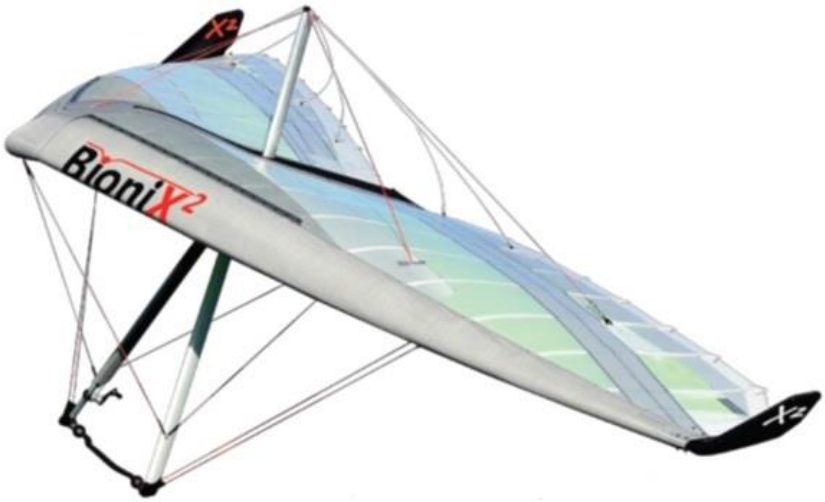
Maintenance Manual

Wing Type :

BioniX² 13



615 Route de l'Aérodrome, 07200 Lanas, France

Telephone: +33 (0)4 75 93 66 66 • Fax: +33 (0)4 75 35 04 03

info@aircreation.fr • http://www.aircreation.fr

1 Table of Contents

2 Amendment Record Sheet

2.1 Table of Amendments

Amendment date	Affected sections	Affected pages	Date inserted	Signature

2.2 Amendments

The information in this manual is based on the data that was available at the time of its publication. The latest amendments to this manual will be issued on the Air Création website (http://www.aircreation.fr) in PDF format. This should be printed out and added to the manual. The amendment table should at that time be updated with the appropriate details and date. Therefore it is important for operators to check the website regularly for any amendments that have been made. If any errors or omissions are found in this manual please advise the factory.

3 Introduction

This manual contains factory recommended procedures and instructions for servicing, inspecting and maintaining the BioniX² wing. The procedures described are to be used in addition to the particular governing body regulations for each country where the aircraft is flown.

The operator is directed to reference the trike maintenance manual for any issues related to the trike component of the aircraft.

3.1 Skills

It is assumed that only people with an adequate skill level will perform maintenance on this aircraft. A sound understanding of mechanical systems, experience with the necessary tools and procedures and knowledge of the specific flight mechanics of weight-shift controlled aircraft is required – as the continuing airworthiness of the aircraft depends on the competence of the person performing the maintenance. If there are any doubts regarding the required and appropriate maintenance then an Air Creation technical station should be contacted for the correct procedures and/or servicing.

All maintenance and repairs should be carried out in accordance with good aeronautical practices.

3.2 Tools

There are no specialized tools needed for the maintenance described in this manual. The following is a list of the type of tools that may be required.

Loctite® will be required in certain locations and should always be replaced after disassembly.

- Loctite® 243 for the frame
- Open ended metric spanner set (6, 10, 13, 17mm)
- Dry lubricant – lubricant that doesn't attract dust after application, like Teflon lubricant.
- Hex key set up to 8mm
- #2 Phillips screwdriver
- Various general care items, specified where needed

This list may not be exhaustive.

3.3 Air Creation Directives

The information in this manual needs to be followed, and it is not acceptable to make changes to the materials and or physical features of this aircraft.

Air Creation will from time to time issue airworthiness directives, which detail any changes to the maintenance manuals, pilot's operating handbook, or any other details that air creation deems necessary for owners to be notified of.

The web address for Air Creation directives is:

http://www.aircreation.fr

3.4 Units

3.4.1 Use of Metric/Imperial Units

This service manual uses the metric unit system as the basic system of measurement. Where common usage or available instrumentation refer to the Imperial system, both units are quoted. The following conversion factors are presented as a ready reference to the conversion factors that have been used in this manual.

1 Pound (lb) = 0.4536 Kilogram (kg)
1 Pound per sq in (psi) = 6.895 Kilopascal (kPa)
1 Inch (in) = 25.4 Millimeters (mm)
1 Foot (ft) = 0.3048 Meter (m)
1 Statute mile = 1.609 Kilometers (km)
1 Nautical mile (NM) = 1.852 Kilometers (km)
1 Millibar (mb) = 1 Hectopascal (hPa)
1 Millibar (mb) = 0.1 Kilopascal (kPa)
1 Imperial gallon = 4.546 Liters (L)
1 US gallon = 3.785 Liters (L)
1 US quart = 0.946 Liter (L)
1 Cubic foot (ft3) = 28.317 Liters (L)
1 Degree Fahrenheit (F) = (1.8 X C)+32
1 Inch Pound (in lb) = 0.113 Newton Meters (Nm)
1 Foot Pound (ft lb) = 1.356 Newton Meters (Nm)

3.5 Main Airframe Description

The wing is a very specific part of the aircraft.

This section allows the user to understand the main function of each of the components of the wing, which should help the operator, or maintenance personnel to properly inspect the wing.

3.5.1 Keel

The keel of the wing is mainly constructed from 2017A aluminum. Each of the major components of the wing is attached to the keel.

3.5.2 Nose Plates

The nose plates are bolted to the keel and provide attachment points from the leading edges to the keel. They are attached to the keel with bolts. The nose plate bolts also fasten the U-channel to the keel. The gooseneck catch fastens the front wires to the U-channel.

3.5.3 U-Bracket

The U-bracket is the major junction for the three main components of the aircraft, the wing (keel attachment), trike (mast attachment) and control frame (top knuckle attachment). The U-bracket has two components, a U-shaped channel, and an internal Delrin sleeve.

The U-bracket is allowed to rotate around the keel, and is held in position longitudinally by rings that are bolted to the keel.

The U-bracket should be checked thoroughly after any unusual loads, especially torsional ones.

3.5.4 King Post

The king post assembly is a vertical post in aluminum 6082 that supports the reflex bridles, the top front wire, and the top side wires. The king post works in compression, and is secured to the keel by means of an aluminum locating foot.

3.5.5 Tensioning U-channel

The cross bars tensioning U-channel is bolted to the keel with two bolts. These bolts are used to attach the rear wires.

3.5.6 Control Frame

The control frame is constructed mainly from 6005 AT5 and 2017 A aluminum. The control frames down tubes work mainly in compression due to the positive loading of the wing, which is reacted through the side wires and base bar sections. The base bar works mainly in tension through the side wire loads from the crossbar and leading edges.

The control frame is bolted to the keel through the U-bracket. The fittings at the top of the control frame allow relative movement between the U-bracket and the control frame. This is necessary because of the movement between the base and the wing during the weight shift control actions.

⚠ *The control bar is not symmetrical. The central portion is offset from the ends to compensate for lateral displacement of the trike due to the torque of the engine. For an engine whose propeller rotates counterclockwise (Rotax 912), the center part must be shifted to the Left. For a propeller rotating clockwise (Rotax 582), the center part must be offset to the Right. If necessary, reverse the direction of the control bar if it does not correspond to the engine used, by removing the connecting screws with the A-frame uprights.*

3.5.7 Leading Edge

The leading edges are mainly constructed from 7075, 2017 and 6082 aluminum. The leading edges are mainly loaded in bending and compression. They share loading with the cross bars during positive and negative flight loads.

The leading edges are attached to the keel through the two nose plates at the front of the wing, and via a bolt assembly to the cross bars and the outboard wires. The rear leading edges fit inside the leading edge tubes, which locate onto a horizontal bolt in the leading edge assembly. The rear leading edges are a part of the leading edge, but are made in order that they may be removed for ease of shipping.

3.5.8 Cross Bars

The cross bars are mainly constructed from 7075 aluminum .the cross bars serve the purpose of holding the leading edges forwards and spread against the sail, they share the loading with the leading edges during positive and negative flight loads.

The cross bars are attached to each other at the keel using a ball joint that allows relative movement.

They are also tethered to the keel via a webbing loop. The cross bars are attached to the leading edges using a bolt assembly. The top and bottom side wires are a part of the bolting arrangement.

3.5.9 Battens

The battens are mainly constructed from 7075 aluminum, with the exception of those at the extremities of the wing which are in a carbon composite. The battens are secured by batten pockets sewn into the sail. “Easyfit” tighteners on the trailing edge allow for the quick installation and tension setting of the battens in their pockets.

The battens help to maintain the profile of the wing during flight, and are important to the correct and stable operation of the wing.

⚠ *Do not fly the wing with any other batten profile than that supplied by Air Creation, as variation may have serious effects on flight performance and stall characteristics of the wing.*

3.5.10 Top and Bottom Side Wires

The bottom side wires are stainless steel braided wires that are attached to the cross bars and the knuckle at the bottom of the control frame by stainless steel plates, thimbles and swaged Nicopress sleeves. The top side wires are attached to the kingpost head.

3.5.11 Top and Bottom Front-Back Wires

The bottom front-back wires are stainless steel braided wires, equipped with stainless steel plates, thimbles and swaged Nicopress sleeves that are attached to the nose catch, control frame and keel. The top front wire is attached to the kingpost head.

3.5.12 Reflex Bridles

The reflex bridles are stainless steel wires, equipped with thimbles and swaged Nicopress sleeves, and attached to the top rear wire via a pulley, and to the sail using shackles. The external reflex bridle acts upon a lateral batten in carbon composite reinforced by an internal tube of Zicral to hold up 3 upper surface battens.

Reflex bridles produce longitudinal stability when the wing is at zero or negative angles of attack. The reflex bridles work by preventing the trailing edge of the wing from moving downward, as they are tethered to the king post assembly. When the wing has any negative load on the top surface the rest of the lifting surface will move downward relative to the trailing edge, effectively creating elevator type control surfaces that produce a positive pitching moment, helping to restore level flight.

3.5.13 CORSET

The BioniX² wing is equipped with a configuration command that allows the setting of cruise speed and the simultaneous adaptation of the shape of the sail in order to offer the best maneuverability and the best performance depending on that speed. The command of the CORSET is activated by a system of pulleys that tighten the two central battens, acting on washout and reflex of the profile at the center of the sail. The CORSET is activated by means of a control level located on the right A-frame strut. This lever automatically locks in the selected position and activates a cone-shaped pulley on which is wound the fine cord of the command.

3.5.14 Sail

The sail comprises the lifting surface of the wing. It is mainly constructed of UV protected Trilam and Dacron polyester fabric, with some ABS and Mylar material making up the leading edge areas. The sail is constructed from many individual panels, which are sewn together using polyester thread to form the required shape. The sail has attachment points sewn into it to attach to the frame at various points and to hold the battens in place. The sail also provides zippers that facilitate easy preflight inspection of all the members inside the double surface wing. The central part of the upper surface is composed of a flexible fabric derived from neoprene which compensates for the differences of tension due to the CORSET system. This part plays no mechanical role and may easily be replaced thanks to the two zippers that hold it in place.

In as much as possible the wing must be stored away from sunlight, as UV rays cause damage to the fabrics.

3.5.15 Tip Fins

The wing tip fins contribute to the stability of the wing in roll and yaw at high speeds. They are made of a carbon composite material and attached to the wing by means of 3 quarter-turn screws. Flexibly mounted, they give way when the wing is placed on the ground so that the end of the leading edge supports the force of any wind.

3.5.16 Special purpose equipment

Training Bars

The training bars are attached to the control bar and uprights in order to extend the possibility to fly the aircraft from the back seat. They are supplied as an option for use by qualified flight instructors.

3.6 Assembling from Shipping Crate

This procedure is to be followed if the wing arrives in a short packed configuration. An approved dealer is responsible for assembly from the short packed configuration. The short packed wing has had the rear leading edges removed to reduce the packed size for transport.

The correct reassembly of the wing is critical for safety and performance of the wing. If there are any doubts about the correct procedure for assembly after shipping contact Air Creation factory.

3.6.1 Reassembly Guide

1. Remove wing from box. Take care that no staple damages the bag or the sail during this operation.
2. Unzip bag
3. Remove all wing straps. Remove padding from control bar and rear leading edges.
4. Unfold the ends of the sail
5. Rotate the wing so that it is lying flat on the ground on the unfolded A-frame
6. Spread both leading edges approximately ½ meter.
7. Insert rear leading edges in the tip openings of the sail with the plastic lugs at the rear of the tubes positioned horizontally and to the inside.

⚠ ***The two rear parts of the leading edges are not identical. A sticker on the tube indicates whether it is a right (D) or left (G).*** *An inversion can have serious consequences because it modifies the tip angle resulting in negative twisting of the tips and strong longitudinal instability.*

8. Finish sliding the rear leading edges in the front part. Turn slightly and push in order to line up the half-hole and the horizontal bolt connecting the crossbar on the front part of the leading edge. Make sure that the plastic lugs at the rear of the tubes are face-to-face. Once installed the rear leading edge slot should be located on the channel horizontal bolt. it should be impossible to rotate the leading edge, if correctly assembled.
9. Remove the self-tapping **screws B 199010** (Refer to drawing **OP10-23CA**) which hold the sail on the leading edge at the nose of the wing. This way, the sail will move back easily.

Figure 3-1

Figure 3-2

10. Attach the sail to the tip sleeves with 4 **screws FHC 6-75-13 (B167510)** (Refer to drawing **OP10-22VO).** Note the indications “Right” & “Left” on the tubes. Make sure that the aluminum guide that allows the setting of the sail’s tension is facing the slot in the sleeves, at the end of the leading edge. To make things easier, use a screwdriver to line up the sail with the foremost drilling and slide the screw in the back. Remove the screwdriver to insert the screw in the front. Figure 3-1 & Figure 3-2. Apply the Threadlock glue to the nuts and tighten the Nylstop bolts.

11. Gradually open the leading edges to the maximum, while checking that the lateral cables tighten correctly at the ends without loops nor blocking the neoprene openings in the sail. Proceed in small steps, returning to the nose of the wing to pull the sail forward and insure that the central battens remain in the right position on the screws of the leading edges. Return them to their place as necessary. Figure 3-3.
12. Assemble the control bar on the revolving base fixed to the left A-frame strut with the **screw CHC 6-40-09 (B064109**), washers, Nylstop nut, Loctite 243 Threadlocker glue and with the push pin on the right side (refer to drawing **D170115**). Close the leather protections.

    The drilling corresponding to the push-pin is slightly larger diameter than the screw side.

The control bar is not symmetrical. The central portion is offset from the ends to compensate for lateral displacement of the trike due to the torque of the engine. For an engine whose propeller rotates counterclockwise (Rotax 912), the center part must be shifted to the Left. For a propeller rotating clockwise (Rotax 582), the center part must be offset to the Right. If necessary, reverse the direction of the control bar if it does not correspond to the engine used, by removing the connecting screws with the A-frame uprights.

13. Unfold the wing as described in the pilot operating hand book (5.1.1, de 5 à 14). Do not assemble the last straight battens at the ends of the wing nor the tip fins.
14. Reassemble the self-tapping nose **screws B 199010**. Figure 3-4.

Figure 3-3

Figure 3-4

15. Each wing tip should now be tightened by means of the tensioning **screw HM 6-45 (B126410)** placed at the end of each sleeve of the leading edge. Figure 3-5. Standard tuning is 10 turns (10 mm tension). Turns are counted from the stop in front of the port, as soon as the tightening of the screw begins to have an effect. Each turn represents 1mm of tension in the sail. After tuning, reassemble the **plastic caps P201610** at the ends of the tubes (Refer to drawing **OP10-20ST**).
16. Check that the rear parts of the leading edges and their wing tip sleeves are assembled on the right side of the wing as indicated by their marking Right/Left.
17. Check that the tubes are pivoted right as indicated by the mark on the scale sticker and blocked by their self-tapping screw. Figure 3-6.The standard setting is **the "0" of the scale**.

Figure 3-5

Figure 3-6

18. Assemble the last straight battens at the ends of the wing nor the tip fins.
19. Complete assembly of the wing as indicated in the Pilot's Handbook.

⚠ *A thorough and complete preflight check is especially necessary after reassembly. Pay special attention to potential transport damage. Thoroughly check all nuts and bolts, wire routing, sail fit, Mylar shape and overall symmetry of the wing before flight.*

3.7 Ground Handling

The wing should only be moved when properly packed or, if necessary, when attached to the trike.

When moving the wing in the assembled position it is recommended to lift the wing with the shoulders while standing in the control frame. It is suggested that an assistant is used to support the weight on the rear of the keel tube.

If there is wind or gusts the wing can easily be caught by the wind without proper handling. If there is a significant amount of wind, it is advisable to have assistants to hold the side wires. The wing should be moved with the nose facing into the wind. In windy conditions, the nose must be kept low. The windward tip should also be kept lower to avoid the wing rising.

3.8 Transportation & Storage

Avoid damage to your wing by using well-padded racks. Careless transportation can cause considerable damage to your wing.

We recommend that you support the wing in at least 3 places or to use a ladder to spread the load. Flat straps should be used for tie downs to avoid damage to leading edge Mylar.

The tip fins are light, but fragile. Store them in a well-protected area and do not stock anything on top of them.

Store the wing in a dry room off the ground. Air the wing out regularly to avoid mildew, and never store wet.

⚠ ***Ageing of the fabric and seams of the sails may cause an important loss of the wing resistance. The degradation is principally caused through exposure to ultraviolet rays emitted by the sun and the moon. In order to slow down the process, the sail should be stored folded in its cover, or if it stays rigged, in covered premises. Always put it in a sheltered place, shielded from the rays of the sun, even between flights. These measures help to lengthen/sail life.***

4 Maintenance Checks

4.1 General

This section sets forth each mandatory replacement time, structural inspection interval, and related structural inspection procedure required.

The time limits and maintenance schedule provided are in addition to any regulation of the governing body where the aircraft is flown.

The pilot of the aircraft must ensure that the required maintenance is carried out and documented in the correct manner.

4.2 Time Limits

Extreme operating conditions and any extreme loads will reduce the time limits for components and the fatigue life of the airframe. The fatigue life of these components is dependent upon rigid adherence to maintenance schedules.

Air Creation will from time to time amend these maintenance checks as the service history of the aircraft evolves. It is the responsibility of the pilot to ensure compliance with new directives. (Information is available on the website http://www.aircreation.fr).

The following components are time limited and should be overhauled or replaced as indicated. This table may be updated to include more components in the future as airworthiness directives are amended.

Wing Component Life

Component	Life
Control frame and cross tubes	On inspection, no fatigue limit
Control Bar	900 h
Leading edges	900 hrs
Keel	1500 hrs
Lower and tensioning wires	600 hrs
Roll bracket	1500 hrs
Bolts	300 hrs
Hang bolt	300 hrs
CORSET fine cord	300 hrs
Neoprene central junction	300 hrs

4.3 Scheduled Maintenance

4.3.1 Wing Maintenance Schedule

Item	Maintenance Requirement	Hours of Operation					
		50	100 1 yr	150	200 2 yrs	250	300
Wing Sail	Wing fabric deterioration and tears		2		2		4
	Wing fabric stitching condition and abrasion		2		2		2
	Wing fabric attachments points	2	2	2	2	2	2
	Straps retaining central battens to keel		2		2		4
	Straps retaining luff lines on the upper surface		2		2		4
	Condition of tension straps on batten clasps		3		3		4
	Zippers of inspection and assembly of the central neoprene junction and Keel Pocket		3		3		3
	Central neoprene junction of the upper surface	2	2	2	2	2	6
	Condition of Velcro strips attaching the keel pocket						4
	Wing fabric sample factory test						2
	Sail removal for general overhaul						4
Wing Airframe	Profile of removable battens of the upper surface		2		2		2
	Condition of the rear part of the central upper surface battens		2		2		4
	Profile of the central upper surface battens						4
	Batten clasps		3		3		3
	Wing tip fins, fittings, condition, quarter-turn screws	3	4	3	4	3	4
	Condition of Velcro strips of the fairings of the kingpost & struts		4		4		4
	Wires and attachment fittings for tension, corrosion, fraying, kinking or fretting	2	2	2	2	2	4
	Hoist, hang bracket pulley, control lever, & accessories of CORSET		3		3		4
	Condition of CORSET fine cord		3		3		6
	Condition and security of all axes, screws, bolts, nuts & washers	2	2	2	2	2	6
	Condition and operation of all push pins	2	4	2	4	2	4
	Outer part of leading edges		4		4		
	Keel and visible tubing	2	3	2	3	2	
	Hang bracket for condition, deformation, cracks	2	3	2	3	2	4
	Main hang bolt	2	4	2	4	2	6
	Nose assembly, U-channel and cable gooseneck catch for condition		3		3		4
	Tensioning u-channel and cable gooseneck catch for condition		3		3		4
	Central cross-bar assembly, protection and webbing for condition		3		3		4
	Cross-bars to leading edges assembly for condition		3		3		4
	Condition of wing tip tensioning device		3		3		4
	All rig/unrig parts for condition and operation		3		3		4
	All airframe tubing for cracks, dents, deformation, corrosion or fretting						4
	All airframe fittings for cracks, dents, deformation, corrosion or fretting						4

⚠ *In the case where the aircraft performs less than 100 hours of operation in a year, a typical 100 hour / 1 year inspection is mandatory.*

Code:

1. Oil, lubricate, clean and service
2. Check as directed
3. Check for security, cracks, wear and faulty operation
4. Remove, inspect and replace if necessary
5. Recommended replacement or overhaul
6. Mandatory replacement

4.4 Unscheduled Maintenance

4.4.1 General

Unscheduled maintenance is required due to abnormal loads such as heavy landings. If any abnormal loads are encountered during transport or storage then the airframe needs to be checked.

The pilot will be responsible for identification of these extreme operating conditions and identification of the affected components. Where damage is found further checks should be carried out upon areas that may also be affected.

Thorough checks should also be carried out after transportation of the aircraft, and after extended storage periods.

4.4.2 Inspection after Heavy Landing

The main attachment point for the wing to the aircraft base should be inspected carefully for any permanent deformation of the U-bracket, the main bolt or the keel, as well as all of the other effected components. If the landing resulted in a jolt on the ground then a 300-hour overhaul must be performed. The tubing relies on being intact and in perfect condition for full strength. If tubing is bent or kinked in any way then it should be replaced prior to flying.

4.4.3 Inspection after Heavy Turbulence

Turbulence is more likely to structurally affect the wing of the aircraft than the trike.

The main areas that require attention after severe turbulence are the attachment points for structures. These include the front and rear wires, the side wires and the main hang point. The sail should also be inspected for any strain or tearing that may have occurred, though this is very unlikely. All of the tubing should be inspected for bending.

5 Standard Practices – Airframe

5.1 Torque and Safety procedures

This chapter provides standard torque and safety procedures that are to be used in all areas of the aircraft unless otherwise specified. The use of these procedures will ensure the security of installation and prevent overstressing the components.

5.1.1 Torque Procedures

Correct Torque of fasteners is critical. If a bolt or fastener is too loose it may cause unnecessary movement resulting in wear or fatigue damage, while over tightening may cause tensile failure of the bolt, or crush components.

Definition of "Just Not Loose"

A definition of torque has been established for the assembly of this wing that is called "just not loose", a setting which is used to achieve the best combination of strength characteristics of the tubing while not allowing any vibration or relative movement of the bolt in the axial direction. In practice this means that the nut shall be tightened adequately to ensure that each of the components that are held by it are in contact with each other, and then approximately ¼ turn more should be made. The resulting fit should not allow any axial movement of the bolt in its location, but will allow rotation (using fingers) of a held component to be achieved with approximately 20mm of lever arm (e.g. A wire tang).

⚠ *The correct torque of the bolts for the wing section of the airframe is especially important for the safety and longevity of the wing. In general standard torque values will not be applicable, because of the nature of the thin wall aluminum tubing that has been used to construct the majority of the wing structure.*

Never tighten nuts so that the aluminum tubing is deformed from its circular cross sectional shape.

Always have at least one full thread showing past any Nylok nut that is used.

Where stainless steel washers are used, the rounded edge should be placed towards the aluminum tube, if any, or towards other aluminum part, if not.

5.1.2 Safety Procedures

- Nylstop Nuts

  Nylstop nuts are used throughout the airframe. Nylstop nuts may not be reused.
- Loctite

  On any bolt that does have or not a Nylstop type locking mechanism, Loctite 243 should be used to prevent premature loosening.

⚠ *Do not fit the plastic nut caps until the airframe has been inspected.*

5.2 Sail Removal

The sail should be removed for close inspection of the airframe if the frame is suspected of having bent tubes following a heavy landing, blow over or crash.

It is mandatory that the sail should be removed from the frame every 300 hours to check for any signs of fatigue or damage from general wear and tear. The removal of the sail may only be performed by an approved Air Creation technical station.

The main points to check are:

- Cross bar hinge joint
- Cross bar/leading edge joint
- Leading edge nose joint
- Nose plates
- Tubes
- Bolt holes
- Profile of central battens
- Wires
- Replacement of all bolts, nuts and push-pins
- Inspection of sail & accessories
- Factory test on one of the sailcloth samples

Special Requirements and Tips

When installing or removing the sail you will need a large unobstructed area of approximately 12 meters by 3 meters. Make sure the surface is clean and not abrasive. Rough concrete will damage the sail, a grass area will not damage the wing, but will provide many hiding places for bolts, nuts and washers – short carpet is ideal.

It is a good practice to note the order of washers and other fittings prior to disassembly and to have a small container to put the hardware in. The Illustrated Parts Catalogue should be referenced for correct assembly.

5.2.1 Wing Dismantling Procedure

Wing folded on the under surface on a pair of trestles, one at the nose, and the other at the tips:

- Check and mark or trace the rotation setting of the sleeves at the ends of the wing and the tension of the sail on the adjustable sleeves on each side of the wing.
- Reduce to the minimum the tension of sail on the leading edges using the **screws 6-45 B126410** at the ends of the leading edge. (Refer to drawing **OP10-20ST**.)
- Unscrew the 2 **nose screws B199010** that secure the sail on the leading edges. (Refer to drawing **OP10-23CA**.)
- Take off the 4 **screws FHC B167210** that secure the sail on the sleeves at the ends of the leading edges. (Refer to drawing **OP10-22VO**.)
- Unfasten the neoprene central joint of the upper surface by means of the zippers.
- Remove the keel pocket by means of the zippers.
- Remove the **screws CHC 6-25 B062510** that fixes the restraining straps of the sail at the ends of the two central battens. (Refer to drawing **OP10-22VO**.)
- Remove the fine cord of the CORSET, the straps and the pulley blocks attached to the central battens.
- Remove the nose battens. The nose battens are in two parts. Drawing **D194554**. The back part is encased in the front part near the king post and held in place by a pushing spring locking pin. Disengage this part backwards by pushing the pin and pulling from the trailing edge. The front part should be slid out of the sail by pulling from the opening of the pocket made at the level of the middle retaining strap (n°1) of the nose battens.
- Remove the luff-line quick links at the trailing edge. (Refer to drawing **OP10-26CA**.)
- Remove all of the pieces of the CORSET, the pulley assembly on the hang bracket and the control lever on the right A-frame strut.
- Dismantle the front and the back lower cables on keel and uprights.
- Dismantle the bolts fixing the lateral lower cables on the control bar.
- Dismantle the bolts fixing the uprights on the upper U-brackets, and remove the U-brackets from the hang bracket.
- Remove the bolt fixing the front upper cable to the nose plate, and pull cable free of sail.
- Remove the bolts fixing the lateral upper and lower cables to the cross bar, and pull cables free of sail.
- Dismantle the luff line pulleys.
- Dismantle the tensioning rail at the rear of the keel.
- Slide the sail from the rear of airframe taking care to keep sail clear of the hang bracket and king post foot.
- Remove the king post foot, the hang bracket body and rings. Insert zip-tie in the king post hole to keep internal sleeve from moving during maintenance work.
- Dismantle the bolts connecting cross bar to leading edge.
- Slide the crossbar backward to disengage them from the keel.
- Remove the aft section of leading edge.
- Remove the crossbar protection at the central junction of the crossbar.
- Dismantle all parts fixed on the crossbar.
- Dismantle all parts remaining on the keel, uprights and control bar.
- Dismantle all parts remaining on leading edges.
- Dismantle the lateral carbon battens of the exterior luff lines by opening the Velcro strips at the interior end of their pockets. (Open the 2 zippers sewn along the under surface battens in front of the openings of the bottom lateral cables in order to slide your hands inside the sail.) (Refer to drawing **UO28271-M000**.)

If the sail needs to be stored or shipped for repair, follow the instructions in 7.2.

5.2.2 Wing Reassembly Procedure

Frame Reinsertion

After the frame has been dismantled for inspection the frame must be properly reassembled to maintain a high level of safety. Particular attention must be paid to the correct orientation of bolts and washers.

Refer to drawings of the "Illustrated Parts Catalogue"

It is mandatory that all self-locking nuts that are removed are replaced with new ones.

1. Crossbar Junction Webbing
   - Refer to the drawing **OP10-09TR** and Figure 5-1 and Figure 5-2 below.
   - The cross tubes (crossbar) are symmetrical, therefore it does not matter which you choose to be right or left. The ball and socket parts have been drilled in position and are therefore matched to each crossbar. The inner sleeve in the crossbar is constructed by slicing the same tube as the outer tube, squeezing it down, and inserting it in the outer tube. Therefore the split visible at the end of the crossbar is not a defect!
   - Lubricate the male & female joints with Teflon grease.
   - Lay the crossbar **(D140640-41)** out in their approximate flying position: slightly swept back, ball and socket joint in the middle, tapered ends outwards with tapered side uppermost.
   - Temporarily secure the ball and socket joints with screw **BHC 6-94/10 (B069410)** and remove any other securing tape etc.
   - The crossbar linking strap **(D075210)** must be secured to the rear of the crossbar using two self-tapping screws **(B199010)** with **6 x14 stainless steel washers (B810610)** between the screws and the webbing.
   - The webbing should be oriented with the central split towards the crossbar.

Figure 5-1

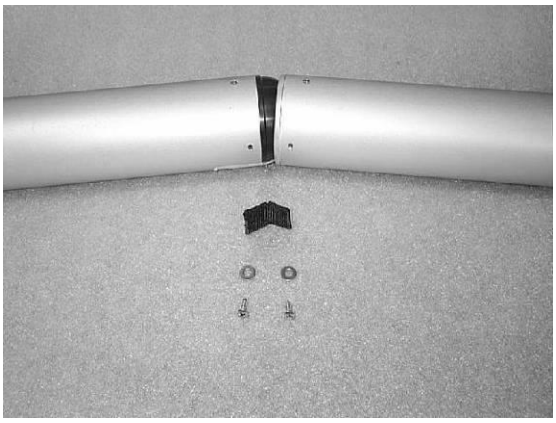


Figure 5-2

2. Crossbar Junction
   - Refer to Figure 5-3,Figure 5-4, and **drawings U028269-M040 & 45**.
   - The upper and lower pull back **tensioning cables (D204591)** are the same length. The plastic sleeves should be placed at the crossbar end.
   - The central bolt, **screw BHC 8-65 (B086710)** has the nut down.
   - Assemble all four plates **crossbar linking lugs (I220010)** on bolt with one pair top and bottom on the bolt, with the other pair on the inside of those (i.e. not staggered).
   - **8 x 18 Stainless steel washers (B810810)** are used between the plates on the central bolt.

- The **crossbar securing lugs (I220010)** are attached to the **crossbar protection sleeve (D074329)**, do not fit them at this stage.
- The crossbar attachment bolts **screw BHC 6-94/10 (B069410)** have the nuts up, assemble with **6-14 nylon washers (B820610)** between the stainless steel plates and the aluminum tubes but do not tighten the nuts yet.
- Apply thread lock to the central bolt and tighten gently, leaving plenty of movement of the pull back cables, as can be seen in Figure 5-5.

Figure 5-3

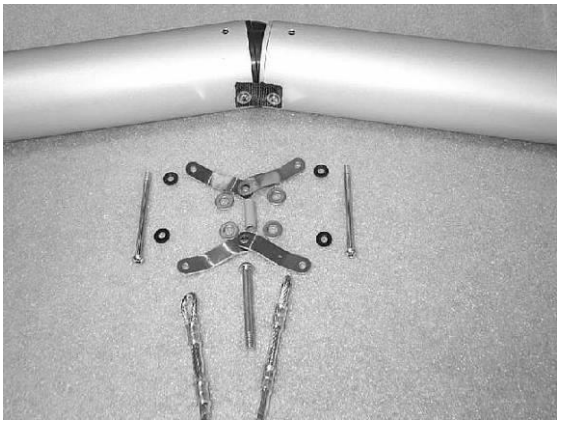


Figure 5-4

3. Crossbar/keel protection sleeve
   - Take the **crossbar protection sleeve (D074329)**.
   - Unroll the security strap towards the back and pass both pull back cables through it.
   - Mount the **4 crossbar securing lugs (D074327)** of the restraining straps to the end of the crossbar securing lugs, but do not tighten yet. Figure 5-6.

Figure 5-5

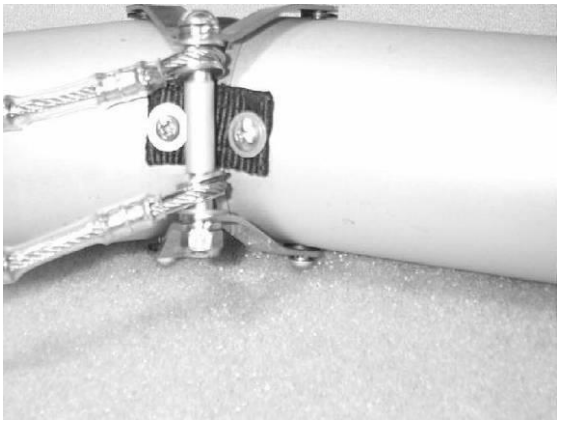


Figure 5-6

4. Nose Plates
   - Please refer to drawings **OP10-05BA** and **U028271-M030**.
   - Place the keel and the leading-edge tubes on a pair of trestles.
   - The leading edges are not defined for right/left, but do have a inside and outside. Examine the holes close to the outer end, where the crossbar attach: the smaller (8mm) hole should be turned to the outside of the frame, with the larger (10mm) hole turned to the inside.
   - Place the two large **nylon cup washers (P355010),** located on the underside of the keel, to align with the bolt holes.
   - Assemble the nose-catch **tensioning rail (D251010)** pointing rearward from the bolts.
   - The **6-14 and 8-18 nylon washers (B820610 and B820810)** are used between the tubes and the **nose plates (D255010)**.

- **Nylon stop washers (D274080-M)** are positioned under the Nylstop of the assembly screws of the leading edge to serve as a rest for each of the central battens.
- Note that the rear keel bolt, **screw FHC 6-85-15 (B168710)** is longer than the front one, **screw FHC 6-80-12 (B168310),** with two **6x14 stainless steel washers (B810610)** on top of the upper nose plate to hold the upper rigging cable later. Do not tighten this nut yet.
- Apply threadlock and tighten the other bolts gently, being careful not to crush any of the tubes by over-tightening the bolts! The leading edges must be free to pivot when rigging and unrigging, so only tighten the bolts until there is no more free play, and make sure to tighten them evenly. This can be checked by making sure the plates remain parallel.

> *Do not assemble the goose neck and lower front cables at this point.*

5. Fitting Crossbar to Keel
   - Refer to **drawings U028271-M040 & OP10-09TR.**
   - Holding the crossbar above the end of the keel, slide the protection sleeve over and up the keel to within about a foot of the nose plate.
   - Place a spacer (e.g. a broom handle or the kingpost) between the crossbar and the keel, Figure 5-7.
   - Apply threadlock and tighten the nuts holding the lugs of the restraining straps to the crossbar, leaving enough slack to allow forceful rotation of the plates. Some thread (just a little) should show from the nut. It may help to tighten the nuts quite firmly, and then back-off a little to allow the required movement.
   - Pull the back-up pull back bridle firmly down the sides of the crossbar and carefully secure them with a **self-tapping screw (B199010)** into the hole in the crossbar, placing a **countersunk washer M6 (B830610)** between the screw and the back-up pull back bridle, Figure 5-8.
   - Remove the spacer.

Figure 5-7

Figure 5-8

6. Leading-Edge Fittings
   - The hole in the leading edge is 8mm on the outside and 10mm on the inside (as mentioned earlier) to receive the **spacer (D252360)**.
   - Apply Teflon® lubricant spray on the flat side of the **aluminum cup washer (D264550)** and its mating part.
   - Assemble the parts as per the **drawing OP10-07CA**.
   - The nut should be threadlocked and tightened to remove all free-play, but still allow smooth rotation of the leading edge cardan.
7. Leading-Edge to Crossbar Junctions
   - Refer to **drawing OP10-11BT**.
   - Slide the aluminum fittings **crossbar V (D264520),** into the ends of the crossbar and check the fit of the bolts **screw CHC 8-50-15 (B085110)** and **screw BHC 8-96/11 (B090960)**.

- Note that the upper wing wire, **kingpost head (D206563)** connected to the head of the kingpost should not be attached yet, therefore do not tighten the nut on this bolt. **Lateral lower cable N1 (D203674)** is the inner wing wire, numbered 1. **Lateral lower cable N2 (D203675)** is the outer wing wire, numbered 2.
- Remember the nylon washers between the aluminum tubes and the steel tangs on the wing wires.
- Apply threadlock and tighten the outer wing wire bolt, **screw CHC 8-50-15 (B085110)**, leave no play, but ensure easy rotation of the tang on the wing wire number 2.
- Note there is no washer between the **crossbar V (D264520)** and the **leading edge cardan (D264540)** on leading edge.
- Apply threadlock and tighten bolt **screw BHC 10-65/17 (B106517)**. However, do not over-tighten the bolt: allow rotation of the bolt using firm hand pressure.

8. Hang-Point
   - Refer to drawing **OP10-02QU** et **U022193-M020**.
   - The hang-bracket is positioned so that the lowest point on the hang-bracket points towards the rear of the wing. Slide the hang point adjustment rings and the hang bracket onto the keel. The rear ring is the aluminum ring **(D263020),** the front ring is the nylon ring **(D263010).**
   - Do not use any oil, grease, or silicone spray to lubricate the hang-bracket, as this will serve only to collect abrasive dirt after a short time in service.
   - Secure the adjustment sleeves, **RAP stop ring (D263020 &D263010),** in the **rear** hang-point location, with their bolts, **screw CHC 6-80-10 (B068312),** inserted from the left side. Insert all bolts in the vicinity of the hang-bracket from the left to ease pre-flight checks.
   - Apply threadlock to the bolts and tighten gently. Do not over-tighten, the rings must remain free to pivot even when bolt is fully tightened.
   - Do not fit the nut caps **(P300610)** at this stage.
9. King-post foot/Tensioning rail
   - Assemble the parts as per the drawing **U028271-M020**.
   - Apply threadlock and tighten bolt **screw BHC 8-85-15 (B088515),** gently.
   - Do not fit the king-post until the sail has been fitted.
   - Assemble the pull-back attachment rail, **tensioning rail (D251010)**, noting that the rail points forward from the bolts. Do not tighten the nuts yet. (**drawing OP10-03QU**.)
   - Replace the three pieces of protective tape (prop tape) on the keel, as shown on **drawing OP10-03QU**.
10. Wing Structure Inspection Stage
    - An inspection must be performed before you put the airframe into the sail.
    - Use the frame control form provided in 7.1.1 to record the inspection.
    - The frame inspection stage is most easily performed with the wing opened up on four trestles, one each at the nose, at the end of the keel, and at each wingtip.

5.2.3 Sail Reinstallation

1. Preparation for Fitting the Sail
   - At this stage a workspace large enough to open the wings fully is required.
   - Place the airframe crossbar uppermost on a pair of trestles, one at the nose, the other at the crossbar ends.
   - Insert the two outer leading edges. These have a notch to engage on the bolt within the inner leading edge, and should be positioned with the mount for the tip-rods innermost (rearwards). The outer leading edges are not defined for right/left.
   - Using clean rags, bubble pack or similar padding at the end of the keel, the hang-bracket, and the ends of the leading edges to protect the sail, Figure 5-9.
   - Hang a weight on the nose, Figure 5-10, approximately enough to balance the weight of the sail when laid half-way between the rear trestle and the end of the leading edge, approximately 5kg.
   - Pull the leading edges together, still with the crossbar on top.

Figure 5-9

Figure 5-10

2. Fitting the Sail to the Airframe
   - Lay out the sail in a straight line back from the end of the leading edges, with the nose towards the structure.
   - The upper wing surface should be uppermost at the nose, folding over to show the undersurface further down the wing, aiming to achieve a straight run for the tubes down the leading edges of the sail.
   - The sail has an inner bridge between the top and bottom surfaces located inboard of the leading-edge/crossbar junctions.
   - Figure 5-13 taken inside the wing from the leading-edge/crossbar junctions shows the membrane from the top to bottom surfaces, behind the crossbar.
   - The leading-edges and the crossbar must pass in front of the membrane during sail fitting.
   - Taking care not to catch the sail on anything as you pull it over the structure, pass the nose opening of the sail over the two leading edges and slide it up to the crossbar and slide it to the level of the cross bars, observing the need to pass all tubes in front of the internal bridge. Figure 5-11 and Figure 5-12.

Figure 5-11

Figure 5-12

- Slide the rest of the sail onto the leading edges.
- Place another trestle under the end of the leading edges and remove the trestle from the crossbar end area.
- Remove the nose weight.
- Slide the nose of the sail over the leading-edges/crossbar junctions and the keel.
- Pass the hang-bracket through the nose of the sail. You may need to rotate the hang-bracket in order to pass the sail over it.
- Check for the keel reaching the hang-bracket position on the underside of the sail. The keel needs to come out of the sail at this position, Figure 5-14. It may help to spread the wingtips by about 1m around this point.

Figure 5-13

Figure 5-14

- The sail should now be completely on the frame, with the wing tips close to the ends of the sail. Check that all the tubes have passed down the leading edge side of the membrane.
- Now remove the protective packing from the ends of the keel and leading-edges.
- Thread a piece of string through the eyelets on the sail at the nose and tie to the nose plates.

3. Top Rigging
   - The upper rigging is attached to the king-post head and comprises two upper wing cross-wires, the upper forward rigging wire, and the buckle of the luff line pulleys.
   - Lay out the upper rigging with the king-post upper fitting laid on top of the sail close to the nose.
   - Thread the upper forward rigging wire down through the opening in the sail close to the nose and to the rearmost bolt on the nose plate as shown in drawing **U028271-M030**.
   - Apply threadlock and tighten the nut, while still allowing rotation of the tang as usual.

- Insert the upper wing wires through the openings in the top surface of the sail close to the cross-boom/leading edge junctions.
- The wing wire can now be attached on top of the crossbar as per drawings **UO28271-M050**.
- Apply threadlock to bolt, screw **BHC 8-96-11 (B090960),** and tighten gently, allowing rotation of the cable tang.
- Pull the lower wing wires through the neoprene opening in the lower sail surface.

4. Wing Tips
   - Refer to Drawing **U028271-M080** and, Figure 5-15 and Figure 5-16.
   - Prepare adjustable sleeve assembly.
   - Insert the bolts **screw FHC 6-75-13 (B167510)**, from the top of the leading-edge towards the under surface of the sail, not forgetting the **countersunk washers (B830610)**. Figure 5-16.
   - Set the zero position with the adjusting screw **HM 6-45 (B126410),** so that the bolts, **screw FHC 6-75-11 (B167510)**, are at the front end of the slot. Insert the tips into the leading edges if not already in place. Insert the **self-tapping screws B199010** that locks the sleeve so that the mark is aligned in the "0" position or the previous setting on the graduated scale towards the back of the leading edges. Figure 5-15.
   - Apply threadlock to the sail attachment bolts, **screw FHC 6-75-13 (B167510),** and tighten gently, then loosen by one turn to allow the tips to slide as the tension screw is adjusted. Figure 5-16.

Figure 5-15

Figure 5-16

   - Do not apply threadlock to the tensioning bolt **screw FHC 6-45 (B126410).**
   - Go to the nose of the wing; use the fine cord to pull the sail firmly as far forwards as possible on the frame.

5. Nose Battens
   - Refer to **drawings D194554-M2, OP10-22VO & UO28271-M110**
   - Lift the wing on trestles at the nose, at the back of the keel, and at the ends of the leading edge.
   - Slightly open the two leading edges.
   - Spray dry lubricant onto the front part of the nose battens, **nose batten (MD194552)**. Carefully insert them into the batten pocket openings right behind the king post. Figure 5-17.
   - Insert the rear part of the nose battens by the extremity of the pockets at the trailing edge (reflex of the trailing edge upwards must be respected), then through the loops in the back maintaining strap on the keel, **retaining strap N°3 D074351** (This strap should go under the keel, the strap seals in leather on the inside of the strap), then through the loops of the **retaining strap N°2 D074350** and finally inside the retaining strap **N°1 D074351** (this strap must make a loop around the keel and the battens). Figure 5-18.
   - The straps of the Corset hoist may be fitted at this stage or later, as indicated in paragraph 18.
   - Insert the battens as far as they will go into the front parts and pivot them until the locking pin comes out.

Figure 5-17

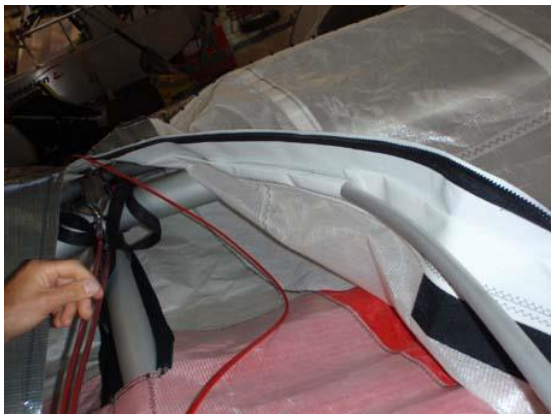
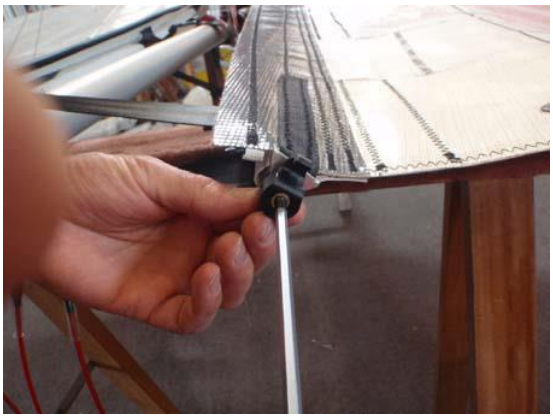


Figure 5-18

- Position the nose battens on the nuts of the fastening bolts of the leading edge above the nose plates, against the stop washers **D274080**. Figure 5-19.
- Open the leading edge progressively to the maximum, while checking that the lateral cables deploy properly at their ends without loops or knots at the neoprene openings of the sail. Proceed in small steps, going back to the nose of the wing to pull the sail forward and insure that the central battens stay in place on the nuts of the leading edge. Help the deployment of the sail on the frame by pulling it backwards on the keel and at the tips of the wing if it is not centered.
- Fasten the retaining straps of the sail to the end of the nose battens and the CORSET batten guides of the lateral batten of the trailing edge, as shown in drawing **UO28271-M0140** and **OP10-22VO.** Figure 5-20.

Figure 5-19

Figure 5-20



6. Upper Surface Battens
   - Put in place the lateral battens, **internal carbon battens D190910**, of the exterior luff lines. Open the 2 zippers sewn along the under surface battens in front of the lower lateral cables in order to slide you hand and the batten itself. Fasten the Velcro strips to hold the battens in position. Close the under surface zippers. Figure 5-21.
   - Insert the upper surface battens in their pockets. The battens whose tips are red belong on the left side of the wing.
   - Install the **batten tighteners P235020** on the straps of the trailing edge. Figure 5-22.

Figure 5-21

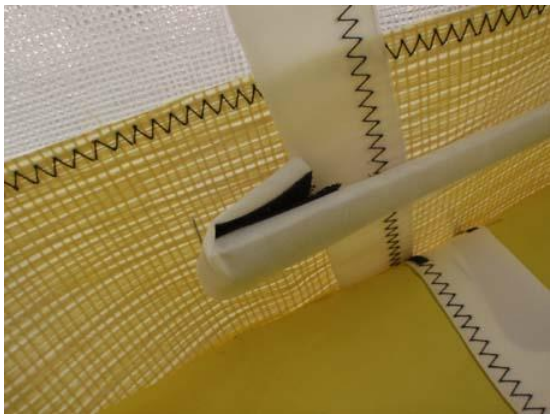


Figure 5-22

7. Pull Back Attachment
   - Refer to drawings **OP10-24ET** & **U028271-M010**.
   - Pull the **pull back cables (D204591)** back behind the kingpost.
   - Check that the pull back cables are not crossed or wrapped around the keel.
   - Thread the pull back cables one by one through the anti-chafe **leather boot (D074811)**.
   - Check cables inside of the sail once again for straight runs, no twists. Figure 5-25.
   - Fit the **rear lower cables (D202573)** on the balancing lug by means of the axles and their split pins. Install the main fixing plate to the fastening screws of the tensioning rail under the keel by inserting two **nylon washers 6-13-2 B820510** so as to leave the central part of the last restraining strap free to slide between the two screws. The leather stops on the strap must be placed on either side of the plate on the inside of the strap to limit the travel. Figure 5-24.

Figure 5-23

Figure 5-24

   - Apply threadlock to the tensioning rail bolts, **FHC 6-70-11 (B167010),** and tighten the bolts gently.
   - The standard position for the catch bolt, **screw CHC 6-30-10 (B063210),** is the most forward hole. Apply threadlock and tighten moderately.
   - Take one **stainless steel shackle (I112510)** and place it onto the pull back cables. Fit the haul-back **goose neck (D251510)**, checking the correct orientation of the catch, then tighten the nut.
   - Apply threadlock, slide the bolt **screw CHC 6-30-10 (B063210)** on the goose neck catch and tighten the nut.

8. Luff Lines
   - Put in place the central neoprene of the upper surface by means of the zippers, up to the back of the king post foot.
   - Insert the king post on its foot.

- Assemble the luff lines on the **pulley block (D255520)**. (Refer to drawing **OP10-26CA**.) The doubled interior luff line, **luff line N°1 D207006**, should be placed in the groove of the front pulley and the exterior luff line, **luff line N°2 D207007**, in the groove of the back pulley. Figure 5-25.
- Apply threadlock and gently tighten the connecting bolt, **screw CHC 6-30-10 (B063210)**.
- Check that the pulley is free to rotate.
- Attach luff lines N°1 to the straps that pass through the eyelets of the trailing edge by means of the **stainless steel shackles (I120310)**.
- Attach luff lines N°2 to the straps of the lateral battens that pass through the eyelets by means of the **stainless steel shackles (I120310)**. (One shackle on each side of the straps.) Figure 5-26.

Figure 5-25

Figure 5-26

- Do not apply threadlock on the shackles. Close & firmly tighten their nuts.
- Check the position of the luff lines on the pulleys at the top of the king post; place them in such a way that they do not cross.

9. Uprights
   - Check that the wing is still opened out fully.
   - Slide the Corset cord through the right A-frame upright and the plastic guides at their ends. Figure 5-27.
   - Assemble the upright upper bases **D257820,** to the **A-frame top (D150410),** and to the hang bracket on the keel. Refer to drawings **D150429, D150431** & **U028271-M060.**
   - Apply threadlock and gently tighten the upright securing bolts, **screw BHC 8-63/13 (B086313).** Also tighten the main bolt, **screw CHC 10-125-15 (B112810).**
   - As usual, do not over-tighten the bolts in order to allow rotation of the parts.
10. Wing Tensioning
    - Prepare the correct position of the sail and cables by pulling on the tensioning cables, then releasing.
    - Check the straightness of all the wires onto their tangs and bolts and that they are not obstructing the opening of the sail on the leading edges.
    - Tension the sail fully by pulling the goose-neck until it hooks on the screw on the rail at the back of the keel, taking care to go through the **inside of the triangle formed by restraining strap N° 1 of the central battens on the keel at the back of the king post**, then flatten the goose-neck and secure it with the push-pin. Figure 5-28.

Figure 5-27

Figure 5-28

- Secure the back-up pull back bridle webbing to the main pull back cables with a ziptie to keep it close to the hang point. This will ease access when rigging, as the hang point back up cable also threads through this back-up loop.

11. A-Frame Corner
    - Refer to the drawing **OP10-32MO** which shows the front view of the port side control frame.
    - Thread the extension base of the right upright D258722 to the lower end of it.
    - Assemble the front lower cables **D201591** and rear lower cables **D202573** to the uprights using the **CHC / BHC 8-55-13 B085510** screws, washers and nuts as shown in view B on the drawing.
    - Thread the wing wires through the **control bar leather protection boots (D074916)**. The stitching must be on the back side.
    - Reinstall a heat shrink sleeve **(P371836)** on the control bar using a heat gun or a hair dryer and assemble the bases **(D258010)** at its ends. The sleeve must be positioned in a balanced manner with respect to the bends of the control bar.
    - Position the control bar at the lower end of the uprights.

> ⚠ ***Take care of the positioning direction ! (cf 3-6-1, 5)***

    - The **lower side cable N1 (D203674),** fixed on the inner drilling of the cross bar, is positioned at the front of the assembly.
    - The **lower side cable N2 (D203675),** fixed on the outer drilling of the cross bar, is positioned at the back of the assembly.
    - Apply threadlock and gently tighten the nuts, allowing easy rotation.
12. Batten Clasps
    - Firmly push the battens in their pockets by hand.
    - Close the **batten clasps P235020** on the tips of the battens, batten **screws P235015**.
13. Nose of Sail
    - Check the symmetry of the sail leading edges at the nose plates, move the sail into the middle by means of the string.
    - Check the tension of the upper part of the sail leading edge at the nose plate, pull downwards on the string if necessary to achieve a smooth profile.
    - If the front part of the leading-edge has been changed, drill a 4mm diameter hole into each leading edge through the eyelet, remove the string and secure with a self-tapping screw. If not, align the eyelets with the existing holes and secure with the **self-tapping screws B199010**. (Refer to drawing **OP10-23CA** & Figure 5-29.)
14. Wing Tip Adjustment
    - Each wing tip should now be tensioned 10 full turns of the tensioning screw, **screw HM 6-45 (B126410)** (or the value that was checked prior to dismantling the wing if particular settings need to be reproduced). Figure 5-30.
    - This should be counted from the start of the slot, or when the slackness in the adjuster screw is first felt to be taken up. Each turn is equivalent to 1mm of sail tension.

- Pop the plastic **covering caps (P201610)** over the tips.

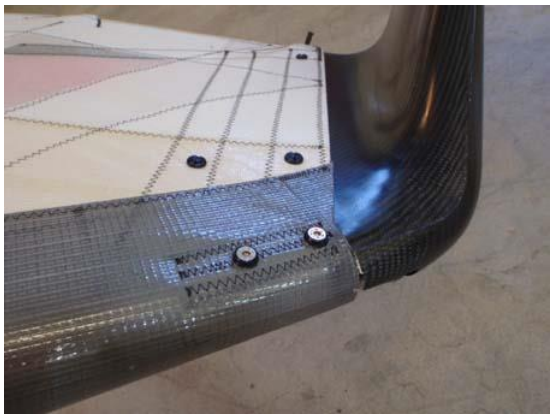
Figure 5-29

Figure 5-30

15. Front Lower Rigging
    - Refer to drawing **U028271-M030**.
    - To maintain the correct tension of the front lower longitudinal cables the goose-neck catch bolt **screw CHC 6-30-10 (B063210)** should be placed in the second rearmost hole in the **tensioning rail (D251010)** when the hang point bracket is in the standard middle position.
    - Apply threadlock and tighten the nut on the catch bolt.
    - Attach the goose-neck, **goose-neck (D251510),** to the cables, remembering to apply threadlock to the bolt and tighten gently. Don't forget the nylon washers between the shackle and the nose catch goose neck.
16. Final Rigging
    - Go to BioniX² wing final assembly stage inspection and perform steps 1 & 2 in the **While Rigging** section of 7.1.2.
    - Lift the wing onto the control frame and attach the nose catch.
    - Place the wing on its nose.
    - Install the undersurface battens.
    - The recesses in the batten tips should seat against the underside of the leading-edges.
    - Attach the Velcro holding the sail on the crossbar near their junction with the leading edges. Figure 5-31.
17. Tip Fins & Tip Battens
    - Refer to drawing **U028271-M130**.
    - Place the two **carbon wing tip battens D190920** on the plastic lug attached to the tube of the leading edge, and tighten them with the **clasps P235020**. Respect the color code of the batten tips, red on the left. The tension of each side should be similar unless special adjustments have been performed and need to be conserved. The standard setting is 3 revolutions (counterclockwise) of the batten tip in relation to its maximum screwed position.
    - Put the wing tip fins **D089010** in place by inserting them between the lower & upper-surfaces and locking them in place by means of the three-quarter-turn screws, **Dart screws P313005**. Figure 5-32.
    - Secure the tightening bungee of the under surface, which should go in two fold over the upper surface clasp. Solidarize the udersurface sailcloth with the intrados of the fins by pressing the Velcro.
    - Test the tension of all of the upper surface batten clasps. It should be sufficiently high that the lateral wrinkles of the sail are reduced, but not excessive so that closing the clasps remains easy. The standard setting is 3 revolutions (counterclockwise) of the batten tip in relation to its maximum screwed position.
    - When this step is finished, the tension of the clasps should be identical on each side, the upper & lower-surfaces being smooth and without wrinkles.

Figure 5-31

Figure 5-32



18. CORSET
    - Refer to drawing **Y153020 & OP10-35CO**.
    - Reassemble the pulley blocks of the CORSET hoist. Check that all of the pulleys are perfectly free to turn without friction. Figure 5-33.
    - Secure the CORSET pulley blocks to the central battens by means of the straps and stainless steel loops and wrapping them around the central battens in the 3 openings made in the pockets. Figure 5-34.

Figure 5-33

Figure 5-34

- Lock the back right strap of the hoist on the central right batten by means of a **self-tapping screw B1999010**. Figure 5-35.
- Assemble & secure the pulley fitting of the CORSET fine cord on the hang point bracket by means of the two **screws BHC 6-25 B062610** and the 2 **nylon washers 6-14 B820610,** the 2 **washers 6-13-2 B820510** and the 4 **washers 6-14-4 B820710** as indicated in drawings **OP10-34CO & U028271-M120**. Apply threadlock to the two fastening screws. Do not over tighten the fixing screw **BHC 6-20 B062110** of the pulley so that it can rotate freely.Figure 5-36.

Figure 5-35

Figure 5-36

- Refer to drawings **Y153030 & UO28271-M100**.
- The fine cord of the CORSET has a knot on the end near the control lever. Thread the cord in the hole on the flat surface of the **cone-shaped pulley D274011** of the control lever by the free end and pull it until the knot is blocked in its housing.
- Assemble the controls of the CORSET and its cone-shaped pulley on the right base so that the body is slightly turned towards the center of the A-frame (about 25°) and positioned nearest to the attachment of the lower front cable, which corresponds to the measurement indicated in drawing **OP10-35CO**. Do not tighten **screw CHC 6-20 B062010** too tightly (the threading is nylon). If dual control bars have been installed for instruction, the body should be turned towards the outside of the A-frame in order to allow for the full rotation of the handle. Figure 5-37.

Figure 5-37

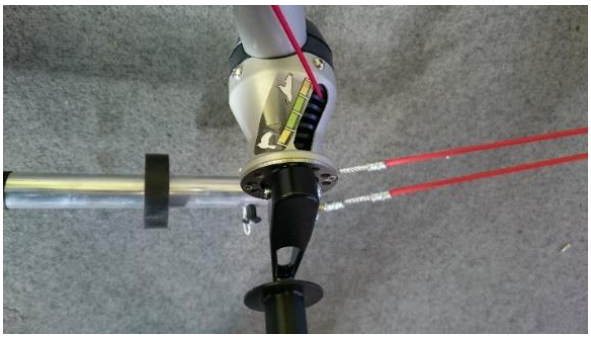


Figure 5-38

- Thread the fine cord in the four guides of the right A-frame strut then on the pulley of the hang point bracket, then wrap it around the pulleys of the hoist and through the hole in the adjusting screw near the trailing edge, as shown in drawing **OP10-35CO**. Tie a figure eight knot right behind the adjusting screw to tighten the retaining straps of the hoist without constraining the protection plate. Tighten the CORSET to the maximum using the lever. You should be able to tighten by hand the slack of the fine cord behind the adjusting screw, **5 more centimeters**, before the front pulleys of the hoist make contact. Adjust the position of the knot to obtain these 5 centimeters. Check by measuring the axel spread between the two central nose battens at the point of **screw 6-25 B062510** securing the guides of the central batten of the trailing edge. A precise measurement of **455mm** should be obtained. Adjust the position of the knot slightly if necessary. Thread the plastic finishing cap, cap for bungee **P230010**, tie a figure eight knot at the end of the fine cord, and close the cap. Figure 5-38.

- Fit the CORSET's pretension bungees in a loop around the nose battens, near the most forward opening in the pockets, just forward the first maintaining strap of the CORSET hoist. The end of the bungees with their plastic caps will be fastened in the most forward hole of the upper plates of the hoist by means of **stainless steel shackles**. Figure 5-38 and **drawing UO28271-M110 & OP10-35CO**. The purpose of these bungees is to avoid slack in the fine cord when the CORSET is being manipulated on the ground, with a lack of aerodynamic forces on the sail. Adjust the tension of the bungees so that there is no slack of the string above the handle of the Corset when the handle is brought back from the most stretched (fast) position to the least stretched (slow) .
- Finish closing the central neoprene joint of the upper surface with the help of the zippers, put in place the trailing edge batten **D190932** and secure it in the safety rings of the zippers. Figure 5-39 and drawing **UO28271-M140**.
- Attach the keel pocket by means of the zippers beginning by the trailing edge. Figure 5-40.

Figure 5-39

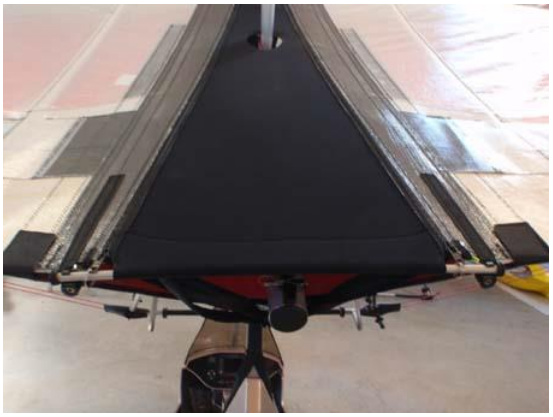


Figure 5-40

Inspection after Reassembly

It is good practice to have an independent person check the airframe. Air Creation always uses a different person for checking the assembly process. Included in 7.1.2 is the Final QA sheet, which may assist in performing the final inspection process. This QA is used by trained personnel and does not represent all of the instructions that are necessary for a safe aircraft. It is to be used as a reference only.

5.3 Inspection Notes

Air Creation wings have been designed to permit easy inspection and operators should have no difficulty in assessing problems or recognizing damage if visual checks are carried out correctly.

Maintenance checks may require partial disassembly of the wing. Inspection should include a thorough visual check of the condition of the component and the attachment point in adequate lighting conditions.

Cleaning of the component may be required for proper inspection. Significant scratches, cracks, galling, corrosion or any other mechanical wear of the component is reason for replacement. The sail requires special attention to the condition of the fabric, after significant amounts of environmental exposure to elements such as UV radiation, chemicals and heat, as well as mechanical wear (and or tears).

The Pilot's Operating Handbook outlines checks required prior to each flight.

5.3.1 Tubing

Inspection

Inspect tubing for cracks, damage from abrasion, corrosion, elongated holes or distortion in tube surface.

Inspect holes in tubing and surrounding areas for cracks during scheduled inspections.

The shaped control bar deserves special attention: the central heat shrink sleeve must be cut to allow inspection of the elbows of the tube. A new sleeve will be replaced before reassembly.

Ensure that the areas are clean. A 10X magnifying glass and good lighting will improve this visual inspection for cracks.

General Care

The tubes can be washed down with warm water and a light detergent followed by rinsing with fresh water.

There are no known fatigue problems with Air Creation wings, but excessive loads and vibration can weaken the structure. Regular inspection for hairline cracks in areas under high stress, such as bolt holes and tube junctions is recommended.

Some components can be replaced with ease, for difficult repairs or if the repair process is not fully understood consult your Air Creation technical station or the Air Creation factory.

Installation & Removal

When removing or installing tubing do not bend or force tubes.

Corrosion

Inspect tubing for corrosion inside and out. Discoloration of the metal may indicate corrosion. Salt is the most common cause of corrosion during coastal operation. Parts affected by salt must be stripped and thoroughly cleaned before reassembly. The cause of the corrosion must be identified and eliminated. If corrosion (pitting or oxidation) is present, the component must be removed and replaced with a new part.

Straightness

Inspect tubing for bending using a perfectly flat surface. The following table gives the maximum admissible bending per meter:

Max Bending Admissible/Meter

Tubes	Tolerance
Keel	2 mm
Front leading edge	5 mm
Crossbar	3 mm
Rear leading edge	4 mm
A-frame struts	2 mm
Kingpost	2 mm
Control bar	+/- 4 mm on total length (1350 mm)

Replacement

Aluminum tubing comes in many different sizes and grades. As sections of the airframe are manufactured from tubing made specifically to Air Creation specification, it is mandatory that only genuine replacement parts, supplied by Air Creation are used.

⚠ *Never attempt to repair tubing. Always replace with a genuine new part.*

5.3.2 Bolts

All airframe bolts are High Tensile Bolts. If it is necessary to replace any bolts or nuts it is important that the specifications of the original bolt are matched when a replacement is selected.

⚠ *Never replace bolts with any other size or grade. The length of the bolt is important. If a shorter bolt is used the thread may encroach on the load bearing area, which increases the stress.*

Installation & Removal

- After tightening, all bolts should have at least 1 to 2 threads showing.
- All Nylstop nuts should not be installed more than once.
- Be sure not to over-torque bolts when installing.
- Check assembly instructions for correct bolt placement.

Inspection

- Check bolts for worn shanks, bad threads or corrosion.

5.3.3 Cables & Terminals

Wire Inspection

When necessary, pull protective covers back to expose cable nearest to the Nicopress sleeve. It may be necessary to slide the red PVC coating back to see the cable next to the sleeve.

Inspection of wires should concentrate on any areas where the wires come into physical contact with other components. These areas may cause stress concentration and mechanical wear. Some areas may need to be partially disassembled to fully inspect wires. Kinks created during packing up, transport and storage should also be checked. Any degradation of wires requires replacement. Check thimbles and stainless steel tangs for deformation.

Control Cables

There is a single fine cord on the BioniX² wing, used to control the tension of the CORSET configuration system. The fine cord of the CORSET runs through the hoist on top of the keel, then through the pulley located on the hang point, then along the right strut of the A-frame through two guides before winding itself around the cone-shaped spool of the command lever. The system should be checked regularly to detect friction or excessive wear. In cases of damage is visible on the protective sleeve of the fine cord, it should be replaced. The replacement of the fine cord is in any case mandatory every 300 flight hours. This replacement is easy to perform by simply detaching the central batten of the trailing edge, opening the zippers of the central neoprene junction up to the kingpost, then pulling out the used cord and inserting a new one prepared by Air Creation. To perform this operation, follow the instructions on paragraph 5.2.3 n° 18.

5.3.4 CORSET

The CORSET system consists of four main elements: the central battens which exert tension on the sail, the hoist that controls the tension, the pulley on the hang point and the command controls.

The central battens are slid in the pockets sewn into the upper surface of the sail. The straps of the CORSET are wrapped around the battens in the openings made in the pockets. The right back strap of the CORSET is blocked on the right batten by means of a Parker screw to prevent the hoist from slipping forwards as it comes under tension. The back ends of the central battens are inserted in the front near the king post. A locking pin blocks any rotational movement of the two parts.The front and rear parts are to be inspected visually during periodic visits to find traces of wear, cracks or deformations around the straps of the hoist and the restraining straps on the keel behind the king post near the trailing edge. The general profile of the central battens is to be checked after disassembly during major overhauls by means of the drawings provided.

The hoist consists of two blocks of pulleys linked to the central battens by straps and held together by a PCV plate. This plate serves to protect the hoist from rubbing against the tensioning cables. The pulleys, mounted on ball bearings, should be completely free to turn without friction. Cleaning the pulleys is recommended during major overhauls to eliminate dust that may have accumulated near the ball bearings.

The elbow of the hang point consists of two mounting brackets and a pulley. The pulley should be totally free to turn without friction.

The command controls consist of a cone-shaped spool for winding and a handle that is locked in position by a lug that fits in the holes of a stainless steel ring which is itself secured to the body of the spool. The handle should naturally return to the locked position after being pushed forward. If the return movement is insufficient, the **spring I144917** should be replaced. The lug, **Corset index D274030** and the blocking ring, **corset indexing plate D274025** can also be replaced in case of excessive usage.

No special maintenance of the CORSET system is necessary, except the periodic checks described above.

5.3.5 Composites

The wing tip fins are made of composite carbon materials and secured to the sail by means of quarter-turn screws.

When you check the tip fins, make sure that they are not cracked, dented, or delaminated, which might detach them from the sail. Also check the condition & working order of the quarter-turn screws.

The two fins provide stability in roll and yaw at high speed. Their structural integrity is important. Each tip fin should be checked every 50 hours and after a long period of storage in a hangar, or after transport, to find any possible damage and to insure that the fastenings are working and that the materials are in good condition. The protective sticker **R1088110**, which limits friction on the ground may be replaced in case of scratches or loss of adhesive.

5.3.6 Sail

Apart from the consequences of heavy landing, or of exceeding flight limitations, the major factors requiring attention are fatigue, wear, UV exposure and heat.

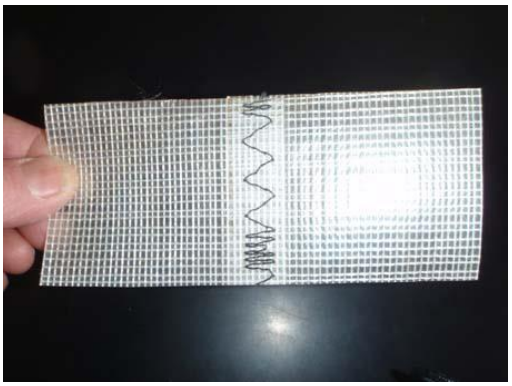
Inspection

- Check for tears in the sailcloth or any loose or unraveled seams.
- Check that none of the securing points (straps, eyelets) secured to the structure (nose, central battens, wing tips) are damaged or worn.
- Check the normal operation & complete closure of all zippers & of the assembly of the central neoprene joint.
- Check the condition of Velcro fasteners on the removable keel pocket.
- Check the condition & elasticity of the central neoprene joint of the upper surface. It should retain lateral tension and not suffer ripples once the CORSET is stretched to the maximum (configuration for high speed). If not, its replacement is imperative.

Fabric samples are stitched in the middle of the sail near the trailing edge, on each side of the central neoprene joint. Each strip is made of two pieces of sailcloth sewed together. Figure 5-41 & Figure 5-42.

Figure 5-41

Figure 5-42



During each overhaul, a strip must be cut off along the lateral stitching and on one of the transversal lines, and sent to the Air Creation factory to be submitted to a test of wear and

tear in our premises. The results of the test will determine when the replacement of the sail becomes essential for safety reasons.

Protection

Ultraviolet radiation from strong sunlight can ultimately reduce the strength of the sailcloth, but this may be reduced to an acceptable level by careful consideration of the wings use and exposure. In its bag the wing is fully protected. The sailcloth may be cleaned with warm soapy water. Strong detergents must not be used. Thoroughly rinse with plenty of clean water.

Minor Tears or Rips in the Sail

Minor repairs may be carried out by the owner of the aircraft, unless local regulations prohibit owner maintenance for sails. A repair is classified as minor if tears are less than 20mm long, provided that no free edges (such as the wing trailing edge) are broken and that the tear is isolated and not within 50mm of an existing seam line or 100mm of the trailing edge. Also, abraded holes no more than 15mm in diameter are considered minor. Such damage may be replaced with self-adhesive patch material (often called "sail tape" or "sticky back sail repair tape") such as used for registration letters, if possible to both sides of the fabric.

This tape is available from Air Creation.

Any other significant damage should be discussed with Air Creation or a technical station for an assessment of the best repair option.

5.3.7 Special Purpose Equipment

Training Bar Maintenance

Refer to **drawing U028271-M090**.

The training bars are likely to be installed and removed often, therefore it is important that the components are accounted for each time that they are removed and installed. The bars are port and starboard sides, and need to be installed on the inside of the down tubes. They should be inspected for bending, and at each of the bolt holes and welds as well as any other wear that may occur each time they are installed. Check the condition of the rubber top fitting too and change them if there is any kind of cracks. Also check the straps, buckles and Velcros of the top bracket on the uprights. If they are permanently affixed to the aircraft they need to be inspected at regular intervals. The frequency of inspection will depend on the amount that they are used. Prior to each flight they should be checked to ensure that they are securely attached to the uprights and base bar.

The welded base bar attachment has been made to be slightly loose, for ease of assembly.

6 Adjustments

6.1 General

Your wing was test flown and delivered in good flying order.

If you feel that the wing requires adjustment to trim in the roll or the pitch axis you should check that the problem is not caused by something asymmetrical in the frame or the battens. In order of priority check the following:

- Check that the rotating sleeves at the tips are correctly positioned and blocked by means of the self-taping screw.
- Check the attachment and the symmetry of the wing tip fins.
- Ensure that the wires, especially the reflex bridles are correctly routed.
- Check the battens profile.
- Check that the leading edges are straight and that the rear leading edges are located correctly.
- Check the keel is straight.

After checking as outlined at the beginning of this section an adjustment can be performed by the following methods:

6.2 Adjustments

⚠ *Never adjust the length of the reflex lines.*

Never adjust the internal membrane setting.

Never alter batten shape except to match the batten profile drawing.

The reflex lines are designed never to be adjusted, and their primary effect is for stability **outside the normal flight envelope**, so adjustment for flight within the envelope is pointless anyway.

The internal membrane is designed to be adjustable, but only by qualified and trained persons. Their effect on the stability and handling of the wing is complicated, and adjustment by unqualified persons could easily result in unexpected stability problems.

The batten shape is intrinsic to stability, stall behavior and handling.

⚠ *The adjustments of a flexwing requires special training and regular practice. We offer hereunder global effect of the main means of tuning, but their application is delicate. We therefore recommend that you solicit the expertise of an Air Création Technical Station or the factory itself if you wish to modify the tuning of your wing!*

Tension of the sail on the last carbon battens of the wing tips.

It is easy to adjust the symmetry of the wing by differentially adjusting the tension of the sail on the last carbon batten wing tips. To do this, simply rotate the plastic tip of the batten (**batten screw P235015**) which is fitted with a thread. The standard setting is 3 revolutions (counterclockwise) of the batten tip in relation to its maximum screwed position. Increased tension raises the trailing edge of the wing tip under consideration and reduces its lift. Decreased tension has the opposite effect. Action should be taken in small corrections (1 turn on the tip batten) and simultaneously applied in opposite directions on each side (+1 turn right, -1 turn left, for example). Check the results and increase the adjustment if necessary.

Symmetric tuning of the tension of the sail on the last carbon wing tip batten leads to a change in hands-off cruising speed. Increasing tension leads to a slowdown, reducing it leads to a speedup. The maximum tension allowed is obtained with 6 turns of tension on the batten tip.

Tension of the sail on the removable battens of the upper surface

The tension of the sail on the upper surface battens may be modified to counteract the effects of aging sail, and improve its performance. This action is not to be considered before a minimum of 300 hours of flight. To adjust the tension, simply rotate counterclockwise the plastic tips of each batten. A retensioning of 2 turns generally provides the desired effect. The cruising speed with the CORSET relaxed or tense will be increased by about 1 km/h per tensioning turn but handling in roll will be slightly reduced.

Pivoting sleeves at the end of leading edges

The swivel sleeves were preset during the first factory tests of the wing, according to the torque of the trike's engine, and they are locked in position by a Parker screw. This position can be checked by means of the positioning mark on the sleeve, which corresponds to a mark (0, +2.5, +5, -2.5, -5) on the scale stuck on the end of the tube. A further correction is possible if the modification of the tension of the last carbon batten wing tips described in the preceding paragraph has not lead to the desired trimming (in case of adaptation to a trike equipped with an engine whose torque is different, for example). Their differential rotation can be used to correct an asymmetry of the wing. The result is comparable to that of the ailerons on a conventional aircraft - lower the trailing edge produces more lift and raising it produces less.

For a wing with a left tendency, dismount the tip fins and the last straight battens of the wing tip, open the Velcro bindings of the lower surface to the upper surface at this level, and remove the self-tapping screws placed on the inside of the leading edge. Turn each sleeve clockwise to achieve the next values (+2.5 on the right, -2.5 on the left) by forcing on the fabric. After the adjustment, reassemble the screws, the battens, the tip fins and the Velcro. If the correction is insufficient for a perfect tuning of the wing, repeat the process until you reach the correct adjustment (maximum allowed: 10 mm difference right/left). Always rotate to the same value the sleeves of each half of the wing. For effective flight operation do not change the tension of the sail on the last carbon wing tip batten.

If the wing has a right tendency, the left sleeve should be rotated by 2.5 mm counterclockwise (towards +), and the right sleeve by the same value in the opposite direction, 2.5 mm clockwise (towards -).

Pivoting the sleeves can also be used to fine tune the cruising speed with the CORSET tensed or relaxed. A joint rotation of the two sleeves of 2.5 mm upwards (towards +)

slows the wing down by 5 kph and speeds it up by 5 kph for a 2.5 mm rotation downwards (towards -). The usable speed range adjustment is limited to +5 and -2.5 mm. Beyond these limits, performance and stability of the wing may be affected and unsightly wrinkles may appear on the fabric of the wing tip.

Tension of the Sail

The tension of the sail at the end of the edges may be modified to counteract the effects of aging on the sail, and improve its performance. This action is not to be considered before a minimum of 300 hours of flight.

To make this adjustment, remove the tip fins, battens and the protective cap of the wing tip and rotate the screw at the end of the sleeve with a 10mm wrench. Replace the cap and tip fins, then adjust the tension of the sail on the last straight batten of the wing tip due to changes in the position of the sail on the leading edge tubes (the same value of increase in the length of the batten as the increase in tension on the leading edge). Tighten up to a maximum of 5 turns (5 mm) and check by test flight. The cruising speeds CORSET relaxed or tense will be increased by about 3 kph for 5 mm of additional tension but handling in roll will be slightly reduced. The maximum allowed is 20 turns (20 mm) of total tension. The standard factory set tension of the new wing is 10 turns (10 mm). The minimum allowed is 5 turns (5mm) of total tension.

Tension of the crossbar cables

The tension of the crossbar tensioning cables may be modified to counteract the effects of aging on the sail, and improve its performance. This action is not to be considered before a minimum of 300 hours of flight. To do this, just move the screw that positions the tensioning swan catch back one hole on the rail at the end of the keel

The cruising speeds CORSET relaxed or tense will not change, but handling in roll will be slightly reduced, while aerodynamic performance will be improved.

Hang point position

As the CORSET is standard on the BioniX², moving the hang point to a different position than the middle (intermediate between the foremost and rearmost) is not necessary under normal use. However, for special use at speeds slower than those obtained in the center position, moving the hang point back to the rearmost provides a reduction of about 8 kph hands-off cruising speed. Moving to the position further is not recommended except in cases of excessive slowdown due to aging of the sail.

The CORSET

The CORSET has been preset at the factory. However, it is possible for a slight loosening of the fine cord to occur over time. This tension is adjusted as follows: detach the central batten of the upper surface, open the zippers of the central neoprene junction of the trailing edge up to the kingpost, and tighten the CORSET to the maximum using the lever. Measure the axel spread between the two central nose battens at the point of **screw 6-25 B062510** securing the guides of the central batten of the trailing edge. A precise measurement of **455 mm** should be obtained, **Corset fully tensed**. Adjust the position of the knot to obtain precisely these 455 mm, then close the two zippers of the central neoprene junction of the upper surface and reinsert the central batten of the trailing edge.

7 Appendix

7.1 Wing Inspection Forms

7.1.1 BioniX² 13 Wing Frame Stage Inspection (1)

Wing serial number and registration: _____

General

This stage inspection should be carried out when the wing frame has been assembled and is ready to be fitted in the sail. It is not possible to properly inspect once the sail has been fitted.

Inspection schedule

Nose plate assembly		Sat / Unsat	
1	General assembly correct (check with drawings M030)	☐	☐
2	Plastic spacer washers in position between plates and tubes	☐	☐
3	Nylon stop washers in position under the Nylstop nuts of the leading edge nose assembly	☐	☐
4	Check for over tightening (distortion of plates/tubes)	☐	☐
5	Length of the thread of bolt B168710 (nut not tightened at this stage)	☐	☐
6	Correct position of nose-catch rail (pointing rearward from the bolts)	☐	☐
Leading edges		Sat / Unsat	
1	Inspect both forward sections for damage and straightness	☐	☐
2	Inspect both rear sections for damage and straightness	☐	☐
Keel		Sat / Unsat	
1	Inspect for damage and straightness	☐	☐
2	Hang bracket fit and orientation (hang bolt hole on rear face)	☐	☐
3	Backward hang point position	☐	☐
4	Stop rings not over tightened	☐	☐
5	Kingpost fitting correctly assembled and not over tightened	☐	☐
6	Length of the thread of bolts B167010 (fixing nuts on tensioning rail not tightened at this stage)	☐	☐
7	Transparent protective film patches of the keel R108810 properly glued & positioned	☐	☐
Crossbar central junction		Sat / Unsat	
1	Check cross tubes for damage and straightness	☐	☐
2	Correct fitting of webbing hinge D074330	☐	☐
3	Check that the crossbar are free to rise up, limited by the straps of the keel protection sleeve	☐	☐
4	Correct assembly order of stainless plates (no stagger, check with drawings M040)	☐	☐
5	Thread showing through each nut on bolts B069410 (just)	☐	☐
6	Centre bolt B086710 not over tightened (cables should wiggle freely), correct length of aluminum spacer D252300	☐	☐
7	Tension cables direction (plastic over sleeves forwards)	☐	☐
8	Leather/webbing protection sleeve D074328 correctly fitted and screws in	☐	☐

9	Check condition & Teflon lubrication of male & female joints	☐	☐

Cross tube to leading edge assembly _____ Sat / Unsat

1	Check general assembly correct (check with drawings M050)	☐	☐
2	Check rotation of vertical hinge bolts B106517 (free to move but play taken up)	☐	☐
3	Check rotation of horizontal hinge bolts B088515 (free to move but play taken up)	☐	☐
4	Confirm that internal spacer is fitted in leading edges on bolt B088515	☐	☐
5	Confirm Teflon® lubrication between aluminum parts D264550 and D264540	☐	☐
6	Correct flying wire fitting and orientation (No2 nearest to hinge) (Top rigging not fitted at this stage)	☐	☐

Wires _____ Sat / Unsat

1	Check all cables are free to rotate where attached to the structure	☐	☐

Snags/rectification work required _____

_____

_____

I have inspected the wing frame to the above schedule and it has _____ Passed/Failed

Inspector Name _____

Date _____

7.1.2 BioniX² 13 Wing Final Assembly Stage Inspection (2)

Wing serial number and registration _____

General:

This stage inspection should be carried out when the wing assembly is complete. This is the final inspection before the test pilot gets his hands on it, so please look carefully!

Inspection schedule:

While Rigging

1 Check control frame upright rotates smoothly on upper hinge bolt
2 Observe for snagged/crossed rigging wires

With wing rigged and placed on control frame

		Sat	Unsat
Control frame assembly			
1	Check for straightness/damage of all tubes	☐	☐
2	Check hand bracket area for correct assembly (drawing M060)	☐	☐
3	Correct assembly & free rotation of the pulley of the CORSET fine cord on the hang point	☐	☐
4	Upper hinge bolt B112810 should be tight enough to pull control frame brackets snug, but also allow easy rotation	☐	☐
5	Check that hang bracket position is in the backward.	☐	☐
6	Check lower corners for correct assembly (drawing M065)	☐	☐
7	Securing bolts of the lateral cables sufficiently tight but also allow the side wires thimbles to rotate under light pressure	☐	☐
8	Securing bolts of the lower longitudinal cables sufficiently tight but also allow the side wires thimbles to rotate under light pressure	☐	☐
9	Check leather corner covers fitted and correctly positioned (seam rearwards)	☐	☐
Keel nose assembly			
1	Refer to drawing M030 and check area for correct assembly and security of all fastenings	☐	☐
2	Check nose area for correct position of nose battens, inserted on the nuts of the leading edges assembly, resting on the nylon stop washers	☐	☐
3	Check sail opening is centrally positioned, symmetrical and holding screws are in place	☐	☐
4	Check forward upper rigging wire is correctly positioned and secure	☐	☐
5	Check that forward lower rigging wires and tensioning rail are correctly assembled, position in the backward hole of the bolt holding the goose neck catch, bolts secure, push pin functioning correctly, wires in good condition and tension	☐	☐
King post assembly			
1	Refer to drawing M020 and check king post for correct seating at base.	☐	☐
2	Refer to drawing M070, check kingpost head area for condition and tension of wires, correct assembly of pitch lines and pulleys, pitch lines untangled)	☐	☐
Keel rear assembly			
1	Refer to drawing M010 and check area for correct assembly, security of all fastenings and catch bolt in front position	☐	☐
2	Check lower rear rigging wires for general condition and tension, attachment fittings, tension equalizer axes, bolts and split pins	☐	☐
3	Check tensioning cables for condition, tension and straightness along the keel	☐	☐
4	Retaining straps of the central battens N° 1, 2, & 3 correctly positioned, according to drawing M110.	☐	☐

5 Retaining straps of the sail secured in the cap at the end of the nose battens, maintaining connectors & batten of the trailing edge in place according to drawing M140 _____ ☐ ☐

6 Check the correct fitting of the leather tensioning boot (D074810) _____ ☐ ☐

Cross tube to leading edge assembly _____ Sat / Unsat

1 Refer to drawing M050 and check the correct position and assembly of all wires and tightness of all nuts (the tangs should be snug but free to rotate under moderate hand force) _____ ☐ ☐

2 Check that the openings of the sail are well positioned with the cables _____ ☐ ☐

3 Check general condition and tension of lower and upper wires _____ ☐ ☐

Tip assembly _____ Sat / Unsat

1 Correct assembly of the sleeves of the wing tips according to drawing M080 _____ ☐ ☐

2 Tension of the sail adjusted to 10 full turns on the sleeves right & left by means of screw B126410 _____ ☐ ☐

3 Rotation angle of the sleeves set on the right & left so that the mark on the leading edge is aligned with the 0 or the mark on the scale, self-tapping lock screw in place _____ ☐ ☐

Sail trailing edge _____ Sat / Unsat

1 Batten tighteners correctly set (Refer to paragraph 5.2.3 batten tighteners) _____ ☐ ☐

2 Check all pitch lines for general condition, that all attachment shackles are done up securely, and make sure that the lines don't wrap around each other, lateral carbon batten in place at luff line #2, Velcro fastened _____ ☐ ☐

Sail General _____ Sat / Unsat

1 Carefully check sail all over for good condition of all attachment points, stitching and general condition _____ ☐ ☐

1 Position & securing of the keel pocket _____ ☐ ☐

1 Position & securing of the central neoprene joint _____ ☐ ☐

2 Check sail for wrinkles. Large wrinkles may require adjustment of batten tighteners. Folding wrinkles in sail are normal _____ ☐ ☐

3 With a helper holding the wing in a level attitude at the rear of the keel, sight the wing from some distance in front and check for overall symmetry _____ ☐ ☐

Wing Tip Fins _____ Sat / Unsat

1 Position & attachments correct _____ ☐ ☐

CORSET _____ Sat / Unsat

1 Correct passage of the fine cord from the hoist to the controls _____ ☐ ☐

2 Correct operation of the controls, no slackness of the rope when decreasing tension _____ ☐ ☐

Finally

1 All plastic caps can be fitted to nuts _____ ☐ ☐

2 The nose cap can be fitted and checked _____ ☐ ☐

Snags/rectification work required _____

_____

_____

I have inspected the aircraft to the above schedule and it has _____ Passed/Failed

Inspector name _____

Date _____

7.2 Method for Folding the Sail

> ⚠ *Caution: If the Mylar is still installed in the wing, avoid sharp creases in this process or the Mylar may be damaged.*

1 Put the wing flat on the ground, upper surface on top.

2 Take the right wing tip and fold it over the left wing tip.

3 Take the two wing tips and bring them on the nose of the wing.

4 Proceed with a second person. One stays at the leading edge, the other holding down the inner surface panel. Fold the leading edge (which is stiffened by the Mylar insert) onto the sail.

5 Take the keel pocket and fold it so that it lies parallel to the leading edge.

6 Take the rest of the wing trailing edge and fold it on the keel pocket.

7 At this stage, the wing looks like a rectangle. Fold this rectangle in 3 equal parts, beginning from the nose.

8 Keep it folded with a fastening Velcro without tightening too hard. The Mylar of the leading edge must not be broken.

7.3 Maintenance Operation Board

Wing Type: _____ Serial Number: _____

Date	Hours Flown	Type of Operation Performed	Operator Name, Address, Stamp

Date	Hours Flown	Type of Operation Performed	Operator Name, Address, Stamp

Date	Hours Flown	Type of Operation Performed	Operator Name, Address, Stamp

615 Route de l'Aérodrome, 07200 Lanas, France

Téléphone: +33 (0)4 75 93 66 66 • Fax: +33 (0)4 75 35 04 03

info@aircreation.fr • http://www.aircreation.fr