

LIFTAIR®

FLIGHT DESIGN

Document No.: AT 0480 0001_00

F2-LSA

Airplane Maintenance Manual (AMM)

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I List of Revisions

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II General

Signatures for generation / verification / approval see section III. Cover page and signature page serve for internal purposes. Distribution of this document shall only be done without cover page and signature page.

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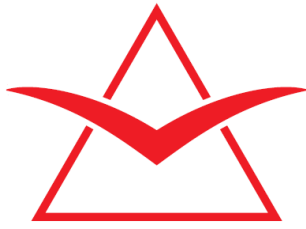
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LIFTAIR®

FLIGHT DESIGN

Airplane Maintenance Manual (AMM)

Airplane Type : F2

Airplane Model : F2-LSA

Airplane Registration Number : _____

Airplane Serial Number : _____

Document Number : AT 0480 0001

Date of Issue : 25-Jun-2021

This document is approved under Manufacturer Self Declaration.

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I.1 RECORD OF MANUAL REVISIONS

Manual revisions are provided by Flight Design general aviation GmbH as available. The updates shall be manually entered to the individual printed version of the AMM by the owner/operator of the aircraft.

Manual updates are provided in electronic format (pdf file) directly to aircraft owners/operators, when the owner/operator leaves the correct contact information with Flight Design general aviation GmbH.

It is the duty of the aircraft owner/operator to ensure that the manual contains all updates applicable to his aircraft serial number. Updates are done by manually removing invalid pages and inserting new or updated pages. Manual update must be logged in the subsequent table.

<i>rev.</i>	<i>date</i>	<i>pages</i>	<i>description</i>	<i>approval</i>	<i>signature</i>
00	25-Jun-2021	all	initial release	initial self-declaration	n/a

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01-00.1 General

This Airplane Maintenance Manual (AMM) contains the data necessary to carry out the maintenance of the F2-LSA. This AMM contains a full description of the systems including wiring diagrams for the electrical systems, removal and installation procedures and maintenance instructions.

Use the following additional sources of information together with this AMM:

1. Applicable Service Notifications including Service Bulletins and Airworthiness Directives.
2. ROTAX® 912i Series Manuals, issued by ROTAX® for the affected engine
 - Operator's Manual OM-912i
 - Maintenance Manual (Line Maintenance) MML-912i
 - Maintenance Manual (Heavy Maintenance) MMH-912i
3. Propeller manual issued by manufacturer

01-00.2 Approval

The content of this manual is approved on the basis of Manufacturer Self Declaration against the applicable ASTM industry standard.

01-00.3 Certification Basis

aircraft	ASTM F2245
engine	ASTM F2339
propeller	ASTM F2506
POH	ASTM F2746
AMM	ASTM F2483
continued airworthiness	ASTM F3198

The revision level of the standards applicable to the specific S/N is identified on the aircraft's Statement of Compliance.

01-00.4 Manufacturer Contact

The aircraft is manufactured by:

Flight Design general aviation GmbH
Am Flugplatz 3, 99820 Hörselberg Hainich
Germany
Web: www.flightdesign.com
e-mail: info@flightdesign.com

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01-00.5 Recovery of Certification Data

If the original manufacturer will lose the ability to support the make and model of this aircraft, you can recover certification documentation through the following contact:

Flight Design Engineering Ukraine Ltd.

Rabochaya 82a
73000 Kherson
Ukraine

01-00.6 General Safety Information

Consider the following warnings to avoid unnecessary risks while you carry out maintenance of the aircraft:

- ▲ **Warning:** Only personnel with adequate qualifications may carry out an inspection or maintenance work.
- ▲ **Warning:** You must carry out inspection and maintenance in accordance with respective national safety requirements.
- ▲ **Warning:** Before you begin any work, you must read and understand all relevant sections of this AMM. In case of any doubt or missing information contact the Flight Design for advice.
- ▲ **Warning:** Consider the safety notes in this manual as unconditional.

01-00.7 Source to Purchase Parts

Spare parts can be ordered directly with the airplane manufacturer:

Flight Design general aviation GmbH

Am Flugplatz 3, 99820 Hörselberg Hainich

Germany

Web: www.flightdesign.com

e-mail: info@flightdesign.com

or through the Flight Design distributor or service center that is responsible for your area. You can find contact details of the distributors and service centers on the www.flightdesign.com web page.

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01-00.8 List of Disposable Replacement Parts

Air filter	RU0810 RD CNT AIR FILTER; K&N
Oil filter	Oil filter – according to specification provided within ROTAX® maintenance manual
Nose & Main Wheels	Tube 4.00-6 Tire 4.00-6, 6 ply
Main Battery	Earth X ETX900 series Earth X ETX680C
Brake Assemblies	Master brake cylinder Part No. MCMC-4CT, MATCO mfg
	Brake pads Part No. WHLWI62L-4 (part of set), MATCO mfg
	Brake disk Part No. WHLWI62L-4 (part of set), MATCO mfg
	Brake Caliper Part No. WHLWI62L-4 (part of set), MATCO mfg
	Aeroshell Brake Fluid 41 MIL-H-5606
Brake Fluid	Brake Fluid i.a.w. MIL-H-5606, for example Shell Fluid 41
Sparkplugs	According to specification provided within ROTAX® maintenance manual

01-00.9 Recommended Torque Values

Table with recommended torque values is provided in CHAPTER 20.

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CHAPTER 02 – ORGANIZATION AND HANDLING OF THE MANUAL

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02-00.1 Manual Structure

02-00.1.1 Chapter and Subchapter Structure

This AMM is structured using the ATA 100 structure for system / subsystem as guideline. This is reflected in the main header of each Chapter, Section and in the page numbers. The contents of chapter and subchapter are structured similarly, so that you can find required information quickly. For your convenience each chapter contains its own table of contents. Four digits are used that represent:

27-20
System - Subsystem
Chapter No. - Section No.

02-00.1.2 Page Numbering System

Pages are numbered using a combination of the chapter and section number, followed by the page number, each separated with a dash “-”.

02-00.1.3 Figures

Figures are numbered using a combination of the chapter and section number, followed by a sequential number that starts with 1 for each subsystem, each separated with a dash “-”.

02-00.1.4 Warnings, Cautions and Notes

Please pay attention to the following symbols which are used throughout this document to emphasize certain information:

- ▲ **Warning:** Used to identify an instruction which if not followed may cause serious injury or even death.
- **Caution:** Used to identify an instruction which if not followed may damage the aircraft severely or lead to the warranty suspension.
- **Note:** Information useful for better handling.

“Shall”, “will”, “should” and “may”:

The words “shall” or “will” are used to express a mandatory requirement or instruction. The word “should” is used to express non-mandatory provisions that are nevertheless highly recommended. The word “may” is used to express permissible provisions.

02-00.1.5 Abbreviations

The table below contains the abbreviations used in this AMM.

Abbreviation	Meaning
AMM	Airplane Maintenance Manual
ATC	Air Traffic Control
CAS	Calibrated Airspeed (indicated airspeed, corrected for installation and instrument errors. CAS is TAS at ISA standard atmosphere at MSL)
CG	Center of Gravity
EASA	European Aviation Safety Agency
ELT	Emergency Locator Transmitter
IAS	Indicated Airspeed (the speed shown by the airspeed indicator)
IFR	Instrument Flight Rules

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IMC	Instrument Meteorological Conditions
ISA	International Standard Atmosphere
VLA	Light Sport Aircraft
MAC	Mean Aerodynamic Chord
MSL	Mean Sea Level
MTOM	Maximum Take-Off Mass
POH	Pilot's Operating Handbook
rpm	Revolutions Per Minute
TAS	True Airspeed (the speed of the airplane relative to the air)
TBO	Time Between Overhaul
VFR	Visual Flight Rules
VMC	Visual Meteorological Conditions

02-00.2 Manual Handling

02-00.2.1 Record of Revisions

This AMM has a Record of Revisions. Use the Record of Revisions to show when changes were included in this AMM.

02-00.2.2 List of Effective Sections

This AMM has a List of Effective Sections. The List of Effective Sections shows you the number and effective date of each section of this AMM. This system implies that revisions are always done section wise; when information in one section changes, all pages of that section get exchanged.

02-00.2.3 Feedback Template

Use the Service Difficulty Report (SDR) Feedback Template to inform the manufacturer about difficulties experienced during maintenance of the airplane. Usage of the template ensures that all relevant information is provided to the manufacturer that allows to handle the report properly.

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Service Difficulty Report (SDR)	 FLIGHT DESIGN <small>LIFTAIR®</small>	Flight Design general aviation GmbH
		Am Flugplatz 2 99820 Hørselberg-Hainich GERMANY DOA EASA.21J.416

Aircraft Identification	
Make and Model	
Serial Number	
Callsign	
Engine Type and SN	
Prop Type and SN	
Total Time	
Further Information	
Reporting Person	
Contact Information	
Occurrence	
Location	
Date and Time	
Description	<div></div> <p>Please be as specific as possible. If needed, attach additional sheets, drawings, sketches, etc.</p>

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CHAPTER 03 – GENERAL DESCRIPTION OF THE AIRPLANE

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03-00.1 General

The F2-LSA is a conventional two seat side-by-side high wing aircraft. The airframe is all composite in prepreg technology. The high wing F2-LSA features cantilevered wings and a conventional empennage. The landing gear is tricycle with a steerable nose wheel. The wing is removable. Removal of the wing may only be done by qualified personnel according to the maintenance manual and to the valid national regulations.

The spacious cockpit is comfortably accessible for the pilot and the passenger via two large gull wing doors held open by gas struts. The extensive acrylic windshield offers outstanding visibility for a high-wing aircraft. The rear side windows allow rearward vision.

Behind the seats there is a large baggage area with tie-down hooks. The baggage area is only accessed through the cabin.

03-00.2 Equipment List

Each aircraft is delivered with an installed equipment list. The next page shows an example.

Every time when there is an update to the installed equipment, a new equipment list must be compiled and added to the aircraft documentation. The owner of the aircraft is responsible for ensuring that the equipment list is current and has a corresponding mass and balance report.

The equipment list is a snapshot of the aircraft configuration at the time when it is created. It is mandatory to record the installation and/or removal of instruments in the aircraft logbook, in addition to the update of the equipment list.

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 FLIGHT DESIGN <small>LIFTAIR</small>		Equipment List
		X - XXXX
make and model: FlightDesign F2-LSA	serial no.: T-XX-XX-XX	TCDS no.: n.a.

minimum equipment		
item	manufacturer and type	serial number
G3X Touch screen LH	GARMIN GDU460	350008855
ADAHRS	GARMIN GSU25	5Q2002426
EMS interface box	GARMIN GEA24	2J2008358
compass	AIRPATH C2300-L4	AS17561
starter battery	Battery ETX 680 C	n/a
engine	Rotax 912 iS2 Sport	7.705.502
exhaust system	ROTAX	n/a
fuel pump	ROTAX	n/a
engine ECU	ROTAX	n/a
engine fuse box	ROTAX	n/a
engine air filter	K&N	n/a
propeller	Sensenich 3B0R5R68C	n/a
safety belt (set of LH and RH)	AmSafe DWG3024_REV.F	S442476-1
main wheels 4.00-6	MATCO	n/a
nose wheel 4.00-6	MATCO	n/a
brakes	MATCO	n/a

equipment options		
item	manufacturer and type	serial number
G3X Touch screen RH	GARMIN GDU460	350008863
XPDR, incl. Antenna	GARMIN GTX 345 w/GPS	3E6423623
COM, incl. Antenna	GARMIN GTR 225A	2A6013804
Magnetometer	GARMIN GMU 11	56J025141
landing light	Whelen P36P1L	321887
NAV/strobe lights	Whelen Orion600	01311/01299
oil thermostat	FRANZ Aircraft	n/a
water thermostat	FRANZ Aircraft	n/a
heating system	FlightDesign	n/a
door gas spring LH	FlightDesign	n/a
door gas spring RH	FlightDesign	n/a
seat cover LH	FlightDesign	n/a
seat cover RH	FlightDesign	n/a

Kherson, dd.Mmm.yyyy	Pavlo Khadykin
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- **Note:** This is only the sample of the equipment list; not valid for the actual aircraft.

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04-00.3	Continued Airworthiness
04-00.4	Life Limited Components

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04-00.1 General

This chapter gives information on mandatory limitations established by the airframe manufacturer.

Compliance with the specified times and intervals is mandatory for maintaining the airworthiness of the aircraft. In addition to this, the manufacturer recommends you to comply with the maintenance time limits and to work with the maintenance checklists (refer to CHAPTER 05).

In any case you must comply with the national maintenance requirements.

04-00.2 Airworthiness Limitations

04-00.2.1 Airframe

Structural inspections given in CHAPTER 05 cover all required structure checks.

There is no structural life limit.

04-00.2.2 Outside Paint and Temperature Limit

All structural parts which are exposed to direct vertical sunlight have to be painted WHITE except of areas provided in Section 51-70.6.5.

The upper temperature limit of the F2-LSA is +54°C (129°F). This limit is based on the storage temperature of the aircraft windshield and windows (glazing). The composite structure is capable to withstand full operational loads at temperatures up to 54°C.

04-00.2.3 Structural Repairs

Major repairs which are not covered by standard repair practices described in CHAPTER 51 of this manual may only be carried out under the authority of the manufacturer or in accordance with a repair scheme which has been approved by the manufacturer.

04-00.3 Continued Airworthiness

Scheduled inspections of the airplane including replacement and overhaul of defined components are required to ensure Continued Airworthiness of the Flight Design F2-LSA aircraft. Time limits in the Maintenance checklists found in CHAPTER 05 shall be used to ensure continued airworthiness of the Flight Design F2-LSA, unless an alternate inspection program is approved by the competent National Airworthiness Authority.

- **Caution:** Non-consideration of the continued airworthiness instructions can cause severe damage to the aircraft and/or lead to warranty suspension and withdrawal of airworthiness approval.

04-00.4 Life Limited Components

<i>Chapter</i>	<i>Item</i>	<i>Overhaul</i>	<i>Replacement Time</i>
25-62	ELT Battery (1)	no	(2)

(1) If so mandated by aircraft operations.

(2) Refer to manufacturer's instructions for battery replacement time limits.

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05-00.1 General

This chapter contains time limits and maintenance checklists for the F2-LSA. We highly recommend you to comply with the maintenance time limits and to work with the maintenance checklists.

05-00.2 Levels of Certification

General

For each task listed in the maintenance manual, a minimum level of certification is specified. For example: Owner/Pilot, RLSA-M and A&P.

Where a minimum level of certification is specified, the implication is that an individual who holds a Light Sport Repairman certificate with a maintenance rating (listed here as a RLSA-M) may perform any task with the minimum level of competency listed as "Owner/Pilot", and an A&P may perform any task where the minimum level of competency is listed as Owner/Pilot, or RLSA-M.

Minimum levels of certification do not preclude the need for additional or task specific training. As a general rule, additional or task specific training is required for heavy maintenance tasks and is required on a case by case basis for line maintenance tasks. The requirement for additional or task specific training will be listed where applicable throughout the manual.

Note: Some tasks may require additional or task specific training for an RLSA-M but not for the holder of an A&P certificate.

Levels of certification

Levels of certification used in this manual are:

Owner/Pilot: The owner of an aircraft who holds a pilot certificate but who has not received any specific authorized training. Note: FAA regulations authorize SLSA aircraft owners who hold at least a sport pilot certificate to perform maintenance as outlined in 14CFRPart43.

RLSA-M: The holder of a LSA Repairman certificate with a maintenance rating. This is generally considered the minimum level of certification to perform line maintenance of LSA.

A&P: An Airframe and Powerplant mechanic as defined by 14 CFR Part 65 in the U.S. or equivalent certification in other countries.

For and questions or comments regarding maintenance procedures or minimum levels of certification, email Flight Design USA at airworthiness@flightdesignusa.com.

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SECTION 05-10 – TIME LIMITS

05-10.1 General

All scheduled maintenance checks have time limits. You shall do the scheduled maintenance within the time limits.

05-10.2 Life Limited Components

The following table lists life limited airplane components which must be replaced or overhauled (as specified) at a specific time.

To allow monitoring the permissible service life the installation or removal of each item must be recorded in the aircraft documentation.

- **Caution:** Under specific environmental circumstances the replacement or overhaul of components may be required before reaching the time limits as listed below. Also, authorized extensions or exceeding of time limits may exist from particular component manufacturers.

Chapter	Item	Overhaul	Replacement Time
25-00.2.2	AMSAFE Safety Harness pilot/ Co-pilot	no	12 years
	AMSAFE Airbag EMA and Igniter	no	10 years
32-20	Urethane shock absorber elements in the nose gear	no	5 years
71-00.3.2	Engine shock mounts	no	2000h or with engine replacement, whichever comes first
28-00 71-00 75-00 79-00	<ul style="list-style-type: none"> ▪ All rubber hoses of the cooling system (except GENUINE ROTAX® silicon hoses), which need to be checked by "on-condition" maintenance according to the instructions of continued airworthiness. ▪ All rubber hoses of the fuel system ▪ All rubber hoses of the lubrication system which are part of the engine supply volume and if they are not in the maintenance schedule of aircraft manufacturer ▪ Connecting hose of the air intake system ▪ V-belt (if equipped with Aux generator) 	no	5 years
71-00.3.2	Engine ROTAX® 912iS Sport	(1)	2000h or 15 years whichever comes first
61-00.3.2	Propeller	(2)	2000h
25-62	ELT Battery (5)	no	(3)
26-00	Fire Extinguisher	no	(4)

- (1) Refer to latest issues of BRP- ROTAX® concerning the TBO, i.e. Service Bulletins, Service information, and to the ROTAX® Aircraft Engines Maintenance Manual for ROTAX® Engine Type 912 Series.
- (2) Refer to latest issue of propeller manufacturer's manual.
- (3) Refer to manufacturer's instructions for battery replacement time limits.
- (4) Refer to expiring date on the bottom of Fire Extinguisher.
- (5) If so mandated by aircraft operations.

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05-10.3 Scheduled Maintenance Time Limits

The table below contains scheduled maintenance time limits recommended by the manufacturer. Different tolerances may apply due to national regulations, depending from the type of operation.

Scheduled Maintenance	Task at these times	Tolerance
100-hour check *National regulations may not require a 100h inspection for non-commercial operation	At 100 hours since new and every 100-hour interval. Do the work of 100-hour check. Perform all engine 100-hour inspection items per engine manufacturer maintenance manual Perform all propeller 100-hour inspection items per propeller manufacturer maintenance manual	±10 hours
25-hour check	At 25 hours since new or at 25 hours after change or overhaul of engine and/or propeller. Perform all engine 100-hour inspection items per engine manufacturer maintenance manual Perform all propeller 25-hour inspection items per propeller manufacturer maintenance manual	±5 hours
"Other times" checks	At specified time interval from checklist since new and every specified time interval. Do the work for "other times" interval specified in checklist	±10 hours
Annual check	At 12 months from new and every 12 months interval. Do the work of annual check.	±30 days

05-10.4 Component Time Limits

05-10.3.1 Time between Overhaul

The airplane components that shall be overhauled on expiration of scheduled time limits are listed in Section 05-00.2.

05-10.3.2 Time between Replacement

The airplane components that shall be replaced on expiration of scheduled time limits are listed in Section 05-00.3.

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SECTION 05-20 – SCHEDULED MAINTENANCE CHECK

05-20.1 General

Perform the scheduled maintenance checks in this Section at the intervals (flight hours and calendar time) marked in SECTION 05-20 with a “□” or at the time specified.

- **Note:** Only persons authorized by the National Aviation Authority of the country where the airplane is registered may perform these checks. Alternatively, a Part-145, Part MF approved maintenance organization or Part 66 certified staff may perform the checks.
- **Note:** The inspection level for each item is a general visual inspection unless differently specified.
- **Note:** The Maintenance Manual of the ROTAX® 912 iS engine contains the periodic maintenance schedule for this engine. We highly recommend you to perform the 100-hour checks of the engine at the same time with the airframe inspection.
- **Note:** The Operating and Maintenance Manual of the DUC propeller contains the periodic maintenance schedule for this propeller. We highly recommend to perform the specified checks of the propeller at the same time with the airframe inspection.

05-20.2 Scheduled Maintenance Checklist F2-LSA

05-20.2.1 Identification

Name of Owner / Operator		Call-sign/N number	
Aircraft S/N	T-____-____-____	Operating Hours	
Engine S/N		Operating Hours TTSN/ TTSO	
Propeller S/N		Operating Hours TTSN/ TTSO	
Maintenance Organization		Name of Inspector	
Hours since Last Scheduled Inspection		Type of Last Scheduled Inspection	<input type="checkbox"/> 100h <input type="checkbox"/> annual <input type="checkbox"/> other:_____
Date of Inspection		Type of Inspection	<input type="checkbox"/> 100h <input type="checkbox"/> annual <input type="checkbox"/> other:_____

05-20.2.2 Aircraft Records

<i>Inspection and/or Required Maintenance Checklist</i>	<i>100hour</i>	<i>Annual</i>	<i>Other Times</i>	<i>Chapter</i>	<i>Initials / Remarks</i>
Aircraft records. Check the presence and condition of the Registration certificate and the Airworthiness Certificate.	<input type="checkbox"/>	<input type="checkbox"/>		N/A	
Aircraft data plate. Check that the plate is secure and readable.	<input type="checkbox"/>	<input type="checkbox"/>		N/A	
Aircraft, Engine and Propeller logbooks. Determine total times, times since the overhaul and times since the last required or recommended maintenance checks and record these times in Identification Table.	<input type="checkbox"/>	<input type="checkbox"/>		N/A	
Airworthiness Directives (AD), Service Notifications (SN), Service Bulletins (SB) Check ADs, SNs, SBs which shall be complied with during the inspection period for airframe and aircraft components.	<input type="checkbox"/>	<input type="checkbox"/>		N/A	
Pilot's Operating Handbook (POH), Airplane Maintenance Manual (AMM), component manuals. You shall always have the latest issue of the POH, AMM, and Manuals for components	<input type="checkbox"/>	<input type="checkbox"/>		N/A	
List of Life Time Limited Components. Check life time of components	<input type="checkbox"/>	<input type="checkbox"/>		05-10.2	
Latest Equipment List corresponds to aircraft equipment	<input type="checkbox"/>	<input type="checkbox"/>		W&B	
Latest Weight and Balance information.	<input type="checkbox"/>	<input type="checkbox"/>		W&B	
Latest Avionic test. Check if Avionics test still valid	<input type="checkbox"/>	<input type="checkbox"/>		AF Logbook	

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05-20.2.3 Run-Up

▲ **Warning:** Run-up shall be performed before any inspection.

▲ **Warning:** Run-up shall continue until all temperatures are acceptable for take-off.

<i>Inspection and/or Required Maintenance Checklist</i>	<i>100hour</i>	<i>Annual</i>	<i>Other Times</i>	<i>Chapter</i>	<i>Initials / Remarks</i>
Engine and engine compartment Clean for leakage check	<input type="checkbox"/>	<input type="checkbox"/>		NA	
Run up of engine: Conduct per following checklist, fill pre-inspection values only:	<input type="checkbox"/>	<input type="checkbox"/>		See Below	

Systems	Pre-inspection	Post-inspection
Engine oil. Check the level of oil and follow the Operator's Manual for all versions of ROTAX® 912 iS or SECTION 12-10.	<input type="checkbox"/>	<input type="checkbox"/>
Brakes and parking brake. Check for proper operation	<input type="checkbox"/>	<input type="checkbox"/>
Starter. Smooth operation, starting properties	<input type="checkbox"/>	<input type="checkbox"/>
Oil pressure. 2...5 bar / 29...73 PSI	bar/PSI	bar/PSI
Engine Instruments. Check engine parameters	<input type="checkbox"/>	<input type="checkbox"/>
Ignition ground test. (See Operator's Manual for all versions of ROTAX® 912)	<input type="checkbox"/>	<input type="checkbox"/>
Oil temperature. 90...110°C /190...230°C	°C/°F	°C/°F
▲ Warning: Ensure that cylinder head temperature (CHT) and oil temperature are within limits.		
Cabin heat	<input type="checkbox"/>	<input type="checkbox"/>
Idle RPM. Tachometer should read 1600 RPM	RPM	RPM
Engine full power RPM. Tachometer should read 4900 to 5100RPM	RPM	RPM
Lane check. Set RPM to 4000. Ignition left. Record rpm drop. Must not be more than 300 Ignition both. Ignition right. Record rpm drop. Must not be more than 300. Determine rpm drop difference Must not be more than 120.	RPM RPM RPM	RPM RPM RPM
Note: usually a slight increase of RPM is monitored during the Lane check instead of a drop. This is perfectly acceptable.		
Functional check of cabin heat system		
▲ Warning: Allow engine to cool down to 149°C (300°F) (CHT) before shutdown. Shut down the engine, set the ignition switch and the master switch to the off position. Remove ignition key from the aircraft.		
Check for fuel and exhaust odors in cabin	<input type="checkbox"/>	<input type="checkbox"/>
Check for fuel and oil leakage in engine compartment	<input type="checkbox"/>	<input type="checkbox"/>
Check function of orifice by turning fuel pump on/off and monitor fuel pressure bleed off in less than 3 sec.		

05-20.2.4 Airframe and Systems

<i>Inspection and/or Required Maintenance Checklist</i>	<i>100hour</i>	<i>Annual</i>	<i>Other Times</i>	<i>Chapter</i>	<i>Initials / Remarks</i>
0. Pre-inspection general check Look for obvious and visible damage to exterior of the aircraft	<input type="checkbox"/>	<input type="checkbox"/>		51-10.1	
Remove and open all access panels except the sealed fuel tank panels in lower wing	<input type="checkbox"/>	<input type="checkbox"/>		57/25	
Check all placards are present and in good condition	<input type="checkbox"/>	<input type="checkbox"/>		11-00.2	
The equipment present matches the list of installed equipment	<input type="checkbox"/>	<input type="checkbox"/>		W&B/logbook	
1. Flight Controls The controls move smoothly / without excess free-play or looseness/slop	<input type="checkbox"/>	<input type="checkbox"/>		N/A	
Pitch trim system functioning properly	<input type="checkbox"/>	<input type="checkbox"/>		27-30.2.1	
All push rods are correctly attached / secured	<input type="checkbox"/>	<input type="checkbox"/>		27-30	
All pivoting parts cleaned and checked	<input type="checkbox"/>	<input type="checkbox"/>		27-30	
Control stick stops (left / right) checked	<input type="checkbox"/>	<input type="checkbox"/>		27-10	
Control cables running smooth / taut / clean / undamaged in forward tunnel area/firewall	<input type="checkbox"/>	<input type="checkbox"/>		27-20	
Check the elevator pushrod/mid-fuselage pivot lever connection, trim system spring for unusual wear, security of the linear actuator, rudder cable pulleys.	<input type="checkbox"/>	<input type="checkbox"/>		27-30-3	
Check rudder centering spring for wear, condition	<input type="checkbox"/>	<input type="checkbox"/>		27-20-2	
All control surfaces are neutral when the stick or rudder pedals are centered	<input type="checkbox"/>	<input type="checkbox"/>		N/A	
All bolts and fasteners tight and secured	<input type="checkbox"/>	<input type="checkbox"/>		N/A	
2. Cabin and Instrument panel Door general condition, hinges secure	<input type="checkbox"/>	<input type="checkbox"/>		52	
Door latches and locks are functional	<input type="checkbox"/>	<input type="checkbox"/>		52	
Seats for condition, fore and aft adjustment latch mechanisms, latch springs and stops are fully functional	<input type="checkbox"/>	<input type="checkbox"/>		25-00.2.6	
Belts undamaged, inertia reel functioning	<input type="checkbox"/>	<input type="checkbox"/>		25	
Nav/Com, secured and functioning	<input type="checkbox"/>	<input type="checkbox"/>		23/34	
Audio Panel / Intercom, secured and functioning	<input type="checkbox"/>	<input type="checkbox"/>		23/34	
Transponder, secured and functioning	<input type="checkbox"/>	<input type="checkbox"/>		23/34	
GPS antennas secured	<input type="checkbox"/>	<input type="checkbox"/>		23	
Garmin G3X Displays, secured and functioning	<input type="checkbox"/>	<input type="checkbox"/>		23/24	
Flap and pitch trim indicators functioning properly	<input type="checkbox"/>	<input type="checkbox"/>		23	
Check wiring in cabin and control sticks for wear, connection and secured	<input type="checkbox"/>	<input type="checkbox"/>		25-002.3.3	

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<i>Inspection and/or Required Maintenance Checklist</i>	<i>100hour</i>	<i>Annual</i>	<i>Other Times</i>	<i>Chapter</i>	<i>Initials / Remarks</i>
Check heating system for leaks and function	<input type="checkbox"/>	<input type="checkbox"/>		21	
Fire extinguisher (Pouch and date)	<input type="checkbox"/>	<input type="checkbox"/>		26	
Perform the ELT Self-Test	<input type="checkbox"/>	<input type="checkbox"/>		ELT MM	
Perform AMSAFE ignitor system check	<input type="checkbox"/>	<input type="checkbox"/>		AMSAFE MM	
Instrument panels installed properly, undamaged	<input type="checkbox"/>	<input type="checkbox"/>		23	
Cockpit windows undamaged and clean	<input type="checkbox"/>	<input type="checkbox"/>		N/A	
Placards match flight manual	<input type="checkbox"/>	<input type="checkbox"/>		POH 2.23	
Placards for the recovery system are visible and legible	<input type="checkbox"/>	<input type="checkbox"/>		N/A	
Check condition of the parachute hatch	<input type="checkbox"/>	<input type="checkbox"/>		25-60.3.3	
3. Systems aft of cabin bulkhead	<input type="checkbox"/>	<input type="checkbox"/>		BRS MM	
Check the date scheduled for repack of parachute	<input type="checkbox"/>	<input type="checkbox"/>		BRS MM	
Check the date of scheduled rocket replacement	<input type="checkbox"/>	<input type="checkbox"/>		BRS MM	
Check the wiring behind cabin bulkhead for wear, connection and secured	<input type="checkbox"/>	<input type="checkbox"/>		25-00.2.4.3 24-00.2	
Check the header tank, fuel pumps and lines for fuel leaks	<input type="checkbox"/>	<input type="checkbox"/>		28	
Check the fuel balancer for function and secured mechanical connections and wiring	<input type="checkbox"/>	<input type="checkbox"/>		28	
Check the rudder cables for wear and clearance of other systems aft of the bulkhead/rear fuselage	<input type="checkbox"/>	<input type="checkbox"/>		27-20.2	
Inspect pitch trim system visually for wear and linear actuator for security of attachment	<input type="checkbox"/>	<input type="checkbox"/>		27-30.2.1	
Autopilot servos (roll and pitch) and linkage securely installed, make sure controls stop before servo arm and linkage go over center	<input type="checkbox"/>	<input type="checkbox"/>		27-10-2.1 27-30-2.3	
Static port lines secured and routed correctly	<input type="checkbox"/>	<input type="checkbox"/>		34.20	
Check and clean water drain holes in fuselage	<input type="checkbox"/>	<input type="checkbox"/>		53-00.3	
Brake reservoir fluid sufficient, line secured	<input type="checkbox"/>	<input type="checkbox"/>		53-00.3	
Check ELT mount, battery, antenna connection	<input type="checkbox"/>	<input type="checkbox"/>		32-40	
4. Horizontal tail, elevator and rudder	<input type="checkbox"/>	<input type="checkbox"/>		25-62	
Horizontal tail safely attached, free of excess play	<input type="checkbox"/>	<input type="checkbox"/>		25-62	
Hinges of the elevator pivoting smoothly, pivot bolts able to rotate and secured with cotter pins	<input type="checkbox"/>	<input type="checkbox"/>		55-10	
Remove Beaver tail fairing, inspect elevator pushrod connection and reinstall	<input type="checkbox"/>	<input type="checkbox"/>		55-20	
Hinges of the rudder pivot smoothly, pivot bolts able to rotate, secured with cotter pins. Rudder cable connections able to rotate and securely attached	<input type="checkbox"/>	<input type="checkbox"/>		55-20	
5. Landing Gear and Brakes	<input type="checkbox"/>	<input type="checkbox"/>		55-40	
Nose gear bearing (upper / lower) free of excess play	<input type="checkbox"/>	<input type="checkbox"/>		55-40	
Nose gear urethane suspension functioning and does not clunk (push on tail and release to check)	<input type="checkbox"/>	<input type="checkbox"/>		32-10	

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<i>Inspection and/or Required Maintenance Checklist</i>	<i>100hour</i>	<i>Annual</i>	<i>Other Times</i>	<i>Chapter</i>	<i>Initials / Remarks</i>
Remove main LDG cover and inspect attachment	<input type="checkbox"/>	<input type="checkbox"/>		32-20	
Main landing gear strut free of cracks, and safely attached to the main gear brackets	<input type="checkbox"/>	<input type="checkbox"/>		32-10.3.5	
Brake system free of leaks, pads and disks within manufacturer tolerances, fluid level OK	<input type="checkbox"/>	<input type="checkbox"/>		32-10.3.6	
Wheel bearings running smooth, free of excessive play, cotter pin secure	<input type="checkbox"/>	<input type="checkbox"/>		32-40	
Wheel axles are securely attached, unbent.	<input type="checkbox"/>	<input type="checkbox"/>		32-10.3.2	
Wheels undamaged, tire tread, air pressure OK	<input type="checkbox"/>	<input type="checkbox"/>		32-10.3.2	
Gear fairings properly installed and undamaged (if applicable)	<input type="checkbox"/>	<input type="checkbox"/>		32-10.3.2	
6. Wings Check fore-aft play of wing attachment (6mm max at wingtip)	<input type="checkbox"/>	<input type="checkbox"/>		32-10.3.2	
Hinges of ailerons pivoting smoothly, pivot bolts able to rotate and secured with cotter pins	<input type="checkbox"/>	<input type="checkbox"/>		57-00.3.2	
Flap Center pivot and inner/outer flap tracks secured and rollers lubricated with grease	<input type="checkbox"/>	<input type="checkbox"/>		57-52.3	
Pitot hoses and wiring undamaged and secured	<input type="checkbox"/>	<input type="checkbox"/>		57-51.3	
Aileron connection / bellcrank bearing secure, free of excess play	<input type="checkbox"/>	<input type="checkbox"/>		34.20	
Flap linear actuator attached properly, functioning properly, free of excess play	<input type="checkbox"/>	<input type="checkbox"/>		57-52-5	
Check position lights and strobes for function	<input type="checkbox"/>	<input type="checkbox"/>		27-50-2 57-51.2	
Check wingtip tank vents for blockage and staining	<input type="checkbox"/>	<input type="checkbox"/>		33-40.3.2.2	
All inspection covers properly reinstalled	<input type="checkbox"/>	<input type="checkbox"/>		28-00-3 33-40-2b	

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05-20.2.5 Engine and Subsystems

The engine maintenance is done according to the ROTAX Maintenance Manual (latest Revision) for the ROTAX 912iS Sport. Following additional maintenance procedures have to be performed.

<i>Inspection and/or Required Maintenance Checklist</i>	<i>100hour</i>	<i>Annual</i>	<i>Other Times</i>	<i>Chapter</i>	<i>Initials / Remarks</i>
0. Remove upper and lower cowlings, place on a padded location to avoid damaging the paint Note: you need to: - unlock and release the radiator from its fixation - unlock and release the oil cooler from its fixation - disconnect the APTS sensor	<input type="checkbox"/>	<input type="checkbox"/>		71-00.3.1	
1. Engine mount Engine mount bolts to firewall tight and secured	<input type="checkbox"/>	<input type="checkbox"/>		71-00.3.2	
Engine to engine-mount bolts tight and secured	<input type="checkbox"/>	<input type="checkbox"/>		71-00.3.2	
Engine mounts free of cracks and rubber isolators not heat cracked or hardened	<input type="checkbox"/>	<input type="checkbox"/>		71-00.3.2.3	
2. Exhaust system Inspect exhaust manifold pipes for cracks proper attachment and excessive blow-by	<input type="checkbox"/>	<input type="checkbox"/>		78-00.3.2	
Springs for muffler attachment installed and coated with Hi Temp RTV	<input type="checkbox"/>	<input type="checkbox"/>		78-00.3.2	
Inspect muffler can for cracks	<input type="checkbox"/>	<input type="checkbox"/>		78-00.3.2	
Exhaust-pipe, check attachment, look for cracks	<input type="checkbox"/>	<input type="checkbox"/>		78-00.3.2	
3. Throttle system Throttle cable runs smoothly and is undamaged. Condition of cable housing, throttle-body lever	<input type="checkbox"/>	<input type="checkbox"/>		76-00.3.1	
Throttle/brake lever assembly moves smoothly	<input type="checkbox"/>	<input type="checkbox"/>		76-00.3.1	
Throttle lever friction system functioning	<input type="checkbox"/>	<input type="checkbox"/>		76-00.3.1	
4. Electrical systems in the engine compartment All harnesses and connectors in good condition secured and tightly connected	<input type="checkbox"/>	<input type="checkbox"/>		N/A	
Cover of the 912iS fuse box tight and sealed	<input type="checkbox"/>	<input type="checkbox"/>		Rotax 912iS LMM	
5. Intake system Intake air scat tubing undamaged and connected	<input type="checkbox"/>	<input type="checkbox"/>		71-00.3.3.1	
Air filter element installed properly	<input type="checkbox"/>	<input type="checkbox"/>		71-00.3.3.3	
Clean and oil air filter or exchange if needed	<input type="checkbox"/>	<input type="checkbox"/>		K&N MM	
Alternate air valve functioning	<input type="checkbox"/>	<input type="checkbox"/>		71-00.3.3.1	
6. Fuel system All fuel lines in engine compartment securely attached, no leaks, heat damage or chafing, inspect ends of fire sleeves	<input type="checkbox"/>	<input type="checkbox"/>		N/A	
Remove and clean the gascolator filter at first 25 hours, 100 or annually thereafter	<input type="checkbox"/>	<input type="checkbox"/>		28-00	

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<i>Inspection and/or Required Maintenance Checklist</i>	<i>100hour</i>	<i>Annual</i>	<i>Other Times</i>	<i>Chapter</i>	<i>Initials / Remarks</i>
Check connection of the fuel vent line, look for any excess fuel in the line.	<input type="checkbox"/>	<input type="checkbox"/>		28-00.3.1	
Open the maintenance fuel shut-off valves in the feeder lines of the header tank and secure them with safety-wire.	<input type="checkbox"/>	<input type="checkbox"/>		75-00.3.1 79-00.3.1	
Fuel tank caps seal properly, no stains or leaks	<input type="checkbox"/>	<input type="checkbox"/>		75-00.3.1	
8. Heating/Ventilation System Check all SCAT tubing for wear and attachment	<input type="checkbox"/>	<input type="checkbox"/>		21-00.3.1	
9. Propeller	<input type="checkbox"/>	<input type="checkbox"/>		61-00.3 propeller MM	
Propeller undamaged, no cracks	<input type="checkbox"/>	<input type="checkbox"/>		61-00.3	
Propeller bolts tight and secured (check prop manual for correct torque)	<input type="checkbox"/>	<input type="checkbox"/>		61-00.3	
Positive clearance propeller / spinner / cowling	<input type="checkbox"/>	<input type="checkbox"/>		N/A	
Spinner undamaged, screws tight	<input type="checkbox"/>	<input type="checkbox"/>		N/A	
10. Cowling No cracks in cowling, oil access hatch ok	<input type="checkbox"/>	<input type="checkbox"/>		71-00.3	
Access hatch for external power OK	<input type="checkbox"/>	<input type="checkbox"/>		71-00.3	
Cowling attachments (camlocks and brackets) OK	<input type="checkbox"/>	<input type="checkbox"/>		71-00.3	
Main inlet clear and undamaged	<input type="checkbox"/>	<input type="checkbox"/>		N/A	
Engine air inlet free of cracks, hoses properly attached	<input type="checkbox"/>	<input type="checkbox"/>		N/A	
Coolers safely attached to inlet	<input type="checkbox"/>	<input type="checkbox"/>		71-00.3	
Check water drains in air inlet	<input type="checkbox"/>	<input type="checkbox"/>		71-00.3	
Seals between coolers and cowling tight	<input type="checkbox"/>	<input type="checkbox"/>		71-00.3	
Check LED Landing light for damage, inspect light wiring and plugs for wear or heat damage	<input type="checkbox"/>	<input type="checkbox"/>			
<p>All service items required by Service Notifications, Service Bulletins, Safety Alerts and Airworthiness Directives and all prescribed scheduled maintenance checks are successfully accomplished. The aircraft is airworthy and meets the condition specified in the aircraft data sheet.</p> <p>Service station: _____ Next inspection when _____ hours of operation has been reached. Place, Date _____</p> <p>Name, signature of mechanic _____ Name, signature of inspector _____ stamp _____</p>					

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05-20.3 Flight-Line Check

05-20.3.1 General

The flight-line checks include the pre-flight and post-flight checks. Do these checks each day the airplane is used.

05-20.3.2 Pre-Flight Check

Perform all Preflight Inspection items as defined in the aircraft POH before the first flight of the day to make sure that the general condition of the airplane and of the engine is good. It is important for flight safety. Look in the airplane logbook for problems before doing the pre-flight check.

▲ **Warning:** Do all the steps of the pre-flight check carefully. Accidents can occur if the pre-flight check is not done correctly.

05-20.3.3 Post-Flight Check

Re-do all Preflight Inspection items as defined in the aircraft POH after the last flight of the day.

You shall also:

- Refuel the airplane (Section 12-10.2.1).
- Record in the logbook each problem found in flight and during the post-flight check.

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SECTION 05-30 – UNSCHEDULED MAINTENANCE CHECK

Please contact the aircraft manufacturer for further instructions.

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CHAPTER 06 – DIMENSIONS

Contents

06-00.1	General
06-00.2	Dimensions
06-00.3	Three-View Drawing

06-00.1 General

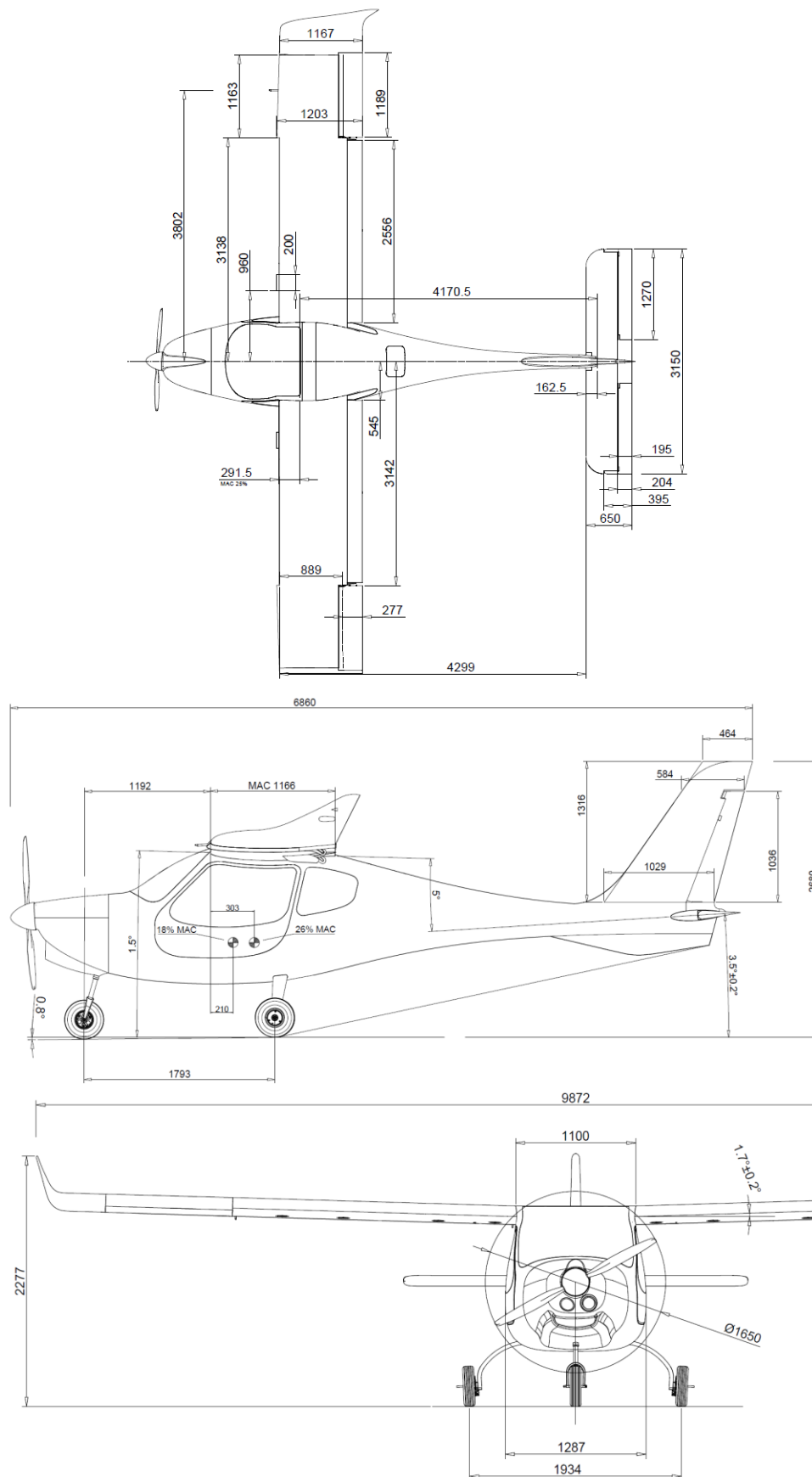
In this chapter, you can find the information on the airplane main dimensions and the three-view drawing of the F2-LSA. All dimensions shown below are approximate.

06-00.2 Dimensions

<i>General</i>		
Length	6880 mm	22,57 ft
Height	2680 mm	8,79 ft
Wing span	9872 mm	32,39 ft
<i>Areas</i>		
Wing	11.32 m ²	118.4 sq. ft
Stabilizer	1.41 m ²	15.17 sq. ft
Elevator	0.6m ²	6.45 sq. ft
Vertical tail	0.8 m ²	8.6sq. ft
Rudder	1.21 m ²	13.02 sq. ft
<i>Aspect Ratios</i>		
Wing	8.54	
Stabilator	4.8	

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06-00.3 Three-View Drawing



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CHAPTER 07 – JACKING

Contents

07-00.1	General
07-00.2	Jacking

07-00.1 General

This chapter provides instructions for the jacking of the aircraft.

▲ **Warning:** Take particular care when jacking the complete aircraft. The fuselage is a delicate, light-weight composite sandwich structure. Distribute any load not specifically on the specified jacking points over a large area and ensure that the aircraft cannot roll to the side (for example, after removing the main gear).

07-00.2 Jacking

07-00.2.1.1 Type of Maintenance

Line

07-00.2.1.2 Minimum Level of Certification

Pilot/Owner

07-00.2.1.3 Procedure

A. Recommended Special Tools and Parts

<i>Item</i>	<i>Quantity</i>	<i>Unit</i>
None		

B. Jacking of the main wheel

<i>Step</i>	<i>Action</i>	<i>Reference</i>
1	Secure the airplane against inadvertent rolling by applying the parking brake and positioning chocks under the wheels which are on the ground.	
2	Remove the wheel fairing.	32-10.3.1
3	Brace the airplane in the wing in the area of the stiffened rib where aileron/flap brackets are installed and lift the wing slightly.	
4	Place the jack or block under the under the bottom an undercarriage.	
5	Remove the wheel.	32-10.3.2

C. Jacking of the nose wheel

<i>Step</i>	<i>Action</i>	<i>Reference</i>
1	Secure the airplane against inadvertent rolling by applying the parking brake and positioning chocks on the main wheels.	
2	Detach the nose wheel fairing. Lift up and secure with a suitable rope or strap.	32-20.3.2
3	Hold the tail down until the nose wheel is free. Place the jack with a padded plate or block or under the fuselage belly right under the firewall.	
4	Remove the wheel.	32-20.3.1

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CHAPTER 08 – WEIGHING AND LEVELING

Contents

08-00.1	General
08-00.2	Weighing and Leveling

08-00.1 General

This chapter provides you with information on how to weigh and level this airplane.

08-00.2 Weighing and Leveling

08-00.2.1.1 Type of Maintenance

Line

08-00.2.1.2 Minimum Level of Certification

LSA- Mechanic (LSRM)

08-00.2.1.3 Procedure

A. Recommended Special Tools and Parts

<i>Item</i>	<i>Quantity</i>	<i>Unit</i>
Scale	3	pcs
Digital level	1	pcs

B. Weighing

<i>Step</i>	<i>Action</i>	<i>Reference</i>
1	Set the airplane in position with the parking brake or chocks.	
2	Make sure that all of the aircraft equipment is installed in the proper location.	
3	Clean the aircraft, remove foreign objects.	
4	De-fuel aircraft except for unusable fuel.	12-10.2.1
5	Fill the engine operating fluids (oil, coolant) and brake fluid.	12-10.2.4 12-10.2.5
6	Move the seats to the most forward position.	
7	Retract flaps completely.	
8	Set all control surfaces in a neutral position.	
9	Put the airplane on a level space on three scales or one scale with leveling blocks.	
10	Make sure that the plane is leveled using a digital level on the central tunnel between the seats.	

C. Leveling

<i>Step</i>	<i>Action</i>	<i>Reference</i>
1	Set the airplane in position with the parking brake or chocks	
2	Make sure that the plane is leveled in a longitudinal direction using a digital level on the tunnel between the seats.	
3	Make sure that the airplane is leveled in transverse direction using a digital level put onto the fuselage roof above the spar box.	

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CHAPTER 09 – TOWING AND TAXIING

Contents

09-00.1	General
09-00.2	Description
09-00.3	Placards and Markings
09-00.4	Maintenance Practices
09-00.4.1	Towing
09-00.4.2	Markings Installation

09-00.1 General

This chapter provides you with information on how to weight and level an airplane.

09-00.2 Description

The aircraft is equipped with a standard Tow Bar connection, there are two protruded pins attached to the nose gear leg. The tow bar is attached to these pins. The tow bar attachment size fits one of the most common tow bars that also fit most Cessna aircraft models. Do not tow the aircraft using a power tug. See Fig. 09-00-1.

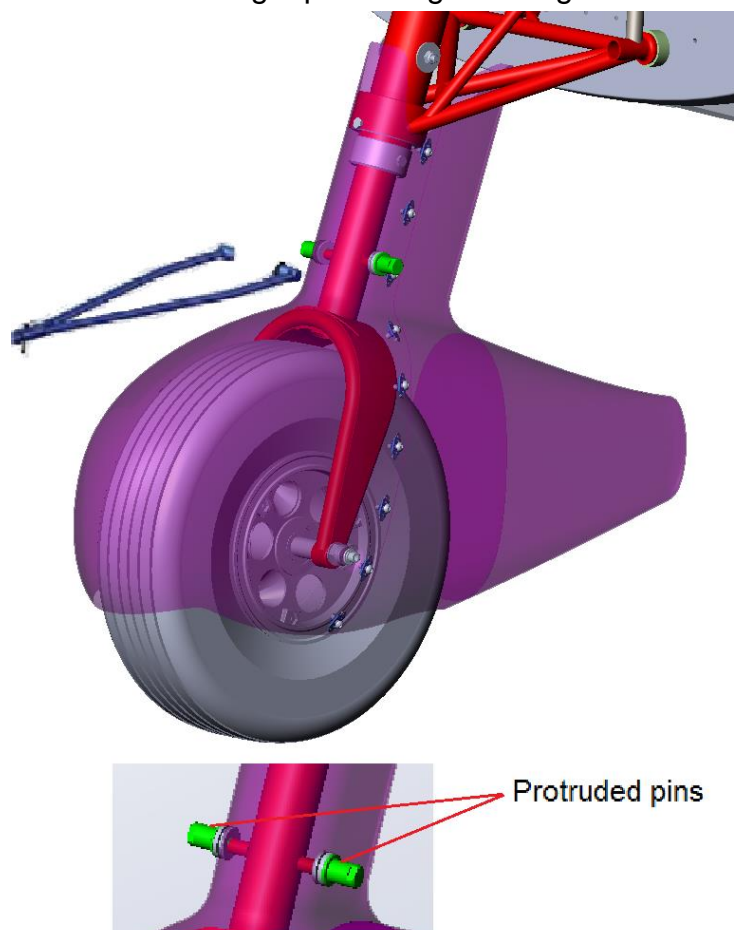


Fig. 09-00-1

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09-00.3 Placards and Markings

The tow bar may only be used when the following markings are present on the aircraft (Fig. 09-00-2). Markings must match with the rudder control system stop adjustment.

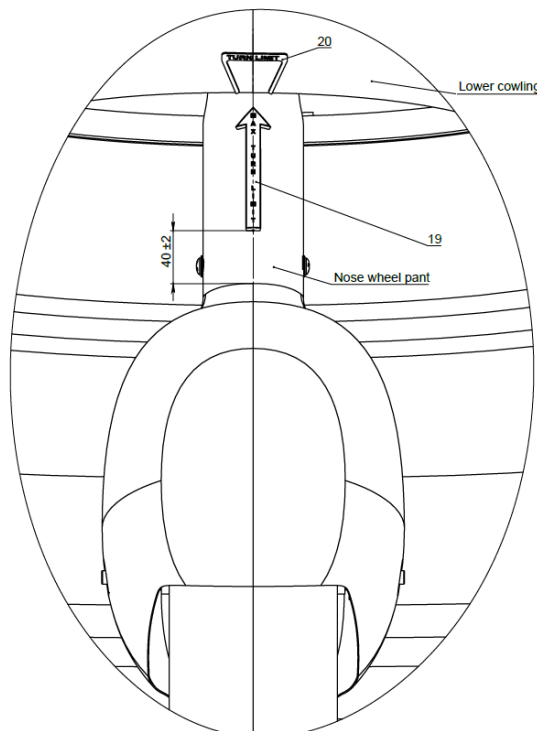


Fig. 09-00-2

Marking "Turn Limit" (item 20) on the cowling mark the maximum deflection obtainable with the nose gear.

Marking "Max Turn Limit" (item 19) on the nose wheel fairing marks the center reference line of the nose wheel and provides the steering position. This marking is in line with the tow bar towing direction, when attached (Fig. 09-00-3).

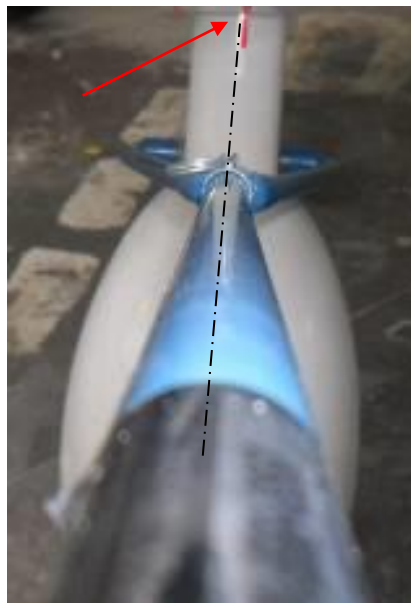


Fig. 09-00-3

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09-00.4 Maintenance Practices

09-00.4.1 Towing

09-00.4.1.1 Type of Maintenance

Line

09-00.4.1.2 Minimum Level of Certification

Pilot/Owner

09-00.4.1.3 Procedure

A. Recommended Special Tools and Parts

<i>Item</i>	<i>Quantity</i>	<i>Unit</i>
Towing bar	1	pc

B. Towing

<i>Step</i>	<i>Action</i>	<i>Reference</i>
1	To attach the tow bar to the towing pins, follow the instructions of the individual towing bar design. Make sure the towing bar dimensions properly match the towing pins.	
2	When the tow bar is attached to the nose gear, the aircraft can be easily moved by hand. You should always pull or slow down with the tow bar. Avoid pulling on the propeller blades to avoid damaging the propeller.	
3	To steer the aircraft while pulling, move the tow bar to the sides. The range of steering is limited by the stops of the rudder control system. Marking "Turn Limit" on the lower cowling show the allowed range of steering. Marking "Max Turn Limits" (arrow) on the nose gear fairing must always stay in between the two lines on the cowling.	

▲ **Warning:** The tow bar has a long arm. When you steer with the tow bar, you can bring high force to the nose gear steering mechanism. When you try to steer more than is possible by the rudder control system stops, you can easily damage the rudder control system. Therefore, always stay within the area indicated by the red lines on the cowling.

▲ **Warning:** Do not use power tugs! The tow bar interface is designed to support towing by hand, only. Usage of power tugs provides a high risk to damage the rudder control system stops.

09-00.4.2 Markings Installation

09-00.4.2.1 Type of Maintenance

Line

09-00.4.2.2 Minimum Level of Certification

Pilot/Owner

09-00.4.2.3 Procedure

A. Recommended Special Tools and Parts

<i>Item</i>	<i>Quantity</i>	<i>Unit</i>
None		

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B. Markings Installation

When cowlings and/or nose wheel fairing has been replaced, or when the markings do not match with the actual adjustment of the rudder control system stops, or when the existing markings are damaged and unusable, new markings must be applied as follows.

Step	Action	Reference
1	Prepare markings "Turn Limit" and "Max Turn Limit".	
2	Mark the center of the nose landing gear fairing. This marking must align with the tow bar (Fig. 09-00-4).	
3	Carefully turn the nose landing gear to the left, up to the stop. Mark this position on the cowlings with the tape. This marking must align with the center mark on the nose wheel fairing (Fig. 09-00-5).	
4	Do this for the right side (Fig. 09-00-6).	
5	Check the correctness of the markings: carefully turn the nose landing gear, looking along the tow bar and using the center marking on the nose wheel fairing. If the markings on the fairing and on the cowlings align and the nose landing gear reaches the stops, then the markings are done correctly. The stops shall never be reached before the markings line up. It is acceptable when the markings line up just before the stop is reached.	

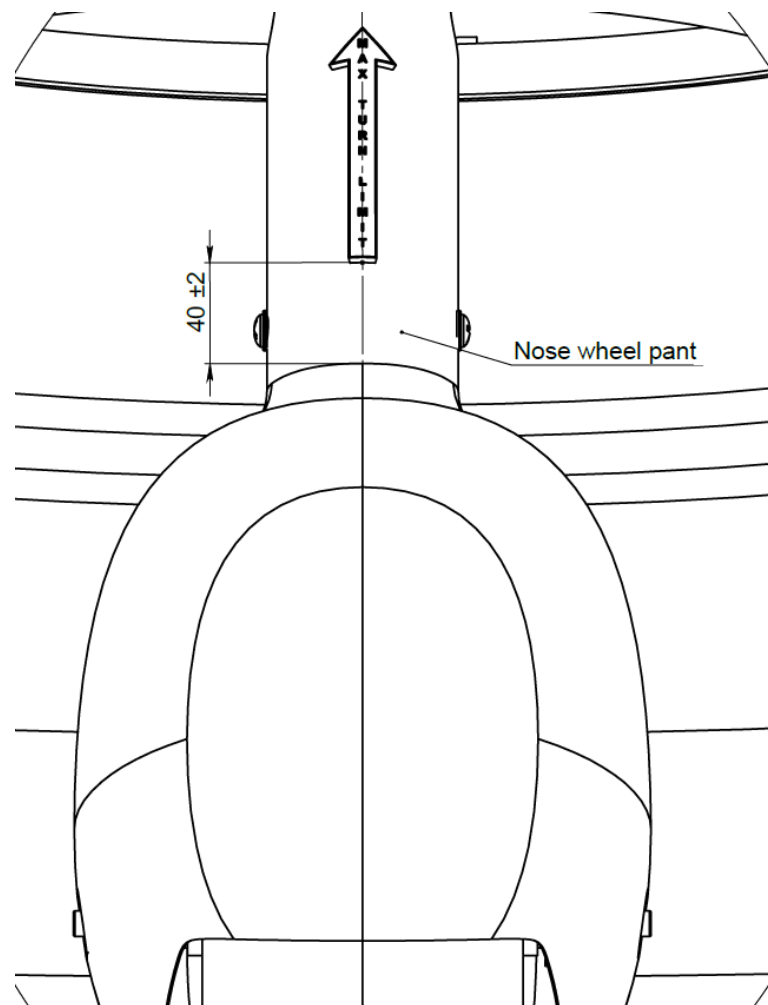


Fig. 09-00-4

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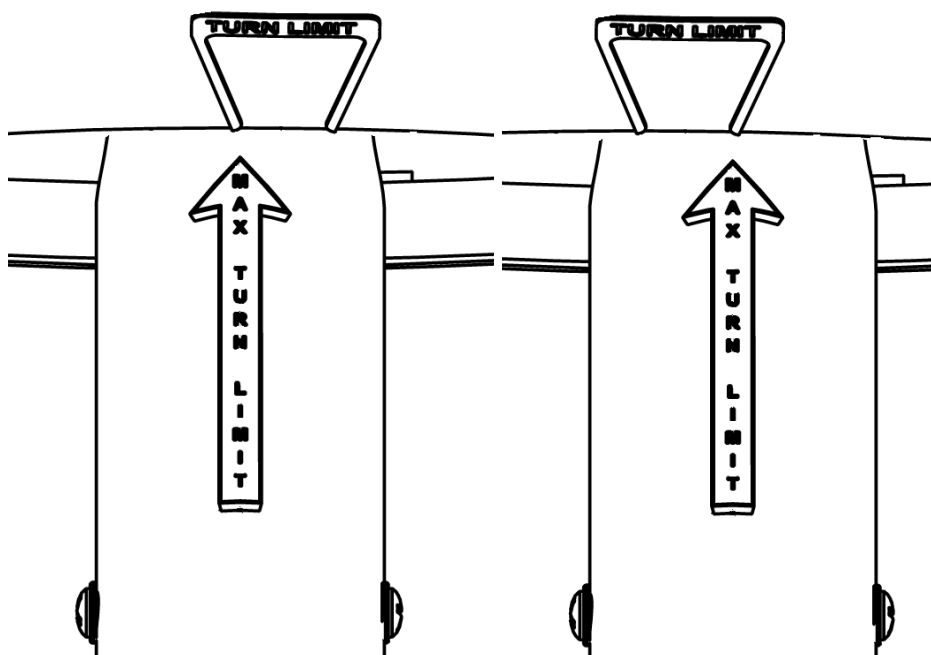


Fig. 09-00-5

Fig. 09-00-6

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CHAPTER 11 – PLACARDS AND MARKINGS

Contents

- 11-00.1 General
- 11-00.2 Placards and Markings

11-00.1 General

This chapter provides you with information about exterior and interior placards and markings.

11-00.2 Placards and Markings






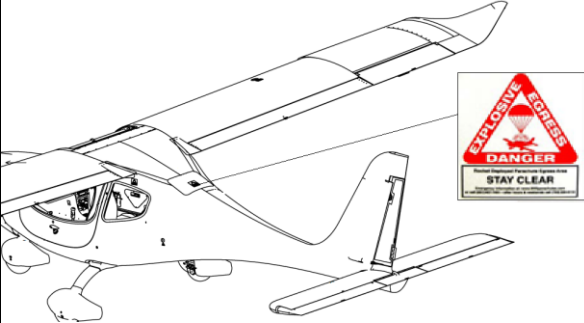
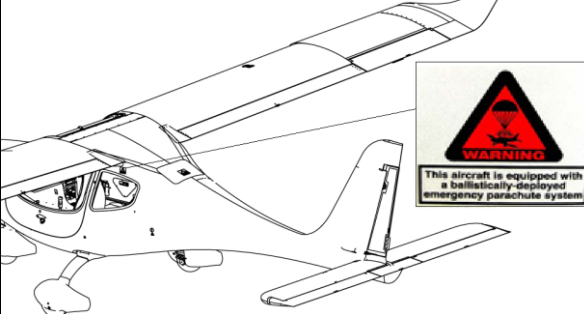
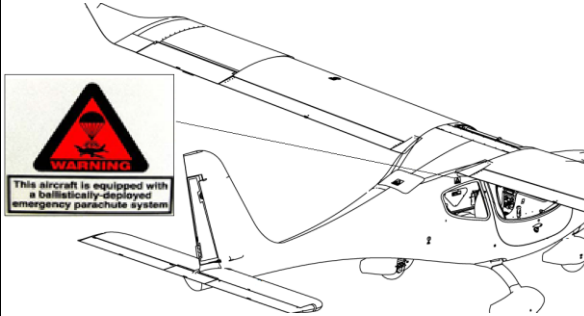

The aircraft is equipped with the following markings and placards:

Item	Location
Warning	<div data-bbox="467 763 1048 927"> <p>FIRE EXTINGUISHER LOCATED ON BACK OF CO-PILOT'S SEAT</p> <p>The markings and placards in this airplane contain operation limitations that must be complied with other operation limitations contained in the Airplane Flight Manual.</p> <p>No acrobatic and intentional spins maneuvers approved, except those listed in the Pilot's Operating Handbook. Maneuvering speed (VA) 103KIAS</p> <p>APPROVED FOR DAY - VFR</p> </div> <div data-bbox="467 938 1048 1043"> <p>This aircraft was manufactured in accordance with Light Sport Aircraft airworthiness standards and does not conform to standard category airworthiness requirements</p> </div>
Fuel grade	<div data-bbox="515 1066 1000 1350"> <p>APPROVED FUEL TYPES AND QUANTITY</p> <p>MOGAS min RON95/AKI91</p> <p>Approved type see AFM</p> <p>MAX Ethanol content 10%</p> <p>AVGAS</p> <p>AVGAS 100LL ASTM D910</p> <p>62,5LTR(16,5 GAL) total usable</p> <p>-per side-</p> </div>
Oil grade	<div data-bbox="636 1373 879 1518"> <p>OIL 15W40</p> <p>AEROSHELL PLUS 4</p> <p>REFER TO AFM</p> </div>
Baggage payload	<div data-bbox="515 1541 1000 1641"> <p>MAX BAGGAGE 40kg (88lb)</p> <p>ONLY WITH BAGGAGE NET</p> </div>
Warning	<div data-bbox="467 1664 1048 1731"> <p>Seat must be locked in position before flight</p> </div> <div data-bbox="579 1742 936 1854"> <p>UP ← SEAT → DOWN</p> </div>







These placards markings are required minimum and are listed in the POH in Section 2 – Limitations.

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The following additional placards are applied:

Engine operation		Adjacent to the relevant control
Cabin heat		On the relevant knob
Brakes		Adjacent to brake lever and park brake valve
Door lock		Adjacent to the door lock handles
No push		On the elevator, aileron, flap, rudder
"DANGER" sticker		Centered on egress panel on top of aircraft.
"WARNING" sticker		On left hand side of aircraft above the window of the luggage compartment
"WARNING" sticker		On right hand side of aircraft above the window of the luggage compartment
"DANGER" sticker		On the tip of the rocket

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"WARNING" sticker		On the rocket launch tube
<p>Component information and limitation stating at minimum:</p> <ul style="list-style-type: none"> Manufacturer's information Part number and revision Serial number Date of Manufacture Service Interval Date Valid for the component where it is attached to. 	<p>Example for the launch tube:</p>  <p>Example for the parachute canister:</p> 	<p>One each per:</p> <ul style="list-style-type: none"> Parachute container Rocket launch tube
"WARNING" sticker	<div style="border: 1px solid black; padding: 10px; text-align: center;"> <p>WARNING</p> <p>USE FOR EXTREME EMERGENCES ONLY SEAT BELT AND SHOULDER HARNESS MUST BE WORN AT ALL TIMES USE OF THIS DEVICE COULD RESULT IN INJURY OR DEATH</p> <p>NO STORAGE AREA</p> <hr/> <p>MAXIMUM DEMONSTRATED DEPLOYMENT SPEED 141 KIAS</p> <hr/> <p>FLIGHT DESIGN AIRFRAME PARACHUTE SYSTEM ACTIVATION PROCEDURE</p> <ol style="list-style-type: none"> 1. THROTTLE.....IDLE 2. IGNITION.....OFF 3. RELEASE COVER.....REMOVE 4. ACTIVATION HANDLE.....STEADY PULL 5. DECLARE EMERGENCY.....MAYDAY MAYDAY 6. BATTERIE.....OFF 7. GENERATOR.....OFF 8. SAFETY BELTS.....TIGHTEN 9. GROUND IMPACT.....BRACE UPRIGHT </div>	On the underside of the center panel
"WARNING" sticker		On right panel
Brake fluid		Near with a brake fluid reservoir
Coolant		On an overflow bottle of cooling system

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CHAPTER 12 – SERVICING

Contents

12-00.1 General

SECTION 12-10 – REPLENISHING

12-10.1 General

12-10.2 Replenishing Practices

12-10.2.1 Refueling and Defueling

12-10.2.2 Fuel Contamination Test

12-10.2.3 Fuel Flow Rate Check

12-10.2.4 Replenishing of Engine Oil

12-10.2.5 Oil Changing

12-10.2.6 Replenishing of Coolant

12-10.2.7 Coolant Changing

12-10.2.8 Replenishing of Brake Fluid

12-10.2.9 Tire Inflation

SECTION 12-20 – SCHEDULED SERVICING

12-20.1 General

12-20.2 Lubrication Chart

SECTION 12-30 – UNSCHEDULED SERVICING

12-30.1 General

12-30.2 Cleaning of the Basic Airframe and Wing Structure

12-30.3 Cleaning of the Windshield and Side Windows

12-30.4 Cleaning of the Engine and Engine Compartment

12-30.5 Interior Cleaning

12-30.6 Ice and Snow Removal

12-00.1 General

The procedures described in this chapter are important for correct servicing of aircraft.

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SECTION 12-10 – REPLENISHING

12-10.1 General

This section provides instructions concerning replenishing procedures.

12-10.2 Replenishing Practices

12-10.2.1 Refueling and Defueling

Fuel content: 130 l (34 Gal.) ½ in each tank

Maximum Usable fuel: 124,3 l

12-10.2.1.1 Type of Maintenance

Line

12-10.2.1.2 Minimum Level of Certification

Pilot/Owner

12-10.2.1.3 Procedure

A. Recommended Special Tools and Parts

<i>Item</i>	<i>Quantity</i>	<i>Unit</i>
None		

B. Refueling

<i>Step</i>	<i>Action</i>	<i>Reference</i>
1	Turn the engine off.	
2	Set parking brake	
3	Remove the filler cap situated on the upper surface of wing skin.	
4	Fill the fuel tank with fuel	
5	Install the fuel filler cap	
6	Do steps 3-5 for the other wing	

C. Defueling

<i>Step</i>	<i>Action</i>	<i>Reference</i>
1	Turn the engine off.	
2	Set parking brake	
3	Put a container below the gascolator drain valve.	
4	Open the gascolator drain valve. Drain all accessible fuel from the tanks.	
5	Close the gascolator drain valve.	

12-10.2.2 Fuel Contamination Test

12-10.2.2.1 Type of Maintenance

Line

12-10.2.2.2 Minimum Level of Certification

Pilot/Owner

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12-10.2.2.3 Procedure

A. Recommended Special Tools and Parts

<i>Item</i>	<i>Quantity</i>	<i>Unit</i>
Transparent fuel tester	1	pcs

B. Fuel Contamination Test

Do this test each day you operate the airplane.

<i>Step</i>	<i>Action</i>	<i>Reference</i>
1	Put the fuel tester under the wing tank drain or gascolator drain valve.	
2	Open the drain valve.	
3	When the container is half full, close the drain valve.	
4	Let the fuel in the glass container stand for 1 minute.	
5	Examine the fuel. Look for small drops of water in the bottom of glass container. Look for small particles of solid material.	
6	If you find any contamination of the fuel you must do the test again.	12-10.2.1

C. Troubleshooting.

If you find any contamination of the fuel you must do the following:

<i>Step</i>	<i>Action</i>	<i>Reference</i>
1	Repeat the fuel contamination test.	
2	If you still find contamination after three tests, drain the fuel tank.	12-10.2.1
3	Flush the tank and fill it with clean fuel.	12-10.2.1

12-10.2.4 Replenishing of Engine Oil

Quality automotive type motor oil as specified by the Rotax Handbook or the most recent Rotax service notice has to be used. The engine is not approved for aircraft motor oil.

Oil capacity: 2 l min ... 3 l max

Oil Specification: Refer to Chapter 10 of the Rotax Operator's Manual applicable for your engine.
Do not use oil additives.

▲ Warning: Engine operation with no engine oil (or very low oil level) will cause engine malfunction or failure.

12-10.2.4.1 Type of Maintenance

Line

12-10.2.4.2 Minimum Level of Certification

Pilot/Owner

12-10.2.4.3 Procedure

A. Recommended Special Tools and Parts

<i>Item</i>	<i>Quantity</i>	<i>Unit</i>
None		

B. Replenishing of Engine Oil

<i>Step</i>	<i>Action</i>	<i>Reference</i>
1	Open the inspection hatch in the top cowling.	

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2	Remove the small filler cap.	
3	Get the dip stick from the oil tank.	
4	Clean the oil dip stick.	
5	Stick the dip stick into the oil tank.	
5	Remove the deep stick and read the oil contents from dip stick.	
6	If necessary, add oil to the tank to bring the system to the correct level.	
7	Dip the oil tank with the stick and confirm proper level. Reinstall the filler cap.	
8	Close the inspection hatch in the top cowling.	

12-10.2.5 Oil Changing

12-10.2.5.1 Type of Maintenance

Line

12-10.2.5.2 Minimum Level of Certification

LSA- Mechanic (LSRM)

12-10.2.5.3 Procedure

A. Recommended Special Tools and Parts

<i>Item</i>	<i>Quantity</i>	<i>Unit</i>
None		

B. Oil Changing. Must be done according to Rotax procedure to avoid damage.

- **Caution:** Flight Design herewith approves all publications, modifications and updates released by ROTAX.

12-10.2.6 Replenishing of Coolant

Cooling fluid in accordance with the ROTAX® Engine Operation Manual has to be selected.

Attention: different types of coolants cannot be mixed! If in doubt, drain the complete contents of the cooling system and replace completely with a new coolant of one approved type.

- ▲ **Warning:** Engine operation with no coolant (or very low coolant level) will cause engine malfunction or failure.

12-10.2.6.1 Type of Maintenance

Line

12-10.2.6.2 Minimum Level of Certification

Pilot/Owner

12-10.2.6.3 Procedure

A. Recommended Special Tools and Parts

<i>Item</i>	<i>Quantity</i>	<i>Unit</i>
None		

B. Replenishing of Engine coolant

<i>Step</i>	<i>Action</i>	<i>Reference</i>
1	Prepare coolant mixture in accordance with ROTAX® Operation Manual	

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2	Remove the cowlings	71-00.3.1
3	Fill the coolant system through the expansion tank in accordance with ROTAX® Operation Manual	
4	Conduct engine run	
5	Check coolant level and refill when necessary in accordance with ROTAX® Operation Manual	
6	Install the cowlings.	71-00.3.1

12-10.2.7 Coolant Changing

Cooling fluid in accordance with the ROTAX® Engine Operation Manual has to be selected.

Attention: different types of coolants cannot be mixed! If in doubt, drain the complete contents of the cooling system and replace completely with new coolant of one type.

▲ Warning: Engine operation with no coolant (or very low coolant level) will cause engine malfunction or failure.

12-10.2.7.1 Type of Maintenance

Line

12-10.2.7.2 Minimum Level of Certification

LSA- Mechanic (LSRM)

12-10.2.7.3 Procedure

A. Recommended Special Tools and Parts

<i>Item</i>	<i>Quantity</i>	<i>Unit</i>
None		

B. Coolant Changing

<i>Step</i>	<i>Action</i>	<i>Reference</i>
1	Prepare coolant mixture in accordance with ROTAX® Operation Manual	
2	Remove the cowlings	71-00.3.1
3	Disconnect the system in any lowest point	
4	Drain the coolant to any suitable container	
5	Connect disconnected hoses.	
6	Fill the coolant system through the expansion tank in accordance with ROTAX® Operation Manual	
7	Conduct engine run in accordance with ROTAX® Operation Manual	
8	Let the engine cool down. Check coolant level and refill if necessary, in accordance with ROTAX® Operation Manual	
9	Check for leaks.	
10	Install the cowlings.	71-00.3.1

12-10.2.8 Replenishing of Brake Fluid

Braking fluid: Aeroshell Fluid 41 MIL-H-5606 Brake Fluid

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12-10.2.8.1 Type of Maintenance

Line

12-10.2.8.2 Minimum Level of Certification

LSA- Mechanic (LSRM)

12-10.2.8.3 Procedure

A. Recommended Special Tools and Parts

<i>Item</i>	<i>Quantity</i>	<i>Unit</i>
None		

B. Replenishing of Brake Fluid

<i>Step</i>	<i>Action</i>	<i>Reference</i>
1	Visually check the system for integrity and signs of leaks	
2	Make sure the brake control handle is in most forward position.	
3	Make sure the aircraft is not set on parking brake	
4	Place a suitable canister under the expansion tank to collect brake fluid in case of overfilling	
5	Using a piece of tube (6x4 nylon tube) connect a 0.35 pint / 200 ml syringe filled with brake fluid without air bubbles.	
6	Screw in the connector A (Fig. 12-10.1).	
7	Move the brake control handle back and forth 5 to 8 times. Note if there are air bubbles in the line close to the caliper.	
8	Unscrew the connector A 1 to 2 turns (Fig. 12-10.1).	
9	Add more brake fluid enough to eliminate air bubbles nearby the caliper	
10	Repeat operations 6 through 9 until full elimination of air in the caliper with pads pushed out against the disk.	
11	Screw in the connector A (Fig. 12-10.1).	
12	Close the valve and move the handle 2 to 3 times back and forth. Note if there are air bubbles in the line nearby the check valve. The lever should not feel soft when pulling back to use the brakes or have a long travel. This indicates air in the lines.	
13	Inspect joints and connections for leaks.	
14	Open the valve sharply (Fig. 12-10.1).	
15	Unscrew the connector A 1 to 2 turns	
16	Add more brake fluid to eliminate air bubbles nearby the check valve	
17	Repeat operations 11 through 16 until full elimination of air in the brake system controls.	
18	Tighten the connector A up to torque 80 lb-in / 9 Nm. Disconnect the syringe (Fig. 12-10.1).	
19	Make sure the line is completely filled by fluid, no air bubbles are seen and the capacity of expansion tank is $\frac{3}{4}$ full.	
20	Make sure the brake disks and pads are dry and clean.	
21	Check brakes for operating 2 to 3 times before flight while warming up the engine and taxiing.	

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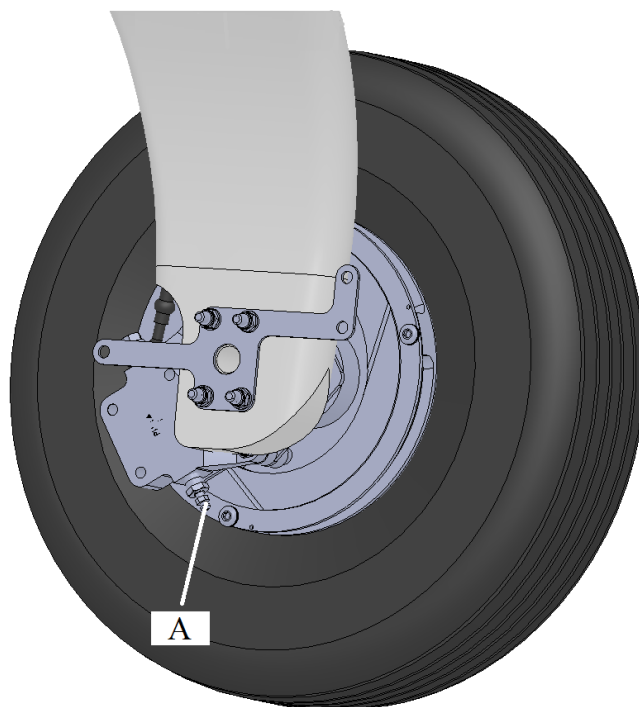


Fig. 12-10-1

12-10.2.9 Tire Inflation

Main wheels: 29-35 PSI / 2.0-2.4 bar

Nose wheel: 29-35 PSI / 2.0-2.4 bar

12-10.2.9.1 Type of Maintenance

Line

12-10.2.9.2 Minimum Level of Certification

Pilot/Owner

12-10.2.9.3 Procedure

A. Recommended Special Tools and Parts

Item	Quantity	Unit
None		

B. Tire Inflation

Step	Action	Reference
1	Examine the tires. Look especially for cuts, friction. Damage, correct alignment of the slippage markers.	
2	Measure the tire pressure. If necessary, inflate the tires to the correct pressure.	

SECTION 12-20 – SCHEDULED SERVICING

12-20.1 General

This section provides lubrication schedule and list of recommended lubricants.

12-20.2 Lubrication Chart

<i>Item</i>	<i>Interval, hours</i>	<i>Recommended Lubricant</i>	<i>Supplier</i>
Hinges of cabin doors	100	Retinax EP2, Alvania EP2	SHELL
		Premium Performance Multi-Purpose Wheel Bearing Grease	National Automotive Parts Association (NAPA)
Sliding supports of rudder pedals	1000	Retinax EP2, Alvania EP2	SHELL
		Premium Performance Multi-Purpose Wheel Bearing Grease	National Automotive Parts Association (NAPA)
Rudder-cable attach points	1000	Retinax EP2, Alvania EP2	SHELL
		Premium Performance Multi-Purpose Wheel Bearing Grease	National Automotive Parts Association (NAPA)
Nose wheel bearings	200	Retinax EP2, Alvania EP2	SHELL
		Premium Performance Multi-Purpose Wheel Bearing Grease	National Automotive Parts Association (NAPA)
Main wheels bearings	200	Retinax EP2, Alvania EP2	SHELL
		Premium Performance Multi-Purpose Wheel Bearing Grease	National Automotive Parts Association (NAPA)
Rod end bearings of control systems	100	GLEITMO 800 Grease for rod end bearings	FLURO-Gelenklager GmbH
		HHS-K hinge lubricant aerosol	Wurth
Ailerons and flaps pivot bearings	100	GLEITMO 800 Grease for rod end bearings	FLURO-Gelenklager GmbH
		HHS-K hinge lubricant aerosol	Wurth
Elevator pivot bearings	100	GLEITMO 800 Grease for rod end bearings	FLURO-Gelenklager GmbH
		HHS-K hinge lubricant aerosol	Wurth

- **Note:** Flight Design has tested the following lubricants. Alternate lubricants may be feasible but have not been tested by Flight Design. Using other lubricants is done at your own discretion.

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SECTION 12-30 – UNSCHEDULED SERVICING

12-30.1 General

This section provides instructions how to clean the aircraft.

Care must be taken when cleaning modern aircraft built with composite materials. Many products have been developed to clean a specific type of material and may be unsuitable or even damaging to others. Using the wrong product may damage your aircraft or its structures. Affected parts may be plainly visible or may be hidden from view. The type of damage can vary from simply unsightly to the outright dangerous. You must always read the instructions for your cleaning products before using them. If you should have any questions about a product's suitability please contact your local dealer.

Each structure has its own cleaning requirements.

12-30.2 Cleaning of the Basic Airframe and Wing Structure

Composite aircraft are typically constructed of a sandwich of structural material (Fiberglass-Carbon Fiber or Kevlar) over a foam or honeycomb core.

The Flight Design F2-LSA is made up of a Carbon fiber-foam or honeycomb-Carbon fiber, sanded and painted with two-part urethane paint. The foam core of the wings is partially Rohacell foam which was chosen for its stiffness and resistance to fuel. The fuselage core is Honeycomb which allows the contours for the F2-LSA fuselage.

The Rohacell foam, while highly resistant to fuel, is not resistant to strong Alkali cleaners or even water with very high alkali content. Therefore, Flight Design requires that the cleaners used on the F2-LSA be PH neutral. Cleaners, such as Fantastik®, Formula 409®, Carbonex®, and Castrol Super Clean®, which are otherwise good Alkali cleaning products, should not be used on the F2-LSA.

The use of this category cleaner can dissolve the foam core of the sandwich leaving a dented looking area that must be repaired and re-painted. Please note that the wing spars of the F2-LSA are sealed in epoxy and cannot be damaged in this manner.

12-30.3 Cleaning of the Windshield and Side Windows

The windows of the F2-LSA are tinted, heat molded acrylic (also known as Plexiglas®). While durable, they must be carefully cleaned to avoid scratching the surface. Never use an abrasive pad, abrasive pastes or even dirty rags when cleaning the window surfaces. Always flush the window surface with water to remove as much dust and dirt before using an aircraft window specific cleaner or a plastic cleaner approved for cleaning acrylic windshields.

When polishing the windshield or side windows never polish in a circular motion, this creates a halo effect when looking into the sun. Always use a horizontal or vertical pattern.

12-30.4 Cleaning of the Engine and Engine Compartment

The ROTAX® 912 maintenance manual recommends the use of a commercially available cold cleaning agent. Some citrus based products have been found to be suitable. However, always read the instructions for any product to be used, keeping in mind that it must be compatible with both the engine components and the airframe structures.

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12-30.5 Interior Cleaning

Clean the interior with a flame-proof vacuum cleaner.

12-30.6 Ice and Snow Removal

Remove snow and ice as soon as possible to prevent melted water from freezing later and causing damage.

Use soft brushes to remove snow from the surfaces. If possible, put the airplane in a heated hangar to remove ice.

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CHAPTER 20 – STANDARD PRACTICES ON AIRFRAME

Contents

20-00.1	General
20-00.2	Bolt and Nut Types Used in the Airplane
20-00.3	Torque Values
20-00.4	Standard Practices on Airframe
20-00.4.1	Installation of the Safety Wire
20-00.4.2	Adjustment of Control Rods Length
20-00.4.3	Crimping of Rudder Cables
20-00.4.4	Usage of Bonding Liquids
20-00.4.5	Hoses and Lines Clamping

20-00.1 General

This chapter provides information on standard practices on the airframe.

20-00.2 Bolt and Nut Types Used in the Airplane

Unless otherwise specified, we use aviation standard AN, MS or class 8.8 zinc-plated or stainless steel bolts and screws, according to DIN standard.

- ▲ **Warning:** Unsecured bolts (with standard nuts) must be locked with service removable thread locker.
- ▲ **Warning:** Once installed then removed, self-locking nuts (with plastic locking ring) must be replaced for new ones.
- ▲ **Warning:** Due to the variable thickness of composite structure, the length of bolts installed on aircraft may be different from the length as defined in the manual. Therefore, each bolt must be measured after removal to prevent the further installation of a bolt with the wrong length.

20-00.3 Torque Values

- ▲ **Warning:** All bolts have to be mounted up to down, inside to outside or front to aft, unless explicitly stated otherwise.
- **Note:** Tolerances $\pm 4\%$ of torque moments indicated in the table are allowed.

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<i>Bolt</i>	<i>AN3</i>	<i>AN4</i>	<i>AN5</i>
<i>Nut</i>	<i>AN365 -3</i>	<i>AN365 -4</i>	<i>AN365 -5</i>
Torques for class 3 fasteners	25 lb-in 2.82 Nm	70 lb-in 7.9 Nm	140 lb-in 15.8 Nm
For areas with bonding paste	23.5 lb-in 2.65 Nm	65.8 lb-in 7.4 Nm	132 lb-in 15 Nm
Parts made of PVC	23.5 lb-in 2.65 Nm	65.8 lb-in 7.4 Nm	132 lb-in 15 Nm
Carbon fabric composite assemblies	23.5 lb-in 2.65 Nm	65.8 lb-in 7.4 Nm	132 lb-in 15 Nm
Glass fiber composite packages	23.5 lb-in 2.65 Nm	65.8 lb-in 7.4 Nm	132 lb-in 15 Nm
Metal parts assemblies (steel, stainless steel, aluminum alloys)	25 lb-in 2.82 Nm	70 lb-in 7.9 Nm	140 lb-in 15.8 Nm

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20-00.4 Standard Practices on Airframe

20-00.4.1 *Installation of the Safety Wire*

Refer to Advisory Circular AC 43-13.

20-00.4.2 *Adjustment of Control Rods Length*

Refer to Advisory Circular AC 43-13.

20-00.4.3 *Crimping of Rudder Cables*

Refer to Advisory Circular AC 43-13.

20-00.4.4 *Use of Bonding Liquids*

Refer to Advisory Circular AC 43-13.

20-00.4.5 *Hoses and Lines Clamping*

Refer to Advisory Circular AC 43-13.

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CHAPTER 21 – CABIN HEAT AND VENTILATION

Contents

21-00.1	General
21-00.2	Description
21-00.2.1	Cabin Ventilation
21-00.2.2	Cabin Heat
21-00.3	Maintenance Practices
21-00.3.1	Cabin Heating System Check

21-00.1 General

This chapter provides a description of the cabin ventilation and cabin heat.

21-00.2 Description

21-00.2.1 Cabin Ventilation

The air intakes for the cabin ventilation are located on both sides of the forward fuselage. Fresh air is supplied to the passenger compartment by rotating the Ball Vents on the left and right of the instrument panel.



Fig. 21-00-1

21-00.2.2 Cabin Heat

Heated air is provided to the cabin through specific warm air nozzles located on the forward tunnel above the rudder pedals. The warm air is generated in an aluminum shroud around the exhaust muffler that heats the fresh air from the cooling intake at the front of the cowlings.

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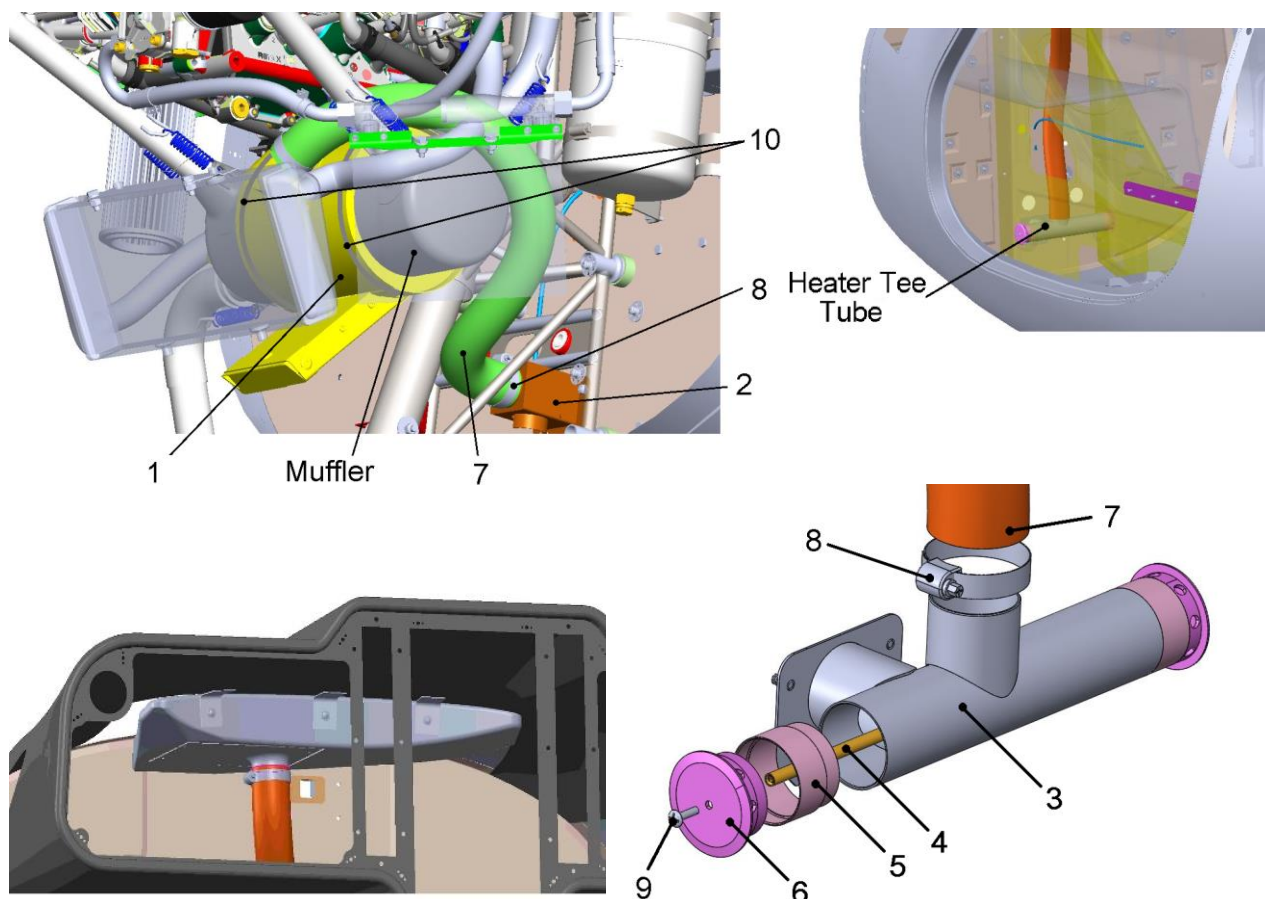


Fig. 21-00-2

Fig.	Item	Part Name	Torque	Reference
24-00-2	1	Heater Shroud		
	2	Heater Box		
	3	Heater Tee tube		
	4	Pin		
	5	Adapter		
	6	Vent		
	7	Aeroduct Hose		
	8	Clamp		
	9	Screw		
	10	Clamp, Shroud		

A cabin heater box regulates the amount of warm air that is guided into the cabin. Within the cabin, the warm air is distributed between two vents (one per side) at the lower sides of the console, next to the pilot and copilot's feet and to slots in the upper instrument console, right at the lower rim of the windscreen. The heating box is operated from the cabin by the handle installed on the instrument console (Fig 21-00-3).

To improve the heating capability in severe winter operation it is recommended to cover any cabin openings with self-adhering clear plastic film. Only use clear plastic film, so that any daily inspections can be conducted as required.

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Fig. 21-00-3

21-00.3 Maintenance Practices

21-00.3.1 Cabin Heating System Check

21-00.3.1.1 Type of Maintenance

Line

21-00.3.1.2 Minimum Level of Certification

Pilot/Owner (P/O)

21-00.3.1.3 Procedure

A. Recommended Special Tools and Parts

Item	Quantity	Unit
None		

B. Cabin Heating System Inspection

Step	Action	Reference
1	Remove the cowlings to get access to the lower part of the firewall.	71-1
2	Check the cabin heater box for operation: When the handle is pushed, the Cabin heat is OFF. When the handle is pulled, the Cabin heat is ON.	
3	Inspect the connecting cable between the choke and the handle.	
4	Remove the central panel from the instrument panel.	31.3.1.3
5	Inspect all the hoses for integrity and connections for proper fastening. Replace if required.	
6	Loosen the Clamps 10 and 8. Remove the Heater Shroud 1. (Fig 21-00-2)	
7	Inspect the Shroud 1 for cracks and other damage, chafing marks and burn spots. Clean if required. Inspect exhaust muffler underneath the shroud for dangerous cracks that could lead to carbon monoxide in the cabin.	
8	Reinstall Shroud in reversed direction order.	

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21-00.3.2 Check and Repair in Case of Malfunction

21-00.3.2.1 Type of Maintenance

Line

21-00.3.2.2 Minimum Level of Certification

Pilot/Owner (P/O)

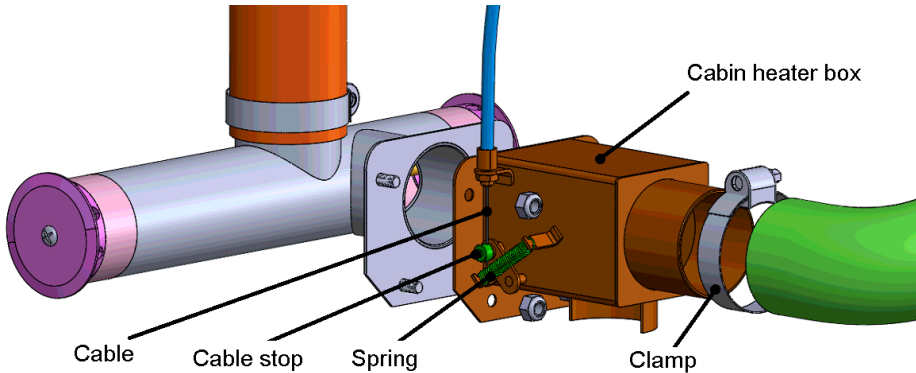
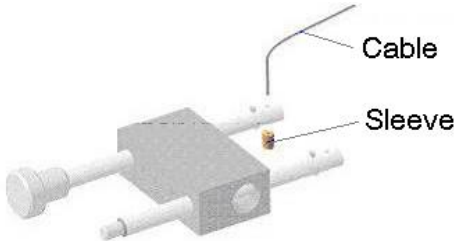
21-00.3.2.3 Procedure

A. Recommended Special Tools and Parts

Item	Quantity	Unit
None		

B. Inspection and Repair in Case of Malfunction

B1. If the cabin heater box leaks hot air or does not operate, inspect the connecting cable between the box and the handle and correct the operation as follows:

Step	Action	Reference
1	<p>Check if the spring is present at the cabin heater box. If the spring is missing or damaged, install a new one. (Fig. 21-00-4)</p>  <p>Fig. 21-00-4</p>	
2	<p>Check if the cable is frayed and if the cable stop is present and swivels as it should at the cable attachment to the lever on the cabin heater box. (Fig. 21-00-4).</p>	
3	<p>If the cable stop is missing, connect the cable to the cabin heater box lever as shown in Fig. 21-00-4 and attach it with a new cable stop using a screwdriver.</p>	
4	<p>Remove the center panel from the instrument panel using a 3 mm hex-nut wrench and check the cable for fraying and if there is the nicopress sleeve at the cable attachment to the handle. (Fig. 21-00-5).</p>  <p>Fig. 21-00-5</p>	
5	<p>If the end sleeve is missing, connect the cable to the handle and secure it with the new nicopress end sleeve.</p>	

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6	<p>If frayed, replace the cable with a new one 59 in. / 1.5 m long. While replacing the handle must be pushed in. (Fig. 21-00-3).</p> <ul style="list-style-type: none"> • Pass it through the cable housing into the engine compartment. • Attach the cable to the cabin heater box lever as shown in Fig. 21-00-4, secure the cable with a cable stop. 	
7	<p>Remove the damaged cable, secure a tip of the new cable by the sleeve using a Nicopress tool for 0.45 - 2.00 mm cable. (Fig. 21-00-5).</p>	
8	<p>Check the cabin heat box for correct operation according to the item 2. If correct, follow the maintenance procedure B2 of this section</p>	21-00-B2

B2. If, while the handle is pulled, the choke is OFF

1	<p>Release the Cable stop a little with a screwdriver and tighten the cable.</p> <ul style="list-style-type: none"> • Note: Loosen the stop bolt and slide the stop along the cable for adjustment 	
2	<p>Secure a cable stop in position with a screwdriver.</p>	
3	<p>Follow the maintenance procedure B3 of this section</p>	21-00-B3

B3. If the Cabin heat box is at OFF position and the handle is not fully pulled out

1	<p>Mark on the handle length it can be pulled out more (distance from the bracket to the cotter-pin stop on the handle). (Fig. 21-00-6).</p> <div data-bbox="406 1005 1181 1279" data-label="Image"> </div> <p style="text-align: center;">Fig. 21-00-6</p>	
2	<p>Release the cable stop unscrewing the bolt in the cable stop by a screwdriver.</p>	
3	<p>Move the cable stop towards the end of the cable and secure the cable stop with a screwdriver.</p>	
4	<p>Follow maintenance procedure B1 of this section</p>	21-00-B1

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CHAPTER 23 – INSTRUMENTS

Contents

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SECTION 23-10 – Avionics: Radios, transponder, audio panel	
23-10.1	General
23-10.2	Description
23-10.3	Maintenance Practices
23-10.3.1	COM Antenna Removal and Installation
23-10.3.2	COM Antenna Check

23-00.1 General

This chapter provides a description of the Instruments.

23-00.2 Description

The F2-LSA includes all flight, communication, switches and circuit breakers located on the instrument panel. The panel contains the main flight, engine monitoring and associated avionics equipment. Fig. 23-00-1 shows the standard arrangement using the Garmin G3X avionics suite.

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Fig. 23-00-1. F2 Panel with the standard avionics package

Pos.	Manufacturer	Type	Description
1	Garmin	GDU46X	G3X Touch Screen Display
2	Garmin	GTR225A	COM radio
3	Garmin	GNC255A	Optional NAV-COM radio
4	Garmin	GTX 345 or 335	Transponder
5	Flight Design	n/a	Rocker switch
6	Flight Design	n/a	Ignition key switch, operates starter and ignition circuits
7	Klixon	7274-2	Circuit breaker
8	Flight Design	n/a	Back up switch
9	Flight Design	n/a	Flap selector switch. Switch to desired flap position
10	AveoAir	AVE-BVBLK-200	Ball vent
11	Garmin	GMA245 or 342 or 345	Digital audio panel/intercom
12	Garmin	G5	Optional back up instrument for night flight

SECTION 23-10 – COM Radio, Transponder, Intercom

23-10.1 General

This section provides a description and information about the Garmin Com radios, transponder and the audio panel used on the F2.

23-10.2 Description

The communication system is typically the Garmin GTR225A Com and an optional GNC255A NAV-COM installed to the upper center panel.

There is a set of separate plugs in the panel that provides a bypass of the intercom in case of intercom failure. The radio is networked to the G3X system that allows frequency pre-selection from the GPS database.

A Garmin GMA 342 (or GMA 245, or GMA 345) audio panel/intercom is installed on top of the radio stack in the center panel. Standard and LEMO Headset plugs are provided at the rear of the armrest on the center tunnel.

The Garmin GTX 345 or GTX 335 Transponder includes both ABS-B out and features full ADS-B in (GTX 345) to the G3X system including traffic and weather.

An optional Garmin GMC 507 Digital autopilot mode controller panel can be positioned at the bottom of the center avionics stack.

The COM antenna is located on the fuselage roof.

23-10.3 Maintenance Practices

23-10.3.1 *Radio, Transponder and Audio panel Installation, Removal and Maintenance*

23-10.3.1.1 Type of Maintenance

Line

23-10.3.1.2 Minimum Level of Certification

LSA-Mechanic (LSRM), unless higher qualification required by Radio manufacturer

23-10.3.1.3 Procedure

Follow instructions provided by the Radio manufacturer.

23-10.3.2 *COM Antenna Removal and Installation*

23-10.3.2.1 Type of Maintenance

Line

23-10.3.2.2 Minimum Level of Certification

LSA-Mechanic (LSRM)

23-10.3.2.3 Procedure

COM Antenna Rami AV-10 assembly is shown on Fig. 23-10-1.

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A. Recommended Special Tools and Parts

<i>Item</i>	<i>Quantity</i>	<i>Unit</i>
None		

B. Antenna Removal

<i>Step</i>	<i>Action</i>	<i>Reference</i>
1	Disconnect the Antenna BNC connector	
2	Unscrew nuts, item 5	
3	Remove ground plane	

C. Antenna Installation

<i>Step</i>	<i>Action</i>	<i>Reference</i>
1	Install Antenna in the reversed order	

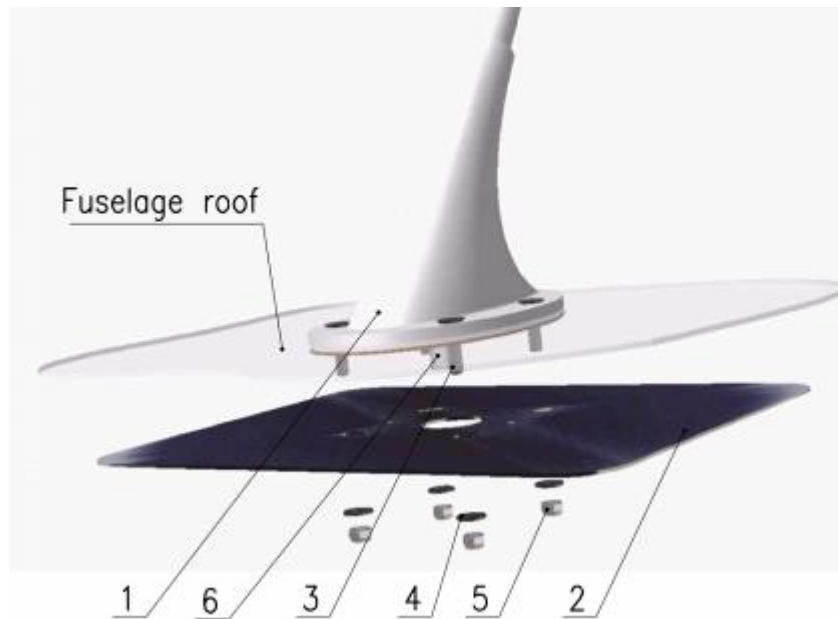


Fig. 23-10-1

<i>Fig.</i>	<i>Item</i>	<i>Part Name</i>
23-10-1	1	Antenna Rami AV-10
	2	Ground plane plate
	3	Machine screw MS24694S65
	4	Washer AN960-10
	5	Self-locking nut AN365-3, regular
	6	Connector

23-10.3.3 COM Antenna Check

23-10.3.3.1 Type of Maintenance

Line

23-10.3.3.2 Minimum Level of Certification

Pilot/Owner

23-10.3.3.3 Procedure

A. Recommended Special Tools and Parts

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<i>Item</i>	<i>Quantity</i>	<i>Unit</i>
None		

B. Antenna Inspection

<i>Step</i>	<i>Action</i>	<i>Reference</i>
1	Check security of attachment	
2	Check communication	

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CHAPTER 24 – ELECTRICAL SYSTEM

Contents

24-00.1	General
24-00.2	Description
24-00.3	Maintenance Practices
24-00.3.1	Starter Relay Removal and Installation
24-00.3.2	Capacitor Removal and Installation
24-00.3.3	Battery Removal and Installation
24-00.3.4	Circuit Breakers Removal and Installation
24-00.3.5	Switches Removal and Installation
24-00.3.6	Electrical Wiring System Check
24-00.3.7	Starter Check
24-00.3.8	Battery Check

24-00.1 General

This chapter provides a description and information on the Electrical System.

24-00.2 Description

The electrical system is powered by a 12V nominal voltage battery. The battery is selected sufficient to permit safe engine starts within the aircraft's approved temperature range. The engine, the Rotax 912 iS series has two alternators (alternator A and Alternator B) that are integrated into the rear crankcase of the engine. The alternator A provides power to engine electric system components. The alternator B is for charging of the aircraft battery and provides power for the aircraft's electric system. With this, the F2-LSA aircraft series is supported by two power buses in the aircraft. The power bus is switched by a master breaker / switch arrangement with two switches. The first switch disconnects the battery. The second switch disconnects the generator. Both switches have combined switch / breaker functionality. Therefore, the system is set up without need for a master relay. The first power bus (Lane A) is used to distribute the power to the main pump, aux fuel pump, ECU and fuse box. The second power bus (Lane B) is used to distribute the power to the equipment, engine, autopilot servos, position lights, landing light, cockpit light, flaps and electric pitch trim. Individual circuit breakers are installed to secure the individual system power circuits. All breakers can be manually released to disconnect the circuit. All ground lines are connected to the battery via a ground bus. The avionics are grounded separately from the rest of the aircraft in order to avoid interference.

The master breaker function of the electric system is achieved by dual breaker-switches. The breakers are designed and qualified to be used as switches. This allows a reduction in the amount of components in the system, and therefore reduces the possibility for system failures.

The layout of the electrical system is shown with a simplified block diagram in the figure below. The block diagram illustrates the wiring layout and helps to explain the electric system function.

The simplified block diagram of electrical system is shown on Fig. 24-00-1. The major components of the electric system within engine compartment are shown on Fig. 24-00-2.

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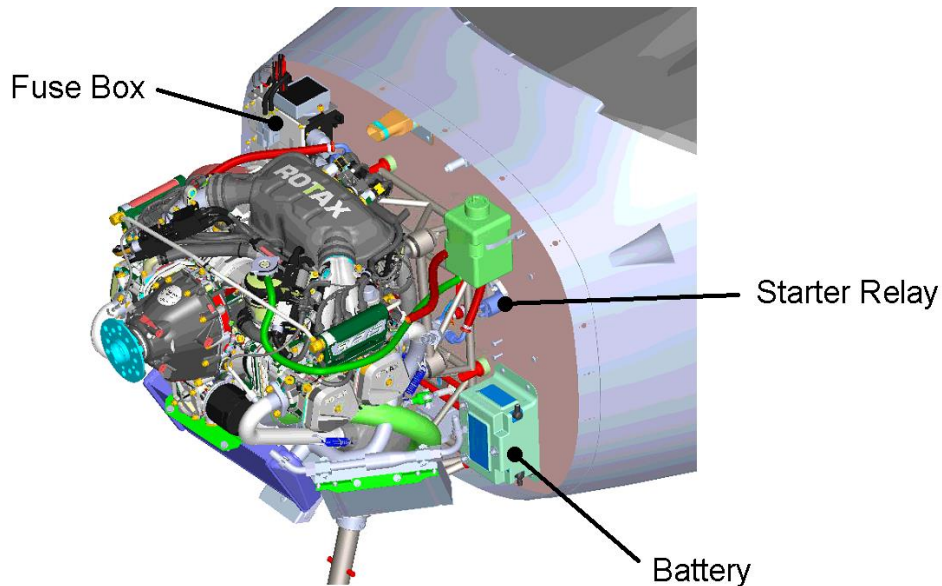


Fig. 24-00-2

24-00.3 Maintenance Practices

24-00.3.1 Starter Relay Removal and Installation

24-00.3.1.1 Type of Maintenance

Line

24-00.3.1.2 Minimum Level of Certification

LSA-Mechanic (LSRM)

24-00.3.1.3 Procedure

Starter Relay assembly is shown on Fig. 24-00-3.

A. Recommended Special Tools and Parts

Item	Quantity	Unit
None		

B. Starter Relay Removal

Step	Action	Reference
1	Disconnect battery	31.3.1.3
2	Disconnect control wire	
3	Remove the protective Cap for nut M6 item 2	
4	Unscrew two nuts item 3	
5	Remove the 2 screws item 8 connecting the Starter Relay to the firewall	

C. Starter Relay Installation

Step	Action	Reference
1	Install the Starter Relay in reversed direction order	
2	Screw in bush item 11 to the contact pin of starter relay. Before screwing apply drop of thread locker (Loctite 242 or similar) on the contact pin M6 of the starter relay	
2	Use only new self-locking nuts Items 5 and 3	

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Fig. 24-00-3

Fig.	Item	Part Name	Torque	Reference
24-3	1	Starter relay assy.		
	2	Cap for nut M6		
	3	Self-locking nut DIN 985-M6, regular		
	4	Washer DIN 125 A2B-6.4mm		
	5	Self-locking nut DIN 985-M5, regular		
	6	Washer DIN 9021-5.3mm VZ		
	7	Bolt DIN 7991 M5x20-8.8		
	8	Washer DIN 9021-5.3mm VZ		
	9	Bolt DIN 933 M5x20-8.8		
	10	Starter relay mounting plate		
	11	Bush		

24-00.3.3 Battery Removal and Installation

24-00.3.3.1 Type of Maintenance

Line

24-00.3.3.2 Minimum Level of Certification

Pilot/Owner

24-00.3.3.3 Procedure

Refer to the battery manufacturer's instructions if the battery in the aircraft is different than the one specified here.

To remove the battery, refer to Fig. 24-00-5.

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▲ **Warning:** To reduce the chance of personal injury and possible equipment damage, remove the negative wire from the battery before removing the positive wire.

Failure to reconnect the battery connectors properly could result in reversing the polarity of the battery.

1. Reinstall the battery with the mounting box over the battery and reinstall 4 screws, using Self-locking nut DIN 985-M5 and tighten them to torque 49 lb-in / 5.5 Nm.
2. Reconnect the two connectors to the battery.

A. Recommended Special Tools and Parts

Item	Quantity	Unit
None		

B. Battery Removal, Installation

Step	Action	Reference
1	Disconnect battery	31.3.1.3
2	Disconnect the two connectors item 4 (unscrew the brass bolts item 5)	
3	Remove the 4 screws connecting the battery bracket to the firewall	
4	Remove the battery	

C. Battery Installation

Step	Action	Reference
1	Install battery in reversed direction order	

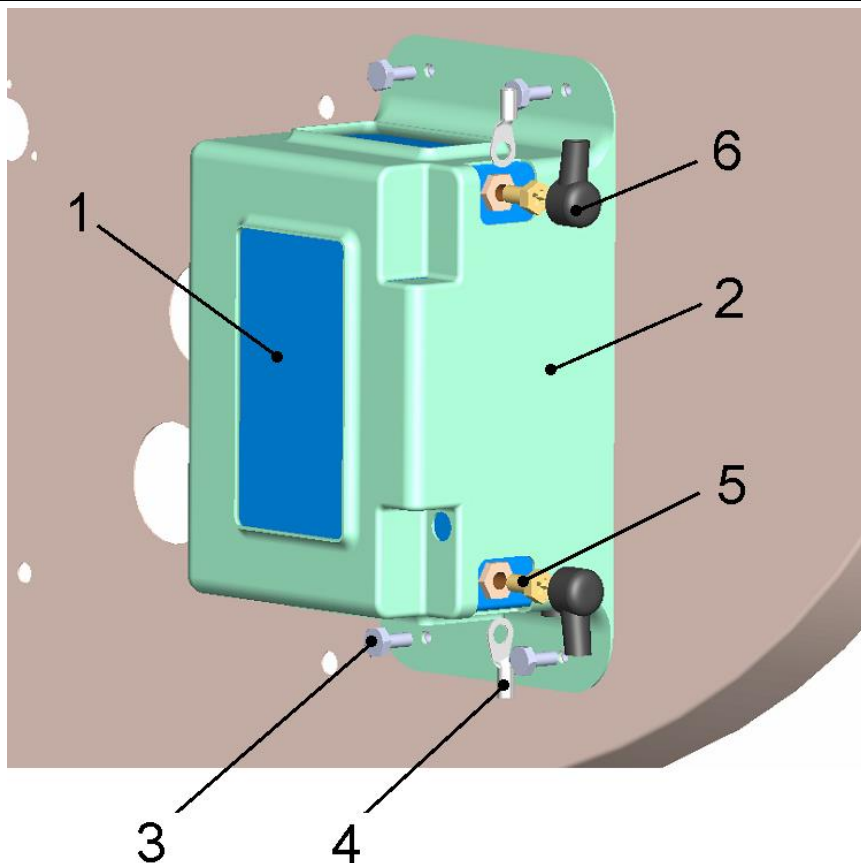


Fig. 24-00-5

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Fig.	Item	Part Name	Torque	Reference
24-5	1	Battery Earth X 680C		
	2	Battery Box		
	3	Bolt DIN 933-M5x16-8.8		
	4	Connector		
	5	Brass Bolt		
	6	Cap for Battery		

- **Note:** If the Battery ETX900-VNT is installed, it has a thermal run-away containment system. The containment system includes vent tubes designed to carry vapor or smoke to the exterior of the aircraft in the event of a thermal run-away condition.

24-00.3.4 **Circuit Breakers Removal and Installation**

24-00.3.4.1 **Type of Maintenance**

Line

24-00.3.4.2 **Minimum Level of Certification**

LSA-Mechanic (LSRM)

24-00.3.4.3 **Procedure**

To install and uninstall circuit breakers refer to Fig. 24-00-6.

A. Recommended Special Tools and Parts

Item	Quantity	Unit
None		

B. Circuit Breaker removal and reinstallation

Step	Action	Reference
1	Disconnect Battery	
2	Using a 3mm hex-head screwdriver, unscrew the panel bolts (marked in red) that hold the panel (Fig. 24-00-6). Protect the console paint by putting a towel or rag between the panel and the console.	
3	Remove the circuit breaker	
4	Remove Shrink hose 19,0/9,5mm clear (Fig. 24-00-7)	
5	Unscrew attachment bolts M4 that hold the sockets to circuit breaker terminals	

C. Circuit Breakers Installation

Step	Action	Reference
1	Install circuit breaker in reversed direction order	
2	Use new shrink hose 19,0/9,5mm clear	



Fig. 24-00-6

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Fig. 24-00-7

24-00.3.5 Switches Removal and Installation

24-00.3.5.1 Type of Maintenance

Line

24-00.3.5.2 Minimum Level of Certification

LSA-Mechanic (LSRM)

24-00.3.5.3 Procedure

To install and uninstall switches refer to Fig. 24-00-7.

A. Recommended Special Tools and Parts

Item	Quantity	Unit
None		

B. Switches Removal

Step	Action	Reference
1	Disconnect Battery	
2	Using a 3mm hex-head screwdriver unscrew the panel bolts (marked in red) that hold the panel (Fig. 24-00-7). Protect the console paint by putting a towel or rag between the panel and the console.	
3	Press the switch locks to remove the switch	
4	Disconnect socket connectors	

C. Switches Installation

Step	Action	Reference
1	Install switch in reversed direction order	



Fig. 24-00-7

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24-00.3.6 *Electrical Wiring System Check*

24-00.3.6.1 Type of Maintenance

Line

24-00.3.6.2 Minimum Level of Certification

LSA-Mechanic (LSRM)

24-00.3.6.3 Procedure

A. Recommended Special Tools and Parts

<i>Item</i>	<i>Quantity</i>	<i>Unit</i>
Multimeter	1	pc

B. Electrical Wiring System Check

<i>Step</i>	<i>Action</i>	<i>Reference</i>
1	Inspect wiring insulation for integrity. Replace wire, if insulation is damaged.	
2	Tighten bolt connections and re-braze soldered connections if needed.	
3	Inspect each electrical instrument for a secure ground connection using a multimeter.	
4	Inspect for leaking current using a multimeter	
5	Inspect terminals and studs for oxidation. Dress the oxidized studs, if necessary. Apply any dielectric grease (for example CRC Technician Grade Dielectric Grease) onto the ground and battery terminals.	

24-00.3.7 *Starter Check*

24-00.3.7.1 Type of Maintenance

Line

24-00.3.7.2 Minimum Level of Certification

Pilot/Owner

24-00.3.7.3 Procedure

To inspect the starter connections refer to Fig. 24-00-8.

A. Recommended Special Tools and Parts

<i>Item</i>	<i>Quantity</i>	<i>Unit</i>
None		

B. Starter Check

<i>Step</i>	<i>Action</i>	<i>Reference</i>
1	Check security of attachment and electrical connections	

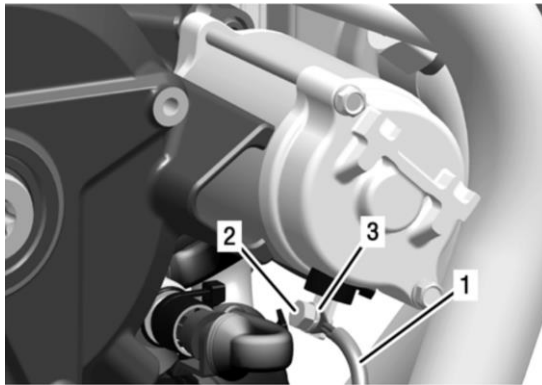


Fig. 24-00-8

Fig.	Item	Part Name	Torque	Reference
24-6	1	Socket non isol.DIN46211 6x4.3mm 6-10sqmm		C9997133R
	2	Bolt DIN 933-M5x16-8.8		C9996283
	3	Self-locking nut DIN 985-M5, regular		C9996333

24-00.3.8 Battery Check

24-00.3.8.1 Type of Maintenance

Line

24-00.3.8.2 Minimum Level of Certification

Pilot/Owner

24-00.3.8.3 Procedure

A. Recommended Special Tools and Parts

Item	Quantity	Unit
None		

B. Battery Check

Step	Action	Reference
1	Check for security, corrosion and general condition of battery box, terminals, and wirings	
2	Check for security of mounting and condition. Ensure that the vent holes are clean.	

▲ **Warning:** Never charge a faulty battery (a battery that will not accept a charge or hold a charge).

If the battery gets hot while charging, discontinue charging and use.

Do not charge the battery in temperatures above 140°F (60°C), or in direct sunlight.

For maximum battery and vehicle starting system life, do not crank an engine for more than 10 seconds within any 1-minute period.

Mixing of batteries of different part numbers or manufacturers, or age is not an acceptable practice. Batteries of different age or capacities in series connection is NOT allowed for it will result in the battery (ies) being over-discharged or overcharged.

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CHAPTER 25 – EQUIPMENT/FURNISHINGS

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25-00.1 General

This chapter provides maintenance practices on the seats and safety belt.

25-00.2 Maintenance Practices

25-00.2.1 Seat removal and Installation

25-00.2.1.1 Type of Maintenance

Line

25-00.2.1.2 Minimum Level of Certification

Pilot/Owner

25-00.2.1.3 Procedure

A. Recommended Special Tools and Parts

Item	Quantity	Unit
None		

B. Seat Removal and Installation (Fig. 25-00-1)

Step	Action	Reference
1	Unscrew two nuts DIN 985-M4 of stop plate on the left and right rails.	
2	Remove the stop plates.	
3	Move the seat upwards to demount it from the rails.	
4	Remove the seat through the door opening.	
5	Installation is done in reversed direction order.	

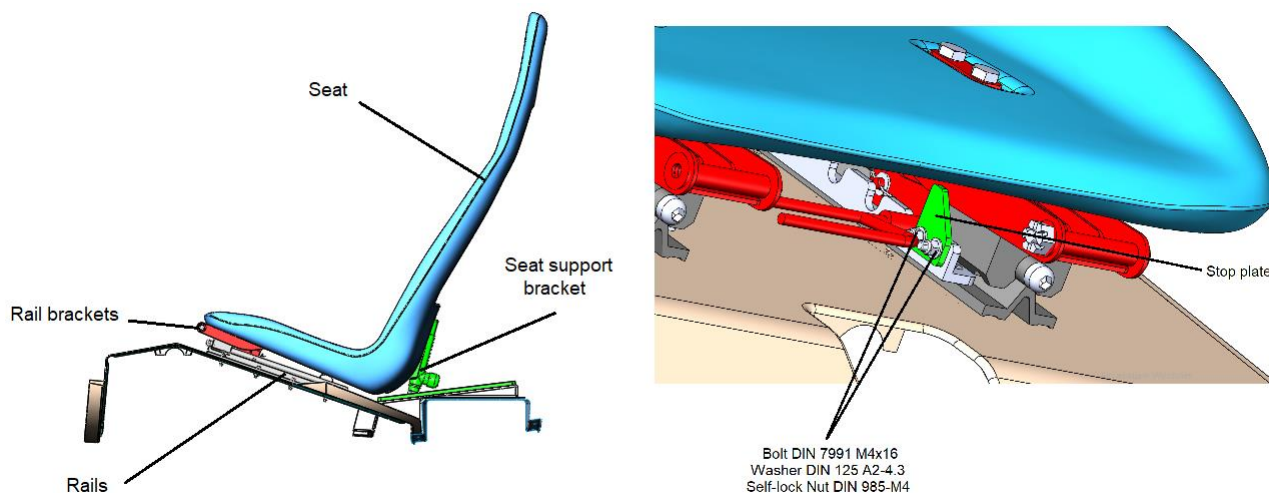


Fig. 25-00-1

25-00.2.2 Safety Belt Removal and Installation

25-00.2.2.1 Type of Maintenance

Line

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25-00.2.2.2 Minimum Level of Certification

Pilot/Owner

25-00.2.2.3 Procedure

A. Recommended Special Tools and Parts

<i>Item</i>	<i>Quantity</i>	<i>Unit</i>
None		

B. Safety Belt Removal and Installation (Fig. 25-00-2)

<i>Step</i>	<i>Action</i>	<i>Reference</i>
1	Unscrew the 3 self-locking nuts DIN 985 M10.	
2	Remove the D-ring, Seat belt retractor, Seat belt holder.	
3	Remove the belt.	
4	Installation is done in reversed direction order.	

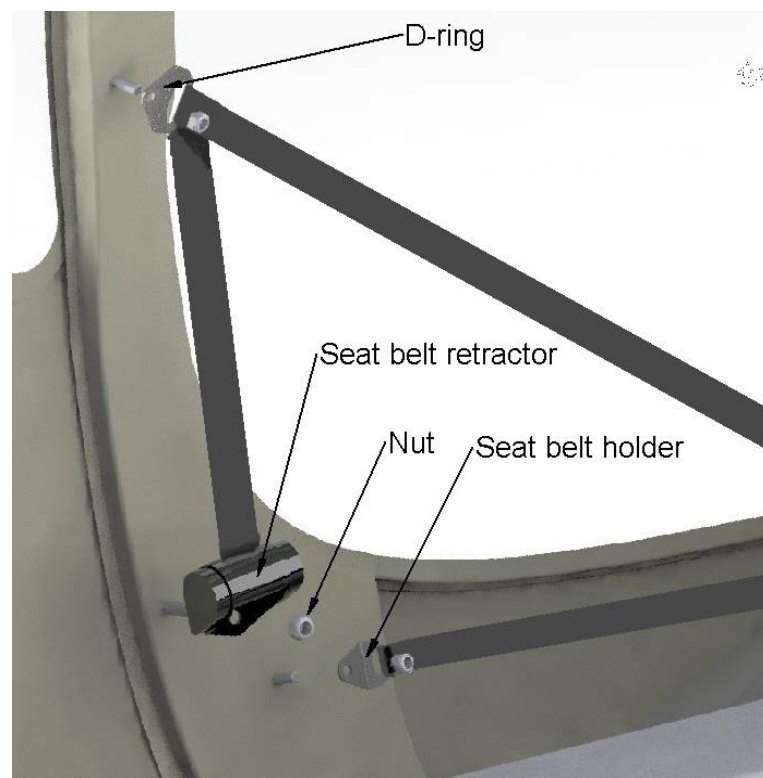


Fig. 25-00-2

25-00.2.3 Access Panels Removal and Installation

25-00.2.3.1 Type of Maintenance

Line

25-00.2.3.2 Minimum Level of Certification

Pilot/Owner

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25-00.2.3.3 Procedure

A. Recommended Special Tools and Parts

Item	Quantity	Unit
None		

B. Access Panels Removal and Installation (Fig. 25-00-3).

Remove access panels to provide access to systems and structural components inspection in accordance with instructions below.

Step	Action	Reference
1	Panel (1) provides access to the brake system, engine control components, stabilator, and aileron controls. It is attached with 4 bolts from the left and right sides. Unscrew the throttle lever knob. Unscrew the 4 bolts to remove the panel.	
2	Panel (2) provides access to fasteners that allow you to dismantle the rails of the seats. Remove the panel 2 as per follows: <ul style="list-style-type: none">- remove the seat;- remove the 2 screws that secure the panel;- remove the panel.	
3	Panel (3), in front of the pyramid, provides access to components of the elevator and aileron controls, antennas. Unscrew 4 bolts to remove the cover.	
4	To provide access to the rest of control components instrument panel has to be removed.	

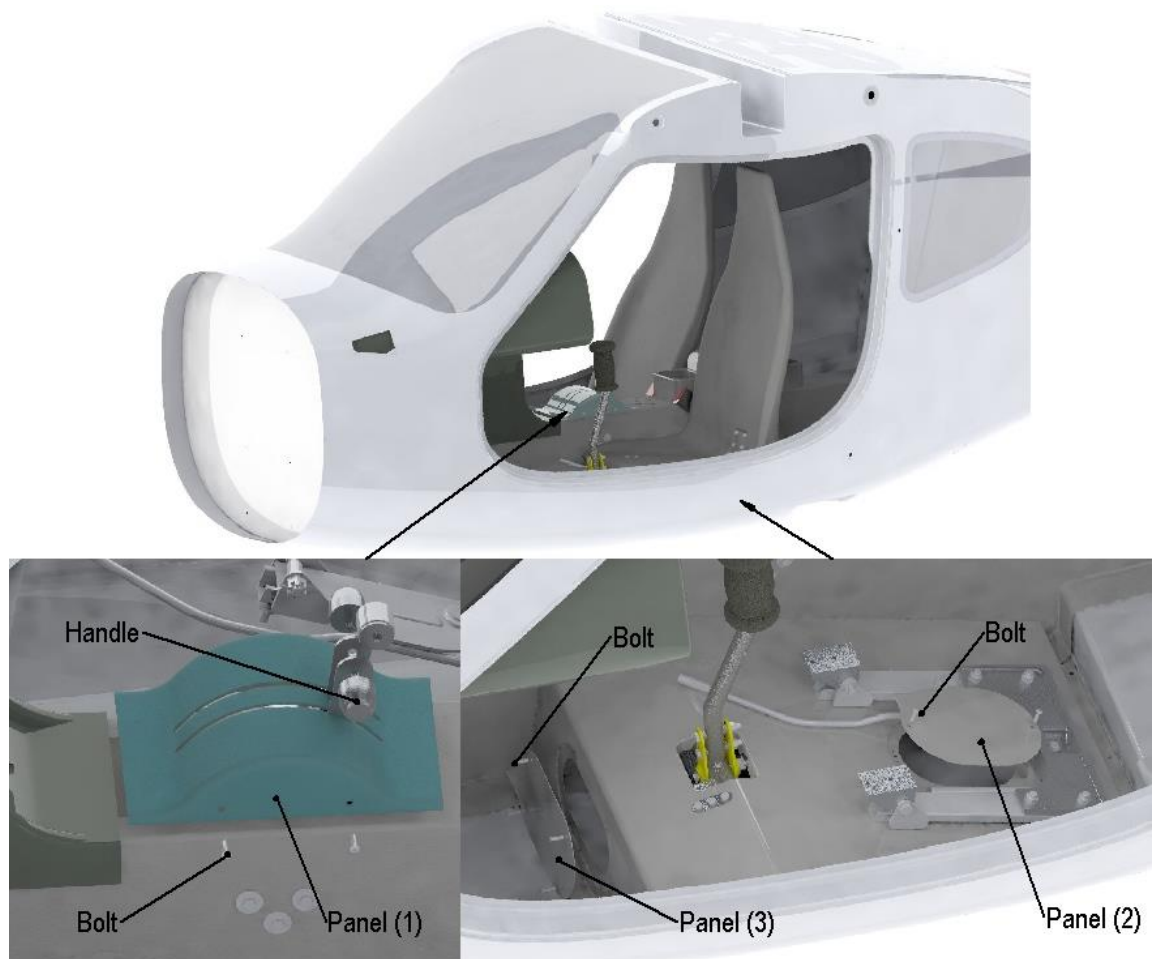


Fig. 25-00-3

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25-00.2.4 Carbon Covers Removal and Installation

25-00.2.4.1 Type of Maintenance

Line

25-00.2.4.2 Minimum Level of Certification

Pilot/Owner

25-00.2.4.3 Procedure

A. Recommended Special Tools and Parts

Item	Quantity	Unit
None		

B. Fabric Covers Removal and Installation (Fig. 25-00-4).

Step	Action	Reference
1	Unscrew 20 bolts of the cover (1) to provide access to components of the aileron controls, trim system, antennas and the parachute system.	

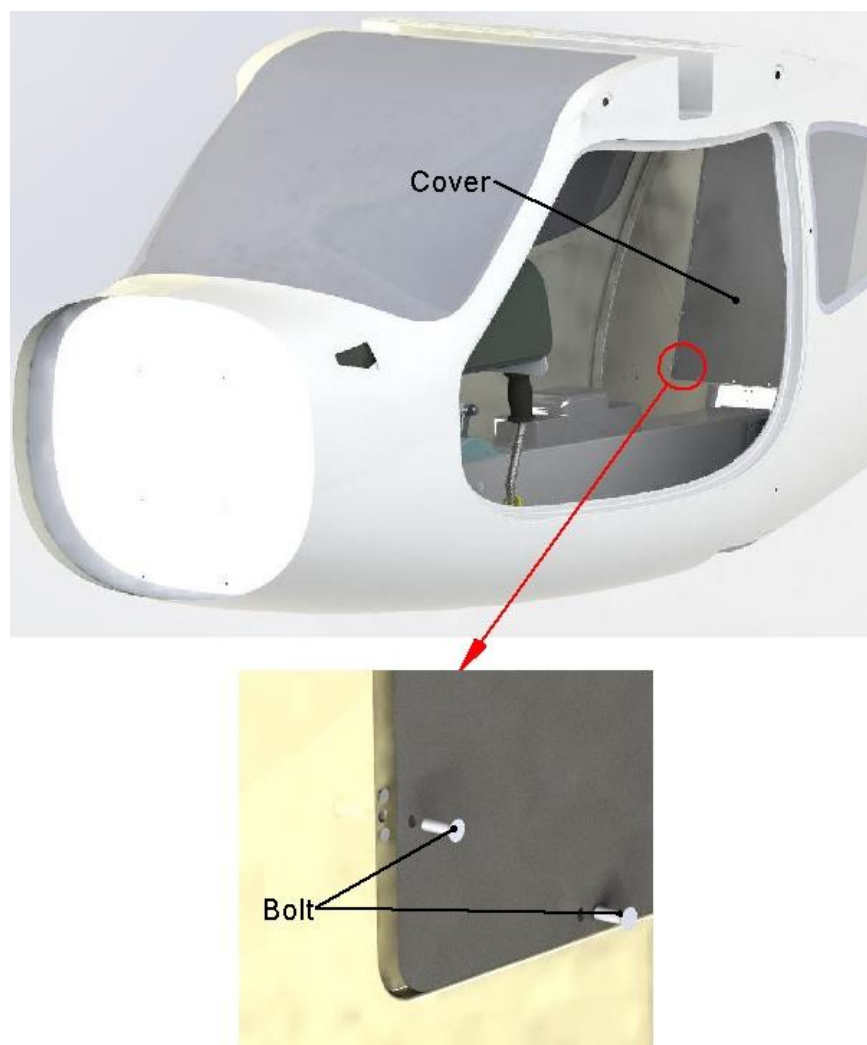


Fig. 25-00-4

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25-00.2.5 *Seat Inspection*

25-00.2.5.1 Type of Maintenance

Line

25-00.2.5.2 Minimum Level of Certification

Pilot/Owner

25-00.2.5.3 Procedure

A. Recommended Special Tools and Parts

<i>Item</i>	<i>Quantity</i>	<i>Unit</i>
None		

B. Seat Inspection

<i>Step</i>	<i>Action</i>	<i>Reference</i>
1	Remove the seat.	25.2.1
2	Remove the upholstery.	
3	Check the seat for damage, cracks, and delamination.	
4	Check the seat brackets for damage, looseness, or play.	
5	Check the seat rails for deformation and signs of damage.	
6	Check the gas spring and latch mechanism for operation.	

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SECTION 25-60 – EMERGENCY EQUIPMENT

25-60.1 General

The data provided in this supplement provides information on the aircraft specific installation and on the basic operation of the AEPS when used in the F2-LSA. For complete system description and operational instructions of the unit as such refer to the respective AEPS manual in the latest revision applicable to the equipment S/N installed into your aircraft, BRS Part No. 020002-01.

The installation of the AEPS does not affect any other system installed to the airplane.

25-60.2 Description

The airplane may be equipped with the Airframe Emergency Parachute System:

- BRS 1350 Softpack

The parachute system is attached with 2 front harnesses (which in turn consist of two short and two long belts) and 1 rear harnesses. All 3 harnesses are jointed together with a locked metal karabiner link. The parachute is connected with the link using an incremental bridle. With the parachute opened and stabilized the aircraft is suspended under the parachute with approx. 21° nose down attitude.

▲ Warning: Full and detailed operating instructions for the Airframe Emergency System are provided in the manual provided by the AEPS manufacturer that is supplied together with the airplane.

The AEPS comprises a recovery parachute and a solid fuel rocket which are located in the upper baggage compartment behind the main bulkhead. The rocket is activated via a pull cable attached to the deployment handle on the underside of the center panel (Fig. 25-60-1).

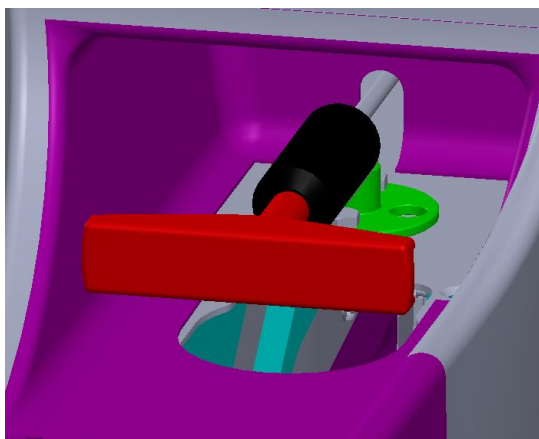


Fig. 25-60-1

Aircraft Emergency Parachute Deployment Handle

The parachute egress hatch is on the upper side of the fuselage, directly above the airframe emergency parachute. The opening is covered by a light flap which easily lifts off when the system is deployed.

After deployment of the airframe emergency parachute, the aircraft is suspended by three main belts. Two front belts are connected to the wing pin. The rear belt is attached to the

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hard point fuselage behind the main bulkhead. With this attachment the aircraft is suspended with approximately 11° nose down pitch under the parachute. In this stable position, the aircraft will come down nose wheel and engine / engine mount first. Deformation of the metal structure will absorb much of the impact energy before the airframe itself is affected.

In non-deployed conditions, the belts are covered by the parachute belt covers and stored behind the main bulkhead. When deployed, typically the opening forces are strong enough to pull these belts.

Fig. 25-60-2 and show the installation of the AEPS systems used in the aircraft.

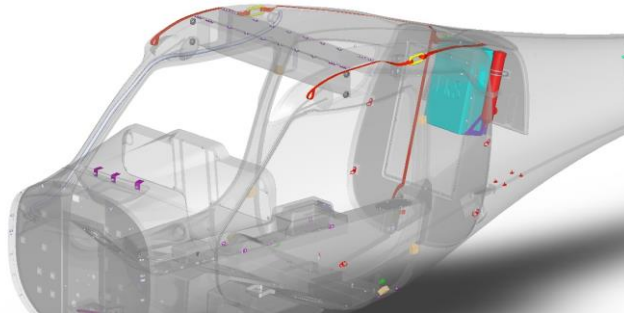


Fig. 25-60-2
Installation of BRS 1350 Softpack

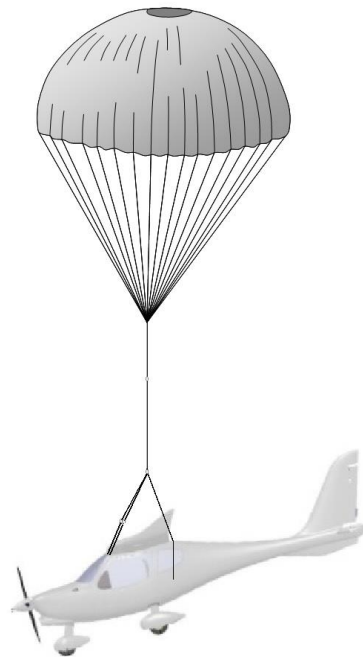


Fig. 25-60-3
Installation of BRS 1350 Softpack

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25-60.3 Maintenance Practices

▲ **Warning:** Before maintaining AEPS make yourself familiar with latest issues of all manuals and instructions. Failure during maintenance could result in personal injury or even death.

Take special care about safety warnings in the Owner's Manual for BRS-6 Emergency Parachute Recovery Systems (BRS document no. 020002-01).

▲ **Warning:** Attention must be paid to the proper securing of the airframe emergency parachute during any servicing or repair work to ensure that it is not inadvertently activated (ensure that the activation handle is secured with the safety pin inserted).

The airframe emergency parachute should only be removed from the aircraft by an authorized personnel or maintenance organization.

Depending upon national regulations, special approval may be required to handle the airframe emergency parachute rocket.

For the AEPS inspection and maintenance instructions refer to the latest issue of maintenance manual provided by the aircraft manufacturer.

25-60.3.1 Replacement of Rocket

When life limit is reached, remove rocket following the Parachute Installation Manual BRS 1350 Softpack F2-LSA (BRS document no. XXXXXX-PM), applicable steps for the rocket installation in reverse order. Use instructions provided within the Owner's Manual for BRS-6 Emergency Parachute Recovery Systems (BRS document no. 020002-01) for disassembly and removal of rocket and shipment.

Install new rocket following the Parachute Installation Manual BRS 1350 Softpack F2-LSA (BRS document no. XXXXXX-PM), applicable steps for the rocket installation.

25-60.3.2 Replacement of Parachute

When repack is due or life limit is reached, remove parachute canister with parachute following the Parachute Installation Manual BRS 1350 Softpack F2-LSA (BRS document no. XXXXXX-PM) in reverse order. When the rocket exchange is not due, leave the rocket with the airplane.

The parachute must be repacked by the parachute manufacturer BRS inc. or by a service station authorized for repack by the AEPS manufacturer BRS inc. National regulations may result in additional limitations. Use instructions provided within the Owner's Manual for BRS-6 Emergency Parachute Recovery Systems (BRS document no. 020002-01) for preparation of the system for repack / return.

Install repacked or new parachute container with parachute following the Parachute Installation Manual BRS 1350 Softpack F2-LSA (BRS document no. XXXXXX-PM).

25-60.3.3 Parachute Hatch Check

25-60.3.3.1 Type of Maintenance

Line

25-60.3.3.2 Minimum Level of Certification

Pilot/Owner

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25-60.3.3.3 Procedure

A. Recommended Special Tools and Parts

Item	Quantity	Unit
None		

B. Parachute Hatch Check

Step	Action	Reference
1	Check the fit of the parachute hatch to the fuselage along the entire edge.	
2	Check that there are no foreign objects between the rocket and the parachute hatch	

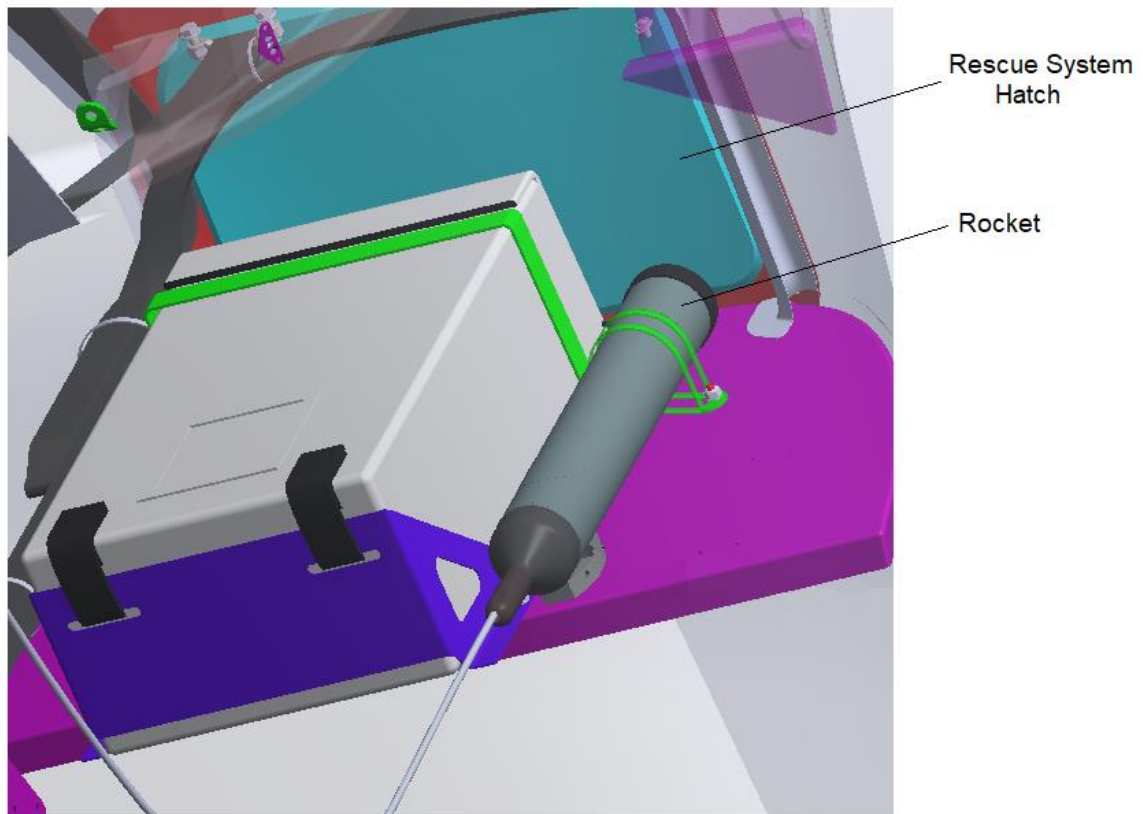


Fig. 25-60-4
Rescue System Hatch

25-60.3.4 Other Maintenance Tasks

When needed please contact the aircraft manufacturer for further instructions.

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SECTION 25-62 – EMERGENCY LOCATOR TRANSMITTER

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25-62.2.2	Safety Belt Removal and Installation
25-62.3.2	ELT Antenna Removal and Installation
25-62.3.3	ELT and ELT Antenna Check

25-62.1 General

This section provides a description and information about Emergency Locator Transmitter KANNAD INTEGRA ELT 406 AF.

25-62.2 Description

The ELT is installed on the airplane for transmitting the emergency signal in cases of emergency. ELT is located in the rear of the luggage compartment after frame 3. The ELT Antenna is located at the top of the fuselage rear from the shut-out opening. The location of the ELT and ELT Antenna is described in Fig. 25-62-1.

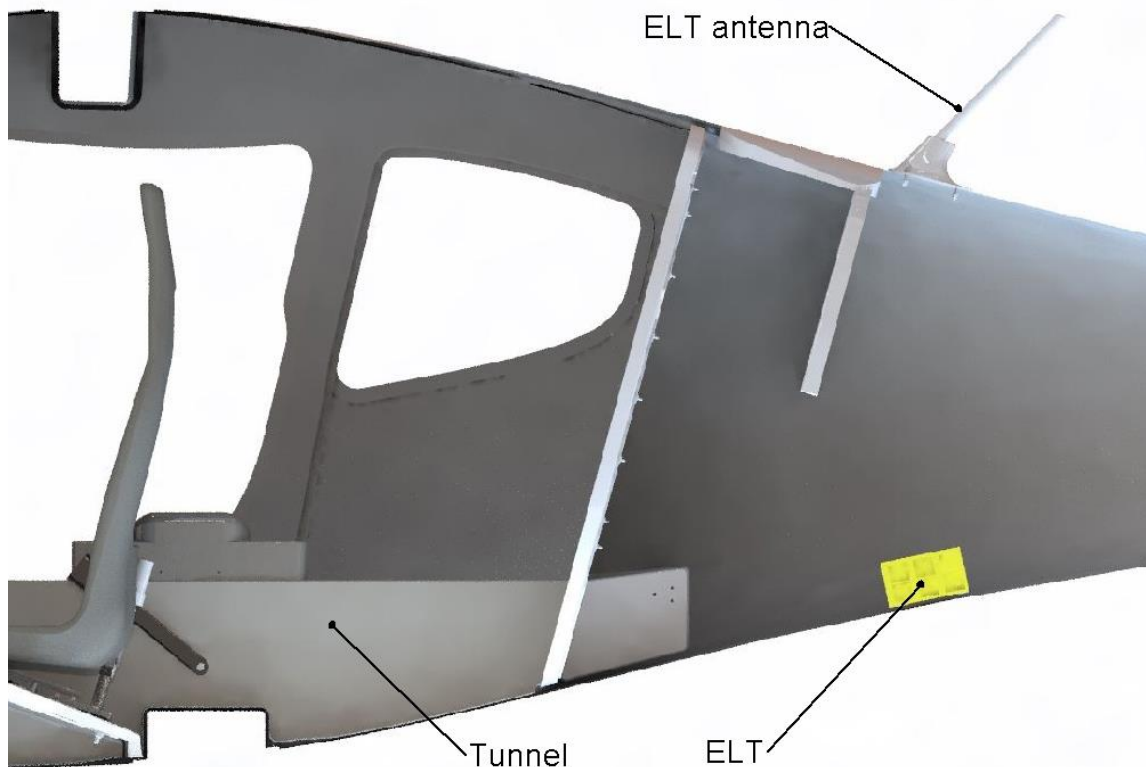


Fig. 25-62-1

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25-62.3 Maintenance Practices

25-62.3.1 ELT Removal and Installation

25-62.3.1.1 Type of Maintenance

Line

25-62.3.1.2 Minimum Level of Certification

Pilot/Owner

25-62.3.1.3 Procedure

Fig. 25-62-2 is described procedure for ELT removal and installation

A. Recommended Special Tools and Parts

Item	Quantity	Unit
None		

B. ELT removal

Step	Action	Reference
1	Switch the ELT to OFF	
2	Disconnect the outside antenna from the BNC connector of the ELT	
3	If connected, disconnect the DIN 12 Connector of the Remote Control Panel 2 or 3-wire bundle from the DIN12 socket of the ELT	
4	Unfasten the wide velcro strap	
5	Remove the transmitter from the bracket	

C. ELT Installation

Step	Action	Reference
1	Install ELT in reversed direction order.	

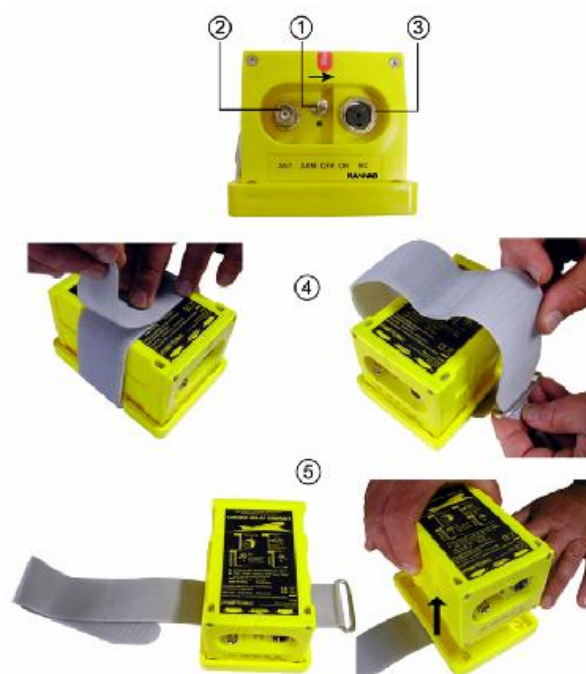


Fig. 25-62-2

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25-62.3.2 ELT Antenna Removal and Installation

25-62.3.2.1 Type of Maintenance

Line

25-62.3.2.2 Minimum Level of Certification

LSA-Mechanic (LSRM)

25-62.3.2.3 Procedure

Fig. 25-62-4 is described procedure for ELT Antenna removal and installation

A. Recommended Special Tools and Parts

Item	Quantity	Unit
None		

B. Antenna removal

Step	Action	Reference
1	Switch the ELT to OFF	
2	Disconnect the BNC connector item 5 from ELT Antenna	
3	Unscrew the nut item 4 and remove the lock washer item 3 and washer item 2	
4	Remove ELT Antenna	

C. Antenna Installation

Step	Action	Reference
1	Install the ELT Antenna in reversed direction order.	

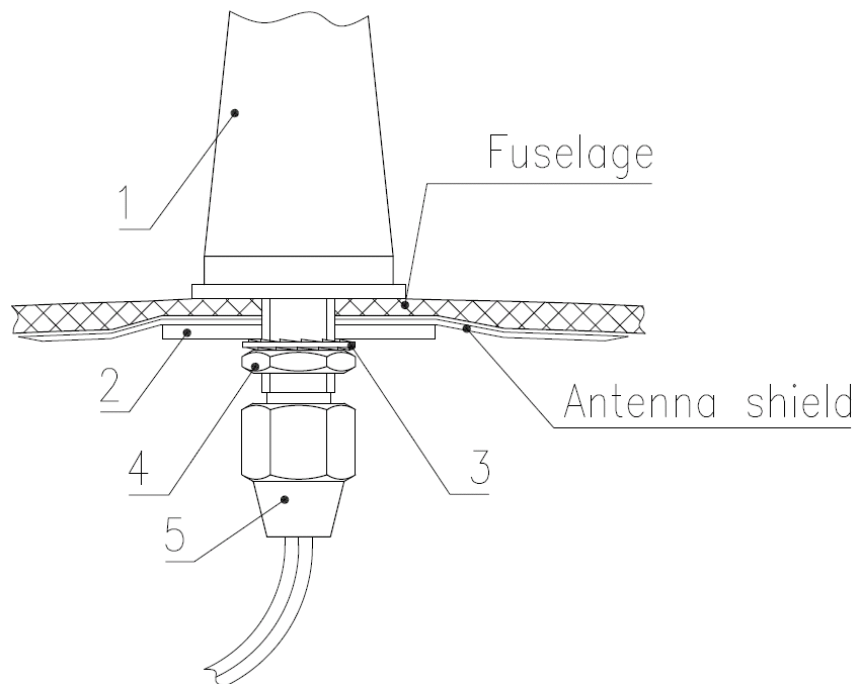


Fig. 25-62-4

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25-62.3.3 *ELT and ELT Antenna Check*

25-62.3.3.1 Type of Maintenance

Line

25-62.3.3.2 Minimum Level of Certification

Pilot/Owner

25-62.3.3.3 Procedure

The ELT and ELT Antenna inspection of KANNAD 406 AF is described in ELT KANNAD installation manual.

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CHAPTER 26 – FIRE PROTECTION

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26-00.1	General
26-00.2	Description

26-00.1 General

This chapter provides information concerning extinguisher located in the pocket at the backside of the copilot seat backrest. Refer to the fire extinguisher manufacturer's manual for more data about the extinguisher.

26-00.2 Description

- ▲ Warning: Every F2-LSA has the fire extinguisher in the pocket on the back of the passenger seat. It can be used to fight small fires in the cockpit.
- ▲ Warning: By the nature of these types of fire extinguishers, they do not ensure functionality at very low temperatures. Verify the specified limitations for the extinguisher used on your specific aircraft.
- ▲ Warning: Fire extinguishers have a limited lifetime. Make sure you replace the fire extinguisher with a suitable new one when the lifetime limit is reached.

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27-30.3.1	Elevator Deflection Measurement
27-30.3.2	Elevator Deflection Adjustment
27-30.3.3	Elevator Controls Inspections
SECTION 27-50 – FLAPS	
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27-50.2	Description
27-50.3	Maintenance Practices
27-50.3.1	Rigging of “Zero” Position of the Flaps
27-50.3.2	Measurement of Flap Deflection
27-50.3.3	Flap Deflection Adjustment
27-50.3.4	Flap Controls Check

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27-00.1 General

This chapter provides a description and information on the Flight Controls.

27-00.2 Description

The aircraft has dual controls, allowing operation from both seats. The dual controls cannot be separated.

Even though the aircraft can be fully operated from both seats, the pilot in command is defined on the left side seat. The arrangement of the instruments and operating devices is primarily optimized for this seat. Thanks to the dual controls, the aircraft is well equipped for training and instruction. In this case, the instructor sits on the right side seat.

27-00.3 Control Surface Deflections

Adjustment Report					
Inspector:				Airplane S/N	
Control surface	Position	Limits, degrees/mm	Tolerance, degrees/mm	Actual, degrees/mm	Notes
Flap left	up	0 deg	±1 deg		
	down	35 deg	±1 deg		
Flap right	up	0 deg	±1 deg		
	down	35 deg	±1 deg		
Aileron left	up	20 deg	±1 deg		
	down	12 deg	±1 deg		
Aileron right	up	20 deg	±1 deg		
	down	12 deg	±1 deg		
Elevator	up	18 deg	±1 deg		
	down	21 deg	±1 deg		
Rudder	left (deg)	17 deg	±1 deg		
	left (mm)				
	right (deg)	17 deg	±1 deg		
	right (mm)				
Date:					

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SECTION 27-10 – AILERONS

27-10.1 General

This section provides a description of the Aileron control system.

27-10.2 Description

The ailerons are activated via push rods which run from the control stick through the tunnel to the bellcranks which are located at the end of tunnel and on the rear side of frame 2.

The following figure shows the aileron control system in the fuselage with connection to the wings. All levers and bellcranks are provided with ball bearings or spherical bearings. The push-rods used in the control system have standard machined, threaded rod end plugs. Each rod end has a spherical bearing. A lock-nut on the threaded shaft locks the rod end in position. You can turn the spherical bearing to adjust the length of the rod.

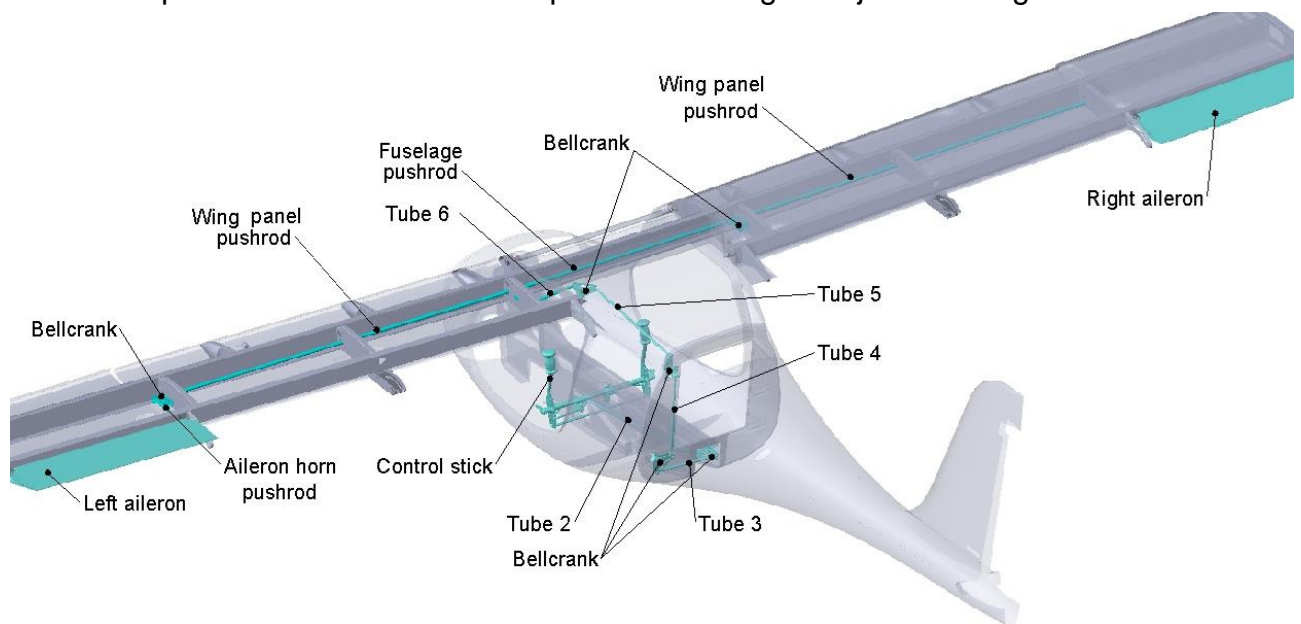


Fig. 27-10-1. Aileron Control, General View

The F2-LSA has a control stick for each pilot for the aileron and elevator controls. Both control sticks are connected by the tube 7 and the stick tube. The stick tube has two attachment points – bracket 10 (mounted on the pyramid) and bracket 10 (mounted on the tunnel wall). Control force on the ailerons is transmitted through the rod. The rod is connected to the middle of the control sticks by the stick levers. The rod is connected to the bellcrank, which is mounted on the tunnel wall by the two brackets, 4. The bellcrank is connected to the tube, 2 which is going through the wall of the central tunnel.

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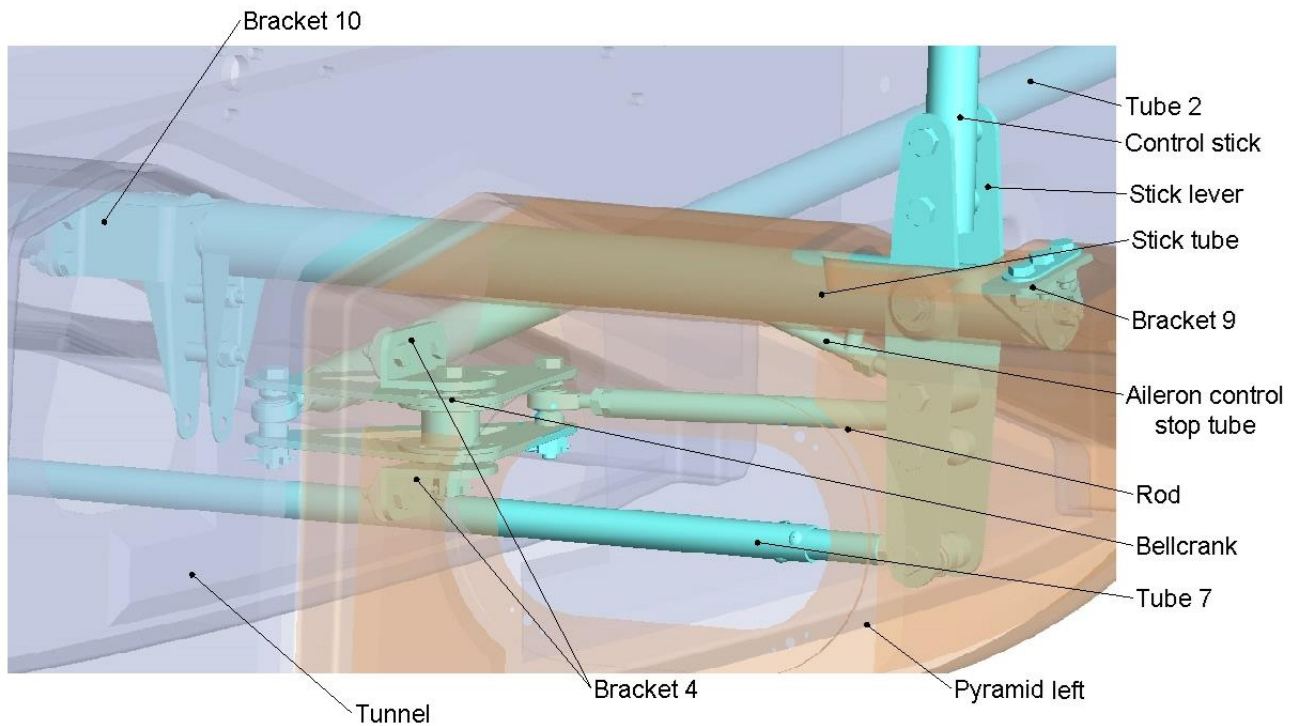


Fig. 27-10-2

Tube 2 is connected to the bellcrank which is mounted on the tunnel wall in the rear tunnel area by two brackets 6. The bellcrank on the lower part of frame 2 (mounted by two brackets 3) connected with bellcrank on tunnel by tube 3.

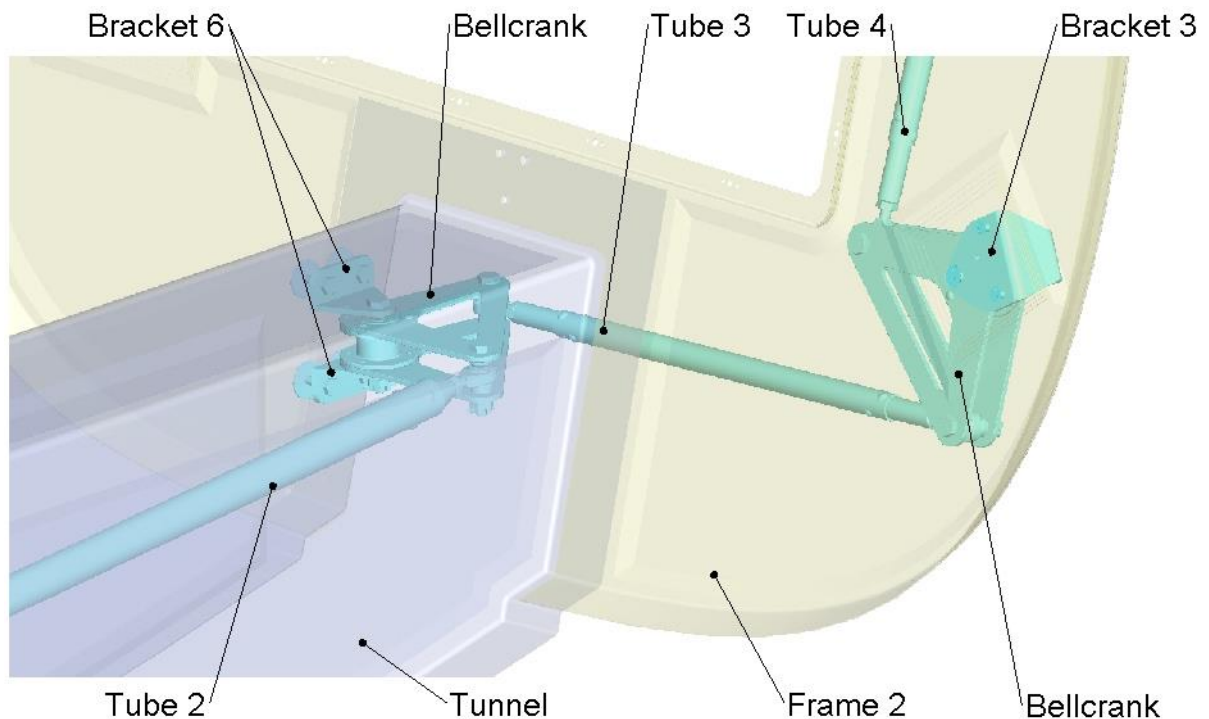


Fig. 27-10-3

The bellcrank on the lower part of frame (aft cabin bulkhead) 2 is connected to the bellcrank on the upper part of frame 2 by tube 4. Upper bellcrank is mounted by bracket 1 and bracket 1-2. Tube 5 connects the upper bellcrank with the lower bellcrank which is mounted on the inner fuselage skin by two brackets 8.

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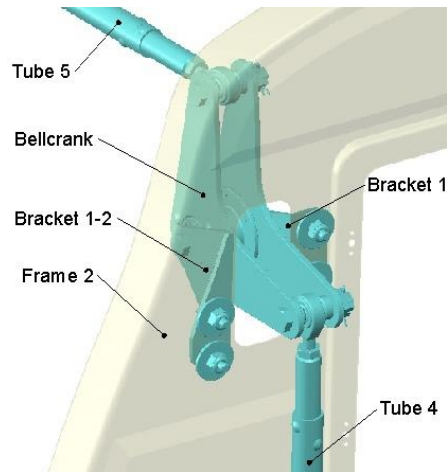


Fig. 27-10-4

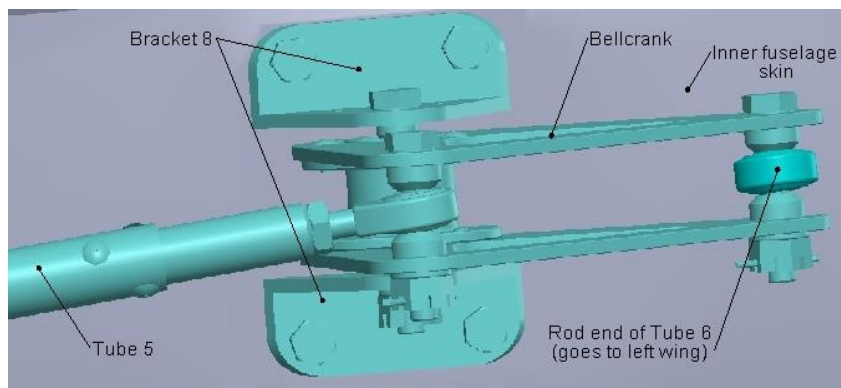


Fig. 27-10-5

Tube 6 goes from the fuselage to the left wing and is connected to the bellcrank which is attached to the rear of the left root rib by the root rib bracket. The wing panel pushrod is connected to the bellcrank and goes along main spar further into left wing panel. The fuselage pushrod is the link between the left, and right wing panel pushrods. It is also connected with the bellcrank and located close to the main spar web.

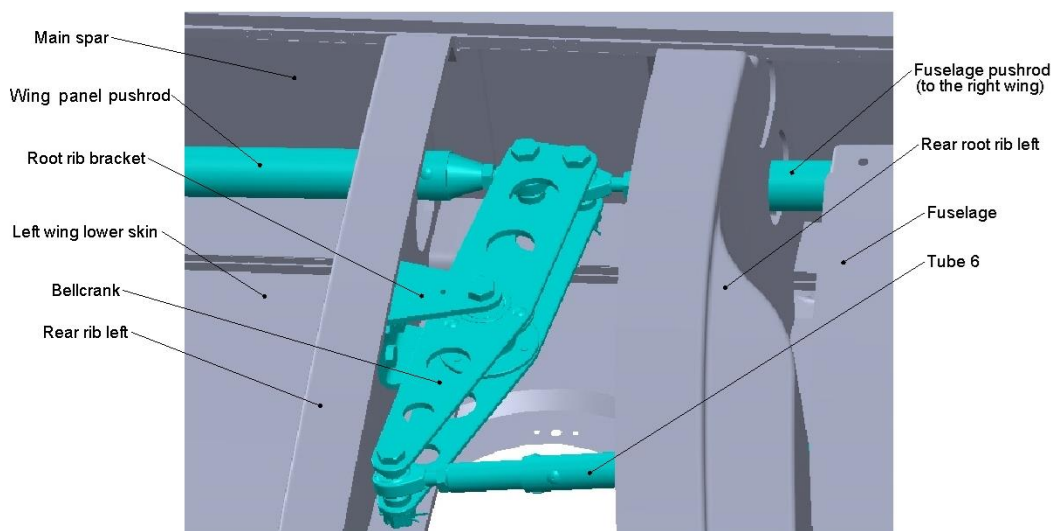


Fig. 27-10-6

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The wing panel pushrod is attached to the wing rib bellcrank which is mounted on rear rib N3. Control force to the left aileron is transmitted through the aileron horn pushrod which is attached to the aileron horn and the wing rib bellcrank.

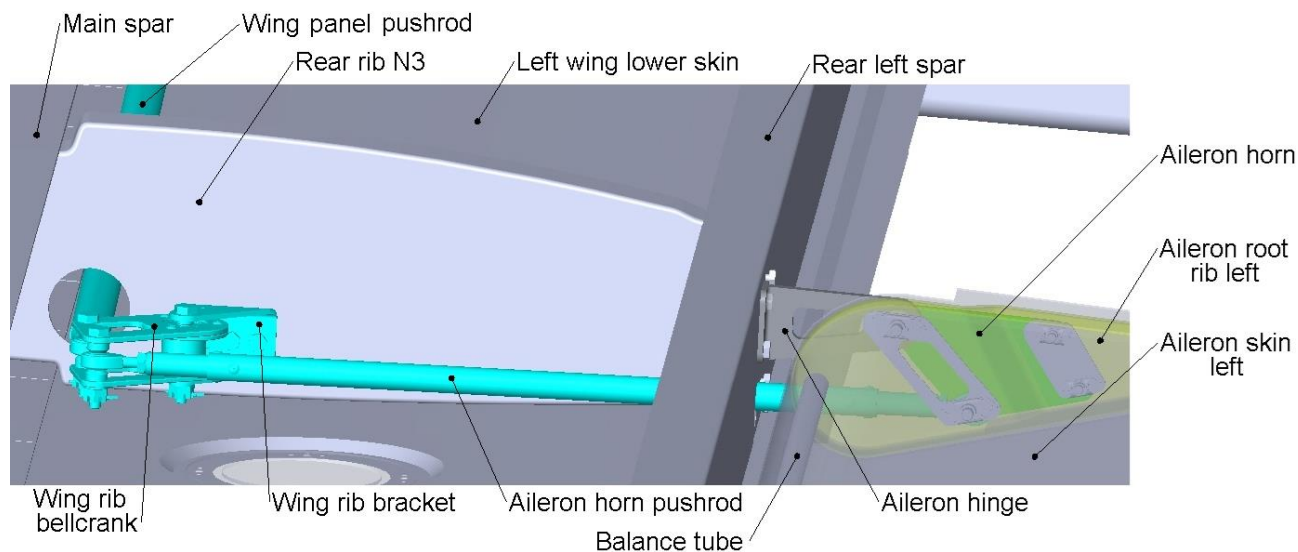


Fig. 27-10-7

In the right wing panel, the fuselage pushrod is attached to the bellcrank that is attached to the right rear rib N1 with two root rib brackets. The wing panel pushrod also attached to the bellcrank and goes further into the wing, similar to the left wing panel.

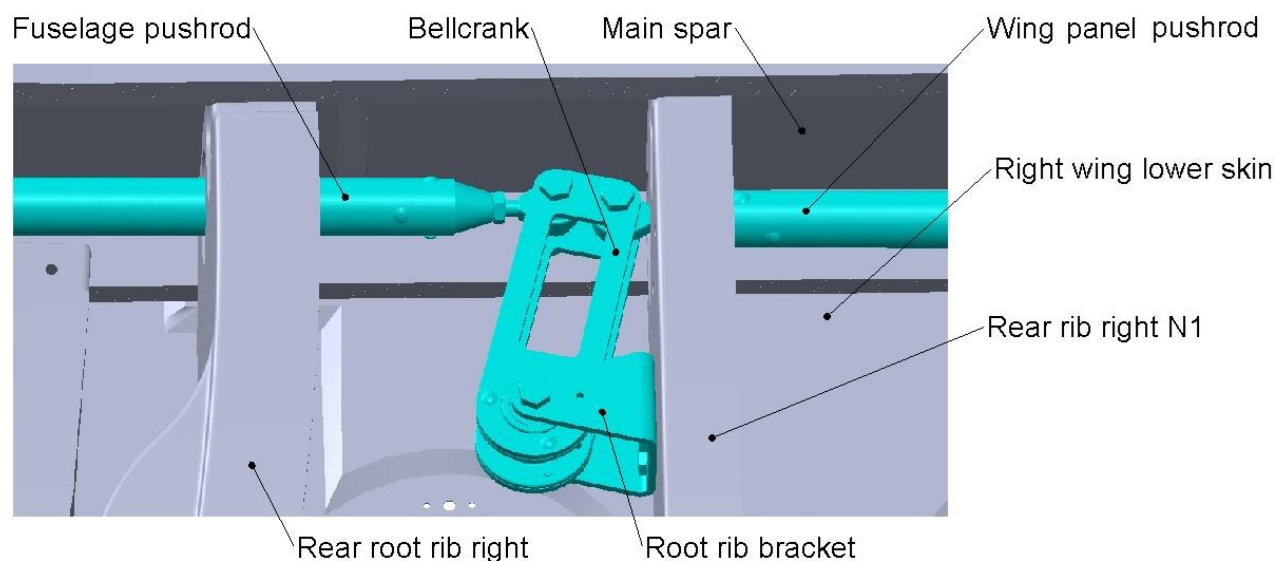


Fig. 27-10-8

The aileron control stop tube limits the control stick movements. Aileron deflection angles can be adjusted by the AN4-7A stop bolt which is screwed into aileron control stop tube. The ailerons control stop is a bushing located between stick levers. The AN4-7A stop bolt contacts the aileron control stop when the control stick is deflected to the limit position.

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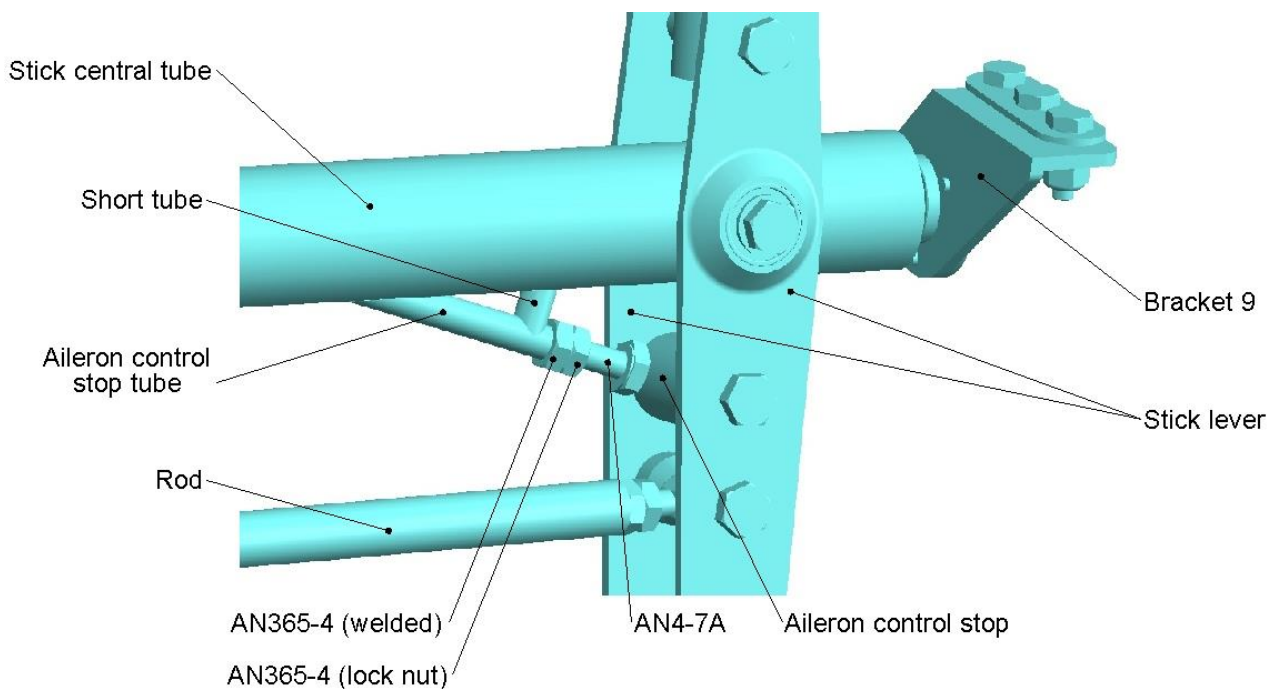


Fig. 27-10-9

27-10.2.1 Autopilot Roll Servo (If chosen option - autopilot)

If the option with the installation of the autopilot is selected, the servo is mounted on the Frame 3 using a bracket (item 16) and, using Rod, is connected to the Aileron control system.

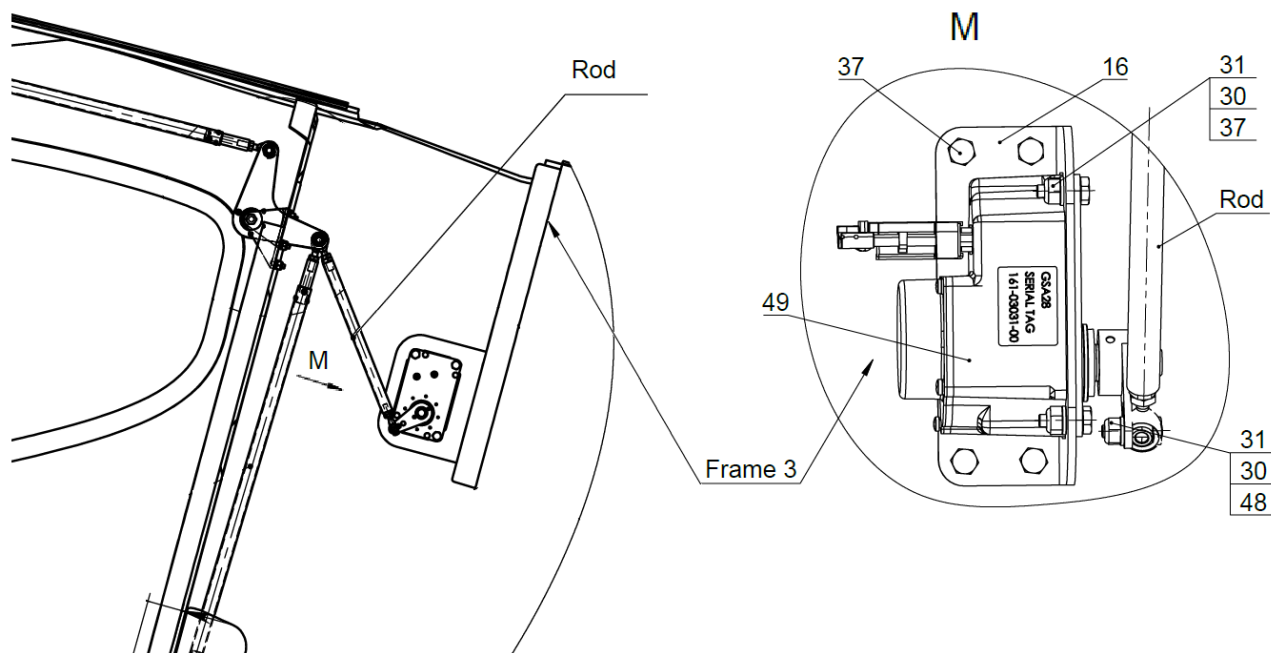


Fig. 27-10-9

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Fig.	Item	Part Name
27-10-9	16	Aileron autopilot bracket
	30	Washer AN960C10
	31	Self-locking nut 10-32 AN365-1032A
	37	Bolt undrilled 10-32 AN3-5A
	48	Bolt undrilled 10-32 AN3-6A
	49	Autopilot servo

27-10.3 Maintenance Practices

27-10.3.1 Rigging of Aileron “Zero” Position

27-10.3.1.1 Type of Maintenance

Heavy

27-10.3.1.2 Minimum Level of Certification

LSA-Mechanic (LSRM)

27-10.3.1.3 Procedure

A. Recommended Special Tools and Parts

Item	Quantity	Unit
Rigging Rod Ø3 mm (50-60 mm length)	9	pcs

B. Rigging of Aileron “Zero” Position

The “Zero” position of the ailerons is the position when the ailerons are aligned with the flaps in cruise configuration.

Step	Action	Reference
1	Set the flap at cruise position “0” with the flap controller	27-00.3
2	Fix the control stick at the neutral position. This can be done using the special Ø3 mm holes in the bellcranks and brackets (Fig. 27-10-12). It is necessary to achieve alignment of these holes using Ø3 mm rigging rods. Every bellcrank and bracket has the special holes for neutral position adjusting.	

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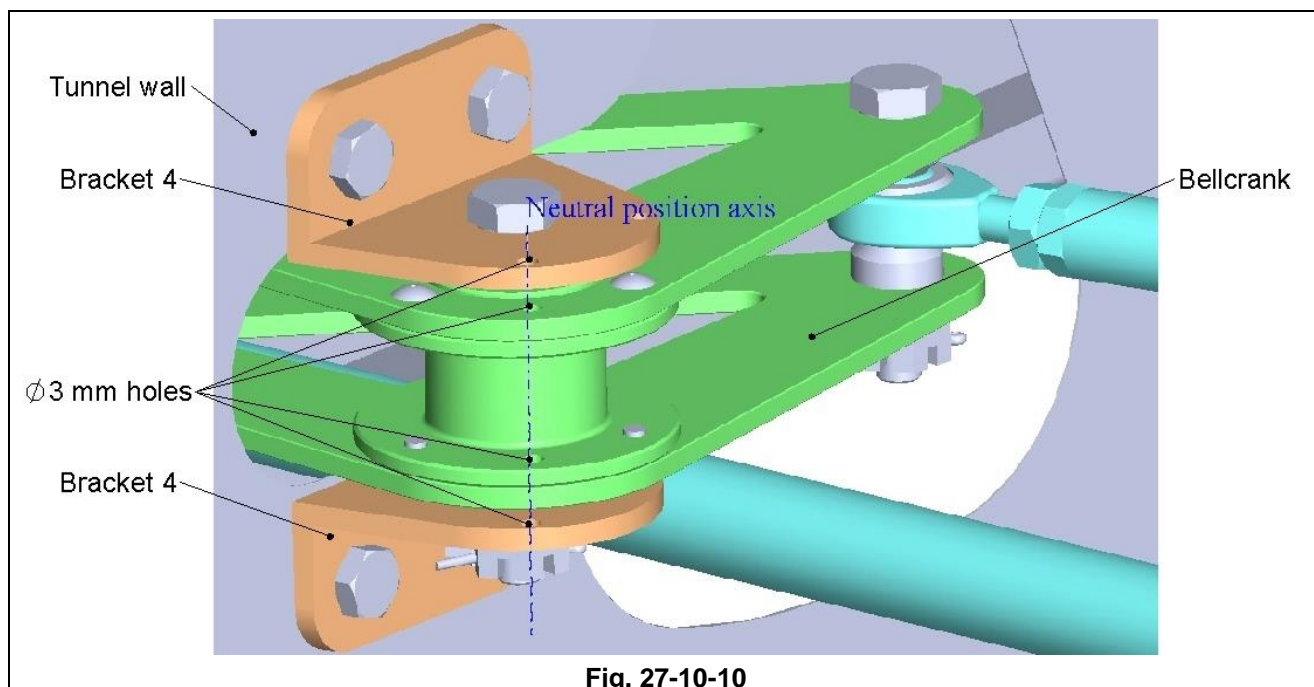


Fig. 27-10-10

3

Adjust ailerons position level with the flaps with the aileron horn pushrod length adjusting (Fig. 27-10-12) and wing panel pushrod (Fig. 27-10-12).

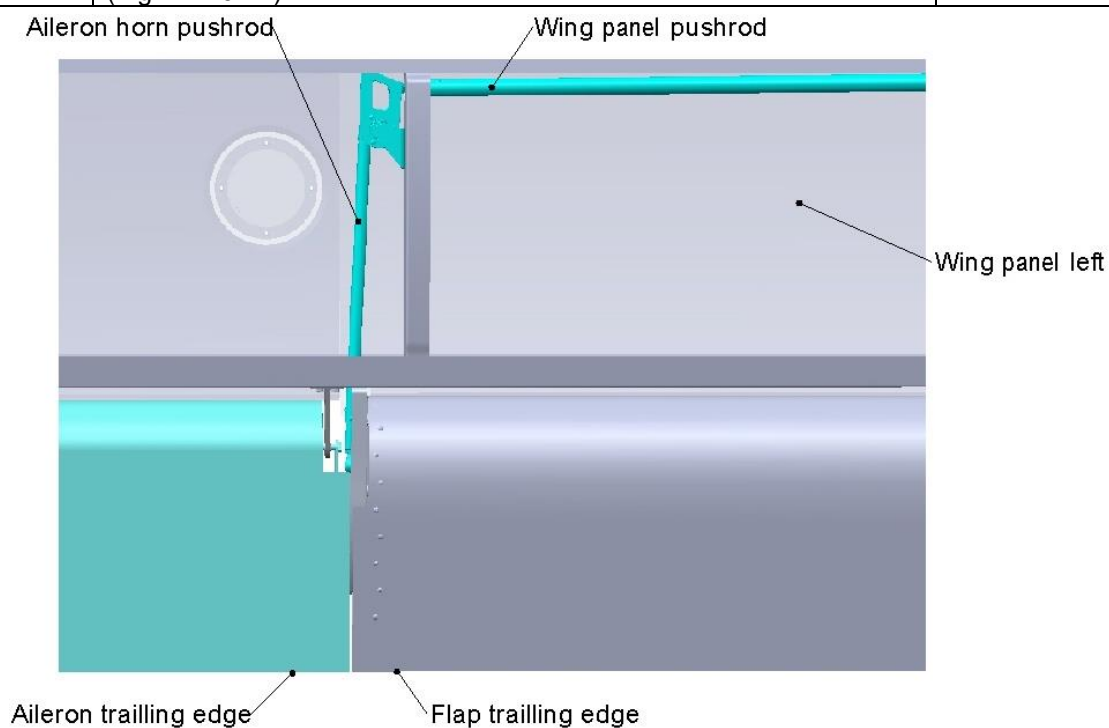


Fig. 27-10-11

27-10.3.2 *Measuring of Aileron Deflection*

27-10.3.2.1 Type of Maintenance

Line

27-10.3.2.2 Minimum Level of Certification

LSA-Mechanic (LSRM)


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27-10.3.2.3 Procedure

A. Recommended Special Tools and Parts

Item	Quantity	Unit
Metric Ruler	1	pc

B. Measuring of Aileron Deflection

Step	Action	Reference
1	Aileron deflections are defined in the deflection table.	27.3
2	Set the flaps at cruise position "0"	
3	Deflect the aileron to the upper extreme position with the control stick. Measure distance between trailing edges of aileron and flap (Fig 27-10-14).	
 Fig. 27-10-12		
4	Deflect the aileron to the lower extreme position with the control stick. Measure the distance between the trailing edges of the aileron and flap (Fig 27-10-14).	
5	Do step 3 and 4 for the other aileron.	

27-10.3.3 Aileron Deflection Adjustment

27-10.3.3.1 Type of Maintenance

Heavy

27-10.3.3.2 Minimum Level of Certification

LSA-Mechanic (LSRM)

27-10.3.3.3 Procedure

A. Recommended Special Tools and Parts

Item	Quantity	Unit
None		

B. Aileron Deflection Adjustment

Step	Action	Reference
1	Aileron deflection (flaps at cruise position "0") can be adjusted by screwing bolt AN4-7A in or out of the aileron control stop tube (Fig. 27-10-9). Screwing the bolt out decreases the aileron deflection range. Screwing the bolt in increases the deflection range. Left and right control stop bolts shall always be the same position. Position of the control stop bolt must be locked with the lock nut.	
2	After each adjustment check the angles of aileron deflection.	27-10.3.2

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27-10.3.4 Aileron Controls System Play Check

27-10.3.4.1 Type of Maintenance

Line

27-10.3.4.2 Minimum Level of Certification

LSA-Mechanic (LSRM)

27-10.3.4.3 Procedure

A. Recommended Special Tools and Parts

<i>Item</i>	<i>Quantity</i>	<i>Unit</i>
None		

B. Checking for Play

<i>Step</i>	<i>Action</i>	<i>Reference</i>
1	After completion of a system inspection after adjustment or during a routine system inspection, secure the control stick in zero position.	
2	Slightly shake trailing edges of the aileron up and down.	
3	Total play of the trailing edge must not exceed 3 mm.	
4	Repeat procedure for the second aileron.	

C. Troubleshooting

<i>Step</i>	<i>Action</i>	<i>Reference</i>
1	In case of any abnormalities during the check is found, please contact Flight Design Customer Care (customercare@flightdesign.com) for further instructions.	

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SECTION 27-20 – RUDDER

27-20.1 General

This section provides a description of the Rudder control system.

27-20.2 Description

The rudder is activated via control cables in the tunnel and along the tail beam (Fig. 27-20-1).

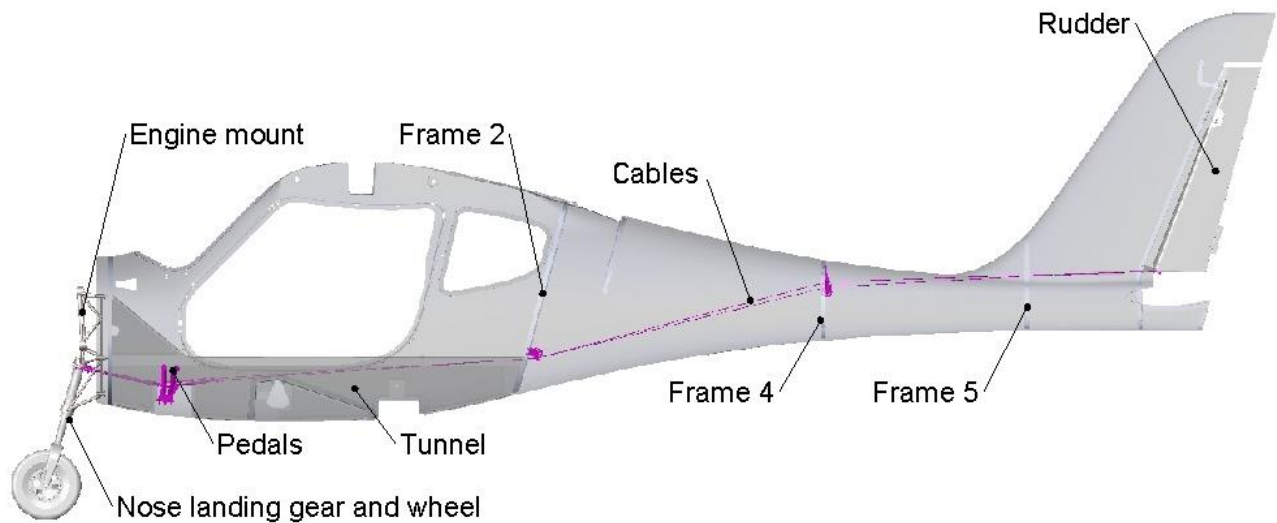


Fig. 27-20-1. Rudder Control, General View

The left and right rudder pedals are coupled through the tunnel and attached to the pedal box. The turnbuckle AN130-32L is used to tension the cables and the connection to the nose wheel steering which is located in the front section of the central tunnel.

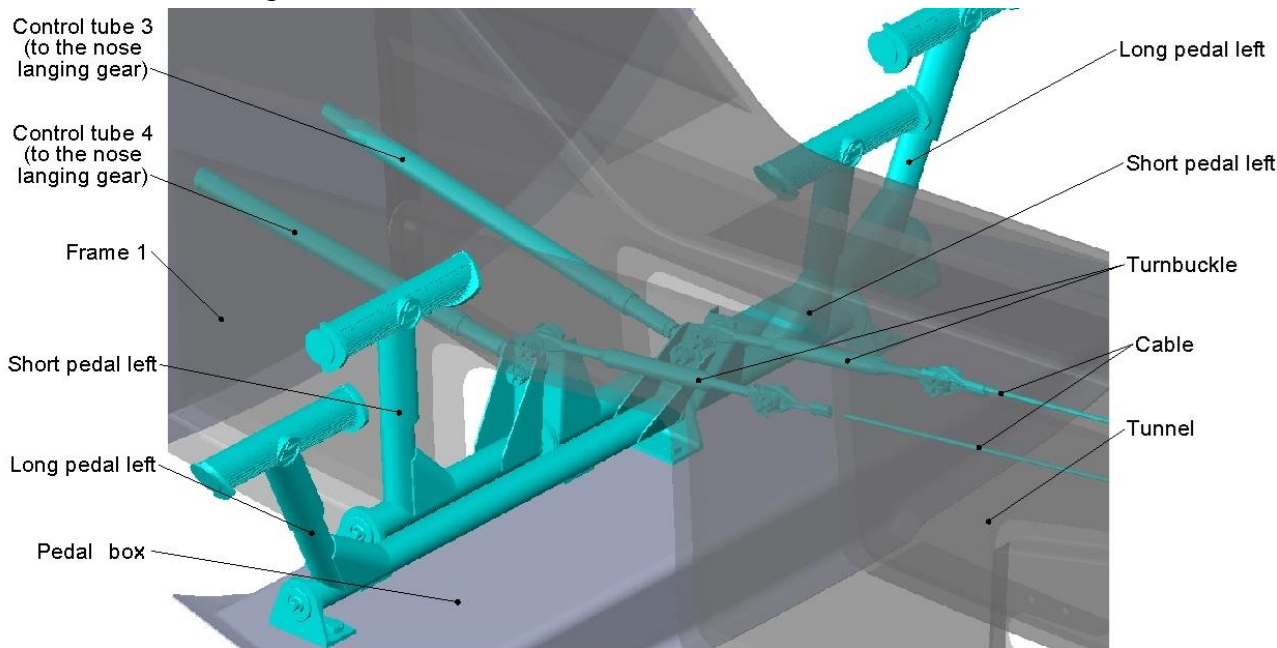


Fig. 27-20-2

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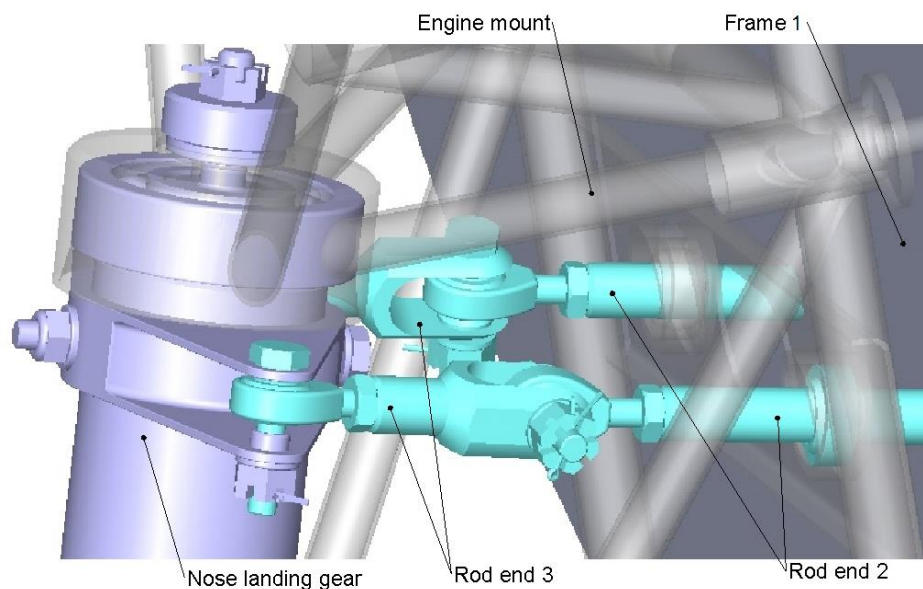


Fig. 27-20-3

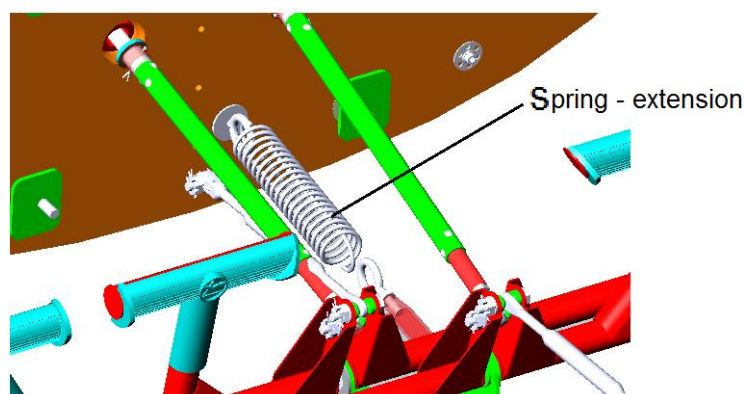


Fig. 27-20-4

An extension-type spring (Fig. 27-20-4) is located in the tunnel. This spring helps to center the rudder pedals in flight, and holds the pedals in neutral position. A minimum force is required to move the pedals from their center position.

Turnbuckles connect the steel rudder cables to the rudder control levers. The cables are routed along the fuselage and tail beam thru pulleys which are mounted of the frame 2 and frame 4 (Fig. 27-20-5 and Fig.27-20-6). The cables exit out of frame 5 of the fuselage and are connected to the rudder (Fig. 27-20-7).

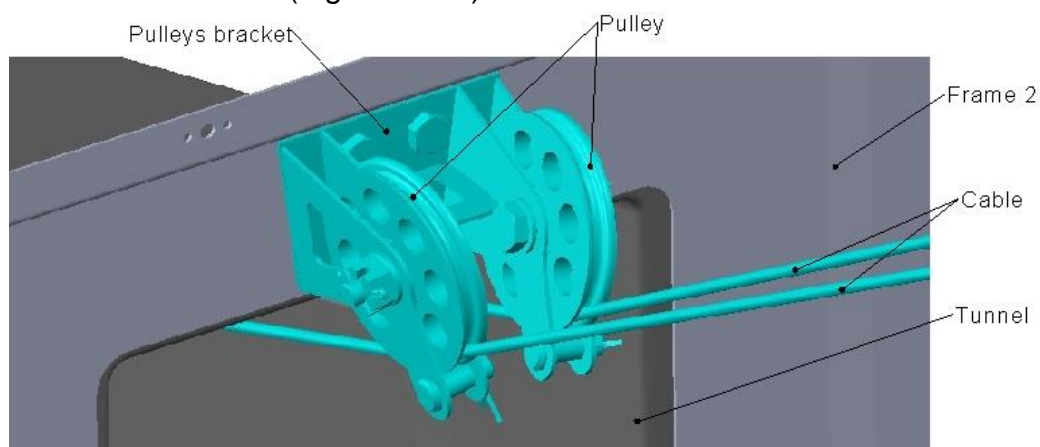


Fig. 27-20-5

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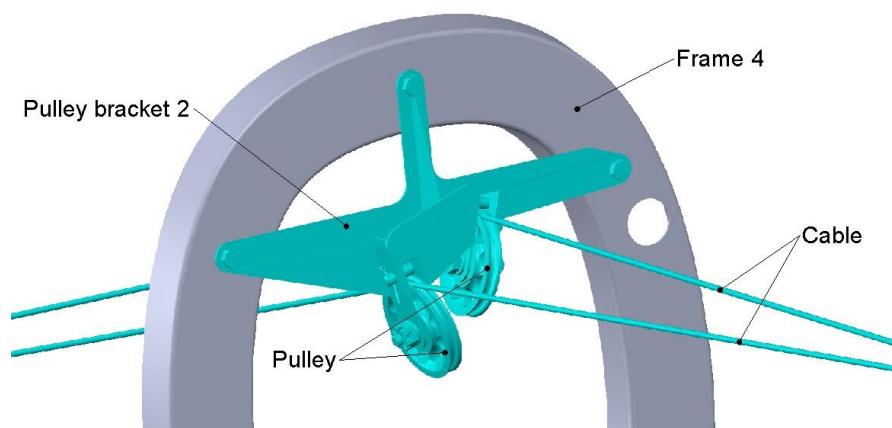


Fig. 27-20-6

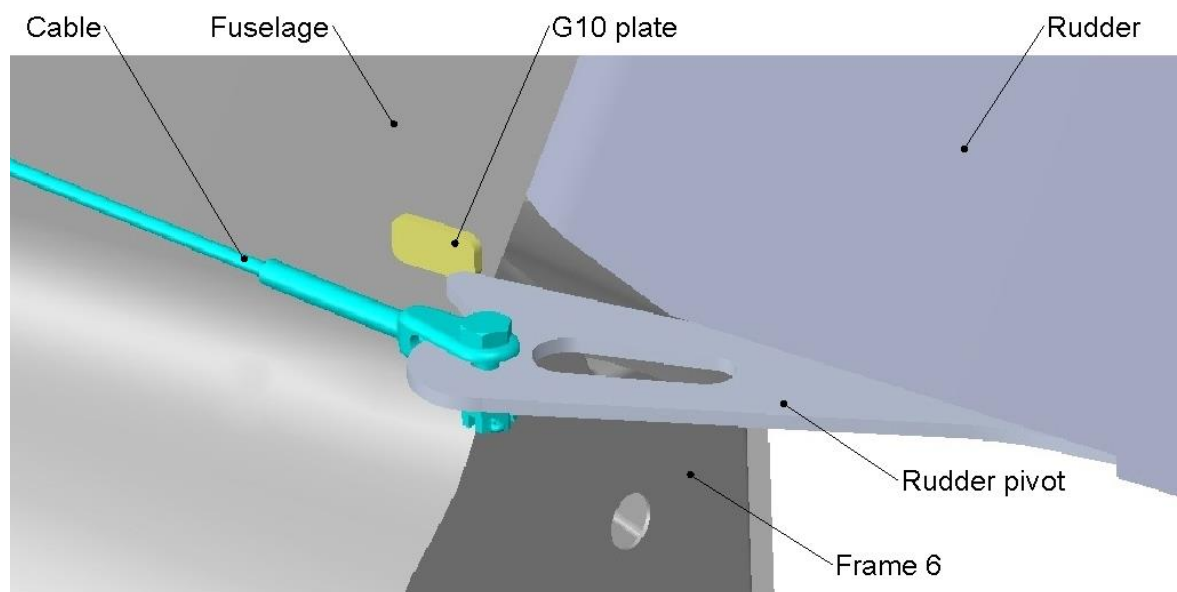


Fig. 27-20-7

The nose wheel steering is coupled to the rudder pedals, using two pushrods. This allows direct and precise steering when taxiing the aircraft.

27-20.3 Maintenance Practices

The deflection ranges of control surfaces provided in Section 27-00.3 of this manual.

27-20.3.1 Rigging of Rudder “Zero” Position

27-20.3.1.1 Type of Maintenance

Heavy

27-20.3.1.2 Minimum Level of Certification

LSA-Mechanic (LSRM)

27-20.3.1.3 Procedure

A. Recommended Special Tools and Parts

Item	Quantity	Unit
None		

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B. Rigging of Rudder “Zero” Position

The adjustment is done with the pedals and turnbuckles AN130-32L which allows adjustment the cable tension.

27-20.3.2 Measuring of Rudder Deflection

27-20.3.2.1 Type of Maintenance

Line

27-20.3.2.2 Minimum Level of Certification

LSA-Mechanic (LSRM)

27-20.3.2.3 Procedure

A. Recommended Special Tools and Parts

<i>Item</i>	<i>Quantity</i>	<i>Unit</i>
Metric Ruler	1	pcs

B. Measuring Rudder Deflection (Fig. 27-20-8)

<i>Step</i>	<i>Action</i>	<i>Reference</i>
1	Rudder deflections are defined in the deflection table.	27.3
2	Set the rudder at the neutral position.	
3	Deflect the rudder to the extreme position using the pedals. Measure the travel range at the bottom of the rudder trailing edge.	
4	Deflect rudder to the other extreme position using the pedals. Measure the travel range at the bottom of the rudder trailing edge.	
5	Adjust if necessary using the following directions	27-20.3.3



Fig. 27-20-8

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27-20.3.3 Measuring of Rudder Cables Tension

27-20.3.3.1 Type of Maintenance

Line

27-20.3.3.2 Minimum Level of Certification

LSA-Mechanic (LSRM)

27-20.3.3.3 Procedure

A. Recommended Special Tools and Parts

<i>Item</i>	<i>Quantity</i>	<i>Unit</i>
Tensiometer for cables with diameter of 4 mm	1	pc

B. Measuring Rudder Cable Tension

<i>Step</i>	<i>Action</i>	<i>Reference</i>
1	Set the rudder at neutral position.	
2	Check the cable tension using access through the service hatch. The tension value must be in the range 13 kg (30 lbs) at 20°C	27-20.3.3
3	Adjust if necessary	27-20.3.5

27-20.3.4 Rudder Deflection Adjustment

27-20.3.4.1 Type of Maintenance

Heavy

27-20.3.4.2 Minimum Level of Certification

LSA-Mechanic (LSRM)

27-20.3.4.3 Procedure

A. Recommended Special Tools and Parts

<i>Item</i>	<i>Quantity</i>	<i>Unit</i>
Metric Ruler	1	pcs

B. Rudder Deflection Adjustment

The rudder deflection is limited by Rudder Stop plates which are glued on the firewall.

If the Rudder deflection does not match the deflection specified in 27-00.3 (Control Surface Deflections) and all other parts of the system are correct, reduce the rudder deflection by increasing the thickness of the G10 stop plate. To increase the rudder deflection, it is necessary to reduce thickness of G10 plates.

27-20.3.5 Control Cable Tension Adjustment

Tension adjustment is performed with the AN130-32L turnbuckles of the rudder control cables.

27-20.3.5.1 Type of Maintenance

Heavy

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27-20.3.5.2 Minimum Level of Certification

LSA-Mechanic (LSRM)

27-20.3.5.3 Procedure

A. Recommended Special Tools and Parts

<i>Item</i>	<i>Quantity</i>	<i>Unit</i>
None		

B. Coarse Control Cable Tension Adjustment

<i>Step</i>	<i>Action</i>	<i>Reference</i>
1	Remove the safety wire securing the turnbuckle from rotating. Put into the middle hole a pin or awl (Fig.27-20-9). Use the pin as a lever.	
2	Rotating AN130-32L turnbuckle around its axis change cables tension.	
3	Check cables tension as described above in Section 27-20.3.3.3.	27-20.3.3
4	Repeat steps 3 when necessary.	
5	Check zero position of the rudder. Adjust if necessary.	27-20.3.1
6	Check measuring deflection.	27-20.3.2
7	Adjust if necessary. Reinstall safety wire according to AC 43-15.	27-20.3.4



Fig. 27-20-9

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27-20.3.6 Rudder Control System Play Check

27-20.3.6.1 Type of Maintenance

Line

27-20.3.6.2 Minimum Level of Certification

LSA-Mechanic (LSRM)

27-20.3.6.3 Procedure

A. Recommended Special Tools and Parts

<i>Item</i>	<i>Quantity</i>	<i>Unit</i>
None		

B. Checking for Play

<i>Step</i>	<i>Action</i>	<i>Reference</i>
1	Secure the rudder pedals at the neutral position.	
2	Slightly shake trailing edges of the rudder left and right.	
3	Total play of the trailing edge must not exceed 3mm.	

C. Troubleshooting

<i>Step</i>	<i>Action</i>	<i>Reference</i>
1	In case any abnormalities are found during the control system check, please contact Flight Design Customer Care (customercare@flightdesign.com) for further instructions.	

27-20.3.7 Control Cable Replacement

Contact Flight Design Customer Care (customercare@flightdesign.com) for further instructions.

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SECTION 27-30 – ELEVATOR

27-30.1 General

This section provides a description of the Elevator control system.

27-30.2 Description

The F2-LSA has a fixed Stabilizer and movable symmetrical Elevator. The stabilizer is attached to a fuselage by two large stabilizer pins and securing bolt. The elevator is attached to the stabilizer via the elevator hinges.

The elevator covers 80% of the Stabilizer span. It is matched to the stabilizer in an aerodynamically optimum manner. An individually matched counter-weight, attached to the front of the Elevator, ensures correct mass-balance.

The Elevator is actuated by the control sticks via push rods that run through the central tunnel and along the fuselage floor.

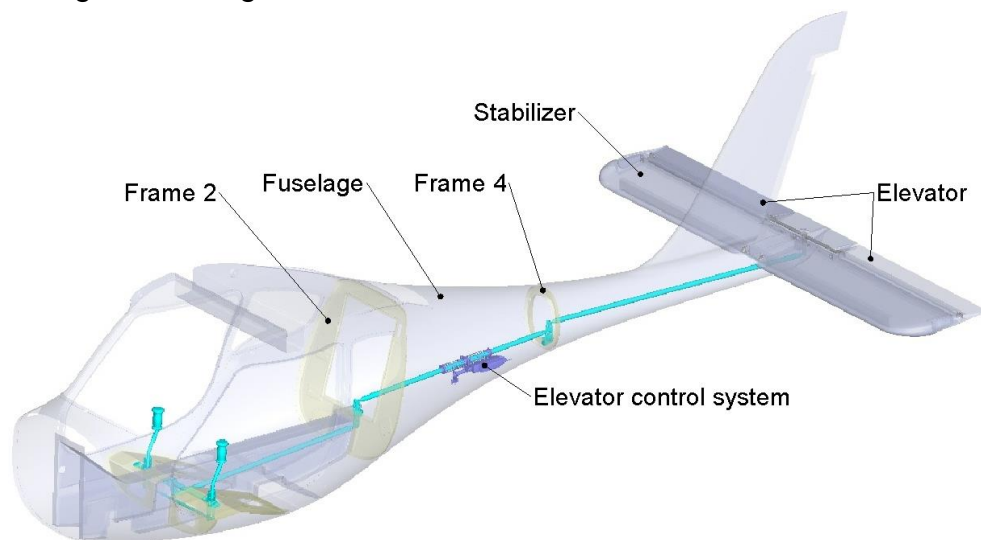


Fig. 27-30-1. Elevator Control, General View

The control sticks are coupled through the central tunnel by tube 7 and the stick tubes. The stick tube has a stops on under the pyramid wall (Fig. 27-30-2).

The stick tube and stick tube 2 are connected to the tube 8 by rod end (Fig. 27-30-3). Tube 8 is located in tunnel and goes further to the frame 2.

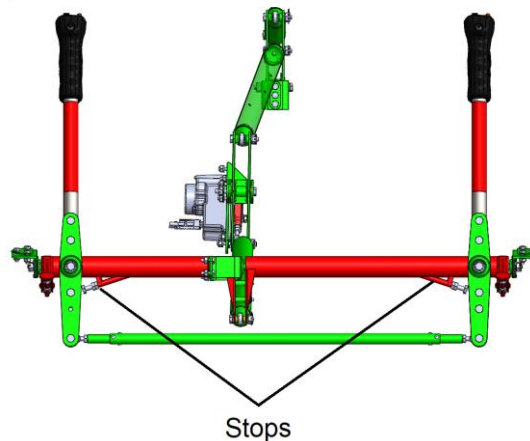


Fig. 27-30-2

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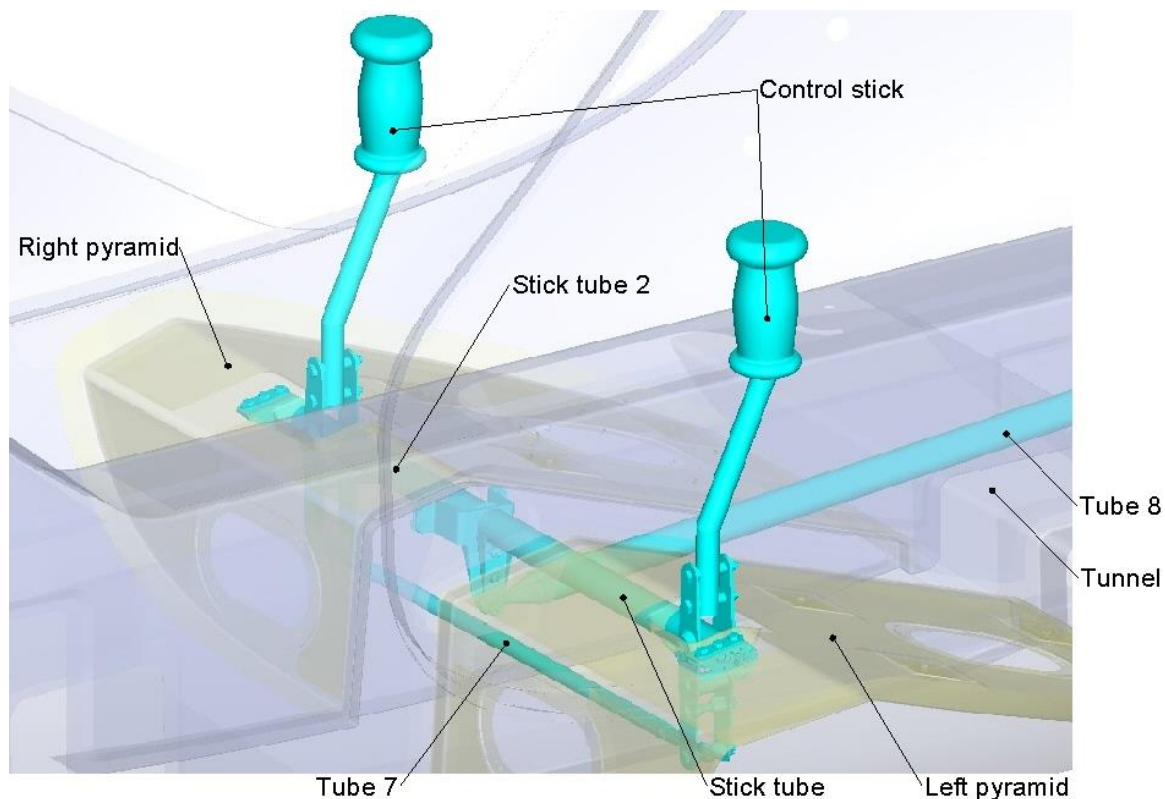


Fig. 27-30-3

Tube 8 is connected with tube 9 behind frame 2 with a bellcrank. The bellcrank is mounted to the bracket 7 which is attached to frame 9. Fig. 27-30-4.

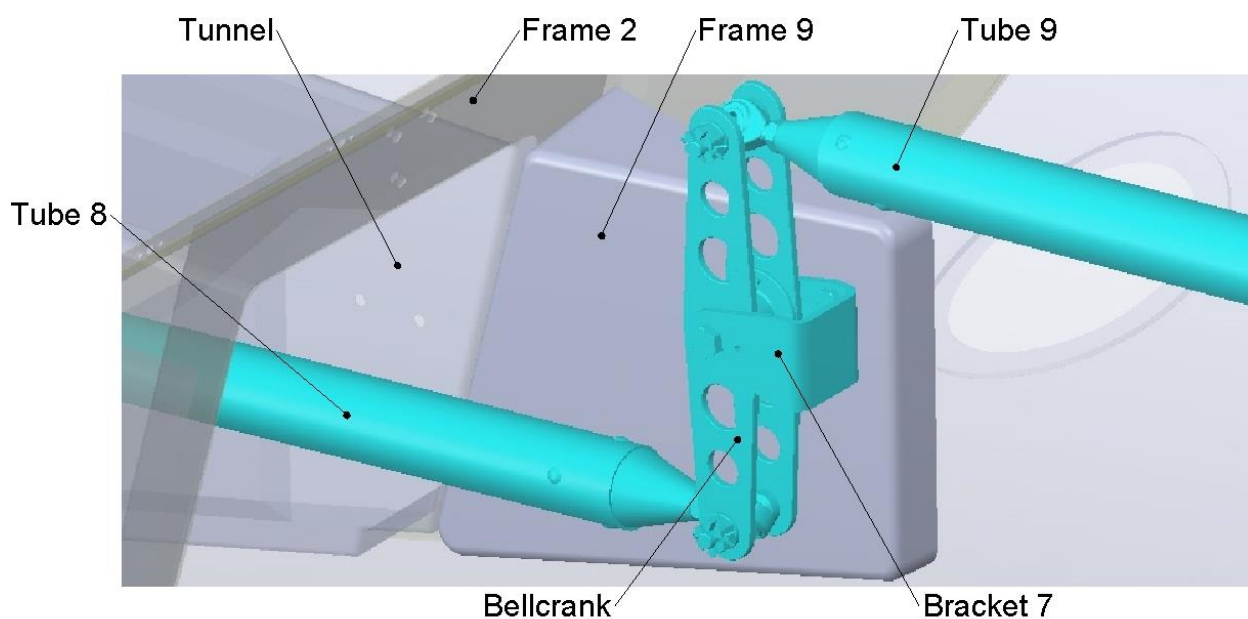


Fig. 27-30-4

Tube 9 is connected with tube 10 behind frame 4 via a second bellcrank. The bellcrank is mounted to the bracket 8 which is attached to frame 4. Fig. 27-30-4.

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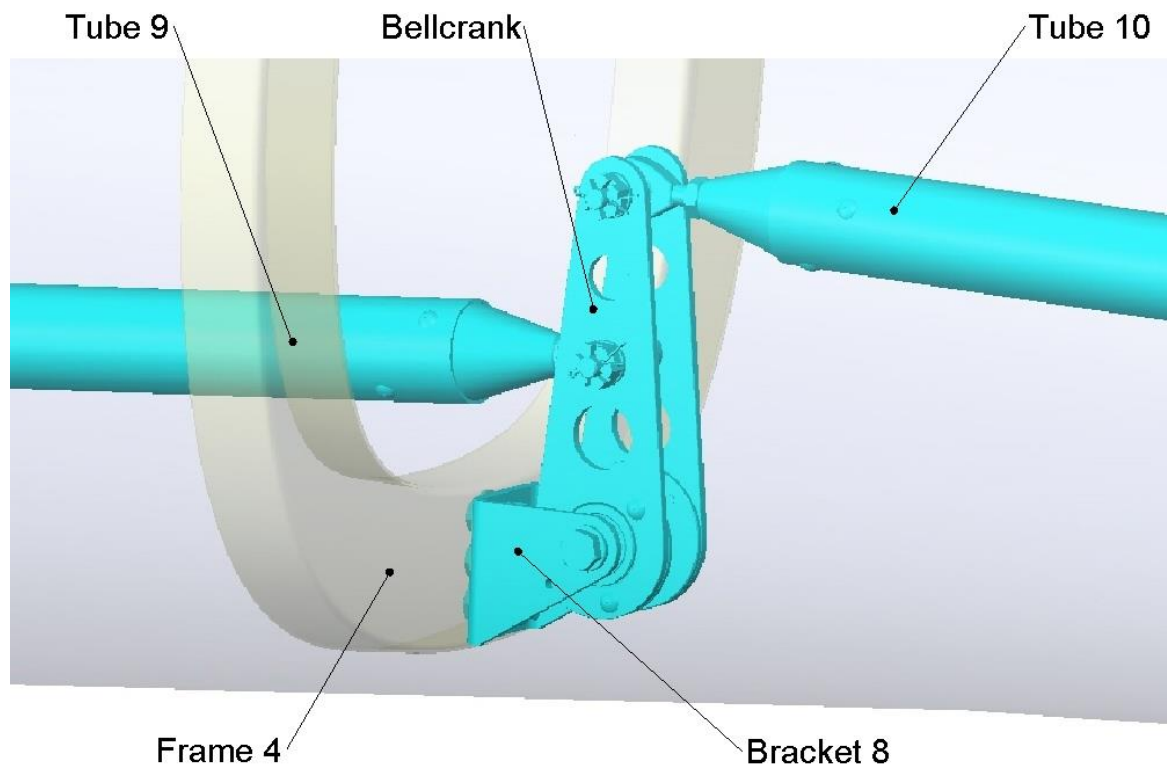


Fig. 27-30-5

Control force to the elevator is transmitted through the elevator pivot which is attached to the tube 10. Fig.27-30-6.

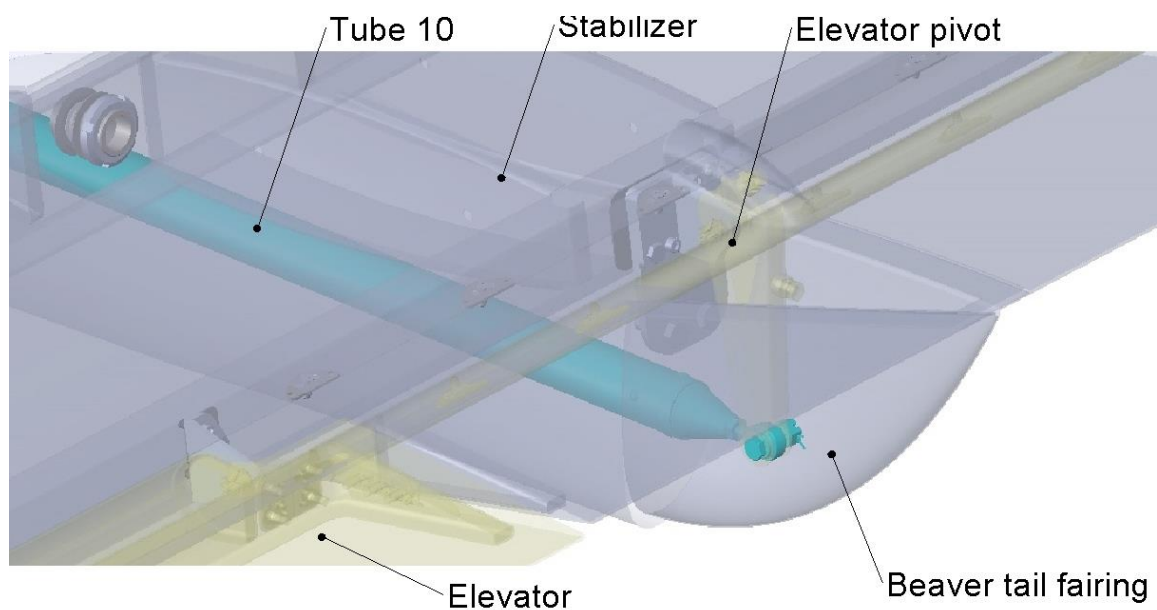


Fig. 27-30-6

The system is provided with stops - special bolts NAS1801-3-15 and NAS1801-3-27 with a screwdriver groove. They are installed on the elevator pivot and secured with lock nuts AN 345-3. When the elevator is deflected to the stop, the bolt is in contact with stabilizer center hinge and limits deflection. To increase the upper deflection of elevator it is necessary to unscrew bolt NAS1801-3-15. To increase the lower deflection of the elevator, it is necessary to unscrew the bolt NAS1801-3-27. To decrease the deflection – the bolt has to be screwed inward. Fig.27-30-7.

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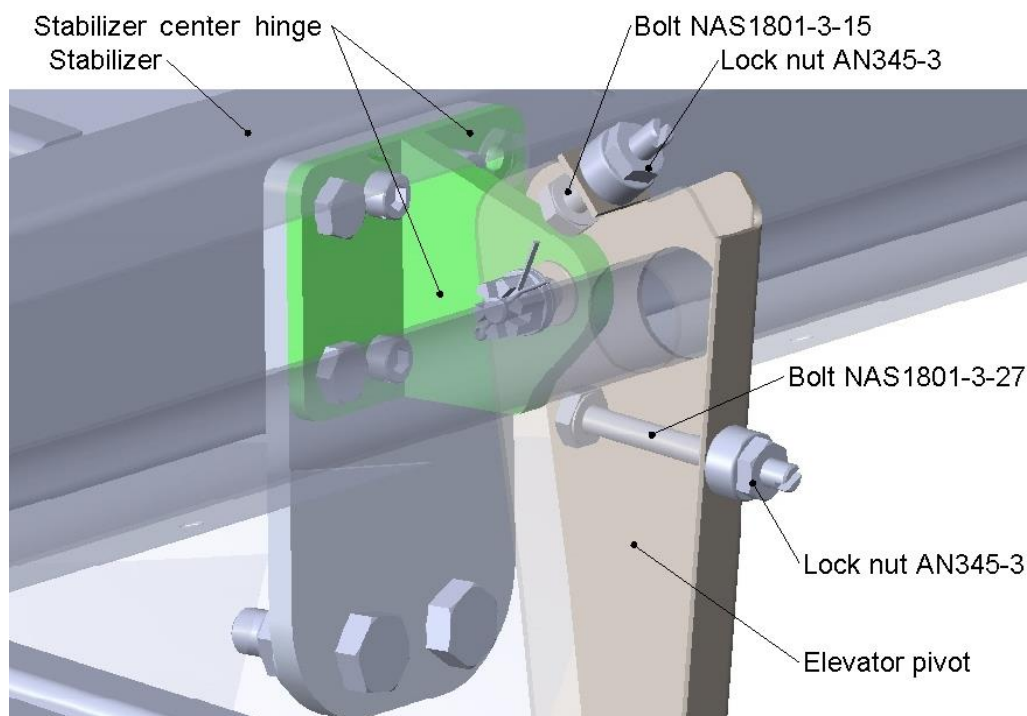


Fig. 27-30-7

27-30.2.1 Elevator trim control system

The elevator trim is adjusted by a linear actuator LA12-90° which is mounted to the fuselage skin by bracket 1 and bracket 2 between frame 2 and frame 4.

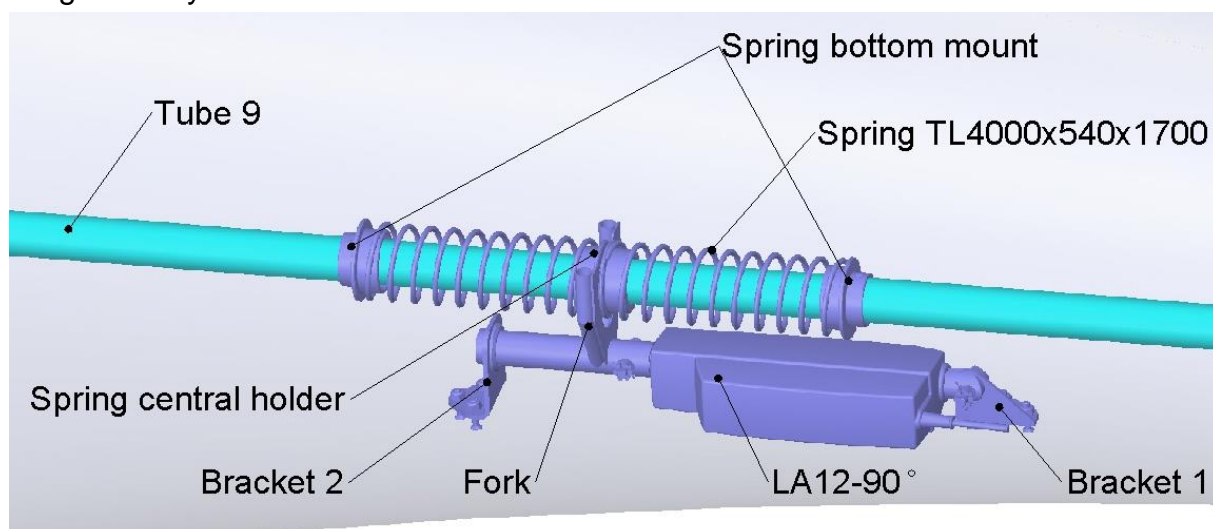


Fig. 27-30-8

The trim force of the elevator is balanced by the fork of the actuator LA12-90° applying more or less pressure on the trim spring TL4000x540x1700 (see Fig. 27-40-8).

27-30.2.2 Adjustment of Elevator trim and Manual Trim

For additional adjustment instructions for electrical and manual trim contact: Flight Design Customer Care (customercare@flightdesign.com).

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27-30.2.3 Autopilot Pitch Servo (If chosen option - autopilot)

If the option with the installation of the autopilot is selected, the servo is mounted on the Frame 9 using a bracket (item 35) and, using Rod 5, is connected to the elevator control system.

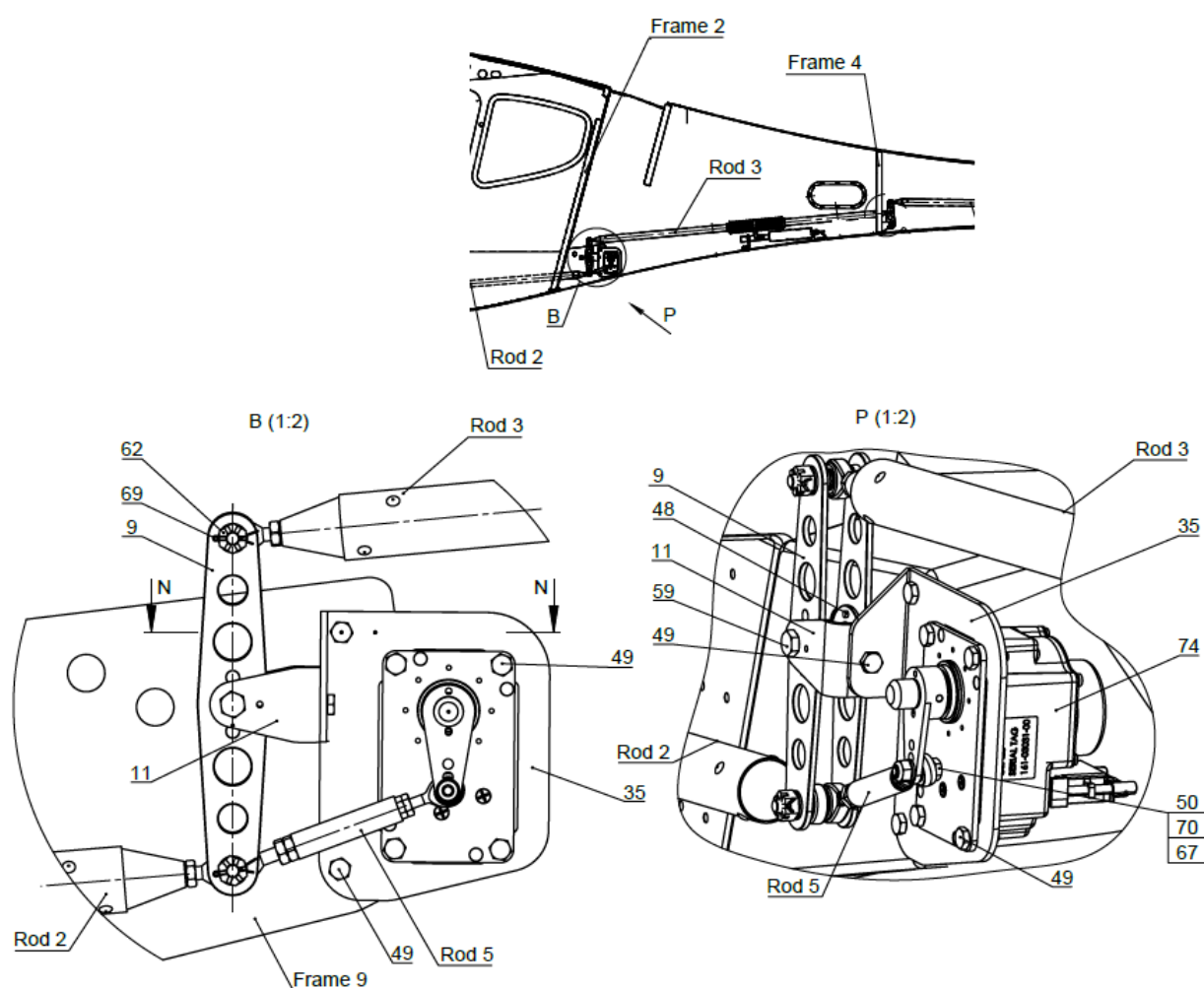


Fig. 27-30-9

Fig.	Item	Part Name
27-30-9	9	Bellcrank arm 6
	11	Bracket 7
	35	Autopilot bracket
	48	Stainless steel blind rivet MIL-R-24243
	49	Undrilled bolt 10-32 AN3-5A
	50	Bolt undrilled 10-32 AN3-6A
	59	Bolt 1/4-28 AN4-22
	62	Castellated nut 1/4-28 AN310-04
	67	Self-locking nut 10-32 AN365-1032A
	69	Cotter pin AN380-2-2
	70	Washer 10 AN960C10
	74	Autopilot servo

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27-30.3 Maintenance Practices

27-30.3.1 Elevator Deflection Measurement

27-30.3.1.1 Type of Maintenance

Line

27-30.3.1.2 Minimum Level of Certification

LSA-Mechanic (LSRM)

27-30.3.1.3 Procedure

A. Recommended Special Tools and Parts

Item	Quantity	Unit
Digital level	1	pcs

B. Elevator incidence angle measurement

Step	Action	Reference
1	Elevator deflections are defined in deflection table	27.3
1	Secure the plane using the parking brake or chocks	
2	Set the Elevator at the neutral position. At this position the leading edge of Elevator coincides with corresponded area of the stabilizer (Fig. 27-30-10).	

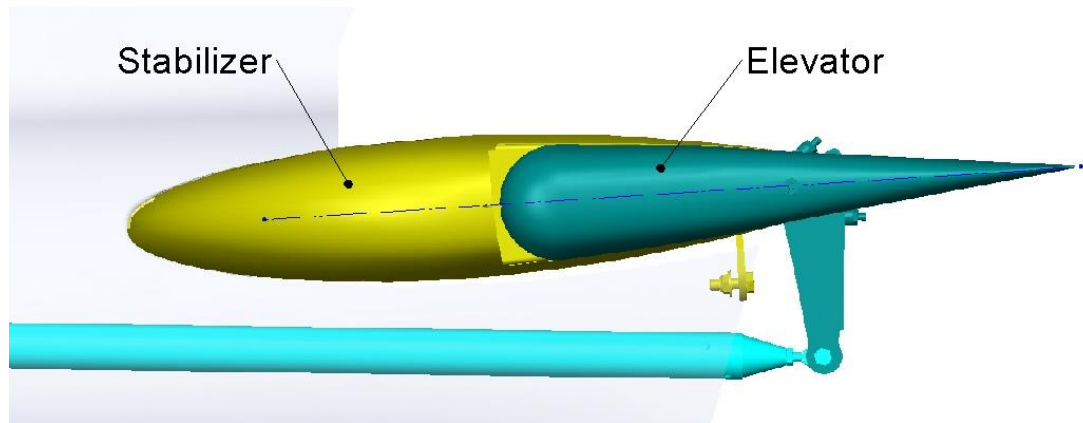


Fig. 27-30-10

3	Put digital level on the Elevator. Calibrate level and set "0".	
4	Deflect Elevator using the control stick to the extreme position until stop bolt contacts the control stop on the stabilizer center hinge. Read the measured deflection value in reference to the Elevator neutral position.	
5	Do step 4 in the other direction.	

27-30.3.2 Elevator Deflection Adjustment

The Elevator deflection range is adjusted by the stop bolt position.

27-30.3.2.1 Type of Maintenance

Line

27-30.3.2.2 Minimum Level of Certification

LSA-Mechanic (LSRM)

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27-30.3.2.3 Procedure

A. Recommended Special Tools and Parts

<i>Item</i>	<i>Quantity</i>	<i>Unit</i>
Digital lever	1	pc

B. Elevator Deflection down Adjustment

<i>Step</i>	<i>Action</i>	<i>Reference</i>
1	Loosen the locking nut AN345-3 on the stop bolt NAS1801-3-27 (Fig. 27-30-7).	
2	Screw/unscrew the bolt to reduce/increase the Elevator deflection.	
3	Measure the Elevator deflection. If necessary, repeat step 2.	27-30.3.1
4	Lock the stop bolt by tightening the locking nut.	

C. Elevator Deflection up Adjustment

<i>Step</i>	<i>Action</i>	<i>Reference</i>
1	Loosen the locking nut AN345-3 on the stop bolt NAS1801-3-15 (Fig. 27-30-7).	
2	Screw/unscrew the bolt to reduce/increase the Elevator deflection.	
3	Measure the Elevator deflection. If necessary, repeat step 2.	27-30.3.1
4	Lock the stop bolt by tightening the locking nut.	

27-30.3.3 Elevator Control Check

27-30.3.3.1 Type of Maintenance

Line

27-30.3.3.2 Minimum Level of Certification

LSA-Mechanic (LSRM)

27-30.3.3.3 Procedure

A. Recommended Special Tools and Parts

<i>Item</i>	<i>Quantity</i>	<i>Unit</i>
None		

B. Checking for Play

<i>Step</i>	<i>Action</i>	<i>Reference</i>
1	Secure the control stick at the neutral position.	
2	Slightly shake trailing edge of the Elevator up and down.	
3	Total play of the trailing edge must not exceed 3mm.	

C. Troubleshooting

<i>Step</i>	<i>Action</i>	<i>Reference</i>
1	In case any abnormalities are found during the control system check, please contact Flight Design Customer Care (customercare@flightdesign.com) for further instructions.	

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SECTION 27-50 – FLAPS

27-50.1 General

This section provides a description of the Flap Control System

27-50.2 Description

The flaps are operated by a linear actuator controlled from the flap control unit in the lower section of the instrument panel. The desired flap setting is selected with a lever switch. The flaps may be set at any of the following positions:

- 0 – Cruise position
- 1 – Takeoff
- 2 – Approach
- 3 – Landing

The following figure shows the flap drive installed to the fuselage.

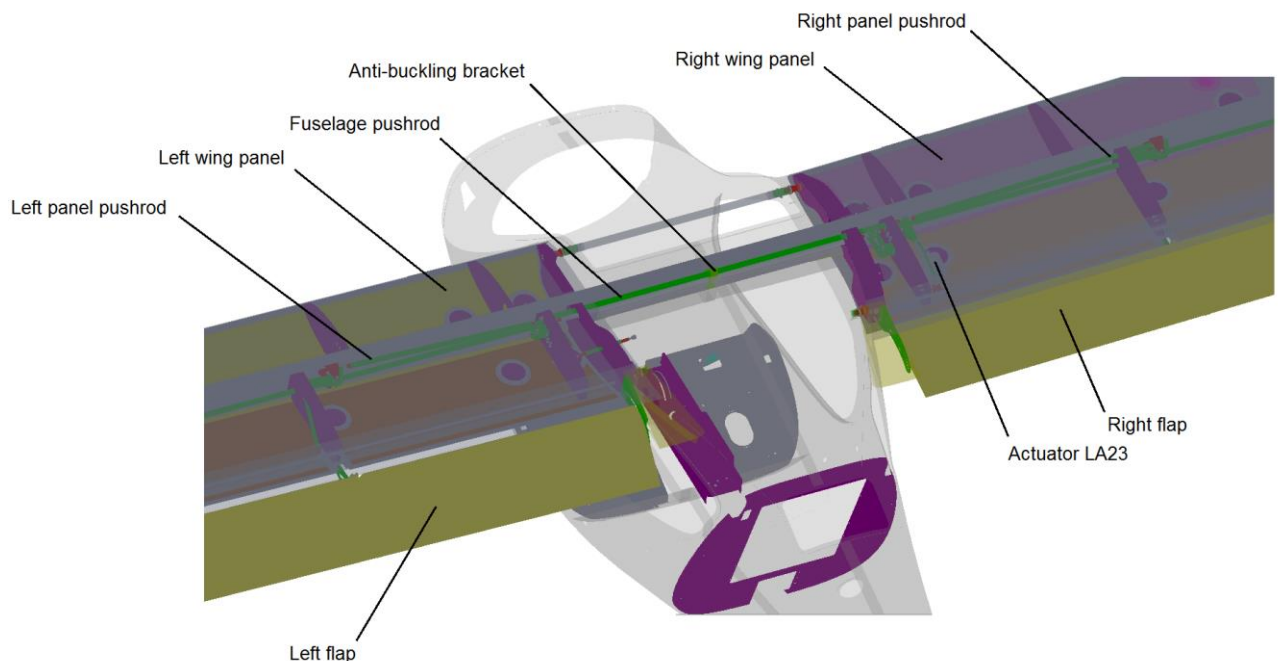


Fig. 27-50-1

The flap motor (linear actuator LA23) is installed in the right wing panel. The motor is attached to the rear right side of the wing spar by the actuator holder bracket and attached to the actuator bellcrank A. Actuator bellcrank A is attached to the right rear rib N1 by the root rib bracket (Fig. 27-50-2).

The flap motor moves actuator bellcrank A. This bellcrank moves the fuselage pushrod that is placed into main spar tunnel and the right panel pushrod.

The fuselage pushrod mechanically connects the left and right flaps. This way the flaps are physically interconnected, left side to right side. This ensures that the flaps always move symmetrically.

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The fuselage pushrod is connected with the left panel pushrod through bellcrank A which is mounted to the left rear rib N1 in the left wing panel. The left panel pushrod is connected with the flap pushrod through the wing panel bellcrank which is mounted on the main spar (Fig. 27-50-3). The flap pushrod finally transmits the actuator movement to the left flap.

The right panel pushrod connects actuator bellcrank A and the wing panel bellcrank. The flap pushrod is attached to the panel bellcrank and finally transmits the actuator force to the right flap (Fig. 27-50-4).

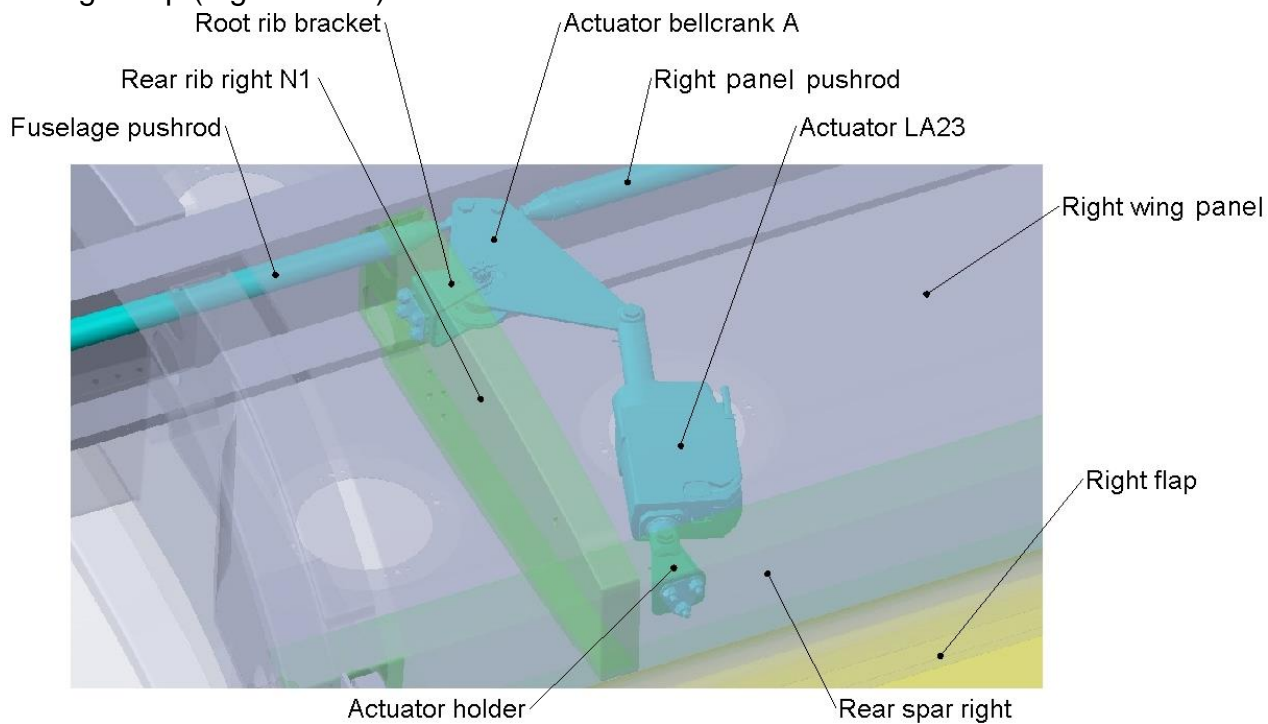


Fig. 27-50-2

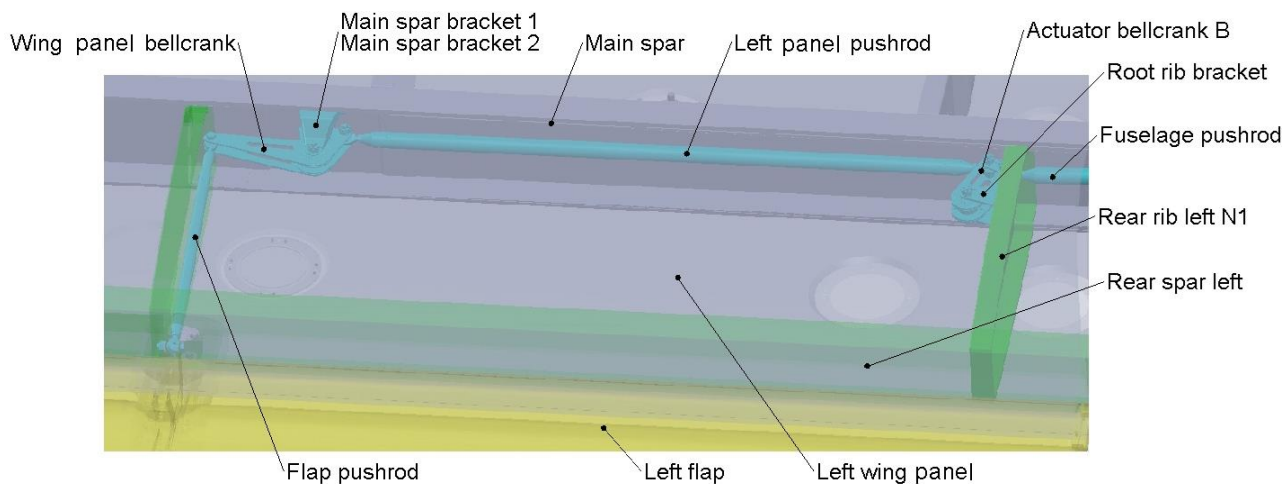


Fig. 27-50-3

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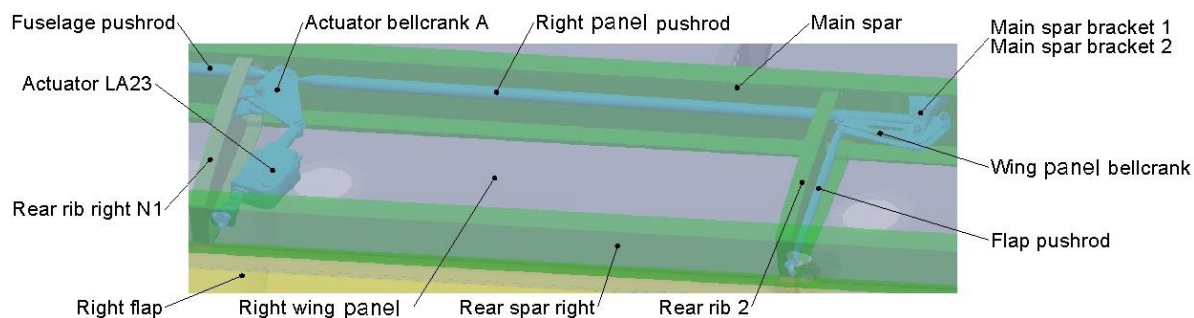


Fig. 27-50-4

The flap pushrod is connected to the movable flap hinge which moves along the flap center rails. The connection method is the same on the both wing panels (Fig. 27-50-5).

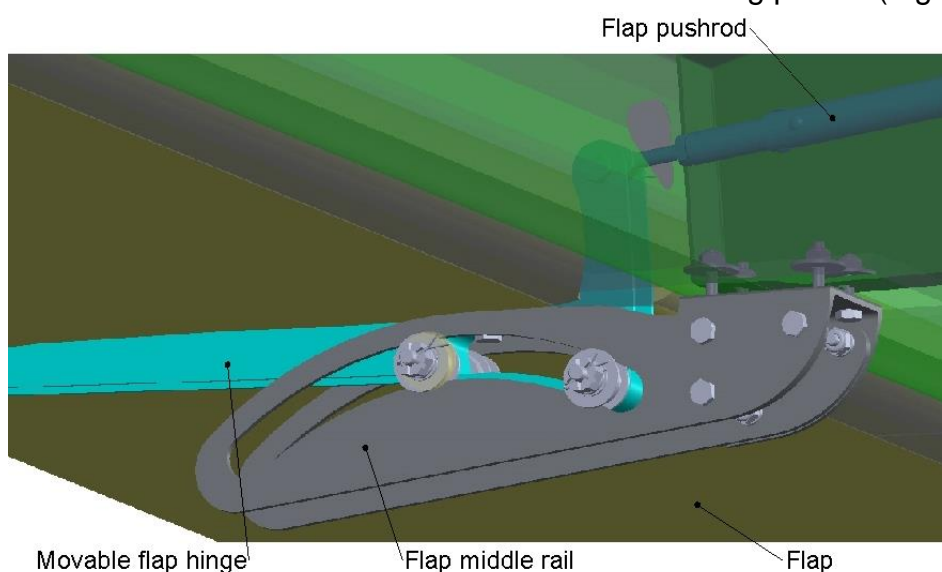


Fig. 27-50-5

The flap control system has an internal load-limiting device which prevents the extension of the flaps at airspeeds exceeding the maximum allowed, preventing damage to the structure.

The flap control circuit breaker is located on the right side of instrument panel. It will pop if the flap servo is continuously over-loaded. As it is a thermal circuit breaker, it can take some time before it can be pushed back in.

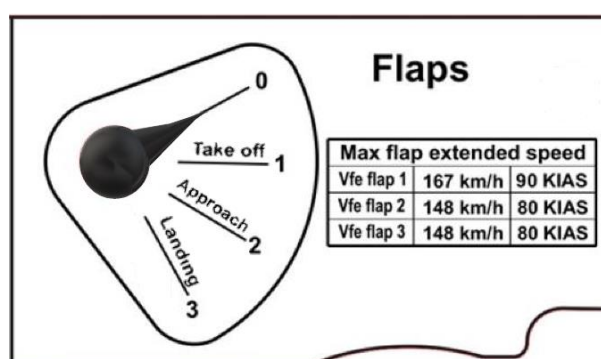


Fig. 27-50-6

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27-50.3 Maintenance Practices

27-50.3.1 Rigging of “Zero” Position of the Flaps

27-50.3.1.1 Type of Maintenance

Line

27-50.3.1.2 Minimum Level of Certification

LSA-Mechanic (LSRM)

27-50.3.1.3 Procedure

A. Recommended Special Tools and Parts

Item	Quantity	Unit
None		

B. Rigging of “Zero” Position of the Flaps

“Zero” position is the position of the flaps when the top skin of the flaps is aligned with the top of the wing fairing (Fig. 27-50.7).

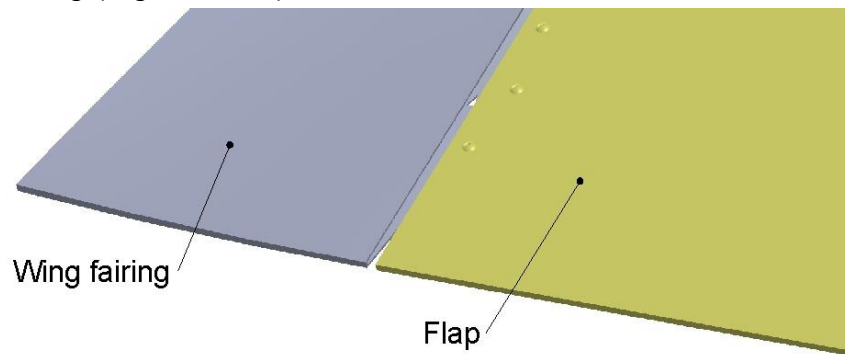


Fig. 27-50-7

If the flaps are not symmetrical (at the “zero” position one is higher than the other), adjust the flap using special Ø3 mm rigging holes in the bellcrank and bracket (Fig. 27-50-8). It is necessary to achieve coincidence of these holes using a Ø3 mm rigging rod. Every bellcrank and bracket has a special hole for neutral position adjusting. To access the bellcrank and bracket, it necessary to remove the access panel by unscrewing 4 screws (Fig. 27-50-9).

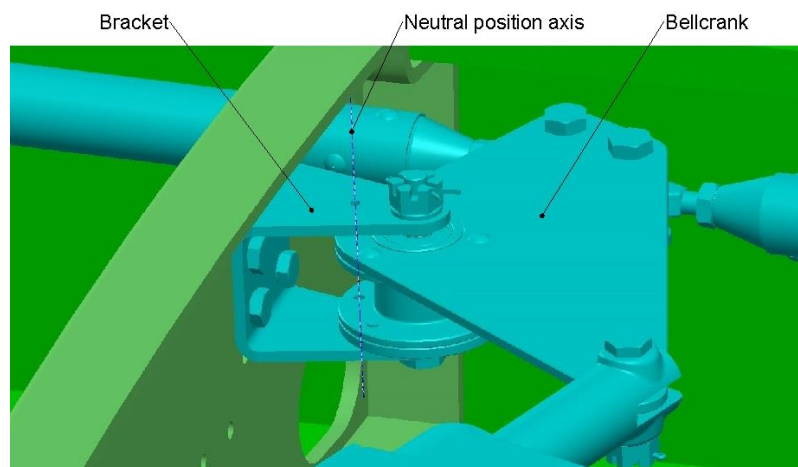


Fig. 27-50-8

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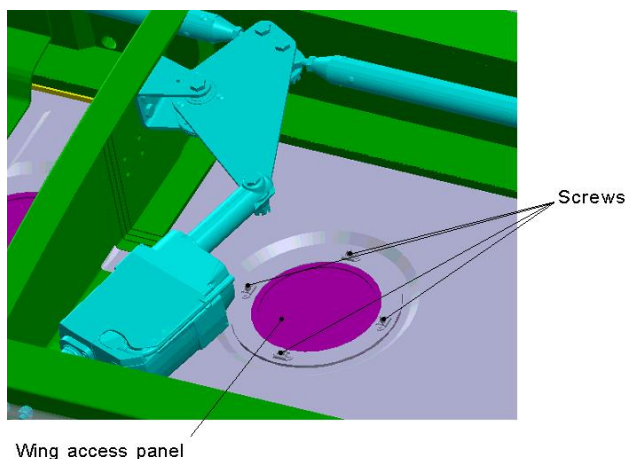


Fig. 27-50-9

27-50.3.2 Measurement of the Flap Deflection

27-50.3.2.1 Type of Maintenance

Line

27-50.3.2.2 Minimum Level of Certification

LSA-Mechanic (LSRM)

27-50.3.2.3 Procedure

A. Recommended Special Tools and Parts

<i>Item</i>	<i>Quantity</i>	<i>Unit</i>
Metric Ruler	1	pcs

B. Measuring Flap Deflection (Fig. 27-50.9)

<i>Step</i>	<i>Action</i>	<i>Reference</i>
1	Flap deflections are defined in the deflection table.	27.3
2	Set the flap to negative deflection (Position 0).	
3	Measure distance between same corners (lowest or topmost) on the rear edge of the flap and on the rear edge on the wing fairing (Fig. 27-50.9, a,b).	
4	Repeat the measurement for the second flap.	
5	Repeat steps 2-4 for flap positions "1", "2", "3".	
6	Compare the measured values with the data provided in the deflection table.	27.3
7	Make sure that the difference between the deflections of left and right flaps for each position doesn't exceed 2.5mm. Otherwise adjust the flap.	27-50.3.1



Fig. 27-50-9

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27-50.3.3 *Flap Deflection Adjustment*

27-50.3.3.1 Type of Maintenance

Line

27-50.3.3.2 Minimum Level of Certification

LSA-Mechanic (LSRM)

27-50.3.3.3 Procedure

A. Recommended Special Tools and Parts

<i>Item</i>	<i>Quantity</i>	<i>Unit</i>
None		

B. Flap Deflection Adjustment

The flap deflection can be adjusted by the flap control panel. Check the flap angle of deflection after each adjustment.

27-50.3.4 *Flap Controls Check*

27-50.3.4.1 Type of Maintenance

Line

27-50.3.4.2 Minimum Level of Certification

LSA-Mechanic (LSRM)

27-50.3.4.3 Procedure

A. Recommended Special Tools and Parts

<i>Item</i>	<i>Quantity</i>	<i>Unit</i>
None		

B. Checking for Play

<i>Step</i>	<i>Action</i>	<i>Reference</i>
1	Slightly shake the trailing edges of the flap up and down.	
2	Make sure that the play of the trailing edge doesn't exceed 5mm.	
3	Total play of the trailing edge must not exceed 5 mm.	

C. Troubleshooting

<i>Step</i>	<i>Action</i>	<i>Reference</i>
1	In case any abnormalities are found during the control system check, please contact Flight Design Customer Care (customercare@flightdesign.com) for further instructions.	

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CHAPTER 28 – FUEL SYSTEM

Contents

28-00.1	General
28-00.2	Description
28-00.3	Maintenance Practices
28-00.3.1	Fuel System Check
28-00.3.2	Fuel Pump Removal and Installation
28-00.3.3	Fuel Hoses and Lines Replacement

28-00.1 General

This chapter provides a description of the Fuel System.

28-00.2 Description

The fuel system consists of:

- integrated fuel tank with a capacity of 65 l (17 Gallons) in each wing
- fuel lines
- fuel valves and control linkage
- fuel system filters and drains
- fuel tank vent system

General view of the system is shown in Fig.28-00-1 and Fig. 28-00-2.

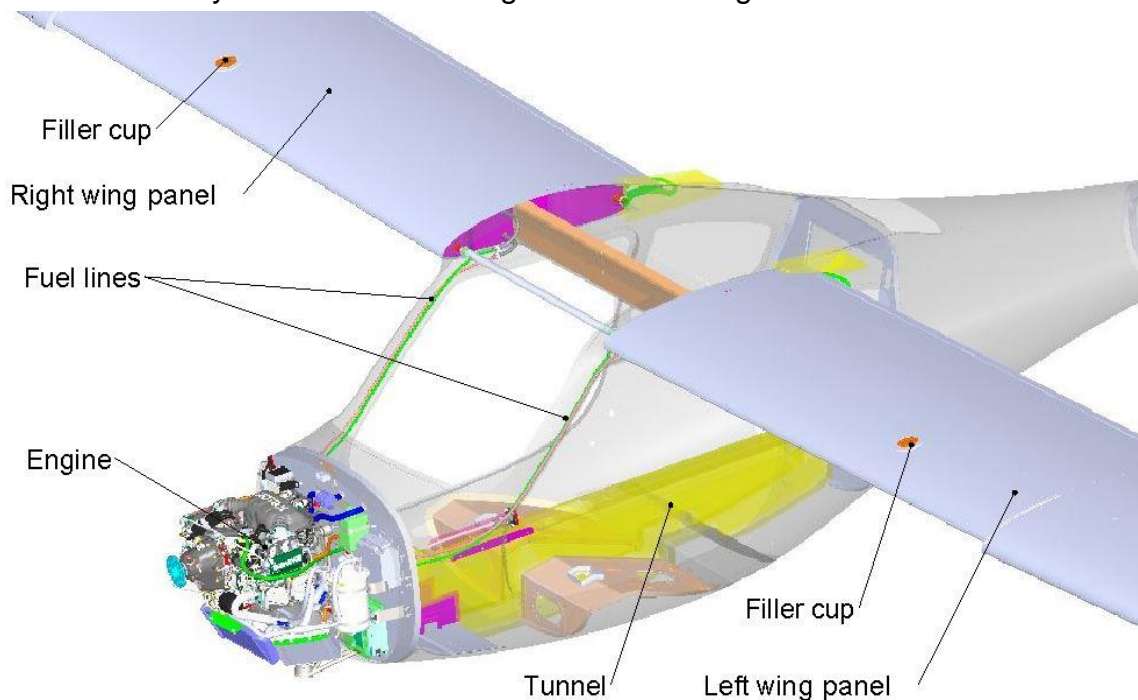


Fig. 28-00-1

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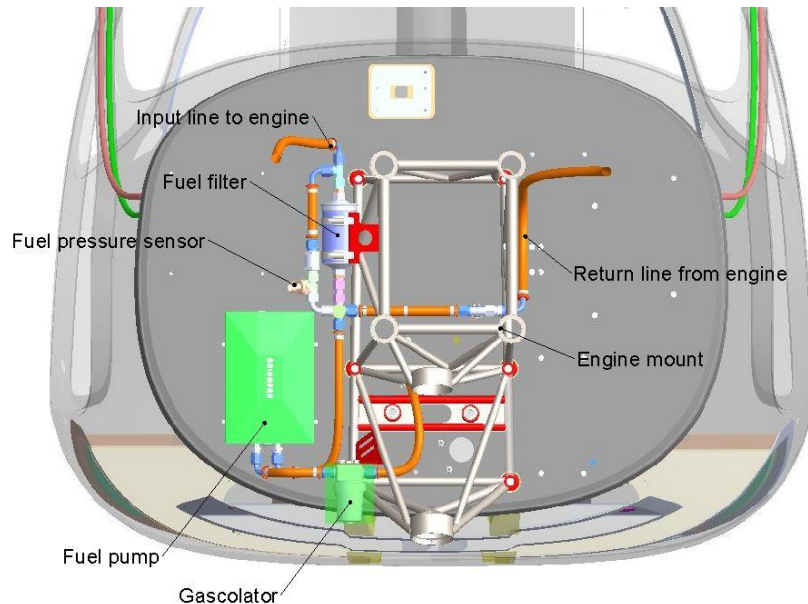


Fig. 28-00-2

The fuel tanks are integrated into the leading edge of each wing console. Both tanks are each divided into two sections by a sloshing fuel tank rib (Fig. 28-00-3). Fuel is filled into the outer section via a fuel filler opening on the upper side of each wing. The fuel tanks are vented via coupled tubes in the outer tank sections.

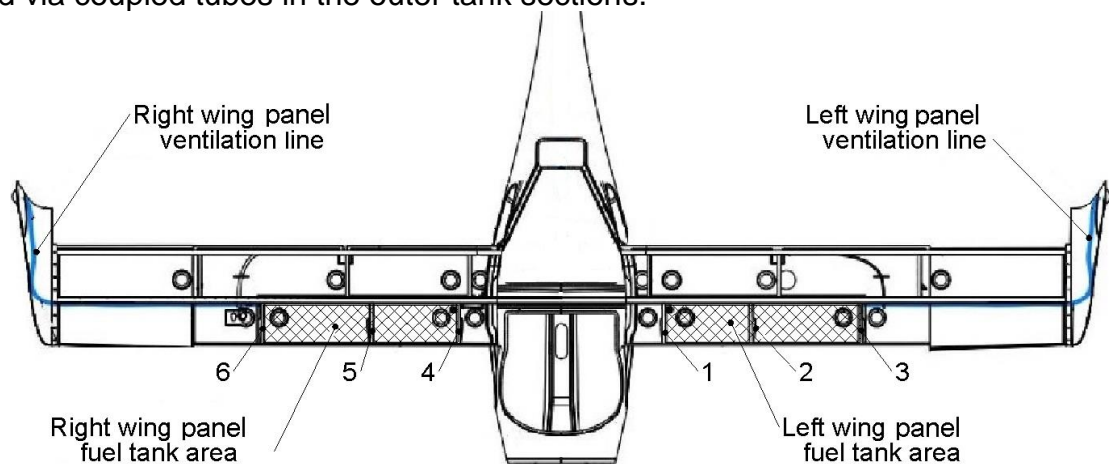


Fig. 28-00-3

Fig.	Item	Part Name
28-00-3	1	Fuel tank root rib left
	2	Sloshing fuel tank rib left
	3	Fuel tank end rib left
	4	Fuel tank root rib right
	5	Sloshing fuel tank rib right
	6	Fuel tank end rib right

Fuel flows via a flapper valve into the inner section of the fuel tank inboard of the sloshing rib. The flapper does not completely seal the inner tank.

It does, however, greatly restrict the return flow of fuel into the outer chamber when one wing is low (sideslip). A sideslip can thus be undertaken even when low on fuel without risking immediate fuel starvation to the engine.

A special epoxy covering is applied to the inner surface of the fuel tank. The covering is resistant to fuel and ethanol and ensures continued proper sealing of the tank.

The outlet fuel line with an integrated fuel filter is installed on the fuel tank root rib. The outlet fuel line can be removed via wing and fuel tank access panels for visual inspection and cleaning. In installed each fuel tank are 2 fuel sensors – one on the fuel tank root rib and second on the fuel tank end rib (Fig. 28-00-4).

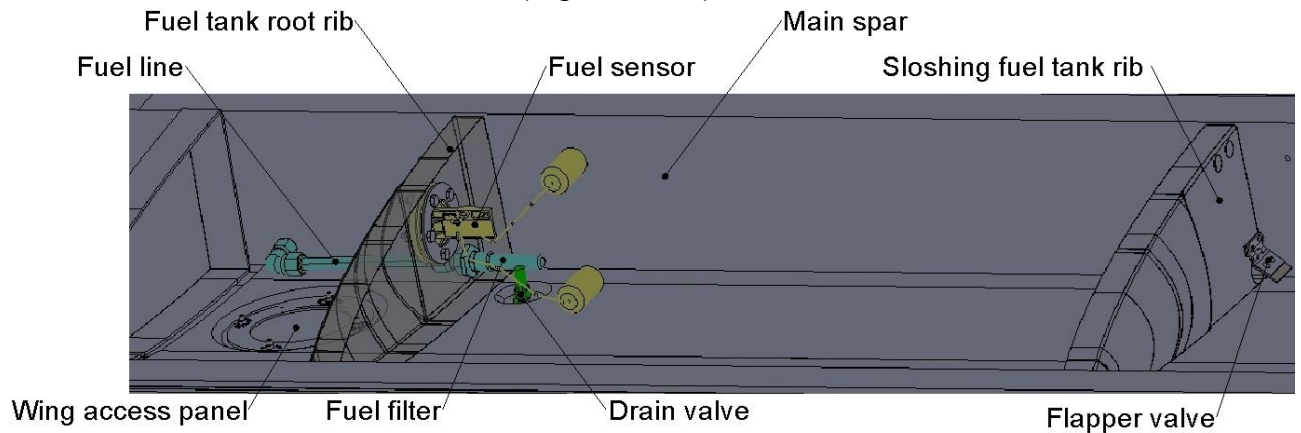


Fig. 28-00-4

Fuel is fed by gravity via two fuel lines in the A-pillars. The two lines are connected to the inlets of the duplex 4-way fuel selector valve. The fuel selector valve has two separate feed and returns fuel sections. The fuel valve operates simultaneously for all positions. The fuel selector valve allows selecting one single tank or both tanks. There is also the possibility to switch off both tanks with this selector (Fig. 28-00-5).

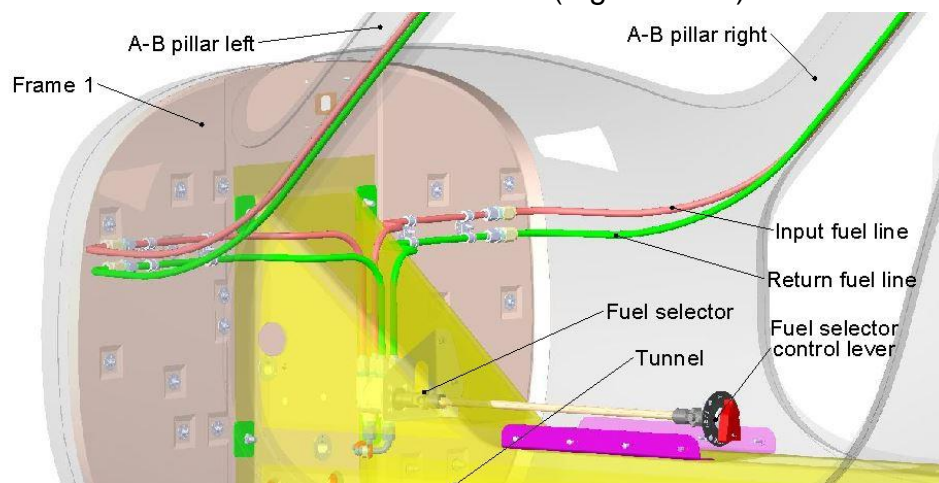


Fig. 28-00-5

Standard operation during flight is always with both wing tanks selected. One tank shall only be selected temporarily, to compensate for a possible uneven fuel level between both tanks. Any time when only one tank is selected, this is announced on the EMS screen as a warning to the pilot. This indication shall remind the pilot to switch back to both tanks as soon as practicable.

▲ Warning: During engine, the operation does not permit switching between left and right fuel tanks through the selector position “OFF”. This would lead to the engine stopping immediately due to the fuel cut.

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The fuel flow from the outlet of the feed section of the fuel selector valve goes into the gascolator through gravity fuel line through the firewall.

The fuel flows from there to the dual electric fuel pumps. The fuel pumps are electrically connected to and controlled from the ECU. Therefore, fuel pumps will only operate once the ECU and the engine are started. Fuel pump operation may be checked, when necessary, by activating the backup power switch and selecting Lane A with the ignition key lock.

▲ Warning: Absolutely ensure propeller clearance during this check, with the backup power switch on and ignition key lock to Lane A the engine ignition is activated and the engine is ready to start.

▲ Warning: Test only for a short duration, as this will drain the battery.

The fuel pumps feed the pressure lines to the engine fuel injection rail. A fine filter is installed on the engine side of the upper firewall. A fuel pressure regulator, part of the engine fuel mounted system, feeds any surplus fuel back to the fuel selector (return section) through the firewall. From there the surplus fuel back to both wing tanks simultaneously or one single tank through back lines in the A-pillars, depending on the selected fuel selector valve position. The fuel selector valve in OFF position closes both fuel feed lines and the return lines.

The drain valve is provided at the low point of the fuel system at the gascolator sump. This valve is accessible through a lower cowling cutout. The fuel system must be drained and inspected for contamination at this point before the first flight of the day and after filling up with fuel.

The fuel system is presented schematically on the diagram (Fig.28-00-6).

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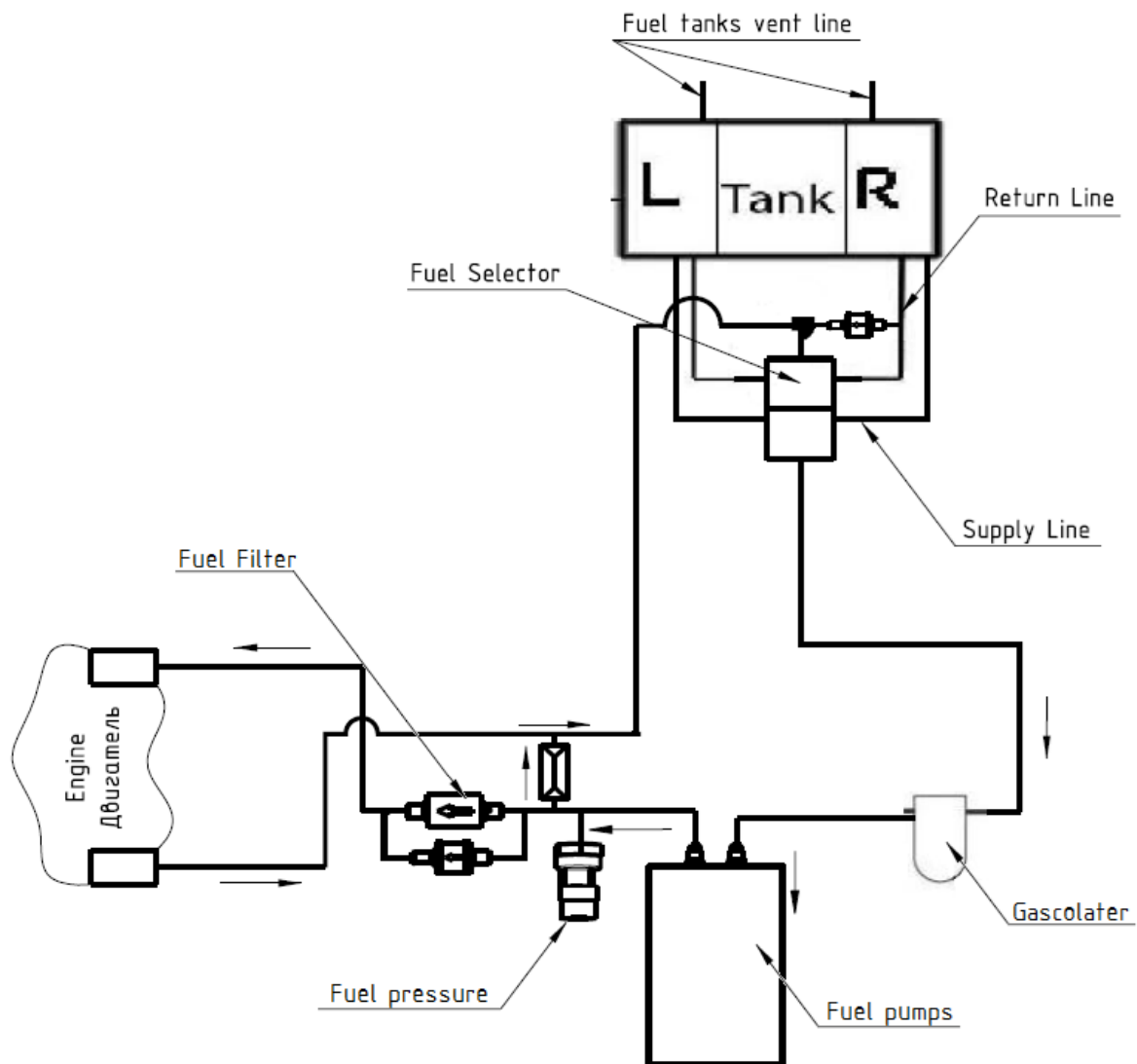


Fig. 28-00-6

28-00.3 Maintenance Practices

28-00.3.1 Fuel System Check

28-00.3.1.1 Type of Maintenance

Line

28-00.3.1.2 Minimum Level of Certification

LSA-Mechanic (LSRM)

28-00.3.1.3 Procedure

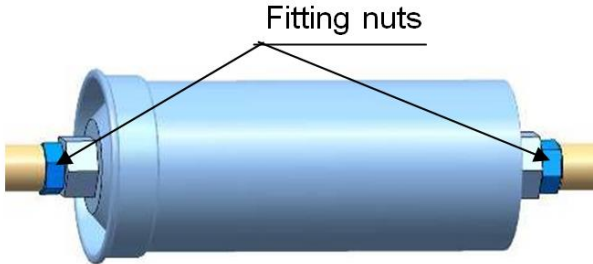
A. Recommended Special Tools and Parts

Item	Quantity	Unit
None		



B. Fuel Filter Check

Step	Action	Reference
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1	Check the fuel filter if the fuel pressure is less than normal or a sharp drop off in pressure is observed.	
2	Check all fuel lines for damage, leaks, and connections securing. Verify lines routing for kinks or restricted elbows.	
3	Check fuel hoses fire sleeves in the engine compartment for hardening from heat, porosity, connections securing.	
4	Move handle to position ON to open fuel shutoff valve.	
5	Drain the rest of the fuel from fuel lines through gascolator to sufficient container. To drain the fuel, push the gascolator drain valve and turn it.	
6	<p>Unscrew fitting nuts and detach fuel lines from the filter. Remove filter. When necessary – replace the filter.</p> 	
7	Install fuel filter in reverse order of step 7.	
8	Fill fuel to the fuel system and operate fuel pumps. Check the system to be free from leaks.	
9	Complete installation in reverse order of Step 6, above.	

C. Gascolator Check

1	<p>Remove lock wire from Gascolator and unscrew lower container.</p> 	
2	Clean gascolator lower container and inspect it for damage, cracks and scuffing marks.	
3	Clean gascolator screen.	
4	<p>Check sealing ring.</p> 	
5	Assemble gascolator in reversed direction order.	

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D. Fuel Tanks Check

1	Drain all fuel from the system.	
2	Remove the wing.	57-00.3
3	Inspect external surfaces of fuel tank for leaks and foreign objects.	
4	Inspect for security and presence of fuel leaks, and readable fuel level indication. Replace fuel tank level senders if necessary.	
5	Inspect Fuel filler caps for proper locking and leaks. Check that the placards are present and readable.	
6	Inspect inner surfaces of fuel tanks for condition of the sealant and inner structure. Clean if required.	
7	Inspect flapper valve in sloshing rib for proper functioning and attachment.	
8	Inspect the fuel outlets. Clean if required.	
9	Check fuel vent lines and connections for leaks and blockage. Blow through if required. Do not clear lines with high pressure air!	

28-00.3.2 Fuel Pump Removal and Installation

28-00.3.2.1 Type of Maintenance

Line

28-00.3.2.2 Minimum Level of Certification

LSA-Mechanic (LSRM)

28-00.3.2.3 Procedure

Refer to the ROTAX® Maintenance Manual valid for your individual engine.

28-00.3.3 Fuel Hoses and Lines Replacement

28-00.3.3.1 Type of Maintenance

Line

28-00.3.3.2 Minimum Level of Certification

LSA-Mechanic (LSRM)

28-00.3.3.3 Procedure

For fuel lines being part of the ROTAX® engine, refer to the ROTAX® Maintenance Manual valid for your individual engine.

Flight Design defines contrary to the ROTAX Maintenance Manual that all hoses do NOT need to be replaced after 5 years. Flight Design approves that all hoses are used ON CONDITION. Contact Flight Design for further instructions.

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CHAPTER 31 – INSTRUMENT PANELS AND FLIGHT INSTRUMENT DISPLAYS

Contents

- 31-00.1 General
- 31-00.2 Description
- 31-00.3 Maintenance Practices
 - 31-00.3.1 Instrumental Panel removal and Installation
 - 31-00.3.2 Instrument Panel Check
 - 31-00.3.3 Instruments Check

31-00.1 General

This section provides descriptions and information concerning the maintenance of the Instrument panel and the electronic displays.

31-00.2 Description

Instrument Console consists of three sections. The basic configuration of the instrument panel is shown in Fig.31-00-1.

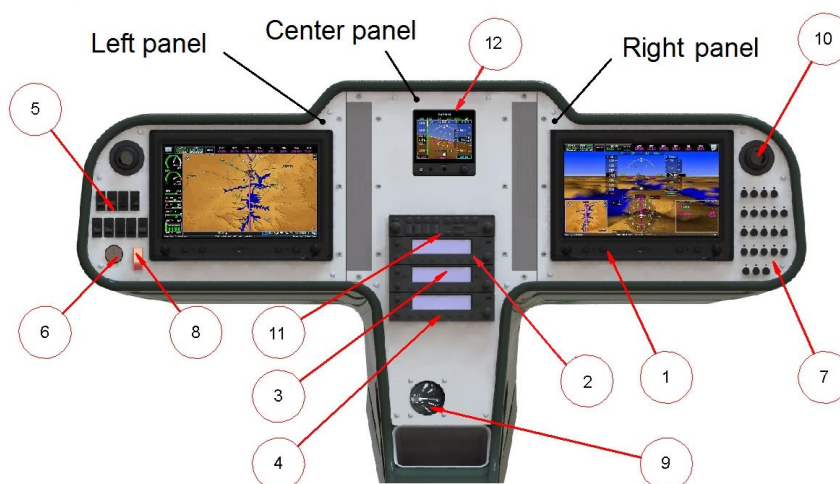


Fig. 31-00-1

Pos.	Manufacturer	Type	Description
1	Garmin	GDU46X	Touch Screen Display
2	Garmin	GTR225A	COM radio
3	Garmin	GNC255A	Optional NAV-COM radio
4	Garmin	GTX 345 or 335	Transponder
5	n/a	n/a	Rocker switch
6	n/a	n/a	Ignition key switch, operates starter and ignition circuits
7	Klixon	7274-2	Circuit breaker
8	n/a	n/a	Back up switch
9	n/a	n/a	Flap selector switch. Switch to desired flap position
10	AveoAir	AVE-BVBLK-200	Ball vent
11	Garmin	GMA245 or 342 or 345	Digital audio panel/intercom
12	Garmin	G5	Optional back up instrument for night flight

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31-00.3 Maintenance Practices

31-00.3.1 Instrumental Panels removal and Installation

31-00.3.1.1 Type of Maintenance

Line

31-00.3.1.2 Minimum Level of Certification

LSA-Mechanic (LSRM)

31-00.3.1.3 Procedure

A. Recommended Special Tools and Parts

Item	Quantity	Unit
None		

B. Instrumental Panels Removal

Step	Action	Reference
1	Disconnect battery.	
2	Unscrew the AN526-832-R7 screws that hold the panels.	Fig. 31-00-2
3	During removal the panels pay attention to protecting the console paint and to the wiring harness and tubing if equipped with analog back up gauges.	

C. Instrumental Panels Installation

Step	Action	Reference
1	Carefully place the wire harness bundles back into position, reinstall the panel with the AN526-832-R7 screws.	



Fig. 31-00-2

31-00.3.2 Instrument Panels Check

31-00.3.2.1 Type of Maintenance

Line

31-00.3.2.2 Minimum Level of Certification

Pilot/Owner

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31-00.3.2.3 Procedure

A. Recommended Special Tools and Parts

<i>Item</i>	<i>Quantity</i>	<i>Unit</i>
None		

B. Instruments Inspection

<i>Step</i>	<i>Action</i>	<i>Reference</i>
1	Check the integrity of the panels (the panels must not be cracked).	
2	Check the bolts tightening that hold the panels.	
3	After panels are removed check integrity of the Rivnuts mounting to the flanges of instrument console and the threads of the Rivnuts should not be damaged.	
4	If the attachment points of Rivnut or the threads of a Rivnut is damaged, it is necessary to remove the Rivnut, repair the flange surface and to rivet a new Rivnut to the flange.	

31-00.3.3 Instruments Check

31-00.3.3.1 Type of Maintenance

Line

31-00.3.3.2 Minimum Level of Certification

Pilot/Owner (P/O)

31-00.3.3.3 Procedure

A. Recommended Special Tools and Parts

<i>Item</i>	<i>Quantity</i>	<i>Unit</i>
None		

B. Instruments Check

<i>Step</i>	<i>Action</i>	<i>Reference</i>
1	Flap position indicator. Inspect annually for operation.	
2	Garmin GTR225A Radio. The GTR225A display lens is coated with a special anti-reflective coating which is very sensitive to skin oils, waxes, and abrasive cleaners. It is very important to clean the lens using an eyeglass cleaner that is specified as safe for anti-reflective coatings and a clean, lint-free cloth.	
3	Garmin GTX345 (GTX335) Mode S Transponder. Other than for regulatory periodic functional checks, maintenance of the GTX345 (GTX335) is "on condition" only. Refer to the GTX345 (GTX335) Maintenance Manual. Periodic maintenance of the GTX345 (GTX335) is not required.	
4	Garmin GNC255A Radio. The GNC255A display lens is coated with a special anti-reflective coating which is very sensitive to skin oils, waxes, and abrasive cleaners. It is very important to clean the lens using an eyeglass cleaner that is specified as safe for anti-reflective coatings and a clean, lint-free cloth.	

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CHAPTER 32 – LANDING GEAR AND BRAKES

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32-00.1 General

This chapter provides a description of the landing gear and brakes.

32-00.2 Description

F2-LSA is equipped with the conventional tricycle landing gear. The main gear beam is made of high strength carbon fiber pre-preg material and are attached to the main gear tunnel located behind the pilot seats.

The nose fork is made from welded 4130 CM steel with an integral urethane shock absorber. The nose fork pivots on ball bearing and is steered via control rods which are attached directly to the rudder pedals.

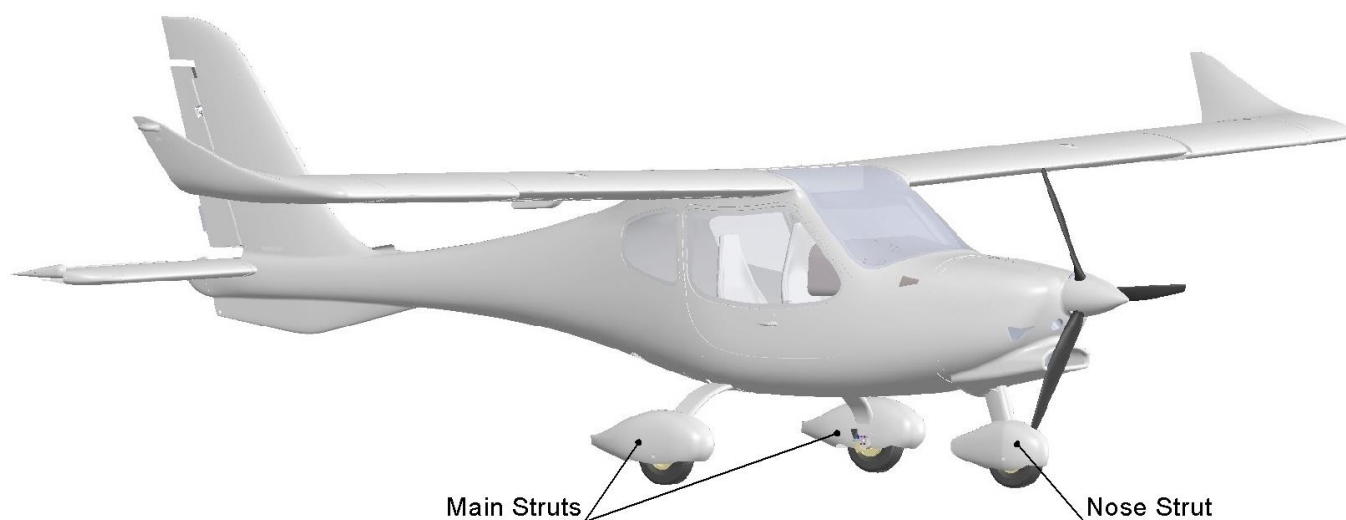


Fig. 32-00-1

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SECTION 32-10 – MAIN LANDING GEAR

32-10.1 General

This section provides description and maintenance procedures for Main Landing Gear.

32-10.2 Description

The main landing gear of the F2-LSA consists of one main gear beam, two main wheels with brakes, wheel fairings and gear leg fairings. The main gear beam forms a cantilever spring with good damping characteristics. The strut is mounted in a tunnel of the fuselage (Fig 32-10-1). This attachment allows for proper load transfer to the fuselage structure.

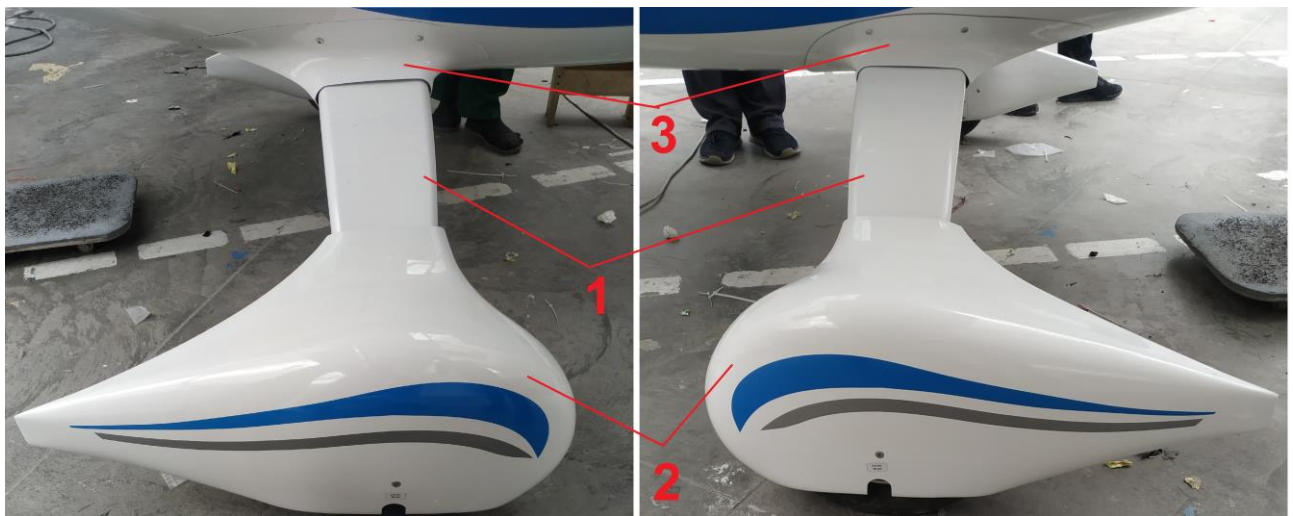


Fig. 32-10-1

	<i>Item</i>	<i>Part Name</i>	<i>Torque</i>
32-10-1	1	Main landing gear beam	
	2	Fairing, Main Wheel	
	3	Fairing, Landing Gear	

The main strut is mounted with four large bolts and two clamps in the fuselage tunnel with a bearing plate inside the fuselage above the main gear clamps. The clamps are cushioned with a thin layer of rubber at the fuselage pass-through supports the gear leg (Fig. 32-10-2).

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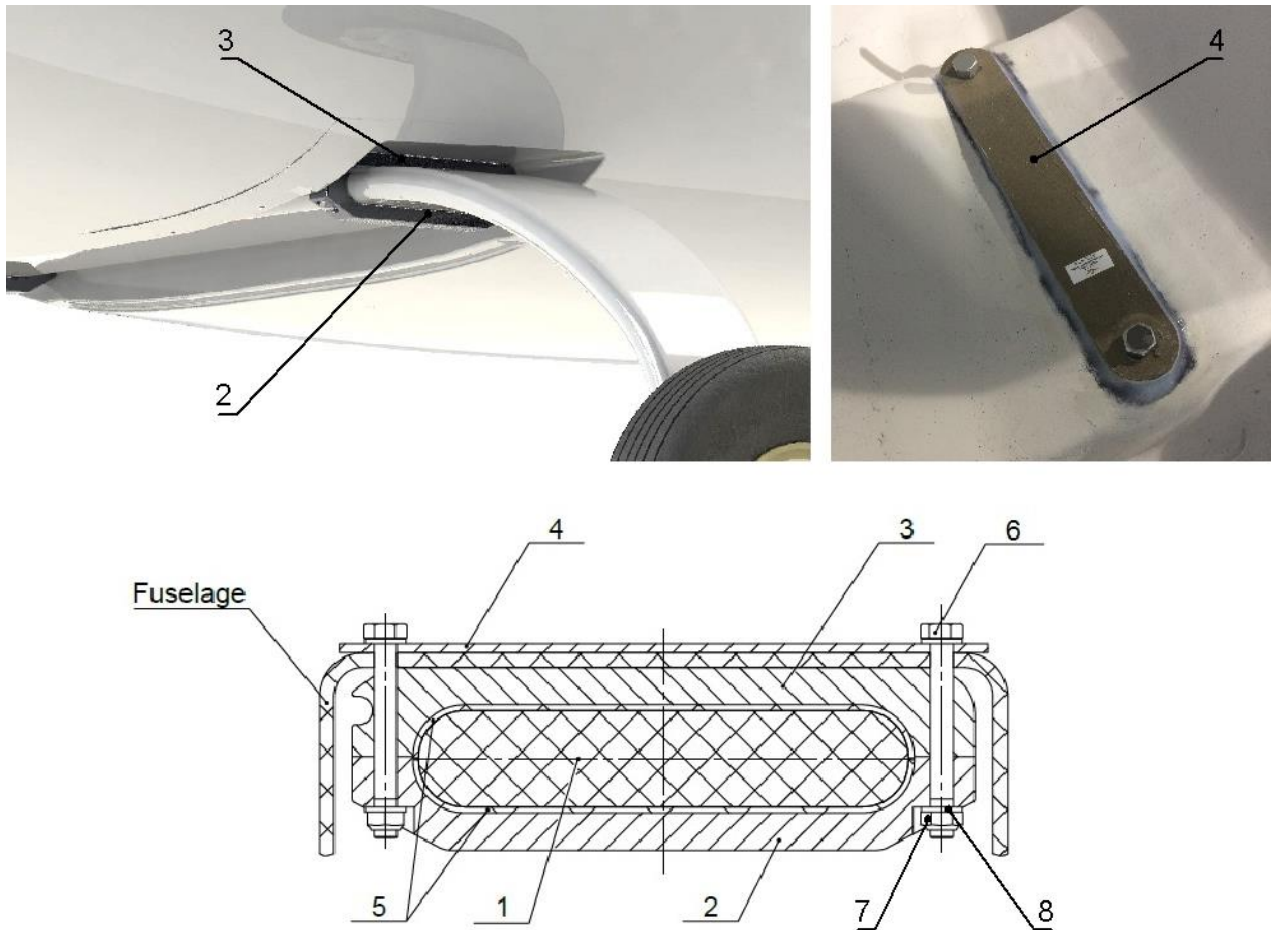


Fig. 32-10-2.

	Item	Part Name	Torque
32-10-2	1	Main landing gear beam	
	2	Main gear clamp	
	3	Main gear clamp, upper	
	4	Upper bearing plate (inside)	
	5	Rubber strip	
	6	Bolt AN5-25A	
	7	Self-Locking nut AN 365-524A	
	8	Washer AN960-516	

The interface between main gear strut and fuselage is covered with a composite fairing for good aerodynamic efficiency. The main wheel axles are attached directly to the main strut. The main wheel assemblies are provided with composite wheel fairings for reduced drag.

32-10.3 Maintenance Practices

32-10.3.1 Main Wheel Fairing, Removal and Installation

The fairings of main wheels are attached in four points from the inner side and in one point from the outer side.

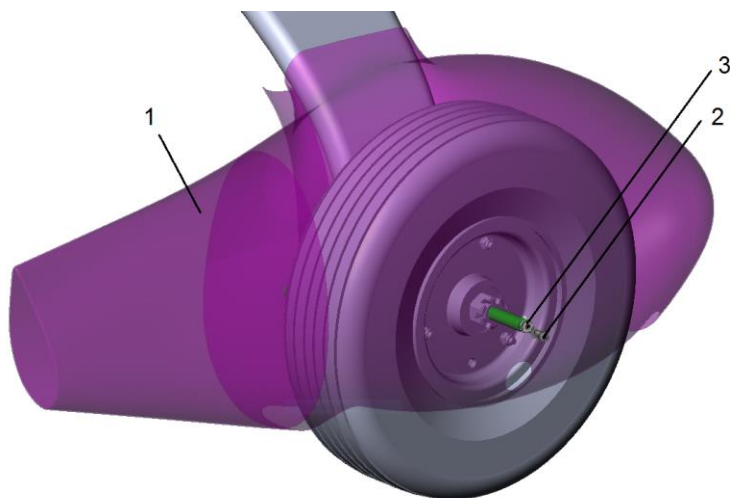


Fig. 32-10-3

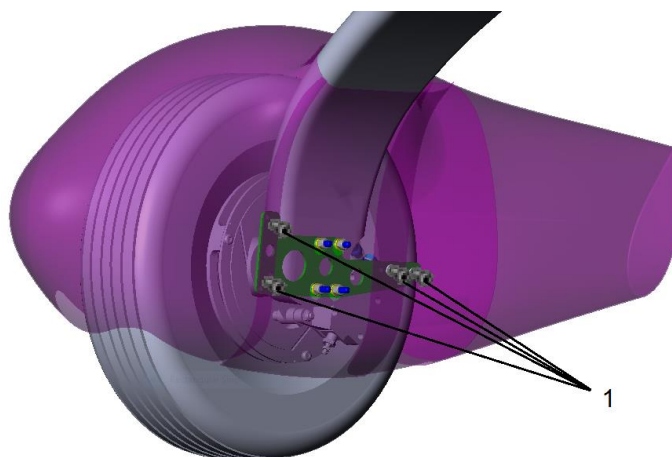


Fig. 32-10-4

Fig.	Item	Part Name	Torque
32-10-3	1	Main Wheel Fairing	
	2	Bolt	80 lb-in 9 Nm
	3	Washer	
32-10-4	1	Screw	49 lb-in 5.5 Nm

32-10.3.1.1 Type of Maintenance

Line

32-10.3.1.2 Minimum Level of Certification

Pilot/Owner

32-10.3.1.3 Procedure

A. Recommended Special Tools and Parts

<i>Item</i>	<i>Quantity</i>	<i>Unit</i>
None		

B. Main Wheel Fairing Removal. Fig. 32-10-3, Fig. 32-10-4.

<i>Step</i>	<i>Action</i>	<i>Reference</i>
1	Unscrew one bolt item 2. Remove washer item 3.	
2	Unscrew three bolts item 1.	
3	Remove fairing.	

C. Fairing, Main Wheel Installation

<i>Step</i>	<i>Action</i>	<i>Reference</i>
1	The fairing is installed in reversed direction order. When installing bolt item 2, apply service removable thread locker.	

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32-10.3.2 Main Wheel Removal and Installation

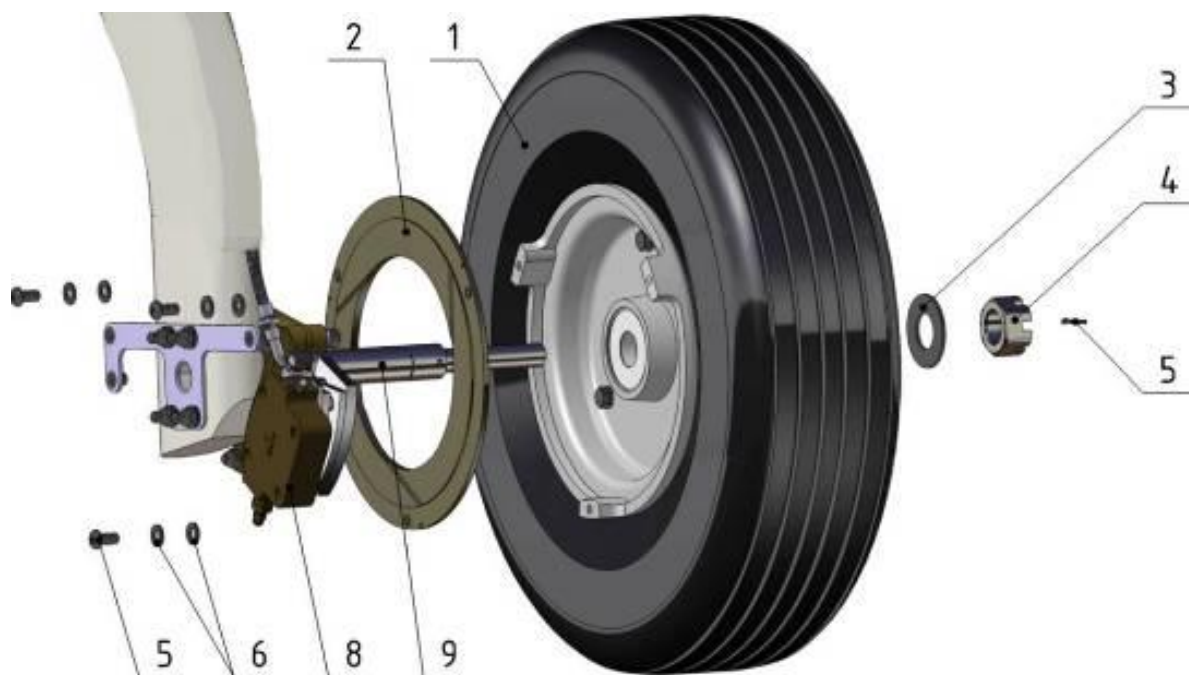


Fig. 32-10-5

Fig.	Item	Part Name	Torque	Reference
32-10-5	1	Main Wheel		KF32100062
	2	Brake disk		
	3	Axle Nut		
	4	Washer		
	5	Cotter Pin		
	6	Screw 0.25"	98 lb-in 11Nm	
	7	Nordlock washer		
	8	Brake Caliper		
	9	Axle		

32-10.3.2.1 Type of Maintenance

Line

32-10.3.2.2 Minimum Level of Certification

LSA-Mechanic (LSRM)

32-10.3.2.3 Procedure

A. Recommended Special Tools and Parts

Item	Quantity	Unit
None		

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B. Main Wheel Removal (Fig. 32-10-5)

Step	Action	Reference
1	Remove cotter pin item 5.	
2	Unscrew Axle Nut item 3.	
3	Unscrew 3 Screws item 5.	
4	Detach brake disk item 2 from the wheel rim.	
5	Pull wheel out and remove from the axle item 9	

C. Main Wheel Installation (Fig. 32-10-5)

The tapered roller bearing must be a packed with a suitable grease.

When installing screws item 5, apply a service removable thread locker.

The main wheel is installed in reversed direction order.

▲ Warning: When installing the Axle Nut, tighten the Axle nut until all play is out of the assembly. Rotate the Main Wheel back and forth while tightening to help seat the Roller Bearings. The Rubber seal on the tapered Roller bearing should remain stationary while the Main Wheel rotates around it. If the Rubber seal is spinning, tighten the Axle nut further until the Rubber seal stops spinning with the Main Wheel. If all requirements are assured and Main Wheel rotates freely, tighten Axle nut to the nearest slot and insert and secure the Cotter pin.

32-10.3.3 Tire and Tube Inspection and Replacement

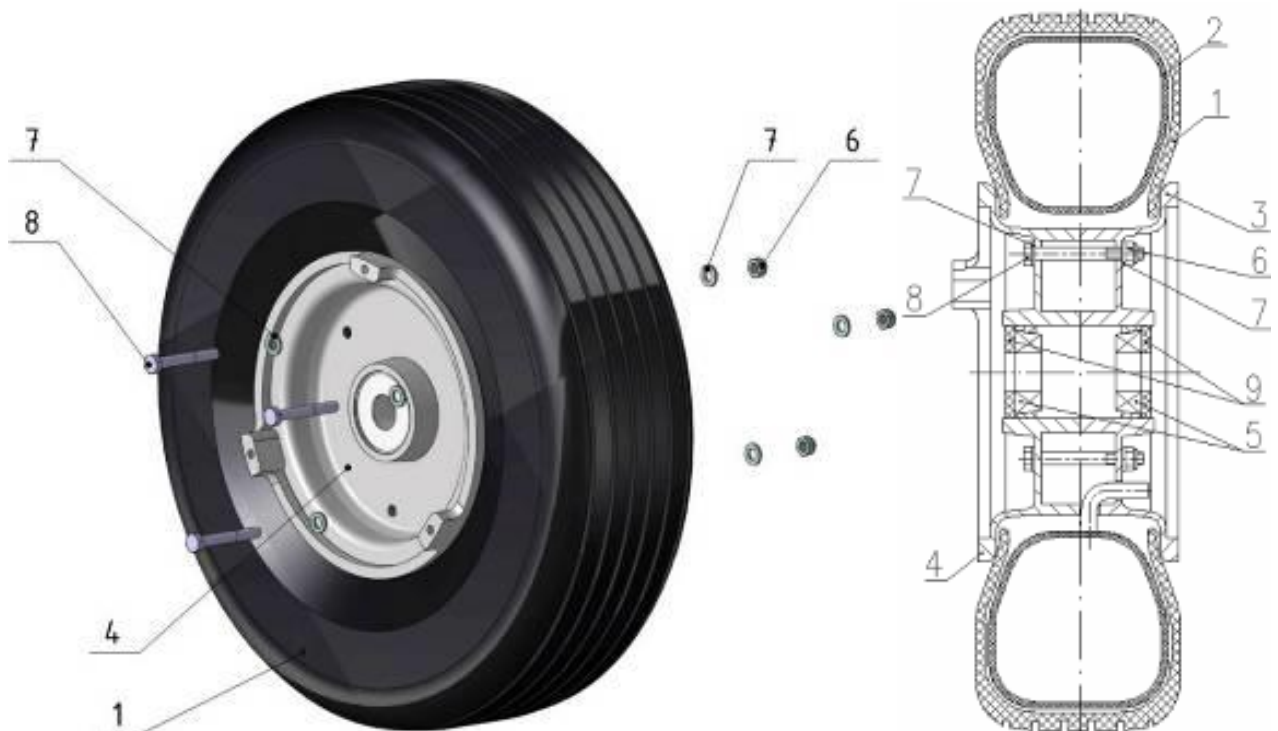


Fig. 32-10-6

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Fig.	Item	Part Name	Torque	Reference
32-10-6	1	Tire		
	2	Tube		
	3	Wheel, Valve Half		
	4	Wheel, Brake		
	5	Roller Bearing		
	6	Lock Nut	98 lb-in 11 Nm	
	7	Washer Thick		
	8	Bolt, Hex		
	9	Rubber seal		

32-10.3.3.1 Type of Maintenance

Line

32-10.3.3.2 Minimum Level of Certification

LSA-Mechanic (LSRM)

32-10.3.3.3 Procedure

A. Recommended Special Tools and Parts

Item	Quantity	Unit
None		

B. Tire and Tube Check and Replacement (Fig. 32-10-6)

Step	Action	Reference
1	Remove the main wheel	32-10.3.2
2	Unscrew the three, locknuts item 6	
3	Remove bolts, item 8, washers item 7	
4	Disconnect the wheel rims, item 3, 4	
5	Remove the tire and tube items 1, 2	
6	Inspect the Tire and Tube. When necessary replace.	
7	Assemble the main wheel in reversed direction order	
8	Install the main wheel	32-10.3.2

32-10.3.4 Main Strut Fairing Removal and Installation

32-10.3.4.1 Type of Maintenance

Line

32-10.3.4.2 Minimum Level of Certification

Pilot/Owner

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32-10.3.4.3 Procedure

A. Recommended Special Tools and Parts

Item	Quantity	Unit
None		

B. Main Strut Fairing Removal and Installation (Fig. 32-10-7)

Step		Reference
1	Detach the Seal Tape from the Fairing, Main Strut and Fuselage.	
2	Remove the two screws that attach the fairing to fuselage.	
3	Slide the main strut fairing down along the main strut.	
4	Installation is done in a reverse order.	

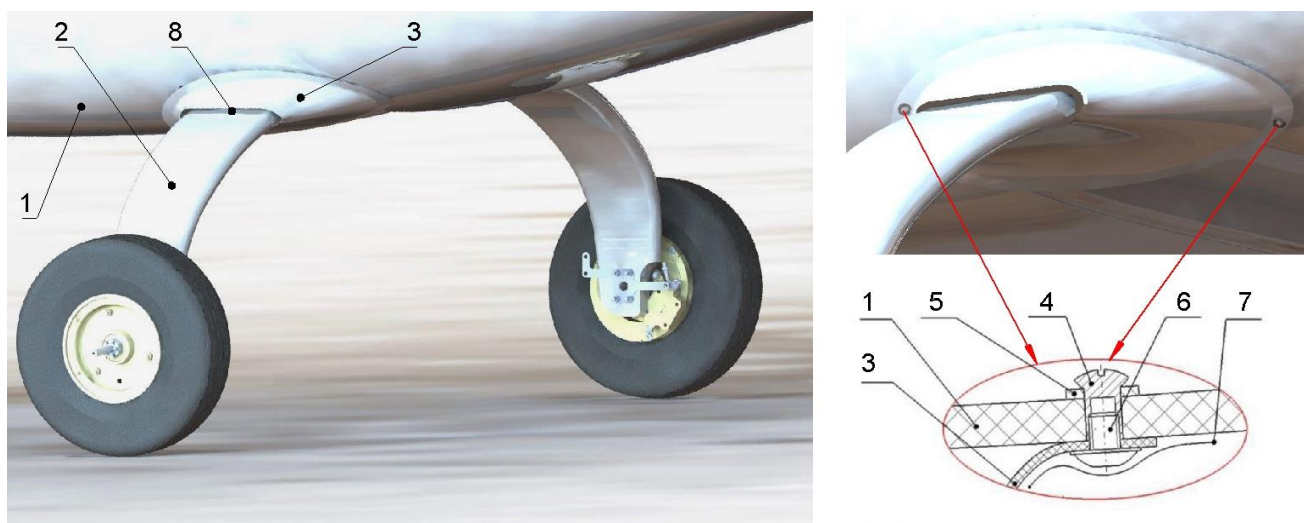


Fig. 32-10-7

Fig.	Item	Part Name	Torque	Reference
32-10-7	1	Fuselage		
	2	Main landing gear strut		DM 3210 0001
	3	Fairing, Main Strut		KF32100020
	4	Blind Nut		KF32100047
	5	Washer AN960-516		
	6	Screw MS24694S4	44 lb-in 5Nm	
	7	Seal Tape		

32-10.3.5 Main Landing Gear Removal and Installation

32-10.3.5.1 Type of Maintenance

Line

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32-10.3.5.2 Minimum Level of Certification

LSA-Mechanic (LSRM)

32-10.3.5.3 Procedure

A. Recommended Special Tools and Parts

Item	Quantity	Unit
None		

B. Main Beam Removal and Installation.

Step		Reference
1	Chock the nose wheel. Remove Main Gear Strut Fairings.	32-10.3.4
2	Disconnect the wheel brake line (Fig. 32-10-8). Unscrew the Fitting, 1/8", FT0107 (2) from Caliper and disconnect the Brake hose (1). Drain brake liquid out of the.	

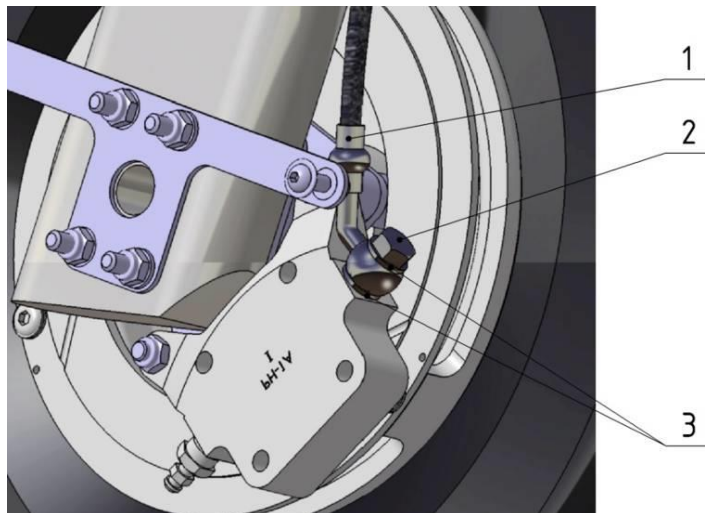


Fig. 32-10-8

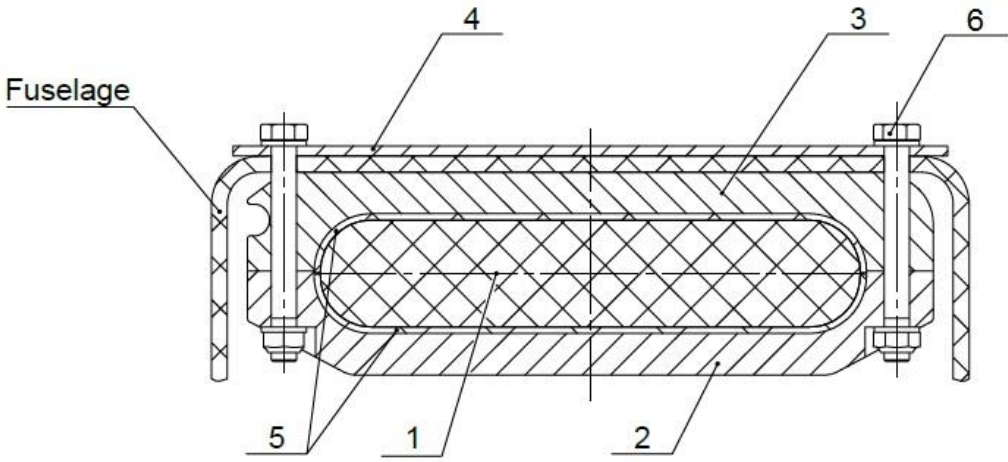
3	Flip the seats forward or remove them. To provide easy access to the attachment bolts (Fig. 32-10-9).	25.2.1
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Fig. 32-10-9

4	Put wing stands or 2 padded step ladders under the aircraft wings. You must secure the aircraft from rocking to the side.	
5	Lift the tail of the fuselage so that the Main Wheel is at least 10" (25 sm.) off the ground.	
6	Insert a padded support under the fuselage securely just behind the Frame 2.	
7	Unscrew 4 self-locking nuts (2) at lower attachment points and remove bolts (6).	

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Remove clamp (2, 3) and rubber seal (5) (Fig. 32-10-12).		
		
Fig. 32-10-12		
9	Detach the main strut.	

32-10.3.6 Main Gear Check

32-10.3.6.1 Type of Maintenance

Line

32-10.3.6.2 Minimum Level of Certification

LSA-Mechanic (LSRM)

32-10.3.6.3 Procedure

A. Recommended Special Tools and Parts

Item	Quantity	Unit
None		

B. Main Gear Inspection.

Step		Reference
1	Check the main beam for signs of damage, including delamination, dents, cracks, paint peeling on the surface and especially near the mounting bracket areas, check the integrity and circularity of the mounting holes. Check all visible surfaces before reassembly.	
2	Check the surrounding area (left/right) for damage, dents, cracks, and paint peeling.	
3	Check for the presence and correct position of the rubber elements located between the landing gear clamps (where the gear leg attaches to the fuselage) and the main gear beam. These elements are important to the protection and proper fitting of the landing gear beam and fuselage in operation.	
4	Check all the above annually with removal of all the parts (main gear cover, strut fairings and so on) during the inspection. Check the main wheel axle attachment area for damage, dents, cracks on the surface, especially in the mounting hole areas. Inspect for integrity and circularity of the mounting holes. In case of a hard landing inspect these immediately after landing.	

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C. Wheel Check.

Step		Reference
1	Check the main wheels for run out, play, binding, strange noises while rotating - at least every 100h. Push the wheel so that it makes 6-8 turns and watch the rotation until it stops.	
2	Check the tires for inflation visually before each flight, measure tire pressure as necessary.	12-10.2.7
3	Check tires for dry rot or cracking, and depth of tread (at least 0.04 inch / 1 mm) – before each flight.	
4	Check the Main Wheel and Strut Fairings for integrity, secure attachment and foreign objects in the aft part of the fairing – before each flight.	

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SECTION 32-20 – NOSE LANDING GEAR

32-20.1 General

This section provides descriptions and information for the maintenance of the Nose Landing Gear.

32-20.2 Description

The nose landing gear is attached to the lower section of the big engine mount with bearings, to allow steering. The nose gear strut is designed to telescope as a shock absorber with integral urethane spring elements. The excellent damping characteristic of the urethane dampener elements give very low spring-back reducing the tendency for porpoising. The nose landing gear is steered via control rods which are attached directly to the rudder pedals.

The nose gear has an aerodynamically optimized composite fairing.

The F2-LSA aircraft is equipped with an interface for a hand operated tow bar. There are two protruding pins attached to the nose gear leg. The tow bar is attached to these pins. The tow bar attachment size fits one of the most common tow bars, that also fits most Cessna aircraft models (Fig. 32-20-2).

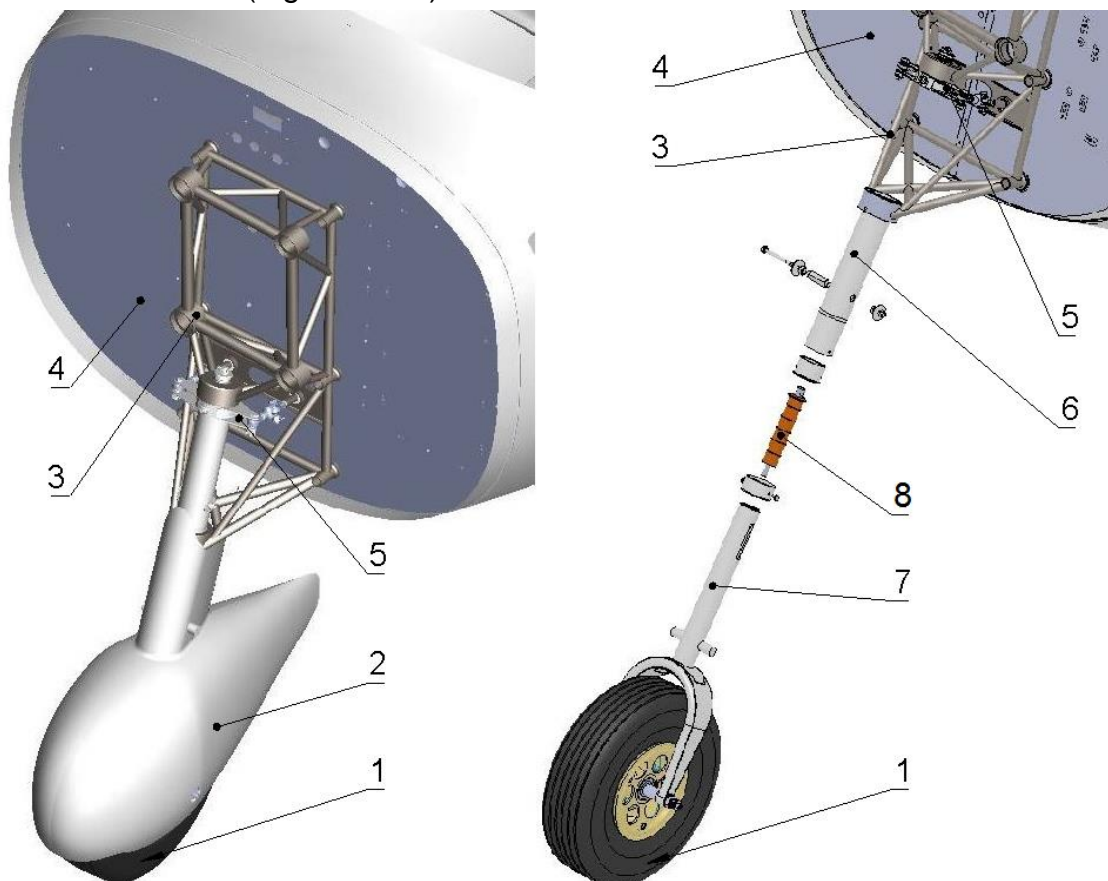


Fig. 32-20-1

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Fig.	Item	Part Name	Torque
32-20-1	1	Nose wheel	
	2	Nose wheel fairing	
	3	Main Engine mount	
	4	Firewall	
	5	Steering plate	
	6	Outer tube	
	7	Nose Fork	
	8	Red Urethane Spring assembly	

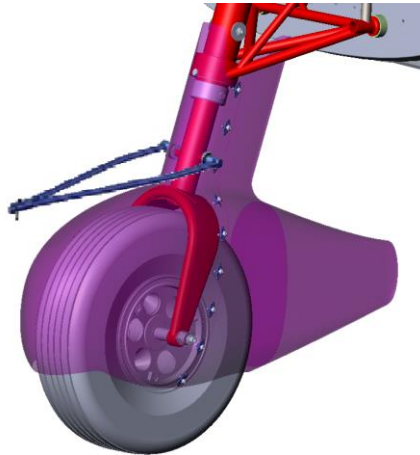


Fig. 32-20-2

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32-20.3 Maintenance Practices

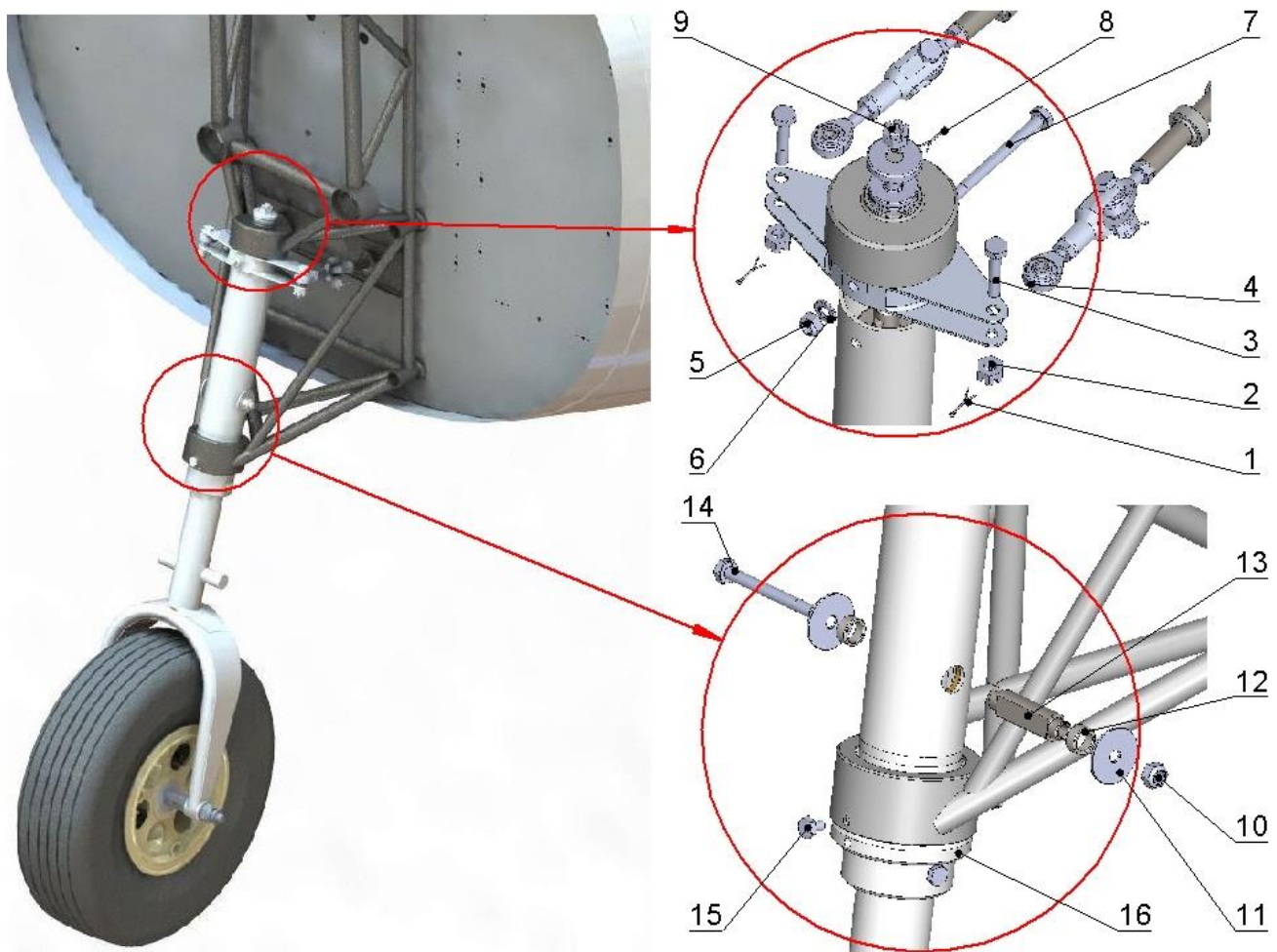


Fig. 32-20-3

Fig.	Item	Part Name	Torque	Reference
32-20-3	1	Cotter pin AN380-2-2		
	2	Castellated nut (AN4) AN310-04		
	3	Bolt AN4-12		
	4	Rod end MM4		
	5	Self-locking nut (AN4) AN365-4		
	6	Washer AN960-416		
	7	Bolt AN4-27A		
	8	Cotter pin AN380-2-2		
	9	Castellated nut (AN5) AN310-05		
	10	Self-locking nut (AN4) AN365-4		
	11	Washer AN970-4		
	12	Pin ring		KM 3220 0008
	13	Pin		KM 3220 0005
	14	Bolt AN4-24A		
	15	Bottom bolt		KM 3220 0011
	16	Bottom bearing ring		KM 3220 0013

32-20.3.1 **Nose Gear Removal and Installation**

For nose gear Removal and Installation, two persons are required.

32-20.3.1.1 **Type of Maintenance**

Heavy

32-20.3.1.2 **Minimum Level of Certification**

LSA-Mechanic (LSRM)

32-20.3.1.3 **Procedure**

A. Recommended Special Tools and Parts

<i>Item</i>	<i>Quantity</i>	<i>Unit</i>
None		

B. Nose Gear Removal (Fig. 32-20-3)

<i>Step</i>	<i>Action</i>	<i>Reference</i>
1	Unscrew bolt Self-locking nut (10)	
2	Take out Washers (11), Bolt (14), Pin rings (12) and Pin (13)	
4	Take out Cotter pin (1)	
5	Unscrew bolt Castellated nuts (2)	
6	Take out Bolts (3)	
7	Disconnect the Rod end (4)	
8	Take out Cotter pin (8)	
9	Unscrew bolt Castellated nut (9)	
10	Unscrew bolt Self-locking nut (5)	
11	Take out Washer (6) and Bolt (7)	
12	Unscrew Bottom bolts (15)	
13	Take out Bottom bearing ring (16)	
14	Pull gear down and remove nose fork from the engine mount	

C. Nose Gear Installation (Fig. 32-20-3)

<i>Step</i>	<i>Action</i>	<i>Reference</i>
1	The nose gear is installed in reversed direction order.	

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32-20.3.2 Nose Wheel Fairing Removal and Installation

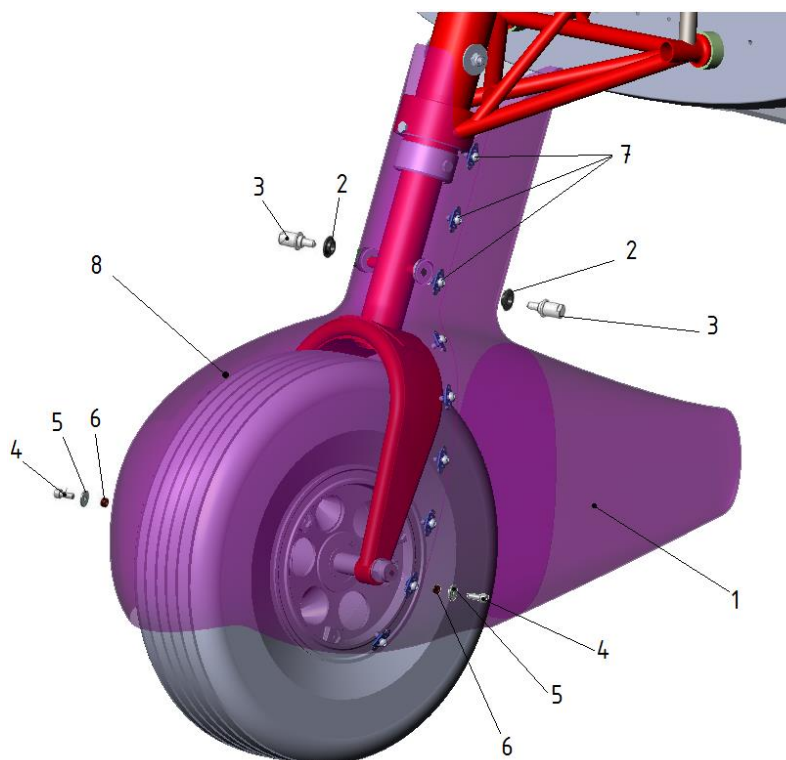


Fig. 32-20-4

Fig.	Item	Part Name	Torque
32-20-4	1	Rear part of Nose Fairing	
	2	Protruded Pin	
	3	Grommet	
	4	Bolt	
	5	Washer	
	6	Grommet	
	7	Screw M5	
	8	Front part of Nose Fairing	

32-20.3.2.1 Type of Maintenance

Line

32-20.3.2.2 Minimum Level of Certification

Pilot/Owner

32-20.3.2.3 Procedure

A. Recommended Special Tools and Parts

Item	Quantity	Unit
None		

B. Nose Wheel Fairing Removal (Fig. 32-20-4)

Step	Action	Reference
1	Unscrew screws item 7. Remove rear part of nose fairing item 1.	
2	Unscrew the two tow bar pins item 3. Remove grommets item 2.	
3	Unscrew bolts items 4. Remove washers and grommets items 5, 6.	
4	Remove front part of nose fairing item 8.	

C. Nose Wheel Fairing Installation (Fig. 32-20-4)

Step	Action	Reference
1	The nose wheel fairing is installed in reversed direction order. When installing bolts items 4 and protruded pins item 2 apply service removable thread locker.	

32.20.3.3 Nose Wheel Removal and Installation

The nose wheel removal can be done after fairing removal. For this, the fairing shall be removed from the nose gear following procedure 32-20-3.2.

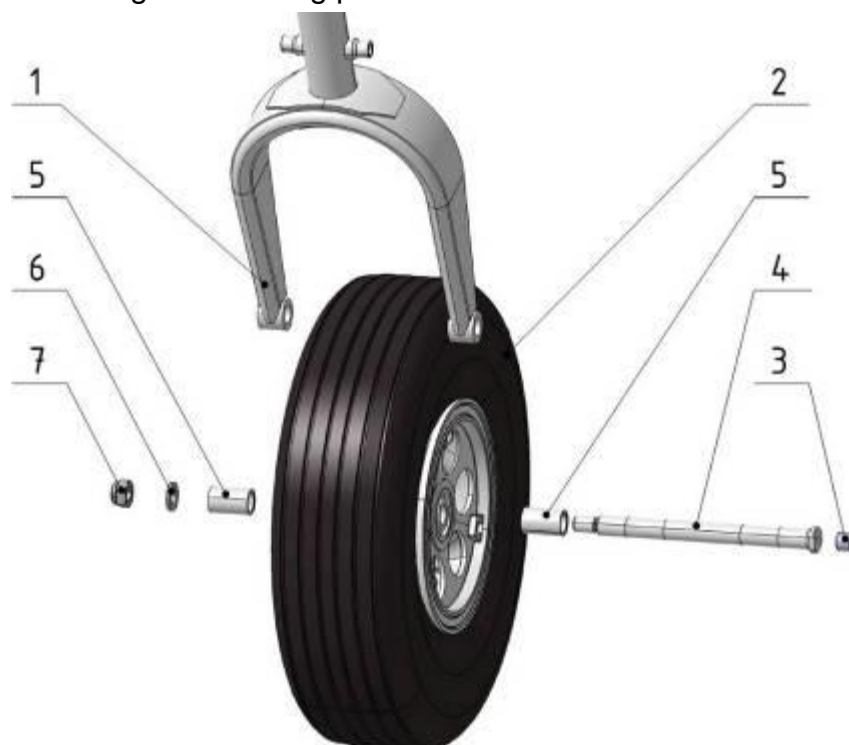


Fig. 32-20-5

Fig.	Item	Part Name	Torque
32-20-5	1	Strut, Nose Gear	
	2	Nose Wheel	
	3	Bush	
	4	Axle	
	5	Spacer	
	6	Washer	
	7	Self-locking nut	

32-20.3.3.1 Type of Maintenance

Line

32-20.3.3.2 Minimum Level of Certification

LSA-Mechanic (LSRM)

32-20.3.3.3 Procedure

A. Recommended Special Tools and Parts

<i>Item</i>	<i>Quantity</i>	<i>Unit</i>
None		

B. Nose Wheel Removal (Fig. 32-20-5)

<i>Step</i>	<i>Action</i>	<i>Reference</i>
1	Unscrew self-locking nut, item 7	
2	Remove axle, bush, spacers, washer items 4, 3, 5, 6.	
3	Remove wheel	

C. Nose Wheel Installation (Fig. 32-20-5)

<i>Step</i>	<i>Action</i>	<i>Reference</i>
1	The nose wheel is installed in reversed direction order.	

When reinstalling the nose wheel, tighten the nut until all play is out of the assembly. Rotate the wheel back and forth while tightening to help seat the bearings. Do not over-torque nut.

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32-20.3.4 Tire and Tube Check and Replacement

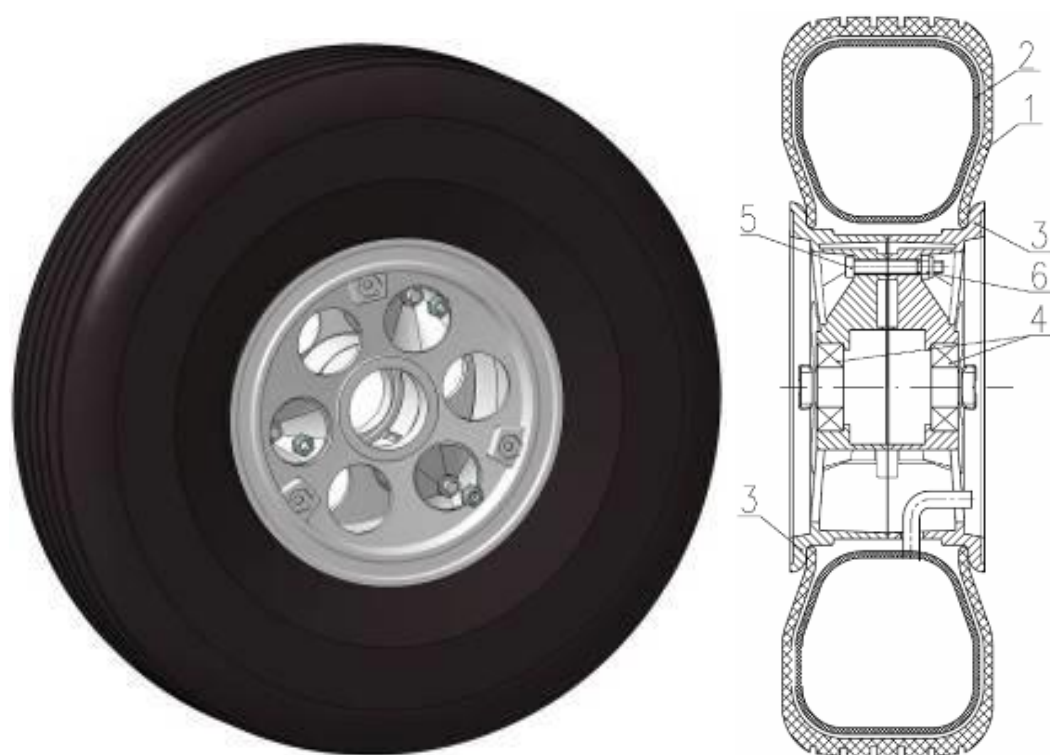


Fig. 32-20-6

Fig.	Item	Part Name	Torque	Reference
32-20-6	1	Tire		
	2	Tube		
	3	Wheel Rim		
	4	Roller Bearing		
	5	Bolt	100lb-in 11Nm	
	6	Lock Nut		

32-20.3.4.1 Type of Maintenance

Line

32-20.3.4.2 Minimum Level of Certification

LSA-Mechanic (LSRM)

32-20.3.4.3 Procedure

A. Recommended Special Tools and Parts

Item	Quantity	Unit
None		

B. Tire and Tube Check and Replacement (Fig. 32-20-6)

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Step	Action	Reference
1	Remove the nose wheel	32-20.3.3
2	Unscrew and remove three bolts item 5.	
3	Remove nuts item 6	
4	Disconnect wheel rims item 3	
5	Remove tire and tube items 1, 2	
6	Check Tire and Tube. When necessary replace.	
7	Assemble main wheel in reversed direction order	
8	Reinstall nose wheel	32-20.3.3

32-20.3.5 Nose Fork and Strut Disassembly

32-20.3.5.1 Type of Maintenance

Line

32-20.3.5.2 Minimum Level of Certification

LSA-Mechanic (LSRM)

32-20.3.5.3 Procedure

A. Recommended Special Tools and Parts

Item	Quantity	Unit
None		

B. Strut Disassembling (Fig. 32-20-7)

Step	Action	Reference
1	Remove the nose gear	32-20.3.1
2	Remove the fairing	32-20.3.2
3	Remove the nose wheel	32-20.3.3
4	Remove self-locking nut (25).	
5	Take out Washer (24) and Bolt (23)	
6	Remove the self-locking nut (21).	
7	Take out Washers (17) and Bolt (20)	
8	Take out Pin (8) and Pin rings (9)	
9	Remove the bottom bolts (13)	
10	Take out the bottom bushing holder (11) and bottom bushing (12)	
11	Disassemble the strut	
12	Inspect urethane dampers item 14. Inspect and replace if wear or damage is observed.	
13	Check the Central spring holder (2) and Spring washers (5). If necessary replace.	

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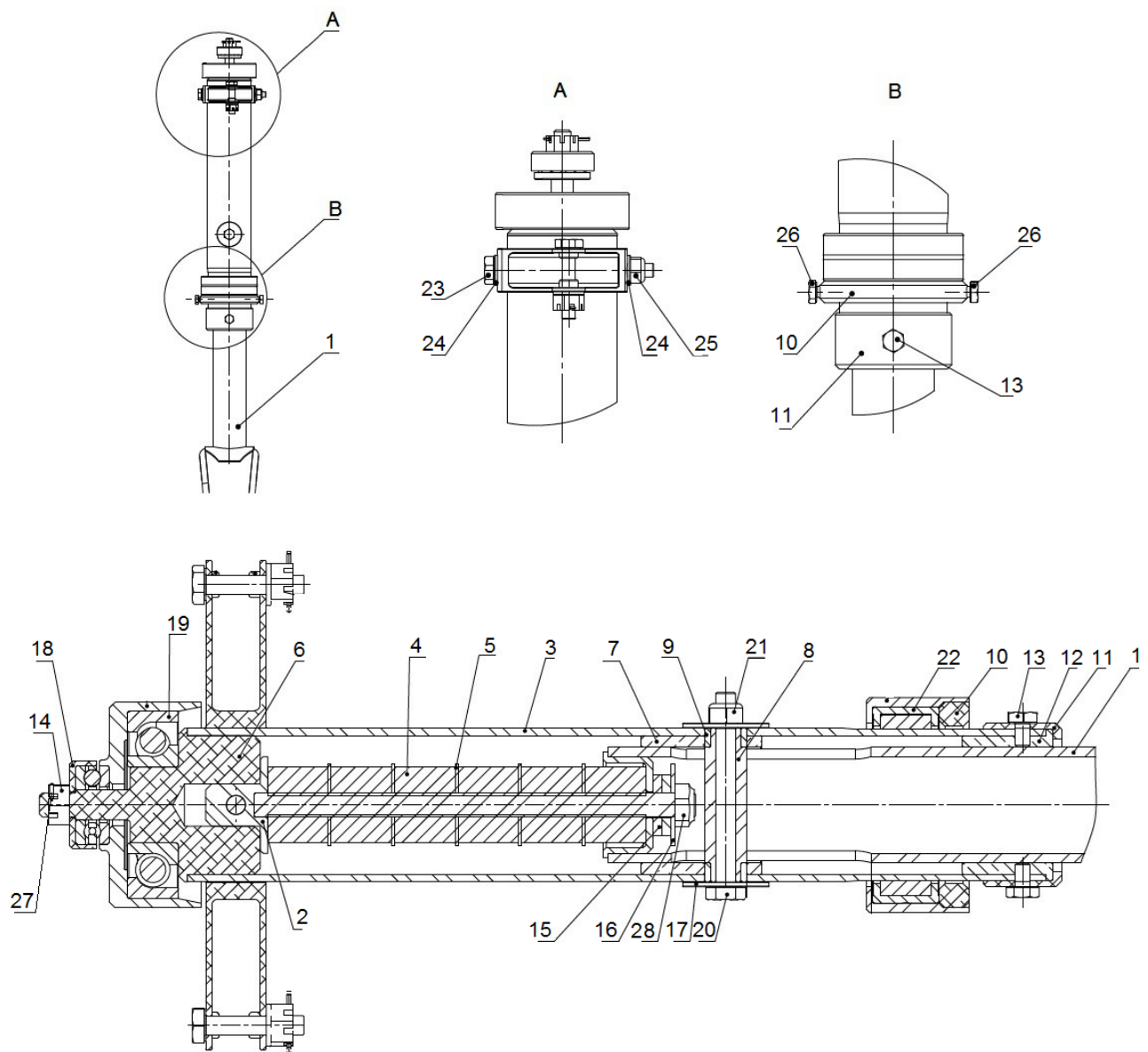


Fig. 32-20-7

Fig.	Item	Part Name	Torque	Reference
32-20-7	1	Nose wheel fork		KM 3220 0100
	2	Central spring holder		KM 3220 0200
	3	Outer tube		KM 3220 0001
	4	Red Metric urethane dampener 10,5 mm ID x 25 mm OD x 20 mm L90A		
	5	Spring washer		KM 3220 0032
	6	Top inner bearing body		KM 3220 0007
	7	Upper bushing		KM 3220 0027
	8	Pin		KM 3220 0005
	9	Pin ring		KM 3220 0008
	10	Bottom bearing ring		KM 3220 0013
	11	Bottom bushing holder		KM 3220 0002
32-20-7	12	Bottom bushing		KM 3220 0003
	13	Bottom bolt		KM 3220 0011

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14	Castellated nut (AN5) AN310-05		
15	Rubber washer 8.1x20x3		
16	Spring washer		KM 3220 0032
17	Washer AN970-4		
18	Top small bearing cover		KM 3220 0010
19	Bearing 7305 BECBM		
20	Bolt AN4-24A		
21	Self-locking nut (AN4) AN365-4		
22	Bearing NKS 50		
23	Bolt AN4-27A		
24	Washer AN960-416		
25	Self-locking nut (AN4) AN365-4		
26	Bottom bolt		KM 3220 0011
27	Cotter pin AN380-2-2		
28	Self-locking nut (AN5) AN365-5		

32-20.3.6 Nose Gear Check

32-20.3.6.1 Type of Maintenance

Line

32-20.3.6.2 Minimum Level of Certification

LSA-Mechanic (LSRM)

32-20.3.6.3 Procedure

A. Recommended Special Tools and Parts

<i>Item</i>	<i>Quantity</i>	<i>Unit</i>
None		

B. Visual Check

<i>Step</i>	<i>Action</i>	<i>Reference</i>
1	Check the strut and fork for damage, dents, cracks, paint detachment separation. Pay specific attention to the welding seam areas. Check for obvious damage to all visible parts each time the fairing is removed.	
2	Check the engine mounts for damage, dents, cracks. Pay special attention to welding seam areas. Check all visible surfaces before each flight (inspect engine compartment visually each time the cowlings are removed).	
3	The firewall for damage, dents, cracks, delaminating. Pay special attention to the areas where the engine mount is attached to the firewall. Check all visible surfaces each time the cowlings are removed.	

C. Shock Absorbers Check

<i>Step</i>	<i>Action</i>	<i>Reference</i>
1	Turn the propeller counter clockwise and set it with two blades downwards.	
2	Push down the propeller with both hands at the root of the blades as hard as possible.	
3	Release sharply. Make sure the plane returned to the original position by the shock absorber.	
4	Repeat for 2-3 times. Listen for any unusual sounds.	

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5	If operation is suspected wrong then remove and disassemble the strut for further inspection.	32-20.3.5
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D. Fork Check

Step	Action	Reference
	Have an assistant push down on the rear fuselage ahead of the horizontal tail to lift up the nose gear and turn the nose gear right by pedals and then release.	
	Turn it to the left and release.	
	Repeat 2-3 times to each side.	
	Check the fork for play, binding and unusual sounds while rotating.	
	If operation is suspected wrong than remove and disassemble the strut for further inspection	32-20.3.5

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SECTION 32-40 – BRAKES

32-40.1 General

This section provides descriptions and information concerning the maintenance of the Brake System.

32-40.2 Description

The main wheels of the F2-LSA have hydraulic disc brakes. They are operated with the brake lever that is located in the throttle quadrant. The braking is symmetric on both wheels. As the aircraft has a steerable nose wheel, this makes for easy ground steering.

The brake lines are reinforced with an outer carbon fiber cover and connections are crimped tightly on to the lines, thus ensuring high line rigidity and stability at a low installed weight. This also results in very good brake efficiency.

The brakes can be locked in the parking position by setting the parking brake which blocks the backflow line. The parking lever is in the middle console in the cockpit, directly behind the brake lever. It is possible to set the locking lever to the parking position, and then apply brake force to the brake lever. This makes one-hand operation of the parking brake easy.

The brake system schematically is presented in the diagram.

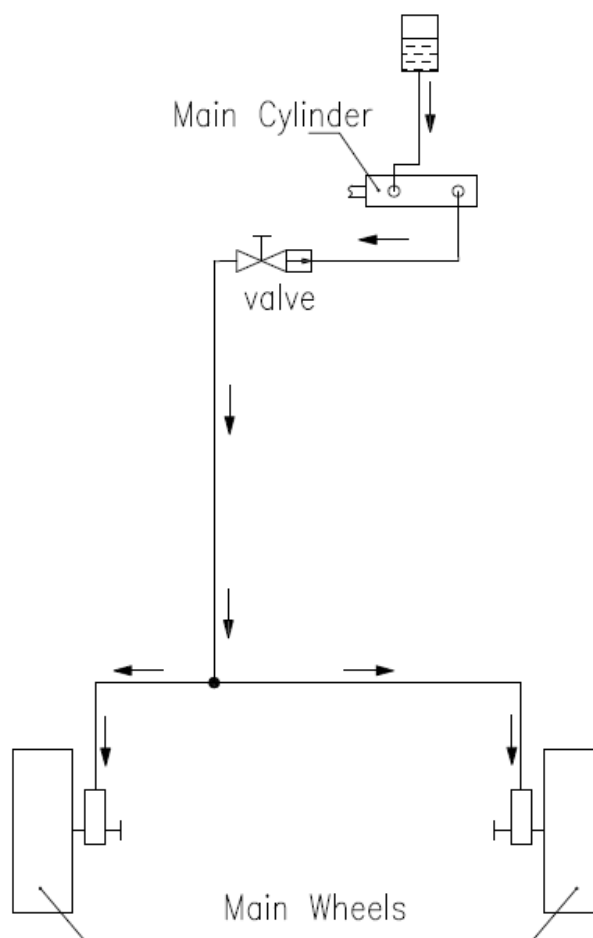
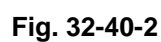


Fig. 32-40-1

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The main cylinder is installed internally in the tunnel. The parking brake is actuated with a combination of the master cylinder and the check valve. The PTFE tube connects the main cylinder and reservoir tank.



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The reservoir is located behind the rear service hatch attached to the rear of the cabin.

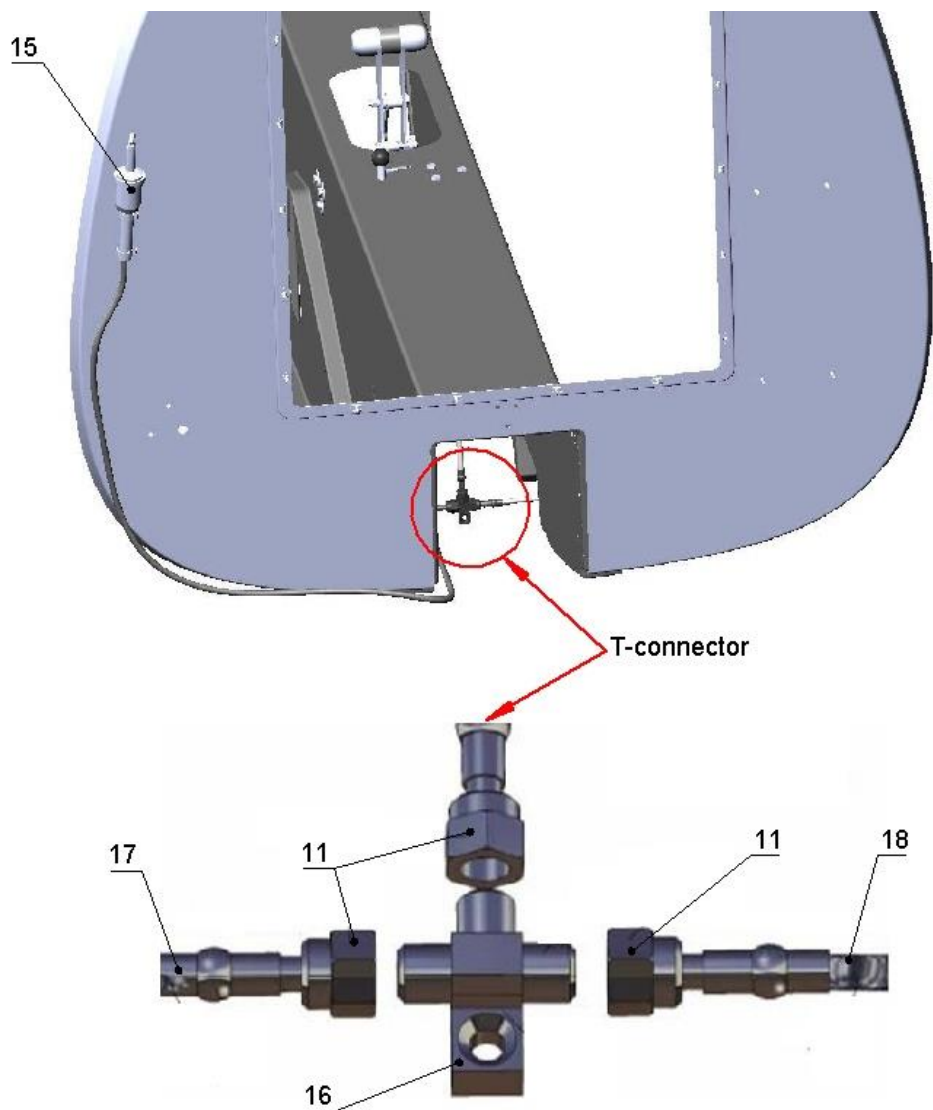


Fig. 32-40-3

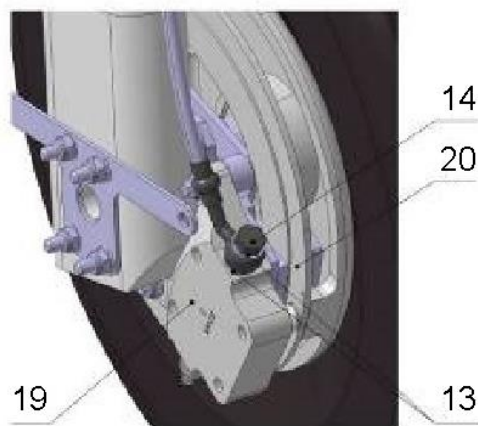


Fig. 32-40-4

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The sticker on the tunnel shows a valve position.

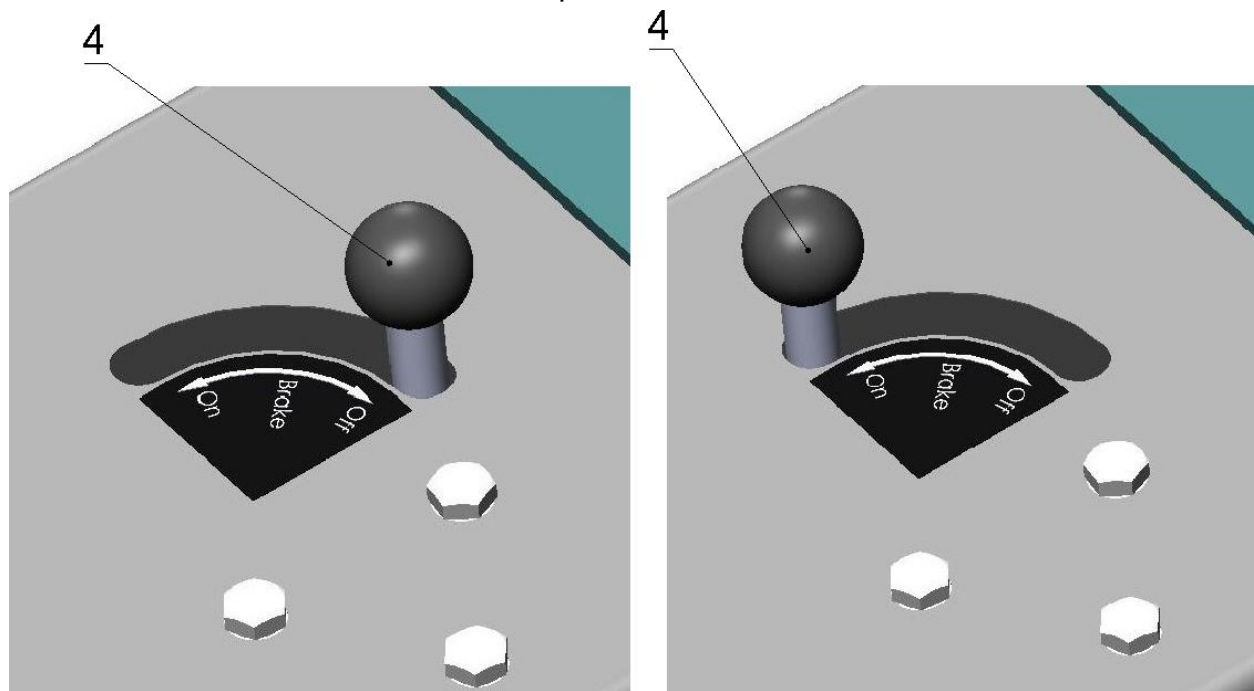


Fig. 32-40-5

The brake line is connected to the main cylinder via metal fittings.

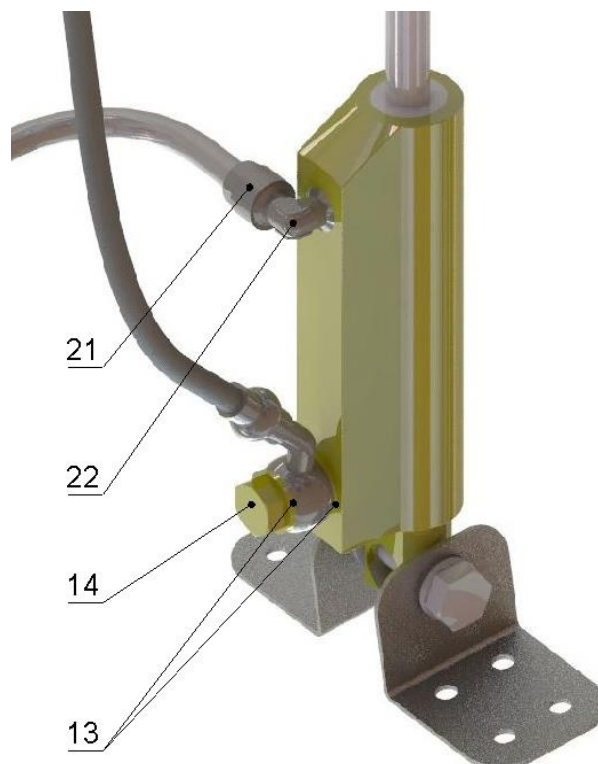


Fig. 32-40-6

For re-assembly after service, use only new Washers item 13.

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Items and tightening torque

<i>Fig.</i>	<i>Item</i>	<i>Part Name</i>	<i>Torque</i>	<i>Reference</i>
32-40-1 – 32-40-6	1	Master Cylinder, MC-4CT, 1/8 BSPT		
	2	Connecting rod		KM 7320 0010
	3	Bolt AN3-4A		
	4	Grip		KM 3240 0004
	5	Lever		KM 7320 0001
	6	Brake lever bushing		KM 7320 0009
	7	Brake hose L=1000 mm		
	8	Self-locking nut AN365-1032A		
	9	Bolt M5x10 DIN 933 A2, AISI 304		
	10	Bolt AN3-7A		
	11	Nut M10x1	10 Nm	
	12	Fitting M10x1-1/8"	15 Nm	
	13	Washer, B22002AL		
	14	Fitting, 1/8", FT0107	15 Nm	
	15	MCR-100 Reservoir		
	16	Fitting M10x1		
	17	Brake hose L=1200 mm		
	18	Brake hose L=1200 mm		
	19	Housing, Caliper PH-1A1		
	20	Brake disk, 5/16" wheel, 0.175 thick		
	21	Nut	10 Nm	
	22	L-adapter, 1/8"		

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32-40.3 Maintenance Practices

32-40.3.1 Brake System Check

32-40.3.1.1 Type of Maintenance

Line

32-40.3.1.2 Minimum Level of Certification

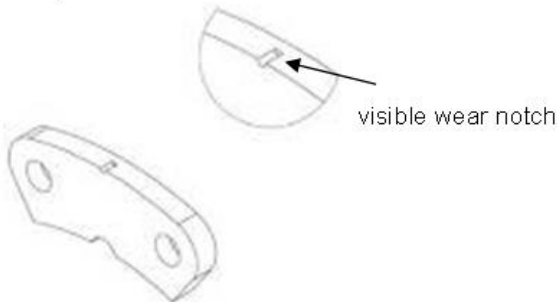
Pilot/Owner

32-40.3.1.3 Procedure

A. Recommended Special Tools and Parts

<i>Item</i>	<i>Quantity</i>	<i>Unit</i>
None		

B. Brakes System Check

<i>Step</i>	<i>Action</i>	<i>Reference</i>
1	Clean and inspect the hydraulic cylinders, activation handle and connections for condition, brake fluid leaks, for cracks and corrosion, securing of components.	
2	Check brake lines at the main landing gear for condition, leaks, security of attachment, and evidence of wear.	
3	Check the outer protection of brake hoses in the places where they go through the fuselage skin for signs of abrasion on the carbon cover.	
4	Check movement of the pistons and pressure plates.	
5	<p>Check brake disks and linings for condition and wear.</p>  <p>The brake lining has a visible wear indicator. The lining should be replaced when the thickness of the remaining brake pad material reaches 2.54 mm and the wear indicator is erased.</p>	
6	Check the level of fluid in the hydraulic system. Replenish if required.	
7	Check all hardware for signs of loss of torque.	
8	Check the vent tube on top of the reservoir with filter for blockage.	

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CHAPTER 33 – POSITION/STROBE LIGHTS

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33-00.1 General

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33-40.1 General

33-40.2 Position/Strobe Lights

33-40.2.1. Description

33-40.2.2 Maintenance Practices

33-40.2.2.1 Wing Tip Position Lights Removal and Installation

33-40.2.2.2 Position Lights Inspection

33-00.1 General

This chapter provides description and information for maintenance of Position lights.

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SECTION 33-40 – POSITION/STROBE LIGHTS

33-40.1 General

This section provides description and information concerning maintenance of exterior lights.

33-40.2 Position/Strobe Lights

33-40.2.1. Description

Fig. 33-40-1 shows location of the Position/Strobe lights.



Fig. 33-40-1

The position lights system consists of position light left (Fig.33-40-2a) and position light right (Fig.33-40-2b).

The Left and Right position lights are installed to the flat surface on the winglet of the aircraft.



Fig. 33-40-2a



Fig. 33-40-2b

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33-40.2.2 Maintenance Practices

33-40.2.2.1 Wing Tip Position/Strobe Light Removal and Installation

33-40.2.2.1.1 Type of Maintenance

Line

33-40.2.2.1.2 Minimum Level of Certification

Pilot/Owner

33-40.2.2.1.3 Procedure

A. Recommended Special Tools and Parts

Item	Quantity	Unit
None		

B. Left and Right Position Lights Removal and Installation

Step	Action	Reference
1	Unscrew Screw (2 pcs.) item 6 (Fig. 33-40-3).	
2	Remove Retainer item 5 (Fig. 33-40-3).	
3	Remove Lens item 7 (Fig. 33-40-3).	
4	Unscrew Screw (3 pcs.) item 4 (Fig. 33-40-3).	
5	Remove Assembly LED Light item 2, 3, (Fig. 33-40-3).	
6	Unscrew Screw (3 pcs.) item 8 (Fig. 33-40-3).	
7	Remove Base plate item 1 (Fig. 33-40-3).	
8	Disconnect socket item 1 and plug item 2 (Fig. 33-40-4).	
9	Installation is done in a reversed direction order.	

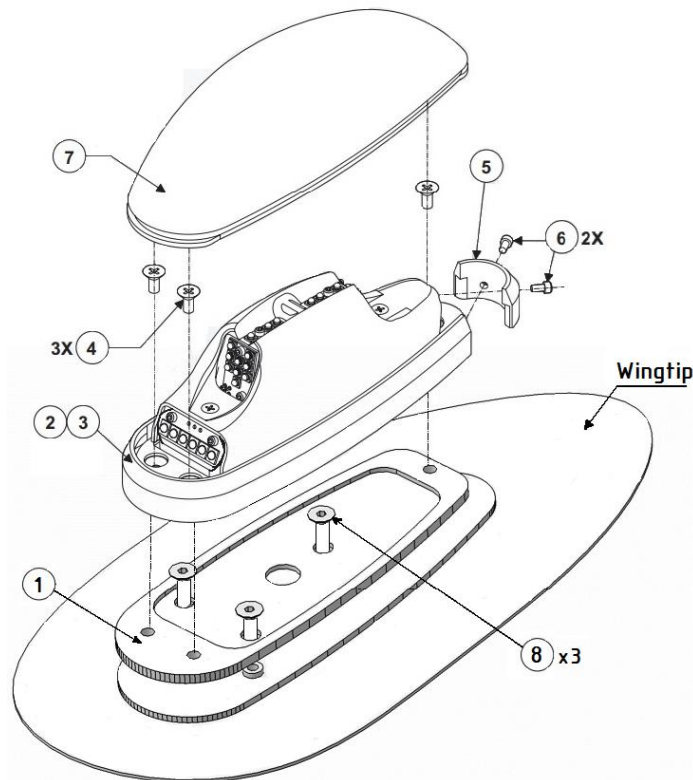


Fig. 33-40-3

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Fig.	Item	Part Name	Torque	Reference
33-40-3	1	Base plate		PoS C9997160N/C9997160M
	2	Assembly, 12V LED Wingtip Light Green 71733		C9997160N
	3	Assembly, 12V LED Wingtip Light Red 71733		C9997160M
	4	Screw, 4-40 x 5/16 P100FH MS24693-C3		PoS C9997160N/C9997160M
	5	Retainer, Lens Model 71733		PoS C9997160N/C9997160M
	6	Screw, 2-56 X 3/16 SCKT HD HEX W/NYLOK		PoS C9997160N/C9997160M
	7	Lens, Clear Model 71733 Hard Coat		PoS C9997160N/C9997160M
	8	Bolt DIN 7991 M4x16-10.9		PoS C9997160N/C9997160M

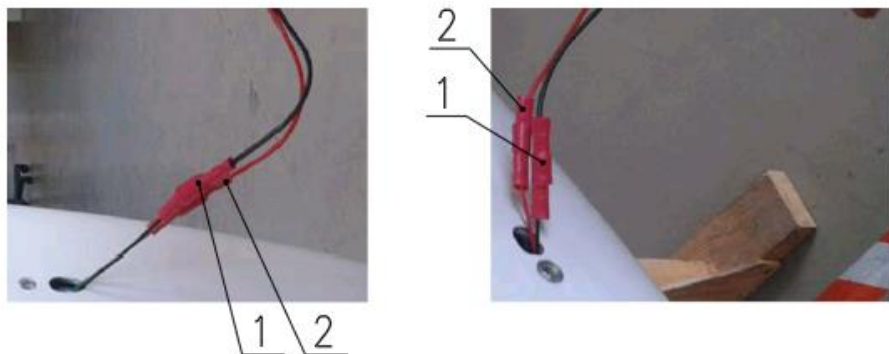


Fig. 33-40-4

33-40.3.2.2 Position/Strobe Light Inspection

33-40.3.2.2.1 Type of Maintenance

Line

33-40.3.2.2.2 Minimum Level of Certification

Pilot/Owner

33-40.3.2.2.3 Procedure

Perform visual inspection of operation. If any of the LEDs or Strobes are not operating properly, or does not operate replace it in accordance with procedure described above.

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CHAPTER 34 – AVIONICS

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34-00.3.1	Avionic Units Removal and Installation
34-00.3.2	Avionic Units Check
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34-20.2	Description
31-20.3	Maintenance Practices
34-20.3.1	Pitot/Static Ports Removal and Installation
34-20.3.2	Check of Pitot/Static System

34-00.1 General

This chapter provides a description of the avionic.

34-00.2 Description

The F2-LSA is equipped as standard with a Garmin GTR 255A COM radio, a Garmin GTX335 Mode S transponder with ADSB out and with GAE12 altitude encoder. Also as an option, the installation of Garmin GNC 255A COM/NAV radio, with Garmin GTX345 Mode S transponder with ADSB in/out. Further equipment may be installed for navigation or comfort acc. to the equipment list. The operation of these units is described in the relevant component manuals. Please refer to Garmin for updates and information about continued operational safety.

The aircraft installation provides two sets of connectors for headsets, located on the rear of the center console between the seats. The connectors on the left side are intended for the pilot headset. The connectors on the right side are intended for the copilot headset.

There is one set of backup headset connectors installed to the lower instrument panel. The backup connectors can be used in case of a total intercom failure. They are directly connected to the radio and allow safe transmission in this case. The connectors can also be used in diagnostics when a problem with the intercom is suspected.

Each control stick is equipped with a push-to-talk button (PTT). The PTT buttons are wired to recognize if the pilot or copilot intends to transmit, and opens the respective microphone.

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34-00.3 Maintenance Practices

34-00.3.1 Avionics components removal and Installation

34-00.3.1.1 Type of Maintenance

Line

34-00.3.1.2 Minimum Level of Certification

Pilot/Owner

34-00.3.1.3 Procedure

A. Recommended Special Tools and Parts

Item	Quantity	Unit
None		

B. Radio Garmin GNC 255A/Transponder GTX345 Removal

Step	Action	Reference
1	Disconnect battery.	31.3.1.3
2	To remove NAV/COM, XPDR from the rack, use the 3/32" hex tool, insert it to the hole as shown on Fig. 34-00-1 and on Fig. 34-00-2 and turn the tool counterclockwise. The unit will be pushed out of the frame by the cam lock assembly. No special extraction tools are required.	
3	Using hex-head screwdriver 3mm unscrew 4 bolts that hold the upper middle panel.	31.3.1.3

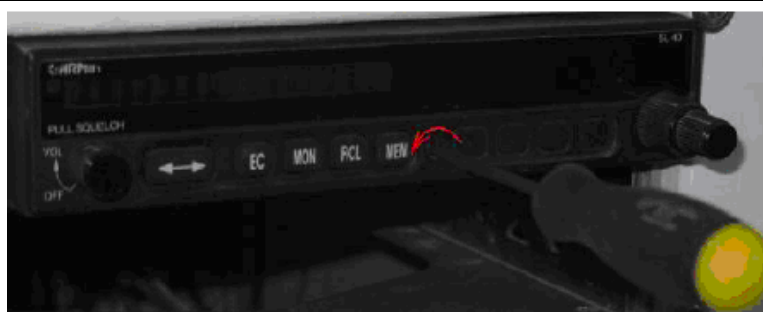


Fig. 34-00-1



Fig. 34-00-2

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34-00.3.2 Avionic Units Inspection

34-00.3.2.1 Type of Maintenance

Line

34-00.3.2.2 Minimum Level of Certification

Pilot/Owner

34-00.3.2.3 Procedure

A. Recommended Special Tools and Parts

<i>Item</i>	<i>Quantity</i>	<i>Unit</i>
None		

B. Equipment Inspection

<i>Step</i>	<i>Action</i>	<i>Reference</i>
1	Radio Garmin GTR 225A/GNC 255A. The GTR 225A / GNC 255A display lens is coated with a special anti-reflective coating which is very sensitive to skin oils, waxes, and abrasive cleaners. It is very important to clean the lens using an eyeglass cleaner that is specified as safe for anti-reflective coatings (one suitable product is Wal-Mart Lens Cleaner) and a clean, lint-free cloth.	
1	Transponder Garmin GTX335/345 Mode S. Other than for regulatory periodic functional checks, maintenance of the GTX 335/345 is "on condition" only. Refer to the GTX 335/345 Maintenance Manual. Periodic maintenance of the GTX 335/345 is not required.	
1	GAE12 altitude encoder. The model GAE12 Altitude Encoder requires no periodical maintenance. Maintenance should be performed on condition.	
1	Audio Panel GMA245/342/345. The GMA245/342/345 display lens is coated with a special anti-reflective coating which is very sensitive to skin oils, waxes, and abrasive cleaners. It is very important to clean the lens using an eyeglass cleaner that is specified as safe for anti-reflective coatings (one suitable product is Wal-Mart Lens Cleaner) and a clean, lint-free cloth.	

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SECTION 34-20 – PITOT/STATIC SYSTEM

34-20.1 General

This section provides description and information concerning maintenance of Pitot/Static system.

34-20.2 Description

The aircraft is equipped with a single Pitot system with an integral static port.

The Pitot system is fed by a Pitot tube installed to the right, wing leading edge. The Pitot tube provides two total pressure inputs. The main pressure is derived from the tip of the probe. The second pressure is derived from an angled surface pointing forward / downward at the probe tip. This second pressure is used to provide signals for an Angle of Attack indication with stall warning.

Pressure lines connect the Pitot tube with a water trap installed inside the right wing, behind the main spar at the span wise Pitot tube position. The water trap is composed of a filter with paper membrane at the lowest point where incoming humidity is trapped and evaporated again from the filter surface, and a bypass line that allows pressure to be transmitted without water influence.

Pressure lines connect the water trap to a pass-through in the rear root rib. The line is connected with the fuselage installed line by a plastic fitting.

Inside the fuselage the line is routed forward along the root rib and down the right “A” pillar into the instrument console. Inside the instrument console the line is split using T connectors, as necessary per installed equipment.

Location of pressure lines is described on Fig. 34-20-1.

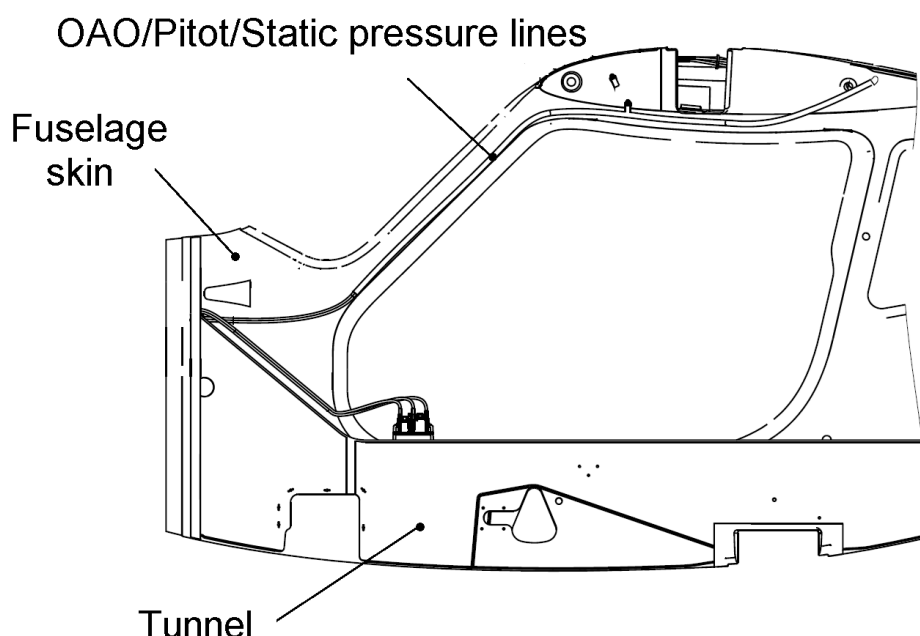


Fig. 34-20-1

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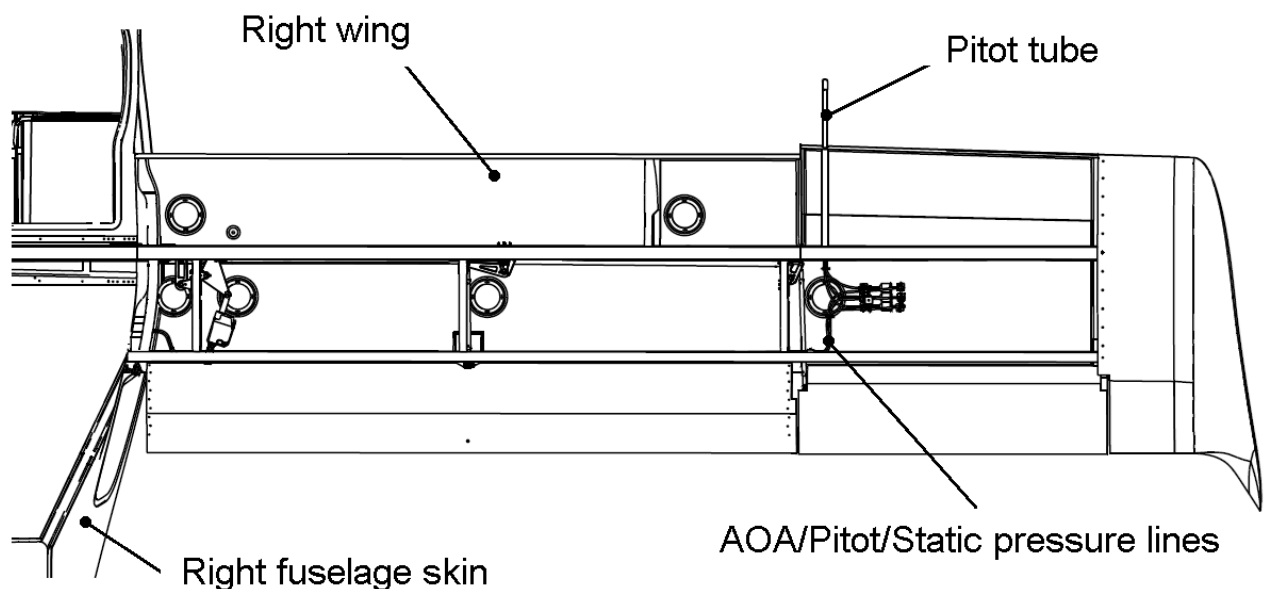


Fig. 34-20-2

31-20.3 Maintenance Practices

34-20.3.1 Pitot/Static/AOA Probe Removal and Installation

34-20.3.1.1 Type of Maintenance

Line

34-20.3.1.2 Minimum Level of Certification

LSA- Mechanic (LSRM)

34-20.3.1.3 Procedure

A. Recommended Special Tools and Parts

Item	Quantity	Unit
None		

B. AOA/Pitot/Static probe Removal and Installation

Step	Action	Reference
1	Take the Pitot tube out of the wing, Pitot tube is removed by hand pressure pulling gently from the wing leading edge as shown on Fig. 34-20-3.	
2	Disconnect Pitot/Static/AOA pressure lines as shown on Fig. 34-20-3.	

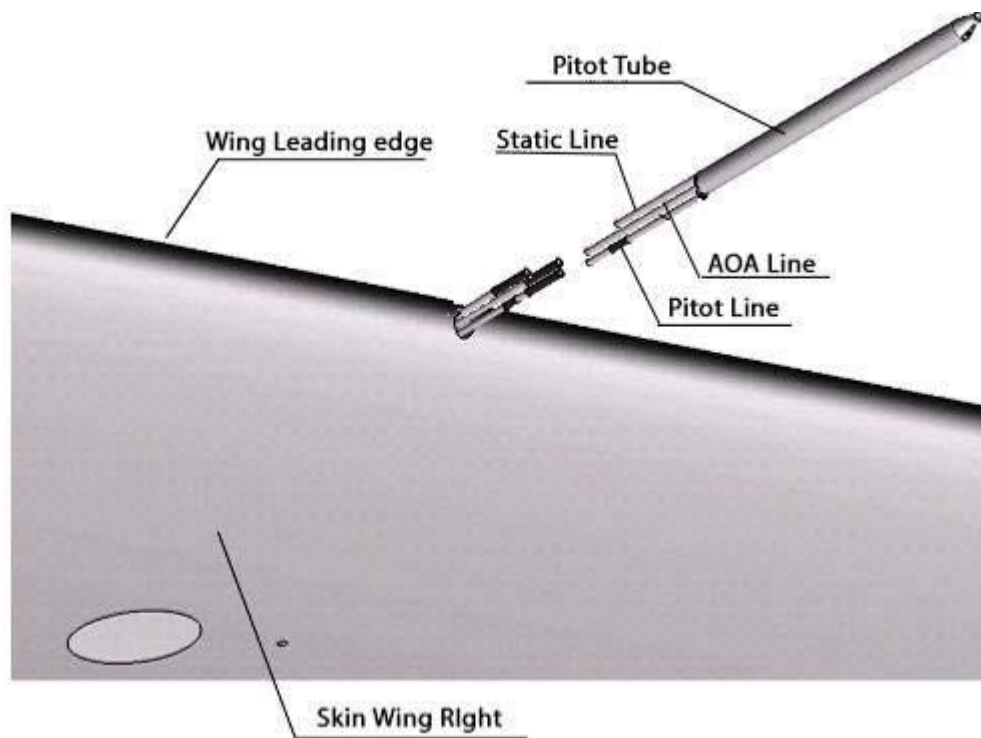


Fig. 34-20-3

34-20.3.2 Inspection of Pitot/Static System

34-20.3.2.1 Type of Maintenance

Line

34-20.3.2.2 Minimum Level of Certification

LSA- Mechanic (LSRM)

34-20.3.2.3 Procedure

A. Recommended Special Tools and Parts

Item	Quantity	Unit
None		

B. Inspection of Pitot/Static System

Step	Action	Reference
1	Take the Pitot tube out of the wing, Pitot tube is removed by hand pressure ahead from the wing leading edge as shown in Fig. 34-20-3. Clean it (remove insects, debris and so on) using a stick. Disconnect Pitot/AOA pressure lines.	
2	Disconnect Static pressure line from Static Port by unscrewing Nylo-seal elbow 269 N06X04 Fig. 34-20-4.	
3	Disconnect Pitot/Static pressure lines from instruments installed on the instrument panel.	
4	Attach a tag to each of the ends of tubes to show with the instrument the ends are to be connected to. Carefully blow out the systems by compressed air with low pressure.	
5	Assemble the Pitot/Static system in reverse order.	

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CHAPTER 51 – STANDARD PRACTICES AND STRUCTURES

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51-00.1 General

This chapter provides a description and information concerning the maintenance of structures.

51-00.2 Description

The airframe is made of high-quality composite materials that permit the production of an optimized and smooth shape with excellent aerodynamic characteristics at an efficient structural weight.

All outside surfaces are weather protected with high performance 2-component PUR paint, that is typically used by the car industry. Interior surfaces are protected with high quality and robust 2-component interior paint system.

The airframe consists of three major components. These are the fuselage (including vertical tail and cowlings), the wing (two pieces, connected by the main spar) and the horizontal tail. Even if the assembly and disassembly of the aircraft are not complex, this may be only be done by qualified personnel.

Due to the complex nature of composite materials and the necessary knowledge in the lay-up of a specific structure, repair work on the composite airframe may only be undertaken by a qualified facility. Should the aircraft structure be damaged, detailed information must be requested from the manufacturer.

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SECTION 51-10 – INVESTIGATION

51-10.1 General

This section provides a description of damage classes and types and presents an overview of applicable damage investigation techniques.

51-10.2 Damage Classes

There are following accepted classes of damage:

A. Damage Class 1

Major structural damage that requires the partial replacement of a structural component, or the damage to a large area, or to a highly stressed component are classified as the Class 1 damage. Such damage restricts or void airworthiness.

B. Damage Class 2

Holes and cracks through both skins of a sandwich are the Class 2 damage. Overlap over the core damage shall be a circle with a diameter of 75 mm (3 inches).

C. Damage Class 3

Small holes or cracks in the outer skin without internal damage to the filler material or to the inner skin are considered as the Class 3 damage.

D. Damage Class 4

Minor scratches or abrasions without the skin cracking or punctures are the Class 4 damage.

51-10.3 Types of Damage

There are the following main types of damage:

A. Disbonding

Disbonding is the damage of a bond between 2 components, for instance between a composite component and a metal component.

B. Delamination

Delamination is the damage of the bond between the layers of glass or carbon fabric in a component.

C. Cracks

There are also two types of cracks: micro cracks in the surface of the resin, and major cracks with broken fibers. Major cracks do not occur with normal flight loads or normal landing loads. The major cracks shall be repaired.

51-10.4 Inspection Techniques

There are following applicable inspection techniques:

A. Visual Inspection

This method may be used to detect damage to composites of any type. Examine visually the inside of a component with a bright light. Glass fiber fabric must be green or brown. The carbon fabric must be black or brown. White areas may be signs of damage. Pay close attention to the areas where components bond to the glass fabric.

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Inspect carefully the outer surface of a component. Cracks or bubbles in the paint means that the composite may be damaged. Refer to 51-10.5.

Inspect for dents. Look especially in areas where stones can hit the airplane below the fuselage and the wings and in the areas of the walkways.

B. Light Test

Use the light test to find delamination on components what do not have rigid foam inside.

■ **Caution:** Do not overheat the composite to prevent its damage.

Point a very bright light at the surface and look at the other side of the surface. Thus you can see the damage as the dark area.

● **Note:** You can use the light test for thick glass fiber but it is difficult to use for carbon fiber.

C. Coin Tap Test

Use the coin tap test to find delamination and dis-bonding. Tap a coin on the laminate surface in the test area. The sound of the coin tapping on the surface of the laminate changes when the coin is moving over the damaged area.

Inspect carefully the area around the damage for secondary damage, which can remain undetected.

51-10.5 Further Inspection

A further inspection shall be carried out in case the paint damage is detected. Inspect the inside of a structure or a component. If necessary, remove panels or other components, or use remote viewing equipment.

Remove the paint coating in the area which is suspected to be damaged. Remove the paint coating carefully, you shall prevent damaging the fabric under the paint coating.

Inspect the surface carefully. If there are cracks in the composite you shall repair the structure.

If you did not detect cracks during the visual inspection, then do the following test. Push the middle of the tested area with your thumb. If you can feel the skin hitting the core of a sandwich (or other layer/component), then the skin is dis-bonded and you must repair the structure.

In some cases, a qualified composite repairman must cut inspection holes in the structure to perform the test correctly. In this case, you shall contact Flight Design for specific instructions.

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SECTION 51-20 – REPAIR PROCESSES

51-20.1 General

This section provides a description of damage classes and types and presents an overview of applicable damage investigation techniques.

When further information is needed, please contact the aircraft manufacturer for further instructions.

51-20.2 Painting and Coating

Since full strength of the fiber composite structure has only been shown up to a temperature of 54°C (129°F), the outer surface of the airplane must be painted white. Exceptions are registration markings and warning marks, which are subject to the following restrictions (refer to Fig. 51-20-1):

- Area 1: No registration markings or warning markings may be applied here.
- Area 2: This area has the same restrictions as Area 1, except that registration marks may be applied here which comply with the restrictions of Area 3.
- Area 3: Registration markings and warning markings may be applied here. They may be any shape and color, provided that the average absorption coefficient of each area measuring 200 mm by 200 mm (8" by 8") does not exceed 0.5.
- Area 4: Registration markings and warning markings of any shape and color may be applied here without restrictions.

● **Note:** No black stripes are allowed in front of the vertical tail, across the top of the fuselage (indicated on Fig. 51-20-1).

■ **Caution:** Do not paint the airplane without consultation with Flight Design. The aircraft must be painted white to reduce heating the composite structure in sunlight. Hi temperatures will cause damage to the airplane structure.

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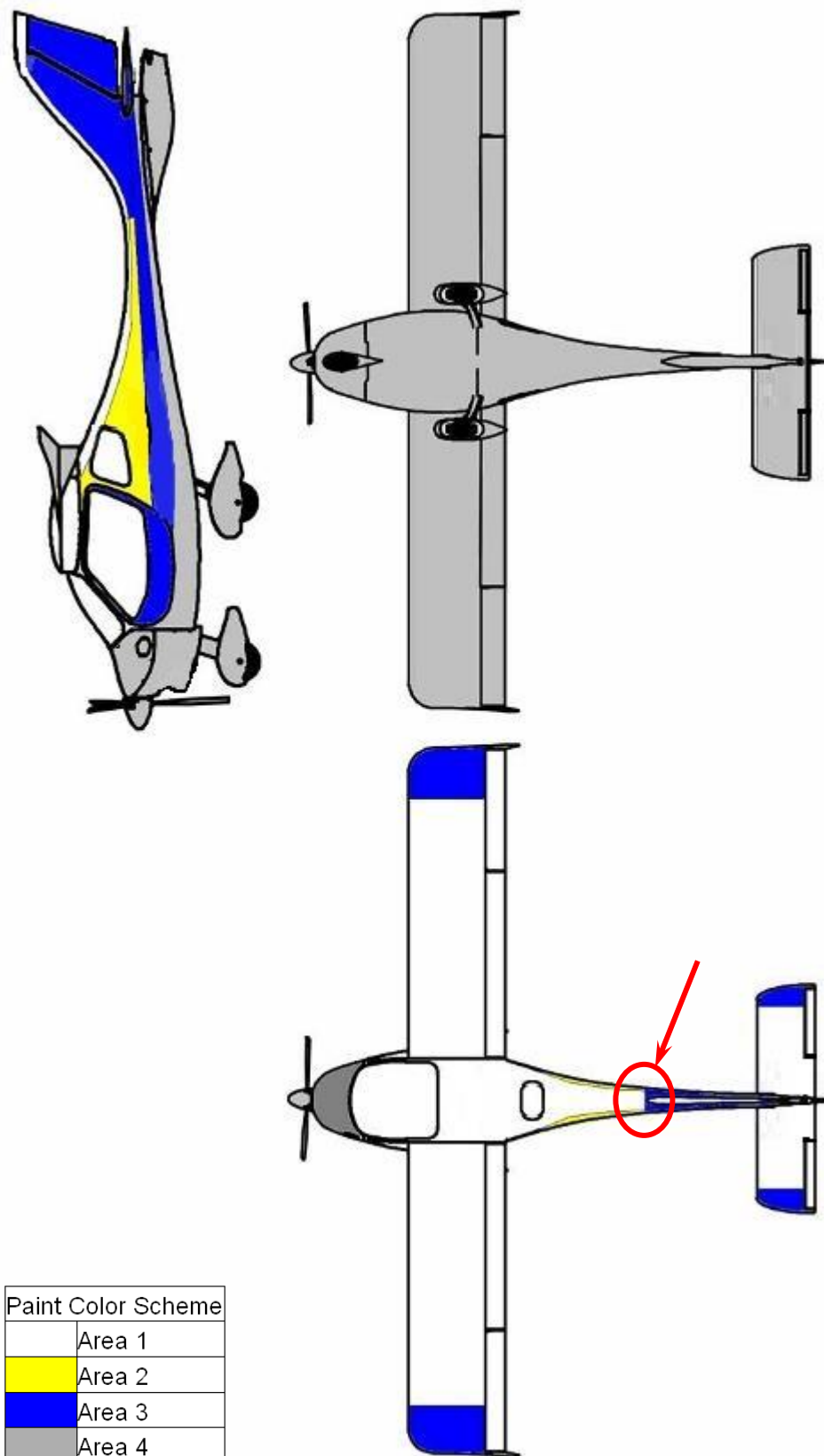


Fig. 51-20-1

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SECTION 51-30 – MATERIALS

When needed please contact Flight Design Customer Care (customercare@flightdesign.com) for further instructions.

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SECTION 51-40 – ELECTRICAL BONDING

51-40.1 General

The airplane can get electrically charged up in flight by the friction of the air on the frontal surfaces and features. This is especially the case during flight in rain and snow. This is called P-static. The bonding system ties all exposed surfaces and systems together into one groundplane. This prevents different levels of electric potential (Voltage caused by P-static)) between systems and airframe and consequently uncontrolled arcing between those systems and the airframe. Even small arcs can cause enough electromagnetic noise to impact the function communication and navigational systems to point of uselessness. These are the effect

Arcing in the fuel system can cause even the ignition of fuel vapor.

51-40.2 Description

The carbon airframe has limited conductivity and is not capable to carry any higher current as common in metal airframes. It is not capable to carry lighting current or even the return current for any electrical system but it is capable to bleed off P-static to dedicated exit points.

The F2 bonding scheme's intention is to tie all extremities of the airplane and the systems together.

Grounding straps connect:

1. Engine to the metal firewall
2. Firewall thru engine frame attachment bolt to fuselage skin
3. Ailerons to aft spar (flaps are grounded thru the flap tracks)
4. Aft spar and upper wing skin to be connected via bonding strap to the fuselage skin inside the removable fairing
5. Elevator to horizontal stabilizer
6. Rudder centering spring and rudder cable connect the rudder to the firewall
7. Control stick central tube to rudder pedals
8. Landing gear strut to landing gear tunnel

The IFR version will use static wicks which will make the bonding of the control surfaces even more important.

51-40.3 Inspection

The following measurements are taken to ensure conductivity of the ground

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Reference point	System	Max allowed resistance in milli ohm
Starter-Battery ground terminal (-)	Firewall	100
Starter-Battery ground terminal (-)	Landing gear tunnel	1000
Starter-Battery ground terminal (-)	Door Handle	2000
Starter-Battery ground terminal (-)	Exhaust	100
Starter-Battery ground terminal (-)	Control stick	500
Starter-Battery ground terminal (-)	Rudder pedals	500
Starter-Battery ground terminal (-)	Instrument panel	500
Starter-Battery ground terminal (-)	Any antenna	2000
Aileron (L and R)	Landing gear tunnel	1000
Flap (L and R)	Landing gear tunnel	1000
Fuel filler cap (ring) (L and R)	Exhaust	1000
Fuel filler cap (ring) (L and R)	MLG axle	1000
Fuel filler cap (ring) left	Fuel filler cap (ring) right	2000
Starter-Battery ground terminal (-)	Elevator	1000
Starter-Battery ground terminal (-)	Position lights	1000
Pitot tube	Landing gear tunnel	1000

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SECTION 51-70 – REPAIRS

51-70.1 General

This section provides a description of damage classes and types and presents an overview of applicable damage investigation techniques.

When further information is needed, please contact the aircraft manufacturer for further instructions.

51-70.2 Structural Repair Criteria

Although this section outlines repair permissible on structure of the aircraft, the decision of whether to repair or replace a major unit of structure will be influenced by such factors as time and labor available, and by a comparison of labor costs with the price of replacement assemblies. Past experience indicates that replacement, in many cases, is less costly than major repair. Certainly, when the aircraft must be restored to its airworthy condition in a limited length of time, replacement is preferable. Restoration of a damaged aircraft to its original design strength, shape, and alignment involves careful evaluation of the damage, followed by exacting workmanship in performing the repairs. This section suggests the extent of structural repair practicable on the aircraft, and supplements Federal Aviation Regulation, Part 43. Consult the factory when in doubt about a repair not specifically mentioned here.

51-70.2.1 *General Consideration for Composite Repair*

All major and structural components of the aircraft are carbon-fiber or glass-fiber construction. We strongly recommend the replacement of components when structural damage is detected or return to factory for repair. Repair to non-structural components may be accomplished using factory specified materials. Observe the resin manufacturer's recommendations concerning mixing and application of the resin. Epoxy resin is mandatory for making repairs, since epoxy compounds are usually more stable and predictable than polyester and, in addition, give better adhesion.

51-70.2.2 *Methods to classify damages*

Following inspection methods are recommended to detect and classify damages at your plane.

Damage	Inspection Method
Scratches	Visual Inspection
Bump, Blowhole, Pressure Points	Visual Inspection
Loose Bondings	Tap Test
Delamination	Tap Test, Visual Inspection
Cracks	Visual Inspection
Deformation	Visual Inspection
Erosion	Measurement

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Keep following questions in mind when classifying the damage.

- Any noticeable changes of the geometry of the plane or parts of it?
- Rudder, flaps difficult to move?
- Laminate smooth or bumps in laminate?
- Are there any delaminated areas?
- Are there any bumps or cracks in the topcoat?
- Is the composite structure cracked or broken through?
- Are there any stress whitening?

51-70.2.3 Category of Damage

Following inspection methods are recommended to detect and classify damages at your plane.

After classifying the damage it is necessary to put your damage into one of the three categories of damage. After that you can read if you are allowed to repair your plane by your own or not.

Class 1:

- Widely damaged areas that need to be repaired
- Cracks and holes in primary structure that are longer than 20 cm - 8"
- All damages at flaps, aileron, elevator, and rudder

Class 2:

- Cracks and holes in primary structure that are not longer than 20 cm – 8"
- Cracks and holes in secondary structure
- It is not allowed that these damages are detected at primary flight controls, such as flaps, aileron, elevator or rudder

Class 3:

- Small cracks or scratches at the outer GRP-skin of the plane
- Small cracks and scratches that are detected in the topcoat

definition of primary structure

- Fuselage structure aft and inclusive of firewall
- Spars of wing and horizontal tail
- Skin of wing and empennage
- Main landing gear
- Control surfaces

definition of secondary structure

- Wingtips with winglets, tips of empennage
- Fairings, cowlings, doors, access hatches
- Tailskid
- Any other structural part not defined as primary structure

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	<i>A&P Mechanic</i>	<i>LSA Repairman</i>	<i>Owner/Operator with Sport Pilot certification</i>	<i>Part 145 Repair Station</i>	<i>Service Center</i>
<i>Class 1</i>	Individual Repair Instruction needed	Individual Repair Instruction needed	NOT allowed to repair	Individual Repair Instruction needed	Individual Repair Instruction needed
<i>Class 2</i>	Allowed to repair	Allowed to repair	Allowed to repair	Allowed to repair	Allowed to repair
<i>Class 3</i>	Allowed to repair	Allowed to repair	Allowed to repair	Allowed to repair	Allowed to repair

For any class 1 damage an individual repair instruction and repair approval issued by the company is required. This is defined in the regulations. The company always takes care of its customers and will provide support, documentation and re-certification of the aircraft.

- **Note:** Please keep in mind that without a written repair approval issued by the manufacturer, the aircraft is considered not in compliance with the applicable regulations and may be subject to regulatory action by FAA. Therefore, the aircraft may not be operated after an unauthorized repair. This is defined in the regulations.

51-70.2.4 Category of Damage

Applicable repair methods are written down in the AC 43.13-1B, Rotax Maintenance Manual (latest Issue) and the General Repair Instruction starting at 17.2 in this section.

51-70.3 General Repair Instruction

51-70.3.1 Labor

Laminating of components is only permitted when the person is introduced in working procedures and firm with all tools. Follow all safety instructions to tools and materials. Everybody working with tools or materials has to maintain the safety measures.

51-70.3.2 Personnel

The following repair procedure may be conducted by following personnel:

- A&P mechanic
- LSA Repairman
- Part 145 Repair Station
- Service Center

51-70.3.3 Tools and Work Clothes

All tools and work clothes that are necessary for repairing need to be free of oil and grease. The vessels, equipment and tools used for the resin and hardener must be clean. The tools and equipment used to handle release agent must be kept separate from the tools and equipment used for the resin and hardener. The risk of contamination can be

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reduced by covering the resin, hardener and mixtures, Tools should be cleaned after work is done.

51-70.3.4 Working Conditions Resin/Hardener

Temperature – The optimal temperature is 20-35°C. Raising the temperature by 10°C halves the pot life and doubles the reactivity.

Important: Larger quantities should not be mixed at higher processing temperatures, above all with highly reactive systems (short pot life less than forty minutes). The mixing vessels exhibits very low heat dissipation, so its contents are very quickly heated by the reaction. This can give rise to temperatures in excess of 200 at which the resin compound burns up emitting a great quantity of smoke. This also affects large volume casts of highly reactive systems.

Air humidity – The relative air humidity during processing should not exceed 70%.

51-70.3.5 Processing of Composites

Attention! It is necessary that all components are free of:

- Fat and Grease
- Release Agent
- Dust
- Liquids
- Silicone. It is very important to protect all surfaces for gluing from silicone!

51-70.3.6 Scarf Joints and Laps

Scarf joints and laps transmit tensile- and shear forces through different laminate plies. Scarf joints are made by abrading transitions of laminate plies. Avoid concentrations of multi-layer parts. In case of damage, it is necessary to maintain a mounting rate of 1:30 for glass fibers and 1:80 for carbon fibers.

51-70.3.7 Gluing of Composite Parts

For a good connection between two or more composite parts, following prearrangements are necessary:

- Rough gluing surface with sand paper (grit 80-100)
- **Note:** Gluing surface is ready if there are no shiny spots to see.
- **Caution:** Front sides and edges must be grinded very careful. Often there is some more paint or a lack of release agent. Bad grinded edges can crack, or they do not connect with resin.
- After preparation of the gluing surface, it is necessary to protect the surface from all the things listed in 1.4 "Processing of Composites".
- Spread gluing surface with normal mixture of resin/hardener before working with mixture of cotton flocks/resin
- Set position of parts by devices that were build before
- Check position of glued parts by devices

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- Remove overrun of resin/cotton flocks mixture accurate

Check adhesion for air inclusions. Rework the adhesion in case of air locks.

51-70.3.8 Gluing of Metal Parts

The surface of metal parts must be rough for gluing. Sand blast or grind (sand paper grit 100-120) the surface that is needed for gluing. Clean the surface with acetone afterwards. Now it is allowed to spread the metal with resin.

It is wise to connect metal part and parts of the plane with a mixture of resin and cotton flocks. Cotton flocks mixed with resin enhance the tensile, compressive, and flexural strengths as well as the fracture behavior.

51-70.3.9 Materials

This manual describes material defined by the manufacturer. However, equivalent material may be used.

51-70.3.9.1 Resin/Hardener

All structure parts are made of resin and hardener. Use an aircraft-grade epoxy system suitable for laminating. For simple gluing tasks, you may either use a high quality composite glue or epoxy thickened with cotton flocks. Best experience has been made with following materials.

resin L20 and hardener EPH 573

This resin/hardener system is specially made for hand lay-ups and has a short pot time of just 15 min. Resin L20 and hardener EPH 573 are cold curing, that means that no annealing on higher temperatures is needed. Curing time is min. 24h at 23°C (73°F). Post curing at 60...70°C (140...160°F) for 15h is optional. Mixing ratio is 100 : 23 by weight of resin to hardener or 100 : 25 by volume of resin to hardener. Compressive strength is 125MPa (18,000psi), tensile strength is min. 70MPa (10,000psi), Young's Modulus is 3,500MPa (500,000psi).

resin L20 and hardener EPH 161

This combination has a longer pot time than the system named above (app. 90min). It is a cold curing system that does not need to be annealed. Curing time is min. 24h at 23°C (73°F). Post curing at 60...70°C (140...160°F) for 15h is optional. Mixing ratio is 100 : 25 by weight of resin to hardener or 100 : 29 by volume of resin to hardener. Compressive strength is 125MPa (18,000psi), tensile strength is min. 70MPa (10,000psi), Young's Modulus is 3,500MPa (500,000psi).

resin L285 and hardener 285 (aka MGS epoxy L285)

This resin/hardener system has a pot time of app. 50min. Resin L285 and hardener 285 are cold curing, that means that no annealing on higher temperatures is needed. Curing time is min. 24h at 23°C (73°F). Post curing at

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60...70°C (140...160°F) for 15h is optional. Mixing ratio is 100 : 40 by weight of resin to hardener or 100 : 50 by volume of resin to hardener. Minimum compressive strength is 125MPa (18,000psi), tensile strength is min. 70MPa (10,000psi), Young's Modulus is 3,500MPa (500,000psi).

resin L385 and hardener 385

This resin/hardener system has a pot time of app. 85min. Resin L385 and hardener 385 are cold curing, that means that no annealing on higher temperatures is needed. Curing time is min. 24h at 23°C (73°F). Post curing at 60...70°C (140...160°F) for 15h is optional. Mixing ratio is 100 : 35 by weight of resin to hardener or 100 : 43 by volume of resin to hardener. Minimum compressive strength is 125MPa (18,000psi), tensile strength is min. 70MPa (10,000psi), Young's Modulus is 3,500MPa (500,000psi).

It is permitted to use equivalent epoxy systems. Refer to the processing information, safety data sheet and technical data sheet to get further information about the resin/hardener system. It is mandatory to follow the mixing ratios, annealing temperatures and safety information given in these data sheets.

The resin/hardener systems are toxic. Handle with care. Please avoid direct contact to your skin (latex gloves) and protect your eyes. Have a closer look at the safety data sheet of this product for more information.

The resin/hardener mixture must be very exact. Mismatching mixing ratio leads to a lower mechanical strength and an imperfect curing. Smallest-scale quantities should therefore be dosed according to volume with disposable injectors. At the same time, it is important to note that parts by weight are not the same as parts by volume, because the constituents exhibit different specific gravities (resins about 1.1 g/cm³, hardeners about 1.0 g/cm³).

The resin and hardener must be mixed with care. The service life (pot life, processing time) of the mixture is defined by the initial quantity (the larger, the faster) and by its history of experienced temperature effects. Larger quantities have an effect. The effects of their exothermal reaction (reaction heat) serve to reduce the open time. They should be transferred to flat dishes to prevent heat accumulation. They must be processed quickly. Small quantities under 100 g have an extended pot life. If the temperature in the mixing vessel should rise noticeably and exceed 40 °C, then the mixture may no longer be used for high-quality laminates. Unvarying quality in the manufacture of laminates can then no longer be guaranteed. Flat mixing vessels with smooth walls and base should be used. Ideal are PE mixing cups. For industrial hygiene reasons, the professional association of chemical workers recommends disposable receptacles. Adherent residue of completely cured resin is environmentally neutral and its disposal is permitted in solid domestic or commercial waste. In principle, reusable plastic receptacles (e.g. of PE) can also be used.

51-70.3.9.2 Reinforcing Fiber

Glass Fiber

- Glass fabric 163 g/m², Interglas-Number: 92110, Twill weave
- Glass fabric 220 g/m², Interglas-Number: 92145, Unidirectional

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- Glass fabric 280 g/m², Interglas-Number: 92125, Twill weave

Carbon Fiber

- Carbon fabric 200 g/m², KDK 8042 or Interglas 98141, Twill weave

51-70.3.9.3 Aggregates

The fillers named below enhance the impact and compressive strength, but not the tensile strength. Owing to their ball-bearing effect they improve the flowability of resins when added in low quantities.

- Micro-Airballons
- Cotton flocks
- Spherical fillers
- Micro-Airballons

The fillers named below enhance the tensile, compressive, and flexural strengths as well as the fracture behavior. The weight of filled resin compounds is increased, the flowability reduced.

- Fibrous fillers
- Cotton flocks

51-70.3.10 Top Coat

The standard top coat used is STANDOX STANDOFLEET, color code: RAL 9003, color name: signal white. Contact manufacturer for more information about the Top Coat. Other manufacturers or brands may be used. Take care for the proper color RAL9003.

Grind the surface with sand paper (grit 320-400) Clean the surface before you start painting the repairing. Keep surface clean of silicone, dust etc. Grind surface with sand paper (grit 320-400). Everything is well grinded if the underground is matt. A higher grid raises stress concentration and the Top Coat will crack.

51-70.3.11 Laminate Plan

In case of damage, it is necessary to maintain a mounting rate of 1:30 for glass fibers and 1:80 for carbon fibers. Therefore, it is practicable to know the quantity, type and adjustment of all plies to repair.

Refer to the applicable laminate plan. All parts to be repaired should get their full strength afterwards. Quantity, fabrics, type of fabric and adjustment need to be concordant to the original part of the plane.

51-70.3.12 Typical Cases of Repair

51-70.3.12.1 Superficial cracks

Before a repair is started it must be ensured that there is a damage in the material. In a lot of cases a crack appears necessary to be repaired but in most cases it is not. This case happens if cracks are just superficial in the paint, in the filler, priming material or spackling paste. In this case start sanding into the crack and find out, if and where there is a

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damage. See the two pictures below for examples of cracks where there is no structural damage but only superficial cracks – optical damage only:



superficial crack in elevator leading edge



superficial crack in paintwork

51-70.3.12.2 *Uncontinuous Hole or Crack in Laminate*

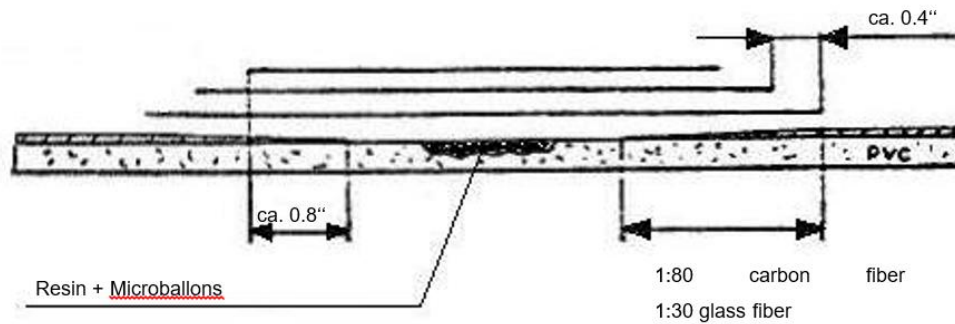
We recommend following repair method for damages in outer parts of laminate, where the sandwich construction is not damaged:

- Grind the crack manually with dry sand paper (grit 60-80) or an angle grinder. Work feeling and circular till Top Coat is removed. It is necessary to remove Top Coat about 1.2” around the crack.

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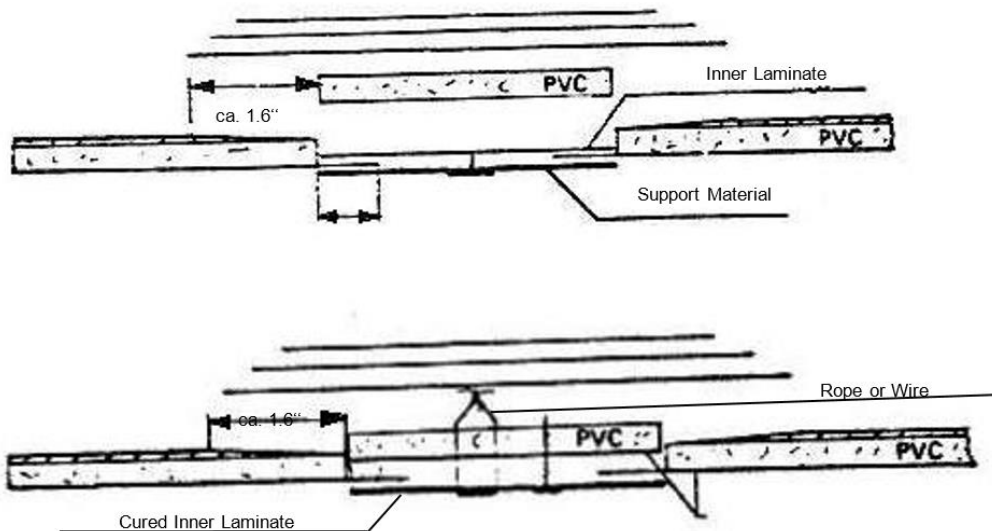
- Cut off the core material down to the inner laminate to ensure that the inner laminate is not harmed. Cut the core material circular. (If there is no core material, just start preparing a scarf joint)
- Take a piece of support material. Trim the support material a bit smaller than the original. (Up to 0.4" smaller) Clean the surface of the repairing. Now use a resin/Microballons/cotton flocks mixture to glue the support material into the repairing. Fulfill the gaps with some mixture of resin/Microballons/cotton flocks. Wait till the resin hardened.
- Grind transitions again.
- Refer to the laminate plan, cut some plies of carbon or glass for your repairing. Mind the type and adjustment of all plies needed. Cut the plies from big to small. That means that the last ply is smaller than the first ply.
- Spread the repairing with some resin. Take the first ply of carbon or glass (biggest ply first) and put it on the repairing. Attention: Regard adjustment and type of fabric.
- Use resin and impregnate the fabric carefully. Be particularly careful with carbon fabrics. It is very difficult to see an impregnation. Glass fabrics are well impregnated if there are no more white spots.
- If it is impossible to impregnate parts of fabrics, it could be that the fabric got wet. The fabric is no longer useful.
- Do not change the adjustment of the fabric while impregnating.
- Put on other fabrics. Refer to the adjustment and impregnate the fabrics.
- Normally it is not necessary to impregnate the last ply. It should be possible to impregnate the last ply only by dabbing with a laminating brush. The ply takes the resin overrun and so the fiber volume fraction is enhanced. The higher the fiber volume fraction, the higher the solidity.
- Put one peel ply fabric over the repairing, to secure the resin from dust, silicone etc. Fix the position of the repairing with some stress belts, or some weights. Wait until the structure is well cured.
- Take off the peel ply fabric when everything is well cured. (Well cured when outer fibers break off brittle)
- If necessary, grind transitions with sandpaper (grit 180) as long as needed to get a good surface.
- The grinded surface must be a bit deeper than the Top Coat. It could be helpful to proof it with the help of a steel rule.
- Prime and finish if necessary.

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51-70.3.12.3 Continuous Hole in Sandwich Construction

- If there are any damages trough the whole sandwich-construction, it is recommendable to rebuild the inner laminate first.
- Cut off the outer laminate and the support material on a length of about 1.2" around the damaged area. Now there should be a 1.2" area of intact inner laminate around the damaged area.
- Rebuild the inner laminate on a plate or form. It is important that the reconstructed laminate has the same form as the original part. Remind the type, adjustment, and quantity of fabrics. If the reconstructed part cured well, it can be glued with a mixture of resin/cotton flocks.
- Glue the support material with a mixture of resin/microballons. Fill the gaps with a mixture of resin/microballons and spread the support material with some resin
- Prepare a scarf joint referring to the part 2.1

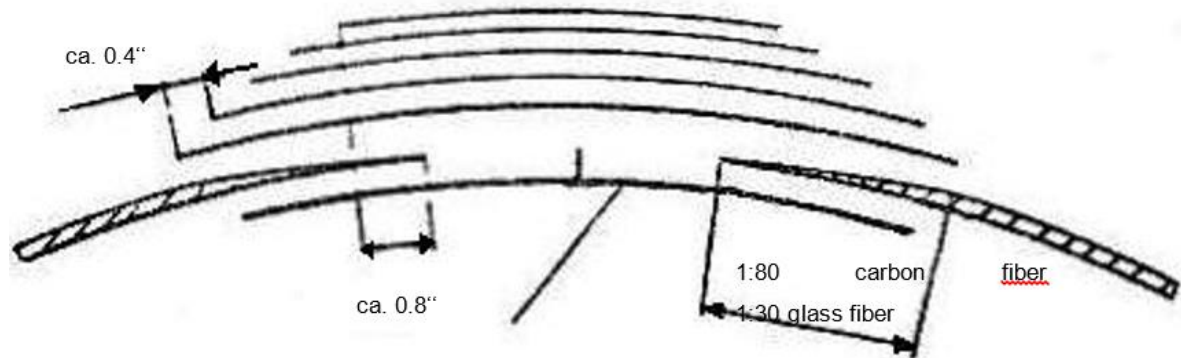


51-70.3.12.3 Damages in Solid Laminate

- Cracks, breaks etc. in solid laminate shall be grinded with sand paper (grit 60-80) first.
- Prepare a scarf joint. Refer to the mounting rates (glass 1:30; carbon 1:80).

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- Do not remove too much damaged laminate. The impregnated fabrics need some underground to keep their form.
- Bigger holes must be prepared with a cured part of laminate. The laminate must have the right size and form. This part is glued at the inside with a mixture of resin/cotton flocks (have a look at the picture). After curing, it is the same procedure as written down in the part “Uncontinuous hole or crack in laminate”.



51-70.3.12.4 Cracks in Connections and Bondings between Laminate Plies

- Cracks parallel to plies can be fixed with resin injections by syringes.
- Another method is filling the crack with a resin/cotton flock mixture. (If the cracks are bigger)
- It is possible to take and glue a fabric stripe over the repairing for strengthening. When everything cured well, start grinding the repairing.

51-70.3.12.5 Loose or worn Bushings

Bushings may get worn with time and even might become loose in the laminate. This might affect the following bushings (for example, this section is not limited to these examples but is valid for all bushings): main landing gear attachment, horizontal tail attachment, lower rudder hinge, etc. Follow these instructions:

- Disassemble the aircraft component affected from the aircraft
- Get the old bushes out of the laminate. Review the condition of the bushings thoroughly and judge if they can be used again or if they need to be replaced by new ones.
- The surface of the bushings must be rough for gluing. Sand blast or grind (sand paper grit 100-120) the surface of the bushings. Clean the surface with acetone afterwards.
- In case the laminate is worn so much, that the bushings cannot be inserted anymore (e.g. the hole is bigger than the collar of the bushing), rebuild the laminate. The original wall thickness shall be achieved. Rule: one layer of 200g/m² carbon cloth has a thickness of 0.25mm. Once the new laminate is cured, drill new holes for the bushings.

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- For installation of the bushings prepare a mixture of resin and cotton flocks. Apply this mixture on the bushings and insert them into their installation holes.
- Fix and adjust the position of the bushings with the help of the component related with the bushing. Make sure that there is no resin inside the bushes. Clean overrun of resin.
- Let everything cure well.
- Prime and finish if necessary.

51-70.3.13 *Finishing*

- If everything is cured well, start grinding the repairing. Start with grit 180-220. If there are any unwished holes or smaller roughness, it is recommendable to use some filler. Try to rebuild the structure with filler, if it is necessary.
- Prepare the surface for finishing by grinding an area of about 12" around the repairing. Work with a grit of 400 or higher. Lower grits enhance the possibility of cracks in the new finish. The surface is well prepared if everything looks matt.
- The middle of the repairing must be a bit lower than the edge of the original finish. In fact it has to look like a mounting.
- After grinding the surface, everything must be cleaned with silicone remover.
- Mask everything around the matt edge so that it is impossible to paint something else than the repairing.
- Try to paint more finish in the middle of the repairing. Try to paint less finish at the edge.
- Depending on the size of the repairing, it is functional to work from the inside to the outside.
- Clean the spray gun with acetone after painting.
- The finish needs about two days to cure.

IF NECESSARY ONLY:

If the painting is not satisfying it is recommendable to grind the surface with a fine grit.

- Start grinding with grit 600 or 800 (depending on grade of roughness) and refine the finish with grit 1000 or 1200. After finishing the surface, there should be no more edges or transitions.
- If there are concave areas to grind, a piece of plastic could be a good sanding block.
- Remove the dust after grinding, and clean the surface.
- A satisfying finish needs at least a polish.

51-70.4 Firewall

A completely sealed firewall separates the engine compartment from the rest of the aircraft. The firewall is an integral part of the fuselage monocoque structure and cannot be

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replaced separately. Sealing is realised by a coating of Chartek® 7 by Akzo Nobel. Chartek® 7 is a high-performance intumescence fire protection cover on an epoxy basis.

In case of a structural or thermal damage, coating must be re-established. A minimum thickness of 4mm must be achieved.

51-70.5 Engine Mount

The mount for the aircraft engine is made of chrome-molybdenum steel tubing, attached to the firewall at four points. Attachment to the firewall is done by rubber shock mounts. The shock mounts are exchangeable, though this does not need to be done during standard maintenance.

Preferably the engine mount should not be repaired, but exchanged. In case the engine mount needs to be repaired, all welding on the engine mount must be of the highest quality since the tendency of vibration is to accentuate any minor defect present and cause fatigue cracks. Engine mount members are preferably repaired by using a larger diameter replacement tube, telescoped over the stub of the original member using fish mouth and rosette type welds. However, reinforced 30- degree scarf welds in place of the fish mouth welds are considered satisfactory for engine mount repair work.

Rubber shock mounts cannot be repaired and must be exchanged.

51-70.6 Masses and Residuum Moments of Control Surfaces

After bigger repairs at all control surfaces (both ailerons, rudder and the elevator), it is necessary to balance.

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CHAPTER 52 – DOORS

Contents

52-00.1	General
52-00.2	Description
52-00.3	Maintenance Practices
52-00.3.1	Door Check

52-00.1 General

The doors are made of composite material and are considered a structural components of the aircraft.

52-00.2 Description

The door is hinged at the top and open like gull wing-door. A gas spring is installed that assists opening and holds the door at the open position. The doors are secured for flight with three pins into holes in the door jam area. The locking device is operated with a lever at the door (Fig. 52-00-1). The lever is located close to the occupant's hand and has good accessibility to operate. The door's design provides a good ability for occupants to conduct an emergency escape.



Fig. 52-00-1

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<i>Fig.</i>	<i>Item</i>	<i>Part Name</i>	<i>Torque</i>	<i>Reference</i>
52-00-2	1	Door		
	2	Gas spring		
	3	Hinge		
	4	Door seal		
	5	Latching mechanism		

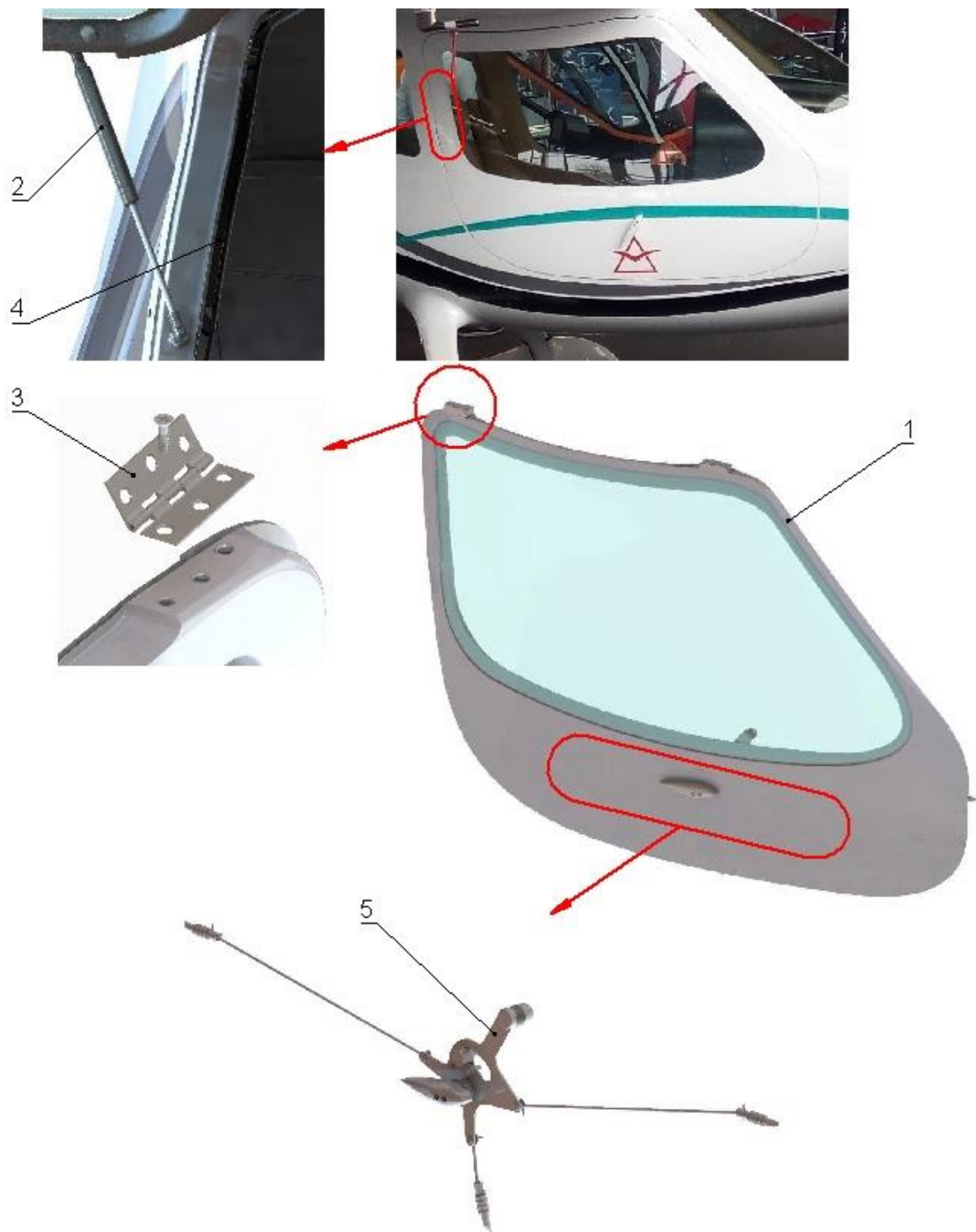


Fig. 52-00-2

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52-00.3 Maintenance Practices

52-00.3.1 Door Check

52-00.3.1.1 Type of Maintenance

Line

52-00.3.1.2 Minimum Level of Certification


Pilot/Owner

52-00.3.1.3 Procedure

A. Recommended Special Tools and Parts

<i>Item</i>	<i>Quantity</i>	<i>Unit</i>
None		

B. Door Check

<i>Step</i>	<i>Action</i>	<i>Reference</i>
1	Check for smooth operation and fit. Inspect the skin, hinges, gas struts, latching	
2	Check condition of the latching mechanism covers (Fig. 52-00-3)  Fig. 52-00-3	
3	Check door structure for cracks and other damage	
4	Lubricate hinges and all moving parts	

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CHAPTER 53 – FUSELAGE

Contents

- 53-00.1 General
- 53-00.2 Description
- 53-00.3 Maintenance Practices
 - 53-00.3.1 Fuselage Check

53-00.1 General

This chapter provides a description of the fuselage.

53-00.2 Description

The fuselage is built in a stressed skin design, supported by structural bulkheads.

The rear fuselage is stiffened with bulkheads as shown.

The vertical fin is designed as an integral part of the fuselage skin.

The fuselage is provided with windshield, door windows, and side windows. All windows are made from Plexiglas. The windows are not considered structural parts.

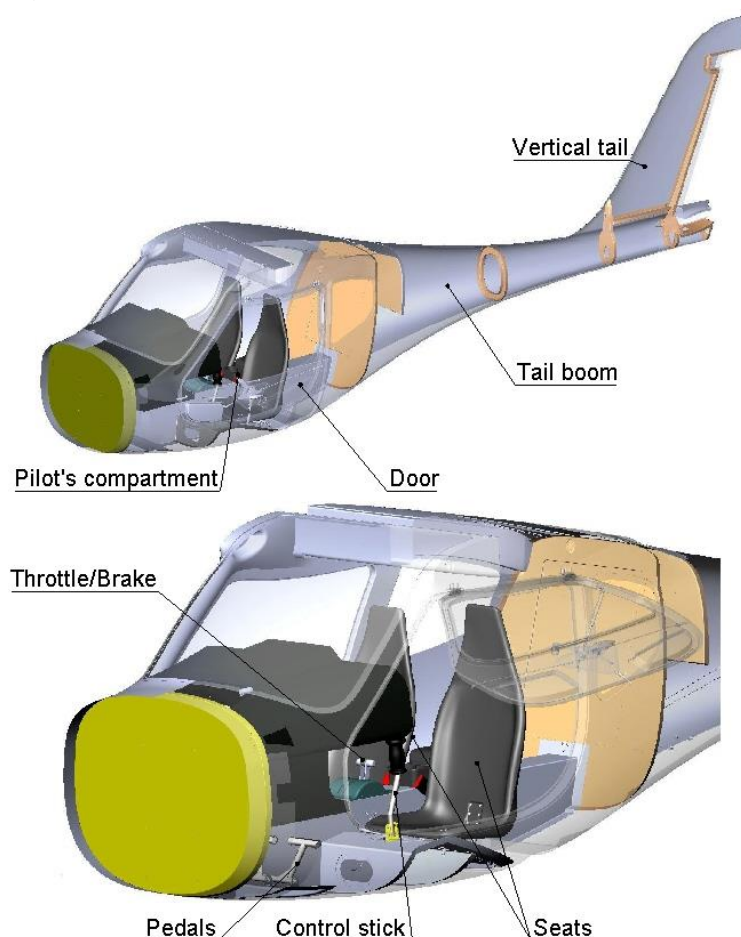


Fig. 53-00-1

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The structure of the fuselage is built using composite materials. Mostly sandwich structures are used due to the low weight and high strength capabilities. In some areas, monolithic lay-up is used without the of Honeycomb sandwich. The composite structure makes use of carbon, glass fibers materials with uni- and multidirectional fibers. The fuselage is designed primarily with Carbon fiber sandwich construction using Honeycomb. Fig. 53-00-2 illustrates the fundamental components of the fuselage and shows the usage of sandwich and monolithic materials in a generalized view.

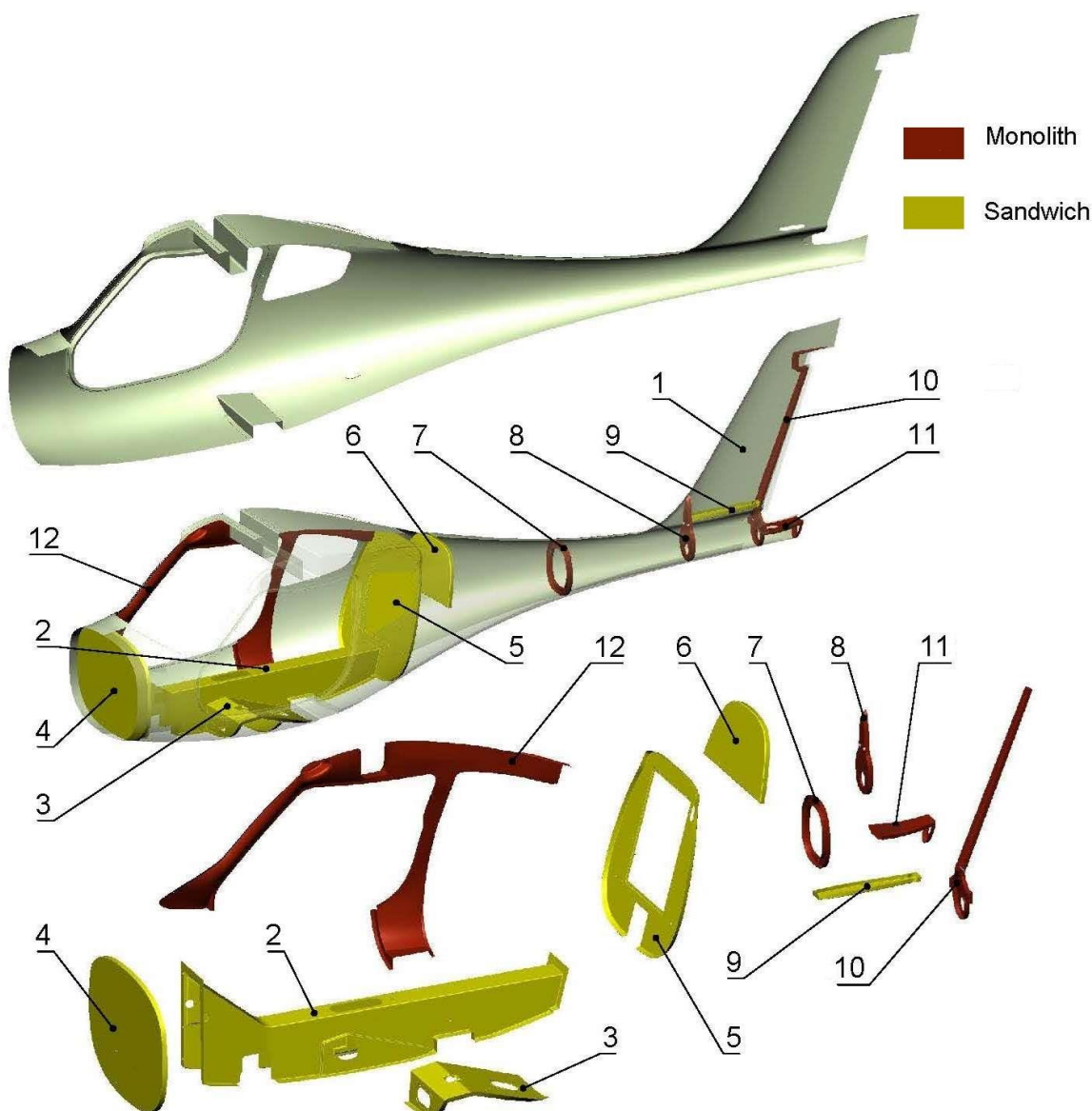


Fig. 53-00-2

Fig.	Item	Part Name	Item	Part Name
53-00-2	1	Fuselage skin	7	Frame 4
	2	Tunnel	8	Frame 5
	3	Pyramid	9	Transition Rib
	4	Frame 1	10	Frame 6
	5	Frame 2	11	Frame 7
	6	Frame 3	12	Interior Fuselage Plate

53-00.3 Maintenance Practices

53-00.3.1 Fuselage Check

53-00.3.1.1 Type of Maintenance

Line

53-00.3.1.2 Minimum Level of Certification

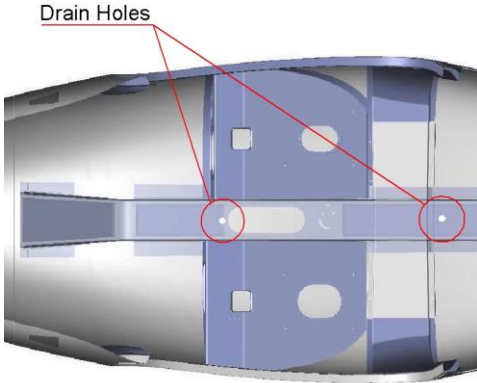
Pilot/Owner

53-00.3.1.3 Procedure

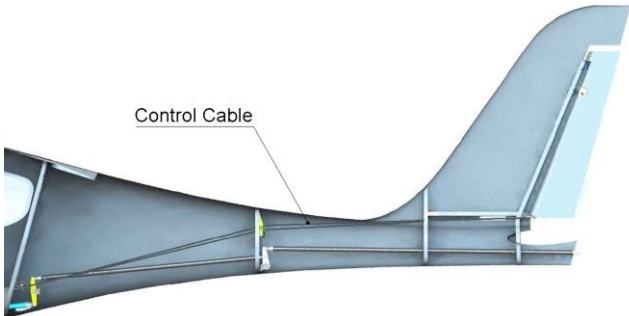
A. Recommended Special Tools and Parts

Item	Quantity	Unit
None		

B. Drain Holes Check

Step	Action	Reference
1	<p>Check the drain holes for obstructions (Fig. 53-00-3). Check the paint condition and cleanliness.</p>  <p>Fig. 53-00-3</p>	

C. Control Cable Guides Check

Step	Action	Reference
1	<p>Check the rudder control cable guides for delamination (Fig. 53-00-4)</p>  <p>Fig. 53-00-4</p>	

C. Troubleshooting

Step	Action	Reference
1	<p>In case if any abnormalities during check were found please contact Flight Design Customer Care (customercare@flightdesign.com) for further instructions.</p>	

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CHAPTER 55 – STABILIZERS

Contents

55-00.1	General
55-00.2	Description
SECTION 55-10 – STABILIZER	
55-10.1	General
55-10.2	Description
55-10.3	Maintenance Practices
55-10.3.1	Stabilizer Installation and Removal
55-10.3.2	Stabilizer Check
SECTION 55-20 – ELEVATOR	
55-20.1	General
55-20.2	Description
55-20.3	Maintenance Practices
55-20.3.1	Elevator Installation and Removal
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SECTION 55-30 – UNDERFIN	
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55-30.2	Description
55-30.3	Maintenance Practices
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SECTION 55-40 – RUDDER	
55-40.1	General
55-40.2	Description
55-40.3	Maintenance Practices
55-40.3.1	Rudder Installation and Removal
55-40.3.2	Rudder Check

55-00.1 General

This chapter provides a description of the stabilizers and control surfaces.

55-00.2 Description

The structure of the stabilizers units is built using composite materials. The composite structure makes use of carbon and glass uni- or multidirectional fibers material with and without foam core sandwich construction.

There are main components:

- vertical stabilizer
- horizontal stabilizer

The vertical stabilizer consists of fin as a part of the fuselage, rudder and ventral fin.

The horizontal stabilizer consists of static Stabilizer and moving Elevator.

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SECTION 55-10 – STABILIZER

55-10.1 General

This section provides a description of the Stabilizer.

55-10.2 Description

The Stabilizer consists of skins and inner structural components.

The skins are made of two halves designed using dry lay-up technology from prepreg fibers sandwich construction. In some areas, monolithic lay-up is used without the use of sandwich foam.

The inner components are designed using dry and wet lay-up technology for monolithic Carbon fiber structure.

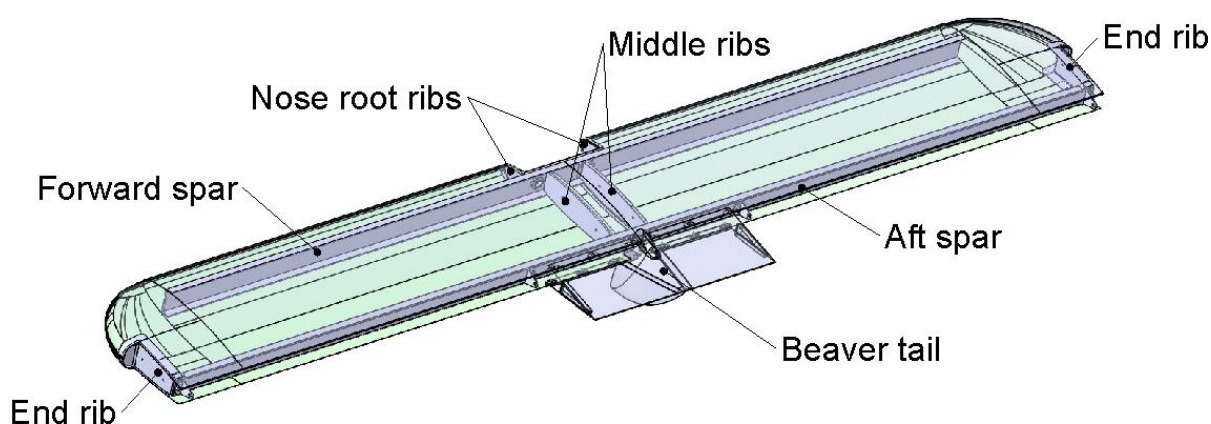


Fig. 55-10-1

The Stabilizer is attached to fuselage in two points - to frame 6 (by two stabilizer pins) and to frame 7 (by two AN5-7A bolts).

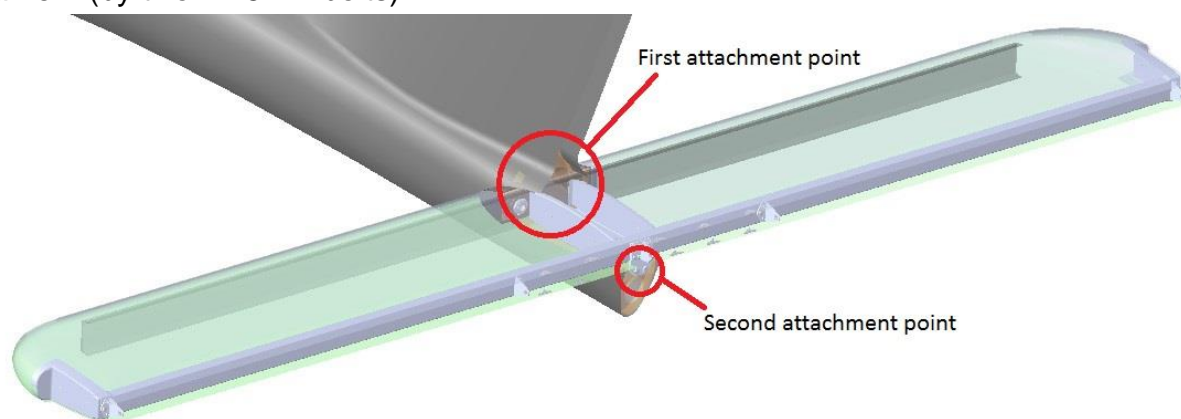


Fig. 55-10-2

First attachment point:

Stabilizer pins are installed into the forward spar with a pin nut. A pressed spherical bearing is installed with the bearing body into frame 6 (Fig. 55-10-3).

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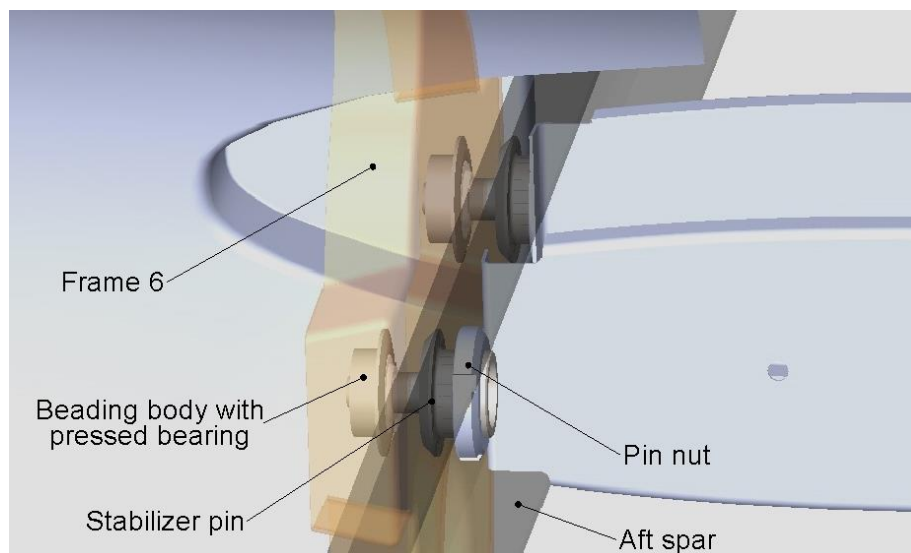


Fig. 55-10-3

Second attachment point:

The Stabilizer plate is attached to the frame 7 with two AN5-7A bolts, two AN365-5 locknuts and washers (Fig. 55-10-4).

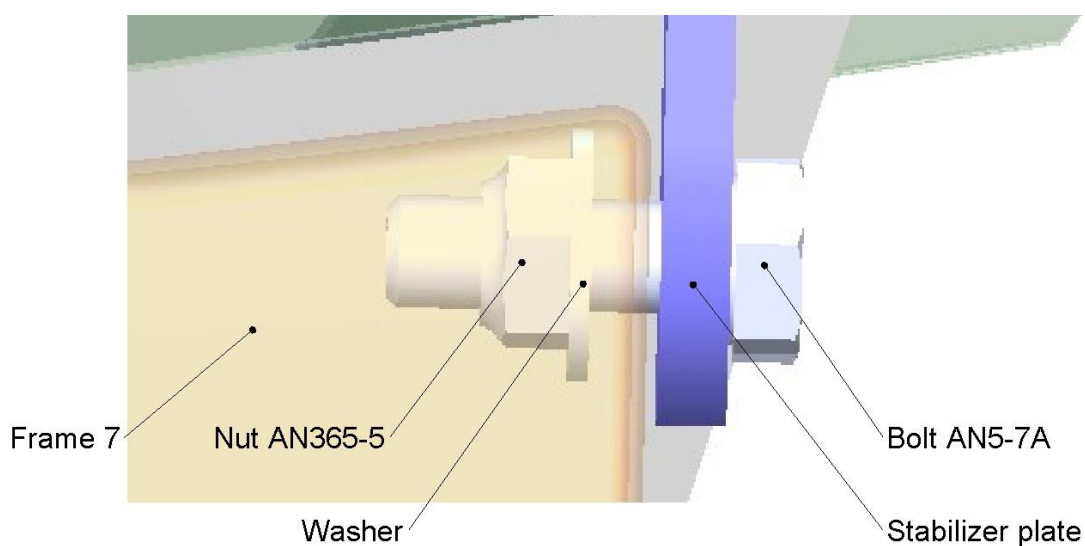


Fig. 55-10-4

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55-10.3 Maintenance Practices

55-10.3.1 Stabilizer Installation and Removal

55-10.3.1.1 Type of Maintenance

Line

55-10.3.1.2 Minimum Level of Certification

LSA- Mechanic (LSRM)

55-10.3.1.3 Procedure

To remove the stabilizer, you must first remove the Beaver tail fairing between the elevator halves. Unscrew mounting screws 1 and remove the Beaver tail fairing 2 (Fig. 55-10-5). Disconnect elevator control pivot (see the next section 55-20.3). To remove the stabilizer, remove locknuts AN365-5 from bolts AN5-7A, remove the stabilizer (Fig. 55-10-4).

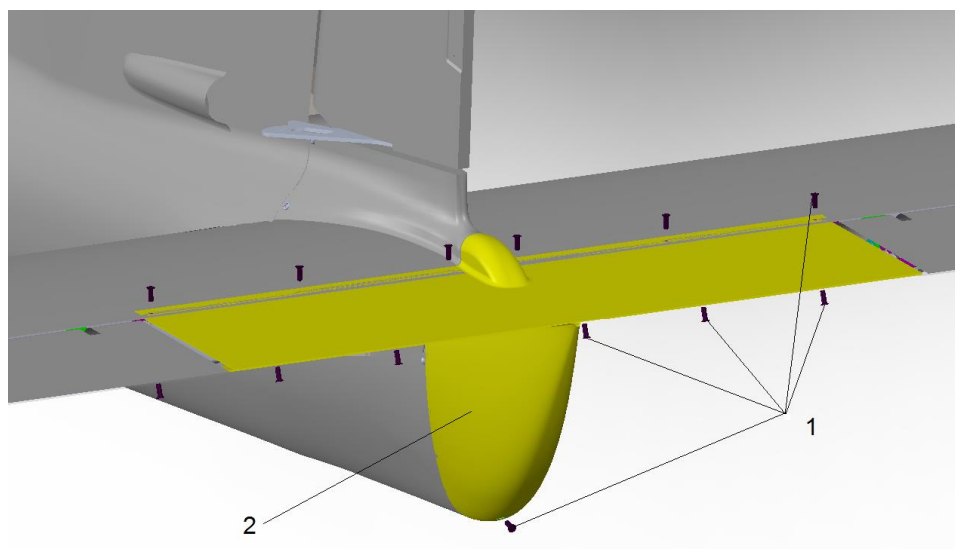


Fig. 55-10-5

Fig.	Item	Part Name	Torque
55-10-5	1	Screw M5	
	2	Beaver tail fairing	

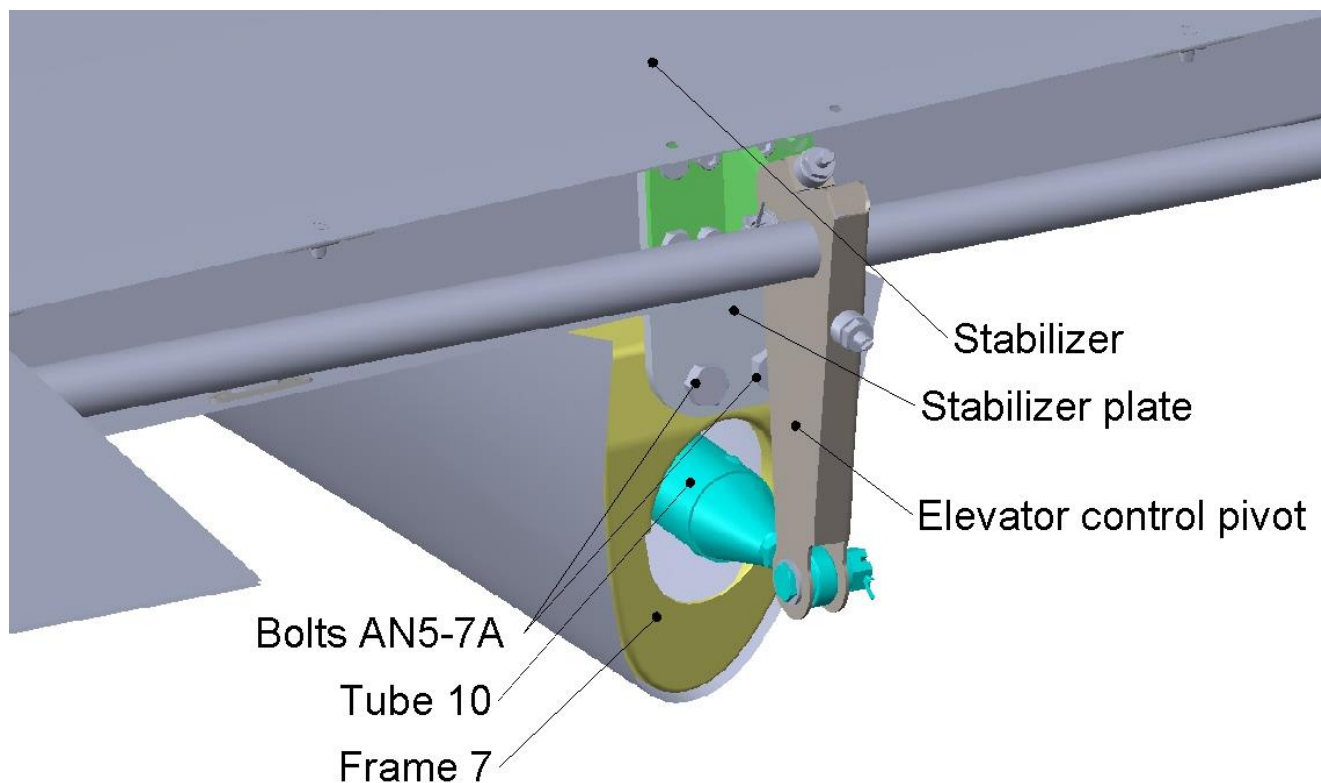


Fig. 55-10-6

55-10.3.1.3.1 Installation and Removal

A. Recommended Special Tools and Parts

Item	Quantity	Unit
None		

B. Installation

Step	Action	Reference
1	Install the stabilizer in the way that the stabilizer pins get into the bearings, installed into frame 6 (Fig.55-10-3)	
2	Install washer and two nuts AN365-5 using hole for in the frame 7 (Fig.55-10-4)	
3	Tight two bolts AN5-7A	
4	Install beaver tail section 2 between the elevator halves screwing mounting screws 1 (Fig. 55-10-5)	

C. Removal

Step	Action	Reference
1	Removal in reversed direction order of installation.	

55-10.3.2 Stabilizer Check

55-10.3.2.1 Type of Maintenance

Line

55-10.3.2.2 Minimum Level of Certification

LSA- Mechanic (LSRM)

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55-10.3.2.3 Procedure

A. Recommended Special Tools and Parts

<i>Item</i>	<i>Quantity</i>	<i>Unit</i>
None		

B. Checking of the Stabilizer

<i>Step</i>	<i>Action</i>	<i>Reference</i>
1	Shake the Stabilizer.	
2	Total play on Stabilizer at the tips must not exceed 5mm.	

C. Drain Holes Check

<i>Step</i>	<i>Action</i>	<i>Reference</i>
1	Check the drain holes provided on the lower surface of Stabilizer skin for blockage.	

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SECTION 55-20 – ELEVATOR

55-20.1 General

This section provides a description of the Elevator.

55-20.2 Description

The Elevator consists of two symmetrical parts connected by elevator control pivot. Each part consists of skins and inner structural components.

The skins are made of two halves designed as Carbon prepreg fibers sandwich construction. In some areas, monolithic lay-up is used without the application of sandwich foam. The inner components are monolithic Carbon fibers structure. The elevator is balanced with steel counterweights

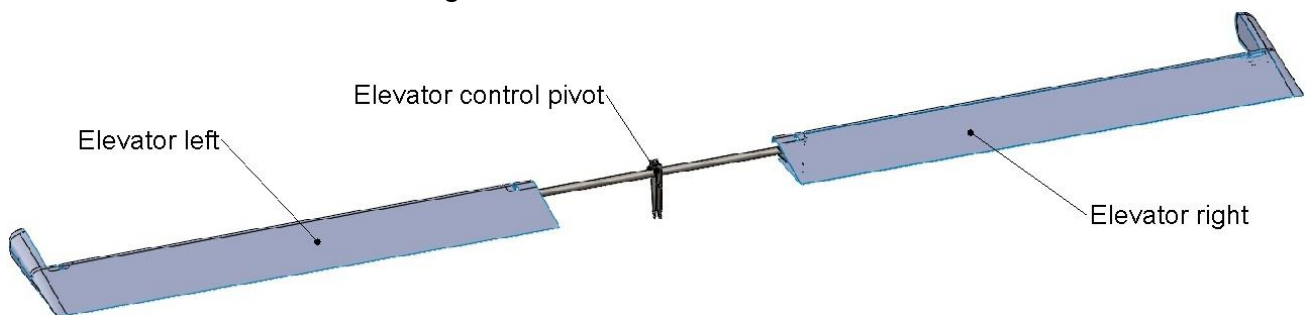


Fig. 55-20-1

Each elevator is attached to stabilizer by two elevator hinges (Fig. 55-20-2 and Fig 55-20-3). In the middle elevator attached to stabilizer by elevator control pivot (Fig. 55-20-2 and Fig. 55-20-2).

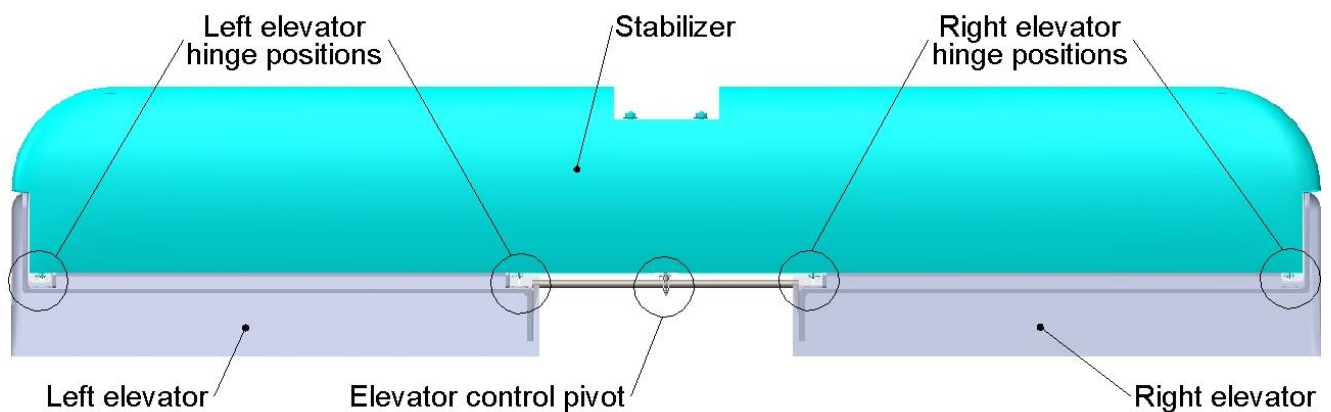


Fig. 55-20-2

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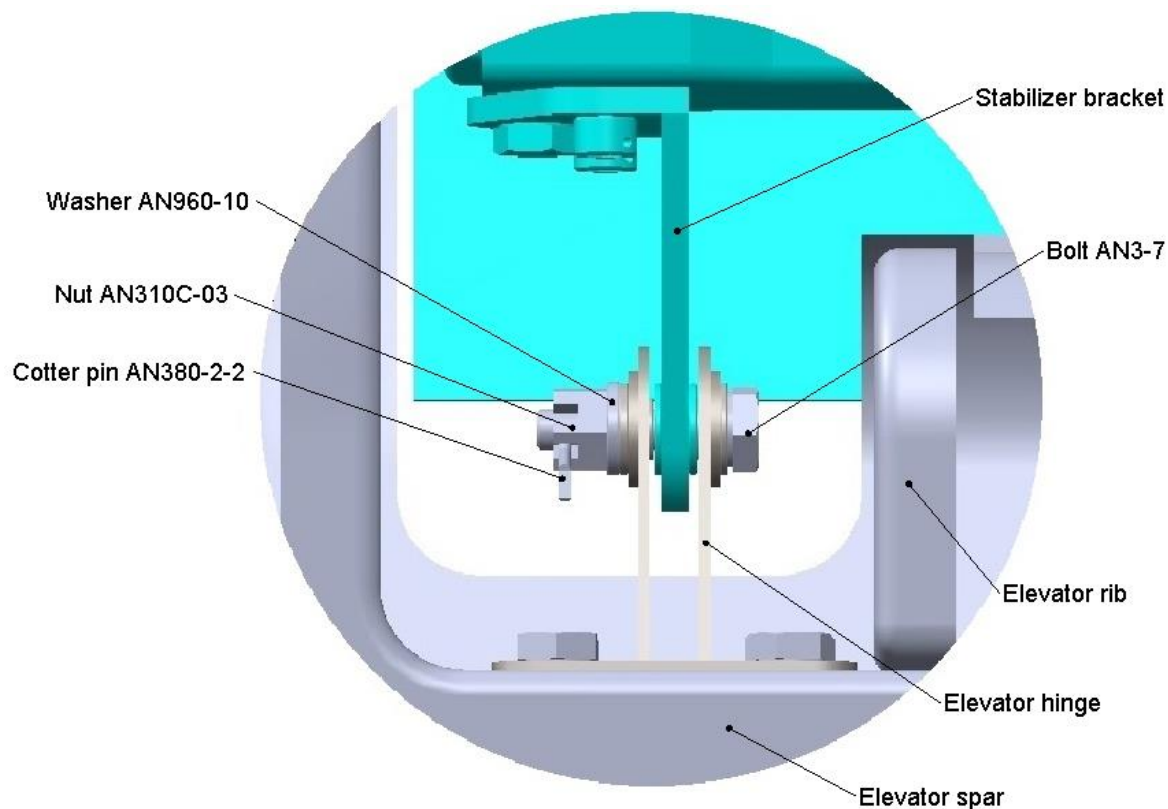


Fig. 55-20-3

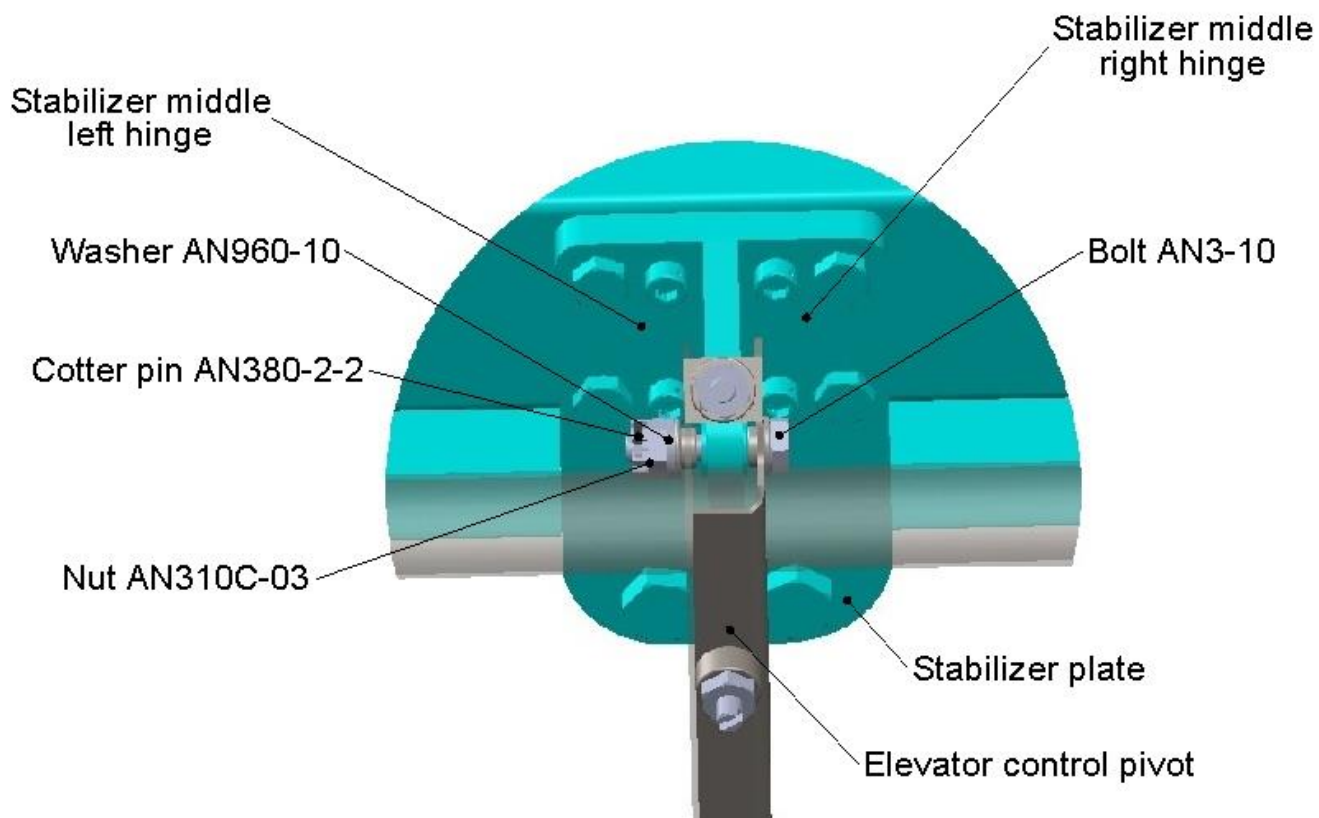


Fig. 55-20-4

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55-20.3 Maintenance Practices

55-20.3.1 Elevator Installation and Removal

55-20.3.1.1 Type of Maintenance

Line

55-20.3.1.2 Minimum Level of Certification

LSA- Mechanic (LSRM)

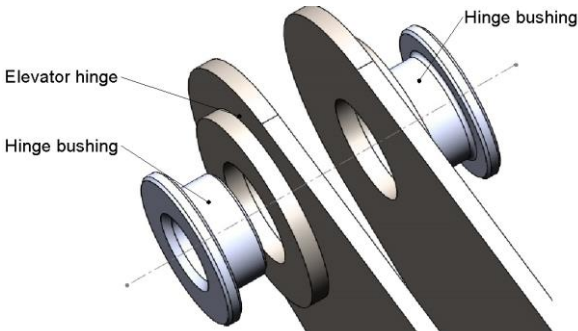
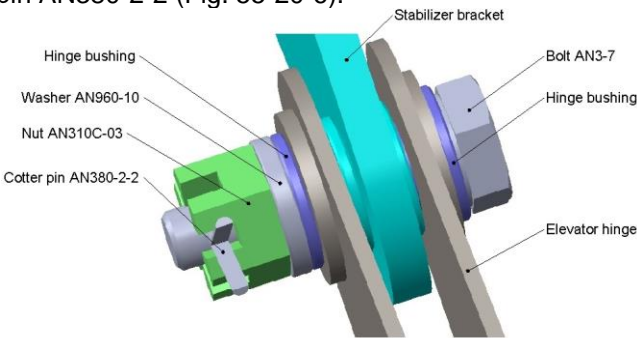
55-20.3.1.3 Procedure

55-20.3.1.3.1 Configuration with Manual Actuator of Trim

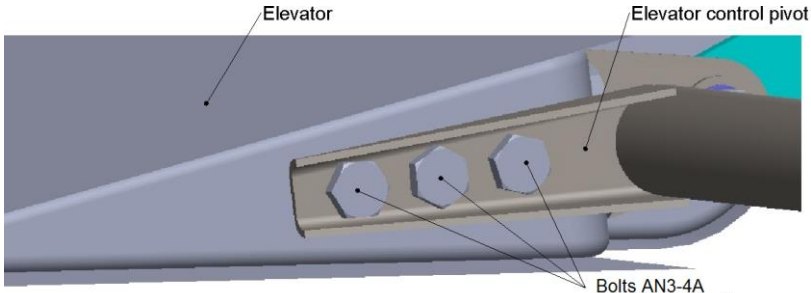
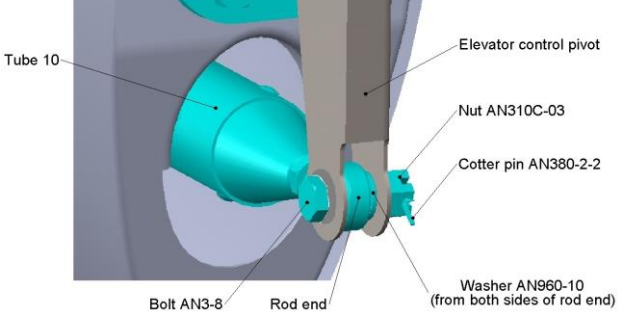
A. Recommended Special Tools and Parts

Item	Quantity	Unit
None		

B. Installation

Step	Action	Reference
1	<p>Press into elevator hinge two hinge bushings if they don't installed (Fig. 55-20-5).</p>  <p>Fig. 55-20-5</p>	
2	Attach each elevator to the stabilizer with bolts AN3-7 using elevator hinges and stabilizer brackets. Lubricate the rotating parts – the inner surface of hinge bushings and bolt surfaces (Fig. 55-20-6).	
3	Put washer AN960-10 under nut AN310C-03 (Fig. 55-20-6).	
4	Tighten the nut AN310C-03 (Fig. 55-20-6) allowing the bolt to spin but it is not loose. Do not overtighten the hinge bolts.	
5	<p>Install cotter pin AN380-2-2 (Fig. 55-20-6).</p>  <p>Fig. 55-20-6</p>	
6	Repeat steps 1-5 for 4 attachment points.	
7	Connect both elevators with elevator control pivot using bolts AN3-4A (Fig.55-	

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	20-7).	 <p>Fig. 55-20-7</p>	
8	Attach elevator control pivot to the stabilizer center left and right brackets. The installation procedure is the same as steps 1-5, but instead of AN3-7 bolts an AN3-10 bolts is used.		
9	Attach the elevator control pivot to the tube 10 (The elevator push rod) (Fig. 55-20-8).	 <p>Fig. 55-20-8</p>	

C. Removal

Step	Action	Reference
1	Removal in reversed direction order of installation.	

55-20.3.2 Elevator Check

55-20.3.2.1 Type of Maintenance

Line

55-20.3.2.2 Minimum Level of Certification

LSA- Mechanic (LSRM)

55-20.3.2.3 Procedure

A. Recommended Special Tools and Parts

Item	Quantity	Unit
None		

B. Check the Elevator for play.

Step	Action	Reference
1	Shake the Elevator.	
	Total play on Elevator trailing edge must not exceed 2mm.	

C. Drain Holes Check

Step	Action	Reference
1	Check the drain holes provided on the lower surface of elevators skins for blockage.	

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SECTION 55-30 – VENTRAL FIN

55-30.1 General

This section provides a description of Ventral fin.

55-30.2 Description

The ventral fin designed as Carbon fiber sandwich foam structure. The ventral fin is integral to the fuselage tail boom. Two bushings glued in the rear of the ventral fin structure are for tie-down (mooring), Fig. 55-30-1.

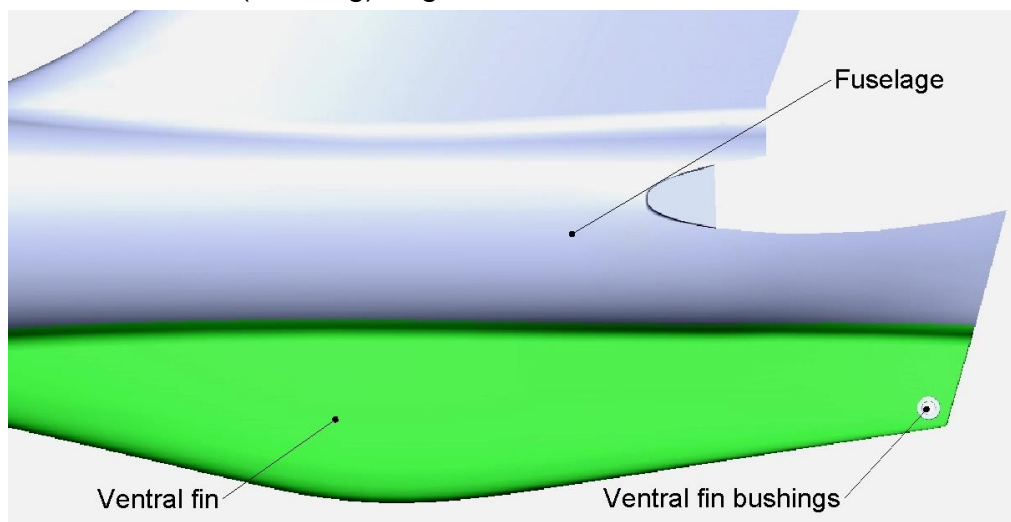


Fig. 55-30-1

55-30.3 Maintenance Practices

55-30.3.1 Ventral Fin Check

57-51.3.1.1 Type of Maintenance

Line

57-51.3.1.2 Minimum Level of Certification

Pilot/Owner

57-51.3.1.3 Procedure

A. Recommended Special Tools and Parts

Item	Quantity	Unit
None		

B. Drain Holes Inspection

Step	Action	Reference
1	Check drain hole provided on the lower surface of the ventral fin for the blockage.	

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SECTION 55-40 – RUDDER

55-40.1 General

This section provides a description of Rudder.

55-40.2 Description

The rudder consists of one cured skin and inner structural components.

The skin is designed as Carbon fiber foam sandwich construction made with prepreg. In some areas, monolithic lay-up is used without the use of sandwich foam.

The inner components are designed as Carbon fibers structure without sandwich foam application. The rudder is balanced with steel counterweights.

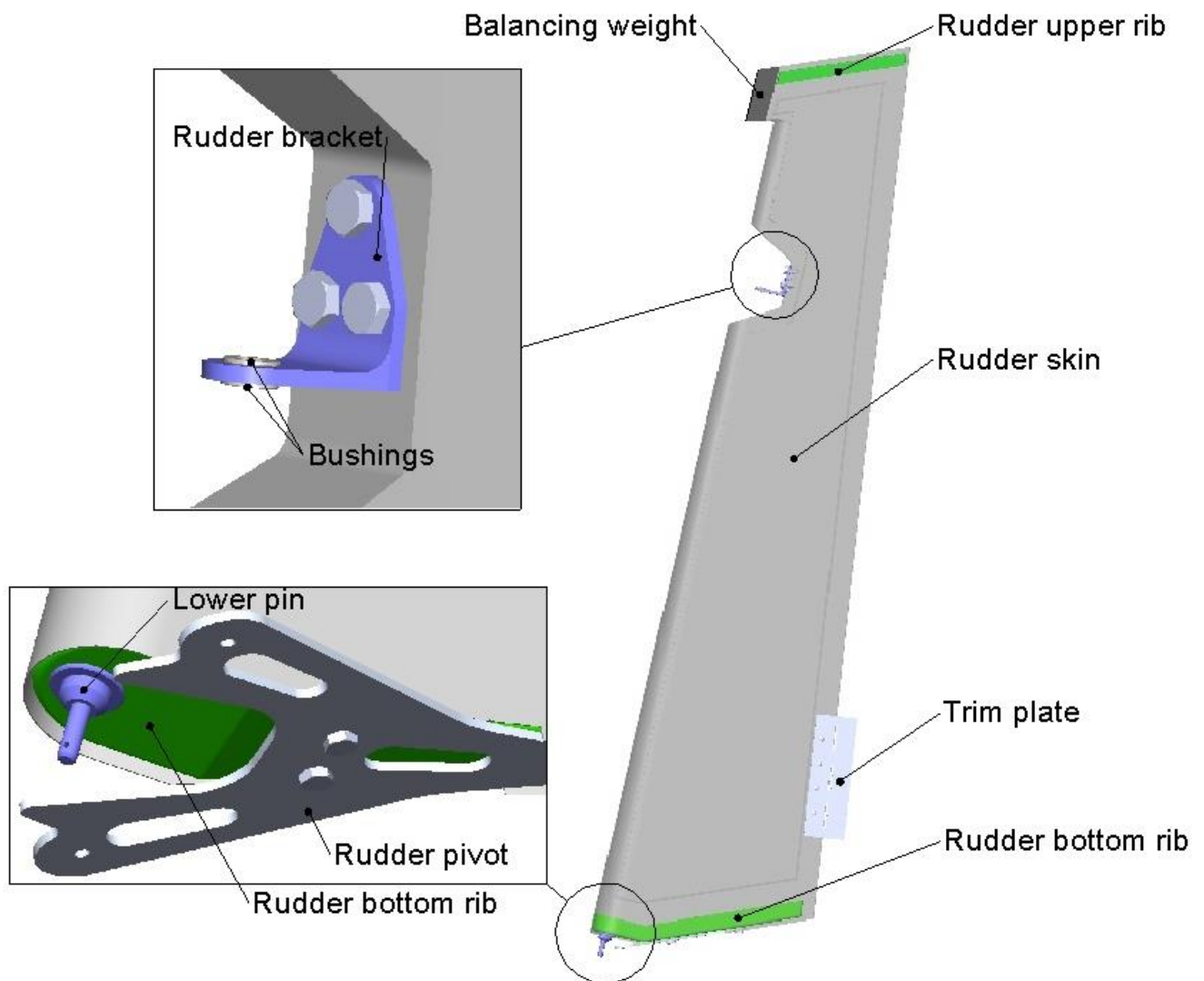


Fig. 55-40-1

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When the rudder is installed, the rudder bracket is attached to the rudder hinge with an AN3-7 bolt , washers, castellated nut, secured with a cotter pin.

The lower pin of the rudder is set in the bearing of the lower fuselage bracket. The pin of the lower bracket is secured with a cotter pin.

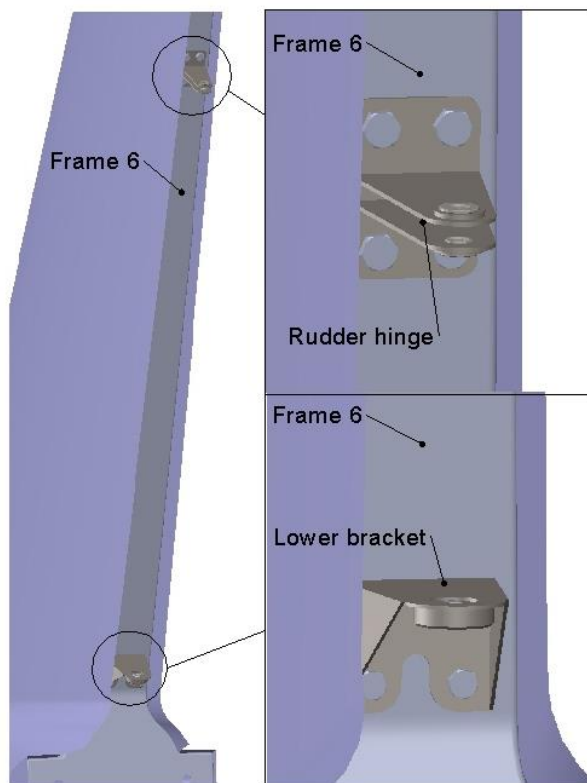


Fig 55-40-2

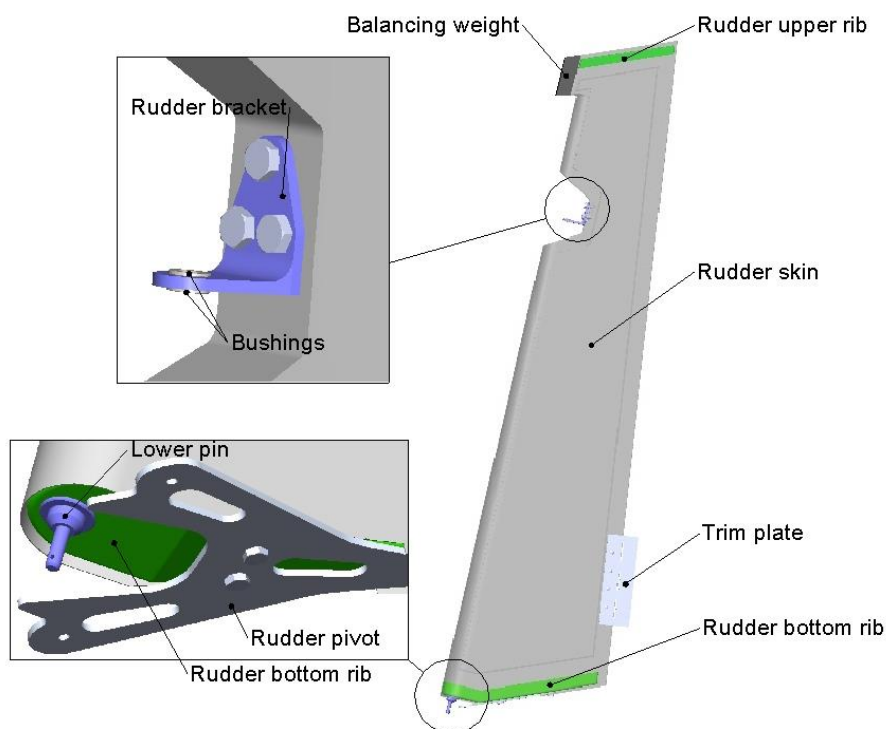


Fig 55-40-3

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55-40.3 Maintenance Practices

55-40.3.1 Rudder Installation and Removal

55-40.3.1.1 Type of Maintenance

Heavy

55-40.3.1.2 Minimum Level of Certification

LSA- Mechanic (LSRM)

55-40.3.1.3 Procedure

A. Recommended Special Tools and Parts

Item	Quantity	Unit
None		

B. Rudder Installation and Removal

Step	Action	Reference
1	Secure the plane with the parking brake. Ensure good access to the rear part of the fuselage.	
2	Match the hole in the bearing of the lower bracket with lower pin (Fig. 55-40-4).	

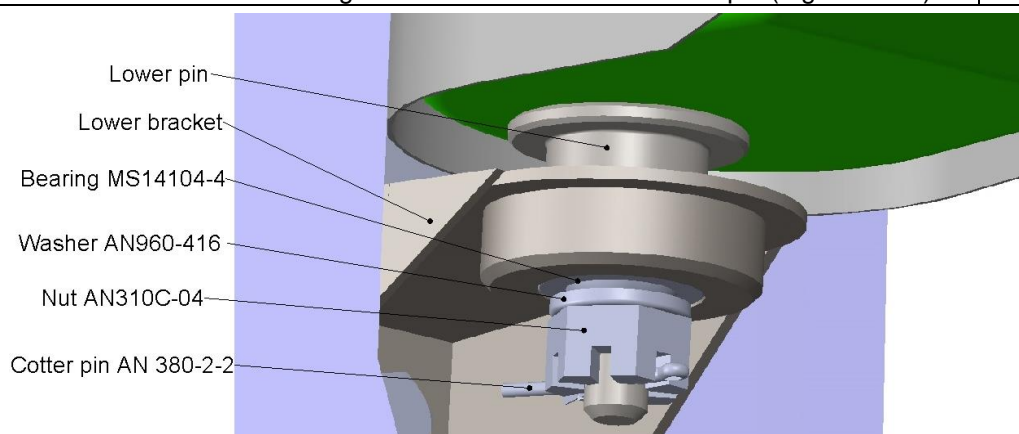


Fig. 55-40-4

3	Match the hole in rudder hinge with rudder bracket and install the AN3-7 bolt as shown on Fig. 55-40-5.	
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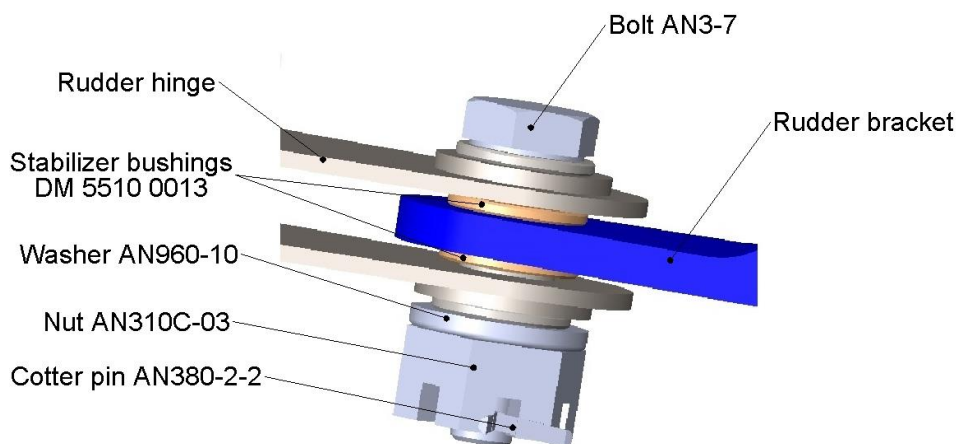
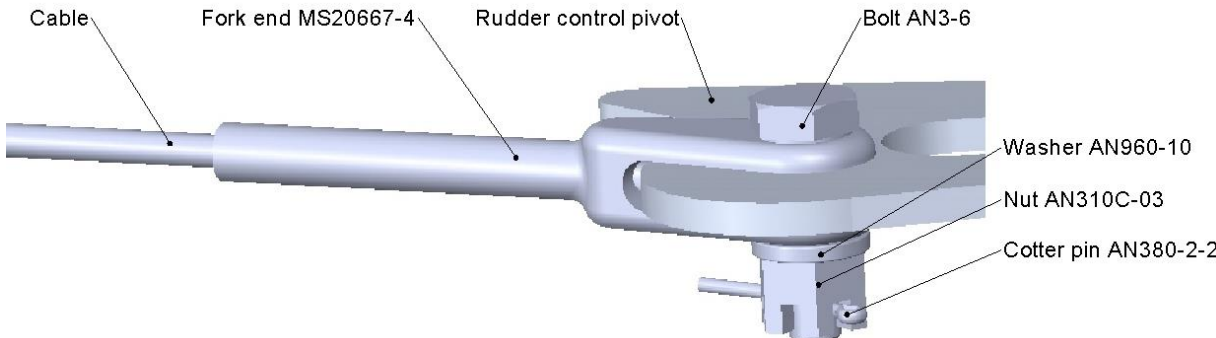


Fig. 55-40-5

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4	Turn the rudder left up to the stop and place the fork end MS20667-4 with rudder cable (Fig. 55-40-6) onto the rudder control horn.	
 <p style="text-align: center;">Fig. 55-40-6</p>		
5	Turn the rudder right up to the stop and repeat the process for attaching the right cable to the rudder.	
6	Check the cables tension.	27-20.3.4
7	Check rudder deflections and Zero position.	27-20.3.1 27-20.3.2

55-40.3.2 Rudder Check

55-40.3.1.1 Type of Maintenance

Line

55-40.3.1.2 Minimum Level of Certification

LSA- Mechanic (LSRM)

55-40.3.1.3 Procedure

A. Recommended Special Tools and Parts

Item	Quantity	Unit
None		

B. Drain Holes Inspection

Step	Action	Reference
1	Check the drain hole provided on the lower surface of the rudder skin for blockage.	

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CHAPTER 56 – WINDOWS

Contents

56-00.1	General
56-00.2	Description

56-00.1 General

This chapter provides a description of windows.

56-00.2 Description

All windows are made from contoured Plexiglas. The windows are bonded to the composite structure, to allow a smooth aerodynamically clean shape.

Please contact Flight Design Customer Care (customercare@flightdesign.com) for further instructions.

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CHAPTER 57 – WING

Contents

57-00.1	General
57-00.2	Description
SECTION 57-00 – WING STRUCTURE	
57-00.1	General
57-00.2	Description
57-00.3	Maintenance Practices
57-00.3.1	Wing Removal and Installation
57-00.3.2	Wing Check
57-00.3.3	Access Panel Removal and Installation
SECTION 57-51 – FLAP	
57-51.1	General
57-51.2	Description
57-51.3	Maintenance Practices
57-51.3.1	Flap Installation and Removal
57-51.3.2	Flap Check
SECTION 57-52 – AILERON	
57-52.1	General
57-52.2	Description
57-52.3	Maintenance Practices
57-52.3.1	Aileron Installation and Removal
57-52.3.2	Aileron Check

57-00.1 General

This chapter provides a description of the wings.

57-00.2 Description

The wing is a cantilevered wing designed in one piece, which is connected with shear pins into bushes at the fuselage and root ribs of the wing.

The wing has a single main spar and a lighter spar at the rear of the main wing panel. There is an integral fuel tank in the inboard leading-edge section of the wing.

The wing is equipped with slotted flaps and ailerons.

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SECTION 57-10 – WING STRUCTURE

57-10.1 General

This section provides a description of the wing structure and maintenance practices.

57-10.2 Description

The structure of the wing is built using carbon pre-preg materials. A carbon and dense foam sandwich structures are used due to the low weight and high strength capabilities.

The wing consists of two wing halves connected by the main spar and a forward connecting tube. Each wing part consists of rear spar, skin, and ribs. Wings parts can't be separated.

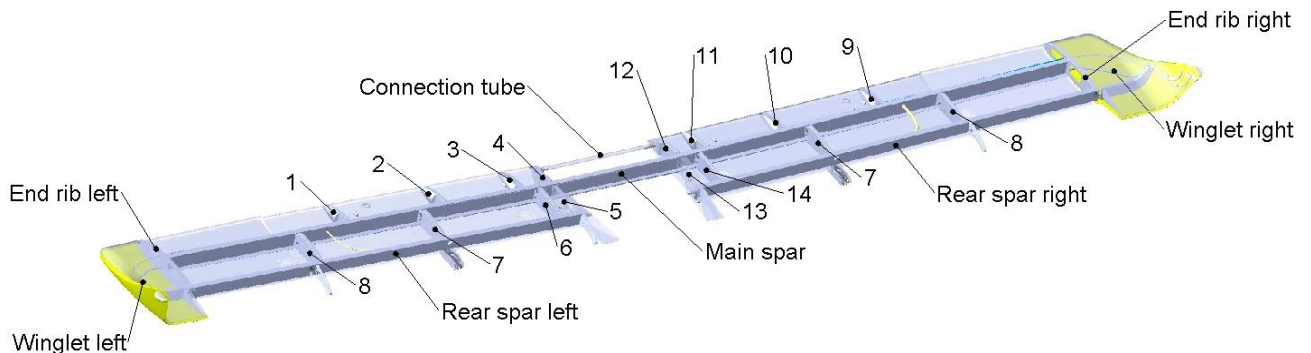


Fig. 57-10-1

<i>Fig.</i>	<i>Item</i>	<i>Part Name</i>
57-10-1	1	Fuel tank end rib left
	2	Anti-sloshing fuel tank rib left
	3	Fuel tank root rib left
	4	Nose root rib left
	5	Rear root rib left
	6	Rear rib left N1
	7	Rear rib N2
	8	Rear rib N3
	9	Fuel tank end rib right
	10	Anti-Sloshing fuel tank rib right
	11	Fuel tank root rib right
	12	Nose root rib right
	13	Rear root rib right
	14	Rear rib right N1

There are two wing fuselage bushings attached to the root ribs and fastened by the nut KM6. Spherical bearings GE15ES are pressed into wing fuselage bushings. Wing attaches with these bushings to pins inserted in the fuselage.

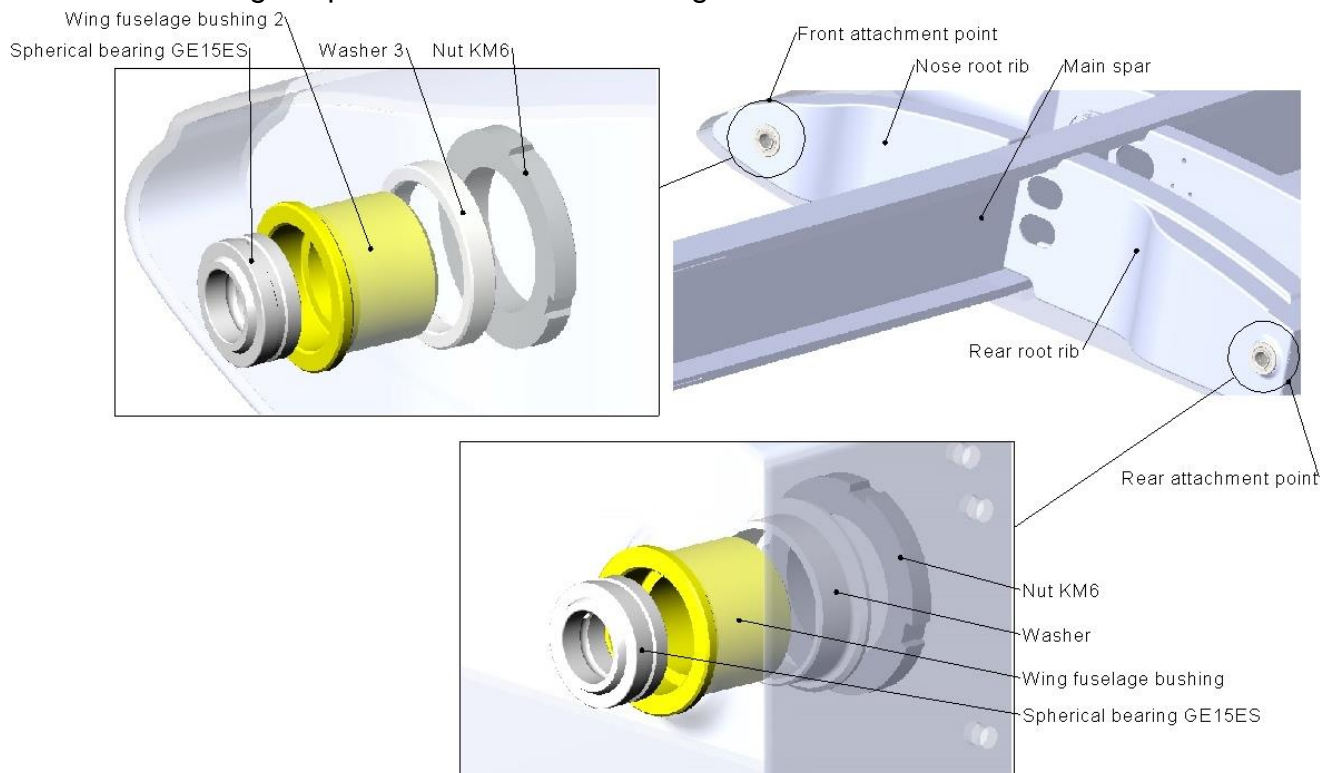


Fig. 57-10-2

Aileron hinges and flap brackets rails installed on the wing rear spar, except flap middle rails attached to the wing skin. On Fig. 57-10-3 is shown a pattern of aileron hinges and flap rails for the right-wing console, for left wing console it is mirrored.

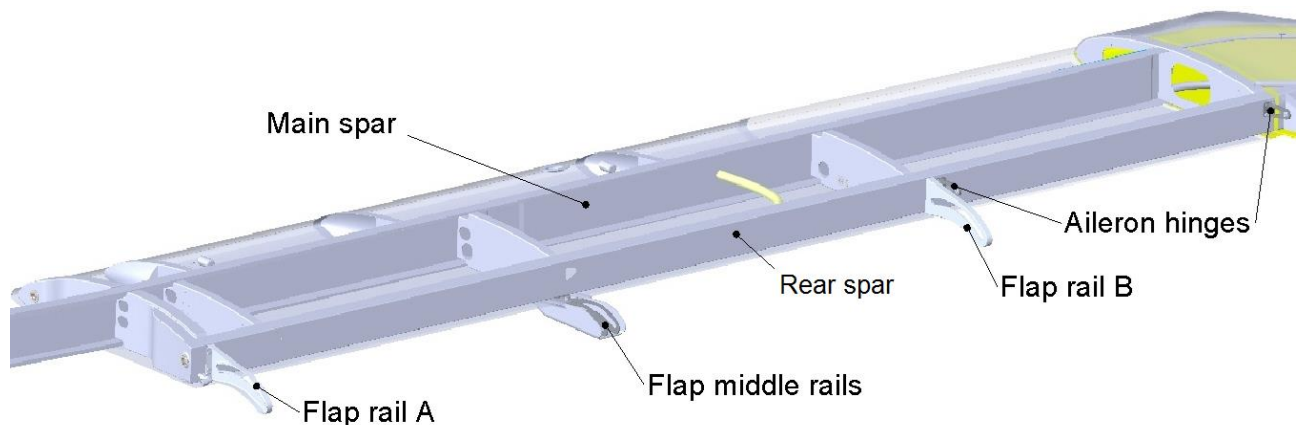


Fig. 57-10-3

The wing skin is provided with inspection wing access panels which are attached by 4 screws. Use these access panels to perform the inspection in accordance with check list provided in Section 05-20.2.7.

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57-10.3 Maintenance Practices

57-10.3.1 Wing Removal and Installation

57-10.3.1.1 Type of Maintenance

Line

57-10.3.1.2 Minimum Level of Certification

LSA- Mechanic (LSRM)

57-10.3.1.3 Procedure

A. Recommended Special Tools and Parts

<i>Item</i>	<i>Quantity</i>	<i>Unit</i>
Padded transmission jack stands	2	



Fig. 57-10-4

B. Wing Installation

<i>Step</i>	<i>Action</i>	<i>Reference</i>
1	Raise the wing up using the screw jacks.	
2	Roll the fuselage under the wing and secure the aircraft with chocks and the parking brake.	
2	Lubricate all metal details before connecting: bearings, pins, and bushings.	
3	Lower the wing into the fuselage spar box slowly.	
4	Support the pre-set wing until wing are installed and fixed by the pins.	

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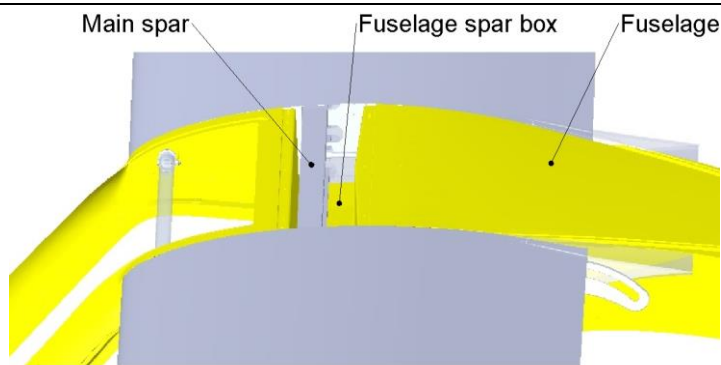


Fig. 57-10-5

5	Connect the pitot lines between the wing and the fuselage on the right wing only.	34-20
6	Connect all fuselage-to-wing wiring, connect the position and strobe lights socket and plug.	33-40
7	Connect front and rear wing-fuselage attachment points. Making sure to attach the Ballistic parachute front harnesses over the front pins. Check the Parachute Installation Manual (PIM) that is included in the F2 document package for more details.	

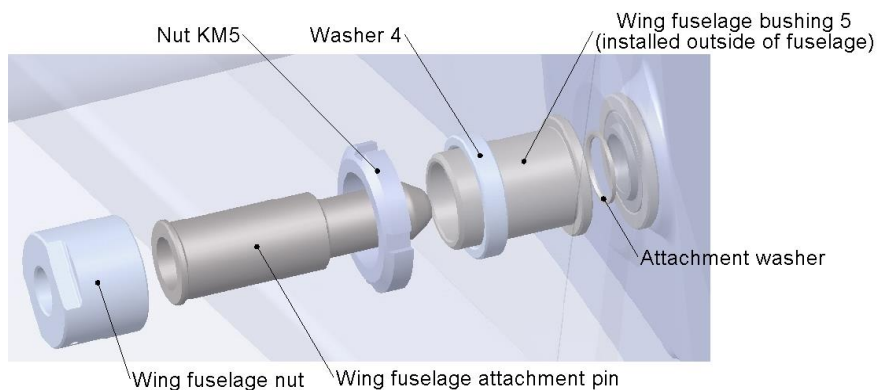


Fig. 57-10-6. Rear attachment point.

Rear attachment point can be assembled in next steps:

1. Insert the wing/fuselage bushing 5 from the outside of the fuselage.
2. Install washer 4 on the wing/fuselage bushing 5 from inside of the fuselage, secure with nut KM5.
3. Insert attachment pin into bushing 5 with attachment washer between the wing and fuselage.
4. Tighten and secure the wing fuselage attachment pin with the wing fuselage nut **after** completing front attachments.

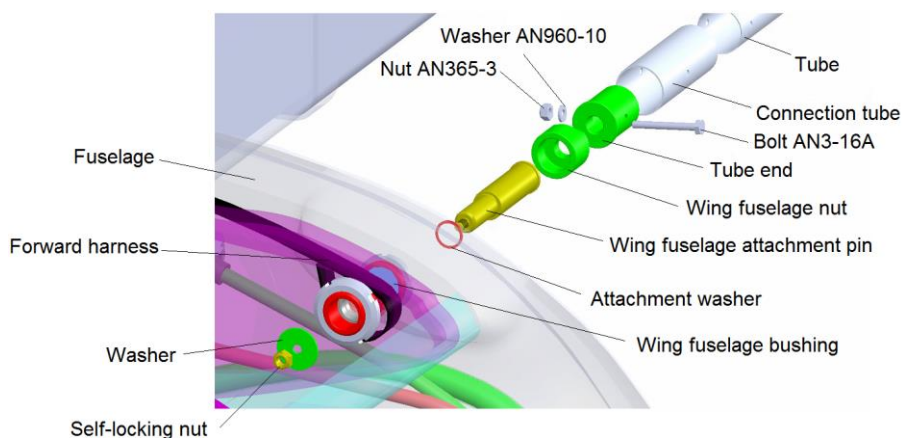


Fig. 57-10-7. Front attachment point.

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Front attachment point can be assembled in next steps:

1. Put the forward harness loop end in position between the wing and fuselage. Insert wing fuselage attachment pin into wing/fuselage bushing 3 with attachment washer in between the wing and the fuselage bushing as shown in figure 57-10-7.
2. Make certain Connection Tubes are in position on the forward tube. Insert the machined tube-end fitting into the forward tube and align the holes with the forward tube.
3. Fit forward tube between left and right front attachment points.
4. Move connection tubes to align the holes as shown in Fig 57-10-7 with the forward tube and tube end fitting.
5. Attach the forward tube, connection tube and tube end with bolt AN3-16A, washer AN960-10 and nut AN365-3.

8

Attach tube 6 (part of aileron control) to the bellcrank which is mounted on the top right side of fuselage. Using the bolt 1, bellcrank washers 2, washers 3 and castellated nut 4 found in position on the bellcrank. Fig. 57-10-8.

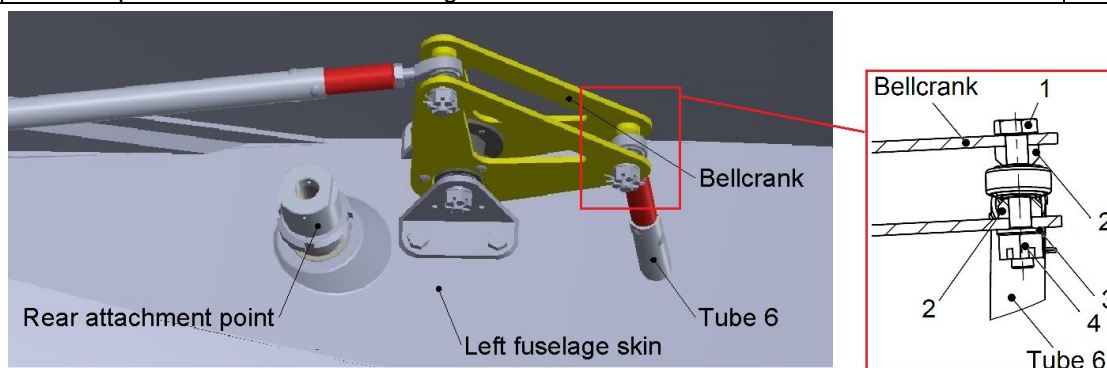


Fig. 57-10-8

<i>Fig.</i>	<i>Item</i>	<i>Part Name</i>
57-10-8	1	Bolt AN4-14
	2	Bellcrank washer
	3	Washer AN960C10
	4	Castellated nut AN310C4

9

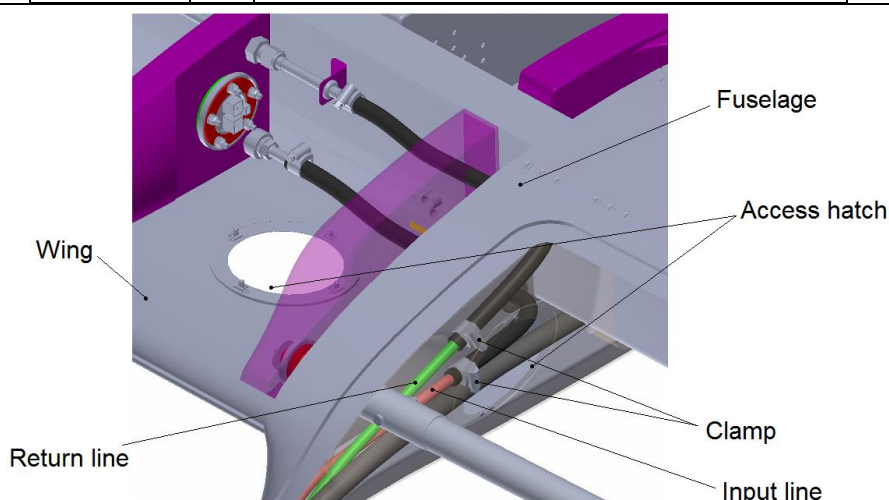


Fig. 57-10-9

Connect the fuel and return lines from the wing located in the inner fuel tank hatch through the access hatch at the root/leading edge of the wing using clamps. Tighten clamps securely to fuel lines in the fuselage.

10

Verification:

	-Make sure the main bolts are properly tight, check torque of the screws. -Make sure the control rod bolts are secured and marked with torque stripe lacquer. -Make sure the fuel lines are properly secured with hose clamps	
11	Check the fuel flow rate.	12-10.2.3
12	Check the flap and aileron zero position and deflection.	27-10.3.1 27-10.3.2 27-50.3.1 27-50.3.2
13	Check position/strobe lights and pitot system are operating.	

C. Wing Removal

Step	Action	Reference
1	Secure the aircraft with chocks and the parking brake.	
2	Drain all the fuel from the wings, fuel lines, and gascolator.	12-10.2.1
3	Removing the wing is done in reverse order to the wing installation process.	

57-10.3.2 Wing Check

57-10.3.2.1 Type of Maintenance

Line

57-10.3.2.2 Minimum Level of Certification

LSA- Mechanic (LSRM)

57-10.3.2.3 Procedure

A. Recommended Special Tools and Parts

Item	Quantity	Unit
None		

B. Wing Brackets Check

Step	Action	Reference
1	Inspect the aileron hinges and flap rails for play. In case of play, check the torque on the fasteners. Check lubrication of Aileron hinges and Flap rails.	

C. Checking Fuselage-Wing Connection for Tangential Play

Step	Action	Reference
1	Make sure that there is no play while moving the wing in accordance with Fig. 57-10-8.	

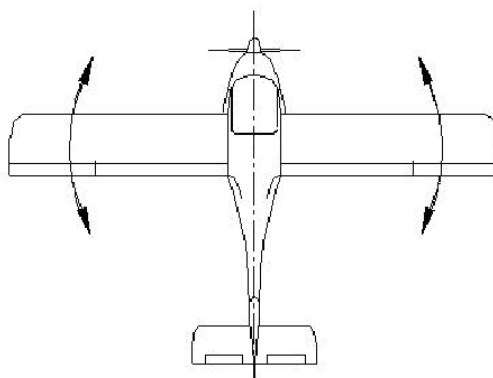


Fig. 57-10-10

D. Drain Holes Inspection

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Step	Action	Reference
1	Check the drain holes provided on the lower surface of wing skin for blockage.	
2	Clean, if necessary.	

E. Troubleshooting

Step	Action	Reference
1	In case when any abnormalities during inspection were found, please contact Flight Design Customer Care (customercare@flightdesign.com) for further instructions.	

57-10.3.3 Access Panel Removal and Installation

55-20.3.3.1 Type of Maintenance

Line

55-10.3.3.2 Minimum Level of Certification

Pilot/Owner

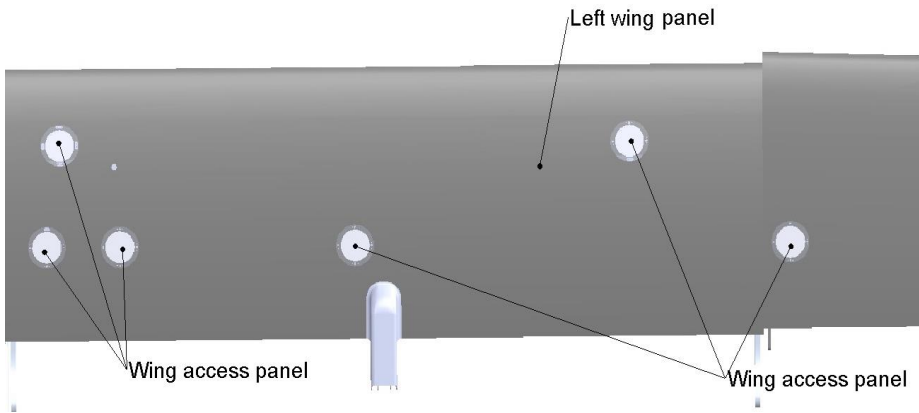
55-10.3.3.3 Procedure

A. Recommended Special Tools and Parts

Item	Quantity	Unit
None		

B. Access Panel Removal and Installation.

Each wing has 6 access panels and 2 fuel tank access panels on the bottom surface. The pattern of access panels on the left wing is shown on Fig.57-10-9.

Step	Action	Reference
1	To remove the wing access panels from the wing, Remove the 4 MS24694S4 screws.	
 <p style="text-align: center;">Fig. 57-10-11</p>		
3	Installation of panels is done in the reverse direction order.	

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SECTION 57-51 – FLAPS

57-51.1 General

This section provides a description of flap structure and maintenance practices.

57-51.2 Description

The flaps are driven by a linear actuator and are activated from the flap control unit in the lower section of the instrument panel. For more information on the actuator system, see section 27.

The flaps move along two (inner and outer) flap rail brackets and the center flap rail. The flap pushrod is connected to the flap hinge bracket which moves along the flap center rails. The connection method is the same on the both wing panels.

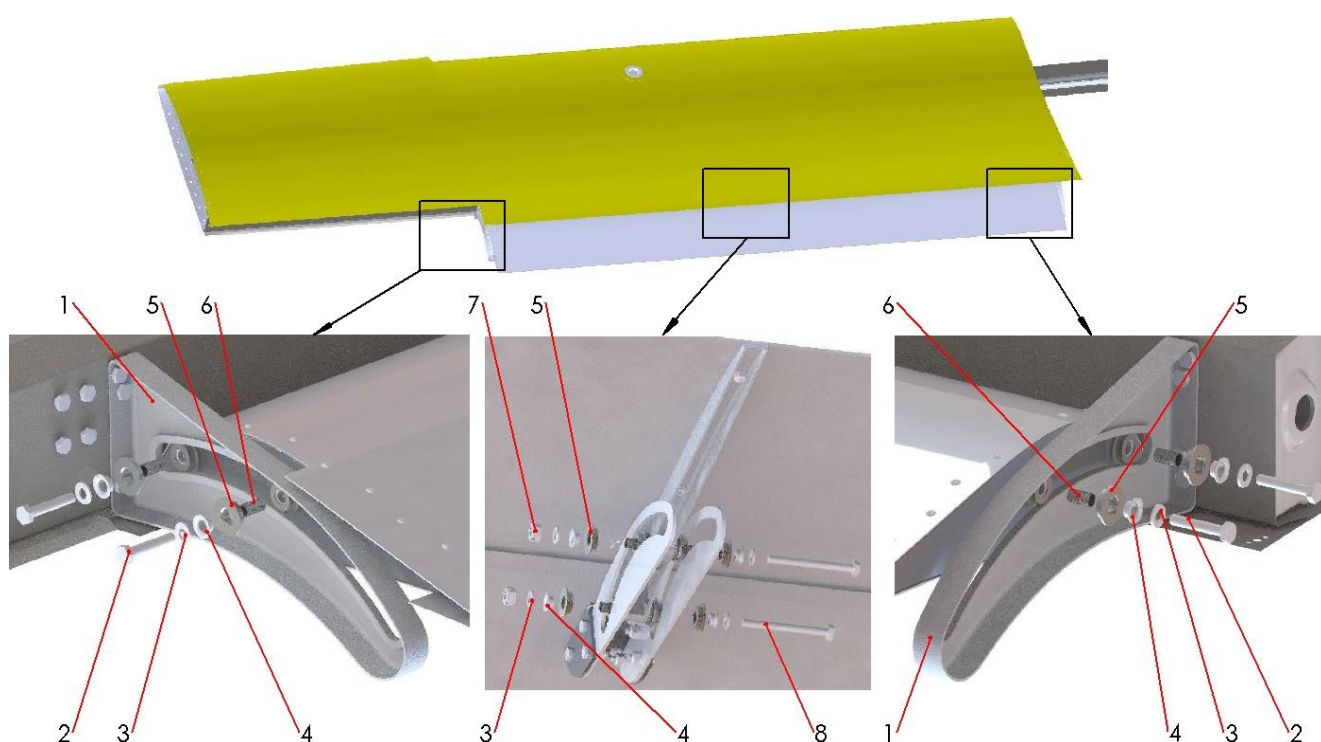


Fig. 57-51-1

Fig.	Item	Part Name	Reference
57-51-1	1	Flap rail A	
	2	Bolt AN4H-13A	
	3	Washer AN960-416	
	4	Bushing PCMF	
	5	Rail bush	
	6	Rail tube	
	7	Nut AN310C-04	
	8	Bolt AN4-26	

57-51.3 Maintenance Practices

57-51.3.1 Flap Installation and Removal

57-51.3.1.1 Type of Maintenance

Heavy

57-51.3.1.2 Minimum Level of Certification

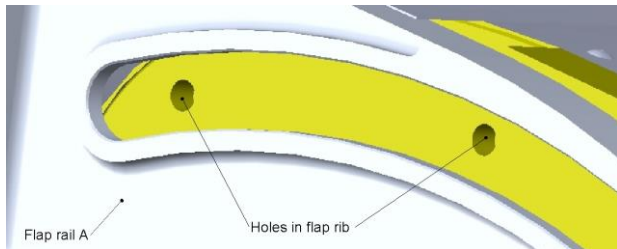
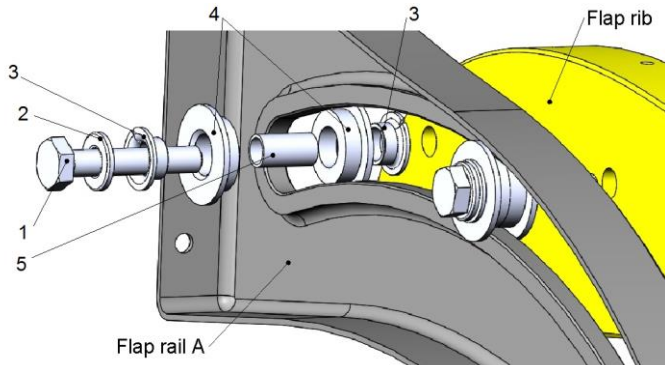
LSA- Mechanic (LSRM)

57-51.3.1.3 Procedure

A. Recommended Special Tools and Parts

Item	Quantity	Unit
None		

B. Flap Installation

Step	Action	Reference																				
1	Match the holes in the flap rib with cutout in the flap rail A.																					
<div><p>Flap rail A</p><p>Holes in flap rib</p><p>Fig. 57-51-2</p></div>																						
2	Insert Bolts 1 into Washer 2, Bushing 3, Rail bush 4, Spacer 5, second Bushing 3 then into the flap rib as shown on Fig.57-51-3. Secure these two AN4H-13A bolts 1 together with safety wire according to procedures found in AC 43-13.																					
<div><p>3</p><p>2</p><p>1</p><p>5</p><p>4</p><p>3</p><p>Flap rib</p><p>Flap rail A</p><p>Fig. 57-51-3</p><table><tr><th>Fig</th><th>Item</th><th>Part Name</th><th>Reference</th></tr><tr><td rowspan="5">57-51-3</td><td>1</td><td>Bolt AN4H-13A</td><td></td></tr><tr><td>2</td><td>Washer AN960-416</td><td></td></tr><tr><td>3</td><td>Bushing PCMF</td><td></td></tr><tr><td>4</td><td>Rail bush</td><td></td></tr><tr><td>5</td><td>Spacer</td><td></td></tr></table></div>			Fig	Item	Part Name	Reference	57-51-3	1	Bolt AN4H-13A		2	Washer AN960-416		3	Bushing PCMF		4	Rail bush		5	Spacer	
Fig	Item	Part Name	Reference																			
57-51-3	1	Bolt AN4H-13A																				
	2	Washer AN960-416																				
	3	Bushing PCMF																				
	4	Rail bush																				
	5	Spacer																				
3	Match holes into Flap Control horn (located in the center of the flap) with hole in the rod end. Assemble it as shown on Fig. 57-51-4.																					

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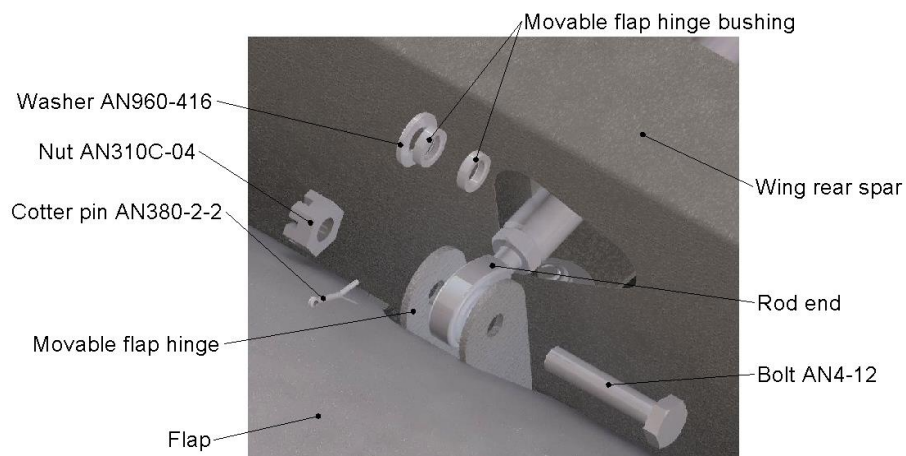


Fig. 57-51-4

- | | | |
|---|--|--|
| 4 | Attach flap horn to the center flap rails with rail bushings and AN4-26 bolts according to Fig. 57-51-5. Secure the castellated nuts with Cotter pins. | |
|---|--|--|

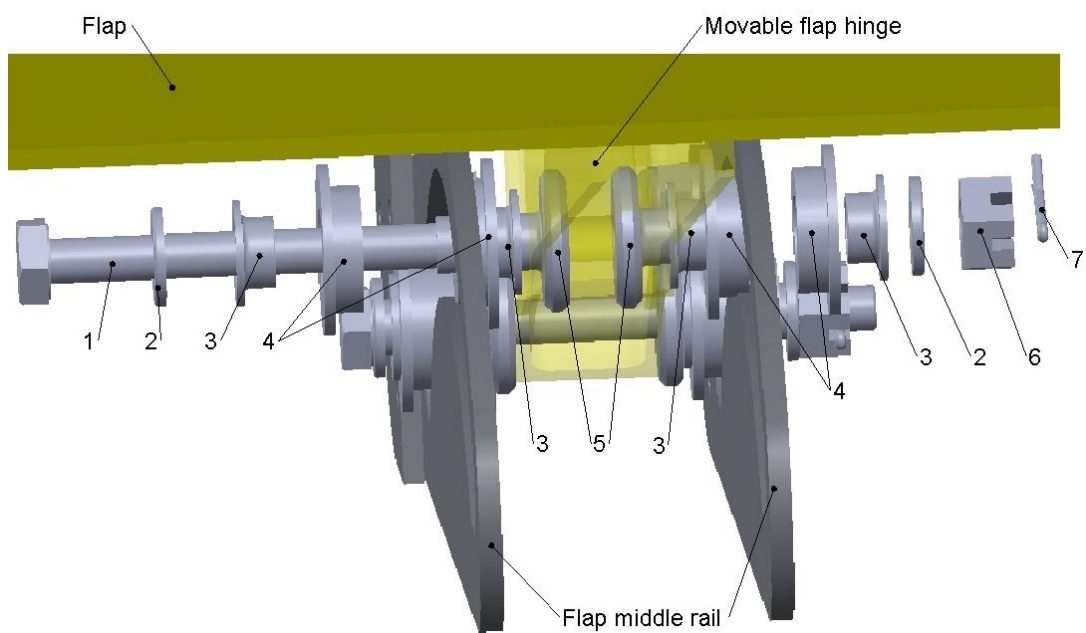


Fig	Item	Part Name	Reference
57-51-5	1	Bolt AN4-26	
	2	Washer AN960-416	
	3	Bushing PCMF	
	4	Rail bush	
	5	Spacer	
	6	Nut AN310C-04	
	7	Cotter pin AN380-2-2	

Fig. 57-51-5

- | | | |
|---|---|------------------------|
| 4 | Check flap Zero position and deflections. | 27-50.3.1
27-50.3.2 |
|---|---|------------------------|

B. Removal

Step	Action	Reference
1	Removal is done in a reverse order.	

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57-51.3.2 Flap Inspections

57-51.3.2.1 Type of Maintenance

Line

57-51.3.2.2 Minimum Level of Certification

LSA- Mechanic (LSRM)

57-51.3.1.3 Procedure

A. Recommended Special Tools and Parts

<i>Item</i>	<i>Quantity</i>	<i>Unit</i>
None		

B. Drain Holes Check

<i>Step</i>	<i>Action</i>	<i>Reference</i>
1	Check the drain holes provided on the lower surface of the flap skin for the blockage.	

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**SECTION 57-52 –
AILERON**

57-52.1 General

This section provides a description of aileron structure and maintenance practices.

57-52.2 Description

The ailerons are made as co-cured parts from a carbon web and two composite ribs. The aileron is attached to the wing by two hinged brackets.

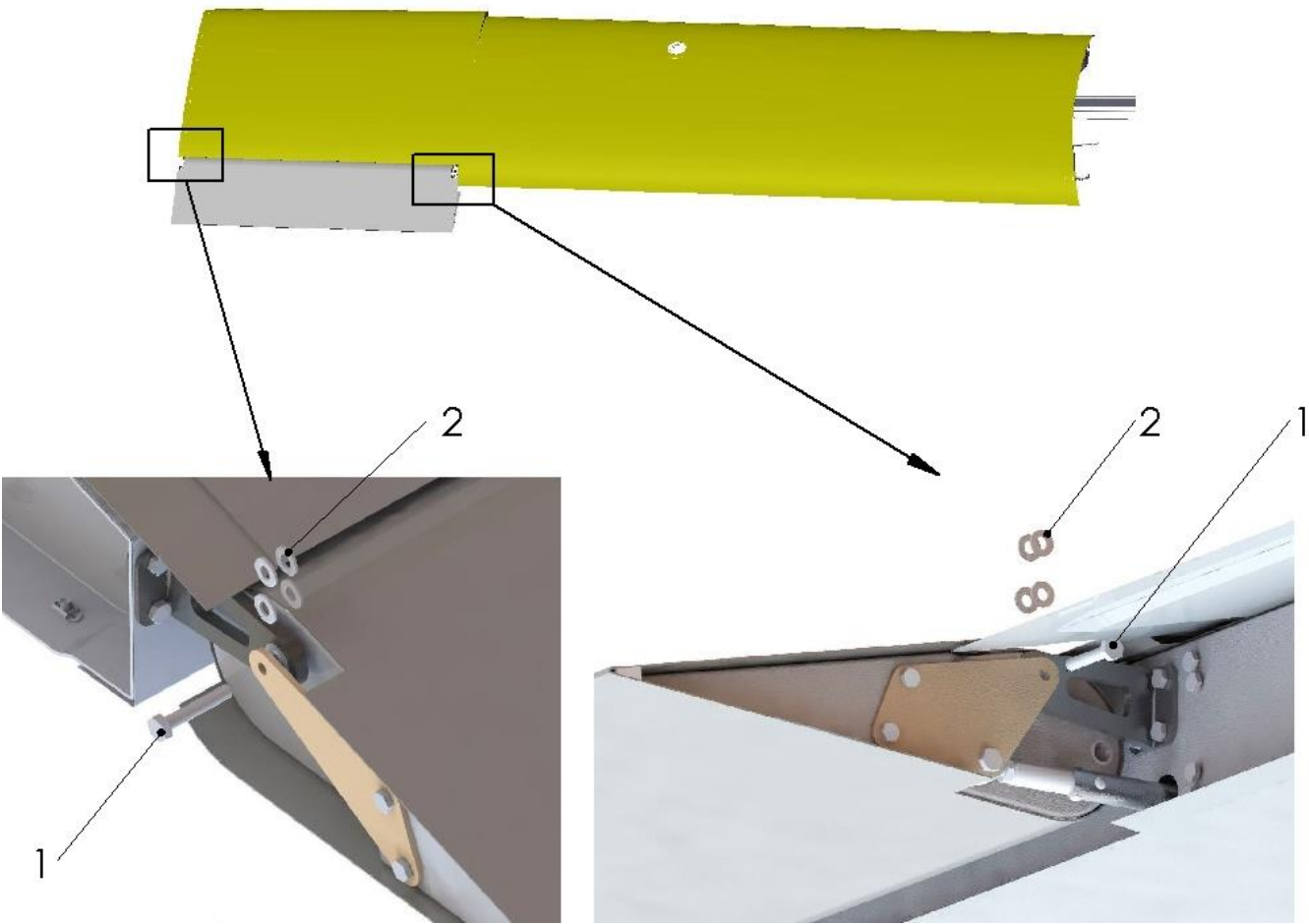


Fig. 57-52-1

<i>Fig.</i>	<i>Item</i>	<i>Part Name</i>	<i>Torque</i>	<i>Reference</i>
57-52-1	1	Bolt AN4H-13A drilled head bolt		
	2	Washer		

57-52.3 Maintenance Practices

57-52.3.1 Aileron Installation and Removal

57-52.3.1.1 Type of Maintenance

Line

57-52.3.1.2 Minimum Level of Certification

LSA- Mechanic (LSRM)

57-52.3.1.3 Procedure

A. Recommended Special Tools and Parts

Item	Quantity	Unit
None		

B. Aileron Installation

Step	Action	Reference
1	Match the hole on the root aileron bracket (4) with the hole in the bearing of the wing bracket (3) and the aileron. Connect them with bolt (1) and washers (2) Fig. 57-52-2). The aileron mounting bolts are secured with safety wire according to AC43-13.	

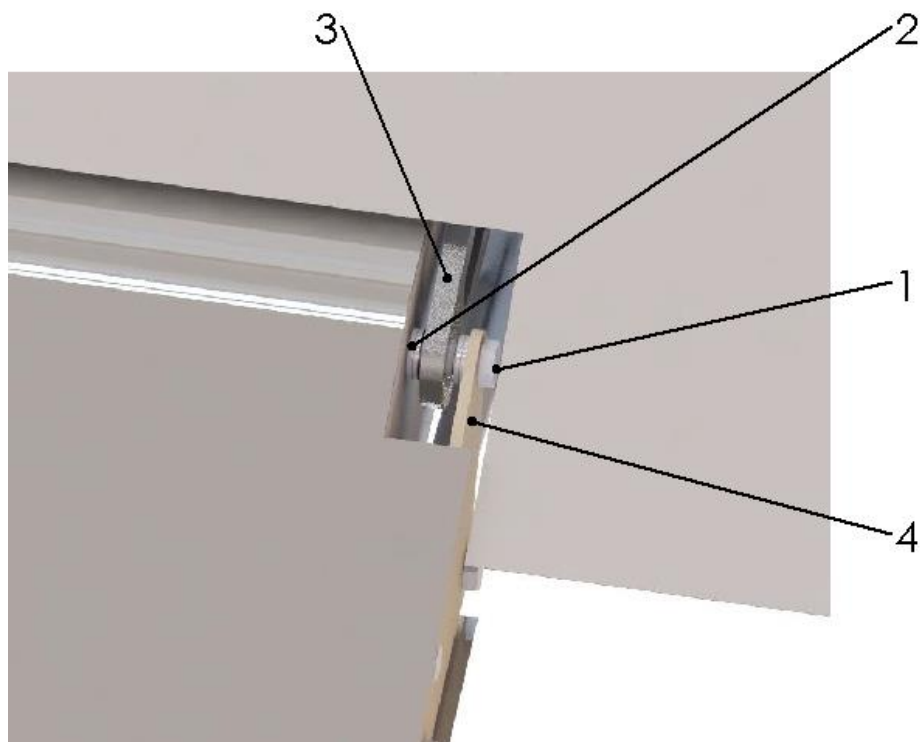


Fig. 57-52-2

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2	Match the hole in the outer aileron bracket (4) with hole in the bearing of the wing bracket (3) and the aileron. Place 4 washers (2) between the wing bracket and the aileron bracket and connect them by the bolt (1) Fig. 57-52-3. Secure with safety wire.	
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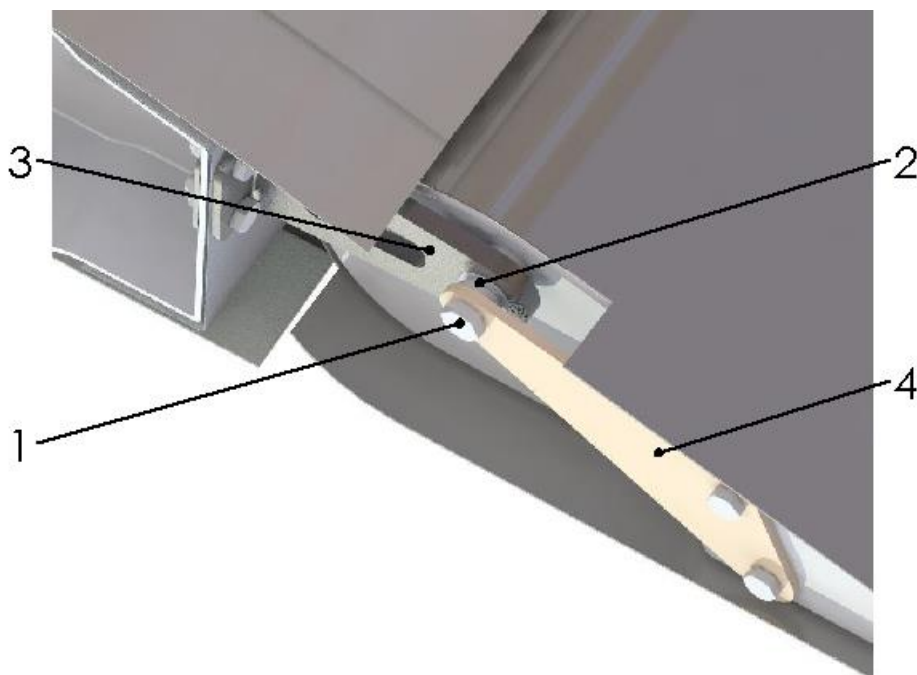


Fig. 57-52-3

3	(1). Install the aileron pushrod with the bearing (4) with the bolt (1) onto the aileron root rib. Use washers (2) as shown (Fig. 57-52-4). Secure all bolts (1) with safety wire according to AC 43-13.	
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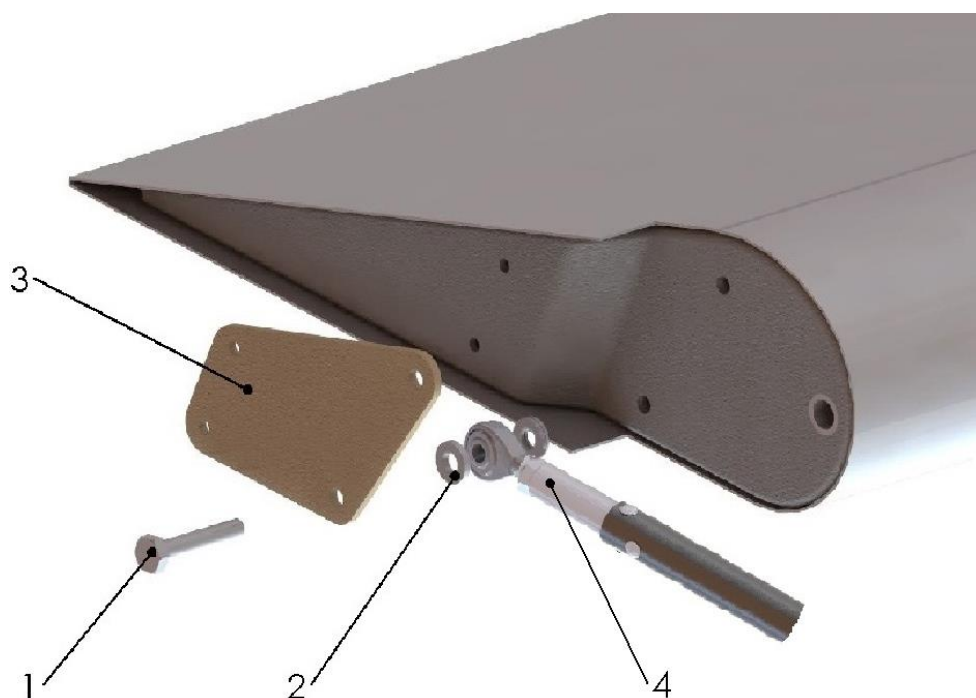
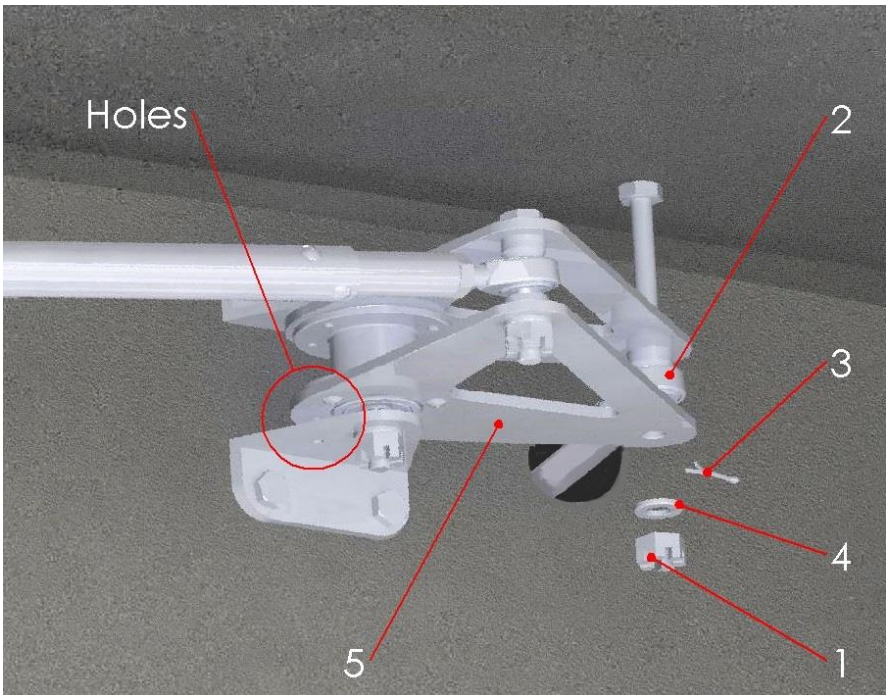
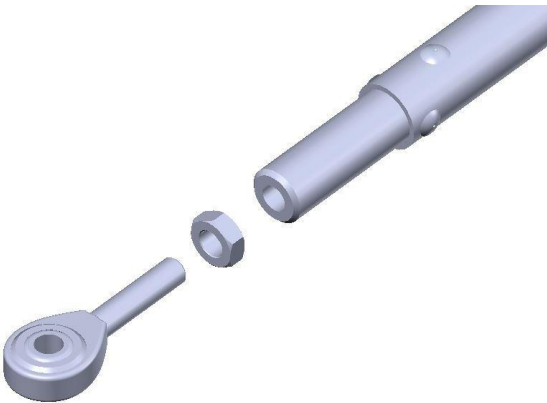


Fig. 57-52-4

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4	Using the holes in the bellcrank, confirm the neutral position. Take out Cotter pin (3) Unscrew the nut (1). Take out washer (4). Disconnect the rod (2) from the bellcrank in the wing (5). Fig. 57-52-5.	
 <p style="text-align: center;">Fig. 57-52-5</p>		
5	Align the aileron to the Zero position.	
6	Connect the rod (2) with the internal bellcrank (5). Fig. 57-52-5.	
7	<p>If necessary, correct the aileron positions by adjusting length of the rod (4) Fig. 57-52-4 rod (2) Fig. 57-52-5; disconnect the rod from internal bellcrank and aileron and adjust length of the rod Fig. 57-52-6. Reconnect aileron to pushrod.</p>  <p style="text-align: center;">Fig. 57-52-6</p>	
8	Check aileron Zero position and angles of deflection.	27-10.3.1 27-10.3.2

B. Removal

Step	Action	Reference
1	Removal in the reverse direction order.	

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57-52.3.2 Aileron Check

57-51.3.2.1 Type of Maintenance

Line

57-51.3.2.2 Minimum Level of Certification

LSA- Mechanic (LSRM)

57-51.3.1.3 Procedure

A. Recommended Special Tools and Parts

<i>Item</i>	<i>Quantity</i>	<i>Unit</i>
None		

B. Drain Holes Inspection (Fig. 57-52-8)

<i>Step</i>	<i>Action</i>	<i>Reference</i>
1	Check the drain holes provided on the lower surface of the aileron skin for the blockage.	



Fig. 57-52-8

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CHAPTER 61 – PROPELLER

Contents

61-00.1	General
61-00.2	Description
61-00.3	Maintenance Practices
61-00.3.1	Spinner Installation and Removal
61-00.3.2	Propeller Removal and Installation
61-00.3.3	Further Propeller Maintenance

61-00.1 General

This chapter provides description of the propeller.

61-00.2 Description

The F2-LSA is available with following propeller:

Sensenich	3Y0R5C70 3-blade composite propeller, ground adjustable
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The instructions for operation and maintenance of this propeller is provided by the propeller manufacturers in separate manuals, see Appendix I of this document.

- **Note:** Flight Design herewith approves all publications, modifications and updates released by Sensenich.

In the case of the Sensenich ground adjustable propeller, the approved pitch adjustment is 22° +/- 1°, measured at 75% propeller blade radius to the lower blade airfoil contour (not to the chord). With this pitch adjustment, the propeller reaches 4900 ... 5100 static engine rpm and does not exceed 5500 engine rpm in level flight at ISA 0 conditions with full throttle.

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61-00.3 Maintenance Practices

For propeller inspection and maintenance instructions refer to the latest issue of maintenance manual provided by the propeller manufacturer.

61-00.3.1 Spinner Installation and Removal

61-00.3.1.1 Type of Maintenance

Line

61-00.3.1.2 Minimum Level of Certification

Pilot/Owner

61-00.3.1.3 Procedure

A. Recommended Special Tools and Parts

Item	Quantity	Unit
None		

B. Spinner Installation and Removal

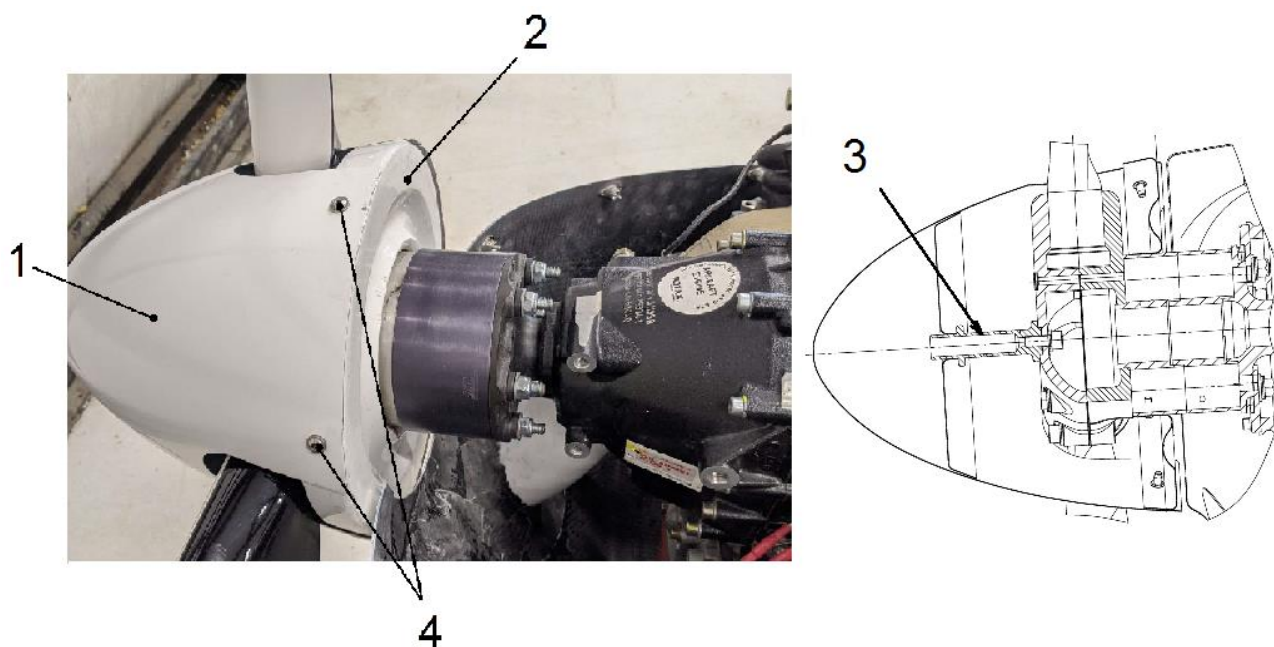


Fig. 61-00-1

Fig.	Item	Part Name	Torque
61-00-1	1	Three-bladed propeller spinner	
	2	Disk, Supporting, Spinner	
	3	Spinner axis	
	4	Screw M5	

Step	Action	Reference
1	Secure the aircraft chocks and confirm the ignition is OFF.	
2	Check the presence of clearance between cowling and Spinner 1.	
2	Remove cowlings.	71.2.1

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3	Inspect the Spinner 1 for cracks, play or wear on the Spinner center axis 3.	
4	Unscrew 6 Screws M5, item 4, and move Spinner 1 forward along the Spinner Axis 3 to remove it.	
5	Inspect Spinner Disk 2 and Spinner 1 for damage, paint delaminating.	
6	Inspect the Spinner Axis 3 for play and screws securing. Inspect for cracks and corrosion.	
7	Install Spinner in reversed direction order.	

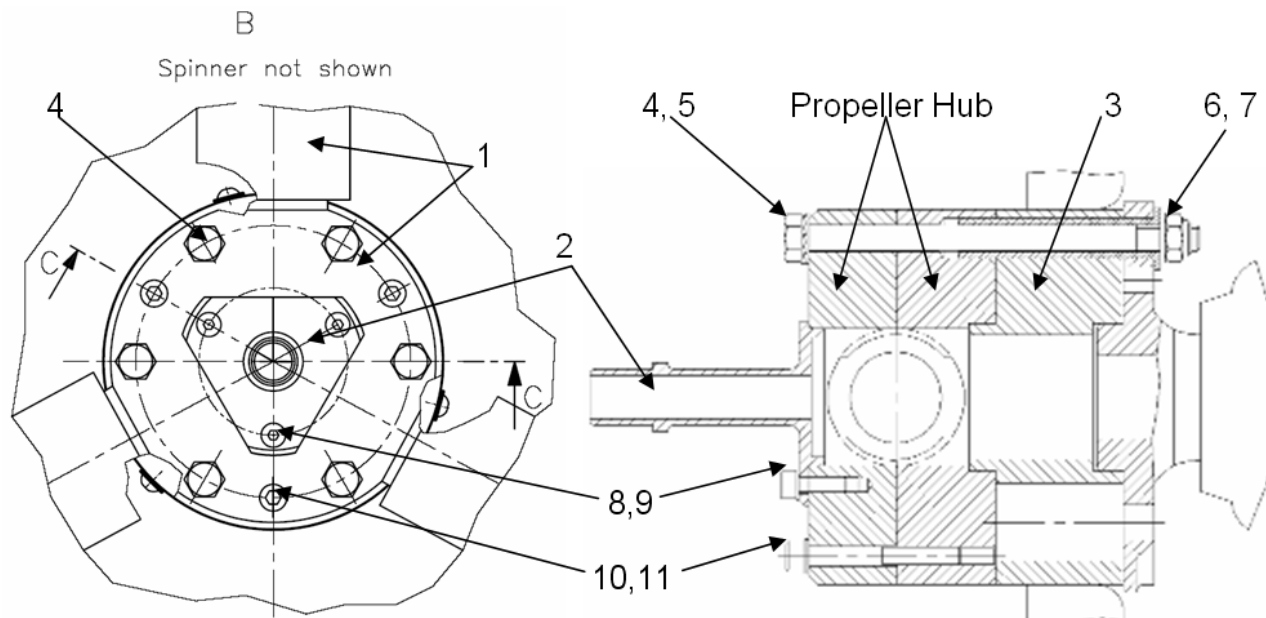


Fig. 61-00-2

Fig.	Item	Part Name	Torque
61-00-2	1	Three bladed Propeller	
	2	Spinner axis	
	3	Spacer	
	4	Bolt M8	
	5	Lock Washer 8.4	
	6	Washer 8.4	
	7	Nut M8	27Nm
	8	Bolt M5	
	9	Washer 5.3	
	10	Bolt M6	
	11	Washer 6.4	10Nm

C. Propeller Inspection

Step	Action	Reference
1	Inspect the Propeller hub and blades for damage, cracks, paint delaminating and corrosion.	
2	Inspect blades for play.	
3	Inspect the Propeller according manufacturers maintenance manual.	
4	Check the proper tightening of all propeller connection screws.	

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61-00.3.2 *Propeller Removal and Installation*

61-00.3.2.1 Type of Maintenance

Line

61-00.3.2.2 Minimum Level of Certification

LSA- Mechanic (LSRM)

61-00.3.2.3 Procedure

Refer to the maintenance manual provided by the propeller manufacturer for the specific propeller.

61-00.3.3 *Further Propeller Maintenance*

For any further maintenance procedures affecting the propeller, propeller blades or propeller hub refer to the maintenance manual provided by the propeller manufacturer for the specific propeller. When additional instruction is required, contact the aircraft manufacturer.

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CHAPTER 71 – ENGINE

Contents

71-00.1	General
71-00.2	Description
71-00.3	Maintenance Practices
71-00.3.1	Engine Cowlings Removal
71-00.3.2	Engine Mount Inspection
71-00.3.3	Air Induction Inspection
71-00.3.4	Starter Replacement
71-00.3.5	Generator Replacement
71-00.3.6	Other Engine Maintenance

71-00.1 General

This chapter provides a description of the engine systems.

71-00.2 Description

The engine of the F2-LSA is a standard ROTAX® 912 iS engine. It is a horizontally opposed, four cylinder, four-stroke engine with central camshaft-push rod-OHV, liquid-cooled cylinder heads and a dry sump, pump-fed lubrication system. The propeller is attached to the engine by an integrated gearbox (2.43:1 reduction). It is also equipped with a fuel injection and a dual electronic ignition and computer fault management system. The installation includes thermostats for the oil and water-cooling systems.

Use the following additional sources of information together with this AMM:

1. Applicable Service Notifications including referenced Service Instructions,
2. Applicable Service Bulletins including referenced Service Instructions,
3. Applicable Safety Alerts including referenced Service Instructions.
4. ROTAX 912i series manuals issued by ROTAX for the affected engine S/N:
 - Operator's Manual OM-912i
 - Maintenance Manual (Line Maintenance) MML-912i
 - Maintenance Manual (Heavy Maintenance) MMH-912i

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71-00.3 Maintenance Practices

71-00.3.1 Engine Cowlings Removal

The upper and lower cowlings cover engine compartment. The cowlings are connected together and attached to the fuselage. The lower cowling is attached to the fuselage with small Phillips head screws. The lower cowling provided with air-inlets for engine cooling, air induction, cabin heat and mounting point for the landing light.

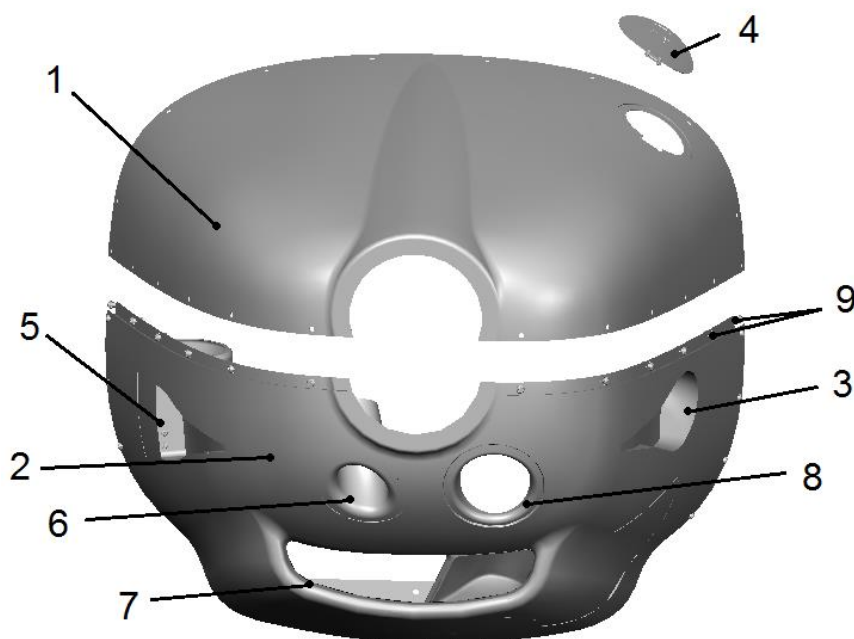


Fig. 71-00-1

Fig.	Item	Part Name	Torque
71-00-1	1	Top engine cowling	
	2	Bottom engine cowling	
	3	NACA inlet for heating system	
	4	Oil tank inspection hatch	
	5	NACA inlet for engine intake air	
	6	Inlet for engine cooling	
	7	Inlet for radiators cooling replace	
	8	Landing light mount	
	9	Screw AN526-1031-R7	

71-00.3.1.1 Type of Maintenance

Line

71-00.3.1.2 Minimum Level of Certification

Pilot/Owner

71-00.3.1.3 Procedure

A. Recommended Special Tools and Parts

<i>Item</i>	<i>Quantity</i>	<i>Unit</i>
None		

B. Engine Cowlings Removal

<i>Step</i>	<i>Action</i>	<i>Reference</i>
1	Secure the aircraft with chocks and switch the ignition OFF	71.2.1
2	Unscrew the 17 Cam-loc type fasteners (X) connecting the Top engine cowling to the lower cowling and remove the top cowling (1).	
3	If you plan to remove the lower cowl, disconnect the two pressure sensors and two temperature sensors	
4	Remove the oil cooler (X) and the coolant radiator (X) from their composite cooler mounts using a very long straight blade screwdriver. The coolers are connected to the lower cowling with Dzus-type fasteners.	
5	Unscrew 2 Screws (9) connecting the Bottom engine cowling (2) and Forward cowling ring (3)	
6	Unscrew 10 Screws (9) connecting Bottom engine cowling (2) and fuselage	
7	Inspect the Cowlings for damage, including chafing on hose, cracks and wear.	
8	Clean cowlings	
9	Install Cowlings in reversed direction order	

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71-00.3.2 Engine Mount Check

The engine is attached to the primary aircraft structure via a welded 4130 CM steel engine mount frame. The small engine mount is attached directly to engine. The small engine mount is attached to the engine mount frame via rubber chock mounts.

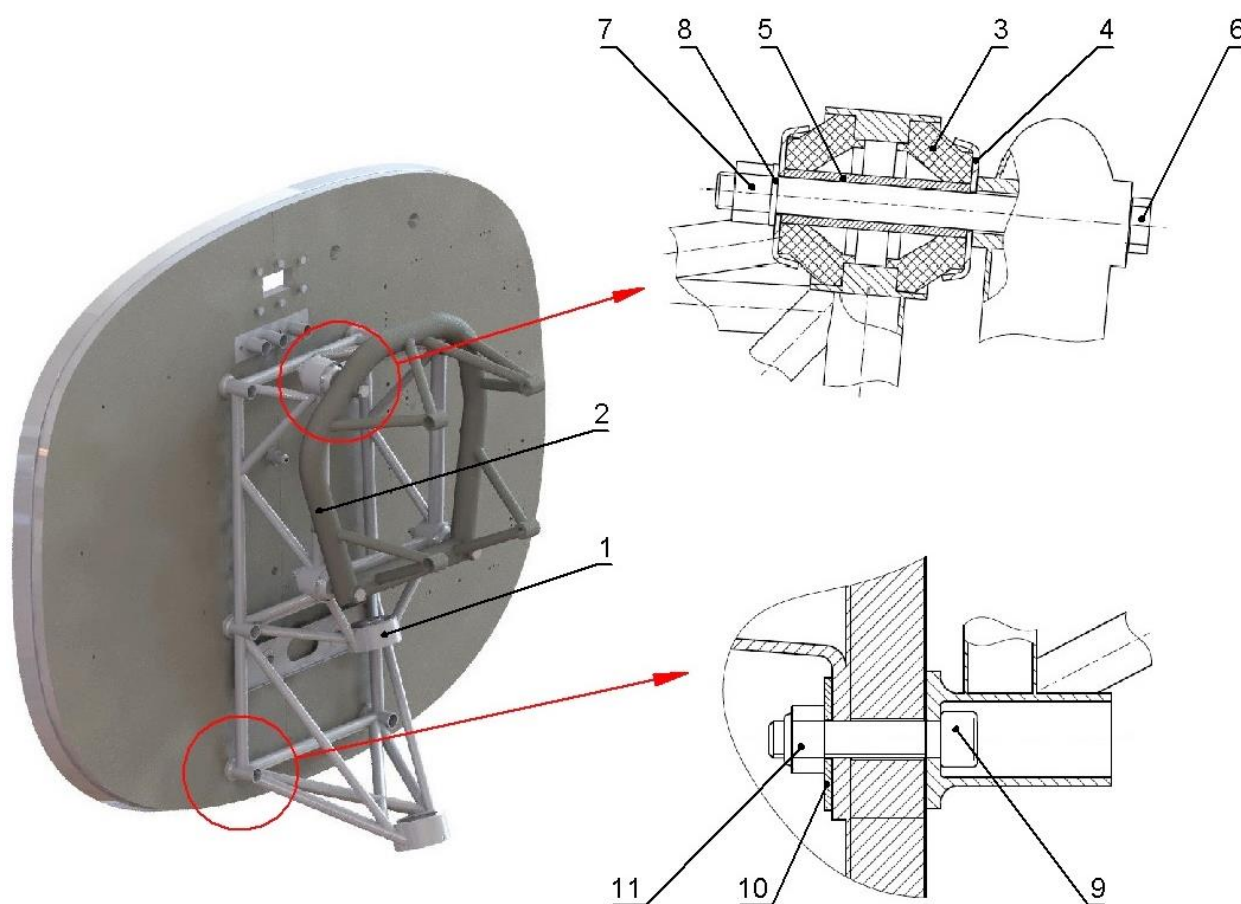


Fig. 71-00-2

Fig.	Item	Part Name	Torque
71-00-2	1	Engine mount frame	
	2	Small Engine Mount	
	3	Shock Mount	
	4	Shock Mount Washer	
	5	Shock mount spacer	
	6	Bolt AN6-41A	
	7	Nut AN363-624	
	8	Washer AN960-616	
	9	Socket head screw	
	10	Washer AN970-5	
	11	Self-locking nut AN365-5	

71-00.3.2.1 Type of Maintenance

Line

71-00.3.2.2 Minimum Level of Certification

LSA- Mechanic (LSRM)

71-00.3.2.3 Procedure

A. Recommended Special Tools and Parts

Item	Quantity	Unit
None		

B. Engine Mount Check

Step	Action	Reference
1	Remove upper and lower cowlings	71.2.1
2	Lift the forward fuselage by pushing down the tail at the narrowest part so that the Nose Wheel is at least 10" (25 sm.) off the ground.	
3	Insert the padded support securely just behind the firewall (under the fuselage bottom).	
4	Check the Engine Mounts 1 and 2 for deformation, cracks, paint delaminating, corrosion, loose hardware, chafing by cables, wires, hoses, etc., and make sure that any flexible item is secured to the engine mount.	
5	Check the rubber Shock Mounts for porosity, cuts, damage and deformation.	
6	Check engine mounting screws for condition and proper torque (the red paint marks on the screw-nut connection).	

71-00.3.3 Air Induction Check

Air is fed into the engine from a NACA inlet at the right side of the lower cowling. Then through a cylindrical air filter installed in the filter box on the lower cowling and through throttle body socket which supplies the airbox with sufficient airflow.

The airbox is equipped with two pressure sensors and two temperature sensors for both injection manifolds.

Air intake to fuel injectors flows through intake manifolds. This process is controlled by the Rotax ECU and provides optimal fuel mixture.

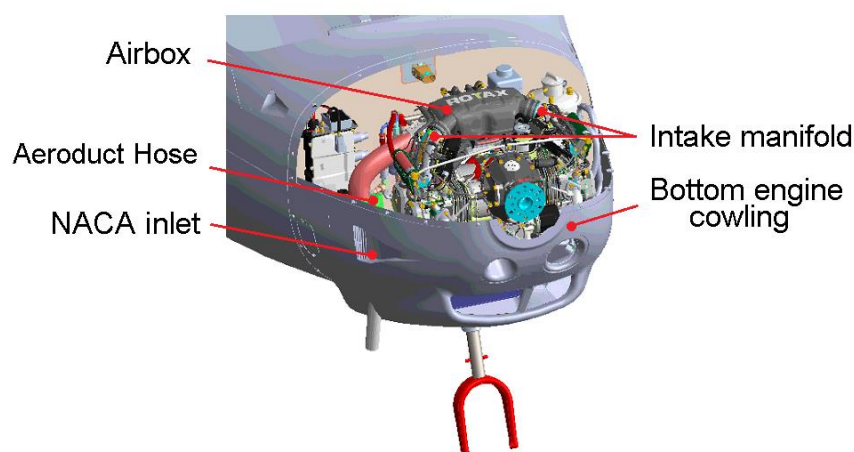


Fig. 71-00-3. Air Induction

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71-00.3.3.1 Type of Maintenance

Line

71-00.3.3.2 Minimum Level of Certification

Pilot/Owner

71-00.3.3.3 Procedure

A. Recommended Special Tools and Parts

Item	Quantity	Unit
None		

A. Air Intake System Inspection; Airfilter Removal and Installation / Exchange

Step	Action	Reference
1	Remove upper cowling	71-00.3.1
2	Check Aeroduct hose for damage, security of attachments and condition.	
3	Check the Air filter installation. Inspect tightening of securing clamps.	

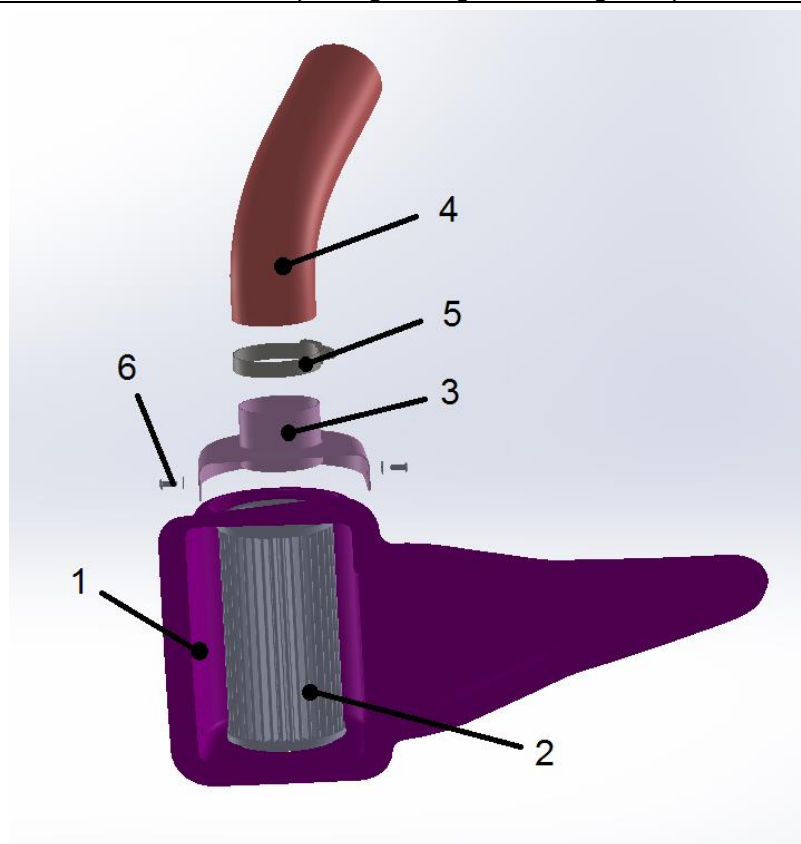


Fig. 71-00-4. Dust Filter installation

Fig.	Item	Part Name	Torque
71-00-4	1	Air Filter Box	
	2	Air filter	
	3	Cover	
	4	Aeroduct Hose	
	5	Clamp	
	6	Bolt	

B. Dust Filter Check.

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Step	Action	Reference
1	Unscrew four screws 6 and remove Cover 3.	
2	Check condition of the Air filter box. Clean Air Filter 2 and re-oil according to the filter directions, clean Air Filter Box 1. Replace Filter only if damage is observed.	
3	Check incoming air duct (scat tube) for damage, the security of attachments and condition.	
4	Reinstall Air filter box and filter in reverse direction order.	

71-00.3.4 Starter Replacement

71-00.3.4.1 Type of Maintenance

Line

71-00.3.4.2 Minimum Level of Certification

Airframe and Powerplant mechanic (A&P).

Refer to the applicable Rotax engine maintenance manual for further task specific requirements.

71-00.3.4.3 Procedure

Refer to the maintenance manual provided by the engine manufacturer for the specific engine.

71-00.3.5 Generator Replacement

71-00.3.5.1 Type of Maintenance

Heavy

71-00.3.5.2 Minimum Level of Certification

Airframe and Powerplant mechanic (A&P).

Refer to the applicable Rotax engine maintenance manual for further task specific requirements.

71-00.3.5.3 Procedure

Refer to the maintenance manual provided by the engine manufacturer for the specific engine.

71-00.3.6 Other Engine Maintenance

This maintenance practice covers all maintenance items that affect the core engine directly, that are not otherwise defined within this AMM and that are appropriately defined within the applicable Rotax engine maintenance manual.

71-00.3.6.1 Type of Maintenance

Heavy

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71-00.3.6.2 Minimum Level of Certification

Airframe and Powerplant mechanic (A&P).

Refer to the applicable Rotax engine maintenance manual for further task specific requirements.

71-00.3.6.3 Procedure

Refer to the maintenance manual provided by the engine manufacturer for the specific engine.

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CHAPTER 73 – ENGINE FUEL AND CONTROL

Refer to the maintenance manual provided by the engine manufacturer for your engine for description and maintenance instructions on the engine-mounted portion of the fuel system.

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CHAPTER 74 – IGNITION

Refer to the maintenance manual provided by the engine manufacturer for your engine for description and maintenance instructions on the ignition system including spark plugs.

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CHAPTER 75 – COOLING

Contents

- 75-00.1 General
- 75-00.2 Description
- 75-00.3 Maintenance Practices
 - 75-00.3.1 Cooling Inspection
 - 75-00.3.2 Cooling Hoses and Lines Replacement

75-00.1 General

This chapter provides descriptions and information concerning the maintenance of engine cooling.

75-00.2 Description

The engine is provided with liquid cooled heads. The coolant radiator installed in front of the engine are mounted in composite mounts near the air-inlet. The fresh air flows through the radiator enclosure and cools down the coolant liquid. A thermostat is included to stabilize engine temperature conditions and for operating in colder temperatures.

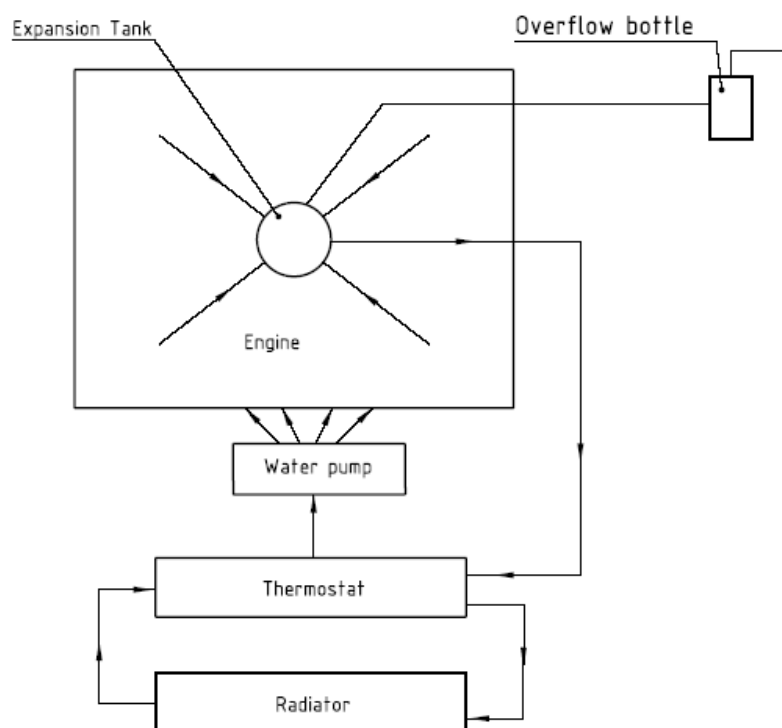


Fig. 75-00-1. Cooling system diagram

From the top of the cylinder heads, the coolant passes on to the expansion tank. Since the standard location of the radiator is below the engine level, the expansion tank located on top of the engine allows for coolant expansion. A pressure cap (with an excess pressure

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valve and return valve) closes the expansion tank. During temperature rise of the coolant, the excess pressure valve opens and the coolant will flow via a hose at atmospheric pressure to the transparent overflow bottle. When cooling down, the coolant will be sucked back into the cooling circuit. The overflow bottle attached to the airframe structure. For cooling system employed components (radiator, extension tank, overflow bottle, thermostat and the set of connection fittings) are supplied together with the engine by the OEM manufacturer. The engine manufacturer provided all requirements for the cooling system parts. Cylinder head temperatures are measured by means of temperature probes installed in the cylinder heads.

Air cooling of the cylinders is provided by a cooling shroud installed on the top of the crankcase. It directs fresh air from the cowling air inlet to all cylinders.

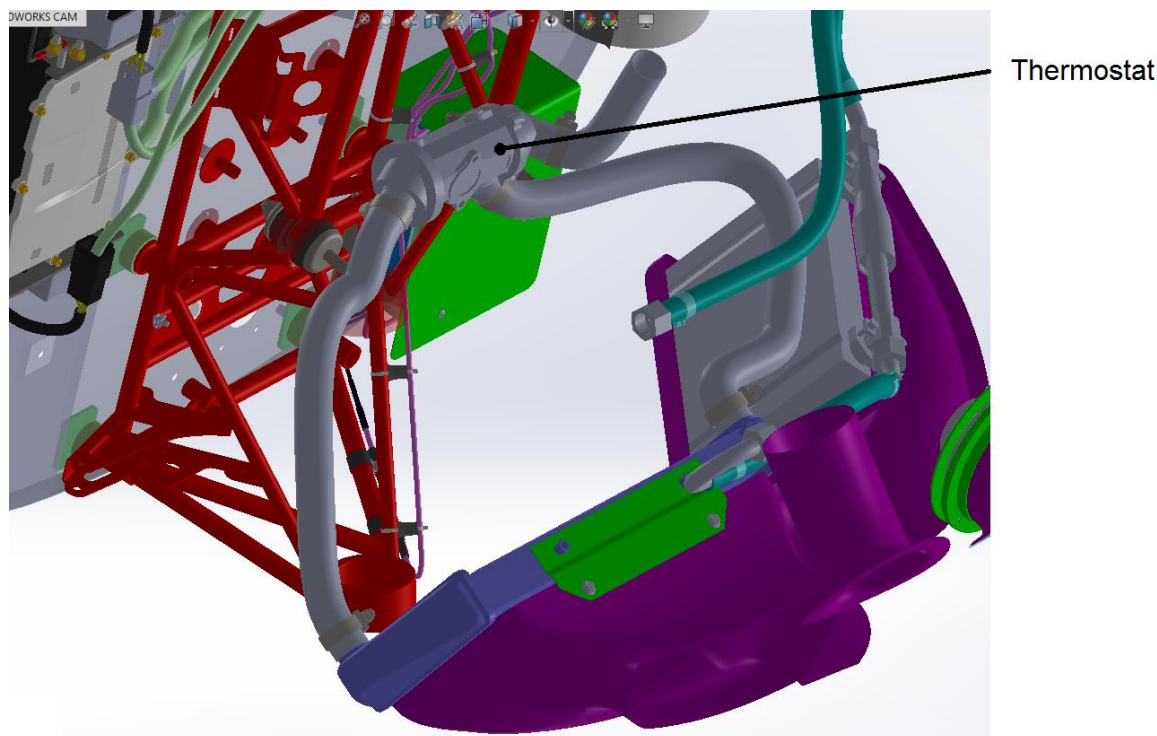


Fig. 75-00-3. Cooling System

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75-00.3 Maintenance Practices

75-00.3.1 Cooling Inspection

75-00.3.1.1 Type of Maintenance

Line

75-00.3.1.2 Minimum Level of Certification

Pilot/Owner

75-00.3.1.3 Procedure

A. Recommended Special Tools and Parts

Item	Quantity	Unit
None		

B. Cooling Inspection

B. Cooling Inspection

Step	Action	Reference
1	Inspect connections for leaks.	
2	Check coolant level. Replenish if required.	
3	Inspect cylinders for seal leaks, oil, cracks and cooling shroud for chafing marks and burn spots. If damage is observed – replace or repair the cooling shroud.	
4	Check the coolant temperature sensor for leaks. (Fig. 75-00-4)	

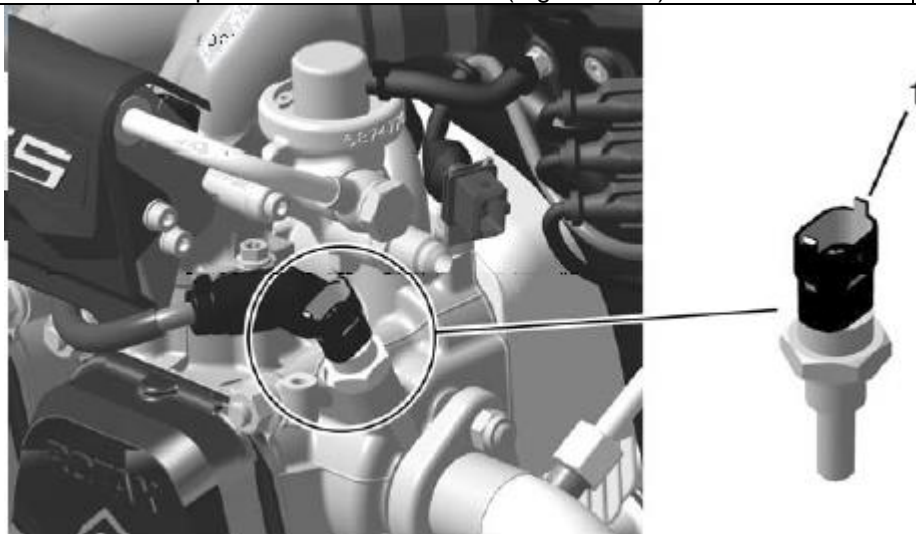
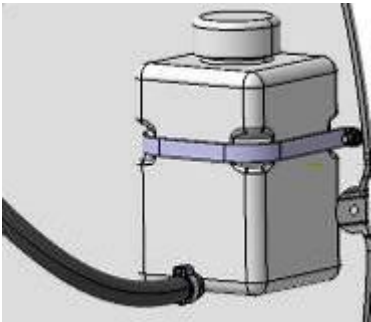


Fig. 75-00-4. Coolant temperature sensor.

5	Check the condition of the coolant lines and connections for leaks. Check the coolant lines for damage, overheating marks on any fire sleeve. Replace coolant lines or clamps if required.	
6	Check the Expansion Tank, Pressure Cap, and Overflow Bottle for damage and abnormalities.	
7	Check Radiator and Oil cooler and mounting points. Check the mounting composite structure and the security of the fasteners.	

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8	<p>Remove the clamp from the overflow bottle hose and disconnect the hose from the nipple. Remove the clamp from vent tube, and disconnect it from nipple. Inspect the overflow bottle vent line for damage and blockage. Replace if required. Drain coolant into clean container</p> <p>Connect compression pump to free end of the hose and provide overpressure 0.2 bar/3 psi for one hour. Check all connection places for leaks.</p>		
9	Connect and secure cooling hose in reversed direction order.		

75-00.3.2 Cooling Hoses and Lines Replacement

Contact Flight Design Customer Care (customercare@flightdesign.com) for further instructions.

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CHAPTER 76 – ENGINE CONTROLS

Contents

76-00.1	General
76-00.2	Description
76-00.3	Maintenance Practices
76-00.3.1	Throttle Box Inspection

76-00.1 General

This chapter provides descriptions and information concerning the maintenance of engine controls.

76-00.2 Description

The throttle quadrant is located in the center pedestal, just behind the lower instrument panel. It can be easily operated from both seats, although it is primarily designed to be operated from the left seat, by the pilot-in-command.

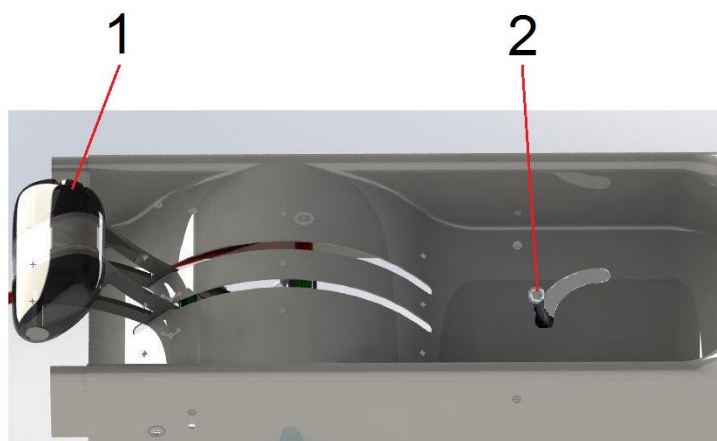


Fig. 76-00-1

<i>Pos.</i>	<i>Description</i>
1	Throttle /Brake lever. Pull to idle, push forward to increase throttle/RPM. Pull back to brake, let go to release brake. Acts simultaneously on both main wheels. Throttle /Brake lever has an adjustable friction knob.
2	Parking brake valve. Move to rear position (as shown on the figure) to set. Brake lever can be held in pulled position when closing the valve, or close valve first and then pull brake lever. Move parking brake lever forward to release.

Detailed view is given in Fig. 76-00-2.

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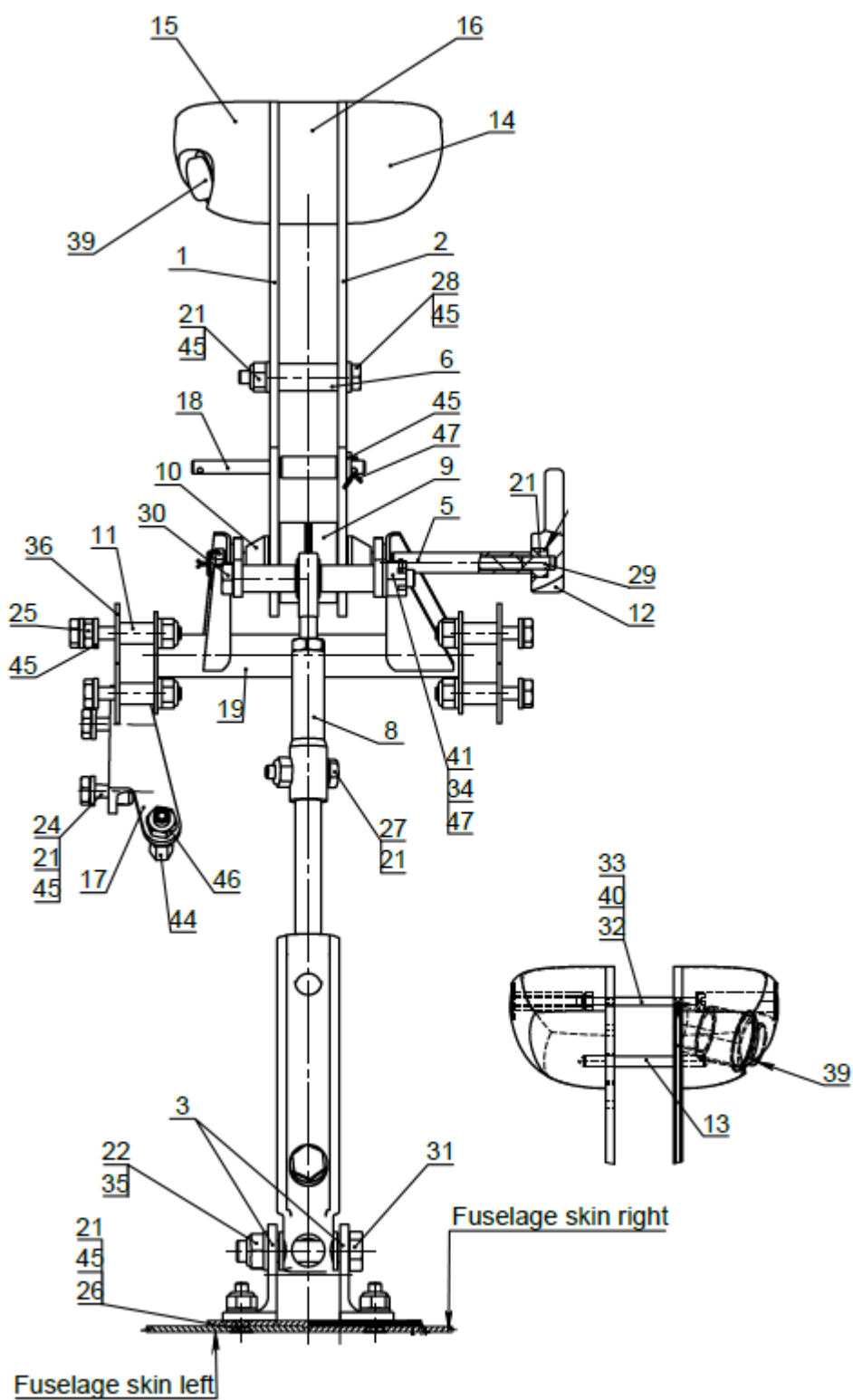


Fig. 76-00-2

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Fig.	Item	Part Name	Torque
76-00-2	1	Lever	
	2	Lever right	
	3	Cylinder bracket	
	5	Control rod bushing	
	6	Middle bushing	
	8	Connecting rod	
	9	Axis bushing	
	10	Throttle axis bushing	
	11	Tube spacer	
	12	Knob for bolt	
	13	Handle rod	
	14	Right handle	
	15	Left handle	
	16	Lever bushing	
	17	Control cable bracket	
	18	Middle bushing 2	
	19	Main lever axis	
	21	Self-locking nut	
	22	Self-locking nut 5/16-24	
	24	Bolt AN3-6A	
	25	Bolt AN3-12A	
	26	Machine screw	
	27	Bolt AN3-7A	
	28	Bolt AN3-15A	
	29	Bolt AN3H46A	
	30	Bolt AN4-25	
	31	Bolt AN5-15A	
	32	Hexagon socket head cap screw M3x10 DIN 912	
	33	Washer M3 DIN 125	
	34	Washer AN960C416	
	35	Washer AN960-516	
	36	Large washer AN970C3	
	39	Push switch	
	40	Self locking nut M3 DIN 985	
	41	Castellated nut AN310-C04	
	44	Bowden clamp M6	
	45	Washer AN960C10	
	46	Nut M6 DIN 934	
	47	Cotter pin AN380-2-2	

76-00.3 Maintenance Practices

76-00.3.1 Throttle Box Check

76-00.3.1.1 Type of Maintenance

Line

76-00.3.1.2 Minimum Level of Certification

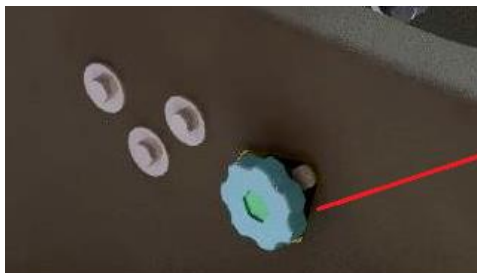
LSA- Mechanic (LSRM)

76-00.3.1.3 Procedure

A. Recommended Special Tools and Parts

Item	Quantity	Unit
None		

B. Throttle Box Check (Fig. 76-00-2).

Step	Action	Reference
1	Unscrew 4 bolt (2) that attaches the Quadrant cover plate (1).	
2	Unscrew knobs (4) that holds knob bushing (5) and carbon bushing (3) between levers (6, 7)	
3	Remove knobs (4), knob bushing (5) and carbon bushing (3).	
4	Remove the covering plate (2).	
5	Check throttle cable for integrity. Look for fraying and kinks. Replace if required.	
6	Check the control levers support (17) for signs of wear.	
7	Check control levers for smooth operation without play or undue friction.	
8	<p>If necessary adjust the throttle friction on the lever by turning knob (A) located on the right side of the tunnel</p> 	

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CHAPTER 77 – ENGINE INDICATING

For maintenance instructions regarding the engine indicating system contact Flight Design Customer Care (customercare@flightdesign.com).

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CHAPTER 78 – EXHAUST

Contents

- 78-00.1 General
- 78-00.2 Description
- 78-00.3 Maintenance Practices
 - 78-00.3.1 Exhaust Muffler and Pipes Removal
 - 78-00.3.2 Exhaust Muffler and Pipes Check

78-00.1 General

This chapter provides descriptions and information concerning the maintenance of engine exhaust system.

78-00.2 Description

The powerplant exhaust system consists of the muffler and exhaust pipes. The exhaust gases from cylinders travel to the muffler via individual exhaust manifolds/elbows. The muffler has an exhaust pipe which aimed for gases to exit outside of the engine compartment. The exhaust elbows are bolted directly to the cylinders with lock nuts. The muffler and exhaust elbows are connected using ball joints and springs.

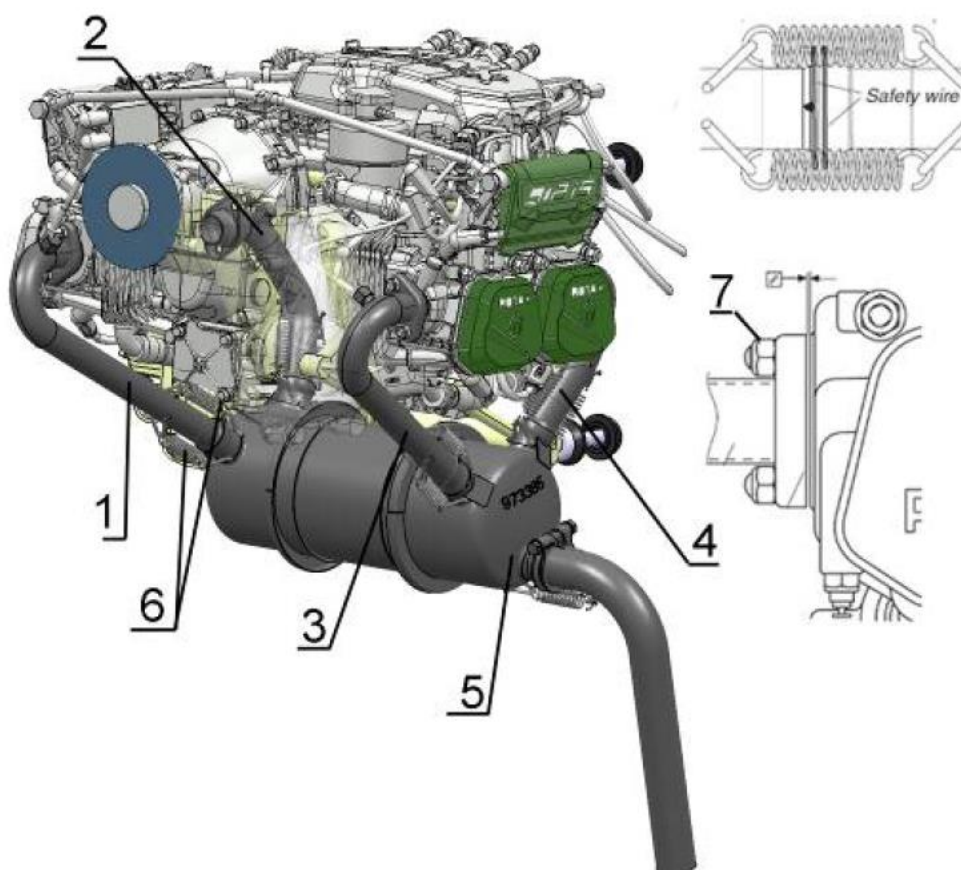


Fig. 78-00-1. Exhaust System

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<i>Fig.</i>	<i>Item</i>	<i>Part Name</i>	<i>Torque</i>
78-00-1	1	Forward exhaust pipe, right	
	2	Rear exhaust pipe, right	
	3	Forward exhaust pipe, left	
	4	Rear exhaust pipe, left	
	5	Muffler	
	6	Spring	
	7	Nut	12 Nm

78-00.3 Maintenance Practices

78-00.3.1 Exhaust Muffler and Pipes Removal

78-00.3.1.1 Type of Maintenance

Line

78-00.3.1.2 Minimum Level of Certification

LSA- Mechanic (LSRM)

78-00.3.1.3 Procedure

A. Recommended Special Tools and Parts

<i>Item</i>	<i>Quantity</i>	<i>Unit</i>
None		

B. Exhaust Muffler and Pipes Removal

<i>Step</i>	<i>Action</i>	<i>Reference</i>
1	Cut the safety wire, disconnect the exhaust Springs (6).	
2	Remove the muffler.	
3	Remove the heating shroud from Muffler.	
4	Mount and secure Muffler in reverse direction order.	

78-00.3.2 Exhaust Muffler and Pipes Check

78-00.3.2.1 Type of Maintenance

Line

78-00.3.2.2 Minimum Level of Certification

LSA- Mechanic (LSRM)

78-00.3.2.3 Procedure

A. Recommended Special Tools and Parts

<i>Item</i>	<i>Quantity</i>	<i>Unit</i>
None		

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B. Exhaust Muffler and Pipes Check

Step	Action	Reference
1	Check the exhaust system for damage and missing parts (springs).	
2	Checks attachment Nuts 7 and Springs 6 for security and fit.	
3	Check exhaust pipes and mounting flanges for the cracks, corrosion, and leaks.	
4	Remove the muffler from the exhaust pipes. Inspect the exhaust pipes for cracking near welds and corner of bends	
5	Check the muffler for cracks, corrosion, and signs of leaks. Replace if cracks are found. Inspect the sockets where the exhaust pipes connect and the main body of the muffler.	
6	Mount and secure Muffler in reverse direction order.	

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CHAPTER 79 – OIL SYSTEM

Contents

79-00.1	General
79-00.2	Description
79-00.3	Maintenance Practices
79-00.3.1	Oil System Check
79-00.3.2	Oil Hoses and Lines Replacement

79-00.1 General

This chapter provides descriptions and information concerning the maintenance of engine oil system.

79-00.2 Description

The oil system is delivered with an oil thermostat.

Configuration of the oil system with oil thermostat installed is shown in Fig. 79-00-1.

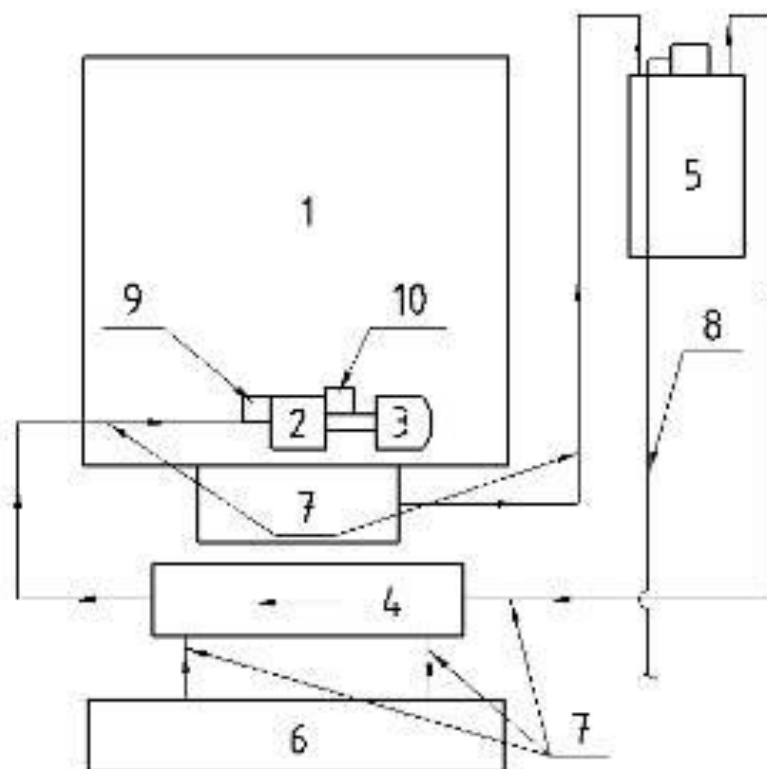


Fig. 79-00-1. Oil System diagram

<i>Fig.</i>	<i>Item</i>	<i>Part Name</i>	<i>Torque</i>
79-00-1	1	Engine ROTAX® 912	

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	2	Oil pump	
	3	Oil filter	
	4	Oil thermostat	
	5	Oil tank	
	6	Radiators Unit	
	7	Oil hose	
	8	Fuel hose (vent line)	
	9	Oil pressure sensor	
	10	Sensor for oil temperature	

When in operation, the oil pump draws the oil from the oil tank through the thermostat to the oil radiator and forces it through the oil filter to the lubrication points. From here the engine oil is distributed to all lubrication points and flows from there back into the oil tank, driven by piston blow-by gases.

The thermostat allows bypassing the oil cooler while the oil temperature is below the normal operating temperature range.

In the case the oil filter element clogs or flow is restricted, an emergency pressure valve will open and unfiltered lube oil will flow to lubrication points.

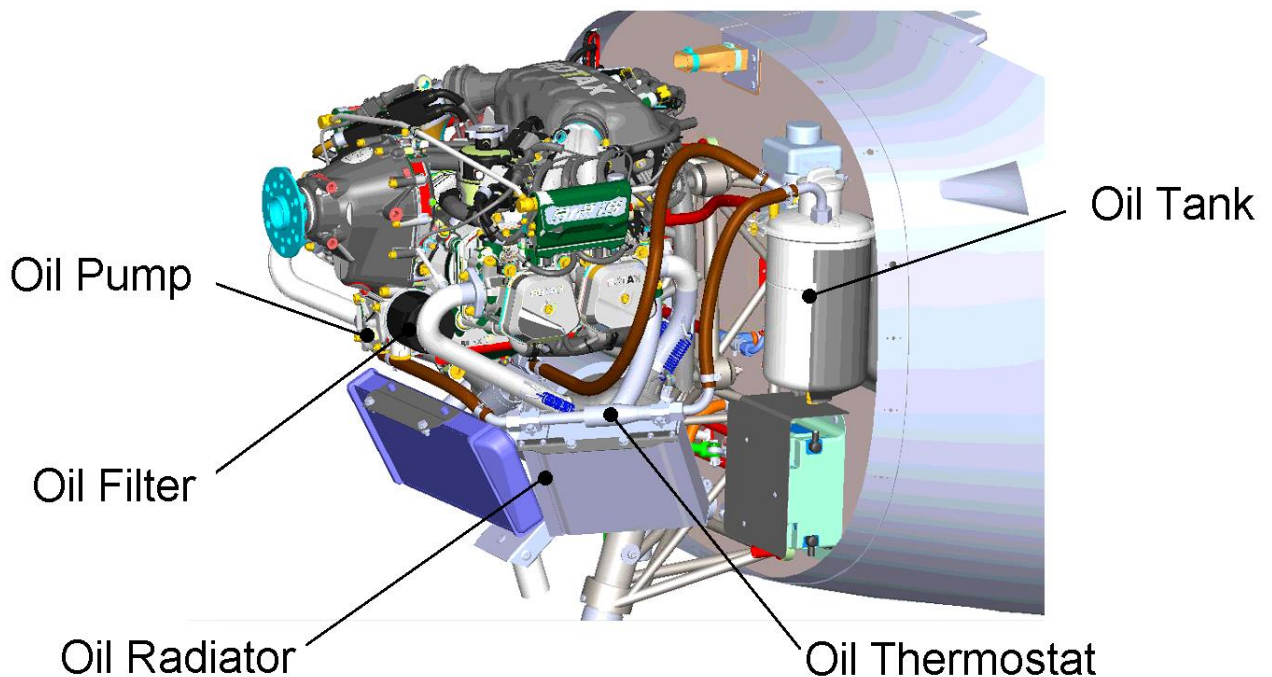


Fig. 79-00-3

79-00.3 Maintenance Practices

79-00.3.1 Oil System Check

79-00.3.1.1 Type of Maintenance

Line

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79-00.3.1.2 Minimum Level of Certification

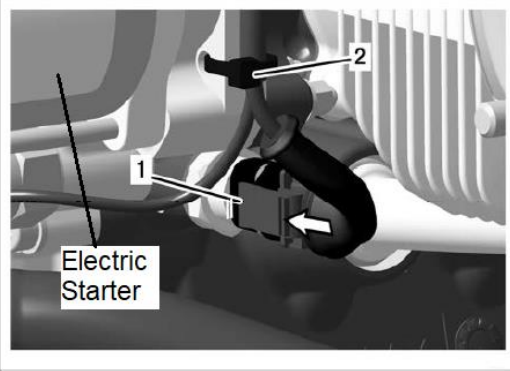
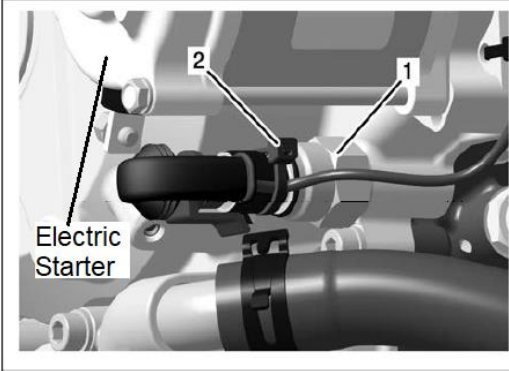
LSA- Mechanic (LSRM)

79-00.3.1.3 Procedure

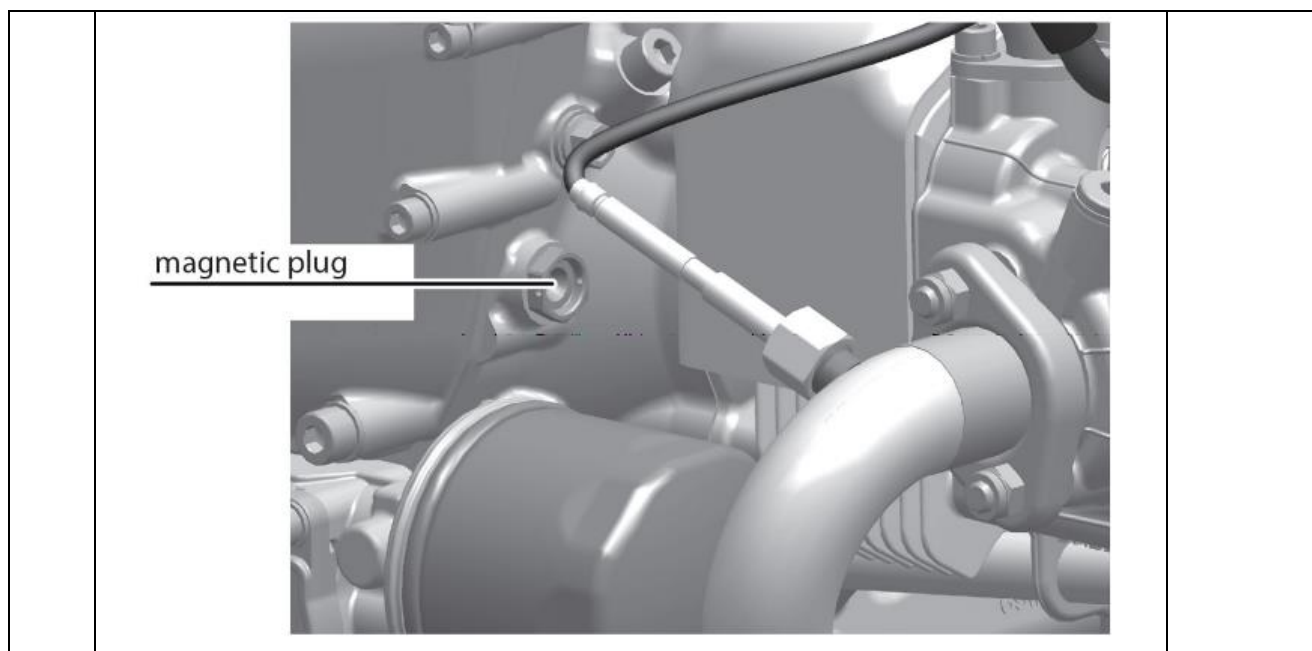
A. Recommended Special Tools and Parts

Item	Quantity	Unit
None		

B. Oil System Check

Step	Action	Reference
1	Check connections for leaks.	
2	Check oil level. Replenish if required.	
3	Check conditions of oil lines, fire sleeves and connections for leaks. Check the oil lines and fire sleeves for damage, overheating marks. Replace line or clamp if required.	
4	Check oil tank vent line for damage and blockage. Replace if required.	
5	Check oil radiator matrix for dirt, oil leaks or to see if it is mechanically blocked.	
6	<p>Check the securing and conditions of oil pressure and oil temperature sensors. Electric connector properly attached to sensor, electric wires properly fasten with cable ties, oil leaks are not observed.</p> <div></div> <p>1. Pressure sensor (OPS) 2. Cable ties 1. Temperature sensor (OTS) 2. Cable ties</p>	
7	Check the security and conditions of magnetic plug. Inspect the safety wire.	

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79-00.3.2 Oil Hoses and Lines Replacement

For maintenance instructions regarding oil hoses and lines replacement contact Flight Design Customer Care (customercare@flightdesign.com).

Flight Design defines contrary to the ROTAX Maintenance Manual that all hoses do NOT need to be replaced after 5 years. Flight Design approves that all hoses are used ON CONDITION. Contact Flight Design for further instructions.

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Appendix I. Equipment Manufacturers Operating and Maintenance Information

The following equipment manufacturer issued manuals are delivered together with the aircraft, and are valid for the specific aircraft S/N. It is the responsibility of the aircraft operator, to verify the sources identified by the equipment manufacturer for possible updates made available through the equipment manufacturer.

- **Note:** It is permitted to amend the subsequent table with separate sheets, when necessary. In this case those amended sheets shall be permanently attached to this document, marked with aircraft S/N and call sign, and identified in the Record of Manual Revisions at the beginning of this document (Section I).

The table below shall be filled out manually, considering the following explanations:

- **Issuing Company** Full name of the company which issues the document, typically the equipment manufacturer;
- **Document No.** Document number, part number or order number, as applicable, as issued by the equipment manufacturer;
- **Document Title** Correct and full title of the document;
- **Rev.** Number (level) of revision of the document as assigned by the equipment manufacturer;
- **Name** Name of the person who makes the entry to this section of this document in legible letters;
- **Signature** Signature or short sign of the person who makes the entry to this section of this document.
-

<i>Aircraft S/N</i>		<i>Call Sign</i>			
<i>Issuing Company</i>	<i>Document No.</i>	<i>Document Title</i>	<i>Rev.</i>	<i>Name</i>	<i>Signature</i>

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