STREAM (UL600)

PILOT'S OPERATING HANDBOOK

This Pilot´s Operating Handbook must remain in the aircraft and be accessible to the pilot at all times.

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Dear Stream Owner,

Congratulations on the purchase of your STREAM Aircraft. This Aircraft is a result of many years of development at our Company and belongs to the Worldwide top in its category.

Thanks to its outstanding performance, the STREAM is nearing the GA Category, however, it can count itself as a significantly more economical and user-friendly Aircraft.

We at TL-ULTRALIGHT believe that this Aircraft will serve you for many years and to your full satisfaction. This Pilot's Operating Handbook and information contained within should largely contribute to this. The Handbook provides information on operation of the Aircraft, as well as its maintenance. The engine, propeller and possibly the safety system operations manuals are an integral part of this Handbook.

Fly safe! Fly fun!

Jiří Tlustý

Manufacturer:

TL-ULTRALIGHT s.r.o.
Letiště 515, Pouchov
503 41 Hradec Králové
Česká republika

www.tl-ultralight.com

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1. GENERAL INFORMATION:

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1.1 Introduction

READ BEFORE FIRST FLIGHT!

CAUTION

A copy of this Handbook is issued with each Aircraft and is required to remain in the Aircraft and be available to the pilot at all times.

CAUTION

Each pilot of this Aircraft must read and understand the operations information and restrictions of this Aircraft.

The Aircraft's installed components operations and maintenance instructions, i.e. engine, parachute safety system, propeller, avionics and other installed components instructions, can be found in manuals issued by the components' respective Manufacturers. **In case of contradicting information contained in this Handbook in relation to other manuals, the information listed in the respective installed components manual supersedes the information found in this Handbook.**

WARNING

This Aircraft is designed solely for operations in VFR / VMC flight conditions. All acrobatic maneuvers including intentional spins are strictly forbidden.

NOTE

This aircraft was manufactured according standards for Sport flying equipment – ultralight aircrafts and not responding ICAO Standards.

For the approval and testing of aircraft were used standards of LAA Czech Republic – UL-2/2019, Airworthiness requirements for Ultralight airplanes aerodynamically controlled.

1.2 Warnings, Cautions and Notes:

The following definitions of alert are used in the text of this Handbook:

WARNING

For information that may prevent threat to the crew and their life.

CAUTION

For information that may prevent damage to the Aircraft and its equipment.

NOTE

For information of other special importance to the pilot.

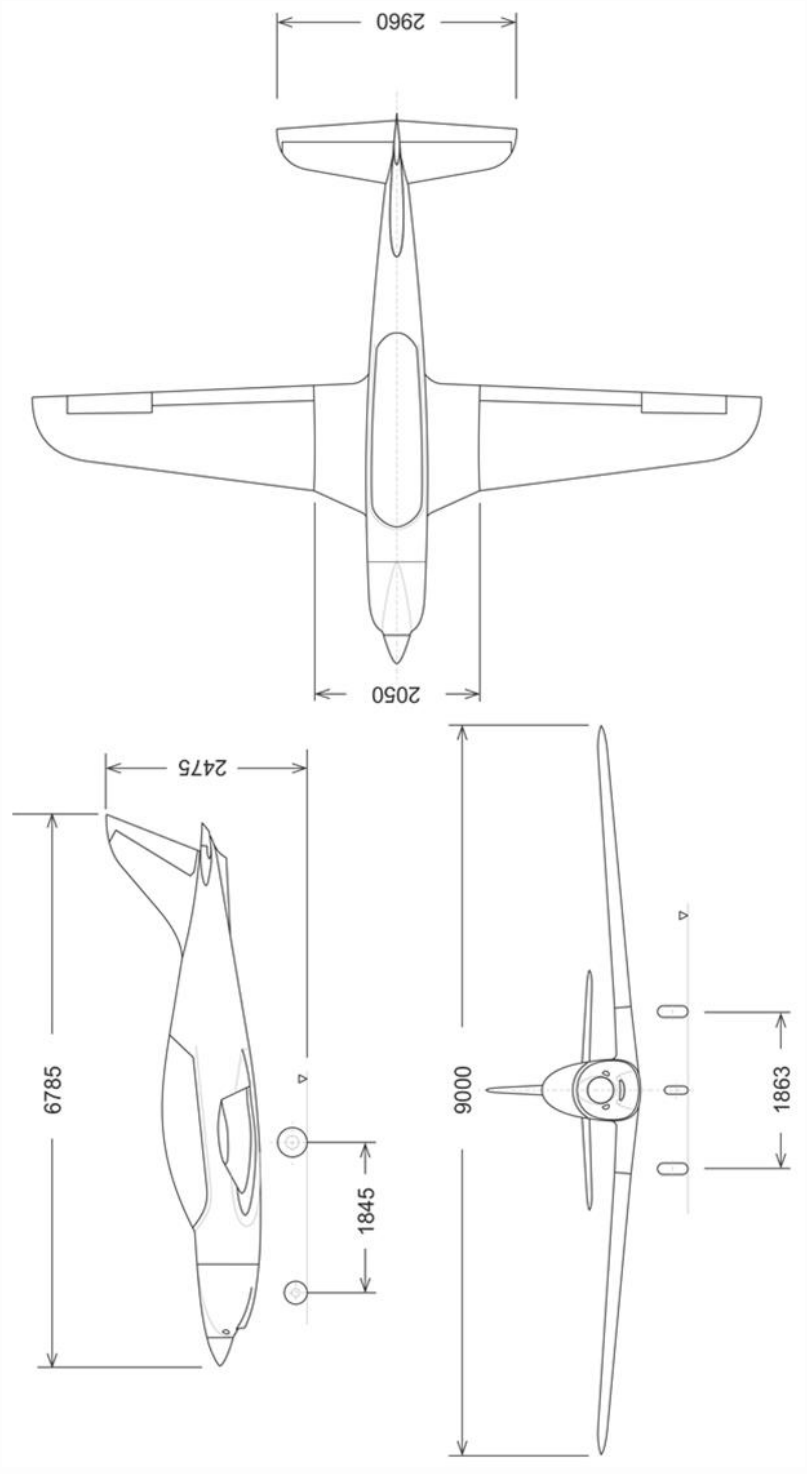
1.3 Aircraft

The STREAM is an aerodynamically controlled tandem two-seater low-wing, with a three-wheel retractable landing gear and a steerable nose gear wheel. The Aircraft's airframe is a composite shell with a UV resistant kevlar, carbon and glass fiber reinforcement, with an inner foam core forming a "sandwich" structure.

1.3.1 Basic Dimensions

Dimension	Value
Basic Dimensions:	
Length	6,79 m
Wing Span	9,00 m
Height	2,48 m
Wing:	
Root Rib Chord	1,80 m
Wing Root Chord	1,30 m
Wingtip Rib Chord	0,70 m
Wing Area	9,96 m^2
Wing Aspect Ratio	8,13
Mean Aerodynamic Chord (MAC)	1,199 m
Wing Dihedral Angle	5°
Flap:	
Flap Surface	0,6 m^2
Flap Deflection – half position during extension	10°
Flap Deflection – half position during retraction	21,5°
Flap deflection - full	32°
Aileron:	
Aileron Surface	0,23 m^2
Aileron Deflection - Up	14°
Aileron Deflection - Down	8°
Horizontal Tail Surfaces:	
Span	2,96 m
Elevator Deflection - Up	22,5°
Elevator Deflection - Down	17,5°
Vertical Tail Surface:	
Surface	0,995 m^2
Rudder Deflection	± 30°

1.3.2 Three-View Drawing:



All dimensions are in mm.

2. LIMITATIONS:

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2.1 Speed Limits:

NOTE

The speeds listed are valid for the maximum permitted weight at sea level and under MSA conditions.

All speeds listed in this Handbook are indicated (IAS). The calibration table can be used to convert to real speed, see Chapter 5.1.

2.1.1 Marking od the Speed Ranges on the Speed Indicator:

MARKING	IAS (km/h)	NOTE
White Arch	**94 - 145**	**Operating range with flaps**. The Lower limit is the maximum weight V_{S0} in landing configuration The upper limit is the maximum permissible speed with flaps extended to max. angle (landing setting)
Green Arch	**121 – 258**	**Normal operating range.** The lower limit is the V_S at maximum permissible weight at foremost position of the CG. The upper limit is the maximum cruise speed.
Yellow Arch	**258 – 342**	**Caution Range.** Maneuvering must be done with increased caution and in calm air only.
Red Line	**342**	**Never exceed speed.** Maximum speed for all operations..

The above listed speeds are valid for flights with maximum permitted weight, at sea level and under the MSA conditions.

2.1.2 Flight Speed Limits:

V	SPEED	IAS (km/h)	NOTE
V_{NE}	Never exceed speed	**342**	Do not exceed this speed at any stage of the flight.
V_A	Maneuver speed	**195**	Do not use full deflections of control surfaces. Do not make sudden and abrupt control changes.
V_{RA}	Maximum speed in strong turbulence	**258**	Do not exceed this speed in strong turbulence.
V_{FE}	Maximum extended flap speed: Small (takeoff) flaps: Big (landing) flaps:	**145** **122**	Do not exceed this speed with flaps extended. Damage to the flap extension mechanism due to aero dynamical forces may occur.
V_{LO}	Maximum permissible speed for landing gear manipulation	**160**	Do not exceed this speed with the landing gear down. Damage to the landing gear and its retracting mechanisms due to aero dynamical forces may occur.

The above listed speeds are valid for flights with maximum permitted weight, at sea level and under the MSA conditions.

2.1.3 Stall Speeds:

V	SPEED	IAS (km/h)	NOTE
V_{S1}	Stall speed (no flaps)	**110**	Při zasunutých vztlakových klapkách udržujte rychlost bezpečně nad touto hodnotou
V_{S0}	Stall speed (flaps fully extended)	**85**	Maintain your speed safely above this limit when operating with flaps fully extended.

The above listed speeds are valid for flights with maximum permitted weight, at sea level and under the MSA conditions.

2.2 Powerplant Limitations:

Engine Type	ROTAX 912 ULS
Performance:	
Maximum takeoff	73,5 kW (100 HP)
Maximum continuous	69 kW (93 HP)
Rotations:	
Maximum takeoff rotations limit	5800 RPM (5 min.)
Maximum continuous rotations	5500 RPM
Oil Pressure:	
Maximum	7 bar (102 psi)
Minimum	0,8 bar (12 psi)
Oil Temperature:	
Maximum	130°C (266°F)
Minimum	50°C (120°F)
Cylinder head temperature:	
Max cylinder head temperature	135°C (284°F)
Coolant temperature	
Max coolant temperature	120°C (248°F)
Engine start, operating ambient temperature:	
Maximum	50°C (120°F)
Minimum	- 25°C (- 13°F)
Fuel pressure:	
Maximum	0,4 bar (5,8 psi)
Minimum	0,15 bar (2,2 psi)

NOTE

For more information, please see the powerplant documentation supplied with the Aircraft.

WARNING

The pilot is always required to opt for such height and flight path, so that at all times he is be able to make a safe emergency landing in case of engine failure.

2.2.1 Marking of powerplant units

	Lower limit – Red	Yellow sector	Green sector- Optimal values	Yellow sector	Upper limit – Red
RPM (ot/min)	0-100	100-1400	1400-5500	5500-5800	5800
Fuel pressure (bar)	0,05	0,05-0,15	0,15-0,35	0,35-0,4	0,4-0,5
Manifold pressure (INHG)	0-3	-	3 - 31	31 - 32	32 - 33,3
Oil pressure (bar)	1,0-1,5	1,5-2,0	2,0-6,0	6,0-8,0	8,0-9,7
Oil Temperature (°C)	0 – 30	30-50	50-125	125-135	135-150
Cylinder head Temperature (°C)	0-30	30-50	50-125	125-130	130-140
Exhaust gas temperature (°C)	0-100	100-200	200-900	900-950	950-1000

2.3 Operational Load Factors

Maximum permissible load factors: no flaps: **+4g, - 2g**
with flaps: **+2g**

2.4 Weight Limitations:

Maximum takeoff weight of the Aircraft with no safety system	**600 kg**
Maximum takeoff weight of the Aircraft with a safety system	**600 kg**
Maximum load per seat	**100 kg**
Minimum pilot's weight for solo flights (solo flights from front seat only)	**60 kg**
Maximum luggage weight in the front luggage compartment	**10 kg**
Maximum luggage weight in the back luggage compartment	**15 kg**

NOTE

The empty weight of the particular Aircraft and its payload distribution options are listed on the label located in the Aircraft's cockpit.

2.5 Center of Gravity

Landing gear Up

Front CG limit with landing gear down	**15 % MAC**
Rear CG limit with landing gear down	**34,5 % MAC**

Landing gear Down

Front CG limit with landing gear up	**15 % MAC**
Rear CG limit with landing gear up	**35 % MAC**

NOTE

For more information on determining the specific configuration of the Aircraft, please see Chapter 6 of this Handbook.

WARNING

In configuration 1x pilot + luggage – store luggage primarily to the rear luggage compartment for prevention of front limit center of gravity exceedances. More in chapter 6.3.1.

WARNING

In configuration 2x pilot + luggage, when rear pilot weight 90-100 kg store the luggage primarily to the front luggage compartment for prevention of rear limit center of gravity exceedances. More in chapter 6.3.2.

2.6 Permitted Maneuvers

This Aircraft is bulit based on UL2/2019 in ultralight category and is not approved for yerobatic operation. An aerobatic maneuver is an intentional maneuver involving an abrubt change in an aircraft's altitude, an abnormal altitude, or abnormal acceleration, not necessary for normal flight. The maximum allowed bank angle in a sharp turn is 60°.

WARNING

All aerobatic maneuvers, intentional stalls and spins are prohibited!

2.7 Crew

Maximum number of people onboard	**2 persons**

2.8 Permitted Types of Operation:

The aviation regulations as well as the Aircraft's equipment limit the Aircraft's operation to flights in VFR conditions only.

WARNING

Only VFR flying with visual land reference is permitted. IFR flying and flying in clouds are forbidden. Flying in icing conditions is forbidden.

2.9 Fuel

2.9.1 Approved Fuel Types:

Unleaded automotive gasoline Natural 95 (standard fuel for spark-ignition engines, ASTM D 4814) or AVGAS 100 LL.

CAUTION

Using unleaded AVGAS fuel will increase the engine wear. Therefore, use AVGAS only if no other approved fuel is available.
For more detailed information, please refer to the ROTAX powerplant documentation supplied with the Aircraft.

2.9.2 Fuel tank Capacity

Fuselage fuel tank capacity	**90 l**
Unusable fuel amount	**1,5 l**

2.10 Ambient Temperatures Limitations

Maximum ambient temperature	**45 °C**
Minimum ambient temperature	**- 25 °C**

CAUTION

The above listed maximum ambient temperature is valid for Aircraft white painted outer surfaces only. It is necessary to consider raised Aircraft surface temperature in differently painted Aircraft.

2.11 Other Limitations

WARNING

Smoking onboard is prohibited.

WARNING

Solo flights are allowed from the front seat only.

CAUTION

Strong rain or extreme humidity may somewhat reduce the Aircraft's performance. When flying in extreme humidity or rain, we recommend that you increase your takeoff and landing speed by approximately 10 km/h.

2.12 Tires pressure

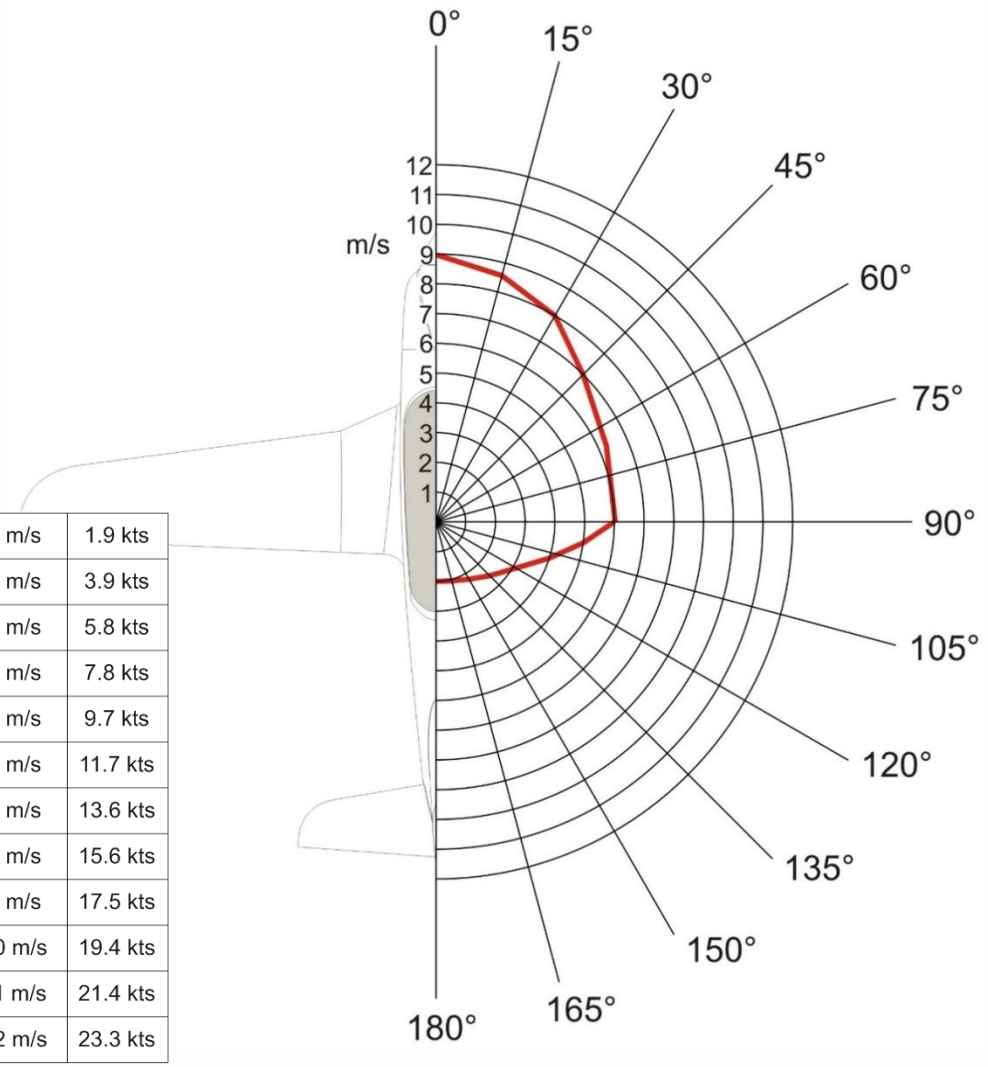
Nose landing gear wheel	**2,5 bar (36 psi)**
Main landing gear wheels	**2,5 bar (36 psi)**

CAUTION

Tires pressure should be controlled during every pre-flight check for ensure the proper function of the landing gear.

2.12 Maximum permissible wind speeds:

Maximum permissible wind speeds (m/s) with vectors for performing takeoff are listed in the diagram below:



1 m/s	1.9 kts
2 m/s	3.9 kts
3 m/s	5.8 kts
4 m/s	7.8 kts
5 m/s	9.7 kts
6 m/s	11.7 kts
7 m/s	13.6 kts
8 m/s	15.6 kts
9 m/s	17.5 kts
10 m/s	19.4 kts
11 m/s	21.4 kts
12 m/s	23.3 kts

CAUTION

The limits needs the pilotage with caution and real limits for take-off and landing are based on each pilot experience.

3. EMERGENCY PROCEDURES

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3.1 Important speeds during emergency procedures

Never Exceed Speed:	**342 km/h IAS**
Stall Speed (No Flaps):	**110 km/h IAS**
Stall Speed (Full Flaps):	**85 km/h IAS**

3.2 Engine Failure and emergency landings:

3.2.1 Engine failure during take-off roll (abort):

1. **Throttle……IDLE**
2. **Ignition switch……OFF**
3. **Main switch……OFF**
4. **Brakes……APPLY AS REQUIRED**

3.2.2 Engine failure immediately after take-off:

1. **Airspeed……145 km/h IAS**
2. **Land……below 150 ft – straight ahead, if possible**
   above 150 ft – select suitable ground
   (closest suitable ground free of obstacles)
3. **Ignition switch……OFF**
4. **Fuel valve……OFF**
5. **Wing flaps……DEFLECT AS REQUIRED**
6. **Landing gear……DOWN**
7. **Main switch……OFF**
8. **Harnesses……TIGHTEN**
9. **Brakes……After touchdown AS REQUIRED**

CAUTION

Perform landing on main landing gear wheels.
Nose gear should be continuously relieved as much as possible by the use of elevator.

3.2.3 Engine failure during flight

1. **Airspeed……..……...……145 km/h IAS**
2. **Trim control……..……TRIM AS REQUIRED**
3. **Emergency landing ground selection…….SELECT**

NOTE

As per situation, check the position of the switches and the fuel valve. Proceed according to flight altitude by either in-flight restart of the engine (Chapter 3.2.4) or by emergency landing into terrain (Chapter 3.2.5).

3.2.4 Engine restart during flight:

1. **Airspeed……..……...……145 km/h IAS**
2. **Main switch……...ON**
3. **Fuel valve……...ON, fuel level check**
4. **Auxiliary fuel pump……...……ON**
5. **Choke……..……OPEN (only when engine cold)**
6. **Throttle……...……..IDLE (when choke opened, otherwise 1/3)**
7. **Ignition switch……..……ON**
8. **Starter…….....…..ON**

NOTE

Should engine restart fail, increase airspeed (150 – 180 km/h IAS) and repeat the whole procedure.

WARNING

Abort the engine restart procedure at sufficient altitude and proceeded to emergency landing onto a suitable ground (as per Chapter 3.2.5)

3.2.5 Emergency landing into terrain:

1. **Airspeed……..……145 km/h IAS**
2. **Landing ground selection:**

   below 150 ft – straight ahead, if possible
   above 150 ft – choose a suitable landing ground (closest suitable obstacle-free ground, and if possible, against wind, possibly against a slope)

3. **Ignition switch……..……OFF**
4. **Fuel valve…….……OFF**
5. **Wing flaps……...DEFLECT AS REQUIRED**
6. **Landing gear……..……DOWN**
7. **Main switch…….……OFF**
8. **Harnesses……..…..TIGHTEN**
9. **Brakes…….……after touchdown AS REQUIRED**

CAUTION

Perform landing on main landing gear wheels.
Nose gear should be continuously relieved as much as possible by the use of elevator.

NOTE

Perform landing onto a difficult, soft and greatly uneven terrain with the landing gear retracted. It is highly probable that this way the aircraft will not flip onto its back and smaller damage to the aircraft will occur.

3.2.6 Carburetor icing

1. **Airspeed……..……145 km/h IAS**
2. **Throttle…….....By switching regimes try and eliminate power loss**
3. **Icing area……..……..DEPART (if possible)**
4. **Throttle…… After 1 – 2 min gradually increase the engine power to cruise**

CAUTION

Should the engine power not be renewed, land at nearest airport or onto a different, suitable ground.

3.3 Fires

3.3.1 Engine fire during start:

1. **Starter……...……CONTINUE CRANKING**

   If engine starts:

2. **Power…….2000 RPM**
3. **Fuel valve……..…….OFF**

   After engine stops:

4. **Main switch and ignition…….OFF**
5. **Fire extinguisher……..……USE AS REQUIRED**
6. **Aircraft……INSPECT FOR DAMAGE**

   If engine fails to start
7. **Throttle……..FULL OPEN**
8. **Starter……..……CONTINUE CRANKING**
9. **Ignition switch……...OFF**
10. **Fuel valve…….OFF**
11. **Main switch…….OFF**

12. **Fire extinguisher……..PREPARE**
13. **Aircraft……..EVACUATE**
14. **Fire extinguisher……....USE AS REQUIRED**
15. **Aircraft……...INSPECT FOR DAMAGE**

WARNING

Do not perform another flight until the cause of the fire has been found and removed.

3.3.2 Engine fire on ground

1. **Fuel valve……..……..……..……OFF**
2. **Throttle…….....FULL OPEN**
3. **Ignition switch……..…….……....OFF**
4. **Main switch……OFF**
5. **Aircraft……EVACUATE**
6. **Fire extinguisher……..…USE AS REQUIRED**
7. **Aircraft……INSPECT FOR DAMAGE**

WARNING

Do not perform another flight until the cause of the fire has been found and removed.

3.3.3 Engine fire during take-off:

1. **Throttle…….....IDLE**
2. **Fuel valve……..……OFF**
3. **Landing ground selection……..……...straight ahead or onto a different, suitable ground**
4. **Brakes…….After touchdown AS REQUIRED**

After aircraft stopping

5. **Ignition switch……..…….……OFF**
6. **Aircraft……..……EVACUATE**
7. **Fire extinguisher……..……USE AS REQUIRED**
8. **Aircraft……..……INSPECT FOR DAMAGE**

WARNING

Do not perform another flight until the cause of the fire has been found and removed.

3.3.4 Engine fire in flight

1. **Fuel valve……OFF**
2. **Throttle…….....FULL OPEN**
3. **Airspeed……..... INCREASE (try and put the flames out by increasing airspeed)**

WARNING

Do not exceed V_{NE} !

4. **Landing ground selection……..Closest airport or a different, suitable ground to perform emergency landing**
5. **Ignition switch……..……OFF**
6. **Airspeed……..……...145 km/h IAS**
7. **Wing flaps……DEFLECT AS REQUIRED**
8. **Landing gear……..DOWN**

CAUTION

**Perform landing on main landing gear wheels.
Nose gear should be continuously relieved as much as possible by the use of elevator.**

NOTE

Perform landing onto a difficult, soft and greatly uneven terrain with the landing gear retracted. It is highly probable that this way the aircraft will not flip onto its back and smaller damage to the aircraft will occur.

NOTE

Should the situation not allow for a sufficient time period to perform complete opening of the landing gear (approx. 20 seconds), make landing into terrain with the landing gear closed
(smaller damage to the aircraft may occur)

9. **Main switch……OFF**
10. **Harnesses……..TIGHTEN**
11. **Brakes……After touchdown AS REQUIRED**

After aircraft stopping

12. **Aircraft……EVACUATE**
13. **Fire extinguisher……USE AS REQUIRED**
14. **Aircraft……INSPECT FOR DAMAGE**

WARNING

If you managed to put out the revealed fire, do not attempt to restart the engine in flight.

WARNING

Do not perform another flight until the cause of the fire has been found and removed.

3.3.5 Fire in cockpit (electric)

1. **Air vents……FULLY OPEN (to remove smoke from the cockpit)**
2. **Instruments…….....ALL UNNECESSARY OFF**
3. **Landing……AS SOON AS POSSIBLE**
4. **Aircraft……..……EVACUATE**
5. **Fire extinguisher…….……...USE AS REQUIRED**
6. **Aircraft……...INSPECT FOR DAMAGE**

WARNING

Do not perform another flight until the cause of the fire has been found and removed.

3.4 Forced precautionary landing (with engine power):

1. **Landing ground……..SELECT GROUND**
2. **Airspeed……145 km/h IAS**
3. **Flyby over selected ground……...…PERFORM at appropriate altitude (to review landing ground)**
4. **Small circuit…..……..……..PERFORM under constant visual with landing ground**
5. **Wing flaps……...SMALL (in downwind position)**
6. **Landing gear……..……..…DOWN**

NOTE

Perform landing onto a difficult, soft and greatly uneven terrain with the landing gear retracted. It is highly probable that this way the aircraft will not flip onto its back and smaller damage to the aircraft will occur.

Standard landing approach should follow with landing on a selected ground.

6. **Brakes……APPLY AS NECESSARY**

CAUTION

Perform landing on main landing gear wheels.
Nose gear should be continuously relieved as much as possible by the use of elevator.

3.5 Landing with damaged extended landing gear

Use standard approach and landing procedure

1. **Harnesses……..…..TIGHTEN**
2. **Instruments……..…. ALL UNNECESSARY OFF**
3. **Touchdown…..……..……..PERFORM using controls, so that the damaged part of the landing gear remains above ground for as long as possible during landing**

After aircraft stopping

4. **Instruments…….....…….....OFF**
5. **Ignition switch……..…OFF**
6. **Main switch…….. OFF**
7. **Fuel valve……..…… OFF**
8. **Aircraft……..……EVACUATE**

CAUTION

Perform landing on main landing gear wheels.
Nose gear should be continuously relieved as much as possible by the use of elevator.

3.6 Emergency gear extension

NOTE

In case of retractable landing gear hydraulic power unit failure, it is possible to manually extend the landing using the emergency pump. The emergency pump handle is located in the front pilot's compartment, on the left side of the instrument panel.

NOTE

Prior to initiating the emergency gear extension procedure, check the circuit breaker of the landing gear's electric circuit. It is located on the central console in the pilot's compartment. Should the circuit breaker be disconnected, attempt to turn it on by applying pressure. If the circuit breaker keeps disconnecting repeatedly, proceed to the below described emergency gear extension procedure.

1. **Airspeed……REDUCE to 145 km/h IAS**
2. **Wing flaps…….…….. SMALL (check position)**
3. **Gear control…….……into DOWN position**
4. **Emergency gear extension pump……..……PUMP**

NOTE

To ensure full extension of the landing gear during the emergency regime, it is necessary to pump the hydraulic system with approx. 70 to 75 movements of the emergency pump handle. Towards the end of the pumping, the resistance will increase and the system will be pressurized. Finish the pumping only once the gear position indicator consistently signals fully extended gear.

5. **Landing…….……AS SOON AS POSSIBLE at nearest suitable airport**

CAUTION

Perform landing as per procedure described in Chapter 3.5 Landing with damaged extended landing gear. On your way to airport, make sure to not exceed the maximum permissible speed for gear manipulation V_{LO}.

WARNING

Do not perform another flight until the cause of fault has been found and corrected.

3.7 Power unit vibrations

1. **Engine RPM……SET to value at which the vibrations are minimal**
2. **Landing……AS SOON AS POSSIBLE including the outside of airport emergency landing**

3.8 Loss of oil pressure in power unit

CAUTION

Should the oil pressure drop, or should it drop below the minimum permitted amount, it is necessary to suspect that engine failure may occur.

1. **Throttle……REDUCE engine power**
2. **Landing……..AS SOON AS POSSIBLE including the outside of airport emergency landing**

3.9 Unexpected icing encounter

1. **Throttle……..….INCREASE POWER above cruising regime**
2. **Icing area……DEPART (if possible)**

3.10 Extreme turbulence encounter

1. **Airspeed……..…REDUCE to 180 – 200 km/h IAS**
2. **Harnesses……..……..…..TIGHTEN**
3. **Loose objects……..……..…… SECURE**
4. **Turbulent area……..……DEPART (if possible)**

3.11 Inadvertent stall, spiral, spin recovery

3.11.1 Inadvertent stall recovery

WARNING

During a normally performed flight, a stall should not occur. Intentional stalls are prohibited.

1. **Airspeed……PUSH-DOWN to increase airspeed**
2. **Throttle……GRADUALLY INCREASE engine power**

NOTE

Altitude loss is 150 – 200 ft (50 – 60m).

NOTE

Once the stall has been recovered to a steady horizontal flight, continue as per normal conditions.

3.11.2 Inadvertent spiral recovery

WARNING

During a normally performed flight, a spiral should not occur. Intentional spirals are prohibited.

1. **Throttle……IDLE**
2. **Controls……..RECOVER ROLL applying opposite ailerons and rudder**
3. **Controls……apply elevator to recover aircraft into a horizontal flight**

WARNING

Apply controls gently when recovering from descent. Abrupt control movements may result in exceeding of operational load factors and airframe overstressing.

NOTE

Once the spiral has been recovered to a steady horizontal flight, continue as per normal conditions.

3.11.3 Inadvertent spin recovery

WARNING

During a normally performed flight, a spin should not occur. Intentional spins are prohibited.

1. **Throttle……IDLE**
2. **Ailerons……NEUTRAL**

3. **Rudder……....APPLY FULL in opposite direction of rotation**
4. **Elevator……..…….... PULL FORWARD**
5. **Rudder…….…….....once rotation stops NEUTRAL**
6. **Elevator……..... RECOVER GENTLY FROM DESCENT**

NOTE

Once the spin has been recovered to a steady horizontal flight, continue as per normal conditions.

NOTE

The aircraft characteristics have not been tested for spins. The above described is a general procedure and for informative purposes only.

3.12 Aircraft parachute rescue system

The STREAM aircraft as standard comes with an aircraft parachute system located in the fuselage behind the rear luggage compartment. It improves crews' chances of survival. The rescue system activation handle is normally installed under the instrument panel in the front pilot's compartment and on the right under the instrument panel in the rear pilot's compartment. It is necessary that each pilot reads and understands the installed rescue system's operations manual.

WARNING

The aircraft parachute system can be considered as a crew rescue method should the aircraft get out of control.

CAUTION

<u>When using the parachute rescue system, please take into account that the aircraft will be destroyed!</u>

WARNING

The proper functioning of the rescue system and its mounting is greatly affected by the weight of the aircraft. When activating the rescue system in an aircraft flying with a weight higher than the max. permitted take-off weight, overstressing of the airframe and malfunction of the rescue system may occur.

3.12.1 Rescue system activation procedure

WARNING

The following procedure contains recommended activities prior to actual rescue system activation. Should the situation (aircraft positioning, low altitude, etc.) require immediate reaction by activating the rescue system, activate the rescue system IMMEDIATELY without undertaking the below described pre-activation steps.

1. **Airspeed……SLOW DOWN THE AIRCRAFT, if possible**
2. **Flight altitude……...min. 1650 ft above terrain, if possible**
3. **Ignition switch…….....OFF**
4. **Harnesses……..……..TIGHTEN**

3.12.2 Rescue system activation:

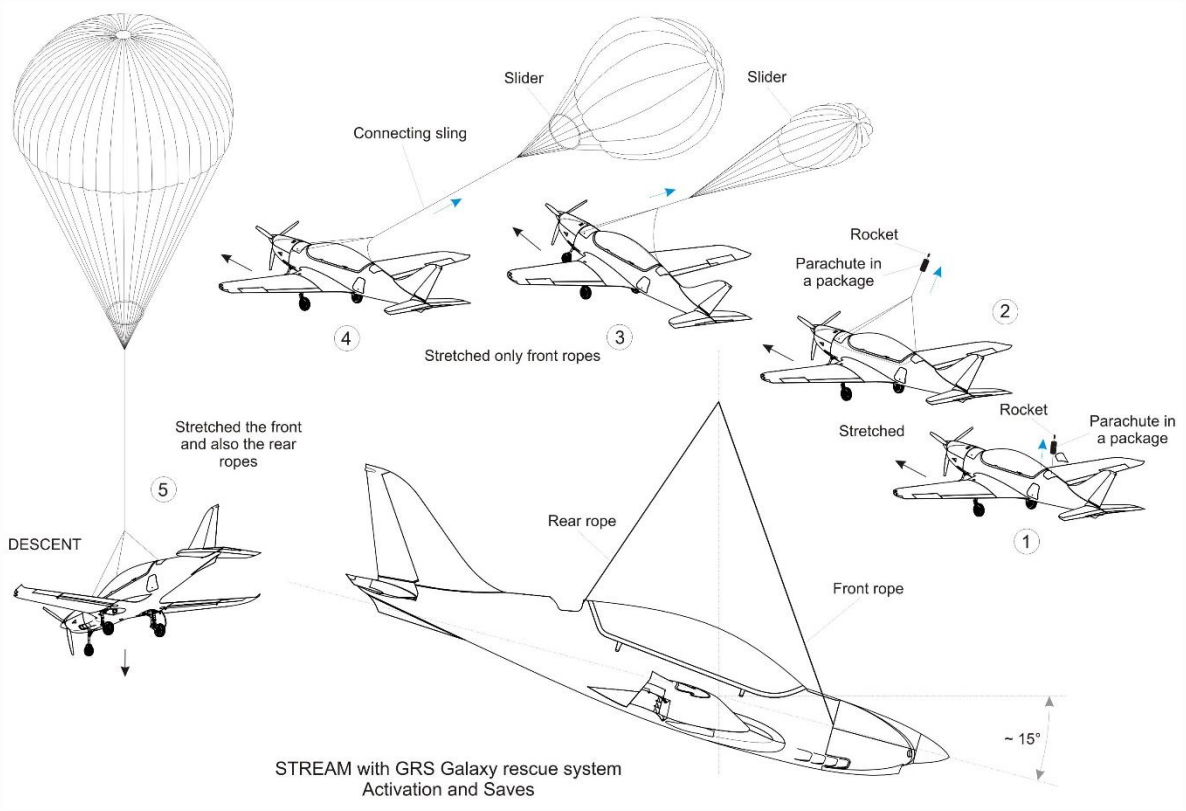
1. **Rescue system activation handle……..…...PULL (approx. 11,5 kg)**

   Once the aircraft fall has been stabilized by parachute (parachute inflation should take approx. 1.5 – 3.5 seconds)

2. **Radio.....REPORT situation and position (121.5 MHz emergency frequency), if possible**
3. **Transponder……..……..…SET TO 7700, if possible**
4. **Emergency locator transmitter (ELT.....ACTIVATE, if possible**

Prior to aircraft impact

5. **Fuel valve……..……..OFF, if possible**
6. **Main switch…….. OFF, if possible**
7. **Crew impact position……..…PULL LIMBS CLOSE TO BODY and COVER FACE**



STREAM with GRS Galaxy rescue system Activation and Saves

WARNING

Maximum weight for aircraft parachute deployment: 600 kg.

WARNING

If the rescue system is activated due to fire in flight, do not activate it immediately at high altitudes. If the conditions allow, attempt to descend to lower altitude and thus minimize the time, during which the fire could spread into the cockpit.

3.12.3 Rescue system activation above water surface

NOTE

Once the aircraft with the rescue system activated makes an impact onto the water surface, it is necessary to evacuate as soon as possible (before it sinks). Therefore, it is essential to prepare for fast evacuation prior to actual impact.

1. **Rescue system activation handle……PULL (approx. 11,5 kg)**

   Once the aircraft fall has been stabilized by parachute (parachute inflation should take approx. 1.5 – 3.5 seconds)

2. **Radio…..REPORT situation and position (121.5 MHz emergency frequency), if possible**
3. **Transponder……SET TO 7700, if possible**
4. **Emergency locator transmitter (ELT)……..ACTIVATE, if possible**

   Prior to aircraft impact

5. **Fuel valve……...OFF, if possible**
6. **Main switch……OFF, if possible**
7. **Canopy……..OPEN and move aside as much as possible**
8. **Harnesses……..Prepare one hand on the harness lock**

9. **Crew impact position……PULL LIMBS CLOSE TO BODY and COVER FACE**

4. NORMAL PROCEDURES

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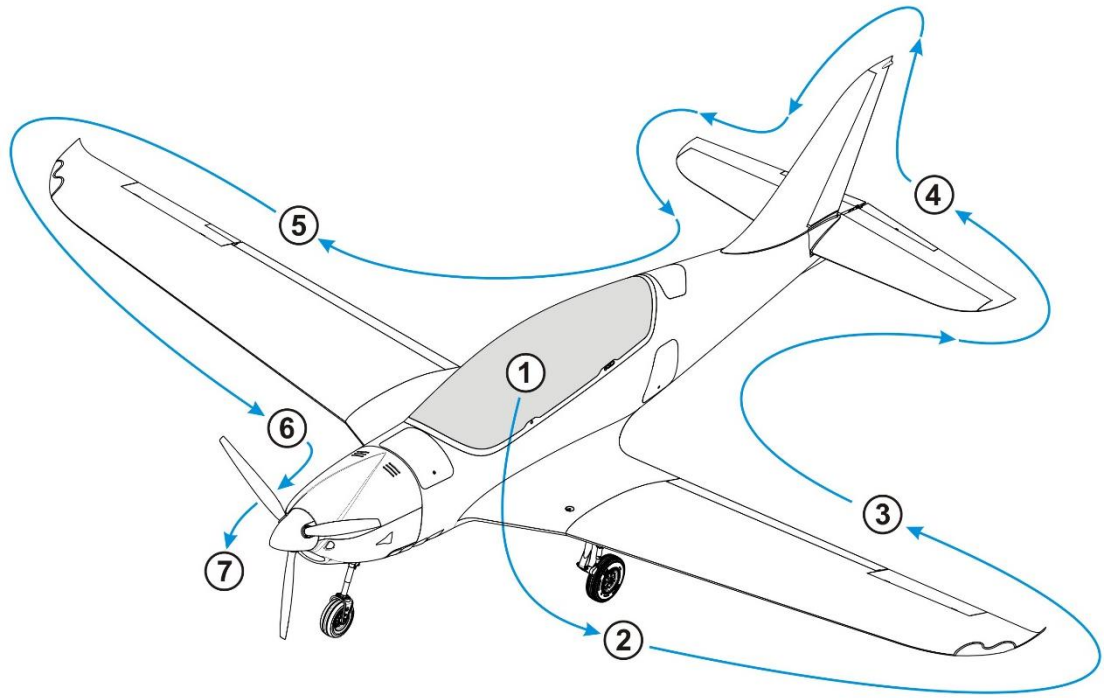
4.1 Preflight Inspection



4.1.1 Cockpit

1. **Main switch and ignition switch……...OFF**
2. **Fuel valve ……..……..……....OFF**
3. **Upholstery and seats mounting....Check condition and mounting**
4. **Harnesses…….... Check condition and mounting**
5. **Hand controls……..…….. Check freedom of movement**
6. **Foot controls (pedals)……..Check freedom of movement**

NOTE

Foot controls are connected with the controls of the nose gear. If the nose gear is not lifted, it will give out resistance.

7. **Brakes……..……..……Check functionality**
8. **Engine controls…..……Check freedom of movement**

9. **Main switch …….....ON**
10. **Trim……...Check functionality (Transverse and longitudinal)**
11. **Fuel gauge……..……..Check quantity**
12. **Flaps..……..Check functionality, SET FULL**
13. **Main switch…….……OFF**
14. **Canopy…….Check condition, mounting, cleanness and locks**

4.1.2 Main Landing Gear – Left

1. **Gear leg and mounting..……Check condition**
2. **Shock absorber……Check polyurethane segments condition, shock absorber plays and its mounting**
3. **Gear tire……...Check for wear and check tire pressure**
4. **Brake system……Check condition, sealing, functionality and wear of brake pads and brake discs**
5. **Gear control system……..Check condition, sealing and wear**
6. **Aerodynamic covers (if installed).....Check condition and mounting**

4.1.3 Left Wing

1. **Wing surface and wing tip.….Check for any damages and cracks**
2. **Wing tip lights cover……Check condition and mounting**
3. **Aileron, mounting and drive……Check condition, plays and freedom of movement**
4. **Flap, mounting and drive……Check condition and plays**
5. **Flap slot cover (in the wing)…....Check condition and mounting**
6. **Pitot-static tube……Check condition, cleanness and mounting**

4.1.4 Fuselage and Tail Surfaces

1. **Fuselage surface……..Check for any damages and cracks**
2. **Rescue system opening in rear fuselage……...Check condition**
3. **Antennas and fuselage sensors…..Check condition and mounting**
4. **Luggage compartment doors……Check mounting and locks**
5. **Tail surfaces……Check for any damages and cracks**
6. **Elevators and their drive..……...Check condition, plays and freedom of movement**
7. **Trimming tabs and their drive……Check condition, plays and freedom of movement**
8. **Lead balance elevator weights……..……..….Check mounting**
9. **Rudder……Check condition, plays and freedom of movement**
10. **Fuselage fuel tank……..Check condition, seal and fuel qty**

4.1.5 Right Wing

1. **Wing surface and wing tip.….Check for any damages and cracks**
2. **Wing tip lights cover……..…Check condition and mounting**
3. **Aileron, mounting and drive……Check condition, plays and freedom of movement**
4. **Transverse trim tab……..Check condition, mounting and control**
5. **Flap, mounting and drive……..……Check condition and plays**
6. **Flap slot cover (in the wing)……...Check condition and mounting**

4.1.6 Main Landing Gear – Right

1. **Gear leg and mounting...……..…Check condition**
2. **Shock absorber……Check polyurethane segments condition, shock absorber plays and its mounting**
3. **Gear tire……..Check for wear and check tire pressure**

4. **Brake system……Check condition, sealing, functionality and wear of brake pads and brake discs**
5. **Gear control system……Check condition, sealing and wear**
6. **Aerodynamic covers (if installed).....Check condition and mounting**

4.1.7 Powerplant and Nose Gear:

1. **Top engine cowling……Dismount**
2. **Engine……Check overall condition**
3. **Engine mount and its mounting…….Check overall condition**
4. **Engine mount silentblocks ……..Check condition**
5. **Exhaust silencer and its mounting…….Check overall condition**
6. **Ignition system……..Check overall condition**
7. **Fuel system……Check overall condition and drain**
8. **Cooling system……..Check overall condition and coolant qty**
9. **Lubrication system……..Check overall condition and oil qty**
10. **Hydraulic landing gear system……..Check aggregate and other elements for leaks, damage and overall condition. Check hydraulic liquid qty.**
11. **Propeller and its controls……Check overall condition**
12. **Nose gear……Check condition and mounting**
13. **Nose gear tire……..Check for wear and check tire pressure**
14. **Nose gear control system……Check condition, sealing and for wear**
15. **Top engine cowling……..Mount back**
16. **Engine cowlings……..Check mounting**

POZNÁMKA

Once you have completed the preflight inspection, set your flaps to up position and check the documentation of the aircraft, powerplant, propeller and parachute rescue system.
Ensure that all mandatory documentation is present onboard.

4.2 Operating Procedures

4.2.1 Starting Engine

1. **Preflight inspection……..……..…..…Done**
2. **Canopy……..……..…CLOSED and SECURED**

CAUTION

Starting the engine or performing engine run-up with the canopy open may cause its damage.

3. **Harnesses…….....…….ADJUST and FASTEN**
4. **Headsets……..….Put on and adjust**
5. **Fuel valve…….……ON**
6. **Throttle…….……IDLE**
7. **Choke…….……..…ON (for cold engine only)**
8. **Main switch……..……..ON**
9. **Auxiliary fuel pump (if installed)……..……..ON**
10. **Auxiliary fuel pump……....Once the prescribed fuel pressure is reached OFF**
11. **Check area around propeller……..….Around prop CLEAR**
12. **Brakes…….……..……ENGAGED**
13. **Starter……..ENGAGE**

NOTE

You can engage starter continuously for 10 seconds max. Then it is necessary to make a 2-minute cooling break.

Once the engine starts

14. **Throttle……..…...2000 RPM**
15. **Choke……..…..Slowly CLOSE**
16. **Instruments……...…….……ON, monitor**
17. **Strobe lights……..……..ON**

4.2.2 Engine Warm-up and Run-up:

1. **Warm-up engine to operating temp……..2000 RPM for 2 min minimum, then possible to gradually increase RPM**
2. **Engine instruments…….....…...Within operating limits**
3. **Brakes……..ENGAGE**
4. **Throttle……..…....Max. power, check**
5. **Throttle……..……..…….4000 RPM**
6. **Magnetos……..……...Check, max. drop 300 RPM max. difference 120 RPM**
7. **Propeller pitch control .....Check the function of the propeller pitch control system by moving the propeller lever full back and front.**

WARNING

The engine run-up should only be performed on an aircraft that has been secured with wedges against movement, positioned against wind, in open space and with regard to safety of other persons.

CAUTION

Do not perform the engine run-up on rocky surfaces, which could result in damage to the propeller or aircraft.

4.2.3 Taxi

1. **Area around aircraft……..……..CLEAR**
2. **Brakes……..Check function and use as required**
3. **Transponder (if installed)……....ON as required**

WARNING

Frequent and intense braking may result in brake liquid overheating and the braking ability may be compromised. Regulate the taxi speed by use of throttle instead of wheel braking.

CAUTION

The maximum taxi speed is 15 km/h. Avoid visibly rough surfaces, so that the landing gear is not being overstressed.

4.2.4 Prior to Take-off

1. **Harnesses……..……....SECURE and tightened**
2. **Loose objects (including luggage compartments)……SECURE**
3. **Rescue system safety pins……..……...REMOVED**
4. **Canopy…….....CLOSED and SECURE**
5. **Controls……Freedom of movement**
6. **Instruments……...Monitor and check settings**
7. **Fuel gauge……..…Check fuel qty**
8. **Fuel valve……..……..…..ON, check position**
9. **Trim (transverse and longitudinal)..…….……..NEUTRAL**
10. **Landing gear control……...DOWN, check position**
11. **Flaps……...TAKEOFF position (small)**
12. **Takeoff runway and area……..……...CLEAR**
13. **Radio……..Transmit**

4.2.5 Take-off:

1. **Throttle……FULL POWER**
2. **Lift off…….....At 80-90 km/h IAS**
3. **Airborne acceleration…….……...To 120 km/h IAS**
4. **Transition to climb mode……...Primary climb speed 130 km/hIAS**
5. **Gear……..……UP**
6. **Throttle…….....Reduce power to max. 5000 RPM**
7. **Climb…….....145 km/h IAS**
8. **Flaps…….....RETRACT above 150 ft AGL and when reaching 145 km/h IAS**
9. **Trim……..……As required**

WARNING

Do not proceed to take-off, should the engine not run smoothly.

4.2.6 Climb

1. **Throttle……..……..…SET TO max. 5200 RPM**
2. **Climb…….....…150 km/h IAS**
3. **Instruments……..……..Monitor**
4. **Auxiliary fuel pump……...OFF (if used during take-off)**

4.2.7 Horizontal Flight:

Enter into a horizontal flight

1. **Throttle……..…4700 RPM, or as required**
2. **Manifold pressure ..... 25 – 27 In, or as required**
3. **Airspeed……..……..As required**
4. **Instruments…….....Monitor**
5. **Trim……..…….…As required**

CAUTION

Continuously monitor the remaining fuel quantity during flight.

4.2.8 Descent

1. **Throttle…….…..…As required**
2. **Instruments……...Monitor**

WARNING

Avoid longer descent at engine IDLE. Powerplant subcooling and loss of usable power may occur.

4.2.9 Downwind

1. **Throttle……..……..……..Adjust for horizontal flight**
2. **Airspeed…….……..……..170 – 190 km/h IAS**
3. **Trim……..…..As required**
4. **Instruments……Monitor**
5. **Fuel……..Check qty and fuel valve position**
6. **Harnesses…….……FASTENED**
7. **Approach and landing area .....…….……CLEAR**
8. **Radio…….……..Report**
9. **Propeller..... Before third turn put propeller lever full FORWARD**

4.2.10 Baseleg:

1. **Throttle……..……..……Adjust for descent as required**
2. **Airspeed……..……..……140 km/h IAS**
3. **Landing gear…….…DOWN (check)**
4. **Flaps……..TAKEOFF position (small)**
5. **Trim……..…..As required**
6. **Final approach area ..……..……..……CLEAR**
7. **Radio…….……..Report**

4.2.11 Final

1. **Approach speed……....……120 km/h IAS**
2. **Instruments…….……Monitor**
3. **Flaps……..LANDING position (full)**
4. **Trim……..……..…..As required**

5. **Landing area……..……..……..…..... CLEAR**
6. **Radio…….....Report**

4.2.12 Landing

1. **Throttle……..……..……..…..IDLE, or as required**
2. **Airspeed……110 km/h IAS**
3. **Level off……At 1 – 2 ft above ground**
4. **Airspeed…….…....…Gradually reduce until touchdown**

CAUTION

Perform landing on main landing gear wheels.
Nose gear should be continuously relieved as much as possible by the use of elevator.

4.2.13 After Landing:

1. **Brakes……....……Use as required**
2. **Flaps……..……..UP**
3. **Instruments……..……All unnecessary off**
4. **Rescue system safety pin……..……....…….INSERT**

WARNING

Frequent and intense braking may result in brake liquid overheating and the braking ability may be compromised. Regulate the taxi speed by use of throttle instead of wheel braking.

4.2.14 Engine Shutdown

1. **Throttle……..……..…Cool engine off at 2000 RPM**
2. **Strobe lights……..……OFF**
3. **Transponder (if installed)…….……OFF**
4. **Instruments……..……..……..OFF**
5. **Radio…….……OFF**
6. **Ignition switch…….....……OFF**
7. **Main switch…….……OFF**
8. **Fuel valve……..…….……OFF**
9. **Canopy……..…UNLOCK and open**

NOTE

Once you disembark the aircraft, set brakes to parking position, tie down the aircraft or use another method of securing the aircraft against unwanted movement. For parking outside of covered areas, lock the controls.

CAUTION

When you leave the aircraft, close and lock the canopy. Do not leave the canopy opened. Damage to the aircraft may occur.

4.2.15 Post-flight Inspection:

1. **Overall aircraft condition ..……..…Check**
2. **Potential operating liquid leaks…….……Check and find cause**
3. **Pitot-static tube cover……...Install, if no other flight planned**
4. **Vents……..……..Closed**

4.3 Go-around Procedure

1. **Throttle……..……..…Steadily maximum power**
2. **Flaps……...TAKEOFF position (small)**
3. **Lift off……..……..At 80-90 km/h IAS**
4. **After lift-off acceleration……..……..To 120 km/h IAS**
5. **Trim……..…….As required**
6. **Transition to climb mode……..Primary climb speed 130 km/h IAS**
7. **Gear……..…….UP**
8. **Throttle…….....Reduce power to max. 5500 RPM**
9. **Climb……..…….....145 km/h IAS**
10. **Flaps…….…….....RETRACT above 150 ft AGL and when reaching 145 km/h IAS**
11. **Trim……..…….As required**

WARNING

Do not perform go-around, should the engine not run smoothly.

4.4 Canopy Manipulation:

The STREAM aircraft comes with a sideways-opening canopy, enabling comfortable crew entry. The canopy is in its closed position secured at two points (by two mechanisms). Only complete securing using both mechanisms will ensure full lock of the canopy, against accidental opening in flight. It is necessary to undertake the following steps when closing the canopy prior to flight:

1. **Check that all canopy contact surfaces are clear and remove any obstacles, which could prevent its complete closing (clothes, harnesses, headsets, etc.).**
2. **Move the canopy to its closed position.**
3. **Secure the canopy in its closed position by rotating (forward) a pair of handles on the left side of the canopy.**
4. **Check that the canopy is securely locked by applying mild pressure to the canopy.**

CAUTION

Should you encounter resistance in the canopy locking mechanisms, do not attempt to close the canopy by force. Damage to the locking mechanisms may occur. On the contrary, open the canopy again and inspect the contact surfaces for presence of any foreign objects, which could be preventing the closing. Ensure that both handles on the left side of the canopy are in their opened position when closing the canopy.

CAUTION

When parking the aircraft on the ground, do not leave the canopy in its opened position. Damage to the canopy caused by sudden gusts or damage to the upholstery above the instrument panel may occur (excessive local overheating of the upholstery caused by magnifying glass effect of the opened canopy's transparent part).

4.5 Crew Movement During Boarding/Disembarking the Aircraft:

CAUTION

Board the aircraft gradually, i.e. the second person waits until the first person is seated inside the cockpit. Excessive load on the step may result in tilting of the aircraft onto its rear fuselage and its damage. Proceed in like manner when disembarking the aircraft.

5. PERFORMANCE

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NOTE

Flight performance information listed in this Chapter is valid for the standard aircraft version with a 600 kg max. take-off weight (including the parachute rescue system), standard flight technique and under MSA conditions. The actual performance may vary based on pilot's experience, weather and aircraft's condition. The standard aircraft version is equipped with a 100 HP 912 ULS ROTAX Engine and an in-flight adjustable DuoMax Propeller or PowerMax Propeller.

5.1 Airspeed Indicator Calibration

IAS (km/h)	CAS (km/h)		
	Cruise Configuration	Take-off Configuration	Landing Configuration
70			67,2
80		77,6	78,2
90		88,0	88,8
100	96,7	98,1	98,9
110	106,1	107,9	108,6
120	115,6	117,5	117,8
130	125,0	126,8	126,6
140	134,5	135,9	
150	144,1	144,7	
160	153,7		
170	163,3		
180	173,0		
190	182,7		
200	192,5		
210	202,3		
220	212,1		
230	222,0		
240	231,9		
250	241,9		
260	251,9		
270	261,9		
280	272,0		
290	282,1		
300	292,3		
310	302,5		
320	312,7		
330	323,0		
340	333,3		

NOTE

IAS – indicated airspeed (as read from the airspeed indicator on an aircraft)
CAS – calibrated airspeed (airspeed at sea level MSA, corrected for instrument and aerodynamic error)

5.2 Take-off Distances

Take-off roll distance: **155 m**, max. power, small flaps, paved runway, DuoMax Propeller

Take-off distance to clear a 15 m high obstacle: **370 m**, max. power, small flaps, paved runway, DuoMax Propeller

Take-off roll distance: **140 m**, max. power, small flaps, paved runway, PowerMax Propeller

Take-off distance to clear a 15 m high obstacle: **345 m**, max. power, small flaps, paved runway, PowerMax Propeller

5.3 Landing Distances

Landing roll with braking (15 m obstacle): **300 m**, adequate braking, dry paved RWY
Landing roll without braking (15 m obstacle): **335 m**, no braking, dry paved RWY

5.4 Rate of Climb

Rate of Climb: **4,1 m/s** at **160 km/h**, V_Y, max. power, DuoMax Propeller

Rate of Climb: **4,35 m/s** at **160 km/h**, V_Y, max. power, PowerMax Propeller

5.5 Horizontal Flight – Cruise Speed

Design cruise speed: **200 – 235 km/h IAS** (as per aircraft equipment))
Max. cruise speed: **235 km/h IAS** (65 % engine power, 4800 RPM)

Max. continuous horizontal flight speed: **272 km/h IAS** (V_H, max. continuous engine power, 5500 RPM, MSA, DuoMax Propeller)

Max. continuous horizontal flight speed: **260 km/h IAS** (V_H, max. continuous engine power, 5500 RPM, MSA, PowerMax Propeller)

5.6 Fuel Consumption

Max. power:	**27,0 l/h**
Max.continuous power:	**25,0 l/h**
75% continuous power:	**18,5 l/h**
65% continuous power:	**16 l/h**

NOTE

For more information, please refer to the ROTAX Engine Operation Manual.

6. WEIGHT AND BALANCE

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6.1 Introduction

It is the pilot's responsibility prior to every flight to ensure that the weight and balance limits are not exceeded and that the aircraft load is distributed and secured correctly.

It might be necessary at times to reduce the amount of fuel or luggage, in order to remain within the maximum permissible take-off weight limits and so that the final CG position stays within the permissible range throughout the whole flight. The maximum permissible take-off weight mustn't be exceeded under any circumstances.

6.2 Permissible values and load arms

The leading edge of the wing (root rib cross-section) has been used as the reference datum plane.

Permissible load values

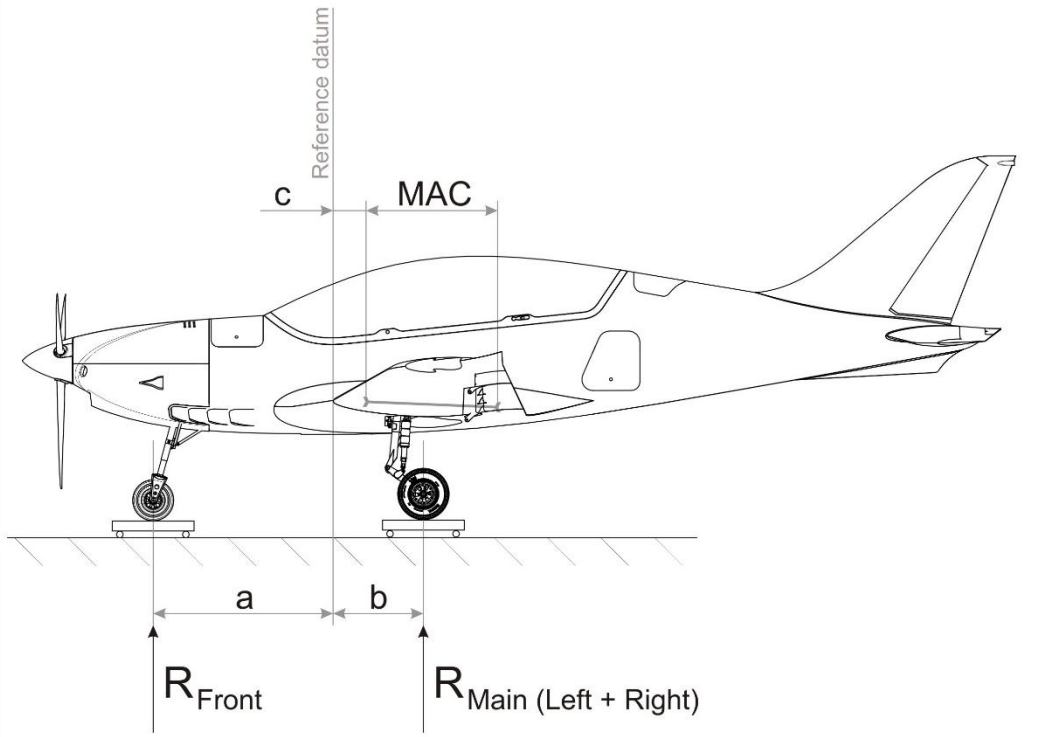
Load Type	Value
Max. take-off weight	600 kg
Max. seat load (front/back)	100 / 100 kg
Min. pilot weight (note: solo flights from front seat only)	60 kg
Max. main fuel tank weight (90 l)	64,8 kg
Max. luggage weight in the front luggage compartment	10 kg
Max. luggage weight in the back luggage compartment	15 kg

Dimensions

Dimension Type	Indication	Value
Mean aerodynamic chord	MAC	1,199 m
Front wheel axis to the reference datum horizontal length	a	1,230 m
Main wheel axis to the reference datum horizontal length	b	0,615 m
Mean aerodynamic chord leading edge to reference datum length	c	0,062 m

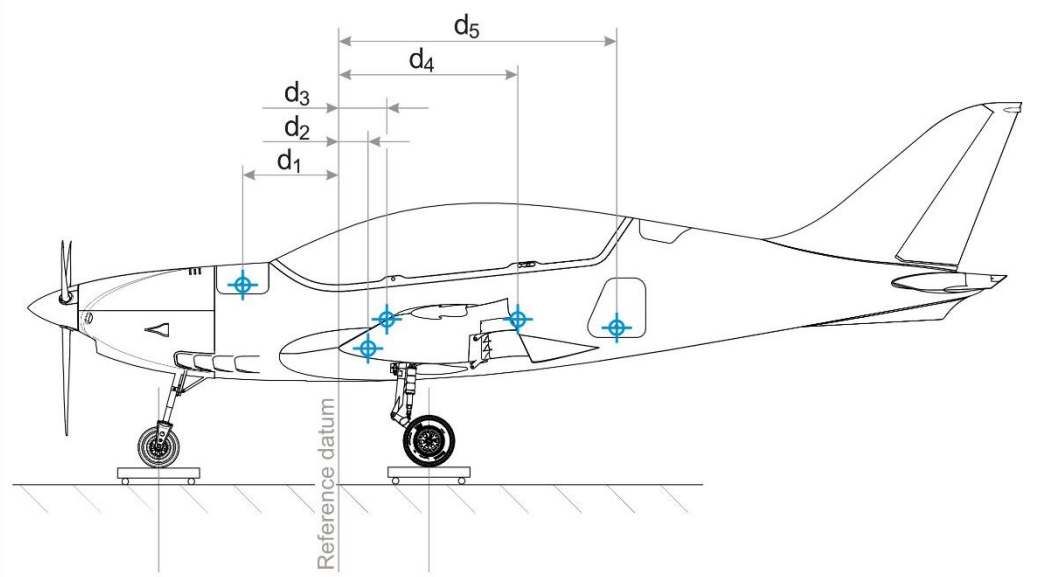
Permissible flight CG limit

Range Type	Value
Permissible flight CG limit in % MAC – gear down	15 až 34,5 % MAC
Permissible flight CG limit in % MAC – gear up	15 až 35 % MAC



Load arms

Load Type	Indication	Value
Luggage arm in front luggage compartment	d_1	- 0,689 m
Fuel arm in main fuel tank	d_2	0,062 m
Front seat crew arm	d_3	0,346 m
Back seat crew arm	d_4	1,368 m
Luggage arm in the back luggage compartment	d_5	1,861 m



6.3 Prior to flight CG determination

WARNING

It is the pilot's responsibility prior to every flight to ensure that the weight and balance limits shall not be exceeded during flight and that the aircraft load is distributed and secured correctly.

The empty aircraft weight has been set by the Manufacturer (please refer to The Test Flight Protocol of the individual aircraft). If any equipment has been added to (or removed from) the aircraft, or if any modification affecting the weight and empty aircraft CG position has been performed, it will be necessary to determine again the empty aircraft weight and CG position (as per Chapter 6.5). The results together with the dates of weighing must be recorded in the following table.

Scaling No.	Empty Aircraft Weight M_{LET} [kg]	Center of Gravity Position		Scaling Date
		$L_{t\text{-}LET}$ [ft]	$X_{\%\text{-}LET}$ [% MAC]	
1				
2				
3				
4				
5				

Record weights of all payload items into the following table and calculate their total sum:

Load Type	Weight [kg]
Luggage in the front luggage compartment	
Fuel in the main fuel tank	
Crew in the front seat	
Crew in the back seat	
Luggage in the back luggage compartment	
Total Payload M_{UZIT}	

Further determine the take-off weight of the selected configuration:

$$M_{KON} = M_{LET} + M_{UZIT} \quad [kg]$$

WARNING

The determined take-off weight of the configuration M_{KON} mustn't exceed the maximum permissible aircraft take-off weight (600 kg).

Further determine the moments of the individual loads:

Moment of luggage in the front luggage compartment:

$$MO_{PREDNI\_ZAV\_PROSTOR} = M_{PRED\_ZAV\_PROSTOR} \cdot d_1 \quad [kg.m]$$

Moment of fuel mass in the main fuel tank:

$$MO_{PALIVO} = M_{PALIVO} \cdot d_2 \quad [kg.m]$$

Moment of crew in the front seat:

$$MO_{PREDNI\_SEDACKA} = M_{PREDNI\_SEDACKA} \cdot d_3 \quad [kg.m]$$

Moment of crew in the back seat:

$$MO_{ZADNI\_SEDACKA} = M_{ZADNI\_SEDACKA} \cdot d_4 \quad [kg.m]$$

Moment of luggage in the back luggage compartment:

$$MO_{ZADNI\_ZAV\_PROSTOR} = M_{ZADNI\_ZAV\_PROSTOR} \cdot d_5 \quad [kg.m]$$

Moment of empty aircraft:

$$MO_{LET} = M_{LET} \cdot X_{t-LET} \quad [kg.m]$$

Sum all determined load moments together:

$$MO_{KON} = \sum MO \quad [kg.m]$$

Determining the CG position of the configuration – landing gear down:

$$X_{\%-KON-VYS} = \frac{\left(\frac{MO_{KON}}{M_{KON}}\right) - c}{MAC} \cdot 100 \quad [\%MAC]$$

WARNING

The determined CG position of the configuration must remain within the permissible flight CG position limits 15 – 34,5 %MAC.

Determining the CG position of the configuration – landing gear up:

Average center of gravity position change after the landing gear retraction is +0,5% MAC (the direction of moving the center of gravity after landing gear retraction is backwards)

$$X_{\%-KON-ZAS} = X_{\%-KON-VYS} + 0{,}5 \quad [\%MAC]$$

WARNING

The determined CG position of the configuration must reamin within the permissible flight CG position limits 15 – 35 % MAC.

6.3.1 Typical critical configuration before the front allowable limit

Tandem configuration could causes, that the wrong placement of permitted maximum loads in aircraft, could move the center of gravity position out of allowed range. The typical critical placement of loads, which combination probably cause dangerous finaly position of center of gravity before the front allowable limit is the solo flight (rear seat is empty) with more fuel and luggage in front luggage compartment (more in the following table):

The example of inappropriate location of loads, which probably cause the final center of gravity position before the front allowable limit:

Load type	Weight
Crew in the front seat	60 - 100 kg
Crew in the back seat	0 kg
Fuel weight in the main fuel tank (more fuel = center of gravity move forward)	0 – 64,8 kg
Luggage in the front luggage compartment	10 kg
Luggage in the back luggage compartment	0 kg

WARNING

In configuration listed in the table above and similar don't perform flight.

Solution of the situation: the luggage in the front luggage compartment move to the rear luggage compartment. Another solution is put weight to the rear luggage compartment.

6.3.2 Typical critical configuration afer the rear allowable limit

Tandem configuration could causes, that the wrong placement of permitted maximum loads in aircraft, could move the center of gravity position out of allowed range. The typical critical placement of loads, which combination probably cause dangerous finaly position of center of gravity after the rear allowable limit is flight with light front pilot (min. permissible weight is 60 kg) and heavy rear pilot (max. permissible weight is 100 kg) with luggage located in the rear luggage compartment and low fuel amount in the fuel tank (be aware that fuel is running low) (more in the following table):

The example of inappropriate location of loads, which probably cause the final center of gravity position after the rear allowable limit:

Load type	Weight
Crew in the front seat	60 kg
Crew in the back seat	100 kg
Fuel weight in the main fuel tank (more fuel = center of gravity move forward)	0 - 10 kg
Luggage in the front luggage compartment	0 kg
Luggage in the back luggage compartment	15 kg

WARNING

In configuration listed in the table above and similar don't perform flight.

Solution of the situation: The luggage in the rear luggage compartment move to the front luggage compartment. Another solution is put some weight to the front luggage compartment. If is it possible, change the possition of the pilots for sitting the hevier pilot in front seat.

6.4 Conditions for weighing the aircraft

For best results, weigh indoors (e.g. inside a hangar). The scales must be calibrated correctly and must be placed on a level ground.

Place a scale under each wheel of the aircraft. If only one scale is used, ensure that all wheels are at the same level prior to the weighing process (transverse and longitudinal axis). Remember that the aircraft must be properly leveled to ensure weighing accuracy (the firewall plane must be vertical).

Any equipment placed on the scales when weighing the aircraft, such as wheel chocks, must be additionally weighed separately and its weight deducted from the scale reading.

Be sure to remove any objects that are not part of the aircraft (e.g. tools, textile canopy covers, etc.) prior to weighing.

Ensure that the weighed aircraft is in a flight configuration (e.g. closed canopy, etc.).

The fuel tank should be empty, except for unusable fuel. If the fuel tank is not empty, then the exact amount of usable fuel in the tank must be determined. The weight of the fuel minus the unusable fuel must be deducted from the empty aircraft weight. Further it is necessary to take into account the moment of this load when determining the CG position of the empty aircraft (fuel arm to reference datum length is listed in Chapter 6.2).

The oil and coolant containers must be properly filled prior to weighing. These liquids necessary for standard aircraft operation are considered part of the aircraft's empty weight.

CAUTION

In case of nonstandard aircraft equipment, it is necessary to determine the actual CG position using a separate formula, or by obtaining the take-off weight and the flight CG position as per procedure described in the following chapter.

6.5 Determining the weight and CG position of an empty aircraft

Prepare the aircraft as per instructions listed in Chapter 6.4.

Read the data on the scale placed under the main landing gear. You can obtain the total weight of main gear R_{MAIN} by summing up the data read on both scales placed under the main landing gear wheels.

Read the data on the scale placed under the front gear wheel R_{FRONT}

The total weight of the empty aircraft M_{LET} can be determined as per below:

$$M_{LET} = R_{MAIN} + R_{FRONT} \quad [kg]$$

Determine the empty aircraft CG position from the reference datum as per the below formula:

$$L_{t-LET} = \frac{R_{MAIN} \cdot b - R_{FRONT} \cdot a}{M_{LET}} \quad [m]$$

Calculate the empty aircraft CG position in %MAC:

$$X_{\%-LET} = \frac{L_{t-LET} - c}{MAC} \cdot 100 \quad [\%MAC]$$

The determined values of the empty aircraft weight M_{LET} [kg], empty aircraft CG position from the reference datum $L_{t\text{-}LET}$ [m] and empty aircraft CG position in %MAC must be recorded in the table listed in Chapter 6.3.

7. DESCRIPTION OF AIRCRAFT AND SYSTEMS

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7.1 Aircraft

The Stream is a single engine, two-place, cantilever low wing aircraft with a retractable tricycle landing gear. The aircraft is built made of composite materials.

7.2 Fuselage

The fuselage is designed as a clean laminate sandwich shell with bulkheads. In the front part of the fuselage is a powerplant mounted onto the engine firewall. Behind the firewall inside the fuselage is a two-place pilot's compartment with seats in a tandem arrangement. The pilots are seated on a pair of two individual seats. There is a dual control (two sidesticks) located in the pilot's compartment. Behind the pilot's compartment is a rear luggage compartment accessible from the side of the fuselage and a rescue parachute system assembly.

7.3 Wing

The wing is an all-composite cantilever design. It is formed as a sandwich monocoque structure with ribs and spar. Fuselage mounting is done using semi-cantilever spars and rear spar hinges. The wing is fitted with ailerons and a double slotted wing flap.

7.4 Landing Gear

The landing gear is a tricycle design. The main wheels have polyurethane block suspension. The nose wheel uses a steel spring. The nose gear is steerable. The landing gear is fully retractable utilizing a hydraulic system equipped with an emergency pump. The landing gear can be equipped with aerodynamic covers. Main wheels are equipped with brakes and their size is kola 360 x 110 mm. The front wheel size is 290 x 100 mm.

7.5 Flight Controls

The aircraft is controlled using a combination of cables and rods. Aileron and elevator control is done by rods; rudder is controlled by cables. The transverse and longitudinal trim is controlled by a servomotor, the aerodynamic tabs are located on an elevator and a right aileron. The wing flaps are controlled electrically, using a servomotor located inside a fuselage. The main wheel brakes are controlled by small pedals as part of foot controls.

7.6 Powerplant

It is intended that more than one engine type will be used. The elementary engine types are ROTAX 912 ULS.

Engine Type	ROTAX 912 ULS
Performance:	
Max. take-off performance	73,5 kW (100 HP)
Max. continuous performance	69 kW (93 HP)
RPM:	
Max. take-off RPM limit	5800 ot/min (5 min.)
Max. continuous RPM	5500 ot/min
Oil pressure:	
Maximum	7 bar (102 psi)
Minimum	0,8 bar (12 psi)
Oil temperature:	
Maximum	130°C (266°F)
Minimum	50°C (120°F)
Cylinder head temp:	
Max. cylinder head temp	135°C (284°F)
Coolant Temperature:	
Max. coolant temp.	120°C (248°F)
Engine start, ambient operating temp.:	
Maximum	50°C (120°F)
Minimum	- 25°C (- 13°F)
Fuel pressure:	
Maximum	0,4 bar (5,8 psi)
Minimum	0,15 bar (2,2 psi)

NOTE

For current and complete information, please refer to the ROTAX Engine Operation Manual supplied with the aircraft.

The used propeller type:

Propeller manufacturer:	TL-ULTRALIGHT
Propeller Model:	DuoMax
Number of Blades:	2
Propeller Type:	In-Flight Adjustable
Propeller diameter (mm):	1708 mm

Propeller manufacturer:	TL-ULTRALIGHT
Propeller Model:	PowerMax
Number of Blades:	3
Propeller Type:	In-Flight Adjustable
Propeller diameter (mm):	1748 mm

NOTE

For current information on the propeller, its installation and use, please refer to the documentation specified by the manufacturer.

7.7 Fuel System

The fuel system consists of a 90 l fuel tank located in the front part of the fuselage center plane, fuel lines, fuel valve, fuel gauge and a fuel filter.

7.8 Pitot-static System

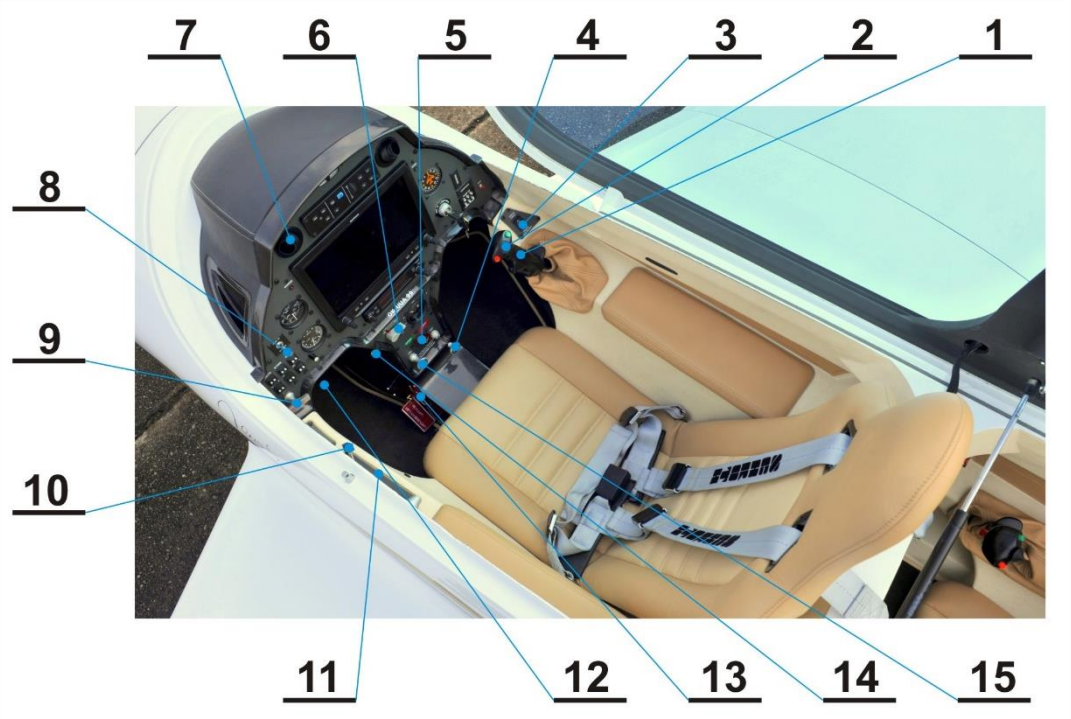
The pitot-static system uses a Prandtl tube located under the left half of the wing. The static pressure data is collected from the sides of the rear fuselage (or possibly otherwise based on different instruments). Channeling of the static and total pressure is done by polyethylene tubes.

7.9 Electrical System

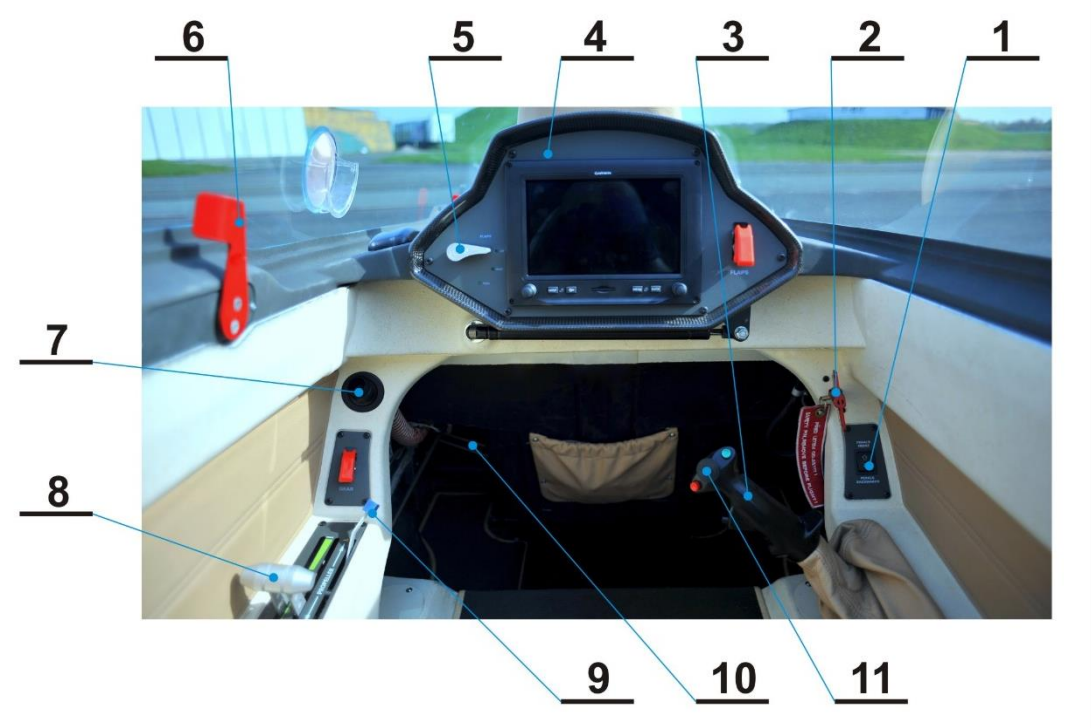
The electrical system uses a 12V DC voltage. The electrical system ensures functioning of the cockpit instruments, avionics, lights, trim tabs and of a wing flap drive. The electrical system also supplies the hydraulic retractable landing gear aggregate. Source is a 12V/ 8 Ah battery.

7.10 Elementary Cockpit Controls

The following illustration demonstrates standard elementary controls placement and aircraft cockpit equipment. Instrument panel equipment may vary based on customers' requirements. Placement of optional equipment for a specific aircraft is listed in Chapter 9 of this Manual.



1	Transverse and longitudinal control sidestick
2	Transverse and longitudinal trim control
3	Front rudder pedal adjustment control
4	Cabin heat control
5	Fuel valve
6	Wing flaps control
7	Cabin ventilation ball valve
8	Landing gear control
9	Emergency gear extension handle
10	Manual propeller pitch control (if adjustable propeller installed)
11	Throttle lever
12	Front rudder control pedals
13	Rescue system activation handle
14	Gear extension system electrical circuit breaker
15	Choke



1	Back rudder pedal adjustment control
2	Rescue system activation handle
3	Transverse and longitudinal control sidestick
4	Back instrument panel mounted a hinged canopy frame
5	Wing flaps control
6	Canopy opening handle
7	Cabin ventilation ball valve
8	Throttle lever
9	Manual propeller pitch control (if adjustable propeller installed)
10	Back rudder control pedals
11	Transverse and longitudinal trim control

8. GROUND HANDLING

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8.1 Ground Handling

CAUTION

Enter the aircraft individually. Loading the aircraft by two persons entering at once may result in unwanted tail tilting of the aircraft and its damage.

8.1.1 Ground Handling the Aircraft

The best way to maneuver the aircraft on the ground is by using the tow bar connected to the nose gear wheel. The tow bar serves for manipulation with an empty aircraft on the ground only. To push the aircraft, it is best to use the wing leading edges (backward movement of the aircraft)

CAUTION

The propeller manufacturers generally prohibit any manipulation with the aircraft by pushing or pulling on the propeller. For more information, please refer to the documentation of the installed propeller.

CAUTION

Pushing or leaning on the control surfaces is prohibited.

CAUTION

Towing the aircraft behind an automobile is prohibited.

8.1.2 Parking

Secure the aircraft against movement at all times when parked. In more severe weather conditions, or when leaving the aircraft for longer period, it is recommended to tie the aircraft down. Activate the parking brake (if installed). The recommended ground aircraft equipment consists of:
- Pitot-static tube protection (cover), located under left wing
- steering blocks (ailerons)
- tie-down set
- textile canopy covers
- textile propeller blade covers

8.1.3 Tie-down

In more severe weather conditions, or when leaving the aircraft for longer period, it is recommended to tie the aircraft down. The tying down is done using anchors and straps, anchoring the nose and main gear. Alternatively, three red tie-down loops, specially designated for this purpose can be used (if installed). If the tie-down loops are used, it is recommended to additionally anchor the aircraft's landing gear legs as well.

8.1.4 Refueling Procedure

Safety instructions for refueling

- It is prohibited to refuel during rain, storm, in closed space, with the electrical system on, or with the engine running.
- The person performing the refueling mustn't wear any clothes materials which could produce static electricity.
- Smoking, use of cellphones, static producing device operation, open flame or any electrical device manipulation is prohibited when refueling.

Refueling Procedure

- Ground the aircraft. The aircraft ground point is located on the engine exhaust pipe
- Open the fuel tank cap
- Fill the necessary quantity of fuel

CAUTION

When refueling the aircraft, avoid any contact of the fuel with the aircraft surface. Damage to the surface may occur.

- Remove the grounding wire between the filling device and the aircraft.
- Once the refueling has been completed, wipe fuel tank filler neck and close the fuel tank with a cap.

WARNING

Prior to refueling, ensure that the aircraft is correctly grounded using the conducting wire (the wire touches the ground), which is found on the left main gear leg. Also ensure that the fuel tank and the filling nozzle are properly grounded. The fuel tank grounding wire should be attached to the exhaust pipe. The exhaust system should be connected with the grounding system of the aircraft.

8.1.5 Checking the Oil Level in the Powerplant

NOTE

For information on which oil type is recommended for ROTAX engines, please refer to the ROTAX Operation Manual.
Do not use additives.

Oil capacity: **3,5 l**
Oil consumption: **max. 0,06 l/h**

Prior to checking the oil level in the powerplant, rotate the engine by manual turning of the propeller, or you can can check the oil level in engine that was just running and oil hasn't had time to flow into the engine block.

WARNING

Before manually cranking the propeller, ensure that both ignition switches are in the OFF position and that the engine has sufficiently cooled off (no chance for self-igniting). For safety reasons, always treat the propeller as if though the engine could start at any give time.

WARNING

NEVER turn the propeller in the opposite direction (clockwise facing the aircraft from the front). Permanent damage to the engine may occur due to oil pressure drop.

Open the access oil lid on the upper engine cowling. To check the oil, unscrew the cap of the oil reservoir, which is found on the engine firewall. Remove the dipstick to check the oil level. The flattened part at the end of the dipstick indicates the oil level range. The upper MAX part indicates the maximum oil level, the bottom MIN part indicates the minimum oil level. Ensure that the oil level remains within these two limits. **The oil level must never drop below the MIN minimum limit.**

8.1.6 Tire Pressure

The tire pressure can be checked without the need for specialized instruments or having to remove any parts.

Main gear wheels tire pressure	**2,5 bar (36 psi)**
Nose gear wheel tire pressure	**2,5 bar (36 psi)**

8.2 Cleaning and Taking Care of the Aircraft

8.2.1 Canopy

The canopy surface should be cleaned using an aircraft windshield cleaner and a micro-fiber cloth only. If the canopy is covered with dust, use clean water first to remove it. Unremoved dust grains may scratch the canopy surface.

CAUTION

Do not use glass cleaner, MEK, acetone, benzene, gasoline, antifreeze or any other products which may cause damage to the plastic materials.

8.2.2 Taking Care of the Interior

Regularly remove dust, dirt or any other particles from the aircraft interior, upholstery or carpets, using a vacuum cleaner. Use suitable products to care for the plastic cockpit parts. Leather interior components and leather upholstery should be cleaned and preserved using suitable products. Only cloths which do not produce static electricity can be used.

8.2.3 Taking Care of Engine

Regularly perform visual inspections of the engine. Ensure that there are no oil, fuel or coolant leaks. Look for any signs of defective seals or faulty connections in the hoses. Ensure that all electrical wires are properly fastened and that the wire protection is not worn out. Ensure that there are sufficient oil, brake fluid, retractable landing gear hydraulic liquid and coolant levels and that there are no leakages in these systems.

Clean the radiators with water, although **never with high water pressure** cleaner. Should any fault or discrepancy arise, consult a trained specialist prior to operating the engine again.

NOTE

For more information on recommended engine care, please refer to the ROTAX Engine Operation Manual.

8.2.4 Taking Care of Propeller

Carefully inspect the propeller for any signs of scratching or cracks. Clean the blades from bugs and any other dirt. When parking the aircraft, it is recommended to use the blade protection sleeves, which protect from the adverse effects of the environment.

NOTE

For more information on recommended propeller care, please refer to the documentation supplied by the Manufacturer of the propeller installed.

8.3 Aircraft Dismantling

WARNING

When servicing the aircraft, always ensure first that the rescue system is safeguarded against unwanted activation (if installed) and main switch with magnetos are in OFF positions.

NOTE

For further information, including the illustrated service procedures, please refer to the Stream Aircraft Maintenance Manual, which is freely available on the Manufacturer's website – www.tl-ultralight.com

8.3.1 Wing Removal

The wing removal will require 3 persons.

Prior to wing removal, prepare supports or mats for storing the half-wings and drain fuel from the wing tanks (if installed on the aircraft). Secure the aircraft against movement (blocks under wheels) and create sufficient space around the aircraft.

NOTE

For further information, including the illustrated procedure, please refer to the Stream Aircraft Maintenance Manual, which is freely available on the Manufacturer's website.

To remove the wing, take the following steps:

1) Extend the flaps to their maximum position.
2) Remove the flap slot covers from the bottom part of the wing trailing edge.
3) Disconnect the aileron control rods (transverse control) located underneath the flap slot covers.
4) Remove the oval shaped covers from the bottom skin of the fuselage center plane.
5) Remove the covers from the main landing gear bays to gain access to the inner pins of the main wing spar.
6) Remove the four metal plates that secure the inner pins of the main wing spar.
7) From the next step, it is necessary that another person supports the removed wing assembly.
8) Remove the hinge pin of the wing rear beam.
9) Remove (slide out) the inner pin of the main wing spar.
10) Remove (unscrew) the outer pin of the main wing spar.
11) Gently slide the half-wing slightly away from center plane. Do not remove the wing completely yet, but leave a gap between the fuselage and the wing root rib to disconnect the electrical and pitot-static systems. By sliding the wing away, the flap drive system should become disconnected.

12) Disconnect the pitot-static system polyethylene hoses (from the left wing-half only).
13) Disconnect the electrical circuit connectors.
14) Disconnect the fuel lines of the fuel tank ventilation.
15) Completely slide the wing-half with the cantilever spar out of the fuselage center plane and place the wing onto the prepared supports or mats.
16) Proceed in like manner when removing the other wing-half.

8.3.2 Horizontal Tail Surfaces Removal

The horizontal tail surfaces removal will require 3 persons.

Prior to horizontal tail surfaces removal, prepare supports or mats for proper storage of the dismantled parts. Secure the aircraft against movement (blocks under wheels) and create sufficient space around the aircraft.

To remove the horizontal tail surfaces, take the following steps:

1) Disconnect the elevators control rods.
2) Remove the back horizontal pin of the stabilizer hinge inside the fuselage together with its safety bolt.
3) Slide the stabilizer gently away from the pair of front pins by pulling backward. Do not slide the horizontal tail surface out completely yet, but leave gap to disconnect the trim tabs servomotor electrical cables.
4) Disconnect the servomotor electrical connector.
5) Now you can slide the horizontal tail surface completely out in backward direction and place onto prepared supports or mats.

8.4 Periodic Maintenance of the Aircraft

These capture shown inspection interval for aircraft. Not for engine and propeller.

Regularly and careful maintenance is a precondition for reliable and safe aircraft operation. Warranty inspection and inspections after 100,300 a 1000 hours are being written into aircraft book.

Inspection name	Flying hours - interval	Performs
Warranty inspection	- after first 25 hours	Manufacturer's service center (TL, D)
50 hours inspection	-every 50 ± 5 hour	Trained operator or manufacturer (O, T, I, TL, D)
100 hours inspection	a)every 100 ± 5 hours b)after 12 months from the last 100 hour inspection	Trained operator or manufacturer (T, I, TL, D)
300 hours inspection	- every 300 ± 5 hour	Manufacturer's service center (TL, D)
1000 hours inspection	a) every 1000 ± 10 hour b) 5 years from manufacture date c) 5 years from the last 1000 hour inspection d) According date, determined by the manufacture based on experience and assessment of the current state at the previous inspection.	Manufacturer's service center (TL, D)

8.4.1 The first service inspection after 25 hours

The first 25hr service inspection entails engine inspection, together with oil and filter replacement. This service inspection can only be performed by the Manufacturer, TL-ULTRALIGHT or by a Manufacturer approved service organization or entity (D).

8.4.2 Inspection after every 50 and 100 hours and the annual inspection

The inspection after every 50 hours of operation is connected with the inspection of engine and replacement of oil and filters, together with the inspection and lubrication of the mechanical parts of the aircraft. The inspection can be performed by the operator (O), a person with an aviation technical competency (T) or by an aviation technology inspector (I), upon obtaining training for performing the 50-hour inspection provided by the Manufacturer, TL-ULTRALIGHT (TL), or by the Manufacturer-approved service organization or entity (D).
The inspection can be performed by the Manufacturer, TL-ULTRALIGHT (TL), or by the Manufacturer-approved service organization or entity (D).

The inspection after every 100 hours of operation or the annual inspection are connected with the inspection of engine and replacement of oil and filters, together with the inspection and lubrication of other parts of the aircraft. The inspection can be performed by a person with an aviation technical competency (T), or by an aviation technology inspector (I), upon obtaining training for performing the 100-hour inspection provided by the Manufacturer, TL-ULTRALIGHT (TL), or by the Manufacturer-approved service organization or entity (D). The inspection can be performed by the Manufacturer, TL-ULTRALIGHT (TL), or by the Manufacturer-approved service organization or entity (D).

The maintenance procedure is as follows:

- Condition inspection checklist
- Aircraft Records checklist
- Run-up checklist
- Post-Run-up checklist
- Propulsion System checklist
- Fuselage checklist
- Wings checklist
- Empennage checklist
- Landing Gear checklist
- Cabin and Baggage Compartment checklist
- Inspection Completion checklist

For making checks every 50 hours, 100 hours and annual checks were created following checklist with clear distribution. It is possible to print these pages of the handbook as a paper for making record of the inspection (documentation of the inspection).

Condition inspection checklist:

Aircraft Model / Serial Number	STREAM /
Registration Number	OK -
Owner´s Name	
Inspector´s Name	
Date of Inspection	
Engine Model / Serial Number	/
Airframe Hours	
Engine Hours	

Condition inspection checklist

Inspection Item	50 hour	100 hour	Annual
Aircraft logbooks. Determine total times, times since overhaul and time since last required or recommended maintenance and record on Inspection Coversheet	☐	☐	☐
Safety Directives (SD´s), Airworthiness Directives (AD´s) and Service Bulletins. Check SD´s, AD´s, and Service Bulletins which may need to be complied within the inspection.			☐
Aircraft records. Check for presence and condition of aircraft federal registration form and airworthiness certificate.			☐
Pilot´s Operating Handbook (POH). Make sure that the last revisions of POH, the Equipment List and Weight and Balance forms are in use.			☐

Run-up checklist:

Type of Inspection	50 hour 100 hour Annual	
ELT battery due (if applicable)**:**		
Altimeter/Transponder test due (if applicable)**:**		
Strobe lights test due (if applicable)**:**		
Systems	**Pre - inspection**	**Post - inspection**
Starter	☐	☐
Oil pressure (PSI)	☐	☐
Brakes	☐	☐
Instrument and Avionics	☐	☐
Navigation and position lights test (if applicable)	☐	☐
Cabin light test (if applicable)	☐	☐
Ignition ground test (See Chapter of the Operator´s Manual for all versions of ROTAX)	☐	☐
Oil temperature (°C)	☐	☐

WARNING **Ensure cylinder heads temperature and oil temperature are within limits.**		
Cabin heat (if installed)	☐	☐
Idle RPM	☐	☐
WARNING **Allow engine to cool to 150 ° C (Cylinder heads temperature) before shutdown.**		
All exterior lights are off	☐	☐
Check for fuel odors in cabin	☐	☐
Check fuel valve off function	☐	☐

Post – Run - up checklist

Inspection Item	50 hour	100 hour	Annual
Flight controls. Check for smooth operation of all flight controls with flaps in retracted and extended positions. Check controls within entire range for binding, play, and unusual sounds.	☐	☐	☐
Wash clean and vacuum the aircraft. See Washing and Cleaning chapter 8.2.	☐	☐	☐
Aircraft exterior. Examine the entire aircraft exterior surface for damage, deformation or abrasion.	☐	☐	☐
Access panels, covers, and spinner. Remove for inspection to ensure access. Check for missing or unscrewed bolts and nuts.	☐	☐	☐

Propulsion system checklist

Inspection Item	50 hour	100 hour	Annual
Engine cowlings. Remove and check engine cowlings for signs of heat damage, leaks or cracks.	☐	☐	☐

Engine Compartment. Check all engine compartment components and engine mount for chafing, loose connections, wear, fluid or exhaust leaks.	☐	☐	☐
Cleaning. Clean the engine as required in the Maintenance Manual for ROTAX Engine Type 912 Series.	☐	☐	☐
Engine. Inspect all systems as required in the Maintenance Manual for ROTAX Engine Type 912 Series.	☐	☐	☐
Oil cooler. Check oil cooler and radiator for damage or debris.	☐	☐	☐
Cowling ducts. Check cowling ducts for blockage	☐	☐	☐
Engine oil. Check the level of oil and follow the Operator´s Manual for all versions of ROTAX 912.	☐	☐	☐
Induction system. Check connection of manifold between Air filter box and carburetors. Check for fuel leakage nearby carburetors.		☐	☐
Induction air filter. Inspect for cleanliness and condition of sealing surfaces. Replace filter, if damaged.		☐	☐
Fuel installation. Inspect the fuel installation, hoses, pumps, connections, and supports. Inspect and clean the fuel filters in the engine area.	☐	☐	☐
Cabin heater. Check clamps and heater attachments. Check the manifold for holes and attachments.			☐
Retractable undercarriage hydraulic system. Inspect the hydraulic installation, aggregates, hoses, pumps, connections, and supports. Inspect fluid level. Service, if necessary. Change hydraulic system fluid after every 2 years.	☐	☐	☐
Engine mount. Inspect for cracks, corrosion, loose hardware, chafing by cables, wires, hoses, etc., and make sure that any flexing item is secured to the engine mount.		☐	☐
Engine mount bolts. Inspect and check engine mount bolts.		☐	☐
Exhaust system. Check the exhaust springs, the pipe system and its attachment for leaks, cracks on the exhaust pipe and welds.		☐	☐

Battery attachment. Inspect for security of mounting and condition. Ensure vent holes are clear.	☐	☐	☐
Throttle and choke controls. Check operation of throttle and choke controls.		☐	☐
Spinner. Inspect for cracks, security to propeller. Clean inside of spinner.			☐
Propeller hub. Inspect for cracks, corrosion. Re-torque all mounting bolts, if loos of torque is suspected on any bolt.			☐
Propeller blades. Inspect for play, dents, nicks, craks, corrosion, pitting, and leading odge erosion.	☐	☐	☐
Propeller. Check required inspection items detailed in the technical and operational documents of the propeller manufacturer		☐	☐
Foreign Objects. Check engine compartment for foreign objects.	☐	☐	☐

Fuselage checklist:

Inspection Item	50 hour	100 hour	Annual
Skin surface. Inspect for obvious latent signs of damage, including cracks, holes, buckling. Check drain holes for obstructions. Check condition of paint and cleanliness.	☐	☐	☐
Placards. Inspect for presence and condition.	☐	☐	☐
Canopy. Clean Inspect for cleanliness, cracks, condition, and bonding. Check vent operating. Inspect for operating and fit. Inspect hinges, gas strut, latching mechanisms. Lubricate latching pins.			☐
Fuel leaks. Inspect the outer skin tank areas for evidence of fuel stains	☐	☐	☐
Static Port. Check static port for evidence of obstructions. Do not apply compressed air to the system, since this will result in damage to the static air flight instruments.		☐	☐
Antennas. Inspect for security and condition.			☐
Aircraft identification tag. Inspect for security and legibility.			☐

Wings checklist:

Inspection Item	50 hour	100 hour	Annual
Wings. Remove wings.		200 hours interval ☐	☐
Main spar pins. Inspect for cracks, corrosion and condition.		200 hours interval ☐	☐
Aileron and flaps control system access. Retract flap on maximum deflection and remove the bottom cover on wing under the flaps for aileron and flaps control system inspection.		200 hours interval ☐	☐
Wing interior. Inspect wing spars, ribs and control system attachment of the wing for signs of cracks or bond failure. Inspect visible areas of ribs and other structures.		200 hours interval ☐	☐
Wing skins. Inspect for obvious signs of damage, including cracks, holes, and buckling. Check condition of paint and placards. Check drain holes for obstructions.	☐	☐	☐
Aileron hinges. Inspect for security of attachment to wing. Inspect bearing for condition. Lubricate the hinges bearing	☐	☐	☐
Flaps hinges. Inspect for security of rails attachment to wing. Inspect rails, rollers, bearing and whole flaps mechanism for condition. Check condition of rod end attachment. Lubricate the rollers and rails.	☐	☐	☐
Ailerons. Inspect skins for damage, looseness, or play in attach bearings. Check for obstruction of drain holes.	☐	☐	☐
Flaps. Inspect skins for condition and signs of bond failure. Check hinges for play and attachment to flap. Check for obstruction of drain holes.	☐	☐	☐
Wings. Assembly wings		200 hours interval ☐	☐

Flap actuator. Assembly wings (if necessary) and run flaps up and down to check for smooth operation.	☐	☐	☐
Flap deflection. Ensure that flaps extend equally on each side of the airplane in all configurations. Measure the down deflection on each side. The difference in static deflection should not be greater than 1/8 ″ (3 mm). Inspect stop switches for operating.		200 hours interval ☐	☐
Flight controls. Inspect all push-pull rods, rod end bearings for condition, play, security of attachment and lubricate.		200 hours interval ☐	☐
Aileron trim tab. Run trim tab on the right aileron up and down to check for smooth operation. Inspect trim tab push-pull lever, rod end bearings for condition, play and security.	☐	☐	☐
Pitot tube. Check condition and pitot tube attachment. Check cleanness of air inlet holes of pitot tube.		☐	☐

Empenage checklist and aileron deflection:

Předmět prohlídky	50 hod	100 hod	Roční
Rudder. Visually check surface condition delaminating, deformation, or cracks. Check suspension and security of the rudder upper/lower hinges. Check attachment and security of rudder cables and push-pull rod. Check attachment of rudder bell crank to rudder torque tube. Check for obstruction of drain holes. Check for continuity, full and free travel.	☐	☐	☐
Rudder angles of deflection. Verify rudder angles of deflection.(more in maintenance manual document)		☐	☐
Rudder lubrication. Lubricate upper rudder hinge according the lubrication plan.		☐	☐
Horizontal Stabilizer and Elevator. Inspect for visible damage and evidence of latent damage. Inspect looseness or play in hinges. Check for obstruction of drain holes. Check suspension and free travel of the elevator.	☐	☐	☐
Elevator angles of deflection. Verify elevator angles of deflection. .(more in maintenance		☐	☐

manual document)			

Elevator lubrication. Lubricate elevator hinges according the lubrication plan.		☐	☐
Horizontal Stabilizer. Remove horizontal stabilizer. Check for surface corrosion and cracks main and rear horizontal stabilizer hinge housings and pins. Inspect for corrosion, cracks, damage and looseness elevator driver and elevator driver rivets attachments. Lubricate horizontal stabilizer hinges. Re-install horizontal stabilizer.		200 hod interval ☐	
Trim tab. Check trim tab operation, condition and hinge. Lubricate hinges according lubricate plan.		☐	☐
Ailerons angles of deflection. Verify ailerons angles of deflection. Check for continuity, full and free travel.		☐	☐
Flight controls. Inspect all push-pull rods, cable, rudder and trim tab control cables, rod end bearings and bell cranks for condition, play, security of attachment and lubricate.		☐	☐

Landing Gear

Inspection Item	50 hour	100 hour	Annual
Visual inspection. Inspect from top to bottom for scratches, cracks, corrosion, signs of overstress and side-loading.	☐	☐	☐
Wheels. Inspect for cracks and corrosion. Check all hardware for signs of loss of torque. Check wheel for free rotation. Inspect tires for splitting, flat spots, wear, and dry-rotting. Check tire pressure, and service as necessary.	☐	☐	☐
Wheel bearings. Inspect for damage, wear, and corrosion. Check bearing for play, binding and bearing protection plate for condition. Replace bearings if necessary.		☐	☐
Nose landing gear. Lift up the nose gear and check rotation of the nose gear. Lubricate bearings.		☐	☐
Hydraulic brake lines. Inspect brake lines. Check for security and evidence of chafing. Check for leaks.	☐	☐	☐

Brake calipers, brake pads and brake discs. Clean and inspect for condition, fluid leakage, for cracks and corrosion, security of components. Inspect brake discs for pitting and signs of overheating. Inspect all hardware for signs of loss of torque. Do not lubricate.		☐	☐
Brake fluid reservoir. Inspect for condition, security, and fluid level. Service, if necessary.	☐	☐	☐
Undercarriage retraction mechanism. Inspect for damage, wear, and corrosion. Check hydraulic lines and cylinders for leaks.	☐	☐	☐
Wheel bay covers. Check condition and wheel bay covers attachment (if installed)	☐	☐	☐
Main undercarriage shock absorber. Inspect for damage, wear, and corrosion. Replace the polyurethane cylinder blocks if they are worn or deformed.	☐	☐	☐

Cabin and Baggage Compartments

Inspection Item	50 hour	100 hour	Annual
Seats inspection. Inspect seat structure for general condition and cracks. Inspect cushions and upholstery for condition.			☐
Fire extinguisher. Remove fire extinguisher (if applicable) and inspect.			☐
Safety belts. Inspect belts for wear, cuts, and broken stitching. Check all buckles for proper locking and release. Check belt attachments to structure.			☐
Avionics and instruments. Check general condition, attachment, and function of the instrument panel, instruments, switches and circuit breakers.			☐
Magnetics compass. Inspect compass correction card for presence and legibility of all headings. Magnetic tools must not be used during this procedure.			☐
Fuel valve. Inspect for operating and signs of fuel leakage.		☐	☐
Starting carb, fuel pump and ventilation. Check function and condition.			☐

Placards. Inspect for presence and condition of all required interior placards.			☐
Rudder pedals. Inspect for security, cracks, and play. Lubricate		☐	☐
Parking brake. Inspect for security of mounting and signs of leakage.			☐
Upholstery. Inspect for general condition, attachment, and cleanliness.			☐
Baggage compartments. Inspect compartment for cleanliness and condition.			☐
Aircraft Parachute system. Check the condition of the chute handles and safety pins for proper fit. Check for proper clearance and freedom from binding of the chute pull (activation) cable. Check the parachute system in accordance with the manufacturer inspection schedule.			☐

Inspection Completion:

Inspection Item	50 hod	100 hod	Roční
Fuselage and wings. Make sure aircraft is free of any tools, parts, and debris, and reinstall all access panels, fairings, seats, and so on, removed for the inspection.	☐	☐	☐
Engine. Verify that there is oil in the oil tank, cooling liquid in the expansion tank and coolant level in overflow bottle take place between min. and max. mark as required by the Operator´s Manual for all versions of ROTAX 912, and engine compartment is free of tools, rags, and debris.	☐	☐	☐
Engine run. Run engine for no more than two minutes at 1400 to 1800. After shutdown, check for leaks at oil filter, and any other components removed during this inspection. Install cowlings, if no leaks are noted.	☐	☐	☐
Aircraft. Operate engine at 2000 to 2500 RPM to warm it up. Operate all aircraft systems to verify proper operation. As engine warms, operate engine systems at appropriate engine speeds and complete all checks listed on Inspection Coversheet.	☐	☐	☐
Aircraft records. Complete entries in logbooks, AD and SD compliance lists, and any other required records.	☐	☐	☐

8.4.3 Inspection after every 300 hours

The inspection after every 300 hours of operation is connected with a complete inspection of the engine, as well as of other parts of the aircraft. This inspection can only be performed by the Manufacturer, TL-ULTRALIGHT (TL), or by the Manufacturer-approved service organization or entity (D).

8.4.4 Periodical engine inspection

Follow manual operating and maintenance manual issued by engine manufacturer

8.4.5 Periodical propeller inspection

Follow manual operating and maintenance manual issued by propeller manufacturer

8.5 Tolerances and adjustment the control surfaces

The following table mentioned deflection on control surfaces included their tolerances.

	Deflection	Tolerances
Elevator	up 22,5° down 17,5°	± 1,5°
Rudder	± 30°	± 1°
Ailerons	up 14° down 8°	± 1,5°
Flaps	Také-off 53 mm landing 168 mm	± 5 mm Difference between left and right flaps = max. 3 mm

8.6 Modifications, major repairs and overhauls

WARNING

Any modifications, major repairs and overhauls can only be performed by the Manufacturer, TL-ULTRALIGHT (TL), or by an organization or entity, subject to written Manufacturer consent, issued for the individual modification, major repair or overhaul.

8.7 List of limited lifetime components:

Type of component	Component	Components marking	Airplane variant	Replacement
Filters	Air filter	ROTAX 825 551	all variants	after every 300 hours
		ROTAX 825 711	all variants	after every 300 hours
		KN Filters R - 1060	all variants	after every 300 hours
	Fuel filter	Gascolator ACS 10580	all variants	on condition
	Oil filter	ROTAX 825012	all variants	after every 100 hours
Hoses	Fuel system hoses	FUB 386 5/11 FUB 386 6/12 FUB 386 8/14	all variants	after every 5 years
	Engine cooling system hoses	Rubena 402529	all variants	after every 5 years
	Oil hoses	ROTAX 956 390	all variants	after every 5 years
	Undercarriage hydraulic system hoses	DIN EN 853 2SN DN6 WP 400 BAR	all variants	after every 5 years
Rubber parts	Engine mount rubber blocks	Rubena 40757 / 042757	all variants	každých 5 let
	Carb. bracket rubber blocks	Rubena 40795	all variants	každých 5 let
	Ignition rubber block	ROTAX	all variants	každých 5 let

Rubber parts	Tire – main wheel	size 14 x 4	all variants	on condition
	Tire – front wheel	size 11 x 4	all variants	on condition
Metal parts	Brake disc	14 x 4 wheel brake disc	all variants	on condition
	Brake pads	14 x 4 wheel brake pads	all variants	on condition
	Metal plates under the engine	STREAM-71-20-002-000-L/P	all variants	after every 300 hours
Engine parts	Ignition sparks	see the current Operator´s Manual for all version of ROTAX 900 series		
Fluids	Oil	see the current Operator´s Manual for all version of ROTAX 900 series		
	Cooling fluid	see the current Operator´s Manual for all version of ROTAX 900 series		
	Braking fluid	DOT 5	Braking fluid	DOT 5
	Undercarriage hydraulic system fluid	ISO VG 32 (PARAMO OT-HP3)	Undercarriage hydraulic system fluid	ISO VG 32 (PARAMO OT-HP3)

CAUTION

For current and complete information regarding list of disposable replacement engine and propeller parts, please see the Maintenance Manual for ROTAX Engine Type 900 Series, the Manual for Propeller and Rescue system supplied with the aircraft.

9. SUPPLEMENTS

TABLE OF CONTENTS

9.1 Required placards & markings

This section contains a list of both placards and markings located inside the cockpit and on the exterior of the aircraft. These placards and markings provide guidance, instruction, or warning. **It is the responsibility of the owner/pilot to understand and comply with the directions of both the placards and markings.**

9.2 Placards

Attached to the safety pin on the parachute system activation handle:

On the instrument panel in pilot's field of vision:

On the canopy:

TL-ULTRALIGHT

Evidenční štítek				
Poznávací značka	OK-	Prázdná hmotnost		kg
Výrobce	TL-ULTRALIGHT s.r.o.	Max. vzlet. hmotnost	600	kg
Typ	Stream			
Výrobní číslo				
Rok výroby				
Model	Stream			

Provozní údaje a omezení			
Poznávací značka	OK-		Tento výrobek nepodléhá schvalování Úřadu pro civilní letectví ČR a je provozován na vlastní nebezpečí uživatele. Úmyslné vývrtky, pády a akrobacie jsou zakázány.
Prázdná hmotnost		kg	
Max. vzlet. hmotnost	600	kg	
Max. užitеč. zatížení		kg	
Max. hmot. zavazadel	10+15	kg	
Min hmot. pilota	60	kg	
Max. příp. rychl. VNE	342	Km/h	
Pádová rychlost v přistávací konfiguraci VSO	85	Km/h	
Max. přípustná rychlost se vztlak. klapkami VFE	140	Km/h	

Max. hmotnost posádky (kg) v závislosti na palivu a zavazadlech					
Plnění nádrží / údaj palivoměru	plné	3/4	1/2	1/4	30 min. letu
Plnění nádrží / množství paliva v litrech	92	69	46	23	7,0
Hmotnost zavazadel 25 kg					
Hmotnost zavazadel 12,5 kg					
Bez zavazadel					

Maximum load weight in front luggage compartment:

Maximum load weight in back luggage compartment:

Max. load in the rear luggage compartment limitation according the weight configuration:

MAX. LOAD IN THE REAR LUGGAGE COMPARTMENT ACCORDING THE WEIGHT CONFIGURATION

WEIGHT OF PILOT ON THE FRONT SEAT	WEIGHT OF PILOT ON THE REAR SEAT	MAX. WEIGHT OF LUGGAGE IN COMPARTMENT
60 - 100 kg	90 - 100 kg	0 kg
100 kg	80 - 90 kg	5 kg
	70 - 80 kg	10 kg
	60 - 70 kg	15 kg
60 - 100 kg	0 kg	15 kg

Max. load in the front luggage compartment limitation according the weight configuration:

MAX. LOAD IN THE FRONT LUGGAGE COMPARTMENT ACCORDING THE WEIGHT CONFIGURATION

WEIGHT OF PILOT ON THE FRONT SEAT	WEIGHT OF PILOT ON THE REAR SEAT	MAX. WEIGHT OF LUGGAGE IN COMPARTMENT
60 - 90 kg	0 kg	0 kg
90 - 100 kg		5 kg
100 kg	60 - 100 kg	10 kg

Marking of a 12V socket (if installed):

9.3 External markings:

Around the main fuel tank cap on fuselage:

Around main fuel tank vent tube (wing tip area):

Around drain valves on the bottom side of fuselage:

Around areas, where static pressure is collected, in the back part of fuselage:

Marking on control surfaces (ailerons, flaps, elevator, rudder):

NO PUSH

Marking on the trim:

NO LIFT

Nose gear wheel tire pressure:

2,5 bar 36 PSI

Main gear wheels tire pressure:

2,5 bar 36 PSI

On the safety parachute system cover and on the vertical tail surface: