PS-28 Cruiser / SportCruiser

MAINTENANCE MANUAL

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PS-28 Cruiser / SportCruiser

MAINTENANCE MANUAL

PS-28 Cruiser / SportCruiser aircraft is designed and manufactured by

CZECH
SPORT AIRCRAFT

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RECORD OF REVISIONS

Rev. No.	Revision name	Changed pages	Issue date	Date and signature
1	Formal correction, supplementation of engine Rotax 912 S, supplementation of chapter General Safety Information; supplementation of parts with life limitation, revision of inspections tasks and lubrication chart; supplementation of aileron rod sealing; change of control surface deflections; supplementation of BRS and ELT; check after shimmy occurrence; change of fuel quantity sensor type, supplementation of fuel filter cleaning; supplementation of engine Rotax 912 S, SR3000 propeller and appropriate maintenance practices supplementation of fuses, change of battery type; chapter rename, supplementation of typical instrument panels and COMM / NAV equipment description and maintenance practices	i to iv, 0-1, 03 to 0-6, 1-1, 1-3 to 1-6, 1-8, 1-9 2-1 to 2-16 4-6, 4-7, 6-27, 7-1 to 7-12, 8-1, 8-12 to 8-15, 8-17 to 8-23, 9-1, 9-5, 9-8, 9-12 10-1 to 10-40 11-2, 11-6, 11-7, 11-11, 11-12 12-1 to 12-30,	2011-07-08	2011-07-08 Konečný

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Contents

1.1 Introduction

In accordance with requirements of the ASTM LSA regulations, the Czech Sport Aircraft a.s., as manufacturer of PS-28 Cruiser / SportCruiser airplane, provides information on maintaining airworthiness of the PS-28 Cruiser / SportCruiser airplane. Information is also contained in the following manuals issued by airplane manufacturer or by manufacturers of equipment used on the airplane:

- Pilot Operating Handbook
- Maintenance Manual
- Illustrated Parts Catalog
- Operator's Manual for ROTAX Engine Type 912 Series
- Maintenance Manual for ROTAX Engine Type 912 Series
- Technical description and operation instructions for the propeller

This Maintenance Manual contains information on airplane maintenance including description of airplane structure and function.

1.2 Airplane Classification

PS-28 Cruiser / SportCruiser airplane is two-seat, single engine, low-wing, all-metal airplane with fixed three-wheel landing gear.

The airplane is designed for basic and advanced training and for leisure time flying.

1.2.1 Power Unit

Power unit consists of:

- Four-stroke, four-cylinder engine with opposite pistons Rotax 912 S / 912 ULS with max. continuous power of 69 kW (92.5 hp) at 5 500 RPM.
- Three-blade, ground adjustable propeller or
- Two-blade, ground adjustable propeller or
- Two-blade, in flight adjustable propeller.

1.2.2 Main Technical Data

Wing

- Span..... 8.600 m *(28.22 ft)*
- Area..... 12.3 m^2 *(132.3 sq.ft)*
- MAC ..... 1500 mm *(59.1 in)*
- Wing loading ..... 49 kg/m^2 *(10.0 lb/sq.ft)*
- Aileron area..... 0.40 m^2 *(4.31 sq.ft)*
- Flap area..... 0.65 m^2 *(7.0 sq.ft)*

Fuselage

- Length..... 6.620 m *(21.78 ft)*
- Width ..... 1.280 m *(50.4 in)*
- Height..... 2.315 m *(7.60 ft)*
- Cockpit width..... 1.170 m *(46 in)*

Horizontal tail unit

- Span..... 2.930 m *(9.61 ft)*
- HTU area..... 2.2 m^2 *(23.7 sq.ft)*
- Elevator area..... 0.8 m^2 *(8.6 sq.ft)*

Vertical tail unit

- Height..... 1.07 m *(3.51 ft)*
- VTU area..... 1 m^2 *(10.7 sq.ft)*
- Rudder area ..... 0.4 m^2 *(4.3 sq.ft)*

Landing gear

- Wheel track ..... 1.520 m *(4.98 ft)*
- Wheel base ..... 2.070 m *(6.79 ft)*
- Nose landing gear wheel diameter ..... 343 mm *(13.5 in)*
- Main landing gear wheel diameter..... 343 mm *(13.5 in)*

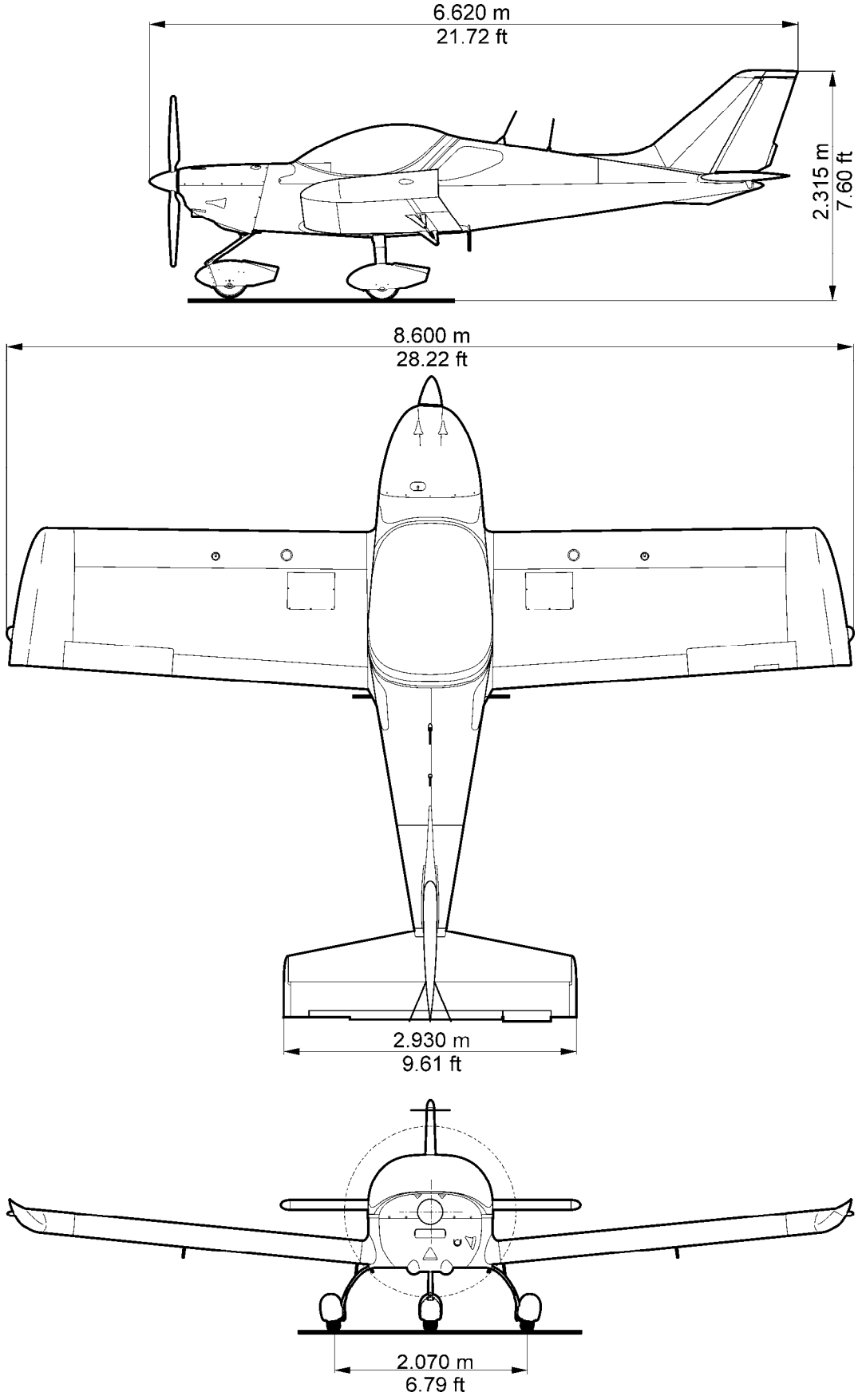

Fig. 1-1: Three-view drawing

1.3 Airplane Manufacturer and Type Certificate Holder

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1.4 Chapter Order

Chapters in this manual are ordered in ascending sequence from No. 1. Every chapter describes one system or assembly.

1.4.1 Page Numbering

Example:

12 – POWERPLANT

Chapter Number nad Title

Page **12 – 10**

Chapter No. | Page No.

1.5 Warnings, Cautions, and Notes

WARNING: **MEANS THAT NON-OBSERVATION OF THE CORRESPONDING OPERATING INSTRUCTION, INSPECTION OR MAINTENANCE PROCEDURE CAN LEAD TO INJURY OR DEATH OF PERSONS.**

CAUTION: MEANS THAT NON-OBSERVATION OF THE CORRESPONDING OPERATING INSTRUCTION, INSPECTION OR MAINTENANCE PROCEDURE CAN LEAD TO DAMAGE OR DESTRUCTION OF DEVICE.

NOTE: Means that the corresponding operating instruction, inspection or maintenance procedure is considered to be important.

1.6 General Safety Information

Safety must be considered the first priority when performing maintenance or service on an aircraft or part. To minimize the risk to both yourself and others, begin by thinking through each task that is to be performed before starting any work. Using common sense, think of ways to avoid these hazards. Be sure to also use the right tool for the task at hand and to use the proper personal protective equipment. Such equipment may include, but is not limited to:

- Eye protection – safety glasses, goggles, and face shield
- Gloves
- Hearing protection – ear plugs or muffs
- Apron
- Protective footwear with non-slip soles

Some other general rules to follow are:

- Prior to performing maintenance or repair always disconnect the negative (-) battery cable from the battery.
- During all service and repair work beware of activating the BRS rocket (if installed).
- Never leave the ignition switch or the master switch turned on when the engine is not running. While running the engine on the ground, keep away from the propeller.
- Remove any loose clothing, such as neckties and scarves. Tuck in your shirt and secure any long hair to prevent them from becoming tangled in power tools.
- Remove all jewelry. Not only can items such as rings, watches, and necklaces become caught in rotating tools, they can also conduct electricity and may cause a short circuit. This could result in burns or damage to electrical circuits.
- Aviation gasoline is also highly flammable. When working with the fuel system, always work in a well-ventilated environment. Any nearby source of ignition such as sparks or an open flame can result in a fire or explosion. Keep all ignition sources away. Always ground the airframe to a suitable earth ground during fueling/defueling operations to reduce the risk of a static discharge ignition source.
- When working with the landing gear, always support the aircraft properly with jacks. Do not work underneath the aircraft unless it is properly supported.

1.7 Definitions and abbreviations

ACCU	Accumulator
ALT	Altimeter
ATC	Air Traffic Control
bar	Pressure unit (1 bar = 14.5037 psi)
BEACON	Anti-collision beacon
°C	Temperature in degree of Celsius (1°C = (°F - 32) / 1.8)
CAS	Calibrated Airspeed
COMM	Communication transmitter
EFIS	Electronic Flight Instrument System
ELT	Emergency Locator Transmitter
EMS	Engine Monitoring System
°F	Temperature in degree of Fahrenheit (1°F = (°C x 1.8) + 32)
ft	foot / feet (1 ft = 12 in = 0.3048 m = 304.8 mm)
ft/min	Vertical speed in feet per minute
GPS	Global Positioning System
hp	Power unit (1 hp = 0.7457 kW)
HTU	Horizontal Tail Unit
IAS	Indicated Airspeed
IC	Intercom
IFR	Instrument Flight Rules
in	inch (1 in = 25.4 mm)
ISA	International Standard Atmosphere
KCAS	Calibrated Airspeed in knots
kg	kilogram (1 kg = 2.2046 lb)
knot	Speed in NM per hour
KIAS	Indicated Airspeed in knots
km/h	Speed in kilometer per hour
knot	Speed in NM per hour
kW	Power unit (1 kW = 1.341 hp)
l	liter (1 l = 0.22 UK gal = 0.264 US gal)
lb	pounds (1 lb = 0.4536 kg)
lbf	force unit (1 lbf = 4.45 N)
LoEP	List of Effective Pages
m	meter (1 m = 1000 mm = 3.28 ft = 39.37 in)
mm	millimeter (1 mm = 0.03937 in)
MAC	Mean Aerodynamic Chord

max.	maximum
min.	minimum or minute
mph	Speed in statute miles per hour
N	Newton - force unit (1 N = 0.225 lbf)
NM	Nautical Mile (1 NM = 1852 m)
OAT	Outside Air Temperature
OFF	System is switched off or control element is in off-position
ON	System is switched on or control element is in on- position
POH	Pilot Operating Handbook
psi	Pressure unit - pounds per square inch (1 psi = 0.0689bar)
RoR	Record of Revisions
rpm	revolutions per minute
sec.	second
SM	Statute Mile (1SM = 1.609 m)
US gal	US gallon (1 US gal = 0.83 UK gal = 3.785 l)
V	Volt
VFR	Visual Flight Rules
VMC	Visual Meteorological Conditions
VSI	Vertical Speed Indicator
VTU	Vertical Tail Unit
V_A	Maneuvering airspeed
V_{FE}	Maximum flap extended speed
V_{NE}	Never exceed speed
V_{NO}	Maximum structural cruising speed
V_{SO}	Stall speed with wing flaps in extended position
V_{S1}	Stall speed with wing flaps in retracted position
V_X	Best angle of climb speed
V_Y	Best rate of climb speed
XPDR	Secondary radar transponder
TSN	Time since new
TSO	Time since overhaul
FH	Flight hour
Cycle	Flight

Contents

2.1 General

This chapter contains information about:

- airframe life limitations
- aircraft parts life limitations
- terms and list of aircraft regular maintenance works
- lubrication chart

2.2 Airframe life limitation

Initial airframe life is 5000 FH.

2.3 Aircraft parts life limitation

	ITEM	INTERVAL	REPLACE	OVERHAUL	NOTES
1	Engine	2000 FH		X	See OM for Engine Type 912 Series
2	Klassic 170/3/R propeller				No specified overhaul time
3	Sensenich 2A0R5R70EN propeller				No specified overhaul time
4	SR3000/2W propeller	1500 FH		X	See OM Electrical adjustable aircraft propeller SR 3000
5	BRS rocket	12 years	X		
6	BRS parachute	25 years	X		Every 6 years repack
7	Flexible fuel lines	5 years	X		
8	Flexible oil lines	5 years	X		
9	Battery	At capacity drop below 80%	X		
10	ELT main unit battery	5 years	X		
11	ELT remote unit battery	5 years	X		

2.4 Ordering spare parts

Order spare parts through the Airplane failures card - see Section 17.4.

2.5 Terms and list of aircraft regular maintenance works

2.5.1 General

Authorization to perform Time Limits/Maintenance Checks and Inspections:

Repairman (LS-M) or Mechanic (A&P)

Maintenance system serves to maintain flight airworthiness of the PS-28 Cruiser / SportCruiser airplane.

Maintenance system is composed of special and scheduled inspections, which must be performed at least in the following intervals:

CAUTION: THE INTERVALS OF ENGINE INSPECTIONS AND THE LIST OF WORKS ARE SHOWN IN THE MAINTENANCE MANUAL (LINE MAINTENANCE) FOR INSTALLED ENGINE. THE INTERVALS OF PROPELLER INSPECTIONS AND THE LIST OF WORKS ARE SHOWN IN INSTALLATION AND OPERATION INSTRUCTIONS FOR THE INSTALLED PROPELLER. IF THE PERIODICAL INSPECTION IS PERFORMED BEFORE REACHING THE SPECIFIED TIME INTERVAL, THEN THE FOLLOWING INSPECTION MUST BE PERFORMED AT THE LATEST WITHIN THE SPECIFIED TIME INTERVAL FROM THIS INSPECTION (E.G. IF THE FIRST 100-FH INSPECTION IS PERFORMED AFTER 87 FH THEN THE FOLLOWING 100-FH INSPECTION MUST BE PERFORMED AT THE LATEST AFTER 187 FH).

(a) Preflight inspection is performed within the scope given in the POH, Section 4.

(b) Special propeller inspection after first 5 and 50 FH (see Installation and Operating Instructions for installed propeller).

NOTE: To be performed with a newly installed propeller or with the propeller that was dismantled and reinstalled on the airplane.

(c) Special engine inspection after the first 25 FH.

CAUTION: INSPECTION AFTER THE FIRST 25 FH TO BE PERFORMED WITH THE NEW ENGINE OR WITH THE ENGINE AFTER OVERHAUL.

(d) Scheduled inspection after 25, 50 FH - inspection of engine and appropriate propeller.

(e) Scheduled inspection after 100+5 FH - airframe and propeller inspections, engine inspection according to maintenance system, which is described in Maintenance Manual (Line Maintenance) for installed engine.

CAUTION: 100-FH LIMIT CAN BE EXCEEDED MAX. BY 5 FH PROVIDING THAT THIS EXCEEDING WILL BE JUST TO FINISH FLIGHT WHICH STARTED BEFORE REACTING 100-FH TERM OR FOR FLIGHT WITH THE PURPOSE TO REACH A PLACE WHERE THE INSPECTION WILL BE CARRIED OUT. OPERATION TIME, WHICH EXCEEDED 100-FH INTERVAL, MUST BE INCLUDED AS A TIME FLOWN FOR DETERMINATION OF THE NEXT 100-FH INSPECTION.

(f) Scheduled annual inspection contains works of 100-FH inspection and other specified works (inspections of airframe, engine and propeller).

2.5.2 Tables of inspection tasks

Tables of inspection tasks include the list of all works, which are performed during inspection.

Number of chapter is indicated in the first column of this Maintenance Manual where you can also find more detailed information for performing individual works.

The description of works, which are performed during inspection, is indicated in the second column.

CAUTION: ALL DEFECTS FOUND OUT DURING AIRCRAFT INSPECTIONS MUST BE ELIMINATED!

SPECIAL INSPECTION AFTER FIRST 5 AND 25 FH

Aircraft S/N: …… **TSN (FH):** ……

Registration mark: …… **TSN (cycles):** ……

Chpt.	Prescribed works	Made by	Checked by
10	**Engine and propeller**		
	List of performed operations for engine is shown in Maintenance Manual (Line Maintenance) for ROTAX Engine Type 912 Series (MML-912).		
	List of performed operations for the propeller is shown in Installation and Operating Instructions for installed propeller.		
	Remove and check engine cowlings for evident signs of heat damage or cracks.		
	Inspect and check tightening and securing bolts on the engine brackets and the engine mount.		
	Check the engine mount for occurrence of cracks.		
	Check the exhaust system (and its attachment) for occurrence of cracks on the exhaust system and welds (see 10.4.5).		
	Remove and clean the fuel filter screen inserted in gascolator.		
	Fuel system – visual check of tightness.		
	Oil system – visual check of tightness.		
	Cooling system – visual check of tightness.		

Notes:

Date: …… Signature:……

SCHEDULED INSPECTION AFTER 25 AND 50 FH

Aircraft S/N: …… **TSN (FH):** ……

Registration mark: …… **TSN (cycles):** ……

Chpt.	Prescribed works	Made by	Checked by
10	**Engine and propeller**		
	List of performed operations for engine is shown in Maintenance Manual (Line Maintenance) for ROTAX Engine Type 912 Series (MML-912).		
	List of performed operations for the propeller is shown in Installation and Operating Instructions for installed propeller.		
	Remove and check engine cowlings for evident signs of heat damage or cracks.		
	Inspect and check tightening and securing bolts on the engine mount and the engine brackets.		
	Check the engine mount for occurrence of cracks.		
	Check the exhaust system (and its attachment) for occurrence of cracks on the exhaust system and on welds (see 10.4.5).		
	Remove and clean the fuel filter screen inserted in gascolator. (see 9.5.3).		

Notes:

Date: …… Signature:……

SCHEDULED ANNUAL PERIODICAL INSPECTION OR INSPECTION AFTER 100 FH

Aircraft S/N: …… **TSN (FH):** ……

Registration mark: …… **TSN (cycles):** ……

Type of inspection: ……

Chpt.	Prescribed works	Made by	Checked by
	General		
	Check the aircraft's logbooks for condition and check if all prescribed records are current (airplane log book, engine log book, propeller log book, and etc.).		
	Check the remaining service life of life limited items.		
	Check that the replacement or overhaul of life limited parts has been in accordance to their specified intervals.		
	Assure that replacements of these parts are performed in appropriate intervals.		
	Check all issued Airworthiness Directives for their accomplishment.		
	Check all aircraft, engine and propeller service bulletins for their accomplishment.		
	Clean the cockpit carefully.		
	Clean the aircraft's exterior, engine and propeller carefully.		
	Check all exterior and interior markings and placards for their condition (legibility, placement and security).		
	Remove and/or open all required covers and hatches.		
	Jack and support the aircraft.		
3	**Fuselage**		
	Visually check surface condition including fiberglass parts - loosened rivets, deformation, cracks and some other damage.		
	Check condition of fuselage-wing and fuselage-stabilizer fairings.		
	Check condition of foot rests.		
	Check condition and attachment of the tailskid.		
	Check condition and attachment of the towing gear (if installed); check for free travel of the control lever.		
	Check condition and attachment of the canopy frame.		
	Check condition of the canopy plexiglass and fixed windows (scratches, cracks, silvering).		
	Check condition and function of canopy gas struts.		
	Check attachment and function of the sunshield.		
	Check condition of the canopy control including canopy lock.		
	Check condition and adjustment of terminal switches.		
	Check condition of rubber sealing of the canopy.		

SCHEDULED ANNUAL PERIODICAL INSPECTION OR INSPECTION AFTER 100 FH

Chpt.	Prescribed works	Made by	Checked by
4	**Wing**		
	Visually check surface condition - loosened rivets, deformation, cracks and some other damage.		
	Check play in the wing attachments.		
	Check condition of antislip strips.		
	Check condition of the wing lockers.		
	Check condition and attachment of the wing tips.		
	Aileron		
	Visually check surface condition - loosened rivets, deformation, cracks and some other damage.		
	Check for free travel.		
	Check hinges.		
	Check for securing control links.		
	Check condition and attachment of the trim tab (right aileron only).		
	Flap		
	Visually check surface condition - loosened rivets, deformation, cracks and some other damage.		
	Check for free travel.		
	Check hinges.		
	Check condition of the control rods and actuator.		
5	**Tail Unit**		
	HTU		
	Visually check surface condition - loosened rivets, deformation, cracks and some other damage.		
	Check horizontal stabilizer attachment and securing.		
	Check elevator attachment and securing.		
	Check condition and attachment of elevator tips.		
	Check free travel of the elevator.		
	Check condition of stop (elevator fully deflected down).		
	Check condition and attachment of the trim tab.		
	Check trim tab actuator connector for connection and securing.		
	Check condition and attachment of the balance tab.		
	Check condition and securing of the elevator control rod and the trim tab control actuator.		
	VTU		
	Visually check surface condition - loosened rivets, deformation, cracks and some other damage.		
	Check attachment and securing of the rudder lower hinge.		

SCHEDULED ANNUAL PERIODICAL INSPECTION OR INSPECTION AFTER 100 FH

Chpt.	Prescribed works	Made by	Checked by
5	**Tail Unit (continued)**		
	Check for free travel of the rudder.		
	Check condition of the stops on the vertical fin.		
	Check attachment and securing of rudder cables.		
	Check run cables over pulleys, securing of the pulleys.		
6	**Control**		
	Aileron and Elevator Control		
	Check for free travel of control (see 6.4.2).		
	Check plays (see 6.4.1).		
	Check securing of links.		
	Check condition of the stops.		
	Rudder Control		
	Check free play of control (see 6.4.2).		
	Check plays (see 6.4.1).		
	Check securing of links.		
	Check condition and attachment of pedal springs.		
	Check condition and tension of cables (see 6.4.5).		
	Check adjustment of pedals and full deflections in all position.		
	Flap Control		
	Check for free travel of the control lever.		
	Check securing of links.		
	Check condition of control actuator and position indicator.		
	Control of the Pitch and Roll Trim Tab		
	Check condition of the control actuators and position indicators.		
	Check plays (see 6.4.1).		
	Check securing of links.		
	Check trim tab neutral position adjustment.		
7	**Equipment**		
	Check cleanness and condition of upholstery.		
	Check condition of seats.		
	Check condition, damage, function and attachment of safety harnesses and straps in baggage compartment.		
	Check condition and attachment of ELT.		
	Check attachment and security of BRS parachute container and rocket.		
	Check security and routing of airframe BRS bridles		

SCHEDULED ANNUAL PERIODICAL INSPECTION OR INSPECTION AFTER 100 FH

Chpt.	Prescribed works	Made by	Checked by
7	**Equipment (continued)**		
	Check attachment, security and routing of BRS activating handle.		
	Check attachment of egress cover.		
8	**Landing Gear**		
	Main Landing Gear		
	Check condition of landing gear legs and attachment points.		
	Check attachment of the wheel axis.		
	Remove and disassemble wheel, clean and lubricate the bearings; reassemble it and install back.		
	Check condition, wear and inflation of tires.		
	Check condition of the wheel disk for occurrence of cracks.		
	Check securing of bolts.		
	Check wheel for free rotation.		
	Check condition and attachment of wheel fairings.		
	Check function of brakes and parking brake.		
	Check condition and attachment of brake hoses.		
	Check visually (using mirror) the condition and wearing of brake pads (minimum admissible thickness of brake pad is 2.5 mm) and brake disc.		
	Check brake fluid leakage - brake fluid hoses, brake pumps, brake cylinders. Replenish brake fluid as needed (see 8.5.4).		
	Exchange brake fluid - applied for annual inspection only (see 8.5.4).		
	Nose Landing Gear		
	Check condition and attachment points of landing gear leg in fuselage.		
	Check of the landing leg tube and fork for cracks.		
	Remove and disassemble wheel, clean and lubricate the bearings; reassemble it and install back.		
	Check condition, wear and inflation of tire.		
	Check condition of wheel disk and for occurrence of cracks.		
	Check securing of bolts.		
	Check for free travel of wheel rotation.		
	Check of friction shock absorber, check friction torque; as necessary tighten the nut (see 8.4.2).		
	Check condition and attachment of wheel fairing.		
	Check depression of nose wheel absorber (see 8.4.1).		

SCHEDULED ANNUAL PERIODICAL INSPECTION OR INSPECTION AFTER 100 FH

Chpt.	Prescribed works	Made by	Checked by
9	**Fuel System**		
	Drain fuel tanks and gascolator (see 9.5.2).		
	Remove and clean or replace the fuel filter screen inserted in gascolator (see 9.5.3).		
	Check condition and integrity of fuel pumps and hose sleeves in the engine compartment.		
	Check fuel selector valve for attachment, function and arrestment.		
	Visually check for fuel system tightness.		
	Check of condition and function of filler caps.		
	Check tightness and condition of fuel pump for occurrence of cracks on the pump body (see 9.4.2).		
	Visual check for impurities in the tank.		
	Check the fuel tank's vent for its condition (assure that the vent tube is not clogged).		
10	**Engine and Propeller**		
	List of performed operations for engine is shown in Maintenance Manual (Line Maintenance) for ROTAX Engine Type 912 Series (MML-912).		
	List of performed operations for the propeller is shown in Installation and Operating Instructions for installed propeller.		
	Remove and check engine cowlings for evident signs of heat damage or cracks.		
	Check attachment of the propeller and propeller spacer.		
	Check condition of the firewall and equipment on firewall.		
	Inspect and check for tightening and securing the bolts on the engine brackets and the engine mount.		
	Check the engine mount for cracks.		
	Check the exhaust system (and its attachment) for cracks on the exhaust system and on welds (see 10.4.5).		
	Check condition and attachment of the airbox.		
	Check condition and cleanness of the air filter.		
	Check for leak of fluids.		
	Check function and condition of throttle and choke controls.		

SCHEDULED ANNUAL PERIODICAL INSPECTION OR INSPECTION AFTER 100 FH

Chpt.	Prescribed works	Made by	Checked by
11	**Electrical System**		
	Check attachment and condition of battery.		
	Check level of battery charge.		
	Perform battery capacity test- applied for annual inspection only.		
	Check condition, attachment and integrity of wiring.		
	Check condition and securing of plug/socket outlets.		
	Check condition of switches, fuses and circuit breakers.		
	Check condition of the landing light.		
	Check condition of the position lights.		
12	**Instruments and Avionics**		
	Check general condition and attachment of the instrument panel.		
	Check condition and attachment of instruments.		
	Check condition and attachment of the pitot tube.		
	Check cleanness of air inlet holes of pitot tube.		
	Check attachment and securing of hoses to the instruments.		
	Check for pitot-static system tightness (see 12.4.1) (with 2 years periodicity).		
	Visually check condition of navigation and communication instruments.		
12	**Instruments and Avionics (continued)**		
	Perform compensation of magnetic and EFIS compass (every two years).		
	Check condition of COMM, ELT, XPDR, NAV antennas and OAT probe.		
13	**Heating and Ventilation System**		
	Check cleanness and passage of air inlet holes.		
	Check line and integrity of the heating and ventilation system hoses.		
	Check condition and attachment of the heat exchanger.		
	Check of functionality of rod and flap.		
All	Check for corrosion.		
	Check for hard handling.		

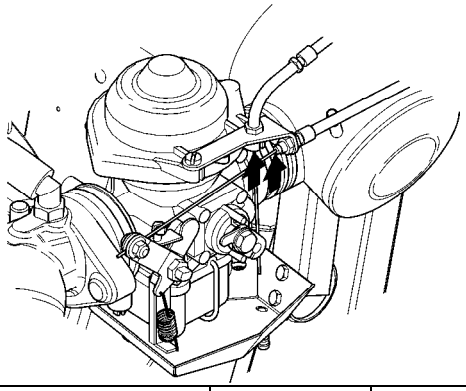
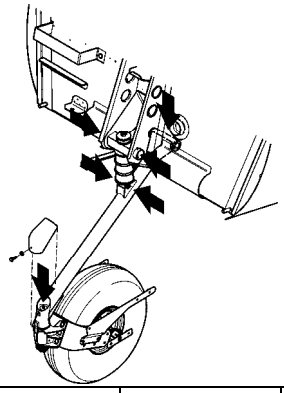
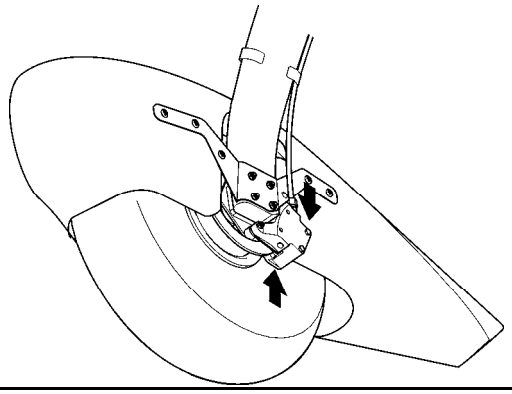
SCHEDULED ANNUAL PERIODICAL INSPECTION OR INSPECTION AFTER 100 FH

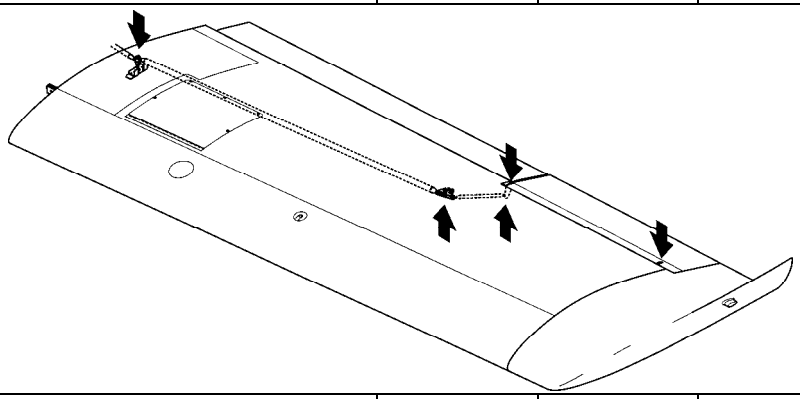
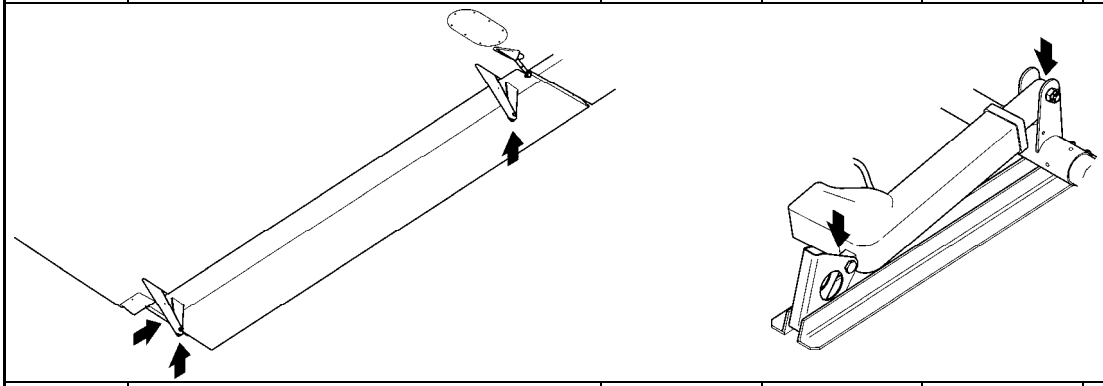
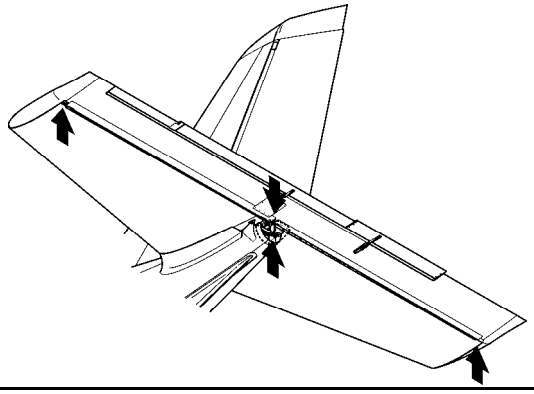
Chpt.	Prescribed works	Made by	Checked by
	Operational and Functional Tests		
	Check the function of the interior and exterior lighting.		
	Check the function of the canopy closed signalization.		
	Check the function of the flap control actuator including signalization.		
	Check the function of the roll and pitch control actuators including signalization.		
	Check function of navigation and communication instruments - in accordance with all valid and applicable regulations - applied for annual inspection only.		
	ELT - perform a functional test according to the applicable regulations		
	Check function of the signalling / warning lights.		
	Check all instruments for their function.		
	Close up Tasks		
	Lubricate all items according to the lubrication chart.		
	Install and close all covers and hatches.		
	Lower the aircraft.		
	Carry out an engine performance check and verify the engine's power.		
	After engine run-up, test and visually check the fuel and oil system for leakage and their security of all components.		
	Check the removal of all detected defects.		
	Fill out the required logbook entries.		

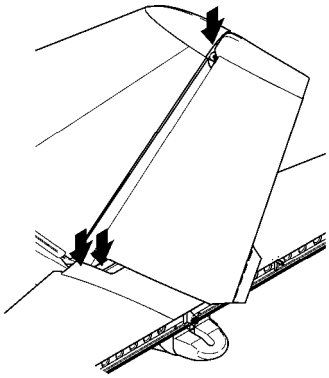
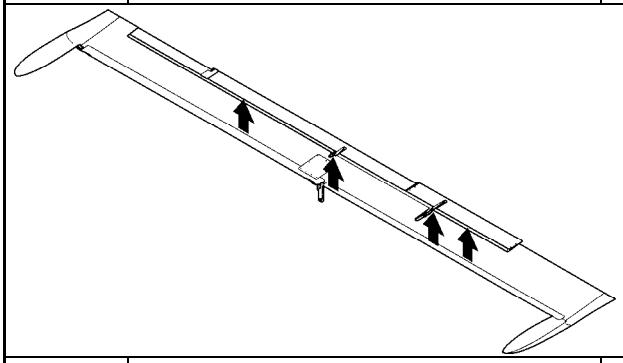
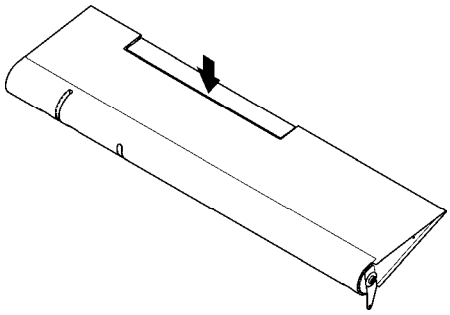
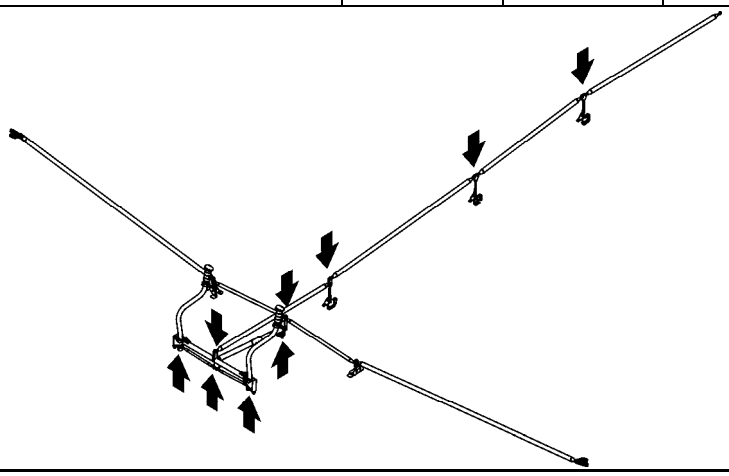
Notes:

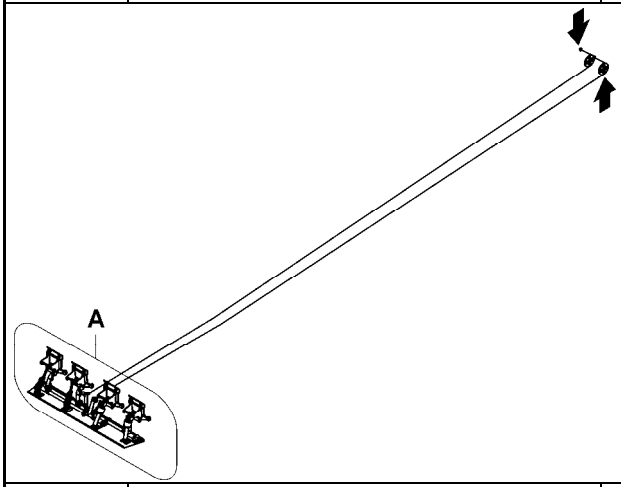
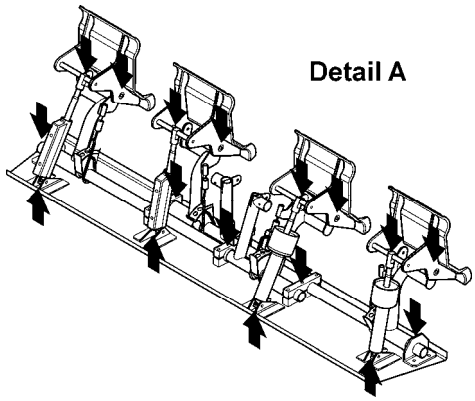
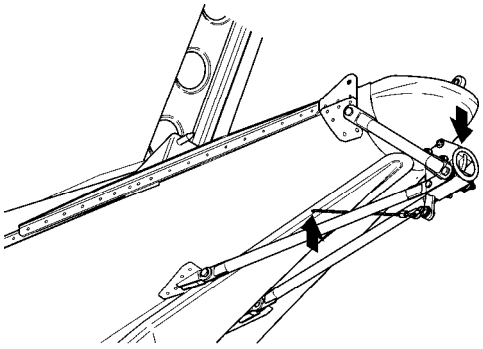
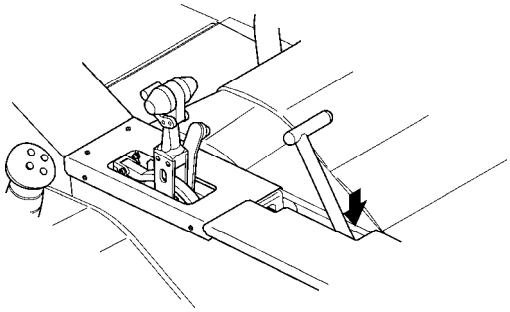
Date: …… Signature:……

2.6 Lubrication chart

Unit	Area of lubrication	After first 25 FH	Every 100 FH	Every 500 FH	Lubricant
Engine	Throttle control cable on the inlet into terminal (in the engine compartment).	X	X	X	LPS
	Choke control cable on the inlet into terminal (in the engine compartment).	X	X	X	LPS
					
Nose landing gear	Landing gear leg in the area of mounting (lubricator) and the axis of rotation (do not lubricate the friction areas).	X	X	X	AeroShell Grease 22
					
Main landing gear	Brake pad pins.	X	X	X	LPS3
					

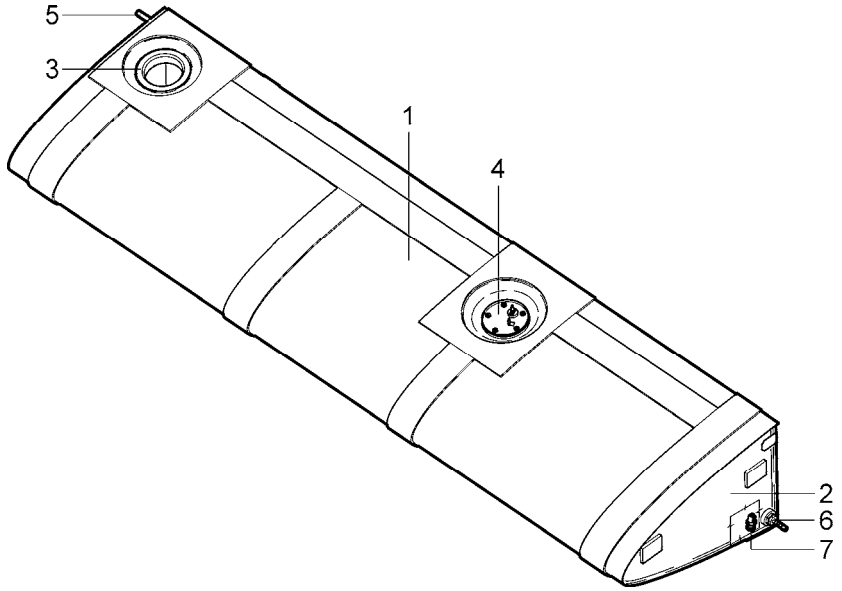
Unit	Area of lubrication	After first 25 FH	Every 100 FH	Every 500 FH	Lubricant
Ailerons	Hinges.	X	X	X	AeroShell Grease 22
	Rod end bearings of the control tubes.	-	-	X	AeroShell Grease 22
	Two-arm control levers in the fuselage.	-	-	X	AeroShell Grease 22
	Bell cranks in the wings.	-	-	X	AeroShell Grease 22
					
Flaps	Hinges.	X	X	X	AeroShell Grease 22
	Rod end bearings on actuator.	-	-	X	AeroShell Grease 22
					
HTU	Elevator hinges.	X	X	X	AeroShell Grease 22
	Rod end bearing of the elevator control tubes.	-	-	X	AeroShell Grease 22
					

Unit	Area of lubrication	After first 25 FH	Every 100 FH	Every 500 FH	Lubricant
VTU	Rudder hinges.	X	X	X	AeroShell Grease 22
	Cable shackles on the rudder control cables.	X	X	X	AeroShell Grease 22
					
Trim and balance tabs	Tabs hinges.	X	X	X	LPS1
	Rod end on actuators.	X	X	X	AeroShell Grease 22
	 				
Aileron, elevator control	All movable links in the cockpit.	-	-	X	AeroShell Grease 22
					

Unit	Area of lubrication	After first 25 FH	Every 100 FH	Every 500 FH	Lubricant
Rudder control	All movable links in the cockpit.	-	-	X	AeroShell Grease 22
	Cable shackles of rudder control.	X	-	X	AeroShell Grease 22
 					
Towing gear	Control cable on the inlet into terminal, control lever	X	X	X	LPS
	Tow hook	X	X	X	AeroShell Grease 22
 					

4.2.4 Fuel tanks

Fuel tanks are of welded all-metal structure consisting of aluminum sheet metal skin (1, Fig. 4-5) and two ribs (2). There are on each tank filler neck (3), fuel quantity sensor (4), venting tube (5), finger screen (6) and drain valve (7).



1 Metal skin
2 Rib
3 Filler neck
4 Fuel quantity sensor
5 Venting tube
6 Finger screen
7 Drain valve

Fig. 4-5: Fuel tank, right

4.2.5 Wing lockers

Wings are equipped with wing locker (7, Fig. 4-2) placed between ribs No.4 and 5 behind main spar. Capacity of each wing locker is 20 kg (*44 lbs*). Access doors installed on piano hinge are locked per quick fasteners.

4.3 Removal / Installation

4.3.1 Wing removal

Type of maintenance: heavy

Authorization to perform:

- Repairman (LS-M) or Mechanic (A&P).

Tools needed:

- wrench size 7/16 in, 1/2 in
- Phillips PH2 screwdriver
- cutting pliers
- hammer

(a) Remove the seats and access cover plates on the seats floor.

(b) Disconnect whole 6 nuts from the attachment bolts on the main spar and remove 6 bolts.

(c) Disconnect aileron control push rod on the control lever in fuselage behind the seats.

(d) Remove cover (11, Fig. 4-7) on the bottom wing root.

(e) Disconnect rear attachment bolts on rear spar.

(f) The first person will hold the wing on the wing tip,

(g) One person hold the wing on the winglet side, the second person by the root on the leading edge side remove first bottom attachment bolt from the main spar, the third person by the root on the trailing edge.

(h) Release the wing by slight lifting the wing tip upwards.

(i) By pulling the wing in direction from the fuselage, disconnect the outer wing from the fuselage.

(j) Move the wing about 300 mm (*12 in*) out from the fuselage and disconnect fuel lines, cable plugs, aileron rod sealing, sockets of electrical systems and on left wing also pitot-static tubes.

(k) Position the disconnected wing in such a way that its damaging cannot occur.

4.3.2 Wing installation

Type of maintenance: heavy

Authorization to perform:

- Repairman (LS-M) or Mechanic (A&P).

Tools needed:

- wrench size 7/16 in, 1/2 in
- Phillips PH2 screwdriver
- pliers
- hammer

Install the wing according to the following procedure:

(a) Before installation clean the attachments and bolts of the outer and center wing from dirt. Preserve bolts and attachments by means of lubricating grease.

(b) Set the wing about 300 mm (*12 in*) to the fuselage side. The first person will hold the wing on the wing tip, the second person near the root on the leading edge and the third person near the root on the trailing edge.

(c) Connect wiring.

(d) Connect fuel hoses and pitot-static hoses on the left wing; attach the aileron rod sealing.

(e) Set the outer wing carefully with the wing attachments on the center wing so that the attachments on the wing and on the fuselage are concentric and flap control pin placed in the flap guiding plate.

(f) The person keeping the wing on the leading edge will insert the first bolt into the upper main attachment (the bolt head is in flight direction) and shift it by means of slight hammering to the stop (shifting can be facilitated by slight moving the wing tip up and down). Then insert the bolts into the lower main attachment and shift them by slight hammering to the stop.

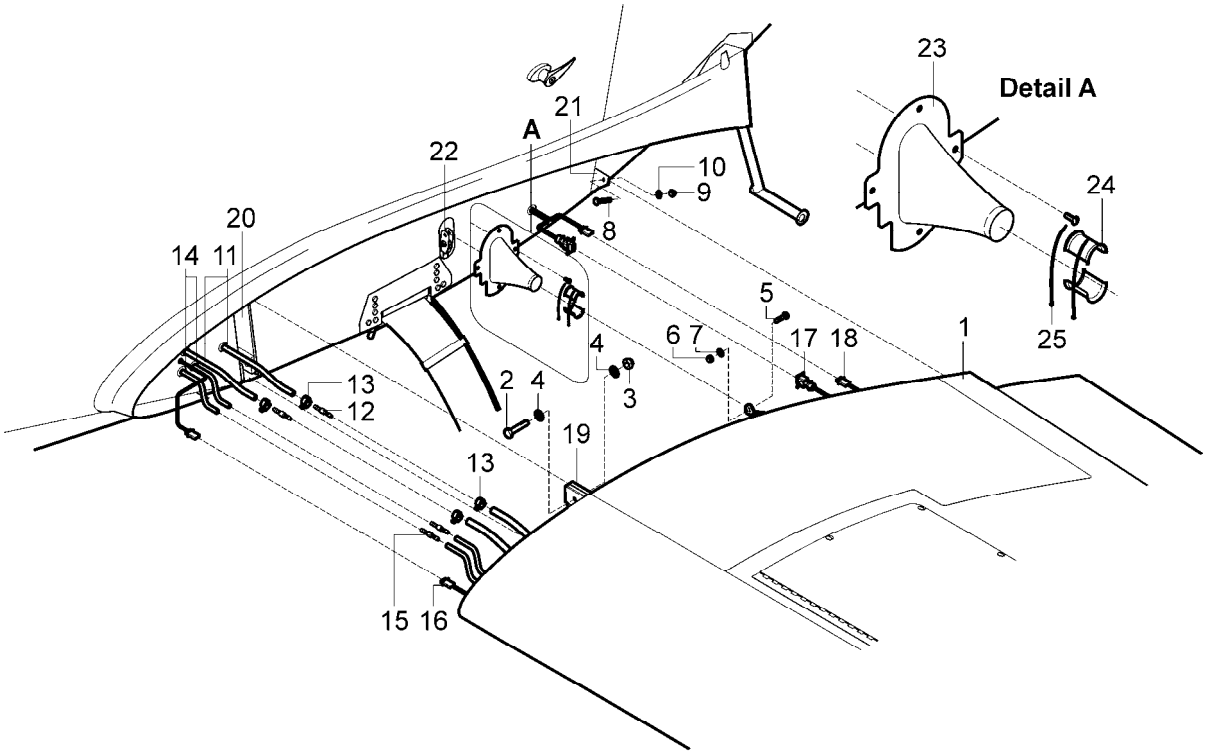
(g) Attach the bolt and nut into the rear attachment of the wing and tight it with the tightening moment 11 – 16 Nm (100 – 140 inch.lb).

(h) Put the washers on all of 6 attachment bolts of the wing and screw the nuts on them.

(i) Connect the aileron control push rod on control lever behind the seats and perform tightening up to the tightening torque.

(j) Perform check the trim tab operation, flaps and ailerons deflections (see 6.4.3), possibly adjusting of theirs deflections (see 6.4.4).

(k) Install access cover plates on the seats floor and access cover on the bottom wing root.



1 Wing, left
2 Bolt (6 pcs.)
3 Nut (6 pcs.)
4 Washer (10 pcs.)
5 Bolt
6 Nut
7 Washer
8 Bolt
9 Nut
10 Washer
11 Fuel hose
12 Hose connector
13 Hose clamp
14 Pitot static hose
15 Hose connector
16 Fuel quantity sensor wiring
17 Aileron trim tab wiring (only right side)
18 Position light wiring
19 Front attachment
20 Front attachment
21 Rear attachment
22 Control lever
23 Aileron rod sealing
24 Bush (2 pcs.)
25 Cable tie (2 pcs.)

Fig. 4-6: Wing removal / installation

4.3.3 Wing flap removal

Type of maintenance: line

Authorization to perform:

- Repairman (LS-M) or Mechanic (A&P)

Tools needed:

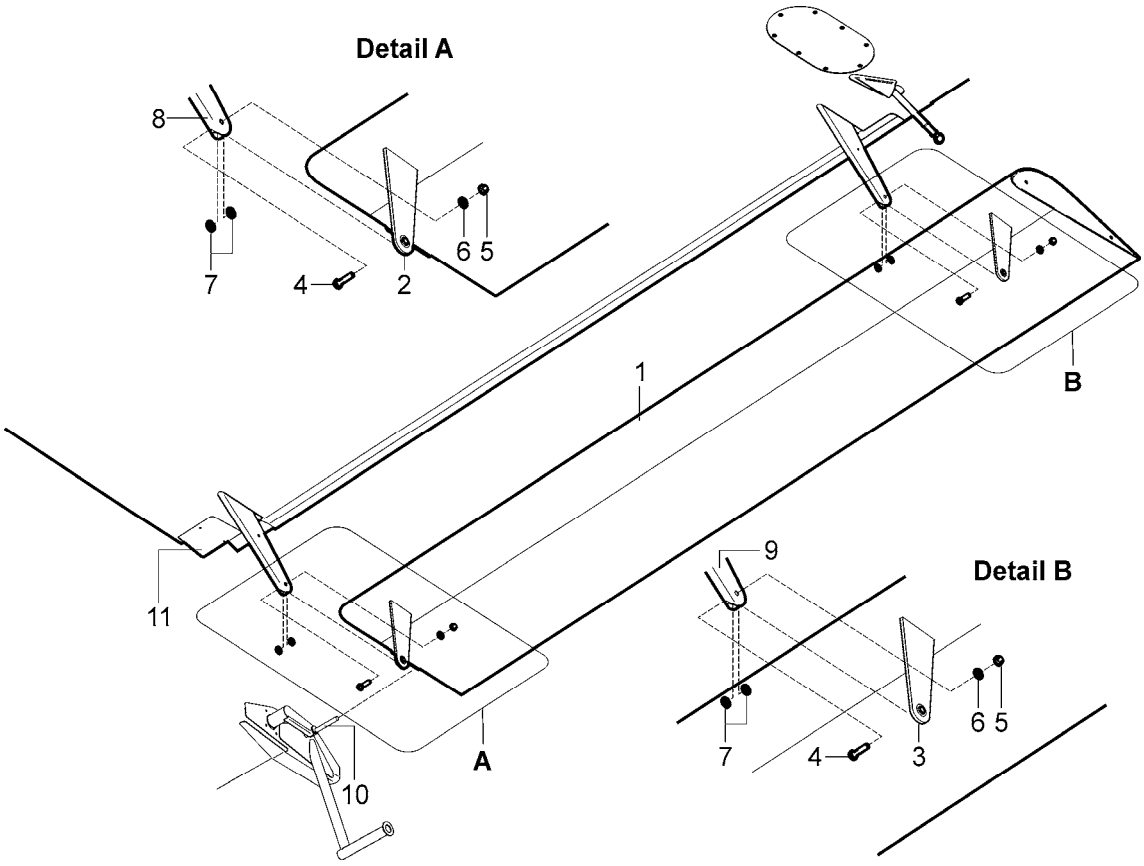
- wrench size 7/16 in

(a) Open the flap (1, Fig, 4-7) in full position.

(b) Unscrew the nuts (5), remove the washers (6), bolts (4) and disconnect both flap hinges; remove the washers (7).

(c) Carefully remove the flap (1) from the wing.

(d) Store the removed flap on a safe place and prevent it from damage.



1 Wing flap
2 Inner flap hinge
3 Outer flap hinge
4 Bolt
5 Nut
6 Washer
7 Washer
8 Wing inner flap hinge
9 Wing outer flap hinge
10 Control pin
11 Rear attachment cover

Fig. 4-7: Wing flap removal / installation

6.4.3 Checking control surface deflections

Control surface deflections of PS-28 Cruiser / SportCruiser are shown in the following table:

Aileron	15° ± 1° up 15° ± 1° down
Rudder	30° ± 2° right 30° ± 2° left
Elevator	24° ± 2° up 24° ± 2° down
Wing flap	0° to 30° ± 1°
Difference between L/R flap deflections	± 0.5°
Elevator trim tab	22° ± 2° up 28° ± 2° down
Elevator balance tab	25° ± 2° up 19° ± 2° down
Aileron trim tab	20° ± 2° up 20° ± 2° down

Tab. 6-1: Deflections of control surfaces

For measuring deflections use protractor with deflecting pointer that will be attached to an appropriate control surface by means of the clamp.

Measuring aileron deflections

(a) Attach the protractor with the deflecting pointer on the upper skin of the aileron by means of the clamp.
(b) Set the aileron to neutral position.
(c) Set the protractor to 0° - starting value for measuring.
(d) Deflect aileron to the lower (possibly upper) extreme position and read the deflection value.
(e) Check deflection values according to the Tab. 6-1.

Measuring wing flap deflections

(a) Attach the protractor with the deflecting pointer on the upper flap skin by means of the clamp.
(b) Set the wing flap to the 0°position.
(c) Set the protractor to 0° - starting value of measuring.
(d) Extend the flaps by means of the flap actuator to individual positions and read the deflection.
(e) Check deflection values according to the Tab. 6-1.

Measuring elevator deflections

(a) Set the protractor with the deflecting pointer on the trailing edge of the elevator by means of the clamps.

(b) Set the elevator to neutral position.

(c) Set the protractor to 0° - starting value of measuring.

(d) Deflect the elevator to extreme positions by means of the control stick and read the deflection.

(e) Check values of deflections according to the Tab. 6-1.

Measuring rudder deflections

The airplane manufacturer uses a special jig for measuring rudder deflections that is slid on the vertical tail unit and it is possible directly to read the rudder deflection. If you do not have this special jig, use the alternative procedure:

(a) Set the rudder to neutral position.

(b) Put the rod to the trailing edge of the rudder and mark the lower margin of the rudder trailing edge.

(c) Deflect the rudder to extreme positions and with the rule measure distance from the sign to the lower margin of the rudder trailing edge.

(d) Calculate angle and compare it with the value mentioned in the Tab. 6-1.

Measuring trim tab deflections

(a) Set the protractor with the deflecting pointer to the trailing edge of the trim tab by means of the clamp.

(b) Set the trim tab to neutral position.

(c) Set the protractor to 0° - starting value of measuring.

(d) By means of the trim control actuator deflect the trim tab to extreme positions and read the deflection.

(e) Check values of deflections according to the Tab. 6-1.

Contents

7.1 General

This is a two-seat cockpit with the side-by-side seat arrangement. The seats are fixed; the rudder control pedals are adjustable. The seats are equipped with safety harnesses. The baggage compartment is located behind the seats and is equipped with straps.

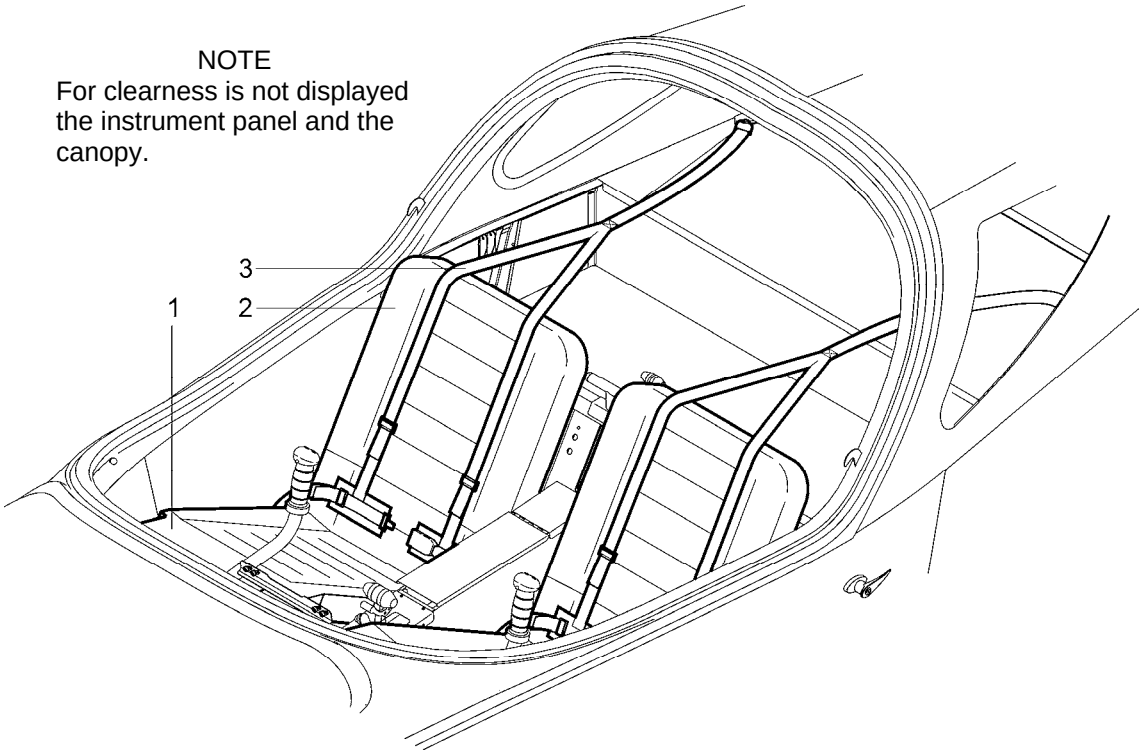
The equipment of PS-28 Cruiser / SportCruiser airplane includes:

- seats
- safety harnesses
- Ballistic Recovery System
- Emergency Locator Transmitter.

7.2 Description and operation

7.2.1 Seats

Seats (1, Fig. 7-1) of the PS-28 Cruiser / SportCruiser airplane are fixed and are equipped with upholstered cushions attached on Velcro. The seat backs (2) are attached to the bulkhead No. 4 per piano hinge.



1 Seat
2 Seat back
3 Safety harnesses

Fig. 7-1: PS-28 Cruiser cockpit

7.2.2 Safety harnesses

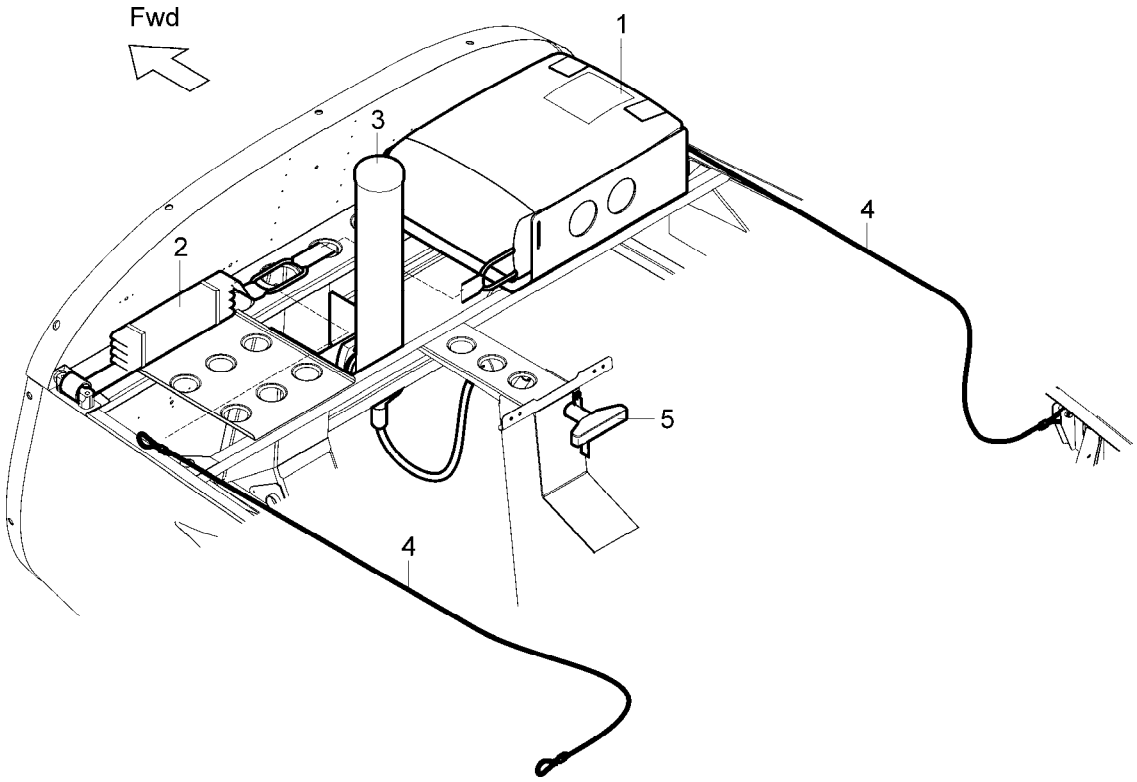
Seats are equipped with safety harnesses (3, Fig. 7-1). Safety harnesses consist of two lap belts, two shoulder belts and a safety harness lock. Length of the lap belts and the shoulder belts is adjustable.

7.2.3 Ballistic Recovery System

The aircraft can be equipped (optional) with BRS emergency parachute system. BRS utilize a manually activated, solid propellant rocket motor to extract a round, non-steerable parachute and recover the aircraft in life-threatening emergency situations.

The parachute with harnesses and the rocket are installed aft of the firewall. Activating handle is located on the middle channel.

NOTE: For detailed information refer to Owner's Manual for BRS-6 Emergency Parachute Recovery Systems (Doc. No. 020000-03) and Parachute Installation Manual for the BRS-1350 onto the Czech Sport Aircraft SportCruiser (Doc. No. 020016-PM), latest revision.



1 Parachute
2 Harnesses
3 Rocket
4 Rear attachment cable
5 Handle

Fig. 7-2: BRS scheme

7.2.4 Emergency Locator Transmitter

The aircraft is equipped with the AK-451 ELT Emergency Locator Transmitter.

The AK-451 ELT is micro controller based, batteries operated and self contained equipment. The ELT is designed only for emergency use. The AK-451 consists of an ELT main unit with a mounting tray, an aircraft-fixed antenna, remote switch unit, an audible buzzer monitor, and interconnecting cables (see Fig. 7-6).

The ELT main unit is mounted in baggage compartment, remote switch unit with the buzzer is mounted on the right instrument panel; the ELT antenna is installed on the upper part of the fuselage.

NOTE: For detailed information refer to Installation and Operation Manual for Model AK-451-( ) Series, (Doc. No. IM 451), latest revision.

7.3 Removal / Installation

7.3.1 Seats removal

(a) Remove the seats from the Velcro

(b) Unscrew the seats together with the piano hinge.

(c) Seat back is not removable.

7.3.2 Safety harnesses removal

Type of maintenance: line

Authorization to perform:

- Sport pilot or higher

Tools needed:

- wrench size 1/2 in

(a) Unscrew the nut (4, Fig. 7-4), remove the washer (5), bolt (3), the bushing (2) and disconnect the shoulder belts bracket (1) from the attachment bracket in baggage compartment.

(b) Remove the bolt (3), the bushing (2), the washer (5) (only at outer lap belt attachment) and disconnect the lap belt bracket (1) from the attachment point on the fuselage / central console side.

7.3.3 Safety harnesses installation

Type of maintenance: line

Authorization to perform:

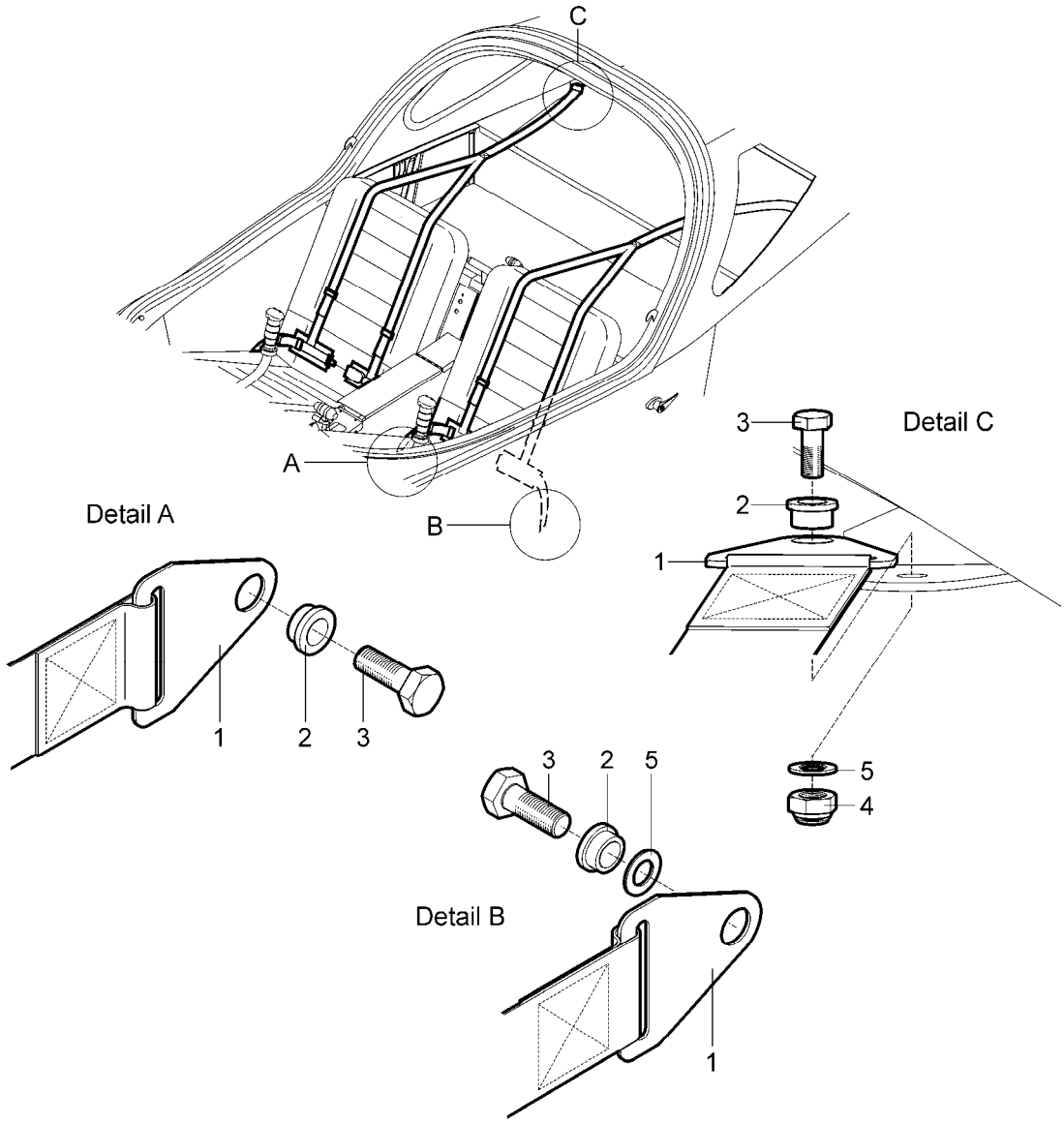
- Sport pilot or higher

Tools needed:

- wrench size 1/2 in

(a) Gradually put the bushing (2, Fig. 7-4), lap belt bracket (1), the washer (5) (only at outer lap belt attachment) on the bolt (3); screw the bolt into the attachment point on the fuselage / central console side.

(b) Put the bushing (2) and shoulder belts bracket (1) on the bolt (3), insert the bolt into the attachment bracket in baggage compartment, insert the washer (5), screw and tighten the nut (4).



1 Attachment bracket
2 Bushing
3 Bolt
4 Nut
5 Washer

Fig. 7-3: Safety harnesses removal / installation

7.3.4 BRS parachute removal

Type of maintenance: heavy

Authorization to perform:

- Repairman (LS-M) or Mechanic (A&P)

Tools needed:

- screwdriver, Philips screwdriver
- wrench size No.7
- cutting pliers, pliers
- Allen wrench size 1/8 in, 1/4 in

WARNING: UNAUTHORIZED PERSONNEL SHOULD NOT ATTEMPT TO MODIFY, REPAIR, OR DISASSEMBLE BRS SYSTEM AT ANY TIME. DURING ALL SERVICE WORK BEWARE OF ACTIVATING THE BRS ROCKET!

NOTE: BRS parachute must be removed from the aircraft for repacking. This service date is printed on placards located on the side of centre panel and on the parachute.

(a) Carefully unglue the cover over parachute on the canopy fixed frame.

(b) Remove both instrument panels and disconnect all cable and pitot-static connection.

(c) Remove COMM/NAV equipment from the centre panel and disassemble it.

(d) Pull open the front flap of the parachute (1, Fig. 7-4) and expose the small link; unscrew the link nut and disconnect the rocket lanyards (5).

(e) Carefully remove the BRS rocket (see 7.3.6).

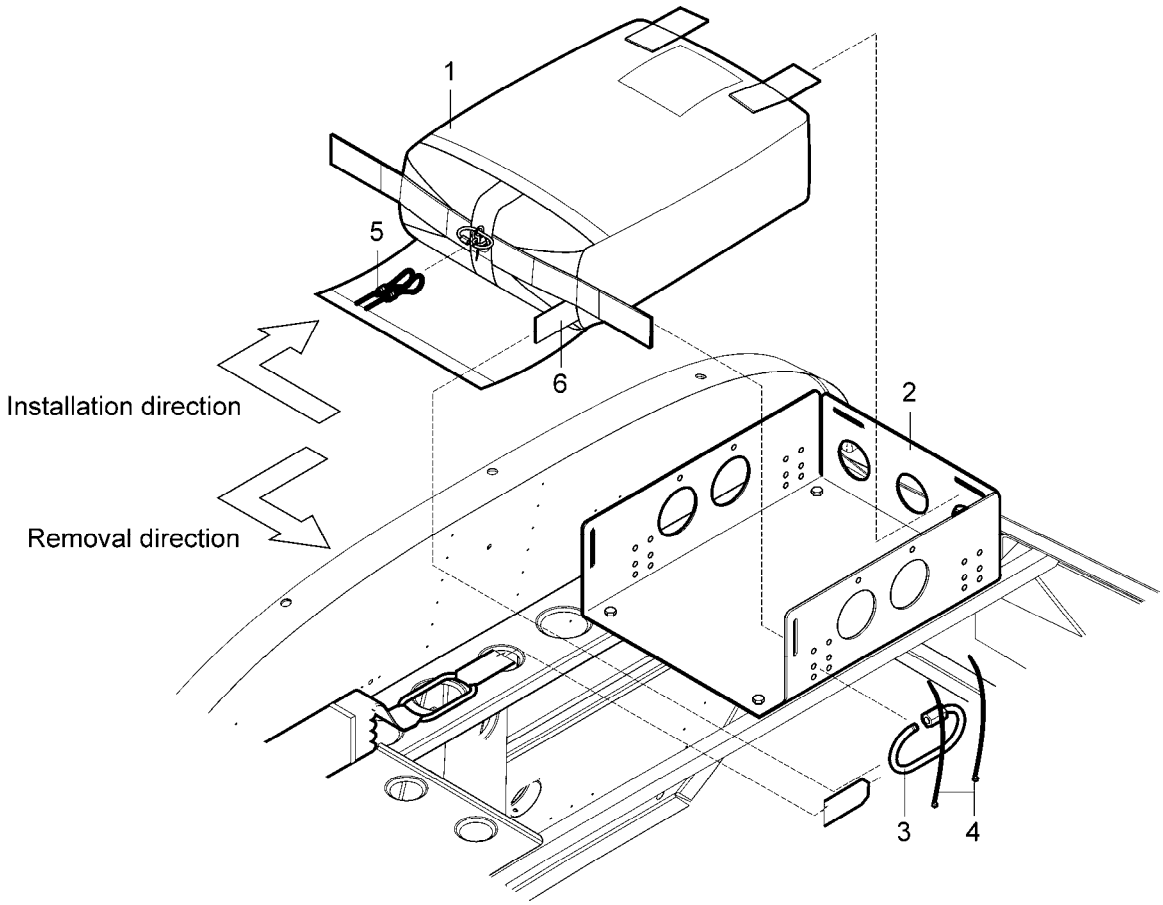
(f) Cut-off cable ties (4) securing link (3) to the tray.

(g) Unscrew the link (3) nut and disconnect the loop of the main brindle (6).

(h) Disengage all four Velcro retaining straps.

(i) Carefully remove parachute (1) from the tray (2).

(j) Repack the parachute by the authorized person.



1 Parachute
2 Tray
3 Link
4 Cable tie
5 Rocket lanyards
6 Main bridle loop

Fig. 7-4: BRS parachute removal / installation

7.3.5 BRS parachute installation

Type of maintenance: heavy

Authorization to perform:

- Repairman (LS-M) or Mechanic (A&P)

Tools needed:

- screwdriver, Philips screwdriver
- wrench size No.7
- cutting pliers, pliers
- Allen wrench size 1/8 in, 1/4 in

WARNING: UNAUTHORIZED PERSONNEL SHOULD NOT ATTEMPT TO MODIFY, REPAIR, OR DISASSEMBLE BRS SYSTEMS AT ANY TIME. DURING ALL SERVICE WORK BEWARE OF ACTIVATING THE BRS ROCKET!

(a) Install the parachute – see Parachute Installation Manual for the BRS-1350 onto the Czech Sport Aircraft SportCruiser (Doc. No. 020016-PM), points 2.8 to 2-17, and 3-5 to 3.11.

(b) Install the BRS rocket (see 7.3.7)

(c) Assemble centre panel and install COMM/NAV equipment.

(d) Connect all cable and pitot-static connection and install both instrument panels.

(e) Glue (by means of the Emfimastic PU 50 sealant) the cover over parachute on the canopy fixed frame.

(f) Perform pitot-static leak test (see Chapter 12.4.1) and check correct function appropriate instruments and systems.

7.3.6 BRS rocket removal

Type of maintenance: heavy

Authorization to perform:

- Repairman (LS-M) or Mechanic (A&P)

Tools needed:

- screwdriver, Philips screwdriver
- cutting pliers, pliers
- Allen wrench size 1/8 in, 1/4 in

WARNING: UNAUTHORIZED PERSONNEL SHOULD NOT ATTEMPT TO MODIFY, REPAIR, OR DISASSEMBLE BRS SYSTEM AT ANY TIME. DURING ALL SERVICE WORK BEWARE OF ACTIVATING THE BRS ROCKET!

NOTE: BRS rocket motor must be replaced by its date of expiry. This service date is printed on placards located on the side of centre panel and on the rocket.

(a) Carefully unglue the cover over parachute on the canopy fixed frame.

(k) Pull open the front flap of the parachute (16, Fig. 7-5) and expose the small link; unscrew the link nut and disconnect the rocket lanyards (2).

(b) Cut-off cable ties securing lanyards.

WARNING: NEVER POINT ROCKET AT ANYONE. ACCIDENTAL ACTIVATION MAY CAUSE DEATH OR SERIOUS INJURY!

ASSEMBLY MUST BE DONE IN THIS SEQUENCE. IF DONE INCORRECTLY, ACCIDENTAL DISCHARGE OF ROCKET MAY OCCUR AND MAY CAUSE DEATH OR SERIOUS INJURY!

(c) Remove plastic cap (6).

CAUTION: KEEP ALLEN WRENCH VERTICAL. BE CAREFUL NOT LO "LEVER" WRENCH AGAINST SIDE, SO AS TO NOT ACCIDENTLY ACTIVATE ROCKET!

(d) Remove screw (7) with 1/8 Allen wrench.

(e) Unscrew adapter (4) from rocket. Carefully remove housing (3) from rocket by turning entire housing assembly.

(f) Loose set screws (10).

(g) Carefully remove the BRS rocket.

(h) As necessary, remove right side panel of the middle channel, unscrew the nut (14), remove the washer (15), bolt (13) and activation housing (3).

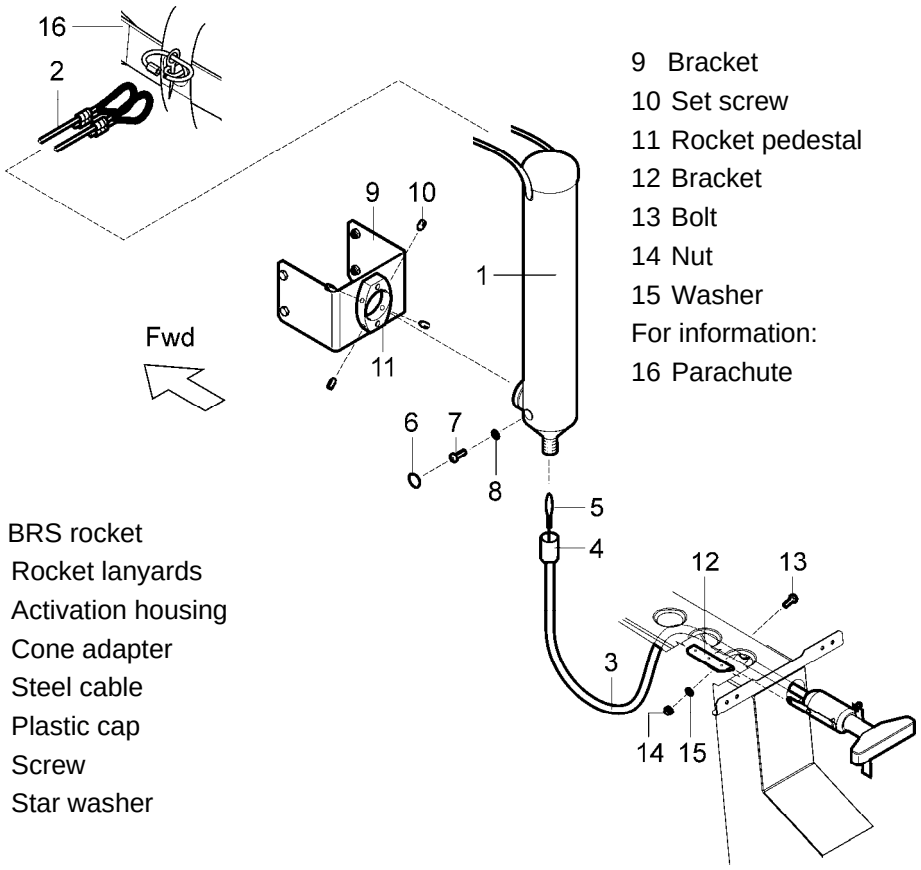


Fig. 7-5: BRS rocket removal / installation

7.3.7 BRS rocket installation

Type of maintenance: heavy

Authorization to perform:

- Repairman (LS-M) or Mechanic (A&P)

Tools needed:

- screwdriver, Philips screwdriver
- cutting pliers, pliers
- Allen wrench size 1/8 in, 1/4 in

WARNING: UNAUTHORIZED PERSONNEL SHOULD NOT ATTEMPT TO MODIFY, REPAIR, OR DISASSEMBLE BRS SYSTEM AT ANY TIME. DURING ALL SERVICE WORK BEWARE OF ACTIVATING THE BRS ROCKET!

(a) Carefully unglue the cover over parachute on the canopy fixed frame.

(b) As necessary, install the activation housing (3) to the middle channel; fasten handle by means of the bolt (13), washer (15) and nut (14); install right side panel of the middle channel.

(c) Route the housing in a gentle arc to the base on the rocket. The housing cable should have no abrupt bends.

(d) Install the rocket – see Parachute Installation Manual for the BRS-1350 onto the Czech Sport Aircraft SportCruiser (Doc. No. 020016-PM), points 3.1 to 3-11.

(e) Connect the activation housing to the rocket - see Parachute Installation Manual for the BRS-1350 onto the Czech Sport Aircraft SportCruiser (Doc. No. 020016-PM), points 5.1 to 5-7.

(f) Glue (by means of the Emfimastic PU 50 sealant) the cover over parachute on the canopy fixed frame.

7.3.8 ELT antenna removal

Type of maintenance: line

Authorization to perform:

- Repairman (LS-M) or Mechanic (A&P)

Tools needed:

- wrench No. 3/4 in

(a) Remove the circular cover on the aft wall of the baggage compartment.

(b) Set the **MASTER BAT** switch to OFF.

(c) Disconnect the connector (2, Fig. 7-6) from the antenna.

(d) Unscrew the nut (5), remove the washer (6) and the antenna (4).

(e) Install the protective cover on the antenna connector.

7.3.9 ELT antenna installation

Type of maintenance: line

Authorization to perform:

- Repairman (LS-M) or Mechanic (A&P)

Tools needed:

- wrench No. 3/4 in

(a) Remove the protective cover from the antenna connector.

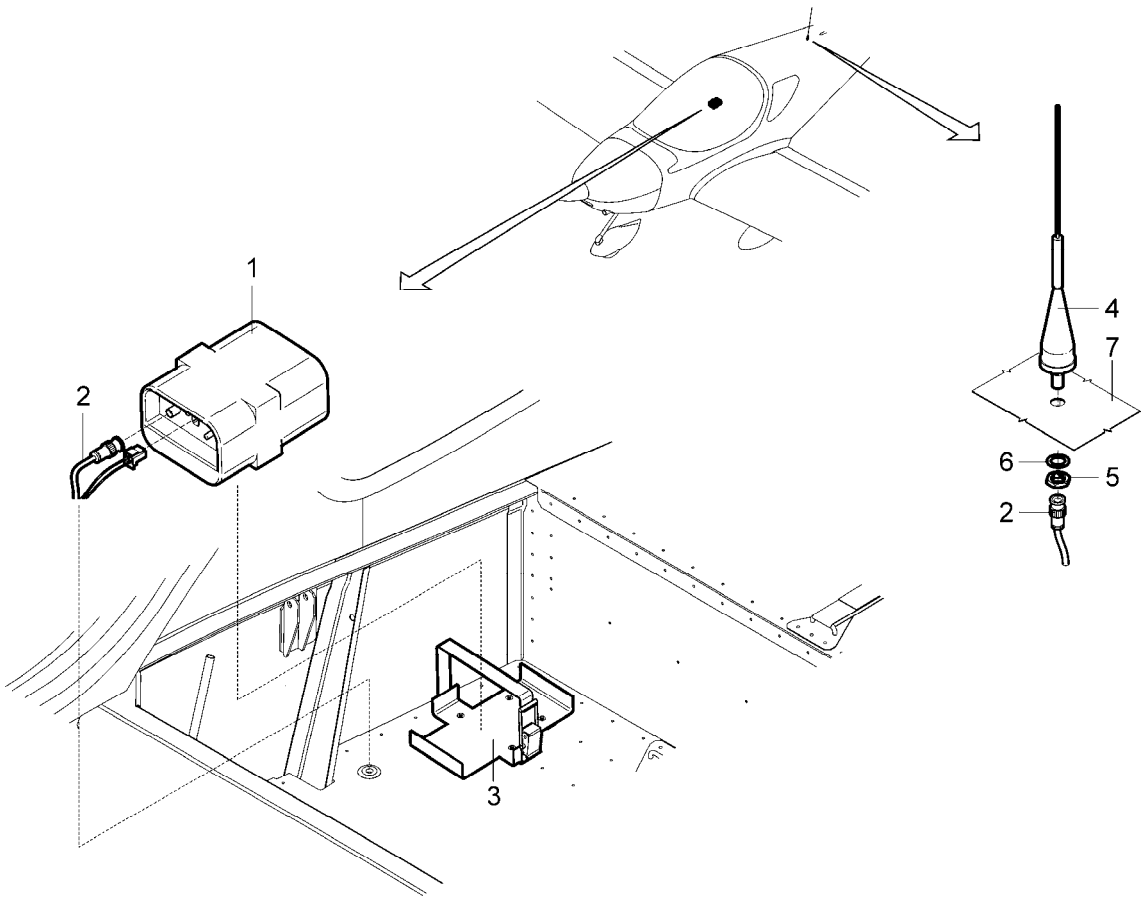
(b) Insert the antenna (4, Fig. 7-6) to the hole in the fuselage upper part (7).

(c) Insert the washer (6), screw and tighten the nut (5) to between 25 to 30 inch lbs.

(d) Connect the connector (2) to the antenna (4).

(e) Install the circular cover on the aft wall of the baggage compartment.

(f) Do an operational test.



1 ELT main unit
2 Cable connector
3 Mounting tray
4 ELT antenna
5 Nut
6 Lockwasher

For information:

7 Fuselage upper part

Fig. 7-6: ELT antenna removal / installation

7.4 Check / Adjustment

7.4.1 Checking of safety harnesses

Check harnesses surface for any damages. Check the lock system function. Check the attachment points of shoulder and side harnesses for any damages or corrosion.

7.5 Exchanges / Service information

7.5.1 Cleaning seat covers and upholstery

(a) Take upholstery and covers out of the airplane.

(b) Brush impurities, possibly clean with warm water with addition of a suitable detergent.

(c) Before reinstalling upholstery and seats in the airplane, let it thoroughly dry.

7.5.2 ELT main unit / remote unit battery replacement

NOTE: The battery pack has a 5 years useful life or batteries must be replaced when the transmitter has been in use for more than one cumulative hour. This service date is printed on placards located on ELT main unit.

For battery replacement refer to Installation and Operation Manual for Model AK-451-( ) Series, (Doc. No. IM 451), latest revision.

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Contents

8.1 General

PS-28 Cruiser / SportCruiser airplane landing gear is of three-wheel fixed design and consists of the main landing gear and the nose landing gear. The nose landing gear is freely rotatable. The main landing gear wheels are equipped with hydraulic disc brakes.

Type and dimension of wheels (manufacturer Matco mfg):

- Main wheel - MHE51CZ (5 in)
- Nose wheel - WHLNW51CC.75R (5 in)
- Tire and tube- Goodyear FLIGHT SPECIAL II – 5.00-5 in (or equivalent aircraft grade).

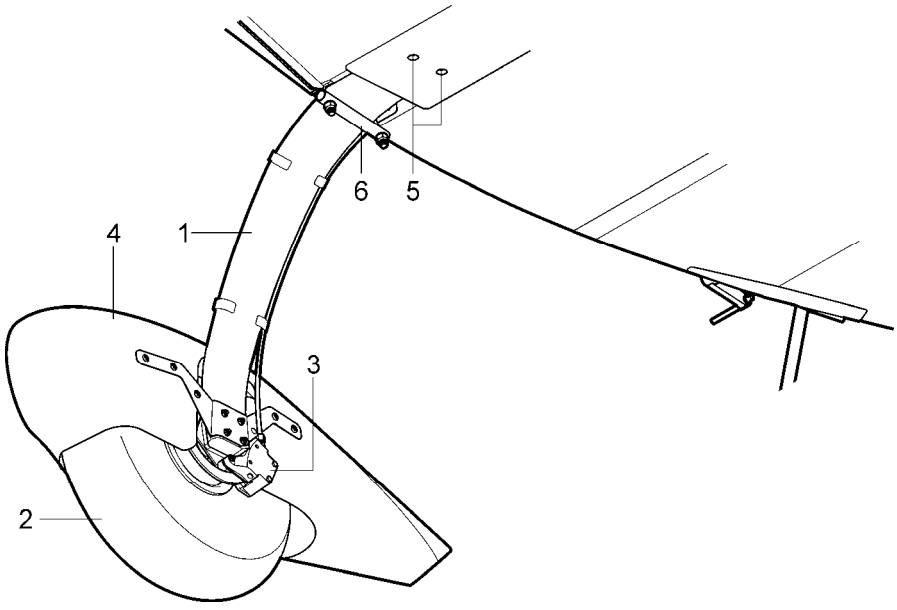
This chapter provides information on:

- main landing gear
- nose landing gear
- brake system
- wheel fairings

8.2 Description and operation

8.2.1 Main landing gear

The main landing gear consists of the composite landing gear leg (1, Fig. 8-1), wheel axle and wheel (2) equipped with the disc brake (3). The landing gear legs are inserted in the gear channel under the seats, where they are attached by two bolts (5) and stirrup (6).



1 Main landing gear leg
2 Wheel
3 Disc brake
4 Wheel fairing
5 Bolt
6 Stirrup

Fig. 8-1: Main landing gear, right

8.3.7 Removal of nose landing gear wheel

Type of maintenance: line

Authorization to perform:

- Sport pilot or higher

Tools needed:

- wrench size 1 1/8 in
- pliers

(a) Jack and support the airplane (see 14.2).

(b) Disassemble wheel fairing (see 8.3.6).

(c) Remove the cotter pin (6, Fig. 8-9) securing nut (4) on wheel axle (2) – on one side only.

(d) Remove the nut (4), washer and tow bracket (8) from wheel axle (2).

(e) Release the wheel axle (2) from the wheel (1), bushings (3) and the wheel fork eyes (8).

1 Nose landing gear wheel
2 Wheel axle
3 Bushing
4 Nut
5 Washer
6 Cotter pin
7 Tow bracket
8 Wheel fork

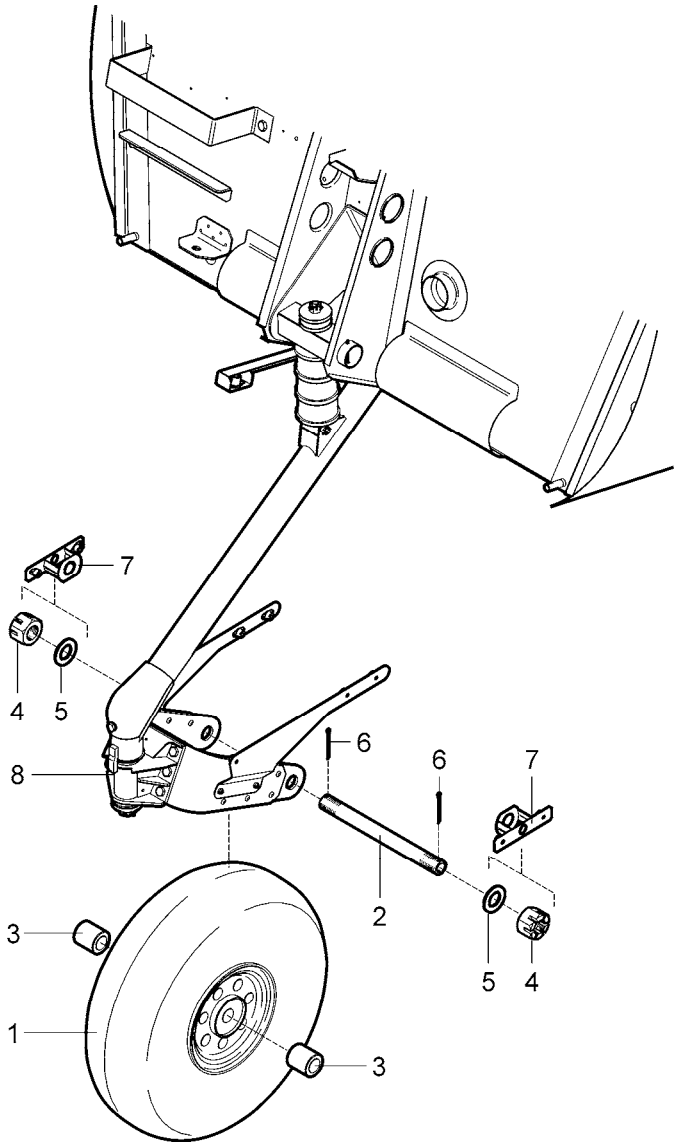


Fig. 8-9: Nose landing gear wheel removal / installation

8.3.8 Installation of nose landing gear wheel

Type of maintenance: line

Authorization to perform:

- Sport pilot or higher

Tools needed:

- wrench size 1 1/8 in
- pliers

(a) Clear the wheel axle (2, Fig. 8-9) of impurities and grease it slightly.

(b) From one side shift the axle (2) into the wheel fork eye (8).

(c) Gradually put first bushing (3), nose wheel (1) and second bushing (3) on the wheel axle (2) and tow bracket (7) according to the figure.

(d) From one side install washer (5), screw nut (3) - set the tow brackets (7) so that the axes of holes for bolts fastening fairings were horizontally; tighten nut (3).

(e) Check for free turning of the nose wheel (turning must be continual without catching).

(f) Secure the nut (3) with the new cotter pin (6).

(g) Install wheel fairing (see 8.3.6).

8.3.9 Removal of the main landing gear leg

Type of maintenance: heavy

Authorization to perform:

- Repairman (LS-M) or Mechanic (A&P).

Tools needed:

- wrench size 9/16 in, 1/2 in

(a) Jack and support the airplane (see 14.2).

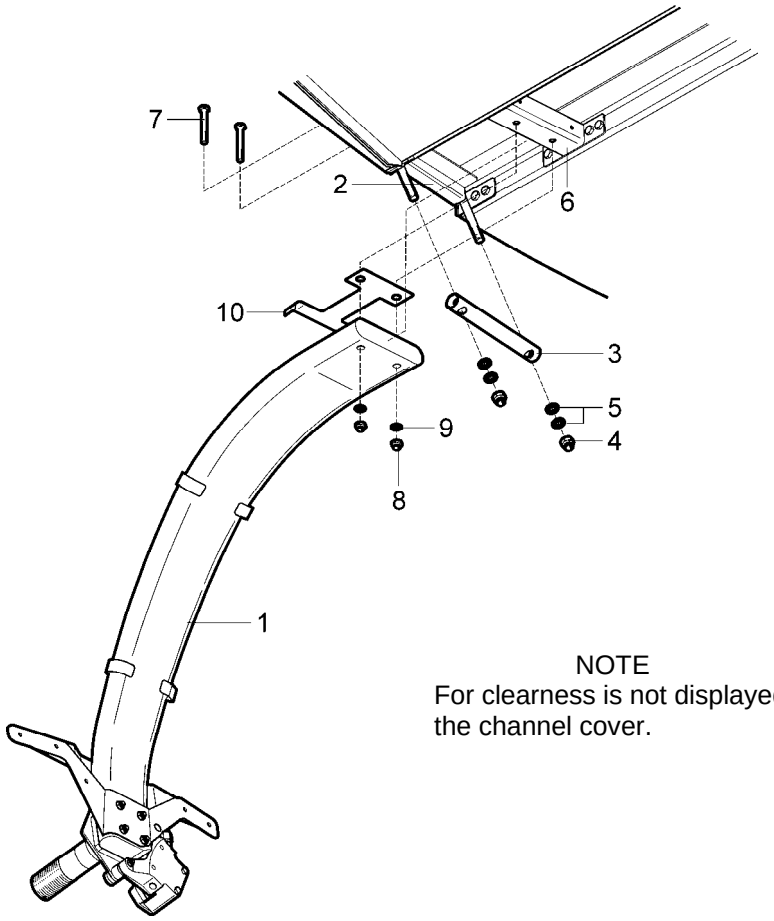
(b) Remove appropriate seat (see 7.3.1).

(c) Disconnect the brake line.

(d) Unscrew the nuts (8, Fig. 8-10), and remove the washers (9) and bolts (7).

(e) Unscrew the nuts (4), and remove the washers (5) and tube (3); remove the spacer (10).

(f) Remove the landing gear leg (1) from the chamber (6) and put it on a suitable place.



NOTE
For clearness is not displayed the channel cover.

1 Main landing gear leg
2 Main gear attachment
3 Tube
4 Locknut
5 Washer
6 Chamber
7 Bolt
8 Locknut
9 Washer
10 Spacer

Fig. 8-10: Main landing gear leg removal / installation

8.3.10 Installation of the main landing gear leg

Type of maintenance: heavy

Authorization to perform:

- Repairman (LS-M) or Mechanic (A&P).

Tools needed:

- wrench size 9/16 in, 1/2 in

(a) Check outer surface of the composite landing gear leg (1, Fig. 8-10) for occurrence of cracks and whether the axle connection is not damaged before installing the landing gear leg.

(b) Insert the landing gear leg (1) with the spacer (10) into the chamber (6) in attachment channel on fuselage and fit the leg in main gear attachment (2).

(c) On the main gear attachment bolts (2) install the tube (3), washers (5), and slightly tighten the nuts (4).

(d) Insert the bolts (7) through spacer (10), chamber (6) and leg (1), install the washers (9) and tighten nuts (8; 4).

(e) Connect the brake lines.

(f) Install seat.

(g) Fill brake system with brake liquid and air-bleed it (see 8.5.4).

8.3.11 Removal of nose landing gear leg

Type of maintenance: heavy

Authorization to perform:

- Repairman (LS-M) or Mechanic (A&P).

Tools needed:

- wrench size 1/2 in, No.17

(a) Jack and support the airplane, (see 14.2).

(b) Remove the lockwire from the bolts (6, Fig. 8-11),

(c) Remove the bolts (6) and washers (7).

(d) Remove the tube (5) from the leg bracket (9).

(e) Remove the cotter pin (9), unscrew the nut (3), remove washers (4), bolt (2) and disconnect the shock absorber (8) from the bracket on the nose gear leg (1).

(f) Remove the gear leg (1) from the fuselage and put it on a suitable place.(d)

8.3.12 Installation of nose landing gear leg

Type of maintenance: heavy

Authorization to perform:

- Repairman (LS-M) or Mechanic (A&P).

Tools needed:

- wrench size 1/2 in, No.17

(a) Check the welds of the gear leg for occurrence of cracks and corrosion and whether the bearings are not damaged before installing the gear leg.

(b) Insert the gear leg (1, Fig, 8-11) into the bracket (9).

(c) Insert the tube (5) to the hole in the bracket (9).

(d) Screw the bolts (6) with the nuts (7) to the tube; tighten the bolts slightly; secure bolts with the lockwire.

(e) Put the lower end of the shock absorber (8) to the bracket on the nose gear leg (1); install the bolt (2) with the nut (3) and washers (4), secure the nut with the new cotter pin (9).

8.4 Check / Adjustment

8.4.1 Check of nose landing gear shock absorber

(a) Several times hoist and lower the nose landing gear of the airplane.

(b) Measure value of absorber and nose landing gear compression according to Fig. 8-13. Perform measuring in vertical direction between the bottom of the engine cowl and the lower shock absorber attachment. The minimum value is 50 mm (*2 in*). If this value is lower than change the dumping elements (see 8.5.2).

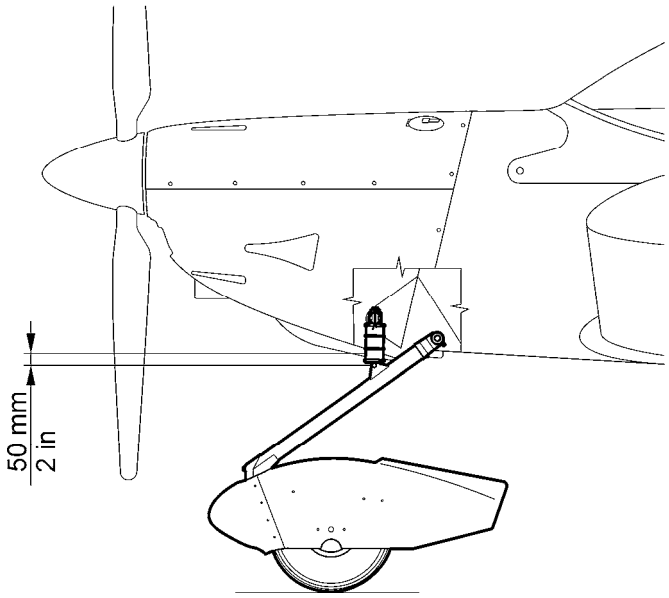


Fig. 8-13: Check of nose landing gear shock absorber

8.4.2 Check of nose landing gear leg after shimmy occurrence

(a) Remove the nose wheel fairing (see 8.3.5).

(b) Remove the nose wheel (see 8.3.7).

(c) Remove the cover (7, Fig. 8-14) and unload nose landing gear.

(d) Check condition of the fork, leg, and shock absorber for cracks (see Fig. 8-14). Use magnifying glass.

(e) Check tire worn and specified inflation (1.2 + 0.1 bar (*17.4 + 1.5 psi)*).

CAUTION: DO NOT EXCESS SPECIFIED TIRE PRESSURE OVERPRESSURED TIRE CAUSED SHIMMY.

(f) Check condition of spring washers (3). Keep washers free of lubricants. Remove cotter pin (6), loose nut (5) and clean washers (2; 3; 4) if necessary, use some solvent for degreasing.

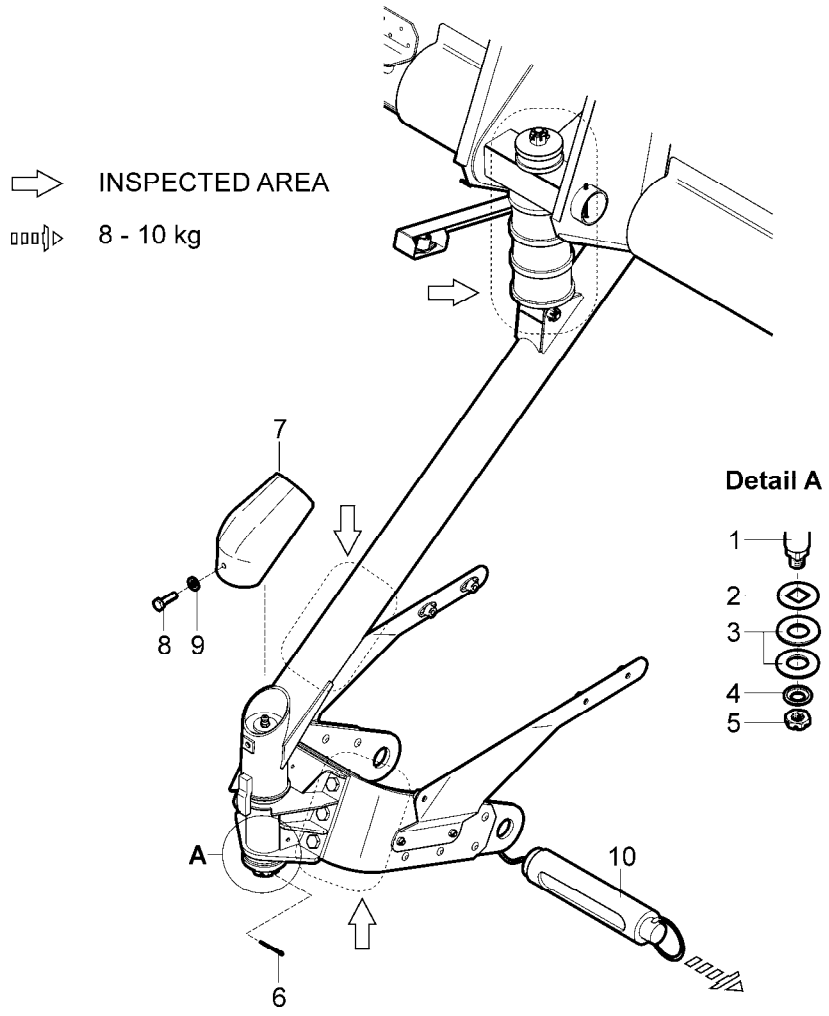
(g) Attach spring scale (10) to fork.

(h) Torque castellated nut (5) so a constant force of 8-10 kg is required to rotate nose wheel fork.

(i) Install new cotter pin (6).

(j) As necessary, grease the axle per grease nipple.

(k) Install the cover (7), nose wheel (see 8.3.8) and nose wheel fairing (see 8.3.6).



1 Spindle
2 Friction washer
3 Spring washer
4 Thrust ring
5 Nut
6 Cotter pin
7 Cover
8 Bolt
9 Washer
10 Spring scale

Fig. 8-14: Check of nose landing gear leg after shimmy occurrence

8.5 Changes / Service information

8.5.1 Tire change

Type of maintenance: line

Authorization to perform:

- Sport pilot or higher

Tools needed:

- wrench size 1/2 in
- Allen wrench size 1/4 in

(a) Jack and support the airplane (see 14.2).

(b) Remove the wheel fairing (see 8.3.1).

(c) Remove the main landing gear wheel (see 8.3.3) or the nose landing gear wheel (see 8.3.5).

(d) Deflate the tire.

(e) Unscrew the bolts (1, Fig. 8-15).

(f) Set apart both halves of the rim (1; 2) and remove the tire (10) with the air tube (11).

(g) Exchange the air tube or the tire, if necessary.

(h) Put the air tube (11) into the tire (10) and inflate it slightly.

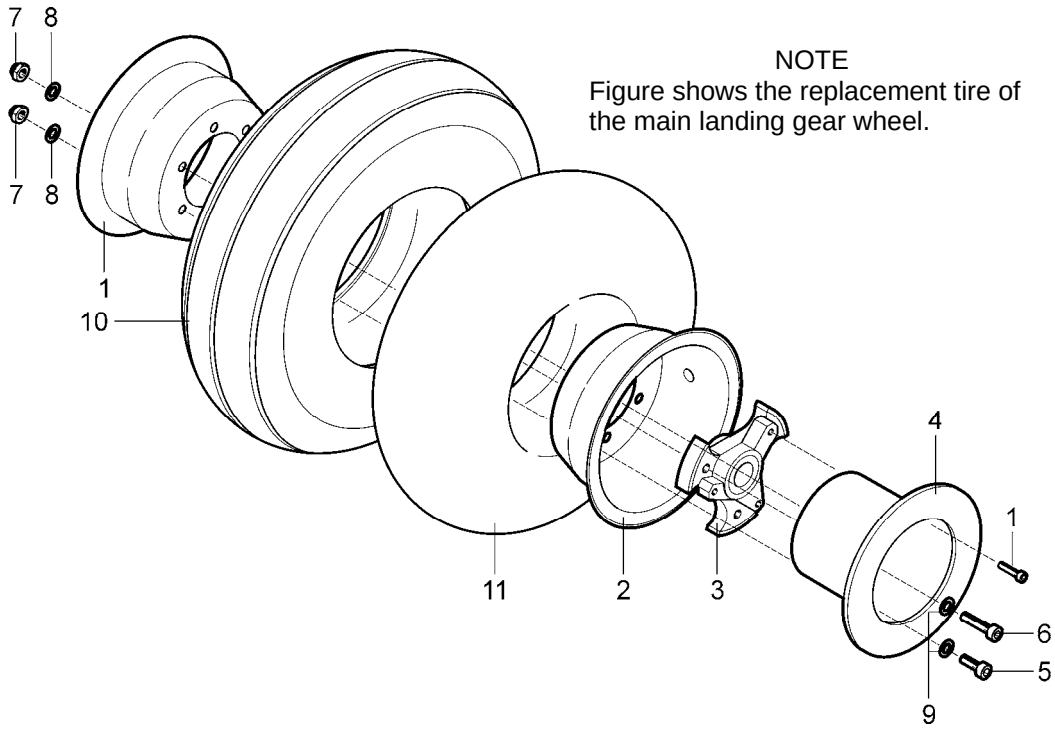
(i) Put the inner tube on that half of the rim, which has the hole for the valve.

(j) Put the other half of the rim on this unit. Join both halves of the rim with bolts – torque value 11.3 Nm (*100 in lbs*).

(k) Inflate tires to the prescribed pressure:

- nose wheel 1.2 + 0.1 bar (*17.4 + 1.5 psi*)
- main wheel 1.8 + 0.2 bar (*26.1 + 2.9 psi*)

(l) Mark position of the rim and the tire by redline overreaching about 10 mm (3/8 in) to the rim and the tire (serves for checking the tire slewing against the wheel rim in operation).



1 Wheel rim, outer
2 Wheel rim, inner
3 Hub
4 Brake disc
5 Bolt
6 Bolt
7 Lock nut
8 Washer
9 Washer
10 Tire
11 Air tube

Fig. 8-15: Tire change

8.5.2 Change of nose landing gear shock absorber dumping elements

Type of maintenance: heavy

Authorization to perform:

- Repairman (LS-M) or Mechanic (A&P).

Tools needed:

- wrench size 1/2 in

(a) Jack and support the airplane (see 14.2).

(b) Remove the cotter pin (10, Fig. 8-16), unscrew the nut (13), remove the washers (12), bolt (11) and disconnect tube (1) from the bracket (2) on the nose gear leg.

(c) Remove the cotter pin (10), unscrew the nut (9) and remove the washers (8; 6; 7; 5).

(d) Turn the tube (1) forward and remove tube (1), dumping elements (2) and washers (3).

(e) As needed, remove the cotter pins (15), push out the tube (14) and remove profile (18) and case (19).

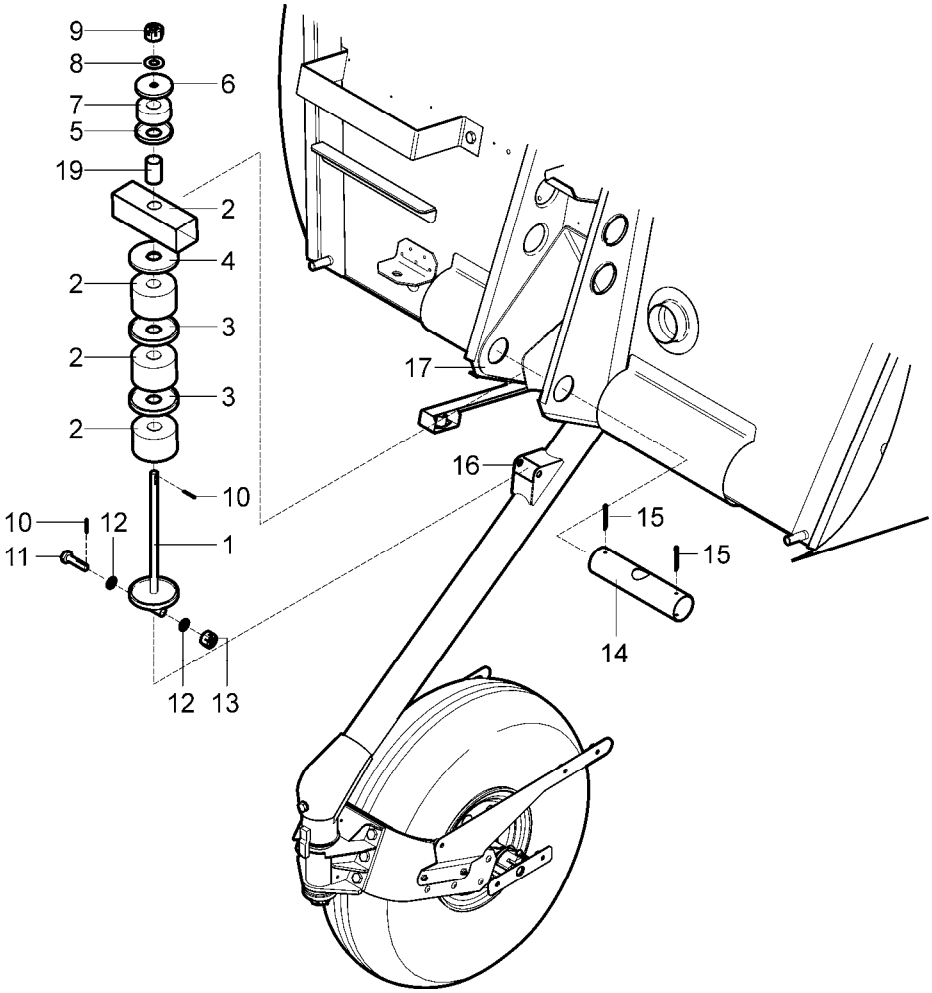
(f) Replace damaged dumping elements (3).

(g) Gradually put on the tube (1) shock absorbers (2), washers (3) and insert tube into the hole on the tube (14) according to the figure.

(h) Gradually install on the tube end (1) washers (5; 7; 6; 8), screw and tighten the nut (9); secure it with the new cotter pin (10).

(i) Put the lower end of the tube (1) to the bracket (16); install the bolt (11) with the nut (13) and washers (12), secure nut with the new cotter pin (10).

(j) Lower the airplane on jacks.



1 Tube
2 Shock absorber
3 Washer
4 Washer
5 Washer
6 Washer
7 Rubber washer
8 Washer
9 Nut
10 Cotter pin
11 Bolt
12 Washer
13 Nut
14 Tube
15 Cotter pin
16 Nose leg bracket
17 Bracket
18 Profile
19 Case

Fig. 8-16: Change of the dumping elements in the nose landing gear

8.5.3 Change of brake lining

Type of maintenance: line

Authorization to perform:

- Sport pilot or higher

Tools needed:

- wrench size 7/16 in
- drill # 25
- electric drill
- brake relining tool, pneumatic press

CAUTION: EXCHANGE ALWAYS BOTH BRAKE PADS!

(a) Jack and support the airplane (see 14.2).

(b) Remove the main landing gear wheel (see 8.3.3).

(c) Remove the caliper from the wheel by removing the two bolts (1, Fig. 8-17) that hold in on.

(d) Remove old linings (4) by drilling the crimped side of the rivet (Do not use punch and hammer). Using a # 25 drill (0.1495 in. diameter), drill through rivet taking care to avoid damaging the rivet hole.

(e) After drilling crimped edge off rivets, lift old lining and remaining rivet pieces from the brake shoe.

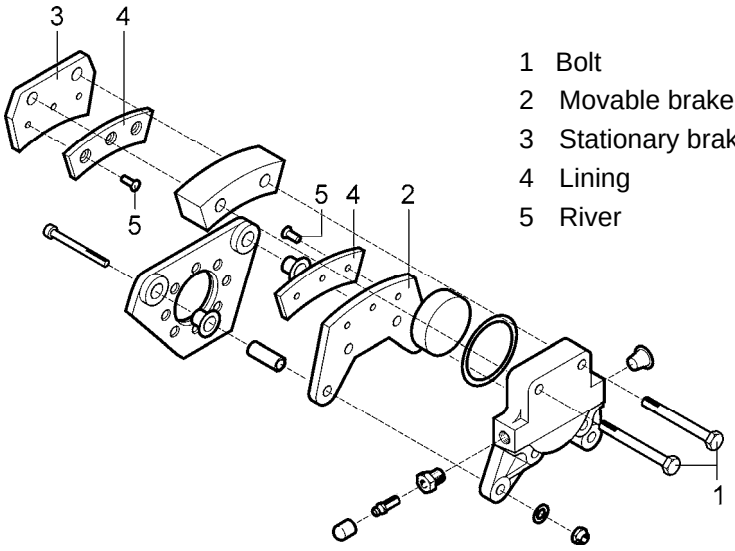
(f) Inspect the brake shoe (2; 3) for any bending or other damage that may have occurred during service. A shoe with more than 0.010 in bend should be replaced. Inspect rivet holes to ensure that no damage has occurred during removal.

(g) Using a brake relining tool or pneumatic press, replace the lining using brass rivet (5).

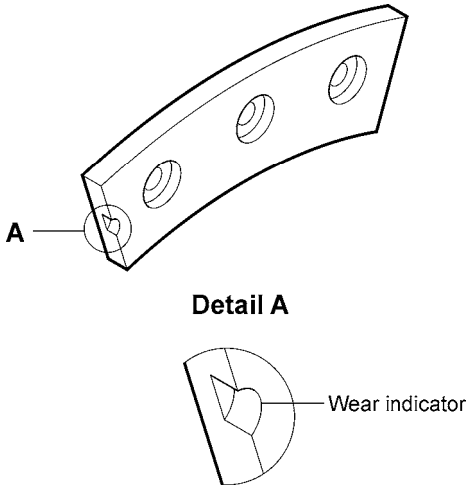
(h) Insert the brake disc and screw them with the caliper.

(i) Reinstall the main landing gear wheel (see 8.3.4).

(j) Check the brake function.



1 Bolt
2 Movable brake shoe
3 Stationary brake shoe
4 Lining
5 River



NOTE: The lining requires replacement when the wear indicator is no longer visible.

Fig. 8-17: Change of brake lining

8.5.4 Refilling / exchanging brake fluid

Draining brake fluid from brake system

Type of maintenance: line

Authorization to perform:

- Sport pilot or higher

Tools needed:

- wrench size 7/16”

(a) Disconnect the brake hose from the brake cylinder and let brake fluid drain into the previously prepared can.

(b) You can accelerate brake fluid draining by compressing the relevant brake pedal.

Filing brake fluid into brake system

NOTE: Brake fluid used by aircraft manufacturer is shown in Section 17.5.

(a) Fix the aircraft with help wedges.

(b) Release the parking brake.

(c) Bleed the hose of the filling equipment and connect it to the filling hole of the left wheel brake.

(d) Unscrew the plug of the left brake cylinder with reservoir using the socket wrench.

(e) Slowly fill the brake system with hydraulic fluid.

(f) Repeatedly push the brake pedal.

(g) Check the brake hose from the point of view of occurrence of bubbles.

(h) Continuous occurrence of bubbles indicates a failure of the filling equipment.

(i) After the reservoir is filled up to the filler hole – stop the filling through closing of the filling valve of the filling equipment.

(j) Disconnect the hose of the filling equipment.

(k) Suck off 20 ml of hydraulic fluid using the syrette.

(l) Screw down the closing plug using the socket wrench.

(m) Repeat the same procedure for the right brake cylinder.

(n) Check the proper resistance of pedals.

(o) Pull the parking brake.
By this way, both wheels must be braked equally.

(p) Remove the wedges.

Refilling brake fluid into brake system

For the refilling – use the procedure for filling (see above).

Contents

9.1 General

The fuel system (see Fig. 9.1) is used for storing fuel in the airplane and its delivering to the engine. The fuel system of PS-28 Cruiser / SportCruiser airplane consists of the following parts: two fuel tanks, fuel tubing, selector valve, gascolator, mechanical fuel pump (located on the engine), electrical fuel pump, fuel quantity sensor, fuel flow-meter, fuel pressure sensor and drain valves of the fuel tanks.

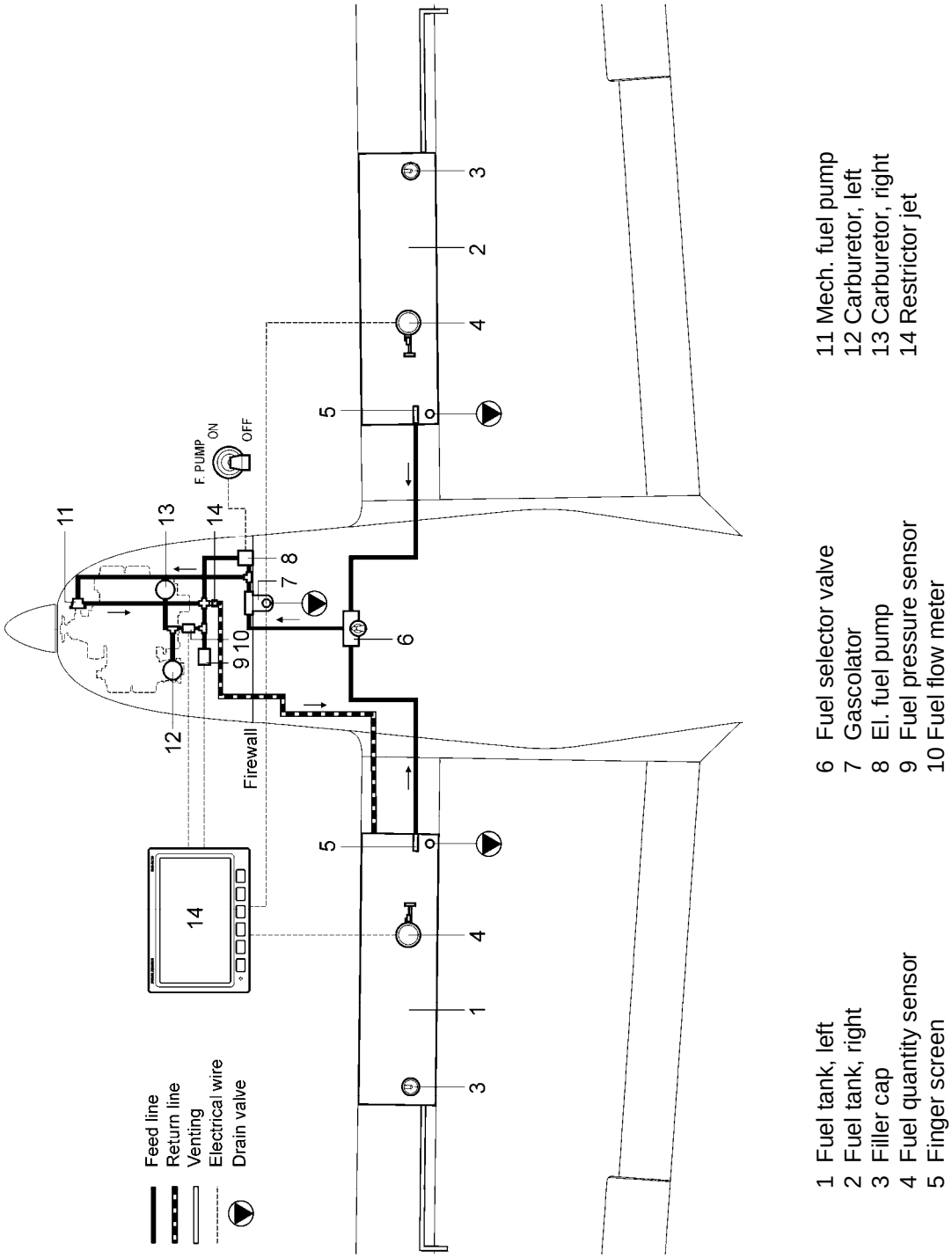


Fig. 9-1: Fuel system layout

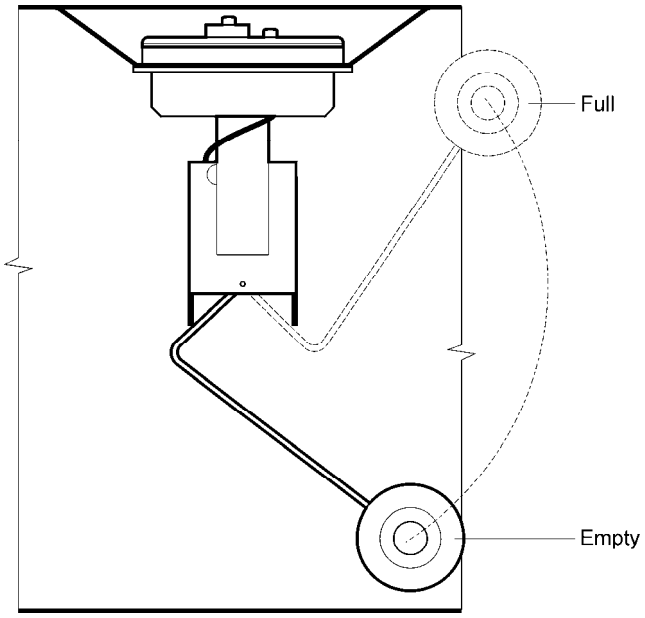


Fig. 9-4: Float mechanism

9.3 Removal / Installation

9.3.1 Fuel tank removal

Type of maintenance: heavy

Authorization to perform:

Repairman (LS-M) or Mechanic (A&P)

Tools needed:

- wrench size No. 8, 1/2 in,
- screwdriver
- drill diam. 3.2 mm (1/8 in), 4.1 mm (5/32 in)
- electric drill
- cutting pliers, pliers

(a) Disconnect the battery.

(b) Drain fuel from the fuel system by the tank drain valve.

(c) Unscrew the filler cap.

(d) Remove the wing (see 4.3.1) and put it on the table.

(e) Drill out the top half of the leading edge skin.

(f) Disconnect wiring from fuel quantity sensor.

(g) Disconnect fuel line.

(h) Carefully remove the tank and store it. Seal the tank holes as needed.

9.3.2 Fuel tank installation

Type of maintenance: heavy

Authorization to perform:

- Repairman (LS-M) or Mechanic (A&P)

Tools needed:

- wrench size No. 8, 1/2 in,
- screwdriver
- riveting pliers
- cutting pliers, pliers

(a) Remove any hole seals from the tank.

(b) Set the tank to the position between the ribs No.4 and 6a. Before installing the tank, check the cork bands for completeness and damage. Change them, if needed.

(c) Connect fuel quantity sensor wire, insert the finger screen – use LOCTITE 565 or equivalent sealant.

(d) Close the leading edge skin on the wing and fit it to the spars and ribs per clecos each second hole through of securing harnesses.

(e) Rivet the skin on the ribs and spar.

(f) Screw back filler cap - use silicon to make connection of filler cap flange and wing skin watertight.

(g) Install the wing (see 4.3.2).

(h) Check the fuel system (see 9.4.1).

(i) Connect the battery ground.

9.3.3 Removal of the finger screen

Type of maintenance: line

Authorization to perform:

- Repairman (LS-M) or Mechanic (A&P)

Tools needed:

- screwdriver
- socket wrench 11/16 inch

NOTE: The finger screen is located in the root tank rib.

(a) Drain fuel from the fuel system.

(b) Remove the wing (see 4.3.1).

(c) Remove the hose clamp (3, Fig. 9-5) and disconnect the fuel hose (4).

(d) Remove the finger screen (2).

9.3.4 Installation of the finger screen

Type of maintenance: line

Authorization to perform:

- Repairman (LS-M) or Mechanic (A&P)

Tools needed:

- Screwdriver
- Socket wrench 11/16 inch

(a) Screw the finger screen (2, Fig. 9-5) into the root tank rib – use LOCTITE 565 or equivalent sealant on finger screen thread.

(b) Connect fuel hose (4) on the finger screen; tighten the hose clamp (3).

(c) Install the wing (see 4.3.2).

(d) Check fuel system tightness (see 9.4.1).

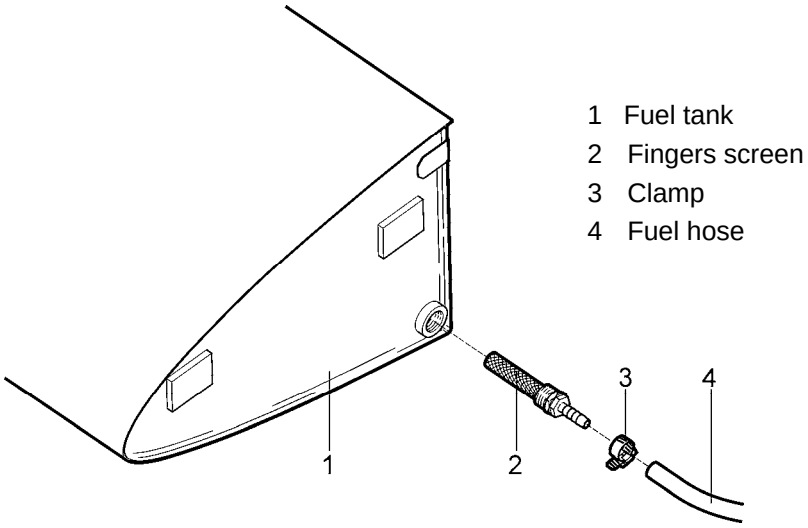


Fig. 9-5: Finger screen removal / installation

9.3.5 Fuel quantity sensor removal

Type of maintenance: line

Authorization to perform:

- Sport pilot or higher

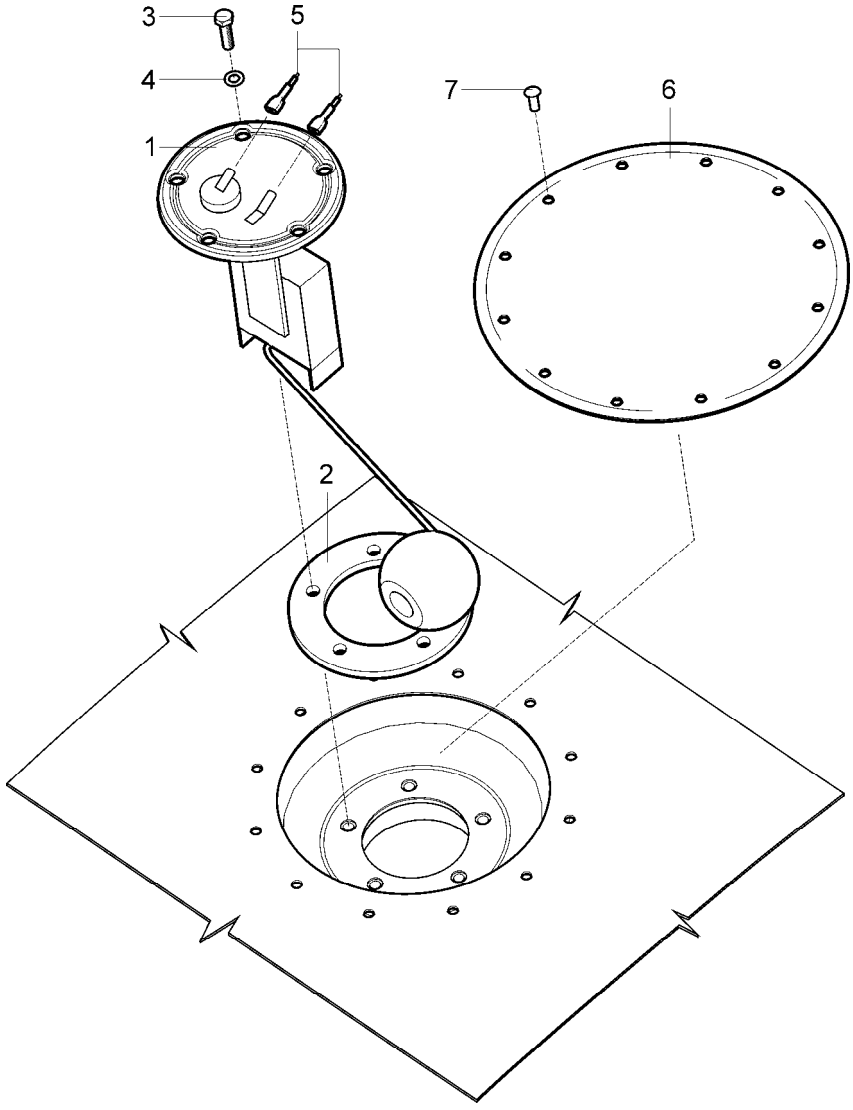
Tools needed:

- electric drill
- drill diam. 3.2 mm (1/8 in)
- screwdriver
- cutting pliers, pliers

(a) Remove (drill off) the fuel quantity cover plate (6, Fig. 9-6).

(b) Disconnect fuel level sender wire (5).

(c) Unscrew bolts (3), remove washers (4) and fuel quantity sensor (1) and gasket (2).



1 Fuel quantity sensor
2 Gasket
3 Bolt
4 Washer
5 Wire
6 Cover plate
7 Rivet

Fig. 9-6: Fuel quantity sensor removal / installation

9.3.6 Fuel quantity sensor installation

Type of maintenance: line

Authorization to perform:

- Sport pilot or higher

Tools needed:

- Phillips PH2 screwdriver
- riveting pliers (riveter)
- cutting pliers, pliers

9.5 Exchanges / Service information

9.5.1 Fuel tank filling

CAUTION: WHEN FILLING FUEL IN THE AIRPLANE, USE ONLY APPROVED KINDS OF FUEL MENTIONED IN THIS MANUAL IN 10.2.1, IN THE POH SECTION 2.4, IN THE ROTAX OPERATOR'S MANUAL SECTION 10.2.2 FUEL, IN THE ROTAX SERVICE INSTRUCTIONS SI-912-016. SAFETY INSTRUCTIONS FOR FILLING FUEL INTO THE AIRPLANE TANKS

(a) The fuel tanks can be filed with fuel only by persons who are fully instructed and familiarized with safety instructions.

(b) It is prohibited to fill the fuel tank:

- during rain and storm
- in a closed space
- when the engine is operating or with electric system switched on.

(c) A person filling the fuel tank must not be wearing polyester clothing or any clothing from a material which creates static electricity.

(d) It is prohibited to smoke or handle with open fire.

Procedure of fuel tank filing

(a) Ground the airplane. The airplane ground point is located on the nose landing gear leg.

(b) Open the fuel tank filler cap.

(c) Fill necessary quantity of fuel.

CAUTION: WHEN FILLING FUEL INTO THE AIRPLANE, AVOID THE CONTACT OF FUEL WITH THE AIRPLANE SURFACE – IT WOULD CAUSE DAMAGE TO SURFACE TREATMENT OF THE AIRPLANE.

(d) When the airplane is filled with fuel, wipe the filler neck of the rest of fuel and close the fuel neck filler cap.

(e) Remove conductive interconnection between the filling device and the airplane.

(f) Sludge the fuel tank.

9.5.2 Draining fuel system

Perform draining the fuel tanks and gascolator after every filling the tank with fuel before the first flight of the day. The fuel tank draining points are on bottom side of the wings and on the firewall.

Draining procedure

(a) Open the drain valve by pressing up.

(b) Drain required quantity of fuel.

NOTE: Draining serves for elimination of impurities and sediments from fuel. Drain so long unless clean fuel flows from the drain valve.

(c) Close the drain valve by releasing pressure.

(d) Check the purity of drained fuel (sediment, water).

9.5.3 Fuel filter cleaning

Perform fuel filter cleaning at each scheduled maintenance or signs of irregular engine running.

Cleaning procedure

(a) Move the fuel selector valve to the **OFF** position.
(b) Use the drain valve to drain the existing fuel from the gascolator bowl.
(c) Remove the lockwire from nut (3. Fig. 9-8).
(d) Loose the nut (3) and remove the gascolator bowl (4) and the gasket (5).
(e) Use a small pointed tool to lift the edge of the filter screen (6) and carefully remove it for cleaning.
(f) Clean the filter screen (6) by washing in fuel, or it can be blown off using an air line; inspect bowl (4) and clean if required.
(g) Carefully install the filter screen (6) to the gascolator body, insert the gasket (5) and the gascolator bowl (4); make sure to correct installation.
(h) Tighten the nut (3) and secure it by lockwire.
(i) Move the fuel selector valve to **LEFT** / **RIGHT** position; check the gascolator for fuel leak.

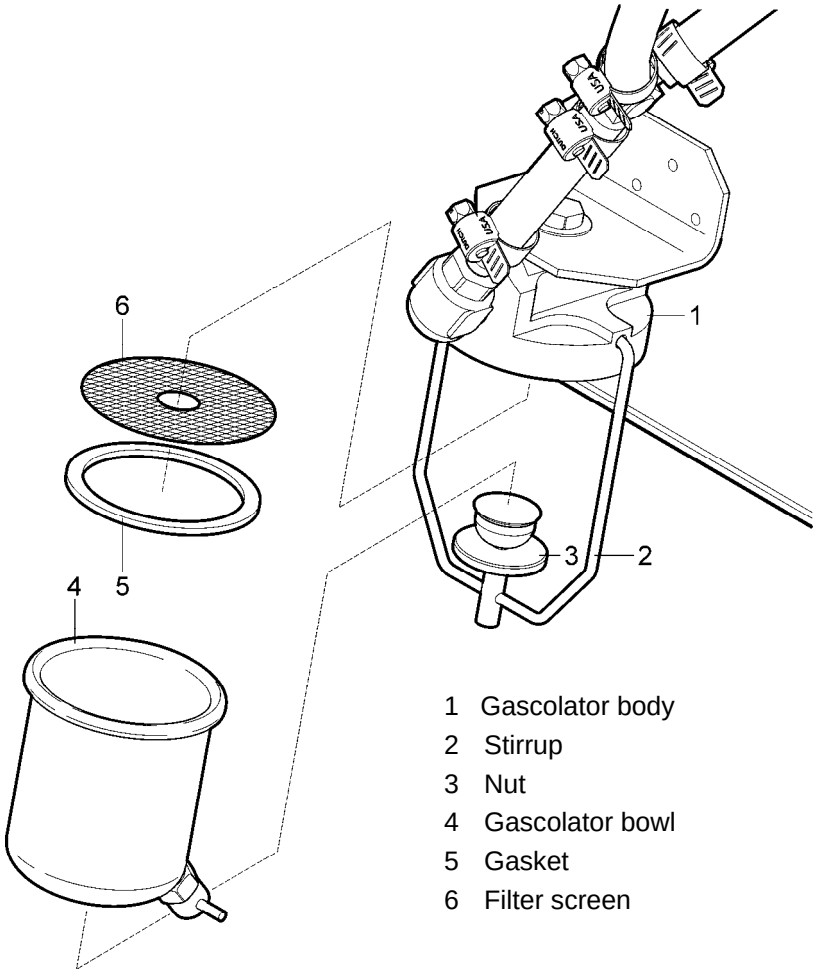


Fig. 9-8: Fuel filter cleaning

Contents

10.1 General

Standard power unit of PS-28 Cruiser airplane is the ROTAX 912 S engine and

- Woodcomp Klassic 170/3/R ground adjustable 3-blade propeller.

Standard power unit of SportCruiser airplane is the ROTAX 912 ULS engine and

- Woodcomp Klassic 170/3/R ground adjustable 3-blade propeller or
- Sensenich 2A0R5R70EN ground adjustable 2-blade propeller or
- Woodcomp SR 3000/2W electrical adjustable 2-blade propeller.

10.2 Description and operation

10.2.1 Engine

The engine ROTAX 912 S / 912 ULS is a four-stroke, four-cylinder, opposed - cylinder engine, central cam shaft and OHV - mechanism with maximal power of 73.5 kW (*98.6 HP)* at 5 800 rpm.

Technical data of the engine:

Engine manufacturer:	Bombardier-Rotax GmbH		
Engine type:	ROTAX 912 S; 912 ULS		
Power:	max. take-off	73.5 kW	(*98.6 hp)*
	max. continuous	69.0 kW	(*92.5 hp)*
RPM:	max. take-off	5 800 rpm max. 5 minutes	
	max. continuous	5 500 rpm	
	idle	1 400 rpm	
Cylinder head temperature:	max.	135°C	(*275°F)*
Oil temperature:	max.	130°C	(*266°F)*
	optimum operation	90 - 110°C	(*190 - 230°F)*
Oil pressure:	max.	7 bar	(*102 psi)*
	min.	0.8 bar	(*12 psi)*
	optimum operation	2 - 5 bar	(*29 - 73 psi)*
Fuel pressure:	max.	0.4 bar	(*5.8 psi)*
	min.	0.15 bar	(*2.2 psi)*

Coolant type:

(refer to the Rotax Operator's Manual, Section 10.1.2 Operating Speeds and Limits, and Section 10.2.1 Coolant; the Rotax Installation Manual, Section 12 Cooling System; the Rotax Service Instruction SI-912-016)

In principle, 2 different types of coolant are permitted:

- Conventional coolant based on ethylene glycol
- Waterless coolant based on propylene glycol

WARNING: THE COOLANT CONCENTRATE *(PROPYLENE GLYCOL)* MAY NOT BE MIXED WITH CONVENTIONAL *(GLYCOL/WATER)* COOLANT OR WITH ADDITIVES!
NON OBSERVANCE CAN LEAD TO DAMAGES TO THE COOLING SYSTEM AND ENGINE!

CAUTION: THE CONVENTIONAL *GLYCOL/WATER* COOLANT REDUCE TO APPLY MAXIMUM PERMISSIBLE COOLANT EXIT TEMPERATURE.

Type of coolant used by aircrafts manufacturer is shown in Section 17.5.

Fuel type:

MOGAS (EN228 Super or EN 228 Super plus with max. 5% ethanol blend, min RON 95; ASTM D4814, min. AKI 91); AVGAS (100LL; ASTM D910; ASTM D7547).

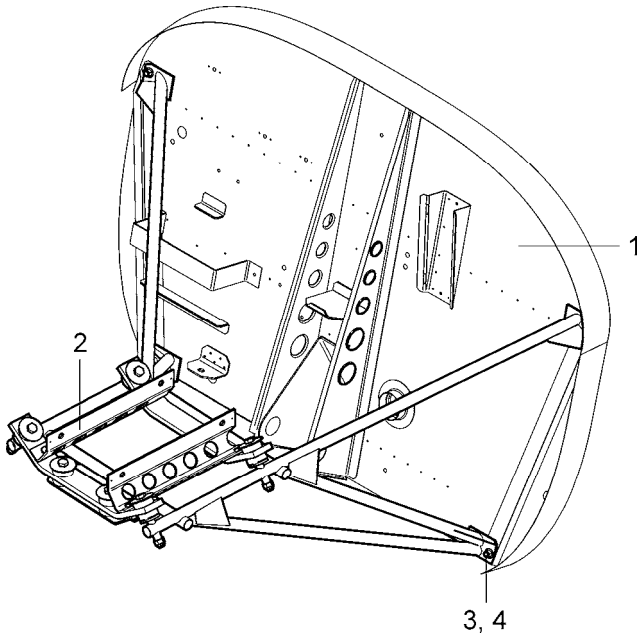
(refer to the Rotax Operator's Manual, Section 10.2.2 Fuel, Rotax Service Instructions SI-912-016)

Oil type:

(refer to the Rotax Operator's Manual)

10.2.1.1 Engine mount

The engine mount serves for mounting the power unit to the airplane. It is welded from 4130 steel tubes and is attached to the firewall and to the engine by means of bolts. The engine mount is installed on the firewall by four attachments. The scheme of engine mount attachment to the firewall and to the engine is shown in the Fig. 10-1.



1 Firewall
2 Engine mount
3 Attachment bolt
4 Nut

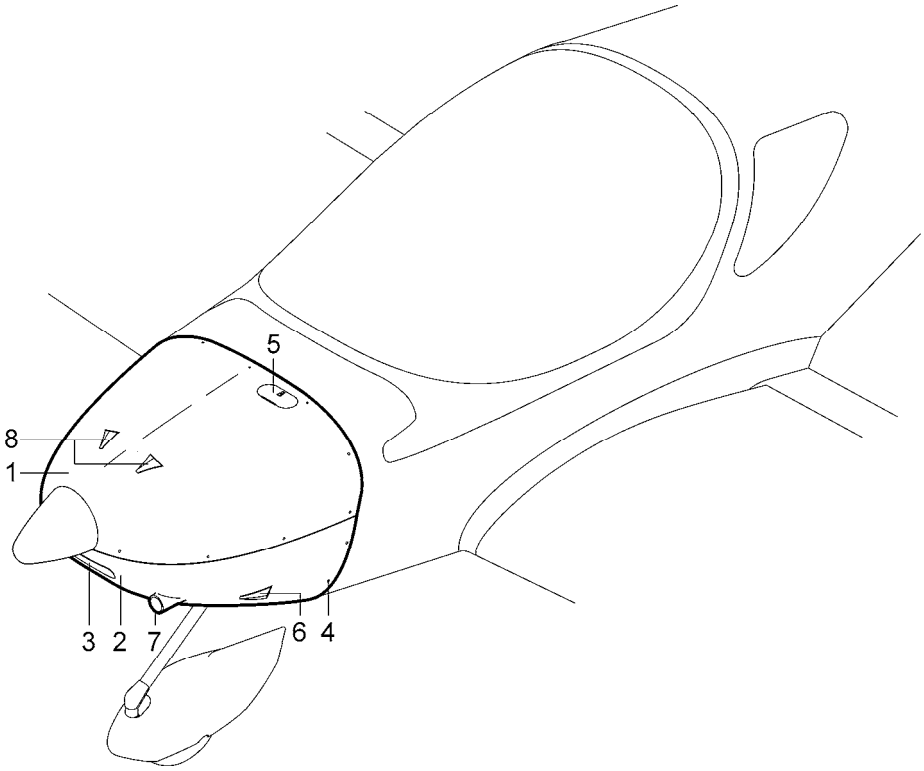
Fig. 10-1: Engine mount

10.2.1.2 Engine cowling

The engine cowling (Fig. 10-2) consists of two parts: upper cowling and lower cowling. The upper cowling (1) is attached by means of quick fasteners (4) to the firewall and to the lower cowling (2). Unlock the quick fasteners by turning the bolt by 90° counter-clockwise. The access cover (5), which is located on the upper cowling on the left in front of the firewall enables to check oil quantity in the oil tank without removing the upper cowling.

The lower cowling (2) is attached by means of quick fasteners (4) to the firewall and to the upper cowling (1). In the front part of the lower cowling (2), there is an oval hole (3) for air

inlet to the radiator. In the bottom part of the lower cowling (2), there is a hole for air inlet to the oil cooler. On the left side in the lower cowling (2) there is a hole (6) for air inlet to the air filter to the engine inlet system.



1 Upper engine cowling
2 Lower engine cowling
3 Air inlet hole for radiator
4 Quick fasteners
5 Access cover
6 Air inlet hole for engine inlet system
7 Landing light
8 Air inlet hole for cylinder cooling

Fig. 10-2: Engine cowling

10.2.1.3 Engine control

Engine power is controlled by means of the throttle control lever which is positioned on the middle channel between the seats and which controls engine power from idle up to max. take-off power. Engine power control lever is mechanically connected (by cable) to the carburetors.

If the control lever is fully pushed, this position corresponds to max. take-off power of the engine. If the control lever is fully pulled, this position corresponds to idle. Changes in the engine power setting can be made by moving of the control lever forward and backward.

10.2.1.4 Engine instruments

Engine parameters (RPM, CHT, EGT, oil pressure and temperature, fuel pressure, manifold pressure) are displayed either on the EMS or on the classical analog instruments. A typical example of the EMS display is shown in the Figure 10-3.

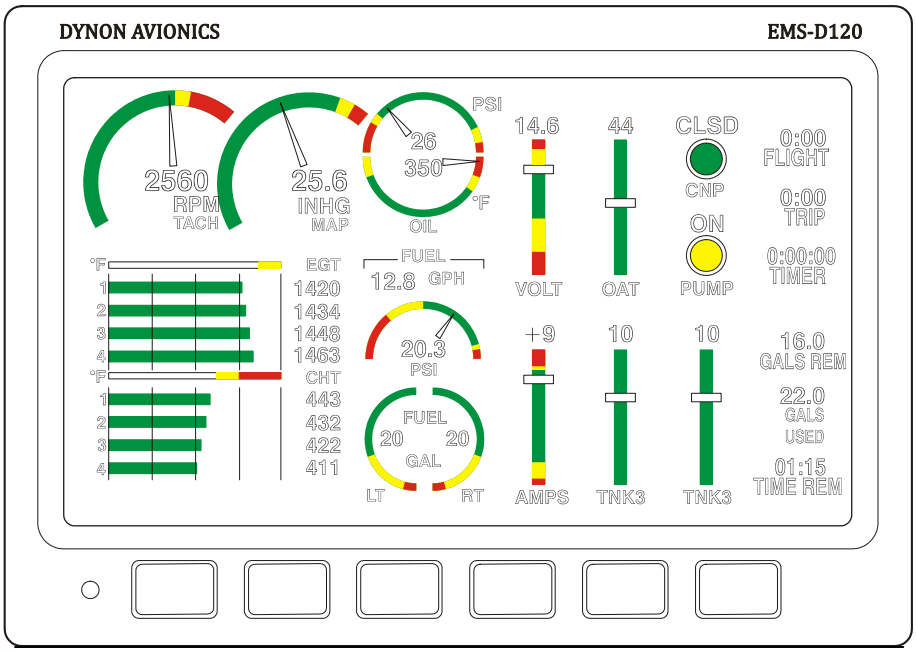
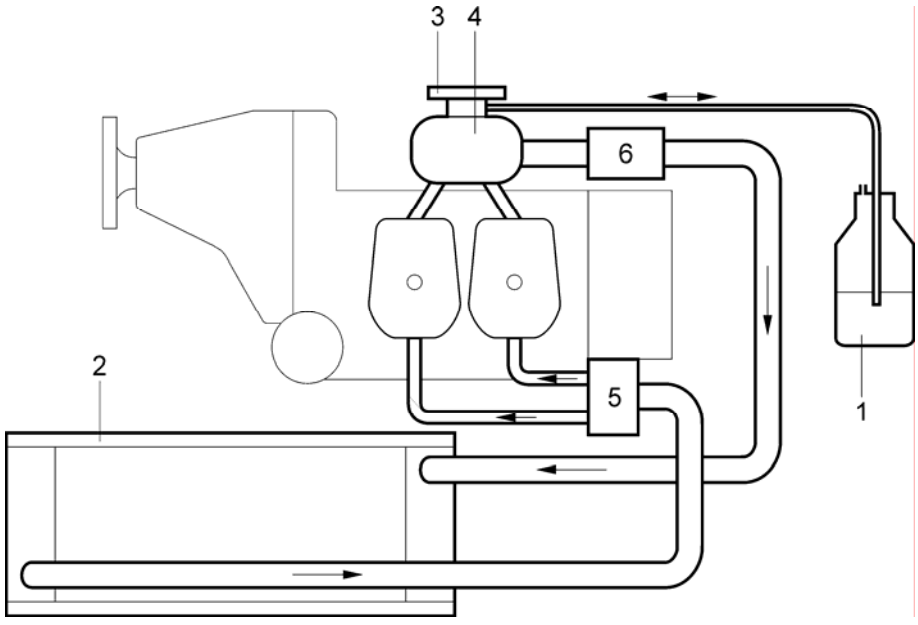


Fig. 10-3: EMS D-120

10.2.1.5 Engine cooling system

Engine cooling is combined, cylinder heads are liquid cooled, and cylinders are air cooled. Cooling circuit of cylinder heads is made as a closed system containing the pump (5, Fig. 10-4), expansion tank (4) with the pressure cap (3), cooler (2), thermostatic valve (6) and the overflow bottle (1).

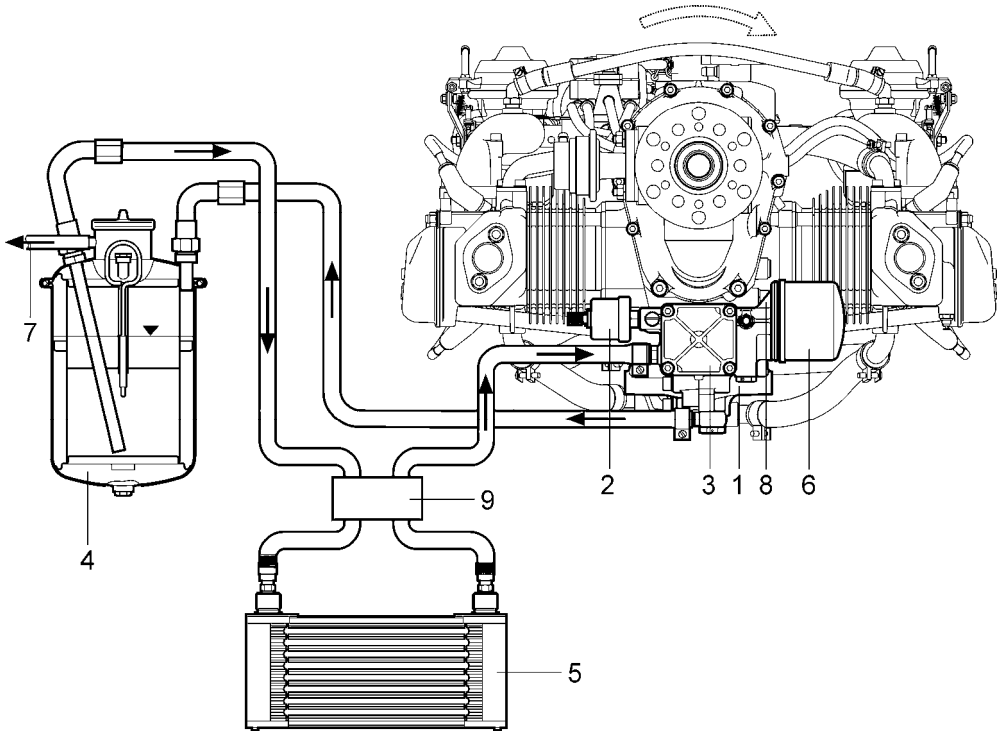


1 Overflow bottle
2 Cooler
3 Pressure cap
4 Expansion tank
5 Pump
6 Thermostatic valve

Fig. 10-4: Cooling system

10.2.1.6 Engine lubrication system

Engine lubrication system is made with the dry sump. Engine lubrication system is equipped with the mechanically driven oil pump (3, Fig. 10-5) with oil filter (6) which ensures oil supply from the oil tank (4) located on the firewall through the thermostatic valve (9) and the oil cooler (5) to the lubricated points on the engine. The oil pump is equipped with the pressure relief valve (1) and with the oil pressure sensor (2). The oil tank is ventilated by venting (7), which is connected to hose and is led under the airplane. Oil pressure and temperature are indicated either on the EMS or on the classical analog instruments.

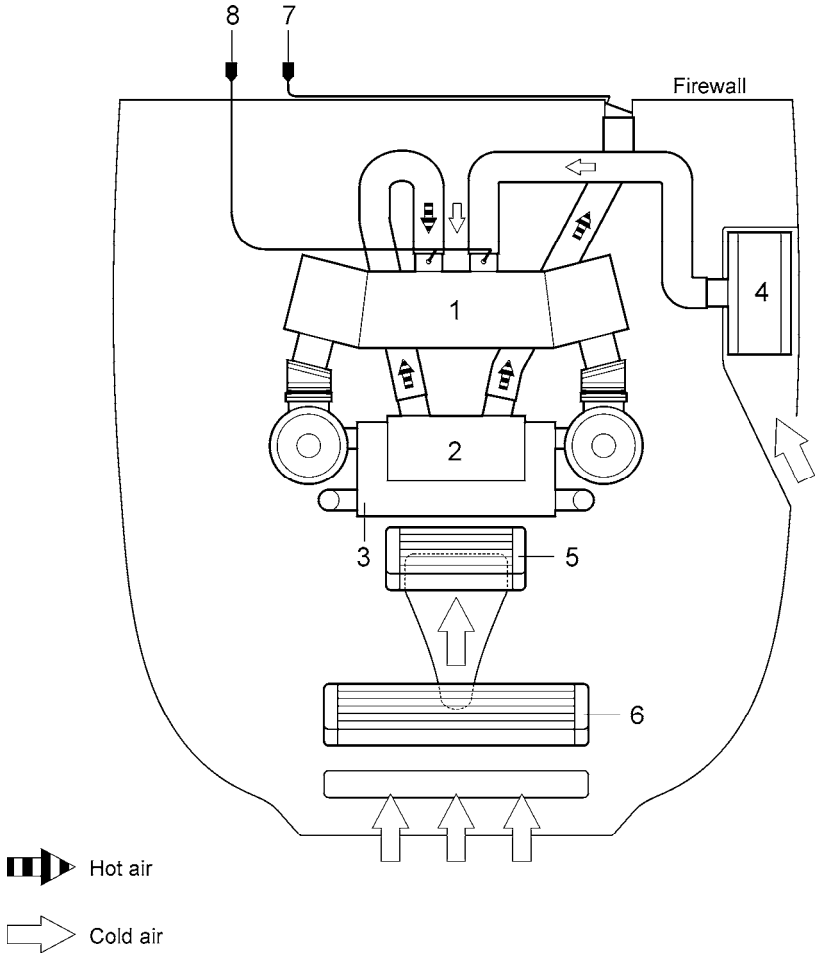


1 Pressure relief valve
2 Oil pressure sensor
3 Oil pump
4 Oil tank
5 Oil cooler
6 Oil filter
7 Oil tank venting
8 Oil temperature sensor
9 Thermostatic valve

Fig. 10-5: Oil cooling system

10.2.1.7 Engine air inlet system

Engine air inlet system ensures supply of sufficient air volume to the engine. Air is supplied to the engine by the NACA type inlet (left on the engine cowling) through the air filter (4, Fig. 10-6) to the airbox (1). Heated air from the heat exchanger (2), which is attached to the exhaust (3), is controlled by flaps in the airbox. The heating control flaps is controlled by **CARB HEAT** knob (8) on the instrument panel.



1 Airbox
2 Heat exchanger
3 Exhaust
4 Air filter
5 Oil cooler
6 Water cooler
7 **CABIN HEATING** knob
8 **CARB HEAT** knob

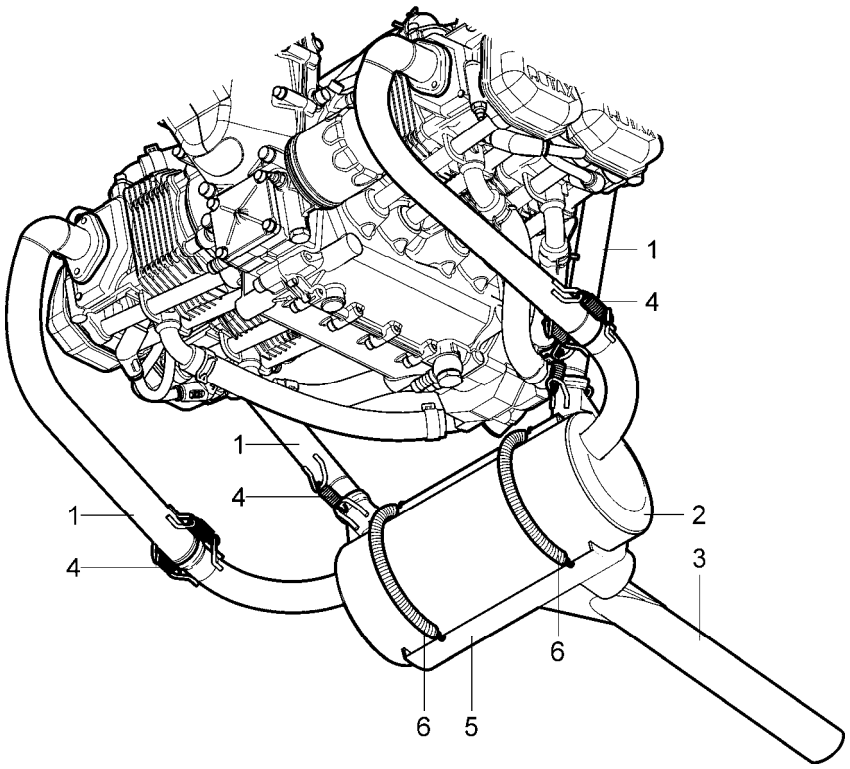
Fig. 10-6: Air inlet system

10.2.1.8 Exhaust system

Exhaust system of PS-28 Cruiser / SportCruiser airplane consist of four exhaust tubes (1, Fig. 10-7) which lead exhaust gases from individual cylinders to the muffler (2). The muffler serves at the same time as a silencer. Exhaust gases are led from there by the exhaust tube (3) down the airplane.

On the muffler there is a heat exchanger (5) from which is taken the warm air for the carburetor preheating and for the cockpit.

The whole exhaust system is manufactured by welding from the stainless steel sheet.



1 Exhaust tube
2 Muffler
3 Outlet exhaust tube
4 Spring
5 Heat exchanger
6 Spring

Fig. 10-7: Exhaust system

10.2.1.9 Ignition system

The engine is equipped with the double contactless ignition system. Every ignition circuit has its source of energy, control unit, 2-ignition coils and 4-spark plugs. It is fully independent on the other circuit and battery. High voltage current is distributed to the spark plugs by means of high voltage cables. The sequence of individual cylinder ignition of the engine is as follows: 1-4-2-3.

Ignition circuits are controlled by the keyed ignition switch on the instrument panel.

Positions of ignition switch:

OFF	Engine ignition of
R	Only ignition circuit B on
L	Only ignition circuit A on
BOTH	Both circuits on
START	Both circuits on and the starter is running up the engine

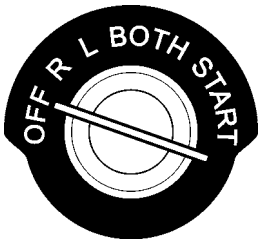


Fig. 10-8: Ignition selection switch

10.2.2 Propeller

The Woodcomp Klassic is a three-blade ground adjustable composite propeller designed for the airplanes with piston engines with power up to 75 kW (100 hp) and max. propeller speed up to 2 600 rpm.

The Woodcomp SR 3000 is a two-blade electrically operated in flight adjustable propeller of mixed structure designed for the airplanes with piston engines with power up to 85.8 kW (115 hp) and max. propeller speed up to 2 650 rpm.

The angle of blade setting is adjusted by a servomotor controlled from the cockpit and it can be adjusted smoothly in the range from the minimum (fine) angle intended for take-off up to the maximum (coarse) angle. The propeller can operate with either of manual control or with automatic control as a constant speed propeller (see Fig. 10-9).

The Sensenich propeller is a two-blade ground adjustable composite propeller designed for the airplanes with piston engines with power up to 85.8 kW (115 hp) and max. propeller speed up to 2 600 rpm.

The leading edge of the propeller blades is protected from damaging side by polyurethane tape (Woodcomp) and co-cured bonded stainless steel (Sensenich). The propeller surface is provided with a sprayed-on coat of resistant polyurethane varnish. The composite propeller spinner is a part of the propeller.

The propeller is attached to the engine by means of bolts.

Technical data of the propellers:

Woodcomp propellers

Propeller manufacturer:	Woodcomp s.r.o.	
Propeller type:	Klassic 170/3/R	
Max. speed:	2 600 rpm	
Diameter:	1.72 m	*(68 in)*
Pitch setting:	17.5° ± 0.5°	
Propeller type:	SR 3000/2W	
Max. speed:	2 650 rpm	
Diameter:	1.70 m	*(67 in)*
Range of setting:	12°	

Sensenich propeller

Propeller manufacturer:	Sensenich Propeller Manufacturing Co., Inc.	
Propeller type:	2A0R5R70EN	
Max. speed:	2 600 rpm	
Diameter:	1.78 m	*(70 in)*

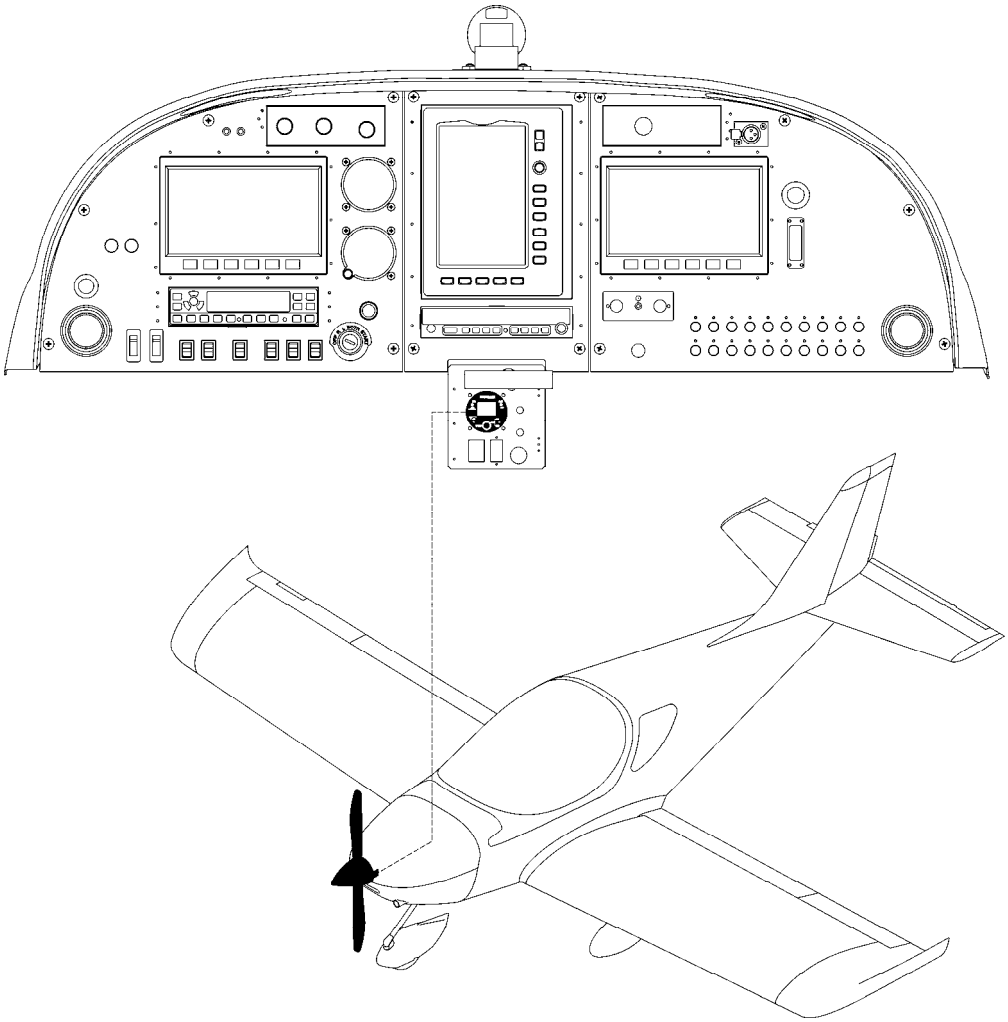


Fig. 10-9: SR 3000 propeller control scheme

10.3 Removal / Installation

10.3.1 Removal of the engine from the airplane

Type of maintenance: heavy

Authorization to perform:

- Repairman (LS-M) or Mechanic (A&P).

Tools needed:

- wrench size No.8, No.9, 3/8", 7/16", 9/16"
- Allen wrench size No.4
- screwdriver
- cutting pliers, pliers
- Cobra pliers (for clamps)

(a) Remove engine cowling.

(b) Disconnect and remove the battery (see 11.3.2).

(c) Remove the propeller (see 10.3.3 or 10.3.5 or 10.3.7).

(d) Disconnect all electrical system wires and bonding between the engine mount and the firewall.

(e) Shut the fuel selector valve (possibly drain fuel from the fuel installation).

(f) Drain oil from the engine (see 10.5.1) and cooling liquid (see 10.5.2).

(g) Disconnect hoses of the oil and the cooling system.

(h) Remove the oil cooler (see 10.3.13) and the water cooler (see 10.3.15).

(i) Disconnect control of carburetors and carburetors heating.

(j) Remove air intake (see 10.3.9).

(k) Remove the exhaust system (see 10.3.11).

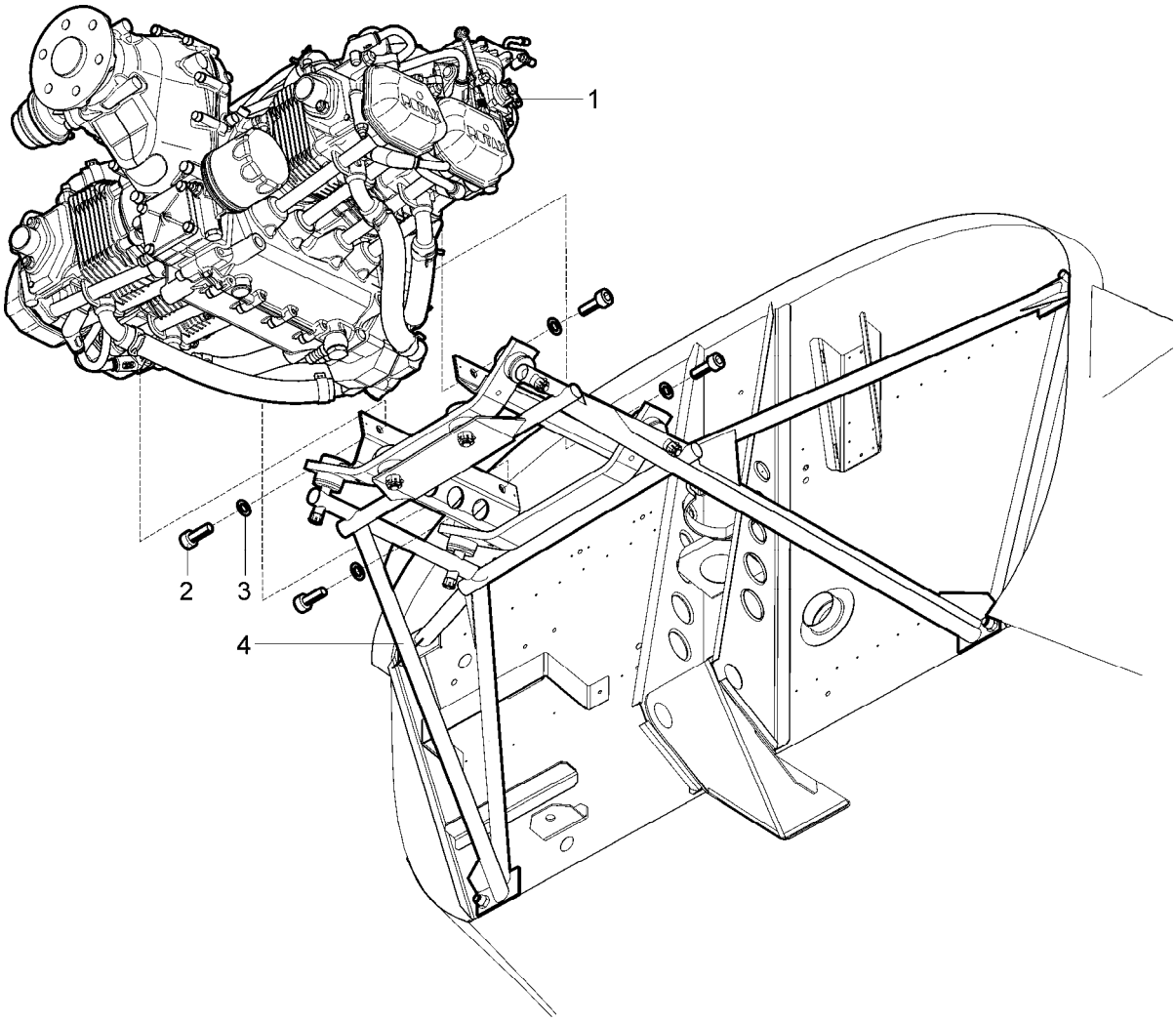
(l) Blind all the holes on the engine so that no debris can get into the engine.

(m) Cut of the wire securing the screw heads (3, Fig. 10-10).

(n) Remove screws (3) and washers (4) attaching the engine to the engine mount (4).

(o) Take the engine (1) away from the engine mount by the crane or with help 2 assistants.

(p) Store the removed engine on a safe place on a suitable support and prevent it from damage.



1 Engine
2 Bolt
4 Washer
4 Engine mount

Fig. 10-10: Engine removal / installation

10.3.2 Installation of the engine on the airplane

Type of maintenance: heavy

Authorization to perform:

- Repairman (LS-M) or Mechanic (A&P).

Tools needed:

- wrench size No.8, No.9, 3/8”, 7/16”, 9/16”
- Allen wrench size No.4
- screwdriver
- cutting pliers, pliers
- Cobra pliers (for clamps)

(a) Put the engine (1, Fig. 10-10) on the engine mount (4) by the crane or with 2 assistants and attach it by the screws (3) with washers (4). Tighten up to a torque of 11 - 16 Nm (*100 – 140 inch lb)*.

(b) Secure the screw heads (3) by lockwire (see 15.8.2).

(c) Install the exhaust system (see 10.3.12).

(d) Connect wiring according the wiring diagrams (see Wiring Manual).

(e) Install the oil cooler (see 10.3.14).

(f) Install the water cooler (see 10.3.16).

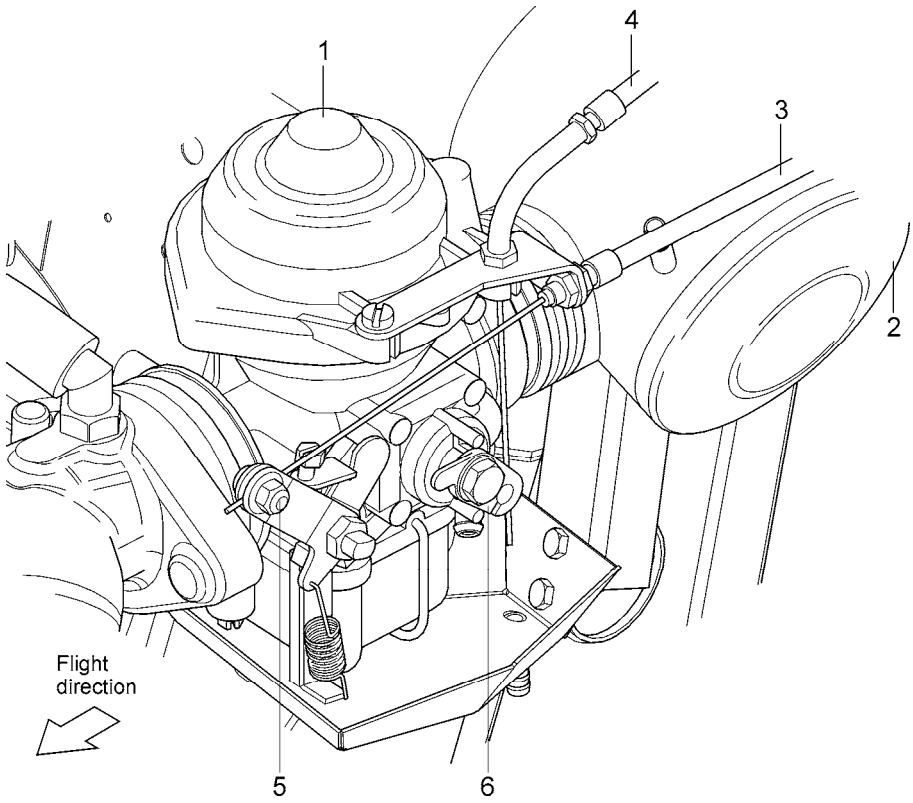
(g) Connect and secure oil system hoses.

(h) Connect and secure fuel system hoses.

(i) Install air intake of the engine (see 10.3.10).

(j) Connect control cable of the carburetors preheating flap.

(k) According to the Fig. 10-10 connect control cables of the throttle and the choke on the carburetors control levers. Adjust throttle control (see 10.4.2) and the choke (see 10.4.3).



1 Carburetor, left
2 Airbox
3 Throttle control cable
4 Choke control cable
5 Throttle control lever
6 Choke control lever

Fig. 10-11: Throttle and choke control connection

(l) Connect the air hose from the heat exchanger for heating the airplane cockpit.

(m) Fill the prescribed amount oil and cooling liquid quantity.

(n) Check fuel system tightness (see 9.4.1).

(o) Install the propeller (see 10.3.4 or 10.3.6 or 10.3.8).

(p) Install and connect the battery (see 11.3.3).

(q) Install engine cowlings.

(r) Perform engine test (see 10.4.1).

10.3.3 Klassic 170/3/R propeller removal

Type of maintenance: line

Authorization to perform:

- Repairman (LS-M) or Mechanic (A&P)

Tools needed:

- wrench size No.13, No. 16 (5/8")
- Allen wrench size No. 6
- screwdriver
- cutting pliers, pliers

WARNING: ENGINE IGNITION MUST BE SWITCHED OFF!

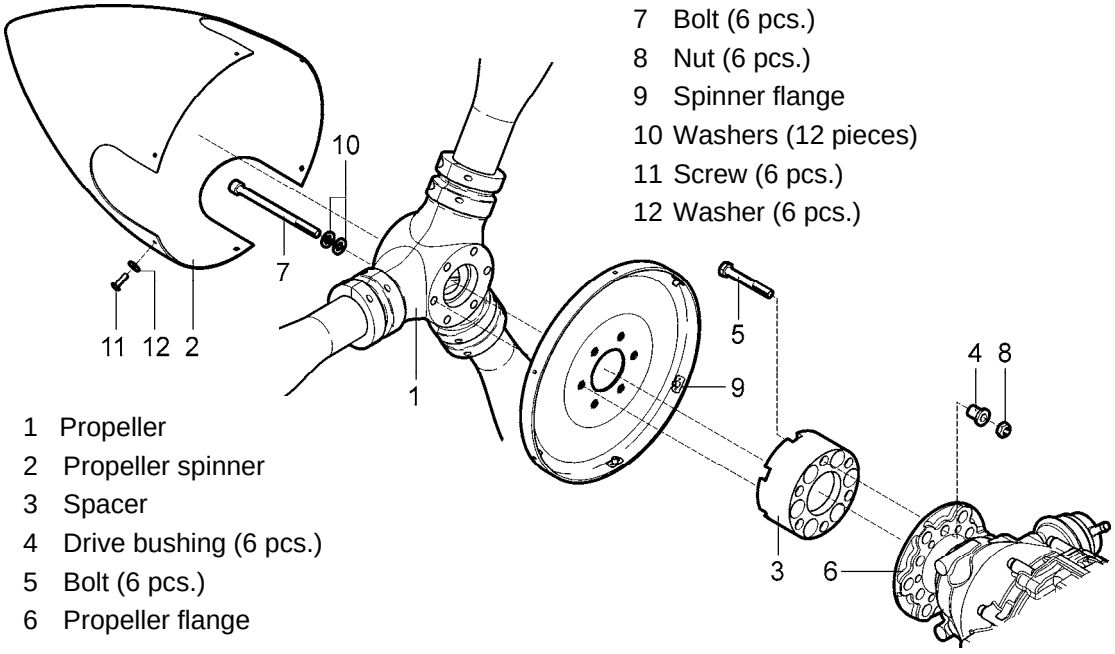
(a) Disconnect the battery and remove upper line of spark plugs from the engine.

(b) Unscrew the screws (11, Fig. 10-12) with the washers (12) and remove the propeller spinner (1).

(c) Cut of the lockwire securing the bolt heads (7).

(d) Unscrew and remove the bolts (7) with the washers (10) and take out the propeller along with spinner flange (9) from the spacer (3).

(e) Put the protective covers on the propeller blades and store the propeller on a safe place so that no damage can occur.



1 Propeller
2 Propeller spinner
3 Spacer
4 Drive bushing (6 pcs.)
5 Bolt (6 pcs.)
6 Propeller flange
7 Bolt (6 pcs.)
8 Nut (6 pcs.)
9 Spinner flange
10 Washers (12 pieces)
11 Screw (6 pcs.)
12 Washer (6 pcs.)

Fig. 10-12: Klassic 170/3/R propeller removal / installation

10.3.4 Klassic 170/3/R propeller installation

Type of maintenance: line

Authorization to perform:

- Repairman (LS-M) or Mechanic (A&P)

Tools needed:

- wrench size No.13, No. 16 (5/8")
- Allen wrench size No. 6
- screwdriver
- cutting pliers, pliers

WARNING: ENGINE IGNITION MUST BE SWITCHED OFF!

(a) Disconnect the battery and remove upper line of spark plugs from the engine.

(b) Check the contacting areas of the spacer propeller shaft flange (3, Fig. 10-12) and the propeller. Clear of all impurities.

(c) Remove protective covers from the propeller blades and carry out visual check of the propeller integrity and condition.

(d) Check out possibly adjust the blades pitch of propeller according to the propeller manual.

NOTE: Propeller pitch is factory set to 17.5° ± 0.5°.

(e) Attach the propeller (1) and the propeller flange (9) to the spacer (3) on the engine flange (6) by means of the bolts (7) with washers (10).

(f) Secure the airplane against its movement (see 14.5).

(g) Tighten the bolts (7) using a star pattern (Fig.10-13) with torque 22 Nm (*16.2 ft.lb.*), and measure the difference in distance of individual blade tips from marking (see Fig. 10-14).

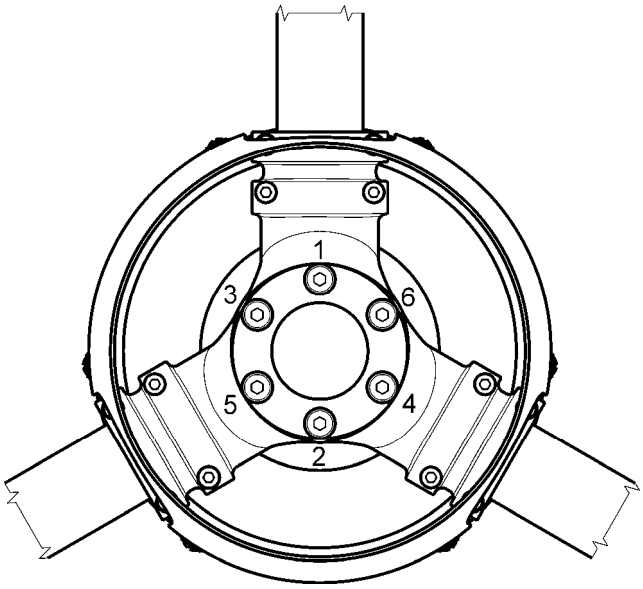


Fig. 10-13: Bolt tightening sequence

(h) The difference can be max. 1.5 mm (*0.06 in*). Possible bigger differences can be corrected by repetition the procedure from point (g).

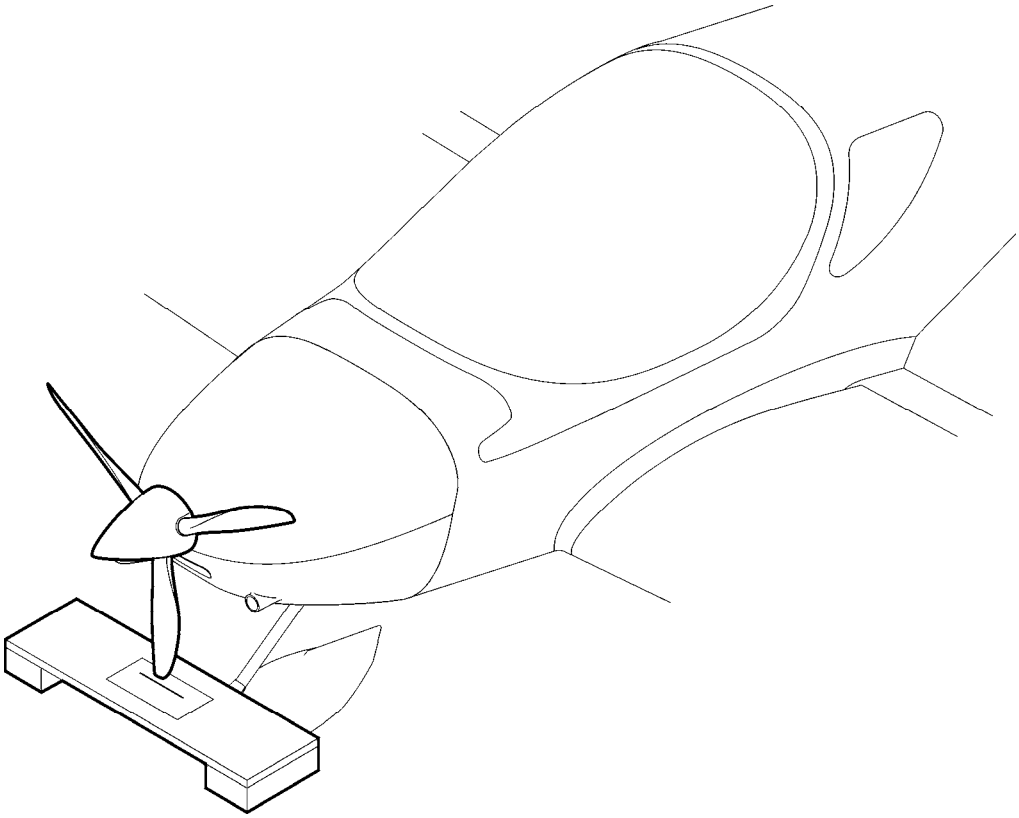


Fig. 10-14: Check of axial propeller running-out

(i) Secure bolt heads (7, Fig. 10-12) by lockwire (see 15.8.2).

(j) Put the propeller spinner (1) on the propeller and attach it with bolts (11) with washers (12).

(k) Install spark plugs to the engine. Tighten up with torque 20 Nm (*15 ft.lb*); connect the battery.

10.3.5 2A0R5R70EN propeller removal

Type of maintenance: line

Authorization to perform:

- Repairman (LS-M) or Mechanic (A&P)

Tools needed:

- wrench size No.13, No. 16 (5/8”)
- Allen wrench size No. 6
- screwdriver
- cutting pliers, pliers

WARNING: ENGINE IGNITION MUST BE SWITCHED OFF!

NOTE: For propeller removal two persons are requested.

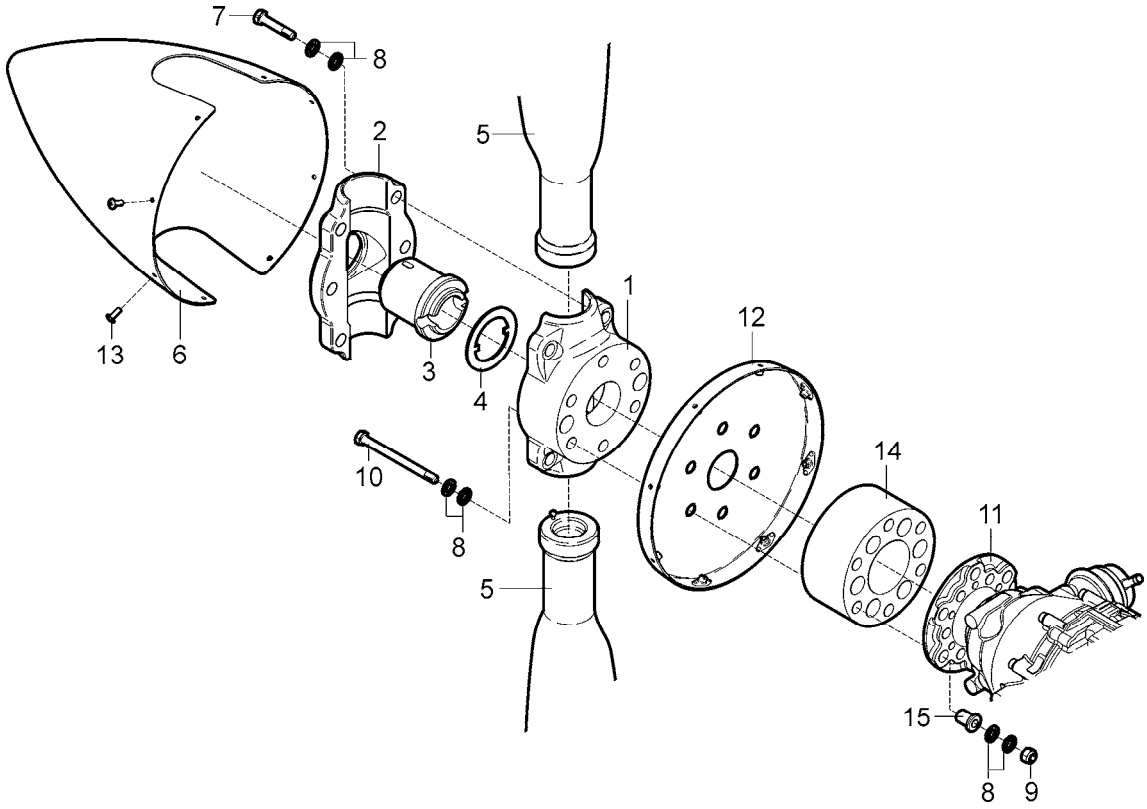
(a) Disconnect the battery and remove upper line of spark plugs from the engine.

(b) Unscrew the screws (13, Fig. 10-15) and remove the propeller spinner (6).

(c) Hold the blade (5); unscrew and remove the bolts (7), washers (8), hub clamp half (2), blades (5) and pitch cylinder (3).

(d) Put the protective covers on the propeller blades and store the blades on a safe place so that no damage can occur.

(e) Unscrew the nuts (16), remove the washers (8) bolts (10), bushings (9; 15), hub mount half (1), spinner flange (1) and spacer (14).



1 Hub mount half
2 Hub clamp half
3 Pitch cylinder
4 Pitch stop
5 Propeller blade
6 Propeller spinner
7 Bolt (6 pcs.)
8 Lock washer (36 pcs)
9 Locknut (6 pcs.)
10 Bolt (6 pcs.)
11 Propeller flange
12 Spinner flange
13 Screw (6 pcs.)
14 Spacer
15 Drive bushing (6 pcs.)

Fig. 10-15: 2A0R5R70EN propeller removal / installation

10.3.6 2A0R5R70EN propeller installation

Type of maintenance: line

Authorization to perform:

- Repairman (LS-M) or Mechanic (A&P)

Tools needed:

- wrench size No.13, No. 16 (5/8")
- Allen wrench size No. 6
- screwdriver
- cutting pliers, pliers

WARNING: ENGINE IGNITION MUST BE SWITCHED OFF!

NOTE: For propeller removal two persons are requested.

(a) Disconnect the battery and remove upper line of spark plugs from the engine.

(b) Check the contacting areas of the spacer (14, Fig. 10-15), propeller flange (11) and hub halves (1; 2). Clear of all impurities.

(c) Remove protective covers from the propeller blades and carry out visual check of the propeller part condition.

(d) Place the spinner flange (12), the hub mount half (1) and spacer (14) on the engine propeller flange (11) (vertical orientation of the hub is recommended).

(e) Insert drive bushings (15) through the back face of the propeller flange and into the hub mount half (1). Check for proper bushing and pilot stub fit into the hub mount half. The hub must sit flush on the mounting flange.

(f) Place washers (8) on bolts (10) and insert into the mounting holes inside the hub mount half (1). Place lock washers (8) and nuts (9) on the bolt and tighten the bolts using a star pattern with torque 22 Nm (*16.2 ft.lb*) (see Fig. 10-16).

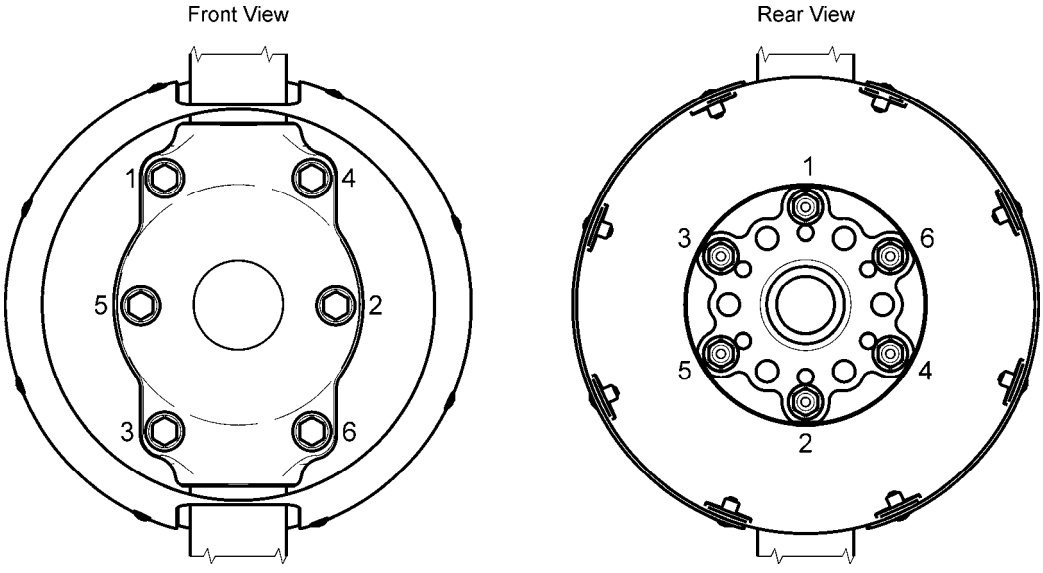


Fig. 10-16: Bolt tightening sequence

CAUTION: THE HUB MUST SIT FLUSH AGAINST THE MOUNTING FLANGE. BOLT BREAKAGE WILL OCCUR IF NOT FLUSH.

(g) Insert the pitch cylinder (3, Fig. 10-15) into the hub mount half (1), aligning the blade pin slots with the hub barrels. Each blade has a round side and a flat side, with the round side facing forward into the wind. Insert one blade (5) at a time into the hub mounting half (1), taking care to insert the blade pitch pin into the blade pin slot, then rotating the blade shank fully into the hub.

(h) Place the hub cover half (2) over the blades. Place washers (8) on bolts (7) and insert into the hub cover half (2). Hands tighten the bolts (7) into the threaded clamp bushings, taking care to maintain an even gap between hub halves on all sides. Grasp each blade shank and firmly pull outwards to seat each blade in the hub.

(i) Set blade pitch by grasping each blade shank and twisting the blades in opposite directions. Align the index mark on the pitch cylinder with the appropriate pitch setting (1, 2, 5) on the hub, as indicated the propeller manual.

(j) Using a torque wrench and rotating from bolt to bolt, tighten the bolts the bolts using a star pattern with torque 22 Nm (16.2 ft.lb.) (see Fig. 10-16), Check the blade pitch setting for rotation away from your desired pitch setting. Once properly torqued, a small gap may remain between hub halves. Check the propeller blades for track (see Fig. 10-14). The blades should track within 1/8" (3.175 mm) of each other at the tip. Setting the pitch accurately is more important than track from blade to blade.

(k) Install spark plugs to the engine. Tighten up with torque 20 Nm (*15 ft.lb.*); connect the battery.

(l) Run the propeller for approximately 5 minutes at 50% of the desired rpm. Check the clamping bolts to see if they have lost torque. If they have, it is because the blades have firmly seated themselves. Tighten again to the proper torque.

Note: This torque value should be checked after the first 5 hours of operation and every 25 hours thereafter.

(m) Put the propeller spinner (6, Fig. 10-15) on the propeller and attach it with bolts (13).

10.3.7 SR3000 propeller removal

Type of maintenance: line

Authorization to perform:

- Repairman (LS-M) or Mechanic (A&P)

Tools needed:

- wrench size No.13
- screwdriver

WARNING: ENGINE IGNITION MUST BE SWITCHED OFF!

(f) Disconnect the battery and remove upper line of spark plugs from the engine.

(g) As necessary, unscrew the screws (4, Fig. 10-17) with the washers (5) and remove the propeller spinner (3).

(h) Unscrew and remove the nuts (8) and take out the propeller from the propeller flange (9).

(i) Put the protective covers on the propeller blades and store the propeller on a safe place so that no damage can occur.

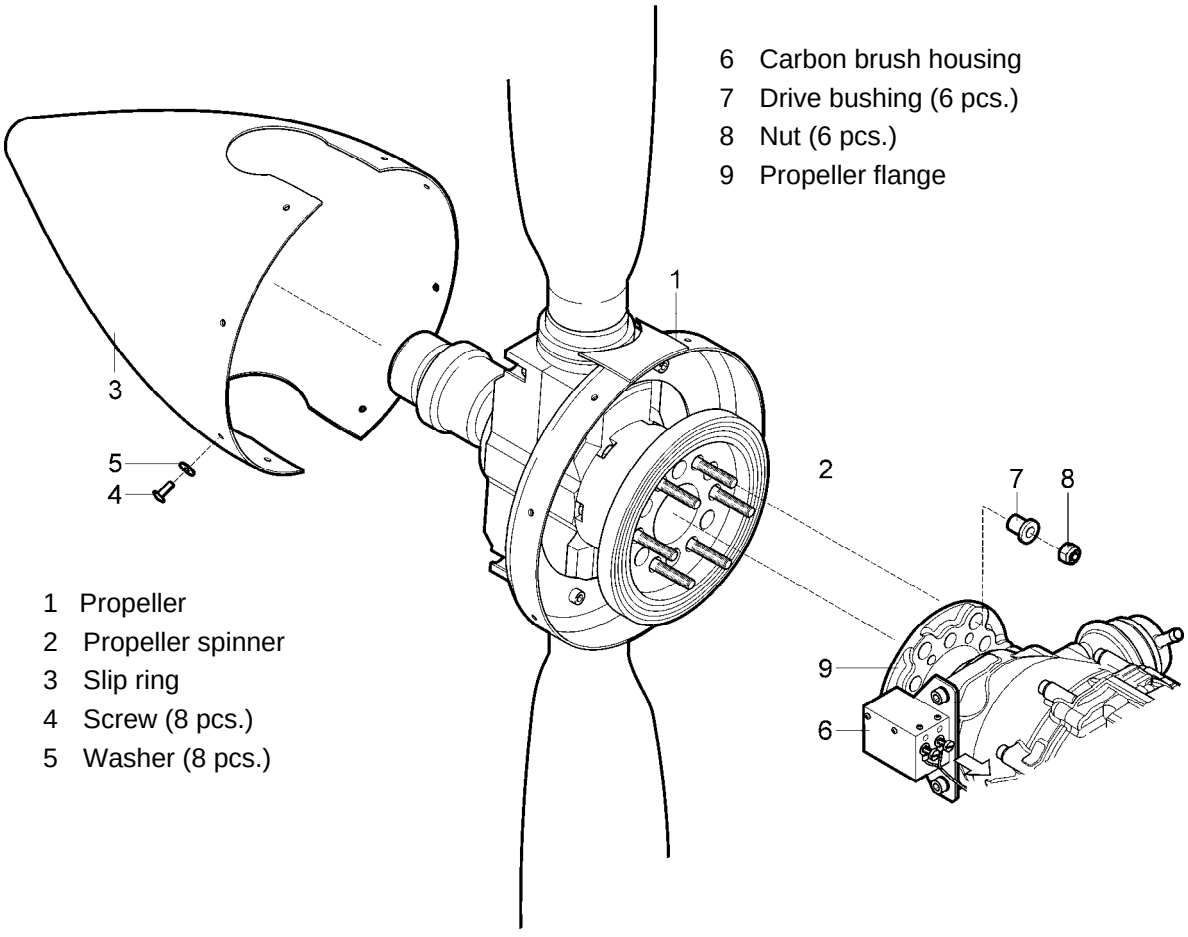


Fig. 10-17: SR 3000 propeller removal / installation

10.3.8 SR3000 propeller installation

Type of maintenance: line

Authorization to perform:

- Repairman (LS-M) or Mechanic (A&P)

Tools needed:

- wrench size No.13
- screwdriver

WARNING: ENGINE IGNITION MUST BE SWITCHED OFF!

(a) Disconnect the battery and remove upper line of spark plugs from the engine.

(b) Check the contacting areas of the propeller flange (9, Fig. 10-17) and the propeller. Clear of all impurities.

(c) Remove protective covers from the propeller blades and carry out visual check of the propeller integrity and condition.

(d) Loose the screws of the carbon brush housing flange and shift the carbon brush housing (6) to its rear position.

(e) Gently push the propeller (1) to the propeller flange (9) by hand and screw the nuts (8).

(f) Secure the airplane against its movement (see 14.5).

(g) Tighten the nuts (7) using a star pattern (see Fig.10-13) with torque 22 Nm (*16.2 ft.lb.*).

(h) Adjust the carbon brush housing according to Fig. 10-18. Turn the propeller by hand and check that the carbon brushes seat properly in the centers of the slip ring, and makes contact with its entire surfaces.

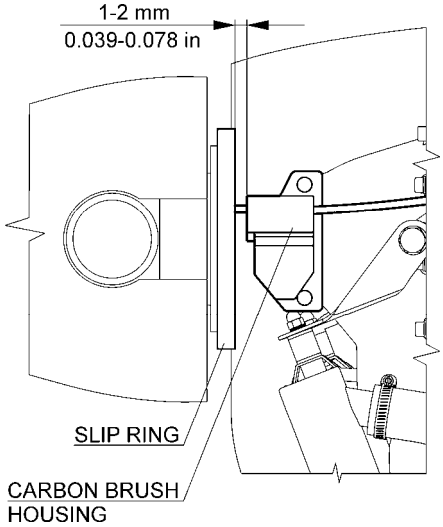


Fig. 10-18: Carbon brush housing adjustment

(i) As necessary, put the propeller spinner (3, Fig. 10-17) on the propeller and attach it with bolts (4) with washers (5).

(j) Install spark plugs to the engine. Tighten up with torque 20 Nm (*15 ft.lb*); connect the battery.

10.3.9 Air intake system removal

Type of maintenance: line

Authorization to perform:

- Sports pilot or higher

Tools needed:

- wrench size No.8, No.10
- screwdriver

WARNING: ENGINE IGNITION MUST BE SWITCHED OFF!

(a) Remove the upper engine cowling.

(b) Disconnect the control cable (13, Fig. 10-19) from the air intake changeover lever (14) and from the holder.

(c) Remove the hose fasteners (4; 5; 16) and disconnect hoses (2; 3), drain hoses (6; 7), and air hoses (8; 15).

(d) Unscrew nut (12), remove washer (11), silentblock (9), and disconnect the bracket (10).

(e) Remove the airbox from the engine and store it.

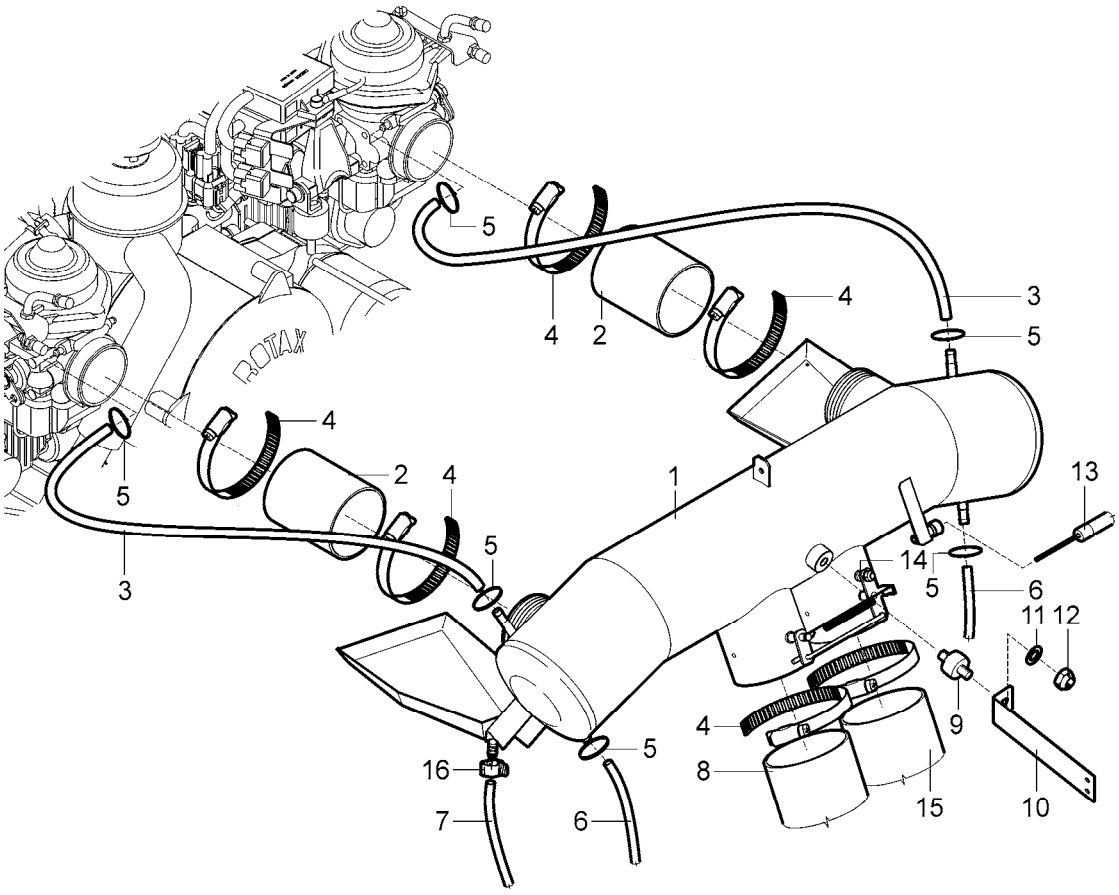


Fig. 10-19: Air intake system removal / installation (page 1 of 2)

1 Airbox
2 Hose connecting airbox / carburetor
3 Hose
4 Hose clamp
5 Cable tie
6 Drain hose
7 Drain hose
8 Air hose – cold air
9 Silentblock
10 Bracket
11 Washer
12 Nut
13 Control cable
14 Air intake changeover lever
15 Air hose – preheated air
16 Hose clamp

Fig. 10-16: Air intake system removal / installation (page 2 of 2)

10.3.10 Air intake system installation

Type of maintenance: line

Authorization to perform:

- Sports pilot or higher

Tools needed:

- wrench size No.8, No.10
- screwdriver

WARNING: ENGINE IGNITION MUST BE SWITCHED OFF!

(a) Attach the outlet pipe of the airbox (1, Fig. 10-19) to the hoses (2) on the carburetor inlet necks; secure it by means of the hose clamps (4).

(b) Fix the airbox by means of the bracket (10), silentblock (9), nut (12) and washer (11) to the firewall.

(c) Connect the air intake hoses to the airbox (1), one (8) from the air filter on the lower engine cowling and the other (15) from the heat exchanger; secure them by hose clamps (4).

CAUTION: DO NOT CONFUSE THESE HOSES!

(d) Connect drain hoses (6) to the airbox (1) and the drain hoses (7) to the drip trays under carburetors - lead them on the engine mount in direction down the airplane and secure them by hose fasteners (5; 16). (fix them by cable ties on the engine mount).

(e) Connect the carburetors control cable of (13) to the lever (14); adjust function of carburetors heating knob.

(f) Install the upper engine cowling.

10.3.11 Exhaust system removal

Type of maintenance: line

Authorization to perform:

- Repairman (LS-M) or Mechanic (A&P)

Tools needed:

- wrench size No.13
- pliers
- small wire hook (spring removal/assembly jig)

WARNING: ENGINE IGNITION MUST BE SWITCHED OFF!

(a) Remove engine cowlings.

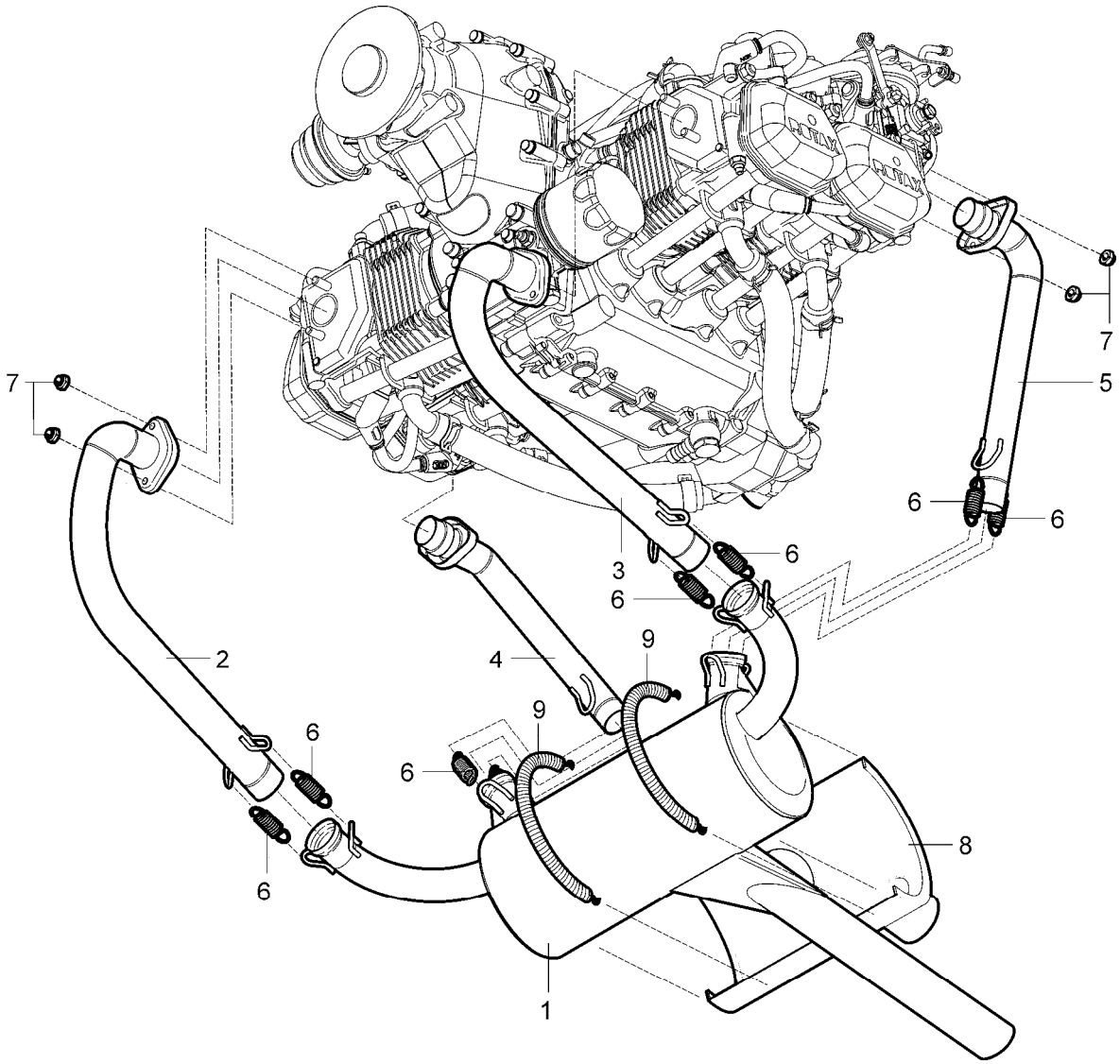
(b) Disconnect air hoses from the heat exchanger (8, Fig. 10-20) (see 10.3.9).

(c) Remove lockwire securing the springs (9).

(d) Remove the springs (9) and dismantle the heat exchanger (8) from the muffler (1).

(e) Remove the springs (6) from the individual exhaust tubes (2; 3; 4; 5) and carefully remove muffler (1).

(f) Unscrew nut (7) and remove exhaust tubes (2; 3; 4; 5) from the necks on the engine.



1 Muffler
2 Exhaust tube 1
3 Exhaust tube 2
4 Exhaust tube 3
5 Exhaust tube 4
6 Spring
7 Locknut
8 Heat exchanger
9 Spring

Fig. 10-20: Exhaust system removal / installation

10.3.12 Exhaust system installation

Type of maintenance: line

Authorization to perform:

- Repairman (LS-M) or Mechanic (A&P)

Tools needed:

- wrench size No.13
- pliers
- small wire hook (spring removal/assembly jig)

WARNING: ENGINE IGNITION MUST BE SWITCHED OFF!

(a) Install the exhaust tubes (2; 3; 4; 5, Fig. 10-20) to the engine necks.
Mind a proper arrangement, each tube is designed for specific necks.
Screw the nuts (7) on the bolts of the engine exhaust necks, do not tighten the nuts.

(b) Install the muffler (1) to the exhaust tubes (2; 3; 4; 5) and secure the tubes by means of the springs (6); secure springs with the lockwire (see 15.8.2).

(c) Gradually tighten all nuts (7) of the flanges on the engine necks.

NOTE: Ensure the sufficient space between the exhaust pipes and the other installed parts.

(d) Put on muffler (1) heat exchanger (8) and secure it by means of springs (9).

(e) Install air hoses on the heat exchanger (see 10.3.10).

(f) Install engine cowlings.

10.3.13 Oil cooler removal

Type of maintenance: line

Authorization to perform:

- Sports pilot or higher

Tools needed:

- wrench size No.19, No.30

WARNING: ENGINE IGNITION MUST BE SWITCHED OFF!

(a) Remove the upper and lower engine cowling.

(b) Drain oil from the oil system (see 10.5.1).

NOTE: It is also possible to pump oil from the cooler to the oil tank. You can do it by manual running the engine by means of the propeller, whereas from the oil tank you will remove the hose leading to the oil cooler.

(c) Remove lockwire securing banjo bolts (6, Fig. 10-21).

(d) Loose hose clamps (9), and disconnect hoses (8) from the banjo fittings (5).

(e) Remove banjo bolts (6), banjo fittings (5), and sealing rings (7) from the oil cooler necks.

(f) Unscrew nuts (4), remove the upper pairs of washers (2; 3), and cooler (1).

10.3.14 Oil cooler installation

Type of maintenance: line

Authorization to perform:

- Sports pilot or higher

Tools needed:

- wrench size No.19, No.30

WARNING: ENGINE IGNITION MUST BE SWITCHED OFF!

(a) Set the oil cooler (1, Fig. 10-21) to the bracket (10) and on the cooler necks install the upper pairs of washers (2; 3), and gradually tight the nuts (4).

(b) Install the banjo fittings (5), screw the banjo bolts (6) with sealing rings (7) and secure these bolts with the lockwire (see 15.8.2).

(c) Install hoses (8) on the banjo fittings (5) and secure them with hose clamps (9).

(d) Fill the oil system with oil (see 10.5.1) and check oil system tightness.

(e) Install the lower and upper engine cowling.

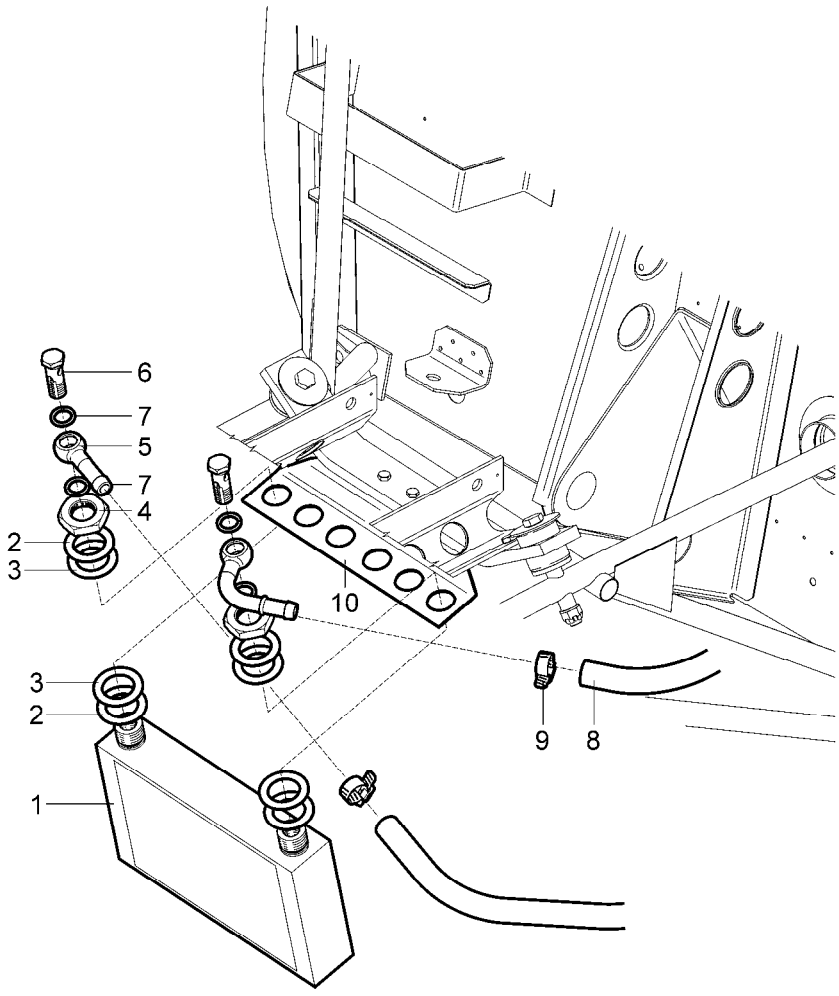


Fig. 10-21: Oil cooler removal / installation (page 1 of 2)

1 Oil cooler
2 Washer
3 Rubber washer
4 Nut
5 Banjo fitting
6 Banjo bolt
7 Sealing ring
8 Hose
9 Hose clamp

Fig. 10-21: Oil cooler removal / installation (page 2 of 2)

10.3.15 Water cooler removal

Type of maintenance: line

Authorization to perform:

- Sports pilot or higher

Tools needed:

- wrench size No.10, No.17
- screwdriver

WARNING: ENGINE IGNITION MUST BE SWITCHED OFF!

(a) Remove the upper and lower engine cowling.

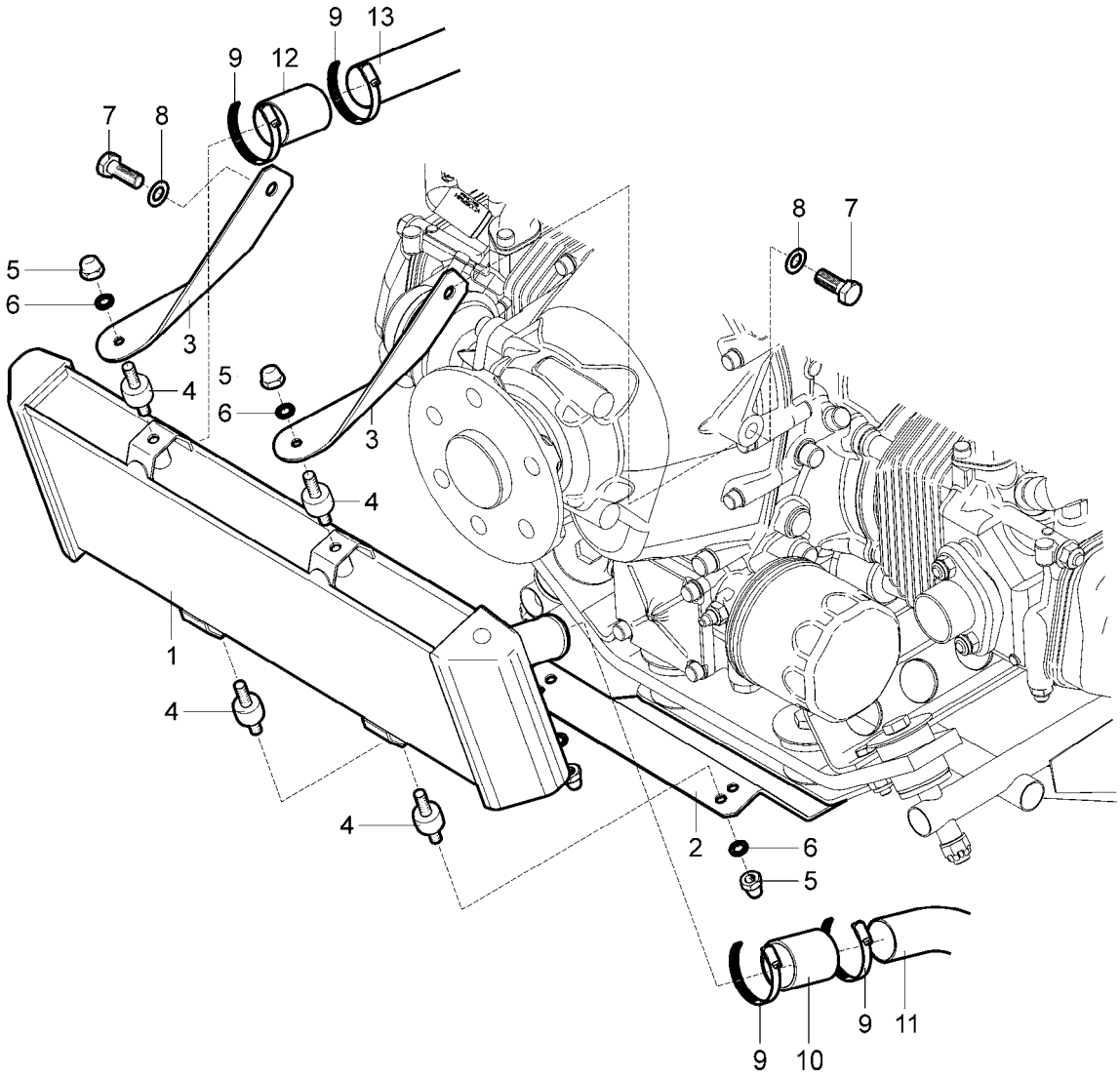
(b) Drain the cooling liquid from the cooling system (see 10.5.2).

(c) Remove the hose clamps (9, Fig. 10-22) and disconnect hoses (10; 12) from the cooler outlets.

(d) Loose the bolts (7).

(e) Remove four nuts (5), washers (6) and cooler (1).

(f) As necessary, remove the silentblocks (4) from the cooler.



1 Cooler
2 Lower bracket
3 Upper bracket
4 Silentblock
5 Cap nut
6 Lock washer
7 Bolt
8 Washer
9 Hose clamp
10 Hose
11 Tube
12 Hose
13 Tube

Fig. 10-22: Water cooler removal / installation

10.3.16 Water cooler installation

Type of maintenance: line

Authorization to perform:

- Sports pilot or higher

Tools needed:

- wrench size No.10, No.17
- screwdriver

WARNING: ENGINE IGNITION MUST BE SWITCHED OFF!

(a) As necessary, screw the silentblocks (4, Fig. 10-22) to the cooler.

(b) Put the cooler on the lower (2) and the upper brackets (3).

(c) Install the washers (6), screw and tighten the nuts (5); tighten the bolts (7).

(d) Install hoses (10) on the cooler outlets and secure them with hose clamps (9).

(e) Fill the cooling system with cooling liquid (see 10.5.2) and check system tightness.

(f) Install the lower and upper engine cowling.

10.3.17 Throttle and choke control levers removal

Type of maintenance: line

Authorization to perform:

- Repairman (LS-M) or Mechanic (A&P)

Tools needed:

- wrench size No.14
- Allen wrench size No. 2
- screwdriver
- cutting pliers

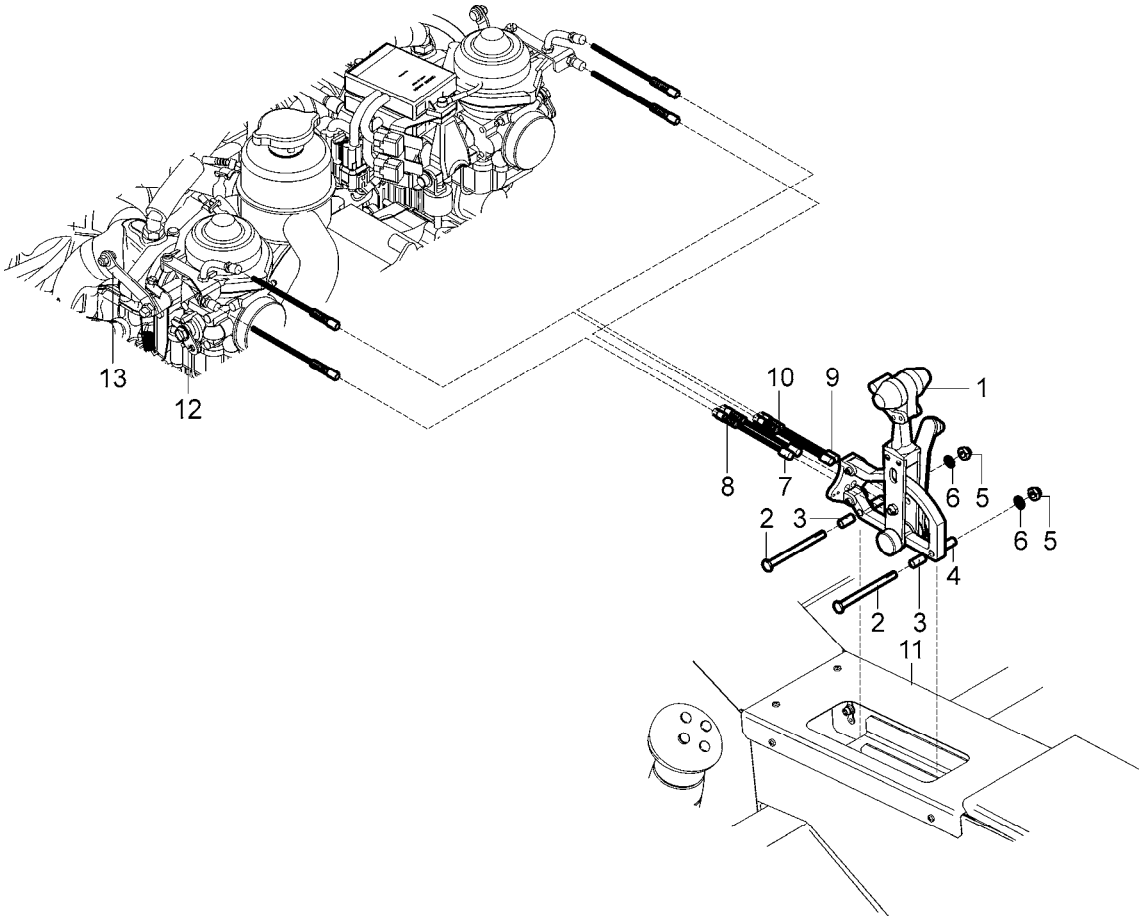
WARNING: ENGINE IGNITION MUST BE SWITCHED OFF!

(a) Remove the cover (11, Fig. 10-23) from the middle channel.

(b) Remove the upper engine cowling.

(c) Disconnect the throttle (7) and choke (9) cables from carburetor levers (12; 3) and from the throttle and choke control levers (1).

(d) Unscrew the nuts (5), remove washers (6), bolts (2), bushings (3; 4) and the throttle control lever witch choke (1) from the middle channel.



1 Throttle control lever with choke
2 Bolt
3 Bushing
4 Bushing
5 Nut
6 Washer
7 Throttle cable
8 Throttle bowden
9 Choke cable
10 Choke bowden
For information:
11 Cover
12 Choke lever
13 Throttle lever

Fig. 10-23: Throttle control lever

10.3.18 Throttle and choke control levers installation

Type of maintenance: line

Authorization to perform:

- Repairman (LS-M) or Mechanic (A&P)

Tools needed:

- wrench size No.14
- Allen wrench size No. 2
- screwdriver
- cutting pliers

WARNING: ENGINE IGNITION MUST BE SWITCHED OFF!

(a) Set the throttle control lever witch choke (1, Fig, 10-23) into the middle channel.

(b) From one side shift the bolts (2) into the holes on the middle channel side.

(c) Gradually put first bushings (3), throttle control lever witch choke (1) and second bushings (4) on the wheel bolts (2) according to the figure.

(d) Install washers (6), screw and tighten nuts (5).

(e) Connect the throttle (7) and choke (9) cables to the throttle control lever witch choke (1), and to the carburetor levers (12; 13).

(f) Install the cover (11) on the middle channel.

(g) Install the upper engine cowling.

(h) Check for continuous travel of the throttle and choke control lever.

(i) Adjust the throttle control (see 10.4.2).

10.3.19 Carburetors heating knob removal

Type of maintenance: line

Authorization to perform:

- Sports pilot or higher

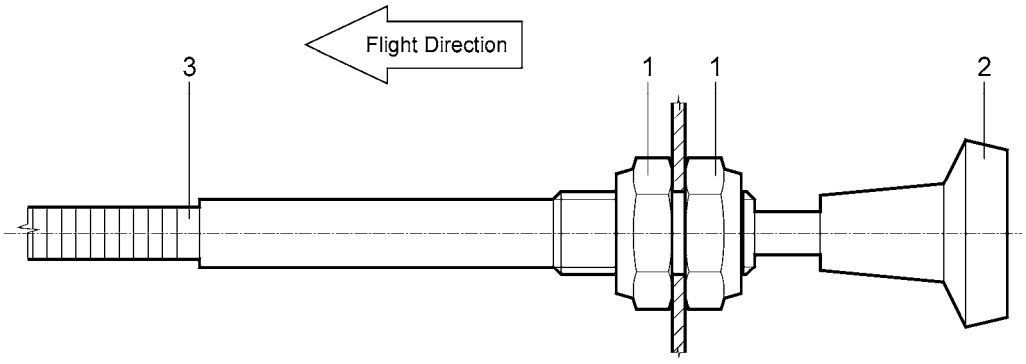
Tools needed:

- wrench size No.8, No.14
- screwdriver
- cutting pliers

(a) Remove the upper engine cowling.

(b) Disconnect the control cable (13 Fig. 10-19) on the changeover lever (14) of the air intake.

(c) Remove the inner nut (1, Fig. 10-24) and pull out the knob (2) with the flexible housing (3) from the firewall and instrument panel.



1 Nut
2 Heating control knob
3 Flexible housing

Fig. 10-24: Carburetors heating knob

10.3.20 Carburetors heating knob installation

Type of maintenance: line

Authorization to perform:

- Sports pilot or higher

Tools needed:

- wrench size No.8, No.14
- screwdriver
- cutting pliers

(a) Put the flexible housing (3, Fig. 10-24) with knob (2) into the hole in the instrument panel and firewall from behind and fasten it from both sides of the instrument panel by the nuts (6).

(b) Fasten the knob from both sides of the instrument panel by the nuts (1).

(c) Connect the control cable (13 Fig. 10-19) on the changeover lever (14) of the air intake.

(d) Adjust carburetors heating control (see 10.4.4).

10.4 Check / Adjustment

10.4.1 Engine test

CAUTION: THE PERSON PERFORMING THE ENGINE TEST MUST BE MECHANIC WITH A VALID CERTIFICATE AND WITH REGISTERED ENGINE TYPE ROTAX 912 ULS. IN THE COURSE OF THE WHOLE TEST AN AIRCRAFT MECHANIC WHO IS FAMILIARIZED WITH THE AIRCRAFT TYPE PS-28 CRUISER / SPORTCRUISER MUST BE PRESENT.

(a) Perform the test out of the buildings at the place assigned for performing engine tests in broad daylight.

(b) Test place must be equipped with extinguisher which is suitable for extinguishing burning liquids and electrical installation.

(c) Brake the airplane and put the chocks under the landing gear wheels.

(d) Before performing engine test, carry out engine and propeller preflight check in the range shown in the POH, Section 4.1, and the Rotax Operator's Manual, Section 10.3.

(e) Start the engine according to the POH, Section 4.2 and the Rotax Operator's Manual, Section 10.3.

- activate starter for max.10 sec. only, followed by a cooling period of 2 min.
- as soon as engine runs, adjust throttle to achieved smooth running at approximate 2 500 rpm
- check if oil pressure has risen within 10 sec. and monitor oil pressure

NOTE: If oil pressure do not rise within 10 sec. above min. pressure 0.8 bar (*12 psi*), switch off the engine. Is admissible max. oil pressure 7 bar (*102 psi*) for a short period at cold start. Fuel pressure has been in range from 0.15 to 0.4 bar (*2.2 to 5.8 psi*).

(f) Engine warm up according to the POH, Section 4.2.3 and the Rotax Operator's Manual, Section 10.3.

As soon as oil pressure will be in range from 2 to 5 bar (*29 to 73 psi*) start warming up period at 2 000 rpm for approx. 2 minutes, continue at 2 500 rpm, duration depending on ambient temperature, until oil temperature reaches 50°C (*122°F*).

(g) Choke – during engine warm up - **OFF**.

NOTE:Watch engine instruments and record the values of oil pressure, oil temperature and head cylinder temperature into the Engine test report, see the Tab. 10-1.

(h) Ignition check:

Engine speed.....4 000 rpm

Ignition switch .....switch from position **BOTH** to **L**, record rpm drop

Ignition switch .....switch from position **BOTH** to **R**, record rpm drop

NOTE: Rpm drop between position **BOTH** and **L** or **R** must not exceed 300 rpm. Mutual difference between ignition circuits **L** and **R** must not exceed 115 rpm. Write down results into the engine test report, see the Tab. 10-1.

(i) Test of max. rpm on the ground:

Throttle .....**MAX**

NOTE: Record max. rpm into the engine test report, see the Tab. 10-1.

ENGINE TEST REPORT					
Aircraft	*PS-28 Cruiser / SportCruiser*	**Registration**		**Serial No.**	
Engine	*ROTAX*	**Type**	*912 ULS*	**Serial No.**	

	Activity	Set down values	Measured values
	Starting up the engine		
1.	Min. oil pressure up to 10 sec.	0.8 bar (*12 psi*)	
2.	Max. oil pressure*	7 bar (*102 psi*)	
3.	Min. fuel pressure	0.15 bar (*2.2 psi*)	
4.	Increase rpm as soon as oil pressure reaches	2 bar (*29 psi*)	
5.	Warming up the engine at 2 000 – 2 500 rpm	smooth running	
6.	Voltage	12.4 – 14.4 V	
	Engine test		
7.	Min. oil temperature	50°C (*122°F*)	
8.	Oil pressure	2-5 bar (*29-73 psi*)	
9.	Max. cylinder head temperature ***	135°C (*275°F*)	
10.	Rpm drop between ignition position **BOTH** and **L**/**R** at 4000 rpm	max. 300 (115 rpm**)	
11.	Acceleration	2 – 3 sec.	
12.	Max. rpm on the ground	5000 rpm	
13.	Idle	min. 1 400 rpm	

Defects:

*	During cold start for a short term only
**	RPM drop between ignition position **BOTH** and position **L** or **R** must not exceed 300 rpm. Mutual difference between left (**L**) and right (**R**) ignition circuit must not exceed 115 rpm.
***	see Rotax Operator's Manual, Section 10.1.2 Operating speeds and limits, and Section 10.2.1 Coolant; Rotax Installation Manual, Section 12, Cooling system; Rotax Service Instruction SI-912-016; POH, Section 8, paragraph. 8.5.3, and section 9, Supplement No.02, Type of coolant used in engine.

Conclusion	**Complying – Non-complying** Complying if the measured values are not out of the range of the prescribed values.

Elaborated by:	Signature:	Date:
Checked by:	Signature:	Date:

Tab. 10-1: Engine test report

10.4.2 Adjusting throttle control

(a) Pull the throttle control to the stop. The throttle lever on the carburetor (5, Fig. 10-10) must be on the stop. The bowden must be supported in the terminals.

(b) Release the nut on the control lever (5) and take up any slack on the cable and tighten up the nut.

CAUTION: CONTROL CABLE SHOULD NOT BE TOO TIGHT FOR THE REASON OF A POSSIBLE DEFORMATION OF THE CONTROL LEVER ON THE CARBURETOR.

(c) Check again whether the controller and the lever on the carburetor are on the stops. If not, perform adjusting by means of adjustable terminals on bowdens.

(d) In order to prevent the bowdens at the carburetor from shifting out from the terminals, secure the bowdens with lockwire. Mark all bolted joints with red paint.

10.4.3 Adjusting choke control

(a) Set the choke lever to the stops position and put it back about 3 mm (*1/8 in*). The lever of choke control on the carburetor (6, Fig. 10-11) must be on the stop. The bowden must rest on the terminals.

(b) Release the bolt on the lever of choke control (6), slightly loosen the cable and tighten up the bolt.

(c) Check again if the choke lever and the lever on the carburetor are on the stops. If not, carry out adjustment by adjustable bowden terminals.

(d) To prevent the bowdens at the carburetor from shifting out of the terminal, secure the bowdens with lockwire. Mark all bolted joints with red paint.

10.4.4 Adjusting carburetors heating control

(a) Push in the carburetor heating knob to the stop and pull it out by about 3 mm (*1/8 in*). The changeover lever (14, Fig. 10-19) on the air intake must be on the stop. The bowden must rest on the terminal.

(b) Release the bolt on the changeover lever (14), slightly stretch the cable and tighten up the bolt.

(c) Check again whether the knob and the lever on the air intake are on the stops. If not, carry out adjustment by adjustable bowden terminals.

(d) To prevent the bowdens from shifting out of the terminal, secure the bowdens with lockwire. Mark all bolted joints with red paint.

10.4.5 Checking exhaust system

WARNING: CHECK OF EXHAUST SYSTEM VERY CAREFULLY. THE BURST OR LEAKY EXHAUST CAN EXPOSE THE CREW TO DANGER PRESENTED BY CARBON MONOXIDE OR CAN RESULT IN ENGINE POWER LOSS, POSSIBLY FIRE.

Check the exhaust system for cracks. Pay special attention to the following areas:

- muffler in the area of the input and the output pipe and the collector head
- all welds and their immediate surrounding
- carefully check all areas showing local overheating caused by exhaust gases
- remove the heat exchanger and check muffler area located under it
- check the whole exhaust pipe between the engine and the muffler including its attachment to the engine
- check outlet pipe from the muffler
- check retaining springs for cracks.

10.5 Exchanges / Service information

10.5.1 Exchange / Refilling oil

- refer to the Rotax Maintenance Manual, Chapter 12-00-00, Section 5 Lubrication System.

NOTE: Recommended kinds of oil are mentioned in the Rotax Operator's Manual, Section 10.2.3 Lubricants, in the Rotax Service Instructions SI-912-016.

Type of oil used by aircrafts manufacturer is shown in section 17.5 Operating Liquids.

Oil volume

Total oil volume in the lubrication system of Rotax 912 ULS engine is approximately 3.8 litres (*1 US gallon*).

Check oil volume preferably after running the propeller by hand in the sense of engine rotation so that oil can fill in the engine space or operate the engine for 1 minute in idle mode.

WARNING: SWITCH OFF IGNITION BEFORE MANUALLY TURNING THE ENGINE!

The oil tank is located in the engine compartment and oil dipstick is accessible after opening the lid on the upper engine cowling (see 10.2.1.2). Oil level must lie between min and max marks (flattening) on the dipstick and must not drop below min mark.

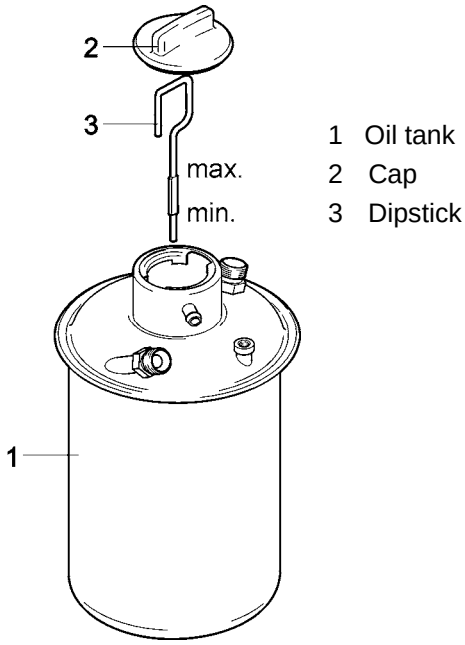


Fig. 10-25: Oil volume check

Oil draining

Drain oil from the oil tank by unscrewing the plug (wrench size No.17) on the lower side of the oil tank. It is possible to drain oil from the engine after unscrewing the plug in the lower part of the engine at the hose of the return branch of oil flow. It is recommended to drain oil immediately after engine test or after finishing the operation when oil is sufficiently hot and better flows both from the engine and from the tank. Clean the tank before filing it with new oil - see the Rotax Maintenance Manual.

Refilling oil

Refill oil in the oil tank that is located on the firewall.

Venting of the lubrication system

After short idling, stop engine and replenish oil to max. mark on dipstick. Never overfill otherwise oil would escape through the vent tube during operation. At oil level inspect, do not exceed the max. mark.

10.5.2 Exchange / Refilling cooling liquid

- refer to the Rotax Maintenance Manual, Chapter 12-00-00, Section 3, Cooling System.

NOTE: Recommended types of coolant are shown in the Rotax Operator's Manual, Section 10.2.1 Coolant, in the Rotax Service Instructions SI-912-016, in the Rotax Installation Manual, Section 12 Cooling System.

Type of coolant used by aircrafts manufacturer is shown in section 17.5 Operating liquids.

Cooling liquid volume

Total volume of coolant in the engine is approximately 2.5 litres (*0.7 US gallons*).

Drainage of cooling liquid

Disconnect the hose supplying liquid from the radiator to the pump (at the lowest point of the system) and drain cooling liquid into the prepared vessel.

Refilling cooling liquid

Refill cooling liquid into the expansion tank in the engine compartment. In addition to this there is a overflow bottle which collects cooling liquid in case of engine overheating and is attached to the fire wall.

10.5.3 Exchange / Check of oil filter

- refer to the Rotax Maintenance Manual, Chapter 12-00-00, Section 5 Oil System

NOTE: Carry out at every oil exchange.

(a) Remove the oil filter.

(b) Remove the filter insert, cut of the upper and the lower lid of the insert. Remove the middle part of the insert, disassemble and check for metal chips, foreign corpuscles and contamination.

CAUTION: IF YOU DETECT AN INCREASED QUANTITY OF METAL PARTICLES (BRASS OR BRONZE CHIPS OR BEARING ABRASIVE), FIND OUT THE REASON AND ELIMINATE IT.

(c) Install the new oil filter. Slightly lubricate the sealing ring of the new filter with engine oil and tighten it up manually by a normal force.

10.5.4 Exchange / Check of air filter

(a) Remove the hose fastener and the bracket attaching the air filter to the left side lower engine cowling and remove the air filter.

(b) Inspect the air filter and if contaminated, clean it according to instructions in the Rotax Maintenance Manual, Chapter 12-00-00, Section 2.4.

(c) Attach the cleaned or the new filter to the hole on the left side of lower engine cowling by means of the bracket and hose fastener.

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Contents

11.1 General

Electrical system of PS-28 Cruiser / SportCruiser airplane serves for supplying electrical current to the instruments.

11.2 Description and operation

The airplane is equipped with 14 VDC electrical installations with grounded negative pole (see Fig. 11-1). Primary source of electrical energy is formed by the generator. The secondary source of electrical energy is the battery 12 V, which is located on the firewall. It is used for starting the engine and in the case of generator failure as a back-up source of electric energy.

DC voltage is distributed to the individual systems by means of the main busbar. Systems are protected by circuit breakers which are permanently ON and switches-circuit breakers which are turning ON as needed. If some of the circuit is overloaded, then the circuit breaker disconnects the circuit. Some circuits are protected by the fuses.

After switching the **MASTER BAT** switch ON and by turning the ignition key to the position **START** the starter is activated. The starter is supplied from the battery before starting the engine. After starting up the engine and reaching the idle rpm and switching the **MASTER GEN** switch ON, the generator starts supplying current to the electrical network.

Information about voltage in the main busbar is indicated by EMS or by the analog voltmeter on the instrument panel.

NOTE: Valid wiring diagrams are mentioned in PS-28 Cruiser / SportCruiser Wiring Manual.

11.2.2 Circuit breakers

Circuit breakers serve for protecting individual electrical circuits from overloading. Every circuit breaker is marked by the placard with a circuit designation. Circuit breakers are located on the right instrument panel.

Circuit breakers – instrument panel with the EFIS/EMS	
Designation	**Description**
COMM	Circuit breaker of VHF transceiver
IC	Circuit breaker of intercom
EMS	Circuit breaker of engine monitoring system display
NAV	Circuit breaker of optional navigation device
EFIS	Circuit breaker of flight instrument system display
HS34	Circuit breaker of HSI navigation interface
GPS	Circuit breaker of GPS
XPDR	Circuit breaker of transponder
FUEL P	Circuit breaker of electric fuel pump
12V	Circuit breaker of 12V socket
AP	Circuit breaker of optional autopilot control unit
ROLL SERVO	Circuit breakers of optional autopilot servos
PITCH SERVO	Circuit breakers of optional autopilot servos
FLAPS	Circuit breaker of flaps
TRIM	Circuit breaker of trims
NAV L	Circuit breaker of position lights
STROBE	Circuit breaker of strobe lights
LDG L	Circuit breaker of landing light
INT L	Circuit breaker of instrument lighting and cockpit lamp
Circuit breakers – instrument panel with the analog instruments	
PWR	Circuit breaker of DC rectifier
ATT	Circuit breaker of attitude indicator
DG	Circuit breaker of directional gyro
TB	Circuit breaker of turn & bank indicator
COMM	Circuit breaker of VHF transceiver
GPS	Circuit breaker of GPS
XPDR	Circuit breaker of transponder
IC	Circuit breaker of intercom
ENG INSTR	Circuit breaker of engine monitoring system display
FUEL P	Circuit breaker of electric fuel pump
FLAPS	Circuit breaker of flaps
TRIM	Circuit breaker of trims
NAV L	Circuit breaker of position lights
STROBE	Circuit breaker of strobe lights
LDG L	Circuit breaker of landing light
12V	Circuit breaker of 12V socket

Tab.11-2: Circuit breakers

11.2.3 Fuses

Fuses serve for protecting individual electrical circuits from overloading. The box with the fuses is located on the firewall in the engine compartment.

Fuses – instrument panel with the EFIS/EMS	
Designation	**Description**
1A SIGN. DOOR	Fuse of unlocked canopy signaling system
25A DC GEN	Fuse of generator
25 A BATTERY	Fuse of battery
Fuses – instrument panel with the analog instruments	
Designation	**Description**
1A SIGN. DOOR	Fuse of unlocked canopy signaling system
1A VOLTMETER	Fuse of voltmeter
1A ENGIN. INSTR.	Fuse of engine instruments
25A DC GEN	Fuse of generator
25 A BATTERY	Fuse of battery

11.2.4 Generator

The generator is a part of the engine which supplies electric current through the rectifier. Regulator supplies electric current of 14 V voltage to onboard network.

Technical parameters of generator:

Maximum output power:	12 V / 20 A at 5 000 rpm

Technical parameters of rectifier - regulator:

Type:	electronic
Output voltage:	14 ± 0.3 V (from 1 000 ± 250 rpm)
Range of operation temperatures:	min. - 25°C (- *13°F*)
	max. + 90°C (+ *194°F*)
Weight:	0.3 kg (*0.66 lbs*)

11.2.5 Battery

Lead-acid maintenance-free battery is installed on firewall. Battery can be charged directly in the airplane after its disconnecting from the onboard electrical system.

Technical parameters:

Voltage	12 V
Nominal capacity	20 Ah
Max. discharge current	300 A (5 s)
Short circuit current	1000 A
Range of operation temperatures	- 20 to + 60°C (*-4 to + 140°F*)
Service life is about	3 - 5 years

Weight: 6 kg (*13 lbs*)

If the airplane is not operated for more than one month, then remove the battery from the airplane and store it.

Always store the battery fully charged at temperature of 20°C (*68°F*). Daily discharging is less than 0.1 % of battery nominal capacity.

Regularly recharge it up to the full capacity of charging once a month.

11.2.6 Lighting

External lighting consists of the LED position / strobe lights which are located in the wing tips and of the landing light which is located in the lower engine cowling. Position lights are switched by the switch **NAV L** and strobe lights are switched by the switch **STROBE**. The landing light is switched by the switch **LDG L**.

Internal lighting consists of the instrument lighting and of the cockpit lamp, which is located on the instrument panel. The instrument lighting (illumination of the altimeter and the airspeed indicator) is switched / controlled by the switch **INSTR L**. The cockpit lamp is switched / controlled by the switch **COCKPIT L**.

11.3 Removal / Installation

11.3.1 Electrical Safety

The aircraft has a low-voltage DC electrical system. When correctly maintained it is safe to work on. But the battery can supply heavy current through low-resistance circuits (for example, if you ground the positive output with a wrench by accident).

Always follow the usual safety practices for working on electrical equipment. Allow only qualified persons to maintain the electrical system.

CAUTION: DISCONNECT THE BATTERY BEFORE DOING MAINTENANCE ON THE ELECTRICAL SYSTEM. MAKE SURE TO DISCONNECT THE NEGATIVE LEAD FIRST.

CAUTION: USE ONLY AIRCRAFT SPARE PARTS APPROVED BY THE MANUFACTURER.

11.3.2 Battery removal

Type of maintenance: line

Authorization to perform:

- Sports pilot or higher

Tools needed:

- screwdriver
- wrench size No.8

(a) Set the **MASTER BAT**, **MASTER GEN** switches to OFF.

(b) Remove engine cowlings.

(c) Unscrew the bolts (5, Fig. 11-2) with washers (6) and disconnect the wires (2; 3; 4) from the battery contacts; make sure to disconnect the negative lead first.

(d) Unscrew the bolts (8) with washers (9), disconnect the battery strap (7) and remove the battery (1) from the airplane.

11.3.3 Battery installation

Type of maintenance: line

Authorization to perform:

- Sports pilot or higher

Tools needed:

- screwdriver
- wrench size No.8

(a) Install the battery (1, Fig. 11-2) into the bracket on the firewall (10).

(b) Fasten it with battery strap (7), bolts (8), and washers (9); tighten bolts so that the battery cannot move in the bracket.

(c) Install the wires (2; 3; 4) by means of bolts (5) with washers (6); make sure you connect the positive lead first.

(d) Grease the battery contacts with lubricating grease.

(e) Install the engine cowlings.

11.4 Exchanges / Service information

11.4.1 Charging the battery

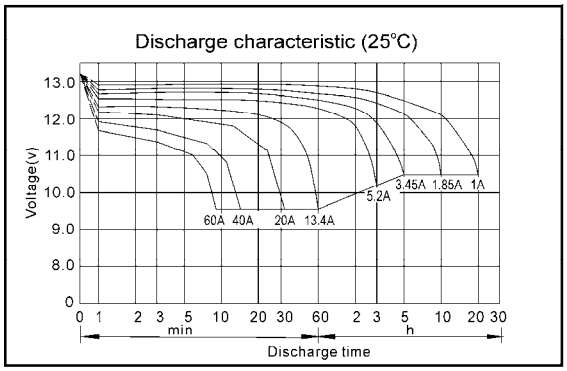
(a) Disconnect the battery from the onboard electrical network.

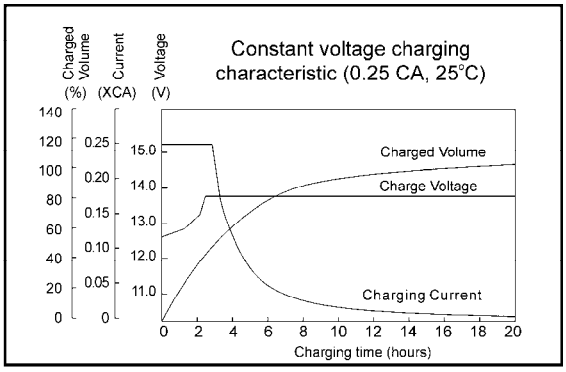
(b) Clean the battery contacts and connect the charging device on them. Mind the polarity!

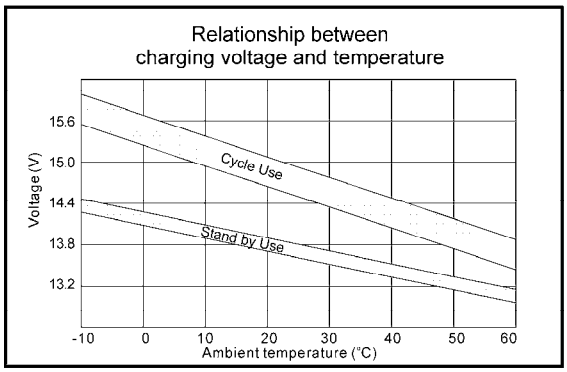
(c) Charging voltage at temperature of 25°C (77°*F*) is:

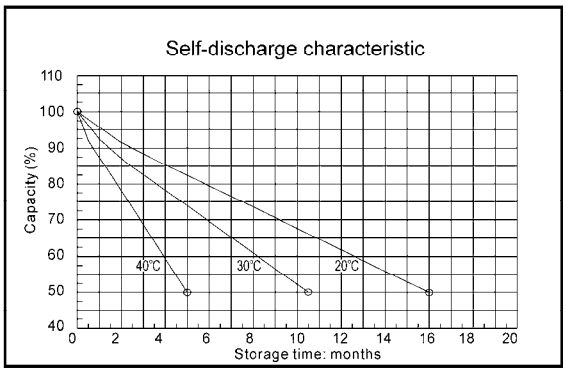
- Cycle use 14.5-14.9 V
- Standby use 13.6 to 13.8 V. Maximum charging current is 8 A.

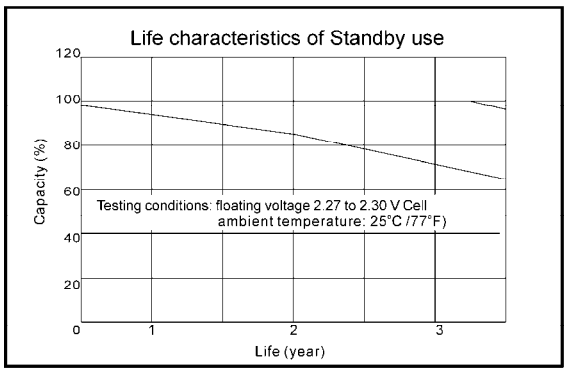
(d) After charging grease the battery contacts with lubricating grease and reconnect the battery to the onboard electrical network.

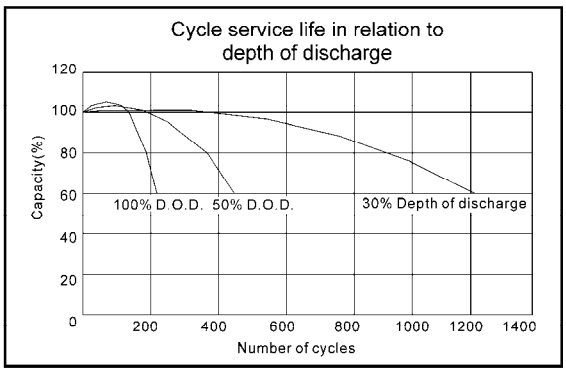


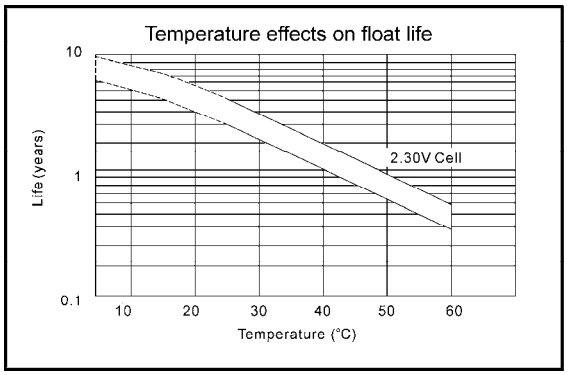












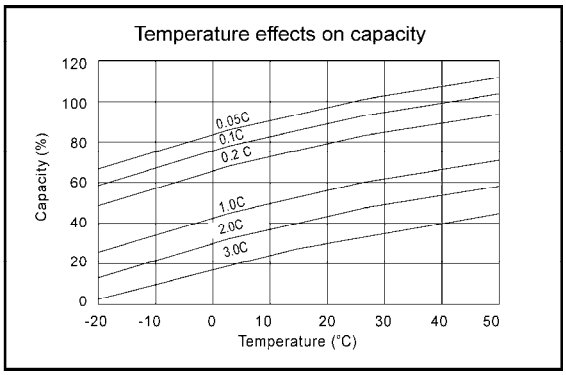


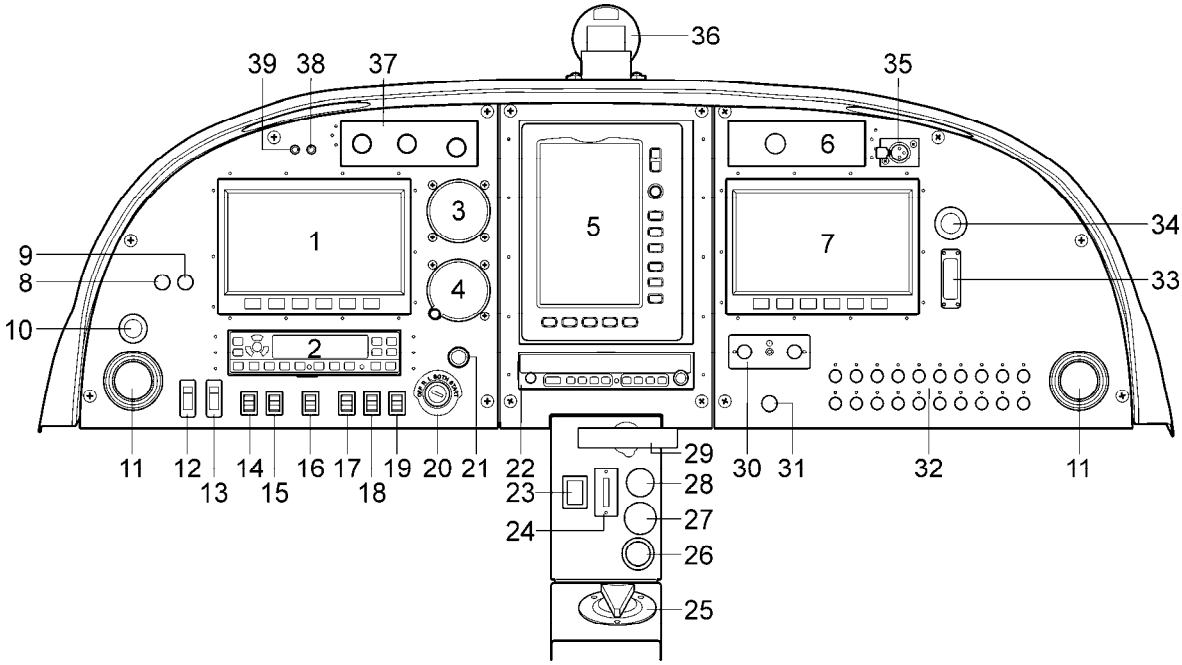
Fig. 11-4: Battery characteristics

Contents

12.1 General

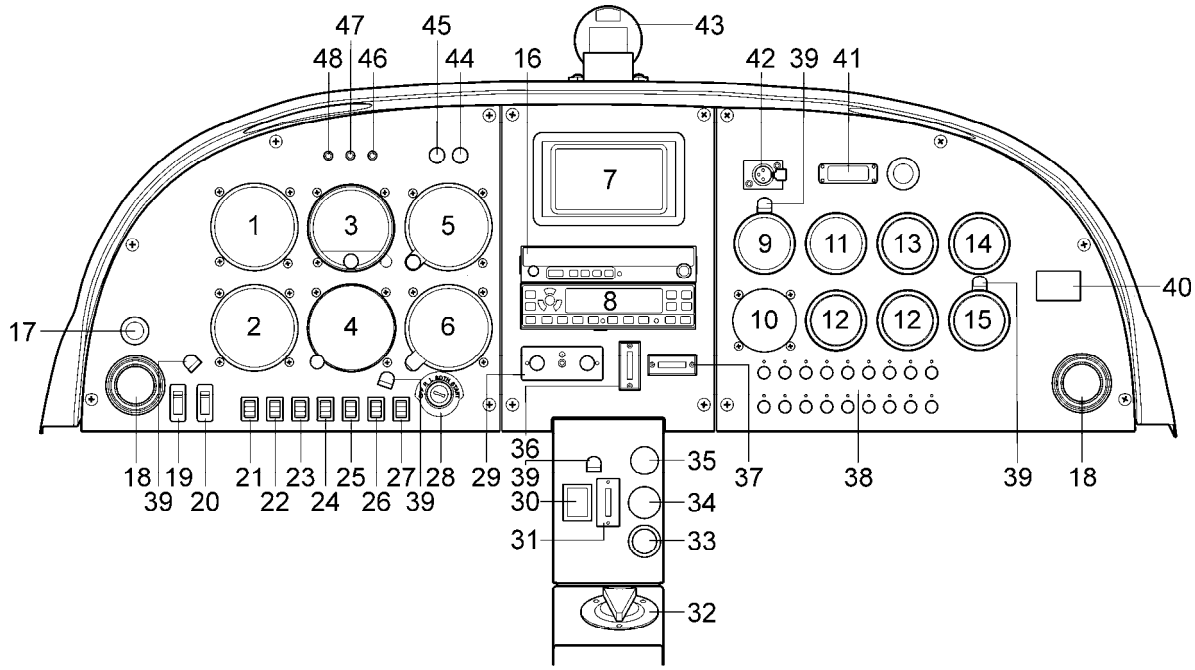
This chapter provides information about pitot-static system and instruments.

The aircraft is equipped with the instrument panel that contains all flight, navigation, and engine instruments that are required for VFR operations. Figures 12-1 and 12-2 show the typical instrument panels used for PS-28 Cruiser / SportCruiser aircraft.



1 EFIS D100
2 GTX 328 transponder
3 Airspeed indicator
4 Altimeter
5 GPSMAP® 695
6 AP74 Autopilot interface module
7 EMS D120
8 **COCKPIT L** dimmer
9 **INSTR L** dimmer
10 **PARKING BRAKE** handle
11 Air vent
12 **MASTER BAT** switch
13 **MASTER GEN** switch
14 **EMS** switch
15 **AVIONICS** switch
16 **FUEL P** switch
17 **NAV L** switch
18 **STROBE** switch
19 **LDG L** switch
20 Keyed ignition switch
21 **AUTOPILOT DISCONNECT** button
22 SL30 NAV/COMM
23 **FLAPS UP/DOWN** switch
24 **WING FLAP UP/DOWN** position indicator
25 **FUEL** selector valve
26 Socket 12 V
27 **CARBURETOR HOT AIR** knob
28 **CABIN HEATER** knob
29 BRS activation handle
30 PM3000 intercom
31 **VOLUME** Dynon alerts control
32 Circuit breakers
33 ELT remote switch
34 ELT remote audio buzzer
35 Cockpit light connector
36 Magnetic compass
37 HS34 HSI expansion module
38 **CABIN OPENED** red warning light
39 **EMS ALARM** yellow warning light

Fig. 12-1: Typical instrument panel with EFIS / EMS



1 Airspeed indicator
2 Turn and bank indicator
3 Artificial horizon
4 Directional gyro
5 Altimeter
6 Vertical speed indicator
7 Aera 510 GPS
8 GTX 327 transponder
9 RPM indicator
10 Fuel pressure indicator
11 Oil pressure indicator
12 Fuel quantity indicator
13 Oil temperature indicator
14 CHT indicator
15 Voltmeter
16 SL40 VHF transceiver
17 **PARKING BRAKE** handle
18 Air vent
19 **MASTER BAT** switch
20 **MASTER GEN** switch
21 **ENG INSTR** switch
22 **FLT INSTR** switch
23 **AVIONICS** switch
24 **FUEL P** switch
25 **NAV L** switch
26 **STROBE** switch
27 **LDG L** switch
28 Keyed ignition switch
29 PM3000 intercom
30 **FLAPS UP/DOWN** switch
31 **WING FLAP UP/DOWN** position indicator
32 **FUEL** selector valve
33 Socket 12 V
34 **CARBURETOR HOT AIR** knob
35 **CABIN HEATER** knob
36 Elevator **TRIM UP/DOWN**
37 **AILERON TRIM L/R**
38 Circuit breakers
39 Instrument lighting
40 Hourmeter
41 ELT remote switch
42 Cockpit light connector
43 Magnetic compass
44 **COCKPIT L** switch
45 **INSTR L** dimmer
46 **CABIN OPENED** red warning light
47 **FUEL PUMP** green signalling light
48 **GEN** red warning light

Fig. 12-2: Typical instrument panel with analog instruments

NOTE: Current instrument panel arrangement is stated in the Pilot's Operation Handbook, Supplement No. 1.

12.2 Description and operation

12.2.1 Pitot-static system

The pitot-static tube for sensing static and total pressure is located under the left half of the wing close to the rib No. 4. Total pressure is sensed through the hole in the pitot-tube face and static pressure is sensed through the holes on the tube circumference. Pressure distribution to individual instruments is performed by means of flexible plastic hoses (see Fig. 12-3).

Airplanes equipped with analog instruments:
Static pressure is lead to the ALT, ASI, VSI and altitude encoder. Total pressure is connected to the ASI only.

Airplanes equipped with EFIS:
Static pressure is lead to the ALT, ASI and EFIS. Total pressure is connected to the ASI and EFIS.

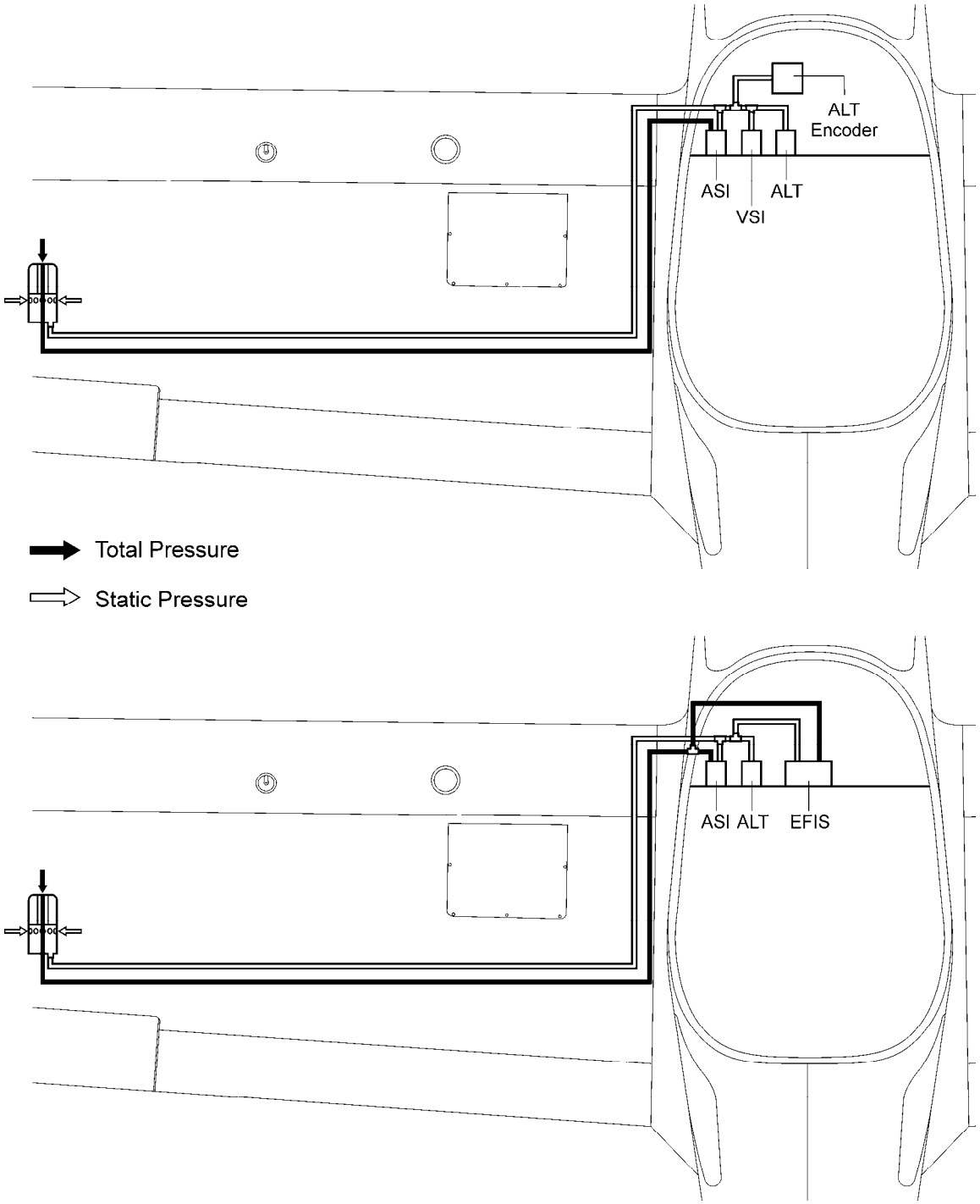


Fig. 12-3: Pitot-static system scheme

12.2.2 Flight instruments

Airspeed indicator - ASI

The airspeed indicator located on the left side of instrument panel is classical analogue round pressure gauge.

The airspeed indicator color range marking is shown in Tab.12-1.

Marking	IAS value or range			Significance
	knot	km/h	mph	
White arc	32-75	59-139	37-86	Flap Operating Range.
Green arc	39-108	72-200	45-124	Normal Operating Range.
Yellow arc	108-138	200-255	124-158	Maneuvers must be conducted with caution and only in smooth air.
Red line	138	255	158	Maximum speed for all operations.

Tab.12-1: ASI color range marking

Altimeter - ALT

The altimeter located on the left side of instrument panel is classical analogue round pressure gauge. Range of measure is up to 20,000 ft.

Magnetic compass

The magnetic compass is designed to determine magnetic course of the airplane. The magnetic compass is positioned on the upper edge of the instrument panel and consists of the vessel filed with nonfreezing liquid with the little window in the front wall. The compass rose is positioned on the rotary and swinging pivot inside the compass.

EFIS D100

The Dynon D100 is a panel-mounted Electronic Flight Instrument System (EFIS). The instrument integrates multiple flight instruments, including airspeed, altitude, gyro-stabilized magnetic compass, turn rate, slip/skid ball, bank angle, and vertical speed. Other useful functions include a clock/timer, g-meter, voltmeter and density altitude/true airspeed calculator.

12.2.3 Engine instruments

Engine parameters (RPM, CHT, EGT, oil pressure and temperature, fuel pressure, manifold pressure) are displayed either on the EMS D120 or on the classical analog instruments. A typical example of the EMS display is shown in the Figure 10-3. The EMS D120 is located on the right side of instrument panel. The engine parameters color marking is shown in Tab.12-2.

Value	Minimum Limit *(red line)*	Caution Range (yellow arc)	Normal Operating Range (green arc)	Caution Range (yellow arc)	Maximum Range (red line)
Engine speed [RPM]	-	0-1 400	1 400-5 500	5 500-5 800	5 800
Oil Pressure	0.8 bar *(12 psi)*	0.8-2 bar *(12-29 psi)*	2-5 bar *(29-73 psi)*	5-7 bar *(73-102 psi)*	7 bar *(102 psi)*
Oil Temperature	50°C *(122°F)*	50-90°C *(122-194°F)*	90-110°C *(194-230°F)*	110-130°C *(230-266°F)*	130°C *(266°F)*
Cylinder head Temperature (CHT)	-	-	50-135°C *(122-275°F)*	-	135°C *(275°F)*
Exhaust Gas Temp. (EGT)	-	400-500°C *(752-932°F)*	500-850°C *(932-1562°F)*	850-880°C *(1562-1616°F)*	880°C *(1616°F)*
Fuel Pressure	0.15 bar *(2.2 psi)*	-	0.15-0.4 bar *(2.2-5.8 psi)*	-	0.4 bar *(5.8 psi)*

Tab.12-2: The engine instruments colour marking

12.2.4 Avionics

COMM, COMM/NAV system

The Apollo SL-30 includes a 760-channel VHF Comm transceiver and 200-channel VOR/LOC/GS navigation receiver with DME display.

NOTE: For detailed information refer to SL-30 Pilot's Guide.

Fig. 12-4: SL-30 COMM/NAV

The Apollo SL-40 is a 760-channel VHF Comm transceiver.

NOTE: For detailed information refer to SL-40 Pilot's Guide.

Fig. 12-5: SL-40 VHF transceiver

The PM3000 is a panel mounted, 4-place high-fidelity stereo intercom system that allows the pilot and copilot/passenger to communicate and listen to music.

NOTE: For detailed information refer to PM3000 Pilot's Guide.

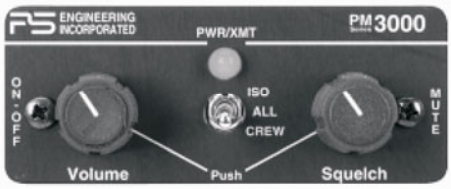


Fig. 12-6: PM3000 intercom

Navigation system

The panel-mounted GTX 327 is a TSO-certified Mode A/C digital transponder with the addition of altitude reporting and timing functions such as flight time and count-up and count-down timers, as well as current pressure altitude.

NOTE: For detailed information refer to GTX 327 Pilot's Guide.

Fig. 12-7: GTX 327 transponder

The panel-mounted GTX 328 is a TSO-certified Mode S digital transponder. In addition to displaying the code, reply symbol and mode of operation, the GTX 328 screen displays pressure altitude, density altitude, temperature, and timer functions, depending on equipment connections and configuration selection. The unit also features an altitude monitor and flight timers. A voice or tone audio output announces altitude deviation and count down timer expiration.

NOTE: For detailed information refer to GTX 328 Pilot's Guide.

Fig. 12-8: GTX 328 transponder

The panel-mounted GTX 330 is a TSO-certified Mode S digital transponder. In addition to displaying the code, reply symbol and mode of operation, the GTX 330 screen displays pressure altitude, density altitude, temperature, and timer functions, depending on equipment connections and configuration selection. The unit also features an altitude monitor, TIS traffic advisories and flight timers. A voice or tone audio output announces altitude deviation, TIS traffic advisory and count down timer expiration.

NOTE: For detailed information refer to GTX 330 Pilot's Guide.

Fig. 12-9: GTX 330 transponder

The GPSMAP 695/696 is the ultimate portable MFD. This portable GPS navigator presents GPS-derived analog flight instrumentation, position, navigation, and hazard avoidance information to the pilot using a bright 7-inch diagonal high-definition sunlight readable color display.

NOTE: For detailed information refer to GPS 695/696 Owner's Manual.

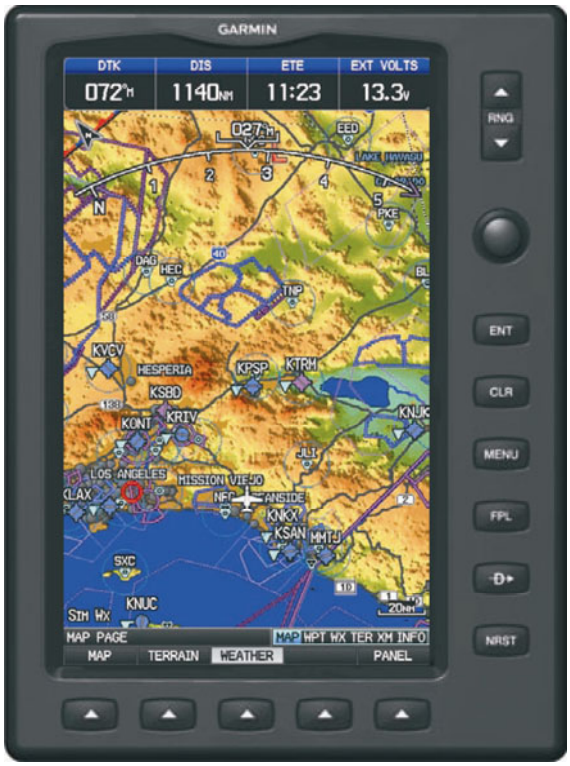


Fig. 12-10: GPSMAP 695/696

The Aera 510 presents GPS-derived analog flight instrumentation, position, navigation, and hazard avoidance information to the pilot using a bright 4.3-inch diagonal high-definition sunlight readable color display with touch screen.

NOTE: For detailed information refer to Aera Models 500, 510, 550, 560 Pilot's Guide.

Fig. 12-11: GPS Aera 510

Antennas

Fig. 12-12 shows the antenna locations. The COMM antenna (1) is installed on the upper part of the fuselage behind the canopy. The ELT antenna (3) is installed directly in the rear of the COMM antenna. The NAV antenna (2) is installed on the top of the fin. The transponder antenna (4) is installed on the bottom part of the fuselage. The GPS antenna is attached to the upper side of the instrument panel cover.

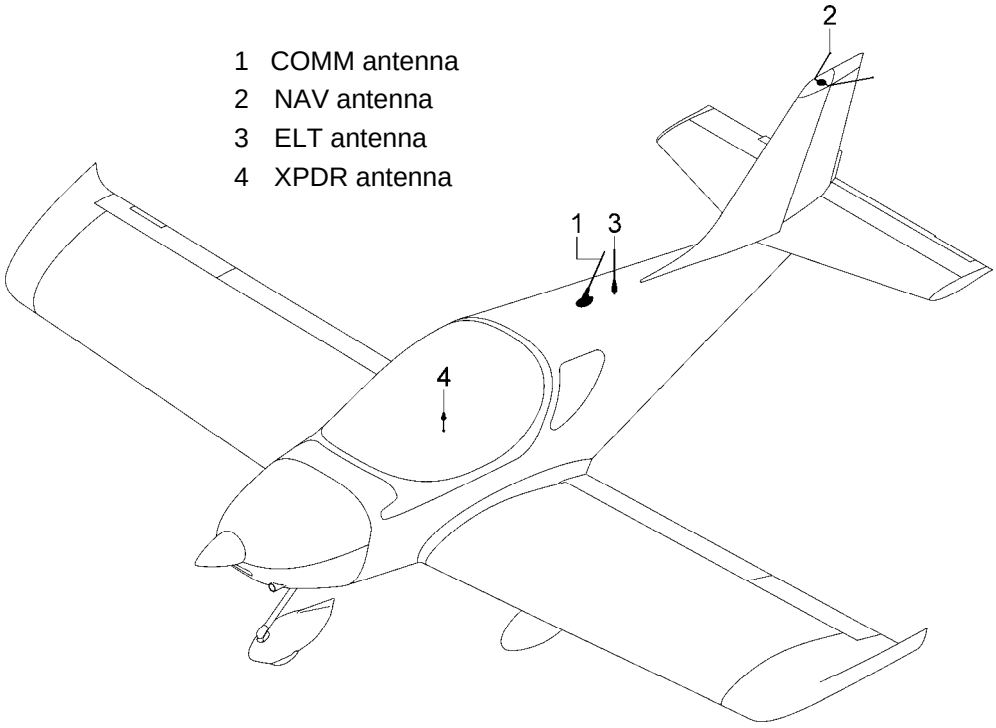


Fig. 12-12: Antenna locations

12.3 Removal / Installation

12.3.1 Removal of the pitot-static tube

Type of maintenance: line

Authorization to perform:

- Repairman (LS-M) or Mechanic (A&P)

Tools needed:

- Phillips PH1 screwdriver
- pliers, cutting pliers

(a) Loose securing bolt (4, Fig. 12-13) in the pitot-static tube bracket (2) and pull out a bit the pitot-static tube (1) with hoses from the bracket.

(b) Remove the cable ties from hoses (3). The hose and tube for static pressure line mark by **S** letter and for total pressure mark by **T** letter.

(c) Disconnect the transparent hoses (3) of static and total pressure from the ports on the pitot-static tube (1).

12.3.2 Installation of the pitot-static tube

Type of maintenance: line

Authorization to perform:

- Repairman (LS-M) or Mechanic (A&P)

Tools needed:

- Phillips PH1 screwdriver
- pliers, cutting pliers

(a) Connect the hoses (3, Fig. 12-13) to the ports on the pitot-static tube (1) and secure them with cable ties.

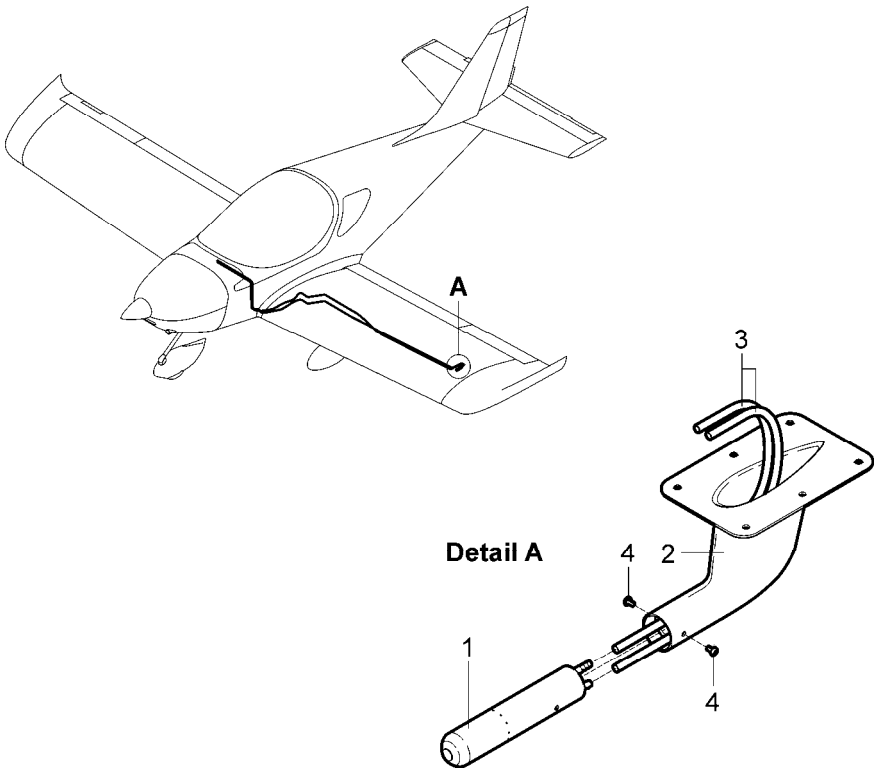
WARNING: WHEN CONNECTING THE PITOT-STATIC SYSTEM HOSES PAY INCREASED ATTENTION. THERE MUST NOT BE ANY INCORRECT CONNECTION! CONNECT THE HOSE MARKED S LETTER TO THE PORT MARKED BY S LETTER AND THE HOSE MARKED T LETTER TO THE PORT MARKED BY T LETTER.

(b) Insert the pitot-static tube (1) in the bracket (2).

(c) Secure pitot-static tube by means of securing bolt (4).

(d) Carry out check of pitot-static system tightness (see 12.4.1).

(e) Check, that pitot-tube is parallel to bottom wing skin.



1 Pitot-static tube
2 Bracket
3 Hose
4 Bolt

Fig. 12-13: Removal / installation of the pitot-static tube

12.3.3 Removal of the flight instruments

Type of maintenance: line

Authorization to perform:

- Repairman (LS-M) or Mechanic (A&P)

Tools needed:

- Phillips PH1 screwdriver
- pliers, cutting pliers

(a) Remove bolts securing the left instrument panel and carefully pull out and hold the instrument panel.

(b) Remove the cable ties (9, Fig. 12-14) from the hoses (7; 8).

(c) Disconnect the hoses (7; 8) of static and total pressure from the rear ports on the appropriate indicator (1; 2).

(d) Disconnect the wires (10) from the illuminator (3).

(e) Unscrew the nuts (5), remove the washers (6) and bolts (4).

(f) Remove the instrument (1; 2) and illuminator (3) from the panel.

(g) Install the protective cover on the rear ports of the instrument.

12.3.4 Installation of the flight instruments

Type of maintenance: line

Authorization to perform:

- Repairman (LS-M) or Mechanic (A&P)

Tools needed:

- Phillips PH1 screwdriver

(a) Remove the protective covers from the rear ports of the instrument.

(b) Connect the hoses (7; 8, Fig. 12-14) to the rear ports on the instrument (1; 2) and secure them with the cable ties (9).

WARNING: WHEN CONNECTING THE PITOT-STATIC SYSTEM HOSES PAY INCREASED ATTENTION. THERE MUST NOT BE ANY INCORRECT CONNECTION! CONNECT THE HOSE MARKED S LETTER TO THE PORTS MARKED BY S LETTER AND THE HOSE MARKED T LETTER TO THE PORT MARKED BY T LETTER.

NOTE: The hose for static pressure line mark by **S** letter and for total pressure mark by **T** letter.

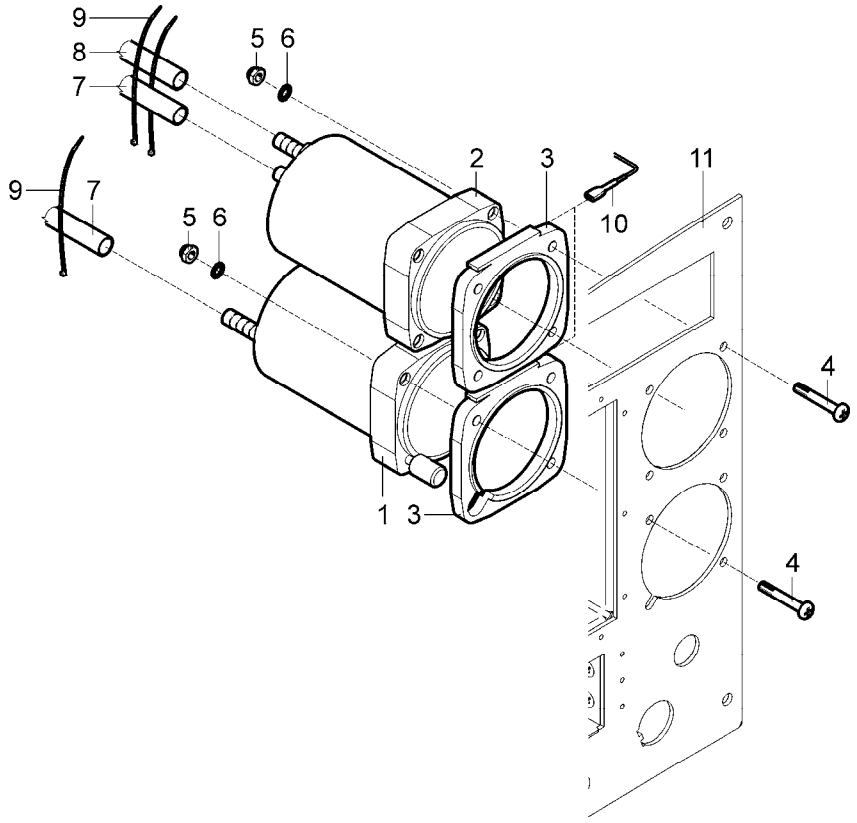
(c) Connect the wires (10) to the illuminator (3).

(d) Put the instrument (1; 2) and illuminator (3) in position in the panel (11).

(e) Attach the instrument (1; 2) with the illuminator (3) by means of the bolts (4), nuts (5) and washers (6).

(f) Install the left instrument panel (10).

(g) Carry out check of pitot-static system tightness (see 12.4.1).



1 Altimeter
2 Airspeed indicator
3 Illuminator
4 Screw
5 Nut
6 Washer
7 Hose
8 Hose
9 Cable tie
10 Wires
For information:
11 Instrument panel

Fig. 12-14: Flight instruments removal / installation

12.3.5 Removal of the EFIS D100

Type of maintenance: line

Authorization to perform:

- Repairman (LS-M) or Mechanic (A&P)

Tools needed:

- 7/64 Allen wrench
- cutting pliers

(a) Set the **MASTER BAT**, **AVIONICS** switches to OFF.

(b) Put a 7/64 Allen wrench into the access hole (2, Fig. 12-15) for the locking screw; engage the screw.

(c) Turn the screw counter-clockwise until the unit disengages from the mounting rack.

CAUTION: DO NOT PRY THE FACE-PLATE. YOU CAN DAMAGE THE UNIT.

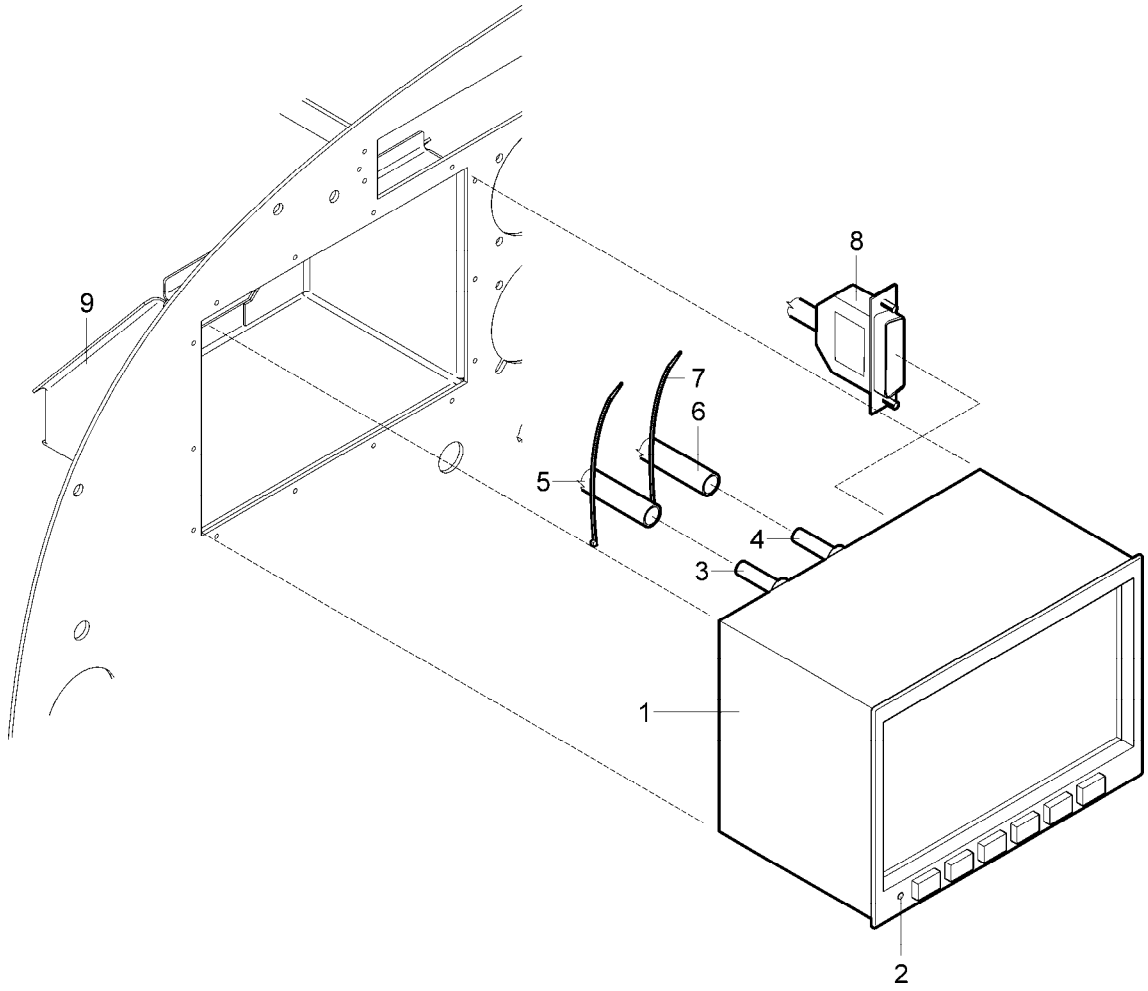
(d) Pull gently on the sides of the unit (1) to remove it from the mounting rack (9).

(e) Remove the cable ties (7) from hoses (5; 6).

(f) Disconnect the hoses (5; 6) of static and total pressure from the rear ports (3; 4) on the unit.

(g) Disconnect the connector (4) from the unit.

(h) Install the protective cover on the rear ports (3; 4) of the unit.



1 EFIS D100
2 Access hole of the locking screw
3 Static port
4 Pitot port
5 Hose
6 Hose
7 Cable tie
8 Connector

For information:

9 Mounting rack

Fig. 12-15: EFIS D100 removal / installation

12.3.6 Installation of the EFIS D100

Type of maintenance: line

Authorization to perform:

- Repairman (LS-M) or Mechanic (A&P)

Tools needed:

- 7/64 Allen wrench

(a) Remove the protective covers from the rear ports on the unit.

(b) Connect the hoses (5; 6, Fig. 12-15) to the rear ports (3; 4) on the unit (1) and secure them with cable ties (7).

WARNING: WHEN CONNECTING THE PITOT-STATIC SYSTEM HOSES PAY INCREASED ATTENTION. THERE MUST NOT BE ANY INCORRECT CONNECTION! CONNECT THE HOSE MARKED S LETTER TO THE PORTS MARKED BY STATIC AND THE HOSE MARKED T LETTER TO THE PORT MARKED BY PITOT.

NOTE: The hose for static pressure line mark by **S** letter and for total pressure mark by **T** letter.

(c) Connect the connector (4) to the unit.

(d) Slide the unit (1) into the rack (9). Engage the locking screw so that the latch front lobe touches the rack.

(e) Turn the locking screw clockwise so that the rear lobe engages the mounting rack.

CAUTION: DO NOT OVER-TIGHTEN THE LOCKING SCREW. YOU CAN DAMAGE THE LOCKING MECHANISM.

(f) Continue to turn the screw until the unit is fully installed in the mounting rack.

(g) Carry out check of pitot-static system tightness (see 12.4.1).

(h) Set the **MASTER BAT**, **AVIONICS** switches to ON and do an operational test of the system.

12.3.7 Removal of the EMS D120

Type of maintenance: line

Authorization to perform:

- Repairman (LS-M) or Mechanic (A&P)

Tools needed:

- 7/64 Allen wrench
- cutting pliers

(a) Set the **MASTER BAT**, **EMS** switches to OFF.

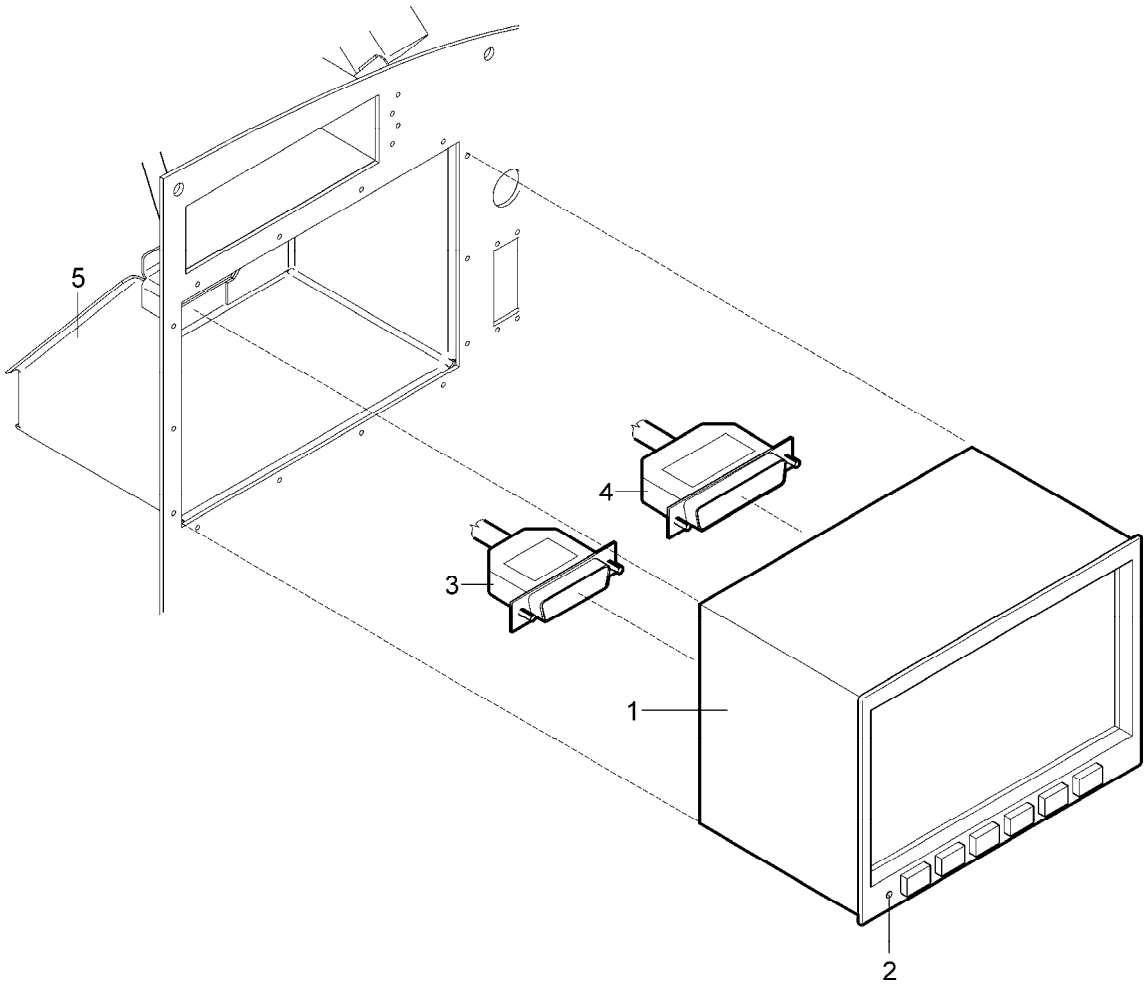
(b) Put a 7/64 Allen wrench into the access hole (2, Fig. 12-16) for the locking screw; engage the screw.

(c) Turn the screw counter-clockwise until the unit disengages from the mounting rack.

CAUTION: DO NOT PRY THE FACE-PLATE. YOU CAN DAMAGE THE UNIT.

(d) Pull gently on the sides of the unit (1) to remove it from the mounting rack (5).

(e) Disconnect the connectors (3; 4) from the unit.



1 EMS D120
2 Access hole of the locking screw
3 Connector
4 Connector
For information:
5 Mounting rack

Fig. 12-16: EMS D120 removal / installation

12.3.8 Installation of the EMS D120

Type of maintenance: line

Authorization to perform:

- Repairman (LS-M) or Mechanic (A&P)

Tools needed:

- 7/64 Allen wrench

(a) Connect the connectors (3; 4, Fig. 12-16) to the unit (1).

(b) Slide the unit (1) into the rack (5). Engage the locking screw so that the latch front lobe touches the rack.

(c) Turn the locking screw clockwise so that the rear lobe engages the mounting rack.

CAUTION: DO NOT OVER-TIGHTEN THE LOCKING SCREW. YOU CAN DAMAGE THE LOCKING MECHANISM.

(d) Continue to turn the screw until the unit is fully installed in the mounting rack.

(e) Set the **MASTER BAT**, **EMS** switches to ON and do an operational test of the system.

12.3.9 Removal of transponder

Type of maintenance: line

Authorization to perform:

- Repairman (LS-M) or Mechanic (A&P)

Tools needed:

- 3/32 Allen wrench

(a) Set the **MASTER BAT**, **AVIONICS** switches to OFF.

(b) Put a 3/32 Allen wrench into the access hole (2, Fig. 12-17) for the locking screw; engage the screw.

(c) Turn the screw counter-clockwise until the transponder (1) disengages from the mounting rack.

CAUTION: DO NOT TOUCH THE CONNECTOR CARD AT THE REAR OF THE UNIT. THE ELECTROSTATIC CHARGE ON YOUR BODY CAN DAMAGE THE UNIT.

(d) Pull gently on the sides of the transponder (1) to remove it from the mounting rack (3).

(e) Install the protective covers on the rear connectors of the transponder.

12.3.10 Installation of transponder

Type of maintenance: line

Authorization to perform:

- Repairman (LS-M) or Mechanic (A&P)

Tools needed:

- 3/32 Allen wrench

(a) Remove the protective covers from the connectors on the transponder.

(b) Looking at the bottom of the unit, make sure the front lobe of the locking mechanism is in a vertical positron.

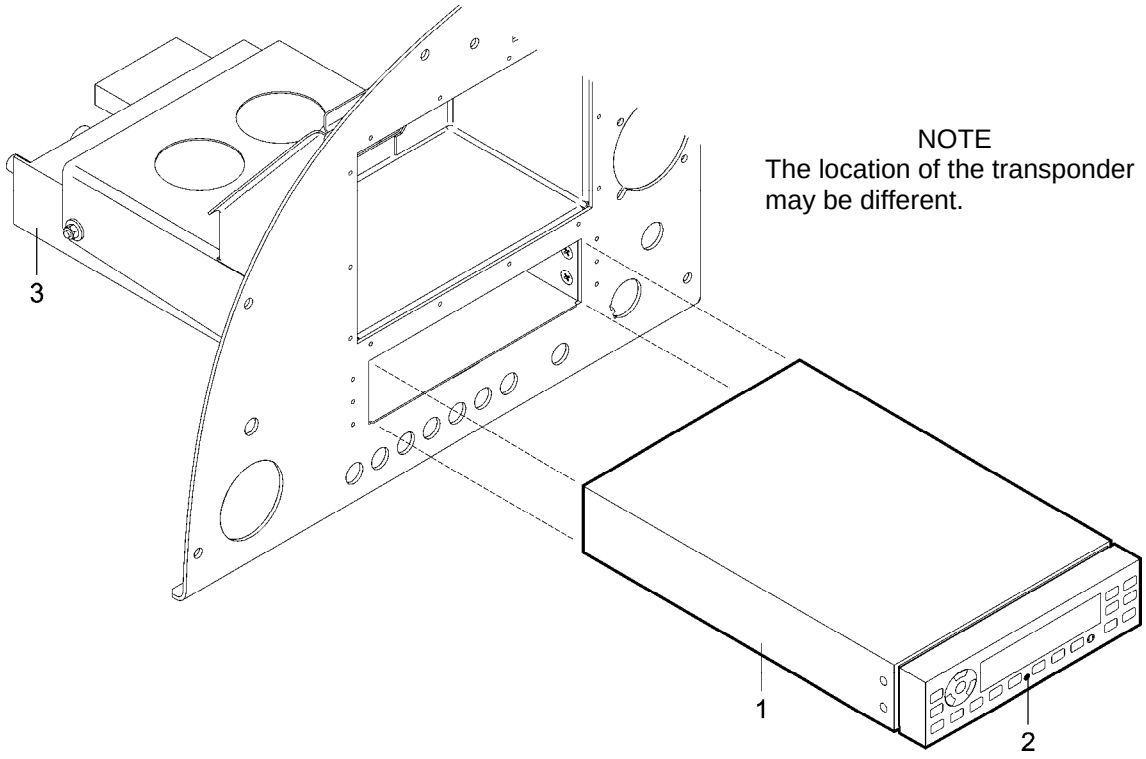
(c) Slide the transponder (1, Fig. 12-17) into the rack (3). Engage the locking screw so that the latch front lobe touches the rack.

(d) Turn the locking screw clockwise so that the rear lobe engages the mounting rack.

CAUTION: DO NOT OVER-TIGHTEN THE LOCKING SCREW. YOU CAN DAMAGE THE LOCKING MECHANISM.

(e) Continue to turn the screw until the transponder is fully installed in the mounting rack.

(f) Set the **MASTER BAT**, **AVIONICS** switches to ON and do an operational test.



1 Transponder
2 Access hole of the locking screw

For information:
3 Mounting rack

Fig. 12-17: Transponder removal / installation

12.3.11 Removal of COMM, COMM/NAV

Type of maintenance: line

Authorization to perform:

- Repairman (LS-M) or Mechanic (A&P)

Tools needed:

- 3/32 Allen wrench

(a) Set the **MASTER BAT**, **AVIONICS** switches to OFF.

(b) Put a 3/32 Allen wrench into the access hole (2, Fig. 12-18) for the locking screw; engage the screw.

(c) Turn the screw counter-clockwise until the unit (1) disengages from the mounting rack.

CAUTION: DO NOT PULL ON THE KNOBS. DO NOT PRY THE FACE-PLATE. YOUCAN DAMAGE THE UNIT.

DO NOT TOUCH THE CONNECTOR CARD AT THE REAR OF THE UNIT. THE ELECTROSTATIC CHARGE ON YOUR BODY CAN DAMAGE THE UNIT.

(d) Pull gently on the sides of the unit (1) to remove it from the mounting rack (3).

(e) Install the protective covers on the rear connectors of the unit.

12.3.12 Installation of COMM, COMM/NAV

Type of maintenance: line

Authorization to perform:

- Repairman (LS-M) or Mechanic (A&P)

Tools needed:

- 3/32 Allen wrench

(a) Remove the protective covers from the connectors on the unit.

(b) Looking at the bottom of the unit, make sure the front lobe of the locking mechanism is in a vertical positron.

(c) Slide the unit (1, Fig. 12-18) into the rack (3). Engage the locking screw so that the latch front lobe touches the rack.

(d) Turn the locking screw clockwise so that the rear lobe engages the mounting rack.

CAUTION: DO NOT PULL ON THE KNOBS. DO NOT PRY THE FACE-PLATE. YOUCAN DAMAGE THE UNIT.

DO NOT TOUCH THE CONNECTOR CARD AT THE REAR OF THE UNIT. THE ELECTROSTATIC CHARGE ON YOUR BODY CAN DAMAGE THE UNIT.

(e) Continue to turn the screw until the unit is fully installed in the mounting rack.

(f) Set the **MASTER BAT**, **AVIONICS** switches to ON and do an operational test.

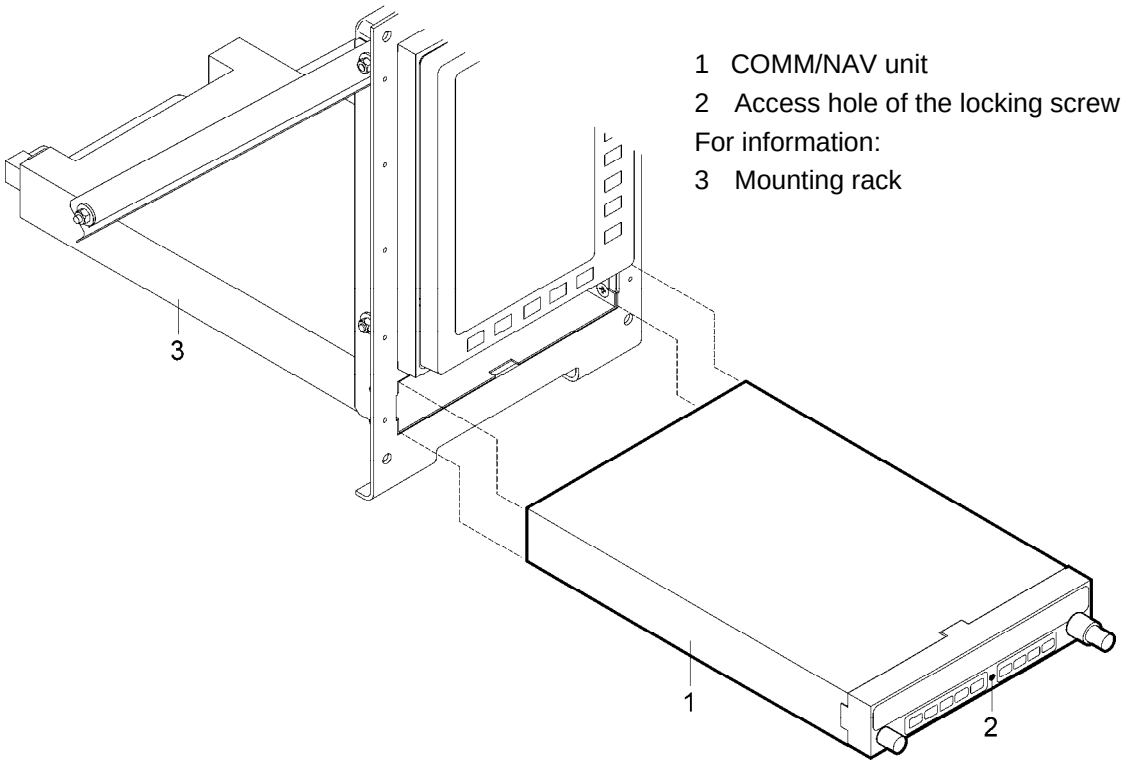


Fig. 12-18: COMM/NAV unit removal / installation

12.3.13 Removal of intercom

Type of maintenance: line

Authorization to perform:

- Repairman (LS-M) or Mechanic (A&P)

Tools needed:

- Phillips PH1 screwdriver

(a) Set the **MASTER BAT**, **AVIONICS** switches to OFF.

(b) Disconnect the connector (5, Fig. 12-19) from the unit.

(c) Remove the knobs (2) from the volume and squelch control shafts.

(d) Unscrew the screws (4) and remove the faceplate (3).

(e) Carefully remove the unit (1).

CAUTION: DO NOT TOUCH THE CONNECTOR CARD AT THE REAR OF THE UNIT. THE ELECTROSTATIC CHARGE ON YOUR BODY CAN DAMAGE THE UNIT.

(f) Install the protective cover on the rear connector of the unit.

12.3.14 Installation of intercom

Type of maintenance: line

Authorization to perform:

- Repairman (LS-M) or Mechanic (A&P)

Tools needed:

- Phillips PH1 screwdriver

(a) Remove the protective cover from the connector on the unit.

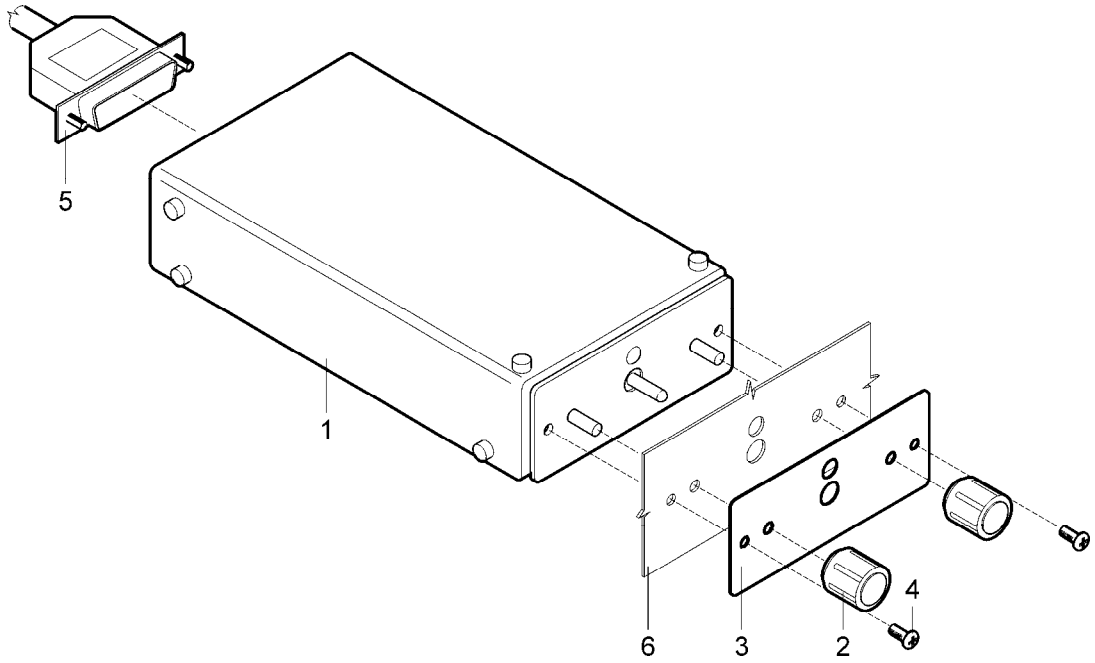
(b) Insert the unit (1, Fig. 12-19) from behind the instrument panel, aligning the holes for the knobs, LED, and switch.

(c) Place the faceplate (3) over the knob shafts and secure it by means of the two screws (4).

(d) Install the knobs (2) over the volume and squelch control shafts.

(e) Connect the connector (5) to the unit (1).

(f) Set the **MASTER BAT**, **AVIONICS** switches to ON and do an operational test.



1 Intercom
2 Knob
3 Faceplate
4 Screw
5 Connector

For information:

6 Instrument panel

Fig. 12-19: Intercom removal / installation

12.3.15 Removal of COMM antenna

Type of maintenance: line

Authorization to perform:

- Repairman (LS-M) or Mechanic (A&P)

Tools needed:

- screwdriver
- wrench No. 7

(a) Set the **MASTER BAT**, **AVIONICS** switches to OFF.

(b) Disconnect the connector (4, Fig. 12-20) from the antenna.

(c) Remove the nuts (4) with the washers (5)

(d) Remove the antenna (1) with the gasket (2), screws (3) and washers (6).

(e) Install the protective cover on the antenna connector.

12.3.16 Installation of COMM antenna

Type of maintenance: line

Authorization to perform:

- Repairman (LS-M) or Mechanic (A&P)

Tools needed:

- screwdriver
- wrench No. 7

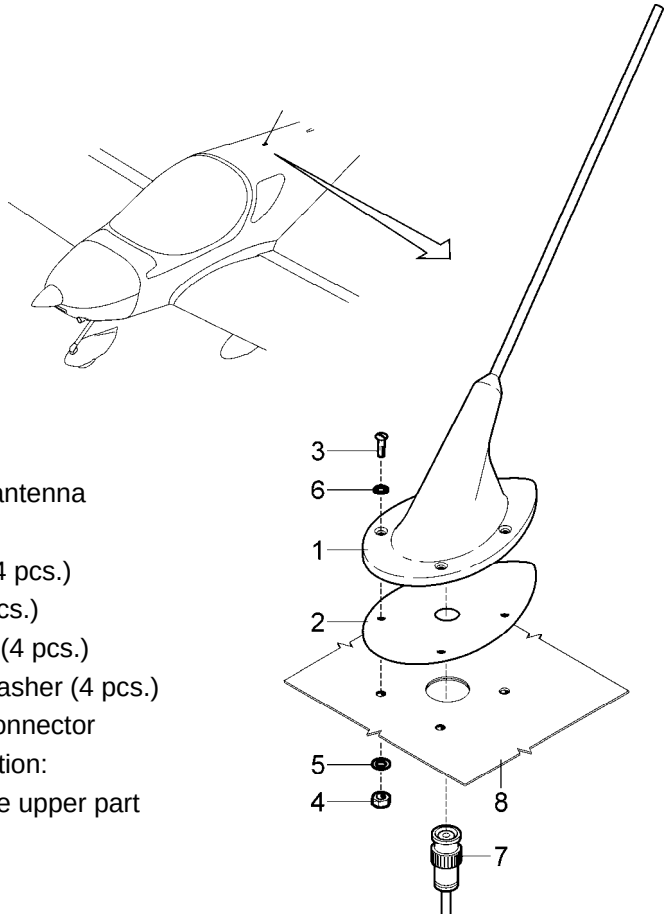
(a) Remove the protective cover from the antenna connector.

(b) Place the antenna (1, Fig. 12-20) with the gasket (2) on the fuselage (8).

(c) Insert the screws (3) with washers (6) to the holes in the antenna body (1); install the washers (5), screw and tighten the nuts (4).

(d) Connect the connector (7) to the antenna (1).

(e) Set the **MASTER BAT**, **AVIONICS** switches to ON and do an operational test.



1 COMM antenna
2 Gasket
3 Screw (4 pcs.)
4 Nut (4 pcs.)
5 Washer (4 pcs.)
6 Tooth washer (4 pcs.)
7 Cable connector

For information:

8 Fuselage upper part

Fig. 12-20: COMM antenna removal / installation

12.3.17 Removal of NAV antenna

Type of maintenance: line

Authorization to perform:

- Repairman (LS-M) or Mechanic (A&P)

Tools needed:

- Phillips PH2 screwdriver
- wrench No. 8

(a) Set the **MASTER BAT**, **AVIONICS** switches to OFF.

(b) Unscrew the screws (7, Fig. 12-21) and remove the fin tip (6).

(c) Remove the nuts (4) and disconnect the cables (5) from antenna studs.

(d) Unscrew the screws (2) with the washers (3) and remove the antenna (1).

1 NAV antenna
2 Screw (2 pcs.)
3 Washer (2 pcs.)
4 Nut (2 pcs.)
5 Cable (2 pcs.)
6 Fin tip
7 Screw (8 pcs.)

For information:

8 Fin

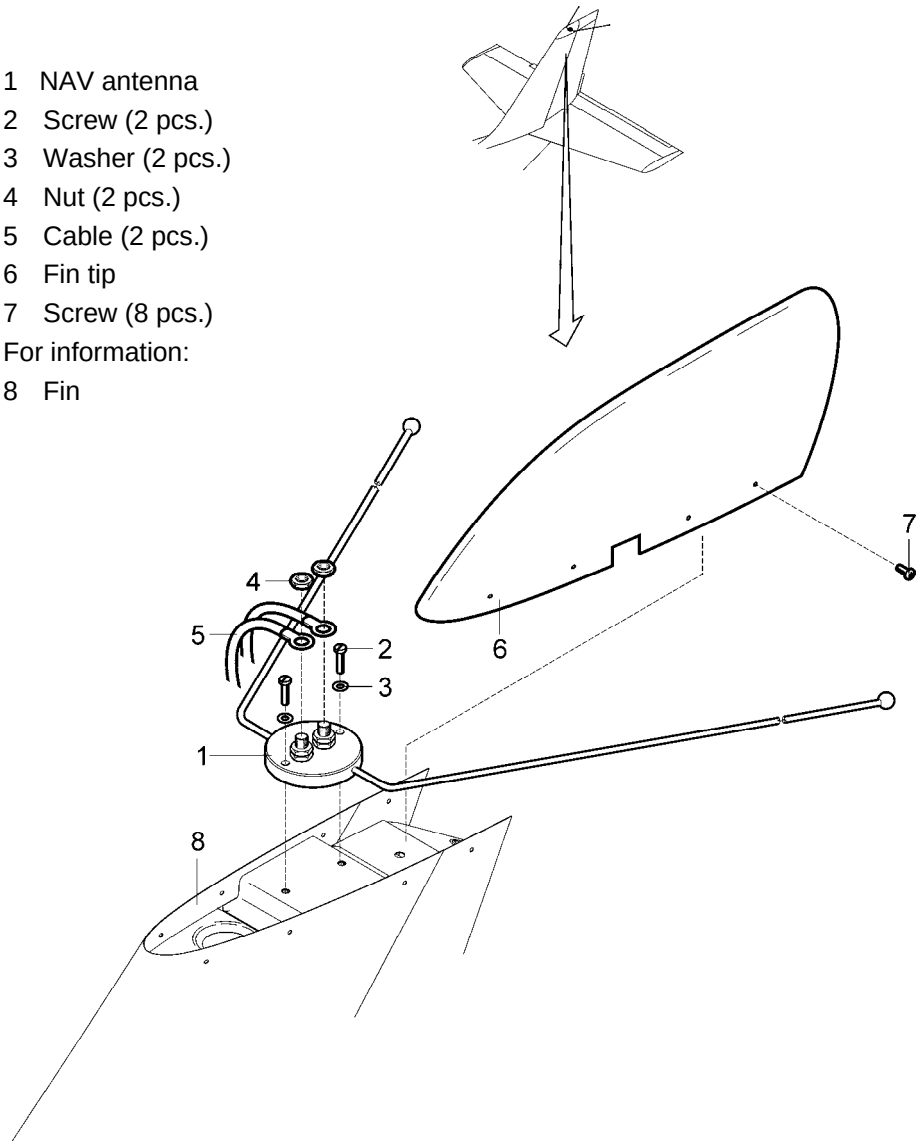


Fig. 12-21: NAV antenna removal / installation

12.3.18 Installation of NAV antenna

Type of maintenance: line

Authorization to perform:

- Repairman (LS-M) or Mechanic (A&P)

Tools needed:

- Phillips PH2 screwdriver
- wrench No. 8

(a) Place the antenna (1, Fig. 12-21) on the bracket and fasten it by means of the screws (2) with the washers (3).

(b) Connect the cables (5) to the antenna studs; screw and fasten the nuts (4).

(c) Place the fin tip (6) on the fin (8) and fasten it by means of the screws (7).

(d) Set the **MASTER BAT**, **AVIONICS** switches to ON and do an operational test.

12.3.19 Removal of transponder antenna

Type of maintenance: line

Authorization to perform:

- Repairman (LS-M) or Mechanic (A&P)

Tools needed:

- wrench No. 3/4 in

(a) Tilt forward the right seat back.

(b) Set the **MASTER BAT**, **AVIONICS** switches to OFF.

(c) Disconnect the connector (4, Fig. 12-22) from the antenna.

(d) Unscrew the nut (2), remove the washer (3) and the antenna (1).

(e) Install the protective cover on the antenna connector.

12.3.20 Installation of transponder antenna

Type of maintenance: line

Authorization to perform:

- Repairman (LS-M) or Mechanic (A&P)

Tools needed:

- wrench No. 3/4 in

(a) Remove the protective cover from the antenna connector.

(b) Insert the antenna (1, Fig. 12-22) to the hole in the fuselage bottom part (5).

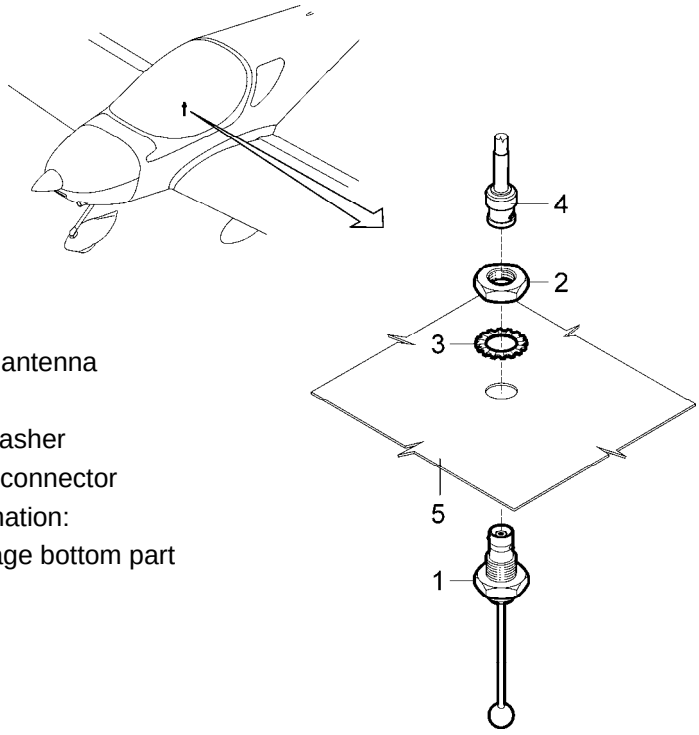
(c) Insert the washer (3), screw and tighten the nut (2).

(d) Connect the connector (4) to the antenna (1).

(e) Place the fin tip (6) on the fin (8) and fasten it by means of the screws (7).

(f) Tilt backward the right seat back.

(g) Set the **MASTER BAT**, **AVIONICS** switches to ON and do an operational test.



1 XPDR antenna
2 Nut
3 Lockwasher
4 Cable connector
For information:
5 Fuselage bottom part

Fig. 12-22: Transponder antenna removal / installation

12.4 Check / Adjustment

12.4.1 Check of pitot-static system tightness

(a) In the static pressure system create the under pressure by means of an appropriate instrument corresponding to altitude of 1 000 ft. Drop in the indicated altitude per one minute must not exceed 100 ft.

(b) In the system of total pressure create the overpressure corresponding to speed of 140 knots (260 km/h, 161 mph) by means of a suitable instrument. Drop in speed during 3 minutes must not exceed 2.3 knots (4.4 km/h, 2.7 mph).

12.4.2 Magnetic / EFIS compass compensation

Rules for doing compensation of the compasses:

(a) Compass compensation must be performed on the approved compass bases, which are at least 100 m (300 ft) from steel structures, electric leading or other over ground or underground steel equipment or objects.

(b) If the compass north is westward from magnetic north, the deviation is westward, i.e. negative. If the compass north is eastward from magnetic north, the deviation is eastward, i.e. positive.

Compensation procedure:

(a) Turn the airplane to "N" heading; eliminate the deviation by "C" screw.

(b) Turn the airplane to "S" heading; reduce the found out deviation to the half-value by "C" screw and write down the rest of the deviation.

(c) Turn the airplane to "E" heading; eliminate the deviation by "B" screw.

(d) Turn the airplane to "W" heading; reduce the found out deviation to the half-value by "B" screw and write down the rest of the deviation.

(e) Turn the airplane by grades indicated in the compensation report (see Tab. 12-3; 12-4) and write down individual deviations in the table.

(f) After finishing compensation of the magnetic compass fill out the deviation card (see Fig. 12-12) and position it in the airplane near the magnetic compass.

COURSE	N	030	060	E	120	150	S	210	240	W	300	330
COMPASS												

TYPE	S/N	COMPENSATED W COMM W/O COMM	DATE CARRY OUT BY

Fig. 12-23: Example of the deviation card

REPORT OF MAGNETIC COMPASS SWING				
Aircraft			Aircraft S/N	
Compass type		CM 24 (L)	Compass S/N	
Check 1.	All electrical equipment ON and operating			
	The engine running, idle			
	Fuselage placed in flying attitude			
	XPDR ON, XCVR receiving			
Check 2.	Switched ON just those instruments, which are necessary for VFR flight. COM, NAV, XPDR, lights - switched OFF			
	The engine running, idle			
	Fuselage placed in flying attitude			

Heading	**Measured**		**Deviation**	
	1.	**2.**	**1.**	**2.**
N 000				
030				
060				
E 090				
120				
150				
S 180				
210				
240				
W 270				
300				
330				

Maximal allowed deviation ± 10°		
If the compass deviations are not identical for both checks, two separate compass correction cards should be done.		
Note:		
General evaluation	Complied	Failed
Performed by:	Elaborated by:	Date:

Tab. 12-3: Report of magnetic compass compensation

REPORT OF EFIS COMPASS SWING			
Aircraft		Aircraft S/N	
Compass type	EDC-D10A	Compass S/N	
EFIS type	DYNON D100	EFIS S/N	

Check 1.	All electrical equipment ON and operating
	The engine running, idle
	Fuselage placed in flying attitude
	XPDR ON, XCVR receiving
Check 2.	Switched ON just those instruments, which are necessary for VFR flight. COM, NAV, XPDR, lights - switched OFF
	The engine running, idle
	Fuselage placed in flying attitude

Heading	**Measured**		**Deviation**	
	1.	**2.**	**1.**	**2.**
N 000				
030				
060				
E 090				
120				
150				
S 180				
210				
240				
W 270				
300				
330				

Maximal allowed deviation ± 10°

If the compass deviations are not identical for both checks, two separate compass correction cards should be done.

Note:

General evaluation	Complied	Failed
Performed by:	Elaborated by:	Date:

Tab. 12-4: Report of magnetic compass compensation

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