BREEZE

Operator's Manual
1997

SOLAR WINGS

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2.0 GENERAL INFORMATION:

Wing Span:	9.2m
Sail Area:	$15m^2$
Aspect Ratio:	5.7
Weight(unpacked):	27kg
Length (packed):	5.4m
Length(breakdown):	3.4m

Reflex Retention Line Lengths

Inner	1679mm
Middle	2234mm
Outer	2905mm

3.0 OPERATING LIMITATIONS

3.1 PILOT RATING

The ***minimum*** pilot rating for flying the **Breeze** is P1/CPC.

3.2 MANOEUVRES

- All aerobatic manoeuvres including whipstalls, spins and negative g's are prohibited.
- Do not pitch nose up or nose down more than 30 degrees from the horizontal.
- Do not exceed more than 60 degrees of bank.

3.3 HANG POINT LOADS

Pilot Clip-in Weight Range:	Min	Max	
	136	**198**	**(lbs)**
	62	**90**	**(kgs)**

3.4 HANG POINT RANGE (Distance measured from nose end of keel tube).

Max Forward Position:	**1580mm**
Max Rearward Position:	**1680mm**

3.5 CROSS SPAR PIVOT RANGE (Distance measured from nose end of keel).

Max Forward Position:	**1180.0mm**
Max Rearward Position:	**1180.0mm**

3.6 AIRSPEED

VNE:	**50mph / 80kph**
Stall (MAUW):	**16mph / 26kph**

3.7 REFLEX CONTROL LINE SETTINGS

Inner:	**±6mm**
Middle:	**±6mm**
Outer:	**±6mm**

3.7.1 CHECKING REFLEX CONTROL LINE SETTINGS

The reflex control line settings and tolerances are given as the heights of the reflex line ends perpendicular to the keel tube (from the top surface of the keel tube). These measurements can be taken by running light weight lines between the reflex line ends and recording their heights above the top surface of the keel tube. Refer to **Fig.1**.

4.0 RIGGING THE AIRCRAFT

4.1 GENERAL

Depending on the prevailing conditions, there are two methods of rigging commonly used. They are:

1. ***Rigging flat on the ground.*** This method is used if there is any wind present, and on clean and unobstructed sites.
2. ***Rigging on the control frame.*** This method is used in nil wind conditions, and where the terrain is likely to cause excessive soiling or damage to the wing.

4.2 INSPECTION WHILST RIGGING

Whichever of the two methods you choose to use when rigging your aircraft, you should always be meticulous in your inspection of each component. This is the best time to see potential faults which may be missed when the aircraft is fully rigged. Never allow yourself to be distracted during assembly of your aircraft and always rig to a repeatable sequence. Do not rely on the pre-flight check to find faults, but look carefully at all aspects of your aircraft as you put it together.

NOTE!
Special attention should be paid to the following:

The symmetry of the wing and the angle of the kingpost.

- All tubes straight, undented and without cracks.
- All cables unkinked, unfrayed and with undamaged sleeves.
- All nuts and bolts secure and locked appropriately.
- All quick release fittings secure.
- Hang-point and heart-bolt undamaged and secure.
- All sail seams intact with no frayed stitching.
- No tears in the sail.

NOTE!
Double check in sail areas of high stress. Particular areas of high stress are:-

- Tip fabric areas including tip fastening.
- Leading edge upper surfaces.
- At the nose of the wing, check that the securing screws and eyelets have not become detached from the sail.
- The trailing edge stitching, eyelets and shock cords.
- Keel pocket, particularly at the point of attachment to the upper surface.
- The point of attachment in the root area of the undersurface to the upper surface.
- All cable entry and exit points.
- The area above the cross spar centre pivot.
- Battens undistorted, undented and in good condition.

4.3 FLAT ON THE GROUND RIGGING METHOD

1. Lay the wing in its bag on clean ground and nose into wind. Unzip, but do not remove, the bag. Locate and remove the batten bag and lay it to one side. Assemble the control frame and secure with the pip pins which are attached to the lower rigging, ensuring that the three sets of rigging wires (fore, aft and side) are not tangled and are routed cleanly to their wing attachment points. Lay the control frame back down on the glider.

2. Lift the glider nose from the bag and roll it through 180 degrees so that the control frame is underneath the glider. Release the remaining sail ties and unfasten the snap hook from the rear of the king post sail aperture where it is stowed to avoid tangles in the luff lines during de-rigging and transport. Raise the king post and fasten the snap hook onto the thimble at the top of the king post, ensuring that the luff lines wires are not twisted.

3. Spread the wings out holding the leading edge about half way along and never more than knee high.

4. Remove the battens from their bag, and check them against the profile guide. If the battens do not conform to the profile guide they may be reformed. Sliding a batten across the knee whilst gently applying pressure allows for a smooth curve to be produced. Do not reform battens by bending in one place. Lay each batten on the ground behind its correct batten pocket. **Green** indicates a **starboard** (RIGHT) batten, **red** a **port** (LEFT) batten. The four longest straight battens are for the undersurface, and for the moment should be laid to one side. Carefully insert the cambered upper surface battens, in a sequence moving inwards from the wingtips lifting the trailing edge to locate the batten pocket.

NOTE!

Take care that the point of the batten does not run along the edge of the stitching as it is inserted, and that it locates over the front of the leading edge tube without the use of excessive force.

To avoid the inside of the glider bag getting soiled, zip up the glider bag complete with your ties, pads and batten bag.

5. Walk out each leading edge fully. The wing can now be tensioned. The cross spar restraint stud is located horizontally through the keel tube, just aft of the rear of the keel pocket. Remove the safety ring from the stud and using the attached nylon cord, pull back the cross spar restraint webbing. Make sure that the webbing is not twisted. Position the restraint tang on the stud and replace the safety ring immediately. ***DO NOT LEAVE THIS OPERATION UNTIL LATER.*** To complete the wing tensioning, allow the excess nylon pull cord to recoil inside the keel pocket.

NOTE!

It will make the operation of pulling back and attaching the restraint webbing easier, if the rear of the keel tube is raised one or two feet off the ground during tensioning.

6. The undersurface battens may now be inserted, ensuring that the cranked ends are pointing to the rear and downwards. This operation may be left, if wind strength permits, until the wing is standing on its control frame.

7. Fit the nose batten last of all. This is inserted from the front and, in its correct position it will have its front end located on the spigot provided at the topside front of the keel tube.

8. The wing may now be erected fully by raising it and rotating the control frame forwards. Do not lift the nose high while doing this, in case the tip battens sustain damage from contact with the ground. Hook the S-catch onto the rear pin of the nose channel and then, to tension the lower rigging, lever the S-catch forwards, locking it by passing the pip-pin through the S- catch and the S-catch channel.

9. The wing is now fully rigged and if the wind is light the wing can be parked tail down into wind or cross wind. If the wind exceeds 10 mph then the wing should be laid flat; if the wing is laid flat in winds above 16 mph the nose should be tethered.

NOTE (1)

With the wing tensioned and laying flat it is possible for the airflow over it to make it lift, therefore some form of picketing device should be used. If the glider does ground loop it is likely to be damaged. If a picketing system is not at hand the Breeze is less likely to lift off if the cross spar tension is released, the luff lines are disconnected from the king post and a weight(eg. harness) is placed behind the top rigging cable at the front of the wing.

NOTE (2)

Make sure that the ground under the control frame base is even and is not putting the control frame under a bending load. DO NOT park nose down as this will subject the control frame to undue stress.

4.4 RIGGING ON THE CONTROL FRAME

1. Lay the wing in its bag on clean ground and tail into wind. Unzip, but do not remove, the bag. Locate and remove the batten bag and lay it to one side. Assemble the control frame in the usual way, ensuring that the three sets of rigging wires (fore, aft and side) are not tangled and are routed cleanly to their attachment points. Attach the nose wires at this point but do not lever the S-catch forward yet: you will need some slack in the fore-and- aft wire circuit later on in the rigging process.

2. Lift the glider nose from the bag and roll it through 180 degrees so that the wing is supported by the control frame. Release the remaining sail ties and unfasten the snap hook from the rear of the king post sail aperture where it is stowed to avoid tangles in the luff lines and rear upper cable during de-rigging and transport. Raise the king post.

3. Walk out the leading edges about three quarters of the way, making sure that they stay on a plane with the keel (to avoid stress on the nose plates). This will allow you sufficient slack in the sail to facilitate the fitting of the battens without damaging the sail. **DO NOT** use the top rigging wire to take out the wings as this will cause sail damage.

NOTE!
If there is any resistance stop immediately and investigate the reason.

It is most likely to be a rigging wire caught around one of the fittings. You should now have the wing supported on the control frame base, rear of the keel, and both wing tips with the tail into wind. Fasten the snap hook onto the thimble at the top of the king post, ensuring that the rigging wires and luff lines are not twisted.

4. At this stage the battens (except the nose batten and tip battens) may be inserted. This method allows easier access to the lower surface, so these battens may also be fitted. Remove the battens from their bag and check them against the profile guide. If the battens do not conform to the profile guide they may be reformed by sliding the batten across the knee whilst gently applying pressure. This method allows for a smooth curve to be produced. Do not reform the batten by bending in one place. Lay each batten on the ground behind its correct batten pocket. **Green** indicates a **starboard** (RIGHT) batten, **red** a **port** (LEFT) batten. The four longest straight battens are for the undersurface and, for the moment, should be laid to one side. Carefully insert the cambered upper surface battens, in a sequence moving inwards from the wingtips lifting the trailing edge to locate the batten pocket.

NOTE!

Take care that the point of the batten does not run along the edge of the stitching as it is inserted, and that it locates over the front of the leading edge tube without the use of excessive force.

When inserting the undersurface battens, make sure that the cranked ends are pointing to the rear and downwards. When you have completed the above, zip up the glider bag with your ties and batten bag inside.

5. When all battens (except the nose batten) have been inserted, walk out each leading edge fully. The wing may now be tensioned in the normal way.

NOTE!

This will be made a lot easier if an assistant is used to support a wing tip.

Located horizontally through the keel tube, just aft of the rear of the keel pocket, is the cross spar restraint stud. Remove the safety ring from the stud and using the attached nylon cord, pull back the cross spar restraint webbing. Position the restraint tang on the stud and replace safety ring immediately. ***DO NOT LEAVE THIS OPERATION UNTIL LATER***. to complete the wing tensioning, allow the excess nylon pull cord to re-coil inside the keel keel pocket.

6. Once the wing is tensioned, the batten elastics may be fitted.

7. Fit the nose batten last of all. This is inserted from the front and, in its correct position it will have its front end located on the spigot provided at the topside front of the keel tube.

8. Now tension the lower rigging by levering the s-catch forward, locking it by passing the pip pin through the s-catch and the s-catch channel.

9. The wing is now fully rigged and can be parked tail down.

5.0 PRE-FLIGHT INSPECTION

Now that the **Breeze** is fully rigged, it is ready for the pre flight inspection. Start at the nose and move around the wing making the following checks:

- Nose catch secure and locked.
- Leading-edge undented.
- Crossboom/Leading-edge junction secure.
- Sail secure on tip.
- Battens secure.
- Luff lines secure.
- Crossboom tensioner secure.
- Keel pocket and components undamaged.
- Hang point secure and correctly positioned for desired trim.
- Control frame assembled correctly.
- Control frame cables secure.
- Crossboom junction secure.
- Nose batten and nose cone secure and correctly fitted.
- Top rigging secure.

NOTE!
Never take off without completing a thorough pre-flight inspection!

6.0 FLIGHT CHARACTERISTICS:

6.1 GENERAL

As stated in Section 3, the minimum pilot rating required to fly the **Breeze** is P1 or a CPC pilot. It is assumed therefore that the pilot has proven competence in the basic flying techniques. The **Breeze** is manoeuvred by "standard weight shift"control. The speed of response and lightness of action should be borne in mind by those pilots converting from other makes of wing. It is important that the wing is correctly rigged and tuned to ensure balanced trim (See Sections 4 and 9.).

6.2 GROUND HANDLING

The **Breeze** has good static balance. However, due to the high aspect ratio and low twist, the wing requires extra care and precision during ground handling, when converting from lower performing wings. It is essential to have an assistant to hold the nose wire during ground handling prior to take off, for wind speeds over 15mph.

6.3 TAKE OFF

No departure is required from the launch procedures described in the BHPA Handbook.

6.4 PITCH

Pitch control is positive, progressive and slightly damped, providing positive feedback in all manoeuvres.

IMPORTANT!
DO NOT PITCH NOSE UP OR NOSE DOWN MORE THAN 30 DEGREES FROM THE HORIZONTAL.

6.5 ROLL CONTROL AND TURNS

Standard weight shift techniques are used to effect turns. However, the **Breeze** is very responsive, therefore when flown inside the normal flight envelope only light roll control inputs are required.

IMPORTANT!
DO NOT EXCEED 60 DEGREES OF BANK.

6.6 TRIM

The **Breeze** is fitted with hang straps which allow the pilot to adjust the trim speeds. This is simply done by loosening the shorter of the two straps, sliding the strap forwards (towards the nose) to increase trim speed or sliding the strap backwards to decrease trim speed. It is recommended when changing hang point position that you adjust in millimetre steps thus ensuring that no sudden changes I trim speed are encountered. The hang point position should not be outside of the grip tape positioning (it is possible to check the maximum and minimum settings using the measurements given in Section 3 of this handbook. The nominal trim is in the middle of the grip tape (situated on the top of the keel at the control frame junction) and is set there during final assembly and inspection.

NOTE!
Before a new hang position is flight tested make sure that the back-up strap is positioned directly behind the main hang strap.

6.7 STALLS

GENERAL: The stall characteristics of the **Breeze** are conventional and should present no problems to a pilot of P1 or a CPC rated pilot.

WINGS LEVEL STALL: Approaching the wings level stall with a maximum airspeed reduction of 2mph per second, no buffet is apparent. The incipient stall phase is indicated instead by diminishing roll control. With the onset of the full stall break the nose will pitch smoothly down, and by allowing the control bar to return to the normal trim position, recovery will be effected immediately with a height loss of approximately 20 ft.

TURNING FLIGHT STALLS: Rather than stall in a turn, the tendency is for the aircraft to sideslip into the turn, regain airspeed and recover normally. During the above manoeuvre a height loss of around 30 ft can be expected.

NOTE!
Stalls should not be approached at airspeed reductions of greater than 2mph per second.

WARNING! ACCELERATED STALLS AND WHIP STALLS ARE PROHIBITED.

6.8 SPINS

The **Breeze** hang glider is not cleared for deliberate spinning. However should a wing be stalled in a turn, the pilot need only let the control frame return to the trim position and the glider will quickly recover from the spin with no more than half a rotation.

6.9 LANDING

You should use a sail-plane type approach when landing. Initially, sellect a landing area that allows room for an overshoot. Then, having completed a base leg, increase airspeed (approx. maximum glide speed plus a third wind speed) on the final turn into the approach and with your hands symmetrically placed on the control frame sides, round out so that you should then be ground skimming with your wings level, then progressively bleed off the airspeed until the ground speed is at a manageable level. In lighter winds, just before the glider approaches the stall, you will need to finish with a strong flare which you should hold until your feet make contact with the ground.

7.0 POST FLIGHT INSPECTION

After flight, and particularly if a heavy landing is experienced, or it is suspected that damage may have occurred during ground handling, the glider must be inspected thoroughly. Pay special attention to the inspection procedure outlined in Section 4.2 and if necessary refer to the maintenance and repair section in this manual.

8.0 DE-RIGGING

8.1 GENERAL

The amount of care taken when de-rigging and packing away the wing will affect both its useful life and second hand value. As with the rigging of the wing there are two basic methods of de-rigging. Here are the de-rigging sequences:

8.2 FLAT ON THE GROUND DE-RIGGING METHOD

1. With the aircraft stood on its control frame, remove the nose batten.

2. Remove the pip pin from the front lower rigging, release the S-catch and detach the lower rigging from the nose. Replace the pip pin in the S-catch channel immediately.

3. Lay the wing flat on the ground.

4. Remove the two tip battens.

5. Release the cross spar tension, replacing the retaining ring in the stud immediately. At this point it is most convenient to fit the restraint stud protection padding.

> **NOTE!**
> ***It will make the operation of releasing the restraint webbing easier, if the rear of the keel tube is first raised one or two feet of the ground.***

6. Remove all the remaining battens. Lay all the battens with the curved ends together and slide them into the batten bag. It is recommended that the battens are stored between the leading edges of the nose section when the glider is in its packed state.

> **NOTE!**
> ***The battens must be stored carefully; deformation will at best result in decreased performance and at worst make the aircraft dangerous to fly***

7. Hold the trailing edge of the sail approximately half way along (at the batten pockets). To fold in the wings towards the keel tube, lift the sail up whilst maintaining a rearward tension.

8. Release the snap hook from the king post and, to ensure that the luff lines and rear rigging do not get tangled during transport, clip the snap hook to the front top rigging wire. Now fold the king post forward.

9. Carefully roll up each side of the sail so that the sail lies neatly parallel with the keel. To restrict the leading edges from splaying out during the sail rolling process, a tie may be used to temporarily secure the wing tips together. To enhance the life and useful performance of the wing, avoid using any method that allows the formation of permanent creases.

10. Temporarily secure the sail ties around the wing.

NOTE!
Position the ties so that:

- The sail does not come into contact with any hardware.
- The mylar leading edges are folded one over the other to form a neat, compact package.
- None of the tubes, keel, control frame etc can be moved causing wear during transport.

11. Fit the carrying bag and roll the wing and bag over. Fold the control frame and fit the protection padding to the control frame ends so that there is padding ***between the keel and the cross tubes***. Then refit the sail ties.

12. Now stow the battens as outlined in para [8.2(6)] and zip up the carrying bag.

8.3 DE-RIGGING ON THE CONTROL FRAME:

1. With the aircraft stood on its control frame and positioned sideways to any wind, remove the nose batten, then allow the glider to rest tail down.

2. Remove the pip pin from the front lower rigging, slacken the S-catch and detach the lower rigging from the nose. Replace the pip pin in the S-catch channel immediately.

3. Remove the two tip battens.

4. Release the cross spar tension, replacing the retaining ring in the stud immediately. At this point it is most convenient to fit the restraint stud protection padding.

5. Release the snap hook from the king post and, to ensure that the luff lines and rear rigging do not get tangled during transport, clip the snap hook onto the the top front rigging wire.

6. Remove all the remaining battens. Lay all the battens with the curved ends together and slide them into the batten bag. It is recommended that the battens are stored between the leading edges of the nose section when the glider is in its packed state.

NOTE!
The battens must be stored carefully; deformation will at best result in decreased performance and at worst make the aircraft dangerous to fly

7. Hold the trailing edge of the sail approximately half way along (at the batten pockets). To fold in the wings towards the keel tube, lift the sail up whilst maintaining a rearward tension. Now fold the king post forward.

8. Carefully roll up each side of the sail so that the sail lies neatly parallel with the keel. To restrict the leading edges from splaying out during the sail rolling process, a tie may be used to temporarily secure the wing tips together. To enhance the life and useful performance of the wing, avoid using any method that allows the formation of permanent creases.

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11. Now stow the battens as outlined in para [8.2(6)] and zip up the carrying bag.

9.0 TUNING

9.1 TURNS

If your glider has a slight turn it can be tuned out by the following methods:

1. TIP ADJUSTERS

Turns may also be reduced by turning the tip adjusters. Adjust the opposite wing tip to the turn by loosening the self tapping screw on the inside of the leading edge tube, then by rotating the tip to increase the washout by no more than 3mm. Adjust the wing tip in the direction of the turn in a similar manner, but in the opposite direction, therefore reducing the washout.

2. UPPER BATTEN CAMBER

The camber may be increased slightly on the outer battens of the falling wing. The camber should be increased by 1-2 cm. on the outer three battens to match the dotted line shown in Fig.2. (following this section).

NOTE!
It is best to apply several small adjustments rather than one large one. Should your glider develop a turn it should be checked for damage and symmetry before any adjustments are made.

9.2 LEADING EDGE TENSION

As the glider ages the sail will stretch. It may eventually be useful to increase the leading edge tension by placing shims in the leading edges. You should always consult Solar Wings or a Solar Wings dealer before you do this.

10.0 MAINTENANCE

10.1 GENERAL

Careful attention to the rigging and de-rigging sequences will protect the wing from the risk of unnecessary damage. Solar Wings recommend that the glider has a factory inspection every 50 hours or after one year, whichever comes first. All *Breeze* components can be replaced without difficulty. Repairs should be undertaken by the Solar Wings factory or a Solar Wings approved repair agency. Please note that regular coastal flying will cause increased corrosion of spars and fastenings, and regular inspection is therefore recommended in this case.

10.2 AIRFRAME MAINTENANCE

Apart from the consequences of heavy landings, or of exceeding flight limitations, the major factors for attention are corrosion and fatigue. There is no inherent fatigue problem with the *Breeze*, but excessive loads can weaken the structure.

1. ALUMINIUM TUBEWORK

Care and consideration in de-rigging and transportation will pay dividends in airframe life. Damage to any one of the structural members is serious and the only remedy is replacement. Insufficient care during ground handling or transportation can lead to tube abrasion or indentation, the first accelerating fatigue fracture and the second reducing the strength of the part. Keep a regular watch for tell-tale hair-line cracks, which are most likely to occur in high stress areas such as around bolt holes.

NOTE!
If you bend, dent or damage the tubular members in any way, seek immediate professional advice before flying again and have replacement parts fitted.

2. FASTENERS

Only fasteners obtained from Solar Wings or Solar Wings parts purchased from an approved stockist should be used for replacement. Any fastener which is bent or shows signs of wear or corrosion should be immediately replaced. Nut caps are used extensively to avoid wear and to help protection.

NOTE!
Nylock nuts should only be used once.
Over-tightening fasteners will cause damage to the airframe.

3. RIGGING CABLES

The main danger with the rigging lies in kinking the cable, usually caused by careless rigging and de-rigging. Once a cable has a kink the strands are damaged and replacement is the only cure. The side cables are particularly important and should receive a frequent detailed inspection. Check for cable damage along the length but the main failure area lies immediately adjacent to the swaged fitting. Look carefully for signs of strand fracture at this position. Corrosion is a serious problem particularly in coastal areas and shows itself as a white powdery deposit. Corrosion cannot be cured and replacement is the only answer.

NOTE!
When replacing lower side rigging wires or when dismantling the control frame lower knuckle assemblies for any other reason always use 'Loctite Screwlock' or similar thread locking compound to secure the knuckle pins.

4. FITTINGS

Many fittings on Solar Wings aircraft are manufactured from aluminium alloy and then anodised. Again, damage can occur through poor ground handling or by the stress of an unduly heavy landing. Look for elongated holes and stress lines in the aluminium.

NOTE!
Damaged items should be replaced.

10.3 WING FABRIC MAINTENANCE

Any cuts or tears through critical areas such as the trailing edge, sail fixing points or similar high load areas, must be repaired at either the Solar Wings factory or a Solar Wings approved workshop. Small damage to panels, leading edge covers etc., can be repaired with proprietary self adhesive tape. We define small damage as abraded holes no more than 10mm diameter and small cuts no longer than 15mm. Anything larger should be inspected by Solar Wings approved personnel.

1. STITCHING DAMAGE

Thread damage never ever gets better and eventually runs. If you abrade a seam or damage the stitching in any way, have the damage repaired before it gets worse. Small, non-loaded areas can often be repaired in situ by the tedious but effective method of hand sewing back through the original stitch holes.

NOTE!
Never use anything but matching polyester thread which is available from Solar Wings or most good sail makers.

2. WING FABRIC CLEANING

Prevention is better than cure in this situation, but if all else fails and you need to wash your wing, then select a dry day and have access to a good hose and clean water supply. Never use strong soaps or detergents since soap residue can react with ultra violet light and degrade the fabric. We recommend a very mild liquid soap (washing-up liquid) and a soft sponge. Gently wash the fully rigged wing, frequently hosing clean. Copious amounts of clean water will not harm the wing and can be very beneficial in removing sand and grit which may get trapped in the nose or wing tip areas inside the leading edge pocket.

NOTE!
Ensure the wing is completely dry before de-rigging.

3. BATTENS

Battens form the wing shape and substantially influence the performance of the wing. They need treating with care and, since they are subject to constant stress both during flight and rigging, they may lose their shape. It is essential that they are checked against the template at frequent intervals and re-formed if necessary. The correct way to re-form is to hold the batten against your knee and, whilst applying pressure to bow the batten, slide it side to side over the area you want to re-shape.

NOTE!
Direct point bending will usually result in either a poor shape or a broken batten.

10.4 RECOMMENDED COMPONENT LIFE

In the main, the safe working life of the structural components of the *Breeze* is dictated by the environment in which the aircraft is used and the care taken during day to day operations. Inspection, therefore, is an essential tool in deciding the continued use of most components. However, by the nature of their material, construction and position within the structure, certain components have a critical fatigue life and it is mandatory that these components are replaced within the time stated below.

Crossbooms	2000 hours.
Leading Edges	1000 hours.
Control Frame Base Bar and fittings	1000 hours.
Keel	1000 hours.
Rigging Wires	100 hours (or 3 years).

11.0 REPAIR

WARNING!

The BREEZE airframe is deceptively simple, but like all aircraft requires skilled and qualified attention. We do not recommend self repair or re-assembly by other than Solar wings or Solar wings nominated repair agents. No replacement parts should be fitted unless they are factory supplied and identified.

11.2 WING

- Repairs shall only be undertaken by Solar Wings Approved Personnel.
- Sail repairs are only to be undertaken by the Solar Wings factory.
- Repairs by replacement only.
- Replacement parts must be obtained from Solar Wings or a Solar Wings appointed agency.
- Bent aluminium tubes must never be straightened, always replaced.
- Frayed cables and cables with damaged or twisted thimbles must always be replaced.

12.0 TRANSPORTING YOUR GLIDER:

12.1 GENERAL

The wing must always be transported inside its bag, and the bag zip must face downwards to prevent the entry of rainwater. During transportation, or when stored on slings, the wing must be supported at its centre and at two points not more than one metre from each end. Supports should be padded and relative movement between glider and supports must be avoided at all costs.

12.2 BREAKDOWN

The *Breeze* leading edge has been specially designed in two main sections, the inner (nose to cross spar leading edge bracket) and the outer (cross spar leading edge bracket to tip) to allow a reduction in total glider length. This facility will be found useful for transport overseas or storage. It may also reduce the cost of a damaged leading edge should the damage be confined to either the outer or inner leading edge sections.

12.3 REMOVAL OF THE OUTER LEADING EDGE

The outer section is kept in position by the use of a spring loaded double push button, situated outboard of the cross spar leading edge bracket. To remove it, lay the glider on its back and unfasten the velcro ties. Partly open the wing and release the sail from the tip by pulling backwards and outwards on the tip webbing. Then run a hand along the leading edge tube just outboard of the cross spar junction, feeling for the double push button. Compress the buttons with thumb and forefinger and, at the same time, rotate and pull the leading edge apart. The outer leading edge can now be removed. Fold the sail forward, taking care not to crease the mylar. The two leading edge outers can be stored inside the bag. Secure the package with the velcro ties and neatly pack to allow the glider bag to zip up easily. Use the reverse procedure when rebuilding the leading edges.