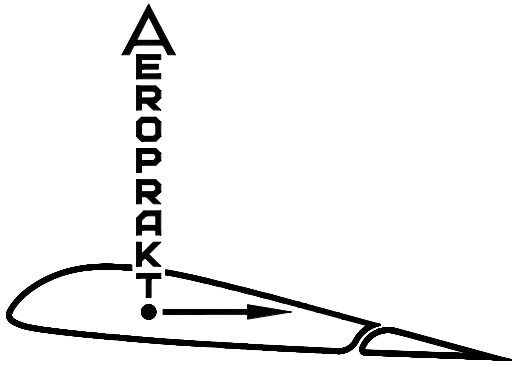




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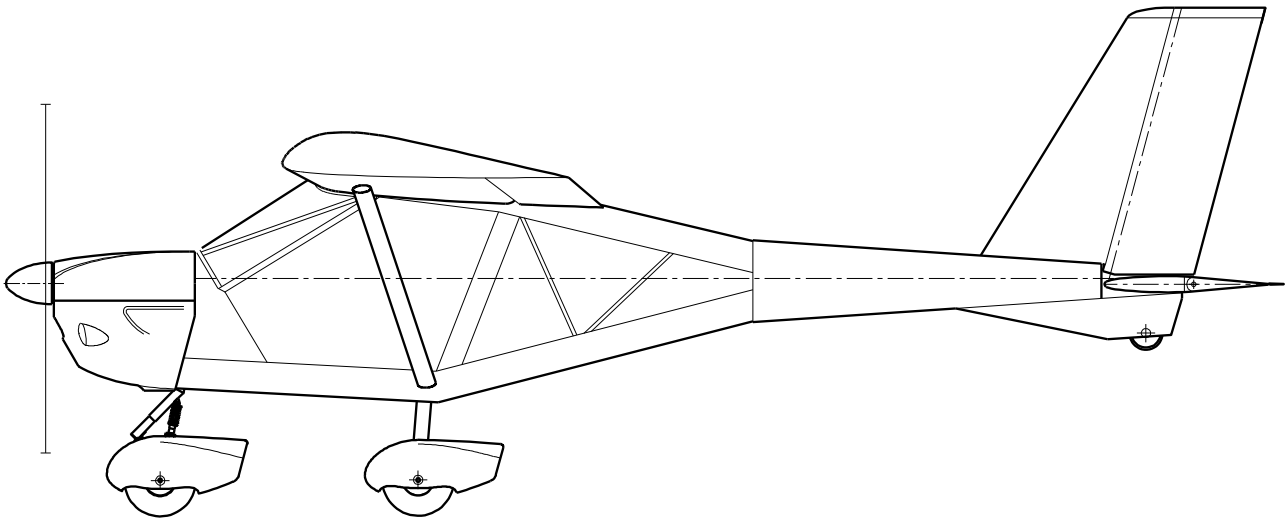
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AEROPRAKT-22LS Airplane Maintenance Manual A22LS-AMM-02



Airplane Model: AEROPRAKT-22LS (A-22LS)

Airplane Registration Number:

Airplane Serial Number: XXX

Date of issue: XX.XX.20XX

Approved by: Yuriy Yakovlyev

Position: Chief designer

Date of approval: XX.XX.20XX

*This manual must be carried in the airplane at all times.
This airplane is to be serviced and maintained in compliance with information and instructions
contained herein.*

RECORD OF REVISIONS

No part of this manual may be reproduced or changed in any manner without a written consent of the Manufacturer.

Any revision of the present manual must be recorded by the Manual holder in the following table according to information from the Manufacturer.

New or amended text in the revised pages must be marked by a black vertical line on the left hand margin. The Revision No. and the date must be shown on the bottom left hand side of the page.

Rev. No.	Notice/Bulletin No.	Affected Pages	Date Issued	Date Inserted	Signature

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1 General

NOTE: Notifications, service bulletins and safety alerts are published at the official website of Aeroprakt company <http://www.aeroprakt.kiev.ua>.

This manual describes the procedures of proper aircraft handling and servicing recommended by the aircraft manufacturer. It also contains certain inspection and maintenance requirements that must be met to maintain flight performance and safe operation of the aircraft. It is recommended to adhere to the scheduled periods of greasing/lubrication and preventive maintenance taking into account the climate and operating conditions.

Each of the inspection or service/maintenance action outlined in this manual specifies:

- recommended special tools (if any) to accomplish the task,
- the parts needed to perform the task,
- type of maintenance, for example, line, heavy, or overhaul,
- the level of certification needed to accomplish the task, for example, owner, A&P, LSA repairman with inspection (or maintenance) rating, and repair station,
- detailed instructions and diagrams as needed to perform the task,
- method to test/inspect to verify the task was accomplished properly.

The types of the maintenance (**TM**) tasks specified in this manual are marked with the following **one-letter** abbreviation and are defined as follows:

Line maintenance (L) – any repair, maintenance, scheduled checks, servicing, inspections, or alterations not considered heavy maintenance that is approved by the manufacturer and is specified in this maintenance manual.

Heavy maintenance (H) – any maintenance, inspection, repair, or alteration which manufacturer has designated that requires specialized training, equipment, or facilities.

Overhaul (O) – maintenance, inspection, repair, or alterations that are only to be accomplished by the manufacturer or a facility approved by the original manufacturer of the product.

The levels of certification (**LC**) needed to accomplish the maintenance tasks specified in this manual are marked with the following **three-letter** abbreviation and are defined as follows:

OWN (owner) – items that can be expected to be completed by a responsible owner who holds a pilot certificate but who has not received any specific authorized training.

LRI (LSA repairman inspection) – items that can be expected to be completed on an ELSA by a responsible owner, which holds an FAA repairman certificate (light sport aircraft), with an inspection rating or equivalent.

LRM (LSA repairman maintenance) – items that can be expected to be completed on a SLSA by a responsible individual, which holds a FAA repairman certificate (light sport aircraft), with a maintenance rating or equivalent.

A&P (airframe and powerplant mechanic) – items that can be expected to be completed by a responsible individual who holds a mechanic certificate with airframe or powerplant ratings, or both, or equivalent.

TSP (task specific) – items that can be expected to be completed by a responsible individual who holds either a mechanic certificate or a repairman certificate and has received task specific training to perform the task.

1.1 Sources to purchase parts

For purchasing any parts or spares for this airplane contact your local dealer/distributor or address the aircraft Manufacturer: Aeroprakt Ltd., Polyova str. 24, 03056, Kyiv, UKRAINE, e-mail: air@prakt.kiev.ua or aeroprakt.kiev@gmail.com, web: www.aeroprakt.kiev.ua.

1.2 Equipment list

This aircraft has the following equipment:

Flight instruments:

- Airspeed indicator,
- Altimeter indicator,
- Vertical speed indicator,
- Compass,
- Slip ball.

Engine instruments:

- Engine speed indicator,
- cylinder head temperature gauge,
- oil temperature gauge,
- oil pressure gauge,
- 2 fuel level indicators.

Avionics:

- Transceiver,
- Intercom,
- Transponder.

Miscellaneous equipment

- Landing light,
- Navigation and strobe lights.

1.3 List of disposable replacement parts

The manual (see Sections 3 through to 16) contains the check lists with information about check periods, recommended change out (RCO) times as well as references to inspection and servicing/maintenance instructions for the airplane components and systems.

Before expiration of the recommended change out time of separate airplane parts or when it is not specified their operation shall be performed on condition (OC). Such parts must be inspected and replaced, if necessary, before expiration of the RCO (if specified).

If inspections and checks arouse any issues not covered in this manual contact the Manufacturer for additional information.

Upon detecting corrosion on airplane structural elements contact the Manufacturer for the required technical support. In this case further operation of the airplane may be dangerous!

1.4 Engine specifications

WARNING! On all issues of engine operation see Rotax engine Operator's Manual. Follow its instructions to ensure safe and efficient operation of the engine.

Engine data and operational limitations are given in the table below:

Engine manufacturer	BRP-Rotax GmbH & Co KG (Austria)	
Engine model	Rotax-912UL	Rotax-912ULS
Engine type	Flat-four, four-stroke	
Take-off performance	59.6 kW (80 h.p.)	73.5 kW (100 h.p.)
Max. continuous performance	58 kW (77.8 h.p.)	69 kW (92.5 h.p.)
Take-off speed	5800 rpm (max. 5 minutes)	
Max. continuous speed	5500 rpm	
Idle speed	min. 1400 rpm	
Oil pressure, maximum minimum normal	7 bar (102 psi) (for a short period at cold start) 0,8 bar (12 psi) (below 3500 RPM) 2,0 to 5,0 bar (29-73 psi) (above 3500 RPM)	
Oil temperature, maximum minimum normal	140 °C (285 °F) 50 °C (120 °F) 90-110 °C (190-230 °F)	130 °C (266 °F) 50 °C (120 °F) 90-110 °C (190-230 °F)
Exhaust gas temperature	max. 880 °C (1616 °F)	
Coolant temperature (coolant exit temperature)	max. 120 °C (248 °F)	
Cylinder head temperature	max. 150 °C (300 °F)	max. 135 °C (275 °F)
Engine start, operating temperature	max. 50 °C (120 °F) (ambient temperature) min. -25 °C (-13 °F) (oil temperature)	
Fuel pressure, maximum minimum	0.4 bar (5.8 psi) 0.15 bar (2.2 psi)	
Fuel antiknock properties	min. RON 90 (min. AKI ¹ 91)	min. RON 95 (min. AKI 91)
European standard of fuel	EN 228 normal, EN 228 super, EN 228 super plus	EN 228 super, EN 228 super plus
Aviation Standard of fuel	AVGAS 100 LL (ASTM D910)	
Oil specification	Use only oil with Rotax norm RON 424 classification	

¹ Anti-Knock Index (RON+MON)/2

1.5 Weight and balance information

The airplane CG position (x_{CG}) must be between 1.500 m [59.06 in] and 1.751 m [68.94 in] or between 19% and 37% of the wing MAC (mean aerodynamic chord) see **Fig. 1**.

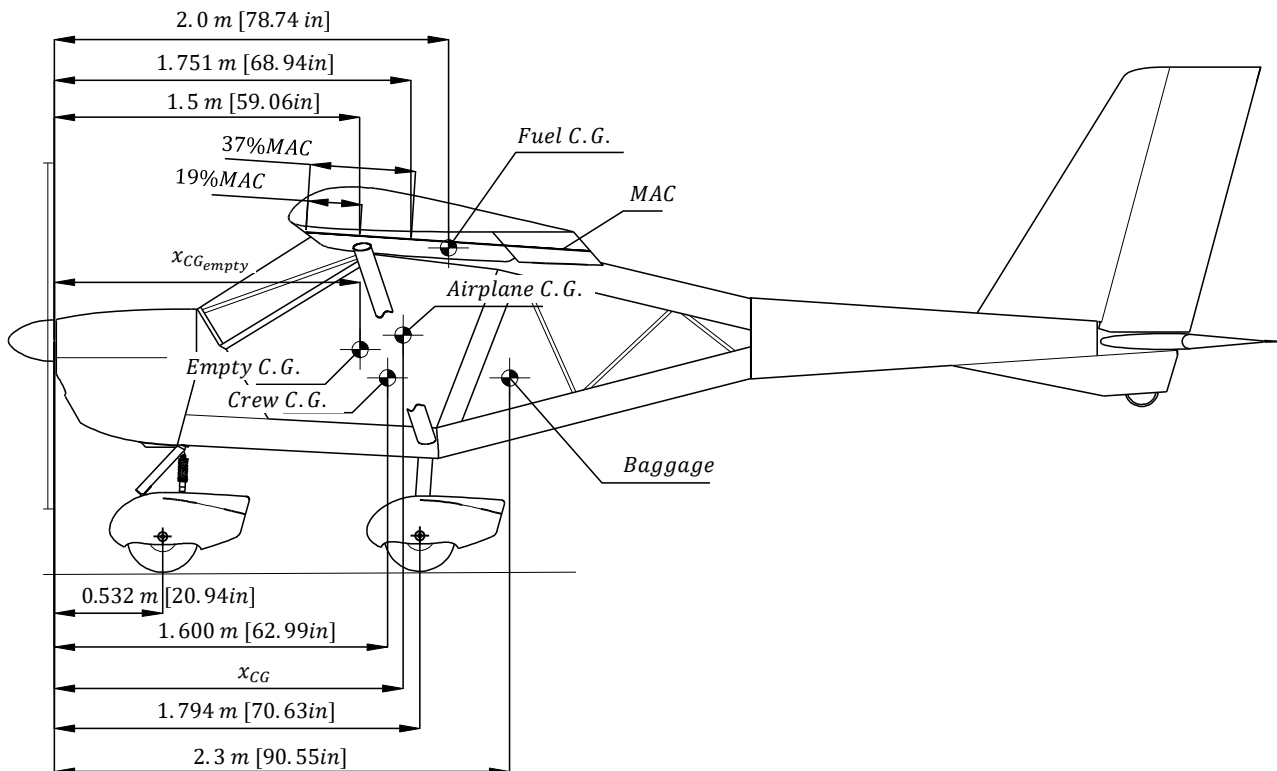


Fig. 1 CG location of the empty airplane, pilots, fuel and baggage

Compute the airplane CG position using the example in the table below:

Item	Weight, kg/lbs	×	CG arm, m/inch	=	Moment, kg×m/lbs×inch
Empty airplane					
Crew (2×xx.x kg)					
Baggage					
Fuel (2×xx l)					
Total:					
$X_{CG} = \text{Total moment} / \text{Total weight}$		=			

1.6 Tire inflation pressure

Normal inflation pressure:

- Main wheels – 1.6 bar (22.7 psi) for 6.00×6 wheels;
- 1.3 bar (19.0 psi) for 8.00×6 wheels;

Front wheel – 1.0 bar (14.5 psi) for both 6.00×6 and 8.00×6 wheels.

1.7 Approved fuel, oils and capacities

WARNING! On all issues of engine operation see Rotax engine Operator's Manual. Follow its instructions to ensure safe and efficient operation of the engine.

Fuel

Approved grades: antiknock properties – min. RON 95 (min. AKI 91²)

European standard – EN 228 super, EN 228 super plus

Aviation standard – AVGAS 100 LL (ASTM D910)

Maximum capacity of the fuel tanks: standard tanks – $2 \times 45 = 90$ liters (23.8 US gal)
optional tanks – $2 \times 57 = 114$ liters (30.1 US gal).

“Fuel Low” warning light ignites at approximately 4.5 liters (1.2 US gal) of fuel left per tank.

Unusable fuel: approximately 1 liter (0.3 US gal) per tank.

Oil

Approved grades: with RON 424 classification.

Oil tank capacity: 3 liters (NOTE: check correct oil level in the tank using the oil probe.)

Coolant

Approved grade: TELKO Polar Premium Long Life Antifreeze.

Quantity: 3 liters (NOTE: check the correct level using the overflow bottle marks.)

Braking fluid

Approved grade: Mobil ATF 220

Quantity: 0.2 liter (NOTE: check the correct level using the overflow bottle marks.)

1.8 Recommended fastener torque values

In A-22LS all fasteners forward of the firewall and in the electrical system is metric, and rear of the firewall – inch. The bolts, screws and nuts (unless specified otherwise) must be tightened (using appropriate torque wrenches) to the following torque:

1. For the static joints with spacing inserts (spacers, spherical bearings, etc.) according to the table:

Metric fasteners	Inch fasteners	Torque, N·m (lb·ft)
M5	10-32	6 (4.4)
M6	1/4	10 (7.4)
M8	5/16	15 (11.0)
M10	3/8	25 (18.4)

2. For the movable joints where bolts serve as hinge axle the nuts tightening must be done only to remove the axial play (gap) while preserving the rotational freedom in the joint.

WARNING! All bolts, nuts (except for self-locking ones), pins, turnbuckles must be locked reliably.

² Anti-Knock Index (RON+MON)/2

1.9 General safety information

Aircraft owner/operator responsibilities:

Each owner/operator of the Aeroprakt LSA must read and comply with the maintenance and continued airworthiness information and instructions provided by the Manufacturer.

Each owner/operator of the Aeroprakt LSA is responsible for providing the Manufacturer with current contact information where the Manufacturer may send the owner/operator supplemental notification bulletins.

The owner/operator of the Aeroprakt LSA is responsible for notifying the Manufacturer of any safety of flight issue or significant service difficulty upon discovery.

The owner/operator of the Aeroprakt LSA is responsible for complying with all notices of corrective action issued by the Manufacturer and for complying with all applicable aviation authority regulations in regard to maintaining the airworthiness of the LSA.

The owner/operator of the Aeroprakt LSA must ensure that any needed corrective action be completed as specified in a notice, or by the next scheduled annual inspection.

Should the owner/operator of the Aeroprakt LSA not comply with any mandatory service requirement, the LSA shall be considered not in compliance with applicable ASTM standards and may be subject to regulatory action by the presiding aviation authority.

1.10 Reporting maintenance, service, and safety difficulties

In case of encountering any maintenance or service or safety difficulties not covered by this Manual report about it to the aircraft Manufacturer by e-mail or by fax using the Feedback Form (see Appendix A). If necessary enclose sketches or photos showing the problem items in sufficient detail.

2 Inspections

This section contains the instructions and checklist for inspection and servicing for the completion of periodic and annual condition/100-h inspections with references to the sections containing detailed instructions for the inspection/servicing action.

↓ Inspection/Servicing action and its interval in hours →	100	200	500	1000	2000
Structures (section 3)					
Inspect fuselage for damage (fatigue cracks, loose rivets, etc.)			X		
Inspect fuselage glazing for damage (silvering, cracks, etc.)	X				
Inspect wings for damage (fatigue cracks, loose rivets, torn fabric covering, etc.)			X		
Inspect wing attachment points for play			X		
Remove the wings and inspect its spherical bearings for axial and radial play, and wing and strut attachment brackets for fatigue cracks					X
Inspect the wing struts for fatigue cracks, deformation and loose rivets			X		
Inspect the sealing fabric tape of the wing strut fairings		X			
Check the wing attachment bolts' torque and locking	X				
Inspect the stabilizer for fatigue cracks, deformation, loose rivets and play in joints	X				
Check the stabilizer attachment bolts/nuts torque and locking	X				
Inspect the tail wheel for damage and play	X				
Check the tail wheel attachment bolt/nut torque and locking	X				
Inspect engine cowlings for damage (cracks, ruptures, damaged paint, etc.)	X				
Landing gear (section 4)					
Inspect the front leg for fatigue cracks, deformation and play	X				
Check the front leg steering bellcrank bolt/nut torque and locking	X				
Check the shock absorber condition and pressure	X				
Inspect the MLG legs and attachment beam for fatigue cracks ³ , deformation and play	X				
Check the MLG legs attachment bolts/nuts torque and locking	X				
Remove the wheel fairings and inspect the wheel tires for cracks, cuts and wear		X			
Inspect the wheel fairings for cracks, ruptures and damaged paint	X				
Check the torque and locking of the fairing attachment bolts/nuts	X				
Inspect the mud-screens for fatigue cracks and deformation ⁴	X				
Check the torque and locking of the mud-screen attachment bolts/nuts ⁴	X				
Inspect the skis for damage ⁵	X				
Check the torque and locking of the ski attachment bolts/nuts ⁵	X				
Braking system (section 5)					
Inspect expansion tank for leaks, cracks, secure attachment. Check the braking fluid level.	X				
Inspect the master cylinder for leaks of braking fluid		X			
Inspect the parking brake valve for leaks of the braking fluid		X			
Inspect the brake unit for the leaks of the braking fluid		X			
Check the form and amount of the brake disk wear		X			
Inspect the braking system tubing and joints for leaks and damage		X			
Engine and its control system (section 6)					
Inspect the engine mount for fatigue cracks and deformation		X			
Check the torque of the engine mount attachment bolts		X			

³ After 5000 landings the MLG legs must be removed and inspected carefully for fatigue cracks

⁴ For an aircraft version on wheels with mud-screens

⁵ For an aircraft version on skis

↓ Inspection/Servicing action and its interval in hours →	100	200	500	1000	2000
Inspect the shock absorbers for damage (deep cracks, disintegration, etc.)			X		
Inspect the engine attachment fitting for the fatigue cracks					X
Check the intake airbox function, condition and attachment ⁶		X			
Check the throttle and choke cables and cable sheath for functioning, wear, damage, kinks	X				
Check the torque of the throttle lever bolt (axle)	X				
Cooling system (section 7)					
Check integrity and torque of the clamps attaching radiator to engine mount	X				
Inspect the overflow bottle for leaks of coolant, cracks in cap and bottle; check coolant level	X				
Inspect the coolant lines for leaks, damage (chaffing, cracks), check tightness of joints	X				
Check torque of the water inlet elbow hose clamps, tighten if necessary	X				
Lubrication system (section 8)					
Inspect the oil tank plug for oil leaks; verify vent line is intact and secured	X				
Inspect oil lines for leaks and damage (chaffing, cracks), check tightness of joints	X				
Fuel system (section 9)					
Remove fuel tanks and inspect them for fuel leaks and damage			X		
Inspect the shut-off and drain fuel valves for leaks of fuel	X				
Check condition and replace fuel filter (if necessary)		X			
Inspect fuel lines for leaks, damage (chaffing, cracks), loose joints	X				
Check condition and replace fuel lines (if necessary)				X	
Exhaust system (section 10)					
Inspect exhaust pipes and muffler for cracks	X				
Verify attachment springs are intact and secured	X				
Propeller (section 11)					
Inspect propeller hub for fatigue cracks; check pitch angles of the blades		X			
Check torque and locking of the propeller attachment bolts/nuts		X			
Check torque of the spinner attachment bolts		X			
Airplane control system (section 12)					
Inspect control surfaces for fatigue cracks, deformation, loose rivets, damaged fabric skin	X				
Check the play in the hinges of control surfaces/linkages	X				
Check tightness/locking of the nuts of control surfaces/linkages	X				
Check tightness/locking of the nuts and play in hinges of control rods/shafts	X				
Extend flaps and inspect flap extension mechanism (play in hinges, bolt/nut tightness/locking)	X				
Grease the sliding bearings of all control surfaces/linkages (where necessary)	X				
Inspect rudder control cables for wear, check cable tension		X			
Inspect rudder pedals for fatigue cracks and deformation	X				
Check tightness/locking of the nuts of the front leg control rods	X				
Check condition of the control cable pulleys and fairleads			X		
Check trim tab attachment bolts/nuts for corrosion. Replace corroded fasteners		X			
Inspect the trim tab control cables and sheath for damage (wear, kinks, etc.)		X			
Take out and inspect the aft elevator control rod for wear. Replace if necessary.			X		
Check control surfaces' deflection angles			X		

⁶ For all aircraft variants equipped with intake airbox

↓ Inspection/Servicing action and its interval in hours →	100	200	500	1000	2000
Electrical system (section 13)					
Verify battery charges/discharges properly, otherwise replace	X				
Inspect starter terminals and starter relay connector, remove corrosion from contacts, if any	X				
Verify starter relay and cables are connected and attached reliably	X				
Verify power cables have good contact with battery, starter and ground	X				
Clean rectifier-regulator and condenser terminals/connectors of corrosion, if any	X				
Check condition of electric switches and warning lights	X				
Clean fuse block terminals of corrosion, if any. Check fuses	X				
Verify correct function of the fuel level sensors/indicators (check readings)		X			
Check landing light function and attaching nut torque	X				
Clean engine sensors' terminals and connectors of corrosion, if any	X				
Inspect electrical harness for damage (chaffing, broken wires, bad insulation)	X				
Cockpit heating system (section 14)					
Inspect warm air scoop for damage. Repair or replace if necessary	X				
Inspect warm air shutter and its housing for damage. Repair or replace if necessary	X				
Inspect warm air duct for damage. Replace if necessary	X				
Check condition and operation of the warm air shutter actuator. Replace if necessary	X				
Instruments, avionics, full and static pressure system (section 15)					
Check condition of the switches and lights. Replace defective ones, if any	X				
Check operation of the instruments and avionics. Replace defective ones, if any	X				
Check condition of the full and static pressure system	X				
Pilot seats and harness belts (section 16)					
Inspect the seats framework for the fatigue cracks and loose rivets	X				
Inspect the seat cushions upholstery for damage	X				
Verify harness belts' locks function properly	X				
Cockpit doors (section 17)					
Inspect door glass, framework, hinges and fasteners for fatigue cracks, mechanical damage	X				
Verify the gas struts function properly	X				
Recovery system (section 18)					
Check attachment of the suspension cables to fuselage structure and to parachute lanyard			X		
Glider and banner towing system (section 19)					
Inspect the tow release control cable for damage/corrosion. Replace if necessary.	X				
Clean, lubricate and check the tow release for operation. Replace if necessary. ⁷	X				

⁷ Tow release must be returned to the manufacturer for complete reconditioning after 10000 operations (approx. 2000 starts).
The manufacturer recommends **general overhaul after 4 years**.

3 Structures

The airframe of A-22LS airplane includes the following parts: fuselage with glazing and cockpit doors, wings, wing struts, horizontal and vertical tail units, wing root and strut fairings and engine cowling. Fuselage with fin, wing struts and stabilizer are made of aluminum alloys. Wing framework including leading edge section and top skin are all-metal and bottom skin is fabric. Flaperons, elevator and rudder have metal framework and fabric skin aft of spar. Rear fuselage panels (on top and on both sides) depending upon customer-selected options may be made of transparent plastic glass, all-metal or combined. Wing root /tip fairings, wheel fairings and engine cowling are made of glass fiber composites. Wing strut fairings are made of transparent plastic using vacuum forming.

When servicing the airplane a special care shall be taken to keeping the paint coating intact which prevents the airframe from corrosion. Care of the fabric skin consists mainly of care of its paint coating. Correct care of the paint coating is one of the conditions of preserving the airplane strength and aerodynamic characteristics. To keep the paint coating of the airplane in good condition the dust and moisture must be removed in time, scratches, spilling oil products, solvents, alkalis and acids on paint must be avoided.

INSPECTION CHART

Description	Interval	RCO	Instr. No.	TM	LC
Fuselage	500 h	OC	3.1	L	LRI
Windscreen glass	100 h	OC	3.2	L	OWN
Rear fuselage skin panel, top	100 h	OC			
Rear fuselage skin panel, right	100 h	OC			
Rear fuselage skin panel, left	100 h	OC			
Wing, right	500 h	OC	3.3	L	OWN
Wing, left	500 h	OC	3.3	L	OWN
Spherical bearings, 4 pcs.	2000 h	OC	3.4	L	LRI
Wing strut, right	500 h	OC	3.5	L	LRI
Wing strut, left	500 h	OC			
Wings strut fairing, top, right	200 h	OC	3.6	L	LRI
Wings strut fairing, top, left	200 h	OC			
Wings strut fairing, bottom, right	200 h	OC			
Wings strut fairing, bottom, left	200 h	OC			
Wing attachment bolts, 4 pcs.	100 h	OC	1.8	L	OWN
Wing strut attachment bolts, 4 pcs.	100 h	OC			
Stabilizer	100 h	OC	3.7	L	LRI
Stabilizer attachment bolts, 2 pcs.	100 h	OC	1.8	L	OWN
Stabilizer attachment nut	100 h	OC			
Tail wheel	100 h	OC	3.8	L	LRI
Tail wheel bolt	100 h	OC	1.8	L	OWN
Engine cowling panel, top	100 h	OC	3.9	L	LRI
Engine cowling panel, bottom	100 h	OC			

Instructions:

- 3.1 Remove the engine cowlings, doors, lower wing strut fairings (undo the screws fixing the fairings and 'slide' them along the strut), pilot seats, and rugs. Inspect the fuselage for cracks and deformation, paying special attention to primary structural elements, areas of their connection and rivet joints.

Inspection for fatigue cracks:

Use torch or any other suitable source of light. When detecting very thin cracks remove the paint in the area of the suspected crack for a closer flaw detection. If possible apply load in this area in a manner that will 'open up' the crack. If the closer inspection confirmed the presence of crack contact the manufacturer for required technical support. If the suspected crack was not detected repaint this area.

Inspection for loose rivets:

When inspecting rivet joints look at the area around rivet heads. The paint around the rivet heads must have no cracks or black stains that indicate a loose and corroded rivet joint. When detecting such flaws contact the manufacturer for the required technical support.

If no flaws were detected, reinstall everything in reverse order. Apply Loctite 222 on the thread of the attachment screws of the wing strut fairings before reinstalling them.

Recommended special tools: magnifying glass, electric torch.

Necessary parts/materials: paint, Loctite 222.

- 3.2 Inspect the glass inside and outside for cracks. If any crack protruding from under the glass attachment strips is detected the glass must be replaced. Contact the local dealer for glass replacement instructions.

WARNING! The glazing material is not resistant to fuels, oils and solvents. Spilling those liquids on glazing may cause its dimness and cracking. Washing the glass with any agents that may damage **PET-G** glass is strictly forbidden!

Recommended special tools: none.

Necessary parts/materials: none.

- 3.3 Drain fuel from the fuel tanks. Remove the upper wing strut fairings and fuel tanks. Inspect the outer surface and, as much as possible, internal structure of the wing for fatigue cracks, deformation and loose rivets as described in 3.1 (2nd and 3rd paragraph). Pay special attention to the strut-to-wing attachment points, rivet joints of the wing leading edge section and top skin.

Inspect the fabric skin for damage and detachment from the wing framework. It is allowed to repair small cuts/ruptures (shorter 50 mm or 2 in) covering them with ORACAL permanent sticking film. Upon detecting bigger damages and detachment of the fabric skin from the framework contact manufacturer for the required technical support.

Verify that there is no play in attachment points of the wing and strut by holding the wingtip gently and moving it up and down with an amplitude of 300 mm (1 ft). No movement in the attachment points due to loose joint (play) is allowed. When detecting insignificant radial play (less than 0.2 mm or 0.01 in) in the strut attachment points it must be eliminated by tightening its attachment bolt. In case if the play is more than 0.2 mm (0.01 in) contact the manufacturer for the required technical support.

In case if no defects are found re-assemble everything in reverse order. Before re-installing the screws attaching the fuel tanks and strut fairings apply Loctite 222 on the thread.

Recommended special tools: magnifying glass, electric torch.

Necessary parts/materials: ORACAL permanent sticking film, Loctite 222.

3.4 To detach the wings do the following:

- detach the doors;
- drain fuel from the fuel tanks;
- disconnect the fuel lines from the fuel valves, close the valves, plug the fuel lines and pull them out of cockpit through the rubber sealing rings in fuselage beams;

CAUTION! Be careful while working with the fuel system, the fuel remaining in the fuel lines is highly fire-hazardous and when spilled on the cockpit glass may cause glass dimness and cracking.

- disconnect the electric connectors of the navigation lights and fuel level probes at wing root and take the cables out of fuselage;
- detach the strut fairings (undo the screws attaching the fairings and slide fairings along the struts);
- detach the Cardan rings of the flaperon shafts by removing the vertical bolts;
- remove the locking pins and undo the nuts from wing and strut attachment points;
- while holding the wing by the tip and strut carefully take out the strut attachment bolts and remove the struts;
- while holding the wing by the tip and at the root take out the wing attachment bolts and slowly move the wing away from fuselage carefully pulling the navigation light cables from the wing fillets.

Inspect the wing and strut attachment fittings for fatigue cracks. Check the spherical bearings of the wing attachment fittings for axial and radial play. When detecting play in the bearings, as well as corrosion and fatigue cracks in the attachment fittings contact the manufacturer for the required technical support. If no defects were detected re-assemble everything in reverse order. Before reinstalling the screws attaching the fuel tanks and strut fairings apply Loctite 222 on the thread.

Recommended special tools: magnifying glass, electric torch.

Necessary parts/materials: screw clamps, Loctite 222.

3.5 Remove the strut fairings (undo the screws attaching the fairings and slide fairing along the strut). Inspect the struts for fatigue cracks, deformation (bend) and loose rivets as described in 3.1 (2nd and 3rd paragraph).

If no defects were found re-install the fairing applying Loctite 222 on the thread of the attaching screws.

Recommended special tools: none.

Necessary parts/materials: none.

3.6 Undo the screws attaching the fairings and slide the fairings along the strut. Inspect outer and inner surface of the fairings for cracks. If the crack length does not exceed 20 mm drill the crack end with Ø3 mm drill bit. The fairing with longer cracks must be replaced.

Upon inspection re-install the fairings applying Loctite 222 on the thread of the attaching screws.

- 3.7 Inspect the stabilizer for fatigue cracks, deformation and loose rivets as described in 3.1 (2nd and 3rd paragraph). Pay special attention to the areas near the stabilizer attachment fittings and leading edge near the hole for elevator trim tab cable.

Verify that there is no play in the stabilizer attachment joints by gently moving the stabilizer by its tip up and down with an amplitude not more than 50 mm (2 in).

CAUTION! The applied load may not exceed 30 N (7 lb).

There must be no movement due to the play in the attachment joints. When detecting insignificant play (less than 0.2 mm or 0.01 in) it must be eliminated by tightening the relevant bolted joint. In case if the play exceeds 0.2 mm (0.01 in) contact the manufacturer for the required technical support.

Recommended special tools: magnifying glass, electric torch.

Necessary parts/materials: none.

- 3.8 Inspect the tail wheel for integrity and play. When detecting a serious damage replace the wheel. When detecting an axial play below 0.5 mm (0.02 in), tighten the tail wheel axle nut. If the play exceeds 0.5 mm (0.02 in), remove the wheel and install back inserting a washer of appropriate thickness between the wheel hub and fuselage. Tighten the tail wheel axle nut to ensure that the wheel can be rotated with an effort.

Recommended special tools: none.

Necessary parts/materials: none.

- 3.9 Remove the top and bottom engine cowling and inspect for cracks, ruptures, as well as damaged paint coating. When detecting damaged paint coating sand the damaged area with sandpaper and re-paint. When detecting cracks and ruptures sand the damaged area from inside with sandpaper and cover it with a patch of fiberglass cloth with epoxy resin. After the resin solidifies properly, sand the damaged area outside with sandpaper and re-paint.

Recommended special tools: rubber gloves.

Necessary parts/materials: fiberglass cloth, epoxy adhesive, paint.

4 Landing gear

A-22LS may have the landing gear (LG) of one of the following three types: wheels, skis or floats. This manual contains the information for servicing the wheel and ski LG. The float type LG is not included in this manual. For obtaining additional information contact the manufacturer. When put on wheels the airplane is equipped with wheels of Matco mfg.

NOTE! When installing wheels tighten the axle nut as follows: first tighten the nut to remove the axial play, then turn it back until its slots aligns with the hole for the split pin in the axle. Then lock the nut using the split pin.

The front LG leg is steerable, of the trailing link type with spring shock absorber. The leg structure consists of a strut, steering bellcrank, trailing link with wheel fork, spring shock absorber, axle, spacing sleeves, wheel/ski and fairing/mud-screen (if installed). The steering is achieved using the rudder pedals via the rods connected to the steering bellcrank on the strut. The leg is attached to the firewall at two points – lower and upper supports. The upper support is made of aluminum alloy plate, the lower support is an assembly. The supports contain bronze bushings.

The main landing gear (MLG) is of cantilever spring type. The MLG consists of 2 flexible legs each with wheel axle, wheel (or ski), brake unit with supporting plate, and wheel fairing (or mud-screen). The MLG leg is made of aluminum alloy. It is attached with bolts at two points to the lower beam of the frame No.2.

Maintenance of the brake unit with supporting plate is described in "**Ошибка! Источник ссылки не найден.**" section.

INSPECTION CHART

Description	Interval	RCO	Instruction	TM	LC
Front LG leg strut	100 h	OC	4.1	L	LRI
Steering bellcrank bolt	100 h	OC	1.8	L	OWN
ROCK SHOX shock absorber	100 h	OC	4.2	L	LRM
Main LG leg, right	100 h	OC	4.3	H	LRM
Main LG leg, left	100 h	OC			
Leg attachment bolts, upper, 2 pcs.	100 h	OC	1.8	L	OWN
Leg attachment bolts, lower, 2 pcs.	100 h	OC			
Front wheel assembly	200 h	OC	4.4	L	LRI
Right wheel assembly	200 h	OC			
Left wheel assembly	200 h	OC			
Front wheel fairing*	100 h	OC	4.5	L	LRI
Right wheel fairing*	100 h	OC			
Left wheel fairing*	100 h	OC			
Front wheel mud-screen**	100 h	OC	4.6	L	LRI
Right wheel mud-screen**	100 h	OC			
Left wheel mud-screen**	100 h	OC			
Front ski***	100 h	OC	4.7	L	LRI
Right ski***	100 h	OC			
Left ski***	100 h	OC			

* for wheel LG version with fairings;

** for wheel LG version with mud-screens

*** for ski LG version.

Instructions:

- 4.1 To inspect the front LG leg put the airplane on the tail wheel and secure it in this position. The parking brake must be switched to ON.

Check the front LG leg supports for play. The radial play in the supports may not exceed 1 mm (0.04 in). No axial play is allowed.

If the radial play in the upper support exceeds the above specified value then the bronze bearing in the support must be replaced. If the radial play in the lower support exceeds the above specified value then the support with bearing must be replaced. Contact manufacturer to obtain the instructions on replacement of the bearing and support.

Upon detecting any axial play in the supports tighten the upper support nut until the play is eliminated, if necessary, insert a washer of an appropriate thickness.

WARNING! Tightening the nut must eliminate the play while ensuring free rotation of the leg in the supports. Do not over-tighten the nut!

Check for play the joint of the wheel fork to the strut and the shock absorber joints to the strut and to the wheel fork. If the play exceeds 0.5 mm replace the bronze bearings in the joints.

Inspect the strut for deformation and fatigue cracks paying special attention to the welded seams.

To remove the front LG leg (if necessary) do the following

- disconnect the control rods from the front leg steering bellcrank;
- remove the split pin and undo the nut of the upper support of the front leg;
- undo the nut and take out the bellcrank bolt;
- carefully take out the front LG leg from the supports simultaneously removing the bellcrank from it.

CAUTION! Do not put the fuselage nose down while the front leg is removed! This may cause damage to the airframe and propeller.

To inspect the wheel fork remove the wheel fairing (if installed) by doing the following:

- take out the bolts attaching the wheel fork and shock absorber to the strut;
- remove the wheel fork together with wheel fairing;
- detach the wheel fairing from the wheel fork by removing three attachment bolts.

Inspect the wheel fork for cracks. Make sure there is no axial play in the joint of the wheel fork and the wheel axle and the wheel rotates freely.

Inspect the wheel tire for cracks and cuts. Estimate degree and uniformness of the tire wear. In case of normal operation the tire wear must be uniform over entire contact surface of the wheel. It is allowed to use the tires until the first wheel cords become visible. If the cords are visible, or there are any deep cuts or cracks in the tire, the tire must be replaced.

If the front wheel must be repaired or its tire must be replaced see instruction 4.4.

In case if the shock absorber must be repaired or replaced see instruction 4.2.

Before applying fresh grease on the friction surfaces of the front LG leg remove the old grease. Any grease for bearings may be used for the strut.

To assemble the front LG leg perform the above operations in reverse order, ensuring free motion and absence of axial play in the movable joints.

CAUTION! Tightening of the nut on the wheel axle must be done as follows: first tighten the nut to remove the axial play, then rotate it a little back to align the hole in the axle for the split pin with the nearest groove in the nut.

Recommended special tools: none.

Necessary parts/materials: grease gun, grease.

- 4.2 If the spring shock absorber is seriously damaged, then it must be removed for repair or replacement.

To remove the shock absorber do the following:

- set the parking brake valve to CLOSE;
- remove the front wheel fairing;
- remove the split pins and undo the nuts of the shock absorber attachment;
- carefully push down the airplane tail near the stabilizer attachment points till the airplane sets on the tail wheel and remove the shock absorber (this operation must be done by two persons);
- secure the airplane in this position with a wooden support under its fuselage as close to the frame No. 1 (firewall) as possible (the support width must be equal or bigger than the fuselage width).

To re-install the spring shock absorber perform the above actions in reverse order. Before installation of the spring shock absorber lubricate its attachment bolts with bearing grease.

WARNING! When installing the shock absorber tighten the nuts as follows: first tighten to remove the axial play, then rotate a little back to align the nearest slot of the castle nut with the hole for the split pin and secure it with a split pin. The shock absorber must rotate freely on the attaching bolts.

Recommended special tools: none.

Necessary parts/materials: grease gun, grease.

- 4.3 Remove the pilot seat and wheel fairing. Inspect the MLG attachment beam and spring for fatigue cracks, deformation and play following the instructions of 3.1 (2nd and 3rd paragraph) of "Structures" section. Pay special attention to the areas of the spring attachment to the beam and wheel axle attachment to the spring.

If axial play is detected in the MLG attachment, check the attachment bolts' torque. If radial play is detected, contact the manufacturer to obtain the required technical support.

After 5000 landings careful inspection of the MLG leg is required. The MLG leg must be removed for that.

To remove the MLG leg do the following:

- put the wheel chokes under the front and main wheel on the other side;
- remove the pilot seats;
- remove the wheel fairing (if installed);
- remove the plastic cable ties fixing the braking system tube to the MLG leg;
- lift the airplane using a jack placed under a special plate near the opening in the fuselage bottom skin for the MLG leg;
- remove the safety wire and undo the brake disk screws and wheel axle nut;

- remove the wheel and brake disk;
- leaving the braking system tube connected, disconnect the braking unit from the supporting plate (undo two bolts and three screws of the braking unit and move the brake unit with the tube aside);

WARNING! When handling the brake pads and disk avoid smearing their working surfaces with any lubricating materials. Do not move the brake actuation lever in the cockpit when the braking disk is removed!

- remove the split pins and undo the nuts of the upper and lower bolts of the MLG leg attachment and take out the bolts;
- remove the spring.

Inspect carefully the spring and fittings of the MLG attachment beam for fatigue cracks. Pay special attention to the areas around the attachment holes in the beam and leg. Upon detecting fatigue cracks in the MLG leg or MLG attachment beam contact the manufacturer to obtain the required technical support.

If no defects were detected, install the MLG leg back by doing the above actions in reverse order.

Before re-installing the attachment screws of the brake disk and pilot seats apply Loctite 222 on their thread.

Recommended special tools: none.

Necessary parts/materials: plastic cable ties.

- 4.4 Remove the wheel fairing. Inspect the tire for cracks and cuts. Estimate the uniformness and degree of the tire wear. In case of normal operation the wear will be uniform over entire operating surface of the tire. Tire operation is allowed until exposure of its cord. In case if exposed cord or deep cuts are detected the tire must be replaced.

To replace the front wheel tire do the following:

- set the parking brake valve to CLOSED;
- remove the front wheel fairing;
- remove the split pin of the front wheel axle nut and undo it;
- carefully push down the airplane tail near the stabilizer attachment points till the airplane sets on the tail wheel and remove the front wheel (this operation must be done by two persons);
- put the airplane's nose down placing a wooden support under the front wheel fork;
- replace the tire;
- inflate the wheel (1.0 bar) and install it back on the airplane making the above actions in reverse order.

To replace a main wheel tire do the following:

- undo the nuts of the three bolts joining the aluminum wheel halves and bearing hub;
- replace the tire and assemble the wheel;
- inflate the wheel (1.6 bar) and install it back on the axle in reverse order.

For more detailed information regarding the servicing (repairing) the wheels visit the wheel manufacturer's web site <http://www.matcomfg.com>.

Recommended special tools: none.

Necessary parts/materials: none.

- 4.5 Inspect the fairing for cracks, ruptures and paintwork damage. If the paintwork is damaged, remove the fairing, clean the damaged area with sand paper and repaint. If cracks and ruptures are detected, remove the fairing, clean the damaged area with sand paper from inside, and apply a patch of fiberglass cloth with epoxy resin. After the resin solidifies properly, sand the damaged area outside with sandpaper and re-paint.

Check the torque of the fairing attachment bolts/nuts.

Recommended special tools: torque wrench, rubber gloves.

Necessary parts/materials: fiberglass cloth, epoxy adhesive, paint.

- 4.6 Inspect the mud-screens for fatigue cracks and deformation. Pay special attention to the areas around the bolt joints and mud-screen framework weld seams. If any cracks are detected in the mud-screen it must be replaced. If cracks are detected in the mud-screen framework it must be replaced too.

Check the torque of the mud-screen attachment bolts/nuts.

Recommended special tools: torque wrench.

Necessary parts/materials: none.

- 4.7 Inspect the ski for mechanical damage. If damage of the paintwork is detected, clean the damaged area with the sand paper and re-paint. In case of serious damage of the ski contact the manufacturer for the required technical support.

Inspect the rubber cord and cable braces of the ski for wear and damage. If the surface of the rubber cord brace is damaged or any cracks are detected in its metal end fittings the brace must be replaced. If any threads of the cable are broken it must be replaced.

Check the torque of the ski brace attachment bolts/nuts.

CAUTION! When installing the ski on the wheel axle tightening of the nut on the axle must be done as follows: first tighten the nut to remove the axial play, then rotate it a little back to align the hole in the axle for the split pin with the nearest groove in the nut.

Recommended special tools: torque wrench.

Necessary parts/materials: paint.

5 Braking system

The main wheels are equipped with Matco mfg hydraulic disk brakes. The braking system includes: expansion tank, master cylinder with lever, parking brake valve, brake units with supporting plates, brake disks, copper tubes, fittings and reinforced rubber hose. The braking system is filled with automotive transmission fluid ATF, application of which is approved by Matco mfg. MIL-H-5606, recommended by Matco mfg, is compatible with ATF and those fluids may be mixed without negative effect on sealing components of the braking system. The amount of the fluid in the system can be checked by its level in the expansion tank and must be not less than half of the tank.

When servicing the braking system it may be necessary to disconnect its tubes. After such disconnection air gets into its cavities which is not permissible.

To fill the braking system with braking fluid and remove air from it in the airplane version with yokes, do the following:

- check the level of the braking fluid in the expansion tank and refill if necessary;
- remove the cover set the parking brake valve to "OPEN";
- remove protecting cap from the brake unit nipple and put on it a transparent PVC tube with the inner diameter of 3 mm (1/8 in) and minimum length of 300 mm (1 ft), put the other end of the tube into a container with the braking fluid so that it is completely submerged into the fluid;
- while holding the tube, loosen the nipple by ½ turn;
- pump the braking fluid through the system with the braking lever till air bubbles stop appearing completely in the transparent tube (they may start appearing after some time of such pumping); while doing it do not forget to add braking fluid into the expansion tank to avoid air inflow into the system;
- after air bubbles disappear, tighten the braking unit nipple, remove the PVC tube and put on the protecting cap;
- repeat above actions for the other wheel.

To fill the braking system with braking fluid and remove air from it in the airplane version with central stick, do the following:

- remove the stick cover;
- disconnect the stick from the roll torque tube and elevator pushrod;
- remove the parking brake;
- remove the plastic clamps holding the braking system tubes;
- put the stick on the longitudinal beams of fuselage with the braking cylinder nipples facing up and pump the braking system through as described above for the airplane version with yokes;
- re-assemble everything in reverse order.

WARNING! When filling the braking system it is necessary to pump through it braking fluid in the amount of 1 to 2 volumes of the expansion tank.

For more detailed information about maintenance (repair) of the braking system components visit its manufacturer web site: <http://www.matcomfg.com>.

Recommended special tools: none.

Necessary parts/materials: 300 mm of Ø3.0 mm PVC tubing, brake fluid.

INSPECTION CHART

Description	Interval	RCO	Instruction	TM	LC
Expansion tank	100 h	OC	5.1	L	LRM
Master cylinder	200 h	OC	5.2	L	LRM
Parking brake valve	200 h	OC	5.3	L	LRM
Brake unit assembly, right	200 h	OC	5.4	L	LRM
Brake unit assembly, left	200 h	OC			
Brake disk, right	200 h	OC	5.5	L	LRM
Brake disk, left	200 h	OC			
Copper tubes	200 h	OC	5.6	L	LRM
Reinforced rubber hose	200 h	OC			

Instructions:

- 5.1 Remove the top engine cowling. Inspect the expansion tank for leaks of braking fluid, cracks in its housing and cap. If the tank is damaged it must be replaced, then the braking system must be filled with braking fluid, following the instructions described in the beginning of this section.

Check the fluid level in the tank and refill if necessary. The required level is at least half of the tank. Make sure the tank attachment to the firewall is secure. Replace the plastic cable ties if necessary.

Recommended special tools: none.

Necessary parts/materials: none.

- 5.2 Remove handles from the control levers of the throttle, trim tab, brake and choke. Remove the horizontal panel. Inspect the master cylinders for leaks of braking fluid. If no defects of the master cylinder are detected re-assemble everything in reverse order. If leaks are detected, it must be removed for repair or replacement.

In order to remove the master cylinder, do the following:

- remove the left seat;
- remove the panel between the pilot seats;
- disconnect the control cables of the engine and elevator trim tab (first from the engine and trim tab ends, and then from the control levers);
- undo the screws of the control lever unit attachment to fuselage beams (9 pcs.);
- disconnect the reinforced rubber hose from the master cylinders after squeezing it with a clamp near the disconnection point;
- disconnect the copper tube connecting the parking brake valve with brake units on the wheels;

WARNING! When disconnecting the braking system tubes some amount of braking fluid may spill out.

- remove the control lever unit assembled with the master cylinder;
- detach the master cylinder from the control lever unit;

To install the master cylinder perform the above actions in reverse order. After re-assembling fill the braking system following the instructions given in the beginning of this section. Then adjust the control systems of the engine and elevator trim tab as described in the corresponding sections of this manual.

Recommended special tools: none.

Necessary parts/materials: none.

- 5.3 Remove the handles from the control levers of the throttle, elevator trim tab, brakes and choke. Remove horizontal panel. Inspect the parking brake valve for leaks of the braking fluid.

If any leak is detected the valve must be removed for repair or replacement.

In order to remove the parking brake valve do the following:

- block the reinforced rubber hose connecting the expansion tank with the master cylinder by squeezing the hose with a clamp;
- cut the plastic cable ties fixing the valve;
- undo the screws attaching the valve;
- disconnect the copper tubes from the valve.

To install the parking brake valve back perform the above actions in reverse order. After assembling fill the braking system with the braking fluid following the instructions described in the beginning of this section.

If no defects are detected in the parking brake valve, re-assemble everything in reverse order.

Recommended special tools: none.

Necessary parts/materials: none.

- 5.4 Remove the wheel fairing (if installed). Inspect the brake unit for leaks of the braking fluid. If any leak is detected the brake unit must be removed for repair or replacement.

To remove the brake unit, do the following:

- put the wheel chokes under the front and opposite main wheel;
- lift the airplane using a jack placed under a special plate near the opening in the fuselage bottom skin for the MLG leg;
- unlock and undo the brake disk screws and wheel axle nut;
- remove the wheel and brake disk;
- disconnect the copper tube from the brake unit;
- disconnect the brake unit from the supporting plate (undo two bolts and three screws of the brake unit) and remove the braking pads from it.

To re-install the brake unit perform the above actions in reverse order. After assembling fill the braking system following the instructions described in the beginning of this section.

Check the brake pads for integrity and wear. The minimum thickness of the pad is 2.54 mm (0.1 in). The wear may be checked using a special depression in the butt of the braking pad. In case of significant wear or loss of integrity the pads must be replaced. In order to do that, detach the brake unit as described above and replace the brake pads (the braking system tubes need not to be disconnected from the brake unit). For more detailed instructions on servicing and replacement of the brake pads contact the manufacturer (Matco mfg).

If the wear is within the permissible limits, re-assemble everything in reverse order. Before re-installing the attachment screws of the brake disk apply Loctite 222 on their thread.

Recommended special tools: none.

Necessary parts/materials: Loctite 222.

- 5.5 Define the character and degree of the brake disk wear. For that remove the brake disk as described in 0. Measure the brake disk thickness at its working surface. It must be at least 3.3 mm (0.13 in). If the disk thickness is less than that, the brake disk must be replaced. For more detailed instructions on servicing and replacement of the brake disk contact the manufacturer (Matco mfg).

If the brake pads wear is within the permissible limits, re-assemble everything in reverse order. Before re-installing the attachment screws of the brake disk apply Loctite 222 on their thread.

Recommended special tools: none.

Necessary parts/materials: Loctite 222.

- 5.6 Remove the handles from the control levers of the throttle, elevator trim tab, brakes and choke. Remove the horizontal panel, main wheel fairings and pilot seats. Inspect the tubing of the braking system for leaks and mechanical damage. Pay special attention to the joints. If any leak or damage is detected replace the corresponding portion of the tubing. To obtain additional technical support contact the manufacturer.

After re-assembly fill the braking system following the instructions described in the beginning of this section.

After inspection (repair) re-assemble everything in reverse order. Before re-installing the pilot seats apply Loctite 222 on the thread of the attaching bolts.

Recommended special tools: none.

Necessary parts/materials: Loctite 222.

6 Engine and its control system

A-22LS is equipped with 100 hp Rotax-912ULS or 80 hp Rotax-912UL four-cylinder four-stroke carburetor engine with combined cooling system manufactured by BRP-Rotax GmbH&Co KG (Austria).

WARNING! Maintenance of the engine must be performed according to the current documentation of BRP-Rotax company on operation and maintenance of Rotax 912 engine. For more detailed information visit the engine manufacturer's web site: www.flyrotax.com.

Arrangement and design of the engine systems (fuel, electric, oil, cooling, control, exhaust) complies with the requirements of the "Installation Manual for Rotax® Engine Type 912 series".

The engine is installed on a mount and is retained on top with a rod. The engine mount consists of upper and lower parts. The lower mount (truss) is attached to fuselage structure (firewall), and the upper mount (frame) is attached to the engine. To damp the vibrations and shock loads produced by the running engine the upper and lower mounts are connected via rubber shock absorbers. The shock absorbers are installed on the upper mount. The rod connects a bracket installed on the engine with fuselage structure. The rod is connected to fuselage structure via a shock absorber as well.

The throttle lever is located between the pilot seats. In the airplane equipped with a central stick the throttle levers are located outboard of the pilot seats. Two cables run from the throttle lever(s) to the left and right carburetors. The engine control system also includes engine start mixture control. The mixture control lever is located near the throttle lever on the horizontal panel. It is connected to the carburetors' chokes with cables.

The engine may be equipped with an intake air box of Aeroprakt design that improves the engine operating conditions, prevents carburetor icing and increases the engine power output in hot climate.

INSPECTION CHART

Description	Interval	RCO	Instr. No.	TM	LC
Engine	*	OC	6.1	H	TSP
Engine mount, upper	200 h	OC	6.2	L	LRI
Engine mount, lower	200 h	OC			
Engine retaining rod	200 h	OC			
Shock absorbers, 6 pcs.	500 h	OC	6.3	H	LRM
Engine attachment fitting	2000 h	OC	6.4	H	LRM
Intake airbox assembly**	200 h	OC	6.5	H	LRM
Throttle cables (central stick)	100 h	OC	6.6	H	TSP
Throttle cables (yokes)	100 h	OC			
Choke cables (central stick)	100 h	OC			
Choke cables (yokes)	100 h	OC			
Throttle cables sheath (central stick)	100 h	OC	6.7	H	TSP
Throttle cables sheath (yokes)	100 h	OC			
Choke cables sheath (central stick)	100 h	OC			
Choke cables sheath (yokes)	100 h	OC			
Throttle lever (central stick)	100 h	OC	6.8	L	OWN
Throttle lever (yokes)	100 h	OC	6.9	L	OWN

* – see "Maintenance Manual for Rotax® Engine Type 912 series"

** – in aircraft version equipped with intake airbox.

Instructions:

- 6.1 The engine servicing must be performed according to the "Maintenance Manual for Rotax® Engine Type 912 series". When servicing and repairing the engine it may be necessary to dismantle it. The plastic cable ties securing the engine system components must be cut. When disconnecting the tubes and hoses it is recommended to plug the holes and fittings. When installing the engine back secure the cables and tubes of the engine systems with the plastic cable ties.

To dismantle the engine, do the following:

- set the fuel valves to CLOSED;
- switch OFF the battery using the battery switch or (if it is not available) disconnect one of the power lines from the battery;
- remove the top and bottom engine cowlings;
- disconnect the fuel line at its joint behind the firewall;

WARNING! Be careful when working with the fuel system, as remains of fuel in the fuel lines are highly fire hazardous.

- remove the muffler and exhaust pipes (see "**Exhaust system**" section);
- disconnect the throttle and choke control cables from the carburetors;
- remove the intake airbox (see instruction 6.5 of this section);
- drain the coolant from the cooling system (see "**Cooling system**" section);
- disconnect the cooling system hose from the coolant pump;
- disconnect the cooling system hoses from the expansion tank outlet and overflow sleeve;
- disconnect the oil system hose from the oil outlet on the bottom of the crankcase and drain the remaining oil from the crankcase;
- disconnect the oil system hose from the oil pump inlet and drain the remaining oil from the system;
- drain oil from the oil tank, if necessary;
- disconnect the oil system hose from the oil tank outlet;
- detach the oil radiator by unfastening the metal clamps attaching the radiator;
- take out the senders of oil temperature and cylinder head temperature (or disconnect the cables from them if possible) and detach the cables from the engine;
- disconnect the cables from the oil pressure sender and untie the cables;
- disconnect the cables from the starter;
- take out the shielded cables of the ignition switches from the ignition system connector and untie the cables;
- take out the shielded cable of generator from the rectifier-regulator connector and untie the cable;
- disconnect the tachometer connector from the engine and untie the cable;
- disconnect the engine retaining rod from fuselage;
- remove the engine by undoing 4 bolts attaching engine to the upper engine mount.

Engine installation is performed in reverse order following the instructions of the "Installation Manual for Rotax® Engine Type 912 series". After engine installation the cooling and oil system must be refilled and engine control system must be re-adjusted.

WARNING! When adjusting the throttle cables ensure 1 mm clearance between the throttle valve control arm in IDLE position and the idle RPM stop (special feature of A-22LS). When installing the vent tubes of the carburetors do not let them protrude out of the engine cowling as this may cause unstable operation of the engine in flight.

Recommended special tools: none.

Necessary parts/materials: fuel line plugs.

- 6.2 Remove the top and bottom engine cowling. Check the torque of the engine mount attachment bolts and tighten if necessary.

Inspect the engine mount for fatigue cracks and deformation. Pay special attention to the weld seams. If any defects were detected contact the manufacturer for the required technical support.

Recommended special tools: magnifying glass, electric torch, torque wrench.

Necessary parts/materials: none.

- 6.3 Remove the top and bottom engine cowling. Inspect the shock absorbers for deep cracks and disintegration. If such defects are detected the shock absorbers must be replaced.

To replace the shock absorbers do the following:

- remove the safety pin and undo the nut of the rod attaching engine to fuselage;
- remove the bolt while holding the engine;
- remove the shock absorbers of the rod;
- install new shock absorbers;

WARNING! The shock absorbers are asymmetric about their attachment plate. They must be installed with their bigger halves towards each other in order to ensure 3-5 mm (0.1-0.2 in) clearance between their bushings.

- put a support of an appropriate size under the tail wheel (with the engine removed the airplane will tend to lower the tail);
- remove the safety pins and undo 2 nuts of the bolts attaching the upper engine mount to the lower one;
- remove the bolts and carefully lift the engine using a hoist;
- remove the shock absorbers;
- install new shock absorbers;

WARNING! The shock absorbers are asymmetric about the plane of their attachment plate. They must be installed with their bigger side towards each other to ensure the dimension along the bushing axes equal to 51 mm (2 in).

- re-assemble everything in reverse order.

Recommended special tools: magnifying glass, electric torch, hoist, torque wrench.

Necessary parts/materials: none.

- 6.4 Remove the top cowling. Disconnect the rod from the fitting. Inspect the fitting for the fatigue cracks.

Check the spherical bearing for play. Permissible radial play is 0.25 mm (0.1 in), axial – 0.5 mm (0.2 in).

If fatigue cracks or play more than permissible are detected the fitting must be replaced. Contact manufacturer for the required technical support.

Recommended special tools: magnifying glass, electric torch, torque wrench.

Necessary parts/materials: none.

- 6.5 Remove top and bottom cowling. Check if the shutter actuator functions properly and the shutter fits tight at its extreme position, adjust if necessary.

To adjust the shutter actuator, do the following:

- set the shutter to ON;
- loosen the screws fixing the cable sheath in the nylon block on the bottom side of the airbox;
- push the shutter to the extreme position with the cable sheath and tighten the screws.

If the cable sheath travel is insufficient for the adjustment, the shutter must be re-installed. Remove the top half of the airbox for that (see installation of the airbox below).

Check the torque of the airbox screws and tighten them if necessary applying Loctite 222 on the thread.

Check the attachment of the shutter actuator, vent tube and corrugated hose and replace the plastic clamps if necessary.

Check the integrity and reliable attachment of the sealing ring of the intake manifold. Install new ring, if necessary, using any suitable glue.

It may be necessary to remove the airbox when servicing and repairing the engine.

To remove the airbox do the following:

- remove the carburetor vent tubes;
- undo the screws connecting the airbox halves;
- undo and remove the bolt joining the upper rod attaching engine to fuselage;
- remove the top half of the airbox by moving the engine forward;
- set the airbox shutter to ON;
- unfix and remove the shutter;
- remove the carburetor air filters;
- cut the plastic clamps fixing the corrugated hose and airbox vent tube;
- loosen the cable sheath clamp screws and take it out from the airbox;
- remove the bottom half of the airbox.

Airbox installation shall be performed in reverse order. Then while installing the shutter, set the carburetor heating knob to ON and ensure 33 mm (1.3 in) clearance between the lower flange and the shutter. After assembling the airbox the shutter can be adjusted by loosening the cable sheath clamp. When assembling the airbox apply Loctite 222 on the thread of its fixing screws.

Recommended special tools: torque wrench.

Necessary parts/materials: Loctite 222.

- 6.6 Remove the top cowling. Remove the handles from the control levers of throttle, elevator trim tab and horizontal panel. Inspect the cables for wear. In case of significant wear the cables must be replaced. Use 1x19 Ø1.5 mm (0.075 in) cable cut to the length of the old one. Tin the cable ends before its installation.

WARNING! Using the cable with broken wires is not allowed.

After replacement or disconnection of the cables the engine control system must be re-adjusted (see "Installation Manual for Rotax® Engine Type 912 series").

Recommended special tools: soldering iron.

Necessary parts/materials: none.

- 6.7 Remove the top cowling. Inspect the control cables for kinks and damage of their sheath, paying special attention to the areas where it goes through the firewall.

A damaged portion of the cable sheath may be repaired by setting over it a piece of thermoshrinkable tube.

If significant kinks in cable sheath were detected that hamper the cable motion, the sheath must be replaced. After replacement or repair of the cable sheath the engine control system must be re-adjusted. (see Installation Manual for Rotax-912 aircraft engine).

WARNING! When adjusting the throttle cables ensure 1 mm clearance between the throttle valve control arm in IDLE position and the idle RPM stop (special feature of A-22LS).

Recommended special tools: heat gun.

Necessary parts/materials: thermoshrinkable tube.

- 6.8 Check the torque of the bolt serving as the axle of the throttle lever and adjust if necessary. The adjustment must ensure that the lever remains at IDLE when engine is running and the force to move the throttle is not too high.

Recommended special tools: torque wrench.

Necessary parts/materials: none.

- 6.9 Remove the left pilot seat. Check the torque of the throttle lever friction stop, located on the left side behind the seat beam, and adjust it if necessary. The adjustment must ensure the throttle lever is retained in IDLE position with engine running and the force to move the lever is low.

Recommended special tools: torque wrench.

Necessary parts/materials: none.

7 Cooling system

Rotax-912 has cooling system of a combined type. The cylinders are air-cooled and the cylinder heads are liquid-cooled.

The liquid cooling system consists of a water pump, expansion tank, radiator, overflow tank and hoses.

Its servicing consists of systematic inspection of its components, timely replacement of the coolant and system cleaning, as well as replacement of its parts with expired service life (hoses, sealing, etc.).

WARNING! Servicing of the cooling system must be performed in accordance with the latest documentation of BRP-Rotax company on operation and maintenance of Rotax 912 engine.

Cooling system capacity is about 3 l (0.8 US gal). Amount of the coolant in the system must be checked by the coolant level in the expansion and overflow tanks.

WARNING! When the cooling system is filled with coolant, air lock may be formed within the top portion of the radiator. To remove it from the system, loosen the clamp of the upper left inlet of the radiator and let the air out by carefully inserting a flat-end screwdriver between the upper surface of the radiator inlet and inner surface of the hose.

To drain coolant from the system remove the top and bottom cowlings, disconnect the lower hose from the lower right outlet of the radiator and let the coolant out.

INSPECTION CHART

Description	Interval	RCO	Instruction	TM	LC
Radiator clamps, 2 pcs.	100 h	OC	7.1	L	LRI
Overflow tank	100 h	OC	7.2	L	LRI
Hoses	100 h	OC	7.3	L	LRM
Coolant inlet elbow hose clamp	First – 25 h; next – 100 h	OC	7.4	L	LRM

Instructions:

- 7.1 Check for integrity the clamps attaching the radiator to the engine mount. If any clamp is damaged it must be replaced. Check the clamp torque and tighten if necessary.

Recommended special tools: torque wrench.

Necessary parts/materials: none.

- 7.2 Remove the top and bottom cowlings. Inspect the tank for leaks of coolant, cracks in its housing and cap. If any damage is detected the tank must be replaced.

Check the level of coolant in the tank and refill if necessary. Check the required level using the marks on the tank.

Make sure the tank is attached reliably to the firewall. Replace the plastic cable ties if necessary.

Recommended special tools: none.

Necessary parts/materials: coolant.

- 7.3 Remove the top and bottom cowlings. Inspect the hoses for leaks and any damage (chaffing, cracks). Pay special attention to the areas of hose attachment and passing close to structural elements of engine and its mount.

Damaged hoses must be replaced. Drain coolant before replacing the hoses and re-fill the cooling system with coolant as described in the beginning of this section.

Check torque of the clamps on joints and tighten if necessary. Pay special attention to tightness of the joints before beginning operation in cold season.

Check the torque of the clamps (except for the screw clamp attaching the water hose to the inlet fitting of the water pump) which must be 2-3 Nm (1.5 – 2.2 lb·ft) and tighten if necessary. Pay special attention to tightness of the joints before beginning operation in cold season.

Recommended special tools: torque wrench.

Necessary parts/materials: none.

- 7.4 Remove the top and (if needed) bottom cowlings. Inspect the hose attachment to water outlet elbow. Check the torque of the screw clamp attaching the water hose to the inlet fitting of the water pump, that must be equal to 4 N·m (3 lb·ft).

Recommended special tools: screwdriver.

Necessary parts/materials: none.

8 Lubrication system

The engine lubrication system is of closed type with dry crankcase and forced circulation of oil. The lubrication system consists of oil pump, oil tank, radiator, filter and connecting lines.

Servicing of the lubrication system consists of systematic inspection of its components, timely replacement of oil and oil filter, as well as replacement of the parts with expired service life (connecting lines, sealing, etc.).

WARNING! Servicing of the lubrication system must be performed in accordance with the latest documentation of BRP-Rotax company on operation and maintenance of Rotax 912 engine.

The lubrication system must be filled with high quality oil for gasoline four-stroke engines, recommended by BRP-Rotax company. Lubrication system capacity is 3 l (0.8 US gal).

INSPECTION CHART

Description	Interval	RCO	Instruction	TM	LC
Oil tank	100 h	OC	8.1	L	LRI
Connecting lines	100 h	1000 h/OC	8.2	H	TSP

Instructions:

- 8.1 Remove top and bottom cowling. Inspect the oil tank bottom plug for oil leaks. If leaks are detected, tighten and lock the plug with safety wire.

Make sure that the vent line has no kinks, is intact and secured reliably. If the line is damaged it must be replaced.

Recommended special tools: none.

Necessary parts/materials: safety wire.

- 8.2 Remove top and bottom cowling. Inspect the connecting lines for leaks of oil and damage (chaffing, cracks). Pay special attention to the areas of connecting lines binding and passing close to engine, its mount and cowling. If damaged connecting lines are detected, they must be replaced.

WARNING! When disconnecting the lines some oil may be spilled out.

Check the torque of the clamps on joints and tighten if necessary. Pay special attention to tightness of the joints before beginning operation in cold season.

Recommended special tools: torque wrench.

Necessary parts/materials: none.

9 Fuel system

The fuel system (see **Fig. 2**) includes:

- two wing fuel tanks (1,2) with filler inlets (3,4);
- fuel lines d8 (5,6,9,10,12,14,16);
- two fuel valves (7,8);
- sediment collector (13);
- fuel drain line d12 (26);
- drain valve (27);
- fuel filter (15);
- T-connector (11) and bulkhead fitting (17);
- genuine ROTAX hoses (18,20,22,23);
- engine fuel pump (19);
- two carburetors (21,24);
- return line d6 (25);
- fuel pressure sensor (28) – optionally;
- fuel flow transducer (29) – optionally.

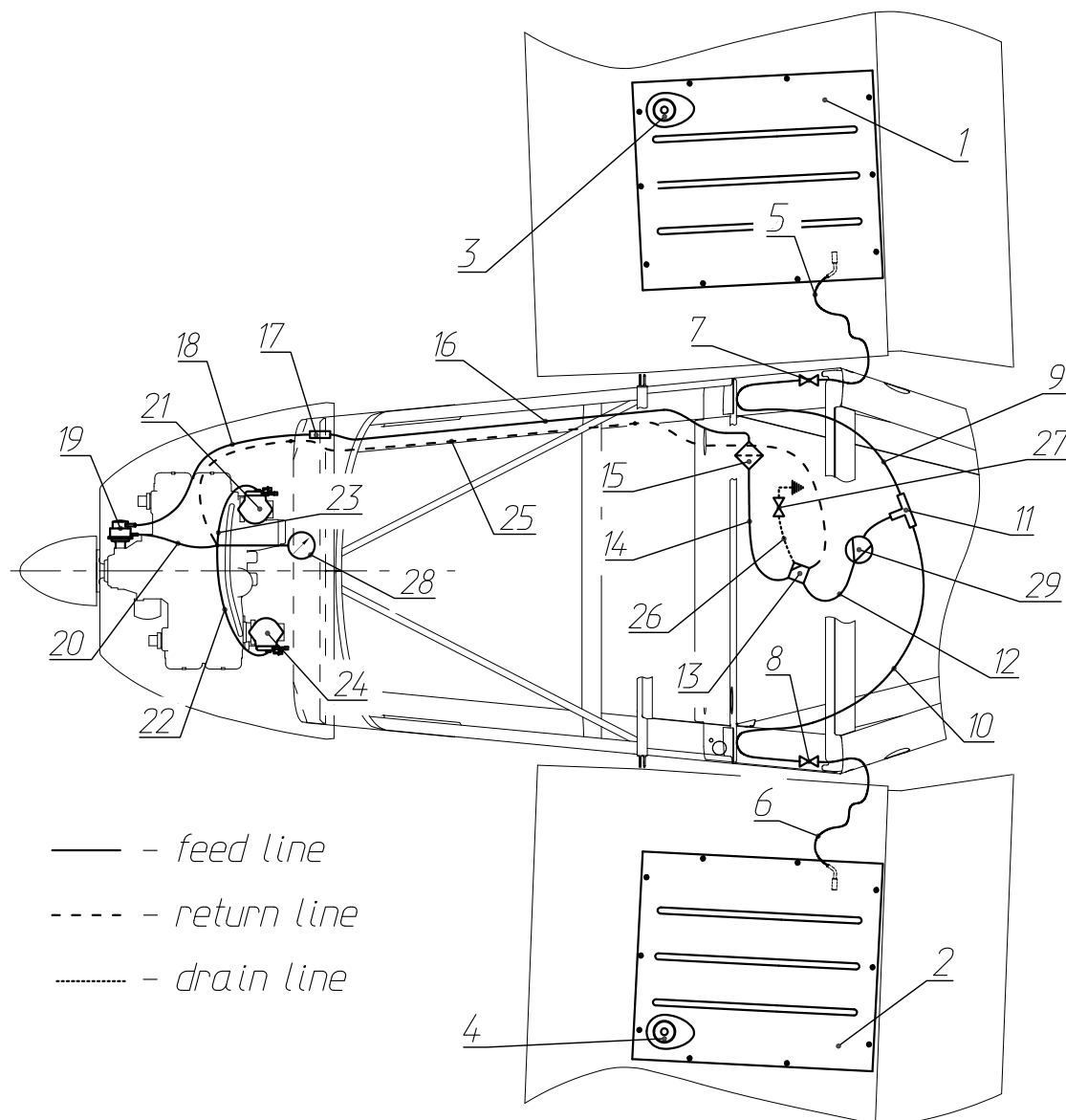


Fig. 2 Fuel system schematic

Servicing of the fuel system consists of systematic inspection of its components, timely replacement of the fuel filter, as well as replacement of the parts with expired service life (connecting lines, sealing, etc.).

WARNING! Be careful when working with the fuel system, as the remains of fuel are highly fire hazardous and when spilled on glass may cause its dimness and cracking.

INSPECTION CHART

Description	Interval	RCO	Instruction	TM	LC
Fuel tank, right	500 h	OC	9.1	L	LRM
Fuel tank, left	500 h	OC			
Fuel valves, 2 pcs.	100 h	OC	9.2	L	LRM
Drain fuel valve	100 h	OC			
Fuel filter	100 h	200 h/OC	-	L	LRM
Connecting lines	100 h	1000 h/OC	9.3	L	LRM

Instructions:

9.1 Drain fuel from the tanks.

Remove the tank and inspect it for leaks of fuel. In case of suspected damage of the tank a more thorough check is necessary. Contact manufacturer for the required technical support. Inspect the inner surface of the tank through the fuel inlet. If the tank bottom is contaminated rinse it with gasoline.

If no defects were detected, re-install the tank, applying Loctite 222 on the tread of the attaching screws.

Recommended special tools: magnifying glass, electric torch.

Necessary parts/materials: Loctite 222.

9.2 Remove the rear plastic panel of the cockpit (if installed). Inspect the fuel valve for leaks of fuel. If leaks of fuel are detected in the areas of valve connection to its fittings, the valve must be replaced.

Recommended special tools: none.

Necessary parts/materials: none.

9.3 Remove the top cowling, upper and lower rear plastic panels of the cockpit (if installed) and the right pilot seat. Inspect the fuel lines for leaks of fuel and damage (chaffing, cracks). Pay special attention to the areas of fuel line binding and passing through the fuselage structure. If damaged fuel lines are found, they must be replaced. For replacement of fuel lines use reinforced rubber hoses resistant to fuels and oils with inside diameter Ø8 mm and Ø12 mm (drain).

Check torque of the clamps on joints and tighten if necessary. Pay special attention to tightness of the joints before beginning operation in cold season.

Make sure the fuel lines are fixed to fuselage structure reliably and replace the plastic cable ties if necessary.

Recommended special tools: none.

Necessary parts/materials: none.

10 Exhaust system

The exhaust system of A-22LS airplane is arranged and installed in accordance with the recommendations of "Installation manual for Rotax-912 aircraft engine".

The system comprises of the exhaust pipes and muffler. Depending on configuration the exhaust pipes may be fitted with exhaust gas temperature (EGT) sensors.

Each exhaust pipe is fixed to the engine with two studs and secured with M8 self-locking nuts. The exhaust muffler is attached to the exhaust pipes via spherical joints and secured with springs.

WARNING! Servicing of the exhaust system must be performed in accordance with the current documentation of BRP-Rotax company on operation and maintenance of Rotax-912 engine.

INSPECTION CHART

Description	Inspection interval	RCO	Instruction	TM	LC
Muffler	100 h	OC	10.1	L	OWN
Exhaust pipe of cylinder 1	100 h	OC			
Exhaust pipe of cylinder 2	100 h	OC			
Exhaust pipe of cylinder 3	100 h	OC			
Exhaust pipe of cylinder 4	100 h	OC			
Springs, 8 pcs.	100 h	OC	10.2	L	OWN

Instructions:

10.1 Remove the top and bottom cowling. Inspect the exhaust system for fatigue cracks. Pay special attention to the weld seams and the areas around them. Use electric torch any other suitable source of light for the inspection.

In case of suspicion for fatigue crack the exhaust system must be dismantled for more thorough flaw detection. In case of a confirmed crack, contact the aircraft manufacturer for the required technical support.

To dismantle the exhaust system, do the following:

- remove the springs retaining the muffler;
- undo the nuts securing the exhaust pipes;
- carefully take out the exhaust pipes and the EGT sensors (if the latter are fitted);
- remove the old heat-resistant grease from the spherical joint of exhaust pipes and muffler.

To install the exhaust system, do the following:

- put in place the EGT sensors (if fitted);
- apply a heat-resistant grease (e.g. LOCTITE ANTISEIZE) on the surfaces of the spherical joint of exhaust pipes and muffler;
- put in place the exhaust pipes and nuts attaching them;
- attach the exhaust muffler and tighten the exhaust pipe nuts.

WARNING! When installing the exhaust pipes follow the requirements of "Installation manual for Rotax-912 aircraft engine".

Recommended special tools: magnifying glass, electric torch.

Necessary parts/materials: heat-resistant grease.

10.2 Remove the top and bottom cowling. Inspect the springs for integrity. Broken or missing springs must be replaced.

Recommended special tools: magnifying glass, electric torch.

Necessary parts/materials: none.

11 Propeller

A-22LS airplane may be fitted with any propeller, approved by Aeroprakt Ltd. Propeller and its spinner servicing comprises of their systematic inspection and timely repair (or replacement) of the parts with expired service life in accordance with the requirements of their manufacturer.

INSPECTION CHART*

Description	Interval	RCO	Instruction	TM	LC
Propeller hub	200 h	**/OC	11.1	L	LRM
Bolts, 6 pcs.	200 h	**/OC	1.8	L	OWN
Spinner	200 h	OC	11.2	L	LRI

* for propeller manufactured by KievProp company (e-mail: kievprop@i.ua, web: <http://www.kievprop.com>) and spinner produced by Aeroprakt

** in accordance with the requirements of KievProp company.

Notes:

11.1 Remove the propeller spinner. Inspect the propeller hub for fatigue cracks. If any cracks are detected contact propeller manufacturer (KievProp, Ukraine, Kyiv, 04128, Tupolev str. 19, tel./fax: +38 (044) 443-79-91, e-mail: kievprop@i.ua) for necessary technical support.

Check the pitch angles of the blades and re-adjust the propeller if necessary.

If no defects are detected install the spinner in place applying Loctite 222 on the thread of the attachment screws.

Recommended special tools: propeller blade angle gauge, torque wrench.

Necessary parts/materials: Loctite 222.

11.2 Check the torque of the screws attaching the spinner. Tighten if necessary using Loctite 222.

Recommended special tools: none.

12 Airplane control system

The airplane control system consists of control systems of ailerons, elevator, elevator trim tab, and aileron drooping mechanism. Control systems of ailerons and elevator may be with either yokes or central stick. The control system of elevator trim tab may be either mechanical or electrical.

Control system linkage for ailerons and elevator is rigid, and for the elevator and its trim tab it is made of cables.

Servicing of the airplane control system comprises of its systematic inspection, lubrication, detection of worn components, repair and timely replacement of the parts with the expired service life.

The control system must operate smoothly without jamming and significant play (see below). The clearances between the movable parts of the control system and fixed structural elements must be at least 5 mm (0.2 in).

Main components of the system to be checked are:

- fabric covering of the control surfaces;
- spherical bearings;
- sliding bearing;
- fairleads;
- cables;
- pulleys;
- fasteners.

The fabric covering must be inspected for damage and delamination from the framework of the control surfaces. Minor ruptures (less than 50 mm or 2 in) may be repaired by covering them with ORACAL permanent sticking film. In case of significant damage and delamination of the fabric covering from the framework contact aircraft manufacturer for the required technical support.

The spherical bearings are installed in hinge brackets of the control surfaces, in control rods and control system supports. The used hinges do not require any servicing. Their wear must be checked by their radial and axial play. Maximum radial play is 0.25 mm (0.01 in) maximum axial play – 0.5 mm (0.02 in). If the play is exceeding the above specified values contact the manufacturer for the required technical support.

Sliding bearings are used in hinge brackets of the control surfaces and in control system supports. They consist of a sleeve and an axle. The sleeves used in this airplane are made either of bronze or steel. In the hinge brackets the sleeve is press-fitted into the bracket, fixed to the airframe structure, and the axle is component of the movable control surface. In the Cardan joints and in the control system supports the sleeves are installed both in fixed and movable parts, and bolts (or pins) are used as axles. Sliding bearing wear must be checked by the radial play. The maximum radial play is 0.5 mm (0.02 in). If the play exceeds the specified value contact the manufacturer for the required technical support.

Sliding bearings require periodic lubrication. They may be lubricated by any grease for bearings every 200 hours or on condition.

The fairleads are used in the control systems of rudder and elevator trim tab and serve to retain the cables. The fairleads are made of composite epoxy material (CEM). The fairleads wear must be checked by the depth of the slot created due to cable friction against them. The slot depth must not exceed double diameter of the cable. If the wear is exceeding the specified value contact the manufacturer for the required technical support.

The cables are used in the control systems of the rudder and elevator trim tab. The cables must be inspected for broken wires. Special attention must be paid to the areas where cables pass through the fairleads, pulleys and to the cable terminations. If broken cable wires are found then the cable must be replaced. Contact the manufacturer for the required technical support.

Pulleys are used in the control system of rudder. The pulley supports do not require any servicing. The pulleys rotate on a sliding bearing which require periodic lubrication. The sliding bearings must be lubricated with any bearing grease every 200 hours or on condition. After re-installation of a pulley after its servicing the joining bolt shall be tightened with a torque corresponding to its size as the inner sleeve of the sliding bearing must be static.

The pulleys must rotate freely without jamming or play. If jamming or play appears the pulleys must be replaced.

WARNING! When servicing the control system avoid over-tightening the bolts serving as sliding bearing axles. The tightening must eliminate the axial play however it must allow unrestricted motion of the movable part of the joint. All bolts, nuts (except for self-locking ones), pins, turnbuckles must be locked reliably.

Adjustment of the aileron control system is achieved by changing the length of the vertical and diagonal control rods.

Adjustment of the elevator control system is achieved by changing the length of the aft control rod.

WARNING! To increase the length of a control rod, loosen the locking nut and screw the rod end OUT (all threads are right-hand!), to reduce the length – screw it IN. After adjusting the rod length tighten the locking nut applying the Loctite 222 on the thread.

Adjustment of the rudder control system is achieved using the turnbuckles of the rudder control cables.

Adjustment of the elevator trim tab control system is achieved by fixing the control cable of the trim tab with a screw in the control arm of the tab at a proper setting.

WARNING! Do not cut the excessive length of the cable beyond the control arm of the tab. This portion is required for passing the cable through its sheath in the elevator when re-attaching the elevator to the stabilizer. After adjusting the cable length coil its free end carefully and secure it to the trim tab control arm with a plastic cable tie but in a manner that does not hamper the tab deflection while it is being controlled.

Adjustment of the control system must ensure the following deflection angles of the control surfaces:

- Flaperon deflection angles (as ailerons): up – $19 \pm 1^\circ$, down – $13 \pm 1^\circ$.
- Flaperon deflection angles (as flaps): 1st setting – $10 \pm 1^\circ$, 2nd setting – $19 \pm 1^\circ$
- Elevator deflection angles: up – $25 \pm 1^\circ$, down – $15 \pm 1^\circ$.
- Elevator trim tab deflection angles: up – $21 \pm 1^\circ$, down – $22 \pm 1^\circ$.
- Rudder deflection angles: neutral – $2 \pm 0.5^\circ$, right/left from neutral – $25 \pm 1^\circ$.

The deflection angles of the control surfaces must be checked every 500 hours of aircraft operation.

INSPECTION CHART

Description	Interval	RCO	Instruction	TM	LC
Flaperon control system					
Flaperon, right	100 h	OC	12.1	L	LRI
Flaperon, left	100 h	OC			
Cardan rings, 2 pcs.	100 h	OC	12.2	L	LRI
Flaperon shaft, right	100 h	OC			
Flaperon shaft, left	100 h	OC			
Rods, vertical, 2 pcs.	100 h	OC	12.3	L	LRI
Roll shaft*	100 h	OC			
Roll shaft	100 h	OC			
Rod, diagonal	100 h	OC	12.2	L	LRI
Rod, horizontal	100 h	OC			
Yoke, right	100 h	OC		L	LRI
Yoke, left	100 h	OC			
Yoke end, right	100 h	OC	12.9	L	LRI
Yoke end, left	100 h	OC			
Control yoke column	100 h	OC	12.3	L	LRI
Control stick column*	100 h	OC			
Flaperon drooping mechanism	100 h	OC	12.4	L	LRI
Elevator control system					
Elevator	100 h	OC	12.5	L	LRI
Rod, aft	100 h	OC	12.3	L	LRI
Rod, aft, in the tail boom	500 h	OC	12.13		
Rod, middle	100 h	OC	12.3		
Rod, front	100 h	OC			
Bellcrank unit, aft	100 h	OC	12.2	L	LRI
Bellcrank unit, front	100 h	OC			
Rudder control system					
Rudder	100 h	OC	12.6	L	LRI
Rudder cable, right	200 h	OC	12.7	L	LRI
Rudder cable, left	200 h	OC	12.7		
Pedals	100 h	OC	12.8	L	LRI
Rods, 2 pcs.	100 h	OC	12.9	L	LRI
Pulleys, front, 2 pcs.	500 h	OC	-	L	LRI
Pulley units, aft, 2 pcs.	500 h	OC	-		
Fairleads, front	500 h	OC	-		
Fairleads, aft	500 h	OC	-		
Elevator trim tab control system					
Trim tab	200 h	OC	12.10	L	LRM
Cable	200 h	OC	12.11	L	LRM

Description	Interval	RCO	Instruction	TM	LC
Fairleads, 2 pcs.	200 h	OC	-	L	LRM
Cable sheath, front	200 h	OC	12.12	L	LRM
Cable sheath, aft	200 h	OC	12.12		

* – for the airplane version with central control stick

Instructions:

- 12.1 Inspect aileron for fatigue cracks, deformation, loose rivets, as described in 3.1 (paragraphs 2 and 3). Pay special attention to the areas near the aileron hinge brackets. Check the play in the aileron hinge brackets and Cardan joint. Grease the sliding bearings if necessary. Check tightness and locking of the nut of the aileron root hinge bracket.

Inspect the fabric covering as described in the beginning of this section.

Recommended special tools: magnifying glass, electric torch.

Necessary parts/materials: none.

- 12.2 Check tightness and locking of the nuts and play in hinged joints. Torque for tightening the nuts on bolts joining the Cardan rings of the aileron control system – 2 Nm. Grease the sliding bearings if necessary.

Recommended special tools: none.

Necessary parts/materials: none.

- 12.3 Check tightness and locking of the nuts and play in hinged joints.

Inspect the riveted joints for loose rivets as described in 3.1 (paragraphs 2 and 3). If loose rivets are detected contact the manufacturer for the required technical support.

Recommended special tools: magnifying glass, electric torch.

Necessary parts/materials: none.

- 12.4 Remove the housing of the aileron drooping mechanism after extending the flaps to 20°. Check tightness and locking of the nuts and play in hinged joints. Grease the sliding bearings if necessary.

Recommended special tools: none.

Necessary parts/materials: none.

- 12.5 Inspect the elevator for fatigue cracks, deformation, loose rivets, as described in 3.1 (paragraphs 2 and 3). Pay special attention to the areas near the elevator control arm and hinge brackets. Check play in the elevator hinges. Grease the sliding bearings if necessary. Check tightness and locking of the nuts on the center hinge and control rod attachment.

Inspect the fabric covering as described in the beginning of this section.

Recommended special tools: magnifying glass, electric torch.

Necessary parts/materials: ORACAL permanent sticking film, Loctite 222.

- 12.6 Inspect the rudder for fatigue cracks, deformation, loose rivets, as described in 3.1 (paragraphs 2 and 3). Pay special attention to the areas near the rudder control arms and hinge brackets.

Check play in the rudder hinges. Grease the sliding bearings if necessary.

Check tightness and locking of the lower hinge nut and locking of the attachment pins of the control cables.

Inspect the fabric covering as described in the beginning of this section.

Recommended special tools: magnifying glass, electric torch.

Necessary parts/materials: ORACAL permanent sticking film, Loctite 222.

- 12.7 Inspect the cable for wear in the areas where it passes through fairleads and pulleys. If any cable wire is broken the cable must be replaced. Contact the manufacturer for the required technical support.

Check the cable tension which must be equal to 20 ± 1.5 kg or 45 ± 3 lb. If necessary adjust the cable tension using the turnbuckles. Lock the turnbuckles with safety wire after that.

Recommended special tools: none.

Necessary parts/materials: none.

- 12.8 Inspect the pedals for fatigue cracks and deformation. Pay special attention to the welded seams. Use electric torch or any other suitable source of light. In case of detecting cracks contact the manufacturer for the required technical support.

Check tightness and locking of the nut of the front wheel control rods.

Check locking of the pins and pedal supports.

Check play in the supports and hinged joints. Grease sliding bearings if necessary.

Recommended special tools: none.

Necessary parts/materials: none.

- 12.9 Check tightness and locking of the nuts and play in hinged joints. Grease the sliding bearings if necessary.

Recommended special tools: none.

Necessary parts/materials: none.

- 12.10 Check the trim tab fasteners for corrosion. Replace corroded fasteners. Grease sliding bearings if necessary.

Recommended special tools: none.

Necessary parts/materials: none.

- 12.11 In airplane version with mechanical control system of the elevator trim tab remove the handles from the control levers of throttle, trim tab, brakes and choke, then the horizontal panel. Inspect the cable for wear in the areas where it passes through fairleads, cable sheath and near its attachment to the control lever and trim tab control arm.

In airplane version with electromechanical control system of the elevator trim tab inspect the cable in the areas where it passes through fairleads, sheath and near its attachment to the control arm of the trim tab and to the servomotor pushrod.

If any cable wire is broken the cable must be replaced. Contact the manufacturer for the required technical support.

After inspection assemble everything in reverse order.

Recommended special tools: none.

Necessary parts/materials: none.

- 12.12 Inspect the cable sheath for kinks and damage. A damaged portion of the cable sheath may be repaired by setting over it a piece of thermoshrinkable tube.

If significant kinks in cable sheath were detected that hamper the cable motion, the sheath must be replaced. After replacement or repair of the cable sheath the trim tab control system must be re-adjusted.

Recommended special tools: heat gun.

Necessary parts/materials: thermoshrinkable tube.

- 12.13 Disconnect the front and rear ends of the aft rod. Lift the elevator up and take out the rod from fuselage. Inspect the area of rod contact with the supporting rollers. If the wear spot is wider than 8 mm replace the rod.

Recommended special tools: none.

Necessary parts/materials: none.

13 Electrical system

The major components of the electrical system of A-22LS airplane are: battery (12 V, 18 Ah), starter relay, rectifier-regulator, condenser (22000 μ F, 25 V), "NO CHARGE" warning light (12 V, 2 W), master switch, ignition and consumer switches, fuse block, electric harness, fuel level senders and indicators and analog engine instruments. Optionally the airplane may be also equipped with ground switch, LED landing light and miscellaneous consumers.

The standard battery is located under the left pilot seat. The optional light lithium-ion battery may be installed on the firewall in the engine compartment. The starter relay, rectifier-regulator and condenser are located on the left side of the firewall. The switches, fuses, and fuel level indicators – on the lower part of the instrument panel. The warning light – on the left side of the instrument panel. Fuel level sensors are installed in the fuel tanks. The landing light – on the left bottom side of the engine cowling.

The electrical system arrangement complies with the requirements of the "Installation manual of Rotax-912 aircraft engine". Electric system wiring depends on the electric equipment/instruments installed in the aircraft and therefore have main and additional (optional) portions. The respective wiring diagrams are shown on **Fig. 3** to **Fig. 8**.

WARNING! Checking the electrical system components belonging to the engine electrical system (rectifier-regulator, condenser, engine instruments) shall be performed in accordance with the current documentation of Rotax company on operation and maintenance of Rotax-912 engine.

Depending to airplane configuration, the electrical system may include miscellaneous consumers (radio, transponder, engine instruments, navigation lights, etc.). Servicing those consumers shall be performed in accordance with the current documentation on their operation and maintenance of their respective manufacturers.

The electrical system of the airplane requires minimum servicing. The main problems that may arise in the electrical system is corrosion of contacts and chaffing of wires.

To prevent oxidation of the connectors and terminals they must be covered with some Lithium-based grease.

To minimize the probability of chaffing and prevent breaking (or short circuit) of wiring the reliable fixation (binding) of harnesses must be ensured. Special attention must be paid to the areas where wiring is located close to the movable parts of airplane. To fix the wiring use plastic cable ties.

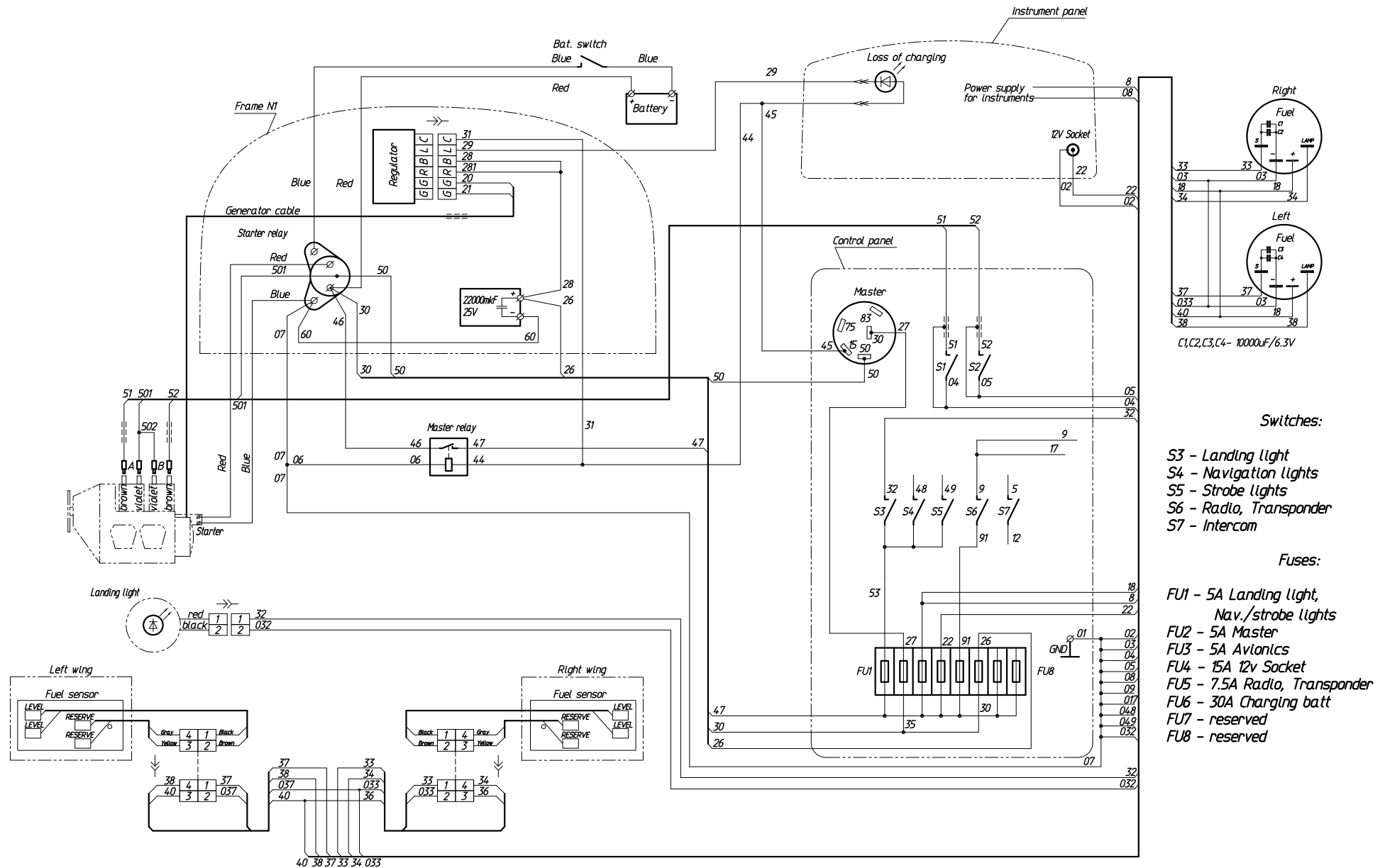


Fig. 3 Wiring diagram of A-22LS electric system (main)

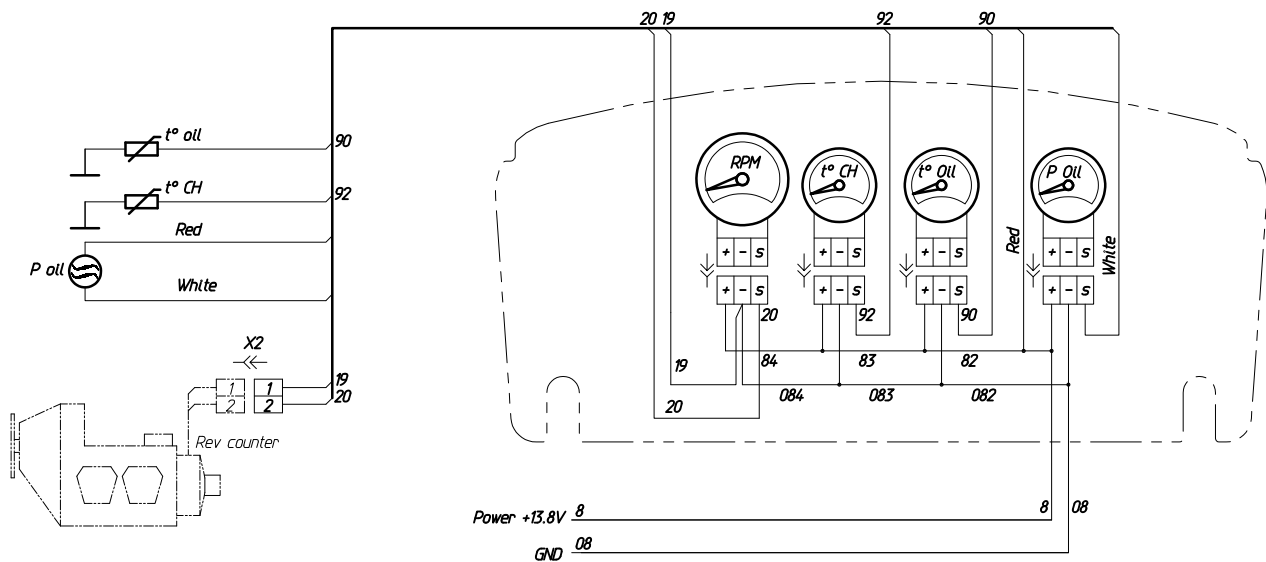


Fig. 4. Wiring diagram for installation of the analog engine instruments

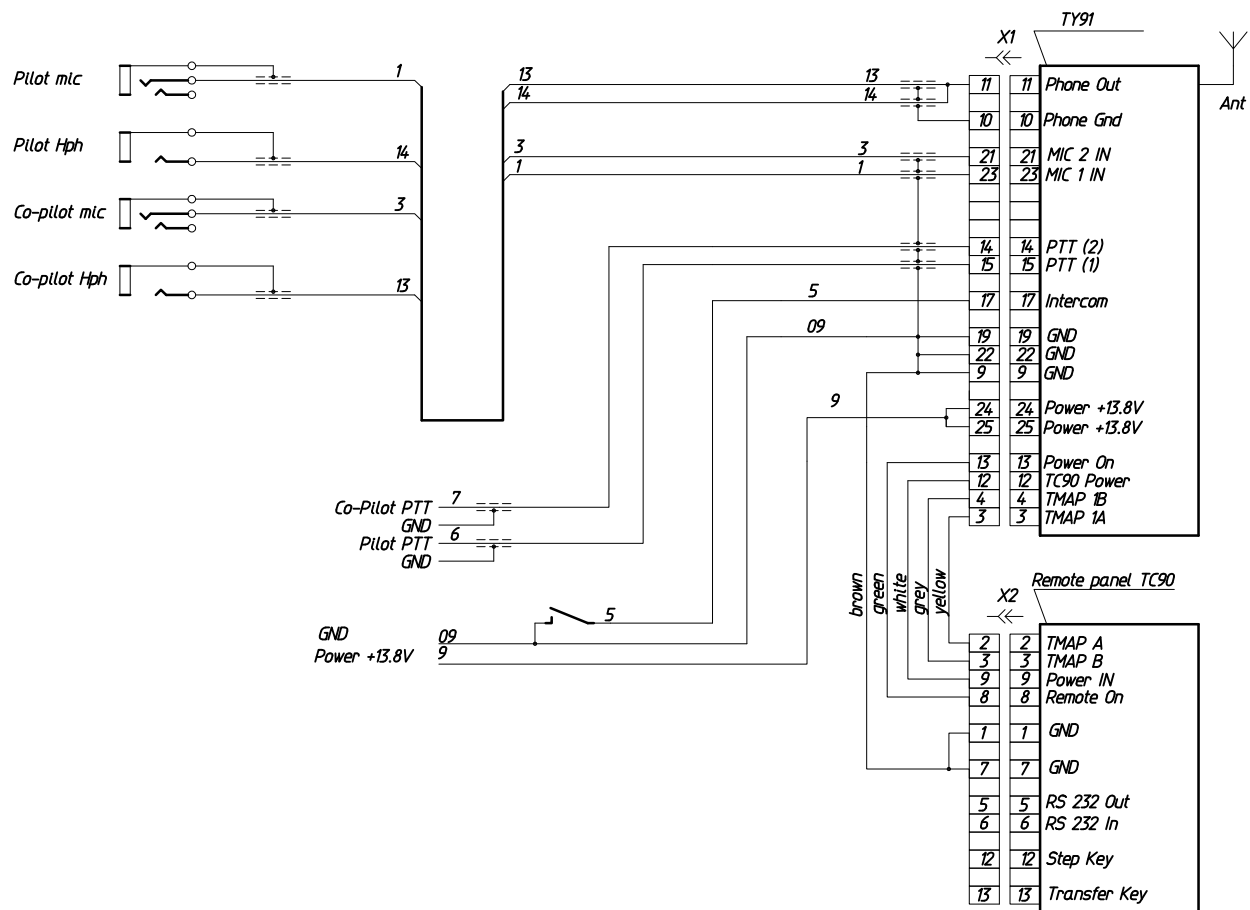


Fig. 5. Wiring diagram for installation of the TRIG TY91 radio

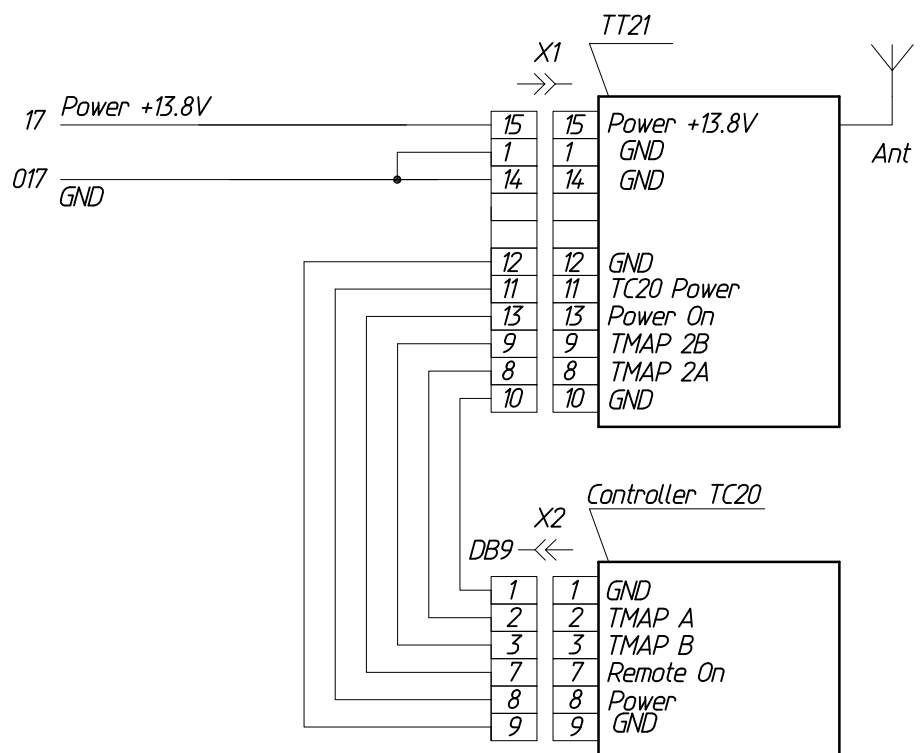


Fig. 6. Wiring diagram for installation of the TRIG TT21 transponder

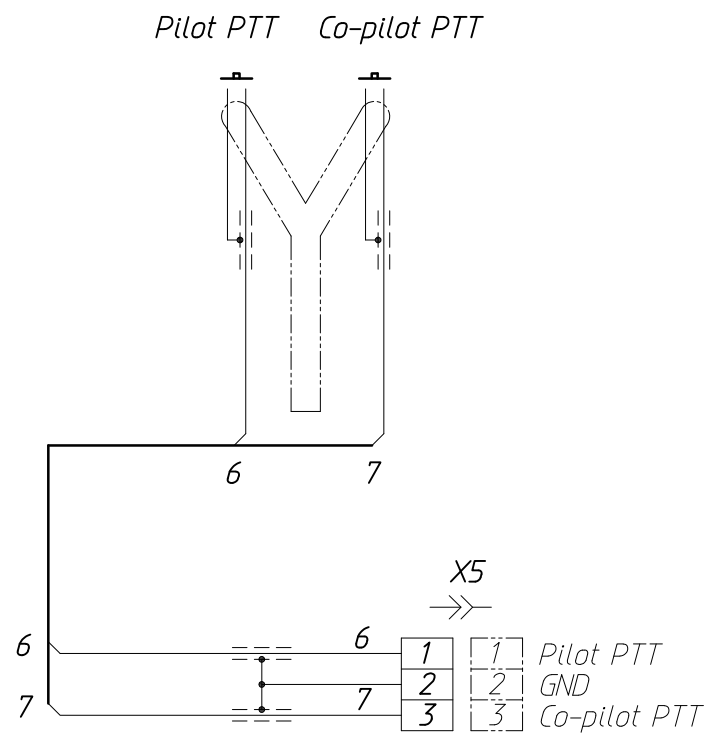


Fig. 7. Wiring diagram for installation of PTT control buttons

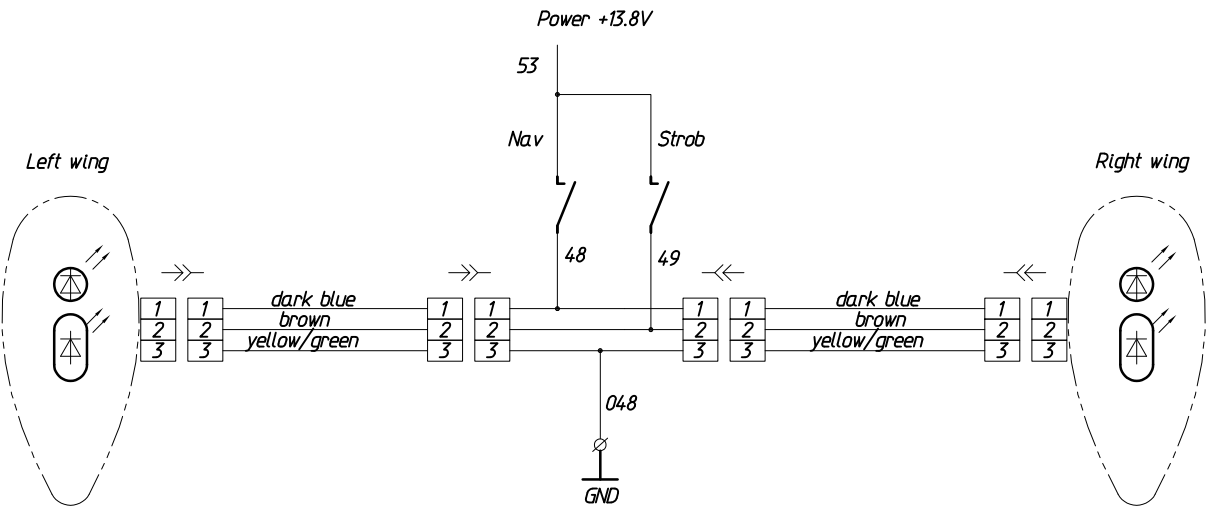


Fig. 8. Wiring diagram for installation of the navigation and strobe lights

INSPECTION CHART

Description	Interval	RCO	Instruction	TM	LC
Battery	100 h	OC	13.1	L	LRM
Starter relay	100 h	OC	13.2	L	LRM
Power cables	100 h	OC	13.3	L	LRM
Rectifier-regulator	100 h	OC	13.4	L	LRM
Condenser	100 h	OC			
"NO CHARGE" warning light	100 h	OC	-	L	OWN
Master switch	100 h	OC	-	L	OWN
Ignition switches, 2 pcs.	100 h	OC	-	L	OWN
Consumer switches	100 h	OC	-	L	OWN
Fuse block	100 h	OC	13.5	L	LRM
Fuses	100 h	OC			
Fuel level sensors, 2 pcs.	200 h	OC	13.6	L	LRM
Fuel level indicators, 2 pcs.	200 h	OC			
LED landing light	100 h	OC	13.7	L	LRM
Engine instruments	100 h	OC	13.8	L	LRM
Main harness	100 h	OC	13.9	L	LRM
Harness for engine instruments	100 h	OC	13.10	L	LRM

Instructions:

- 13.1 Replace the battery when it is not charging or does not hold charge. Keep the battery terminals clean; do not allow corrosion to appear on its surfaces.

Recommended special tools: none.

Necessary parts/materials: none.

- 13.2 Inspect terminals and connector of the starter relay for corrosion and clean them if necessary.

WARNING! To prevent starter from inadvertent engagement or short circuit switch OFF the ground switch (if installed) or disconnect one of the power cables from the battery.

Make sure the relay and cables connected to it are attached reliably.

Recommended special tools: none.

Necessary parts/materials: none.

- 13.3 Inspect the terminals of the power cables connecting the battery to the starter and airplane ground for corrosion and damage at cable terminations. If necessary clean the terminals from corrosion. Bad contact will cause cable overheating and difficult engine start.

If the cables are damaged, contact manufacturer for the required technical support.

Recommended special tools: none.

Necessary parts/materials: none.

- 13.4 Inspect terminals and connectors for corrosion and clean if necessary.

Recommended special tools: none.

Necessary parts/materials: none.

- 13.5 Remove the fuses one by one and inspect their sockets. If corrosion is detected the fuses and sockets must be cleaned. After servicing put in place the fuses and fuse block cover.

Recommended special tools: none.

Necessary parts/materials: none.

- 13.6 Verify correctness of the fuel level indicators' readings. For that do the following:

- close the fuel valve of one tank and open of another;
- full drain fuel through the drain valve;
- close the drain valve and the fuel valve;
- fill the tank with 45 l (11.9 US gal) of fuel;
- open the valve of the fuel tank;
- switch ON the master switch;
- drain fuel through the drain valve and compare the fuel level indicator readings against the fuel remaining in the tank:
 - «F» – 42 l (11.1 US gal);
 - «1/2» – 21 l (5.6 US gal);
 - «E» – 4.5 l (1.2 US gal);
 - “reserve fuel remains” light ignites – 4.5 l (1.2 US gal).

The acceptable deviation of the fuel value is ± 3 l (0.8 US gal). If higher deviation, contact the manufacturer for the required technical support.

WARNING! Be careful while working with the fuel system, the fuel is highly fire-hazardous.

- switch OFF the master switch;
 - perform the check of the other fuel level sensor and indicator;
- If the “reserve fuel remains” light does not ignite it must be replaced. If after replacement the light still does not ignite, contact the manufacturer for the required technical support.

Recommended special tools: none.

Necessary parts/materials: none.

- 13.7 Remove top and bottom cowling. Check torque of the nut attaching the landing light and tighten it if necessary.

Check LED landing light functioning and replace the lamp if necessary.

Recommended special tools: none.

Necessary parts/materials: none.

- 13.8 Inspect the terminals and connectors of the sensors for corrosion and clean if necessary.

Recommended special tools: none.

Necessary parts/materials: none.

- 13.9 Remove top cowling. Inspect the electrical harness for damage (chaffing, broken wires). Restore damaged insulation by setting a piece of thermoshrinkable tube over it. Connect broken wires by soldering with following insulation of the soldered areas with thermoshrinkable tube.

Special attention must be paid to the areas where harness comes through the firewall and near the airbox.

After every 1000 hours of flight time the harness must be freed from its fixation inside the fuselage (cut the plastic cable tie fixing the harness and preventing the harness extraction and inspection) and moved carefully to 10-15 mm (0.4-0.6 in) away from its place for inspection. The abraded insulation of wires detected during the inspection must be restored by covering it with insulating tape or thermoshrinkable tubing. After that put the harness in its place and fix with plastic cable ties.

Recommended special tools: heat gun, soldering iron.

Necessary parts/materials: thermoshrinkable tube, soldering alloy, cable ties.

- 13.10 Remove the top cowling. Inspect the electrical harness for damage (chaffing, broken wires). Restore damaged insulation by setting a piece of thermoshrinkable tube over it. Connect broken wires by soldering with following insulation of the soldered areas with thermoshrinkable tube.

Inspect the terminals and connectors of the sensors for corrosion and clean if necessary.

Recommended special tools: heat gun, soldering iron.

Necessary parts/materials: thermoshrinkable tube, soldering alloy, cable ties.

14 Cockpit heating system

Cockpit heating system of A-22LS airplane consists of warm air scoop (located behind the engine cooling system radiator), warm air duct (flexible corrugated hose), warm air shutter housing (attached to the firewall inside the engine compartment of the left side) and warm air shutter actuator. The control handle of the actuator (No. 4 on Fig. 9) is located on the left side of the instrument panel. The shutter actuator comprises a thick wire and a flexible conduit. The warm air duct connects the warm air scoop to the warm air shutter housing. The duct is attached to the scoop and housing with screw clamps. In flight some portion of the air cooling the engine radiator is forced into the warm air scoop and then is going via the duct to the shutter housing and (when the cockpit heating handle is in the "ON" position) through the hole in the firewall into the cockpit. When the cockpit heating handle is set to "OFF" position, the shutter closes the hole in the firewall and the warm air is not getting into the cockpit but is released into the engine compartment via an opening in the shutter housing.

INSPECTION CHART

Description	Interval	RCO	Instruction	TM	LC
Warm air scoop	100 h	OC	14.1	L	OWN
Warm air shutter housing	100 h	OC	14.2	L	A&P
Warm air shutter	100 h	OC			
Warm air duct	100 h	OC	14.3	L	LRI
Warm air shutter actuator	100 h	OC	14.4	L	LRM

Instructions:

- 14.1 Remove the top and bottom engine cowling. Inspect the warm air scoop for damage. If it is damaged, remove it from its place, clean the damaged area with sand paper and apply a patch of fiberglass cloth impregnated with epoxy adhesive.

Recommended special tools: sand paper, rubber gloves.

Necessary parts/materials: fiberglass cloth, epoxy adhesive.

- 14.2 Remove the top engine cowling. Inspect the warm air shutter housing and shutter for damage. Check if the shutter closes and opens fully and moves freely and without jamming. If the shutter or housing is damaged so that the shutter is not functioning properly, replace the shutter or housing.

Recommended special tools: electric drill, drills, reamers, pop-rivet tool.

Necessary parts/materials: pop-rivets.

- 14.3 Remove the top and bottom engine cowling. Inspect the warm air duct for damage and secure attachment to air scoop and shutter housing. If the hose is damaged (i.e. has holes or ruptures) replace it.

Recommended special tools: electric torch, mirror.

Necessary parts/materials: none.

- 14.4 Remove the top engine cowling. Check the condition of the air shutter actuator in the engine compartment and in the cockpit (remove the instrument panel if necessary). If the actuator has kinks or other damage that impede the shutter control, replace it.

Recommended special tools: electric torch.

Necessary parts/materials: none.

15 Instruments, avionics, full and static pressure system

Instrument panel is shown on **Fig. 9** The list of instruments and avionics are installed in the airplane is in subsection **1.2 Equipment list**.

The instruments and avionics of A-22LS are located on the main and additional (lower) instrument panels in the cockpit.

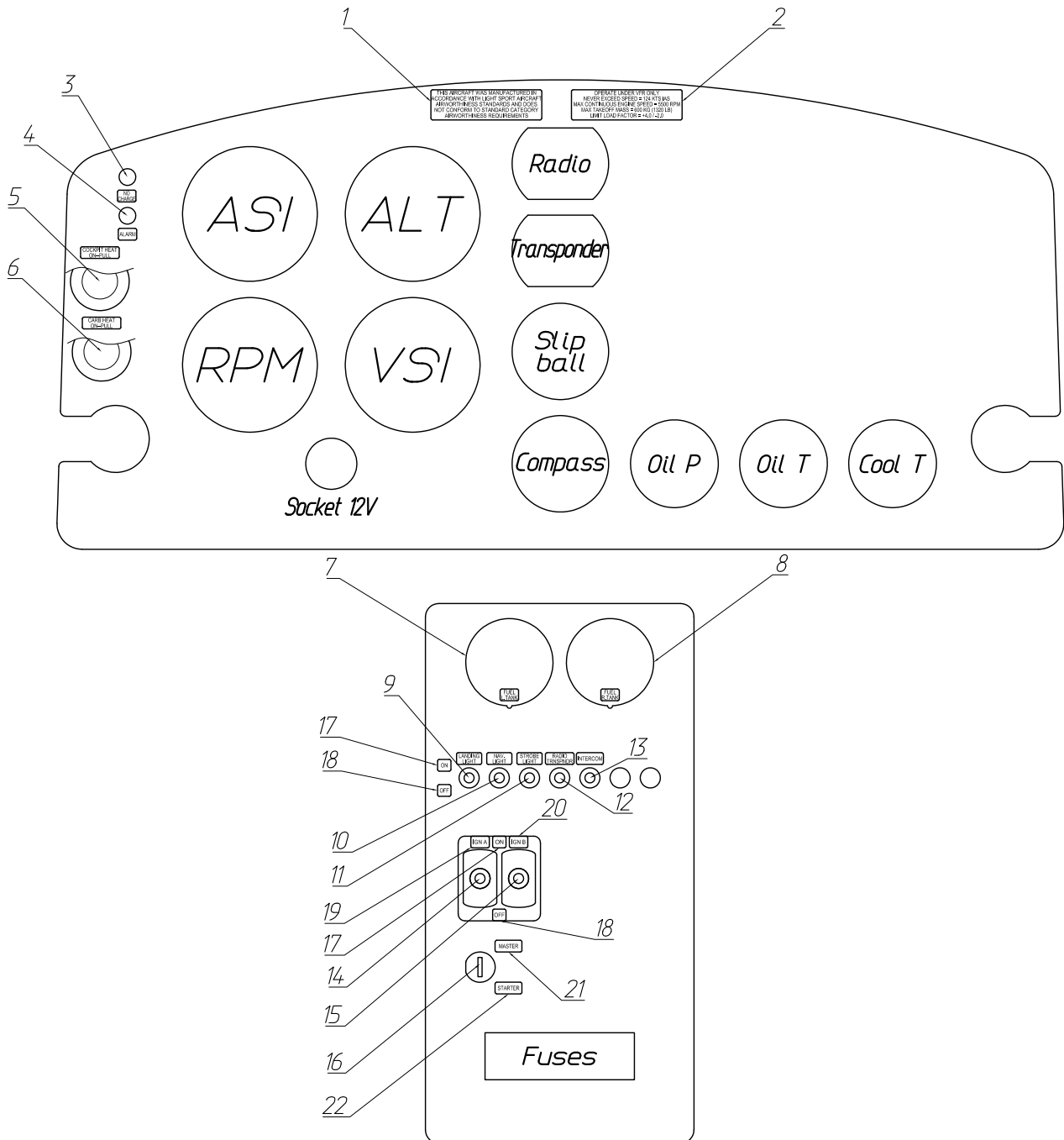


Fig. 9 Instrument panel

Numbers in **Fig. 9** denote the following:

1. Placard with passenger warning:

THIS AIRCRAFT WAS MANUFACTURED IN
ACCORDANCE WITH LIGHT SPORT AIRCRAFT
AIRWORTHINESS STANDARDS AND DOES NOT
CONFORM TO STANDARD CATEGORY
AIRWORTHINESS REQUIREMENTS

2. Placard with operating limitations:

OPERATE UNDER VFR ONLY
NEVER EXCEED SPEED – 124 KTS IAS
MAX CONTINUOUS ENGINE SPEED – 5500 RPM
MAX TAKEOFF MASS – 600 KG (1320 LB)
LIMIT LOAD FACTOR – +4.0 / -2.0

3. NO CHARGE indicator and marking
4. ALARM indicator and marking
5. Cockpit heating control knob and marking
6. Carburetor heating control knob and marking
7. Left tank fuel level indicator and marking
8. Right tank fuel level indicator and marking
9. Landing light switch and marking
10. Navigation lights switch and marking
11. Strobe lights switch and marking
12. Radio, transponder switch and marking
13. Intercom switch and marking
14. IGN A switch
15. IGN B switch
16. Master and starter key
17. ON marking for electric and ignition switches
18. OFF marking for electric and ignition switches
19. IGN A marking
20. IGN B marking
21. MASTER marking
22. STARTER marking

The full and static pressure system (see Fig. 10) supplies the full (dynamic) and static pressure of the outside air to the instruments measuring the flight parameters: airspeed, rate of climb and altitude. The system consists of the full and static pressure probe (1) and full (2) and static (3) pressure lines connecting the probe to the instruments. Full and static pressure lines have joints (4) for disconnecting the lines when the left wing is removed during aircraft disassembly.

The full and static pressure probe (1) is located on the left wing strut. The full and static pressure lines are connected to the airspeed indicator. The altimeter and vertical speed indicator are connected to the static pressure line.

Good condition of the full and static pressure system is important for correct measurement of the flight parameters and therefore for flight safety. Pilots must take all measures necessary to keep the system in good condition. During the preflight check pilot must remove the cover from the full and static pressure probe and inspect the probe and lines to make sure that they are not damaged or blocked (by water, ice, dirt, etc.). After flight pilot must put the cover back on the probe.

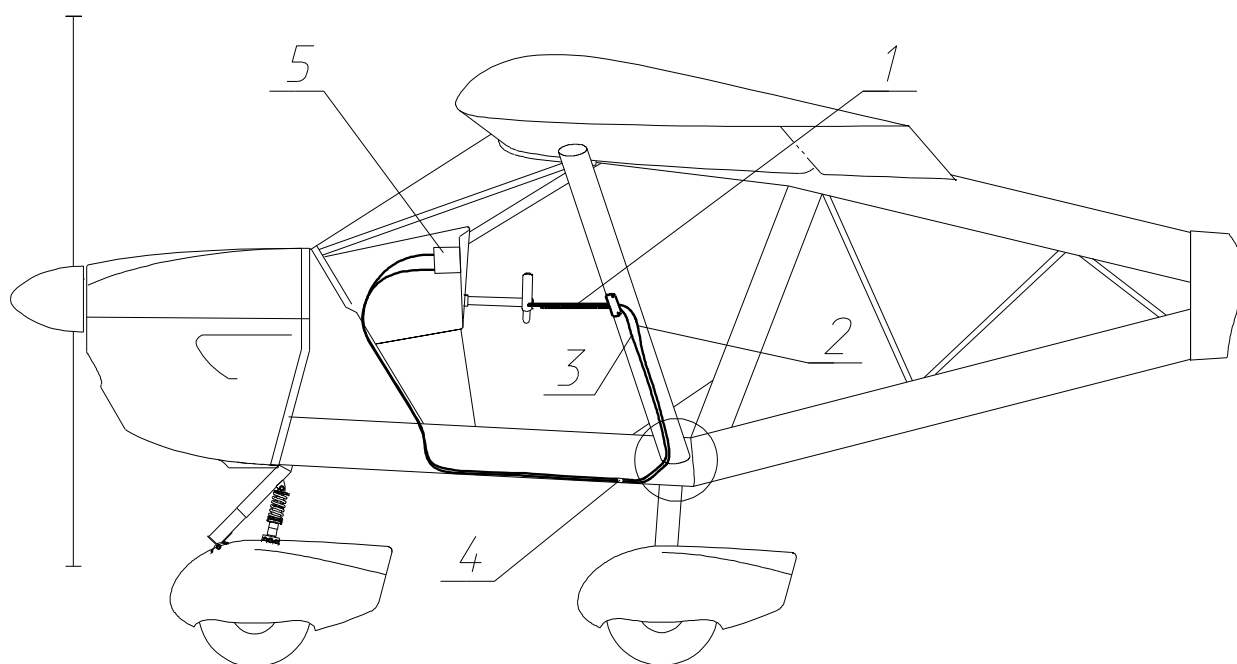


Fig. 10 Full and static pressure system

Maintenance and repair of the instruments together with the full and static pressure system and avionics consists in periodic checks of its operation and replacement of the components that failed.

INSPECTION CHART

Description	Interval	RCO	Instruction	TM	LC
Switches	100 h	OC	15.1	L	LRM
Lights	100 h	OC	15.2	L	LRM
Instruments and avionics	100 h	OC	15.3	L	LRM
Full and static pressure system	100 h	OC	15.4	L	LRM

Instructions:

15.1 Switch on the master switch. Check operation of the switches, by switching them ON one by one. Replace the ones that are not functioning properly. To replace a switch detach the lower panel, remove the switch and replace it for a new one of the same model/type. Put the panel in place.

Recommended special tools: none.

Necessary parts/materials: none.

- 15.2 Switch on the master switch. Check operation of the lights. Replace defective ones. To replace a light detach the main instrument panel to get access to the light to be replaced. After replacing the light put the instrument panel in place and fix it properly with its attaching screws.

Recommended special tools: none.

Necessary parts/materials: none.

- 15.3 Inspect the instrument panel, make sure that arrows of analog instruments are set to zero. Switch on the master switch. Check indications of the electronic instruments. If necessary start the engine and check if the instruments are functioning properly. If an instrument is defective replace it. To replace the instrument detach the instrument panel to which it is fixed and move it to get access to the instrument to be replaced. Take care not to damage any wiring behind the instrument panel. If necessary cut the plastic cable ties, disconnect and put carefully aside the cables that do not allow removal of the instrument to be replaced. Replace the instrument and fix the electric cables with cable ties to hold them away from the movable parts of the flight control system. Put the instrument panel in place.

Recommended special tools: none.

Necessary parts/materials: none.

- 15.4 Inspect the Pitot tube. Check condition of the full and static pressure lines and of their joints in the cockpit. The lines must be intact and have no water, dirt or any foreign objects trapped inside. Replace damaged lines. To remove water, dirt or foreign objects from the lines disconnect the lines from the instruments and clean them with compressed air.

Recommended special tools: none.

Necessary parts/materials: none.

16 Pilot seats and harness belts

The pilot seats of A-22LS airplane are adjustable (they have 2 fixed settings) and consist of an aluminum framework and a cushion.

The harness system is of four-point type. It consists of two sets of harness belts.

INSPECTION CHART

Description	Interval	RCO	Instruction	TM	LC
Pilot seat frameworks, 2 pcs.	100 h	OC	16.1	L	LRM
Pilot seat cushions, 2 pcs.	100 h	OC	16.2	L	OWN
Harness belts set, 2 pcs.	100 h	OC	16.3	L	LRI

Instructions:

- 16.1 Remove the cushions from the seat framework. Inspect the framework for the fatigue cracks and loose rivets.

Upon detecting cracks with length less than 10 mm (0.4 in) stop the crack propagation by drilling carefully a Ø3 mm (0.12 in) hole at its end. If the crack is longer than 10 mm (0.4 in), the framework must be replaced (repaired). To obtain the instructions on repair of the framework contact the manufacturer.

If loose rivets are detected they must be replaced. For that do as follows:

- remove the pilot seat framework;
- remove the cores from the loose pop-rivets;
- drill out the rivets with a Ø3 mm (0.12 in) drill;
- install new Ø3×6 rivets;
- install the seat framework in place.

If no defects are detected install the seats back. Apply Loctite 222 on the thread of the attaching bolts.

Recommended special tools: electric drill, Ø3 mm drill.

Necessary parts/materials: Ø3×6 rivets, Loctite 222.

- 16.2 Inspect the seat cushions for damage of the upholstery and replace it if necessary.

Recommended special tools: none.

Necessary parts/materials: none.

- 16.3 Check functioning of the harness belts' locks. For that apply a 300 N (67 lb) tension to the waist belts. The lock must not unlock spontaneously under the load. Otherwise the lock must be replaced.

Inspect the belts for damage (cuts, chaffing). Upon detecting any damage contact the manufacturer for the required technical support.

Recommended special tools: none.

Necessary parts/materials: none.

17 Cockpit doors

The cockpit doors are made in form of a transparent plastic on a riveted metal framework. The doors may be fitted optionally with locks. The doors are retained in their open position with a gas strut. The forward part of each door is fitted with a ventilation air scoop.

The doors can be removed quickly. To remove the doors do the following:

- while holding the door open detach the gas strut from fuselage (remove the securing clamp and move the strut away);
- while holding the door outside remove the pins from the door hinges (first the aft than the front one);
- remove the door.

To install the door repeat above actions in reverse order.

INSPECTION CHART

Description	Interval	RCO	Instruction	TM	LC
Door, right	100 h	OC	17.1	L	LRI
Door, left	100 h	OC			
Gas struts, 2 pcs.	100 h	OC	17.2	L	LRI

Instructions:

17.1 Inspect the door glass as described in 3.2.

Inspect and if necessary replace the door sealing. To do that carefully clean the door from the old sealing and fix the new one.

Inspect the framework, hinges and fasteners of the door for fatigue cracks, damage and loose rivets, as described in 3.1 (paragraph 2 and 3).

Recommended special tools: none.

Necessary parts/materials: none.

17.2 Check the functioning of the gas strut. Its cylinder rod must move smoothly and without jamming. The gas strut must retain the door in open position. If not than the gas strut must be replaced.

Recommended special tools: none.

Necessary parts/materials: none.

18 Recovery system

This airplane may be equipped with a quick-acting MAGNUM 600 SSP or Galaxy GRS 6/600 recovery system.

The recovery system is installed on the right side behind the luggage container. The system actuation handle is installed on the panel between the pilot seats.

The system suspension cables are fixed to fuselage in three locations (at firewall and near the rear attachment points of the wings).

System servicing must be performed in accordance with the current documentation of the recovery system manufacturer.

WARNING! Before any servicing of the system install the safety pin into its actuation mechanism.

INSPECTION CHART

Description	Interval	RCO	Instruction	TM	LC
Container with parachute	*		-	L	TSP
Actuation handle with cable	*		-	L	TSP
Suspension cable, front	500 h	OC	18.1	L	LRI
Suspension cable, right	500 h	OC			
Suspension cable, left	500 h	OC			

* – see Maintenance Manual of the respective recovery system

Instructions:

18.1 Check attachment of the suspension cables to the parachute lanyard and to fuselage structure. If necessary, replace the plastic cable ties fixing the cables.

Recommended special tools: none.

Necessary parts/materials: none.

19 Glider and banner towing system

A-22LS airplane can be optionally equipped with E 85 tow clutch manufactured by Tost Flugzeuggerätebau company (<http://www.tost.de>) for towing of gliders or banners.

The tow clutch is attached to the tail fuselage on a special fitting. The tow clutch can be actuated by pulling the tow release handle (located near the flap extension lever) connected to the tow release lever with a control cable.

INSPECTION CHART

Description	Interval	RCO	Instruction	TM	LC
Tow clutch control cable	100 h	OC	19.1	L	TSP
Tow clutch	100 h	2000 starts / 4 years	19.2	L	TSP

Instructions:

- 19.1 Inspect the tow clutch control cable from the release handle to the tow clutch lever. The cable must be intact and free from corrosion (otherwise the cable must be replaced).

Check the tow release force on the release handle. If release the force has increased too much – check condition of the tow clutch control cable and grease the cable near its fearleads.

Recommended special tools: none.

Necessary parts/materials: none.

- 19.2 Clean, lubricate and check for proper operation the tow clutch. The tow clutch opening must be performed without jamming. If the jamming occurs it must be eliminated or the clutch must be replaced for the one identical to that installed on the airplane.

Recommended special tools: none.

Necessary parts/materials: none.

NOTE: The tow clutches are approved aeronautical parts. Their safety and operating life can be assured only by observing the maintenance intervals prescribed by EASA. The clutch must be returned to the manufacturer for complete reconditioning after 10000 operations (approx. 2000 starts). Manufacturer recommends the **general overhaul after 4 years**. Due to environmental influence the clutch may corrode or become stiff and thus fail during operation.

20 Structural repair

20.1 General

This section describes the repairs that can be performed by aircraft owners, LSA repairmen or aircraft and powerplant mechanics without further consultation with the aircraft manufacturer. However when planning to perform the particular repair work it is recommended to consult the aircraft manufacturer in order to verify that the necessary repair was correctly identified and properly prepared. Before commencing to perform the repairs described in this section study carefully this section and prepare all necessary tools, parts and materials. Make sure that the level of certification requirements are met. In case of doubt consult your local dealer or aircraft manufacturer.

20.2 Cockpit glazing repair

If any cracks appeared in the windscreen glass stop flying the airplane and replace the damaged windscreen glass in the service center.

Before the ferry flight to the service center drill the cracks ends with Ø3 mm drill bit to stop further growth of the cracks.

WARNING! Flying the airplane with the windscreen glass crack(s) exceeding 50 mm is strictly prohibited!

Type of maintenance: line.

Level of Certification: owner.

Recommended special tools: hand drill, Ø3 mm drill bit.

Necessary parts/materials: none.

20.3 Fabric covering repair

The fabric covering of the wing, flaperons, elevator and rudder is soft and therefore it may be damaged accidentally in operation. If minor damage (holes, cuts or rupture of size less than 50 mm) of the fabric covering is detected during inspection it must be repaired by covering the damaged area with a patch of ORACAL permanent sticking film of suitable color, shape and size as shown on Fig. 11 below.

WARNING: this repair is allowed for fabric skin damage (holes, cuts, rupture, etc.) less than 50 mm in size and located away from the fabric covering edges and airframe parts to which the fabric covering is attached with adhesive. In case if the damage is greater than 50 mm in size or if the attachment of the fabric covering to airframe parts is damaged contact aircraft manufacturer.

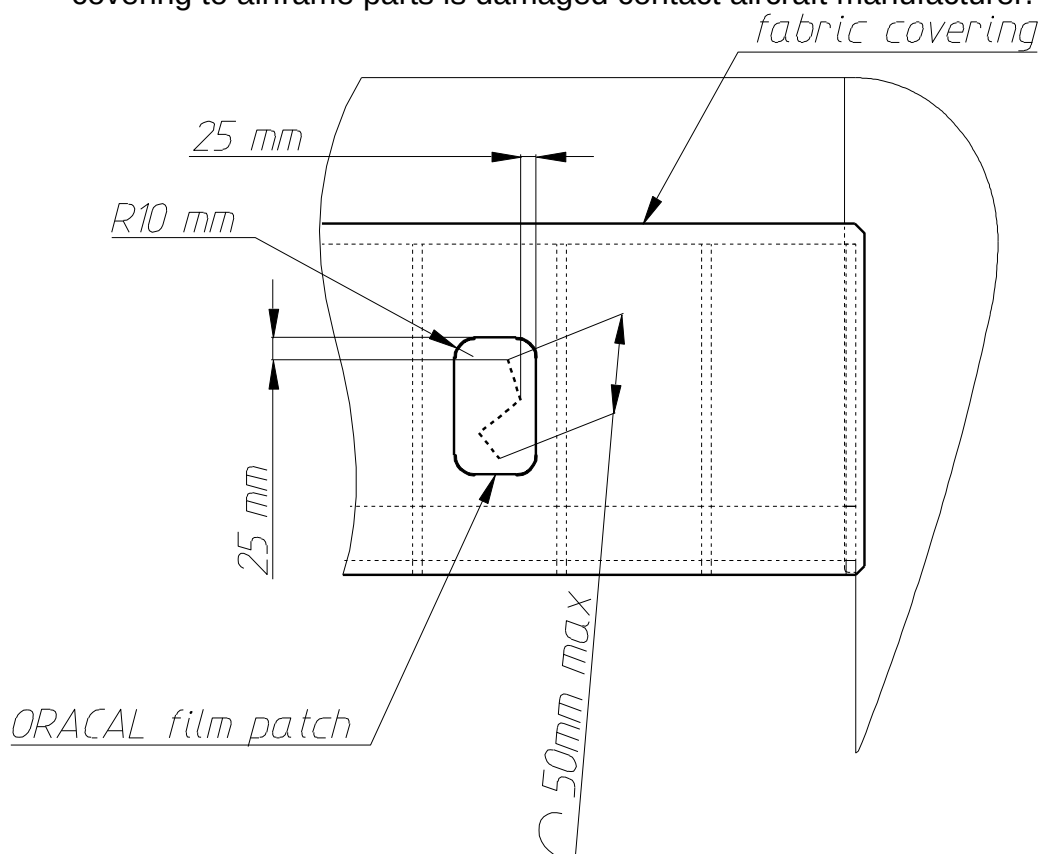


Fig. 11 Fabric covering repair

This repair operation must be performed indoor (in the workshop or hangar) at a temperature not below 15°C for the film to stick properly to the fabric covering and dry air. Before repairing the fabric covering wash the damaged area from any contamination (dust, greasy stains, etc.) with a piece of soft cloth soaked with warm soapy water, then wipe away the water and soap with a clean wet cloth and let it dry. Cut a patch of ORACAL film of suitable color, shape and size and apply it on the damaged area so that the minimum distance from any edge of the damage to the patch edge is at least 25 mm as shown on Fig. 11. Apply the patch to the fabric covering evenly over entire damaged area without wrinkles and bubbles. Make sure that all patch edges stuck reliably to the fabric covering.

Type of maintenance: line.

Level of Certification: owner.

Recommended special tools: none.

Necessary parts/materials: ORACAL permanent sticking film.

20.4 Composite parts' repair

Some parts of the aircraft such as engine cowlings, wheel fairings, wing tips, fin tip, wing root fairings are made of composite materials. Those parts may be damaged in operation accidentally. If during inspection any damage of those parts such as cracks, dents, etc. is found it can be repaired as described below.

WARNING: this repair is allowed for the composite parts' damage (holes, cracks, dents, etc.) less than 50 mm in size and located away from the attachment points (bolt holes, quick-release locks, etc.). In case if the damage is greater than 50 mm in size or if the attachment of the composite parts to airframe is damaged contact aircraft manufacturer.

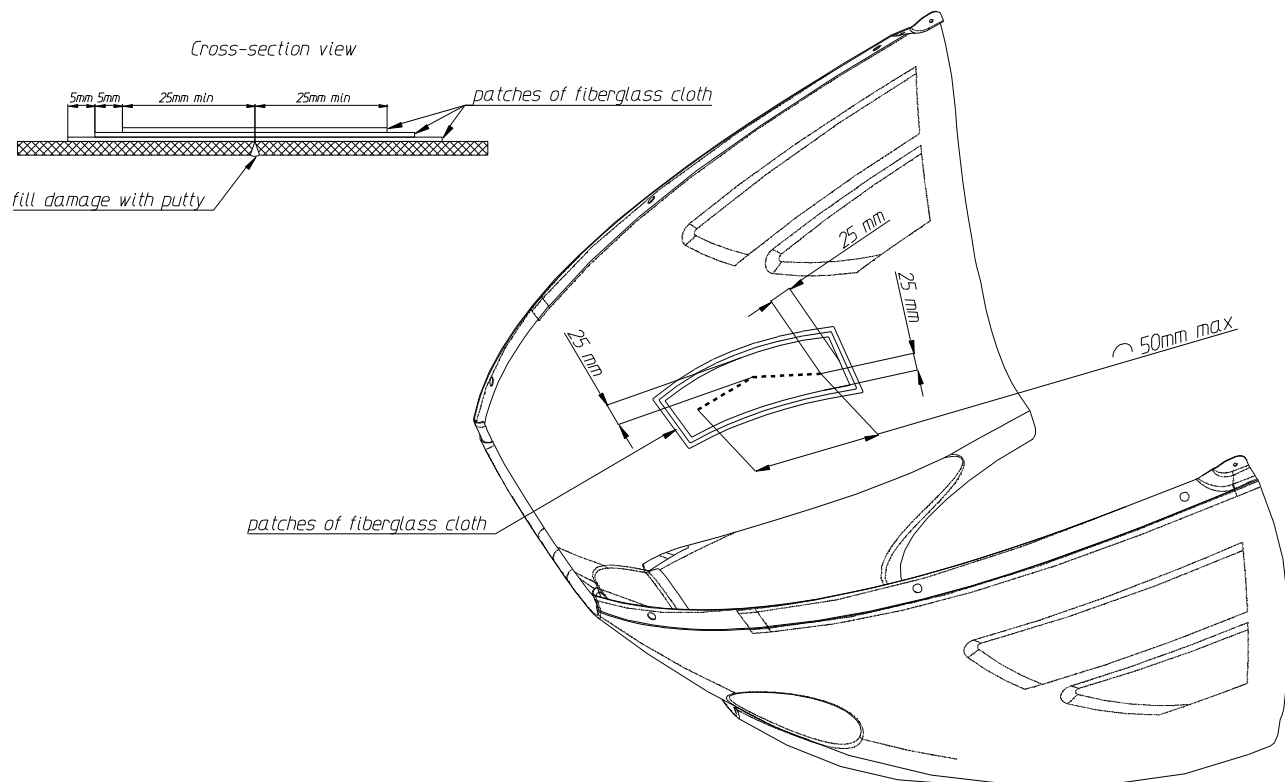


Fig. 12 Composite parts repair

Repair of damaged composite parts must be performed in a premise with temperature not below 15°C (for the epoxy resin to solidify properly) and some kind of air ventilation (for health protection). The composite part to be repaired must be removed from the airplane. The composite parts such as wing root fairings, wing tips, fin tip that are riveted to airframe structure cannot be removed from the airplane and therefore must be brought into the repair premise together with the airframe component to which they are riveted (wing, fuselage).

After removing the composite part to be repaired clean and degrease the damaged area with soapy water and let it dry completely. Sand the damaged area from inside or from outside (if the inner surface of the part is inaccessible) with sand paper of a medium grain size and clean thoroughly the damaged area from dust and chips created by sanding. When sanding the outer surface of the parts with inaccessible inner surface (wing tips, wing root fairings) make sure to remove the paint from entire area where the repair patches will be applied later.

WARNING! Use protective means (rubber gloves, respirator, protective glasses and clothes) when sanding or working with epoxy adhesive. Make sure the air in the working area is ventilated properly.

Cut several patches of fiberglass cloth of suitable shape and size that cover the damaged area as shown on Fig. 12 above (at least 25 mm to the damaged spot from any edge of the patch). The number of the patches should be such that the total thickness of the patches is approximately equal to the thickness of the repaired part in the damaged area. The size of each following patch should be slightly less to form a pack with gradual increase of the thickness at the edges as shown on Fig. 12.

Prepare the necessary amount of epoxy adhesive by mixing its components in proper ratio, impregnate the preliminarily cut patches of fiberglass cloth and apply them on the damaged area as necessary (inside or outside). Apply the patches evenly over entire damaged area without wrinkles and bubbles. Make sure that all edges of the patches stuck reliably to the part surface. Fill the cavities of the damaged spot (holes, dents, cracks) with putty made of the preliminarily prepared epoxy adhesive mixed with some powder filler.

After applying the patches over the damaged spot let the epoxy resin to solidify completely. Then sand the solidified patches to obtain a smooth surface and restore the damaged paint on the outer surface of the repaired part.

Type of maintenance: line.

Level of Certification: LSA repairman maintenance.

Recommended special tools: respirator, protective glasses, rubber gloves, sanding paper.

Necessary parts/materials: fiberglass cloth, epoxy adhesive, putty, paint.

20.5 Restoring of damaged paint/coating

It is recommended to restore the damaged paint/coating in a closed room with ventilation and temperature sufficient for the paint/coating to dry. The parts/components requiring restoring of the paint/coating must be removed from the airplane.

WARNING! use protective means (gloves, respirator, protective glasses and clothes) when sanding or painting. Make sure the air in the working area is ventilated properly.

Restoring of the damaged paint/coating shall be done as follows:

1. Remove the delaminated paint/coating in the damaged area and sand with sandpaper. Degrease the sanded area.
2. The scratches and nicks of paint/coating must be filled with polyether putty.
3. Using a spray gun apply epoxy (for metal parts) or acrylic (for composite parts) primer on the damaged area.
4. When the primer is dry apply nitro putty if necessary; sand with sandpaper.
5. Remove the sanding dust and degrease the repaired area.
6. Cover undamaged surface of the part/component with protecting paper/film and sticking tape.
7. Using spray gun apply the paint on the repaired area and let it dry.
8. When the paint is dry remove the protecting paper/film. Polish the repaired area if necessary.

Type of maintenance: line.

Level of Certification: LSA repairman maintenance.

Recommended special tools: respirator, spray gun, protective glasses and clothes, gloves, spatula.

Necessary parts/materials: solvent, epoxy or acrylic primer, paint, sticking tape, paper or polyethylene film sandpaper, polyether putty.

This section contains a form for the aircraft owner or maintainer to provide notification to the manufacturer about issues and anomalies identified during the operation or maintenance of the aircraft or in the content of the manual.

Aeroprakt LSA Feedback Form	
Airplane model _____	Airplane serial No. _____
Airplane registration _____	Date of event _____
Date of airplane manufacture _____	Airplane total hours _____
Engine model _____	Engine serial No. _____
Engine total hours _____	Engine hours since last overhaul _____
Description of occurrence: _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____	
Enclose all available data including photos, sketches, etc. and send to: Aeroprakt Ltd., Polyova str. 24, 03056, Kyiv, UKRAINE, phone: +38 (044) 496-77-21, fax: +38 (044) 496-77-21, e-mail: air@prakt.kiev.ua or aeroprakt.kiev@gmail.com , web: www.aeroprakt.kiev.ua	
Owner: _____	Contacts: _____
Address: _____	