

Bautek: FIZZ

Manual

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FIZZ

Owner Manual

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Fizz Manual

[as of 27. March 2012]

General Information

The “Fizz” evolved out of a two year development for a new, light, topless, high performance glider, which produced after a year a flight ready prototype; but the weight did not satisfy the high expectations. Therefore a change in concept was made, before the extensive flight tests were started.

Most pilots, especially longtime and experienced ones, today prefer light, uncomplicated, but high performance and affordable gliders. The heavy, topless, high-performance, competition gliders are too demanding to fly and take the fun out of hang glider flying!

For this reason we developed five years ago the kingposted high performance “Kite”, which excites many pilots by it’s easy handling and very good thermaling characteristics today and will do so in the future.

The planned topless was to become a top class glider with kingpost, that sets new standards in faster glide mode and in X-country flying.

The engine of any hang-glider is the sail. With best sail fabrics the cut for a flat wing profile was fitted to the flexibility of the leading edge tubes and the sail battens. In frame and cables we can trust our safe and tested components. Everything is light and simple to inspect; damage can be repaired economically.

At the end of a development each glider has a personality, representing launch-, flight- and landing-characteristics, which are marked by the goal and capabilities of the designer. With the "Fizz" our top model became reality! We are convinced, the "Fizz" matches exactly the expectations of the demanding recreational- and X-country pilot.

- Best thermaling and climbing characteristics
- Very good glide ratio in wind penetration or fast flight
- Easy launch- and landing characteristics
- Safety tested for DHV-airworthiness requirements
- Bautek maintenance and repair service



The "Fizz":

- Full Mylar sail of high quality ODL 04/06 (Technora Black)
- 90% double surface sail
- Thin wing profile with 24 top and 6 bottom battens
- Narrow wing projection of 152 sft.
- VG extended travel with a 24to1 advantage, for easy operation
- Radial wingtips with winglets
- Spring loaded side wires
- Optional profiled Alu-Speedbar with split wheels

Thanks to many clever construction details the set up and break down of this glider is exemplary simple, and without effort.

We wish you many beautiful flights and always "happy landings"!

Delivery package:

1 Batten plan; 1 Batten-quiver; 3 Padding [kingpost, keel center and end]; 2 yellow Velcro ties; 1 red Velcro tie; 2 Batten plugs front and rear; 2 Wing tip bags; 1 Cover bag.

Before the first time set-up, it is necessary to read this manual thoroughly. For additional questions or when uncertain the manufacturer should be consulted.

The enclosed “Air sport equipment certificate” is part of this manual.

Assembly from the short pack of 13.5 ft [4.15 m]

(Combination cover bag long/short)



Lay down the short pack with the control bar area pointing up. Open the zipper and put the batten bundle [quiver] and both rear leading edge [wing tubes] to the side. If you are flying with non-split wheels, slide these on the speed bar now, before mounting it.

The bow of the speed bar is pointing up, when assembling. Alternatively the use of a profiled bautek- Alu-speedbar [with or without wheels] is an option. Attach the speed bar right and left with the push-pins at the control bar corners.

Now turn the wing over so it lies on the control bar and open the Velcro ties.

Unfold the rear sail-halves to the rear and the swivel-tip of the right and left outside [= rear] leading edge tube towards the front in the direction of the keel.



Push the rear sections of the leading edge tubes from the rear into the sail. Let the swivel tip exit the double sail at the zipper opening and push the tube into the front leading edge tube with the swivel tip cable pointing up. The swivel tip will swing to the rear. Press both snaps in and see that both snap out again through the holes in the front tube.



Then pull the wide, black, inside loop at the end of the sail leading edge over the end-cap of the rear leading-edge tube. There is an auxiliary loop, which helps to do this. Pay attention to the proper seating of the loop webbing in the grove of the plastic end-cap. Close the Velcro loop inside the sail to keep the black loop from moving out of its grove during transport.

Spreading the sail and inserting the top battens:

Stand the glider on the control bar and raise the kingpost.



Spread the wings in steps, since the spreader bar has limited float.

In strong winds keep the glider flat on the ground for the next steps.

Push the top battens 1-10, starting at the center with Batten 1, into their sail pockets and secure them with the spring-loaded end plug, by pushing the plug forward against the spring and releasing the flat tang into the open space in the trailing edge seam of the sail.



Red batten numbers = left side, green batten numbers = right side, looking in flight direction. [Portside and Starboard for the mariners] The batten quiver has separate pockets for the right and left wing. After the top battens are inserted, you can stand the glider up, if not done earlier, and tension it.

Before **tensioning** the glider, standing on the control bar, the wings should be spread as far as possible. Out of the keel-pocket leads a tensioning line to an elongated hole in the keel tube. Pull the spreader bar with this line to the rear and hang the steel ring in the notch of the tension line receptacle.



Then the steel ring of the rear upper rigging placed in the same notch. Check if the snap behind both rings is out and secures them.

In the front the two nose wires of the lower rigging are combined with a small screw closed triangle. Hang the triangle into the receptacle under the nose plate and again confirm that the snap secures it.



After this attach the snap hook of the spreader-bar safety cable from below = upwards into the tensioning line eye at the spreader bar; the zipper of the double sail is closed after this.



Folding tip battens tensioning: sail end caps = winglets attachment:

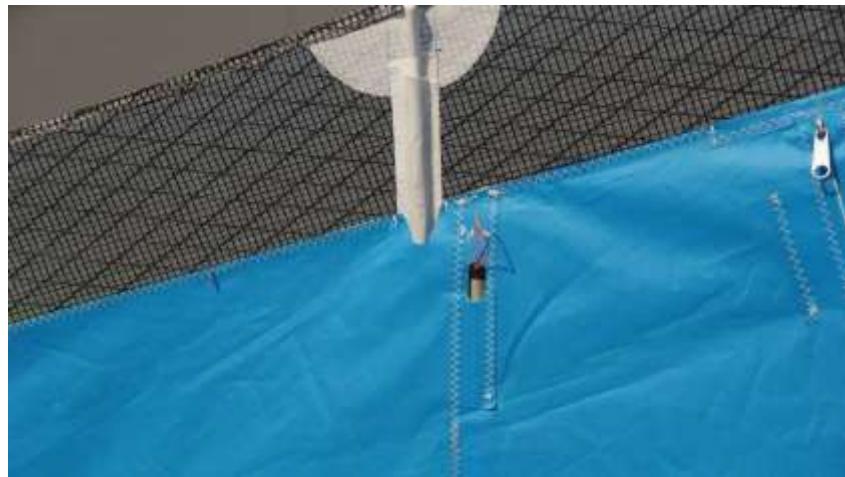
The folding mechanism of the tip battens allows their tensioning with ease. Tension the tip batten always **after** the spreader bar is tensioned. With de-tensioned mainframe [=spreader bar] the tip battens carry substantial higher loads! For tensioning unfold the short end of the batten tube in the direction of the end of the keel and insert its end plug into the web loop at the rear sail corner. Now with the **open** hand [Warning: danger of pinching] inside the double sail and the other hand at the sail corner, push the hinge of the batten past its balance point in the direction of the end of the keel.



Fit the two sail end caps [winglets] outside, exactly at the front of the sail and close the Velcro at the edge of the upper sail first and then the one at the edge of the lower sail.

Inserting lower sail battens and folding out the Swivel-tips:

Push the straight battens into their pockets in the lower sail; they are not specifically marked, but clearly of different length; the elongated holes in the lower sail mark their pockets. Insert them fully and secure them against the rear seam.



The swivel tips are now folded out and automatically secured in their rear pocket and the closure of the zipper.



Nose plate cover:

The center battens rest each on a rivet case in the upper nose plate. In the leading edge right and left in the nose plate area are two short zippers, which prevent folding of the leading edge in the cover / transport bag. Before you place the nose plate cover as the last step of the set-up, take a look through the opening of the upper sail at the nose plate area; make sure all parts are operational. Close the two zippers in the leading edge and press the Velcro strips of the cover in the proper position at the upper and lower sail on.



The glider is now flight-ready assembled.





Pre-flight check:

Make it a habit, to do a careful pre-flight check before each start. Functioning equipment and proper judgment of conditions and the weather reduce the risk in hang gliding significantly.

1. Check from the nose plate the even bend of both leading edge tubes, the symmetrical assembly of the glider and the “out” position of safety snap for the nose wires.
2. Check for easy operation of the VG pulley system and proper functioning of the VG jam cleat.
3. Base tube installed correctly and no cables kinked and tangs or eyes twisted?
4. Down tubes straight? Keel tube undamaged at control bar apex?
5. Check all lower rig cables, especially at eyes and press fittings.
6. Lift the glider at the rear end of the keel and check with tensioned VG for symmetry of the glider, the swivel tips right and left and installation of the straight battens and their secure seat in the double sail seam.
7. Tensioning line/cable ring seated correct in its seat?
8. Is the keel pocket screwed securely to the keel tube?
9. Are both pilot Hang strap and Safety strap correctly fastened and undamaged?

Periodically and after a crash inspect in addition:

- All tubes for dents and bends as described in the maintenance and repair protocol.
- Upper and lower rigging right and left and the lines and cables inside the double sail as well as the swivel tip cables.
- Batten curves according to the batten chart.

Start:

Always make a hang check before the start or always get in your harness after it is hooked to the glider and the karabiner is locked. One standard routine needs to be adopted. A hook-in check is essential immediately before any start.

The “Fizz” is neutral on the shoulders and easy to guide on launch. The integral spring system keeps the side wires tensioned, even when the VG is off; so there is no problem to set proper attitudes and balance for the start. Pilots, who like “tight” side wires for launching, can do so with ca. 3 ft pulled out on the VG. Start with a slow jog and accelerate continuously till lift-off.

Close your harness after you are a safe distance from the ground and the glider flies self-stabilizing.

Flight:

The Fizz has a variable geometry = nose angle [VG], with which the sail tension can be increased in flight. With loose VG the wing has more twist, is neutral in turns and easy to handle. For the first flight half tensioned VG is recommended to avoid over controlling. **Even with full tensioned VG can the Fizz be controlled around the vertical axle;** in this configuration the wing has little twist and its best glide ratio. The Fizz should be steered with short control impulses, especially at higher speeds under tow, e.g. winch- or UL aero-tow. Airstream separation [stall] occurs late with loose VG setting and is easily controlled; after a short dip of the wing the airstream reattaches right away. With full tensioned VG the stall is more sudden and the wing dips more pronounced. In very slow turning mode, with tensioned VG the Fizz can be made to spin, by weight transfer to the rear [“pushing out”]. **To exit a spin bring your weight forward [“pull in”] first then steer against the turn to the outside of it.** [Roll input is after pitch input] For fast altitude loss, e.g. in “cloud suck”, pull in the base tube and put your weight in one corner. In steep spirals a lot of altitude is destroyed this way. To exit such a maneuver, center your weight and level out gradually.

Landing:

Landing starts at altitude with repeated checks of the wind direction. Only after you are sure of the wind direction, should one decide on the approach and **then stick to it.**

The Fizz is easy to land; but an exact landing pattern is important. Too much altitude is hard to get rid of. Fly the final approach in a straight glide with some extra speed against the wind and let the glider lose its energy in ground effect. Change hand position when the glider flies level and **at trim speed**. **Keep your legs bent and behind you till flair time; arch your back.** Your upper body is thus closer to the down tubes and you have a longer way for the flair. The Fizz glides long in ground effect and stalls soft and easy, with 1/3 VG harder, but more definitive. The nose comes up by itself during the flair, increases angle of attack and drag, and stand up landings are already possible in a light head wind.

Towing:

The Fizz is licensed for winch- and UL- tow. Requirements for this per DHV are:

- A certified hand glider tow winch
- Tow training of the pilot
- Training of the winch operator and the UL-Pilot
- A certified tow hook up / latch system

For the UL-tow the VG should be ca. 70-100 % tensioned. Then the glider has less control bar pressure, but is still very controllable. **Give at disturbances only short, strong steering impulses with the hip [body center of gravity] and keep the tow latch in the middle of the base tube.** Weight shift into a corner and waiting for a course correction leads as a rule to PIO [pilot induced oscillations] of the glider. Do not support yourself on the base tube. Tip: Pull in on the base tube with open hands.

General information and limitations:

The Fizz is in Germany type tested by the DHV and certified as a class 3 model.

The Fizz is licensed to be flown only:

- by pilots with a correspondent license and training
- solo
- with an angle of +30deg to -30deg to the horizon
- with a roll angle up to 60deg, and
- with a top speed of max. 56 mph

The Fizz is not to be used for aerobatics. It can be motorized with different motor systems [take notice of the license].

In Germany hang gliders can only be started and landed in approved/official fields. If after a X-country flight an out landing is necessary, a timely search for a suitable landing field is advisable. If damage is caused in the landing, owner and personal liability insurance company are to be informed.

Maximum flight enjoyment through optimal trim:

The sails of modern High Performance [HP] gliders are more tensioned and therefore more sensitive to their configuration = trim. Sail fabric and sail-construction tolerances are with special measuring devices taken into account and individually corrected for. Despite these in depth measuring techniques it might be necessary after some time, to correct the basic trim.

Test the glider always in light thermal conditions, because changes in flight characteristics are easier detected in moving air. It is certainly not the case that more tension also brings about better performance. The sail tension in the direction of the wingspan can be changed with the position of the leading edge end pieces and the folding batten length. The end pieces are in standard production screwed through the middle hole to the tube end.

In case you make any changes, we recommend, marking first the old position, so that in case the change is unsuccessful, the original position can be found again.

Center of gravity:

The Fizz should fly ca. 18.5-22 mph [30-35kmh] with hands of = at trim. By repositioning the kingpost in its base [case-nut, for six point insert] the center of gravity can be adjusted. Moving forward = nose heavy = faster, to the rear = tail heavy = slower!

Straight flight:

Glider draws slightly to the right: left end piece higher, i.e. screwed through the lower hole, or/and reducing right folding batten length by ca. two revolutions.

Glider draws slightly to the left: right end piece higher, i.e. screw in lower hole, or/and batten length on left side reduced by ca. 2 revolutions.

If these changes are not sufficient, can on the better carrying side the bend of batten no. 10 at the high point be reduced by ca. 3/16 to 3/8 inch [5-10mm]; or on other side be increased.

If the leading edge end piece tension is increased on one side, then the folding batten of the same side has to be lengthened by ca. 5/32 inch [4mm]. The folding batten has a threaded adjustment at the front, turning the nut changes the length of the batten. Check the curve of the battens from time to time.

Call us, if flight characteristics and performance of your glider do not meet your expectations and you are not totally enthusiastic about your wing. We love to advise you in finding the optimal adjustment / trim for your weight.

Warnings:

Open zippers and / or no nose cone result in a dangerous flying tendency with negative bar pressures, especially in fast flight. In this case fly rather slow to the closest landing area!

Raindrops on the leading edge disturb the airflow! In this case fly faster, to blow them partially off, do not fly tight turns and anticipate an early and sudden stall at the landing. Tip: Apply a dishwashing soap to the leading edge before the start. This prevents for a time the forming of droplets and assures normal flight characteristics even in rain!

Glider breakdown:

The breakdown of the glider is done in reverse order of the assembly, with attention to the following details:

Remove the nose cone and open both zippers at the leading edge, before you place the glider down on the nose. Open the zippers of the four swivel tips and swing the swivel tips outward.

Loosen the underside of the sail end caps [winglets] first with a finger, before removing the caps sideways from the Velcro on the upper sail edge.

Pull the lower battens and detension the folding battens. Set the glider on the end of the keel and detach the spreader bar safety cable and the triangle of the nose wires. This triangle can be hooked into the snap hook of the spreader bar safety cable, so it is close at hand at the next assembly.

Pull the upper battens 10 – 1 right and left out of the sail and fold the wing in increments together. Roll up each side of the sail and secure each side, separately at the middle swivel tip with a flour yellow Velcro tie. The red tie is longer and is placed in front of the control frame apex. Each rolled up sail end is put together with the folded swivel tip in the long cover bag.

Close the ties loosely to avoid permanent folds. Pull the cover bag over the standing glider and close it's zipper from the front up to the control frame apex. Now turn the glider over, lay it on it's back and remove the speed bar. Put the protective pouch, sown to the cover bag, over both down tube ends.

Lay the batten bag and the sail end caps in the rear of the cover bag. Close the zipper all the way.

Maintenance and Repair protocol:

For car transport a special support system or a ladder are advantageous. Do not roll the sail to tight at the Mylar insert. The Velcro ties should also not be too tight, to avoid folds in the leading edge. A wet glider needs to be **spread out for drying** after transport, to prevent mildew spots in the sail. Undo the Velcro ties for this! **Carefully inspect** the glider after a crash!

In the lower sail at the keel and the swivel tips are zippers, which facilitate a thorough inspection. After a hard crash the disassembly ob the tubes is recommended. In an overload situation a tube is first permanently bent and then breaks subsequently. Therefore bent tubes where already overstressed and need to be promptly replaced, because the metal structure is damaged. Call us, if in doubt. Because of repeated set up and break down most cables are subject to added (ab-) use, especially in the area of the press fittings and eyes; **Check this area regularly!**

From time to time the sail battens need to be checked for correct form according to the batten plan. The length of the leading edge tube end piece is for each glider individually adjusted. **If such a part is replaced, the original length must be ordered or adjusted to.**

Damaged down tubes can be removed by pushing in the snap safety at the top and unscrewing the M5 Allen bolt at the bottom. All bolt connections without nylon locknuts are to be secured with Loctite 243. Instructions are on the Loctite container.

Inspections:

After 60 month the Fizz needs to be inspected by the manufacturer or self inspected according to the attached inspection protocol. This inspection is to be repeated and documented every 24 month thereafter.

Storage, maintenance and disposal:

Spray all zippers from time to time with Cockpit spray [silicon spray]. Standard gentle washing soaps will clean the sail. Rinse with clear water. Spots on the Mylar leading edge, e.g. adhesives from markings can be removed with acetone. **For maintenance of the Mylar upper sail and the leading edge a plastic deep care solution [automotive shop] can be used. This keeps the Mylar flexible and protects it better from sunlight [UV-radiation]. Store the glider in a dry room on wall brackets.**

For transport on the car roof support a PVC cover bag over the light standard bag is recommended. This will protect the sail from rain and flapping.

For final disposal of the glider cut up the sail with a new box knife and bundle it. The sail fabric is polyester and goes to a waste disposal site. The aluminum tubes get disassembled and go with the SS cables and bolts to the metal recycler.

Technical specifications:

• Bautek model: [type tested DHV 01-0462-12]	Fizz
• HG class: 3, solo	DHV
• Sail area: sft [14.1 qm]	152
• Span: [10.41 m]	34 ft
• Nose angle: degr.	130
• Aspect ratio:	7.7
• Double surface:	90 %
• Length packed-: 18.7 ft; short 13.5 ft [5.7m, 4.1m]	long
• Battens: top; 6 bottom	24
• Stall speed: mph [25 km/h]	ca. 16

• V ne (never to exceed):	56
mph [90 km/h]	
• V min sink:	ca. 19
mph [31 km/h]	
• V best glide:	ca. 28
mph [45 km/h]	
• Take-off weight:	min
198 Lbs; max 320 Lbs [90 kg; 145 kg]	
• Hook-in weight:	min
132 Lbs; max 251 Lbs [60 kg; 114 kg]	
• Glider weight:	69
Lbs, without cover [31.5 kg]	

Inspection protocol for Bautek Hang gliders

(for solo and tandem gliders as of Jan. 2011)

Legal regulations for the inspection

All hang-glider are individually inspected when new and are delivered in air-worthy condition. The air-worthiness of a hang-glider can in everyday use deteriorate, due to sail shrinkage, wear and tear, UV exposure, crash etc., to a state of non-air-worthiness.

Because of this the law makes the regular inspection for air-worthiness mandatory under the owners responsibility [LuftGerPV #14 Inspection].

If and when this inspection has to be carried out, at the manufacturer, by the pilot himself or on his order, determines the manufacturer / holder of the design certification/license in an inspection instruction, which is included with the operation manual.

The owner/pilot himself is responsible for the safety and air-worthiness of his aircraft!

Inspection intervals

New Bautek hang-gliders have to be inspected after 60 months [5 years] and thereafter every 24 month [2 years].

DHV-Model-Inspection Instruction

The DHV [Deutscher Hang-glider Verband] did, many years ago, based on years of experience and consultation with manufacturers, come up with a so-called "DHV-Model-Inspection-Instruction". This instruction is the base of the following "Bautek inspection instruction" and assures the best possible inspection quality.

Two-seater hang-gliders should be inspected only at the manufacturer's factory, because of liability concerns. Solo Bautek hang-gliders can be inspected by the owner himself, if he is previously made familiar with the examination/inspection work at the factory. An inspection report is to be made; the owner examiner sends a copy to Bautek.

The following documents, tools and equipment are needed for the inspection:

- Inspection protocol
- DHV-Type-Specification page for the model to be inspected
- Survey-equipment
- Special tools for type and model
- Sewing machine, maybe

How is the inspection carried out?

1. Preparation

The hang-glider is unpacked and visually examined. The type, model and test label are checked for correctness, completeness and readability. The information for model, type, year built etc. are entered in the inspection-protocol.

2. Sail removal

The control frame and cables are unbolted, the nose-batten is pulled out of the sail and the attachment of the sail at the front of the leading edge tube is removed. Now the complete sail can carefully be pulled off.

3. Sail inspection

The sail is spread out and upper- and lower sail are visually checked for tears and damage. Attention is paid to signs of wear at seams, sail-attachment bands, batten-pockets, grommets, zippers, securing rubbers, profile-ribs and Mylar inserts. The yarn should still have a minimal tensile strength of 2 kg [4.4 lbs].

The leading edge is also closely examined.

The nose-plate cover is checked for wear at seams, the Velcro closures for wear and strength of adhesion and are reinstalled.

4. Alum-tube frame

Connective bolts are loosened and tubes removed. The following items are inspected for damage [bending, compression, dents, cracks, wear-points, corrosion, diameter, length] and when necessary replaced with original parts:

- Alum-tubes [wing-, keel-, spreader-, kingpost-, down- tubes, speed-bar and swivel-tip tubes]
- Control frame corners
- Nose-plates
- Connection parts
- Central joint
- Other accessory parts
- Swivel-tips

5. Screws and bolts / quick-pins

All screws, bolts and quick-pins are checked for bends, wear, corrosion and thread damage and if needed replaced with original parts.

6. Rigging [stays/guys]

Now the side-, front- and rear- lower- and upper-rigs are examined for damage of strands, cover, kinks; eyes, thimbles and press-fittings are checked for defects. Then the cable lengths are measured on a measuring bench and compared to the given length on the type-specification page and if necessary replaced.

Damaged steel cables are to be replaced with original parts.

7. Sail-battens

All sail-battens are checked for their exact profile on the batten-plan and, if needed, corrected. Also end-pieces and springs are checked for functionality.

8. Crossbeam tensioning- and safety-line/cable

The crossbeam tensioning line is checked for damage and measured for length. The thimbles, eyes and Nico-press fittings, the VG- line and VG-pulleys/bushing are to be free of damage. Defective parts are to be replaced.

9. Pilot hook-in assembly

The pilot hook-in assembly is examined for wear; the stitching is inspected and correct mounting assured. The safety loop should not impede the free movement of the assembly.

10. Sail installation

After repairs on sail and frame the sail is reinstalled. During this operation attention is to be paid, that the wing tubes are placed between leading edge and profile ribs and the keel in the provided keel pockets. The king post is mounted on the keel-tube.

The sail attachment bands [webbing loops] are inserted in the plastic end caps at the outside wing tube and secured with Velcro strips. The lower side wires are threaded through the provided openings in the sail and possibly together with the upper side wires bolted to the wing- or cross-tube.

Control frame and speed-bar are with the connecting parts bolted to the main frame, lower rear cables to the keel, as well as all remaining lower rigging to the right and left, respectively, to shackles and corner brackets of the control frame.

Except for lock nuts, all nuts are to be secured with Loctite or similar.

11. Set-up

Now the glider is placed on the control frame and the wings are spread. The nose batten is inserted and the keel-pocket with attachment band screwed to the marked hole in the keel. The sail is fastened right and left beside the nose-plate to the wing-tube. After these steps the glider set-up is completed according to the instructions in the owner's manual to the flight ready state.

12. Survey

The glider is placed on the control bar and the end of the keel on a ladder. The VG is tensioned, because guyed heights are only checked in VG-on position. **All with pitch-lines elevated sail-batten ends** are step-by-step connected with a [fishing] line left to right [e.g. batten #5 left with batten #5 right etc.]. Then the distance between the line and the top of the keel tube is measured and recorded. After this the outside

battens, which are elevated by swivel-tips, are likewise surveyed. The individual measurements are recorded in the inspection protocol and compared to the type specification page and if necessary corrected [Tolerance +/- 1cm = 5/8 inch.]

On swivel-tip supported sail-battens [topless or high-performance] the respective swivel-tips are checked with a digital level or the supported battens are measured with the line method as described above. The length of the swivel-tips can be changed by screw action and allows adjustment to the required heights [longer=higher].

All repairs and corrective work need to be recorded in a protocol. One copy of the inspection protocol is send to the manufacturer Bautek. The owner is obligated to report exceptional defects to the manufacturer.

The inspection is with a sticker on the glider, with date and signature of the authorized inspector, documented. The date of the next required inspection is also given. The copy of the inspection protocol is put into the factory logbook.

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