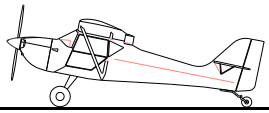


AEROPRO , *Production of UL Planes*
Dlha 126, 949 07 NITRA Slovakia
www.aeropro.sk

Pilot Operating handbook

And

Flight training supplement

AEROPRO + EuroFOX Aviation

EuroFOX

Aircraft Type:

EuroFOX Tail wheel Version

Serial Number:

Registration:

Date of Issue: Feb 2018

Stamp, Signature

This aircraft kit was manufactured in accordance with CS VLA airworthiness standards and approved by the UK LAA. It does not conform to standard category airworthiness requirements.

AIRCRAFT DATA

	Type	Production	Serial Number:	Year of production
Fuselage	EUROFOX Tail Wheel	AEROPRO		
Engine	ROTAX 912 ULS 912iS 912ULS EP modified	BOMBARDIER-ROTAX GMBH AUSTRIA Edge Performance Norway		
Propeller	SR200 Propuls DUC Swirl and Windspoon	Woodcomp Czech Rep DUC France		

…… ……

Signature Stamp

0.1 RECORD OF REVISIONS

Any revisions or amendments to the present manual shall be issued in the form of bulletins with attached new pages. It is in the interests of every user to enter such revision into the table of revisions and to replace the existing page by the new one. The revised or corrected text shall be indicated by a vertical line on left page margin and the page shall bear revision number and date of its issue.

Rev. No.	Pages Affected	Date of Issue	Bulletin Number	New Page Inserted	Signature
1	Initial issue	Nov 11			
2	Parachute added	Mar 13			
3	912iS added	April 14			
4	Operating limits clarified. Chap 3.5	October 14			
5	Additional prop	Jan 2015			
6	4 wing tanks	Aug 2017		Para 2.3 modified	
7	120hp engine upgrade	Feb 2018		Para 2.2 new Para 7 new	

TABLE OF CONTENTS:

1. General information

1.1 Introduction

This handbook is provided with your aircraft to allow you to attain as much knowledge about the aircraft and its operation as possible. Read this manual thoroughly before your first flight and make sure you understand all the information contained here. This aircraft is equipped with a non-certified engine. When flying the aircraft always ensure that a safe landing would be possible in the event of loss of engine power. Pay attention to the fact that you as the pilot are fully responsible for safety of your passengers and persons or property on the ground.

1.2 Certification Basis

This aircraft kit was manufactured in accordance with CS-VLA airworthiness standards approved by the UK LAA

1.3 Manufacturer

AEROPRO s.r.o
Dlhá 126
949 07 Nitra
Slovak Republic
www.aeropro.sk

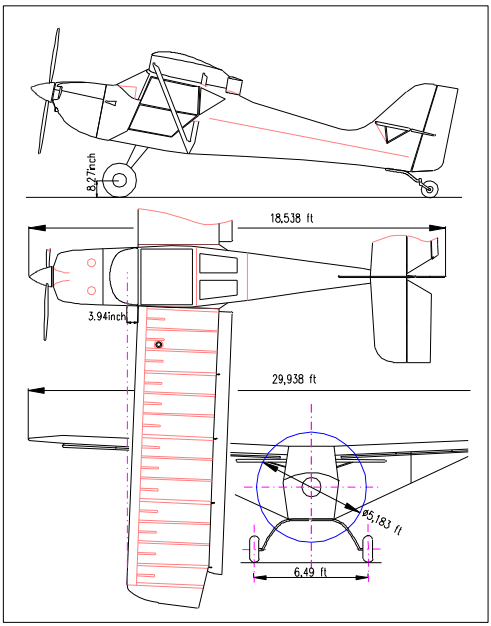
UK and Ireland Distributor www.eurofoxuk.co.uk

1.4 Warning, Caution and Note

In this handbook the following is used to highlight especially important information:

WARNING	**Information which could prevent personnel injury or loss of life**
CAUTION	Information which could prevent damage to equipment
NOTE	*Information of special importance to pilots*

2. Aircraft and Systems Description



The EuroFOX is designed as a high-wing monoplane. A two-spar wing is equipped with flaperons. The fuselage is an open truss structure welded with steel tubes. The tail unit is formed from a lattice-work tube frame. The Aircraft is equipped with tricycle landing gear and incorporates a steerable nose wheel.

Wing span.....9,125 m

Length.....5,605 m

Height .....2,25 m

Wing area with flap .....11,4 m^2

Chord length without flap.....1,12 m
with flap.....1,3 m

Wing loading .....39,47 kgm^{-2}

Aspect-ratio.....7,3

Propeller clearance in flight condition (Woodcomp SR200).....0,220 m

2.1 Engine

The EuroFOX is powered by ROTAX 912 UL, 912ULS, 914UL, 912iS Sport or 912ULS modified (120hp) engines. It is a four-cylinder, four-stroke, horizontally opposed-cylinder, centre-camshaft engine with over-head valves. Engine cooling is of a combined type, cylinder heads are water-cooled, while cylinders are air-cooled. The engine has dry sump lubrication. The ignition system is of a dual, distributor less and capacitor flywheel magneto type. The engine is equipped with an electric starter, AC generator and a mechanical fuel delivery pump, with optional additional electric pump. The propeller is powered from an integrated reduction gear with mechanical damping.

Engine manufacturer.....ROTAX GmbH., Austria

Engine model .....ROTAX 912 ULS 100hp

Max. power - take-off..... 73.5 kW / 100 HP

- continuous ..... 69.0 kW / 94 HP

Max. engine speed (MSL) - take-off..... 5800 r.p.m. (max. 5 min)

- continuous .....5500 r.p.m.

Max. cooling liquid temperature .....120 °C

Max. oil temperature.....130 °C

Oil pressure - minimum ..... 0.8 bar

- maximum ..... 7 bar

Oil consumption .....max. 0.1 l/h

Fuel pressure - minimum ..... .0.15 bar

- maximum ..... 0.5 bar

Consumption at starting.....16.2 l/h

Consumption at 75% of power rating .....12.1 l/h

Specific consumption.....285 g/kWh

Fuel pressure - minimum ..... 0.15 bar

- maximum ..... 0.40 bar

Propeller gearbox reduction ration ..... 2.43 : 1

For more details see **Operator's Manual for all versions of Rotax 912/914** supplied with the engine.

2.2 The 912ULS EP Modified 120 hp engine

Engine manufacturer .....ROTAX GmbH., Austria.

Modification - Edge Performance, Norway

Engine model **ROTAX 912 ULS EP modified** 120 hp

Max. power - take-off.....120 HP

- continuous ..... 117 HP

Max. engine speed (MSL) - take-off..... 5800 r.p.m. (max. 5 min)

- continuous .....5500 r.p.m.

Max. cooling liquid temperature .....120 °C

Max. oil temperature.....130 °C

Min. oil temperature.....50 °C

Oil pressure - minimum ..... 0.8 bar

- maximum ..... 7 bar

Oil consumption .....max. 0.1 l/h

Fuel pressure - minimum ..... .2.0 bar

- Normal.....2.2 - 3.1 bar

- maximum ..... 3.5 bar

Max. EGT temperature .....880°C

Caution EGT temperature.....800 °C

Propeller gearbox reduction ration ..... 2.43 : 1

WARNING

This aircraft is equipped with non-certified engine.

When flying the aircraft always ensure that a safe landing would be possible in the event of loss of engine power. The pilot is fully responsible for consequences of such failure.

2.3 Propeller

Four ground adjustable propellers are approved on the EuroFOX with 912ULS or 912iS engines.

Duc Windspoon is specifically for aerotowing. The Woodcomp Propuls or the Woodcomp Sr200 are standard issue with the kit, the DUC swirl is an upgrade option. For general flying all these 3 props are fine, perhaps the Propuls being the smoothest, but it can vary from one engine to another.

For setting up the pitch of these props, please refer to the build manual.

For additional propeller information see **Operators Manual and Technical description** supplied with the propeller.

2.4 Fuel and fuel capacity

Fuel tank capacity - wing tanks .....2x 40 litres

- central connecting tank..... .6 litres

Max. fuel quantity…..... .86 litres

Usable fuel quantity ..... .85 litres

Unusable fuel quantity ..... .1 litre

Fuel specification EN228 min RON 90 unleaded Mogas fuel (Standard Spec. for Automotive Spark-Ignition Engine) or AVGAS 100 LL.

Due to the higher lead content in AVGAS, the deposits in the combustion chamber and lead sediments in the lubrication system will cause an increase in the wear of the valve seats. Therefore, use AVGAS only if you encounter problems with vapour lock or if other fuel types are not available.

For additional information concerning fuel specification consult **Operator's Manual for all versions of Rotax 912** supplied with the engine and the most recent updates as issued by Rotax.

The fuel system includes two wing tanks of 40 litres each, a central tank of 6 litres, Fuel drain valve, fuel valves, a fuel filter, an engine fuel pump and connecting lines. Fuel tanks and fuel lines are suitable for fuel containing ethanol.

The fuel is gravity-fed from the right-hand or left-hand wing tank into the 6L central tank depending on which wing tank fuel valve is open. The fuel is then further directed from the central tank via the main fuel valve and fuel filter into the mechanical fuel pump on the engine which delivers the fuel to the carburettors. (additional electric fuel pump optional)

The amount of fuel in each tank is indicated by a wing root visual fuel gauge which is a part of each tank. Minimum fuel quantity in the central feeder tank is indicated by a warning light on the instrument panel. When remaining fuel is 4,1 litres, the light will illuminate and this means enough fuel for approximately 10 minutes of flight. The warning light condition can be verified at any time by pushing the control button. No red light indication when the control button is pushed and held means the bulb is blown out and the minimum fuel quantity is not indicated:- In this case, make a more conservative estimate for fuel on board, check fuel quantity in wing tanks and land as soon as you are not confident of the fuel quantity inside the wing tanks.

Do not forget to properly open and manage the main fuel tank valves to ensure continuous flow of fuel to the engine.

The fuel drain valve outlet is behind the left seat on the outside bottom side of the fuselage; to drain off water and dirt, the drain pipe is to be pressed into the fuselage and subsequently a fuel sample is to be taken.

For refuelling information see section 10.1

Four Wing Tank Option

An approved factory fitted option of two additional wing tanks (one each side) proving an extra 80 litres fuel capacity.

With this extra tank modification, a separate fuel line from each individual tank feeds and exits on the underside of the wing, close to the wing root. These feed a single 3 way valve (one per wing) inside the cabin, with the selections being – inboard tank, outboard tank or off. (see photo)

A single fuel line then exits this 3 way valve to the header tank and then to the most forward main fuel valve by the pilot (below panel). Excess fuel that is not used by the engine is returned via a fuel line to the header tank.

Guidance for 4 tank operation.

1. The aircraft additional outboard tanks should only be used if additional fuel to the standard inboard 2 x 40 litre tanks is needed. The two inboard tanks are used as first choice for normal operations and only if more fuel is needed, then the outboard tanks should be used additionally. Outboard tanks should be kept empty if possible when not required.

2. If the outboard tanks contain fuel, these must be used first and exhausted if possible before switching to the inboard tanks.

3. Whichever wing tanks are used, the main fuel valve under the panel will always be in the fully on position during flight.

4. When the aircraft is flown with fuel in all 4 tanks the pilot will use the a single outboard wing tanks first with inboards shut off. There is no direct fuel gauge for the outboard tanks, the header “4 litres remaining” warning light, located on the panel, can be used to gauge each of the outboard tanks separately. Suggested fuel tank selection sequence to be used is:

a) Port outboard until empty (using warning light or a flight time)

b) Starboard outboard until empty

c) Both inboards, or if pilot wants to select only one, Port inboard

The two inboard tanks are then monitored using the sight gauges in the wing roots as normal.

Red warning light and bulb test button. Wing tank selector (one per side)

5. Do not fold the wings with more than approx 20 litres in the inboard tanks. Ideally the outboard tanks should be empty when wings are folded, or as a maximum 20 litres for a short duration (overnight for example).

2.5 Oil

Oil tank capacity..... 3.2 litres

Maximum oil quantity..... 2.6 litres

Minimum oil quantity ..... 2.1 litres

Oil specification:

When selecting the most suitable lubricants refer to the latest recommendations issued by Rotax.

- Use only oil as recommended by Rotax
- Oils primarily for Diesel engines are **insufficient** due to **high temperature properties and additives which favor clutch slipping, are generally therefore are unsuitable.**

CAUTION**:** If the engine is mainly run on AVGAS **more frequent** oil changes will be required. See the latest Rotax Service Information.

For additional information concerning oil system consult **Operator's Manual for all versions of Rotax 912** supplied with the engine, with supplements as issued periodically by Rotax.

The maximum and minimum oil level is indicated by two marks on the dip stick in the oil tank.

2.6 Operating weights and loading (occupants, baggage, fuel, ballast)

Typical empty weight (standard version) .....289 kg

Max. take-off weight.....560 kg

Max. landing weight.....560 kg

Max. fuel weight.....61 kg

Max. baggage weight in baggage compartment .....20 kg

Maximum number of persons on board…… …2

Minimum crew weight .....55 kg

Maximum loading per seat.....120 kg

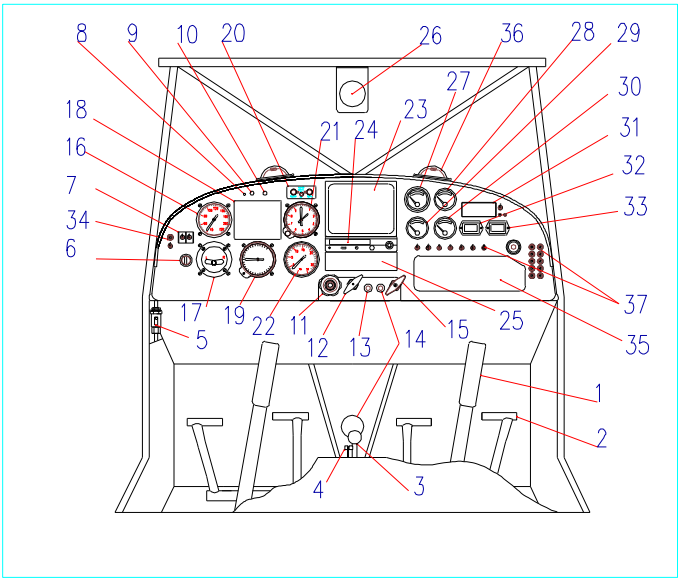
WARNING

Make sure that above mentioned weight limits are strictly followed.

Structural failures which result from overloading of the aircraft may be dramatic and catastrophic.

The additional stress placed on the structural parts by overloading can accelerate the occurrence of metal fatigue failures. Also flight characteristics might change significantly when the aircraft is overloaded. Takeoff and landing distance are significantly longer for overloaded aircraft. Overloading and out of balance loading of the aircraft is one of the most common causes of accidents.

2.7 Cabin overview (guide only)



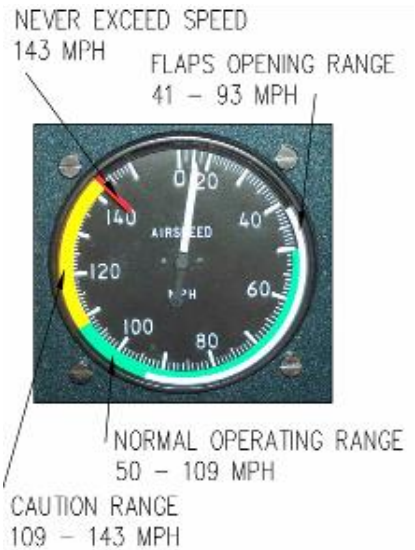


Figure 1 - Airspeed Indicator marking

TYPICAL LAYOUT OF THE PANEL CONTROLS AND INSTRUMENTS

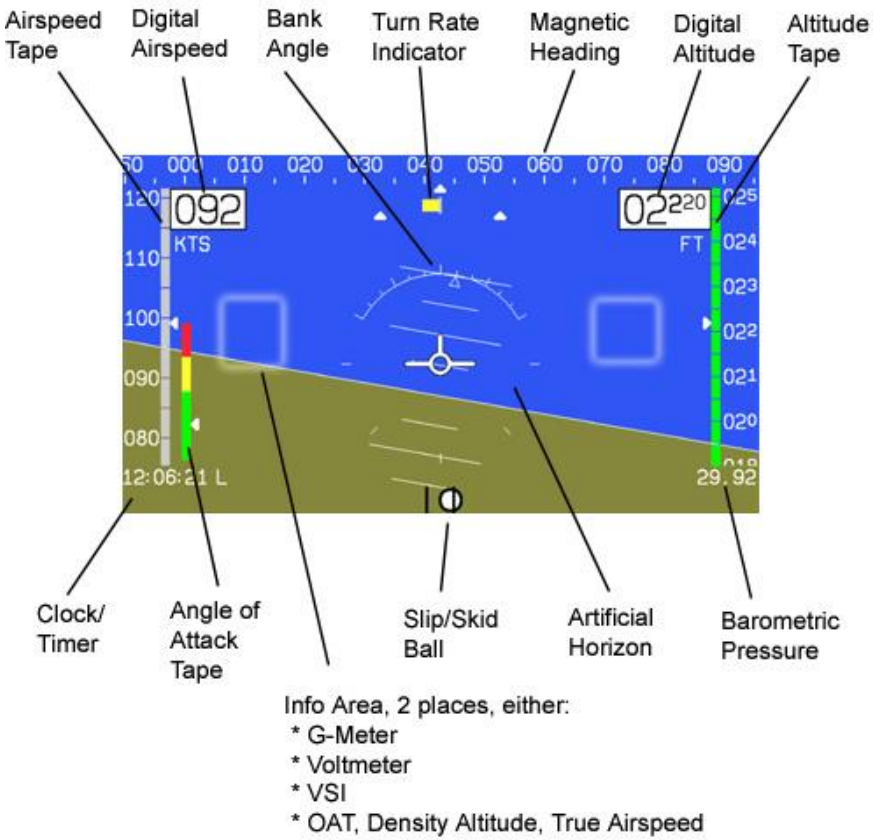
(see following pages for details, however the Kit builder has freedom to organise the panel to his or her wishes – this is only a guide as each aircraft will be different)

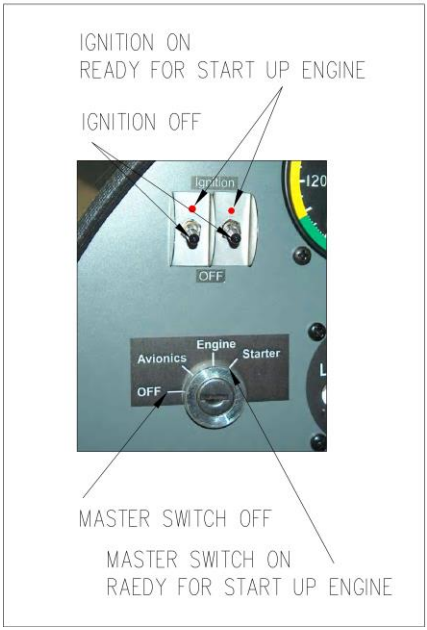
1. Control stick
2. Rudder pedals
3. Wing flaps
4. Trim elevator
5. Fuel cock
6. Master Switch
7. Ignition
8. Min. fuel pushbutton
9. Last 4 liter warning light
10. Charging light
11. Throttle control lever
12. Brake with park brake
13. Carb heat.
14. Heater
15. Choke
16. ASI
17. Slip Ball indicator
18. EFIS – D6 or D10
19. VSI
20. INTERCOM
21. Altimeter
22. RPM indicator
23. GPS
24. Radio
25. Transponder
26. Magnetic Compass
27. Oil temperature
28. Oil pressure gauge
29. Head temperature gauge
30. Fuel pressure gauge
31. Outside temperature.
32. Flight hours gauge
33. Engine hour gauge
34. Switch for Electric fuel pump.
35. Compartment for maps
36. Ventilation
37. Switch + circuit breakers
37.1 Landing light
37.2 Strobe light
37.3 Gyro or EFIS
37.4 Free
37.5 Radio
37.6 Transponder
37.7 GPS

II. List of installed instruments and other equipment:

	Type	Serial No.
Airspeed indicator	BK -32	
Altimeter	BG – 3H	
Vertical speed indicator	BC - 2A	
Bank indicator	BZW-4B	
Magnetic compass	CM – 13 S	
Fuel pressure	BDT1/31/B	---
RPM + engine hours	VDO	---
Oil pressure gauge	VDO 999 161 011	---
Oil temperature gauge	VDO 999 161 019	---
Cylinder Head temperature gauge	VDO 999 161 019	---
Flight-hour meter		
Engine-hour meter		
GPS		
Intrecom		
Radio		
Transponder		

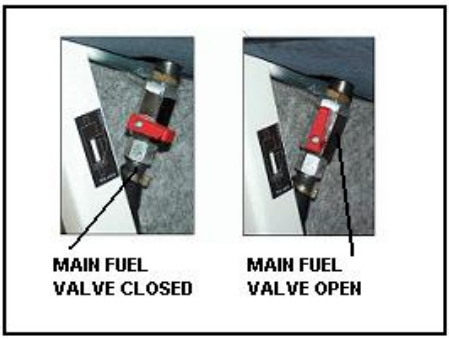
Screen example of an Electronic Flight information System

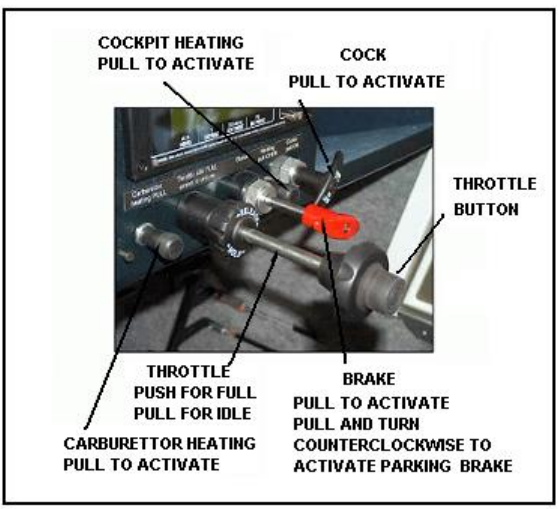




Ignition and master switch

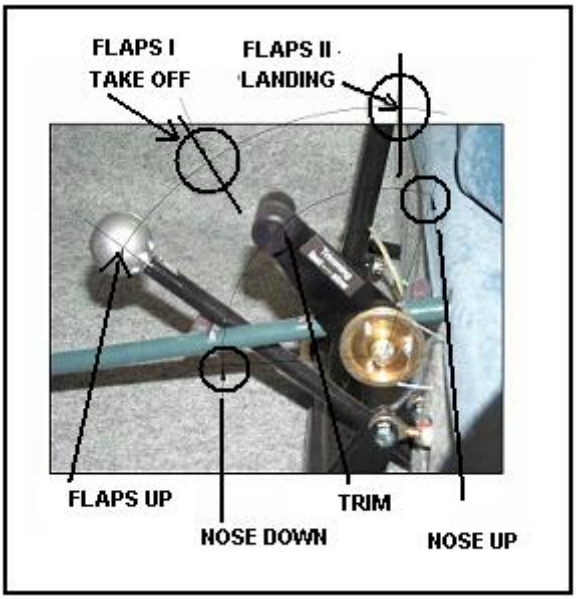
Main Fuel Valve open and close position





Central panel

Note if a vernier style throttle body is fitted: Rotate throttle knob for fine power settings (clockwise to increase power, counterclockwise to reduce power), for larger changes push/pull throttle when the central button is pressed and held



Intuative flap and trim levers located between P1 and P2 seat position

Example of switch and fuse layout

Warning lights and fuel reserve bulb check button

Door locking mechanism

The battery (Dryfit A500, 12 V, 16 Ah) is located behind the right-hand pilot's seat. Nominal voltage in aircraft system is 13.5 to 14.2 V. The engine is equipped with integrated AC generator with external rectifier-regulator (12 V, 20A DC). A lithium battery option is also available.

3. Operating limitations

MPH	
IAS	CAS
40	43
45	48
50	52
60	61
70	70
80	78
90	87
100	96
110	105
120	115

Airspeed indicator system calibration:

All flight speeds are presented as indicated airspeeds in miles per hour (MPH). As the calibrated airspeed cannot usually be determined by simple reading of the aircraft airspeed indicator, corresponding calibrated airspeed in miles per hours (MPH) are also presented in this document. All airspeed values in this handbook assume no instrument error. The pitot dynamic tube head is located on the port underside wing. The static tube reference is in the cabin.

3.1 Stall speed at maximum takeoff weight (V_S and V_{SO})

Aircraft configuration	Stall speed Mph – angle of bank 0°	
	IAS	CAS
Flaps down (V_{so})	41	45
Flaps up (V_s)	49	51

WARNING

The stall speed mentioned above are with wings level. Once any angle of bank (e.g. turn) is encountered the stall speed is significantly increased.

Example: angle of bank – 60° ……. V_S= 73 MPH

The more bank – the higher stall speed. This simple rule is especially important when a turn at maximum permitted angle of bank (60°) is performed. Do not start the turn until you have sufficient airspeed reserve – recommended entry speed is 92 MPH. Full throttle is also essential to have sufficient thrust reserve as the drag is increased during a steep turn.

3.2 Flaps extended speed range (V_{SO} to V_{FE}) Mph

	IAS	CAS
Lower limit	41	45
Upper limit	93	90

3.3 Maximum maneuvering speed (V_A) Mph

	IAS	CAS
Max. manoeuvring speed (V_A)	109	104

3.4 Never exceed speed (V_{NE}) Mph

	IAS	CAS
Never exceed speed (V_{NE})	143	134

3.5 Crosswind limitation

Maximum permitted wind speed components for take-off and landing:

Crosswind…….. 15 mph (12 knots)

The EuroFOX has demonstrated to be able to cope well with crosswinds exceeding this, especially with more experience pilots.

Cross wind take offs and landings require training and experience, the higher the crosswind component, the better your skill must be. Do not fly without proper experience when the wind speed is approaching the limit.

Avoid take offs with tail wind when possible – the total take off distance is significantly longer and longer ground distance is required to gain altitude.

When landing with tail wind the aircraft ground speed is higher resulting in a longer landing distance.

3.6 Service ceiling

Ceiling.....14 760 ft

WARNING	**Oxygen mask and/or other equipment required to reach maximum ceiling, consult respective regulations.**

3.7 Load factors

Flaps up:

Maximum positive centre of gravity load factor..... + 4 Gs

Maximum negative centre of gravity load factor ..... - 2 Gs

Flaps down:

Maximum positive centre of gravity load factor..... + 2 Gs

Maximum negative centre of gravity load factor ..... 0 Gs

3.8 Prohibited manoeuvers

WARNING	**Aerobatics and intentional spins are prohibited.** **Maximum angle of roll, port and Starboard: 60°** **Maximum angle of pitch up and down: 45°**

3.9 Other Limitations

WARNING	**No smoking**

WARNING	**Flights with rear "turtle deck" canopy removed are prohibited**

WARNING	**Only VFR day flights at ambient temperature above -10° C are permitted.** **Flights at ambient temperature between -10° C and 0° C are permitted only under no icing conditions and when the carburettor heating is activated (if fitted).**

WARNING	**IFR flights and flying in cloud is prohibited.** **Flight into know icing conditions is prohibited**

This aircraft is not certified for operation in IMC (Instrument meteorological conditions). Always stay clear of clouds and have visual contact with the ground. Follow the airspace classification regarding distance from clouds. Always evaluate the weather during your flight and try to get weather information from your destination using the radio whenever possible. When weather is deteriorating make a diversion or turn back before low cloud base and/or low visibility are outside local licence requirements.

4. Weight and Balance Information

4.1 Equipment list possible

		VFR Day
	Airspeed indicator	X
	Turn Bank indicator	X
	Attitude indicator	X
	Altimeter	X
	Magnetic compass	X
	Vertical speed indicator	X
Oil Pressure indicator		X
Oil temperature indicator		X
Fuel pressure indicator		X
Cylinder head temperature		X
Radio		X
Intercom		X
Transponder		X
ELT		X
12V socket		X
Additional as builders spec		X

4.2 Center of gravity (CG) range and determination

Aircraft handling and performance have been determined for this range of CG positions.

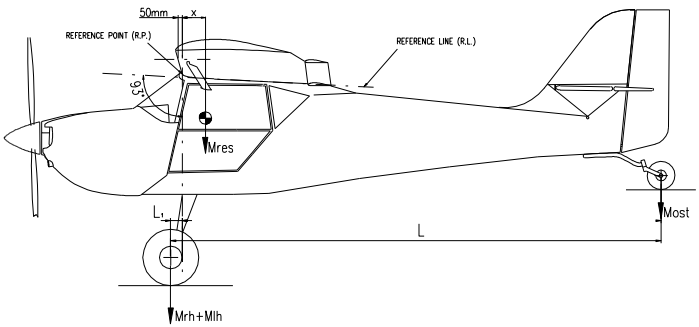
	Front limit (mm)	Rear limit (mm)
Centre of gravity limits	259	442

4.2.1 Aircraft weight and balance statement

The CG position of the empty aircraft is determined by weighing. The procedure is described in the Maintenance manual and in LAA publications. The whole procedure must be repeated and new **Aircraft weight and balance statement** be prepared whenever a modification or repair having an impact on the weight of the aircraft occurs.

Serial Number		**Registration:**	

Aircraft Leveling: Bottom of door entrance level at zero degrees



Values Weighed:

Main wheels	right-hand	MRH =	kg	L=	mm
	left-hand	MLH =	kg	L_1=	mm
Tail wheel		MTS =	kg		
Resulting weight		Mres =	kg		

C.G. position

$B = (M_{pr} \times L) / M_{vys}$ = mm

X = L1 – B + 50 = mm

Date: Performed by:

The datum point (50 mm forward of the wing leading edge at the root) to wheel centre line distances on all EuroFOX aircraft are as follows: (these figures take into account the wing forward sweep of 50 mm and simply go into the appropriate form.)
There is no need to measure these positions as all positions are set by factory jigging before kit delivery.

Nose wheel:

- From datum point to nose wheel centre line = -919 mm
- From datum point to main wheel centre line = 503 mm

Tail wheel

- From datum point to main wheel centre line = -21 mm
- From datum point to tail wheel centre line = 4289 mm

4.2.2 Weight and balance determination for flight

WARNING

The aircraft must not be operated outside of its approved weight and balance limitations to assure safe flying.

Maximum take off weight is the maximum weight approved for the start of the take off roll.

We have prepared 2 tables for guidance below, one at 289 kgs max empty weight, and the other at 300 kgs max empty weight as each aircraft build will be different.

These tables represent the maximum amount of fuel for given crew weight and given weight in the baggage compartment. The CG (centre of gravity) position is within the approved range for all combinations in these tables and any interpolation between displayed values.

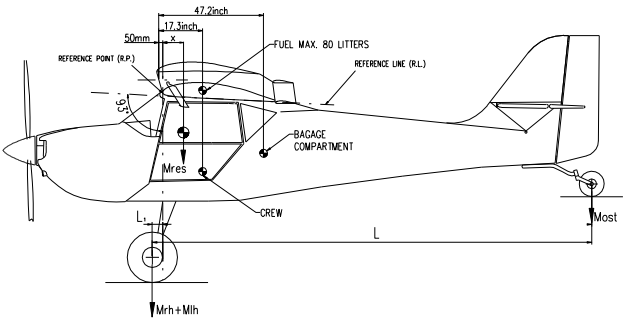
Maximum amount of fuel (Litres) for given crew and baggage weight (based on empty wt 289 kgs)

Crew Weight Kgs		55	82	95	123	136	163	189	210
Baggage weight in Compartment	0.0	86	86	86	86	86	86	86	85
	7.0	86	86	86	86	86	86	86	75
	14.0	86	86	86	86	86	86	86	65
	20.0	86	86	86	86	86	86	86	57

Maximum amount of fuel (Litres) for given crew and baggage weight (based on empty wt 300 kgs)									
Crew Weight Kgs		55	82	95	123	136	163	189	210
Baggage weight in Compartment	0.0	86	86	86	86	86	86	86	69
	7.0	86	86	86	86	86	86	86	60
	14.0	86	86	86	86	86	86	79	50
	20.0	86	86	86	86	86	86	70	42

All these loadings will keep the aircraft within MAUW and within the C of G range. It is imperative that the pilot knows exactly the real empty weight of his or her aircraft.

4.2.3 Detailed calculation of CG position



As all reference points are located behind the leading edge of the wing at the root, the leading edge was selected as the reference plane. The table below shows a typical calculation including an example.

Example: Weight & Balance for EuroFOX	Actual Weight (kgs)	Arm (mm's)	Moment
Empty aircraft wt S/N……..	289	277	801
Crew weight	189	440	832
Fuel weight (86 Ltrs)	62	440	273
Baggage compartment	20	1200	240
Totals	560		2145
Loaded aircraft CG position in mm's	Total moment / Total weight		X 100
Permitted C.G from reference point	259 mm	To	442 mm
Actual C.G result		383	mm

5. Performance

The data is based on particular flight measurements undertaken with the aircraft of this type in good service conditions and with application of average piloting skills. The performance stated below are calculated at sea level of the international standard atmosphere (ISA). Variations in pilot technique can cause significant differences as well as the other conditions like runway slope, runway surface condition, humidity etc.

Use the following data for guidance but do not plan a take-off or landing when only 50 ft extra runway length is available or do not plan a cross country with only 8 litres of fuel expected to remain when arriving at your destination. Always be conservative when planning a flight and be ready for the unexpected – unexpected wind, atmospheric turbulence or sudden weather change at the destination forcing you to divert to airfield 60 NM away. Always plan a reasonable fuel reserve – 60 minutes seems to be sufficient time for most of flights, but this time should be increased when complicated weather conditions (strong headwind or rain showers) are expected en route.

The propeller installed on your aircraft was set to achieve the best compromise between take off and cruising performance (the performance information below are based on this setting). You can change the setting (see propeller documentation) to achieve a better rate of climb or a better cruising speed. Always be carefully when making this change and make a record of the current settings. When the propeller is set to achieve a maximum cruise speed, the take-off distance is significantly longer. On the other hand, when the propeller is set to achieve good rate of climb, the fuel consumption during level flight is higher. When a finer pitch is set (e.g. climb setting), a higher static RPM is achieved when aircraft is static and full power is applied. Be careful not to exceed the Rotax maximum limit RPM.

5.1 Takeoff and landing distances (based on 912ULS)

Surface	Take off Distance (Metres)	
	Ground run	Take off distance to 50 ft
Grass runway	149	319
Hard runway	139	309

Surface	Landing Distance (Metres)	
	Landing distance from 50 ft	Ground run
Grass runway	349	170
Hard runway	329	149

Both take-off and landing distance are significantly increased by the following factors:

- Tail wind
- High airport altitude
- High air temperature
- Up-hill runway slope
- Runway wet or covered with snow, dust or water
- Propeller set to achieve better cruising performance

5.2 Rate of climb

	MTOW 560 kg
Rate of climb (fpm)	816

5.3 Cruise speeds Mph

Maximum cruising speed at 75% .....109 IAS (104 CAS)

5.4 RPM

Max. take off power ..... 5,800 (5 mins)

Max. continuous power 5,500

Cruise flight ..... 4,200 – 5,200

Idle speed ….approx. 1,600 – 2000 rpm 912iS or 912ULS EP modified

5.5 Fuel consumption

Engine settings	Fuel consumption (Litres per hour)
Take off power performance	26
Max. continuous performance	24
Cruise performance	12-19

Fuel consumption during cruise flight is dependent on various factors. The most important ones are engine settings and propeller settings. The higher the engine RPM is set during cruise, the higher the fuel consumption. When propeller is set to minimum angle to achieve good climbing performance, level flight will be slower together with higher fuel consumption. When planning a flight, always consider all these and other factors like wind direction and speed or expected weather en route. Always plan for sufficient fuel reserve when arriving at the destination. Always carefully evaluate fuel consumption during the flight.

5.6 Other performance data

Max. endurance..... 6 hours

Max. range…….... 620 Statute miles

Max. speed flying with doors open…….... 75 MPH

6. Performance 912iS

The data is based on particular flight measurements undertaken with the aircraft of this type in good service conditions and with application of average piloting skills. The performance stated below are calculated at sea level of the international standard atmosphere (ISA). Variations in pilot technique can cause significant differences as well as the other conditions like runway slope, runway surface condition, humidity etc.

Use the following data for guidance but do not plan a take off or landing when only 50 ft extra runway length is available or do not plan a cross country with only 8 litres of fuel expected to remain when arriving at your destination. Always be conservative when planning a flight and be ready for the unexpected – unexpected wind, atmospheric turbulence or sudden weather change at the destination forcing you to divert to airfield 60 NM away. Always plan a reasonable fuel reserve – 60 minutes seems to be sufficient time for most of flights, but this time should be increased when complicated weather conditions (strong headwind or rain showers) are expected en route.

The propeller installed on your aircraft was set to achieve the best compromise between take off and cruising performance (the performance information below are based on this setting). You can change the setting (see propeller documentation) to achieve a better rate of climb or a better cruising speed. Always be carefully when making this change and make a record of the current settings. When the propeller is set to achieve a maximum cruise speed, the take off distance is significantly longer. On the other hand, when the propeller is set to achieve good rate of climb, the fuel consumption during level flight is higher. When a finer pitch is set (e.g. climb setting), a higher static RPM is achieved when aircraft is static and full power is applied. Be careful not to exceed the Rotax maximum limit RPM.

6.1 Startup procedure 912iS

Start up

1. Throttle closed and friction lock on
2. Brakes ON
3. Fuel on – all 3 taps
4. Turn EMU on and wait for display to boot up
5. Turn key to “Avionic” tab
6. Turn lane “A” (primary computer) on, then turn lane “B” (secondary computer) on
7. Turn fuel pump “A” (main fuel pump) on the fuel pump “B” (auxiliary fuel pump) on
8. Hold on in the “up” position the momentary start switch – fuel pumps will start running
9. Wait EMU display to show green for lane “A” and lane “B”
10. Wait for the red lights above lane “A” and lane “B” to extinguish
11. Set throttle to % position as indicated for best start position up by EMU, lock throttle tight
12. Whilst continuing to hold the momentary start switch “UP” and on, turn ignition key to “ON”
13. When engine starts release momentary switch and allow key to return to “Avionics” and move hand to throttle control
14. Engine should be running, check all engine information on EMU

Shut down (normally wait 5 mins after landing) Note – never turn the fuel pumps off first

1. Turn off any comms, GPS, lights, strobes using their individual switches and move key switch to “Engine”
2. Set engine to idle
3. Turn off lane “A” and lane “B”
4. Turn off fuel “A” and fuel “B”
5. Switch ignition key to off
6. Turn EMU off
7. Close all 3 fuel taps
8. Brakes on

The Rotax 912iS engine manual chapter 2 should be used in place of EuroFOX POH sections 3 and 7 for normal and abnormal operations

6.2 Takeoff and landing distances

Surface	Take off Distance (Metres)	
	Ground run	Take off distance to 50 ft
Grass runway	149	319
Hard runway	139	309

Surface	Landing Distance (Metres)	
	Landing distance from 50 ft	Ground run
Grass runway	349	170
Hard runway	329	149

Both take off and landing distance are significantly increased by the following factors:

- Tail wind
- High airport altitude
- High air temperature
- Up-hill runway slope
- Runway wet or covered with snow, dust or water
- Propeller set to achieve better cruising performance

6.3 Rate of climb

	MTOW 560 kg
Rate of climb (fpm)	816

6.4 Cruise speeds Mph

Maximum cruising speed at 75% .....110 IAS (105 CAS)

RPM

Max. take off power ..... 5,800 (5 mins)

Max. continuous power 5,500

Cruise flight ..... 4,200 – 5,200

Idle speed..... approx. 1,600

6.5 Fuel consumption

Engine settings	Fuel consumption (Litres per hour)
Take off power performance	26
Max. continuous performance	24.5
Cruise performance	12-19

Fuel consumption during cruise flight is dependent on various factors. The most important ones are engine settings and propeller settings. The higher the engine RPM is set during cruise, the higher the fuel consumption. When propeller is set to minimum angle to achieve good climbing performance, level flight will be slower together with higher fuel consumption. When planning a flight, always consider all these and other factors like wind direction and speed or expected weather en route. Always plan for sufficient fuel reserve when arriving at the destination. Always carefully evaluate fuel consumption during the flight.

6.6 Other performance data

Max. endurance..... 6 hours

Max. range..... 620 Statute miles

Max. speed flying with doors open..... 75 MPH

Best Glide speed ..... 65 MPH

7. Performance 912ULS EP Modified 120hp

The data is based on particular flight measurements undertaken with the aircraft of this type in good service conditions and with application of average piloting skills. The performance stated below are calculated at sea level of the international standard atmosphere (ISA). Variations in pilot technique can cause significant differences as well as the other conditions like runway slope, runway surface condition, humidity etc.

Normal EuroFOX operating procedures apply as detailed in this POH, however the additional power available significantly increases the take off and climb performance. Although when primarily used as a aerotowing aircraft, when used without something on tow, care should be taken.

The propeller installed on your aircraft should be set to achieve the best compromise between take off and cruising performance or for best aerotowing performance as appropriate. You can change the setting (see propeller documentation) to achieve a better rate of climb or a better cruising speed. Always be carefully when making this change and make a record of the current settings. When the propeller is set to achieve a maximum cruise speed, the take off distance will be longer. On the other hand, when the propeller is set to achieve good rate of climb, the fuel consumption during level flight is higher. When a finer pitch is set (e.g. climb setting), a higher static RPM is achieved when aircraft is static and full power is applied. Be careful not to exceed the Rotax maximum limit RPM.

The figures below are based on an aircraft set up to aerotow – WOT = 5500 rpm in the climb at 70 kts indicated. This is with a DUC Windspoon propeller fitted, but operated without anything on tow.

7.1 Startup procedure 912ULS EP Modified 120hp

Start

1. Fuel on all 3 taps
2. Brakes on
3. Throttle closed or just off the stop
4. Oil flap pull out and closed
5. Check throttle friction lock engaged
6. Turn key to second “engine on” position
7. Ignition switch ON
8. Both mags A and B on
9. Fuel pump A on***
10. Press start button, keep right hand on throttle
11. Pick up with throttle and close choke, tick over 1800-2000 rpm
12. Strobes and avionics on

*** Only one fuel pump should be used at any one time. Both pumps will not increase fuel pressure and the available power from the alternator will be on the limit. A good operating practice is to fly to your destination on pump A and fly back on pump B, thus giving both pumps regular use and ensuring good lifetime. Both pumps are identical.

Pre take off

1. Throttle 2000 rpm, hold on brakes if required
2. Flying Controls - Full and free
3. Doors and Harness Closed, locked, secure
4. Stowage items - Secure
5. Radio TX – On correct 1st and 2nd frequency
6. Trim - Set take off
7. T & P’s - All in range
8. RPM – Mag check Up to 3800 rpm check, hold with brakes
9. Check each fuel pump separately on/off

10. Fuel sufficient and on – all 3 taps
11. Flaps Set take off – typically ½

Before landing

1. Brakes - off
2. Back up fuel pump on and sufficient
3. Flaps and trimmer - Set landing as POH
4. Landing light - On
5. Instruments T & P's all ok
6. Doors and harnesses - Closed, locked, secure

Shutdown

1. Hold on brakes
2. Allow engine to cool down approx. 30 secs, open oil flap
3. Strobes and avionics off
4. Throttle out and friction locked
5. Both mags off
6. Ignition switch off
7. Fuel pumps off
8. Key to off
9. Fuel taps closed

7.2 Takeoff and landing distances @ MAUW, calm conditions

Surface	Take off Distance (Metres)	
	Ground run	Take off distance to 50 ft
Grass runway	Less than 100	250
Hard runway	Less than 80	200

Surface	Landing Distance (Metres)	
	Landing distance from 50 ft	Ground run
Grass runway	349	170
Hard runway	329	149

Both take-off and landing distance are significantly increased by the following factors:

- Tail wind
- High airport altitude
- High air temperature
- Up-hill runway slope
- Runway wet or covered with snow, dust or water
- Propeller set to achieve better cruising performance

7.3 Rate of climb

	MTOW 560 kg
Rate of climb (fpm)	1500

7.4 Cruise speeds Mph

Maximum cruising speed at 75% .....110 IAS (105 CAS) RPM

Max. take off power ..... 5,800 (5 mins)

Max. continuous power 5,500

Cruise flight ..... 4,200 – 5,200

Idle speed.....approx. 1800-2000

7.5 Fuel consumption

Engine settings	Fuel consumption (Litres per hour)
Take off power performance	26
Max. continuous performance	24.5
Cruise performance	12-19

Fuel consumption during cruise flight is dependent on various factors. The most important ones are engine settings and propeller settings. The higher the engine RPM is set during cruise, the higher the fuel consumption. When propeller is set to minimum angle to achieve good climbing performance, level flight will be slower together with higher fuel consumption. When planning a flight, always consider all these and other factors like wind direction and speed or expected weather en route. Always plan for sufficient fuel reserve when arriving at the destination. Always carefully evaluate fuel consumption during the flight.

7.6 Other performance data

Max. endurance..... 6 hours

Max. range..... 620 Statute miles

Max. speed flying with doors open..... 75 MPH

Best Glide speed ..... 65 MPH

8. Emergency procedures

8.1 Introduction

This section contains procedures for various emergencies which may occur. Emergencies caused by aircraft or engine malfunctions are rare if proper pre-flight inspections and maintenance are practised.

The chapter describes basic emergencies and recovery procedures. Not all emergencies that may occur can be listed here in full, therefore their solution depends on the experience of the crew controlling course of such events. All air speed values in this chapter are presented in MPH Indicated Airspeed, as this value represents instrument reading better than the Calibrated air speed. In respect to any engine failure, first priority is always FLY THE AIRCRAFT.

8.2 Engine Failure and Emergency landings

8.2.1 Engine Failure during Take-Off Run

- throttle — REDUCE TO IDLE
- ignition — OFF
- master switch — OFF
- brakes — AS REQUIRED

8.2.2 Engine Failure during Take-Off

- airspeed — 75 mph IAS
- choice of landing site — - after take-off and up to 150 ft - land in straight direction ahead, if possible
  - over 150 ft choose suitable landing site

The landing site is to be preferably chosen in the runway direction or the nearest suitable site clear of obstacles

- master switch — OFF
- ignition — OFF
- main fuel valve — SHUT
- tank fuel valves — SHUT

- flaps EXTEND AS NEEDED
- safety belts TIGHTEN

after touchdown:

- brakes AS REQUIRED

8.2.3 In-flight Engine Failure

- airspeed 75 Mph IAS
- landing site selection SELECT
- transmit MAYDAY on 121,5, ELT ON, XPDR 7700 - if time permits

check
- master switch ON
- ignition ON
- main fuel valve OPEN
- wing tank fuel valves OPEN to tank with more fuel
- throttle SET TO 1/3 OF TRAVEL
- starter START THE ENGINE

If the engine cannot be restarted, proceed in accordance with the procedure 8.2.2 .

8.2.4 Additional information on engine failure and emergency landing procedures

If the engine failure occurs during the take off run, the pilots main concern should be to stop the aircraft on the remaining runway. Those extra items in the checklist are to add protection should the runway be too short to stop.

In flight, prompt reduction of pitch attitude to obtain and maintain a proper glide speed upon experiencing an engine failure is the first priority. If the failure has occurred shortly after take off, a landing should be planned straight ahead with only small changes in the flight direction to avoid obstacles. The best gliding ratio can be achieved with flaps up – flaps down will reduce the stall speed but at the same time deteriorating gliding performance. Try to stop rotation of propeller if restarting efforts are not

successful – wind milling propeller has a higher drag than stopped propeller.

While gliding towards a selected forced landing site, an effort should be made to determine and correct the cause of engine failure – time and altitude permitting. Do not concentrate on cause determination or restart effort unless you have selected a suitable landing site and you are confident of this manoeuvre. Flying the aircraft (especially maintaining the proper gliding speed) is always the first priority. If the cause cannot be determined and corrected the emergency landing must be accomplished.

Always announce your intent and position after engine failure using radio and other equipment when time permits. Turn radio to international emergency frequency – 121.5 and transmit MAYDAY message. Activate Emergency locator transmitter (ELBA) – set the switch to ON position. Set transponder (XPDR) to emergency code 7700. When the above mentioned procedure can not be performed due to time constraints try to complete as many steps as possible. Transmitting MAYDAY message on the frequency already tuned on your radio should be the minimum procedure.

WARNING

During a landing it is vital for the pilot to continue to fly the aircraft. Damages and/or injuries can be minimised if the pilot is fully concentrating on controlling the aircraft until it comes to complete stop

8.2.5 Carburettor Icing

Carburettor icing mostly occurs when getting into an area of ice formation. The carburettor icing shows itself through a decrease in engine power and an increase in engine temperatures. To recover the engine power, the following procedure is recommended:

- carburettors heating — ACTIVATE
- airspeed — 75 Mph IAS
- throttle — 1/3 of power ≈ (3500 RPM)
- if possible, leave the icing area
- gradually increase the engine power to cruise conditions after 1-2 minutes
- if you fail to recover the engine power, land at the nearest airfield (if feasible), or, depending on circumstance, off-airfield, following the procedure given under 8.2.2

8.3 In-flight Engine Starting

- airspeed	75 Mph IAS
- landing site selection	SELECT
- master switch	ON
- main fuel valve	OPEN
- wing tank fuel valves	OPEN to tank with more fuel
- choke	SWITCH ON (cold engine only)
- throttle	- ADJUST to 1/3 of travel
	- IDLE (when choke is activated)
- ignition	ON
- starter	START UP

- if the engine cannot be restarted, increase the airspeed to 85 – 95 Mph IAS so that air flow can rotate the propeller, thus enabling engine starting.

WARNING Loss of height needed for in-flight engine starting is about 500 to 650 ft.

8.4 Fires

Follow these procedure when fire or smoke in the engine compartment or cockpit is detected. Fires are extremely rare in properly maintained aircraft.

8.4.1 Engine fire on the ground

- main fuel valve	SHUT
- tank fuel valves	SHUT
- throttle	FULL
- ignition	switch off when engine has stopped as all remaining fuel in carburettors was burned
- master switch	OFF

- abandon the aircraft and extinguish fire (if possible)

- Fire damage	INSPECT

NOTE	Time needed to burn fuel remaining in carburettors after fuel valves are closed is around 30 sec.

WARNING	**DO NOT CONDUCT ANOTHER FLIGHT BEFORE THE FIRE CAUSE HAS BEEN DETERMINED AND REPAIRED BY AUTHORISED PERSONNEL**

8.4.2 Engine fire during takeoff

- throttle	IDLE
- main fuel valve	SHUT
- tank fuel valves	SHUT
- airspeed	75 Mph IAS
- brakes	STOP
- throttle	FULL
- ignition	switch off when engine has stopped as all remaining fuel in carburettors has burned

- abandon the aircraft and extinguish fire (if possible) once the aircraft is stopped

8.4.3 Engine fire in flight

- main fuel valve	SHUT
- tank fuel valves	SHUT
- throttle	FULL
- airspeed	INCREASE as required to find an airspeed which will provide an incombustible mixture. Do not exceed V_{NE}
- landing site selection	guide the aircraft to the nearest airfield, or choose a suitable landing site for emergency landing

- ignition	switch off when engine has stopped as all remaining fuel in carburettors was burned
- master switch	OFF
- airspeed	75 Mph IAS
- wings flaps	EXTEND AS NEEDED
- safety belts	TIGHTEN

- perform emergency landing
- abandon the aircraft and extinguish fire (if possible)

WARNING **DO NOT ATTEMPT TO RESTART THE ENGINE**

WARNING **DO NOT CONDUCT ANOTHER FLIGHT BEFORE THE FIRE CAUSE HAS BEEN DETERMINED AND REPAIRED BY AUTHORISED PERSONNEL**

8.4.4 Cockpit or electrical fire

Electrical fires are usually signalled by the odour of burning insulation.

- cockpit door	OPEN to remove smoke from the cockpit
- avionics and other switches	OFF

Land at the nearest suitable landing site. Consider shutting down the engine (and master switch) once the suitable landing site is reached. Extinguish fire as soon as possible.

8.5 Gliding

gliding ratio ..... 1 : 9

optimum gliding speed.....70 Mph IAS

rate of descent.....551 fpm

Always consider flying though areas of descending air when calculating gliding range. Do not forget to have and maintain sufficient altitude to perform a landing procedure once suitable landing site has been reached.

8.6 Precautionary Landing

- choose suitable landing site, evaluate wind direction and speed, surface, surrounding obstacles and total safety of the manoeuvre under consideration

- perform approach and fly-over at a speed of 75 Mph IAS along the selected landing site at a height of 150 ft to estimate the area condition, obstacles and to determine exact landing direction

- Follow normal landings checklist and land

after touchdown

- Ignition OFF
- master switch OFF
- fuel valves SHUT
- brakes AS REQUIRED

A precautionary landing is preferable to an emergency landing. When engine vibration or engine roughness is presented, do not wait until the engine stops, perform a precautionary landing as soon as possible.

A precautionary landing is also used when the fuel exhaustion is imminent. This should not happen when proper flight preparation is performed. Always perform a precautionary landing before all fuel is consumed, emergency landing following the loss of power is more complicated and more risky.

Also consider a precautionary landing when bad weather is encountered. Again, it should not happen when proper flight planning is made. When the cloud base is forcing you to fly in low altitude and/or visibility is limited, try to fly a 180 course to avoid bad weather area. If the conditions are not getting better or even are deteriorating, perform a precautionary landing before the conditions become even worse.

8.7 Blown-Out Tyre Landing

- carry out normal approach-to-land

- when flaring at landing, keep the damaged wheel above ground as long as possible using ailerons (or elevator for the nose wheel)

- maintain the direction at landing run, applying rudder

8.8 Damaged Landing Gear Landing

- carry out a normal approach-to-land
- if the nose wheel is damaged, perform a touch-down on main wheels and hold the aircraft nose wheel up as long as possible till the speed is lost.
- if the main landing gear is damaged, perform touch-down at the lowest speed possible and maintain direction at landing run, if possible

8.9 Vibrations or other engine problem

If any forced vibrations appear in the aircraft, it is necessary:

- to set engine speed to such power rating where the vibrations are the lowest
- to land on the nearest airfield, or to perform a precautionary landing off-airfield
- if the vibrations are increasing, carry out an emergency landing off-airfield, following procedures given under 8.2.2

If the oil pressure reduces during a flight, an engine failure is probable. Reduce the engine power and execute a nearest airfield or precautionary landing before the engine failure occurs.

8.10 Inadvertent icing encountered

- carburettor heating	ACTIVATE
- throttle	INCREASE above normal cruise settings
- course	REVERSE or ALTER as required to avoid icing

WARNING **EVASIVE ACTION SHOULD BE INITIATED IMMEDIATELY WHEN ICING CONDITIONS ARE ENCOUNTERED**

A prompt action must be taken immediately once icing conditions are encountered. A 180° turn and a climb is usually appropriate. If the airframe ice builds extremely rapidly, consider off-airport forced landing. Approach speed should be increased slightly depending upon icing severity.

8.11 Extreme turbulence encountered

- Airspeed REDUCE to 75 KIAS
- safety belts SECURED
- loose objects SECURED

When an area of extreme turbulence is entered reduce airspeed to approximately 85 Mph IAS. Do not reduce the airspeed too low in order to prevent the aircraft from stalling due to turbulence. Do not increase the speed into the yellow arc so as to prevent structural damage to the aircraft.

8.12 Electrical system malfunctions

8.12.1 Charging indicating light is illuminated

When the red charging light is illuminated no immediate action is required. All avionics and other equipment are powered from the battery, so the power source is limited. Try to switch off instruments which are not necessary for flight and land at the nearest airfield

8.13 Inadvertent Stall and spin recovery

Stall or spin should not occur during normal aircraft operation and they are prohibited.

8.13.1 The following general procedure should be followed should a stall occur:

- lower the nose by pushing the control stick
- gradually increase power

8.13.2 The following general procedure should be followed should a spin occurs:

- throttle IDLE
- rudder opposite to rotation
- control stick fully pushed

Once the rotation is stopped, centre rudder and establish a level flight.

9. Normal procedures

All air speed values in this chapter are presented in MPH Indicated Airspeed, as this value represents instrument reading better than the Calibrated air speed.

9.1 Pre-flight inspection

Pre-flight inspection must be conducted before the first flight of the day. The pre-flight inspection is recommended prior to any flight or series of flights by one pilot on any given day. Prior to any flight fuel and oil quantity should be checked as a minimum.

If the aircraft has been stored outside the engine area and other points of entry should be checked for evidence of bird occupancy. All control surfaces and travel stops should be examined for wing damages. Wheel fairings are not recommended for muddy field operation due to possible mud accumulation inside the fairings. When operating from gravel fields pay special attention to propeller leading edges. Fuel caps should be monitored for any deterioration periodically to avoid fuel leakage in flight or water infiltration.

The aircraft general condition should be noted during a visual inspection of the aircraft. Inspect any signs of deterioration, distortion and any damages to fabric skin of the aircraft. In cold weather, all traces of ice, snow, and frost should be removed from the aircraft. Make sure that no ice, snow or debris is trapped between any movable control surfaces.

Make sure that all instruments are in good condition with no broken glass. Airspeed indicator should read zero, altimeter should be checked against ramp or field elevation.

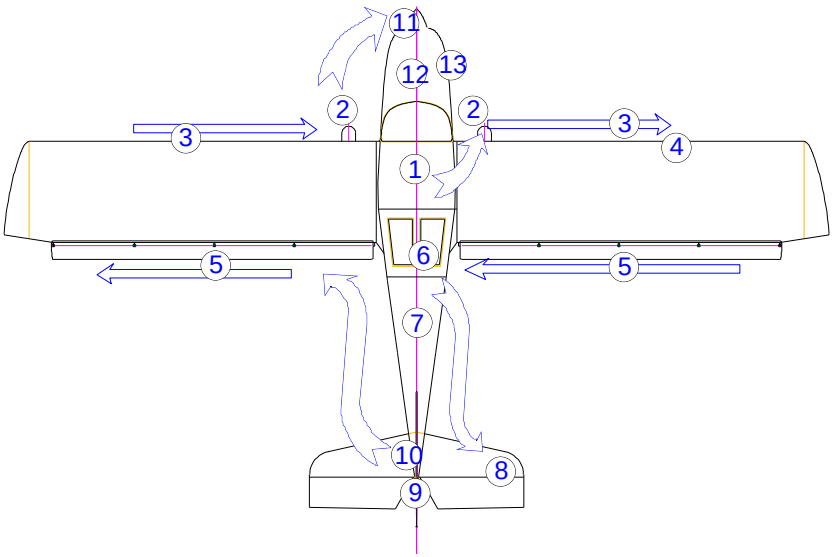
Do not activate the electrical system when anyone is near the propeller to prevent injury that could possibility result from an electrical system malfunction.

Pay special attention to the propeller area – make sure the ignition and master switches are OFF before touching the propeller. Avoid touching propeller when possible to prevent possible injury resulting from electrical system malfunction.

WARNING

DO NOT FLY THE AIRCRAFT IF YOU FIND ANY DAMAGE OR PROBLEMS DURING A PRE-FLIGHT INSPECTION. ALWAYS CONSULT AUTHORISED PERSONNEL FOR REPAIRS

9.1.1 Daily Preparation



1. Cockpit

POH and other documentation	review and available to pilot
master switch	OFF
ignition	OFF
fuel valves	OPEN, fuel quantity check
instruments	INSPECT
safety belts	INSPECT
check of flaperon tie rods	INSPECT

control stick	INSPECT , freedom of movement
rudder pedals	INSPECT , freedom of movement
brakes	INSPECT
trim	freedom of movement, proper function
engine controls	INSPECT, freedom of movement
loose objects in cockpit	remove
cockpit windows	INSPECT
door	INSPECT, shut and locked

2. Main landing gear

gear legs and attachment	INSPECT
wheels	INSPECT, tyre pressure 29 PSI
brakes	INSPECT

3. Wings	INSPECT – wing, struts, hinges, surface
4. Pitot tube	INSPECT
5. Flaperons	INSPECT –hinges, surface freedom of movement
	counterweights attachment.
6. Rear cockpit cover	INSPECT, secured
7. Fuselage	INSPECT
8. Stabilizer, elevator, hinges	INSPECT –surface, hinges, attachment of stabilizer struts
	freedom of movement of elevator and trim tab.
9. Fin, rudder, hinges	INSPECT surface, attachment, freedom of movement
	condition and attachment of balance tab.
10. Nose wheel	INSPECT, tyre pressure – 29 PSI
11. Propeller	INSPECT / blades, propeller hub, check of locking propeller nuts (when visible)

12. Engine

Remove the top engine cowling and

INSPECT - engine mount

INSPECT - air intake, carburettors and controls

INSPECT - exhaust system

INSPECT – coolant, quantity (0.4 inch above bottom) - (between MIN and MAX marks), leakages –(see picture 1)

INSPECT – oil, quantity (between MIN and MAX marks), leakages. The oil level should be at least in the middle between marks when planning a long term operation.

INSPECT - fuel system, filter and carburettors

INSPECT - electrical system, ignition, cable connections

13. Fuel

Quantity (between MIN and MAX, at least middle for longer flights)

INSPECT - draining off water and dirt from the central tank. Fuel system must be sampled daily to assure lack of contamination. Inspect the type of fuel.

Fuel caps secured, correct vent orientation – open end against air in flight.

9.1.2 Engine Warm-Up, Power Check

- wheels chocked, brakes on.
- Start the engine - see section 9.2
- warming-up to operating temperature – as per the Rotax instructions and until the oil temperature reaches 50 deg C
- temperature and pressure values - within operating limits
- set maximum power - speed of about 5000 RPM (3 to 5 secs.). The maximum RPM may vary with vary with temperature and propeller setting

- check of ignition (magnetos) – set 3,850 RPM, RPM drop should not exceed 300 on either magneto nor 120 differential between magnetos.
- Idle rotation - 1600 RPM
- All engine instrument readings must not exceed operating limits under any rating
- Remove wheel chocks for further operation, secure the aircraft

CAUTION	Perform the engine check heading upwind. Do not carry it out on loose terrain. Nobody is allowed to stand within dangerous proximity and, in particular, within the propeller arc Select proper aircraft orientation – propeller blast can be surprisingly powerful.
CAUTION	The engine is cowled for optimum cooling during flight. Use high power settings for limited time only during ground operation to avoid engine overheating
CAUTION	*After a check of engine power, cool down the engine for a short time to avoid evaporation of the cooling liquid in cylinder heads.*

9.1.3 Pre-Flight Inspection

Make a brief walk around before you board the aircraft. This short inspection might discover damage or problems when occurred during the last flight. It is especially important to make this inspection when you are taking over the aircraft from other pilot.

Use chocks for main wheels when possible and practical to prevent the aircraft from moving. Always make sure that the person you asked to remove your chocks while the engine is running is aware of propeller danger. The best practise is to use chocks only for engine warm-up and engine checks and shut the engine down and remove chocks with the engine stopped. Before using chocks make sure they do not make contact with wheel spats to prevent any damage.

Cockpit - INSPECT COCKPIT INTERIOR EQUIPMENT

	- INSPECT SAFETY BELTS
	- CONTROL SYSTEM-FREEDOM OF MOVEMENT, CHECK FOR DAMAGE
wings	- INSPECT WING SURFACES
	- INSPECT WING AND STRUTS SUSPENSIONS
	- INSPECT FLAPERONS.
Fuselage	- INSPECT
tail unit	- INSPECT
landing gear	- INSPECT
engine and propeller	- INSPECT.

9.2 Engine starting

Lack of oil pressure within 10 seconds after engine starting can lead to serious engine damage.

Make sure people or objects are near the propeller when staring the engine. Shout CLEAR PROP.

9.2.1 Use of External Power Supply

If the aircraft is not provided with a connection for external power supply - the external power supply may be connected to battery contacts when necessary.

9.2.2 Engine Starting

- pre-flight inspection	COMPLETED
- safety belts	ADJUST AND SECURE
- rudder pedals	FREEDOM OF MOVEMENT
- brakes	CHECK FUNCTION
- control stick	FREEDOM OF MOVEMENT
- trim	FREEDOM OF MOVEMENT
- wing flaps	FREEDOM OF MOVEMENT, RETRACTED
- engine control + choke	FREEDOM OF MOVEMENT
- instruments	CHECK OF VALUES, SETTINGS

- door	CLOSED, LOCKED
- master switch	SWITCH ON
- main fuel cock	OPEN
- wing tank fuel cocks	OPEN TO TANK WITH MORE FUEL
- choke	SWITCH ON (COLD ENGINE ONLY)
- throttle	1/3 OF TRAVEL (IDLE for cold engine)
- control stick	PULLED (clamped between legs)
- brakes	ON
- propeller area	"CLEAR"
- ignition	SWITCH ON
- starter	SWITCH ON (10 sec as maximum without interruption, followed by a cooling period of 2 minutes)

- after starting the engine, adjust speed to smooth operation – IDLE

- instruments	CHECK OF INDICATION (oil pressure must rise within 10 seconds. Increase of engine speed is permitted only at steady oil pressure readings above 30 PSI)
- choke	SWITCH OFF (cold engine only)
- avionics and other switches	SWITCH ON (transceiver, IC, turn-and- slip indicator .....)

The aircraft has a tendency to roll forward easily on paved surfaces like asphalt even when the engine is at idle. A tail wind is also a significant factor. Make sure that the aircraft is not moving once the engine is started. If the aircraft is rolling and cannot be stopped with brakes, turn the engine off immediately using the ignition switch.

9.3 Taxiing

9.3.1 Prior to Taxiing

Be aware of the entire area around the aircraft to ensure that the aircraft will clear all obstruction and other aircraft. When first beginning to taxi,

the brakes should be tested for proper operation as soon as the aircraft is put in motion. If braking action is unsatisfactory, the engine should be shut down immediately.

- brakes	FUNCTIONAL CHECK
- stop watch	SWITCH ON, record time

9.3.2 Taxiing

- taxiing speed is 8 knots maximum. Steering is performed by rudder pedals controlling the nose wheel.

- in crosswind hold ailerons „upwind“, using the control stick.

- In strong crosswind taxi the aircraft with an assisting person holding the wing by its windward side.

- When taxiing on gravel surfaces use as low engine power as possible to prevent damage to the propeller leading edges.

9.4 Normal takeoff

9.4.1 Prior to Take-Off

- brakes	BRAKES ON
- speed	3,850 RPM
- magnetos	CHECK (R, BOTH, L, BOTH)
- carburettor heating	ACTIVATE WHEN NECESSARY
- choke	OFF
- trim	NEUTRAL
- wing flaps	TAKE-OFF POSITION
- master switch	ON
- ignition	ON
- main fuel valve	OPEN
- tank fuel valves	FUEL QUANTITY CHECK, OPEN TO BOTH OR TANK WITH MORE FUEL QUANTITY
- instruments	CHECK
- door	CLOSED, LOCKED

- safety belts	FASTENED, TIGHTENED
- controls	FREEDOM OF MOVEMENT
- runway	not occupied by another aircraft

9.4.2 Take-Off

Continuously increase engine power to maximum (max. 5800 RPM is not to be reached when aircraft is not moving and the propeller is not “in flight adjustable”), bringing the aircraft into motion. At a speed above 45 Mph IAS rotate the aircraft by slight pulling. Do not climb before the airspeed of 55 IAS is reached.

Then make a transition to the climb out, get the aircraft to climb at a speed of 65 IAS. Accelerate during initial climb to 75 Mph IAS unless the best angle of climb is required. Maintain the airspeed for best climb angle carefully, do not let the speed drop below 70 Mph IAS.

- throttle	FULL
- engine instruments	CHECK
- elevator control	ROTATE at 50 KIAS by slight pulling
- initial climb speed	70 Mph IAS
- engine instruments	CHECK
- wing flaps	slowly FLAPS UP ABOVE 150 FT
- trimming	TRIM

WARNING

Take-off is forbidden - if engine running is not smooth.
- if runway is occupied.

Perform a brief magneto check before take off after positioning the aircraft clear of other aircraft. When a magneto problem is present, do not take off. Monitor power and engine RPM early during take off run – if the engine RPM is lower than usual (exact RPM value depends on propeller settings) or engine is not running smoothly abort the take off immediately.

If taking off the from a gravel surface apply the power slowly to prevent propeller leading edge damage.

Always retract wing flaps slowly – sudden retraction of the flaps might cause a loss of attitude.

Always judge, based on your experience, whether the available runway is sufficient for normal take off. Always make a realistic estimate and be ready to abort the take off before critical speed is reached.

9.5 Best angle of climb speed (V_X)

9.5.1 Climbing

- throttle	5,500 PRM MAX
- airspeed	70 Mph IAS
- engine instruments	CHECK

9.6 Best rate of climb speed (V_y)

9.6.1 Climbing

- speed	5,500 PRM MAX
- airspeed	75 Mph IAS
- engine instruments	CHECK

9.7 Cruise

9.7.1 Cruise Flight

- bring the aircraft into horizontal flight

- speed	4,000 – 5,500 RPM
- airspeed	70 – 110 Mph IAS as required
- engine instruments	CHECK
- fuel tank valves	SWITCH BETWEEN TANKS (open one side and close the other) regularly

During cruising flight an RPM up to 5,500 can be used. Always monitor all engine parameters during cruise flight, especially when high engine settings are set. Higher RPM means higher speed, but fuel consumption

will increase significantly at the same time. An RPM setting around 4,500 is usually the best compromise between time and fuel consumption. A propeller setting is always an important factor. Monitor minimum fuel bulb indication condition by pushing control button when you expect minimum fuel quantity (4 litres).

Monitor the atmospheric condition as well – do not enter an area of turbulence at a high speed. Be ready for a sudden weather change during your flight – stronger head wind can limit your ability to safely reach your planned destination.

When carburettor icing is possible, activate carburettor heating. Fuel consumption and remaining fuel on board should be monitored. Always make a comparison between planned and actual time above any waypoint.

Select carefully the flight route – avoid flying over large urban areas, large forests or large areas of water, as well as over mountains. Good landing possibilities are very limited in case of engine failure or other emergencies over these areas.

Always have a suitable landing area within gliding range. When it is necessary to cross a large area not suitable for emergency landing, always climb to the appropriate altitude to reach a suitable landing site if an emergency occurs.

Always monitor the airspace around your to prevent a mid-air collision.

WARNING	**Do not forget to change the wing tank supplying the engine on regular basis to prevent fuel starvation.** **A proper fuel supply to the engine is provided by a central connecting tank whilst changing fuel wing tanks.**

9.8 Approach

9.8.1 Descent

- throttle	INCREASED IDLE OR AS REQUIRED
- engine instruments	CHECK
- carburettor heating	ACTIVATE WHEN NECESSARY

WARNING

During long approaches and when descending from a considerable height, it is not advisable to reduce the engine throttle control to idle. In this case the engine becomes overcooled and a loss of power might occur. When descending, apply increased idle so that engine instrument readings range within the limits for normal use.

9.8.2 Downwind

- power	4,000 – 5,000 RPM
- airspeed	75 – 90 Mph IAS
- engine instruments	CHECK
- fuel	FUEL QUANTITY CHECK, SWITCH TO TANK WITH MORE FUEL
- brakes	CHECK FUNCTION BY SHORT BRAKING (check proper system resistance)
-safety belts	TIGHTEN
- base leg and final leg airspace	CHECK OF FREE SPACE
- landing site	SITUATION

9.9 Normal landing

9.9.1 On Base Leg

- power	3,000 RPM
- airspeed	75 Mph IAS
- engine instruments	CHECK
- wing flaps	TAKE-OFF
- trimming	TRIM
- final leg airspace	CHECK FOR OTHER TRAFFIC

9.9.2 On Final

- airspeed	55 Mph IAS
- power	ADJUST AS NEEDED

- carburettor heating	ACTIVATE WHEN NECESSARY
- engine instruments	CHECK
- wing flaps	LANDING
- trimming	TRIM
- engine instruments	WITHIN LIMITS

- check of clear landing site (people, obstacles).

9.9.3 Landing

Always judge, based on your experience, whether the available runway is sufficient for A normal landing. Always make a realistic estimation and be ready for baulked landings.

At a height of about 30 ft reduce the engine speed to idle. Maintain speed of 55 Mph IAS till flare. When flaring at a height of 1,5 to 3 ft above ground, decelerate gradually by pulling the control stick backward. At a speed of about 40 to 45 Mph IAS the aircraft touches-down.

When landing with a significant crosswind component do not set the flap to landing position – use take-off setting to touch down at higher speed to ensure proper control over the aircraft before it touches the ground.

Entry speed to side slip..... 75 Mph IAS

9.9.4 After landing

- brakes	APPLY WHEN NECESSARY
- wing flaps	RETRACT
- trim	TAIL HEAVY

9.9.5 Engine Stopping

- power	cool down the engine at 2,000 RPM when necessary
- engine instruments	CHECK
- turn radio to 121,5	CHECK ELT IS NOT ACTIVATED.
- avionics and other switches	OFF
- ignition	OFF
- master switch	OFF
- avionics and other switches	OFF

- main fuel valve SHUT

- tank fuel valves SHUT

- secure the aircraft chocks or other way to prevent the aircraft from unintended movement, lock the controls (using safety belts)

During normal operation the engine is usually cooled enough during the approach and landing. Make sure that all avionics and other instruments are switched off before the engine is stopped.

Do not use parking brake to hold unattended aircraft, especially when the aircraft is located in hanger.

9.9.6 Post-Flight Check

- check
  - damage to fuel system. fuel leakage
  - damage to oil system, oil leakage
  - damage to cooling circuit, liquid leakage
  - damage to electrical system, ignition
  - check the aircraft exterior for damage to:
  - fuselage - wings, flaperons
  - tail unit
  - landing gear
  - fiberglass covers
  - wash down the aircraft, remove dirt and bugs
  - cover the cockpit with a protective cover

9.10 Short field take off and landing procedures

The standard take off procedure should be followed. The only difference is that the full throttle is applied with brakes on – do not forget to have elevator in full up (stick back) position to prevent the danger of the aircraft nosing over. Brakes are released when the maximum RPM is achieved from the engine. To clear possible obstacles in the runway direction climb at speed for best rate of climb – see section 9.6

When approaching a short field make sure that the approach speed of 75 Mph IAS is carefully maintained and full flaps are set.

9.11 Balked landing procedures

- power	MAX. 5500 R.P.M
- airspeed	75 Mph IAS
- engine instruments	CHECK
- wing flaps	TAKE-OFF
- trimming	TRIM
- wing flaps	RETRACT AT A HEIGHT OF 150 FT
- trimming	TRIM
- power	MAX. 5500 RPM
- climb	75 Mph IAS

9.12 Information on stalls, spins and any other useful pilot information

WARNING **Aerobatics, intentional stalls and spins are prohibited.**

9.12.1 Rain

When flying in the rain, no additional steps are required. Aircraft qualities and performance are not substantially changed.

10. Aircraft Ground Handling and Servicing

10.1 Servicing fuel, oil, coolant

10.1.1 Servicing fuel

1. Verify the main switch OFF position
2. Remove fuel tank cap
3. Service with fuel of proper type until level rises to the filler openings (or any required level)
4. Replace fuel cap and check for security
5. Wash any spilled fuel from wings with a clean water
6. Repeat for opposite fuel tank.

It is not advisable to change the type of fuel during engine operation. Refuelling should be carried out in places not endangering either the aircraft, its pilots or the environment. Prior to refuelling it is always necessary to check fuel for the absence of water. Sampling should be carried out from both any jerry cans used and from all aircraft tanks via the fuel system through drain sump. When refuelling from a jerry can, a funnel must be used containing a strainer to trap impurities, or, even better, with a buckskin leather which can trap any fuel moisture content. Fuel tank draining is performed similarly by means of the drain valve.

When filling fuel into tanks, be careful to avoid staining the cockpit window panels and glass with fuel as it contains corrosive components that will cause fast deterioration and damage to cockpit glazing. Make sure that fuel tanks are closed when refuelling is finished.

10.1.2 Servicing oil

The proper oil type should be used – see this manual or engine manual. .

1. Make sure that ignition and master switch are off
2. Remove the top engine cowling.
3. Open the oil tank.
4. When a level is not between minimum and maximum marks (or not high enough for expected longer operation), add oil. Do not add oil above the MAX level – the oil will overflow out of the engine.

5. Replace oil tank cap
6. Replace the top engine cowling

The oil is to be changed every 50 or 100 hours of operation – see Maintenance manual and engine documentation for details. The first oil change is to be performed after initial 25 hours of operation of a new or overhauled engine.

10.1.3 Servicing coolant

The proper coolant type should be used – see this manual or Rotax engine manual.

1. Make sure that ignition and master switch are off
2. Remove the top engine cowling.
3. Remove the cap of the coolant tank
4. Add estimated quantity of coolant
5. Replace coolant tank cap
6. Replace the top engine cowling

10.2 Landing gear tyre dimension and pressure

Track..... 1.96 m

Wheel base ..... 1.3 m

Main landing gear wheel tyre 14x4
Tyre pressure .....200 kPa

Nose wheel tyre.....12x4
Tyre pressure .....200 kPa

10.3 Ground handling and tie-down instructions

10.3.1 Aircraft moving instruction

1. Make sure that parking brake is off
2. Check the space around the aircraft and in the proposed direction of movement
3. Push and hold the tail down - use handle located on fuselage close to rudder leading edge
4. Push the aircraft in the desired direction

Aircraft can be also ground handled using a nose wheel tow bar – optional equipment, ask your dealer for details.

CAUTION Never push, pull, or lift the aircraft by use of control surfaces

10.3.2 Aircraft tie-down instruction

1. Turn the aircraft into wind, if possible
2. Lock the controls (using safety belts)
3. Make sure that parking brake is on, install wheel chocks when possible.
4. Attach ropes to the ring located on the lower wing surface (front strut attachment)
5. Attach rope the nose wheel
6. Attach rope to the tail (between tail skid and fuselage)
7. Secure all ropes to the tie-down points

It is recommended to install a soft foam rubber or fabric cover into the engine intakes to prevent foreign matter form accumulating inside the engine cowling. Before using make sure they do not collide with wheel fairings preventing any damage.

CAUTION Never push, pull, or lift the aircraft by use of control surfaces

11. Required Placards and Markings

11.1 Airspeed indicator range markings and Overview of speed limits:

Marking	MPH (Indicated Air Speed)	Operations
Marking	**IAS**	**Operations**
White Arc	**41 ÷ 93**	**Flaps operating range. Lower limit is maximum weight zero thrust stall speed in the landing configuration. Upper limit is maximum speed allowable with flaps extended.**
Green Arc	**50 ÷ 109**	**Normal operating range. Lower limit is maximum weight zero thrust stall with flaps retracted, upper limit is manoeuvring speed .**
Yellow Arc	**109 ÷ 143**	**Caution range – Operation must be conducted with caution and only in smooth air**

Speed		IAS Mph	Remarks
V_{NE}	Never exceed speed	143	V_{NE}
V_A	Manoeuvring speed	109	V_A
V_{FE}	Maximum wing-flaps extended speed	93	V_{FE}
V_{S0}	Stall speed	41	V_{S0}
V_{S1}	Minimum steady flight speed	50	V_{S1}

11.2 Operating limitation placard on instrument panel

Manufacturer:	**AEROPRO s.r.o., 949 07 Nitra, Slovakia**		
Max. take-off weight:		**560 Kgs**	
Empty weight:		**289 Kgs**	
Max baggage weight:		**20 Kgs**	
Min/Max cockpit load:		**55/220 Kgs**	
Never exceed speed (Mph)	**V_{NE}**	**143**	**IAS**
Max. Flap Extended speed (Mph)	**V_{FE}**	**93**	**IAS**
Stalling speed - wings level, flaps down	**V_{S0}**	**41**	**IAS**
Loading limits		**+4G -**	**-2G**

Or equivalent in knots

11.3 If parachute fitted

WARNING – Emergency Parachute
Pull handle to deploy
WARNING – Danger rocket exit area
Unapproved equipment – see POH

11.4 Passenger warning

This aircraft was manufactured in accordance with CS VLA airworthiness standards and does not conform to standard category airworthiness requirements.

11.5 "No intentional spins"

The following placard should be located on the instrument panel

AEROBATICS and INTENTIONAL SPINS ARE PROHIBITED

11.6 Miscellaneous placards and markings

Occupant warning – to be placed inside cabin

This aircraft has not been certified to an international requirement

To be placed by the fuel tank filler cap

Fuel tanks capacity: 86 litres
Fuel specification:
Mogas EN228 Min Ron 90 or AVGAS 100LL

To be placed inside cabin

No Smoking
Approved for flight in VFR conditions

To be placed on the panel in view of the pilot

Engine Limitations

Max take off (5 min max):	5800 rpm
Max continuous:	5500 rpm
Idle (Approx)	1600 rpm
Max CHT:	150 Deg C
Max Water Temp:	110 Deg C
Max/Min Oil Temp:	140/50 Deg C
Max/Min Oil Pressure:	1.5/7.0 Bar
Max/Min Fuel Pressure:	0.15/0.4 Bar

12. Supplementary information

12.1 Familiarisation flight procedures

The familiarisation flight procedure depends on the pilot's experience. The whole familiarisation should start with the careful study of this document (Pilot Operating Handbook and Flight training supplement). The maintenance manual should be read as well.

The recommended procedure for an experienced pilot usually consists of:

- Local flight of duration of approximately 30 minutes with instructor
- 5 to 10 circuits with instructor
- 5 flights – emergency situations
- local flight of 30 minutes – solo
- 5 circuits solo

Always perform as many flights as required to be able to properly control the aircraft, the syllabus above is for reference only.

12.2 Pilot operating advisories

It is always recommended that familiarisation flights should take place on fine weather days

12.3 Further Information

Further study is available from many books, pelase consult the lates recommendations from the LAA. Another invaluable source is other pilots and instructors.

12.4 Starting and pre-flight checks

Starting, pre-flight, pre take off and pre landing check lists. This list is a guide and requirements will vary depending on the exact fit of the individual aircraft. It is recommended that the pilot compiles his or her own list using this table as a guide only.

Starting	
Park brake	On
Doors	Closed and secure
Harnesses	Secure and comfortable
Radio and TX	Off
Flap	Neutral
Master switch	On
Strobe landing light	On
Fuel tap + pump	On and on
Mags	On
Throttle + Choke	Set, choke on
Lookout	Clear prop
Start	Turn starter
Oil P &T	Check, Oil P rising?
Starter engage and volt light	Light out
Pre-flight / Take off	
Throttle	2000 rpm
Flying Controls	Full and free
Doors and Harness	Closed, locked, secure
Stowage items	Secure
Radio TX	On
Trim	Set take off
T & P's	All in range
RPM – Mag check	Up to 3800 rpm check
Choke	Off
Fuel and pump	Sufficient on and on
Flaps	Set take off
Lookout and line up	Check all clear
Landing	
Brakes	Check pressure OK
Undercarriage	Check no damage
Propeller	Set fine if VP
Fuel and pump	Sufficient on and on
Flaps	Set landing as POH
Landing light	On
Instruments	T & P's all ok
Carb heat	Set as required
Doors and harnesses	Closed, locked, secure
Park and shutdown	Hope you enjoyed the flight