



Version: 2.0
Date: 15.01.2021

**Paraglider and paramotor
glider inspection**

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I General information on inspections

The legal provisions referred to in these instructions are those applying in the Federal Republic of Germany at the time the glider received type-test certification. They are not set out in detail. Please check whether there have been any amendments in the meantime and whether there are any regional and national guidelines, regulations and laws (in your own country). It is the owner's responsibility to observe and comply with these.

1. Subject matter of the inspection

This is an inspection in accordance with the LuftGerPV – German Ordinance on Testing Aviation Equipment. Air-worthiness of the equipment under Section 10a must be tested by or on behalf of the owner in accordance with the instructions provided by the manufacturer. The owner is responsible for ensuring that inspections are carried out in full and at the intervals required. The owner must immediately notify the manufacturer if there are any defects in the equipment or shortcomings in the test instructions. Sections 15 and 18 - 20 do not apply. (Section 14(5) of the LuftGerPV)

Note: special requirements apply to wing units (paragiders) for equipment subject to approval under Section 1 of the LuftVZO – German Ordinance on Air Traffic Licensing, referred to as "heavy trikes" (unladen mass > 120 kg).

Inspections must be logged and recorded on the equipment.

Please read these instructions carefully before inspecting the paraglider or making any repairs to it yourself. They contain information on the requirements, conditions and procedure for an inspection.

SWING's general recommendation is that inspections and any repairs be carried out by Swing or by a Swing-approved workshop. This is a prerequisite for any warranty claims.

Find out from SWING prior to inspection whether there have been any changes to glider-specific inspection instructions.

The glider should be sent to the manufacturer if the owner cannot afford the costs involved in inspection (refer to the section “Documents and equipment required”).

SWING Flugsportgeräte GmbH takes no responsibility for inspections it has not carried out itself and does not provide any warranty for such inspections.

Contact your insurance company in good time for information on the implications under insurance law of carrying out inspections yourself.

2. Inspection intervals

The table below gives a general overview of inspection intervals. The intervals given in the Instruction Manual and on the equipment itself take precedence, and may differ from this table.

Ground handling time must be doubled when calculating total hours of use.

The manufacturer must be notified immediately if there is any abnormal flight behaviour and the glider must be returned for inspection if necessary.

paraglider type	Inspection intervals	
	every year or every 100 flight hours*	every 2 years or every 150 / 100 flight hours*
light weight glider / Mini-Wings	-	x
acro glider / Speedrider	x	-
solo glider	-	x
paramotor wing (unladen mass UL [microlight] < 120 kg)	-	x
wing unit for heavy trike (unladen mass UL > 120 kg) – private use	-	x
wing unit for heavy trike (unladen mass UL > 120 kg) – commercial use	x	-
tandem glider for private use	-	x
tandem glider for commercial use	-	x
school glider (used for instruction)	-	x
competition glider	x	-

* whichever applies first

3. Who can carry out the inspection?

The requirements for carrying out inspections depend on whether the glider being inspected is one's own or belongs to a third party. These are the manufacturer's minimum requirements. Verify prior to inspection whether there are further legal requirements, in particular regarding inspection of paragliders belonging to third parties and inspection of heavy trikes.

Requirements for carrying out a personal inspection of a solo glider:

- A current unrestricted licence for paragliders/hang-glidern or other equivalent licence.
- Maintenance work that goes beyond the replacement or correction of individual lines or minor repairs must be handed over to a SWING workshop.

Requirements for carrying out inspections on behalf of third parties and for tandem gliders:

- Appropriate training to carry out an inspection.
- Two years' professional experience in the manufacture or maintenance of paragliders and hang-gliders or a technically similar activity. Of that time, 6 months within the last 2 years must have been with a manufacturer of aviation equipment, or by confirmation from the manufacturer.
- Adequate relevant instruction by the manufacturer or importer.
- Relevant introduction to each type of equipment – this must be renewed every year.

Requirements for carrying out inspections of wing units for heavy trikes:

Wings units (paragliders) for equipment subject to approval under section 1 of the LuftVZO, referred to as "heavy trikes" (unladen mass > 120 kg), must be inspected by the manufacturer or by an importer with authorisation from Swing.

4. Documents and equipment required:

- gauge, preferably JDC or Kretschmer, and operating instructions,
- Bettsometer (tear resistance tester) and operating instructions,
- the manufacturer's maintenance instructions,
- airworthiness instructions for the particular piece of equipment,
- aviation equipment reference sheet / EBL (see service book),
- line length table (see service book)
- previous inspection reports (if available),
- inspection report (copy) for the records.

Note: Review all documents prior to inspection to determine if they are up-to-date, and update to the latest version if necessary.

II Procedure:**The following procedure should be followed for the inspection:**

- Identify the equipment:
- **Canopy:** inspect the top surface, bottom surface and seams for holes, tears, worn areas, any stretches and porosity. Inspect the ribs
- **Connections:** inspect the risers and quick links
- **Lines:** check the line breaking strength, line lengths and line fastenings
- Visual inspection of trim and adjustment: check the brake lines
- Description of material and technical information
- Other
- **Inspections carried out:** record results in the inspection report (see attachment) and sign the paraglider

1. Identification of equipment:

Identify the equipment from the DHV certification label and the labelling on the paraglider and using the manufacturer's documentation.

Is there a glider information and certification sticker, and is it legible and accurate?

If not, contact the manufacturer or dealer.

2. Canopy:

Inspect the top surface, bottom surface and seams for:

1. Porosity
2. Tear resistance
3. Holes / tears
4. Worn areas and any stretches
5. Inspect the ribs

Measuring the canopy's porosity

The porosity of the following parts of the canopy must be read and the results recorded in the inspection report. Note which measuring instrument is used (and follow the instructions). The measuring instruments must be re-calibrated annually by the manufacturer.

The air permeability should be higher than the readings in the chart, at each of the areas where measurements are taken (see below). The paraglider must be returned to the manufacturer if the readings are poor (e.g. less than 5 on the JDC).

Areas where measurements should be taken

Carry out the inspections on both the **top surface and bottom surface** of the glider:

Middle cell, approx. 20 - 30 cm from the leading edge

Fifth cell to the left/right, approx. 20 - 30 cm from the leading edge

Tenth cell to the left/right, approx. 20 - 30 cm from the leading edge.

Record the readings in the inspection report.

The following readings apply to Swing gliders:

porosity table				
instrument test result				condition
Kretschmer		JDC		
LD 100 [1s]	LD 100 [1/10s]	LD 150 [1/10s]	[s]	
> 600	> 6000	> 25000	> 250	like new
250 - 600	2500 - 6000	10000 - 25000	100 - 250	used - in very good condition
150 - 250	1500 - 2500	4000 - 10000	40 - 100	used - in good condition
50 - 150	500 - 1500	1500 - 4000	15 - 40	hard used - in good condition
30 - 50	200 - 500	500 - 1500	5 - 15	hard used - material check in short intervals necessary
< 30	< 200	< 500	0 - 5	worn out NOT airworthy anymore

Caution: Gliders with less than 15 secs. on the JDC porosimeter should be inspected after use. If the reading is less than 5 secs., the glider should be declared no longer airworthy.

Check tear resistance

The Bettsometer (B.M.A.A. approved Patent Nr. GB 2270768 Clive Betts Sales) is used for this. See the instructions for how to carry out the inspection:

Make a needle hole on the top surface and the bottom surface, where the A-line attachment points are, and test the tear resistance. The limit for the measurement is 500g and a tear of < 5 mm in length.

The reading given is recorded in the inspection report.

Holes / tears

A thorough visual check of the top surface and the bottom surface, panel by panel, from the leading edge to the trailing edge must be carried out, checking the following points:

Are there any holes, small holes or larger tears, worn areas or stretches?

Can you see any defects in the coating?

Can you see anything else conspicuous e.g. areas which have already been repaired?

If the answer to 1) or 2) is 'yes', then the glider must be returned to the manufacturer.

Worn areas and stretches

Visual inspection:

If there are any large or major areas of wear or any stretches, then the panel must be replaced by the manufacturer.

Checking ribs

Working from one side of the glider to the other, from the leading edge to the trailing edge, check whether the inside seams, cell walls and reinforcement are in good condition i.e. free from tears, stretches, worn areas, damage to the coating.

The glider must be returned to the manufacturer or authorised inspector if any ribs are torn or if any inside stitching is weak, loose or missing. Record the result in the inspection report.

3. Connections:

Inspect the risers and quick links

- Are there any worn areas, kinks, tears, signs of heavy wear and tear?
- Is all the stitching firm?
- Can the speed bar move and is it intact?
- Are the brake handles still sewed on firmly?
- Are the quick links free from rust and can the threads be loosened and tightened?
- Do the A, B, C, and D riser lengths and the acceleration distance correspond?

Take the measurements using a weight of 5 daN. The values given should be compared with the specifications and recorded in the inspection report. Permissible variations (tolerance) can be found in the manufacturer's instructions (service book).

If the riser or any part of it is defective, order an original part from the manufacturer and replace it.

4. Lines:

Checking line strength

Select the line:

Select a centre A, B, C and D main line and check breaking strength using a tensile strength testing device. To check line breaking strength further, in addition an A, B and C line from the middle and upper cascade must be tested.

It is not necessary to inspect tear strength of sheathed Dyneema lines for gliders less than 3 years old and with less than 150 h if the general condition of the glider is "good, normal signs of use" or better.

Pull speed of pull cylinder: $v = 30 \text{ cm/min}$.

Breaking strength values:

These values vary according to the model and size of paraglider.

The relevant values are given in the glider's Maintenance and Service book.

Lines are acceptable if the values are above the upper limit.

The glider should be inspected soon if the values fall between the upper and lower limits.

If the values are below the lower limits, the relevant cascade must be replaced.

All lines must hold at least 25kg, irrespective of the "g" load.

If the lines tested do not pass these tests, they must be replaced with new original lines. All lines replaced are marked with a black pen near the attachment (seam) and recorded in the test log with the date they were replaced and the glider's flight hours. At the next inspection, an original neighbouring line is used to test the line strength.

The values given are recorded in the inspection report.

Inspect the line lengths and line attachments

Starting at the middle and working towards the outside, visually inspect the main lines, cascade lines and brake lines for damage to the sheath, kinks and worn areas. Start with the A-lines, then the B-lines etc.

Are all the lines adequately sewn into the line attachments and suitable for use?

Are the line sheaths in good condition?

Are all loops, knots and stitching in good condition?

Are the quick links done up tightly?

Are there any worn areas?

If a line is defective, it must be replaced immediately. Please take the name of the line from the line plan, order it from the manufacturer and then install it or have it installed accordingly.

Record the results in the inspection report.

Measuring line length and checking trim

Measuring line lengths is part of the regular check.

The lines must be measured with a 5daN load to obtain comparable results. The correct line lengths are given in your paraglider's Maintenance and Service book. The measurement is taken from the line-shackle to the canopy. Numbering is done from the centre to the wing-tip. A symmetrical comparison can also be carried out to measure the opposite side of the wing, using the same procedure.

The result is recorded in the inspection report and compared to the target line lengths. The permissible tolerance for the line lengths differs according to the line cascade and is given in the Maintenance and Service book. The tolerances given should ensure in particular correct trim of the glider. It is therefore permissible to shift the zero point when measuring by up to 0.5% of the total line length of the innermost B line. This must be applied equally to all suspension lines and control lines.

Trim and control line lengths must also be corrected.

If a line is faulty, it must be replaced immediately. Find the description of the line on the line plan, order it from the manufacturer and then replace it/have it replaced.

Any adjustments and line replacements must be recorded in the inspection report. The inspection report must show the line lengths after any changes.

5. Visual inspection of trim and adjustment:

Lay out and inflate the glider. Carry out a visual inspection of the canopy and lines before the test flight. In particular, check the length of the brake lines on an inflated glider. A test flight should not be carried out until there are no concerns about whether the brake lines have been correctly set up.

6. Description of material and technical information:

See Maintenance and Service book.

It can also be downloaded in pdf form from the relevant product information at www.swing.de or www.powerplay-gliders.de.

7. Other

Full details of all measurements taken and any repairs to the paraglider must be recorded in the inspection report. The inspection report and/or record of measurements must be signed and dated (and the location given). They must be kept for 4 years.

8. Inspections carried out:

Paraglider model Size Serial number

Date	Inspector	Signature



SWING Flugsportgeräte GmbH

An der Leiten 4
82290 Landsberied
Germany
www.swing.de