FLIGHT MANUAL

WT9 Dynamic LSA

Type:	**WT9 Dynamic LSA**
Model:	**Club LT**
Airplane Serial Number:	**DY-448/2012 LSA**
Airplane Registration Number:	**OH-DLI**
Publication Number:	**0**
Date of Issue:	**16.07.2012**

Signature:	
Authority:	
Stamp:	
Original date of approval:	

This airplane has to be operated in compliance with information and limitations contained herein.

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0.1 RECORD OF MANUAL REVISION

Any revision of the present manual, except actual weight data, must be recorded in the following table and in case of approved sections endorsed by the responsible airworthiness authority.

The new or amended text in the revised pages will be indicated by a black vertical line in the right hand margin, and the Revision No. and the date will be shown on the bottom left side of the page.

Rev. No.	Affected Section	Affected Pages	Date of issue	Approval	Date	Date inserted	Signature
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0.3 TABLE OF CONTENTS

1. GENERAL INFORMATION

1.1. Introduction

The airplane Flight Manual has been prepared to provide pilots and instructors with information for the safe and efficient operation of this airplane. This manual contains supplementary data supplied by the airplane manufacturer.

1.2. Certification basis

CS-LSA Certification Specification for Light Sport Aeroplanes.

1.3. Warnings, cautions and notes

The following definitions apply to warnings, cautions and notes used in the flight manual.

WARNING

Means that the non-observation of the corresponding procedure leads to an immediate or important degradation of the flight safety!

CAUTION

Means that the non-observation of the corresponding procedure leads to a minor or to a more or less long term degradation of the flight safety!

NOTE

Draws the attention to any special item, not directly related to safety but which is important or unusual!

1.4. Descriptive data

1.4.1. Airplane description

WT9 Dynamic LSA Club LT is low-wing monoplane with fixed undercarriage. The airframe consists of a sandwich shells from advanced composite material. There are two places in the cockpit, side by side type. Airplane is equipped with towing hook. This aircraft is intended for sporting, recreation, glider towing and tourist flying in accordance with VFR day.

Powerplant of the aircraft is the 4 cylinder, 4-stroke engine ROTAX 912 ULS with a maximum takeoff RPM limitation 5800 min^{-1}.

This plane is fitted with a 3 bladed in flight electrically adjustable propeller and the following type and model is approved: WOODCOMP SR2000D with diameter 1700 mm.

1.4.2. Technical data

Airplane	
Wing area	10,30 m^2
Wing span	9,00 m
Length	6,40 m
Height	2,00 m
Wing aspect ratio	7,82
Aerodynamic mean chord (MAC)	1,185 m

Control surfaces	
Aileron area	0,273 m^2
Aileron span	1,25 m
Flap area	0,75 m^2
Flap span	2,28 m
Horizontal tail area	1,68 m^2
Horizontal tail span	2,40 m
Vertical tail area	1,02 m^2
Vertical tail span	1,022 m

Landing gear	
Wheel spacing	1,49 m
Wheel base	2,27 m
Nose wheel diameter	0,32 m
Main wheel diameter	0,35 m

Weights	
Empty weight	316,0 kg
Maximum takeoff weight	600 kg
Useful load	284,0 kg
Fuel tank capacity	126 l

1.5. Airplane views

1.5.1. Three view drawing

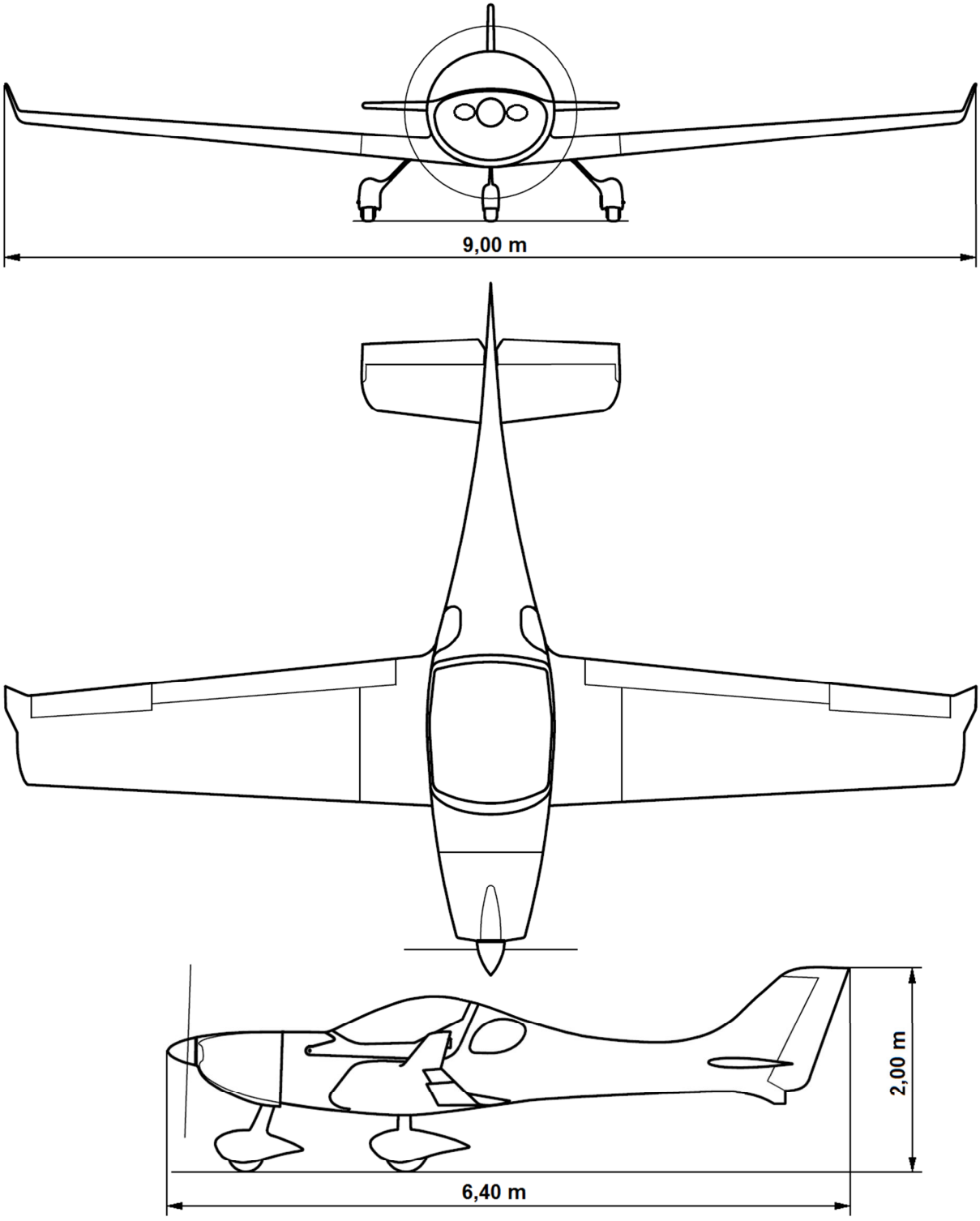


Fig. 1 Three view drawing

2. LIMITATIONS

2.1. Introduction

Section 2 includes operating limitations, instrument markings, and basic placards necessary for safe operation of the airplane, its engine, standard systems and standard equipment.

2.2. Airspeeds

Airspeed limitations and their operational significance are shown below:

Speed		IAS			Remarks
		km/h	mph	knots	
V_{NE}	Never Exceed speed	**280**	**174**	**151**	Do not exceed this speed in any operation.
V_{NO}	Normal Operating Limit speed	**250**	**155**	**135**	Do not exceed this speed except in smooth air, and then only with caution.
V_{RA}	Rough Air speed	**225**	**140**	**121**	Do not exceed this speed except in smooth air. Air movements in lee-wave rotors, thunderclouds, visible whirlwind, or over mountain crests are to be understood as rough air.
V_A	Manoeuvring speed	**180**	**112**	**97**	Do not make full or abrupt control movement above this speed, because under certain conditions the aircraft may be overstressed by full control movement.
V_{FE}	Maximum Flap Extended speed	**140**	**87**	**76**	Do not exceed these speeds with the given flap setting.

2.3. Airspeed indicator markings

Airspeed indicator markings and their colour code significance are shown below:

Colour code significance	Speed or speed range (IAS)			Significance
	km/h	mph	knots	
White arc	76 - 140	47 - 87	41 - 76	Operating range with extended flaps. (Lower limit is v_{S0}. Upper limit is v_{FE}.)
Green arc	89 - 225	55 - 140	48 - 121	Normal operating range. (Lower limit is v_S. Upper limit is v_C.)
Yellow arc	225 - 280	140 - 174	121 - 151	Manoeuvres must be conducted with caution. (Lower limit is v_C. Upper limit is v_{NE}.)
Yellow triangle	112	70	60	Minimum approach speed.
Yellow line	180	112	97	Manoeuvring speed v_A.
Red line	280	174	151	Never exceeded speed v_{NE}.

2.4. Powerplant

Engine		
Engine manufacturer	-	ROTAX Bombardier, Gunskirchen, Austria
Engine model	-	ROTAX 912 ULS
Maximum power	Takeoff *(max. 5 min.)*	73,5 kW / 100 hp
	Continuous	69,0 kW / 94 hp
Maximum RPM	Takeoff *(max. 5 min.)*	5800 min^{-1}
	Continuous	5500 min^{-1}
Cylinder head temperature	Maximum	135 °C
Oil temperature	Maximum	130 °C
	Minimum	50 °C
Oil pressure	Maximum	7 bar / 102 psi
	Minimum	0,8 bar / 12 psi
Oil consumption	Maximum	0,06 l/h
Fuel pressure	Maximum	Airbox pressure + 0,40 bar / 5,80 psi
	Normal	Airbox pressure + 0,25 bar / 3,63 psi
	Minimum	Airbox pressure + 0,15 bar / 2,18 psi

Oil grade:

Motorcycle oil of a registered brand with gear additives. Use only oil with API classification „SG“ or higher! If using aircraft engine oil, then only blended one. Due to the high stresses in the reduction gears, oils with gear additives such as high performance engine cycle oils are required. Heavy duty 4-stroke engine cycle oils meet all the requirements. These oils are normally not mineral oils but semi or fully synthetic oils.

WARNING

Never use AVGAS, LB 95 with fully synthetic engine oils!

Fuel grade:

Following types of fuels can be used:

- Min. RON 95 EN 228 Super (Unleaded Automotive Gasoline RON 95)
- EN 228 Super Plus (Unleaded Automotive Gasoline RON 98)
- AVGAS 100 LL (Due to higher lead content in AVGAS, the wear of the valve seats, depositing in combustion chamber and lead sediments in the lubrication system will increase. Therefore use AVGAS only if you encounter problems with vapour lock or if the other fuel types are not available.)
- Fuel E10 (Unleaded gasoline blended with 10% ethanol)

Propeller	
Propeller manufacturer	WOODCOMP spol. s r. o., Odolená Voda, Czech republic
Propeller model	SR2000D, 3-bladed in flight electrically adjustable
Propeller diameter	1700 mm

Additional data can be found in Section 7.9, or in the Operator’s Manual for engine and in the User’s Guide for propeller.

WARNING

Never run the engine without propeller! This inevitably causes engine damage and is an explosion hazard!

2.5. Powerplant instrument markings

According to customer requirement round one–purpose needle instruments can be mounted. Powerplant analogue instrument markings and their colour code significance are shown in table below:

Analogue powerplant instruments are not installed.

2.6. Miscellaneous instrument markings

According to option of the customer miscellaneous instrument can be mounted. Powerplant digital instrument markings and their colour code significance are shown table below:

Digital instrument (Dynon SV-D1000)	Unit	Red Line Minimum Limit	Green Arc Normal Operating	Yellow Arc Caution Range	Red Line Maximum Limit
Tachometer	**RPM**	1400	1400 - 5500	5500 - 5800	5800
Manifold pressure	**inHg**	-	0,0 - 28,0	28,0 - 29,5	29,5
Cylinder head temperature	**°C**	50	90 – 110	50 – 90 110 – 135	135
Oil temperature	**°C**	50	90 - 110	50 - 90 110 - 130	130
Oil pressure	**bar**	0,8	2,0 - 5,0	0,8 - 2,0 5,0 - 7,0	7,0
Exhaust gas temperature	**°C**	250	300-800	250-300 800-880	880
Fuel pressure	**bar**	0,15	0,20 - 0,35	0,15 - 0,20 0,35 - 0,40	0,40
Fuel flow meter	**l/h**	-	0,0 - 25,0	-	over 25,0
Fuel level	**l**	Red light annunciator will be illuminated with the remaining 7 litres of fuel in the fuel tank.			

2.7. Weight

Weights	
Empty weight	316,0 kg
Maximum takeoff weight	600 kg
Maximum landing weight	600 kg
Useful load	284,0 kg
Maximum fuel weight	90,7 kg
Maximum occupant weight per seat	120,0 kg
Minimum weight solo pilot (with 40 kg of baggage)	54,0 kg
Minimum weight solo pilot (without baggage)	72,2 kg
Maximum weight in baggage compartment	40 kg

WARNING

Maximum takeoff weight is 600 kg!

2.8. Centre of gravity

CG positions	
Empty airplane CG position	12 ± 2% MAC
Position of CG in flight	20 ÷ 30% MAC

Rear centre of gravity limit is valid for en-route weight at maximum crew weight and minimum fuel amount. Forward centre of gravity limit is valid for minimum pilot weight and maximum capacity of the fuel tanks. Example to check the centre of gravity position is in Sect. 6.

WARNING

A flight shall not be commenced until the pilot-in-command is satisfied that the mass of the airplane and centre of gravity location are such that the flight can be conducted safely!

2.9. Approved manoeuvres

Manoeuvre	Appropriate entry speed (IAS)		
	km/h	mph	knots
Steep turns with the angle of bank up to 60°	145	90	78
Lazy eights	145	90	78

WARNING

Aerobatic manoeuvres and intentional spins are prohibited!

2.10. Manoeuvring load factors

Speed		IAS			Load factor
		km/h	mph	knots	
V_A	Manoeuvring speed	180	112	97	+4
V_{NE}	Never exceed speed	280	174	151	+4
V_A	Manoeuvring speed	180	112	97	-2
V_{NE}	Never exceed speed	280	174	151	-2
V_{FE}	Maximum Flap Extended speed	140	87	76	+2

2.11. Flight crew

The minimum flight crew with which the airplane is allowed to fly is one pilot sitting in the left pilot seat. The passenger or another pilot may occupy the right seat in the cockpit.

2.12. Kind of operation

The aircraft WT9 Dynamic LSA Club LT is approved to perform flights in accordance with VFR day only. Aerobatic manoeuvres and intentional spins are prohibited!

WARNING

IFR flights and flights in icing conditions are prohibited!

For flight operations the following minimum equipment must be installed:

- Magnetic compass
- Sensitive barometric altimeter
- Airspeed indicator
- Pilot's safety belts

2.13. Fuel

The fuels that can be used for the aircraft WT9 Dynamic LSA Club LT operation are listed in Section 2.4 Powerplant and in the Operator's Manual for engine ROTAX 912 ULS. Fuel tank's capacities are in table below:

	Left tank (l)	Right tank (l)
Total quantity of fuel in the tank	63,0	63,0
Unusable fuel quantity in the tank	2,9	2,9
Total usable quantity of fuel in the tank	60,1	60,1

2.14. Maximum passenger seating

The maximum number of passenger aboard is one passenger sitting in the right seat in the cockpit.

2.15. Other limitations

(a) Wind speed

The maximum demonstrated crosswind velocity for takeoff and landing is 12,4 m/s (24 knots).

(b) Smoking

No smoking on board the aircraft.

(c) Glider towing

Maximum towing cable load is 3000 N. If the strength of tow cable is more than 3000 N a weak link must be used. Maximum weight of glider to be towed is 750 kg. Maximum crew of towing airplane is only a pilot.

2.16. Limitations placards

Airspeed IAS		
Never Exceed speed	**V_{NE}**	**151 knots**
Normal Operating Limit speed	**V_{NO}**	**135 knots**
Rough Air speed	**V_{RA}**	**121 knots**
Manoeuvring speed	**V_A**	**97 knots**
Maximum Flap Extended speed	**V_{FE}**	**76 knots**

Aerobatic manoeuvres and intentional spins are prohibited!

IFR flights and flights in icing conditions are prohibited!

Maximum allowed filling of the fuel tanks in litres												
Baggage weight (kg)	**Crew weight (kg)**											
	100	**110**	**120**	**130**	**140**	**150**	**160**	**170**	**180**	**190**	**200**	**210**
0	**Full**	**Full**	**Full**	**Full**	**Full**	**Full**	**Full**	**Full**	**Full**	**Full**	**116**	**102**
20	**Full**	**Full**	**Full**	**Full**	**Full**	**Full**	**Full**	**Full**	**116**	**102**	**88**	**75**
40	**Full**	**Full**	**Full**	**Full**	**Full**	**Full**	**116**	**102**	**88**	**75**	**61**	**47**

Maximum baggage weight 40 kg!

3. EMERGENCY PROCEDURES

Section **Page**

3.1. Introduction

Section 3 provides checklist and amplified procedures for coping with emergencies that may occur. Emergencies caused by airplane or engine malfunction are extremely rare if proper pre-flight inspections and maintenance are practised.

However, should an emergency arise, the basic guidelines described in this section should be considered and applied as necessary to correct the problem.

3.2. Engine failure

3.2.1. Engine failure at takeoff roll

1. Throttle lever:	Set to idle position.
2. Ignition:	Both circuits switched OFF.
3. Brakes:	Apply until stop.

3.2.2. Engine failure at takeoff up to height 164 ft

1. Sufficient runway:	Complete a normal landing without engine power.
2. Insufficient runway:	Perform emergency landing according to procedure 3.6.1.

3.2.3. Engine failure at takeoff above height 164 ft

A. Sufficient altitude

1. Air start:	Start the engine according to procedure 3.3.
2. Unsuccessful start:	Perform emergency landing according to procedure 3.6.1.

B. Insufficient altitude

1. Insufficient altitude:	Perform emergency landing according to procedure 3.6.1.

3.2.4. Engine failure in flight

1. Air start:	Start the engine according to procedure 3.3.
2. Unsuccessful start:	Perform emergency landing according to procedure 3.6.1.

3.2.5. Performance loss due to irregular running of the engine during flight

This situation may occur with carburettor icing: Apply carburettor pre-heating as required to restore normal power, smooth running.

Or it can happen due to emptying of fuel tank (indication is loss of fuel pressure): Select the non empty fuel tank.

If everything fails: perform an emergency landing according to procedure 3.6.1.

3.3. Air start

1. Airspeed:	Modify to 65 knots.
2. Altitude flight:	Check.
3. Field selection:	Select according to height available.
4. Fuel selector:	Open (non empty fuel tank selected).
5. Choke:	Without choke.
6. Throttle lever:	Slightly move forward.
7. Ignition:	Both circuits switched ON.
8. Starter key:	Start the engine.
9. Successful start:	Adjust throttle to achieve smooth running at 2500 RPM for approximately half a minute before reaching required power.
10.Unsuccessful start:	Perform emergency landing according to procedure 3.6.1.

WARNING

The rate of descent approximately 492 ft/min causes measurable loss of altitude during the air start. If the air start is unsuccessful up to height 492 ft above ground level, perform the emergency landing according to procedure 3.6.1!

3.4. Smoke and fire

3.4.1. Engine fire on the ground

1. Fuel selector:	Close.
2. Throttle lever:	Set full throttle.
3. Ignition:	Both circuits switched OFF after the fuel has been consumed.
4. Crew:	Leave the cockpit immediately.
5. Extinguish fire:	With best available means.

3.4.2. Engine fire in flight

1. Fuel selector:	Close.
2. Throttle lever:	Set full throttle.
3. Ignition:	Both circuits switched OFF after the fuel has been consumed.
4. Extinguish fire:	Try to extinguish the fire with side slip.
5. Emergency landing:	Perform emergency landing in accordance with procedure 3.6.1.

CAUTION

After the fire has been extinguished, do not start engine again!

3.4.3. Fire in cockpit

1.	Fire source:	Locate.
2.	Ignition:	Both circuits switched OFF.
3.	Master switch:	Set OFF.
4.	Crew:	On the ground: Leave the cockpit. During flight: Perform an emergency landing in accordance with procedure 3.6.1.
5.	Try to extinguish	Try to extinguish with best available means.

3.5. Glide

Glide path will determine the field selection for emergency landing. The optimum gliding performance is with retracted wing flaps and with stopped propeller.

In case of engine failure it is necessary to maintain the following optimum speeds for given configuration.

Glide			
Optimum descent airspeed (IAS)	km/h	mph	knots
	130	81	70
Maximum gliding range	10		
Rate of descent	3,0 m/s (590 ft/min.)		

3.6. Landing emergency

3.6.1. Emergency landing

1.	Airspeed:	Modify to 65 knots.
2.	Field selection:	Select in the direction of the free area without obstacles, if possible against the wind.
3.	Flaps:	Extend as required.
4.	Fuel selector:	Close.
5.	Ignition:	Both circuits switched OFF.
6.	Master switch:	Set OFF.

CAUTION

The loss of height for 360° turn is approximately 492 ft!

3.6.2. Precautionary landing

In the event of the airplane failure, disorientation, shortage of fuel, dangerous deterioration of the meteorological conditions (visibility, thunderstorm) and approaching sunset, a precautionary landing should be conducted.

1. Select a suitable landing field, if possible against the wind.
2. Fly over selected field with wing flaps 15° and 65 knots airspeed at a height 164 ft AGL, check properly the preferred area for landing to inspect the terrain properties (obstructions, surface conditions).
3. Make landing circuit at a height 492 ft AGL or at a safe altitude as allowed by cloud base with flaps 15° and 65 knots airspeed. Extend “down wind” position and make approach with sufficient power.
4. Don’t lose sight on the selected field in the case of low visibility.
5. Landing approach with flaps for landing and sufficient power.
6. Arrange approach so that the desired touchdown spot will be immediately after passing the edge of the selected landing field. In the case of object collision, perform obstacle avoidance manoeuvre to the side.
7. After touchdown apply heavy breaking till stopped.
8. When the airplane comes to a stop, shut down the engine, master switch off, close the main fuel selector, secure the airplane and seek assistance.

3.6.3. Landing with a flat tyre

1.	Landing approach:	With wing flaps 35° and airspeed 61 knots.
2.	Touchdown:	With the bank angle on the inflated tyre at minimum touchdown speed.
3.	Direction after landing:	Maintain ground roll direction.

3.7. Recovery from unintentional spin

For recovery from an unintentional spin the following procedure should be used:

1.	Throttle lever:	Set to idle position.
2.	Control stick:	Set neutral position, without deflection of the ailerons.
3.	Rudder control:	Apply full rudder opposite to the direction of rotation.
4.	Control stick:	Move forward of neutral in a brisk motion until rotation stops.
5.	Rudder control:	Immediately as rotation stops, neutralize rudder position.
6.	Control stick:	Make a smooth recovery from the resulting dive.

WARNING

Intentional spins are prohibited!

3.8. Other emergencies

3.8.1. Control failures

Aileron control fault:

The airplane is possible to control laterally by the secondary effect of the rudder. Start and termination of the yawing up to bank angle 15° is possible using the rudder only.

Rudder control fault: The yawing and the termination are conducted with help of the lateral control of the ailerons.

3.8.2. Vibrations

The powerplant can be the source of the vibrations.

1. Reduce engine speed to minimize the vibrations.
2. Proceed to the nearest airport for landing or select a suitable precautionary landing field in accordance with procedure 3.6.2.

3.8.3. Rescue system

Not installed.

3.8.4. Unsecured cockpit canopy

If the „Before takeoff“ checklist is performed insufficiently (Section 4.5.5., point 13. Canopy of cockpit), there is a danger of partial cockpit canopy latching and insufficient locking. The canopy is equipped with a lock on the upper rear section of the frame and it is secured by the lock lever shot backwards. The lock pin is projected as latch with compression spring. The gap approx. 8-12 mm will be rise between fuselage and cockpit canopy, which is constant during straight line flight without side-slipping due to the air flow and the function of the gas struts. Partial cockpit canopy latching and non locking will stack up by the noise increase due to the agitated air through the gap between fuselage and cockpit canopy. Partial cockpit canopy latching is possible to close safely during straight line flight without side-slipping by the following way according to appropriate stage of flight.

3.8.4.1. During takeoff roll

1. Abort the takeoff, if the cockpit canopy unlatching, unlocking is detected during takeoff roll.
2. Latch and lock the cockpit canopy by normal procedure after stopping. (The cockpit canopy handle pull down and check the cockpit canopy latching and locking by canopy frame and the red ring position) (see Section 7.8).

3.8.4.2. After unstuck or during climbing

1. Safely terminate takeoff.
2. Climb to safety altitude.
3. Fly straight line flight without side-slipping and carry out procedure 3.8.5.3 During level flight.

3.8.4.3. During level flight

1. Open the left ventilation sliding window on cockpit canopy.
2. Reduce speed to 65 knots.
3. Hold control stick by one hand.
4. The cockpit canopy handle pull down for cockpit canopy latching and locking.
5. Check the cockpit canopy latching and locking by canopy frame and red ring position.
6. Close the left ventilation sliding window on cockpit canopy.
7. Adjust flight airspeed to cruising speed.

WARNING

During side-slipping flights (incorrect turn – slipping turn, skidding turn, and side slipping for landing) with partial cockpit canopy latching or non locking due to asymmetrical flow over fuselage by the air flow, the cockpit canopy will be carved through the gap and subsequently will be full open by help of the gas struts. The cockpit canopy will become the braking shield, what will cause abnormal airplane descent due to increased total drag!

4. NORMAL PROCEDURES

4.1. Introduction

Section 4 provides checklist and amplified procedures for the conduct of normal operation. Normal procedures associated with optional systems can be found in Section 9.

4.2. Rigging and derigging

4.2.1. Rigging of the wings

The airplane has possibility of the wings disassembling for transportation purposes or to save space in the hangar. There is a description for the rigging procedure of the right wing. The procedure for the left wing is analogous. Thoroughly clean and lubricate all the wing fittings and pins before each assembling.

1. Fit the spar end of the wing into the spar end (fork) of the wing central section and push the wing along its longitudinal axis so that a connection slot between the wing central section and the wing root is approx. 100 mm. Connect the hoses from the Pitot probe (only right wing), prepare and adjust the wing fuel tank hoses and connect the wiring for fuel tank conductive connection (if the wing is equipped with fuel tanks) and position lights (Fig. 2).
2. Fully push the wing into the wing central panel and slide the wing tank fuel hoses on their sockets together with theirs clamps. Carefully insert the wing flap lever on the wing flap hinge. Take care of the hoses from the Pitot probe (only right wing) and for fuel hoses (if the wing is equipped with fuel tanks) which must not be twisted!
3. Insert wing's pins to connect wing spar with the wing central section. The outer wing pin is inserted through the access hole on the lower wing surface. The inner wing pin is inserted from the cockpit interior (slightly lift and lower the wing tip to ease the pin's insertion).
4. Insert rear spar into the fitting of the central section's rear spar. Secure all 6 pins with safety pins (Fig. 3a and Fig. 3b).
5. Connect the wing flap lever with the wing flap hinge. Connect the flap control rod to the wing flap lever using the wing flap rod pin. During this procedure the flap control lever in the cockpit shall be set to the rearmost position and the wing flap shall be deflected to maximum down position (Fig. 4).
6. Connect the aileron control rod 2 with the aileron control rod 1 and secure the nut (Fig. 3a) with the safety pin. Tight the fuel hose clamps (if the wing is equipped with fuel tanks).
7. Stick the adhesive tape on the gap between wing and wing centre section.
8. Repeat the procedure with the second wing. After checking the security of the all connection. The connection slot between wing and the wing centre section should be sealed with sticky tape.

WARNING

After rigging of the wings check for correct operation and security of the aileron control pins and the flap control pins as well as the connection of the hoses from the Pitot probe and fuel hoses!

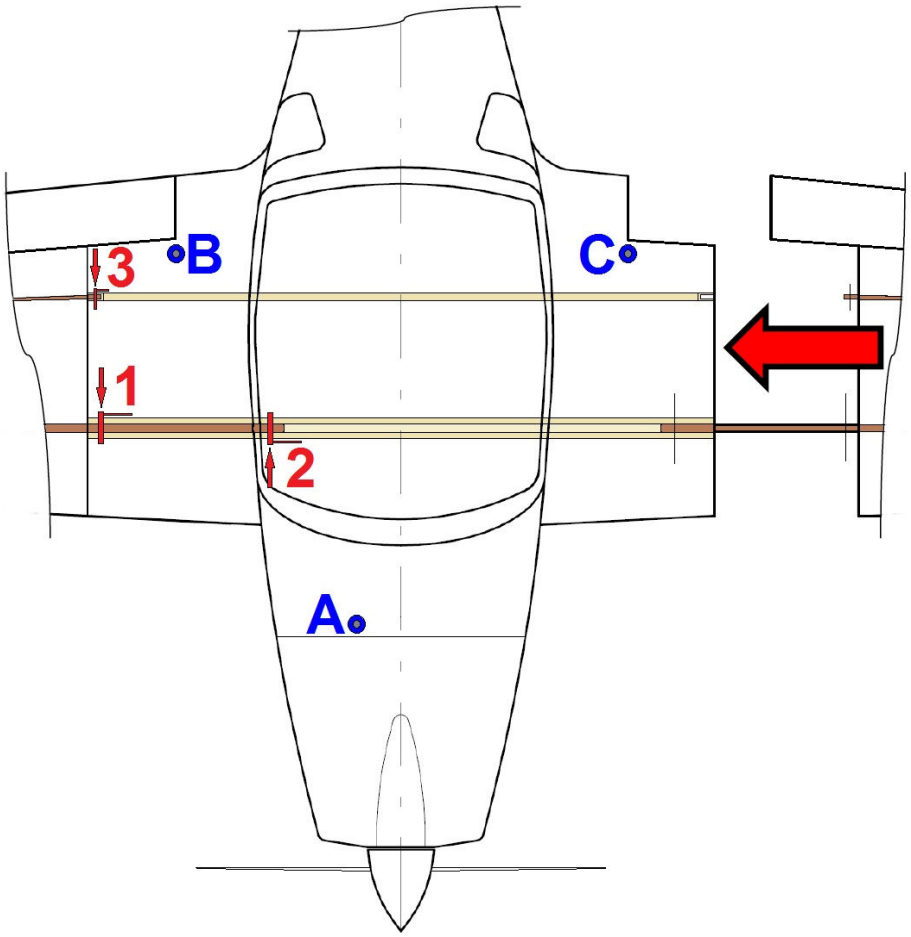


Fig. 2 Insertion of the wing spar into the wing centre section, position of the wing pins (1, 2 and 3) and the support points (A, B and C)

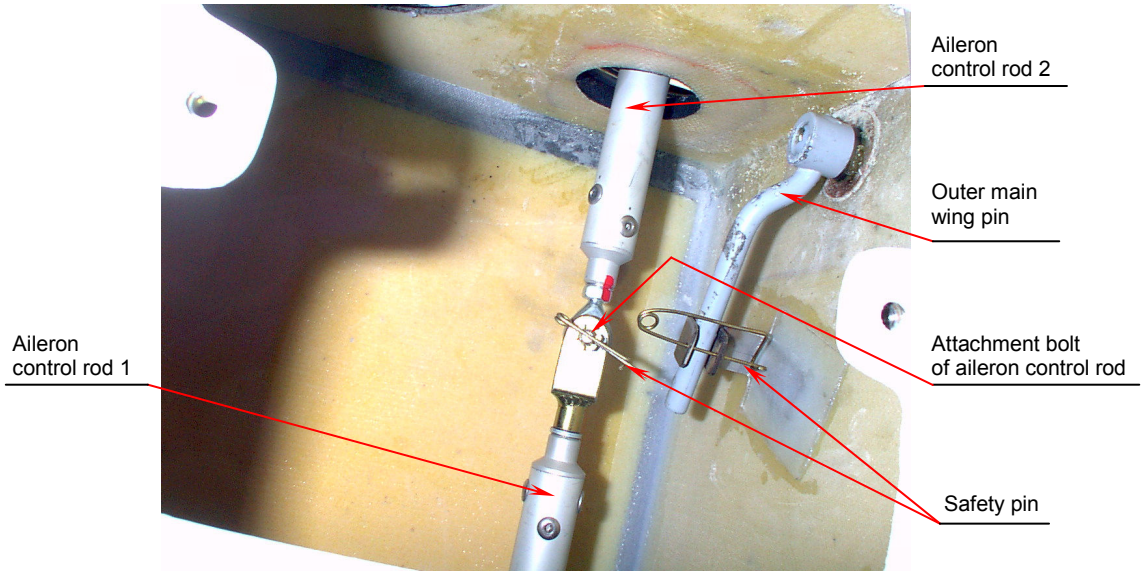


Fig. 3a Outer main wing pin and aileron's connection

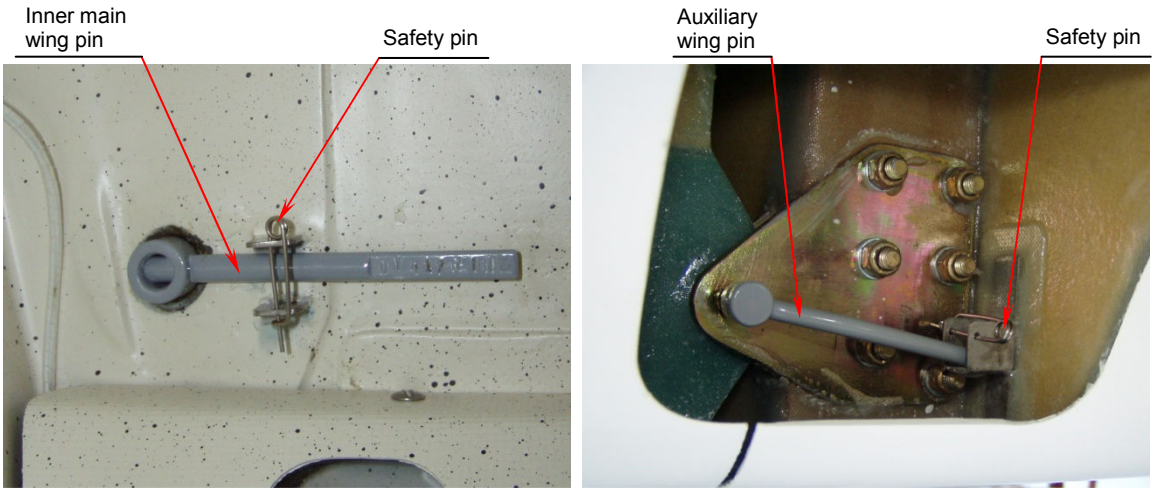


Fig. 3b Inner main and auxiliary wing pin

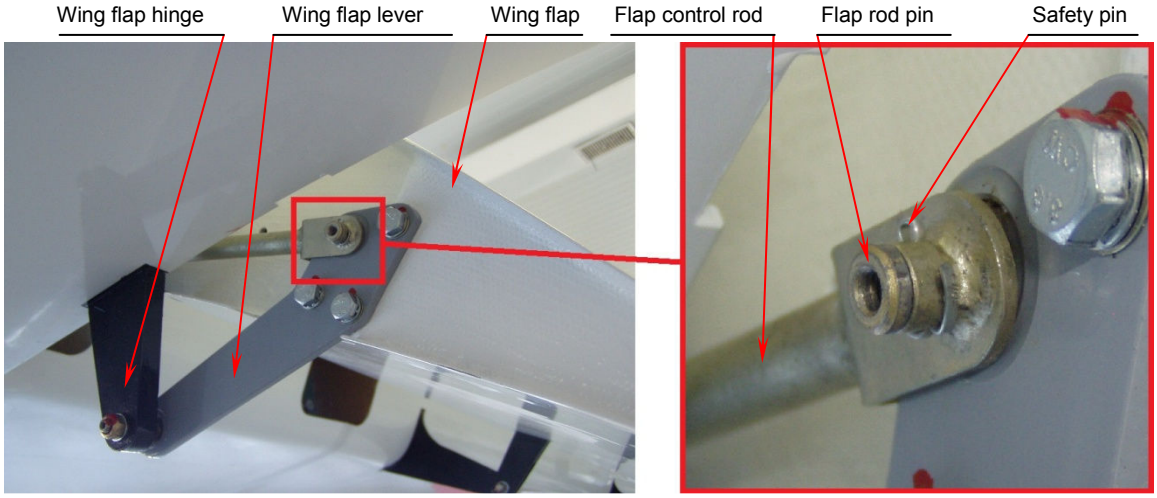


Fig. 4 Wing flap control connection

4.2.2. Derigging of the wings

1. Drain central section fuel tanks and wing tanks (if the wing is equipped with fuel tanks).
2. Remove the adhesive tape covering the gap between wing and the wing centre section.
3. Disconnect aileron control rod 2 from the aileron control rod 1 (Fig. 3a). Release the fuel hoses clamp (if the wing is equipped with fuel tanks).
4. Disconnect the flap control rod from wing flap lever. Disconnect the wing flap lever from the wing flap hinge (Fig. 4).
5. Pull out all wing's pins (connecting the wing's main and auxiliary spar with the wing central section) (Fig. 3a and Fig. 3b).
6. Pull out the wing along its longitudinal axis so that there is an approx. 100 mm distance between the wing central section and the wing root (Fig. 2). Disconnect the hoses from the Pitot probe (only right wing), the wing fuel tank hoses and wiring for fuel tank conductive connection (if the wing is equipped with fuel tanks) and position lights.
7. Carefully pull the wing away from the wing centre section and put on soft mats.
8. Repeat above process also for second wing.

4.3. Daily inspection

The daily inspection must be performed every day before flight of the airplane. The scope of this inspection is to check the following:

1. Airplane log-book and airworthiness certificate.
2. Airplane technical log-book.
3. Cockpit.
4. Landing gear.
5. All control surfaces for full and free movement.
6. All surfaces of the airplane for cracks, nicks or any visible damage.
7. Powerplant and propeller.
8. Service fluids.

WARNING

If any problems are found they must be corrected before flying!

4.4. Pre-flight inspection

It is most important to perform a pre-flight inspection carefully to prevent possible trouble. The pre-flight inspection is essential for flight safety. Pre-flight inspection proceeding is on Fig. 5.

CAUTION

Special attention must be devoted to the parts, which are affected by high vibrations and high temperatures!

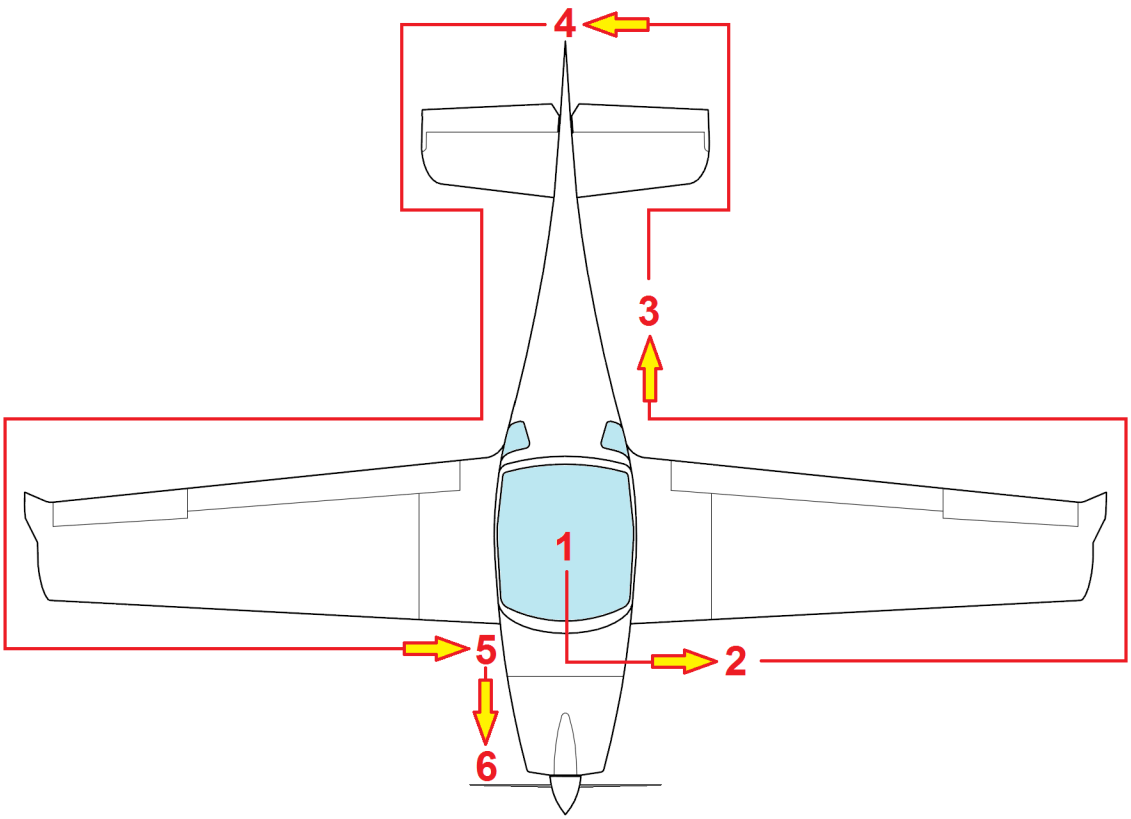


Fig. 5 Pre-flight inspection proceeding

A. Cockpit:

Flight controls:	Check for freedom of movement.
Master switch:	Switched OFF.
Ignition switch:	Both circuits switched OFF.
Loose items:	Secure or remove.
Check instruments:	Set “0” (zero).
Cockpit canopy glass:	Clean, check cockpit canopy lock.
Safety harness:	Inspect.
Rescue system actuator:	Remove secure lock (if installed).
Fuel:	Check fuel quantity, check fuel selector.

B. Wing:

Surface:	State of wing surface.
Connection:	Wing pins fully inserted and secured.
Fuel tank caps:	State of fuel tank caps.
Pitot probe:	Pitot probe cover removed, check opening for blockage.
Leading edges:	Without damage, clean.
Ailerons:	Check for freedom of movement and security.
Flaps:	Without play, check hinges for security.

C. Fuselage:

Surface:	Without damage.
Static pressure receivers:	Check opening for blockage.
Antennas:	Fixed, without damage.
Cockpit wing walks:	Without damage.

D. Tail units:

Surface:	Without damage.
Control surfaces:	Check for freedom of movement, without excess play.
Tail skid:	Check for secure attachment.

E. Landing gear:

Main wheel tyres:	State, inflation (250 kPa).
Brakes:	Visually check condition of pads, brake system for leaks.
Legs:	State without damage, attachment.
Nose wheel leg:	Nose wheel tyre state, inflation (200 kPa) attachment, suspension check, wheel free of rotation.

F. Powerplant

Propeller:	Attachment, leading edge blade state, check for nicks and security, check spinner for cracks and attachment.
Engine:	Check for any operating fluids leaks. State of the engine cowlings. State of the exhaust system attachment. Check coolant level and oil level. Engine attachment in rubber silentblocks. Carburettors attachment. State of hoses holders. Condition and integrity of wires, plugs Fuel filters. Turn the propeller by hand several times for odd noises or excessive resistance and normal compression.

WARNING

Before cranking the propeller switch off both ignition circuits. The propeller must be caught at the blade surface every time. Do not catch at the edge!

4.5. Normal procedures and check list

The standard cockpit control arrangement is shown in Fig. 6 and the actual instrument panel is shown in Fig. 7 (see Section 7.4).

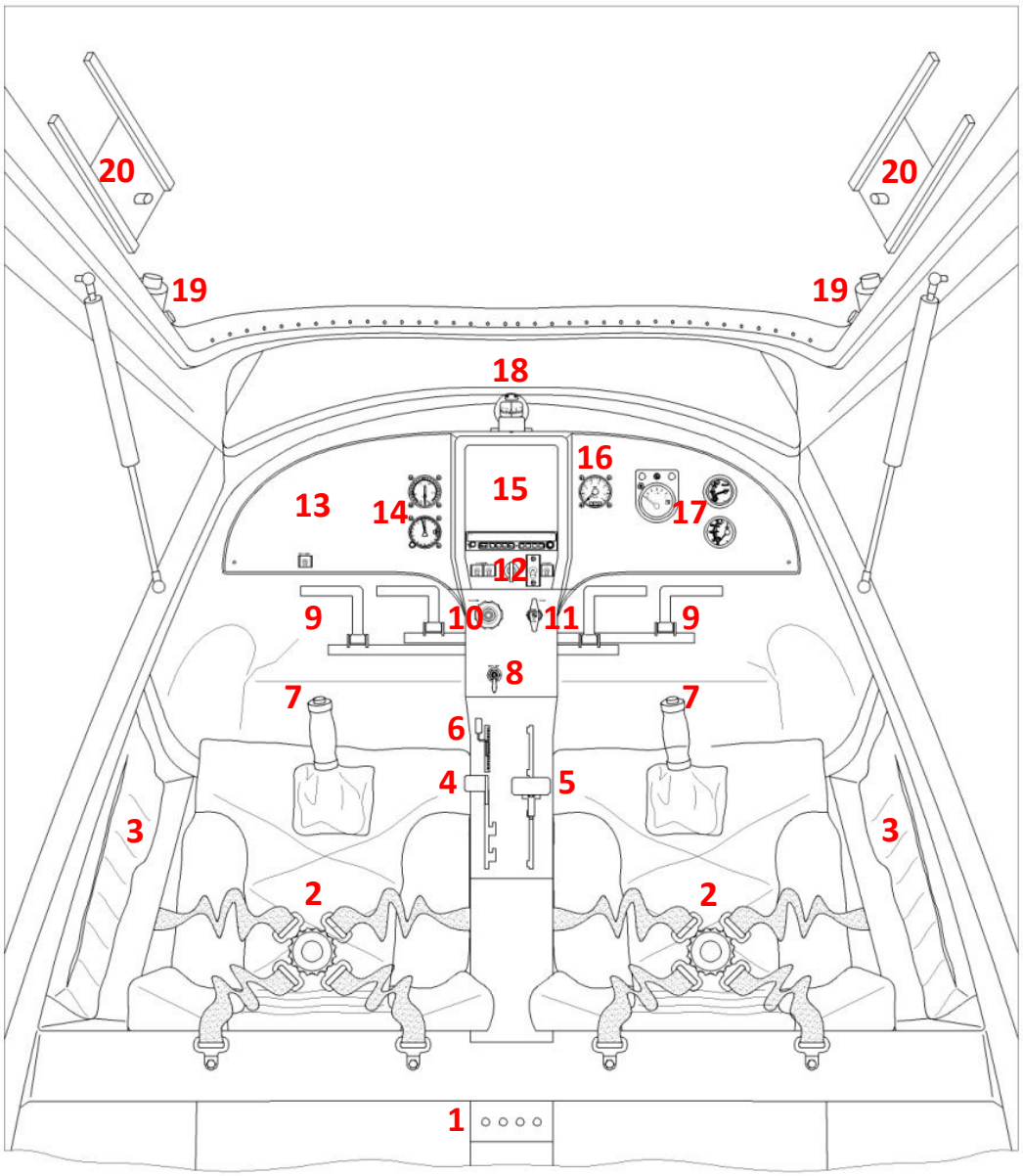


Fig. 6. The standard cockpit controls (see also Section 7.4)

1. Headset socket/jack	11. Choke
2. Seat and safety belt	12. Ignition, starter key, master switch
3. Pocket	13. Instrument panel
4. Brake lever	14. Flight instruments
5. Wing flap lever	15. GPS, radio, transponder
6. Trim lever	16. Tachometer
7. Control stick	17. Powerplant instruments
8. Fuel selector	18. Magnetic compass
9. Rudder pedals	19. Ventilation flow baffle
10. Throttle lever	20. Ventilation sliding window

4.5.1. Before starting engine

1. Ignition:	Both circuits switched OFF.
2. Rudder pedals:	Freedom of movement.
3. Control stick:	Freedom of movement.
4. Throttle lever:	Freedom of movement, set to idle position.
5. Elevator trim control:	Set to neutral position.
6. Fuel quantity:	Check.
7. Instruments:	Setting and check-up of the value.
8. Radio:	Function check.
9. Seat and safety harness:	Adjust and lock.
10. Brake:	Function check.
11. Propeller pitch range:	Only electrically adjustable propellers: Check the min. and max. propeller blade's pitch.
12. Canopy of cockpit:	Latched and locked.

4.5.2. Engine starting

Cold engine:

1. Brakes:	Set on parking position.
2. Fuel selector:	Left tank.
3. Choke:	Activate.
4. Throttle lever:	Set to idle position.
5. Master switch:	Switch ON.
6. Starter key:	Switch to 1st position.
7. Fuel pump:	Switch ON and establish the fuel pressure and then switch OFF.
8. Ignition:	Both circuits switch ON.
9. Starter key:	Actuate. Activate starter for max. 10 sec only without interruption followed by a cooling period.
10. As soon as engine runs:	Adjust throttle lever to achieve smooth running at approximately 2500 RPM, check if oil pressure has risen within 10 sec to 2 bar and monitor oil pressure.
11. Choke:	De-activate.
12. Warming up:	Start warming up procedure according to procedure 4.5.3.

Warm engine (if the engine is already at operating temperature):

1.	Brakes:	Set on parking position.
2.	Fuel selector:	Left tank.
3.	Throttle lever:	Set to idle position.
4.	Master switch:	Switch ON.
5.	Starter key:	Switch to 1st position.
6.	Ignition:	Both circuits switch ON.
7.	Starter key:	Actuate. Activate starter for max. 10 sec only without interruption followed by a cooling period.
8.	As soon as engine runs:	Adjust throttle lever to achieve smooth running at approximately 2500 RPM, check if oil pressure has risen within 10 sec to 2 bar and monitor oil pressure.

4.5.3. Engine warming up

In accordance with the Operator's Manual for ROTAX 912 ULS start the warming up period at 2000 RPM for approx. 2 minutes, continue at 2500 RPM, duration depending on ambient temperature, until oil temperature reaches 50 °C. Check temperatures and pressures.

Engine ground test:

1.	Ignition check:	Check the two ignition circuits at 4000 RPM. Speed drop with only one ignition circuit must not exceed 300 RPM. Max. difference 115 RPM of speed by use of either circuit A or B.
2.	Throttle response:	Short full throttle ground test, speed must not exceed 5800 RPM.
3.	Minimum speed:	Minimum speed on the ground at full throttle must be 5500 ±200 RPM depending on ambient temperature and pressure.
4.	Idle speed:	Check the idle speed 1600 ±100 RPM.
5.	Propeller pitch range:	Only hydraulic adjustable propellers: Set up engine speed at 4000 RPM, set up min. pitch and then max. pitch. Between these ends positions of propeller pitch should be observed significant engine speed variation and acoustic manifestation generated by propeller.

4.5.4. Taxiing

Using of the throttle control (movement forward or backward) adjust power during taxiing. Taxiing of the aeroplane is controlled by the rudder pedals which are connected to the nose wheel steering. The wheel brakes are actuated by sliding the brake lever rearwards in the centre console.

4.5.5. Before takeoff

1.	Rudder pedals:	Freedom of movement.
2.	Control stick:	Freedom of movement.
3.	Elevator trim control:	Set neutral position.
4.	Wing flaps:	Set takeoff position.
5.	Fuel selector:	Left tank.
6.	Powerplant instrument:	Check for correct readings.
7.	Flight instrument:	Check altimeter setting.
8.	Propeller:	Set minimum fine angle (takeoff position) (only when equipped with pitch adjustable propeller).
9.	Seat and safety harness:	Adjust and lock.
10.	Canopy of cockpit:	Latched and locked.

4.5.6. Normal takeoff

1.	Fuel pump:	Switch ON.
2.	Throttle lever:	Full throttle.
3.	Control stick:	Set into neutral position.
4.	Direction on the ground:	Control by rudder pedals.
5.	Unstick:	At speed at 49 – 51 knots (according to takeoff weight).
6.	Accelerating:	Accelerate to speed 65 – 70 knots (after unstuck).
7.	Fuel pump:	Should be switched OFF after takeoff in safety altitude.
8.	Throttle lever:	Adjust throttle lever to max. continues power (5500 RPM).
9.	Flaps retracting:	At height 164 ft AGL retract the wing flaps.

4.5.7. Climbing

Normal climb is conducted at climb speeds 70-76 knots in accordance with the takeoff weight of the airplane. Monitor cylinder head temperature and oil pressure during climb. Oil temperature limits must not be exceeded. In case of high readings, increase airspeed and reduce engine power setting.

4.5.8. Cruise

The range of cruising speeds is from 76 to 135 knots in accordance with the engine speed setting from 4000 to 5500 RPM. The economy airspeed for best fuel economy is 97 knots, the optimum operation is between 97 - 121 knots. In case of turbulence reduce the cruising speed below 121 knots. Under certain conditions the airplane may be overstressed. The airplane is able to be trimmed through the range of the cruising speeds.

Due to economy reasons is recommended to maintain the following data:

Engine ROTAX 912 ULS Engine power setting	Engine Speed (RPM)	Performance (kW)	Torque (Nm)	Manifold pressure (inHg)
Takeoff power	5 800	73,5	121,0	27,5
Continuous power	5 500	69,0	119,8	27,0
75 %	5 000	51,0	97,4	26,0
65 %	4 800	44,6	88,7	26,0
55 %	4 300	38,0	84,3	24,0

4.5.9. Approach

Approach is conducted at airspeeds 65 - 70 knots with the throttle lever set to idle position. For increasing the rate of descent it is recommended setting of wing flaps to landing position (35° flaps deflection) and proceeding at airspeed 65 knots. In this configuration the gliding range is 1:8.

Side slipping is conducted with airspeed 70 knots, and bank angle 30° with help of full rudder deflection. The side slip direction is controlled by the bank.

4.5.10. Landing

Check fuel before approach for landing. Landing approach is conducted at small glide slope angle due to long distance of the float before aeroplane's touchdown.

1. Propeller: Set minimum angle (only when equipped with pitch adjustable propeller).
2. Fuel selector: Left tank.
3. Fuel pump: Switch ON.
4. Approach: Conduct at speed 65-70 knots according to the weight.
5. Wing flaps: As required extend the flaps down at speed below 76 knots.
6. Elevator trim: Adjust as required.
7. Levelling: Begin approx. 10 - 6,5 ft above ground.
8. Touchdown: Touchdown should be made with power-off and on the main wheels first. The nose wheel should be lowered smoothly to the runway as speed is diminished.

9. Control during landing:	Control the aeroplane with help of the rudder pedals.
10. Braking:	Apply braking as required. The main wheel brakes are actuated via the handle on the top of central tunnel between the pilot seats.

4.5.11. Balked landing

1. Throttle lever:	Smoothly adjust the throttle lever to full open (a thrust yawing moment is manifested in case of the steep setting of the throttle lever).
2. Airspeed:	Modify to 65 knots.
3. Flaps:	Retract the wing flaps if safe.
4. Elevator trim:	Adjust as required and proceed in climbing.

4.5.12. After landing

1. Engine RPM:	Adjust throttle for taxiing.
2. Wing flaps:	Retract the wing flaps.
3. Elevator trim:	Set to most rear position of neutral.
4. Fuel pump:	Switch OFF.
5. Taxiing:	To the parking position.

4.5.13. Securing aeroplane

1. Brakes:	Set to “park” position.
2. Throttle lever:	Set to idle.
3. Propeller:	Set minimum pitch (takeoff position) (only when equipped with pitch adjustable propeller).
4. Instruments:	Switch OFF all electronic instruments (avionics).
5. Ignition:	Switch OFF the first circuit and after 2-3 s switch OFF the second circuit.
6. Master switch:	Switch OFF.
7. Fuel selector:	Close.
8. Rescue system:	Lock the actuator (if installed).
9. Cockpit leaving:	After cockpit leaving the canopy should be covered with the cloth dust-cover, to avoid the effects of the sun.

4.5.14. Takeoff and landing within crosswind

Operation in direct crosswinds of 12,4 m/s (24 knots) has been demonstrated.

Takeoffs under strong crosswind conditions normally are performed with the minimum flap setting (position 0 or 1) necessary for the field length, to minimize the drift angle immediately after takeoff. With the ailerons partially deflected into the wind, the airplane is accelerated to a speed slightly higher than normal, then the elevator control is used to quickly, but carefully; lift the airplane off the ground and to prevent possible settling back to the runway while drifting.

When clear of the ground, make a coordinated turn into the wind to correct for drift and continue in takeoff.

When landing in a strong crosswind, use the minimum flap setting (position 1 or 2 maximum, never position 3) required for the field length. Although the crab or combination method of drift correction may be used, the wing low method gives the best control.

After touchdown, hold a straight course with the steerable nose wheel, with aileron deflection as applicable and occasional braking if necessary.

4.5.15. Aero towing

See 2.15 "Other limitations" for aero towing.

Takeoff and climbing with towed glider up to MTOW 410 kg do with flaps in position 15°. At safe height (minimum 164 ft) retract the wing flap.

Takeoff and climbing with towed glider with water ballast or from MTOW 410 kg up to MTOW 750 kg do with flaps in position 0°.

WARNING

Take care for maximum towing speed of towed glider!

CAUTION

After release of the glider the maximum speed for retracting rope is 86 knots (when retracting mechanism is installed)!

WARNING

When appropriate and necessary, use guillotine lever of tow rope (when retracting mechanism is installed)!

5. PERFORMANCE

5.1. Introduction

Section 5 provides approved data for airspeed calibration, stall speed and takeoff performance and non-approved additional information. The data in the charts has been computed for condition of the standard atmosphere from actual flight tests with the airplane at maximum takeoff weight and engine in good condition and using average piloting techniques.

5.2. Approved data

5.2.1. Airspeed indicator system calibration

IAS (knots)	**27**	**30**	**32**	**36**	**42**	**48**	**54**	**60**	**67**	**74**
CAS (knots)	**30**	**32**	**35**	**38**	**43**	**49**	**54**	**59**	**65**	**70**

IAS (knots)	**79**	**84**	**89**	**95**	**99**	**110**	**121**	**132**	**144**	**154**
CAS (knots)	**76**	**81**	**86**	**92**	**97**	**108**	**119**	**130**	**140**	**151**

IAS - Indicated airspeed
CAS - Calibrated airspeed

5.2.2. Stall speed

The data is valid for following conditions: MTOW 600 kg, CG is 30% MAC, engine at idle:

Position wing flaps	**0°**	**15°**	**35°**
Stall speed IAS in knots	48	45	41
Stall speed CAS in knots	49	46	43

5.2.3. Takeoff performance

The data is valid for following conditions: H = 0 ft MSL, Temperature t = 15 °C, wing flaps position 15°, MTOW 600 kg:

Surface of the runway	**Takeoff run distance (ft)**	**Takeoff distance up to 50 ft (ft)**
Paved runway	482	1027
Non paved – grass	568	1142

5.2.4. Landing distance

The data is valid for following conditions: H = 0 ft MSL, Temperature t = 15 °C, wing flaps position 35°, landing speed 1,3 V_{S0}, MTOW 600 kg, braking during roll:

Surface of the runway	Landing distance from 50 ft height (ft)	Landing run distance (ft)
Paved runway	863	246
Non paved - grass	892	276

5.2.5. Climb performance

The data is valid for wing flaps retracted, MTOW 600 kg:

Attitude (ft)	Speed IAS (knots)	Rate of climb (ft/min)
0	70	896
3281	70	622
6562	70	500

The service ceiling is 18 000 ft at the max. continuous power.

5.3. Additional information

5.3.1. Balked landing climb

The data is valid for following conditions: MTOW 600 kg, wing flaps position 35° (retracted during balked landing):

Attitude (ft)	Speed IAS at full throttle application	Rate of climb after 5 s from full throttle application (ft/min)
0	65	830
3281	65	561
6562	65	433

5.3.2. Effect on flight performance and characteristics

No disturbing effects on flight performance and characteristic of the aeroplane WT9 Dynamic LSA Club LT were recorded during the flight tests.

5.3.3. Demonstrated crosswind performance

The maximum demonstrated crosswind speed for takeoff and landing is 12,4 m/s (24 knots).

5.3.4. Noise data

The maximum noise data 58,7 dB (A) was measured during the flight tests according to the German noise requirement LS – UL 96.

5.3.5. Aero towing performance

The following table shows the takeoff and climbing performance:

Glider type	MTOW (kg)	Distance (ft)		Time of climb up to (min:sec)		Airspeed (knots IAS)	Rate of climb (ft/min)
		Takeoff roll	Takeoff up to 50 ft	1312 ft	1968 ft		
Duo Discus	750	1047	2356	4:33	6:06	75	354

6. WEIGHT AND BALANCE AND EQUIPMENT LIST

6.1. Introduction

This section contains the payload range with which the aircraft may be safely operated. CG position is very important parameter which affects the safety of flight.

6.2. Weighting procedure

To define the airplane CG it is necessary to weigh the empty airplane with standard and optional equipment, with operating fluids of the engine but without the fuel in the fuel tanks (for empty weight and empty moment see Weight and balance record).

The airplane is weighted with the help of three weighting-machines located under the left and right main wheels and under the nose wheel.

The airplane position for weighting has to be adjusted to be levelled the side edge of the cockpit. The reference point (RP) is leading edge of wing root section where wing-fuselage radius starts. Measure the distance from datum point to centre of main landing wheel axle and nose wheel axle.

The leading edge of Mean Aerodynamic Chord (MAC) is located in distance 77 mm rearward from RP. CG position is expressed as a distance from MAC leading edge (X_T (mm)) and as a MAC ratio (X_{CT} (% MAC)).

CG position after loading of airplane (crew, fuel and baggage or additional equipment) can be calculated as follows (see CALCULATION OF FLIGHT CG POSITION in Section 6.3):

1. Determine the partial weights of crew (G_C), fuel (G_F)*, baggage (G_B) and add them to empty weight (G_E) to get total weight (G_T).
2. Calculate the partial moments of crew (M_C), fuel (M_F)*, baggage (M_B) and add them to empty moment (M_E) to get total moment (M_T).
3. Calculate the position of CG on MAC (X_T) (in mm). Calculate the position of CG on MAC (X_{CT}) (in %MAC)
4. Check if the flight CG is inside of allowed range (For safety flight it must be considered that the fuel is consumed during flight what results in moving of CG forward!).

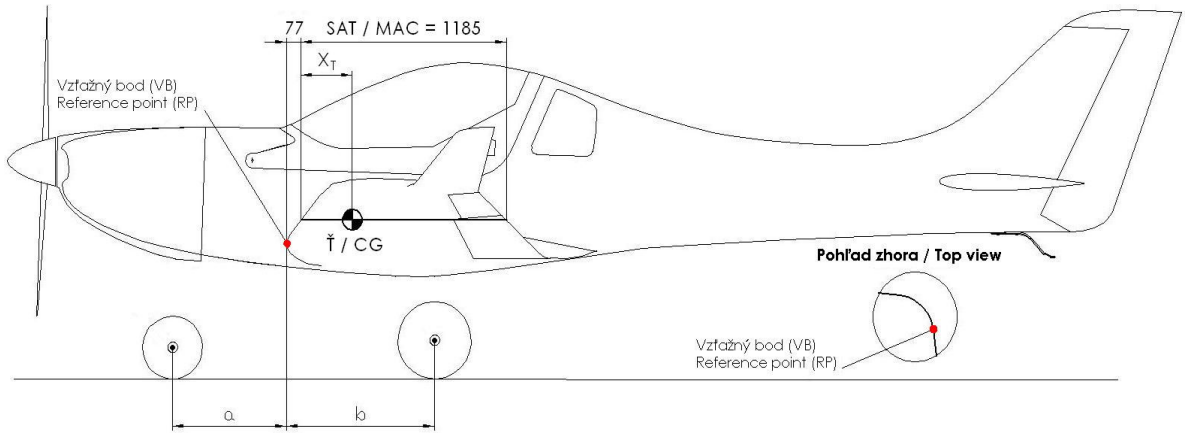
* Be careful to use fuel weight (in kg) not fuel volume (in litres)!

6.3. Weight and balance record and permitted payload range

Permitted crew + passenger weight with											
Date	Empty weight (kg)	Empty moment (kg.mm)	CG Position (%)	Max. baggage 40 kg		Half baggage 20 kg		No baggage		Approved	
				Max. (kg)	Min. (kg)	Max. (kg)	Min. (kg)	Max. (kg)	Min. (kg)	Date	Signed
16.07.12	316,0	76628,0	13,97 %	119,4	54,0	165,8	54,0	212,3	72,2		

Condition: Aircraft in the range from maximum possible fuel amount of 126,0 litres to minimum fuel of 7 litres.

CALCULATION OF FLIGHT CG POSITION



Empty airplane (G_E)* (See Weight and balance record)	**kg**	**Empty moment** (M_E)* (See Weight and balance record)	**kg.mm**
	Weight (G_i) **(kg)**	**Distance from RP** (l_i) **(mm)**	**Moment** $(M_i = G_i . l_i)$ **(kg.mm)**
Crew (G_C)	kg	720 mm	kg.mm
Fuel** (G_F)	kg	240 mm	kg.mm
Baggage (G_B)	kg	1100 mm	kg.mm
Total weight (G_T) $G_T = G_E + G_C + G_F + G_B$	**kg**	**Total moment** (M_T) $M_T = M_E + M_C + M_F + M_B$	**kg.mm**

Calculation of CG position X_T on MAC (in mm):

$$X_T(mm) = \frac{M_T}{G_T} - 77 = \text{\_\_\_\_\_} - 77 = \qquad mm$$

Calculation of CG position X_{CT} on MAC (in %MAC), (MAC = 1185 mm):

$$X_{CT}(\%MAC) = \frac{X_T}{MAC} \cdot 100 = \frac{\text{\_\_\_\_\_}}{1185} \cdot 100 = \qquad \%MAC$$

Permitted flight CG position is in range 20,00-30,00 %MAC!

Calculated flight CG position is whitin permitted range:

☐ **YES** ☐ **NO**

Date, place ..... Signature .....

* Empty weight includes operating fluids of engine and standard equipment.

** Attention, make sure that weight of fuel (**in kg**) was used in calculation!

6.4. Master minimum equipment list

The following minimum instrument equipment is requested:

Flight and navigation instruments:

1. Airspeed indicator.
2. Sensitive barometric altimeter.
3. Magnetic compass.

Powerplant instruments:

1. Fuel indicator.
2. Tachometer.
3. Oil temperature indicator
4. Oil pressure indicator.
5. Cylinder head temperature indicator.

Additional equipment:

1. Master switch of the electrical system with circuit breakers.
2. Battery – located in front of the firewall.
3. Safety harness – 4 point static harness restrain system is attached to the fuselage structure.
4. Limitation placards - in accordance with Section 2.16.

CAUTION

If additional equipment is mounted within the magnetic field of the compass, it may affect the readings of the compass!

7. AIRPLANE AND SYSTEM DESCRIPTION

7.1. Introduction

This section provides a description of the operation of the airplane and its systems. Refer to Section 9, Supplements, for details of optional systems and equipment.

7.2. Airframe

WT9 Dynamic LSA Club LT is a single engine aircraft, controlled aerodynamically, made of advanced composite material, low-wing monoplane with two side-by side seats. The airplane is equipped with a fixed tricycle undercarriage.

Fuselage:

The fuselage sandwich shell is divided in the symmetry plane. The shell is of three layer construction. The external and internal shell layers are made of glass and carbon fibre fabrics, which are saturated with a resin. Between them there is a filling of hard foam panels. The fin is made together with the fuselage. The wing central panel is fixed at the fuselage.

There are two places in the cockpit, side by side type. The interior width is 1,15 m. A lifting cockpit canopy hinges forward. The canopy opening system is assisted by a gas strut. The wing central panel with span 2,45 m is fixed at the fuselage. There is an integral tank in the forward box of the wing central panel.

Wing:

The tapered wing is a monospar construction with a rear auxiliary spar for the aileron and flap attachments. The main spar caps are made from carbon rovings. The slotted flaps are rectangular sandwich construction. The flap is attached to the wing with four hinges. The aileron is attached to the upper surface of the wing with three hinges. The spars of right and left wings are joined to the wing central panel spar with the help of two pins. The third connecting point is the pin in the rear auxiliary spar. An aileron control system consists of duraluminium rods. The control handle of flaps is attached to the top of central tunnel in the cockpit. The movement by help of the rods and the bellcranks is transmitted to the flap's torsion tube in the wing, next the movement from the flap's torsion tube is transmitted to the flaps. Optional wing fuel tanks are integral part of wing structure. They are connected with central section tanks with simple hose connection and tightened with clamps.

Horizontal tail unit:

The horizontal tail unit consists of a stabilizer and elevator. The stabilizer consists of sandwich shells from advanced composite material. The stabilizer is fixed at the fin. The width of the horizontal tail unit is 2,4 m, (similar width as the wing central panel) and allows the transport of the fuselage with regular truck.

The elevator consists of two parts, which are joined together by help of the elevator control.

Vertical tail unit:

The vertical tail unit consists of the fin and rudder and has trapezoidal shape. The rudder consists of a sandwich shell from advanced composite material. The rudder is attached by three hinges at the fin.

7.3. Flight controls

The aircraft has dual controls with two control sticks. The ailerons are controlled by control sticks, connecting rods and arms. The elevator is controlled by control sticks, connecting rods. The rudder is controlled by steel cables attached at the rudder pedals and guided alongside the fuselage sides to the rudder. The rudder pedals position is adjustable (see Maintenance Manual, Directional control system, page 1-22).

The wing flaps are controlled by a flap lever located on the top of central tunnel manually. The slotted link allows four positions of the flaps: retracted, takeoff (flaps deflection 15°), landing position (flap deflection 24°) and landing position (flap deflection 35°). Movement with help of rods and bellcranks is transmitted onto the flap's torsion tube and from the flap's torsion tube is transmitted onto the flaps with help of the rod.

7.4. Instrument panel

The Instrument panel arrangement is shown in the following figure (Fig. 7).

Fig. 7 Instrument panel

1. Brake lever	12. Flap control unit	23. Radio
2. Throttle lever resistance setting	13. PTT button and trim control	24. Dynon SkyView SV-D1000 (2)
3. Throttle lever	14. Pedals adjustment handle	25. Airspeed indicator
4. Trim control select switch	15. 12V Socket	26. Intercom
5. Fuel selector	16. Switches*	27. Trim indicator
6. Choke	17. Ignition	28. USB connector (1)
7. Oil flap control	18. Starter key	29. USB connector (2)
8. Carburettor pre-heating	19. Master switch	30. Propeller governor
9. Cabin ventilation	20. Circuit breakers**	31. Check lights (CL) and Buttons (B)***
10. Cabin heating	21. Altimeter	
11. TOW mechanism handle	22. Dynon SkyView SV-D1000 (1)	32. Magnetic compass

* *AVIONICS, ACL, LAND, FUEL PUMP*

** *Circuit breakers are listed on the next page*

*** *OVER SPEED WARNING (CL), FUEL PUMP (CL), FUEL RES. LEFT (CL), FUEL RES. RIGHT (CL), D-1000 (CL), CHARGE (CL), TEST (B)*

Circuit breakers installed at instrument panel		
No.	**Protected instrument**	**Circuit breaker value (A)**
1.	Auto Pilot	3
2.	ACL / NAV	5
3.	Landing Lights	10
4.	Fuel Pump	2
5.	D-1000	8
6.	D-1000	8
7.	Radio	5
8.	Transponder	3
9.	Propeller	10
10.	Trim Control	2
11.	Flaps Control	8
12.	Socket 12V	10
13.	Avionic (behind panel)	1

7.5. Landing gear system

The main wheels of the model Club LT are mounted on spring legs, which are attached to the left and to the right outside of the wing central panel. The nose wheel leg is attached at the fire wall (Fig. 8). The nose wheel is sprung by help of rubber components and is controlled with the rudder pedals.

The main wheels on both legs are equipped with hydraulic disc brakes. The main wheels are braked by brake system unit, which is located under the pilot seats. The main wheel brakes are actuated via the brake lever handle placed on the top of central tunnel between the pilot seats. This handle actuates the parking brake too.

The tyres of the main landing gear have dimensions 15x6,00-6, the tyre of the nose wheel has dimensions 13x5,00-6. Wheels are equipped with wheel fairings.

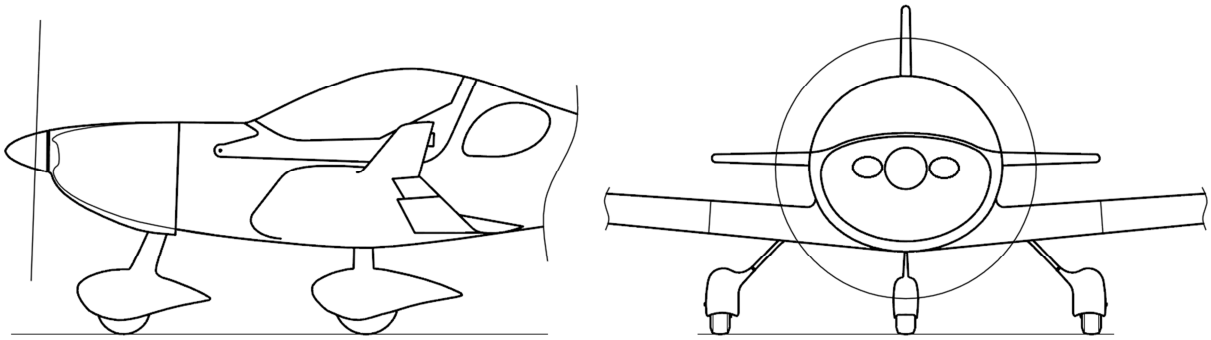


Fig. 8 Fixed undercarriage

7.6. Seats and safety harness

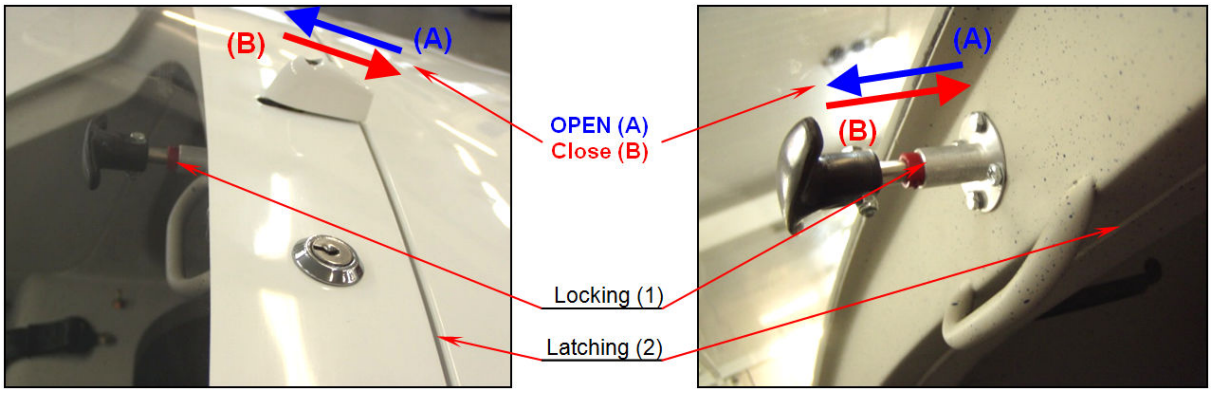
The plane has two side-by-side seats which are fixed, un-adjustable. The back support of the seats is glued into the fuselage construction as the frame. The safety belts – 4 point static harness restraint system is attached to the left and right seat side panel and to the strut behind the back support of the seats.

7.7. Baggage compartment

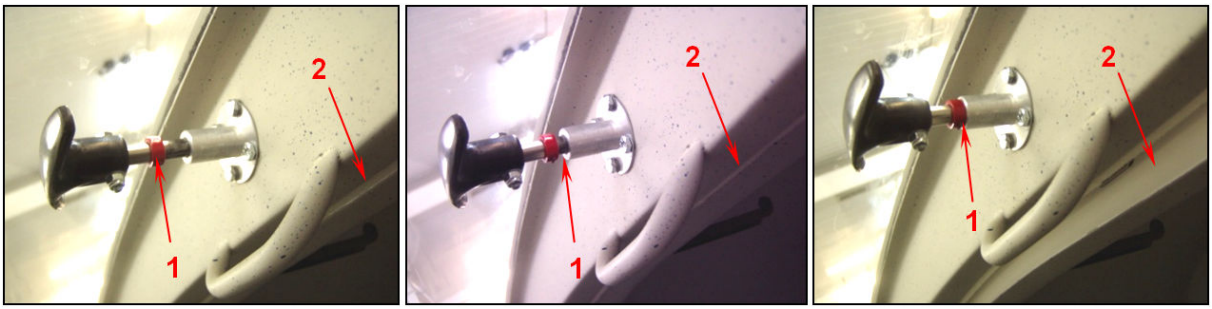
The baggage compartment is situated behind the seats. Maximum baggage weight is stated on a placard near the compartment. Hard objects may not be carried in the baggage compartment without a suitably designed lashing or anchorage.

7.8. Doors, windows and exits

The cockpit canopy consists of one part. The Plexiglas is glued on the composite frame. The canopy is attached to the front section of the fuselage by pins which make it possible for the canopy to be tilted forward. For easier manipulation, the weight of the canopy is counterbalanced by two gas struts which allow it to open effortlessly. On the lower frame there are handles outside the canopy. The canopy is equipped with a lock on the upper rear section of the frame (see Fig. 9) and the red ring on lock pin as the correct cockpit canopy locking indicator.



CORRECT *latching and locking* ***CORRECT*** *latching and locking*



Latched (2) but unlocked (1) ***WRONG!*** *Latched (2) but partially locked (1)* ***WRONG!*** *Clearly locked (1) but unlatched (2)* ***WRONG!***

Fig. 9 Cockpit canopy latching and locking

7.9. Powerplant

Powerplant consists of 4 cylinder horizontally opposed 4-stroke engine ROTAX 912 ULS and a 3-bladed in flight electrically adjustable propeller WOODCOMP SR2000D.

These engines are suitable for aircraft, but they must never fly at locations, airspeeds, altitudes, or in any other circumstances from which a successful no-power landing cannot be made, after sudden engine stoppage.

Engine:

ROTAX 912 ULS is 4-stroke, 4 cylinders horizontally opposed, spark ignition engine, one central camshaft-push-rods-OHV. Combined liquid cooled cylinder heads and ram air cooled cylinders. Dry sump forced lubrication. The engine is fitted with an electric starter, AC generator, mechanical fuel pump and the reduction gear with integrated shock absorber (Fig. 10). For more information regarding ROTAX 912 ULS see the Operator's Manual for engine ROTAX 912 ULS.

WARNING

Due to carburettors, flying in icing conditions is prohibited!

The periodic inspections must be performed according to the maintenance schedule (see the Maintenance Manual for ROTAX 912 ULS).

There are two laminated cowlings (upper and lower) which cover the engine compartment. The disassembly and assembly of the upper cowling is easy – just release the quick-closing locks. The upper cowling is usually removed during engine pre-flight inspection to check the engine compartment, operating fluids quantity (oil, coolant) and to check engine installation.

After removing the upper cowling of the engine, check the following:

1. Oil quantity check: Remove the cover of the oil tank. The oil level in the oil tank should be between two marks (max./min.) on the dip-stick, but must never fall below the min. mark.
2. Coolant quantity check: Remove the cover of the expansion tank. The coolant level in the overflow bottle should be between min. and max. mark.

The lower cowling is removed after unscrewing of attachment screws connecting the cooler to the cowling face side, and then unscrew the attachment screws connecting the cowling to the firewall border.

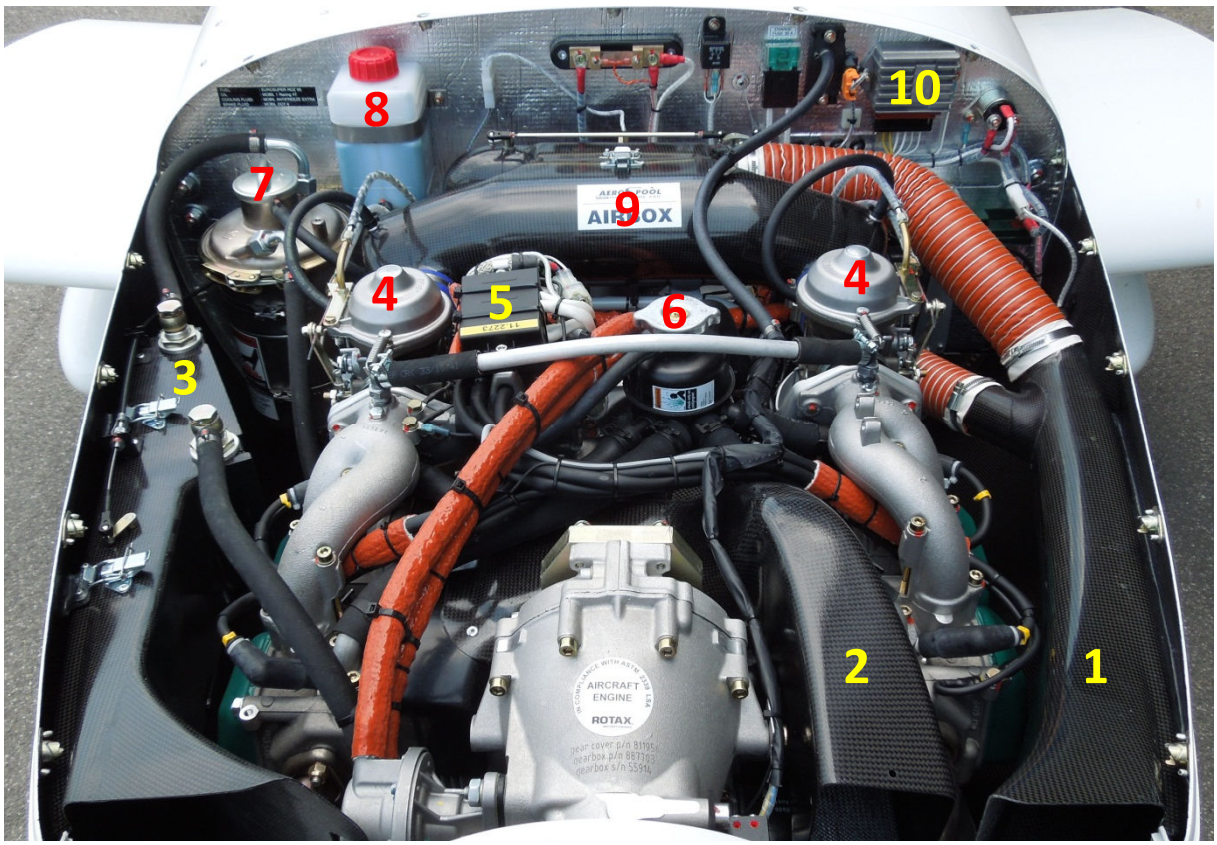


Fig. 10 Powerplant ROTAX 912 ULS

1. Cabin venting and engine intake	6. Expansion tank
2. Cooling air distributor to cylinders	7. Oil tank
3. Oil cooler	8. Coolant overflow bottle
4. Carburettor	9. Airbox
5. Ignition	10. Regulator

Propeller:

SR2000D is 3-bladed in flight electrically adjustable aircraft propeller with diameter 1700 mm of mixed structure. The propeller is controlled with electronic constant speed instrument which is shown below (Fig. 11). For operation instruction see Operation manual delivered by producer of equipment.

Fig. 11 Electronic constant speed instrument

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7.10. Fuel system

The integral fuel tanks are located in the forward box of the wing central panel and in wing's leading edge. The fuel system scheme is shown at figure below (Fig. 12).

The fuel is fed to engine driven fuel pump through the fuel selector located inside the cockpit below the instrument panel from the left or right fuel tank (in dependence on position of fuel selector). Fuel line between left fuel tank and fuel selector is equipped with an electric fuel pump. Engine driven fuel pump supplies the fuel into the carburettors through the fuel flow meter. Unconsumed fuel flows back through the return piping into the left fuel tank. In the fuel system is installed also fuel pressure sensor.

Fuel tank vent pipe is outgoing from the upper part of each fuel tank, proceeds along the rescue system board, inside of central tunnel and discharge through the lower surface of fuselage in front of main beam.

Fuel quantity indicators indicate the amount of fuel in left and right fuel tank. Red light annunciators will be illuminated when 7 litres of fuel remain in corresponding fuel tank.

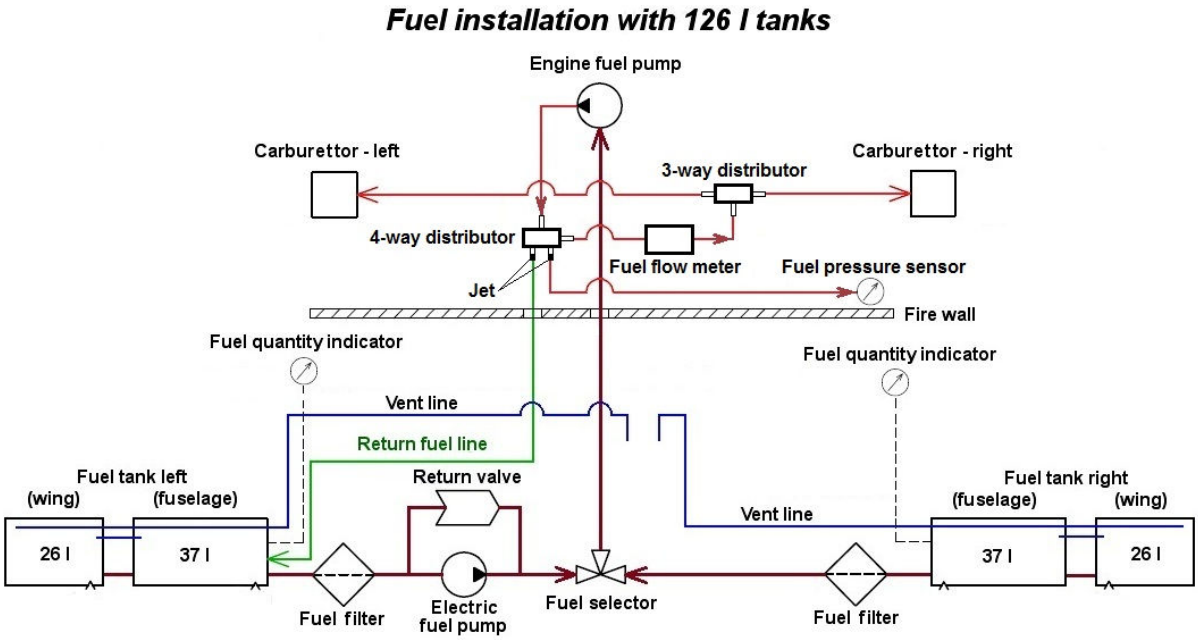

Fig. 12 The fuel system diagram

CAUTION

Electric fuel pump running when the left fuel tank is not selected can cause its damage!

NOTE

The tanks in wings are connected with the fuselage tanks with a hose. The hose diameter is not enough to fill the fuselage tank from wing tank when refuelling. Please wait when the fuel from the wing tank comes into the fuselage tank, and then fill up till the wing tanks are full!

The left tank must be used for all takeoffs and landings. When you are flying with full tanks, use the left tank for 30 – 40 minutes before changing to the right tank. This makes space in the left tank for the return of unconsumed fuel without venting it overboard.

Monitor the fuel quantity when you are doing long flights or flights with low fuel quantity. To maximize range/endurance when the red annunciator lights flash (7 litters of fuel in each fuel tank), the following procedure is recommended:

1. Select the right tank and use this tank until all the fuel is consumed.
2. Change back to the left tank where more than 7 litres of fuel due to fuel return is. (7 litres of fuel allows approximately 20 minutes of flying depending on power settings).
3. Continue flying and landing procedure with the electric fuel pump on as written in this manual.

NOTE

When the fuel tank annunciator starts to flash there is about 7 litres of fuel in the fuel tank what allows approximately 20 minutes of flying depending on power settings!

7.11. Electrical system

There are electrical system diagrams in the Maintenance Manual for the airplane WT9 Dynamic LSA Club LT. The wiring system depends on instrumentation and other electric equipment of an individual airplane according to a customer's desire. The dual engine ignition is a separate part of the electric system. Each of two ignition circuits has its own break switch. The detailed description of the ignition and the AC generator is listed at the Operator's Manual for ROTAX 912 ULS engine.

7.12. Pitot and static pressure system

The Pitot probe for the airspeed indicator is located bellow the right wing. Pressure distribution to individual instruments in the cockpit is done through flexible plastic hoses. The static pressure receivers are located on the both sides of the fuselage behind the cockpit. Keep the system clear to assure its right function.

7.13. Avionics

The following avionics are mounted in the airplane: radio and intercom. This equipment must be connected with the headphones and with the antenna. The airplane might be equipped with other instruments such as GPS, transponder, board computer. These flight and navigation instruments are mounted as an option of the customer (see Section 9). For right operation of the instruments and for more details see the corresponding manuals supplied with installed instruments.

7.14. Miscellaneous equipment

Rescue system Magnum 601 S-LSA:
Not installed.

8. AIRPLANE HANDLING, SERVICING AND MAINTENANCE

8.1. Introduction

This section contains factory recommended procedures for proper ground handling and servicing of the airplane. It also identifies certain inspection and maintenance requirements which must be followed if the airplane is to retain that new-plane performance and dependability. It is wise to follow a planned schedule of lubrication and preventive maintenance based on climatic and flying conditions encountered.

The airframe surfaces should be protected with light plastic foil or cloth cover against dust. All engine intakes, vents, the fuel vents and pitot static system should be covered before long term airplane parking or storing, due to contamination by foreign objects (insects, birds).

The external surfaces of the airplane should be washed with a sufficient quantity of the water and an adequate quantity of detergent. Do not apply petrol or chemical solvents for cleaning the external surfaces of the airplane.

It is advisable to park the airplane inside a hangar or eventually inside other weather-proof space with stable temperature, good ventilation, low humidity and dust-free environment. The parking place should be protected against possible damage caused by sun radiation, humidity and wind. Sunbeams reflected through the canopy can magnify and may cause spot heating, which can create damage to the cockpit area and the upholstery.

8.2. Airplane inspection periods

8.2.1. Powerplant

The engine periodic inspections and maintenance are conducted according to the procedures contained in the Maintenance Manual for ROTAX 912 ULS.

Daily inspection:	Is carried out in accordance with the instructions for execution of the pre-flight inspection, which are contained in Section 4, item 4.4.
Check after 25 hr. of operation:	Must be carried out according to the Maintenance Manual for ROTAX 912 ULS Series.
Check after 50 hr. of operation:	Must be carried out according to the Maintenance Manual for ROTAX 912 ULS Series.
100 hr. check:	Must be performed according to the Maintenance Manual for ROTAX 912 ULS Series every 100 hr. of operation or 1 year, whichever comes first. The renewal of the spark plugs, the fuel filter and the coolant are carried out after 200 hr. of operation.
TBO (Time Between Overhaul):	2000 hr. or 15 years, whichever comes first.

Oil change

It must be performed according to the Maintenance Manual for ROTAX 912 ULS Series. There is an oil drain screw at the bottom of the oil tank. There is an oil filter at the left side beside the propeller gearbox. At every oil change, replace the oil filter and open the old one with special tool, to ensure the engine is not producing chips. Remove filter insert, cut top and bottom cover off, unroll and check it for metal chips, foreign matter, contamination and abrasion. This check is important as it allows conclusions regarding the condition of the engine and gives information about a possible cause of any failure.

8.2.2. Propeller

The propeller in operation does not require any special maintenance. In case of propeller contamination wash its surface with a piece of cloth dipped in warm water with addition of the usual detergent. The operator is allowed carry out repairs to common little nicks on the leading edges, up to a maximum size of 4 mm. This repair can be done by using epoxy resin with filler. The damaged place is to be degreased and fill with resin. After hardening the resin the repaired area is to be sanded and protected with enamel or varnish of the epoxy or polyurethane type. Replace the parts supplied by producer and remove the cone from the propeller. Any other dismantling is forbidden. The repair of large damage must be carried out by the manufacturer or by an authorised service centre. Operator's Manual for propeller WOODCOMP SR2000D includes additional information about maintenance.

TBO (Time Between Overhaul): 1500 hours.

8.2.3. Airframe

Daily inspection: Is carried out in accordance with the instructions for the execution of the pre-flight inspection, which are contained in Section 4.4.

Check after 25 hr. of operation: It must be performed according to the Maintenance Manual for WT9 Dynamic LSA after the first 25 $\pm$ 2 hr. operation together with the engine check. The scope of this check is same as the check after 50 hr. of operation.

Check after 50 hr. of operation: It must be performed according to the Maintenance Manual for WT9 Dynamic LSA after the first 50 $\pm$ 3 hr. of operation together with the engine check. The scope of this check is same as the check after 25 hr. of operation. The following work should be carried out:

1. **Fixed undercarriage**: Check the legs attachment into the wing central panel and into the fuselage. Check the control of the nose wheel, brakes and tyres.
2. **Outside surface check**: Check all control surface shafts, the rods, the articulated joints, the hinges, the control cables, and the auxiliary tail skid. Sparingly lubricate the control service hinges. Thoroughly clean and lubricate the piston rod of the canopy gas struts.
3. **Check the control cable guides**: Lubricate the roller-bearings of the elevator control rod.
4. **Check charging:** Charge battery if necessary, cleaning.
5. **Powerplant:** Visually check the hoses for condition, damage, leaks, attachment and security, the rubber flange of the air filter for cracks. Visually check exhaust system for condition, cracks, deformation or damage. Lubricate the bowden cable for throttle and starting carburettor (choke) (see the Maintenance Manual for ROTAX 912 ULS).
6. **Check the brake fluid level**: Check the fluid level in the brake system unit, which is located under the pilot seat. Check the brakes for operation.
7. **Control surfaces deflections:** To check the control surfaces deflections see Control Surfaces Deflections Record, which is contained in the Maintenance Manual for WT9 Dynamic LSA.

100 hr. check: Must be performed every 100 hr. of operation or 1 year, whichever comes first. This inspection must be performed by qualified staff. The scope of this inspection is the same as the check after 50 hr. of operation covering the following work:

1. Full cleaning of the airplane.
2. Check airplane surfaces for mechanical damage and cracks.
3. Pay special attention to:
   - Undercarriage and its attachment into the wing central panel.
   - Wing-fuselage connection reliability, clearances, spar ends state.
   - Engine mount, welded areas, rubber engine mounts, security of attachment bolts: engine-engine mount, engine mount-firewall.
4. Visually check condition and integrity of wires, check charging – charge battery, function of the signal bulbs, function of the fuel quantity indicator, fuel drains and fuel vents for blockages, fuel filters.
5. Visually check condition of the instruments and the avionics (connector, a plug) and for correct operation.
6. Lubricate according to the Lubrication Chart.
7. Check tyres for condition, cuts, uneven or excessive wear and slippage – replace if needed.

Lubrication Chart:

The manufacturer recommends using grease and oil without acid for lubrication only. Apply the lubricants sparingly without contaminating of the airframe.

Check condition of the bearings of the main wheels – clean and lubricate if needed, at least every 2 years.

Check condition of the bearings of the nose wheel – clean and lubricate if needed, at least twice per year.

Lubricate: Main and rear spar pins.
The axle of the nose wheel leg.
Guide tube of the flap control lever.
The pins of the nose undercarriage leg and support bearings.

Sparingly lubricate: The hinges of the control surfaces, movable parts of the control surfaces, bearings of the ailerons, the pedals and the brake control lever, all control cables at inlet into the terminations (in engine compartment).

Battery:

The aircraft is equipped with 17 Ah lead-acid battery. The powerplant is equipped with an AC generator, which recharges the battery in the flight.

Battery is dry and hermetically closed. It doesn't release any toxic or explosive gas. The battery needs a visual check of the attachment and security.

Rubber parts:

All rubber parts (hoses, tyres, etc.) have to be changed after 5 years of operation.

8.3. Airplane alterations or repairs

It is essential that the responsible airworthiness authority be contacted prior to any alterations on the airplane to ensure that the airworthiness of the airplane is not violated. For repairs refer to the applicable Maintenance Manual. The operator is allowed replace parts supplied by the producer only. The repairs to damaged skin must be carried out by qualified staff in accordance with approved procedures.

WARNING

After airplane repairs, repainting or mounting of additional instruments or equipment it is necessary to check weights and CG positions!

8.4. Ground handling / Road transport

The airplanes can suffer higher stress loads on the ground than in the air. In this case it can result a potential menace of the safety, as the airplane construction is designed for the manoeuvring load. The high aircraft normal accelerations are occurred at the hard landing, during the taxiing at the rough surface and during the driving through a hole at road.

Don't use unnecessary transportation in the road.

CAUTION

The airplane is equipped with mooring eyes which are screwed into the threaded hubs on the wing lower surface located approx. half way along the wing. It is also necessary to moor the nose wheel landing gear!

CAUTION

Push or pull the airplane from the propeller blade root only, never at the wing tips or the control surfaces!

8.5. Cleaning and care

Regular cleaning and care of the powerplant, propeller, wings and the airframe is the first consideration for safe and efficient operation. Cleaning and care should be based on climatic and flying conditions. The exterior painted surfaces should be cleaned with clear water using a sponge or soft cotton towel and chamois. These surfaces should also be protected with a silicone free hard wax reapplied at least once a year by hand or with a rotating cloth disc.

Clean the Plexiglass canopy only as necessary using a soft cotton towel and clear water mixed with a small amount of mild detergent. Protect the canopy with anti-static cleaning agents which are made specifically for Plexiglas.

CAUTION

Do not clean the canopy with alcohol, acetone or lacquer thinner, because the canopy is made from acrylic. Acrylic becomes fragile after contact with these liquids!

8.6. Winter operation

The cooling system of the cylinder heads is filled with a mixture of anti-freeze and water, which protects the cooling system against freezing up to -38 °C. Check coolant with dense meter or glycol tester before winter operation to prevent the failure of the radiator or cooling system due to ice.

If the temperature is below this value, the coolant must be drained or renewed with pure anti-freeze liquid. The coolant must be renewed every two years. Use only coolant according to the current Operator's Manual for ROTAX 912 ULS.

If low cylinder head or oil temperatures occur during operation under low outside temperature, then the following is recommended:

Cover a part of radiator face by a duralumin sheet or drawing paper of appropriate dimensions, insert it between the radiator and the bottom engine cowling.

Cover the oil cooler face or a part of the face only, by a duralumin sheet or drawing paper attached with a suitable adhesive tape (or bend the oil cooler with that tape) and lag the oil tank.

CAUTION

The temperature limits of the coolant, cylinder heads and oil must be checked after these arrangements!

I winter operation is advisable to disconnect the ventilation intake hose (VIH) (Fig. 13) due the better performance of heating system. After disconnecting the ventilation intake hose close the socket for the hose. Otherwise the ram air will be lost through this opening.

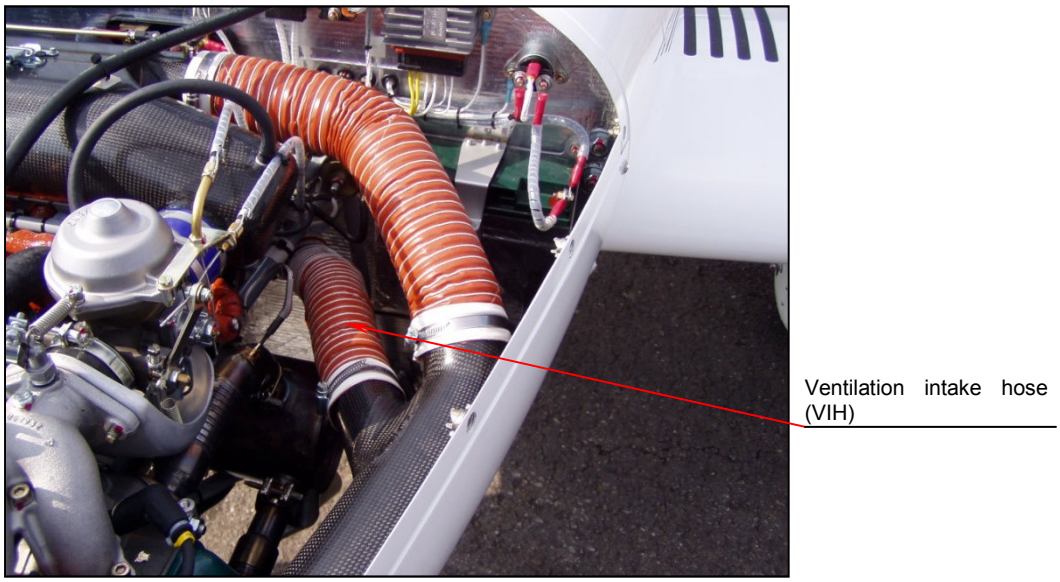

Fig. 13 Ventilation intake hose

9. SUPPLEMENTS

9.1. Introduction

This section contains the appropriate supplements necessary to safely and efficiently operate the airplane when equipped with various optional systems and equipment not provided with the standard airplane.

NOTE

Additional individual equipment in accordance with a customer's request will increase the airplane empty weight and reduce the allowed useful load!

9.2. List of inserted supplements

Inserted supplements are listed in "Checklist of equipment" which is part of production documentation.

9.3. Supplements inserted

For operation and handling with inserted supplements see corresponding Operation manuals.