test sample

Free Force 3-22

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78609 Tuningen
Deutschland**

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Zulässiges max. Anhängelast / Allowable max. payload	95 kg
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Schulungstauglich (Herstellerangabe) / suitable for training	Nein / no

Tragegurtlängen mm/ Riser lenght mm	A	A2	B	C	D	E
Offen-normal / open-normal	560	560	560	560	560	0
Beschleunigt / Accelerated	380	380	400	480	560	0
Geschlossen / closed	0	0	0	0	0	0

Erklärung über Bauausführung und Leistung (EBL)

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EBL-GS-DB - Stand 01.11.2010 - V4

Gleitsegel - Paraglider

Musterprüfung / Type testing

EAPR-GS-7419/-

Gerätemuster / Test sample

Free Force 3-24

Musterprüfinhaber / Type Testing Holder

**U-Turn GmbH
Esslinger Straße 23
78609 Tuningen
Deutschland**

Datum der Musterprüfbescheinigung / Date of type testing certification	
Art der Prüfung / Type of testing	umfassend
Bezug / reference	

Nachgewiesene Normen und Verfahren <i>Certified standards and procedures</i>	LTF 91/09 EN 926-1 & 926-2
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Gerätegewicht ohne Packsack / System weight without bag - kg	5,8 kg
Zulässiges min. Anhängelast / Allowable min. payload	70 kg
Zulässiges max. Anhängelast / Allowable max. payload	105 kg
Anzahl der Sitze / Number of seats	1
Klassifizierung / Classification	C
Fußbeschleuniger / Foot accelerator	ja / yes
Trimmer (von Hand zu bedienen) / Trim device (hand operated)	nein / no
Schulungstauglich (Herstellerangabe) / suitable for training	Nein / no

Tragegurtlängen mm/ Riser lenght mm	A	A2	B	C	D	E
Offen-normal / open-normal	560	560	560	560	560	0
Beschleunigt / Accelerated	380	380	400	480	560	0
Geschlossen / closed	0	0	0	0	0	0

Erklärung über Bauausführung und Leistung (EBL)

Declaration of Design and Performance (DDP)

02.10.2011



EBL-GS-DB - Stand 01.11.2010 - V4

Gleitsegel - Paraglider

Musterprüfung / Type testing

EAPR-GS-7419/-

Gerätemuster / Test sample

Free Force 3-24

Musterprüfinhaber / Type Testing Holder

**U-Turn GmbH
Esslinger Straße 23
78609 Tuningen
Deutschland**

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Art der Prüfung / Type of testing	umfassend
Bezug / reference	

Nachgewiesene Normen und Verfahren <i>Certified standards and procedures</i>	LTF 91/09
	EN 926-1 & 926-2

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Zulässiges max. Anhängelast / Allowable max. payload	105 kg
Anzahl der Sitze / Number of seats	1
Klassifizierung / Classification	C
Fußbeschleuniger / Foot accelerator	ja / yes
Trimmer (von Hand zu bedienen) / Trim device (hand operated)	nein / no
Schulungstauglich (Herstellerangabe) / suitable for training	Nein / no

Tragegurtlängen mm/ Riser lenght mm	A	A2	B	C	D	E
Offen-normal / open-normal	560	560	560	560	560	0
Beschleunigt / Accelerated	380	380	400	480	560	0
Geschlossen / closed	0	0	0	0	0	0

Erklärung über Bauausführung und Leistung (EBL)

Declaration of Design and Performance (DDP)

02.10.2011



EBL-GS-DB - Stand 01.11.2010 - V4

Gleitsegel - Paraglider

Musterprüfung / Type testing

EAPR-GS-7465/

Gerätemuster / Test sample

Free Force 3-26

Musterprüfinhaber / Type Testing Holder

**U-Turn GmbH
Esslinger Straße 23
78609 Tuningen
Deutschland**

Datum der Musterprüfbescheinigung / Date of type testing certification	
Art der Prüfung / Type of testing	vereinfacht
Bezug / reference	7419

Nachgewiesene Normen und Verfahren <i>Certified standards and procedures</i>	LTF 91/09 EN 926-1 & 926-2
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Gerätegewicht ohne Packsack / System weight without bag - kg	6,8 kg
Zulässiges min. Anhängelast / Allowable min. payload	85 kg
Zulässiges max. Anhängelast / Allowable max. payload	125 kg
Anzahl der Sitze / Number of seats	1
Klassifizierung / Classification	C
Fußbeschleuniger / Foot accelerater	ja / yes
Trimmer (von Hand zu bedienen) / Trim device (hand operated)	nein / no
Schulungstauglich (Herstellerangabe) / suitable for training	Nein / no

Tragegurtlängen mm/ Riser lenght mm	A	A2	B	C	D	E
Offen-normal / open-normal	560	560	560	560	560	0
Beschleunigt / Accelerated	380	380	400	480	560	0
Geschlossen / closed	0	0	0	0	0	0

Erklärung über Bauausführung und Leistung (EBL)

Declaration of Design and Performance (DDP)

02.10.2011



EBL-GS-DB - Stand 01.11.2010 - V4

Gleitsegel - Paraglider

Musterprüfung / Type testing

EAPR-GS-7465/

Gerätemuster / Test sample

Free Force 3-26

Musterprüfinhaber / Type Testing Holder

**U-Turn GmbH
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78609 Tuningen
Deutschland**

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	EN 926-1 & 926-2

Gerätegewicht ohne Packsack / System weight without bag - kg	6,8 kg
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Geschlossen / closed	0	0	0	0	0	0

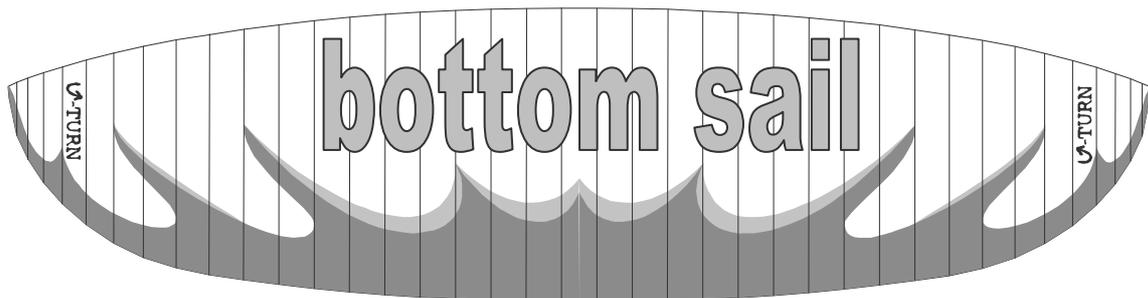
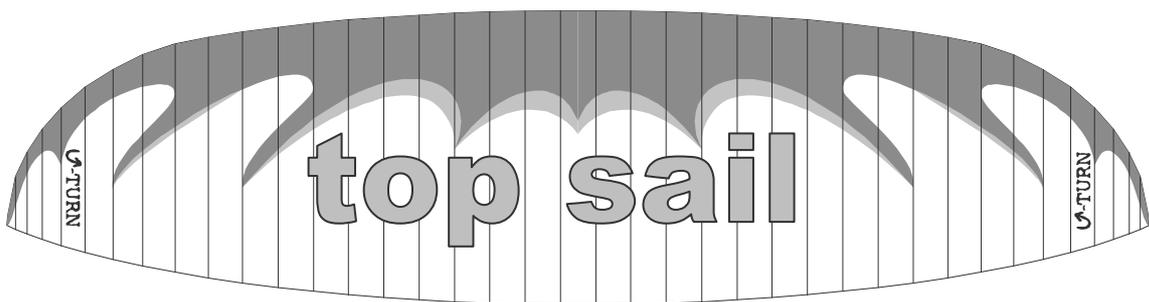
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Instruction leaflet for repairs and 2 annual Check

Name:	
Adress:	
Land:	Telephone Number:
E-Mail:	
Paraglider type and Color:	Serial number:
comments/notes:	

- | | |
|---|---|
| <input type="checkbox"/> 2 annual Check | <input type="checkbox"/> Line Check incl. strength test |
| <input type="checkbox"/> Air permeability check | <input type="checkbox"/> Repair of the marked damage |
| <input type="checkbox"/> Recall with sighting of the paraglider | |



Please pretend the repair-destitute place in the top sail and / or bottom sail





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 Germany

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LINE ORDER SHEET / BESTELLFORMULAR FÜR LEINEN

Name	
Adress / Adresse	
E-mail	
Telephone Number / Telefon Nummer	
Paragliding name / Gleitschirm Name	
Size / Größe	
Other / Sonstiges	

Serial Number / Serien Nummer: _____

Line ID / Bezeichnung	Quantity/ Stückzahl	Line ID / Bezeichnung	Quantity/ Stückzahl