AEROLA

Powered Sailplane

ALATUS – M

OWNER'S MANUAL

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AEROLA Ltd., 19 Tupoleva str., Kiev 04128 Ukraine tel. (+380) 44 443-78-85;
fax. (+380) 44 449-94-68; info@alatus.biz www.aerola.com.ua

ALATUS-M is essentially a new ultralight soaring glider. Experience of a creation and serial production of the rigged wing Phantom and new original design and processing ideas which have allowed combining in it advantages of rigged wing and classical glider. ALATUS-M self-launches from a small airfield and it is able to soar like a rigged wing in light conditions and microlift.

ALATUS-M possesses higher flight performances, fine controllability, good behavior in spin or stall conditions. Glider is comfortable, ergonomic and safe for pilot over a flying condition. An obtainable price and low operating expenses also are a great value for customers.

ALATUS-M is called to occupy the extensive niche existing between foot-launch machines and gliders. For successful operation with ALATUS-M it should be studied this Owners Manual carefully in details with limitations, warning and instructions. Full reading and comprehension of this manual is imperative before the first flight.

WISH YOU PLEASANT FLIGHTS!

Aerola Team

RECORD OF REVISIONS

Rev. No.	Affected Section	Affected Page	Date of Revision

CONTENTS

1. GENERAL

1.1. SUMMARY DESCRIPTION OF POWERED SAILPLANE ALATUS-M

The powered sailplane ALATUS-M corresponds with an ultralight flying machine is controlled by a manner of aerodynamic, which is made on modern technologies with wide application of composite materials. Being available a retractable power unit allows it to self-launch and to climb although the glider is permitted to aerotow by flexwing microlight or fixed-wing ultralight; glider on this case is equipped by the towing hook.

Flight specifications and flight-navigation instruments provide of flights in daylight and in simple weather conditions.

Landing gear and thrust/weight ratio allow to take-off/landing from an airfield with concrete, ground or grass covering at minimum sub-soil strength of 0,3 MPa (3 kg/cm^2).

The sailplane power unit is equipped by engine of CORS - AIR M25Y 'BLAK DEVIL'.

Sailplane general overview with engine of CORS - AIR M25Y 'BLAK DEVIL' is shown in Fig.1 below.

1.2. WARNING, CAUTIONS AND NOTES

The following definitions apply to warning, cautions and notes used in the Owners Manual:

WARNING: means that the non-observation of the corresponding procedure leads to an immediate or important degradation of the flight safety.

COUTION : means that the non-observation of the corresponding procedure leads to a minor or to a more or less long term degradation of the flight safety.

NOTE : draws the attention on any special item not directly related to safety but which is important or unusual.

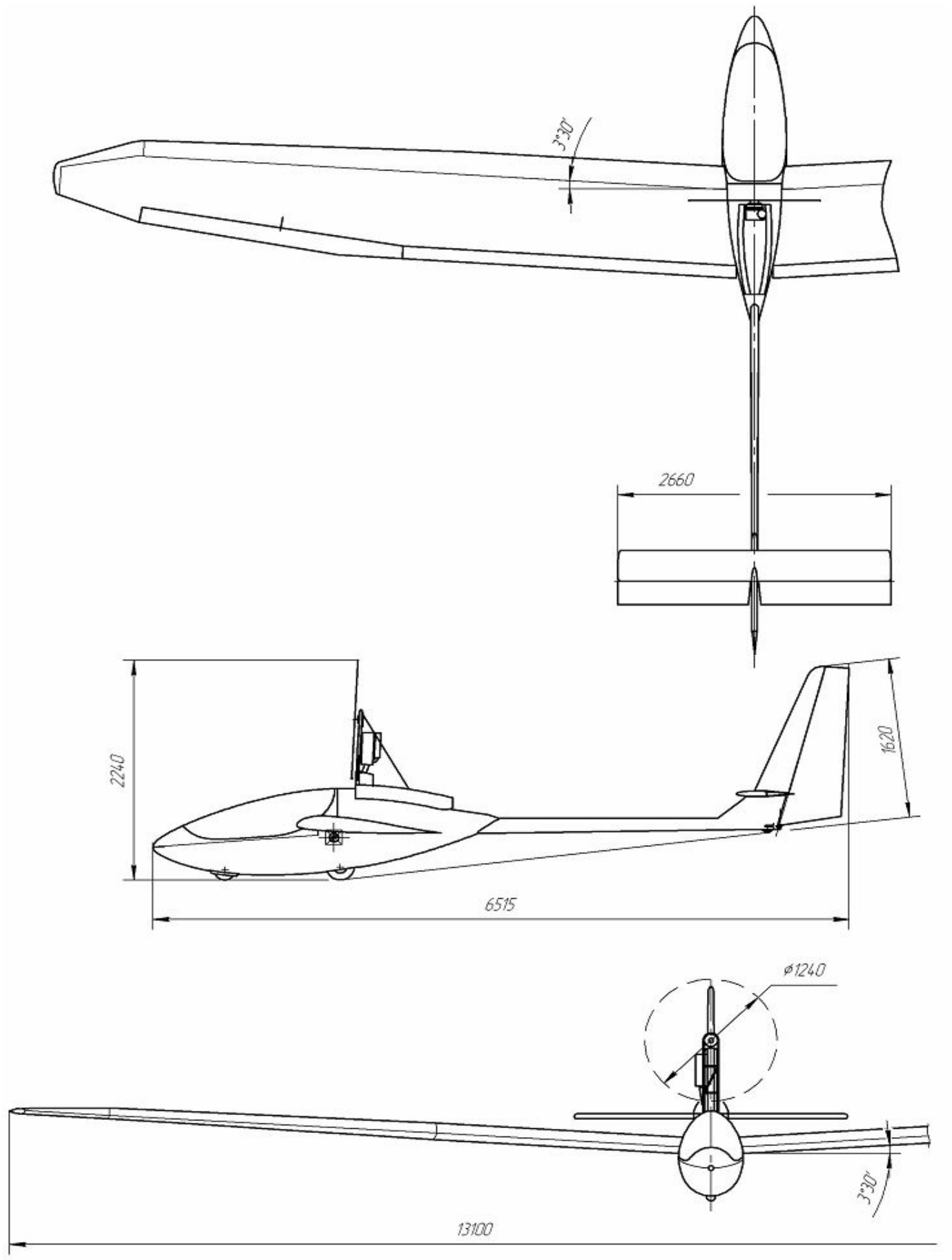


Fig.1. Glider overview.

2. SPECIFICATIONS

2.1. DIMENSIONS DATA

Length	6,5 m
Height	1,16 m
Wing span	13,1 m
Wing area	13,2 m^2
Aspect ratio	13,3
Deflection angels:	
- ailerons	up 25° down 15°
- flaps	up 0° down 70°
- elevator	up 25° down 15°
- rudder	left 30° right 30°
Cockpit: height / width	0,85 / 0,61 m
Transporting overall dimensions:	
- wing	5,9 x 0,64 x 0,4 m
- cockpit	2,9 x 0,6 x 0,9 m

2.2. WEIGHT DATA

Empty weight (without rescue system GRS 225)	112± 2% kg
Maximum take-off weight	235 kg
Minimum take-off weight	180 kg
Pilot weight range	60 – 110 kg
Wing loading	13,6 - 17,8 kg/m^2

2.3. FLIGHT PERFOMENCES

	M_0=180kg	**M_0=235kg**
Maximum L/D ratio	27	27
Maximum L/D ratio speed	60 km/h	67 km/h
Minimum rate of descent	0,6 m/s	0,65 m/s
Minimum rate of descent with extension power-plant	1,6 m/s	1,6 m/s
Economic speed	50 km/h	56 km/h
Rate of descent at full extended flaps (at cruising speed)	2,3 m/s	2,5 m/s
Stall speed	42 km/h	48 km/h
Take-off distance, ground airfield with grass covering	80 m	100 m
Lift-off speed	55 km/h	60 km/h
Take-off distance from rest to attaining a height of 15 m		260 m
Landing run, ground airfield with grass covering		30 m
Landing run from attaining a height of 15 m to rest, ground airfield with grass covering		190 m

WARNING! INDICATED SPEEDS ONLY ARE GIVEN IN MANUAL

2.4. POWER- PLANT DATA

Engine	CORS-AIR M25Y 'BLACK DAVIL'
Take-off condition (up to 3 min.):	
- power	21 HP
- maximum rotational speed	7500 RPM
- fuel consumption	2,5 - 4,0 l/h
Sparking plug GK BR9ES	1
Fuil – petrol with 98 octane	
Lubrication – fuil/oil mixture, mixing proportion 1:50, at hot-day conditions 1:45.	
Synthetic oil SUPER-TWO-STROKE	
Fuil capacity	5,5 liters
Reducer	driving ribbed belt
- reduction ratio	2,58
Cooling	air
Propeller	pulling
- blade	2
- rotating direction	right
- diameter	1,2 m

3. LIMITATIONS

3.1. POWERED SAILPLANE LIMITATIONS

Maximum take-off (landing) weight	235 kg
Maximum forward CG position	20 % MAC*
Maximum rearward CG position	32 % MAC*
Maximum maneuvering load factors (flying weight 235 kg)	+4 / -2
Maximum indicated flying speed:	
Maximum flying speed	130 km/h
- rough air speed	96 km/h
- at full extended flaps	96 km/h
Maximum aerotow speed	96 km/h
Maximum wind speed at level ground:	
- headwind	10 m/s
- crosswind	5 m/s
- fair wind	3 m/s
Minimum take-off distance from rest to attaining a height of 15 m (at take-off weight 235kg)	260 m

* *20%MAC - 0,2b Mean Aerodynamic Chord*

WARNING! ALATUS-M IS UNMANOEUVRED POWERED SAILPLANE. EXCEEDING FLYING MANOEUVRE LIMITATIONS ARE PROHIBITED.

WARNING! FLYING ON ICING AREA IS PROHIBITED.

WARNING! ADVANCED AEROBATIC MANOEUVRES ARE PROHIBITED. SIMPLE AEROBATIC MANOEVRES ARE PERMITED (spin, slip, steep climb etc.).

WARNING! POWERED SAILPLANE ABUSE CAN BREACK FLIGHT SAFETY APPRECIABLY.

3.2. POWER-PLANT LIMITATIONS

Fuil tank	5,6 liters
Engine continuous running time:	
- take-off condition	up to 3 min
- idle condition (at 2000 RPM)	up to 5 min
- rest condition	unlimited
Maximum cylinder head temperature	200°C
Operation temperature,	+ 40 ... – 10 °C

WARNING! CORS-AIR M25Y HAS NOTHING AIRWORTHNESS CERTIFICATE AND HAS NOT BEEN TESTED ON MEETING WITH AIRWORTHNESS REQUIREMENTS. PILOT MUST KNOW THAT ENGINE CAN FAIL IN FLIGHT THEREFORE FLYING THIS ENGINE IS DONE ENTIRELY UNDER PILOT'S OWN RESPONSIBILITY AND RISK.

WARNING! THERE ARE NO ANY MECHANICAL IMPURITIES IN FUIL.

WARNING! FOR ENGINE GREASING PURPOSE APPLIES ONLY SYNTETIC BASED OIL. NO USE ETHYLATED PETROL.

WARNING! DON'T USE MIXTURE OF VARIOUS OIL TYPE.

WARNING! NOT RECOMMENDED TO USE FUIL/OIL MIXTURE AFTER LONG STORAGE.

3.3. RESCUE SYSTEM LIMITATIONS

Minimum rescue system opening height of GRS- 225 or ALPHA 500	50 m

4. SUMMARY DESCRIPTION OF DESIGN AND SYSTEMS

4.1. CONTROL SYSTEMS

The control system of powered sailplane consists of the joy stick, adjustable pedals according to pilot's height, combined push-pull/cable control systems (links, cables etc.), rudder, elevator and ailerons. The control of the adjustable pedal (blue) is on the central panel more to the right. Near the control stick (at left below) a trimmer spring is located. Moving it forward increases a balancing speed, backwards reduces.

The flap lever is located on the cabin wall to the left it has two fixed positions:

#1 removed flaps (flap angle - 0^0). The flap lever is in fixed position PUSH TO STOP;

#2 extended flaps (flap angle - 20^0). A flap lever is in fixed take-off position. The further flaps extending (PULL TO STOP up to 70^0) needs for growing a gliding angle at level landing.

4.2. POWER-PLANT

The retractable power-plant into the rear fuselage cover (engine bay) includes each component that the engine with ribbed belt reducer, pulling propeller and exhaust system which installed on the carbon column.

The engine carbon column are fastened by means of the rubber shock absorbers to the lower carbon engine mount which activated by a linear actuator. In whole with the fuel tank and engine controls are assembled on a welded frame.

An engine ignition system, fuil system, decomressor and the prop locking device are related to a power-plant functionally which allow to fix the propeller in vertical position during retracting.

4.2.1. CORS-AIR M25Y (BLAK DEVIL) is petrolic, two-strokes, one-cylinder and air cooling engine with the petal-type inlet valve, carburetor mixture formation, with the unduplicated electronic ignition system which is equipped by resonance exhaust system.

An engine control is occurred by

1) the throttle lever with pilot's left hand it position PULL TO STOP is idle and it position PUSH TO STOP is take-off. Moving the throttle lever changes of a butterfly position by means of the cable;

2) the switches on the control panel. The engine control panel is located on the left wall of the cockpit. There is Master Switch, Ignition Switch, button of START, Retraction/Extension 3-position Switch and Position Indicators (green and red) on the control panel.

Engine is started by means of the Ignition Switch and button of START.

Engine is stopped by means of Ignition Switch ONLY.

The linear actuator is driven by Retraction/Extension 3-position marked Switch. Green Position Indicator lights in extension position; red indicator does in retraction position or in-between position.

The engine starting has been blocked when the engine does not retract out of the engine bay fully or propeller is locked.

Before retracting the engine into the engine bay the propeller should be fixed exactly in vertical position provided by the prop stop locking device. The propeller is turned over by hand on the ground and by airflow in the flight until stopped. There is a decompressor for the propeller autorotation.

Locking of the prop locking device and opening of the decompressor valve are carried out by the control levers located on the cockpit wall to the right. Both of the control levers are united while the propeller locking the decompressor valve opens automatically.

4.2.2. The fuel system consists of a fuel tank, a filter, lines and fittings. There is a fuel nipple, fuil quantity indicator and tank filler on the fuil tank.
Unusable fuel is 0,1 liter.

WARNING! INLET AND OUTLET OF FUEL FILTER IS MARKED BY ARROW AND SHOULD COORDINATE WITH FUEL FLOW.

4.2.3. The power supply is provided by the battery with 6-7 A·h capacity and controlled by the Master Switch. Airborne voltage is DC 12 V. The battery charging is occurred by the generator coil during the engine running by means of the relay-switch (Electric Diagram gives in Appendix No.1).

Battery storage is under the cockpit floor and closed marked cover.

4.3. LANDING GEAR

The landing gear is a bicycle type:

- a nose wheel size is 200x50 mm;
- a mane wheel size is 260x85 mm;
- a tire pressure into the nose and main wheel is 2,5 bar.

There are two rollers on the wing tips and one roller on the rear of the tail beam.

4.4. BRAKE SYSTEM

The wheel brake with cable system is power brake. There is a brake handle on the sailplane joy stick.

4.5. VENTILATION SYSTEM

The ventilation system prevents the misting of the canopy. Airblow is regulated by the handle located under the instrument panel.

4.6. SEAT AND SAFATY HARNESS SYSTEM

The harness system consists of standard and shoulder belts. The harness lock is quick-release and conical one. The backrest angle and pilot's height position of the seat-back is adjustable. For flights with a parachute the seat-back pillow is removed.

4.7. TOWING LOCK

The towing lock is installed in the forewheel well. The towing lock handle (yellow) is located on the central panel to the left. If the angle between towing cable and centerline exceeds 90^0, the towing lock releases the towing cable automatically.

4.8. FLIGHT AND NAVIGATION INSTRUMENTS

The instrument panel is installed on the canopy frame and connected to static pressure system with hermetic pipe connections ($P_{stat.}$ and $P_{din.}$) which is fastened by screw.

On the instrument panel are installed

- air-speed indicator;
- altimeter;
- variometer;
- magnetic direction indicator (option);
- mirror for control of retraction/extension position.

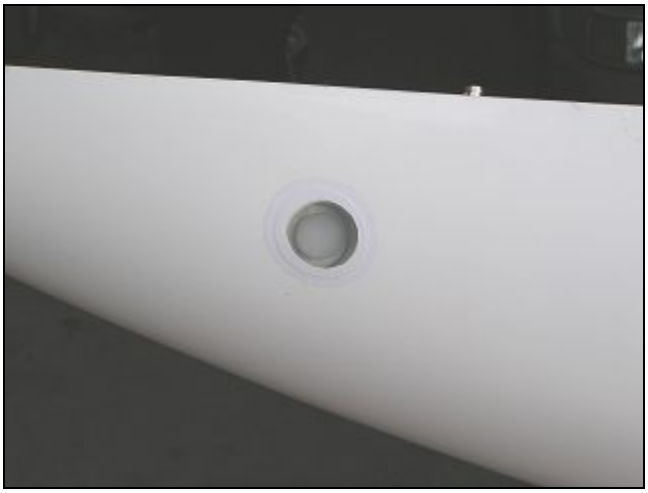
Flight and navigation instruments can be changed by customer.

The engine functioning is checked out with an electronic controller with tachometer, voltmeter and timer which places on a central panel below the towing lock handle.

Instrument location on the panel is shown below:

4.8. RESCUE SYSTEM

For the purpose of an emergency rescue in flight level a parachute rescue system of GRS 225 or Alpfa-500 is installed which providing a landing of machine together with a pilot. The description of a parachute rescue system is presented in Instruction Manual for Assembly and Use. The launching handle is located on the cockpit wall to the right and painted in red, a handle is secured by the peg with the warning red flag. The safety peg must be removed only when the aircraft is ready for take-off, and re-inserted immediately upon completion of every flight.



5. ALATUS-M SETUP PROCEDURE

5.1. Sailplane rigging.

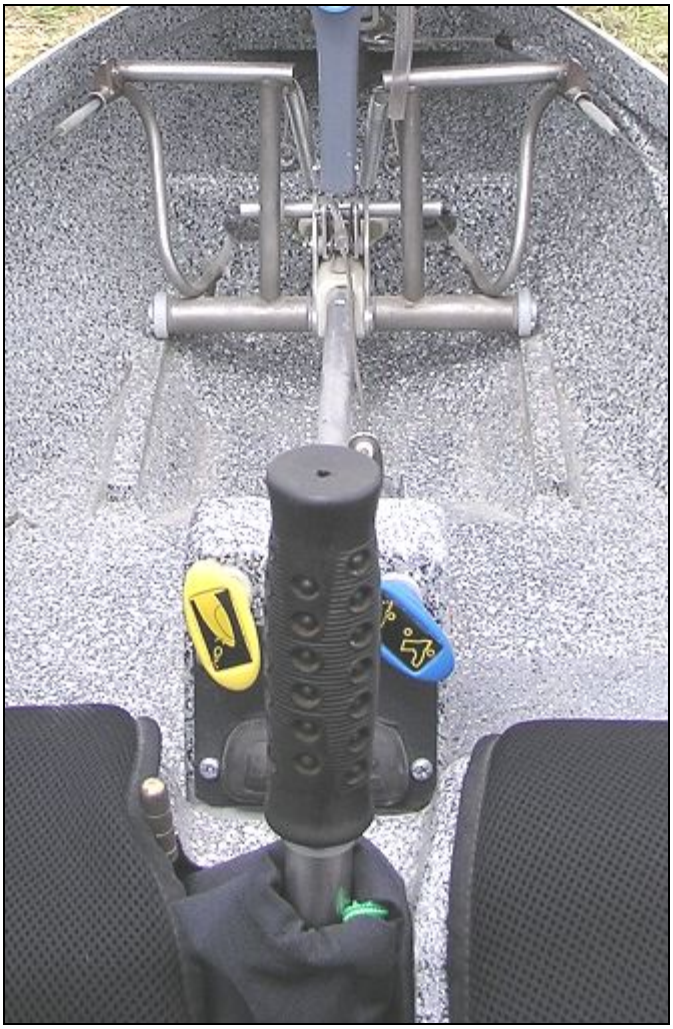
5.1.1. Unzip the bag and put the wing/tail beam package out.

5.1.2. Set up the low rigging support under the wing/tail beam package about 1.5 m away from the front side.

5.1.3. Spread the D-Cell apart 1.5m from the tail beam. Remove the tail beam bags out. Set up the control arms of ailerons, elevator and rudder in neutral position.

5.1.4. Remove the cockpit bag out. Remove the foreign subjects away from the cockpit. Check a pressure into the nose and main tires. (P= 2,5 bar). Before checking the nose wheel fairing mast be removed.

5.1.5. Set the trimmer spring up in neutral position. Set the joy stick and pedals up in neutral position.



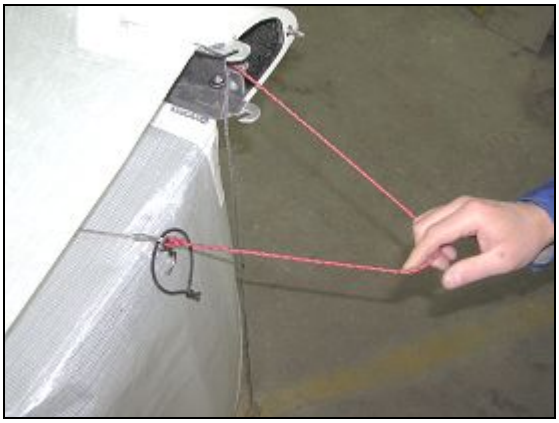
5.1.6. Pull the pins out from the cockpit main joins (2 pins on the mane wall; 1 pin on the rear wall). Approach the cockpit upwards to the wing until matching the main joins with the tail beam joins. Remove the low rigging support, pull down the tail beam, and push the pins in holes and lock them with loops of bungee.

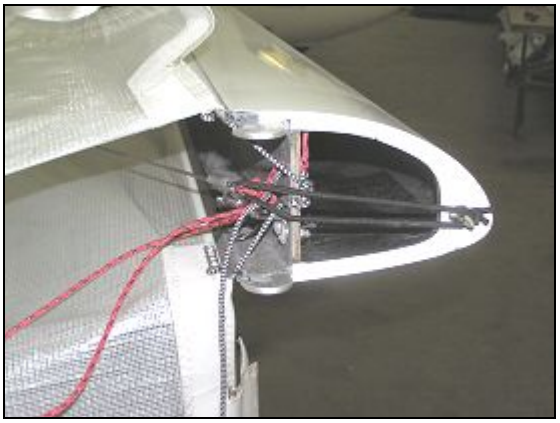
5.1.7. Having moved the control stick and pedals make sure that the control system was connected correctly. Spread the wings out fully until they stop and set the high rigging supports up under the wings.

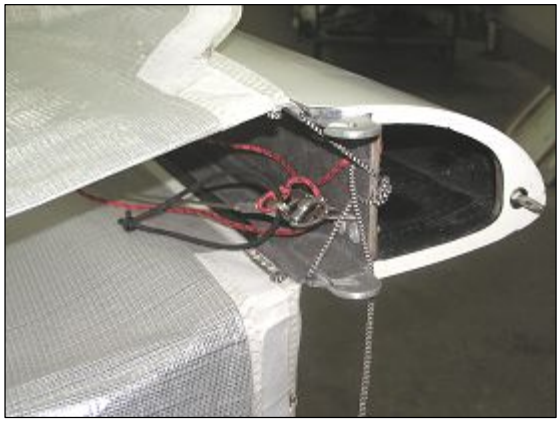
5.1.8. Unzip the bottom sail at a middle part.

5.1.9. Attach the right strut (R) installing the Ball Lock Pin into the wall bracket then moving the wing back and forth matching the strut with the tail beam plate. Install the tapered pin and lock it by the still ring. Repeat all steps on the other side the same way. Make sure that the control cable and the rib cable routes ABOVE the strut.

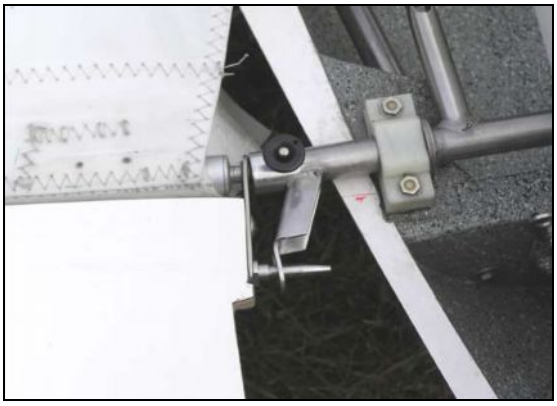
5.1.10. Remove the Velcro around the D-Cell and carefully pull the sail over the D-Cell. Go to the wingtip. Reach inside the sail and locate the wire (red) that's attached to the rib safety cable. Pull that cable out of the sail and hook the loop of bungee over the tip pin at the end of the D-Cell. Push the ribs into contact with the Trailing Edge Tube. Be sure that they are properly aligned so the sail doesn't get damaged. The bungee tension should hold them nicely in place. Verify that the ribs are aligned properly, connect the rib safety cable to the bracket located on the wall of the D-Cell.





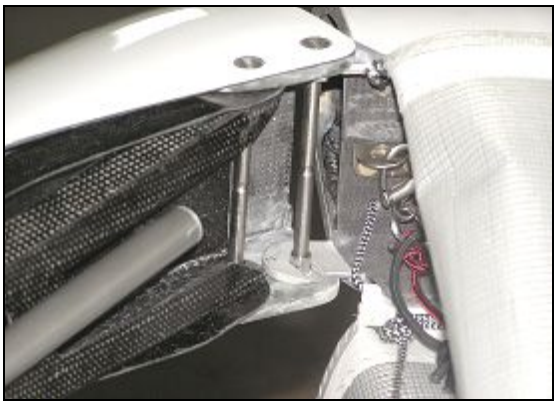


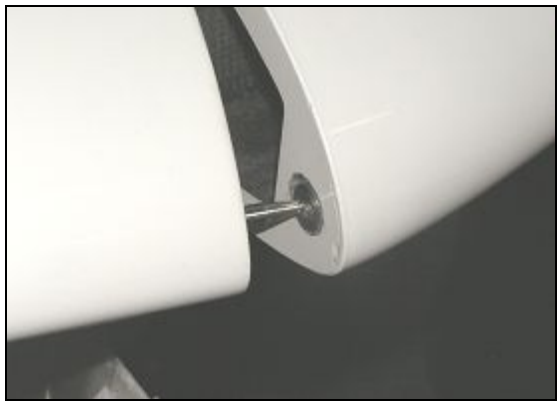
5.1.11. Pull the socket on the Trailing Edge Tube into alignment with the fitting and install he Ball Lock Pin. Make sure that the flap spike slips into the hole in the arm located on the cockpit.



5.1.12. Reach in the aileron pushrod through the aileron rib access.

5.1.13 Remove the tip sections from the bag. Align the tip section with the hooks on the D-Cell and using a back and forth motion, wiggle the tip into place. Be sure the sail is not caught in the assembly. Once the tip is in place, while holding it forward, rotate the ears toward the inboard section of the D-Cell until they are fully parallel with the wall of the D-Cell. You will hear a "snap" as they lock into place.

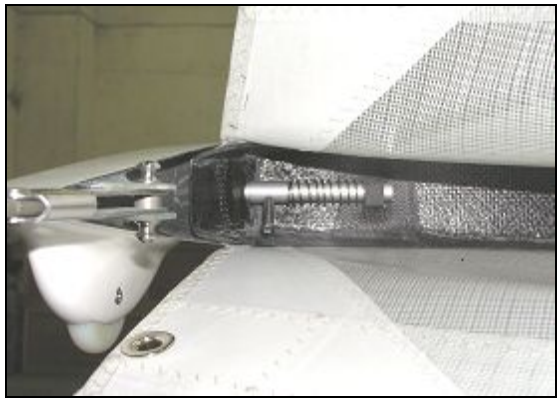




5.1.14. Open up the carbon rib on the tip section and put the spike on the Trailing Edge Tube into the hole in the carbon rib.

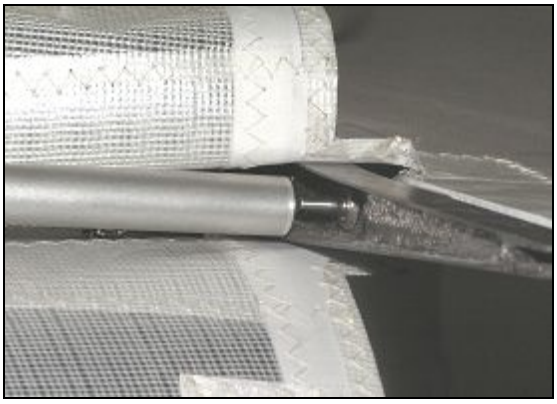
5.1.15. Pull the tip section of the sail out from inside the body of the sail. Open the Sail Clamp by pulling the spring loaded bolt toward the cockpit. Zip and Velcro the sail around the sail clamp.

5.1.16. Close the Sail Clamp making sure that the spring loaded bolt is fully pushed closed and there are no wrinkles in the sail. It will be VERY tight.

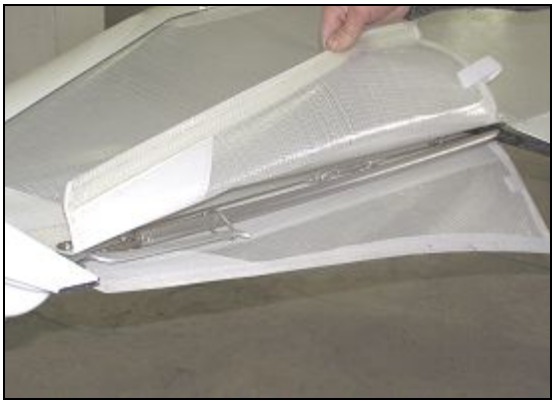


5.1.17. Rotate the tip section rearward enough to slip the grommets on the upper and lower surface over the pins on the tip section.

5.1.18. Open the Trailing Edge Clamp all the way. Slip the hole in the inboard end of the Trailing Edge Clamp over the spike of the Trailing Edge Tube.



5.1.19. Insert the Tensioning Lever through the split on the outboard end of the Trailing Edge Clamp. Tension the Trailing Edge Clamp. Close the Tensioning Lever to tension the ribs. Slip the end of the Tensioning Lever through the steel ring to lock it in place.

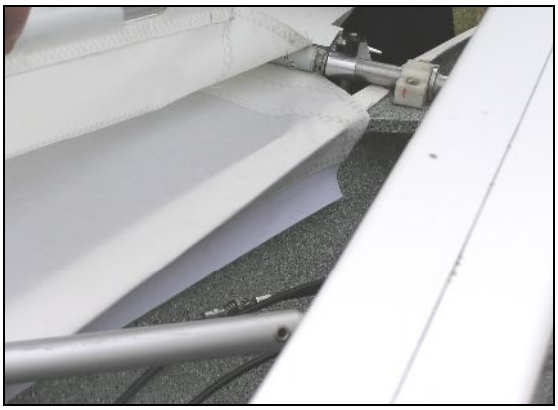


5.1.20. Insert the Carbon Edge to be complied with the marking.

5.1.21. Wrap the sail over the Carbon Edge and Velcro it tightly starting from the middle of the Carbon Edge.

5.1.22. Connect the Aileron Pushrod to the aileron with the Ball Lock Pin. Push the loop of line back inside the sail and Velcro the access closed.

5.1.23. Zip the lower surfaces at the cockpit. Velcro the lower surfaces tightly to the wall of the cockpit.

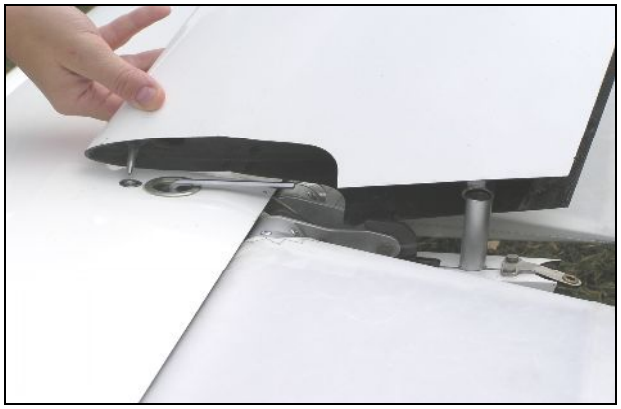


5.1.24. Install the battens into the upper surfaces on the inboard of the sail, connect the battens between the right and left side of the glider at the center. Route the forward restraining strap under the keel beam.

5.1.25. Envelop the shackle of the rescue system around the tail beam and check the safety peg with warning red flag to secure the activation handle.

5.1.26. Install the tailplane on the pintle of the tail beam in the rear. The spanner must be oriented backward to the flight direction, along the keel beam.

5.1.27. Install the fin up.

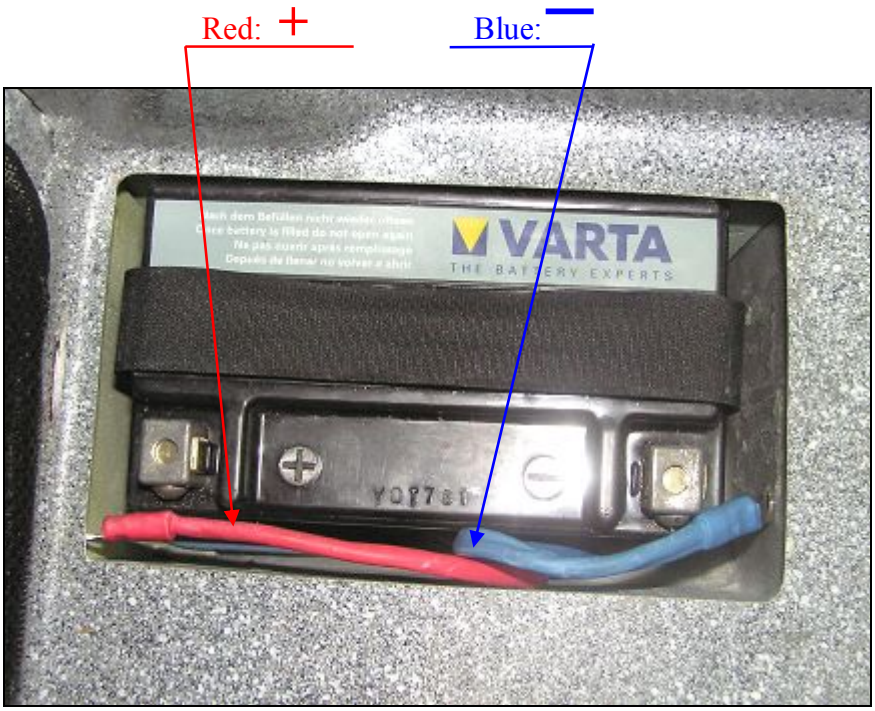


5.1.28. Install the rudder up starting from the top bracket. Make sure that the spring lock slips the ends through the lower cup holes to lock it in place.

5.1.29. Glider Overview (without canopy and rear fuselage cover).

5.2. Power plant installation.

5.2.1. Insert the battery into the battery bay complied with the marking.

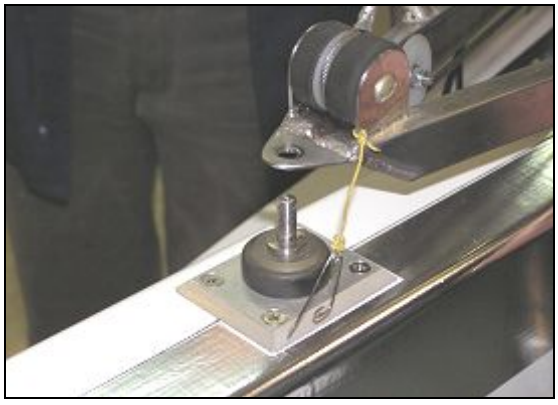


5.2.2. Close the cover of the battery bay and lock it.

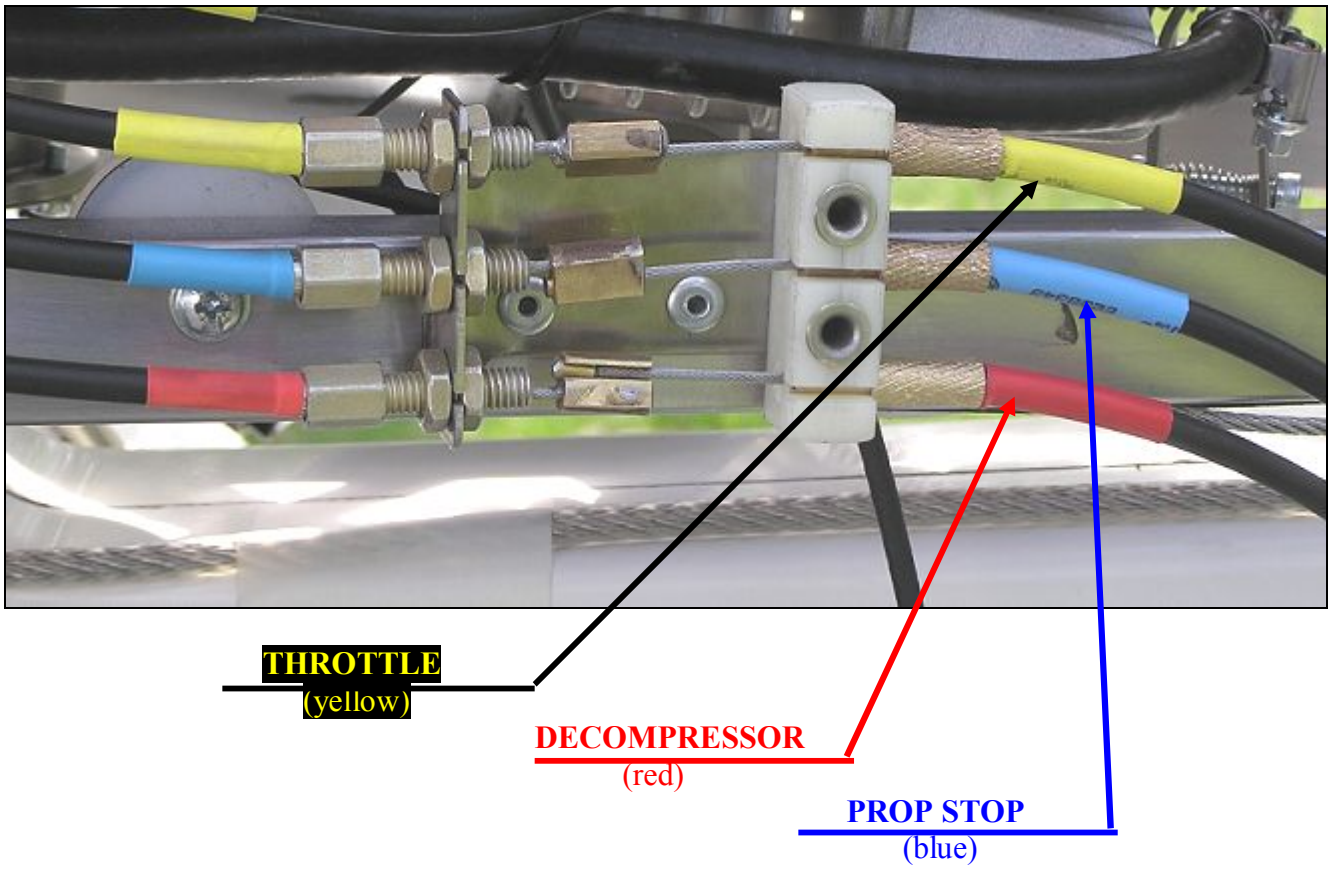
5.2.3. Erect the welded frame of the power plant.

5.2.3.1. Forward attachment points.

5.2.3.2. Lock the reward attachment point.



5.2.4. Join the engine control cables to be complied with the marking.



5.2.5. Join the electric cables.

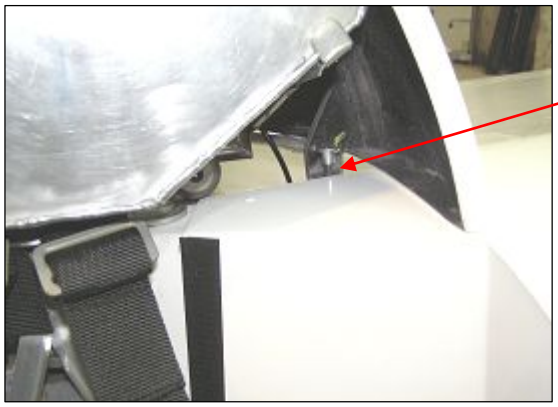
5.2.6. Route the drainage pipe to the bottom at the rearward of the cockpit.

5.2.7. Make a preparation of the power plant according with pt.6.1. of that Owners Manual.

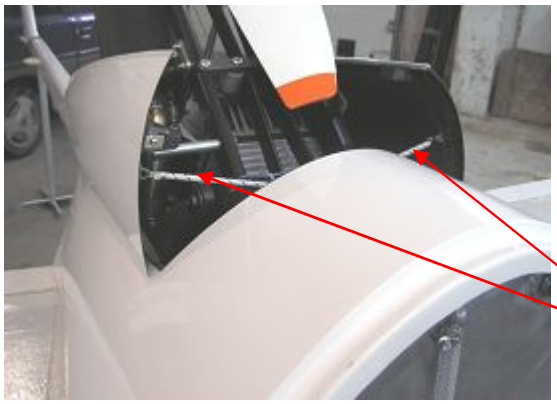
5.3. Get on the rear fuselage cover of the cockpit

5.3.1. Retract the engine carbon column in an intermediate position.

5.3.2. Connect the rear fuselage cover to the D-Cells with the Ball Lock Pins.



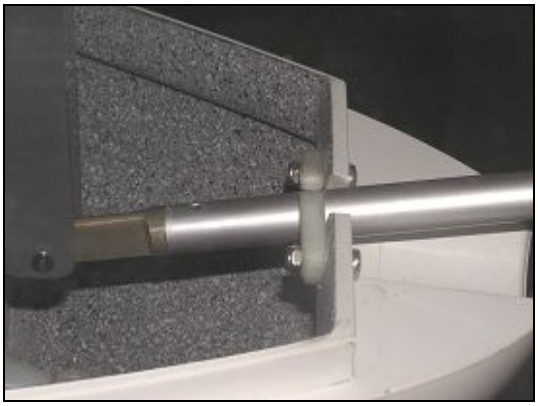
5.3.3. Connect the bungees to the engine bay doors.

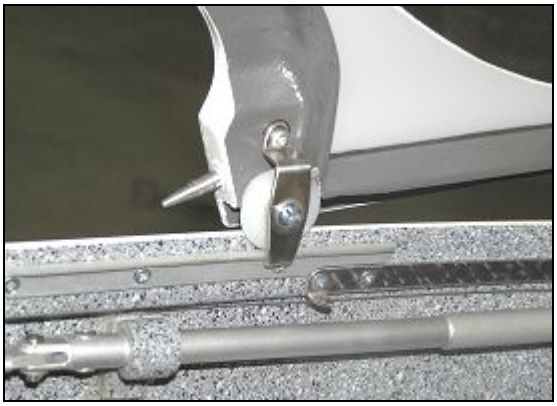


5.3.4. Velcro the Dacron diaphragm to the rear fuselage cover.

5.4. Insert the seat-back and the floor-mat.

5.5. Insert up the canopy.





5.6. Powered sailplane Alatus-M overview.

6. POWER-PLANT OPERATION

6.1. POWER-PLANT PREPARING

There are some main steps:

- make sure that Master Switch and Ignition Switch are in OFF position;

Extending a power plant:

- move Master Switch on the control panel in ON position;
- move Retraction/Extension 3-position Switch in UP position;
- be convinced that power-plant moving is occurred smoothly without jamming;

NOTE! OPERATOR SHOULD BE READY TO STOP MOVEMENT OF POWER-UNIT BY SWITCH AT ANY MOMENT IN CASE OF OBSTARCLE WHICH ABLE TO CAUSE DAMAGE OF REAR FUSELAGE COVER OR COLUMN

- after extending an engine from the engine bay, the engine bay doors are opened, the main thrust cable is pulled tightly (be convinced that the main thrust cable has not anything breakage and twists), Green Indicator lights;
- the engine extending is carried out for 14-18 sec;
- check up a reliability of the movable joints;
- check up the motor-frame for absence of damages;
- check up a fastening reliability of the engine and a condition of its fastened units;
- check up the engine for absence of damages and fuel leakage;
- check up a fuel level in the fuel tank;
- be convinced that fuel tank, fuil lines and all fuel system elements are fixed, damages and fuil leakage are absent;
- close and lock-wire the tank filler cap;
- be convinced that the engine control system is correct, the throttle lever should moved smoothly between the stops;
- check up a reliability of fixing the sparking plug cap;
- check up the belt reducer for absence of damages, check up a tension of ribbed and lock-wiring the draft bolt;
- be convinced that a hub and blades of the prop have not any damages and cracks, a prop is tightened (10 Nm), and lock-wiring there are no any foreign subjects near the engine and in the cockpit;
- check up the exhaust system and its fastening units for absence of damages, check up a reliability of fastening of the exhaust system. Draw the attention to the rubber shock absorbers integrity of an exhaust system and its springs;
- check up an operating of the prop locking device and opening of the decompressor:
  - pull the united control levers to stop;
  - turn the prop over (it should be turned smoothly without effort) up to contact of a blade with the prop stop;
  - push the united control levers to stop;
  - be convinced that the prop stop is removed fully.

6.2. ENGINE STARTING, TESTING AND STOPPING

6.2.1. ENGINE STARTING AND STOPPING IN LEVEL GROUND

Before working with engine the fire extinguishing means are available.
There are main steps:

- tie the tail beam tightly to a reliable support (car turnbuckle, tree, etc);
- remove a canopy aside;
- make sure that people and foreign subjects are absent in running area, fastened belts in a cockpit are clasped;
- an operator should be able to operate with engine skillfully and to be ready at any moment to an emergency engine stop.

Be convinced that:

- the engine controls are in a starting position pull (idle) the throttle lever to stop, Master Switch and Ignition Switch is in OFF position), the propeller is unlocked, the decompressor valve is closed;
- move Master Switch in ON position; check a voltage with the electronic controller it should be not less than 12,7 V, remove the controller in a tachometer mode;
- move Ignition Switch in ON position, give a command 'OFF A PROP', having convinced that in a dangerous area there are no people, start the engine;
- press button of START and keep it until the engine starts;

COUTION! CONTINUOS STARTER RUNNING IS FOR 3 sec. AFTER COOLING FOR 1 min ENGINE RESTARTING IS PERMITTED. (Recommendations for a case when the engine is not started for 3-5 attempts, look in the appendix)

- set up 3000-4000 RPM
- warm the engine for 3 min;

After warming:

- push smoothly the throttle lever to stop in TAKE-OFF position for 4-6 sec. and keep the engine at 6600 RPM for 30 sec;
- pull smoothly the throttle lever to stop in IDLE position;
- check an engine acceleration up, moving the throttle control from IDLE to TAKE-OFF position for 1,5-2 sec. Time of an engine acceleration (time of peak RPM) should be no more than 3 sec;
- pull the throttle lever to stop in IDLE position;
- cool the engine at 2500 - 3000 RPM for 2 min;
- turn the ignition off, having moved Ignition Switch in OFF position;
- move Master Switch in OFF position.

The engine should work stably on all engine power setting. In case of the faults in an engine work: a strong vibration, an unwanted sounds and an engine wobble the engine must be sopped to remedy the defects.

NOTE! ENGINE STOPPING OCCURS ONLY TUNNING IGNITION SWITCH OFF BUT **NOT** MASTER SWITCH DOES.

COUTION! ENGINE TESTING WITHOUT PROPELLER IS PROHIBITED.

COUTION! THERE ARE EMERGENCY VIBRATION ZONES AT ENGINE RUNNING. CONTINUOUS ENGINE RUNNING IS NOT RECOMMENDED WITHIN THOSE ZONES.

WARNING! ENGINE STARTING AND FLING ESPECIALLY UNTIL TROUBLE-SHOOTING CAN CAUSE ENGINE BREAKDOWN, EMERGENCY LANDING, CRUSH OF MACHINE AND PILOT INJURE.

6.2.2. POWER PLANT STOPPING AND RETRACTING IN LEVEL FLIGHT

- set up a gliding speed of 60 km/h;
- cool the engine at 3500 - 4000 RPM for 1 min.;
- push the throttle control to stop in IDLE position;
- turn off the ignition, having move Ignition Switch in OFF position;
- pull the united control levers to stop, the prop is locked, the decompressor valve is opened;
- watching in a vanity mirror a prop position increasing a gliding speed pushing out the joy stick not more than 80 km/h until the prop sets in vertical position;
- move the Retraction/Extension 3-position Switch on the engine control board in DOWN position;
- after waiting for 15-20 sec. having looked in a vanity mirror to be convinced that the power plant is retracted, the engine bay doors is closed and the Red Indicator on the engine control board lights;
- push the united control levers to stop;
- continue flight target.

COUTION! GLIDING ENROUTE FLIGHT WITH EXTENTION POWER PLANT IS NOT RECOMENDED BECAUSE SAILPLANE DRAG GROWING HARDLY. IF LINEAR ACTUATOR IS BROKEN MACHINE SHOULD BE LANDED FOR REPAIRING.

COUTION! POWER PLANT RETRACTING SHOULD BE MADE AT SAFETY ALTITUDE ABOVE SUITABLE LANDING AREA

NOTE: DURING LEVEL LANDING AND TAXYING ENGINE IS COOLED WELL ENOUGH THEREFORE IT CAN STOP WITHOUT PRECOOLING.

6.2.3. EMERGENCY ENGINE STOPPING

The emergency engine stopping is a turning off the ignition without precooling. The emergency engine stopping occurs if further engine operation can cause to people injure, to failure of the engine and the machine.

6.2.4. POWER PLANT EXTENDING AND STARTING IN LEVEL FLIGHT

There are main steps:

- set the gliding speed 70 km/h;
- move Retraction/Extension 3-position Switch on the engine control panel in UP position;
- make sure that the engine carbon column is extended fully and Green Indicator lights;
- make sure that the united control levers in PULL TO STOP position the prop is unlocked and the decompressor valve is closed;
- make sure Master Switch is in ON position;
- turn Ignition Switch on;
- move the throttle lever in IDLE position;

- press button of START and keep it until the engine starts but no more than 10 sec. to try restarting after a pause;
- if it is an opportunity to warm up the engine for 2-3 min. at 3000-4000 RPM then set up the engine power needs for the further flight target;
- in case of emergency climbing if it is possible do not put the engine at once on take-off position.

COUTION! POWER PLANT EXTENDING SHOULD INCREASE DESCENT OF GLIDER HARDLY IF ENGINE CAN NOT BE STARTED PREMATURE LANDING IS POSSIBLE THEREFOR EXTENDING MUST BE MADE AT SUITABLE LANDING AREA. MINIMUM RECOMENDED ALTITUDE FOR POWER PLANT EXTENDIND IS 200 m.

7. PECULIARITIES OF TAXYING, TAKE-OFF AND LANDING

7.1 The powered sailplane allows providing good taxying singly, using two rollers on the wing tips. The driving direction is corrected by rudder. To turn it is necessary to do as follows below:

- pull the joy stick;
- apply on a brake;
- move the rudder in the necessary side;
- pull the throttle lever increasing RPM smoothly releasing the brake to turn.

Independent taxying can be carry out at wind not exceed 3 m/s, at greater wind keeping of driving direction is hampered, the attendant who holds the end of the wing is required. The helping is desirable in case of rough airfield and obstacles which are able to make pierce a hole in the sail of dropped wing. Speed of driving should not be inconvenient for the attendant and in case of change of direction it is necessary to pause to move from outside to inside of a turn.

7.2. For self-launching it is necessary:

- extend the flaps in position #1;
- apply on a brake and pull fully the joy stick;
- push the throttle lever in TAKE-OFF position;
- release the brake and to stat the movement;
- after lifting-off the nose wheel, continue the take-off run keeping the angle of pitch;
- after lifting-off of the sailplane from the strip, set speed of 65 km/h and climb;

7.3. Analysis on landing with the retracted power-unit should make with overfly at speed not less than 65 km/h:

- after the fourth turn the flaps extend in position #1;
- the gliding angle should correct by increasing of extending of the flaps;
- if the sailplane with the full flaps overflies the chosen point of landing it is necessary to increase a speed of gliding within the limitation.

At rough conditions the landing should be at raised speed.

7.4. Analysis on landing with extended and non-running engine should be taken into account the power-unit increases a gliding angle appreciably. Landing approach mast be performed at speed not less than 75 km/h.

7.5. Analysis on landing with running engine should be made in a manner that sudden engine failure did not influence on safety landing.

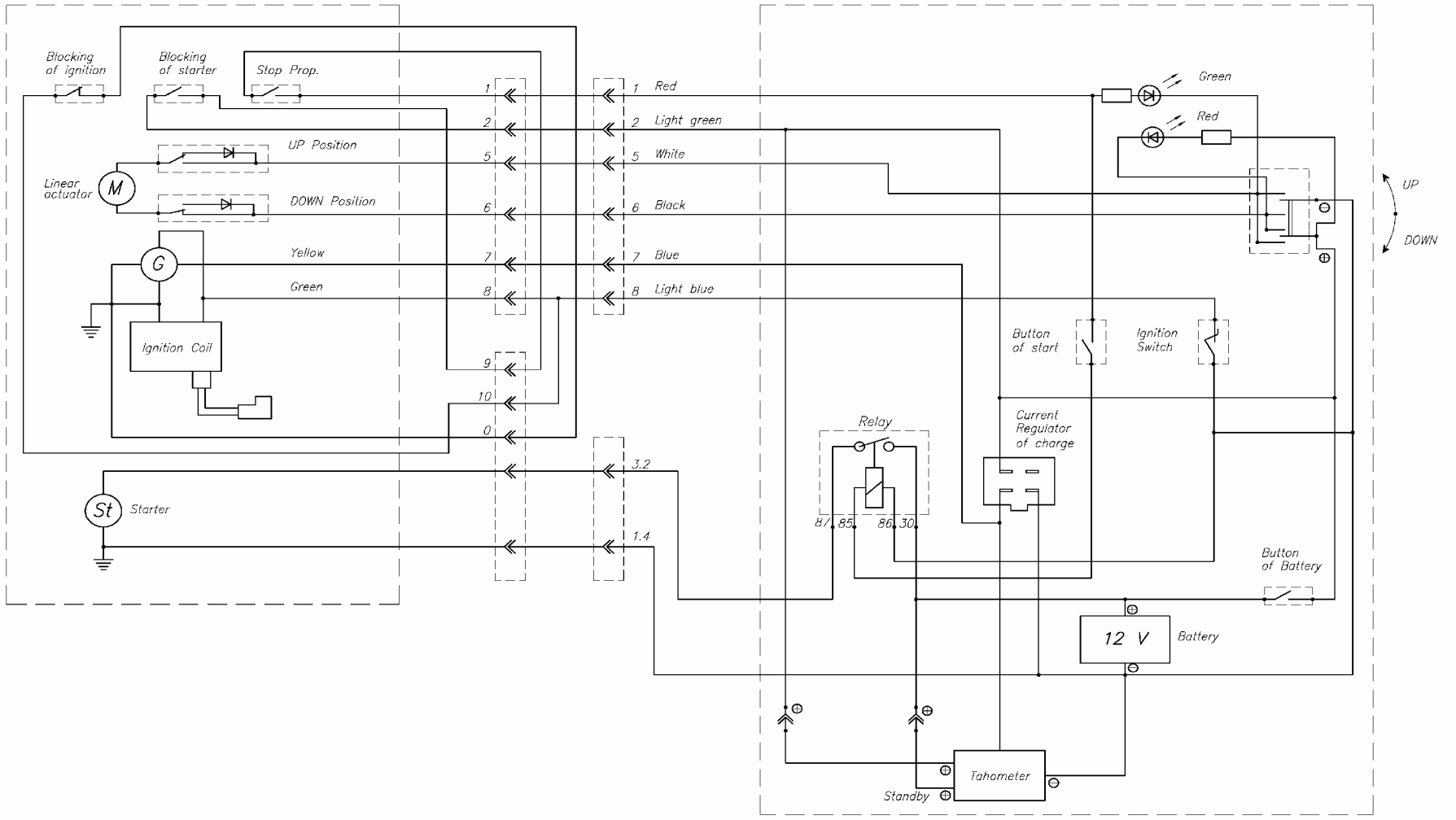
8. LOW-SPEED FLIGHT

Having been fully pulled the control stick the sailplane have been trimmed at 46-48 km/h keeping its Lateral and Directional controllability. At pulling rapidly on the control stick to the stop the sailplane gets into a spin. After making a ¼ turn the sailplane is able to recover from the spin turns into a spiral dive with increasing the speed and positive maneuvering factor.

The glider is stability and controllable in a spiral. The flight on speeds lower then maximum L/D ratio speed causes the shuddering due to the wing root section stall and the fluctuation of a fabric of the sail caused by this phenomenon. Speed on which this effect and its intensity are shown depends on wing load and sail tension. This phenomenon not dangerously also can be used as the indicator of speed.

APPENDIX No.1

ELECTRIC DIAGRAM



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