

FLIGHT MANUAL FOR ULTRALIGHT AEROPLANE

U-15 Phoenix



Registration: LN-YPV

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Producer address:

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OPERATIONS AND FLIGHT MANUAL FOR ULTRALIGHT

U15 Phoenix

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Section 1

1. Pilot operating handbook

Each U15 Phoenix includes Aircraft Operating Instructions (AOI). The content and format herewith is defined by ultralight rules. All flight speeds are given in terms of indicated airspeeds (IAS).

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Section 2

2. General information

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2.1 Read this before your first flight!

Every pilot has to understand the limitations and specifications of this light sport glider. The AOI must be read thoroughly. Please pay attention to the pre-flight and daily checks. Maintenance instructions for the aircraft are given in a separate Maintenance Manual. For maintenance of the Jabiru engine, emergency parachute system and other installed equipment refer to the original manufacturer's manuals.

Flying of U15 Phoenix must be always done with the possibility of a safe landing due to loss of the engine power.

U15 Phoenix is a VFR aircraft only. Because of cruising speed and range of U15 Phoenix flight in to vastly different weather patterns and meteorology conditions can occur. The entry in to bad weather with IFR conditions with VFR aircraft is extremely dangerous. As the owner or operator of an aircraft you are responsible for the safety of your passenger and yourself. Do not attempt to operate U15 Phoenix in any manner that would endanger the aircraft, the occupants or persons on ground.

2.2 Manufacturer

phoenix^{air}

Lochmanova 64

562 01 Ústí nad Orlicí

Czech Republic

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2.3 Warnings, cautions and notes

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

Warning

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

Caution

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

Note

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

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2.4 Descriptive data

2.4.1 Airplane description

U15 Phoenix is intended for recreational, sport, cross-country and training. It is not approved for aerobatic operation.



U15 Phoenix is a single engine, carbon airplane with two side-by-side seats. The aeroplane is equipped with fixed two main wheel undercarriage with a steerable tail wheel. The fuselage is a carbon shell with carbon/kevlar seats integrated. Safety belts are attached to the seats and to a shelf intended for putting off lightweight objects (headphones, maps, etc.).

The wing is a monospar construction with a sandwich skin composed of two layers of carbon fiber and special foam. Control surfaces and empennage is of the same construction.

The airplane is controlled by dual push-pull control system, only rudder drive is controlled by cable. The ailerons and elevator are controlled by the control stick located between the pilot's legs (co-pilot's). The rudder is controlled by the rudder pedals, flaps and spoilers are operated by control levers located between the pilots.

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2.4.2 Basic Technical data

Wing

Span/span with wing extension34,77/49.21 ft
Area/area with wing extension 115/133 ft²
MAC 3.238 ft

Flaperon

area8.56 ft²

Fuselage

length21.32 ft
width4,00 ft
height4.26 ft

Horizontal tail unit

span8.20 ft
area 14.00 ft²
elevator area4,84 ft²

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Vertical tail unit

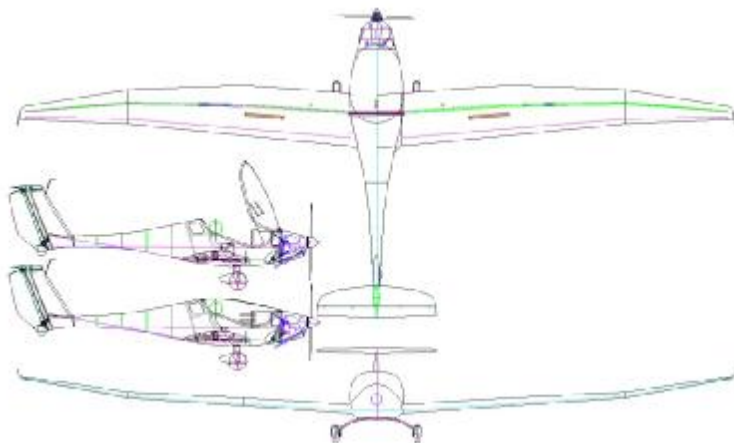
height3.93 ft
area11.84 ft²
rudder area4.73 ft²

Landing gear

wheel track5.47 ft
wheel base13.61 ft
main wheel diameter1.18 ft
tail wheel diameter0.65 ft

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2.5 Three-view drawing



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Section 3

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3.1 Operating weights and loading

NOTE

Actual empty weight is stated in SECTION 10.5

Minimum load per seat.....	65 kg
Maximum weight per seat	110 kg
Empty weight (standard).....	295 kg
Max. take-off weight.....	472,5 kg
Max. landing weight	472,5 kg
Max. baggage weight.....	4+10 kg

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Weighing

Put the airplane on three scales on a level surface. Make certain the plane is levelled using a bubble level put onto the canopy frame. Mark the wheel axle positions on the ground using a plumb.

phoenix^{air} Phoenix Air s.r.o.		Weighting protocol	
Airplane:	U-15 Phoenix	Registration:	Serial number: 03/U15
Equipment: engine - Jabiru 2200A , propeller - Sensenich 1420/2, Rescue system -Galaxy, airspeed indicator, altimeter, vertical speed indicator, slipball, 1x indicator of tank, Flydat TL-3724 , radio, transponder, encoder, magnetic compass, long wing extensions, battery.			
	fuel cap.	weight crew	
1/4 tank(s)	25 l	148 kg 326 lb	fuel density 0,714 kg/dm ³
1/2 tank(s)	50 l	130 kg 286 lb	
3/4 tank(s)	75 l	112 kg 247 lb	
full tank(s)	100 l	94 kg 207 lb	
30 min of fly		158 kg 348 lb	
	Displayed weight Ri (kg)	Weight of support Pi (kg)	Weight Gi=Ri-Pi (kg)
Tail wheel	R _{tail} = 20,8	P _{tail} = 0	G _{tail} = 20,8
Left main wheel	R _{left} = 137,4	P _{left} = 0	G _{left} = 137,4
Right main wheel	R _{right} = 139	P _{right} = 0	G _{right} = 139
Total weight			m (kg) = 297,0
C.G. position			
$x_T = \frac{G_{tail} \times (a+b)}{m}$	$= \frac{20,8 \times 3649}{297,0}$		x_T(mm) = 273,9
C.G. Position in % of depth of middle aerodynamic chord of wing			
$x_T = \frac{x_T - a - X_{bsat}}{b_{sat}} \times 100$	$= \frac{273,9 - 60,5 - 65}{930} \times 100$		x_T = 29,9 %
<small>Permitted C.G. position of empty airplane 30% +/- 2% MAC</small>			
Ústí nad Orlicí 7.5.2010		Ing. Martin Štěpánek	
Place / Date		Weighing done by.....(Name / Signature)	

Date of Issue: 24/07/2010

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3.2 Propeller

Producer Sensenich. 2 blade, wooden propeller is attached to the propeller flange with 6 bolts, and covered with a conic spinner.



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3.3 Fuel and fuel capacity

Fuel specification:

Automotive Premium Unleaded per ASTM D 4814, minimum Octane 95 for Jabiru 2200.

For suitable fuel types refer to the original Jabiru Operator's Manual.

Warning

Do not use fuel containing more than 10% ethanol.

Fuel capacity:

2 x wing fuel tank 50 liters each (100 liters total).

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3.4 Oil

For suitable oil types refer to the original Jabiru Operator's Manual.

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3.5 Engine

Engine Manufacturer : Jabiru Australia

Engine Model: Jabiru 2200

Power:

Max. Take-off: 63 Kw / 85 hp
at 3300 rpm

Engine RPM:

Max. Take-off: 3300 rpm.

Max. Continuous: 3300 rpm

Cruising: 2800 rpm

Idling: 900 rpm (set while engine is hot)

Cylinder head temperature:

Maximum: 200 °C

Oil temperature:

Minimum: 15 °C

Maximum: 100 °C (Indicated at instrument)

Opt. operating: 65 °C – 95 °C

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Warning

The Jabiru 2200 engine has not been certified as an aircraft engine and its failure may occur at any time. The pilot is fully responsible for consequences of such a failure.

RPM, oil temperature, oil pressure and CHT table

Function	Minimum Limit	Normal Operating Range	Caution Range	Maximum Range
Engine speed (RPM)	900	2000-2900	-	3300
Cylinder Head Temperature (CHT) [°C]	60	100-150	150-180	200
Oil Temperature [°C]	15	65-95	95-100	100
Oil Pressure [bar]	0.8 at idle	2.2 – 4.0	4.0 – 5.0	5.25 cold engine starting

NOTE

TL engine instrument is installed in U15 Phoenix. Do not cross recommended limits.

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Description of design

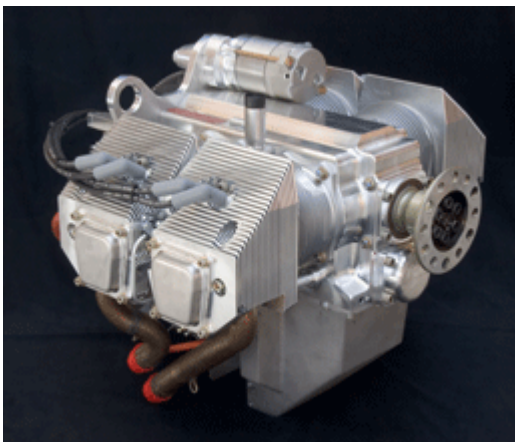
There is installed Jabiru 2200 engine in U15 Phoenix aeroplane.

Jabiru 2200 is 4-stroke, 4 cylinder horizontally opposed, spark ignition engine.

Ram air cooled cylinders and cylinder heads.

Dry sump forced lubrication.

Dual breaker less capacitor discharge ignition. The engine is fitted with electric starter, AC generator and mechanical fuel pump.



Note

For actual and complete information read the Jabiru operation manual supplied with the aircraft.

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Section 4

4. Operating limitations

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**4.1 Stalling speeds at maximum takeoff weight (v_{S1}
and v_{S0})**

$V_{S1} = 40\text{kts}$

$V_{S0} = 35\text{kts}$

4.2 Flap extended speed range (v_{S0} and v_{FE})

$V_{fe} = 70\text{kts}$

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4.3 Maximum maneuvering speed (v_A)

$V_A = 97$ kts

Up to speed V_A all control surfaces can be fully deflected

4.4 Never exceed speed (v_{NE})

$V_{NE} = 140$ kts short wing span / 120 Kts long wing span

From V_A to V_{NE} only 1/3 of the maximum deflection of control surfaces is allowed.

4.5 Maximum aerotow speed (v_T)

N/A

4.6 Maximum winch tow speed (v_W)

N/A

4.7 Maximum landing gear extended operating speed (v_{LO})

N/A

4.8 Never exceed speed (v_{NE})

$V_{NE} = 140$ kts short wing span / 120 Kts long wing span.

From V_A to V_{NE} only use 1/3 of the maximum deflections of control surfaces is allowed.

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4.9 Crosswind and wind limitations for takeoff and landing

Maximum demonstrated crosswind components for takeoff and landing is 23 kts. Cross wind takeoffs and landings demand a lot of training and skill, the higher the crosswind component, the greater your skill must be.

In gusty wind or wind speed more than 25 kts flight operations should be stopped.

4.10 Load factors

From V_{SO} up to V_{NE} +4 g / -2 g

4.11 Prohibited maneuvers

The U15 Phoenix is not certified for aerobatics or spins.

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Section 5

5. Weight and Balance Information

5.1 Installed equipment list

Phoenix has the following cockpit installation:



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- | | |
|--------------------------|-------------------|
| 1. Wheel brake | 6. Trim lever |
| 2. Pilot control stick | 7. Throttle |
| 3. Pedals | 8. Co-pilot stick |
| 4. Spoiler control lever | 9. Fuel valve |
| 5. Flap lever | |

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Instrument panel



- | | |
|-------------------------|-------------------------|
| 1. Master switch | 12. Magnetos |
| 2. Slip/skid | 13. VSI |
| 3. Airspeed | 14. Rescue sys. handle |
| 4. Altimeter | 15. Choke |
| 5. TL engine instrument | 16. Switches |
| 6. Cockpit ventilation | 17. Throttle |
| 7. Radio | 18. Carburettor heating |
| 8. Transponder | 19. Map box |
| 9. Fuel indicator | 20. Fuel valve |
| 10. 12V power socket | |
| 11. Engine cooling flap | |

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5.2 Center of gravity (CG) range and determination

phoenix^{air} Phoenix Air s.r.o.		Weighting protocol	
Airplane: U-15 Phoenix	Registration:	Serial number: 03/U15	
<p>Equipment: engine - Jabiru 2200A , propeller - Sensenich 1420/2, Rescue system -Galaxy, airspeed indicator, altimeter, vertical speed indicator, slipball, 1x indicator of tank, Flydat TL-3724 , radio, transponder, encoder, magnetic compas, long wing extensions, battery.</p>			
	fuel cap.	weight crew	
1/4 tank(s)	25 l	148 kg	326 lb
1/2 tank(s)	50 l	130 kg	286 lb
3/4 tank(s)	75 l	112 kg	247 lb
full tank(s)	100 l	94 kg	207 lb
30 min of fly		158 kg	348 lb
			fuel density 0,714 kg/dm ³
			a = 60,5 mm
			b = 3685,5 mm
			c = 600 mm
			Xbsat = -65 mm
			bbsat = 530 mm
Weighting point	Displayed weight Ri (kg)		Weight of support Pi (kg)
Tail wheel	Rtail =	20,6	Ptail = 0
Left main wheel	Rleft =	137,4	Pleft = 0
Right main wheel	Rright =	139	Pright = 0
	Total weight		Weight
	m = Gtail + Gleft + Gright = 20,6 + 137 + 139		G = Ri - Pi (kg)
	m (kg) = 297,0		
C.G. position			
$xT = \frac{Gtail \times (a+b)}{m}$	$= \frac{20,6 \times (3685,5)}{297,0}$		xT(mm) = 273,9
C.G. Position in % of depth of middle aerodynamic chord of wing			
$\bar{xT} = \frac{xT - a - Xbsat}{bbsat} \times 100$	$= \frac{273,9 - 60,5 - (-65)}{530} \times 100$		$\bar{xT} = 29,9 \%$
Permitted C.G. position of empty airplane 30% +/- 2% MAC			
Ústí nad Orlicí 7.5.2010		Ing. Martin Štepanek	
Place / Date		Weighing done by (Name / Signature)	

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Section 6

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6.1 Gliders

N/A

6.2 Powered gliders

6.2.1 Takeoff distances

Take-off distances stated in the following table are valid at sea level and for MTOW.

	Take-off run distance [feet]	Take-off distance over 15 m obstacle [feet]
Grass	450	900
Paved	400	600

Landing distances stated in the following table are valid at sea level and for MTOW.

	Landing distance over 15 m obstacle [feet]	Landing run distance (full braking) [feet]
Grass	900	300
Paved	900	300

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6.2.2 Rate of climb

For Jabiru 2200 and Sensenich propeller is the best rate-of-climb 1000 feet/min.

6.2.3 Climbing speeds

The best climbing speed is 70 kts IAS

6.2.4 Maximum RPM

All information is for Jabiru 2200.

Takeoff performance	3 300 rpm
Max. continuous performance	3 300 rpm
Maximum RPM (red line)	3 300 rpm
Idle RPM	900 – 1000 rpm
75% cruise RPM	2 800 rpm

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6.2.5 Time limit for the use of takeoff power

There is no limit for takeoff power if RPM is not over 3 300 rpm, and if all temperatures are in Engine Operating Manual limits.

6.2.6 Fuel consumption and total usable fuel volume

Fuel consumption at takeoff power 25 l/h

Fuel consumption at cruising power 10 l/h

Fuel consumption at 3 100 rpm 20 l/h

6.2.7 Crosswind and wind limitations for takeoff and landing

Maximum demonstrated crosswind components for takeoff and landing is 23 kts. Cross wind takeoffs and landings demand a lot of training and skill, the higher the crosswind component, the greater your skill must be.

In gusty wind or wind speed more than 25 kts flight operations should be stopped.

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6.2.8 Speeds for extracting and retracting powerplant

N/A

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Section 7

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Section 7 provides checklist and amplified procedures for coping with emergencies that may occur.

Emergencies caused by airplane or engine malfunctions are extremely rare if proper pre-flight inspections and maintenance are practised.

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

For best glide ratio, speeds and performance please see section 5. performance.

7.1 Engine failure

7.1.1 Engine failure during take-off run

1. Throttle - retard to idle
2. Ignition - off

7.1.2 Engine failure immediately after take-off

1. Speed
 - keep gliding speed at 55 kts
 - sink rate 180 feet/min
2. Altitude
 - below 100 feet: land in take-off direction
 - over 150 feet: choose landing area
3. Wind
 - evaluate direction and velocity
4. Landing area
 - choose free area without obstacles, into wind
5. Air brake
 - extend as needed
6. Fuel valve
 - off
7. Ignition
 - off
8. Safety harness
 - tighten

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- 9. Master key - switch off position before landing
- 10. Land

Note

Skip 6-10 if necessary.

7.1.3 Engine failure in flight (Forced landing)

- 1. Speed
 - keep gliding speed at 55 kts
 - sink rate 180 feet/min
- 2. Altitude
 - below 100 feet: land in take-off direction
 - over 150 feet: choose landing area
- 3. Wind
 - evaluate direction and velocity
- 4. Landing area
 - choose free area without obstacles
- 5. Air brake
 - extend as needed
- 6. Fuel valve
 - off
- 7. Ignition
 - off
- 8. Safety harness
 - tighten
- 9. Master switch
 - off before landing
- 10. Land

OPERATIONS AND FLIGHT MANUAL FOR ULTRALIGHT U15 Phoenix

7.2 In-Flight start

1. Speed - keep speed a bit higher at 65 kts
2. Altitude - check
3. Landing area - choose according to altitude (safest area)
4. Master switch - on
5. Fuel valve - open
6. Choke - closed initially, then as needed
7. Throttle - closed
8. Fuel pump - on
9. Ignition key - on – verify prop unfeathered
10. Ignition key - start, then on
11. Fuel pump - off

7.3 Smoke and fire

7.3.1 Fire on ground

1. Fuel valve - off
2. Throttle - full
3. Master switch - off
4. Ignition - off
5. Abandon the airplane
6. Extinguish fire if possible or call fire department.

**OPERATIONS AND FLIGHT MANUAL FOR ULTRALIGHT
U15 Phoenix**

7.3.2 Fire during take-off

1. Fuel valve - off
2. Throttle - full
3. Speed - 55 kts
4. Master switch - off
5. Ignition - off
6. Land and brake
7. Abandon the airplane
8. Extinguish fire if possible or call fire department.

OPERATIONS AND FLIGHT MANUAL FOR ULTRALIGHT U15 Phoenix

7.3.3 Fire in flight

1. Fuel valve - off
2. Throttle - full
3. Master switch - off
4. Ignition - off after using up fuel in carburetors then engine stops
5. Choose of area - heading to the nearest airport or choose emergency landing area
6. Emerg. landing - perform according to par.3.6.1
7. Abandon the airplane
8. Extinguish fire if possible or call fire department.

Note

Estimated time to pump fuel out of carburetors is 30 sec.

7.4

**OPERATIONS AND FLIGHT MANUAL FOR ULTRALIGHT
U15 Phoenix**

7.5 Landing emergencies

7.5.1 Emergency landing

1. An emergency landing may be carried out due to engine failure and when the engine cannot be restarted.
2. Speed - 55 kts
3. Trim - trim the airplane
4. Safety harness - tighten
5. Flaps - extend as needed
6. Air brake - extend as needed
7. COMM - if installed - report your location if it is possible
8. Fuel valve - off
9. Ignition - off
10. Master switch - off

OPERATIONS AND FLIGHT MANUAL FOR ULTRALIGHT U15 Phoenix

7.5.2 Precautionary landing

A precautionary landing may be carried out due to low fuel and/or bad weather conditions.

1. Choose landing area, determine wind direction
2. If a COMM is installed - report your plan to land and land area location to nearest ATC
3. Perform low-altitude passage into wind over the right-hand side of the chosen area with flaps extended to the take-off position at a speed of 55 kts to thoroughly inspect the area
4. Perform flight around the chosen area
5. Perform an approach at increased idling with fully extended flaps
6. Reduce power to idle when over the runway threshold and touch-down at the very beginning of the chosen area
7. After stopping the airplane switch off all switches, shut off the fuel valve, lock the airplane and look for a help

Note

Watch the chosen area continuously during precautionary landing.

7.5.3 Landing with a flat tire

1. Approach - Normal
2. Touch down - good tire first, keep the damaged wheel above ground as long as possible using ailerons
3. Maintain the direction at landing run, applying braking control

**OPERATIONS AND FLIGHT MANUAL FOR ULTRALIGHT
U15 Phoenix**

7.5.4 Landing with a defective landing gear

1. If the main landing gear is damaged, perform touch-down at the Lowest speed possible and maintain direction during landing run, if possible
2. If the tail wheel is damaged perform touch-down at the lowest possible speed and maintain direction during landing run, if possible.

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7.6 Recovery from unintentional spin

Warning

Intentional spins are prohibited!

There is no tendency of spontaneous uncontrollable spin entry if normal pilot techniques are used.

Should an inadvertent spin occur, the following recovery procedure should be used:

1. Throttle - retard to idle
2. Control stick - hold ailerons neutralized
3. Rudder pedals - apply full opposite rudder
4. Control stick - forward elevator control as required to break the spin
5. Rudder pedals - immediately after the stopping of a rotation neutralise the rudder
6. Recover from dive

OPERATIONS AND FLIGHT MANUAL FOR ULTRALIGHT U15 Phoenix

7.7 Other emergencies

7.7.1 Vibration

If vibrations appear:

1. Set engine speed to power setting where the vibrations are the lowest.
2. Land at the nearest airfield or perform a precautionary landing according to 3.6.2

7.7.2 Carburetor icing

Carburetor icing mostly occurs when getting into an area of humidity formation. The carburetor icing shows itself through a decrease in engine power and an increase of engine temperatures.

To recover the engine power, the following procedure is recommended:

1. Apply carby heater system
2. Throttle - set for 1/3 power
3. If possible, leave the icing area, and use carby heat during flight
4. 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 possible) or depending on circumstance, execute a precautionary landing according to 3.6.2

U15 Phoenix

Section 8

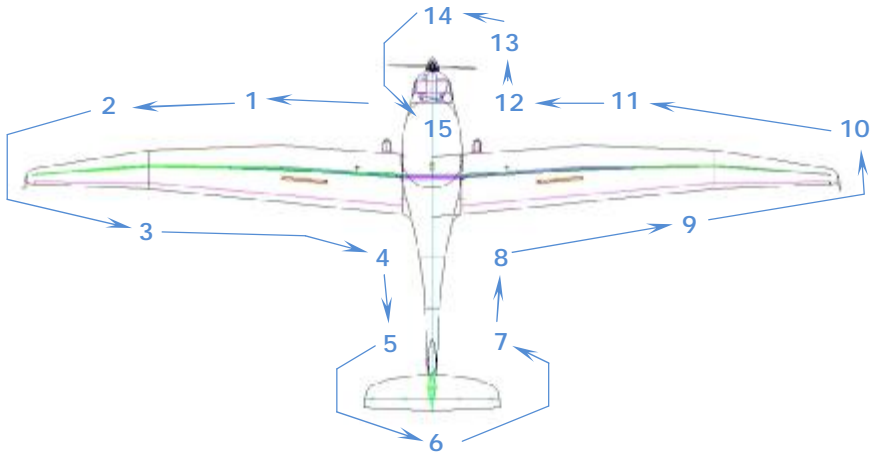
8. Normal Procedures

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8.1 Pre-flight check

The pre-flight inspection is very important because an incomplete or careless inspection could allow airplane failure. The following pre-flight inspection procedure is recommended by the airplane Manufacturer:



OPERATIONS AND FLIGHT MANUAL FOR ULTRALIGHT U15 Phoenix

⇒ Check if ignition is switched off in the cockpit

1. Wing
 - Wing surface condition
 - Leading edge condition
 - Wing flaps free movement

2. Wing tips
 - Surface condition
 - Check of tips attachment
 - Condition and attachment of position lights (if installed)

3. Flaperons
 - Surface condition
 - Attachment
 - Play

4. Fuselage rear
 - Surface condition

5. Vertical tail unit
 - Surface condition
 - Play
 - Free movement
 - Pitot-tube inspection

**OPERATIONS AND FLIGHT MANUAL FOR ULTRALIGHT
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6. Horizontal tail

- Surface condition
- Attachment
- Play
- Free movement
-

7. see. 5

8. see. 4

9. see. 3

10. see. 2

11. see. 1

12. Landing gear

- Check of main landing gear and tail wheel attachment
- Tail wheel steering
- Condition and inflation of tires
- Condition and attachment of wheel fairings (if installed)

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13. Engine

- Engine cowlings condition
- Oil flap condition and check of movement
- Engine mount condition
- Engine attachment check
- Oil quantity check (after burping the engine)
- Cooling liquid quantity check
- Fuel and Electrical system visual check
- Fuel system drain

Caution

It is advisable to turn the propeller by hand **with ignition off** if the engine has been out of operation for a long time. Avoid excessive pressure on a blade tip and trailing edge.

14. Propeller

- Propeller attachment
- Blades, Hub, Spinner condition

15. Cockpit

- Ignition key - off
- Master switch - off
- Instruments - check of condition
- Fuel gauge - fuel quantity check

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- Controls
 - visual check
 - check for proper function
 - check of plays
 - check of flaps extension
 - check of free movement up to the stops
- Check for loose items
 - secure papers
- Canopy
 - Condition of attachment, cleanliness

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8.2 Powered glider normal procedures

8.2.1 Ground engine starting

Before entering cockpit

1. Airplane surface - check for damage
2. Cockpit - items inside the cockpit
3. Ignition - off
4. Master switch - off

After entering cockpit

1. Rudder control - free movement check - Correct?
2. Brakes - check function
3. Hand control - free movement check - Correct?
4. Trim - check control movement
5. Engine controls - throttle and choke lever movement
6. Fuel valve - off
7. Fuel gauge - fuel quantity check
8. Circuit breakers - off
9. Ignition - off
10. Instruments, COMM- condition check
11. Safety harness - check of integrity and attachment
12. Cockpit - condition and canopy lock function

OPERATIONS AND FLIGHT MANUAL FOR ULTRALIGHT

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Before engine starting and Engine starting

1. Fuel valve - on
2. Ignition key - off
3. Circuit breakers - in
4. Throttle - set for idling
5. Choke - according to engine temperature
6. Control stick - fully pulled
7. Check of free area - clear
8. Master switch - on
9. Ignition key - on, verify prop unfeathered, start
10. After starting - set throttle to idling
11. Oil pressure - within 10 sec. min. pressure
12. Oil flap - fully open
13. Choke - off
14. Engine warm - according to 4.4.4

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Caution

The starter should be activated for max.10 sec., then 2 min. pause for engine cooling.

After engine starting adjust the throttle for smooth running at 1500 rpm. Check oil pressure which should increase within 10 sec. Increase engine speed after oil pressure reaches 2 bars and is steady.

To avoid shock loading start the engine with throttle lever set for idling or max. 10 % opened, then wait 3 sec to reach constant engine speed before accelerating.

Use ignition key for magneto check.

Engine warm up, Engine check

Lock the main wheels by means of wheel chocks before engine check. Refer to the Engine Manual for warming .

Set max. power.

Check acceleration from idling to max. power. If necessary cool the engine prior to its shutdown.

Caution

Engine check should be performed with the airplane pointing upwind and not on loose terrain (the propeller will pick up debris which can damage the propeller).

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8.2.2 Taxiing

The maximum recommended taxiing speed is 8 kts. The direction of taxiing can be controlled by the steerable rear wheel – rudder. Use the lever on the control stick to operate the brakes intermittently. Do not ride the brakes which can cause overheating of the brake pads and possible locking of the brakes. Use appropriate controls in windy conditions: position the stick to climb into a headwind, and dive away from a tailwind while taxiing.

OPERATIONS AND FLIGHT MANUAL FOR ULTRALIGHT U15 Phoenix

8.2.3 Normal takeoff

Before take-off (CCCIGAAR – Lights, Camera, Action)

- | | |
|----------------|---------------------------|
| 1. Controls | - check of free movement |
| 2. Canopy | -closed and locked |
| 3. Choke | - off |
| 4. Instruments | - set and in the green |
| 5. Gas | - fuel valve on left tank |
| 6. Attitude | - trim set for take-off |
| 7. Airbrakes | - closed and locked |
| 8. Flaps | - take-off (5°) |
| 9. Runup | - 3000rpm |
| 10. Lights | - strobe lights on |
| 11. Camera | - transponder on alt |
| 12. Action | - fuel pump on |

OPERATIONS AND FLIGHT MANUAL FOR ULTRALIGHT U15 Phoenix

Take-off

Gradually increase the throttle (max. power) to set the airplane into motion.

The direction of take-off run can be controlled by steerable tail wheel and rudder. Place the stick 2 inches forward of the rear stop. The airplane takes-off at a speed above 38 kts, then slightly push forward the stick to reach climb speed of 55 kts. Refer to the par. 5.2.5 for optimum climb speed. Max. flap extended speed is 70 kts.

Warning

The Take-off is prohibited if:

- The engine run is unsteady
- The engine instruments values are beyond operational limits
- The engine choke is on
- The crosswind velocity exceeds permitted limits. 5.3.3

8.2.4 Engine extraction and retraction

N/A

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8.2.5 Best rate of climb

For Jabiru 2200 and Sensenich propeller is the best rate-of-climb 1000 feet/min.

1. Throttle - Max.
2. Speed - 70 kts
3. Trim - adjust as needed to reduce stick pressure
4. Instruments - CHT, Oil temp. and pressure within limits.

Caution

If cylinder head or oil temperature exceed limits, reduce the angle of climb to increase airspeed and allow better cooling.

8.2.6 In-flight starting of engine

Follow same engine start procedures as in 8.2.1

8.2.7 Ground shutdown of engine

1. Engine speed - idling
2. Instruments - engine instruments within limits
3. COMM + intercom - off
4. Ignition key - off
5. Circuit breakers - off
6. Master switch - off
7. Fuel valve - off

OPERATIONS AND FLIGHT MANUAL FOR ULTRALIGHT U15 Phoenix

8.3 Cruise

The airplane flight characteristics are very forgiving within permitted limits of airspeeds, configurations and C/G range. The airplane can be controlled very easily. Refer to the Section 5 par. 5.3.1 .

Warning

Never remove your feet from rudder pedals during flight!
Your feet are making tension in rudder control line!

8.4 Approach

Descent

1. Throttle - idling
2. Speed - 55 kts
3. Trim - as necessary to reduce stick pressure
4. Instruments - within limits

Caution

When on long final or descending from a very high altitude, it is not advisable to reduce the engine Throttle control lever to idle. The engine becomes overcooled and a loss of power occurs. When descending, apply increased idle so that engine instrument readings stay within the limits for normal use.

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Check before landing – GPS-USTALL

1. Gas - fuel on left tank
2. Pump -fuel pump on
3. Straps -tight
4. Undercarriage - down
5. Speed - 55kts
6. Trim - adjust as required
7. Airbrakes - unlocked and operational
8. Flaps - 0°
9. Look - watch for other traffic
10. Land - stabilized approach to land

On base leg

1. Speed - 55 kts
2. Airbrakes - as necessary
3. Flaps - take-off position 5°
4. Throttle - as necessary

On final

1. Speed - 55 kts
2. Air brakes - as necessary
3. Flaps - landing position 10°
4. Throttle - as necessary

OPERATIONS AND FLIGHT MANUAL FOR ULTRALIGHT U15 Phoenix

8.5 Normal landing

Landing

The airspeed during final is slowly reduced, so that the touchdown speed is about 38 kts.

Gradually pull the stick after touchdown. The landing run can be shortened by braking.

Caution

If the airplane rebounds 2 or 3 feet hold the control stick fully pulled. If higher, go around.

Balked landing

1. Throttle - full
2. Engine speed - Max.
3. Spoilers - closed and locked
4. Climb - at a speed of 55 kts
5. Trim - as necessary
6. Instruments - within limits
7. Flaps - 0 setting
8. Fuel pump - off above 500 feet agl

OPERATIONS AND FLIGHT MANUAL FOR ULTRALIGHT U15 Phoenix

After landing

1. Engine speed - set as necessary for taxiing
2. Fuel pump - off

Engine shutdown

1. Instruments - engine instruments within limits
2. COMM + intercom - off
3. Ignition key - off
4. Circuit breakers - off
5. Master switch - off
6. Fuel valve - off

8.6 Information on stalls, spins and any other useful pilot info

Recovery from unintentional spin and stall

There is no tendency of spontaneous uncontrollable spin entry if normal pilot techniques are used.

OPERATIONS AND FLIGHT MANUAL FOR ULTRALIGHT

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Should an inadvertent spin occur, the following recovery procedure should be used:

1. Throttle - retard to idle
2. Control stick - hold ailerons neutralized
3. Rudder pedals - apply full opposite rudder
4. Control stick - forward elevator control as required to break the spin
5. Rudder pedals - immediately after the stopping of a rotation neutralise the rudder
6. Recover from dive

Warning

Intentional spins are prohibited!

Flight in rain

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

Feathering of the propeller

1. Shut off engine with ignition key (off position)

**OPERATIONS AND FLIGHT MANUAL FOR ULTRALIGHT
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Engine restarting

Follow same engine start procedures as in 8.2.1

Caution

After extended soaring flight, the engine could be cooled down.
Use the choke if engine fails to start initially.

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Section 9

9. Airplane Ground Handling and Servicing

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9.2	Towing and tie-down instructions.....	9-3

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9.1 Servicing fuel, oil, coolant

Fuel check

2 x wing fuel tanks (50 l each, 100 l total) are an integral part of the wings, and fuel quantity sensors are located inside the wings. In addition, a coarse filter, fuel valve, and fine filter are parts of the fuel system.

For draining use the drain valve located on the bottom of the wing.

To fill up the fuel tank one person is needed

- Ø Make sure the plane is set on parking brake
- Ø Open fuel cap
- Ø Pour in the fuel per specification
- Ø Check visually the amount of fuel after pouring
- Ø Close the cap

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Oil quantity check

To service oil one person is required.

- Ø Remove top cowling
- Ø Make sure the ignition and both magnetos are OFF
- Ø Open the oil tank cap
- Ø Turn the prop 3-4 times counter-clockwise standing in the front of aircraft until burp is heard
- Ø Check the level of the oil by the dipstick
- Ø Add oil if necessary
- Ø Close the tap

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9.2 Towing and tie-down instructions

Towing

It is easy to tow the airplane a short distance by holding the blade root because the empty weight of this aeroplane is relatively low.

Suitable surfaces to hold the airplane airframe are the rear part of the fuselage before the fin and wing roots..

Caution

Avoid excessive pressure at the airplane airframe - especially at the wing tips, elevator, rudder, trim etc.

Caution

Handle the propeller by holding the blade root - never the blade tip! If starting the engine manually - always handle the propeller on a blade surface i.e. do not hold only an edge

Parking

It is advisable to park the airplane inside a hangar or eventually inside other weather proof space (such as a garage) with a stable temperature, good ventilation, low humidity and dust-free environment.

It is necessary to tie-down the airplane when parking outside.

When the plane must be tied-down outdoors for extended periods, it is advisable to cover the cockpit canopy, and if possible, the entire airplane using a suitable cover.

OPERATIONS AND FLIGHT MANUAL FOR ULTRALIGHT U15 Phoenix

Tie-down

The airplane is usually tied-down after a flight day or when needed. This is necessary to protect the aeroplane against possible damage caused by wind gusts.

The airplane is equipped with tie-down bolts on the wing tips.

Procedure:

- Check: Fuel valve off, Circuit breakers and Master switch off, Ignition key off.
- Tie the control stick with the safety harness
- Close and lock cockpit
- Shut all the ventilation windows
- Tie-down the wings to the ground by means of the straps. It is also necessary to tie-down the fuselage rear (lace a rope through the fork).

Note

It is advisable to cover cockpit canopy, if possible the whole airplane, by means of a suitable covering material attached to the airframe for long term outside parking.

OPERATIONS AND FLIGHT MANUAL FOR ULTRALIGHT U15 Phoenix

Jacking

Because the empty weight of this aeroplane is relatively low it is easy to lift the airplane using 2 persons.

First prepare two suitable jacks to support the airplane.

The airplane should be lifted by the following parts:

- To jack the rear of the fuselage grab the fuselage near the auxiliary tail skid, lift it upward and support.
- To lift the wings, push on the wings lower surface at the main spar. Do not lift by the wing tips.

Levelling

Refer to the Operating, Maintenance and Repair Manual for U-15 Phoenix for more details about levelling.

Road transport

The airplane may be transported in a suitable trailer. It is necessary to dismantle airplane before loading to avoid damage to roadway signs.

OPERATIONS AND FLIGHT MANUAL FOR ULTRALIGHT U15 Phoenix

Airplane Assembly

Note

No special qualification needed for assembling/disassembling.

Degrease and clean all connecting parts and grease again using suitable lubricants.

- **Horizontal Tail Unit (HTU) Installation:**

Set the HTU on the two main pins and at the same time insert the elevator control bell into automatic gripping.



Then screw the front screw and secure with safety pin.



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- ***Wing Installation:***

Set the left half of the wing on the pins and check automatic connection of control rods.

Then secure the rear auxiliary pin.

Follow with the right half of the wing, insert the wing in automatic connection device and secure the rear auxiliary pin.

Connect fuel sensor and automatic fuel connectors from left and right fuel tank.

Insert the main eccentric pin, turn it 180 ° to tighten both halves of the wing together.

Don't forget to secure the main pin with a "butterfly" screw.

Then secure "butterfly" screw by small safety pin thru pre-drilled hole.

Check control system and fuel gauge function. Use an adhesive tape to cover the gap between the center section and the wing root.

Airplane Disassembly

Follow the Assembly steps in reverse order.

OPERATIONS AND FLIGHT MANUAL FOR ULTRALIGHT U15 Phoenix

Cleaning and care

Use cleaning detergents to clean airplane surface. Oil spots on airplane surface (except the canopy!) may be cleaned with appropriate degreasers.

The canopy should be cleaned only by washing it with lukewarm water and mild detergents, using clean, soft cloth sponge or deerskin. Then use suitable polishers to clean the canopy.

Caution

Never clean the canopy under "dry" conditions (it will scratch) and never use gasoline or chemical solvents!

Upholstery and covers may be removed from the cockpit, brushed or washed in lukewarm water with mild detergents. Dry the upholstery before reinstalling inside the cockpit.

Caution

For long term storage cover the canopy to protect the cockpit interior from the direct sunshine.

**OPERATIONS AND FLIGHT MANUAL FOR ULTRALIGHT
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Section 10

10. Required Placards and Markings

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Caution

The owner (airplane operating agency) of this airplane is responsible
for placards readability during airplane service life.

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U15 Phoenix**

10.1 Airspeed indicator range markings

Airspeed indicator system calibration

V IAS	dV	V CAS
[kts]	[kts]	[kts]
38	-2.7	35
43	-1.6	42
49	-1.1	47
54	-0.5	53
59	0.0	59
65	0.5	65
70	1.1	71
76	1.6	77
81	2.2	83
86	2.7	89
92	3.2	95
97	3.8	101
103	4.9	107
108	5.4	113
116	7.0	123

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Airspeed limitations

Airspeed limitations and their operational significance are shown below:

Airspeed		IAS [kts]	Remarks
V_{NE}	Never exceed speed	140/120	Do not exceed this speed in any operation.
V_B	Maximum structural cruising speed	90	Do not exceed this speed except in smooth air, and then only with caution.
V_A	Maneuvering speed	97	Do not make full or abrupt control movement above this speed, because under certain conditions the aircraft may be overstressed by full control movement.
V_{S1}	Stall speed	35	Stall speed

OPERATIONS AND FLIGHT MANUAL FOR ULTRALIGHT U15 Phoenix

Airspeed indicator markings

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

Marking	Range or value [IAS kts]	Significance
Green arc	35-97	Normal Operating Range
Yellow arc	97-120	Maneuvering must be conducted with caution and only in smooth air.
Red line	140 / 120	Maximum speed for all operations.

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10.2 Operating limitations on instrument panel

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



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U15 Phoenix

PRODUCER: Phoenix Air s.r.o.
MADE IN: CZECH REPUBLIC
TYPE: U-15 Phoenix

YEAR OF PRODUCTION: 2010
SERIAL NUMBER: 03/U15
REGISTR. NUMBER: LN-YPV
MTOW: 472,5 kg

28 - 29,5 psi

28 - 29,5 psi

26,5 - 28 psi

LOCK
BEFORE FLY

Acrobatics and Intentional spins are prohibited

Passenger warnings

The warning placard: "This aircraft was manufactured in accordance with Light Sport Aircraft airworthiness standards and does not conform to standard category airworthiness requirements." is placed on co-pilot side of instrument panel.

**OPERATIONS AND FLIGHT MANUAL FOR ULTRALIGHT
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Photo of instrument panel



10.3 No intentional spins

The placard: "No intentional spins" is placed on co-pilot side of instrument panel.

**OPERATIONS AND FLIGHT MANUAL FOR ULTRALIGHT
U15 Phoenix**

Warning

No intentional spins!

10.4 Empty weight

Empty weight 297 kg

10.5 Maximum takeoff weight

Maximum takeoff weight of U-15 Phoenix is 472,5 kg.

Warning

Never exceed 472,5 kg MTOW.

**OPERATIONS AND FLIGHT MANUAL FOR ULTRALIGHT
U15 Phoenix**

10.6 Maximum and minimum weight of crew

Max. weight of crew if....

$\frac{1}{4}$ fuel tank (25 l)	148 kg
$\frac{1}{2}$ fuel tank (50 l)	130 kg
$\frac{3}{4}$ fuel tank (75 l)	112 kg
full fuel tank (100 l)	94 kg
30 min flight	158 kg

**10.7 Seat for solo operations of two seated
gliders**

Seat for solo operations is LEFT seat.

**OPERATIONS AND FLIGHT MANUAL FOR ULTRALIGHT
U15 Phoenix**

Section 11

11. Supplementary Information

11.1 Familiarization flight procedures

For familiarization flight procedure, refer to the Flight Training Supplement.

11.2 Pilot operating advisories

No any other pilot operating advisories.

U15 Phoenix

Section 12

12. Maintenance Manual

Maintenance manual containing routine, inspection and repair maintenance procedures for the aircraft and engine and propeller is provided with each U15 Phoenix.