



# BLACK OUT<sup>+</sup>

## MANUAL

**English Rev. 1.2 Effective: October 2018**  
Please read this manual  
before you fly your U-Turn BLACKOUT PLUS  
for the first time.



HAPPINESS IS THE  
HIGHEST LEVEL  
OF SUCCESS.

#FLYBLACKOUT



# WE DID EVERYTHING, TO MAKE THE DYNAMIC EASY TO HANDLE.

Congratulations, you have chosen the acro wing BLACKOUT PLUS. We thank you for your confidence in U-Turn and see this as confirmation to continue to pursue and further develop our uncompromising quality standards.

We wish you many enjoyable flights and great moments in the air.

Congratulations, you have chosen the acro wing BLACKOUT PLUS. We thank you for your confidence in U-Turn and see this as confirmation to continue to pursue and further develop our uncompromising quality standards.

We wish you many enjoyable flights and great moments in the air.

[www.u-turn.de/product-registration](http://www.u-turn.de/product-registration)

▶ **JETZT REGISTRIEREN**



This operating manual is an important part of the aircraft. There is an **OBLIGATION** towards this aircraft and its user manual to inform yourself about its specific features prior to its first use. The manual should help you to make the operation of the U-Turn BLACKOUT PLUS as safe and easy as possible.

# INHALT

WELCOME TO THE WORLD OF U-TURN	6
BLACKOUT PLUS - SIMPLE DYNAMIC	7
BLACKOUT PLUS	8
- Motorised Paragliding	8
- Winching	8
- Base- and brakeline adjustment	9
- Safety precautions	10
equipment description	11
- Short description	11
- Risers	12
- Speed system	12
- Trimmer	12
- IMPORTANT! Trimming of the lines	13
- Stabilo-Line-Security-Function	13
THE FLIGHT	14
- Flight practice	14
- The Launch	14
- Turning	15
- Active Flying	15
- Landing	15
RAPID DECENT	16
- „Big Ears“	16
- B-Stall	16
ADVANCED HANDLING	17
- Spiral Dive	17
- Wingover	17
- Full Frontal	17
- Collapses	18
- How to avoid collapses	18
- Deep Stall	19
- Fullstall	19
- Negative Turn	20
- Emergency Piloting	20
-	
- Storage and Transport	20
- Repairs	20
- Maintenance and care	21
- Nature and environment-friendly behaviour	21

FLIGHT ACCESSORIES	22
- Harness	22
- Suitable Rescue Systems	22
ASSUMPTION OF RISK	23
- Liability claim and renouncement of exclusion	23
- Safety Advice and Liability	23
RELEASE OF LIABILITY, RENOUNCEMENT OF ENTITLEMENT	24
Technical Data U-Turn BLACKOUT PLUS	25
Linecode-Info BLACKOUT PLUS	26
Lineplan BLACKOUT PLUS	27
Instruction leaflet for repairs	
Line order form	30
Product registration	31
MAINTENANCE MANUAL	33
TOPIC OF INSPECTION AND REINSPECTION INTERVALS	33
- Who may inspect/test?	33
- Individual personal prerequisites for the inspections	33
- Necessary equipment and documentation	34
DURING INSPECTION THE FOLLOWING STEPS NEED TO BE TAKEN:	34
- Positive identification of the device	34
- Inspection of the top- and bottom sail and reserve parachute	34
- Holes and Tears	34
- Abrasion and Deformities	35
- Testing of the ribs	35
- Check of the tear resistance	35
- Porosity check of the canopy	35
- Connecting parts	36
- Lines	36
- Check of the line length and line attachments	36
- Visual check of trim and adjustment	37
- Description of materials and technical data	37
- Miscellaneous	37
Completed check - very important!	38

# THE EXCITEMENT SHARES YOUR RIDE- WELCOME TO THE WORLD OF U-TURN.

## FLYING IS A PRIVILEGE.

It creates moments of presence and of bliss. U-Turn is committed to the excitement of flying and is living this not just every day itself but also wants to make it accessible to as many people as possible. U-Turn develops innovative products for the sport of paragliding and is offering a full-service product range.

## OUR STATEMENT "SAFE FUN" IS AN ACKNOWLEDGEMENT FOR SAFETY.

U-Turn is pursuing the absolute upper limit of passive safety, because the products should bring delight and joy. Part of that is also that the products support the pilot even when the conditions get more difficult. Because the fun factor considerably rises once the risk factor sinks. For us not only the doable counts, but the maximum of safety. Products with high technological aspirations, innovation and design with a quality, that shows durability over time.

## U-TURN HAS A CLEAR GOAL »MAKE THE BEST EVEN BETTER«

We are working tirelessly on improvements and progress and push ourselves to get better every day. To develop more ideas for more safety and constantly think things over and find intelligent solutions. Thereby we are proud of our work, appreciate uncompromising quality and love our sport. The products are produced with the utmost care, because they should generate long-ranging quality.

## THE CENTER OF OUR ACTING IS THE INDIVIDUAL.

Acting responsibly towards our staff and nature is a given, just as it is to do so towards every single pilot. U-Turn is maintaining an authentic and transparent style. Slim structures enable dynamic operating.



Thank you for your confidence.  
Have lots of great moments  
*Fly safe & have fun*

Werde Teil der U-Turn-Piloten-Community:



U-TURN PARAGLIDERS

# BLACKOUT PLUS SIMPLE DYNAMIC.

The acro wing with the unbeatable handling! The story of success on the BLACKOUT is based on balanced canopy-harmony, which offers the perfect mix out of mistake-forgiving dynamic and precise handling. The BLACKOUT PLUS was able to achieve a clear improvement in terms of dynamics as well as the handling, without making the glider more aggressive. Much dynamic with easy handling, that is what makes the BLACKOUT PLUS equally suitable for hobby acro pilots and acro beginners as well as professionals.

The aspirations of the upgrade stood under the premise of simplification. It appeared almost impossible to enhance the outstanding features of the BLACKOUT and keep the sweet-temperedness of the dynamic wing at the same time. We are proud to present this improvement and the most balanced acro wing yet with the BLACKOUT PLUS. The upgrade was developed in close coordination with the Acro Team pilots during the competition season. Countless modifications were inspired and tested by team pilots. Besides the optimized pre-tensioning, there have been works on the brake geometry as well as the trim and on the stabilos. The result is a distinct improvement in all connections, the BLACKOUT PLUS works much better when it comes to the Heli connections. Additionally, the BLACKOUT PLUS brings more power to the maneuvers like Sat2Heli, Heli2Sat and prevents fluttering stabilos due to the heightened internal pressure, which is especially noticeable in Anti-Rhythmic. Through the modified brake geometry Helico and Twister are also easier to fly.

Even though the BLACKOUT PLUS masters all acro maneuvers without problems, attention was paid to the fact that the glider forgives pilot mistakes. Brake and canopy tension were chosen in a way that especially acro beginners can get fast senses of achievement. The easy handling was particularly in focus when thinking of the basic maneuvers like Rhythmic Sat / Infinity / Heli2Sat / Sat2Heli / Misty / Mctwist / Misty2Heli. The turning in the connections of all negative maneuvers is very homogeneous with the BLACKOUT PLUS which reduces the twist-tendency and offers more safety, especially for acro beginners.

An important point during the countless test flights of the glider through U-Turn Acro Team pilots was the optimization of the brake pressure. Maneuvers like Corkscrew or Mctwist can be done without winding that way.

Much value was also placed upon durability of the BLACKOUT PLUS as well as maintaining the excellent flying features under extreme loads. Therefore, the wing is supplied pre-trimmed. The BLACKOUT PLUS also uses the specifically developed PX40 material. The well-established material was first used for the THRILLER and continuously improved upon. An innovative coating provides better long-term results and optimized tear resistance. PX40 is currently the strongest fabric that can be used to build a wing. When it comes to the processing everything is done for durability and form fidelity - that includes multiple reinforced sewings and reinforcements at the line attachment points and V-tapes. Chief designer Ernst Strobl builds the wing on 50 cells and counts on a modified line geometry. Like all acro gliders, the BLACKOUT PLUS is also equipped with the Stabilo Security Function (SSF), to quickly resolve the situation when making a swaying movement.

# BLACKOUT PLUS

## Motorised Paragliding

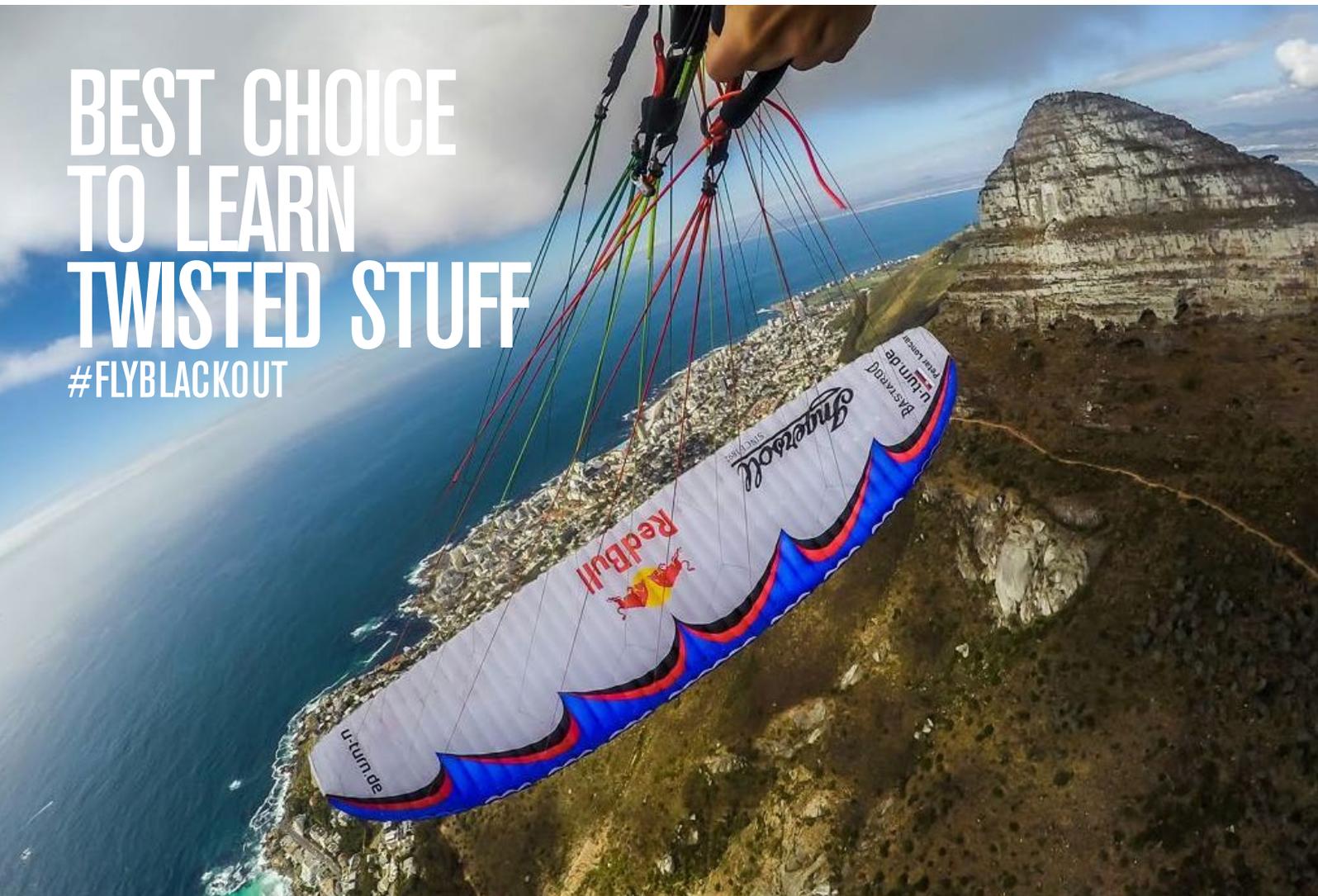
We recommend to NOT use the U-Turn BLACKOUT PLUS in motorised flight. There is a risk of fatal injury!

## Winching

Because of its excellent start characteristics and its high trimmed speed, the U-Turn BLACKOUT PLUS offers the best conditions for winching operations. Take the following points into account:

- Do not use a tow line tension over 120 kg with the U-Turn BLACKOUT PLUS.
- If you are not operating at your usual winch, get acquainted with the local procedures. Every visitor on unfamiliar flying grounds needs to get a good briefing by a local pilot.
- Never winch the U-Turn BLACKOUT PLUS with loads exceeding the permitted weight range.
- All involved persons, machines and accessories need to have the appropriate licenses, approvals or certification for winching. That applies to pilots, hoist operator, towing attachment & attachment points as well as all further machines and accessories for which a certificate of competence is required.

**BEST CHOICE  
TO LEARN  
TWISTED STUFF**  
#FLYBLACKOUT

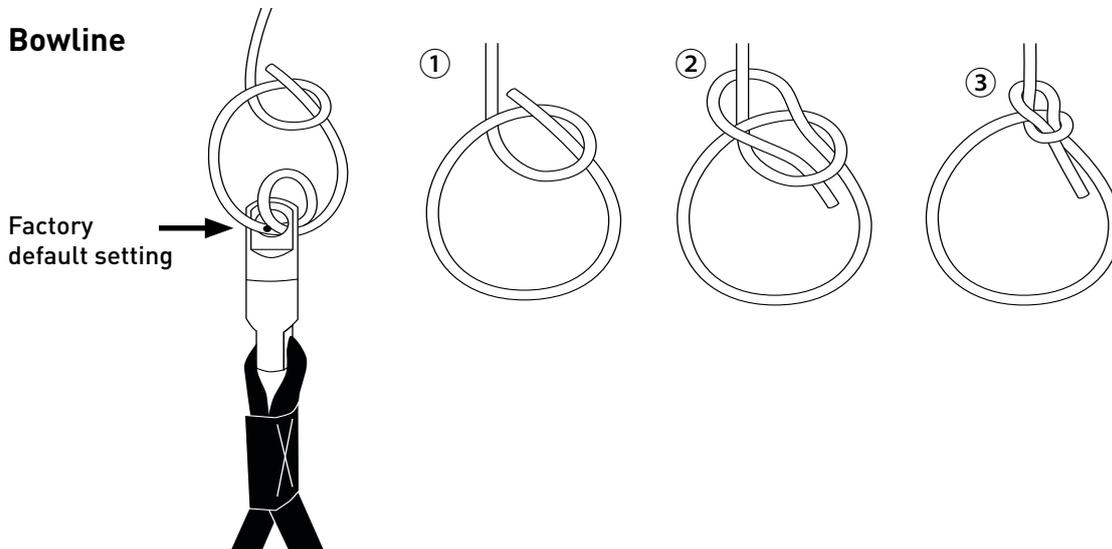


## Base- and Brakeline adjustment

The factory brake-line setting corresponds to 0-free travel plus 5 cm. The trailing edge needs to be free and without any pull when the brake lines are completely free and you are in maximum accelerated flight.

If the brake lines need to be adjusted, attention must be paid that enough free run is possible. In no case the brakes may be adjusted too short, otherwise the glider may fly with a little, but continuous applied brake pressure. This could be extremely dangerous during takeoff, flight and landing!

When fixing the brake handles, always be aware that both sides are adjusted symmetrically and that a permanent knot is used. The bowline works particularly well because of the fact that it weakens the line the least but provides excellent slip resistance.



## Acro-Handles “HIGH-FIVE”

The BLACKOUT PLUS is equipped with the high-quality Acro-Handles “High Five” by U-Turn. The ergonomic neoprene supporting loop is padded with moisture-resistant foam to ensure its comfort even during long training days. The specifically produced bar provides a perfect grip and, by means of the embedded swirl, a low suspension point. The wing comes with pre-installed brake rollers. The shipment also comprises the rubber bands for the Freebrakes. Harness as well as handles come with flaps for switching to Freebrakes. The brake rollers can easily be removed by unlooping them from the quick links.



## Safety precautions

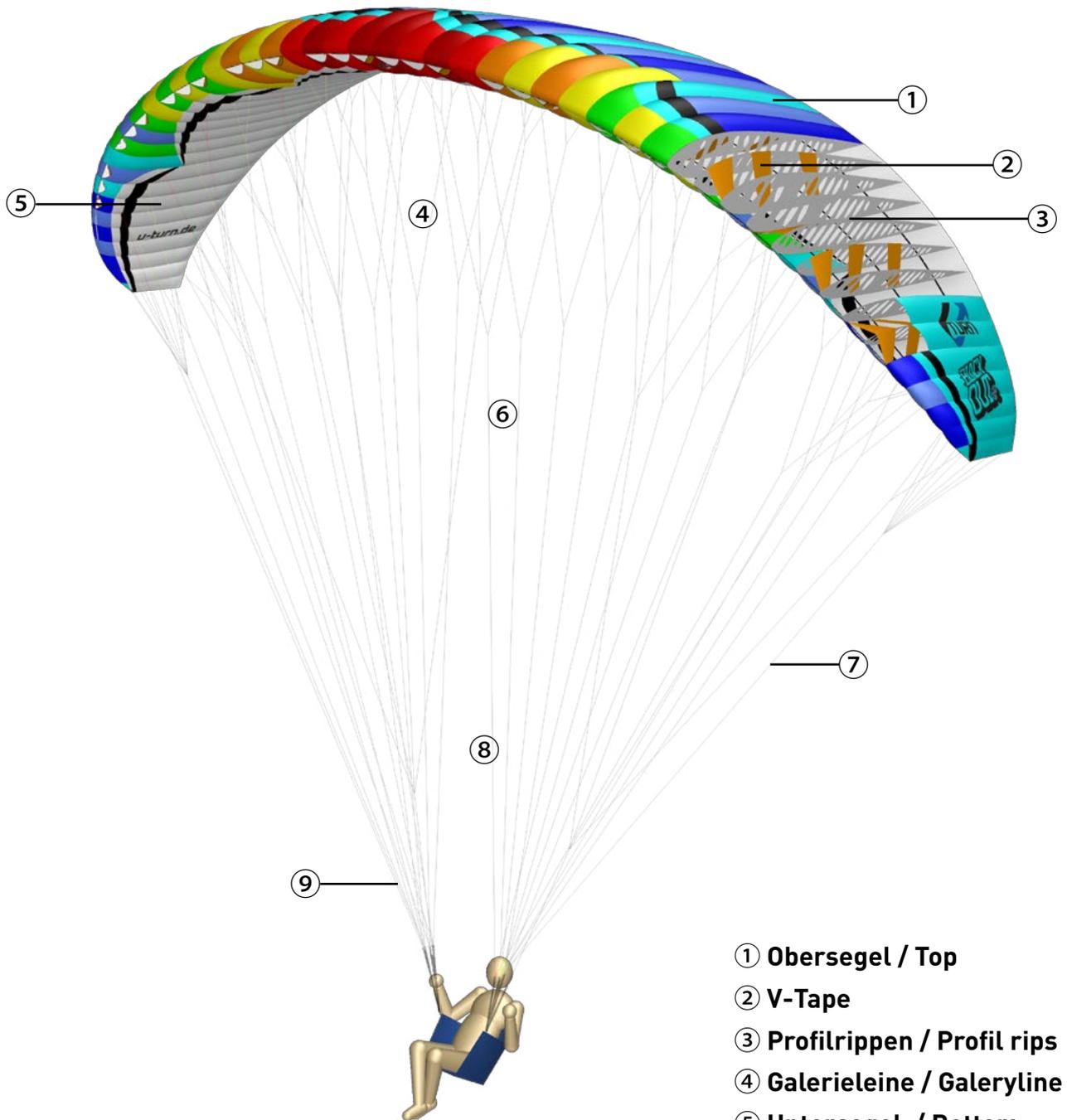
- Prior to the first flight, the canopy, lines, all connections and sewing, mallions, brake line and brake line knots as well as possibly twisted lines need to be checked by trained and authorized personnel and confirmed in the signboard of the glider.
- Make your maiden flight in a familiar flying site and calm conditions.
- Test your U-Turn BLACKOUT PLUS only above water.
- In a „dynamic flight“ not only you are exposed to Hike loads but also the glider. Do not underestimate this condition!
- Only fly your U-Turn BLACKOUT PLUS with at least one reserve parachute!
- Observe and abide by the local aviation laws which rule in the respective country in question.
- Successful completion of appropriate training/schooling, having the needed knowledge as well as the actual flight experience are a prerequisite to operate your U-Turn BLACKOUT PLUS.
- The use of suitable, certified and in the respective country approved accessories (helmet, harness, reserve) is a requirement for the use of the U-Turn BLACKOUT PLUS.
- Before every take off execute a thorough inspection of your equipment (top sail, bottom sail, ribs, especially the lines, carabiners, buckles, cloth speed system etc.) A flight with a tear in a glider or lines can be life threatening.
- Always make sure that your flying gear is in good condition and all checks are done.
- Be aware that you as a pilot have to be in a physical and mental state to control each flight unimpaired. You have to concentrate completely on flying, in order to avoid potential distressing flight conditions. Most accidents are caused by pilot error.
- Never fly in close proximity to high voltage power lines, airports or motorways, over people or with lightning! You could endanger your life and the physical well being of yourself as well as third parties and at the same time act reckless and negligent. At no circumstance should the minimum distance fall below 50 m at any given time. At airports this minimum distance to maintain is 5 km.
- Inform yourself on the weather forecast and/or the predominating local weather conditions. Use the U-Turn BLACKOUT PLUS only in wind strengths, in which you are able to control the wing to 100%. Do not use the U-Turn BLACKOUT PLUS, in wind with a great gust factor. Never use the glider with approaching thunderstorms or if probability of those of the development of thunderstorms is high. If a thunderstorm is approaching land immediately!
- The flying of aerobatics is generally forbidden and is dangerous. Unforeseen flight orientations can occur, which can spill out of control, arising the danger of overload on pilot and equipment.



**ATTENTION:** Ignoring one or several safety precautions can lead to a leisurely fun flight turning into a fatal event!

# EQUIPMENT DESCRIPTION

## Short description



- ① Obersegel / Top
- ② V-Tape
- ③ Profilrippen / Profil ribs
- ④ Galerieleine / Galleryline
- ⑤ Untersegel / Bottom
- ⑥ Gabelleine / Gabelline
- ⑦ Stabiloleine / Stabiloline
- ⑧ Stammleine / Mainline
- ⑨ Tragegurte / Riser

## Risers

The A- and B-risers have different colors to ensure positive identification at take off and during a B-stall decent. Other adjustable, removable or variable mechanisms are nonexistent.

## Speed system

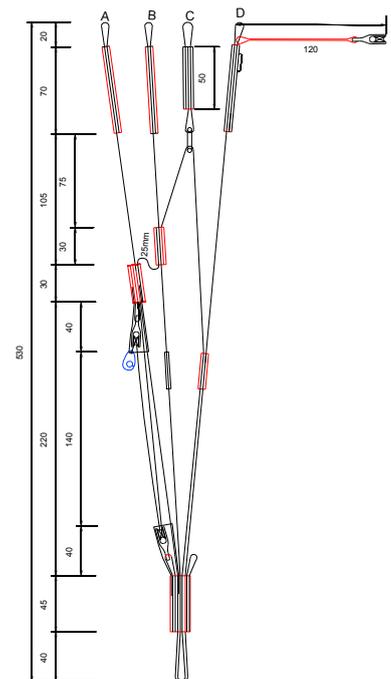
The U-Turn BLACKOUT PLUS is equipped with a very effective foot actuated speed system. When applied, it increases the speed up to approx. 13 km/h depending on the wing size, pilot weight and surface loading respectively. Consequently, it shouldn't be activated in extreme flight conditions or deactivated as soon as such occurs. All extreme flight attitudes (e.g. collapses) happen more dynamically at higher speed.

Since the maximum acceleration distance refers to the safety behavior of the wing, it may happen for some harnesses to not be able to use the full acceleration distance!

The speed system needs to be adjusted before the first flight. Therefore the connection lines of the foot extensor are being connected through the Brummel hooks with the speed system on the riser. To be able to undertake the right adjustment the harness should be hung up so you can sit in flying position. The attached risers are best held up by someone else. It should be adjusted in a way so that the pulleys are on top of each other and you have your legs stretched out. And you are also responsible to watch out that the speed system is adjusted symmetrically and not too short so the glider is not pre-accelerated in the flight.

## Trimmer

The BLACKOUT PLUS has been optimized in consideration of the new Twisted-Tricks. For the preservation of its outstanding properties with crossed straps, the Trimm has been specifically enhanced. In order not to create any additional friction, the straps have been kept clean, without the use of Trimmer. This is what makes the BLACKOUT PLUS the first choice when it comes to practicing new tricks.



## IMPORTANT! Trimming of Lines

Due to the extremely high pressure occurring in the course of ACRO manoeuvres and the straining of lines resulting thereof, we tested these stresses in extreme challenges and calculated them into the delivery state of the U-Turn BLACKOUT PLUS. This means that all U-TURN ACRO gliders are trimmed too quickly in their delivery state. It takes high straining like in spiral dives or tumblings (please keep in mind for both halves of the wing to be eagerly, or rather symmetrically, strained) in order to stretch the main lines to their ideal trim! No sooner than after this stretching of the lines, the full dynamics of the gliders are available!!!

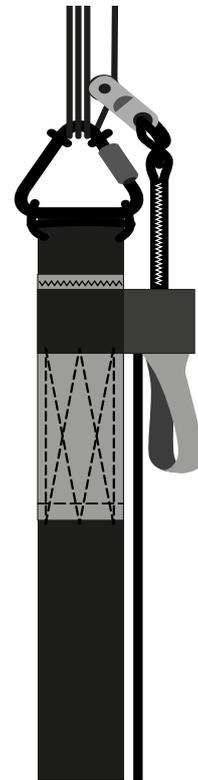


**NOTE:** After 150 hours of operation, the complete set of lines has to be renewed at the latest.

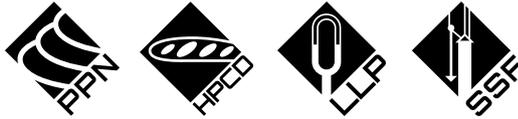


## Stabilo-Line-Security-Function

Even top pilots aren't safe from cravats, especially not when they practice new routines or max out existint choreographies. Most cravats ended with the emergency parachute, since acro flying happens with high acceleration forces that are even higher, the smaller the surface of a glider. For a pilot exposed to such forces, it's not easy - irrespective of their abilities and level of training - to find the Stabilo-line quickly. Releasing the cravat isn't too much of a problem in most cases, the challenge however is finding and holding onto the Stabilo-line in a swift fashion. With the "Stabilo Line Security Function", this will be a lot easier: The SLSF is a roll through which the Stabilo-line is pulled and fixed at the B-strap with a rubber line. In case of cravats, this enables the pilot to pull the Stabilo-line quickly by drawing the rubber line close to the handle and consequently release the cravat.



# TECHNICAL DATA U-TURN BLACKOUT PLUS



	16	17	18	20	21	24
Start weight Startgewicht	55-100 kg	60-105 kg	65-110 kg	70-115 kg	75-120 kg	80-120 kg
Flat area Fläche ausgelegt	16,2 m <sup>2</sup>	17,2 m <sup>2</sup>	18,2 m <sup>2</sup>	20,2 m <sup>2</sup>	21 m <sup>2</sup>	24 m <sup>2</sup>
Projected area Fläche projiziert	14,113m <sup>2</sup>	14,985 m <sup>2</sup>	15,856 m <sup>2</sup>	17,598 m <sup>2</sup>	18,295 m <sup>2</sup>	20,909 m <sup>2</sup>
Flat wingspan Spannweite ausgelegt	9,55 m	9,841 m	10,123 m	10,664 m	10,873 m	11,624 m
Projected wingspan Spannweite projiziert	7,82 m	8,058 m	8,289 m	8,733 m	8,904 m	9,519 m
Flat AR Streckung ausgelegt	5,63	5,63	5,63	5,63	5,63	5,63
Projected AR Streckung projiziert	4,333	4,333	4,333	4,333	4,333	4,333
Chord: center / wingtip Flügeltiefe: Mitte / Stabulo	2,105 / 0,470 m	2,169 / 0,484 m	2,232 / 0,498 m	2,351 / 0,525 m	2,397 / 0,535 m	2,563 / 0,572 m
V-trim V-Trim	42-44 km/h	41-43 km/h	41-43 km/h	41-43 km/h	40 - 42 km/h	40-42 km/h
V-max V-Max.	55 km/h +					
Bridle height Abstand Tragegurt-Kappe	5,73 m	5,904 m	6,074 m	6,399 m	6,524 m	6,524 m
Nr. of cells Zellenanzahl	50	50	50	50	50	50
Glider weight Gewicht	5,5 kg	5,7 kg	5,9 kg	6,4 kg	6,6 kg	6,9 kg
Bridle length Gesamt Leinenlänge	296,85 m	304,55 m	313,28 m	330,04 m	336,51 m	352,42 m
Line diameter Leinendurchmesser	2,4 / 2,0 / 1,65 / 1,3 1,2 / 1,1 / 0,7 / 0,65 mm	2,4 / 2,0 / 1,65 / 1,3 1,2 / 1,1 / 0,7 / 0,65 mm	2,4 / 2,0 / 1,65 / 1,3 1,2 / 1,1 / 0,7 / 0,65 mm	2,4 / 2,0 / 1,65 / 1,3 1,2 / 1,1 / 0,7 / 0,65 mm	2,4 / 2,0 / 1,65 / 1,3 1,2 / 1,1 / 0,7 / 0,65 mm	2,4 / 2,0 / 1,65 / 1,3 1,2 / 1,1 / 0,7 / 0,65 mm
Speed system / trimmer Fuß Beschleuniger / Trimmer	Yes / Yes Ja / Ja					
Certification Zulassung	No Certification Keine Zulassung					
Certified standards and procedures Angewandte Testverfahren	Tested and trimmed by U-Turn Acro-Team					

Errors and omissions expected. Subject to change without notice. Reproduction in whole or in part without written permission of U-Turn GmbH is prohibited.  
Irrtümer, Druckfehler und Änderungen bleiben vorbehalten. Nachdruck auch auszugsweise, nur mit schriftlicher Genehmigung der U-Turn GmbH.

## Acro-Material PX40

With the BLACKOUT PLUS, a high value has been set upon the long-life cycle and preservation of the excellent flight quality under extreme strain. To ensure this, the specially developed PX40 has been employed. This well-proven material has been first used for the THRILLER and has since been improved permanently. A novel coating provides better long-term values and optimized tear resistance. PX40 is currently the strongest fabric wings can be built of.



# PILOT PROFILE

## Requirements

The BLACKOUT PLUS addresses ambitious acro pilots looking for a highly developed dynamic wing with sportive handling. Acro newbies as well as professionals have to be in very good condition physically and mentally. Dynamic flying demands especially high concentration from the pilot while exposing them to extreme physical stress due to the great centrifugal forces. We ask for you to always pursue aviation with the proper cautiousness and respect. This includes well-founded flight preparation as well as the examination of meteorological conditions and the proper evaluation of the weather situation. Act defensively, because the less the risk, the more the fun.

## Environmental aspects

Having a responsible attitude towards fellow human beings and nature is as self-evident to us as that towards every single pilot. Accordingly, we ask you to pursue our sport in respect for the environment. The sensitive biological equilibrium in the mountains demands consideration, which comprises not leaving garbage behind and using existing paths for entering launch sites. Especially at launch sites, unnecessary noise has to be omitted.



# THE FLIGHT

## Flying experience

This manual is only focusing on the points of the technique of flying that are important for the U-Turn BLACKOUT PLUS. It cannot and should not replace a profound flight training in an approved flying school! Without flight training and according experience paragliding is life-endangering!

## Take off

After the paraglider is unpacked and laid out in the shape of a horseshoe, the following points are to be considered:

- The paraglider should be laid out in such way that when pulling up by the A-risers, the center lines are evenly and earlier tensioned than those towards the wing tips. This ensures an easy and symmetrical inflation at the launch.
- Take the wind direction in consideration when laying out the glider, so that when it is pulled up into the wind, both sides of the glider can rise symmetrically.
- Ensure the risers are without twists and the brake line runs freely through the pulleys to the trailing edge of the glider.
- No lines should pass underneath the sail. A line-over at take-off can have fatal consequences.
- Of course the 5-point check shouldn't be forgotten either.  
In the 5-point check the following is checked:
  1. Strapped (helmet, harness and carabiners are closed)
  2. Suspended (risers aren't twisted when hung into the carabiner, speed system is mounted correctly, carabiners are closed)
  3. Lines (A-lines on top, all lines are sorted, brake line runs freely through the pulleys)
  4. Canopy (canopy lies in the shape of a horseshoe with opened leading edge at the launch)
  5. Wind and airspace (wind appropriate for launch, airspace is empty)

The center of the U-Turn BLACKOUT PLUS is marked by the U-Turn logo on the leading edge. It's sufficient to hold only the main A-risers. Since the U-Turn BLACKOUT PLUS has little to no tendency to overshoot, it requires only minimal brake input during the launch. If needed, directional corrections with the brakes should be undertaken only if the wind is already overhead, since too much brake input could drop the glider back. The remaining risers should not be grabbed during take off. With an even pull, but overall light input only, the glider is to be inflated. Unlike other gliders, it is not necessary to inflate the U-Turn BLACKOUT PLUS with aggressive pulling or even fast running. That is also true when there is little to zero wind. Measured pulling up is the simplest and safest way to launch the U-Turn BLACKOUT PLUS. Once the pilot made sure that the glider is overhead and fully inflated, the final decision is made whether to take off. After some dynamic steps the pilot takes off.

## Turning

The U-Turn BLACKOUT PLUS has a high agility and reacts to steering inputs directly and instantly. You can fly flat turns with little altitude loss by shifting your body weight. A combined steering technique of appropriate pull on the inner brake line and shift of body weight is the best way for a coordinated turn. The turn radius depends on the amount of pull on the brake line. At about 75 % of brake line travel, the U-Turn BLACKOUT PLUS increases bank significantly and performs a fast steep turn that can be continued to a diving spiral.



**ATTENTION:** A rapid pull on the brake line may cause a negative spin!

## Active Flying

The U-Turn BLACKOUT PLUS 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 careful that the canopy does not get behind you. 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 you when leaving an updraft or entering a downdraft, the brakes have to be applied to counter that. Accelerated flight however is advisable when flying through downdraft zones. The U-Turn BLACKOUT PLUS is naturally very stable due to its unique way of construction. Active flying in turbulent air (as described above) significantly increases the safety. Collapsing and deforming of the canopy can be avoided through active flying.

## Landing

Start your landing preparation at sufficient altitude. Due to its excellent flaring characteristics the U-Turn BLACKOUT PLUS is very easy to land, when the brake is applied in the right moment. After a straight final approach against the wind let the glider slide 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 the ground, beyond the stalling point OR - 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 to the landing to avoid PLF.



**ATTENTION:** During a strong wing take off attempt, ground handling and landing the leading edge can hit the ground with high speed. This is to be avoided because otherwise the ribs, the sewing or the fabric can be damaged!

# RAPID DESCENT

In any situation where you have to get down ASAP for different reasons e.g. thunderstorms, extreme updraft or other danger there are a couple of techniques to do so that are described in this following chapter.



**ATTENTION:** The described manoeuvres stress your paraglider more than normal and should only be performed for practice or in a real emergency situation!



## „Big Ears“

Both designated outer A2-risers (grab at or above the quick links) are being pulled down simultaneously for 15-20 cm to fold in the wing tips. The brake toggles are to be held in hand together with the pulled down A-lines. For additional stability and for an increased sink rate the speedsystem should be actuated. The glider remains fully steerable by weight shifting and descends at an elevated sink rate (4-7 m/sec, depending on how many cells are folded in) straight forward. Once the A-risers are released, the folded wingtips reinflate automatically, if not you may pump the brakes gently. Due to the high wingload "big earing" is a very stable flight condition even in turbulent conditions. Please be aware that you reduce the trimspeed during "big ears", but this can be compensated by applying the speedbar. "Big ears" in combination with weight shifting in order to get the spiral dive, will achieve the highest sink rate. This decent method is often taught in SIV training. Be mindful that this exposes the glider to extreme loads, should one need to use this manoeuvre we recommend an equipment inspection afterwards.

## B-Stall

Another very efficient method is the B-stall. The B-stall is generally known as the easiest decent method. But caution, if done wrong, it is anything but harmless!

The B-stall allows a sink rate of 6 to over 9 m/sec. Check the airspace under and above you prior to initiating a B-stall. Also pay attention to sufficient height. To initiate you hold the two B-risers above the quick links. With the brakes in hand at all times, pull down the B-risers progressively and symmetrically down to the shoulder to about chest level. Hold this position. Your sail will stop, the wing will become partially empty and stabilize itself overhead. During this the wing will fall back a little, which must not tempt you to release the B-lines again. The glider would then shoot forward and oscillate vigorously. Only when the glider has stabilized overhead it is ok to exit the B-line stall. Therefore bring the B-risers swiftly and symmetrically back into their original position. We recommend not to simply let the risers snap shut as this puts an enormous load on fabric, sewings and lines. In the paragraph titled "advanced handling" you can read what to do if unexpectedly caught in a stall.



# ADVANCED HANDLING

Even though the U-Turn BLACKOUT PLUS has a very high aerodynamic stability it is possible that the glider gets into an extreme flight situation due to pilot errors or turbulent air. The best method to stay calm and react correctly is to take part in a flight safety course. The pilot will learn to manage extreme flight situation under professional supervision. Extreme flight manoeuvres may only be executed in calm air and in sufficient height under professional supervision (e.g. safety training). Once again we mention that a rescue system is required by the law. The following extreme flight figures and flight manoeuvres can either be caused intentionally, through turbulences or through pilot errors. Every pilot can get into these flight situations! All mentioned extreme flight figures and manoeuvres are dangerous if performed without the appropriate knowledge, enough altitude or necessary introduction. A wrong execution of these described figures and manoeuvres may have fatal consequences!

## Spiral Dive

Like a normal turn, initiating the spiral dive is very easy with the U-Turn BLACKOUT PLUS. The spiral dive leads to very good sink rates (up to 15-20 m/sec). To safely use the spiral dive when necessary it should be practised in calm conditions. You move down vertically within the airmass. Do not underestimate the G-forces that act upon the pilot when diving down in an efficient spiral.

The glider has a strong nose-dive when the bank increases during the spiral dive. The behaviour is very dynamic and should be piloted through lessening the brake-line-pull on the inside of the turn resp. accordingly with the outside brake and should only be practised under professional supervision.



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

## Wingover

The pilot has to perform right and left turns with increasing bank until the desired angle is reached. Collapsing wingtips are prevented by gently applying brake pressure in the up- and/or down-swing of the wingover. Normally there is no danger of collapsing wing tips with the U-Turn BLACKOUT PLUS except for when there is a very high bank. With shifting the body weight while applying the brake it is possible to fly the highest possible wingovers.

## Full Frontal

A negative AoA caused by turbulences of the simultaneous pull-down of the A-risers by the pilot, results in a frontal collapse of the leading edge. The U-Turn BLACKOUT PLUS comes out of a frontstall by itself very quickly. Smooth and symmetric applying of the brake positively influences the re-opening of the canopy.

## Collapses

Even with its high stability and very well responses in turbulences, strong turbulences can cause the canopy of the U-Turn BLACKOUT PLUS to collapse. Usually that situation is not dangerous and clears itself automatically without any further input. To support the recovery, firmly apply the brakes on the affected side and simultaneously steer opposite on the open side. When a large part of the canopy collapses the counter steering is to be exercised in moderation in order not to completely interrupt the airflow to the positive side of the wing and spin the glider.

### How to avoid collapses

Tips and tricks by U-Turn chief designer, test and competition pilot Ernst Strobl

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

The best way to avoid collapses up front 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 optimise the feeling for your glider on the ground, try the following: Practice 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 at 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 meadow 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 brake lines adjustment and your arm length. 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 lines as much as possible. If you are too low for that, stabilize the canopy on the opposite side 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 gliders as well as your own abilities.

Thus far the expert advice concerning collapses by Ernst Strobl.

## Deep Stall

The U-Turn BLACKOUT PLUS is not stall sensitive. If in a stall, caused by over-pulling 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 too low), a symmetric forward push on the A-riser or step the speed system recovers the stall.



**ATTENTION:** Practicing stalls should be done with enough safe altitude. Never apply asymmetric brakes during a stall, it could cause a spin. If the BLACKLIGHT 2 is in deep stall, one should only release the brake if the glider is in front.

## Fullstall

To initiate a full stall, pull both brakes without a wrap slowly to the point of stall. As soon as the point of stall is reached, hold both hands down. The glider falls back. At this point, under no circumstance should the hands let up or release the brakes. To recover from a full stall the canopy should be stabilized overhead and pre-filled. For this slightly let up both brakes symmetrically. To exit completely, let up both brakes symmetrically and slowly in its entirety. With a correct symmetrical exit the glider returns swiftly, as soon as the glider shoots strongly forward, it must be checked by a brief brake input. An asymmetrical recovery is to be avoided, this could lead to falling into the glider.

## Negative Turn

A negative turn/spin is initiated, when the pilot pulls the brake on one side fast and completely through to the point of stall while letting the other brake partly free. With a negative turn the glider turns relatively fast around its center, while the inside flies backwards. In order to exit a negative spin, the applied brake is released, where stalled side of the wing can pick up speed or one exits through a full stall, by braking the flying side into a stall as well.



**ATTENTION:** The Spin and the Fullstall are unpredictable and dangerous flight figures and should only be executed in a safety training under supervision and never be executed intentionally. There is danger of riser twist. With a riser twist the brake lines can get blocked.



**ATTENTION:** The glider has been overloaded. Fullstalls and negative turns/spins as a descent method are dangerous, because a wrong exit, regardless of glider type, can have fatal consequences.

## Emergency Piloting

In any situation where normal steering is not possible, the U-Turn BLACKOUT PLUS can be easily steered and landed with the back risers. Turns can be flown with weight shift, however be careful that the glider doesn't lock into a spiral.



BE DIFFERENT, BE YOU  
#FLYBLACKOUT

# FLYING ACCESSORIES

## Harness

The U-Turn BLACKOUT PLUS can be used with any certified harness system without fixed cross-bracing that comply with the minimum distance between chest strap and hanging height of the certification. The lower the mounting point of the harness, the better you can steer the U-Turn BLACKOUT PLUS by shifting your body weight. U-Turn recommends use of the acro- and freestyle-harness BLACKJACK, which was developed in perfect accordance with the BLACKOUT PLUS. BLACKJACK offers a resource-conserving energy transmission with an ergonomic support function. Solid padding grants cushioned sitting comfort for intense days of training. The height of the mounting also changes the relative brake distance. If you have any questions about the usage of your harness with the BLACKLIGHT 2, ask your U-Turn dealer or directly contact U-Turn. We are happy to help!



ACRO- AND FREESTYLE  
HARNESS

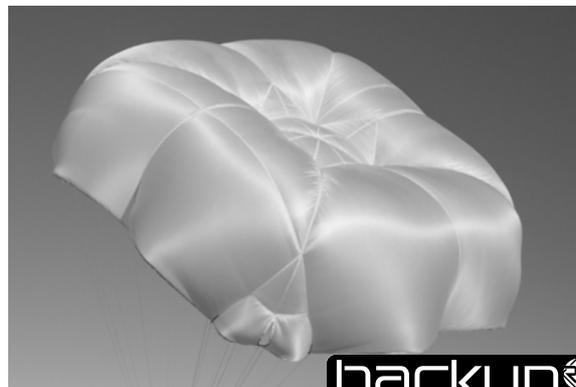
## Suitable Rescue Systems

It is required by law and absolutely necessary for safe operation of your paraglider that you always carry a rescue system. When choosing your rescue system, watch out that it is approved and suitable for the intended takeoff weight.

With the innovative rescue systems of the BACKUP-series by U-Turn we offer light-weight, convenient and safe reserves with short opening times and minimum sink-rates.



X-CROSS



RS-ROUNDSQUARE



# MAINTENANCE AND CARE

The life span and safety of operation of your equipment is very dependent of the care of the pilot, treat and maintain your flight equipment always with the utmost care. We recommend that you regularly check your BLACKOUT PLUS for signs of wear and tear as well as damages.

## Packing

Look for a clean - best case also soft - underlay to spread out your glider.

Free the cloth of soiling like leaves, grass or sand and sort the lines evenly. Use the riser-fix system at the rear end of the wing for the risers. Make sure that the glider is dry and clean before you pack it up. Now start to fold the glider from the middle out cell by cell. After that place both halves on top of each other and fold the glider to the end format. Shifted packing prevents constant abrasion of the middle of the paraglider.

## Maintenance

Since U-Turn exclusively uses high-quality material, the U-Turn BLACKOUT PLUS will be unrelievedly airworthy for many years at good care and maintenance. The aging of your U-Turn BLACKOUT PLUS depends on the total flying time, the conditions in which 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:

- Do not leave your U-Turn BLACKOUT PLUS out in the sun more than necessary, but put it back into the backpack after your flight.
- Consider the choice of terrain when choosing a take-off site to lay out your glider.
- Do not drag your glider on the ground and prevent friction.

Please consider that:

- the lines need to be checked for damage regularly.
- the lines are not being bent unnecessarily and you don't step on the lines when laying out the glider.
- lines need to be checked after overloads (tree or water landings etc.) for their strength and correct length and exchanged if necessary.
- lines need to be checked for their correct length in case of changing inflight handling characteristics.
- the main brake lines aren't knotted too many times at the grip since every knot weakens the line.

## Cleaning

For cleaning of the canopy it is best to use just warm water and a soft sponge. Never may chemicals be used for the cleaning because these damage the coating and strength of the cloth.

## Checking

The BLACKOUT PLUS needs to be checked according to the check intervals resp. hours of operation. At the check the condition of all components is tested by strict guidelines. Subsequently the overall condition of the glider is assessed and recorded in the check protocol. The BLACKOUT PLUS needs to be checked after 12 months or 100 hours of operation. This data is also stated in the signboard in the front edge of the glider. Information on the licensed check workshops can also be found on our website: [www.u-turn.de](http://www.u-turn.de)

## Transport and storage

When transporting the glider mechanical abrasions are to be avoided. Additionally the glider shouldn't be exposed to any liquids or high temperatures. It has to be packed completely dry and otherwise be aerated properly. Always store the BLACKOUT PLUS dry and away from UV radiation. Furthermore never store the wing together with acids or similar damaging goods.



**ATTENTION:** After a longer storage period the glider needs to be thoroughly checked.

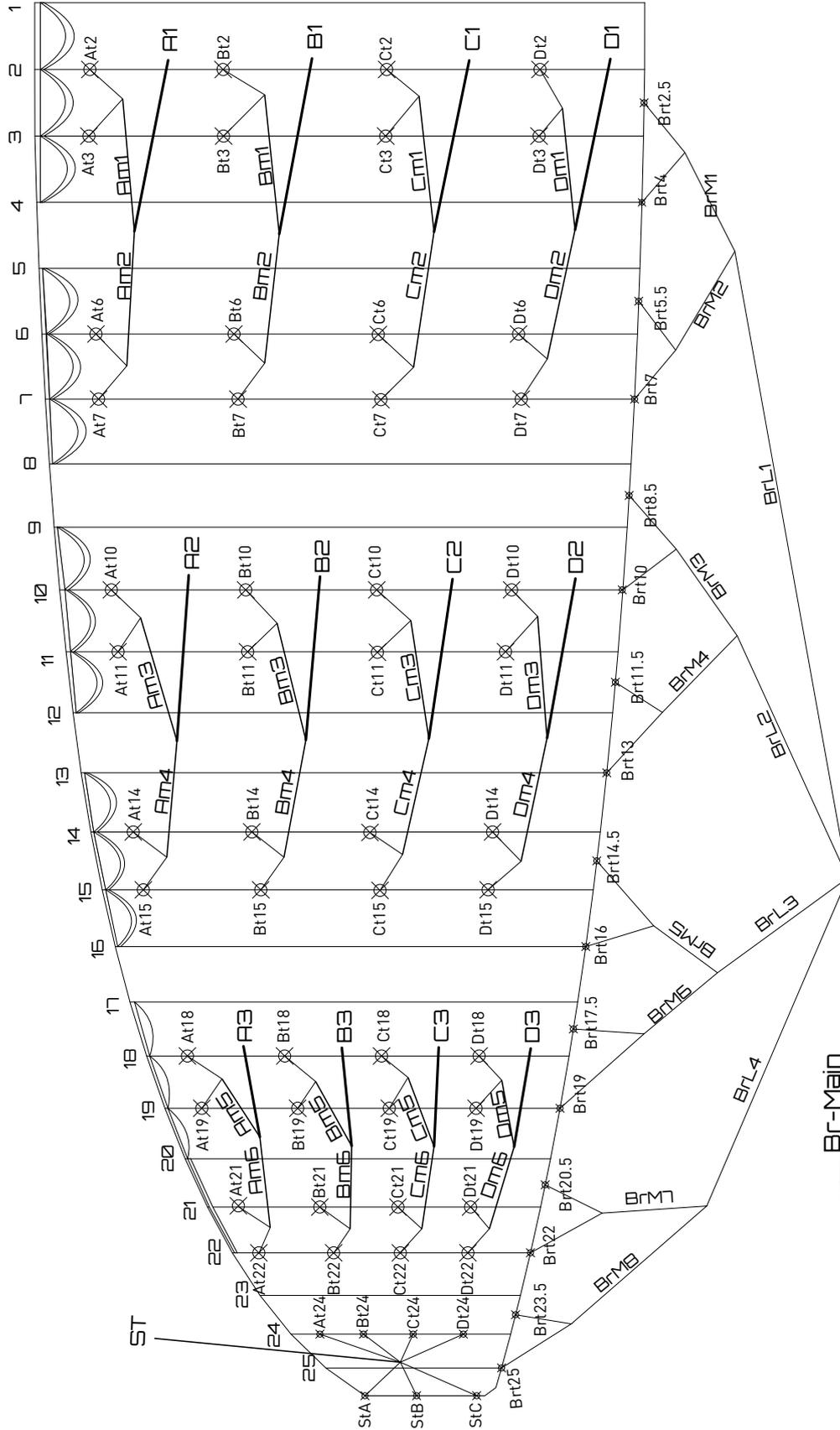
## Repairs

Basically only authorized service centers may execute repairs on paragliders. Small damages like tears or small holes up to a size of 2 x 2 cm, where a repair without special equipment is possible, the pilot may do by himself. The included self-sticky tape from the repair-kit is to be used for that. Tears or holes need to be fixed from both sides. Please take care that the repair tape sticks out at least 2cm beyond the damaged area on all sides. The self-sticky tape can be cut into the right form. Rounding off the corners prevents it from becoming detached.

## Recycling

U-Turn uses only safe materials and puts a lot of value on saving the resources. Nevertheless the materials used in a paraglider need proper disposal. Please return worn out gliders to U-Turn GmbH or disassemble the glider into its parts and dispose.

# LINECODE-INFO BLACKOUT PLUS



# LINEPLAN BLACKOUT PLUS

All line plans can be requested at U-Turn via  
the e-mail address [info@u-turn.de](mailto:info@u-turn.de).

# PRESUMPTION OF RISK

The usage of the U-Turn BLACKOUT PLUS contains certain dangers of bodily harm or even death of the user of this product or a third party. With the use of the BLACKOUT PLUS you consent to all known and unknown risks and accept probable and improbable risks of injury. The dangers innate with the practice this kind of sport can be reduced by adhering to the warning notes in the manual, as well as the required attention to detail on each flight. The risks inherent to the sport can be reduced to a large degree, if one adheres to both the maintenance guidelines, which are listed in this operating manual, as well as using common sense.

## **Liability claim and renouncement of exclusion**

With the completion of the purchase of a U-Turn BLACKOUT PLUS you express your in consent with the following points of legal specifications:

THE RENOUNCEMENT EXCLUSION OF ALL LIABILITY CLAIMS,

deriving from the use of the U-Turn BLACKOUT PLUS and or either components thereof, now or in the future, against the U-Turn GmbH and all other contracting parties.

Releasing U-Turn GmbH and all other contracting parties of all liability claims concerning loss, damage, injury or expenses that you, your next of kin, relatives or any other user of the U-Turn BLACKOUT PLUS could suffer as a result of the usage of the BLACKOUT PLUS. This includes but is not limited to lawful or contractual liability on behalf U-Turn GmbH and all other contracting parties as a result of the of production and processing the U-Turn BLACKOUT PLUS and all its components. With the occurrence of death or disability, all directives stated here come into force and bind their beneficiaries, next of kin, trustees, legal successors and/or representatives. The U-Turn GmbH and all other contracting parties express no verbal or written representation and deny assertively that this was done with exception of what is specified here and in the manual of U-Turn BLACKOUT PLUS.

## **Safety Advice and Liability**

This glider complies with EAPR regulations, for the tested type, at time of delivery (see appendix). Any unauthorized alteration is followed by the expiration of the operating licence! The operation of the glider is at your own risk and the pilot needs to make sure that the aircraft is checked for its airworthiness before every flight. We also take it as a given that the pilot is in possession of the required certificate of qualification and that the given legal requirements are met. Use of the equipment is at your own risk! The manufacturer and the dealer don't take any liability for accidents and possible consequential damages. Please consider all safety notes, cautions and warnings for safe flying.

# RELEASE OF LIABILITY, RENOUNCEMENT OF ENTITLEMENT

Hereby you declare, that -prior to use of the U-Turn BLACKOUT PLUS you have read and understood the U-Turn BLACKOUT PLUS user manual in its entirety, including directions and warnings, which are included in this user manual.

Moreover you declare to carry responsibility - prior to granting the use of U-Turn BLACKOUT PLUS to a third party - through transferring ownership temporary or permanently, for this other user to have read and understood the U-Turn BLACKOUT PLUS user manual in its entirety, including directions and warnings, which are included in this user manual.

-----  
Place and date

-----  
Signature of the first pilot

-----  
Place and date

-----  
Signature of the second pilot

-----  
Place and date

-----  
Signature of the third pilot

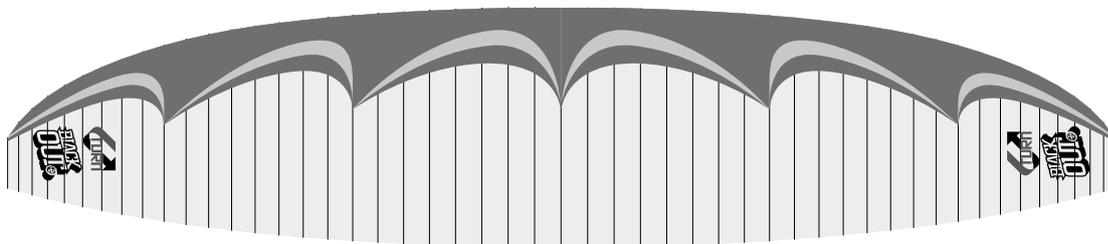
**U-Turn does not take responsibility, liability and/or  
guarantee for inspections and repairs that are not performed by U-Turn.**

# INSTRUCTION LEAFLET FOR REPAIRS & 2-YEARLY-CHECK

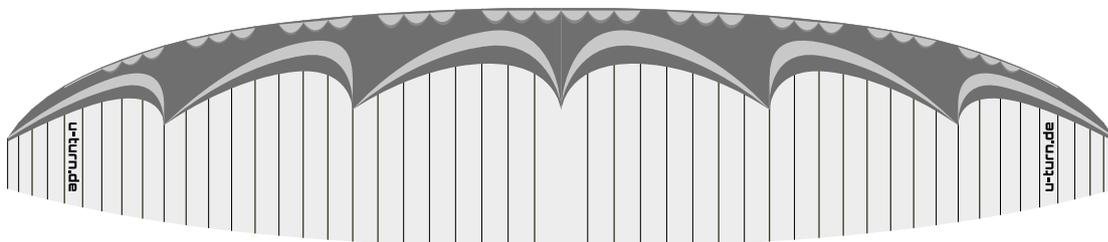


Last Name:	First Name:
Street Address:	Zip Code, City:
Country:	Telephone:
E-Mail:	
Glider Model and Size:	
Serial Number:	
Comments/Notes:	

- 2-year Check
- Air Permeability Check
- Call-back at Sighting of the Glider
- Line Check incl. Strength Test
- Repair of the marked Damage



**Obersegel / Top**



**Untersegel / Bottom**



U-TURN GmbH  
Im Neuneck 1  
D-78609 Tuningen



Fax: +49 (07464) 98912828  
Tel. +49 (07464) 9891280



info@u-turn.de  
www.u-turn.de

# LINE ORDER FORM



Last Name:	First Name:
Street Address:	Zip Code, City:
Country:	Telephone:
E-Mail:	
Reserve Model:	
Size:	
Serial Number:	
Comments/Notes:	

Line ID-Code	Quantity



U-TURN GmbH  
Im Neuneck 1  
D-78609 Tuningen



Fax: +49 (07464) 98912828  
Tel. +49 (07464) 9891280



info@u-turn.de  
www.u-turn.de

**#CATCHYOURSHADOW**

Follow up on the activities of the U-Turn-Acro-Team in the Community:



**U-TURN ACRO TEAM**







# MAINTENANCE MANUAL

as developer and manufacturer of paragliders,  
harnesses and rescue systems

**English Rev. 1.2 Effective: April 2018**

Copyright ©

2018 by U-Turn GmbH, all right preserved. No part of this publication may be reproduced or developed further on in any way without written approval of the U-Turn GmbH.

All technical details in this manual have been carefully checked by U-Turn. However we like to mention that we do not 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.

# TOPIC OF INSPECTION AND REINSPECTION INTERVALS

Regular inspection according to aircraft inspection ordinance for standardized evaluated gliders.

For End-user equipment after 24 months, for school equipment after 12 months.

Inspections must take place in the given intervals or after 150 flight hours at the latest. Ground handling needs to be included in the sum of flight hours.



**ATTENTION:** In case of any abnormal flight behaviour, the manufacturer should be informed and the glider, if necessary, sent in for inspection.

## Who may inspect?

Except for the manufacturer or person/instance approved by it, only the owner of the glider itself is authorized to warrant the 2-yearly inspection, if he has the needed prerequisites.

## Individual personal prerequisites for the inspections

Personal prerequisites for the inspection of solo gliders for recreational use only:

- Holder of a valid unrestricted licence for paragliders or equivalent accredited licence.
- An adequate orientation in the operation by the manufacturer.  
Therefore a 3 month schooling with the manufacturer is necessary.
- If a glider was tested for personal use exclusively, its use by a third party is not allowed.

Individual personal prerequisites for the inspection of gliders, rescues, harnesses used by third parties or as tandem:

- professional training prescribed for the testing.
- a vocational activity in the production or maintenance of glider rescue, harness or of a technically similar nature. Of such 6 months in the last 24 months at a manufacturer for free flight aircrafts.
- Subject to charge, at least two-week-long type specific training course through the manufacturer.
- an applicable orientation for each type of equipment, which is to be refreshed annually.

## **Necessary equipment and documentation**

- Gauge, preferably Kretschmer (brand) with manual
- Bettsometer with manual
- Maintenance directions by manufacturer
- Original materials and spare parts, as well as original material list for the piece of equipment
- Assertion of airworthiness for the piece of equipment
- Aircraft equipment identification tag (see manual)
- line length table (see manual)
- Inspection logs (if available)
- Inspection log (template) for the documentation
- Light-table for visual inspection of the rescue system

## **DURING INSPECTION THE FOLLOWING STEPS HAVE TO BE TAKEN:**

### **Positive identification of the piece of equipment:**

Positive identification of the aircraft based on the certification seal or the label.

- Are the pertinent manufacturer documents available?
- Are signboard and certification seal in place, readable and correct?
- If not so: Please obtain from the manufacturer or dealer in question.

The determined values / modifications need to be recorded in the inspection log!

### **Inspection of the Rescue Gear**

Before packing the Rescue System, it is to be controlled by the packer. Has the parachute been opened for a rescue situation, it needs to be re-inspected.

Is a packed rescue parachute to be repacked, a release control is to be performed.

Within such, it has to be determined whether the release force is between 3 and 6 kg.

### **Inspection of top- and bottom sail, seams, reserve parachute**

#### **Holes and tears**

The topsail and undersail of both paragliders as well as reserve parachutes must be submitted to the below listed checks for each cell (paragliders) and each gore (parachutes), from the leading edge to the trailing edge. If in one of the following attributes anomalies are discovered, the glider is to be sent in to the manufacturer for inspection.

- Check for holes, smaller or larger tears, deformations and abraded areas
- Deficiencies in the coating, other anomalies in the canopy e.g. old repair areas
- With reserve parachutes a light-table is to be used for inspection of holes, tears and deformations.

### **Abrasion and deformations**

With large and critical abraded and deformed areas, the entire cell panel in question must be replaced by the manufacturer.

The determined values / modifications need to be recorded in the inspection log!

### **Testing of the ribs**

Visual inspection of the chambers (from the leading to the trailing edge) whether the stitching in the seams, cell partition ribs and reinforcements are in good shape, thus without tears, deformations, abrasions or damage of the coating.

With torn ribs, defective, loose or missing stitching in the seams the glider must be returned to the manufacturer or authorized inspection instance.

The determined values/modifications need to be recorded in the inspection log!

### **Testing of the tear resistance**

To be conducted with the Bettsometer at the following points (B.M.A.A. approved patent number GB2270768 Clive Betts Sails)

- In both the top and bottom sail where the A-lines connect, push a needle-thick hole and check the tear resistance.
- The limit value of the measurement is determined at 500g, and a tear width of fewer than 5mm.

The determined values/modifications need to be recorded in the inspection log!

### **Testing of the porosity of the canopy**

At all following measuring points the air porosity has to be more than at least 20 sec. (by Kretschmer). At smaller air permeability values the paraglider must be returned to the manufacturer.

Measuring points: The porosity measurements by the Kretschmer measuring method (please consider operating instruction) are to be conducted at the following points on the canopy check on both under and upper sail.

- middle cell approx. 20-30 cm from the cell opening
- 3. cell from the middle (left and right) approx. 20-30 cm from the cell opening
- 10. cell from the middle (left and right) approx. 20-20 cm from the cell opening

The determined values/modifications need to be recorded in the inspection log!

## Connection pieces

Checking the risers and quick links

- are chafe marks, kinks, tears, or severe signs of wear and tear present?
- are all sewings firm?
- is the accelerator pulley free and intact?
- are the brake loop fasteners still sewn tight?
- are all quick links corrosion-free, is the thread going freely?

The measuring should occur under a load of 5 kg. The determined values are to be compared with the specifications from the DHV type rating sheet. Permissible deviations can be found in the manufacturers instructions. If the riser or parts of it are defective, replacement parts must be ordered from the manufacturer and the defective parts replaced with an original replacement part.

The determined values/modifications need to be recorded in the inspection log!

## Lines

Checking the line tear resistance:

Line selection: a middle A-, B, and C- main line and if available middle B and B cascade line should be selected and tested for tear strength using a tensile tester.

Pull speed of the pull cylinder:  $v = 30 \text{ cm / min}$

Tear / Tensile strength values

The determined values/modifications need to be recorded in the inspection log!



**ATTENTION:** Each size (line diameter) is assigned a fixed value. If the lines cannot withstand the specified tensile load or tensile strength, all other lines must be replaced. If the tested lines meet these test criteria, only they will be replaced by new ones. All replaced lines should be marked near the shackle (seam) with a black marker and noted in the test report with the date of the exchange and the number of hours of operation on the equipment. At the next inspection, an original neighbour line will be used for the line strength test. The different line diameters are assigned a minimum stitching length!

## Checking of the line lengths and line attachment points

Visually inspect main-, cascade- and brake lines for tears, kinks and abrasion marks. First A-line level then B etc.

- Are all the lines sewn and attached into the line fixtures adequately?
- Are the sheathings of the lines accurate?
- Are Are all loops, knots and stitches in good condition?
- Are abrasions visible?

Measurement of the line lengths: Part of the regular data control is the measuring of the line lengths.

- The lines must be measured with an attached load equal to 5 kgs to get comparable results. You will find the corresponding line lengths in the air sports equipment data sheet of your manual.
- The measuring is carried out in accordance with the DHV method from the line shackle to the canopy (including the line loop on the canopy).
- Numbering takes place from the center of the wing to the stabilo. The measurement of the opposite wing side can also be done by a symmetry comparison under the same conditions.
- The result is noted again in the inspection log and compared to the nominal line lengths of the DHV type label. The tolerance deviation should not exceed  $+ / - 1.5$  cm.
- If a line is defective it must be replaced immediately. Please take the line code out of the line plan, order from the manufacturer and then have them installed accordingly.

The determined values/modifications need to be recorded in the inspection log!

## **Visual check of trimming and adjustment**

Before a check-flight the visual control of canopy and lines needs to be made with the equipment laid out or pulled up. Especially the length of the steering lines (brake lines) should be paid attention on at the pulled up glider. Only when all concerns about incorrect adjustment of the control lines (brake lines) are eliminated, a check flight may be carried out.

## **Material description and technical data**

See manual of your paraglider

## **Miscellaneous**

- All inspection-, measuring- and repair works on paraglider and rescue system need to be fully documented in the inspection report.
- When repacking the rescue system, it is essential to pay attention to the special way of packing the rescue system! See manual of the reserve parachute.
- When replacing components only original materials or original spare parts may be used!
- For sewing work the original sewing pattern is to be observed, patch and thread material in the same strength and quality as original need to be used!
- The Inspection and measuring log report need to be issued with signature, place and date.
- The retention period is 4 years.

# DONE INSPECTION - VERY IMPORTANT!

Before you carry out your own personal checks and/or repairs on your paraglider, we ask you to read the following page carefully. This informs you about the requirements and conditions for a private 2-yearly-check.

- According to the new DHV regulation, the customer (owner of the paraglider) can carry out the 2-year inspection of the paraglider under his own responsibility with the help of the inspection instruction and all necessary equipment and documents. The paraglider does not need to be sent to the manufacturer.
- The 2-yearly-check may only be carried out by the paraglider owner in person, if he meets the requirements, or by the manufacturer and its authorized test centres. Therefore contact the manufacturer for authorized testing centres.
- The owner of the glider must be aware of the responsibility he assumes with an on-the-spot 2-yearly inspection of the glider. The private 2-yearly-check is only legally effective if it is confirmed with date, name (in block letter) and signature on or besides the signboard label inside the glider.
- You should obtain timely information from your insurer on the insurance effects of your own two-yearly check.
- An inspection is only valid if the inspection report is completely filled. Also, be aware of possible changes to the inspection instructions from the manufacturer before the check.
- Important: If the necessary expenses for the maintenance check cannot be provided (see necessary equipment and documents), the glider should be sent in for the check with the manufacturer or an authorized test centre.
- For paragliders, harnesses and rescue equipment that was checked, repaired, packed or repacked flown in or had other maintenance work done by personnel that was not authorized by U-Turn, any warranty and guarantee is void!
- All maintenance work must be carried out in accordance with the maintenance instructions in the operating instructions and the manufacturers special maintenance instructions and IHB publications.
- In the event of extraordinary occurrences during the maintenance work, the technical manager must be informed and must decide how to proceed further.
- When replacing components or assemblies only original materials or original spare parts must be used!



## **U-Turn GmbH**

Im Neuneck 1

78609 Tuningen

Fon: +49 (0)7464 98 91 28-0

Fax: +49 (0)7464 98 91 28-28

info@u-turn.de

More information at: [www.u-turn.de](http://www.u-turn.de)

Copyright ©

2018 by U-Turn GmbH, all right preserved. No part of this publication may be reproduced or developed further on in any way without written approval of the U-Turn GmbH.

All technical details in this manual have been carefully checked by U-Turn. However we like to mention that we do not 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.

