



CROSSROCK

MANUAL

English Rev. 1.1 Effective: January 2018

Please read this manual
before you fly your U-Turn CROSSROCK
for the first time.



LET'S ROCK THE SKY

#CROSSROCK



WE MADE PERFORMANCE LIGHT, SO YOU CAN FLY XC LIGHT-HEARTEDLY.

Congratulations, you have chosen the cross country wing CROSSROCK. 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.

Communication is important to us as we are constantly striving to optimise our products in the sense of “pilots for pilots”. Your experiences are held as a high priority at U-Turn, and we are happy about active contributions in the form of suggestions and criticism. We are happy to help you with any unanswered questions. To ensure optimal service and communication register your CROSSROCK here:

www.u-turn.de/product-registration

▶ REGISTER NOW



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 CROSSROCK as safe and easy as possible.

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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

Become a part of the U-Turn community:



U-TURN PARAGLIDERS

CROSSROCK WITH LOW WEIGHT ACROSS THE COUNTRY.

The CROSSROCK is a lightweight travel-wing suitable for every day. It combines small pack volume with performance-oriented flight calmness. A hybrid of lightweight and everyday-glider, that offers high comfort even on extensive routes. The CROSSROCK is hungry for far destinations and pulls towards the cloudbase even in weak thermal conditions. Thereby the smooth glider slices through turbulent airmass and is hardly knocked off course.

Despite its low canopy weight the CROSSROCK lies heavy in the air and light in hand. Control pulses are translated accordingly precisely and the wing is easily rotated into the thermal lift. The performance-oriented lightweight glider is aimed at pilots who desire light luggage and small pack size for everyday flights on the XC route. Whether it is flying in the reliable thermal spots, travelling to remote places or on the mountain, the CROSSROCK is built for the trying use in everyday life. The mid-B wing offers maximum safety reserves through damped reactions besides its outstanding rise features. Finally the good feeling is what ensures the lasting comfort on long routes. At the high performance capability and the sweet-tempered features the constructional proximity to the BLACKLIGHT 2 is clearly discernible.

Chief designer Ernst Strobl counts on the efficiency of simplification at the CROSSROCK. That does not only lead to a weight reduction but also gives the wing its outstanding characteristics. Based on the concept for success of Blacklight 2 several modifications for the CROSSROCK were made to maintain the form fidelity at long durability. The sharknose provides more stability at higher speeds. The 3D-shaping gives the leading edge a dynamic tension and elevates - in combination with the Precision Profile Nose (PPN) - the profile fidelity in the nose area. Pre-tensioning of the wing and the ballooning help to provide the perfect flow around the profile through elaborate calculations. The High Pressure Crossport Design (HPCD) optimizes the lateral aeration of the crossports and provides a balanced internal pressure of the wing. The line-set-up with three main lines is very straight-forward. Here the newest generation of PPSLS lines are being used, which ensure extremely high loads with minimal diameter.

When choosing the materials just as much value was placed upon the durability as it was on optimized weight management. The little weight of the glider absorbs less energy and thereby facilitates a sweet-tempered reaction-behavior. The used materials Skytex 32 and Skytex 27 have double coating and are superior to heavy materials because of the little weight. The materials were tested under harsh criteria for long-term durability.

The CROSSROCK is aimed at all pilots who want to rock kilometers with light luggage. Thereby the glider offers high performance potential with high safety reserves which even ambitious pilots will like. The CROSSROCK offers optimized performance weight without renouncing the comfort.

CROSSROCK

Usage

The CROSSROCK is aimed at all pilots who want to rock kilometers with light luggage. Thereby the glider offers high performance potential with high safety reserves which even ambitious pilots will like. The CROSSROCK was build exclusively for one-seated usage and is a light aircraft with a mass of less than 120 gks in the class of paragliders. The CROSSROCK is sample inspected and certified after LTF/EN B.

SAMPLING INSPECTION:

Test Guideline: LTF 91/09 & EN 926-1:2016, 926-2:2013

Test Centre: EAPR GmbH, Marktstr. 11, D-87730 Bad Grönenbach

Motorised Paragliding

The CROSSROCK is ideally equipped for the motorised flight because of its outstanding rise features, its uncomplicated handling and the high trimmed speed. Please note that NO ACRO MANEUVERS are allowed in the motorised flight.

The extremely high area loading through the additional weight of the motor brings even the U-Turn CROSSROCK to its load limits. Currently no U-Turn BLACKLIGHT is certified for motorised usage, the allowed weight ranges must not be exceeded!



Winching

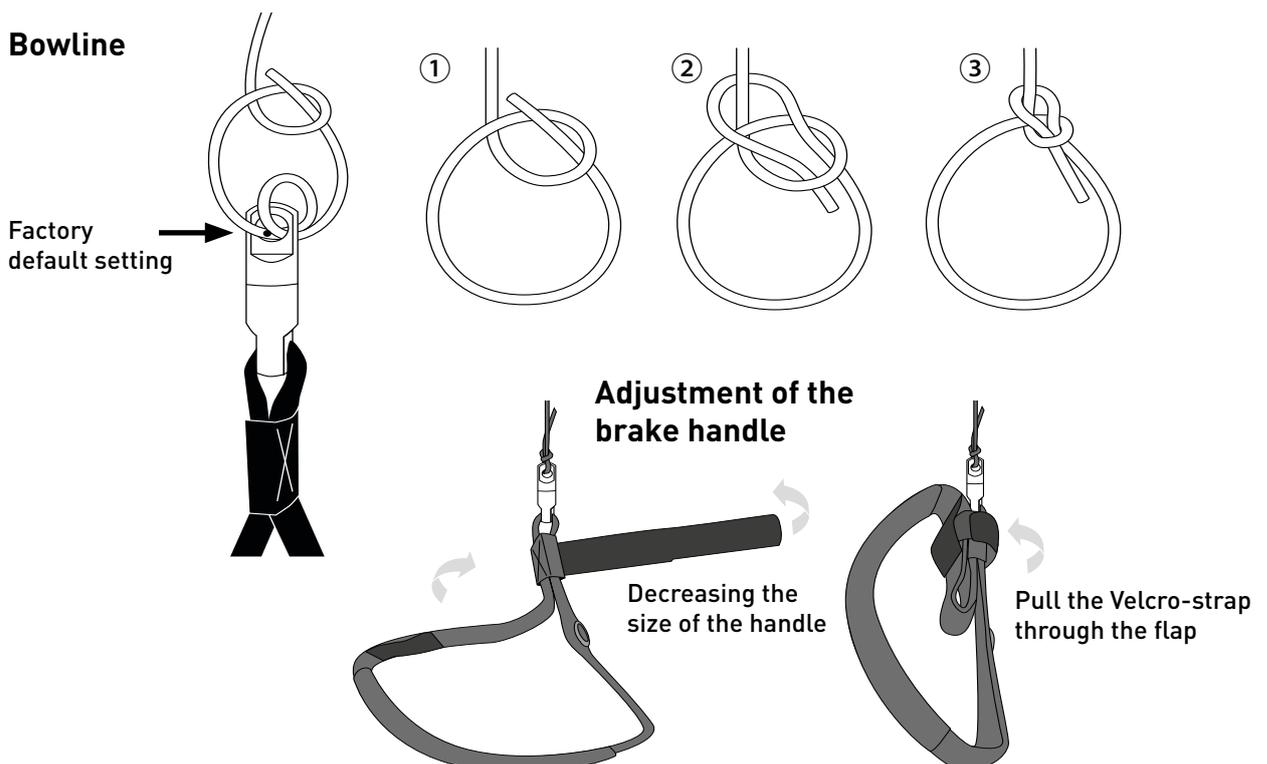
Because of its excellent start characteristics and its high trimmed speed, the U-Turn CROSSROCK offers the best conditions for winching operations. Take the following points into account:

- Do not use a tow line tension over 100 kp with the U-Turn CROSSROCK.
- 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 CROSSROCK with loads outside 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.

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.



Safety precautions

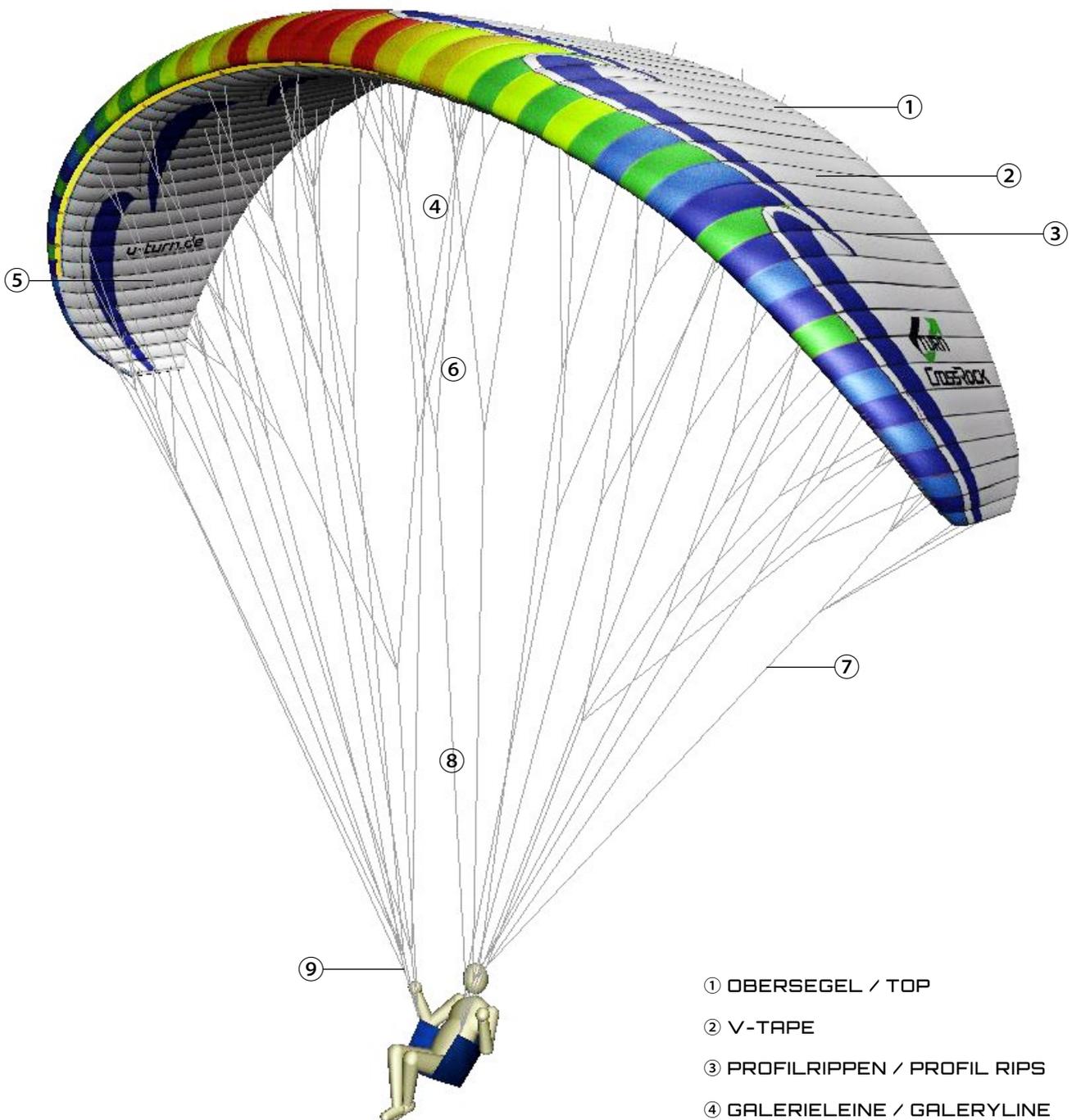
- Before the first flight the canopy, lines, all connections and sewing, mallions, brake line and brake line knots as well as ev. twisted lines need to be checked by trained and authorized personnel and confirmed in the signboard of the glider.
- Make your maiden flight in a familiar flying site and calm conditions.
- Test your U-Turn CROSSROCK only over 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 CROSSROCK with at least one reserve parachute!
- Observe and abide to 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 CROSSROCK.
- 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 CROSSROCK.
- 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 CROSSROCK only in wind strengths, in which you are able to control the wing to 100%. Do not use the U-Turn CROSSROCK, 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



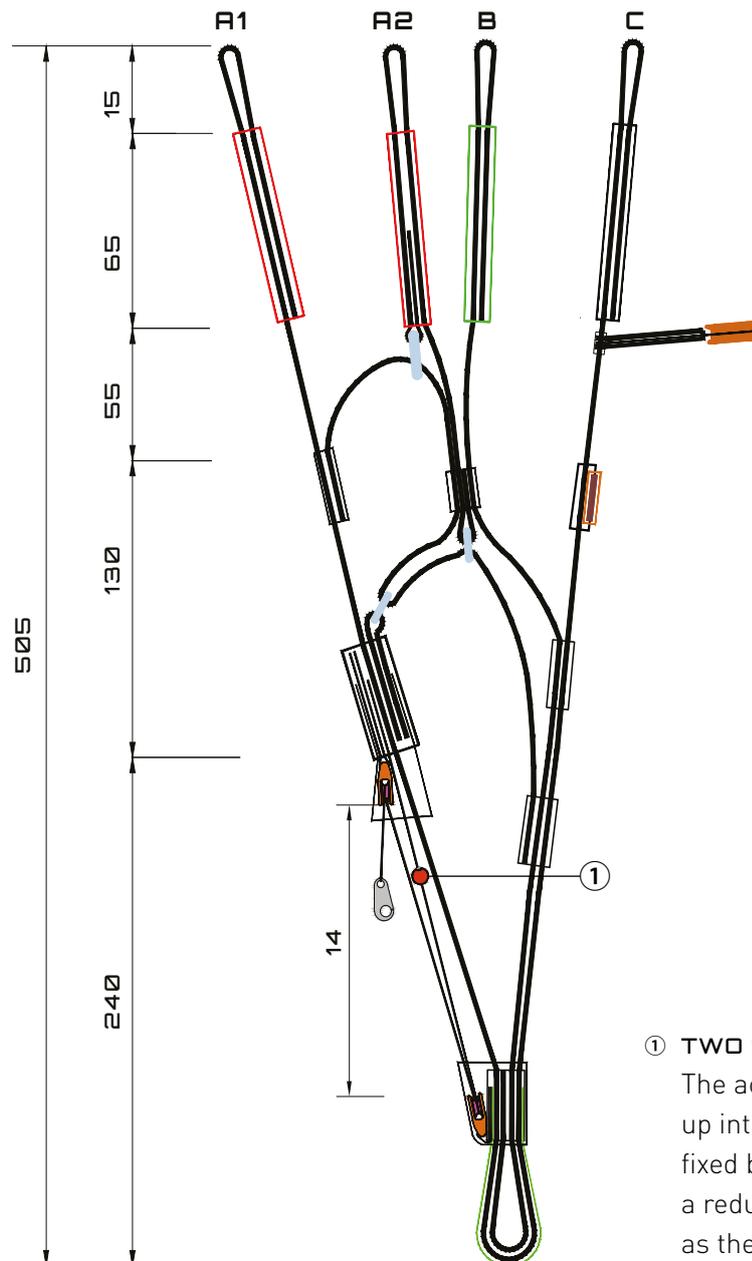
- ① OBERSEGEL / TOP
- ② V-TAPE
- ③ PROFILRIPPEN / PROFIL RIPS
- ④ GALERIELEINE / GALERYLINE
- ⑤ UNTERSEGEL / BOTTOM
- ⑥ GABELLEINE / GABELLINE
- ⑦ STABIOLEINE / STABIOLINE
- ⑧ STAMMLEINE / MAINLINE
- ⑨ TRAGEGURTE / RISER

Risers

The A- and B-risers have different colors to ensure positive identification at take off and during a B-stall decent.

Number of risers: 3+1

The risers of the U-Turn CROSSROCK are made out of 10mm Dyneema tube webbing.



① TWO STAGE ACCELERATOR

The accelerator travel and reduction is split up into 2 stages by a hollow ball its position is fixed by a knot on the rope the first stage has a reduction by factor 3 (the second stage by 2) as the ball reaches the pulley it is blocking it so that the reduction factor is in the second stage 2. the second stage has so an increased the sensitivity and gives so more wing feed-back to the pilot. the pulley to pulley travel of the accelerator is 140 mm.

Speed System

The U-Turn CROSSROCK is equipped with a very effective foot actuated speed system. It increases the speed when applied up to approx. 15 km/h depending on the wing size and pilot weight resp. surface loading. Through the level steered speed system the profile form is maintained therefore the outstanding flight features are kept even in high speed. All extreme flight attitudes (e.g. collapses) happen at accelerated speed more dynamically.

Therefore only activate the speed system to such a degree where you feel comfortable below your wing at any time.

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.

The two-stage speed system also enables an exact fine adjusting at your harness (foot accelerator). By moving the knot that fixes the ball the accelerator distance and pressure can be individually adjusted.

- If the knot is moved down towards the harness suspension, the second stage is reached sooner thereby the accelerator way is shortened.
- If the knot is moved up towards the line shackles, the second stage is reached later and the accelerator way is getting longer.



ATTENTION: Take care that the accelerator is not adjusted too short so the glider is not pre-accelerated before the flight.

TECHNICAL DATA U-TURN CROSSROCK

	XS	S	M	L
Start weight Startgewicht	55-80	65-97	80-105	95-120
Flat area Fläche ausgelegt	22,6m ²	24,8m ²	27,2m ²	29,2m ²
Projected area Fläche projiziert	19,641m ²	21,553m ²	23,639m ²	25,377m ²
Flat wingspan Spannweite ausgelegt	11,26m	11,795m	12,353m	12,799m
Projected wingspan Spannweite projiziert	9,127m	9,561m	10,013m	10,374m
Flat AR Streckung ausgelegt	5,61	5,61	5,61	5,61
Projected AR Streckung projiziert	4,241	4,241	4,241	4,241
Chord: center / wingtip Flügeltiefe: Mitte / Stabilo	2,445 / 0,547 m	2,561 / 0,572 m	2,682 / 0,601 m	2,779 / 0,627 m
V-trim V-Trim	39 [+/-1] km/h	39 [+/-1] km/h	39 [+/-1] km/h	39 [+/-1] km/h
V-max V-Max.	54 [+/-2] km/h	54 [+/-2] km/h	54 [+/-2] km/h	54 [+/-2] km/h
Bridle height Abstand Tragegurt-Kappe	6,869m	7,195m	7,535m	7,807m
Nr. of cells Zellenanzahl	59	59	59	59
Glider weight Gewicht	3,6 kg	4,0 kg	4,6 kg	5,0 kg
Bridle length Gesamt Leinenlänge	230,219m	238,925m	274,066m	306,446m
Line diameter Leinendurchmesser	0,55 / 0,65 / 0,7 / 1,1 1,2 / 1,3 / 1,45 / 1,6 mm	0,55 / 0,65 / 0,7 / 1,1 1,2 / 1,3 / 1,45 / 1,6 mm	0,55 / 0,65 / 0,7 / 1,1 1,2 / 1,3 / 1,45 / 1,6 mm	0,55 / 0,65 / 0,7 / 1,1 1,2 / 1,3 / 1,45 / 1,6 mm
Speed system / trimmer Fuß Beschleuniger / Trimmer	Yes / No Ja / Nein			
Certification Zulassung	EN-B / LTF-B	EN-B / LTF-B	EN-B / LTF-B	EN-B / LTF-B
Certified standards and procedures Angewandte Testverfahren	LTF 91/09 & EN 926-1:2006, 926-2:2013			
Folding lines used for certification Faltleinen für Testflüge benutzt	No Nein	No Nein	No Nein	No Nein
Certification No. Zulassungsnummer	EAPR-GS-0784/17	EAPR-GS-0783/17	EAPR-GS-0782/17	EAPR-GS-0781/17

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PILOT PROFILE

Requirements

The CROSSROCK is aimed at ambitious XC pilots who are looking for a highly developed performance wing with sportive handling. The experienced pilot is able to recognize disturbances at the first onset and can fully make use of the high performance potential by active flying. The CROSSROCK is based on the newest development knowledge and thereby stands at the maximum of the safety standards in its class.

Nevertheless we would like you to always conduct the flying sport with the needed caution and respect. That includes profound preparations for the flight as well as getting acquainted with the given meteorological conditions and correct assessment of the weather. Act defensive because the fun factor rises when the risk factor sinks.

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 off marked paths, don't leave any waste, don't make noise uselessly and respect the sensitive biological equilibrium in the mountains. Especially at take-off areas maximum care for nature is necessary.



THE FLIGHT

Flying experience

This manual is only focusing on the points of the technique of flying that are important for the U-Turn CROSSROCK. 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 CROSSROCK 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 CROSSROCK 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 CROSSROCK 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 CROSSROCK. 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 CROSSROCK 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 CROSSROCK 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 CROSSROCK 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 CROSSROCK 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 CROSSROCK 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 DECENT

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 CROSSROCK 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 CROSSROCK. 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 air-mass. 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 CROSSROCK 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 CROSSROCK 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 CROSSROCK 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 advise concerning collapses by Ernst Strobl.

Deep stall

The U-Turn CROSSROCK 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 CROSSROCK 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 CROSSROCK 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.

CROSSROCK

ROCK KILOMETERS WITH LIGHT LUGGAGE

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 CROSSROCK for signs of wear and tear as well as damages.

Maintenance

Since U-Turn exclusively uses high-quality material, the U-Turn CROSSROCK will be unrelievably airworthy for many years at good care and maintenance. The aging of your U-Turn CROSSROCK 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 CROSSROCK 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 pack it on a patch of grass.

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.

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.

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 CROSSROCK 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 CROSSROCK needs to be checked after 24 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

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 CROSSROCK 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.

Recycle

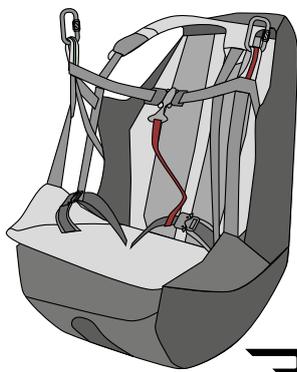
U-Turn uses only safe materials and puts a lot of value on saving the resources. Nevertheless the materials used in a paraglider need proper disposal. Please return worn out gliders to U-Turn GmbH or disassemble the glider into its parts and dispose.

FLYING ACCESSORIES

Harness

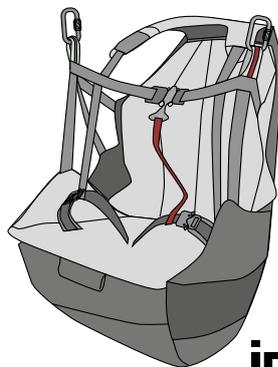
All certified harness systems with mounting at about breast height are compatible with the U-Turn CROSSROCK. The lower the mounting point of the harness, the better you can steer the U-Turn CROSSROCK by shifting your body weight.

Please keep in mind, that also your harness is exposed to extreme loads. U-Turn recommends the use of the very safe and comfortable U-Turn harness RX4 or the practical comfort reversible harness INSIDE, which match the U-Turn CROSSROCK perfectly. The height of the mounting also changes the relative brake distance. If you have any questions about the usage of your harness with the CROSSROCK, ask your U-Turn dealer or directly contact U-Turn. We are happy to help!



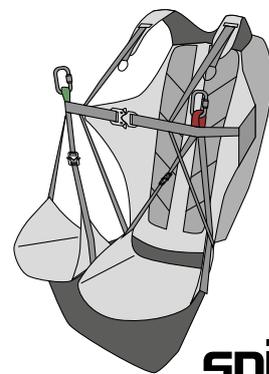
RX4

ALLROUND
HARNESS



inside

REVERSIBLE
HARNESS



spirit

LIGHTWEIGHT
REVERSIBLE
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

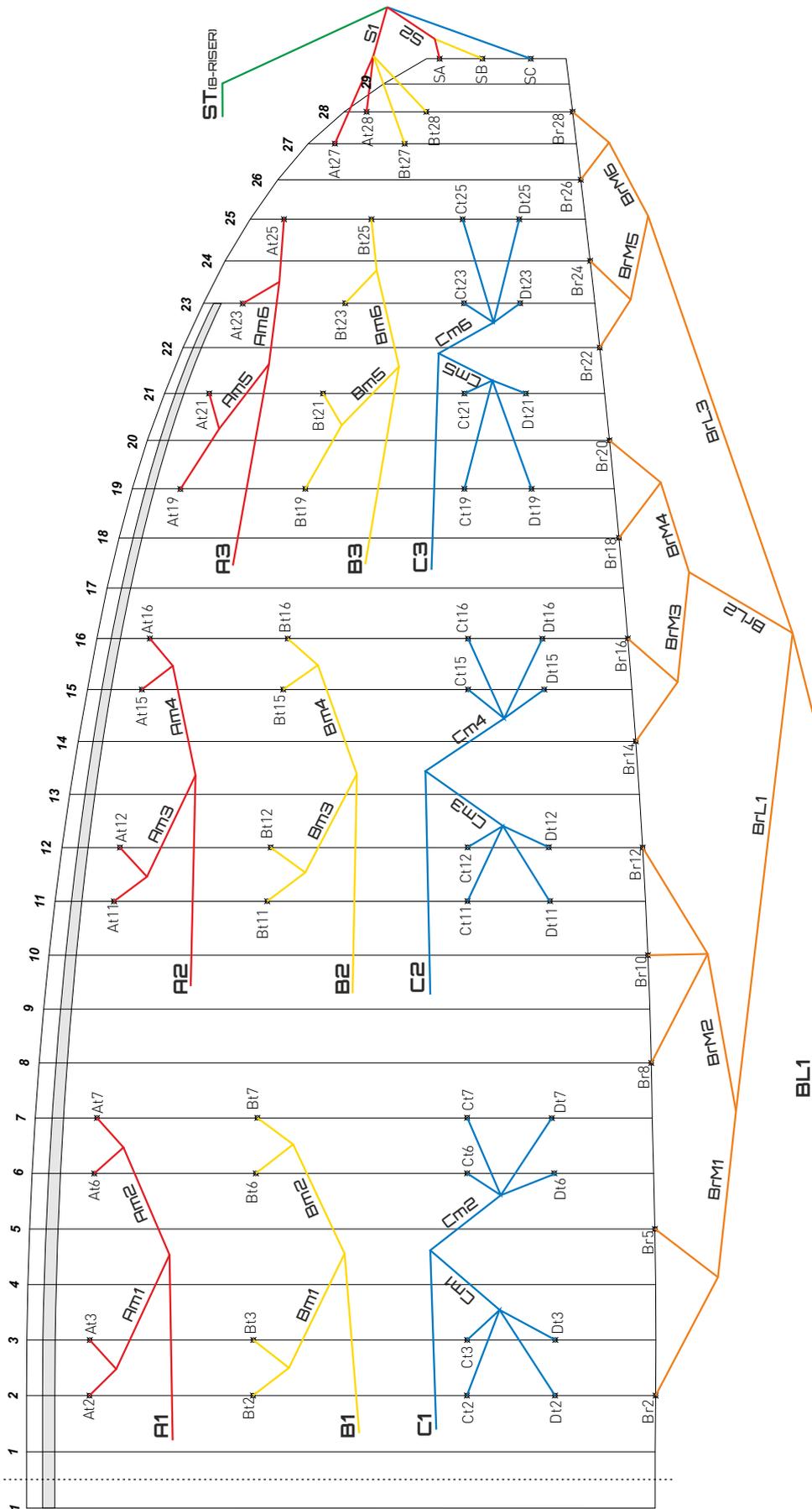
backup 15



RS-ROUNDSQUARE

backup 12/10

LINECODE-INFO CROSSROCK



LINEPLAN CROSSROCK XS

All line plans can be requested at U-Turn via
the e-mail address info@u-turn.de.

LEINENPLAN CROSSROCK S

LEINENPLAN CROSSROCK M

LEINENPLAN CROSSROCK L

PRESUMPTION OF RISK

The usage of the U-Turn CROSSROCK contains certain dangers of bodily harm or even death of the user of this product or a third party. With the use of the CROSSROCK 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 CROSSROCK you express your consent with the following points of legal specifications:

THE RENOUNCEMENT EXCLUSION OF ALL LIABILITY CLAIMS,

deriving from the use of the U-Turn CROSSROCK 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 CROSSROCK could suffer as a result of the usage of the CROSSROCK. 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 CROSSROCK 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 CROSSROCK.

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 CROSSROCK you have read and understood the U-Turn CROSSROCK 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 CROSSROCK to a third party - through transferring ownership temporary or permanently, for this other user to have read and understood the U-Turn CROSSROCK 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

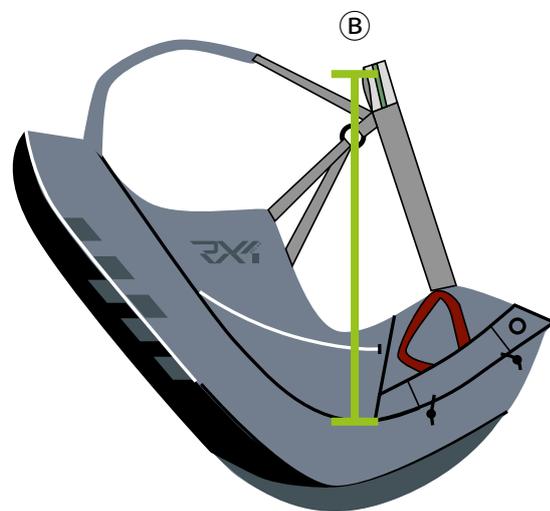
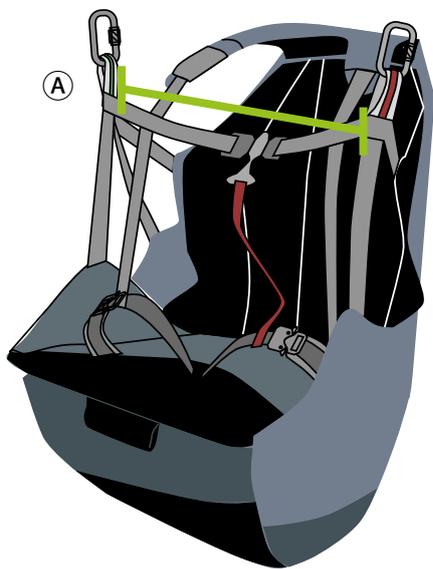
Signature of the third pilot

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

PREREQUISITES FOR LTF/EN CERTIFICATION

Harness dimensions

Weight	A-measurement	B-measurement
< 50 kg	38 cm	38 cm
50-80 kg	42 cm	42 cm
> 80 kg	46 cm	46 cm



Control Travel

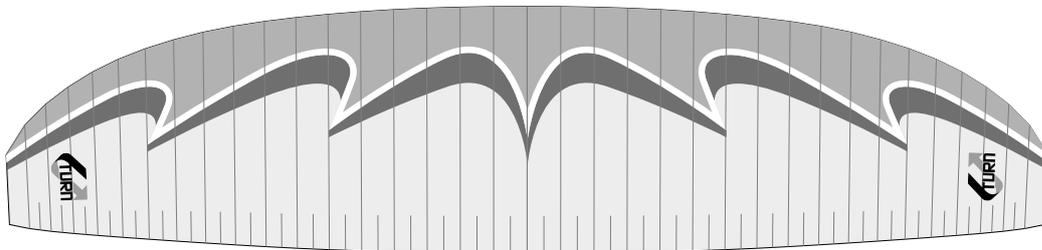
CROSSROCK size	Max. symmetrical control travel at max. weight
XS	> 55 cm
S	> 60 cm
M	> 60 cm
L	> 65 cm

INSTRUCTION LEAFLET FOR REPAIRS & 2-YEARLY-CHECK

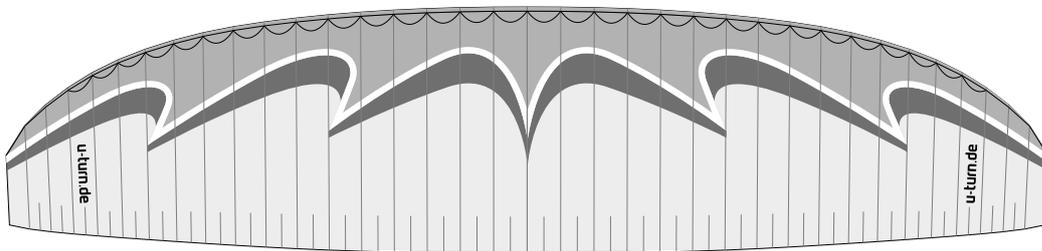


Last Name:	First Name:
Street Address	ZIP code, City
Country	Phone
E-Mail:	
Glider model and size	
Serial number	
Comments/notes:	

- 2-yearly check
- Air permability check
- Call-back at sighting of the glider
- Line check incl. strength test
- Repair of the marked damage



Obersegel / Top



Untersegel / Bottom



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D-78609 Tuningen



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Tel. +49 (07464) 9891280



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www.u-turn.de

LINE ORDER FORM



Last Name:	First Name
Street address:	ZIP code, City
Country:	Phone number:
E-Mail:	
Reserve model:	
Size:	
Serial number:	
Comments/notes	

Line ID-code	quantity

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REPLY CARD



Last Name:

First Name:

Street address:

ZIP code, city:

Country

Phone number:

E-Mail:

Product:

Serial number:

Date of purchase:

Purchased at:

Pilot since:

Number of flights per year:

Club:

Yes, i would like to get informed on the newest activities and developments of U-Turn.



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MAINTENANCE- MANUAL

as developer and manufacturer of paragliders,
harnesses and rescue systems

English Rev. 1.2 Effective: April 2018

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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. The inspection must take place in the given intervals. 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 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!

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