# passenger 2

# MANUAL

**English Rev. 1.1 Effective: April 2017**

Please read this manual
before you fly your new U-Turn Passenger 2
for the first time.

U-TURN
SAFE FUN

# SHARE YOUR FUN

#PASSENGER2

# WE CUT THE BRAKE LOAD PRESSURE IN HALF, SO YOUR FUN DOUBLES.

Congratulations, you chose the newest B-class glider PASSENGER2. We thank you for your trust in U-Turn and view it as confirmation to further pursue and develop our uncompromising quality demands. We wish you many enjoyable flights and great moments in the air.

Dialogue is important to us since we are always trying to optimise our products in the sense "from pilots - for pilots". Therefore we welcome active contributions in the form of suggestions and criticism. If you have any questions, we are happy to help anytime.
In order to guarantee the best service and dialogue please register your PASSENGER 2 here:

www.u-turn.de/product-registration **▸ REGISTER NOW**

**This manual is an important part of the glider.**
**Please read it carefully, because there is an OBLIGATION to deal with the glider and its special features. The manual is supposed to make the handling with the U-Turn PASSENGER2 as easy and safe as possible.**

# CONTENTS

# 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 wuth 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 iit is to do so towards every single pilot. U-Turn is maintaining an authentic and transparent style. Slim structures enable dynamic operating.

SAFE FUN BY U-TURN

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

# PASSENGER 2
# HANDLING TO THE POWER OF TWO

It's time for a new interpretation of flying tandem. The PASSENGER 2 brings the agile solo handling to the two seater class for the first time – high turn propensity with low control pressure are making the PASSENGER 2 a very efficient work tool for every tandem pilot. The PASSENGER 2 combines high performance with highest safety and is putting the fun in flying first. The advanced two seater is available in two configurations as GT or Pro version.

The PASSENGER 2 is newly designed from scratch. Much value was placed upon the first class handling, which is clearly noticeable through the low control pressure. The double seater reacts precise and without any delay to the smallest control pulses and is therefore easily steered into curves. Therefore it can easily happen that you forget you are flying a tandem right now. Although the PASSENGER 2 makes up for its surface area, when it comes to the performance the surface area has a double effect. The PASSENGER 2 is working very efficiently in the thermal lift and reliably transforms it into height. And even the glider stands solid in turbulent air it facilitates precise feedback and a direct flight feeling. The sharknose is providing high stability and an extended inflow area. When it is about bringing passengers in the air, passive safety has doubled priority. The canopy reactions looks accordingly moderate and very damped, that provides calmness in every situation.

Especially much value was put upon the outstanding starting features during the development. Even at zero-wind the PASSENGER 2 fills itself, fast and without any effort and rises over the pilot in a controlled fashion. The low take off speed and a surprisingly short start run are offering a stress free start even with demanding passengers. But also during the landing the outstanding slow-flight features convince combined with the high performance potential of the wing for very good flair characteristics. So the landing will be simple with the PASSENGER 2.

Chief designer Ernst Strobl equips the PASSENGER 2 with various constructive innovations. The PPN and the sharknose are providing a higher profile fidelity alongside the cell opening. Elaborate calculations of the ballooning in combination with the optimized pre-tensioning of the wing are ensuring the perfect flow around the profile. The High Pressure Crossport Design (HPCD) provides an ideal cross aeration of the crossports and ensures a balanced internal pressure in the whole wing. In the rear part of the wing Miniribs and the Break Gathering System (BGS) are providing an efficient force transmission of the brakes.

Low weight of the canopy with high durability – that is what the intelligent material mix and the high quality processing of the new PASSENGER 2 promises. The top materials Dokdo 30 and Dokdo 20 are providing a low weight at high abrasion resistance. At the PRO version the specifically developed PX40 material from the acro area is used. The extreme resistance to abrasion and tearing is especially noticeable during the return on investment of professional tandem companies.
The PASSENGER 2 is covering a high weight range for a start weight from 140 kg up to 230 kg for one and two seated flying. The PASSENGER 2 is available in the versions GT and PRO. Both versions have the LTF/EN B certification.

# PASSENGER 2

## Usage

The PASSENGER 2 is only developed and tested for the use as paraglider for foot and winch start. Usage other than intended is not allowed. The PASSENGER 2 is not built and tested for aerobatics. It is not suitable and not certified for such usage. If someone were to do aerobatics with the PASSENGER 2 it means risk of death for everyone involved. When doing aerobatic figures not only unpredictable flight attitudes can appear but also an overload of material and pilot. The PASSENGER 2 is a light aircraft with a mass of less than 120 kg in the class of paragliders.

The PASSENGER 2 is built for two-seated use. It is not authorized for multi-seated usage. All persons and gear involved in the air traffic need the according licences and certifications, especially for the two-seated flying of paragliders, to ensure a safe air traffic. That applies to pilot, harness, rescue system and tandem suspense. The PASSENGER 2 is sample inspected and certified after LTF/EN B norm.

SAMPLING INSPECTION:
Test Guideline:  LTF 91/09 & EN 926-1:2006, 926-2:2013
Test Centre: EAPR GmbH, Marktstr. 11, D-87730 Bad Grönenbach

## Features

The PASSENGER 2 is available in the versions GT and PRO.
Thereby the GT is aimed at ambitioned tandem pilots and the PRO version is aimed at professionals. AT the PRO version the PX40 material from the acro-area is used. It has extreme abrasion- and tear-resistance.

## Motorised Paragliding

The PASSENGER 2 is not tested and certified for motorised flight. If you want to use the PASSENGER 2 in motorised flight, please contact U-Turn regarding the certification.

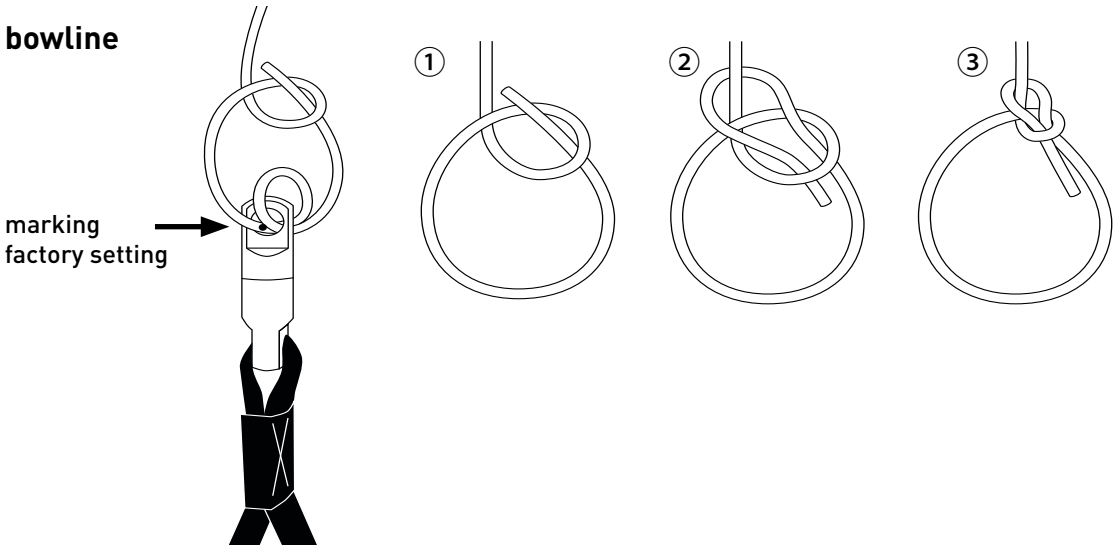
## Winching

The PASSENGER 2 has no specifics when it comes to winching. But here a few tips that we urge every pilot to take into consideration.
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. At the start take special care that the glider is completely over the pilot's head before the start commando is given. Eventual corrections to the direction with the brakes should not be applied before the canopy is over the pilot, otherwise the glider could fall back through too intense braking or the glider is towed away in non-flight-ready condition. The start commando must not be given before the glider is under absolute control. Strong direction correction during the start phase and before reaching the safety height are to be avoided. Attention also needs to be paid to the fact that a shallow angle is kept until reaching safety height. Do not use a tow line tension over 150 kp with the PASSENGER 2. 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, other attachment points as well as all further machines and accessories for which a certificate is required.

## Base- and brake line adjustment

The factory brake-line setting corresponds to 0-free travel plus 5 cm. It is recommended to adjust your brake line travel after the first flight to your personal preferences. Be aware not to adjust the brakes 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!
The afore mentioned factory brake setting allows for ample brake travel in extreme flight situations as well as for landing. At the same time it enables during flight at trim-speed a position of comfort for the pilots arms. In no case the setup A, B and C main lines should be changed before the wing has been flown in the original setup. Please also note that adjusting the height of the suspension to the hang points on the harness, changes the relative braking travel. When setting the adjustment it is to be made certain that both sides are symmetrical and that a permanent knot is used. The bowline works particularly well because of the fact that it weakens the lines the least with excellent slip resistance.

**bowline**



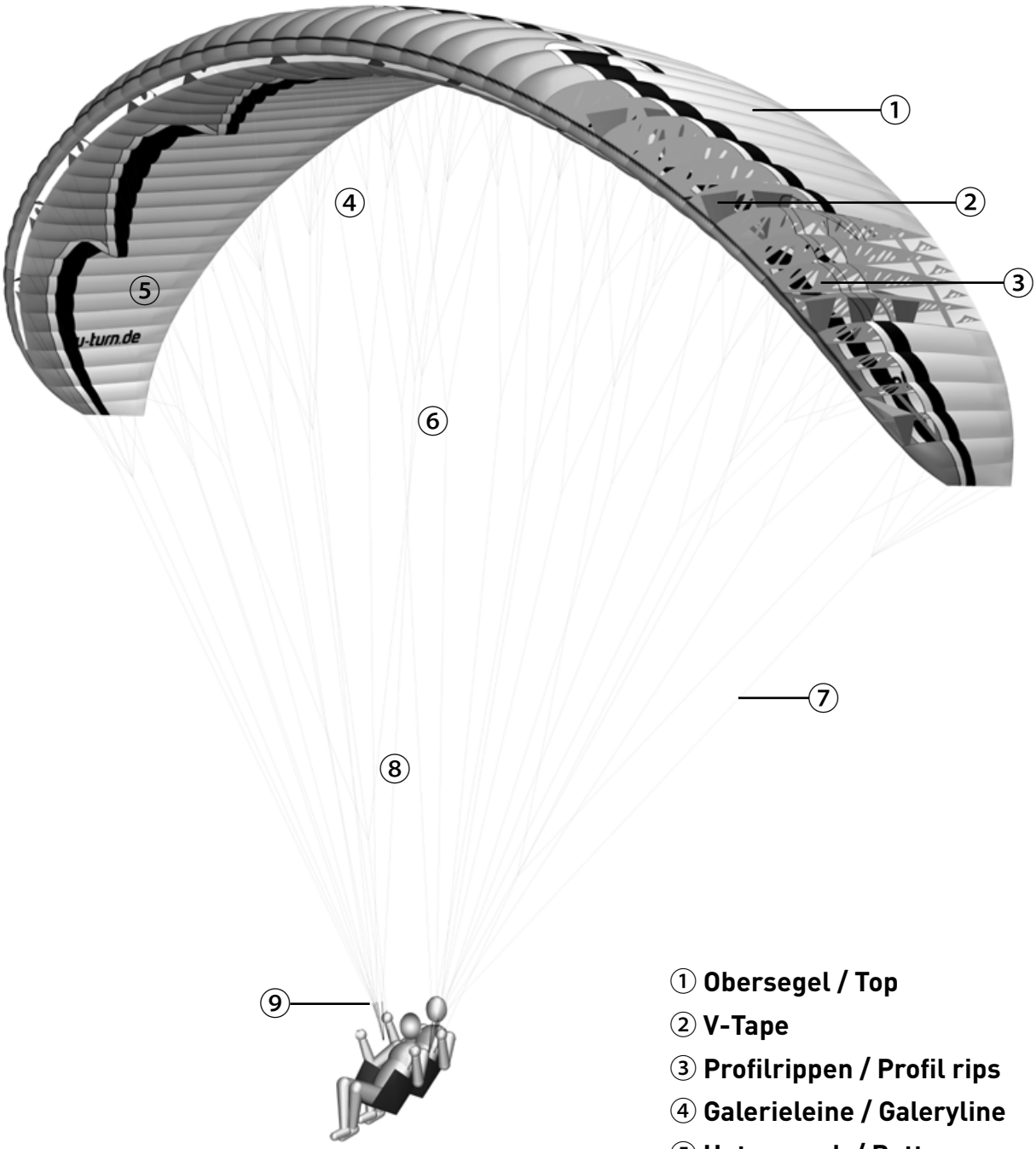
## Safety precautions

- 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 PASSENGER 2 only over water.
- In a „dynamic flight" not only you are exposed to Hike loads but also the glider. Do not underestimate this!
- Only fly your U-Turn PASSENGER 2 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 PASSENGER 2.
- 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 PASSENGER 2.
- 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 cold 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 50m at any given time. At airports this minimum distance to maintain is 5km.
- Inform yourself on the weather forecast and/or the predominating local weather conditions. Use the U-Turn PASSENGER 2 only in wind strengths, in which you are able to control the wing to 100%. Do not use the U-Turn PASSENGER 2, 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

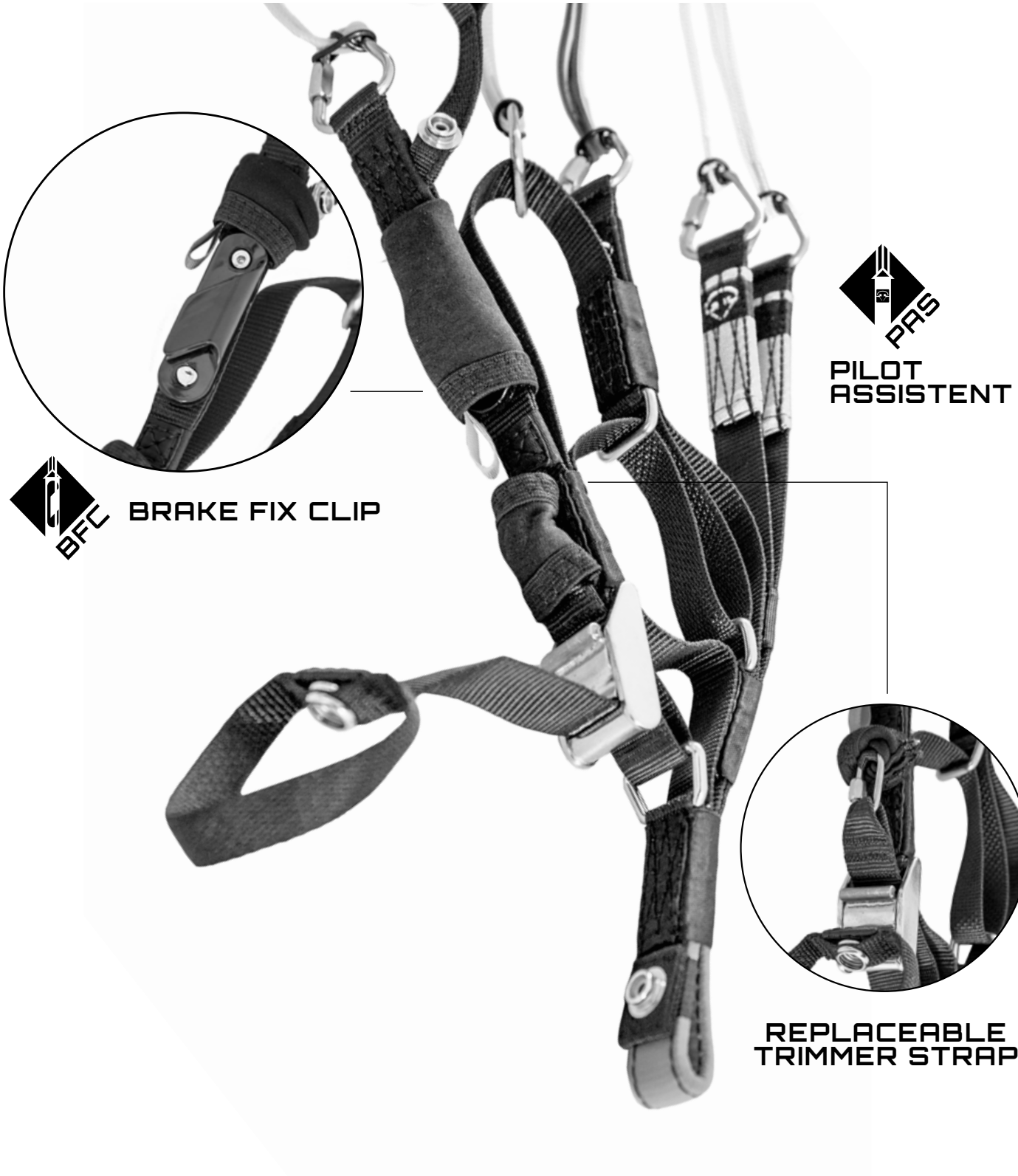
**Short description**




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

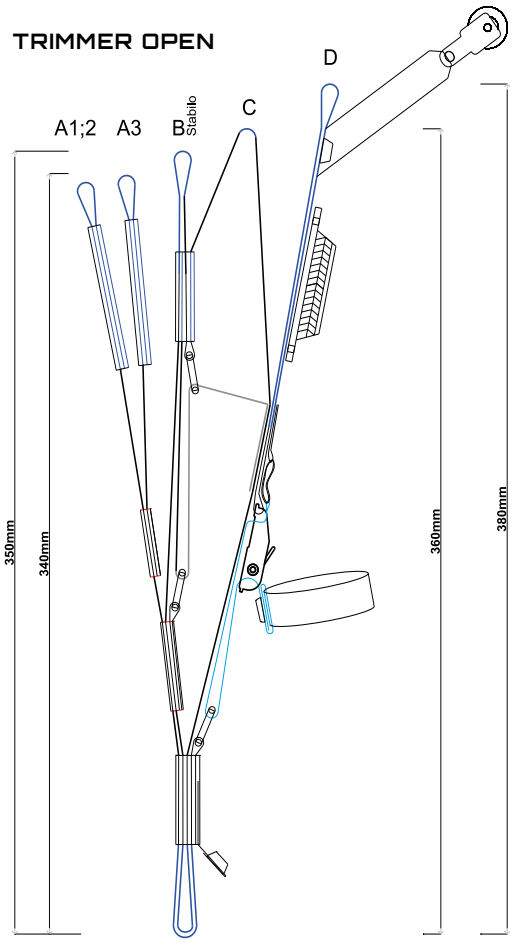
## Risers

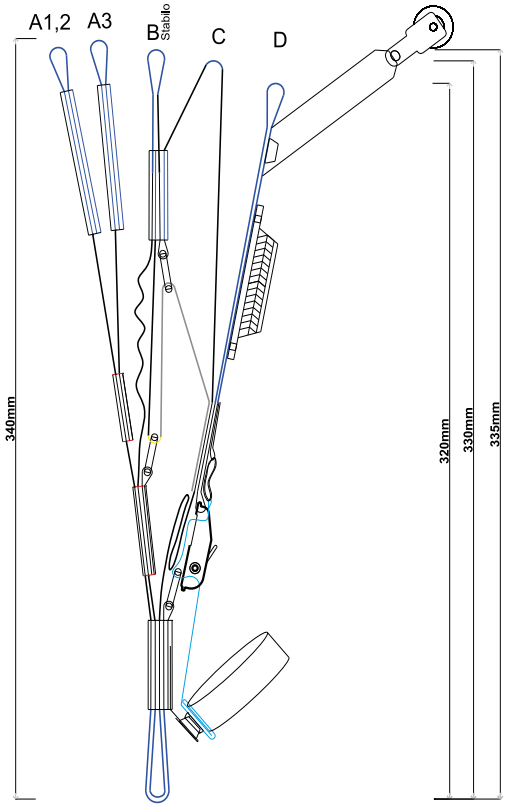
The A- and B-risers have different colors and are equipped with the Pilot Assistent System to ensure positive identification at take off and during the flight or a B-stall decent.
The D -riser is equipped with the BRAKE-FIX-CLIP.
The clamping device is elegantly covered with neoprene and allows the pilot to fix the brake lines at any desired position. Thereby even if the conditions are turbulent you can concentrate on your passenger.



## Trimmer

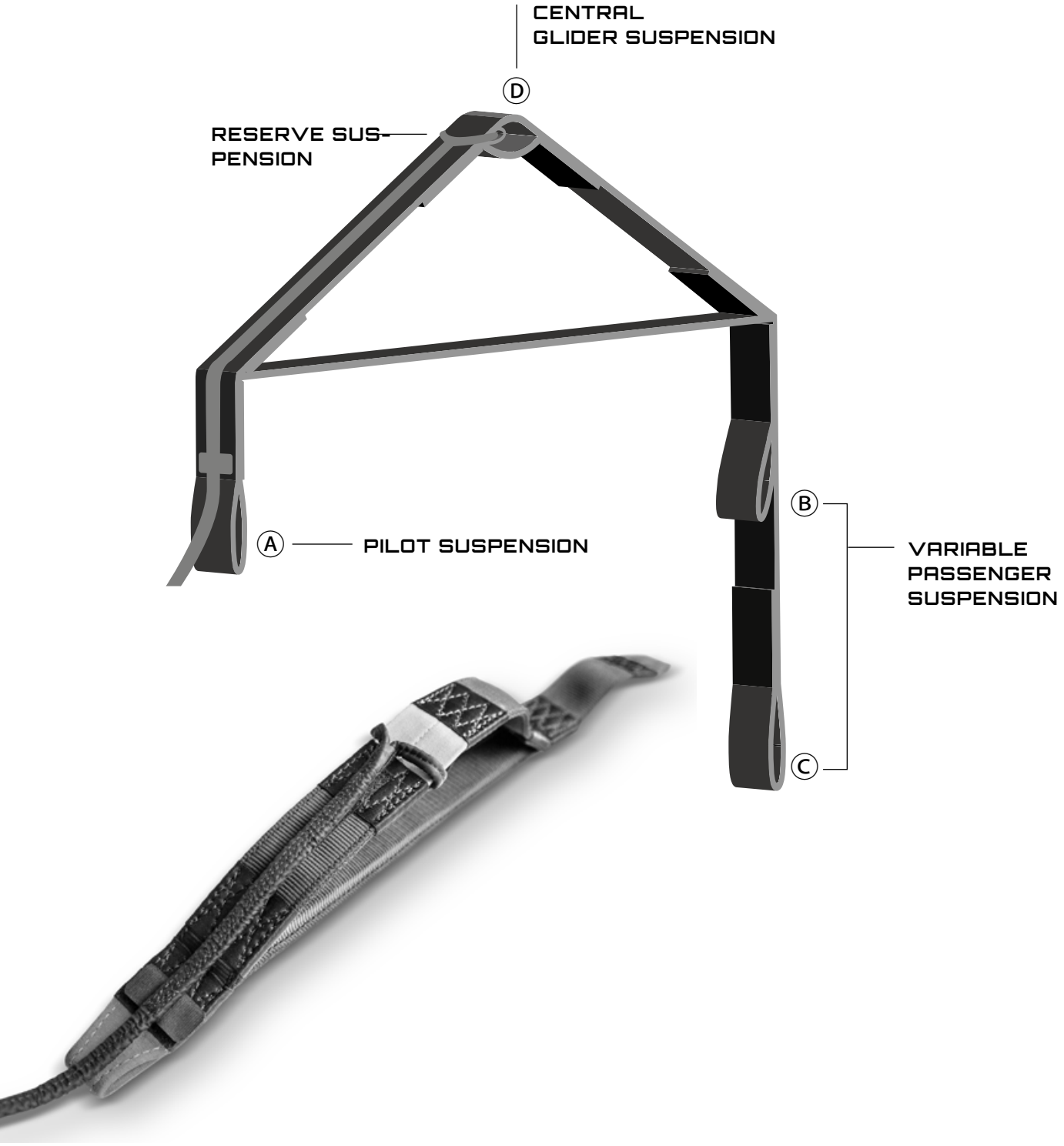
The PASSENGER 2 is equipped with an innovative trimmer system. The effective system avoids the twisting of the profile through not only accelerating D and C level but also the B level is adjusted in relation to the angle of attack. Thereby the form of the profile stays intact which ensures clearly better gliding.
U-Turn recommends to keep the trimmer closed during take off and landing. All extreme flight attitudes (e.g. collapses) are occurring more dynamically at higher speed.
Additionally the PASSENGER 2 is equipped with the changeable trimmer band. That is easily changed through a carabiner that is covered with neoprene.  Other adjustable, removable or variable mechanisms are not available.



## Spreader bar

The PASSENGER 2 comes with a hard spreader bar. However, soft spreaders may also be used. The double-seat distance suspension has a suspension loop for the pilot (A) two suspension loops for the passenger (B + C) and the centre glider suspension (D). The pilot always hangs himself in loop A. For smaller passengers, use loop C and loop B is for heavier passengers. It is essential to ensure that it is suspended symmetrically. The unbalanced suspension can cause the pilot and passenger to be in an uncomfortable flight position and also makes it difficult to control the glider.



# GENERAL INFORMATION FOR TANDEM FLIGHT

## Dealing with the passenger

The launch site should be chosen away from the hustle and bustle, with a first look at the approach rout. It is recommended to carry out warm-up exercises with the passenger before the start and to start the take-off run in succession or side by side, depending on the equipment. It is particularly important to point out to the passenger that the start consists of two phases: the winding-up phase and the acceleration phase.

Practical experience has shown that many passengers sit in the harness to early due to the slowing down of the take-off run by the paraglider and thus cause a faulty start. It has proved to be useful to explain that it is first necessary to mount the paraglider with slow steps (in order to have correction options) but that, like any other aircraft, it has to be brought up to speed in order to be able to take off.
Exception: In strong headwinds, the passenger and the pilot must always brace themselves in the wind-up phase (preferably by grasping the Tbar), so as not to be knocked over.

## Equipment

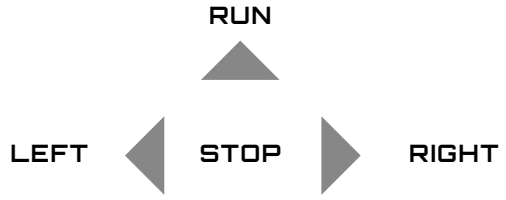
The clothing of the passenger should be adapted to the temperatures and necessarily include ankle-high shoes with a non-slip sole and a helmet. Gloves are also recommended. Although full-face helmets offer better protection, the should be equipped with a removable or wide chin-guard because of the possible risk of vomiting (panic). Please remember to inform the passenger early, not just on the mountain, about the necessary equipment.

## Airfield

When choosing the starting position, pay particular attention to the requirements of the tandem glider, i.e. a possibly longer start-up phase and a limited correction possibility must be considered. In addition, attention must be paid to the absolute obstacle clearance of the run-up route. Due to the generally higher speed of double seats, a longer sliding distance should be taken into account when choosing the landing site, as well as the limited manoeuvrability near the ground. The landing field should be generously sized and the landing site can be obstacle and turbulence free.

## Briefing of the passenger

For the start run the following commands are agreed: Pulling up (better: 3-2-1 go)




From the command "run" the passenger has to bring speed to the paraglider. In case of an aborted launch the pilot immediately calls lout "stop". Corrections are made by specifying the course of the run that's to be changed. The direction of a possible start abort is to be determined before the start! The pilot should especially bear in mind that the higher wing loading requires a longer start-up distance and a higher air speed than in single-seat aircraft operation. The further flight phase is also to be discussed with the passenger before the start. It is important that the start of a refusal by the passenger may under no circumstances be enforced.

It has also proved helpful to warn the passenger not to look down, but rather focus attention on other aspects of the flight in order to avoid any emerging fear of heights. Also in this phase the pilot actively engages the passenger in all activities, although only the pilot is responsible for the proper execution.

After laying out and sorting the lines the pilot helps the passenger to put on the harness. It is recommended to do a seat test, most simply wit the help of another pilot who lifts the passenger off the ground in his harness on the carabiners. Thus the seat position can be checked in flight and any necessary correction can still be made. Crucial importance is the control of the leg loops and the chest strap! Harnesses with an airbag or protector have proven to be effective, as many passengers to not run when landing, but tend to sit down in the grass.

## Pre-Flight Check

A careful pre-check is required for each aircraft, including PASSENGER 2. Our experience has shown that tandem paragliders are often used by several people. Please double check if you are not the only pilot using this paraglider. If you are lending your glider, please inform the borrower as well. Also ensure that the borrower knows the operating limits of PASSENGER 2 and has the required certificate of competence. Before each start, check the lines, straps and glider canopy for damage. Even with small defects you should definitely not start. After the paraglider has been unpacked and designed to be semicircular, note the following:
The paraglider should be laid out so that when pulling the A-risers the lines in the middle of the glider are tense a little bit earlier than those at the wing tips. This ensures a light and directional start. When laying out, please always pay attention to the wind direction, so that both halves of the paraglider a loaded symmetrically hen mounting against the wind. The line groups should be carefully separated and the risers arranged. Special attention should be paid to the A-lines. They must run freely and without entanglement from the A-riser to the canopy. Equally important is that the brake lines are completely unobstructed and can not get stuck anywhere when starting. If the risers are not twisted, the brake lines run freely through the eyelet to the trailing edge of the screen. Make sure there are no lines under the canopy. A line-over can have fatal consequences at the take-off. It is highly recommended to include the passenger in the pre-check fo familiarise them with the aircraft accordingly.

## Hang Point Check

The decision as to whether the passenger should be suspended in a longer or shorter loop of the T- bar (if available) must be made by taking into account the height of the person and any weight difference that may be present. If the passenger is smaller than the pilot, he is to be hung in the lower suspension loop. This prevents the passenger from being raised too early from the ground and also the view for the pilot is kept free. After attaching the pilot in the T-bar with straps and screwing the carabiners, he asks the passenger to stand in front of him to hook him correctly. He is asked to visually follow the process. Do not forget: the passenger's carabiners are also to be screwed together (except Twistlock). The passenger is in front of or alongside the pilot during all flight phases. Suspensions which allow a position of the passenger behind the pilot are not permitted for reasons of safety!

## Pilot/Passenger Configuration

There are two ways of starting: one behind the other (passenger in front) or side by side.

**Behind Each Other:**
For the method of starting in succession, it says that the passenger does not swing forward after the start and can be pushed in right direction during the acceleration phase. In addition it can be prevented that the passenger sits down in the harness too quickly by an additional impulse with the knee.

**Juxtaposition:**
The advantage of starting next to each other is better possibility for running and freedom of movement. Even with a reverse start, this technique offers certain advantages. Often a disadvantage that is mentioned is that the passenger swings in the starting direction after the start. By holding onto the passenger at the chest belt or the cross bracing of the pilot, however, this can be prevented and a synchronicity in the running direction can be achieved. This starting position is more problematic in strong winds as the passenger is less able to brace himself against the wind. So he can not exert pressure to the front and take almost no influence on the paraglider during the mounting process.

In such a case, therefore, a reverse start or help in take-off by two well-versed pilots can be the better choice. At the behind-each-other starting method the passenger best holds onto the loop of the T-bar ie. short above the carabiners. At the Juxtaposition starting method he grabs the pelvis or chest belt of the pilot.
ATTENTION: Immediately before take-off, the pilot must again check both harnesses, carabiners, suspension (T-bar), lines - including the brakes, and the correct position of the paraglider (5-point-check).

## Inflating the Paraglider

The paraglider is inflated by the pilot as described in the chapter "Flight Practice / The Start". This process can be facilitated in particular with the starting method "one behind the other" in that the passenger grabs the T-bar above the carabiners and thus helps to pull the glider up. This has the further advantage that the passenger has something in his hand and is actively involved in the starting process.
It is important for the pilot to carefully check whether the glider is filled correctly or if it has to be aborted. In case of problems an immediate abort occurs, otherwise now - with properly filled canopy and untwisted lines - the decision to start with the command "run" to the passenger occurs. After the command "run" a fast acceleration takes place up to the lifting point. If the passenger runs too timid, the command "run" should be repeated aloud and the passenger may be encouraged to accelerate by pressure from the pilot.

## Flight

After the start, the passenger is asked to look up to see the open carrying wing. This creates confidence in the aircraft (and calms the nerves). It is also important to ask the passenger whether he sits comfortably in the harness and not just on the front edge of the seat board. If the knees of the passenger are clearly hanging down, he has not yet the right seating position, but if the knees point up, the pilot can see that his passenger already slipped into the harness as its supposed to be. If necessary, the pilot helps the passenger, after sufficient ground clearance, to slip properly into the harness. Only then does he adjust his harness himself, so that not too much unrest arises.
Always keep in mind that a tandem paraglider has a larger turning radius and reacts slower than your solo paraglider. But also with the tandem paraglider the handling can be decisively improved by shifting your weight. Overfilled thermal hoses are taboo for the tandem! The sitting position behind each other cause that you can not look the passenger in the eye. Therefore, it is important to exchange words of encouragement and excitement during the flight, in order to counteract any emerging fear of heights or even just a feeling of discomfort, or to recognise this in the beginning. A good advice in such a case is to look at the horizon and not look down. In general, the more relaxed the pilot is towards the passenger, and the more calm he radiates, the more confidence the passenger will gain and enjoy the flight all the more.

## Landing

The preparation of the passenger on the landing should be done only in flight. Due too much information before the start, the passenger is just unnecessarily overwhelmed. Especially on longer flights, it is recommended to stimulate the blood circulation of the legs of the pilot and passenger by movement before landing. At sufficient altitude and before you reach the position, check the wind direction at the landing side, altitude and air traffic. Especially for double-seated flights, this is of crucial importance because of the generally slightly higher approach speed and reduced mobility. A back wind landing for two carries a high risk of injury!
The landing area should be dimensioned large-scale. Corrections near the ground are to be avoided because of the pendulum tendency. The landing should be done side by side in every case, since experience has shown that many passengers - despite the request to do so - don't run but sit down instead. It would be possible that the pilot bounces his chin on the helmet of the passenger and thereby bangs his teeth or at least very much bites his tongue, or even falls over the passenger and injured him. Also make sure that the passenger does not rest his hands on the ground when landing because of the risk of injury. It has proved useful, to push the passenger to the side with one leg and ask him to slide out of the harness and into body verticality on command before landing in the stabilised approach. Then take a step to make it easier to run out! The position of the passenger has to be checked by the pilot!
Perform the final approach in the medium to high speed range to have sufficient residual buoyancy for a fall-free landing even in calm conditions. The steering lines should be pulled through at a uniform speed. It is optimal, if pilot and passenger touch down with minimal travel.

## After the Flight

After the flight, the passenger should be given the opportunity to describe his experiences or to ask questions, because right now, there is often the need to share the experience.

# FLYING EXPERIENCE

## The Start

Hold A-risers and brake handles in your hands. A final check on the laid-out glider is obligatory. The middle of the glider of the PASSENGER 2 can be seen by coloured differentiation of the middle flares. Careful laying-out of the canopy according to the wind direction and a run in line of the center of the glider facilitates a smooth start substantially.

**ATTENTION:** When the wind exceeds at 5 km / h from the front, the centre A-risers are sufficient for mounting the glider. With less or no wind use both A-risers!

The glider is filled with a consistent, even draft. The arms are to be stretched, in extension of the A-lines. As soon as the inflation slows down - the canopy is above the pilot at this point - the pilot looks up and verifies that the glider is fully opened above him. The PASSENGER 2 has no overshoot tendency, so that braking in this starting phase is normally not necessary. Any directional corrections with the brakes should only be made once the glider is already above the pilot, as the glider may fall back due to excessive braking. The final decision to start is only now. After a few quick steps, you take off and release the brakes to accelerate.

## Turning

The PASSENGER 2 is extremely agile and responds to control impulses directly and without delay. By shifting your weight, it is very easy to take turns with minimal loss of height. A combined steering technique, weight shifting and pull of the inner curve brake line, is ideal in every situation, to turn, although the radius of turn is determined by the amount of well-dosed pulling of the brake lines. If you manage to include your passenger in the control of the PASSENGER 2, you can increase manoeuvrability by shifting the weight of the pilot and passenger. This allows a fatigue-free flying. If it is necessary to turn the PASSENGER 2 slowly in a confined space, it is recommended to control the pre-braked paraglider by loosening the outside and well-dosed further pulling of the inside brake line (opposite movement of the brake lines).
From about 75% of one-sided brake line pulling, the PASSENGER 2 has a significant lateral inclination and a fast and steep curve, which can be extended to the spiral. The spiral has to be slow in and out. The inclined position is controlled by careful pulling / slackening of the inner curve brake line. The minimum symmetrical control travel is more than 65cm.

**ATTENTION:** If you pull a brake line through too abruptly, the glider can do a negative turn!

## Thermal / Turbulence

The PASSENGER 2 shows its strengths especially when flying in the thermals, in the house thermal as well as on long journeys. In turbulent air, the PASSENGER 2 should be operated with a light brake pull. By increasing the angle of attack, the stability of the canopy is advantaged. When entering strong thermals or with broken thermals, make sure that the paraglider canopy does not lag behind the pilot and enter a dynamic stall. This is prevented by giving in to the upwind region of the thermal something to speed up.
Conversely, the paraglider must be braked when the support surface comes in front of he pilot by entering into a downwind area or out of the thermals. To fly faster is useful for traversing downwind zones. Due to its design, the PASSENGER 2 has a very high stability. An active flight style in turbulent air, as described above, however, additionally contributes to further safety. Folding and deforming the canopy can be largely prevented by active flying style.

## Landing

The PASSENGER 2 can be landed very easily and precisely. In the end up into the wind, let the PASSENGER 2 glide out with normal flight and then pull the brakes determined and fast when you're about 2 m above the ground. In strong head winds slow down the brake pull accordingly. Landings from banked turns and fast turns before landing are to be avoided because of the associated pendulum movements.

**ATTENTION:** In case of strong wind starts, ground handling and landing the canopy can hit the ground at very high speed. This should be avoided, since otherwise cracks, damage to the seams or the cloth may occur.

## Extreme Flight Maneuvers

Although the PASSENGER 2 has a very high level of aerodynamic stability, turbulence or pilot errors can cause the PASSENGER 2 to reach an extreme flight situation. The most established method of being able to react calmly and correctly in such a case is to attend a safety training course (SIV) where, under professional guidance, one learns to master extreme flight situations. Extreme manoeuvres should only be carried out in calm air and at a sufficient altitude and only during safety training under professional guidance and equipped with a rescue parachute. At this point the existing obligation to only fly equipped with a reserve parachute.

The extreme flight patterns and flight situations that are described in this chapter can either be intentional, caused by turbulence or pilot error. Any pilot who is in turbulence or makes a mistake in the control of his paraglider, can get into these flight situations. All of the extreme flight patterns and flight conditions described here are dangerous if performed without adequate knowledge, at a low safety level, and without the appropriate instruction. The incorrect execution of the flight patterns and flight conditions described here can be life-threatening. Under no circumstances may extreme manoeuvres be intentionally brought on with a passenger.

## Wingover

To fly a wingover, the pilot flies alternating turns with increasing curve slope until the desired slope is reached. Collapsing normally only occurs with the PASSENGER 2 at a very high curve slope.

**ATTENTION:** An inclination of more than 60 degrees is considered aerobatics.

## Frontal Collapse

A negative angle of attack - caused by turbulence or the reversing of the A-risers on both sides, causes a frontal collapse of the leading edge. The PASSENGER 2 usually terminates a front collapse quickly and independently. Uniform symmetrical braking on both sides can assist re-opening.

## Deep stall

The U-Turn PASSENGER 2 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 to low), a symmetric forward push on the A-riser or opening the trimmers recovers the stall.
Flight exercises that intentionally approach the stall should only be performed with sufficient safety height. In no case the glider should be braked one-sidedly if one believes to be in deep stall. The canopy could turn negative!

## Full Stall

⚠ **ATTENTION:** The forces that occur on a tandem paraglider of this size during the execution of a full stall are enormously high!

To start a full stall, both brakes are fully pulled through. Depending on the length of the pilot's arm, it may be necessary to wrap the brake lines. The PASSENGER 2 does not empty completely and therefore does not form a stall rosette. The effort required to keep the PASSENGER 2 in the Full stall is very high. The canopy should be stabilised before exiting the full stall. To release, both brakes are released slowly and symmetrically without collapsing. With correct symmetrical discharge, the canopy shoots only moderately forward without folding. An asymmetrical collapse is to be avoided. The resulting dynamic forces and the reactions of the canopy during the discharge are very strong and the paraglider can fold.

## Collapse

Although the PASSENGER 2 has a very high aerodynamic stability, more turbulence can, as with all paragliders, cause the canopy to fold. This is usually not critical and self-reopening is quick and reliable. Reopening can be assisted by vigorously braking or pumping the affected side, while counter-steering on the open side. In case of large-scale collapse, the countermeasure has to be precise in order not to completely tear off the flow on the canopy and to get into the full stall.

## 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 optimize 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 to 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 no 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.

## Spiral Dive

As already described, the introduction of the spiral to the PASSENGER 2 is very easy. The spiral dive leads to very good sink rates. In order to use the spiral in extreme situations safely, you should practice them in quiet conditions.
Do not underestimate the G-forces that act upon the pilot when diving down in an efficient spiral. The accompanying passenger  may experience the centrifugal forces that occur significantly worse than the pilot himself.

⚠ **ATTENTION:** Never fly a spiral dive with the wings folded inwards. This figure is prohibited aerobatics, there is a risk of overloading the paraglider, pilot, passenger and equipment!

⚠ **ATTENTION:** The agile and dynamic handling of the PASSENGER 2 allows very high sink rates when using a spiral dive. At the same time, strong forces act on the pilot and the passenger due to the high speeds in the curve. U-Turn expressly points out that even at sinking rates of 12 meters per second at high curve speeds impairments of the performance from pilot and passenger up to unconsciousness can occur. Depending on the configuration of the harness, the position of pilot and passenger and the rate of descent, the paraglider remains stable in the spiral and must be actively deflected. U-Turn therefore advises caution and care in exercising this manoeuvre. Due to the agile handling and the high performance, the spiral has to be exited cleanly.

# RAPID DECENT

**ATTENTION:** „Under no circumstances may the following manoeuvres be initiated without the passenger being prepared accordingly!“

## B-Stall

On both sides, the red auxiliary loops attached to the B-belts are pulled down simultaneously and quickly. The brake handles are released, or passed to the passenger, if this is also a pilot. As a result, the flow on the prober side breaks down to a great extent and the glider goes into a bag-like flight without advancing forward. By further pulling the loops, the area can be reduced and increase the rate of descent. If the loops are loosened, the profile will regain its current, the paraglider will pick up speed and return to normal. The loops on the B-straps should be released evenly and quickly to finish. If the PASSENGER 2 gets into the deep stall due to too slow skipping of the B-stall, which is not normally the case, see chapter “Extreme manoeuvres / deep stall”.

## „Big Ears“

On both sides, the outer A-risers of the split A-riser are folded downwards (see note), causing the outer wings to fold. You keep the brake handles together with the folded outer A-risers in your hand. The glider remains fully controllable by one-sided braking and weight shifting and steers straight ahead with increased descent speed (3-4 m / sec, depending on the number of folded-in cells). If you let go of the outer A riser straps, the folded-in cells open with appropriate load by itself. Should this not be the case, the unfolding is to be initiated by gently braking.

**ATTENTION:** It is sufficient to fold the outer risers down to cover your ears. If the outer A-risers are pulled down over this area, the desired directional stability is no longer guaranteed by the too large folded-in area.

All descent aids should be practiced in calm air and in sufficient altitude to be able to use them effectively in extreme conditions!

## Emergency Control

If for some reason it is not possible to control the U-Turn PASSENGER 2 with the brake lines, it can also be steered and landed very well with the rear risers. Curves can be added with weight shifting, but note that the shield does not enter a spiral.

## Transport and Storage

When transporting the paraglider, make sure that it is not exposed to any liquids. It has to be packed dry. When storing the PASSENGER 2 it should be taken care that it is not exposed to UV rays. In addition it must not be stored together with acids or the like. Dry storage is extremely important.

⚠ **ATTENTION:** For prolonged storage, the canopy must be thoroughly checked.

## Repairs

In principle, repairs to paragliders may only be carried out by authorised service centres. Small damage such as cracks or small holes up to a size of 2 x 2 cm, which can be carried out without special equipment may be carried out by the pilot himself. The supplied repair tape from the repair kit must be used. For Cracks or small holes the repair tape has to be applied from both sides of the damaged area. Please note that the repair stick is at least 2 cm above the damaged area on all sides. The repair tape can be cut into the right shape. The rounding of the corners prevents detachment.

## Legal aspects

In the case of double-seated flying, the pilot assumes great responsibility as a pilot. It is therefore essential that he knows all the legal aspects. Knowledge of applicable laws, regulations and regulations is taught during tandem pilot training. We point out that this is necessary not only for the appearance, but also for the proper exercise of the two-seater flies. We therefore ask you to observe the aviation regulations when operating your U-Turn PASSENGER 2. When operating the PASSENGER 2 abroad, the applicable laws and regulations in the respective country apply.

# HAPPINESS DOUBLES WHEN YOU SHARE IT

#PASSENGER2

# MAINTENANCE AND CARE

Since U-Turn exclusively uses high-quality material, the U-Turn PASSENGER 2 will be unrelievedly airworthy for many years at good care and maintenance. The aging of your U-Turn PASSENGER 2 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:

Long lasting exposure to UV radiation and extreme acro manoeuvres reduce the strength of every material over time.

- Do not leave your U-Turn PASSENGER 2 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.
- Placing the opening reinforcements on top of each order prolongs the life time of 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 in-flight handling characteristics.
- the main brake lines aren't knotted too many times at the grip since every knot weakens the line.

To clean the canopy only use warm water and a soft sponge. Never apply any chemicals for cleaning, since they weaken the material and damage the coating. Store your glider at a dry and dark location away from any chemicals. After 24 months or 150 flight hours, whichever occurs first, your U-Turn PASSENGER 2 has to be inspected by the manufacturer or importer. In case of extreme use we are glad to do that earlier. You know best about the condition of your glider.

## 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 synthetic materials your U-Turn glider is build of must be depolluted appropriately. At the end of its life-cycle please return your glider to U-Turn GmbH, we will take care of recycling and removal.

# FLYING ACCESSORIES

## Harness

All certified harness systems with mounting at about breast height are compatible with the U-Turn PASSENGER 2. The lower the mounting point of the harness, the better you can steer the U-Turn PASSENGER 2 by shifting your bodyweight.
For the pilot, special tandem harnesses have proven themselves, which ensure optimum freedom of movement during takeoff, flight and landing. For the passenger, a simple, uncomplicated harness is recommended. Too many adjustment options unsettle the passenger.
Important for the passenger harness is a good protector, if possible a shock absorbing foam protector, as some newcomers to the aircraft tend to sit down at the first ground contact instead of walking along. Care must be taken to ensure that the height of the suspension of the harness also changes the relative braking distance.
If you have any questions about the usage of your harness with the PASSENGER 2, ask your U-Turn dealer or directly contact U-Turn. Of course we also offer a large range of harnesses which are ideal as passenger harnesses.

The PASSENGER 2 is certified for harnesses without rigid cross bracing. The suspension height of the harnesses used in the tests was 42 cm between the seat board and carabiner and 46 cm horizontally between the chest straps.

## Suitable Reserve Parachutes

The carrying of a suitable and certified reserve parachute is not only mandatory it is absolutely vital for the safe operation of a paraglider. When selecting the reserve parachute, make sure that it is suitable and approved for the intended starting weight.
Special tandem reserve equipment is necessary here, such as the U-Turn Secure.
The parachute loop(s) of the parachute have to be connected to the V-line and hooked into the suspension of the spreader bar (when attached to the pilot's harness, there is a risk of the passenger hanging about one meter lower the passenger is seriously injured when landing!)
The rescue must be stowed in the pilot's harness, and any mishap by the pilot or passenger must be eliminated.
Learning to handle the rescue equipment in the context of a safety training is highly advisable, since todays bi-placed paragliders  are very difficult to retrieve due to their more than 40 sqm and the resulting forces that occur. The use of approved quick-out carabiners definitely has proved to be advantageous here, which can be purchased from specialised dealers. When purchasing the carabiner, make sure that they are certified for the intended load range.

# PRESUMPTION OF RISK

The usage of the U-Turn PASSENGER 2 inherents certain dangers of bodily harm or even death of the user of this product or a third party. With the use of the PASSENGER 2 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 exclution

With the completion of the purchase of a U-Turn PASSENGER 2 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 PASSENGER 2 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 PASSENGER 2 could suffer as a result of the usage of the PASSENGER 2. 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 PASSENGER 2 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 PASSENGER 2.

## 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 PASSENGER 2- you have read and understood the U-Turn PASSENGER 2 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 PASSENGER 2 to a third party - through transferring ownership temporary or permanently, for this other user to have read and understood the U-Turn PASSENGER 2 user manual in its entirety, including directions and warnings, which are included in this user manual.

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Place and date

---

Signature of the first pilot

---

Place and date

---

Signature of the second pilot

---

Place and date

---

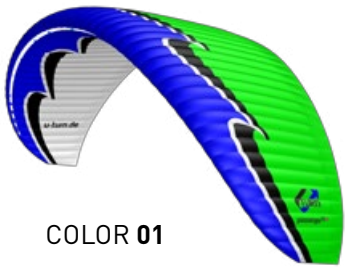
Signature of the third pilot

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

# TECHNICAL DATA U-TURN PASSENGER 2

| | 42,5 |
|---|---|
| Start weight<br>Startgewicht | 140-230 kg |
| Flat area<br>Fläche ausgelegt | 42,5 m² |
| Projected area<br>Fläche projiziert | 36,0 m² |
| Flat wingspan<br>Spannweite ausgelegt | 15,149 m |
| Projected wingspan<br>Spannweite projiziert | 11,898 m |
| Flat AR<br>Streckung ausgelegt | 5,4 |
| Projected AR<br>Streckung projiziert | 3,931 |
| Chord: center / wingtip<br>Flügeltiefe: Mitte / Stabilo | 3,422 / 0,780 m |
| V-trim<br>V-Trimm | 37-40 km/h |
| V-max<br>V-Max. | 43-46 km/h |
| Bridle height<br>Abstand Tragegurt-Kappe | 9,09 m |
| Nr. of cells<br>Zellenanzahl | 52 |
| Glider weight<br>Gewicht | GT 7,3kg // PRO 8,3kg |
| Bridle length<br>Gesamt Leinenlänge | 457,52 m |
| Line diameter<br>Leinenduchmesser | 0,9 / 1,1 / 1,3 / 1,5 / 1,8 / 2,2mm |
| Speed system / trimmer<br>Fuß Beschleuniger / Trimmer | Nein / Ja<br>No / Yes |
| Beschleunigerweg<br>max.way of accelaration | 60 mm |
| Certified standards and procedures<br>Angewandte Testverfahren | LTF 91/09 & EN 926-1:2006, 926-2:2013 |
| Folding lines used for certification<br>Faltleinen für Testflüge benutzt | Nein<br>No |
| Certification No.<br>Zulassungsnummer | GT EAPR-GS-0492/16<br>PRO EAPR-GS-0418/16 |

## COLOR-INFO GT

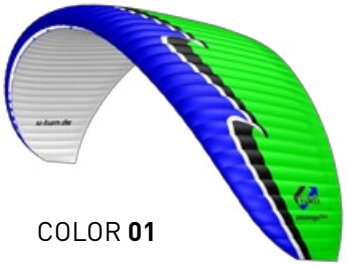


COLOR **01**

COLOR **02**

COLOR **03**

## COLOR-INFO PRO



COLOR **01**

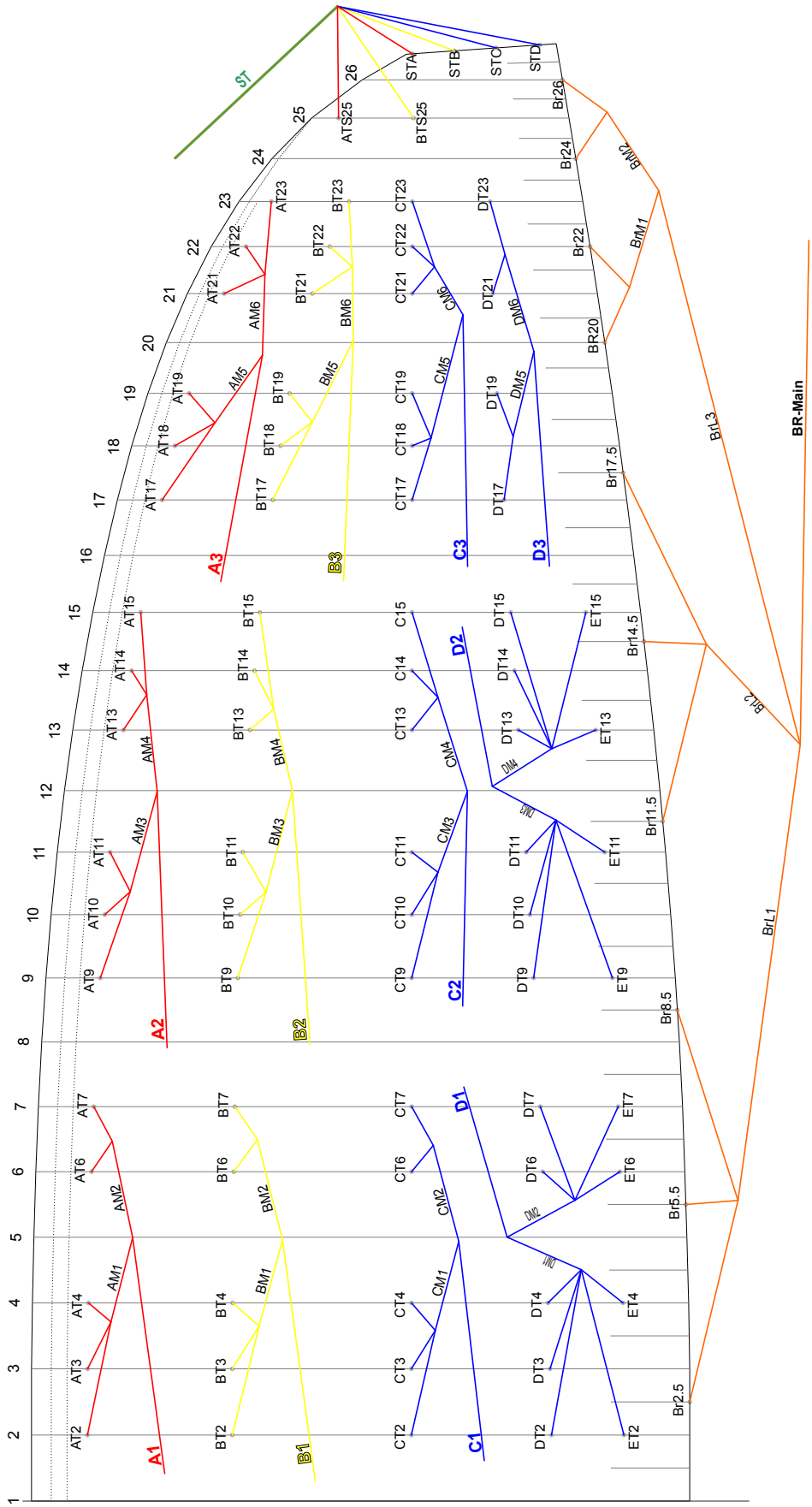
# MATERIAL LIST U-TURN PASSENGER 2 GT

| Description in the paraglider | Manufacturer description | Technical Data, Dimension, Weigt, Solidness |
|---|---|---|
| Line Hook up point Material (Loop Material) | M21030 NYLON 12mm HBT WHITE | NYLON 12mm HBT |
| Trimmer | 20mm Buckle | 20mm / 33g |
| Brake pulley | M40010 PL-PULLEY NYLON | PL-PULLEY NYLON |
| Trimmer Webbing | 20mm Wave webbing | 20mm / Brakingstrenght: 650kg |
| Brake loop webbing Material (Loop Material) | M21000 nylon10mm tape white | Nylon 10mm tape |
| Brake handle | Polyester 20mm Tubular Webbing | Polyester 20mm |
| Brake handle - Brake line conection | HEAVY SWIVEL 8mm | Stainless Steel 8mm |
| Brake handle, fix on riser | Magnet | Magnet 20mmX3t |
| Brake, main line | DSL300 | 2,6mm / 300daN |
| Lines | upper - DC100 /DC60 / DSL 70<br>middle - TSL 190 / 140<br>main - TSL 380 / 280 / 220 | details see at Passenger 2 line configuration rev2 |
| Shackle | Mylon Rapid | Braking load 600kg |
| Top Material (front / tail) | SBS107PG (Dokdo 30) / Skytex 32 (Dokdo 20) | 42 g/m² PA 6.6 / 32 g/m² PA 6.6 |
| Bottom Material (front / tail) | SBS107PG (Dokdo 30) / Skytex 32 (Dokdo 20) | 42 g/m² PA 6.6 / 32 g/m² PA 6.6 |
| Rib, Profile | Dokdo 30 Hard Finish | 40 g/m², PA 6.6 HT, HF |
| Mini Ribs | Dokdo 20 | 36 g/m², PA 6.6 |
| V-Tape / V-Ribs / H-Stripe | Dokdo 30 Hard Finish | 40 g/m², PA 6.6 HT, HF |
| Profile nose reinforcement | Nylon root | 2,0mm |
| Riser | 20mm Polyester | 20mm |
| Riser redirection | SUS RING | 20mm x 10mm BAR (2mm) |
| Reinforcement on Profile (A,B,C,D) | M01260 NCV 024201450X15000(W420) Pes Scrim Laminated Pes film SR scrim | Pes Scrim Laminated Pes film SR scrim |
| Sewing yarn canopy | M70010 SERAFIL 60<br>5000m FS(150D/3) (WHITE) | 150D/3" |
| Sewing yarn lines | M70020 SERAFIL 40 5000m<br>FS1(225D/3) (WHITE) | 225D/3" |

# MATERIAL LIST U-TURN PASSENGER 2 PRO

| Description in the paraglider | Manufacturer description | Technical Data, Dimension, Weigt, Solidness |
|---|---|---|
| Line Hook up point Material (Loop Material) | M21030 NYLON 12mm HBT WHITE | NYLON 12mm HBT |
| Trimmer | 20mm Buckle | 20mm / 33g |
| Brake pulley | M40010 PL-PULLEY NYLON | PL-PULLEY NYLON |
| Trimmer Webbing | 20mm Wave webbing | 20mm / Brakingstrenght: 650kg |
| Brake loop webbing Material (Loop Material) | M21000 nylon10mm tape white | Nylon 10mm tape |
| Brake handle | Polyester 20mm Tubular Webbing | Polyester 20mm |
| Brake handle - Brake line conection | HEAVY SWIVEL 8mm | Stainless Steel 8mm |
| Brake handle, fix on riser | Magnet | Magnet 20mmX3t |
| Brake, main line | DSL300 | 2,6mm / 300daN |
| Lines | upper - DC100 /DC60 / DSL 70<br>middle - TSL 190 / 140<br>main - TSL 380 / 280 / 220 | details see at Passengere 2 line configuration rev2 |
| Shackle | Mylon Rapid | Braking load 600kg |
| Top Material | SBS107PG / Dokdo 30 | 42 g/m² PA 6.6 |
| Bottom Material | SBS107PG / Dokdo 30 | 42 g/m² PA 6.6 / 42 g/m² PA 6.6 |
| Rib, Profile | Dokdo 30 Hard Finish | 42 g/m², PA 6.6 HT, HF |
| Mini Ribs | Dokdo 20 | 36 g/m², PA 6.6 HAT |
| V-Tape / V-Ribs / H-Stripe | Dokdo 30 Hard Finish | 42 g/m², PA 6.6 HT, HF |
| Profile nose reinforcement | Nylon root | 2,0mm |
| Riser | 20mm Polyester | 20mm |
| Riser redirection | SUS RING | 20mm x 10mm BAR (2mm) |
| Reinforcement on Profile (A,B,C,D) | M01260 NCV 024201450X15000(W420) Pes Scrim Laminated Pes film SR scrim | Pes Scrim Laminated Pes film SR scrim |
| Sewing yarn canopy | M70010 SERAFIL 60<br>5000m FS(150D/3) (WHITE) | 150D/3“ |
| Sewing yarn lines | M70020 SERAFIL 40<br>5000m FS1(225D/3) (WHITE) | 225D/3“ |

# LINE CODE-INFO PASSENGER2



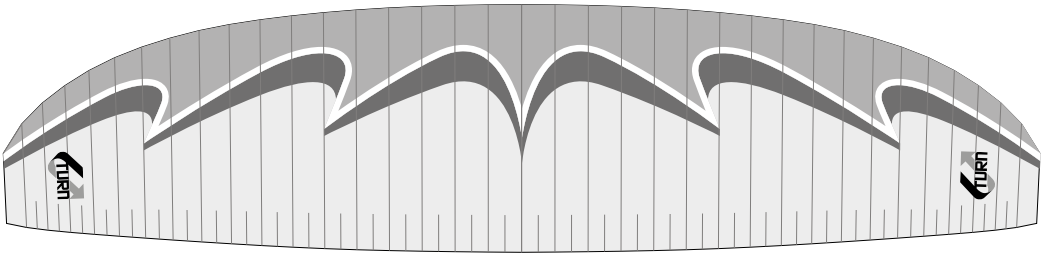
# LINE PLAN PASSENGER2

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

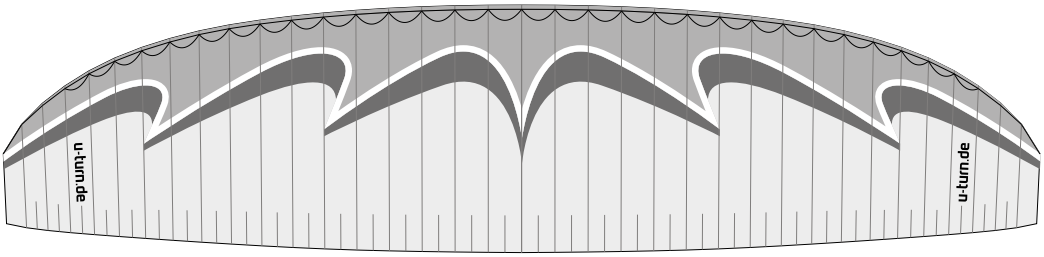
# INSTRUCTION LEAFLET FOR REPAIRS & 2-YEARLY-CHECK

| | |
|---|---|
| Last name: | First name: |
| Street address: | ZIP code, city: |
| Country: | Phone number: |
| E-mail address: | |
| Glider model and color: | |
| Serial number | |
| Comments / notes: | |

- ☐ 2 -yearly-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**

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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: | Phone number: |
| E-mail address: | |
| Glider model and color: | |
| Size: | |
| Serial number: | |
| Comments / notes: | |

| Line ID-code | quantity |
|---|---|
| | |
| | |
| | |
| | |
| | |
| | |

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# PRODUCT REGISTRATION

| | |
|---|---|
| Last name: | First name: |
| Street address: | ZIP code, city: |
| Country: | Phone number: |
| E-mail address: | |
| Product: | |
| Serial number: | |
| Date of purchase | |
| Purchased at: | |
| Pilot since: | |
| Number of flights per year: | |
| Club: | |

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

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# MAINTENANCE-MANUAL

as developer and manufacture of paragliders,
harnesses and rescue systems

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

# TOPIC OF INSPECTION AND REINSPECTION INTERVALS

Regular inspection according to aircraft inspection ordinance for standardized evaluated gliders. For end customer equipment after 24 months, for school gliders after 12 months.
The inspection must take place in the aforementioned intervals, or no later than 150 flying hours. Ground handling needs to be included in the sum of flight hours.
Generally speaking: in the case any abnormal flight behaviour, the manufacturer should be informed and the canopy, if necessary, sent in for inspection.

⚠ **ATTENTION:** In the case of abnormal flight behaviour, the manufacturer should be informed and the canopy - 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 reserve parachute

Before packing the reserve parachute this is to be checked by packer. If the parachute was deployed for rescue, then it is subject to an inspection. If a folded reserve parachute is re-packed again a deployment check is to be staged, to be determined is if the force for deployment is between a minimum of 3 kg and maximum of 6 kg.

### Inpection 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 the 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 stichings 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 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 meed 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 chafing 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 stit

ches in good condition?
- Are chafe marks 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 frm 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

## Other

- 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.

# COMPLETED CHECKS / INSPECTIONS - VERY IMPORTANT!

Before your 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 inspecion 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.

- Reserve equipment packing interval (according to DHV): New pack every 4 months. Permitted operating time: 8 years, then up to 12 years at annual inspection.

- 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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