Sling 2

AIRCRAFT SERIAL NO : _____

AIRCRAFT REGISTRATION : _____



DC-POH-002-X-B-3.0

PILOT OPERATING HANDBOOK







DATE: NOVEMBER 2026

REVISION 3.0

SLING AIRCRAFT | HANGAR 8 | TEDDERFIELD AIRPARK | JHB SOUTH | EIKENHOF | 1872 | SOUTH AFRICA
PO BOX 308 | EIKENHOF | 1872 | SOUTH AFRICA
Phone: +27 11 948 9898 | Information: technical@slingaircraft.com

Airplane model :	**Sling 2**
Manufacturer :	**Sling Aircraft (Pty) Ltd**
Airplane Serial Number :	**…….**
Date of Construction :	**……..**
Registration :	**……**
Airworthiness Category :	**FAR Part 22 (Light Sport Category Aircraft)**
Issue Date of POH :	**16/11/2026**

PLEASE ADVISE SLING AIRCRAFT ON CHANGE OF OWNERSHIP OF THE AIRCRAFT

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

NOTICE

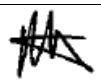
THIS MANUAL IS WRITTEN FOR THE STANDARD 912 iS POWERED SLING 2, AS MANUFACTURED ON PREMISES BY SLING AIRCRAFT (PTY) LTD. DIFFERENCES APPLICABLE TO THE STANDARD 914 UL, 912 ULS, 915 iS OR 916 iS POWERED SLING 2 AIRCRAFT, AS MANUFACTURED ON PREMISES BY SLING AIRCRAFT (PTY) LTD, ARE INCLUDED IN APPLICABLE SUPPLEMENTS IN SECTION 9 OF THIS HANDBOOK.

AIRCRAFT WHICH DIFFER FROM THE PRODUCTION STANDARD, IN WHATEVER WAY, ARE NOT ADDRESSED IN THIS MANUAL, EXCEPT TO THE EXTENT SAID AIRCRAFT CORRESPOND WITH THE PRODUCTION STANDARD.

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 appear at the foot of each page.

Rev No.	Affected Section	Affected Pages	Date of Issue	Approved by	Date of approval	Date inserted	Sign.
1.1	All	All	2011/04/20		2011/04/20	2011/04/20	
1.2	All	All	2012/03/12		2012/03/12	2012/03/12	
1.3	All	All	2012/05/10		2012/05/10	2012/05/10	
2.0	All	All	2012/06/04		2012/06/04	2012/06/04	
2.1	2	7	2012/09/01		2012/09/01	2012/09/01	
2.2	All	All	2012/11/01		2012/11/01	2012/11/01	
2.3	All	All	2014/11/10		2014/11/10	2014/11/10	
2.4	All	All	2015/04/07		2015/04/07	2015/04/07	
2.5	9	9-52 – 9-56	2017/12/08	Andrew Pitman	2017/12/08	2017/12/08	
2.6	1,2,4,6,7,8,9	43	2018/08/01	Andrew Pitman	2018/08/01	2018/08/01	
2.7	9	13	2019/06/10	Andrew Pitman	2019/06/10	2019/06/10	
2.8	1,2,6,7,9	See List of Manual Revisions	2026/01/30	Andrew Pitman	2026/01/30	2026/01/30	
3.0	All	All	2026/11/16	James Pitman	2026/11/16	2026/11/16	

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INTRODUCTION

ASTM Standards

The ASTM Standards used for the design, construction and continued airworthiness for the Sling 2 are:

F3815-26	Standard Specification for Integration for Light Sport Airplane
F2316-12(2022)	Standard Specification for Airframe Emergency Parachutes
F2339-26	Standard Practice for Design and Manufacture of Reciprocating Engines for Light Sport Aircraft
F2483-26	Standard Practice for Maintenance Program for Light Sport Category Aircraft
F2506-26	Standard Specification for Design and Testing of Light Sport Category Aircraft Propellers
F2563-16(2025)	Standard Practice for Kit Assembly Instructions of Aircraft Intended Primarily for Recreation
F2745-15(2023)	Standard Specification for Required Product Information to be Provided with an Airplane
F2746-26a	Standard Specification for Pilot Operating Handbook (POH) for Light Sport Category Aircraft
F2839-11(2025)	Standard Practice for Compliance Audits to ASTM Standards on Light Sport Category Aircraft
F2930-16(2025)	Standard Guide for Compliance with Light Sport Category Aircraft Standards
F2972-26	Standard Specification for Light Sport Aircraft Manufacturer's Quality Assurance System
F3035-26	Standard Practice for Production Acceptance in the Manufacture of a Light Sport Aircraft
F3153-22	Standard Specification for Verification of Aircraft Systems and Equipment
F3198-25	Standard Specification for Light Sport Aircraft Manufacturer's Continued Operational Safety (COS) Program
F3619-26	Standard Specification for Aeroelasticity Requirements for a Light Sport Category Airplane
F3695-26	Standard Specification for Angle of Attack (AoA) Functional Requirements
F3737-25	Standard Specification for Aircraft Design and Construction
F3746-26	Standard Specification for Maintenance Manuals for Light Sport Category Aircraft
F3768-26a	Standard Specification for IFR Operations in IMC for a Light-Sport Aircraft
F3793-26	Standard Specification for Flight Characteristics and Performance
F3810-26b	Standard Specification for Oxygen Systems for Light Sport Aircraft
F3792-26	Standard Specification for Light Sport Category Aircraft Flown at Night
F3813-26	Standard Specification for Light Sport Category Aircraft Occupant Safety
F3828-26	Standard Specification for Structures for Light Sport Category Aircraft
F3835-26	Standard Specification for Light Sport Category Aircraft Landing Gear Systems
F3824-26	Standard Specification for Non-Fatigue Aerial Work for Light Sport Category Aircraft
F3827-26	Standard Specification for Indirect Flight Controls
F3826-26	Standard Specification for Liquid Energy Storage Systems for Light Sport Category Aircraft
F3829-26	Standard Specification for Light Sport Category Aircraft Powerplant Systems
F3814-26	Standard Specification for Light Sport Category Aircraft Electrical Systems
F3830-26	Standard Specification for Electrical Energy Storage Systems
F3834-26	Standard Specification for Systems and Equipment for Light Sport Category Aircraft
F3825-26	Standard Specification for Operating Limitations, Markings, Placards, and Warnings for Light Sport Aircraft

Manufacturer Information

Name	-	Sling Aircraft (Pty) Ltd
Contact Information	-	Phone: +27 11 948 9898 FAX: 086 632 4493 (RSA Only) E-mail: sales@slingaircraft.com
Sling HQ Address	-	Hanger 8, Tedderfield Airpark 23 Nettleton Road, Eikenhof Johannesburg South, 1872 South Africa

NOTICE

Quality assurance records are stored with the manufacturer in South Africa, at the address provided above.

1 GENERAL INFORMATION

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1.1 Introduction to Airplane

The Sling 2 is a two-seat (side-by-side), single engine, tricycle undercarriage aluminium aircraft with a conventional low wing design.

Historically, the aircraft has been based on the EASA CS-VLA standards. Sling 2 models preceding Serial Number *481* are designed to meet CS-VLA standards. All aircraft after, and including, Serial Number *481 (excl. 482, 483, 484 and 485)*, are designed to meet the standards set out in both the EASA CS-VLA and FAR ASTM F3815 standards.

All the Sling 2 models have a maximum all up weight of 700kg.

The Sling 2 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 2.

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.

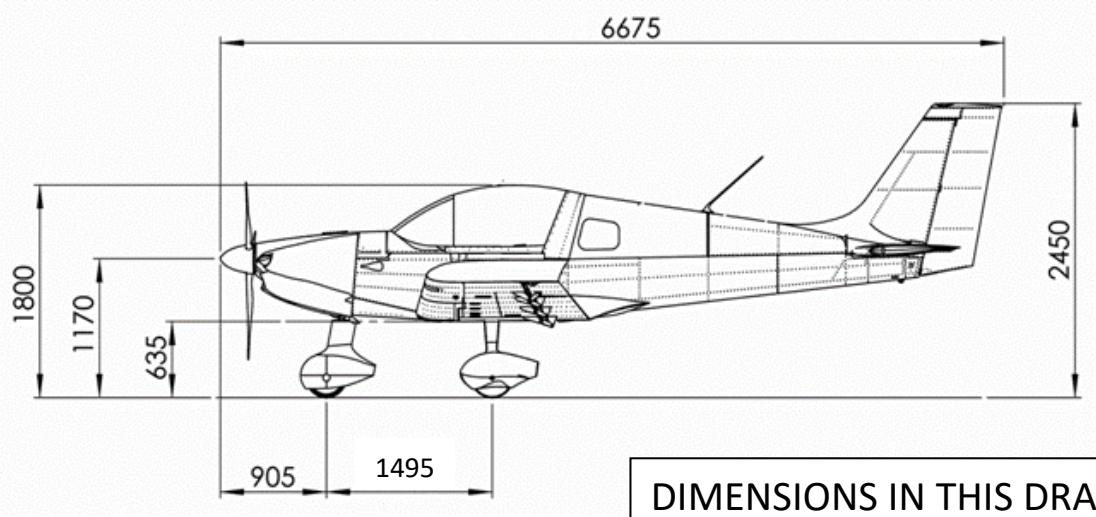
NOTE

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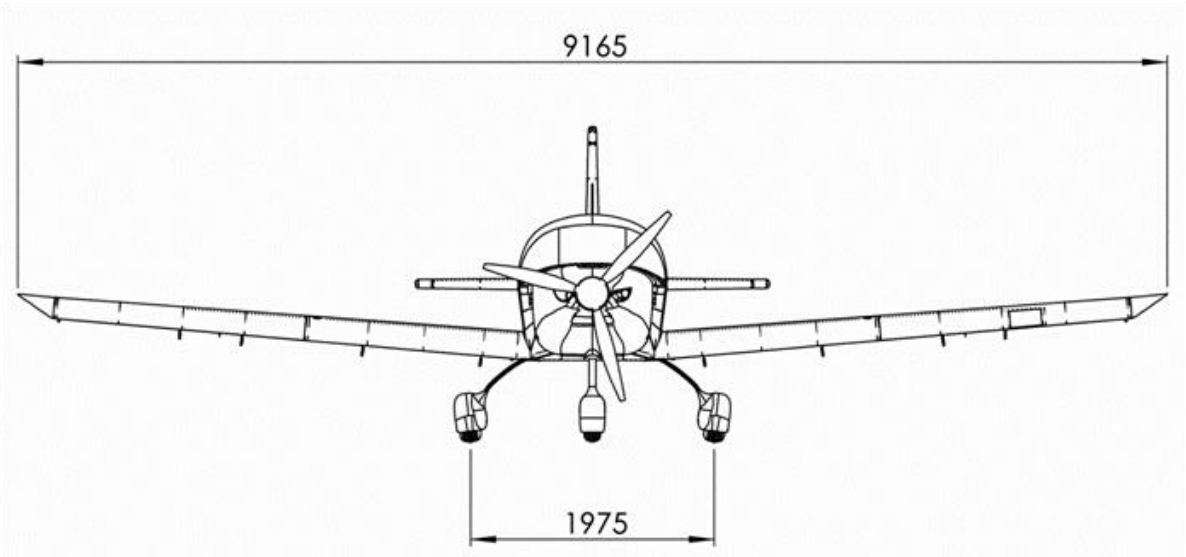
James Pitmanames P

1.3 Aircraft 3-view drawing

1.3.1 Drawings in Millimeters

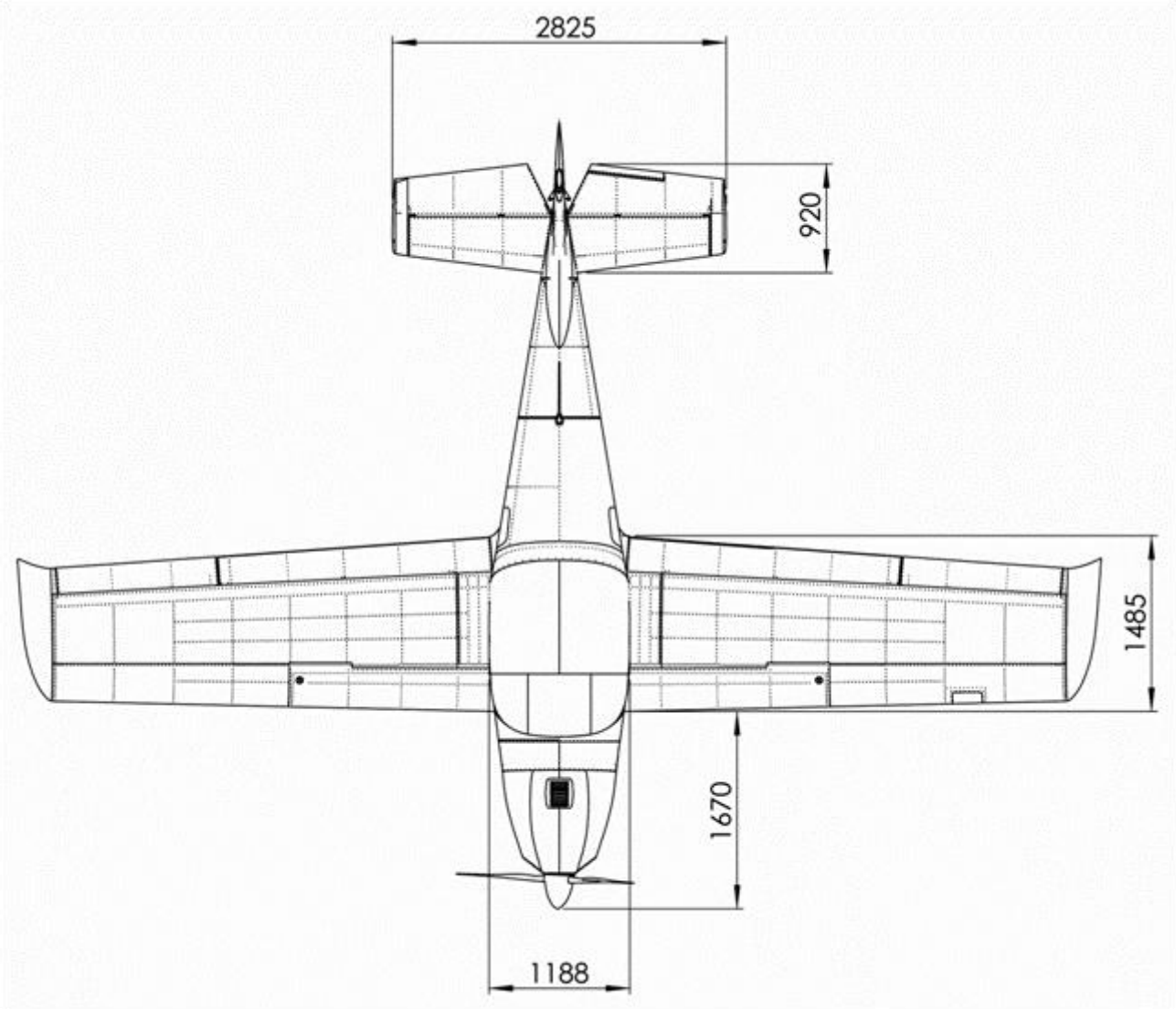


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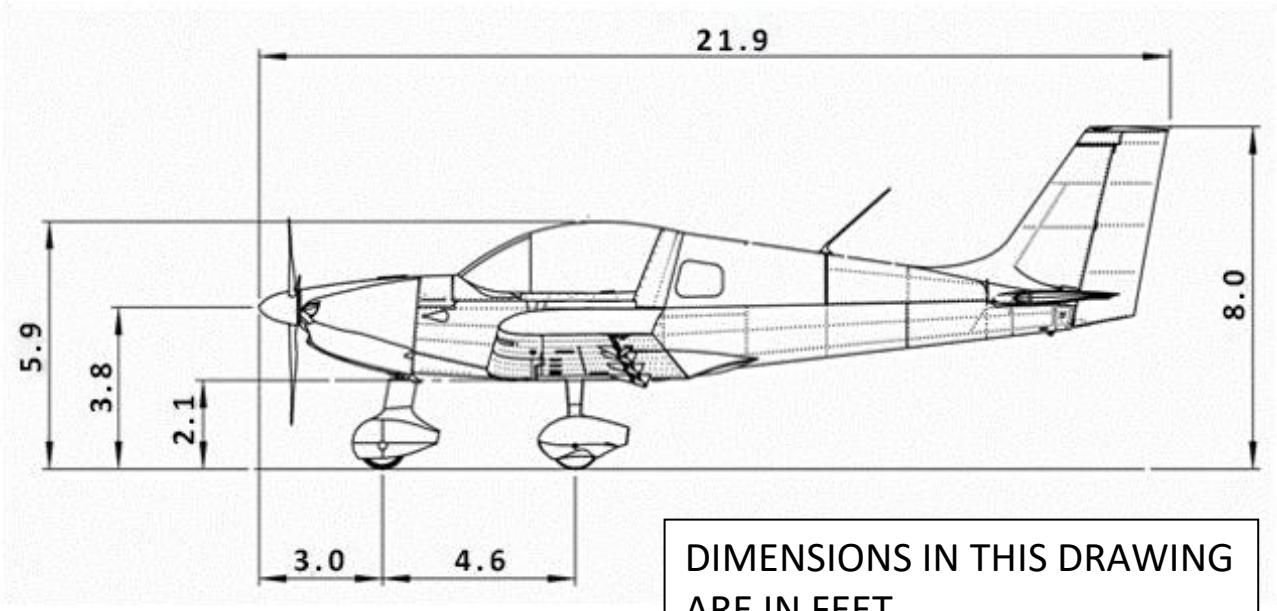
CAUTION

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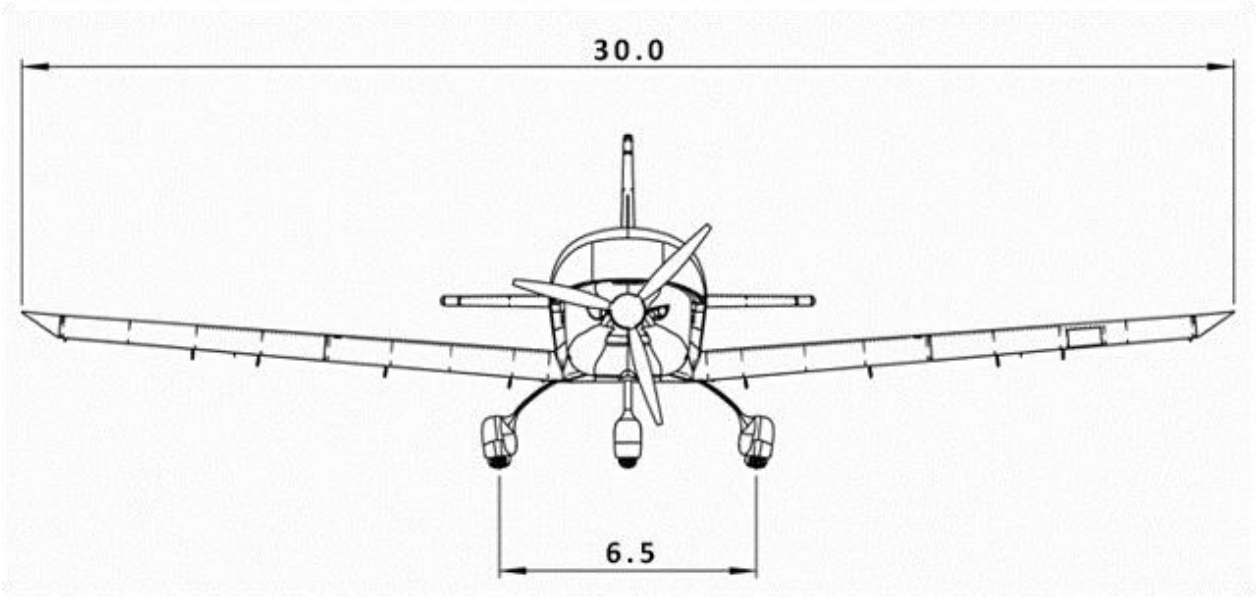


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1.3.2 Drawings in Feet

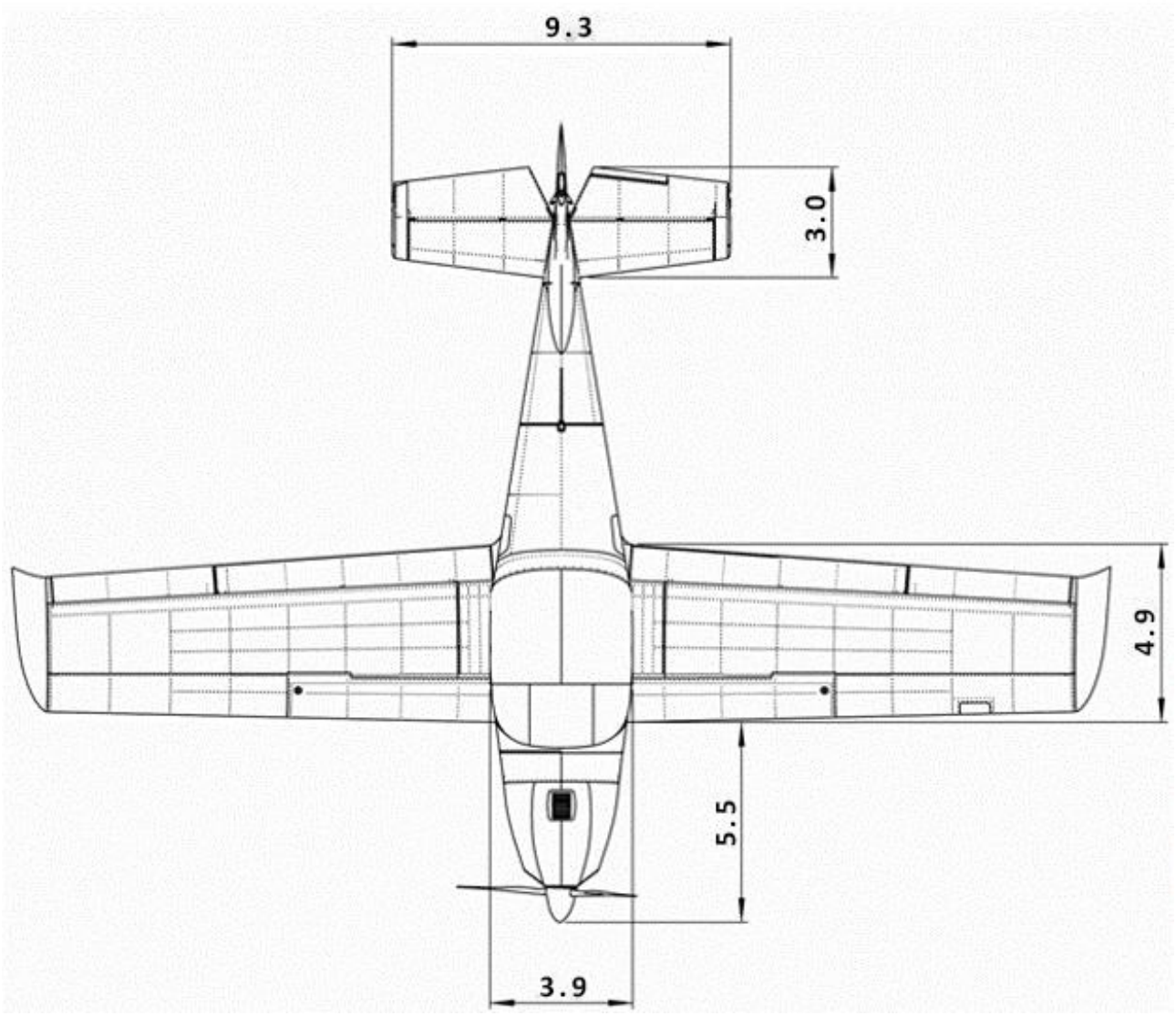


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CAUTION

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DIMENSIONS IN THIS DRAWING ARE IN FEET.

1.4 Data for Sling 2 aircraft and systems

1.4.1 WING

Parameter	Value
Wingspan	9.165 m / 30 ft.
Mean Aerodynamic Chord	1.339 m / 52.72 in.
Wing Surface Area	11.845 m^2 / 127.5 ft^2
Wing Loading	59.1 kgm^{-2} / 12.1 lbs/sq ft
Aspect Ratio	7.04
Taper Ratio	1.375
Dihedral	5°

1.4.2 FUSELAGE

Parameter	Value
Fuselage Length	5.77 m / 19 ft
Overall Length	6.675 m / 21 ft 11 in.
Overall Width	1.18 m / 47 in.
Overall Height	2.45 m / 97 in.

1.4.3 EMPENNAGE

Parameter	Value
Horizontal Stabilizer Span	2.825 m / 9 ft 3 in.
Horizontal Stabilizer Surface Area	0.96 m^2 / 10 ft^2
Elevator Surface Area	1.02 m^2 / 11 ft^2
Horizontal Stabilizer Angle of Incidence	-4°
Vertical Stabilizer Span	1.47 m / 4 ft 10 in.
Vertical Stabilizer Surface Area	0.53 m^2 / 6 ft^2
Rudder Surface Area	0.59 m^2 / 6.4 ft^2

1.4.4 LANDING GEAR

Parameter	Value
Wheel Track	1.98 m / 6 ft 6 in.
Wheelbase	1.41 m / 4 ft 7 in.
Brakes	Hydraulic
Main Gear Tyre Size	15x6.00-6, 6-ply
Main Gear Tyre Pressure	2.2 bar / 31.91 psi
Nose Gear Tyre Size	5.00-5, 6-ply
Nose Gear Tyre Pressure	1.8 bar / 26.1 psi

1.4.5 CONTROL SURFACE TRAVEL LIMITS

Parameter	Value
Ailerons	24° up / down (±2°)
Elevator	30° up / 20° down (±2°)
Trim Tab	8° up / 20° down (±5°)
Rudder	21° left / right (-2° / +14°)
Flaps	0° to 30° down (±3°)

1.4.6 ENGINE

Parameter	Value
Manufacturer	Bombardier-Rotax GmbH
Model	912 iS
Type	4-cylinder, horizontally opposed, with an overall displacement of 1352cc, mixed cooling, fuel injection, integrated reduction gearbox with torque damper.
Maximum Power	73.5 kW (98.5hp) at 5 800 rpm (max 5 minutes) 69 kW (92.5hp) at 5 500 rpm (continuous)

1.4.7 PROPELLER

Parameter	Value
Manufacturers	Warp Drive, Whirlwind, DUC
Number of Blades	3
Material	Composite
Diameter	1.75 – 1.83m / 68.9 – 72 in.

1.4.8 FUEL

Parameter	Value
Fuel Grade: RON	Minimum RON 95 (Min. AKI 91)
Fuel Grade: MOGAS	EN 228 Super, EN 228 Super Plus, ASTM D4814
Fuel Grade: AVGAS	AVGAS 100LL (ASTM D910)
Fuel Tanks	2 x Wing tanks, one tank integrated within each wing leading edge, each tank equipped with finger strainers (in pick up line) and drain fittings.
Capacity of Each Tank	75 liters / 19.8 US Gallons
Total Capacity	150 liters / 39.6 US Gallons
Total Usable Fuel	146 liters / 38.6 US Gallons

1.4.9 Brake System

Parameter	Value
Brake System	MATCO Brakes
Brake Fluid	MIL-H-5606 / MIL-H-83282

1.4.10 COOLING

Parameter	Value
Cooling System	*Mixed* – Air and closed-circuit pressurized liquid. Air cooled cylinders and liquid cooled cylinder heads.
Coolant	Conventional coolant based on ethylene glycol with 50% water content. Do not use waterless coolant based on propylene glycol for operation of 912i Series.
Coolant Capacity	2.5 liters / 2.64 quarts / 5.28 pints
Note: Do not mix the above types of coolant.	

1.4.11 OIL SYSTEM

Parameter	Value
Oil System Type	Forced, with external oil reservoir
Oil Grade	Shell AeroShell Oil Sport Plus 4 with specification RON 424. XPS Full Synthetic Aviation Engine Oil with specification RON 451. (Refer to the latest revision of the engine operator's manual for more)
Viscosity	SAE 10W-40 and SAE 5W-50
Capacity	Approx. 3.5 litres (3.7 Quarts/7.4 pints) from dry

1.4.12 MAXIMUM WEIGHTS

Parameter	Value
Maximum take-off weight	700 kg / 1543.2 lb.
Maximum landing weight	700 kg / 1543.2 lb.
Maximum baggage weight	35 kg / 77 lb.
Front Luggage Compartment Max. Weight	35 kg / 77 lb.
Rear Luggage Compartment Max. Weight	25 kg / 55 lb.

1.4.13 STANDARD WEIGHTS

Parameter	Value
Standard Empty Weight	420 kg / 926 lb.
Maximum Useful Load	280 kg / 617 lb.

1.4.14 SPECIFIC LOADINGS

Parameter	Value
Wing Loading (MAUW)	59.1 $kg.m^{-2}$ / 12.1 $lb.ft^{-2}$
Power Loading (MAUW)	7 kg/hp / 15.6 lb/hp

1.5 Terminology, symbols and conversion factors

1.5.1 General terminology / acronyms

Acronym	Description
AC	Alternating Current
ALT	Altimeter
API	American Petroleum Institute
ASI	Airspeed Indicator
ASTM	American Society for Testing and Materials
AKI	Anti-Knock Index
AVGAS	Aviation gasoline
COM	Communication (radio)
CS-VLA	Certification Standard Very Light Aircraft
EASA	European Aviation Safety Agency
EFIS	Electronic Flight Information System
FAA	Federal Aviation Administration
GLS	GPS Landing System
GmbH	Gesellschaft mit beschränkter Haftung (company with limited liability)
GPS	Global Positioning System
IFR	Instrument Flying Rules
IMC	Instrument Meteorological Conditions
LED	Light Emitting Diode
LSA	Light Sport Aircraft
MOGAS	Automobile (car) gasoline
NGL	Normal Ground Line
NRV	Non-Return Valve
POH	Pilot Operating Handbook
PTT	Push-To-Talk (button)
RON	Research Octane Number
RSA	Republic of South Africa
VFR	Visual Flying Rules

VMC	Visual Meteorological Conditions
VSI	Vertical Speed Indicator

1.5.2 General airspeed terminology and symbols

Acronym	Description
IAS	Indicated Airspeed
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
TAS	True Airspeed
V_A	Maneuvering speed
V_{BG}	Best Glide Speed, being the speed (at MAUW) which results in the greatest gliding distance over the ground
V_{FE}	Maximum Flap Extended Speed, being the highest speed permissible with wing flaps deployed
V_H	Maximum Speed in level flight at maximum continuous power
V_{LOF}	Lift-off Speed, being the speed at which the aircraft generally lifts off from the ground during take-off
V_{NE}	Never Exceed Speed, being the speed that may not be exceeded at any time
V_{NO}	Maximum Structural Cruising Speed, being the speed that should not be exceeded, except in smooth air, and then only with caution
V_{REF}	Indicated airspeed at 15 m (50 ft) above threshold, which is not less than $1.3V_{so}$
V_{ROT}	Rotation Speed, being the speed at which the aircraft should be rotated about the pitch axis during take-off (i.e. the speed at which the nose wheel is lifted of the ground)

V_S	Stall Speed, maximum weight, forward CG, engine idling, flaps fully retracted
V_{SO}	Stall Speed in landing configuration (flaps fully extended), MAUW, engine idling
V_X	Best Angle of Climb Speed, being the speed (at MAUW, flaps fully retracted) which results in the greatest altitude gain over a given horizontal distance (i.e. highest climb angle)
V_Y	Best Rate of Climb Speed, being the speed (at MAUW, flaps fully retracted) which results in the greatest altitude gain over a given time period

1.5.3 Meteorological terminology

Acronym	Description
ISA	International Standard Atmosphere
QNH	The local pressure setting that if set on the subscale of an altimeter will cause the altimeter to indicate local altitude above mean sea level
QFE	The local airfield pressure setting that if set on the subscale of an altimeter will cause the altimeter to indicate local height above airfield

1.5.4 Engine terminology

Acronym	Description
CHT	Cylinder Head Temperature
EGT	Exhaust Gas Temperature
OHV	Overhead Valve
RPM/ rpm	Revolutions per minute, being the number of revolutions per minute of the engine crank

1.5.5 Airplane performance and flight planning terminology

Acronym	Description
Crosswind component	The velocity of the crosswind component for which adequate control of the aircraft during takeoff and landing can be demonstrated
g	The acceleration / load factor
Landing run	The distance measured during landing from actual touchdown to the end of the landing run
Landing distance	The distance measured during landing from clearance of a 15 m obstacle (in the air) to the end of the landing run
Take-off distance	The take-off distance measured from the actual start of the take-off run to clearance of a 15 m (50 ft) obstacle (in the air)
Take-off run	The take-off distance measured from actual start of the take-off run to the wheel lift off point
Usable fuel	The fuel available for flight planning

1.5.6 Weight and balance terminology and symbols

Acronym	Description
Arm	The horizontal distance from the reference datum to the centre of gravity of an item
CG	Centre 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
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 centre point of the flat front face of the engine flange of the Rotax engine)
Empty weight	The weight of the airplane with engine fluids and oil at operating levels
MAC	Mean Aerodynamic Chord
MAUW	Maximum All Up Weight
Maximum Landing Weight	The maximum weight approved for the landing touch down
Maximum Take-off Weight	The maximum weight approved for the start of the take-off run
Moment	Is the product of the weight of an item multiplied by its arm
W_R	Weight read from scale under right main wheel during aircraft weighing
W_L	Weight read from scale under left main wheel during aircraft weighing
W_N	Weight read from scale under nose main wheel during aircraft weighing
W_E	Aircraft empty weight
W_T	Aircraft total weight

W_{MAUW}	Aircraft maximum (allowed) all up weight
L_R	Right main wheel arm (aft of reference)
L_L	Left main wheel arm (aft of reference)
L_N	Nose wheel arm (aft of reference)
M_T	Total moment arm

1.5.7 Useful conversion factors

1 pound	=	0.4536 kilogram
1 pound per square inch	=	6.895 kilopascal
1 inch	=	25.4 millimetres
1 foot	=	0.3048 metre
1 statute mile	=	1.609 kilometres
1 nautical mile	=	1.852 kilometres
1 millibar	=	1 hectopascal
1 millibar	=	0.1 kilopascal
1 imperial gallon	=	4.546 litres
1 US gallon	=	3.785 litres
1 US quart	=	0.946 litre
1 cubic foot	=	28.317 litres
degrees Fahrenheit	=	[1.8 x degrees Celsius] + 32
degrees Celsius	=	(degrees Fahrenheit - 32) x (5/9)

1.6 Supporting documents

The following documents are regarded as supporting documents to this Pilot Operating Handbook:

1. Latest revision / edition of the Operators Manual For Rotax® Engine Type 912 i Series, Ref No.: OM-912 i.
2. For aircraft fitted with 914 UL engines: latest revision / edition of the Operators Manual For Rotax® Engine Type 914 Series, Ref No.: OM-914.
3. For aircraft fitted with 912 ULS engines: latest revision / edition of the Operators Manual For Rotax® Engine Type 912 Series, Ref No.: OM-912.
4. For aircraft fitted with 915 iS engines: latest revision / edition of the Operators Manual For Rotax® Engine Type 915 i Series, Ref No.: OM-915 i.
5. For aircraft fitted with 916 iS engines: latest revision / edition of the Operators Manual For Rotax® Engine Type 916 i Series, Ref No.: OM-916 i
6. For aircraft fitted with an Airmaster constant speed propeller: latest revision / edition of the Airmaster AP3 series And AP4 Series Constant Speed Propeller Operators Manual.
7. Latest revision / edition of Rotax service instruction SI-914-019, SI-912-016 or SI-912i-001, as applicable (to type of engine fitted).
8. Garmin G3X Installation Manual.
9. Operator manuals for COM radio and transponder (if fitted) equipment fitted to the aircraft.
10. Latest revision / edition of the Stratos 07 Magnum ballistic parachute manual for mounting and use, where applicable.

Reference should be made to these documents for operational guidelines and instructions. These should be incorporated into the normal and emergency procedures for the aircraft as applicable.

2 LIMITATIONS

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2.1 Introduction

This section includes operating limitations, instrument markings and basic placards necessary for the safe operation of the Sling 2, its engine, systems and equipment.

2.2 Airspeed limitations

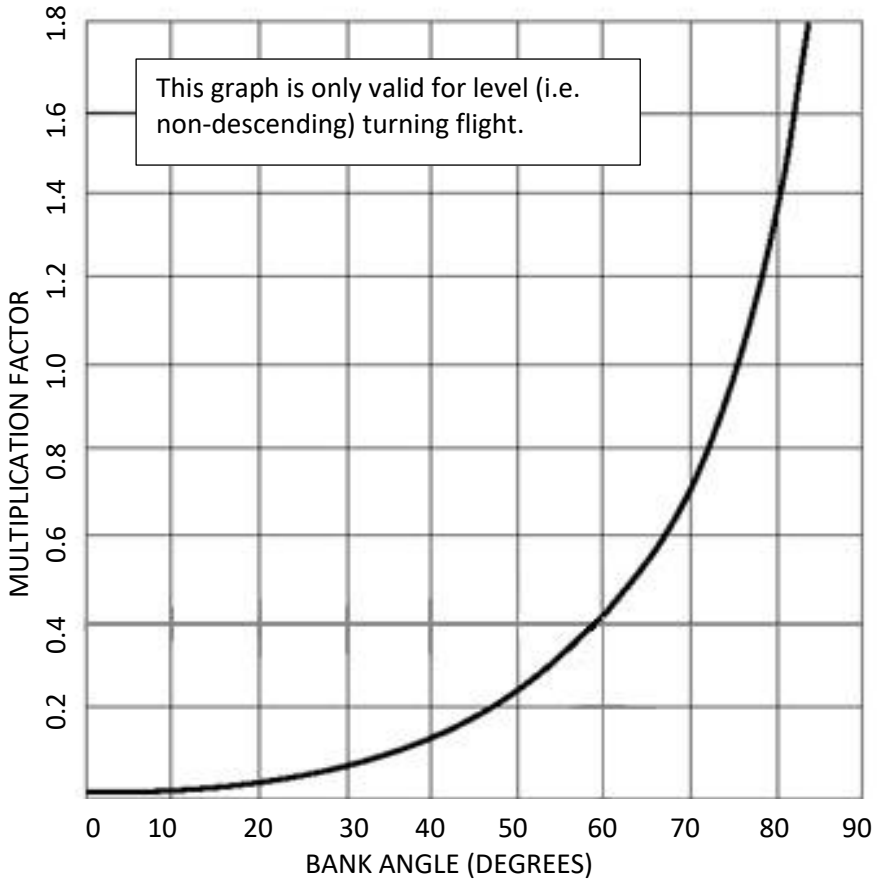
SPEED		KIAS	REMARKS
V_{NE}	Never exceed speed	135	Never exceed this speed in any operation.
V_{NO}	Maximum structural cruising speed	105	Never exceed this speed unless in smooth air, and then only with caution.
V_A	Maneuvering speed	91	Do not make full or abrupt control movements above this speed as this may cause stress in excess of limit load factor.
V_{FE}	Maximum flap extended speed	85	Never exceed this speed unless the flaps are fully retracted.
V_H	Maximum speed in level flight	116	The aircraft will not exceed this speed at MAUW in level flight, at maximum continuous power.
V_S	Stall speed (at MAUW)	46	At maximum all up weight in the most forward CG configuration, with flaps fully retracted, engine idling, the aircraft will stall if flown slower than this speed.
V_{S0}	Stall speed with flaps	42	With full flap, maximum all up weight, engine idling, the aircraft will stall if flown slower than this speed.

2.3 Airspeed indicator markings

MARKING	KIAS	SIGNIFICANCE
White arc	42-85	Flap Operating Range (lower limit is V_{S0} at maximum weight, and upper limit is the maximum speed (V_{fe}) permissible with flaps deployed).
Green arc	46-105	Normal Operating Range (lower limit is V_S at maximum weight, most forward CG with flaps retracted, engine idling; upper limit is maximum structural speed VNO).
Yellow arc	105-135	Manoeuvres must be conducted with caution and only in smooth air.
Red line	135	Maximum speed for all operations.

2.4 Stall speed adjustment for turning flight and load factor

Stall speeds listed in Section 2 (this section) are listed for straight and level (non-turning) flight at load factor = 1 g and should be adjusted for turning flight or increased load factor:



$V_T = V + (V \times \text{MULTIPLICATION FACTOR})$

- V is straight and level stall speed (at load factor = 1 g).
- V_T is stall speed in turn (non-descending).

$V_{ST} = V\sqrt{N}$

- V is straight and level stall speed (at load factor = 1 g).
- V_{ST} is stall speed due to increased load factor.
- N is (positive) load factor.

2.5 Crosswind and wind limitation (demonstrated)

Item	Value
Maximum demonstrated cross wind component for take-off and landing	15 kts

2.6 Service ceiling

Item	Value
Service Ceiling	16000 ft. / 4876 m

2.7 Load factors

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

2.8 Weights

Item	Value
Maximum take-off weight (MAUW)	700 kg / 1 543.24 lb.
Maximum landing weight	700 kg / 1 543.24 lb.
Maximum total baggage weight	35 kg / 77 lb.
Front Luggage Compartment Max. Weight	35 kg / 77 lb.
Rear Luggage Compartment Max. Weight	25 kg / 55 lb.

2.9 Centre of gravity range

Item	Value
Datum	Centre of front face of engine flange (*without propeller extension*).
Reference (Longitudinal Levelling)	Upper surface of canopy sliders on cockpit side skins, with canopy open.
Reference (Transverse Levelling)	Upper surface of centre spar cap under pilot and passenger seats.
Forward Limit	1.635 m / 5.364 ft (20% MAC) aft of datum.
Rear Limit	1.808 m / 5.931 ft (33% MAC) aft of datum.

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

2.10 Prohibited maneuvers

The Sling 2 is approved for normal maneuvers including the following:

- Steep turns not exceeding 60° bank.
- Lazy eights.
- Chandelles.
- Stalls (not including 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 – operating maneuvering speed)

2.11 Flight crew

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

2.12 Passengers

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

2.13 Kinds of operation

2.13.1 Normal VFR Operation

The Sling 2, in standard configuration, is approved for day VFR operation with visual contact with terrain.
Minimum equipment required is as follows:

Equipment
Altimeter with encoding transponder
Airspeed indicator
Compass
Fuel gauges
Oil pressure indicator
Oil temperature indicator
Cylinder head temperature indicator
Outside air temperature indicator
Tachometer
Chronometer
First aid kit (Compliant with local authority)
Fire extinguisher

2.13.2 Night Operation

Subject to the legal requirements applicable in the country of registration, Sling 2 aircraft fitted with the following additional equipment may also be operated at night.

Equipment
Red beacon / Strobe lights
Navigation lights

Landing light(s) (Two separate lights or a single light with two independent filaments)
Instrument panel lighting
Serviceable hand torch per required crew member

2.14 Engine operating limits

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

Always refer to latest edition / revision of the Operators Manual for latest information regarding operating limitations.

ENGINE START AND OPERATION TEMPERATURE LIMITS (912 iS)	
Maximum	50 °C (122 °F) (ambient temperature)
Minimum	-20 °C (-13 °F) (oil temperature)

ENGINE LOAD FACTOR (ACCELERATION) LIMITS	
Maximum	5 seconds at maximum -0.5 g.

For airplanes with other Rotax engine models installed, refer to the applicable supplement at the end of this manual.

ENGINE OPERATING AND SPEEDS LIMITS (912 iS)		
Engine Model:		ROTAX 912 iS
Engine Manufacturer:		BRP-Rotax GmbH & Co KG
Power	Maximum take-off	73.5 kW (98.6 hp) at 5800 rpm, max. 5 min.
	Maximum continuous	69 kW (92.5 hp) at 5500 rpm
RPM	Maximum take-off	5800 rpm, maximum 5 minutes
	Maximum continuous	5500 rpm
	Idle	1 400 rpm (minimum)
Cylinder head temperature	Minimum	N/A
	Maximum	135 °C (275 °F)
	Normal	75 to 110 °C (167 to 230 °F)
Oil temperature	Minimum	50 °C (122 °F)
	Maximum	130 °C (266 °F)
	Normal	90 to 110 °C (194 to 230 °F)
EGT	Maximum	950 °C (1742 °F)
Coolant temperature	Maximum	120 °C (248 °F)
Oil pressure	Minimum	0.8 bar (12 psi) – below 3500 rpm
	Maximum	7 bar (102 psi) – permissible for short period during cold engine start
	Normal	2 to 5 bar (29 to 73 psi) – above 3500 rpm
Fuel Pressure	Minimum	2.8 bar (40.6 psi) – 2.5 bar (36 psi) acceptable for 3 sec.
	Maximum	3.2 bar (46 psi) – 3.5 bar (51 psi) acceptable for 3 sec.

2.15 Flight in IMC

Provided that the aircraft is appropriately equipped as per ASTM 3815 standard requirements, the aircraft may be safely flown under IFR and in IMC. The entitlement to operate the aircraft under IFR and in IMC may be contingent upon the regulatory environment in which the aircraft is operated. It is the responsibility of the aircraft operator to ensure that all legal and safety requirements are met, along with the installation of the required systems and instrumentation for IFR (and IMC) flight requirements under the ASTM standards.

WARNING

Notwithstanding that installed equipment may include GPS and other advanced flight and navigational aids, such equipment may not be certified in all aircraft and operators should ensure that the regulatory requirements under which the aircraft are operated are met.

NOTE

Additional equipment may be required to fulfil national or specific requirements and may be fitted provided that additional equipment does not interfere with other aircraft systems.

2.16 Flight in rain

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

2.17 Limitation placards

The following limitation warning placards must be placed in the aircraft and positioned in plain view of the pilot, passenger or third person, as the case may require.

On the instrument panel:

MAXIMUM PERMISSIBLE AIRSPEED 135 KIAS
MAXIMUM PERMISSIBLE RPM 5 800 RPM FOR 5 MINUTES
MAXIMUM CONTINUOUS RPM 5 500
MAXIMUM PERMISSIBLE MASS 700 KG/1 540 LB

In a place visible to pilot and passenger:

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

Note: The passenger notification placard shall be modified as necessary to comply with applicable Civil Aviation Authority requirements.

NO SMOKING

WARNING **AEROBATICS AND INTENTIONAL SPINS ARE PROHIBITED**

On the baggage space separator channel:

MAX BAGGAGE WEIGHT – FRONT SECTION – 35 KG / 77 LB **MAX BAGGAGE WEIGHT – REAR SECTION – 25 KG / 55 LB** **MAX TOTAL BAGGAGE WEIGHT – 35 KG / 77 LB**

Adjacent to the fuel filler caps:

AVGAS **OR** **MOGAS** **75 LITRES**

On the inboard upper wing flap surface:

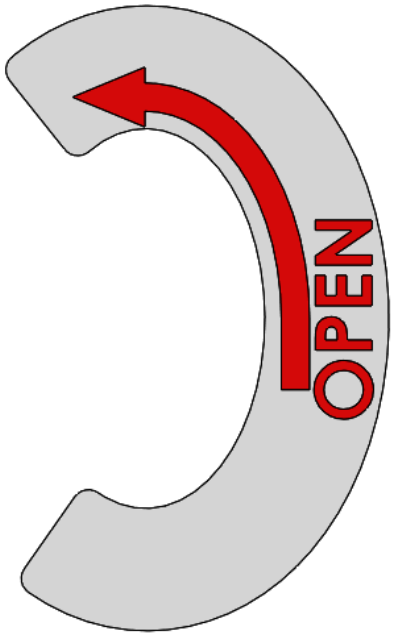
NO STEP

On a fireproof metal plate attached to the aircraft:

##-### **CONSTRUCTOR – SLING AIRCRAFT** **MODEL – SLING 2** **SERIAL NO – ###** **ENGINE ROTAX 912 iS – 98.6 HP** **MANUFACTURED - ###**

Note: ### represents the information applicable to the aircraft

Adjacent to the exterior canopy handle:



The airplane must be placarded to show the identity of:

- All fuses/circuit breakers.
- Lane switches.
- All other switches.
- Starter.
- Trim: Nose up and down.
- Flaps: Up, Position 1, Position 2, Down.

3 EMERGENCY PROCEDURES

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3.2 Speeds for emergency operations 3-2
3.3 Engine Related Emergencies 3-3
3.4 Smoke and Fires 3-7
3.5 Emergency Landings 3-11
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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 Speeds for emergency operations

SPEED		KIAS	REMARKS
V_{BG}	Best Glide Speed	72	The speed (at MAUW, flaps fully retracted) which results in the greatest gliding (horizontal) distance. Horizontal distance travelled (still air) is approximately 3 048 m (10 000 ft) per 304.8 m (1000 ft) descent (i.e. glide ratio of 10 : 1).
	Speed for in-flight engine start	> 72	Recommended speed.

3.3 Engine Related Emergencies

3.3.1 Engine Failure During Take-off Run

1. Throttle ..... IDLE
2. Brakes ..... APPLY

after aircraft comes to a complete stop –

3. Lanes..... OFF
4. Fuel Pump(s) ..... OFF *(BOTH)*
5. Fuel Selector ..... OFF
6. Other Electrical Systems..... OFF

3.3.2 Engine Failure Immediately After Take-off

1. Airspeed ..... 72 KIAS
2. Landing Area ..... LOCATE (CLEAR GROUND)
3. Flaps ..... AS NEEDED
4. Fuel Pump(s) ..... OFF (BOTH)
5. Fuel Selector ..... OFF

before touch-down –

6. Ignition Lanes / Magnetos ..... OFF (BOTH)
7. Master ..... OFF

WARNING

Flaps and elevator trim cannot operate with master switch OFF. Make final flap and trim selection before turning master switch off.

3.3.3 Engine Irregularities in Flight

3.3.3.1 Irregular Engine rpm

1. Airspeed ..... 72 KIAS
2. Lanes ..... ON *(BOTH)*
3. Throttle ..... ADJUST POSITION
4. Fuel Pumps ..... ON *(BOTH)*
5. Fuel Selector .....CHANGE *(UNLESS 2ND TANK DRY)*
6. Fuel Quantity .....CHECK
7. Fuel Pressure.....CHECK
8. Fuel Flow.....CHECK

   If fuel pressure and flow is normal, but engine rpm remains irregular –
9. Manifold Pressure.....CHECK

   If manifold pressure and engine rpm is decreasing –
10. Alternate Air Intake.....OPEN
11. Oil - Pressure .....CHECK
12. Oil - Temperature .....CHECK
13. Coolant - Temperature .....CHECK
14. EGT - Temperature .....CHECK

    If engine running remains irregular –
15. Land ..... AS SOON AS POSSIBLE

3.3.3.2 Low fuel pressure (refer to engine limitations, Section 2 or specific engine supplements at end of manual)

1. Fuel Pumps ..... ON *(BOTH)*
2. Fuel Quantity ..... CHECK
3. Fuel Selector ..... CHANGE *(UNLESS 2ND TANK DRY)*

   If fuel pressure remains low –
4. Throttle ..... DECREASE IF POSSIBLE

   If fuel pressure remains low –
5. Land ..... AS SOON AS POSSIBLE

3.3.3.3 Low oil pressure (refer to engine limitations, Section 2 or specific engine supplements at end of manual)

1. Oil - Temperature ..... CHECK (MAX. 130 °C)

   If oil temperature is high or increasing –
2. Airspeed ..... 72 KIAS

   If oil pressure remains low or temperature remains high/increasing
3. Land ..... AS SOON AS POSSIBLE

3.3.3.4 High Oil Pressure

1. Oil - Temperature ..... CHECK (MIN. 50 °C)

   If oil temperature is low or decreasing –
2. Throttle ..... DECREASE RPM

   If oil pressure remains high or temperature remains low –
3. Land ..... AS SOON AS POSSIBLE

3.3.4 In-Flight Engine Restart

1. Fuel Pumps..... ON (BOTH)
2. Fuel selector..... SWITCH TO UNUSED/FULLEST TANK.
3. Throttle..... SET TO MIDDLE POSITION
4. Master switch..... ON
5. Lanes..... ON
6. Airspeed..... 72 KIAS
7. Starter..... ENGAGE

   If engine should fail to restart
8. APPLY FORCED LANDING WITHOUT ENGINE POWER PROCEDURE, ACCORDING TO 3.5.1.

NOTE

It is possible that the propeller may continue to rotate if the airspeed remains above approximately 75 KIAS. In such circumstances no application of the starter switch may be required. If the propeller stops rotating increasing airspeed may result in it again starting to do so.

3.4 Smoke and Fires

3.4.1 Engine Fire on Ground During Start

1. Starter..... RELEASE
2. Fuel Selector..... CLOSE
3. Fuel Pumps..... OFF (BOTH)
4. Throttle..... IDLE
5. Lanes..... OFF
6. Master switch..... OFF
7. RETRIEVE FIRE EXTINGUISHER IF POSSIBLE
8. EXIT THE AIRPLANE
9. EXTINGUISH FIRE BY FIRE EXTINGUISHER OR CALL FOR A FIRE-BRIGADE IF YOU CANNOT DO IT

3.4.2 Engine Fire on Ground with Engine Running

1. Cabin Heat.....CLOSE
2. Fuel Selector..... CLOSE
3. Fuel Pumps.....OFF (BOTH)
4. Throttle..... IDLE
5. Lanes..... OFF
6. Master switch..... OFF
7. RETRIEVE FIRE EXTINGUISHER IF POSSIBLE
8. LEAVE THE AIRPLANE
9. EXTINGUISH FIRE BY FIRE EXTINGUISHER OR CALL FOR A FIRE-BRIGADE IF YOU CANNOT DO IT

3.4.3 Engine Fire During Take-Off Run

1. Throttle..... IDLE
2. Brakes..... APPLY
3. Cabin Heat..... CLOSE
4. Fuel Selector..... CLOSE
5. Fuel Pumps.....OFF (BOTH)
6. Lanes..... OFF
7. Master switch..... OFF
8. RETRIEVE FIRE EXTINGUISHER IF POSSIBLE
9. LEAVE THE AIRPLANE
10. EXTINGUISH FIRE BY FIRE EXTINGUISHER OR CALL FOR A FIRE-BRIGADE IF YOU CANNOT DO IT

3.4.4 Engine Fire in Flight

1. Cabin Heat ..... CLOSE
2. Cabin Air Vent ..... OPEN
3. Fuel Selector ..... CLOSE
4. Throttle ..... IDLE
5. Fuel Pumps ..... OFF (BOTH)
6. Flaps..... UP
7. Ignition Lanes ..... OFF
8. Master ..... OFF
9. Airspeed ..... INCREASE TO VNE
10. Forced Landing ..... AS PER 3.5.1

WARNING
Do not attempt to re-start the engine!

3.4.5 Electrical Fire in Flight

An electrical fire is often characterized by white smoke and an acrid smell.

1. Master ..... OFF[(a)(b)]
2. Ignition Lanes ..... REMAIN ON
3. Instrument Switches ..... OFF
4. Extinguisher ..... USE (IF POSSIBLE)
5. Ventilate Cabin ..... OPEN VENTS

   If the fire is extinguished –
6. Precautionary Landing ..... EXECUTE (AS SOON AS POSSIBLE)

   If the fire is NOT extinguished –
7. Forced Landing ..... EXECUTE

NOTE

a. If the location / source of the electrical fire can be determined and electrical power can be removed from that system / location by isolating / switching the system off, do so. This may alleviate the need to switch off the master switch

b. The EFIS and associated equipment (GSU/GEA/GAD/etc.) can still be powered (to provide engine monitoring) from the EFIS back-up battery circuit when the master switch is off, provided that the EFIS system is not the location / source of the electrical fire.

3.4.6 Cabin Fire

If the fire is electrical in nature, follow the procedure for electrical fires in flight (3.4.5).

Alternatively:

1. Master ..... OFF
2. Cabin Heat ..... CLOSE
3. Ventilate Cabin ..... OPEN VENTS
4. Extinguisher ..... USE (IF POSSIBLE)
   If the fire is extinguished -
5. Precautionary Landing ..... CONSIDER
   If the fire is NOT extinguished -
6. Forced Landing ..... EXECUTE

3.4.7 Use of Fire Extinguisher

When use of a fire extinguisher is required in one of the above-mentioned emergency procedures:

1. Fire extinguisher..... REMOVE FROM SECURING BRACKET
2. Safety pin..... REMOVE
3. Extinguisher nozzle..... AIM AT THE BASE OF THE FLAME
4. Operating handle..... SQUEEZE TO RELEASE EXTINGUISHING AGENT
5. IF UNABLE TO EXTINGUISH FIRE, CALL FOR A FIRE BRIGADE

3.5 Emergency Landings

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

3.5.1 Engine-Off Emergency Landing

1. Airspeed ..... 72 KIAS
2. Landing Location ..... LOCATE
3. Engine Air-start ..... ATTEMPT (IF TIME PERMITS) (a)

If the engine fails to restart -

4. Fuel Pumps ..... BOTH OFF (MAIN & AUX)
5. Ignition Lanes ..... OFF (A & B)
6. Fuel Selector ..... OFF
7. Throttle ..... CLOSED
8. Flaps ..... FULL (BEFORE TOUCHDOWN)
9. Communication ..... REPORT IF TIME PERMITS
10. Passenger ..... BRIEF

Immediately Before Touchdown -

11. Master ..... OFF

EMERGENCY PROPELLER FEATHER PROCEDURE (IF APPLICABLE)

1. Select AUTO / FEATHER.
2. Actuate feather engage switch to initiate the propeller automatic feathering cycle.

CAUTION

The pilot should be aware that a feathered propeller is less likely to break if it hits the ground, as it is stronger in this orientation. In this a situation, the impact of the propeller with the ground may cause the aircraft to tip over. In the event of a forced landing where a propeller blade may dig into the landing surface due to an undercarriage failure or the like, consideration should be given to leaving the propeller unfeathered.

NOTE

The automatic feather cycle takes 20 to 40 seconds depending on what pitch the propeller is at when the cycle is commenced and at what pitch the feather pitch limit is set at.

NOTE

The propeller may be unfeathered at any time by simply selecting any other position on the propeller control selector (i.e. the hold speed governing mode or one of the pre-set speed governing modes). The propeller will then automatically move to the flight range and constant speed governing will commence as soon as a controllable engine/propeller speed is achieved.

3.5.2 Precautionary Landing

1. Airspeed ..... 72 KIAS
2. Flaps ..... TAKE-OFF POSITION
3. Fuel Pumps ..... ON (BOTH)
4. Seatbelts..... SECURE
5. Passenger ..... BRIEF
6. Landing Area ..... INSPECT
7. Flaps ..... FULL (ON FINAL APPROACH)
   after aircraft comes to a complete stop -
8. Master Switch ..... OFF
9. Lanes ..... OFF
10. Fuel Pumps ..... OFF (BOTH)
11. Fuel Selector ..... OFF

NOTE
Keep the chosen area in sight during precautionary landing.

3.5.3 Landing with a Flat Tyre / Damaged Wheel

1. Approach ..... NORMAL
2. Airspeed ..... 65 KIAS
3. Airspeed at flare ..... SLOWEST PRACTICAL

If nosewheel is damaged/flat -

4. Nosewheel ..... KEEP OFF GROUND FOR AS LONG AS POSSIBLE

3.5.4 Emergency Descent

1. Throttle ..... IDLE
2. Airspeed ..... 91 KIAS
3. Bank ..... 45° TO LEFT OR RIGHT
4. Recover ..... NO LOWER THAN 1000 FT

3.6 Spin Recovery

WARNING
Intentional spins are prohibited!

3.6.1 Recovery from Unintentional Spin

1. Throttle ..... IDLE
2. Lateral Control ..... AILERONS NEUTRAL
3. Longitudinal Control..... FULL NOSE DOWN
4. Yaw Control ..... RUDDER IN OPPOSITE DIRECTION OF SPIN

when rotation stops -

5. Yaw Control ..... RUDDER NEUTRAL
6. Longitudinal Control ..... RECOVER FROM DIVE

3.6.2 Recovery from Unintentional Flat Spin

1. Throttle .....IDLE
2. Lateral Control .....AILERONS NEUTRAL
3. Longitudinal Control .....FULL NOSE DOWN
4. Yaw Control ..... RUDDER IN OPPOSITE DIRECTION OF SPIN

   when rotation stops -

5. Yaw Control ..... RUDDER NEUTRAL
6. Longitudinal Control .....RECOVER FROM DIVE

3.7 Other Emergencies

3.7.1 Vibration

1. Fuel ..... CHECK QUANTITY
2. Fuel Selector ..... CHANGE (UNLESS 2ND TANK DRY)
3. Fuel Pumps ..... BOTH ON
4. ECU Backup ..... ON
5. Engine RPM ..... SET WHERE VIBRATION IS LEAST
6. Precautionary Landing ..... EXECUTE

3.7.2 EFIS System Failure

1. Straight and Level Flight ..... MAINTAIN[(a)]
2. EFIS 1 Switch ..... OFF
3. EFIS Back-Up Switch ..... OFF
   wait for 5 seconds -
4. EFIS Backup Switch ..... ON
5. EFIS 1 Switch ..... ON
   wait for at least 15 seconds for the system to boot -
6. EFIS Functionality ..... CONFIRM
   if EFIS still not functioning correctly -
7. Land ..... AS SOON AS PRACTICABLE

NOTE

a. Through use of ground references and other instruments.

3.7.3 Inadvertent Icing Encounter

1. Pitot Heat ..... ON
2. Navigate ..... TO AREA WITH NO VISIBLE MOSITURE OR PRECEPITATION, WITH A HIGHER TEMPERATURE. CHANGE ALTITUDE AND DIRECTION OF FLIGHT IF NEEDED
3. Control Surfaces ..... MOVE CONTINUOUSLY TO AVOID LOCKING
4. Engine RPM ..... INCREASE TO AVOID PROP ICE BUILD UP

3.7.4 Suspected Blockage of External Static Port

The external static port might get obstructed during flights in IMC due to icing or moisture build-up. (Foreign debris can also be the cause)

The following observations are possible indications of a blocked port;

a. During straight and level flight, without any control inputs or power setting changes, if the indicated airspeed suddenly increases or decreases.
b. While climbing or descending, if the indicated air speed, vertical speed and altitude doesn't change.

If either of the above is observed;

1. Static Port Switch.....CHANGE TO INTERNAL

3.7.5 Alternator / Charge System Failure

3.7.5.1 Alternator A Failure

Generator A failure is evident by the steady illumination of the lane A warning light, and a drop in the main bus voltage to nominal battery voltage (+/- 12.5 V)

1. Lane A ..... CYCLE SWITCH (OFF 5 SECONDS, BACK ON)
2. Lane A ..... VERIFY WARNING LIGHT OFF
   If Lane A warning light is still on – assume generator failure.
3. EFIS Backup ..... VERIFY ON
4. EFIS 1 Switch ..... OFF
5. Non-Essential Equipment ..... ALL OFF[(a)] *Lights, autopilot, secondary EFIS, etc.*
6. Volts 1 ..... MONITOR
7. Radio Communication ..... MINIMUM
8. Land ..... AS SOON AS PRACTICABLE

NOTE

a. No battery charging will occur in this scenario, and the main battery must be conserved if there is to be a subsequent alternator B failure.

NOTE

The ECU typically uses GEN A to run the engine, and GEN B is used to charge the main battery. If GEN A fails, GEN B is reprioritized to run the engine only and the main battery will no longer charged.

3.7.5.2 Alternator B Failure

Generator B failure is evident by the steady illumination of the Lane B warning light, and a drop in the main bus voltage to nominal battery voltage (+/- 12.5 V).

1. Lane B ..... CYCLE SWITCH (OFF 5 SECONDS, BACK ON)
2. Lane B ..... VERIFY WARNING LIGHT OFF
   If Lane B warning light is still on – assume generator failure.
3. EFIS Backup ..... VERIFY ON
4. EFIS 1 Switch ..... ON
5. Non-essential Equipment..... OFF[(a)] *Lights, autopilot, secondary EFIS, etc.*
6. Radio Communication ..... MINIMAL
7. Land ..... AS SOON AS PRACTICABLE

NOTE

a. No battery charging will occur in this scenario, and the main battery must be conserved if there is to be a subsequent alternator A failure.

3.7.5.3 Alternator A and B Dual Failure

This will result in engine stoppage when the main battery goes flat, since no power is available to the ECU and subsequently the fuel pumps. It must be powered by the main battery in order for the engine to run.

1. ECU Battery Backup ..... ON
2. EFIS Backup ..... VERIFY ON
3. EFIS 1 Switch ..... OFF
4. Main Battery ..... VERIFY VOLTAGE[(a)]
5. Non-essential Equipment..... OFF Lights, autopilot, secondary EFIS etc.
6. Radio Communication ..... MINIMAL
7. Land ..... AS SOON AS POSSIBLE

NOTE

a. Expect **systems failure** when battery voltage drops below **10 Volt**. This includes the ECU and fuel pumps, which will result in engine failure.

WARNING

The engine can run from the main battery for a maximum of 30 minutes, following a dual generator A and B failure; from a full charge with all ancillary equipment turned off. The engine will fail due to fuel starvation, as the fuel pumps will stop when the voltage is too low.

3.7.6 Main bus power failure

Please refer to 7.13.4 Main Bus, for a list of equipment affected by a loss of power to the main bus.

1. ECU Battery Backup ..... ON
2. EFIS Backup ..... VERIFY ON
3. Land ..... AS SOON AS POSSIBLE

CAUTION

Power loss to the main bus will not result in the main fuel pump stopping but the starter motor will become unavailable/non-operational. If the engine is allowed to run dry and stop, the engine will have to be restarted via airstream driven propeller rotation (windmilling).

3.7.7 Over Voltage

1. Volts 1 and 2 ..... CHECK

   If Volts 1 Overvoltage
2. Lights ..... ALL ON
3. Autopilot ..... ON
4. Pitot Heat ..... ON
5. Volts 1 ..... MONITOR

   If Volts 1 Overvoltage continues
6. Master Switch ..... OFF
7. Volts 1 ..... MONITOR

   If Volts 2 Overvoltage
8. EFIS Backup ..... OFF
9. Volts 2 ..... MONITOR

3.7.8 Loss of Flight Controls

1. Autopilot ..... DISCONNECT
2. Airspeed ..... 91 KIAS
3. Other Control Stick ..... CHECK FUNCTION
4. Foot Wells ..... CHECK FOR LOOSE ARTICLES BLOCKING CONTROL STICK
5. Controls ..... USE THROTTLE, TRIM, OR ANY AVAILABLE MEANS TO CONTROL AIRCRAFT
6. Land ..... AS SOON AS POSSIBLE

3.7.9 Inadvertent Opening of Canopy

1. Airspeed……85 KIAS
2. Controls……NEUTRAL
3. Canopy……ATTEMPT TO CLOSE AND SECURE LATCH
   If unable to latch due to mechanical failure or similar issue of the latching mechanism
4. Airspeed……85 KIAS
5. Land……AS SOON AS POSSIBLE

NOTE

The airflow over the Sling 2 fuselage, and specifically the canopy, is of such that the canopy is forced to the closed position. (Ie. forward). Therefore, in the event of inadvertent opening of the canopy without the possibility of latching it, land as soon as a safe landing area has been identified.

3.7.10 Structural Damage or Overspeed

1. Airspeed……72 KIAS
2. Controls……AVOID FULL DEFLECTION OR ABRUPT INPUTS
3. Flaps……RETRACTED
4. Land……..AS SOON AS POSSIBLE (*Continuing with a flaps retracted landing*)

3.7.11 Use of Crash Axe Hammer

In the unlikely event of a roll-over during an emergency landing, the below steps should be followed to ensure effective use of the crash axe hammer to break the window/s.

1. Velcro strap.....LOOSEN
2. Crash axe hammer……REMOVE FROM HOUSING BRACKET
3. Break window……..USE THE SHARP POINT OF THE HAMMER (*For most effective breakage, hit in the corner of the window)*
4. Vacate aircraft.....AS SOON AS PRACTICAL

4 NORMAL PROCEDURES

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4.1 Introduction

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

4.2 Speeds for Normal Operation

Unless otherwise noted, the following speeds are based on a maximum weight of 700 kg (1 543.23 lb).

SPEED		KIAS	REMARKS
V_x	Best Angle of Climb Speed	65	The speed (at MAUW, flaps fully retracted) which results in the greatest altitude gain over a given horizontal distance (i.e. largest climb angle).
V_Y	Best Rate of Climb Speed	72	The speed (at MAUW, flaps fully retracted) which results in the greatest altitude gain over a given time period.
V_{ROT}	Rotation Speed	45	The speed at which the aircraft should be rotated about the pitch axis during take-off (i.e. the speed at which the nose wheel is lifted off the ground).
V_{LOF}	Lift-off Speed	48	The speed at which the aircraft generally lifts off from the ground during take-off.
-	Cruise Climb	75 to 90	
-	Approach speed - long finals	65 to 75	
V_{REF}	Threshold crossing speed	≥ 65	Indicated airspeed at 15 m (50 ft) above threshold, which is not less than $1.3V_{SO}$.

4.3 Use of Taxi, Landing, Strobe and Navigation Lights

Refer to paragraph 7.18.

Taxi lights should be used as appropriate and their use should be incorporated in the applicable (taxi and before take-off) procedures as required. Give consideration to taxi lights as an aid to enhancing the aircraft's visibility to other traffic / pedestrians / wildlife.

Landing lights should be used as appropriate and their use should be incorporated in the applicable (before take-off, take-off, climb, approach and landing) procedures as required. Give consideration to landing lights as an aid to enhancing the aircraft's visibility to other traffic / pedestrians / wildlife.

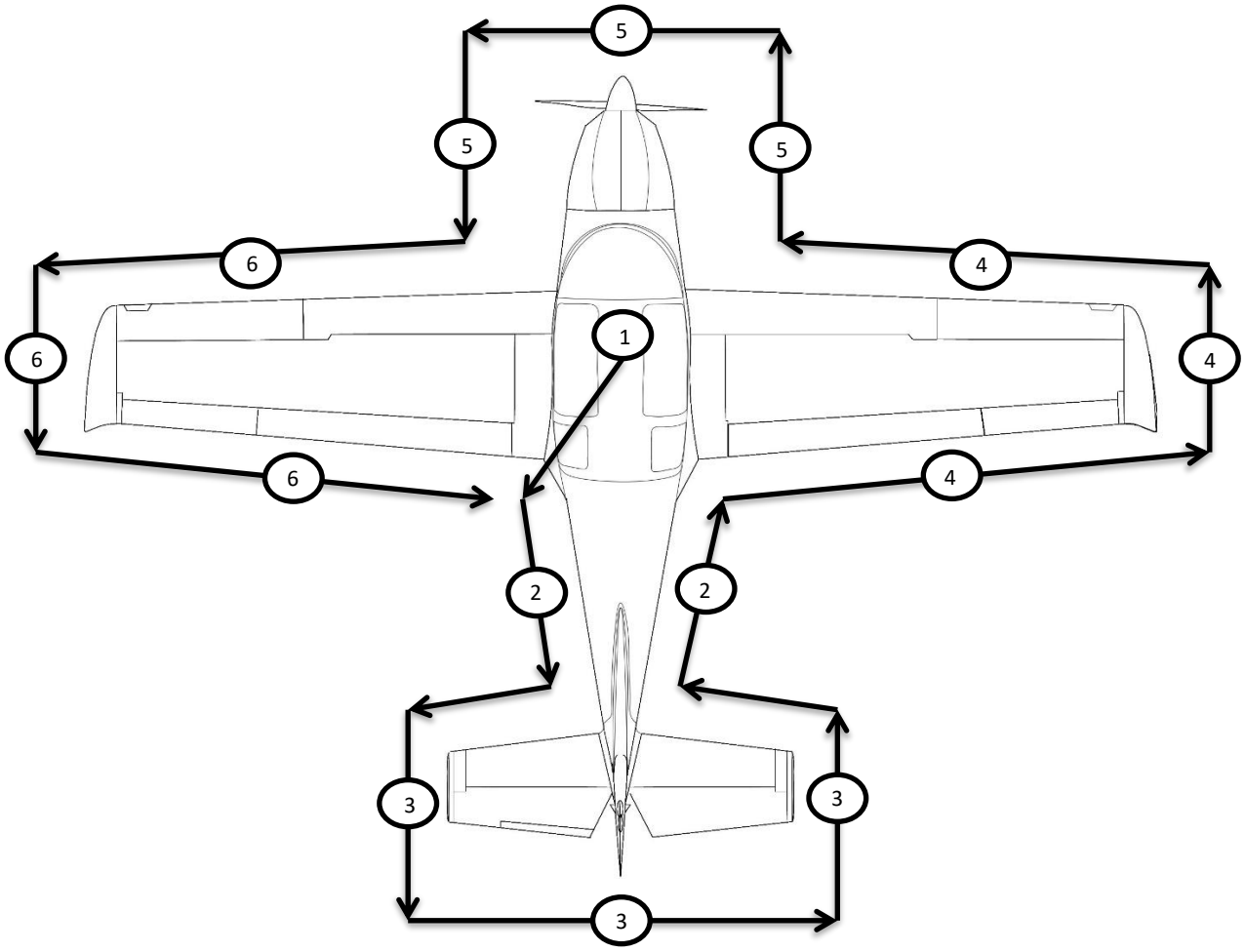
Strobe and navigation lights should be used as appropriate and their use should be incorporated in the following (normal) procedures as required. Give consideration to using the strobe light as an indicator / warning of imminent engine start (i.e. switch on the strobe before starting the engine).

4.4 Pre-Flight Inspection

Carry out the pre-flight inspection every day prior to the first fight. Pre-flight inspections must also be performed after any accident, incident, maintenance activity, assembly of any aircraft component or suchlike. Incomplete or careless inspection can result in 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.



4.4.1 Inspection Checklist

4.4.1.1 Cabin

Lanes ..... OFF
Master Switch ..... ON
EFIS 1 ..... ON
Lights ..... CHECK
Flaps 3
Fuel ..... CHECK QUANTITY
EFIS ..... OFF
Master Switch ..... OFF
Safety Equipment ..... CHECK (fire extinguisher, flotation devices)
Aircraft Documents ..... CHECK[a]
Canopy and Windshield .... CHECK CONDITION and cleanliness
Harnesses and Seats ..... CHECK[b]

NOTE

a. Documents such as current POH, ATF, RF Licence (RSA Only).
b. Check security of buckles and attachment points. Ensure the seat adjustment mechanism is locked correctly after adjustment.

4.4.1.2 Fuselage

Surface Condition .....CHECK CONDITION
Antenna/e .....CHECK CONDITION / SECURITY
Static Source (If Installed) .....CHECK CONDITION
Wing/fuselage Fairing .....CHECK

4.4.1.3 Empennage

Empennage Fairing ..... CHECK
Vertical Stabilizer ..... CHECK CONDITION
Horizontal Stabilizer ..... CHECK CONDITION
Elevator..... CHECK CONDITION / MOVEMENT
Elevator Trim Tab ..... CHECK CONDITION
Rudder ..... CHECK CONDITION / MOVEMENT
Tie-down Rope ..... REMOVED

4.4.1.4 Right Wing and Right Main Gear

Fuel Sump ..... CHECK FOR CONTAMINANTS
Fuel Vent (underside of wing) ..... CHECK UNOBSTRUCTED
Tie-down Rope ..... REMOVED
Wing Leading Edge..... CHECK CONDITION
Wingtip/Light ..... CHECK CONDITION
Aileron ..... CHECK SECURITY / MOVEMENT
Aileron Hinges, Control Horn, Pushrod ..... CHECK CONDITION / SECURITY
Flap ..... CHECK SECURITY
Flap Hinges, Control Horn, Pushrod ..... CHECK CONDITION / SECURITY
Wheel and Brakes ..... CHECK CONDITION[(a)]
Wheel Strut and Fairing ..... CHECK CONDITION / CRACKS

NOTE

a. Fluid Leaks, brake pad and disc condition, tyre condition, tyre inflation

WARNING

Physically verify the fuel level before each take-off to make sure you have sufficient fuel for the planned flight. Fuel can be visibly seen (through the filler cap) to just cover the (total) bottom of the fuel tank with 30 litres present.

4.4.1.5 Nose Section and Nose Gear

Engine Cowling ..... CHECK CONDITION / SECURITY
Engine Bay ..... CHECK FOR LEAKS / DAMAGE
Exhaust Pipes/Manifold ..... CHECK CONDITION
Air Intakes ..... CHECK CONDITION / OBSTRUCTION
Propeller and Spinner ..... CHECK CONDITION / SECURITY
Nose Gear/Wheel ..... CHECK CONDITION
Radiators ..... CHECK CONDITION
Brake Fluid ..... CHECK LEVEL
Coolant ..... CHECK LEVEL(a)
Engine Oil ..... CHECK LEVEL WITH DIPSTICK
Gascolator (If Installed) ..... CHECK FOR CONTAMINANTS
Parachute (If Installed) ..... CHECK COVER SECURITY

CAUTION

In case of long-term parking it is recommended to turn the engine over several times (ignition / magnetos OFF!) by turning the propeller in order to prime the lubrication system. Always handle the propeller blade area with the palm of your hand i.e. do not grasp only the blade edge with your fingers.

4.4.1.6 Left Wing and Left Main Gear

Wheel and Brakes ..... CHECK CONDITION[(a)]
Wheel Strut and Fairing ..... CHECK CONDITION / CRACKS
Fuel Sump ..... CHECK FOR CONTAMINANTS
Fuel Vent (underside of wing) ..... CHECK UNOBSTRUCTED
Tie-down Rope ..... REMOVED
Wing Leading Edge..... CHECK CONDITION
Wingtip/Light ..... CHECK CONDITION
Aileron ..... CHECK SECURITY / MOVEMENT
Aileron Hinges, Control Horn, Pushrod ..... CHECK CONDITION / SECURITY
Flap ..... CHECK SECURITY
Flap Hinges, Control Horn, Pushrod ..... CHECK CONDITION / SECURITY
Taxi/Landing Light ..... CHECK CONDITION
Pitot Tube Cover..... REMOVE

NOTE

a. Fluid Leaks, brake pad and disc condition, tyre condition, tyre Inflation

WARNING

Physically verify the fuel level before each take-off to make sure you have sufficient fuel for the planned flight. Fuel can be visibly seen (through the filler cap) to just cover the (total) bottom of the fuel tank with 30 litres present.

4.5 Engine Start and Taxi

4.5.1 Passenger Safety Briefing

Briefing Item	Briefing Action
Light Sport Aircraft	Review LSA Warning Placard
Seat Belt Usage	Demonstrate Usage
Motion Sickness	Notify PIC/Sick-Sack Location
Emergency Egress	Meet Behind Aircraft
Fire Extinguisher	Location/When to Use
Push To Talk Button	Where/Usage/Sterile Cockpit
Canopy	Latch Usage/Watch Head
Rudder Pedals	Location/Usage
Switches/Controls	Do Not Touch Unless Directed
Traffic Awareness	Scan/Notify PIC of Traffic

4.5.2 Before Engine Start

1. Preflight Inspection ..... COMPLETE
2. Emergency Equipment..... ON BOARD
3. Passenger Briefing ..... COMPLETE
4. Seats ..... CORRECTLY ADJUSTED
5. Harnesses ..... SECURE
6. Park Brake ..... ON
7. Circuit Breakers ..... IN
8. Parachute Safety Pin ..... REMOVE

4.5.3 Engine start

1. Fuel Selector ..... EMPTIEST TANK (IF NOT EMPTY)
2. EFIS Backup Switch ..... ON
3. EFIS Main Switch ..... ON
4. ECU Backup Switch ..... ON
5. Master Switch ..... ON
6. Ignition Lanes ..... ON (A & B)
7. Aux Fuel Pump ..... ON (FUEL PRESS. / NO ABNML. SOUND)
   ..... OFF (AFTER 5 SEC.)
8. Main Fuel Pump ..... ON (FUEL PRESS. / NO ABNML. SOUND)
9. Throttle ..... SET (±40 to 60%)
10. Propeller ..... AREA CLEAR
11. Starter ..... ENGAGE (MAX. 10 SECONDS)
12. Oil Pressure ..... CHECK (CORRECT WITHIN 10 SECONDS)
13. Throttle ..... +/- 2500 RPM
14. Lane Lights..... VERIFY OFF
15. ECU Backup Switch ..... OFF
16. Alternator B ..... CHECK ONLINE[(a)]
17. Avionics Switch ..... ON
18. Oil Temperature ..... 2500 RPM until oil temperature
    ..... is > 50 °C (122 °F)[(b)]

NOTE

a. Main bus voltage should move up from +/- 12.5V to above 13V when the engine RPM is held above/at 2500 RPM for more than 5 seconds. This is the indication that Alternator B has been brought online by the ECU.
b. When the oil is below 50 °C, the oil filter is bypassed due to the increased viscosity of the oil. Significant throttle settings must not be used during this period, as it may cause damage.

CAUTION

- The starter can be activated for a maximum of 10 seconds, followed by a 2-minute pause, to allow the starter to cool.
- Only increase engine speed 10 seconds after start, if the oil pressure is steady above 2 bar (29psi).

4.5.4 Taxi

1. Flaps ..... UP
2. Brakes ..... OFF
3. Control ..... INTO WIND OR NEUTRAL
4. Power ..... AS REQUIRED
5. Brakes ..... VERIFY OPERATION AT START OF TAXI

4.6 Before Takeoff

4.6.1 Run-Up

1. Face into wind ..... IF POSSIBLE
2. Parking Brake ..... SET
3. Canopy ..... CLOSED AND LATCHED
4. Engine Gauges ..... CHECK *(ALL GREEN AND NORMAL)*
5. Fuel Selector ..... SWITCH TANK
6. Flight Controls ..... CHECK *(FREE AND CORRECT*)
7. Throttle ..... 4000 RPM
8. Lane A ..... OFF *(5 SEC., MAX DROP/RISE 250 RPM)*
   ..... ON *(WAIT FOR LANE A LIGHT OFF)*
9. Lane B ..... OFF *(5 SEC., MAX DROP/RISE 250 RPM)*
   ..... ON *(WAIT FOR LANE B LIGHT OFF)*
10. Throttle ..... IDLE CHECK
11. Throttle ..... 2000 RPM
12. Fuel Pumps ..... AUX ON
    ..... MAIN OFF
13. Fuel Pressure ..... CHECK *(CORRECT AND STABLE)*
14. Fuel Pumps ..... BOTH ON
15. Fuel Selector ..... FULLEST TANK
16. Circuit Breakers ..... ALL IN
17. Takeoff Briefing ..... COMPLETED

4.6.2 Pre-Takeoff

1. Canopy ..... CLOSED / LATCHED
2. Engine Parameters ..... VERIFY (TEMPERATURES, PRESSURES, VOLTAGES)
3. Fuel Pumps ..... VERIFY BOTH ON
4. Lights ..... AS REQUIRED
5. Flaps ..... SET
6. Trim ..... SET NEUTRAL

4.7 Take-Off

1. Throttle ..... FULL OPEN
2. Engine Speed ..... VERIFY (4500 – 5800 rpm)
3. Engine Parameters ..... VERIFY (PRESSURES, TEMPERATURES)
4. Rotate ..... 45 – 55 KIAS
5. Airspeed ..... 72 KIAS (Vy)
6. Brakes ..... APPLY BRIEFLY TO STOP WHEEL ROTATION
7. Flaps ..... UP (MIN. 75 KIAS / MIN. ALT. 300 ft AGL)
8. Aux Fuel Pump..... OFF

WARNING

Take-off is prohibited if:

- The engine is running unsteadily or intermittently.
- The engine parameters (instrument indications) are outside operational limits.
- The crosswind velocity exceeds permitted limits (see 2.5).

CAUTION

Ensure that engine oil temperature is above 50 °C prior to take off.
Climbing with engine at 5 800 rpm is permissible for 5 minutes.
Thereafter a maximum continuous engine rpm of 5 500 applies.

4.8 Flight

4.8.1 Climb

1. Throttle ..... SET *(AT OR BELOW 5500 RPM)*
2. Flaps ..... UP *(ABOVE 300 FT)*
3. Engine Parameters ..... VERIFY *(PRESSURES, TEMPERATURES)*
4. Airspeed ..... CRUISE CLIMB *(75 – 90 KIAS)*

CAUTION

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

4.8.2 Cruise

1. Aux Fuel Pump ..... OFF
2. Throttle ..... AS REQUIRED
3. Trim ..... AS REQUIRED

NOTE

Fuel tank should be switched every hour. The AUX FUEL PUMP must be turned ON when switching tanks in flight.

4.8.3 Descend

1. Altimeter(s) ..... SET
2. Auxiliary Fuel Pump ..... ON
3. Fuel Selector ..... FULLEST TANK
4. Lights ..... AS REQUIRED
5. Seatbelts ..... SECURE
6. Approach Brief ..... COMPLETE

4.9 Landing

4.9.1 Before Landing

1. Park Brake ..... OFF
2. Fuel Pumps ..... BOTH ON (AUX & MAIN)
3. Flaps ..... AS REQUIRED
4. Trim ..... AS NEEDED
5. Harnesses ..... SECURE
6. Landing Light ..... ON

WARNING

The fuel lift pipe in each 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. - wing with near empty tank 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 stoppage. This poses a particular threat when at low altitude, typically prior to landing.

4.9.2 Normal Landing

1. Airspeed @50 ft ..... 65 KIAS
2. Touchdown ..... MAINS FIRST (HOLD NOSE WHEEL OFF)
3. Brakes ..... APPLY AS NEEDED

4.9.3 After Landing

1. Transponder ..... SET
2. Aux Fuel Pump ..... OFF
3. Lights ..... AS REQUIRED
4. Flaps ..... UP

4.9.4 Engine Shutdown

1. Throttle ..... IDLE
2. Parking Brake ..... SET
3. Lights ..... OFF (EXCEPT STROBE)
4. EFIS 2 ..... OFF
5. Autopilot ..... OFF
6. Avionics ..... OFF
7. Lane B ..... OFF
8. Lane A ..... OFF
9. Master ..... OFF
10. Fuel Pumps .....BOTH OFF
11. EFIS Backup ..... OFF
12. EFIS 1 ..... OFF
13. Strobe Light ..... OFF
14. Parachute Safety Pin..... INSERT

NOTE

At least 2 minutes must pass between landing and shutting off the engine. If the ambient temperature is excessively warm, and causes the coolant temperature to rise, then engine may be shut down prior to the 2-minute mark.

CAUTION

Rapid engine cooling should be avoided during operation. This happens especially during descent and taxi i.e. Low engine RPM scenarios. Under normal conditions, the engine temperatures stabilize during descent and taxi at suitable values to stop the engine overheating. If temperatures are unstable (high or low), run the engine at +/- 2500 RPM for a minimum of 2 minutes to stabilize the temperatures prior to shut down.

Normal landing

4.10 Special Procedures

4.10.1 Baulked/Rejected Landing

1. Throttle ..... FULL
2. Engine..... CONFIRM >4600 RPM
3. Flaps ..... STAGE 2
   ..... UP (75 KIAS, min. 300ft.)
4. AUX Fuel Pump ..... OFF
5. Boost Pump ..... OFF
6. Trim ..... AS NECESSARY

Complete circuit for a new approach

4.10.2 Short Field Take-Off

Complete Pre-Takeoff checklist items

1. Runway Position ..... MAXIMUM POSSIBLE LENGTH AHEAD
2. Flaps ..... SET *(STAGES 1 – 2)*
3. Brake ..... HOLD
4. Engine Parameters ..... VERIFY *(PRESSURES, TEMPERATURES)*
5. Throttle ..... FULL OPEN
6. Brake ..... RELEASE
7. Rotate ..... 45 KIAS
8. Abort ..... IF NOT AIRBORNE BY ABORT POINT
9. Climb ..... BEST ANGLE *(VX – 65 KIAS)*

Once clear of obstacle, return to normal Climb.

NOTE

Minimise aircraft weight for departure. Calculate density altitude and ensure aircraft performance meets runway length. Establish an abort point on the runway.

4.10.3 Short Field Landing

Complete Landing checklist items

1. Approach Airspeed ..... 65 KIAS[(a)]
2. Touch down ..... MAINS FIRST
3. Braking ..... HEAVY[(b)]

If runway overrun is possible -

4. Ignition Lanes ..... OFF *(MINIMISE PROPELLER/GEARBOX DAMAGE)*

NOTE

a. Exercise caution approaching at low speeds as the effects of a wind *gust will be amplified.*
b. Do not overuse brakes and lock wheels.

4.10.4 Soft Field Take-off

Complete Pre-Takeoff checklist items

1. Flaps ..... SET *(STAGES 1 – 2)*
2. Brake ..... HOLD
3. Engine Parameters ..... VERIFY *(PRESSURES, TEMPERATURES)*
4. Throttle ..... FULL OPEN
5. Brake ..... RELEASE
6. Elevator ..... BACK *(UNTIL NOSE WHEEL JUST LIFTS)*
7. Lift-off..... 45 KIAS

4.10.5 Soft Field Landing

Complete Landing checklist items

1. Hold Off ..... IN GROUND EFFECT
   (0.5M / 2FT. ABOVE RUNWAY)
2. Main Wheels ..... TOUCH AT OR JUST BEFORE STALL, WITH FULL .....ELEVATOR
3. Nose Wheel ..... HOLD OFF WITH FULL ELEVATOR

4.10.6 Crosswind Take-off

Complete Pre-Takeoff checklist items

1. Pre-Takeoff Checks ..... NORMAL
2. Aileron ..... INTO WIND
3. Take-off Procedure ..... NORMAL
4. Aileron ..... REDUCE INPUT AS REQUIRED

4.10.7 Crosswind Landing

Complete Landing checklist items

1. Rudder ..... INTO CROSSWIND
2. Wing ..... LEVEL
3. Rudder ..... ALIGN WITH AIRCRAFT DIRECTION OF MOVEMENT OVER GROUND WHEN NOSEWHEEL SETTLES
4. Direction ..... ALIGN WITH RUNWAY

4.11 Sloped Landing Surface

The Sling 2 has not been evaluated for operation from significantly sloped landing surfaces. The pilot shall not operate the aircraft from a landing surface where the slope may adversely affect take-off or landing performance, braking, directional control, ground handling, or aircraft clearance. The selection of a suitable landing surface remains the responsibility of the pilot.

4.12 Aircraft parking and tie-down

1. Site.....PARK THE AIRCRAFT ON AS LEVEL AN AREA AS POSSIBLE.
2. Ignition/Lanes..... OFF
3. Master switch..... OFF
4. Fuel selector.....OFF
5. Parking brake..... USE AS NECESSARY
6. Canopy..... CLOSE, LOCK AS NECESSARY
7. Secure the airplane.

NOTE

It is recommended that the parking brake (shut-off valve) be utilized for short-period parking only. If the airplane is to be parked for long periods it is advisable to use not only the parking brake, but also wheel chocks.

NOTE

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

5 PERFORMANCE

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5.6 Airspeed indicator system calibration 5-6

5.1 Introduction

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

If not stated otherwise, the performance stated in this section is valid for maximum take-off weight (700 kg/1 540 lbs) and under ISA conditions.

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

Take off and landing performance was determined using normal takeoff and landing procedures stated in Section 0 on level runways with minimal grade.

5.2 Take-off and Landing Distance

Take-off distances:

Surface	Take-off run	Take-off distance over 15m (50 ft) obstacle
Concrete	140 m / 460 ft	280 m / 920 ft
Grass	160 m / 525 ft	300 m / 985 ft

Landing distances:

Surface	Landing run (braked)	Landing distance over 15 m (50 ft) obstacle
Concrete	90 m / 295 ft	260 m / 855 ft
Grass	90 m / 295 ft	260 m / 855 ft

5.3 Rate of Climb

Values relevant for maximum continuous power of 5500 RPM –

Altitude	**Best rate of climb speed (V_Y)**	**Rate of climb**
[ft. ISA]	*[KIAS]*	*[fpm]*
0 ft ISA	72	700
3 000 ft ISA		500
6 000 ft ISA		420
9 000 ft ISA		330

5.4 Cruise Speeds (with Fixed Pitch Propeller)

Altitude [ft ISA]	Engine speed [rpm]	KIAS	KTAS
100	4 500	78	79
	4 800	93	94
	5 000	98	99
	5 300	103	105
	5 500	109	111
3 000	4 500	69	73
	4 800	84	90
	5 000	95	102
	5 300	101	107
	5 500	105	111
6 000	4 500	62	70
	4 800	77	86
	5 000	87	97
	5 300	95	105
	5 500	98	112
9 000	4 500	60	70
	4 800	71	85
	5 000	84	96
	5 300	88	102
	5 500	91	105

5.5 Fuel consumption

Altitude	[ft ISA]	3 000				
Fuel quantity (Usable)	[l]	146				
	[US gallons]	38.57				
Engine speed	[rpm]	**4 500**	**4 800**	**5 000**	**5 300**	**5 500**
Fuel consumption	[l/h]	14	16	18	20	21
	[US gallons]	3.70	4.23	4.76	5.29	5.55
Airspeed	[KTAS]	73	90	102	107	111
Endurance	[hh:mm]	10:25	9:05	08:05	07:20	07:00
Range (no reserve)	[nm]	761	812	827	780	771

5.6 Airspeed Indicator System Calibration

IAS [knots]	CAS [knots] (average)	CAS [knots] (this aircraft)
25	28	
30	33	
35	37	
40	41	
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

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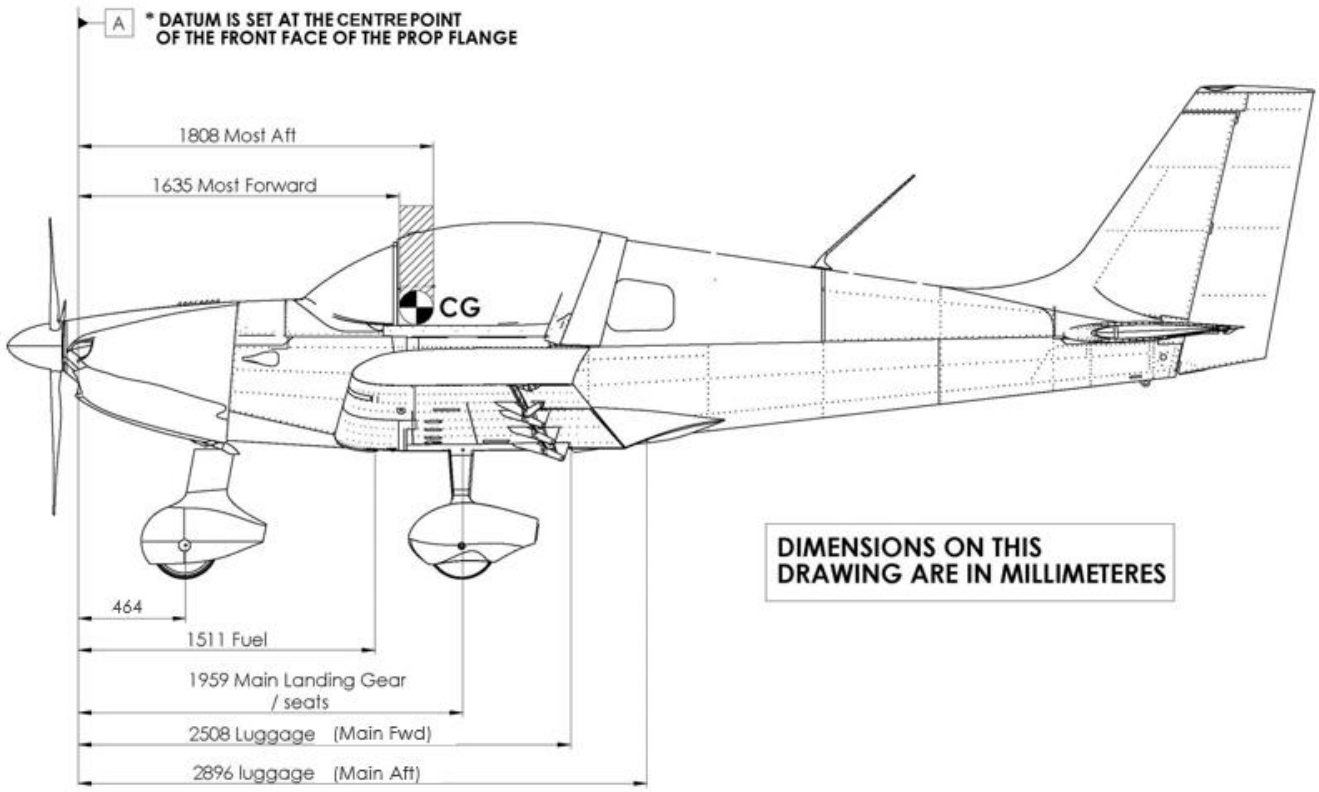
6.1 Introduction

This section contains weight and balance records and the payload range for safe operation of the Sling 2.

6.2 Installed Equipment List

Type	Equipment
Standard	Garmin G3X (GDU460) Glass Cockpit
	Garmin GTX35 Transponder
	Garmin GTR200 Radio
	3Ah IBBS Backup Battery
	Electric Flap Controller
	Electric Elevator Trim System
	Magnetic Compass
	Heated Pitot
Optional	Garmin G5 Certified Electronic Flight Instrument
	Garmin GMA245R Audio System
	Garmin GMC507 Auto Pilot
	Heated & Regulated Pitot
	ELT
	(Additional instruments that don't interfere with the standard equipment or cause deviation from CG envelope boundaries)

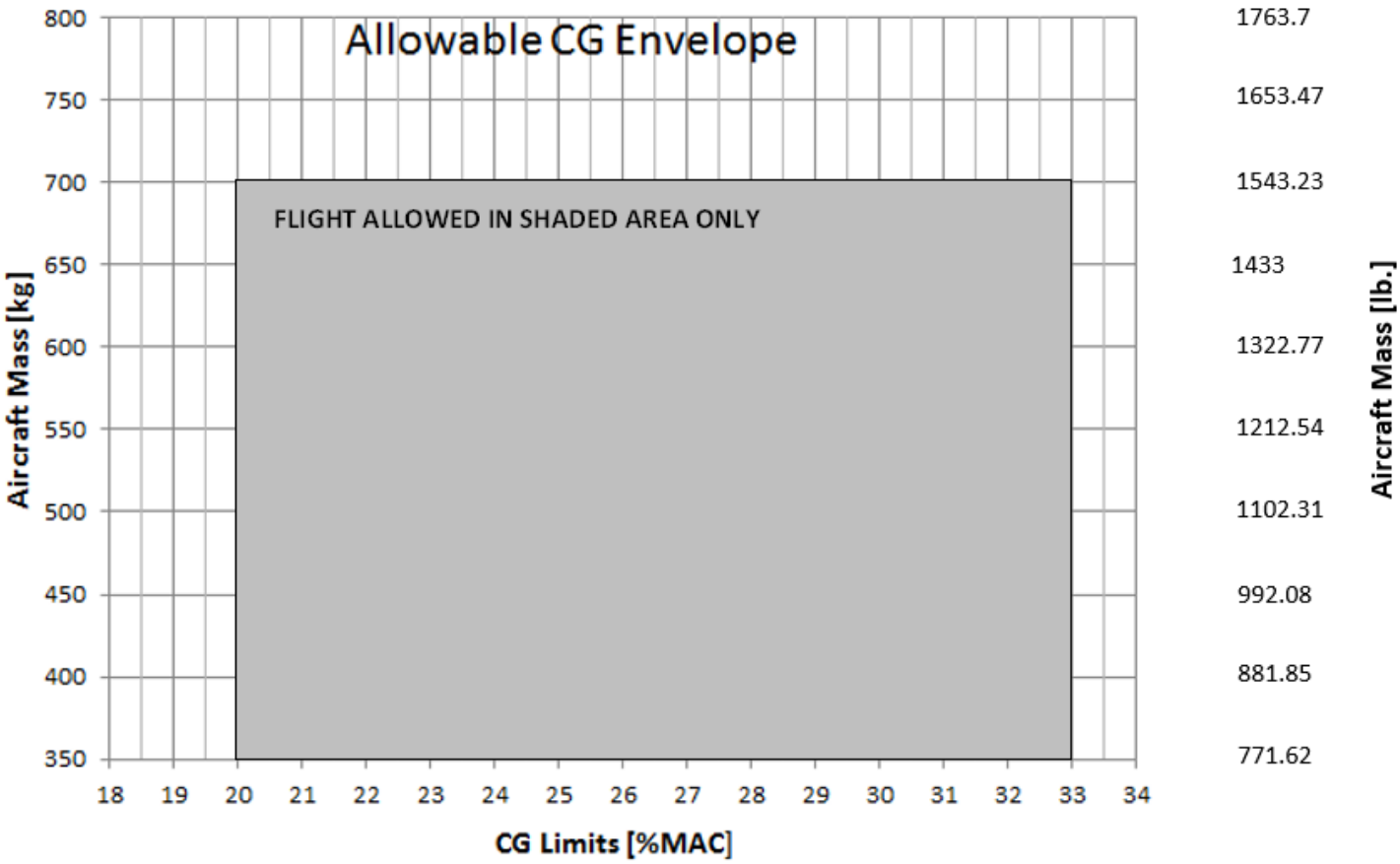
6.3 Center of Gravity (CG) Range



WARNING
Aircraft CG and MAUW limitations must be adhered to at all times.

- CG range is 1 635 mm (5.364 ft) to 1 808 mm (5.931 ft) aft of the reference datum (20 to 33% of MAC).
- The leading edge of the MAC is 1 366 mm (4.482 ft) aft of the reference datum.
- The MAC is 1 339 mm (4.393 ft).

6.4 CG Envelope



6.5 Determination of CG

Sling Aircraft makes use of a numerical method in calculating the CG of the aircraft. The following will be required to complete a CG check:

#	Item
1	Empty CG Value
2	Blank CG Form
3	Forward CG Check
4	Rear CG Check

The principal formula for CG calculation is:

$$CG = \frac{Total\ Moment}{Total\ Weight}$$

The %MAC formulas are:

$$\%MAC = (CG - 1366\,mm)\ x\ \frac{100}{1\,339\,mm}$$

or,

$$\%MAC = (CG - 4.482\,ft)\ x\ \frac{100}{4.393\,ft}$$

WARNING

For each flight the most forward CG (i.e. with take-off fuel) and the most rearward CG (i.e. with landing fuel) must be calculated (to be within aircraft CG range / limits).

The aircrafts empty CG is determined in a conventional manner, by weighing the aircraft whilst it is standing level. Refer to the Maintenance Manual for more.

Maximum all up weight (MAUW) = 700kg (1,540lb)

Maximum useful load (example):

$W_{max\ useful}$ = $W_{MAUW} - W_E$
= 700 kg (1 543 lb) - 420 kg (926 lb)
= 280 kg (617 lb)

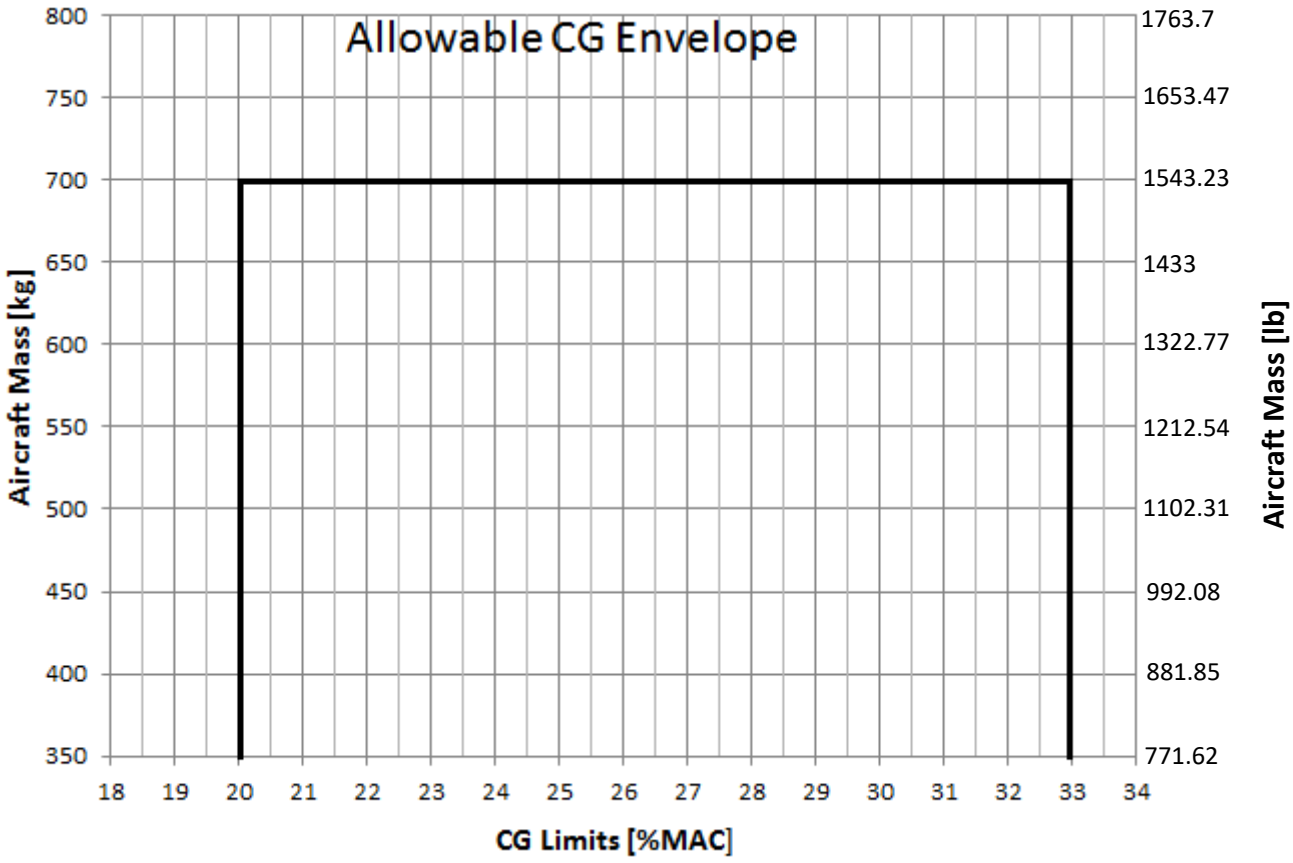
6.6 Empty CG Determination

	ITEM	WEIGHT [kg (lb)]	ARM [mm (ft)]	MOMENT (weight x arm) [kg.mm (lb.ft)]
Aircraft Empty CG	Right Main Wheel	W_R =	L_R = 1 959 (6.427)	
	Left Main Wheel	W_L =	L_L = 1 959 (6.427)	
	Nose Wheel	W_N =	L_N = 464 (1.522)	
	Computed empty CG	Empty weight: W_E = ……..kg (lb)	CG = …….. mm (ft) (……% MAC)	Aircraft moment:

Maximum all up (take-off) weight = 700 kg (1 540 lb).

6.7 Blank Form and Graph for Use

	WEIGHT [kg (lb)]	**ARM** [mm (ft)]	**MOMENT** (weight x arm) [kg.mm (lb.ft)]
PILOT & PASSENGER		1 959 (6.427)	
BAGGAGE (MAIN FWD)		2 508 (8.228)	
BAGGAGE (MAIN AFT)		2 896(9.501)	
FUEL		1 511 (4.957)	
ADD EMPTY VALUES			
TOTAL			
	W_T =		M_T =
			CG = mm (ft)
			CG = %MAC


Allowable CG Envelope
Aircraft Mass [kg]
800
750
700
650
600
550
500
450
400
350
1763.7
1653.47
1543.23
1433
1322.77
1212.54
1102.31
992.08
881.85
771.62
Aircraft Mass [lb]
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
CG Limits [%MAC]

7 AIRCRAFT AND SYSTEMS

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7.1 Airframe

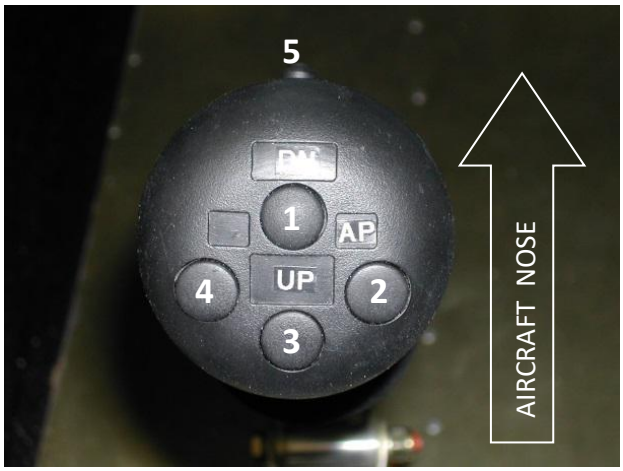
The Sling 2 has an all-metal construction with single curvature stressed aluminium alloy skins riveted to stiffeners. Construction is of 6061-T6 aluminium alloy sheet metal riveted to aluminium alloy angles with high quality blind rivets. This high strength aluminium alloy construction provides long 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 / Pilot Controls

7.2.1 Control Stick(s)

The aircraft is equipped with dual control sticks. The control sticks operate in the standard pitch and roll (elevator and aileron) configuration. See the picture below for control stick button allocation:

Button	Function
1	Trim down
2	Autopilot control
3	Trim up
4	Not allocated
5	Radio PTT



7.2.2 Rudder Pedals / Nose Wheel Steering

The aircraft is fitted with dual rudder pedals, which control the rudder and steer the nose wheel, for yaw control in flight and directional control while on the ground.

7.2.3 Brake Controls

7.2.3.1 Brake Lever

The braking system is typically a single hydraulic master cylinder acting on both wheels of the main landing gear, through a disk/caliper arrangement. Activation of the brakes is via the lever located on the cabin's centre console.

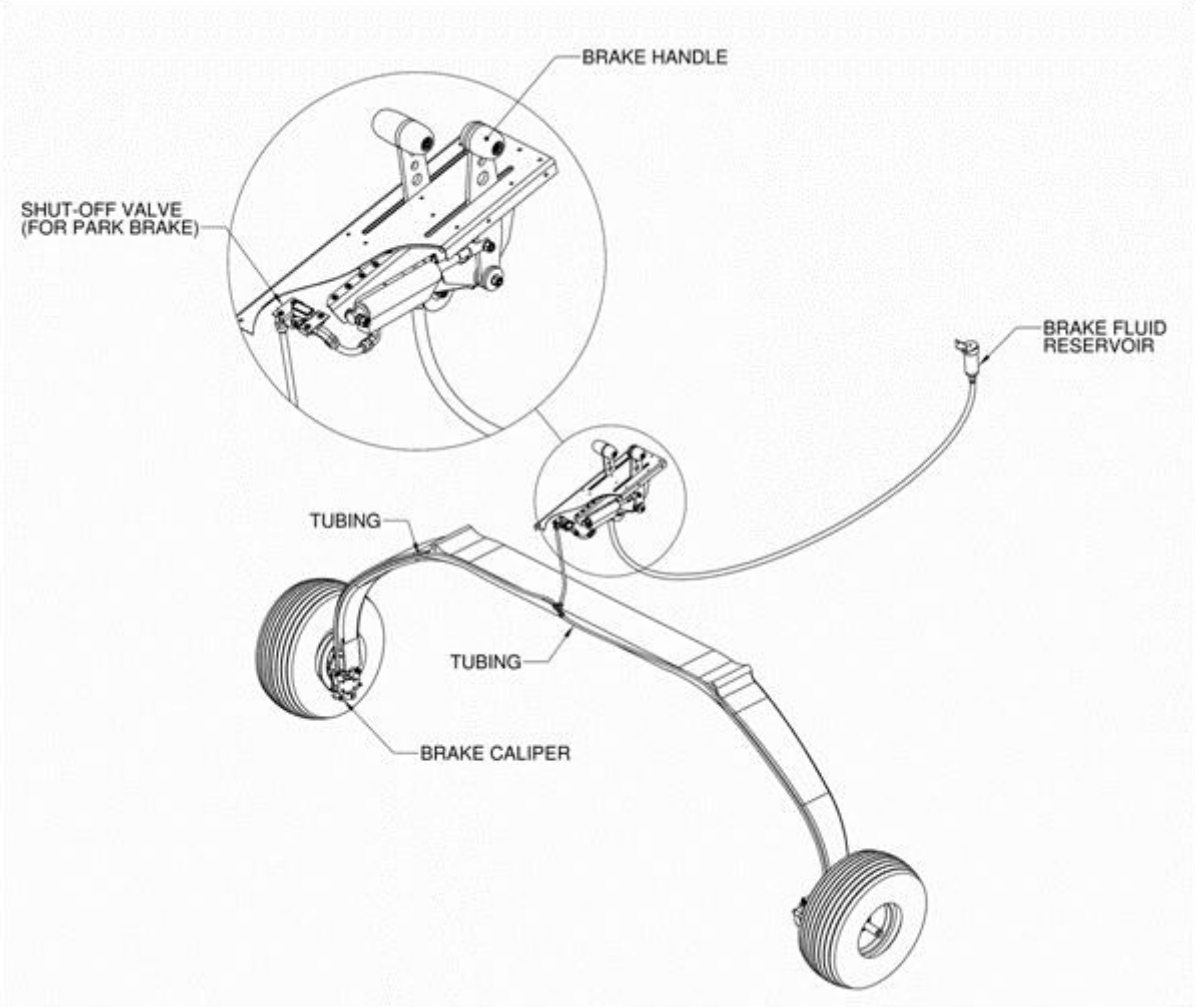
7.2.3.2 Toe Brakes

A differential foot-controlled braking system may also be fitted as an option. Each brake calliper is separately actuated by way of a master brake cylinder fitted to each pedal; with the right pedal actuating the right calliper, and the left pedal the left calliper

7.2.3.3 Park Brake

The park brake is an intercepting valve, which stops pressure relief when pressure is removed from the brake lever/toe brakes. For normal braking operation, the intercept valve must be off.

7.2.3.4 Brake System Diagram



7.2.4 Throttle Lever

The aircraft makes use of a single lever, FADEC (Full Authority Digital Engine Control) power delivery system.
Refer to 7.8 Cockpit Layout.

7.2.5 Fuel Selector Valve

Fuel tank feed selection is enabled by a red coloured, three-position (LEFT, RIGHT, OFF) rotary selector valve, located at the bottom centre of the instrument panel/front of the centre console. Refer to in 7.8 Cockpit Layout, for the location of the selector.

An additional knob must be activated to move the selector, through a detent, to the OFF position. This prevents accidental closure of the valve (OFF position).

7.2.6 Ballistic Parachute (if fitted)

The red-coloured activation lever is located at the bottom centre of the instrument panel.
The accidental operation of the lever is prevented by a locking pin, which is tagged with a red flag.

This pin must be removed before flight.

7.2.7 Electrical Equipment Selection / Control Switches

SWITCH / LABEL	FUNCTION	POSITION
MASTER / STARTER KEY	Power disconnected from main bus.	OFF
	Main bus connected to power.	ON
	Engage starter motor.	START
EFIS	Switch power (from main bus) to EFIS system on / off.	UP (ON) DOWN (OFF)
EFIS BKUP	Connects EFIS system to EFIS back-up battery.	
MAIN PUMP	Switch main fuel pump on / off.	
AUX PUMP	Switch auxiliary fuel pump on / off.	
LAND	Switch landing lights on / off.	
TAXI	Switch taxi lights on / off.	
NAV	Select position (navigation) lights.	
STROBE	Select anti-collision (strobe) lights.	
AVIONICS	Switch power to radio and transponder (if fitted) on / off.	
ECU BKUP	Connects the EMS / ECU to the main battery (to provide back-up power).	
AUTOPILOT	Switch power to autopilot servos on / off.	
MASTER	Switch power to main bus on / off.	
LANE A	Select Lane A magneto/ignition source.	
LANE B	Select Lane B magneto/ignition source.	

7.2.8 EFIS

The EFIS selection and control mechanism is described in detailed in the EFIS manufacturer documentation. Please refer to this documentation. Refer to 7.9.3 EFIS System for more detailed information.

7.2.9 Elevator Trim

Elevator trim is electrically controlled by buttons on the control column, and these buttons are detailed in 7.2.1 Control Column(s).
The trim motor is located in the left elevator (if facing forward) and drives the trim tab. Pilot controls are via buttons on the control column, as detailed in 7.2.1 Control Column(s). The trim servo is powered by the main bus, through a circuit breaker.

7.2.10 Flap Control

Wing flaps are electrically controlled by a four-position rotary knob or a four-pushbutton sector located on the instrument panel. Each selector position corresponds to the following flap deflection:

Selector Position	Degrees flap deflection
0	0°
1	10°
2	20°
3	32°

The flap system makes use of an interconnected torque tube, with a servo in the cabin centre console. Bar a linkage failure, this prevents the flaps from being deployed in an unsymmetrical manner.
The flap controller is powered from the main bus, via a circuit breaker.

CAUTION
If power on the main bus fails, the flap and trim system becomes defunct.

7.2.11 Cabin Heat

Heated air (warmed by heat exchange with engine exhaust) can be selected via a selection knob located on the instrument panel. Refer to the instrument panel layout in 7.9 Instruments and Avionics. Hot air is selected by pulling out the knob.

7.3 Landing Gear

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

7.4 Safety Harness and Seats

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.

CAUTION

Ensure that the seat(s) is securely locked into position after adjustment.

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.

7.5 Baggage compartment

The baggage compartment comprises two sections positioned behind the seats and is designed to carry up to 35 kg (77 lb) in total. The baggage compartment comprises a narrow, slightly lowered front section and a higher, larger back section. 35 kg (77 lb) of luggage may be loaded in the front section and 25 kg (55 lb) in the back section, subject to a total maximum baggage weight of 35 kg (77 lb). 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.

7.5.1 Baggage restraint system

The baggage compartment is equipped with a baggage restraint net to restrain baggage and reduce the potential for baggage to impact occupants during an emergency landing or other high-load event. The net must be correctly attached to all designated lacing hooks and positioned to adequately restrain the baggage. Before each flight, the pilot must verify that the baggage restraint net is correctly installed and securely attached to all designated lacing hooks, that the net and lacing hooks are free from damage or deterioration, and that all baggage is properly positioned and adequately restrained.

WARNING

Baggage must be adequately restrained to reduce the risk of injury to occupants during an emergency landing.

7.6 Canopy

The airplane is equipped with a sliding canopy mechanism. External access to the cabin can be from either side of the aircraft. A latching mechanism is provided inside the cabin at the top, centre of the roll-over bar. The same mechanism can be used from the outside through a separate handle, located in line with the inside handle, on the centre, front section of the canopy.

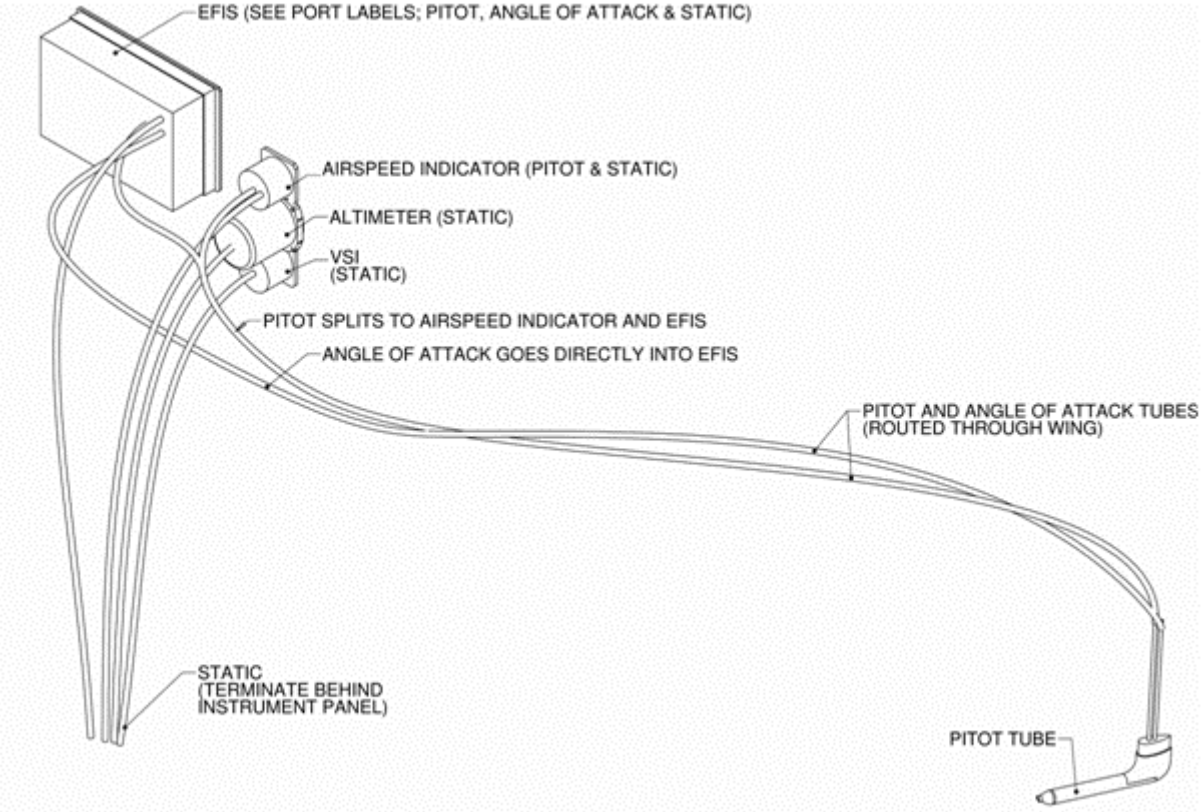
WARNING
Ensure that the canopy / mechanism is securely latched into position before operating the aircraft.

7.7 Pitot and static systems

A pitot 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. The static port is located behind the instrument panel or on the fuselage. Keep the pitot head clean to ensure proper functioning of the system.

Ensure that the pitot tube cover is removed prior to every flight and that it is replaced after every flight.

An example of a pitot static system is below:

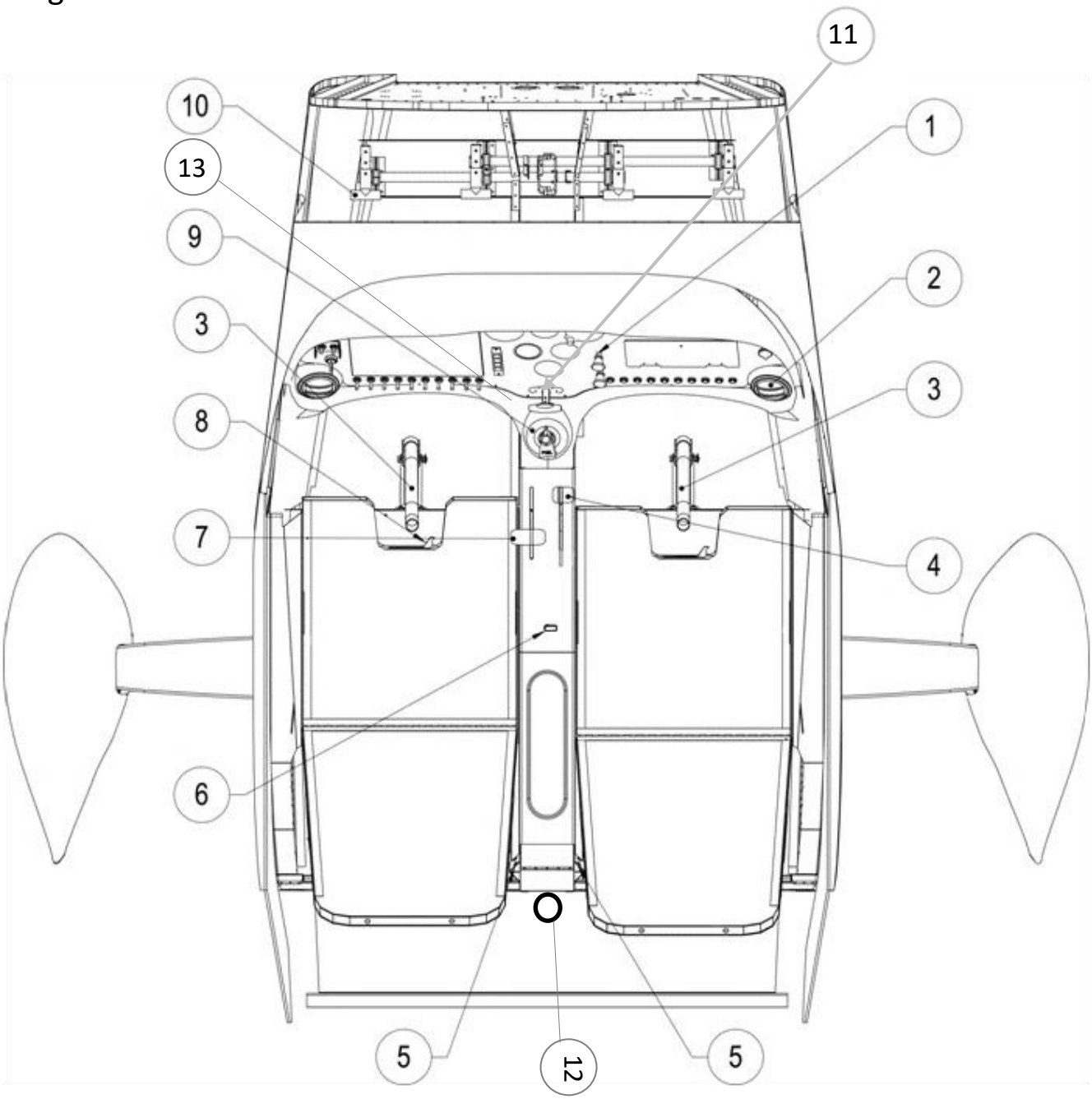


NOTE

Please note that this drawing is representative of a pitot and static system only and may differ from the actual installation in the aircraft, with regard to, for example, placement of instruments and actual instruments installed.

7.8 Cockpit layout

The basic cockpit layout is the same for all Sling 2 aircraft, notwithstanding that instrumentation may differ substantially. All airplanes contain the minimum instrumentation, but particular airplanes may contain substantial additional instrumentation. The basic cockpit layout is configured as in the diagram below.



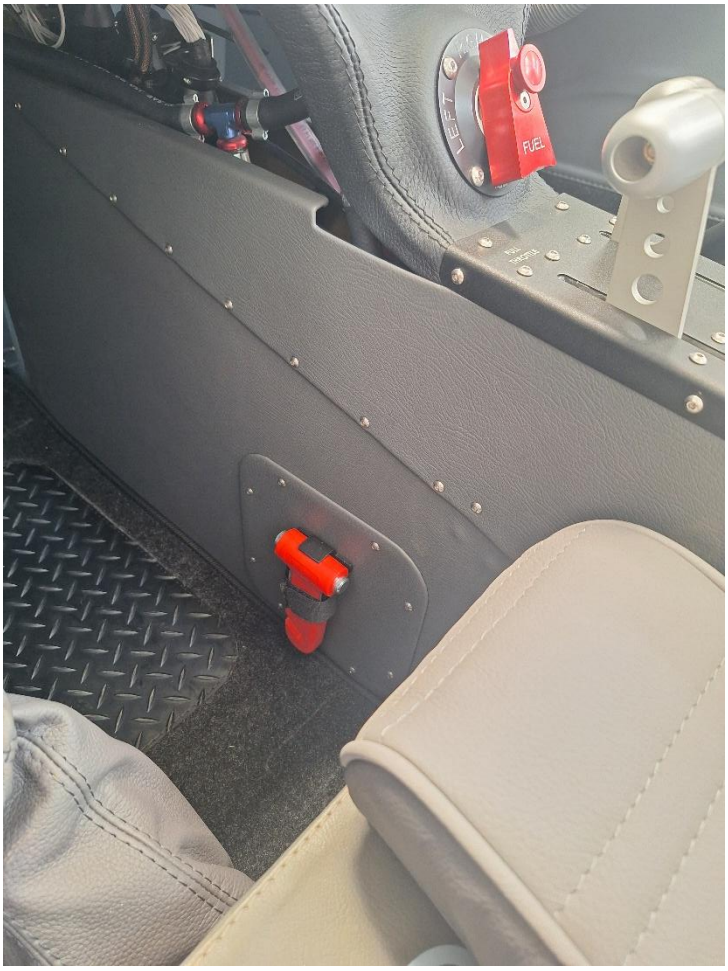
Cockpit Layout Key	
1	Instrument panel
2	Air vent
3	Control stick (With PTT, Trim, AP Control)
4	Brake actuator (if footbrake not fitted)
5	Headset plugin sockets
6	Park-brake actuator valve
7	Throttle
8	Seat adjustment lever
9	Fuel selector valve
10	Rudder pedals (with brakes if toe-brakes are fitted)
11	Ballistic parachute operating lever
12	Fire extinguisher

NOTE

- If differential footbrakes are fitted, the hand operated brake actuator on the centre console will be absent.
- Seats have a slide mechanism with a sideways moving unlocking lever in the centre front of each seat in order to move the seat for comfort and to ensure that the rudder pedals can easily be reached by all pilots. Rudder pedals may also be adjusted through removal of a locking / setting bolt(s).
- Air vents are located on the lower right and left sides of the instrument panel.
- Baggage space is immediately behind the seats. A fire-extinguisher is held in place against the front retaining wall of the baggage space.
- An adjustable red interior cockpit light is positioned behind and between the pilot's and passenger's heads, on the rear fuselage front former structure.
- The crash axe hammer is stowed on the side panel of the center console, next to the pilot's leg position.

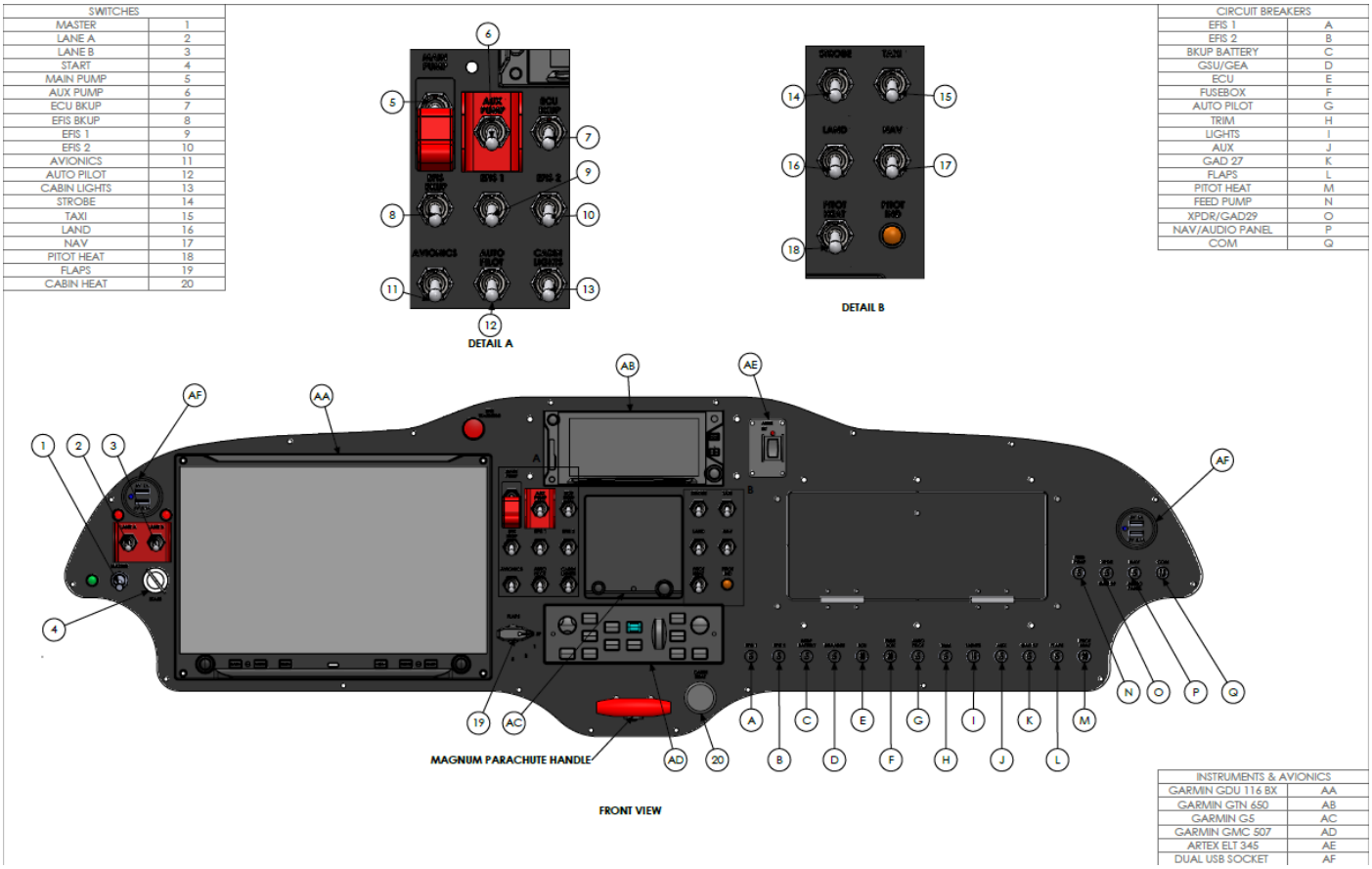
7.8.1 Crash Axe Hammer

As per the note on the previous page, the crash axe hammer is located on the side panel of the center console, next to the pilot's leg. It is secured on its own bracket with a Velcro strap. Refer to the image below for further reference of its cockpit placement.



7.9 Instruments and Avionics

The diagrams below represent an instrument panel containing the required minimum instrumentation, together with typical back-up and additional instrumentation supplied with the aircraft. The instrument panel in any particular aircraft may differ from that illustrated in the diagram. It is the responsibility of the pilot to ensure that s/he is familiar with the instrumentation in the aircraft, its layout and its operation.



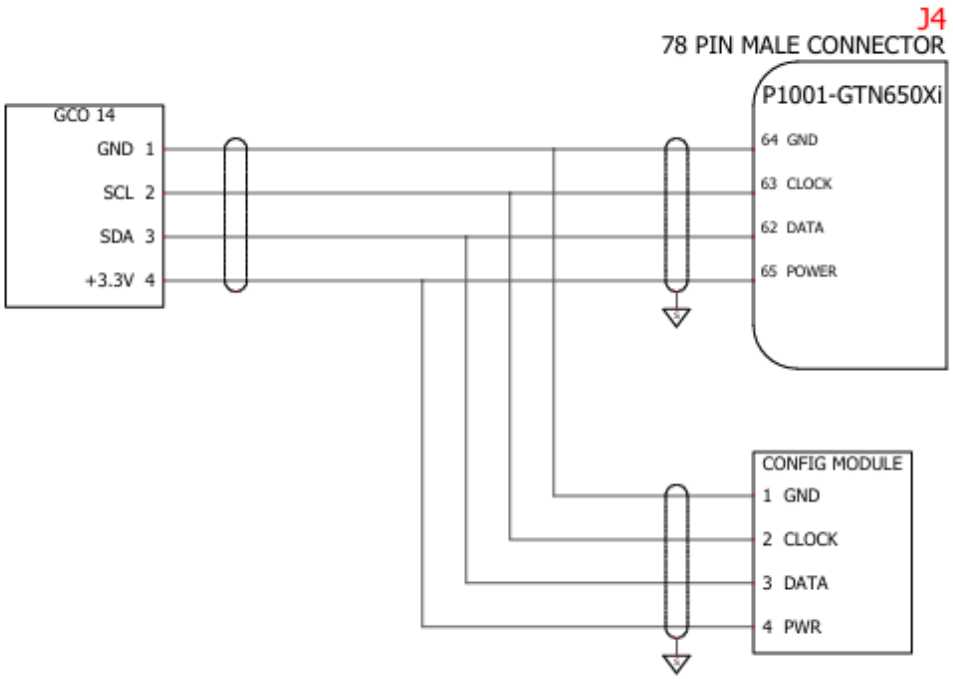
7.9.1 Radio and Transponder

Power to the radio and transponder (if fitted) is provided via the main bus and activated via a single switch (for both) labeled AVIONICS, located on the instrument panel. Refer to paragraph 7.13.11.

7.9.2 Garmin Carbon Monoxide Detector

7.9.2.1 GCO 14 Description

The GCO 14 is a carbon monoxide sensor that provides CO level information to its host LRU. The host LRU uses this data to alert the pilot of potentially hazardous levels of CO. It monitors the CO levels in the aircraft with the GCO 14 carbon monoxide detector. It enables select Garmin avionics and flight displays to provide prompt alerting should CO exposure reach potentially harmful levels for cabin occupants.



7.9.2.2 How it Works

Avionics can provide both visual and aural alerts. CO typically enters the cockpit via a leak in the aircraft's exhaust or cabin heating systems. The GCO 14 detects CO, providing alerts if levels become a hazard to aircraft occupants. Visual alerts flash a "CO Level" or "CO" text readout on the display. An aural alert, "Carbon Monoxide," can also be triggered when the avionics are connected to an audio panel. To supplement preset alert thresholds, custom advisories can activate a CO message at pilot-selectable limits. It is compatible with the AXIS Flight Displays and GTN™ Xi navigators.

To view and verify the data from your Garmin GCO 14 on a GTN 650 (or GTN 650 Xi), you must check the dedicated Carbon Monoxide status page or data fields within the navigator's menu. Because the GCO 14 is a remote-mounted sensor with no physical buttons, you verify its operational status directly through the touchscreen interface using the following steps:

7.9.2.3 How to Check CO Status on the GTN 650

Method: The Utilities Menu (Full Status)

1. Press the Home key on the GTN 650.
2. Select the Utilities icon.
3. Select CO Detector.
4. This page will display the current carbon monoxide level in parts per million (ppm). If the sensor is operating normally, it will typically read 0 ppm in a clean cabin.

Automatic Power-On Self-Test (POST): Every time the avionics master switch is turned on and your GTN 650, G3X Touch or Axis boots up, the GCO 14 runs an automated internal hardware and circuitry test. If it detects a fault, it instantly throws a "CO DETECT FAIL" or "CO FAIL" system message.

7.9.2.4 Alerting Criteria

CO alerts are provided at predetermined thresholds. Users can set both the PPM and "alert after" time for custom advisories. If the unit fails to communicate or loses power, an error or fault message will be displayed on your integrated Garmin avionics

Concentration (PPM)	Alert After (minutes)
≤30	No Alert
>30	120
>50	60
>100	10
>300	No Delay



7.9.2.5 Procedure for CO Level Alert Detection

1. Monitor the CO concentration, the CO level on the Garmin display.
2. Turn OFF or reduce airflow from suspected sources of carbon monoxide, where applicable.
3. Cabin heat OFF; open fresh-air vents fully to maximize cabin airflow.
4. Use supplemental oxygen, if available.
5. Shut off or reduce airflow from possible CO sources.
6. If the CO indication clears, continue flight with all possible CO sources shut off and monitor the CO indication.
7. If the CO indication remains, land as soon as practicable or make an immediate emergency landing, as conditions warrant.

8. If any occupant experiences symptoms consistent with CO exposure, treat the situation as an emergency and land as soon as practicable.

7.9.3 EFIS System

The Garmin Axis multifunction "glass cockpit" instruments is the standard EFIS used by Sling Aircraft. This instrument incorporates a range of different instruments and functions. The full instrumentation provided by the EFIS will typically include:

Feature	Comment
Speeds	• ASI, IAS and TAS • Ground Speed
Altitude	• ALT • Height Above Ground *(Dependent on loaded maps)*
VSI	• Vertical Speed Indicator
Compass	-
Attitude Indicator	-
Turn Coordinator	-
G-meter	-
Time	• Clock and Stopwatch • Flight Time Recorder
Autopilot	• If servos are fitted
GPS Navigation	• Comprehensive mapping and navigation software and data, including GPS and GLS (GPS Landing System)
Engine Monitoring	• RPM Indicator • CHT and EGT Indicators • Coolant Temperature • Oil Temperature and Pressure Indicators • Fuel Level, Flow and Pressure Indicators • Hobbs and Flight Time Recorder • Voltmeter

The EFIS installed can be powered from two separate systems:

- Main Bus
  - Through the main EFIS switch, labelled “EFIS”
- Backup Battery
  - Through the selection switch, labelled “EFIS BKUP”
  - It is recommended that both the main and the backup switches are kept on during the operation of the aircraft. This will ensure that, if there is a power failure on the main bus, the EFIS will automatically change over to the backup battery.

NOTE

Use and set-up of the EFIS and its features extensively described in documentation supplied with the unit and will not be dealt with in this handbook. The autopilot functionality is incorporated in the EFIS.

WARNING

Users should desist from entering the EFIS setup pages during flight as changes to the setup may result in incorrect readings and/or warnings resulting in safety degradation.

In the event of a charge system failure:

- Switch the EFIS main switch off. This will allow the EFIS to switch over to (and be powered from) the EFIS back-up battery supply (provided that the EFIS battery back-up switch is on and the EFIS back-up battery contains adequate charge). Leaving the EFIS main switch on will cause the EFIS to be powered from the main battery (via the main bus), contributing (unnecessarily) to the discharge of the main battery.

- Set the EFIS screen brightness to the minimum acceptable for readability (to reduce current drain on the back-up battery).

7.10 Minimum Instruments and Equipment Required for Flight

The following minimum instrumentation and equipment is required for day VFR flight:

#	Item
1	Altimeter
2	Airspeed Indicator
3	Compass
4	Fuel Gauges
5	Oil Pressure Indicator
6	Oil Temperature Indicator
7	Cylinder Head Temperature Indicator
8	Outside Air Temperature Indicator
9	Tachometer
10	Chronometer
11	First Aid Kit *(Compliance with Local Regulations)*
12	Fire Extinguisher

NOTE

Additional equipment may be required to fulfill national or specific requirements and may be fitted.

WARNING

Notwithstanding that installed equipment may include GPS and other advanced flight and navigational aids, such equipment may only be used as the sole information source for purposes of navigation or flight, where permitted by law. The aircraft instrumentation is not certified and applicable regulations should be complied with at all times.

7.11 Engine

The Rotax 912 iS engine is a 4-stroke, 4-cylinder, horizontally opposed, spark ignition engine with one central camshaft-pushrod OHV and a displacement of 1352cc (1.35l / 82.5 cubic inch). The engine features liquid-cooled cylinder heads with air-cooled cylinders. The engine makes use of liquid-cooled cylinder heads with air-cooled cylinders. The lubrication system can be described as sump forced lubrication and the ignition makes use of dual contactless capacitor-discharge magneto type ignition system, that is ECU controlled. The engine is fitted with an electric starter motor, two AC alternators and two electric fuel pumps. The propeller is driven through a reduction gearbox, of ratio 2.43, and features an integrated shock absorber. The engine will continue to run after dual alternator failure for approximately 30 min. This is the operating time provided by the battery to run the fuel pumps and ECU.

See the manufacturer documentation and applicable supplements to this Pilot operating Handbook for applicable information should the airplane be fitted with a Rotax 914 UL, a Rotax 912 ULS, a Rotax 915 iS or a Rotax 916 iS engine.

7.12 Cooling system (914 UL / 912 ULS / 912 iS)

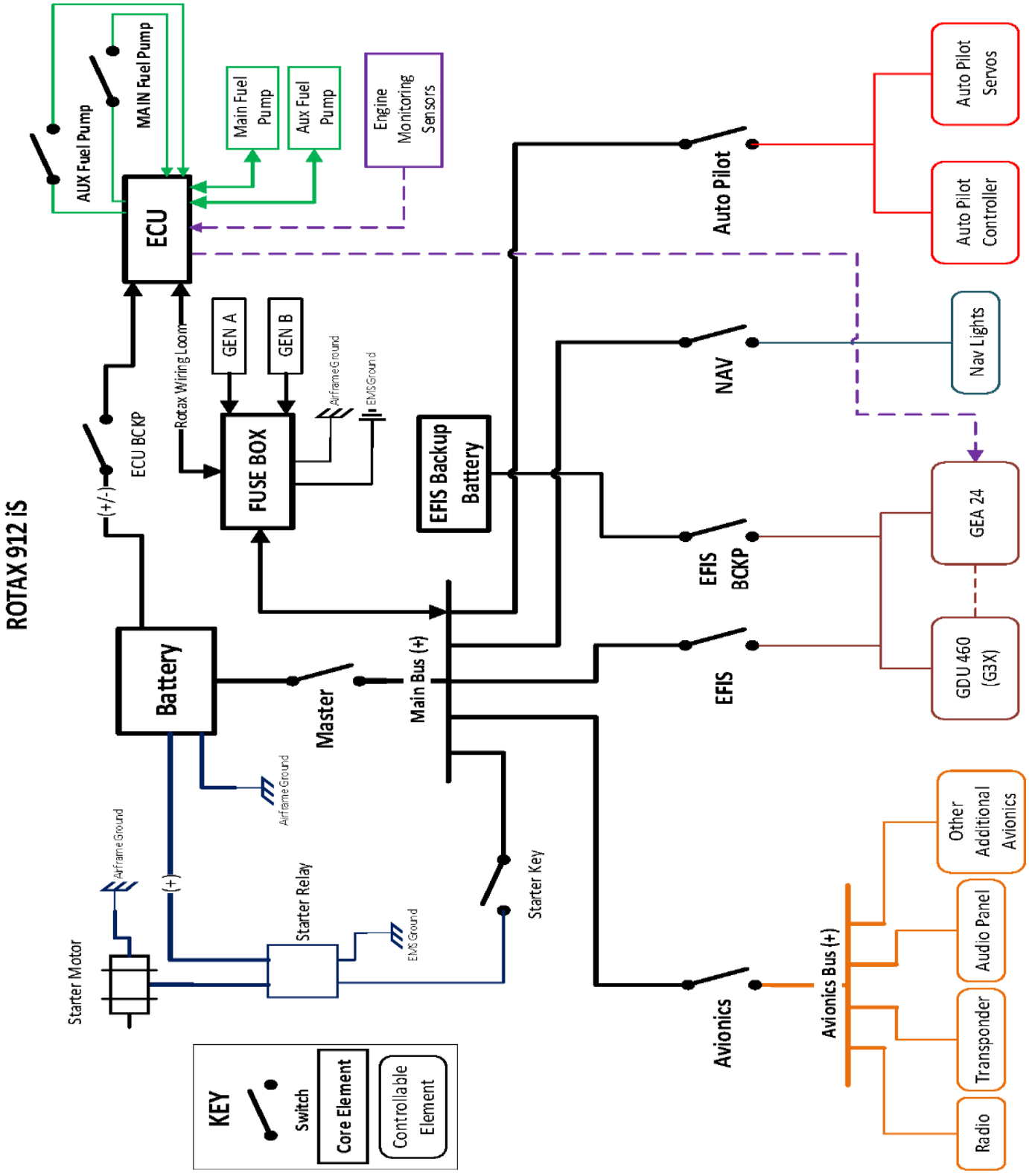
Cylinders are air-cooled, through forced air circulation from the inlets on the nose of the cowl, over cooling fins on the barrels.
Cylinder heads are liquid-cooled via a closed-circuit system, with an expansion tank. The pump is driven from the camshaft and circulates the coolant in the loop (cylinder heads/radiator).
The expansion tank is closed by a pressure cap. When the coolant temperature rises, there is a pressure increase and the coolant is forced into the overflow bottle, mounted to the firewall. When the coolant cools down, the coolant in the overflow bottle is drawn back into the expansion tank.
Conventional ethylene glycol coolant and distilled water mixture (1:1) may be used. Please refer to the latest edition of the engine manufacturers operators and maintenance manual. The coolant volume is approximately 2.5 litres (0.0.66 US Gal.)

WARNING

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

7.13 Electrical System

7.13.1 Broad Overview Diagram



7.13.2 Charge system

The alternating current (AC) output of the two generators (A and B) is passed through a rectifier, where it is converted to direct current (DC) for the aircraft systems. The charge system output is approximately 13.5 to 14V (from 1000 +/- 250 rpm and higher). When a third external generator is installed, the output is used to charge the battery through a breaker switch.

7.13.3 Main Battery

The 12 V main battery is mounted on the engine side of the firewall.

7.13.4 Main Bus

When power to the main bus is unavailable / fails the following equipment becomes non-operational:

#	Item
1	Autopilot (specifically, the servos)
2	Flaps
3	Radio
4	Transponder
5	Cabin Lights
6	Strobe, navigation, landing and taxi lights
7	EFIS (unless powered by the EFIS battery back-up)

7.13.5 EFIS Back-up Battery / Circuit

The 12 V EFIS back-up battery is mounted on the cabin side of the firewall, behind the instrument panel.

7.13.6 Master and Starter Switches

The master switch is a toggle switch located on the left side of the instrument panel. It links the main bust to the 12V battery / charge system. The starter switch is a key switch that is mounted on the left side of the instrument panel. It activates the starter motor.

7.13.7 Ignition Switches

Two ignition switches, one for each system, are located on the left-hand side of the panel. The switches are marked as 'LANE A' and 'Lane B', and are two separate ignition circuits.

NOTE

The engine ignition system is independent of the aircraft electrical system (except for starter motor operation) and will operate even with the master switch and / or any circuit breaker(s) off. 912 iS engine require adequate power supply to at least one electrical fuel pump to remain operational (to prevent fuel starvation).

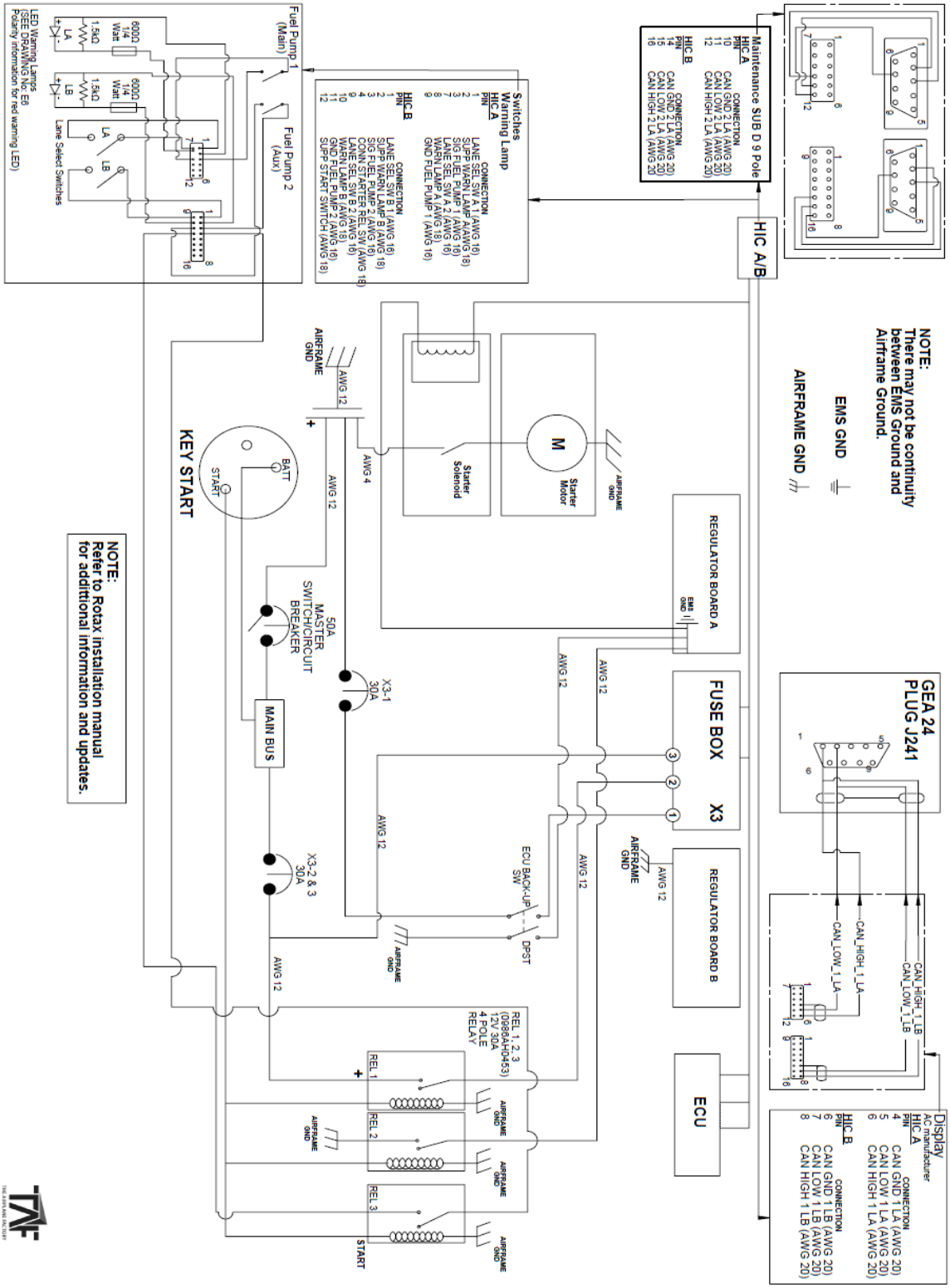
7.13.8 Electrical Equipment Switches

Lever type switches are used, and are ON in the UP position, and OFF in the DOWN position. There are exceptions to this, for instance, the taxi light switch is a three-way switch, i.e. ON-WIG WAG-OFF.

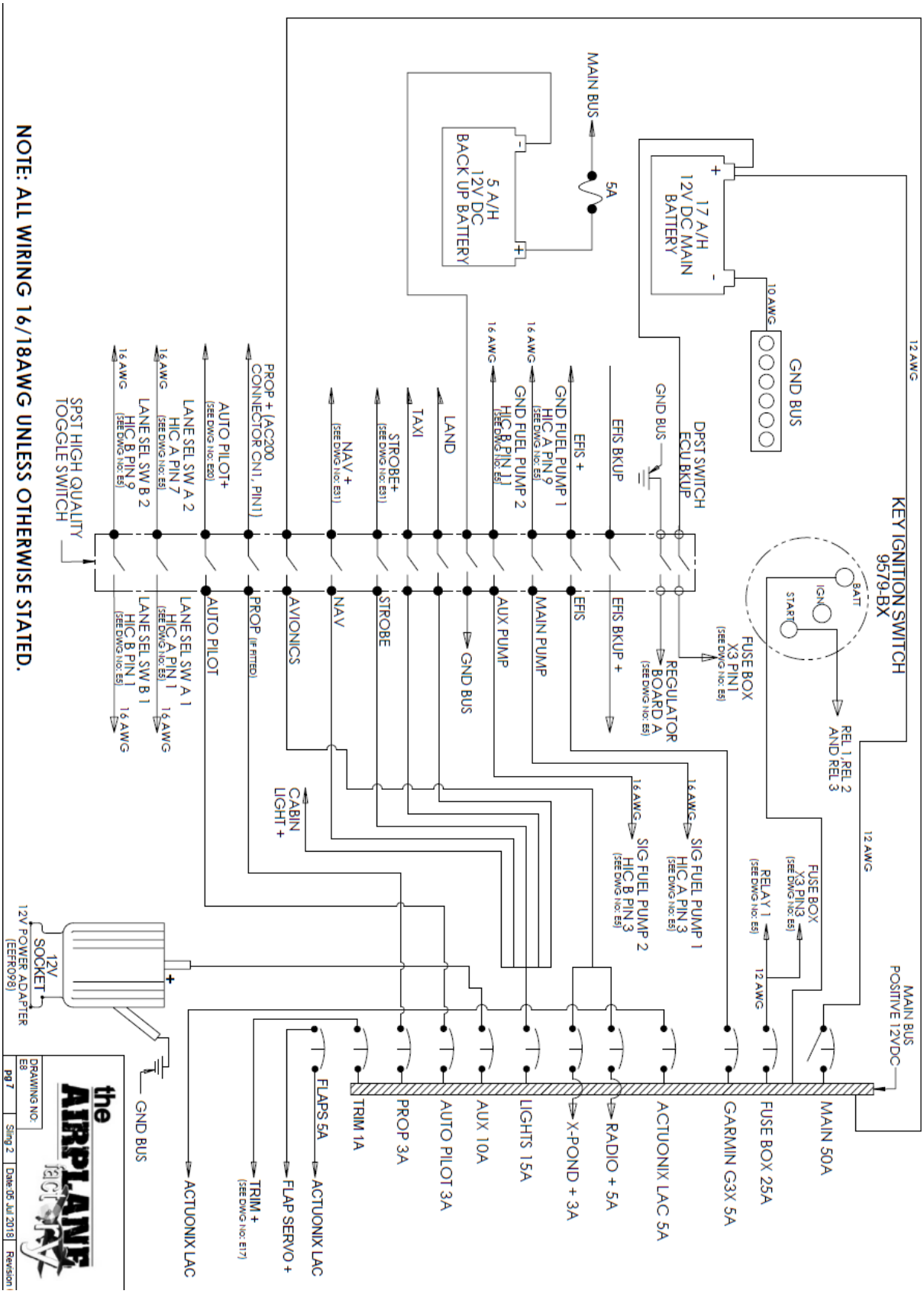
7.13.9 Circuit breakers

Circuit breakers are push-to-reset (i.e. push-in) for restoring / supplying electrical power to their corresponding electrical circuits. Circuit breakers are located on the instrument panel.

7.13.10 Charge system / start system / electric fuel pump wiring diagram (912 iS)

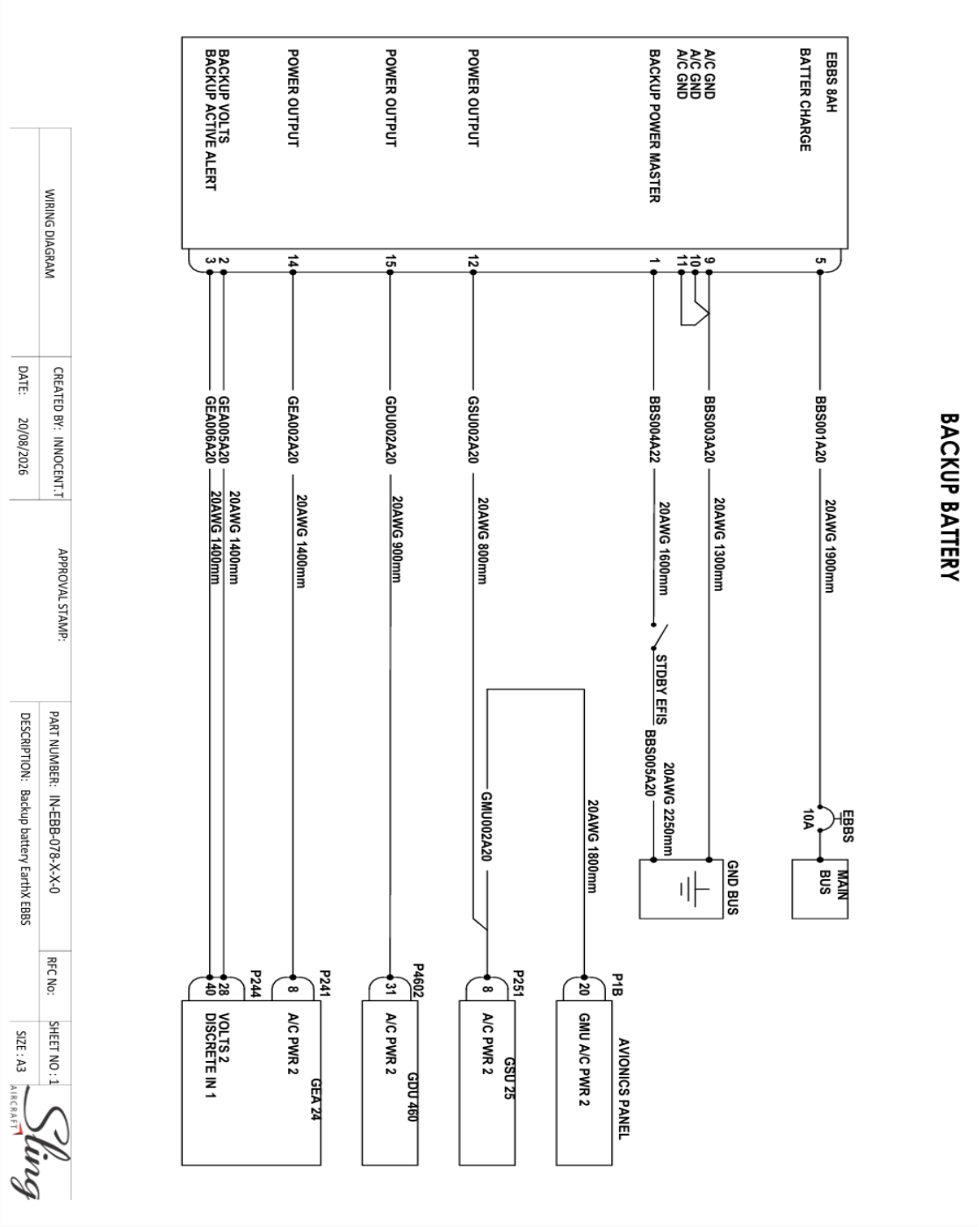


7.13.11 Switches and circuit breakers diagram (912 iS)



7.13.12 EarthX EBBS EFIS Back-Up Battery

7.13.12.1 Wiring Diagram (EarthX EBBS)



7.13.12.2 EBBS BMS (Battery Management System)

EarthX's integrated Battery Management System (BMS) continuously monitors bus voltage, cell voltage, pack voltage, current, and temperature to provide the following protective functions:

• Over-charging (over-voltage): The charge current is blocked above 15 volts; auto-reset when bus returns to < 15 volts. The discharge current (current out of battery) is unaffected in this situation.

• Over-discharge: If the battery cells are damaged because of severe over-discharge, the battery will not allow re-charging. The discharge current (current out of battery) is unaffected in this situation.

• Short-circuit/over-current: The current out of the battery is interrupted in the case of direct short or current demand > 14 amps; the internal breaker automatic resets after the fault are removed and device cools.

• High Temperature: Charging is halted above 85DegC.

• Cell Charge Level Imbalance: Internal circuitry works to equalize the charge level of the cells.

• Fault / Status: The fault LED output is active (active low level) when any of the following is true; high temperature (>75 °C), < 50% State of Charge (SoC), cell to cell charge level imbalance. The BMS was designed to Design Assurance Level (DAL), C (major).

Note: Failure to follow all application use, installation, charging, and storage instructions may result in battery damage and or thermal runaway! Never disassemble the battery or disable the built-in Battery Management System (BMS) under any circumstance.

7.13.12.3 Operation of the EBBS through its BMS

The purpose of the BMS is to protect the battery and provide warning indications when abnormal conditions occur. EBBS uses an integrated Battery Management System (BMS) that continuously monitors:

- Bus voltage
- Cell voltage
- Battery pack voltage
- Current
- Temperature

7.13.12.4 EBBS Warning Indication / Fault Condition

When a BMS fault/status condition is present:

- The fault output becomes active.
- The LED output can be used to alert the pilot or connect to an EFIS annunciation input.

The BMS fault output will become active when a fault condition exists. The pilot or avionics system will monitor the LED/fault output to indicate an abnormal condition. In short, the EarthX EBBS BMS does not simply monitor the battery, it actively protects against over-voltage, over-current, and over-temperature, while providing warnings through the Fault/Status output and external LED output so the pilot can identify abnormal battery conditions before they become critical.

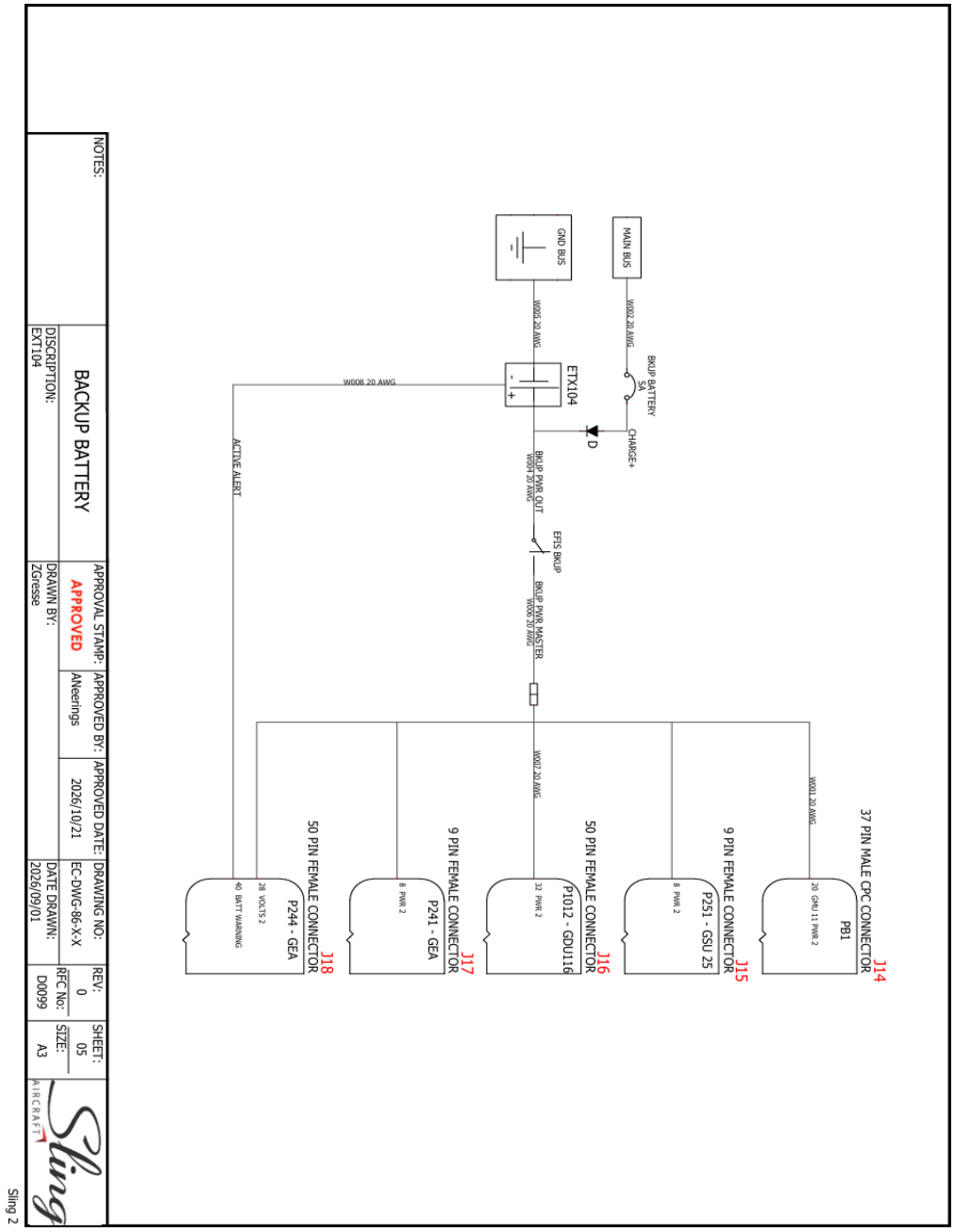
7.13.12.5 EBBS Warnings and Recommended Action.

LED Light	Voltage	Possible Cause	Recommended Action
Solid Light	Less than 12.7V	Battery over-discharged due to faulty charging system (alternator) not charging the battery.	Charge the battery with the EarthX supplied charger. Verify aircraft charging system is functioning.
Solid Light	12.5V - 14.5V	Weak or failing cell	Charge the battery with an approved charger and observe the fault LED. If the LED persists after another flight, charge the battery a second time. If the LED fault persists for several consecutive flights, replace the battery.
Solid Light	Greater than 15V	Over-charging due to faulty charging system regulator	Verify aircraft charging system is functioning properly. Inspect the voltage regulator and/or over-voltage protection device.
Solid Light	Any Voltage	BMS electronics issue	Isolate the battery from the aircraft (disconnect cable). If the fault is not clear, replace the battery.
Off; no output power (resets automatically)	Any Voltage	Short-circuit protection activated	Turn off the "Master Backup Enable" switch or remove load for 30 seconds. Internal fuse resets automatically. Verify connected loads are within specification.

Solid Light	Any Voltage	Battery temperature very high (>85°C / 185°F); warm to the touch	Allow the battery to cool before charging. Relocate the battery to a cooler environment.

7.13.13 EarthX ETX104 EFIS Back-Up Battery

7.13.13.1 Wiring Diagram (EarthX ETX104)



7.13.13.2 ETX104 BMS (Battery Management System)

EarthX's integrated Battery Management System (BMS) continuously monitors bus voltage, cell voltage, pack voltage, current, and temperature to provide the following protective functions:

• Over-charging (over-voltage): The charge current is blocked above 15 volts; auto-reset when bus returns to < 15 volts. The discharge current (current out of battery) is unaffected in this situation.

• Over-discharge: If the battery cells are damaged because of severe over-discharge, the battery will not allow re-charging. The discharge current (current out of battery) is unaffected in this situation.

• Short-circuit/over-current: The current out of the battery is interrupted in the case of direct short or current demand > 14 amps; the internal breaker automatic resets after the fault are removed and device cools.

• High Temperature: Charging is halted above 85DegC.

• Cell Charge Level Imbalance: Internal circuitry works to equalize the charge level of the cells.

• Fault / Status: The fault LED output is active (active low level) when any of the following is true; high temperature (>75 °C), < 50% State of Charge (SoC), cell to cell charge level imbalance. The BMS was designed to Design Assurance Level (DAL), C (major).

Note: Failure to follow all application use, installation, charging, and storage instructions may result in battery damage and or thermal runaway! Never disassemble the battery or disable the built-in Battery Management System (BMS) under any circumstance.

7.13.13.3 Operation of the ETX104 through its BMS

The purpose of the BMS is to protect the battery and provide warning indications when abnormal conditions occur. ETX 104 uses an integrated Battery Management System (BMS) that continuously monitors:

- Bus voltage
- Cell voltage
- Battery pack voltage
- Current
- Temperature

7.13.13.4 ETX104 Warning indication / Fault Condition

When a BMS fault/status condition is present:

- The fault output becomes active.
- The LED output can be used to alert the pilot or connect to an EFIS annunciation input.

The BMS fault output can become active when a fault condition exists. The pilot or avionics system can monitor the LED/fault output to indicate an abnormal condition. In short, the EarthX ETX 104 BMS does not simply monitor the battery. It actively protects against over-voltage, over-current, and over-temperature, while providing warnings through the Fault/Status output and external LED output so the pilot can identify abnormal battery conditions before they become critical.

7.13.13.5 ETX104 Warnings and Recommended Action

LED Light	Voltage	Possible Cause	Recommended Action
Solid Light	Less than 12.7V	Battery over-discharged due to faulty charging system (alternator) not charging the battery.	Charge the battery with the EarthX supplied charger. Verify aircraft charging system is functioning.
Solid Light	12.5V - 14.5V	Weak or failing cell	Charge the battery with an approved charger and observe the fault LED. If the LED persists after another flight, charge the battery a second time. If the LED fault persists for several consecutive flights, replace the battery.
Solid Light	Greater than 15V	Over-charging due to faulty charging system regulator	Verify aircraft charging system is functioning properly. Inspect the voltage regulator and/or over-voltage protection device.
Solid Light	Any Voltage	BMS electronics issue	Isolate the battery from the aircraft (disconnect cable). If the fault is not clear, replace the battery.

Off; no output power (resets automatically)	Any Voltage	Short-circuit protection activated	Turn off the "Master Backup Enable" switch or remove load for 30 seconds. Internal fuse resets automatically. Verify connected loads are within specification.
Solid Light	Any Voltage	Battery temperature very high (>85°C / 185°F); warm to the touch	Allow the battery to cool before charging. Relocate the battery to a cooler environment.

7.14 Propeller

The propeller is a Warp Drive, 72-inch, composite, ground adjustable, 3 blade composite propeller, a Whirlwind, 70-inch, composite, ground adjustable, 3-blade propeller or an Airmaster AP332/AP330, 72-inch, composite, electric constant speed, 3-blade propeller.

NOTE

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

See the manufacturer documentation and applicable supplements to this Pilot operating Handbook for applicable information should the airplane be fitted with the Airmaster AP332/AP330, the Airmaster AP430/431, the DUC Inconel® FLASH, the DUC FlashBlack-3-R, the MTV-6-A/190-69 or the MTV-6-R/190-69 propeller.

7.15 Fuel system

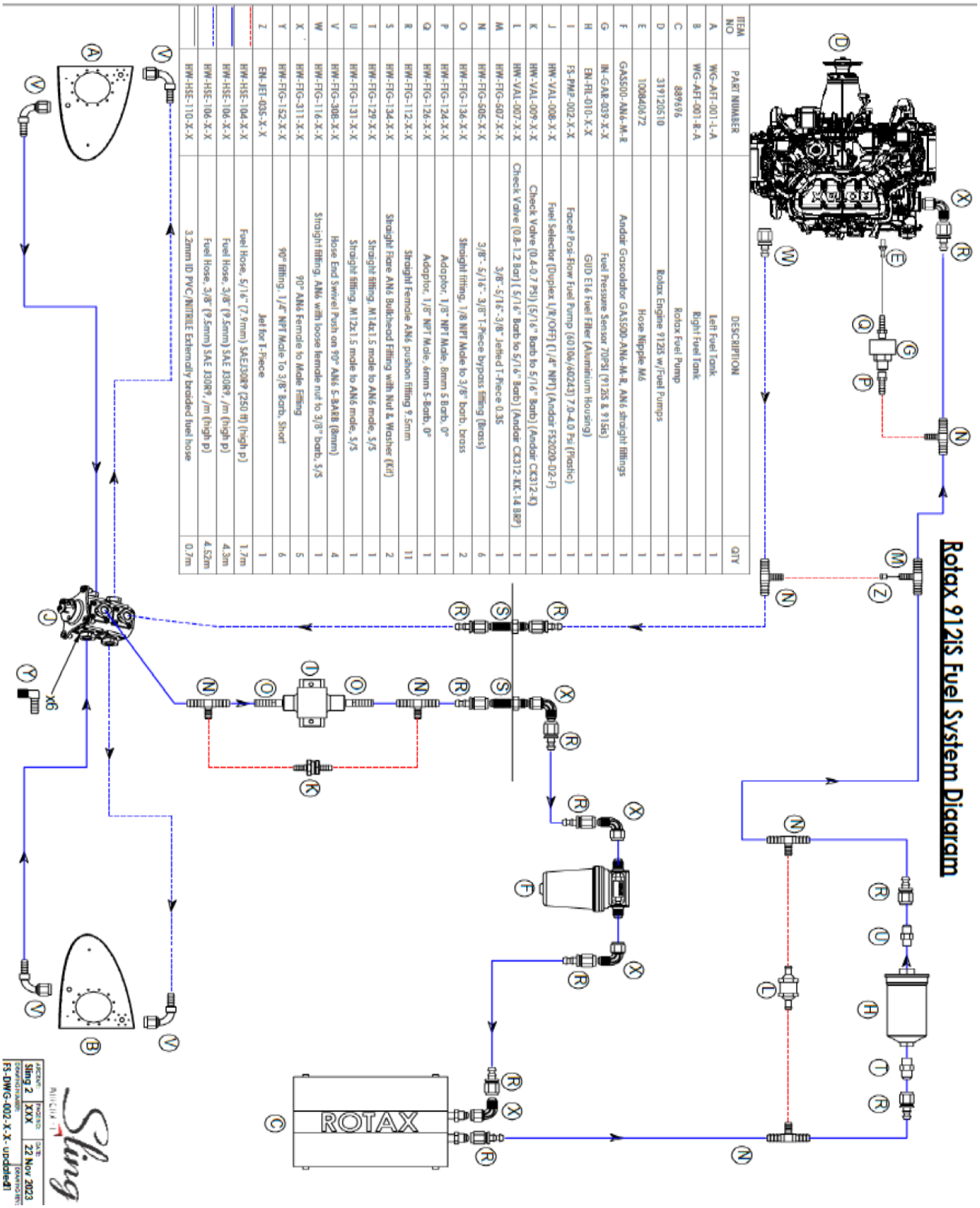
The aircraft makes use of a fuel tank located in the leading edge of each wing. The tank is equipped with a vent at the outside tank edge (underneath the wing) and a finger screen (at fuel pickup). A drain valve is located at the lowest point of the tank to collect possible contaminates, such as water. The tank outlet leads to the fuel selector valve, situated on the central console in the cockpit. From there, it flows through a feed pump and then through a gascolator. From there, it leads through two electric fuel pumps and then through a fuel filter. After the fuel filter it leads through to the engine, past a fuel pressure sensor which is displayed on the EFIS. The fuel return is then routed back to the respective tank, which returns excess fuel supplied by the pumps and not used by the engine.

Volume of wing tanks: 2 x 75 litres (2 x 19.8 US gal), (73 litres / 19.2 US gal useable per tank).

WARNING

The fuel lift pipe in each 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 which is in use (i.e. wing with near empty tank 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.

A diagram of the fuel system can be found on the next page, with a key thereafter.



ITEM NO	PART NUMBER	DESCRIPTION	QTY
A	WG-AFT-001-L-A	Left Fuel Tank	1
B	WG-AFT-001-R-A	Right Fuel Tank	1
C	889496	Rotax Fuel Pump	1
D	3191205I0	Rotax Engine 912iS w/Fuel Pumps	1
E	1008404072	Hose Nipple M6	1
F	GAS500-AN6-M-R	Andair Gascolator GAS500-AN6-M-R, AN6 straight fittings	1
G	IN-GAR-039-X-X	Fuel Pressure Sensor 70PSI (91265 & 9156)	1
H	EN-FIL-010-X-X	GUD E16 Fuel Filter (Aluminium Housing)	1
I	FS-PMP-002-X-X	Facet Posi-Flow Fuel Pump (60106/60243) 7.0-4.0 Psi (Plastic)	1
J	HW-VAL-008-X-X	Fuel Selector (Duplex 1/R/OFF) (1/4" NPT) (Andair FS2020-02-F)	1
K	HW-VAL-009-X-X	Check Valve (0.4-0.7 PSI) (5/16" Barb to 5/16" Barb) (Andair CK312-4)	1
L	HW-VAL-007-X-X	Check Valve (0.8-1.2 Bar) (5/16" Barb to 5/16" Barb) (Andair CK312-XX-14 BRP)	1
M	HW-FIG-507-X-X	3/8"-5/16"-3/8" Jetted T-Piece 0.35	1
N	HW-FIG-505-X-X	3/8" - 5/16" - 3/8" T-Piece Bypass fitting (Brass)	6
O	HW-FIG-136-X-X	Straight fitting, 1/8 NPT Male to 3/8" barb, brass	2
P	HW-FIG-124-X-X	Adaptor, 1/8" NPT Male, 8mm S Barb, 0°	1
Q	HW-FIG-126-X-X	Adaptor, 1/8" NPT Male, 6mm S Barb, 0°	1
R	HW-FIG-112-X-X	Straight Ferrule AN6 pushon fitting 9.5mm	11
S	HW-FIG-134-X-X	Straight Flare AN6 Bulkhead Fitting with Nut & Washer (Kit)	2
T	HW-FIG-129-X-X	Straight fitting, M14x1.5 male to AN6 male, S/S	1
U	HW-FIG-131-X-X	Straight fitting, M12x1.5 male to AN6 male, S/S	1
V	HW-FIG-308-X-X	Hose End Swivel Push on 90° AN6 S-BARB (8mm)	4
W	HW-FIG-116-X-X	Straight fitting, AN6 with loose ferrule nut to 3/8" barb, S/S	1
X	HW-FIG-311-X-X	90° AN6 Ferrule to Male Fitting	5
Y	HW-FIG-152-X-X	90° fitting, 1/4" NPT Male To 3/8" Barb, Short	6
Z	EN-JET-035-X-X	Jet for T-Piece	1
	HW-HSE-104-X-X	Fuel Hose, 5/16" (7.9mm) SAEJ30R9 (250 ftl) (high p)	1.7m
	HW-HSE-106-X-X	Fuel Hose, 3/8" (9.5mm) SAE J30R9, /m (high p)	4.3m
	HW-HSE-106-X-X	Fuel Hose, 3/8" (9.5mm) SAE J30R9, /m (high p)	4.52m
	HW-HSE-110-X-X	3.2mm ID PVC/NITRILE Externally braided fuel hose	0.7m

AIRCRAFT:	Sling 2
PROJECT:	XXX
DRAWING NUMBER:	FS-DWG-002-X-X - updated1
DATE:	22 Nov 2023
DRAWING REV:	

Fuel System Diagram Key – 912 iS			
A	Left Fuel Tank	N	3/8”-5/16”-3/8” T-Piece bypass fitting
B	Right Fuel Tank	O	Straight fitting, 1/8”NPT male to 3/8” barb
C	Rotax fuel pump	P	Adaptor, 1/8” NPT male, 8mm
D	Rotax engine 912 iS	Q	Adaptor, 1/8” NPT male, 6mm
E	M6 Hose Nipple	R	AN6 push on fitting, female
F	Andair gascolator	S	AN6 bulkhead fitting
G	Fuel Pressure Sensor (70 PSI)	T	Straight fitting, M14 to AN6
H	GUD E16 Fuel Filter	U	Straight fitting M12 to AN6
I	Feed pump	V	90° AN6 hose end swivel
J	Fuel selector	W	Straight fitting, AN6 nut to 3/8” barb
K	Check valve (0.4-0.7 PSI)	X	90° AN6 female to male fitting
L	Check valve (0.8-1.2 Bar)	Y	90° fitting, 1/4” to 3/8” barb
M	3/8”-5/16”-3/8” Jetted T-Piece	Z	Jet for T-Piece

7.15.1 Main and Auxiliary Fuel Pumps

The main and auxiliary fuel pumps are powered via the EMS/ECU. As long as power is available to the EMS/ECU, both fuel pumps can be selected/operated, irrespective of the master switch status. The feed pump is powered via the main battery and will only receive power if the master switch is on. The main pump and feed pump are wired to the same switch. This means when the main pump is switched on, the feed pump will turn on as well, if the master switch is on.

WARNING

At least one fuel pump must be operational at all times during flight for the engine to be operational. With no pump operational, engine stoppage will occur due to fuel starvation.

NOTICE

Use only the correct fuel for the specific climate zones.

There is a risk of vapor lock formation if winter fuel is used for summer operation. So, use summer blend fuels only in summer and winter blend fuels must only be used in winter conditions.

RECOMMENDATION

In particularly hot ambient weather (higher than 25 degrees Celsius), it is recommended that either pure AVGAS or an AVGAS/MOGAS mixture having at least 50% AVGAS be used in order to reduce the possibility of percolation or vapor lock forming in the fuel system of aircraft.

7.16 Lubrication System

This information is relevant for the 912 iS. For information regarding the 912 ULS, please see the appendix at the back of this manual.

The engine is provided with a dry sump forced lubrication system with a camshaft driven pump, with an integrated pressure regulator. The pump delivers oil from the oil reservoir, through an oil cooler and oil filter to points of lubrication.

Surplus oil emerging from the points of lubrication gather at the bottom of the crankcase from where it is forced back to the oil reservoir by piston blow-by gasses.

Oil temperature is sensed by a sensor located on the crankcase.

The lubrication circuit is vented at the oil reservoir. The oil reservoir is mounted on the firewall.

The lubrication system has an approximate volume of 3.5 litres (3.7 Quarts/7.4 pints).

Refer to the latest revision of the applicable Rotax engine and operator manuals and the latest revision of the applicable Rotax service bulletins.

7.17 Autopilot System

The autopilot system is integrated into / with the EFIS unit and the Autopilot Control Panel (GMC507), if fitted.
Please refer to the latest revisions of the Garmin Axis Installation manual for detailed instructions on autopilot operation and functionality.

The EFIS / autopilot inputs data from an electronic compass and AHRS, and controls two servos (one for pitch and one for roll) linked to the aircraft control system.

Power to the servos is controlled via a switch labeled AUTOPILOT, located on the instrument panel. This switch must be on for the autopilot to have any effect.

The autopilot can be engaged by:

- The autopilot engage / disengage button on the control stick(s)
- Via the EFIS keypad.
- Through the autopilot control panel.

The autopilot can be disengaged by:

- The autopilot engage / disengage button on the control stick(s)
- Via the EFIS keypad.
- A servo reports (to the autopilot / EFIS) a slipping clutch or torque overdrive for 1 second, i.e. the pilot overrides the autopilot via mechanical force on the control stick.
- Removing power to the autopilot servos (switching off the AUTOPILOT switch), effectively removing the EFIS / autopilot's control / actuation of the servo motors.

7.18 Position, Anti-Collision, Taxi and Landing Lights

The aircraft is equipped with a landing light and taxi light in the leading edge of the wing. The standard option is left wing only, with an optional extra for left and right wing. The requirement for this option depends on the judicial region's requirements. The control of these lights is through switches labelled (LAND) and (TAXI). With the dual light option, the TAXI switch is a three-way switch controlling
ON-WIG WAG-OFF.

Combination navigation / position lights (red, green and white) and anti-collision lights (white) are fitted to the wing tips, in the standard configuration (red left, green right). A combination position / anti-collision strobe light (white) is fitted underneath the vertical stabilizer.

The white light on the empennage is a dual function light that can either be on continuously (position light), flash (strobe light) or flash at a higher brightness level superimposed on continuous operation (i.e. combination position and anti-collision / strobe light).

The method of control of all lights is shown in the table below:

Switch	**Light Element**				
	Landing	Taxi	Red / Green Wingtips	White Wingtips	White Empennage
TAXI		ON			
WIG-WAG		ON *(Flashing)*			
LAND	ON				
NAV			ON		ON *(Steady)*
STROBE				ON *(Flashing)*	ON *(Flashing)*

8 AIRPLANE GROUND HANDLING AND SERVICING

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8.2 Servicing fuel, oil and coolant 8-2
8.3 Grounding during refueling 8-2
8.4 Ground Handling 8-3
8.5 Servicing 8-8
8.6 Cleaning and care 8-10

8.1 Introduction

This section contains factory-recommended procedures for proper ground handling and servicing of the aircraft. It also identifies certain inspection and maintenance requirements, which should be followed at all times. Full details for servicing and maintenance appear in the aircraft maintenance manual. This document does not replace the maintenance manual. Reference should always be made to the maintenance manual.

8.2 Servicing fuel, oil and coolant

Refer to the appropriate chapters in the Rotax engine maintenance and operator manuals and the Sling 2 Aircraft Maintenance Manual.

8.3 Grounding during refueling

Before refueling, the aircraft should be grounded using an unpainted metal surface, such as the exhaust, to ensure a proper grounding/bonding connection. The bonding connection shall be established before the fuel filler cap is opened and maintained throughout the refueling operation to prevent static electrical discharge. Refueling shall be carried out with the engine and electrical equipment switched off and away from sources of ignition. Do not commence or continue refueling if the bonding connection is not secure.

8.4 Ground Handling

8.4.1 Taxiing

When taxiing, it is important to use all controls at their minimum to achieve what is required, such as the throttle and brakes. Speed must be kept to a minimum during all ground operations. Caution must be taken in windy conditions, and the following control inputs must be made, depending on wind direction (originating from):

Wind Direction ***(Originating from)***	**Control**	**Action**
Front	Elevator	Nose Down
Front Left	Elevator	Neutral
	Aileron	Roll Left
Front Right	Elevator	Neutral
	Aileron	Roll Right
Rear Left	Elevator	Nose Down
	Aileron	Roll Right
Rear Right	Elevator	Nose Down
	Aileron	Roll Left
Rear	Elevator	Nose Down

8.4.2 Towing

If you wish to move the aircraft on the ground, other than under its own power, it is best to pull/push the aircraft 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 pushed 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 backwards by putting pressure on the wing leading edges close to the root, directly on a rib, or on the horizontal stabilizer leading edge next to the root over a rib.

CAUTION

Avoid excessive pressure on the aircraft 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.

8.4.3 Tow Bar

The aircraft can be towed by making use of a tow bar that is hooked to the nose wheel of the aircraft. The aircraft can be steered by rotating the nose wheel through the tow bar. The nose wheel will reach its rotation limit when the pedal control stops become engaged. For installation of the tow bar refer to the Sling 2 Maintenance Manual.

WARNING

When steering the aircraft with the tow bar, care should be taken to not rotate the nose wheel too violently or too far. This could cause the rudder pedal stops to deform.

8.4.4 Parking

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

When parking for an extended period, cover the cockpit canopy, and possibly the whole aircraft, by means of a suitable tarpaulin.

When parking the aircraft outside, avoid parking for extended periods of time. Cover the panel/interior with a suitable cover or canopy cover to avoid degradation of the upholstery due to the sun.

8.4.5 Mooring

The aircraft should be tied down when parked outside the hangar. Mooring is necessary to protect the aircraft against possible damage caused by wind and gusts.
For this reason, the aircraft is equipped with mooring eyes located on the lower surfaces of the wings and one under the tail.

Mooring procedure:

1. Fuel Selector ..... OFF
2. Switches ..... ALL OFF
3. Master ..... OFF
4. Ignition / Lanes ..... OFF
5. Control Column ..... SECURE[(a)]
6. Air Vents ..... CLOSE
7. Canopy ..... CLOSE AND LOCK
8. Moor ..... THOUGH MOORING EYES[(b)]
9. Chocks ..... INSTALL

NOTE

a. Through use of a, for example, safety harness.
b. Typically, rope will be used to connect the aircrafts mooring eye, with a mooring eye fastened in the ground/concrete.

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 tarpaulin attached to the airframe.

8.4.6 Road Transporting

The aircraft may be transported after loading on a suitable, aircraft specific trailer, or a flatbed with suitable rigging. It is necessary to remove the wings before road transport. It is suggested that the wings should be securely stored in a cradle of some kind.

8.5 Servicing

8.5.1 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 rear fuselage section down above the bulkhead, the fuselage front section may be raised, and a support placed under the firewall. The same effect can be achieved by pushing down on the horizontal stabilizer as described under 8.4.2 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 of a large, flat surface to avoid damage to the under-fuselage skin. The wings should also be gently supported to prevent the aircraft from rolling as its weight shifts to the nose wheel.

- To lift a wing, push from underneath the wing at the main spar only, and use a support with a large surface area again. Do not attempt to lift the wing by placing force on the composite wingtip.

- A wheel can be lifted by either lifting the wing or jacking under the wheel strut where it meets the fuselage.

8.5.2 Aircraft Inspection/Servicing Periods

Periods of checks and contingent maintenance depend on operating conditions and the overall condition of the aircraft.
Inspections and servicing should be carried out according to (at least) the following periods:

After first flight	25 flight hours
Thereafter, whichever first	100 flight hours or annually
Please refer to the *latest revision* of the *maintenance manual* for the *aircraft, propeller,* and *engine* separately, as more specific service intervals may be required	

8.5.3 Aircraft Modifications and Repair

It is recommended that you contact the aircraft 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 aircraft/engine/propeller manufacturer.
If the aircraft's weight is affected by the modification, a new mass and balance calculation is necessary. This should be completed comprehensively and recorded in all relevant documentation.

8.5.4 Servicing Fuel, Oil and Coolant

This document makes a brief statement on these topics in Section 1.
Before carrying out any work, refer to the Rotax Maintenance and Operators Manual, along with the Sling 2 Aircraft Maintenance Manual.

8.6 Cleaning and care

Use efficient cleaning detergents to clean the aircraft, such as regular car wax or degreaser. Detergents with a wax coating will better preserve the paintwork of the aircraft. Oil spots on the aircraft surface ***(except for the canopy)*** may be cleaned with petrol/gasoline.

The canopy should only be cleaned by washing it with a sufficient quantity of lukewarm water and an adequate amount of compatible detergent. Use either a soft, clean cloth sponge or deerskin. Then use suitable dry polishers/soft cloth to clean the canopy.

Upholstery and covers may be removed from the cockpit, brushed and washed in lukewarm water, with an adequate quantity of detergents.

Dry the upholstery before refitting.

CAUTION

Never clean the canopy under dry conditions and **never** use petrol or chemical solvents.

CAUTION

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

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.

List of inserted supplements

Date	Suppl. No.	Title of inserted supplement
04/06/12	01/2010	Airplanes fitted with a Rotax 914 UL engine
04/06/12	02/2010	Airplanes fitted with a Magnum 601 Ballistic Parachute recovery system
04/06/12	03/2010	Airplanes fitted with an Airmaster AP332/AP330 Propeller
27/10/26	04/2012	Airplanes fitted with a Rotax 912 ULS engine
08/12/17	06/2017	Airplanes fitted with a tow hitch release mechanism.
05/06/19	06/2019	Front luggage compartment.
	02/2025	Airplanes fitted with a DUC 3-Blade Inconel Flash Propeller.
25/08/2025	08/2025	Airplanes fitted with a Rotax 915 iS engine.
25/08/2025	08/2025	Airplanes fitted with a Rotax 916 iS engine.

9.1 SUPPLEMENT 01/2010 – AIRPLANES FITTED WITH A ROTAX 914 UL ENGINE

This Supplement provides information relating to the operation of a Sling 2 aircraft fitted with a Rotax 914 UL engine.
This supplement must be contained in the Pilot Operating Handbook during operation of the airplane.

Information contained in this supplement adds to or replaces information from the standard Sling 2 Pilot Operating Handbook in regard only to the specific sections addressed herein. Limitations, procedures and information not addressed in this supplement remain as set out in the Sling 2 Pilot Operating Handbook.

Technical data on the Rotax 914 UL engine given in this supplement / manual is provided for information purposes and is subject to latest information / documentation as provided by the engine manufacturer.

The Rotax 914 UL engine is a 4-stroke, 4-cylinder, horizontally opposed, turbocharged spark ignition engine with one central camshaft-push-rod-OHV. The engine features liquid cooled cylinder heads with air cooled cylinders. It utilizes dry sump forced lubrication and has a dual contactless capacitor discharge ignition system. The engine is fitted with an electric starter, AC generator (alternator) and an electrical fuel pump. A back-up electrical fuel pump is also fitted. Propeller drive is via reduction gear with integrated shock absorber.

The engine will continue to run after an alternator / charge system failure, until the battery voltage is low (approximately 30 minutes if all ancillary equipment is switched off and provided that the battery is fully charged at the time of alternator / charge system failure). The engine will cease running due to fuel starvation (due to electrical pump(s) stopping) when the battery is depleted.

9.1.1 ROTAX 914 UL ENGINE OPERATING AND SPEED LIMITS

Always refer to latest edition / revision of the engine Operators Manual for latest information regarding operating limitations.

ENGINE START AND OPERATION TEMPERATURE LIMITS (914 UL)	
Maximum	50 °C (122 °F) (ambient temperature)
Minimum	-25 °C (-13 °F) (oil temperature)

ENGINE LOAD FACTOR (ACCELERATION) LIMITS	
Maximum	5 seconds at maximum -0.5 g.

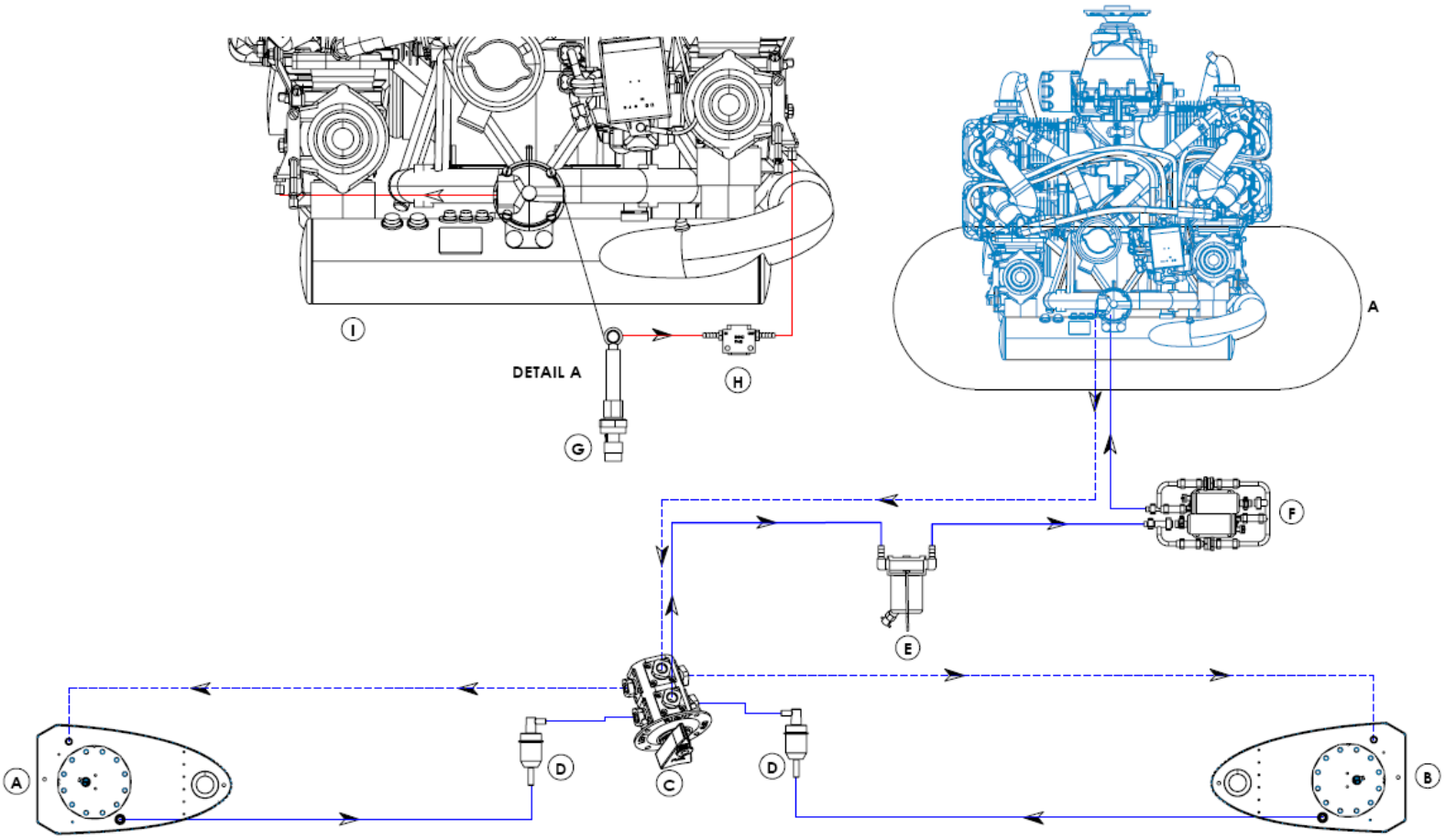
ENGINE OPERATING AND SPEED LIMITS				
Engine Model:			ROTAX 914 UL	
Engine Manufacturer:			BRP-Rotax GmbH & Co KG	
Power		Maximum take-off	85.76 kW (115 hp) at 5800 rpm, maximum 5 minutes	
		Maximum continuous	74.6 kW (100 hp) at 5500 rpm	
Engine RPM		Maximum take-off	5800 rpm (maximum 5 minutes)	
		Maximum continuous	5500 rpm	
		Idle	1 400 rpm (minimum)	
Temperature	EGT	Maximum	950 °C (1742 °F)	
	Cylinder head	Minimum	50 °C (122 °F)	
		Maximum	135 °C (275 °F).	
		Normal	90 to 110 °C (194 to 230 °F)	
	Oil	Minimum	50 °C (122 °F)	
		Maximum	130 °C (266 °F)	
		Normal	90 to 110 °C (194 to 230 °F)	
	Coolant	Minimum	50 °C (122 °F)	
		Maximum	120 °C (248 °F)	
		Normal	80 to 100 °C (175 to 210 °F)	
Pressure	Oil	minimum	0.8 Bar (12 psi) – below 3500 rpm	
		Maximum	7 bar (102 psi) - permissible for short period on cold engine start	
		Normal	2 to 5 bar (29 to 73 psi) - above 3500 rpm	
	Fuel	Minimum	1.15 bar (16.7 psi)	
		Maximum	1.85 bar (26.8 psi)	
	Manifold	Maximum take-off	1.35 bar (19.58 psi)	**NOTE** Overshoot of manifold pressure is allowed but has to stabilize within limits within 2 seconds.
		Maximum continuous	1.2 bar (17.4 psi)	

9.1.2 ROTAX 914 UL OPERATING FLUIDS

<table>
<tr><td colspan="4">FUEL (914 UL)
Minimum RON 95 / Minimum AKI 91</td></tr>
<tr><td rowspan="3">Grade</td><td colspan="2">MOGAS</td><td>DIN EN 228 Super, DIN EN 228 Super Plus, ASTM D4814.</td></tr>
<tr><td rowspan="2">AVGAS</td><td>Leaded</td><td>AVGAS 100LL ASTM D910.</td></tr>
<tr><td>Unleaded</td><td>UL91 ASTM D7547.</td></tr>
<tr><td colspan="4">ENGINE OIL (914 UL)</td></tr>
<tr><td>Grade</td><td colspan="3">Shell AeroShell Oil Sport Plus 4 with specification RON 424.
XPS Full Synthetic Aviation Engine Oil with specification RON 451.
(Refer to the latest revision of the engine operator’s manual for more)</td></tr>
<tr><td>Oil Viscosity</td><td colspan="3">SAE 10W-40 and SAE 5W-50</td></tr>
<tr><td colspan="4">COOLANT (914 UL)</td></tr>
<tr><td rowspan="2">Grade / type</td><td colspan="2">Waterless coolant based on propylene glycol applicable for engine S/N without suffix -01.</td><td rowspan="2">DO NOT MIX THESE TWO TYPES OF COOLANT.</td></tr>
<tr><td colspan="2">Conventional coolant based on ethylene glycol with 50% water content.</td></tr>
</table>

Refer to latest revision of Rotax operator / maintenance manuals and latest revision of Rotax service instruction SI-914-019 with regard to selection of operating fluids.

9.1.3 ROTAX 914 UL FUEL SYSTEM



A	Left fuel tank	F	TAF fuel pump system
B	Right fuel tank	G	Garmin fuel pressure sensor
C	Fuel selector (LEFT, RIGHT, OFF)	H	Fuel flow sensor
D	90° Fuel filter	I	914 UL Engine
E	Gascolator		
———	8mm Fuel hose SAE J30R7		
- - - - - -	8mm Fuel hose SAE J30R7 return		
———	Existing Rotax engine pipes		

Fuel feed is through two electric pumps. Each pump has a parallel installed check valve (NRV).

The fuel feed from the fuel pumps enters a fuel pressure controller mounted on the engine, where after it splits into two separate branches, one for each carburettor. A fuel pressure sensor is connected to one fuel pipe branch. A fuel flow sensor is connected in the one fuel pipe branch. The sensors are connected to the EFIS via the RDAC unit.

Fuel return lines return excess fuel supplied by the fuel pump(s) to the fuel tank in use.

Main fuel pump

The main fuel pump is connected to the main bus. The pump cannot be operated when power to the main bus is unavailable.

Auxiliary fuel pump

The auxiliary fuel pump is connected to the output of the charge system rectifier and via the charge relay to the main battery and main bus (as long as the main bus is powered (i.e. the master switch is on) and the charge relay is energised).

If the charge system fails the auxiliary fuel pump can be operated via power from the main bus, provided that the charge relay remains energised / is not failed, the master switch is on and there is no failure of the power supply to the main bus.

If power to the main bus is unavailable, or the charge relay fails, the charge system is disconnected from the main bus and battery. In this case the

auxiliary pump can be operated from the output of the charge system / rectifier, provided that the charge system remains operational.

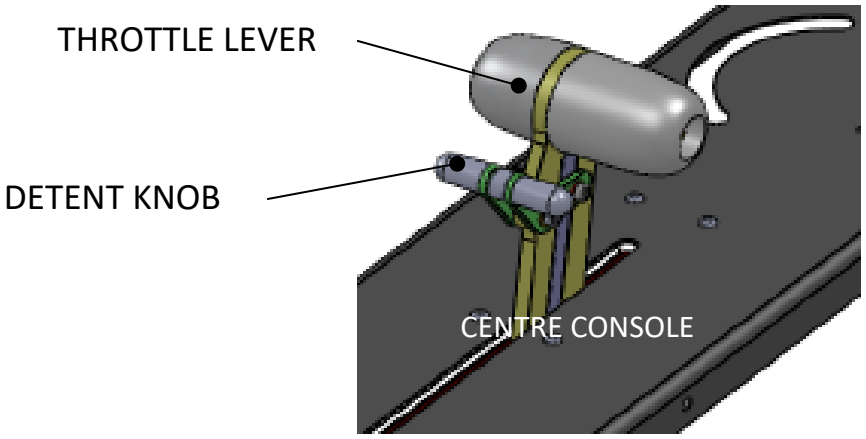
9.1.4 SUPPLEMENTARY INFORMATION - OPERATIONAL USE OF THE FUEL SYSTEM

WARNING

At least one fuel pump must be operational at all times during flight for the engine to be operational! With no pump operational engine stoppage will occur due to fuel starvation.

9.1.5 SUPPLEMENTARY INFORMATION - THROTTLE

The throttle lever incorporates a detent mechanism which stops the lever at the 100% throttle selection position. Moving the throttle lever past the 100% throttle selection requires the manipulation of a detent control / enabling knob located on the throttle lever. Operation of the throttle is related to turbocharger / boost control. Refer to **SUPPLEMENTARY INFORMATION – TURBOCHARGER CONTROL UNIT (TCU)** in this supplement.

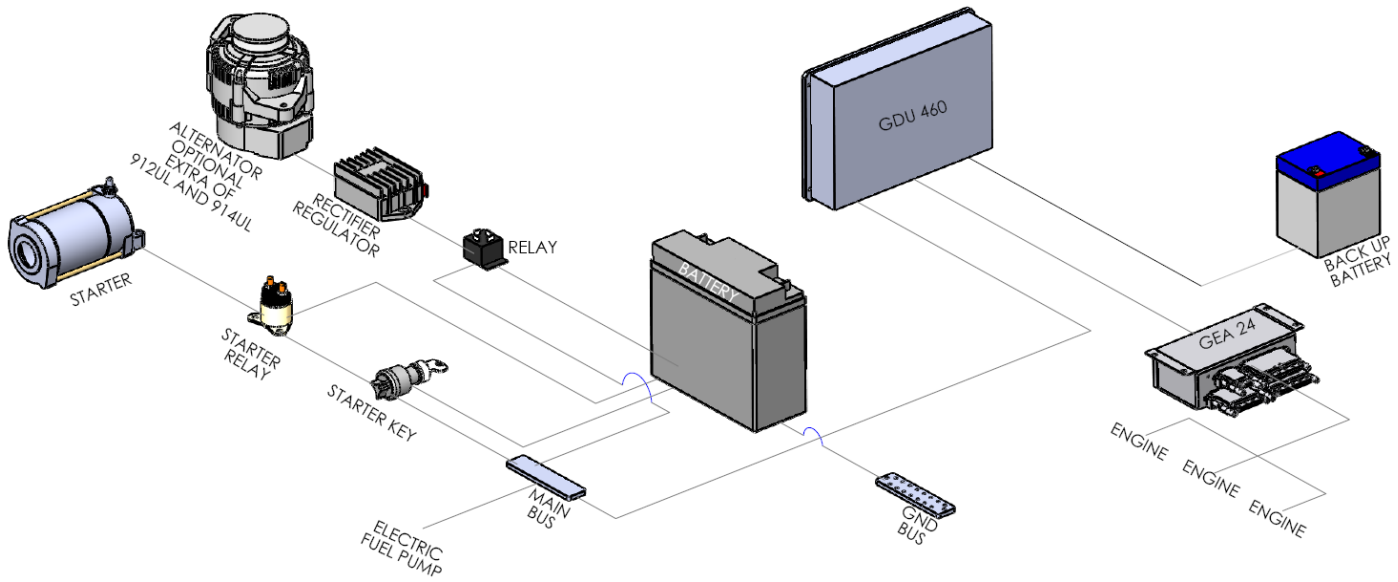


9.1.6 SUPPLEMENTARY INFORMATION – ELECTRICAL EQUIPMENT SELECTION / CONTROL SWITCHES

SWITCH / LABEL	FUNCTION	POSITION
MASTER / STARTER KEY SWITCH	Power disconnected from main bus	OFF
	Main bus connected to power	ON
	Engage starter motor	START
EFIS	Switch power (from main bus) to EFIS system on / off.	UP (ON) DOWN (OFF)
EFIS BKUP	Connects EFIS system to EFIS back-up battery supply.	
MAIN PUMP	Switch main fuel pump in / off.	
AUX PUMP	Switch auxiliary fuel pump on / off.	
LAND	Switch landing lights on / off.	
TAXI	Switch taxi lights on / off.	
NAV	Select position (navigation) lights.	
STROBE	Select anti-collision (strobe) lights.	
AVIONICS	Switch power to radio and transponder (if fitted) on / off.	
PROP (if fitted)	Switch power to propeller motor and controller on / off.	
AUTOPILOT	Switch power to autopilot servos on / off.	
MASTER	Switch power to main bus on / off.	
MAG A	Select Magneto A	
MAG B	Select Magneto B	

9.1.7 SUPPLEMENTARY INFORMATION – ELECTRICAL SYSTEM OVERVIEW

The drawing below provides an overview of the electrical system (914 UL equipped aircraft).



9.1.8 SUPPLEMENTARY INFORMATION – MAIN BUS

When power to the main bus is unavailable / fails the following equipment, in addition to those listed (and applicable) in paragraph 7.13 under **Main bus**, becomes non-operational:

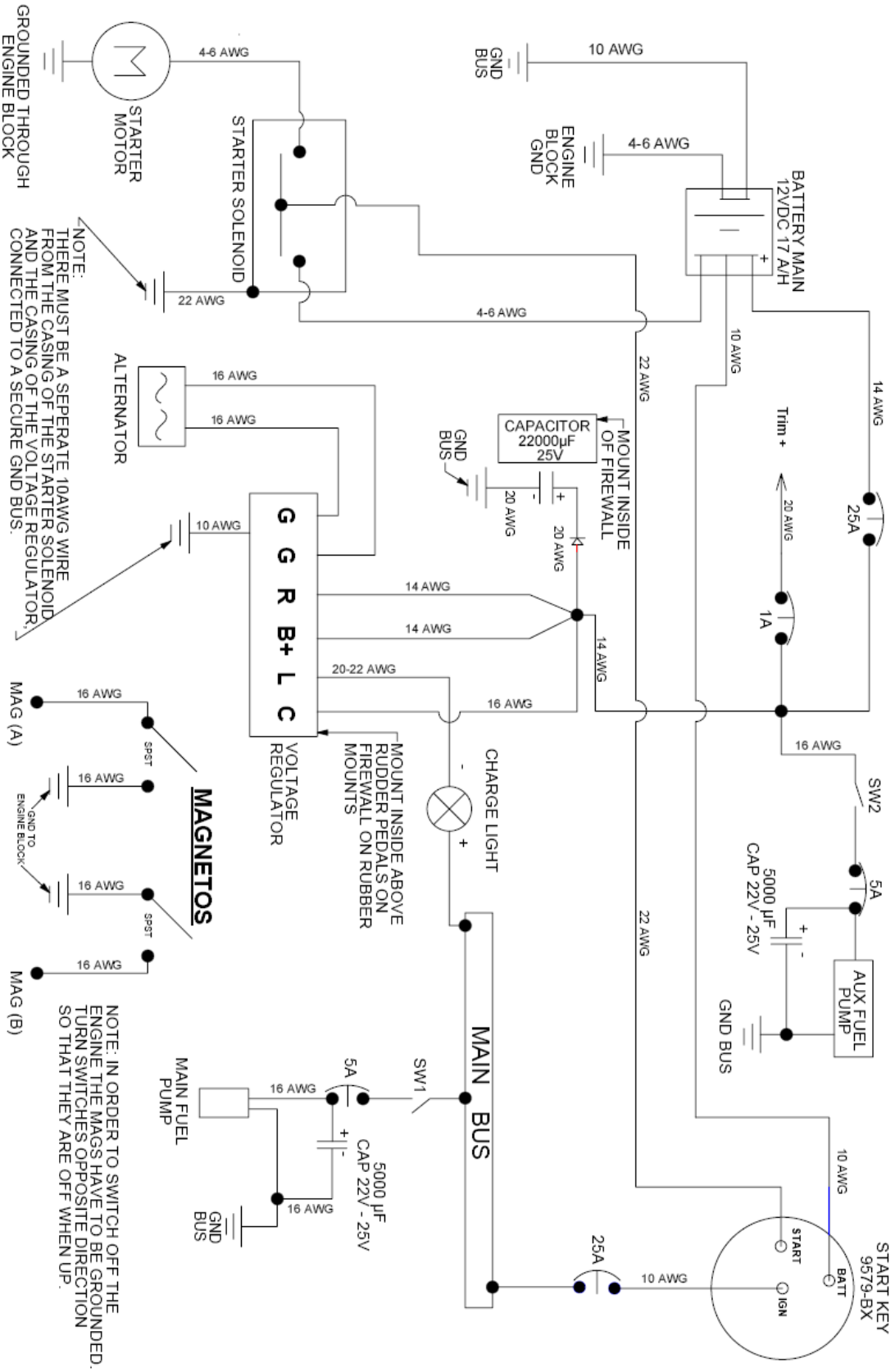
1. Main fuel pump.
2. TCU (Turbocharger Control Unit) / waste gate servo.

With regard to the above:

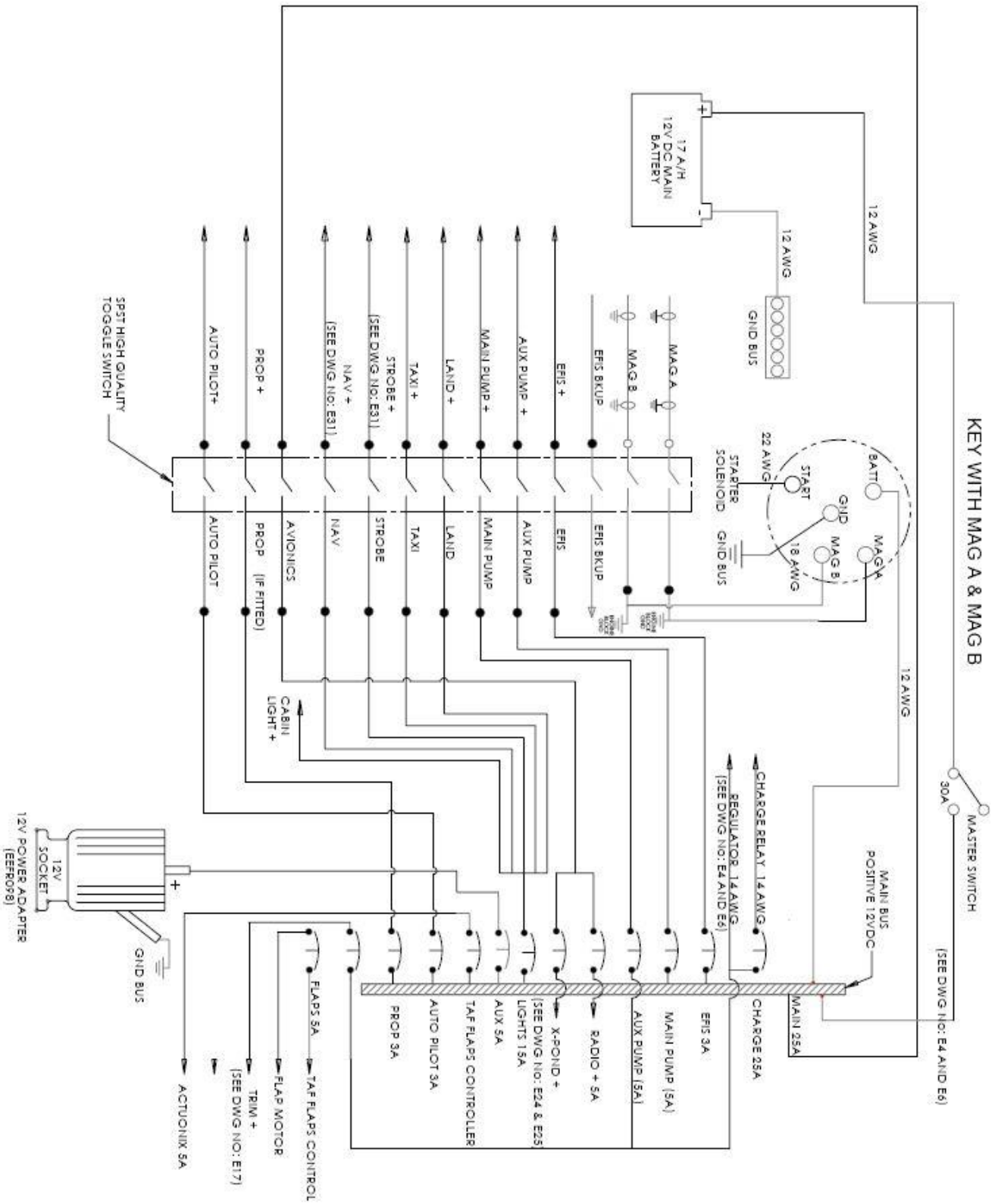
1. The auxiliary fuel pump can be operated via the charge system output, provided that the alternator / charge system remains operational.

2. With loss of power to the TCU, the waste gate servo is not powered and will remain in its last commanded position. Boost pressure control is not available and limited flight operation is applicable. Refer to **SUPPLEMENTARY INFORMATION – MAIN BUS POWER FAILURE** in this supplement.

CHARGE AND START SYSTEM WIRING DIAGRAM (914 UL)



SWITCHES AND CIRCUIT BREAKERS WIRING DIAGRAM (914 UL)



9.1.9 LUBRICATION SYSTEM

The engine is provided with a dry sump forced lubrication system with a camshaft driven main pump with integrated pressure regulator and additional suction pump. The main pump delivers oil from the oil reservoir, through an oil cooler (radiator) and oil filter to points of lubrication.

Surplus oil emerging from the points of lubrication gathers at the bottom of the crankcase from where it is forced back to the oil reservoir by a piston blow-by gas.

Oil temperature is sensed by a sensor located on the oil pump housing.

The lubrication circuit is vented at the oil reservoir. The oil reservoir is located on the firewall.

The turbocharger is supplied with oil via a separate oil line from the main pump. Return oil from the turbocharger is collected in a stainless-steel sump and is sucked back to the suction pump and then pumped back to the oil reservoir via a return line.

Refer to the latest revision / edition of the Rotax 914 UL engine operator and maintenance manuals.

The lubrication system volume is approximately 3.5 litres (7.4 pints).

9.1.10 SUPPLEMENTARY INFORMATION – TURBOCHARGER CONTROL UNIT (TCU)

The applicable sections in the Rotax 914 UL operator's manual should be carefully read conjunction with this section.

A throttle arm position sensor is mounted on one carburetor. The sensor measures (throttle) position linearly from 0% to 115%, corresponding to engine idle and engine full (100%) power respectively. The TCU (Turbocharger Control Unit) utilizes throttle position in conjunction with aircraft ambient pressure, airbox pressure, engine rpm and airbox temperature to actuate an electronically controlled flap (waste gate) to regulate the speed of the turbocharger / boost pressure in the engine airbox.

The TCU starts adding full boost from the 108% throttle position onward.

The throttle lever (in cabin) is equipped with a detent at the 100% throttle lever position. A lever on the throttle lever is activated to move the throttle lever past the detent position to allow movement up to the 115% throttle position. Note that 115% throttle position equates to 100% engine power (full take-off power).

Relationship between throttle position and engine power		
Throttle position	Engine power	
115%	100%	**Maximum 5 minutes!** (take-off power)
100%	85%	Maximum continuous power

NOTE

Throttle position from 108% to 110% result in a rapid rise in boost pressure. Avoid constant throttle settings in this range, as it may result in boost pressure control fluctuations (surging). To avoid unstable boost pressure the throttle should be moved smoothly through this range to full power (115% throttle position), or on a power reduction, to maximum continuous power (100% throttle position)

The TCU controls two indicator lights mounted on the instrument panel. When supply voltage is supplied to the TCU (master switch is switched on) the TCU is subjected to a self-test. Both the BOOST and CAUTION lights should illuminate for 1 to 2 seconds and then turn off. If not, this indicative of a deficiency and the engine should not be taken into operation before the problem has not been identified and rectified.

TCU LIGHT INDICATIONS			
POSSIBLE CAUSE	Maximum admissible boost pressure exceeded.	Full throttle (115%) operation exceeded maximum duration of 5 minutes.	Sensor failure, wiring failure, TCU failure, possible airbox leak.
BOOST LIGHT INDICATION	Illuminates steadily.	Blinks.	
CAUTION LIGHT INDICATION			Blinks.
NOTE	Boost pressure will not be reduced automatically. Limited operation as boost control may be unavailable or insufficient.	Boost pressure will not be reduced automatically.	Limited operation as boost control may be unavailable or insufficient.
ACTION	Use throttle lever to reduce boost pressure manually to within operating limits.	Use throttle lever to reduce boost pressure manually to within operating limits (at least maximum continuous values). The BOOST light resets when the throttle setting is below the 108% position for a minimum of 5 minutes.	Use throttle lever to reduce boost pressure manually to within operating limits.

When supply voltage to the TCU fails the waste gate servo (and thus the waste gate flap) will remain in its last commanded position. Boost pressure regulation is not available and limited flight operation is applicable.

9.1.11 SUPPLEMENTARY INFORMATION – FUEL CONSUMPTION

Take off performance (5 800 RPM)	33.0 l/hr	(8.7 US gal/hr)
Max continuous power (5 500 RPM)	27.2 l/hr	(7.2 US gal/hr)
75% continuous power (cruise)	20.4 l/hr	(5.4 US gal/hr)

Refer to the fuel consumption graphs and tables in the latest edition / revision of the Rotax 914 UL operator manual for up to date information.

9.1.12 SUPPLEMENTARY INFORMATION – ALTERNATOR / CHARGE SYSTEM FAILURE

Alternator failure is evidenced by the illumination of the (red) alternator / charge warning light. **Procedure as stated in the applicable Rotax Manual**

WARNING

The engine will continue to run after an alternator / charge system failure, until the battery voltage is low (approximately 30 minutes if all ancillary equipment is switched off and provided that the battery is fully charged at the time of alternator / charge system failure). The engine will cease running due to fuel starvation (due to stoppage of the fuel pump(s)) when the battery is depleted.

NOTE

As per the procedure in **paragraph 3.7.5** the auxiliary fuel pump is switched off / verified to be off to conserve battery charge. If required, the auxiliary pump can still be operated from the main bus provided that the master switch is on, there is no failure of power supply to the main bus and the charge relay remains energized / is not failed.

9.1.13 SUPPLEMENTARY INFORMATION – EMERGENCY AND ABNORMAL PROCEDURES - ENGINE IRREGULARITIES IN FLIGHT

Turbocharger Control Unit (TCU) lights indication

Refer to the table (**TCU LIGHT INDICATIONS**) relating TCU indicator light mode of indication to probable causes and suggested pilot action in **SUPPLEMENTARY INFORMATION – TURBOCHARGER CONTROL UNIT (TCU).**

NOTE

Refer to the applicable parts (**Caution Lamps**) of the section on **Abnormal Operation** in the Rotax 914 UL engine operator manual.

Sudden drop in boost pressure

Possible causes may be the turbocharger fracturing or the waste gate not closing.

Fractured turbocharger: A loud bang may be heard as a result of and indicating turbocharger fracture. Flight with reduced performance may be possible. Monitor oil pressure. Land as soon as possible.

Waste gate not closing: The TCU CAUTION light may be flashing, indicating equipment failure. Limited flight operation (waste gate not responding).

Sudden increase in boost pressure

A possible cause might be that the waste gate is fully closed. The TCU CAUTION light may be flashing, indicating equipment failure. The BOOST lamp will illuminate steadily when admissible boost pressure is exceeded.

Immediately reduce engine speed / rpm until boost pressure is within limits.

NOTE

Refer to the applicable parts of the section on **Abnormal Operation** in the Rotax 914 UL engine operator manual.

9.1.14 SUPPLEMENTARY INFORMATION – MAIN BUS POWER FAILURE

Refer to **SUPPLEMENTARY INFORMATION – MAIN BUS** in this supplement, for an overview of equipment affected by loss of power to the main bus.

1. Auxiliary fuel pump - on
2. Use the throttle lever to set / control engine speed and boost pressure to within operating limits (at least maximum continuous values).
3. Rest of procedure as in paragraph 3.7.6.

CAUTION

Power loss to the main bus will result in the main fuel pump stopping and the starter motor becoming unavailable / non-operational. If the engine is allowed to run dry and stop before switching over to the auxiliary fuel pump the engine will have to be restarted via airstream driven propeller rotation (windmilling).

The TCU and waste gate servo is not powered and automatic boost pressure control is not available.

9.1.15 SUPPLEMENTARY INFORMATION – PERFORMANCE

1. It should be noted that the performance of the aircraft will be altered through use of a 914 UL engine (instead of a 912 iS engine). In particular:

1.1. V_h will be increased from 116 KIAS to 125 KIAS.
1.2. The aircraft service ceiling will decrease to 15 000 ft.
1.3. Take-off run on concrete and grass will be 80 m (262.5 ft) and 100 m (328.1 ft) respectively.
1.4 Take-off distance (over 15 m (50 ft)) on concrete and grass will be 140 m (459.3 ft) and 160 m (524.9) respectively.
1.5. Rate of climb at 0, 3 000, 6 000 and 9 000 ft ISA will increase to 1 000, 900, 800 and 720 fpm respectively.
1.6. Cruise speeds will not be altered substantially, unless higher power settings are used.

2. Reference should be made to the latest revision / edition of the Operators Manual of the Rotax 914UL engine for engine operating speeds and limits. Reference should also be made to the Operators Manual of the Rotax 914 UL engine for operational guidelines and instructions. These should be incorporated into the normal or emergency procedures as applicable.

3. Reference should also be made to the latest revision of Rotax service instruction SI-914-019 with regard to the use and selection of operating fluids (fuel, oil and coolant).

9.1.16 SUPPLEMENTARY INFORMATION – ENGINE START

When system voltage is applied (Master switch is switched on) both TCU lights should illuminate for approximately 1 to 2 seconds (TCU self-test) and then extinguish. If not, it indicates a deficiency (refer to Rotax 914 maintenance manuals).

WARNING
Do not take the engine into operation before having rectified the cause of the deficiency.

Procedure as in 4.5.3.

9.2 SUPPLEMENT 02/2010 – AIRPLANES FITTED WITH A MAGNUM 601 BALLISTIC PARACHUTE

This supplement must be contained in the Pilot Operating Handbook during operation of the airplane.

Information contained in this Supplement adds to or replaces information from the standards Pilot Operating Handbook in regard only to the specific sections addressed herein. Limitations, procedures and information not addressed in this Supplement remain as set out in the Pilots Operating Handbook.

This supplement provides information necessary for the operation of an aircraft fitted with a Magnum 601 ballistic parachute.

1. The Sling 2 is designed specifically for convenient fitment of a Magnum 601 ballistic parachute recovery system. The system is designed to enable the pilot or passenger to deploy the parachute in case of emergency in such a manner that the aircraft structure is carried under the parachute to the ground, on the basis that the occupants will not be injured, and the aircraft structure suffers minimum damage.

3. Use of a ballistic parachute system involves inherent risks and the system should be properly understood by the pilot prior to use.

9.2.1 BALLISTIC PARACHUTE OPERATIONAL PARAMETERS

PARAMETER	
Limit speed	320 km.h^{-1} / 198.84 mph / 172.77 kt.
Deployment time (limit speed)	3 s.
Maximum supported mass	759 kg / 1673.31 lb.
Descend rate (maximum mass)	7 m.s^{-1}.

9.2.2 BALLISTIC PARACHUTE DEPLOYMENT

1. Observe ballistic parachute operational parameters.
2. Throttle - idle
3. Magneto / Lane switches – off
4. Electric fuel pump(s) - off
5. Fuel selector lever – off
6. Deploy the parachute by pulling the T-shaped activation handle (situated in the centre front) positively.
7. Master and avionics switch - as dictated by radio communication requirements - off before impact with ground.
8. Other electrical equipment switches - off

9.3 SUPPLEMENT 03/2010 – AIRPLANES FITTED WITH AN AIRMASTER AP332/AP330 PROPELLER

This supplement must be contained in the Pilot Operating Handbook during operation of the airplane.

Information contained in this supplement adds to or replaces information from the standard Pilot Operating Handbook in regard only to the specific sections addressed herein. Limitations, procedures and information not addressed in this supplement remain as set out in the Pilots Operating Handbook.

This supplement provides information necessary for the operation of an aircraft fitted with an Airmaster AP332/AP330 variable pitch (constant speed) propeller.

Propeller control is via an electronic control unit mounted on the instrument panel.

Power to the propeller / propeller controller is provided via the main bus and activated by a switch labeled PROP, located on the instrument panel. Refer to paragraph 7.13.11 (for 912 iS equipped aircraft) or to the wiring diagrams under **SWITCHES AND CIRCUIT** breakers in the applicable supplements (for 914 UL and 912 ULS equipped aircraft).

1. Fitment of an AP332/AP330 propeller to the aircraft will substantially improve aircraft performance relative to use of a fixed pitch propeller. General improvement will be witnessed, where the aircraft is fitted with a Rotax 912 ULS or 912 iS engine, in relation to:

1.1. V_h, which will be increased from 116 KIAS to 120 KIAS.

1.2. The aircraft service ceiling will decrease to 14 000 ft.
1.3. Take-off run distance on concrete and grass will be 100 m (328.1 ft) and 120 m (393.7 ft) respectively.
1.4 Take-off distance (over 15 m (50 ft)) on concrete and grass will be 160 m (524.93 ft) and 180 m (590.55) respectively.
1.5. Rates of climb at 0, 3 000, 6 000 and 9 000 ft ISA will increase to 900, 800, 700 and 600 fpm respectively.
1.6. Cruise speeds will not be altered substantially, unless higher power settings are used.
1.7. Fuel consumption will not be changed unless higher power settings are used.

2. Reference should be made to the Operators Manual for the Airmaster AP332/AP330 Propeller operational guidelines and instructions. These should be incorporated into the normal and emergency procedures for the aircraft as applicable.

9.3.1 SUPPLEMENTARY INFORMATION – PROPELLER CONTROL FAILURE

The propeller / propeller controller can fail in a variety of modes / ways. The pilot(s) should completely familiarize him or herself with the parts of the Airmaster propeller operator's manual which deals with **Emergency Operation** and **Failure Modes**.

The following immediate actions should be taken in the event of any propeller control failure:

1. If required, immediately reduce throttle to avoid exceeding engine speed limitations.

2. Select manual mode (MAN).
3. If manual control of the propeller pitch is still available:
   - Set propeller pitch and engine throttle to give desired power and engine speed combination.

CAUTION

Selection of too fine a propeller pitch for the engine throttle setting will result in an over-speed situation.

Selection of too coarse a propeller pitch may result in the engine being unable to maintain the desired engine speed, even at full throttle.

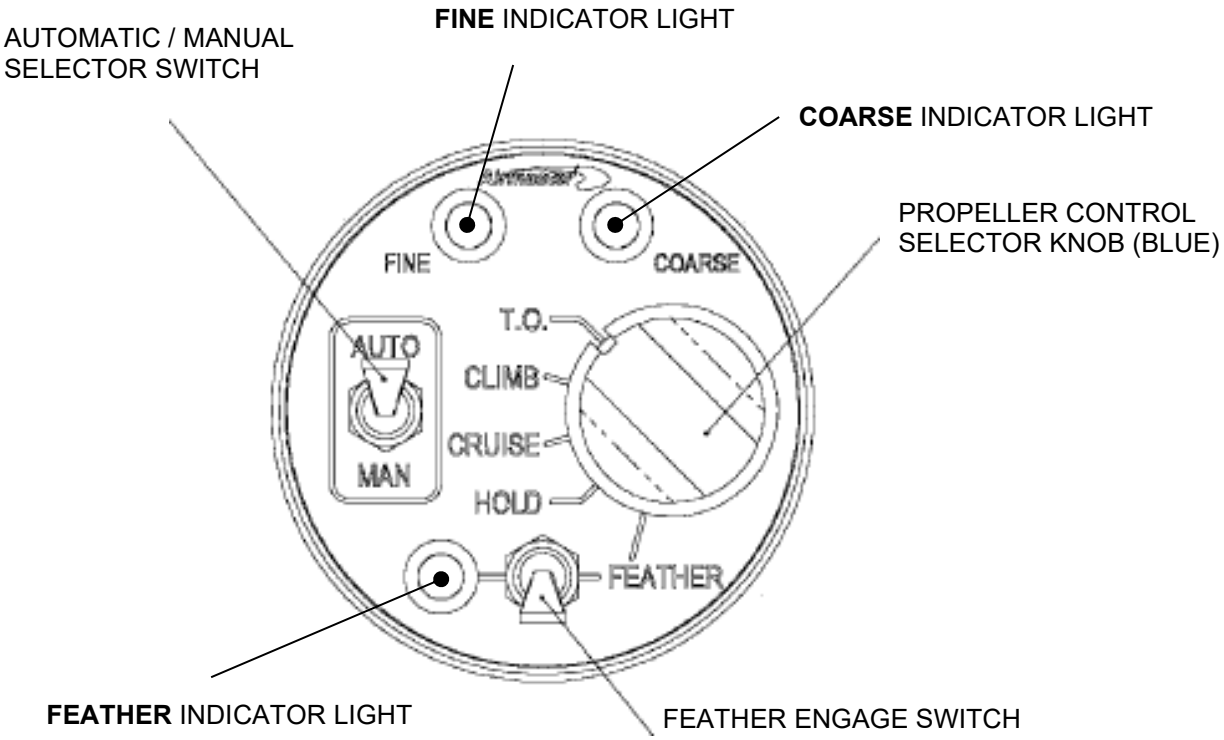
4. If manual control of the propeller pitch is not available:

   - If propeller control failed with the propeller pitch set inside the flight range, continued flight is possible, but with caution. Use the engine throttle to control engine / propeller speed, as with a fixed pitch propeller.
   - Propeller switch - off

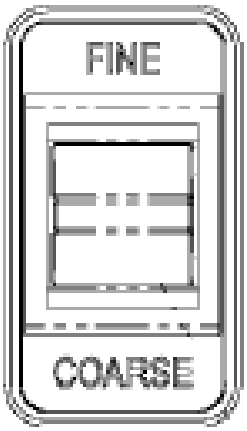
CAUTION

If failure occurred with propeller pitch set at any other pitch than the fine pitch limit, full power from the engine / propeller combination may not be available at low speeds. **Consideration should be given to this during approach and landing.**

9.3.2 SUPPLEMENTARY INFORMATION – PILOT CONTROLS - PROPELLER



PROPELLER CONTROLLER



MANUAL PROPELLER CONTROL SWITCH

Pilot operable controls related to the constant speed propeller system are the following:

- Power switch (labelled PROP), located on the instrument panel. This switch activates / deactivates the power supply to the propeller controller unit and to the propeller motor.

- Automatic / Manual Selector switch, located on the propeller controller. This switch selects between propeller automatic (AUTO) and manual (MAN) control modes:

    - Automatic mode (AUTO) operation includes constant speed governing in pre-set (take-off, climb, and cruise) and hold modes, and feathering.

    - In manual mode (MAN) the Manual Propeller Control switch provides direct control over propeller pitch, allowing the propeller to be used as an in-flight adjustable variable pitch propeller.

- Propeller Control Selector knob. This rotary (blue) knob has no function when manual mode (MAN) is selected on the Automatic / Manual Selector switch. With automatic (AUTO) mode selected, the knob is used to select between the various pre-set propeller modes:

  - **TO**. This selection is used for take-off and landing.

  - **CLIMB**. Used for climbing and any other operations where continuous higher power settings are required.

  - **CRUISE**. This selection is used for normal cruise operation.

  - **HOLD**. Provides constant speed propeller governing at a pilot selected speed.

- Feather Engage switch. With automatic (AUTO) mode selected on the Automatic / Manual Selector switch and the Propeller Control Selector knob set to FEATHER, engaging this switch will initiate automatic feathering of the propeller.

- Manual Propeller Control switch, located separately from the propeller controller unit on the instrument panel. The Manual Propeller Control switch provides for:

  - Direct control of the propeller pitch when manual mode (MAN) is selected with the Automatic / Manual Selector switch. Moving the switch up changes propeller pitch in the fine direction. The

Fine indicator light should indicate orange during the operation. Moving the switch down changes propeller pitch in the coarse direction. The Coarse indicator light should indicate orange during the operation.

- With the Automatic / Manual Selector switch set to AUTO and the Propeller Control Selector knob selected to HOLD mode, the Manual Propeller Control switch is used to set a pilot selected propeller governing speed.

  Actuate the switch to change propeller pitch in the direction desired. When the desired speed (rpm) is reached, release the switch. The engine/propeller speed will be governed to that speed. Finally, set the desired power with the throttle.

NOTE

When power is initially applied to the propeller controller, the speed setting at which the HOLD mode will govern the propeller is set equal to the pre-set CRUISE mode governing speed, until altered by pilot selection.

Information conveyed to the pilot(s) by the propeller system is provided by three lights located on the propeller controller, namely the Coarse indicator light, Fine indicator light and Feather indicator light. The following table lists the various propeller status indications provided by said lights in automatic (AUTO) mode and, where applicable, manual (MAN) mode:

PROPELLER STATUS	INDICATOR LIGHT		
	FINE	COARSE	FEATHER
Pitch decreasing	Orange		
Pitch increasing		Orange	
Pitch increasing in feather			Orange
No speed signal	Orange flashing		
Fine pitch limit	Green		
Coarse pitch limit		Green	
Feather pitch limit			Green
Driving at fine pitch limit	Green flashing		
Driving at coarse pitch limit		Green flashing	
Driving at feather pitch limit			Green flashing
Over-current while pitch decreasing	Red		
Over-current while pitch increasing		Red	
Over-current while pitch increasing in feather			Red
Open circuit failure	Red flashing	Red flashing	Red flashing
Controller software fault	Rapid red flashing	Rapid red flashing	Rapid red flashing

9.4 SUPPLEMENT 04/2012 – AIRPLANES FITTED WITH A ROTAX 912 ULS ENGINE

9.4.1 Introduction

This supplement must be kept with the Pilot Operating Handbook during operation of the airplane.

The information contained in this supplement adds to or replaces information from the standard Pilot Operating Handbook, with regards only to the specific sections addressed herein. Limitations, procedures and information not specifically addressed in this supplement remain as set out in the Pilot Operating Handbook.

This supplement provides information relating to the operation of an aircraft fitted with a Rotax 912 ULS engine.

The Rotax 912 ULS makes use of dual carburettors and is not electronically controlled like the iS version. The ULS has the same power rating as the iS and airplane performance with the two engines materially similar. Better fuel economy, especially in cruise, may be observed with the iS engine.

There are minor differences between the engines at starting and shutdown, and in the case of certain engine related emergency procedures. The instructions in this supplement are the minimum required for the pilot to competently operate the 912 ULS engine. It is the responsibility of the pilot to fully familiarize themselves with the engine Operators Manual supplied by Rotax GmbH. A copy of this document is supplied with the aircraft.

9.4.2 Rotax 912 ULS Engine Operating and Speed Limits

Always refer to latest edition / revision of the engine Operators Manual for latest information regarding operating limitations.

ENGINE START AND OPERATION TEMPERATURE LIMITS (912 ULS)	
Maximum (at start)	50 °C (122 °F) (ambient temperature)
Minimum (at start)	-25 °C (-13 °F) (oil temperature)

ENGINE LOAD FACTOR (ACCELERATION) LIMITS	
Maximum	5 seconds at maximum -0.5 g.

ENGINE OPERATING AND SPEED LIMITS (912 ULS)		
Engine Model:		ROTAX 912 ULS
Engine Manufacturer:		BRP-Rotax GmbH & Co KG
Power	Max take-off	73.5 kW (98.6 hp) at 5800 rpm (maximum 5 minutes)
	Max continuous	69 kW (92.5 hp) at 5500 rpm
Engine	Max take-off	5800 rpm, maximum 5 minutes
	Max continuous	5500 rpm
	Idle	1 400 (minimum)
EGT	Maximum	950 °C (1742 °F)
Cylinder head temperature	Minimum	N/A
	Maximum	135 °C (275 °F)
	Normal	75 to 110°C (167 to 230 °F)
Oil temperature	Minimum	50 °C (122 °F)
	Maximum	130 °C (266 °F)
	Normal	90 to 110 °C (194 to 230 °F)
Oil pressure	Minimum	0.8 bar (12 psi) – below 3500 rpm
	Maximum	7 bar (102 psi) – permissible for a short period on cold engine start
	Normal	2 to 5 bar (29 to 73 psi) – above 3500 rpm
Coolant temperature	Maximum	120 °C (248 °F)
Fuel pressure	Minimum	0.15 bar (2.2 psi)
	Maximum	0.4 bar (5.8 psi)

9.4.3 Rotax 912ULS Fuel, Oil and Coolant Specifications

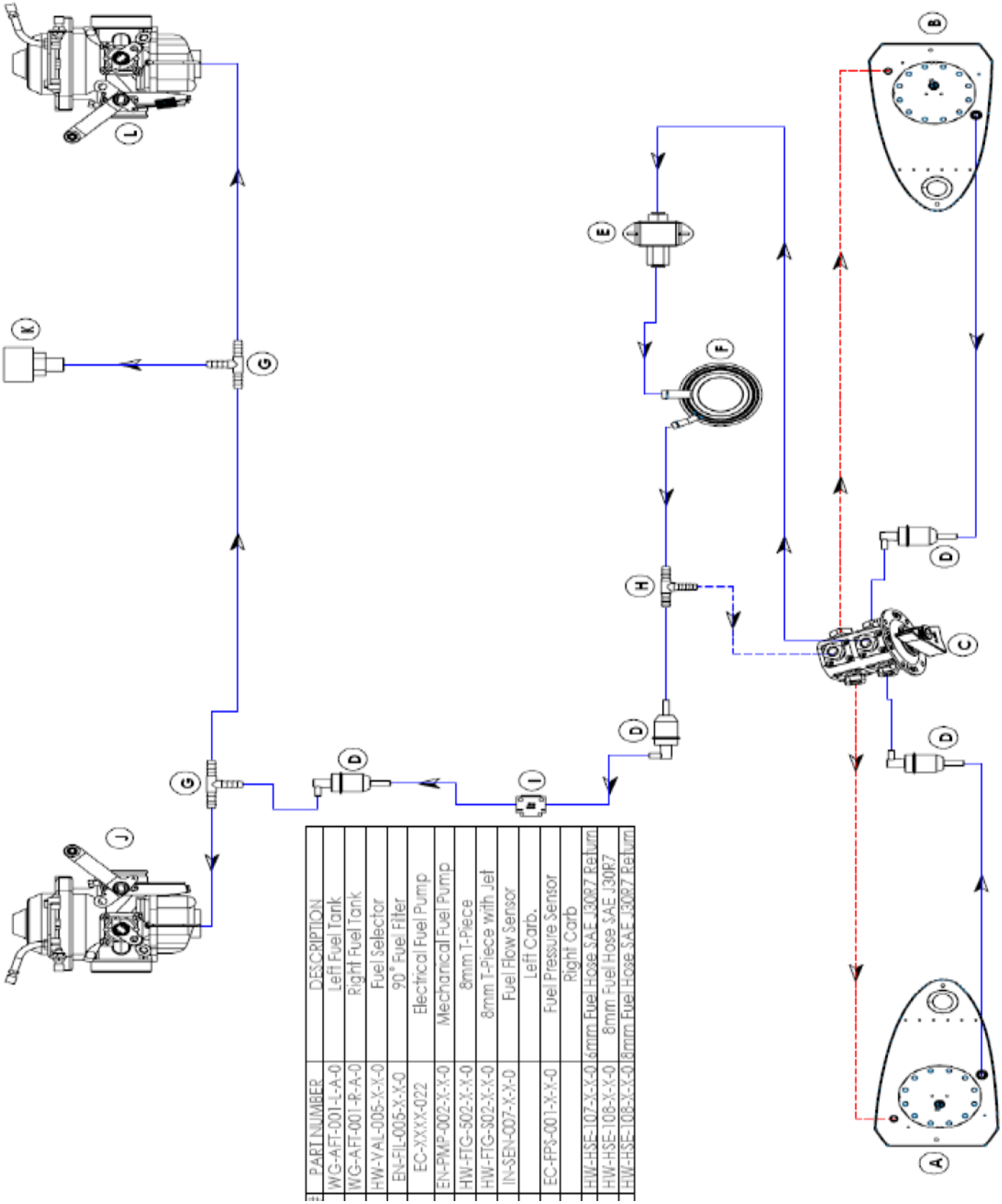
Fuel and oil specification are the same as the 912 iS motor.

NOTE: AVGAS 100LL places greater stress on the valve seats due to its lead content and forms increased deposits in the combustion chamber and lead sediments in the oil system. Thus, it should only be used in case of problems with vapour lock and when other types of gasoline are unavailable.

Coolant	
Item	**Value**
Cooling System	*Mixed* – Air and close circuit pressurized liquid. Air cooled cylinders and liquid cooled cylinder heads
Coolant	Conventional coolant based on ethylene glycol with 50% water content. Waterless coolant based on propylene glycol applicable for engine S/N without suffix -01.
Coolant Capacity	Approx. 2.5 litres (5.28 pints)

Refer to the latest revision of the Rotax operator / maintenance manuals and the latest revision of the Rotax service instruction with regard to selection of operating fluids.

9.4.4 Rotax 912 ULS Fuel System

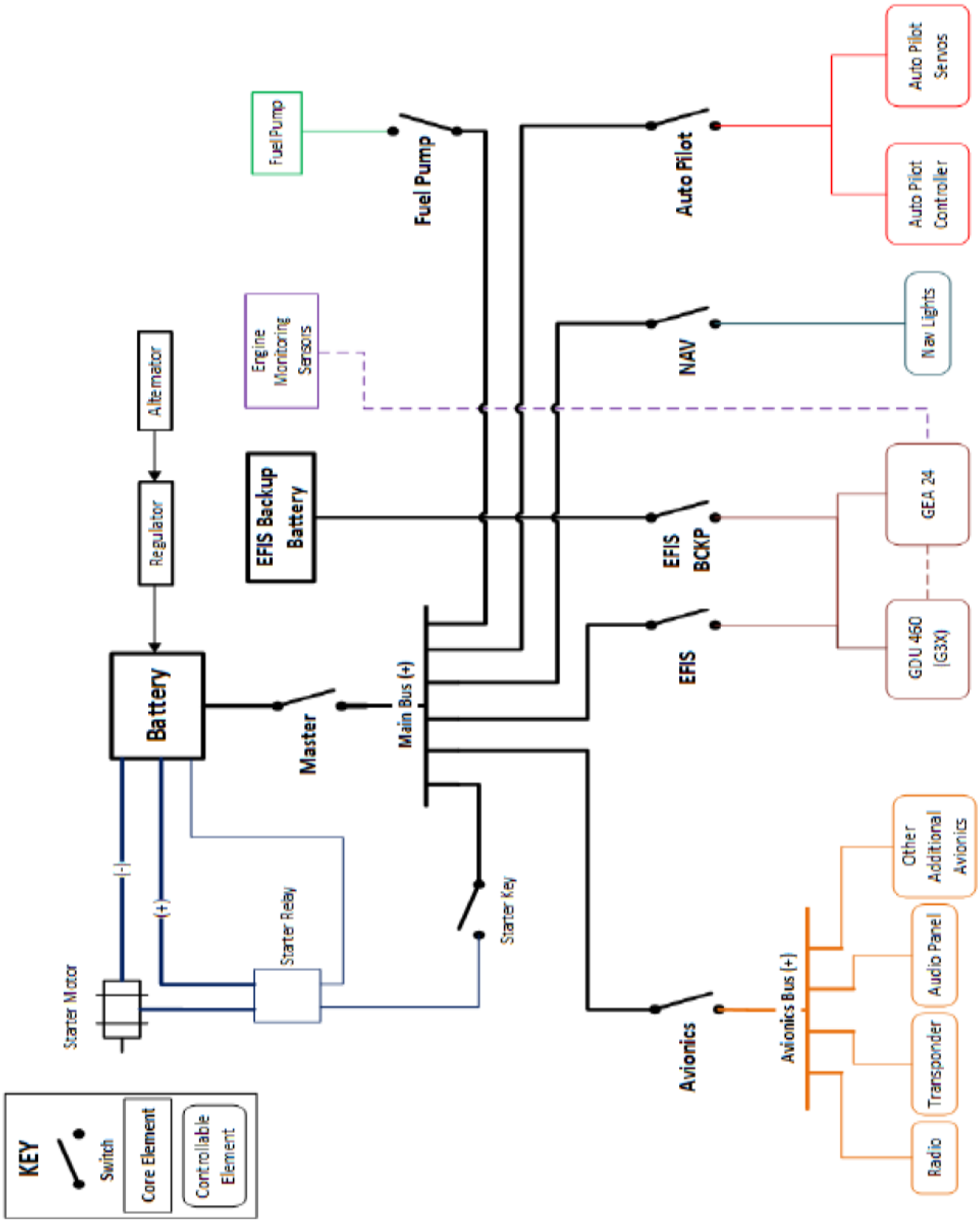


#	PART NUMBER	DESCRIPTION
A	WG-AFT-001-L-A-0	Left Fuel Tank
B	WG-AFT-001-R-A-0	Right Fuel Tank
C	HW-VAL-005-X-X-0	Fuel Selector
D	EN-FIL-005-X-X-0	90° Fuel Filter
E	EC-XXXX-022	Electrical Fuel Pump
F	EN-PMP-002-X-X-0	Mechanical Fuel Pump
G	HW-FTG-502-X-X-0	8mm T-Piece
H	HW-FTG-302-X-X-0	8mm T-Piece with Jet
I	IN-SEN-007-X-X-0	Fuel Flow Sensor
J		Left Carb.
K	EC-FPS-001-X-X-0	Fuel Pressure Sensor
L		Right Carb
	HW-HSE-107-X-X-0	6mm Fuel Hose SAE J30R7 Return
	HW-HSE-108-X-X-0	8mm Fuel Hose SAE J30R7
	HW-HSE-108-X-X-0	8mm Fuel Hose SAE J30R7 Return

9.4.5 Electrical Switches

SWITCH / LABEL	FUNCTION	POSITION
MASTER / STARTER KEY SWITCH	Power disconnected from main bus	OFF
	Main bus connected to power	ON
	Engage starter motor	START
EFIS	Switch power (from main bus) to EFIS system on / off.	UP (ON) DOWN (OFF)
EFIS BKUP	Connects EFIS system to EFIS back-up battery supply.	
FUEL PUMP	Switch main fuel pump on / off.	
LAND	Switch landing lights on / off.	
TAXI	Switch taxi lights on / off.	
NAV	Select position (navigation) lights.	
STROBE	Select anti-collision (strobe) lights.	
AVIONICS	Switch power to radio and transponder (if fitted) on / off.	
AUTOPILOT	Switch power to autopilot servos on / off.	
MASTER	Switch power to main bus on / off.	
IGNITION	Switch on key; *Mag A, Mag B, Both, Start*	

9.4.6 Electrical System Overview (912 ULS)



9.4.7 Master And Starter Switches

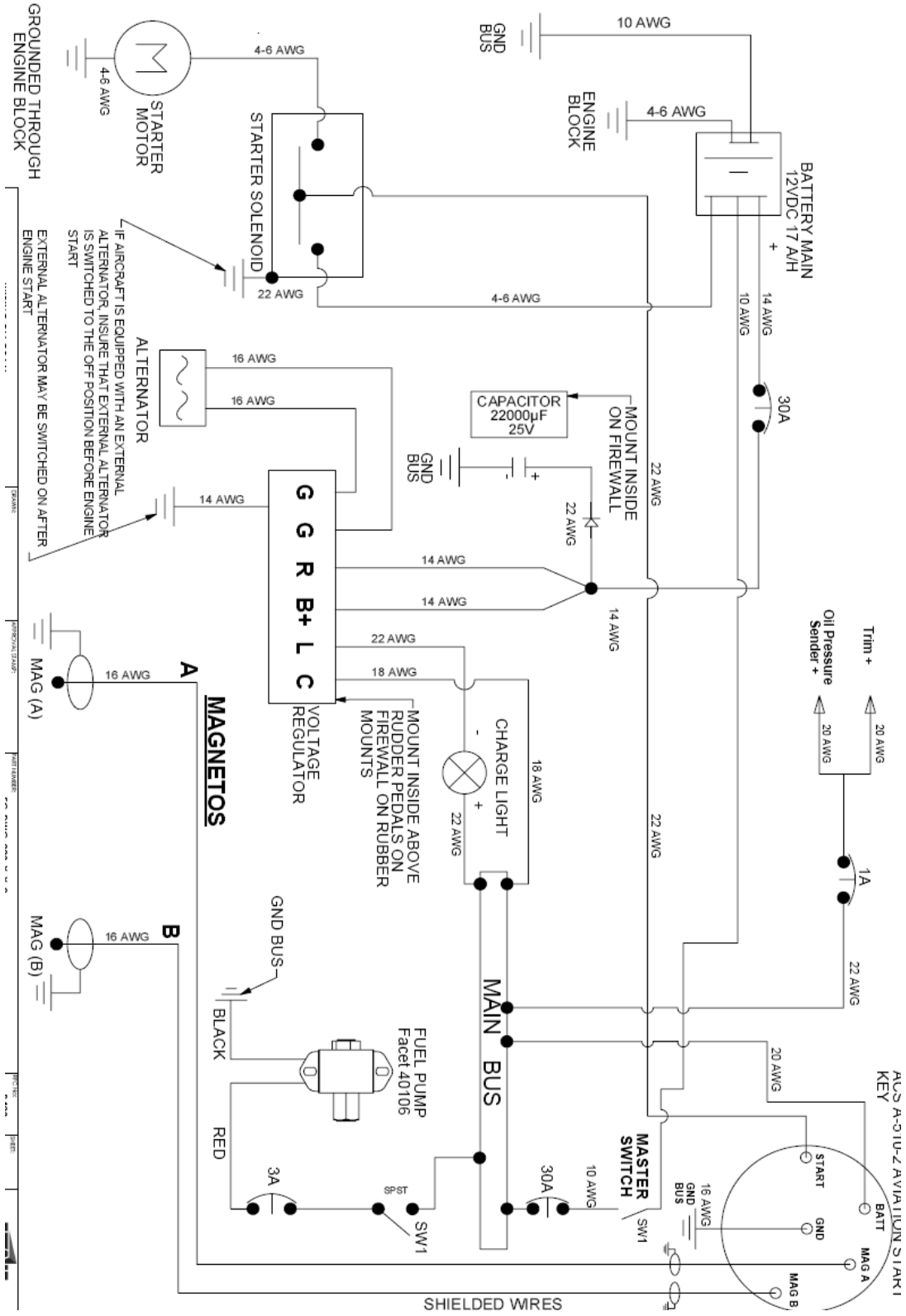
The Master switch in 912 ULS equipped aircraft provides the following functionality:

- Connects / disconnects the main battery to the main bus.

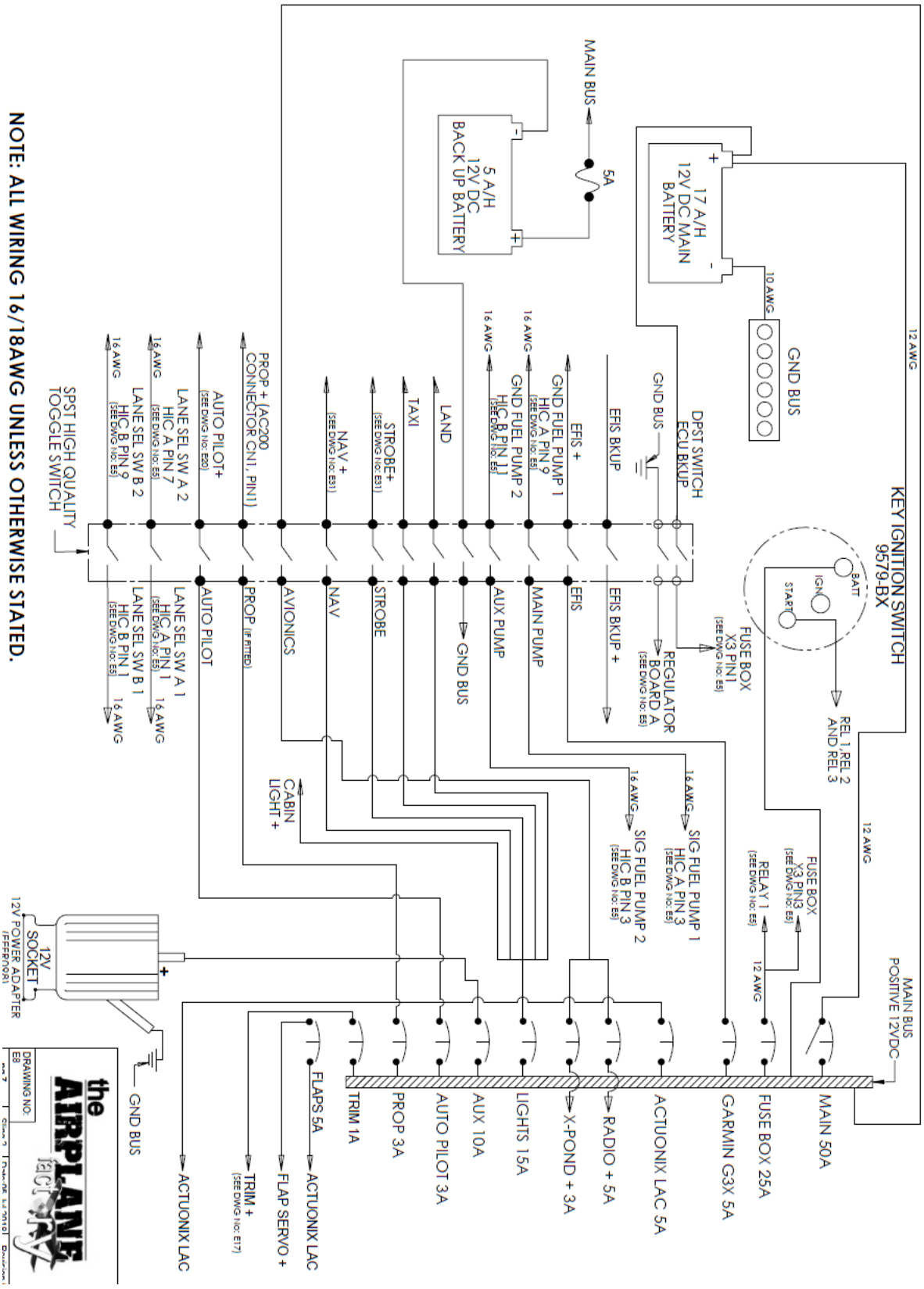
The Ignition switch on the 912 ULS equipped aircraft provides the following functionality:

- Selection of the magneto (A, B, BOTH)
- Activation of the starter

9.4.8 Rotax 912 ULS Wiring Diagram



9.4.9 Rotax 912 ULS Switches and Circuit Breakers Wiring Diagram



9.4.10 Electrical Power Generation and Failure

Unlike the 912 iS, the 912 ULS only has one internal generator, which is rectified and regulated to charge the main battery. If this generator fails, the engine will continue to run. The ULS does not make use of an ECU, but uses magnetos and carburettors instead, which is why it can run after an generator failure. All non-essential equipment must be turned off to ensure that battery is conserved before being able to land. Utilize the capacity of the EFIS backup battery fully, then when it goes flat, switch back to the main battery. This will ensure that all battery resource is used to power all instruments at once i.e., EFIS, Radio, Transponder, Flaps, Trim etc.

9.4.11 Emergency Procedures (Alternative)

9.4.11.1 Air-Start

1. Fuel Pump ..... ON
2. Fuel Selector ..... CHANGE *(UNLESS 2ND TANK DRY)*
3. Throttle ..... CHECK MOVEMENT
4. Throttle ..... MIDDLE POSITION
5. Master ..... ON
6. Magnetos ..... BOTH ON
7. Starter ..... ENGAGE

9.4.11.2 Irregular Engine RPM

1. Magnetos ..... BOTH ON
2. Throttle ..... VERIFY POSITION
3. Fuel Quantity ..... CHECK
4. Fuel Selector ..... CHANGE *(UNLESS 2ND TANK DRY)*
5. Fuel Pump ..... ON
6. Oil – Pressure ..... CHECK
7. Oil – Temperature ..... CHECK
8. Coolant – Temperature ..... CHECK
9. EGT – Temperature ..... CHECK

If engine continues to run rough –

10. Precautionary Landing ..... AS SOON AS POSSIBLE

9.4.11.3 Generator Failure

A generator failure is characterized by the charge warning light being illuminated on the instrument panel.

1. Battery / Charge Voltage .... VERIFY FAILURE[(a)]
2. Non-Essential Equipment .... OFF
3. EFIS Back-up ..... ON
4. EFIS Screen Brightness ..... MINIMUM
5. Radio Communications ..... MINIMUM
6. Land ..... AS SOON AS PRACTICABLE

NOTE

a. If alternator is operating correctly, the voltage will be above 13V. If the charge circuit has failed, this voltage will be below 13V.

9.4.12 Normal Procedures (Alternative)

9.4.12.1 Engine Start

1. Fuel Selector ..... EMPTIEST TANK *(IF NOT EMPTY)*
2. EFIS Backup Switch ..... ON *(VERIFY BATTERY VOLTAGE)*
3. EFIS Main Switch ..... ON
4. Master Switch ..... ON
5. Magnetos ..... ON
6. Fuel Pump ..... ON *(NO ABNORMAL SOUND)*
7. Fuel Pressure ..... VERIFY *(WITHIN RANGE)*
8. Fuel Pump ..... OFF
9. Choke ..... ON *(IF REQUIRED)*
10. Throttle ..... SET (+ -50%)
11. Propeller ..... AREA CLEAR
12. Starter ..... ENGAGE *(MAX. 10 SECONDS)*
13. Choke ..... OFF *(WHEN ENGINE RPM STABLE)*
14. Oil Pressure ..... CHECK *(CORRECT WITHIN 10 SECONDS)*
15. Throttle ..... +/- 2500 RPM
16. Battery Voltage..... VERIFY CHARGE[a]
17. Avionics Switch ..... ON
18. Oil Temperature ..... 2500 RPM *until oil temperature* ..... *is* > 50 °C (122 °F)[b]

WARNING

a. Main bus voltage should move up from +/- 12.5V to above 13V when the charge circuit is active.

b. When the oil is below 50 °C, the oil filter is bypassed due to the increased viscosity of the oil. *Significant throttle settings must not be used during this period, as it may cause damage.*

9.4.12.2 Run Up & Pre-Takeoff

1. Face into wind ..... IF POSSIBLE
2. Oil Temperature ..... ABOVE 50°C
3. Fuel Pump ..... ON
4. Engine..... 4000 RPM
5. MAG A ..... OFF *(2 SEC., NO MORE THAN 300 RPM DROP)*
   ..... ON
6. MAG B ..... OFF *(2 SEC., NO MORE THAN 300 RPM DROP)*
   ..... ON
7. Fuel Pressure ..... CHECK *(CORRECT AND STABLE)*
8. Engine..... 2500 RPM
9. Fuel Quantity ..... VERIFY *(SUFFICIENT FOR PLANNED FLIGHT)*
10. Fuel Selector ..... FULLEST TANK
11. Circuit Breakers ..... ALL IN
12. Switches ..... CHECK AND SET AS REQUIRED
13. Instruments ..... CHECK AND SET ALL
14. Controls ..... FREE & FULL / CORRECT SENSE
15. Trim ..... SET NEUTRAL
16. Flaps ..... SET STAGE 1 / TAKEOFF
17. Engine Parameters ..... VERIFY *(TEMPERATURES, PRESSURES, VOLTAGES)*
18. Canopy ..... CLOSED / LATCHED
19. Harness ..... SECURE *(CORRECTLY FASTENED AND TIGHT)*
20. Brief Passengers ..... BRIEF

9.5 SUPPLEMENT 05/2017 - OPERATION OF SLING 2 AIRCRAFT FITTED WITH A GLIDER AND BANNER TOW HOOK MECHANISM WITH QUICK RELEASE

The Sling 2 aircraft is approved for the optional fitment of a glider tow hook which may be used for purposes of glider tugging and/or banner towing. The aircraft manufacturer has designed, tested and approved the fitment of a Tost E22 series glider hook with a maximum load capacity of 700kg. This mechanism has been extensively tested in a Sling 2 aircraft with a 914 UL engine and Airmaster AP332/AP330 constant speed propeller.

This supplement provides information relating to the operation of the Sling 2 aircraft fitted with the Tost E22 glider hook mechanism with quick release when used for glider and banner towing.

This supplement must be contained in the Pilot Operating Handbook during operation of the aircraft with such mechanism fitted.

Information contained in this supplement adds to or replaces information from the standard Sling 2 Pilot Operating Handbook in regard only to the specific sections addressed herein. Limitations, procedures and information not addressed in this supplement remain as set out in the Sling 2 Pilot Operating Handbook.

NOTE: Glider and/or banner towing and use of the tow hitch should be undertaken only by appropriately rated pilots with the required endorsement in their pilot logbook and license. Special care is required when performing tugging and towing operations which, by their nature, present a number of risks and challenges to the pilot.

This supplement is NOT intended to address all operational considerations applicable to the tugging of gliders or the towing of banners in aircraft. Pilots

are expected to be familiar with all normal procedures applicable to such operations and are expected to comply with all safety, operating and emergency procedures which would ordinarily be applicable in such circumstances. This supplement is intended only to provide abbreviated material to the pilot who is familiar with tugging and towing operations as well as the Sling 2 aircraft type, who wishes to understand in what manner the operation of the Sling 2 for tugging and towing operations may differ from normal Sling 2 operations, or in what manner the operation of the Sling or tugging and towing operations may differ from tugging and towing operations in other aircraft types.

9.5.1 Specifications:

Tow hook weight	1 kg
Tug and tow operating speeds	50-90 KIAS, as required
Maximum tugged glider weight	700 kg
Max. permissible cable Load	10.7 kN (1090 kg)
Max. permissible release lever force	140 N (14 Kg)
Max. release lever restoring force	50 N (5 Kg)

Note: The addition of the tow hitch does affect the CG of the aircraft. The CG of the aircraft moves towards the rear of the aircraft. The CG range mentioned in Section 6 of this document continues to apply and following fitment of a tug mechanism the empty CG of the aircraft should be measured and appropriately recorded.

9.5.2 Flight performance:

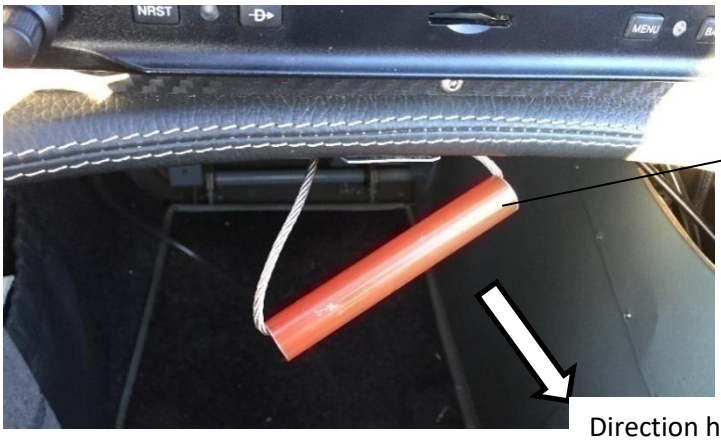
There is no noticeable change in flight performance between an aircraft fitted with the tow hook mechanism and without. The change in overall mass is considered insignificant and the change in dimensions in the aircraft has no noticeable effect on performance.

A Sling 2 aircraft fitted with a glider tow mechanism can accordingly be safely flown by a pilot without a tow rating or experience, provided that it is not used for any tug or towing activities.

9.5.3 Installation of hook and release mechanism

The glider tow hook is fitted to an aluminum structure attached to the lower rear fuselage. Since the rearward extent of the hook attachment mechanism is forward of the rearmost extent of the rudder, there is no change in overall aircraft length. The installation does, however, extend closer to the ground than fuselage without the mechanism, and the tie down point is accordingly marginally extended with fitment of the tow hook, so that in the event of a tail strike the tie down point it strikes the ground before the tow hook mechanism itself. This is in order to protect the tow hook mechanism in the case of a tail-strike. A tail-strike with tow mechanism installed will accordingly occur at a slightly lower angle than without the mechanism. This is not, however, considered to be of any significance.

The tow hook installation design provides for the fitment of a red release handle immediately beneath the lower edge of the instrument panel and between the pilot's knees. The release handle is connected to a cable that runs from the panel, along the centre of the fuselage to the lever on the release mechanism. When the handle is pulled, the release mechanism will be activated.



Pilots using the aircraft for glider tugging and banner towing purposes should familiarize themselves with the tension in the release lever spring and accordingly the force required to activate the release prior to operation. Very little difference in force is required to activate the release when there is a load on the hook and when there is none.

9.5.4 Operations and precautions:

Operational instruction on glider tugging and banner towing is considered beyond the scope of this POH. The following considerations, however, should at all times be borne in mind –

- Glider tugging and banner towing are inherently unpredictable and high risk activities. They should be performed only by experienced persons operating in accordance with clear guidelines and in accordance with good aviation practices.
- Engine and airframe monitoring is especially critical during glider tug and banner tow operations as additional stress is placed upon the aircraft. Operate at all times within the limits applicable to the engine, airframe and propeller and, if this is not possible in any particular configuration or at any particular time, discontinue operations immediately.
- Pilots should at all times operate in accordance with the provisions of the Tost E22 series Operating Manual and good aviation practice.
- The lighter the aircraft during any tugging or towing operation the better the performance is likely to be.
- The responsibility of ensuring that the aircraft performance and parameters in any tug or tow configuration are satisfactory and manageable is entirely the pilot's. Tug and tow operations are by their nature complex systems and the aircraft manufacturer takes no

responsibility for aircraft performance and behavior when used for such purposes.

- The manufacturer's approval of the Sling 2 aircraft for glider tugging and banner towing purposes assumes an aircraft fitted with-
    - the manufacturer's design attachment mechanism housing a Tost E22 series tow hook with quick release mechanism;
    - a Rotax 914 UL engine;
    - an Airmaster AP332 propeller.
- Although the aerodynamic responses of the aircraft are likely to be similar where other hook, engine and propeller combinations are used, each pilot flying such a combination is responsible for ensuring that the aircraft performance is sufficient for the operational requirements and that applicable limitations are met at all times.
- It is assumed that at all times pilots and support crew will comply with good aviation practices applicable to the kinds of operations engaged in. Provided that these guidelines are followed, testing has demonstrated that the Sling 2 aircraft in the configuration referred to in this supplement 05/2017 may be safely operated for purposes of –
    - Tugging gliders of a weight of up to 700kg
    - Towing banners of a size of up to 2m x 30m.

9.6 SUPPLEMENT 06/2019 – FRONT LUGGAGE COMPARTMENT

The parachute compartment of a Sling 2 may be used as a luggage compartment if a ballistic parachute is not installed. The front luggage compartment is situated between the firewall and the windscreen. The maximum luggage capacity of the aircraft remains 35kg (Section 2.8), but the centre of gravity of the aircraft moves forward if the front luggage compartment is used.

NOTE

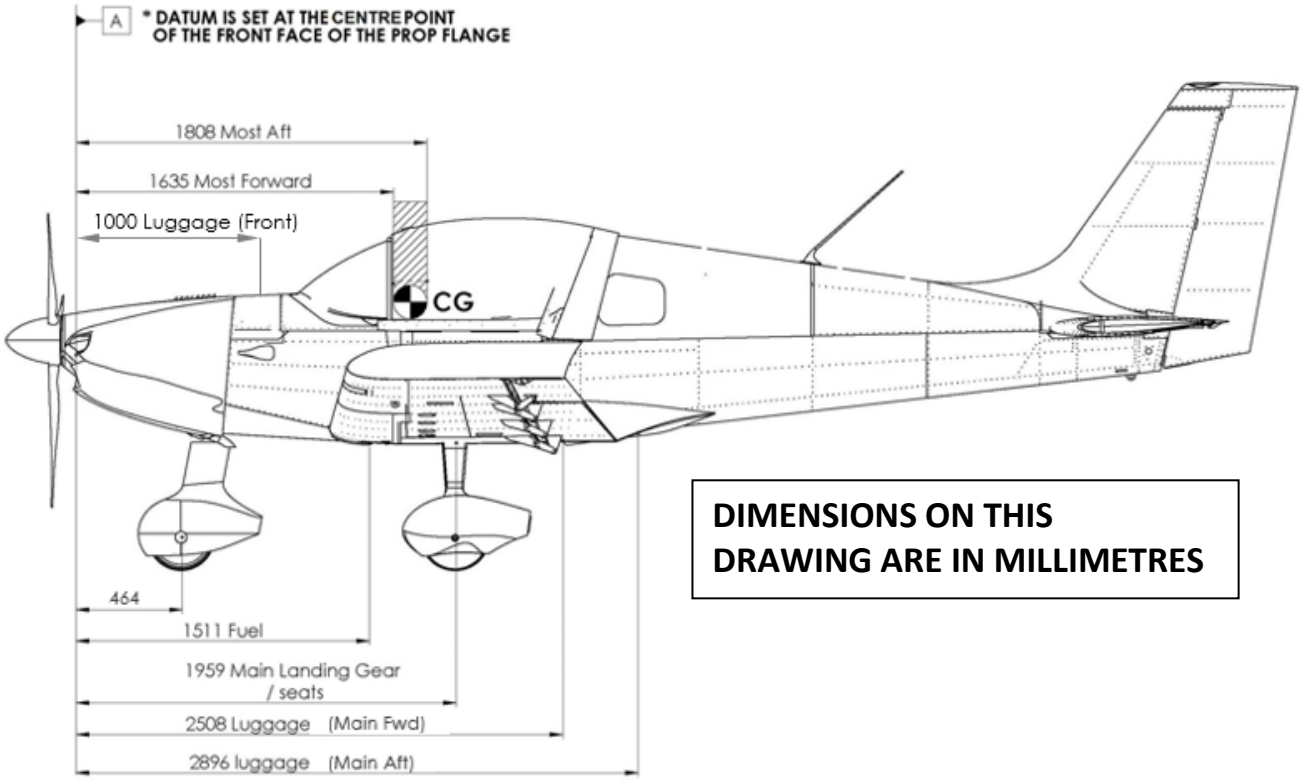
This supplement should be used in conjunction with Section 6 (Weight and Balance) of this manual.

9.6.1 Weights

Maximum total baggage weight	35 kg (77 lb).
Front luggage compartment maximum	12 kg (26.45 lb)
Main Fwd luggage compartment maximum	35 kg (77 lb).
Main Aft compartment maximum	25 kg (55 lb).

9.6.2 Center of Gravity

Parachute luggage compartment arm	1000 mm (3.281 ft)



DIMENSIONS ON THIS DRAWING ARE IN MILLIMETRES

CG range is 1 635 mm (5.364 ft) to 1 808 mm (5.931 ft) aft of the reference datum (20 to 33% of MAC).

- The leading edge of the MAC is 1 366 mm (4.482 ft) aft of the reference datum.
- The MAC is 1 339 mm (4.393 ft).

WARNING

Aircraft CG and MAUW limitations must be adhered to at all times.
Refer to Sections 2.8 and 2.9 for CG and MAUW limitations.

9.6.3 CG Determination Table

	WEIGHT [kg (lb)]	**ARM** [mm (ft)]	**MOMENT** (weight x arm) [kg.mm (lb.ft)]
PILOT & PASSENGER		1 959 (6.427)	
BAGGAGE (FRONT)		1 000 (3.281)	
BAGGAGE (MAIN FWD)		2 508 (8.228)	
BAGGAGE (MAIN AFT)		2 896(9.501)	
FUEL		1 511 (4.957)	
ADD EMPTY VALUES			
TOTAL			
	W_T =		M_T =
			CG = %MAC

9.7 SUPPLEMENT 02/2025 – AIRPLANES FITTED WITH A DUC 3-BLADE INCONEL FLASH PROPELLER

9.7.1 Introduction

This supplement must be kept with the Pilot Operating Handbook during operation of the airplane.

The information contained in this supplement adds to or replaces information from the standard Pilot Operating Handbook, with regards only to the specific sections addressed herein. Limitations, procedures and information not specifically addressed in this supplement remain as set out in the Pilot Operating Handbook.

This supplement provides information necessary for the operation of an aircraft fitted with a DUC 3-blade Inconel® FLASH fixed pitch propeller, that is ground adjustable.

9.7.2 Performance

9.7.2.1 Takeoff Distances

Weight	Altitude [ft]	Surface Type	Run Distance	Distance over 15m / 50 ft Obstacle
650 kg	5 000	Concrete/Tar	210m / 689ft	400m / 1 312ft

9.7.2.2 Rate of Climb

Values relevant for maximum continuous power of 5 500 RPM –

Altitude	Best Rate of Climb Speed (V_Y)	Rate of Climb
[ft. ISA]	*[KIAS]*	*[fpm]*
0	72	875
1 000		830
2 000		780
3 000		735
4 000		690
5 000		640
6 000		590
7 000		545
8 000		510
9 000		440
10 000		405

9.8 SUPPLEMENT 08/2025 – AIRPLANES FITTED WITH A ROTAX 915 iS ENGINE

The Rotax 915 iS engine may be fitted to the Sling 2. This engine is a 4-stroke, 4-cylinder, turbocharged, horizontally opposed, spark-ignition engine, with one central camshaft -pushrod OHV and a displacement of 1352cc (1.35L/82.5 cubic inch). The engine makes use of liquid-cooled and air-cooled cylinders. The lubrication system can be described as sump forced lubrication and the ignition makes use of dual contactless capacitor-discharge magneto type ignition system, that is ECU controlled. The engine is fitted with an electric starter motor, two AC alternators and two electric fuel pumps. The propeller is driven through a reduction gearbox, of ratio 2.52, and features an integrated shock absorber. The engine will continue to run after an alternator/battery failure. Please see 3.7.5.

9.8.1 Engine limitations

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

Always refer to the *latest edition / revision* of the engine Operators Manual for latest information regarding operating limitations

9.8.1.1 Engine Start and Operation Temperature Limits

Item	Value
Start - Maximum (Ambient Temperature)	50 °C / 122 °F
Start - Minimum (Oil Temperature)	-20 °C / -4 °F

9.8.1.2 Engine Load Factor Limits (Acceleration)

Item	Value
Maximum	5 seconds at maximum -0.5g

9.8.1.3 Oil System

Parameter / Item	Value
Oil System Type	Forced with external oil reservoir.
Oil Grade	Shell AeroShell Oil Sport Plus 4 with specification RON 424 and viscosity SAE 10W-40. XPS Full Synthetic Aviation Engine Oil with specification RON 451 and SAE 5W-50. *(Refer to the latest revision of the engine operator's manual for more)*
Oil Viscosity	SAE 10W-40 and SAE 5W-50
Oil Capacity	Approx. 3.0 litres (3.2 quarts/6.3 pints) from dry

9.8.1.4 Cooling

Parameter / Item	Value
Cooling System	*Mixed* – Air and closed-circuit pressurized liquid. Air-cooled cylinders and liquid-cooled cylinder heads.
Coolant	Conventional coolant based on ethylene glycol with 50% water content. Do not use Waterless coolant based on propylene glycol for operation of 916i Series and 915i Series. *(Refer to the latest revision of the engine operator's manual for more)*
Coolant Capacity	Approx. 1.5 litres (1.6 quarts / 3.2 pints)

9.8.1.5 Engine Operational and Speed Limits

Item		Value
Engine Model		ROTAX 915 iS
Engine Manufacturer		BRP-Rotax GmbH & Co KG
Power	Maximum take-off	104 kW / 141 hp at 5800 rpm, max. 5 minutes
	Maximum continuous	99 kW / 135 hp at 5500 rpm
	Cruise 75% Throttle	90 kW / 120 hp at 5000 rpm
RPM	Maximum take-off	5800 rpm, max. 5 minutes
	Maximum continuous	5500 rpm
	Cruise	5000 rpm – 5400 rpm
	Idle	1 800 rpm (minimum)
Oil Temperature	Minimum	50 °C (122 °F)
	Maximum	130 °C (266 °F)
	Normal	90 to 110 °C (194 to 230 °F) [(a)]
EGT	Maximum	950 °C (1742 °F)
Coolant Temperature	Minimum	-20 °C (-4 °F)
	Maximum	120 °C (248 °F)
Oil pressure	Minimum	0.8 bar (12 psi) – below 3500 rpm
	Maximum	7 bar (101.5 psi) – permissible for short period during cold engine start
	Normal	2 to 5 bar (29 to 72.5 psi) – above 3500 rpm
Fuel Pressure	Minimum	2.9 bar (42 psi)
	Maximum	3.2 bar (46 psi)
Manifold Pressure	Minimum	1.77 in. hg (60 hPa)
	Maximum	51 in. hg (1730 hPa)

NOTE

a. *Oil temperature must, once per flight day, exceed 100°C to boil off any moisture that may have collected in the oil.*

9.8.1.6 Take-off Distances

The data presented in this section has been deduced from flight tests with the aircraft and engine in good condition and using average piloting techniques. All tests were performed on the concrete/tar surface.

The performance in this section is valid for a maximum take-off weight of 700 kg (1 543.24 lb).

Propeller	Density Altitude	Run Distance	Distance over 15m / 50ft Obstacle
Airmaster AP430/431	MSL	106 m / 348 ft	233 m / 764 ft
	5,000-7,000	145 m / 475 ft	320 m / 1,050 ft
MTV-6-A/190-69	MSL	99 m / 325 ft	250 m / 820 ft
	5,000-7,000	126 m / 413 ft	348 m / 1,142 ft

9.8.1.7 Landing Distance

Surface Type	Density Altitude	Landing Distance with braking	Distance over 15m / 50ft Obstacle
Concrete/Tar	MSL	90 m / 295 ft	260 m / 855 ft
Grass	MSL	90 m / 295 ft	260 m / 855 ft

9.8.1.8 Rate of Climb

Values relevant for maximum continuous power of 5,500 RPM –

Altitude	Rate of Climb Airmaster AP430/431	Rate of Climb MTV-6-A/190-69	Best Rate of Climb Speed (V_Y)
[ft. ISA]	*[fpm]*	*[fpm]*	*[KIAS]*
0	1260	1940	72
1 000	1245	1852	
2 000	1231	1777	
3 000	1216	1690	
4 000	1202	1615	
6 000	1172	1454	
8 000	1143	1294	
10 000	1114	1128	
12 000	1085	972	
14 000	1056	817	
16 000	1026	664	
18 000	997	513	

9.8.1.9 Cruise Speeds

Due to the excess power available when a Sling 2 is outfitted with a 915 iS engine, a cruise speed of 115 KIAS can be achieved at a power setting of approximately 56%. Due to this, the pilot must pay careful attention to the airspeed and ensure that the aircraft conforms to the airspeed limitations at all times.

WARNING

Aircraft speed limitations must be adhered to at all times.

Refer to Section 2.2 for Aircraft Airspeed Limitations.

9.8.1.10 Fuel Consumption

Engine Power		**%**	**56%**
Flight Level		**ft**	**6500**
Engine RPM		*RPM*	5,500
Fuel Burn		*LPH*	21
		GPH	5.5
150 Litre Main Tanks 39.6 US GAL	**Endurance**	*[hrs]*	6.2
	Range[(a)]	*[nm]*	817

NOTES

a. Calculated at airspeed of 115 KIAS.

Range and endurance information is calculated using maximum useable fuel and includes a 45-minute reserve.

9.9 SUPPLEMENT 08/2025 – AIRPLANES FITTED WITH A ROTAX 916 iS ENGINE

The Rotax 916 iS engine may be fitted to the Sling 2. This engine is a 4-stroke, turbocharged, 4-cylinder, horizontally opposed, spark ignition engine, with one central camshaft -pushrod OHV and a displacement of 1352cc (1.35L/82.5 cubic inch). The engine makes use of liquid and air-cooled cylinders. The lubrication system can be described as sump forced lubrication and the ignition makes use of dual contactless capacitor discharge magneto type ignition system, that is ECU controlled. The engine is fitted with an electric starter motor, two AC alternators and two electric fuel pumps. The propeller is driven through a reduction gearbox, of ratio 2.54, and features an integrated shock absorber. The engine will continue to run after an alternator ***or*** battery failure. Please see 3.7.5 for more information.

Refer to the *latest revision* of the manufacturer documentation (Operators Manual / Maintenance Manual) for more information.

9.9.1 Engine limitations

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

Always refer to the *latest edition / revision* of the engine Operators Manual for latest information regarding operating limitations

9.9.1.1 Engine Start and Operation Temperature Limits

Item	Value
Start - Maximum (Ambient Temperature)	50 °C / 122 °F
Start - Minimum (Oil Temperature)	-20 °C / -4 °F

9.9.1.2 Engine Load Factor Limits (Acceleration)

Item	Value
Maximum	5 seconds at maximum -0.5g

9.9.1.3 Oil System

Parameter / Item	Value
Oil System Type	Forced with external oil reservoir.
Oil Grade	XPS Full Synthetic Aviation Engine Oil with specification RON 451. Do not use Aeroshell Oil Sport Plus 4 for operation of ROTAX® 916 iSc/iS A and 916 iSc/iS C24 Series. *(Refer to the latest revision of the engine operator's manual for more.)*
Oil Viscosity	SAE 5W-50
Oil Capacity	Approx. 3.5 litres (3.7 Quarts / 7.4 pints) from dry.

9.9.1.4 Cooling

Parameter / Item	Value
Cooling System	*Mixed* – Air and closed-circuit pressurized liquid. Air-cooled cylinders and liquid-cooled cylinder heads.
Coolant	Conventional coolant based on ethylene glycol with 50% water content. Do not use Waterless coolant based on propylene glycol for operation of 916i Series and 915i Series. *(Refer to the latest revision of the engine operator's manual for more)*
Coolant Capacity	Approx. 1.5 litres (1.6 quarts / 3.2 pints)

9.9.1.5 Engine Operational and Speed Limits

Parameter		Value
Engine Model		ROTAX 916 iS
Engine Manufacturer		BRP-Rotax GmbH & Co KG
Power	Maximum take-off	117kW / 160 hp at 5800 rpm, max. 5 minutes
	Maximum continuous	101 kW / 137 hp at 5500 rpm
RPM	Maximum take-off	5800 rpm, max. 5 minutes
	Maximum continuous	5500 rpm
	Idle	1 800 rpm (minimum)
Oil Temperature	Engine start minimum	-20 °C (-4 °F)
	Take-off minimum	50 °C (122 °F)
	Normal	50 to 120 °C (122 to 248 °F)
EGT	Maximum	950 °C (1742 °F)
Coolant Temperature	Maximum	120 °C (248 °F)
Oil pressure	Minimum	0.8 bar (11.6 psi) – below 3500 rpm
	Maximum	7 bar (101.5 psi) – permissible for short period during cold engine start
	Normal	2 to 5 bar (29 to 72.5 psi) – above 3500 rpm
Fuel Pressure	Minimum	2.9 bar (42 psi)
	Maximum	3.2bar (46 psi)
Manifold Pressure	Maximum	1800 hPa / 53.15 in. Hg
	Minimum	60 hPa / 1.77 in. Hg
Altitude limitations	Service ceiling	23,000 ft
	Full take off power	Up to 15,000 ft

NOTE

b. *Oil temperature must, once per flight day, exceed 100°C to boil off any moisture that may have collected in the oil.*

9.9.1.6 Take-off Distances

The data presented in this section has been deduced from flight tests with the aircraft and engine in good condition and using average piloting techniques. All tests were performed on the concrete/tar surface.

The performance in this section is valid for a maximum take-off weight of 700 kg (1 543.24 lb).

Propeller	Density Altitude	Run Distance	Distance over 15m / 50ft Obstacle
DUC Flashblack-3-R	MSL	TBC	119 m / 390 ft
	5,000-7,000	TBC	300 m / 984 ft
MTV-6-R/190-69	MSL	87 m / 285 ft	220 m / 722 ft
	5,000-7,000	111 m / 364 ft	307 m / 1,007 ft

9.9.1.7 Landing Distance

Surface Type	Density Altitude	Landing Distance with braking	Distance over 15m / 50ft Obstacle
Concrete/Tar	MSL	90 m / 295 ft	260 m / 855 ft
Grass	MSL	90 m / 295 ft	260 m / 855 ft

9.9.1.8 Rate of Climb

Values relevant for maximum continuous power of 5,500 RPM –

Altitude	Rate of Climb DUC Flashblack-3-R	Rate of Climb MTV-6-R/190-69	Best Rate of Climb Speed (V_Y)
[ft. ISA]	*[fpm]*	*[fpm]*	*[KIAS]*
0	1970	1969	72
1 000	1869	1880	
2 000	1781	1803	
3 000	1682	1715	
4 000	1595	1639	
6 000	1408	1475	
8 000	1224	1313	
10 000	1035	1145	
12 000	854	986	
14 000	677	829	
16 000	500	674	
18 000	326	521	

9.9.1.9 Cruise Speeds

Due to the excess power available when a Sling 2 is outfitted with a 916 iS engine, a cruise speed of 115 KIAS can be achieved at a power setting of approximately 56%. Due to this, the pilot must pay careful attention to the airspeed and ensure that the aircraft conforms to the airspeed limitations at all times.

WARNING

Aircraft speed limitations must be adhered to at all times.

Refer to Section 2.2 for Aircraft Airspeed Limitations.

9.9.1.10 Fuel Consumption

Engine Power		**%**	**56%**
Flight Level		**ft**	**6500**
Engine RPM		*RPM*	5,500
Fuel Burn		*LPH*	21
		GPH	5.5
150 Litre Main Tanks 39.6 US GAL	**Endurance**	*[hrs]*	6.2
	Range[(a)]	*[nm]*	817

NOTES

b. Calculated at airspeed of 115 KIAS.

Range and endurance information is calculated using maximum useable fuel and includes a 45-minute reserve.