



INSTRUCTION AND MAINTENANCE HANDBOOK

Wing Type MILD 16

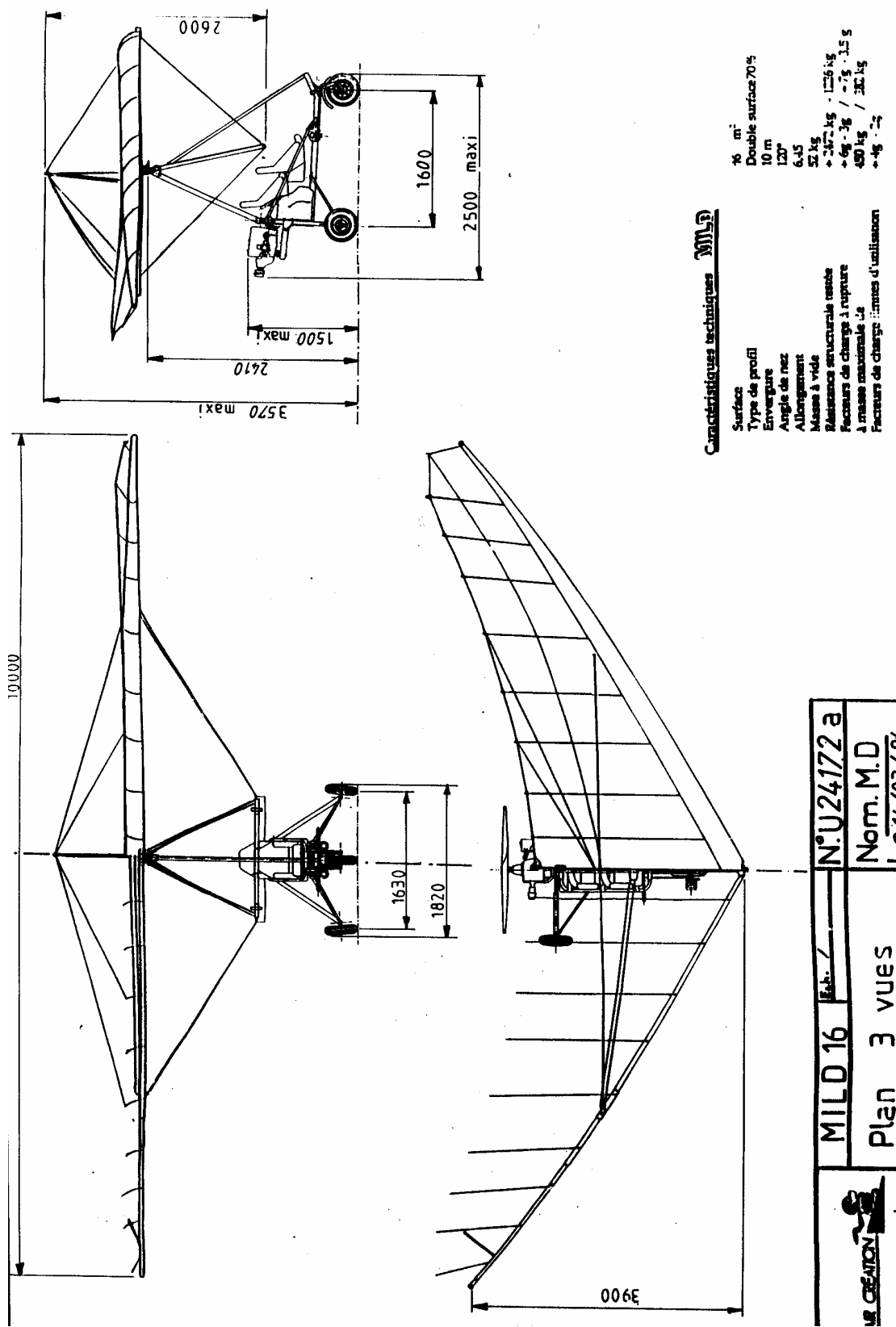
I) Drawings

II) Technical specifications - Performances

III) Instructions for use

IV) Maintenance

I) Drawings



II) Technical Specifications - Performances

a) Technical Specifications

Area	178 sqft (16,5 m ²)
Airfoil type	Double surface 70%
Span	32,80 ft (10 m)
Nose angle	120°
Aspect ratio	6.06
Empty weight	114,5 lbs (52 kg)
Tested structured strength	+5463 lbs (2472 kg) - 2731 lbs (- 1236 kg)
Ultimate load factors	+ 6g - 3g
Maximum take-off weight	992 lbs (450 kg)
Limit load factors	+ 4g 0g (-2g under gust)

b) Maximum added load/ trikes adjustment

The maximum load may be added under the wing is **877 lbs (398 kg)**. The following chart defines the useful load of our various trike models with a Mild wing.

Useful load

	TWIN 503	TWIN 503 SL	TWIN 582 SL (BUGGY)	GTE 503 S (SL)	GTE 582 S (SL)	CLIPPER 582 S
Maximum useful load	291 kg 643 lbs	287 kg 634 lbs	278 kg (269 kg) 614 lbs (595 lbs)	278 kg (283 kg) 614 lbs (625 lbs)	268 kg (272 kg) 592 lbs (601 lbs)	258 kg 570 lbs

Any trike, built by an amateur or in series production, of a total maximum weight less than 877 lbs (398 kg) may be fixed under the wing. In any case, some progressive tests will have to be done to check the adaptation wing / trike. The necessary engine power for a safe two-seater flight should be at least 40 HP. Check when fitting whether the trike propeller stays clear of the lower rear longitudinal cables and the keel. A minimum clearance of 10 cm should be respected since the wing is in its most backward position reference.

c) Performance with maximum take-off weight

TRIKE	TWIN 503	GTE/TWIN 503 S et SL	GTE / TWIN 582 SL et S (CLIPPER / BUGGY)
Max take-off weight	995 lbs - 450 kg	995 lbs - 450 kg	995 lbs - 450 kg
Stall speed	33 mph 53 km/h	33 mph 53 km/h	33 mph 53 km/h
Minimum level flight speed	35 mph 57 km/h	35 mph 57 km/h	35 mph 57 km/h
Take-off run	180 ft - 55 m	200 ft - 60 m	180 ft - 55 m
49 ft clearing distance	475 ft - 145 m	490 ft - 150 m	445 ft - 135 m
Climb rate	390 ft/mn 2 m/s	390 ft /mn 2 m/s	490 ft/mn 2,5 m/s
Landing distance from 50 ft height	541 ft - 165 m	541 ft - 165 m	541 ft-165 m (558 ft-170 m)
Max L/D ratio	7,5	7,5	7,5 (8)
Max glide ratio speed	46 mph 75 km/h	46 mph 75 km/h	46 mph 75 km/h
Side wind limits	18 mph 30 km/h	18 mph 30 km/h	18 mph 30 km/h
V.N.E. (speed never to be exceeded)	84 mph 135 km/h	84 mph 135 km/h	84 mph 135 km/h
V. max (never to be exceeded in very turbulent air)	56 mph 90 km/h	56 mph 90 km/h	56 mph 90 km/h
Roll rate at 120% V min. (45° / 45°)	4 s	4 s	4 s

III) Instruction for use

a) Assembling - Dismantling

- Open the wing bag, make sure that the 'A' frame is on top, and remove fastenings and packing.
- Assemble the 'A' frame with the pushpin. Cables must not pass through the inside.
- Turn the wing over, and carefully open the two half wings to their maximum extend.
- Fit the king post onto its locating lug, take care that the tensioning cables do not entangle and that they pass on each side of the king post.
- Carefully slide the upper sail battens in their respective pockets and secure them with the doubled ropes. Do not force the battens during the assembly.
- Place the two straight battens of the wing tips on the lug on the leading edge. Carefully check the correct framing (sail tensioning screw in the tip struts axle) of the pivoting sleeves of the leading edge before to tighten the cords.
- Slip the cross tubes swan catch tensioning device through the opening upper surface at the king post backwards, pull to hook it on the rail screw tensioning at the keel tip. To simplify the operation, carefully centralize the 'A' frame and ensure that the heat shrink covering of the lower lateral cables do not get stuck in the sail opening at the cross tube-to-leading edge connection.
- Pull down the swan catch tension lever and fix it in the rail with the pushpin. Ensure that the pin is locked.
- Raise the nose of the wing and lift it on the 'A' frame.
- Fix the front lower longitudinal cables in the locating rail under the nose plate with the tension lever and the pushpin. Ensure that the pin is locked.
- Lower the wing onto its nose. Slip bottom surface battens in their pockets and secure them with the rubber bands.
- Place the tip struts into the locating sockets on the leading edges by playing acting on the retaining rubber bands. Slide your arm in the wing opening at the end of leading edge and lift up the sail to simplify the operation.
- When hooking the trike, slip the security fastening cable in the strap buckle at the king post level, make a turn backward around the king post, slip it again in the buckle, and then fix it on the upper beam of the trike. The security cable should pass under the tensioning cables. This operation secures hooking of the trike as well as fastening of the crossbar tensioning system.
- Fix the nose bonnet with the Velcro (essential point see "c" flying characteristics).

Dismantling is carried out in reverse order of the assembling operations. *Before folding up the two half-wings*, make sure that the tensioning device level isn't stuck in the opening upper surface forward the king post in order to avoid hooking one of the units of the sail or the structure when closing the leading edges.

b) Preflight-check

A preflight check is essential before lifting up it above the trike. To that effect, position the wing horizontally after having hooked the trike.

- Check the camber of the two leading edges and correct attachment of the nose bonnet.
- Check the thimbles and nicopress of the front lower longitudinal cables and the correct fastening of the tensioning device and pushpin.
- Slide your hand along the leading edges to check for possible defects.
- Check the crossbar/leading edges connection by unzipping the lower surface access. Check fastening of the lateral cables is correct, the condition of these cables and their nicopress and that the sail is not snagged on a metallic part.
- Check the fastening of the sails at the wing tips as well as the correct positioning of the two sleeves (the two screws should be positioned directly in line with the tip strut), the moving of the tip struts.
- Check whether the battens and their fastening rubber bands are securely positioned, check the condition of the luff-lines and their fastening to the sails.
- Check whether any of the upper cables is looped round the king post and if the luff-lines are correctly positioned in the pulley on the rear upper longitudinal cable.
- Check the thimbles and nicopress of the rear lower cables at the keel tip.
- Check tensioning of the crossbar cables, the correct positioning of pushpin and its safety, as well as condition and fastening of the strap retaining the keel pocket.
- Slide your hand along all the lower cables to detect signs of wear.
- Check the connection of lower cables onto the 'A' frame, the condition of these cables and their nicopress, the pushpin of the control bar.
- Check the hang point device, the condition, and positioning of the tension cables. Ensure they are not crossed and check their maintaining strap forward the king post.
- Check the hang point piece (strain, cracks), condition and positioning of hooking screw, its butterfly nut and its safety ring.
- Check the correct framing of the hang point trike safety cable which must imperatively get below the tensioning cables in the buckle of the retaining strap, make a round behind the king post and pass again in the buckle before fixing it onto the upper beam of the trike (this system ensures the fastening of the trike as well as tensioning of the crossbars in case of failure of one of the main components).

c) Flight specifications

WARNING :

The wing has not been designed for aerobatics flying.

Flight envelope's respect is imperative

- **Pitch attitudes is limited to + or - 30°**
- **Roll banking limited to 60°**
- **Inverted flight is forbidden**
- **V.N.E. (never to be exceeded) : 84 mph (135 km/h)**
- **Stalls authorized only in glide path with a progressive speed reduction and throttle to idle position.**

Over these limits, some stability problems, loss of control, structural failure or irreversible "tumbling" motions can occur.

Better handling will only be reached after about 10 flying hours and roll control will be more difficult during the first flights.

– **Control bar :**

Pushing the bar forward causes the wing to pitch nose up ,which increases its angle of attack and decreases its speed.

Maneuvering the bar laterally causes the trike to shift in the opposite direction of your movement so as the center of gravity of the aircraft. It produces a roll movement in the direction of the trike displacement.

– **Short take-off and landing techniques :**

The minimum take-off run distance is reached by taking a full power with brake and nosing up the wing at its maximum from the very start of rolling. The control bar should be brought backwards immediately when the wheel are airborne to obtain a climbing speed of 40 mph (65 km/h). A short landing needs a slow approach speed of about 40 mph (65 km/h) and a flare out started few meters before touching the ground in order to touch the wheels at stalling speed. Brake and pull the control bar in order to reach a better aerodynamic braking once the rear wheels have touched ground.

– **Behavior during stalling :**

Stalling point is reached by pushing gently the control bar. When stall angle of attack is close, the control bar starts pushing back forcefully. By simple allowing this downward tendency for a moment, the wing will return to correct speed. In that case, the loss of altitude will be less than 33 ft (10 m). If the control bar stays pushed out in spite of the warning signs, the wing will stall, and the loss of altitude may easily reaches some 100 ft (30 m). An asymmetrical start on one wing is possible, particularly during the running-in of the sail (first 50 flying hours).

To avoid tumbling risk, the stalling exercises must be imperatively carried out throttle down engine, with a slow decreasing speed obtained by a progressive control bar pushing out.

– **Banking :**

Banking of the wing has to go along with a progressive pushing out of the control bar in order to make easier the maneuver and to balance the banking. By doing the opposite, a pulling in of the control bar will allow a horizontal return quicker.

With a low cruise speed adjustment, some increase in speed is necessary before the wing is put into banking to avoid stalling of the lower wing. An increase in engine power is advisable to maintain the flight level during banking.

– **Behavior in strong wind :**

◦ *When stationary on the ground*

Park the aircraft perpendicularly to the direction of the wind, with its windward wing lowered. Fix the 'A' frame on the front tube of the trike with the Velcro used for packing the sails and put chocks under the three wheels. Take down the wing off the trike and put it flat on the ground windward, if the aircraft is not going to be used immediately.

◦ *Groundruns*

Keep the sail flat into a headwind.

Push the control bar against the trike front strut with a tailwind. This will avoid tipping over. Slightly lower the windward wing with a side wind. It may be difficult to hold the 'A' frame in its position. Never let the wind lift the wing up.

◦ *Take-off and landing*

As ground run distances are decreasing considerably by strong wind, try to place yourself into wind. Should this not be possible, perform the take-off and landing maneuvers with greater speed than you normally do, in order to reduce the drift angle and counter the effects of the gradient. Keep to the axis of the runway with the front wheel control.

– **Load effect - dynamic stability :**

Increase of the carrying load will require more efforts for pitching and rolling, and create a light reduction of the cruising speed, control bar released, and an increase in stall speed.

Pitching swinging made or divergent, of a frequency about 10 seconds are possible if the control bar is let free after a pitch motion.

To counter this inherent phenomenon in behavior under load factor of the flexible sails, it is better to go along the wing movements (one hand on the control bar is enough) in order to create the necessary damping to a progressive return at the adjusting speed.

WARNING :

Do not fly without the nose bonnet. This streamlining has considerable effect over pitch and roll stability. Its lack creates an alteration of the internal pressure of the sail, which result in considerable modifications of the airfoil shape.

d) Adjustments

Hang point position

Hang point position adjustment is done by moving the hang point piece on the keel. The nylon locking rings of this part should be positioned according to the desired positions (4 positions). The hand-off cruising speed increase of about 3 mph (5 km/h) if the hang point is moved one centimeter 0,40 in. (1 cm) forward and vice versa. Each position may be used, the only effect is a change of the cruising speed, without any repercussions on stability and performances.

However, the hang point should never be brought back to its most backward point on the keel if the total added load exceeds 441 lbs (200 kg). The cruising speed thus obtained would be too close to the stalling speed of the wing. As well as, using a front maximum position with only one person on board would make piloting uncomfortable, as regards to the too backward position of the control bar when flying and the pitch pressure control decreasing. During the first flights, the hang point position should be left in its original position, which has been designed to take the aircraft easily in hand.

Warning : Any alteration of hang point position means a variation of the 'A' frame tilt and therefore modification of the lower longitudinal cables tension. There are various adjustment holes in the cable fixation rail at the nose of the wing, to allow them to keep a correct tension whichever the adopted position of the swan nose catch may be.

Position of the pivot sleeves at the leading edges tips

The two bolts of the tips adjusters have originally been designed to be in line with the tip struts. Their differential pivoting should only be used for rectifying a tendency to pull to the side. Once adjustment has been made, mark with a felt-tip pen the leading edge link with the sleeve or secure it with a pop rivet in order to find the correct position again at each assembling. If the wing pulls to the right, turn the left wing sleeve anticlockwise in order to increase the twist, and the right wing sleeve anticlockwise too, in order to decrease the twist. For a wing pulling to the left, turn the two sleeves in a clockwise direction. Should the correction not be enough for a perfect wing adjustment, tension the sail as indicated in the next section.

Sail tension

The sail tension at the wing tip may be altered to rectify disymmetry observed during flying, or to make up for wear of the sails. To perform this adjustment, remove the protecting cap from the wing tips, and rotate the bolt placed at its end with a 10 mm wrench. Put the cap back and readjust if necessary the tension of the small ropes or rubbers of the bottom and upper surface of the last wing tip batten, because of the modifications of the sail position on the leading edges tubes.

- In order to rectify the tendency to pull to one side, tighten the bolt on the leading edge of the "upward" half-wing and loosen the bolt of the "downward" half-wing, if it is not at its minimum tension adjustment already. Do two and a half turns at the utmost 0,10 in. (2,5 mm) tension on each half-wing, then test the aircraft. Repeat the operation until the wing is perfectly adjusted.
- To keep the original tension of the sails, which slacken by use, it is necessary to draw the sail symmetrically tight again on the two leading edges. The first adjustment should take place **after 50 hours of use**. A new tensioning of 0,20 in. (5 mm) (5 turns) would be necessary to keep the original characteristics of the wing. As a rule, tension increase on the leading edges means an increase in aerodynamic performance and in pitch stability of the wing. The roll rate, on the other hand, is altered by this operation.

IV) MAINTENANCE

Rigging the wing when folded in 4,5 m :

The following procedure should be followed for assembling the wing :

Open out the ends of the sail.

Slide the rear leading edges through the opening of the wing tips and in the front part of the leading edge.

WARNING : The 2 leading edges tubes are different. You will find a mark on the tube, which will tell you if it is the right part (D) or the left one (G). Make sure you do not reverse them, it may have bad results because it would modify the tip struts angle entailing positive twist of the wing tips and important pitch instability.

- Then, install the leading edges by slight turns and pushing motions in order to line up the tube cut and the connecting plates bolts with the cross bars on the front part of the leading edge. Make sure that the tip struts stand inner side and face to face. A reverse position would prevent the setting of the tip struts.
- Slide the wing tips sleeve, in the leading edges.
- Fix the sail on the leading edges with the 4 bolts FHC and the nylstop nuts. For this, while holding the extremity of the leading edge, pull the sail forward on one of the 2 leading edges with a string, which goes through the grommet, which is at the extremity of the sail. Install the bolt corresponding to the internal grommet and the inner most drilling of the wing tip sleeve. This process needs 2 persons. Make sure that the aluminum guide retainer, which adjusts the tensioning, is lined up with the cut of the end leading edge sleeve. Install the other bolt after having removed the string. Moderately tight the nylstop nut. Follow this procedure for the other leading edge. If you find it too difficult, first, remove the 2 self-tapping screws, which fix the sail on the leading edge to the nose wing. This way, the sail will move back easily. Replace those 2 screws once the wing completely opened and tensioned by pulling the sail forward or by turning it so that the grommet are lined up with the drilling. Watch out the position of the fabric around the nose plates and the nose batten in front of the keel when you will open the sail.
- Assemble the wing following the usual procedure. While opening the two leading edges, control the position of the central nose batten and check the wing is not jammed on the connecting screws.
- Rotate the wing tip sleeves, and line up the bolts of the sail attachment onto the tip struts axis. If an adjustment has been carried out before, line up with marks drawn on the tubes.
- Install the control bar on the revolving base fixed to the left trapeze strut with the CHC bolt of 6 mm, washers, and nylstop nut. Close up the leathered protection.
- Assemble the wing according to the normal procedure, check the sail fixations located at the end of the wing. Turn the rotating sleeves in order to line up the fixing bolts with the tip struts axis. Check the negative washout provided by the tip struts on the sail and check the fixation of the control bar.

Transportation :

Bumpy and long drives might damage the wing unless not properly loaded. Transporting the wing and the trike by road requires that the wing, in particular, is properly braced, cannot shake about and is generally very carefully loaded and tied down, so that no hard points can damage tubes and sail.

Carry the wing carefully on a ladder covered with foam rubber to avoid precarious overhanging.

Storage :

Keep it in a dry place protected against U-V rays. Clean it with fresh water after it has been exposed to sea air. Any grass stain should be washed out with water and household soap. Open the cover to allow the sail and the structure to dry after transport or use in the rain.

Overhauling :

IMPORTANT

IN REGULAR CONDITIONS OF USE* A COMPLETE OVERHAUL OF THE WING IS ESSENTIAL EVERY 150 FLYING HOURS AND AFTER ANY HEAVY LANDING. THIS OVERHAUL INCLUDING COMPLETE SAIL AND STRUCTURE DISMANTLING, REPLACEMENT OF ALL SCREWS AND NUTS AND A SYSTEMATIC CONTROL, MUST BE CARRIED OUT IN OUR WORKSHOPS OR IN AN AUTHORIZED TECHNICAL STATION***. IT IS NECESSARY FOR SAFETY.**

* A peculiar use (mountain, tropics, sea environments and rough fields) requires a superior frequency, i.e. every year and every 100 hours.

** Or at least every two years if the wing flies less than 150 hours.

*** Whose operators follow a specific technical training in our workshops. An updated list is available on demand.

Aging of the fabric and seams of the sails may cause an important reduction 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 closed premises. Always put it away in a sheltered place, shielded from the rays of the sun, even between flights. These measures help to lengthen sail life.

A strip of identical fabric as the one used for the top sail is stitched to it in the middle and over the keel pocket. The strip is made from two musters sewed together. During each periodical overhaul, part of the strip must be cut off, and submitted to a test of wear and tear in our premises. The result of the test determines when the replacement of the sail becomes essential for safety reasons.

Every 50 flying hours, check :

- Whether all screw is correctly tightened and that they have not worked loose as well as the back-up ropes links.
- Condition of the cables.
- The seams of the upper surface sail and the keel pocket in center of the wing.
- possible tear of the sail.
- The maintaining strap of the tensioning cables forward the king post and the one which maintains the keel pocket.
- The correct condition of the ropes of the fixation battens. Stretch it again if necessary. The tension of the ropes maintaining the two last trip battens situated at the tip of the sail should be very strong indeed.
- Fastening bolts :
 - of the cables at the bottom of the 'A' frame
 - of the 'A' frame knuckle joints to the control bar
 - of the crossbar/leading edges link
 - of the tension device on the keel
 - of the hang point systemChange them if there are any traces of wear or rust.
- The swan nose catch and leading edges-to-keel connection plates to detect wear or cracks.

In the event of heavy landing, check imperatively :

- The straightness of the leading edges (imperative dismantling of the rear parts)
- The nose plate and its nuts
- The swan nose catch (wear - cracks)
- The straightness of the keel
- The lower cables
- The fastening of the sail at the wing tips
- The seams of the keel pocket on the sail
- The crossbars and their link with the leading edges
- The screws, the 'A' frame uprights
- The tensioning device at the rear of the keel
- The battens (airfoil symmetry)
- The tip struts
- The fastening of the luff-lines on the sail

WARNING :

Every "nylstop" screw must be replaced after each *dismantling* and always tightened with a special glue of the "LOCTITE" type : 243.

- **The wing has not been designed for aerobatics flying.**
- **Flight envelope's respect is imperative**
- **Pitch attitude is limited to + or - 30°**
- **Roll banking is limited to 60°**
- **Inverted flight is forbidden**
- **V.N.E. (never to be exceeded) : 84 mph (135 km/h)**
- **Stalls authorized only in glide path with a progressive speed reduction and throttle to idle position.**
- **Over these limits, some stability problems, loss of control, structural failure or irreversible "tumbling" motions can occur.**

**All repair work should be carried out in our
workshops or at an authorized technical
station***

* Whose operators follow yearly a specific technical training in our workshops. An updated list is available on demand.

PERIODICAL OVERHAULS BOARD

Serial number : _____

Date	Hours flown	Company which has carried out the overhaul address and stamp

PERIODICAL OVERHAULS BOARD

Serial number : _____

Date	Hours flown	Company which has carried out the overhaul address and stamp

Notes

WING - QUALITY FORM

Anxious to ensure the perfection of our products, we have set a sequence of controls covering all the steps of production. We are working continuously on their improvement and we are in need of your help.

Please return this reply form accurately filled if you find any mistake or problem concerning your trike, which could affect its quality or finish, even if it is a minor one.

Your name, address and telephone number :

Type : _____

Delivery date : _____

Wing serial number : _____

Colors of wing : _____

Distributor : _____

Hours flown : _____

Problems noticed : (explanations and / or drawing)

