



- Owner's Manual
- DHV Line data

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Text and Graphics: Ernst Strobl

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## U-Turn Contact

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The U-TURN crew congratulates you on buying a new U-TURN Paraglider. You made a supreme choice. We wish you long and enjoyable flights and many happy landings with your U-TURN Bodyguard.

Looking back at a long tradition in air sports, U-TURN provides state of the art technology, and with our unique concepts we are setting the standard for the market. The combination of top notch construction technology and the know-how of experienced test- and competition pilots provide the tools for our professional work.

Our customer's needs and demands are the guideline for our work; therefore we like to get your suggestions and critique. Should there be any open questions please feel free to contact your U-TURN dealership or our company. We are glad to assist you in any possible way.

To keep you in the loop of information about the latest technical improvements and innovations about U-TURN products, we ask you to fill in the questionnaire and send it back to:

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*Please read this manual carefully and understand the informations it contains before you operate your Bodyguard for the first time. We wrote this manual for your safety and to enable you to easily operate you're Bodyguard.*

# Answer sheet

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Name:
First name:
Address
Telephone Nr.:
E-Mail:
U-Turn Bodyguard Serial Nr:
Date of purchase:
Dealership:
Tested by:

Paraglider since:
Flying hours:
Club:



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## Introduction

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Paragliders made by U-Turn are a class of its own. U-Turn stands for uncompromising safety, best components and out-performing flight-characteristics. Fly it and be happy, as U-Turn is the brand for those who appreciate the difference. The limits of physics are unbribable. To do the most practicable within this given frame is our goal. We concede: This is an ambitious and somehow immodest demand, but you'll find U-Turn always at the cutting edge of technology. Oscar Wilde once said in his very british understatement his taste is just basic: Only the best is always good enough. The U-Turn team agrees with this attitude: We always want to deliver the best possible glider. Not more, but certainly not less. Customer's wishes are key for the U-Turn stuff, so we appreciate any comments. Please feel free to contact your competence center or U-Turn directly when you're in need for a good piece of advice. To keep you in the loop of information we ask you to fill the registry card and send it to:

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## General Description, AFS

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To paraglide with lots of fun and have the highest level of security possible, especially for inexperienced pilots, this is the promise of BODYGUARD - the brand-new U-Turn canopy with its revolutionary "Automatic Flight Stabilisation" (AFS).

By implementing a lot of technical innovations, designer Ernst Strobl entered a new dimension. Using the latest tools of computer-aided engineering with the well-known U-Turn goal of always providing customers with a product at the cutting-edge of technology led to the BODYGUARD - the new reference among the DHV-1 gliders available. Strobl worked together with the most experienced flight instructors from our competence centres. Their know-how, having taught thousands of flight students, was introduced into the design-process right from the beginning, another reason for the outstanding security level of this glider. Andreas Schubert, one of the most experienced instructors from the "Rhöner Gleitschirmschulen", was involved in the writing of the specification sheet:

- " What are the mistakes most commonly made by beginners?
- " What are the major difficulties in learning to fly actively and safely?
- " Which features must a modern canopy have to provide beginners maximum safety, but also fun and convenience?

The BODYGUARDS answers to these questions are convincing:

- " The AFS-system.
- " The B-stall Help.
- " The extra strap as assistance for Big-Ears.
- " The swept-back design of the wing tips.
- " The Easy-Fix system of the risers.
- " The Dirt-Outs with Velcro closure.

These innovations make the BODYGUARD a high-tech-glider, flying in a class of its own.

## General Description, AFS

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With the AFS-system U-Turn introduces a world first to the market. To fly safely means to fly actively - the system employed on the BODYGUARD allows this to happen automatically to a certain level. The secret of the AFS-system is based on a pre-tensioning principle. In the area of the brake attachment points the undersurface is pre-tensioned. Whilst the sail is gliding through smooth air, there is enough pressure inside and the pre-tensioning is neutralised: The effect of internal pressure is more powerful than the pre-tensioning and the trailing edge stays aerodynamically perfect in the air like a conventional glider.

When entering turbulent air with the BODYGUARD the system adjusts immediately, even the slightest drop of internal pressure allows the system to react. The pre-tensioning at the trailing edge is effectively like pulling the brakes.

Ernst Strobl recalls the fine-tuning, "Our computer-based calculations were impressively confirmed during our tests".

The system is extremely responsive so that a top-quality manufacturing is key. U-Turn Co-founder Thomas Vosseler adds, "We will guarantee a strongly supervised manufacturing process".

The AFS works like the Electronic Stability Programs known in the automotive industry, you could call it an "ESP for the air". It intervenes for the benefit of safety when an inexperienced pilot, or a pilot in trouble, enters turbulence and is unable to fly actively.

Andreas Schubert, who has taught 10 % of all new pilots in Germany over the last ten years confirms, "This is a major step as far as safety is concerned. The main reason for accidents, the full collapse of the canopy, is minimized dramatically".

Even without AFS the BODYGUARD would be a very safe glider says Strobl. Due to the extremely pulled down winglets and the resulting spread of the canopy the BODYGUARD has far more than average resistance to collapses.



## General Description, AFS

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Schubert confirms, "The BODYGUARD glides stably ahead even after an accelerated asymmetric collapse, a situation that may happen after leaving a thermal, even with 50% of the wing area collapsed". This is simply outstanding.

The computer optimised wing layout leads to very good thermal lift and maximizes the stall characteristics, both improving safety.

### **New features: B-Stall Help and assistance for Big-Ears**

As a very experienced instructor Schubert asked for more features to help give flight students a safe beginning in paragliding. Sources of error doing fast descents by B-stall or Big-Ears should be eliminated by appropriate design. B-stall and Big-Ears both have potential for error if they are not performed properly.

Folding the winglets, known as Big-Ears, leads normally to a very stable flight attitude. The canopy stays steerable with a sink rate of around 3 - 5 metres/second (depending on the number of cells folded) and will fly straight ahead because both the angle of attack and the wing load increase. However, inexperienced pilots often mix up the outer A-lines with the outer B-lines, the wingtip lines, or with the most serious results, the outer D-lines.

The BODYGUARD comes up against these dangers with another world first, the "Big-Ears Assistant". An extra long, thin and distinctive strap, attached to the risers, makes sure of safe and efficient Big-Ears. Schubert explains, "We see during our training again and again, that inexperienced pilots in stressful situations don't know which line to pull". With the new assistant this issue is history.

The situation is similar with the B-stall Help. The B-stall is initiated by pulling the B-lines, the airflow at the top-surface detaches and the canopy folds in a span wise direction, the glider sinking 4-5 metres/second with a save forward flight.

## General Description, AFS

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In case of pulling the C-lines mistakenly, the whole flight attitude starts to become unstable, the canopy enters deep stall and violent oscillation arises - simply not possible with the distinctive B-stall Help.

Ernst Strobl conceived a way that eliminates possible sources of error. Using conventional gliders, the pilot must pull relatively hard during the first five to ten centimetres, before any further pulling becomes easier.

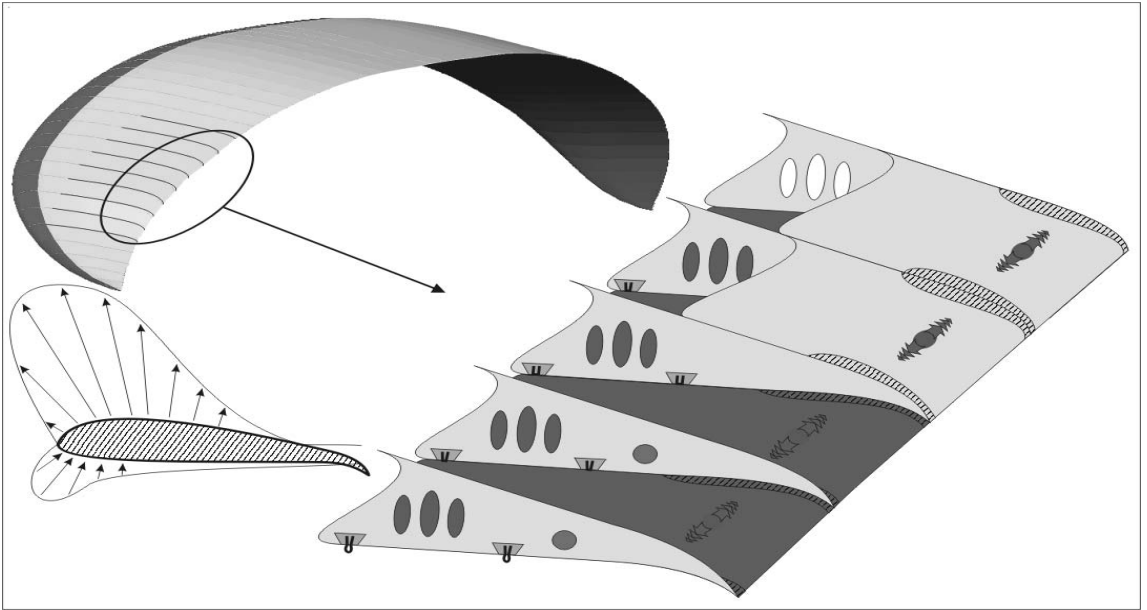
Until now there has been no clear reference point up to which a safe B-stall was possible. Due to the innovation of the BODYGUARD it is now very easy to initiate a B-stall, without effort and highly responsive. The well-defined reference point makes sure that pilots do not over pull the lines.

Besides these safety features the BODYGUARD provides several user-friendly details, maximizing the fun. Using the Easy-Fix you can fix the risers after packing. This eliminates possible tangling of the lines in the risers. Whoever flies often or likes to climb up the hill immediately after a flight will love the Easy-Fix system.

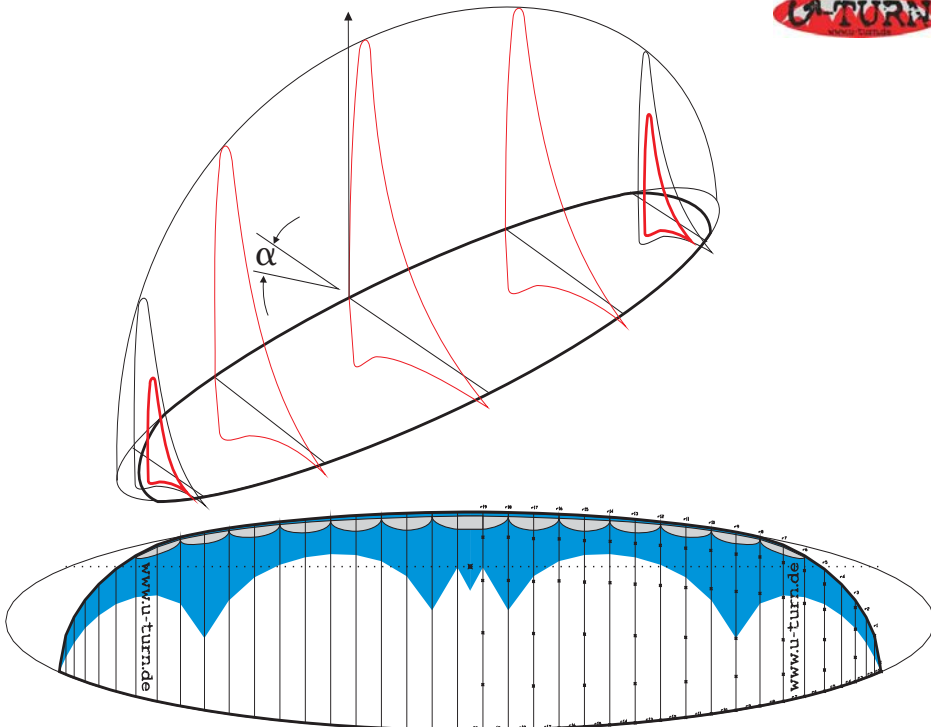
Finally the Dirt-Outs lighten the effort of removing dirt or greenery out of the canopy.

In the strictest sense, the BODYGUARD is not only setting benchmarks as far as safety is concerned, it is ringing in a paradigm shift in glider design. Although the whole design process was primarily concerned with safety, Ernst Strobl managed to design a piece of sports equipment, whose characteristics guarantee untroubled fun.

On the one hand the BODYGUARD is uncompromisingly safe, but with the BODYGUARDS attractive flight characteristics there is no compromise, the enjoyment of paragliding is not diminished.



## AUFTRIEBSVERTEILUNG UND GRUNDRISS DES BODYGUARD



## AFS system and new features

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To paraglide with lots of fun and have the highest level of security possible, this is the promise of the revolutionary AFS-System (Automatic Flight Stabilisation). It intervenes for the benefit of safety when an inexperienced pilot, or a pilot in trouble, enters turbulence and is unable to fly actively. AFS works like the Electronic Stability Programs known in the automotive industry, you could call it an “ESP for the air”.

By implementing many technical innovations, designer Ernst Strobl entered a new dimension in glider design, having invented both the Improved Stabilisation System (IST) and the Multiple Speed System (MSS). Strobl now presents a paradigm shift: For the first time a designer has managed to allow safety to happen automatically to a certain extent.

The core innovation of the AFS-system is based on the principle of pre-tensioning the undersurface at the trailing edge. “This idea I had during a flight”, Strobl recalls his sudden inspiration, “It must be possible to pre-tension the under-surface by making sure of an exactly calculated cut – so that on the one hand the canopy is neutral while there is enough pressure inside, but on the other hand any drop of pressure causes the system to react”.

Dozens of computer-based calculations with high-end software from the aviation industry allowed the break-through to be achieved. A special production process around the brake attachment points leads to the desired effect. Whilst the canopy is gliding through smooth air and there is enough pressure inside, the pre-tensioning is neutralised and the trailing edge stays aerodynamically perfect like a conventional glider.

When entering turbulent air with the Bodyguard the system adjusts immediately, even the slightest drop of internal pressure allows the system to react. The pre-tensioning at the trailing edge is effectively like pulling the brakes.

A canopy featuring the AFS-system reacts without any steering or braking action from the pilot exactly in the way that the safety experts of the DHV recommend: It flies actively and therefore safely. Ernst Strobl recalls the fine-tuning, “Our computer-based calculations were impressively confirmed during our tests”.

The system is extremely responsive and top-quality manufacturing is necessary. U-Turn Co-founder Thomas Vosseler adds, “We will guarantee a strongly supervised manufacturing process”.

Andreas Schubert, of the “Rhöner Gleitschirmschulen”, who has taught 10 % of all new pilots in Germany over the last ten years confirms, “This is a major step as far as safety is concerned. The main reason for accidents, the full collapse of the canopy, is minimized dramatically”.

## AFS system and new features

---

The principle of the pre-tensioning of the canopy led Strobl to more design improvements. AFS works best in combination with the geometric setting of the profiles. This means that the profiles do not run lengthwise along the canopy (90 degrees to flight direction), but at an angle between 80 and 100 degrees, allowing every cell to perform in the optimal way. Furthermore, Strobl did not design the width of the cells uniformly; he used a very fine tuned asymmetry that also required lots of computer power to calculate. Strobl calls this dynamic cell-width reduction. In a third step the whole system works more efficiently by using a swept-back design of the wing tips.

Together these innovations lead to better characteristics under normal flight conditions. "First I have to mention the optimal start behaviour," says Strobl, "The first glider providing the new system is called BODYGUARD; a DHV 1 glider that will set fantastic benchmarks. The BODYGUARD is easily to inflate in all kinds of wind; there is no need for pulling the A-risers or other tricks and it is impossible for the canopy to become stuck before the overhead position. Inflation is easy even for beginners and due to the AFS-System the canopy sits right above the pilot. If the canopy falls backwards, the BODYGUARD comes up immediately after releasing the brakes – even at angles where other gliders give up".

The new construction principle also automatically improves the stall characteristics in flight. Pilots can slow down the BODYGUARD to very low speed without having to lose manoeuvrability. The newcomer will come to terms and feel comfortable with an AFS-glider on the first flight for another reason: "The wing tip comes slightly forward when the brakes are pulled", Strobl explains, "the canopy sits right above the pilot and this effect can even be seen while Paramotoring, this is what inexperienced pilots will appreciate".

## Material Specifications

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Top	Porcher Marine, NCV, France	9092-E85A* Water-repellent
Bot *		PA 6.6 High Tenacity
Profile		9017 - E38A
Mylar	Porcher Marine, NCV	P260
Mylar	Dimension-Polyant	W420 - 182 g/m <sup>2</sup>
lines	Teijin Limited, Japan	1.1/1.3/1.6/1.9/2.1/2,3mm
Riser	Techni Sangles, France	22mm/1100kg BS/25g/m

The sailmaterial of the U-Turn Bodyguard consists of high strength, stretch resistant NYLON with a special anti-UV coating.

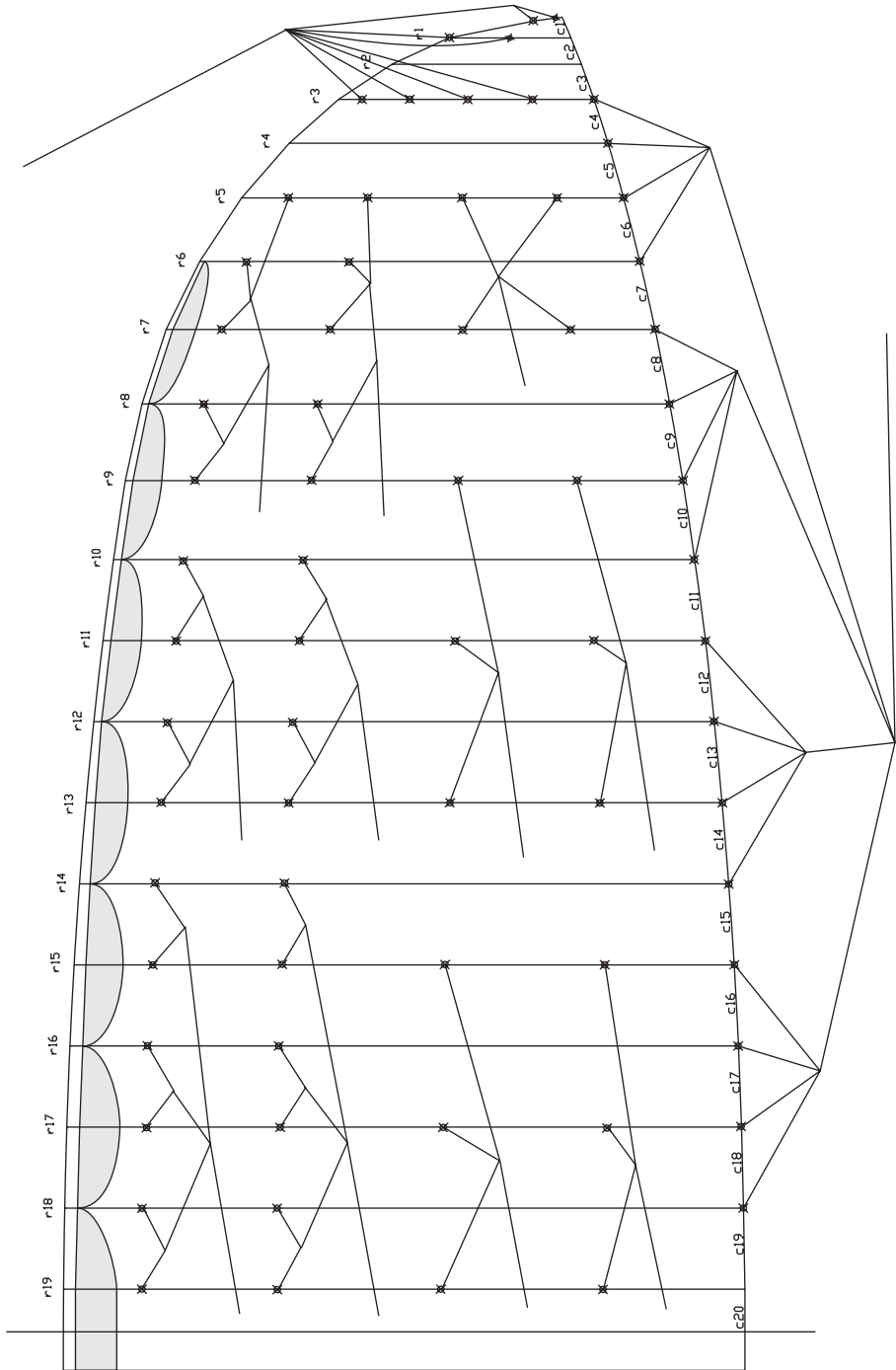
## Startweight

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Start Weight (kg)	50	55	60	65	70	75	80	85	90	95	100	105	110	115	120	125	130		
<b>BodyGuard XS</b>	2,1	2,3	2,6	2,8	3,0	3,2													kg/m <sup>2</sup>
<b>BodyGuard S</b>				2,5	2,6	2,8	3,0	3,2	3,4										
<b>BodyGuard M</b>							2,8	2,9	3,1	3,3	3,4	3,6	3,8						
<b>BodyGuard L</b>										3,0	3,2	3,3	3,5	3,7	3,8	4,0	4,1		

# Technical data U-Turn BodyGuard XS, S, M, L

	<b>XS</b>	<b>S</b>	<b>M</b>	<b>L</b>
Startgewicht	50 - 75 kg	65 - 90 kg	80 - 110 kg	95 - 130 kg
Fläche ausgelegt	24,5 m <sup>2</sup>	26,5 m <sup>2</sup>	29,0 m <sup>2</sup>	31,5 m <sup>2</sup>
Fläche projiziert	21,5 m <sup>2</sup>	23,3 m <sup>2</sup>	25,5 m <sup>2</sup>	27,7 m <sup>2</sup>
Spannweite ausgelegt	11,01 m	11,45 m	11,98 m	12,49 m
Spannweite projiziert	8,91 m <sup>2</sup>	9,26 m <sup>2</sup>	9,69 m	10,10 m <sup>2</sup>
Streckung ausgelegt	4,9	4,9	4,9	4,9
Streckung projiziert	3,6	3,6	3,6	3,6
Zellenzahl	39	39	39	39
V-Trim	36 Km/h	36 Km/h	37 Km/h	37 Km/h
V-Min	21 Km/h	21 Km/h	20 Km/h	20 Km/h
V-Max	47 Km/h	47 Km/h	48 Km/h	48 Km/h
Konstruktionsart / Besonderheiten	AFS, Zugbänder, B-Stall Hilfe	AFS, Zugbänder, B-Stall Hilfe	AFS, Zugbänder, B-Stall Hilfe	AFS, Zugbänder, B-Stall Hilfe
Zahl der Tragegurte	Geteilter A-Tragegurt		Geteilter A-Tragegurt	
Zahl der Leinenstockwerke	5	5	5	5
Fußbeschleuniger/Trimmer	A&B Leinen 3 / C&D Leinen 2	A&B Leinen 3 / C&D Leinen 2	A&B Leinen 3 / C&D Leinen 2	A&B Leinen 3 / C&D Leinen 2
Nähte Ober-, Untersegel	Fußbeschleuniger innen	Fußbeschleuniger innen	Fußbeschleuniger innen	Fußbeschleuniger innen
Kappengewicht	4,8 kg	5,0 kg	5,4 kg	6,0 kg
Zulassung DHV	DHV 1		DHV 1	





## Line System

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We use 1,1 / 1,3 / 1,5 / 1,8 / 2,1 and 2,7mm Technora by TAE-GU Lines Weaving Inc. with a special weaved aramid core. They have a high tear strength and are unlikely to bend. This stretch resistance denies changes in flight characteristics caused by different stretching after a short time of usage. An optimum of safety and strength in relation to drag is achieved by the use of different line diameters. The whole line system consists of single elements that are sewed and looped on both ends. All suspension and brake lines are forked in the upper part. The different colour of the lines guarantee easy handling and control. All suspension lines are looped seperately in rapidlinks and conected to the risers. The rapidlinks have collectorclips built in to prevent slipping of the lines. The main brakeline is looped through a reel at the D-riser with a colour-marking where a brakegriphas to be tied on. The manufacturer setting is 0 travel plus 5cm. Shortening more than 5cm is not allowed and results in a "brake" condition in flight which is extremely dangerous for takeoff, flight and landing.

The basic setting provides sufficient braking action at landing and in extreme flight conditions besides a comfortable armposition in trimmed flight. Never change the basic setting of the lines before you have operated the paraglider in the originally delivered version.

Please note that with the height of the harness mounting also the relative brakedistance changes. When adjusting the setting, both sides have to be symmetrically and a permanent knot has to be used. Optimum solution is the "Spierenstich" knot with its high slide resistance and its little effect on the lines.

## Risers

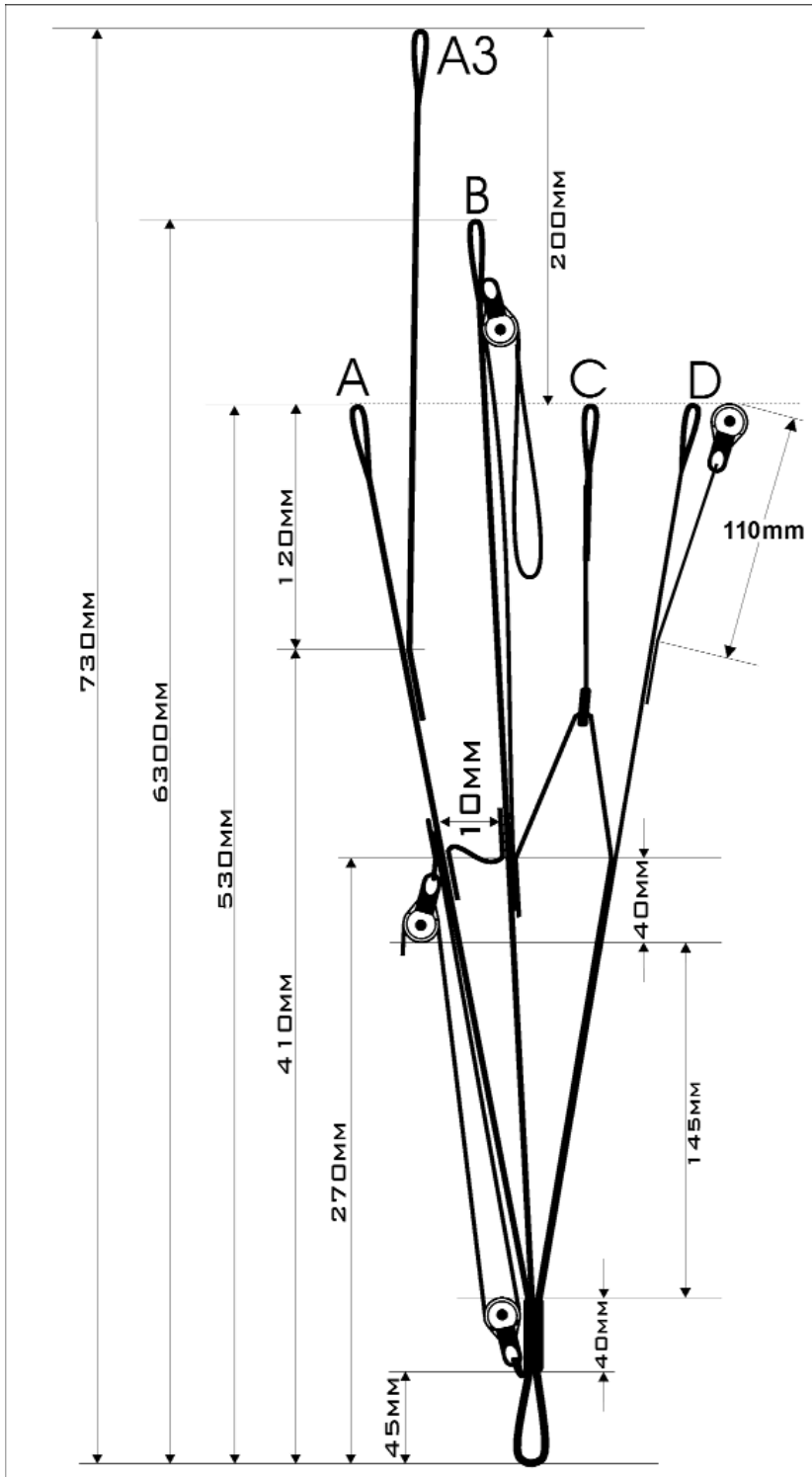
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The A- and B- risers have a different colour to ensure positive identification at takeoff and during a B-stall descent. The length of all risers has been chosen in a way to get easy access to all lines and lineshackles in flight for special manoeuvres.



Made of rigid and stretch resistant Polyester-belts, the Bodyguard risers guarantee a long-term, stable trim.



## **Suitable Harness**

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All officially approved harness systems with mounting about the breast height are suitable for the BODYGUARD (they have to be DHV rated GH). The lower the mounting, the better is the steering by shifting of the bodyweight.

The positioning of the mounting also changes the relative brakedistance.

If you have any questions about the usage of your harness with the BODYGUARD, ask your U-TURN dealer or directly contact U-TURN. We assist you in any possible way.

## **Suitable Rescue System**

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

## **Speed System**

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The BODYGUARD is equipped with a very effective leg-actuated

speedsystem that increases the speed btw. 8 and 15 km/h depending on model and pilots weight. During extreme manoeuvres the speedsystem should not be activated, when entering an extreme manoeuvre it should be immediately deactivated. All extreme manoeuvres (i.e. stalls...) get more dynamically at higher speed.

## **Operation**

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

## **Field of Operation**

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

## **Aerobatics**

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

## **Motorised Paragliding**

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The BODYGUARD is well suitable for motorized operation due to its

outstanding takeoff performance, its wide weight range and its easy handling. Please note that a separate approval is necessary for the glider / motor-combination. If you intend to operate the BODYGUARD motorized, please contact the motor manufacturer, U-Turn and the DULV (Deutscher Ultraleichtflug Verband) for official approval.

Use only approved motor / glider combinations and adhere to the aeronautical regulations as well as the training requirements. The according rules and regulations for the country of operation apply.

## Pre-Flight Check

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

All lines, risers and the canopy have to be carefully checked for damage before every takeoff. Even in case of minor damages takeoff is not an option.

After the glider is unpacked and layed on the ground in a half-circle-shape, check following items:

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

## Takeoff

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Hold on to the A-risers and the brakegrrips. Recheck the glider once more visually. Take the U-Turn sign in the middle of the canopy as device to get a centered takeoff run into the wind. Rise the canopy with a firm, steady and even pull. Reach forward with your arms to prolong the A-lines. When the force lightens, the canopy is now over the pilot, look up to ensure that it is fully open above you. The BODYGUARD has a light tendency to overshoot a little, but braking is not required during the takeoff phase. Even with little or no wind you don't need an aggressive takoff, or to run into the glider with momentum. An even, smooth pull is the easiest and safest way to get the BODYGUARD airborne.

## Takeoff

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Directional inputs with the brakes should not be done before the canopy is fully erected over the pilot, because the canopy could fall backwards when the braking action is too strong. Now is the right time to make the final decision for takeoff. A couple of quick steps forward and a slight release on the brakes for acceleration will get you airborne.

## Turning

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The BODYGUARD has a normal agility and reacts directly and instantly to steering inputs. You can fly flat turns with little altitude loss by shifting of bodyweight. A combination of appropriate pull on the inner brakeline and shift of bodyweight is the best way for a coordinated turn. The turn radius depends on the amount of pull on the brakeline.

At about 75% of brakeline travel, the BODYGUARD increases bank

significantly and performs a fast steep turn that can be continued to a diving spiral. The diving spiral has to be initiated and terminated slowly. The bank angle is controlled by increasing and decreasing the pull on the inner brakeline.

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

## Thermals and Turbulences

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The BODYGUARD shows its strength apart from its outstanding launch characteristics and its high pitch- and rolling-stability also with flights in the thermics by its outstanding combination of security and efficiency.

The BODYGUARD 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 thermics or strong turbulences watch out that the canopy does not get behind the pilot.

## Thermals and Turbulences

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To avoid that, release the brakes a bit to get an increase in speed when entering the updraft. If the canopy gets in front of the pilot when leaving a updraft or entering a downdraft the brakes have to be applied to counter that. Accelerated flight however is adviseable when flying thru a downdraft zone. The BODYGUARD is very stable overall, never the less is active flying a big flight safety factor. Collapsing and deforming of the canopy can be avoided by active flying (as above mentioned) in turbulent air.

## Landing

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

## Winching

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Because of its excellent landing characteristics, the BODYGUARD is well suitable for winching operations. Take the following points into account:

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



- maximum line tension for winching is 100kp.
- never winch the BODYGUARD with loads outside the allowable weight range
- all involved persons, machines and accessories have to have the appropriate licenses, approvals, certifications for winching.

## Advanced Handling

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

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

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

A wrong execution of these manoeuvres may have fatal consequences!

## Wingover

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The pilot has to perform right and left turns with increasing bank until the desired angle is reached. Collapsing is only a factor when the bank angle is very high.

**Warning: More than 60° of bank is illegal aerobatics!**

## Frontstall

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

## Stall

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

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

## Fullstall

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

Caution: Never release the brakes at the beginning of the recovery when the canopy tilts forward, the canopy may accelerate forward in a way that makes contact or even falling into the canopy possible. The fullstall is a dangerous manoeuvre and should not be performed intentionally except during a flight safety course. Caution: Never pull a brake to cause a Deep Stall. This could cause the glider to spin (negative turn)!

## Emergency Piloting

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

## Negative Turn / Spin

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

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

## Collaps

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Even with its high stability and very good reaction in turbulences, strong turbulences can cause the BODYGUARD to collaps. That situation is not really dangerous and clears itself automatically and not impulsivly. To support the recovery, firmly apply brakes on the according side and simultaneously steer opposite on the open side. When a large part of the canopy is collapsed be careful and smooth when applying opposite steering to avoid a complete departure of airflow and entering a fullstall.

### **To avoid the collaps**

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

## To avoid the collaps

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The best way to avoid collapses upfront is the right choice of the paraglider. A lot of pilots fly a glider that is a little to hot to handle for them. So why dont you get a glider with a lower rating but in the end fly better and higher in the updrafts and have a lot more fun and by the way be safer, too. To optimize the feeling for your glider on the ground, try the following: Practise on the ground with the right wind at a suitable location. Slowly pull up the canopy and try to hold it up as long as possible without looking towards it. That is a good way to improve the feeling for your glider and is a prerequisite for "active flying" (the key to avoid collapses).

Very important is also a close look at the terrain. Watch for obstacles that could cause turbulences ( buildings, trees, ...). On certain days, for example a freshly mowed madow as landing field, could cause a lot of thermal activity. Fly very alert on a thermal active day. Watch your canopy, collapses most of the tie, announce themself. Light braking in turbulences mostly avoids a collaps. You should have already practised that on the ground. Should a collaps 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 collaps, and maybe a little pumping action. Some canopies open a lot better whe the brakes are fully applied once on the according side, but that depends on the brakeline adjustment and your armlength. Wrapped lines are cleared by braking the opposite side at enough altitude and pumping the affected side a couple of times. Watch out for a possible stall. If that does not clear the situation, try to pull down the outer line as much as possible. If you are too low for that, stabilize the canopy on the opposite side to avoid turning away, and leave the lines like they are. Instead of any -risky manoeuver rather concentrate on the landing.

## Rapid Descent

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

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

## Spiral Dive

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Like a normal turn, it is very easy to get the BODYGUARD into a spiral dive. The spiral dive gets you a descent rate up to 20 m/s. To be settled for the real thing, practise it in optimum conditions. The diving spiral gets the pilot down faster than other techniques and is therefore best suited for an emergency descent. Don't forget the G-forces when diving down, and take that into consideration before initiating a rapid descent. Caution: If initiation is too fast there is a danger of a spin, in this case release the brake and try a smoother initiation.

*Warning: Never fly a spiral dive when "big earing" the glider. It is illegal aerobatics and may overstress the pilot and the material.*

## B-Stall

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Pull down the B-risers on both sides simultaneously 20-30cm. The airflow separates now on the upper camber and the canopy compresses backwards, the lift decreases almost completely and the glider descends at about 5-8m/s without forward movement. The first 5-10cm need a fairly firm pull, but with any further pull the wing area decreases and the rate of descent increases. If you pull too far on the B-risers, the canopy becomes unstable and starts to turn away. If you release the risers, the canopy takes on airflow again, you get forward movement and it starts to fly normal. You have to release the B-risers simultaneously and expeditious. The BODYGUARD has no tendency to stall when exiting a B-stall. During a B-stall you drift away with the wind further than during a spiral dive..

## Big Ears

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Pull down on the outer A-risers one after the other (grab the line shackles) about 15-20cm to collapse the wingtips. Hold the brakegrips together with the A-risers. The glider stays fully steerable and descends with 3-5m/s straight forward. If you release the A-risers, the collapsed cells open automatically. Should there be any problem with the reopening, apply easy braking.

"Big earing" is due to the high wingload a very stable flight condition and well suited for turbulent air. Be aware that you reduce the trimspeed, but that can be compensated by accelerating with your legs.

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

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

## Maintenance and Care

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

A couple of tips for maintenance and care:

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

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

Plase take following points into consideration:

- regular checks for damage
- no unneccessary bending
- don't tie the brakelines on the grips if not needed, it weakens the lines
- after an overstress (treelanding, waterlanding and extreme situations), the lines have to be inspected an maybe exchanged
- in case of changing inflight handling characteristics, the lines have to be checked for their correct length

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

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

Should there be a need for any repairs they are to be done by the manufacturer.

## Safety Advices and Liability

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This glider complies with DHV, AFNOR (SHV and ACPUL) regulations, for the tested type, at time of delivery (see appendix) The operation of the glider is at your own risk. The manufacturer and the dealer don't take any liability for accidents and follow on damages. Please consider all safety notes, cautions and warnings for safe flying.

Special emphasis on following points:

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

**U-Turn – Enjoy the best!**





**Service Remarks**

Art der Arbeiten /  
type of works:.....

.....

Bemerkungen /  
remarks:.....

.....

Datum, ausgeführt von /  
date, done by:.....

.....

Service Betrieb /  
service - shop:.....

.....

Art der Arbeiten /  
type of works:.....

.....

Bemerkungen /  
remarks:.....

.....

Datum, ausgeführt von /  
date, done by:.....

.....

Service Betrieb /  
service - shop:.....

.....

# Luftsportgeräte-Kennblatt Gleitschirm

Geräte-Kennblatt NrDHV GS-01-1323-05 Ausgabe Datum 14.02.2005

## I. Musterprüfung

1. Gerätemuster: Bodyguard L
2. Hersteller: U-Turn GmbH
3. Datum der Musterprüfbescheinigung: 15.02.2005

## II. Merkmale und Betriebsgrenzen

1. Gerätegewicht (ohne Packsack (kg):
2. Zulässiges Startgewicht minimal (kg): maximal (kg): 130
3. Anzahl der Sitze: ~~1~~ max: 1
4. Klasse: 1
5. Gurtzeugbeschränkung: GH
6. Fußbeschleuniger: Ja
7. Trimmer (von Hand zu bedienen): Nein
8. Projizierte Fläche (m<sup>2</sup>): 27.7
9. Windenschlepp: Ja
10. Tragegurtlängen (mm):

	Tragegurt A:	Tragegurt A2:	Tragegurt B:	Tragegurt C:	Tragegurt D:
normal:	530	710	630	530	530
beschleunigt:	400	590	510	475	530

11. Leinenlängen (mm):

A	B	C	D	BR
1 8130	7935	8025	8190	8850
2 8075	7880	7935	8100	8670
3 8040	7845	7975	8140	8535
4 8030	7830	7910	8060	8435
5 8035	7830	7795	7935	8410
6 8060	7855	7805	7935	8290
7 8005	7800	7690	7790	8215
8 7945	7740	7470	7550	8200
9 7920	7720	7015	7055	8150
10 7920	7720	6720	6700	8100
11 7720	7710			8070
12 7630	7625			8095
13 7540	7565			7995
14 7440	7485			7895
15 7390	7425			7800
16 7125	7045			7745
17 6815	6760			

12. Sonstige Besonderheiten:

13. Nachprüffristen 24 Mo

III. Betriebsanweisungen

Betriebsanleitung in der genehmigten Fassung vom 1.1.2005



11. Leinenlängen (mm):

A	B	C	D	BR
1 7785	7590	7690	7845	8470
2 7730	7535	7600	7760	8305
3 7690	7495	7645	7805	8180
4 7675	7480	7570	7720	8090
5 7680	7485	7460	7605	8060
6 7700	7510	7475	7605	7950
7 7645	7455	7350	7500	7880
8 7590	7405	7140	7270	7860
9 7560	7390	6710	6745	7825
10 7560	7390	6425	6405	7770
11 7380	7370			7750
12 7295	7290			7755
13 7205	7230			7635
14 7115	7155			7530
15 7065	7100			7445
16 6810	6740			7395
17 6520	6470			

12. Sonstige Besonderheiten:

13. Nachprüffristen 24 Mo

III. Betriebsanweisungen

Betriebsanleitung in der genehmigten Fassung vom 1.1.2005



11. Leinenlängen (mm):

A	B	C	D	BR
1 7450	7245	7345	7515	8145
2 7400	7205	7270	7435	7985
3 7360	7165	7310	7475	7860
4 7355	7160	7255	7400	7775
5 7355	7160	7150	7285	7740
6 7375	7180	7145	7280	7635
7 7320	7135	7050	7185	7570
8 7270	7080	6845	6950	7555
9 7245	7055	6420	6455	7530
10 7245	7060	6145	6130	7480
11 7070	7055			7455
12 6985	6980			7495
13 6885	6920			7355
14 6800	6840			7240
15 6750	6790			7155
16 6515	6455			7110
17 6235	6190			

12. Sonstige Besonderheiten:

13. Nachprüffristen 24 Mo

III. Betriebsanweisungen

Betriebsanleitung in der genehmigten Fassung vom 01.01.2005