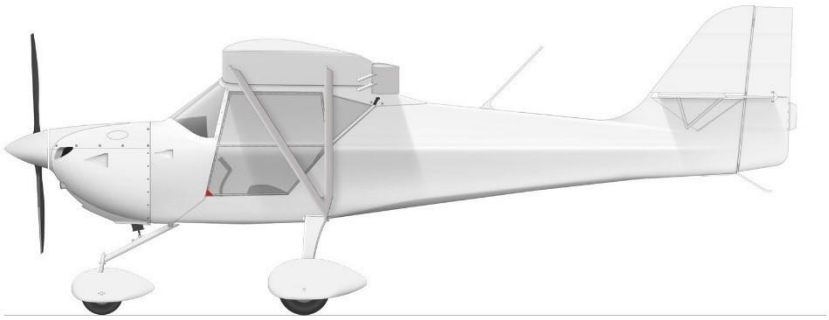
PILOT OPERATING HANDBOOK
AND
FLIGHT TRAINING SUPPLEMENT



AEROPRO

EuroFOX 3K

Aircraft Model:

EuroFOX 3K TOW

Serial Number: **72024**

Registration: **OM – W070**

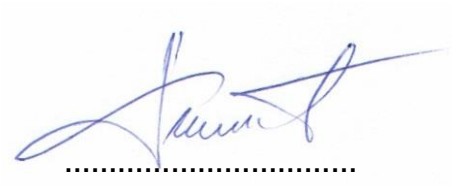
Date of Issue: 15. July 2024

Stamp, Signature

This aircraft was manufactured in accordance with Light Sport Aircraft airworthiness standards and does not conform to standard category airworthiness requirements.

DATA OF THE AEROPLANES

	Type	Produktion	Serial Number:	Year of production
Fuselage	EuroFOX 3K TOW	AEROPRO	67024	2024
Engine	ROTAX 915 iS2A	BOMBARDIER-ROTAX GMBH AUSTRIA	10 004 962	2024
PROPELLER	Flash-3	DUC HELICES France	S/N: 40	2024



.....

Signature

.....

Stamp

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 On, Signature

TABLE OF CONTENTS:

Fuselage *0-3*
Engine *0-3*
PROPELLER *0-3*
…… ……..... 0-3
SIGNATURE STAMPRECORD OF REVISIONS 0-3

0. GENERAL INFORMATION 0-9

0.1 INTRODUCTION 0-9
0.2 CERTIFICATION BASIS 0-9
0.3 MANUFACTURER 0-9
0.4 WARNING, CAUTION AND NOTE 0-9

1. AIRPLANE AND SYSTEMS DESCRIPTION 1-10

1.1 ENGINE 1-11
1.2 PROPELLER 1-12
1.3 FUEL AND FUEL CAPACITY 1-12
1.4 OIL 1-13
1.5 OPERATING WEIGHTS AND LOADING (OCCUPANTS, BAGGAGE, FUEL, BALLAST) 1-14
1.6 COCKPIT OVERVIEW 1-15
1.7 OTHER EQUIPMENT 1-20

2. OPERATING LIMITATION 2-21

2.1 STALL SPEED AT MAXIMUM TAKEOFF WEIGHT (V_S AND V_{SO}) 2-21
2.2 FLAPS EXTENDED SPEED RANGE (V_{SO} TO V_{FE}) 2-22
2.3 MAXIMUM MANEUVERING SPEED (V_A) 2-22
2.4 NEVER EXCEED SPEED (V_{NE}) 2-22
2.5 CROSSWIND AND WIND LIMITATION 2-22
2.6 SERVICE CEILING 2-23
2.7 LOAD FACTORS 2-23
2.8 PROHIBITED MANEUVERS 2-23
2.9 OTHER LIMITATIONS 2-23

3. WEIGHT AND BALANCE INFORMATION 3-25

3.1 INSTALLED EQUIPMENT LIST 3-25
3.2 CENTER OF GRAVITY (CG) RANGE AND DETERMINATION 3-25
3.2.1 Airplane weight and balance statement 3-26
3.2.2 Weight and balance determination for flight 3-26
3.2.3 Detailed calculation of CG position 3-27

4. PERFORMANCE 4-29

4.1 TAKEOFF AND LANDING DISTANCES 4-30
4.2 RATE OF CLIMB 4-30
4.3 CRUISE SPEEDS 4-30
4.4 RPM 4-31
4.5 FUEL CONSUMPTION 4-31
4.6 OTHER PERFORMANCE DATA 4-31

5. EMERGENCY PROCEDURES 5-32

5.1 INTRODUCTION 5-32
5.2 ENGINE FAILURE AND EMERGENCY LANDINGS 5-32
5.2.1 Engine Failure during Take-Off Run 5-32
5.2.2 Engine Failure during Take-Off 5-32
5.2.3 In-flight Engine Failure 5-33
5.2.4 Additional information to engine failure and emergency landing procedures 5-33
5.3 IN-FLIGHT ENGINE STARTING 5-34
5.4 FIRES 5-34
5.4.1 Engine fire on the ground 5-35
5.4.2 Engine fire during takeoff 5-35
5.4.3 Engine fire in flight 5-36
5.4.4 Cockpit or electrical fire 5-36
5.5 GLIDING 5-37
5.6 PRECAUTIONARY LANDING 5-37
5.7 BLOWN-OUT TIRE LANDING 5-38
5.8 DAMAGED LANDING GEAR LANDING 5-38
5.9 VIBRATIONS OR OTHER ENGINE PROBLEM 5-38
5.10 INADVERTENT ICING ENCOUNTER 5-38
5.11 EXTREME TURBULENCE ENCOUNTER 5-39
5.12 ELECTRICAL SYSTEM MALFUNCTIONS 5-39
5.12.1 Indicator of warning light is illuminated immediately - Switch ON Backup battery switcher. All avionics and other equipment is powered from the battery, so the power source is limited. Try to switch off instruments not necessary for flight and land at the nearest airfield 5-39
5.13 INADVERTENT STALL AND SPIN RECOVERY 5-39
5.13.1 The following general procedure should be followed should a stall occurs: 5-39
5.13.2 The following general procedure should be followed should a spin occurs: 5-39

6. NORMAL PROCEDURES 6-41

6.1 PRE-FLIGHT INSPECTION 6-41
6.1.1 Daily Preparation 6-42
6.1.2 Engine Warm-Up, Power Check 6-44
6.1.3 Pre-Flight Inspection 6-45
6.2 ENGINE STARTING 6-46
6.2.1 Use of External Power Supply 6-46
6.2.2 Engine Starting 6-46
6.3 TAXIING 6-48
6.3.1 Prior to Taxiing 6-48
6.3.2 Taxiing 6-48
6.4 NORMAL TAKEOFF 6-48
6.4.1 Prior to TakeOff 6-48
6.4.2 Take-Off 6-49
6.5 BEST ANGLE OF CLIMB SPEED (V_X) 6-50
6.5.1 Climbing 6-50
6.6 BEST RATE OF CLIMB SPEED (V_Y) 6-50
6.6.1 Climbing 6-50
6.7 CRUISE 6-50
6.7.1 Cruise Flight 6-50
6.8 APPROACH 6-52
6.8.1 Descent 6-52
6.8.2 Downwind 6-52
6.9 NORMAL LANDING 6-52
6.9.1 On Base Leg 6-52
6.9.2 On Final 6-53
6.9.3 Landing 6-53
6.9.4 After landing 6-53
6.9.5 Engine Stopping 6-53
6.9.6 Post-Flight Check 6-54
6.10 SHORT FIELD TAKEOFF AND LANDING PROCEDURES 6-54
6.11 BALKED LANDING PROCEDURES 6-55
6.12 INFORMATION ON STALLS, SPINS AND ANY OTHER USEFUL PILOT INFORMATION 6-55
6.12.1 Rain 6-55
6.13 TOWING GLIDERS 6-56
6.13.1 General 6-56
6.13.2 Flight limits 6-56
6.13.3 NORMAL PROCEDURES for towing gliders 6-56
6.13.4 Before Take Off 6-56
6.13.5 Take OFF roll: 6-57
6.13.6 Climbing: 6-57

6.13.7 Towing speed according to the glider limitations. *6-58*
6.14 WING FOLD OPERATION AND DESCRIPTION……..……6-59
6.14.1 *Description*……..…6-59
6.14.2 *Wing fold for transport*……..……6-59

7. AIRCRAFT GROUND HANDLING AND SERVICING 7-62

7.1 SERVICING FUEL, OIL, COOLANT 7-62
7.1.1 Servicing fuel *7-62*
7.1.2 Servicing oil *7-62*
7.1.3 Servicing coolant *7-63*
7.2 LANDING GEAR TIRE DIMENSION AND PRESSURE 7-63
7.3 TOWING AND TIE-DOWN INSTRUCTIONS 7-63
7.3.1 Aircraft towing instruction *7-63*
7.3.2 Aircraft tie-down instruction *7-64*

8. REQUIRED PLACARDS AND MARKINGS 8-65

8.1 AIRSPEED INDICATOR RANGE MARKINGS 8-65
8.2 OPERATING LIMITATION ON INSTRUMENT PANEL 8-66
8.3 PASSENGER WARNING 8-67
8.4 "NO INTENTIONAL SPINS" 8-67
8.5 MISCELLANEOUS PLACARDS AND MARKINGS 8-67

9. SUPPLEMENTARY INFORMATION 9-68

9.1 FAMILIARIZATION FLIGHT PROCEDURES 9-68
9.2 PILOT OPERATING ADVISORIES 9-68
9.3 FURTHER INFORMATION 9-68

0. General information

0.1 Introduction

This handbook is provided with your aircraft to allow you to attain as much knowledge about the aircraft as its operation as possible. This manual is following ASTM F 2245–11 and ASTM 2746-14 document – Standard Specification for Design and Performance of a Light Sport Airplane. Read this manual thoroughly before your first flight and make sure you understand all the information contained here. This aircraft is equipped with non-certified engine that meets ASTM F-2339 engine standard. Flying this aircraft must always be done with the possibility of a safe landing due to 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.

0.2 Certification Basis

This aircraft was manufactured in category 95.55 airworthiness standards and with type certificate Micro light airworthiness by Slovak Aviation Authority issues with No.: V-82/2004 and V – 84/2007.

0.3 Manufacturer

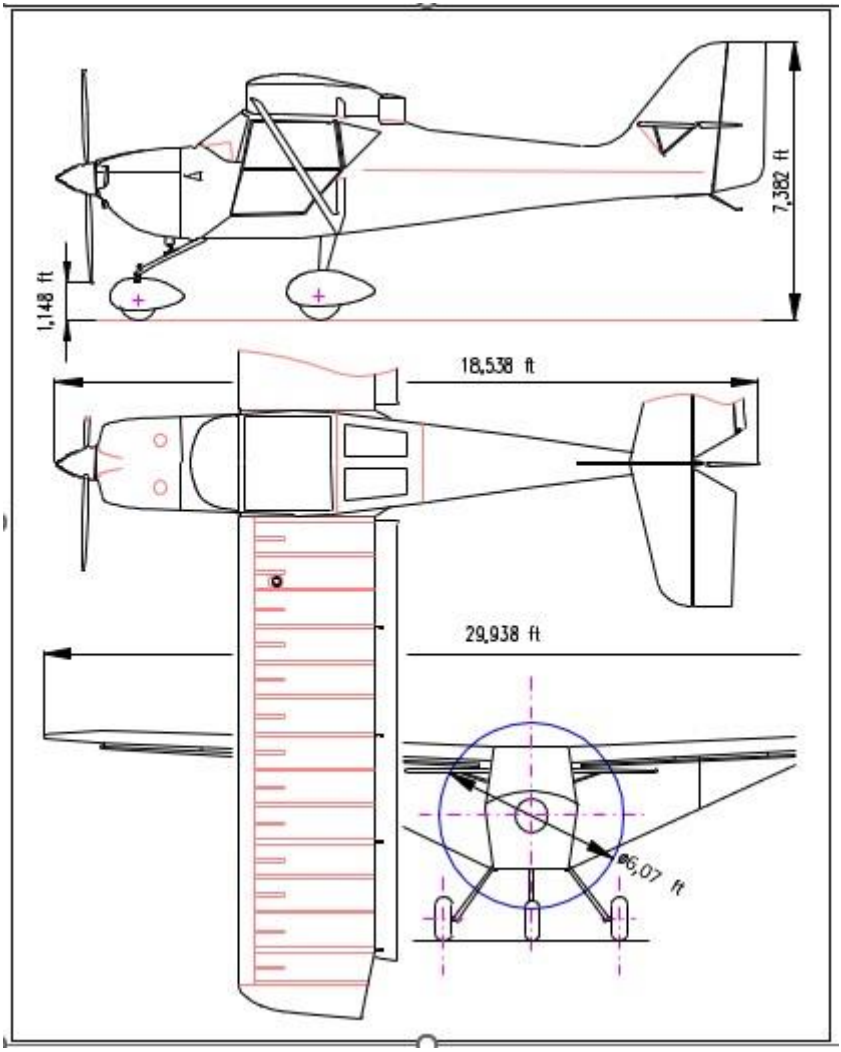
AEROPRO s.r.o.
Dlhá 126
94907 Nitra
Slovenská republika

0.4 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**

1. Airplane and Systems Description



EuroFox is designed as a high-wing monoplane. A two-spar wing is equipped with flaperon. Fuselage is an open truss structure welded of steel tubes. Tail unit is formed of a lattice-work tube frame. The airplane 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 (At MTOW) ..... 49,12 kgm^{-2}

Aspect-ratio 7,3

Propeller clearance (in flight position) ..... 0,22 m

1.1 Engine

The engine is a 4 cylinder horizontally opposed, 4-stroke piston engine with liquid cooled cylinder heads, ram-air cooled cylinders, dry sump forced lubrication, turbocharger with intercooler, exhaust system and it is controlled by a dual channel Full Authority Digital Engine Control (FADEC) system for ignition and injection. The engine is equipped with a reduction gear box with integrated torsion shaft, dampening clutch and overload protection clutch to reduce the crankshaft speed to the designed propeller shaft speed. The engine will be operated with automotive gasoline or AVGAS.

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

Engine model ..... ROTAX 915 iS2A SPORT /141hp

Max. power - take-off ..... 104 kW / 141 HP

- continuous ..... 99 kW / 135 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 ..... 7,0 bar

Oil consumption ..... max. 0.06 l/h

Fuel pressure - minimum .....2,5 bar

- maximum .....3,5 bar

Fuel Consumption at Take off .....48 l/h

Fuel Consumption at 75% of power rating .....36 l/h

Specific consumption .....280 – 310 g/(kW·h)

Propeller gearbox reduction ratio .....2.54 : 1

For more details see **Operator's Manual for all versions of Rotax 915** supplied with the engine.

WARNING	**This aircraft is equipped with non-certified engine** **Flying this aircraft must always be done with the possibility of a safe landing due to loss of engine power. The pilot is fully responsible for consequences of such failure.**

1.2 Propeller

The DUC Flash-3 propeller is made by DUC Helices – company. The propeller is a four-bladed, ground adjustable, clockwise rotation, tractor, made of composite. Propeller diameter – 1850 mm

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

1.3 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…….... Premium unleaded auto fuel (Standard Spec. for Automotive Spark-Ignition Engine, Fuel, ASTM D 4814, EN 228 Super, EN228 Super Plus) or AVGAS 100 LL.

Due to the higher lead content in AVGAS, the wear of the valve seats, the deposits in combustion chamber and lead sediments in the lubrication

system will increase. Therefore, use AVGAS only if you encounter problems with vapor lock or if other fuel types are not available.

For additional information concerning fuel specification consult **Operator's Manual for all versions of Rotax 915** supplied with the engine.

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 box and connecting lines.

The fuel is gravity-fed from the right-hand or left-hand wing tank into the central tank depending 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 electrical fuel pump box, that contains two fuel pumps, located under seats which delivers the fuel to the injection system of the system.

The amount of fuel in each tank is indicated by a visual fuel gauge which is a part of each tank. Minimum fuel quantity in the central tank is indicated by a warning light on the instrument panel. The remaining fuel (4,1 litres), is in that case enough for approximately 6 minutes of flight. The warning light condition can be verified 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 manipulate the 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 7.1

1.4 Oil

Oil tank capacity.....3.2 litres

Maximum oil quantity .....2.6 litres

Minimum oil quantity .....2.1 litres

Oil specification:

Use Oil "AeroShell" Oil Sport Plus 4 (RON 424 , Viscosity 10W-40).

Caution**:** When selecting the most suitable lubricants refer to the additional information in the Rotax Service Information SI-915 i-001. .

CAUTION**:** If the engine is mainly run on AVGAS **more frequent** oil changes will be required. See Rotax Service Information SI-915 i-001.

For additional information concerning oil system consult **Operator's Manual for all versions of Rotax 915** supplied with the engine.

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

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

Empty weight (standard version).....349,1 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

Maximum useful load .....210,9 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 aircraft is overloaded. Takeoff and landing distance is significantly longer for overloaded aircraft. Overloading of the aircraft is one of the typical causes of accidents.

1.6 **Cockpit overview**

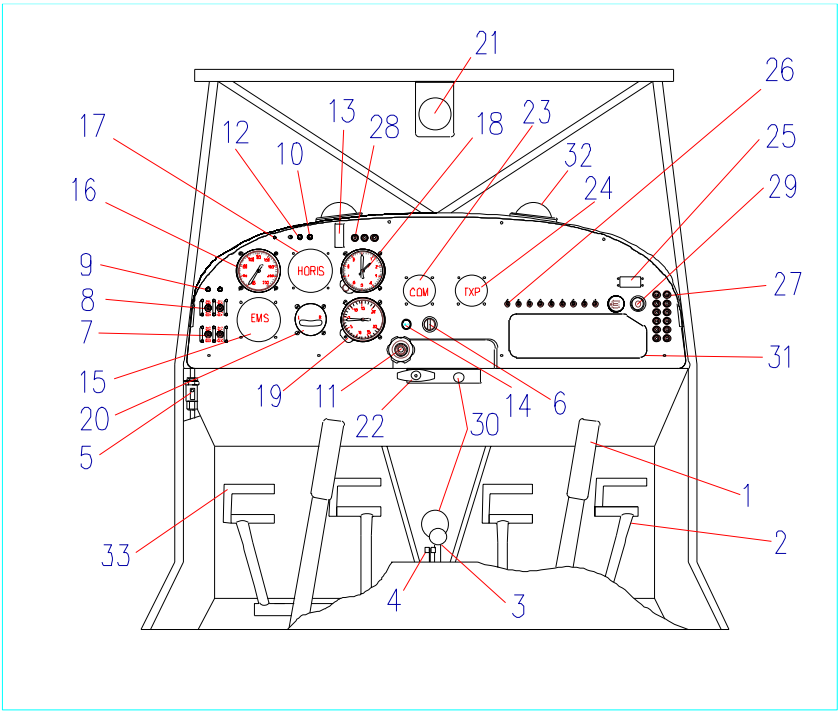


Figure 1 – Cockpit overview

LAYOUT OF CONTROLS AND INSTRUMENTS

(see following pages for details)

1. Control stick	16. Air speed indicator	e) Transponder
2. Rudder pedals	17. HORIS	f) GPS
3. Wing flaps	18. Altimeter	g) Free
4. Trim elevator	19. VSI	h) Free
5. Fuel valve	20. Slip indicator	i) USB
6. Master switch	21. Magnetic Compass	27. Service C/Bs
7. Fuel pump switches	22. Tow hook release	28. Engine C/Bs
8. ECU switches	23. COM Radio	29. USB port + 12V socket
9. ECU lights	24. Transponder	30. Cabin heating
10. Momentary switch light	25. ELT	31. Glove box
11. Throttle lever	26. Section Switches	32. Ventilation
12. Fuel reserve light	a) Landing lights	33. Pedal brakes
13. Backup battery switches	b) Position lights	
14. Startup button	c) Strobe lights	
15. Engine Mon. system	d) Radio	

LAYOUT OF CIRCUIT BREAKERS

Landing lights	10A	Free	5A
Position lights	2A	Free	5A
Strobe lights	3A	USB	3A
Radio COM	5A	Kanardia	2A
Transponder	3A	EMSIS	2A
GPS	2A	12V Socket	5A

Key Switch	30A	Backup battery	30A	Fuse box	30A

II. List of installed instruments and other equipment:

Instrument	Type	Serial No.
Air Kanardia	Horis PFD (Master)	25254
	Airspeed Indicator (Slave)	25570
	Altimeter 80 (Slave)	24456
	Vertical Speed Indicator (Slave)	30306
	EMSIS	19865
	MiniDaqu	20093
TQ	KRT2-S-TQ	50001299T
	KTX2-S.V2	20001603T
ACK	E-04	45005
FALCON	MCPN2L	2202114

Figure 2 – Air Kanardia EMSIS (For more information regarding Air Kanardia EMSIS refer to EMSIS Installation and User Manual)

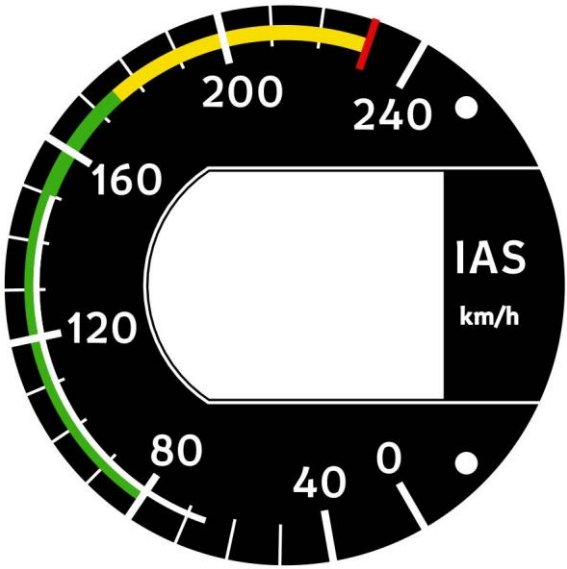


Figure 3 - Airspeed Indicator marking

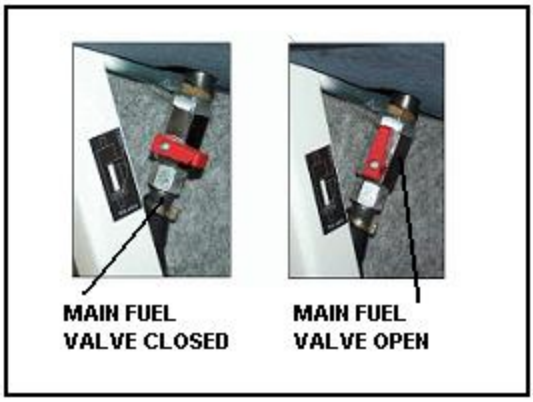


Figure 4 – Fuel valve

Figure 5: Central panel (yellow lever: Tow cable release, middle lever: Throttle, right lever: Cockpit heating)

Note: Rotate throttle lever for smooth power settings (clockwise to increase power, counterclockwise to reduce power), for larger changes push/pull lever

Figure 6 – Flaps and trim

Figure 7 – Door locking mechanism

The battery JMT HJTX20CH-FP Li-Ion is located behind the right-hand pilot's seat. Nominal voltage in aircraft system is 13.5 to 14.2 V and capacity is 6 Ah. The engine is equipped with integrated AC generator with external rectifier-regulator (12 V, 20A DC).

1.7 Other equipment

reserved

2. Operating limitation

Airspeed indicator system calibration:

km/h (Indicated Air speed)	km/h (Calibrated Air speed)
64	71
74	77
92	95
111	95
130	111
148	127
167	159
185	175
207	186
219	197
230	208

As requested by ASTM F-2245-04 §9.1 all flight speeds are presented as calibrated airspeeds in kilometer per hour (km/h). As the calibrated airspeed can not be usually determined by simple reading of aircraft airspeed indicator, corresponding Indicated airspeed in kilometers per hours (km/h) are also presented in this document. All airspeed values in this handbook assume no instrument error.

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

Aircraft configuration	Stall speed – angle of bank 0°	
	Km/h (Indicated Air speed)	Km/h (Calibrated Air speed)
Flaps down (V_{so})	60	72
Flaps up (V_s)	78	82

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 increasing.** **Example: angle of bank – 60° ……. V_S= 120 km/h**

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 150 km/h. Full throttle is also essential to have sufficient thrust reserve as the drag is increasing during a steep turn.

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

	km/h (Indicated Air speed)	**km/h (Calibrated Air speed)**
Lower limit	60	72
Upper limit	150	145

2.3 Maximum maneuvering speed (V_A)

	Km/h (Indicated Air speed)	**Km/h (Calibrated Air speed)**
Max. manoeuvring speed (V_A)	175	167

2.4 Never exceed speed (V_{NE})

	Km/h (Indicated Air speed)	**Km/h (Calibrated Air speed)**
Never exceed speed (V_{NE})	230	215

2.5 Crosswind and wind limitation

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

Max. wind (in runway direction)……..... 40 km/h (22 knots)

Crosswind…….. 28 km/h (15 knots)

tail wind…… 10 km/h (5 knots)

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

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

When landing with tail wind the aircrafts possessive ground speed is higher resulting in longer landing distance.

2.6 Service ceiling

Ceiling.....14 760 ft

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

2.7 Load factors

Flaps up:

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

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

Flaps down:

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

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

2.8 Prohibited maneuvers

WARNING	**Aerobatics, intentional stalls and spins are prohibited.** **Maximum angle of bank : 60°**

2.9 Other Limitations

WARNING	**No smoking**

WARNING	**Flights with rear canopy removed are prohibited**

WARNING	**Only VFR day flights at ambient temperature above 14° F are permitted.** **Flights at ambient temperature between 14° F and 32° F are permitted only under no icing conditions and when the carburettor heating is activated.**

WARNING	**IFR flights and flying in clouds is prohibited.** **Flight into known icing 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 weather during your flight and try to get weather information from your destination using radio whenever possible. When weather is deteriorating make a diversion or turn back before the low cloud base and/or low visibility are critical.

3. Weight and Balance Information

3.1 Installed equipment list

		VFR Day
Garmin FIS and EFIS	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
	Head temperature indicator	X
Radio		X
Intercom		-
Transponder		X
ELT		-
12V socket		X

3.2 Center of gravity (CG) range and determination

Aircraft handlings and performances have been determined for this range of CG positions.

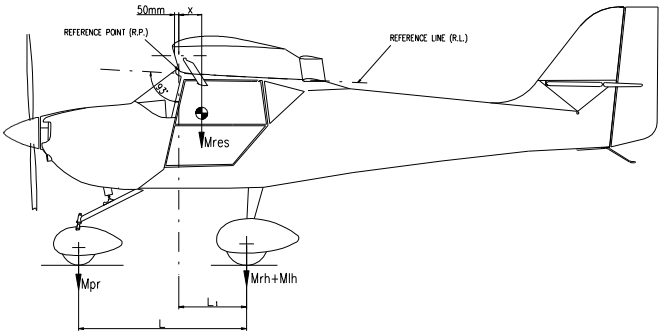
	Front limit (%)	Rear limit (%)
Center of gravity limits	20	34

3.2.1 Airplane weight and balance statement

The CG position of empty aircraft is determined by weighting. The procedure is described in the Maintenance manual. The whole procedure must be repeated and new **Airplane weight and balance statement** must be prepared whenever a modification or repair having impact to the weight of the aircraft occurs.

Serial Number **72024** **Registration:** **OM-W070**

Aircraft Leveling:



Values Weighed:

Main wheels	right-hand	M_{RH} =	139,8 kg	L=	1435 mm
	left-hand	M_{LH} =	139,2 kg	L_1=	506 mm
Nose wheel		M_{TS} =	60,9 kg		
Resulting weight		Mres =	339,9 kg		

C.G. position

$B = (M_{TS} \times L) / M_{res}$ = 257,11 mm

$X = L1 - B + 50$ = 298,89 mm

$\overline{X} = (X \times 100) / 1300$ = 22,99 % B_{SAT}

Date: 15.07.2024 Performed by:

3.2.2 Weight and balance determination for flight

WARNING	**The aircraft must not be operated in violation of its approved weight and balance limitations to assure safe flying.**

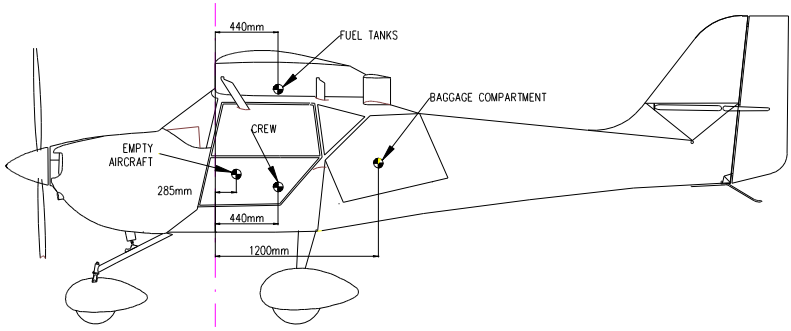
Maximum takeoff weight is the maximum weight approved for the start of the takeoff roll.

The table given bellow represents the maximum amount of fuel for given crew weight and given weight in the baggage compartment. The CG (center of gravity) position is within the approved range for all combination in the table and any interpolation between displayed values.

Max. Take-Off Weight									
Weight Baggage (kg)	Crew Weight (kg)								
	55	110	120	130	140	150	160	170	180
5 kg	85 L	85 L	85 L	85 L	85 L	75L	61L	48L	35L
10 kg	85 L	85 L	85 L	85 L	81L	68L	55L	41L	28L
20 kg	85 L	85 L	85 L	81L	68L	55L	41L	28L	15L

3.2.3 Detailed calculation of CG position

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



Empty aircraft		Weight (kg)	X (mm)	Moment (kg.cm)
Crew			*440,0*	
		Example: 180		*Example:* 792
Fuel	Liters		*440,0*	
	max 85 liters	*Example:* 43		*Example:* 187,44
Baggage			*1200,0*	
		Example: 10		*Example:* 120
Total				
		Example: 487		*Example:* 1955,6
Loaded aircraft CG position in inches:		$X_T = \frac{\text{Total moment}\ [1]}{\text{Total weight}\ [2]}$		
Example	***X_T=***	$\frac{1956 \times 100}{487} =$		**402 mm**
Permitted C.G. range in inches		***259 mm ≤***	.....	***≤ 416 mm***
Loaded aircraft CG position in % MAC:		$[\%] = \frac{X_T}{13} * 100$		
Example [%]		$\frac{402 \times 100}{1300} =$		*30,89 %*
Permitted C.G. range in %		***20% ≤***	.....	***≤ 34%***

4. 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 technique. 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 takeoff or landing when only 50 ft excess runway is available or do not plan a cross country with only 2 gallons fuel planned when arriving to your destination. Always be conservative when planning a flight and be ready for the unexpected – not forecasted wind, atmospheric turbulence or sudden weather change in destination forcing you to divert to airfield 60 NM away. Always plan a reasonable fuel reserve – 30 to 60 minutes seems to be sufficient time for most of flights, but this time should be even more 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 takeoff and cruising performance (the performance information below is 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 careful when making this change and make a record of the current settings. When the propeller is set to achieve a maximum cruise speed, the takeoff distance is significantly longer. On the other hand, when the propeller is set to achieve good rate of climb, the fuel consumption during a level flight is higher. The finer pitch is set (e.g. climb setting), the higher static RPM are achieved when aircraft is static and full power is applied.

4.1 TakeOff and Landing distances

Surface	TakeOff Distance (ft)	
	Ground run	Takeoff distance to 50 ft
Grass runway	492	1049
Concrete runway	459	1017

Surface	Landing Distance (ft)	
	Landing distance from 50 ft	Ground run
Grass runway	1148	558
Concrete runway	1082	492

Both takeoff 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

4.2 Rate of climb

	MTOW 560 kg
Rate of climb (fpm)	816

4.3 Cruise speeds

Maximum cruising speed at 75% .....172 km/h (Indicated)

(164 km/h Calibrated)

4.4 RPM

Max. take off power..... 5,800

Max. continuous power 5,500

Cruise flight..... . 4,200 – 5,200

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

4.5 Fuel consumption

Engine settings	Fuel consumption (Litres / hour)
Takeoff power performance	48
Max. continuous performance	46
Cruise performance	25-40

Fuel consumption during cruise flight is depending on various factors. The most important ones are engine settings and propeller settings. The higher the engine RPM is set during cruise, the higher 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 to the destination. Always carefully evaluate fuel consumption during the flight.

4.6 Other performance data

Max. endurance .....4,0 hours

Max. range…….. 610 km

5. Emergency procedures

5.1 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 experience of the crew controlling course of such events. All air speed values in this chapter are presented in km/h Indicated Airspeed, as this value represents instrument reading better than the Calibrated air speed.

5.2 Engine Failure and Emergency landings

5.2.1 Engine Failure during Take-Off Run

- throttle — REDUCE TO IDLE
- ECU A, B — OFF
- master switch — OFF
- brakes — AS REQUIRED

5.2.2 Engine Failure during Take-Off

- airspeed — 120 km/h
- 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
- ECU A, B — OFF
- main fuel valve — SHUT
- tank fuel valves — SHUT
- flaps — EXTEND AS NEEDED
- safety belts — TIGHTEN

after touchdown:

- brakes AS REQUIRED

5.2.3 In-flight Engine Failure

- airspeed 120 km/h
- landing site selection SELECT
- transmit MAYDAY on 121,5 MHz, XPDR 7700 - if time permits

check	- master switch	ON
	- ECU A, B	ON
	- backup battery switch	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 started up, proceed in accordance with the procedure 5.2.2 .

5.2.4 Additional information to engine failure and emergency landing procedures

If the engine failure occurs during the takeoff 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 takeoff, 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 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 of 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 intentions 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 cannot be performed due to time constrains 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 minimized if the pilot is fully concentrating on controlling the aircraft until it comes to complete stop**

5.3 In-flight Engine Starting

- airspeed	120 km/h
- landing site selection	SELECT
- master switch	ON
- backup battery switch	ON
- main fuel valve	OPEN
- wing tank fuel valves	OPEN to tank with more fuel
- throttle	ADJUST to 1/3 of travel
- ECU A, B	ON
- starter button	Push to START

- if the engine cannot be started up, increase the airspeed to 136 – 160 km/h 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.

5.4 Fires

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

5.4.1 Engine fire on the ground

- main fuel valve	SHUT
- tank fuel valves	SHUT
- throttle	FULL
- ECU A, B	switch off when engine has stopped as all remaining fuel in engine cylinders was burned
- master switch	OFF
- fuel pump switches A/B	OFF
- main fuel valve	SHUT
- tanks fuel valves	SHUT

- abandon the aircraft and extinguish fire (if possible)

- fire damage	INSPECT

NOTE	Time needed to burn fuel remaining in the injection system 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 AUTHORIZED PERSONNEL**

5.4.2 Engine fire during takeoff

- throttle	IDLE
- fuel pump switches A/B	OFF
- main fuel valve	SHUT
- tank fuel valves	SHUT
- airspeed	120 km/h
- throttle	FULL
- ECU A, B	switch off when engine has stopped as all remaining fuel in engine cylinders was burned

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

5.4.3 Engine fire in flight

- main fuel valve	SHUT
- tank fuel valves	SHUT
- fuel pumps switches A/B	OFF
- throttle	FULL
- airspeed	INCREASE as required to find an airspeed which will provide as 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
- ECU A,B	switch off when engine has stopped as all remaining fuel in engine cylinders was burned
- master switch	OFF
- airspeed	120 km/h
- 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 AUTHORIZED PERSONNEL**

5.4.4 Cockpit or electrical fire

Electrical fires are usually signalled by the odor 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.

5.5 Gliding

gliding ratio.....1 : 11

optimum gliding speed .....110 km/h

rate of descent .....551 fpm

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

5.6 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 120 km/h 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

Precautionary landing should be preferred instead of emergency landing. When engine vibration or engine roughness is presented, do not wait until the engine stops and perform a precautionary landing.

Precautionary landing is also used when a fuel exhaustion is imminent. This should not happen when a 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 a proper flight planning is done. When the cloud base is forcing you to fly in low altitude and/or visibility is limited, try to fly reverse of other course to avoid bad weather area. If the conditions are not getting better or even are deteriorating, perform a precautionary landing before the conditions are getting even worse.

5.7 Blown-Out Tire 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

5.8 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

5.9 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 5.2.2

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.

5.10 Inadvertent icing encounter

- 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.

5.11 Extreme turbulence encounter

- Airspeed REDUCE to 137 km/h
- safety belts SECURED
- free objects SECURED

When an area of extreme turbulence is entered reduce airspeed to approximately 137 km/h. Do not reduce the airspeed to lower values to prevent the aircraft stalling due to turbulence as well as do not to keep high speed to prevent structural damages to the aircraft.

5.12 Electrical system malfunctions

5.12.1 Indicator of warning light is illuminated immediately - Switch ON Backup battery switcher. All avionics and other equipment is powered from the battery, so the power source is limited. Try to switch off instruments not necessary for flight and land at the nearest airfield

5.13 Inadvertent Stall and spin recovery

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

5.13.1 The following general procedure should be followed should a stall occurs:

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

5.13.2 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, center rudder and establish a level flight.

6. Normal procedures

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

6.1 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 at any given day. Prior to any flight at least fuel and oil quantity should be checked.

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, 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 can possibility resulting from 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 DAMAGES OR PROBLEMS DURING A PRE-FLIGHT INSPECTION. ALWAYS CONSULT AUTHORISED PERSONNEL FOR REPAIRS**

6.1.1 Daily Preparation

1. Cockpit

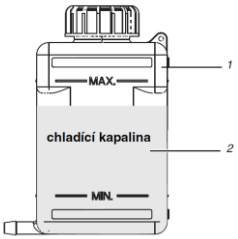
POH and other documentation	review and available to pilot
master switch	OFF
backup battery switch	OFF
ECU A, B	OFF
fuel pump switch A	OFF
fuel pump switch B	OFF
fuel valves	OPEN, fuel quantity check
instruments	INSPECT
safety belts	INSPECT
check of flaperon tie rods	INSPECT
control stick	INSPECT , freedom 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
doors	INSPECT, shut and locked

2. Main landing gear

gear and attachment	INSPECT
wheels	INSPECT, tire 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, tow hook	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, tire 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, intercooler 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 injection system

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.

6.1.2 Engine Warm-Up, Power Check

- Brakes on.
- Start the engine - see section 6.2
- warming-up to operating temperature - first at 2000 RPM for 2 minutes, then at 2500 RPM to reach oil temperature of 50°C
- temperature and pressure values - within operating limits-
- Set Engine at 2000 RPM
- Deactivate Fuel Pump1 – Verify Fuel Pressure at Green range
- Activate Fuel Pump 1
- Deactivate Fuel Pump 2 – Verify Fuel Pressure at Green range
- Activate Fuel Pump 2
- Set Engine at 2500 RPM
- Deactivate ECU A – Verify RPM drop is not more than 250 RPM
- Activate Fuel ECU A
- Deactivate ECU B – Verify RPM drop is not more than 250 RPM
- Activate ECU A
- Set engine at Idle
- Verify ECU A,B Caution lamp are extinguished.
- Set Throttle - Maintain 5000 RPM
- Deactivate ECU A Wait 15 seconds
- Check warning indicators and engine parameters are in compliance with operating limits.

- Activate ECU A — Await Warning indicator A to extinguish.
- Deactivate ECU B — Wait 15 seconds
- Check warning indicators and engine parameters are in compliance with operating limits.
- Activate ECU B — Await Warning indicator B to extinguish.
- Throttle — - IDLE
- Verify Positive Battery Charge
-
- All engine instrument readings must not exceed operating limits under any rating
-

  Note:
- The PCV check and the ECU A,B, and ignition check might be combined in one check

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 propeller level! 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 check of engine power, cool down the engine for a short time to avoid evaporation of the cooling liquid in cylinder heads.*

6.1.3 Pre-Flight Inspection

Make a brief walk around before you board the aircraft. This short inspection might discover damages or problem 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 engine is running is aware of propeller danger. The best practise is to use chocks only for engine warm-up and engine check, shut down the engine and remove chock while the engine is stopped. Before using chock make sure they do not collide with wheel fairings preventing any damage.

cockpit	- INSPECT COCKPIT INTERIOR EQUIPMENT
	- INSPECT SAFETY BELTS
	- CONTROL SYSTEM-FREEDOM OF MOVEMENT, DAMAGES
wings	- INSPECT WING SURFACES
	- INSPECT WING AND STRUTS SUSPENSIONS
	- INSPECT FLAPERONS.
fuselage	- INSPECT
tail unit	- INSPECT
landing gear	- INSPECT
break system	- INSPECT

engine and propeller - INSPECT.

oil Level - - INSPECT AND FILL AS REQUIRED

oil Coolant- INSPECT AND FILL AS REQUIRED

6.2 Engine starting

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

Make sure nobody and/or nothing is near the propeller when staring the engine.

6.2.1 Use of External Power Supply

The external power supply may be connected to battery contacts when necessary through the connector of power supply which is located below the co-pilot seat close to the door.

6.2.2 Engine Starting

- pre-flight inspection COMPLETED

- safety belts	ADJUST AND SECURE
- rudder pedals	FREE OF MOVEMENT
- brakes	CHECK FUNCTION
- control stick	FREE OF MOVEMENT
- trim	FREE OF MOVEMENT
- wing flaps	FREE OF MOVEMENT, RETRACTED
- engine control	FREE OF MOVEMENT
- instruments	CHECK OF VALUES, SETTINGS
- doors	CLOSED, LOCKED
- master switch	SWITCH ON
- main fuel cock	OPEN
- wing tank fuel cocks	OPEN TO TANK WITH MORE FUEL
- fuel pump switches A and B	ON
- throttle	IDLE According to diagram 3.3 at the engine Operator Manual
- control stick	PULLED (clamped between legs)
- brakes	ON
- propeller area	“CLEAR”
- ECU A, B	SWITCH ON
- ECU A,B Caution Lamp	Light Distinguished
- starter button	PUSH to start

note: 10 sec activation maximum without interruption, followed by a cooling period of 2 minutes

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

- instruments	CHECK OF INDICATION (oil pressure must rise within 10 seconds. Increase of engine RPM is permitted only at steady oil pressure readings above 30 PSI)
- 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 at idle. The 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 immediately off using ignition switch.

6.3 Taxiing

6.3.1 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

6.3.2 Taxiing

- taxiing speed is 15 kph maximum. Steering is performed by rudder pedals controlling the nose wheel.
- in crosswind hold ailerons „upwind“, using the control stick.
- In strong crosswind perform the taxiing with an assisting person holding the wing by its windward side.
- When taxing on gravel surfaces use as low engine power as possible to prevent damage to the propeller leading edges.

6.4 Normal TakeOff

6.4.1 Prior to TakeOff

- brakes	BRAKES ON
- trim	NEUTRAL
- wing flaps	TAKE-OFF POSITION
- master switch	ON
- ECU A, B	ON
- main fuel valve	OPEN

- tank fuel valves	FUEL QUANTITY CHECK, OPEN TO BOTH OR TANK WITH MORE FUEL QUANTITY
- instruments	CHECK
- doors	CLOSED, LOCKED
- safety belts	FASTENED, TIGHTENED
- controls	FREEDOM OF MOVEMENT
- runway	not occupied by another aircraft

6.4.2 Take-Off

Continuously increasing engine power to maximum (max. 5800 RPM are not to be reached) , bringing the aircraft into motion. At a speed above 74 KPH IAS rotate the aircraft by slight pulling. Do not climb before the airspeed of 93 KPH IAS is reached. Then make a transition to climb, get the aircraft to climbing at a speed of 111 KPH IAS. Accelerate during initial climb to 120 KPH IAS unless the best angle of climb is required. Maintain the airspeed during best angle climb carefully, do not let the speed drop below 111 KPH IAS.

- throttle	FULL
- engine instruments	CHECK
- elevator control	ROTATE at 75 km/h by slight pulling
- initial climb speed	111 km/h
- engine instruments	CHECK
- wing flaps	slowly FLAPS UP ABOVE 150 FT
- trimming	TRIM

WARNING	**TakeOff is forbidden - if engine running is not smooth. - if runway is occupied.**

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

If taking off the from gravel surface apply the power slowly to prevent propeller leading edges damages.

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

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

6.5 Best angle of climb speed (V_X)

6.5.1 Climbing

- throttle	5,500 RPM MAX
- airspeed	95 km/h
- engine instruments	CHECK

6.6 Best rate of climb speed (V_y)

6.6.1 Climbing

- speed	5,500 RPM MAX
- airspeed	104 km/h
- engine instruments	CHECK

6.7 Cruise

6.7.1 Cruise Flight

- bring the aircraft into horizontal flight

- speed	4,000 – 5,500 RPM
- airspeed	110 – 152 km/h as required
- engine instruments	CHECK
- fuel tank valves	SWITCH BETWEEN TANKS IF NEEDED (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

is set. Higher RPM means higher speed, but fuel consumption is increasing 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 liter).

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

A fuel consumption and remaining fuel on board should be monitored. Always make a comparison between estimated and actual time above any waypoint.

Select carefully the flight path – avoid flying over large urban areas, large forests or large water areas as well as over mountains. Landing possibilities are very limited in case of engine failure or other emergency over those areas. Always have some suitable landing area within a gliding range. When it is necessary to cross a large area not suitable for emergency landing, always climb to the appropriate altitude to reach suitable landing site once emergency occurs.

Always monitor the airspace around you 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 during changing the active fuel tank change.**

6.8 Approach

6.8.1 Descent

- throttle	INCREASED IDLE OR AS REQUIRED
- engine instruments	CHECK

WARNING	**During long approaches and when descending from a considerable height, it is not advisable to reduce the engine throttle control to idle. In such 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.**

6.8.2 Downwind

- power	4,000 – 5,000 RPM
- airspeed	120 – 145 km/h
- engine instruments	CHECK
- fuel	FUEL QUANTITY CHECK, SWITCH TO TANK WITH MORE FUEL IF NECESSARY
- 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

6.9 Normal landing

6.9.1 On Base Leg

- power	3,000 RPM
- airspeed	120 km/h
- engine instruments	CHECK
- wing flaps	TAKE-OFF
- trimming	TRIM

- final leg airspace check of free space

6.9.2 On Final

- airspeed	120 km/h
- power	ADJUST AS NEEDED
- engine instruments	CHECK
- wing flaps	LANDING
- trimming	TRIM
- engine instruments	WITHIN LIMITS

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

6.9.3 Landing

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

At a height of about 30 ft reduce the engine speed to idle. Maintain speed of 120 km/h 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 64 – 72 km/h 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.....120 km/h

6.9.4 After landing

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

6.9.5 Engine Stopping

- throttle	- IDLE
- ECU A,B	Verify both lamp are extinguished and engine parameters complies with engine limitations.

- Oil Temperature - Maintain in idle at least 2 minutes for oil cooling.
- radio OFF
- avionics and other switches OFF
- ECU's A,B OFF
- fuel Pumps OFF
- master switch 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.

6.9.6 Post-Flight Check

- check - damage of fuel system. fuel leakage
  - damage of oil system, oil leakage
  - damage of cooling circuit, liquid leakage
  - damage of electrical system, ignition
- check aircraft exterior for damage - fuselage
  - wings, flaperons
  - tail unit
  - landing gear
- wash the aircraft, clean it of dirt
- cover the cockpit with a protective cover

6.10 Short field takeoff and landing procedures

The standard takeoff procedure should be followed. The only difference is that the full throttle is applied with brakes on – do not forget to set elevator in fully pull position to prevent aircraft turn over. Brakes are released when

the maximum RPM are achieved by the engine. To clear possible obstacles in the runway direction climb at speed for best rate of climb – see section 6.6

When approaching a short field make sure that the approach speed of 120 km/h is carefully maintained and full flaps are set.

6.11 Balked landing procedures

- power	MAX. 5,500 RPM
- airspeed	120 km/h
- 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	120 km/h

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

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

6.12.1 Rain

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

6.13 Towing Gliders

This Chapter contains completing information regarding towing gliders which is important for maintaining flight performances of this airplane:

6.13.1 General

This aircraft is permitted to tow gliders

Caution	Tow cable release handle is painted yellow and it is positioned at the center of the instrument panel below throttle.

6.13.2 Flight limits

Towing gliders is permitted according data in this table:

- Maximal Take Off weight of glider…… …… 750 kg
- Maximal take off weight of towing aeroplane …….560 kg (it is recommended to minimize takeoff weight, baggage content etc.)
- Towing rope has to include Reserve insert:
- Maximal Breaking load for Reserve insert … 3 000 N (300 kg)
- Aero tow cable length …… from 40 - to 60 m

6.13.3 NORMAL PROCEDURES for towing gliders

6.13.4 Before Take Off

- Brake	set a brake
- RPM	3500 per minutes
- trim	free running and functional check
- wing flaps	to wind speed 5m/s – position I. about wind speed 5m/s - position 0.
- Master switch	On
- ECU A, B	On
- avionic switches	On
- main fuel cock	On

- wing tank fuel cocks	open, fuel quantity check
- Instruments	check of values, settings
- doors	shut, locked
- safety belts	fasten
- control	free for movement
- check runway	clean, another traffic
- check of the towing cable	take out slack and check in the mirror
- give signal to glider pilot	ready to Take Off

6.13.5 Take OFF roll:

- take off roll	maintain 80 - 96 km/h
- speed	max. cont. power, max. 5700 rpm
- airspeed	depends on type of gliders 100 – 140 km/h
- engine instruments	within limits

Caution	During Take Off rolling and climbing check attitude of glider in back mirror.

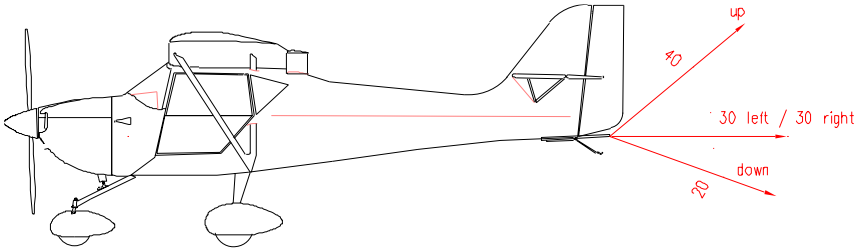
6.13.6 Climbing:

- Maintain speed in range 110 – 140 km/h, depends of type of glider
- After Take Off flaps position – 0.
- Check RPM and maintain in range 5500 – 5750 rpm. Change throttle setting to optimal RPM.
- Check attitude of glider in the back mirror

Warning	Maintain airspeed during climb in required range

6.13.7 Towing speed according to the glider limitations.

Allowed range of glider position



6.14 Wing Fold operation and description

6.14.1 Description

The rectangular-plan wing is of a metal frame structure. It is composed of two duralumin carrying tubes and a system of duralumin ribs and diagonal stiffeners. The duralumin rib system comprises of 14 full ribs and 13 false ribs, stiffening the skin in the leading-edge area of assembly. The horizontal plane section of the wing is strengthened with a system of steel diagonal tubular stiffeners. There is a 40 litre fuel tank built in the wing root section which is welded of aluminium alloy metal sheet. Correct shape of the wing leading edge is guaranteed due to a fiberglass die-formed shell glued on the leading edge tube. The trailing edge is formed of a duralumin shaped piece. The wing is fabric-covered.

Below the wing trailing edge are the flapperons incorporating both function of ailerons and wing flaps; they are attached to the rib ends by means of five hinges. The flapperon structure consists of a duralumin load-carrying tube swinging in the hinges and a fiberglass sandwich part, itself an inversely moulded aerofoil.

The wings are attached to the fuselage by wing struts which are load-carrying tubes attached to the underside section of the wing and the side the fuselage at special location tabs. The wing attachment uses a rotation bolt at the lower wing strut attachment point which makes it possible to swing the wings simply backward lengthwise to the fuselage.

6.14.2 Wing fold for transport

Required Tools: Screwdriver, 8,9,12 mm spanners

Parts required: None

To transport the aircraft, it is necessary to fold the wings to the transport position, i.e. to disconnect the wing front suspensions, to fold wings and fix them to the fuselage in transport position secured with transport struts (pos. 7).

For short distances the aircraft can be towed on its own landing gear behind a vehicle by means of a simple tow bar attached to the rear fuselage suspension section.

For longer distances it is recommended to transport the aircraft on a suitable trailer, either open or covered.

To prepare the aircraft for transport: (see photos on the following page

a. Unlock and remove the rear “turtle deck” cover, and put it on the seat (pos.1,2).

b. Close the wing tank fuel cocks.

c. Fit simple foam protection at each end of the flapperon trailer edge

d. Disconnect the flapperon tie rods on both wings (pos.3).

e. Remove the split pin and nut from the leading edge wing bolt connecting the wing to the fuselage.

f. Remove the wing bolt (either a light tap or move the wing to relieve the load on the bolt

g. Holding the wing with one hand, fold it carefully backwards while simultaneously moving the flapperon using the other hand to prevent it from striking on fuselage cross tubes (above the baggage bay).

h. Fix the fully folded wing to the fuselage by means of the transport struts (pos.7).

i. Repeat above points for the second wing (pos.4).

j. To open the wings out in preparation for the next flight, repeat the above, in reverse.

Note: if loading the aircraft onto a trailer for road transport, ensure the transport struts are fully tightened, and also have a back up strap holding both wings together, just to be sure!


2
1


3


4


5


6


7

7. Aircraft Ground Handling and Servicing

7.1 Servicing fuel, oil, coolant

7.1.1 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 used type of gasoline during engine operation. Refuelling should be carried out in places not endangering either the aircraft, its attendance or environment. Prior to refuelling it is always necessary to check gasoline for absence of water. Sampling should be done both from the transportation containers and from tanks and aircraft fuel system through drain sump. When refuelling from a barrel, a funnel must be used provided with a strainer to trap impurities, or, even better, with a buckskin leather which can trap also eventual fuel moisture content. Fuel dumping is performed similarly as sampling by means of a drain cock.

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

7.1.2 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 be overflowed out of the engine anyway.
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.

7.1.3 Servicing coolant

The proper coolant type should be filled in – see this manual or 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

7.2 Landing gear tire dimension and pressure

Track.....1.96 m

Wheel base.....1.3 m

Main landing gear wheel tire 600x6,00
Tire pressure.....300 kPa

Nose wheel tire 15x6.00/6prl
Tire pressure.....150 kPa

7.3 Towing and tie-down instructions

7.3.1 Aircraft towing instruction

1. Check the space around the aircraft and in the proposed direction of movement
2. Push and hold the tail down - use handle located on fuselage close to rudder leading edge
3. Push the aircraft in desired direction

Aircraft can be also towed using a tow bar – optional equipment, ask your dealer for details.

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

7.3.2 Aircraft tie-down instruction

1. Turn the aircraft into wind, if possible
2. Lock the controls (using safety belts)
3. Place 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 engine intakes to prevent foreign matter form accumulating inside the engine cowling. Before using chock 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

8. Required Placards and Markings

8.1 Airspeed indicator range markings

Marking	km/h IAS	Signification
White arc	60 ÷ 150	Range of wing-flaps use.
Green arc	70 ÷ 175	Normal range of operation.
Yellow arc	175 ÷ 230	Manoeuvres must be conducted with special caution and in smooth air
Red line	230	Never exceed speed

Overview of speed limits:

Speed		km/h IAS	Remarks
V_{NE}	Never exceed speed	230	Do not exceed this speed in any operation.
V_{NO}	Normal operating limit speed	175	This speed may be exceeded under smooth air only, do not apply deflections of control surfaces over one third.
V_A	Manoeuvring speed	175	Do not apply full or steep deflections of control surfaces above this speed. The aircraft might be overloaded!
V_{FE}	Maximum wing-flaps extended speed	150	Do not exceed this speed with wing flaps extended.
V_{S0}	Minimum steady flight speed	60	with extended wing flaps
V_{S1}	Minimum steady flight speed	70	wing flaps retracted

8.2 Operating limitation on instrument panel

Manufacturer: AEROPRO s.r.o., Nitra, Slovak republic

Max. take-off weight:		**560 kg**	
Empty weight:		**349,1 kg**	
Never exceed speed	**V_{NE}**	**230**	**km/h**
Max. Flap Extended speed	**V_{FE}**	**150**	**km/h**
Stalling speed			
– wing level, flaps down	**V_{S0}**	**60**	**km/h**

8.3 Passenger warning

This aircraft was manufactured in accordance with Light Sport Aircraft airworthiness standards and does not conform to standard category airworthiness requirements.

8.4 "No intentional spins"

The following placard is located on the instrument panel

AEROBATICS, INTENTIONAL STALLS AND SPINS ARE PROHIBITED

8.5 Miscellaneous placards and markings

Reserved

Passenger warning

Fuel tank capacity:40 L
Fuel specification:
ASTM D4814 or AVGAS 100LL

9. Supplementary information

9.1 Familiarization flight procedures

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

The recommended procedure for experienced pilot usually consists of:

- Local flight in duration of approximately 30 minutes with instructor
- 5 to 10 traffic patterns with instructor
- 5 flights – emergency situations
- local flight do 30 minutes – solo
- 5 traffic patterns solo

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

9.2 Pilot operating advisories

reserved

9.3 Further Information

The following general information is recommended for further study among other books available:

The ***Pilot's Handbook of Aeronautical Knowledge*** provides general basic knowledge that is essential for pilots.

The ***Airplane Flying Handbook*** is designed as a general technical manual to introduce basic pilot skills and knowledge that are essential for piloting airplanes.