

Aeros-2/Cross Country ultralight

OWNER /SERVICE MANUAL



Wing: PROFI

Engine: HKS 700E

Manufactured by:

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Introduction

Thank you for purchasing the Aeros-2/Cross Country ultralight.

The Aeros-2/Cross Country ultralight is an advanced product of Aeros Ltd. It has been developed to provide the economy and durability combined with maximum safety and comfort.

The success of our ultralights based upon a high standard of product quality, innovative design engineering and exceptional standards of reliability and performance that have been established since 1991.

Please read and be sure you thoroughly understand this manual before operating your Aeros-2/Cross Country ultralight. Be sure you are thoroughly familiar with the ultralight and the contents of this manual before initial operation.

Regular maintenance is required to keep your ultralight in a safe condition. Maintenance requirements are outlined in the Wing maintenance and Trike maintenance sections of this Manual. Please reference these sections to ensure your ultralight is maintained correctly.

The operating procedures outlined in this Manual are the result of Aeros knowledge and experience gained since 1991.

Aeros data packages will be revised from time to time. It is therefore important that you visit us regularly at <http://www.aeros.com.ua>

In case of any doubts or questions contact your local dealers or Aeros.

We wish you a safe and enjoyable flying career.

Aeros Ltd.

AMENDMENT RECORD SHEET

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1. GENERAL INFORMATION

1.1 Symbols Abbreviations and Terminology

In this Manual:

CG means the centre of gravity.

IAS means the airspeed indicated on the cockpit mounted airspeed indicator.

Landing Approach Speed means the airspeed that allows control in turbulence, wind gradient or sudden engine failure during landing.

Maneuvering Speed means the indicated airspeed above which the pilot may not make full or abrupt control movements.

QNH means the pressure setting, that if set on the subscale of a sensitive altimeter, will cause the altimeter to indicate the correct local altitude above mean sea level.

Stall Speed means the indicated airspeed at which an uncontrolled downward pitching motion of the ultralight occurs or the forward control bar limit is reached.

Take Off Safety Speed means the airspeed that allows control in turbulence, wind gradient or sudden engine failure during the climb following take-off.

Trim Speed means the indicated airspeed at which the ultralight remains in a stabilized condition without pilot input.

Trike in this Manual means fuselage of the weight shift controlled powered aircraft with a power plant and a tricycle undercarriage.

Ultralight in this Manual means weight shift controlled powered aircraft with tricycle base (trike) and a flex wing.

VNE means the indicated airspeed that the ultralight is never to exceed.

1.2 Definitions

Definitions used in this Manual such as WARNING, CAUTION and NOTE are employed in the following context:

WARNING

OPERATING PROCEDURES, TECHNIQUES, ETC. WHICH IF NOT FOLLOWED CORRECTLY, MAY RESULT IN PERSONAL INJURY OR DEATH.

CAUTION

OPERATING PROCEDURES, TECHNIQUES, ETC. WHICH IF NOT STRICTLY OBSERVED, MAY RESULT IN DAMAGE TO THE ULTRALIGHT OR ITS INSTALLED EQUIPMENT

NOTE

Operating procedures, techniques, etc. which it is considered essential to highlight.

WARNING

THE OWNER AND OPERATOR MUST UNDERSTAND THAT DUE TO INHERENT RISK INVOLVED IN FLYING A MICROLIGHT/ULTRALIGHT/TRIKE/POWERED HANG GLIDER, NO WARRANTY IS MADE OR IMPLIED, OF ANY KIND, AGAINST ACCIDENTS, BODILY INJURY OR DEATH OTHER THAN THOSE, WHICH CANNOT BE EXCLUDED BY LAW.

THE SAFE OPERATION OF THIS ULTRALIGHT RESTS WITH YOU, THE PILOT.

WE BELIEVE THAT IN ORDER TO FLY SAFELY YOU MUST MATURELY PRACTICE AIRMANSHIP.

OPERATIONS OUTSIDE THE RECOMMENDED FLIGHT ENVELOPE SUCH AS AEROBATIC MANOEUVRES OR ERRATIC PILOT TECHNIQUE MAY ULTIMATELY PRODUCE EQUIPMENT FAILURE. YOU ARE REFERRED TO THE OPERATING LIMITATIONS IN SECTION 2 OF THIS MANUAL

THE SETTING UP AND BREAKING DOWN OF A MICROLIGHT/ULTRALIGHT/TRIKE/POWERED HANG GLIDER, TRANSPORTATION AND FLYING WILL HAVE AN EFFECT OVER TIME ON ITS STRUCTURAL INTEGRITY.

THE ULTRALIGHT WILL REQUIRE MAINTENANCE AS OUTLINED IN THE APPLICABLE MAINTENANCE MANUALS.

LIKE ANY ULTRALIGHT, SAFETY DEPENDS ON A COMBINATION OF CAREFUL MAINTENANCE AND YOUR ABILITY TO FLY INTELLIGENTLY AND CONSERVATIVELY.

WE HOPE THAT YOUR ULTRALIGHT WILL PROVIDE YOU WITH MANY HOURS OF SAFE AND ENJOYABLE FLYING

1.3 Two View Photos



1.4 General Dimensions

DIMENSIONS	METRIC		IMPERIAL	
Wing span	10.0	m	32.8	ft
Wing area	14.5	sq m	155.9	sq ft
Aspect ratio	6.9			
Wing weight (without bag)	51	kg	113	lbs
Wing length (packed)		m		ft
Wing length (short packed)		m		ft
Trike width	1.9	m	6.22	ft
Trike length	2.75	m	9	ft
Wheel track	1.65	m	5.41	ft
Wheel base	1.67	m	5.48	ft
Trike height (without wing)	2.57	m	8.43	ft
Cockpit width	0.8	m	2.62	ft
Overall height (control bar fwd)	3.65	m	11.97	ft

1.5 General Description

1.5.1 Trike

The Aeros-2/Cross Country trike is a two seat (in line) weight shift controlled ultralight. A HKS 700E four-stroke engine producing 60 HP powers the base. It is attached to the wing by way of a universal joint which allows the free movement of the trike in pitch and roll by which control is affected. The trike includes the tricycle undercarriage, power plant and cockpit.

The engine is mounted to the engine platform at the base of the engine. The fuel tank is mounted beneath the engine platform.

The pilot cockpit is designed to allow for various size pilots.

The cockpit has a windscreen for improved wind deflection.

1.5.2 Wing

The Profi wing is the result of continued refinement of Aeros trike wings over the years since 1991. The wing is designed for two-seater trikes. It is the result of an extensive design and development program aimed at optimizing your level of safety and satisfaction as a pilot, through high performance and strength of construction.

This wing is safely controllable and stable at a wide range of operating speeds. The strength of the wing is sufficient for different conditions of flight with defined load. It is very stable, and has been designed primarily for cross-country flying.

The Profi sail has several cloth and Velcro shear ribs, which combined with an excellent sail fit, produces a wing that has light handling and very comfortable in turbulence. The battens ends are designed to be adjustable to vary tension for tuning the wing. The batten mechanism allows effortless installation and removal the battens.

An airfoiled aluminium section is used for the down tubes and king post to achieve minimum drag.

1.5.3 Ultralight

The Aeros-2/Cross Country combined with the Profi wing has proven to be an excellent combination. The total fuel capacity is 54 litres and combined with the HKS 700E delivering a smooth 60 HP allows long cross country flights.

2. LIMITATIONS

2.1 General

The limitations section of this Manual outlines the various operating limitations, instrument function and placards necessary for the safe operation of this ultralight, engine and standard equipment.

2.2 Airspeed Limitations

SPEED	km/h	mph	COMMENTS
Vne (never exceed speed)	135	84	Do not exceed this speed in any operation
Va (maximum maneuvering speed)	120	75	Do not make full or abrupt control movements above this speed

2.3 Power Plant Limitations

2.3.1 Engine

Manufacturer: HKS

Model: HKS 700E (4 Stroke)

Gearbox ratio: 3.47:1

WARNING:

This is **non-certified** aircraft engine , the possibility of engine failure exists at all time.Do not operate this engine over densely populated areas.Do not operate this engine over terrain where a safe, power off landing cannot be performed.

ENGINE LIMITATIONS	Metric		Imperial	
Engine speed				
Take off (Max 3 minutes)	6200	rpm	6200	rpm
Maximum (continuous)	5800	rpm	5800	rpm
Power output				
Take off power	44.7	kW	60	hp
Maximum continuous power	41.7	kW	56	hp
Oil pressure				
Minimum (at 6200 rpm)	5	bar	72	psi
Minimum (at idle rpm)	1.2	bar	17	psi
Oil temperature				
Normal	80 - 100	Deg C	170 - 212	Deg F
Maximum	120	Deg C	248	Deg F
Minimum	50	Deg C	122	Deg F
Cylinder head temperature				
Maximum	170	Deg C	338	Deg F
Exhaust gas temperature				
Maximum at Max continuous power	760	Deg C	1400	Deg F
Ambient start and operating temperature				
Maximum	40	Deg C	104	Deg F
Minimum	-20	Deg C	-4	Deg F

NOTE

Minimum Oil Temperature of 50 deg C should be reached before take off. Operate for 5 min at 2000 rpm continue at 3000 rpm so that the oil pressure will not exceed 4 bar(57 psi) during run up,until minimum temperature is reached.

2.3.2 Fuel

Super grade gasoline, lead free, min RON 95 or aviation gasoline 100LL.

2.3.3 Lubricating Oil

The HKS 700E engine has dry sump forced lubrication.

In general use only brand-name 100% synthetic oil, API classification .SJ. Multigrade is recommended. Take the viscosity of the oil named with SAE at least 15W-30, if available 5W-30 is highly recommended. 0W-30 or 0W-40 is recommended in winter.

Oil Capacity: 4 Litres (this will vary based on the oil line layout and oil cooler size used), oil level is between 1/2 and 2/3 of the oil tank after 3 minutes idling, and consumption 0.1 Litres/Hr Max.

2.3.4 Cooling System

Free air -cooling.

2.4 Weight limits

	Metric	Imperial
Maximum take off weight	472.5 kg	1050 lbs
Empty weight (with Emergency Rescue System)	232.5 kg	517 lbs
Permitted range of pilot weights		
Front seat	55-100 kg	122-222 lbs
Rear seat	0-100 kg	0-222 lbs
Total maximum crew weight	200 kg	444 lbs

2.5 Operational Limits

2.5.1 Centre of Gravity limits

Centre of gravity limits are not critical on the trike of a flex wing ultralight. Having the trike unit attached to the wing with a universal bracket, variations of cockpit loading and fuel loading cannot influence the ultralight's balance. The Aeros-2/Cross Country is therefore not critical in regards to centre of gravity although the distribution of load in the trike has an affect on the in-flight attitude of the ultralight.

2.5.2 Maneuvering Limits

All aerobatic maneuvers including spinning are prohibited.

Aerobatic manoeuvres including stalls, stalled spiral descents and negative G manoeuvres are not permitted. It must be emphasized that a stall, spiral descent or negative G manoeuvre can never be conducted safely. These manoeuvres put the ultralight outside the pilots control and put both the ultralight and its occupants in extreme danger.

Do not pitch nose up or nose down more than 45 degrees from the horizontal. The front support tube of the trike and the pilot's chest limit the fore and aft movement of the control bar respectively.

2.5.3 Bank Angle

Do not exceed 60 degrees of bank angle. In roll there is no stop for the control movement. When performing the pre flight procedure check that the wing moves freely by lowering each wing to within 10 cm of the ground (on ground level).

2.5.4 Flight Load Factor Limits

Max positive maneuvering load factor: 4.0 G.

Negative load factors prohibited.

Load factors below 1.0 G to be avoided.

2.5.5 Kinds of Operation Limits

The ultralight is only to be flown under visual flight rules (VFR), and the minimum equipment required to operate under VFR conditions are an Air speed indicator, Altimeter and instruments required by the engine manufacturer.

Additional equipment may be required for some foreign operations.

2.5.6 Fuel Limitations

Tank capacity 54 liters (14.3 US Gal)

2.5.7 Maximum Passenger Seating Limits

One passenger maximum allowed.

2.5.8 Minimum Pilot Weight

The microlight ultralight must only be flown solo from the front seat. Minimum pilot weight flown solo shall not be below 55 kg. Maximum power at minimum take off weight can cause an abrupt climb rate that, if uncorrected, may cause climb angles of greater than maximum of 45 degrees.

Approximately 2/3 of maximum take off power is considered comfortable for a minimum take off weight. Take off distance will be extended at reduced power.

2.5.9 Other Limitations

Maximum Cross Wind - 6m/s

Maximum Wind Strength - 12m/s

Maximum Ambient Operating Temperature + 40 ...-10 deg C

No person who is untrained or unqualified in weight shift controlled flight or, who is unfamiliar with the wing and trike combination, should ever attempt to pilot the ultralight unless under professional instruction. The effect of light rain on the ultralight can increase the stall speed. It is extremely important to maintain speeds in excess of the take off and landing safety speeds when the wing is wet. If the ultralight has been left out in the rain or heavy dew it is necessary to wipe the wing down prior to take off. It is also recommended that the ultralight be flown solo first to ensure all excess moisture is removed. Continued operation in heavy rain is not recommended due to the abrasive effect of raindrops on the propeller.

CAUTION

MOISTURE ON THE WING CAN INCREASE STALL SPEED AND SHOULD BE REMOVED PRIOR TO TAKE OFF.

3. ULTRALIGHT & SYSTEMS DESCRIPTION

3.1 General

This section provides descriptions of the ultralight and its systems as well as methods of operation where appropriate.

Information on the ultralight flight controls is detailed in this section, but it is mandatory that you receive professional training prior to any solo flight.

3.2 Ground / Flight Control

Ground / flight Controls are as follows:

- Push left pedal = Taxi steering right
- Push left toe = Brakes on
- Ignition switch forward = Switch on
- Choke forward = Choke on

- Control bar move left = Right turn
- Control bar move right = Left turn
- Control bar push out = Pitch up
- Push right toe = Throttle open
- Hand throttle forward = Throttle open

3.3 Trim device operation

Aeros-2/Cross Country ultralight could be equipped with the trim device mechanism for trimming the ultralight in pitch.

Specifications of the Wing Trim Device

Voltage supply	9 – 14 V
Nominal force	300 kg
Maximum force	1000 kg
Consumption current at nominal force	10 A
Travel	92 mm
Emergency travel	100 mm
Complies with	IP54
Moving speed	15 mm/sec.
Operating mode	Short-term, repeated
Temperature range	-15...+55 °C
Time to failure	
relay	500000 turn-ons
terminal switch	100000 turn-ons
electric motor	1000 hours
Dimensions	Diam. 48 x 371 mm
Weight	1.425 kg

NOTE:

In the power supply system of the trim device it is necessary to have a 15A safety fuse.

For take off and landing the trim device position is 25 – 30 mm from most aft position (visual check).

For cruise trim the ultralight on desired cruise speed with the trim device.

The travel range of 92 mm is sufficient for trimming the ultralight in the horizontal straight flight at the speed range of 65 – 100 km/h.

After the trim device has reached the most for or aft positions its travel automatically stops.

WARNING:

THE TRIM DEVICE IS DESIGNED TO OPERATE IN HORIZONTAL FLIGHT, DURING TAKE OFF AND LANDING ONLY.

WARNING:

IT IS NOT RECOMMENDED TO USE THE TRIM DEVICE IN MOST FORWARD POSITION IN TURBULENT AIR IN ORDER TO AVOID EXCEEDING MAX. LOAD FACTOR.

CAUTION:

DO NOT LEAVE THE TRIM DEVICE ON IN MOST FORWARD AND AFT POSITION FOR LONG PERIOD OF TIME.

The trim device consists of:

- travel mechanism;
- rear bracket;
- front bracket;
- joint unit;
- electric wiring with connectors, control switch and safety fuse.

The control switch is mounted on the right side of the cockpit (Aeros-2 trike) or on the seat frame bottom bracket (Cross Country trike).



NOTE:

In case of the trim device failure in most forward position it is recommended to use flat, with no obstacles landing field which is long enough for landing due to increased landing approach speed.

3.4 Instrument panel

The instrument panel consists of:

- air speed indicator;
- variometer;
- altimeter;
- oil pressure gage;
- oil temperature gage;
- head temperature gage;
- engine operation time counter;
- fuel gage;
- tachometer;
- compass.

The instruments arrangement is shown on the photo:



The Pitot static gage supplies ram air pressure to the air speed indicator from the nose of the cockpit.

The static pick up is at the rear of the instrument under the dash.

The power switch, ignition switches and the starter button can be found on the bottom side of the dash.

3.5 Occupant restraint Harness

Both front and rear seats are fitted with a restraint harness system.

When flying the trike solo it is important to fasten the rear seat belt to prevent contact with hot engine components in flight

3.6 Engine

The power unit is a HKS 700E 4-stroke engine designed and built in Japan. The HKS 700E engine is fitted with a gearbox, which delivers smooth thrust via a reduction drive. This power unit is complemented with a ground adjustable propeller giving the ultimate in performance and reliability. The engine is fitted with Bing carburetors with an external dry filter.

3.7 Propeller

Manufacturer: Aerolux

Model: _AL-E3R

Type: 3 Blade Composite ground adjustable

Diameter: 1800mm

Pitch:

The maximum propeller speed occurs when the engine RPM reaches 5800 RPM.

The propeller pitch is set at 14-16 deg. . Settings outside this specification have an unknown effect on the Ultralight performance, and are not approved.

3.8 Carburetors air heating system

The system is designed for minimizing risk of carburetor icing.

With ambient temperatures between 0 deg.C(32 deg.F) and 10 deg.C(60 deg.F) and very high humidity, carburetor icing may occur.

Control switch is mounted on the left side of the cockpit(Aeros-2 trike) .

3.9 Brake System

A front wheel disk brake system or rear wheels hydraulic disk brake system is used on the ultralight.

Parking brake operating:

- in case of the front wheel disk brake system, press the brake lever, lift up the rack and fix the brake lever;
- in case of the rear wheels hydraulic disk brakes, press the brake lever, lift up the brake valve handle.

Depressing the brake lever on the left hand side of the front footrest actuates the brake(front wheel disk brake system)or lowering the brake valve(in case of rear wheels hydraulic disk system).

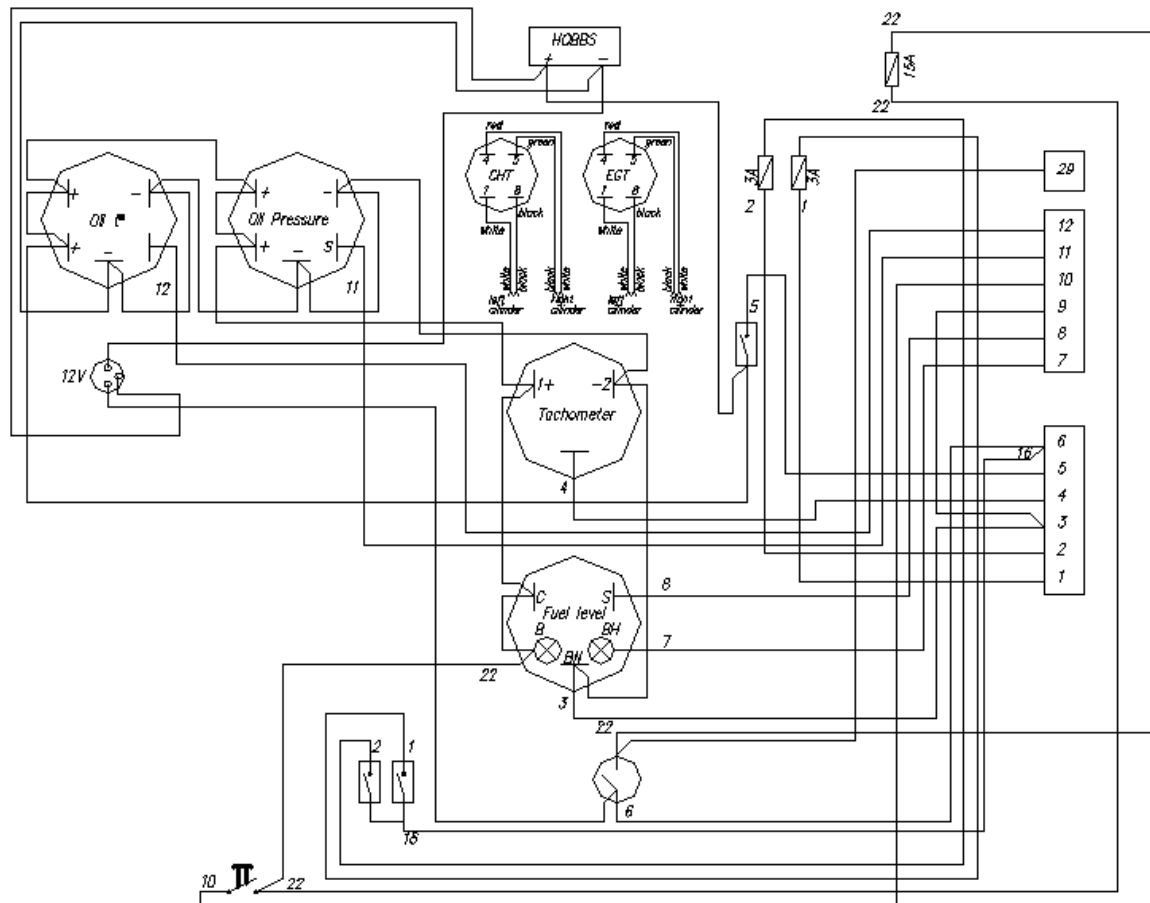
3.10 Electrical System

Electrical schematic for the ultralight is shown in the diagrams.

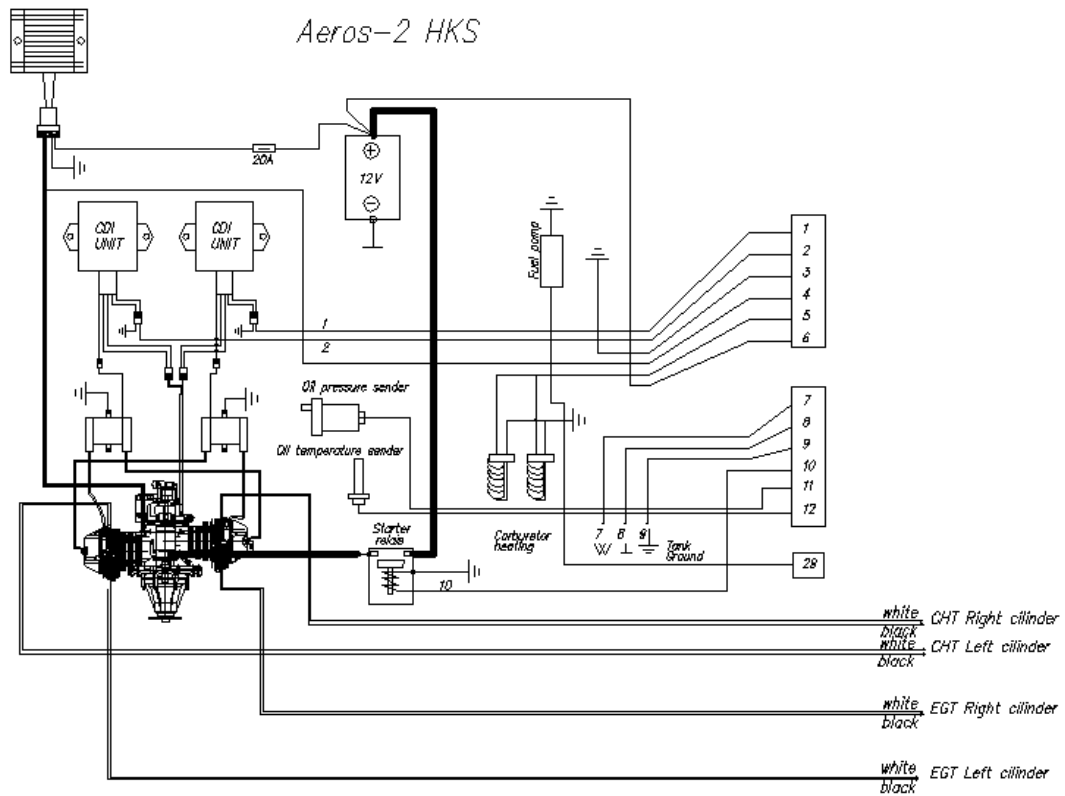
The Electrical circuits comprise:

- instrumentation circuit. The 12 V DC supply is protected by a 25 amp fuse at the battery. The master switch on the dash, when in the off position, disables the DC power socket, flight instrument and the electric start push button;
- engine management circuit;
- ignition circuit.

When stopping the engine both switches on the dash should be switched off. The master switch on the dash should then be turned to the off position to remove supply to the accessories.



Aeros-2 HKS



3.11 Emergency Rescue System.

The ultralight is fitted with emergency rescue system MAGNUM 450 (made in Czech Republic). The rescue system provides for landing in case of emergency without the necessity for the pilot to leave the ultralight in the air. It is necessary to remove the safety lock before each flight and the safety lock must be replaced before the pilot alights from the ultralight.

4. ULTRALIGHT ASSEMBLY PROCEDURES

4.1 Wing Assembly Procedure

The following sequence of procedures assumes that the wing is packed up. If the wing and base were already assembled this section is not required.

Your instructor should demonstrate the correct assembly and disassembly procedures for your ultralight. This section is intended as a reference only and assumes prior knowledge of assembly Aeros ultralight.

4.1.1 Set up procedure from the package 4 meters long

Having used the specific techniques described in this manual you will perform the set up and break down procedures without any difficulties.

However, the following procedural descriptions are not intended to be a substitute for the familiarization procedure of your dealer at the time the wing is delivered.

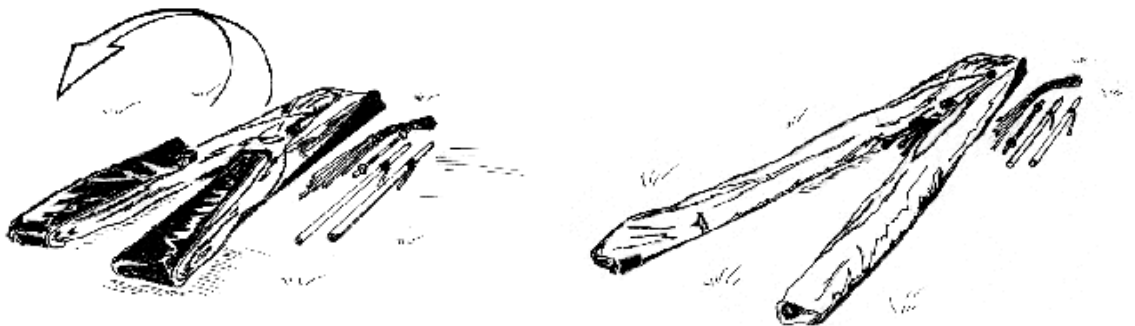
The set up procedure should be carried out on a clean, not abrasive surface. Before performing the set up procedure you must place the glider nose to the wind. During this procedure you must make a preflight inspection of the wing.

4.1.1.1. With the glider in the bag (4 metres long) lay the glider on the ground.

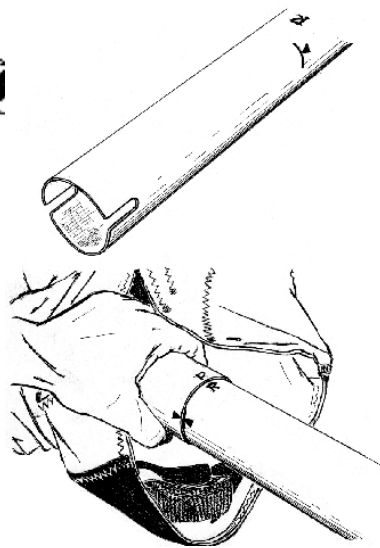
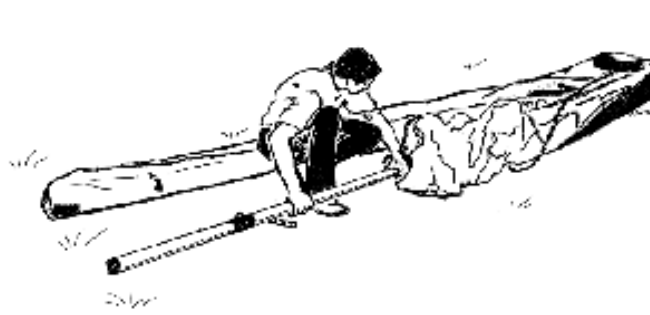
4.1.1.2. Undo the zipper. Untie the Velcro straps. Remove the battens, the control bar and the leading edge tubes N3 from the bag.

4.1.1.3. Turn the glider so that the downtubes packed into the safety bags are on the bottom and kingpost is on the top.

4.1.1.4. Unfold the sail along the leading edge.

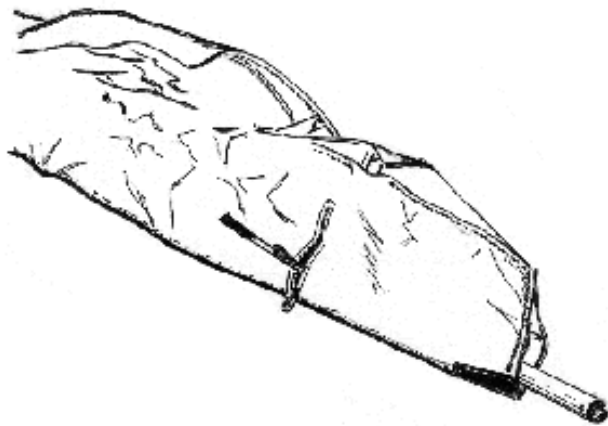


Attach the leading edge tubes N3 to the leading edge tubes N2 according to the marking (L-left, R-right, marks must be on the top).

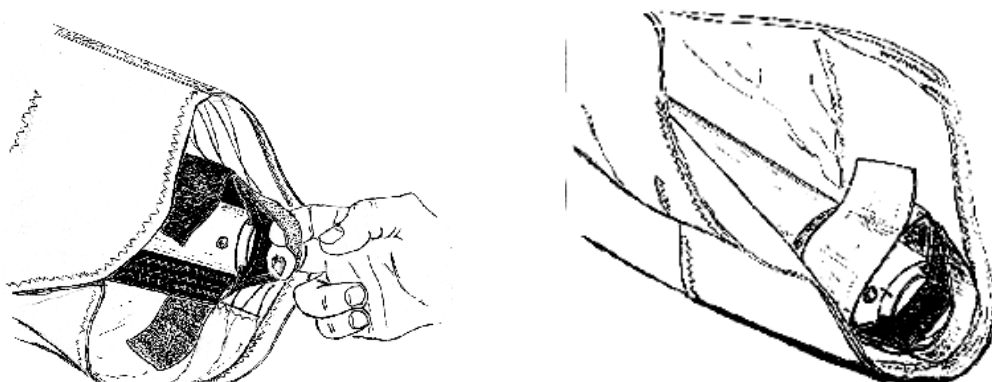


4.1.1.5. While installing the leading edge tubes into the sail, place the washout struts facing forward toward the nose of the wing and along the leading edge tubes.

Put washout tips outside of the sail through the access zippers. Make sure that the leading edge tube #3 is properly installed.

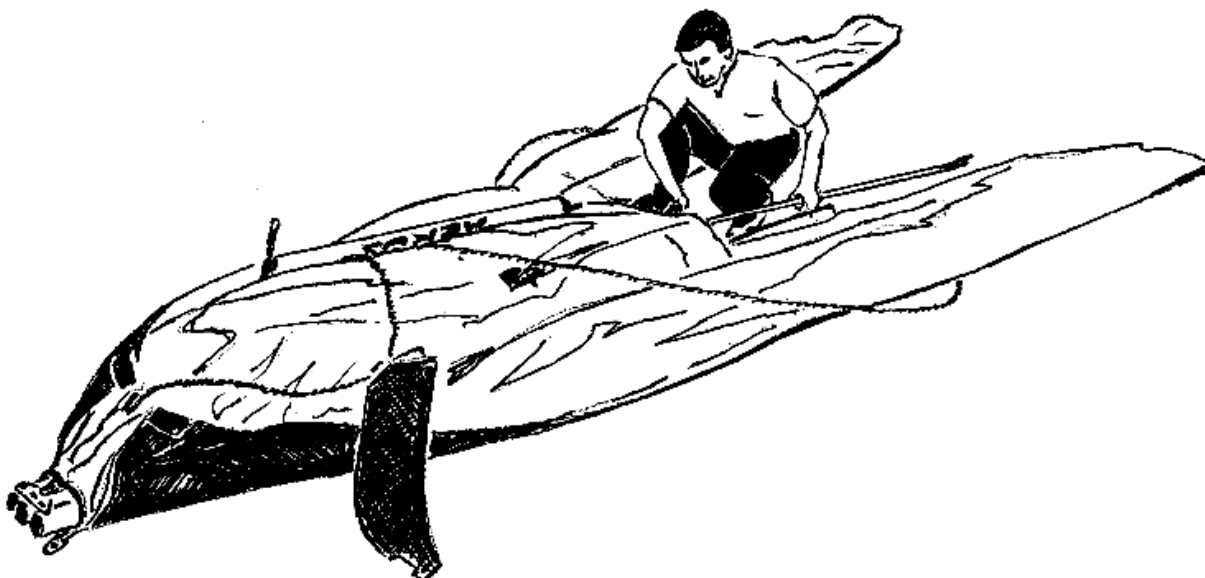


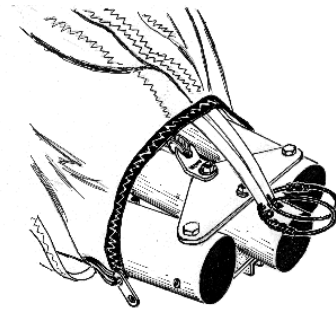
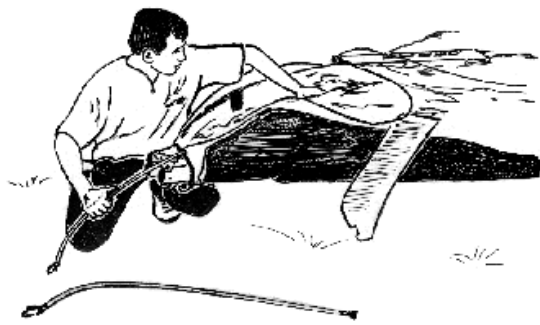
4.1.1.6. Tighten the sail along the leading edge and mount it to the rear leading edge, make sure to align the sail mount webbing squarely in the slot and attach the securing Velcro. The sail is mounted to the leading edge by the inner (forward) of the two loops of webbing. The outer loop is a pull handle only.



4.1.1.7 If the keel and #1 battens don't installed in the sail, it's necessary to make this. Remove the battens from the batten bag and install the #1 battens to the wing. Next step is to install the keel battens.

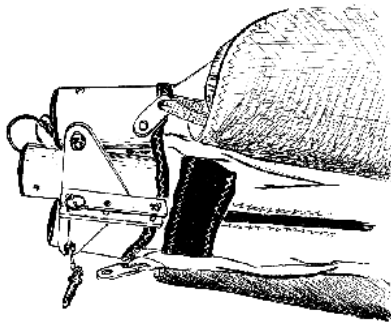
Aeros convention is that blue marked battens go in the left wing and red marked battens in the right. But you can feel free to install them the other way around, i.e. blue marked battens go to the right and red marked battens go to the left. This is because Aeros do not tune glider's turn by changing battens camber, so originally your glider comes with left and right corresponding battens symmetrical between each others. Battens are numbered from the center outwards, and the longest batten in a Profi is designated as the "# 1" batten.



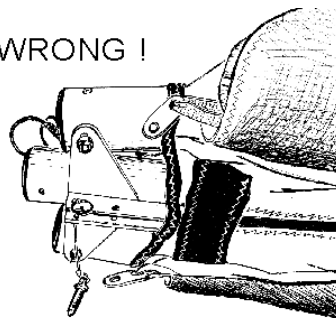


4.1.1.8. Spread the wings all the way. **Pay attention to the nose bottom part of the sail, it has to be located between the keel tube and nose channel!**

Near the kingpost hole find the shackle of the sweep wire. Pull the shackle out the rear end of the keel pocket, and check that the sweep wire is not wrapped around the keel. Install the pin of the kingpost to the corresponding place on the keel tube. Attach the shackle of the sweep wire to the hook which is placed on the keel tube. Install the tangs on the nose of the sail over the bolt and secure the assembly with a nut.



WRONG !

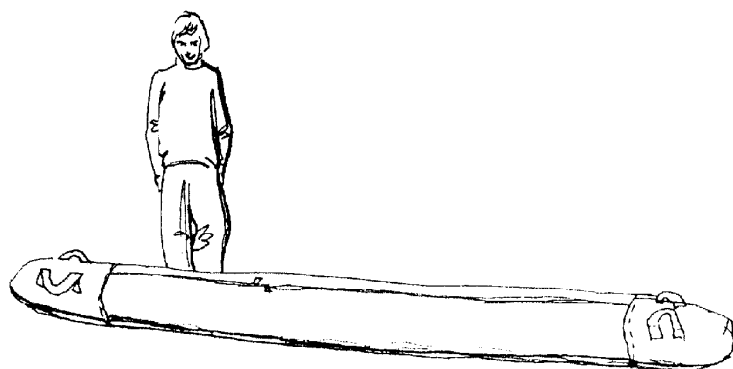


4.1.1.9. Release the sweep wire from the hook on the keel tube to loose a tension of the sail.

4.1.1.10. The further set up procedure is similar the one from a 6-meter long bag (Section 4.2.2, except points 4.2.2.1-4.2.2.4).

4.2.2 Set up procedure from the package 6 meters long

4.2.2.1. With the glider in the bag (6 meters long) lay the glider on the ground.



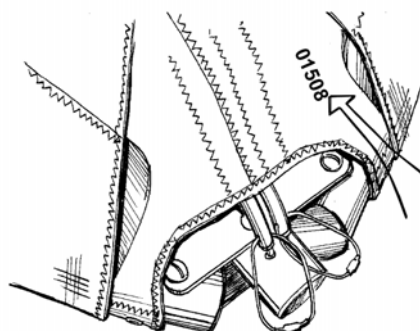
4.2.2.2. Undo the zipper. Remove the battens and the control bar from the bag.

4.2.2.3. Untie the Velcro straps.

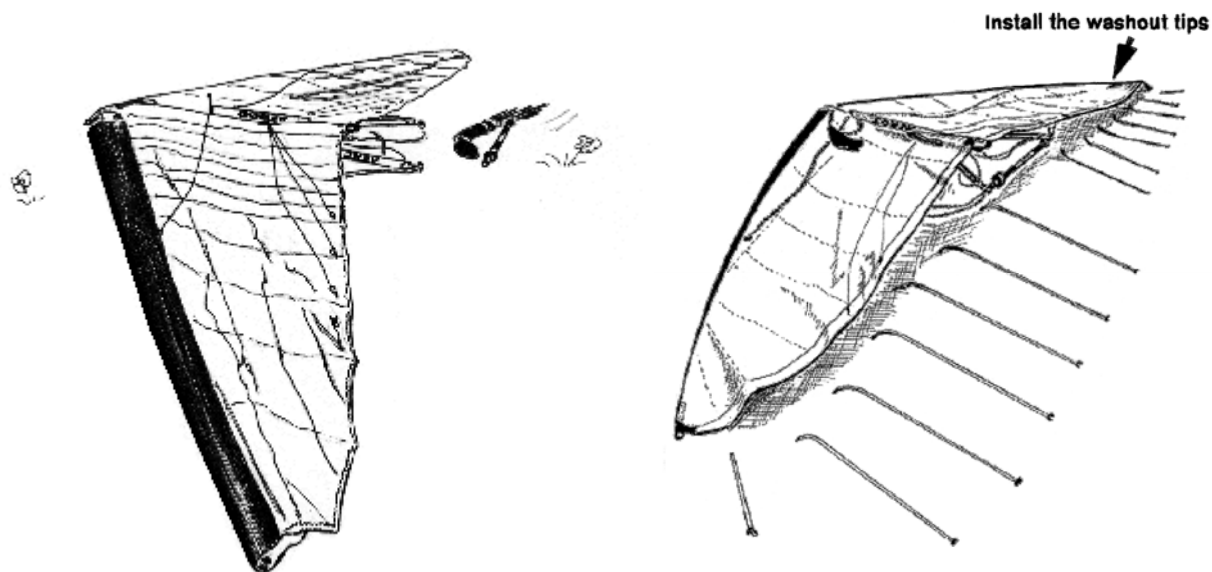
4.2.2.4. Turn the glider so that the downtubes packed into the safety bags are on the bottom and kingpost is on the top.



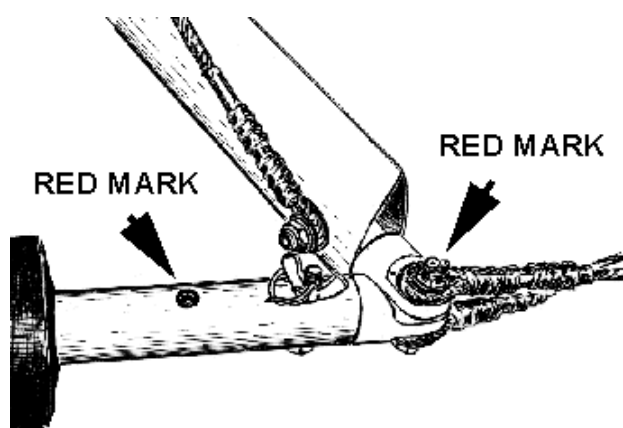
4.2.2.5. By lifting up and back on the nose batten strings, push the nose battens fully back into the sail so that the tips rest on top of the keel tube.



4.2.2.6. Spread the wings so, that the sail is a little loose and the glider is resting flat on the ground.



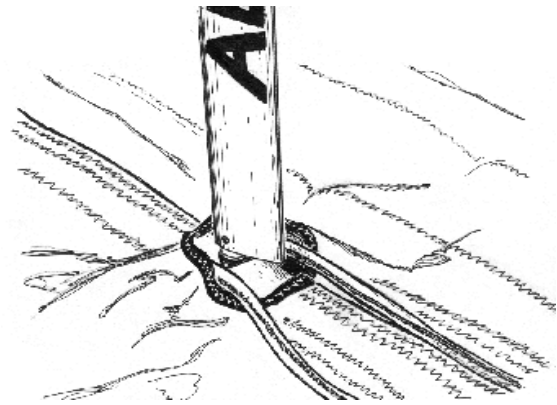
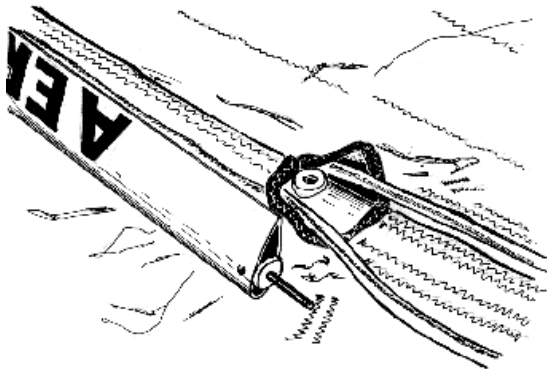
4.2.2.7. Remove the protective bags from the downtubes. Spread the downtubes. Install the control bar according to the marking. Fix the control bar using nuts and safety rings.



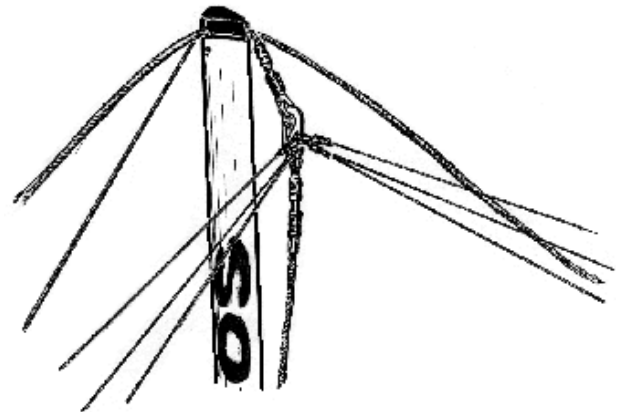
NOTE: Take care that the reflex wires and the top wires are not wrapped around the keel and are free from the keel hardware.

Put out of the sail the cross tube tension wire and install the pin of the kingpost to the corresponding place on the keel tube.

The kingpost has to be placed between cross tube tension wires!



4.2.2.8. Attach the hook of the top rear wire with the washout wires to the thimble of the top front wire. Make sure that the hook is not inverted and the reflex wires or top wires are not twisted.

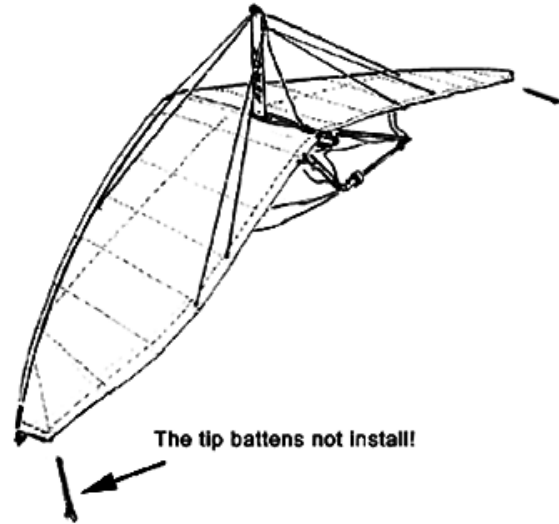
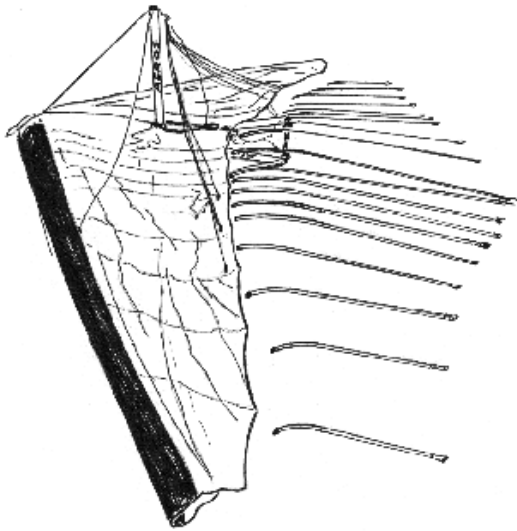


4.2.2.9. Remove the battens from the batten bag, and check each batten for symmetry against the corresponding batten from the other wing. Align the battens at the nose, and at about the 60% chord point. There should not be any deviation of more than 3mm (1/8") from one batten to the other along the full length of the battens. Correct any that are asymmetric using the template.

Aeros convention is that red marked battens go in the left wing and green marked battens in the right. But you can feel free to install them the other way around, i.e. red marked battens go to the right and green marked battens go to the left, you need only to adjust the sail tension along the battens. This is because Aeros do not tune glider's turn by changing battens camber, so originally your glider comes with left and right corresponding battens symmetrical between each others. Battens are numbered from the center outwards, and the longest batten in a Profi is designated as the "# 1" batten.

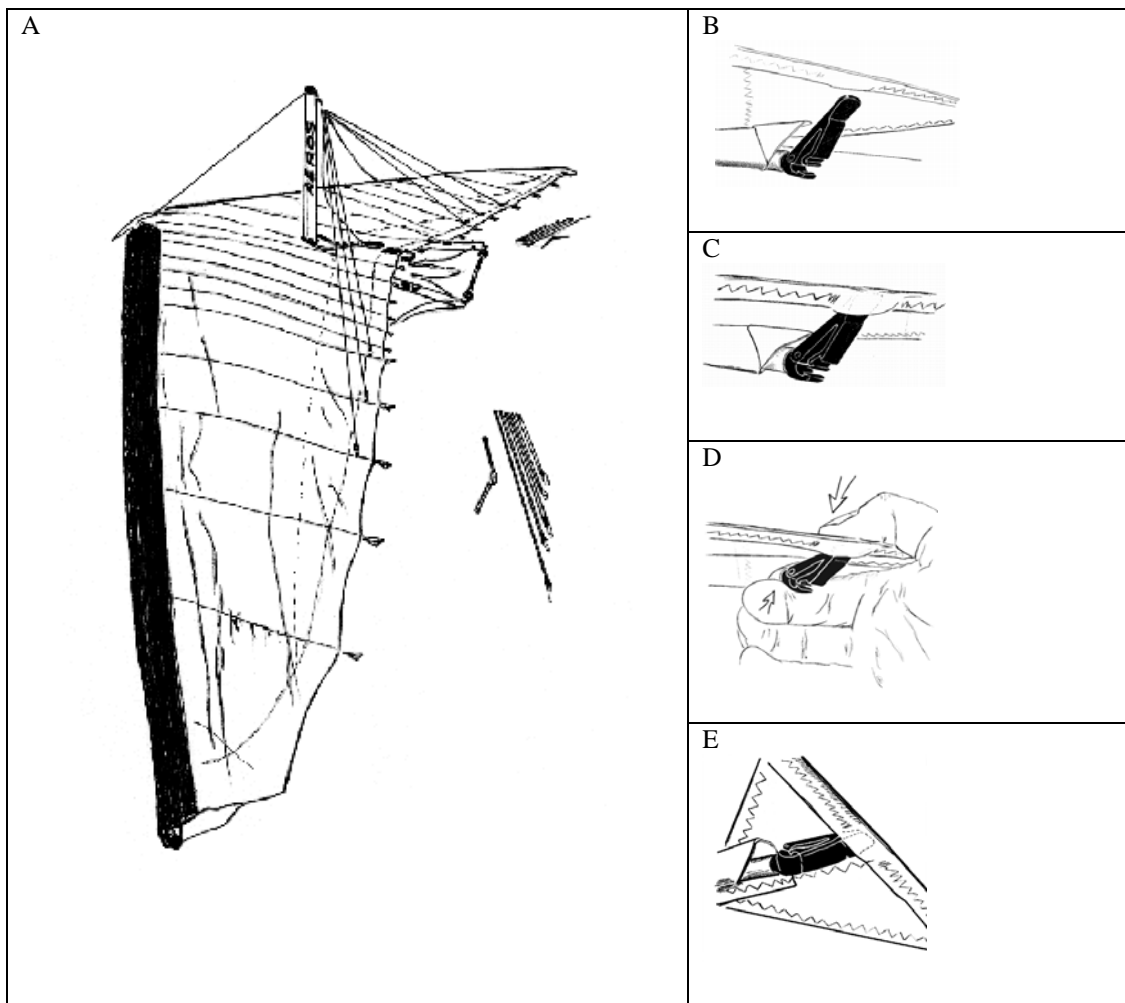
Install the cambered top surface battens in the sail, leaving out the shortest two on each side for now. Insert the battens carefully, so as to minimize stress and wear on the sail. Never insert or remove top surface battens with the crossbar tensioned (except for up to the last two on each side) and never insert or remove battens with heavy wind pressure on the top of the sail or in any condition which causes the battens to slide with great resistance in the pockets.

If you choose not to check your battens for symmetry before each flight, you should, at a minimum, check them once a month.

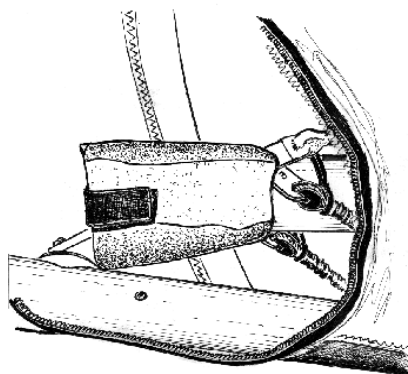


NOTE: Two longest battens are not removed from the battens pockets during the break down procedure.

4.2.2.10. Install the lever batten tips into the hem of the trailing edge. At each batten, make sure the opening in the underside of the trailing edge hem is spread to accept the tab on the batten tip. Make sure the tab slides fully into the hem. Except battens #9, 10, 11 (it should be made after sail tensioning).

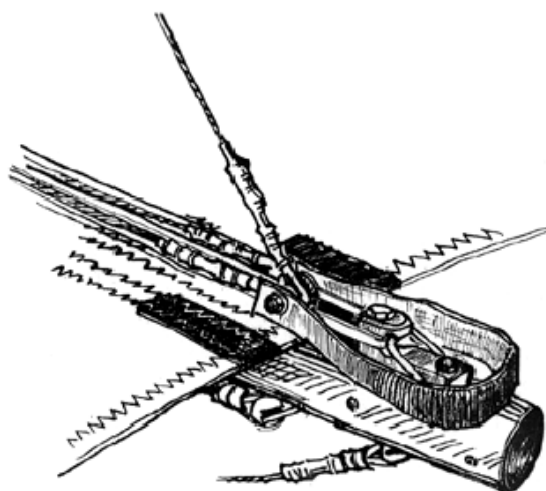


4.2.2.11. Check all wires for twisted thimbles or tangs.

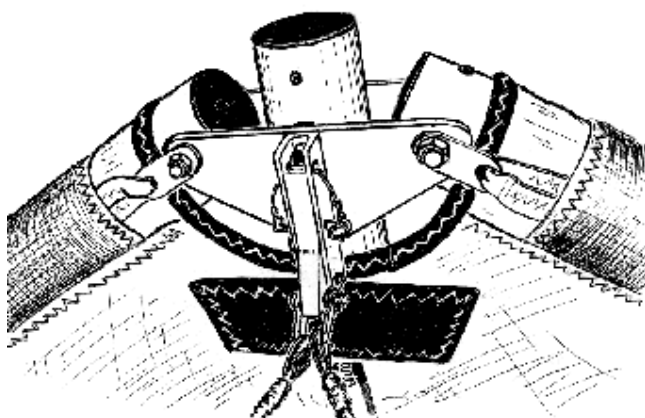


4.2.2.12. Attach the shackle of the sweep wire to the hook which is placed on the keel tube.

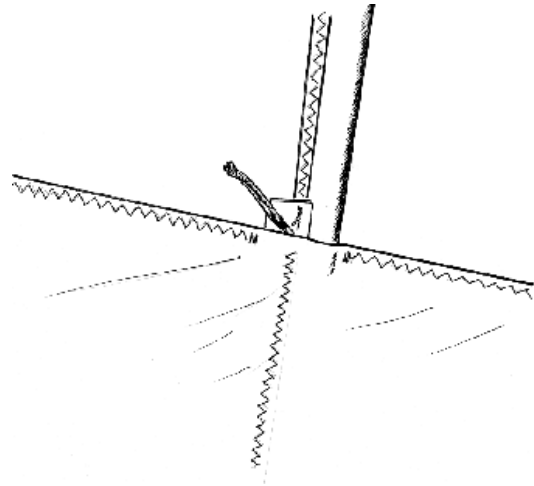
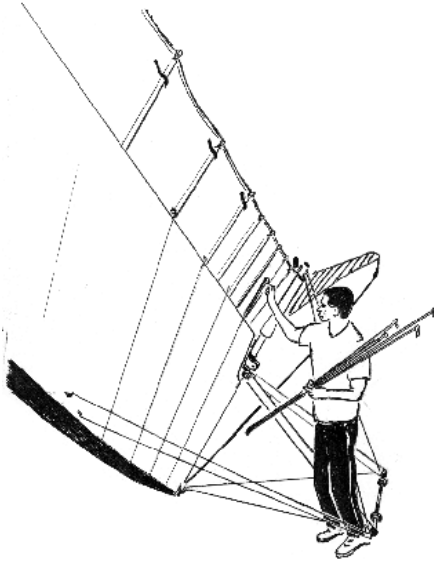
An in-flight disengagement of this attachment will cause a complete loss of structural support of the glider and a total loss of control. Never attach the pull handle of the shackle to the hook, even temporarily.



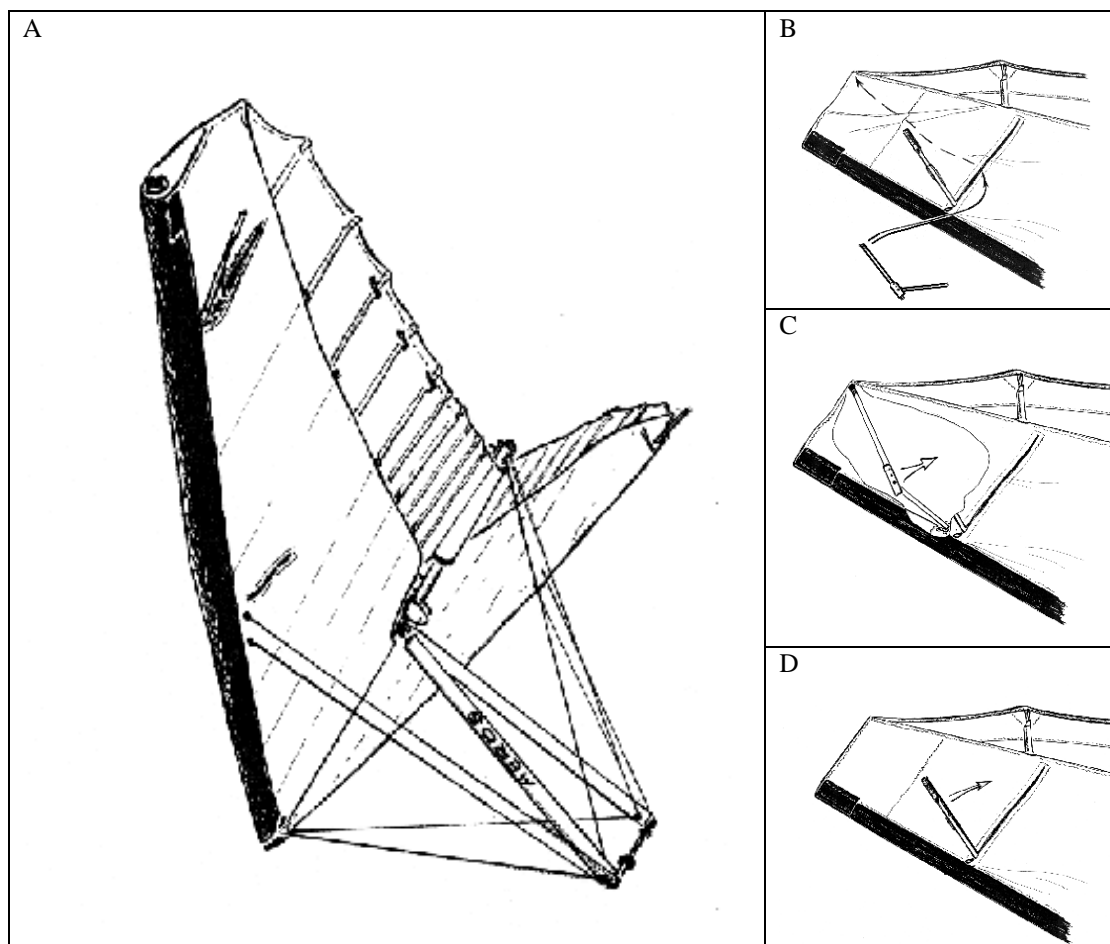
4.2.2.13. Put the glider on the A-frame. Secure the nose catch of the bottom wires on the nose junction channel using the clevis pin and the safety ring .



4.2.2.14 Install the bottom surface battens. The longest bottom surface batten is inboard batten. Push the battens all way into the pocket until the rear end is secure in the batten pocket. The strings on the rear ends of the bottom surface battens are to facilitate removal of the battens from the sail during breakdown.



4.2.2.15 Install the tip battens through the access zipper in the bottom surface:
 bend the tip batten with angle approx 60 degrees;
 install the batten into the sail with bend going towards the wing tip;
 install flat end of the batten to the angle of the sail tip;
 straighten it a little bit and guide another end of the batten onto the leading edge batten
 hook;
 pull the bend towards the keel and gently straighten the batten completely



4.2.2.16. Install the washout tips, just swing them to the right place underneath the corresponding top surface battens through the access zipper in the bottom surface.

4.2.2.17. Remove the protective bag from hang detail.

4.2.2.18. Do a complete preflight inspection of the glider, Section 3.

It is imperative that you carry out this inspection every time you rig and before you fly.

CAUTION

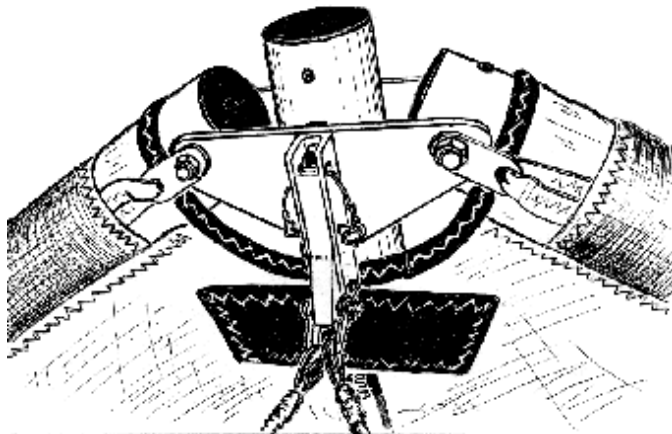
BEFORE FLIGHT CHECK THAT ALL INSPECTION ZIPS ARE FULLY CLOSED.

4.3 Preflight Inspection of the wing

Conduct a complete preflight inspection of the wing, checking all assemblies, which have not already been checked. Every bolt, nut, pin, safety ring, and fastener of any kind should be checked during every pre-flight. A full pre-flight inspection should precede every flight you make, not just the first flight of the day.

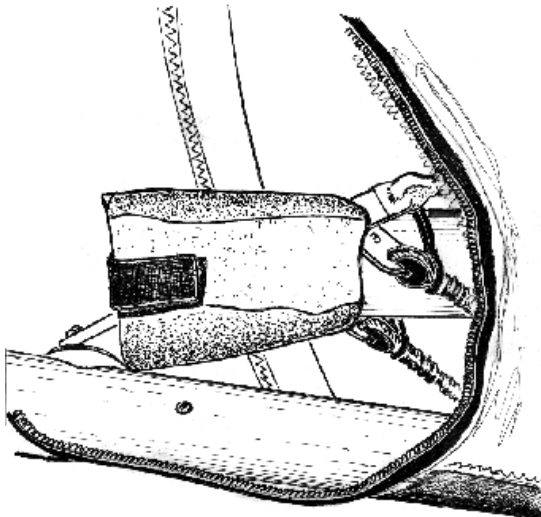
Carefully check the entire length of the leading edge pocket to insure that the mylar insert is lying flat in the pocket. If any section of the mylar is folded under, de-tension the crossbar, remove the batten closest to the area of distortion, and unfold the mylar.

4.3.1. Beginning at the nose, check all self-locking nuts, the clevis pin and the safety ring which secure the lock of the bottom front wires.



4.3.2. Along the left leading edge

Open the crossbar junction access zipper and look inside, making sure that side wires are properly secured to the crossbar, that the thimbles are not cocked on the tang. Check the splint pin and the nut, which secures the leading edge – crossbar junction. Check that the sail is not caught on the crossbar end, nor on any of the hardware. Remember to close the access zipper.



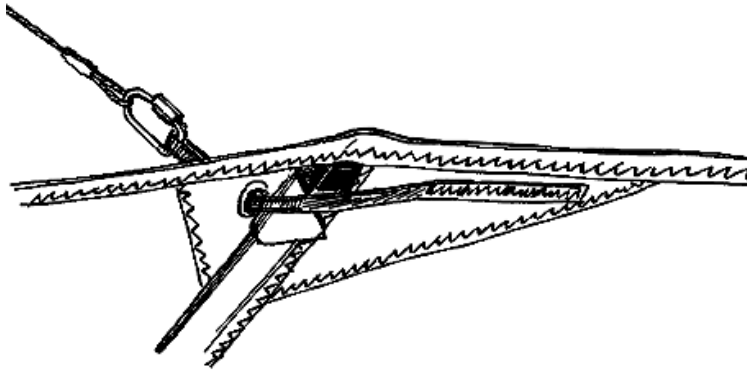
Remember to close the access zipper!

4.3.3. At the left wingtip

Look into the sail at wing tip, and check that the tip batten are properly seated and fixed.
Check that the washout tip are installed properly.

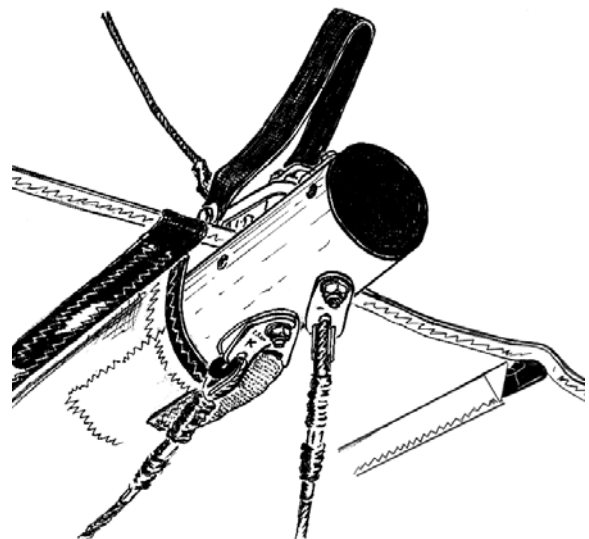
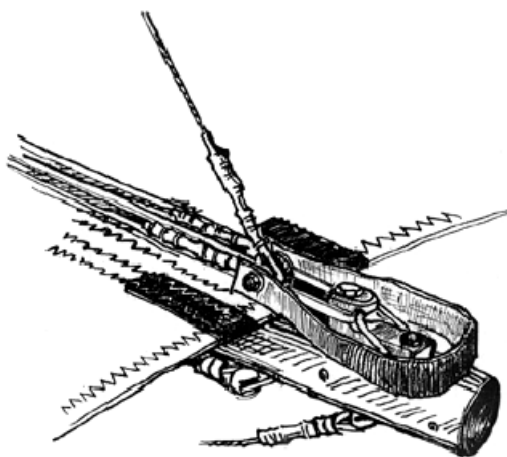
4.3.4. Along the trailing edge, left wing

Check that there are no tears in the sail material along the trailing edge.
Check that all battens are properly secured.
Check that the washout tip is properly secured in position supporting the batten, and that the washout tip access zipper is properly closed.
Check that the bridles are properly engaged.
Check the trailing edge for any cuts, tears or broken stitching.



4.3.5. From the rear keel

Check that the sweep wires are tight and secured on the hook on the keel tube.
Check the kingpost top for proper attachment of the bridles and condition of the top rear wire and bridle wires.
Check the keel mount webbing, and bottom rear wires are safely secured to the keel tube.



4.3.6. Along the trailing edge, right wing
Same as for the left wing.

4.3.7. At the right tip
Same as for the left tip.

4.3.8. Along the right leading edge
Same as for the left leading edge.

4.3.9. Under the wing at the control bar

Check the cables at the control bar corners, making sure there are no kinks or twisted thimbles. Inspect each Nico press sleeve for slippage and/or corrosion.

Check each thimble for distortion, flattening or wear where it touches a bolt, shackle or tang.

Check for proper installation of all nuts and safety rings at the control bar corners. Check that the downtubes are straight and undamaged.

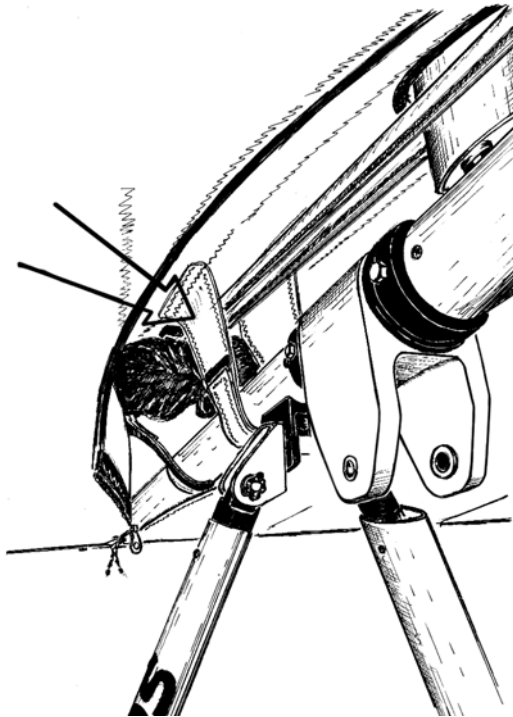
Unzip the center zipper. Check that all bottom surface battens are under the leading edge tube.

Check the sweep wire for wear.

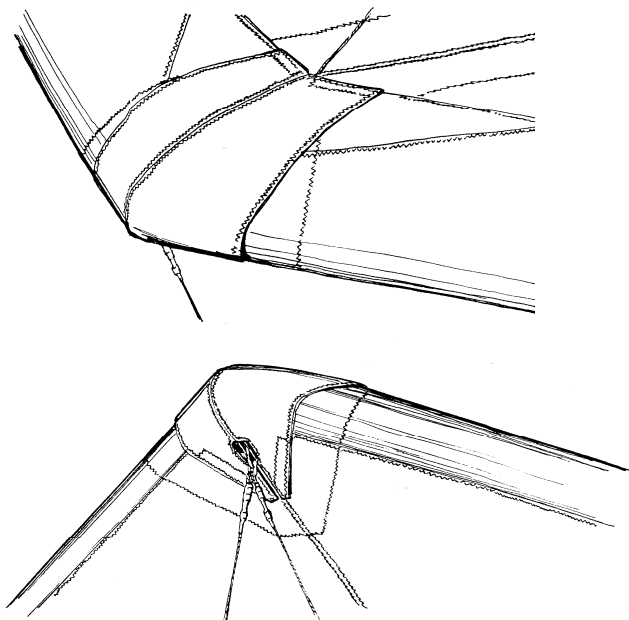
Check the crossbar center plates assembly including the sweep wire/X-bar junction and the center bolt.

Also, visually inspect the crossbars by sighting along the length of the crossbars looking for any evidence of damage.

Check all bolts, nuts and the safety rings, which secure the downtubes to the channel. Make sure that the channel and hang detail are secured.



4.3.10. Fit the nose cone over the front of the keel and attach the Velcro at the top rear of the nose cone. Pull the bottom corners of the nose cone back until the nose cone is tight around the nose and secure the Velcro on the bottom of the nose cone.



Now your glider is ready for mounting on the trike.

Don't fly without the nosecone!

4.4 Attaching Wing to Trike

4.4.1. Attach the wing part of the rescue system bridle to the wing, as shown on the pictures below.



Check the ignition switches are off.

Position the wing on its control frame, facing into the wind, with the nose on the ground. The pylon of the trike should be held down. Wheel the trike behind the wing, rolling the front wheel over the control bar.



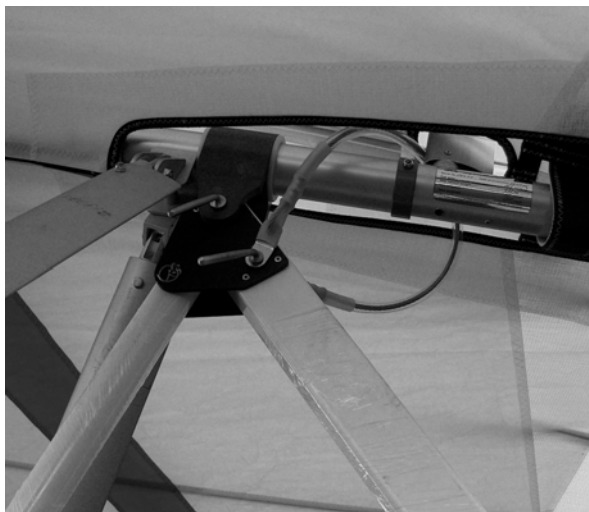
4.4.2. Lift the nose of the wing up until high enough to connect the universal junction of the trike to the U-bracket of the wing. and allow the bushing of the U-bracket of the wing to slide into position into the slits on the universal junction of the trike. Insert the heart bolt , tighten wing nut firmly and secure with a safety ring.



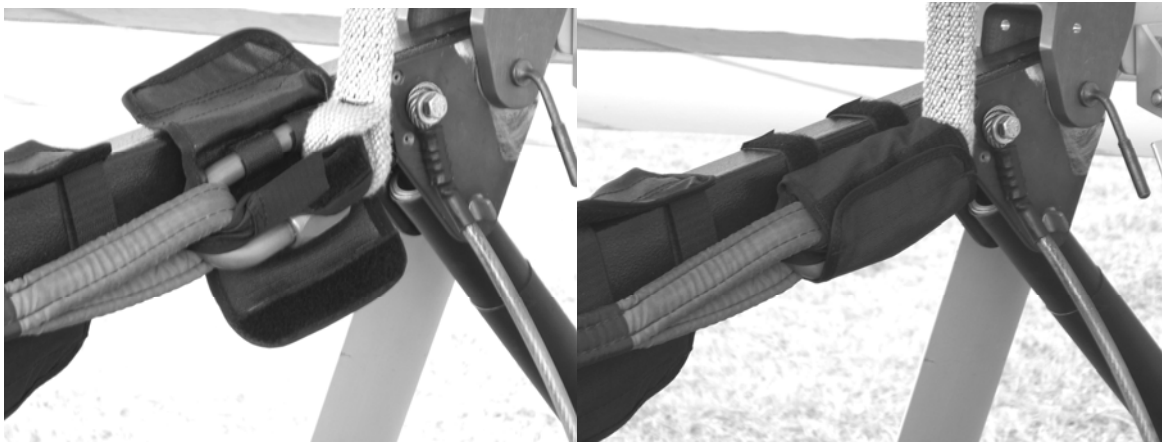
4.4.3 Attach the rescue system bridle to the carabine as shown on the figure



4.4.4. Connect backup loop so that it passes over the keel and back to the pylon. Tighten a nut and secure with a safety ring.



4.4.5. Attach second part of the rescue system bridle as shown on the figure



4.4.6. Lift the nose of the wing to allow the front wheel to be rolled rearward over the control frame so that the base tube is forward of the cockpit and the rear of the keel rests on the pylon.



4.4.7. Install the nose cone of the wing by applying the top Velcro first then gently tension over the nose plates and attach the Velcro to the undersurface of the wing.



4.4.8 Apply the trike park brake. Go to the nose of the wing. With the mast brace tube in one hand and the control bar in the other hand lift the base tube. Rise the wing up. In strong winds maintain a firm grip on the wing.



4.4.9. Attach the mast brace tube in to position, bolt it and secure with a nut and a safety ring.



4.4.10. Install the bolt into the pilon's joint as shown on the picture.



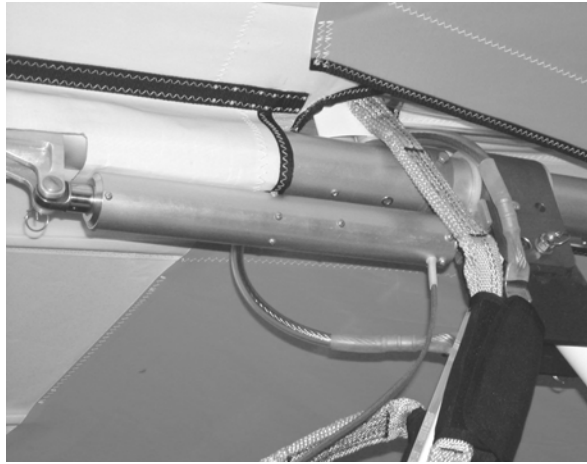
4.4.11. Secure the base tube with the safety belt.

Park the ultralight in a crosswind position with the wing base tube secured with a safety belt. The wing should be at approx zero angle of attack to avoid the ultralight to be turned upside down with the wind.



4.4.12. Connect the trim device to the rear bracket on the keel tube using a pin and a safety ring. Connect the trim device to the U-bracket of the wing with a pin and a safety ring.





Connect the pin and socket connector of the trim device.

Check the trim device operation in most forward and aft position. Check the trim device operation in take-off position, which is 30 – 35mm from the most aft position. Fix the electrical wire of the trim device with a plastic hose clamp.

5. FLIGHT PREPARATION

5.1 General

Prior each flight depending on the purposes of flight it is necessary to work out the flight task:

- prepare flight maps and study the flight conditions;
- study meteorological conditions at the departure airfield, on course and at the arrival airfield;
- estimate the possibility of accomplishment the flight task;
- proceed with all necessary formalities which are relative to given flight;
- estimate the necessary fuel state;
- conduct complete preflight inspection of the ultralight.

WARNING

NO ATTEMPT SHOULD BE MADE TO FLY THE ULTRALIGHT WITHOUT APPROPRIATE ULTRALIGHT FLIGHT TRAINING WITH AN APPROVED INSTRUCTOR.

Speeds for Normal Operation

Trim speed	65-100	Km/h	40-63	mph
Stall speed at maximum take off weight	52	Km/h	32.5	mph
Take off speed and approach speed with maximum take off weight	75	Km/h	47	mph
Maximum speed in turbulent air	100	Km/h	63	mph
Maximum level speed	130	Km/h	80	mph

5.2 Complete Ultralight Pre Flight inspection

A full pre-flight inspection should precede every flight you make, not just the first flight of the day. Daily inspections as outlined in the HKS Operator's Manual should be carried out in conjunction with the following inspections.

Ensure that the ignition switches are off prior to inspection

5.2.1 Wing preflight inspection

Refer to the section 5.3 for the complete preflight inspection of the wing.

5.2.2 Trike Pre-flight Inspection

- No leaks from fuel system and engine.
- No leaks from oil system and engine
- Fuel filter clean and operational.
- Sufficient fuel for flight.
- Radiator mounts secure and operational.
- Oil level OK
- No splitting, denting or delamination of the propeller.
- Propeller hub assembly secure and tie wired.
- No cracking in tyre treads, or evidence of cracking around the rim. Wheels are secured.
- No bolts bent, fractured or evidence of corrosion.
- Electrical system secure and operational.
- Throttle operation, both foot and hand throttle. Verify free and full movement.
- Seat belt attachments secure.
- All engine components secure - air filter, muffler, plug leads.
- Mechanical components. Rotate propeller anticlockwise and observe for noise or excessive resistance.

5.2.3 General inspection of complete ultralight.

Check that wing and trike universal bracket is secure.

Check that back up cable secure

5.3 Before Starting Engine

Safety is everyone's business. Included are only some important safety tips. Keep a good lookout, be thoughtful and always show your intentions prior to starting.

Prior to flight a thorough pre flight inspection of the ultralight should be carried out. Details of the pre flight inspection are shown earlier in this section. Make sure all engine controls are operative and you understand the on/off positions of the throttle and ignition. These controls are readily accessible and you must be able to operate them instinctively without hesitation.

The primary throttle control is foot-operated and complemented by the hand throttle (rearward for full power and forward for power off). The ignition switches are for the:

- front sit – on the bottom of the instrument dashboard (upward for on and downward for off), and for the:
- rear seat –(if it's mounted) on the right hand side of the cockpit (forward for on and rearward for off).

Never run the engine on the ground with the propeller turning unless you are doing so in a run up area and can observe anyone or anything entering the danger area. It is recommended that the engine not be run for any long periods whilst stationary on the ground. Possible damage to the engine may occur due to overheating.

Before starting your engine you should read and be familiar with the engine manual.

Run through the following checklist prior to starting the engine for each and every flight:

- Passenger briefing has been completed.
- Brakes in On / Park position.
- Tires - inflated and serviceable.
- Full and free movement of the wing when attached to the trike.
- Throttle - full and free movement.
- Wind - check direction and strength.
- Wires - secure and airworthy.
- Mixture - chokes off.
- Pins - fitted and secured.
- Fuel - On and sufficient.
- Instruments - check, set and operational.
- Switches - ignition check (all switches on).
- Chocks - removed (secured in ultralight).
- Harness and Helmet in place and secure.
- Remove a safety lock from the parachute.

Remember that the pilot in command has the ultimate responsibility for the airworthiness of the ultralight.

5.4 Fuelling

Fuel flow is from a single fuel tank fitted with a self-venting tube. The fuel tank has a water drain tap, which is mounted at the bottom of the tank.

Never refuel if fuel could be spilled on hot engine components. Use only safety approved fuel containers and never transport fuel in an unsafe manner.

The fuel system has an in-line fuel filter, which is mounted at the back of the tank. This filter can be easily disassembled for cleaning and inspection.

Fuel tank capacity is 54 litres

A fuel gauge is provided on the instrument panel. Its purpose is to provide the pilot with a visual indication of the quantity of the remaining fuel. The calibration is valid for the ultralight sitting on level ground and indicates total fuel.

WARNING

ENSURE THE ULTRALIGHT IS EARTHED TO AVOID STATIC DISCHARGE IGNITING FUEL DURING THE REFUELLING OPERATION

5.5 Helmet Recommendation

The open cockpit of the Aeros-2/Cross Country exposes the occupants to the elements during flight and exposes them to objects outside of the ultralight in an emergency situation.

Helmets and eye protection are recommended for occupants for protection from precipitation, strike by insects.

Helmets are also recommended for risk reduction during an emergency landing of the ultralight. The helmets recommended for use in the ultralight are those certified for air sports.

6. ULTRALIGHT FLYING

6.1 Starting the engine

All controls should be checked with the ignition OFF. Passengers should have seat belts secure and be briefed for the flight.

CAUTION

REMEMBER TO CLEAR PROP!

The engine should be started with the pilot in the front seat!

The following procedure should be used:

- Park Brake is locked in the on position
 - Hand and foot throttle off
 - Turn the key switch on.
 - Switch both ignitions ON.
 - Apply full choke unless the engine is hot.
 - Check visually that the propeller area is clear and call "Clear Prop" out loud.
 - Depress start button. If the engine refuses to start switch off the ignition before investigation.
 - When the engine starts, increase the engine RPM to a little above idle and release the chokes.
 - Oil pressure should indicate within 10 seconds.
 - Warm up the engine. Minimum Temperature should be reached before take off. Operate for 5 min at 2000 rpm continue at 3000 rpm until minimum temperature of 50 deg C is reached.
- Keep an ultralight log and enter any unusual engine behavior. Do not fly unless you have corrected a given problem and recorded the correction in the log.

6.2 Taxiing

Taxiing in normal conditions is fairly easy.

With the engine idling the brake lever should be depressed which will disengage the park brake. The control frame should be positioned so that it is in the approximate position for normal trim speed. The pilot's feet actuate steering on the ground. Left turn occurs when the right footrest is pushed forward. Right turn occurs when the left footrest is pushed forward.

NOTE

Control sense for turning is opposite to that of a conventional three axis ultralight.

When taxiing in strong wind conditions the following procedures apply:

- Head Wind conditions requires the nose of the wing to be lowered just below the trim position.
- Down Wind conditions requires the nose of the wing to be raised just above the trim position.
- Cross wind conditions requires the upwind tip to be lowered.

6.3 Before take off

Before flight a full-throttle check is to be carried out. During this operation the pilot must be seated in the cockpit and prepared to switch off the ignition at very short notice if an emergency should arise.

The two ignition circuits should be tested with the engine running at 4000 rpm. Ignition one should be switched off and the RPM drop should not exceed 300 rpm. Both ignitions should be in the on position and ignition two should be turned off and the RPM drop should not exceed 300 rpm. Ensure both switches are in the on position after ignition circuit testing.

WARNING

NEVER LEAVE YOUR ULTRALIGHT UNATTENDED WHILE THE ENGINE IS RUNNING.

CAUTION

BEWARE OF LOOSE STONES IN THE RUN UP AREA. LOOSE STONES CAN BE SUCKED UP BY THE PROPELLER AND CAUSE SEVERE PROPELLER DAMAGE IN A VERY SHORT TIME. RUN UPS ARE BEST CONDUCTED ON A CLEAR SEALED SURFACE OR ON GRASS, NEVER ON GRAVEL

Check the trim device operation in most forward and aft position.

During take off and landing the recommended trim device setting is 30 – 35mm from the most aft position.

6.4 Take Off

Aeros trike wings have a neutral static balance allowing a safe take-off that is controllable under all suitable flying conditions.

Take off should be made on full power with only the foot activated throttle used during take off.

During the take-off, the control bar should be held in the forward position with the wings level. Accelerate smoothly to the take off safety speed. If the ultralight is fully loaded you will require full power.

When the ultralight reaches the takeoff safety speed it lifts up and the trike rotates quickly on the main wheels. As the ultralight leaves the ground the control bar must be eased back to the trim position to maintain takeoff safety speed.

Maintain your engine in top condition and assume it's going to stop running at any time. Leave yourself a way out for an unexpected engine failure.

Never fly your ultralight at locations, airspeeds, altitudes, or under any circumstances from which a successful engine-off landing cannot be attempted.

6.5 Climb

Initial climb out should be made on full power for maximum take off weight. Approximately 2/3 of maximum take off power is considered comfortable for a minimum take off weight. Take off distance will be extended at reduced power. Once climb is established power should be reduced to below maximum continuous power of 5500 rpm. A minimum of takeoff safety speed should be used. At this speed the ultralight would round out nicely into a glide should the engine fail. Avoid pitching the nose of the wing up more than 45 degrees to the horizon. Very steep climbs are dangerous and can result in a stall followed by a severe pitching of the nose forward.

6.6 Cruise

When the desired flight altitude is reached the ultralight may be levelled out and throttle reduced to that required to maintain level flight.

The hand-operated throttle can be used to set engine rpm. Once the hand throttle is adjusted the pressure on the foot pedal may be removed. When the hand throttle is actuated increase power can still be achieved with the use of the foot throttle. The rpm will always return to the cruise setting when foot pressure is removed. If the hand throttle is set a reduction in RPM is not achievable using the foot throttle. The hand throttle must be in the off position to achieve low RPM.

CAUTION

HIGH-ANGLE CLIMB-OUTS NEAR THE GROUND SHOULD BE AVOIDED.

WARNING

AT LOW ALL UP WEIGHTS, THE TAKE OFF CLIMB OUT AT THE TAKE OFF SAFETY SPEED CAN RESULT IN HORIZONTAL PITCH INCLINATIONS IN EXCESS OF THE PLACARDED 45 DEGREES MAXIMUM. THE PILOT MUST BE AWARE OF THIS AND SHOULD KEEP WITHIN THE PLACARDED LIMITATIONS BY LOWERING THE ATTITUDE OR REDUCING ENGINE POWER.

WARNING

REDUCED POWER TAKE OFFS WILL EXTEND TAKE OFF DISTANCE. IT IS THE PILOTS RESPONSIBILITY TO ENSURE THAT THERE IS SUFFICIENT RUNWAY AVAILABLE TO CLEAR ALL OBSTACLES WHEN CONDUCTING REDUCED POWER TAKE OFFS.

6.7 Descent, Approach and landing

Landing should always be into wind with a long straight approach.

An approach to the airstrip can be made with or without power, but in either case the airspeed should be maintained above the nominated approach speed.

During take off and landing the recommended trim device setting is 30 – 35mm from the most aft position. The ultralight should be flown on final approach at or above the nominated safety speed. The additional airspeed allows for wind gradient, and to provide greater controllability in the rough air that may lie close to the ground. Maintaining airspeed on final is very important for engine-off landings, allowing a margin for round out before touch down.

The trike is designed to land with the rear wheels touching down slightly before the nose wheel. Once firmly on the ground aerodynamic braking may be achieved by pulling in the control bar, then applying the front nose wheel brake.

NOTE

After a hard landing, your ultralight must be completely checked.

6.8 Cross Wind Landing and Take Off

Pilots with less experience should avoid landing or taking off in conditions with high crosswind components, as skills do not always match the capabilities of the ultralight. Crosswind landings or take off with low wind components up to 3 m/s are quite safe and controllable, even to the inexperienced pilot.

WARNING

NEVER STALL THE ULTRALIGHT WITH THE NOSE PITCHED UP BEYOND 45 DEGREES. MANOEUVRES BEYOND THIS ARE DANGEROUS AND CAN RESULT IN A TAIL SLIDE FOLLOWED BY A SEVERE TUMBLE. REFER TO SECTION 3.3.12 OF THIS FLIGHT MANUAL FOR DETAILS OF THE PROCEDURES FOR RECOVERY FROM UNUSUAL ATTITUDES

The nominated approach speed of 75 km/h should be increased to 85 km/h when landing in cross wind conditions of 5m/s or more.

After touchdown in cross wind conditions the relative airflow over the wing will become increasingly spanwise (From tip to tip) as the ultralight slows down. The upwind wing tip should be lowered slightly (the amount depends on the wind strength), and the undercarriage wheels will retain firm contact with the ground.

Take off procedure is unchanged for the nominated crosswind limit. The upward wing may need to be lowered at the start of the take off procedure in higher cross winds.

6.9 Balked Landing

During a situation where a balked (go around) landing is required, normal take off power and procedures should be used.

6.10 Stopping the Engine

To stop the engine after a period of running, the ignitions should be switched off at idle. Switching off at high RPM floods the engine and makes restarting difficult. If the engine has been running under full power allow the engine to cool at idle, before switching off.

6.11 After Landing / Securing

After landing and when in the parking area apply parking brake and lock. Switch the ignition, electrical switch and radio equipment off. The ultralight should be parked in a crosswind position with the base tube secured to the mast brace. The rescue system safety pin should be inserted before leaving the ultralight.

7. EMERGENCY PROCEDURES

7.1 General

This section of the Manual describes the procedures to be adopted in the event of an emergency or abnormal situation occurring on this ultralight.

These procedures are arranged in the sequence considered to be the most desirable in the majority of cases. Steps should be performed in the order listed unless a suitable reason to deviate exists.

This section contains operating procedures for flight and system emergency conditions that are essential for the continued safe operation of the ultralight.

Always maintain correct airspeed and altitudes in the circuit area.

Never fly in uncertain weather conditions and always fly within your proven ability. Be sure only to extend your capabilities under planned training situations.

Carry out safe airmanship whilst flying and be aware of possible emergency landing areas along your flight path.

If possible check these areas from the ground as you enter the airfield or flying site. This technique is for safety reasons as engines are susceptible to stopping, no matter how reliably manufactured or maintained.

Keep a good lookout for other ultralight, always be thoughtful and show your intentions.

It should be remembered that the manufacturer cannot foresee all conceivable circumstances. Particular circumstances such as multiple or unanticipated emergencies, adverse weather etc may require modification to these procedures. A thorough knowledge of the ultralight and its systems is required to analyze the situation correctly and to determine the best course of action.

Maximum maneuvering speed 90 km/h.

Best glide speed (with maximum load) is 70 km/h.

7.2 Engine Failure on Take Off

7.2.1 Engine Failure on Take Off Run

If the engine fails on take off run before the ultralight has lifted off proceed as follows:

- pull the control bar in to prevent the ultralight lifting from the ground;
- use pedals to maintain the ground run direction, using the brake at the same time;
- switch off the ignition.

7.2.2 Engine Failure on Climb Out

If your engine fails on climb out before you have reached 5 meters altitude, land straight ahead. Proceed as follows:

- pull the control bar in further than the trim position to prevent the ultralight from losing airspeed;
- at 2 – 2.5 meters altitude push the control bar out for the short period of time for flare out and landing in accordance with section 6.7 of the Manual.
- switch the ignition off.

7.3 Engine Failure at Height

If the engine stops while operating at cruise or full power when the ultralight is well clear of the ground, check fuel contents and make sure that ignition is on.

If your engine fails in flight, do not attempt to restart the engine unless one of these items is found to be incorrect and is able to be rectified. Relax and maintain control whilst concentrating on correct forced landing techniques.

7.4 Full Power Engine Shutdown (In Flight)

If the throttle should jam full open in flight proceed as follows:

Maintain Control.

Get height with engine at full power, adjust height and ground position to improve the outcome of forced landing.

Increase airspeed to keep the climb angle less than 30 degrees above the horizontal.

Switch off ignition.

Prepare for forced landing section 7.5.

7.5 Forced Landing

Proceed as follows:

Maintain control and airspeed - nominated approach speed.

Close the throttle.

Switch the ignition off.

Tighten the seat belts.

Carry out final approach and landing as closely as possible to normal power off landing procedure.

7.6 In Air Engine Fire

For fire occurring whilst in flight, the initial procedure would be to maintain control of the ultralight and evaluate the extent of the fire. This emergency is unlikely to occur but to avoid any further problems, use common sense and land the ultralight safely. Proceed as follows:

Maintain Control

Ignition off

Forced Landing

After landing release seat Belt

Release Passenger seat belt

Evacuate ultralight

7.7 On Ground Engine Fire

For fire occurring whilst in motion on the ground proceed as follows:

Maintain control and use remaining speed to clear people, ultralight and buildings.

Close the throttle.

Turn the ignition off.

Evacuate the ultralight.

After stopping release seat belt, then release passenger seat belt.

7.8 Propeller Damage

The indication of propeller damage is usually felt by extreme vibration and lack of thrust. Proceed as follows:
Maintain Control and airspeed.

Close the throttle.

Turn the ignition off.

Prepare for forced landing.

This problem may be avoided if precautions are taken prior to take off. Inspect the strip or ground you are to use as your take off area for sticks, rocks or any debris that may be flicked up by the tyres and sucked through the propeller.

Ensure that all items carried by occupants (such as cameras and sunglasses) are secured so they are not able to come loose and pass through the propeller.

7.9 Sail Damage

If you encounter damage to the sailcloth during flight, the first procedure is to maintain control of the ultralight. If the sail damage is not impairing the flight characteristics of the ultralight, land at the nearest landing field to inspect the damage.

7.10 Emergency Rescue System

The Emergency rescue system is only to be used in emergency situations as a last resort and when you are certain that:

- the ultralight has suffered structural damage to the extent that control is not possible; or
- if the ultralight is in an irrecoverable situation where structural damage is likely to occur.

To operate the parachute pull the handle at least twenty centimetres for the parachute rocket projectile to be activated. The parachute will allow the complete ultralight to be lowered to the ground.

WARNING

AT FULL ENGINE RPM THE TIP OF THE PROPELLER IS SPINNING AT SPEEDS IN EXCESS OF 650 KILOMETRES PER HOUR.

EVEN SMALL OBJECTS CAN CAUSE SIGNIFICANT DAMAGE TO THE PROPELLER.

WARNING

IT IS IMPORTANT TO REALISE THAT WHILST THE PARACHUTE CONTROLS THE RATE OF DESCENT, THE PILOT WILL HAVE NO CONTROL OVER THE PLACE THE ULTRALIGHT WILL LAND.

For using emergency rescue system proceed as follows:

Close the throttle.

Turn the ignition off.

Tighten seat belts.

Check that emergency rescue system pin is removed.

Deploy emergency parachute

Prepare for the forced landing.

7.11 Ignition Circuit Failure

The HKS engine requires a short circuit on the ignition circuit to stop the engine. If the ignition circuit is broken using full choke to flood the engine should stop the engine.

Do not restart the engine until the fault has been fixed.

7.12 Stalls

In practice, in level flight it is only possible to induce a nose down stall of the ultralight in level flight at high take off weights. The beginning of stall is indicated by a significant increase in control bar loads.

Recovery from a mild stall is very gentle, whether power is on or off. Recovery is quick, with height loss of less than 20 meters.. A stall would have to be forced violently, to induce a danger.

Never stall with the nose pitched up too high. This is a dangerous maneuver and can result in a tail slide followed by a severe tumble. As a guideline, the nose up angle at which the ultralight stalls is about the nose down angle it will recover at.

7.13 Spins and Spiral Descents

Deliberate spinning is prohibited.

A spiral dive may develop after a stall if the bar is maintained at the forward limit and a large roll rate is allowed to develop. If this condition is not corrected it will lead to large and increasing roll attitudes (beyond the 60 degree limit). Increasing attitude, increasing speeds and large control bar feed back forces will occur. Incipient spiral dives can be terminated at any time by rolling wings level. If the spiral dive is allowed to develop to extreme roll attitudes, recovery is expedited by relieving control bar forces before rolling wings level and recovering from high-speed condition.

WARNING

DO NOT ATTEMPT TO SPIN THE ULTRALIGHT.

SPIRAL DIVES SHOULD NOT BE ATTEMPTED.

DURING DESCENDING TURNS ULTRALIGHT ATTITUDE MUST BE KEPT WITHIN PLACARDED PITCH, ROLL AND AIRSPEED LIMITS.

8. ULTRALIGHT DE-RIGGING PROCEDURE

Careful attention to the recommended rigging and de-rigging sequences will protect the ultralight from the risk of unnecessary damage.

The de-rigging procedure is a direct reversal of the rigging procedure. A summary of the procedure follows:

8.1 Removing Wing from Trike

See section 4.4 (Attaching Wing to Trike) and use reverse procedure:

- Apply park brake.
- Set the trim device to the aft position and then slightly forward.
- Disconnect the socket connector and remove the trim device from the wing.
- Remove the bolt from the front support compression tube.
- Remove the bolt from the pylon joint.
- Lower the wing until the control bar is on the ground.
- Remove the nose cone from the wing.
- Lower the nose of the wing to allow the front wheel to be rolled forward over the control frame.
- Detach the rescue system bridle from the carabines.
- Detach the back up loop.
- Unbolt the trike from the U Bracket.

8.2 Wing Break Down Procedure

This section assumes that the wing has been removed from the trike. This section is intended as a reference only and assumes prior knowledge of the break down procedure.

8.2.1. With the glider on the A-frame put the protection cover on the U bracket.

8.2.2 Remove undersurface battens.

Insert the finger through the string loop and pull the batten forward. Once the batten is forward pull string down to remove from oval pocket. Slide the batten rearward until all the way out.

8.2.3. Remove the tip battens.

8.2.4. Open the access zipper and remove the washout tips.

8.2.5. Lay the glider flat on the ground facing the nose into the wind.

8.2.6. Release the crossbar sweep wire by removing the shackle from the hook on the keel tube and allow the webbing handle to move forward.

8.2.7. Remove the top surface battens. Place top surface battens, undersurface battens and tip battens in the battens bag.

8.2.8. Detach the base tube and place it in the bag.

8.2.9. Remove the kingpost by lifting it upward. Put protection bags on both ends of the kingpost.

8.2.10. Fold both wings in symmetrically, (approx. ½ from fully closed) bringing both leading edges back at the same time or in small steps side to side.

8.2.11. Remove the nose battens from their holes on the top of the keel tube by lifting upwards and backwards at the same time on the nose batten strings.

8.2.12. Fold two downtubes of the control frame together. Put wires into protection bags. Avoid kinking the wires.

8.2.13. Lift nose of the wing up.

Make sure the U-bracket is in correct position and is in the protection bag.

CAUTION: IF YOUR WING FEATURES THE TRIM DEVICE SLIDE THE U-BRACKET FULLY BACKWARDS BEFORE FOLDING THE CONTROL FRAME, OTHERWISE THE DOWNTUBES CAN BE DAMAGED BY THE U-BRACKET.

8.2.14. Put the protection padding on the top of the control frame. Put the nose of the wing back on the ground. Fit the protection bag on the rear of the keel tube.

8.2.15. Fold both wings in completely. Roll the sail inwards as shown on the figure. Put protection bags on the rear end of each wing.

8.2.16. Once the leading edges are together apply slight pressure downwards on the keel and raise the leading edges above the down tubes and attach Velcro strap around both wings and keel.

8.2.17. Stow the battens with the curve down at the front of the wing. Attach remaining Velcro straps so that they are evenly spaced.

8.2.18. Position the wing bag to the nose of the wing. Stretch the wing bag down the wing and enclose the tips and the nose of the wing in. Enclose the base tube in the rear of the wing between leading edges.

8.2.19. Zip up the wing bag. The bag zipper has to be up to avoid damage during the transportation.

9. PERFORMANCE

9.1 General

The performance data in the following section has been computed from actual flight tests with the ultralight and power plant in good condition and using average piloting techniques. It should be noted that piloting techniques, climatic conditions and ultralight condition will cause significant variation to these performance figures.

9.2 Take Off and Landing

Take off and landing distances are specified for maximum take off weight of the ultralight

Take Off

Take off Distance to 15 m altitude is 245m.

Takeoff distance is specified for elevation at the sea level with maximum take off power, a level dry runway with short grass, zero wind conditions and air temperature 15 deg C

There are following factors which will increase takeoff distance:

- Reduced power take off;
- Higher drag runway surfaces such as wet or long grass;
- Tail wind;
- Uphill takeoff;
- Air temperature above 15 deg C;
- Runway elevation above sea level;

The pilot is required to take into account the effect of the above when determining takeoff distance.

Landing

Landing Distance from 15 m altitude is 300m.

Landing distances are specified for elevation at the sea level with maximum take off power, a level dry runway with short grass, zero wind conditions and air temperature 15 deg C.

The following factors will increase landing distance:

- Lower drag runway surfaces;
- Tail wind;
- Down hill landing;
- Air temperature above 15 deg C;
- Runway altitude above sea level.

The pilot is required to take into account the effect of the above when determining landing distance.

Always exercise judgment when selecting locations for take-off and landing. Leave adequate margin for appropriate control action in the event of sudden engine failure or turbulence being encountered.

9.3 Climb

Climb rate with maximum take off weight at 80 km/h is 3m/sec. Climb data is given at sea level elevation and 15 deg C.

9.4 Stall Speeds

Stall speed at maximum take off weight is 56 km/h.

Stall speed at 320kg take off weight is 52km/h.

9.5 Glide

Glide figures have been determined with the engine off at maximum take off weight with the trim device set in the take-off configuration.

At 80km/h the descent rate is 2,8 m/sec.

Glide distance from 300 meters is 2.4 km.

Glide data is for ISA conditions (Sea Level at 15 deg C)

9.6 Cruise

Cruise speed at maximum take off weight is 100 km/h

Fuel consumption at cruise speed is 10liters per hour.

Range at cruise speed is 490 km

NOTE

Fuel consumption figures are included as a guide only. The consumption figures should not be used for planning purposes. Changes in ultralight configuration, load, altitude, wind strength and direction as well as climatic conditions will cause significant variation in fuel consumption.

10. HANDLING SERVICE AND MAINTENANCE

10.1 Introduction

This section contains factory recommended procedures for proper ground handling and routine care for your Aeros-2/Cross Country ultralight. Included in this section is relevant information required by the operator.

WARNING

IT IS THE PILOTS RESPONSIBILITY TO ENSURE THAT ALL AIRWORTHINESS DIRECTIVES HAVE BEEN ADDRESSED. IT IS ALSO THE PILOTS RESPONSIBILITY TO ENSURE SERVICING AND MAINTENANCE HAS BEEN PERFORMED AS OUTLINED IN THE APPROPRIATE MAINTENANCE MANUAL AND IN ACCORDANCE WITH THE APPLICABLE AVIATION REGULATIONS.

10.2 Identification Plate

The ultralight has two identification plates. The wing identification plate can be found on the left side of the keel tube next to the king post. The wing number can be also found on the top of the sail at the nose part of the glider. The trike identification plate can be found on the seat mast block in front of the seat. The Serial number should be quoted when corresponding with the factory.

10.3 Ultralight Inspection, Maintenance and repair

Maintainer qualifications vary from country to country. The operator / maintainer should be familiar with the local requirements. Maintenance requirements are outlined in the base maintenance manual for the base unit and in the wing maintenance manual for the wing. The following sections have been included because it is considered that the information may be required on a more regular basis.

10.4 Filling Fuel Tank

Initial capacity is 54 liters.

The Aeros-2/Cross Country has a single fuel tank. When the tank is being filled there may be a slight pressure differential between the sides of the tank, causing the fuel cap side to fill slightly faster than the other side. Allow time for the breather valves to equalize the pressure to allow complete filling and, check that both sides are sufficiently full. Fill to the neck of the fuel entrance.

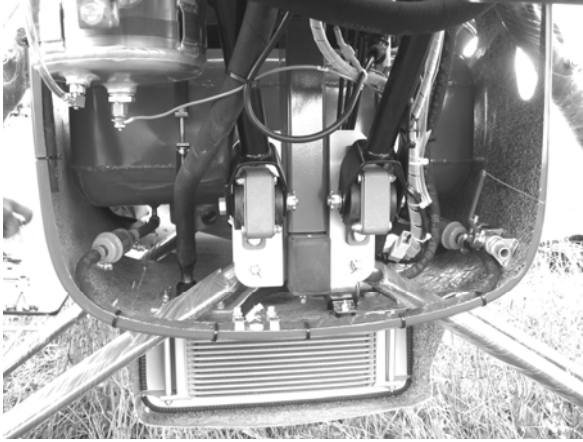
10.5 Fuel Specification

Super grade gasoline; lead free, min RON 95

Refer to the HKS manual section 3.6 for engine fuel specifications that apply to the region where the ultralight is being flown.

10.6 Fuel Sampling

There is a drain cock on the base of the fuel tank, which may be used to check the quality of the fuel, and to drain fuel if necessary, it is especially important to remove any water that may have been introduced from the system. The fuel is checked for water and contaminants by draining a sample of the fuel into a clear glass container. Once a sample has been taken the quality of the fuel can be checked by looking for any water at the bottom of the glass, and checking for any other visual contaminants.



If the fuel has been sitting for an extended period without use it may be advisable to replace it with fresh fuel. For draining the fuel ensure that a suitable receptacle is found for the fuel that is to be drained, position the trike above the receptacle and open the draincock. Ensure that there are no ignition sources and that the fuel is disposed of correctly.

10.7 Engine Oil System Replenishment

The minimum oil level is between 1/2 and 2/3 of the oil tank after 3 minutes idling. This checked and replenished by removing the oil sump lid.

HKS has provided service instructions, which detail how to check the oil.

10.8 Lubricating Oil

The HKS engine has an external sump, and the entire system is standard to the HKS engine.

The oil specification is given in the HKS Operators Manual, Section 3.6.

In general use only brand-name 100% synthetic oil, API classification .SJ. Multigrade is recommended. Take the viscosity of the oil named with SAE at least 15W-30, if available 5W-30 is highly recommended.

0W-30 or 0W-40 is recommended in winter.

10.9 Cooling System

Free air-cooling system.

10.10 Tire Inflation

The recommended tire inflation pressures are 2 Bar for both the front and rear tires. When checking the tire pressures the opportunity should be taken to examine the tires for wear, cuts, bruises, slippage and other defects.

10.11 Circuit Breaker and Fuses

The fuses for the electrical equipment are located in two positions.

1. There is 25 amp fuse located on the dash board.
2. There are two fuses 15 amp (trim device) and 40 amp located at the rear of the trike, on the right hand side of the battery.

11. TRANSPORTATION AND STORAGE

With good care and correct maintenance your trike will retain its good conditions for many years.

We recommend that you do not expose your wing to any more direct sunlight than necessary. Do not leave under the sun for long periods of time when you are not flying.

Do not leave your wing on the trike for a long period of time in strong winds. It will decrease the life of the sail, the hang joint and the frame of your wing.

The wing may be transported in its bag in any vehicle that offers protection from mechanical damage, soiling and long exposure to rain. It is not recommended that the wing be carried or transported without its bag.

During transportation, or when stored on supports, the wing must be supported at its center and at two points not more than one meter from each end.

Supports should be softly padded, and any support systems used for transport, such as roof racks, must use attachment straps that are sufficiently secure to eliminate the possibility of damage from vibration and movement.

Avoid damage to your wing by using well-padded racks. As the wing is quite heavy a strong set of racks are required. Flat straps should be used for tie downs to avoid damage to leading edge Mylar.

When transporting the trike use trike and prop covers to protect your ultralight. Tie the propeller to the trike to stop it from rotating at speed.

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

If you fly at the costal area or your ultralight has been exposed to salt water dismount it and rinse with tap water thoroughly before storage. If you fly frequently at the costal area it is necessary to wash the ultralight with tap water at least once a month to prevent all aluminum parts from corrosion.

See your trike wing Manual for detailed description of the trike wing maintenance.

See your HKS Manual for precautions to be observed if you intend to store the ultralight without use for extended periods.

The recommended storage temperature is from -10 to +25 deg. Centigrade.