
It is recommended that you regularly check your wing, especially after a heavy period of use, after an incident/accident or long period of storage. Through use, paraglider lines shrink or stretch. Generally, A- and B-lines stretch, whereas C-lines shrink. As a result, the paraglider flies slower and the handling is less agile. All lines are affected in this way to a greater or lesser degree – regardless of material or manufacturer.

After a year or 15 to 20 flying hours (whichever comes first), this stretching or shrinking has settled. We recommend that you then send the paraglider to Wallend-Air. We have developed our service centre protocol to ensure that we can give you the best possible services and repairs for your complete safety and flying fun.

When it comes to checks we are very particular. We check all the details of the paraglider: porosity, line lengths, correct trimming, etc. With our specifically developed analysis software, the service inspector can view previous checks. The technician will measure all the lines and our software program automatically feeds the data into the diagnostic software. Using the measurements, the software program calculates the paraglider trim and suggests possible trim corrections. These are evaluated by the service inspector and then implemented.

Using this data we can analyse and improve our know-how on lines for future paragliders.

From time to time it will be necessary to patch holes, repair or replace panels, ribs or even the whole leading edge of your glider and we've got an excellent team of seamstresses to do this for you, under our guidance. We also repair harnesses and associated paragliding equipment. We take pride in the quality of our repairs with a quick turnaround time.

As an innovative company involved with the unique technicalities of paragliding, we implement our 20 years of experience to further the development of our checks and systems.

"The regular service of your paraglider is vital for safety and best performance."

## Contact Wallend-Air to book a service

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www.wallendair.com

Wallend-Air follows paraglider manufacturers' inspection recommendations wallendair.com











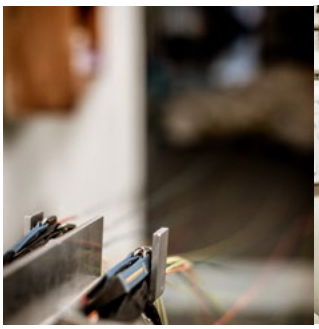


# Paraglider service and repairs

## Lines

Most lines for paragliders today are manufactured by three different factories and supplied to the paraglider manufacturers worldwide. Each line manufacturer has different manufacturing techniques, using different materials, therefore the lines all behave differently.

All lines change when:

- The paraglider is flown.
- The lines are exposed to UV, dust & dampness.
- The lines are bent and/or overheated.

Your paraglider's performance ultimately depends on your lines being in perfect trim. Should lines be out of trim, the recovery from a collapse or paraglider pitching & rolling due to turbulence will not have the same recovery originally analysed during certification testing.

## Line repairs

Line repairs or line replacement for lines should be:

- The same line type and the same manufacturer.
- If not from the same manufacturer they should be the same line type.
- After one year or initial 15 – 20 hours of flights all the paragliders' line lengths may have changed by some percentage and therefore may no longer be "as in trim" as they were when the paraglider left the factory.
- Providing a replacement line to a client may not match the original line when it is cut to the length of the line plan because of these probable changes mentioned above.
- A new replacement line will also behave differently to the used line that it has replaced.
- When checking the trim of the paraglider for airworthiness stretching lines does not work. Any line that is stretched will return to its previous length within 5-10 min.
- All lines need to be adjusted when out of specification and specifically any replacement lines taking the existing complete line trim into consideration on the paraglider.

## Fabric

The thinner and lighter the fabric is, the shorter the lifespan, and the faster the wing will lose performance.

Fabric lifespan is affected by:

- If a paraglider is stored when damp.
- Abrasion caused by the paraglider being dragged on the ground.
- UV exposure and heat, especially being stored in a car's boot. (It can get very hot in this confined space.)
- Being packed, unpacked or stuffed into a bag.
- Using your paraglider for pull up training decreases the lifespan by double or more.
- Any careless use of the paraglider will affect its safety, lifespan and performance.

# Wallend-Air service and inspection protocol

The following factors affect the airworthiness of your paraglider and will be checked:

## 1a. Line dimensions

Line lengths are critical as they control the shape and angle of attack of the paraglider and thus the performance.

The "check length" of the lines is defined as the distance from the lower surface of the canopy to the inside edge of the maillons connecting the lines to the risers.

All lines must be measured under a 5kg tension (load).

The measured lengths of individual lines should match those in the line lengths table within a +/-10mm tolerance. This tolerance also applies to symmetry. The line tables are specified by each manufacturer.

An offset of up to +/-50mm of the line-lengths table is acceptable. This means the entire line set can be longer or shorter up to a maximum value of 50mm.

The risers should be measured as part of the overall line length. The measurements of each riser's branch under 5kg tension load should match the lengths specified in the manual with a tolerance of +/-5mm.

## 1b. Line strength

The line breaking strength is measured by slowly increasing the tension of a single dismounted line until it breaks. This destructive test is the preferred method and feeds accurate data into the specifically developed analysis software.

The minimum acceptable value is defined as follows:

*For the lower A and B lines of the first and second ranges/cascades:*

$$\frac{\text{[max flight load] x 8}}{\text{number of all lower A and B lines excluding the stabiliser}}$$

*For the lower C, D and E lines (if any) of the first and second ranges/cascades:*

$$\frac{\text{[max flight load] x 6}}{\text{number of all lower C, D and E lines excluding the stabiliser}}$$

The same calculation applies for mid and upper levels. The minimum value for upper/top lines is 30kg.

## 2a. Fabric tear strength

Tear strength is measured with a calibrated Bettsometer. The measurement is made in the middle of a panel near the centre of the upper surface. At 600g load, the tear should not exceed 5mm, nor break a ripstop thread.

## 2b. Porosity

Porosity is measured with a calibrated Porosity meter. It is measured in at least 3 different places on the upper surface, at 20-30cm from the leading edge in the centre of a panel. The minimum acceptable value is 20 seconds. Anything below this value must be approved by the manufacturer.

## 3. Visual check for integrity of parts and connectors

The different components of the wing are visually checked: panels, ribs, structural diagonals and straps, plastic rod sleeves, tabs, lines, splices, risers and seams. Any damaged part is be repaired or replaced according to the manufacturer's specifications and detailed in the service report.

# General paraglider care

Follow these simple rules to prolong the life of your glider:

- Keep a logbook of flights and airtime on your paraglider.
- Regular ground handling may damage your paraglider to the equivalent of double the amount of airtime or more, therefore, take care or use a ground handling/pull-up wing/paraglider.
- When ground handling, take care to not saw the brake lines against the risers or main lines. The abrasion caused by a sawing motion can damage the main lines and the risers. If you notice any signs of abrasion, especially to the lines, make sure to replace them. It is important to adjust your ground handling technique to reduce or alleviate any future damage.
- DO NOT drag your wing along the ground or any hard surface as this will cause damage to the fabric. Lift it high enough to clear the ground when carrying it.
- DO NOT open your wing in strong winds before untangling the lines as this puts unnecessary strain on the lines.
- DO NOT walk on the lines or wing.
- DO NOT repeatedly inflate the paraglider and then allow it to crash back down. Keep this pull-up movement as smooth as possible by stepping towards the paraglider as it comes down.
- DO NOT allow your paraglider to slam down on the ground with the leading edge first. This impact puts a massive strain on the paraglider and stitching and can even burst cells.
- FLYING in salty air and areas with abrasive surfaces (sand, rocks etc.) and ground handling in strong winds will speed up the ageing process.
- DO NOT expose the paraglider to moisture by flying in the rain.
- DO NOT expose the paraglider to high levels of heat or unnecessary UV by leaving the paraglider sitting in the sun or allowing it to get hot (i.e. in the back of a car or boot). This will significantly increase the chances of premature ageing.
- If you fly with a wrap, you should regularly undo the twisting that appears on the main brake lines. By twisting the line it may become shorter and can end up with constant tension on the trailing edge.
- Change your main brake lines if they are damaged.
- Most wings have an opening on the wingtips called the 'Butt hole'. We kid you not. The Butt hole makes it easy to empty any sand, leaves, rocks, mobile phones etc. that may have accumulated in the wing which should be cleaned out regularly.