Aircraft Maintenance Manual

ALPHA Trainer / ALPHA Club, registered as UL or EXP

For additional document applicability information refer to: SB-160-00-80-990

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Created by Pipistrel Vertical Solutions d.o.o.

AIRCRAFT MAINTENANCE MANUAL

ALPHA Trainer / ALPHA Club

Aircraft type:	ALPHA Trainer, Virus 912 SW 80
Aircraft model:	ALPHA Trainer, ALPHA Club

In accordance with European and/or national regulation, pilots and persons engaged in maintaining or modifying the aircraft shall report occurrences which may represent a risk to aviation safety to the manufacturer. Occurrences can be reported by following this link: https://www.pipistrel-aircraft.com/support/issue-reporting/safety-occurrence-report/.

The airplane must be maintained in compliance with information and limitations contained herein.

Table of contents

SCOPE

This ALPHA Trainer aircraft maintenance manual (AMM) was prepared by Pipistrel d.o.o. for trained aviation mechanics. It contains a wealth of information about how to successfully clean, inspect, service, remove/install equipment on and operationally inspect the aircraft. It does not, however, contain everything needed to keep the aircraft in airworthy condition. This manual must be used in conjunction with the installation/user/maintenance manuals pertaining to the components/equipment found on the aircraft. Moreover, all airworthiness directives (AD) issued by the NAA in the country where the aircraft is registered, as well as all applicable information for continued airworthiness (ICA), must be adhered to.

USING THIS MANUAL

This This manual's structure is similar to that outlined in the standard chapter numbering system ATA 100. The header on each page clearly displays the chapter number and chapter name. The page number and page revision number are displayed in the footer of each page. The PDF version of this manual enables the user to jump from section to section by clicking on references. Press ALT + LEFT ARROW to return to previous page. The following warnings, cautions and notes can be found throughout this manual. They provide additional information about particular procedures and makes the owner/operator/mechanic aware of any safety hazards.

WARNING: These provide crucial information about things that may cause bodily harm.

CAUTION: These provide information about things that may cause component damage.

NOTE: These provide information such as tips and hints that aid the mechanic when carrying out a specific procedure.

Revision tracking, filing and identifying

Pages to be removed or replaced in the Aircraft Maintenance Manual are determined by the log of effective pages located in this section. This log contains the page number and revision number for each page within the AMM. As revisions to the AMM occur, the revision number on the affected pages is updated and the page number in the log is highlighted with bold font type. When two pages display the same page number, the page with the latest revision shall be used in the AMM.

The revision number on the log of effective pages shall also coincide with the revision number of the page in question. As an alternative to removing and/or replacing individual pages, the owner can also print out a whole new manual in its current form.

Revised material is marked with a vertical bar that will extend the full length of deleted, new or revised text added to new or previously existing pages. This marker will be located adjacent to the applicable text in the marking on the outer side of the page. The same system applies when the header, figure or any other element inside this AMM is revised. A list of revisions is located at the beginning of the log of effective pages. Pipistrel is not responsible for technical changes/updates to OEM manuals supplied with the aircraft (eg. radio, transponder, GPS, etc.).

Index of document revisions

Doc. Rev.	Reason for revision	Date of issue
A00	Initial release	8th July 2022
A01	ELT installation/removal added, lubrication instructions updated, nose landing gear inspection/removal/installation procedures updated, battery, external power, DC electrical load distribution, section 95 content added, editorial amendments.	16th August 2023
B00	Throttle cable preparation and installation procedure added, Helix propeller introduced, lubrication table amendments, cleaning solutions updated, torque values for wing installation added, door procedures amended, rudder cable inspection amended, chapter 79 added	22 January 2026 PIPISTREL RELEASED

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AIRCRAFT DESCRIPTION

Pipistrel's ALPHA Trainer is all-composite, high wing monoplane with cantilevered wings, conventional empennage (T-tail) and tricycle landing gear configuration. The nose landing gear is integrated into the engine mount. It`s steerable, connected to the pedals and incorporates a shock -absorber element. The load-bearing structure of the airplane is made of carbon fiber composite material, the components of which, epoxy resin as well as carbon fiber materials. The proven low-pressure wet lay-up method from sailplane industry is used to build the airplane structure.
The aircraft is powered by a Rotax 912 UL - 80 hp engine.

List of abbreviations

Abbreviation	Description
MM	Maintenance manual
AMM	Aircraft maintenance manual
OM	Operator’s manual
POH	Pilot operating handbook
MLG	Main landing gear
IPC	Illustrated parts catalogue
OEM	Original equipment manufacturer
ELT	Emergency locator transmitter
SB	Service bulletin
SL	Service letter
AD	Airworthiness directives
FH	Flight hours
MAC	Mean aerodynamic chord

List of applicable documents

The following is a list of OEM documents that should be on hand whenever the aircraft is being serviced or maintenance procedures are being performed. They're referred to frequently throughout this manual by a number in square brackets.

NOTE: Only the latest version/revision of the documents listed below should be used.

NOTE: Please refer to Pipistrel Website for the current status of all Pipistrel documents and bulletins.

NOTE: Some of the documents listed in the table below are supplied in printed form, along with aircraft delivery. Other documents are available for download in electronic format on their respective OEM website.

NOTE: Some of the maintenance procedures found in the OEM manuals below may or may not be referenced to in this manual. It is the responsibility of the owner, operator and/or maintenance personnel to acquaint themselves with their content before conducting any maintenance on the aircraft.

Reference	OEM Document
[1]	Rotax 912 UL Series engine technical documentation (https://www.flyrotax.com/): - [1a] Installation manual: IM-912 - [1b] Overhaul Manual: OHM-912 (only available upon request, please locate and contact nearest Rotax Service Center: https://dealerlocator.flyrotax.com//) - [1c] Maintenance manual line: MML-912 - [1d] Maintenance manual, heavy maintenance: MMH-912 / MMH-914
[2]*	Applicable flight manual (SEE [5])
[3]*	SAMM-100-00-60-001 Electric airbrakes supplement to AMM
[4]*	SPOH-161-00-41-050 Electric airbrakes POH supplement
[5]*	SB-160-00-80-990 Status of AT UL continuing airworthiness documentation
[6]	DAQU User's and Installation manual (by Kanardia) https://www.kanardia.eu/ (support -> doucmentation)
[7]	DIGI User's and Installation manual (by Kanardia) https://www.kanardia.eu/ (support -> doucmentation)
[8]	Transponder (TT models)/VHF Radio (TY models) installation/operating manuals (by Trig)
[9]	HORIS User's and Installation manual (by Kanardia) https://www.kanardia.eu/ (support -> doucmentation)
[10]	[10a]* **FP02-80** - Pipistrel Fixed Pitch 2-blade propeller:
	POM-160-00-60-001 FP02-80 Propeller operator's manual
	[10b] **HELIX R-SI-18-2** - Helix Fixed pitch 2-blade propeller:
	See propeller's manufacturer original maintenance manual (https://helix-propeller.de/services/docs-downloads/)
[11]	Kannad Integra 406 GPS ELT Operation Manual: DOC14002E (manuals available for download upon registering and creating an account on portal: (http://aviationpartners.orolia.com)
[12]	Artex ELT 345 Description, Operation, Installation and Maintenance Manual: Y1-03-0282 (https://www.acrartex.com/)
[13]**	Pipistrel Online IPC (https://ipc.pipistrel.si/Shop)
[14]*	SB-100-00-80-015 Battery installation recommendations
[15]	ETX Lithium Battery User's Manual: 11017_AC (https://earthxbatteries.com/)

* NOTE: Documents available on Pipistrel's Technical Publications Portal.

** NOTE: Access to the Pipistrel Online IPC is attained by registering an account, which typically takes 24 hours to process. To register just click on the REGISTER tab on the home page of the Online IPC.

List of applicable SBs, SIs and ADs

Please refer to our Website www.pipistrel-aircraft.com for a list of applicable SBs, SIs and Ads. The owner/operator is required to acquaint themselves, or any maintenance staff, with their content before performing any maintenance procedures.

For accessing the Technical Publications Portal, use credentials, found in [2].

List of referenced videos

Reference	OEM Video
[v1]	5 - Year maintenance ALPHA trainer service video: AMV 100-00-20-001
[v2]	BERINGER Tech Tip #4 (https://www.youtube.com/watch?v=_-jonch_RIM)
[v3]	BERINGER Tech Tip #6 (https://www.youtube.com/watch?v=cfmX0UKiRBA)
[v4]	BERINGER Tech Tip #5 (https://www.youtube.com/watch?v=mKaYmaN4RnY)
[v5]	Engine removal procedure for Alpha Trainer aircraft: AMV-160-72-00-001 Engine installation procedure for Alpha Trainer aircraft: AMV-160-72-00-002

Please refer to [v1] for maintenance of all components with 5 year interval, listed in the Time Limits Table (see Table 05-001 in section 05-10).

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04

CHAPTER 04 – AIRWORTHINESS LIMITATIONS

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04-00 GENERAL

Chapter 04-00 of this airplane maintenance manual (Airworthiness Limitations) is approved under the authority of **SLO.DOA.002**. It shows the mandatory limitations that apply to the aircraft and outlines the maximum replacement intervals and/or maintenance requirements for aircraft components, systems, and structures determined to be life limited and/or require monitoring through scheduled maintenance.

Where an interval is given in both flight time and calendar years, the limit that is reached first must be applied.

The time limits given in chapter 04 must be applied to ensure continued airworthiness of the aircraft.

NOTE: Regular inspections of the airplane including replacement and overhaul of certain components are required to ensure continued airworthiness of the aircraft.

The following airworthiness limitations and requirements are separated into groups as described below.

Maintenance Limitations - Component and system checks required to be performed during airplane scheduled maintenance.
Structural Limitations – Listing of any limitations associated with the aircraft's structure.

1. Maintenance limitations

The scheduled maintenance requirements listed below must be adhered to:

- **Paint**

Areas exposed to direct sunlight must remain in original white color. No other color is permitted. Only certain areas which are defined in chapter 51-00 of this manual (for example, registration markings, placards and warning markings) may have a different color. The color for registration markings is (gray, red, blue).

- **Paint Finish**

Allowable paint on the wing will have an absorptivity not greater than 0.4, with an emissivity of at least 0.9.

The maximum allowable paint on the fuselage will have an absorptivity not greater than 0.6, with an emissivity of at least 0.7.

2. Structural limitations

The certification requirements require that the composite airframe structure, cabin, wing, empennage, their carry-through and attaching structure, whose failure would be catastrophic, must be designed to safe life cycle.

Pipistrel aircraft have been designed and tested for a selected airframe life of 10,000 flight hours with no special structural limitations or inspections.

The structural inspections given in chapter 05-00 cover all required structure checks.

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05

CHAPTER 05 – TIME LIMITS AND MAINTENANCE CHECKS

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05-00 GENERAL

It is the aircraft owner's responsibility to keep the aircraft in good, airworthy condition at all times and this chapter provides information on how to do it. It covers topics such as intervals for the overhaul/replacement of components, scheduled/unscheduled maintenance for the aircraft and general maintenance hints/tips. The time intervals mentioned in this chapter are those by the manufacturer, Pipistrel d.o.o., and should be considered the minimum required to keep the airplane in good operating condition.

It should be noted, however, that the NAA in the country where the aircraft is registered may have different requirements regarding time limits and maintenance checks. Its requirements must be adhered to at all times, including any directives or bulletins it issues. The requirements found in this manual DO NOT override those of the NAA.

All of the intervals and checks outlined in this manual were established based on test data taken in moderate conditions on grass runways. If the aircraft is operated in extreme conditions, such as those with drastically high/low temperatures, sandy environments and/or air with a higher than normal salt content, the intervals may be adjusted.

CAUTION: The NAA of the country where the aircraft is registered may, if deemed necessary, choose to shorten and/or lengthen the time limit/inspection intervals in this chapter. The aircraft owner/operator is required to acquaint themselves with NAA alterations/changes before maintaining/servicing the aircraft.

NOTE: Pipistrel reserves the right to change the contents of this manual, including maintenance intervals, and all/any changes will be published in the form of a revision.

NOTE: Only qualified aircraft mechanics with the appropriate rating are permitted to carry out the maintenance procedures outlined in this maintenance manual.

NOTE: A record of all maintenance performed on the aircraft must be indicated in the aircraft logbook.

NOTE: The aircraft maintenance mandated in this chapter is to be performed according to flight time, the engine maintenance is to be performed according to the "HOBBS" value displayed on the MFD, while items with calendar time intervals shall be serviced according to the time that has elapsed since the dates found in the document "List of Limited Life-Time Items for Aircraft" (LLLTI), supplied with aircraft.

05-10 TIME LIMITS

Certain components installed on the Pipistrel aircraft have time limits, which dictate when, at the latest, they should be overhauled or replaced. These same components can and should be replaced/overhauled prior to the interval listed if, upon inspection, it's determined that they're faulty, unserviceable, have incurred damage or are in bad condition.

CAUTION: All of the time limits outlined in Table 05-001 must be considered when performing the 100 hour/Annual inspection. Removal or overhaul of any these items must be entered into the aircraft technical log book.

CAUTION: If a components time limit is to occur before the next planned inspection, it must be included in the current inspection.

NOTE: The limits mentioned in Table 05-001 DO NOT indicate product lifetime and must not be interpreted as such.

NOTE: The aircraft owner/operator and/or the person maintaining/servicing the aircraft is required to acquaint themselves with and implement the time limits listed in the various maintenance manuals referred to in Table 05-001.

Item No.	Description	Interval		Maintenance		Notes/Reference
		HRS	YRS	OH	RPLC	
1	Landing gear - tires		5		X	See 32-41
2	Beringer brake caliper pistons	3000*	5*		X	*Whichever comes first or in case of rejected take-off, see [v2]
3	Beringer brake rubber seals	3000*	5*		X	*Whichever comes first, anytime the seals are removed/ uninstalled (i.e. piston replacement) or in case of rejected take-off see [v3]
4	Standard wheel/brake assembly - brake lines				O/C	See 32-00
5	Hydraulic brake fluid	3000*	5*		X	*Whichever comes first Drain the brake system, see 12-20: 2.7. Perform inspection check 32-42: 2.4. Replenish the brake system, see 12-10: 2.5.
6	Propeller Assembly	Depending on the applicable				See applicable [10]
7	Engine Fuel Pump		5		X	See [1], see [v1]
8	Auxiliary Fuel pump	2000			X	
9	Standard muffler	1000			X	See 78-20
10	Akrapovič single and double tail pipe muffler	2000			X	See 78-20
11	Exhaust system springs and fire protection				X	On condition - all springs
12	Throttle and choke cables		5		X	See [v1]
13	Engine	2000	15	X		See [1]–Extending or exceeding the TBO by %5 or 6 months is allowed, whichever comes first
14	Coolant		5		X	[v1] Or during overhaul at the latest or when the engine is replaced, whichever comes first
15	Nose gear shock absorber	2000			X	See 32-20
16	All flexible fuel lines		5		X	See [v1]
17	Flexible oil lines		5		X	See [v1]
18	Flexible vent lines		5		X	See [v1]
19	Rubber coolant hoses		5		X	See [v1]
20	Gascolator filter		5		X	See [v1]
21	Gascolator O-ring				X	Upon reassembly, always
22	Engine mount rubber isolators		5*		X	*Replace earlier if required. See [1], see [v1]
23	Fuel filter	500	5*		X	*Whichever comes first, see [v1]
24	GRS ballistic parachute rescue system		30		X	*Rescue system needs to be removed, sent to OEM and replaced. See 95-00
25	GRS ballistic parachute rescue system		6 or 9*			*Rescue system needs to be removed and sent to OEM for repacking. See 95-00
26	Control system springs (rudder, el.trim, stabilizer main bolt)	500			X	
27	Throttle and choke control cables		5		X	
28	ELT battery	1*			X	* After one hour of real transmission or before/on the battery expiration date. See [11]
29	ELT system		6*			* Various tests, inspection and replacements. See [11]
30	Battery		*		X	* 8 yrs for EarthX and 5 yrs for Aliant battery

Table 05-001
Time Limits

05-20 SCHEDULED MAINTENANCE

The inspection schedule outlined in this chapter is what the manufacturer, Pipistrel d.o.o, regards as the minimum, in order to keep the aircraft in airworthy condition. The owner/operator is responsible for keeping the aircraft in airworthy condition and shall use this chapter as a guide. It is not, however, by any means the only guide that should be used. The NAA airworthiness directives in the country the aircraft is registered in MUST be adhered to. Maintenance/service personnel is chosen by the aircraft owner/operator and thus it is also his/her responsibility to ensure they are qualified.

CAUTION: The owner/operator must give any personnel carrying out maintenance/servicing procedures on the aircraft access to records of any past maintenance, as well as all of the aircraft's documentation.

VISUAL INSPECTION

The most common task found in the Aircraft's inspection schedule is the visual inspection. This is essentially an inspection to determine the general state of a component and typically does not require disassembly/removal of any other assemblies/equipment nearby. It is to be performed according to the following criteria and with any/all aids deemed necessary:

Metal Parts – discoloration due to heat exposure, distortion, wear/cracks due to fatigue, corrosion, weld damage, cleanliness and any other forms of damage.

Moving Components – Proper and unhindered operation, alignment, sufficient sealing, cleanliness, sufficient lubrication, travel, general condition, fastening material secured, signs of excessive wear, cracking, corrosion, deformation, and any other forms of damage.
Fuel, Air, coolant, and Oil Lines – Kinks, deterioration, chafing, poor flexibility, obstruction, bend radius, cleanliness, sufficiently secured/fastened and any other forms of damage.

Fastening Material - corrosion, wear, damage, loosening (paint marker) and safety wiring intact.

Composite Components – general condition, cleanliness, deformation, dents, warpage, cracks, scratches and any other forms of damage/wear. Composite surfaces that are bare, therefore, not painted, can also be checked for signs of delamination, fluid saturation and wear.

NOTE: If any composite component damage is found, a tap test should be performed to determine how extensive it is. Refer to 51-10 for additional guidelines on how to properly perform a visual inspection and/or tap test on composite components.

Electrical Installations - loose, corroded, or broken terminals/connectors; chafed, broken, or worn insulation; fastening material intact, heat deterioration, deformation, hardening, and any other forms of damage.

Filters and Screens - contamination, obstructions, signs of wear/damage.

Areas with Liquids - Evidence of leaks, sealant condition, signs of bacteria growth, cleanliness, corrosion, delamination, separation of bond, and structural fatigue.

OPERATIONAL INSPECTION

The second most common task found in the Aircraft's inspection schedule is the operational inspection. This is essentially an inspection to determine whether the component/part/assembly functions properly and does what it's supposed to do. Operational inspections of control surfaces must include a positive check, which is where one person holds the control surface steady, while the other moves the flight controls in both directions. This check confirms that movement of the flight controls results in movement of the control surface.

NOTE: It is expected that whenever a specific part or component is inspected, the inspection will include observation and evaluation of the component's surrounding area.

SCHEDULED MAINTENANCE PROGRAMS AND REQUIREMENTS

All airplanes of EU registry must undergo a complete "a 100 Hour Inspection Program" each 12 calendar months and additional requirements of the NAA of the country where the airplane is registered.

The 100 Hour Inspection Program is required, in addition to a complete Annual Inspection, for all airplanes of EU registry.

Inspection Program Intervals

Annual Inspection Time Intervals

The inspection interval to the next Annual Inspection may not exceed twelve calendar months. For Example: If an inspection were signed off on 14 June 2005, the next Annual Inspection would be due and must be accomplished no later than 30 June 2006. All subsequent Annual Inspections will be due in June unless the schedule is reset by performing an Annual Inspection early.

100 Hour Inspection Time Intervals

The interval between 100 Hour Inspections should never be exceeded by more than 10 hours, and then only if additional time is required to reach a place where the inspection can be satisfactorily accomplished. Additionally, the time the interval was exceeded must be included as flight hours in the next interval. For example: If a 100 Hour Inspection was due at 650 flight hours and was actually signed-off at 658 flight hours, the next 100 Hour Inspection is due at 750 flight hours, not 758 flight hours. Inspection tolerances cannot be accumulated.

Airplane Operational and Functional Checks

Operational and Functional Checks must be performed before and after Scheduled Maintenance Inspections to detect any airplane abnormalities or malfunctions. These inspections are listed in chapter 05-30, Airplane Operational and Functional Checks. (See 05-30).

Unscheduled Maintenance Checks

Abnormal airplane operations require special maintenance checks. Definitions and inspection procedures for hard/overweight landings, exceeded speed limit, severe air turbulence, lightning strike, high drag/side loads due to ground handling, and ground gusts are listed in chapter 05-50, Unscheduled Maintenance Checks.

SCHEDULED INSPECTION REPORT

All references to “05-20” under the “ATA Ref” reference column are to be understood as reference to Visual Inspection criteria defined above under Inspection Groups and Criteria.

Overhaul and Replacement Times

The overhaul and replacements times are listed in chapter 05-10, Time Limits. These maintenance items must be incorporated into the 100 Hour or Annual Inspections as applicable.

Special Inspections

Special Inspections are highlighted in red and always denoted with a bracketed asterisk [*]. Those special inspections beginning with the word “And” indicate that the special inspection is to be performed IN ADDITION TO the regularly scheduled interval. For example, the following inspection states that in addition to changing engine oil every 50 Hours, the oil should be changed after the first 25 hours of operation as well.

Fuselage and Empennage Group	ATA Ref	50 Hr	Annual/ 100 Hr
Tail skid - Visual inspection. *Special Inspection: And after first 25 hours	05-20	[x]	[ ]

Note: The inspection above is an example and not part of the scheduled inspection report.

If the special inspection includes the word “Only”, this means that the it’s to be performed ONLY at the specified time interval. For example, the following inspection states that the Cabin Air Control Assembly Inspection/Check should only be performed every 500 hours or every 5 years, whichever occurs first.

Cabin Group	ATA Ref	50 Hr	Annual/ 100 Hr
Fuselage skin/shell - Perform inspection/check + major bonding lines tap test *Major Inspection: Only every 2000 FH (see 53-10: 2.1.)	53-10: 2.1.1. 51-10: 2.2.	[ ]	[x]

Note: The inspection below is an example and not part of the scheduled inspection.

Major Inspections

Major Inspections are also highlighted in red and accompanied by the word “and” or “only” (see Special Inspections). They are thorough, in-depth inspections that determine whether or not the load-bearing components have incurred any wear/damage that may affect the airworthiness of the aircraft.

Scheduled Inspection Report			
Make: PIPISTREL ALPHA Trainer	Model: ALPHA Trainer (Rotax 912 UL) ALPHA Club	Serial Number:	Registration Number:
Owner:	Date:	Place:	
Type of Inspection: [ ] 50 Hour [ ] 100 Hour	[ ] Annual [ ] 200 Hour [ ] 500 Hour [ ] 1000 Hour [ ] 10000 Hour	Operating Time: Flight Hours: Landings:	

Item No.	Pre-Inspection	ATA Ref	50 Hr	Annual/ 100 Hr	200 Hr	500 Hr	1000 Hr	10000 Hr
1	Wash and clean the aircraft fully (external and internal)	12-20: 2.6.	[ ]	[x]	[ ]	[ ]	[ ]	[ ]
2	Operational/Functional Check Perform an airplane run-up in accordance with Operational Check in 05-30. Record of all abnormalities during the inspection. After completing the Operational Check, perform a walk around to detect fluid leaks or other abnormalities.	05-30	[ ]	[x]	[ ]	[ ]	[ ]	[ ]
3	Review compliance status with current NAA Aviation Regulations. This includes inspection of the following: - Aircraft Log Book - Registration Certificate - Certificate of Airworthiness - Weight and Balance Record - NAA Airworthiness Directives - POH **NOTE:** Please refer to Pipistrel Website and Tech Pub Portal for the current status of all Pipistrel documents that apply to the the airplane.	-	[ ]	[x]	[ ]	[ ]	[ ]	[ ]

05-20
SCHEDULED MAINTENANCE

Item No.	Engine Group	ATA Ref	50 Hr	Annu-al/ 100 Hr	200 Hr	500 Hr	1000 Hr	10000 Hr
1	25 Hour Inspection On new, rebuilt, or overhauled engine, perform complete 100-Hour Engine Inspection in accordance with the manufacturer's approved Instructions for Continued Airworthiness, see [1]; ***Special Inspection: Only first 25 hours,**		[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
2	Perform 100-Hour Engine Inspection in accordance with the manufacturer's approved Instructions for Continued Airworthiness, see [1] chapter 05-20-00 ***Special inspection: and if more than 30% of AV-GAS is used.**		[*]	[x]	[ ]	[ ]	[ ]	[ ]
3	Engine Cowling - Perform visual Inspection Perform operational inspection of oil filler door.	05-20	[ ]	[x]	[ ]	[ ]	[ ]	[ ]
4	Foam baffling/seals - Visual Inspection, replace if necessary	05-20 71-00: 2.2.	[ ]	[x]	[ ]	[ ]	[ ]	[ ]
5	Throttle and choke cable connections on hot side of firewall - Visual Inspection + lubrication	05-20 12-20 76-00: 2.2.1. 53-30: 2.1.1.	[ ]	[x]	[ ]	[ ]	[ ]	[ ]
6	Gascolator - Visual inspection and inspection/cleaning ***Special Inspection: and after first 5 and 50 hours**	05-20 28-20: 2.1.3.	[ ]	[x]	[ ]	[ ]	[ ]	[ ]
7	Exhaust System Visual Inspection for soot, distortion, general condition.	05-20	[ ]	[x]	[ ]	[ ]	[ ]	[ ]
8	Engine cooling air inlet and diffuser - Visual Inspection	05-20	[ ]	[ ]	[x]	[ ]	[ ]	[ ]
9	Exhaust System Perform inspection/check *100 hours for standard exhaust system, 500 hours for either of the Akrapovič systems	05-20 78-20: 2.1	[ ]	[ ]	[ ]	[x]	[ ]	[ ]
10	Engine mount and mounting fixture - Perform inspections/checks	71-20: 2.1.1. 71-20: 2.2.1.	[ ]	[x]	[ ]	[ ]	[ ]	[ ]
11	Firewall - Perform inspection/check	53-30: 2.1.1.	[ ]	[ ]	[ ]	[ ]	[x]	[ ]
12	Battery cables - Visual inspection	05-20	[ ]	[x]	[ ]	[ ]	[ ]	[ ]
13	Lubrication - Time interval depends on the component, please check the table for details.	12-20: 2.5.	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
14	Vibration damping isolators	71-20: 2.2.1.	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
16	Carburetor drip collector line - Inspection/check	71-70: 2.1.1.	[ ]	[x]	[ ]	[ ]	[ ]	[ ]
17	Oil reservoir breather line - Inspection/check	71-70: 2.2.1.	[ ]	[x]	[ ]	[ ]	[ ]	[ ]

Item No.	Propeller Group	ATA Ref	50 Hr	Annu-al/ 100 Hr	200 Hr	500 Hr	1000 Hr	10000 Hr
1	Spinner * See applicable propeller manual [10]		[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
2	Blades * See applicable propeller manual [10]		[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
3	Propeller Hub * See applicable propeller manual [10]		[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

Item No.	Cabin Group	ATA Ref	50 Hr	Annu-al/ 100 Hr	200 Hr	500 Hr	1000 Hr	10000 Hr
1	Cabin windows and windshield - Visual Inspection for cracking, crazing, and general condition. Perform inspections/checks	05-20 56-00	[ ]	[x]	[ ]	[ ]	[ ]	[ ]
2	Magnetic Compass - Visual Inspection	05-20	[ ]	[x]	[ ]	[ ]	[ ]	[ ]
3	Placards and Instrument Markings - Visual Inspection for conformity, security, and con-dition. Replace if necessary.	05-20 11-20	[ ]	[x]	[ ]	[ ]	[ ]	[ ]
4	Upholstery - Visual Inspection	05-20	[ ]	[ ]	[ ]	[x]	[ ]	[ ]
5	Seats Visual and operational inspection	05-20	[ ]	[x]	[ ]	[ ]	[ ]	[ ]
6	Seats - Operational inspection: pneumatic pump/backrest bladder	05-20	[ ]	[ ]	[ ]	[x]	[ ]	[ ]
7	Safety harnesses Visual and operational inspection	05-20	[ ]	[x]	[ ]	[ ]	[ ]	[ ]
8	Instrument Panel Visual Inspection	05-20	[ ]	[x]	[ ]	[ ]	[ ]	[ ]
9	Avionics + Switch panel Master switch ON - Avionics switch ON. Perform visual and operational inspection	05-20	[ ]	[ ]	[x]	[ ]	[ ]	[ ]
10	Control stick + control stick drive - Perform inspections/checks ***Major Inspection: Only every 3000 Hr (see 27-30: 2.4.2. and 27-30: 2.5.2.).**	27-30: 2.4.1. 27-30: 2.5.1.	[ ]	[x]	[ ]	[ ]	[ ]	[ ]
11	Wiring behind the instrument and switch panel – Perform inspection/check	05-20 31-10: 2.3.3. 31-10: 2.1.1.	[ ]	[ ]	[ ]	[x]	[ ]	[ ]
12	Rudder Control System - Perform inspections/checks	27-20: 2.1.3. 27-20: 2.3. 27-20: 2.2.1.	[ ]	[x]	[ ]	[ ]	[ ]	[ ]
13	Brake actuation hand lever - Visual and operational Inspection	05-20	[ ]	[x]	[ ]	[ ]	[ ]	[ ]
14	Flexible Brake Hoses - Visual Inspection -	05-20	[ ]	[ ]	[x]	[ ]	[ ]	[ ]
15	Fuel System Perform inspection/check	28-20: 2.3.3. 28-20: 2.4.1.	[ ]	[ ]	[x]	[ ]	[ ]	[ ]
16	Cabin Doors - Perform inspection/check	52-10: 2.1.3.	[ ]	[x]	[ ]	[ ]	[ ]	[ ]

continued on the next page

Item No.	Cabin Group	ATA Ref	50 Hr	Annu-al/ 100 Hr	200 Hr	500 Hr	1000 Hr	10000 Hr
16	Cabin Doors - Perform inspection/check	52-10: 2.1.3.	[ ]	[x]	[ ]	[ ]	[ ]	[ ]
17	Wing spar fastening material – Remove wings and perform visual inspection of wings spar pins/bolt	05-20 57-10: 2.1.1.	[ ]	[ ]	[x]	[ ]	[ ]	[ ]
19	Rudder Control System - Perform inspections/checks	27-20: 2.1.2. 27-20: 2.2.1. 27-20: 2.1.3.	[ ]	[ ]	[x]	[ ]	[ ]	[ ]
20	Ventilation system – Adjustable circular vents Visual and operational inspection	05-20	[ ]	[ ]	[x]	[ ]	[ ]	[ ]
21	GRS ballistic parachute rescue system activation handle - Perform inspection/check	95-00: 2.1.1.	[ ]	[ ]	[ ]	[x]	[ ]	[ ]
22	HORIS - Kanardia (if installed) – Visual inspection - see OEM Documentation	05-20	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
23	Battery installation – Visual inspection of mounting bracket, cables, terminals	05-20	[ ]	[x]	[ ]	[ ]	[ ]	[ ]
24	Battery installation – Perform inspection/check	24-30: 2.1.2.	[ ]	[ ]	[x]	[ ]	[ ]	[ ]
25	Flaperon control system - Perform inspections/checks *Major Inspection: Only every 3000 FH (see 27-50: 2.4.2.).	27-50: 2.1.1. 27-50: 2.2.1. 27-50: 2.3. 27-50: 2.4.1. 27-50: 2.5.1.	[ ]	[ ]	[x]	[ ]	[ ]	[ ]
26	Brake system hydraulic fluid Check and replenish if necessary	12-10: 2.5.	[ ]	[x]	[ ]	[ ]	[ ]	[ ]
27	Cabin floor - Perform inspection/check + tap test	53-20: 2.1.1.	[ ]	[ ]	[ ]	[x]	[ ]	[ ]
28	Elevator control system - Perform inspections/checks *Major Inspection: Only every 3000 FH (27-30: 2.2.2.).	27-30: 2.2.1. 27-30: 2.3.1. 27-30: 2.1.	[ ]	[ ]	[x]	[ ]	[ ]	[ ]
29	Fuel filter and fuel pump Perform inspection/check *Special Inspection: and after first 5 hours	28-20: 2.3.3.	[ ]	[x]	[ ]	[ ]	[ ]	[ ]
30	Lubrication - Time interval depends on the component, please check the table for details.	12-20: 2.5.	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
31	ELT - Visual inspection	05-20	[ ]	[ ]	[x]	[ ]	[ ]	[ ]
32	ELT - Special Inspection in accordance with NAA: Only every 24 months or earlier if required by NAA where the aircraft is registered. See [11]/[12] and contact NAA	-	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
33	Transponder - Special Inspection in accordance with NAA: Only every 24 months or earlier if required by NAA where the aircraft is registered. See [8] and con-tact NAA	-	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
34	Air-brake control system - Perform inspections/checks	27-60: 2.1.1. 27-60: 2.2.1.	[ ]	[ ]	[x]	[ ]	[ ]	[ ]
35	Flight compartment - Inspection/check	33-10: 2.1.1.	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
36	Pitot-static system test - *Special inspection in accordance with NAA: Only every 24 months or as required by the local NAA	34-10	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

Item No.	Landing Gear Group - Standard Brakes	ATA Ref	50 Hr	Annu-al/ 100 Hr	200 Hr	500 Hr	1000 Hr	10000 Hr
1	Main Landing Gear Fairings - Visual inspection	05-20	[ ]	[x]	[ ]	[ ]	[ ]	[ ]
2	Nose Landing Gear Fairing - Visual inspection	05-20 32-20: 2.1.1.	[ ]	[x]	[ ]	[ ]	[ ]	[ ]
3	Tires - Visual inspection and check/replenish tire pressure	05-20 12-10: 2.4.	[ ]	[x]	[ ]	[ ]	[ ]	[ ]
4	Wheels - Visual and operational Inspection. Replace bear-ings on condition.	05-20	[ ]	[x]	[ ]	[ ]	[ ]	[ ]
5	Brake system - Perform inspection/check - Visual Inspection for leaks, chafing, security, and condition.	32-42: 2.1.1. 32-42: 2.2.2.	[ ]	[ ]	[x]	[ ]	[ ]	[ ]
6	Nose gear - Perform Inspection/Check	32-20: 2.2.1. 32-50: 2.1.1.	[ ]	[x]	[ ]	[ ]	[ ]	[ ]
7	Main landing gear strut - Perform inspection/check. Major Inspection after a hard landing (see 05-50: 2.2.)	32-10: 2.1.1.	[ ]	[x]	[ ]	[ ]	[ ]	[ ]
8	Nose gear fork - Perform Inspection/Check	32-20: 2.2.1.	[ ]	[ ]	[x]	[ ]	[ ]	[ ]
9	Lubrication - Time interval depends on the component, please check the table for details.	12-20: 2.5.	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

Item No.	Landing Gear Group - Beringer	ATA Ref	50 Hr	Annu-al/ 100 Hr	200 Hr	500 Hr	1000 Hr	10000 Hr
1	Main Landing Gear Fairings - Visual inspection	05-20 32-20: 2.1.3.	[ ]	[x]	[ ]	[ ]	[ ]	[ ]
2	Nose Landing Gear Fairing - Visual inspection	05-20	[ ]	[x]	[ ]	[ ]	[ ]	[ ]
3	Prop up one side of the aircraft.	07-10: 2.1.1.	[ ]	[x]	[ ]	[ ]	[ ]	[ ]
4	Tires - Visual inspection and check/replenish tire pressure	05-20 12-10: 2.4.	[ ]	[x]	[ ]	[ ]	[ ]	[ ]
5	Wheels - Perform inspection/check	32-41: 2.2.3	[ ]	[x]	[ ]	[ ]	[ ]	[ ]
6	Brake system - Perform inspection/check	32-42: 2.2.1. 32-42: 2.4.1.	[ ]	[x]	[ ]	[ ]	[ ]	[ ]
7	Measure brake pad thickness. If pads are less than 1 mm thick or wear indicator is invisible, remove pads, perform inspection/check and install new pads.	32-41: 2.2.1. [v1] 32-42: 2.4.1. 32-41: 2.2.2.	[ ]	[x]	[ ]	[ ]	[ ]	[ ]
8	Measure brake discs thickness. If discs are less than 2.8 mm thick, remove discs, perform inspec-tion/check and install new discs.	32-41: 2.2.1. [v1] 32-42: 2.4.3. 32-41: 2.2.2.	[ ]	[x]	[ ]	[ ]	[ ]	[ ]
9	Remove the landing gear stand from under the landing gear strut. Prop up the other side of the air-craft and perform steps 5 to 8 on the other wheel/ brake system.	07-10: 2.1.1.	[ ]	[x]	[ ]	[ ]	[ ]	[ ]

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Item No.	Landing Gear Group - Beringer	ATA Ref	50 Hr	Annu-al/ 100 Hr	200 Hr	500 Hr	1000 Hr	10000 Hr
10	Remove the landing gear stand from under the landing gear strut.	07-10: 2.1.1.	[ ]	[x]	[ ]	[ ]	[ ]	[ ]
11	Nose gear - Perform Inspection/Check	32-20: 2.2.1.	[ ]	[x]	[ ]	[ ]	[ ]	[ ]
12	Main landing gear strut - Perform inspection/check. **Major Inspection if equiupped with MLG strut access patch (see** Figure 32-003)**:** **Only every 2000 hours (see** 32-10: 2.1.2.) **or after a hard landing (see 05-50: 2.2.)**	32-10: 2.1.1.	[ ]	[x]	[ ]	[ ]	[ ]	[ ]
13	Nose gear Perform inspections/checks	32-50: 2.1.1. 32-20 2.2.1.	[ ]	[ ]	[x]	[ ]	[ ]	[ ]
14	Lubrication - Time interval depends on the component, please check the table for details.	12-20: 2.5.	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

*If/when replacing brake pads and/or discs, also perform inspection/check of wheel and brake assembly, see 32-40: 2.1.1.

Item No.	Fuselage and Empennage Group	ATA Ref	50 Hr	Annu-al/ 100 Hr	200 Hr	500 Hr	1000 Hr	10000 Hr
1	Exterior Placards Visual Inspection for conformity, security, and con-dition. Replace if necessary.	05-20 11-10	[ ]	[x]	[ ]	[ ]	[ ]	[ ]
2	Fuselage skin/shell - Perform inspection/check + major bonding lines tap test ***Major Inspection: Only every 2000 FH (see 53-10: 2.1.)**	53-10: 2.1.1. 51-10: 2.2.	[ ]	[x]	[ ]	[ ]	[ ]	[ ]
3	GRS ballistic parachute rescue system - Perform inspection/check	05-20	[ ]	[x]	[ ]	[ ]	[ ]	[ ]
4	Vertical Stabilizer and Rudder Surfaces – Visual Inspection + vertical stabilizer major bonding line tap test	05-20 51-10: 2.2.	[ ]	[x]	[ ]	[ ]	[ ]	[ ]
5	Rudder Control System – Perform inspections/checks.	27-20: 2.1.1. **	[ ]	[x]	[ ]	[ ]	[ ]	[ ]
6	Rudder Control System – Perform inspections/checks	27-20: 2.1.1. 27-20: 2.4. 27-20: 2.5.1. 27-20: 2.6.1. 27-20: 2.7.1.	[ ]	[ ]	[x]	[ ]	[ ]	[ ]
7	Horizontal Stabilizer and Elevator Surfaces - Visual Inspection + horizontal stabilizer major bonding line tap test	05-20 51-10: 2.2.	[ ]	[x]	[ ]	[ ]	[ ]	[ ]
8	Horizontal Stabilizer and Elevator Surfaces - Perform inspection/check	55-20: 2.1.3.	[ ]	[ ]	[x]	[ ]	[ ]	[ ]
9	Vertical/horizontal stabilizer – Perform inspections/checks	55-30: 2.1.1. 55-10: 2.1.3.	[ ]	[x]	[ ]	[ ]	[ ]	[ ]
10	Vertical stabilizer – Perform inspections/checks + tap test	55-30: 2.1. 51-10: 2.2.	[ ]	[ ]	[ ]	[x]	[ ]	[ ]
11	Elevator Control System Perform inspections/checks	27-30: 2.4.1. 27-30: 2.5.1.	[ ]	[x]	[ ]	[ ]	[ ]	[ ]

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Item No.	Fuselage and Empennage Group	ATA Ref	50 Hr	Annual/ 100 Hr	200 Hr	500 Hr	1000 Hr	10000 Hr
12	Elevator Control System Perform inspections/checks *Major Inspection: Only every 2000 FH (see 27-30: 2.6.2.)	27-30: 2.6.1.	[ ]	[ ]	[x]	[ ]	[ ]	[ ]
13	Fuselage Vent/Drain Holes Visual Inspection for obstructions or blockage.	APPENDIX 99-D	[ ]	[x]	[ ]	[ ]	[ ]	[ ]
14	Antennas - Visual inspection	05-20	[ ]	[x]	[ ]	[ ]	[ ]	[ ]
15	Baggage compartment - Visual Inspection of composite around safety harness attachment points	05-20	[ ]	[ ]	[ ]	[x]	[ ]	[ ]
16	Control Surface and Stabilizer Vent/Drain Holes - Visual Inspection for obstructions or blockage.	APPENDIX 99-D	[ ]	[ ]	[x]	[ ]	[ ]	[ ]
17	Lubrication - Time interval depends on the component, please check the table for details.	12-20: 2.5.	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

**perform without removing the rudder (2.1.1.3) for the 100-hour check, just move rudder to one side and inspect/check. Perform with rudder removed every 200 hours.

Item No.	Wing Group	ATA Ref	50 Hr	Annual/ 100 Hr	200 Hr	500 Hr	1000 Hr	10000 Hr
1	Wing surface - Visual Inspection for general condition, deterioration, delamination, distortion, cracks, paint condition, and other evidence of failure. *Major Inspection: Only every 2000 FH (see 57-10: 2.1.3.).	05-20	[ ]	[x]	[ ]	[ ]	[ ]	[ ]
2	Wing Leading Edge Visual Inspection for foreign matter and debris + leading edge bonding line tap test	05-20 51-10: 2.2.	[ ]	[x]	[ ]	[ ]	[ ]	[ ]
3	Flaperon Surfaces - Visual Inspection	05-20	[ ]	[x]	[ ]	[ ]	[ ]	[ ]
4	Flaperon system free play- Perform inspection/check	27-50: 2.1.3. 27-50: 2.1.4.	[ ]	[ ]	[x]	[ ]	[ ]	[ ]
5	Flaperon surfaces- Perform inspection/check	57-50: 2.1.2.	[ ]	[ ]	[x]	[ ]	[ ]	[ ]
6	Pitot tube - Visual inspection	05-20	[ ]	[x]	[ ]	[ ]	[ ]	[ ]
7	Wing Vent/Drain Holes - Visual Inspection for obstructions or blockage.	APPENDIX 99-D	[ ]	[x]	[ ]	[ ]	[ ]	[ ]
8	Air brakes - (if installed) Perform inspections/checks	57-70: 2.1.	[x]	[ ]	[ ]	[ ]	[ ]	[ ]
9	Lubrication - Time interval depends on the component, please check the table for details.	12-20: 2.5.	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
10	NAV/STROBE lights - Inspection/check	33-40: 2.1.1. 33-40: 2.2.1.	[ ]	[x]	[ ]	[ ]	[ ]	[ ]

05-30 AIRPLANE OPERATIONAL AND FUNCTIONAL CHECK

The following check must be performed before and after the Scheduled Maintenance Inspection to detect any airplane abnormalities or malfunctions. A portion of the check is accomplished with the engine running and warmed up. Please refer to the aircraft POH [4] for additional details about operating procedures and equipment.

WARNING: In order to perform the following check, the engine must be operating. Do not stand or let anyone else stand close to the arc of the airplane's propeller while conducting this check.

CAUTION: During all engine operations outlined in this check, exercise caution to avoid harm or damage to personnel and equipment due to propeller blast and rotating propeller blades.

CAUTION: Excessive engine temperatures must be avoided since run-up temperatures must closely parallel in-flight temperatures.

Item No.	Operational Inspection Report	Check	Notes
1	Flight Controls Check for full range of travel and excessive friction. Visual Inspection for obstructions.		
2	Engine Controls Check full range of motion without any obstruction or excessive friction to travel.		
3	MASTER switch + AVIONICS switch When switches are toggled ON the following should occur (see aircraft specific POH for a more detailed description of the equipment installed): — EMS/HORIS turn on and run with no indication of any errors (See POH). — Other electrically powered flight instruments turn on (See POH). — Radio and transponder turn on.		
4	Engine — Start engine (see POH). — Check that starter spins propeller without slipping or dragging. — Set engine speed to 2500 RPM and wait till oil temperature reaches green arc (50°C). — Check that the oil pressure is in the green arc within 30 seconds. — Check that the fuel pressure is in the green arc. — Check voltage. — Set engine to 4000 RPM and carry out magneto check as per latest version of Rotax 912 series MM. — Throttle full forward for 5 seconds. Engine RPM should indicate between 5300 and 5600. **NOTE: The RPM should not exceed 5800 at anytime during operation.** — Check that brakes hold aircraft stationary at full power with no slipping. — Set engine to idle. Engine should cease when ignition key set to magneto OFF position. — Shut down (see POH).		

05-50 UNSCHEDULED MAINTENANCE

1. Description

The following describes those maintenance checks and inspections on the aircraft which are dictated by special or unusual conditions which are not related to the time limits specified in 05-10, Scheduled Maintenance Checks.
These includes inspections and checks for wing strike, hard/overweight landing, exceeded speed limit, severe air turbulence, lightning strike, high drag/side loads, ground gusts, operation in harsh environmental conditions, and operation on unimproved runway surfaces.

2. Maintenance practices

05-50: 2.1. Wing strike

05-50: 2.1.1. Fuselage

Step	Action	Required parts, materials and tools	Reference
1	Aft Floor Structure – Area around and under the wing attach points and overhead seat areas, inspect for delamination, cracking, whitening, and any other evidence of structural damage.		

05-50: 2.2. Hard landing

NOTE: A hard landing is any landing made at what is believed to be an excessive sink rate. An overweight landing is defined as landing the airplane at any gross weight which exceeds the maximum landing weight as specified in the Pilot's Operating Handbook. If the hard/overweight landing is combined with high drag/side loads, additional checks are required.

05-50: 2.2.1. Fuselage

Step	Action	Required parts, materials and tools	Reference
1	Aft Floor Structure – Inspect for delamination, cracking, whitening, and any other evidence of structural damage.		
2	Main landing gear strut - Inspect for security of attachment, permanent deformation, delamination, and cracking or splintering of strut.		32-10: 2.1.2.
3	Main gear attachments and supporting structure - Inspect for security loose or failed fasteners, permanent deformation, tire damage, and any other evidence of structural damage.		

continued on the next page

Step	Action	Required parts, materials and tools	Reference
4	Nose gear and attaching structure - Inspect for security, loose or failed fasteners, permanent deformation of strut or axle, strut weld cracks, puck delamination and cracks, puck pan weld cracks, engine mount weld cracks, tire damage, and any other evidence of structural damage.		
5	Wings surface - Inspect for skin cracks, loose of failed fasteners, and any evidence of structural damage.		
6	Trailing edge - Inspect for any deformation effecting normal flaperon operation.		

05-50: 2.3. Exceeded speed limit

An exceeded speed limit inspection must be performed anytime the airplane has exceeded one or both of the following:

- exceeding placard speed limits of flaps.

- exceeding design speeds.

05-50: 2.3.1. Fuselage

Step	Action	Required parts, materials and tools	Reference
1	Landing gear - Main gear axle and fittings - Inspect for cracks, security, and evidence of structural dam- age. Tires - Inspect tires for flat spots, excessive wear, and tire slip-page on the wheel rim.		
2	Fuselage - Windshield and windows - Inspect for buckling, dents, loose or failed fasteners, and any evidence of structural damage.		
3	Cowling - Inspect for buckling, cracks, loose or failed fasteners, and indications of structural damage.		
4	Stabilizers - Inspect skins, hinges and attachments, movable surfaces, mass balance weights, and attaching structure for cracks, dents, buckling, loose or failed fasteners, and evidence of structural damage.		
5	Wings - Flaps - Inspect for skin buckling, cracks, loose or failed fasteners, attachments and structural damage.		

05-50: 2.3.2. Severe turbulence and/or maneuvers

Atmospheric conditions producing violent buffeting of airplane. Severe maneuvers can be defined as any maneuvers exceeding the Pilot's Operating Handbook and the airplane's flight limits.

Step	Action	Required parts, materials and tools	Reference
1	Horizontal stabilizer, hinge fittings, and fittings - Inspect for security, loose or failed fasteners, and any evidence of structural damage.		
2	Vertical stabilizer - Inspect for evidence of structural damage, and damage to hinges and fittings.		
3	Elevator and rudder balance weight supporting structure - Inspect for security, loose or failed fasteners, and evidence of structural damage.		
4	Wing to body fittings and supporting structure - Inspect for security, loose or failed fasteners, and evidence of structural damage.		
5	Wing trailing Edge - Inspect for and deformation affecting normal operation of flap and aileron.		

05-50: 2.4. Lightning strike

If flown through a region of the atmosphere where electrical discharge is occurring, the airplane may become part of the discharge path. During a lightning strike, the current enters the airplane at one point and exits another, usually at opposite extremities. It is in these entrance and exit points where damage is most likely to occur. Burning and/or eroding of small surface areas of the skin and structure may be detected during inspection. In most cases, the damage is obvious. In some cases, however, hidden damage may result. In the case of lightning strike, this inspection must be accomplished before returning it to service.

05-50: 2.4.1. Communications

Step	Action	Required parts, materials and tools	Reference
1	Antennas - Inspect all antennas for evidence of burning or eroding. If damage is noted, contact PIPISTREL for disposition. Any component connected to the antenna may need to be returned to manufacturer for servicing.		

05-50: 2.4.2. Navigation

Step	Action	Required parts, materials and tools	Reference
1	Compass should be considered serviceable if the corrected heading is within plus or minus 10 degrees of heading indicated by the remote compass system. If remote com- pass is not within tolerance, remove, repair, or replace.		

05-50: 2.4.3. Fuselage

Step	Action	Required parts, materials and tools	Reference
1	Skin - Inspect surface of fuselage skin for evidence of damage.		

05-50: 2.4.4. Stabilizers

Step	Action	Required parts, materials and tools	Reference
1	Inspect surfaces of stabilizers for evidence of damage.		

05-50: 2.4.5. Wings

Step	Action	Required parts, materials and tools	Reference
1	Skin - Inspect for evidence of burning and eroding.		
2	Wing tips - Inspect for evidence of burning and pitting.		
3	Flight surfaces and hinging mechanisms - Inspect for burning and pitting.		

05-50: 2.4.6. Landing gear/wheels

Step	Action	Required parts, materials and tools	Reference
1	Landing gear attach fittings and axles - Inspect for evidence of pitting and damage.		
2	Wheels - Inspect for evidence of pitting and damage.		
3	Wheel pants and fairings - Inspect fasteners for pitting and damage.		
4	Brake lines - Inspect for evidence of pitting, damage, or hydraulic fluid leaks.		

05-50: 2.4.7. Propeller

Step	Action	Required parts, materials and tools	Reference
1	Propeller - Inspect surfaces for evidence of damage. If damage is noted, remove from service and have inspected at an authorized repair station.		[2]

05-50: 2.4.8. Power plant

Step	Action	Required parts, materials and tools	Reference
1	Engine - See the manufacturer's approved Instructions For Continued Airworthiness.		

05-50: 2.4.9. Control system

Step	Action	Required parts, materials and tools	Reference
1	Check all bearings and joints for unhindered movement		

05-50: 2.5. High drag/side loads due to ground handling

A high drag/side load condition is defined as situations when the airplane skids or overruns from a prepared surface onto an unprepared surface. This condition can also be met due to landings short of prepared surfaces, landings which cause the blowing of tires, or skidding conditions where the safety of the airplane was in question. This covers takeoffs, landings, or unusual taxi conditions.

05-50: 2.5.1. Landing gear

Step	Action	Required parts, materials and tools	Reference
1	Main gear (fairings if included) - Inspect for loose or failed fasteners, buckling, security, cracks, and evidence of structural damage.		
2	Nose gear (fairings if included) - Inspect for loose or failed fasteners, cracks, security, buckling, and evidence of structural damage.		

05-50: 2.5.2. Wings

Step	Action	Required parts, materials and tools	Reference
1	Wing to fuselage fittings and attaching structure - Inspect for security, loose or failed fasteners, and evidence of structural failure.		

05-50: 2.6. Ground gusts

Ground gusts are defined as conditions where a parked or taxiing airplane is exposed to side, aft quartering, or aft wind gusts exceeding 40 knots. Such conditions can cause control system damage due to rapid oscillation and/or slamming of the control surfaces against system stops.

05-50: 2.6.1. Rudder

Step	Action	Required parts, materials and tools	Reference
1	Hinges - Inspect for loose or failed fasteners, deformation, cracks, evidence of structural damage, and for any other evidence of damage or premature wear.		
2	Attaching structure - Inspect for loose or failed fasteners, delaminating, cracks, evidence of structural damage, punctures, scratches, and for any other evidence of damage or pre- mature wear.		
3	Skin - Inspect for buckling, dents, misalignment, punctures, scratches, and for any other evidence of damage or premature wear.		

continued on the next page

Step	Action	Required parts, materials and tools	Reference
4	Attaching hardware - Inspect for loose or failed fasteners, deformation, cracks, security of mass balance weights, balance weight supporting structure and for any other evidence of damage or premature wear.		
5	Bellcrank - Inspect for failed fasteners, cracks and deformation.		

05-50: 2.6.2. Elevator

Step	Action	Required parts, materials and tools	Reference
1	Hinges - Inspect for loose or failed fasteners, deformation, cracks, evidence of structural damage, and for any other evidence of damage or premature wear.		
2	Attaching structure - Inspect for loose or failed fasteners, delaminating, cracks, evidence of structural damage, punctures, scratches, and for any other evidence of damage or pre- mature wear.		
3	Skin - Inspect for buckling, dents, misalignment, punctures, scratches, and for any other evidence of damage or premature wear.		
4	Bellcrank - Inspect for failed fasteners, cracks and deformation.		

05-50: 2.6.3. Flaperons

Step	Action	Required parts, materials and tools	Reference
1	Hinges - Inspect for loose or failed fasteners, deformation, cracks, evidence of structural damage, and for any other evidence of damage or premature wear.		
2	Attaching structure - Inspect for loose or failed fasteners, delaminating, cracks, evidence of structural damage, punctures, scratches, and for any other evidence of damage or pre- mature wear.		
3	Skin - Inspect for buckling, dents, misalignment, punctures, scratches, and for any other evidence of damage or premature wear.		

05-50: 2.7. Operation on unimproved runway surfaces

Operation on unimproved runway surfaces will cause additional wear and may require additional maintenance or inspection.

05-50: 2.8. Operation in humid areas

In humid areas, special care should be taken to keep engine, accessories, and airframe clean to prevent oxidation. Fuel and oil should be checked frequently and drained of condensation to prevent corrosion. Visually inspect flight control surfaces, nose landing gear and control systems for corrosion in accordance with best aviation maintenance practice.

06

CHAPTER 06- DIMENSIONS AND AREAS

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06-00 DIMENSIONS AND AREAS

This chapter outlines the basic dimensions/areas of the airplanes treated in this manual and the control surface travel/deflections.

1. Airplane dimensions and areas

Basic Dimensions	ALPHA Trainer (Type 160)	
	Metric	Imperial
Length	6.40 m	21.00 ft
Span	10.50 m	34.45 ft
Height	2.05 m	6.73 ft
WINGS		
Area	9.29 m^2	99.97 ft^2
MAC	0.90 m	2.95 ft
HORIZONTAL TAIL		
Area	1.02 m2	10.98 ft^2
Span	2.18 m	7.15 ft
VERTICAL TAIL		
Area	0.86 m^2	9.26 ft^2
Height	1.11 m	3.64 ft
Drawing ref.	Figure 06-001	

Figure 06-001
ALPHA Trainer 3-view drawing

2. Control surfaces deflection angles - checking positions

Please see APPENDIX 99-A.

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07

CHAPTER 07 – LIFTING AND SHORING

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07-00 GENERAL

This chapter covers the materials and procedures that apply to lifting and shoring the aircraft. The procedures outlined in this chapter mainly apply to situations where the aircrafts landing gear needs to be attended to, serviced and/or removed.

07-10 JACKING

1. Description

Particular maintenance procedures require propping certain parts of the aircraft up. Removing the main landing gear wheel, for example, requires propping up the landing gear strut. Removing the nose landing gear wheel, on the other hand, requires propping up the front end of the aircraft. A description of how to carry this out and the materials needed is outlined in this chapter.

2. Maintenance Practices

07-10: 2.1. Main landing gear strut

NOTE: Two people are required to carry out this procedure.

07-10: 2.1.1. Propping up one side

Step	Action	Required parts, materials and tools	Reference
1	Position the aircraft on a surface that is flat and hard.	- Landing gear stand (P/N 1190264) - Torx screwdriver set - T-handle hex head screwdriver set	
2	Lift the wing.		Figure 07-001
3	Place landing gear stand under landing gear strut.		Figure 07-002
4	Slowly lower wing so that the landing gear strut rests on the stand.		

Figure 07-001
Lifting the wing

Figure 07-002
Landing gear stand placement

NOTE: If necessary, the landing gear strut can be propped up on both sides using the same stand and following the same procedure as outlined above.

07-10: 2.2. Nose landing gear

07-10: 2.2.1. Propping up

Step	Action	Required parts, materials and tools	Reference
1	Position the aircraft on a surface that is flat and hard. **CAUTION:** Position the aircraft so it's front end is clear of all other objects. Make sure the propeller and/or engine cowlings won't hit anything when the front end is propped up.	- tail cone counterweight (oblong bean bag)	Figure 07-003
2	Slowly place counterweight on tail cone.		

Figure 07-003
Tail cone counterweight

07-20 SHORING

1. Description

Shoring/hoisting the aircraft is only necessary in a few instances, such as when the landing gear has failed or the aircraft's fuselage is badly damaged. This chapter describes the equipment needed and procedure that needs to be followed in order to shore/hoist the aircraft.

2. Maintenance Practice

07-20: 2.1. Hoisting the fuselage

CAUTION: Before lifting/hoisting the airframe always clear the immediate area of people and equipment.

07-20: 2.1.1. Hoisting the fuselage

Step	Action	Required parts, materials and tools	Reference
1	Remove the wings.	- Hoisting rod set	57-10
2	Slide both hoisting rods through the fuselage's cabin support strut assembly and secure them so they can't shift or move.		
3	Use chains or some heavy-duty nylon straps to fasten the hoisting rods to a crane or hoist.		
4	Use the crane/hoist to slowly lift the airframe from it's position. Adjust the hoisting rods, straps or chains if necessary.		
5	Prop the airframe up with some padded trestles.		

08

CHAPTER 08 – LEVELING AND WEIGHING

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08-00 GENERAL

This chapter provides all the information needed to level and weigh the airplane properly. If the aircraft is not operated in the right center of gravity envelope, flight performance and safety may be compromised. The aircraft must be weighed and the center of gravity calculated/checked every time a modification is carried out that could affect these characteristics.

08-10 LEVELING

1. Description

This chapter describes how to level the airplane for any maintenance procedures which may be necessary.

2. Maintenance practices

08-10: 2.1. Leveling

08-10: 2.1.1. Leveling the airplane using the leveling kit

Reference: POH **[5]**, APPENDIX 99-C

Step	Action	Required parts, materials and tools	Reference
1	Inflate tires.	- aircraft leveling kit (P/N 1190460) - Spirit level	12-10
2	Prop up starboard MLG wheel by pulling the port wing down and place MLG balance block under wheel. Do the same for the port MLG wheel by lifting the port wing.		
3	Prop up nose wheel by weighing down the tail cone. Place nose wheel wedge under wheel.		
4	Fit the tail cone with the leveling tool and place spirit level on it.		Figure 08-001
5	Adjust nose wheel wedge until the spirit level reads 0°.		

Figure 08-001
Leveling tool and spirit level setup

08-10: 2.1.2. Leveling the airplane without the leveling kit

This procedure can be use when the leveling kit is not available

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Inflate tires.	- digital level	12-10
2	Prop up starboard MLG wheel by pulling the port wing down and place MLG balance block under wheel. Do the same for the port MLG wheel by lifting the port wing.		
3	Prop up nose wheel by weighing down the tail cone. Place nose wheel wedge under wheel.		
4	Calibrate the digital level so that it reads 0° when positioned on the leveling surface (i.e the surface the aircraft is on)		
5	Adjust nose wheel wedge until the digital level reads the same value (in absolute value) when positioned above and under the tail cone, just fore of the vertical stabilizer. The aircraft is level once these two readings are the same in absolute value.		

08-20 WEIGHING

1. Description

This chapter describes how to properly weigh the aircraft. Expected flight performance and safety can only be achieved if the aircraft is operated in the approved center of gravity envelope. If the aircraft is modified in any way, the center of gravity and weight must be recalculated and verified as acceptable.

NOTE: For center of gravity calculation, weight & balance record and equipment list please see chapter 6 in the pilot operating handbook (POH) [5].

2. Maintenance practices

08-20: 2.1. Weighing

Reference: POH **[5]**, APPENDIX 99-C

08-20: 2.1.1. Preparation

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Replenish the brake fluid reservoir.	- three scales (one with minimum scale capacity of 250 kg, two with 500 kg)	12-10
2	Drain fuel system.		
3	Replenish the engine oil.		
4	Close the doors, set the flaps to 0° and retract the air brakes.		
5	Check/verify equipment list (See in POH[5])		
6	Level aircraft and place a scale under each of the MLG balance blocks and over the nose wheel wedge.		08-10

Note: The two scales used under the MLG wheels must be equal in height and placed as outboard as possible.

08-20: 2.1.2 Measuring

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Drop a plump bob from datum (each wing root leading edge at root) and stretch a line between the plump bobs and mark the position of the line at the airplane center line.	- plump bob - string - measuring tape	Figure 08-002
2	Stretch a line between the main wheel centers and mark the position of the line at the airplane center line.		Figure 08-003

continued on the next page

Step	Action	Required parts, materials and tools	Reference
3	Measure the distance between the position of the wing root leading edge and the position of the MLG wheel centers horizontally along the airplane center line. Obtain value 'b'.		Figure 08-004

Step	Action	Required parts, materials and tools	Reference
NOTE: For center of gravity calculation please see chapter 6 in the pilot operating handbook (POH) [5]. Use the applicable weight and balance report to the aircraft.			
4	Measure the distance between the position of the wing root leading edge and the position of the nose wheel center horizontally along the airplane center line. Obtain value 'a'.		Figure 08-004
5	Remove the level/leveling fixture and record the weight values show on the scales.		

Figure 08-002
Plump bob from wing leading edge

Figure 08-003
Plum bob from center of the MLG wheels
- Illustrative only -

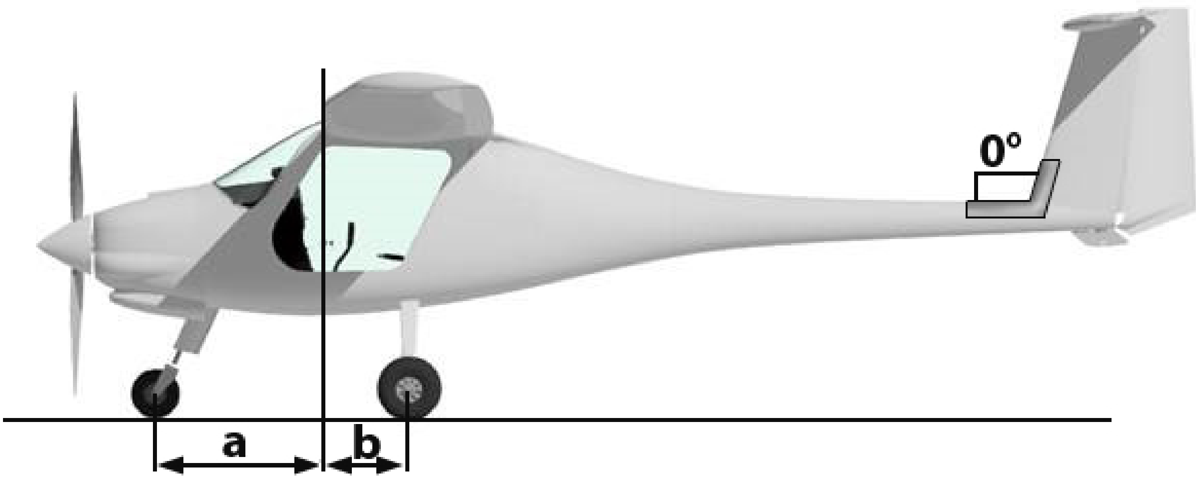

Figure 08-004
Weight and Balance measurements

09

CHAPTER 09 – TOWING AND TAXIING

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09-00 GENERAL

This chapter describes how to properly tow and taxi the airplane along the ground.

09-10 TOWING

1. Description

One person can easily tow the aircraft by him/herself along smooth, hard terrain by pulling/pushing it. Turning is made easier by propping up the front end of the aircraft while simultaneously pushing/pulling it. The following procedures describe how to properly tow the aircraft.

2. Maintenance practices

CAUTION: Never push or pull the aircraft using its control surfaces.

09-10: 2.1. Towing

09-10: 2.1.1. Backwards

Step	Action	Required parts, materials and tools	Reference
1	Remove wheel chocks.		
2	Check that there is nothing obstructing the way or any hazards in the vicinity.		
3	Push the aircraft backwards using the point halfway up the vertical stabilizers as a push point.		
4	Place wheel chocks under wheels.		

09-10: 2.1.2. Forwards

Step	Action	Required parts, materials and tools	Reference
1	Remove wheel chocks.		
2	Check that there is nothing obstructing the way or any hazards in the vicinity.		
3	Push the aircraft forwards using the point on the fuselage halfway between the wing's trailing edge and the vertical stabilizer as a push point.		
4	Place wheel chocks under wheels.		

09-10: 2.1.3. Turning

Step	Action	Required parts, materials and tools	Reference
1	Check that there is nothing obstructing the way or any hazards in the vicinity.		
2	Prop the front end of the aircraft up slightly by pushing down on the tail cone while simultaneously pushing the aircraft in the desired direction.		

1. Description

09-20 TAXIING

This chapter provides instructions necessary to taxi the aircraft. The thrust needed to taxi it is supplied by the propeller, while turning/steering is done by foot pressure on the rudder pedals. The immediate area around the aircraft must be inspected for any obstructions/safety hazards and cleared if necessary.

2. Maintenance practices

09-20: 2.1. Taxiing

CAUTION: Excessive braking can lead to worn brake pads/discs. The area must be cleared of all/any personnel before taxiing ensues. All potholes and rough terrain should be avoided if possible. Refer to the POH [5] for all other procedures/checks pertaining to taxiing.

09-20: 2.1.1. Taxiing the airplane

Reference: POH [5]

Step	Action	Required parts, materials and tools	Reference
1	Remove wheel chocks.		
2	Start the engine.		
3	Gradually throttle up until taxiing ensues and then immediately check that the brakes work.		
4	Taxi the aircraft to the desired location.		
5	Shut the aircraft down.		
6	Place wheel chocks until wheels.		

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10

CHAPTER 10 – PARKING, MOORING AND STORAGE

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10-00 GENERAL

This chapter describes how to park, moor and store the aircraft properly. Mooring is typically required when the aircraft is left outside for longer periods of time and may be exposed to windy conditions. The recommended storage measures outlined in this chapter should be implemented in order to prevent wear/deterioration of the aircraft structure/systems.

10-10 PARKING

1. Description

This chapter describes how to park the ALPHA Trainer and ALPHA Club properly. It outlines measures that should be for long term parking and parking in abnormal conditions.

2. Maintenance Practice

10-10: 2.1. Parking

10-10: 2.1.1. Temporary (< 10 days)

Reference: chapter 4 of POH[5]

Step	Action	Required parts, materials and tools	Reference
1	Engage the parking brake if necessary.	- wheel chocks	
2	Set the fuel selector to OFF.		
3	Leave air-brake handle unlocked, hanging down freely, to unload the plate springs.		
4	Check that the rescue system activation handle pin is inserted.		
6	Check drain holes for blockage, see APPENDIX 99-D for drain holes locations on the aircraft.		APPENDIX 99-D
7	Cover the pitot tube.		
8	Place wheel chocks under wheels.		
9	Close all the cabins windows/openings if wet weather is expected.		
10	Moor the aircraft if windy weather is expected.		10-20: 2.1.1.

10-10: 2.1.2. Long term (> 10 days)

Follow the same procedure outlined above for temporary parking, however, consider the storage measures outlined in 10-30.

10-20 MOORING

1. Description

This chapter describes how to moor the aircraft properly. Each wing has a fixed mooring point built into its bottom surface. In nose wheel configuration, the tail skid has a hole that can be used as the third tie down point. These points can be used to fasten the aircraft to the ground.

2. Maintenance Practice

10-20: 2.1. Mooring

10-20: 2.1.1. Mooring the airplane

Reference: IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Park the aircraft.	- wheel chocks - mooring rings (P/N 1190014) - tie down straps (synthetic)	10-10
2	Retract the flaps fully.		
3	Block the control surfaces by blocking the control stick movement.		
4	Remove the mooring point caps.		
5	Install the mooring rings.		
6	Run tie down straps through the rings and secure them to the ground.		
7	Run a tie down strap through the tail skid hole and secure it to the ground.		

NOTE: Refer to chapter 10-30 for additional storage measures/procedures.

10-30 STORAGE

1. Description

This chapter describes all of the measures necessary to store the airplane for temporary or long-term storage.

2. Maintenance practices

10-30: 2.1. Storage

10-30: 2.1.1. Short term storage (30-90 days of inactivity)

Reference: POH [2]

Step	Action	Required parts, materials and tools	Reference
1	Park the aircraft on a level surface that is not exposed to sunlight, but do not engage the parking brake.		10-10: 2.1.
2	Moor if necessary.		10-20: 2.1.1.
3	Check main and nose landing gear tire pressure on a weekly basis and replenish if necessary.		12-10: 2.4.1.
4	Disconnect the battery (pull the battery disconnect ring) and consider all maintenance and shelf-life measures recommended by the battery manufacturer.		
5	Clean all aircraft surfaces and remove bugs/dirt.		
6	Clean the entire propeller and remove bugs/dirt.		
7	Replenish the fuel system so that the fuel tanks are about 90% full.		12-10: 2.1.1.
8	Implement the engine storage/preservation measures found in the latest version of Rotax's 912 OM and MM.		
9	Turn ELT transmitter off (i.e. unit, not switch) and disconnect cables.		

NOTE: It is recommended to turn each wheel by a quarter turn once a week to avoid warping/damage.
NOTE: It is recommended to cover windshield and sunroof with a cotton sheet.
CAUTION: Make sure to take additional precautionary measures and properly protect the aircraft in areas with extreme humidity or presence of sand, dust or insects.
CAUTION: If the wings must be disassembled (57-10: 2.1.1.) due to hangar space limitations, the fuel system must be drained (12-20: 2.1.) and wings stored in a dry, cool space with no sunlight, and cover them with a cotton sheet.

10-30: 2.1.2. Long term storage (> 90 days of inactivity)

Reference: POH [2]

Step	Action	Required parts, materials and tools	Reference
1	Perform short term storage.		10-30: 2.1.1.
2	Drain the fuel system.		12-20: 2.1.

CAUTION: If the wings must be disassembled (57-10: 2.1.1.) due to hangar space limitations, store the wings in a dry, cool space with no sunlight, and cover them with a cotton sheet.

10-30: 2.2. Reactivation after storage

10-30: 2.2.1. Reactivation after short term storage (30-90 days of inactivity)

Reference: POH [2]

Step	Action	Required parts, materials and tools	Reference
1	If present, remove any/all tie down straps, mooring rings and reinstall mooring point caps.		
2	If present, remove the windshield and sunroof cotton shields.		
3	Check for fluid leakages (coolant, brake fluid, fuel) on the external surfaces of the aircraft and surrounding area.		
4	Check main and nose landing gear tire pressure, replenish if neces-sary.		12-10: 2.4.
5	Remove the cowlings.		71-10: 2.1.1.
6	Check for fuel/coolant leakage or condensation inside the engine compartment.		
7	Check the engine cooling system coolant level on the overflow bottle, replenish if necessary.		12-10: 2.3.1.
8	Re-install the cowlings.		71-10: 2.1.2.
9	Check the brake fluid level in reservoirs on the rudder pedals, replenish if necessary.		12-10: 2.5.1.
10	Remove the crew seats.		25-10: 2.1.1.
11	Check for fuel leakage or condensation behid the cabin.		
12	Check drain holes for blockage, see APPENDIX 99-D for drain holes locations on the aircraft.		APPENDIX 99-D
13	Connect ELT cables and put the switch on the ELT unit to ARM/OFF position.		
14	Put the remote ELT switch in the cabin to ARM/OFF position.		
15	Re-install the crew seats.		25-10: 2.1.2.
16	Perform pre-flight inspection of the aircraft.		See in IPC [13]
17	Re-install the pitot cover after performing the pre-flight inspection in previous step.		

10-30: 2.2.2. Reactivation after long term storage (>90 days of inactivity)

Step	Action	Required parts, materials and tools	Reference
1	Perform reactivation procedure after short term storage.		10-30: 2.2.1.

NOTE: If the aircraft is stored for more than a year perform an annual inspection.

11

CHAPTER 11 – REQUIRED PLACARDS

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11-00 GENERAL

There are various placards located throughout the aircraft that provide pilots, occupants and first responders with very important information. They identify safety precautions, provide service instructions, indicated command direction/movements and provide operating instructions. Those with a white background are made from polymeric stabilized PVC film and have a permanent opaque acrylic adhesive on the back face. Those with a black background are made from translucent polymeric stabilized, cadmium-free vinyl film and have an acrylic solvent-based adhesive.

NOTE: For more information about which placards are required and where they're located on the ALPHA Trainer, please refer to the POH [5].

11-10 EXTERIOR PLACARDS

1. Description

This chapter describes the maintenance practices which apply to those placards located on the exterior of the aircraft, including: Door; Open & Close, Baggage Door Location, ELT Location, BPRS Location, Oil-Door Location, Fuel Filler Location, Gnd Power Receptacle Location, No-Step, No Push, and Rescue Instruction.

NOTE: Please refer also to the POH [5] for more details.

2. Maintenance Practice

11-10: 2.1. Exterior Placard

11-10: 2.1.1. Removal

Step	Action	Required parts, materials and tools	Reference
1	Peel placard away from surface. If it doesn't peel away easily, apply heat with heat gun and try again.	- heat gun	

CAUTION: Be careful when using the heat gun. Do not allow the surface temperature to exceed 54°C (129° F), as this may cause structural damage.

Step	Action	Required parts, materials and tools	Reference
2	Once removed, clean the surface with cleaning benzine 60/90 or isopropyl alcohol (according to TT-I-735 standard) to remove residual adhesive.	-cleaning benzine 60/90 or isopropyl alcohol -Multi foam	

11-10: 2.1.2. Installation

Follow the same procedure outlined above for temporary parking, however, consider the storage measures outlined in 10-30.

Step	Action	Required parts, materials and tools	Reference
1	Wash/wipe the surface down with water and clean white cotton cloth.	- Water - cleaning benzine 60/90 or isopropyl alcohol - Multi foam - clean white cotton cloth - paper towel	
2	Clean the surface with cleaning benzine 60/90 or isopropyl alcohol (according to TT-I-735 standard).		
3	Allow to air dry.		
4	Remove placard from protective foil.		
5	Apply placard to surface. Avoid creating wrinkles by applying one edge of the placard first and then running your finger along it until it's completely adhered.		

11-20 INTERIOR PLACARDS

1. Description

This chapter describes the maintenance practices which apply to those placards located on the interior of the aircraft, including:
BPRS Handle Cover, Engine Control Panel, Circuit Breaker Panel, Bolster Switch Panel, Instrument Panel, Audio Panel, Baggage Door, ELT Location, and Parking Brake Release.

NOTE: Please refer also to the POH [5] for more details.

2. Maintenance Practice

11-20: 2.1. Interior Placard

11-20: 2.1.1. Removal

Step	Action	Required parts, materials and tools	Reference
1	Peel placard 11-07 away from surface. If it doesn't peel away easily, apply heat with heat gun and try again.	- Heat gun	

CAUTION: Be careful when using the heat gun. Do not allow the surface temperature to exceed 54°C (129° F), as this may cause structural damage.

Step	Action	Required parts, materials and tools	Reference
2	Once removed, clean the surface with cleaning benzine 60/90 or isopropyl alcohol (according to TT-I-735 standard) to remove residual adhesive.	- cleaning benzine 60/90 or isopropyl alcohol - Multi foam	

11-20: 2.1.2. Installation on non-composite and/or paint-coated composite surfaces

Step	Action	Required parts, materials and tools	Reference
1	Wash/wipe the surface down with water and clean white cotton cloth.	- Water - Multi foam - cleaning benzine 60/90 or isopropyl alcohol - Clean white cotton cloth - Paper towel	
2	Clean the surface with cleaning benzine 60/90 or isopropyl alcohol (according to TT-I-735 standard).		
3	Allow to air dry.		
4	Remove placard from protective foil.		
5	Apply placard to surface. Avoid creating wrinkles by applying one edge of the placard first and then running your finger along it until it's completely adhered.		

11-20: 2.1.3. Installation on bare composite surfaces

Step	Action	Required parts, materials and tools	Reference
1	Clean the surface with cleaning benzine 60/90 or isopropyl alcohol (according to TT-I-735 standard).	- Multi foam - cleaning benzine 60/90 or isopropyl alcohol - Paper towel - Spray glue (Extra strong, Tesa)	
2	Allow to air dry.		
3	Remove placard from protective foil.		
4	Spray some glue on the back surface of the placard and apply it to the surface. Avoid creating wrinkles by applying one edge of the placard first and then running your finger along it until it's completely adhered.		

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12

CHAPTER 12 – SERVICING

TABLE OF CONTENTS

12-00 GENERAL

This chapter clearly outlines all of the procedures/practices involved in properly servicing the aircraft. Procedures such as replenishing operating fuels, lubricating various components and keeping the aircraft clean, are key to ensuring the aircraft remains in good condition, safe and airworthy.

The maintenance/servicing intervals specified in chapter 12-00 are those regarded by the manufacturer as the minimum required in normal operating conditions. If the aircraft is operated in abnormal conditions, such as salt water environments, extremely humid areas and dusty environments, or if it's operated any unusual conditions, it shall be considered prudent to shorten the intervals in chapter 12-00.

CAUTION: Not adhering to the warning and cautions outlined in this chapter can cause damage to the aircraft, harm to the aircrafts operator and possibly harm to others. Only those operating fluids mentioned in this manual are permitted to be used. Mixing various fluids, using non-recommended brands or using contaminated fluids is not permitted and can lead to aircraft damage or harm to its operators/occupants.

12-10 REPLENISHING

1. Description

This chapter outlines the maintenance procedures that pertain to replenishing the airplane operating fluids. For servicing intervals refer to chapter 05-00. Table 12-001 contains information about approved operating fluids and their capacity.

Description	P/N or Spec.	Capacity
Fuel	AVGAS, MOGAS or car fuel (min RON 95; EN228 Premium or Premium plus with max. 10% ethanol). Refer to latest revision of ROTAX Service Instruction No. SI-912-016 Selection of Suitable Operating Fluids	50.0 L (13.2 US gal.) in the fuselage tank. Total unusable fuel: 2.0 L
Engine Oil	Refer to ROTAX Service Instruction No. SI-912-016 Selection of Suitable Operating Fluids for Rotax® Engine Type 912 I, 912 and 914 Series	3.5 L (3.7 US Quarts) (min. oil required marked on dipstick)
Engine Coolant	Referring to the latest revision of ROTAX Service Instruction No. SI-912-016 Selection of Suitable Operating Fluids for Rotax® Engine Type 912 I, 912 and 914 Series	3 L (max and min coolant levels marked on overflow bottle)
Brakes	DOT 4 Hydraulic Fluid	0,20L
Nose Tire (Size 4.00 X 4”)	Dry Compressed Air	1.8 bar
Main Tires (Size 4.00 X 6”)	Dry Compressed Air	2.8 bar
NOTE: Please refer to the POH [5] for more nformation regarding fuel and oil operating pressure		

Table 12-001
Approved operating fluids and capacities

2. Maintenance practices

12-10: 2.1. Fuel system

WARNING: All electrical equipment, or any equipment that could produce a spark, must be disabled before refueling and/or defueling.
WARNING: Smoking is not permitted within 30 meters of the aircraft while refueling/defueling. Nor is the presence of an open flame.
WARNING: The battery must be disabled before refueling/defueling.
WARNING: A fire extinguisher must be present at all times while refueling/defueling.
WARNING: The aircraft's exhaust tailpipe and all fuel servicing equipment must be grounded during all/any refueling/defueling procedures.

12-10: 2.1.1. Refueling

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Locate the fuel filler on fuselage and place fire extinguisher near it.	- Approved fuel (see 12-10), - Fire extinguisher, - Grounding cables	POH [5]
2	Use grounding cables to attach the nozzle to the aircraft's exhaust tailpipe, the tailpipe to the fuel truck/cart and the fuel truck/cart to an earth ground.		
3	Remove the fuel filler cap.		
4	Place nozzle in the fuel filler.		

CAUTION: Do not touch the wing's surface, the filler's rim or the inner surface of the fuel tank with the fuel nozzle as this could cause damage.

Step	Action	Required parts, materials and tools	Reference
5	Refuel to desired level.	- Approved fuel (see 12-10), - Fire extinguisher, - Grounding cables	POH [5]
6	Install fuel filler cap.		
8	Disconnect all of the grounding cables.		

12-10: 2.2. Oil system

CAUTION: Always ensure that the oil level is within the limits indicated on the dipstick before flying.
CAUTION: The aircraft must be level before checking/replenishing oil levels.

12-10: 2.2.1. Replenishing the oil system

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Master switch OFF, ignition OFF.	- flathead screwdriver, - approved oil (see 12-10)	
2	Remove engine top cowling.		71-10
3	Remove oil tank cap.		
4	Rotate propeller in normal direction until a gurgling noise is heard. This is evidence that the oil has been pumped through the system and has settled in the sump.		
5	Replenish oil system until dipstick reading is within the marked limits.		
6	Reinstall dipstick and oil tank cap.		
7	Install engine cowlings.		71-10

12-10: 2.3. Cooling system

12-10: 2.3.1. Replenishing the coolant

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Remove engine cowlings.	- flathead screw-driver, - approved cool-ant, (see 12-10)	71-10
2	Locate water cooler and remove cap.		
3	Replenish coolant level in water cooler until it's completely full.		
4	Reinstall water cooler cap.		
5	Locate cooling system's overflow bottle.		
6	Remove overflow bottle cap.		
7	Replenish cooling system until level is within the limits marked on the overflow bottle.		
8	Install overflow bottle cap.		
9	Install engine cowlings.		71-10

12-10: 2.4. Tires

12-10: 2.4.1. Check/replenish tire air pressure

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Roll aircraft backwards or forwards a little until the tire’s fitting is in a comfortable position.	- compressed air - pressure gauge (P/N 5610132)	
2	Remove tire valve cap.		
3	Measure tire air pressure.		
4	Replenish if necessary with compressed air to the required pressure.		Table 12-001
5	Release pressure from the tire if it is already overinflated.		
6	Install tire valve cap.		

12-10: 2.5. Brake system hydraulic fluid

12-10: 2.5.1. Brake system replenishing procedure (Hand-brake system)

Reference:

Step	Action	Required parts, materials and tools	Reference
1	Open the brake fluid reservoir lid, by releasing the two screws on the top. Pull the brake handle to reach the aft screw with the screw driver.	- Philips screw drivers set - Meter or measuring tape - Plastic cups	
2	Using a plastic cup, pour the brake fluid into the brake reservoir. Check the fluid level, and fill till the level is 10 mm measured from the reservoir top edge.		12-10
3	Close the brake reservoir lid.		
4	Bleed the brake system and perform a functional test.		12-20: 2.7

3. Battery System

The battery can be found in the cabin, fastened to the firewall, just behind the switch panel. It is maintenance free and doesn’t require any replenishing of operating fluids.

12-20 SCHEDULED SERVICING

1. Description

This chapter describes the regular servicing requirements of the aircraft. Systems and components such as fuel, oil, the brakes and the tires, need be serviced regularly in order to keep the aircraft in good operating condition. How to clean the aircraft and its various components/assemblies is also covered.

2. Maintenance practices

12-20: 2.1. Fuel system

WARNING: All electrical equipment, or any equipment that could produce a spark, must be disabled before refueling and/or defueling.
WARNING: Smoking is not permitted within 30 meters of the aircraft while refueling/defueling. Nor is the presence of an open flame.
WARNING: The battery must be disabled before refueling/defueling
WARNING: A fire extinguisher must be present at all times while refueling/defueling.
WARNING: The aircraft's exhaust tailpipe and all fuel servicing equipment must be grounded during all/any refueling/defueling procedures.

12-20: 2.1.1. Defueling (gravity driven)

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Place jerry can, canister or fuel tray under the gascolator.	- jerry can, - canister or fuel tray, - grounding cables	
2	Make sure the fire extinguisher is within arm's reach.		
3	Ground the container to the aircraft's exhaust tailpipe and the aircraft to an earth ground.		
4	Open the fuel valve.		
5	Locate valve below gascolator, open it and drain.		

NOTE: A fuel hose (inner diameter 6 mm or 1/4 inch) can be attached to the gascolator's valve and led to the container to avoid splashing.

12-20: 2.1.2. Defueling (electric fuel pump if available)

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Place jerry can, canister or fuel tray under the gascolator	- jerry can, - canister or fuel tray, - grounding cables - electric fuel pump	
2	Make sure the fire extinguisher is within arm's reach		
3	Ground the container to the aircraft's exhaust tailpipe and the aircraft to an earth ground		
4	Open the fuel valve.		
5	Run a fuel hose (inner diameter 6 mm or 1/4 inch) from the gascolator's valve to the electric fuel pump and another from the electric fuel pump to the container		
6	Locate valve below the gascolator, open it and activate the electric fuel pump		

12-20: 2.2. Oil system

12-20: 2.2.1. Oil level check

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Master OFF, ignition OFF.	- paper towel	
2	Remove the upper cowling or, if available, open the upper cowling's oil check door.		71-10
3	Remove oil tank cap.		
4	Perform oil level check as prescribed in Rotax 912 MM		[1]
5	Replenish if necessary.		12-10
6	Install oil tank cap.		
7	Close the upper cowling's oil check door.		

For all other oil system servicing procedures, including how to change the oil filter, how to inspect it and how to change the oil (i.e drain the system), refer to chapter 11 of chapter 12-20 in the latest revision of Rotax's maintenance manual.

12-20: 2.3. Cooling system

12-20: 2.3.1. Draining the system

Reference: the latest revision of Rotax's maintenance manual.
Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Remove the engine cowlings.	- spring clamp pliers - jerry can - canister or fuel tray	71-10
2	Locate cylinder #1's coolant outlet fitting and the hose attached to it.		
3	Place jerry can, canister or fuel tray under cylinder #1 .		
4	Roll the orange fire sleeve back to expose the spring clamp securing the coolant hose to the outlet fitting.		
5	Loosen the spring clamp and slide it off the outlet fitting.		
6	Slowly slide the coolant hose off the outlet fitting and allow the coolant to drain into the jerry can, canister or fuel tray.		

12-20: 2.4. Tires and wheels

Tire and wheel servicing procedures are covered in 12-10: 2.4. Tires

Refer to 32-40 for tire and wheel removal instructions.

12-20: 2.5. Lubrication

The aircraft has a number of components and assemblies that must be kept well lubricated in order to avoid premature wear, deterioration and possible ceasing. The table below, Table 12-002, shall be used as a lubrication guide. It clearly indicates what needs to be lubricated, how often and what it should be lubricated with. All the joints in Table 12-002 must be cleaned first with some paper towel before fresh lubricant is applied.

Group	Component	Interval (hrs)	Recommended lubricant
Engine	Joint between throttle control cable and carburetor lever	100	SKF LGMT 2/0.2 multipurpose grease
Engine	Joint between choke control cable and carburetor lever	100	SKF LGMT 2/0.2 multipurpose grease
Cabin	Battery terminals	200	SKF LGMT 2/0.2 multipurpose grease
Cabin	All rod end bearings accessible from the cabin floor control stick openings	100	Wurth HHS Lube
Cabin	Control stick drive end bearings	100	Wurth HHS Lube
Cabin	All rod end bearings located between the cabin and baggage. compartment bulkheads	200	Wurth HHS Lube
Cabin	Joints between cables and rudder bellcrank	200	SKF LGMT 2/0.2 multipurpose grease
Cabin	BPRS activation handle and respective case bracket	100 or annually, whichever is earlier	any silicone-based lubricant
Fuselage	Door hinges	100	Wurth white assembly paste

continued on the next page

Fuselage	Elevator hinge pins	200*	SKF LGMT 2/0.2 multipurpose grease
Fuselage	Upper rudder hinge pin	200*	Wurth white assembly paste
Fuselage	Upper rudder bushing	200*	Wurth white assembly paste
Fuselage	Horizontal stabilizer T-fixation plate pins	100	Wurth white assembly paste
Fuselage	Horizontal stabilizer att. bolt assembly	100	Wurth white assembly paste
Fuselage	Vertical stabilizer bushings	100	Wurth white assembly paste
Fuselage	Rudder cable bellcrank bearing	200	Wurth white assembly paste
Fuselage	Wing shear pin bushings	200*	Wurth white assembly paste
Fuselage	Upper flaperon bellcrank clutch	200	Wurth white assembly paste
Fuselage	Vertical elevator push rod end bearings and aft horizontal elevator push rod end bearing	200	Wurth HHS Lube
Wings	Flaperon pins/bushings	200*	SKF LGMT 2/0.2 multipurpose grease
Wings	Wings spar pins	200	SKF LGMT 2/0.2 multipurpose grease
Wings	Shear pins	200*	Wurth white assembly paste
Wings	Wing spar bushings	200	SKF LGMT 2/0.2 multipurpose grease
Fuselage	Fuel tank cap thread	200	SKF LGMT 2/0.2 multipurpose grease
Landing gear	Wheel axis and bearings	100 or annually, whichever is earlier	Refer to Beringer documentation (if Beringer wheels), or SKF LGMT 2 0,2 (if Pipistrel wheels)

*Shortening service interval is recommended for all aircraft that operate in unusual/abnormal environments (i.e. high humidity, salt water, dusty conditions, extreme temperatures, etc.).

Table 12-002
Lubrication guide

12-20: 2.6. Cleaning

In order for the aircraft to perform the way it should, all of the airframe's surfaces must be cleaned on a regular basis. This is especially true for the wing's leading edges, which can seriously affect performance if left dirty. Cleaning must be carried out carefully, so that the aircraft's composite surfaces don't incur any damage.

CAUTION: Rubbing any of the aircraft's surfaces aggressively or polishing any of them is not permitted and, if necessary, can only be carried out by an approve maintenance organization.
CAUTION: Avoid the use of ALL aggressive cleaning solutions and organic solvents whenever possible, including window cleaning spray, benzene, aggressive shampoos etc.
CAUTION: When flying in regions with a lot of bugs in the air the leading edges of the airframe (propeller, wings, tail) need to be protected before flight with anti-static furniture spray cleaner such as Pronto (transparent, manufacturer: Johnson Wax), or something equivalent. When using such spray, do not apply it directly onto the wing but onto a soft cloth instead (old T-shirts are best).
CAUTION: After having finished with flight activity for the day, clean the leading edges of the airframe as soon as possible with a lot of water and a drying towel (chamois, artificial leather skin). This will be very easy to do if the leading edge was sprayed with an anti-static spray cleaner before flight.

After-flight wash down

Bugs, which represent the most of the dirt to be found on the airframe, are to be removed with clean water and a soft cloth (this can also be done using a drying towel, chamois or artificial leather skin). Begin by soaking all the leading edges of the airframe first. Then wipe the aircraft's entire surface until it is completely dry. Clean the propeller and remove any grease spots separately using a mild car shampoo with a wax.

CAUTION: Do not, under any circumstances attempt to use aggressive cleaning solutions, as you will severely damage the lacquer, which is the only protective layer before the structural laminate.

When using the aircraft in difficult atmospheric conditions (intense sunshine, dusty winds, coastline, acid rains etc.) make sure to clean the outer surface more thoroughly.

CAUTION! Do not, under any circumstances attempt to remove such bug-spots with abrasive sponges and/or rough polishing pastes.

Periodical cleaning of all outer surfaces with car shampoo

It is recommended the aircraft be cleaned from top to bottom using a soft sponge. Be careful not to use a sponge that is contaminated with any fine particles, such as those found in mud and sand, as this could abrade/damage the surface. While cleaning, soak the surface and the sponge many, many times. Use a separate sponge to clean the bottom of the fuselage, as is it usually greasier than the rest of the airframe. When pouring water over the airframe, be careful not to direct it over the fuel reservoir caps, wing-fuselage joining chapter, parachute rescue system straps and cover, pitot tube, tail static probe and/or engine cowlings.
Always rinse the shampooed surfaces again before they dry, then just wipe the whole aircraft dry using a drying towel, chamois or artificial leather skin. Also, clean the control surface gap seals on the wing and empennage. Lift the seals gently and insert ONE layer of cloth underneath, then move along the whole span of the seal.

Cleaning the Lexan transparent surfaces

All the of the aircraft window surfaces are made of Lexan. Cleaning Lexan is not the same as cleaning Plexiglas. It is really important to only use clean water (no cleaning solutions are necessary) when cleaning and a really clean drying towel.

CAUTION: Do not use the towel that was used to dry the airframe's surfaces to dry the window surfaces. Use another unused towel for the window surfaces.

Should the window surfaces be dusty, remove the dust first by pouring water (not spraying!) and gliding your hand over the surface. Glide the drying towel over the surface, squeeze it out and soak it before touching the glass again. If there are bugs on the windshield, soak them with plenty of water first, so less wiping is necessary. After drying the window surface, apply some anti-static furniture spray cleaner such as Pronto (transparent, manufacturer: Johnson Wax), or something similar and wipe the surface clean with a separate soft cotton cloth.

12-20: 2.7. Brakes

12-20: 2.7.1. Brake system draining procedure (tor brakes system)

Step	Action	Required parts, materials and tools	Reference
1	Disconnect the brake lines from the hand brake system.		
2	Drain the brake fluid from the hoses into drain pan.		

12-40 DISPOSABLE REPLACEMENT PARTS

1. Description

Table 12-003 contains a list of disposable parts found on the aircraft. These parts can be ordered directly from Pipistrel d.o.o. Please refer to the type specific IPC for more information.

DISPOSABLE REPLACEMENT PARTS	
Item	**Pipistrel P/N**
In-line fuel filter	See IPC - 1350164
Tires	See IPC - 5050010 (MLG) - 5050007 (Nose LG)
Air filter	See IPC - 1150218 - 115082
Oil filter	See IPC

Table 12-003
Disposable Replacement Parts

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CHAPTER 20 – STANDARD PRACTICES – AIRFRAME

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20-00 GENERAL

This chapter contains information about the standard practices that shall be followed when carrying out any maintenance procedures on the aircraft. It covers topics such as fastening hardware, torque values, approved thread locking fluids, sealants and adhesives.

20-10 SEALANTS AND LUBRICANTS

1. Description

Table 20-001 outlines the sealants and lubricants that are approved for use on the aircraft.

Approved Sealants and Lubricants			
Item	**Supplier**	**Specification**	**Pipistrel P/N**
SKF general purpose grease	SKF group	LGMT 2/0.2	5092004
Wurth white assembly paste	Adolf Würth GmbH & Co. KG	0893 1041	5092021
Super Impact grease	Xintex	502001	5092008
Krown Rust Inhibitor	Krown rust control systems	KL 73	5092020
Tekasil neutral profi white silicone	TKK Srpenica d.d.	-	5093024
Termosil 300°C neutral black silicone	TKK Srpenica d.d.	-	5093017
Termosil N6	TKK Srpenica d.d.	-	5093018
Loctite 577 thread sealant	Loctite Corp.	-	5091033
Akrapovič ceramic anti-seize grease	Akrapovič d.d.	-	5092002
Akrapovič copper anti-seize grease	Akrapovič d.d.	-	5092001
Loctite silver grade anti-seize	Henkel Corp.	LB 8150	5091041

Table 20-001
Approved sealants and lubricants

NOTE: Please refer to the latest revision of the applicable IPC for additional information as to where the sealants/lubricants listed in Table 20-001 are used.

CAUTION: When using the sealants and lubricants listed in Table 20-001 always refer to the supplier's instructions for information about how to store them properly, how to use them properly and any safety precautions.

WARNING: **Don't use any sealants or lubricants that have expired.**

20-20 THREAD-LOCKING FLUIDS

1. Description

Table 20-002 outlines the thread-locking fluids that are approved for use on the aircraft.

Approved Thread-Locking Fluids			
Item	**Supplier**	**Specification**	**Pipistrel P/N**
Loctite 243	Loctite Corp.	-	5091023
Loctite 262	Loctite Corp.	-	5091024
Loctite 270	Loctite Corp.	-	5091025
Loctite 577	Loctite Corp.	-	5091033

Table 20-002
Approved thread-locking fluids

NOTE: Please refer to the latest revision of the applicable IPC for additional information as to where the thread-locking fluids listed in Table 20-002 are used.

CAUTION: When using the thread-locking fluids listed in Table 20-002 always refer to the supplier's instructions for information about how to store them properly, how to use them properly and any safety precautions.

WARNING: Don't use any thread-locking fluids that have expired.

WARNING: All of the aircraft bolted joints requiring thread-locking fluids are labeled in the latest revision of its IPC. Failure to apply thread-locking fluids to the aforementioned bolted joints can cause them to loosen and possibly a safety hazard.

20-30 FASTENER INFORMATION AND TORQUE VALUES

1. Description

Information about the fastening material used on the aircraft can be found in the latest revision of the applicable IPC. The large majority of bolts used adhere to the DIN ("Deutsche Industrie Norm) standard. Any bolted joints that require special torquing are labeled in the IPC. All other bolted joints that are otherwise not labeled with a specific torque, must be torqued to the values found in Table 20-003.

Fastener	Torque (Nm)
M4	2.8
M5	5.5
M6	9.5
M8	23.0
M10	46.0
M12	79.0
M14	125.0

Table 20-003
Standard torque values

WARNING: **Bolts on the aircraft are only permitted to be replaced by equal grade bolts.**

CAUTION: When fastening bolted joints always torque the nuts whenever possible.

20-40 FASTENER/HARDWARE GENERAL REQUIREMENTS

1. Description

This chapter outlines the standard practices that apply to fastening material and hardware found on the aircraft. It covers the maintenance practices that apply to torque marking, proper use of locknuts and fittings with tapered thread.

2. Maintenance Practices

20-40: 2.1. Torque marking

Torque marking refers to act of marking a bolt joint after it's been torqued (see Figure 20-001). This allows for any loosening that may occur to be detected visually.

NOTE: All bolted joints on the aircraft must be torque marked after being torqued to ensure easy detection of any loosening.
CAUTION: The fastening material of any bolted joint that has loosened must be removed and replaced.

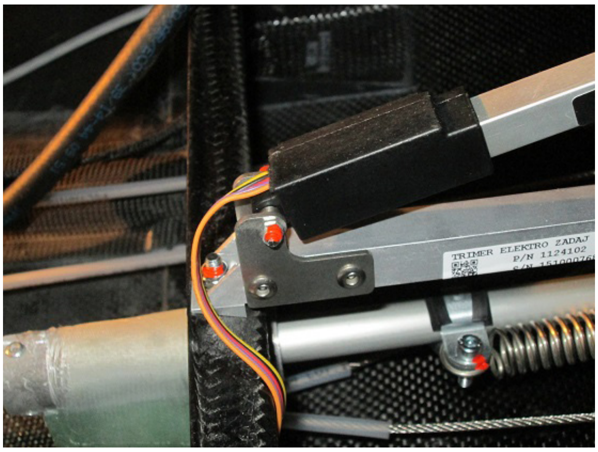

Figure 20-001
Example of torque marked bolted joints

20-40: 2.2. Locknuts

Locknuts are used throughout the aircraft because they resist loosening. Their plastic lining creates additional friction between it and the bolt.

CAUTION: Reusing locknuts is not permitted on the aircraft.

20-40: 2.3. Fitting with tapered thread

Some of the components found on the aircraft have tapered NPT thread and thus require special attention when removing/installing them. All of the aforementioned components can be found in the latest revision of the IPC. The following points must be adhered to when working with tapered thread on the aircraft:

- An approved thread sealant (Loctite 577) must be applied to the external thread before fastening. This will ensure a leak-free seal.
- The component must be tightened by hand first and then tightened an additional two (2) turns with a wrench, so that the thread deforms and creates the seal.

CAUTION: Any components or fastening material with tapered thread, once removed, are not permitted to be reused and must be replaced with new ones.

20-50 ADHESIVES

1. Description

Table 20-004 outlines the adhesives that are approved for use on the aircraft.

Approved Sealants and Lubricants			
Item	Supplier	Specification	Pipistrel P/N
Tesa professional spray glue	Tesa SE	60022	5091063
Pattex universal classic contact adhesive	Henkel	-	5091011
Wurth window adhesive classic plus	Adolf Würth GmbH & Co. KG	0890023701	5091018
Scotchmount primer	3M Deutschland GmbH	4297	5095009

Table 20-004
Approve adhesives

CAUTION: When using the adhesives listed in Table 20-004 always refer to the supplier's instructions for information about how to store them properly, how to use them properly and any safety precautions.

WARNING: Don't use any adhesives that have expired.

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CHAPTER 21 – ENVIRONMENTAL SYSTEMS

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21-00 GENERAL

The chapter covers all of the systems that control/regulate air flow and temperature in the aircraft.

21-10 VENTILATION SYSTEMS

1. Description

The aircraft primary ventilation system consists of a set of adjustable vents on the door lexan, that direct fresh ram air into the cockpit (See Figure 21-001). An additional circular vent is built into the sun roof.

Figure 21-001
Example of ventilations system

2. Maintenance practices

21-10: 2.1. Primary ventilation system

21-10: 2.1.1. Inspection/check

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Inspect the port door's adjustable circular vent for free, unhindered movement. Check for signs of damage and/or wear.		
2	Inspect the sunroof's adjustable circular vent for free, unhindered movement. Check for signs of damage and/or wear.		

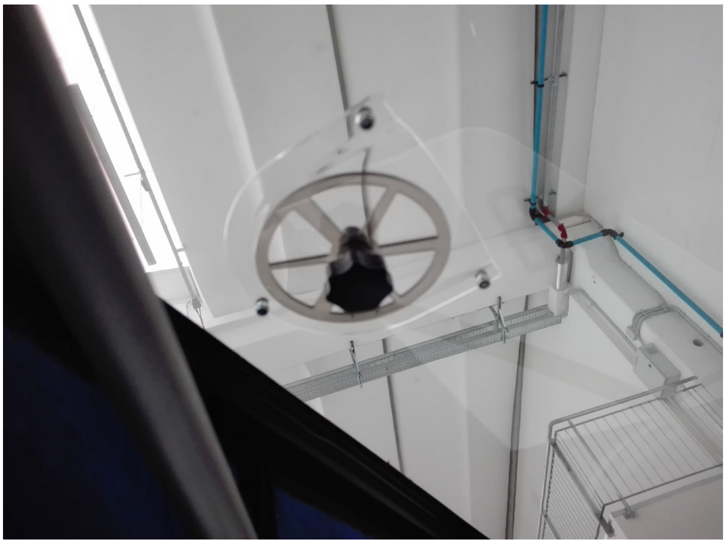

Figure 21-002
Sunroof circular vent

21-40 HEATING SYSTEM

1. Description

The aircraft is equipped with a simple heating system composed by a shut-off valve on the firewall that allows the passage into the cabin of hot air from engine compartment. The shut-off valve is activated by a control knob positioned at the bottom of the switch panel (see Figure 21-003 and 21-004).

Figure 21-003
Cabin Heat control knob location

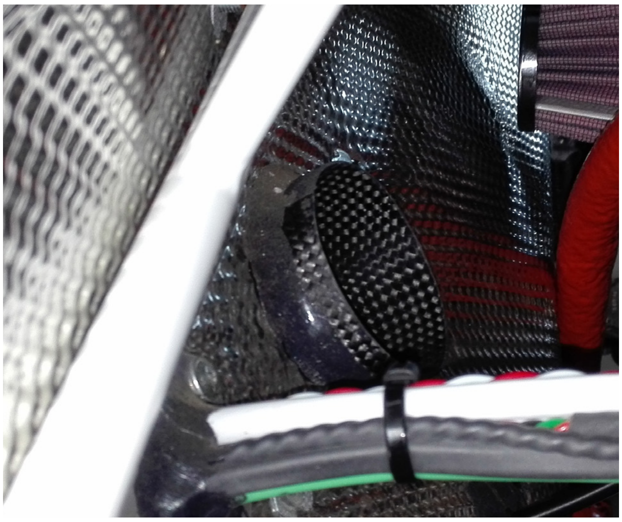

Figure 21-004
Cabin Heat - Firewall passage

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CHAPTER 24 – ELECTRICAL POWER

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24-00 GENERAL

The aircraft is equipped with a single-generator, single-battery, 14-volt direct current (VDC) electrical system designed to reduce the risk of electrical system faults. The system provides uninterrupted power for avionics, flight instrumentation, lighting, and other electrically operated and controlled systems during normal operation.

24-30 DC GENERATION

1. Description

The electrical system is a 14-Volt DC system. Power is supplied by an integrated generator with approximately 250W AC output at 5800 RPM and rectified with an electronic full-wave rectifier regulator (RU 912). The generator system is capable of delivering max. 18A at 14V which feeds the on-board battery (12V, 11Ah – see Figure 24-001). In case of emergency, the battery will supply reduced number of necessary direct-current loads with power for 30 minutes. When Earth-X ETX battery type is installed, the switch panel is equipped with an additional LED connected to the battery, that informs the pilot about battery malfunctions using a blinking code [15]. The electrical system is controlled by means of switches/fuses, which are arranged in one row on the upper half of the switch panel under the instrument panel.

Figure 24-001
Battery installation

NOTE: Correct strap installation for the retrofit EarthX battery configuration, which incorporates a spacer below the battery, is the same as the one without a spacer (Figure 24-002).

2. Maintenance Practices

24-30: 2.1. Battery

NOTE: The following removal/installation content applies to aircraft that have an EarthX battery installed. Please refer to SB-100-00-80-015 [14] for information that applies to aircraft equipped with an Aliant battery.

24:30: 2.1.1. Removal
Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	MASTER switch off, AVIONICS switch off.	- Metric ratchet/ socket set - Screwdriver set	
2	Pull battery disconnect ring on switch panel.		

Step	Action	Required parts, materials and tools	Reference
3	Remove the straps securing battery in place.		
4	Remove terminal bolt caps.		
5	Loosen/remove the terminal bolts.		
6	Disconnect the cables.		
7	Remove the battery.		
8	Disconnect the battery LED connector positioned along the wire that runs from the battery to the switch panel LED.		[15]

24-30: 2.1.2. Inspection/check

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Carry out visual inspection of the battery. Inspect its terminals for any signs of oxidation. If necessary, remove the battery and remove oxidation.		05-20 Figure 24-002 24-30: 2.1.1.
2	Wipe away any residual lubricant on the terminals and re-apply lubricant.		12-20: 2.5.

Figure 24-002
Example of battery terminal oxidation

24:30: 2.1.3. Installation

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Position battery in mounting bracket and secure with straps.	- Metric ratchet/ socket set	
2	Connect cables (red terminal first) and secure them using bolts.		
3	Install terminal bolt caps.		
4	Connect battery manually closing the flag-type lever switch on the firewall electric board.		
5	Connect the battery LED male Faston terminal to the female Faston terminal from the LED light on the switch panel.		

24-30: 2.2. Battery caution LED light

24-30: 2.2.1. Removal

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Remove the switch panel.	- screwdriver set.	31-10: 2.3.1.
2	Disconnect molex connector of the battery caution LED light.		
3	Detach the LED light from the switch panel by pressing on the plastic clips and pushing it out off the opening on the switch panel.		
4	Cut the LED light wiring between the LED light and the molex connector and remove the parts.		

24-30: 2.2.2. Installation

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Insert the battery caution LED light in to the switch panel opening from the front side, passing the wires through first.	- Metric ratch-et/ socket set	
2	Fasten the battery caution LED light to the switch panel by applying pressure to it.		
3	Connect LED light wire terminals to the molex connector (male)		Figure 24-003
4	Connect the male molex from the LED light to the female molex connector.		
5	Install the switch panel.		31-10: 2.3.2.

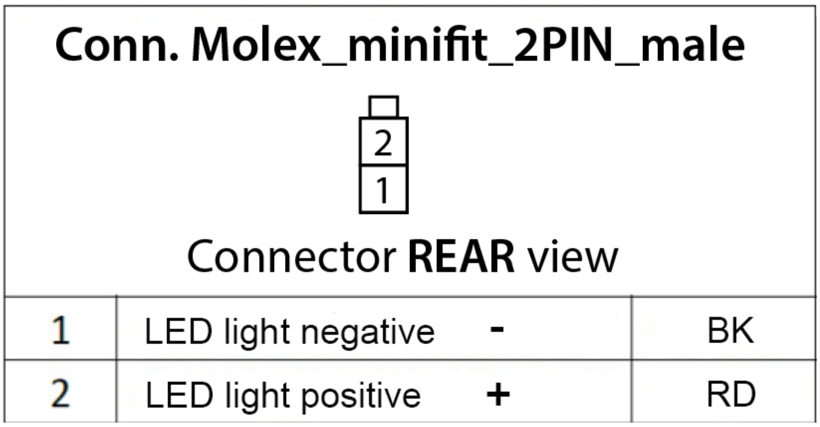

Figure 24-003
Battery caution LED light
wiring diagram

24-40 EXTERNAL POWER

1. Description

If the engine doesn't start an auxiliary power supply can be used to jump start it. Refer to chapter 8 of the applicable POH [5] for detailed information about how to jump start the airplane.

24-60 DC ELECTRICAL LOAD DISTRIBUTION

1. Description

The electrical system is controlled by means of switches/fuses, which are arranged in one row on the upper half of the switch panel under the instrument panel. The circuit breakers (CB) are located under the switch panel`s switches/fuses. If the airplane is equipped with optional Garmin or Dynon PFD/MFD, certain instruments and indications may already be integrated. For more details about individual configuration, please refer to applicable Pilot's Operating Handbook.

The electrical system itself includes three solenoids, one activated by the master switch, the second activated by the avionics switch and the starter engage. All electrical loads, apart from the 12 V socket and the Pitot heat, are connected to the avionics bus via push-pull circuit breakers (after implementation of SB-160-00-80-005 Fuel pump switch retrofit, 12V socket is connected to respective CB/Fuse too). For loads, which are engaged and disengaged more often, fused rocker switches are used (NAV lights, LDG light, etc.) All other loads (e.g. avionics) receive power as soon as the Avionics switch is ON. The avionics switch has no function when the master switch is OFF. The starter engage button is also disabled when the master switch is OFF.

The 22000uF/25V capacitor provides a continuous control voltage for the regulator/rectifier in the event of momentary interruption of battery voltage. This is necessary as generator output voltage is variable with RPM and may increase to as much as 30-40V AC.
The avionics bus covers all avionics loads and electrically operated instruments. The electrical system's harnesses run from the engine through the firewall and connect to the electrical panel, as well as other systems. The electrical system is divided into three main subsystems (engine harness, main electrical board and switch panel) which are connected to all equipment/devices.

2. Maintenance Practices

For applicable wiring diagram please contact Pipistrel support.

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CHAPTER 25 – EQUIPMENT AND FURNISHING

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25-00 GENERAL

This chapter describes all of the equipment and furnishings found in cabin and baggage compartment. It covers everything from the seats and three-point seat safety harnesses to the upholstery and control stick boots.

25-10 FLIGHT COMPARTMENT

1. Description

This chapter describes all of the equipment and furnishings found in the cabin and outlines the maintenance practices that apply to them.

Crew seats

The crew seats are comprised of a bottom cushion, hard padded back rest and a head rest.
The backrest and head rest are attached to the aft cabin bulkhead, while the bottom cushion is attached to the seat shell. All of the seats' components are secured in place by means of Velcro patches. The seats' position cannot be adjusted, nor can they be reclined, however, the backrest features a manual pneumatic pump to adjust the size of the lumbar bladder and consequently the amount of back support.

Safety harnesses

The harness is a 3-point restraint system with quick release buckle. The lap straps are attached to the composite seat shell with M8 bolts in an area that is that is locally reinforced. The shoulder straps are attached to the bottom of the rear baggage compartment bulkhead with M8 bolts. The attachment point is also locally reinforced.

Control stick boots

Each control stick is equipped with a leather boot that protects the stick and prevents any dirt/ debris from entering the area beneath the cabin floor.

2. Maintenance practices

25-10: 2.1. Crew seats

25-10: 2.1.1. Removal

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Tear head rest away from Velcro patches and remove it.		
2	Tear backrest away from Velcro patches, slide shoulder straps around it and remove it.		
3	Tear bottom cushion away from Velcro patches and remove it.		
4	Carry out visual inspection.		05-20

25-10: 2.1.2. Installation

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Position bottom cushion in seat shell and press it up against the Velcro patches on the seat shell.		
2	Position the backrest behind the shoulder straps and press it up against the Velcro patches on the aft cabin bulkhead.		
3	Position the head rest so that it's bottom flap rests behind the backrest and then press it up against Velcro patches on the aft cabin bulkhead.		

25-10: 2.2. Safety harnesses

25-10: 2.2.1. Removal

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Remove crew seats.	T-handle socket screwdriver set	25-10: 2.1.1.
2	Remove baggage compartment.		25-50: 2.1.1.
3	Remove fastening material securing the harnesses to their attachment points.		
4	Remove safety harnesses.		
5	Carry out visual inspection.		05-20

25-10: 2.2.2. Installation

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Apply Loctite 243 to the fastening material thread.	- T-handle socket screwdriver set, - Loctite 243	
2	Fasten the safety harnesses to their attachment points.		
3	Install baggage compartment.		25-50: 2.1.2.
4	Install crew seats.		25-10: 2.1.2.
5	Carry out operational inspection of seats.		05-20

25-10: 2.3. Control stick boot

25-10: 2.3.1. Removal

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Remove the self-tapping screws securing the base of the boot in place.	Phillips screwdriver	
2	Release the strap at the top of the boot.		
3	Remove the boot by sliding it off the control stick.		
4	Carry out visual inspection.		05-20

25-10: 2.3.2. Installation

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Slide the boot over the control stick and position it on the cabin floor	Phillips screwdriver	
2	Fasten it to the cabin floor using the self-tapping screws		
3	Fasten the strap at the top of the boot		
4	Carry out operational inspection of the control stick.		05-20

25-50 BAGGAGE COMPARTMENT

1. Description

The baggage compartment is an optional equipment and is positioned behind the cabin and it is accessible removing the port side crew seat. Baggage compartment floor is made of CFRP and, aside from supporting baggage, also acts as a barrier between it and the control rods nearby, so that luggage cannot interfere with them.

WARNING: Storing material in the baggage compartment when it is not equipped with CFRP walls and floor can be dangerous because luggage can interfere with the control system.

WARNING: It is not allowed to store material behind the starboard seat.

2. Maintenance practices

25-50: 2.1. Baggage compartment

NOTE: Applicable on aircraft with baggage compartment installed.

25-50: 2.1.1. Removal

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Remove crew seats.	-T-handle hex head screwdriver set	25-10: 2.1.1.
2	Remove the flexible curtain between the parachute container and the cabin bulkhead, attached to the structure by velcro.		
3	Remove the fastening material securing the port floor board to the fuselage, and take the floor boar out of the fuselage.		
4	Remove the fastening material securing the starboard floor board to the fuselage, and take the floor boar out of the fuselage.		
5	Remove the vertical flaperon push-rod protective cover unfastening the screws.		
6	Carry out visual inspection of baggage compartment components.		05-20
7	Install crew seats.		25-10: 2.1.2.

25-50: 2.1.2. Installation

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Remove crew seats.	-T-handle hex head screwdriver set	25-10: 2.1.1.
2	Install the vertical flaperon push-rod protective cover in place.		
3	Install the starboard floor board and connect it to the fuselage with the fastening material.		
4	Install the port floor board and connect it to the fuselage with the fastening material.		
5	Install the flexible curtain between the parachute container and the cabin bulkhead, secured by velcro patches.		
6	Install crew seats.		25-10: 2.1.2.

Figure 26-001
Baggage compartment

25-60 EMERGENCY

1. Description

Emergency locator transmitter (ELT)

ALPHA Trainer is equipped with two different ELT models; Kannad 406 AF Compact ELT or Artex ELT 345. In both cases, the ELT transmitter is installed immediately aft of the cabin bulkhead. The ELT is mounted slightly to the right of the airplane centerline. The transmitter is accessible by removing the seats, while the ELT antenna is located on the top of the cockpit.

Kannad 406 RCP / Artex 345 RCS

The Kannad 406 AF Compact ELT has a remote control panel (RCP) Kannad RC200, installed on the instrument panel for easy access and checking of system's proper functionality.

The Artex 345 has a remote control switch, installed on the instrument panel for easy access and checking of system's proper functionality.

WARNING: ELT and RCP / RCS batteries must be inspected in accordance with the requirements of the replacement schedule in chapter 5. The ELT and RCP / RCS batteries must be replaced upon reaching the date stamped on the batteries or whenever the batteries have been in use for one cumulative hour.

NOTE: Electrical equipment and electrically powered instruments are individually protected by means of circuit breakers, except the ELT which is separate from electrical system of the aircraft.

For additional information of the ELT, refer to the Kannad 406 AF Compact ELT Installation and Operation Manual [11] or to Artex ELT 345 ELT Installation and Operation Manual [12].

2. Maintenance practices

25-60: 2.1. Kannad 406 AF Compact ELT

25-60: 2.1.1. Removal

Reference: [11]

Step	Action	Required parts, materials and tools	Reference
1	Remove crew seats.		25-10: 2.1.1.
2	Locate ELT behind passenger seat.		
3	Set the 3-position switch of the front panel to OFF.		
4	Disconnect the antenna cable from the BNC connector of the ELT.		
5	Disconnect the DIN 12 Connector of the RCP from the DIN 12 socket of the ELT.		
6	Release strap.		
7	Remove ELT.		
8	Carry out visual inspection.		05-20

25-60: 2.1.2. Installation

Reference: [11]

Step	Action	Required parts, materials and tools	Reference
1	Position ELT in mounting brace with "Flight direction" arrow pointing towards the front of the aircraft.		
2	Secure strap tightly.		

NOTE: Once installed in the mounting brace, the installer must be sure that the transmitter is firmly attached in its bracket by trying to extract it manually, thereby verifying there is no play and that it remains attached when extraction from the bracket is attempted.

Step	Action	Required parts, materials and tools	Reference
3	Connect the antenna cable to the BNC connector of the ELT.		
4	Connect the DIN 12 Connector of the RCP to the DIN 12 socket of the ELT.		
5	Set the 3-position switch on the front panel of the ELT to ARM.		

NOTE: To avoid inadvertent activation or to save ELT's battery, set the switch to OFF when:
-aircraft is about to be shipped
-maintenance will be performed
-aircraft is about to be stored for a longer period

NOTE: Make sure, that switch is set back to ARM before next flight.

Step	Action	Required parts, materials and tools	Reference
6	Install crew seats.		25-10: 2.1.2.

25-60: 2.2. Artex ELT 345

25-60: 2.2.1. Removal

Reference: [12]

Step	Action	Required parts, materials and tools	Reference
1	Remove crew seats.		25-10: 2.1.1.
2	Locate ELT behind passenger seat.		
3	Disconnect antenna coax cable from the ELT.		
4	Disconnect RCS harness D-sub plug.		

NOTE: Check the coax cable center conductor pin which is prone to retracting into the connector housing.

Step	Action	Required parts, materials and tools	Reference
5	Release the metal harness.		
6	Slide the ELT up and out, and away from the mounting tray.		
7	Carry out visual inspection.		05-20

25-60: 2.2.2. Installation

Reference: [12]

Step	Action	Required parts, materials and tools	Reference
1	Insert the ELT into the mounting tray at an angle, engaging the locking ears at the tail end first. Press the ELT down until it is fully seated in the mounting tray.		
2	Secure the metal harness.		
3	Connect the RCS harness to the ELT, taking care to insert the D-sub receptacle straight in. Secure the D-sub receptacle with the thumbscrews.		

NOTE: Care must be taken in the cable connection process to avoid shorting any pins to ground or each other. Under some circumstances, the shorting or grounding of the pins signal the ELT as if the remote switch was activated. This may result in ELT transmissions or setting the ELT into a monitoring condition. This may result in the ELT exhibiting battery runtime in excess of regulations. To avert this condition, after the harness connection is complete the installer shall activate the self-test on the installed unit. This action will need to be performed whenever the harness is disconnected and then re-connected.

NOTE: To avoid inadvertent activation or to save ELT's battery, set the switch to OFF and disconnect D-sub receptacle when:
-aircraft is about to be shipped
-maintenance will be performed
-aircraft is about to be stored for a longer period
NOTE: Make sure, that D-sub receptacle is connected and that switch is set back to ARM before next flight.

NOTE: A connection jumper (“G-switch loop”) between pins 5 and 12 on the D-sub receptacle enables the G-switch circuitry, allowing activation when the acceleration threshold is exceeded. The jumper is located in the mating D-sub receptacle of the cockpit remote switch wire harness. When this D-sub receptacle is removed, the ELT can be manipulated without the possibility of activation. With the G-switch loop in place, neither the cockpit remote switch nor the ELT control switch can be positioned to prevent automatic activation. With the G-switch loop open (removed), the ELT cannot be activated by dropping, rough handling or during shipping.

Step	Action	Required parts, materials and tools	Reference
4	Set the 3-position switch on the front panel of the ELT to ARM.		
5	Connect the antenna coax cable to the ELT.		
6	Install crew seats.		25-10: 2.1.2.

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CHAPTER 27 – FLIGHT CONTROLS

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27-00 GENERAL

1. Description

This chapter describes the aircraft control system and the maintenance procedures that pertain to it.

The control system consists of various push/pull rods, bellcranks, cables and pulleys. An elevator attached to the horizontal stabilizer gives longitudinal control, while a rudder, which is attached to the vertical stabilizer, provides yaw control. The wings have flaperons attached to their trailing edge which provide lateral control, as well as extra lift for landing and taking off.

The aircraft has a control stick for each pilot. The elevator can be trimmed using a trim knob found in the center console, just between the two seats.

Each pilot has a rudder pedal assembly that is attached to the cabin floor and allows for complete yaw control as well as nose wheel steering. The rudder pedal assembly's position is adjustable.

2. Maintenance Practices

27-00: 2.1. Push/pull rods

27-00: 2.1.1. Adjusting length

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Loosen jam nut.	-metric ratchet/socket set, -metric combination wrench set -Marker paint	
2	Remove fastening material securing the rod end to the stud/brace.		
3	Slide rod end off stud/brace.		
4	Rotate rod end bearing clockwise to shorten the push/pull rod or counterclockwise to lengthen it.		
5	Slide rod end back onto stud/brace.		
6	Fasten rod to stud/brace. Torque and apply Loctite if necessary (see pull/push rod assembly in IPC).		20-30
7	Apply marker paint		
8	Carry out operational inspection.		05-20

27-20 RUDDER

1. Description

Rudder pedals are available for each pilot and are adjustable in flight in the fore-aft direction. Metal cables in Teflon-coated protective sleeves run from the individual pedal to an intermediate junction point inside the fuselage, and then directly to the rudder. Rudder cable tension can be adjusted using turnbuckles. The nose wheel is part of the yaw control system and moves whenever the pedal is pressed. The cables that allow for nose wheel steering run from the aft rudder cables joints to the nose wheel bellcrank.

Figure 27-001
Rudder control system

2. Maintenance Practices

27-20: 2.1. Rudder cables

27-20: 2.1.1. Inspection/check near the rudder

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Remove rudder.	- metric ratchet/socket set	55-40: 2.1.1.
2	Carry out visual inspection of rudder cables in the vicinity of the rudder cable bellcrank.		05-20

NOTE: Pay special attention to the cables' individual strands, as if even one damaged strand requires complete cable replacement. Also inspect their thimbles and sleeves for any signs of damage or wear.

Step	Action	Required parts, materials and tools	Reference
3	Carry out operational inspection of the rudder cables in the vicinity of the rudder cable bellcrank.		05-20
4	Install the rudder.		55-40

27-20: 2.1.2. Inspection/check in the fuselage aft of the cabin

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Remove the crew seats	- metric ratchet/socket set - T-handle hex head screwdriver set	25-10: 2.1.1.
2	Remove baggage compartment (if applicable).		25-50: 2.1.1.
3	Carry out visual inspection of rudder cables behind the cabin and in the fuselage tail cone.		05-20

NOTE: Pay special attention to the cables' individual strands, as if even one damaged strand requires complete cable replacement.

Step	Action	Required parts, materials and tools	Reference
4	Carry out operational inspection of the rudder cables behind the cabin and in the fuselage tail cone.		05-20
5	Install the baggage compartment (if applicable)		25-50: 2.1.2.
6	Install crew seats		25-10: 2.1.2.

27-20: 2.1.3. Inspection/check in the cabin

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Carry out visual and tactile inspection of rudder cables in the cabin near the rudder pedals. Make sure to position rudder pedals to both furthermost positions, to be able to inspect also the section of the cables that is hidden in the tube		05-20

NOTE: Use gentle cloth to protect hands when performing the tactile inspection to prevent possible injury.
NOTE: Pay special attention to the cables' individual strands, as if even one damaged strand requires complete cable replacement.

continued on the next page

Step	Action	Required parts, materials and tools	Reference
2	Detach the rudder pedal return springs to access to the bottom end of the S-shaped tube.		

NOTE: Pay special attention to the area where the cables enter and exit the pedals' S-shaped tube (see Figure 27-002).

Step	Action	Required parts, materials and tools	Reference
3	Reattach the rudder pedal return springs.		

Figure 27-002
Upper pedal-rudder cable joint

Step	Action	Required parts, materials and tools	Reference
4	Carry out operational inspection of the rudder cables in the cabin.		05-20

27-20: 2.2. Rudder pedals

27-20: 2.2.1. Inspection/check
Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Carry out visual inspection of rudder pedals.		05-20
2	Carry out operational inspection of rudder pedals.		05-20

27-20: 2.3. Rudder pedal return springs

27-20: 2.3.1. Inspection/check
Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Carry out visual inspection of the springs. Pay special attention to the springs' end hooks and check for any signs of deformation.	Rudder deflection verification template (P/N 1190345)	05-20
2	Fit the aircraft with the rudder deflection verification template.		
3	Align the rudder with the template's center mark.		
4	Verify that the rudder pedals are parallel to each other.		

CAUTION: Damaged or deformed rudder pedal return springs can cause unexpected/odd yaw behavior. Replace them if necessary (see 27-20).

Step	Action	Required parts, materials and tools	Reference
5	Remove the rudder deflection verification template.		

27-20: 2.3.2. Removal/installation
Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Unhook the springs from the pedals.	- Vernier caliper - needle nose pliers - rudder deflection verification template (P/N 1190345)	
2	Install new springs		
3	Check that the rudder pedals are parallel to each other with the rudder centered.		27-20
4	Carry out operational inspection of the rudder pedal return springs.		05-20

27-20: 2.4. Rudder

27-20: 2.4.1. Inspect/check
Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Remove rudder.		55-40
2	Visual inspection of the rubber seals. Replace if necessary.		
3	Inspect the paint marker on the threaded stopper pins. If they have loosened/shifted, adjust the deflection angle.		20-40: 2.1. 27-20: 2.4.2.
4	Wipe clean and lubricate upper rudder bushing.		12-20

27-20: 2.4.2. Deflection angle adjustment
Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Position and fasten the rudder deflection template to the fuselage.	- rudder deflection verification-template (P/N 1190345)	
2	Vertify that rudder's deflections angles are within tolerance using markings on template.		
3	If necessary, adjust deflection angles by regulating threaded stopper pins on lower rudder hinge.		06-00

CAUTION: Rudder deflection angles that don't adhere to those in APPENDIX 99-A can result in unexpected/odd yaw behavior.

27-20: 2.4.3. Radial free play check
Reference: Figure 27-004

Step	Action	Required parts, materials and tools	Reference
1	Remove the horizontal stabilizer.	- Vernier caliper	53-10
2	Place Vernier caliper between rudder and the elevator retainer and, while moving the rudder back and forth in the radial direction, measure the free play.		

CAUTION: The maximum permissible amount of radial rudder free play is 0.5 mm.

Step	Action	Required parts, materials and tools	Reference
3	Install the horizontal stabilizer.		53-10

Figure 27-004
Rudder radial free play check

27-20: 2.4.4. Axial free play check

Reference: Figure 27-005

Step	Action	Required parts, materials and tools	Reference
1	Remove the horizontal stabilizer.	- Vernier caliper	55-10
2	Place Vernier caliper as shown in Figure 27-005 and, while moving the rudder back and forth in the axial direction, measure the free play.		

CAUTION: The maximum permissible amount of radial rudder free play is 0.1 mm.

Step	Action	Required parts, materials and tools	Reference
3	Install the horizontal stabilizer.		55-10

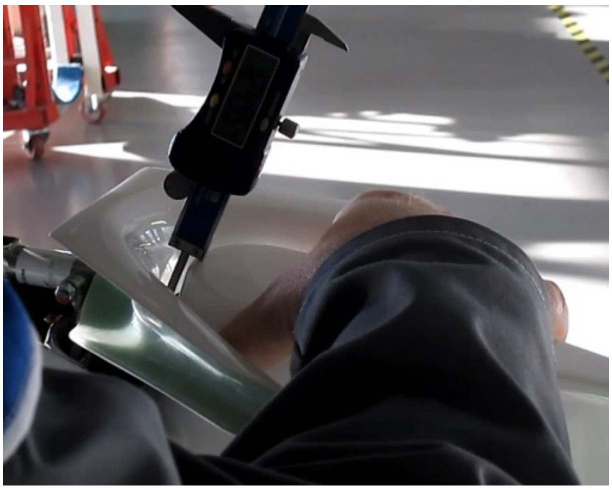

Figure 27-005
Rudder axial free play check

27-20: 2.5. Upper rudder hinge

27-20: 2.5.1. Inspection/check

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Remove rudder.	- metric ratchet/socket set - torque wrench - paper towel	55-40
2	Carry out visual inspection of upper rudder hinge.		05-20
3	Inspect paint marker.		20-40: 2.1.
4	Clean hinge pin with paper towel and lubricate it.		12-20
5	Install rudder.		55-40

27-20: 2.6. Lower rudder hinge

27-20: 2.6.1. Inspection/check

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Remove rudder.	- metric ratchet/socket set - torque wrench - paper towel	55-40
2	Carry out visual inspection of lower rudder hinge.		05-20
3	Inspect paint marker.		20-40: 2.1.
4	Clean hinge pin with paper towel and lubricate it.		12-20
5	Install rudder.		55-40

27-20: 2.7. Rudder cable bellcrank

27-20: 2.7.1. Inspection/check

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Remove rudder.		55-40
2	Carry out visual inspection of rudder cable bellcrank.		05-20
3	Clean it with paper towel and lubricate it.		12-20
4	Inspect paint marker.		20-40: 2.1.
5	Carry out operational inspection of the rudder cable bellcrank.		05-20
6	Install rudder.		55-40

27-30 ELEVATOR

1. Description

The elevator is fastened to the horizontal stabilizer and is operated using the pilot control sticks (see Figure 27-006). The sticks are mounted on a common lateral drive assembly, which actuates the horizontal elevator push-rod that runs along the entire length of the fuselage. A bellcrank is located on the bottom side of the vertical stabilizer and can be inspected through a provision in the vertical stabilizer end-rib. The hook-up to the elevator is via a composite U-shaped retainer which conforms to the shape of the elevator. Upon removal of the horizontal stabilizer/elevator, the U-member remains attached to the fuselage. The pitch control system does not include any cables. Control stops are integrated into the lateral drive assembly for elevator deflection control.

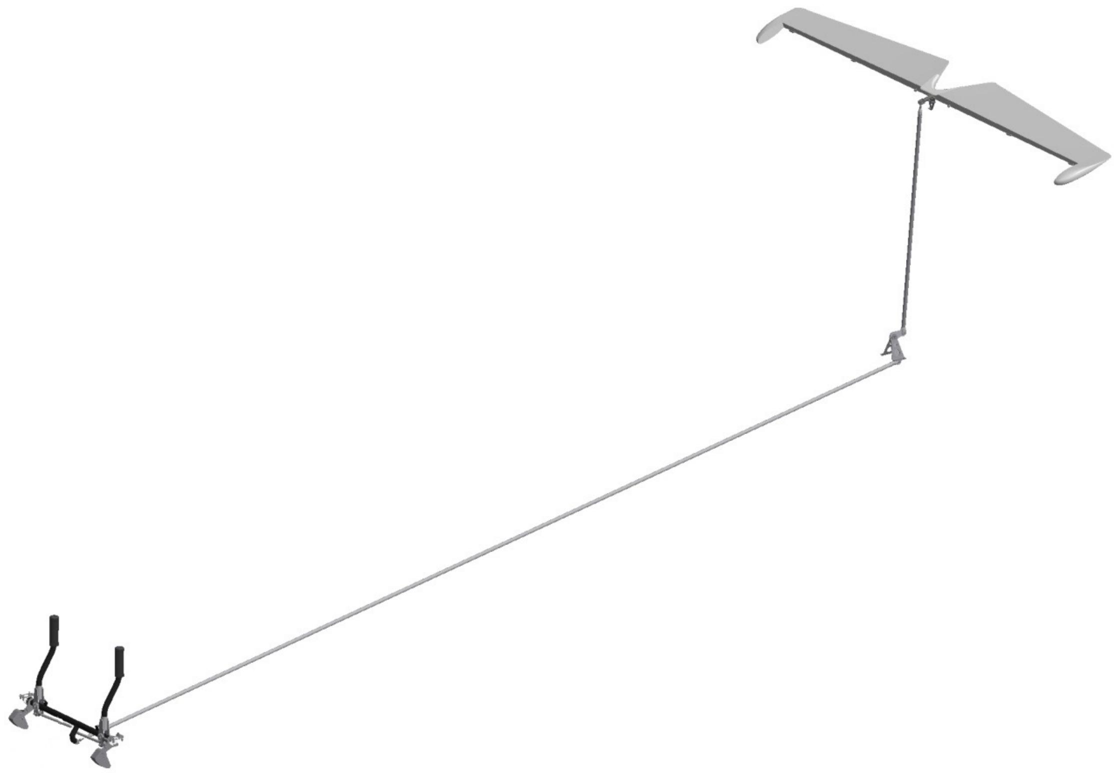

Figure 27-006
Elevator control system

A spring-based elevator trim is activated electrically by a servo motor assembly located behind the baggage compartment (see Figure 27-007). The motion of the linear servo is controlled through a cockpit switch and an integral position sensor. Trim position is indicated with discrete steps on a dedicated LED display on the instrument panel.

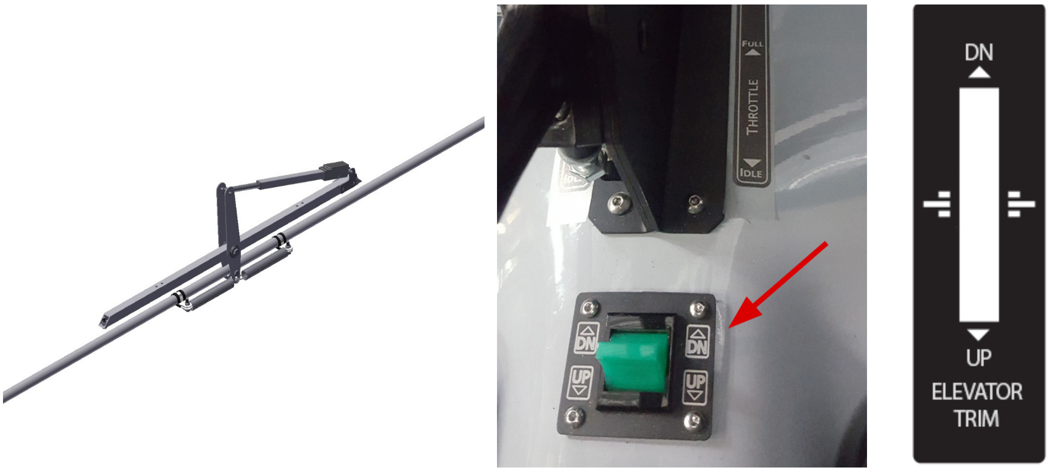

Figure 27-007
Example of Elevator trim system and cockpit switch/display

2. Maintenance Practices

27-30: 2.1. Elevator

27-30: 2.1.1. Inspection/check (stopper pins on stick drive assembly)

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Remove the port control stick boot.		25-10: 2.3.1.
2	Inspect the paint marker on the threaded stopper pins at port end of the control stick drive. If they have loosened/shifted, adjust the deflection angle.		27-30: 2.1.2.

27-30: 2.1.2. Inspection/check (stopper hose clamps on elevator push-rod)

(if required after performing inspection/check in 27-30: 2.1.1.)

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Remove crew seats.		25-10: 2.1.1.
2	Remove baggage compartment (if applicable).		25-10: 2.1.1.
3	Inspect the hose clamps positioned along the elevator push-rod in the baggage compartment. Check if they have loosened/shifted, adjust the deflection angle.		27-30: 2.1.3.
4	Install baggage compartment (if applicable).		25-10: 2.1.2.
5	Install crew seats.		25-10: 2.1.2.

27-30: 2.1.3. Deflection angle adjustment

(if required after performing inspection/check in 27-30: 2.1.1.)

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Fit elevator deflection measurement tool on trailing edge of elevator.	- elevator deflection measurement kit (P/N 1190464)	Figure 27-016
2	Put elevator in neutral position by aligning it with horizontal stabilizer. Set inclinometer to 0°.		
3	Verify the elevator's deflection angles adhere to those found in APPENDIX 99-A.		APPENDIX 99-A 06-00
4	Adjust the deflection angles by screwing/unscrewing the control sticks' longitudinal threaded stopper pins, or, for hose clamp system, shifting the position of the stopper hose clamps along the elevator push-rod inside the baggage compartment.		05-20 06-00

CAUTION: Elevator deflection angles that don't adhere to those in APPENDIX 99-A can result in unexpected/odd pitch behavior.

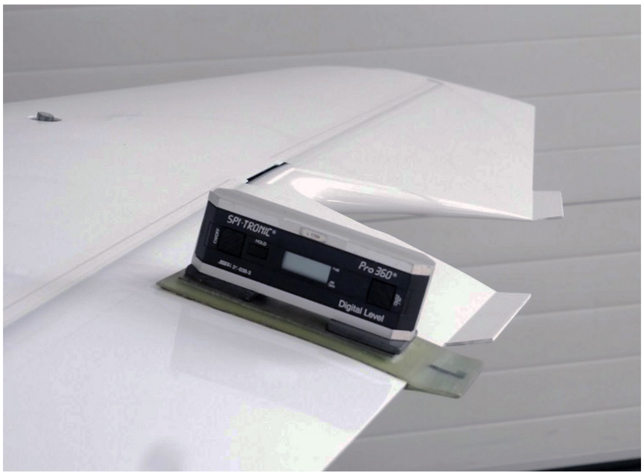

Figure 27-0016
Elevator deflection angle adjustment

27-30: 2.1.4. Axial free play check

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Lower the tail chapter to the ground.	- Vernier caliper	
2	Place Vernier caliper between elevator and horizontal stabilizer, while moving the rudder back and forth in the axial direction, measure the free play.		Figure 27-008

CAUTION: The maximum permissible amount of axial elevator free play is 0.5 mm

Figure 27-008
Elevator axial free play check

27-30: 2.1.5. Radial free play check

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Lower the tail chapter to the ground	- Vernier caliper	
2	Place Vernier caliper between elevator and horizontal stabilizer, while moving the rudder back and forth in the radial direction, measure the free play.		Figure 27-009
CAUTION: The maximum permissible amount of radial rudder free play is 0.5 mm.			
3	Install the horizontal stabilizer.		55-10

Figure 27-009
Elevator radial free play check

27-30: 2.2. Horizontal elevator pushrod

27-30: 2.2.1. Inspection/check

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Remove the crew seats.		25-10: 2.1.1.
2	Remove the baggage compartment.		25-50: 2.1.1.
3	Remove the fuel tank.		28-10:2.1.1
4	Carry out visual inspection of horizontal elevator push-rod. Inspect the push rod's surface where it travels through the bearings. Surface discoloration is acceptable, however, gouges and surface deformations are not.		05-20 Figure 27-010 Figure 27-011
CAUTION: Surface damage and/or gouges in the horizontal elevator push-rod deeper than 0.15 mm are a safety hazard and require push-rod replacement.			
4	Carry out operational inspection of horizontal elevator push-rod.		05-20

Figure 27-010
Horizontal elevator pushrod surface discoloration

Figure 27-011
Horizontal elevator pushrod surface gouges

27-30: 2.2.2. Major inspection

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Remove the control stick boots.	Phillips screwdriver	25-10: 2.3.1.
2	Remove the crew seats.		25-10: 2.1.1.
3	Remove the baggage compartment. (if applicable).		25-50: 2.1.1.
4	Use bore-scope to carry out visual inspection of the horizontal elevator push rod under the cabin floor.		05-20
5	Install the baggage compartment.		25-50: 2.1.2.
6	Install the crew seats.		25-10: 2.1.2.
7	Install control stick book.		25-10: 2.3.2.

27-30: 2.3. Elevator trim assembly

27-30: 2.3.1. Inspection/check

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Remove the crew seats	- Vernier caliper, - measuring tape	25-10: 2.1.1.
2	Remove the baggage compartment		25-50: 2.1.1.
3	Remove the fuel tank.		28-10: 2.1.1.
4	Carry out visual inspection of elevator trim assembly. Inspect its springs for any signs of damage. Check that the fastening material securing them to the assembly hasn't loosened. Make sure their end hooks aren't deformed. Replace if necessary.		05-20 Figure 27-012
5	Carry out operational inspection of elevator trim assembly.		05-20
6	Verify that the hose clamps, securing the elevator trim assembly's springs to the horizontal elevator push-rod, haven't shifted in position.		
7	Install the fuel tank.		28-10: 2.1.2
8	Install the baggage compartment		25-50: 2.1.2.
9	Install the crew seats.		25-10: 2.1.2.

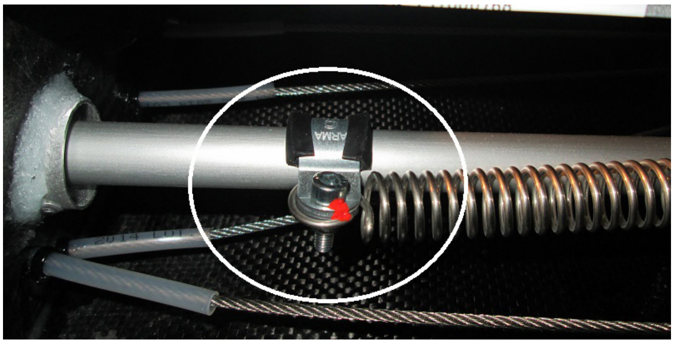

Figure 27-012
Elevator trim assembly spring fastening material

27-30: 2.4. Control sticks

27-30: 2.4.1. Inspection/check

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Remove the control stick boots.	Phillips screwdriver	25-10: 2.3.1.
2	Carry out visual inspection of the control sticks.		05-20
3	Carry out operational inspection of the control sticks.		
4	Secure one control stick so that it can't move and move the other back and forth laterally. Measure the amount of free play.		
CAUTION: More than 8 mm of control stick free play is unacceptable and must be attended to immediately.			
5	Carry out the same free play check for the other control stick.		
6	Install the control stick boots.		25-10: 2.3.2.

27-30: 2.4.2. Major inspection

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Remove the control stick boots.	Phillips screwdriver	25-10: 2.3.1.
2	Use bore-scope to carry out visual inspection of the control sticks.		05-20
3	Install the control stick boots.		25-10: 2.3.2.

27-30: 2.5. Control stick drive

27-30: 2.5.1. Inspection/check

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Remove the control stick boots.	Phillips screwdriver	25-10: 2.3.1.
2	Carry out visual inspection of the control stick drive.		05-20
3	Carry out operational inspection of the control stick drive.		
4	Lubricate drive's end bearings and all adjacent rod end bearings.		12-20: 2.5.
5	Install the control stick boots.		25-10: 2.3.2.

27-30: 2.5.2. Major inspection

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Remove the control stick boots.	Phillips screwdriver	25-10: 2.3.1.
2	Use bore-scope to carry out visual inspection of the control stick drive assembly.		05-20
3	Install the control stick boots.		25-10: 2.3.2.

27-30: 2.6. Vertical elevator push rod

27-30: 2.6.1. Inspection/check

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Remove the horizontal stabilizer.	Phillips screwdriver	55-10: 2.1.
2	Remove rudder.		55-40: 2.1.
3	Carry out visual inspection of the vertical elevator push rod.		05-20
4	Carry out operational inspection of the vertical elevator push rod.		
5	Lubricate push rod end bearings and aft horizontal elevator push rod end bearing.		12-20: 2.5.

27-30: 2.6.2. Major inspection

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Remove the horizontal stabilizer.	Phillips screwdriver	55-10: 2.1.
2	Remove rudder.		55-40: 2.1.
3	Use bore-scope to carry out visual inspection of the vertical elevator push rod from the opening in the lower rudder hinge.		05-20

27-50 FLAPERONS

1. Description

Roll control is accomplished via asymmetric deflection of the flaperons. The flaperon control system consists of various bellcranks, push/pull rods and torque tubes (see Figure 27-013). The pilots can change the flaperon deflection angle using a lever located between the seats. The lever's handle is spring-locked and has different positions corresponding to defined flap deflections (see Chapter 6 for details). The thumb-lock button prevents inadvertent lever movement. The aft end of the flap lever connects to the main flaperon bellcrank.

Figure 27-013
Flaperon control system

2. Maintenance Practices

27-50: 2.1. Flaperons

27-50: 2.1.1. Inspection/check

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Remove the control stick boots.		25-10: 2.3.1.
2	Inspect the paint marker on both stopper bolts found on the top of the control stick drive. If they have loosened/shifted, adjust the flaperon deflection angle.		27-50: 2.1.2.

27-50: 2.1.2. Deflection angle adjustment (if required after performing inspection/check 27-50: 2.1.1.)

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Fit flaperon deflection measurement tool to trailing edge of verification template.	- flaperon deflection measurement kit (P/N 1190463)	Figure 27-0017
2	Put flaperon in neutral position by aligning it with wing. Set inclinometer to 0°.		
3	Verify that the deflection angles of both flaperons adhere to those found in the Weight and Balance Report (APPENDIX 99-A) of this manual, in all of the different flaperon handle positions.		APPENDIX 99-A
4	Adjust the deflection angles by screwing/unscrewing the control sticks' lateral threaded stopper pins.		

CAUTION: Flaperon deflection angles that don't adhere to those in APPENDIX 99-A can result in unexpected/odd roll behavior.

Figure 27-017
Flaperon deflection angle adjustment

27-50: 2.1.3. Axial free play check

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Remove the wings.	Vernier caliper	57-10: 2.1.1.
2	Place Vernier caliper between flaperon and the wingtip and, while moving the flaperon back and forth in the axial direction, measure the free play.		Figure 27-014

CAUTION: The maximum permissible amount of axial flaperon free play is 0.5 mm.

Flaperon axial free play check

27-50: 2.1.4. Radial free play check

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Remove the wings.	Vernier caliper	57-10: 2.1.1.
2	Place Vernier caliper between flaperon and the wing-tip and, while moving the flaperon back and forth in the radial direction, measure the free play.		Figure 27-015

CAUTION: The maximum permissible amount of radial rudder free play is 0.5 mm.

Figure 27-015
Flaperon radial free play check

27-50: 2.2. Vertical flaperon pushrods

27-50: 2.2.1. Inspection/check
Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Remove the crew seats.		25-10: 2.1.1.
2	Remove the baggage compartment		25-50: 2.1.1.
3	Carry out visual inspection of the vertical flaperon pushrods.		05-20
4	Carry out operational inspection of the vertical flaperon push-rods.		05-20
5	Lubricate push-rod bearings.		12-20
6	Install the baggage compartment.		25-50: 2.1.2.
7	Install the crew seats.		25-10: 2.1.2.

27-50: 2.3. Upper flaperon bellcranks

27-50: 2.3.1. Inspection/check
Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Carry out visual inspection of the upper flaperon bellcranks.		05-20
2	Carry out operational inspection of the upper flaperon bell-cranks.		05-20

27-50: 2.3.2. Inspection/check
Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Remove wings.		57-10: 2.1.1.
2	Carry out visual inspection of the upper flaperon bellcrank clutch.		05-20
3	Clean and lubricate the upper flaperon bellcrank clutch.		12-20
4	Install wings.		57-10: 2.1.2.
5	Carry out operational inspection of the flaperons.		05-20

27-50: 2.4. Flaperon bellcrank assembly

27-50: 2.4.1. Inspection/check
Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Remove the crew seats.		25-10: 2.1.1.
2	Remove the baggage compartment.		25-50: 2.1.1.
3	Remove control stick boot.		25-10: 2.3.1.
4	Carry out visual inspection of the flaperon bellcrank assembly.		05-20
5	Carry out operational inspection of the flaperon bellcrank assembly.		
6	Lubricate bearings.		12-20
7	Install the baggage compartment.		25-50: 2.1.2.
8	Install the crew seats.		25-10: 2.1.2. 25-10: 2.3.2.
9	Install control stick boot.		

27-50: 2.4.2. Major inspection
Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Remove the control stick boots.	Phillips screw-driver	25-10: 2.3.1. 25-10: 2.1.1.
2	Remove the crew seats.		
3	Remove the baggage compartment.		25-50: 2.1.1.
4	Use bore-scope to carry out visual inspection of the flaperon bell-crank assembly sticks.		05-20
5	Install the baggage compartment.		25-50: 2.1.2.
6	Install the crew seats.		25-10: 2.1.2. 25-10: 2.3.2.
7	Install control stick boot.		

27-50: 2.5. Flaperon handle assembly

27-50: 2.5.1. Inspection/check
Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Remove the crew seats.	Phillips screw-driver	25-10: 2.1.1.
2	Remove the baggage compartment.		25-50: 2.1.1.
3	Carry out visual inspection of the flaperon handle assembly.		05-20
4	Carry out operational inspection of the flaperon handle assembly.		
5	Lubricate bearing.		12-20
6	Install the baggage compartment.		25-50: 2.1.2.
7	Install the crew seats.		25-10: 2.1.2.

27-60 AIR BRAKE LEVER

1. Description

A Schempp-Hirth style air brake system is incorporated into the wings of the aircraft and is activated by a ceiling mounted pull-lever in the cabin. The lever is connected to the air brake control system in the wings via a self-fitting coupling mechanism. The pull-lever has a step-control mechanism that allows the pilot to leave the lever in certain positions. The pull-lever can only be used once a thumb-trigger lock is released.

2. Maintenance practices

27-60: 2.1. Air brake lever

27-60: 2.1.1. Inspection/check

Step	Action	Required parts, materials and tools	Reference
1	Carry out visual inspection of the air brake lever.		05-20
2	Carry out operational inspection of the air brake lever.		
3	Lubricate the air brake lever's clutches.		12-20: 2.5.

27-60: 2.2. Air brake step control

27-60: 2.2.1. Inspection/check

Step	Action	Required parts, materials and tools	Reference
1	Carry out visual inspection of the air brake step control mechanism.		05-20
2	Carry out operational inspection of the air brake step control mechanism.		

28

CHAPTER 28 – FUEL

TABLE OF CONTENTS

28-00 GENERAL

The aircraft is equipped with a single 50 lt (13.2 US gal) fuel tank positioned in the fuselage, aft the crew seats. The feed fuel line runs through the fuel filter and through the fuel pump (facet type). Then the fuel enters the fuel shut-off valve, operated by a lever positioned on the cabin floor, and finally passes through the firewall, direct to the engine compartment. Here the feed fuel line passes through the fuel drain valve, positioned at the bottom of the hot side of the firewall and then through the gascolator before being directed to the engine pump. The fuel return line enters the cabin through the firewall, passes below the crew seats and then is connected to the upper part of the fuel tank. A vent line connects the fuel tank top to the fuselage belly. Fuel level is monitored by a fuel level sensor, positioned inside the fuel tank.

28-10 STORAGE

1. Description

Refer to section 28-00 for system description.

2. Maintenance Practices

28-10: 2.1. Fuel tank

28-10: 2.1.1. Removal of fuselage main fuel tank

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Drain the fuel system	- Flat head screwdriver - Cutting nippers - Allen key set - Combination wrench set	12-20
2	Remove the seats		25-10: 2.1.1.
3	Remove the baggage compartment		25-50: 2.1.1
4	Loosen hose clamps and disconnect fuel feed/return/ breather lines from tank.		
5	Loosen hose clamps and disconnect fuel filler hose on the top.		
6	Disconnect the fuel level sensor and remove the reservoir cap on the back of the airplane		
7	Remove all the bolts and washers holding the fuel tank in place on the bulkhead.		
8	Slide the tank out from behind the cabin.		

28-10: 2.1.2. Installation of fuselage main fuel tank

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Apply Loctite 243 to the nuts bonded into the tank attachment bulkhead.	- Flat head screwdriver - Cutting nippers - Allen key set - Combination wrench set - Loctite 243	12-20
2	Reposition the tank in place behind the cabin.		
3	Fix the tank to the bulkhead using the fixing bolts and washers.		
4	Connect the fuel sensor level plug and the fuel filler hose on the top.		
5	Connect the feed and return hoses, and the breather line.		
6	Install the baggage compartment		25-50: 2.1.2.
7	Install the seats.		25-10: 2.1.2.

Figure 28-001
Fuselage fuel tank return and breather lines

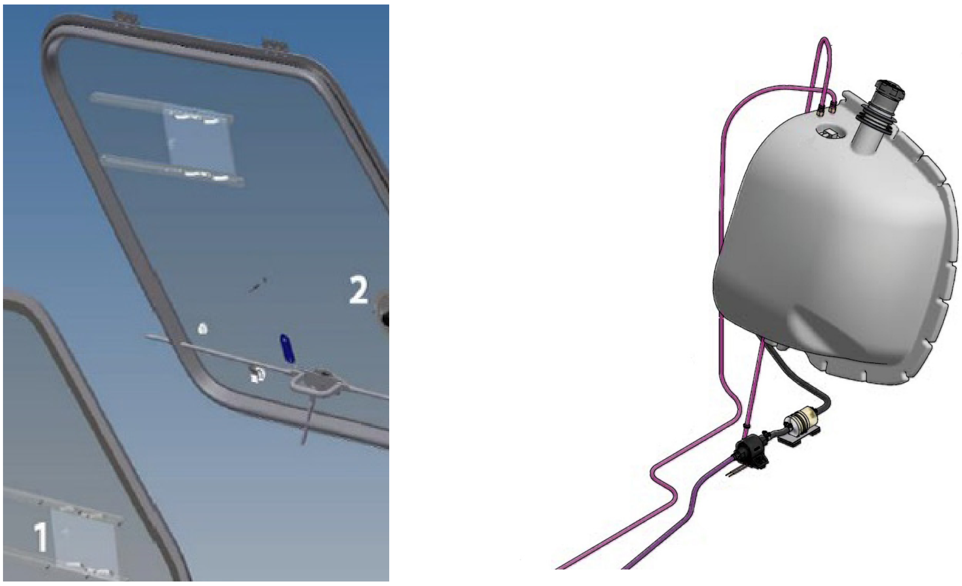

Figure 28-002
Fuselage fuel tank system
Plastic and composite tank versions

28-20 DISTRIBUTION

1. Description

The fuel distribution system consists of thermoplastic polyurethane fuel hoses in the fuselage and rubber hoses in the engine compartment. The latter are protected with either a certified glass-teflon coating or heat resistant sleeve.
The system features a fuel return circuit, fixed/quick-release fittings and a gascolator that's located on the bottom port side of the engine bay and is equipped with a fuel/water drain valve.

2. Maintenance Practices

28-20: 2.1. Gascolator

28-20: 2.1.1. Removal

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Put the fuel switch in the CLOSED position.	- Flathead screwdriver, - Wrench set	
2	Drain the fuel system.		12-20
3	Loosen the hose clamp at the gascolator's inlet and outlet and disconnect the fuel hoses.		
4	Loosen and remove the two M6 hex-head bolts securing the gascolator to its mounting support.		
5	Remove the gascolator.		

28-20: 2.1.2. Installation

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Install the gascolator to its support using the two M6 hex-head bolts.	- Flathead screwdriver, - Wrench set - Liquid paint marker	
2	Mark the two M6 bolts with paint marker.		
3	Connect the feed fuel line and fasten it in place with hose clamp.		
4	Torque mark.		20-40

continued on the next page

Step	Action	Required parts, materials and tools	Reference
5	Connect fuel line at gascolator outlet and secure with hose clamp.		
6	Torque mark.		20-40
7	Replenish the fuel system and carry out visual inspection.		12-10 05-20

Figure 28-003
Gascolator

Figure 28-004
Gascolator filter

28-20: 2.1.3. Inspection/Cleaning

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Loosen the four screws that connect the bottom part of the gascolator to the upper part	- Allen key set - cleaning benzine 60/90 - Compressed air	
2	Carefully remove the bottom part of the gascolator.		
3	Remove the gasket and carry out visual inspection.		05-20
4	Replace the gasket if necessary.		
5	Remove and carry out visual inspection of the filter and internal spring.		Figure 28-004
6	Clean with cleaning benzine 60/90 and compressed air.		
7	Reassemble the gascolator repositioning the filter and gasket.		
8	Close the gascolator using the four screws		

28-20: 2.3. Fuel filter and fuel pump

28-20: 2.3.1. Fuel filter removal

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Drain the fuel system.	- Flathead screwdriver	12-20
2	Release hose clamps and disconnect the inlet and oulet fuel lines that are attached to the fuel filter.		
3	Carry out visual inspection and replace if necessary.		05-20

28-20: 2.3.2. Fuel filter installation

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Connect the two fuel lines to the filter and secure with hose clamps.	- Flathead screwdriver - Marker paint	
CAUTION: When reinstalling the fuel filter be sure to position it properly. An arrow on the side of it's housing shows the flow direction.			
2	Torque mark the hose clamps.		20-40
3	Replenish the fuel system and carry out visual inspection.		12-10 and 05-20

28-20: 2.3.3. Fuel pump removal

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Drain the fuel system.	- Flathead screwdriver - Wrench set -Cutting nippers	12-20
2	Remove crew seats.		25-10: 2.1.1.
3	Remove baggage compartment (if applicable).		25-50: 2.1.1.
4	Cut the cable tie securing the fuel pump electric connector. Disconnect the clip		
5	Release hose clamps/cable ties. Disconnect inlet and outlet hoses from the pump fittings.		Figure 28-009
NOTE: Take into account cable tie/hose clamp placement to aid in the appropriate installation.			
6	Unscrew the two hex self locking nuts from the pump housing and remove the fuel pump.		

28-20: 2.3.4. Fuel pump installation

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Connect the inlet and outlet fuel hoses to the fuel pump fittings using hose clamps/cable ties based on prior installation.	- Flathead screwdriver - Wrench set - Liquid paint marker	12-20 See NOTE 28-20: 2.3.4.
2	Apply marker paint to the hose clamps screw heads.		
3	Install the fuel pump using the two hex self locking nuts and washers and apply marker paint to the nuts.		
4	Connect the fuel pump electric plug and secure it with a cable tie.		
5	Install baggage compartment (if applicable).		25-50: 2.1.2.
6	Install crew seats.		25-10: 2.1.2.
7	Perform visual, operational and leak inspection of the fuel pump.		

28-20: 2.3.5. Fuel filter and pump inspection

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Remove crew seats	- Rag or cloth that stains when comes in contact with liquids - Allen key set	25-10: 2.1.1.
2	Remove baggage compartment		25-50: 2.1.1.
3	Check for leakages: run a rag along the fuel lines and around the joints. A leakage is present if the rag get stained.		
4	Check the fuel filter for dirt and debris inside. Replace if necessary.		
5	Perform visual inspection of the fuel pump.		
6	Install baggage compartment		25-50: 2.1.2.
7	Install crew seats		25-10: 2.1.2.

28-20: 2.4. Fuel lines

28-20: 2.4.1. Inspection/check

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Remove crew seats.	- Allen key set	25-10: 2.1.1.
2	Remove baggage compartment.		25-50: 2.1.1.
3	Remove control stick boots.		25-10: 2.3.1.
4	Check for fuel leakage signs along the lines and on line the joints in the baggage compartment and below the cabin floor.		
5	Install baggage compartment.		25-50: 2.1.2.
6	Install crew seats.		25-10: 2.1.2.
7	Install control stick boots.		25-10: 2.3.2.

Figure 28-005
Fuel pump and filter
below baggage compartment

28-40 INDICATING

1. Description

The fuel tank is equipped with an internal capacitive fuel level sensor. The sensor is located at the top of the tank and almost extends to the lowest point on the inside of the tank allowing for accurate readings through all phases of fuel consumption.

2. Maintenance Practice

28-40: 2.1. Fuel level sensor

NOTE: The procedures in this section are only applicable to the older - composite design fuel tanks. Plastic ABS type fuel tanks have different fuel level sensing system.

28-40: 2.1.1. Removal

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Disconnect cable connected to fuel level sensor.	- Wrench set - Hex key set	
1	Remove Fuel tank.		28-10: 2.1.1.
2	Remove bolts securing fuel level sensor to fuel tank.		
3	Remove Fuel level sensor.		

28-40: 2.1.2. Installation

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Install fuel level sensor in opening.	- Wrench set - Hex key set - Loctite 243 - Fuel level sensor (P/N 1159263)	[5]
2	Apply loctite to the Hex-head bolts		
3	fasten the fuel level sensor to the fuel tank using the hex-head bolts and washers.		
4	Install fuel tank.		28-10: 2.1.2
5	Perform fuel level sensor calibration - empty tank indication (0%)		28-40: 2.1.3.
6	Perform fuel level sensor calibration - full fuel tank indication (99%)		28-40: 2.1.4.
7	Reconnect fuel level sensor cable.		

28-40: 2.1.3. Fuel level calibration - empty fuel tank indication (0%)

Step	Action	Required parts, materials and tools	Reference
1	Empty the fuel tank completely.		
	NOTE: Leave 2L of fuel for reserve.		
2	Press and hold the reset button.		
3	Switch Master ON, switch Avionics ON.		
4	Stopwatch to 10 (3*) seconds, release button.		
	CAUTION: Timing 10 seconds for new sensors model and 3 seconds for old sensors model. See sensor label; 4 Volts sensor is the new sensor type (10 sec.) and the 5 Volts sensor is the old sensor type (3 sec.). **NOTE:** If 10 seconds procedure does not calibrate the sensors, try the 3 second procedure and vice versa.		
5	You will see 0% on the display. Wait 10 seconds.		
6	Switch Avionics OFF, switch Master OFF.		

NOTE: This calibration should be completed after component replacement or when false readings are suspected. If readings continue to be false, then the sensor is most likely defective.

28-40: 2.1.4. Fuel level calibration - full fuel tank indication (99%)

Step	Action	Required parts, materials and tools	Reference
1	Fill up the fuel tank completely.		
	NOTE: Wait 5 minutes for the fuel to settle.		
2	Press and hold the reset button.		
3	Switch Master ON, switch Avionics ON.		
4	Stopwatch to 20 (6*) seconds, release button.		
	CAUTION: Timing 20 seconds for new sensors model and 6 seconds for old sensors model. See sensor label; 4 Volts sensor is the new sensor type (20 sec.) and the 5 Volts sensor is the old sensor type (6 sec.). **NOTE:** If 20 seconds procedure does not calibrate the sensors, try the 6 second procedure and vice versa.		Figure 28-002
5	You will see 99% on the display. Wait 1 minute.		
6	Switch Avionics OFF, switch Master OFF.		

NOTE: This calibration should be completed after component replacement or when false readings are suspected. If readings continue to be false, then the sensor is most likely defective.

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CHAPTER 31 – INDICATING/RECORDING SYSTEMS

TABLE OF CONTENTS

31-00 GENERAL

This chapter describes the indicating/recording system. The instrument panel and the caution/warning system are also covered in this chapter.

31-10 INSTRUMENT AND CONTROL PANELS

1. Description

The instrument panel is designed for glare-free use in all flight conditions. It is designed so that it can easily be used from both the left and right pilot seat. It's central pedestal houses a switch panel where all of the circuit breakers, fuses and switches, required for smooth operation, can be found. In general the equipment consists of flight, navigation and communication instruments, in the form of analog/digital instruments or Multi-Function displays.
Please refer to POH [5] for more detailed information.

2. Maintenance Practices

31-10: 2.1. Front panel

31-10: 2.1.1. Internal inspection/check

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	MASTER switch off, AVIONICS switch off.		
2	Remove the instrument panel cover.		31-10: 2.2.1.
3	Perform visual inspection for any loose/damaged wires		05-20
4	Install the instrument panel cover.		31-10: 2.2.2.

31-10: 2.2. Instrument panel cover

31-10: 2.2.1. Removal

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	MASTER switch off, AVIONICS switch off.	- torx screwdriver set - Phillips screwdriver (standard + stubby)	
2	Disconnect the battery.		
3	Unscrew/remove all of the torx and self-tapping screws securing the cover to the instrument panel/fuselage.		
4	Lift cover and disconnect the Garmin G26C gps antenna and the compass' lighting cable.		
5	Remove the instrument panel cover.		

31-10: 2.2.2. Installation

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Position the cover on the instrument panel.	- torx screwdriver set - Phillips screwdriver (standard + stubby)	
2	Lift cover and connect the Garmin G26C gps antenna and the compass' lighting cable.		
3	Fasten the cover to the instrument panel/fuselage using the torx and self-tapping screws .		
4	Carry out visual inspection.		05-20
5	Carry out operational inspection of the Garmin G26C gps antenna and the compass light.		
6	Connect the battery.		

31-10: 2.3. Switch panel

31-10: 2.3.1. Removal

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	MASTER switch off, AVIONICS switch off.	- torx screwdriver set	
2	Remove all of the torx screws securing the switch panel to the instrument panel pedestal.		
3	Carefully dislodge the panel and move it away from the pedestal.		

31-10: 2.3.2. Installation

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	MASTER switch off, AVIONICS switch off.	- torx screwdriver set	
2	Carefully slide the panel into place on the pedestal.		
3	Fasten it to the pedestal using torx screws.		

31-10: 2.3.3. Internal inspection/Check

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	MASTER switch off, AVIONICS switch off.	- torx screwdriver set	
2	Remove the switch panel		31-10: 2.3.1.
3	Perform visual inspection for any loose/damaged wires		
4	Install the switch panel		31-10: 2.3.2.

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CHAPTER 32 – LANDING GEAR

TABLE OF CONTENTS

32-00 GENERAL

This chapter describes those units and components which furnish a means of supporting and steering the airplane.

The tricycle-type landing gear consists of a composite, glass fiber strut that is bolted to the airframe structure and provides adequate shock absorption, as well as a steerable nose gear strut, which is of tubular aluminum and steel construction, has an oleo shock absorber and is integrated into the engine mount.

The main wheels have hydraulically operated brakes, actuated by pulling a hand lever.

32-10 MAIN GEAR

1. Description

The main landing gear strut is made of basalt fiber and has two parallel elements that produce a semi-redundant structure that allows for predictable stress point locations. The strut is composed by two parallel elements producing a semi-redundant structure and allowing for predictable locations of stress points. During normal landing and taxi operations, the main gear legs act as primary shock absorbing units and provide support for majority of aircraft weight. The strut is directly attached to the bottom side of the cabin floor by four bolts and additionally supported by two composite reinforcements (see Figure 32-001).

Figure 32-001
Landing Gear Installation

2. Maintenance Practices

32-10: 2.1. Main landing gear strut

32-10: 2.1.1. Inspection/check

Reference: see in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Remove the main wheel fairings.		Figure 32-10
2	Carefully inspect the entire strut for any signs of damage. Pay particular attention to where the strut is in contact with the fuselage and where the wheels are fastened to it. Look for any wear, chips, signs of delamination or cracks.		Figure 32-002
CAUTION: Any damage incurred by the main landing gear strut can be a safety hazard and must be reported to Pipistrel.			
3	Install main landing gear strut cover.		
4	Install main wheel fairings.		Figure 32-10

Figure 32-002
Example of a damaged main landing gear strut

32-10: 2.1.2. Major inspection

N/A

32-10: 2.1.3. MLG strut removal - Nose wheel configuration

Step	Action	Required parts, materials and tools	Reference
1	Detach the wings and support firmly the fuselage on a point aft the center of gravity of the fuselage itself.	- Allen key set - Metric wrench set	57-10: 2.1.1
2	Drain the brake lines fluid.		
3	Disconnect the brake hydraulic lines from the pedals, hand brake system or parking brake, depending on the actual airplane equipment.		32-40
4	Remove the seats from the cabin and locate the four M10 retaining hexagon socket screws of the MLG strut.		
5	Remove the composite cover plate applied over the MLG strut on the bottom of the fuselage. This is done by removing of the gap seal tape and of the six M4 fixing screws.		
6	Slip from the bottom of the fuselage the brake lines.		
7	Separate the MLG Strut from the fuselage.		
8	If necessary separate the wheel/axle assemblies from the MLG strut.		32-41: 2.1.3. 32-41: 2.1.4.

32-10: 2.1.4. MLG strut installation - Nose wheel configuration

Step	Action	Required parts, materials and tools	Reference
1	Support firmly the fuselage on a point aft the center of gravity of the fuselage itself. Remove the seats.	- Torque wrench	
	NOTE: in case the MLG strut that will be installed is a new spare part, it will come without mounting holes, that have to be drilled. Follow the instruction steps (3) to (5) for this case, otherwise skip to step (6).		
2	Prepare the MLG strut mounting the wheel/axle assemblies, in case they are not already.	- Metric drill bit set - Allen key set - Loctite 243 - Gap seal tape (5230023) - Red Marker paint - Hand driller and drill bit set - Permanent marker pen	32-41: 2.1.2 32-41: 2.1.4
3	Place the MLG strut below the fuselage into its groove. Check the positioning and alignments. Cardboard spacers can be used to center the positioning. From the cabin floor, mark on the MLG strut the position where the fixing holes will be drilled. Use a permanent marker pen to do this, passing it through the fixing holes on the cabin floor.		Figure 32-007
4	Remove the MLG strut from the fuselage and drill on it the fixing holes, first with 8 mm, then with a 10 mm drill bit.		
	NOTE: Please refer to **Figure 32-007** for the drill bit geometry requirements.		Figure 32-008
5	Run the brake lines through the strut out from the holes on the bottom surface of the central part of the strut.		
6	Place again the MLG strut below the fuselage into its groove, Apply Loctite 243 to the four hexagon socket M10 screws, insert them from the cabin and secure to 45 Nm torque.		
7	Apply red marker paint on the M10 nuts.		

continued on the next page

Step	Action	Required parts, materials and tools	Reference
8	Insert the hydraulic brake lines into the dedicated holes through the fuselage and connect the line terminals to their joints on the pedals, hand brake lever or parking brake, depending on the installed equipment.		32-40
9	Cover the joint area of the MLG strut below the fuselage with the composite cover plate. Secure it using six M4 screws and then apply sealing tape around the border.		
11	Reinstall crew seats.		25-10 2.1.2.
12	Refill the brake circuit.		12-10: 2.5.
13	Perform some taxi tests to check the correct functionality of the MLG strut and brakes.		

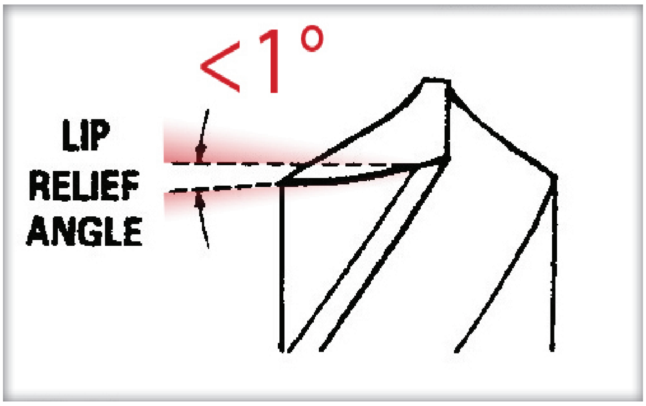

Figure 32-007
Drill bit - Geometry requirements

32-10: 2.2. MLG fairings

32-10: 2.2.1. Removal

Step	Action	Required parts, materials and tools	Reference
1	Remove the hex head bolt securing the fairing to the fairing spacer.	- T-handle hex head screwdriver set, - Torx screwdriver set	
2	Remove the six screws securing the fairing to the fairing plate.		
3	Remove fairing.		

32-10: 2.2.2. Installation

Step	Action	Required parts, materials and tools	Reference
1	Position the spacer over the wheel and main landing gear strut.	- T-handle hex head screwdriver set, - Torx screwdriver set - Loctite 243	
2	Apply Loctite to the hex head bolt's thread.		
3	Install fastening material to finger tight.		

NOTE: Make sure there is adequate clearance between the fairing and other landing gear components.

4	Tighten fastening material.		

32-20 NOSE GEAR

1. Description

The nose gear strut assembly consists of a tubular strut attached to the engine mount. The free castering nose wheel's maximum turning arc is 45 degrees either side of center. Shock absorption is provided by a telescopic strut in which compression of a piston rod reacts against the engine mount.

2. Maintenance Practices

32-20: 2.1. Nose wheel

32-20: 2.1.1. Nose wheel - Removal

Reference: see in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Prop the nose landing gear up by weighing down the tail cone.	- metric wrench set - T-handle hex head screw-driver set - T-handle socket wrench set	07-10: 2.2.1
2	Remove the fastening material nut and bolt (axle) securing the wheel to nose gear fork.		
3	Remove nose wheel.		

32-20: 2.1.2. Nose wheel - Installation

Reference: see in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Position nose wheel in the fork.	- metric wrench set - T-handle hex head screw-driver set - T-handle socket wrench set - Loctite 243	
2	Insert the bolt (axle).		
3	Apply Loctite 243 to nose wheel axle nut.		
4	Fasten nose wheel bolt (axle) in place by tightening the nut.		20-30

NOTE: After installing the wheel make sure there is adequate clearance between it and the other nose gear components. Make sure that the wheel turns freely and isn't hindered by anything.

Step	Action	Required parts, materials and tools	Reference
5	Remove counterweight from tail cone and lower the nose of aircraft.		

32-20: 2.1.3. Nose wheel and fairing fork - Removal (standard and Beringer wheel type)

Reference: see in IPC [13]

Step	Action	Required parts, materials and tools	Reference
	NOTE: for aircraft not equipped with nose landing gear fairing perform only steps 1 - 2 - 5.		
1	Prop the nose landing gear up by weighing down the tail cone.	- metric wrench set - T-handle hex head screw-driver set - T-handle socket wrench set	07-10: 2.2.1
2	Remove nose wheel		32-20: 2.1.1.
3	Remove white tape securing fairing cover to fairing.		
4	Remove fairing cover.		
5	Remove fastening material securing the nose wheel fork to the nose landing gear strut.		
6	Separate nose wheel fairing from the fork.		

32-20: 2.1.4. Nose wheel fairing and fork - Installation (standard and Beringer wheel type)

Reference: see in IPC [13]

Step	Action	Required parts, materials and tools	Reference
	NOTE: for aircraft not equipped with nose landing gear fairing perform only steps 1 - 4 - 5		
1	Prop the nose landing gear up by weighing down the tail cone.	- metric wrench set - T-handle hex head screw-driver set - T-handle socket wrench set - Loctite 243	07-10: 2.2.1
2	Position the nose wheel fork inside the fairing.		
3	Position the nose wheel fork below the nose landing gear strut.		
4	Fasten the nose wheel fork and fairing to the nose landing gear strut flange. Apply Loctite 243 on the four cylinder head cap screws.		
5	Install nose wheel.		32-20: 2.1.2.
	NOTE: After installing the wheel make sure there is adequate clearance between it and the other nose gear components. Make sure that the wheel turns freely and isn't hindered by anything.		
6	Install nose landing gear fairing cover.		
7	Apply tape to secure the nose landing gear fairing cover.		
5	Remove counterweight from tail cone and lower front end of aircraft.		

32-20: 2.2. Nose landing gear

32-20: 2.2.1. Inspection/check

Step	Action	Required parts, materials and tools	Reference
1	Inspect nose landing gear strut for any signs of damage, such as deformation, cracks or corrosion.	- metric wrench set, - T-handle hex head screw-driver set, - T-handle socket wrench set	32-20
2	Grab the propeller with both hands, block the nose wheel with your foot or a wedge and lean back. Inspect the movement of the nose landing gear's shock absorber. Make sure it's movement is smooth and unhindered.		

continued on the next page

Step	Action	Required parts, materials and tools	Reference
3	Inspect the shock absorber for any signs of impact damage or wear.	- Loctite 243	
4	Inspect the nose landing gear's turning range. Confirm that it's movement is unhindered and smooth. Also confirm that the nose landing gear's bellcrank is in good working condition and moves freely.	- feeler gauge tool - shock absorber extractor tool (P/N 1190177	
5	Prop the nose landing gear up by weighing down the tail cone		07-10: 2.2.1.
6	Remove the nose gear strut guard.		32-20: 2.2.3.
7	Inspect the mating point between the shock absorber flange and the engine mount strut clamp. Use a feeler gauge tool to determine the amount of gap around the entire circumference of the mating surfaces between the shock absorber flange and the engine mount strut clamp. See note and warning below.		Figure 32-008 Figure 32-009

NOTE: If there is no gap, or if the gap is always less than 2.5 mm at any points around the circumference, no further action is required. Reinstall the nose gear strut guard assembly according to 32-20: 2.2.4.

WARNING: If the gap between the shock absorber flange and the engine mount strut clamp is 2.5 mm or bigger at any points around the circumference, proceed to step 8.

Step	Action	Required parts, materials and tools	Reference
8	Inspect the gap closer. - If the shock absorber fillet is clearly resting on the engine mount strut clamp (see Figure 32-010) and thus preventing the gap from being any smaller no further action is required: **inspection task completed.** - If this is not the case, proceed to step 9.		Figure 32-010

NOTE: f any other component or foreign object is found to be the cause of the gap (i.e. stuck between the shock absorber and the engine mount strut clamp), flying is NOT RECOMMENDED. Please contact *maintenance@pipistrel-aircraft.com* for instructions on how to proceed.

Step	Action	Required parts, materials and tools	Reference
9	Remove the nose gear shock absorber.		32-20: 2.2.5.
10	Clean the shock absorber shaft and the shock absorber housing on the engine mount with a degreaser.		
11	Reinstall the shock absorber.		32-20: 2.2.6.
12	Repeat inspection according to method described in step 7. <u>Take note of the min and max gap width measurement</u>. - If the gap is between the limits after re-installation, perform the tests described in step 14. - If the gap is outside the limits proceed to step 13.		

continued on the next page

Step	Action	Required parts, materials and tools	Reference
13	Inspect the gap closer. - If the shock absorber fillet is clearly resting on the engine mount strut clamp (see Figure 32-010) and thus preventing the gap from being any smaller perform tests described in step 14. - If this is not the case, the issue is not solved and flying is NOT RECOMMENDED. Please contact *maintenance@pipistrel-aircraft.com* for instructions on how to proceed.		

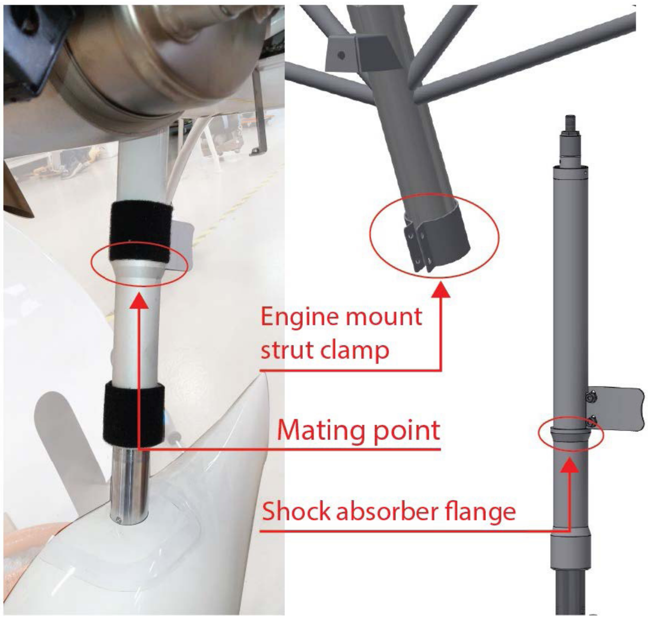

Figure 32-008
Inspection main focus points

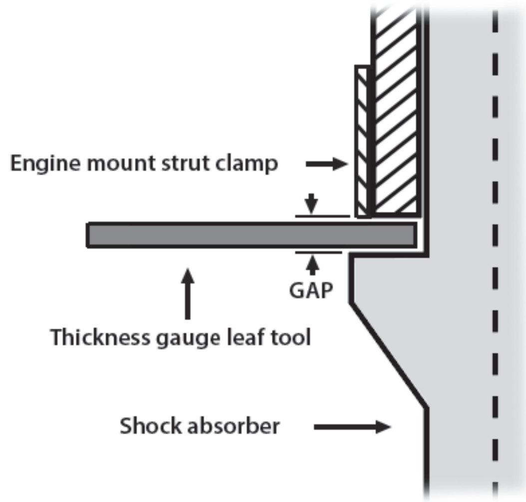

Figure 32-009
Inspection execution

Figure 32-010
Shock absorber fillet and engine mount strut clamp interference example

continued on the next page

Step	Action	Required parts, materials and tools	Reference
14	TESTS a) TORQUE TEST: - Prop the nose landing gear up by weighing down the tail cone and install the shock absorber extractor tool (P/N 1190177) on the shock absorber on the 42 mm diameter section (Figure 32-011). - Mark the position of the shock absorber flange relative to the engine mount strut clamp with marker paint. - Apply a torque of 50 Nm to the shock absorber extractor tool arm (on the plane that is normal to the shock absorber axis – see Figure 32-012 for torque application details) and visually inspect the marking to see if any relative rotation occurred during the torque the test. - If any relative rotation between the shock absorber flange and the engine mount strut clamp occurred, the issue is not solved and flying is NOT RECOMMENDED. Please contact *maintenance@pipistrel-aircraft.com* for instructions on how to proceed. - If no relative rotation between the shock absorber flange and the engine mount strut clamp is found, proceed to the next test b). b) TECHNICAL FLIGHT: - Perform one technical flight, preferably from an unpaved runway. - Repeat inspection after the flight, using the same method indicated in step 7 and compare the gap width to the measurements noted in step 12. - If the gap has not changed after the technical flight, no further action is required: **inspection task completed.** - If the gap width has changed after the technical flight, the issue is not solved and flying is NOT RECOMMENDED. Please contact *maintenance@pipistrel-aircraft.com* for instructions on how to proceed.		Figure 32-011 Figure 32-012

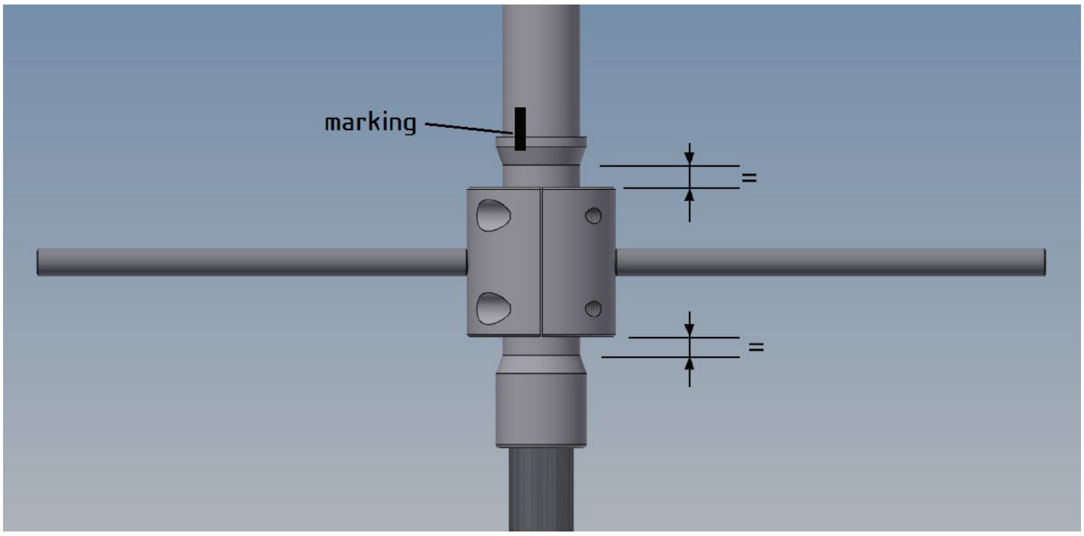

Figure 32-011
Shock absorber extractor tool installation position

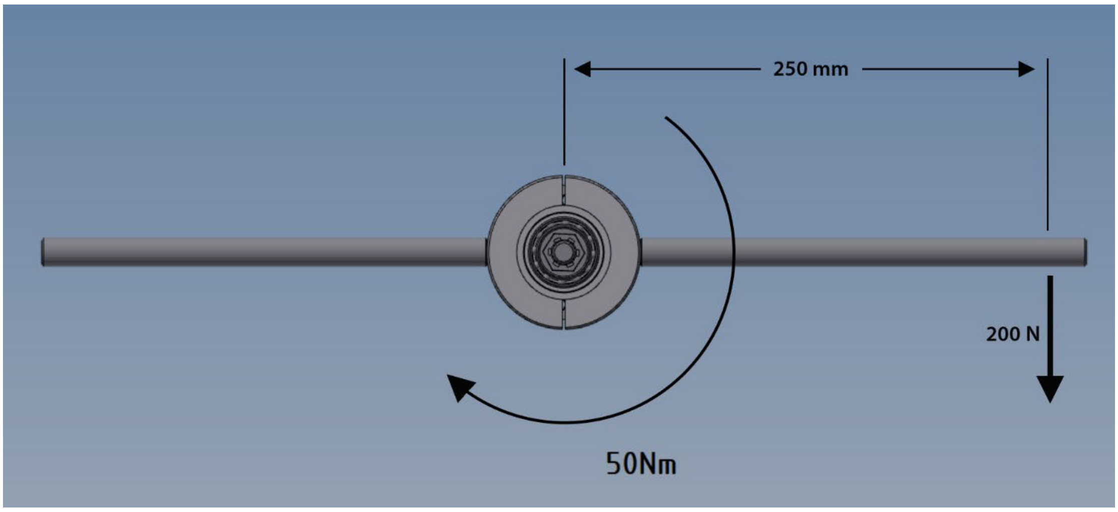

Figure 32-012
Torque test execution

32-20: 2.2.2. Nose landing gear fork - inspection/check

Reference: see in IPC [13]

Step	Action	Required parts, materials and tools	Reference
	NOTE: for aircraft not equipped with nose landing gear fairing perform visual inspection without carrying out the following steps.		
1	Prop up the nose of the airplane.	- Metric wrench set, - T-handle hex head screw-driver set, - T-handle socket wrench set - Loctite 243	07-10: 2.2.1.
2	Remove the nose landing gear fairing and nose wheel.		32-20: 2.1.1.
3	Inspect the nose landing gear fork for any signs of damage, such as deformation, cracks or corrosion.		
4	Install nose wheel fairing and nose wheel.		32-20: 2.1.3.
5	Lower the aircraft nose down.		07-10: 2.2.1.

32-20: 2.2.3. Nose gear strut guard removal

Reference: see in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Unscrew and remove the three M4 bolts on the rear part of the strut guard.	- Metric wrench set - Screw driver set - T-handle hex head screw-driver set	
2	Pull and separate the aft edges of the strut guard. The edges are connected by velcro stripes inside.		
3	Remove the strut guard from the nose wheel strut.		

32-20: 2.2.4. Nose gear strut guard installation

Reference: see IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Pull and open the aft edges of the strut guard. The edges are connected by velcro stripes inside.	- Metric wrench set - Screw driver set - T-handle hex head screw-driver set	
2	Install the strut guard on the nose wheel strut.		
3	Fix the strut guard to the supporting plate on the strut using a M4 screw on the central hole of the guard.		
4	Insert and secure the other two bolts.		
5	Apply pressure on the back edges of the strut guard to connect the parts with the velcro.		

CAUTION: The strut guard must be aligned with the airplane longitudinal axis, when rudder and nose wheel are centered. Strut guard acts as an aerodynamic surface and incorrect alignment can cause unexpected yaw tendency.

32-20: 2.2.5. Nose gear shock absorber removal

Reference: see IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Remove engine cowlings.	- wrench/allen key set - spring hook tool - nose gear shock absorber extractor tool (P/N 1190177)	
2	Remove the nose wheel strut guard.		32-20: 2.2.3
3	Unfasten the two M6x16 cylinder head cap screws and remove the strut guard fixation plate from the engine mount strut clamp.		
4	Enter the cabin and remove M4 screws securing steering mechanism housing's cover.		
5	With the spring removal tool disconnect the two centering springs from the attachment point on the fuselage.		
6	Mark the top side of the forks with a pen, and the relative position of the fork and the nut, and make sure that the parts do not rotate during the rest of the procedure (Figure 32-013).		Figure 32-013
7	Remove the fastening material securing the rudder's two bottom studs to the rudder cable bellcrank.		
8	Support the rudder with both hands and give it a jolt upwards to slide off its hinges. Remove it and place it on a dry, padded surface.		
9	Remove the M8 bolt with fastening material securing rudder cable bellcrank to lower rudder hinge. **NOTE:** keep pulling force on the bellcrank while removing the bolt and release it gradually to contrast the tension of the rudder cables.		07-10: 2.2.1.
10	Manually turn the nose wheel to one side, disconnect one fork from the steering bellcrank, then turn the nose wheel to the other side and disconnect the other fork from the steering bellcrank		
11	Enter the cabin, unscrew the bellcrank hex nut and remove the bellcrank.		
12	Prop-up the airplane nose by pushing down the airplane tail and secure it by weighing it down.		07-10: 2.2.1.
13	Fit the shock absorber with the shock absorber extractor, push downward the shock absorber removal tool while simultaneously rotating it slightly left and right to ease removal of the shock absorber from the engine mount.		Figure 32-014

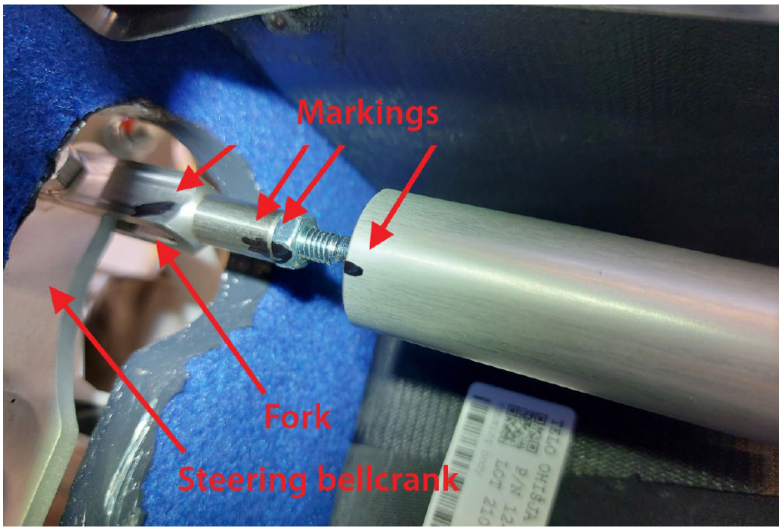

Figure 32-013
Steering bellcrank cable fork markings

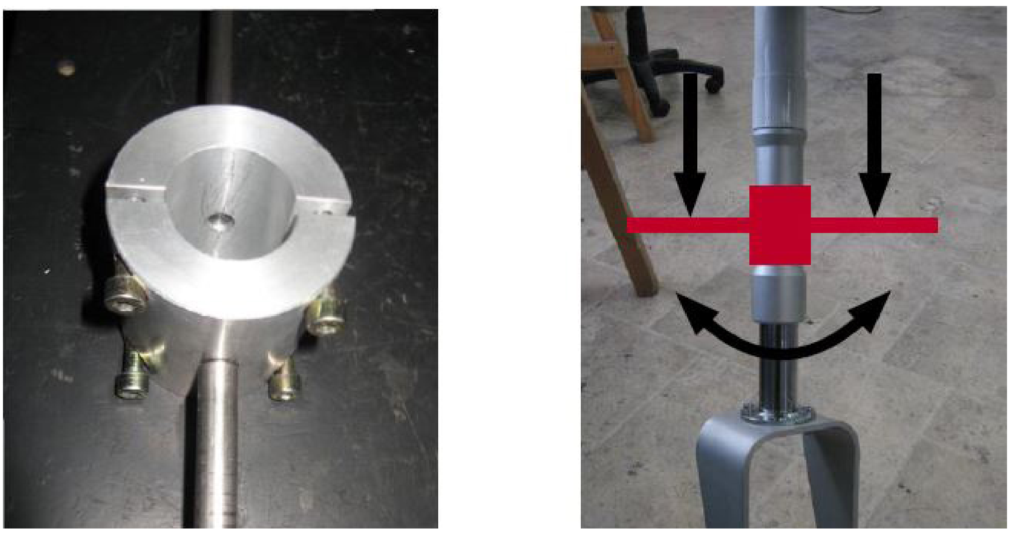

Figure 32-014
shock absorber extractor

32-20: 2.2.6. Nose gear shock absorber installation

Reference: see IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Clean and degrease the shock absorber, apply anti-seize to entire mating surface of the shock absorber and insert it in the engine mount. Use the shock absorber removal tool if needed. Fasten the steering bellcrank to the top of the shock absorber and torque.	- wrench/allen key set - spring hook/removal tool - nose gear shock absorber extractor tool (P/N 1190177)	20-10 Figure 32-014
2	Install the strut guard fixation plate on the engine mount strut clamp. Use two new M6 selflocking nuts and secure the clamp. **NOTE**: Torque M6 bolts to 11 Nm.		20-30
3	Manually turn the nose wheel to one side, connect one fork, turn the nose wheel to the other side and connect the second fork. **NOTE:** make sure that the forks and the other parts did not rotate from the original position during the procedure (check markings – Figure 32-013).		Figure 32-013
4	Go to the aircraft tail section, use two metal rods (e.g. two T-handle hex screwdrivers – see Figure 32-015) through the 6 mm holes of the rudder bellcrank to pull it backwards and to reinstall it in position. Secure the bolt with washer a new nut, apply marker paint.		Figure 32-015
5	Lubricate the upper rudder hinge pin.		20-10
6	Slide the rudder's upper bushing over its upper hinge pin while simultaneously sliding its two bottom studs into the rudder cable bellcrank.		
7	Fasten the rudder in place, torque nuts (use new nuts) and apply marker paint.		
8	Enter the cabin, reinstall the springs on the steering mechanism, using the spring removal tool.		
9	Install the steering mechanism housing's cover.		
10	Install nose gear strut guard.		32-20: 2.2.4.
11	Perform operational check of steering and rudder system.		
12	Repeat inspection after the flight, using the same method indicated at step 8. If the gap dimension did not change after the test, then continue to the next step. If the gap dimension has changed after the check flight, ground the plane and proceed to step 21.		
13	Install the nose wheel strut guard.		32-20: 2.2.4.
14	Lower the aircraft nose.		07-10: 2.2.1.
15	Apply marker paint to nuts and bolts.		20-40:2.1.
16	Check that the movement of the nose wheel is free, with no friction and correct in range and direction.		

NOTE: Upon installation check the gap between the shock absorber flange and the engine mount strut clamp according to instructions in 32-20: 2.2.1., including performing the test a) and test b) described within the task.

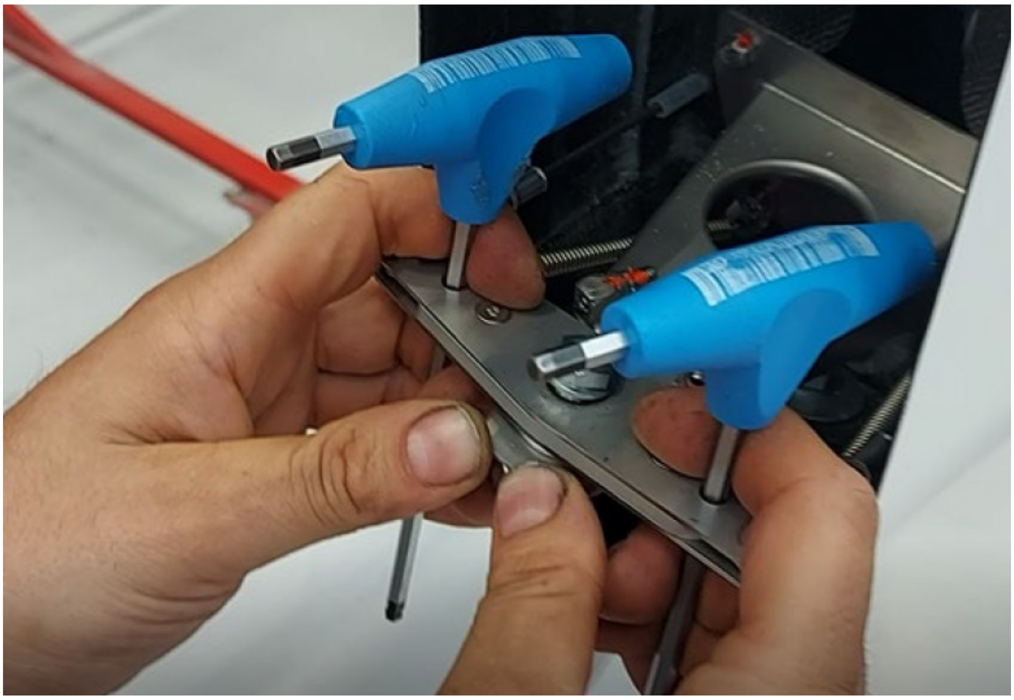

Figure 32-015
Rudder bellcrank installation

32-40 WHEELS AND BRAKES

1. Description

This chapter describes the wheel and brakes system. This system is what allows the aircraft to roll along the ground while taxiing and stop when needed.

2. Maintenance Practices

32-40: 2.1. Wheel and Brake Assembly

32-40: 2.1.1. Inspection/check

Reference: see in IPC [13]

Step	Action	Required parts, materials and tools	Reference
	NOTE: Whenever maintenance work which requires wheel removal is done the inspection/check procedure below is performed. If the reason for wheel removal is replacement of a certain component (e.g. brake pads, disc, caliper, bearings...) skip the step that pertains to the component being replaced.		
1	Visually inspect/measure wheel halves. Following criteria require halve(s) replacement: - presence of corrosion and cracks - nicks of depth > 0.1 mm - scratches of cumulated length > 2’’ / depth > 0.1 mm		05-20
2	Visually inspect wheel and brake assembly screws. Following criteria require assembly screw(s) replacement: - misaligned torque paint mark - corrosion - deformation		05-20
3	Perform visual and operational inspection of bearings. Following criteria require bearing(s) replacement: - presence of cracks, rings flaking, corrosion - scratches of depth > 0.1 mm		05-20
4	Visually inspect/measure the caliper: Following criteria require caliper replacement: - presence of corrosion and cracks - nicks of depth > 0.1 mm - scratches of cumulated length > 1’’ / depth > 0.1 mm		05-20
5	Visually inspect/measure the backplate. Following criteria require backplate replacement: - presence of corrosion and cracks - nicks of depth > 0.1 mm - scratches of cumulated length > 1’’ / depth > 0.1 mm		05-20
6	Visually inspect wheel axle. Check for scratches, nicks and corrosion.		05-20

32-41 WHEELS

1. Description

Beringer MLG wheel assembly and Tires

The main wheels are 6 inches in diameter. Rims are manufactured by Beringer and made from high strength aluminum alloy, machined solid on CNC and anodized for optimal corrosion resistance. The wheel is secured to the axle with a nut, and cotter pin. Tires are tubeless type, 4.00x6 size, 6-ply, manufactured by Mitas or Aeroclassic (optional).

Nose Wheel and Tire

The nose wheel is manufactured by Beringer. It is made of aluminum alloy and uses a 4.00x4, 4-ply tubeless tire manufactured by Kenda. As option, a plastic/ABS nose wheel designed for tires with inner tubes can be installed. It uses tires 4.00x4 size, 4-ply rated, manufactured by Duro or Tost (option). Wheels rotate on two bearings protected against contamination by grease seals.

2. Maintenance Practices

32-41: 2.1. Standard Main Landing Gear Wheels

32-41: 2.1.1. MLG wheel removal
Reference: see in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Remove main landing gear fairings.	- Metric wrench set - Cutting nippers - Landing gear stand (P/N 1190264)	32-10: 2.2.1.
2	Remove fairing spacer.		
3	Prop MLG strut up with landing gear stand.		07-10: 2.1.1.
4	Unscrew the M14 hex nut on the outer center of the wheel.		
5	Pull the wheel and slide it off the axle.		
6	If necessary disconnect the brake pad from the brake line and slide it off the axle.		

32-41: 2.1.2. MLG wheel installation

Reference: see in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Re-install the brake pad sliding it on the axle, and push it in position gently hitting it with a hammer if necessary. Reconnect the brake line to the brake pad.	- Metric wrench set - Hammer - Landing gear stand (P/N 1190264)	
2	Position the wheel on axle, and place on the hub the bearing cover.		
3	Insert and tighten on the axle the M14 nut right until the wheel stops turning and then loose the nut for 1/4 turn so that the wheel can rotate freely by hand turning.		
4	Apply Loctite 243 on the wheel fairing spacers threads (if installed) before fastening it on to the axle.		
5	Remount the wheel fairing and fasten it in place (if installed on the airplane).		32-10: 2.2.2.

32-41: 2.1.3. MLG wheel axle removal

Reference: see in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Remove main landing gear fairings and the fairing spacer (if installed).	- Metric wrench set - Allen key set - Landing gear stand (P/N 1190264)	32-10: 2.2.1.
2	Prop MLG strut up with landing gear stand.		07-10: 2.1.1.
3	Drain/clamp and disconnect the brake lines.		
4	Unscrew the four M5 cap-head screws and remove the wheel fairing support plate (if present).		
5	Pull from the wheel and slide the complete assemble off from the MLG strut.		
6	Remove the outer wheel axis fixation plate.		

32-41: 2.1.4. MLG wheel axle installation

Reference: see in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Insert the wheel axle on the MLG strut.	- Metric wrench set - Allen key set - Landing gear stand (P/N 1190264) - Torque wrench	32-10
2	Fasten the axle to the strut using the M14 nut and washer.		
	WARNING: Torque the M14 nut to 55 Nm, using torque wrench		
3	Connect the brake line to the brake shoe.		
4	Refill the brake circuit if necessary.		12-10: 2.5.

32-41: 2.1.5. MLG tire removal

Reference: see in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Remove MLG wheel.		32-41: 2.1.3.
2	Deflate tire pressure to zero.		
3	Remove M6 bolts securing wheel half.		
4	Slide tire off the wheel.		

32-41: 2.1.6. MLG tire installation

Reference: see in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Slide new tire on wheel.	- Metric wrench set - Cutting nippers - M25 slotted nut key (P/N 1190113) - Landing gear stand (P/N 1190264)	
2	Secure wheel halves using M6 bolts.		
3	Replenish tube with compressed air to the required pressure.		Table 12-001
4	Install MLG wheel.		32-41: 2.1.4.

32-41: 2.1.7. MLG wheel bearing replacement

Reference: see in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Remove the wheel and place it on the workbench.	- Metric wrench set -T-handle hex head screwdriver set - Hammer 200 gr. - SKF multipurpose grease	32-41: 2.1.3.
2	Remove the bearing cover.		
3	Remove the tapered roller bearing by pulling it out of its housing.		
4	Use a piece of paper to clean the wheel and check for any signs of damage or wear.		
5	Use a hammer and a hex head screwdriver to push out of place the ball bearing positioned on the other side of the hub.		
6	Flip the wheel over and use the hammer and hex screw-driver to remove the tapered roll bearing bushing out of its place.		
7	Use a piece of paper to clean the wheel and check for any signs of damage or wear.		
8	Install the replacement parts starting from the new roller bearing bushing. Install it on the wheel knocking it in with the hex head screwdriver handle and a hammer.		
9	Install the tapered rolling bearing on its bushing applying some grease on both the parts.		

continued on the next page

Step	Action	Required parts, materials and tools	Reference
10	Apply some grease on the bearing cover and reinstall it on the wheel.		
11	Install the ball bearing on the other side of the wheel.		
12	Install the wheel.		32-41: 2.1.4.

32-41: 2.2. Beringer Main Landing Gear Wheels

32-41: 2.2.1. MLG wheel removal

Reference: see in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Remove main landing gear fairings.	- Metric wrench set - Cutting nippers - M25 slotted nut key (P/N 1190113) - Landing gear stand (P/N 1190264)	32-10: 2.2.1.
2	Remove fairing spacer.		
3	Prop MLG strut up with landing gear stand.		07-10: 2.1.1.
4	Cut/remove wheel locking wire.		
5	Remove M25 slotted nut.		
6	Slide wheel off axle.		

32-41: 2.2.2. MLG wheel installation

Reference: see in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Position wheel on axle and brake disc.	- Metric wrench set, - 1 mm locking wire, - M25 slotted nut key (P/N 1190113)	
2	Fasten wheel to axle using M25 slotted locknut. Tighten until the nut comes into contact with the wheel's bearing. Torquing is NOT required!		

WARNING: Never reuse this, or any other locknut after removing it. Always replace it with a new one!
WARNING: After installing the wheel make sure there is no play between it and the axle. Make sure that the wheel turns freely and isn't hindered by anything.

Step	Action	Required parts, materials and tools	Reference
3	Positive lock the brake disc with locking wire.		
4	Remove landing gear stand.		
5	Install main landing gear fairings.		32-10: 2.2.2.

32-41: 2.2.3. Inspection/check

Reference: see in IPC [13]

Step	Action	Required parts, materials and tools	Reference
	NOTE: If after this inspection/check a replacement of a certain component is necessary and it requires wheel removal, additionally perform inspection/check of wheel and brake assembly, see 32-40: 2.1.1. Inspection/check.		
1	Visually inspect both wheel halves. Replace the wheel if corrosion and/or cracks are present.		05-20
2	Visually inspect the wheel torque ears. Replace the wheel half if any of following is present on torque ears: - cracks, nicks and wear marks		05-20 Figure 32-016
3	Visually inspect wheel locking wire.		05-20
4	Visually inspect the assembly screws. Replace the screws if torque paint mark is misaligned.		05-20
5	Perform operational inspection of bearings by spinning the wheel. In case of unusual noise, hindered rotation or free play remove bearings, perform inspection/check and reinstall new bearings.		32-41: 2.1.6. 32-41: 2.2.10. 32-41: 2.1.7.

32-41: 2.2.4. MLG wheel axle removal

Reference: see in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Prop MLG strut up with landing gear stand.	- Metric wrench set - Allen key set - Cutting nippers - Landing gear stand (P/N 1190264)	07-10: 2.1.1.
2	Drain/clamp and disconnect brake lines from the brake pad.		07-10: 2.1.1.
3	Unscrew from the MLG inner side the M14 lock-nut and the four M6 cap-head screws connecting the wheel axle to the MLG strut. Separate the wheel fairing support plate (if installed) and collect the washers.		
4	Pull from the wheel and slide the complete assemble off from the MLG strut.		
5	If required, separate the assembly component as described in section 32-41: 2.1.1. MLG wheel removal..		32-41: 2.1.1.

32-41: 2.2.5. MLG wheel axle installation

Reference: see in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Insert the wheel axle on the MLG strut.	- Metric wrench set - Allen key set - Landing gear stand (P/N 1190264) - Torque wrench	32-10
2	Mount the washers on the M6 screws and on the M14 nut, and secure them interposing the wheel fairing support plate if required. Torque the M14 nut to 55 Nm.		
	WARNING: Torque the M14 nut to 55 Nm, using a torque wrench!		
3	Connect the brake line to the brake shoe.		
4	Refill the brake circuit if necessary.		12-10: 2.5.2.

Figure 32-016
Wheel torque ears and disc clips

32-41: 2.2.6. MLG Tire removal

Reference: see in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Remove MLG wheel.	- T-handle hex head screwdriver set - Landing gear stand (P/N 1190264)	32-41: 2.1.1.
2	Deflate tire pressure to zero.		
3	Remove M6 bolts securing wheel half.		
4	Remove O-ring.		
5	Slide tire off wheel.		

32-41: 2.2.7. MLG Tire installation

Reference: see in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Apply grease to rim and slide new tire on wheel.	- T-handle hex head screwdriver set - Landing gear stand (P/N 1190264)	
2	Install new O-ring.		
3	Secure wheel half using M6 bolts.		
4	Replenish with compressed air to the required pressure.		Table 12-001
5	Install MLG wheel.		32-41: 2.1.2.

32-41: 2.2.8. MLG wheel bearing removal
Reference: see in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Remove the MLG wheel.	- Snap ring pliers - Press in jig	32-41: 2.1.1.
2	Remove the MLG tire.		32-41: 2.1.4.
3	Remove bearing snap-rings with a snap-ring plier.		
4	Heat the wheel half to 110°C - 120°C.		

CAUTION: Heating temperature must not exceed 150 °C not to damage anodized coating.

Step	Action	Required parts, materials and tools	Reference
5	Remove the bearing immediately after heating. If the bearing does not fall out by itself, tap it evenly with a fiber drift pin or use a press in jig with a suitable interface.		

32-41: 2.2.9. MLG wheel bearings installation
Reference: see in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Make sure that the inside bore of wheel half is clean and dry.	- snap ring pliers - press in jig	
2	Heat the wheel half to 110°C - 120°C.		

CAUTION: Do not attempt to install bearing without heating the wheel flange, it will damage bearing bore.

CAUTION: Heating temperature must not exceed 150 °C not to damage anodized coating.

CAUTION: Do not re-install a bearing that was uninstalled from a wheel, even if in new condition.

Step	Action	Required parts, materials and tools	Reference
3	Insert the bearing into the bore of heated wheel half. Fix into place with a press in jig making sure cup is evenly seated against shoulder of wheel half.		

CAUTION: Do not use a hammer to press bearing, it will damage turning elements and cause failure of bearing.

Step	Action	Required parts, materials and tools	Reference
4	After cooling down period, install new snap rings and make sure they are correctly seated in their groove.		

CAUTION: Snap rings maintain bearings, if they are not in place bearing can slide out and cause the blocking of the wheel.

Step	Action	Required parts, materials and tools	Reference
5	Reinstall the MLG tire.		32-41: 2.1.6.
6	Reinstall the MLG wheel.		32-41: 2.1.2

32-41: 2.2.10. Inspection/check

Step	Action	Required parts, materials and tools	Reference
	NOTE: This inspection check is performed anytime the wheel bearings are replaced.		
1	Visually inspect wheel assembly screws. Following criteria require assembly screw(s) replacement: - corrosion - deformation		05-20
2	Visually inspect the snap rings. Following criteria require ring(s) replacement: - corrosion, deformation		05-20

32: 41: 2.3. Nose landing gear wheel

32-41: 2.3.1. Removal

Step	Action	Required parts, materials and tools	Reference
1	Follow procedure 32-20: 2.1.1..		

32-41: 2.3.2. Installation

Reference: see in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Follow procedure 32-20: 2.1.2..		

32-41: 2.3.3. Tire/inner tube change (Standard/Pipistrel wheel type)

Step	Action	Required parts, materials and tools	Reference
1	Remove nose landing gear wheel.	- Metric wrench - Socket set - T-handle hex head -Screwdriver set - Loctite 243	32-20: 2.1.1.
2	Deflate tire/tube.		
3	Remove the fastening material holding the wheel's two halves together.		
4	Remove both halves of the wheel.		
5	Pull inner tube out of tire.		
6	Inspect both the tire and tube for any signs of damage/ wear. Replace if necessary.		
7	Insert the new inner tube in the tire.		
8	Install the two halves of the wheel hub, applying Loctite 243 on the nuts' thread before torquing.		
9	Install the nose wheel.		
10	Replenish tire air.		12-20: 2.4.

32-41: 2.3.4. Nose wheel bearings replacement (Standard/Pipistrel wheel type)

Reference: see in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Remove nose wheel and place it on the workbench.	- Metric wrench + socket set - T-handle hex head - Screwdriver set - Loctite 243 - Hammer 200 gr.	32-20: 2.1.1.
2	Use a hammer and a hex head screwdriver to push out of place the ball bearings.		
3	Use a piece of paper to clean the wheel and check for any signs of damage or wear.		
4	Install the replacement bearings on the wheel knocking them in with the a hammer.		
5	Install the nose wheel.		32-20: 2.1.2.

32-41: 2.3.5. Tire/inner tube replacement

Reference: see in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Remove nose landing gear fairing/wheel.	- Metric wrench + socket set - T-handle hex head - Screwdriver set - Loctite 243	32-20: 2.1.1.
2	Deflate tire/tube.		
3	Remove the fastening material holding the wheel's two halves together.		
4	Remove both halves of the wheel.		
5	Pull inner tube out of tire.		
6	Inspect both the tire and tube for any signs of damage/ wear. Replace if necessary.		
7	Reassemble following the steps above in the reverse order. Apply Loctite 243 to the nuts' thread before torquing.		
8	Replenish tire air.		12-10: 2.4.1.

Figure 32-017
Nose wheel
Standard type
without wheel fairing

32-42 BRAKES

1. Description

The brake system consists of a dual piston single disc brake assembly on each main landing gear wheel, master cylinder for each rudder pedal, hydraulic fluid reservoir, parking brake, and associated hydraulic plumbing. The hydraulically operated brakes are individually activated by floor mounted toe pedals located at both pilot stations. The master cylinders are located forward of the pilot's rudder pedals. The reservoir is serviced with DOT 4 hydraulic fluid. The parking brake mechanism holds induced hydraulic pressure on the disc brakes for parking. It's control lever can be found on the cabin floor, on the port side of the instrument panel's pedestal.

2. Maintenance Practices

32-42: 2.1. Hydraulic brake lines

32-42: 2.1.1. Inspection/check

Step	Action	Required parts, materials and tools	Reference
1	Remove the main wheel fairings.	- T-handle hex head - Screwdriver set - Torx screwdriver set	32-10: 2.2.1.
2	Inspect brake lines where they exit the main landing gear strut and attach to the brake system. Check for signs of chafing, wear and damage.		
3	Do the same for all of the hydraulic brake lines that are accessible in the cabin.		

32-42: 2.2. Brake pads and brake discs

32-42: 2.2.1. Brake pads and brake discs inspection (Beringer type)

Step	Action	Required parts, materials and tools	Reference
1	Remove main landing gear fairing.	- Allen key set - Vernier caliper - Landing gear stand (P/N 1190264) - Metric wrench set	32-10: 2.2.1.
2	Prop up one side of the aircraft.		07-10: 2.1.1.
3	Cut and remove the locking wire securing the brake disk to the wheel.		
4	Remove MLG wheel.		32-41
5	Disconnect the brake lines and remove the caliper assembly from the wheel axle.		

continued on the next page

Step	Action	Required parts, materials and tools	Reference
6	Measure brake disc thickness and compare it to the maximum permissible wear found in. Replace if necessary.		32-42: 2.4.
7	Remove assembly screws and open the caliper assembly.		
8	Measure brake pad thickness and compare it to the maximum permissible wear found in. Replace if necessary.		32-42: 2.4.
9	Check the two brake pistons and replace them if necessary.		32-42: 2.4.
10	Install the brake caliper on the axle and place the brake disc in the caliper slot.		
11	Install the wheel and secure the brake disc to the wheel using locking wire.		32-41: 2.1.2.
12	Install the MLG fairing.		32-10: 2.2.2.
13	Repeat the operation on the other side of the aircraft.		

32-42: 2.2.2. Brake pads and brake discs inspection (Standard/Pipistrel wheel type)

Step	Action	Required parts, materials and tools	Reference
1	Remove main landing gear fairing.	- Allen key set - Vernier caliper - Landing gear stand (P/N 1190264) - Metric wrench set - Loctite 243	32-10: 2.2.1.
2	Prop up one side of the aircraft.		07-10: 2.1.1.
3	Remove main landing gear wheel.		32-41
4	Remove the brake pad and measure the thickness on each of the eight protrusions using a Vernier caliper.		

WARNING: If you get an average measurement of 2mm or less, the brake pad must be replaced with a new one. A measurement of 1.5 mm is the bare minimum and a safety hazard!

Step	Action	Required parts, materials and tools	Reference
5	Once the wheel has been removed, the brake disk is visible on the inner face of the wheel hub. Examine the heads of the three bolts holding the disc in place. If the material of the disc has been consumed till the bolt's head, the disc must be replaced.		
6	Unfasten the M5 Hexagon socket head cap screws to remove the brake disc.		
7	Replace the disc and fix it to the wheel applying Loctite 243 to the screws.		
8	Install the brake pad.		
9	Install the wheel.		32-41: 2.1.4.
10	Install the MLG fairing		32-10: 2.2.2.
11	Repeat the operation on the other side of the aircraft.		

32-42: 2.3. Hand brake

32-42: 2.3.1. Brake circuit bleeding procedure - hand brake version (Standard/Beringer wheels)

Step	Action	Required parts, materials and tools	Reference
1	Connect on the nipple fitting on the right brake a silicon hose of about 30 cm of length.	- Wrench set - Allen key set - Pliers - Extra brake fluid	
2	Pump the hand brake several times, in order to build up pressure on the system		
3	Take a small cup and place it near the right wheel.		
4	Release the nut at the base of the nipple, on the right brake. Collect into the cup the fluid that drips out from the hose.		
5	Repeat the steps 2 to 4 two or more times, until no air bubbles remain in the line.		
6	Screw and close the nipple nut and detach the auxiliary silicon hose from the brake pad.		
7	Refill the system from the cabin reservoir.		12-10: 2.5.1.
8	Repeat the steps from (1) to (7) for the left wheel brake line.		
9	Refill the system again with hydraulic fluid from the cabin reservoir.		12-10: 2.5.1.
10	Perform functional test of the brake system.		

32-42: 2.4. Beringer brake system

32-42: 2.4.1. Inspection/check

Step	Action	Required parts, materials and tools	Reference
	NOTE: If after this inspection/check a replacement of a certain component is necessary and it requires wheel removal, additionally perform inspection/check of wheel and brake assembly, see 32-40: 2.1.1. Inspection/check		
1	Visually inspect the brake lines. Replace if lines are damaged and/or leakage is present.		05-20
2	Visually inspect the disc clips. Replace the disc clips if corrosion, cracks or deformation is present.		05-20 [v3] Figure 32-012
3	Visually inspect the brake disc. Replace the disc if crazing is present and perform inspection/check.		05-20 [v1] 32-42: 2.1.1.

continued on the next page

Step	Action	Required parts, materials and tools	Reference
4	Visually inspect the caliper. Replace the caliper if corrosion and/or cracks are present, see [v1]. If brake fluid leakage or seepage from caliper is present: • if it comes from the interface with pistons, replace seals, see [v1] and [v2] • if it comes from hydraulic line, uninstall and reinstall the brake line.		05-20
5	Visually inspect the backplate. Replace the backplate if corrosion and/or cracks are present.		05-20 [v1]

32-42: 2.4.2. Inspection/check

Step	Action	Required parts, materials and tools	Reference
	NOTE: This inspection check is performed anytime the brake pads are replaced.		
1	Visually inspect the disc clips: Following criteria require disc clip(s) replacement: - presence of corrosion, cracks, deformation - clearance with disk > 0.4 mm		05-20 Figure 32-012
2	Visually inspect the caliper housing. If brake fluid leakage or seepage from caliper is present: • if it comes from the interface with pistons, replace seals, see [v1] and [v2] • if it comes from hydraulic line, uninstall and reinstall the brake line.		05-20
3	Visually inspect/measure the brake disc. Following criteria require disc replacement: - grooves, bumps > 0.2 mm - thickness < 2.8 mm - disc coning > 0.3 mm - inner diameter ovalization > 0.2 mm		05-20 32-42: 2.1.1.

32-42: 2.4.3. Inspection/check

Step	Action	Required parts, materials and tools	Reference
	NOTE: This inspection check is performed anytime the brake discs are replaced.		
1	Visually inspect/measure the disc clips: Following criteria require disc clip(s) replacement: - presence of corrosion, cracks, deformation - clearance with disk > 0.4 mm		[v1]

32-50 STEERING

1. Description

In airplanes with nose gear configuration, the nose gear is steerable. It is connected to the rudder pedal control system by a bellcrank and a set of cables/springs (see Figure 32-018).

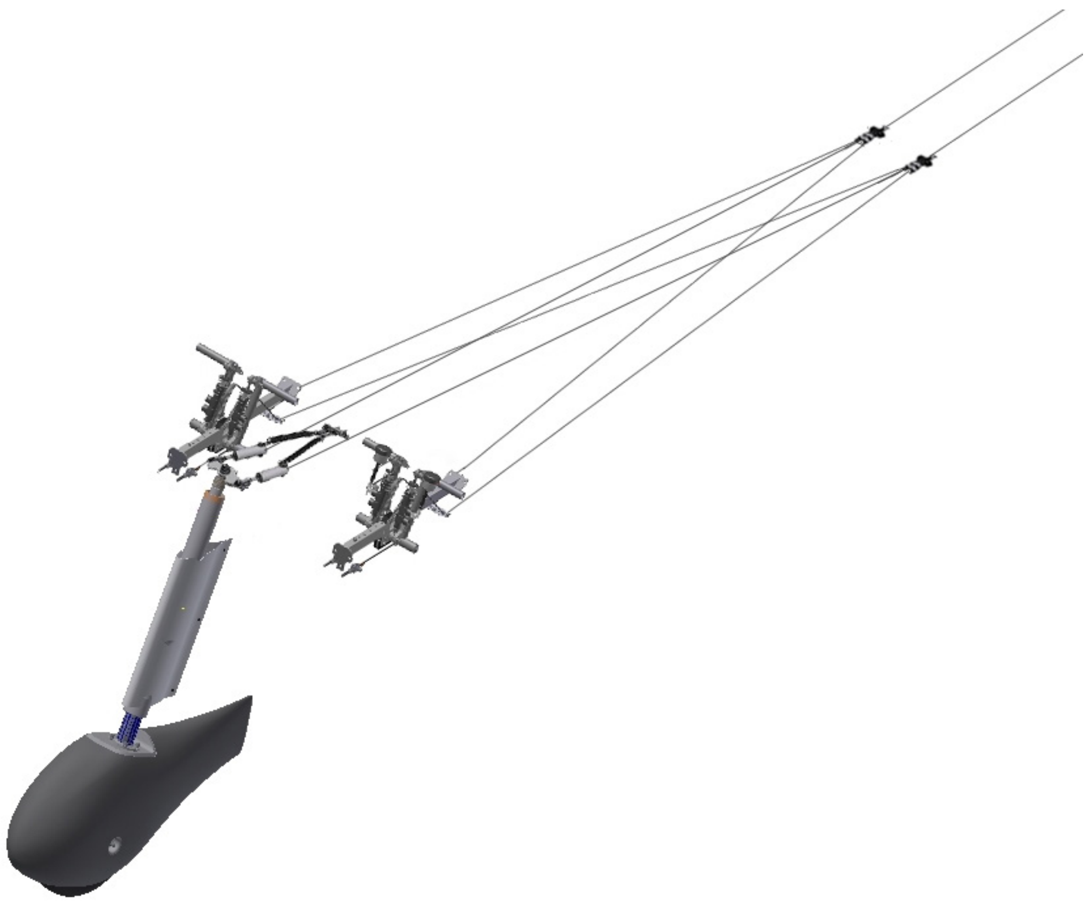

Figure 32-018
Steering System
Nose landing gear configuration

2. Maintenance Practices

32-50: 2.1. Steering bellcrank

32-50: 2.1.1. Inspection/check

Step	Action	Required parts, materials and tools	Reference
1	Remove the nose landing gear fairing.		32-20: 2.1.3.
2	Inspect the nose landing gear's turning range. Confirm that it's movement is unhindered and smooth.		
3	Confirm that the nose landing gear's bellcrank is in good working condition and moves freely.		
4	Install nose landing gear fairing.		32-20: 2.1.4.

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CHAPTER 33 – LIGHTS

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33-00 GENERAL

This chapter contains information about the interior and exterior lighting systems used on the aircraft. Exterior lighting consists of optional wing tip navigation lights with integral anti-collision strobe lights and a miniature anti-collision tail light. The separately controlled landing light, which also serves as the taxi light, is located on the bottom engine cowling. All lights incorporate LED technology.

Interior lighting consists of a separately controlled, incandescent overhead light for general cabin lighting, individual lights for the pilots and dimmable panel floodlights. The flight instruments and avionics equipment are dimmable.

33-10 FLIGHT COMPARTMENT

1. Description

A cabin flood-light is present and illuminates the master electrical panel and circuit breakers. Primary analogue instruments, such as the airspeed indicator and the altimeter, are internally illuminated. Other instrumentation has backlit dimmable LCD displays and illuminated buttons.

2. Maintenance practices

33-10: 2.1. Flight compartment

33-10: 2.1.1. Inspection/check

Reference: See in [13]

Step	Action	Required parts, materials and tools	Reference
1	Carry out visual inspection of all the flight compartment lights.		05-20
2	Carry out operational inspection of all the flight compartment lights.		05-20
3	Replace if necessary.		

33-40 EXTERIOR LIGHTING

1. Description

The aircraft can be optionally equipped with NAV/STROBE lights located on the wingtips, a LED landing light fastened to the bottom engine cowling and a tail light mounted to rudder upper surface.

Navigation Lights

These lights are controlled by the NAV/STROBE light switch on the switch panel. 12 VDC for navigation light operation is supplied through the NAV/STROBE light switch, which includes a resettable circuit breaker element (see Figure 33-001).

Strobe Light

Anti-collision strobe lights are integrated into the standard navigation light and controlled by the same switch.

Figure 33-001
NAV/STROBE light installation

Landing Light

A High Intensity LED landing light is mounted in the lower engine cowl. The landing light is controlled through the LDG light switch on the switch panel. 12 VDC for navigation light operation is supplied through the LDG light switch, which includes a resettable circuit breaker element. The landing light has thermal protection built in and its operation is not time limited (see Figure 33-002).

Figure 33-002
Example of landing light installation

2. Maintenance Practices

33-40: 2.1. NAV/STROBE lights

33-40: 2.1.1. Inspection/check

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Carry out visual inspection of the NAV/STROBE lights.		05-20
2	Carry out operational inspection of the NAV/STROBE lights.		
3	Replace if necessary.		

33-40: 2.2. NAV/STROBE lights

33-40: 2.2.1. Inspection/check

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Carry out visual inspection of the landing light.		05-20
2	Carry out operational inspection of the landing light.		
3	Replace if necessary.		

33-40: 2.3. LANDING light

33-40: 2.3.1. Removal

Reference: **See in IPC** [13]

Step	Action	Required parts, materials and tools	Reference
1	Locate landing light on lower cowling.	- Torx screwdriver set	
2	Disconnect landing light cable from connector.		
3	Remove screws and washers connecting landing light to lower cowling.		
4	Disconnect and remove the old landing light.		

33-40: 2.3.2. Installation

Reference: **See in IPC** [13]

Step	Action	Required parts, materials and tools	Reference
1	Position new landing light into lower cowling.	- Torx screwdriver set - Loctite 243	
2	Run the new landing light cable through the hole in the fuselage.		
3	Apply Loctite 243 to the bolts' thread.		
4	Tighten screws and washers connecting landing light to lower cowling.		
5	Fasten the new landing light to the fuselage.		
6	Fit connector to cable.		
NOTE: white wire is "+", white with blue stripe is "-".			
7	Connect landing light to existent wire harness.		
8	Adjust landing light position. The angle between the light axes and the lower cowling is 20°.		Figure 33-003

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CHAPTER 34 – NAVIGATION AND PITOT-STATIC SYSTEMS

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34-00 GENERAL

The chapter describes the navigation systems used on the aircraft. It covers components such as the pitot-static system, indicators, positioning systems and landing aids.

34-10 FLIGHT ENVIRONMENTAL SYSTEMS

1. Description

This chapter discusses all of the equipment/instruments that collect data from the environment and convert it into usable information for the pilot. This includes the pitot-static system, outside air temperature sensor, vertical speed indicator, altimeter and airspeed indicator.

Pitot-Static system

The pitot tube is mounted on the starboard wing (see Figure 34-001). The lines drive the static and total pressure to flight instruments.

Figure 34-001
Standard Pitot tube installation

Outside Air Temperature

The outside air temperature sensor (OAT) is mounted to the fuselage just aft of the port side wing (see Figure 34-002). It provides the avionics with data in degrees Celsius (°C).

Figure 34-002
OAT sensor installation

Airspeed indicator

Indicated airspeed is shown on an internally lit precision airspeed indicator installed on the pilot's instrument panel. The instrument shows air speed information on a conventional round scale and on a LCD color display.

Altimeter

Altitude is shown on an internally lit precision altimeter installed on the pilot's instrument panel. The instrument shows altitude information on a conventional round scale and on a LCD color display.

Vertical Speed Indicator

Vertical Speed is shown on an internally lit precision altimeter installed on the pilot's instrument panel. The instrument shows vertical speed information on a conventional round scale and on a LCD color display.

Other instruments

The aircraft is equipped with compact Radio and Transponder by Trig. Artificial horizon HORIS is available as option. Engine data is available on the EMS display on the instrument panel.
See POH [5], [8] and [9] for additional information.

2. Maintenance Practices

34-10: 2.1. Pitot tube

34-10: 2.1.1. Inspection/check

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Locate the pitot tube fastened to the bottom surface of the starboard wing.		
2	Carry out visual inspection. Make sure the wing's composite structure around the tube's mounting flange hasn't incurred any damage.		05-20

34-10: 2.1.2. Removal

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Locate the pitot tube fastened to the bottom surface of the starboard wing.	- T-handle hex head screwdriver set	
2	Unscrew/remove the screws securing the Pitot tube to the wing.		
3	Pull the Pitot tube away from the wing slightly to access the hose ports.		
4	Disconnect the Pitot.		
5	Remove the Pitot tube.		
6	Carry out visual inspection of the Pitot tube and hoses.		05-20

34-10: 2.1.3. Installation

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Attach the Pitot hoses to the Pitot tube.	- T-handle hex head screwdriver set	
2	Position the Pitot tube on the wing's bottom surface.		
3	Fasten the Pitot tube to the wing.		

CAUTION: Install the Pitot tube so that it's parallel to the aircrafts longitudinal axis, therefore, pointing in the direction of flight. The readings given by navigation instruments will not be accurate if it's installed at an angle.

WARNING: Do not blow into the Pitot tubes entry ports as this could easily damage the instruments.

34-10: 2.2. Pitot and Static leak tests (PIPISTREL PITOT)

CAUTION: When performing a pitot or static leak test, comply with the following precautions to avoid damaging the air data instruments!

TEST PRECAUTIONS:

- The pitot system pressure must be equal to or higher than the static system pressure.

- Air data instruments can be damaged if the pitot and static pipes are reversed.

- The applied pressure and rate of pressure change must not exceed the design limits of the equipment under test.

- After performing the test, return the system to its operating conditions.

NOTE: Always perform a Pitot leak test after performing maintenance actions on the Pitot system and a low-range Static leak test after performing maintenance on the Static system.

34-10: 2.2.1. Static system test

Step	Action	Required parts, materials and tools	Reference
1	Remove the screws, attaching the pitot tube to the wing and hold the tube	Pitot Static leak tester	
2	Lower the tube from the wing to reveal the connections		
3	Disconnect the static hose		
4	Connect the pitot-static tester to the static hose		
5	Apply a vacuum equivalent to 1.000ft altitude above the ambient pressure altitude		
6	Monitor the system pressure - the leak rate should not exceed the equivalent of 100ft altitude per minute		

NOTE: If the reading exceeds the limit, described in Step 6, perform a Pitot-static leak inspection. (See 34-10: 2.2.3.)

34-10: 2.2.2. Pitot leak test

Step	Action	Required parts, materials and tools	Reference
1	Connect the pitot-static tester to the pitot-static probe	Pitot Static leak tester	
2	Apply the pressure, equal to closest lower round value to aircraft V_{NE} (see applicable Flight Manual) to the pitot port		
3	Let the pressure inside the system stabilize for one minute		
4	Monitor the system pressure - the leak rate must not be greater than 10 knots per minute		

NOTE: If the reading exceeds the limit, described in Step 4, perform a Pitot-static leak inspection. (See 34-10: 2.2.3.)

34-10: 2.2.3. Pitot-static system leak inspection

Step	Action	Required parts, materials and tools	Reference
1	Check the system for any loose connections		
2	Inspect the hoses for signs of deterioration, particularly at the bends and at the connection points to the pitot mast/ static ports and avionics		
3	Replace hoses that are cracked or hardened with identical specification hoses		

NOTE: Any time a hose is replaced, perform a system leak test. (See 34-10: 2.2.)

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CHAPTER 51 – STANDARD PRACTICES - STRUCTURES

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51-00 GENERAL

This chapter covers all the maintenance procedures that pertain to the aircraft structure. The airframe is a complex composite structure that needs to be checked periodically for signs of wear and damage. Damage to composite components can be difficult to detect, but some simple techniques can make it easier.

Please see Appendix-E for definition and determination of primary and secondary structures.

51-10 DETECTING/ASSESSING COMPOSITE DAMAGE

1. Description

Composite damage comes in many forms and is sometimes difficult to detect. The most common is impact damage, such as dents or punctures. These, as well as scratches and gouges, can usually be detected by visually inspecting the component. Other types of damage however, such as delamination, which are sometimes just as critical as other forms of damage, can go easily go undetected. That is why thorough inspection of the airframe is advisable and needed in order to keep the aircraft in good working condition and its occupants safe.

2. Maintenance Practices

51-10: 2.1. Visual inspection of composite components

Light is an excellent visual inspection aid. Place the composite component, whether big or small, in a well lit space and move it slowly so that the light reflects off it at different angles. Any bends, warping and/or dents should be detectable by using this technique. Once detected, the extent of the components damage needs to be assessed.

51-10: 2.2. Tap test

Composite components are known for mechanical strong and robust, yet very light. Their underlying structure must remain intact in order to ensure good mechanical properties. Any damage that it incurs, however, can easily go undetected, because it's not visible.

One way of a detecting interior composite damage, or determining the extent of damage already incurred, is a tap test. This is to be carried out with a hard, metallic object, such as a coin. To avoid damaging the composite test specimen, be sure to use an object that isn't sharp or pointed. Simply tap the surface of the composite component with the blunt, metallic object and listen to the sound this produces. Areas that are undamaged typically sound sharp and clear, whereas areas that have suffered delamination or disband, sound hollow and/or flat.

Any damage to the major bonding lines of the aircraft's structural components can also be detected by the tap test described above. The following bonding lines, clearly depicted in Figures 51-001 to 51-004, are to be considered major:

- Upper fuselage/vertical stabilizer bonding line
- Lower fuselage bonding line
- Wing leading edge bonding line
- Horizontal stabilizer leading edge bonding line

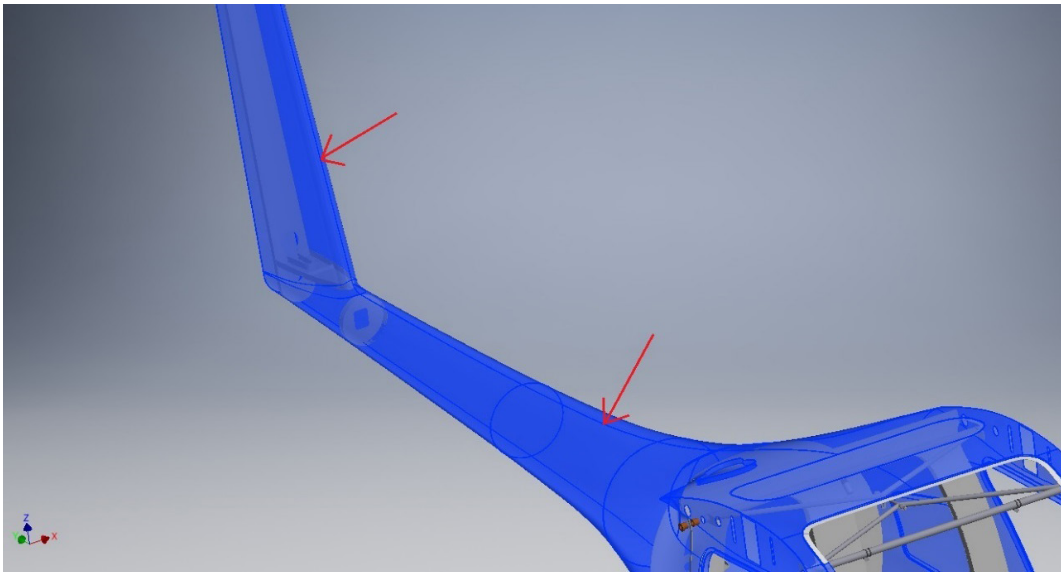

Figure 51-001
Upper fuselage/vertical stabilizer bonding line
- illustrative purposes only -

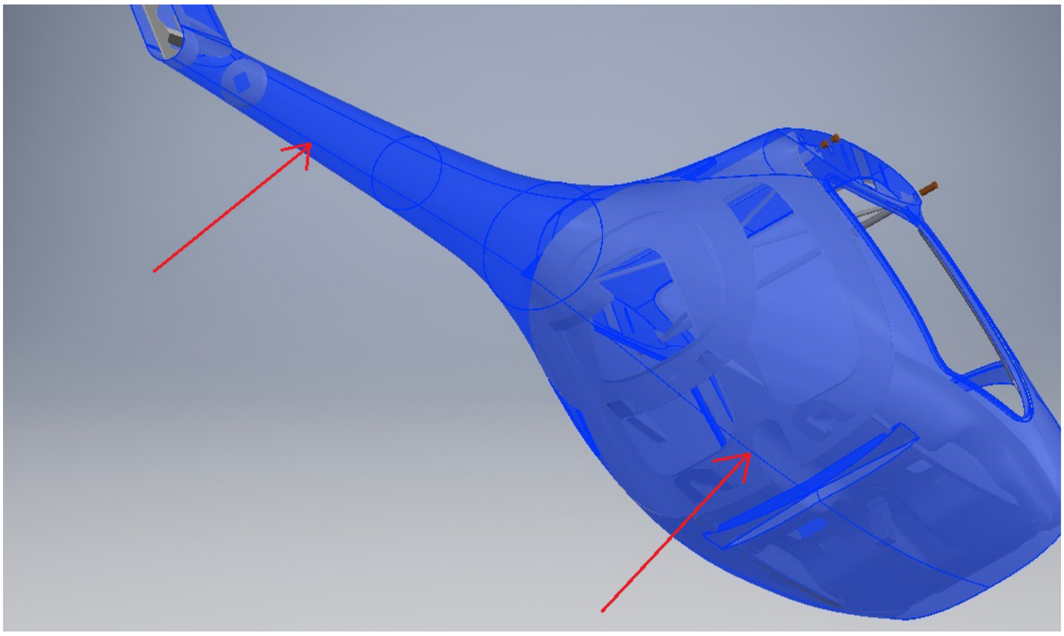

Figure 51-002
Lower fuselage bonding line
- illustrative purposes only -

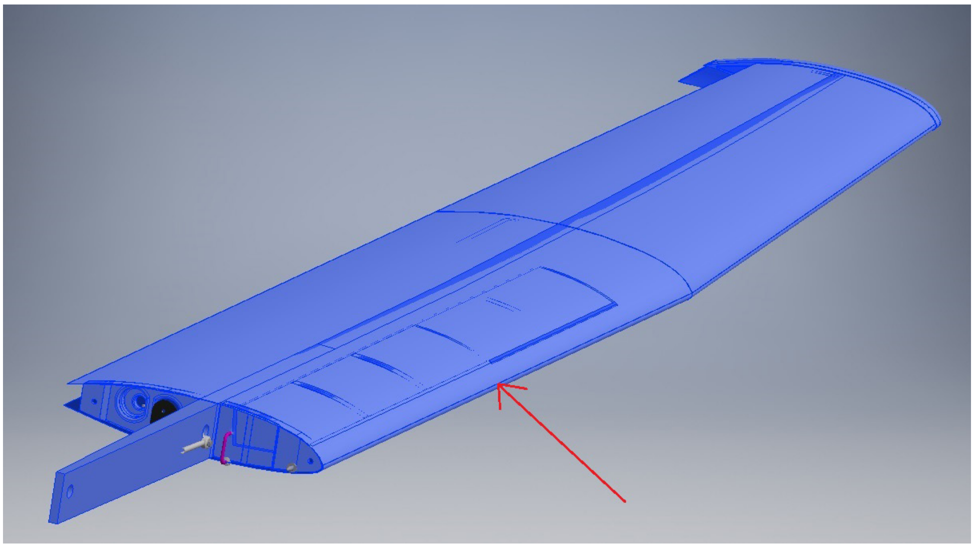

Figure 51-003
Wing leading edge bonding line
- Illustrative purposes only -

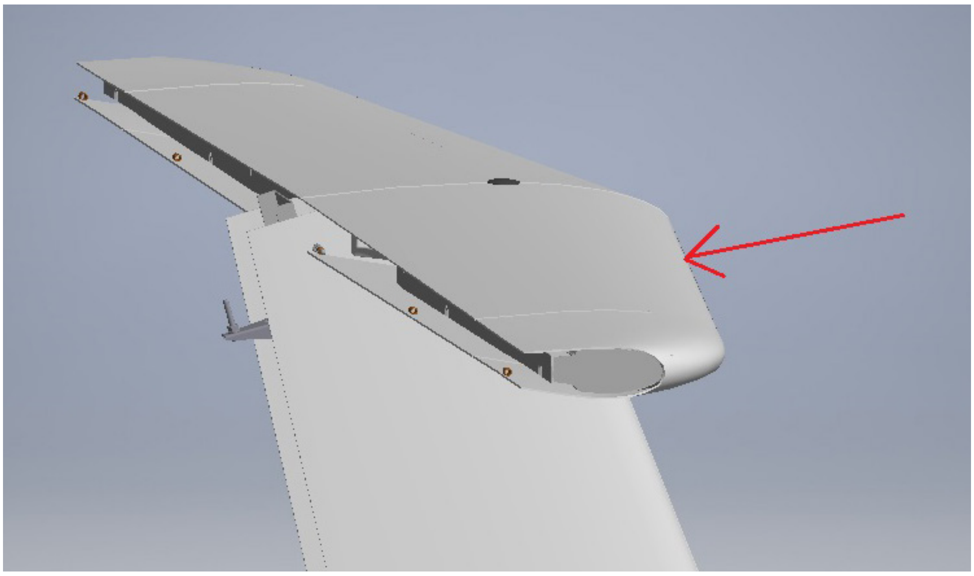

Figure 51-004
Horizontal stabilizer leading edge bonding line
- illustrative purposes only -

51-60 CONTROL SURFACES BALANCING

All of the control surfaces on the aircraft must be balanced at all times to ensure the safety of its occupants. They can, however, become unbalanced if altered or modified (i.e. damaged, repainted, repaired, etc.).

WARNING: If altered in any way, control surfaces must be rebalanced. Instructions on how to properly balance them can be attained on request by contacting Pipistrel.

51-70 REPAIRS

Please contact Pipistrel d.o.o. for further guidance regarding any repairs.

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CHAPTER 52 – DOORS

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52-00 GENERAL

This chapter describes the ALPHA Trainer's doors. The windshield, upper window and door windows are made from Lexan shatter-resistant polycarbonate. The fuselage has two cabin doors made out of CFRP frames and one independent luggage compartment door on the left side. Doors are locked in the closed position via 3 locking pins operated simultaneously by rotating a common central handle.

The baggage compartment door provides access to the baggage compartment and can be locked to prevent it from opening during aircraft operation.

Figure 52-001a
Doors with old locking mechanism installed

Figure 52-001b
Door with new locking mechanism installed

52-10 PASSENGER AND CREW DOORS

1. Description

The two crew/passenger doors are fastened to the aircraft by hinges. They incorporate a flush-mounted, outer door handle and a conventional inner door handle. The door latch handle is centered at the bottom of the door window and actuates three latching pins that extend downwards/outwards into the fuselage.

2. Maintenance practices

52-10: 2.1. Main doors

52-10: 2.1.1. Removal

Step	Action	Required parts, materials and tools	Reference
1	Put the door handle in the locked position.	- 2.5 mm T-handle hex head screwdriver, - rubber hammer	
2	Push the hinge pins out of the door's hinges using the T-handle hex head screwdriver and rubber hammer.		
3	Unlock the door handle and remove the door.		

52-10: 2.1.2. Installation

Step	Action	Required parts, materials and tools	Reference
1	Position door on the airframe and put door handle in locked position	- 2.5 mm T-handle hex head screwdriver, - rubber hammer	
2	Lubricate hinge pin.		12-20: 2.5.
3	Slide hinge pin into hinge and center it.		
	NOTE: The hinge pin is tapered. While installing mind the correct orientation, flattened side facing fore.		
4	Unlock door handle and carry out operational inspection.		05-20

52-10: 2.1.3. Inspection/check

Step	Action	Required parts, materials and tools	Reference
1	Carry out visual inspection of doors.	- 2.5 mm T-handle hex head screwdriver, - rubber hammer	05-20
2	Position door on the airframe and put door handle in locked position.		
3	Use T-handle hex head screwdriver and rubber hammer to remove the doors hinge pins.		
4	Wipe the hinge pins clean with paper towel.		
5	Lubricate hinge pin.		12-20: 2.5.
6	Slide hinge pin into hinge and center it.		
7	Unlock door handle and carry out operational inspection.		05-20

52 -10: 2.2. Door handle Mechanism

52-10: 2.2.1.a Removal - old system

Step	Action	Required parts, materials and tools	Reference
1	Remove the door handle locking pin by unfastening the selflocking and hex nut.	- metric wrench set - T-handle hex head screw-driver set	
2	Remove the decorative plug on the door handle.		
3	Remove the handle retaining M5 bolt and the door handle fastening material.		
4	Turn the door handle and pull the locking rods from the guides in the door frame.		

52-10: 2.2.1.b Removal - new system*

***NOTE:** See Figure 001b for reference.

Step	Action	Required parts, materials and tools	Reference
1	Remove M3 screw holding the cover plate and remove cover plate	- metric wrench set - T-handle hex head screw-driver set	
2	Disconnect the spring from the lower locking rod.		
3	Remove the decorative plug on the door handle.		
4	Remove the handle retaining M5 bolt and the door handle fastening material.		
5	Turn the door handle and pull the locking rods from the guides in the door frame.		

52-10: 2.2.2.a Installation - old system

Step	Action	Required parts, materials and tools	Reference
1	Insert the door handle mechanism locking rods into the guides in the door frame.	- metric wrench set - T-handle hex head screw-driver set	
2	From the cabin side insert the hex button head bolt through a latch plate and through the hole in the window.		
3	From the out-side install all the spacers, external door handle and all the fastening material.		
	NOTE: The Lexan window fits between the two plastic washers.		
4	Fasten the new selflocking nut and cover it with decorative plug.		
	NOTE: Always use only new selflocking nuts.		
5	Inspect the correct movement of the locking rods and install the door handle locking pin.		

52-10: 2.2.2.b Installation - new system*

***NOTE:** See Figure 001b for reference.

Step	Action	Required parts, materials and tools	Reference
1	Insert the square spacer (P/N 1121067) into the stainless steel spacer (P/N 1121066).	- metric wrench set - T-handle hex head screwdriver set	
2	Insert the door handle mechanism locking rods into the guides in the door frame.		
3	From the cabin side insert the hex button head bolt through a latch plate and through the hole in the window.		
4	From the out-side install all the spacers, external door handle and all the fastening material.		
	NOTE: The Lexan window fits between the two plastic washers.		
5	Fasten the new selflocking nut and cover it with decorative plug.		
	NOTE: Always use only new selflocking nuts.		
6	By using mylar washer (P/N 5012240), spacer (P/N 1215210065), and screw, assemble them together with the spring (P/N 5083086) into the hole shown on Figure 002 and 003.		Figure 002 Figure 003
7	Attach the spring to the spacer of short (lower) locking rod (1215210063) result should look like in Figure 004		Figure 004
8	Adjust the spacer handles – cover plate holders (1215210080), if necessary. The upper or lower edge must be in line.		
9	Install cover plate by using M3 screws		
10	Inspect the correct movement of the locking rods and install the door handle locking pin.		

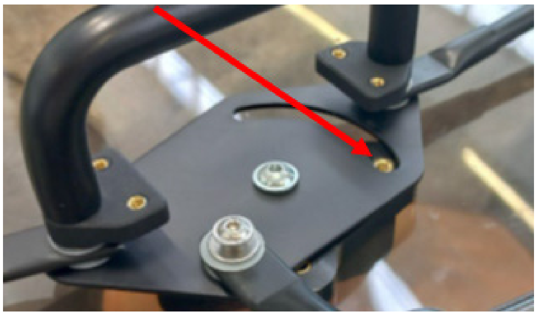
Figure 52-002


Figure 52-004


Figure 52-003

52-10: 2.2.3. Door handle locking mechanism - Inspection/check

NOTE: Instead of locking pins, new version introduces the spring which is securing the handle in position. The operational check (05-20) must still be performed. See Figure 001b for reference.

Step	Action	Required parts, materials and tools	Reference
1	Check the locking force of the handle in both end positions.		05-20

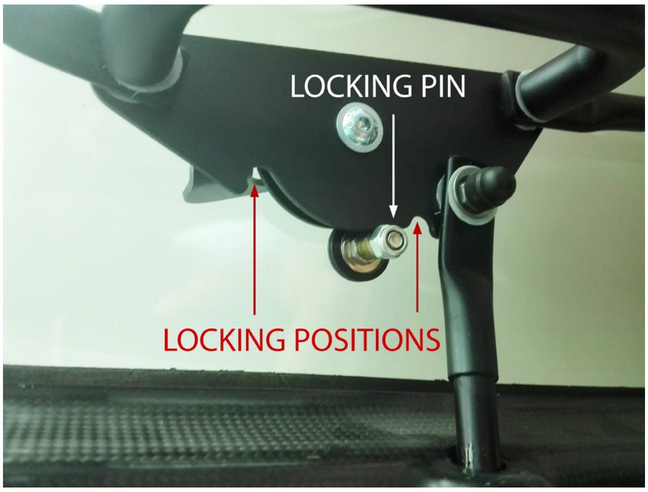

Figure 52-005
Handle locking mechanism - example of old locking system

52-20 BAGGAGE DOOR

1. Description

The baggage compartment door, located on the port side of the fuselage aft of the door, provides access to the baggage compartment. The baggage door is hinged on the forward edge and latched on the rear edge. The door is locked from the outside with a key lock.

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CHAPTER 53 – FUSELAGE

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53-00 GENERAL

The aircraft fuselage incorporates a carbon fiber, honeycomb-sandwich main frame, reinforced with various bulkheads and longerons. This chapter describes all of the main fuselage elements and the maintenance practices that pertain to them.

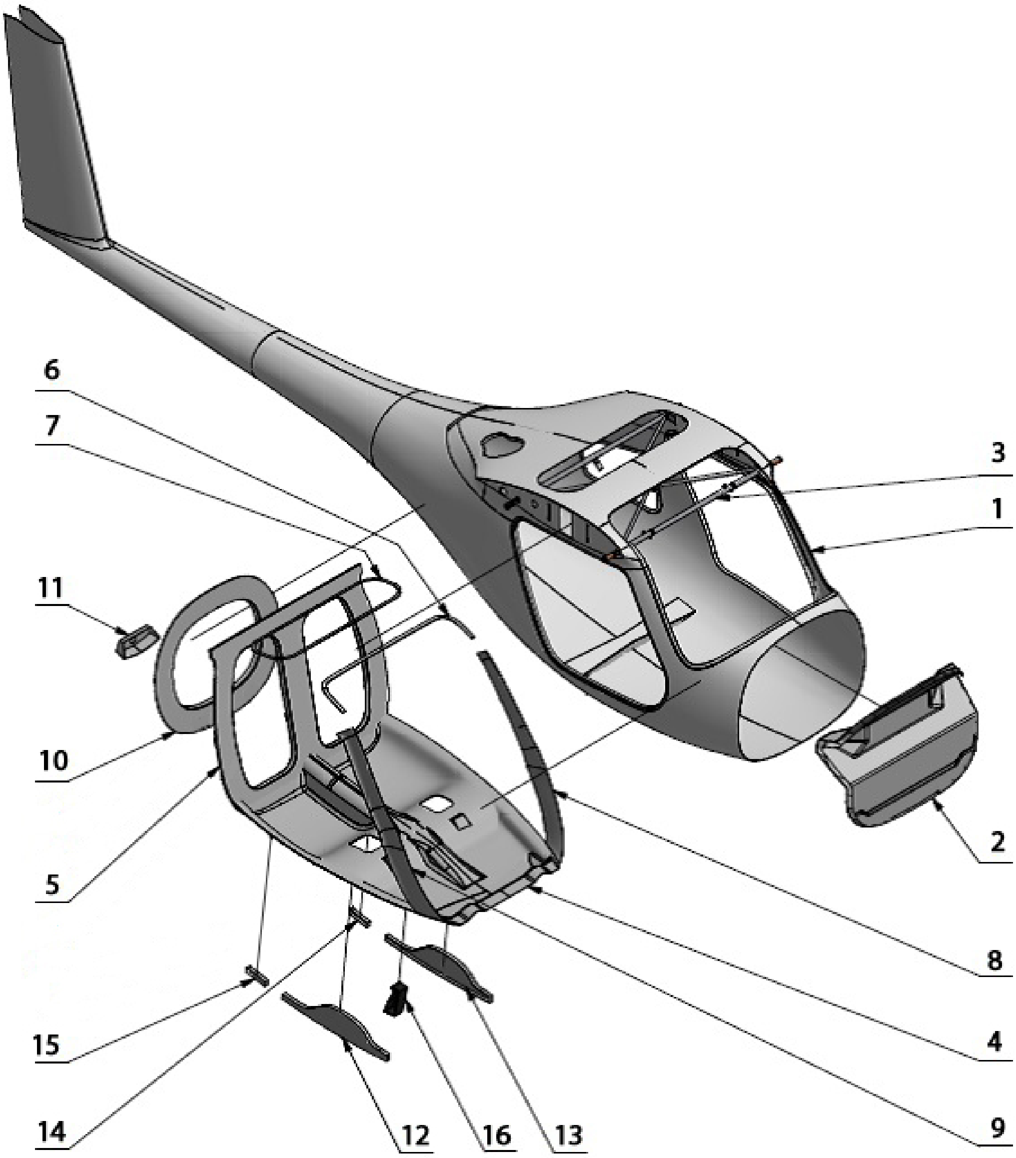

Figure 53-001
Fuselage components description
- Illustrative purposes only -

1	Main frame	7	Sunroof frame	13	Port fore longeron
2	Firewall	8	Port roll cage beam	14	Port aft longeron
3	Cabin support strut	9	Strbrd roll cage beam	15	Strbrd aft longeron
4	Cabin floor	10	Baggage comp. bulkhead	16	Cabin floor support beam
5	Cabin bulkhead	11	Trim ass. bulkhead		
6	Windshield frame	12	Strbrd fore longeron		

53-10 MAIN FRAME

1. Description

The fuselage is designed as a carbon fiber honeycomb-sandwich construction that uses aramid fibers as inner laminate in the cockpit area. The external structure is covered by a protective acrylic paint coating, which has already been applied in the mold.

2. Maintenance practices

53-10: 2.1. Main frame

53-10: 2.1.1. Inspection/check

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Carry out visual inspection of the fuselage main frame.		51-10
2	Carry out visual inspection of the area where the main landing gear strut is attached to the main frame. Check for any signs of damage, such as cracks, delamination or deformation.		Figure 53-002

WARNING: Any damage incurred by the fuselage's main frame is a safety hazard and must be repaired immediately by an authorized maintenance/composite repair organization.

Figure 53-002
Example of fuselage main frame damage

53-20 CABIN FLOOR

1. Description

The cabin floor supports the crew seats and is made primarily out of CFRP. Some areas of the cabin floor are reinforced with aramid fibers. It's supported by two longerons and a central beam. The passenger safety harness lap belts are fastened to the cabin floor.

2. Maintenance practices

53-20: 2.1. Cabin floor

53-20: 2.1.1. Inspection/check + tap test

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Remove the crew seats.		25-10
2	Carry out visual inspection of the cabin floor. Pay special attention to the area around the safety harnesses and undercarriage strut attachment points. Check for any signs of damage, such as cracks, delamination or deformation.		05-20 and Figure 53-002
3	Carry out tap test in area adjacent to undercarriage strut bolt attachment points.		51-10
4	Install the crew seats.		25-10

WARNING: Any damage incurred by the fuselage's cabin floor requires immediate repair and must be carried out by an authorized maintenance/composite repair organization.

Figure 53-003
Safety harnesses attachment point on the cabin floor

53-30 FIREWALL

1. Description

The firewall is designed to separate the engine compartment from the rest of the fuselage and support various airplane components on both the forward and aft side. The firewall, constructed of a CFRP prepreg honeycomb sandwich, includes metal fittings that support the engine mount and reinforced points that support various engine components. Fire protection is provided by a layer of ceramic insulation covered by a sheet of stainless steel.

2. Maintenance practices

53-30: 2.1. Firewall

53-30: 2.1.1. Inspection/check

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Remove engine cowlings.		71-10: 2.1.1.
2	Carry out visual inspection of the firewall. Check for any signs of deformation due to high temperatures, such as deformation, charring or scorching. Check the area around the engine mount attachment points for signs of damage.		05-20
3	Install the engine cowlings.		71-10: 2.1.2.

WARNING: Any damage incurred by the fuselage's firewall requires immediate attention and must be repaired out by an authorized maintenance/composite repair organization.

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CHAPTER 55 – STABILIZERS

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55-00 GENERAL

The stabilizers consist of a detachable horizontal stabilizer, a single piece elevator, a fixed vertical stabilizer and a detachable rudder. All of the empennage components are conventional spar (shear web), rib, and skin construction. This chapter describes the maintenance practices that pertain to the aforementioned components.

NOTE: The COG of the aircraft must be recalculated/verified following any stabilizer/control surface repairs.

55-10 HORIZONTAL STABILIZER

1. Description

The horizontal stabilizer is attached to an aluminum bracket that is fastened to the vertical stabilizer and can be removed. The design of the horizontal tail's shell incorporates CFRP sandwich material.

2. Maintenance practices

55-10: 2.1. Horizontal stabilizer

55-10: 2.1.1. Removal

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Weigh the tail cone down to access the horizontal stabilizer.	- 14 mm spark plug socket wrench (P/N 1190003), - flathead screw-driver	07-10: 2.2.1.
2	Remove the attachment bolt's black cap.		
3	Slide screwdriver perpendicularly through 14 mm socket wrench and use it to unscrew/remove the horizontal stabilizers' attachment bolt assembly.		
4	Lightly jolt the elevator's trailing edge, so that the horizontal stabilizer pops out of place.		
5	Remove it and set it on a dry, padded surface.		
6	Remove tail cone counterweight.		

55-10: 2.1.2. Installation

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Weigh the tail cone down to access the horizontal stabilizer .	- 14 mm spark plug socket wrench (P/N 1190003), - flathead screwdriver	07-10: 2.2.1.
2	Lubricate horizontal stabilizer pins and bushings.		12-20
3	Lubricate horizontal stabilizer attachment bolt assembly		12-20
4	Position the horizontal stabilizer so that it's pins slide into their respective bushings.		
5	Use 14 mm socket wrench to fasten the horizontal stabilizer to the aircraft while simultaneously pushing down on the bolt with the screwdriver.		Figure 55-001
6	Orient the bolt's head so that slides into the spring-loaded locking mechanism.		Figure 55-002
7	Shake stabilizer a little to ensure it is secured to the aircraft.		
8	Install the attachment bolt assembly's black cap.		

continued on the next page

Step	Action	Required parts, materials and tools	Reference
9	Carry out operational inspection of the elevator.		05-20
10	Check elevator deflection angles.		27-30

55-10: 2.1.3. Inspection/check

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Remove horizontal stabilizer.	Retainer ring pliers	55-10: 2.1.
2	Remove attachment bolt retainer ring.		
3	Remove attachment bolt assembly.		
4	Carry out visual inspection of attachment bolt assembly.		05-20
5	Clean and lubricate attachment bolt assembly.		12-20
6	Install attachment bolt assembly.		
7	Carry out operational inspection of attachment bolt assembly.		05-20

Figure 55-001
Attachment bolt installation

Figure 55-002
Attachment bolt assembly head orientation

55-20 ELEVATOR

1. Description

The elevator is designed as a bottom surface supported hinged flap. The elevator is actuated using a pushrod, which is connected to the elevator control bracket. The elevator shell is designed as a 1-cell CFRP sandwich shell. The elevator is hinged in maintenance-free bushings mounted on stainless steel brackets at the stabilizer rear spar and bottom shell.

2. Maintenance practices

55-20: 2.1. Elevator

55-20: 2.1.1. Removal

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Remove horizontal stabilizer.	Metric ratchet/ socket set	55-10
2	Flip it upside down on a dry, padded surface.		
3	Remove the fastening material from the first port-side hinge securing the elevator to the horizontal stabilizer.		
4	Slightly wiggle the elevator up and down while simultaneously sliding it off its hinges.		
5	Remove and place on a dry, padded surface.		

55-20: 2.1.2. Installation

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Slide elevator into position on the horizontal stabilizer and fasten it in place.	Metric ratchet/ socket set	
2	Carry out operational inspection of the elevator.		05-20
3	Install horizontal stabilizer.		55-10
4	Check elevator deflection angles.		27-30

55-20: 2.1.3. Inspection/check

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Remove elevator.	Metric ratchet/ socket set	55-10: 2.1.
2	Carry out visual inspection of the elevator.		05-20
3	Lubricate elevator hinge pins.		12-20
4	Install elevator.		55-10: 2.1.2.

55-20: 2.2. Elevator control surface seals

The gap between the stabilizer and the elevator is sealed to improve performances, control surface effectiveness and to prevent any foreign objects from entering the area between the two parts. The sealing consists of a stripe of thin curved plastic material, applied externally along the stabilizer upper surface and covering the gap with the elevator (see Figure 55-003 and -004). The stabilizer has two sealing stripes, one for each semi-elevator.

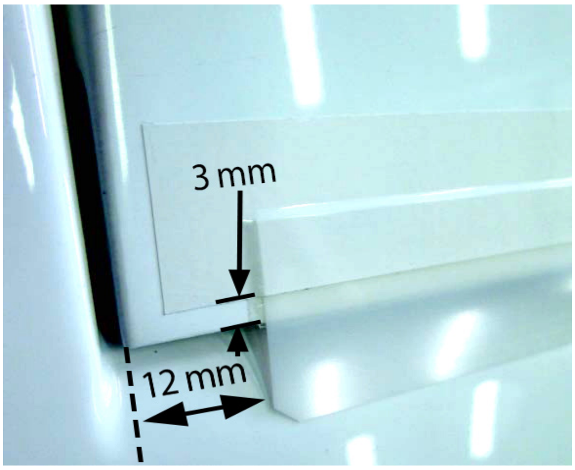

Figure 55-003
Elevator seal
Positioning details - tip area

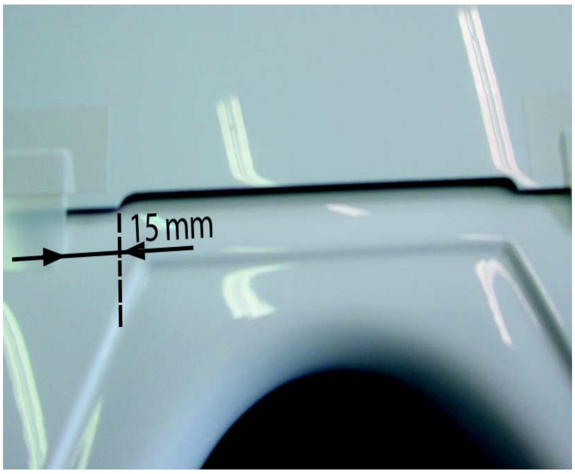

Figure 55-004
Elevator seal
Positioning details - central area

55-20: 2.1.1. Control surfaces sealing - Removal

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Remove the horizontal stabilizer from the tail	- Plastic blade - Multi foam - Cleaning benzine - Cloth	55-10: 2.1.
2	Place the stabilizer on a dry, padded surface.		
3	Use a plastic filling blade to lift a corner of the sealing starting from the one tip.		
4	Peel off and remove the sealing from the wing togheter with the cover tape.		
5	Remove the adhesive tape from the stabilizer surface.		
6	Use a cloth to clean the surface from adhesive remains.		05-20
7	Repeat the procedure for the other half of the stabilizer		

55-20: 2.1.2. Control surfaces sealing - Installation

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Remove the stabilizer.	- Masking tape - Cloth - Multi foam - Cleaning benzine	55-10: 2.1.
2	Place athe stabilizer on a dry, padded surface. Upper side up.		
3	Clean the stabilizer along the hinge line to improve bonding of adhesive tape.		
4	Apply the double-sided adhesive tape on the stabilizer upper surface, along and against the the hinge line. The tape must be applied on the stabilizer, not on the equilibrator moving surface. Do not remove the protective strip from the tape at this point. See Figures for additional details.		Figure 55-003 Figure 55-004
5	Run a smooth object along the tape to improve the adhesion, and to squeeze out any air bubbles.		
6	Position the control seal over the double-sided tape. Align one edge of the seal with the edge of the double-sided tape.		Figure 55-003 Figure 55-004
7	Fix temporarily the ends of the seal strip to the stabilizer using pieces of masking tape.		
8	Starting from one end, lift locally the seal, remove the protective strip from the double-sided tape and stick carefully the seal to the tape.		

continued on the next page

Step	Action	Required parts, materials and tools	Reference
9	Continue the step 8 along the hinge line. Remove progressively the protective strip and stick the seal starting from an end of the strip to the other.		
10	Run a smooth object along the seal to improve the adhesion, and to squeeze out any air bubbles.		
11	Position the cover tape on the stabilizer, in the same position of the double-sided tape.		Figure 55-003 Figure 55-004 Figure 55-005
12	Fix temporarily the ends of the cover tape to the stabilizer using pieces of masking tape.		
13	Starting from one end, remove progressively the protective strip from the cover tape and stick it carefully to the seal.		
14	Run a smooth object along the cover tape to improve the adhesion, and to squeeze out any air bubbles.		
15	Repeat the procedure on the other half of the stabilizer.		

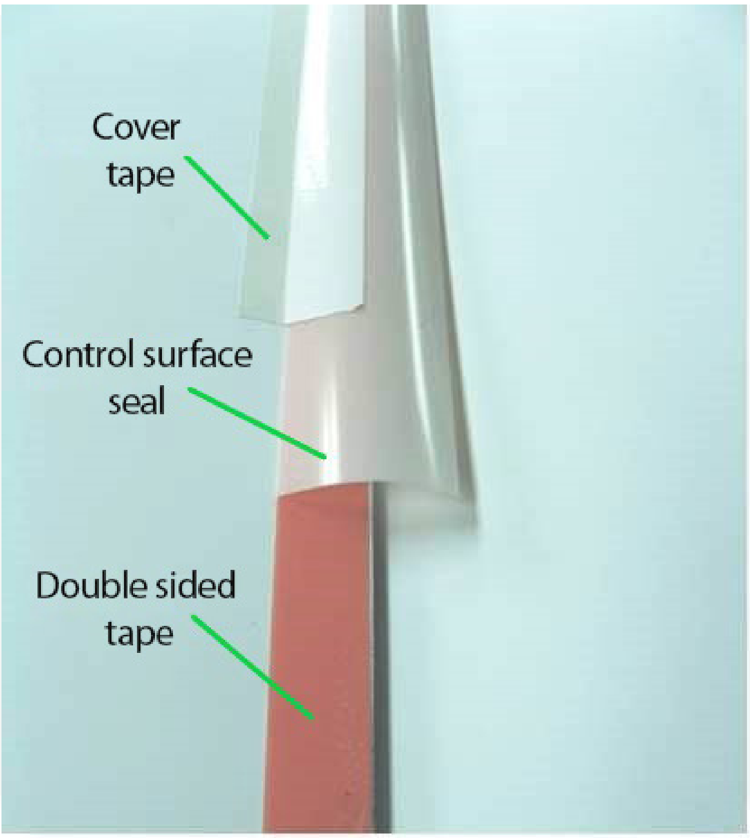

Figure 55-005
control surface sealing
component layers

55-30 VERTICAL STABILIZER

1. Description

The vertical stabilizer is designed to be one part with the tail fuselage, made of carbon honeycomb sandwich with carbon spars. The bending moment is carried by one C-type spar which is reinforced by CFRP tapes at the flanges.

2. Maintenance practices

55-30: 2.1. Vertical stabilizer

55-30: 2.1.1. Inspection/check

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Remove horizontal stabilizer.		55-10: 2.1.
2	Carry out visual inspection of vertical stabilizer bushings for wear.		05-20
3	Clean and lubricate vertical stabilizer bushings.		12-20
4	Clean and lubricate horizontal stabilizer T-fixation plate pins.		
5	Install horizontal stabilizer.		55-10: 2.1.2.

55-30: 2.1.2. Inspection/check + tap test

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Remove horizontal stabilizer.		55-10: 2.1.
2	Carry out tap test around the vertical stabilizer bushings.		51-10
3	Install horizontal stabilizer.		55-10: 2.1.2.

55-40 RUDDER

1. Description

The rudder is a single-cell GFRP sandwich shell that's designed like centrally supported hinged flap. It's rotation is attributed to two maintenance-free spherical plain bearings. Balancing weights are mounted on the front end of the rudder.

2. Maintenance practices

55-40: 2.1. Rudder

55-40: 2.1.1. Removal

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Remove the fastening material securing the rudder's two bottom studs to the rudder cable bellcrank.	Metric ratchet/ socket set	
2	Support the rudder with both hands and give it a jolt upwards. It should slide of its hinges.		
3	Place it on a dry, padded surface.		
4	Carry out visual inspection of the rudder.		05-20 and 51-10

55-40: 2.1.2. Installation

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Lubricate the upper rudder hinge pin.	Metric ratchet/ socket set	12-20
2	Slide the rudder's upper bushing over its upper hinge pin while simultaneously sliding its two bottom studs into the cable bellcrank.		
3	Fasten it in place and torque nuts.		
4	Carry out operational inspection.		05-20
5	Check the rudder deflection angles.		27-20: 2.4.2.

55-40: 2.2. Rudder control surface sealing

The gap between the vertical stabilizer and the rudder is sealed to improve performances, control surface effectiveness and to prevent any foreign objects from entering the area between the two parts. The sealing consists of a stripe of thin curved plastic material, applied externally along the stabilizer upper surface and covering the gap with the rudder. The vertical stabilizer has two sealing stripes, one on each side.

55-40: 2.2.1. Removal

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Lift the top end of the control surface sealing using a plastic blade.	- Multi foam - cleaning benzine 60/90 or isopropyl alcohol - Cloth - Plastic blade	
2	Remove the sealing tearing it off the vertical stabilizer.		
3	Clean the vertical stabilizer surface using a cloth and cleaning benzine 60/90 or isopropyl alcohol (according to TT-I-735 standard).		
4	Repeat the procedure on the other side.		

55-40: 2.2.2. Installation

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Clean the vertical stabilizer surface along the hinge line using a cloth and cleaning benzine 60/90 or isopropyl alcohol (according to TT-I-735 standard).	- Multi foam - cleaning benzine 60/90 or isopropyl alcohol - Cloth - Masking tape	
2	Position temporarily the rudder seal on the vertical stabilizer along the hinge line, without removing the protective tape and keeping it in place using some masking tape.		
3	Once the positioning is satisfactory, start removing the protective tape from one end and stick the seal end to the vertical stabilizer.		Figure 55-005
4	Continue to remove the protective tape along the seal and stick it to the vertical stabilizer		
5	Run a smooth object along the seal to improve the adhesion, and to squeeze out any air bubbles.		
6	Repeat the procedure on the other side of the vertical stabilizer.		

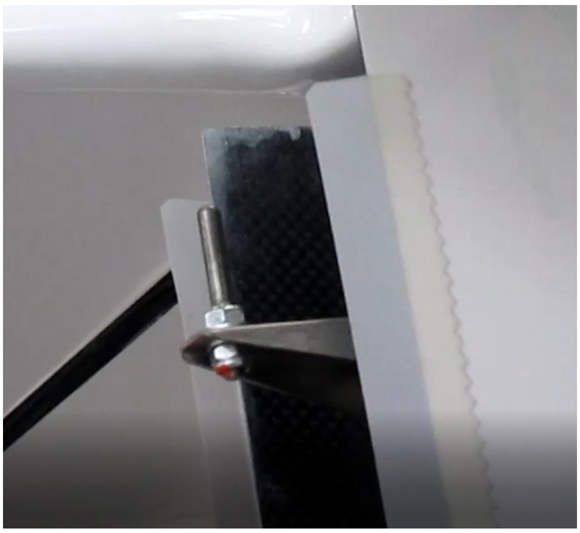

Figure 55-005
Rudder control surface seal

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CHAPTER 56 – WINDOWS

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56-00 GENERAL

1. Description

The aircraft is equipped with a windshield, cabin door windows and a sunroof. All of the aforementioned windows are made from Lexan shatter-resistant polycarbonate and bonded/fastened to the fuselage or door structure using adhesive and rivets. All the windows are fixed in place and cannot be opened, the exception being the doors which have sliding windows for direct fresh ram air into the cabin.

2. Maintenance practices

NOTE: The following maintenance practices apply to all of the window surfaces (i.e. windshield, sunroof and door).

56-00: 2.1. Windows

56-00: 2.1.1. Surface inspection/check

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Carry out visual inspection of the window.		51-10
	Inspect the window for any signs of damage such as cracks, scratches, chips or smudges.		Figure 56-001
	Inspect the windows clarity: objects should appear clear and hazy or fuzzy.		Figure 56-002 and Figure 56-003

Figure 56-001
Cracked windshield

Figure 56-002
Example of adequate window clarity

Figure 56-003
Example of inadequate window clarity

WARNING: Damaged windows that impede pilot visibility are a safety hazard and must be replaced.

56-00: 2.1.2. Rivet inspection/check

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Carry out visual inspection of the window rivets.		05-20
	Make sure that none of them have loosened and/or gone missing. They should all be flush with the window's surface.		Figure 56-004

Figure 56-004
Example of loosened window rivet

CAUTION: Any damaged and/or loosened window rivets must be replaced with new ones.

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CHAPTER 57 – WINGS

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57-00 GENERAL

The detachable wing is a single spar cantilever wing. The left and right wing are connected by two pins through the spar ends. The wing structure is made mostly from CFRP, while the main spar shear web and the root ribs are made from GFRP. This is for visual inspection and easier damage detection reasons. The spar caps are produced using carbon roving. The wing spar is designed as double T-type spar. Lateral loads and twisting moments are conventionally transferred to the fuselage through root ribs and lateral-force bolts.

57-10 WING STRUCTURE

1. Description

The wing shell is designed as a 2-cell CFRP sandwich shell which is closed by a rear shear web which the flaperons are attached to. The wings are fastened together the same way classic gliders are - two spar ends connected with two spar pins. There is also a middle bolt which mates the wings to the fuselage and provides torsional stiffness. The wing roots have pins that slide into bushings in the fuselage and thus allow the wings to be easily positioned/fitted.
Wings are equipped with flaperons and optionally with electrically actuated air-brakes.

2. Maintenance practices

CAUTION: Installing and removing the wings must carried out in a space where the temperature is equal to or lower than 20°C (68°F), as temperature higher than this could make certain parts very difficult to assemble.

57-10: 2.1. Wing structure

57-10: 2.1.1. Wing removal

NOTE: A minimum of three people are required to carry out this task.
Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Engage the parking brake.	-Metric ratchet vand socket set -T-handle hex head screwdriver set	
2	Place wheel chocks under main landing gear wheels.		
3	Remove white wing-fuselage joint seal.		
4	Remove pitot tube.		34-10: 2.1.2.
5	Enter the cabin and disconnect all static/pitot lines and electrical cables from the wing roots.		
6	Support each wing at the wingtip.		Figure 57-001
7	Remove central wing spar bolt.		
8	With both wings supported at their ends, remove the two spar pins.		
NOTE: Moving the wingtips up and down slightly makes spar pin removal easier.			
9	With one person at each end of the wing, slowly remove one of the wings from the fuselage.		
10	Place it in wing cart or on any dry, padded surface.		
11	With one person at each end of the wing, slowly remove the other wing from the fuselage.		
12	Place it in wing cart or on any dry, padded surface.		
13	Disengage parking brake.		

continued on the next page

Step	Action	Required parts, materials and tools	Reference
14	Remove wheel chocks.		
15	Carry out visual inspection of the wings.		05-20

Figure 57-001
Support the wings

57-10: 2.1.2. Wing installation

NOTE: A minimum of three people are required to carry out this task.
Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Clean spar pins, wing positioning pins/bushings and wing spar bushings with a piece of paper towel and lubricate them.	- Metric ratchet and socket set - T-handle hex head screwdriver set - Paper towel, white wing-fuselage joint seal (P/N 5230014)	12-20
2	Engage the parking brake.		
3	Place wheel chocks under main landing gear wheels.		
4	Support one wing at both ends and slide its spar into the fuselage. When the wing root is about 10 cm away from the fuselage all/any electrical cables and pitot lines through their respective openings in the fuselage. Slide the wing into its final position using the wing positioning pins as a guide. Continue to support the wingtip as the spar rests against the fuselage.		
5	Support the other wing at both ends and slide its spar into the fuselage. When the wing root is about 10 cm away from the fuselage all/any electrical cables and fuel lines through their respective openings in the fuselage. Slide the wing into its final position using the wing positioning pins as a guide. Continue to support the wingtip as the spar rests against the fuselage.		

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57-10
WING STRUCTURE

Step	Action	Required parts, materials and tools	Reference
	CAUTION: While pushing the wings into their final position make sure that the flaperon and air brake control controls have engaged properly.		
6	With the wings supported at their wingtips, slide the spar pins through the wing spar bushings and fasten them in place.		
	CAUTION: If at this point the spar pins are properly inserted and the wings are secured, it is no longer necessary to support the wingtips.		
7	Secure spar pins with fastening material, tighten bolts to torque 23 Nm.		
8	Insert and tighten the central spar bolt to torque 15 Nm.		
9	Carry out operational check of the flaperon control system.		05-20
10	Carry out operational check of the air brakes (if applicable).		05-20
11	Connect all electrical cables and pitot/static lines.		
	CAUTION: The pitot and static lines are marked in the cabin and on the lines themselves with a P and S respectively.		
12	Install pitot tube.		
13	Carry out operational check of the pitot tube.		05-20
14	Apply white wing-fuselage joint seal.		

57-10: 2.1.3. Major inspection

NOTE: A minimum of three people are required to carry out this task.

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Remove the wings.	-Metric ratchet and socket set, -T-handle hex head screwdriver set	57-10: 2.1.
2	Remove flaperons.		57-10: 2.1.
3	Remove wing access panel.		
4	Use borescope to carry out visual inspection of wing's internal structure and air brake drive mechanism.		Table 12-002
5	Install flaperons.		57-50: 2.1.

Figure 57-002
Wing spar pins and central spar bolt

57-50 FLIGHT SURFACES

1. Description

Roll is controlled using flaperons that are activated using push-rod mechanisms. A flap handle can be found in the cabin that allows the pilot to symmetrically displace the flaperons. This chapter describes the maintenance practices that apply to the apply to the flaperons.

2. Maintenance practices

57-50: 2.1. Flight surfaces

57-50: 2.1.1. Removal

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Remove the wings.	-Metric combination wrench set	57-10: 2.1.
2	Place the wing upside down on a dry, padded surface.		
3	Locate the flange hinge opening closest to the wing root, remove cotter pin and castellated nut securing the flaperon to the wing.		
4	Slide the flaperon off its hinges by pushing it towards the wing root.		
5	Carry out visual inspection of the flaperon.		05-20

57-50: 2.1.2. Inspection/check

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Remove the flaperon.	-Paper towel, -Phillips screwdriver	57-10: 2.1.
2	Check flaperon and its hing pins for any signs of damage, wear or corrosion.		
3	Clean hinge bushings and hinge pins with a paper towel.		
4	Check that the hinge pins have not come loose by sliding a screwdriver through them and applying a bit of torque.		
5	Lubricate the hinge bushings and pins.		12-20

57-50: 2.1.3. Installation

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Fit the flaperon to the wing by sliding its hing pins into the hinge bushings on the wing.	-Metric combination wrench set, -Loctite 243	
2	Install castellated nut and cotter pin.		
3	Carry out operational check of the flaperon.		05-20

CAUTION: After being installed the flaperon must move completely unhindered. If this is not the case the castellated nut may have been tightened too much. If this is the case, unscrew the castellated nut a little, reinstall the cotter pin and carry out the operational check again.

57-70 AIR BRAKES

1. Description

A Schempp-Hirth Style air brake system is incorporated into the wings as optional equipment. The air brakes are activated by two electric servomotors controlled by a knob mounted in the instrument panel.

Please refer to **[3]** and **[4]** for additional information.

2. Maintenance practices

57-70: 2.1. Air brakes

Please refer to **[3]** and **[4]** for additional information.

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CHAPTER 61 – PROPELLER

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61-00 GENERAL

The aircraft is equipped with FP02-80 or HELIX R-SI-18-2, 2-blade propeller.

Please refer to [10] for additional information.

61-10 PROPELLER ASSEMBLY

1. Description

Please refer to applicable [10] for propeller description and information.

2. Maintenance practices

For maintenance documentation and information for certain types of propeller please refer to applicable [10].

CAUTION: Prior to servicing the propeller the area around the aircraft must be cleared and barricade tape put up, to warn passersby of the possible hazard.

WARNING: Turn the MASTER and AVIONICS switches off, remove the ignition key and disconnect the battery prior to conducting any work on the propeller assembly.

NOTE: The removal/installation information below is to be used in addition to the information found in the latest revision of applicable [10]. Consult with the aforementioned manual before removing or installing the applicable propeller assembly.

61-10: 2.1. HELIX R-SI-18-2 propeller

61-10: 2.1.1. Removal

Step	Actions	Required parts, materials and tools	Reference
1	Remove the screws securing the spinner to the spinner plate and remove the spinner.	- Wrench set - 2.5 mm Allen key	
2	Remove the spinner by bending it slightly, sliding it off the spinner plate and around the propeller blades.		
3	Remove the nuts securing the propeller blades assembly to the propeller flange on the motor.		
4	Slide the propeller blades assembly together with the fastening material (bolts, washers, plate) off the flange.		
5	Remove the spinner plate from the propeller flange.		
6	Remove the bushings from the propeller flange.		

61-10: 2.1.2. Installation

Step	Action	Required parts, materials and tools	Reference
1	Find the two markings on the spinner plate which are important for proper installation of the propeller blades and spinner.	- Torque wrench - 2.5 mm Allen key - Loctite 243	
2	Insert the bushings through the propeller flange on the motor.		Figure 61-001
3	Place the spinner plate to propeller flange and make sure to match the bushings on both sides.		
4	Assemble the propeller blades by aligning the markings on both blades.		Figure 61-002

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Figure 61-001
Inserting the bushings

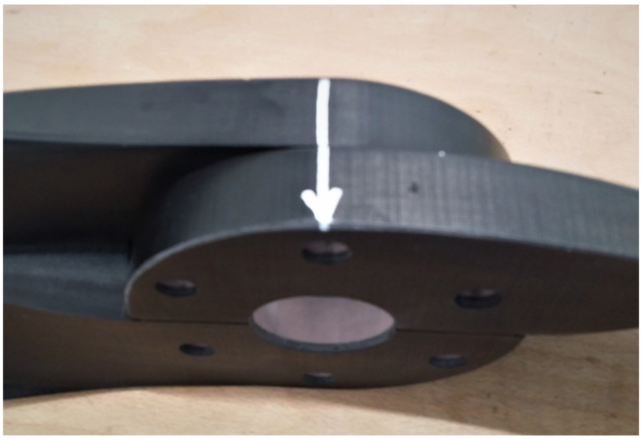

Figure 61-002
Assembling the propeller blades

Step	Action	Required parts, materials and tools	Reference
5	Prepare the fastening material (washers, bolts, plate) and insert the bolts through the mounting holes on the propeller blades.		Figure 61-003
6	Place the propeller blade assembly on the spinner plate by inserting the bolts through the bushings and matching the markings.		Figure 61-004

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Figure 61-003
Preparing the fastening material

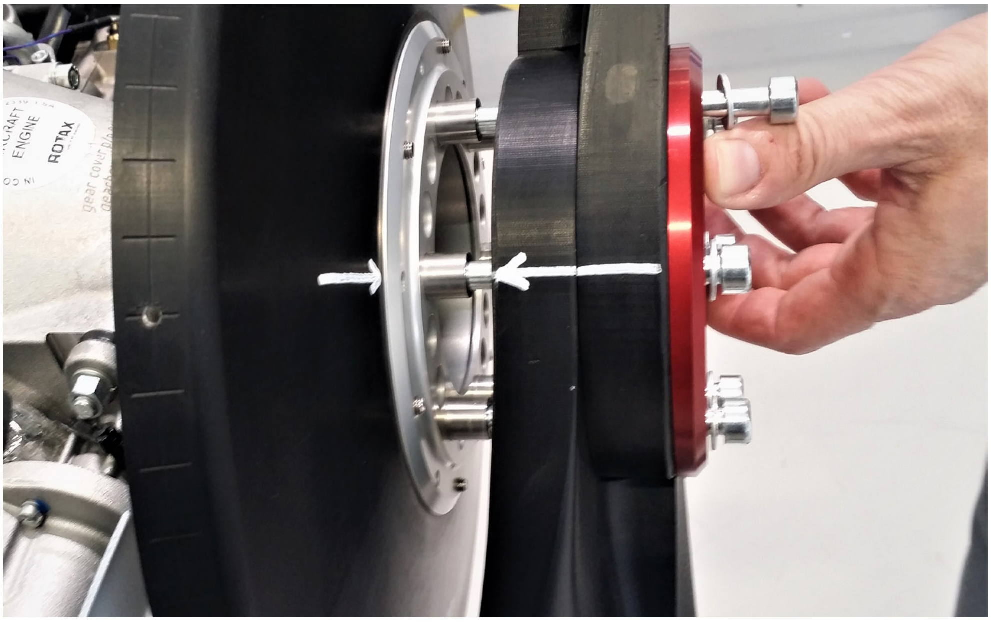

Figure 61-004
Placing the propeller blade assembly on the spinner plate

Step	Action	Required parts, materials and tools	Reference
7	Apply Loctite 243 on the M8 nuts and hand tighten them to the propeller bolts.		Figure 61-005
8	Torque the propeller fastening nuts by cross-tightening them with torque key to 23 Nm.		
9	Place the spinner to the spinner plate by slightly bending the spinner around the blades and make sure to align the marking on the inner side of the spinner with one on the spinner plate.		Figure 61-006 Figure 61-007
10	Insert the screws securing the spinner to the spinner plate without tightening them.		
11	Cross tighten the spinner screws with hex key.		

Figure 61-005
Propeller fastening nuts on the flange

Figure 61-006
Marking on the inner side of the spinner

Figure 61-007
Marking on the spinner plate

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CHAPTER 71 – POWER PLANT

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71-00 POWER PLANT

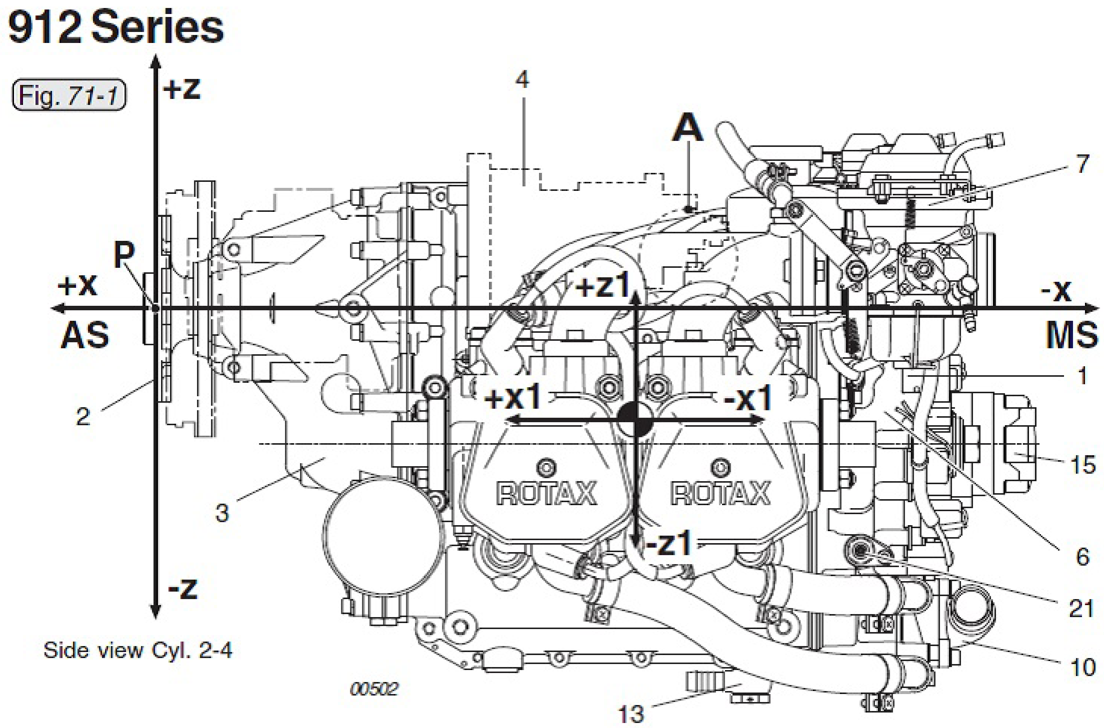
1. Description

This chapter covers all the maintenance practices involved with the following components: engine, baffling, cowling, mount, attach fittings, electrical harnesses, air intake, and engine drains.

2. Maintenance Practices

71-00: 2.1. Engine

The aircraft is powered by a Rotax 912 UL four cylinder, normally aspirated air & water cooled, engine.
Power rating is 58,8 kW (80 HP) (See Figure 71-001).



1) *Engine number*
2) *Propeller flange*
3) *Propeller gearbox*
4) *Vacuum pump or hydraulically controlled constant speed propeller governor*
5) *Intake manifold*
6) *Ignition housing*
7) *Constant depression carburetor*
8) *Airbox (optional)*
9) *Engine suspension frame (optional)*
10) *Coolant pump*
11) *Expansion tank*
12) *Oil pump*
(13) *Connection for oil return line (engine)*
(14) *Oil filter*
(15) *Electric starter*
(16) *Electronic module*
(17) *Compensation tube*
(18) *Oil pressure sensor*
(19) *Oil temperature sensor*
(20) *2x sensor for cylinder head temperature*
(21) *Connection for mechanical rev counter*
(22) *Oil tank*
(23) *External alternator*
(24) *Magnetic plug*
(25) *Fuel pump*

Figure 71-001
Rotax 912 S3 (courtesy of Rotax)

71-00: 2.2. Baffling

The baffling consists of a carbon composite air intake, a carbon composite diffuser and various foam seals. The former two ensure that all ram air, needed to cool the engine, is uniformly distributed over the engine's cylinders. The latter rest between the engine's cowlings and various components in the engine compartment, and ensure optimum airflow needed for oil/water cooling.

Figure 71-002
Example of upper oil cooler seal

Figure 71-003
Example of ram cooling air intake

Figure 71-004
Example of lower oil cooler seal

Figure 71-005
Example of water cooler seal

3. Maintenance practices

71-00: 3.1. Engine baffle foam seals

71-00: 3.1.1. Removal

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Remove engine cowlings.	- Silicone remover (Non-agressive and sol-vent-based), - box cutter	71-10: 2.1.1.
2	Tear seal away by hand. Use box cutter if necessary, being careful not to damage the component the seal bonded to.		
3	Apply some silicone remover to any residual silicone that is difficult to remove.		

71-00: 3.1.2. Installation

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Clean the surface with pure cleaning benzine 60/90 or isopropyl alcohol (according to TT-I-735 standard) and wait for the surface to dry.	- Silicone (neutral, perma-nently elastic, one-com-ponent, permanent ex-posure 250°C, temporary exposure 300°C), - Primer (3m 4297), - Multi foam - cleaning benzine 60/90 or isopropyl alcohol	
2	Apply primer.		
3	Remove protective foil from back of foam.		
4	Apply foam.		
5	Seal gap between foam and component using silicone.		
6	Install engine cowlings.		71-10: 2.1.2.

71-10 COWLINGS

1. Description

The aircraft comes equipped with two tight-fitting, all-composite engine cowlings that protect the engine and ensure superb engine cooling. They're attached to the fuselage and to each other by allen screw cowling fasteners that allow the user to install and remove them easily.

2. Maintenance Practices

71-10: 2.1. Cowlings

71-10: 2.1.1. Removal

NOTE: Installing and removing the engine cowlings, although it can be done by one person alone, is much easier to carry out with the help of someone else. This will also decrease the chances of any components getting scratched or damaged.

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Open the oil check door and disconnect the cold air ventilation line from the upper cowling's NACA inlet (if equipped).	- Allen screwdriver, - T-handle hex-head screwdriver set	
2	Unscrew all of the upper cowling's fasteners.		
3	Remove the upper cowling and, while doing so, make sure it's front end doesn't rub up against the spinner. Disconnect the ventilation tubing from the upper cowling inlet, if present.		
4	Locate the landing light cable and disconnect it.		
5	Remove all of the bottom cowling's M4 screw EXCEPT for the last one at the top on each side.		
6	Remove all of the bottom M4 screws.		
7	Remove the last two quick-release fasteners while simultaneously supporting the bottom cowling.		
8	Slowly slide the bottom cowling down and out from under the engine, while making sure it doesn't rub up against the spinner, exhaust tailpipes and/or the nose wheel strut guard.		

71-10: 2.1.2. Installation

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Slowly slide the bottom cowling over the exhaust tailpipes and up against the fuselage, while making sure it doesn't rub up against the spinner.	- Allen screwdriver, - T-handle hex-head screwdriver set	
2	Fasten it to the fuselage using M4 screws.		
3	Locate and connect the landing light cable.		
4	Secure the upper cowling to the lower cowling and the fuselage using fasteners. Connect the ventilation tubing to the cowling inlet, if present.		
5	Open the oil check door and connect the cold air ventilation line to the upper cowling's NACA inlet.		

71-20 MOUNTS

1. Description

The aircraft's engine is attached to the airframe by several tubular steel weldments, one of which incorporates four conventional elastomeric isolators for vibration damping. The engine mount is bolted to the composite firewall in five locations. The firewall attachment points are structurally reinforced with gusset-type attachments that transfer thrust and bending loads into the fuselage shell.

2. Maintenance Practices

71-20: 2.1. Engine mount/Mounting fixture/Lower engine block mount

71-20: 2.1.1. Inspection/check
Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Remove engine cowlings.	- Torque wrench	71-10: 2.1.1.
2	Inspect entire mount for any signs of wear, such as cracks and/or deformation. Particular attention needs to be paid to the mount's joints, where two tubes meet and are welded together.		
3	Inspect fastening material paint marker. Check if any bolts have loosened. Verify torque using torque wrench.		20-30
4	Install engine cowlings.		71-10: 2.1.2.

71-20: 2.2. Vibration damping isolators

71-20: 2.2.1. Inspection/check
Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Remove engine cowlings.		71-10: 2.1.1.
2	Inspect isolators for any signs of wear, such as cracks, deformation, tears, etc. Replace if necessary.		
3	Install engine cowlings.		71-10: 2.1.2.

71-60 INDUCTION AIR INTAKES

1. Description

Each of the engines carburetors is equipped with an air intake filter that ensures the induction air is free of any foreign particles/debris. The induction air is pulled directly from behind the water cooler, eliminating the need for any carb heat.

2. Maintenance Practices

71-60: 2.1. Induction air filter

71-60: 2.1.1. Removal

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Remove engine cowlings.	Flathead screwdriver	71-10: 2.1.1.
2	Loosen the hose clamp holding the air filter in place.		
3	Remove air filter.		
4	Cover carburetor intake with plastic cap.		

71-60: 2.1.2. Installation

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Remove plastic cap from carburetor intake.	Flathead screwdriver	
2	Slide air filter onto the carburetor intake's flange.		
3	Fasten in place by tightening hose clamp.		
4	Install engine cowlings.		71-10: 2.1.2.

71-60: 2.1.3. Inspection/Cleaning

Reference: Rotax 912 maintenance manual, chapter 2.1 in 12-20-00
Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Remove engine cowlings.	- Flathead screwdriver, - K&N air filter cleaner, - K&N air filter oil, - water	71-10: 2.1.1.
2	Follow steps in the referenced manual.		
3	Install engine cowlings.		71-10: 2.1.2.

71-70 ENGINE DRAINS

1. Description

The engine comes with a drip collector for each carburetor and an oil reservoir breather. The following chapter describes the maintenance practices that pertain to the aforementioned components.

2. Maintenance Practices

71-70: 2.1. Carburetor drip collector line

71-70: 2.1.1. Removal

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Remove engine cowlings.	Cutting nippers	71-10: 2.1.1.
2	Cut all of the plastic ties holding the tube in place.		
3	Remove the tube.		
4	If replacing, measure the length of the tube as a reference for the new tube.		

71-70: 2.1.2. Installation

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Fit the tube to the drip collector's hose fitting.	- Cable tie gun, - pliers, - cutting nippers	
2	Run it down to the firewall's bottom edge.		
3	Fasten in place using cable ties.		
4	Cut away excess cable tie ends.		
5	Install engine cowlings.		71-10: 2.1.2.

71-70: 2.1.3. Inspection/check

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Remove engine cowlings.		71-10: 2.1.1.
2	Check tube for any signs of damage and/or wear.		
3	Check tube for any kinks.		
4	Check that the tube is firmly fastened in place by plastic ties.		
5	Make sure the tube's opening is not blocked by anything.		
6	Install engine cowlings.		71-10: 2.1.2.

71-70: 2.2. Oil reservoir breather line

71-70: 2.2.1. Removal
Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Remove engine cowlings.	Cutting nippers	71-10: 2.1.1.
2	Cut all of the plastic ties holding the tube in place.		
3	Remove the tube.		
4	If replacing, measure the length of the tube as a reference for the new tube.		

71-70: 2.2.2. Installation
Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Fit the tube the oil reservoir's breather fitting.	- Cable tie gun, - pliers, - cutting nippers	
2	Run it down to the firewall's bottom edge.		
3	Fasten in place using cable ties.		
4	Cut away excess cable tie ends.		
5	Install engine cowlings.		71-10: 2.1.2.

71-70: 2.2.3. Inspection/check
Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Remove engine cowlings.		71-10: 2.1.1.
2	Check tube for any signs of damage and/or wear.		
3	Check tube for any kinks.		
4	Check that the tube is still firmly fastened in place by plastic ties.		
5	Make sure the tube's opening is not blocked by anything.		
6	Install engine cowlings.		71-10: 2.1.2.

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CHAPTER 72 – ENGINE

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72-00 ENGINE

The Rotax 912 UL engine is installed on the aircraft. Please refer to the engine manufacturer's documentation for detailed technical information about all the engine types installed on the aircraft. For information pertaining to this chapter such as maintenance practices, limits, and procedures for tear-down, cleaning, inspection, assembly, testing, etc., refer to the manufacturer's approved Instructions for Continued Airworthiness (Rotax 912 Series Installation manual and Line Maintenance Manual). The engine's technical specifications can be found in Table 72-001. Please refer to Rotax documentation for additional details.

Specification	Metric Value	Imperial Value
Bore	79.5 mm	3.13 in
Stroke	61 mm	2.40 in
Displacement	1211.2 cm3	73.91 cu.in
Gear ratio (crankshaft: propeller shaft)	2.27	
Dry weight (excl. exhaust- clutch- ext altern-eng mount)	55.4 kg	122 lbs.
Take-off performance rpm (max. 5 min) at sea level pressure altitude	59.6 kW @ 5800 rpm	-

Table 72-001
Rotax 912 UL engine specifications

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CHAPTER 73 – ENGINE FUEL

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73-00 GENERAL

This chapter describes the fuel system components integrated into the Rotax 912 series engine. It also covers those components on the aircraft that measure fuel pressure and air flow needed for proper engine operation. Refer to chapter 28-00 for additional data on the airplane fuel system.

73-10 DISTRIBUTION

1. Description

Figure 73-001 shows a diagram of the Rotax 912 fuel system. Gravity-fed fuel runs through the mechanical fuel pump to the top of the engine where a distributor is located. This is where the fuel is distributed to the carburetors. It's also where the fuel pressure is measured. Any excess fuel is returned to the fuel tank.

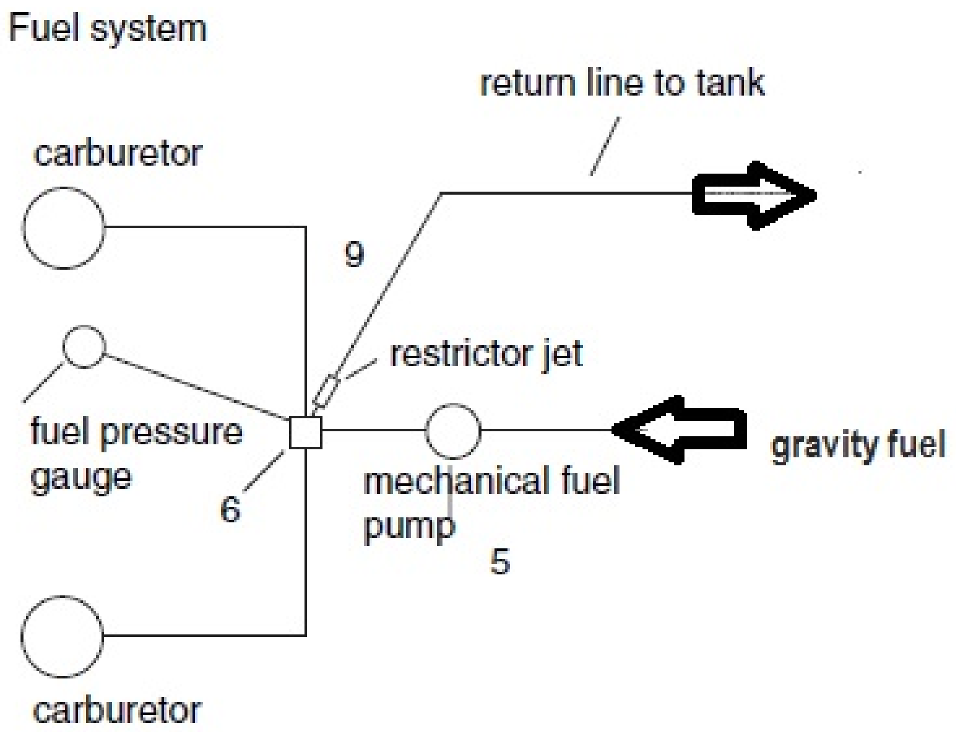

Figure 73-001
Rotax 912 fuel system (courtesy of Rotax)

Induction air enters the engine compartment through the water cooler and is sucked through the air filters into the carburetors, after which, the manifold pressure is measured.

73-30 INDICATING

1. Description

The fuel feed line has a fuel flow sensor installed that provide the pilot with a very accurate fuel consumption reading. See chapter 28 for more information about the fuel system.
The fuel pressure is measured by a sensor screwed into the fuel distributor and shown in the EMS display.
Please refer to [6] and [7] for additional information.

2. Maintenance practices

73-30: 2.1. Fuel pressure sensor

73-30: 2.2.1. Removal

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Remove engine cowlings.	- Metric wrench set	71-10: 2.1.1.
2	Close fuel shut off valve in the cabin		
3	Drain firewall forward fuel from the drain valve.		
4	Locate the fuel pressure sensor.		
5	Remove the fuel pressure sensor by unscrewing it.		
6	Disconnect it from its instrument/connector.		
7	Install engine cowlings.		71-10: 2.1.2.
8	Carry out visual inspection of sensor.		05-20

73-30: 2.2.2. Installation

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Remove engine cowlings.	- Metric wrench set, - Loctite 577	71-10: 2.1.1.
2	Apply Loctite 577 to sensor thread.		
3	Install sensor into fuel distributor and tighten.		
4	Connect it to its instrument/connector.		
5	Install engine cowlings.		71-10: 2.1.2.
6	Open fuel shut off valve in the cabin.		
7	Carry out functional inspection of fuel pressure sensor.		05-20

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CHAPTER 74 – IGNITION

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74-00 GENERAL

1. Description

This chapter describes the components that provide the spark needed to ignite the fuel-air mixture in the engine cylinders.

The aircraft has a dual, self-powered electronic ignition system that is connected to two spark plugs in each cylinder. The system is denominated as Magnetos, as it mimics the typical functionality of mechanical magnetos. Both magnetos are used during normal aircraft operation as this results in a more complete burning of the fuel-air mixture.

Two switches and a button, located on the main switch panel, control ignition and starter operation. The switches are labeled MAG R and MAG L and the starter button is designated START. In the OFF position, the starter is electrically isolated, the ignition systems (''magnetos'') are grounded and will not operate. Normally, the engine is operated on both magnetos (switches both in ON position) except for magneto checks and emergency operations. The alternate OFF positions for magneto switches are used for individual magneto checks and for single magneto operation when required. When the master switch ON, activating the magneto switches and pressing START button energizes the starter and activates both magnetos. The starter is automatically disengaged when START button is released.

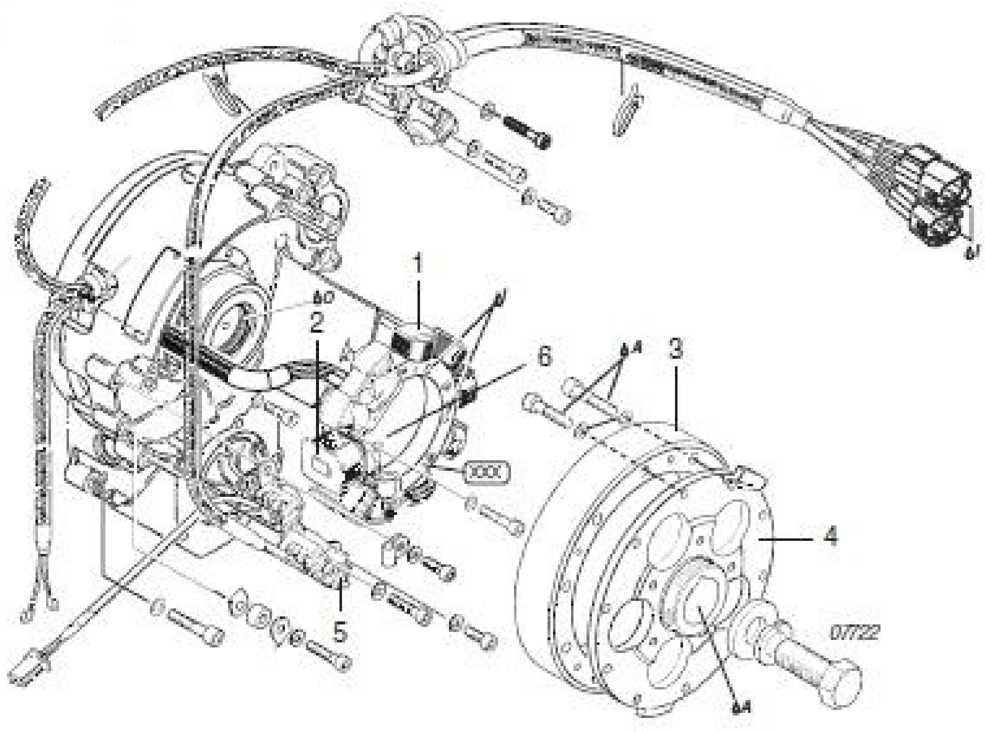

Figure 74-001
Ignition system (courtesy of Rotax)

2. Maintenance practices

For additional maintenance practices information about the engines ignition system please refer to the latest revision of ROTAX's maintenance manual.

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CHAPTER 75 – ENGINE COOLING

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75-00 GENERAL

This chapter describes the engine cooling system incorporated into the aircraft and the maintenance practices that pertain to it.

75-10 AIR COOLING

1. Description

The Rotax engine is equipped with a carbon-composite diffuser and inlet that direct all cooling air over the engine cylinders (see Figure 75-001). The diffuser's inlet is coupled with a hole in the engine cowlings on the starboard side.

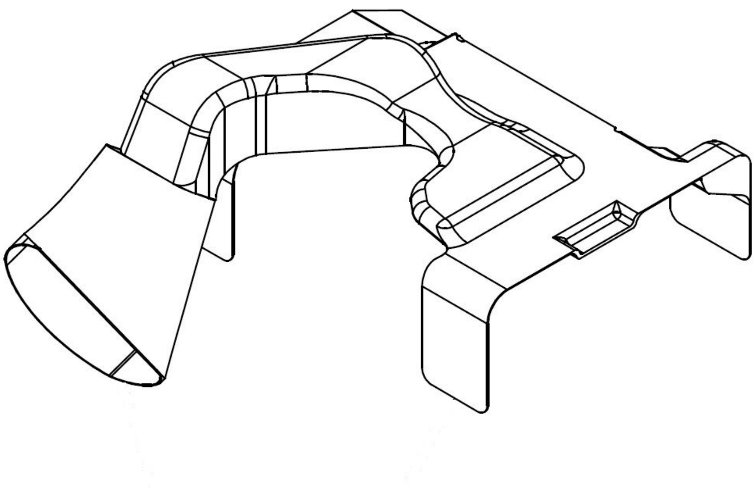

Figure 75-001
Engine cooling air diffuser

2. Maintenance Practices

The carbon-composite diffuser doesn't require any maintenance and/or servicing. Refer to chapter 71-00 for more information about the maintenance practices that pertain to the foam seal that rests between the diffuser and the engine cowlings.

75-20 LIQUID COOLING

1. Description

The Rotax engine is both air and liquid cooled. The liquid cooling system consists of a cooler that receives ram air, an engine-driven mechanical pump and an overflow bottle (see Figure 75-002). For more information about approved operating fluids, including the engine coolant, please refer to the latest revision of ROTAX Service Instruction No. SI-912-016 Selection of Suitable Operating Fluids for Rotax® Engine Type 912 I, 912 and 914 Series.

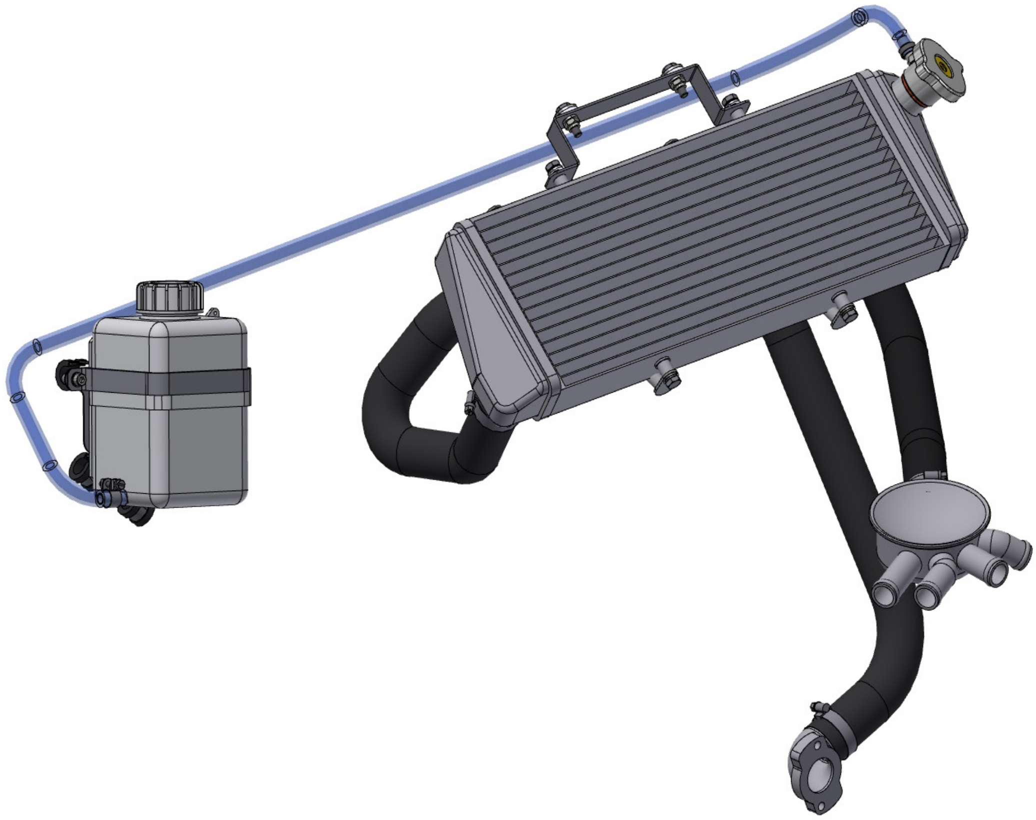

Figure 75-002
Engine liquid cooling system

2. Maintenance Practices

For information about how to replenish the liquid cooling system please refer to chapter 12-00.

For additional maintenance practices information about the engines liquid cooling system please refer to the latest revision of ROTAX's maintenance manual.

75-20: 2.1.1. Water cooler removal

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Drain the cooling system.	- Metric wrench set	12-20: 2.3.1.
2	Cut the cable tie securing the silicon breather tube to the fitting near the water cooler cap.		
3	Disconnect the silicon breather tube from the fitting.		
4	Loosen the hose clamp securing the feed and return hoses to the water cooler.		
5	Disconnect the hoses from the cooler.		
6	Remove the bolts securing the water cooler to its mount.		
7	Remove the water cooler.		

75-20: 2.1.2. Water cooler installation

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Fasten the water cooler to its mount. Apply Loctite 243 to the bolts.	- Metric wrench set - Red marker paint - Loctite 243	
2	Secure the feed and return hoses to the water cooler using hose clamps.		
3	Apply paint marker to the bolts.		
4	Secure the hoses to the engine mount using plastic ties.		
5	Reconnect the silicone breather tube to the fitting near the water cooler cap.		
6	Secure the silicone breather tube using a plastic tie.		
7	Replenish the system with coolant.		12-10: 2.3.1.

75-20: 2.1.3. Water expansion tank removal

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Drain the cooling system.	- Allen key set - nippers	12-20: 2.3.1.
2	Cut the cable tie securing the silicon breather tube to the fitting near the water cooler cap.		
3	Disconnect the silicon breather tube from the fitting.		
4	Remove the retainer securing the expansion tank to the hose clamps on the engine mount		
5	Remove the expansion tank.		

75-20: 2.1.4. Water expansion tank installation

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Fasten the water expansion tank to the clamps on the engine mount. Apply Loctite 243 to the bolts.	- Allen key set - Red marker paint - Loctite 243	
2	Connect the breather tube to the fitting positioned near water cooler cap.		
3	Secure the breather tube using a cable tie.		
4	Apply paint marker to the bolts.		
5	Replenish the system with coolant.		12-10: 2.3.1.

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CHAPTER 76 – ENGINE CONTROLS

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76-00 GENERAL

1. Description

This chapter describes the engine control assembly, the system that the pilot uses to operate the engine. Incorporating a standard control quadrant design, the engine control system consists of a single-lever power (throttle) control and a choke lever. The throttle lever controls the throttle valve in the carburetor, by two separate bowden type cables working synchronously. The choke lever actuates the choke shaft of both carburetors synchronously, which provides assistance with cold starts. The levers are easily accessible to both pilots, as their housing is fastened to the cabin floor between the two crew seats (see Figure 76-001). All bowden cables run from the control quadrant under the cabin floor, up through the instrument panel, through firewall grommets and to the carburetor control levers.

2. Maintenance practices

76-00: 2.1. Engine control cables

CAUTION: The joints where the engine control cables are attached to their respective control levers in the engine compartment must be lubricated on a regular basis (see 12-20).

76-00: 2.1.1. Inspection/check

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Remove the engine cowlings.	- Phillips screw-driver, - T-handle hex head screwdriver set	71-10: 2.1.1.
2	Carry out visual inspection of the engine control cables.		05-20
3	Clean joints between control cables and levers.		
4	Lubricate joints between control cables and levers.		12-20
5	Carry out operational inspection of the engine control cables.		05-20
6	Remove control stick boots.		25-10: 2.3.1.
7	Carry out visual inspection of the engine control cables under the cabin floor.		05-20
8	Remove instrument panel cover.		31-10
9	Carry out visual inspection of the engine control cables behind the instrument panel.		05-20

CAUTION: The engine control cables must be kept in good working condition. Any wear or damaged incurred could lead to loss of engine control and consequently a safety hazard. Attend to and amend any issues immediately after noticing them.

76-00: 2.2. Engine control levers

76-00: 2.2.1. Inspection/check

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Carry out visual inspection of the engine control cables.		05-20
2	Carry out operational inspection of the engine control cables.		

76-00: 2.2.2. Movement friction adjustment

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Remove the decorative nut cap.	- Flathead screwdriver - metric wrench set	
2	Tighten or loosen friction adjustment nut depending on whether the levers movement is too slack or too stiff.		

CAUTION: The engine control cables are attached to spring-loaded levers at the carburetors. If any of the control quadrant levers shift towards the full-forward position by themselves this means the friction adjustment nut needs to be adjusted for stiffer movement.

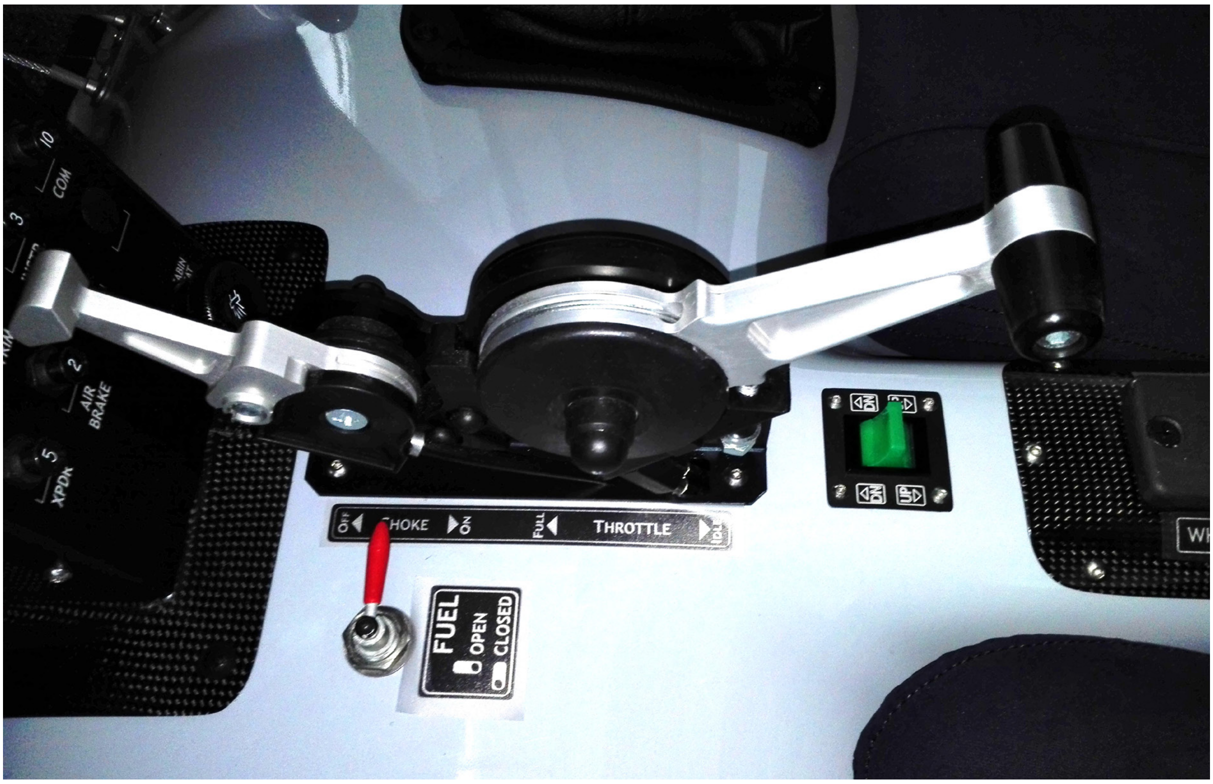

Figure 76-001
Engine control quadrant (throttle and choke)

76-00: 2.3. Throttle cable

76-00: 2.3.1. Throttle cable preparation and installation

Step	Action	Required parts, materials and tools	Reference
1	Procedure is outlined in the Engine installation procedure for ALPHA Trainer aircraft, see video from 15:58 onwards.	- See video	[v5]

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CHAPTER 77 – ENGINE INDICATING

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77-00 GENERAL

This chapter describes the various sensors installed on the aircraft that provide the pilot with engine power and temperature information. All of the data supplied by sensors are collected by DAQU data acquisition unit by Kanardia and is displayed on the EMS display.
Please refer to [6] and [7] for additional information.

77-10 POWER

1. Description

RPM on the aircraft's engine is measured via ignition system pulses. There is no remote tachometer. The RPM is displayed in the Tachometer on the instrument panel

The manifold pressure is measured from the compensating tube assembly between the two intake manifolds. The sensor is integrated in the DAQU box by Kanardia and connected to the compensating hose by a tube passing through the firewall. The MAP value is displayed on the EMS.
Please refer to [6] and [7] for additional information.

2. Maintenance Practices

CAUTION: When removing any sensors in the engine compartment be sure insulate/plug any and all openings in order prevent the ingression of dirt or debris.

77-10: 2.1. Manifold pressure sensor

77-10: 2.1.1. Removal

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Remove the engine cowlings.	- T-handle ball head screwdriver set, - cutting nippers, metric wrench set, - pin extraction tools (M81969/17-03 and M81969/17-04)	71-10: 2.1.1.
2	Locate the starboard firewall connector.		
3	Extract the manifold pressure sensor pins.		Figure 77-001
4	Cut/remove all the zip ties securing the sensor's cable in place.		
5	Locate the barbed fitting the sensor is fastened to.		
6	Remove the hose clamp securing it.		
7	Unscrew/remove the sensor.		
8	Carry out visual inspection of the sensor.		05-20

77-10: 2.1.2. Installation

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Apply Loctite 577 to the sensors thread.	- T-handle ball head screwdriver set, - metric wrench set, - Loctite 577, - pin insertion tools (M81969/19-01 and M81969/19-01)	
2	Install the sensor in the barbed fitting.		20-40
3	Fasten the barbed fitting in place.		
4	Torque mark the hose clamps bolt.		
5	Run the sensors cable to the starboard firewall connector.		
6	Fasten it in place using zip ties.		
7	Insert the sensors pins.		
8	Carry out operational inspection of the sensor.		05-20
9	Install engine cowlings.		71-10: 2.1.2.

77-20 TEMPERATURE

1. Description

Two exhaust gas temperature (EGT) sensors are installed on the aircraft, one for each cylinder. They are fastened to a port in the exhaust headers, just downstream from where the gases exit the cylinders (see Figure 77-002).

Two coolant temperature (CT) sensors are installed on the aircraft, one for cylinder #2 and one for cylinder #3 (see Figure 77-003). These sensors provide the pilot with temperature data of the coolant running through the cylinder heads during operation.

Sensors are connected to a DAQU data acquisition ox by Kanardia and shown on the EMS display. Pelase refer to [6] and [7] for additional information.

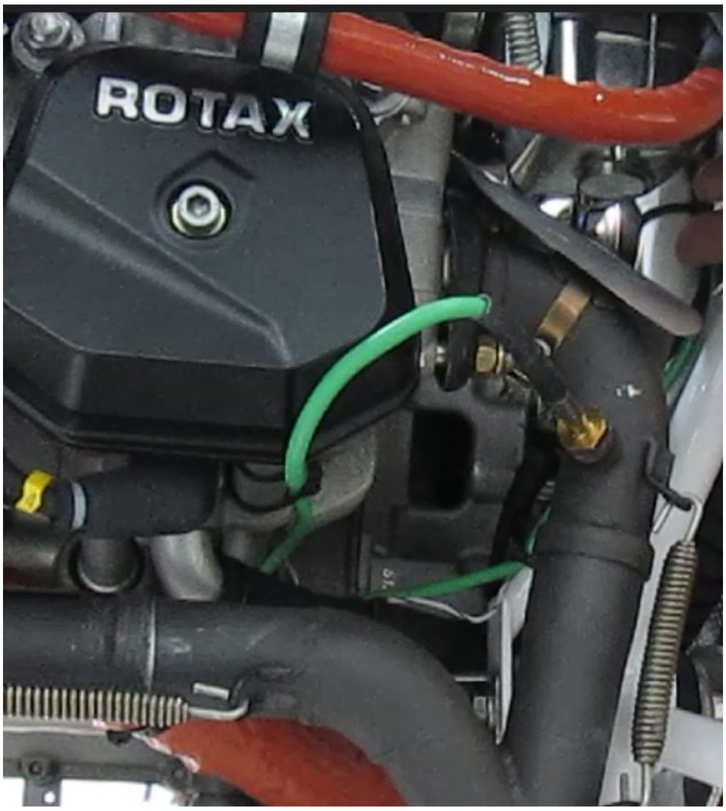

Figure 77-002
EGT sensor installation

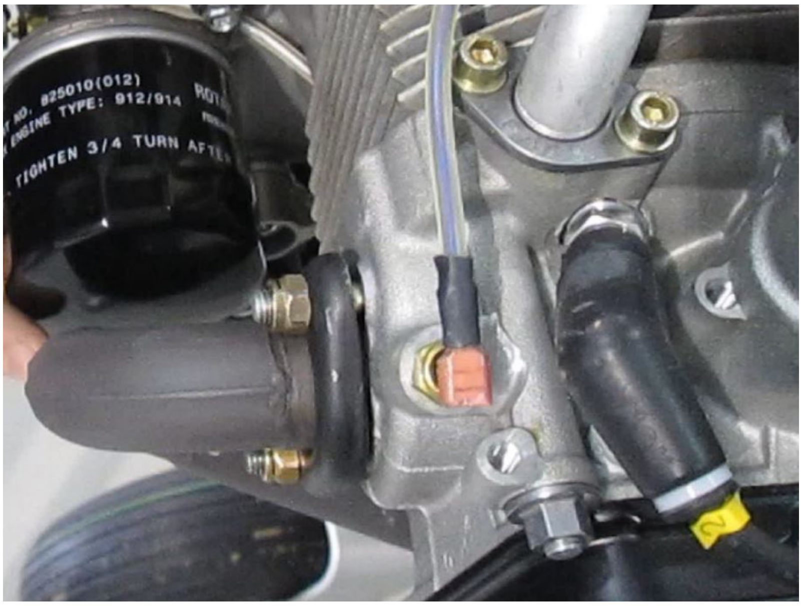

Figure 77-003
CT sensor installation

2. Maintenance Practices

CAUTION: When removing any sensors in the engine compartment be sure insulate/plug any and all openings in order prevent the ingression of dirt or debris

CAUTION: When replacing EGT sensors the whole set (two sensors) should be from the same manufacturer/brand. Do NOT mix brands.

77-20: 2.1. EGT sensor

77-20: 2.1.1. Removal

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Remove the engine cowlings.	- cutting nippers, - metric wrench set, - pin extraction tools (M81969/17-03 and M81969/17-04)	71-10: 2.1.1.
2	Locate the starboard firewall connector.		
3	Extract the EGT sensor pins.		
4	Cut/remove all the zip ties securing the sensor’s cable in place.		
5	Locate the EGT sensor.		
6	Unscrew/remove the sensor.		
7	Carry out visual inspection of the EGT sensor.		05-20

77-20: 2.1.2. Installation

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Install the sensor in the exhaust header.	- metric wrench set, - zip ties, - pin insertion tools (M81969/19-01 and M81969/19-01)	
2	Run the sensors cable to its respective firewall connector.		
3	Fasten it in place using zip ties.		
4	Insert the sensors pins.		
5	Carry out operational inspection of the sensor.		05-20
6	Install engine cowlings.		71-10: 2.1.2.

77-20: 2.2. CT sensor

77-20: 2.2.1. Removal

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Remove the engine cowlings.	- cutting nippers, - metric wrench set, - pin extraction tools (M81969/17-03 and M81969/17-04)	71-10: 2.1.1.
2	Drain the cooling system.		75-20
3	Locate the CT sensors respective firewall connector.		
4	Extract the CT sensor pins.		
5	Cut/remove all the zip ties securing the sensor’s cable in place.		
6	Locate the CT sensor.		
7	Unscrew/remove the sensor.		
8	Carry out visual inspection of the CT sensor.		05-20

77-20: 2.2.2. Installation

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Install the CT sensor in cylinder head.	- metric wrench set, - zip ties, - pin insertion tools (M81969/19-01 and M81969/19-01)	
2	Run the sensors cable to its respective firewall connector.		
3	Fasten it in place using zip ties.		
4	Insert the sensors pins.		
5	Carry out operational inspection of the sensor.		05-20
6	Replenish the cooling system.		12-10
7	Install the engine cowlings.		71-10: 2.1.2.

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CHAPTER 78 – EXHAUST

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78-00 GENERAL

The aircraft is equipped with an exhaust system that expels exhaust gases from the aircraft via a single tail pipe that protrudes out of the bottom surface of the lower engine cowling.

The engine exhaust system consists of exhaust headers, Y-pipe collectors, an exhaust muffler with integrated tailpipe and associated joints/fasteners.

Each engine cylinder, on port and starboard side of the engine, is equipped with an exhaust header that leads down to a Y-collector that joins the two. The exhaust gases then leave the Y-collector and enter the exhaust muffler, finally exiting the exhaust system via the tailpipe.

Joints are employed to allow movement due to heat expansion and normal operating loads at the pipes connections.

Two exhaust system versions can be found on the aircraft: steel exhaust is shown in Figure 78-001, while Akrapovič titanium exhaust is shown in Figure 78-002.

Figure 78-001
Standard Pipistrel
steel exhaust system

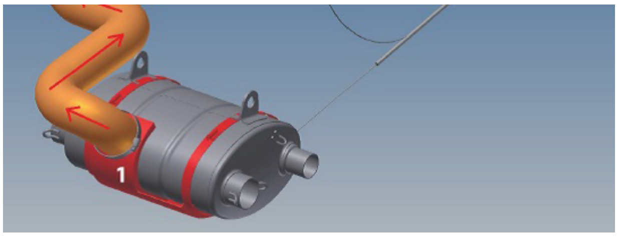

Figure 78-002
Akrapovič titanium exhaust system

2. Maintenance Practices

78-00: 2.1. Exhaust system removal

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Remove engine cowlings.	- T-handle ball-ended hex screwdriver set, - Metric wrench set, - Phillips screwdriver, - Exhaust spring puller	71-10: 2.1.1.
2	Remove upper two Y-collector springs.		
3	Remove the EGT sensor from the fore exhaust header.		77-20: 2.1.1.
4	Remove the fore exhaust header nuts.		
5	Remove the fore exhaust header.		
6	Loosen carburetor clamp.		
7	Remove both hex head bolts holding the carburetor drip collector in place.		
8	Shift the carburetor assembly backwards so that the aft exhaust header can be accessed.		
9	Remove the EGT sensor from the aft exhaust header.		77-20: 2.1.1.
10	Remove the aft exhaust header nuts.		
11	Remove the aft exhaust header.		
12	Remove lower two Y-collector springs.		
13	Remove Y-collector.		
14	Carry out visual inspection of all components. Replace any if deemed necessary.		05-20

78-00: 2.2. Exhaust system installation

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Clean all mating surfaces with paper towel so that they're free of all grease/anti-seize residue and burrs.	- T-handle ball-ended hex screwdriver set, - Ceramic anti-seize grease (Akrapovič) - Copper anti-seize grease (Akrapovič) - Loctite LB8150 anti-seize - Paper towel	
2	Apply a thin layer of ceramic anti-size grease to all mating surfaces.		
NOTE: use Loctite LB8150 anti-seize only on standard steel exhaust system (Figure 78-001).			
3	Slide Y-collector into muffler's mating joint and fasten in place using exhaust springs.		
4	Install EGT sensor.		77-20: 2.1.2.
5	Slide aft header onto engine studs and Y-collector.		
6	Apply copper anti-seize grease to header nuts and install finger tight.		
NOTE: use Loctite LB8150 anti-seize only on standard steel exhaust system (Figure 78-001).			
7	Fasten aft header to Y-collector using exhaust spring.		
8	Reattach carburetor assembly to engine.		
9	Install EGT sensor.		77-20: 2.1.2.
10	Slide fore header onto engine studs and Y-collector.		
11	Apply copper anti-seize grease to header nuts and install finger tight.		
12	Fasten fore header to Y-collector using exhaust spring.		
13	Torque header nuts.		20-30
14	Reinstall the carburetors and fasten the carburetor clamps		
15	Install engine cowlings.		71-10: 2.1.2.

78-10 COLLECTOR

1. Description

This chapter describes the portion of the exhaust system which collects the exhaust gases from the cylinder and dumps them overboard. Exhaust headers and collector weldments combine to form the exhaust header assemblies.

Each of the four headers are connected to the engine by nuts screwed onto threaded studs. The two headers on each side of the engine are connected to a Y-pipe collector weldment through a slip joint and a spring to allow for contraction and expansion as well as engine movement. This Y-pipe collector combines the 2 header pipes on each side of the engine into one pipe (per side). A slip joint connects the Y-pipe collectors which takes the exhaust gas across to the LH and RH side of the engine and then aft to the exhaust muffler.
Slip joints are employed to allow movement due to heat expansion and normal operating loads.

2. Maintenance Practices

78-00: 2.1. Headers and Y-collector

78-00: 2.1.1. Removal

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Remove engine cowlings.	- T-handle ball-ended hex screwdriver set, - metric wrench set, - Phillips screwdriver, - exhaust spring puller	71-10: 2.1.1.
2	Remove upper two Y-collector springs.		
3	Remove the EGT sensor from the fore exhaust header.		77-20: 2.1.1.
4	Remove the fore exhaust header nuts.		
5	Remove the fore exhaust header.		
6	Loosen carburetor clamp.		
7	Remove both hex head bolts holding the carburetor drip collector in place.		
8	Shift the carburetor assembly backwards so that the aft exhaust header can be accessed.		
9	Remove the EGT sensor from the aft exhaust header.		77-20: 2.1.1.
10	Remove the aft exhaust header nuts.		
11	Remove the aft exhaust header.		
12	Remove lower two Y-collector springs.		
13	Remove Y-collector.		
14	Carry out visual inspection of all components. Replace any if deemed necessary.		05-20

78-00: 2.1.2. Installation

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Clean all mating surfaces with paper towel so that they're free of all grease/anti-seize residue and burrs.	- T-handle ball-ended hex screwdriver set, - ceramic anti-seize grease (Akrapovič) - copper anti-seize grease (Akrapovič) - Loctite LB8150 anti-seize - paper towel	
2	Apply a thin layer of ceramic anti-size grease to all mating surfaces.		
NOTE: use Loctite LB8150 anti-seize.			
3	Slide Y-collector into muffler's mating joint and fasten in place using exhaust springs.		
4	Install EGT sensor.		77-20
5	Slide aft header onto engine studs and Y-collector.		
6	Apply copper anti-seize grease to header nuts and install finger tight.		
NOTE: use Loctite LB8150 anti-seize.			
7	Fasten aft header to Y-collector using exhaust spring.		
8	Reattach carburetor assembly to engine.		
9	Install EGT sensor.		77-20
10	Slide fore header onto engine studs and Y-collector.		
11	Apply copper anti-seize grease to header nuts and install finger tight.		
12	Fasten fore header to Y-collector using exhaust spring.		
13	Torque header nuts.		20-30
14	Reinstall the carburetors and fasten the carburator clamps		
15	Install engine cowlings.		71-10: 2.1.2.

78-20 NOISE SUPPRESSOR

1. Description

The exhaust system incorporates a muffler that suppresses all/any noise the system generates and dumps all exhaust gases overboard. It’s attached to the engine block by a metal bracket and attached to the exhaust collector/headers by slip joints.

2. Maintenance Practices

78-20: 2.1. Muffler

78-20: 2.1.1. Removal

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Remove engine cowlings.	- T-handle ball-ended hex screwdriver set, - Flathead screwdriver	71-10: 2.1.1.
2	Remove collectors/headers.		78-10
3	Unscrew the two bolts securing the muffler to its support brackets.		
4	Remove muffler.		

WARNING: Any serious exhaust system damage is a safety hazard and must be repaired immediately.

78-20: 2.1.2. Installation

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Clean all of the muffler’s mating surfaces with paper towel so that it’s free of all grease/anti-seize residue and burrs. Do the same for the two inbus bolts.	- T-handle ball-ended hex screwdriver set, - ceramic anti-seize grease (Akrapovič) - copper anti-seize grease (Akrapovič) - Loctite LB8150 anti-seize - exhaust spring puller, - paper towel	71-10
2	Apply copper anti-seize grease to the muffler’s fastening bolts and install to finger tight.		
NOTE: use Loctite LB8150 anti-seize			
3	Apply a thin layer of ceramic anti-seize grease to the muffler’s mating surfaces.		
NOTE: use Loctite LB8150			
4	Install collectors/headers.		78-10
5	Install engine cowlings.		71-10: 2.1.2.

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CHAPTER 79 – OIL

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79-00 GENERAL

ALPHA Trainers are typically equipped only with bottom oil cooler, with or without the thermostat. An engine-driven pump ensures constant circulation, while the thermostat determines how much oil is circulated depending on cooling requirements. The components are connected by rubber hoses, which are protected by heat sleeves.

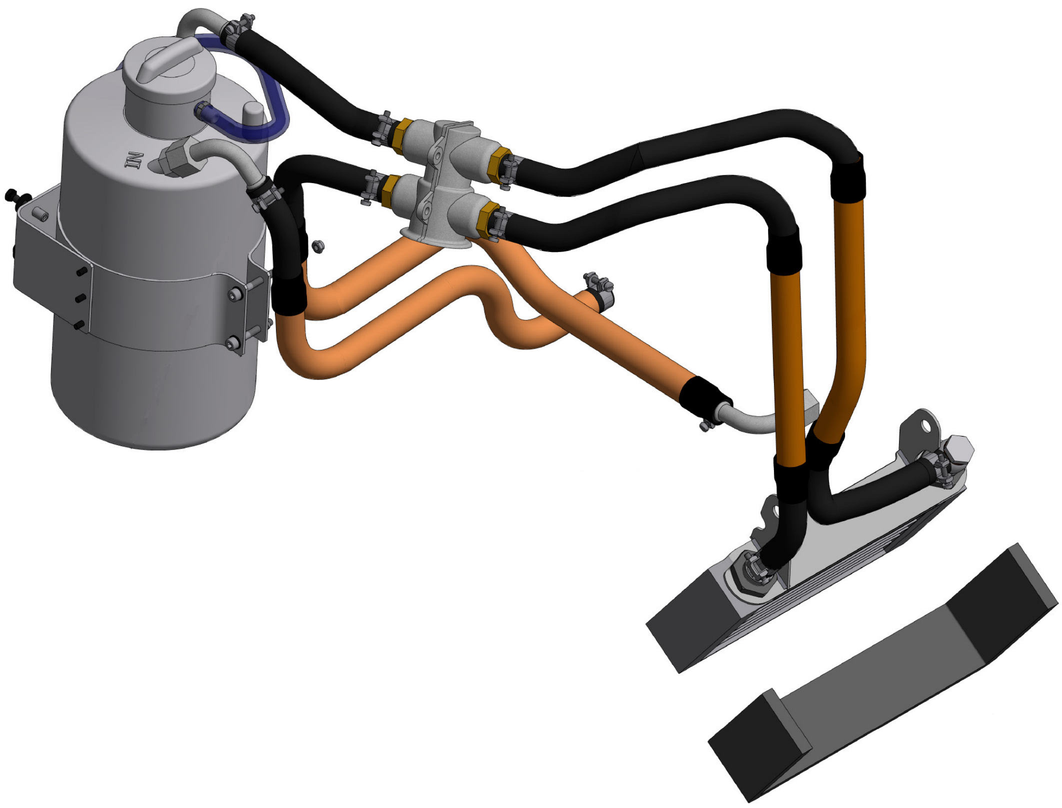

Figure 79-001
Example of lubrication system with
two oil coolers setup and a thermostat

79-10 STORAGE

1. Description

The lubrication system's oil is stored in a 3.5 liter reservoir (see Figure 79-004), which is fastened to the firewall on the RH side of the aircraft. It has a breather tube that ensures the pressure inside is always ambient and any excess oil is dumped overboard. It also has an inlet, outlet and plug at the bottom that allows for easy drainage.

2. Maintenance practices

79-10: 2.1. Oil tank

79-10: 2.1.1. Removal

Step	Action	Required parts, materials and tools	Reference
1	Remove engine cowlings.	- Metric combination wrench set - Screw drivers set	71-10: 2.1.1.
2	Drain the oil tank and the oil system.		
3	Cut the cable ties securing the oil tank breather tube to the engine mount.		
4	Cut cable tie securing oil tank breather tube to the oil tank fitting and remove the tube.		
5	Unfasten the hose clamps on the inlet and outlet oil tank fittings.		
6	Disconnect inlet and outlet oil hoses from the fittings and plug the openings with protective plastic caps.		
7	Loosen the two M5x35 cylinder head cap screw on the oil tank holder.		
8	Remove the oil tank from the oil tank holder.		

79-10: 2.1.2. Installation

Step	Action	Required parts, materials and tools	Reference
1	Position the oil tank in the oil tank holder.	- Metric combination wrench set - Screw drivers set - Red marker paint	Figure 79-002
2	Fasten the two M5x35 cylinder head cap screw on the oil tank holder.		
3	Connect inlet and outlet oil lines to oil tank fittings and secure them with hose clamps		
4	Apply marker paint to the holder screws and to the hose clamp screws.		
5	Fasten the oil tank breather tube to the engine mount using cable ties.		
6	Replenish the oil system.		12-10
7	Install engine cowlings.		71-10: 2.1.2.

Figure 79-002
Example of oil tank
installation orientation

79-20 DISTRIBUTION

1. Description

The oil distribution system consists of components which are used to conduct oil from and to the engine (rubber hoses, two coolers, fittings, ...).

2. Maintenance practices

79-20: 2.1. Oil Cooler / Radiator

79-20: 2.1.1. Removal

Step	Action	Required parts, materials and tools	Reference
1	Manually turn the propeller to move as much oil to the oil tank as possible.	- Cutting nippers - Metric wrench set	
2	Remove both oil hoses from the radiator.		
3	Unbolt the radiator from the engine (two Allen/Hex bolts) and remove the radiator.		

79-20: 2.1.2 Installation

Step	Action	Required parts, materials and tools	Reference
1	Install the new oil radiator and fix it in place using two Allen/Hex bolts.	- Cutting nippers - Metric wrench set	
2	Fill the new radiator with oil.		
3	Reinstall both oil hoses.		

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CHAPTER 95 – SPECIAL PURPOSE EQUIPMENT

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95-00 GENERAL

1. Description

This chapter describes the special purpose serial equipment on the aircraft. It covers the Galaxy Rescue System GRS 5/472. The system is not accounted for in the sense of “alternative level of safety”. It is considered a true “second chance” beyond what is required by the certification standard.

The system is placed inside a durable cylinder mounted on the right hand side of the baggage compartment. The parachute, which is stored inside a deployment bag with a rocket engine underneath, is installed in the aforementioned cylinder.
The parachute rescue system is activated manually, by pulling the activation handle mounted on the cabin bulkhead. After being activated, the main canopy opens and fully inflates within few seconds.

WARNING! The activation handle safety pin should be inserted when the aircraft is parked or hangered to prevent accidental deployment. The safety pin MUST be removed before operating the aircraft.

95-00
GENERAL

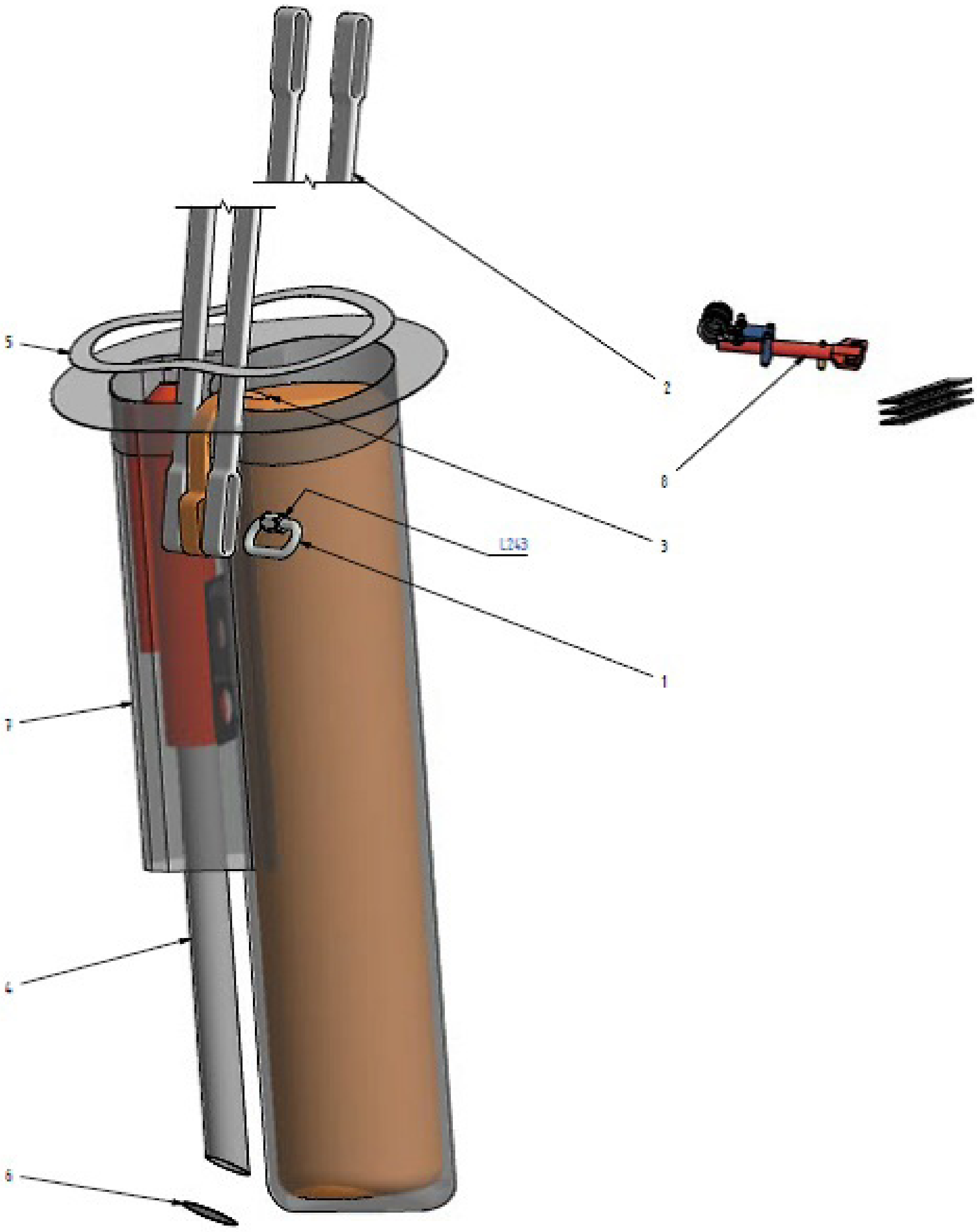


Figure 95-001
GRS rocket charged parachute
rescue system

1	Carbiner
2	Kevlar belt
3	GRS Rescue system GRS 6-600
4	Rocket blast tube
5	Container cover mask
6	Adhesive label
7	Parachute container assembly
8	Parachute release handle fastening material

2. Maintenance practices

WARNING: The rescue system incorporates a ballistic rocket that can cause serious injuries and bodily harm if not dealt with carefully.

WARNING: DO NOT, IN ANY CIRCUMSTANCES, ACTIVATE THE RESCUE SYSTEM ON THE GROUND. People in the vicinity of the aircraft may be injured and the aircraft will be rendered out of service until repaired.

95-00: 2.1. Activation handle

95-00: 2.1.1. Inspection/check

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Locate the activation handle in the cabin		
2	Carry out visual inspection of the handle.		05-20
3	Remove the safety pin. Rotate the handle to determine whether it moves unhindered and hasn't incurred any damage. DO NOT PULL THE HANDLE! JUST LEAVE IT IN ITS HOUSING AND ROTATE IT.		
4	Install the safety pin.		

95-00: 2.2. Rescue system hatch

95-00: 2.2.1. Inspection/check

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Locate the rescue system hatch on the top of the fuselage, just behind the sunroof.		
2	Carry out visual inspection of the rescue system hatch. Make sure it's not obstructed by anything.		05-20

95-00: 2.3. Rocket exhaust hatch

95-00: 2.3.1. Inspection/check

Reference: See in IPC [13]

Step	Action	Required parts, materials and tools	Reference
1	Locate the rocket exhaust hatch on the bottom of the fuselage, marked by a dedicated placard and a red circle.		
2	Carry out visual inspection.		05-20

95-00: 2.4. Repacking after 6/9 Year Service-Cycle Expires

WARNING: The rescue system must be repacked by the repacking date, which is indicated on the parachute container (Figure 95-002).

WARNING: REMOVAL AND INSTALLATION MUST BE CARRIED OUT FOLLOWING PIPISTREL'S INSTRUCTIONS AND ONLY BY A CERTIFIED AVIATION MECHANIC. ONLY GALAXY HOLDING s.r.o. IS PERMITTED TO REPACK THE RESCUE SYSTEM. ONCE THE SYSTEM IS REMOVED FROM THE AIRCRAFT, IT IS THE OWNER/OPERATOR'S RESPONSIBILITY TO CONTACT GALAXY HOLDING s.r.o. AND ARRANGE FOR IT TO BE REPACKED OR REPLACED.

WARNING! Do not handle the system in any way other than as specified in this manual.

WARNING! Do not, under any circumstances, disassemble the GRS system.

WARNING! Do not remove detachable safety components of the system (i.e. red seal, tape, wires or safe rivets) unless a certain procedure calls for it.

WARNING! The GRS unit must be handled as a pyrotechnical device and should never be pointed towards a person. Always keep the area in the firing direction clear.

WARNING! The activation handle must be secured against incidental launching while the aircraft is on the ground,

WARNING! If you are unsure about the system's reliability for any reason, due to impact or tampering, contact your Pipistrel distributor immediately.

WARNING! Do not activate the system after each 6/9-year service-cycle expires, until it's repacked/reinstalled or anytime after the 30-year lifetime.

WARNING! It is forbidden to fly with the system secured (i.e. the safety pin with the warning flag must be removed from the activation handle for flight).

Figure 95-002
Repacking date indicated on the parachute container

95-00: 2.4.1. Removal Procedure

Step	Action	Required parts, materials and tools	Reference
1	Remove the crew seats.	- plastic wrap - screwdriver set - wrench key set - long nose pliers - utility knife - M5 Allen key - 2 mm metal wire	
2	Secure the rescue system activation handle by inserting the safety pin.		
3	Wrap the whole handle (red part) with plastic wrap.		
4	Remove the fastening material (i.e. nuts, bolts, hose clamps) securing the activation handle to the cockpit support strut assembly.		
5	Remove the strips of Velcro securing the activation handle cable to the parachute container.		
6	Cut the silicon adhesive around the strap covers and rescue system hatch.		
CAUTION: Pay attention not to cut/damage the main straps while cutting through the silicon adhesive.			
7	Lift and remove the rescue system strap covers and hatch.		
8	Remove the safety pin securing the parachute fixing straps.		Figure 95-003

Step	Action	Required parts, materials and tools	Reference
9	Remove the strips of Velcro securing the support straps to the parachute container.		Figure 95-003
10	Open the carabiner connecting the main parachute strap and the support straps and disconnect them.		
11	Pull the parachute and the straps connecting the rocket and the parachute pack out of the container.		
12	As soon as the body of the parachute slides out of the opening on the top of the fuselage, grab it by the sides and pull it out.		
WARNING! Pay special attention to the activation handle while pulling the parachute out. Check the activation handle several times throughout the procedure and make sure it's secure.			
13	Remove the duct tape covering the holes on the parachute container wall.		Figure 95-011
14	Unscrew the bolts securing the rocket assembly to the rocket's blast tube wall.		
15	Pull the activation handle and the rocket assembly out of the rocket blast tube.		
16	Secure the rocket charge against unintentional activation: - with a safety wire (dia. 2mm) [A] - an M5 bolt [B].		Figure 95-004
17	Pack the complete and secured parachute rescue system (parachute and rocket assembly) into an original stainless steel shipping basket.		

Figure 95-003

Figure 95-004

95-00: 2.4.2. Storage, Shipment for Repacking

STORAGE

Whenever the GRS is not mounted on the aircraft, it should be stored in clean, dry area, secured with the Ø2 mm transport safety A from steel wire and transport safety B bolt M5.

CAUTION: Do not expose the system to hard impact, mechanical damage or aggressive chemicals.

GRS SHIPMENT FOR REPACKING

Please refer to Galaxy GRS Ballistic parachute rescue system manual (latest revision) and contact Galaxy Holding s.r.o. before preparing the GRS shipment for repacking.

WARNING: Only Galaxy holding s.r.o. is permitted to repack the rescue system. Once the system is removed from the aircraft, it is the owner/operator's responsibility to contact Galaxy Holding s.r.o. and arrange for it to be repacked.

95-00: 2.4.3. Unpacking the Parachute and Preparing the Rocket

Step	Action	Required parts, materials and tools	Reference
	WARNING! Pay special attention to the activation handle while performing the steps written below. Check the activation handle several times throughout the procedure to make sure it's secure!		
1	Unpack the parachute from its shipping box and separate the rocket from the parachute where the straps are connected with a carabiner.	- wrench key set - M5 Allen key	
2	Unscrew the bolts on the steel shipping basket and remove the rocket from the basket.	- M5 drill bit - cutting pliers	
3	Remove and set the four M5 Allen head bolts from the rocket mounting plate aside.		Figure 95-005
4	Re-drill the holes in the mounting plate with a M5 drill bit to re-move any possible residual glue from the holes.		Figure 95-006
5	Remove the safeties from the rocket: - cut the wire which goes through the rocket motor [A] - unscrew the M5 safety bolt [B] - remove the red warning flag [C] - remove the rocket engine plastic cap [D]		Figure 95-007 Figure 95-008 Figure 95-009

WARNING! From this moment onwards the rocket is not secure anymore and will be activated if the handle is pulled !

Figure 95-005

Figure 95-006

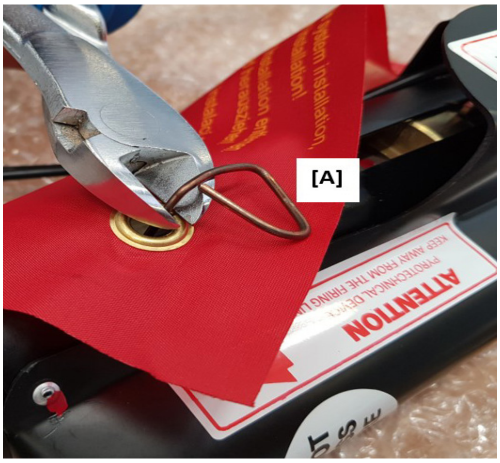
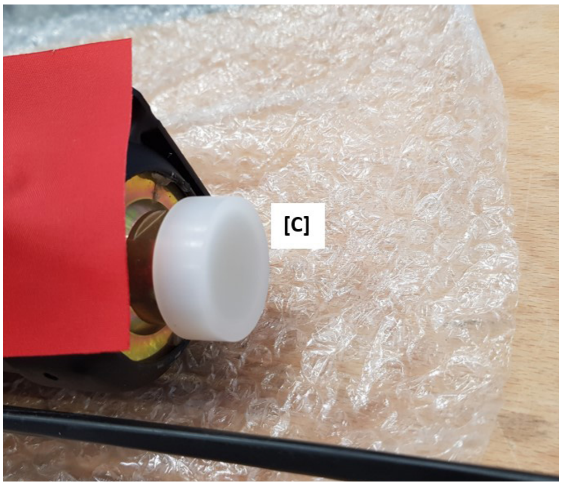


Figure 95-007

Figure 95-008

Figure 95-009



95-00: 2.4.4. Installation of the Rocket and the Parachute

Step	Action	Required parts, materials and tools	Reference
1	Apply Loctite 243 to the thread of the rocket assembly's mounting plate.	- Loctite 243 - M5 Allen key - duct tape	Figure 95-010
2	Locate the four holes already drilled between the main parachute container and the rocket assembly blast tube.		Figure 95-011
3	Insert the rocket assembly into the rocket blast tube by first running the activation handle downwards through the bottom of the rocket assembly blast tube. The connecting strap should be pulled out of the top of the rocket assembly blast tube.		
	CAUTION: When inserting the rocket make sure the rocket engine fits into the exhaust tube.		
4	Fasten the rocket assembly in place using the four M5 Allen head bolts that came with the rocket assembly.		Figure 95-011
5	Cover the holes with duct tape.		Figure 95-012
6	Place the parachute in the parachute container, parachute release straps should be aligned properly.		Figure 95-013

Figure 95-010

Figure 95-011

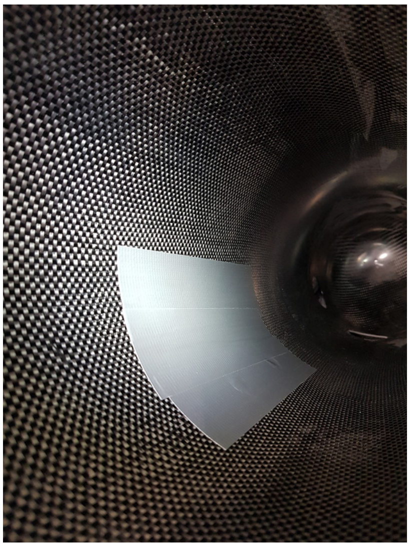


Figure 95-012

Figure 95-013

95-00: 2.4.5. Installing the Activation Handle

Step	Action	Required parts, materials and tools	Reference
1	Run the activation handle cable around the back of the parachute container to the cockpit support strut assembly above the crew seats.	- activation handle installation kit (p/n 1143005) - surface primer - wrench key set - torque marker paint	
2	Fasten the activation handle cable to the parachute container using the Velcro strips that come with parachute kit (p/n 1143005). Apply primer first to attain a better bond between the Velcro and the rescue system container's surface.		
3	Fasten the handle to cockpit support strut assembly and paint mark the nuts.		Figure 95-014

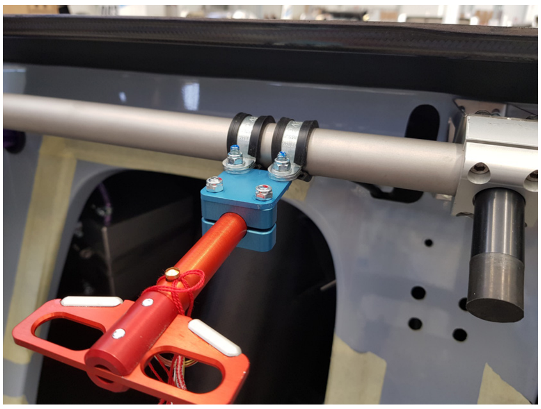


Figure 95-014

Figure 95-019

Figure 95-020

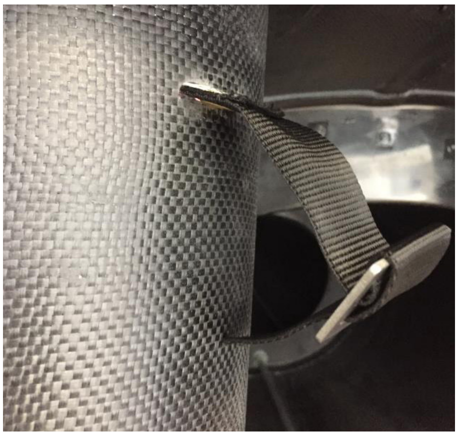


Figure 95-021

Figure 95-022

95-00: 2.4.9. Closing the Rescue System Hatch

Step	Action	Required parts, materials and tools	Reference
1	Put the rescue system hatch in place, flush with the fuselage, and temporarily secure it with adhesive tape.	- adhesive tape - glue gun - silicone gun - cleaning benzine - white sticker (p/n 1111069)	Figure 95-023
2	Use a glue gun to create a bond between the hatch and the fuselage. Apply glue to just a few spots along the hatch's edge.		
3	Allow the glue to dry and remove any excess glue with alcohol-based cleaning agent.		
4	Carefully fill all the gaps between the hatch and fuselage with black silicone. This will prevent water ingress.		Figure 95-024

Step	Action	Required parts, materials and tools	Reference
5	Remove any excess silicone and let it cure for 12 hours. Then remove any residual silicone from the surface using cleaning benzine.		Figure 95-024
6	Apply a white sticker (p/n 1111069) to cover the gap.		

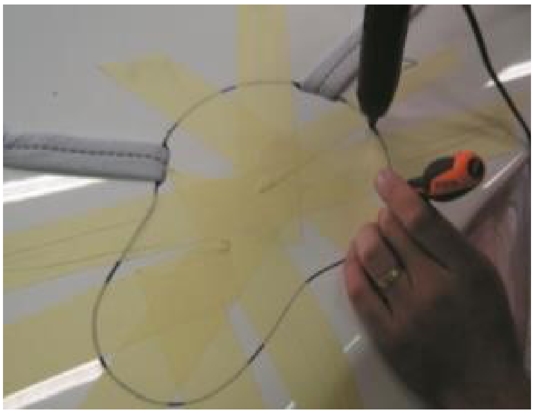


Figure 95-023

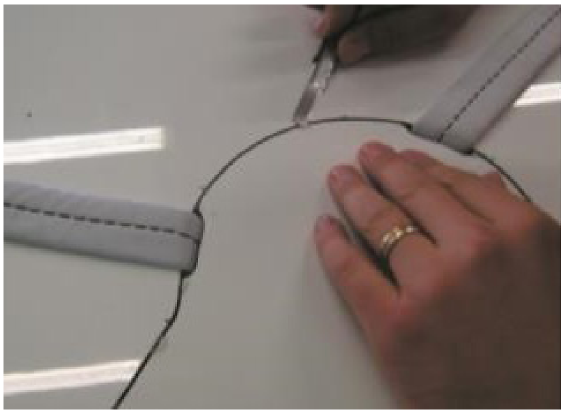


Figure 95-024

95-00: 2.4.10. Closing the Rescue System Hatch

Step	Action	Required parts, materials and tools	Reference
1	Apply some black silicone to the back surface of the strap covers.	- silicone gun - strap covers (p/n 1143053, p/n 1143054) - cleaning benzine	Figure 95-025
2	Mount the strap covers in place on the fuselage and slightly push on the strap covers edges to attain a better bond.		Figure 95-026
3	Remove the excess silicone and let it cure for 12 hours. Then remove any residual silicone from the surface using cleaning benzine.		
4	Install the crew seats.		

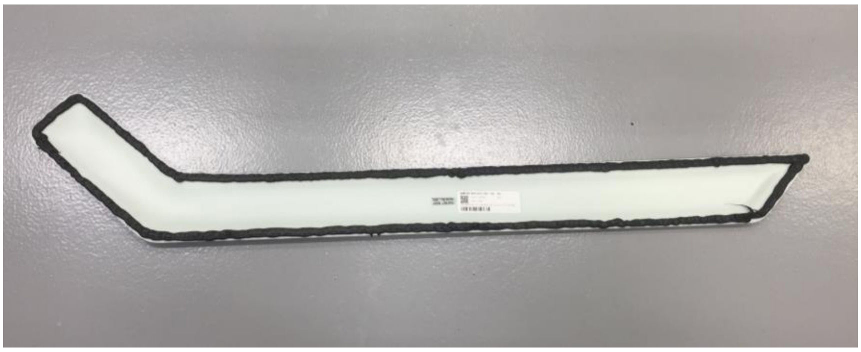


Figure 95-025

Figure 95-026

95-00: 2.5. Unscheduled Maintenance

95-00: 2.5.1. Moisture and Other Contaminants

If the GRS system has been exposed to large quantities of water or moisture and it is believed the components might have incurred some damage, the unit must be sent to the manufacturer to be inspected. The same applies if the system is exposed to very dusty environments and it is not certain whether dust or other contaminants have penetrated the system enough to cause failure or malfunction. In this case it's recommended to have the system checked by the manufacturer.

WARNING! If the handle is stuck and doesn't move, contact the your Pipistrel distributor immediately, because if the handle is stuck, the system cannot be activated. This will not happen if the unit is checked regularly and occasionally treated with silicon oil.

95-00: 2.5.4. Aircraft Crash Without GRS Deployment

If the aircraft incurs major damage or is involved in a crash and it’s impossible to secure the system or when it is unclear as to what condition the system is in, contact your local Pipistrel dealer immediately for further instructions.

95-00: 2.6. Disposal

95-00: 2.6.0. Disposing of GRS Unit

The user may, at any time, return the system to the manufacturer for safe recycling. This is mandatory after the 30-year operational lifetime expires. Before doing so, however, the user must equip the system with the transport safety A and B or with the protecting steel basket (see removal and shipment for repacking procedures).

To get the rescue system repacked, please contact:

GALAXY HOLDING s.r.o.
Třída 1. máje 24a
460 01 Liberec 3
Czech Republic
tel./fax: ++420 48 510 44 92
mobile: ++420 777 55 00 91

To get the rescue system replaced, please contact:

PIPISTREL d.o.o.
GORIŠKA CESTA 50a
SI-5270 AJDOVŠČINA
SLOVENIA
tel.: +386 5 36 63 873
fax.: +386 5 36 61 263

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CHAPTER 99 – APPENDICES

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APPENDIX 99-A

Control Deflections

Control Deflections (°)			
	Design deflections		
	NEUTRAL	UP	DOWN
Flaperon left (at flaps 0)	0°	-13° ±1.5°	+10° ±1.5°
Flaperon right (at flaps 0)	0°	-13° ±1.5°	+10° ±1.5°
Flaperon left (at flaps +1)	+15° ±1°		
Flaperon right (at flaps + 1)	+15° ±1°		
Flaperon left (at flaps+2)	+25° ±1.5°		
Flaperon right (at flaps +2)	+25° ±1.5°		
Elevator	0°	-25° ±1.5°	+15° ±1.5°
	NEUTRAL	LEFT	RIGHT
Rudder	0°	30° ±1°	30° ±1°

APPENDIX 99-B

VENT/DRAIN HOLE LOCATIONS

1. Two on the bottom surface of the wing at the wing root
2. One at each end of the air brake bay
3. One at each end of the flaperons
4. One at the bottom of the rudder
5. One near the horizontal stabilizer’s hinges
6. One on the elevator
7. One on the bottom surface of the fuselage just aft of the undercarriage strut
8. One on the bottom surface of the fuselage near the control sticks

APPENDIX 99-C

WEIGHT AND BALANCE REPORT (WBR)

The WBR document applicable to a specific aircraft serial number is included in the aircraft documentation package.
Please contact *Pipistrel support* to request a new/blank copy of the document, if needed.

APPENDIX 99-D

VENT/DRAIN HOLE LOCATIONS

1. Two on the bottom surface of the wing at the wing root
2. One at each end of the air brake bay
3. One at each end of the flaperons
4. One at the bottom of the rudder
5. One near the horizontal stabilizer’s hinges
6. One on the elevator
7. One on the bottom surface of the fuselage just aft of the undercarriage strut
8. One on the bottom surface of the fuselage near the control sticks

APPENDIX 99-E

PRIMARY AND SECONDARY STRUCTURES

The table below shows a list of components that are to be considered primary structures:

PRIMARY STRUCTURES
FUSELAGE ASSEMBLY/MAIN FRAME
FIREWALL
INTERNAL FUSELAGE BULKHEADS
CABIN STRUT SUPPORT ASSEMBLY
ENGINE MOUNT
NOSE LANDING GEAR STRUT
MLG STRUT
WING
CONTROL SURFACES
EMPENNAGE

The table below shows a list of components that are to be considered secondary structures:

SECONDARY STRUCTURES
CABIN DOORS
WINDSHIELD
ENGINE COWLINGS
INSTRUMENT PANEL

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