

# AEROS NANOLIGHT TRIKE

# ANT

## ULTRALIGHT OWNER /SERVICE MANUAL



*Wing: Combat-T, Discus-T, Fox-T, Fox-13TL, Fox13-T, ADAM-13T*

*Engine: Vittorazi Cosmos 300, Vittorazi Moster 185, Polini Thor 303*

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*July 2024*

## AMENDMENTS

No.	Section	Pages	Date of correction	Comments
1		2	10.07.2024	Amendments table added.
2	1	7	10.07.2024	$V_{NE}$ , $V_A$ and $V_{So}$ have been entered in the table.
3	2	8	10.07.2024	Table with airspeed limitations has been removed and a reference to the table in section 1.3 has been added instead.

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# INTRODUCTION

Thank you for purchasing the Aeros ANT ultralight.

Over the many years of production and hundreds of flight hours, the ANT trike has undergone significant changes since the beginning of its production. This is mainly due to the technical improvement of the trike, new wings, the discontinuance of the old line of engines and their replacement by new, more advanced engines. In this regard, it became necessary to change and revise the ANT manual to comply with the numerous changes in the design.

Please read and be sure you thoroughly understand this manual before operating your ANT trike. 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.

## Symbols Abbreviations and Terminology

In this Manual:

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.

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.

$V_{NE}$  means the indicated airspeed that the ultralight is never to exceed.

$V_A$  - maneuvering speed (the maximum speed at which full or abrupt control movements are permitted).

$V_{So}$  - stalling speed or the minimum steady flight speed in a specific configuration.

## 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 are considered essential to highlight.

# 1. GENERAL INFORMATION

## 1.1 Trike

The ANT trike is a one seat weight shift controlled ultralight. It is fully complies with the concept of maximum portability – it can be folded up to fit in the back of many cars. The wing is light and once packed can easily be carried on car roof racks. There is a choice of Vittorazi Moster 185 (2 stroke, 25 hp), Vittorazi Cosmos 300 (2 stroke, 36 hp) or Polini Thor 303 (2 stroke, 38 hp) engines to power the trike. The base is attached to the wing by way of a hang bracket which allows the free movement of the trike in pitch and roll by which control is affected.

The trike is equipped with ground adjustable pedals to allow for various size pilots.

The ANT has manually retractable landing gear. After take-off the rear wheels can be retracted to aid in drag reduction. The great advantage of retractable landing gear is transportation – the trike can be easily fitted inside of ordinary car.

NOTE: The sizes of the ANT main upper pylons and front brace tubes differ for different wings due to their different size control frames.

ANT	
Empty weight without engine and without rescue system, kg	29.3
Empty weight with Moster 185 engine (without rescue system), kg	49.2
Empty weight with Cosmos 300 LS engine (without rescue system), kg	65.9
Empty weight with Thor 303 engine (without rescue system), kg	62.2
Fuel tank volume, l	18
Starter type	Electric, manual, dual
Dimensions (folded, no prop, no engine), m	L=1.35, W=0.55, H=0.95

## 1.2 Wing

There is a choice of Combat-T, Discus-T, Fox-T, Fox-13TL, Fox13-T and ADAM-13T wings for the ANT.

Discus-T has been especially designed for nanolight trikes, with a Discus hang glider used as a base. It comes in two sizes: Discus-14T and Discus-15T. Handling the Discus-T in the air is as easy as handling a conventional hang glider.

Combat-T is another step higher in nanolight technology. It is designed for those who want to extend their abilities of flying faster and farther. Due to its unique design the nanolight trike with a Combat-T wing will allow you the whole aircraft storage with the wing only partially de-rigged and folded in but still attached to the trike.

Fox-T is another wing for nanolight trikes for those who want to feel the simplicity and real pleasure of bird-like flying. It has been developed from our beginner glider Fox and has been reinforced and adapted for flying with nanolight trikes.

Fox-13TL is a kingpostless wing that combines performance of a Discus-T with simplicity of construction and quickness of rigging and de-rigging of a Fox-T. Due to its unique design the nanolight trike with a Fox-13TL wing will allow you the whole aircraft storage with the wing only partially de-rigged and folded in but still attached to the trike. This allows storing the trike with the wing on it in a really limited space in a hangar or even in a garage. Setting the wing that already attached to the trike up for flight takes about five minutes.

Fox13-T wing has been designed especially for sub 70kg nanolight trikes, using a Fox hang glider and Fox13-TL nanolight trike wing as a prototypes. It is a light weight wing designed to comply with sub 70kg aviation regulations. The regulations allow hang glider pilots to fly sub 70kg aircraft on wheels with a simple powered endorsement, which means there is no need to do a full ultralight licence.

ADAM-13T wing has been designed especially for Flylight Airsports and Aeros sub 70 nanolight trikes, using a Fox-13T nanolight trike wing as a base. It is a light weight wing designed to comply with sub

70kg aviation regulations. These regulations allow hang glider pilots to fly sub 70kg aircraft on wheels with a simple powered endorsement, which means there is no need to do a full ultralight licence. Minimum amount of battens for maintaining the airfoil has resulted in relatively low weight and fast set up time. ADAM-13T has double surface with relatively large percentage of undersurface which gives the wing more performance compare to Fox-13T wing.

Wing type	Combat-T	Discus-14T	Discus-15T	Fox 13TL	Fox -T	Fox13-T	ADAM-13T
Sail area, sq.m. (sq.ft.)	12.8 (138)	13.7 (147.5)	14.7 (158)	13 (140)	16.2 (174)	13 (140)	13 (140)
Wing span, m (ft)	10.0(32.7)	10.0(32.8)	10.3(33.8)	8.65 (28.35)	9.6 (31.4)	8.65 (28.4)	8.65 (28.4)
Aspect ratio	7.8	7.3	7.2	5.75	5.7	5.75	5.75
Nose angle, deg	130	126	126	121	120	121	121
Stall speed, kmph (mph)*	37 (23)	35 (22)	35 (22)	37(23)	35 (22)	37 (23)	37 (23)
Speed of max glide angle, kmph* (mph)	48 (30)	45 (28)	45 (28)	48(30)	43 (27)	45 (28)	45 (28)
Operating overloads	+4/-2	+4/-2	+4/-2	+4/-2	+4/-2	+4/-2	+4/-2
Maximum payload, kg (lb)	178 (392)	170 (375)	170 (375)	200 (441)	168 (370)	155 (342)	155 (342)
Weight without bag, kg (lb)	39 (86)	33 (73)	35 (77)	35 (77)	28 (61.5)	25.5 (56)	26.5 (58)

\* - with maximum payload

#### NOTE

For full details of the wings, refer to the relevant wing manual.

#### WARNING

WE RECOMMEND USING Fox13-T AND ADAM-13T WINGS FOR THE ANT TRIKE WITH Vittorazi Moster 185 ENGINE ONLY, AS THIS ENGINE IS RELATIVELY LIGHT AND HAS A WIDER RANGE OF PILOT WEIGHTS.

FOR Vittorazi Cosmos 300 AND Polini Thor 303 ENGINES WE DO NOT RECOMMEND USING Fox13-T AND ADAM-13T WINGS DUE TO THE LARGE WEIGHTS OF THESE ENGINES. FOR THESE ENGINES DUE TO THEIR LARGER WEIGHTS WE RECOMMEND USING Combat-T, Discus-T, Fox-T, Fox-13TL WINGS.

#### WARNING

WE DO NOT RESPONSIBLE FOR ANY DISCREPANCIES ARISING FROM THE CUSTOMER'S OWN INSTALLATION OF OTHER BRANDS AND TYPES OF WINGS.

#### WARNING

DO NOT USE Combat-T, Discus-T, Fox-T, Fox-13TL, Fox13-T AND ADAM-13T WINGS FOR FLYING WITHOUT A TRIKE.

### 1.3 Ultralight

The ANT trike in combination with any of above mentioned wing has proven to be an excellent combination to feel simplicity and real pleasure of bird-like flying.

The entire aircraft can be de-rigged and stored at home, if needed, with minimum time and effort without any tools required.

Ultralight		ANT					
Wing type		Combat-T	Discus-T	Fox 13TL	ADAM-13T	Fox 16T	Fox 13T
Engine type	Vittorazi Moster 185						
Power, hp	25						
Propeller	2 blade						

Starter type	Manual or electric+manual				
Empty weight (incl. rescue system), kg	93.8	89.8	89.8	81.3	82.8
Empty weight without wing (incl. rescue system), kg	54.8	54.8	54.8	54.8	54.8
Max.pilot weight with 10 l of fuel, kg	104	103	108	88.1	100.6
Max take-off weight, kg	210	205	210	182	196
V <sub>NE</sub> , km/h	95	80	85	80	70
V <sub>A</sub> , km/h	80	75	75	75	66
V <sub>so</sub> , km/h	39	37	37	37	33
Fuel consumption at cruise speed, l/hour	4	4.1	4.5	4.5	4.5
Load factors, g	4g/-2g				
Climb rate, m/s	3	2.8	2.6	2.7	2.7

Ultralight	ANT			
Wing type	Combat T	Discus T	Fox 13TL	Fox T
Engine type	Vittorazi Cosmos 300			
Power, hp	36			
Propeller	2 or 3 Blade			
Starter type	electric+manual			
Empty weight (incl. rescue system), kg	110.5	106.5	106.5	99.5
Empty weight without wing (incl. rescue system), kg	71.5	71.5	71.5	71.5
Max.pilot weight with 10 l of fuel, kg	87	86	91	84
Max take-off weight, kg	210	205	210	196
V <sub>NE</sub> , km/h	95	80	85	70
V <sub>A</sub> , km/h	80	75	75	66
V <sub>so</sub> , km/h	39	37	37	33
Fuel consumption at cruise speed, l/hour	4	4.1	4.5	4.5
Load factors, g	4/-2			
Climb rate, m/s	4.3	4	3.6	3.6

Ultralight	ANT			
Wing type	Combat T	Discus T	Fox 13TL	Fox T
Engine type	Polini Thor 303			
Power, hp	38			
Propeller	2 or 3 Blade			
Starter type	electric+manual			
Empty weight (incl. rescue system), kg	106.8	102.8	102.8	95.8
Empty weight without wing (incl. rescue system), kg	67.8	67.8	67.8	67.8
Max.pilot weight with 10 l of fuel, kg	91	90	95	88
Max take-off weight, kg	210	205	210	196
V <sub>NE</sub> , km/h	95	80	85	70
V <sub>A</sub> , km/h	80	75	75	66
V <sub>so</sub> , km/h	39	37	37	33
Fuel consumption at cruise speed, l/hour	4	4.1	4.5	4.5
Load factors, g	4/-2			
Climb rate, m/s	4.5	4.2	3.8	3.8

There are weights of some possible options listed below, that may be useful for you to calculate and optimize the weight characteristics of your ultralight.

- trike fairing - 2.25kg;
- rescue system – 5.6kg;
- battery – 2.55kg;
- fuel, 18 liters – 12.6kg

## 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 the ANT ultralight with engine and standard equipment.

### 2.2 Airspeed Limitations

Airspeed limitations of the ANT ultralight depend on the wing type installed on the ultralight (see the table above in the section 1.3).

### 2.3 Power Plant Limitations

#### 2.3.1 Engine

ENGINE PERFORMANCE & LIMITATIONS			
Engine Type	Vittorazi Moster 185	Vittorazi Cosmos 300	Polini Thor 303
Take off RPM (Max 1 minute), rpm	8300-8600 (max. 5 minutes)	7550(max. 1 minute)	8000 (max. 3 minutes)
Maximum RPM (continuous), rpm	7800	6500	7000
Engine head temperature (coolant temperature*) min., °C	120	65*	55*
Engine head temperature (coolant temperature*) max., °C	250	90*	90*
EGT maximum, °C	-	650	680
Take off power, hp	25	36	38

#### WARNING:

Moster 185, Cosmos 300 and Thor 303 ARE NON-CERTIFIED AIRCRAFT ENGINES, THE POSSIBILITY OF ENGINE FAILURE EXISTS AT ALL TIME. DO NOT FLY WITH THESE ENGINES OVER DENSELY POPULATED AREAS. DO NOT FLY WITH THESE ENGINES OVER TERRAIN WHERE A SAFE, POWER OFF LANDING CANNOT BE PERFORMED.

#### 2.3.2 Fuel

The following fuels shall be used.

##### Vittorazi Moster 185 engine

Fuel mixture of premium super gasoline and full synthetic top-quality oil for 2-strokes engines (Castrol TTS) at 2,5%.

##### Vittorazi Cosmos 300 engine

Fuel mixture of gasoline and engine oil to operate.

Premium 95 Ron Octane unleaded petrol is approved with the engine. In case the available petrol doesn't meet the required standards, it is recommended to use 100 RON AVGAS 100LL petrol.

Recommended oil is Motul 710 or Motul 800. Motul 710 is suggested for infrequent use with moderate and short climbs at maximum RPM. Motul 800 is suggested for frequent use.

Recommended fuel mixture when using Motul 710: oil at 2,0% or 50:1.

Recommended fuel mixture when using Motul 800: oil 1.5% or 66:1.

##### Polini Thor 303 engine

Fuel mixture of premium petrol 95-99 (Ron) Octane unleaded or AVGAS 100LL and oil at 2.5%.

Use synthetic top-quality oil for 2-strokes engines only.

## 2.4 Weight

Weight characteristics of your ultralight will depend on the wing type, the engine and the starter type installed on your ultralight and the trike fairing and the rescue system availability. Due to this fact they may be different for your ultralight.

See tables with your wing and engine options in tables on pages 6-7 to calculate weight data for your ultralight.

## 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 hang bracket, variations of cockpit loading and fuel loading cannot influence the ultralight's balance. The ANT 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 maneuvers including stalls, stalled spiral descents and negative G maneuvers are not permitted. These maneuvers put the ultralight outside the pilot control and put both the ultralight and its occupant in extreme danger.

Do not pitch nose up or nose down more than 45 degrees from the horizontal.

Do not make high speed abrupt turns.

### 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 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: 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 is 18 liters.

### 2.5.7 Maximum Occupant Seating Limits

One occupant maximum allowed.

### 2.5.8 Pilot Weight

The ultralight must only be flown solo.

Minimum pilot weight shall not be less than 55 kg.

Maximum pilot weight will depend on the wing type, the engine and the starter type installed on your ultralight and the trike fairing and the rescue system availability. Due to this fact maximum pilot weight may be different for your ultralight. Refer to tables on pages 6-7 to calculate maximum pilot weight permitted for your ultralight.

### 2.5.9 Other Limitations

Maximum Cross Wind - 2m/s

Maximum Wind Strength - 8m/s

Maximum Ambient Operating Temperature + 35 ...-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.

The effect of light rain on the wing 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. 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 entire ultralight, which includes trike and wing 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
- Key position right = 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 Hand Throttle



The trike may be equipped with a hand throttle (fig. 1). The hand throttle is positioned on the right side of the seat frame.

Figure 1

**WARNING**

THE HAND THROTTLE MAY BE APPLIED FOR CRUISE FLIGHT ONLY. CHECK THAT IT IS IN THE REAR POSITION BEFORE YOU OPERATE THE ENGINE. THE HAND THROTTLE SHOULD NOT BE USED DURING ENGINE START, TAXI, TAKE-OFF AND LANDING.

#### 3.4 Retractable Landing Gear

The ANT trike is equipped with manually retractable landing gear.

Grate advantage of retractable landing gear is transportation – the disassembled trike with landing gear retracted can be easily fitted in its transportation bag inside of ordinary car.

The rear wheels can also be retracted to aid in drag reduction.

The retractable landing gear is simple and easy to operate.

To retract the landing gear on the ground (in case the ultralight is dismantled for storage, the wing and the engine must be removed from the trike) do the following. Lift the rear of the trike up (best done with an assistant), open the lock (*fig. 2*) and fold the landing gear struts forward one by one. Pivot the struts forward until they rest in the retracted position on the locks (*fig. 3*).



*Figure 2*



*Figure 3*

The dismantled for storage trike with the landing gear retracted can easily fit into the boot or cabin of most cars.

To open the landing gear, pull the handle to open the landing gear lock (*fig. 4*). Manually position the landing gear struts one after the other into the landing position and lock them in the opened position with the lock lever (*fig. 5*). Be careful not to injure your fingers while locking the landing gear.



*Figure 4*



*Figure 5*

### 3.5 Control Panel

The control panel positioned on the left rest arm and, depending on the model (*fig. 6 and fig. 7*), may consist of:

- engine head temperature,
- EGT temperature,
- coolant temperature,
- tachometer and hour meter,

- master key,
- ignition switch (switches),
- start button,
- primer.



Figure 6



Figure 7

### 3.6 Occupant Restraint Harness

The seat is fitted with a 4-point restraint harness system.

### 3.7 Engine

The following engines can be installed on the aircraft.

Vittorazi Moster 185 (2 stroke, 25 hp) air cooled engine with either hand starter or both: electric starter and hand starter.

Vittorazi Cosmos 300 engine. It is a single cylinder, two-stroke, liquid cooled piston engine with either electric starter or pull starter or both: electric starter and pull starter.

Polini Thor 303 engine. It is a single cylinder, two-stroke, liquid cooled piston engine with either electric starter or pull starter or both: electric starter and pull starter.

The trike can also be equipped with other engines with similar characteristics.

### 3.8 Propeller

Manufacturer: Helix

Type: 2 or 3 Blade Composite

Diameter: 1300 - 1400 mm

The maximum propeller speed occurs when the engine RPM reaches its maximum RPM (depends on the engine type and manufacturer).

### 3.9 Brake System

A front wheel disk brake system with mechanical drive is used on the ultralight. It is rather effective especially on the asphalt or concrete runways. It is recommended to brake with caution and do not apply too much force to the brake pedal. During landing run use the brake in the second part of the run only, pressing on the brake pedal gradually.

#### CAUTION

THE BRAKE SYSTEM IS RATHER EFFECTIVE ESPECIALLY ON THE ASPHALT AND CONCRETE RUNWAYS.  
BRAKING AT HIGH SPEED SHARPLY WILL RESULT IN THE BRAKE DISC OVERLOAD AND THE BRAKE SYSTEM FAIL.

### 3.10 Emergency Rescue System.

The ultralight may be equipped with emergency rescue system. The rescue system provides for landing in case of emergency without the necessity for the pilot to leave the ultralight in the air.

The Cylindricone pneumatic rescue system is equipped with a pressure gauge. The reading of the pressure gauge must be between 120 and 180 bar.

There is an engine emergency stop system to stop the engine when pulling the rescue system deployment handle. Plug-in the stop connector in to the appropriate socket at the front part of the instrument panel to engage the system.

### 3.11 Ground Adjustable Pedals

Depending on the pilot's height, it is possible to reposition the front fork together with the pedals on the ground.

Figure 8 shows the pedals in the front position.

To move the pedals to the rear position, detach the front fork and remove the front wheel fairing. In the kit that came with the trike, find the rectangular rubber insert and place it in the recess of the nose wheel fairing as shown on the *figure 9*. Fit the front wheel fork to the rear hole in the front lower beam, fit the nose wheel fairing and tighten the bolt connections.



Figure 8



Figure 9

## 4. TRIKE ASSEMBLY PROCEDURES

### 4.1 Trike Assembly

The trike is easy to de-rig, pack-up and transport in pack-up bags as shown on the figures below. It comes in two bags – the trike and the engine. If your trike is with a fairing, there will be additional bag with it. A propeller, an upper pylon and a front brace tube come in separate bags (*fig. 10 and 11*). A propeller, an upper pylon and a front brace tube are transported separately (or they may be transported inside the wing bag).



Figure 10



Figure 11

The assembly and disassembly procedures are as simple as possible and do not require any special tools.

4.1.1 Unzip the bags with a trike, an engine and a fairing, remove a propeller, an upper pylon and a front brace tube from their bags (*fig. 12*).

4.1.2 Remove a bolt's set from the trike side pocket (*fig. 13*).



*Figure 12*



*Figure 13*

4.1.3 Install the front lower beam with the nose wheel.

To do so swing the front lower beam with nose wheel forward, secure it with quick-release bolts and wing nuts. Use quick-release bolts with red levers at this time. (*fig. 14, 15*). Make sure that the throttle cable is not caught on something when swinging the front lower beam.



*Figure 14*



*Figure 15*



*Figure 16*

Adjust the correct tightening of the wing nuts and tighten the bolts with eccentric levers, then lock them with the safety rings (*fig. 16*).

4.1.4 Extract both landing gear legs (see photos below) and lock them in position with the lock system as shown on the figures (*fig. 17, 18 and 19*).



Figure 17



Figure 18



Figure 19



Figure 20

4.1.5 Mount the engine on the main lower pylon (*fig. 20*). The engine mount plates have special tabs on top to keep the engine from slipping off the mounts. Do not let the engine to swing around and insert the quick-release bolt into the bottom mount hole (*fig. 21*). Insert the quick-release bolt into the upper mount hole. Use remaining quick-release bolts with black levers at this time.

Adjust the wing nuts to the correct tightening torque and tighten the bolts with the eccentric levers (*fig. 22*), then secure them with safety rings (*fig. 23*).

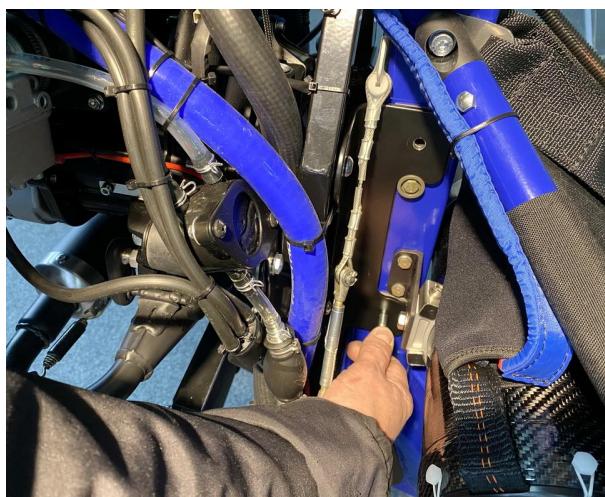


Figure 21



Figure 22



Figure 23

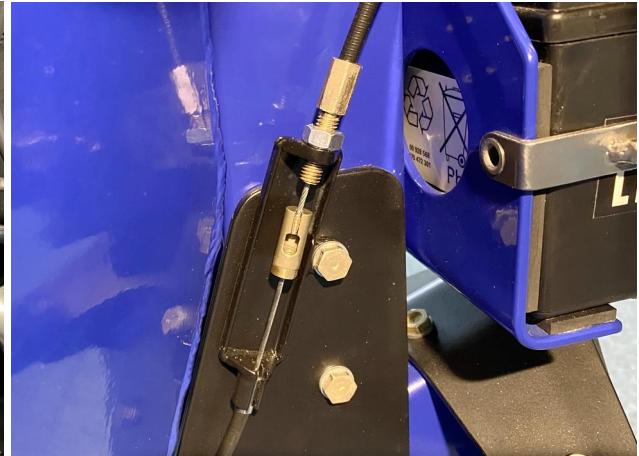


Figure 24

4.1.6 Install the throttle rod. Feed the throttle rod with the rod end through the rod support and position it in place as shown on the figure (fig. 24).

**WARNING**

MAKE SURE THE THROTTLE ROD IS FULLY INSERTED INTO THE THROTTLE ROD MOUNT.



Figure 25



Figure 26

4.1.7 Connect the fuel line with the quick connector (fig. 25).

4.1.8 Connect the electric wiring power connector (fig. 26).



Figure 27

4.1.9 Mount the control panel by installing its mounting plate in to the corresponding pocket on the left side of the trike and fixing it with Velcro (fig. 27).

**WARNING**

IF YOUR TRIKE IS EQUIPPED WITH THE RESCUE SYSTEM, PLUG THE ENGINE STOP CONNECTOR INTO THE APPROPRIATE SOCKET OF THE INSTRUMENT PANEL, OTHERWISE THE ENGINE WILL NOT START (FOR ENGINE WITH ONE IGNITION CIRCUIT) OR ONE IGNITION CIRCUIT WILL NOT OPERATE (FOR ENGINE WITH TWO IGNITION CIRCUITS) (fig. 28).

4.1.10 Fix the electric wires hose to the side of the seat frame with Velcro straps (*fig. 29*).



*Figure 28*



*Figure 29*

4.1.11 Install the main upper pylon and secure it with quick-release bolts and wing nuts. Use quick-release bolts with black levers. Adjust the correct tightening force of the wing nuts, tighten the bolts with eccentric levers (*fig. 30*) and then lock them with safety rings (*fig. 31*).

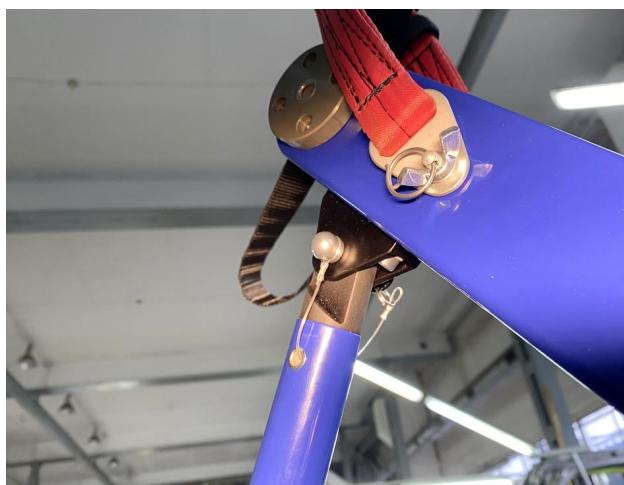


*Figure 30*



*Figure 31*

4.1.12 Install the front upper brace tube, attaching it first to the main upper pylon (*fig. 32*) and then to the front lower beam (*fig. 33*).



*Figure 32*



*Figure 33*

4.1.13 If your trike is equipped with a manual starter, install the pull handle on the main upper pylon, fixing it with butterfly nut and secure with safety rings as shown on the picture (fig. 34). Check the manual starter rope routing all the way through the manual starter pulley (fig. 35).



Figure 34



Figure 35



Figure 36

4.1.14 Remove the propeller from the transport cover.

For assembling the 2-blade propeller it is necessary to align the slots on the propeller hub and slide the blades until the holes on the propeller hub are fully overlapped (fig. 36). The 3-blade prop is assembled in a certain order, this order is defined by special markings on the blades: •, ••, and •••. Once you have selected the appropriate blades and positioned them in the required order (fig. 37-a), match the markings: • with •, •• with •• and ••• with ••• (as indicated in the red circle on fig. 37-b). To assemble the propeller, align the slots on the propeller hub and slide the blades in until the holes on the propeller hub are fully overlapped (fig. 37-b).



Figure 37-a



Figure 37-b

#### NOTE

The propeller blades are not identical to each other. Make sure that the propeller is assembled correctly and that the Helix lettering on the propeller blades are on the same side.

## CAUTION

INCORRECT PROPELLER ASSEMBLY MAY CAUSE THE PROPELLER TO DAMAGE AFTER THE ENGINE START.

4.1.15 Mount the propeller on the trike. Note that the lettering on the propeller blades are on the back. Depending on the modifications, the propeller can be attached with either six bolts (*fig. 38-a and fig. 38-b*) or with one central bolt (*fig. 39-a and fig. 39-b*).



Figure 38-a



Figure 38-b

Tighten the prop bolts crosswise to a torque of 22 Nm. Do not exceed the tightening torque. Secure all the prop bolts in pairs with a locking wire so that the locking wire prevents the bolts from loosening (*fig. 38-b*).

The propeller may be secured through the propeller hub with one central bolt. Fit the rubber washer, flange and tighten the bolt as shown on the figure (*figure 39-a*). Secure the assembly with the locking pin (*fig. 39-b*).



Figure 39-a



Figure 39-b

Now your trike is ready for attaching the wing.

If your trike is equipped with a fearing it is better to install it after the wing is connected to the trike.

## 4.2 Installing the Trike Fairing

As it has been mentioned above it is much easier to install the trike fairing after the wing has been connected to the trike.

4.2.1 Unzip the bag with fairing and remove the fairing from its bag.

4.2.2 Stick both rear Velcro straps on the fairing as shown on the figure (*fig. 40.*)



Figure 40



Figure 41

4.2.3 Lift the front part of the trike and position the trike fairing under the trike as shown on *figure 41*.

4.2.4 Attach the trike fairing rear Velcro to the seat frame as shown on the figure (*fig. 42*).

4.2.5 Attach the trike fairing to the front brace tube with a quick pin (*fig. 43*).



Figure 42



Figure 43

4.2.6 Attach the main pylon fairing with Velcro (*fig. 44*). If your trike is equipped with a manual starter, it will be necessary to reposition the pull handle on top of the fairing. Fix it with butterfly nut and secure with safety rings as shown on the figure (*fig. 45*).



Figure 44

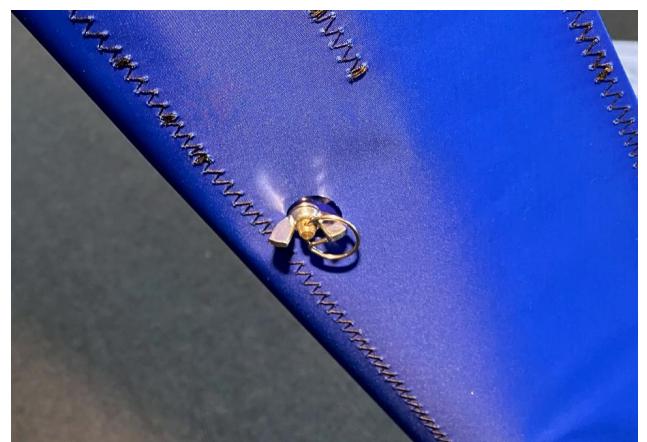


Figure 45

## 5. ULTRALIGHT ASSEMBLY PROCEDURES

### 5.1 Wing Assembly Procedure

Combat-T, Discus-T, Fox-T, Fox-13T, Fox-13TL and ADAM-13T wings are differ from each other in both flight performance and design, so their assembly procedures are significantly different.

The wing assembly procedure, as well as all necessary information related to the wing, is described in details in the manual of the wing you have chosen. Please read it thoroughly and make sure it is clearly understood.

### 5.2 Preflight Inspection of the Wing

Conduct preflight inspection of the wing before attaching it to the trike as written in a wing Manual. The ultralight preflight inspection is written in section 7. FLIGHT PREPARATION

### 5.3 Attaching Combat-T, Discus-T and Fox-T Wing to the Trike

5.3.1 Position the wing on its control frame, facing into the wind, with the nose on the ground and the nose cone removed. Remove the rear part of the keel tube from the wing.

5.3.2 Install the hang bracket on the keel tube of the wing. To do so place two pieces of the plastic cube around the keel tube between the two stop rings (*fig. 46*).

After that mount the U-plate, insert the two bolts, hand tighten the nuts and secure with the safety rings (*fig. 47*).



Figure 46



Figure 47



Figure 48

5.3.3 Go to the trike. Check that the ignition switches and the master key are in off position. Remove the upper quick-release bolt from the upper pylon / lower pylon mounting assembly. Open the lever of the lower quick-release bolt, so that the upper pylon / lower pylon mounting assembly are temporarily loose (*fig. 48*). The upper pylon must rotate around the lower bolt when lowering the upper pylon down and lifting it up when raising the wing upwards.

5.3.4 Check that the ignition switch and the key are in off position. Wheel the trike behind the wing (*fig. 49*), rolling the front wheel over the control bar. Detach the front strut from the front lower beam and lower the upper pylon downwards.



*Figure 49*



*Figure 50*

5.3.5 Lift the nose of the wing up until high enough to connect the upper pylon junction of the trike to the mount bracket of the wing (*fig. 50*). Insert the heart bolt, hand-tighten the nut and secure it with a safety ring. Connect the backup loop as shown on the figure (*fig. 51*). Hand-tighten the nut and secure it with a safety ring.



*Figure 51*



*Figure 52*

5.3.6 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 front wheel and the rear of the keel rests on the pylon. Make sure the protection pad on the main upper pylon is in proper position and protects the pylon against bottom rear wires (*fig. 52*).



*Figure 53*



*Figure 54*

5.3.7 Having ensured that the keel batten is correctly positioned and resting with its nose on the keel tube, install the nose cone by first attaching it to the upper surface of the wing and then by pulling the lower edges of the nose cone backwards to the lower surface (*fig. 53*).

5.3.8 Attach an auxiliary strap to the pedals as shown on the figure (*fig. 54*).

5.3.9 Go to the nose of the wing. Step on the auxiliary strap with one foot to prevent the trike from lifting up the front wheel when rising the wing up. With the front brace tube in one hand and the base tube in the other hand lift the base tube and lift the wing up (*fig. 55*). In strong winds maintain a firm grip on the base tube.

5.3.10 Attach the front brace tube in position using a quick-pin (*fig. 56*).



Figure 55



Figure 56

5.3.11 In the connection between the upper pylon and the lower pylon, fit the upper quick-release bolt and the wing nut. Adjust the wing nut to the correct tightening torque and tighten the bolt with the eccentric lever, then secure it with the safety ring. Tighten the lower quick-release bolt with the eccentric lever (*fig. 57*).



Figure 57



Figure 58

5.3.12 Park the ultralight. In light winds, secure the base tube with the harness straps and park the ultralight against the wind. The angle of attack of the wing should be approximately 0 degrees or less. In fresh or gusty winds, position the ultralight so that the wind direction in relation to the ultralight is to the side and slightly to the rear. Move the base tube towards the front strut and lower the wing facing downwind towards the ground. Fix the base tube to the front strut (*fig. 58*).

## 5.4 Attaching Fox-13TL, Fox-13T and ADAM-13T Wing to the Trike

5.4.1 Position the wing on its control frame, facing into the wind, with the nose on the ground and the nose cone removed. Remove the rear part of the keel tube from the wing.

5.4.2 Install the hang bracket on the keel tube of the wing as written in the paragraph 5.3.2.

5.4.3 Go to the trike. Check that the ignition switches and the master key are in off position. Install the wing mount bracket on the front lower pylon as shown on *figure 59*.



Figure 59



Figure 60

5.4.4 Detach the front strut from the front lower beam. Press the front strut push pins buttons and fold the front strut tube in as far as it will go. Tilt the upper pylon down and place the lower tip of the front strut on the pilot's seat.

5.4.5 Wheel the trike behind the wing. Lift the control frame of the wing up and rest the base tube on the wing mount bracket. Fasten straps of the wing mount bracket around the base tube (*fig. 60*).

5.4.6 Attach the front strut to the front lower beam channel using a quick-pin (*fig. 61*).



Figure 61



Figure 62

5.4.7 Lift the nose of the wing up until high enough to connect the hang bracket of the wing to the main pylon of the trike. Insert the heart bolt, hand-tighten the nut and secure it with a safety ring. Connect the backup loop as shown on the figure (*fig. 62*). Hand-tighten the nut and secure it with a safety ring.

5.4.8 Having ensured that the keel batten is correctly positioned and resting with its nose on the keel tube, install the nose cone by first attaching it to the upper surface of the wing and then by pulling the lower edges of the nose cone backwards to the lower surface (*fig. 63*).

5.4.9. Sit in the pilot's seat. Undo straps around the base tube. Take a firm grip on a base tube and lift it up on your knees first and then all the way up until the push pin buttons of the front brace tube click in position (*fig. 64*).



Figure 63



Figure 64

5.4.10 Install the quick pin to secure the front brace tube from folding in (*fig. 65*).



Figure 65



Figure 66

5.4.11 In the connection between the upper pylon and the lower pylon, fit the upper quick-release bolt and the wing nut. Adjust the wing nut to the correct tightening torque and tighten the bolt with the eccentric lever, then secure it with the safety ring. Tighten the lower quick-release bolt with the eccentric lever (*fig. 66*).

5.4.12 Remove the wing mount bracket from the front lower pylon.

5.4.13 Park the ultralight. In light winds, secure the base tube with the harness straps and park the ultralight against the wind. The angle of attack of the wing should be approximately 0 degrees or less. In fresh or gusty winds, position the ultralight so that the wind direction in relation to the ultralight is to the side and slightly to the rear. Move the base tube towards the front strut and lower the wing facing downwind towards the ground. Fix the base tube to the front strut (*fig. 58*).

5.4.14 For more information on installing the Fox-13TL wing on a trike, see the video:  
<https://www.youtube.com/watch?v=liqnoVQ2rBo>

## 6. FLIGHT PREPARATION

### 6.1 General

#### 6.1.1 Pre-Flight Planning

Planning is critical to the legal safe operation of all aircraft. Prior to each flight depending on the purposes of flight it is necessary to work out the flight plan. Please ensure that you have completed the following procedures:

- proceed with all necessary formalities which are relative to given flight;
- 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;
- estimate the necessary fuel state;
- conduct complete preflight inspection of the ultralight.

#### 6.1.2 Air Law

Before you fly, make sure that your aircraft documents and pilot qualifications meet the requirements of the countries in which you intend to fly. Air law may vary from country to country; make sure you always fly within the air law of your country. Make sure you have permission to fly from both the takeoff site and the intended landing site.

#### 6.1.3 Route Planning

Plan your flight route using the appropriate pilot map, properly folded and stowed in an appropriate map holder that is securely attached to the pilot/passenger or the aircraft. Make sure that your planned route is within the applicable air law of your state/country. Always plan your route so that in the event of loss of power or complete engine failure, you will fly a safe distance to a suitable landing field. Avoid flying over mountains or large hills or lakes, seas, populated areas, forests, soft sand deserts, or any other place that makes it impossible to land safely in case of an emergency. Remember that there is an increased risk of turbulence when flying near mountains. Never fly from the lee side of hills or mountains if the surface wind is different than calm, as a lee rotor can be extremely dangerous. Always plan for the possibility of diverting to an alternate airfield due to bad weather and make sure you have enough fuel to reach your alternate destination with another 30 minutes of flight time to spare. Use the advice given in this paragraph in conjunction with the advices you received during formal training. These tips should not be used as a substitute for proper training.

#### 6.1.4 Airstrip

The airstrip should be smooth, flat, unobstructed, clear of stones and other obstacles that can damage the aircraft and especially the propeller.

The ideal surface is shortcut grass or asphalt. The airstrip should be long enough to allow for a straight ahead landing in case of engine failure or climb out. Both the approach and climb out zones should be clear of any tall obstructions such as trees, poles and buildings, and ideally these zones should have alternate landing fields to ensure a safe landing in case of engine problems during landing or takeoff. Airstrips surrounded by trees or other obstacles should be avoided, especially in windy conditions, as turbulence and rotors are likely at low levels. Exercise great caution when visiting other airstrips for the first time, as it is quite possible that they are not suitable for safe operation of the ultralights.

#### 6.1.5 Weather Conditions

Flexwing lightweight ultralights should be flown only in calm conditions. The cautious pilot tries to avoid flying in high winds (over 3 - 4m/s), gusty, thermal, rain, and any thunderstorm. Remember that the weather at your destination airfield may be different from the weather at your departure airfield, so check it before you take off. Detailed aviation weather reports are usually available at your local airfield and online. If the weather changes unexpectedly for the worse during your flight, the safest option is to land at a suitable landing area at the earliest opportunity.

#### WARNING

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

## 6.2 Complete Ultralight Pre Flight Inspection

### WARNING

ENSURE THAT THE IGNITION SWITCH AND THE MASTER KEY ARE OFF PRIOR TO 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 Engine Operator's Manual should be carried out in conjunction with the follow inspections.

#### 6.2.1 Trike Pre-Flight Inspection

- No leaks from fuel system and engine.
- Fuel filter clean and operational.
- Sufficient fuel for flight.
- No splitting, denting or delaminating of the propeller.
- Propeller hub assembly secure and tie wired.
- No cracking in tire 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 (if available). Verify free and full movement.
- Seat belt attachments secure.
- All engine components secure - air filter, muffler, plug leads.
- Mechanical components. Rotate propeller and observe for noise or excessive resistance.

#### 6.2.2 Wing Pre-flight Inspection

The complete preflight inspection of the wing is outline in the wing Manual.

#### 6.2.3 General Inspection of the Complete Ultralight.

Check that the hang bolt and hang bracket is secure.

Check that back up strap is secure.

Check that there is enough fuel to complete the flight.

## 6.3 Before Starting Engine

### NOTE

Your trike is carefully test flown at Aeros factory. However, the brake-in procedure of the engine is rather continuous and has not been finished. It needs about 10 flying hours for the brake-in to be completed.

During this period it is forbidden to use maximum power, except for very short time during take-off.

Good braking-in will prolong the life of your 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 may be complemented by the hand throttle (forward for full power and rearward for power off).

The ignition switch forward is for on and rearward is for off. It disables the start button.

### 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 SURFACE OR ON GRASS, NEVER ON GRAVEL

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.

## 6.4 Fueling the Ultralight

Fuel flow is from a single fuel tank fitted with a self-venting tube.

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. This filter can be easily disassembled for cleaning and inspection.

Fuel tank capacity is 18 liters. Unusable fuel is 0.5 liters.

The remaining fuel in the fuel tank is monitored by means of a measuring tube located directly on the fuel tank. Its purpose is to provide the pilot with a visual indication of the quantity of the remaining fuel. Dispose of petrol/oil mixture that is older than 1 month.

### WARNING

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

See paragraph 11.6 Fueling for more information.

## 6.5 Helmet Recommendation

The open cockpit of the ANT exposes the pilot to the elements during flight and exposes him to objects outside of the ultralight in an emergency situation.

Helmet and eye protection are recommended to protect the pilot from precipitation, strike by insects.

Helmet is also recommended for risk reduction during an emergency landing of the ultralight. The helmet recommended for use in the ultralight is that certified for air sports.

# 7. ULTRALIGHT FLYING

## 7.1 Starting the Engine

The pilot must always start the engine when sitting in the cockpit with seatbelts secured and helmet worn

All controls should be checked with the ignition OFF.

### CAUTION

REMEMBER TO CLEAR PROP!

The engine should be started with the pilot in the seat.

The follow procedure should be used:

- Brake is in the on position.
- Hand throttle off.
- Turn the master key on.
- Switch ignition ON.
- Check visually that the propeller area is clear and call "Clear Prop" out loud.

From this point on the starting procedure is differing, depending on the engine type installed on your trike.

### 7.1.1 Vittorazi Cosmos 300

Pull the choke control handle and hold, or rotate it to fix (*fig. 67*). Simultaneously press the start button or pull the manual starter until the fuel line is completely full and you hear the first strokes. Move the choke control handle to neutral position, continuing to activate the start button or pull the manual starter again until the engine start.

Starting the cold engine. Throttle position at idle or less than 20% open. In case of difficult start pull the chock control handle until you hear first strokes.

Starting the warm engine. Throttle position at idle. It is not necessary to refill the fuel line. When the fuel line is full and the engine is warm it is not necessary to pull the choke control handle to start the engine.



Figure 67



Figure 68

Starting the engine when it is flooded. Switch the ignition off. Fully open the throttle. No choke control activated. Press on the start button for several seconds or pull the manual starter a few times. Switch the ignition on, press the start button or pull the manual starter to start the engine.

Warm the engine up as indicated below before flight.

30 sec	Gently accelerate to stabilize the engine RPM and carburetor
2-6 min	Warm up the engine at constant RPM (4500 RPM). The coolant temperature should reach no less than 65°C before take off
15-20 sec	Keep full throttle

#### CAUTION

IF THE AMBIENT TEMPERATURE IS BELOW 15°C, COVER THE CENTRAL PART OF THE RADIATOR WITH THE RADIATOR COVER (*fig. 68*).

#### 7.1.2 Polini Thor 303



Figure 69

Fill in the fuel system squeezing the priming pump several times. Make petrol reach the carburetor hole and then pump up 4-5 times to fill in the bowl. Pull upwards the black lever placed on the upper side of the carburetor to enrich the fuel mixture (*fig. 69*). Simultaneously press the start button or pull the manual starter until the engine starts. Stop the engine and lower the black lever placed on the upper side of the carburetor down. Start the engine again, slightly accelerating and warm it up. Warm up the engine at slightly above the idle so that the gear clutch does not engage and the propeller does not turn. The coolant temperature should reach no less than 55°C before take off.

When you start the warm engine it may not be necessary to pull upwards the black lever placed on the upper side of the carburetor to enrich the fuel mixture.



Figure 70

No matter what engine you fly with, if the ambient temperature on the ground drops under 15°C, it is recommended to cover the radiator with a special cover, at least partially (*fig. 70*).

#### **WARNING**

KEEP AN EYE ON THE ENGINE TEMPERATURES IN FLIGHT. IF THE ENGINE TEMPERATURES RAISES OR FALLS TOWARDS THEIR LIMITS MAKE A LANDING DECISION IN TIME TO INVESTIGATE A PROBLEM AND MAYBE REMOVE OR ADD THE RADIATOR COVER

### 7.1.3 Vittorazi Moster 185



Figure 71

Fill in the fuel system pressing the transparent priming bulb until it becomes hard (*fig. 71*). Right after that, press the priming bulb 2 – 3 times more to allow fuel to get into the carburetor. Simultaneously press the start button or pull the manual starter until the engine start. If the engine is not running stable after the start it is recommended to press the priming bulb 2 – 3 times more until the engine work smoothly. Warm up the engine. Warm up the engine at slightly above the idle so that the gear clutch does not engage and the propeller does not turn. The engine head temperature should reach no less than 120°C before take off.

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.

## 7.2 Taxiing

Before taxiing:

- Wear a protective helmet, wear safety glasses or lower the safety shield of the helmet;
- Make sure the harness straps are fastened;
- If the trike is equipped with a rescue system, remove the rescue system safety pin;
- Make sure there are no obstacles in the taxiing direction;
- Ask for permission to taxi;
- Once cleared, check brakes operation by pressing on the brake pedal and increasing engine rpm - the trike should not move until 1/2 of the throttle pedal applied;
- Reduce engine speed, release the brake pedal;
- Increase engine RPM until the ultralight moved out.

Taxiing in normal conditions is fairly easy.

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.

Remember to make sufficient allowance for the span of the aircraft when manoeuvring in confined spaces. Always be ready to switch off the engine in the event of any problem. Respect ground handling limitations and avoid taxiing in strong winds and gusty conditions.

#### **NOTE**

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

When taxiing in strong wind conditions the follow procedures apply:

- Head Wind conditions require 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 wingtip to be lowered.

### **7.3 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.

#### **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 CLEAR SURFACE OR ON GRASS, NEVER ON GRAVEL.

### **7.4 Take Off**

The trike has 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 wing level. Accelerate smoothly to the take off safety speed.

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.

### **7.5 Climb**

Initial climb out should be made on full power for maximum take off weight. Once climb is established power should be reduced. 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 ultralight too high to the horizon. Very steep climbs are dangerous and can result in a stall followed by a severe pitching of the nose forward.

#### **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 TUMBLE.

### **7.6 Cruise**

When the desired flight altitude is reached the ultralight may be leveled 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.

## **7.7 Descent, Approach and Landing**

### **WARNING**

BEFORE FINAL APPROACH, CHECK BOTH LEFT AND RIGHT LANDING GEAR STRUTS POSITION AND MAKE SURE THEY ARE EXTENDED!

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

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

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 wheel brakes.

### **NOTE**

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

A flight is not completed successfully and safely until the engine is stopped, the aircraft is safely parked, moored, or hangared, and the pilot have disembarked. Do not make the mistake of losing concentration just because you have landed safely. Never taxi at a speed greater than that of a walking pace. Use the brakes carefully.

## **7.8 Cross Wind Landing and Take Off**

Pilots with less experience should avoid landing or taking off with high crosswind components, as skills do not always match the capabilities of the ultralight. Crosswind landing or take off with low wind components up to 1 m/s are quite safe and controllable, even to the inexperienced pilot.

The nominated approach speed of 51 km/h should be increased to 60 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 span wise (From tip to tip) as the ultralight slows down. The upwind 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 may need to be lowered at the start of the take off procedure in higher cross winds.

## **7.9 Go-Around Landing**

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

## **7.10 Stopping the Engine**

To stop the engine after a period of running, the ignition should be switched off at idle. If the engine has been running under full power, allow the engine to cool at idle before switching off.

## **7.11 After Landing / Securing**

After landing and when in the parking switch the ignition off and set the key in off position. 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.

## 8. LANDING GEAR OPERATION

Please, bear in mind that the main purpose of the retractable landing gear on the ANT trike is significant reduction in the dimensions of the folded in transport position trike. The drag reduction from retracted landing gear is fairly small and it won't be noticeable in a short flight.

The in-flight landing gear retraction and extension procedures are similar to those described in the section 3.4 Retractable Landing Gear. The only difference is that the pilot will be sitting in the seat and piloting the trike which will make it less comfortable to operate the undercarriage.

**WARNING**

PRIOR ATTEMPTING THE LANDING GEAR RETRACTION IN FLIGHT, TRAIN DOING THIS PROCEDURE ON THE GROUND FROM THE PILOT SEAT. SECURE THE TRIKE IN LIFTED POSITION BEFORE TRAINING.

**WARNING**

DON'T FORGET TO EXTEND THE LANDING GEAR BEFORE LANDING.

## 9. EMERGENCY PROCEDURES

### 9.1 General

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.

Remember 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 is 65 km/h.

Best glide speed (with maximum load) is 50 km/h.

### 9.2 Engine Failure on Take Off

#### 9.2.1 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, avoid direct collision with obstacles;
- switch off the ignition.

#### 9.2.2 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 loosing airspeed;
- Land in accordance with section 6.7 of the Manual. Avoid direct collision with obstacles.
- switch the ignition off.

### **9.3 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.

### **9.4 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 10.5.

### **9.5 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.

### **9.6 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

Evacuate ultralight.

### **9.7 On Ground Engine Fire**

If fire occurring whilst on the ground proceed as follows:

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

Close the throttle.

Turn the ignition off.

After stopping release seat belt.

Evacuate the ultralight.

### **9.8 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 airstrip or ground you are going to use as your take off area for sticks, rocks or any debris that may be flicked up by the tires and sucked through the propeller.

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

**WARNING**

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

EVEN SMALL OBJECTS CAN CAUSE SIGNIFICANT DAMAGE TO THE PROPELLER.

## 9.9 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 changing the flight characteristics of the ultralight, land at the nearest landing field to inspect the damage.

## 9.10 Emergency Rescue System

The Comelli Cylindicone ballistic rescue system may be installed on the ANT trike.

The rescue system is equipped with a pressure gauge to check the charge of the cylinder before each flight. The reading of the pressure gauge must be between 120 and 180 bar (*fig. 72*).



Figure 72



Figure 73

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. The emergency system will automatically kill the engine after deployment.

**WARNING**

REMOVE THE EMERGENCY RESCUE SYSTEM SAFETY PIN BEFORE FLIGHT (*fig. 73*). DO NOT FORGET TO INSTALL IT BACK IN PLACE AFTER YOU LAND.

**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:

Tighten seat belt.

Deploy emergency parachute

Prepare for the forced landing.

## 9.11 Stalls

In practice, in level flight it is difficult to induce a nose down stall of the ultralight, although it greatly depends on the wing type you fly. 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.

## 9.12 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 wing level.

### **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.**

## 9.13 Icing Conditions

Icing conditions: rain, drizzle, wet snow, fog at temperatures of 5°C and below.

If conditions or signs of wing icing appear, make an emergency landing IMMEDIATELY as recommended by paragraphs 7.7, 9.5.

When flying at temperatures close to zero, watch for the appearance of possible icing conditions.

Carefully sweep off frost, frozen droplets, snow, dew and rain droplets from the leading edge of the wing before flight. Their presence leads to a strong deterioration of the stability and controllability of the ultralight.

### **WARNING**

**FLYING IN ICY CONDITIONS AND IN THE PRESENCE OF SNOW ON THE WING IS PROHIBITED.**

**DO NOT FLY IN ICY OR SNOWY CONDITIONS!**

### **WARNING**

**THERE IS A HIGH RISK OF ICE BUILDING IN THE CARBURETOR OF Polini Thor 250 ENGINE AT ENVIRONMENTAL TEMPERATURE 0 - 8°C AND HIGH HUMIDITY, THIS CAN CAUSE THE ENGINE STOP!**

# 10. 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.

## 10.1 Removing Combat-T, Discus-T and Fox-T Wings from the Trike

The procedure for removing the Combat-T, Discus-T and Fox-T wings from the trike is in reverse order to attaching the wing (see section 5.3):

- ensure that the ignition switch and the lock key are in the off position;
- position the ultralight with its nose against the wind;

- remove the upper pylon quick-release bolt by releasing the bolt with the eccentric lever, removing the control ring and unscrewing the nut;
- release the lower quick-release bolt with the eccentric lever;
- remove the "quick pin" fixing the lower connection of the front strut;
- using the auxiliary strap, take the front strut in one hand and the centre of the control bar in the other and lower the wing with the trapeze down until the control bar is on the ground;
- drive the trike nose wheel over the control bar inside the wing's trapeze;
- remove the wing nosecone;
- detach the back up loop;
- unbolt the trike from the hang bracket of the wing;
- lower the nose of the wing to the ground;
- remove the mount bracket from the wing.

## 10.2 Removing Fox-13TL, Fox-13T and ADAM-13T Wing from the Trike

The procedure for removing the Fox-13TL, Fox-13T and Adam-13T wing from the trike is in reverse order to attaching the wing (see section 5.4):

- ensure that the ignition switch and lock key are in the off position;
- position the ultralight with its nose against the wind;
- mount the wing mounting/removal bracket on the lower beam;
- remove the upper pylon quick release bolt by releasing the bolt with the eccentric lever, removing the control ring and unscrewing the nut;
- release the lower quick-release bolt with the eccentric lever;
- remove the front strut locking "quick pin";
- sitting in the pilot's seat and holding the control bar, simultaneously press the spring release buttons on the front brace tube and lower the wing first into your lap and then down, placing the control bar on the wing mounting/removal bracket;
- secure the bracket straps around the control bar;
- remove the nose cone;
- detach the back up loop;
- unbolt the trike from the hang bracket of the wing and lower the wing nose to the ground;
- disconnect the front strut from the lower beam. Angle the main pylon down and place the lower tip of the front strut on the pilot seat;
- unfasten the straps around the control bar;
- lift the wing trapeze upwards and roll the trike backwards, then lower the wing onto the control bar;
- remove the wing mounting/removal bracket from the lower pylon;
- remove the mount bracket from the wing.

For more information on removing the Fox-13TL, Fox-13T and Adam-13T wing from a trike, see the video: <https://www.youtube.com/watch?v=D2GxGgtRxU>

## 10.3 Wing Break Down Procedure

Combat-T, Discus-T, Fox-T, Fox-TL, Fox-13T and Adam-13T wings differ from each other in both flight performance and design, so their break down procedures are significantly different. The wing disassembly procedures, as well as all necessary information related to the wing, is described in details in the manual of the wing you have chosen. Please read it thoroughly and make sure it is clearly understood.

## 10.4 Trike Disassembling Procedure.

The trike disassembling procedure is simply reverse to the trike assembling procedure (See section 4 Trike Assembly Procedure). Please re-read the section 4 Trike Assembly Procedures thoroughly before performing the trike disassembling procedure. Refer to the pictures from this section as much as necessary and make sure everything is clearly understood.

Pay special attention to the paragraph 4.1.3 making sure that the throttle cable is not caught on something when swinging the front lower beam.

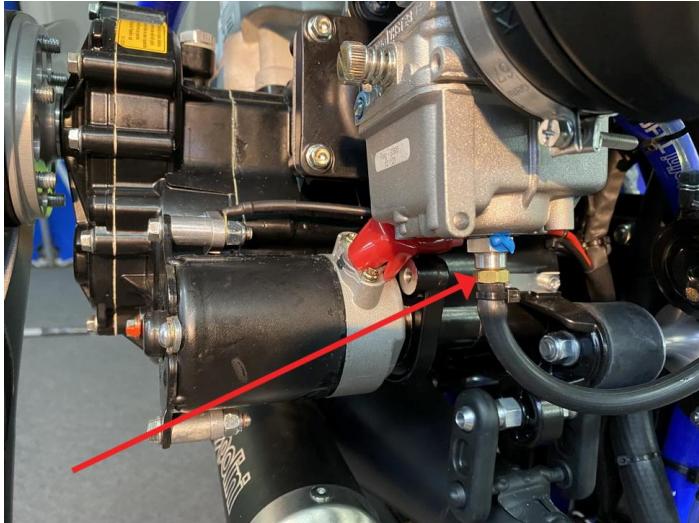


Figure 74

For Polini Thor 303 engine to avoid the fuel leakage from the fuel line it is required to empty the fuel from the carburetor before disconnecting the fuel line.

Easy off the hose fitting as shown on the figure 74 and drain the fuel from the carburetor through the drain hose.

## 11. HANDLING, SERVICE AND MAINTENANCE

### 11.1 Introduction

This section contains factory recommended procedures for proper ground handling and routine care for Your ANT trike. 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.

### 11.2 Identification Plate



Figure 75

The trike identification plate positioned on the main pylon, right side (fig. 75). The Serial number should be quoted when corresponding with the factory.

For the wing identification plate position please refer to the wing Manual.

### 11.3 Fuel

The following fuels shall be used.

Vittorazi Moster 185 engine

Fuel mixture of premium super gasoline and full synthetic top-quality oil for 2-strokes engines (Castrol TTS) at 2,5%.

### Vittorazi Cosmos 300 engine

Fuel mixture of gasoline and engine oil to operate.

Premium 95 Ron Octane unleaded petrol is approved with the engine. In case the available petrol doesn't meet the required standards, it is recommended to use 100 RON AVGAS 100LL petrol.

Recommended oil is Motul 710 or Motul 800. Motul 710 is suggested for infrequent use with moderate and short climbs at maximum RPM. Motul 800 is suggested for frequent use.

Recommended fuel mixture when using Motul 710: oil at 2,0% or 50:1.

Recommended fuel mixture when using Motul 800: oil 1.5% or 66:1.

### Polini Thor 303 engine

Fuel mixture of premium petrol 95-99 (Ron) Octane unleaded or AVGAS 100LL and oil at 2.5%.

Use synthetic top-quality oil for 2-strokes engines only.

Dispose of petrol/oil mixture that is older than 1 month.

## 11.4 Fuel Sampling

There is no drain cock on the fuel tank. To draining fuel from the fuel tank proceed as follow. Open the filler neck. Lift the front wheel of the trike up until the fuel drain out from the filler neck. 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 container, and checking for any other visual contaminants. Ensure that there are no ignition sources and that the fuel is disposed of correctly.

If the fuel has been sitting for an extended period without use it may be advisable to replace it with fresh fuel.

## 11.5 Lubricating Oil

All mentioned above engines use oil in the fuel mixture to lubricate the engine (see 11.3 Fuel for specific engine).

To lubricate the gearbox, these engines use the oils specified in the relevant manuals.

## 11.6 Fueling

Do not refuel the ultralight when it is raining (snowing), very dusty, unless measures are taken to prevent precipitation and dust from entering the filler necks. Do not refuel the ultralight during thunderstorms.

Do not start the engine, do not turn on the ignition switch, do not use explosive electric lamps or carry out any assembly or disassembly work on the ultralight during refueling.

It is forbidden to refuel the ultralight if there is another aircraft with a running engine at a distance of less than 25 m.

The ultralight must be properly grounded before refueling.

Before refueling, make sure the fuel is free of water and mechanical contaminants. Fill the tank through a funnel with a filter, taking into account fire precautions. Do not allow dust, dirt and foreign contaminants to enter the tank. When filling the tank, keep fuel away from the seat and wheel pneumatics.

Poor quality fuel is the main cause of engine failures.

Do all fuel work outdoors or in a well ventilated area and observe general safety precautions.

Use clean containers with a filter sump and expansion space for storing fuel.

Do not use fuel after a long period of storage.

Drain fuel from the fuel system when not in use for more than one month.

Fill fuel through a filter with a filter fineness of at least 0.15 mm.

Do not fuel the ultralight while the engine is running.

Do not operate the ultralight with fuel spilled on the ultralight components or at the ultralight parking area.

## 11.7 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 and other defects.

## 11.8 Exhaust System

Every 20 hours, lubricate the joint between the outlet of the exhaust system and the exhaust pipe with high temperature (up to 1100°C) grease. Inspect the exhaust system periodically for cracks. The springs must be fitted so that they do not rub against the silencer and so that the springs are not lost if they fail.

## 11.9 Wing

For all necessary information on wing operation and maintenance, refer to the relevant wing manual for the specific wing.

## 11.10 Vittorazi Cosmos 300 Engine Servicing Schedule

	Before and after each flight	At 5h	At 10h	Every 25h	Every 50h	Every 100h	Every 200h	Every 1000h
Breakages, oil leaks, worn parts	Check							
Screws and nuts	Check							
Propeller screws	Check							
Throttle	Check							
Engine idle	Check							
Engine rubber mountings	Check					Replace		
Carburetion from spark plug color			Check	Check				
Carburetor				Check Clean				
Carburetor membranes					Check	Replace		
Airbox snap lock				Replace				
Airbox				Check Clean				
Airbox sponge and sleeve				Check Clean				
Pull starter system	Check					Replace		
Reed valve				Check		Replace		
Soundproofing material silencer						Replace		
Spark plugs				Replace				
Gaskets(head, cylinder, reed valve,exhaust, carburetor, transmission,							Replace	

water pump)							
Piston rings						Replace	
Piston						Clean Measure	
Piston roller bearing						Replace	
Coolant							Replace
Head and cylinder						Clean Measure	
Oil seal carter case						Check	Replace
Crankshaft bearings							Replace
Crankshaft							Measure Replace
Gearbox oil				Check		Replace	
Transmission bearings							Replace
Centrifugal clutch						Measure	Replace
Exhaust bushing					Replace		
Silencer rubber mountings				Check			Replace

Refer to the Vittorazi Cosmos 300 Engine Manual for more information.

## 11.11 Polini THOR 303 Engine Servicing Schedule

Every use:

- Check the bolts and screws tightening;
- Check the coolant level;
- Check the silent block condition.

After first 10 hours:

- Replace the gear oil;
- Check the carburetion.

Every 50 hours:

- Replace the spark plug;
- Clean the air filter;
- Replace the gear oil;
- Check the starter wear; replace the starter rope and the lock pins.

Every year or every 100 hours:

- Replace the air filter;
- Replace the starter rope and the lock pins;
- Clean the carburetor;
- Replace gaskets and the carburetor seal needle;
- Change the coolant;
- Replace the silent block;
- Replace the fuel system pipes.

Every 100 hours:

- Replace muffler springs;
- Check the reed valve;
- Check the piston, piston rings and the small end bearing;
- Decarbonize and clean the decompression hole.

Every 150 hours:

- Remove the gear and check the clutch and the bell wear;
- Replace the piston, the piston rings and the small end bearing;
- Replace the silencer deadening material;

- Replace the reed valve.

Every 300hours:

- Replace all bearings and seals;
- Replace the crankshaft;
- Replace the cylinder.

Refer to the Polini THOR 303 Engine Manual for more information.

### 11.12 Vittorazi Moster 185 Engine Servicing Schedule

	Before & after flight	Every 25 hours	Every 100 hours
Broken or damaged piping and wiring, leak of oil, worn out parts	Check		
Screws and nuts	Check		
Throttle	Check		
Engine idle	Check		
Rubber mountings	Check		
Carburation by the spark-plug colour		Check	
Carburetor		Check and clean	
Air-box	Check and clean		Rubber manifold change
Pull starter system		General checkup: rope, toothed wheel, springs and hooks	Toothed wheel. Rope and hooks or new starter complete
Carburetor membranes		Check	100 hours or 1 year, replacement
Reed valve		Check	Replacement
Soundproofing material silencer	Optional replacement		Necessary replacement
Gaskets			Replacement
Piston ring			Replacement
Piston			Cleaning soot and measure. After 200h replacement.
Piston roller bearing			Replacement
O-ring head			Replacement
Head and cylinder			Cleaning soot from the head. Cylinder measure, cleaning exhaust port, decompressor hole
Oilseal carter case			Replacement
Bearing crankshaft			Up to 200 hours replacement
Crankshaft			Up to 200 hours measurement. Replacement roller bearing
Belt		Cleaning and tension	Replacement
Bearing reduction			Replacement

Refer to the Vittorazi Moster 185 Engine Manual for more information.

## 12. 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 trike 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 trike. The trike and the engine may be transported in their bags in any vehicle that offers protection from mechanical damage, soiling and long exposure to rain. It is not recommended that the engine be carried or transported without its bag. During transportation, or when stored on supports, the wing must be supported not less than in three points: at its center and at two more points. 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. Flat straps should be used for tie downs to avoid damage to leading edge Mylar. Store the trike in a dry room off the ground; air the trike out regularly to avoid mildew, and never store wet.



Figure 76

If you choose to store the trike rigged it is highly recommended to install the prop covers and keep the trike in the storage bag (*fig. 76*).

If you fly at the coastal 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 coastal area it is necessary to wash the ultralight with tap water at least once a month to prevent all aluminum parts from corrosion. The recommended storage temperature is from  $-10$  to  $+25^{\circ}\text{C}$ .