MAINTENANCE MANUAL

for

DOVA AIRCRAFT® DV-1 SKYLARK

(MTOW 600 KG)

Aircraft Serials 09/227 & Subsequent with Rotax® 912 ULS Engine
and Kaspar™ KP-4/3-PA propeller

Type certificate is registered by LAA ČR under Nb.: ULL 05/2005
amendment ,,A"

Serial Num.: _____ Registration:_____

Original issue: October 2011
Revision: R3.0 June 2024

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Foreword

This Aircraft Maintenance Manual has been prepared by Dova Aircraft s.r.o. to familiarize operators with the aircraft and its maintenance schedule, procedures and recommended practices. Read this document carefully. It offers a clear guide on how to safely operate and maintain the aircraft to ensure consistent performance and reliability. Failure to follow the procedures recommended in this manual may result in degrated performance of the aircraft or failure of some of its components or systems.

Dova Aircraft s.r.o. recommends all owners and operators of DV1 Skylarks to seek professional guidance and support from authorised repair shops and maintenance organisations only, to ensure the continued airworthyness of the aircraft.

Ownership Records

Owner of aircraft:

Name:	
Address:	
Registration:	
Registration Date:	

Change of owner:

Name:	
Address:	
Registration:	
Registration Date:	

Change of owner:

Name:	
Address:	
Registration:	
Registration Date:	

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Part 1.0 General	Information about your aircraft and its components.
Part 2.0 Aircraft Overview	Detailed overview of the aircraft and its systems
Part 3.0 Basic Handling	Basic handling instructions, applicable to maintenance activities
Part 4.0 Maintenance	Regular maintenance procedures and checklists
Part 5.0 Repairs	Extraordinary maintenance procedures and recommendations
Part 6.0 Appendix	Additional information

1.0 General

Introduction
The DV-1 SKYLARK aircraft is designed for tourist, recreational, or pilot-school non-aerobatic flights. These flights are permitted in VFR conditions only.
The DV-1 SKYLARK is a single-engine, full-metal, low-wing, two-seater ultralight aircraft. The seats are placed side-by-side.
The wing surface is trapezoid-shaped with semi-monocoque construction. As control surfaces, simple folding flaps and ailerons are installed. Each wing is attached to the fuselage with three hinges.
The fuselage is a semi-monocoque construction created by metal skin, longitudinal beams, and perpendicular walls.
The empennage is created as a full-metal, self-supporting T-tail construction.
Non-structural parts like engine cowls, wing fairings, and winglets are made from composite materials.
The aircraft is mostly equipped with Kaspar's propellers. Two- or three-blade fixed or in-flight adjustable propellers are available.

Lift Surfaces:
The trapezoid-shaped wing is a semi-monocoque construction. This design places the main beam at 1/4 of the chord and the auxiliary beam in the control surfaces connection. Fuel tanks are installed in the wings, constructed as full-metal riveted tanks sealed with petrol-resistant glue. The wing ends are equipped with a pair of fiberglass winglets. The wing surface is divided into left and right halves, each attached with three hinges.

Fuselage:
The fuselage's lower cross-section is rectangular with blended corners, while the upper cross-section is elliptically shaped. The vertical fin is an integral part of the fuselage construction. In the middle part of the fuselage, there is a two-pilot space covered with a canopy made from a single piece of organic glass. The engine compartment is separated from the pilots by a steel firewall, which

also serves as an important construction point for the front undercarriage leg and engine bed, as well as for the ballistic rescue system.

Empennages:
The tail surfaces are designed as a T-tail. The horizontal tail surfaces are rectangular-shaped and consist of an elevator connected with hinges to the stabilizer. The stabilizer is attached through four bolts to the fin's construction. An electrically controlled hinged trim surface is located on the left side of the elevator. The trim electrical control system includes a trim surface position indicator placed on the instrument panel. The rudder is trapezoid-shaped and attached to the vertical fin with two hinges.

Controls:
The aircraft controls follow a classical doubled system. Aileron and elevator control systems are created using duralumin rods, angle levers, and steel control levers. The rudder control is based on stainless ropes. Flap control can be operated through the flap control handle in the middle panel or via an electrical servo engine. Elevator trim surfaces are controlled using an electrical servo engine.

Undercarriage:
The main undercarriage legs are made from composite springs. The main undercarriage wheels are equipped with hydraulic brakes. The front undercarriage leg features a rubber shock absorber. The front wheel is attached through a duralumin fork to the front leg and is steerable. The tire size for both the front and main undercarriage wheels is the same.

Power Plants:
The aircraft is primarily powered by ROTAX 912UL and ROTAX 912ULS engines. These engines are attached through shock absorbers to an engine bed welded from steel rods. The engine compartment is covered with two fiberglass cowlings (lower and upper). Both

cowlings are one-sided painted to match the aircraft and are removable. The upper cowling is attached with cam locks.

Fuel System:
Two integral fuel tanks are mounted in the wings, each with a 45L volume. They are constructed from riveted and sealed duralumin sheets. Each fuel tank is equipped with a filling intake, outlet valve, sludge valve, air-bleeding valve, and a fuel meter. The fuel system itself includes a three-way fuel valve, fuel filters, and an electrical fuel pump.

Interior:
The aircraft features two upholstered seats placed side-by-side. Each seat's position is adjustable and secured with a position lock. Additional equipment includes four-point safety belts, a baggage compartment located behind the seats, and a safety net for securing luggage.

Canopy:
The canopy consists of a single piece of organic glass, riveted and glued to a welded frame made from duralumin tubes. It opens with a forward sliding movement and is attached to the fuselage via a metal pull-out system. The canopy latch is positioned at the top and can be locked.

Ventilation System:
Ventilation is provided through a rounded valve in front of the canopy. Additionally, side sliding windows are available as an option.

Electrical Installation:
The electrical system operates on a single-phase 12V system with the negative pole grounded. It relies on a duty-free battery and an engine alternator as the power source. Each electrical circuit is protected by a fuse or circuit breaker located on the instrument panel.

Labels:

A ready-to-fly aircraft delivered from the manufacturer comes equipped with the necessary labels. In the case of a kit, the owner must place the labels in their correct positions. It's important to note that the owner is responsible for ensuring the label's readability throughout the aircraft's lifetime.

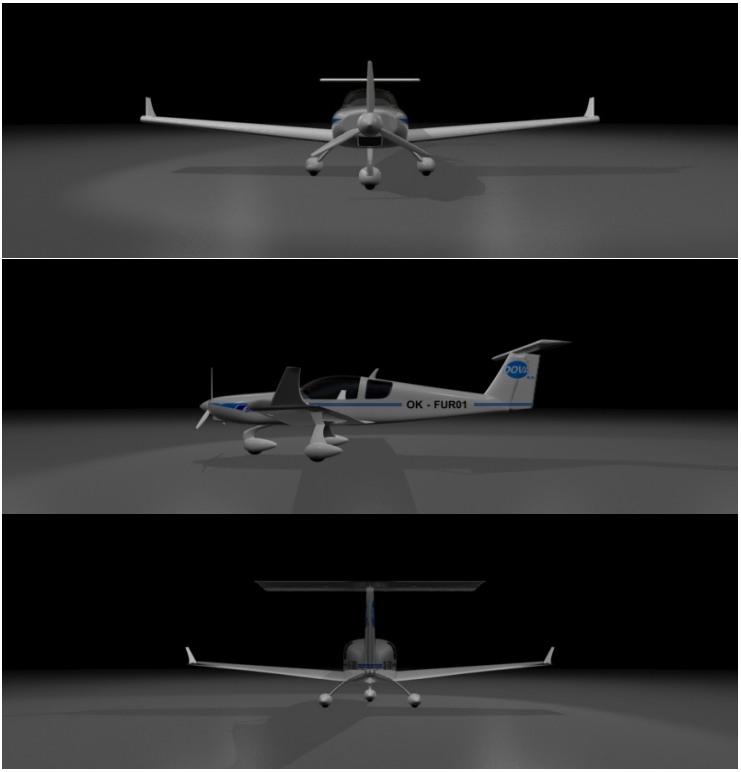
Instruments:
The minimal instrument equipment includes:
In-flight instruments: airspeed indicator, altimeter, vertical speed indicator, slip-ball indicator, compass, and fuel gauges.
Engine instruments: tachometer, oil temperature indicator, engine head temperature indicator, and oil pressure indicator. Other optional instruments include the ICOM 200 radio, Ray Allen T10A servo for elevator trim, fuel pressure indicator, manifold pressure indicator, GPS AvMap EKP IV, Garmin transponder, artificial horizon, and a 100W landing light.

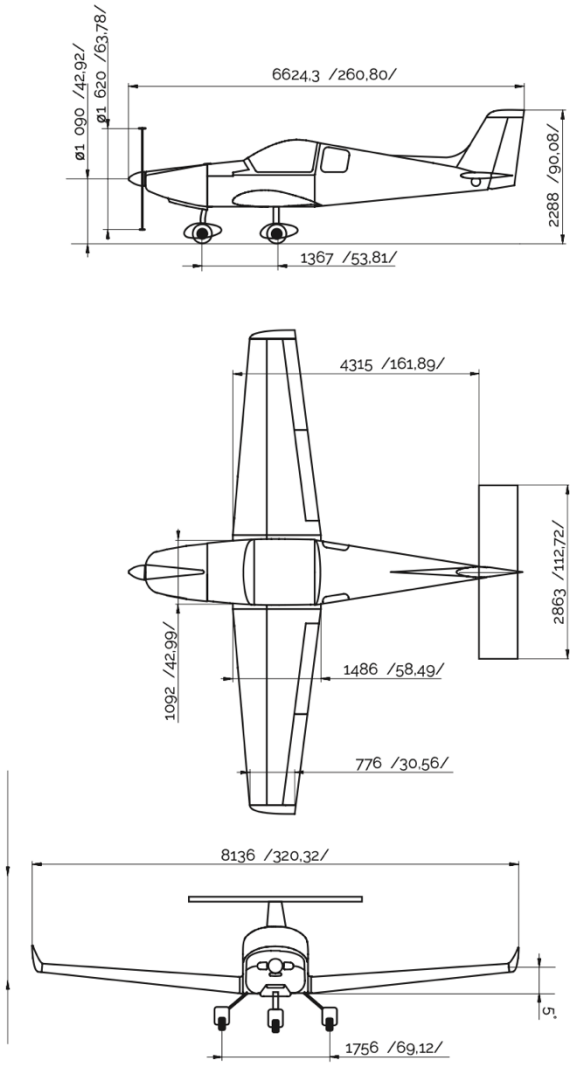
Signal Lights:
Position lights are placed in the winglets, and there are strobe lights (two on each winglet and two on the fuselage).

Additional Equipment:
The aircraft is already prepared for the installation of ballistic rescue systems.

2.0 Aircraft Overview

Front, side and back views of the DOVA DV1 Skylark

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2863 /112,72/
1092 /42,99/
1486 /58,49/
776 /30,56/
8136 /320,32/
1756 /69,12/

2.1 Basic dimensions

FUSELAGE	Length	6.62 m
	Width	1.09 m
	Height	2.28 m
WINGS	Wingspan	8.14 m
	Wing surface	9.44 m2
EMPENNAGE	Horizontal tail surface	1.47 m2
	Vertical tail surface	1.02 m2
UNDERCARRIAGE	Track	1.70 m
	Wheelbase	1.36 m

2.2 Weights and performances:

Empty weight	315 Kg
MTOW	600 Kg
Baggage	20 Kg
Min. pilot weight	60 Kg
Max. pilot weight	120 Kg
COG position Front	21% SAT
COG position Rear	36% SAT

Mass	m=370 kg	m=600 kg
Without flaps V_{S1}	75 km/h	80 km/h
Landing configuration V_{S0}	65 km/h	73 km/h

Uncertified ceiling	3650 m	12 000 feet

2.3 Fuel consumption

Values for Rotax 912 ULS – please refer to the official Rotax operating and maintenance manual for additional information.

5500 rpm (performance cruise)	22 liters / h
5000 rpm (regular cruise)	20 liters / h
4300 rpm (economy cruise)	16 liters / h

2.4 Engine lifetime

Term of engine overhaul is given as 2000 flight hours or 10 years for ROTAX 912 UL/S(first reached is valuable).
See Rotax Bulletins – operational condition of engine manufacturer

2.5 Engine parts with restricted lifetime

Have to be changed every 5 years:

- air supplying hose for carburetors (AIRBOX)
- all rubber hoses of cooling circuit
- all rubber hoses of oil circuit
- carburetors flange
- rubber hoses connecting carburetors
- belt attaching alternator
- fuel pump including fuel hoses

Have to be changed every 2 years:

- cooling liquid of engine

2.6 List of parts with restricted lifetime

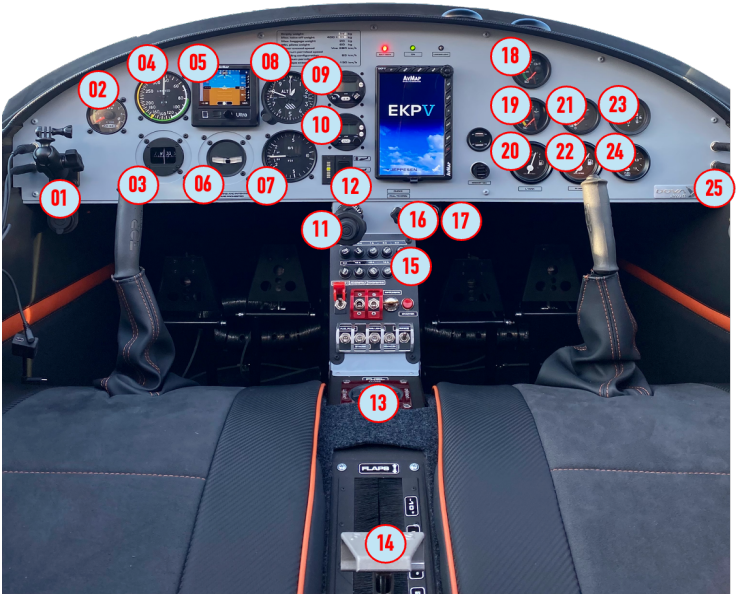
– structural : lifetime for changing parts of structural joint will be estimated by manufacturer, alternatively authorized service center during estimated inspections. In case that you will find any sign of rising wear of parts, higher friction or backlashes during your pre/after flight check, call authorized service center.

– flight, navigation and engine instruments: DV-1 SKYLARK is equipped with following instruments

ITEM	NB	OVERHAUL CONDITIONS	DATE

2.8 Instrument Panel

Configurations may vary. The aircraft owner is responsible for ensuring the content of the POH is aligned to the current configuration of the aircraft.



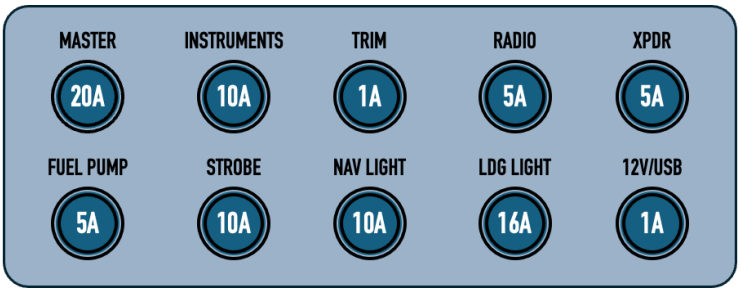
Item	Description
01	RAM Mount
02	RPM Gauge
03	Horizontal Compass
04	Airspeed indicator
05	AVMAP Ultra EFIS
06	Slip indicator
07	VSI
08	Altitude (hPa)
09	Trig Radio

Item	Description
14	Flaps actuator
15	Fuse panel
16	Choke control
17	Hot cabin control
18	CHT Gauge
19	Oil Temperature
20	Left fuel quantity
21	Oil Pressure
22	Right fuel quantity

10	Trig Transponder		23	Hobbs meter
11	Throttle		24	Fuel pressure
12	Elevator Trim Indicator		25	Audio jack plugs
13	Fuel valve selector			

2.92 Fuse Box

In case of electrical malfunction of on-board instrumentation, remove the relevant fuse by turning it counter-clockwise.
This will disable the current flow from/to the selected system.



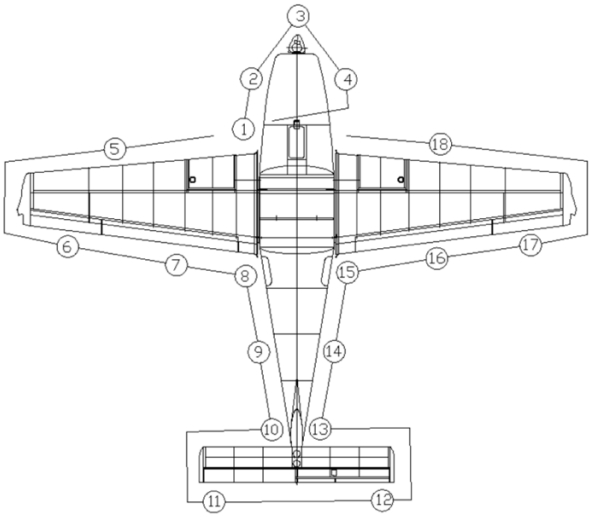
3.0 Basic handling

3.1 Ground handling

During handling (hold/push/pull) aircrafts parts always touch in place of structural reinforcement, like ribs, wall and beams (shortly in positions of rivets lines). Do not touch fiberglass parts, neither control surfaces. The aircraft can be pushed/pulled only through: - Propeller and only in case of holding it as close to its cone as possible
- Step-on surface on wings
- Eventually though fuselage in place of its walls
In case of parking outside the hangar, use wing's anchors and fuselage strut to fix aircraft movement
For easy movement on the ground, the aircraft is equipped by hangers on sides of fork of front undercarriage leg. So you can pull/push aircraft through towing rod.

3.2 Pre-flight inspection, maintenance

Remove all covers, disconnect anchors (in case of parking aircraft outside of hangar) and block the wheels.



AIRCRAFT WALK-AROUND

1. **RAM-AIR intake.....FREE**
2. **OIL Level.....CHECK**
3. **PROPELLER .....SPIN (for OIL check)**
4. **OIL Level.....CHECK (after propeller spin)**
5. **Pitot cover .....REMOVE**
6. **L Aileron movement.....FREE**
7. **L Flap .....CHECK**
8. **L tire pressure .....CHECK**
9. **XPDR Antenna .....CHECK**
10. **Vertical stabilizer .....CHECK**
11. **Horizontal stabilizer.....CHECK**
12. **Trim Tab.....NEUTRAL**
13. **Rudder controls.....CHECK**
14. **Radio Antenna .....CHECK**

15. **R tire pressure .....CHECK**
16. **R Flap.....CHECK**
17. **R Aileron movement.....FREE**
18. **R Wing leading edge.....CHECK**

FUEL CHECK

1. **Fuel quantity R/L TANK.....CHECK**
2. **Fuel sample R/L TANK .....CHECK**
3. **Fuel cap R/L TANK .....LOCKED**

ALSO CHECK THE INDICATED FUEL LEVEL IN THE COCKPIT MATCHES THE ACTUAL FUEL QUANTITY IN BOTH TANKS.

3.3 (Dis) Assembling of wings

Warning:

(Dis) Assemble aircraft always on place with enough space to safely manipulate with the parts or with whole aircraft.
In case of disassembling aircraft, be sure that you have enough right pads (soft, clean, height enough) to protect the wing from damage during storage (on ground for ex.).
During handling (hold/push/pull) aircraft parts always touch in pace of structural reinforcement like ribs, wall and beams (shortly in positions of rivets lines).

Two individuals are required at minimum to (dis) assemble the wing safely.
Always keep all disassembled parts, joining materials and others aircrafts items.
Used self-locking nuts must be replaced with new ones!

Disassembling of wings

- remove the covers inside the pilots cabin (flap control handle, under pilot, around the steering)
- disconnect aileron control rod from the steering joystick
- disconnect and blind fuel hoses from the wing-fuselage connection
- disconnect the pitot-static hoses in left wing connection – first mark the hoses with static pressure and then disconnect to prevent wrong re-connection . Blind disconnected hoses to prevent getting dirty inside
- after each re-assembling check proper pitot-static hoses connection and verify function
- disconnect electro-installation connectors from wing to fuselage
- remove self-locking nuts with washers from wing hinges on main and rear beam. (6+6 peaces on main, 2+2 peaces on rear one)
- remove bolts from rear hinges, remove bolts from main hinges except 1+1 in upper hinges and except 1+1 in lower hinges
- one man holds the end of the wing and second one remove upper and lower bolts (little up and down movement of wings end is required to release the bolts)
- one man holds the end and second one holds the wing root attachment. Move the wing slowly out of the fuselage. During moving out, watch carefully the rod ball-ends, hoses, connectors to avoid their damaging from edges. During moving wing out, automatic disconnection of flap control happened, so it is better to hold the flap position during that act.
- Put the wing carefully on suitable pad (watch out for the pitot-static tube under the wing – has to be lifted)
- Same procedure for opposite wing

Assembling of wings

- Assembling means reverse procedure of disassembling
- During assembling it is required to connect the flap controls properly. For that it is needed to set 0 positions on control flap handle and 0 positions on flap itself (that means trailing edge in straight line). With that the flap control will re-connect automatically.

3.4 (Dis) Assembling of tail surfaces
Disassembling horizontal tail surfaces

- remove fiberglass covers from stabilizer
- disconnect connectors for trim control and strobe lights in front cavity
- disconnect elevator control in rear cavity
- remove self-locking nuts, washers and 4 bolts connecting stabilizer together with fin.
- Remove horizontal tail surfaces and put it on suitable pad

Assembling of horizontal tail surfaces
Assembling consists of the reverse operation of the instructions mentioned above.

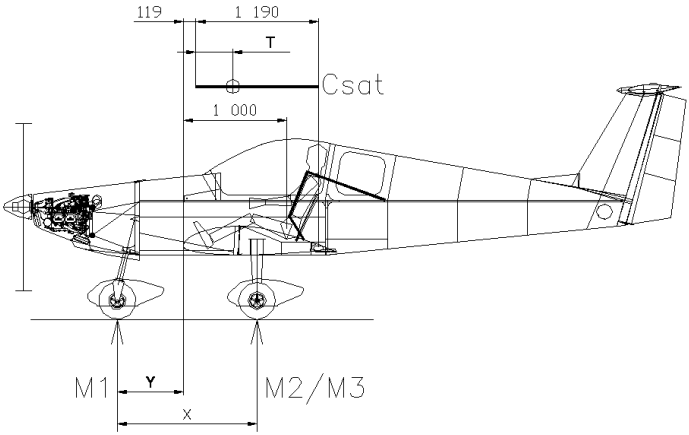
3.5 (Dis) Assembling of engines cowling

- Disassembling of upper engine cowling requires just releasing cam-locks fasteners and removing two screws in front of the cowlings – close to the propeller nose. Removing of this cowling for the pre/after flight check of the engines compartment is required. Removing creates easy access to check level of engines liquids like oil and cooling liquid.
- Disassembling of lower part of the cowlings requires disconnecting vent hoses from Naca's inlets and removing

of bolts connecting cowling with firewall. It is required to start removing bolts from lower one and then move up to next ones. Removing will create easy access to exhausts pipe system, coolers, temperatures and oil sensors.

Assembling consists of the reverse operation of the instructions mentioned above.

3.6 Estimating aircraft weight and center of gravity:



Center of gravity position:

T = (X * (M2+M3)/(M1+M2+M3) – Y – 119) / 11,9 (% mac)

Examples of C.G. position for Aircraft with BRS

1. Empty

Fuel (liters)	0
Left Pilot (kg)	0
Right Pilot (kg)	0
C.G. position (%mac)	13.5%
Weight (kg)	315

2. With pilot 86 kg

Fuel (liters)	0
Left Pilot (kg)	86
Right Pilot (kg)	0
C.G. position (%mac)	25%
Weight (kg)	401

3. With pilot 60 kg

Fuel (liters)	0
Left Pilot (kg)	60
Right Pilot (kg)	0
C.G. position (%mac)	22%
Weight (kg)	375

4. With 2 pilots 86+47 kg + 20 kg baggage

Fuel (liters)	0
Left Pilot (kg)	86
Right Pilot (kg)	47
Baggage (kg)	20
C.G. position (%mac)	35%
Weight (kg)	468

5. With two pilots of 86 kg

Fuel (liters)	0
Left Pilot (kg)	86
Right Pilot (kg)	86
Baggage (kg)	0
C.G. position (%mac)	32%

Weight (kg)	487

3.7 Operational values:

Information bellow is not complete. Complete information can be found in Original ROTAX 912 engines manual.

The recommendations in the Rotax engine manual are to be followed.

Oil pressure	max. 7 bar min. 0,8 bar normal 2-5bar
Oil temperature	min. 50°C, max. 130° normal 90-110°C
CHT	max. 135°C
Exhaust Gas Temperature	max. 880°C –start max. 850°C – flight normal 800°C
Fuel Pressure	max. 0,4 bar normal 0,15-0,4 bar
RPM	RPM idling 1650 rpm Maximum Continuous: 5500 rpm Maximum for 5 minutes: 5800 rpm

3.8 Control Deflections

AILERONS	Up	15° ± 1°
	Down	10° ± 1°
FLAPS	Position -1	-10° ± 2°
	Position 0	0
	Position 1	+10° ± 2°
	Position 2	+21° ± 2°

	Position 3	+40° ± 2º
ELEVATOR	Up	30° ± 2º
	Down	20° ± 2°
RUDDER	Right	30° ± 2º
	Left	30° ± 2º

4.0 Maintenance

4.1 General

Flight and operational eligibility directly depend on complying with scheduled maintenance intervals and degree. Proper maintenance service considers factors such as weather, hangar quality, airfield surface, and other relevant conditions. This manual provides information for maintenance and operation under average standard conditions typical for this category.

4.2 Maintenance List with Terms

Caution: The intervals for engine inspections and the corresponding work are detailed in the Maintenance Manual (Line Maintenance) for the installed engine.

Similarly, the propeller inspection intervals and associated tasks are specified in the Technical Description and Operation Instructions for the installed propeller. If a periodical inspection occurs before reaching the specified time interval, the subsequent inspection must be performed no later than the specified time interval from the initial inspection (e.g., if the first 100-hour inspection occurs after 87 flight hours, the next 100-hour inspection must occur no later than 187 flight hours).

The maintenance system comprises periodic inspections that must occur at least within the following intervals:

a) Pre-flight inspection: Conducted within the scope outlined in the Flight Manual.

b) Propeller inspection: After the first 5, 20, and 50 flight hours (refer to the Technical Description of the propeller). This inspection applies to newly installed propellers or those that were dismantled and reinstalled on the airplane.

c) Inspection after the first 25 flight hours: Engine inspection. Caution: This inspection should be performed with either a new engine or an engine after overhaul.

d) Periodical inspection after 50 flight hours: Includes inspection of both the engine and propeller.

e) Periodical inspection after 100+5 flight hours: Covers airframe and propeller inspections, as well as engine inspection according to the maintenance system described in the Maintenance Manual (Line Maintenance) for the installed engine.

4.3 Maintenance

Maintenance occurs at periodically estimated intervals. Pay attention to revising parts based on their function, wear, and importance. The purpose of periodical maintenance is to prevent or detect damage or wear in the aircraft construction that could lead to part failure.

Specific maintenance guidelines:

- **Engines maintenance:** Follow the maintenance manual for the installed engine (e.g., ROTAX 912UL/S engines).
- **Propeller maintenance:** Refer to the propeller manufacturer's manual (e.g., Kaspar's propeller manual).
- **Aileron, flap, rudder, elevator, and trim surfaces hinges:** Ensure free, noiseless movement without backlash. Re-grease once per each 100 flight hours or annually. In dusty conditions, clean and grease more frequently.
- **Front leg movement:** Pay attention to the sliding surface of the leg and its wear. Verify zero movement in the X and Y axes of the leg within the lower and upper "pertinax" guides. Clean and re-grease every 50 flight hours or annually. Adjust for extreme operating conditions.
- **Bowden cable for throttle, choke, and ventilation valve:** Re-grease annually. Adjust for extreme conditions.
- **Swing-bearings of control rods:** Grease annually. Adjust for extreme operational conditions.
- **Pitot-Static system:** Consistently check for seal condition, proper function, hose connections, and secure instrument connections. Ensure the Pitot-tube intake is free and clean. Remove condensate water if present and dry the system.
- **Check the tightening of bolts**: *Engine's frame* - check the bolts between engines bed and firewall, between engine's frame and engine's ring,

between engine and engine's ring
Front undercarriage – check the bolts on lower and upper guide, bolt of shock absorber, bolt of front wheel and bolts attaching fork to leg
Main undercarriage – check bolts attaching legs to U/C beam, check the M12 bolt with plastic washer on the leg, check the main wheels nuts
Elevator control system – check the bolts connections of the control rods with steering, angle lever and elevator. At same places check the secure nuts of swing- bearing of the rods
Front leg control system – check the bolts connections of the control rods with front leg steering arm and pedals. At same places check the secure nuts of swing-bearing of the rods
Ailerons control system – check the bolts connections of the control rods with steering levers, angle levers in wings and ailerons. At same places check the secure nuts of swing-bearing of the rods
Flap control system – check bolt attaching flap control handle to U/C beam, bolts connecting pushing rod to handle and to torsion tube, check the secure nuts of swing- bearing of pushing rod.
Rudder control system – check the bolts attaching ropes to rudder and to pedals, check the secure-wiring on turnbuckles

- **Special equipment inspections – given** by suppliers manuals (for example ballistic rescue system)

4.4 Periodical inspection after the first 25 hours

SERIAL NUMBER: **REGISTRATION:**	**FLIGHT HOURS:** **NUMBER OF STARTS:**

PRESCRIBED INSPECTIONS	**MADE BY**	**CHECKED BY**
Engine and propeller		
According to engine's manual		
According to propeller's manual		
Engine's cowlings		
Remove and check engine's cowlings for any signs of thermal damage, bubbles or cracks		
Engine frame		
Inspection, tightening, securing (if necessary) of engine's ring and frame bolts.		
Inspection of welded frames for any signs of cracks, inspection of rubber shock absorbers between engine's ring and frame		
Intake system		
Inspection of air-filters, their attachment to carburettors		
Inspection of intake pipes		
Inspection of carburettors – attachment, control, cleanness		
Electrical installation		

Inspection of wires and cables for undamaged condition, their connection and securing		
Battery		
Check the battery voltage (should not be less then 12,4V unplugged) and wires connections		
Fuel installation		
Visual inspection of seal installation		
Cooling system		
Inspection of undamaged hoses, their connections, attachment and securing		
Check the volume of cooling liquid in system Check the density of cooling liquid to prevent freezing in winter condition. Fill in non-frost liquid if needed		
Damaged hoses need to be replaced		
Oil system		
Check the oil level in oil tank according to engine's manual		
Provide inspection of cooler for cleanness, seal and undamaged condition. Check the cooler attachment for cracks.		
Exhaust system		
Inspection of exhaust system for any signs of crack or damage on welds or tubes		
Check the silencer attachment and its faultless condition		
Check the self-locking nuts used on exhaust system		
Front undercarriage		

Inspect condition and attachment of front leg, check and refill if necessary pressure of front tire Inspect and tight if necessary all unmovable joints with bolts, all moveable joints secure		
Main undercarriage		
Inspect condition of composite leg for cracks, cranny or holes, even for paint damage. In case of finding mentioned fault, contact the manufacturer Inspect tightening of bolts		
Check hydraulic brake system for leak		
Wing		
Visual inspection for loose rivets, skin deformation, cracks or other damages		
Visual inspection of fuel tank for leak		
Aileron		
Visual inspection		
Check free noiseless movement		
Inspection of hinges		
Inspection of controls		
Flap		
Visual inspection, check free noiseless movement Inspection of hinges and controls		
Wings anchor		
Visual inspection, cleaning, conservation Tightening of joint verifying		
Fuselage		
Visual check for loose rivets, skin deformations, crack or other damage		

Cockpit canopy		
Inspection of canopy latch		
Horizontal tail surfaces		
Visual check for loose rivets, skin deformations, crack or other damage		
Inspection of free noiseless elevator's movement Check elevators hinge		
Inspection of trim surface and control		
Inspect stabilizer attachment with vertical fin Check fiberglass ends of stabilizer		
Vertical tail surfaces		
Visual check for loose rivets, skin deformations, crack or other damage		
Inspection of free noiseless rudder movement Inspection of rudder hinges		
Check securing of hinges and bolts joint		
Cockpit		
Inspect proper function of choke control Inspect proper function of throttle control Inspect proper function of vent control Inspect proper function of propeller control		
Steering joystick		
Inspect free noiseless movement Inspect backlashes in the system Inspect securing of bolts		
Pedal steering		
Inspect strength of system		
Inspect securing of bolts		
Inspection for hydraulic brake system leak Inspection of rudder ropes condition and attachment		

Flap control		
Inspect free noiseless movement		
Pitot's tube		
Inspection for clean waterless undamaged condition		

Notes:

Date: **Signature:**

4.5 Periodical inspection after the first 50 hours

SERIAL NUMBER: **REGISTRATION:**	**FLIGHT HOURS:** **NUMBER OF STARTS:**

PRESCRIBED INSPECTIONS	**MADE BY**	**CHECKED BY**
Fuselage		
Inspection of fiberglass fairing between wing and fuselage for faultless condition		
Inspection of fiberglass fairing between fin and fuselage for faultless condition		
Inspection of spur for faultless condition		
Inspection of side windows of fuselage for faultless condition		
Inspection of ventilation system for proper function and condition		
Inspection of proper function and condition of canopy latch		
Inspection of condition and completeness of safety equipment, if it is installed		
Inspection of tires condition, inspection of rubber sealing of canopy.		
Inspection of canopy attachment		
Inspection of rivet lines of undercarriage beams		
Inspection of condition and attachment of accessories like antenna, strobe...		

Wing		
Visual inspection for loose rivets, deformations, cracks and other damages of construction including fiberglass parts.		
Inspection of wing hinges backlashes in fuselage attachment		
Inspection of condition and attachment of winglets Inspection of condition of position lights Inspection of condition of strobe lights		
Inspection of condition of landing light		
Visual inspection for loose rivets, deformations, cracks and other damages of construction including fiberglass parts.		
Ailerons		
Visual inspection for loose rivets, deformations, cracks and other damages of construction		
Inspection of free noiseless movement Inspection of hinge		
Flaps		
Visual inspection for loose rivets, deformations, cracks and other damages of construction		
Inspect free noiseless movement Inspect the hinge		
Inspect controls rods		
Empennage		
Horizontal tail surfaces		
Inspection of attaching and securing of horizontal tail surfaces		

Visual inspection for loose rivets, deformations, cracks and other damages of construction		
Inspection of fiberglass ends of stabilizer and its attachment		
Inspect free noiseless movement of the elevator Visual inspection of trim surface		
Visual inspection of trim surface's and elevator's control and their securing		
Vertical tail surfaces		
Visual inspection for loose rivets, deformations, cracks and other damages of construction including fiberglass parts.		
Inspection of rudder condition and attachment		
Inspection of lower rudder bushing and securing of lower hinge		
Inspection of upper rudder bushing and securing of upper hinge		
Inspect free noiseless rudder movement		
Inspect condition and rudder control ropes securing		
Controls		
Steering joystick		
Inspect free noiseless movement		
Check backlashes		
Inspect securing of bolts		
Inspect steering limits condition		
Steering pedals		

Inspect free noiseless movement Inspect backlashes in system Inspect securing of bolts		
Check the system limits conditions		
Inspect condition, pre-stress and securing of controlling ropes		
Inspect hydraulic brake system for leak		
Flap control		
Inspect free noiseless movement		
Inspect securing of bolts		
Inspect flap control handle and its position lock function Elevator's trim surface control		
Serve-control inspection		
Inspect system backlashes		
Inspect securing of trim surface hinge pin		
Verify neutral position of trim surface		
Inspect trim surface position indicator		
Equipment		
Verify its completeness and its validity of documentation		
Inspect Instrument panel condition and electrical connectors securing		
Inspect instruments connections and functionality		
Check condition and function of switches and fuses		
Inspect condition and function of throttle, choke controls, fuel valve, heating and ventilation controls Check the readability and completeness of labels		

Inspect conditions of safety and rescue equipment Inspect cleanness and conditions of upholstery Inspect seats condition		
Inspect safety belts attachments and belt's faultless condition		
Undercarriage		
Main undercarriage		
Main legs condition and attachment inspection		
Inspect level of lubrication and securing of moveable parts of the wheels.		
Inspect wheel's condition and its attachment		
Check tires wear, conditions and pressure		
Inspect wheel's disc for any signs of cracks or damage Inspection of undercarriage bolts tightening		
Inspect the wheel's free and noiseless rotation		
Verify brake system function		
Inspect brake system hoses for undamaged condition and its attachment		
Inspect brake's pad's level of wear and of the brake disc		
Inspect hydraulic brake system for leak from valves, connectors, cylinders. Exchange of brake liquid can be done.		
Inspect wheel's covers conditions and its attachment		
Front undercarriage		

Inspection of leg and its attachment point		
Inspect the shock absorbers condition and level of wear		
Inspect the front wheel disc for any sign of cracks or damages		
Inspect the bolts securing		
Inspect free noiseless rotation of the wheel		
Inspect the front wheel control system and its free movement		
Inspect the condition of control pushing rods and its securing		
Check the tore pressure and its faultless condition		
Fuel system		
Empty the fuel from wings Fuel filter exchange		
Inspect condition of fuel pump (seek for any signs of cracks) and of fuel hoses in engine's compartment Inspect fuel system for leak of fuel		
Fuel hoses connections inspection		
Propeller and engine		
Inspect according to Engine's and Propeller's manufacturer		
Disassembling of engine's cowlings and inspect their condition for sign of thermal damage, cracks, or other defects		
Inspection of tightening and securing of engine's frame bolts		
Inspect the engine's frame for any sign of cracks		

Inspection of exhaust system for any signs of cracks on tubes or welds		
Electrical system		
Inspection of battery's condition and its attachment Inspection of battery's voltage		
Check the connectors conditions and their securing Verify zero electrical resistance of connectors Pitot-Static systems		
Inspect the pitot-static system condition		
Inspect inlets of pitot-static tube for its cleanness and waterless condition		
Inspect pitot-static system for presence of condensate water – if so, remove it		
Inspection of pitot-static system connections with instruments and their securing		
Inspection of proper function of pitot-static tube		
Inspect the seal status of the system		
Heating and vents		
Inspection of cleanness of intakes		
Check the faultless condition of distribution's hoses		
Inspection of thermal exchanger condition and its attachment to exhaust system		
Navigation and communicative instruments		
Inspection of status		
Inspection of functionality		

Re-calibrate compensation of compass declination		

Notes:

Date: **Signature:**

4.6 Periodical inspection after the first 100 hours

SERIAL NUMBER: **REGISTRATION:**	**FLIGHT HOURS:** **NUMBER OF STARTS:**

PRESCRIBED INSPECTIONS	MADE BY	CHECKED BY
Fuselage		
Inspection of fiberglass fairing between wing and fuselage for faultless condition		
Inspection of fiberglass fairing between fin and fuselage for faultless condition		
Inspection of spur for faultless condition		
Inspection of side windows of fuselage for faultless condition		
Inspection of ventilation system for proper function and condition		
Inspection of proper function and condition of canopy latch		
Inspection of condition and completeness of safety equipment, if it is installed		
Inspection of tires condition, inspection of rubber sealing of canopy.		
Inspection of canopy attachment		
Inspection of rivet lines of undercarriage beams		
Inspection of condition and attachment of accessories like antenna, strobe...		

Wing		
Visual inspection for loose rivets, deformations, cracks and other damages of construction including fiberglass parts.		
Inspection of wing hinges backlashes in fuselage attachment		
Inspection of condition and attachment of winglets Inspection of condition of position lights Inspection of condition of strobe lights		
Inspection of condition of landing light		
Visual inspection for loose rivets, deformations, cracks and other damages of construction including fiberglass parts.		
Ailerons		
Visual inspection for loose rivets, deformations, cracks and other damages of construction		
Inspection of free noiseless movement Inspection of hinge		
Flaps		
Visual inspection for loose rivets, deformations, cracks and other damages of construction		
Inspect free noiseless movement Inspect the hinge		
Inspect controls rods		
Empennage		
Horizontal tail surfaces		
Inspection of attaching and securing of horizontal tail surfaces		

Visual inspection for loose rivets, deformations, cracks and other damages of construction		
Inspection of fiberglass ends of stabilizer and its attachment		
Inspect free noiseless movement of the elevator Visual inspection of trim surface		
Visual inspection of trim surface's and elevator's control and their securing		
Vertical tail surfaces		
Visual inspection for loose rivets, deformations, cracks and other damages of construction including fiberglass parts.		
Inspection of rudder condition and attachment		
Inspection of lower rudder bushing and securing of lower hinge		
Inspection of upper rudder bushing and securing of upper hinge		
Inspect free noiseless rudder movement		
Inspect condition and rudder control ropes securing		
Controls		
Steering joystick		
Inspect free noiseless movement		
Check backlashes		
Inspect securing of bolts		
Inspect steering limits condition		
Steering pedals		

Inspect free noiseless movement Inspect backlashes in system Inspect securing of bolts		
Check the system limits conditions		
Inspect condition, pre-stress and securing of controlling ropes		
Inspect hydraulic brake system for leak		
Flap control		
Inspect free noiseless movement		
Inspect securing of bolts		
Inspect flap control handle and its position lock function Elevator's trim surface control		
Serve-control inspection		
Inspect system backlashes		
Inspect securing of trim surface hinge pin		
Verify neutral position of trim surface		
Inspect trim surface position indicator		
Equipment		
Verify its completeness and its validity of documentation		
Inspect Instrument panel condition and electrical connectors securing		
Inspect instruments connections and functionality		
Check condition and function of switches and fuses		
Inspect condition and function of throttle, choke controls, fuel valve, heating and ventilation controls Check the readability and completeness of labels		

Inspect conditions of safety and rescue equipments Inspect cleanness and conditions of upholstery Inspect seats condition		
Inspect safety belts attachments and belt's faultless condition		
Undercarriage		
Main undercarriage		
Main legs condition and attachment inspection		
Inspect level of lubrication and securing of moveable parts of the wheels.		
Inspect wheel's condition and its attachment		
Check tires wear, conditions and pressure		
Inspect wheel's disc for any signs of cracks or damage Inspection of undercarriage bolts tightening		
Inspect the wheel's free and noiseless rotation		
Verify brake system function		
Inspect brake system hoses for undamaged condition and its attachment		
Inspect brake's pad's level of wear and of the brake disc		
Inspect hydraulic brake system for leak from valves, connectors, cylinders. Exchange of brake liquid can be done.		
Inspect wheel's covers conditions and its attachment		
Front undercarriage		

Inspection of leg and its attachment point		
Inspect the shock absorbers condition and level of wear		
Inspect the front wheel disc for any sign of cracks or damages		
Inspect the bolts securing		
Inspect free noiseless rotation of the wheel		
Inspect the front wheel control system and its free movement		
Inspect the condition of control pushing rods and its securing		
Check the tore pressure and its faultless condition		
Fuel system		
Empty the fuel from wings Fuel filter exchange		
Inspect condition of fuel pump (seek for any signs of cracks) and of fuel hoses in engine's compartment Inspect fuel system for leak of fuel		
Fuel hoses connections inspection		
Propeller and engine		
Inspect according to Engine's and Propeller's manufacturer		
Disassembling of engine's cowlings and inspect their condition for sign of thermal damage, cracks, or other defects		
Inspection of tightening and securing of engine's frame bolts		
Inspect the engine's frame for any sign of cracks		

Inspection of exhaust system for any signs of cracks on tubes or welds		
Electrical system		
Inspection of battery's condition and its attachment Inspection of battery's voltage		
Check the connectors conditions and their securing Verify zero electrical resistance of connectors Pitot-Static systems		
Inspect the pitot-static system condition		
Inspect inlets of pitot-static tube for its cleanness and waterless condition		
Inspect pitot-static system for presence of condensate water – if so, remove it		
Inspection of pitot-static system connections with instruments and their securing		
Inspection of proper function of pitot-static tube		
Inspect the seal status of the system		
Heating and vents		
Inspection of cleanness of intakes		
Check the faultless condition of distribution's hoses		
Inspection of thermal exchanger condition and its attachment to exhaust system		
Navigation and communicative instruments		
Inspection of status		
Inspection of functionality		

Re-calibrate compensation of compass declination		

Notes:

Date: **Signature:**

4.7 Lubrication plan

Unit	Area of Lubrication	After first 25 hours	Every 100 hours	Lubricant
Propeller	According to propeller's manual	X	X	---
Engine	Throttle control cable on the inlet into terminal (in the engine compartment).	X	X	Engine Oil
Engine	Choke control cable on the inlet into terminal (in the engine compartment).	X	X	Engine Oil
Landing Gear	Landing gear leg in the area of mounting	X	X	Pro-Long Grease
Landing Gear	Bearings	X	X	Pro-Long Grease
Landing Gear	All moveable joints	X	X	Pro-Long Grease
Ailerons	Hinges.	X	X	Pro-Long Grease
Ailerons	Rod end bearings of the control tubes.	X	X	Pro-Long Grease
Ailerons	Two-arm control lever in the wings.	X	X	Pro-Long Grease
Ailerons	Torque tube bearings in centre console in fuselage and wings.	X	X	Pro-Long Grease
Flaps	Hinges.	X	X	Pro-Long Grease
Flaps	Rod end bearings on actuators.	X	X	Pro-Long Grease

HTU	Elevator hinges.	X	X	Pro-Long Grease
HTU	Rod end bearing of the elevator control tubes.	X	X	Pro-Long Grease
VTU	Rudder hinges.	X	X	Pro-Long Grease
VTU	Cable shackles on the rudder control cables.	X	X	Pro-Long Grease
Trim tab	Tab hinges.	X	X	Engine Oil
Manual controls	All movable links in the cockpit.	X	X	Pro-Long Grease
Feet controls	All movable links in the cockpit.	X	X	Pro-Long Grease

4.8 After–flight inspection – maintenance
Maintenance of aircraft after each flight
Wash the aircraft and propeller with clean water without any cleaning additions. According to degree of staining, you can use cleaning additions for places like exhaust pipe, main undercarriage or wheel's covers. As cleaning additions you can use automotive one. Organic glass of the canopy had to be washed very carefully with plenty of water used forward to soften the rests of insect. Wash with soft and clean sponge without using strength. Drying drops of water can be removed by using wet deerskin. During washing procedure you can watch for condition of rivet lines, screwed joints, leading and trailing edges of aero-dynamical surfaces. For cockpit cleaning use vacuum cleaner. We suggest to provide visual check of intake's holes in engine's cowling providing air to engine's coolers. Founded obstacles remove carefully. After finishing cleaning of the aircraft, check fuel, oil and cooling liquid volumes. Re-fill if needed.

4.9 Maintenance Entries (access panels)
There are 7 installed maintenance entries on the aircraft. Two are placed on lower side of each wing, one at the end of the fuselage and last two on horizontal stabilizer.

4.10 Brakes
Installation guide for hydraulic brake system with closed brake circuit for 6" eco power brake wheels:

Type of brakes:
Single-disc with disc placed in the wheel, with single-piston brake valve, closed hydraulic circuit, one main brake cylinder with a 16 mm diameter on the control lever or two 14 mm cylinders on pedals.

Brake wheel installation:

The assembly of brake wheels is usually simple and trouble-free, providing the output diameter and length of the wheel shaft output, fastened to the aircraft leg, is predetermined. The wheels are supplied as a set and during assembly the wheel shafts including wheel and brake set are usually only inserted into pre-made (original) wholes. If dimensions are not arranged beforehand, it is necessary to adjust the aircraft leg to the dimensions according to the supplied shaft (usually the brake valves have a horizontal orientation with the piston in the backward direction).
Prior to inserting the wheel shaft into the aircraft leg, the brake disc must be placed in carrier pins inside the wheel and the brake valve needs to turned so the output for the brake hose is facing in the upward direction. The wheel set with brake and shaft prepared this way can be assembled to the aircraft leg and tighten the shaft nut by means of torque, according to leg type. The nut requires a securing pin, providing it is not self securing. The same method is applied for the assembly of the second wheel.
Note:
Disassembling the entire wheel set with brake is not necessary for changing a tire.

All that is required is to unscrew the front M14x1.5 nut and remove the wheel itself along with tire.

Installing the main brake cylinder:
The main brake cylinder is clamped to the control lever using a socket. It is tightened on the control lever in the forward direction in order to ensure a trouble-free grip - pressing the lever when braking as well as preventing the lever from interfering during flight and aircraft control. The main brake cylinders are assembled to pedals via designated holders found on the pedals, always in the upward direction. The holders shall be made individually, according to the type of plane and pedal area. Cylinders supplied for pedals are not modified any further.

Brake hose connection:
All brake hoses can be connected upon installing the wheels with brakes and the main brake cylinder(s). The supplied hose shall be connected to the main brake cylinder on the control lever. A "T" connector is screwed on the other end. Brake hoses are then stretched from this connector to the wheels. The 4x2 PA6 hose is fastened to the screw joint via a caulking ring. The hose is shortened perpendicularly and cleanly. The supplied brass hose insertion is inserted into the pipe. We then insert this hose into the follower nut of the screw joint and firmly tighten the nut. The tightening torque cannot be selected due to it being made of plastic, which can deform. Check the tightening after 10 hours of flight.

Venting - filling the brake system:
The filling of the system starts with the wheels, or brake valves. A pressure filling container is used for the filling process. If a pressure container is not available, the system can be filled using a physician's syringe, though this filling method is not easy and quality venting of the brake system is not ensured and could lead to impaired brake functionality.

! ATTENTION!
DOT 3 or DOT 4 automobile brake fluid is the only brake system filling permitted for use. Using other fillings will damage sealing elements!!

Filling:
Place the pressure container hose on the filling screw of the brake valve (pos. 1) and verify all other filling and venting screws are closed. Place the overflow hose on the venting screw of the main brake cylinder. The entire main brake cylinder needs to be removed from the control lever and the venting screw turned upward (pos. 2) in order to remove all air bubbles from the system. As soon as the main brake cylinder is turned, the venting screw can be released and the pressure container tap can be opened. The liquid begins to flow. The venting screw of the main brake cylinder shall be closed after air bubbles no longer appear and clean brake fluid begins to flow. The

filling screw is also closed at the wheel as well as the filling container tap. The same method is applied to fill the second wheel, or the brake of the second wheel. The functionality and parking brake efficiency are checked and a visual control of the hoses and their tightness and proper filling (air bubbles) is executed upon filling the entire system. The above described filling method concerns the main brake cylinder on the control lever. The same filling method is applied for the main brake cylinders on the pedals, the only difference being that the procedure is executed independently with each individual cylinder. The lever of the main cylinder for middle tunnel is filled in the same manner with the outputs also in the upward direction. The venting screws of all brake cylinders must be facing perpendicularly upward during the filling process.

Brake and brake system control and maintenance:
The closed brake system operates reliably and with minimum need of up keeping. A visual control of the brake system, leaking or other damage shall be executed prior to every start. Check the brake function when preparing for start. Do not start if you have any doubts. Perform the inspection again! In comparison with passenger cars, the wearing of brake pads does affect brake efficiency. Therefore it is necessary to check and set the clearance between brake pad and brake disc if you find the main brake cylinder step has excessively increased.

Setting the clearance of brake pads:
The clearance is adjusted by tightening the setting screw located on the opposite side of the piston (pos. 3). The adjustment is performed using an adjustment spanner supplied along with the brakes (a large screwdriver may also be used). The smallest clearance possible is set. The wheel should be able to rotate freely. The clearance decreases in the clockwise direction and increases in the counter clockwise direction.
Check the purity of the brakes if you experience improper functionality, though the adjustment and venting processes were

executed properly. The brakes shall not come into contact with substances such as lubricants or other greasy substances. Remove all other impurities.

!CAUTION!
The closed brake system is subject to small thermal expansivity during extensive temperature differences. This expansivity is significant primarily during the summer-winter, winter-spring transitions. Therefore we recommend inspecting the system or venting the system twice per year in order to maintain 100% brake functionality and eliminate undesired deceleration or a small brake effect.
The system shall also be checked for wearing as well as damaged tires which are an important part of the landing gear. A damaged tire shall be replaced with a new tire!

4.11 Installation with main brake cylinder on steering rod in Attachment Nb. 2
4.11 Installation with main brake cylinders on pedals in Attachment Nb. 2

5.0 REPAIRS

5.1 General

Due to operating of aircraft, damage can easily happened. Seriousness of damage is given by concerned parts, sort of damage, its size and frequency of incidence. Small repair can be done by owner, other only by authorized service. All kind of damages and its repairs had to be written down to aircraft operational documentation – see chapter 5

5.2 Metal skin repairs

Materials used:
duralumin 2024-T3

Thickness used:
2mm, 1,2mm, 1mm, 0,6 mm, 0,5 mm, 0,4 mm

Small cracks shorter than 5mm had to be stopped by drilling 1,5mm diameter hole placed at the tip-end of the crack.

Small holes smaller diameter of 4mm can be blinded by rivet. Small non-structural damage can be repaired by using a small frame and patch.

Frame and patch had to have same thickness as repaired skin. Patches smaller area then 50mm2 can be fixed by single perimeter line of rivets. Greater on needs to have double perimeter line of rivets. Before riveting the patch, all inner mating surfaces had to be painted. After riveting final paint can be used.

5.3 Riveting

We suggest providing such repair in authorized service center.

5.4 Fiberglass parts

Only small cracks and cranny of non-structural parts can be repaired by the owner/operator.

According to type of the defect – the damaged area is cut-out or just re-brushed. Paint in close area of repair had to be removed. In case of using fiberglass patch – use 40-50mm oversized one. During overlying the patches, apply bonding material at the same time. Two layers should be enough. For faster drying procedure, you can use warm air from some air-heater. In case of greater surfaces, you need to underlay repaired area by shaped pad covered with foil to avoid gluing. After drying, brush the surface, use filler if needed, and paint it.

5.5 Paint renovation

Small repairs can be performed by the owner/operator.

5.6 Re-assembly of the aircraft after any repair

In case of larger repair, following things have to be performed:

- Weight of aircraft before and after repair
- leveling of aircraft geometry, re-setting deflections of control surfaces
- Inspection of tightening bolts, their securing, backlashes in controls system or in control surfaces movement and inspection of electrical installation
- Engine test
- Flight test and resolution of any squawk.

5.7 Post-repair first flight

Test flight can be made by qualified licensed pilots and authorised to perform a test flight.

Flight test had to be done in following cases:

- After repair, or exchange aero-dynamical surfaces like wing, aileron, flap, horizontal stabilizer, elevator, rudder.
- In case of repair or exchange of undercarriage, engine, propeller
-

After such changes, the flight performances of the aircraft can be different. That's why flight test had to be done again. It will be rechecked handling and control during start, climb cruise, stall, descend and lading.
After finishing flight tests, the Test Flight Report has to be made.

5.8 Spare parts orders

Contact local authorized service center or manufacturer.

6.0 Appendix

Changes made on aircraft
All changes and additions are executed by Bulletins. It is owner's duty to write down provided changes to the table. Bulletins can be found on manufacturer websites.

Change	Bulletin	Date	Note	Signed
1	2008.001	15.7.2008	Wing system L1-11-00-00 Flap backlash check	Dova Aircraft s.r.o.

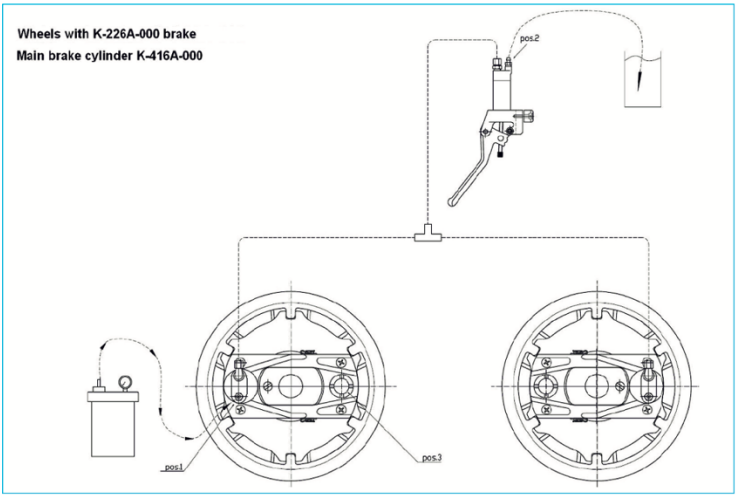
Repair records

All kinds of repairs, which were done on the aircraft, had to be written down (+ archive documentation from repair).

Repair #	Date	Part(s) Repaired	Repaired by	Signed
1				

Attachment NB2. Installation with main brake cylinder on steering rod, joystick and pedals.

Instalation with main brake cylinder on steering rod / joystick



Instalation with main brake cylinder on pedals