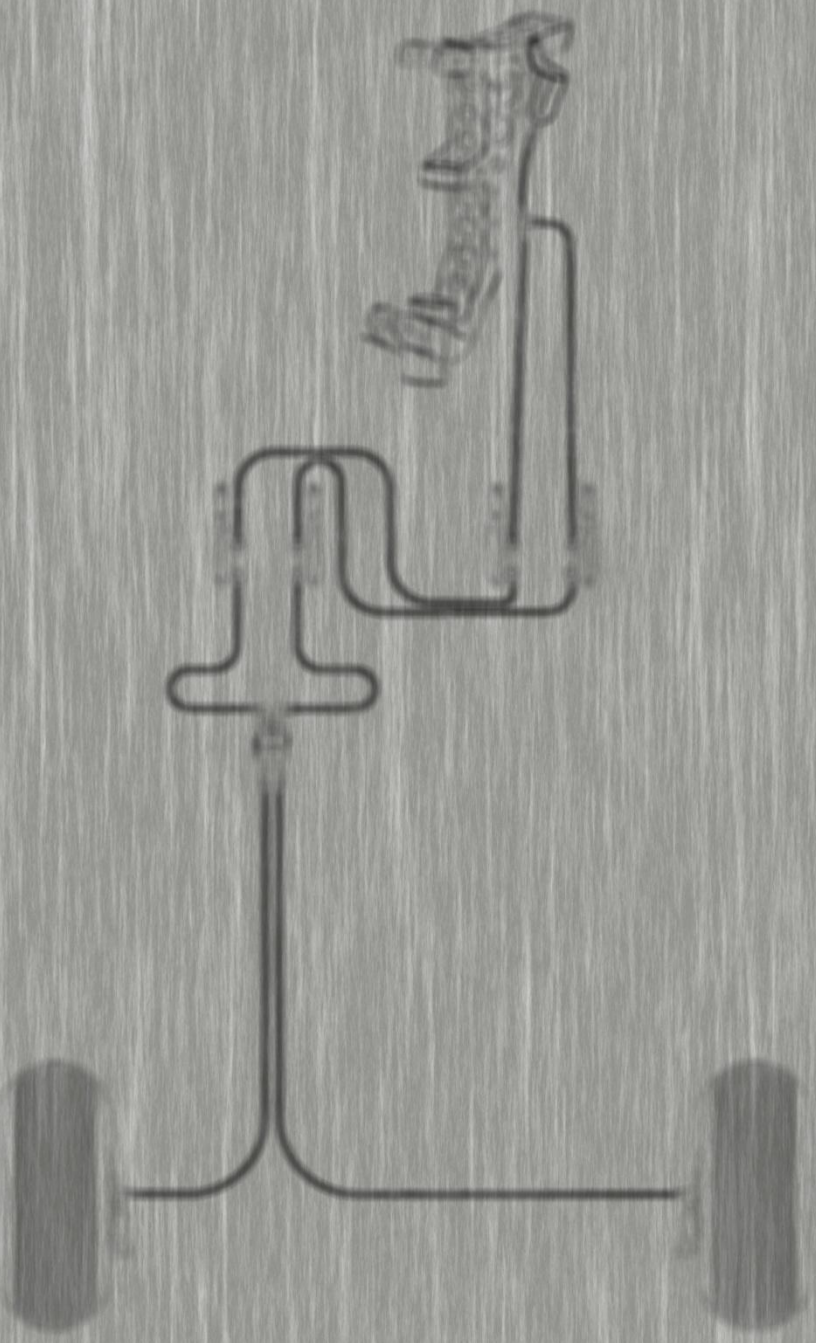
BushCat

by SkyReach

Maintenance Manual



BCMM-NT-009-000

SkyReach

MAINTENANCE MANUAL

BushCat

NOSE-WHEEL AND TAIL-DRAGGER
FITTED WITH ROTAX 912ULS ENGINE

APPROVED FLIGHT MANUAL PART NUMBER:	BCMM-NT-009-000
AIRCRAFT TYPE:	CHEETAH – BUSHCAT*
DATE OF ISSUE:	24 October 2019

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ISSUES AND REVISIONS

This maintenance manual may be revised and amended periodically and as a result new issues and revisions will be made and published. Revisions will be made to rectify small changes or errors with this manual which do not change page numbering. Corrected pages simply replace existing pages. New issues will be released if major changes to this manual are made and page many or all page numbers change. If this manual has been shipped with an aircraft it will be suitable for the aircraft and subsequent issues will not be required for it to be complete - i.e., a later issue operating manual will only be applicable to aircraft shipped after that particular issue. If revisions are published you will be notified by SkyReach or by your distributer as they will apply to the correctness of your manual. It should be noted that all revisions and revisions are available on the SkyReach website as downloadable PDF files. The part number of your manual (shown on the front cover) will have the following format:

BCMM-NT-aaa-bbb

The first two parts show that it is a BushCat maintenance manual for nose-wheel and tail-dragger variants. The numbers replacing 'aaa' show the issue number of your manual, and the numbers replacing 'bbb' indicate the latest revision which has been included in this manual. If you receive a revision to your manual, your manual number will change in the 'bbb' section.

A record of issues and revisions are given on the following page.

RECORD OF ISSUES AND REVISIONS

The following issues have led to this current issue:

Issues Number	Date Published	Notable Changes
001	28/10/2013	Original
002	05/12/2013	Electrical system schematic moved to A/C supplement
003	07/07/2014	New Zealand distributer address added
004	08/07/2014	Several changes
005	19/11/2014	Fuel line inspection added
006	01/04/2015	MTOW increased to 600kg
007	19/07/2016	Canada distributor address added
008	01/04/2017	Multiple
009 (Current)	24/10/2019	Multiple, Updated for new empennage, detailed maintenance procedures moved to new document.

The following revisions have been included in this issue. Please document further amendments in the blank spaces provided:

Revision Number	Date Published	Notable Changes
000	N/A	Original (No revisions)

The following table lists the most up-to-date revision for each page:

Page	Issue-Rev	Page	Issue-Rev	Page	Issue-Rev	Page	Issue-Rev	Page	Issue-Rev
1	009-000	2	009-000	3	009-000	4	009-000	5	009-000
6	009-000	7	009-000	8	009-000	9	009-000	10	009-000
11	009-000	12	009-000	13	009-000	14	009-000	15	009-000
16	009-000	17	009-000	18	009-000	19	009-000	20	009-000
21	009-000	22	009-000	23	009-000	24	009-000	25	009-000
26	009-000	27	009-000	28	009-000	29	009-000	30	009-000
31	009-000	32	009-000	33	009-000	34	009-000	35	009-000
36	009-000	37	009-000	38	009-000	39	009-000	40	009-000
41	009-000	42	009-000	43	009-000	44	009-000	45	009-000
46	009-000	47	009-000	48	009-000	49	009-000	50	009-000
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66	009-000	67	009-000	68	009-000	69	009-000	70	009-000
71	009-000	72	009-000	73	009-000	74	009-000	75	009-000
76	009-000	77	009-000	78	009-000	79	009-000	80	009-000
81	009-000	82	009-000	83	009-000	84	009-000	85	009-000
86	009-000	87	009-000	88	009-000	89	009-000	90	009-000
91	009-000	92	009-000	93	009-000	94	009-000	95	009-000
96	009-000	97	009-000	98	009-000	99	009-000		

FEEDBACK FORM

Please use the following form to notify us of any improvements or corrections needed, as well as for continued operational safety reporting or for an owner's change of address notice. After completing the form please fax or email it to the relevant contact shown on the next page. In addition, please keep a copy of the completed form in your Maintenance Manual.

Name:

Email:

Phone Number:

Date:

BushCat Serial Number:

Registration number:

Feedback information:

Email or fax to:

South African Address:	**USA Address:**	**New Zealand Address:**
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Ecuadorian Address: Use South African contact details	**Namibian Address:** Use South African contact details	**Polish Address:** Use South African contact details
Brazilian Address: Use South African contact details		

TABLE OF CONTENTS

1. GENERAL

1.1. INTRODUCTION TO THE MANUAL

Thank you for purchasing a BushCat Light Sport Aircraft.

The BushCat represents the best value in a light sport aircraft without any compromise in quality and safety.

In order to extract maximum safety and performance from your BushCat please familiarize yourself with the entire contents of this Maintenance Manual.

This manual conforms to ASTM F2483-12 standards – Standard Specifications for Maintenance Manuals (MM) for Light Sport Airplanes.

This aircraft is equipped with a non-certified engine which meets the ASTM F2339-06 engine standard.

All factory-built aircraft have been manufactured by Rainbow SkyReach (PTY) LTD – a part 148 approved manufacturing organisation, approved by the South African Civil Aviation Authority.

1.2. INTRODUCTION TO THE CHEETAH SERIES

It should be noted that the term 'BushCat' refers to the third (and most current) variant of Cheetah aircraft; The Cheetah-BushCat. Original production acceptance certification with the SACAA was obtained under the name of 'Cheetah'. The two main upgrades to the aircraft were approved as 'Cheetah-XLS' and 'Cheetah-BushCat'. For certification in foreign countries which was based on the South African approval the term 'BushCat' was used in place of 'Cheetah-BushCat'. This manual applies only to the Cheetah-BushCat and not to the Cheetah-Standard or Cheetah-XLS aircraft.

1.3. A NOTE ON STAND UNITS

Aircraft manufacturers traditionally present figures in the standard units adopted by the country of manufacturer. The BushCat is a South African designed and manufactured aircraft and as such it presents metric units as default. However, Rainbow SkyReach (PTY) LTD makes efforts to present both Metric and Imperial units in all published documentation where practical. The operator should bear this in mind to avoid errors from using figures with incorrect units.

1.4. REFERENCE DOCUMENTATION

The following documents are referenced within this manual:

1. ASTM 2245 – Specifications for the design and performance of a Light Sport Aircraft
2. The BushCat kit assembly manual.
3. The BushCat pilot operating handbook.
4. ROTAX 912UL/ULS operating manual, edition 3

1.5. SUPPLIED DOCUMENTATION

The following manuals are supplied in either hardcopy or electronic format as part of your BushCat aircraft in addition to any pertinent avionics and equipment manuals

1. The Rotax 912 ULS engine operators manual
2. The BushCat Pilots Operating Handbook
3. The BushCat Quick Reference Handbook
4. The BushCat Maintenance Manual
5. The BushCat Detailed Maintenance Procedures Manual
6. The BushCat Assembly Manual (for kit build option)

1.6. TERMINOLOGY

Annual Condition Inspection	Detailed inspection accomplished once a year in accordance with instructions provided in the maintenance manual supplied with the aircraft to ensure continued safe operation.
A&P	Airframe and Power plant mechanic as defined by 14 CFR Part 65 in the U.S. or equivalent certification in other countries.
Heavy Maintenance	Any maintenance, inspection, repair or alteration a manufacturer has designated that requires specialized training, equipment or facilities. Level 3 authorization as per the table in chapter 2 is required to accomplish heavy maintenance.
Line Maintenance	Any repair, maintenance, scheduled checks, servicing, inspections or alterations not considered heavy maintenance that is approved by the manufacturer and is specified in the manufacturer's maintenance manual. Level 2 authorisation as per the table in chapter 2 is required to accomplish line maintenance.
LSA (light sport aircraft)	Aircraft designed in accordance with ASTM standards under the jurisdiction of Committee F37 Light Sport Aircraft (for example Specification F2244 for powered parachutes, Specification F2245 for airplanes, and Specification F2352 for Gyroplanes.) or equivalent in other countries.
LSA Repairman Inspection	U.S. FAA-certificated repairman (light sport aircraft) with an inspection rating as defined by 14 CFR Part 65, authorized to perform the annual condition inspection/ 100 hour inspection on experimental light sport aircraft, or an equivalent rating issued by other civil aviation authorities. *
LSA Repairman Maintenance	U.S. FAA-certificated repairman (light sport aircraft) with a maintenance rating as defined by 14 CFR Part 65, authorized to perform line maintenance on aircraft certificated as special LSA aircraft. Authorized to perform the annual condition/100-h inspection on an LSA, or an equivalent rating issued by other civil aviation authorities. *
Maintenance Manual(s)***	Manual provided by an LSA manufacturer or supplier that specifies all maintenance, repairs, and alterations authorized by the manufacturer in accordance with the Chapter 2.
Major Repair, Alteration, or Maintenance	Any repair, alteration, or maintenance for which instructions to complete the task excluded from the maintenance manual(s) supplied to the consumer are considered major. **
Manufacturer	Any entity engaged in the production of an LSA or component used on an LSA.
Minor Repair, Alteration, or Maintenance	Any repair, alteration, or maintenance for which instructions provided for in the maintenance manual(s)*** supplied to the consumer of the product are considered minor.

Overhaul	Maintenance, inspection, repair, or alterations that are only to be accomplished by the original manufacturer or a facility approved by the original manufacturer of the product. **
Overhaul Facility	Facility specifically authorized by the aircraft or component manufacturer to overhaul the product originally produced by that manufacturer.
Repair Facility	Facility specifically authorized by the aircraft or component manufacturer to repair the product originally produced by that manufacturer.
100-h inspection	Same as an annual condition inspection, except the interval of inspection is 100 h of operation instead of 12 calendar months.

* Experimental LSA do not require the individual performing maintenance to hold any FAA airman certificate in the U.S.

** Alterations to the aircraft cannot be authorized without the approval of the aircraft manufacturer.

*** For the purposes of this definition the "Maintenance Manuals" include both the publication entitled "Maintenance Manual" and the associated publication entitled "Detailed Procedures Manual".

2. AUTHORISATIONS

This section details the personnel permitted to accomplish each task as detailed in the associated "Detailed Procedures Manual".

WARNING It should be noted that modifications to the airframe or engine are not permitted without written approval from the manufacturer.

Level of Authorization	**Classification of tasks to be performed**	**Qualification required to perform the tasks.**
Level 1	Minor maintenance, repairs and alterations	The owner / operator who holds at least a sport pilot certificate may perform these items.
Level 2	Line maintenance, repairs and alterations	An aircraft kit builder, LSA Maintenance Repairman (or country specific equivalent), Aeroplane A&P or an FAA (or similarly approved) Repair Station may perform these items.
Level 3	Heavy maintenance, repairs and alterations	An LSA Maintenance Repairman (or country specific equivalent) with task specific training, A&P or FAA (or similarly approved) Repair Station may perform these items.
Level 4	Major repair, alterations and overhauls	Only the manufacturer of the LSA or component on the LSA may perform or authorise other entities (including, but not limited to, contracted agents in other countries) to perform these items. A separate overhaul manual, in addition to the manufacturer's maintenance manual, is frequently required to perform these items. For additional information or explanations, please contact the factory or distributer using the contact details supplied on page 5.

3. AIRCRAFT SYSTEMS DESCRIPTIONS AND GENERAL SPECIFICATIONS

This section details general aircraft specifications, capacities and basic instructions for handling the aircraft on the ground. For more detailed specifications, please refer to the accompanying BushCat "Pilot's Operating Handbook".

3.1. GENERAL

3.1.1. DIMENSIONS

Dimensions of the BushCat nose-wheel and tail-dragger variants are shown on the followings pages.

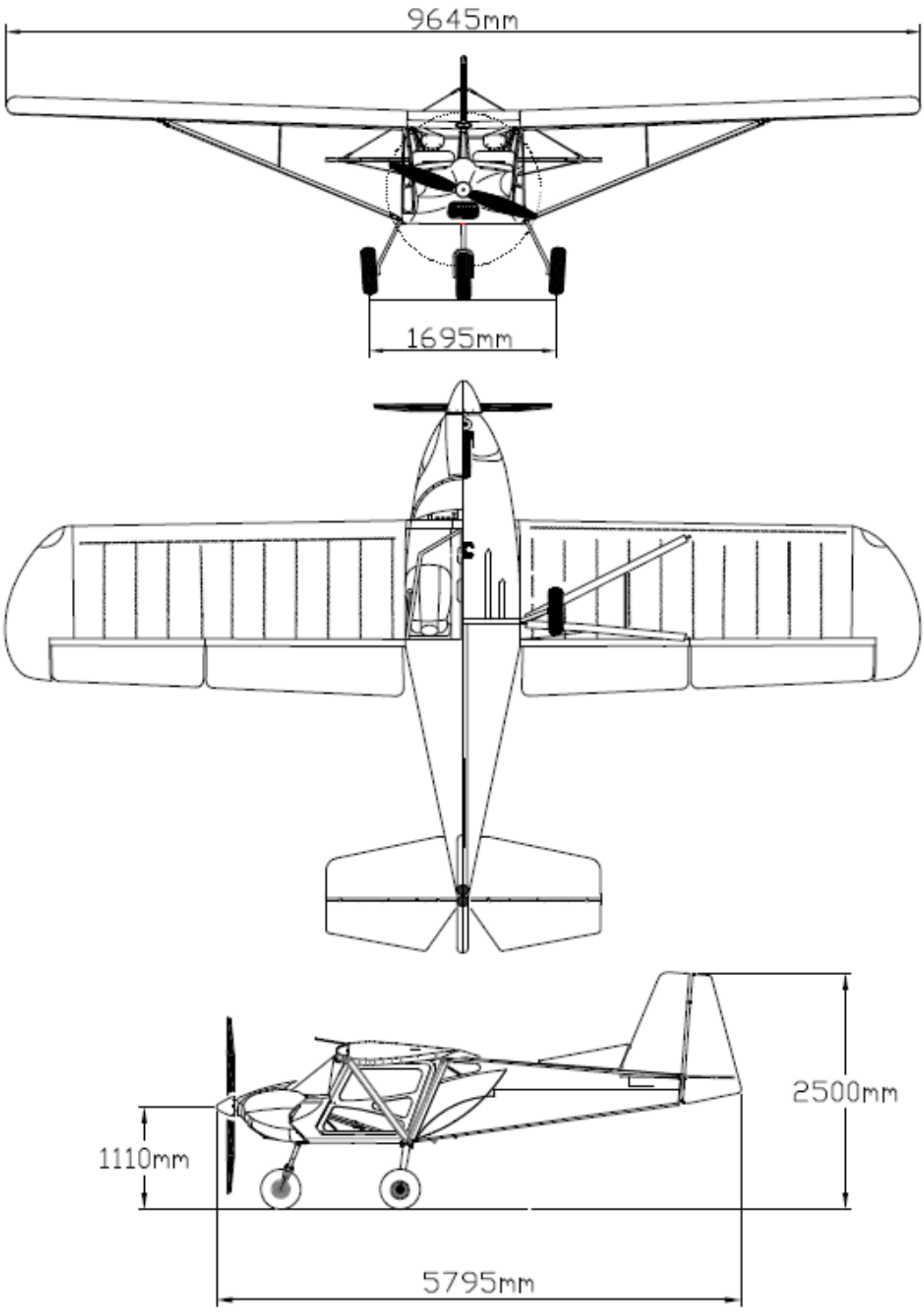

Figure 3.1.1 - Dimensions - Bushcat Nose-Wheel

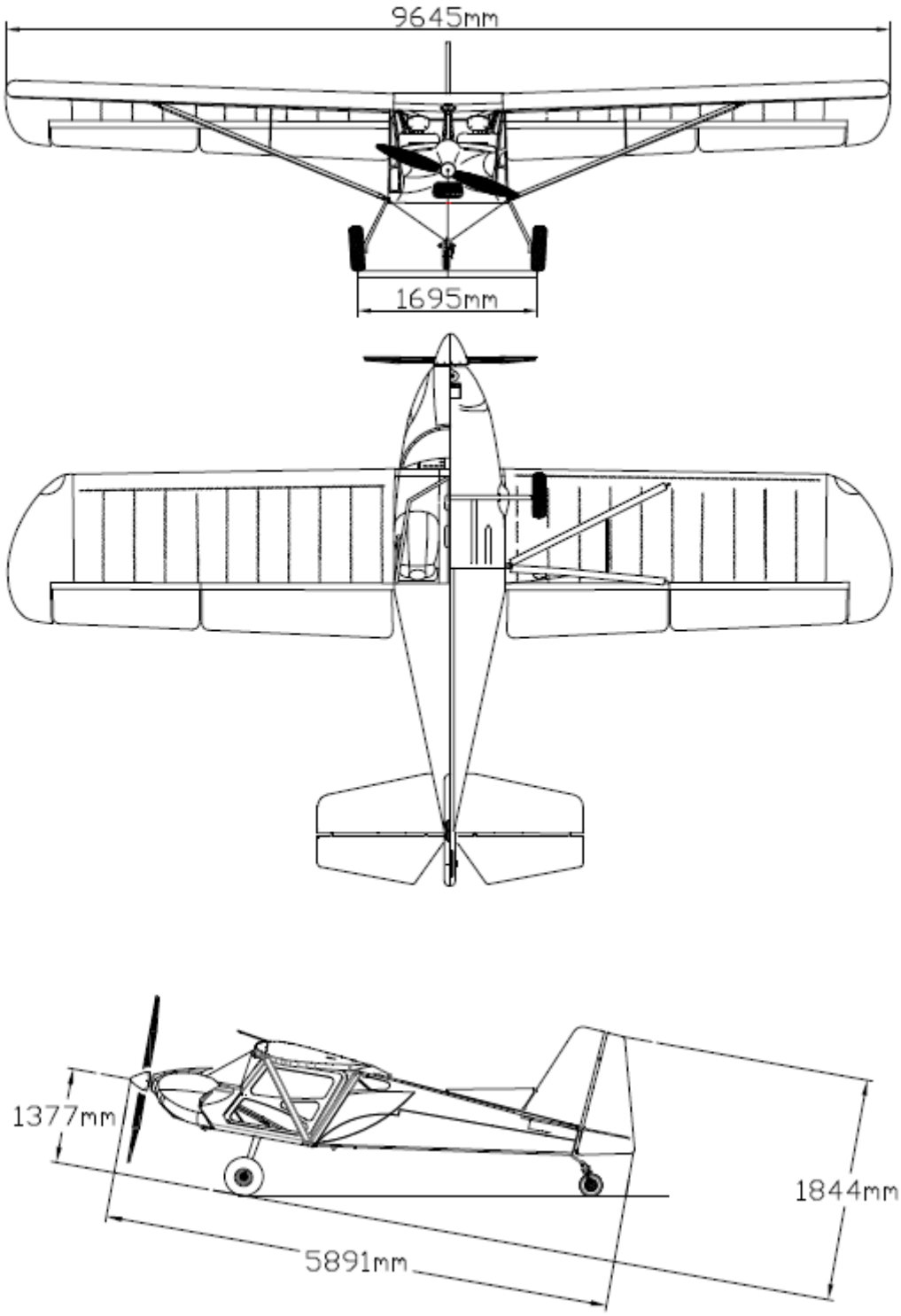

Figure 3.1.2 - Dimensions - Bushcat Tail-Dragger

3.1.2. BAGGAGE SPACE

The aircraft is fitted with two storage areas as standard:

Upper baggage area behind seats:	Capacity:	59 litres (2 ft^3)
	Maximum load:	23.2 kg (51 lbs)
Lower luggage area behind seats:	Capacity:	150 litres (5.3 ft^3)
	Maximum load:	20 kg (44.1 lbs)

This combination results in a maximum baggage weight of 43.2kg (95.2lbs).

3.1.3. CABIN ENTRY DIMENSIONS

Door width:	900 mm (35.4 inches)
Door height:	800 mm (31.5 inches)

3.1.4. SPECIFIC LOADINGS

	Minimum*	**Maximum**	
Wing loading	32.40 kg/m^2 (6.63 lbs/ft^2)	560 kg (1230 lbs) MTOW	41.24 kg/m^2 (8.45 lbs/ft^2)
		600 kg (1320 lbs) MTOW	44.18 kg/m^2 (9.05 lbs/ft^2)
Power loading (Rotax 912 ULS)	4.4 kg/HP (9.7 lbs/HP)	560 kg (1230 lbs) MTOW	5.6 kg/HP (12.33 lbs/HP)
		600 kg (1320 lbs) MTOW	6.0 kg/HP (13.22 lbs/HP)

* Assuming an operating empty mass of 440kg (970 lbs)

3.1.5. GROUND TURNING CLEARANCE

Radius for wingtip: 20.1 meters (66 feet).

3.1.6. EQUIPMENT LIST

The standard equipment installed on the BushCat includes the following:

- Rotax 912 ULS Engine with Kiev composite three blade propeller
- Aerodynamic compensators, sun shield
- Strobe, position lights, and landing lights

The equipment list for the aircraft as it is delivered from the factory is found in the supplement of the POH. No additional equipment may be installed without written authorization from the manufacturer.

3.1.7. SOURCES TO PURCHASE PARTS

Please refer to page 7 for all distributer's contact details to source parts.

3.1.8. LIST OF DISPOSABLE REPLACEMENT PARTS

Item	Comments
Air filter	If cleaning of the filters is not possible, they can be replaced with new ones and old ones disposed of in accordance with local laws. All parts can be obtained from the aircraft distributer / manufacturer (see page 5 for the contact details of your distributer.)*
Battery	When the sealed maintenance free battery is to be replaced, the old battery should be recycled in accordance with local laws. All parts can be obtained from the aircraft distributer / manufacturer (see page 5 for the contact details of your distributer.)
Fuel filters	Disposable fuel filters or metal mesh non disposable ones which are approved by the engine manual may be used. The aircraft comes standard with disposable in line fuel filers, and they must be replaced with new ones and the old ones disposed of in accordance with the local laws. All parts can be obtained from the aircraft distributer / manufacturer (see page 5 for the contact details of your distributer.)
Fuel line	When fuel line has to be replaced, the old line should be properly disposed of in accordance with local laws. All parts can be obtained from the aircraft distributer / manufacturer (see page 5 for the contact details of your distributer.)
Fuel tank	The fuel tank is not repairable, and should be replaced once it has been damaged and disposed of in accordance with the local laws. All parts can be obtained from the aircraft distributer / manufacturer (see page 5 for the contact details of your distributer.)
Fuses	The fuses used in this aircraft are disposable when blown (10 amps and 15 amps). All parts can be obtained from the aircraft distributer / manufacturer (see page 5 for the contact details of your distributer.)
Oil filters	Oil filters should be properly disposed along with the oil at each oil change in accordance with local laws. All parts can be obtained from the aircraft distributer / manufacturer (see page 5 for the contact details of your distributer.)
Tyres	All tyres when worn should be properly replaced and old ones disposed of properly per local laws. All parts can be obtained from the aircraft distributer / manufacturer (see page 5 for the contact details of your distributer.)

* The air filters should only be disposed if they need to be replaced.

3.1.9. MASS AND BALANCE FORM

It is a legal requirement that a mass and balance calculation be performed before each flight for the particular load case of the aircraft. The following form should be used, in conjunction with the empty aircraft data in section 2.1.4 of the detailed maintenance procedures manual. Once completed, fill in the table below and ensure that the 'total' values fall within the allowable range shown. Three limits of the allowable range are shown; two dotted lines, and the ultimate solid upper line. Refer to section 2.4 of the POH for the maximum mass permissible in your licensing category. It is recommended that the operator keep photocopies of this page for regular operational use.

Item		Mass	x	Arm	=	Moment
Empty aircraft			x		=	
Pilot and passenger			x	580	=	
Fuel:	Litres x 0.734 = kg US Gal x 6.126 = lbs		x	1085	=	
Upper baggage			x	1075	=	
Lower baggage			x	1600	=	
		Add column				Add column
TOTAL						

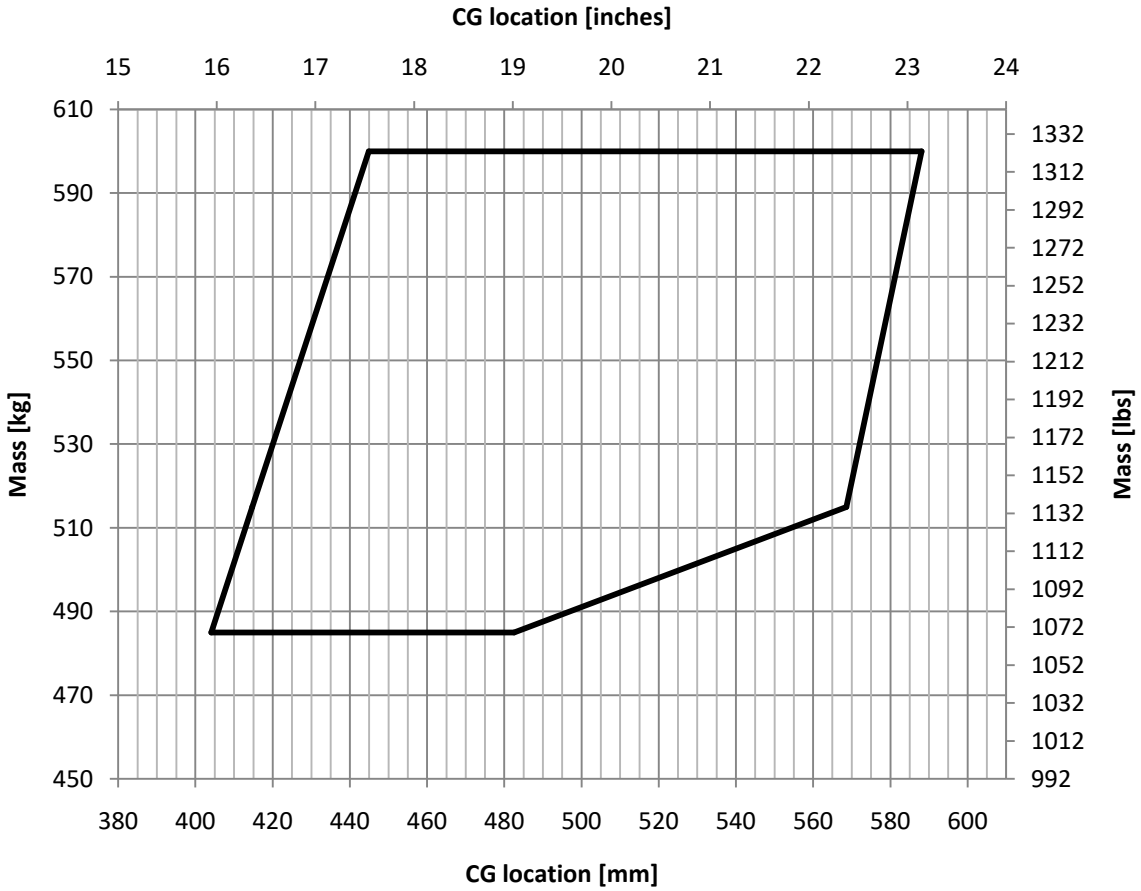

Figure 3.1.9.1: Mass vs. CG go/no-go graph

3.1.10. TYRE INFLATION PRESSURES

The following list of tires and pressures applies to standard tires used on the BushCat nose-wheel and tail-dragger.

Tyre make and size	Recommended pressure
Trac-Gard 2.80 x 2.50 – 4 (4 ply) tail wheel	1.3 – 2.0 bar (20 – 30 psi)
Air Trac 6.00 – 6 (6 ply)	1.0 – 1.3 bar (15 – 20 psi)
Carlisle 8.00 – 6 (4 ply)	0.7 – 0.9 bar (10 – 13 psi)
Air Trac 8.50 – 6 (6 ply)	0.5 – 0.8 bar (8 – 12 psi)
Aero Classic 27.5 x 10.0 – 8 (4 ply)	As required for operation

All wheel assemblies should have creep marks to allow the operator to identify instances where tyre creep occurs.

3.1.11. GENERAL SAFETY INSTRUCTIONS

1. Never refuel aircraft when there is an open flame near the fuel supply.
2. Be extremely careful with cellular mobile phones near fuel as this could cause a fire.
3. Always use the correct specified oils and fuel as prescribed by the engine manufacturer.
4. Never leave the aircraft unattended with the engine running.
5. Always make sure that the surrounding area is clear when the engine is started.
6. Always be sure to inform spectators and other people near the aircraft that you will be starting the aircraft.
7. Never attempt to change a tire outside in the open when the wind is above 5 MPH.
8. When servicing the engine oil, make sure to clean spilled oil to prevent fire or environmental contamination.
9. Make sure that all tooling, rags, and equipment have been accounted for before the next flight.
10. Make sure that all caps, safety devices, and plugs have been installed correctly before the next flight

3.1.12. INSTRUCTIONS FOR REPORTING POSSIBLE SAFETY OF FLIGHT CONCERNS FOUND DURING INSPECTIONS / MAINTENANCE

If you have any concerns relating to the safety of the aircraft during any maintenance or inspection, please gather the following information and send it to the manufacturer / distributer so that help can be given. Contact details can be found on page 5.

1. Aircraft make, model, serial number
2. Engine make, model, serial number (if concern includes engine)
3. Date of inspection
4. Total time
5. Airframe
6. Engine
7. Description of the un-airworthy items found
8. Owner of aircraft

3.2. AIRCRAFT SYSTEMS DESCRIPTIONS

3.2.1. ENGINE

The BushCat is available with one choice of engine that is ASTM compliant:

1. ROTAX 912ULS (100HP at maximum RPM).

The Rotax 912ULS 100hp engine is a 4-stroke, 4-cylinder horizontally opposed spark ignition engine; and features a single central cam-shaft with pushrods and overhead valves. Cooling is achieved using the RAM air for the cylinder bodies and liquid cooling for the cylinder heads. The engine features 2 constant depression Bing carburettors and makes use of a duel breakerless capacitor discharge ignition system (different to the typical dual magneto system used on other aircraft engines). A mechanical fuel pump is also fitted which provides constant pressure in the fuel system. The Rotax 912 series engines come standard with a 12V 0.7kW starter motor; however the preferred starter motor for the Bushcat is the optional 12V 0.9kW high power starter motor.

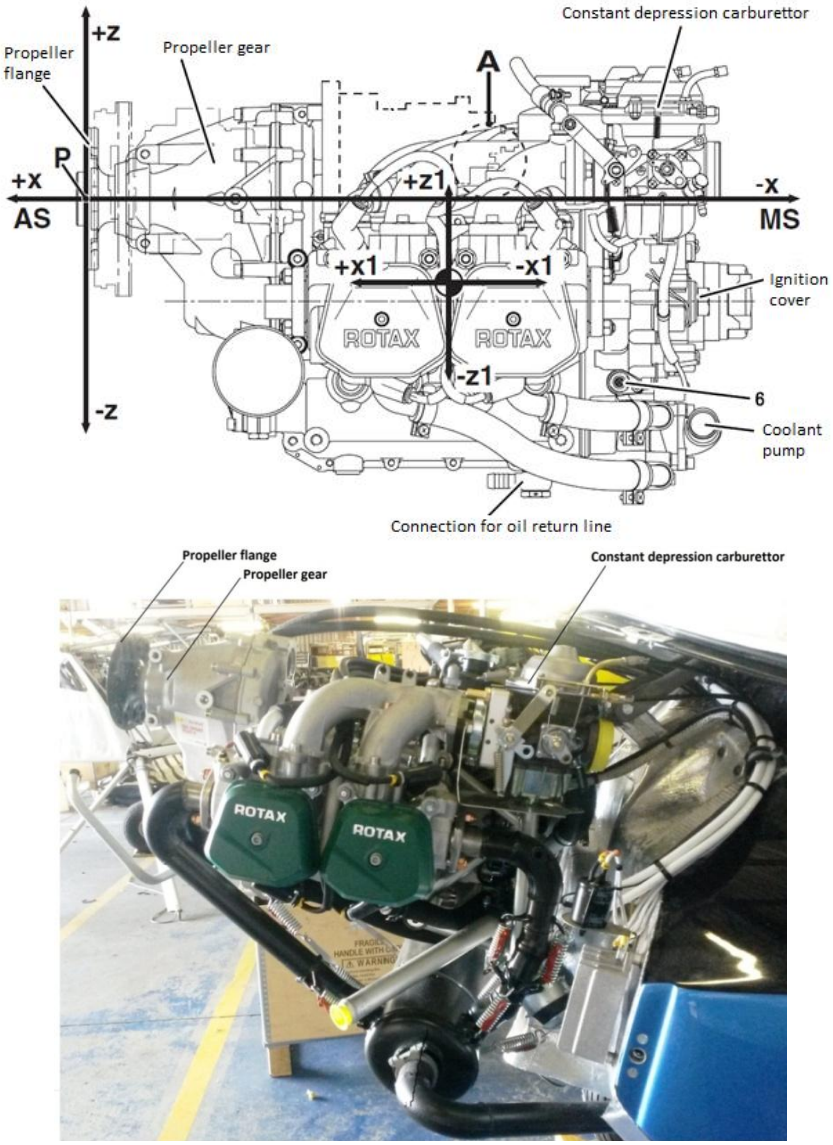

Figure 3.2.1.1: Rotax engine side view

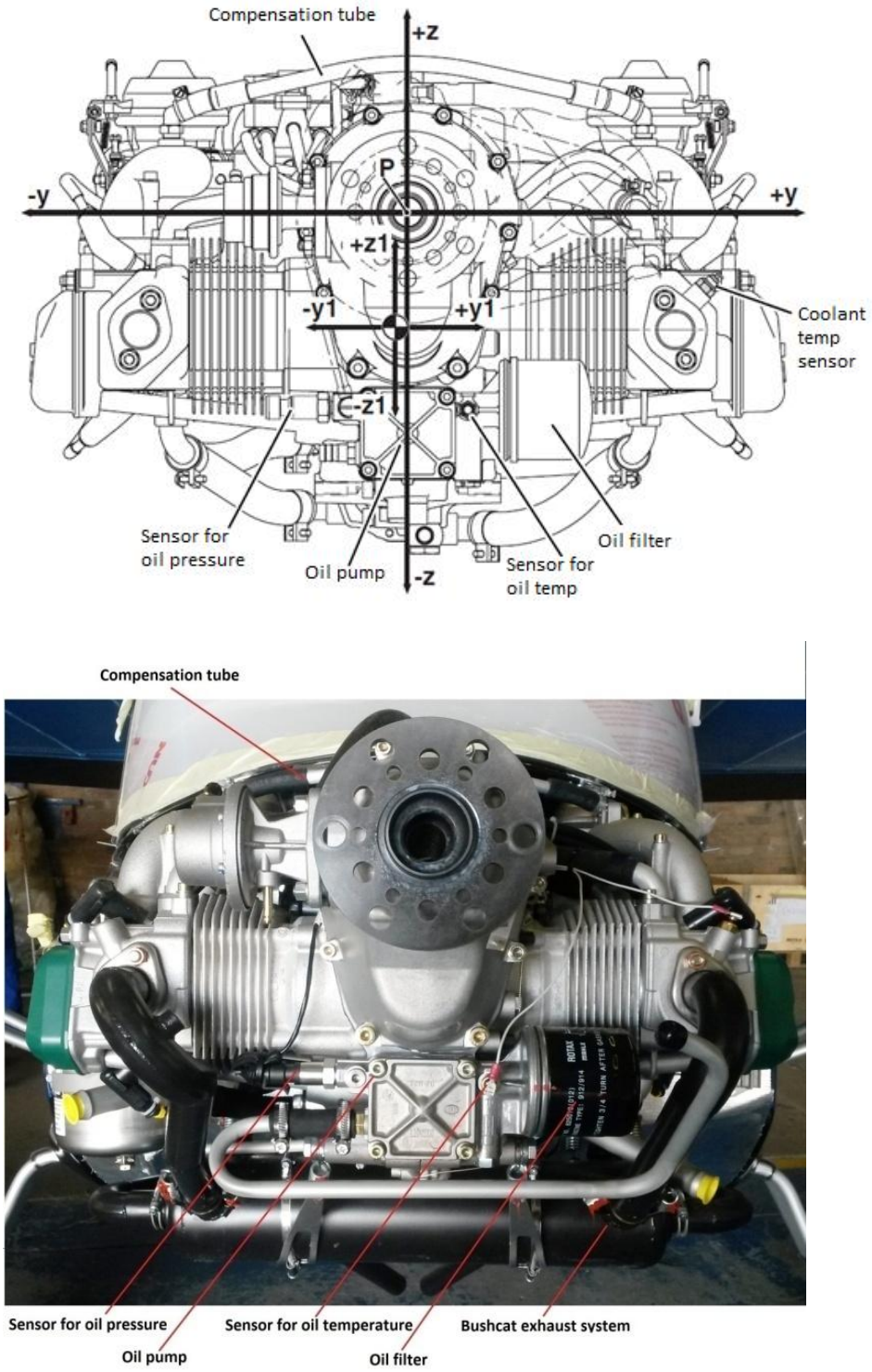

Figure 3.2.1.2: Rotax engine front view

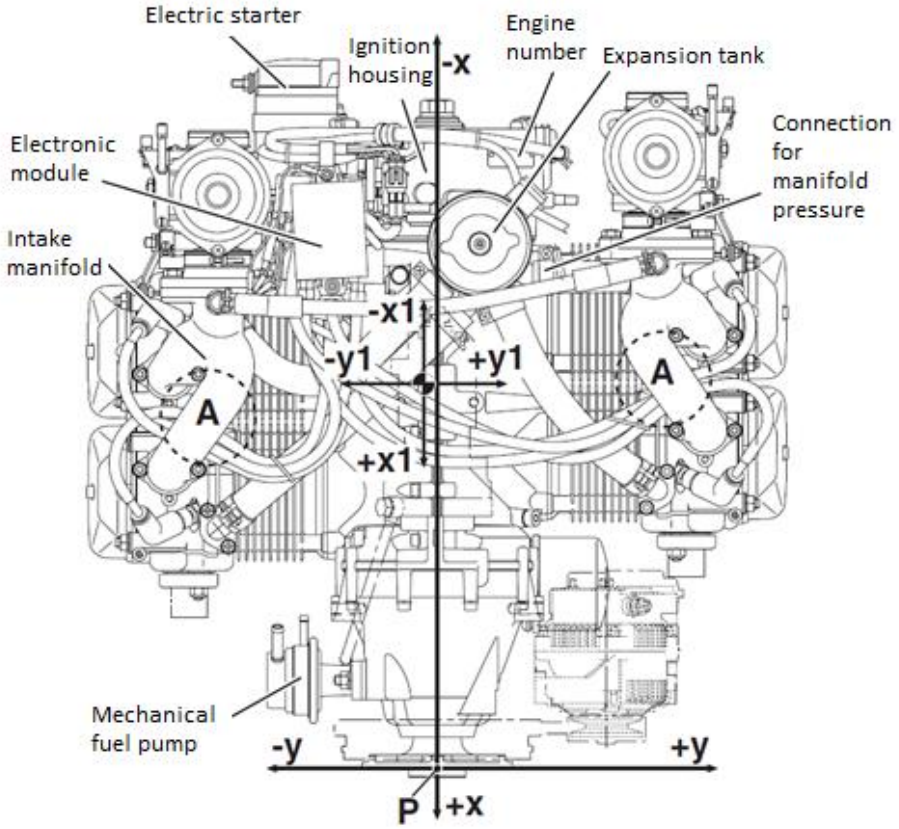

Figure 3.2.1.3: Rotax engine top view

The following engine limitations have been taken from the ROTAX 912ULS operating manual, edition 3, revision. While every effort has been made to provide a true and up to date representation of the engine performance specs, in the case of any discrepancy between this manual and the ROTAX manual, the ROTAX manual takes precedence in all cases. All performance figures are given for ISA conditions.

Table 3.2.1.1: Rotax engine limitations

POWER AND SPEED LIMITATIONS:	
Take-off power	73.5 kW (99 HP) at 5800 RPM
Max. continuous power	69.0 kW (93 HP) at 5800 RPM
Take-off speed	5800 RPM (max. 5 min)
Max. continuous speed	5500 RPM
Idle speed	1400 RPM min.
LOAD FACTOR LIMITATIONS:	
Max. Negative load factor	-0.5g
Max. duration	5 seconds
OIL PRESSURE:	
Maximum value	7 bar (102 psi)
Minimum value	0.8 bar (12 psi) (below 3500 RPM)
Normal range	2.0 to 5.0 bar (29-73 psi) (above 3500 RPM)
OIL TEMPERATURE:	
Maximum value	130°C (258°F)
Minimum value	50°C (120°F)
Normal range	90°C to 110°C (190°F -230°F)
EXHAUST GAS TEMPERATURE:	
Maximum value	880°C (1616°F)
CYLINDER HEAD TEMPERATURE:	
Maximum value*	135°C (330°F)
COOLANT TEMPERATURE:	
Maximum value*	120°C (248°F)
FUEL PRESSURE:	
Maximum value	0.4 bar (5.8 psi) 0.5 bar (7.26 psi)**
Minimum value	0.15 bar (2.2 psi)
STARTING & OPERATING TEMPERATURE:	
Maximum value	50°C (120°F)
Minimum value	-25°C (-13°F)

*For installations with conventional coolant, permanent monitoring of both coolant temperature and cylinder head temperature are required, except for engines with serial number suffix '-01' in which case permanent monitoring of only coolant temperature is required, as long as coolant temperature is measured in the cylinder head. For installations with waterless coolant, permanent monitoring of only cylinder head temperature is required.
**Applicable only for fuel pump from S/N 11.0036

Engine Instrumentation:

Engine instrumentation is optionally supplied. For all maintenance instructions, the relevant instrument maintenance manual needs to be consulted.

Carburettor heat:

The ROTAX 912 series of engines are installed with a water jacket type carburettor heat system, which allows water bled off the engine liquid cooling system to pass through aluminium jackets around the carburettor intake manifolds. This system provides heat to the butterfly valve and venturi which reduces the chance of ice formation in these critical areas. As a result, the ROTAX 912 series engine carburettor heat system requires no input from the pilot as it is always operational.

Engine performance curves:

The following performance curves have been extracted from the Rotax 912 series operating manual:

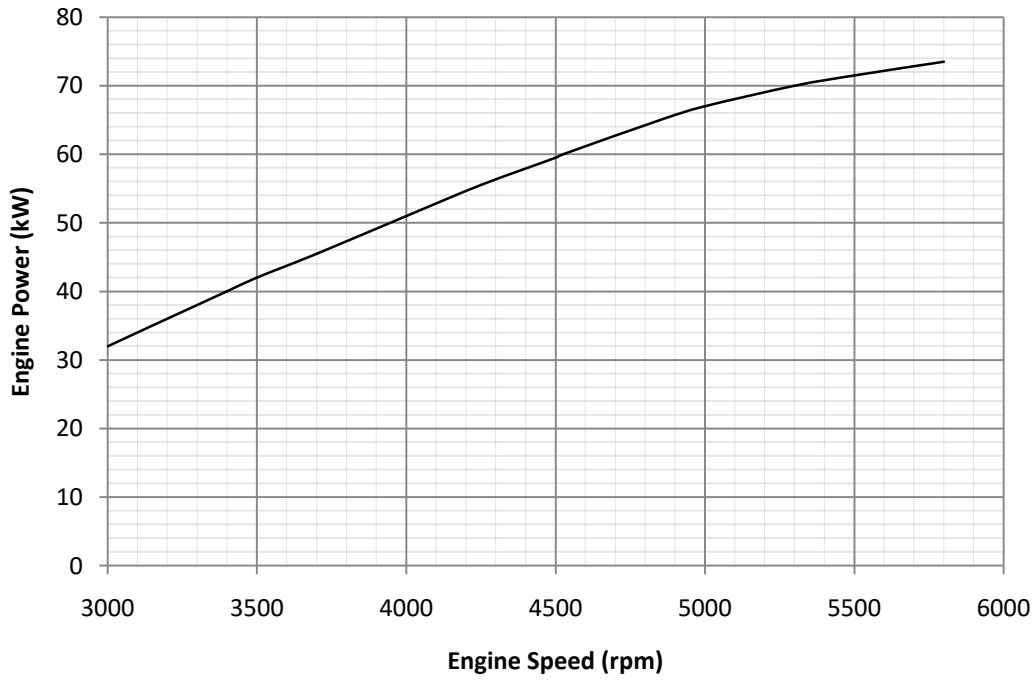

Figure 3.2.1.4: Rotax 912 ULS engine power vs. engine speed

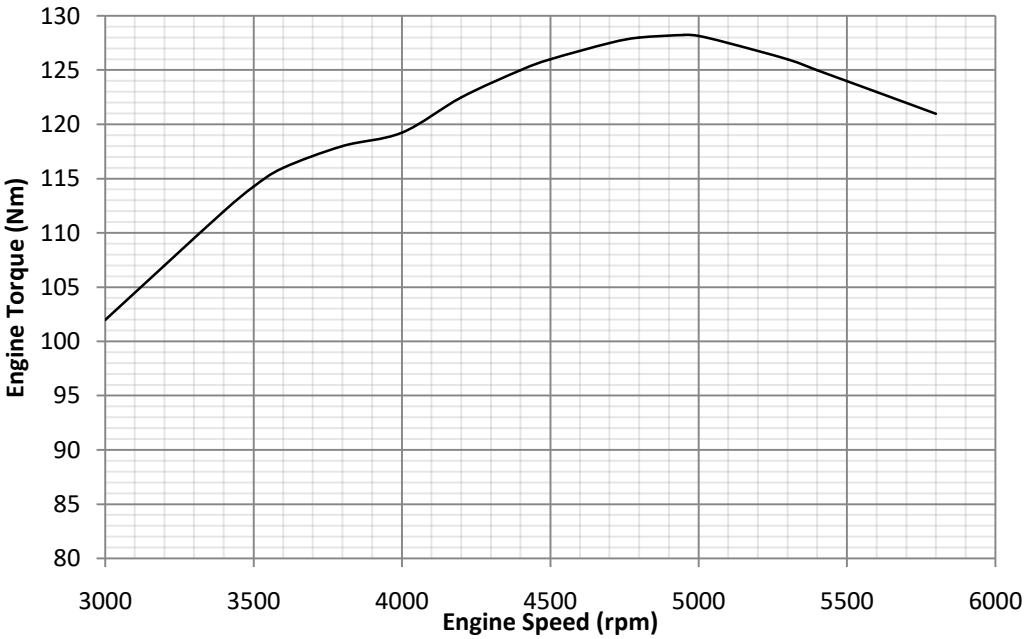

Figure 3.2.1.5: Rotax 912 ULS engine torque vs. engine speed

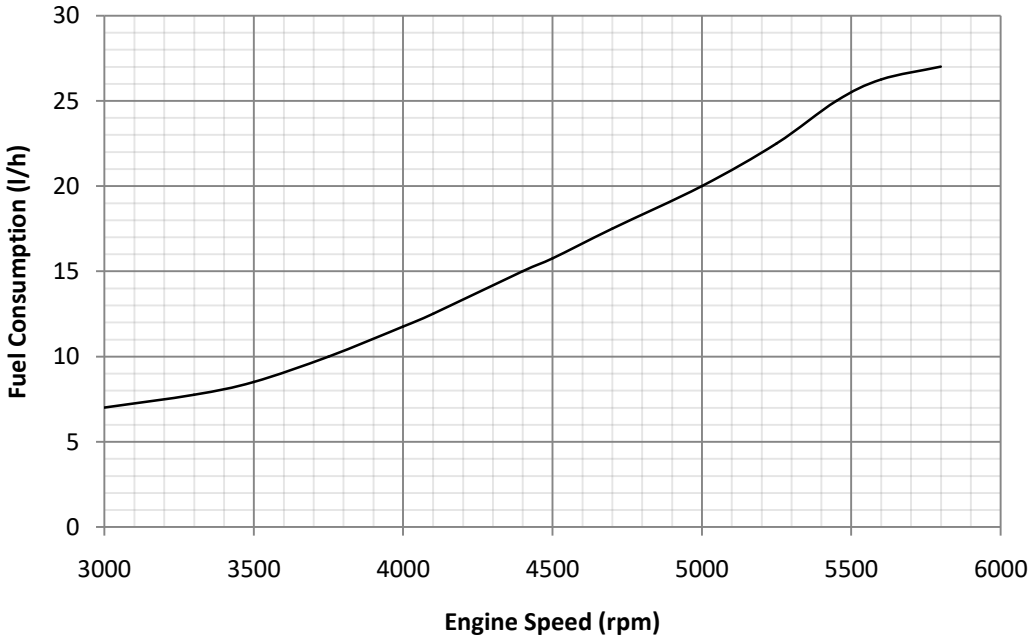

Figure 3.2.1.6: Rotax engine fuel consumption vs. engine speed

3.2.2. PROPELLER

The standard propeller used on the BushCat with either engine option is a Kiev-Prop with the following data:

Make:	Kiev Prop
Model:	#283
Construction:	Composite (glass fibre reinforced plastic)
Pitch:	Ground adjustable
Number of blades:	3
Disk diameter:	1800mm (70.9”)
Direction of rotation:	Clockwise when viewed from Cockpit
Approximate weight:	3.8 kg / 8.36 lbs.
Max output power:	130 Hp
Max allowable rotational speed:	2700 rpm

Kiev propellers are designed for installation on engines with a gearbox and damper incorporated.

The propeller is fitted to the engine flange with 6 bolts in mounting holes of 75mm diameter. The bolts should be tightened to 25 Nm.

Kiev propellers are life limited to 6 years for blades made earlier than 01-01-2015 and 8 years for blades made thereafter. *

* True at the time of publishing. Should any discrepancy occur between this data and that provided in official Kiev publications, the data distributed by Kiev must take precedence.

3.2.3. IGNITION

The Rotax 912 series engines are equipped with a breakerless dual ignition system (DCDI - Dual Capacitor Discharge Ignition). The ignition unit needs no external power supply.

Each of the two independent charging coils located on the generator stator supplies one of the two ignition circuits. The energy is stored in the capacitors of the electronic modules. At the moment of ignition, 2 each of the 4 external trigger coils actuate the discharge of the capacitors via the primary circuit of the dual ignition transformers.

The standard equipment also includes an integrated AC generator with an external rectifier-regulator (12V DC 250 W).

CAUTION The additional external alternator given as an option by ROTAX is not suitable for this aircraft as it won't fit inside the cowling.

The electric system comprises the internal generator with the charging coils for the ignition and the ignition electrics with the electronic boxes and the 4 double ignition coils.

Internal generator:

This consists of stator with 8 generator coils and the 2 independent ignition charging coils and the tenpole magneto ring. The fly wheel hub (ignition triggering) is attached to the magneto ring. The 4 trigger coils are fitted externally on the alternator.

Ignition electrics:

This consists of 4 dual ignition coils connected together by their magnetic cores and the two electronic modules positioned above. The 3 point suspension is with one each support on crankcase, ignition housing and intake manifold.

CAUTION For safety reasons, the ignition electrics must not be exposed to ambient temperatures higher than 80°C (176°F).

The ignition unit comprises two independently working ignition circuits (separate trigger coil, electronics module, charging coils etc.)

NOTE: The ignition unit cannot be disassembled and needs no adjustment.

Each ignition circuit consist of two ignition branches. Ignition occurs on cylinder 1 and 2 simultaneously every 360° as well as on cylinder 3 and 4, but at an 180° offset.

3.2.4. ELECTRICAL

The BushCat electrical system is simplistically separated into the charging circuit and the working circuit as depicted in the logic schematic.

In the charging circuit, the aircraft rectifier converts the alternating current received from the engine into a 12 volt direct current output. The circuit includes a charge switch and charge fail light for monitoring purposes, and charges the battery through a 30 Amp circuit breaker.

In the working circuit, the battery and the rectifier supply the hot battery bus with power through another 30 Amp circuit breaker. The hot battery bus powers the master switch, but the master bus draws power from the battery and the rectifier through a 30 Amp circuit breaker. Additional items can be wired directly to the hot battery bus directly (for example a 12 Volt auxiliary power supply).

The master bus supplies power to various systems including but not exclusive to the landing lights, navigation/strobe lights, fuel pump and heater directly; and powers the avionics bus through the Avionics Master Switch. Each system also has its own switch and circuit breaker.

The avionics bus powers the avionics equipment, such as the radio, XPNDR, EFIS, EIS, GPS etc. through individual circuit breakers.

The master bus also powers the start switch, but the start circuit draws power directly from the rectifier and the battery through a 50 Amp fuse via a relay which powers the starter motor. Closing off the start switch also enables a magneto soft start.

Each individual aircraft may be fitted with one of the standard panels or it may have a unique panel. For this reason several wire-for-wire electrical system schematics are given in figures 7 to 12 below. Please consult the aircraft pilot operating handbook to determine which panel is fitted to the aircraft. The table below shows which schematic number will correspond to the fitted panel.

Schematic Numbers	Schematic description	Panel number (as per POH)
1 & 2	Panels with all analogue flight and engine gauges.	Standard panel 4
		Standard panel 6
1 & 3	Panels with MGL Stratomaster Velocity engine monitors.	Standard panel 1
		Standard panel 2
		Standard panel 3
		Standard panel 5
1 & 4	Panels with MGL xTreme EFIS/EMS displays and RDAC units.	Standard panel 7
		Standard panel 8
1 & 5	Panels with MGL iEFIS displays and RDAC units.	Standard panel 9
1 & 6	Panels with Dynon avionics	Standard panel 10

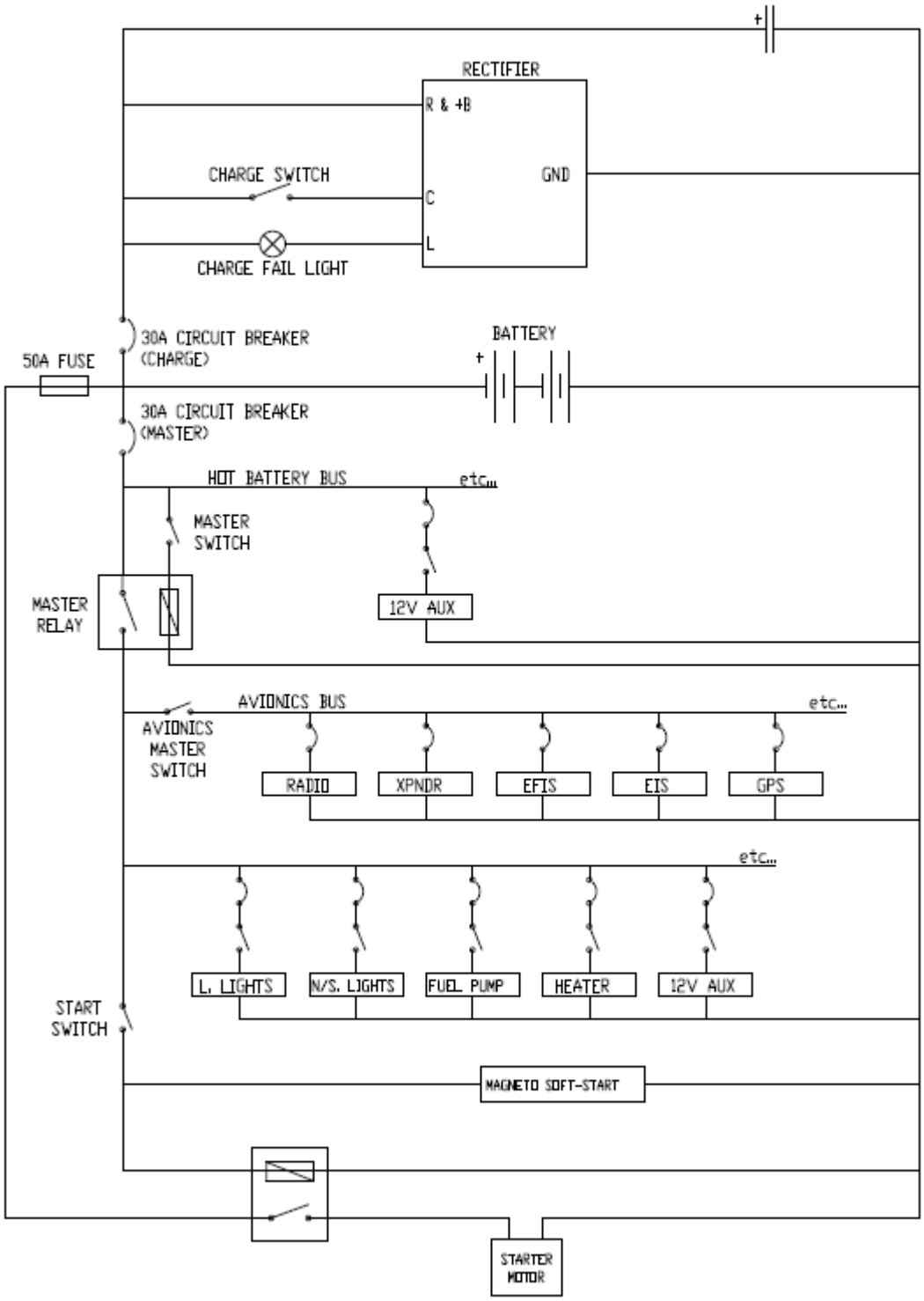

Figure 3.2.4.1- Wiring logic schematic

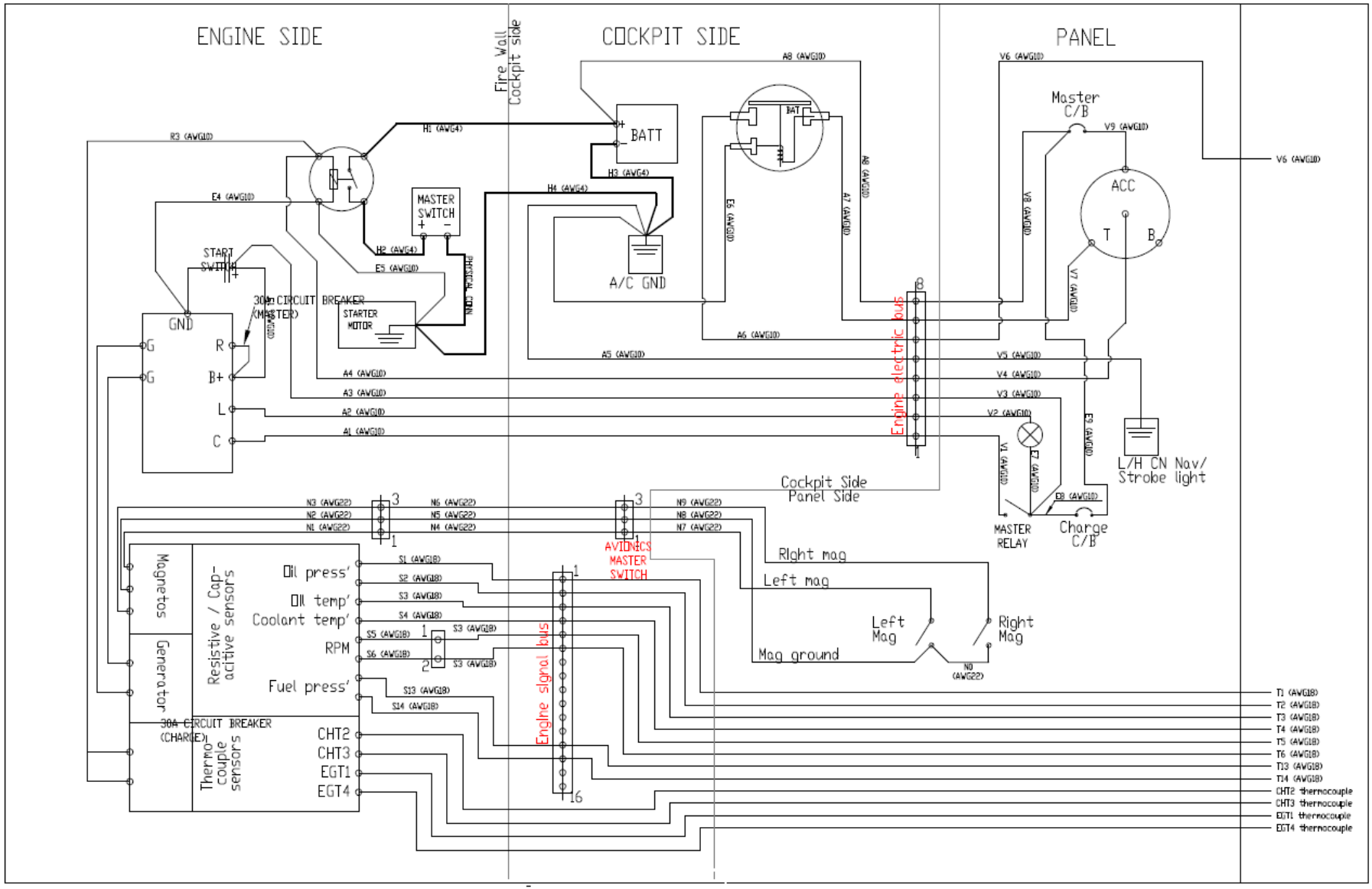

Figure 3.2.4.2 - Aircraft wiring diagram LHS

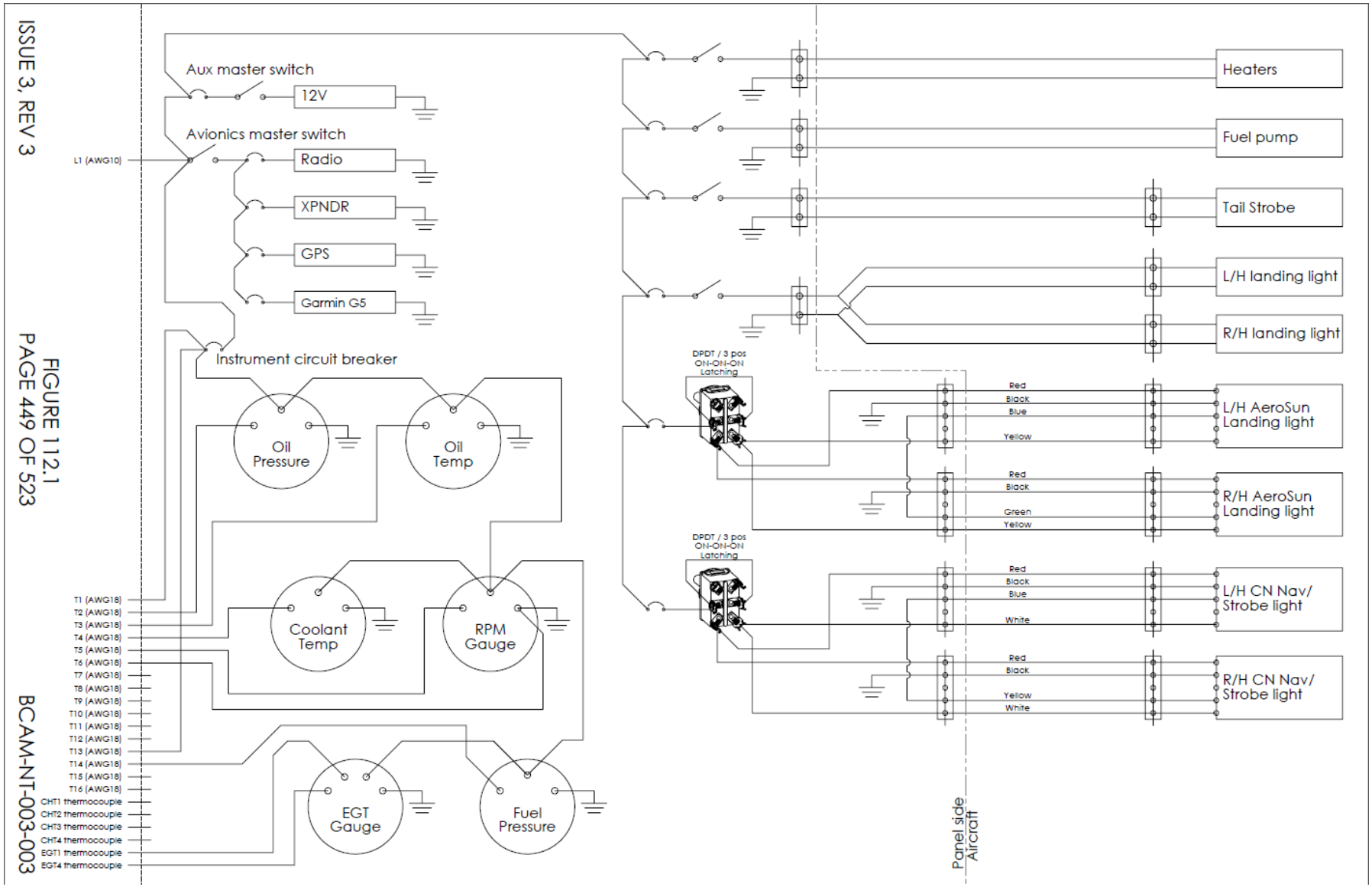

Figure 3.2.4.3 – Aircraft wiring diagram type 1 (Analogue instruments)

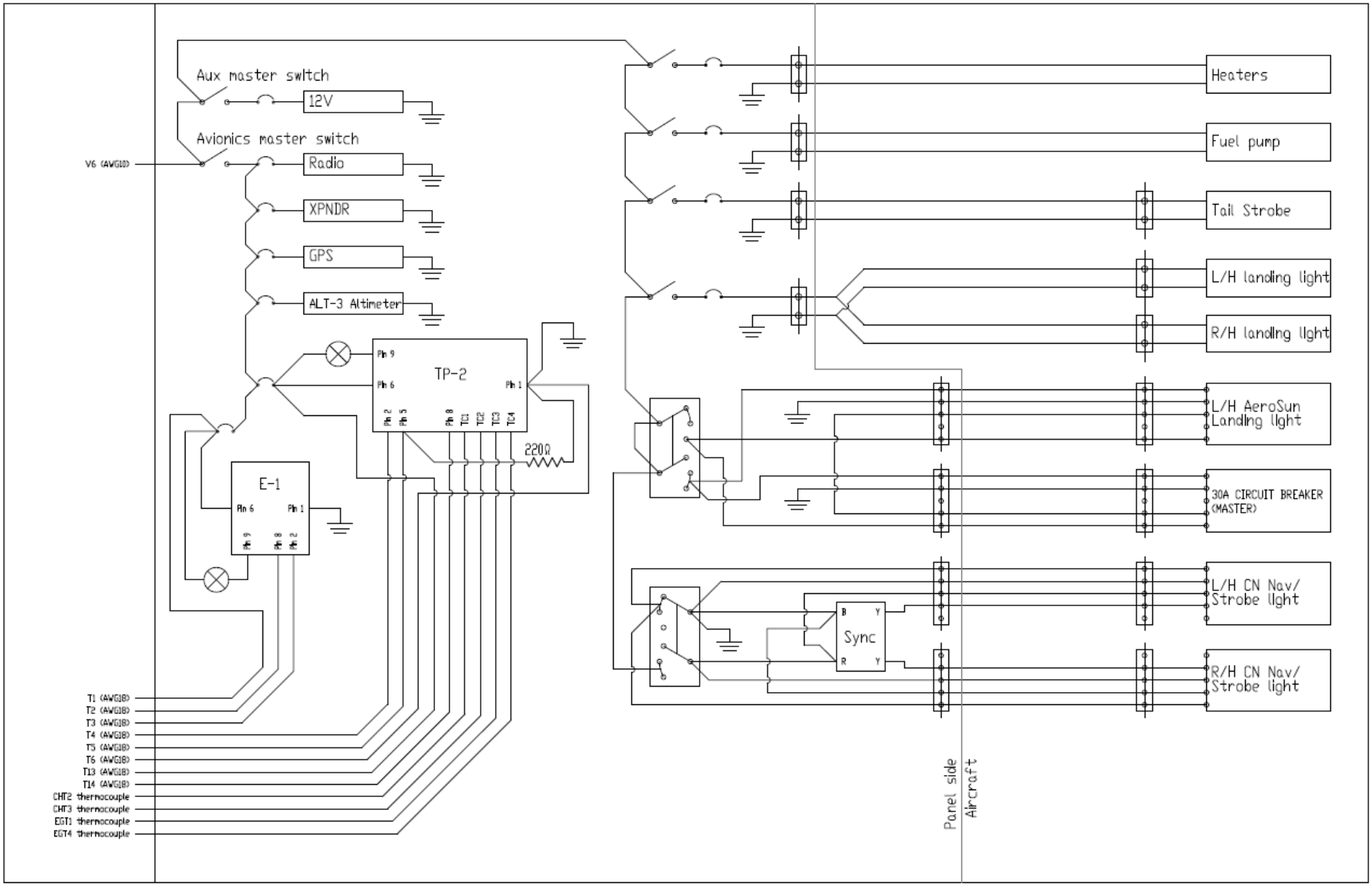

Figure 3.2.4.4 - Aircraft wiring diagram RHS type 2

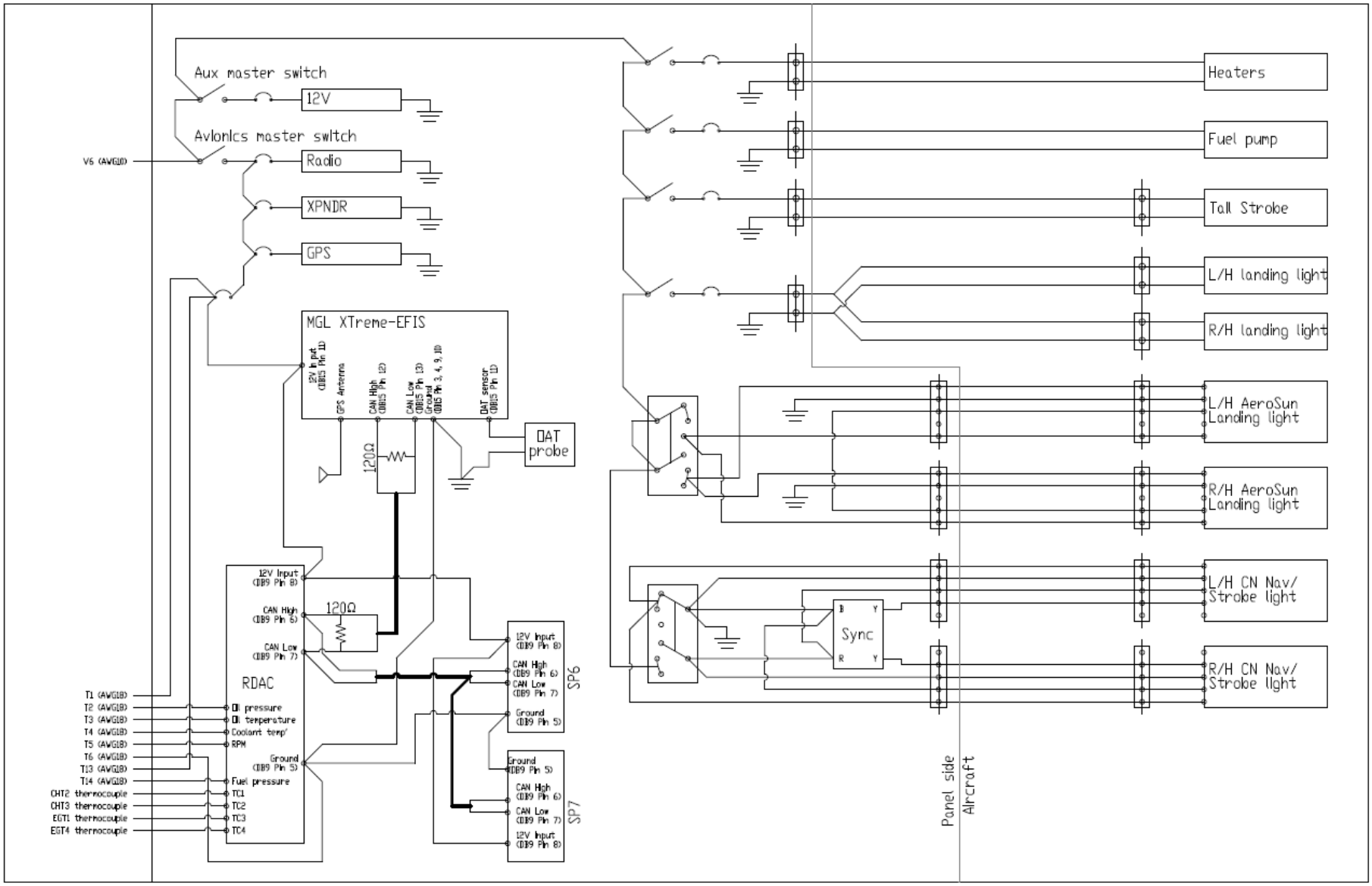

Figure 3.2.4.5 - Aircraft wiring diagram RHS type 3

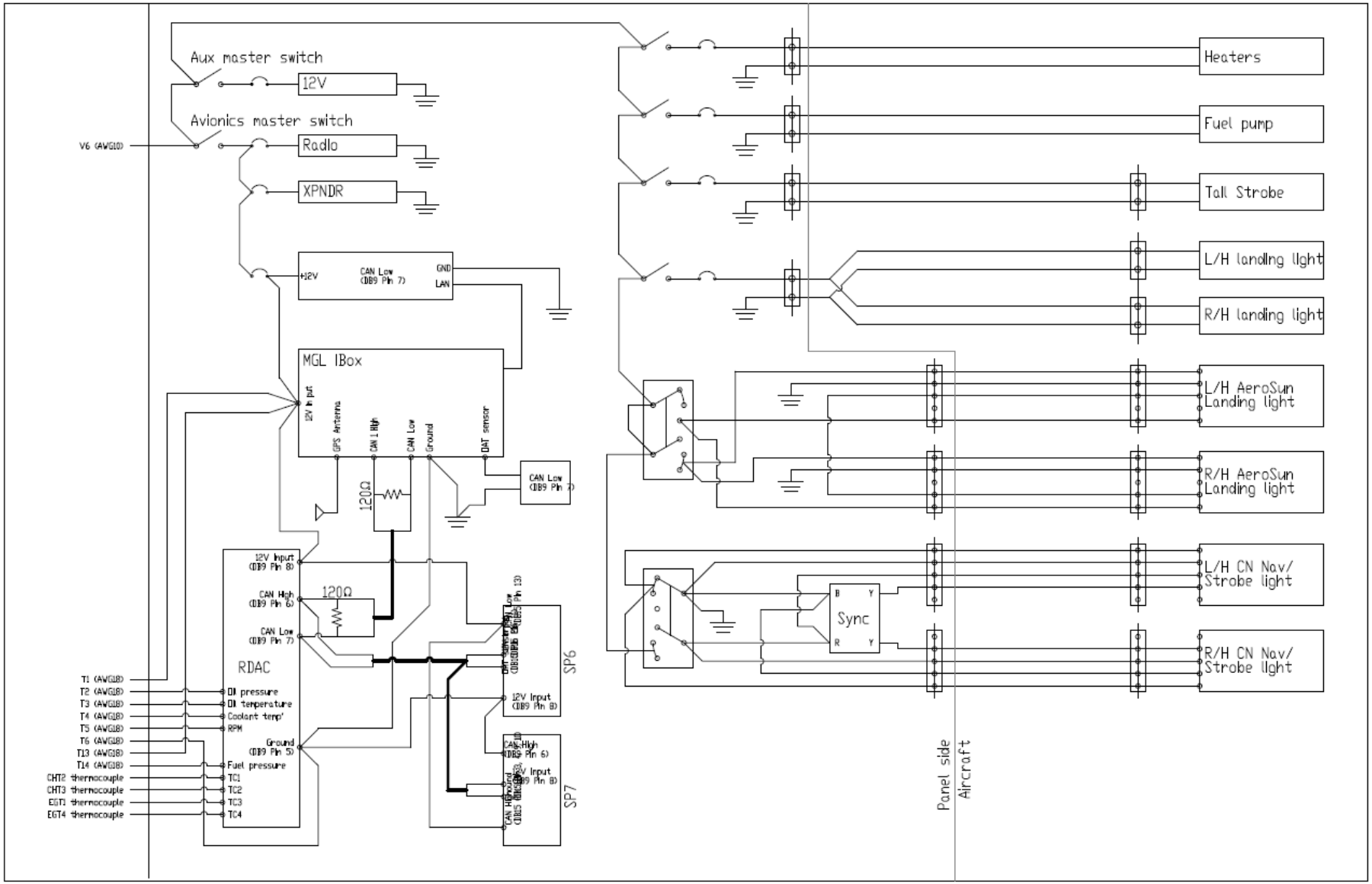

Figure 3.2.4.6 - Aircraft wiring diagram RHS type 4

Figure 3.2.4.7 – Aircraft wiring diagram type 5 (DYNON glass cockpit)
Panel design under development

3.2.5. BATTERY

The BushCat makes use of a 12 Volt, 18 Amp-Hour battery exclusively.

3.2.6. FUEL SYSTEM

The BushCat fuel system makes use of a single 94 litre (24.8 US gallons) fuel tank, of which 88 litres (23.2 gallons) are useable. The tank is located aft of the crew seats and is equipped with dual pickups and dual fuel filters. As the tank is lower than the engine, an electric booster pump is also fitted for use during the critical phases of flight. The electric booster pump is located under the fuel tank against the fuel tank support tube. A fuel shut-off valve is located on the LH floor board. It has two positions: On and off. To move the selector to the off position the spring loaded lock must be pulled upward while turning the selector.

The fuel tank fuel levels are marked in two areas (for the spray painted tanks); a set of markings are evident on the forward face of the tank, which can be seen between and behind the two seats. These markings provide information on the fuel quantity when the aircraft is level. This implies that these markings will under read if used on tail-dragger variants while the aircraft is on the ground. The second fuel level marking is located on the left side of the tank. This features a curved graduated line which shows correct readings for both nose-wheel and tail-dragger variants while on the ground, assuming that the aircraft is parked level (laterally). The markings on the tank will either be spray painted on the tank or applied to the front of the tank only as an adhesive placard.

It should be noted that the fuel tank has a raised section in the centre to allow control cables to pass under it. If the fuel quantity is less than 6 litres (1.6 gallons) the fuel cannot move from one side of the tank to the other, and the redundancy provided by two fuel pickups is lost. While this is not a major concern in most cases, care should be taken when operating with fuel quantities less than those mentioned above and fuel quantity checks should include symmetry checks to confirm that a fuel pickup or filter is not blocked.

WARNING Fuel starvation to one pickup results in fuel flow cessation in the entire system when that pickup is drawing in air.

It should be noted that 45 minutes of flight time requires approximately 15 litres of fuel. Operating below this quantity is considered a fuel emergency by most aviation authorities.

The allowable fuel types have been tabulated below.

NOTE: Fuel lines and hoses, filters, clamps, fuel pumps and the fuel tank itself are all considered to be disposable parts. Once they have been damaged, they must be replaced.

During normal engine operation, the fuel is drawn up from the fuel tanks though the filters to the mechanical fuel pump. The pump maintains the fuel pressure throughout the system and distributes the fuel to the union T with a jet in the line returning to the tank.

The unrestricted paths carry fuel to a second union T which distributes it to the carburettors to either side. The jet allows excess fuel to pass back to the tank to prevent vapour lock in the system while maintaining the pressure of the fuel going to the carburettors.

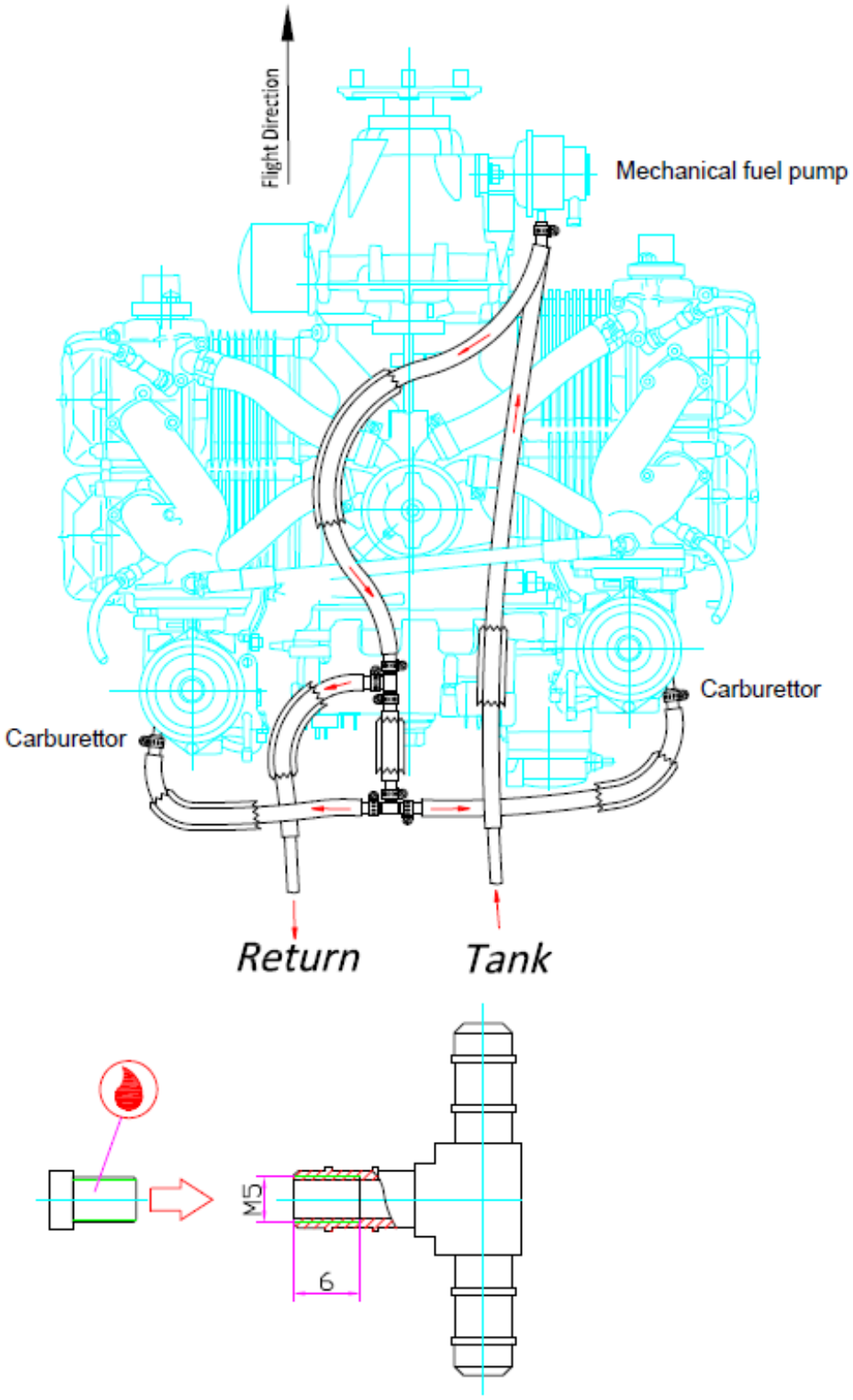

Figure 3.2.6.1 - Fuel system schematic

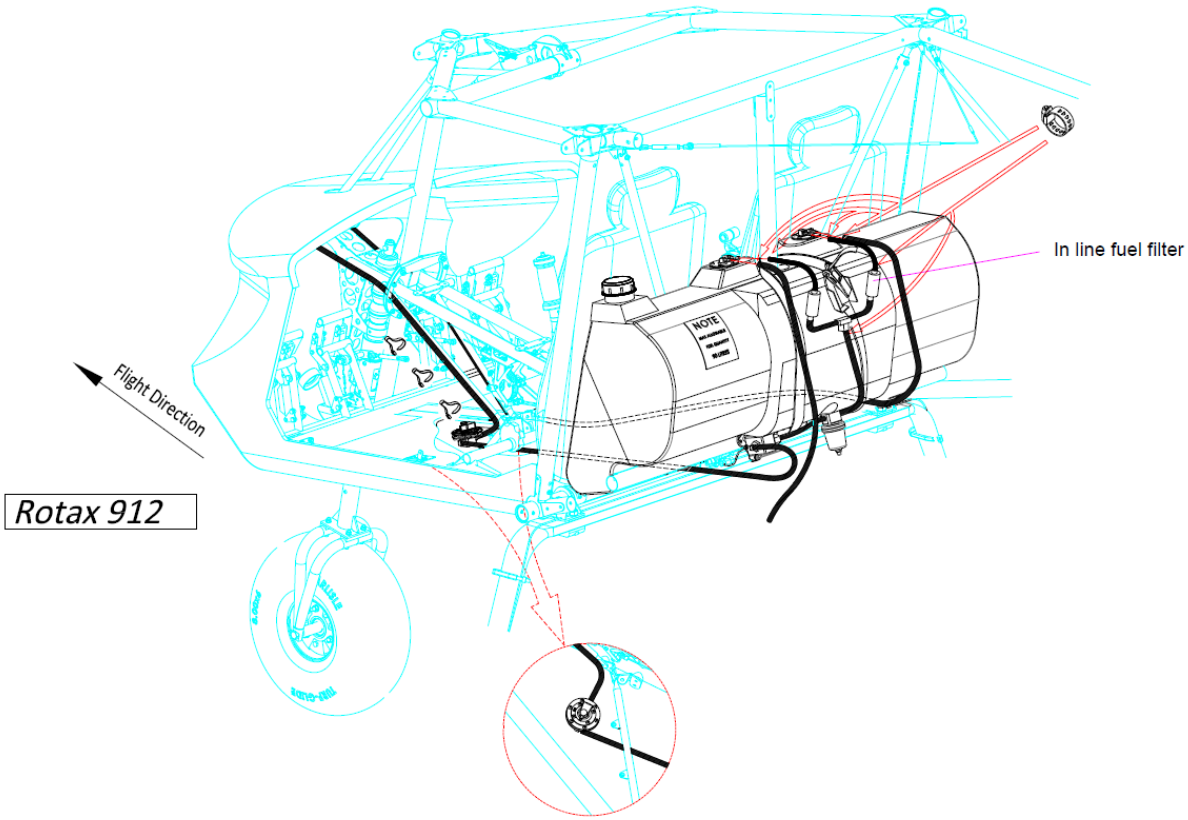

Figure 3.2.6.2 - Fuel tank position and fuel line routing

Fuel system capacities:

Total fuel tank capacity:	94 Litres*	24.8 US Gallons
Total useable fuel:	88 Litres*	23.2 US Gallons

*Assuming an average fuel density of 0.734kg/L

Approved fuels:

Fuel Type	**Rotax 912UL**	**Rotax 912ULS**
Knock Resistance	Min. RON90 (Min. AKI87)	Min. RON95 (Min. AKI91)
MOGAS	EN 228 Normal EN 228 Super EN 228 Super plus	 EN 228 Super EN 228 Super plus
AVGAS*	AVGAS 100LL* (ASTM D910)	

*The use of AVGAS has an adverse effect on engine maintenance procedures including, but not limited to) a 50 hour maintenance interval. Please refer to the Rotax SI-912-016 (latest revision) document for more information.

3.2.7. OIL SYSTEM

The Rotax 912 series of engines feature a dry sump forced lubrication system. As a result, an external oil tank is fitted to the aircraft on the right side of the firewall. Oil cooling is achieved though two radiators connected in series – one above and one below the engine. The second radiator allows the BushCat to be operated in climates where the ambient temperate reaches the maximum operating temperature of the Rotax 912 series engines. The additional cooling of the second radiator means that operations in colder climates might require blanking strips to be installed which cover some of the radiator surface area to prevent oil temperatures which are too low.

The entire oil system contains between 3.5 and 3.6 litres (0.92 to 0.95 U.S. Gallons) of oil – this includes all oil in the engine, oil filter, oil hoses, both radiators, sufficient oil to reach midway on the oil dipstick when the engine is hot. The quantity of oil which is defined by the marked region on the dipstick is 0.45 litres (0.95 liq pt). As per Rotax recommendations, the ideal oil level is between the middle and upper mark on the dipstick.

The maximum oil consumption of the engine = 0.06 l/h (0.13 liq pt/h) as per the Rotax Operators Manual for the 912 series of engines.

Several oil types have been approved for the Rotax 912 series of engines. The most favourable type of oils are synthetic or semi-synthetic automotive or motorcycle oils. Motorcycle oils often include gearbox anti-wear additives which makes them most favourable. If Synthetic oils are used, the engine must run unleaded autogas at least 70% of the time, with no more than 30% use of Avgas. The use of Avgas with synthetic oils causes a lead paste build up in the engine. Generally petroleum/mineral based oils (dinosaur) oils work well if Avgas is used as the primary fuel type, however it should be noted that maintenance intervals are adversely affected by the use of Avgas. Ashless dispersant type aircraft oils are not acceptable.

The guidelines given above are general limitations. All oils which are permitted have been documented and published by Rotax. This document is regularly updated as new oils are tested. The reader is therefore referred to Rotax SI-912-016 document for approved oil types, and maintenance procedures for each oil and fuel type.

Monitoring of the oil temperature is essential to the correct operation of the engine. The oil temperature limitations are tabulated in section 2.9 in the POH.

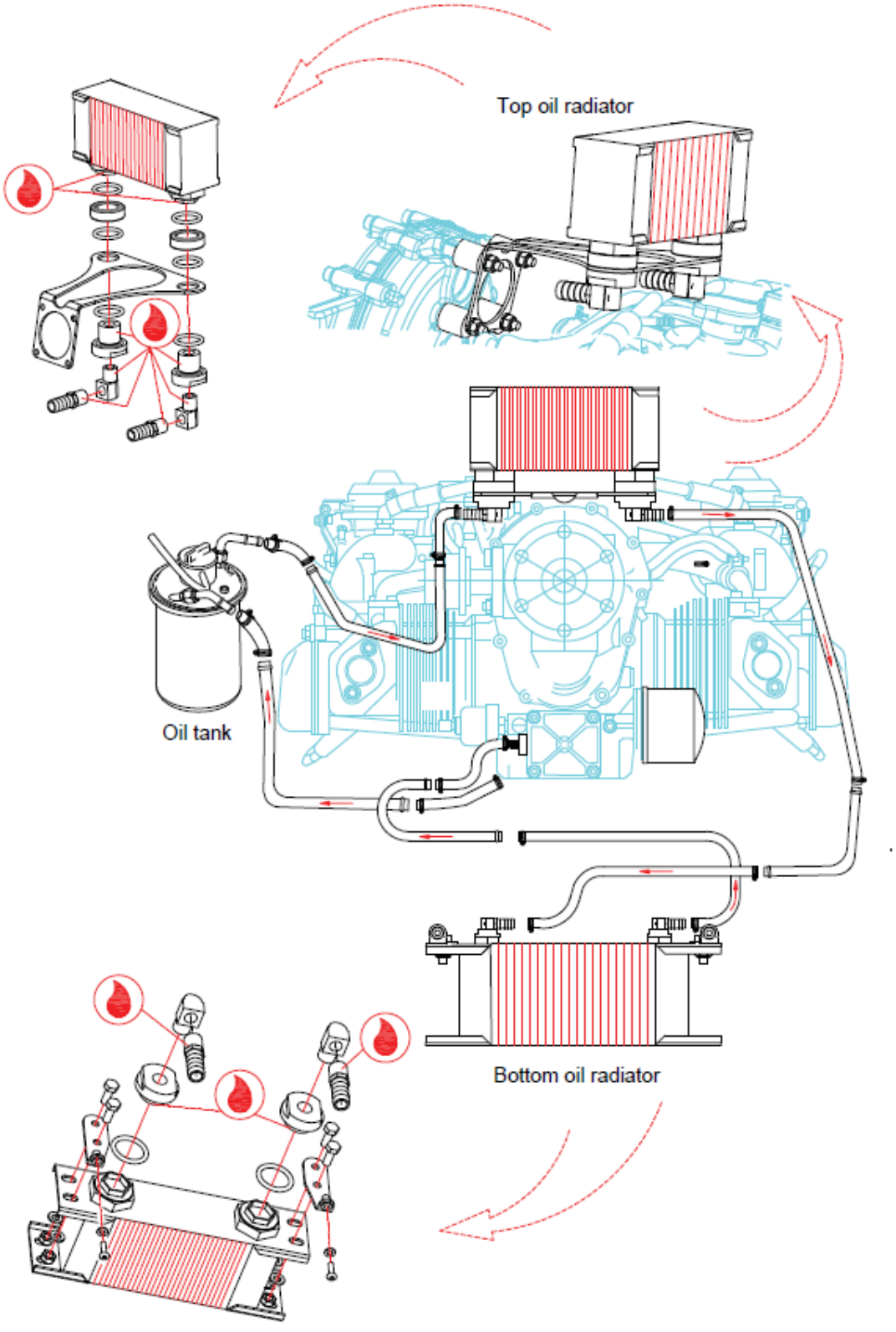

Figure 3.2.7.1: Oil system schematic

3.2.8. LIQUID COOLING SYSTEM

Cylinder head cooling is achieved thought a liquid cooling system which makes use of one large radiator. The system is based on the standard Rotax 912 liquid cooling system with a modification to incorporate the carburettor heat system. The entire cooling system takes approximately 1.5 litres (0.4 U.S. Gallons) of coolant as per the ROTAX Line Maintenance Manual, section 12-10-00.

Several cooling fluids have been approved for use in the Rotax 912 series of engines, and have been detailed in the service instruction document SI-912-016. It should be noted that if the operator has chosen to use Evans Waterless Coolant fluid (as opposed to conventional coolant), only Evans Waterless Coolant can be used to top up the system. In installations where conventional coolant has been used, the operator may top up the system with conventional coolant or distilled water.

Monitoring the cooling system is important for controlling engine cooling and the prevention of knocking during combustion within the operating limits. It is imperative that the coolant circuit design prevents the coolant from reaching boiling point under any conditions.

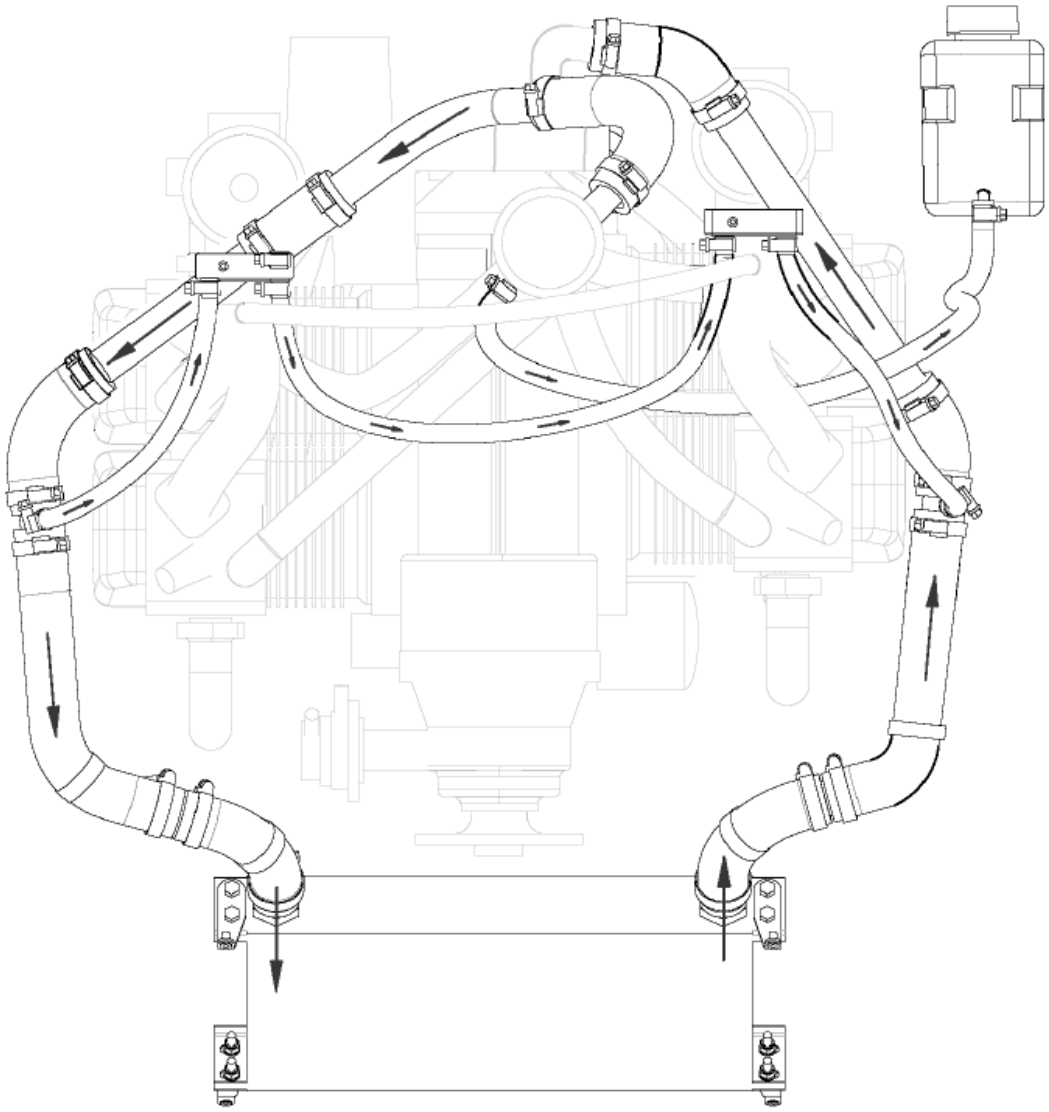

Figure 3.2.8.1: Liquid cooling system schematic

3.2.9. BRAKING SYSTEM

The BushCat is equipped with toe-brakes attached to the top of the rudder pedals. Some models may have toe-brakes on both the pilot and co-pilot side, however some models may only have toe-brakes on the pilot side. In both cases the master cylinders are located on the pilot side pedals and in the case of the former these are plumbed in series to the co-pilot side pedals, before continuing to the brake callipers. A brake fluid reservoir is located against the firewall just forward of the co-pilot's pedals and is plumbed to the master cylinders. Some nose-wheel variants of the BushCat may have a hand operated master cylinder located on the control stick as opposed to toe brake pedals. In this case, the brake fluid reservoir is built into the hand operated brake lever assembly. All systems (regardless of actuation method) are equipped with a park brake valve located on the pilot-side floorboard. The valve is a resettable check valve meaning that when open (off position) it allows hydraulic fluid to move freely. When closed it allows flow in one direction only. The park brake can set either by applying pressure to the brake pedals and then shutting the valve or by first shutting the valve and then applying pedal pressure. It is recommended that the park brake should only be disengaged when pressure is applied to the pedals – first apply pressure to the brake pedals, then disengage the park brake. This recommendation was made by the valve manufacturer and will help to increase the operating life of the valve. A schematic of the entire brake system is shown in figure 3.2.9.1 below

The following fluids are suitable for use in the BushCat:

- Automatic Transmission fluid (ATF).
- DOT5.
- MIL-H-5606 Aircraft Hydraulic Fluid.

WARNING Do not use DOT5-1, which contains glycol. DOT3 and DOT4 may not be used on this aircraft as they will immediately cause damage to the seals

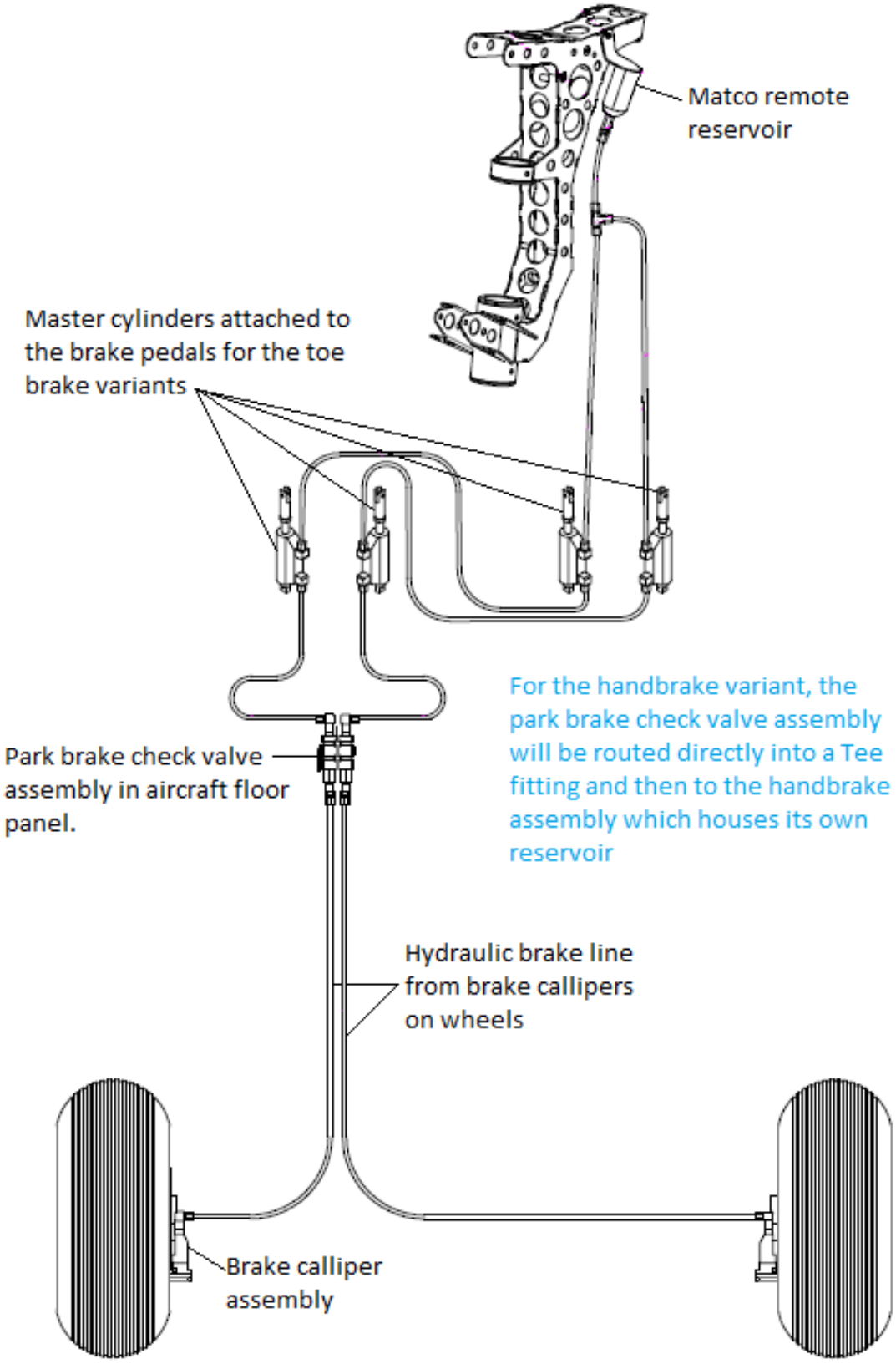

Figure 3.2.9.1: Braking system schematic

4. SCHEDULED MAINTENANCE INSPECTION / SERVICE ITEMS

The following detailed inspection sheets can be photocopied, signed off and stored separately from the body of the file as a record of the completion of each of the tasks. All maintenance and/or inspections conducted on an aircraft must be logged in a suitable logbook (e.g.: the aircraft maintenance logbook, an airframe or engine logbook, a journey log, etc) as per the requirements of the country of registration.

A table of primary life limits and cycle limits is provided below in addition to a table of scheduled inspections and service items to facilitate maintenance tracking.

ITEM DESCRIPTION	CYCLE LIMIT (HOURS)	LIFE LIMIT (YEARS)
Elevator control stick hinge bolt	1500	5
Ethylene Glycol Coolant Replacement	-	2
Fuel Pump	-	5
Kiev Propellers	-	6 / 8*
ROTAX 912UL up to and incl. 4,152.666**	600	10
ROTAX 912UL from 4'152'667 up to and incl. 4,404.717**	1200	15
ROTAX 912UL from 4,404.718 up to and incl. 4,409.715**	1500	15
ROTAX 912UL from 4,409.716**	2000	15
ROTAX 912ULS up to and incl. 4,427.532**	1200	10
ROTAX 912ULS from 4,427.533 up to and incl. 6,775.789**	1500	12
ROTAX 912ULS from 6,775.790**	2000	15
Rubber parts including: 1. Venting hose of the Carburettors. 2. Rubber hoses of the cooling system 3. Rubber hoses of the fuel system.*** 4. Venting hose of the fuel pump. 5. Rubber hoses of the lubrication system. 6. Carburettor sockets. 7. Connecting hose of the air intake system. 8. Diaphragm on both Carburettors. 9. Rubber hose on compensating tube. 10. V-belt.	-	5
Tri Laminate Sail Cover	1500	5

* Kiev Propellers are life limited to 6 years for props made before 01-01-2015 and 8 years for newer models.
** In the case of the ROTAX engines, this is the time between overhaul.
***Excluding all genuine ROTAX Teflon hoses of the fuel system.

Inspection / service item	Intervals - hours																				
	25*	50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000
100 hour airframe inspection			X		X		X		X		X		X		X		X		X		X
100 hour engine inspection	X		X		X		X		X		X		X		X		X		X		X
200 hour engine inspection					X				X				X				X				X
500 hour airframe inspection											X										X
600 hour engine inspection													X								
1000 hour engine inspection																					X
Oil change**		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

* In order to demonstrate continued airworthiness, an engine must be inspected after the first 25 hours of operation. The checks performed at the 25hr inspection are the same as for the 100 hour inspection. This applies to both newly delivered engines and to overhauled engines.

** 50 hour oil changes are only applicable for aircraft using leaded AVGAS more than 30% of the time.

4.1. AIRFRAME PERIODIC INSPECTIONS / SERVICES

The airframe manufacturer requires periodic inspections and service items which must be performed at 100 hour intervals or annually, whichever comes first, in accordance with the procedures detailed below. This means that every 100 hours of operation (provided the date limit is not exceeded), a 100 hour inspection must be carried out.

Additional inspections and service items are also tabulated below. When they become due, they must be done additional to the 100 hour inspection.

For intervals between maintenance work, a tolerance of ±10 hours is permissible, but these tolerances must not be exceeded. This means that if a 100 hour check is actually carried out at 110 hours, the next check will be due at 200 hours ±10 hours, not 210 hours ±10 hours.

If the maintenance is performed before the prescribed interval, the next maintenance check is to be done at the same interval. (For example, if the first check is done at 87 hours of operation, the next 100 hour check must be carried out after 187 hours of operation.)

If the airframe has less than 100 hours of operation during one year, a 100 hour check must be carried out. For the annual inspection a tolerance of ±2 months is given.

4.1.1. AIRFRAME 100 HOUR / ANNUAL INSPECTION

SCOPE AND DETAILS OF THE **BUSHCAT AIRFRAME 100 HOUR / ANNUAL INSPECTION** Each person performing the inspection shall complete paragraphs A through J.			
A)	Pre- Inspection action	PASS	FAIL
	Each person to carry out the BushCat 100 hour inspection will open the cockpit doors, baggage area and wing inspection area zippers and remove centre console inspection panels.		
B)	Fuselage and Hull	PASS	FAIL
1) System and components	Inspect all systems and components for improper installation, apparent defects and unsatisfactory operation. Complete a detailed inspection including: 1. Check all bolts and nuts are properly fastened. 2. Check that torque seal is intact. 3. Check that the fuel pump and gascolator are securely attached. 4. Check the operation of the fuel drain valves. 5. Check the security of the fuel tank. 6. Check the top fuselage cables are tensioned to a tension of 80kg (176 lbs.) (a tolerance of ±5% is acceptable). 7. Check the symmetry of the top fuselage cables. Both cables should be the same length, while satisfying the load conditions in point 7 above. 8. Check the tension of the elevator and rudder control cables according to the values specified in sections 2.3.3 and 2.3.4 respectively of the detailed maintenance procedures manual. 9. Check the fuselage sail condition and tension. 10. Check the zip operation. 11. Check that the information plate is fitted. 12. Check the condition of all placards.		
2) Safety wire, cable and turnbuckle inspection.	Inspect the structural elements of the fuselage, including a detailed inspection of the structural cables (refer to section 2.1.9 in the Detailed Procedures Manual), turnbuckles and locking wire holding the turnbuckles in position. Ensure there is no: 1. Evident distortion of the turnbuckle, 2. Missing or loose locking wire 3. Fraying evident on the cable.		
C)	Cabin and Cockpit	PASS	FAIL
1) General	Inspect for cleanliness and loose equipment that might foul the operation of the flight controls. Conduct a detailed inspection of the cabin including: 1. Check all bolts and nuts are properly fastened. a. Check particularly that the M6 bolt installed inverted in the axis tube aft of the joystick butterfly assembly in front of the centre console is present and tight.		

	2. Check that the torque seal on all critical fasteners is intact. 3. Check the condition of all placards.		
2) Seats and Safety belts	Inspect the seats for poor condition, any apparent defects and ensure correct operation of harnesses. Check also for the presence of the "ASTM compliance" seatbelt sticker on the tube aft of the seatbelt attachment.		
3) Windows and windshield	Inspect for cracks, deterioration due to ultraviolet rays, surface scratches and transparency.		
4) Instruments	Inspect for condition, mounting, markings, and proper operation. Check pitot static connections are secure.		
5) Controls	Complete a detailed inspection including: 1. Check the operation of the throttle levers. 2. Check the operation of the choke lever. 3. Check operation of the elevator trim lever in response to control input. 4. Check the aileron movement in response to control input. 5. Check the flap movement in response to control input. 6. Check the rudder movement in response to control input.		
6) Batteries	Inspect for proper installation and correct charge.		
7) All systems	Inspect for proper installation, general condition, obvious defects and security of attachment. Check all bolts and nuts are properly fastened and that the torque seal is intact.		
8) Tie wraps	Inspect all tie wraps for general condition, any cracking and proper tightness. Replace if defects are found.		
D)	Engine Bay / Mount	PASS	FAIL
1) Engine Bay	Conduct a visual inspection of the engine bay. Check for: 1. Any signs of oil / fuel leakage. 2. Discolouring and warping, as this may indicate overheating.		
2) Fasteners	Inspect all studs, bolts and nuts for: 1. Surface damage 2. Secure seating 3. Locking wire (as applicable) 4. Torque seal intact. 5. Other visually evident damage.		
3) Installation	1. Inspect for proper installation and security of all fasteners. 2. Inspect engine mount for cracks and corrosion.		
4) Vibration mounts	Inspect engine mount rubbers for condition deterioration and security of attachment.		
5) Controls	Inspect the controls to the engine for deterioration, proper installation, correct travel and correct safe tying.		
6) Exhaust	1. Inspect for proper security of installation, cracks and obvious		

	defects. 2. Inspect exhaust springs for corrosion and breakages. 3. Check exhaust outlet pipes for cracks, corrosion and security of attachment.		
7) Accessories	Conduct a visual inspection of the radiator and lines to check for: 1. Visible damage 2. Discoloration or cracking of the lines.		
8) Systems and Functionality.	Inspect all systems for security of installation, condition and obvious defects. This will include detailed inspections of: 1. Check the security of carburettors and air filters. 2. Check the engine staring mechanism. 3. Check the engine ignition switches.		
9) Cowling	Inspect for cracks, chafing marks, condition of fasteners and signs of overheat.		
E)	Fuel System	PASS	FAIL
1) Fuel tank	Inspect for leakage from fuel drains. Check for sail stains (In flight leakage will stain fuselage sail).		
2) Fuel lines – tank to firewall	Inspect fuel lines from tank to firewall. Check outer surface for abrasions or any visible damage.		
3) Fuel lines – engine side of firewall	Inspect fuel lines on engine side of firewall. Pull back protective foam near each junction and check condition of fuel line surface.		
4) Fuel Filters	With reference to section 2.6.2 in the Detailed Procedures Manual, inspect the fuel filters for debris and replace. In the event of high debris content being evident on the outside of the mesh, increase the fuel filter replacement frequency to 50 hours.		
F)	Landing Gear	PASS	FAIL
1) Complete assembly	1. Inspect for condition, security of attachment. Check that all bolts and nuts are properly fastened and that the torque seal is intact on all critical fasteners. 2. Inspect gear stop-shift pin for security.		
2) Shock absorbers	Inspect for proper freedom of movement, deterioration and condition of spring.		
3) Construction	Inspect the members, attachment hard points and attachment brackets. Also inspect bolts for excessive wear and general condition. Check the operation of the front suspension.		
4) Wheels	Inspect for proper inflation (Check tyre pressure). Ensure the gear is still centred. Check for cracks and assess the wheel bearing condition. Check the wheels for correct alignment.		
5) Brakes	1. Inspect hydraulic brake lines for integrity and correct operation. 2. Inspect brake system for proper hydraulic bleeding and adjustment.		

6) Tyre	Inspect the tyres for general condition, wear and proper inflation.		
7) Safety wire, turnbuckles and cables.	Where applicable, inspect all cables for fraying, turnbuckles for signs of deformation, and ensure that safety wire is not loose or absent.		
G)	Wing and Centre Section	PASS	FAIL
1) Complete assembly	Inspect the condition of the wing and centre section components for general condition, fabric deterioration, distortion, evidence of failure, correct operation of components, security of attachment and installation. Complete a detailed inspection including: 1. Check all bolts and nuts are properly fastened. 2. Check that the torque seal on all critical fasteners is intact. 3. Check the free movement of control surfaces. 4. Check that control cables do not rub against structure (unless protection is fitted). 5. Check that aileron deflections are equal on both sides. 6. Check that flap deflections are equal on both sides. 7. Check the wing tension cables are tensioned to 160kg (353lbs) (±5%). 8. Check the symmetry of the wing cables. 9. Check aileron control cable tensions according to the values specified in section 2.3.1 of the detailed maintenance procedures manual. 10. Check sail condition and tension on all control surfaces. 11. Check zip operation. 12. Check the security of attachment of all junctions on the wing. 13. Check the security of attachment of all batten pouches to the aircraft skin and the security of the battens in their pouches.		
2) Safety wire, turnbuckles and cables.	Where applicable, inspect all cables for fraying, turnbuckles for signs of deformation, and ensure that safety wire is not loose or absent.		
H)	Empennage	PASS	FAIL
1) Complete assembly	Inspect the condition of the empennage section components for general condition, fabric deterioration, distortion, evidence of failure, correct operation of components, security of attachment and installation. Complete a detailed inspection including: 1. Check all bots are nuts are properly fastened. 2. Check that the torque seal on all critical fasteners is intact. 3. Check the free movement of control surfaces. 4. Check that elevator deflections are equal on both sides. Refer to section 2.3.2 of the detailed maintenance procedures manual as applicable.		

	5. Check the upper stabilizer cable tension is **60kg (132lbs) ±5**%. 6. Check sail condition and tension on all control surfaces. 7. Check zip operation.		
2) Safety wire, turnbuckles and cables.	Where applicable, inspect all cables for fraying, turnbuckles for signs of deformation, and ensure that safety wire is not loose or absent.		
I)	Propeller	PASS	FAIL
1) Propeller	Inspect for cracks, erosion and delamination.		
2) installation	Inspect the installation of the propeller for security of the fasteners and safety devises.		
3) Spinner	Inspect for damage and security of attachment.		
4) Attachment	Verify that the torque values of the attachment bolts are still correct at 25Nm as per the Kiev website.		
J)	Avionics and Electrical Systems	PASS	FAIL
1) Radio and Electronics	Inspect for correct installation and security of attachment. 1. Check intercom and radio squelch of com radio. Ensure no feedback is heard. 2. Check all lights, fuel pump and other installed electronics devices.		
2) Wiring and conduits	Conduct a detailed inspection including: 1. Check the wiring is properly secured and not obstructing movement of occupants or controls. 2. Check all connectors for secure contact. 3. Check all aircraft wiring harnesses are secured and not in contact with hot surfaces. 4. Check all fuses are correct current rating. 5. Remove all panel mount fuses and test each fuse circuit individually.		
3) Bonding and shielding	Security of installation and obvious damage or defects.		
4) Antenna	Security of installation and obvious damage or defects.		
5) ELT	Annual inspection must be carried out as per the specific ELT inspection manual.		

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4.1.2. AIRFRAME ADDITIONAL ITEM / 500 HOUR INSPECTION

SCOPE AND DETAILS OF THE **BUSHCAT AIRFRAME 100 HOUR / ANNUAL INSPECTION & SERVICE** Each person performing the inspection shall complete paragraphs A through B.			
A)	Elevator Control Hinge Bolt Inspection	PASS	FAIL
1) Bolt inspection.	Remove bolt, washers and nut and inspect for any signs of imminent failure indications such as: 1. Looseness. 2. Surface damage. 3. Bending or distortion.		
B)	Tri-laminate inspection	PASS	FAIL
2) Tri-lam inspection.	Perform a detailed visual inspection on the Tri Laminate skin covering for deterioration, distortion, other evidence of failure and defective or insecure attachments or fittings.		

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4.1.3. AIRFRAME 100 HOUR / ANNUAL SERVICE

SCOPE AND DETAILS OF THE **BUSHCAT AIRFRAME 100 HOUR / ANNUAL SERVICE** Each person performing the inspection shall complete paragraph A		
A)	Replacement items	
Spark plugs	Replace on 100 hour inspection (refer to section 2.5.7 in the "Detailed Procedures Manual")	
Oil	Complete an oil change and replace the oil as per section 2.7.4 in the "Detailed Procedures Manual".	
Oil filter	Replace the oil filter after inspection (refer to section 2.7.3 in the "Detailed Procedures Manual").	
Fuel Filters	Should the inspection deem it necessary, replace the fuel filters as per section 2.6.2 in the "Detailed Procedures Manual".	
Air filters	Should the inspection deem it necessary, replace the air filter as per section 2.5.3 in the "Detailed Procedures Manual".	

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4.2. ENGINE PERIODIC INSPECTIONS

The engine manufacturer requires periodic inspections which must be performed at 25, 100, 200 and 600 hours in accordance with the ROTAX Line Maintenance Manual, Ch 05-20-00*. This means that every 100 hours of operation a 100 hour check must be carried out. Every 200 hours of operation, a 100 hour inspection and the additional 200 hr inspection items must be carried out.

	Intervals - hours									
	25 hr	100 hr	200 hr	300 hr	400 hr	500 hr	600 hr	700 hr	to	2000 hr
100 hr	X	X	X	X	X	X	X	X		X
200 hr			X		X		X			
600 hr							X			

* This was included from the ROTAX maintenance manual for line maintenance / heavy maintenance for the reader's convenience. While every effort has been made to provide a true and up to date representation of the ROTAX inspections, should the ROTAX manuals differ from the instructions presented here, the ROTAX manual supersedes this manual in all cases.

4.2.1. ENGINE 100 HOUR INSPECTION

In order to demonstrate continued airworthiness, an engine must be inspected after every 100 hours of operation or after every 12 month period, whichever comes first.

For intervals between maintenance; a tolerance of ±10 hours is permissible, but these tolerances must not be exceeded. This means that if a 100 hour check is actually carried out at 110 hours, the next check will be due at 200 hours ±10 hours, not 210 hours ±10 hours.

If the maintenance is performed before the prescribed interval, the next maintenance check is to be done at the same interval. (For example, if the first check is done at 87 hours of operation, the next 100 hour check must be carried out after 187 hours of operation.

If the engine has less than 100 hours of operation during one year, a 100 hour check must be carried out. For the annual inspection a tolerance of ±2 months is given.

4.2.2. ENGINE 25 HOUR INSPECTION

In order to demonstrate continued airworthiness, an engine must be inspected after the first 25 hours of operation.

The checks performed at the 25 hour inspection are the same as for the 100 hour inspection. This applies to both newly delivered engines and to overhauled engines.

SCOPE AND DETAILS OF THE **ROTAX ENGINE 100 HOUR / ANNUAL INSPECTION & SERVICE** 1. & 2. Each person performing the inspection shall complete paragraphs A through Q			
A)	PRE- Inspection action	PASS	FAIL
	Each person to carry out the BushCat Rotax Engine 100 hour inspection will remove the engine cowling to conduct the inspection.		
B)	Engine Visual Inspection	PASS	FAIL
General	A general visual inspection of the engine for damage or abnormalities needs to be conducted in accordance with the ROTAX line maintenance manual, Ch. 12-20-00, section 3. The cooling air duct and cooling fins of the cylinders need to be checked for obstructions, cracks, wear and condition. Particular note should be taken of changes due to temperature influence.		
Sensor inspection	A visual inspection of the temperature sensor and the oil pressure sensor needs to be conducted. Check: 1. Sensor fit. 2. Sensor general condition.		
Coolant hose inspection	Inspect all coolant hoses for damage in accordance with the ROTAX line maintenance manual, Ch. 12-20-00, SECTION 9.1. Check for: 1. Leakage 2. Hardening from heat 3. Porosity 4. Loose connections 5. Secure attachment Verify the routing of the hoses if free of kinks and restrictions.		
Water pump inspection	Carry out the visual inspection of leakage bore at the base of the water pump for signs of leakage in accordance with the ROTAX line maintenance manual, Ch.12-20-00, section 4.		
Expansion tank	Inspection the expansion tank for damage and abnormalities in accordance with the ROTAX line maintenance manual, Ch. 12-20-00, section 9.1,9.4 and in accordance with the ROTAX line maintenance manual, Ch. 12-10-00, section 3.1 1. Check the coolant level, replenish as necessary. 2. Inspect the radiator cap. 3. Inspection the protective rubber on the expansion tank base for the correct fit.		
Oil line inspection	Inspect all oil lines in accordance with the ROTAX line maintenance manual, Ch.12-20-00, section 4. Check all lines for:		

	1. Damage 2. Leakage 3. Hardening from heat 4. Porosity 5. Security of connections and attachments. Verify the routing is free of kinks and restrictions.		
Fuel line inspection	Inspect all fuel lines in accordance with the ROTAX line maintenance manual, Ch. 12-20-00, section 4. Check for: 1. Damage 2. Leakage 3. Hardening from heat 4. Porosity 5. Security of connections and attachments. Verify the routing is free of kinks and restrictions.		
Wiring inspection	Inspect the wiring and its connection for secure fit, damage and signs of wear in accordance with the ROTAX line maintenance manual, Ch. 12-20-00, section 13.1.		
Fuel filter inspection	Visually inspect the translucent casing of the fuel filter for evidence of excessive debris. Cut the fuel filters open and ascertain the nature of the debris on a white background for clarity and replace the fuel filters. If there is evidence of excessive debris, increase the service interval to 50 hours. (Refer to section 2.6.2 of the "Detailed Procedures Manual".		
C)	Magnetic Plug	PASS	FAIL
Magnetic plug inspection	Check the magnetic plug in accordance with the ROTAX line maintenance manual, Ch. 12-20-00. Section 12 (Reproduced in section 2.5.5. of the "Detailed Procedures Manual" for convenience).		
D)	Fuel Shut off Valve Check.	PASS	FAIL
Fuel Shut off valve.	To test the fuel shut off valve, start the engine as per the start-up procedure in the POH, then use the fuel shut off to shut the engine down to ensure that it is operational. This can form part of the engine test run.		
E)	Checking the engine suspension	PASS	FAIL
Engine suspension inspection	Inspect the engine suspension and fasteners for secure fit in accordance with the ROTAX line maintenance manual, Ch. 12-20-00, section 3.1. Include checks for: 1. Damage from heat 2. Deformation 3. Cracks		
F)	Checking the air intake system	PASS	FAIL
Air intake inspection	Inspect suspension and fasteners for secure fit including checks for: 1. Damage from heat 2. Deformation		

	3. Cracks.		
G)	Engine external parts	PASS	FAIL
External parts	Inspect all the screws and nuts of all external parts for tight fit. Inspect and replace safety wiring as necessary.		
H)	Engine cleaning	PASS	FAIL
Engine Cleaning.	Clean engine in accordance with the ROTAX line maintenance manual, Ch. 12-20-00, section 1. (Reproduced in section 2.5.1 of the "Detailed Procedures Manual" for convenience).		
I)	Checking the air filter	PASS	FAIL
Air filter inspection	Check the air filter in accordance with the ROTAX line maintenance manual, Ch. 12-20-00, section 2. (Reproduced in section 2.5.2 of the "Detailed Procedures Manual" for convenience).		
J)	Checking the carburettors	PASS	FAIL
Idle Speed Check	Check the idle speed in accordance with the ROTAX line maintenance manual, Ch. 12-20-00, section 10.3.1.		
Actuation	Check for free movement of the carburettor actuation controls (throttle lever and starting carburettor) in accordance with the ROTAX line maintenance manual, Ch.12-20-00, section 10.6. Check that the Bowden cable allows the full travel of the throttle lever from stop to stop.		
Synchronization	Check mechanical and pneumatic synchronisation of the carburettor in accordance with the ROTAX line maintenance manual, Ch.12-20-00, sections 10.1, 10.2 and 10.3. (Reproduced in section 2.6.3. of the "Detailed Procedures Manual" for convenience).		
K)	Spark Plugs	PASS	FAIL
Spark plug inspection	Remove all spark plugs and check the heat range designation, clean, check electrode gap and adjust if necessary in accordance with the ROTAX line maintenance manual, Ch 12-20-00, section 13.2. (Reproduced in section 2.5.6 of the "Detailed Procedures Manual" for convenience). Replace as necessary. (Refer to section 2.5.7. in the "Detailed Procedures Manual")		
L)	Checking the Propeller Gearbox	PASS	FAIL
Friction torque check	Check the friction torque in rotation on gearbox with overload clutch in accordance with the ROTAX line maintenance manual, Ch. 12-20-00, section 14.1. Actual friction torque _____ Nm (in. Lbs)		
M)	Oil Change	PASS	FAIL
Draining oil	Drain oil from tank in accordance with the ROTAX line maintenance manual, Ch. 12-20-00, section 11.2. 3. (Reproduced in section 2.7.4. of the "Detailed Procedures Manual" for convenience).		

Oil filter change	Remove old oil filter from engine and install new oil filter in accordance with the ROTAX line maintenance manual, Ch. 12-20.00, section 11.3. 3. (Reproduced in section 2.7.3. of the "Detailed Procedures Manual" for convenience).		
Oil filter inspection	Cut old oil filter without producing any metal chips and inspect it in accordance with the ROTAX line maintenance manual, Ch. 12-20-00, section 11.4 for wear and/or missing material. 3. Filter mat. Findings: _____ _____ ____ Filter cover findings: _____ _____ ____ Sealing lip findings: (wear, cracks, missing material) _____ _____ ____ Spring of bypass valve (small) findings: _____ _____ ____ Positioning springs (large) findings: _____ _____ ____		
Oil Refill	Refill the oil tank with approximately 3 litres of oil in accordance with the ROTAX line maintenance manual, Ch. 12-20-00, section 11.2. For oil quality, refer to the ROTAX Operators Manual and SI-912-016, latest edition. 3.		
N)	Oil level check	PASS	FAIL
Oil Check	Verify the oil level, replenish as necessary in accordance with the ROTAX line maintenance manual, Ch. 12-10-00, section 4.1. (Reproduced in section 2.7.1 of the "Detailed Procedures Manual" for convenience).		
O)	Checking the V-belt tension	PASS	FAIL
V-belt tension	On configurations with auxiliary generator, check the attachment and the V-belt tension in accordance with the ROTAX line maintenance manual, Ch. 12-20-00, section 6.		
P)	Smooth Performance of the Engine	PASS	FAIL

Crankshaft turning inspection	For all engines with crankcase up to S/N 27811 inclusive, conduct an inspection of the turning of the crankshaft in accordance with the ROTAX line maintenance manual, Ch. 05-50-00, section 3.13. Torque: _____ Nm NOTE: For engines with a new crank case (S/N 06.0010 or higher), inspect only in case of suspected damage due to unscheduled maintenance event.		
Q)	Engine test run	PASS	FAIL
Engine Test Run	Conduct an engine test run in accordance with the ROTAX line maintenance manual, Ch. 12-20-00. (Reproduced in section 2.5.8 of the "Detailed Procedures Manual" for convenience). 1. Start the engine and run to operating temperature (for the Limits, refer to the ROTAX Operators Manual for the 912 series). 2. Ignition check at _____ rpm engine speed. 3. Speed drop without ignition circuit: A (Off)_____rpm B (Off)_____rpm A/B (difference)_____rpm 4. Inspect carburettor heat system. 5. Hit the preheating and make a note of speed drop. Speed drop _____rpm. 6. Preheating "OFF", engine idle running and make a note of idle speed running _____rpm. 7. After engine test run, re-tighten the oil filter by hand (once the engine is cold). 8. Check for leaks.		

1. This was included from the ROTAX maintenance manuals for line maintenance / heavy maintenance as revised on September 01/2012 for the reader's convenience. While every effort has been made to provide a true and up to date representation of the ROTAX inspections, should the ROTAX manual differ from the instructions presented here, the ROTAX manual supersedes this manual in all cases.
2. The 100 hour engine inspection presented here must be used to conduct the "25 hour inspection" prescribed by ROTAX after the first 25 hours of operation of a new or overhauled engine.
3. For aircraft using unleaded AVGAS for more than 30% of the time, this must be accomplished at 50 hour intervals.

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4.2.3. ENGINE ADDITIONAL ITEM 200 HOUR INSPECTION

<table>
<tr><td colspan="4">SCOPE AND DETAILS OF ROTAX ENGINE 200 HOUR ADDIONAL ITEM ANNUAL INSPECTION & SERVICE
Each person performing the annual inspection shall complete paragraph A.</td></tr>
<tr><td colspan="4"></td></tr>
<tr><td>A)</td><td>ROTAX ENGINE CHECKS 1.</td><td>PASS</td><td>FAIL</td></tr>
<tr><td>Compression Check</td><td>Check the compression by the differential pressure method in accordance with the ROTAX line maintenance manual, Ch. 12-20-00, Section 5.

Test pressure _____ hPa (psi)

<table><tr><td colspan="5">Pressure drop (% of fraction)</td></tr><tr><td>Cylinder No.</td><td>1</td><td>2</td><td>3</td><td>4</td></tr><tr><td>Bar / psi</td><td></td><td></td><td></td><td></td></tr></table></td><td></td><td></td></tr>
<tr><td rowspan="4">Carburettor checks (Refer to section 2.6.4 in the “Detailed Procedures Manual” in addition to the applicable Rotax manuals)</td><td>Check the ventilation of the float chambers. Any trouble with the float chamber ventilation will impair the engine and carburettor functioning.

Check that the passage of the ventilation lines is free and that no kinks can arise.</td><td></td><td></td></tr>
<tr><td>Removal / assembly of the 2 carburettors for carburettor inspection as per ROTAX heavy maintenance manual, Ch. 73-00-00.</td><td></td><td></td></tr>
<tr><td>Check the weight of the floater in accordance with the ROTAX heavy maintenance manual, Ch. 12-20-00, section 10.4.1 2.</td><td></td><td></td></tr>
<tr><td>Inspect the carburettor sockets for damage and abnormalities, checking for cracks, wear and condition in accordance with the ROTAX heavy maintenance manual, Ch. 73-00-00, section 3.4.3. 3.
Take note of changes caused by the influences of temperature.</td><td></td><td></td></tr>
<tr><td rowspan="2">Spark plug checks</td><td>Check that resistance spark plug connectors fit tightly on the spark plugs. Minimum pull-off force is 30N (7lb).</td><td></td><td></td></tr>
<tr><td>Replace spark plugs in accordance with the ROTAX heavy maintenance manual, Ch. 12-20-00, section 13.2. 4. (Reproduced in section 2.5.7 of the “Detailed Procedures Manual” for convenience).</td><td></td><td></td></tr>
</table>

1. This was included from the ROTAX maintenance manual for line maintenance / heavy maintenance as revised on September 01/2012 for the reader’s convenience. While every effort has been made to provide a true and up to date representation of the ROTAX inspections, should the ROTAX manuals differ from the instructions presented here, the ROTAX manual supersedes this manual in all cases.
2. This should be included in the annual inspection if that occurs before 200 hours.
3. See SB-912-030, latest edition.
4. Accomplish every 100 hours with the use of leaded fuel for more than 30% of the operation.

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4.2.4. ENGINE ADDITIONAL ITEM 600 HOUR CHECK

SCOPE AND DETAILS OF **ROTAX ENGINE 600 HOUR ADDITIONAL ITEM** ANNUAL INSPECTION & SERVICE Each person performing the annual inspection shall complete paragraph A.			
A)	ROTAX ENGINE CHECKS 1.	PASS	FAIL
Overload clutch inspection 2.	For gearboxes with an overload clutch, the overload clutch must be inspected in accordance with the ROTAX line maintenance manual, Ch. 05-50-00, section 2 and SB-912-033.		
Prop gearbox inspection. 3.	Propeller gearboxes with no overload clutch must be inspected in accordance with the ROTAX line maintenance manual, Ch. 12-20-00, section 14.2.		

1. This was included from the ROTAX maintenance manual for line maintenance / heavy maintenance as revised on September 01/2012 for the reader's convenience. While every effort has been made to provide a true and up to date representation of the ROTAX inspections, should the ROTAX manuals differ from the instructions presented here, the ROTAX manual supersedes this manual in all cases.
2. For all aircraft using leaded fuel for more than 30% of the time, this inspection must be performed.
3. For engine types 912 ULS without the overload clutch.

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4.2.5. ENGINE ADDITIONAL ITEM 1000 HOUR CHECK

SCOPE AND DETAILS OF **ROTAX ENGINE 1000 HOUR ADDITIONAL ITEM** ANNUAL INSPECTION & SERVICE Each person performing the annual inspection shall complete paragraph A.			
A)	ROTAX ENGINE CHECKS 1.	PASS	FAIL
Prop gearbox inspection 2.	Propeller gearboxes with an overload clutch must be inspected in accordance with the ROTAX line maintenance manual, Ch. 12-20-00, section 14.2.		

1. This was included from the ROTAX maintenance manual for line maintenance / heavy maintenance as revised on September 01/2012 for the reader's convenience. While every effort has been made to provide a true and up to date representation of the ROTAX inspections, should the ROTAX manuals differ from the instructions presented here, the ROTAX manual supersedes this manual in all cases.
2. For engine types 912 ULS with the overload clutch.

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5. UNSCHEDULED MAINTENANCE INSPECTION / SERVICE ITEMS

The following detailed inspection sheets can be photocopied, signed off and stored separately from the body of the file as a record of the completion of each of the tasks. All maintenance and/or inspections conducted on an aircraft must be logged in a suitable logbook (e.g.: the aircraft maintenance logbook, an airframe or engine logbook, a journey log, etc) as per the requirements of the country of registration.

It is highly recommended to have the aircraft verified for airworthiness by authorised service personnel after any reportable incident that may have resulted in serious structural damage.

In the event that any obvious damage becomes evident on conducting these inspections, make use of the contact details for your country as per the table after the "Feedback Form" and send a detailed description with photos to the relevant party to establish a recommended course of action.

Additionally, attach the photos to and complete the description on the "inspection findings" section following the inspection and keep them as part of the maintenance record of the aircraft.

5.1. WING STRIKE INSPECTION

SCOPE AND DETAILS OF THE **BUSHCAT AIRFRAME WING STRIKE INSPECTION** Each person performing the wing strike inspection shall complete paragraphs A through B.			
A)	Detailed Wing Inspection	PASS	FAIL
Wing structural inspection	1. Inspect the condition of the wing and centre section components for general condition, distortion, evidence of failure, security of attachment and installation. Take particular care to inspect the interfaces between plates and tubes and manipulate the structure by hand to check for unusual movement or play. 2. Inspect front and rear spar attachment bolt holes for signs of elongation. 3. Conduct a thorough check of the primary and secondary control surfaces to ensure that they operate correctly in response to activation from the cockpit and that they are capable of full and unrestricted movement. 4. In the likely event of it being a wing tip strike, check the security of the composite wingtip attachment to the wing, the functionality of the wingtip light and the condition of the composite surface and paint.		
Wing fabric inspection	Inspect the fabric for tears, scuffing or separation from the underlying structural components.		
B)	Fuselage and Hull Inspection	PASS	FAIL
Fuselage structural inspection	Gain access to the structural components of the fuselage in the region of the wing attachment. Inspect the condition of the fuselage components for general condition, distortion, evidence of failure, security of attachment and installation.		

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5.2. TAIL STRIKE INSPECTION

SCOPE AND DETAILS OF THE **BUSHCAT AIRFRAME TAIL STRIKE INSPECTION** Each person performing the tail strike inspection shall complete paragraphs A through B.			
A)	Detailed Empennage Inspection	PASS	FAIL
Empennage structural inspection	Inspect the condition of the vertical and horizontal tail components for general condition, distortion, evidence of failure, security of attachment and installation. Conduct a thorough check of the primary and secondary control surfaces to ensure that they operate correctly in response to activation from the cockpit and that they are capable of full and unrestricted movement.		
Empennage fabric inspection	Inspect the fabric for tears, scuffing or separation from the underlying structural components.		
B)	Fuselage and Hull Inspection	PASS	FAIL
Fuselage structural inspection	Gain access to the structural components of the fuselage in the region of the empennage attachment. Inspect the condition of the fuselage components for general condition, distortion, evidence of failure, security of attachment and installation. Take particular care to inspect the bracket interfaces with the tubes and ensure that the attachment bolts have not torn through the tubes. This should also be evident in the case of unusual movement of tubes relative to one another on manipulation by hand.		

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5.3. HARD LANDING INSPECTION

SCOPE AND DETAILS OF THE **BUSHCAT AIRFRAME HARD LANDING INSPECTION** Each person performing the airframe hard landing inspection shall complete paragraphs A through E.			
A)	Detailed Undercarriage Inspection	PASS	FAIL
Undercarriage structural inspection	Inspect the condition of the undercarriage components for general condition, distortion, evidence of failure, security of attachment and installation. Conduct an inspection of the tyres for any sign of excessive wear and resulting increased chance of failure on the next flight.		
B)	Fuselage and Hull Inspection	PASS	FAIL
Fuselage structural inspection	Gain access to the structural components of the fuselage in the region of the main and nose (tail) wheel attachment. Inspect the condition of the fuselage components for general condition, distortion, evidence of failure, security of attachment and installation.		
C)	Engine mount inspection	PASS	FAIL
Engine mount inspection	Conduct a thorough inspection of the engine mount. If any damage to the engine is suspected, conduct the ROTAX inspection described for a prop strike.		
D)	Propeller inspection	PASS	FAIL
Propeller inspection	Check the tips of the propeller blades for any evidence of a prop strike. If any damage to the propeller is suspected, conduct the ROTAX inspection described for a prop strike and contact the aircraft manufacturer with photos of damage to the prop itself for a recommended course of action.		
E)	Final testing	PASS	FAIL
Ground testing	Taxi the aircraft without entering into any phase of flight, ensuring the correct response to input from the cockpit in right and left hand turns and on the straight. Ensure that the aircraft is not inclined to pull in either direction.		

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5.4. EXCEEDANCE OF OPERATING LIMITATIONS OF THE ENGINE

An inspection of the engine must be performed if the operating limits of the engine have been exceeded (for example engine overspeed, excessive temperature etc.), or if unusual operating conditions have occurred during operation (e.g. lightning strike) in accordance with the ROTAX line maintenance manual and heavy maintenance manual as applicable.

This was included from the ROTAX maintenance manual for line maintenance / heavy maintenance as revised on September 01/2012 for the reader's convenience. While every effort has been made to provide a true and up to date representation of the ROTAX inspections, should the ROTAX manuals differ from the instructions presented here, the ROTAX manual supersedes this manual in all cases.

5.4.1. RETURNING ENGINE TO SERVICE AFTER SUBMERGING IN WATER

An engine which has been submerged in water must be inspected, repaired or overhauled in accordance with the BRP-Powertrain instructions for continued airworthiness by the manufacturer. Contact the aircraft distributor / airframe manufacturer / authorised ROTAX distributor to conduct the necessary inspections.

NOTE: Prior to shipping, the engine must be clearly marked "Engine submerged in water". Define on the label whether fresh or salt water.

All systems must be inspected for correct functioning and a detailed inspection of the affected engine components must be conducted.

5.4.2. EXTREME CLIMATIC CONDITIONS

Flying in deserts or areas with heavily contaminated or dusty air causes increased wear on all components. To accommodate for this, shorter engine maintenance intervals are recommended.

NOTE: For extreme climatic conditions, air filter, coolant radiator and oil cooler inspections every 25 hours are recommended.

Flying in areas with extreme climatic conditions or at extreme altitudes requires adjustment to the carburettor jetting and cooling system. Contact the aircraft distributor / airframe manufacturer / authorised ROTAX distributor to make the necessary adjustments.

5.4.3. RETURNING ENGINE TO SERVICE AFTER EXPOSURE TO FIRE

After exposure to fire, the engine must be inspected, repaired or over-hauled in accordance with the BRP-Powertrain instructions for continued airworthiness. Contact the aircraft distributor / airframe manufacturer / authorised ROTAX distributor to conduct the necessary inspections.

NOTE: Prior to detailed inspection, all parts should be cleaned and inspected for weld penetration or melted materials.

In the event the engine was exposed to fire, first a visual inspection of all parts must be completed; and then a hardness test of all mechanical parts must be performed, including but not limited to a hardness test of the crankcase, cylinder and cylinder heads.

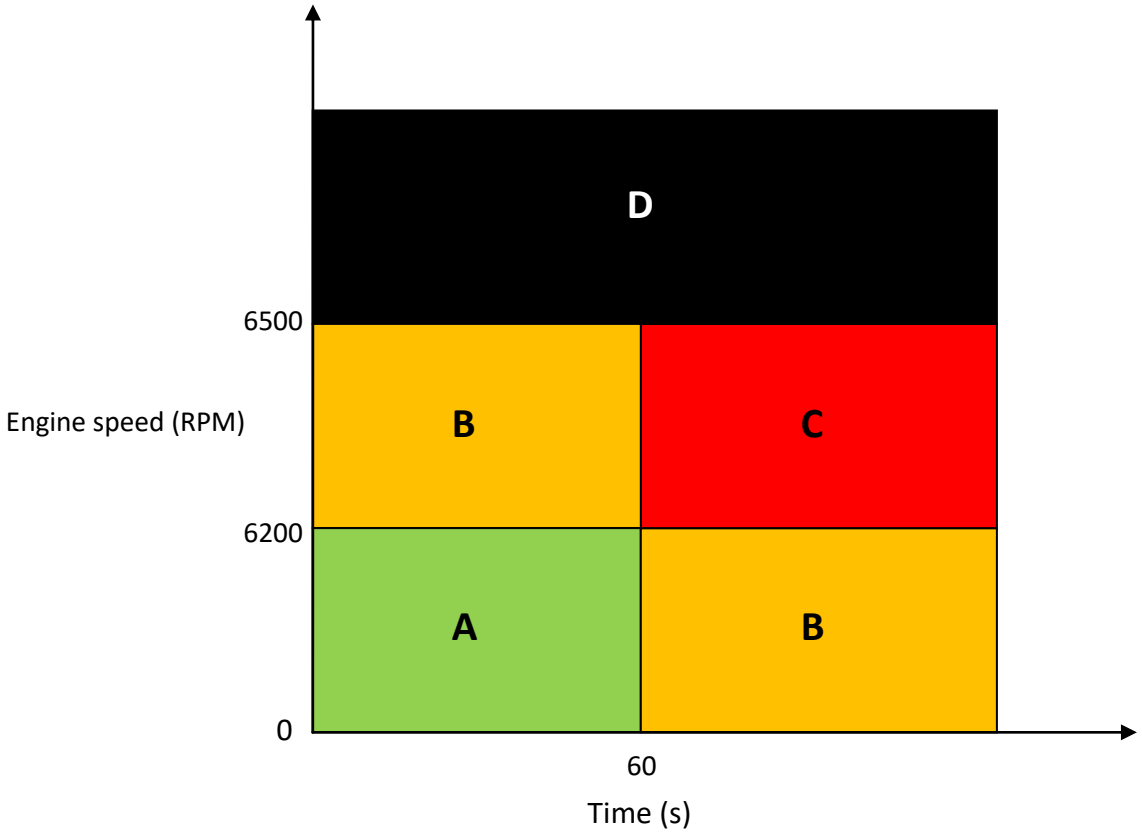
In most cases an overhaul is necessary and the engine needs to be sent without delay to an authorized ROTAX overhaul facility via the airframe distributer.

5.4.4. EXCEEDANCE OF MAXIMUM PERMISSIBLE ENGINE RPM

NOTE:

Any exceedance of the maximum permissible engine RPM must be entered by the pilot into the engine log book stating the duration and extent of over-speed and pertinent details.

Prior to proceeding to the tables for maintenance procedures, consult the inspection chart below to establish what action needs to be taken for the exceedance experienced.



SCOPE AND DETAILS OF **MAX ENGINE RPM EXCEEDANCE INSPECTION** Each person performing the max engine rpm exceedance inspection shall complete A, B, C or D as applicable in accordance with the chart above.			
Engine Inspection Procedure		PASS	FAIL
A	No action needed.	n/a	n/a
B	Check that the pushrods are straight.		
C	1. The whole engine must be inspected, repaired or overhauled in accordance with the BRP-Powertrain instructions for continued airworthiness. 2. Check that the pushrods are straight. 3. Inspect the crankshaft for out-of-roundness in accordance with the ROTAX Heavy Maintenance Manual, Ch. 72-00-00, section 3.9. 4. Inspect all systems for correct functioning. 5. Perform a detailed inspection of all affected engine components.		
D	1. The whole engine must be inspected, repaired or overhauled in accordance with the BRP-Powertrain instructions for continued airworthiness. 2. Check that the pushrods are straight. 3. Check differential pressure. 4. Inspect the crankshaft with mounted drive gear for run-out and distortion in accordance with the ROTAX Heavy Maintenance Manual, Ch. 72-00-00, section 3.9 and 3.18. 5. Check if the piston made contact with the valve. 6. Check the roundness of the valves. 7. Inspect all systems for correct functioning. 8. Perform a detailed inspection of all affected engine components.		

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5.4.5. EXCEEDANCE OF MAXIMUM PERMISSIBLE COOLING SYSTEM TEMPERATURE

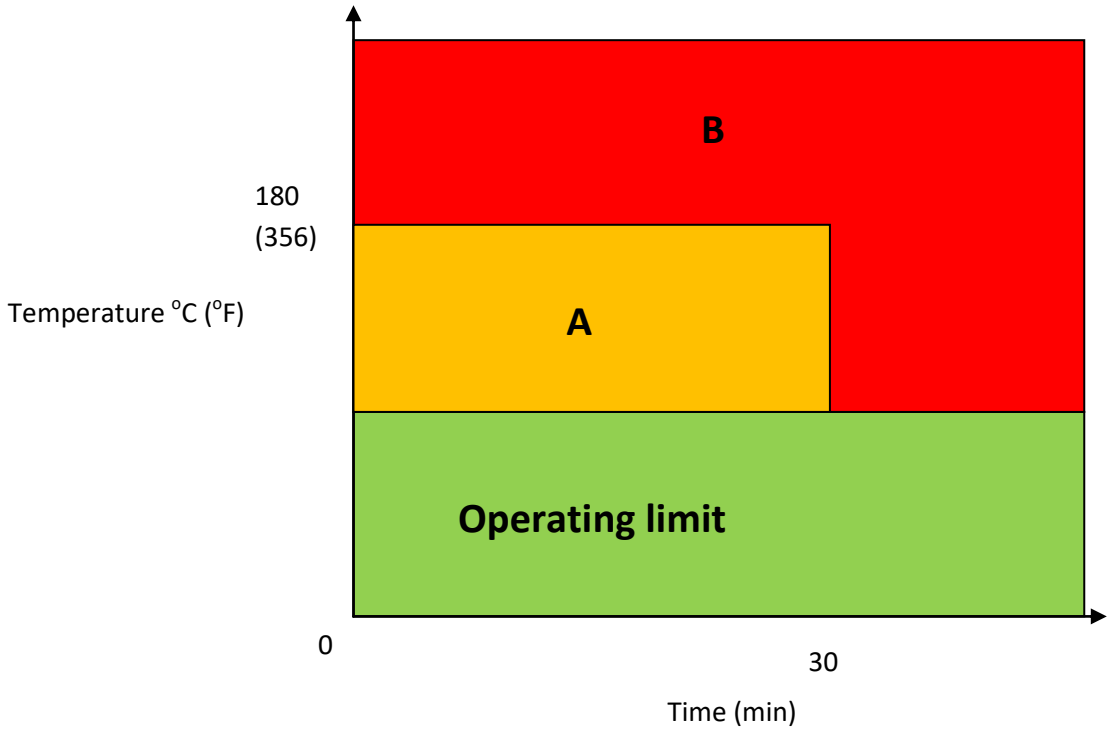
NOTE: If the maximum cooling system temperature is exceeded, other limits are also often exceeded (e.g. max oil temperature limit) Please observe the relevant instructions for other exceedances simultaneously.

NOTE: Any exceedance of the maximum admissible cooling system temperature must be entered by the pilot into the engine log book, stating duration and extent of excess temperature and all other pertinent details.

<u>EXCEEDANCE OF MAX CYLINDER HEAD TEMPERATURE (ENGINE SERIAL NUMBERS WITHOUT SUFFIX -01):</u>

NOTE: See SB-912-068, latest issue.

The maximum permissible operating temperature limit for coolant is defined in section 3.14 above as per the ROTAX Installation Manual, section 2.1 or 2.2 (as applicable), Operating limits.



SCOPE AND DETAILS OF **MAX COOLANT TEMPERATURE EXCEEDANCE INSPECTION – ALL ENGINES WITH SERIAL NUMBER WITHOUT SUFFIX-01** Each person performing the max coolant temperature exceedance inspection shall complete A or B as applicable in accordance with the chart above.			
	Engine Inspection Procedure	PASS	FAIL
A	1. The whole cooling system must be inspected, repaired or overhauled in accordance with the BRP-Powertrain instructions for continued airworthiness. 2. Inspect all further systems for correct functioning. 3. Carry out a detailed inspection of the affected engine components such as: a. Leakage check on the cooling system. b. Check that the cylinder head attachment is fitted securely. If the cylinder head nut is loose, proceed as instructed in section "B" of this table. c. Check all coolant fittings (feed/outflow) for secure fit.		
B	1. The whole cooling system must be inspected, repaired or overhauled in accordance with the BRP-Powertrain instructions for continued airworthiness. 2. Inspect all further systems for correct functioning. 3. Carry out detailed inspection of the affected engine components. 4. All cylinder heads and cylinders must be removed and subjected to a detailed check including hardness testing in accordance with the ROTAX heavy maintenance manual, chapter 72-00-00.		

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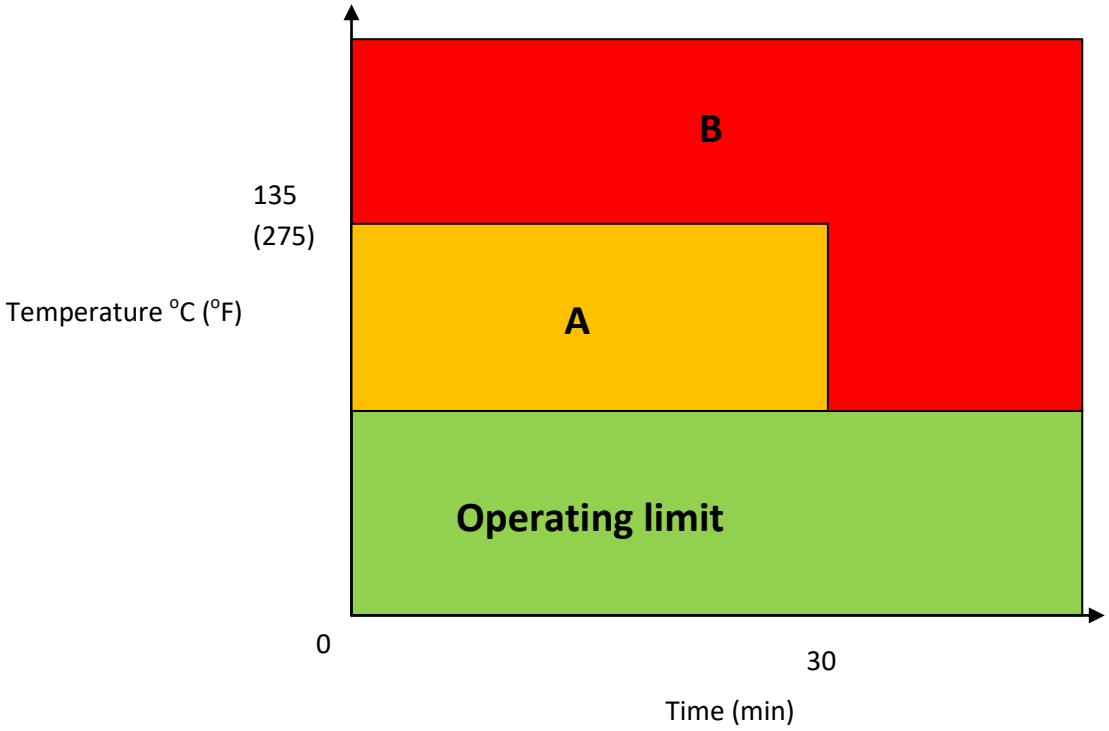
EXCEEDANCE OF MAX CYLINDER HEAD TEMPERATURE (ENGINE SERIAL NUMBERS WITH SUFFIX -01):

NOTE: See SB-912-068, latest issue.

The maximum permissible operating temperature limit for coolant is defined in the ROTAX Operators Manual, section 2.1 or 2.2 (as applicable), Operating limits.



SCOPE AND DETAILS OF **MAX COOLANT TEMPERATURE EXCEEDANCE INSPECTION – ALL ENGINES WITH SERIAL NUMBER WITH SUFFIX-01** Each person performing the max coolant temperature exceedance inspection shall complete A or B as applicable in accordance with the chart above.			
	Engine Inspection Procedure	PASS	FAIL
A	1. The whole cooling system must be inspected, repaired or overhauled in accordance with the BRP-Powertrain instructions for continued airworthiness. 2. Inspect all further systems for correct functioning. 3. Carry out a detailed inspection of the affected engine components such as: a. Leakage check on the cooling system. b. Check that the cylinder head attachment is fitted securely. If the cylinder head nut is loose, proceed as instructed in section “B” of this table. c. Check all coolant fittings (feed/outflow) for secure fit.		
B	1. The whole cooling system must be inspected, repaired or overhauled in accordance with the BRP-Powertrain instructions for continued airworthiness. 2. Inspect all further systems for correct functioning. 3. Carry out detailed inspection of the affected engine components. 4. All cylinder heads and cylinders must be removed and subjected to a detailed check including hardness testing in accordance with the ROTAX heavy maintenance manual, chapter 72-00-00.		

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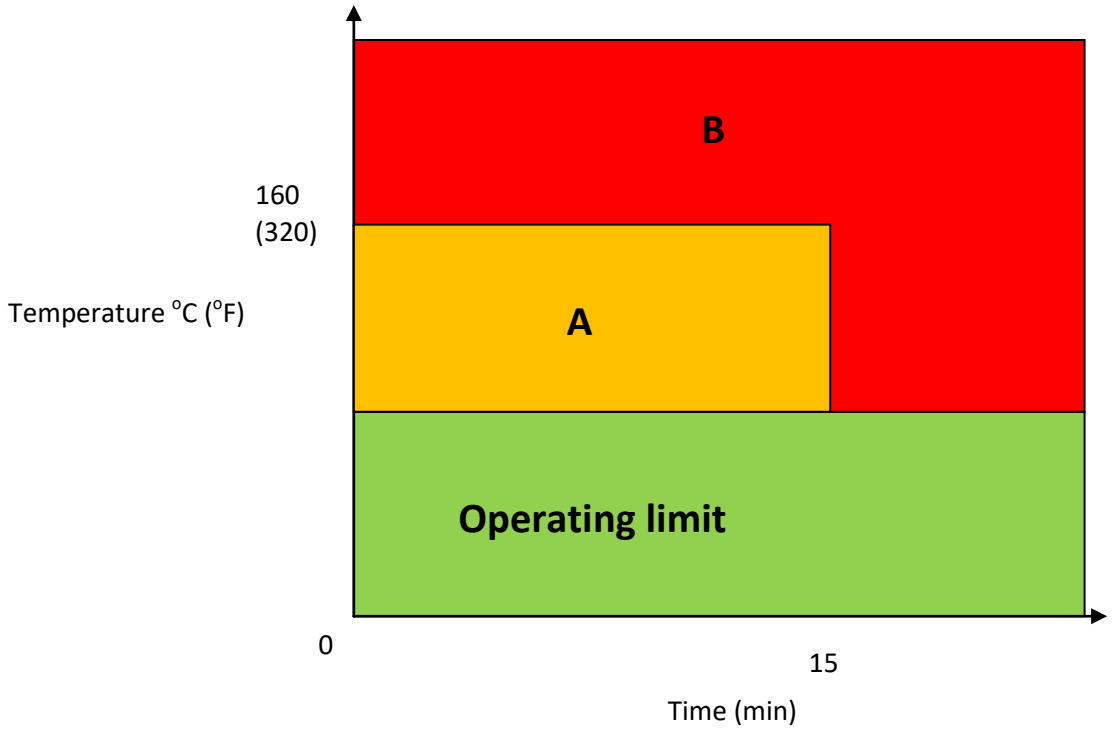
5.4.6. EXCEEDANCE OF MAXIMUM PERMISSIBLE OIL TEMPERATURE

NOTE: If the maximum permissible oil temperature is exceeded, other limits are also often exceeded (e.g. coolant system temperature limit). Please observe the relevant instructions for other exceedances simultaneously.

NOTE: Any exceedance of the maximum admissible oil temperature must be entered by the pilot into the engine log book, stating duration and extent of excess temperature and all other pertinent details.

The maximum permissible operating temperature limit for coolant is defined in the ROTAX Operators Manual, section 2.1 or 2.2 (as applicable), Operating limits.



SCOPE AND DETAILS OF **MAX OIL TEMPERATURE EXCEEDANCE INSPECTION** Each person performing the max oil temperature exceedance inspection shall complete A or B as applicable in accordance with the chart above.			
	Engine Inspection Procedure	PASS	FAIL
A	1. The whole oil system must be inspected, repaired or overhauled in accordance with the BRP-Powertrain instructions for continued airworthiness. 2. Inspect oil level in the oil tank. 3. Inspect oil cooler for contamination and check the entire oil circuit for correct functioning. 4. Check that the oil lines are routed correctly and undamaged. 5. Cut oil filter housing and inspect filter mat for foreign matter. 6. Carry out oil change. 7. Inspect all further systems for correct functioning.		
B	1. The whole engine must be inspected, repaired or overhauled in accordance with the BRP-Powertrain instructions for continued airworthiness. 2. Inspect all further systems for correct functioning. 3. Carry out detailed inspection of the affected engine components. 4. The whole oil system (oil cooler and oil lines) must be inspected. 5. Cut the oil filter housing and inspect filer mat for foreign matter. 6. Carry out oil change.		

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5.5. PROPELLER SUDDEN STOPPAGE

A propeller sudden stoppage is defined as any incident while the engine is stationary or running which makes it necessary to perform repairs on the propeller. This includes, but is not limited to, a prop strike incidence.

In the event of a propeller sudden stoppage, additional to the repair / replacement of the propeller in accordance with the Kiev prop manual, an inspection on the engine and overload clutch must be accomplished.

SCOPE AND DETAILS OF **KIEV PROPELLER SUDDEN STOPPAGE INSPECTION** Each person performing the prop sudden stoppage inspection shall complete section A.			
A)	Prop Inspection	PASS	FAIL
Prop inspection	Inspect the prop for damage. It is highly likely that the prop has failed completely. Replacement of the prop is then the only course of action.		

Additionally, an inspection of the engine must be performed in accordance with the Rotax line maintenance manual, Ch. 05-50-00 to ensure that no damage has been incurred by the engine.

This was included from the ROTAX maintenance manual for line maintenance / heavy maintenance as revised on September 01/2012 for the reader's convenience. While every effort has been made to provide a true and up to date representation of the ROTAX inspections, should the ROTAX manuals differ from the instructions presented here, the ROTAX manual supersedes this manual in all cases.

SCOPE AND DETAILS OF **ROTAX ENGINE PROPELLER SUDDEN STOPPAGE INSPECTION** Each person performing the prop sudden stoppage inspection shall complete section A through D.			
A)	Engine Inspection	PASS	FAIL
Engine inspection	Inspect the engine for damage. If any damage is detected, inspect, repair or overhaul the whole engine in accordance with the relevant manual. Inspect all systems for correct functioning.		
B)	Add-on Component Inspection	PASS	FAIL
Add-on component inspection	Inspect add on components such as the propeller governor, vacuum pump and any external alternator. Observe the manufacturer's instructions for each component.		
C)	Engine Mount Inspection	PASS	FAIL
Engine mount inspection	Conduct an inspection of the engine mount. Check for: 1. Cracks in the engine mounts. 2. Fastener damage		

	3. Damage to the vibration mount rubbers.		
D)	Fuel Pump and Gearbox Inspection	PASS	FAIL
Fuel pump & gearbox	Remove the fuel pump and gearbox.		
Prop shaft	Remove the roller bearing in the crankcase for the propeller shaft.		
Gearbox inspection	The whole gearbox must be inspected, repaired or overhauled in accordance with the BRP-Powertrain instructions for continued airworthiness; including but not limited to: 1. A detailed inspection of all the gearbox components. 2. NDT for cracks on the gearbox housing, propeller shaft and gear set. 3. An inspection of the drive for the governor and vacuum pump (if fitted).		
Crankshaft inspection	Inspect the crankshaft on the power take off side for out of roundness in accordance with the Heavy maintenance manual, Ch. 72-00-00, section 3.9.		
Gearbox installation	Reinstall the gearbox.		

***** This was included from the Rotax maintenance manual for line maintenance as revised on September 01/2012 for the reader's convenience. Should the Rotax manual differ from the instructions presented here, the Rotax manual supersedes this manual in all cases.

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5.6. EXCEEDANCE OF AIRCRAFT G-LIMITATIONS / SPEED LIMITATIONS

SCOPE AND DETAILS OF THE **BUSHCAT AIRFRAME G-LIMIT EXCEEDANCE / SPEED LIMIT EXCEEDENCE INSPECTION** Each person performing the airframe g-limit / speed limit exceedance inspection shall complete paragraphs A through C.			
A)	Detailed Wing Inspection	PASS	FAIL
Wing structural inspection	Inspect the condition of the wing and centre section components for general condition, distortion, evidence of failure, security of attachment and installation. Conduct a thorough check of the primary and secondary control surfaces to ensure that they operate correctly in response to activation from the cockpit and that they are capable of full and unrestricted movement.		
B)	Fuselage and Hull Inspection	PASS	FAIL
Fuselage structural inspection	Gain access to the structural components of the fuselage in the region of the wing attachment. Inspect the condition of the fuselage components for general condition, distortion, evidence of failure, security of attachment and installation.		
C)	Detailed Undercarriage Inspection	PASS	FAIL
Undercarriage structural inspection	Inspect the condition of the undercarriage components for general condition, distortion, evidence of failure, security of attachment and installation.		

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APPENDIX 1: EQUIPMENT CHANGE REQUEST

Date: _____

To whom it may concern

Subject: BushCat equipment change authorization

Manufacturer authorizes repairman, A&P, IA (Authority certificate number) to install the following equipment in LSA BushCat (insert serial number here)

Product Name_____ Model_____ Part Number_____
Product Name_____ Model_____ Part Number_____
Product Name_____ Model_____ Part Number_____
Product Name_____ Model_____ Part Number_____
Product Name_____ Model_____ Part Number_____

All equipment will be installed in accordance with the Rainbow Aircraft's written instructions and diagrams. Such instructions, diagrams, and any additional instructions for continued airworthiness must be kept indefinitely with the owner's Aircraft's Maintenance Manual.

Manufacturer or agent authorization block:

Title	Name	Authorization given by

Signature

Affidavit of ASTM compliance:

I certify that the installation of the above equipment will not alter the applicable ASTM design and performance of this aircraft. I have followed all the Manufacturer's instructions and the installation has been checked for compliance

Title	Name	Authorization given by

Signature