

PILOT OPERATING HANDBOOK & FLIGHT TRAINING SUPPLEMENT



THE AIRPLANE FACTORY SLING

THE AIRPLANE FACTORY (Pty) Ltd.

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Aircraft model : **Airplane Factory Sling LSA**

Manufacturer : **The Airplane Factory (Pty) Ltd**

Aircraft serial Number : _____

Date of construction : _____

Registration : _____

Airworthiness category : **Light Sport Aircraft (LSA)**

Issue date of POH : **12 March 2012**

This airplane must be operated in compliance with information and limitations contained herein. This pilot's operating handbook must be available on board of the airplane at all times.

Airplane Factory SLING LSA
Pilot Operating Handbook

RECORD OF REVISIONS

Any revisions to this Pilots Operating Handbook must be recorded in the following table, and, where applicable, be endorsed by the responsible airworthiness authority

Revision numbers and dates appear at the foot of each page.

Revision No.	Affected Section	Affected Pages	Date of Issue	Approved by	Date of approval	Date inserted	Sign.
1.1	All	All	20 /04/2011				
1.2	All	All	12/03/2012				

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POH Compliance Notice

ASTM Standards used for the design, construction, and continued airworthiness:

- ASTM F2279
- ASTM F2295
- ASTM F2245

Quality Assurance Records are stored both with the original manufacturer in South Africa and with its US Distributor at the below addresses.

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Continued Operational Safety Monitoring

Manufacturer Responsibilities

The Airplane Factory has a procedure in place to monitor the safety of the fleet and to alert pilots of any potential safety issues. The owner of a Light Sport Aircraft is responsible for making sure they receive pertinent safety information and complying with bulletins. The owner of a Light Sport Aircraft is also responsible for alerting the manufacturer of any potential safety of flight issues.

Report a Safety of Flight Issue

Please contact our US Distribution Center to report any maintenance, service or safety issues.

Service/Maintenance/Safety issues: safety@airplanefactory.com

Or, fill out a safety/service form on our website: www.airplanefactory.com

Sign up to receive safety notices

Method for Owner/Operator to obtain the latest Safety of Flight Information

Please sign up on our website for continued safety/service updates:

www.airplanefactory.com, or

Call 310-721-9190, and we'll sign you up

In addition, all updates will be posted to our website

Detailed Owner/Operator Responsibilities

- Each owner/operator of a LSA shall read and comply with the maintenance and continued airworthiness information and instructions provided by the manufacturer.
- Each owner/operator of a LSA shall be responsible for providing the manufacturer with current contact information where the manufacturer may send the owner/operator supplemental notification bulletins.
- The owner/operator of a LSA shall be responsible for notifying the manufacturer of any safety of flight issue or significant service difficulty upon discovery.
- The owner/operator of a LSA shall be responsible for complying with all manufacturer issued notices of corrective action and for complying with all applicable aviation authority regulations in regard to maintaining the airworthiness of the LSA.
- An owner of a LSA shall ensure that any needed corrective action be completed as specified in a notice, or by the next scheduled annual inspection.
- Should an owner/operator not comply with any mandatory service requirements, the LSA shall be considered not in compliance with applicable ASTM standards and may be subject to regulatory action by the presiding aviation authority (FAA).

1. GENERAL INFORMATION

1.1 Introduction to airplane

The Airplane Factory Sling is a two seat, single engine, tricycle gear aluminum aircraft with a conventional low wing design. The aircraft is based upon the FAA Light Sport Aircraft (LSA) category according to ASTM Standards F2245, F2279 and F2295. In this configuration the Sling is known as the Sling LSA.

The Sling is intended chiefly for recreational and cross-country flying. It is not intended for aerobatic operation. It is considered to be suitable for use as a trainer. This Pilot Operating Handbook has been prepared to provide pilots with information for the safe and efficient operation of the Sling.

1.2 Warnings, cautions and notes

The following definitions apply to warnings, cautions and notes in the Pilot Operating Handbook.

WARNING

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

CAUTION

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

NOTE

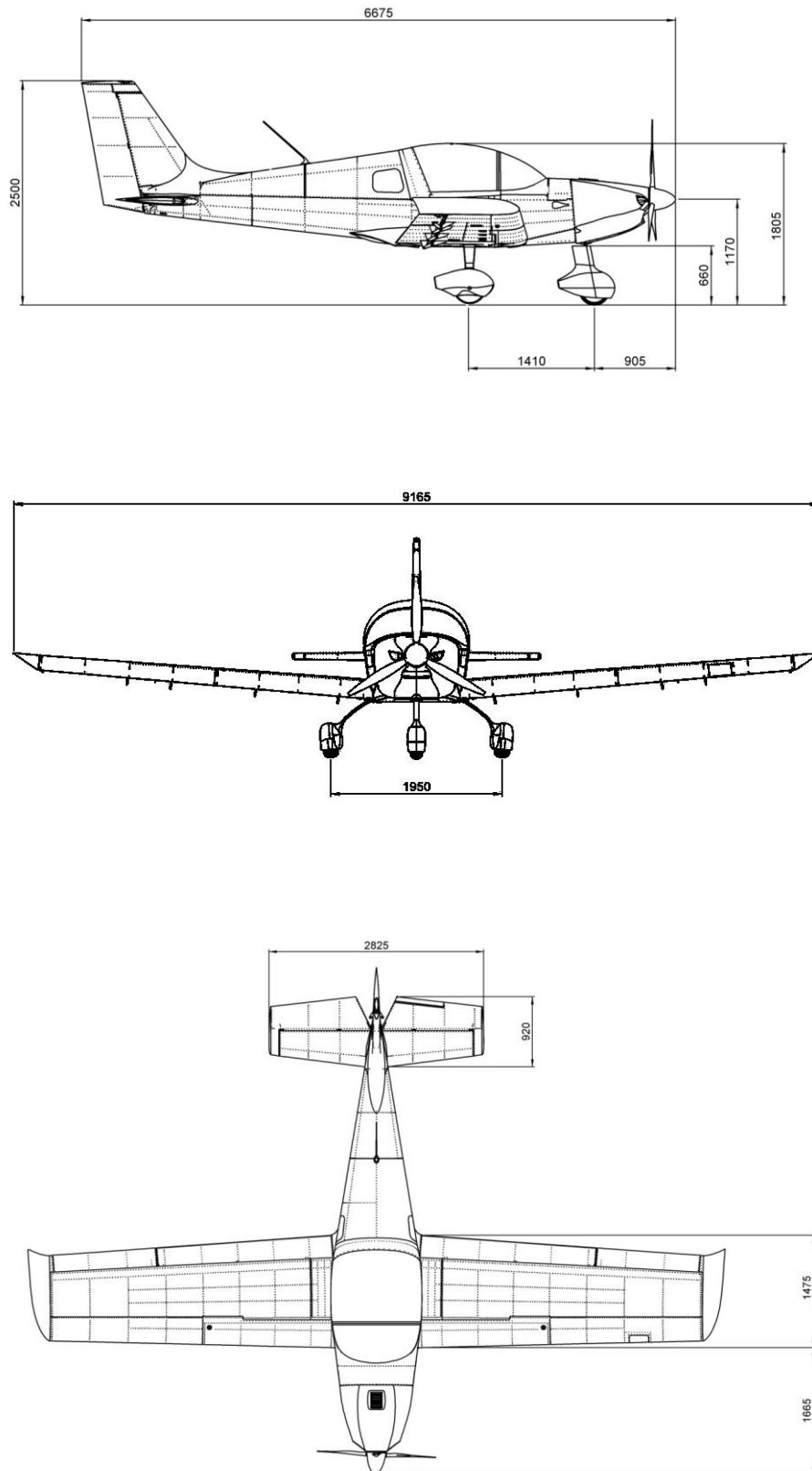
Draws attention to any special item not directly related to safety but which is important or unusual.

1.3 Descriptive data for the Airplane Factory Sling LSA

The Sling LSA is a single-engine, all metal, low-wing monoplane of semi-monocoque construction with two side-by-side seats. The airplane is equipped with a fixed tricycle gear and a steerable nose wheel.

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1.4 Aircraft layout – Measurements in Millimeters



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WING

Wing span:	30.07 ft. (9.165 m)
Mean Aerodynamic Chord:	4.39 ft. (1.339 m)
Wing surface area:	127.5 ft ² (11.845 m ²)
Wing loading:	10.37 lbs/ft ² (50.65 kg/m ²)
Aspect ratio:	7.04
Taper ratio:	1.375
Dihedral:	5°

FUSELAGE

Fuselage length:	18.93 ft. (5.77 m)
Overall length:	21.9 ft. (6.675 m)
Overall width:	3.77 ft. (1.15 m)
Overall height:	8.2 ft. (2.5 m)

EMPENNAGE

Horizontal stabilizer span:	9.27 ft. (2.825 m)
Horizontal stabilizer surface area:	10.33 ft ² (0.96 m ²)
Elevator surface area:	10.98 ft ² (1.02 m ²)
Horizontal stabilizer angle of incidence	-3°
Vertical stabilizer span:	4.82 ft. (1.47 m)
Vertical stabilizer surface area:	5.7 ft ² (0.53 m ²)
Rudder surface area:	6.35 ft ² (0.59 m ²)

LANDING GEAR

Wheel track:	6.4 ft. (1.95 m)
Wheel base:	4.63 ft. (1.41 m)
Wheel hubs and brakes:	
Main gear tires:	15 X 6.00 - 6, 6 ply
Nose gear tires:	5.00 - 5, 6 ply

CONTROL SURFACE TRAVEL LIMITS

Ailerons:	22° up and down (±3°)
Elevator:	28° up and 20° down (± 2°)
Trim tab:	20° up and 25° down (± 3°)
Rudder:	25° left and right (± 2°)
Flaps:	0° to 32° down (± 3°)

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ENGINE

Manufacturer: Bombardier-Rotax GmbH
Model: 912 ULS
Type: 4 cylinder horizontally opposed with overall displacement 1352cc, mixed cooling (water-cooled heads and air-cooled cylinders), twin carburetors, and integrated reduction gearbox with torque damper
Maximum power: 98.5 hp (73.5 kW) @ 5800 RPM (max 5 mins.)
92.5 hp (69 kW) @ 5500 RPM (max continuous)

PROPELLER

Manufacturer: Warp drive
Model: 70 inch 3 blade composite (70RWT3)
No of blades: 3
Diameter: 70 inches (1.78 m)
Type: Composite

FUEL

Fuel grade: 91 (AKI Index) Octane MOGAS or 100LL AVGAS
Fuel tanks: 2 wing tanks integrated within wing's leading edge, equipped with finger strainers outlet and drain fittings
Capacity of each tank: 19.8 Gallons (75 Liters)
Total capacity: 39.6 Gallons (150 Liters)
Total usable fuel: 38.6 Gallons (146 Liters)

OIL SYSTEM

Oil system type: Forced, with external oil reservoir
Oil: Automotive grade API "SF" or "SG" type oil preferably synthetic or semi-synthetic
Oil capacity: 2.6 Quarts (2.5 Liters)

COOLING

Cooling system: Mixed air and liquid pressurized closed circuit system
Coolant: Antifreeze liquid (*type BASF Glysanthin Anticorrosion or equivalent*) and water mixture
Capacity: 3.2 Quarts (3 Liters)

MAXIMUM WEIGHTS

Maximum take-off weight: 1,320 Lbs. (600 kg)
Maximum landing weight: 1,320 Lbs. (600 kg)
Maximum baggage weight: 77 Lbs. (35 kg)

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STANDARD WEIGHTS

Standard empty weight: 794 Lbs. (360 kg)

SPECIFIC LOADINGS

Wing loading: 10.37 lbs/ft² (50.65 kg/m²)
Power loading: 13.23 lbs/hp (6.00 kg/hp)

TERMINOLOGY AND SYMBOLS

General airspeed terminology and symbols

KCAS	Calibrated Airspeed, being the indicated airspeed corrected for position and instrument error, expressed in knots
KIAS	Indicated Airspeed, being the speed shown on the airspeed indicator, expressed in knots
KTAS	True Airspeed, being the airspeed, expressed in knots, relative to undisturbed air, and which is KCAS corrected for altitude and temperature
V _A	Maneuvering airspeed
V _{FE}	Maximum Flap Extended Speed, being the highest speed permissible with wing flaps in a prescribed extended position
V _{NO}	Maximum Structural Cruising Speed, being the speed that should not be exceeded except in smooth air, and then only with caution
V _{NE}	Never Exceed Speed, being the speed that may not be exceeded at any time
V _S	Stall Speed
V _{SO}	Stall Speed in Landing Configuration (i.e. - with wing flaps in extended position)
V _{S1}	Stall speed with wing flaps in retracted position
V _X	Best Angle of Climb Speed, being the speed which results in the greatest altitude gain in a given horizontal distance (i.e. - highest climb angle)
V _Y	Best Rate of Climb Speed, being the speed which results in the greatest altitude gain in a given time
V _R	Rotation Speed, being the speed at which the aircraft should be rotated about the pitch axis during take-off
V _{LO}	Lift Off Speed, being the speed at which the aircraft generally lifts off from the ground during take-off
V _{OBS}	Obstacle Speed, being the speed at which the aircraft flies over a 50 ft (15 m) obstacle during take-off and landing, properly executed

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Meteorological terminology

OAT	Outside Air Temperature, being the free air static temperature expressed in degrees Fahrenheit (°F) or Celsius (°C)
T _s	Standard Temperature, being 59 °F (15 °C) at sea level pressure altitude and decreased by 3.5 °F (2 °C) for each 1,000 ft. of altitude
H _p	Pressure Altitude, being the altitude read from an altimeter when the barometric scale has been set to 29.92 "Hg (1013 mb)

Engine terminology

RPM	Revolutions per Minute, being the number of revolutions per minute of the engine crank, being 2.4286 times the number of revolutions performed by the propeller per minute pursuant to the reduction gearbox mounted between engine and propeller
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Airplane performance and flight planning terminology

Crosswind Velocity	is the velocity of the crosswind component for which adequate control of the airplane during takeoff and landing can be guaranteed
Usable fuel	Is the fuel available for flight planning
G	is the acceleration due to gravity
TOR	Is the take off distance measured from actual start to wheel lift off point
TOD	Is the take off distance measured from the actual start to clearance of a 15m obstacle
GR	Is the distance measured during landing from actual touchdown to the stopping point
LD	Is the distance measured during landing from clearance of a 15m obstacle to the stopping point
S/R	Is the specific range, being the distance, in nautical miles, which can be expected of the aircraft at a specific power setting and/or flight configuration per kilo of fuel used

Weight and balance terminology

Datum	Reference datum is an imaginary vertical plane from which all horizontal distances are measured for balance purposes. (In the Sling this plane runs through the center point of the flat front face of the propeller flange of the Rotax 912 engine)
Arm	Is the horizontal distance from the reference datum to the center of gravity of an item
Moment	Is the product of the weight of an item multiplied by its arm
CG	Center of Gravity, being the point at which the airplane, or equipment, would balance if suspended. Its distance from the reference datum is found by dividing the total moment by the total weight of the airplane
Empty weight	Is the weight of the airplane with engine fluids and oil at operating levels
Maximum Take-off Weight	Is the maximum weight approved for the start of the take-off run
Maximum Landing Weight	Is the maximum weight approved for the landing touch down
Tare	Is the weight of chocks, blocks, stands, etc. used when weighing an airplane and included in the scale reading. Tare is deducted from the scale reading to obtain the actual (or net) airplane weight

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2. LIMITATIONS

2.1 Introduction

This section includes operating limitations, instrument markings and basic placards necessary for the safe operation of the Airplane Factory Sling LSA, its engine, systems and equipment.

2.2 Airspeed limitations

SPEED		KIAS	REMARKS
V _{NE}	Never exceed speed	135	Never exceed this speed in any operation
V _{NO}	Maximum structural cruising speed	120	Never exceed this speed unless in smooth air, and then only with caution
V _H	Maximum speed in level flight	118	The aircraft will not exceed this speed at MTOW in level flight
V _A	Maneuvering speed	91	Do not make full or abrupt control movements above this speed as this may cause stress in excess of limit load factor (*Note: Maneuvering Speed quoted is at gross weight. V _A decreases with a decrease in weight)
V _{FE}	Maximum flap extended speed	85	Never exceed this speed unless the flaps are fully retracted
V _{S1}	Stall speed in Specific Configuration	45	At maximum takeoff weight in the most forward CG configuration the aircraft will stall if flown slower than this speed
V _{SO}	Stall Speed in Landing Config.	40	The aircraft will stall at this speed in straight flight when at maximum gross weight with the power at idle and full flaps.

2.3 Airspeed indicator markings

MARKING	KIAS	SIGNIFICANCE
White arc	40-85	Positive Flap Operating Range (lower limit is V _{SO} at maximum weight, and upper limit is the maximum speed permissible with flaps deployed)
Green arc	45-120	Normal Operating Range (lower limit is V _{S1} at maximum weight and most forward CG with flaps retracted and upper limit is maximum structural speed V _{NO})
Yellow arc	120-135	Maneuvers must be conducted with caution and only in smooth air
Red line	135	Maximum speed for all operations

2.4 Crosswind and wind limitation (demonstrated)

Maximum permitted cross wind velocity
for take-off and landing 15 kts

2.5 Service ceiling

Service ceiling 12,000 ft

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2.6 Load factor

Maximum positive limit load factor	+ 4g
Maximum negative limit load factor	- 2g
Maximum positive load factor with flaps	+2g
Maximum negative load factor with flaps	-1g

2.7 Weights

Maximum take-off weight	1,320 Lbs. (600 kg)
Maximum landing weight	1,320 Lbs. (600 kg)
Maximum baggage weight	77 Lbs. (35 kg)

2.8 Center of gravity range

Datum	Center of front face of propeller flange without spacer
Reference for leveling	Center fuselage upper channel surface with canopy open
Forward limit	-64.37 in. (-1.635 m) (20% MAC)
Rear limit	-69.76 in. (-1.772 m) (30.3% MAC)

WARNING

It is the pilot's responsibility to ensure that the airplane is properly loaded. Refer to section 6 for information on weight and balance

2.9 Prohibited maneuvers

The Sling LSA is approved for normal maneuvers including the following:

- Steep turns not exceeding 60° bank
- Lazy eights
- Chandelles
- Stalls (except whip stalls)

WARNING

Aerobatics and intentional spins are prohibited

WARNING

Limit load factor would be exceeded by moving flight controls abruptly to their limits at a speed above V_A (91 KIAS – maneuvering speed)

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2.10 Flight crew

Minimum crew for flight is one pilot seated on the left side.

2.11 Passengers

Only one passenger is allowed on board the aircraft in addition to the pilot.

2.12 Kinds of operation

The Sling LSA, in standard configuration, is approved only for day VFR operation. Additional packages for Day/Night VFR and IFR are required for operations in those respective environments where approved by regulation.

Minimum equipment required is as follows-

- Altimeter
- Airspeed indicator
- Compass
- Fuel gauges
- Oil pressure indicator
- Oil temperature indicator
- Cylinder head temperature indicator
- Outside air temperature indicator
- Tachometer
- Chronometer
- First aid kit
- Fire extinguisher
- Emergency Locator Transmitter

2.13 Engine operating speeds and limits

Engine Model:		ROTAX 912 ULS
Engine Manufacturer:		Bombardier-Rotax GMBH
Power	Max take-off	98.6 hp (73.5 kW) at 5800 rpm, max. 5 min.
	Max continuous	92.5 hp (69 kW) at 5500 rpm
	Cruising	71 hp (53 kW) at 4800 rpm

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Engine RPM	Max take-off	5800 rpm, max. 5 min.
	Max continuous	5500 rpm
	Cruising	4600 rpm to 5400 rpm
	Idling	~ 1400 – 1650 RPM
Cylinder head temperature	Minimum	- N/A
	Maximum	302 °F (150 °C)
	Optimum	167 – 230 °F (75 – 110 °C)
Oil temperature	Minimum	122 °F (50 °C)
	Maximum	284 °F (140 °C)
	Optimum	194 – 230 °F (90 – 110 °C)
Oil pressure	Minimum	12 psi (0.8 bar) – below 3500 rpm
	Maximum	102 psi (7 bar) – cold engine starting
	Optimum	29 – 73 psi (2 – 5 bar) – above 3500 rpm

Instruments reflecting engine parameters should in each case be marked to reflect the minimum and maximum figures

2.14 Other limitations

- No smoking is allowed on board of the aircraft.

WARNING
Intentional flights under icing conditions are prohibited!

2.15 Flight in rain

When flying in the rain no additional steps are required. Aircraft qualities and performance are not substantially changed. However, VMC should be maintained.

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2.16 Limitation placards

The following limitation warning placards must be placed in plain view of the aircraft.

In a place visible to pilot and passenger -

PASSENGER WARNING
THIS AIRCRAFT WAS MANUFACTURED IN ACCORDANCE
WITH LIGHT SPORT AIRCRAFT AIRWORTHINESS
STANDARDS AND DOES NOT CONFORM TO STANDARD
CATEGORY AIRWORTHINESS REQUIREMENTS



NO INTENTIONAL SPINS

FASTEN SEATBELTS



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**EMERGENCY
BALLISTIC CHUTE
REMOVE LOCKING PIN BEFORE FLIGHT
PULL HANDLE TO FIRE**



On the baggage space separator channel -

MAX BAGGAGE WEIGHT – 77 Lbs / 35 Kgs



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Adjacent to the fuel filler caps -

FUEL
19.8 U.S. GALS.
91 OCT. MOGAS
100LL AVGAS



Adjacent to the filler hole in the wheel pants on each wheel -

Main Gears:

TIRE PRESSURE
22 P.S.I



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Nose Gear:

**TIRE PRESSURE
20 P.S.I**



On the inboard upper wing flap surface -

NO STEP



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On the exterior of the fuselage adjacent to the entrance to the cockpit -

Light Sport – Both Passenger and PIC Side

LIGHT-SPORT

WARNING

This aircraft is equipped with a ballistically-deployed emergency parachute system



When Ballistic Parachute is installed:

On the exterior of the fuselage adjacent to the egress point of the Parachute Recovery System -

DANGER EXPLOSIVE EGRESS
Rocket Deployed Parachute Egress Area
STAY CLEAR



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On the Parachute Rocket Body inside the Rocket housing -

DANGER EXPLOSIVE ROCKET



On a fireproof metal plate attached to the exterior of the fuselage aft of the cockpit -

AIRCRAFT IDENTIFICATION
BUILDER: THE AIRPLANE FACTORY (Pty) Ltd
MODEL: SLING
SERIAL NO: xxx
MADE IN SOUTH AFRICA



The airplane must be placarded to show the identity of:

- All fuses/circuit breakers
- Magneto switches
- Choke
- Starter
- Trim : Nose up and down
- Flaps : Up and Down

3. EMERGENCY PROCEDURES

3.1 Introduction

This section provides checklists and amplified procedures for coping with various emergencies that may arise.

Emergencies caused by aircraft or engine malfunction are extremely rare if proper pre-flight inspections and maintenance are practiced. However, should an emergency arise, the basic guidelines described in this section should be considered and applied as necessary to correct the problem.

In case of emergency the pilot should remember the following priorities –

- 1 Keep control of and continue flying the aircraft
- 2 Analyze the situation
- 3 Apply applicable procedures
- 4 Inform air traffic control of the situation if time and conditions permit it

3.2 Engine related emergencies

3.2.1 Engine failure during take-off run

- | | |
|-----------------------------------|-------------------|
| 1. Throttle | - Reduce to idle |
| 2. Magneto | - Switch off |
| 3. Brakes | - Apply as needed |
| 4. Magnetos: | - Off |
| 5. Alternator and master switches | - Off |

With airplane under control –

- | | |
|------------------------|-------|
| 6. Fuel selector valve | - Off |
| 7. Electric fuel pump | - Off |

3.2.2 Engine failure immediately after take-off

- | | |
|--|--|
| 1. Speed | - Check |
| 2. Find a suitable place on the ground to land safely. The landing should be planned straight ahead with only small changes in direction not exceeding 45 degrees to either side | |
| 3. Flaps | - As needed (plan to land as slowly as possible) |
| 4. Throttle | - As needed |

At touch down

- | | |
|------------------------|--------------|
| 5. Magneto | - Switch off |
| 6. Fuel selector valve | - Switch off |
| 4. Electric fuel pump | - Off |

3.2.3 Engine irregularities in flight

3.2.3.1 Irregular engine rpm

1. Check throttle position
2. Check engine gauges
3. Check fuel quantity gauge
4. Turn electric fuel pump on
5. Check fuel selector valve and change if required

If engine continues to run irregularly

6. Land as soon as possible

NOTE

If one fuel tank is empty ensure that fuel selector is set to fullest tank

3.2.3.2 Low fuel pressure (2.2 psi (0.15 bar) or less)

1. Check fuel quantity indicator
2. Switch electric fuel pump on
3. Check that fuel selector is correctly set

If fuel pressure remains low

4. Decrease throttle setting if viable to do so

If fuel pressure remains low

5. Land as soon as possible

3.2.3.3 Low oil pressure (12 psi (0.8 bar) or less)

1. Check oil temperature

If oil temperature is high or increasing

2. Set throttle to a setting which gives an aircraft speed of 70 KIAS (most efficient speed)

If oil pressure remains low or temperature remains high or increasing

3. Land as soon as possible and remain vigilant for impending engine fault

3.2.4 In-flight engine restarting

- | | |
|-----------------------------------|--------------------------|
| 1. Electric fuel pump | - On |
| 2. Fuel selector | - Ensure on |
| 3. Throttle | - Set to middle position |
| 4. Master and alternator switches | - Check on |

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- | | |
|-------------|-------------|
| 5. Magnetos | - Check on |
| 6. Starter | - Switch on |

If engine should fail to restart

8. Apply forced landing without engine power procedure

3.3 Smoke and fire

3.3.1 Fire on ground at engine starting

- | | |
|--|-----------------------|
| 1. Starter | - Release Immediately |
| 2. Fuel selector | - Close |
| 3. Throttle | - Set to Idle |
| 4. Magnetos | - Switch off |
| 5. Collect the fire extinguisher from luggage compartment if possible | |
| 6. Leave the airplane | |
| 7. Extinguish fire by fire extinguisher or call fire department if necessary | |

3.3.2 Fire on ground with engine running

- | | |
|--|--------------|
| 1. Heating | - Close |
| 2. Fuel selector | - Close |
| 3. Throttle | - Full power |
| 4. Magnetos | - Switch off |
| 5. Collect the fire extinguisher from luggage compartment if possible | |
| 6. Leave the airplane | |
| 7. Extinguish fire by fire extinguisher or call fire department if necessary | |

3.3.3 Fire during take-off

- | | |
|--|------------------------------|
| 1. Speed | - 70 knots |
| 2. Heating | - Close |
| 3. Fuel selector | - Close |
| 4. Throttle | - Set to Idle if appropriate |
| 5. Magnetos | - Switch off |
| 6. Land and stop the airplane | |
| 7. Collect the fire extinguisher from luggage compartment if possible | |
| 8. Leave the airplane | |
| 9. Extinguish fire by fire extinguisher or call fire department if necessary | |

3.3.4 Fire in flight

- | | |
|----------------------|---|
| 1. Heating | - Close |
| 2. Fuel selector | - Close |
| 4. Throttle | - Full power |
| 5. Magnetos | - Switch off after the fuel in carburetors is consumed and engine shut down |
| 6. Choose an area | - Heading to the nearest airport or choose emergency landing area |
| 7. Emergency landing | - Perform according to 6.5.1 |

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8. Leave the airplane
9. Extinguish fire by fire extinguisher or call fire department if necessary

NOTE

Estimated time to pump fuel out of carburetors is 30 seconds

WARNING

Do not attempt to re-start the engine!

3.3.5 Fire in the cockpit

- | | |
|------------------------------|--------------|
| 1. Master switch | - Switch off |
| 2. Heating | - Close |
| 3. Use the fire extinguisher | |

3.4 Landing Emergencies

Emergency landings are generally carried out in the case of engine failure and the engine cannot be re-started. Other reasons for an emergency landing may arise, however.

3.4.1 Engine-off emergency landing

- | | |
|---------------------|--|
| 1. Speed | - Apply best glide speed of 70 KIAS |
| 2. Trim | - Trim for best glide speed |
| 3. Landing location | - Locate most suitable landing location, free of obstacles and preferably into wind |
| 4. Safety harness | - Tighten |
| 5. Engine restart | - If time permits and if appropriate attempt to identify reason for engine failure and attempt restart |
| 6. Flaps | - Extend as needed |
| 7. Safety harness | - Tighten |
| 8. Communications | - Report your location to third parties if possible |
| 9. Passenger | - Brief passenger |

Immediately before touchdown-

- | | |
|------------------------------------|--------------|
| 10. Fuel selector | - Shut off |
| 11. Magnetos | - Switch off |
| 12. Master and alternator switches | - Switch off |
| 13. Electric fuel pump | - Switch off |

3.4.2 Precautionary landing

A precautionary landing is generally carried out in the cases where the pilot may be disorientated, the aircraft has no fuel reserve or possibly in bad weather conditions.

1. Choose landing area, determine wind direction

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2. Report your intention to land and land area location if a COMM is installed in the airplane
3. Perform low-altitude passage into wind over the right-hand side of the chosen area with flaps extended as needed and thoroughly inspect the landing area.
4. Perform circle pattern.
5. Perform approach at increased idling with flaps fully extended.
6. Reduce power to idle when flying 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 selector, lock the airplane and look for assistance.

NOTE

Watch the chosen area steadily during
precautionary landing.

3.4.3 Landing with a flat tire

1. If the main landing gear is damaged, perform touch-down at the lowest practicable speed with aircraft slightly banked towards good tire. Keep flat tire off the ground just above or very lightly on the ground until minimum speed possible, while maintaining directional stability during landing run.
2. If the nose wheel is damaged perform touch-down at the lowest practicable speed and hold the nose wheel above the ground by means of the elevator control as long as possible.

3.5 Recovery from unintentional spin

WARNING

Intentional spins are prohibited!

The aircraft is unlikely to enter an unintentional spin unless extreme inputs are used.

Unintentional spin recovery technique:

- | | |
|-------------------------|--|
| 1. Throttle | - Idle |
| 2. Lateral control | - Ailerons neutralized |
| 3. Rudder pedals | - Full rudder in direction opposite to spin |
| 4. Rudder pedals | - Neutralize rudder immediately when rotation stops |
| 5. Longitudinal control | - Neutralize stick or push forward if necessary to lower nose, then recover from dive ensuring V_{NE} and G limitations are not exceeded |

3.6 Other emergencies

3.6.1 Vibration

If any forced aircraft vibrations appear:

1. Set engine speed to such power rating where the vibrations are lowest.

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2. Land on the nearest airfield or to perform a precautionary landing according to 6.5.2.

3.6.2 Carburetor icing

Carburetor icing is evidenced through a decrease in engine power and an increase of engine temperatures.

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

1. Speed - 75 knots
2. Throttle - Set to 1/3rd power
3. If possible, leave the icing area
4. Increase the engine power gradually up to cruise conditions after 1 – 2 minutes.

If you fail to recover the engine power, land on the nearest airfield (if possible) or depending on the circumstances, perform a precautionary landing according to 6.5.2.

4. NORMAL PROCEDURES

This section provides checklists and recommended procedures for normal operation of the aircraft.

4.1 Pre-flight check

Carry out the pre-flight inspection every day prior to the first flight. Pre-flight inspections must also be performed after any accident, incident, maintenance activity, assembly of any aircraft component or similar. Incomplete or careless inspection can cause an accident. Carry out the inspection following the instructions in the Inspection Check List.

NOTE

The word “condition” in the instructions means a visual inspection of surface for damage deformations, scratching, chafing, corrosion or other damages, which may lead to flight safety degradation.

Inspection Check List

1. Cabin

- | | |
|------------------------|--|
| - Magnetos | - OFF |
| - Master switch | - ON |
| - Fuel level indicator | - Check fuel quantity |
| - Flaps | - Move to full down position |
| - Master switch | - OFF |
| - Avionics | - Check condition |
| - Control System | - Visual inspection, free movement up to stops, check function |
| - Canopy | - Attachment condition, clean |
| - Cockpit | - Check for loose objects |
| - Fire extinguisher | - Check present and valid |
| - Documentation | - Check present and valid |

2. Nose Section and Nose Gear

- | | |
|---|-------------------------------------|
| - Engine cowling condition | - Check |
| - Propeller and spinner condition | - Check |
| - Air intakes | - Check |
| - Radiators | - Check |
| - Engine mount and exhaust manifold condition | - Check |
| - Oil and coolant quantity check | - Check |
| - Visual inspection of the fuel and electrical system | - Check |
| - Engine checks as per manual | - Complete |
| - Other actions according to the engine manual | |
| - Parachute cover | - If fitted check sealed and secure |
| - Tire | - Condition, inflation, wear |
| - Wheel | - Security, general condition |
| - Chocks and tie-down ropes | - Remove |
| - Suspension | - Check and test |

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3. Right Fuselage

- | | |
|--------------------------|--------------------------------|
| - Surface condition | - Check |
| - Cowling attachment | - Check |
| - Wing/fuselage fairings | - Check |
| - Empennage fairings | - Check |
| - Antennae | - Check condition and security |

4. Right Wing and Main Gear

- | | |
|--|--|
| - Wheel fairing | - Security, cracks, tire condition, inflation, wear |
| - Service condition | - Check |
| - Leading edge condition | - Check |
| - Wheel and brakes | - Fluid leaks, security, general condition |
| - Wheel strut | - Condition, cracks |
| - Fuel vent (underside) | - Unobstructed |
| - Wing trailing edge | - Check condition |
| - Aileron | - Freedom of movement, attachment, surface condition |
| - Aileron hinges, control horn, bolts, pushrod | - Secure, condition |
| - Flap hinges, control horn, bolts, pushrod | - Secure, condition |
| - Wing tip | - Check condition |
| - Strobe/Nav light and lens | - Check for cracks and condition |

5. Empennage

- | | |
|--|--------------------------|
| - Tie-down rope | - Removed |
| - Horizontal and vertical stabilizers | - Check condition |
| - Elevator and tab | - Condition and movement |
| - Rudder | - Condition and movement |
| - Hinges, control horn, bolts, pushrod | - Condition and secure |

6. Left Fuselage

- | | |
|--------------------------|--------------------------------|
| - Surface condition | - Check |
| - Cowling attachment | - Check |
| - Wing/fuselage fairings | - Check |
| - Empennage fairings | - Check |
| - Antennae | - Check condition and security |

7. Left Wing

- | | |
|--|--|
| - Wheel fairing | - Security, cracks, tire condition, inflation, wear |
| - Service condition | - Check |
| - Leading edge condition | - Check |
| - Wheel and brakes | - Fluid leaks, security, general condition |
| - Wheel strut | - Condition, cracks |
| - Wing trailing edge | - Check condition |
| - Aileron | - Freedom of movement, attachment, surface condition |
| - Aileron hinges, control horn, bolts, pushrod | - Secure, condition |
| - Flap hinges, control horn, bolts, pushrod | - Secure, condition |
| - Wing tip | - Check condition |
| - Strobe/Nav light and lens | - Check for cracks and condition |
| - Pitot tube | - Security and clear |

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WARNING

Physically check the fuel level before each take-off to make sure you have sufficient fuel for the planned flight.

CAUTION

In case of long-term parking it is recommended to turn the engine several times (Magnetos OFF!) by turning the propeller. Always handle by palm the blade area i.e. do not grasp only the blade edge. It will facilitate engine starting.

4.2 Engine starting

4.2.1 Before starting engine

- | | |
|----------------------------------|---------------------|
| 1. Pre-flight inspection | - Completed |
| 2. Emergency equipment | - On board |
| 3. Passengers | - Briefed |
| 4. Seats, seatbelt and harnesses | - Adjust and secure |
| 5. Brakes | - On |

4.2.2 Engine starting

- | | |
|--------------------------|--|
| 1. Master switch | - On |
| 2. Backup battery | - On check MGL Voyager on and backup battery voltage |
| 3. Fuel selector | - Select fuller tank |
| 4. Magnetos | - On |
| 5. Choke (cold engine) | - Pull to open and gradually release after engine start |
| 6. Throttle | - Closed if choke used, cracked just open if not |
| 7. Propeller area | - Clear of people and obstructions |
| 8. Starter | - Hold activated to start engine |
| 9. MGL Voyager switch | - On and check battery charging |
| 10. Avionics main switch | - On |
| 11. Warm engine | - 2000 rpm for 2 minutes, then 2500 rpm until oil temp is 120 °F (50 °C) |

** Starter may be operated continuously for a maximum of 10 seconds. Thereafter a cool down period of 2 minutes is required. Failure to comply with this limitation will result in starter motor damage.

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CAUTION

The starter should be activated for a maximum of 10 sec., followed by 2 min. pause for engine cooling.

As soon as engine runs, adjust throttle to achieve smooth running at approx. 2500 rpm. Check the oil pressure, which should increase within 10 sec. Increase the engine speed after the oil pressure has reached 29 psi (2 bars) and is steady.

To avoid shock loading, start the engine with the throttle lever set for idling or 10% open at maximum, then wait 3 sec to reach constant engine speed before new acceleration. Only one magneto should be switched on (off) during Magneto check.

4.2.3 Engine warm up, engine check

Prior to engine check block the main wheels using chocks or ensure that the brake is firmly on. Initially warm up the engine to 2000 rpm for approx. 2 minutes, then continue to 2500 rpm until the oil temperature reaches 120 °F (50 °C). The warm up period depends on ambient air temperature.

Check both Magneto circuits at 4000 rpm for Rotax 912 ULS. The engine speed drop when either Magneto is switched off should not be over 300 rpm. The maximum engine speed drop difference between circuits A and B should be 120 rpm.

NOTE

Only one magneto should be switched on (off) during
magneto check

Set maximum power for verification of maximum speed with given propeller and engine parameters (temperatures and pressures).

Check acceleration from idling to maximum power. If necessary, cool the engine at 3000 rpm before shutdown.

CAUTION

The engine check should be performed with the aircraft heading
upwind and not on a loose terrain (the propeller may suck grit
which can damage the leading edges of blades).

4.3 Taxiing

- | | |
|---------------------|---|
| 1. Flaps | - Up |
| 2. Taxi light | - On |
| 3. Brakes | - Off (Carefully check stop brake valve is off) |
| 4. Controls | - Neutral position, or as required for wind |
| 5. Power and brakes | - As required |
| 6. Fuel selector | - Switch tank |
| 7. Brakes | - Check |
| 8. Instruments | - Check |

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Apply power and brakes as needed. Apply brakes to control movement on ground. Taxi with usual procedures and precautions when wind velocity exceeds 15 knots.

4.4 Normal take-off

4.4.1 Before take-off

- | | |
|------------------------------------|--|
| 1. Controls | - Test full and free movement, directions |
| 2. Trim | - Set neutral position |
| 3. Choke | - Check off |
| 4. Propeller pitch (if applicable) | - Full fine |
| 5. Flaps | - As required, 12 degrees recommended for best take-off roll and initial climb |
| 6. Fuel quantity | - Confirm |
| 7. Fuel selector | - Both (but fuller tank if one tank near empty) |
| 8. Electric Fuel pump | - Test |
| 9. Fuses | - All in |
| 10. Instruments | - Check all |
| 11. Switches | - Check, as required |
| 12. Power and Magnetos | - Check mags at 3,800 rpm, max diff 50 rpm, max drop 150 rpm |
| 13. Engine parameters | - Temperatures, pressures, current/voltage |
| 14. Canopy | - Closed and latched |
| 15. Safety harnesses | - On and tight |

4.4.2 Take-off

- | | |
|---|---|
| 1. Take-off power | - Throttle fully forward (max. 5800 rpm for 5 minutes) |
| 2. Engine speed | - Check rpm (propeller specific) |
| 3. Instruments within limits | - Check |
| 4. Nose wheel unstuck | - 40 KIAS |
| 5. Airplane lift-off | - 48 KIAS |
| 6. Wing flaps | - Retract when speed of 70 KIAS is reached, at altitude of minimum 300 ft |
| 7. Transit to climb | |
| 8. Climb with flaps at 70 knots. Best rate of climb without flaps is 75 knots | |

WARNING

Take-off is prohibited if:

- The engine is running unsteadily
- The engine instrument values are beyond operational limits
- The crosswind velocity exceeds permitted limits (see 3.6)

4.5 Climb

- | | |
|-------------|---|
| 1. Throttle | - Max. take-off power 5800 rpm (for max. 5 minutes) |
| | - Max. cont. power 5500 rpm |
| 2. Airspeed | - $V_x = 65$ KIAS |
| | - $V_y = 72$ KIAS |
| | - Cruise climb = 75 to 90 KIAS |
| 3. Trim | - Trim the airplane |

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- | | |
|----------------|--------------------------------------|
| 4. Instruments | - Check |
| | - Oil temperature and pressure |
| | - Cylinder temperature within limits |
| 5. Brakes | - Apply to stop wheel rotation |

CAUTION

If the cylinder head temperature or oil temperature approach their limits,
reduce the climb angle to increase airspeed and thus fulfill the limits.

Best angle of climb speed (V_X): 65 knots

Best rate of climb speed (V_Y): 72 knots

4.6 Cruise

Refer to section 5, for recommended cruising figures

WARNING

The fuel lift pipe in the fuel tank is situated adjacent to the lower inside wall of the tank. The aircraft should at no time be subjected to a sustained side slip towards a near empty fuel tank (i.e. - right wing down) as, despite the baffling, this may have the consequence that the fuel runs towards the outer edge of the tank exposing the fuel lift pipe to suck air, thereby starving the engine of fuel leading to engine failure. This poses a particular threat when at low altitude, typically prior to landing.

4.7 Descent

Optimum glide speed	- 70 KIAS
---------------------	-----------

4.8 Approach

Approach speed	
Long finals	- 65 KIAS
Short finals	- 60 KIAS
1. Throttle	- As needed
2. Wing flaps	- Extend as needed
3. Trim	- As needed

CAUTION

It is not advisable to reduce the engine throttle control lever to minimum on final approach and when descending from very high altitude. In such cases the engine becomes over-cooled and a loss of power may occur. Descent at increased idle (approx. 3000 rpm), speed between 65-76 knots (75-87 mph, 120-140 km/h) and check that the engine instruments indicate values within permitted limits.

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4.9 Normal landing

4.9.1 Before landing

- | | |
|---------------|--------------------|
| 1. Throttle | - As needed |
| 2. Airspeed | - 60 KIAS |
| 3. Wing flaps | - Extend as needed |
| 4. Trim | - As needed |

4.9.2 Landing

- | | |
|------------------------------|---|
| 1. Throttle | - Idle |
| 2. Controls | - Flare to minimum flying speed |
| 3. Touch-down on main wheels | |
| 3. Apply brakes | - As needed (after the nose wheel touch-down) |

4.9.3 After landing

- | | |
|-----------------|-------------------------------|
| 1. Engine speed | - Set as required for taxiing |
| 2. Wing flaps | - Retract |

4.9.4 Engine shutdown

- | | |
|---------------------|------------------------------------|
| 1. Engine speed | - Idle |
| 2. Instruments | - Engine instruments within limits |
| 3. Avionics | - Switch off |
| 4. Magnetos | - Switch off |
| 5. Circuit breakers | - Switch off |
| 6. Master switch | - Switch off |
| 7. Switch box | - Turn key to switch off |
| 8. Fuel selector | - Off |

CAUTION

Rapid engine cooling should be avoided during operation. This happens above all during aircraft descent, taxiing, low engine rpm or at engine shutdown immediately after landing. Under normal conditions the engine temperatures stabilize during descent, taxiing and at values suitable to stop engine by switching the Magnetos off. If necessary, cool the engine at 2500 – 2750 rpm to stabilize the temperatures prior to engine shut down.

4.10 Short field take-off and landing procedures

Not considered necessary. Ordinary short field procedures may be used if the pilot deems it appropriate.

4.11 Balked landing procedures

- | | |
|--------------------|------------------------------|
| 1. Throttle | - Full power (max. 5800 rpm) |
| 2. Pitch for V_x | - 65 KIAS |
| 3. Wing flaps | - Extend as needed |
| 4. Trim | - Adjust as needed |

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- | | |
|-------------------|--|
| 5. Wing Flaps | - retract to 50% as soon as possible and retract fully at height of 300 ft after reaching 70 knots |
| 6. Trim | - Adjust |
| 7. Repeat Pattern | |

4.12 Aircraft parking and tie-down

- | | |
|------------------------|---|
| 1. Site | - Park the aircraft on as level an area as possible |
| 2. Magneto check | - OFF |
| 3. Master switch check | - OFF |
| 4. Fuel selector | - OFF |
| 6. Parking brake | - Use as necessary |
| 7. Canopy | - Close, lock as necessary |
| 8. Secure the airplane | |

NOTE

It is recommended to use parking brake (if installed) for short-time parking only, between flights during a flight day. After ending the flight day or at low temperatures of ambient air, do not use parking brake, but use the wheel chocks instead.

NOTE

Use anchor eyes on the wings and fuselage rear section to fix the airplane. Move control stick forward and fix it together with the rudder pedals. Make sure that the cockpit canopy is properly closed and locked.

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5. PERFORMANCE

The presented data has been computed from actual flight tests with the aircraft and engine in good conditions and using average piloting techniques.

If not stated otherwise, the performance stated in this section is valid for maximum take-off weight 1,320 lbs. (600 kg) and under ISA conditions.

The performance shown in this section is valid for aircraft fitted with a ROTAX 912 ULS 73.5kW (98.6 hp) engine.

5.1 Take-off and landing distance

Take-off distances:

RWY	Take-off run distance	Take-off distance over 50 ft (15 m) obstacle
Concrete	394 ft. (120 m)	755 ft. (230 m)
Grass	459 ft. (140 m)	820 ft. (250 m)

Landing distances:

RWY	Landing run distance (braked)	Landing distance over 50 ft. obstacle
Concrete	230 ft. (70 m)	656 ft. (200 m)
Grass	230 ft. (70 m)	656 ft. (200 m)

5.2 Rate of climb

Conditions: Max. continuous Power: 5500 rpm Weight: 1,320 lbs (600kg)	Best rate of climb speed IAS	Rate of climb
	KIAS	fpm
0 ft ISA	72	900
3,000 ft ISA	72	700
6,000 ft ISA	72	520
9,000 ft ISA	72	430

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5.3 Cruise speeds

Altitude [ft. ISA]	Engine speed [rpm]	KIAS
100	4500	75
	4800	90
	5000	98
	5300	102
	5500	106
3,000	4500	72
	4800	87
	5000	94
	5300	100
	5500	104
6,000	4500	65
	4800	80
	5000	90
	5300	98
	5500	101
9,000	4500	55
	4800	70
	5000	80
	5300	88
	5500	91

5.4 Fuel consumption

Altitude	[ft. ISA]	3,000				
Fuel quantity	[Gallons]	39.6				
	[Liters]	150				
Engine speed	[rpm]	4500	4800	5000	5300	5500
Fuel consumption	[GPH]	3.4	4	4.2	4.8	5.3
	[l/hr]	13	15	16	18	20
Airspeed	[KIAS]	72	87	94	100	104
Endurance	[hh:mm]	11:30	10:00	09:22	08:20	07:30
Range	[NM]	828	870	881	833	780

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5.5 Airspeed indicator system calibration

IAS	CAS
<i>Knots</i>	
25	28
30	33
35	38
40	44
45	45
50	50
55	55
60	60
65	65
70	70
75	75
80	80
85	85
90	90
95	95
100	100
105	105
110	110
115	115
120	120
125	125
130	130
135	135

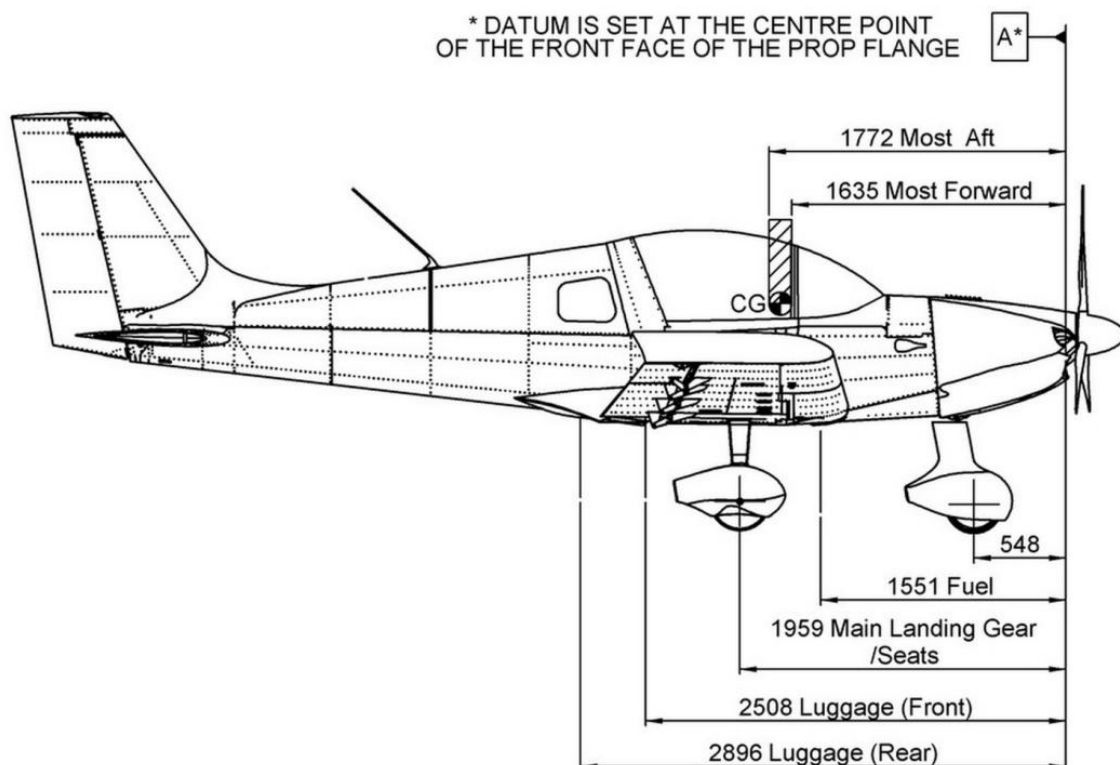
6. WEIGHT AND BALANCE

This section contains weight and balance records and the payload range for the safe operation of the Sling.

6.1 Standard Installed Equipment List

- MGL Avionics Voyager EFIS
 - EGT, CHT, OT, OP, RPM, Fuel Level, Fuel Press., Fuel Flow, Man. Press
 - FT-60 Red Cube Fuel Flow Transducer
- 3 1/8" Backup Instruments
 - ASI, Alt
- 2 1/4" Compass, Slip/Skid
- MGL Avionics V6 VHF Radio/Intercom
- Ray Allan electric trim system on elevator (T2-10A-TS)
- Transmotec electric flap actuator DLA-12-20-A-100-POT-IP65
- Internal Red LED Cabin Light

6.2 Center of gravity (CG) range and determination



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Operating CG range -64.37 inches (-1,635mm) to -69.76 inches (-1,772mm) from reference datum (20 to 30.3% of MAC – Leading edge of MAC is -53.78 inches (-1,366mm), MAC is 52.72 inches (1,339mm))

Determination of CG

Weight and balance report lists:

- Empty CG check
- Forward CG check
- Rear CG check
- Blank CG form

$$\%MAC \text{ (metric) (mm)} = \frac{(\text{Total moment arm} + 1366)}{\text{Total weight}} \times \frac{100}{(-1339)}$$

$$\%MAC \text{ (US) (inches)} = \frac{(\text{Total moment arm} + 53.78)}{\text{Total weight}} \times \frac{100}{(-52.72)}$$

6.3 Empty CG Check

	Item	Weight Lbs. (kg)	Arm Inches (mm)	Moment (weight x arm)
Aircraft Empty CG	Right Main Wheel	$W_R =$	$L_R = -77.13'' (-1959\text{mm})$	
	Left Main Wheel	$W_L =$	$L_L = -77.13'' (-1959\text{mm})$	
	Nose Wheel	$W_N =$	$L_N = -21.57'' (-548\text{mm})$	
	Computed CG empty	Empty weight: $W_E = \dots\dots\dots\text{kg}$	CG = mm (.....% MAC)	Aircraft moment :

Maximum take-off weight is 1,320 Lbs. (600 kg)

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6.4 Forward CG check

	WEIGHT Lbs. (kg)	ARM Inches (mm)	MOMENT (weight x arm)
PILOT		77.13 " (1959 mm)	
PASSENGER		77.13" (1959 mm)	
FRONT BAGGAGE		98.74" (2508 mm)	
REAR BAGGAGE		114.02" (2896 mm)	
FUEL TANKS		59.49" (1511 mm)	
ADD EMPTY VALUES	906	65.08" (1653 mm)	58,962
TOTAL			
Take-Off Weight	$W_T =$		$M_T =$
PILOT			CG = % MAC

6.5 Rear CG check

	WEIGHT Lbs. (kg)	ARM Inches (mm)	MOMENT (weight x arm)
PILOT		77.13 " (1959 mm)	
PASSENGER		77.13" (1959 mm)	
FRONT BAGGAGE		98.74" (2508 mm)	
REAR BAGGAGE		114.02" (2896 mm)	
FUEL TANKS		59.49" (1511 mm)	
ADD EMPTY VALUES	906	65.08" (1653 mm)	58,962
TOTAL	$W_T =$		$M_T =$
Take-Off Weight	kg		CG = % MAC

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6.6 Blank CG form for use

	WEIGHT Lbs. (kg)	ARM Inches (mm)	MOMENT (weight x arm)
PILOT		77.13 " (1959 mm)	
PASSENGER		77.13" (1959 mm)	
FRONT BAGGAGE		98.74" (2508 mm)	
REAR BAGGAGE		114.02" (2896 mm)	
FUEL TANKS		59.49" (1511 mm)	
ADD EMPTY VALUES	906	65.08" (1653 mm)	58,962
TOTAL	$W_T =$		$M_T =$
Take-Off Weight			CG = % MAC

7. SYSTEMS

7.1 Airframe

The airplane has an all-metal construction with single curvature stressed aluminum skins riveted to stiffeners. Construction is of 6061-T6 aluminum sheet metal riveted to aluminum angles with high quality blind rivets. This high strength aluminum alloy construction provides long life and low maintenance costs thanks to its durability and corrosion resistant characteristics. The wing has a high lift airfoil (NACA 4415) and is equipped with semi-slotted fowler type flaps.

7.2 Control system

The airplane is equipped with dual stick controls and dual rudder pedals which control rudder and steer the nose wheel. Braking is controlled on both main wheels with a hand actuator situated in the center console.

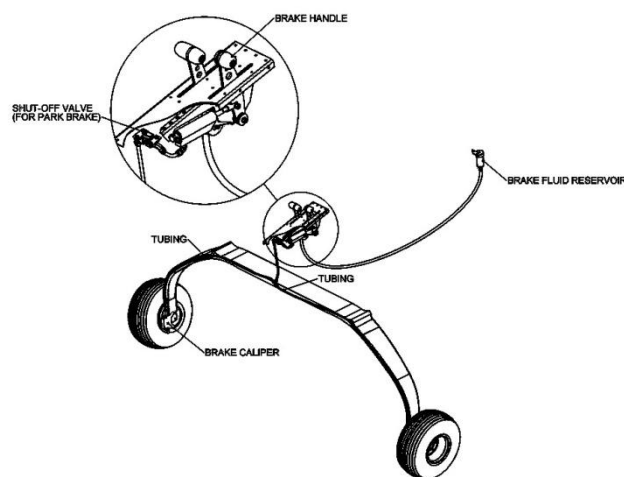
Elevator trim is electrically controlled by buttons on the control stick. Wing flaps are electrically controlled by a rocker switch located on the instrument panel or control stick, according to owner choice.

7.3 Landing gear

The landing gear is a tricycle landing gear with a steel sprung steerable nose wheel. The main landing gear uses a single continuous fiberglass spring section.

7.4 Brake

The aircraft braking system is a single hydraulic system acting on both wheels of the main landing gear through disk brakes. An intercept valve acts as a parking brake by stopping pressure relief. For braking to be operational the brake intercept valve must be off and the brake lever activated. The arrangement is apparent in the diagram below-



Brake system

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7.5 Safety and safety harness

The aircraft has side-by-side seating. Four point safety belts are provided for each seat. Seats can be adjusted backwards and forwards for comfort with forward movement slightly raising the seat height.

NOTE

Prior to each flight, ensure that the seat belts are firmly secured to the airframe, and that the belts are not damaged. Adjust the buckle so that it assumes a central position relative to the body. Ensure that the seat slider is locked firmly in place.

7.6 Baggage compartment

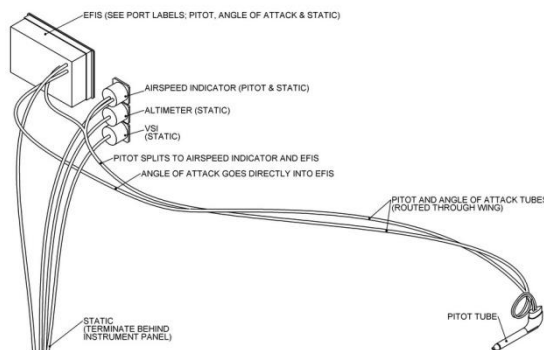
The baggage compartment comprises two sections positioned behind the seats and is designed to carry up to 77 lbs (35 kg) in total. The baggage compartment comprises a narrow, slightly lowered front section and a higher, larger back section. 77 lbs (35 kg) of luggage may be loaded in the front section and 55 lbs (25 kg) in the back section, subject to a total maximum baggage weight of 77 lbs (35 kg). Regardless of the manner in which baggage is loaded, it is the obligation of the pilot to ensure that the aircraft CG is within the permissible limits. All baggage must be properly secured.

7.7 Canopy

The airplane is equipped with a sliding canopy mechanism. External access to the cabin is from either side. Latching mechanism is provided inside the cabin at the top centre of the roll-over bar. Please ensure that the canopy is latched and that the mechanism is securely locked into position before operating the aircraft.

7.8 Pitot – static system

A pitot-static tube is located below the left wing. Pressure distribution to the instruments is through flexible plastic hoses. The tube incorporates a second inlet for measurement of angle of attack. Keep the pitot head clean to ensure proper functioning of the system. Ensure that pitot tube cover is removed prior to flight.

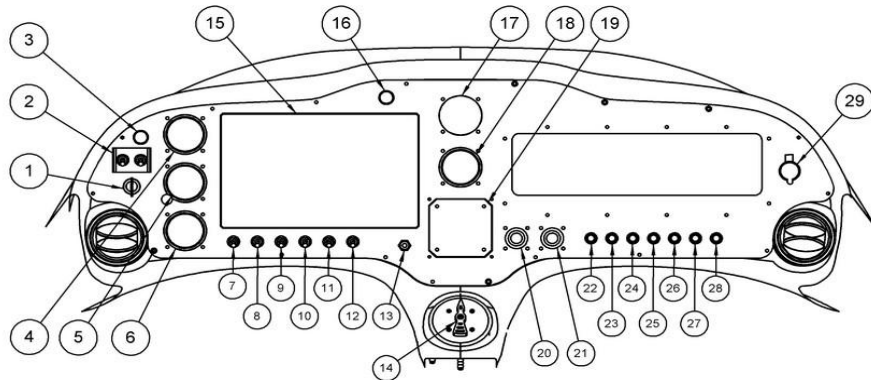


Pitot and static system

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7.9 Cockpit



1	Master switch	18	Slip indicator
2	Magneto switches left and right	19	MGL V10 radio
3	Generator light	20	Engine choke control knob
4	Analogue airspeed indicator	21	Cabin heat control knob
5	Analogue altimeter	22	Main fuse (25A)
6	Analogue VSI	23	Instruments fuse (10A)
7	MGL Voyager switch	24	Radio fuse (5A)
8	Backup battery switch	25	MGL Voyager fuse (3A)
9	Electric fuel pump switch	26	Trim motor fuse (1A)
10	Taxi light switch	27	12V power socket and flap motor fuse (5A)
11	Landing light switch	28	Fuel pump fuse (5A)
12	Avionics switch	29	12V power source socket
13	Flap deployment switch		
14	Fuel selector valve		
15	MGL Voyager		
16	MGL Voyager warning light		
17	Magnetic compass		

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7.10 Instruments and Avionics

- MGL Voyager is a multifunction “glass cockpit” instrument and incorporates –
 - ASI
 - VSI
 - ALT
 - Compass
 - Artificial Horizon
 - Turn co-coordinator
 - G meter
 - Clock/timer
 - Comprehensive mapping and navigation software and data
 - GPS
 - Stopwatch
 - Autopilot if fitted to servos
 - Full engine monitoring and management capacity including –
 - RPM indicator
 - CHT indicators
 - EGT indicators
 - Oil temperature indicator
 - Oil pressure indicator
 - Fuel level indicators
 - Fuel flow indicator
 - Tachometer
 - Flight time recorder
 - Charge current indicator
 - Voltmeter

See MGL Voyager operations manual for operating details.

7.11 Miscellaneous equipment

The following additional equipment and systems can be used in the aircraft-

- Ray Allen elevator trim control motor in elevator with PTT on both control sticks
- Kuntzleman wing tip nav lights with red, green and white LED
- Kuntzleman strobe light under tail
- Kuntzleman wing leading edge LED landing and taxi lights on left wing
- Hand actuated hydraulic brakes on main wheels with actuator in center console
- Park brake mechanism operated by brake fluid shutoff valve in center console

7.12 Minimum instruments and equipment list for VFR flights:

- Altimeter
- Airspeed indicator
- Compass
- Fuel gauges
- Oil pressure indicator
- Oil temperature indicator
- Cylinder head temperature indicator
- Outside air temperature indicator
- Tachometer
- Clock

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- First aid kit
- Fire extinguisher

7.13 Powerplant

The Rotax 912 ULS engine is a 4-stroke, 4 cylinder, horizontally opposed, spark Ignition engine with one central camshaft-push-rod-OHV. The engine features liquid cooled cylinder heads with ram air cooled cylinders. It uses dry sump forced lubrication and has a dual contactless capacitor discharge magneto type ignition system. The magneto system will continue to operate in the event of a battery or generator failure. The engine is fitted with an electric starter, AC generator and mechanical fuel pump. A backup electrical fuel pump is fitted. Prop drive via reduction gear with integrated shock absorber.

7.14 Coolant

Coolant type

Either water-free propylene glycol coolant concentrate or the conventional glycol/water coolant mixture can be used (refer to ROTAX engine Operator's Manual – section 10.2.1 and Installation Manual – section 11.6.1 and 11.6.2).

WARNING

The coolant concentrate (propylene glycol) may not be mixed with conventional (glycol/water) coolant or with additives! Non observance can lead to damage to the cooling system and engine.

Coolant liquid volume

Coolant volume is approximately 2.64 Quarts (0.7 Gal) (2.5 Liters)

7.15 Throttle and Choke

Engine power is controlled by means of a hand operated throttle situated in the center console. A choke lever is positioned in the center of the instrument panel. Both levers are mechanically connected by cable to activators on the carburetors. Springs are added to the throttle push rods to ensure that the engine will go to full power if the linkages fail.

7.16 Carburetor pre-heating/anti-ice

A Skydrive, anti-ice, warming mechanism is fitted to the carburetor intake housings to prevent icing.

7.17 Electrical System

Battery

The battery is mounted on the engine side of the firewall.

Master switch

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The master switch connects the electrical system to the 12 Volt battery and charger/coils, controlled by the regulator. See the Rotax engine Installation manual for engine electrical system details.

Magneto Switches

Both Magneto switches should be in the "ON" position to operate the engine.

NOTE

The engine ignition system is independent of the power source and will operate even with master switch and/or any circuit breaker/s off.

NOTE

All switches or engine controls are "up" or "push forward" for operation, except the choke and brake actuator which are "pull" for "on". Optional equipment, switches and/or fuses are subject to change or installed as requested. See Aircraft Equipment List and Photo and Description of Equipment and Controls in the Cockpit.

General

The electrical system also incorporates a generator light found on the upper left side of the instrument panel. The light will light up if there is a generator failure or a failure of the regulator/rectifier, with consequent overvoltage sensor shutoff.

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7.18 Propeller

The propeller is a Warp Drive 70 inch composite ground adjustable three blade propeller.

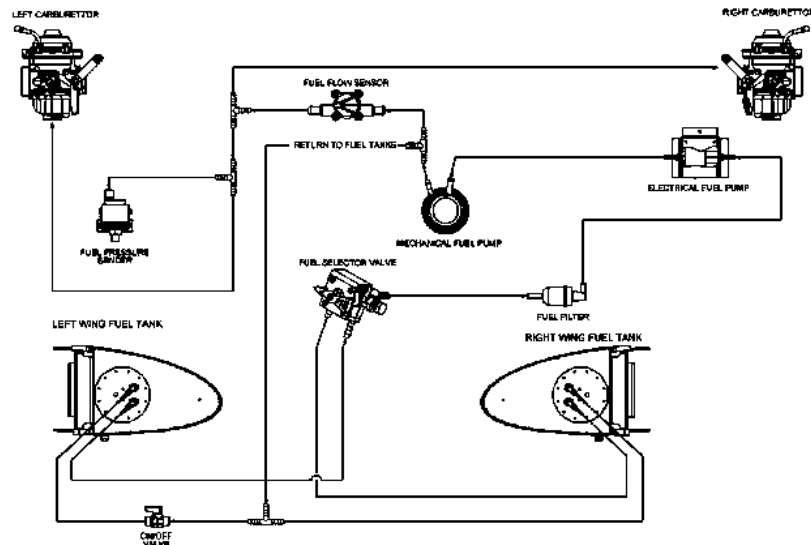
NOTE

For technical data refer to documentation supplied by the propeller manufacturer.

7.19 Fuel system

Volume of wing tanks: 19.8 Gallons (75 Liters) per wing (max 19.3 Gallons Usable)

The tanks are equipped with a vent outlet and finger screen. A drain valve is located in the lowest point of the tanks. Tank outlets lead to a fuel selector valve situated on the central console in the cockpit. The system appears from the diagram below.



Fuel system

WARNING

The fuel lift pipe in the fuel tank is situated adjacent to the lower inside wall of the tank.

The aircraft should at no time be subjected to a sustained side slip towards the near empty fuel tank (e.g. - the right tank, right wing down) as, despite the baffling, this may have the consequence that the fuel runs towards the outer edge of the tank exposing the fuel lift pipe to suck air, thereby starving the engine of fuel leading to engine failure.

This poses a particular threat when at low altitude, typically prior to landing.

8. AIRPLANE GROUND HANDLING AND SERVICING

This section contains factory-recommended procedures for proper ground handling and servicing of the airplane. It also identifies certain inspection and maintenance requirements, which should be followed at all times. Full details for servicing and maintenance appear from the aircraft maintenance manual.

8.1 Servicing fuel, oil and coolant

See appropriate chapters in the ROTAX engine Maintenance and Operator's manuals and Sling Aircraft Maintenance Manual.

8.2 Towing and tie-down instructions

8.2.1 Towing

If you wish to move the aircraft on the ground other than under its own power, it is best to pull the aircraft forwards or push it backwards by hand holding one or more propeller blades close to the spinner. The rear fuselage may be pushed down directly above a bulkhead or the horizontal stabilizer may be pressed down close to the root directly over the front spar at the point where it attaches to a rib in order to lift the nose of the aircraft for maneuvering purposes. It is best to press down on both points at once to spread the load. It is also acceptable to push the aircraft carefully backwards by putting pressure on the wing leading edges close to the root directly on a nose rib, or on the horizontal stabilizer leading edge next to the root over a rib.

CAUTION

Avoid excessive pressure at the airplane airframe – especially at or near control surfaces. The skins are very thin and minimum pressure should be placed on them. Maintain all safety precautions, especially in the propeller area.

8.2.2 Tie-down

The airplane should be tied down when parked outside a hangar. The tie-down is necessary to protect the airplane against possible damage caused by wind and gusts.

For this reason the aircraft is equipped with tie-down eyes located on the lower surfaces of the wings and one under the tail.

Tie-down procedure:

1. Check: Fuel Selector shut off, Circuit breakers and Master switch switched off.
2. Fix the joystick (using for example a. safety harness).
3. Close air vent.
4. Close and lock canopy.
5. Tie-down the aircraft to the ground by means of a tie-down rope passed through the tie-down eyes located on the lower surfaces of the wings and below the rear fuselage.

NOTE

In the case of long term parking, especially during winter, it is recommended to cover the cockpit canopy or possibly the whole aircraft by means of a suitable airplane cover attached to the airframe.

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8.3 Parking

It is advisable to park the airplane inside a hangar or alternatively inside any other suitable space (garage) with stable temperature, good ventilation, low humidity and a dust-free environment.

When parking for a long time, cover the cockpit canopy and possibly the whole airplane by means of a suitable airplane cover.

8.4 Jacking

Since the empty weight of the aircraft is relatively low, two people are usually able to lift the aircraft.

It is possible to lift the aircraft in the following manner:

- By pushing the fuselage rear section down above a bulkhead, the fuselage front section may be raised and then supported under the firewall. The same effect can be achieved by pressing down on the horizontal stabilizer as described under "towing".
- By lifting the rear fuselage under a bulkhead the rear fuselage may be raised and then supported under that bulkhead. The support should comprise a large, flat surface area to avoid damage to the under fuselage skin. The wings should also be gently supported to prevent the aircraft from rolling.
- To lift a wing, push from underneath the wing **only** at the main spar area and again using a support that has a large surface area. Do not lift up a wing by handling the wing tip.
- A single wheel can be lifted by jacking carefully under the end of the wheel strut.

8.5 Road transport

The aircraft may be transported after loading on a suitable car trailer. It is necessary to remove the wings before road transport. The aircraft and dismantled wings should be attached securely to protect these parts against possible damage.

8.6 Cleaning and care

Use efficient cleaning detergents to clean the aircraft surface. Oil spots on the aircraft surface (except the canopy!) may be cleaned with fuel.

The canopy may only be cleaned by washing it with a sufficient quantity of lukewarm water and an adequate quantity of detergents. Use either a soft, clean cloth sponge. Then use suitable polishers to clean the canopy.

Upholstery and covers may be removed from the cockpit, brushed and eventually washed in lukewarm water with an adequate quantity of detergents. Dry the upholstery thoroughly before insertion into the cockpit.

CAUTION

Never clean the canopy under "dry" conditions and **never** use fuel or chemical solvents

CAUTION

In the case of long term parking, cover the canopy to protect the cockpit interior from direct sunshine.

8.7 Assembly and Disassembly

Refer to the Sling Maintenance Manual for assembly and disassembly instructions.

8.8 Aircraft inspection periods

Periods of overall checks and contingent maintenance depend upon operating conditions and overall condition of the airplane.

Inspections and revisions should be carried out in the following periods, at least:

after the first	25 flight hours
thereafter, at	50 flight hours
thereafter after every	100 flight hours, or annually, whichever comes sooner.

Refer to the Engine Operator's Manual for engine maintenance.

Maintain the propeller according to its manual.

Comprehensive airplane maintenance procedures are set out in the airplane Maintenance Manual.

8.9 Aircraft modifications and repairs

It is recommended that you contact the airplane manufacturer prior to making any modifications to the aircraft to ensure that the airworthiness of the aircraft is not affected. Always use only the original spare parts produced by the airplane (or engine/propeller) manufacturer, as the case may be.

If the aircraft weight is affected by a modification, a new mass and balance exercise is necessary. This should be completed comprehensively and new figures should be recorded in all relevant documentation.

9. SUPPLEMENTARY INFORMATION

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

9.5 List of inserted supplements

Date	Suppl. No.	Title of inserted supplement
01/11/10	01/2010	Rotax 912 ULS engine
01/11/10	02/2010	Magnum 601 Ballistic Parachute recovery system
01/11/10	03/2010	Warp Drive Composite Propeller