Sling 4 TSi

SERIAL NO : ______________

REGISTRATION : ______________

DC-POH-001-X-F-3.3

PILOT OPERATING HANDBOOK

DATE: 21 JULY 2025

REVISION 3.3

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 4 TSi**
Manufacturer:	**Sling Aircraft (Pty) Ltd**
Airplane Serial Number:	**……………………………….**
Date of Construction:	**……………………………….**
Registration:	**……………………………….**
Airworthiness Category:	**FAR Part 23**
Issue Date of POH:	**2025/07/21**

Please advise Sling Aircraft upon change of ownership of this 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 915 iS or 916 iS powered Sling 4 TSi, as manufactured on premises by Sling Aircraft (Pty) Ltd.

Aircraft which differ from the production standard, in whatever way, are not addressed in this manual, except to the extent said aircraft corresponds with the production standard.

NOTICE

This manual may contain specific references to South African regulations. Therefore, the manual can be regarded as a manual accordingly consistent with RSA regulations only.

Compliance Statement

The FAA Standards used for the design, construction, and continued airworthiness for the Sling 4 TSi are:

- FAA FAR, Part 23 – Airworthiness Standards: Normal, Utility, Aerobatic and Commuter Category

Quality Assurance records are stored with the manufacturer in South Africa, at the address below:

Sling Aircraft (Pty) Ltd.
Hangar 8, Tedderfield Air Park, Johannesburg South, Eikenhof, 1872, South Africa
PO Box 308, Eikenhof, 1872, South Africa
Tel: +27 11 948 9898
sales@slingaircraft.com

Continued Operational Safety Monitoring

Manufacturer Responsibilities:

Sling Aircraft has a procedure in place to monitor the safety of the fleet and to alert pilots of any potential safety issues. The owner of a Sling 4 TSi is responsible for making sure they receive pertinent safety information and comply with bulletins. The owner of a Sling 4 TSi is also responsible for alerting the manufacturer of any potential flight safety issues they may encounter.

Owner/Operator Responsibilities:

- Each owner/operator of a Sling 4 TSi shall read and comply with the maintenance and continued airworthiness information, along with all instructions provided by the manufacturer.
- Each owner/operator of a Sling 4 TSi shall be responsible for providing the manufacturer with current contact information, where the manufacturer may send the owner/operator supplemental notification bulletins/letters.
- The owner/operator of a Sling 4 TSi shall be responsible for notifying the manufacturer of any flight safety issues or significant service difficulty, upon discovery.
- The owner/operator of a Sling 4 TSi shall be responsible for complying with all manufacturer issued notices of corrective action and with all applicable aviation authority regulations, with regards to maintaining the airworthiness of the aircraft.
- The owner of a Sling 4 TSI shall ensure that any needed corrective action be completed as specified in a bulletin/letter/notice, or by the next scheduled annual inspection.
- Should an owner/operator not comply with any mandatory service requirements, the Sling 4 TSi shall be considered not in compliance with applicable standards and may be subject to regulatory action by the presiding aviation authority in the respective region.

Record of Revisions

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

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

Rev. No.	Affected Section	Affected Pages	Date of Issue	Approved by	Sign
0	Initial Issue	Initial Issue	2018/07/24	James Pitman	
1	1.4, 2.2 & 5	1.9, 2.3 & 5.5 – 5.7	2019/05/20	James Pitman	
2.0	All	All	2020/01/31	James Pitman	
2.1	All	All	2020/12/09	James Pitman	
2.2	All	All	2021/01/26	James Pitman	
3.0	All	All	2021/07/14	James Pitman	
3.1	All	All	2021/11/18	James Pitman	
3.2	9.5.2, 9.7, 9.8	See List of Manual Revisions	2023/12/13	James Pitman	
3.3	1.3, 1.4, 2.14,4.4, 5.1, 6.3, 6.5, 6.6, 7.12, 7.8, 9.9	See List of Manual Revisions	2025/07/24	Terry Musiker	

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Table of Contents

1 General Information

1.1 Introduction to Airplane

The Sling 4 TSi is a four-seat *(two pairs of side-by-side seats)*, single-engine, fixed tricycle undercarriage *(with steerable nose wheel),* aluminium aircraft of semi-monocoque construction with a conventional low wing design.

The aircraft design is based upon the FAA FAR 23 certification standards and has a maximum all up weight of 950 kg (2,094 lb). Notwithstanding that the aircraft design is based upon the FAA FAR 23 certification standards, the aircraft has not been proven to comply with all the provisions of the standard.

The Sling 4 TSi makes use of the Rotax 915 iS aviation power plant, that outputs 141hp, combined with the Airmaster AP40 variable pitch propeller. Alternatively, the Sling 4 TSi may be outfitted with a Rotax 916 iS power plant, that outputs 160hp, combined with a MTV-6/190-69 propeller.

The Sling 4 TSi is intended chiefly for recreational and cross-country flying. It is not intended for aerobatic operation. This Pilot Operating Handbook has been prepared to provide pilots with information for the safe and efficient operation of the Sling 4 TSi.

1.2 Warnings, Cautions and Notes

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

WARNING

Warning – Indicates that non-observation of the corresponding procedure leads to a serious and immediate degradation of flight safety.

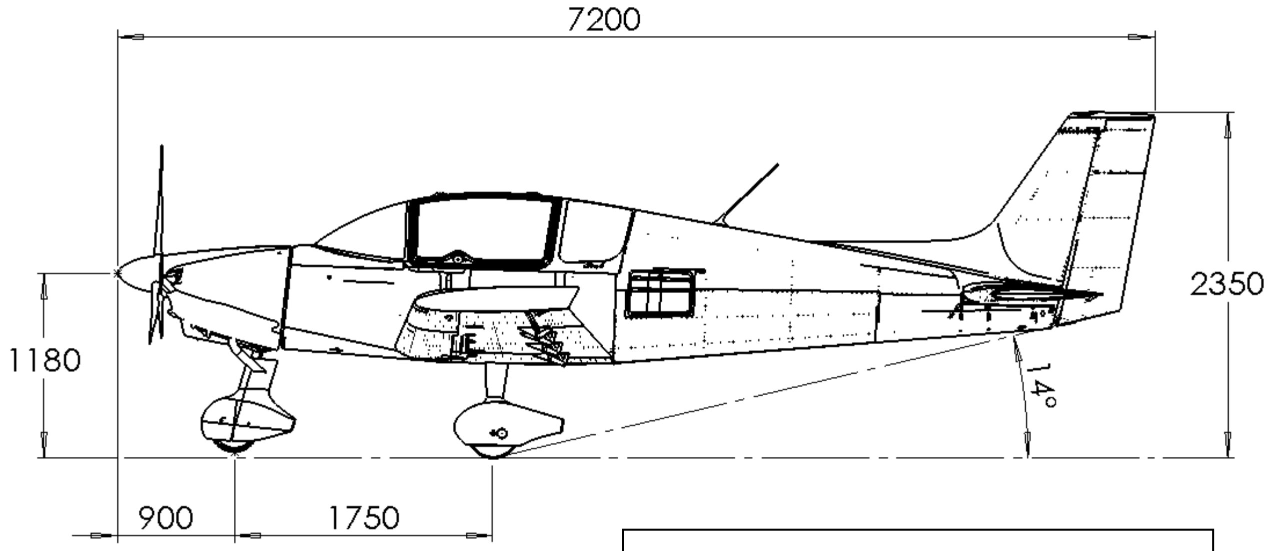
CAUTION

Caution – Indicates that non-observation of the corresponding procedure leads to minor and possible long-term degradation of flight safety.

NOTE

Note – Draws special attention to any item that is not related to safety but is still important or unusual.

1.3 Aircraft 3-View Drawing



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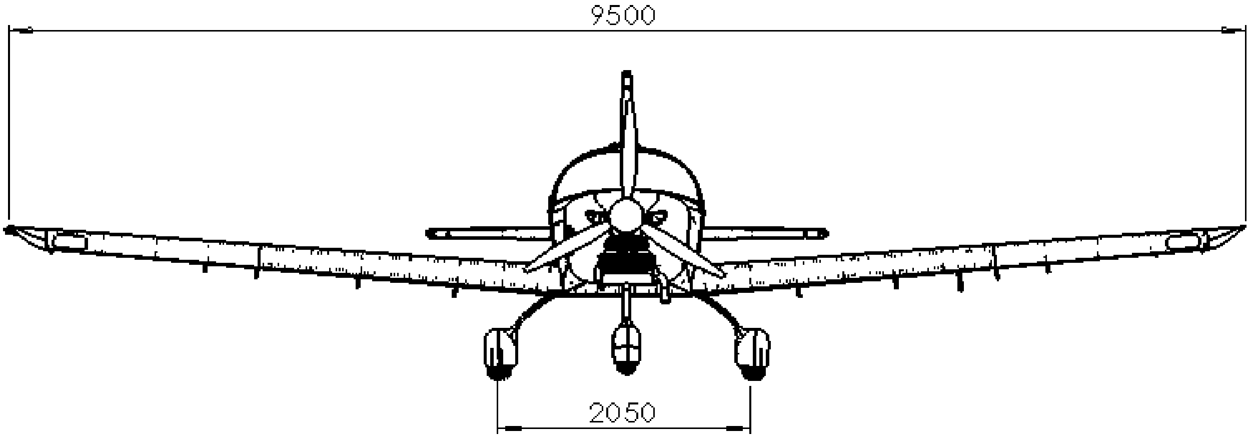
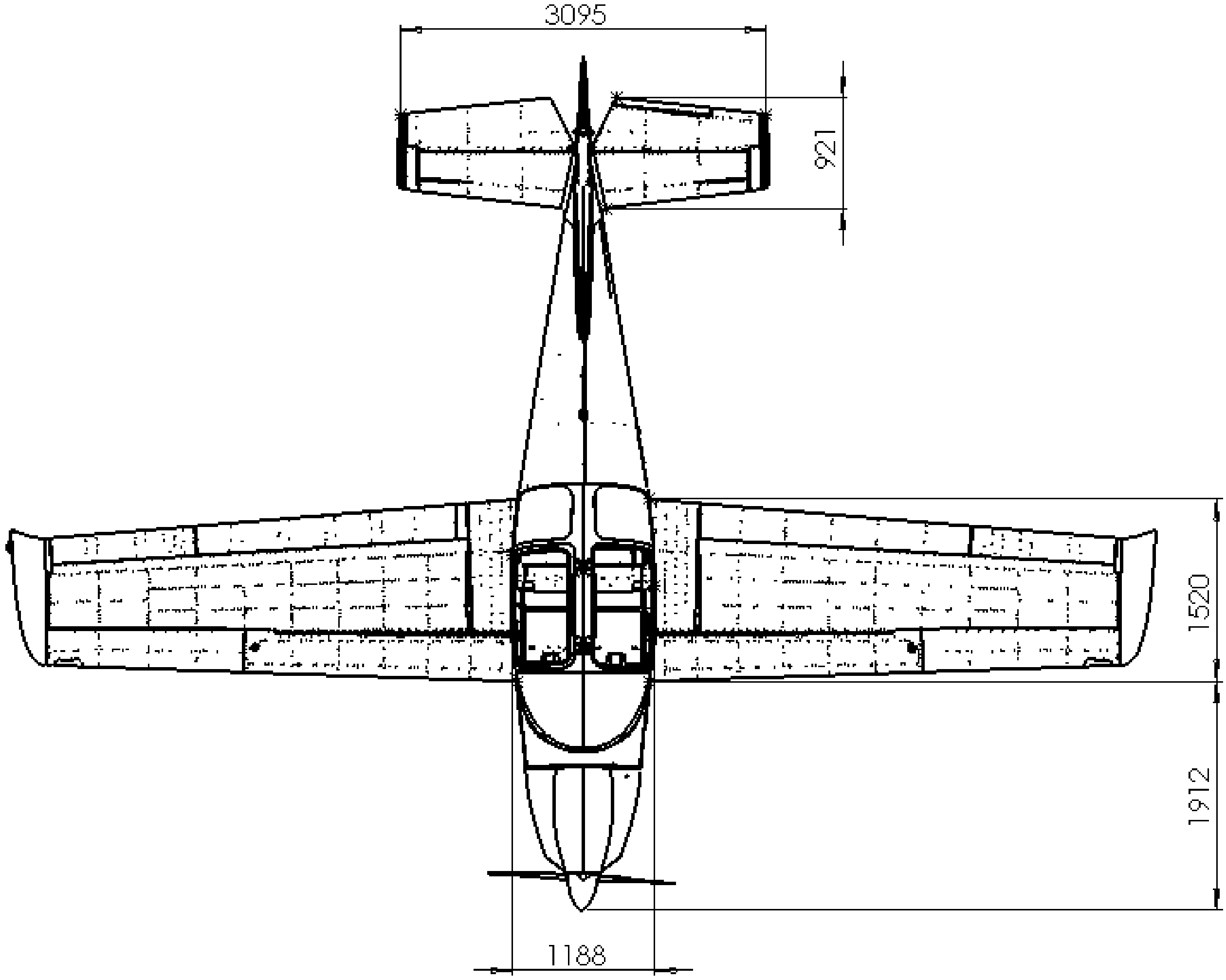


CAUTION

Do not use these values for weight and balance, as they are overall dimensions for illustration purposes and do not use the prescribed reference plane.



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1.4 Data for Sling 4 TSi Aircraft and Systems

1.4.1 *Wing*

Parameter	Value
Wingspan	9.50 m / 31 ft. 2 in.
Mean Aerodynamic Chord	1.339 m / 52.72 in.
Wing Surface Area	11.85 m^2 / 127.55ft^2
Aspect Ratio	7.68
Dihedral	4.5°
Tip Washout	1.5°

1.4.2 *Fuselage*

Parameter	Value
Fuselage Length	6.220 m / 20ft. 5in.
Overall Length	7.2 m / 23ft. 7in.
Fuselage Width	1.188 m / 3ft. 11in.
Overall Height	2.35 m / 7ft. 8in.

1.4.3 *Empennage*

Parameter	Value
Horizontal Tail Span	3.095 m / 10 ft. 2in.
Horizontal Stabilizer Surface Area	1.14 m^2 / 12.27 ft^2
Horizontal Stabilizer Angle of Incidence	-0.1°
Elevator Surface Area	1.164 m^2 / 12.5 ft^2
Vertical Stabilizer Span	1.470 m / 4ft. 10in.
Vertical Stabilizer Surface Area	0.532 m^2 / 5.7 ft^2
Rudder Surface Area	0.600 m^2 / 6.5 ft^2

1.4.4 Landing Gear

Parameter / Item	Value
Wheel Track	2.05 m / 6ft. 9in.
Wheelbase	1.75 m /5ft. 9in.
Brake Type	Hydraulic
Main Gear Tyres Size	15x6.00-6; 6-ply
Nose Wheel Tyre Size	5.00-5; 6-ply
Main Gear Tyres Pressure	2.5 bar / 36 psi
Nose Wheel Tyre Pressure	1.8 bar / 26 psi

1.4.5 Control Surface Travel Limits

Parameter	Value
Ailerons	24° up / down (±2°)
Elevator	32° up / 22° down (±3°)
Trim Tab	5° up / 25° down (±5°)
Rudder	23° left / right (-2° / +10°)
Flaps	0° up / 34° down (±3°)

1.4.6 Engine

Parameter / Item	Value
Manufacturer	Bombardier-Rotax GmbH
Model	915 iS or 916 iS[1]
Type	4-cylinder, horizontally opposed, turbocharged, with an overall displacement of 1352cc, mixed cooling, fuel injection, integrated reduction gearbox with torque damper (see 7.12 Engine).
Maximum Power (915 iS)	104 kW (139.5 hp) at 5,800 rpm (max. 5 minutes) 99 kW (133 hp) at 5,500 rpm (continuous)
Maximum Power (916 iS)	117 kW (160 hp) at 5,800 rpm (max. 5 minutes) 101 kW (137 hp) at 5,500 rpm (continuous)
Gearbox Ratio	2.54 Reduction (from engine to propeller)

[1] For 916 iS engine information please see relevant supplement provided in this document.

1.4.7 Propeller

Parameter / Item	Value
Manufacturers	Hub – Airmaster Blades – Whirlwind, *or* Sensenich MT[2] MTV-6/190-69 DUC[3] FlashBlack-3-R
Model	AP430CTF-WWR72B, *or* AP430CTF-SNR70E *or* MTV-6/190-69 *or* FlashBlack-3-R
Number of Blades	3, Composite or 4, Composite (only for DUC propeller)
Diameter	AP430CTF-SNR70E 70”/ 1.78m AP430CTF-WWR72B 72” / 1.83m MTV-6/190-69 75” / 1.90m FlashBlack-3-R 75” / 1.90m

2 For operation of the MTV-6, please see relevant supplement provided in this document.
3 For operation of the DUC FlashBlack 3, please see relevant supplement provided in this document.

1.4.8 Fuel

Parameter / Item		**Value**
Fuel Grade: Anti-Knock		Minimum - MON 85 / RON 95 / AKI 91
Fuel Grade: MOGAS		EN 228 Super EN 228 Super Plus
Fuel Grade: AVGAS		AVGAS 100 LL (ASTM D910)
176L Main Fuel Tanks	Fuel Tanks Capacity	88 L / 23.2 US GAL *(2x)*
	Fuel Tanks Useable Capacity	86 L / 22.7 US GAL *(2x)*
	Total Fuel Capacity	176 L / 46.5 US GAL
	Total Useable Fuel Capacity	172 L / 45.4 US GAL
198L Main Fuel Tanks	Fuel Tanks Capacity	99 L / 26.2 US GAL *(2x)*
	Fuel Tanks Useable Capacity	97 L / 25.6 US GAL *(2x)*
	Total Fuel Capacity	198 L / 52.3 US GAL
	Total Useable Fuel Capacity	194 L / 51.2 US GAL

1.4.9 Oil System

Parameter / Item	**Value**
Oil System Type	Forced with external oil reservoir
Oil Grade	Automotive-grade API “SG” type oil, or higher, preferably synthetic, or semi-synthetic. When operating on unleaded fuels or MOGAS, fully synthetic oil is recommended. Conventional aircraft oils (a.d. = ashless dispersant) are not suitable. *(Refer to the latest revision of the engine operator’s manual for more)*
Oil Viscosity	Multi-grade oils are recommended
Oil Capacity	Approx. 3.0 litres (3.2 quarts/6.3 pints) from dry

1.4.10 Cooling

Parameter / Item	Value
Cooling System	*Mixed* – Air and closed-circuit pressurized liquid. Air-cooled cylinders and liquid-cooled cylinder heads.
Coolant	Ethylene glycol-based coolant mixed 1:1 with distilled water. *(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)

1.4.11 Maximum Weights

Parameter	Value
Maximum Take-off Weight	950 kg (2,094 lb.)
Maximum Landing Weight	950 kg (2,094 lb.)
Maximum Baggage Weight *(Total)*	35 kg (77 lb.)
Maximum Baggage Weight *(Baggage Extension)*	3 kg (7 lb.)

1.4.12 Standard Weights

Parameter	Value
Using a 915 iS engine and Airmaster prop.	
Standard Configuration Empty Weight	500 kg (1,102 lb.)
Maximum Useful Load	450 kg (992 lb.)
Using a 916 iS engine and MT prop.	
Standard Configuration Empty Weight	505 kg (1,113 lb.)
Maximum Useful Load	445 kg (981 lb.)

1.4.13 Specific Loadings

Parameter	Value
Wing Loading *(MAUW)*	82.54 kg/m^2 (16.90 lb/ft^2)
Power Loading *(MAUW)*	6.74 kg/kW (11.08 lb/hp)

1.5 Terminology, Symbols and Conversion Factors

1.5.1 General Terminology

Acronym	Description
AC	Alternating Current
AHRS	Attitude and Heading Reference System
AKI	Anti-Knock Index
ALT	Altimeter
API	American Petroleum Institute
ASI	Airspeed Indicator
AVGAS	Aviation Gasoline
COM	Communication (Radio)
EFIS	Electronic Flight Information System
FAA	Federal Aviation Authority
FAR	Federal Aviation Regulations
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
LE	Leading Edge
LED	Light Emitting Diode
MOGAS	Automobile (car) Gasoline
MON	Motor Octane Number
NGL	Normal Ground Line
NRV	Non-Return Valve
POH	Pilot Operating Handbook
PTT	Push-To-Talk (Button)
RSA	Republic of South Africa
RON	Research Octane Number
VFR	Visual Flying Rules
VMC	Visual Meteorological Conditions
VP	Variable Pitch *(Propeller)*
VSI	Vertical Speed Indicator

1.5.2 Speed and Performance Terminology

Acronym	Description
IAS	Indicated Airspeed.
KCAS	Calibrated Airspeed – the indicated airspeed corrected for position and instrument error, expressed in knots.
KIAS	Indicated Airspeed – the speed shown on the airspeed indicator, expressed in knots.
KTAS	True Airspeed – the airspeed of the aircraft relative to the undisturbed air through which it passes.
TAS	True Airspeed.
V_A	Manoeuvring speed.
V_{BG}	Best Glide Speed – the speed *(at MAUW)* which results in the greatest gliding distance for loss in unit altitude.
V_{FE}	Maximum Flap Extended Speed – the highest speed permissible with wing flaps deployed.
V_H	Maximum Speed – the maximum speed in level flight at maximum continuous power.
V_{LOF}	Lift-off Speed – the speed at which the aircraft generally lifts off from the ground during take-off.
V_{NE}	Never Exceed Speed – the speed that may not be exceeded at any time.
V_{NO}	Maximum Structural Cruising Speed – the speed that should not be exceeded, except in smooth air, and then only with caution.
V_{REF}	Reference Speed – the indicated airspeed, at 15 m (50 ft) above the threshold, which is not less than $1.3V_{SO}$.
V_{ROT}	Rotation Speed – 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_S	Stall Speed – the speed at which the aircraft stalls, at *MAUW*, engine idling, flaps fully retracted.
V_{SO}	Stall Speed – the speed at which the aircraft stalls in the landing configuration, at *MAUW*, engine idling, flaps fully down.
V_X	Best Angle of Climb Speed – 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 – 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 the altimeter, it will indicate local altitude above mean sea level.
QFE	The local airfield pressure setting that if set on the subscale of the altimeter, it will indicate local altitude above the airfield.
QNE	The barometric pressure used for the standard altimeter setting (1013 hPa / 29.92 in. Hg)

1.5.4 *Engine Terminology*

Acronym	Description
CHT	Cylinder Head Temperature.
EGT	Exhaust Gas Temperature.
OHV	Overhead Valve.
RPM	Revolutions per Minute.
Coolant Temperature	The temperature of the coolant as it leaves the cooling jacket of cylinder head 4 *(Rotax 915iS).*

1.5.5 *Airplane Performance and Flight Planning Terminology*

Terminology	Description
Crosswind Component	The velocity of the crosswind component during take-off and landing.
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 Run	The take-off distance is measured from the actual start of the take-off run to the clearance of a 15 m (50 ft) obstacle (in the air).
Take-off Distance	The take-off distance is measured from the actual start of the take-off run to the clearance of a 15 m (50 ft) obstacle (in the air).
Useable Fuel	The fuel available for flight planning.

1.5.6 Weight and Balance Terminology/Symbols

Terminology	Description
Arm	The horizontal distance from the reference datum to the centre of gravity/point load of/on the aircraft
CG	Centre of Gravity, being the point at which the Airplane would balance if suspended. The value is given as a distance from the reference datum or as a percentage of MAC and has minimum and maximum permissible values.
Datum	The reference datum is an imaginary vertical plane from which all horizontal distances are measured for weight and balance purposes. The Sling 4 TSi datum is 52mm aft of the propeller flange.
Empty Weight	The weight of the Airplane with engine fluids at operating levels.
MAC	Mean Aerodynamic Chord. The average chord value of the main wing.
MAUW	Maximum All Up Weight or Maximum Takeoff Weight. Maximum permissible weight approved for takeoff/flight
Maximum Landing Weight	The maximum weight approved for the landing touch down
Moment	The product of the weight of an item multiplied by its arm
W_R	Weight reading from scale under right main wheel during aircraft weighing
W_L	Weight reading from scale under left main wheel during aircraft weighing
W_N	Weight reading from scale under nose main wheel during aircraft weighing
W_E	Aircraft empty weight
W_T	Aircraft total 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

Imperial		Metric	
pound	*1*	0.4536	kilogram
pound per square inch	*1*	6.895	kilopascal
inch	*1*	25.4	millimetres
foot	*1*	0.3048	meters
statute mile	*1*	1.609	kilometres
nautical mile	*1*	1.852	kilometres
millibar	*1*	1	hectopascal
		0.1	kilopascal
imperial gallon	*1*	4.546	litres
US gallon	*1*	3.785	litres
US quart	*1*	0.946	litres
cubic foot	*1*	28.317	litres
°F		$(1.8 \times °C) + 32$	
$(°F - 32) \times \left(5/9\right)$		°C	

1.6 Supporting Documents

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

1. *The latest revision* of the Operators Manual for Rotax® Engine Type 915 iS A Series, ref. no.: OM-915 I A.

2. The *latest revision* of the Rotax® service instruction SI-915 i-001 entitled "Selection of Suitable Operating Fluids".

3. The *latest revision* of the Operators Manual for the Airmaster AP3 and AP4 Series Constant Speed Propellers.

4. The *latest revision* of the Operators Manual for the Garmin G3X Glass Cockpit.

5. The *latest revision* of the Operators Manual for the relevant COM radio, transponder and any other relevant equipment fitted.

6. The *latest revision* of the Operators Manual for the Stratos 07 Magnum ballistic parachute, 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 where applicable.

2 Limitations

2.1 Introduction

This section includes operating limitations, instrument markings and placards necessary for the safe operation of the Sling 4 TSi, its engine, systems, and equipment.

2.2 Airspeed Limitations

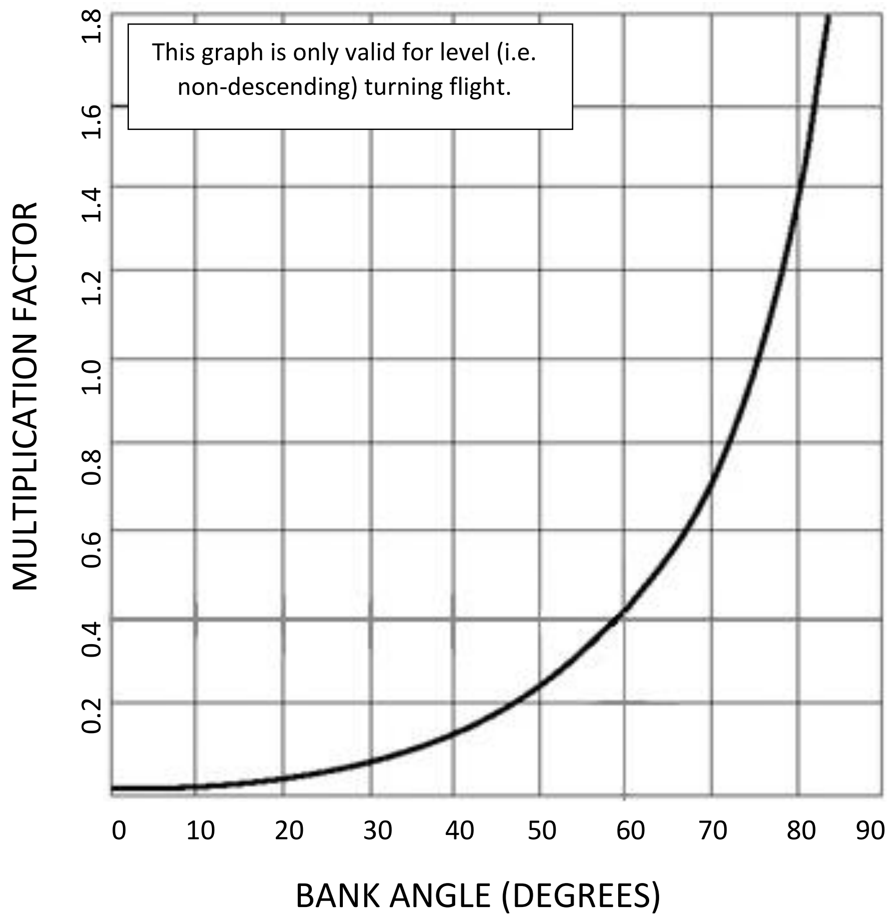
Speed		KIAS	Remarks
V_{NE}	Never Exceed Speed	155	Never exceed this speed in any operation.
V_{NO}	Maximum Structural Cruising Speed	135	Never exceed this speed unless in smooth air, and then only with caution.
V_A	Manoeuvring Speed	108	Do not make full or abrupt control movements above this speed, as this may cause stress in excess of the 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	140	Never exceed this speed in level flight, at MAUW.
V_S	Stall Speed	55	The aircraft will stall at this speed with flaps fully retracted, at MAUW in the most forward CG configuration and engine idling.
V_{S0}	Stall Speed in Landing Configuration	48	The aircraft will stall at this speed with full flap, at maximum all up weight in the most forward CG configuration and engine idling.

2.3 Airspeed Indicator Markings

Marking	KIAS	Significance
White Arc	48-85	Flap Operating Range Lower Limit - V_{S0} (At MAUW) Upper Limit - V_{fe} (Max. flap operation speed)
Green Arc	55-135	Normal Operating Range Lower Limit - V_S (At MAUW, max forward CG) Upper Limit - V_{NO} (Max. Structural Speed)
Yellow Arc	135-155	Manoeuvres must be conducted with caution and only in smooth air.
Red Line	155	Maximum speed for all operations.

2.4 Stall Speed Adjustment for Turning Flight

Stall speeds listed earlier in this section are for straight and level flight, at a load factor of 1g. Speeds should be adjusted for turning flight or increased load factor.



$V_T = V + (V \times Multiplication\ Factor)$

- 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 crosswind component for take-off and landing	15 knots

2.6 Service Ceiling

Item	Value
Service Ceiling	18,000 ft. / 5,486 m

2.7 Load Factors

Item	Value
Maximum positive limit load factor	+3.8g
Maximum negative limit load factor	-1.9g
Maximum positive load factor *with flap*	+2.5g
Maximum negative load factor *with flap*	-1g

2.8 Weights

Item	Value
Maximum take-off weight (MAUW)	950kg / 2,094 lb.
Maximum landing weight	950kg / 2,0595 lb.
Maximum total baggage weight	35kg / 77 lb.
Maximum baggage extension weight	3kg / 7 lb

2.9 Centre of Gravity Range

Item	Value
Datum	52mm aft of the centre of the front face of the engine propeller flange
Reference (Longitudinal Levelling)	The second row of rivets below the canopy frame edge, on the outside of the fuselage, above the wing.
Reference (Transverse Levelling)	The upper surface of the centre spar cap under pilot and passenger seats.
Forward CG Limit	1,847 mm / 6.060 ft. (18% MAC) aft of datum
Rear CG Limit	2,043 mm / 6.703 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 Weight and Balance for more information.

2.10 Prohibited Manoeuvres

The Sling 4 TSi is approved for normal manoeuvres, including the following:

- Steep turns not exceeding 60°
- 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 (108 KIAS – manoeuvring speed).

2.11 Flight Crew

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

2.12 Passengers

Only three passengers are allowed on board the aircraft *(in addition to the pilot and in accordance with CG limitations).*

2.13 Kinds of Operation

2.13.1 Normal VFR Operation

The Sling 4 TSi, in standard configuration, is approved only for day VFR operation with visual contact with terrain.

Minimum equipment is as follows:

Equipment
Altimeter, with encoding transponder
Airspeed Indicator
Magnetic Heading 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, the Sling 4 TSi fitted with the following additional equipment, may also be operated at night; provided that operations are at all times conducted in VMC.

Item
Red Beacon / Strobe Lights
Navigation Lights
Landing Light(s). *(Two separate lights or a single light with two independent filaments)*
Instrument Panel Lighting

2.13.3 IFR Operation

Provided that the aircraft is appropriately equipped, the aircraft may be safely flown under IFR. Depending on the practical and legal requirements of the judicial region the aircraft will be operated, the aircraft may also be safely flown in IMC conditions, in accordance with IFR. 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.

WARNING

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

NOTE

Additional equipment may be required to fulfil national or specific requirement and may be fitted.

2.14 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 the latest information regarding operating limitations.

2.14.1 Engine Start and Operation Temperature Limits

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

2.14.2 Engine Load Factor Limits (Acceleration)

Item	Value
Maximum	5 seconds at maximum -0.5g

.

2.14.3 Engine Operational and Speed Limits

Item		Value
Engine Model		ROTAX 915 iS
Engine Manufacturer		Bombardier-Rotax GMBH
Power	Maximum take-off	105 kW / 141 hp at 5800 rpm, max. 5 minutes
	Maximum continuous	100 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	1 400 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 (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)
	Maximum	3.2 bar (46.4 psi)
Manifold Pressure	Minimum	1.77 in. hg (60 hPa)
	Maximum	51 in. hg (1727 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.*

2.15 Other Limitations

- No smoking is allowed on board the Airplane.
- VFR only flights are permitted unless the operator has equipped the aircraft correctly for IFR flight.

WARNING

Intentional flights under icing conditions are prohibited!

2.16 Flight in Precipitation

Flying through rain should be avoided, but can be achieved with no additional steps. Airplane qualities and performance are not substantially changed. However, VMC should be maintained unless the flight is under IFR.

2.17 Limitation Placards

The following limitation warning placards must be placed in the aircraft and positioned in plain view of the pilot and passenger.

2.17.1 *Instrument Panel*

OPERATE UNDER VMC ONLY
MAXIMUM PERMISSIBLE AIRSPEED 155 KIAS
MAXIMUM PERMISSIBLE RPM 5 800 RPM FOR 5 MINUTES
MAXIMUM CONTINUOUS RPM 5 500
MAXIMUM PERMISSIBLE MASS 950 KG/2,094 LB

2.17.2 *Visible to Pilot and Passenger*

WARNING
NON-CERTIFIED AIRCRAFT
THIS AIRCRAFT IS NOT REQUIRED TO COMPLY WITH ALL THE REGULATIONS FOR TYPE CERTIFIED AIRCRAFT
YOU FLY IN THIS AIRCRAFT AT YOUR OWN RISK

WARNING
AEROBATICS AND INTENTIONAL SPINS ARE PROHIBITED

NO SMOKING

2.17.3 *Exterior of Baggage Door*

MAX TOTAL BAGGAGE WEIGHT – 35KG / 77LB

2.17.4 Adjacent to Fuel Filler Cap

AVGAS
OR
MOGAS
98 LITRES

2.17.5 Inboard Upper Wing Flap Surface

NO STEP

2.17.6 Fireproof Metal Plate Attached to Aircraft

ZU-###
CONSTRUCTOR – SLING AIRCRAFT
MODEL – SLING 4 TSi
AIRCRAFT SERIAL NO – ###
ENGINE ROTAX 915 iS – 141 HP
MANUFACTURED - ###

NOTE

- *### represents the information applicable to the specific aircraft.*
- *The registration number (on above plate) is specific to the country of registration. The format shown above is the South African standard.*

2.17.7 Other Placards

The aircraft must be placarded to show the identity of:

- All Fuses / Circuit Breakers
- Ignition switches
- Starter
- Trim: NOSE UP and NOSE DOWN
- Flaps: UP, STAGE 1, STAGE 2, DOWN
- All Other Switches
- Canopy handle OPEN and CLOSED position
- Ballistic parachute deployment handle, if equipped.

3 Emergency Procedures

3.1 Introduction

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

Emergencies caused by aircraft or engine malfunction are extremely rare if the appropriate procedures are followed, such as pre-flight inspections and general maintenance. Should an emergency arise, however, basic guidelines described in this section should be considered and applied accordingly to mitigate the consequences of the emergency.

In case of an emergency, the pilot should remember the following priorities, in order of importance:

1. **FLY THE AIRCRAFT** – Keep control and continue flying.
2. **ANALYSE** – Analyse the situation as a whole, keeping an open mind.
3. **PROCEDURES** – Apply applicable procedures.
4. **COMMUNICATE** – Inform ATC / local traffic of the situation, if time permits.

3.2 Speeds for Emergency Operations

Speed		KIAS	Remarks
V_{BG}	Best Glide Speed	72	This speed (MAUW, flaps up) results in the best gliding distance, along the ground. Horizontal distance travelled (in still air) is approx. 3,660m (12,000ft.) per 305m (1,000ft) descent. Glide ratio 12:1
-	Speed for in-flight engine start	> 75	Recommended speed.

3.3 Engine Related Emergencies

3.3.1 Engine Failure During Take-off

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

with aircraft under control –

3. Ignition Lanes .... OFF *(A & B)*
4. Master .... OFF
5. Fuel Selector................................. OFF
6. Fuel Pumps................................... BOTH OFF *(MAIN & AUX)*
7. Boost Pump .... 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 Pumps................................... BOTH OFF *(MAIN & AUX)*
5. Boost Pump .... OFF
6. Fuel Selector................................. OFF
7. Ignition Lanes .... OFF *(A & B)*

before touch-down –

8. Master .... OFF

WARNING

Flaps and elevator trim will not operate with the master switch off, and they are powered by the main bus. Make final flap and trim selection before turning master switch off.

3.3.3 Engine Failure During Flight

1. Airspeed .... 72 KIAS
2. Landing Area .... CLEAR GROUND
3. Air Start .... COMMENCE

If engine successfully restarts –

4. Continue.. PROCEED WITH CAUTION
5. Land... AS SOON AS POSSIBLE

If the engine should fail to restart –

6. Land... FORCED LANDING

3.3.4 Air-Start

1. Master... ON
2. Ignition Lanes .... ON *(A & B)*
3. ECU Backup Switch........................ ON
4. Fuel Pumps.................................... BOTH ON *(MAIN & AUX)*
5. Boost Pump .... ON
6. Fuel Selector.................................. CHANGE *(UNLESS 2ND TANK DRY)*
7. Throttle .... CHECK MOVEMENT
8. Throttle .... MIDDLE POSITION
9. Starter .... ENGAGE

NOTE

An air-start is possible with the propeller windmilling and the ECU Backup Switch ON. The starter can also be used while the propeller is windmilling, if needed.

3.3.5 Irregular Engine RPM

1. Ignition Lanes .... ON *(A & B)*
2. Throttle .... VERIFY POSITION
3. ECU Backup Switch .... ON
4. Fuel Quantity................................. CHECK
5. Fuel Selector.................................. CHANGE *(UNLESS 2ND TANK DRY)*
6. Fuel Pumps.................................... BOTH ON *(MAIN & AUX)*
7. Boost Pump .... ON
8. Oil - Pressure .... CHECK
9. Oil - Temperature .... CHECK
10. Coolant - Temperature .... CHECK
11. EGT - Temperature .... CHECK

    If the engine continues to run rough –

12. Land... AS SOON AS POSSIBLE

3.3.6 Low Fuel Pressure

1. Fuel Quantity................................. CHECK
2. Fuel Selector.................................. CHANGE *(UNLESS 2ND TANK DRY)*
3. Fuel Pumps.................................... BOTH ON *(MAIN & AUX)*
4. Boost Pump .... ON

    If fuel pressure remains low –

5. Throttle .... DECREASE IF POSSIBLE

    If fuel pressure remains low –

6. Land... AS SOON AS POSSIBLE

3.3.7 Low Oil Pressure

1. Oil - Temperature .... CHECK (MAX. 120 °C)

   If the oil temperature is high or increasing –

2. Airspeed .... 72 KIAS[(a)]

   If oil pressure remains low or temperature remains high/increasing –

3. Land... AS SOON AS POSSIBLE[(b)]

NOTES

a. 72 KIAS is the speed at which the aircraft is most efficient.
b. Remain vigilant for an impending engine failure.

3.4 Emergency Landing Procedures

3.4.1 Emergency Landing without Engine Power

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. Boost Pump .... OFF
6. Ignition Lanes .... OFF *(A & B)*
7. Fuel Selector.................................. OFF
8. Throttle .... CLOSED
9. Flaps .... FULL *(BEFORE TOUCHDOWN)*
10. Communication .... REPORT IF TIME PERMITS
11. Passenger .... BRIEF

    Immediately Before Touchdown –
12. Master .... OFF

NOTES

a. Do not lose perspective of time trying to restart the engine. Retry a limited number of times, which will depend on the altitude where the failure occurred. Rather focus on the best possible landing location and your approach to it.

3.4.2 Precautionary Landing with Engine Power

1. Airspeed .... 75 KIAS
2. Flaps .... TAKE-OFF
3. Fuel Pumps .... BOTH ON *(MAIN & AUX)*
4. Boost Pump .... ON
5. Landing Area .... INSPECT *(AS PER PROCEDURE)*
6. Flaps .... FULL *(ON FINAL APPROACH)*
7. Airspeed .... 65 KIAS
8. Brakes.. APPLY

when aircraft is under control –

9. Ignition Lanes .... OFF *(A & B)*
10. Fuel Selector.................................. OFF
11. Master Switch .... OFF

3.4.3 Ditching

1. Airspeed .... 65 KIAS
2. Flaps .... FULL
3. Descent .... ESTABLISH 50 ft/min
4. Direction
   i. High Wind .... INTO WIND
   ii. Light Wind................................ PARALLEL TO SWELLS
5. Crew .... BRIEF
6. Canopy .... OPEN
7. Touch-down Speed........................ SLOWEST PRACTICAL
8. Crew .... EVACUATE
9. Life Jackets / Raft .... INFLATE

3.4.4 Landing with a Flat Tyre / Damaged Wheel

1. Approach .... NORMAL
2. Airspeed .... 65 KIAS
3. Airspeed at flare .... SLOWEST PRACTICAL *(+/- 60 KIAS)*

If nosewheel is damaged / flat –

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

NOTE

The Sling 4 TSi lands within ground effect since the wings are low to the ground. Anticipate an increase in lift just before touch-down, unless airfoil stalls before entering ground effect.

3.5 Smoke and Fires

3.5.1 Engine Fire on Ground During Start

1. Starter .... RELEASE
2. Fuel Selector.................................. CLOSE
3. Fuel Pumps.................................... BOTH OFF *(MAIN & AUX)*
4. Boost Pump .... OFF
5. Throttle .... IDLE
6. Ignition Lanes .... OFF *(A & B)*
7. Master.. OFF
8. Fire Extinguisher............................ RETRIEVE
9. Exit Aircraft
10. Extinguish Fire

3.5.2 Engine Fire on Ground

1. Cabin Heat..CLOSE
2. Fuel Selector.....................................CLOSE
3. Fuel Pumps.......................................BOTH OFF *(MAIN & AUX)*
4. Boost Pump ....OFF
5. Throttle ....IDLE
6. Ignition Lanes ....OFF *(A & B)*
7. Master...OFF
8. Fire Extinguisher...............................RETRIEVE
9. Exit Aircraft
10. Extinguish Fire

3.5.3 Engine Fire during Take-off Run

1. Throttle .... IDLE
2. Cabin Heat..................................... CLOSE
3. Brakes... APPLY UNTIL STOP
4. Fuel Selector.................................. CLOSE
5. Fuel Pumps.................................... BOTH OFF *(MAIN & AUX)*
6. Boost Pump .... OFF
7. Ignition Lanes .... OFF *(A &B)*
8. Master... OFF
9. Fire Extinguisher............................ RETRIEVE
10. Exit Aircraft
11. Extinguish Fire

3.5.4 Engine Fire in Flight

1. Cabin Heat..................................... CLOSE
2. Cabin Air Vent .... OPEN
3. Throttle .... IDLE
4. Fuel Pumps.................................... BOTH OFF *(MAIN & AUX)*
5. Boost Pump .... OFF
6. Ignition Lanes .... OFF *(A & B)*
7. Master... OFF *(AFTER FLAP DEPLOYMENT)*
8. Fuel Selector.................................. CLOSE
9. Airspeed .... INCREASE TO VNE *(155 KIAS)*
10. Forced Landing .... AS PER 3.4.1

3.5.5 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

NOTES

a. If the location/source of the fire can be determined, electrical power can be removed from that circuit via the isolating switch. This will remove the need to switch off the master.

b. The EFIS and associated equipment (iBox, RDAC etc.) can still be powered from the EFIS battery backup circuit when the master switch is off; provided that the EFIS system is not the source of the electrical fire.

3.5.6 Cabin Fire

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

3.6 Recovery from Unintentional Spin

WARNING

Intentional spins are prohibited.

Unintentional spin recovery technique.

1. Throttle .... IDLE
2. Lateral Control.............................. AILERONS NEUTRAL
3. Yaw Control .... RUDDER FULL IN OPPOSITE DIRECTION OF SPIN
4. Longitudinal Control .... ELEVATOR THROUGH NEUTRAL – NOSE DOWN [a]

   when rotation stops –

5. Yaw Control .... RUDDER NEUTRAL
6. Longitudinal Control...................... RECOVER FROM DIVE[b]

NOTES

a. Apply nose down elevator sufficient to unstall the wing – full nose down elevator deflection may be required for fully developed and/or flat spins.

b. Do not exceed VNE or load factor limits in the recovery dive.

In the unlikely event that the aircraft enters a flat spin and the steps above do not result in recovery of control, the following may be implemented:

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

when rotation stops –

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

3.7 Other Emergencies

3.7.1 Propeller VP Failure

1. Engine Speed................................ PREVENT OVERSPEED
2. Propeller Mode .... SELECT MANUAL *(MAN)*
3. Propeller Pitch.............................. VERIFY OPERATION

If propeller pitch control is still ***available*** *–*

4. Propeller Pitch.............................. SET TO REQUIRED

If propeller pitch control is ***unavailable*** *–*

5. Propeller Switch .... OFF

If failure results in pitch ***within*** *flight range –*

6. Proceed .... WITH CAUTION

If failure results in pitch ***outside*** *flight range –*

7. Precautionary Landing.................. EXECUTE

CAUTION

Selection of too fine a propeller pitch, and high throttle settings may result in an engine overspeed.

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

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.**

3.7.2 Engine Vibration / Rough Running

If any abnormal engine vibrations occur:

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

3.7.3 EFIS System Failure

If the EFIS freezes, fails or reacts incorrectly in flight:

1. Straight and Level Flight .... MAINTAIN[a]
2. EFIS Main Switch .... OFF
3. EFIS Back-Up Switch .... OFF

Wait for 3 seconds –

4. EFIS Main Switch .... ON
5. EFIS Back-Up.................................. 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[b]

NOTES

a. Through use of ground references and other instruments.
b. Execute landing at first safe opportunity and have instrument repaired.

3.7.4 Alternator / Charge System Failure

An alternator A/B failure is indicated by the lane warning lights.

3.7.4.1 Alternator A Failure –

Alternator 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 2 SEC., ON)*
2. Lane A... VERIFY WARNING LIGHT OFF

If Lane A warning light is still on – assume alternator failure.

3. ECU Backup .... ON
4. EFIS Backup .... ON
5. Non-Essential Equipment .... ALL OFF[(a)]
6. EFIS Brightness .... MINIMUM
7. Radio Communication .... MINIMUM
8. Land... AS SOON AS PRACTICABLE

NOTES

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. Non-essential equipment includes lights, auto-pilot, secondary EFIS etc.

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.

3.7.4.2 Alternator B Failure –

Alternator 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 2 SEC., ON)*
2. Lane B.. VERIFY WARNING LIGHT OFF

If Lane B warning light is still on – assume alternator failure.

3. ECU Backup .... ON
4. EFIS Backup .... ON
5. Non-essential Equipment .... OFF[(c)]
6. Radio Communication .... MINIMAL
7. Land... AS SOON AS PRACTICABLE

NOTES

c. 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. Non-essential equipment includes lights, auto-pilot, secondary EFIS etc.

3.7.4.3 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 for the engine to run.

1. ECU Backup .... ON
2. EFIS Backup .... ON
3. Main Battery .... VERIFY VOLTAGE[(d)]
4. Non-essential Equipment .... OFF
5. Radio Communication .... MINIMAL
6. Precautionary .... AS SOON AS PRACTICABLE

NOTES

d. 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 approximately 30 minutes, following a dual alternator 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.

3.7.4.4 Loss of Sensors

The engine sensors, for redundancy purposes, are powered by Lane A/B separately. This means that if one of the two lanes fail, a subset of the engine sensors will also fail.

Failure of Lane	Resultant Sensor Failure
A	Coolant Temperature
	Exhaust Gas Temperature
	Ambient Temperature
	Ambient Pressure
	Throttle Level Position
B	Oil Temperature
	Oil Pressure

3.7.5 *Main Bus Power Failure*

Please refer to 7.14.4 Main Bus, for a list of equipment affected by a loss of power to the main bus.

1. ECU Backup .... ON
2. EFIS Backup .... 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 stopped, the engine will have to be restarted via airstream driven propeller rotation (windmilling).

4 Normal Procedures

4.1 Introduction

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

The checklists proposed are considered to be the most desirable, and checks should follow them unless there is a valid reason to deviate from them.

4.2 Speeds for Normal Operation

Unless otherwise noted, the following speeds are based on a maximum weight of 950 kg (2,094lb).

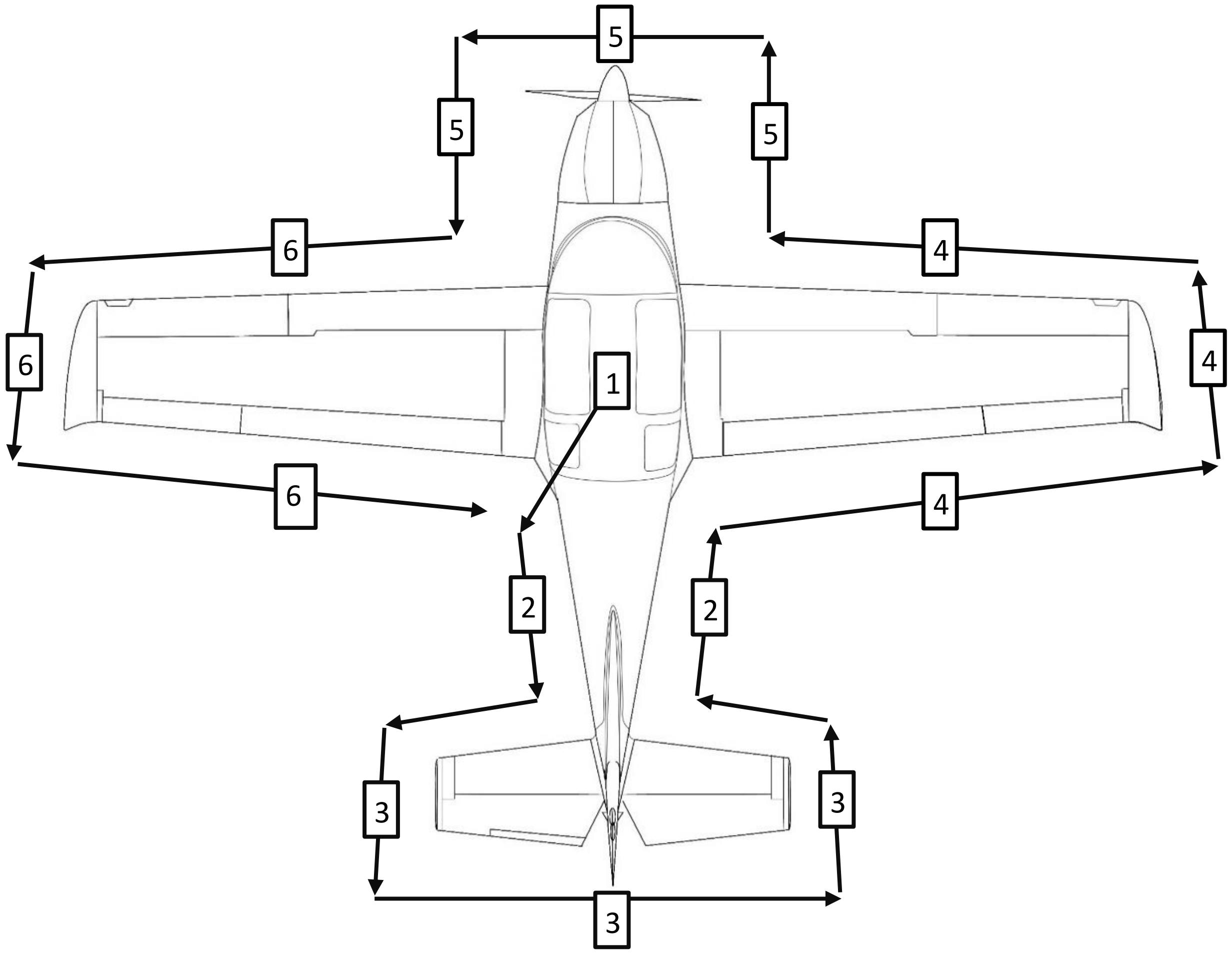
SPEED		KIAS	REMARKS
V_X	Best Angle of Climb Speed	65	The speed (flaps fully retracted) which results in the greatest altitude gain over a given horizontal distance.
V_Y	Best Rate of Climb Speed	75	The speed (flaps fully retracted) which results in the greatest altitude gain over a given time period.
V_{ROT}	Rotation Speed	55	The speed at which the aircraft should be rotated about the pitch axis during take-off.
V_{LOF}	Lift-off Speed	61	The speed at which the aircraft generally lifts off from the ground during take-off.
-	Cruise Climb Speed	85 - 100	
-	Approach speed	70 - 85	
V_{REF}	Threshold crossing speed	65	Indicated airspeed at 15 m (50 ft) above the threshold, which is not less than $1.3V_{SO}$.

4.3 Preflight Inspection

A preflight inspection is required prior to every flight, or first flight of the day. It must also be performed after any incident, accident, maintenance activity etc. Incomplete or careless inspections can result in an accident. Carry out the inspection following the instructions on the Inspection Checklist.

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.



4.3.1 Inspection Checklist

4.3.1.1 Cabin

Ignition Lanes............................ OFF
Master Switch........................... ON
Fuel.. VERIFY QUANTITY
Flaps... FULL DOWN
Avionics.................................... VERIFY CONDITION
Master Switch........................... OFF
Controls (all)............................. CHECK *for full, free movement up to stops*
Harnesses and Seats.................. CHECK CONDITION[(a)]
Canopy and Windshield............. CHECK CONDITION and cleanliness
Doors.. CHECK CONDITION AND SECURITY
Cockpit...................................... CHECK FOR LOOSE OBJECTS and secure
Fire Extinguisher........................ VERIFY PRESENT / VALID
Documentation.......................... VERIFY PRESENT / VALID[(b)]

NOTES

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

4.3.1.2 Fuselage

Surface Condition........................ CHECK CONDITION
Wing/fuselage Fairing................. CHECK
Empennage Fairing...................... CHECK
Antenna/e.................................. CHECK CONDITION / SECURITY
Luggage Compartment Door........ CLOSED / LOCKED
Static Source (*if applicable*)........... CHECK CONDITION

4.3.1.3 Empennage

Tie-down Rope............................ REMOVED
Horizontal Stabilizer..................... CHECK CONDITION
Vertical Stabilizer .... CHECK CONDITION
Elevator....................................... CHECK CONDITION / MOVEMENT
Elevator Trim Tab......................... CHECK CONDITION
Rudder .... CHECK CONDITION / MOVEMENT
Hinges, Bolts, Pushrods................ CHECK CONDITION / SECURITY
Strobe .... CHECK CONDITION

4.3.1.4 Right Wing and Right Main Gear

Wheel Fairing.............................. CHECK CONDITION / SECURITY
Wheel and Brakes .... CHECK CONDITION[a]
Wheel Struts .... CHECK CONDITION / CRACKS
Chocks .... REMOVE
Flap .... CHECK SECURITY
Flap Hinges, Control Horn, Pushrod .... CHECK CONDITION / SECURITY
Wing Trailing Edge .... CHECK CONDITION
Aileron .... CHECK SECURITY / MOVEMENT
Aileron Hinges, Control Horn, Pushrod..... CHECK CONDITION / SECURITY
Wingtip .... CHECK CONDITION
Nav Light..................................... CHECK CONDITION
Taxi/Landing Light Lens................ CHECK CONDITION
Wing Leading Edge....................... CHECK CONDITION
Fuel Vent (underside of wing).......... CHECK UNOBSTRUCTED
Fuel Quantity .... CHECK THOUGH FILLER

NOTES

a. Fluid Leaks, brake pad and disc condition, tyre condition, tyre inflation (See 4.3.1.7 Tyre Pressure Visual Inspection)

WARNING

Physically verify the fuel level before each take-off. Fuel can be visibly seen, through the filler cap, just covering the (total) bottom of the fuel tank with 30 litres present.

4.3.1.5 Nose Section and Nose Gear

Engine Cowling .... CHECK CONDITION / SECURITY
Propeller and Spinner .... CHECK CONDITION / SECURITY
Air Intakes.................................... CHECK CONDITION / OBSTRUCTION
Radiators...................................... CHECK CONDITION
Engine Mount .... CHECK CONDITION / SECURITY
Exhaust Manifold......................... CHECK CONDITION
Leaks.. CHECK COWL OUTLETS
Engine Oil..................................... CHECK LEVEL WITH DIPSTICK
Coolant .... CHECK LEVEL[a]
Parachute .... CHECK COVER SECURITY
Nose Wheel .... CHECK CONDITION
Chocks .... REMOVE

NOTES

a. Do not fill the coolant level to the max mark on the overflow bottle mounted to the firewall. Its best practice to have the fluid level just above the min mark when cold. If there is any doubt about fill level, remove the radiator cap (only when cold) to verify fluid presence.

CAUTION

During the pull-through, **make sure the ignition lanes are OFF.** Always handle the propeller blade area with the palm of your hand, and not only the tips of your fingers.

4.3.1.6 Left Wing

Fuel Quantity .... CHECK THOUGH FILLER
Fuel Vent (underside of wing).......... CHECK UNOBSTRUCTED
Pitot Tube .... CHECK CONDITION
Wing Leading Edge....................... CHECK CONDITION
Taxi/Landing Light Lens................ CHECK CONDITION
Wingtip .... CHECK CONDITION
Nav Light .... CHECK CONDITION
Aileron .... CHECK SECURITY / MOVEMENT
Aileron Hinges, Control Horn, Pushrod ...... CHECK CONDITION / SECURITY
Wing Trailing Edge .... CHECK CONDITION
Flap .... CHECK SECURITY
Flap Hinges, Control Horn, Pushrod .... CHECK CONDITION / SECURITY
Wheel Fairing............................... CHECK CONDITION / SECURITY
Wheel and Brakes .... CHECK CONDITION[(a)]
Wheel Struts .... CHECK CONDITION / CRACKS
Chocks .... REMOVE

NOTES

a. Fluid Leaks, brake pad and disc condition, tyre condition, tyre inflation (See 4.3.1.7 Tyre Pressure Visual Inspection)

WARNING

Physically verify the fuel level before each take-off. Fuel can be visibly seen, through the filler cap, just covering the (total) bottom of the fuel tank with 30 litres present.

4.3.1.7 Tyre Pressure Visual Inspection

The tyres must be visually inspected prior to every flight. It is not necessary to check the pressure of the tyre with a gauge; it is sufficient to visually inspect the tyre.

Correct Inflation	Underinflation
	
	

NOTE

Pay specific attention to the following, in order to decern satisfactory inflation:

- Outmost tread lines
- Sidewall deflection

4.4 Engine Start and Taxi

4.4.1 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

4.4.2 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. Boost Pump .... ON *(NO ABNML. SOUND)*
   .... OFF *(AFTER 5 SEC.)*
8. Aux Fuel Pump .... ON *(FUEL PRESS. / NO ABNML. SOUND)*
   .... OFF *(AFTER 5 SEC.)*
9. Main Fuel Pump .... ON *(FUEL PRESS. / NO ABNML. SOUND)*
10. ECU Backup Switch................. OFF
11. Throttle .... SET (±40 to 60%)
12. Propeller................................ AREA CLEAR
13. Starter .... ENGAGE *(MAX. 10 SECONDS)*
14. Oil Pressure .... CHECK *(CORRECT WITHIN 10 SECONDS)*
15. Throttle .... +/- 2500 RPM
16. Lane Lights............................. VERIFY OFF
17. Alternator B........................... CHECK ONLINE [(a)]
18. Avionics Switch...................... ON
19. Oil Temperature .... 2500 RPM *until oil temperature*
    .... *is* > 50 °C (122 °F) [*(b)*]

NOTE

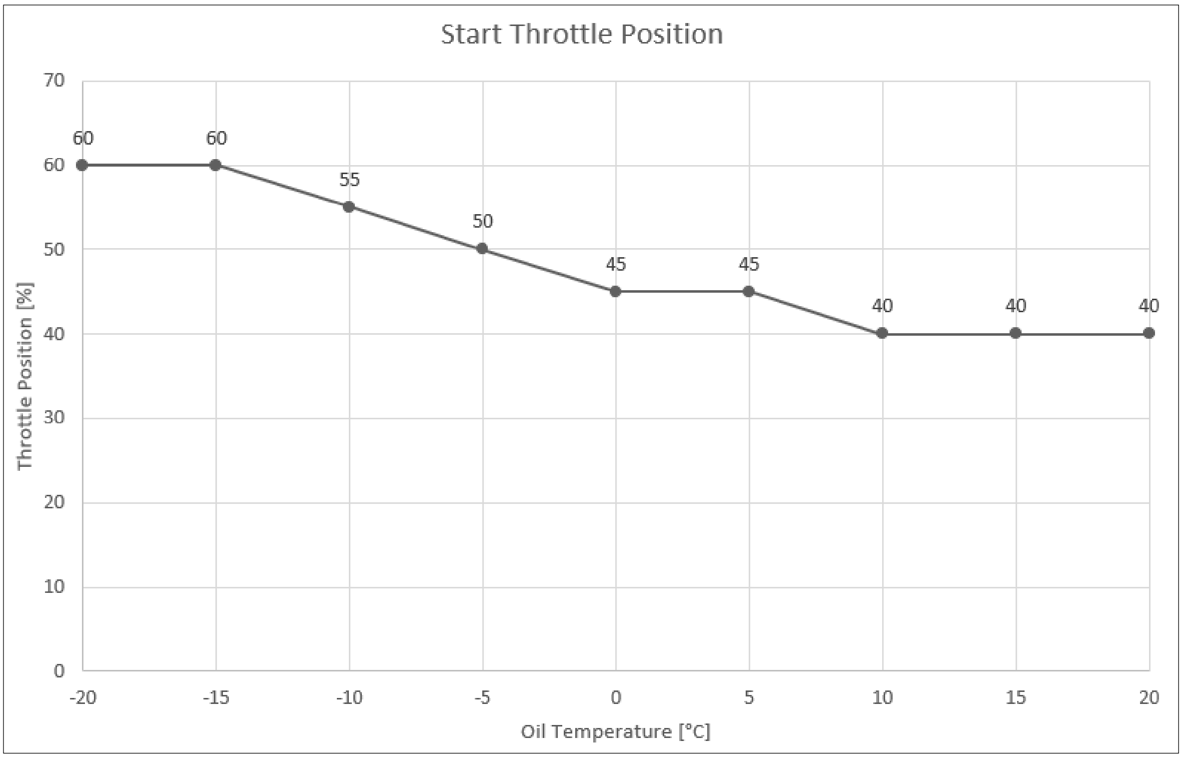
a. Main bus voltage should move up from +/- 12.5V to above 13V when the engine RPM is held above/at 2500 RPM for more than 5 seconds. This is the indication that Alternator B has been brought online by the ECU.

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).

4.4.2.1 Start Throttle Position vs. Oil Temperature



NOTE

Since the engine tends to vibrate substantially with low throttle settings on start-up, start the engine with the throttle set as per the graph above to achieve a throttle RPM of approximately 2,000rpm.

4.4.3 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

4.5 Before Take-off

To be conducted at a holding point or equivalent –

4.5.1 Run Up & Pre-Take-off

1. Direction.......................... INTO WIND
2. Oil Temperature .... ABOVE 50°C
3. Fuel Selector.................... FULLEST TANK
4. Engine RPM .... 4000 RPM
5. Lanes .... B OFF – ON*(a)*
   .... A OFF – ON*(a)*
6. Main Fuel Pump .... MAIN ON, AUX OFF *(CHECK FUEL PRESS.)*
7. Aux Fuel Pump .... AUX ON, MAIN OFF *(CHECK FUEL PRESS.)*
8. Fuel Pumps...................... BOTH ON *(MAIN & AUX)*
9. Boost Pump .... ON
10. Propeller.......................... CHECK VP FUNCTIONALITY*(b)*
11. Engine RPM .... 2500 RPM
12. Trim .... SET NEUTRAL
13. Flaps .... SET STAGE 1 / TAKEOFF
14. Controls .... FREE & FULL / CORRECT SENSE
15. Fuel Quantity................... VERIFY *(SUFFICIENT FOR PLANNED FLIGHT)*
16. Circuit Breakers .... ALL IN
17. Switches .... CHECK AND SET AS REQUIRED
18. Instruments .... CHECK AND SET ALL
19. Engine Parameters .... VERIFY *(TEMP., PRESS., VOLTS)*
20. Doors .... CLOSED / LATCHED
21. Harness .... SECURE
22. Brief Passengers .... BRIEF

NOTE

a) Lane Check

Switch off each lane for 2 seconds, then switch back on. Wait until the lane warning light extinguishes (+/- 5 sec) before proceeding to the next lane / check. No more than 250rpm increase / decrease during check.

b) Propeller VP Functionality Check

1. Set Propeller Controller to MAN *(Manual)*
2. Adjust pitch coarse +/-500 rpm
3. Adjust pitch fine +/- 500 rpm
4. Adjust pitch coarse +/- 500 rpm
5. Set propeller controller to AUTO
6. Confirm rpm return to 4,000 rpm

4.6 Take-off

1. Throttle .... FULL
2. Engine Speed .... VERIFY 5,800 RPM
3. Elevator Control .... NEUTRAL
4. Engine Parameters .... VERIFY *(TEMP., PRESS.)*
5. Rotate .... 55 KIAS
6. Airspeed .... 75 KIAS (V_y)
7. Brakes .... APPLY TO STOP WHEEL SPIN
8. Flaps .... UP *(MIN .75 KIAS / MIN. ALT. 300FT)*
9. Trim .... AS REQUIRED
10. Power .... AS REQUIRED
11. Climb .... COMMENCE

WARNING

Take-off is prohibited if:

- The engine is running rough or intermittently.
- The engine parameters *(instrument indications)* are outside operational limits.
- The crosswind component exceeds permitted limits (15 knots).

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 rpm applies.

4.7 Flight

4.7.1 Climb

1. Throttle .... FULL
2. Propeller.. CLIMB (5,500 RPM)
3. Airspeed .... V_X – 65 KIAS
   .... V_Y – 75 KIAS
   .... CRUISE 85 – 100 KIAS
4. Trim .... AS REQUIRED
5. Engine Parameters .... VERIFY *(TEMP., PRESS.)*

CAUTION

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

NOTE

It is best practice to limit using the full 5,800 RPM to only when its necessary i.e. takeoff, emergency climbing.

4.7.2 Cruise

1. Airspeed .... 108-145 KIAS
2. Aux Fuel Pump .... OFF
3. Boost Pump.................................... OFF
4. Throttle .... AS REQUIRED
5. Trim .... AS REQUIRED
6. Fuel... SWITCH EVERY HOUR
   (*BOOST PUMP ON DURING SWITCH*)

4.7.3 Descent

1. ATIS / Weather .... CHECKED
2. Altimeter .... SET
3. Fuel Selector.................................. FULLEST TANK
   (BOOST PUMP ON DURING SWITCH)
4. Lights .... AS REQUIRED
5. Seatbelts.. CHECKED
6. Approach Brief .... COMPLETE
7. Throttle .... AS REQUIRED
8. Trim .... AS REQUIRED

4.8 Landing

4.8.1 Before Landing

1. Park Brake .... OFF
2. Fuel Pumps.................................... BOTH ON *(AUX & MAIN)*
3. Boost Pump .... ON
4. Airspeed .... 75 KIAS
5. Flaps .... 1 STAGE ON DOWNWIND
   .... 2 STAGE ON BASE
6. Trim .... AS NEEDED
7. Harnesses .... SECURE
8. Landing Light .... ON

4.8.2 Approach

1. Airspeed .... 70 – 75 KIAS
2. Propeller.. T.O. (5,800 RPM)
3. Flaps .... FULL ON FINAL
4. Trim .... AS REQUIRED
5. Throttle .... AS REQUIRED[a]

WARNING

The fuel tank pickup point is situated at the bottom of the inboard wall. In normal operation, the dihedral of the wing ensures fuel is always present at the pickup. The aircraft should never be subjected to a sustained side slip towards a near empty fuel tank that is being drawn from. This may expose the pickup point to air, thereby starving the engine and leading to engine stoppage. This is particularly dangerous at low altitudes during an approach.

4.8.3 Normal Landing

1. Airspeed @50 ft .... 70 KIAS
2. Power .... IDLE IN GROUND EFFECT
3. Flare .... TO MINIMUM FLIGHT SPEED
4. Touchdown .... MAINS FIRST
5. Brakes... APPLY AS NEEDED

4.8.4 After Landing (Clear of Runway)

1. Flaps .... UP
2. Aux Fuel Pump .... OFF
3. Boost Pump .... OFF
4. Landing Light .... OFF
5. Transponder .... STANDBY

4.8.5 Engine Shutdown

1. Engine Speed................................ IDLE
2. Park Brake .... SET
3. Engine Parameters .... WITHIN LIMITS
4. Lane B.. OFF
5. Lane A.. OFF
6. Main Fuel Pump .... OFF
7. EFIS.. OFF
8. Master.. OFF
9. All Switches .... OFF
10. Fuel Selector................................. OFF

NOTES

At least 5 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 5-minute mark.

CAUTION

Rapid engine cooling should be avoided during operation. This can happen during descent and taxi i.e. low engine RPM scenarios. Under normal conditions, the engine temperatures stabilize during descent and taxi to suitable values in order to stop the engine. If temperatures are unstable (high or low), run the engine at +/- 3000 RPM for a minimum of 2 minutes to stabilize the temperatures prior to shut down.

4.9 Special Procedures

4.9.1 Baulked / Rejected Landing

1. Throttle .... FULL
2. Engine... CONFIRM 5,800 RPM
3. Flaps .... STAGE 2
   .... UP *(75 KIAS, min. 300ft.)*
4. AUX Fuel Pump.............................. OFF
5. Boost Pump .... OFF
6. Trim .... AS NECESSARY
7. Complete circuit for a new approach

4.9.2 Short Field Take-off

1. Runway Length................ MEASURED[a]
2. Abort Point .... MARKED
3. Aircraft Weight .... MINIMISE
4. Runway Position............. MAXIMUM POSSIBLE LENGTH AHEAD
5. Elevator and Trim .... NEUTRAL
6. Flaps .... STAGE 2
7. Park Brake .... SET FULL
8. Throttle .... FULL OPEN
9. Engine Parameters .... VERIFY *(TEMP., PRESS.)*
10. Park Brake .... RELEASE
11. Rotate.............................. 50 KIAS
12. Abort .... IF NOT AIRBORNE BY ABORT POINT
13. Climb .... BEST ANGLE (V_X – 65 KIAS)

NOTES

a. Calculate Density Altitude before takeoff, and ensure runway length is within aircraft capability.

4.9.3 *Short Field Landing*

1. Approach .... FLAT / UNDER POWER
2. Throttle .... AS REQUIRED
3. Approach Airspeed .... 65-70 KIAS[(a)]
4. Throttle .... IDLE
5. Flare .... COMMENCE
6. Touch down...................... MAINS FIRST
7. Braking .... HEAVY

   If runway overrun is possible –

8. Ignition Lanes .... OFF

NOTES

a. Exercise caution approaching at low speeds as the effects of a wind *gust will be amplified.*

4.9.4 *Soft Field Landing*

1. Crew .... SECURE
2. Flaps .... FULL
3. Approach .... FLAT UNDER POWER
4. Approach Speed .... 70 – 75 KIAS
5. Flare .... ABOVE THRESHOLD
6. Power .... IDLE
7. Hold Off .... IN GROUND EFFECT
   (0.5M / 2FT. ABOVE RUNWAY)
8. Speed .... 55 KIAS
9. Main Wheels .... TOUCH BEFORE STALL
10. Nose Wheel .... HOLD OFF WITH FULL ELEVATOR

4.9.5 Soft Field Take-off

1. Aircraft Weight .... MINIMISE
2. Elevator Trim .... NEUTRAL
3. Flaps .... STAGE 2
4. Propeller.......................... T.O. (5,800RPM)
5. Parking Brake .... SET FULL
6. Throttle .... FULL OPEN
7. Engine Parameters .... VERIFY *(TEMP., PRESS.)*
8. Parking Brake .... RELEASE
9. Elevator .... FULL BACK
   UNTIL NOSE WHEEL JUST LIFTS, THEN MAINTAIN
10. Unstuck .... 61 KIAS

4.9.6 *Crosswind Take-off*

1. Pre-Take-off Checks......... NORMAL
2. Aileron............................ FULL INTO WIND
3. Take-off Procedure.......... NORMAL
4. Aileron............................ REDUCE INPUT AS REQUIRED[a]

NOTES

a. As the aircraft accelerates, the pilot must reduce aileron input to avoid the wing hitting the ground. Only a slight roll angle into the wind is normally required to keep the aircraft tracking true.

4.9.7 *Crosswind Landing*

1. Approach Procedure .... NORMAL
2. Approach......................... UNDER POWER
3. Final Approach .... LONG
4. Rudder............................ INTO CROSSWIND
5. Flare .... OVER THRESHOLD
6. Roll Angle .... LEVEL
7. Rudder............................ APPLY OPPOSITE
8. Direction.......................... ALIGN WITH RUNWAY
9. Main Gear .... TOUCH DOWN
10. Nose Wheel .... HOLD OFF
11. Brakes.............................. APPLY *(ONCE NOSE WHEEL ON THE GROUND)*

5 Performance

5.1 Introduction

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.

The performance in this section is valid for:

- Maximum take-off weight of 950 kg (2094 lb).
- 915 iS Engine
- Airmaster AP430CTF-WWR72B

5.2 Take-off and Landing Distance

5.2.1 Take-off Distances

Surface Type	Density Altitude	Run Distance	Distance over 15m / 50ft Obstacle
Concrete/Tar	MSL	220 m / 720 ft	350 m / 1,150 ft
Concrete/Tar	7,000	300 m / 985 ft	480 m / 1,575 ft

5.2.2 Landing Distance

Surface Type	Density Altitude	Landing Distance with braking	Distance over 15m / 50ft Obstacle
Concrete/Tar	MSL	150 m / 490 ft	350 m / 1,150 ft
Concrete/Tar	7,000	250 m / 820 ft	425 m/ / 1,395 ft

5.3 Rate of Climb

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

Altitude	**Rate of Climb**	**Best Rate of Climb Speed (V_Y)**
[ft. ISA]	*[fpm]*	*[KIAS]*
0	800	75
1,000	795	
2,000	785	
3,000	780	
4,000	770	
6,000	755	
8,000	740	
10,000	730	
12,000	715	
14,000	700	
16,000	685	
18,000	670	

5.4 Cruise Speeds

Power	**95%[(a)]**		**MAX ECO[(b)]**		**75%[(c)]**	
Propeller State	**Climb 5,500 RPM**		**Cruise 5,000 RPM**		**Cruise 5,000 RPM**	
Altitude	**IAS**	**TAS**	**IAS**	**TAS**	**IAS**	**TAS**
0	145	145	135	135	130	130
1000	144	146	134	136	129	131
2000	143	148	134	138	129	133
3000	142	149	133	139	128	134
4000	141	150	133	141	127	136
5000	140	151	132	142	127	137
6000	139	153	131	143	126	138
7000	138	154	131	145	125	140
8000	137	155	130	146	125	141
9000	136	156	130	147	124	142
10000	135	158	129	149	123	144
11000	134	159	128	150	123	145
12000	133	160	128	152	122	147
13000	132	162	127	153	121	148
14000	131	163	126	154	121	149
15000	130	164	126	156	120	151
16000	129	165	125	157	119	152
17000	128	167	125	159	119	154
18000	127	168	124	160	118	155

NOTES

a) Maximum continuous power.

b) The Rotax 915 iS uses an automatic switching ECO mode, which has a significant effect on fuel consumption. At lower altitudes, ECO mode is activated below approximately an 80% power setting. At higher altitudes, ECO mode is activated below approximately a 77% power setting. MAX ECO is the power setting just before the engine leaves ECO mode, which results in an approximate fuel consumption change from 28 LPH to 33 LPH in the cruise propeller setting.

c) Cruise information for the Sling 4 TSi is declared using 75% power setting at 5,000RPM.

5.5 Fuel Consumption

Engine Power		%	100%	95%	90%	MAX ECO[(b)]	75%[(c)]
Engine RPM		*RPM*	5,800	5,500	5,000	5,000	5,000
Fuel Burn		*LPH*	43	39	37	28	27
		GPH	11.4	10.3	9.8	7.40	7.13
176 Litre Main Tanks 46.5 US GAL	**Endurance**	*[hrs]*	3.3	3.7	3.9	5.4	5.6
	Range[(c)] 1,000 ft.	*[nm]*		535	560	730	740
	Range 5,000 ft.	*[nm]*		555	580	765	770
	Range 10,000 ft.	*[nm]*		580	610	805	810
198 Litre Main Tanks 51.3 US GAL	**Endurance**	*[hrs]*	3.8	4.2	4.5	6.2	6.4
	Range[(c)] 1,000 ft.	*[nm]*		620	650	840	845
	Range 5,000 ft.	*[nm]*		640	670	875	880
	Range 10,000 ft.	*[nm]*		670	700	920	930

NOTES

Please see previous page for information regarding notes (b) and (c).

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

5.6 Airspeed Indicator System Calibration

IAS *[knots]*	**CAS** [knots] *(average)*	**CAS** *[knots]* *(this aircraft)*
25	28	
30	33	
35	38	
40	44	
45	45	
50	50	
55	55	
60	60	
65	65	
70	70	
75	75	
80	80	
85	85	
90	90	
95	95	
100	100	
105	105	
110	110	
115	115	
120	120	
125	125	
130	130	
135	135	

6 Weight and Balance

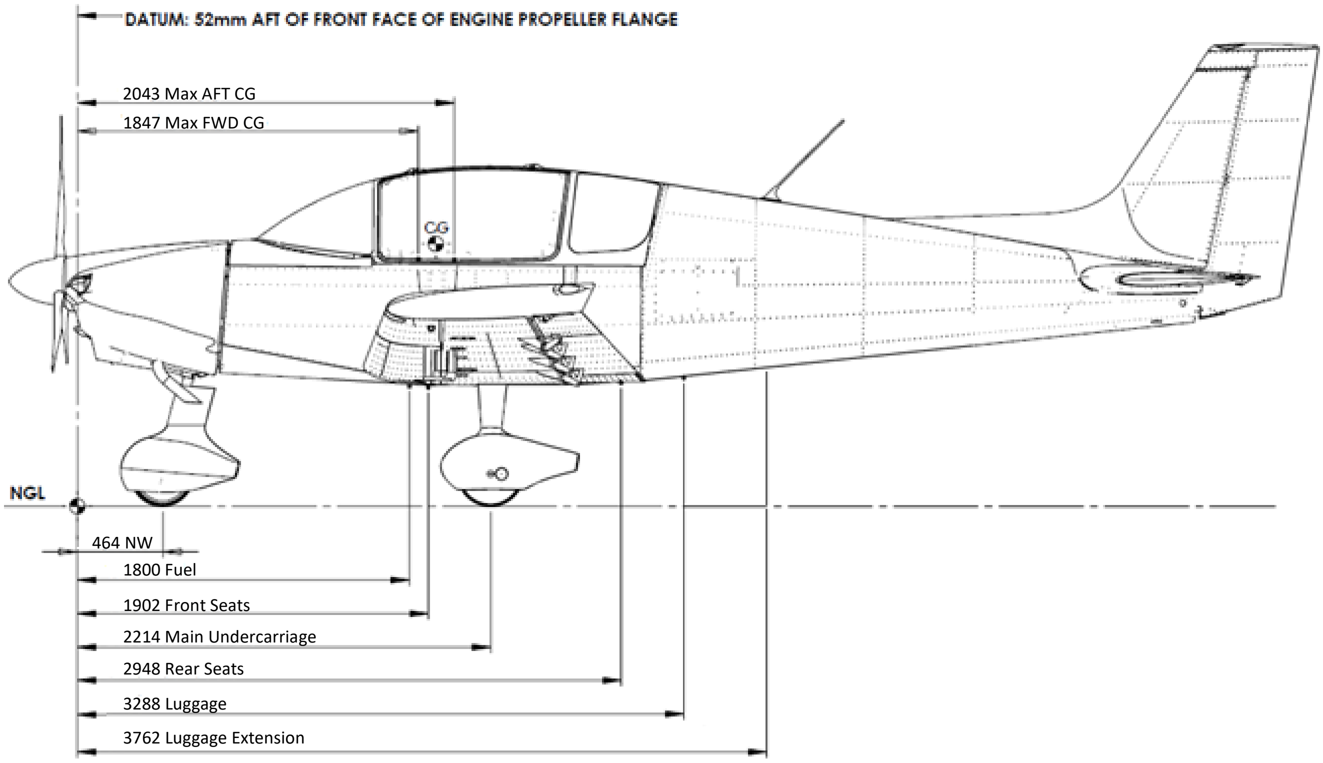
6.1 Introduction

This section details weight and balance information, along with payload ranges for the safe operation of the aircraft.

6.2 Installed Equipment List

Type	Equipment Item
Standard	Garmin G3X (GDU460) Glass Cockpit
	Garmin GTX35 Transponder
	Garmin GTR200 Radio
	Garmin GFC500 Autopilot
	3Ah IBBS Backup Battery
	Electric Flap Controller
	Electric Elevator Trim System
	Magnetic Compass
	Airmaster AP430CTF-WWR72B Propeller
	5V USB Charge Port
	12V Power Port
Optional	Garmin G5 Certified Electronic Flight Instrument
	Garmin GMA245R Audio System
	Heated Pitot
	ELT

6.3 Centre of Gravity Arms



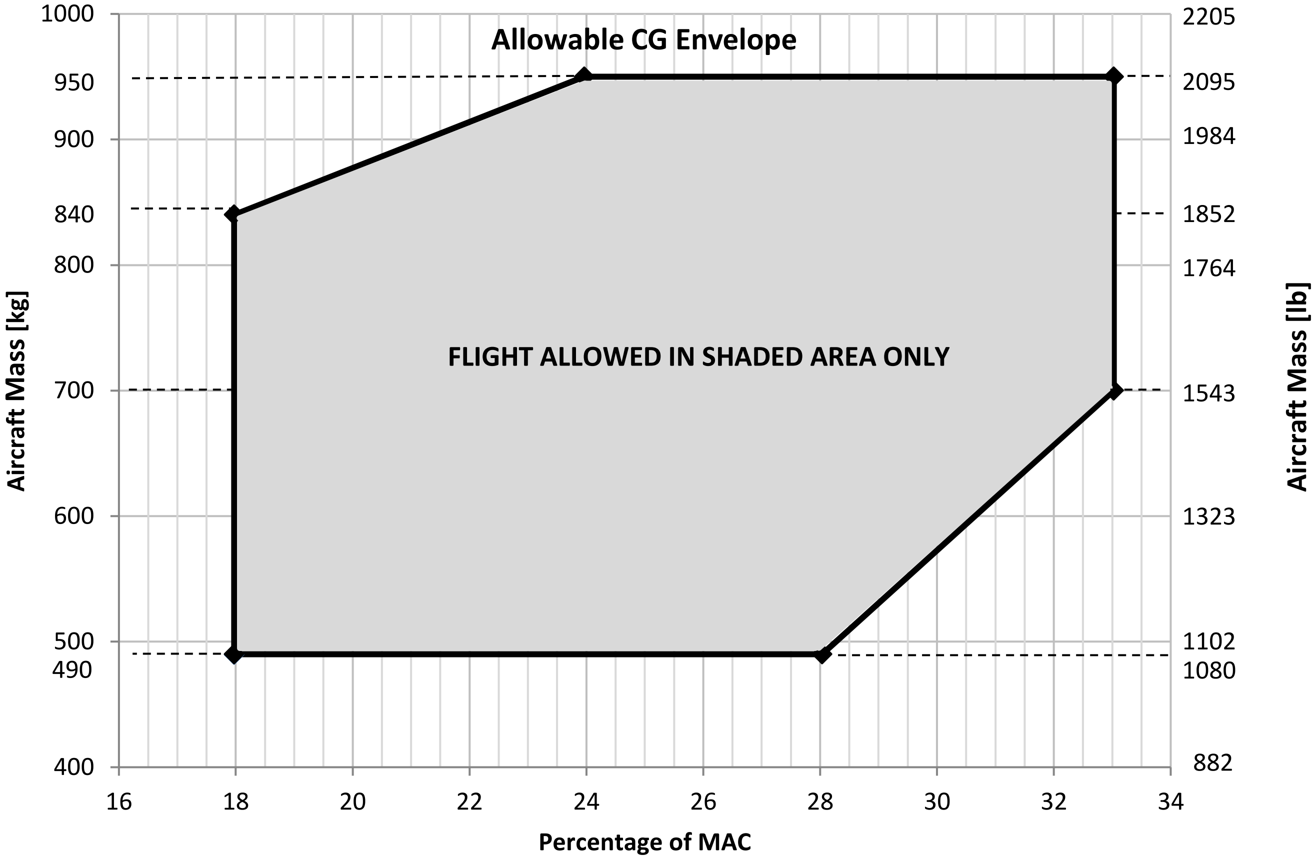
WARNING

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

NOTE

- GC range is 1847mm (6.060 ft) to 2043 mm (6.703 ft) aft of the reference datum (18 to 33% of MAC).
- The leading edge of the wing at MAC is 1602 mm (5.256 ft) aft of the reference datum.
- The MAC is 1339 mm (4.393 ft).

6.4 CG Envelope



Allowable 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:

$$\%MAC = (CG - 1602m) \times \frac{100}{1339mm}$$

$$or,$$

$$\%MAC = (CG - 5.256ft.) \times \frac{100}{4.393ft.}$$

WARNING

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

The aircraft's empty CG is determined conventionally, by weighing the aircraft whilst it is standing level. Refer to the Maintenance Manual for more.

Maximum all up weight (MAUW) = 950kg (2,094lb)

Maximum useful load (example) –

$$W_{max,useful} = W_{MAUW} - W_E$$

$$= 950kg\ (2{,}094lb) - 500kg\ (1{,}102lb)$$

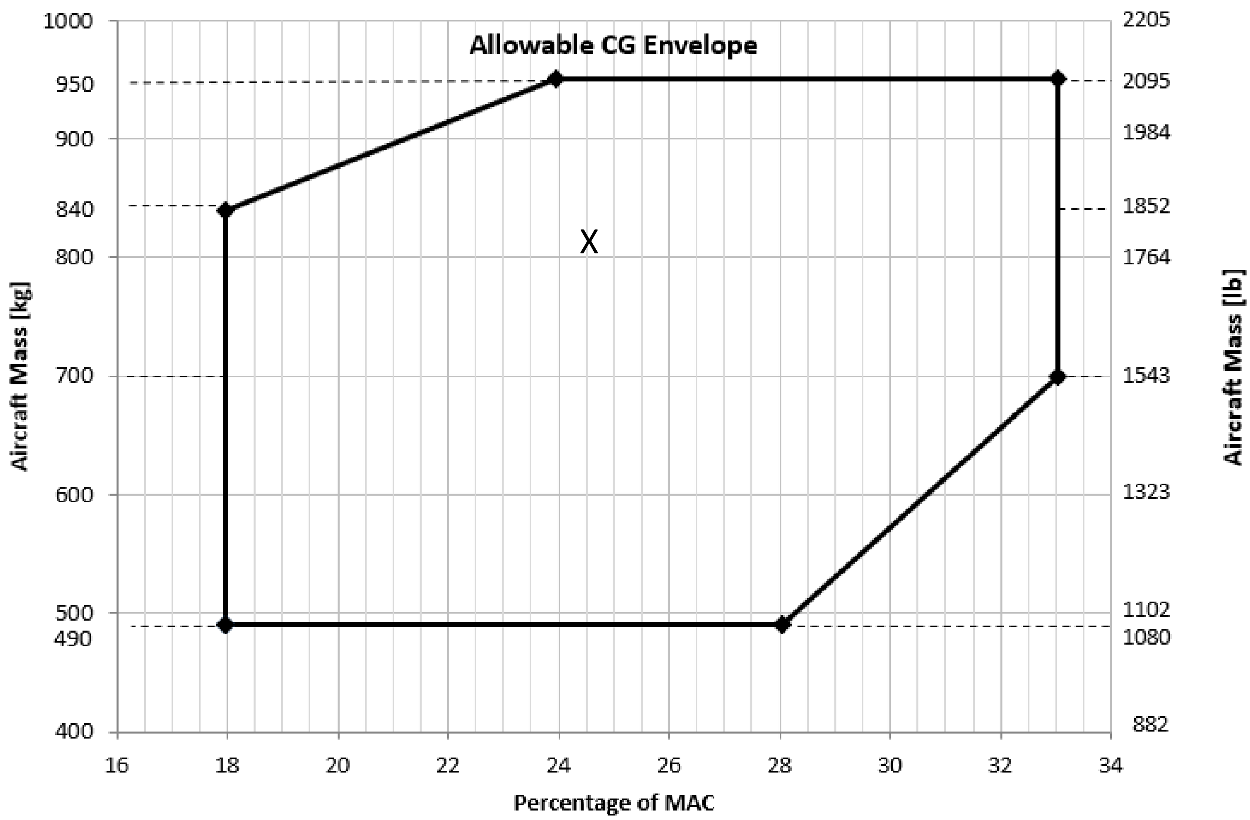
$$= 450kg\ (992\text{lb})$$

6.6 Determination of Empty CG

	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 = 2 214 (7.26)	
	Left Main Wheel	W_L =	L_L = 2 214 (7.26)	
	Nose Wheel	W_N =	L_N = 464 (1.522)	
	Totals	Empty weight: W_E = ……………….	-	Aircraft moment: M_0=…………………..
	Empty CG	CG = ………………… mm (ft)		

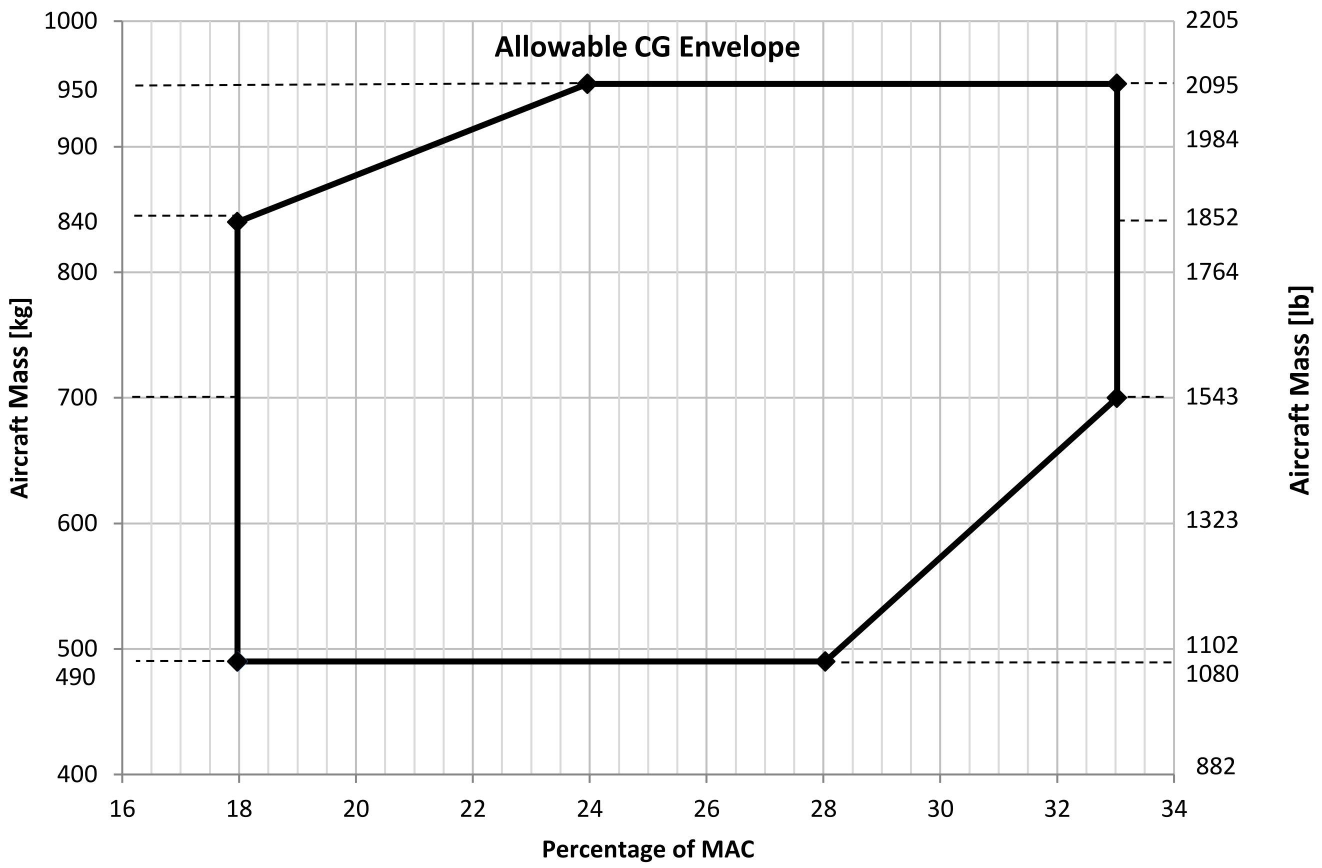
6.7 CG Determination (Example)

	Weight [kg (lb)]	Arm [mm (ft)]	Moment (weight x arm) [kg.mm (lb.ft)]
Crew [Front]	2x 85kg = 170kg	1 902 (6.240)	323 340
Passengers [Rear]	0kg	2 948 (9.672)	0
Baggage	35kg	3 288 (10.787)	115 080
Baggage Ext.	0kg	3 762 (12.342)	0
Fuel	100kg	1 800 (5.906)	180 000
AC Empty	500kg	1 873 (6.145)	936 500
Totals	W_T = 805kg	-	M_T = 1 554 920
			CG = 1 931.6 mm
			CG= 24.5 %MAC



6.8 Blank CG Form and Graph for Use

	Weight [kg (lb)]	**Arm** [mm (ft)]	**Moment** (weight x arm) [kg.mm (lb.ft)]
Crew [Front]		1 902 (6.240)	
Passengers [Rear]		2 948 (9.672)	
Baggage		3 288 (10.787)	
Baggage Ext.		3 762 (12.342)	
Fuel		1 800 (5.906)	
AC Empty CG			
Totals	W_T =	-	M_T =
			CG =______mm
			CG=_____%MAC



Allowable CG Envelope

7 Aircraft and Systems

7.1 Airframe

The Sling 4 TSi 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 angles, of the same material, with high-quality blind rivets. This high strength aluminium alloy construction provides a long life and low maintenance costs, thanks to its durability and corrosion resistance characteristics. The wing has a high lift airfoil (NACA 2414) and is equipped with semi-slotted fowler type flaps.

7.2 Control System / Pilot Controls

7.2.1 Control Column(s)

The aircraft is equipped with dual control sticks, which manipulate two of the three control axes: pitch (elevator) and roll (aileron). The stick has the following button allocations:

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

7.2.2 Rudder Pedals

The aircraft is fitted with dual rudder pedals, which control the rudder and 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/calliper arrangement. Activation of the brakes is via the lever located on the cabin’s centre console.

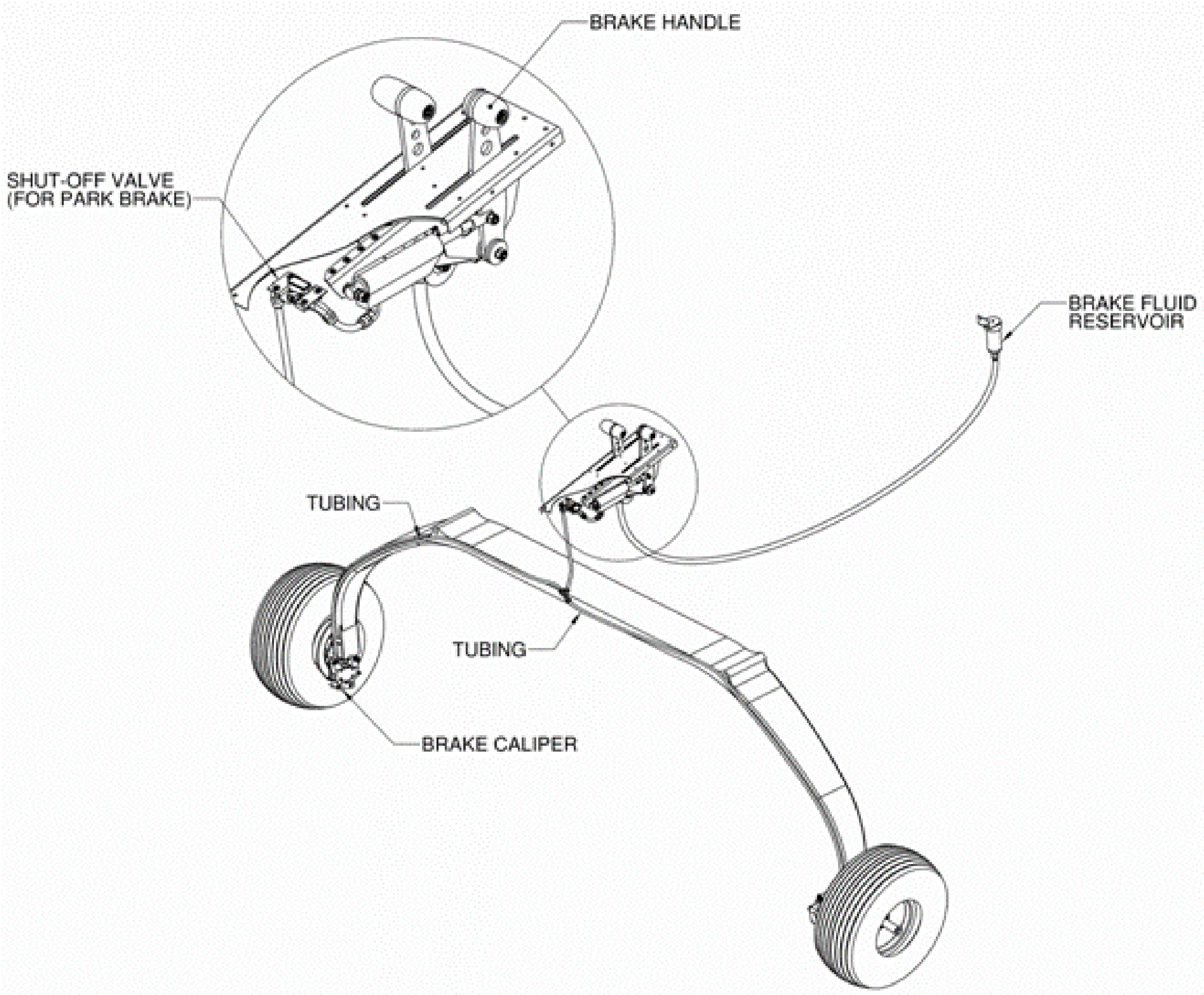
7.2.3.2 Toe Brakes –

A differential foot-controller braking system may also be fitted as an option. Each brake calliper is separately actuated by way of two master brake cylinders 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 typically 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 7.9 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 7.9 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 / Control Switches

Switch / Label	Function	Position
MASTER / STARTER KEY SWITCH	Power disconnected from the main bus.	OFF
	Main bus connected to power.	ON
	Engage starter motor.	START
EFIS	Switch power (main bus) to the EFIS system on/off.	UP ON DOWN OFF
EFIS BKUP	Connects EFIS to EFIS backup 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 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 A magneto/ignition source.	

7.2.8 EFIS

The EFIS selection and control mechanism is described in detail in the EFIS manufacturer documentation. Please refer to this documentation. Refer to 7.10.1 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	34°

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 the heat exchanger with the engine exhaust, can be selected via a selection knob located on the instrument panel. The system can be activated by pulling out the knob.

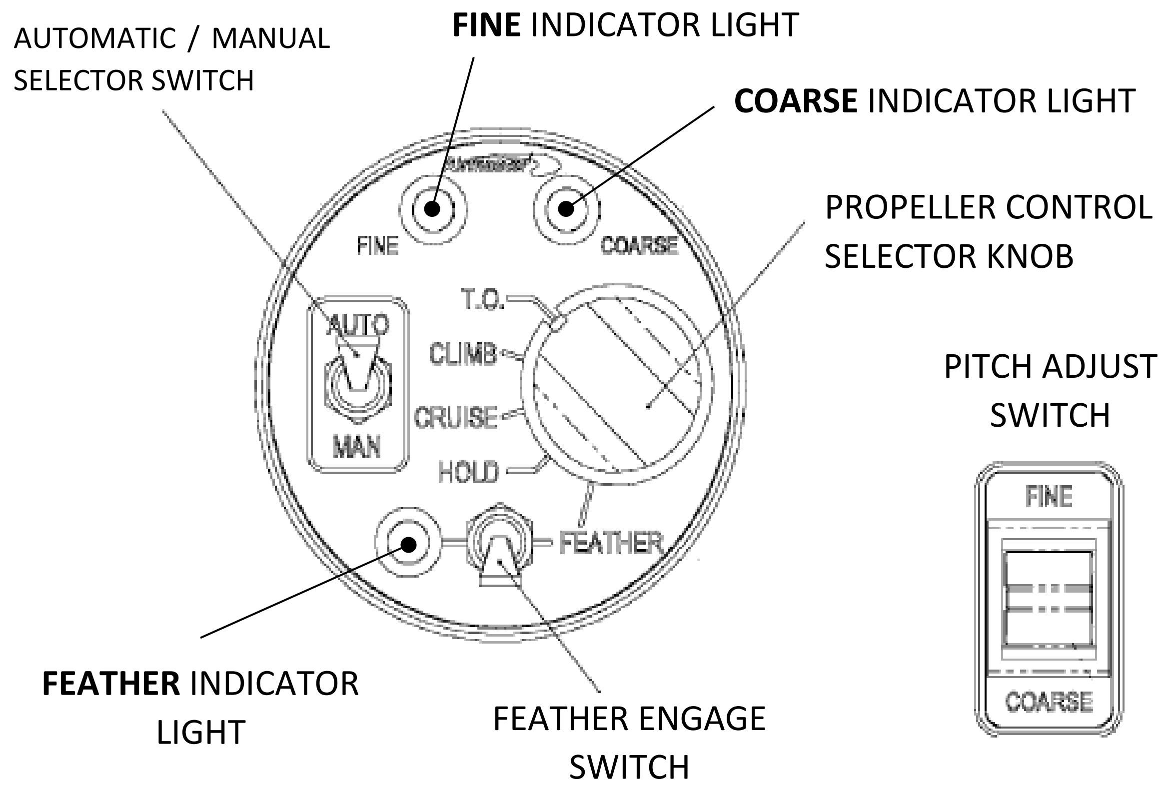
7.3 Propeller

7.3.1 Introduction

The Sling 4 TSi makes use of the Airmaster AP430CTF-WWR72B, or AP430CTF-SNR70E propeller which has variable pitch and constant speed capabilities.

Power to the propeller/propeller controller is provided via the main bus and activated by a switch labelled PROP, located on the instrument panel.

7.3.2 Pilot Controls – Propeller



7.3.2.1 Operation of the propeller controls

- The power switch labelled **PROP**, located on the instrument panel. This switch activates/deactivates the power supply to the propeller control unit and propeller pitch adjustment motor.
- Automatic/Manual **[AUTO/MAN]** selector switch, located on the propeller controller, changes the propeller mode between automatic and manual.
    - **AUTO** – Automatic mode operation allows constant speed governing in pre-set modes i.e. Take-off, climb, cruise and hold.
    - **MAN** – manual mode operation allows direct control over the propeller pitch, allowing the propeller to become a more traditional in-flight variable pitch propeller.

- **Propeller control selector**, the blue rotary knob, allows the pilot to change between pre-set propeller settings. This knob has no effect when manual [MAN} is selected on the automatic/manual selector switch. These pre-set setpoints are:
    - **T.O.** – Use for take-off and landing.
    - **CLIMB** – Use for climbing and any other operations where continuous high-power settings are required.
    - **CRUISE** – Use for cruise and normal operation.
    - **HOLD** – Use for constant speed governing at a pilot selected speed not a part of the options above.

- **Feather engage switch** is active when the AUTO mode is selected on the automatic/manual selector switch, and the propeller control selector is set to FEATHER. Engaging this switch will initiate the automatic feathering of the propeller.

- **Manual propeller control** switch is a toggle button, located separately from the propeller controller unit on the instrument panel. This switch allows:
    - Direct control of the propeller pitch when manual mode (MAN) is selected with the automatic/manual selector switch.
    - Moving the switch up moves the propeller in the fine direction. The fine indicator light should be illuminated orange during this operation.
    - Moving the switch down moves the propeller in the coarse direction. The coarse indicator light should be illuminated orange during this operation.
    - With the automatic/manual switch set to AUTO, and the propeller control selector knob selected to HOLD, the switch (manual propeller control) is used to set a pilot selected propeller governing speed.
        - Actuate the switch to change the propeller pitch in the direction desired. When the desired rpm is reached, release the switch. The propeller/engine will be governed to that speed.
        - 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.

7.3.2.2 Indicator Lights

Information conveyed to the pilot by the propeller system is through three lights located on the propeller controller, namely Coarse, Fine and Feather indicator lights. The following table lists the various propeller status indications provided by the lights.

Indicator Light		***Propeller Status***
FINE	Orange	Pitch decreasing
	Orange Flashing	No speed signal
	Green	Fine pitch limit
	Green Flashing	Pitch motor engaged at fine pitch limit
	Red	Over-current while pitch decreasing
COARSE	Orange	Pitch increasing
	Green	Coarse pitch limit
	Green Flashing	Pitch motor engaged at coarse pitch limit
	Red	Over-current while pitch increasing
FEATHER	Orange	Pitch Increasing in Feather
	Green	Feather pitch limit
	Green Flashing	Pitch motor engaged at feather pitch limit
	Red	Over-current while pitch increasing in feather
ALL	Red Flashing	Open circuit failure
	Rapid-Red Flashing	Controller software fault

When the propeller is in manual mode, many of the indicator lights will still operate.

7.4 Landing Gear

The landing gear is a tricycle landing gear with a steerable nose wheel, regardless of the braking architecture. The main landing gear uses a single continuous composite spring section.

7.5 Safety Harness and Seats

The aircraft features side-by-side seating. Three-point safety belts are provided for each seat. Seats can be adjusted forwards and backwards, with forward movement also leading to the seat being elevated.

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.

7.6 Baggage Compartment

The baggage compartment is positioned behind the seats and is designed to carry up to 35kg (77lb) in total. The baggage extension compartment is located on the left side of the rear bulkhead. The baggage extension is designed to carry up to 3kg (6.6 lb.). *It is the pilot's obligation to ensure that the aircraft CG is within the permissible limits and that all baggage must be properly secured*.

7.7 Canopy

The aircraft is equipped with two gullwing doors. External access to the cabin is from either side. Operating levers for the door latching mechanisms are provided on the inside and outside of the doors (in the centre of the bottom edge of each door).

WARNING

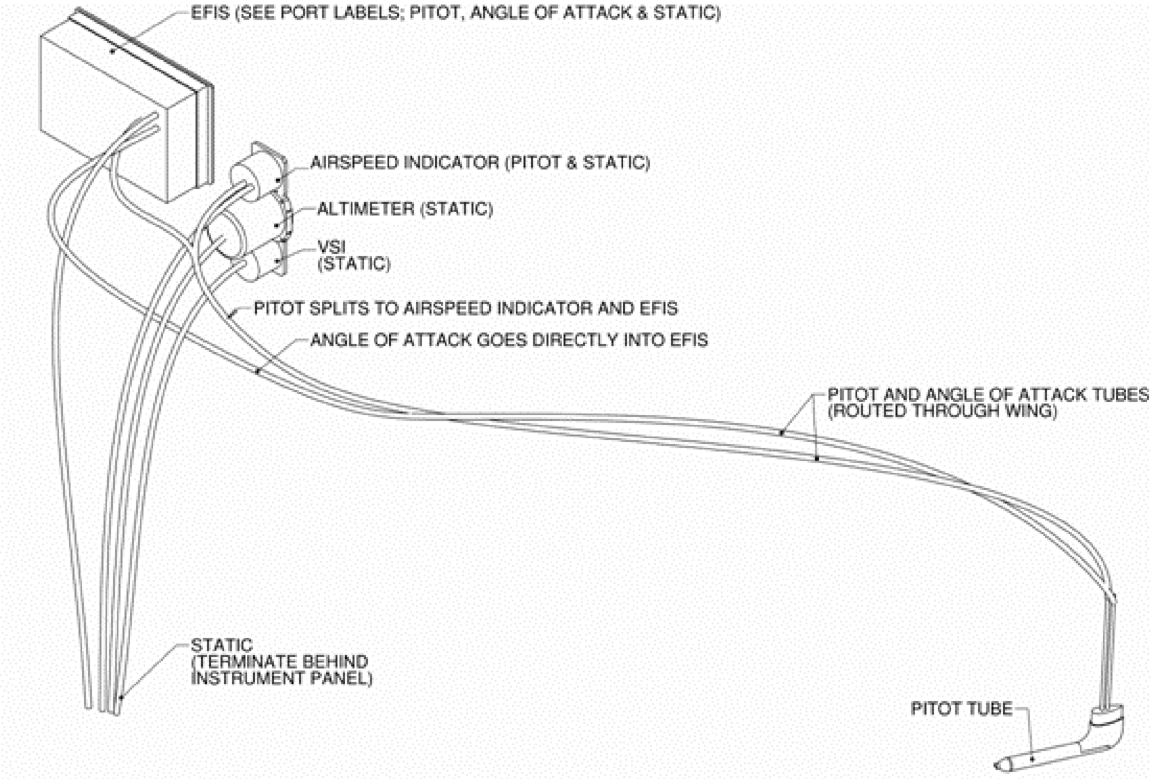
Ensure that the canopy/mechanism is securely latched into position before operating the aircraft.

7.8 Pitot and Static Systems

A pitot tube is located below the left wing, and the relevant pressures, experienced by the pitot, are transferred to the instrument through flexible hoses. The pitot features a second hole for the measurement of the angle of attack. The static port is located behind the instrument panel. 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:

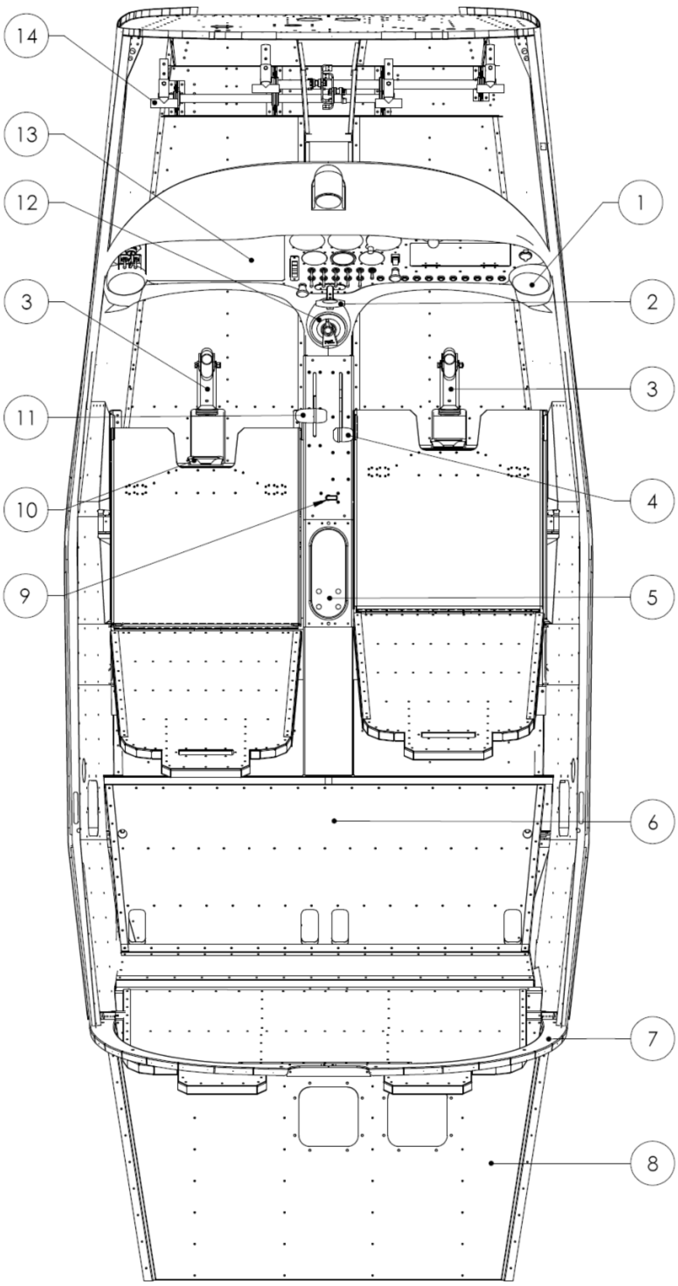


NOTE

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

7.9 Cockpit Layout

The basic cockpit layout is the same for all Sling 4 TSi 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, with key, below:



Cockpit Layout Key			
1	Air vent	9	Brake shut-off valve (park brake)
2	Ballistic parachute activation lever	10	Seat adjustment handle/lever
3	Control stick	11	Throttle
4	Brake lever	12	Fuel tank selector
5	Headset connection sockets	13	Instrument panel
6	Rear seat(s)	14	Rudder pedals
7	Rear headphone connection sockets	15	Fire extinguisher
8	Luggage compartment	16	Rear air vents

NOTE

If differential footbrakes are fitted, the hand operated actuator on the centre console will be absent.

Seats and pedals are adjustable. There is a unlocking lever that allows the movement of the seat, and a locking/setting bolt that allows movement of the pedals.

A fire-extinguisher is held in place against the front retaining wall of the baggage space.

An adjustable red interior light is positioned behind and between the pilot and passengers' heads.

7.10 Instruments and Avionics

The diagram below represents 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 below, as the choice of instruments and layout is decided by the customer. It is the responsibility of the pilot to ensure that they are familiar with the instrumentation in the aircraft, its layout and operation.

Instruments and Avionics Key			
1	Power ON light	14	ACK ELT display unit
2	Master switch	15	Circuit breakers
3	Ignition switch	16	Air vent
4	Lane A and Lane B warning lights	17	Cabin air flow control knob
5	Lane A and Lane B switches	18	GMC 307 Control unit
6	12 V Power port / socket	19	Cabin heat fan speed knob
7	Garmin GDU 460 (EFIS)	20	Ballistic rescue parachute activation handle
8	EFIS warning light	21	Cabin heat temperature control knob
9	Propeller controller	22	Flap position control knob (rotary)
10	Garmin G5	23	Propeller control switch
11	Radio (GTR 200)	24	Switches: EFIS, EFIS back-up battery, propeller, avionics, taxi lights, landing lights, strobe lights, navigation lights, external alternator (if fitted), autopilot, etc.
12	RAM mount (Ball type)	25	Fuel pump switches
13	Cubby hole		

7.10.1 EFIS System

The Garmin G3X multifunction "Glass Cockpit" instrument 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, but is not limited to:

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 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.

7.11 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 *(Compliant with Local Regulations – not required in US)*
12	Fire Extinguisher

WARNING

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

7.12 Engine

The engine fitted, as standard, is the Rotax 915 iS. 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 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 2.52, and features an integrated shock absorber. The engine will continue to run after an alternator/battery failure. Please see 3.7.4

Alternator / Charge System Failure for more.

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

7.13 Cooling System

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.

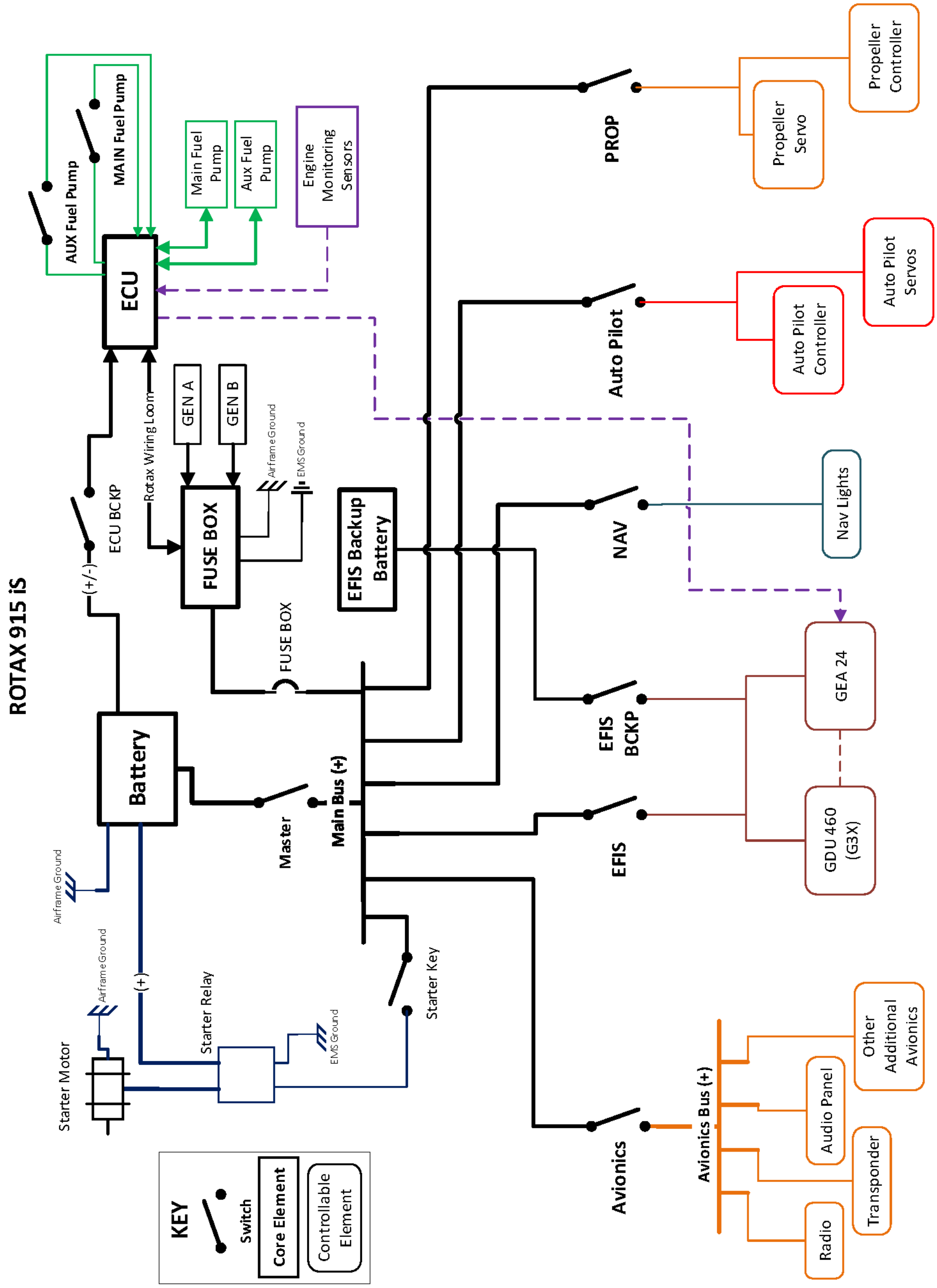
The coolant volume is approximately 1.5 litres (0.40 US Gal.)

WARNING

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

7.14 Electric System

7.14.1 Broad Overview Diagram



7.14.2 Charge System

The alternating current (AC) output of the two alternators (A and B) is passes 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 alternator is installed, the output is used to charge the battery through a breaker switch.

7.14.3 Main Battery

The 12V, 17 Ah main battery is mounted on the engine side of the firewall.

7.14.4 Main Bus

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

#	Item
1	Autopilot (including 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 backup)
8	Propeller (VP Functionality)

7.14.5 EFIS Back-up Battery / Circuit

The 12V EFIS backup battery is mounted on the cabin side of the firewall, under the instrument panel.

7.14.6 Master and Starter Switches

The master switch is a toggle switch located on the left side of the instrument panel. It links the main bus 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.

7.14.7 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. <u>The 915 iS engine requires adequate power supply to at least one electrical fuel pump to remain operational (to prevent fuel starvation).</u>

7.14.8 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.

7.14.9 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.

7.15 Fuel System

The aircraft has two fuel tanks, one located in the inside leading edge of each wing.

Volume of wing tanks: 2 x 88 Litre (23.2 US GAL), 176 Litres (46.5 US GAL) total, 172 Litres (45.4 US gallons) useable.

OR

Volume of wing tanks: 2 x 99 Litre (26.2 US GAL), 198 Litres (52.3 US GAL) total, 194 Litres (51.2 US GAL) useable.

Each tank is equipped with a vent outlet. A drain valve is located in the lowest point of each tank. A tank outlet/fuel pick-up is located at the lowest point of the inboard sidewall of each tank. A finger screen is fitted to each fuel pick-up. The fuel selector valve is mounted on the lower centre instrument panel (refer to cockpit layout, paragraph 7.9).

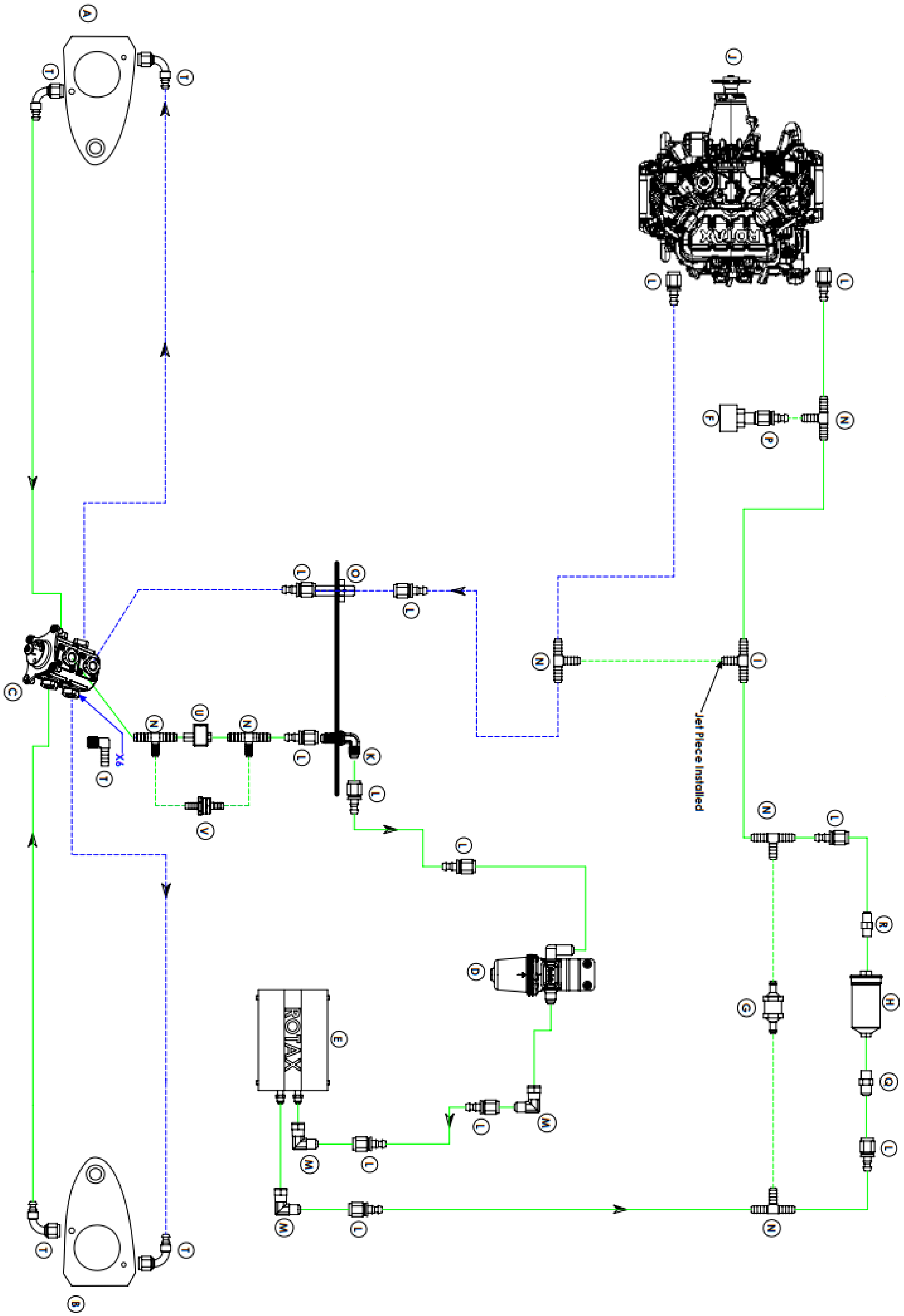
Fuel feed is through the facet posi-flow electrical boost pump and Rotax fuel pump. The facet posi-flow pump has a parallel in-line check valve and is activated with a switch mounted on the instrument panel. The Rotax fuel pump has a parallel installed check valve (NRV) across each pump.

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

WARNING

The fuel pick-up pipe in the fuel tank is situated adjacent to the lower inside wall of the tank. The aircraft should at no time be subjected to a sustained sideslip towards a near empty fuel tank, as it may cause air to be drawn into pickup, as fuel will run to the tip end of the tank. This poses a significant threat when at low altitudes, such as landing.

A diagram of the fuel system is as follows, with a key –



Fuel System Key			
A	Left fuel tank	N	T-piece 3/8”-5/16”-3/8”
B	Right fuel tank	O	AN6 straight flare bulkhead fitting
C	Fuel selector	P	1/8” NPT female adaptor
D	ANDAIR gascolator	Q	M14x1.5 AN 6 male
E	Rotax fuel pump	R	M12x1.5 AN6 male
F	Fuel pressure sensor	S	90º ¼” male 3/8” barb hose
G	Bypass pressure valve	T	90º hose-end push on AN 6
H	Fuel filter	U	Facet Posi-Flow Electrical Fuel Pump
I	Jet T piece	V	ANDAIR Check Valve
J	Rotax 915 iS		
K	AN6 90º bulkhead		3/8” fuel hose SAE J30R9
L	AN6 straight female push-on fitting		3/8” fuel hose SAE J30R9
M	Male to female AN6 90o		5/16” fuel hose SAE J30R9

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.

WARNING

When the aircraft is operated using a single fuel pump at high throttle settings, in hot conditions, at high altitudes and using automotive fuels, it is possible that vaporisation of fuel may occur in the fuel pump system, causing cavitation. In these extreme conditions there may be a decrease in fuel pressure to below the minimum permissible pressure. In such circumstances BOTH fuel pumps should be selected. In the highly unlikely event that a low fuel pressure warning persists with the use of both fuel pumps, the throttle setting or propeller speed should be reduced to a level which results in the fuel pressure returning to within range. Should the above circumstances arise or should the conditions which can lead to such circumstances be present, pilots may choose to use avgas in favour of mogas so as to minimise the possibility of such a fuel pressure loss. The addition of the boost pump to the fuel system mitigates this issue

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.

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.

7.16 Lubrication System

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).

7.17 Autopilot System

The autopilot system is integrated into/with the EFIS unit.

The EFIS / autopilot inputs data from an electronic compass and AHRS. With this, it 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 labelled 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 screen interface

The autopilot can be disengaged by:

- The autopilot engage/disengage button on the control stick(s).
- Via the EFIS screen interface
- A servo reports a slipping clutch or torque overdrive for 1 second, i.e. the pilot overrides the autopilot via force in the control column.
- Removing power to the autopilot servos, at the isolating switch, removing the ability of the controller to control the servos.

7.18 Light Systems

7.18.1 Position, Anti-collision, Taxi and Landing Lights

The aircraft is equipped with a landing and taxi light in the leading edge of the wing. The standard option is left-wing only, with an optional extra for the right-wing. This is typically a requirement for IFR rated aircraft. 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 wingtips, in the standard configuration (red left, green right). A combination position/anti-collision light (white) is fitted underneath the vertical stabilizer.

The white lights on the wingtips and rudder are dual function lights, that can either be on continuously *(position light),* flash *(anti-collision)*, or flash at a higher brightness level superimposed on continuous operation, i.e., combined position and anti-collision light.

The method of control of all lights is:

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

7.18.2 Cabin Lights

Interior lighting consists of front and rear overhead LED lights. Two red LED reading lights with adjustable beam angle are fitted for the pilot and front-seat passenger. These are each operated with ON/OFF switches and are dimmable through the rotary switch knob located aft of the pilot's light.

Two white touch lights are fitted for the rear cabin. These are dimmable through the rotary switch knob located between the two lights.

Cabin lights are powered from the main bus via a circuit breaker, labelled cabin light, located on the instrument panel.

7.18.3 Tow Hook

For aircraft fitted with a tow-hook, please see the relevant appendix.

8 Ground Handling and Servicing

8.1 Introduction

This section contains factory-recommended procedures for proper ground handling and servicing of the Sling 4 TSi. 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.*

8.2 Ground Handling

8.2.1 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

8.2.2 Towing

If you wish to move the aircraft, other than under its own power, it is best to pull/push the aircraft by holding one or more of the propeller blades, close to the spinner. The rear fuselage/empennage may be pushed down directly above the bulkhead or close to the root on the horizontal stabilizer, directly above the front spar where it attaches to a rib. This is for lifting the nosewheel for manoeuvring purposes.

It is also acceptable to push the aircraft backwards by putting pressure on the wing/horizontal stabilizer leading-edge, directly over a rib.

CAUTION

Avoid excessive pressure on the aircraft airframe - especially at or near control surfaces. The skins are thin and minimum pressure should be placed on them. Excessive pressure could lead to the buckling of the skin.

8.2.3 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 is fully rotated once the pedal control stops have been engaged. For installation of the tow bar refer to the Sling 4 TSi 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 slip.

8.2.4 Parking

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

When parking for extended periods, 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.

8.2.5 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.

The mooring procedure is as follows:

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

NOTES

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.

8.2.6 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.

8.3 Servicing

8.3.1 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 8.2.2 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.

8.3.2 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	

8.3.3 Aircraft Modifications and Repairs

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.

8.3.4 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 4 TSi Aircraft Maintenance Manual.

8.4 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 or use petrol or chemical solvents.

9 Supplementary Information

9.1 Introduction

This section contains the appropriate supplements necessary to safely and efficiently operate the aircraft when equipped with various common optional extras not supplied with the standard aircraft.

The supplements included in this manual are –

Date	Supplement No.	Title of inserted supplement
24/03/2020	01/2020	Airplanes Fitted With Long Range Fuel Tanks
11/05/2020	02/2020	External Alternators
07/07/2021	01/2021	Stratos 07 Ballistic Parachute
21/09/2023	01/2021	BRS Aerospace Ballistic Parachute
07/07/2021	02/2021	Tow Hook
31/03/2022	01/2022	Airplanes Fitted With Extra-Long-Range Fuel Tanks
15/11/2023	11/2023	MTV-6/190-69
15/11/2023	11/2023	Rotax 916 iS Engine
01/02/2025	02/2025	DUC 4 bladed FlashBlack-3-R

9.2 Suppl. 01/2020 – Airplanes Fitted with Long Range Fuel Tanks

This supplement provides information relating to the operation of Sling 4 TSi aircraft fitting with long range fuel tanks.

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

Information contained in this supplement adds to or replaces information from the standard Sling 4 TSi 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 Sling 4 TSi Pilot Operating Handbook.

9.2.1 Introduction

The two long-range fuel tanks are located inside the leading edge of each outboard wing section. The volume of the long-range tank is dependent on the volume of the main tank installed (176L or 198L)

176 Litre / 46.5 US GAL Main Tanks
  Volume of long-range tanks: 2 x 40 Litres (10.6 US GAL), 80 Litres (21.1 US GAL) total.

OR

198 Litre / 52.3 US GAL Main Tanks
  Volume of long-range tanks: 2 x 25 Litres (6.6 US GAL), 50 Litres (13.2 US GAL) total.

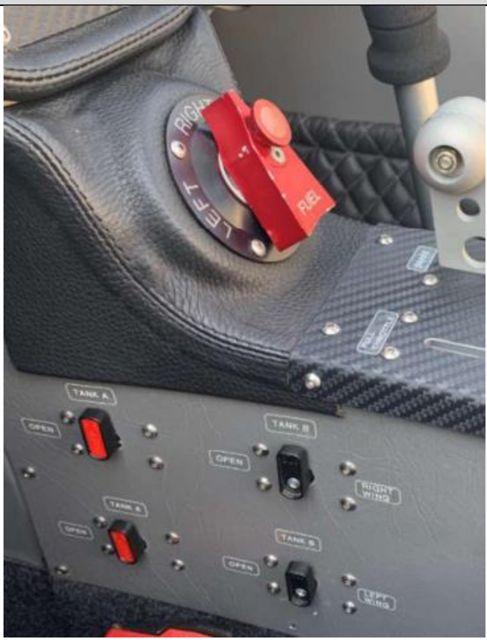
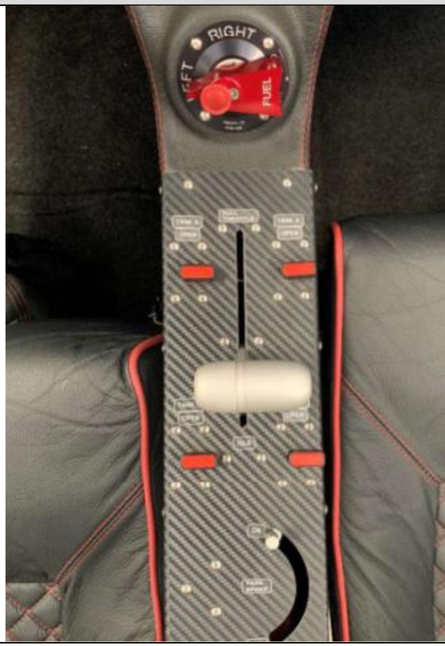
As in the main tanks, each tank is equipped with a vent outlet. A drain valve is located in the lowest point of each tank. A tank outlet/fuel pick-up is located at the lowest point of the inboard sidewall of each tank. A finger screen is fitted to each fuel pick-up. An inline mesh fuel filter is fitted in the fuel line from each tank to the electrical fuel pump through a common T-piece.

Fuel feed from both tanks is through a facet electrical fuel pump. Two parallel shut-off valves supply the fuel feed to the fuel tank in use.

9.2.2 Operation of Long-Range Fuel Tanks

Fuel tank feed selection is enabled by shut-off valves located against the centre console sidewall, close to the pilot’s right knee for aircraft with standard brakes. For the toe-brake configuration, the shut-off valves are on the top of the centre console. Both arrangements, with shut-off valves in the closed position, are shown in the pictures below.

9.2.3 Fuel System Valve Setup

Location of shut-off valves	
Standard Brakes	Toe Brakes
	

The Facet electric pump is activated by the transfer pump switch on the instrument panel. Either (long-range) B tank, left or right can supply to the main (A tank) in use. Fuel tank feed selection is enabled by the two shut-off valves, both labelled Tank B on the centre console. Valve operation is shown in the pictures below for an aircraft with the toe-brake configuration.

9.2.4 *Example of Shut-Off Valve States*

<table>
<tr><th colspan="2">Different Transfer Options</th></tr>
<tr><td>Left B Tank to Right A Tank</td><td>Right B Tank to Right A Tank</td></tr>
<tr><td>
</td><td>
</td></tr>
<tr><td>Left B Tank to Left A Tank</td><td>Right B Tank to Left A Tank</td></tr>
<tr><td>
</td><td>
</td></tr>
</table>

9.2.5 Effect on Aircraft CG

For long-range tanks, an amendment is made to the standard blank CG form. The moment arm for long-range tanks, 1 822 mm, is added as shown in the table below.

	Weight [kg (lb)]	**Arm** [mm (ft)]	**Moment** (weight x arm) [kg.mm (lb.ft)]
Crew [Front]		1 902 (6.240)	
Passengers [Rear]		2 948 (9.672)	
Baggage		3 288 (10.787)	
Baggage Ext.		3 762 (12.342)	
Fuel (A Tanks)		1 800 (5.906)	
Fuel (B Tanks)		1 822 (5.911)	
AC Empty CG			
Totals	W_T =	-	M_T =
			CG = mm
			CG= %MAC

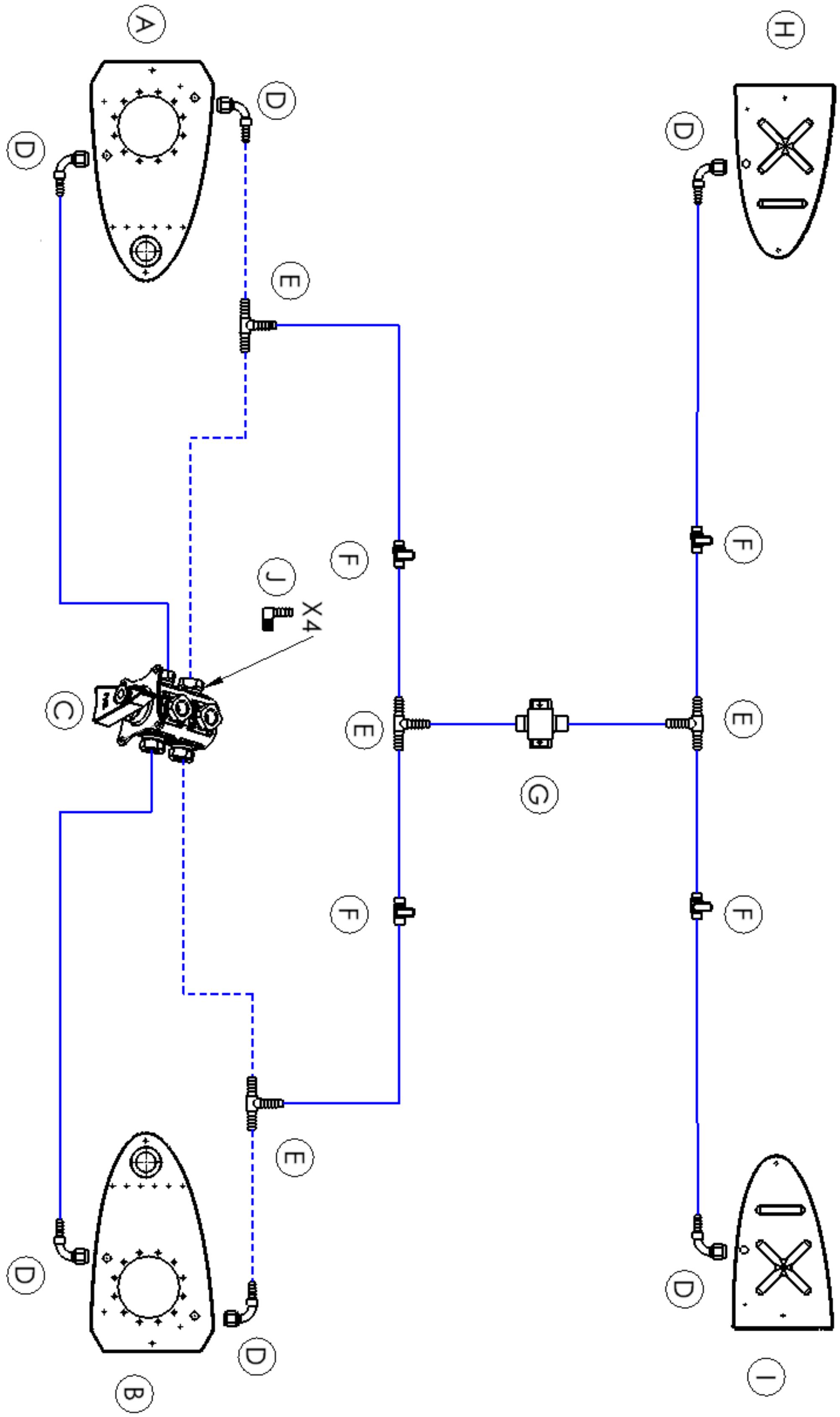
NOTE

The blank form and graph in paragraph 6.5 are still applicable and should be referred to in addition to the amended table above.

9.2.6 Long Range Fuel System Diagram Key

Long Range Fuel System Key			
A	Left fuel tank	H	Left L/R fuel tank
B	Right fuel tank	I	Right L/R fuel tank
C	Fuel selector	J	90° male to female brass
D	90° female barb 8 mm	———	3/8" fuel hose SAE J30R9
E	8 mm T-Piece	- - - -	3/8" fuel hose SAE J30R9, Return
F	Shut-off valve		
G	Electrical fuel pump		

9.2.7 Long Range Fuel System Diagram



9.3 Suppl. 01/2022 – Airplanes Fitted with Extra-Long-Range Fuel Tanks

This supplement provides information relating to the operation of Sling 4 TSi aircraft fitting with extra-long range fuel tanks.

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

Information contained in this supplement adds to or replaces information from the standard Sling 4 TSi 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 Sling 4 TSi Pilot Operating Handbook.

9.3.1 Introduction

The two extra-long-range fuel tanks are located inside the fuselage, in place of the rear seats. These fuel tanks will be referred to as ‘C Tanks’. The volume of the C Tanks are as follows:

Tank	Capacity
Floor C Tank	90 L / 24 GAL
Seat C Tank	140 L / 37 GAL
Total *usable* capacity	226 L / 59 GAL

As in the main tanks (A Tanks), each tank is equipped with a vent outlet. A tank outlet is located on the top of each tank, with the fuel pick-up located at the lowest point of each tank.

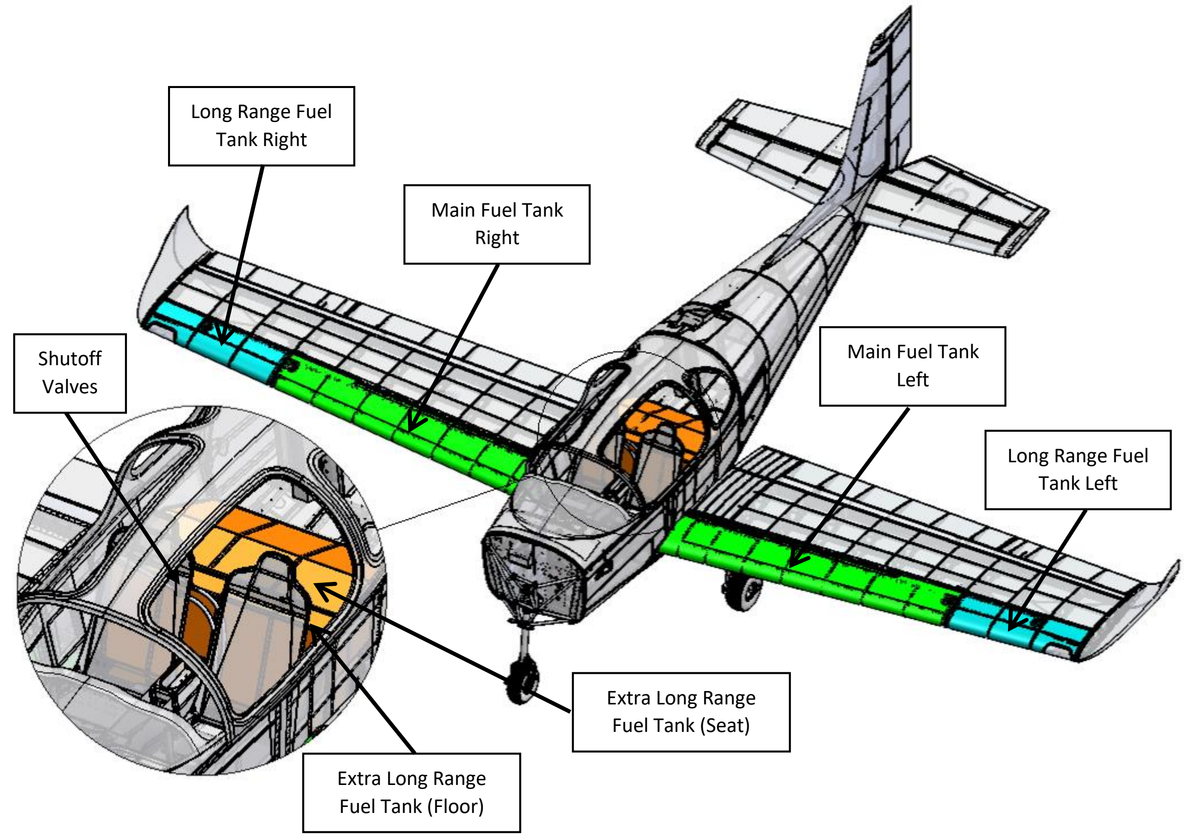
Fuel from each C Tank is fed through shut-off valves, which allows the pilot to choose which tank to use. The fuel from both C Tanks are then routed through a T piece fitting and then through a Facet electrical fuel pump. The fuel is then fed into the return hose from the firewall to the fuel selector. The fuel selected can then be used to choose which main Tank (A Tanks) the fuel is pumped into.

9.3.2 Operation of Extra-Long-Range Fuel Tanks

Fuel tank feed selection is enabled by shut-off valves located in the rear of the cabin, just aft of the front seats. The fuel tanks and shut-off valve locations are shown in the pictures below.

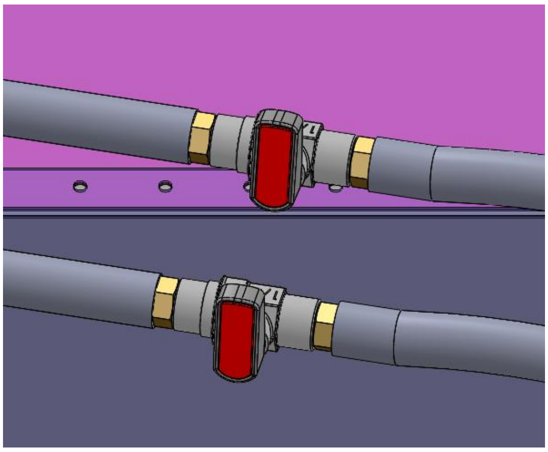
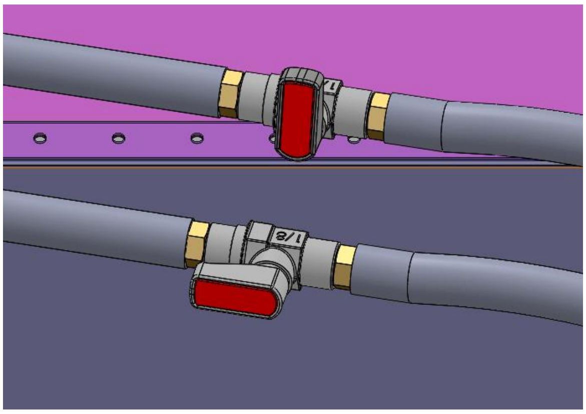
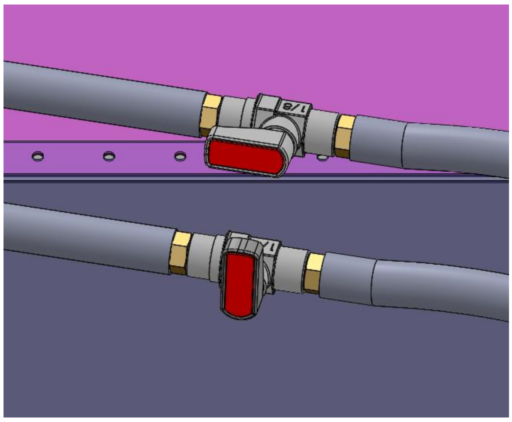
9.3.3 Fuel System Location

Location of Fuel Tanks



The Facet electric pump is activated by the transfer pump switch on the instrument panel. Either C Tank can supply to the main tank (A tank) in use. Fuel tank feed selection is enabled by the two shut-off valves, which are located on the fuel lines exciting the C Tanks.

9.3.4 Example of Shut-Off Valve States

<table>
<tr><th colspan="2">Different Transfer Options</th></tr>
<tr><td colspan="2">Both C Tank valves closed</td></tr>
<tr><td colspan="2"></td></tr>
<tr><td>Floor C Tank open, Seat C Tank closed</td><td>Seat C Tank open, Floor C Tank closed</td></tr>
<tr><td></td><td></td></tr>
</table>

9.3.5 Effect on Aircraft CG

For Extra-long-range tanks (C Tanks), an amendment is made to the standard blank CG form. The moment arm for Floor and Seat C Tanks, 2 688mm and 2 311mm respectively, is added as shown in the table below.

	Weight [kg (lb)]	**Arm** [mm (ft)]	**Moment** (weight x arm) [kg.mm (lb.ft)]
Crew [Front]		1 902 (6.240)	
Baggage		3 288 (10.787)	
Baggage Ext.		3 762 (12.342)	
Fuel (A Tanks)		1 800 (5.906)	
Fuel (B Tanks)		1 822 (5.911)	
Fuel (Floor C Tank)		2 311 (7.580)	
Fuel (Seat C Tank)		2 688 (8.820)	
AC Empty CG			
Totals	W_T =	-	M_T =
			CG = mm
			CG= %MAC

NOTE

The blank form and graph in paragraph 6.5 are still applicable and should be referred to in addition to the amended table above.

Some aircraft may not have standard long-range tanks (B Tanks) even though they have C Tanks installed.

As the C Tanks are depleted, the aircraft's CG will shift due to the fuel burn. The CG will shift backwards as the fuel in the main tanks gets depleted if the fuel in the Extra-Long-Range tanks is not pumped into the main tanks. As fuel is pumped from the Extra-Long-Range tanks into the main tanks, the CG will shift forwards. The Pilot must ensure that the aircraft still conforms to the CG envelope at all times, as specified in paragraph 6.4.

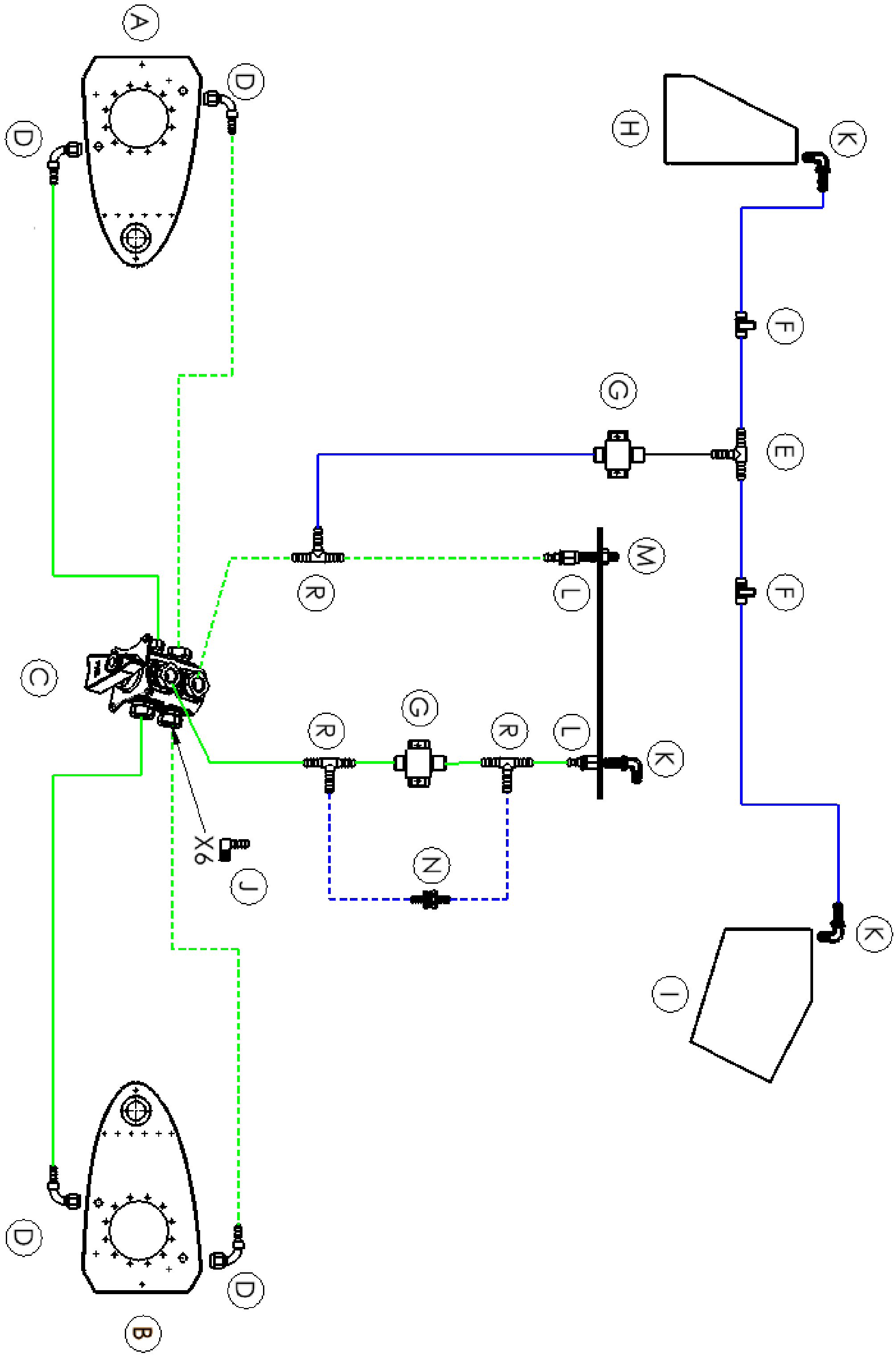
The Facet Posi-Flo Fuel Pump is capable of pumping approximately 2 l/min of fuel from the C Tanks to the A Tanks. This should be considered when determining the change in CG, if the C Tanks are used.

9.3.6 C Tank Fuel System Diagram Key

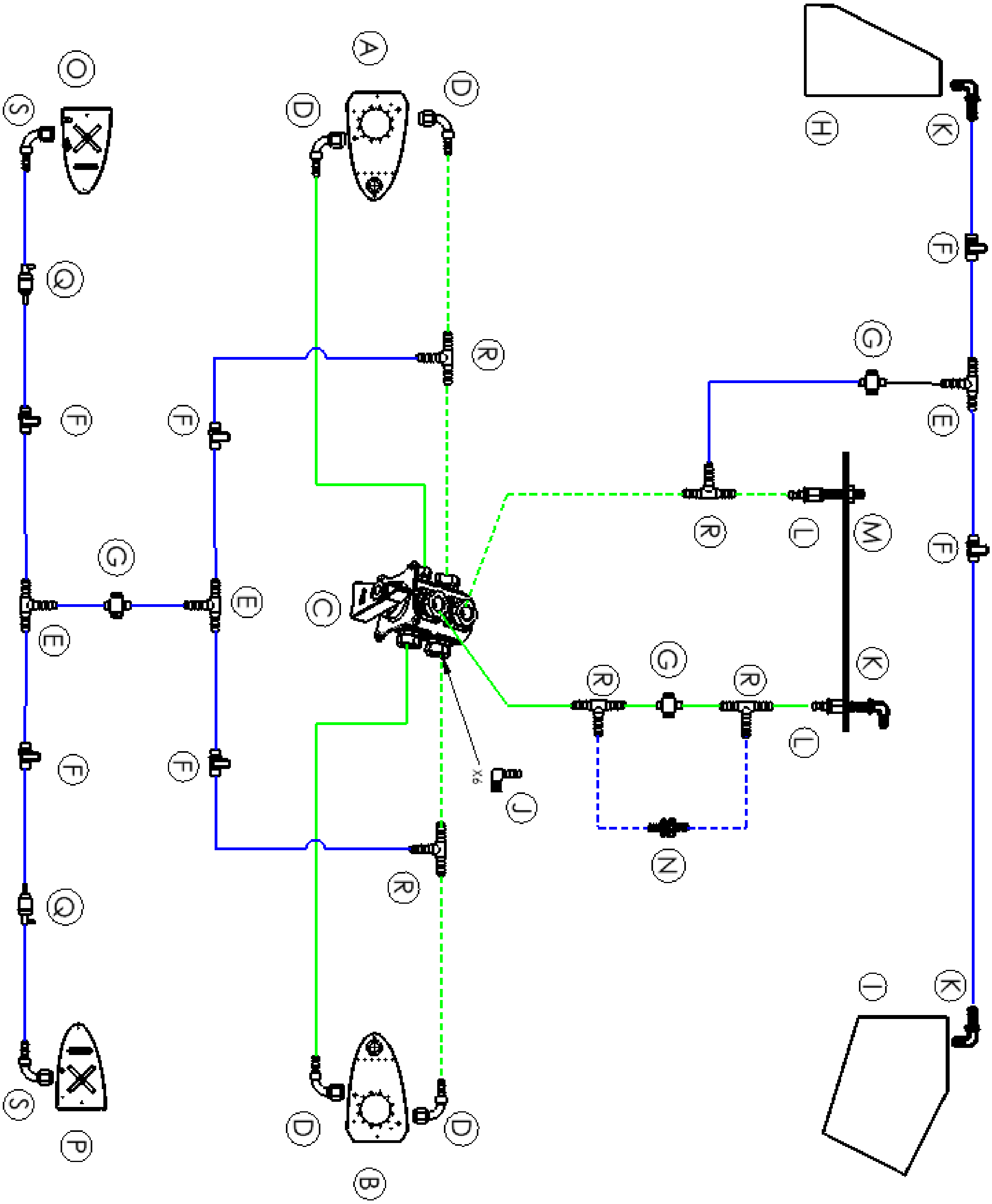
Extra-Long-Range Fuel System Key			
A	Left A Tank	M	Straight flare AN6 bulkhead fitting with nut & washer
B	Right B Tank	N	Check valve, 0.4-0.7 Psi
C	Fuel selector	O	Left B Tank
D	90° Push on fitting, 9.5mm hose	P	Right B Tank
E	8 mm T-Piece	Q	90° Mesh Fuel Filter (Plastic Housing)
F	Shut-off valve	R	T-Piece 3/8"-5/16"-3/8"
G	Electrical fuel pump	S	90° Hose end swivel push on AN6 5-BARB (8mm)
H	Floor C Tank	—	5/16" (7.9mm) SAE J30R9 Fuel Hose
I	Seat C Tank	- - - -	5/16" (7.9mm) SAE J30R9 Fuel Hose, Return
J	90° fitting, 1/4" NPT male to 3/8" barb.	—	3/8" SAE J30R9 Fuel Hose
K	90° AN6 bulkhead fitting, flare, nut & 2 washers	- - -	3/8" SAE J30R9 Fuel Hose, Return
L	Straight female AN6 pushon fitting 9.5mm		

9.3.7 C Tank Fuel System Diagram

If only the A and C Tanks are installed, refer to the figure blow:



It is also possible to have all the fuel tanks installed (A, B and C Tanks). If you have this configuration installed refer to the diagram below.


O
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9.4 Suppl. 02/2020 – Airplanes Fitted with an External Alternator

Information contained in this supplement adds to or replaces information from the standard Sling 4 TSi 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 Sling 4 TSi Pilot Operating Handbook.

This supplement provides information necessary for the operation of an aircraft fitted with an external alternator. An external alternator is fitted as an option if the output of the integrated generator is inadequate. Reference should be made to the service instruction (SI-PAC-001) for Rotax 915 i (Series).

9.4.1 Operational Parameters

The alternating current (AC) output of the external alternator is routed to its integrated rectifier regulator where it is converted (rectified) and regulated, to provide direct current (DC) output available to the main battery. The external alternators charge output is 14.2 to 14.8 V DC.

9.4.2 Operational Instructions

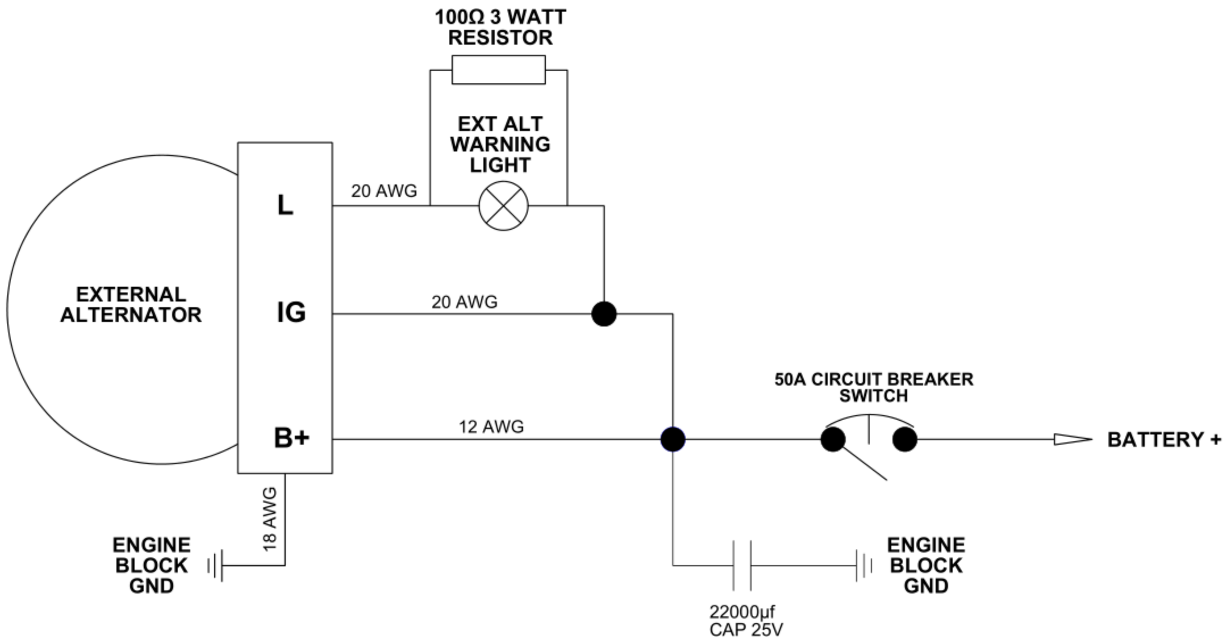
The external alternator is operated with a circuit breaker switch (refer to external alternator wiring in the picture below). Trip indication is by switch actuation in the OFF (DOWN) position. Refer to paragraph 7.10 for the switch layout on the instrument panel.

Ensure that the external alternator is switched to the off position before engine start. It may be switched on after engine start.

The external alternator warning light (labelled Alt 2) comes on when the alternator is not functioning. The light should illuminate if there is an external alternator failure.

Refer to paragraph 3.7.4 for procedures following a charge system failure.

9.4.3 External Alternator Wiring



9.4.4 Effect on Mass and Balance

The CG range mentioned in Section 6 of this document continues to apply and following the fitment of the external alternator, the empty CG of the aircraft should be measured and appropriately recorded. Refer to paragraph 6.5 The external alternator mass is 3.0 kg (6.6 lbs).

9.5 Suppl. 01/2021 – Airplanes Fitted with Ballistic Parachute

9.5.1 Magnum 901 Ballistic Parachute

9.5.1.1 Introduction

This supplement must be kept with the Pilot Operating Handbook during the 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 Magnum 901 ballistic parachute.

- The Sling 4 TSi is specifically designed for convenient fitment of the Magnum 901 ballistic parachute recovery system, manufactured by Stratos 07. The system is designed to enable the pilot or passenger to deploy the parachute, in case of an emergency, in such a manner that the aircraft structure is carried under the parachute to the ground. Thus, to ensure that the occupant will not be injured, and the aircraft suffers minimum damage.
- The use of a ballistic parachute system involves inherent risks, and the system should be properly understood by the pilot prior to use.

9.5.1.2 Ballistic Parachute Operational Parameters

Parameter	Value
Limit Deployment Speed	320 km/h *or* 173 kt.
Deployment Time *(at Limit Speed)*	8 s
Maximum Supported Mass	950 kg *or* 1674 lb.
Descent Rate *(at Maximum Mass)*	7 m/s

9.5.1.3 Ballistic Parachute Deployment Procedure

1. Speed ....BELOW 173 KIAS
   ....DEPLOY (AS SLOW AS PRACTICABLE)
2. Throttle ....CLOSE
3. Ignition Lanes / Magnetos .....OFF
4. Fuel Pump(s) ....OFF (BOTH)
5. Fuel Selector..........................OFF
6. Harnesses ....SECURE & TIGHT
7. Security ....ALL LOOSE OBJECTS SECURE
8. Parachute ....DEPLOY
   ....PULL ACTIVATION HANDLE

   before impacting the ground –

9. Master...................................OFF
10. Avionics ....OFF

9.5.2 BRS Aerospace Ballistic Parachute

9.5.2.1 Introduction

This supplement must be kept with the Pilot Operating Handbook during the 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 SLTSCM-08 system manufactured by BRS Aerospace.

- The Sling 4 TSi is specifically designed for convenient fitment of the SLTSCM-08 system. The system is designed to enable the pilot or passenger to deploy the parachute, in case of an emergency, in such a manner that the aircraft structure is carried under the parachute to the ground. Thus, to ensure that the occupant will not be injured, and the aircraft suffers minimum damage.
- In instances where the aircraft is flying at low altitudes and the pilot possesses the ability to maneuver the aircraft to a safer altitude, it is recommended that they do so. Pilots may encounter situations that require an immediate activation of SLTSCM-08 such as: an engine failure after takeoff, mid-air collision, or a loss of control in flight.
- The use of a ballistic parachute system involves inherent risks, pre-briefing these circumstances often will help the pilot to react quickly and activate SLTSCM-08 in a timely manner, increasing the probability of SLTSCM-08 working properly.

9.5.2.2 BRS Ballistic Parachute Operational Parameters

Parameter	Value
Limit Deployment Speed	287 km/h *or* 155 kt.
Maximum Supported Mass	950 kg *or* 1674 lb.
Descent Rate *(at Maximum Mass)*	9.4 m/s *(minimum at 5,000 [ft (DA)])*

9.5.2.3 BRS Ballistic Parachute Deployment Procedure

1. Speed ....BELOW 155 KIAS
2. ....DEPLOY (MINIUMUM POSSIBLE)

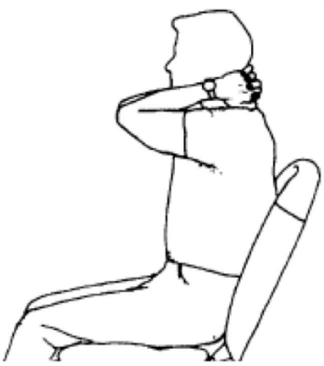
   It is desirable to shut engine off prior to SLTSCM-08 activation if time and altitude permit.

3. Throttle ....CLOSE
4. Ignition Lanes / Magnetos.....OFF
5. Parachute ....DEPLOY
   ....PULL ACTIVATION HANDLE (BOTH HANDS UNTIL HANDLE IS FULLY EXTENDED)

   Approximately 21 [kg] of force is required to activate SLTSCM-08.

9.5.2.4 After Deployment Procedure

6. Ignition Lanes / Magnetos.....CHECK, OFF
7. Fuel Pump(s) ....OFF (BOTH)
8. Fuel Selector..........................OFF
9. ELT...ON
10. Harnesses..............................SECURE & TIGHT
11. Loose Items ....SECURE
12. ....ASSUME
    EMERGENCY LANDING BODY POSITION as shown before touchdown. Place both hands behind the head, fingers locked, elbows forward to shield the head and face. Maintain an upright upper torso.



If time permits, declare the emergency, and announce SLTSCM-08 activation prior to turning off AVIONICS.

13. Avionics ....OFF
14. Master...................................OFF

9.6 Suppl. 02/2021 – Aircraft Fitted with a Tow Hook

9.6.1 Introduction

A tow hook attachment can be added to the aircraft as an optional fitment for the purposes of glider tugging and/or banner towing. The aircraft manufacturer has, tested and approved the fitment of a Tost E22 series glider hook with a maximum load capacity of 700kg.

This section 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 that 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 4 TSi aircraft type, who wishes to understand in what manner the operation of the Sling 4 TSi for tugging and towing operations may differ from normal Sling 4 TSi operations, or in what manner the operation of the Sling 4 TSi or tugging and towing operations may differ from tugging and towing operations in other aircraft types.

NOTE

Glider and/or banner towing and use of the tow hook 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.

9.6.2 Specifications

Specifications	
Tow hook weight	1 kg
Tug and towing operating speeds	50-90 KIAS, as required
Max. 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)

9.6.3 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 4 TSi 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.

9.6.4 Installation of Hook and Release Mechanism

The glider tow hook is fitted to an aluminium 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 the fitment of the tow hook, so that in the event of a tail strike the tie-down point strikes the ground before the tow hook mechanism itself. This is to protect the tow hook mechanism in the case of a tail-strike. A tail-strike with a 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.

9.6.5 Operations and Precautions

Operational instructions on glider tugging and banner towing is considered beyond the scope of this POH. The following considerations, however, should always 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 always within the limits applicable to the engine, airframe and propeller. If this is not possible in any configuration or at any time, discontinue operations immediately.
- Pilots should always operate in accordance with the provisions of the latest 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 pilots. Tug and tow operations are by their nature complex systems and the aircraft manufacturer

takes no responsibility for aircraft performance and behaviour when used for such purposes.

- The manufacturer's approval of the Sling 4 TSi 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 a quick-release mechanism
    - a Rotax 915 iS engine
    - an Airmaster AP430CTF-WWR72B 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 4 TSi aircraft in the configuration referred to in this section may be safely operated for purposes of –
    - Tugging gliders of a weight of up to 700kg
    - Towing banners of a size of up to 20m x 30m

9.7 Supplement 11/2023 – MTV-6/190-69

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.

9.7.1 Introduction

This supplement provides the necessary information for the operation of an aircraft fitted with an MTV-6/190-69 constant speed propellor.

The propellor is hydraulically actuated though use of a constant speed governor mounted on the back of the engine's gearbox. There are two distinct control system variants for the MTV-6, manually controlled constant speed and single lever control.

9.7.2 Manual Constant Speed Control

This control system arrangement makes use of an aviation standard of control, the vernier control. Blue in colour to indicate pitch, the pilot can adjust the desired propellor RPM one of two ways:

- Coarse Control
  - Depressing the button on the end of the control knob will allow actuation of the control inwards and outwards. This provides coarse adjustment of the propellor RPM.
- Fine Control
  - Turning the control knob, without depressing the button, will allow for fine adjustment of the propellor PRM.

9.7.3 Single Lever Control (RS Flight Systems)

A single lever control system is created by combining the MTV-6 propellor system with the RS Flight Systems 9iS SCU.

There is no interface for propellor control afforded to the pilot, as the control of the propellor happens internally in the single lever system. The RS Flight System SCU features a specific engine/propellor control map that is used to best optimize power delivery at all times, without breaching continuous power/RPM limitations of the powerplant itself.

9.8 Supplement 11/2023 – Rotax 916 iS Engine

The Rotax 916 iS engine may be fitted to the Sling 4 TSI. 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 3.7.4 Alternator / Charge System Failure for more information.

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

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	Automotive grade API “SG” type oil, or higher, preferably synthetic, or semi-synthetic. When operating on unleaded fuels or MOGAS, fully synthetic oil is recommended. Conventional aircraft oils (a.d. = ashless dispersant) are not suitable. Oils with gear additives such as AeroShell Oil Sport Plus 4 are highly recommended. Oils with friction modifier additives are unsuitable because this could result in clutch slipping during standard operation. Engine oils tested according to RON 424 are to be used with ROTAX® engine types. *(Refer to the latest revision of the engine operator’s manual for more.)*
Oil Viscosity	SAE 10 W-40
Oil Capacity	Approx. 3.5 litres (3.7 Quarts / 7.4 pints) from dry.

9.8.1.4 Engine Operational and Speed Limits

Parameter		Value
Engine Model		ROTAX 916 iS
Engine Manufacturer		Bombardier-Rotax GMBH
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 73 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

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

9.8.1.5 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.

The performance in this section is valid for a maximum take-off weight of 950 kg (2094 lb).

Surface Type	Density Altitude	Run Distance	Distance over 15m / 50ft Obstacle
Concrete/Tar	MSL	180 m / 590 ft	330 m / 1,085 ft
Concrete/Tar	7,000	230 m / 755 ft	460 m / 1,510 ft

9.8.1.6 Landing Distance

Surface Type	Density Altitude	Landing Distance with braking	Distance over 15m / 50ft Obstacle
Concrete/Tar	MSL	150 m / 490 ft	350 m / 1,150 ft
Concrete/Tar	7,000	250 m / 820 ft	425 m/ / 1,395 ft

9.8.1.7 Rate of Climb

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

Altitude	Rate of Climb	Best Rate of Climb Speed (V_Y)
[ft. ISA]	*[fpm]*	*[KIAS]*
0	940	75
1,000	930	
2,000	915	
3,000	905	
4,000	890	
6,000	865	
8,000	840	
10,000	810	
12,000	785	
14,000	760	
16,000	735	
18,000	710	

9.8.1.8 Cruise Speeds

Power	95%[a]		MAX ECO[b]		80%		75%	
Propeller State	Climb 5,500 RPM		Cruise 5,500 RPM		Cruise 5,000 RPM		Cruise 5,000 RPM	
Altitude	IAS	TAS	IAS	TAS	IAS	TAS	IAS	TAS
0	146	144	138	138	134	134	129	129
1000	145	145	137	140	134	136	128	130
2000	144	147	137	141	133	137	128	132
3000	143	148	136	143	133	139	127	133
4000	142	150	136	144	132	141	127	135
5000	142	151	135	146	132	143	126	136
6000	141	153	134	148	131	144	125	137
7000	140	154	134	149	131	146	125	139
8000	139	156	133	151	130	148	124	140
9000	138	157	133	152	130	149	124	142
10000	138	159	132	154	129	151	123	143
11000	137	160	131	156	129	153	122	144
12000	136	162	131	157	128	154	122	146
13000	135	163	130	159	128	156	121	147
14000	134	165	130	160	127	158	121	149
15000	134	166	129	162	127	160	120	150
16000	133	168	128	164	126	161	119	151
17000	132	169	128	165	126	163	119	153
18000	131	171	127	167	125	165	118	154

NOTES

a) Maximum continuous power.
b) The Rotax 916 iS uses an automatic switching ECO mode, which has a significant effect on fuel consumption. ECO mode is activated at approximately 90% power setting. MAX ECO is the power setting just before the engine leaves ECO mode, which results in an approximate fuel consumption of 33 LPH at 5,500 RPM.

9.8.1.9 Fuel Consumption

Engine Power		%	**100%**	**95%**	**90% MAX ECO(b)**	**80%**	**75%**
Engine RPM		*RPM*	5,800	5,500	5,500	5,000	5,000
Fuel Burn		*LPH*	46	40	33	27.5	25
		GPH	12.2	10.5	8.8	7.3	6.7
176 Litre Main Tanks 46.5 US GAL	**Endurance**	*[hrs]*	3.0	3.6	4.5	5.5	6.1
	Range(c) 1,000 ft.	*[nm]*		520	625	750	800
	Range 5,000 ft.	*[nm]*		540	650	785	835
	Range 10,000 ft.	*[nm]*		565	690	830	880
198 Litre Main Tanks 51.3 US GAL	**Endurance**	*[hrs]*	3.5	4.1	5.1	6.3	7.0
	Range(c) 1,000 ft.	*[nm]*		596	715	855	915
	Range 5,000 ft.	*[nm]*		620	750	900	955
	Range 10,000 ft.	*[nm]*		651	790	950	1000

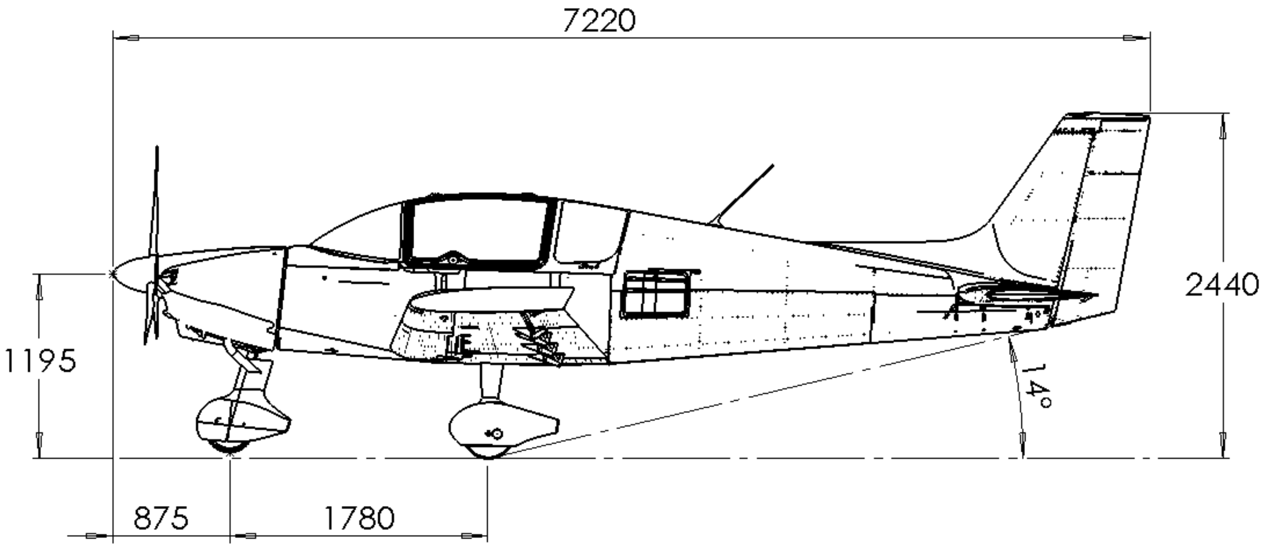
NOTES

Please see previous page for information regarding notes (b)

(c) Endurance information is calculated using maximum useable fuel, exclusive of 45-minutes reserve fuel. The range information was calculated inclusive of 45-minutes reserve fuel.

9.8.2 *Weight and Balance*

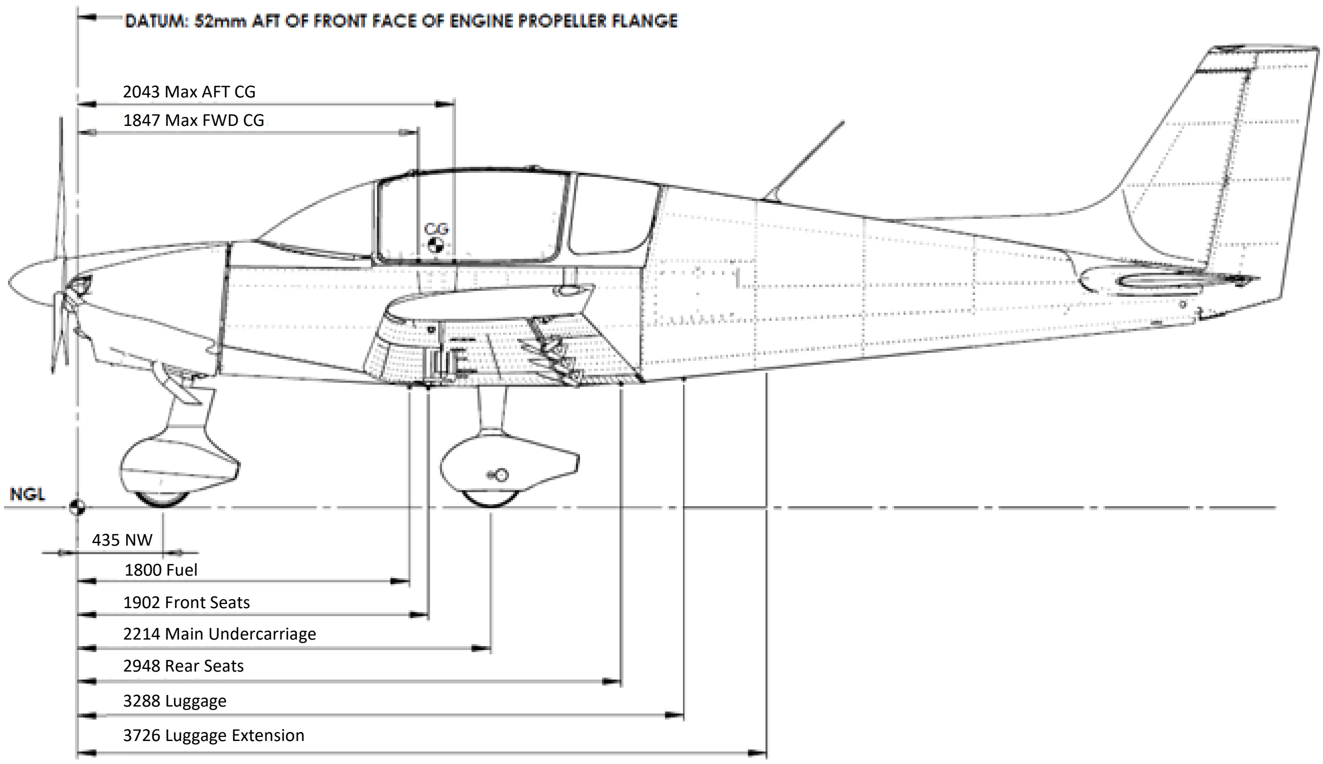
When the Sling 4 TSi is outfitted with a Rotax 916 iS engine, the propellers used have a larger diameter than those originally used with the 915 iS engine version. To accommodate this larger propeller diameter the nose gear was lengthened to ensure adequate propeller clearance between the blades and the ground.



DIMENSIONS IN THIS DRAWING ARE IN MILLIMETRES.

Due to the different undercarriage placement, the nose gear moment arm used for the mass and balance calculations is slightly different compared to the Sling 4 TSi's outfitted with 915 iS engines.

9.8.2.1 Centre of Gravity Arms



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

> **NOTE**
>
> - GC range is 1847mm (6.060 ft) to 2043 mm (6.703 ft) aft of the reference datum (18 to 33% of MAC).
> - The leading edge of the wing at MAC is 1602 mm (5.256 ft) aft of the reference datum.
> - The MAC is 1339 mm (4.393 ft).

9.8.2.2 Determination of Empty CG

	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 = 2 214 (7.26)	
	Left Main Wheel	W_L =	L_L = 2 214 (7.26)	
	Nose Wheel	W_N =	L_N = 435 (1.43)	
	Totals	Empty weight: W_E = ………………..	-	Aircraft moment: M_0=…………………..
	Empty CG	CG = ………………… mm (ft)		

9.9 Supplement 02/2025 – DUC 4 bladed FlashBlack-3-R

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 Pilot Operating Handbook.

9.9.1 Introduction

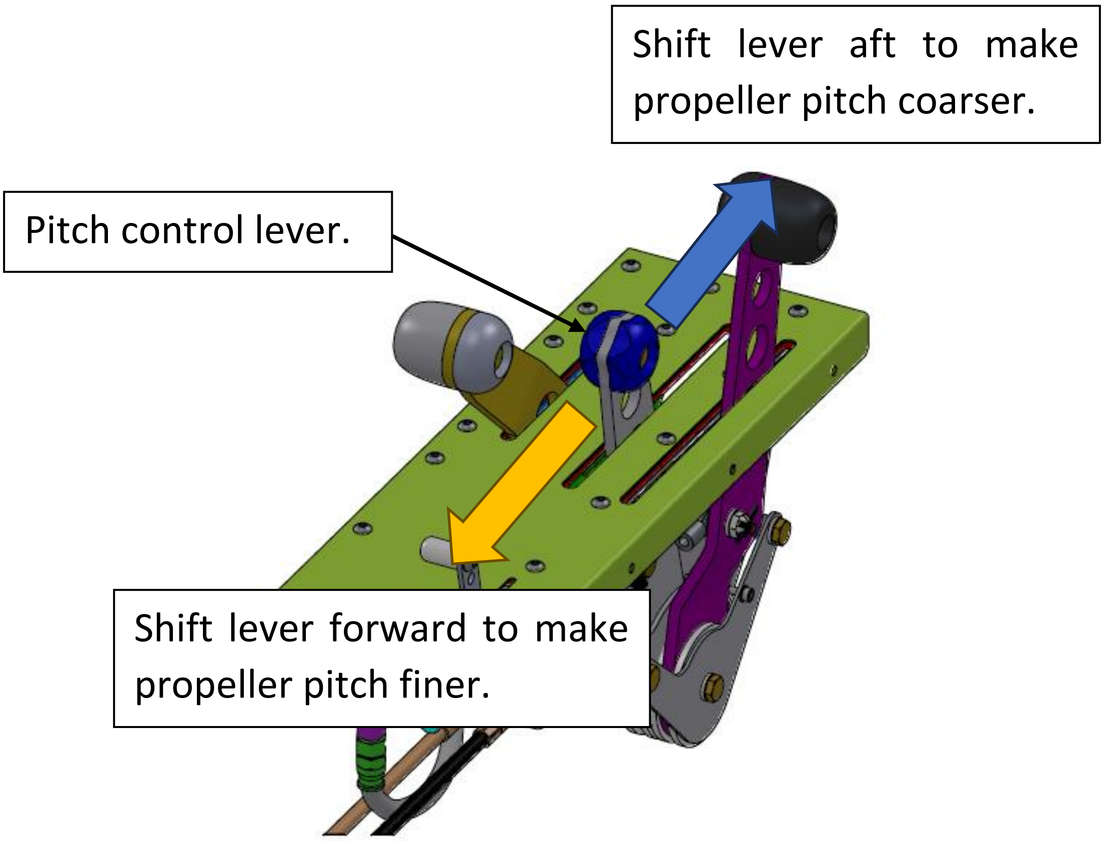
This supplement provides the necessary information for the operation of an aircraft fitted with a DUC, 4 bladed, FlashBlack-3-R constant speed propellor.

The propellor is hydraulically actuated through use of a constant speed governor mounted on the back of the engine's gearbox, that is manually controlled.

9.9.2 Manual Constant Speed Control

In order to control the pitch of the propeller (and ultimately the engine RPM), the blue leaver on the throttle quadrant may be used.

As seen in the figure below, shifting the lever forward will make the propeller pitch finer and shifting it aft will make the pitch coarser.



9.9.3 Performance

The Sling 4 TSi can be outfitted with the DUC FlashBlack 3 propeller. When the aircraft is outfitted with a FlashBlack 3 propeller and Rotax 916 iS engine, it achieves similar flight performance to that which are outfitted with a MTV 6 propeller and Rotax 916 iS engine.

The DUC FlashBlack 3 achieves the same take-off and cruise performance as the MTV 6 propeller, but slightly lower climb rates at higher altitudes. The table below details the climb rates for different altitudes of the aircraft, when outfitted with a 916 iS and DUC FlashBlack 3.

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

Altitude	**Rate of Climb**	**Best Rate of Climb Speed (V_Y)**
[ft. ISA]	*[fpm]*	*[KIAS]*
0	1 250	75
1,000	1 190	
2,000	1 130	
3,000	1 080	
4,000	1 020	
6,000	910	
8,000	790	
10,000	680	
12,000	560	
14,000	450	
16,000	330	
18,000	220	