

# AIRCRAFT MAINTENANCE MANUAL

## FK 9 Mk IV / Mk V / Mk VI



Designed as Ultralight Aircraft according to

BFU 95 / LTF-UL 2003 / LFT-UL 2019  
Type Certificate: US-SLSA

Model:

FK9 Mk IV

FK9 Mk V

FK9 Mk VI

Serial Number:

Registration :

Date of manufacture:

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B & F Technik Vertriebs GmbH Speyer – Germany**

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Important service information/bulletins can be obtained from our service website. Check our website regularly as automatic update by mail is not assured.



#### **▲ WARNING**

**Before starting any maintenance activities, read the entire Maintenance Manual carefully, as it contains important safety-relevant information. Failure to do so may void warranty or cause serious personal injury or death!**

Please pay attention to the following reoccurring symbols, warning, caution and note, which you will find throughout the maintenance manual. These symbols/signs indicate special safety guidelines and therefore are of high importance.

**▲ WARNING:** Instructions, which if not followed, may cause serious injury or death.

**■ CAUTION:** This section describes an instructions which if not followed, may result in damage to the aircraft or could void warranty.

**○ Note:** Proposal for better handling, useful recommendations or durability

We appreciate critical observations, **suggestions**, ideas and other feedback concerning the maintenance manual. We would like to thank our customers and users, who have sent suggestions and requirements for further development.

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## **0. Introduction**

### **0.1. Revisions**

The owner/operator is responsible for keeping all pages of this manual to the revision status indicated in the table, by exchanging the relevant pages as and when a new revision is published.

For updates regularly check the technical service site of B & F Technik Vertriebs GmbH.

This revision information page shall be filed behind the checklist for amendments for about 6 month in order to get at a glance all the changes that became effective during this time.

<b>Index/Page</b>	<b>remove REV</b>	<b>insert REV</b>	<b>Remark / Reason for REV</b>
all	all	REV 2	several editorial changes due to authorities request
several	several	REV 3	several small changes, adding of Mk VI

### **0.2. Record of Revisions**

The fact of having inserted revised pages shall be confirmed in the list below.

<b>Revision</b>		<b>inserted</b>	
<b>No.</b>	<b>of</b>	<b>by ---</b>	<b>on</b>
FE	--	--	--
REV 1	1.Dec.2012	KR	1.Dec.2012
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REV 3	1.Dec 2020		

<b>Revision</b>		<b>inserted</b>	
<b>No.</b>	<b>of</b>	<b>by ---</b>	<b>on</b>



### **0.3. List of effective Pages**

**Date: 1. of December 2020**

<b>Page</b>	<b>Revision</b>	<b>Date</b>		<b>Page</b>	<b>Revision</b>	<b>Date</b>		<b>Page</b>	<b>Revision</b>	<b>Date</b>
0-1	Rev 2	01.11.13		0-2	Rev 2	01.11.13		0-3	Rev 2	01.11.13
0-4	Rev 2	01.11.13		0-5	Rev 3	01.12.20		0-6	Rev 3	01.12.20
0-7	Rev 3	01.12.20								
1-1	Rev 3	01.12.20		1-2	Rev 2	01.11.13		1-3	Rev 3	01.12.20
1-4	Rev 2	01.11.13		1-5	Rev 2	01.11.13		1-6	Rev 3	01.12.20
1-7	Rev 3	01.12.20								
2-1	Rev 2	01.11.13		2-2	Rev 2	01.11.13		2-3	Rev 2	01.11.13
2-4	Rev 2	01.11.13								
3-1	Rev 2	01.11.13		3-2	Rev 2	01.11.13		3-3	Rev 2	01.11.13
3-4	Rev 2	01.11.13		3-5	Rev 3	01.12.20		3-6	Rev 2	01.11.13
3-7	Rev 2	01.11.13		3-8	Rev 2	01.11.13		3-9	Rev 2	01.11.13
3-10	Rev 2	01.11.13		3-11	Rev 2	01.11.13		3-12	Rev 2	01.11.13
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4-1	Rev 3	01.12.20		4-2	Rev 2	01.11.13		4-3	Rev 2	01.11.13
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7-1	Rev 2	01.11.13		7-2	Rev 2	01.11.13		7-3	Rev 2	01.11.13
7-4	Rev 2	01.11.13		7-5	Rev 2	01.11.13		7-6	Rev 2	01.11.13
8-1	Rev 2	01.11.13		8-2	Rev 2	01.11.13		8-3	Rev 2	01.11.13
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10-1	Rev 2	01.11.13								
11-1	Rev 2	01.11.13		11-2	Rev 2	01.11.13				

## **1. General**

This manual must be read carefully by the owner and operator in order to become familiar with the maintenance of the FK 9 Mk IV and Mk V and Mk VI. The manual presents suggestions and recommendations to help obtain safe and maximum performance without sacrificing economy. **It does not replace procedures or limitations mentioned in the Pilot's Operating Handbook (POH)!**

The owner and operator should also be familiar with the applicable aviation regulations concerning operation and maintenance of his airplane.

All limits, procedures, safety practices, servicing, and maintenance requirements contained in this manual are considered mandatory to keep the airplane airworthy.

All values in this manual are based on ICAO Standard Atmosphere conditions and maximum take-off weight (MTOW).

The pilot in command shall make sure that the airplane is airworthy and operated according to this manual.

### **1.1. Equipment List**

The following shows a list of the standard equipment for the FK9 Mk IV and FK9 Mk V and Mk VI. A current list with optional equipment can be found on the FK-aircraft webpage. The ballistic recovery system (BRS) is not required by law in every country and is therefore not part of the standard equipment.

#### **Note:**

- For weight and balance it is mandatory to list all installed equipment.

#### Standard FK9 MK IV equipment:

- basic instruments: speed indicator, altimeter (5000ft), compass,
- slip indicator, oil pressure and oil temperature, cylinder head temperature (CHT), rpm indicator
- hydraulic disc brake 6" main wheel system with park lock
- fiberglass seats with two color upholstery
- oil-inspection cap integrated in engine cowl
- side air vents in both cockpit doors
- mechanical elevator trim, electrical flap position indicator
- 60l fuselage fuel tank with electric level indicator and drain vent
- electric fuel booster pump and fuel pressure warning
- single color white with standard decoration

#### Standard FK9 Mk V and Mk VI equipment:

- basic instruments: speed indicator, altimeter (5000ft), compass,
- slip indicator, oil pressure and oil temperature, CHT, rpm indicator
- hydraulic disc brake 6" main wheel system with park lock
- fiberglass seats with two color upholstery
- seatrests adjustable in position and angle
- oil-inspection cap integrated in engine cowl
- side air vents in both cockpit doors
- mechanical elevator trim, electrical flap position indicator
- 60l fuselage fuel tank with electric level indicator and drain vent
- electric fuel booster pump and fuel pressure warning
- additional pockets on both cockpit sidewalls
- electrically operated flaps
- luggage compartment with external access door
- additional aerodynamic fairing set for wing strut nose and intersections
- electric multi-information display (MID)

### 1.1.1. Placards

Refer to the respective POH

Location:	Placard:
In the Cockpit	max. TOW ..... kg spins and acrobatics prohibited
Cockpit	Weighing date: Empty weight: Position of fuel:
Cockpit rear seat (fuel selector)	typ. placard (m) OPEN / CLOSE
Fuel selector in flow direction	Fuel
Fuel selector closed position	Close
Aft baggage compartment	max. load 15 kg with 60L fuel
Choke (ROTAX only)	Choke
Carburetor heat	carb. (option)
Cabin heat	cabin heat (option)
Trim handle	Trim
Trim markings	Neutral; nose up; nose down
Oil temperature indication VDO	OIL
CHT indication VDO	CHT
Fuel cap (for Rotax Version)	FUEL AVGAS / MOGAS
Fuel indication	Markings every 10l
Vicinity of rescue system	placard Rescue system
Rocket Exit Area	Danger: Rocket Exit Area
safety pin rescue system	Remove before flight
Wheel fairings main wheels	2.8 bar
Wheel fairing nose wheel	1.8 bar
<b>Towing version only:</b>	
Vicinity of airspeed indicator	Care for tow speed !
Handle for cowl flap	Cowl flap
Handle for towing clutch	TOW

### 1.1.2. Instrument Markings

Airspeed Indicator: refer to respective POH

Engine Instruments: refer to respective engine manual

### 1.2. Sources to purchase Parts

Spare parts and service/support for all FK planes can be ordered from your local dealer or directly from:

B & F Technik Vertriebs GmbH Speyer  
Anton-Dengler-Str. 8  
D-67346 Speyer, Germany  
Tel.: +49(0)6232/72076  
Fax: +49(0)6232/72078  
Email: [service@fk-aircraft.com](mailto:service@fk-aircraft.com)

#### Note:

- Please use the relevant form to order spare parts.

All spare part orders are processed and delivered in the quickest possible time.

Ask your local dealer to maintain a spare parts inventory, it might be better and faster (especially outside Europe) to purchase orders from the local FK dealer.

### 1.3. List of disposable replacement parts

Description	Type
<b>Engine:</b>	ROTAX 912
oil	Shell Advance VSX 4
oil filter	Rotax 825706, gasket oil filter, gasket for oil drain
Air filter	Rotax 825551
spark plugs	Rotax NGK DCPR7E (80hp) NGK DCPR8E (100hp)
engine shock mount	Megi Konus
exhaust-muffler support spring	Rotax
coolant	Glysantin @ 50% mixing ratio
fuel filter	MANN WK 42/2
<b>Electric:</b>	
battery	Motorcycle battery 12V / 14Ah 12V / 16Ah, Hawker gel battery
fuses	Micro fuse 0,5- 8 A (delay action) generator blade type fuses 20 A
Landing light bulb	12V 50W
Tail light bulb	12V 5W
Strobe light bulb	12 V 30W (Xenon) not for LED
Position light bulb	12 V 5W
<b>Landing gear:</b>	
Nose wheel	Duro 4.00 x 4 minimum 4-ply
Main wheel	Sava 4.00 x 6 or 6.00 x 6 minimum 4-ply Tundra 8.00 x 6 minimum 4-ply
Tube nose wheel	4.00 x 4 with 90° valve
Tube main wheel	4.00 x 6 or 6.00 x 6 with 90° valve Tundra 8.00 x 6 with 90° valve
Disk brake	M.I. 42354-6
Brake pads	M.I 42176
<b>Fuselage:</b>	
Seat cover	FK-Lightplanes

### 1.4. Engine specifications

refer to the respective engine manual

Exhaust system (ROTAX):

The engine is delivered optionally with a Rotax steel or with a stainless steel exhaust system.

#### Note:

- Based on past experience, it is recommended to install the stainless steel system because of the durability of the product, especially in regions with high humidity.

#### CAUTION:

- A complete description of engines, parts, their maintenance requirements, performance and service bulletins can be found in the manufacturer's manuals or on the manufacturer's webpage.

#### 1.4.1. Power Plant Limitations

refer to the respective engine manual

#### Note:

- The following SB-912-036R1 has been issued for all ROTAX 912A / 912F / 912S / 914F engines:

Subject: Oil system, Engine lubrication system

Engines which have had the propeller spun for more than 1 turn in reverse direction allow air to be ingested into the valve train.

Action:

- It is forbidden to turn the propeller in reverse direction for more than 1 turn.
- Inspection for correct venting of the oil system has to be performed in cases when the propeller has been spun in reverse direction for more than 1 turn.

## 1.5. Weight and Balance

### 1.5.1. Abbreviations and Terminology

Reference Datum	An imaginary vertical plane from which all horizontal distances are measured for balance purposes
Arm	The horizontal distance from the reference datum to the center of gravity of an item
Moment	The product of the weight of an item multiplied by its arm
Airplane center of gravity (C.G.)	The point at which an airplane would balance if suspended. Its distance from the reference datum is found by dividing the total moment by the total weight of the airplane
C.G. arm	The arm obtained by adding the airplane's individual moments and dividing the sum by the total weight
C.G. limits	The extreme center of gravity locations within which the airplane must be operated at a given weight
Empty weight	Weight of the airplane including unusable fuel, full operating fluids and full oil; equipment as indicated

### 1.5.2. Basic Empty Weight

By using the following formula, the C.G. is computed. Reference line (datum) for all arms is the leading edge of the wing. Prior to delivery, each aircraft has been weighed with the fuselage level, (reference line see drawing below), including oil and coolant, as well as equipment as indicated but no fuel (except un-drainable fuel). During this procedure the respective arms are determined as well.

All these data are transferred to the Basic Empty Weight and Balance Form (German: *Wägebericht*). This "*Wägebericht*" contains a list of equipment installed and is part of the POH.

All changes to the airplane affecting weight and balance (installation of new equipment etc.) require a new weighing.

#### Formula to compute the center of gravity (X):

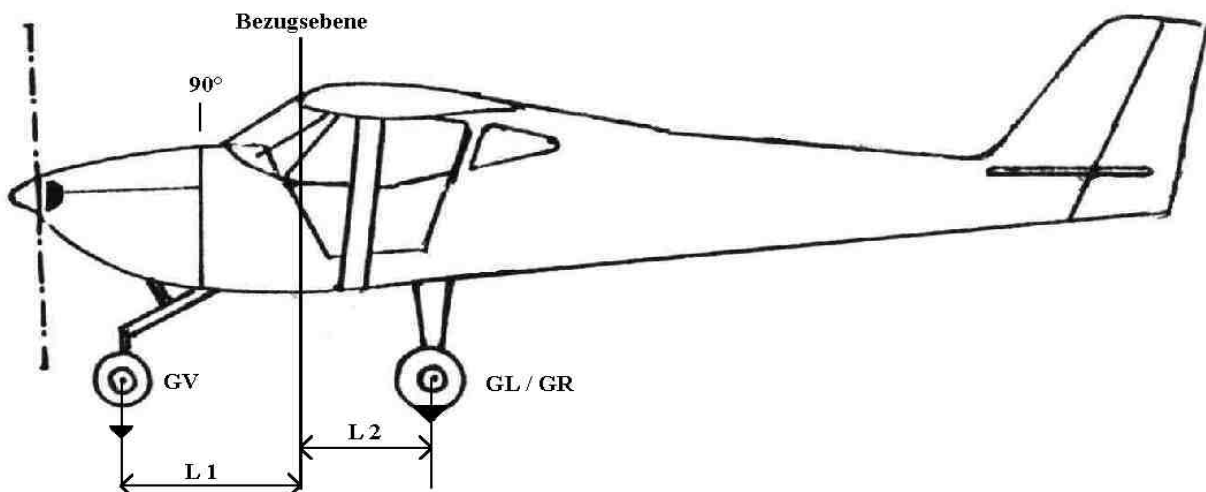
$$\text{Center of Gravity in [m]} \quad CG = \frac{\sum M}{\sum G}$$

GG = total weight  
GV = weight front  
GR = weight right  
GL = weight left

$$X[m] = \frac{-L1 \cdot GV + L2 \cdot (GR + GL)}{GG} \quad \text{Tricycle}$$

$$X[m] = \frac{(GR + GL) \cdot L1 + GH \cdot L2}{GG} \quad \text{Tail wheel}$$

GH = weight aft



**Arms (Datum: wing leading edge):**

See actual Form "Wägebericht"

For the tail wheel version, following applies:

L 1 = from datum to the axle of the main wheels

L 2 = from datum to the axle of the tail wheel

**1.5.3. Weighing**

The best place for the weighing is inside a hangar with a flat surface and no air current. The weighing should be performed as shown. For a correct result the plane should be rolled, if necessary over ramps onto the three weighing scales. It is very important that the plane is not lifted on the scales. By lifting the plane on the scales the lateral forces of the main gear spring can falsify the result. Once the plane stands on the scales, it must be checked if the firewall is perpendicular to the floor. By inserting a plate under the front or main wheels, the plane can be aligned correctly.



**CAUTION:**

- The plane must be secured with the park brake to prevent rolling.

**1.5.4. Required Tools**

- 3 x weighing scales (min. measuring range for each scales 200 Kg / 441 lbs.)
- if necessary ramps for the scales
- spirit level
- plummet
- tape measure

**1.5.5. Parts/materials required**

- None

**1.5.6. Level of maintenance**

- Line

**1.5.7. Certification required**

- A&P Mechanic or LSA Repairman Maintenance

## **1.6. Tire Inflation Pressure**

Wheel	Size	Pressure
Main	4.00 x 6, 6.00 x 6	2,8 bar
	8.00 x 6	41 psi
Front	4.00 x 4	1,8 bar 26 psi
Tail	125 / 150mm	

### **Note:**

- To improve the durability of the tires, you should avoid excessive solar radiation (UV radiation) as it causes premature ageing. It is recommended to examine the tires for wear marks during pressure checking.

## **1.7. Approved Oils and Capacities**

### **1.7.1. Oil**

refer to the respective engine manual

### **1.7.2. Fuel**

#### **Fuel capacity Option 1 Fuselage tank:**

- 2 x fuselage fuel tank 30l (7.92 US gal.) each, 60l (15.85 US gal.) total.

#### **Optional flexible Wing tanks (in addition to fuselage tank):**

- 2 x wing tanks 20l (5.28 US gal.) each, 76l (10.57 US gal.) total.

#### **Fuel capacity Option 2 Wing tank:**

- 2 x wing tanks 38l (10 US gal.) each, 76l (20 US gal.) total  
optional: Long range wing tanks 2 x 55l (14.5 US gal.) each, 110l (29 US gal.) total

### **▲ WARNING:**

- **The values include unusable fuel!**

#### **Fuel specification:**

Refer to the original corresponding chapter in the engine operator's manual.

#### Rotax engines:

AVGAS should only be used if MOGAS is not available or in case of problems caused by vapor locks.

- AVGAS 100 LL
- MOGAS
- premium unleaded automobile fuel without bioethanol (ASTM D4814)

#### Smart M160 engine:

- Unleaded fuel, **mandatory for M160 (smart)**
- Min. ROZ/ RON 95-Octane rating without bioethanol (unleaded fuel)

### **▲ WARNING:**

- **Restrictions apply for use of fuels containing methanol – see related service bulletin!**

### **1.7.3. Coolant**

approx. (ROTAX) 1.5l (0.4 US gal.)

delivered ex-factory with Glysantin Protect Plus/G48 from BASF® mixture with water 1:1

### **1.7.4. Brake Fluid**

FMVSS 116-**DOT4** - SAE J 1073

### **▲ WARNING:**

- Never mix brake fluids with different DOT ratings.
- Using DOT ratings not listed above can damage seals.

### **1.8. Recommended Fastener Torque Values**

The torque values set out in the table are ISO standards and should only be used as reference. All values should be used for any installation described in the maintenance manual, unless other values are specified.

**Note:**

- All bolts must be mounted up to down, inside to outside or front to back, unless design does not permit.

Metric Bolt Assembly Torque, Grade 8.8

Size	Wrench size mm	tightening torque in Nm	tightening torque in lbf ft.
M4	7	4	2.9
M5	8	6	4.4
M6	10	10	7.3
M8	13	24	16.9
M10	16	35	25.8

**CAUTION:**

- Never exceed the values set out in the tables as this will result in mechanical damage. Once you have re-opened any lock nut, it must be replaced with new nut. Never re-use lock nuts. Bolts or nuts without any self-locking property must be marked with thread locker.

### **1.9. General Safety Information**

This chapter deals with the procedures recommended for the safe maintenance operation of the FK 9.

**WARNING:**

- Ensure that the parachute system is always secured with the safety pin.
- Never leave the plane unattended with unauthorized persons especially when the engine is running.
- Use caution during taxi and engine run up. Note that a foreign object can come into the danger zone of the propeller at any time.
- Never perform engine run up with full throttle on smooth surfaces without wheel chocks.
- Ensure that the keys are removed and main switches and ignition switch are turned OFF during any work on the engine and propeller.

**Note:**

- The illustrations of this Manual show the typical construction. They may not represent in full detail or the exact shape of the parts, which have the same or similar function.

### **1.10. Instructions for Reporting**

Email to [service@fk-aircraft.com](mailto:service@fk-aircraft.com) the following information:

- Aircraft Make, Model, Serial Number
- Engine Make, Model, Serial Number
- Date of Inspection
- Total Time
- Airframe
- Engine
- Color
- Description of the un-airworthy items found
- Owner of Aircraft



## **2. Inspections**

### **2.1. Inspections**

Light Sport Aircraft (LSA) aircraft are designed to be lighter than normal aircraft but must withstand similar loads. The structure and the engine must be inspected regularly to maintain airworthiness.

If there is any damage it is recommended to consult a certified maintenance facility or contact the manufacturer. This applies especially to composite and aluminum structures.

#### **Note:**

- Weather or environmental influences may negatively influence the recommended intervals. The result is a reduction of the intervals.

#### **2.1.1. Required Tools**

- Set hexagon Allen wrench
- Set screwdriver
- Set metric ratchet wrench or set of metric combination wrench
- Torque wrench
- Oil filter wrench
- Side cutters
- Pliers
- Safety wire twisters

#### **2.1.2. Parts/materials required**

- Metric screws and nuts
- Loctite 243
- Safety wire
- Oil filter
- Gaskets
- Spark plugs

#### **2.1.3. Level of maintenance**

- Line

#### **2.1.4. Certification required**

- Owner, LSA Repairman Inspection, LSA Repairman Maintenance, A&P

### **2.2. General Advice**

- The vibration dampers at the engine mount should be treated regularly with Vaseline to prevent aging.
- Fuel lines, cables and Bowden cables must not be damaged.

#### **CAUTION:**

- For any maintenance or repair works first secure rescue system with safety pin and disconnect aircraft battery completely from electric system.
- Never turn the propeller for more than 1 turn in opposite direction (ROTAX engine)

**2.3. Regular Maintenance and Lubrication Schedule**

The following actions must be performed after certain flight hours or time intervals as applicable. There are some actions which must be done for the first time after the very first 2 / 10 / 25 flight hours. The regular maintenance intervals are 100 / 200 / 500 flight hours or every year / every 2 / every 4 years. Engine maintenance is not part of this manual, it must be performed additionally according to the respective engine manual.

Download the latest, valid updated version of the maintenance plan from the [FK-Service site!](#)

Item	Interval		
Check and tighten all engine connections (oil, coolant and fuel lines)	after the first 2 hours		
Check oil level			
Check cooling and brake system for leaks			
Check all screws	after the first 10 hours		
Check the screws (tight and secured) of the main gear beam to the fuselage			
Check the propeller for blade synchronization and wear at the spinner			
Item	100	200	500
Check engine vibration damper for cracks and wear	X	X	X
Treat the Bowden cables with Teflon spray	X	X	X
Check the screw connection of the main gear beam to the fuselage and gear-beam for no play	X	X	X
<b>Change screws every 1000 landings</b>			
Check the propeller for synchronization, proper connection and wear	X	X	X
Check flight controls for wear, lubrication and binding	X	X	X
Check the trim for proper operation, the mesh must be high enough to assure the trim does not move without pilots action	X	X	X
Check fuel system for leaks, contamination, dirt. Change the fuel filter	X	X	X
Check nose wheel damper for cracks and wear	X	X	X
Check tail wheel for cracks and wear. Check nose / tail wheel steering for wear, corrosion, lubrication	X	X	X
Item	100	200	500
Check flaps for no play when retracted	X	X	X
Check flap handle for correct position	X	X	X
Check tires for wear and tire pressure	X	X	X
Check brake system for wear; hydraulic disc brake only: check for leaks, <b>change fluid every 2 years</b>	X	X	X
Check elevator bearing bolts secured	X	X	X
ROTAX only: change carburetor flange (with air box change required every 200 hours)	X	X	X
After 500 hours total: check the rivets at the elevator	X	X	X
Air box: check all screws and mechanical parts tight	X	X	X
Change or clean air filter		X	
Check Bowden cables of carburetors for lubrication and wear; <b>replace every 400 hours</b>		X	
<b>Or every 2 years: replace engine vibration damper</b>		X	
Check rudder cables for wear			X
Check bearings of flight controls and flaps for wear / play			X
Check bolts for wear and corrosion			X
Check Ceconite covered parts for condition of the skin			X
<b>Or every 4 years: replace all rubber tubes for fuel, oil and cooling liquid</b>			X
Lubrication Schedule			
<b>Or every year: Bearings nose-/tail wheel steering</b>	X	X	X
Flight control linkage	X	X	X
Flight control bearings	X	X	X
<b>Or every year: Bolts</b>	X	X	X
Engine control cables	X	X	X

## **2.4. Hard Landing Inspection**

After a hard landing or any other abnormal strain on the landing gear, thoroughly examine all affected components and connection points. Damages can be detected after the accident or during the pre-flight checks.

### **Note:**

- An indication for an overload on the landing gear can be:
  - Abnormal taxi behavior
  - Propeller cone does not fit anymore to the cowling
  - Unbalanced alignment from wings to ground

### **2.4.1. Required Tools**

- Standard metric tools
- Torch light
- Inspection Mirrors

### **2.4.2. Parts/materials required**

- Only if a described part is damaged

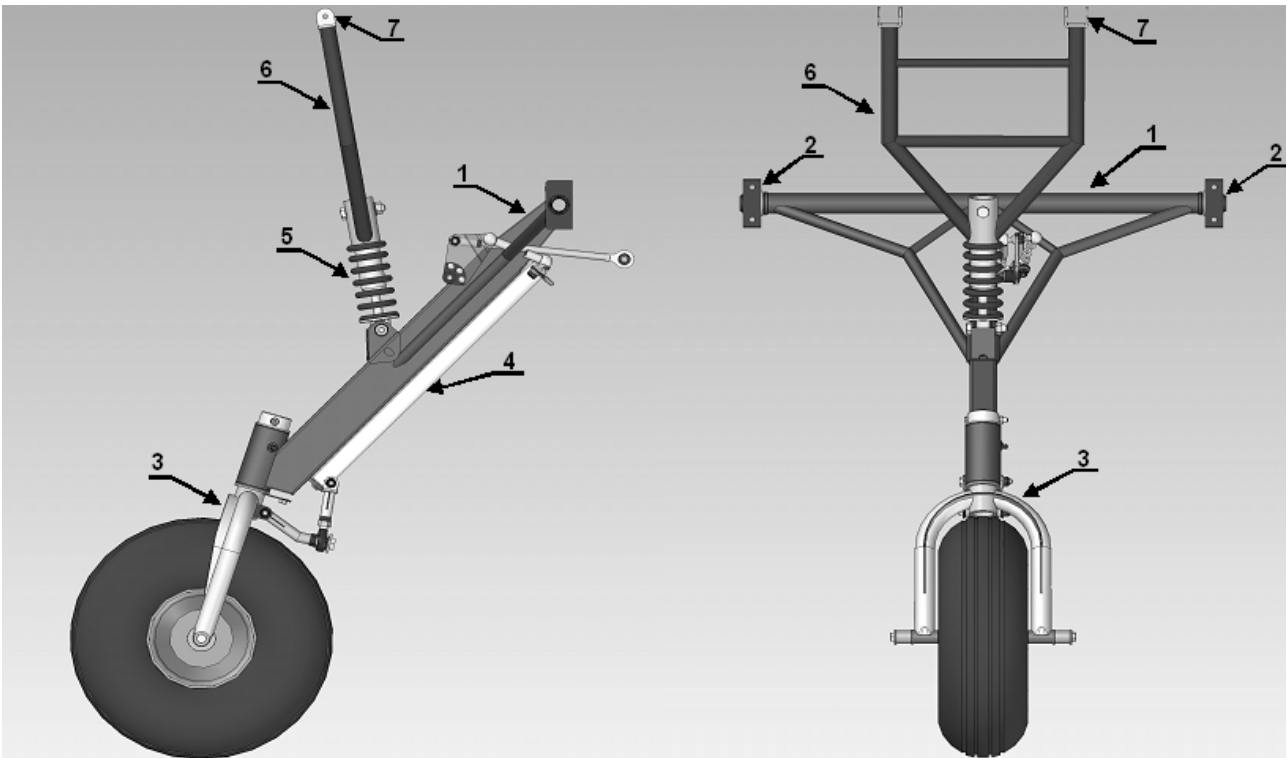
### **2.4.3. Level of maintenance**

- Line

### **2.4.4. Certification required**

- Owner, LSA Repairman Inspection, LSA Repairman Maintenance, A&P

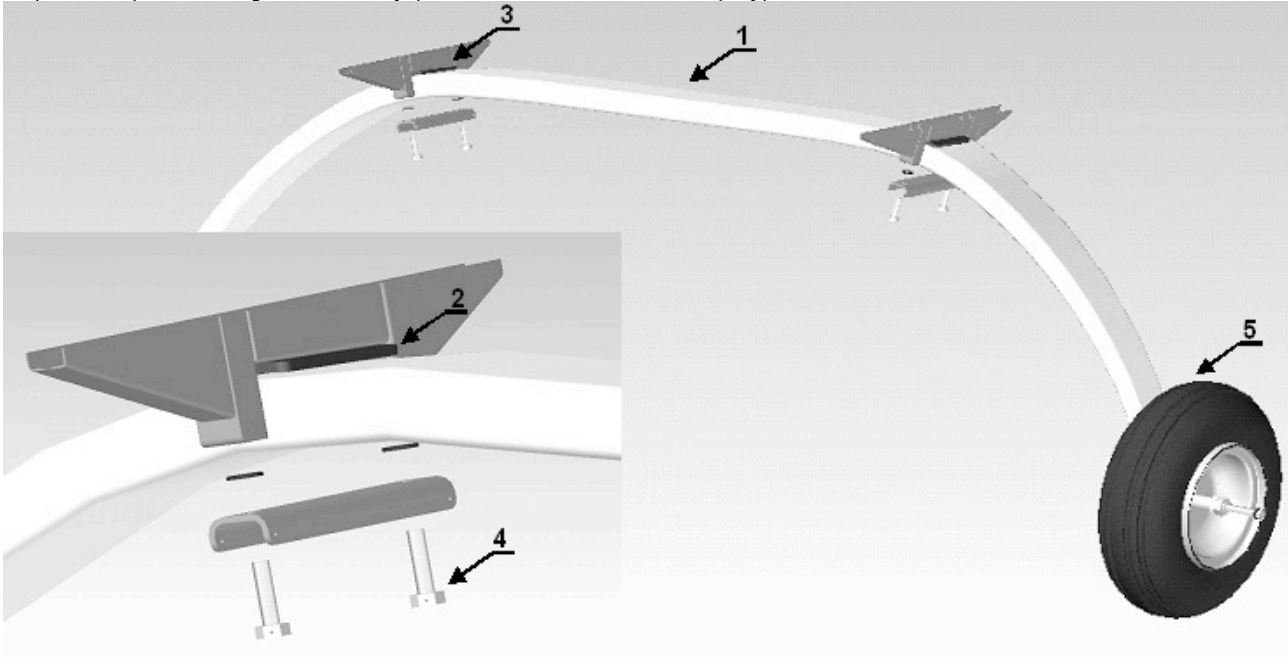
### **2.4.5. Nose landing gear**



Inspect the complete nose gear assembly (for cracks, deformation and play).

- Pos. 1: Inspect nose gear leg for cracks and deformation especially between the fitting (aluminum) for connection of nose gear-leg to fuselage.
- Pos. 2: Inspect aluminum fittings for connection of nose gear-leg to fuselage, Teflon-insert in aluminum fitting and surrounding structure, for cracks and deformation.
- Pos. 3: Inspect nose gear in the unloaded state, especially nose gear fork, tire radial run out, bearings and nose gear linkage. Check for cracks, deformation and increased play. See [Nose Gear FK9 TM-FK9/FK14#01-2009](#)
- Pos. 4: Inspect complete nose gear to pedals linkage in the unloaded state, especially the bell cranks. Check for cracks, deformation and increased play. See [Nose wheel steer play](#)
- Pos. 5: Check nose wheel shock-absorber and spring, for cracks, deformation or leakage.
- Pos. 6: Check nose wheel-strut to engine for cracks or deformation.
- Pos. 7: Check suspension point from nose wheel-strut to engine mount for cracks.

Inspect complete main gear assembly (for cracks, deformation and play).



Pos. 1: Inspect main gear spring for cracks deformation and position.

**Note:**

- Be aware that the composite main gear spring can collapse, due to their characteristics, long after the overload

Pos. 2 : Check if washer plates for main gear spring is in position.

Pos. 3: Inspect main gear spring attachment points and surrounding structure for cracks.

Pos. 4: Check if main gear spring screw M8x35 10.9 DIN 933 shows cracks or fracture.

Pos. 5: Inspect complete main wheel assembly, especially tire radial run out, bearings, main gear wheel axle and brake system. Check for, cracks, deformation, increased play and leakage.

In addition to mentioned inspections, carry out an inspection of the complete engine mount frame, engine shock mounts and engine mount frame attachment points on the firewall.

Furthermore, check the attachment points of the wings, wing struts and stabilizers to the fuselage for cracks, play and deformation.

## **2.5. Time between Overhaul (TBO)**

- For the main structure: none
- Recommendation:  
engine, propeller and rescue system: overhaul according to the respective manufacturer

## **3. Structures**

### **3.1. Ground Handling**

Park aircraft with the nose facing into the wind and secure by putting chocks in front of the wheels. To tie down the aircraft, attach long straps to the bolts connecting the wing to the strut and also tie down the nose/tail wheel.

Do not park aircraft in wet conditions or exposed to UV radiation for extended periods.

Always cover windscreen when parked to avoid smudging.

The FK 9 can be stored in a trailer. For details consult the manufacturer.

### **3.2. Cleaning**

#### **3.2.1. Required Tools**

- Vacuum cleaner
- Soft cloth
- Chamois leather

#### **3.2.2. Parts/materials required**

- Lukewarm water
- Cleaning agents normally used for automobiles
- Upholstery cleaning agents or mild laundry detergent

#### **3.2.3. Level of maintenance**

- Line

#### **3.2.4. Certification required**

- Owner, LSA Repairman Inspection, LSA Repairman Maintenance, A&P

#### **Note:**

- A clean surface is very important for aircraft performance. Keep the whole aircraft and especially the leading edges of the wings and propeller blades as clean as possible.
- Clean the airplane after each flight day.

#### **3.2.5. Painted Surfaces**

Before washing, cover the pitot tube prevent water incursion. Wet all painted surfaces with lukewarm water, use a soft brush, a soft sponge and non-aggressive (car) cleaning agents to soak the surfaces. After a short reaction time to loosen any dried-on dirt, rinse well with fresh water and wipe with a soft cloth or a microfiber cloth.

Once a year treat the painted surface with a silicon-free car polish or car wax after cleaning the plane.

#### **CAUTION:**

- Before polishing or waxing a new airplane, let the paint dry for one month to allow the maximum drying time.
- Polishing with machines can easily burn the paint.
- Never use corrosive cleaners.
- Never wipe on dry surfaces
- Repair paint damages immediately.
- Ceconite covered surfaces require special care.

### **3.2.6. Windshield and Windows**

The windshield and windows can be cleaned by washing it with lukewarm water and car or mild laundry detergents. Use a clean, soft cloth to soak the all surfaces. After a short soaking time to loosen any dried-on dirt, rinse well with fresh water and wipe clean with chamois leather.

#### **Note:**

- The polycarbonate (Lexa, Makrolon) windshield and windows cannot be polished. Only the optional Plexiglas front canopy can be polished with e.g. Acrylglas / PLEXIGLAS® Polishing & Repair Paste.

#### **CAUTION:**

- Never clean dry windshield and windows.
- Avoid any contact between Lexan or Plexiglas with aggressive fluids such as alcohol, fuel, brake cleaner or thinner.
- Do not wipe the canopy in circular movements.

#### **Note:**

- Cover the canopy with a cover sheet especially the polycarbonate (Lexa, Makrolon).

### **3.2.7. Engine and Engine Cowling**

Engine:

Refer to the respective engine manual

Engine Cowling:

Wet the inside of the cowling, use a soft brush or a soft sponge and a soft cleaning agents to soak. After a short reaction time to loosen any dried-on dirt, rinse well with fresh water and rub down.

#### **Note:**

- Leakages (e.g. oil circuits) will be easier to detect if the inside of the cowling is clean.

### **3.2.8. Upholstery and Interior**

Remove the floor mats. Vacuum the seats, and the carpet by using the proper attachment. Use a soft brush attachment to vacuum the dashboard. Use the same attachment vacuuming the seats. Upholstery covers and seat cushions can also be removed from the cockpit.

A number of upholstery cleaning agents available. Use them according to the instructions.

If you don't have an upholstery cleaner, a mild laundry detergent will work as well. Mix some detergent with lukewarm water and wipe the upholstery by using a cloth. Work harder on dirty areas. When finished, dry out well with a clean, soft dry cloth. You can clean the carpet the same way you cleaned the seats and upholstery.

#### **CAUTION:**

- Be careful not to damage the Nextel painting.
- Leather seats are susceptible to damage, be careful not to scratch them with the vacuum hose.
- Before treatment with upholstery agents test on an inconspicuous section.
- Be careful with water inside the cockpit - if the water gets into electrical components it may cause problems.

### **3.2.9. Propeller**

refer to the respective propeller manual

#### **WARNING:**

- Ensure that the keys are removed and main switches and ignition switch are turned **OFF** during any work on the engine and propeller.

Wet the propeller blades and the hub, use a soft brush or a soft sponge and a soft cleaning agents to soak the blades. After a short reaction time to loosen any dried-on dirt, rinse well with fresh water and rub down

### **3.2.10. Wheels**

Wet the tires, use a soft brush or a soft sponge and a soft cleaning agents to soak the tires. After a short reaction time to loosen any dried-on dirt, rinse well with fresh water and rub down.

### **3.3. Wing & Struts Removal / Installation**

#### **3.3.1. Required Tools**

- activator **only** for ext. mechanism

#### **3.3.2. Parts required**

- None

#### **3.3.3. Level of maintenance**

- Line

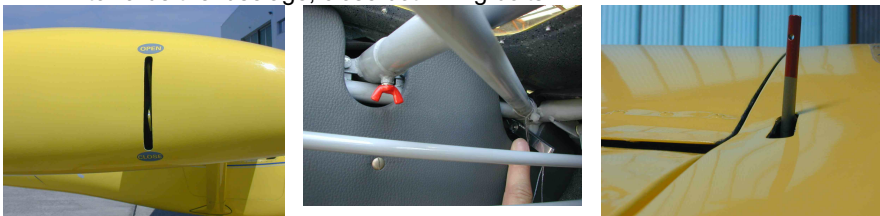
#### **3.3.4. Certification required**

- Owner

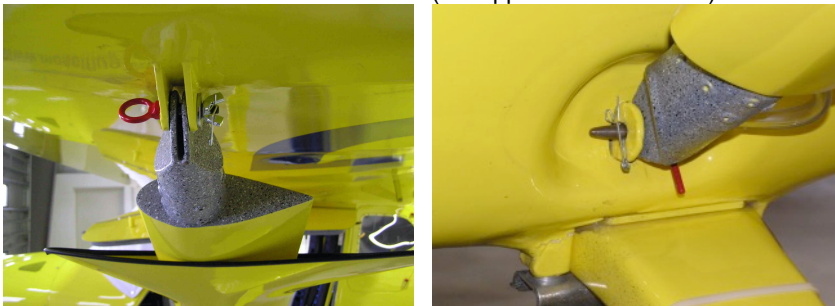
#### **3.3.5. Instructions**

Assemble the aircraft as follows:

- Check all parts for damage
- Check fuselage and wings for loose or foreign objects
- Connect the wings to the fuselage (doors must be removed or closed)
- **IMPORTANT** for wing assembly:  
unfold the wing with the leading edge facing downwards; turn the wing into its normal position and push it towards the fuselage; close both wing bolts



- Install the strut with its two bolts (the upper one is screwed)



- Cover the gap between wing and fuselage with tape for better aerodynamics
- Secure all bolts
- Install the other wing in the same manner
- The storing device at the aft fuselage can now be removed
- Mount the outer parts of the elevator
- Connect and secure the rods for aileron and flaps
- Connect the pitot tube line
- Install the doors
- Install the strut covers (if available)
- Check the function of all flight controls and flaps



To disassemble the aircraft follow above mentioned steps in reverse order, observe the following steps.

- If required, remove the elevator tips
- install the storing device for the wings at the aft part of the fuselage
- Note: the screws at the main tube of the folding mechanism (overhead the pilots) are the stop for the folding mechanism; they must only be removed if it is intended to detach the wings completely from the fuselage
- to fold the wing:  
pull the wing outside until the stop, turn it 90° (the leading edge facing to the ground), now fold it and store it into the device

### **3.4. Fuselage Interiors**

#### **3.4.1. Required Tools**

- Standard metric tools

#### **3.4.2. Parts required**

- None

#### **3.4.3. Level of maintenance**

- Annual Aircraft Inspection

#### **3.4.4. Certification required**

- LSA Repairman Maintenance

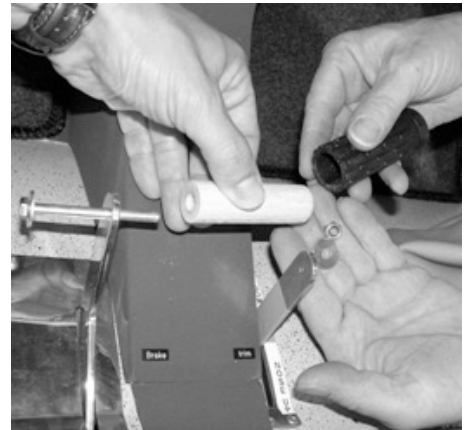
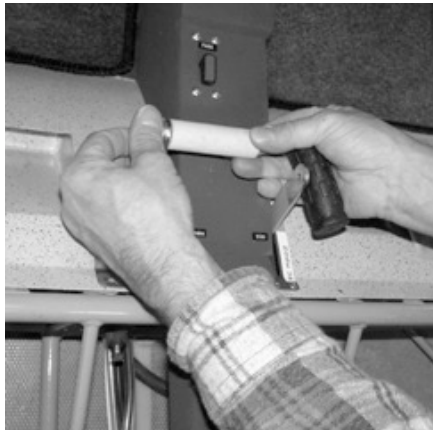
#### **3.4.5. Dismantling interiors and seats**

Here shown on version Mk IV – other versions may have small design differences

Front console removal

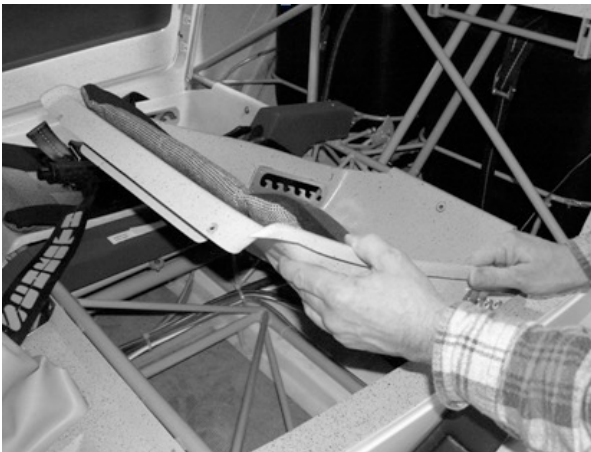


Unscrew activator handles for brakes and trim

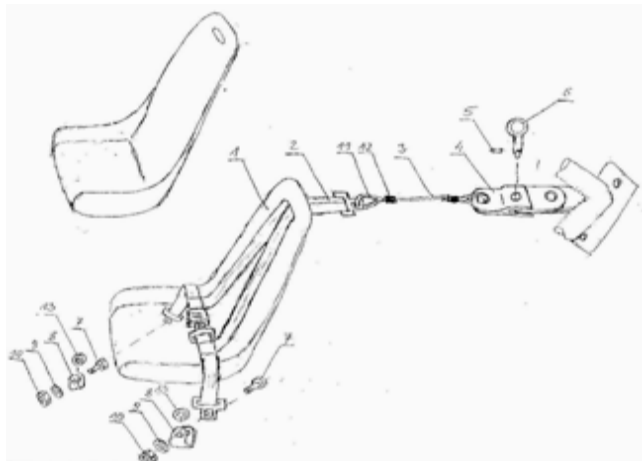


The seats can be taken off their holds by unlocking its screws to give easy access to the baggage compartment (Mk IV) as well as for inspection of the aft fuselage. Ensure that the seats are firmly replaced in their holds afterwards. The 4-point seatbelts can be adjusted to fit every size. The lock is released by pressing the red button.

Remove upper seat part, unscrew and remove lower section



Note: scheme shown as for Mk IV





### **3.5. Landing Gear**

#### **3.5.1. Landing Gear Description**

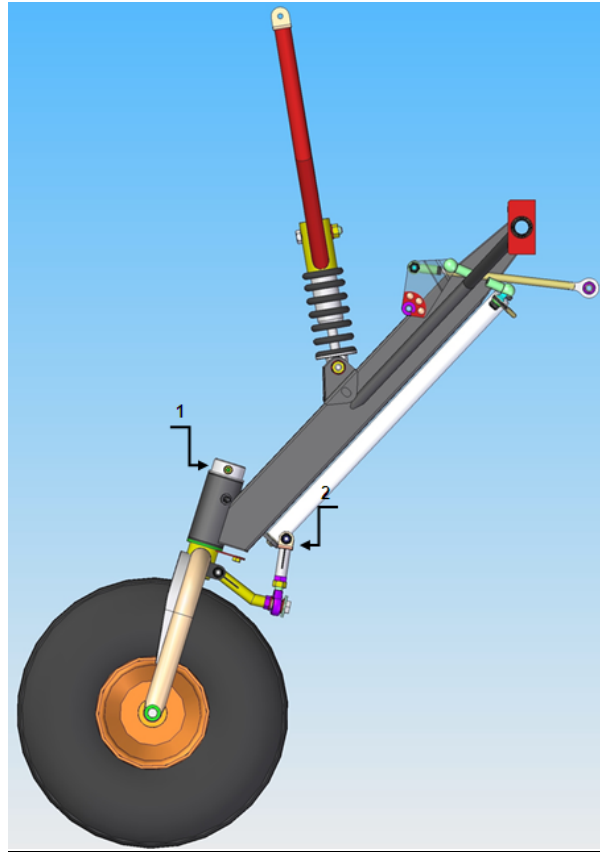
The FK9 is available in nose- and tail wheel configuration. Both version have a hydraulic disc brake system. The main landing gear is an one peace multi-layer sandwich construction which has spring characteristics. Wheels are available only with tubular tires

##### **Nose Gear Version (TG):**

The FK9 has a fixed, tricycle type landing gear, with a steerable nose wheel, which is connected to the left rudder pedal.

The nose wheel has a shock absorber with hydraulic damping and adjustable spring.

Nose wheel size is 4.00 x 4, main wheel size is 4.00 x 6. Aerodynamic wheel pants are available for the nose and main wheels.



##### **Tail wheel (Classic) Version:**

The taildragger version has a steerable tail wheel, which is connected to the rudder cables. The tail wheel support is a multi-layer sandwich construction which has spring characteristics. Aerodynamic wheel pants are available for the smaller wheels.

#### **3.5.2. Required Tools**

- None

#### **3.5.3. Parts/materials required**

- None

#### **3.5.4. Level of maintenance**

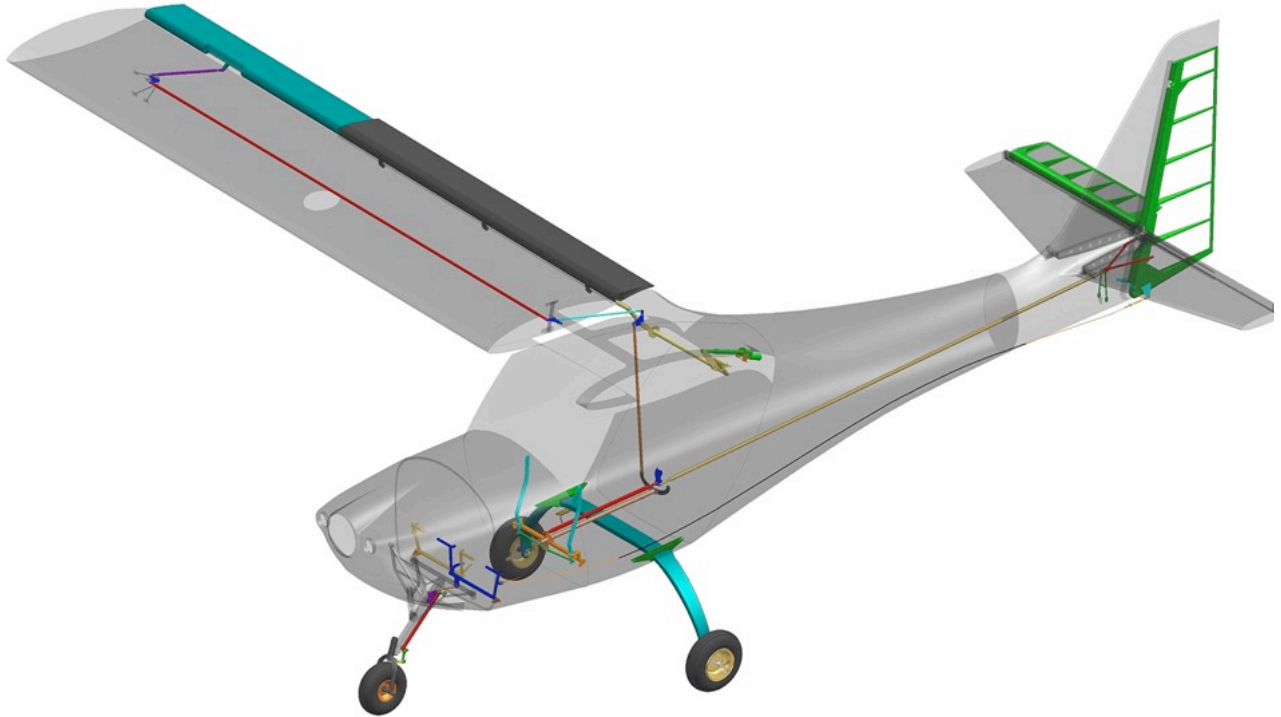
- Line

#### **3.5.5. Certification required**

- Owner

### **3.6. Flight Controls**

#### **3.6.1. General**



#### **3.6.2. Required Tools**

- Standard metric tools

#### **3.6.3. Parts required**

- None

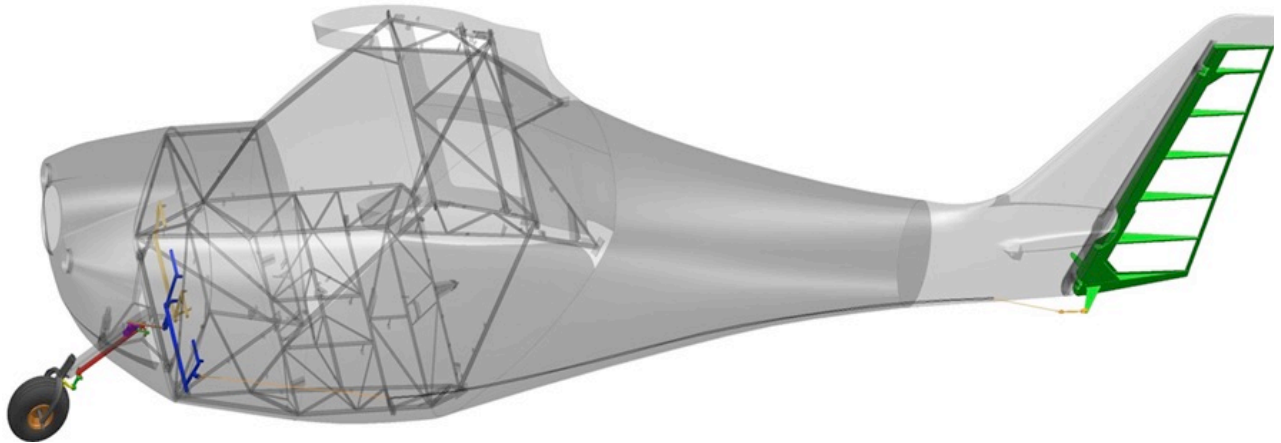
#### **3.6.4. Level of maintenance**

- alteration or maintenance, minor repair and Aircraft Inspection

#### **3.6.5. Certification required**

- A&P Mechanic

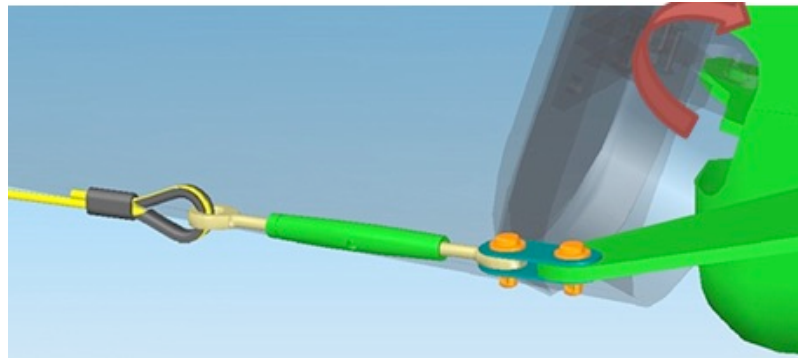
### 3.6.6. Rudder



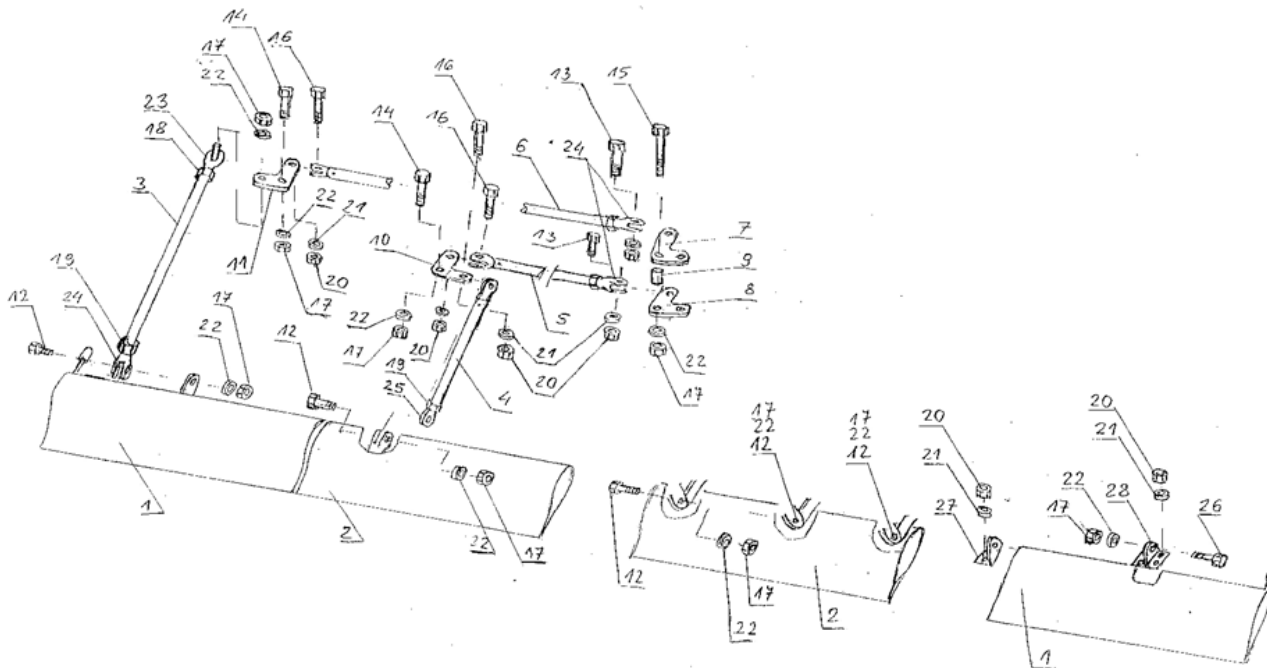
Rudder and nose wheel control is served by dual rudder pedals.

The rudder is served by cables, the nose wheel is controlled by a push pull rod connected to the left pedal.

The rudder is mounted to the vertical fin by two hinges and is secured by two bolts with split pins (cotter pins).

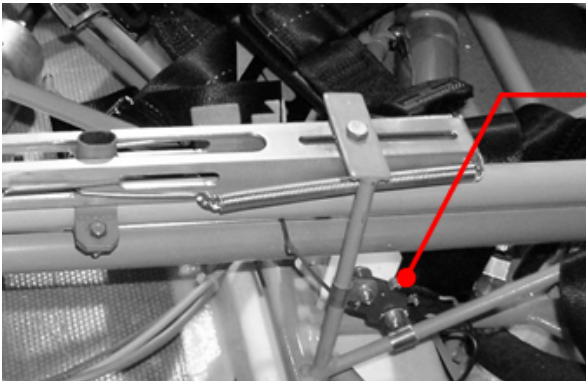


**3.6.7. Flaps and ailerons**



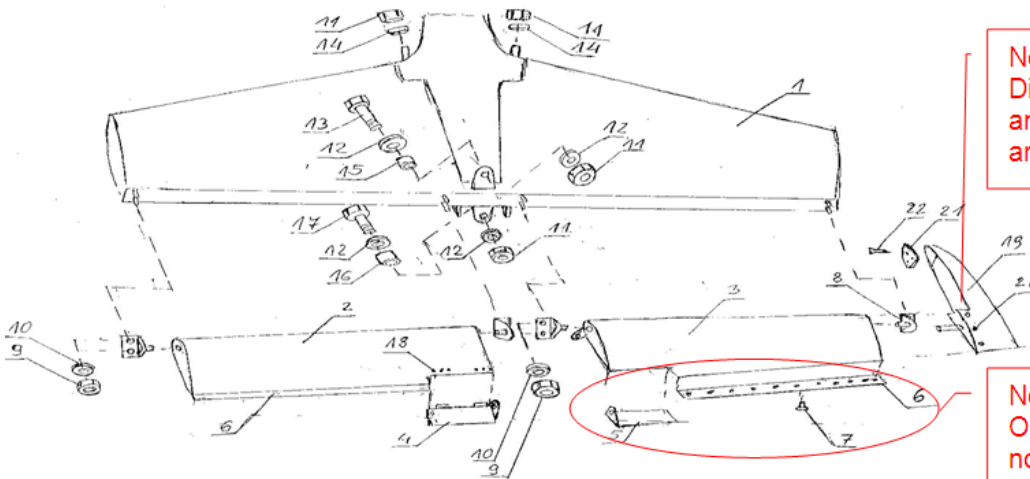
Note; scheme as shown for Mk IV

**Pickup for flap position indication (Mk IV)**



Note:  
in case of malfunction of the flap indicator  
lights, check the electric contacts in the  
control system.  
Keep the safety belts clear of them!

### 3.6.8. Elevator

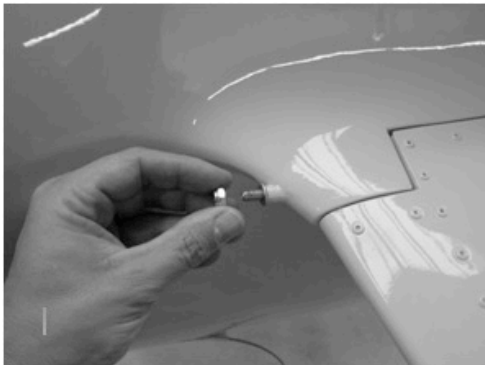


Note:  
Dismantle regularly  
and check for worn  
areas!

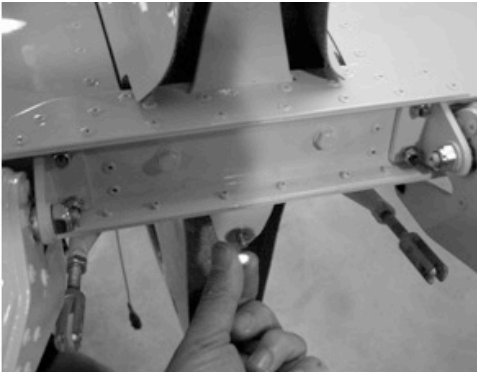
Note:  
On Mk IV/V version  
no antitab or trim  
trailing edge is used!

#### dismantling of tailplane

To dismantle the elevator, first remove the rudder.  
Disconnect cables and hinge bolts of the rudder so the rudder can be taken away.  
Then dismantle elevator:



Remove nuts  
in front of and  
behind the  
elevator



Make sure washers will  
remain on correct position  
for later reassembly!



### **3.6.9. Trim System**

#### **Aileron & Rudder Trim:**

Ground-adjustable trim tabs are mounted on both ailerons and on the rudder.

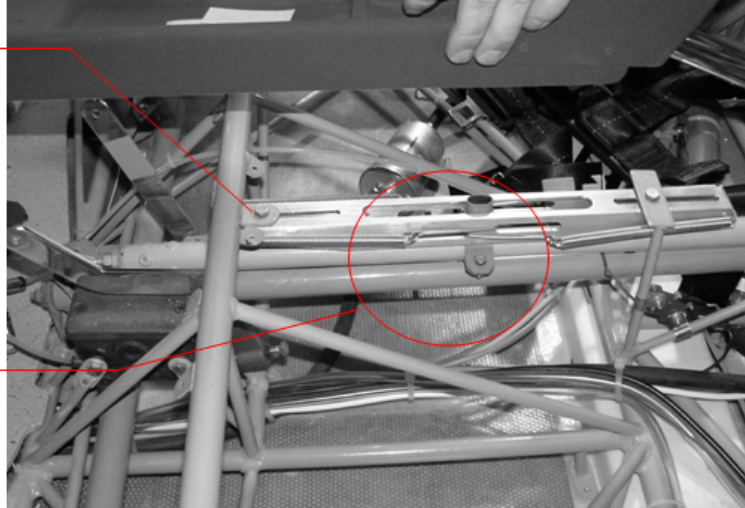
#### **Elevator Trim:**

The elevator has an in-flight, adjustable spring trim. The spring trim determines the neutral position of the elevator by springs whose tension can be adjusted by a control lever on the middle console. The neutral position is marked in green, moving the lever forward the aircraft will be trimmed nose down and by moving the lever back the aircraft will be trimmed nose up.

Friction of trimsystem can be adjusted by tightening this screw

**note:**  
scheme as shown for type MkIV

Check always for correct travel of center-pin and proper lubrication



### **3.7. Control Surface Deflection**

for control surface deflection values and tolerances refer to POH

### **3.8. Jacking / Towing / Storage**

#### **3.8.1. Jacking**

##### **CAUTION:**

- As a general rule, apply force to aircraft structure only on main structural elements such as frames, ribs or spars.

Use following points for jacking:

1. lower engine mount where connected to the fuselage or engine mount junctions (hanging up)
2. main gear beam where connected to the fuselage
3. nose/tail wheel where connected to the fuselage

For towing (forward only), connect the rope to the main gear.

To stow the dismantled wings, use storage tools with a minimum contact area of 150mm. The leading edge should have no contact to the storage tool in the first 20mm.

**For long distance transport in truck, trailer or container the following dismantling and storage procedure is recommended:**

- Dismantle airframe including wings, tailplane.
- Secure controls
- Dismount wheel fairings to avoid damages
- Dismantle propeller
- Disconnect electric circuits, dismantle fuses and battery
- De-install shock-sensitive avionics (radio/transponder/glass panels) and pack in upholstered boxes

Additional for road transport in trailer or truck:

- Remove liquids (oil system/cooling system)

Additional for air transport:

- Remove complete engine (considered as hazardous good for airfreight!)

#### **Reassembling the aircraft for operation:**

Proceed according to assembly checklist.

### 3.8.2. Towing

**▲ WARNING:**

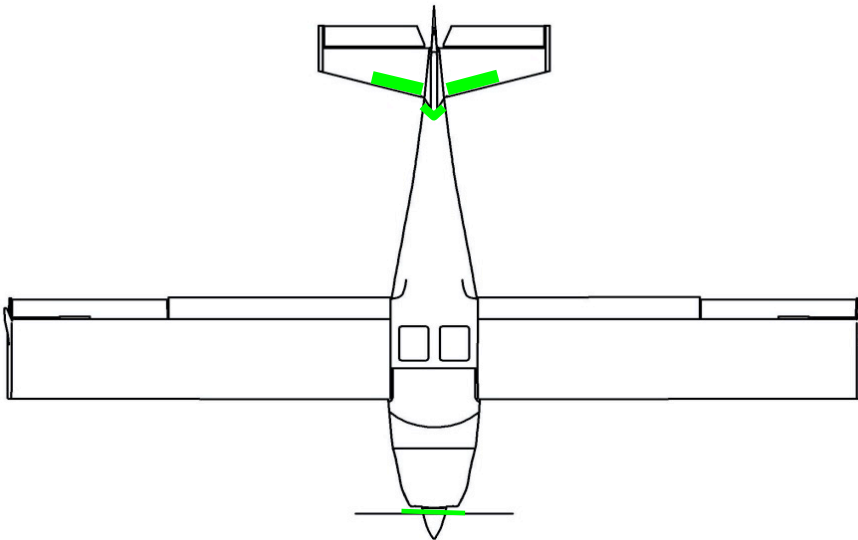
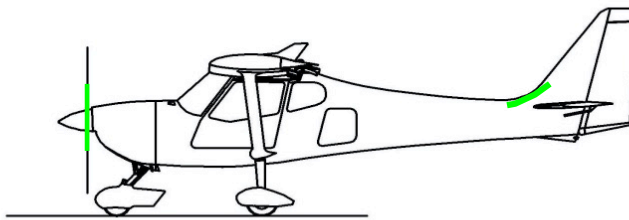
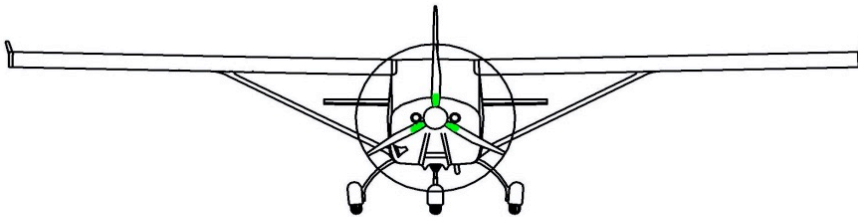
- Ensure that the keys are removed and main switches and ignition switch are turned **OFF**.

**○ Note:**

- Motorized towing is not recommended.

**■ CAUTION:**

- Do not push or pull on control surfaces to move the aircraft.
- Do not steer the aircraft by moving the nose wheel faring.
- Do not apply excessive pressure and point loading to the fin, the leading edge and the surface of the horizontal stabilizer
- Attention when towing on wet, frozen or snowed soil and weather conditions.



For towing we recommend to use a hand tow bar which is connected to the nose gear axle of the aircraft. Push or pull with one hand on the propeller blade in close proximity to the propeller cone and with the other hand steer the plane with the tow bar. A tow bar may be used to tow the aircraft over long distances

The aircraft can also be towed by pressing down with one hand the leading edge of the fin (vertical stabilizer) to the tail plane and with the other hand on the tail plane. The nose wheel will rise off the ground and allow easy steering over the main wheels.

### **3.8.3. Flyable Storage**

Flyable storage is defined as a maximum of 30 days non-operational storage.

#### **CAUTION:**

- Do not set the parking brake as brake seizing can result. Secure the aircraft with wheel chocks

Ensure that the engine has been stopped by turning off the fuel valve, so as to not leave any fuel in the carburetor bowl.

#### **Note:**

- We recommend that aircrafts be stored only when clean and dry.
- We recommend that aircrafts be stored in a dry, clean and climate-controlled hangar.
- Placing a vapor barrier plastic sheet on the floor under the aircraft if being stored indoors, will prevent water vapor buildup in an unheated hangar. It also makes it very easy to spot fluid leaks when the aircraft returns to service.
- Check fuel tanks and fuel system for moisture once a week (especially when stored outside).
- Cover windshield and windows.

Turn the propeller through 5 revolutions every 7 days without running the engine.

Aircraft stored outside must be secured sufficiently at the corresponding tie-down points. In addition, the pitot tube, static air vents, air vents, openings in the engine cowling, and or similar openings should have protective covers to avoid the possibility of any contamination.

Covers offer good protection against influences from the environment and weather. If you use a cover, we recommend covers which are ventilated and allows water vapor to escape.

#### Returning Aircraft to Service:

After flyable storage, returning the aircraft to service is ensure by performing a thorough pre-flight inspection. Ensure all protective covers are removed.

### **3.8.4. Temporary Storage**

Temporary storage is defined as aircraft in a non-operational status for a maximum of 90 days.

#### **CAUTION:**

- Do not set the parking brake as brake seizing can result. Secure the aircraft with wheel chocks

In addition to the flyable storage we recommend:

- Fill fuel tanks to prevent moisture accumulation.
- Clean and apply a protective layer of wax, polish thoroughly. This will help to keep out corrosion.
- Rotate wheels every 30 days, this keeps the bearings from sticking as well as change the pressure point on the tires.
- Remove battery and store in a cool dry place, Service the battery periodically and charge as required
- Cover windshield and windows.

#### Inspection During Storage:

- Inspect airframe and all movable parts, if necessary lubricate moving parts/joints.
- Remove dust regularly and clean surfaces if necessary.
- Check fuel tanks and fuel system for moisture once a week (especially when stored outside).

#### Returning Aircraft to Service:

After temporary storage, returning the aircraft to service is ensured by performing a thorough pre-flight inspection. Ensure all protective covers are removed.

In addition it is recommended to:

- Check tire pressure.
- Check brakes and braking force.
- Check remaining battery power, charge if necessary and install.
- Check oil, air and fuel filter, replace if necessary.
- Check oil quantity refer to the engine operator manual.
- Check fuel tanks and fuel system for moisture and drain more than usual.
- Check fuel tank breather if it is working properly.



### **3.8.5. Indefinite Storage**

**CAUTION:**

- Do not set the parking brake as brake seizing can result. Secure the aircraft with wheel chocks

In addition to the temporary storage we recommend:

- Cover the instruments panel.
- Cover the seats.
- Completely empty the luggage compartment.

Inspection During Storage:

- Inspect airframe and all movable parts, if necessary lubricate moving parts/joints.
- Remove dust regularly and clean surfaces if necessary.
- Check fuel tanks and fuel system for moisture once a week (especially when stored outside).

Returning Aircraft to Service:

After indefinite storage, perform a thorough pre-flight inspection before returning the aircraft to service. Ensure all protective covers are removed.

In addition we recommend:

- Carry out at least a 100-hour inspection.
- Check tire pressure.
- Check brakes and braking force.
- Check remaining battery power, charge if necessary.
- Check oil, air and fuel filter, replace if necessary.
- Check oil quantity, refer to the Rotax operator manual.
- Check fuel tanks and fuel system for moisture and drain more than usual.
- Check fuel tank breather if it is working properly.

## **4. Engine**

Refer to the engine manufacturer's manual.

### **Note:**

- All Rotax engines in the FK9 are non-certified engines that meet ASTM F-2339 engine standard.

### **4.1. Inspections**

- Refer to the corresponding chapter in the engine manufacturer's manual.

#### **4.1.1. Required Tools**

- Refer to the corresponding chapter in the engine manufacturer's manual.

#### **4.1.2. Parts required**

- Refer to the corresponding chapter in the engine manufacturer's manual.

#### **4.1.3. Level of maintenance**

- Refer to the corresponding chapter in the engine manufacturer's manual.

#### **4.1.4. Certification required**

- Refer to the corresponding chapter in the engine manufacturer's manual.

## **4.2. General**

The engine cowling can easily be removed for maintenance and checks. Oil and coolant can be checked by opening a small cap on the right upper part of the cowling.

### **Note:**

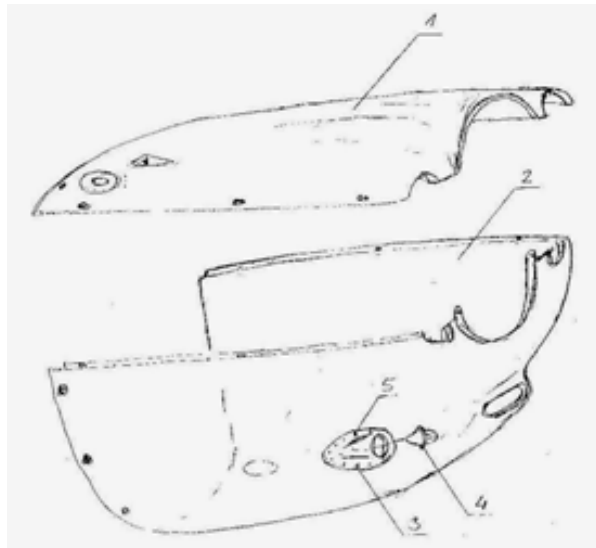
- Optional landing light must be disconnected before removing the lower cowling.

### **engine cowl**

The lower engine cowl is different with respect to water-cooler-air inlet size for type Mk IV and Rotax 912-S "towplane" version.

FK9 Mk V / Mk VI version has a different cowl and air inlets!

**note:**  
picture shows Mk IV (ROTAX engine)



**Overview of engine installation and engine systems (ROTAX)**

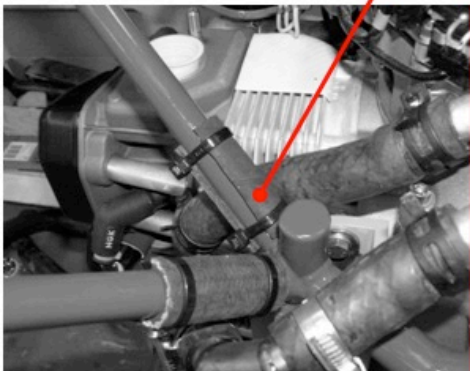
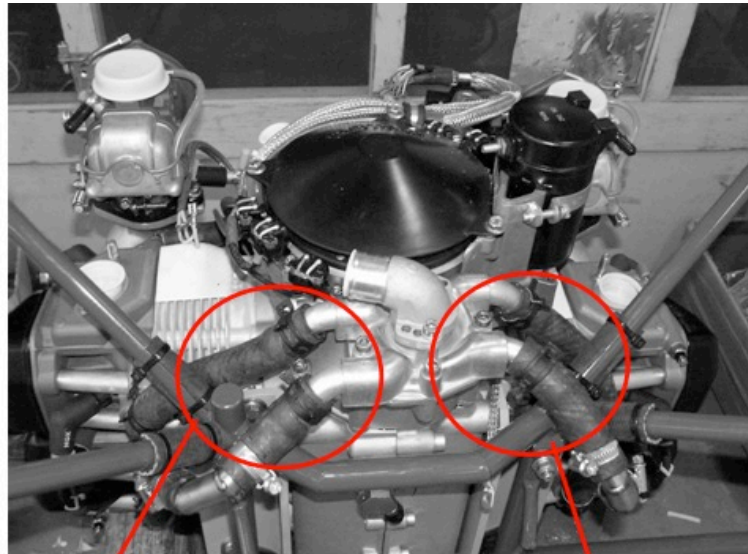


Important note:  
engine and all connected systems and parts  
should be clear from aircraft cowl, engine mount  
or any fixed aircraft structure, especially with  
engine running!

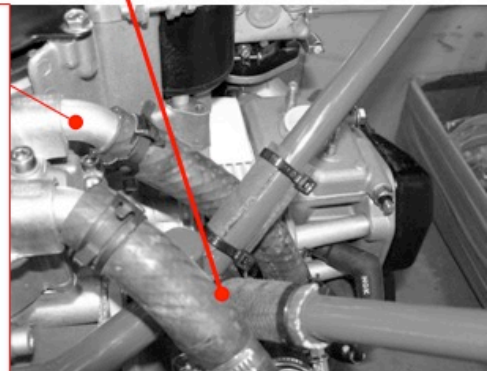
pictures show type Mk IV



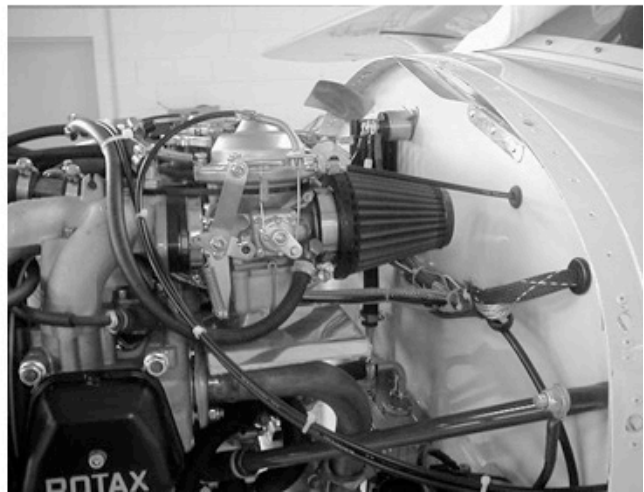
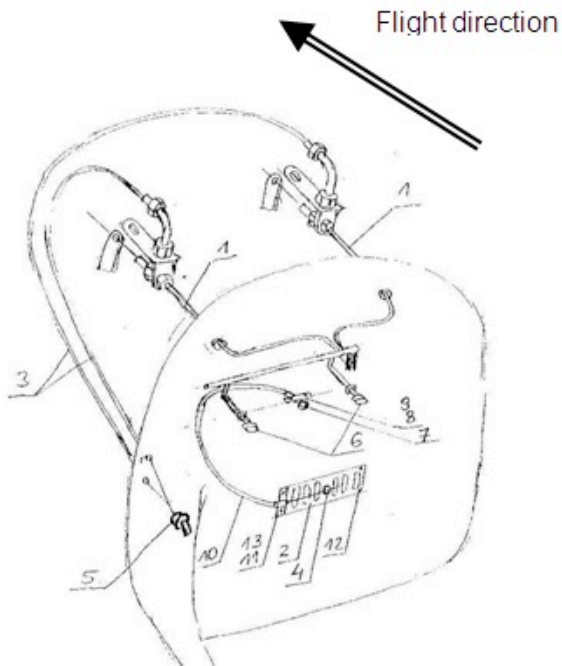
**Systematic of waterlines connected to water pump**



Important note:  
To install stock engine (type ROTAX) the orientation of the fittings of waterlines at cylinder heads and pump must be changed. This has to be done by heating the parts with hot air and unscrew them. After cleaning the threads they have to be re-inserted with LOCTITE 221 and set to proper orientation!



**Carburetors and throttle activators**



## **5. Fuel System**

### **General description**

The FK 9 Mk IV is equipped with fuselage tanks. The FK 9 Mk V / Mk VI is equipped either with fuselage (Option 1) or with wing tanks (Option 2). A fuel filter and an electrical fuel pump are installed in the fuel system. The electrical pump is operated by a switch at the main switch panel. Depending on national requirements the fuel system can differ in some details – check the valid POH of your FK9 to make sure!

#### **CAUTION:**

- Ensure that **no** fuel spills on the cockpit windows during fuelling/draining.
- Clean spilled fuel from wings or windows with clean water immediately.
- Coated surfaces may discolor after contact with fuel.

### **General safety information**

#### **CAUTION:**

- Do not allow smoking, flames, or other sources of ignition when working with fuel.
- Know the next location and operation of fire extinguishers.
- Disconnect the battery and remove or turn off ignition sources before working with fuel.
- Any work on the fuel system should be done in a well-ventilated area.

#### **Note:**

- To reduce the risk of moisture condensation, the tanks should be filled after the last flight of the day or before storage.

### **5.1. Inspections**

- According to Inspection plan. Replace fuel lines, fittings or filters only against same type, size and specification!

#### **5.1.1. Required Tools**

- Set of screwdriver
- Set of metric ratchet wrench or set of metric combination wrench
- Fuel line clamp tool
- Side cutters
- Pliers

#### **5.1.2. Parts required**

- Fuel filter (MANN WK 42/2)
- Fuel lines
- T-connectors, fuel line fittings
- Cable ties
- Hose clamps
- Fuel pump

#### **5.1.3. Level of maintenance**

- Maintenance or overhaul

#### **5.1.4. Certification required**

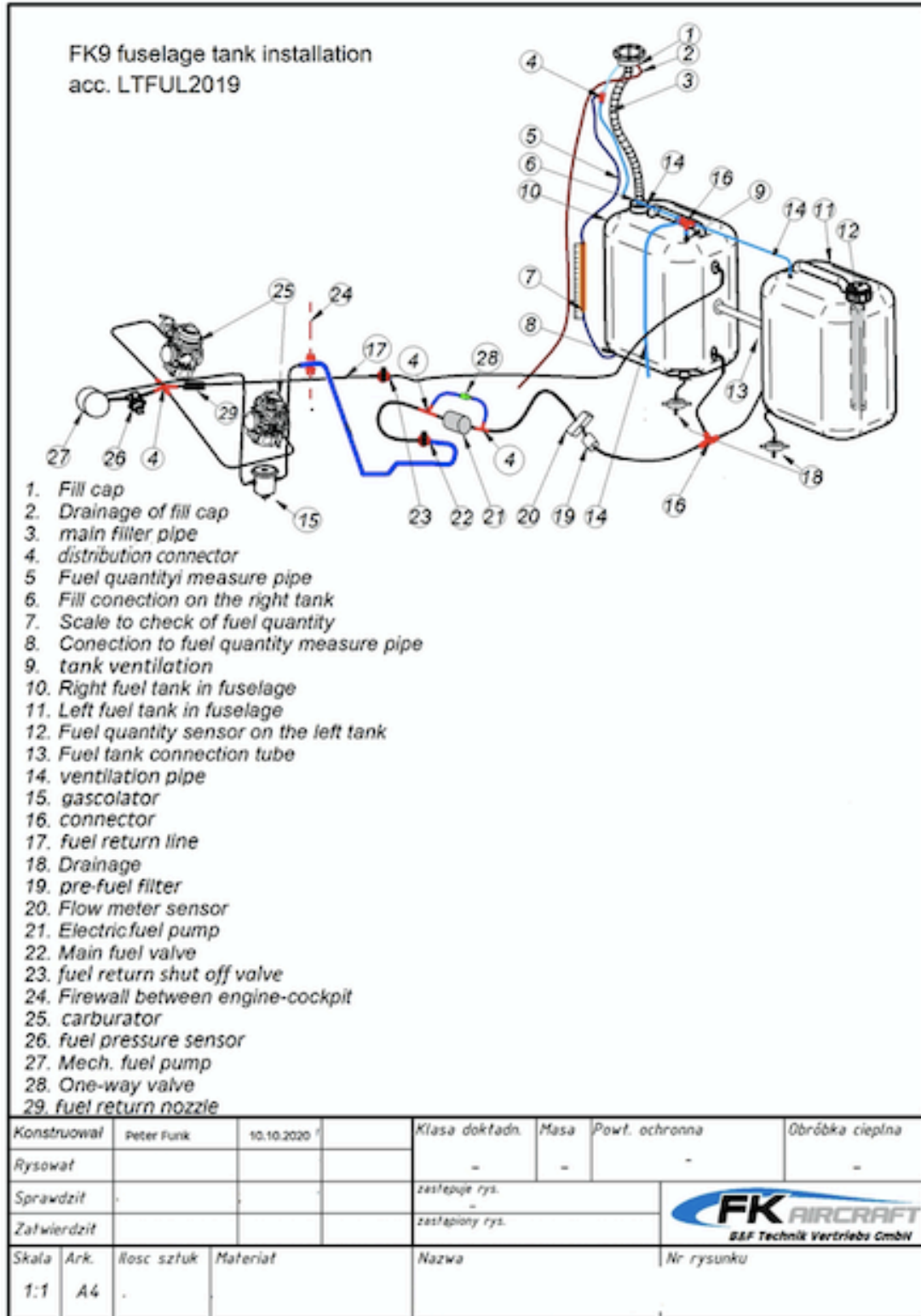
- LSA Repairman Maintenance

### 5.1.5. Option 1: Fuselage Tanks

The two fuel tanks are mounted behind the pilots seats. The fuel valve (ROTAX only) is located at the center console with positions ON and OFF. The version with SMART engine has no manual fuel valve because its electrical fuel pump closes the fuel line as soon as the ignition is switched off. One fuel drain valve is located at the lower fuselage forward of the main landing gear.

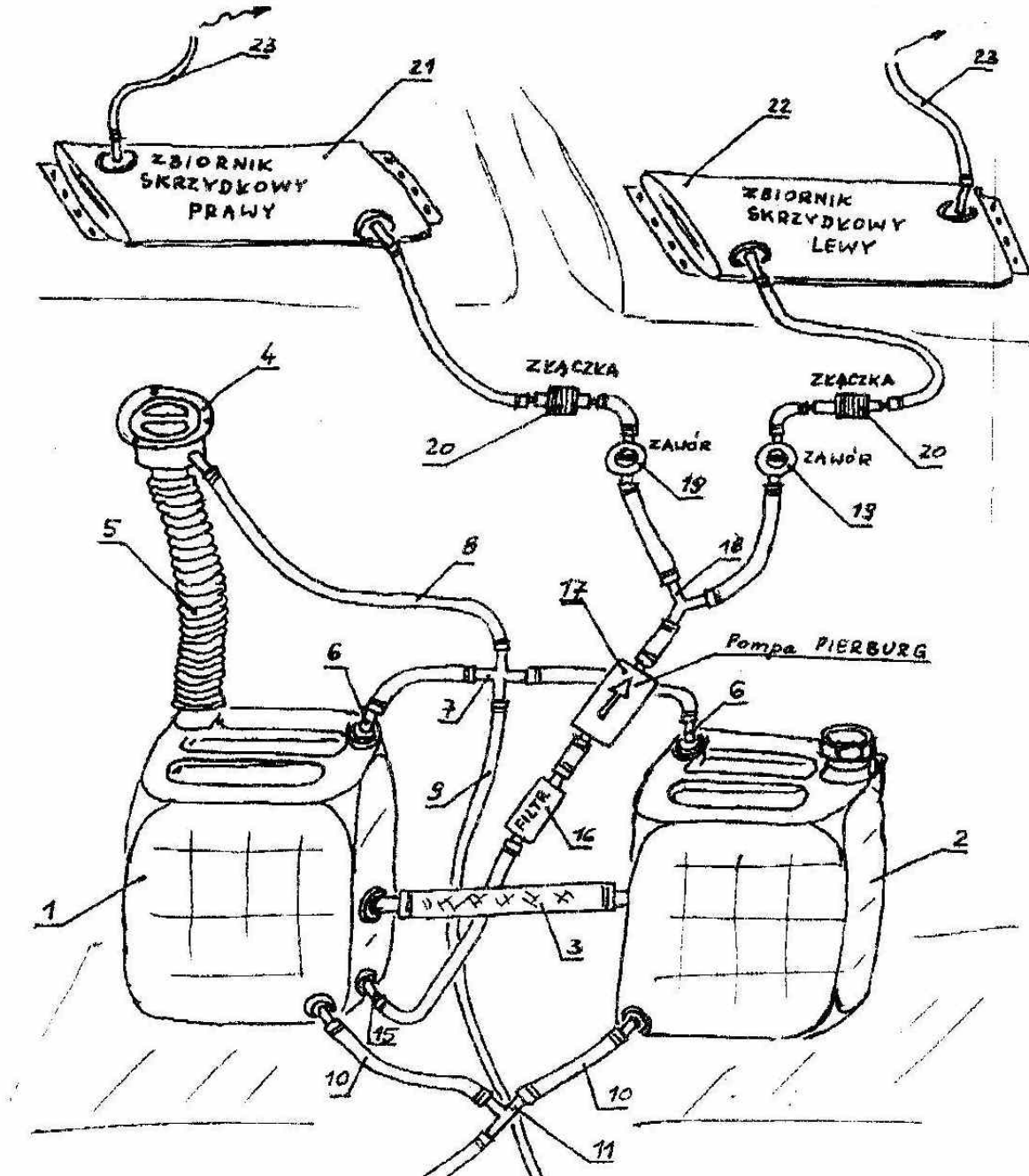
Fuel quantity is indicated by a gauge at the tank. After refueling, this indication is accurate after both tanks have leveled. This can take up to 5 minutes.

Although the fuel cap has a water drain, it is recommended to secure the cap from water entering during strong rain by putting an extra cover on top of the cap when the aircraft is parked.



**5.1.6. Additional flexible Wing tanks**

(with fuselage tanks installed, optional)



Additional flexible fuel tanks (capacity 20l each) can be installed in the wings of the FK 9. They are connected to the main tank and are filled and emptied by using an additional electrical pump. The overflow/vent (23) is connected to the vent system (8) of the main tank. Each tank has a fuel valve (19).

**Handling of the wing tank:**

To fill or empty the tank, the respective fuel valve (19) must be open and the pump must be switched to the UP or DOWN position.

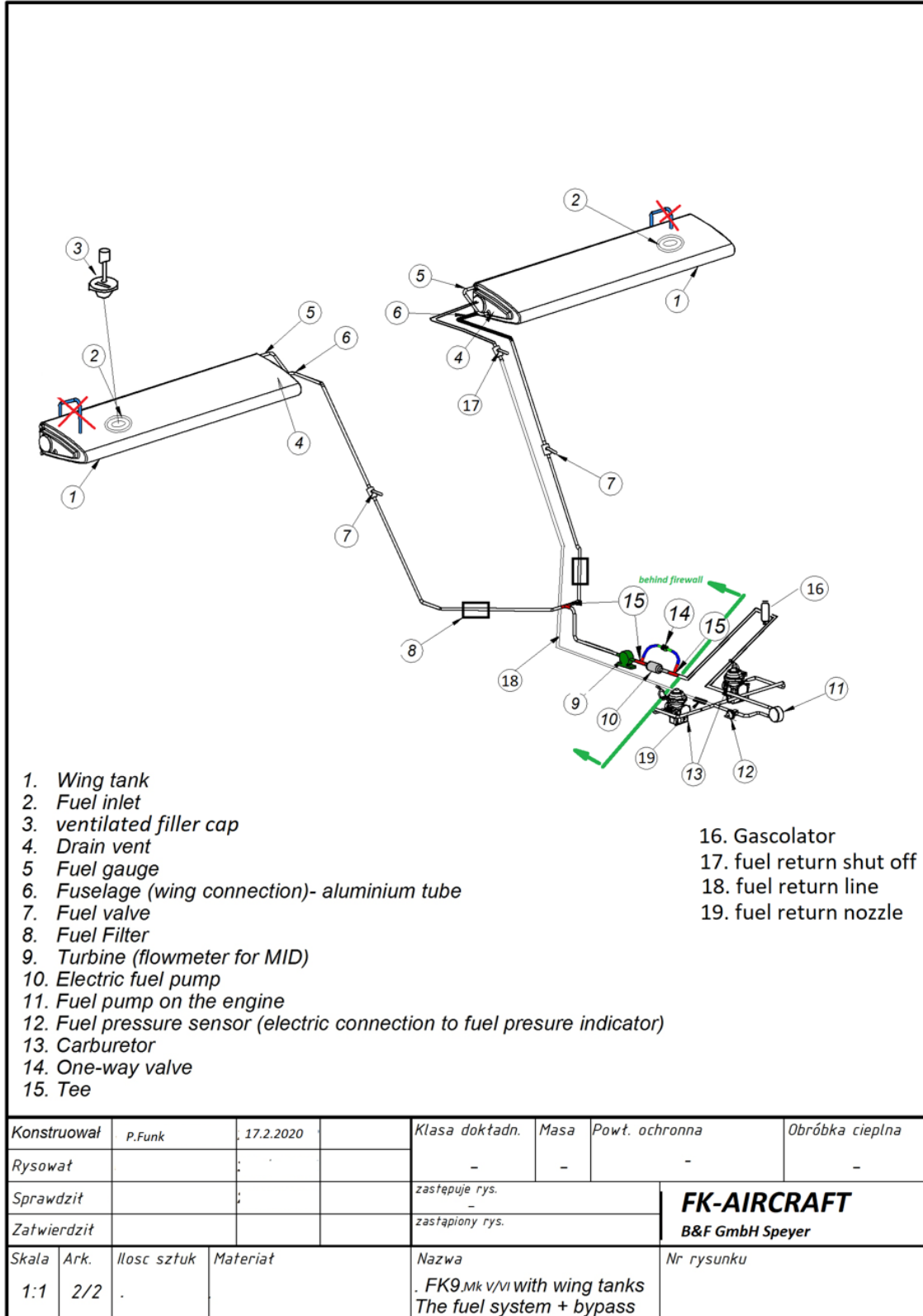
Filling of the wing tank has to be done on ground with at least 20l of fuel in the main tank. The wing tank is full as soon as fuel is flowing via the overflow/vent (23) into the vent system (8) of the main tank. Now the pump has to be switched off and the valve must be closed.

During flight, the fuel can be pumped out of the wing tank as soon there is space for at least 20l in the main tank.



**5.1.7. Option 2: Wing Tanks:**

There are two wing tanks installed. Each tank has a fuel valve and a fuel quantity indication. Fuel caps and vents are on top of the wings. Fuel feeding to the engine is similar to option 1. Fuel must be used from one tank at a time. For take-off and landing, the fullest tank must be used. The drain valve is located underneath the wing. Ensure that no fuel spills on the cockpit windows during fuelling / draining, because fuel can damage Lexan windows.







Fuel quantity indication (5)

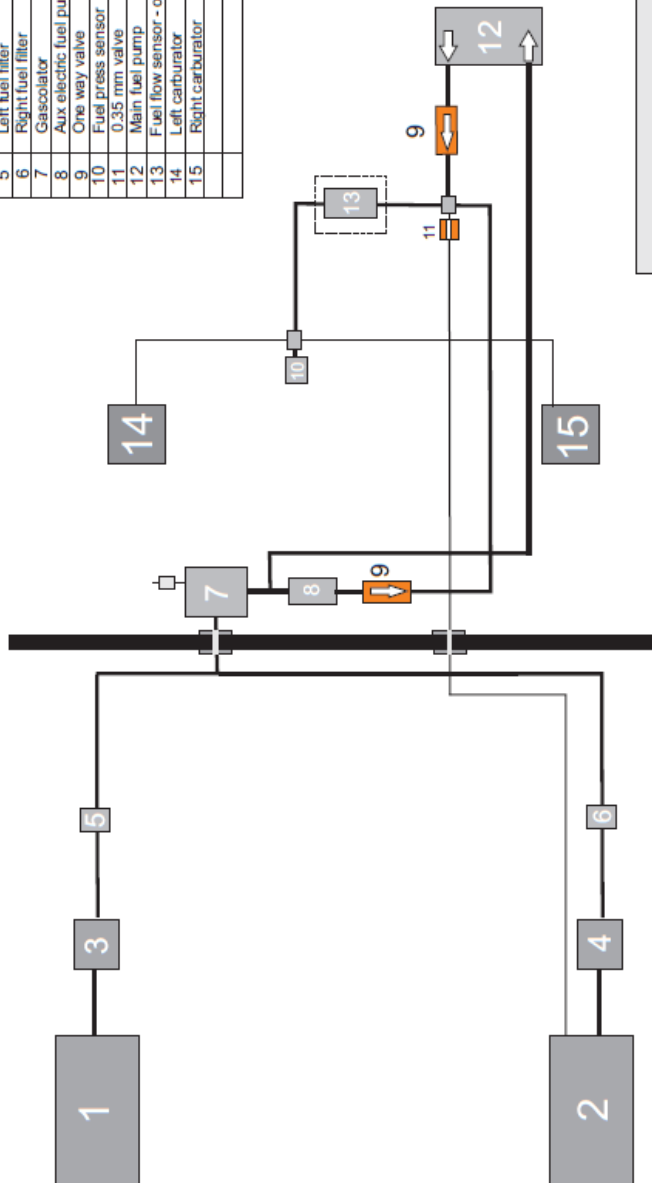


Fuel valve (7)

**Fuel System Version Wing Tanks (Italy and Mk VI only):**

There is a drain valve at the gascolator in the engine compartment.

1	Left fuel tank
2	Right fuel tank
3	Left fuel valve
4	Right fuel valve
5	Left fuel filter
6	Right fuel filter
7	Gascolator
8	Aux electric fuel pump
9	One way valve
10	Fuel press sensor
11	0.35 mm valve
12	Main fuel pump
13	Fuel flow sensor - option
14	Left carburetor
15	Right carburetor



**FK 9 Ela** Wing tank  
"Advanced" type Italian regulation  
DPR133 annex V  
FUEL SYSTEM SCHEME



### **5.1.8. Fuel Low Pressure Warning**

One fuel pressure warning light or the MID indicate fuel pressure below minimum.

### **5.1.9. Fuel Quantity Indication**

Beside the gauges at the respective tanks (see Option 1 & 2), there is a fuel quantity display at the MID. This display derives the information from two different sources, depending on the system installed:

- a) the pilots enters the fuel quantity before takeoff and the MID computes the remaining fuel using the fuel flow sensor .
- b) fuel level sensors are installed in the tank and transmit fuel quantity to the MID.

In flight, the fuel quantity indication on the MID offers a rough estimate of the current fuel on board. The accuracy of the system is not sufficient for flight planning purposes.

### **5.1.10. Maintenance**

If the fuel tanks are contaminated with dirt (check the inside by using a torch), they must be dismantled (fuselage tanks) and cleaned. For this, drain the complete system (by using the electrical fuel pump) and dismantle all connections. Clean the tanks using fuel or spirit/alcohol. Do not use water or solvents.

Change fuel lines, filter and hardware according cycles given in maintenance tables!

### **5.1.11. Fuel Filter Removal and Installation**

Before starting make sure that the tanks have been emptied or the fuel lines are compressed with the fuel line clamp tool to prevent fuel spill.

#### Location:

Option 1 Fuselage Tanks:

- Fuel filter is located behind the passenger seat, at the bottom of the fuselage.
- Replace seat pan and back wall for access.

Option 2 Wing Tanks:

- Fuel filter is located behind the dashboard.
- Fold back for access.

#### **Note:**

- Residual fuel inside the filter might spill.
- Wear protective gloves to safeguard and avoid skin contact with fuel.

#### Steps:

Open both hose clamps on the fuel filter.

Disconnect fuel lines from the fuel filter, attention with fuel leakage.

Replace filter.

#### **WARNING:**

- The fuel filter has only one direction of flow, an engraved arrow on the filter shows the direction which must point to the engine.

Reassemble the filter in reverse order.

### **5.1.12. Electrical Fuel Pump Removal and Installation**

Before starting make sure that the tanks have been emptied or the fuel lines are compressed with the fuel line clamp tool to prevent fuel spill.

#### Location:

Option 1 Fuselage Tanks:

- Fuel pump is located under the passenger seat.
- Replace seat pan for access.

Option 2 Wing Tanks:

- Fuel Pump is located behind the dashboard next to the firewall
- Fold back for access.

#### Steps:

- Open both hose clamp on the fuel pump.
- Disconnect fuel lines from the fuel pump, attention with fuel leakage.
- Open both bolts which holds the pump and disconnect all electric cables.
- Replace fuel pump.

#### **▲ WARNING:**

- The fuel pump has only one direction of flow, an engraved arrow on the pump shows the direction which must point to the engine.

Reassemble the pump in reverse order.

#### **CAUTION:**

- Make sure the fuel pump is properly grounded.

## **6. Propeller**

### **6.1. Inspections**

Different propellers can be installed. Regularly check the symmetry of the angle of attack for the propeller installed. The propeller manufacturer may indicate a method for quick checking without dismantling of any part and is not included in this manual.

#### **6.1.1. Adjusting of angle of attack**

Adjustment of the angle of attack requires a special tool which differs by specific propeller type.

Shown below is the procedure for propeller type "Warp Drive"

First, release the fixing screws from propeller hub to engine flange, then remove the propeller cone plate. Release fixing screws of propeller blades so that it is possible to move the blades.



Attach the angle of attack tool in way as shown. Adjust each blade to required angle of attack. When fixing the screws measure proper angle of attack again – this may change by tightening the screws!

Add propeller cone plate and tighten propeller fixing screws.

All hardware must meet minimum DIN 8.8, all nuts must be standard AN or metric safety nuts.

All turning moments of screws according to propeller manual.



Add propeller cone to its plate.  
A marking on plate and cone indicates correct position.



Check distance from propeller cone to engine cowl. This must not be lower than 10mm!

**6.1.2. Required Tools**

- angle of attack tool

**6.1.3. Parts required**

- new lock nuts

**6.1.4. Level of maintenance**

- Line; Overhaul; alteration or maintenance, Inspection

**6.1.5. Certification required**

- A&P Mechanic

## **7. Fuselage, Interior and Utility Systems**

### **7.1. Rescue system**

The FK 9 can be equipped with a rescue system BRS 1050 or 1350 (depending on MTOW) mounted into the fuselage behind the seats. Only original BRS Kevlar harness parts and hardware must be used. There must be no obstructions for the deployment of the rocket.

Detailed information concerning max. speed, capacity and maintenance cycles are provided in the respective rescue system manual.

All installations use a 3-point connection where the front-bridles are attached to outer cockpit frame knots. The balance cable (different in length!) is connected to rear center of cockpit frame.

The installation scheme of the rescue system is shown in the "BRS installation scheme for FK9".

**Note: use only original bridle set from rescue system manufacturer! The rear bridle must be shorter than the front ones!**

### **7.2. Baggage**

The baggage compartment is located behind the pilots seats separated from the cabin by the backrest (bulkhead). The access is on the left side from the outside by a small door.

#### **CAUTION:**

- Secure all items in the baggage compartment before flight.

### **7.3. Doors**

The doors can be opened and locked from inside with a handle.

The pilots door can also be opened / closed from outside.

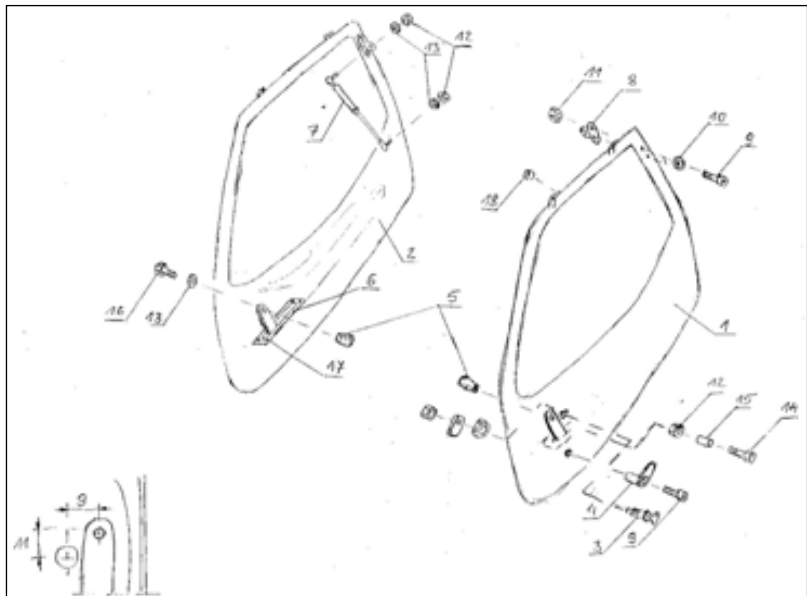
Both doors have a small vent.

Doors can be removed completely.

The door latches move two locking bolts operated by the handle in the inside of each door and from a rotary-type knob on the outside of pilot door. Pulling the handle back or turning the knob in clockwise direction will unlock (open) the door.

#### **Note:**

- when the doors are open a spring pushes the locking bolts into the locked (closed) position.



#### **7.3.1. Removal and Installation**

To remove cabin doors open the doors and remove the safety pin from the door gas spring and disconnect the spring from the door bracket.

#### **Note:**

- Only disconnect gas springs from the door bracket when the door is fully open.

Leave ajar the doors on the fuselage, remove the safety ring on the rear door hinge and shift the door forward. Installation is carried out in the reverse order.

### **7.3.2. Required Tools**

- None

### **7.3.3. Parts/materials required**

- None

### **7.3.4. Level of maintenance**

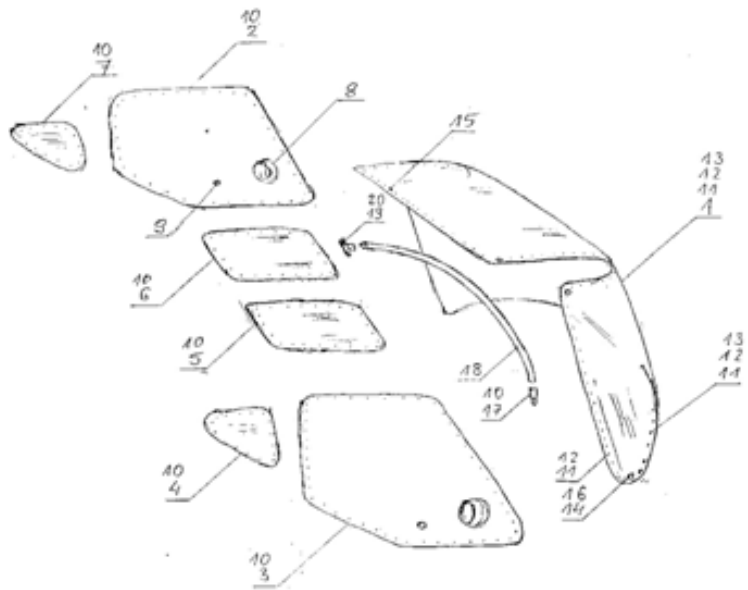
- Line

### **7.3.5. Certification required**

- Owner

## **7.4. Windscreen and Windows**

The door, roof and aft windows are LEXAN (polycarbonate) type 1.0mm.  
All windows are glued to the fuselage with SIKAFLEX 221 (Fk9 Mk V).  
The roof windows are additionally secured with Alu-Alu rivets.  
LEXAN can only be cleaned and not polished.  
The front windscreen optionally may be Plexiglas 2.5mm glued into the airframe



### **Note:**

- Only use Alu-Alu rivets to secure LEXAN windows, other type of rivets produce too much tension forces which result in cracks on the boreholes.

### **CAUTION:**

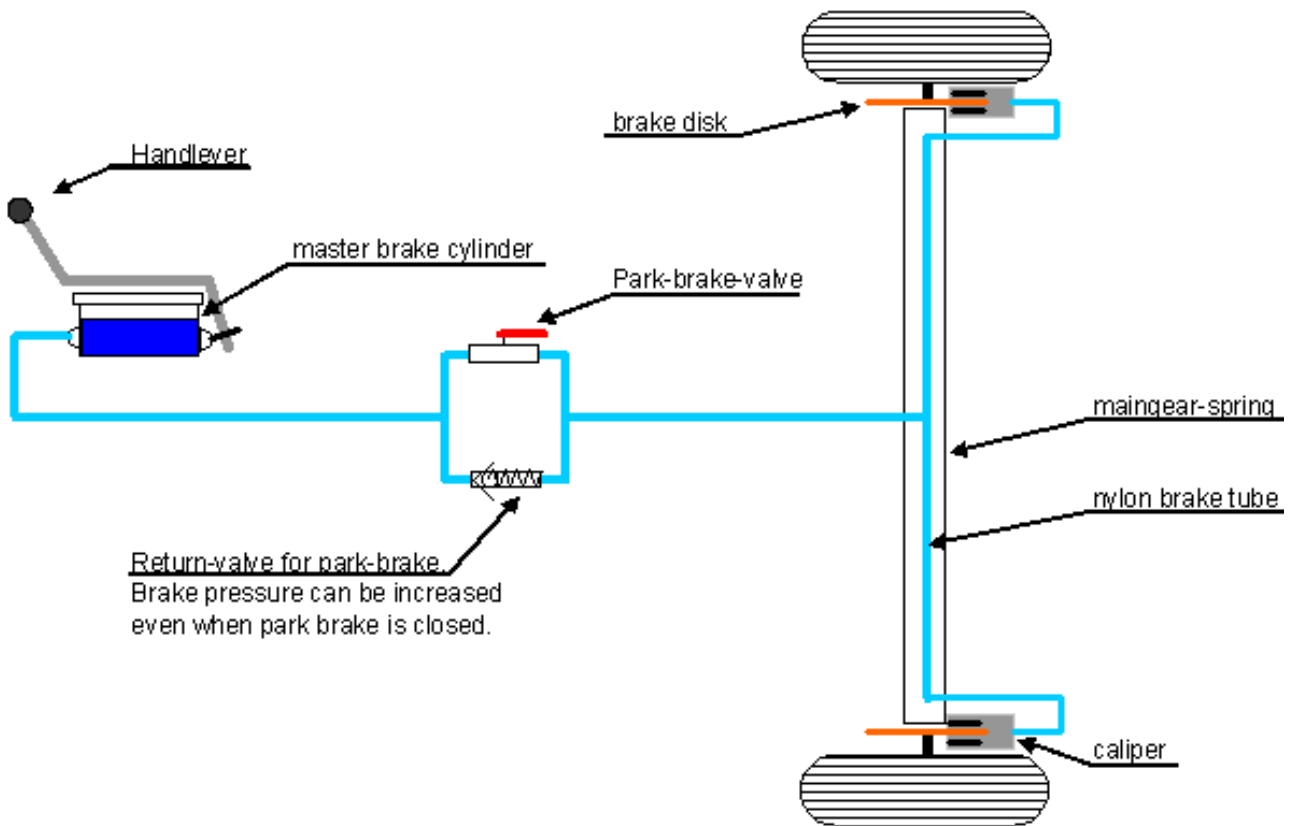
If cracks appear longer than 30mm the windscreen has to be replaced!

### 7.5. Hydraulic brake system

Brakes are controlled by a handle at the center console and are applied to both main wheels at the same time. The brake fluid reservoir (master brake cylinder) is located under the pilot's seat.

By closing a valve at the center console when pressure has been applied, the hydraulic brake can function as a parking brake.

**CAUTION:** (only models manufactured before November 2005): if the valve is closed (park brake set), the brake handle is without function. In case the aircraft starts to move with park brake set, open the valve and pull brake handle. Thereafter the valve can be closed again.





### 7.5.1. Brake bleeding

#### CAUTION:

- We recommend wearing protective gloves and safety glasses while working with brake fluid.
- Brake fluid is toxic, and must be handled carefully and professionally recycled.
- All FK9 are delivered ex-factory with FMVSS 116-DOT4 - SAE J 1073 (synthetic) brake fluid, which may be mixed with DOT 3, but DOT 5 is silicone based and not compatible with DOT 3 or 4.
- Most brake fluid harm paint and plastics on contact, spilled fluid must be cleaned immediately with alcohol.
- Brake fluid is hygroscopic and readily absorbs moisture, at regular intervals the brake fluid should be checked or be replaced (see maintenance schedule).

**Note:** Bleeding of the hydraulic brake system is better done from the lowest point which is the disc brake caliper at the main wheels. The bleeding process is performed by injecting clean, bubble-free brake fluid through the entire system to the master brake cylinder.

Unscrew the cover of the master brake cylinder, with the Phillips screw driver. Check level of brake fluid, it should be filled max. approximately two thirds.

**CAUTION:** Do not remove the cover from the master brake cylinder.

Fill the syringe with brake fluid and eliminate all air bubbles in the syringe.

Remove the protection cap from the bleeder valve and open the valve with the combination wrench 7mm till it can be unscrewed by hand.

**Note:** Do not unscrew the bleeder valve too much, otherwise the brake system may suck in air.

Connect the syringe with the hose to the bleeder valve and inject the brake fluid slowly. This process must be carried out several times on both main wheel until no air bubbles are visible in the nylon brake tubes.

After the injection, close the bleeder valve with the combination wrench 7mm and cover the valve with the protection cap.

Check level of brake fluid, it should be filled max. approx. two thirds and close the cover of the master brake cylinder. Check the brake pressure several times, the wheel brakes must affect at the same point with the same force every time. If this is not the case, the brake system must be bled again.



### 7.5.2. Required Tools

- 1 combination wrench 7mm for the bleeder valve at the brake caliper
- 1 Phillips screw driver
- 1 Plastic syringe (volume ca. 100 ml) with transparent PVC hose. Syringe to inject brake fluid.

### 7.5.3. Parts required

- Brake fluid FMVSS 116-DOT4 - SAE J 1073 (synthetic)

### 7.5.4. Level of maintenance

- Owner; A&P Mechanic; LSA Repairman Maintenance; Manufacturer

## **7.6. Heating and Ventilation**

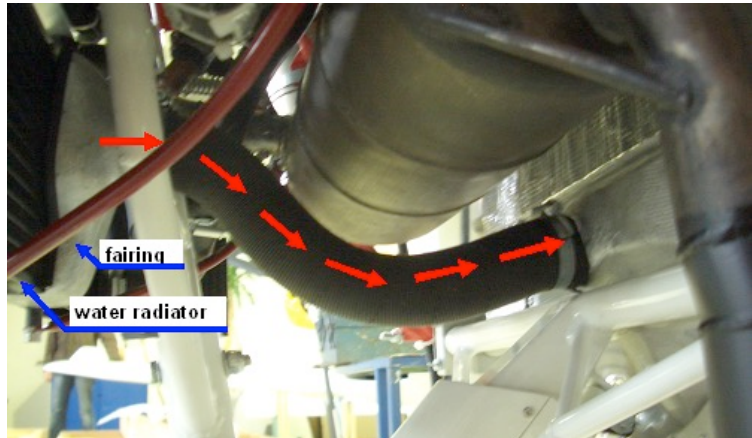
The FK 9 is optionally equipped with cabin heating.

By pulling the lever below the instrument panel, heated air is allowed to enter the cabin through the front of the pilots feet.

Hot air is supplied by a fairing mounted on the water radiator.

There are different types of heat systems installed depending on manufacturing years

The cabin is ventilated by the vents in the doors and optionally by two eye-ball vents in the middle console, provided by a naca inlet on upper left fuselage.



### **7.6.1. Inspections**

- Periodically check heat-tubes, fittings, clamps, activator mechanism

### **7.6.2. Required Tools**

- Standard metric tools

### **7.6.3. Parts required**

- Standard (heat resistant) tubes, fittings and clamps

### **7.6.4. Level of maintenance**

- Alteration or maintenance; Annual Aircraft Inspection; 100-hour inspection

## **7.7. Parking**

Parking procedures depend on local weather conditions. When parking the airplane outside the hangar, the airplane should be adequately secured to the ground especially in severe weather. If possible head the plane into the wind.

The aircraft should be parked in the following configuration:

- Flaps up
- Trim neutral
- Electrical fuel pump OFF
- Avionics OFF
- Ignition OFF
- Battery switch OFF
- Rescue system secured (insert safety pin)
- Pull control sticks firmly back and secure with the safety belts.
- Parking brake set.
- After closing the parking brake valve pull again on the brake lever.
- Chock the main gear wheels for longer parking (see storage procedures).

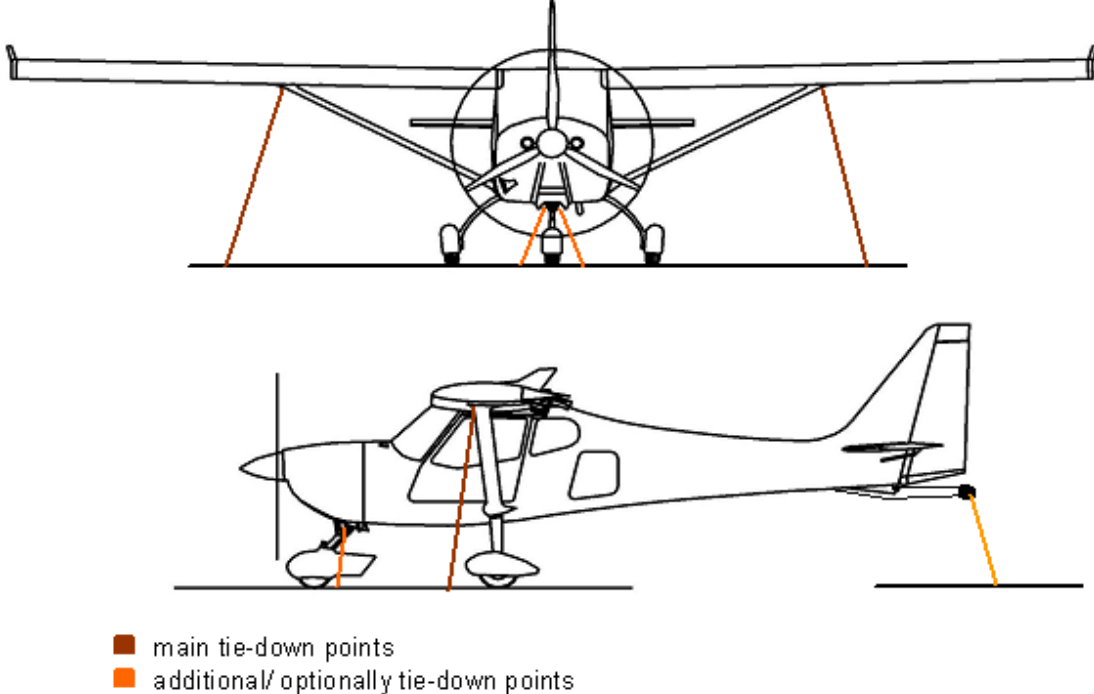
### **Note**

- Do not set parking brake below freezing point or when brakes are overheated.

### 7.8. Tie-Down

The main tie-down points are on each wing located under the upper strut fairing. For frequent use of tie-down points, the fairings may have a cutout hole to ease the access to the tie-down rings. For flight these openings can be closed with PVC tape. Attach a long rope to the red tie-down ring fittings.

Tie-down point on the nose wheel are the nose gear leg cross struts. The tail (wheel) should be secured by the optionally tow support or by wrapping the tail wheel.



#### Note

- To secure the airplane use sufficiently strong anchors and ropes.
- In severe weather conditions use multiple lines. During gusty or high wind conditions, a periodically review of ropes and ground anchors is necessary to prevent excessive movement of airplane
- Do not install ground anchors direct under the tie-down points.
- Chock the main gear wheels.
- Secure control stick to prevent any damages to the control surfaces. Pull control sticks firmly back and secure with the safety belts.
- Cover windshield and windows.
- Close or protect all vents.
- Close and lock the doors.
- Anchor the aircraft to the ground adequately using the tie-down points noted above.

## **8. Instruments and Avionics**

The instrument panel contains all required flight, navigation and engine instruments for VFR operations. This describes a standard equipment configuration for Rotax 912 engine type, different options can be provided on request.

### **8.1. Instrument Panel**

#### **Analoge basic Panel**



<b>Instruments</b>	<b>Avionics</b>
air speed indicator	
altimeter (5000ft)	
compass	
slip indicator	
oil pressure	
oil temperature	
CHT	
rpm indicator	
MID computer ( Mk V / Mk VI)	

**Analoge Panel**



Instruments	Avionics
air speed indicator	Filsler ATR833 Radio
three-point altimeter (20.000ft/min) 80mm instead of original altimeter	TRT800 Transponder
climb-indicator (80mm,feet/min)	Garmin 695 GPS
compass	
slip indicator	
oil pressure	
oil temperature	
CHT	
rpm indicator	
MID computer ( Mk V / Mk VI)	

**Dynon EFIS / EMS Panel**



Instruments	Avionics
air speed indicator / backup instrument	D100 PFD
altimeter (5000ft)/ backup instrument	D120 EMS
climb-indicator (80mm,feet/min)	Filser ATR833 Radio
compass	TRT800 Transponder
slip indicator	Garmin 695 GPS
oil pressure	
oil temperature	
CHT	
rpm indicator	
MID computer ( Mk V / Mk VI)	

**Garmin EFIS / EMS Panel**



Instruments	Avionics
air speed indicator / backup instrument	duo G3X screens with PFD, MFD, EMS
altimeter (5000ft)/ backup instrument	Garmin SL40 Radio
climb-indicator (80mm,feet/min)	Garmin GTX328 Transponder
compass	
slip indicator	
oil pressure	
oil temperature	
CHT	
rpm indicator	
MID computer ( Mk V / Mk VI)	

## 8.2. Antennas

### 8.2.1. COM Antenna

A rod type COM antenna is mounted on the top of the fuselage behind the cockpit.

### 8.2.2. Transponder Antenna

The transponder antenna is a low profile blade-type antenna mounted directly underneath the co-pilot on the underside of the aircraft.

### 8.2.3. GPS Antenna

The GPS antenna is mounted on a bracket over the co-pilots head under the windscreen.

## 8.3. Static and Dynamic Pressure System

Static pressure is provided from a single pressure port on the rear left fuselage. The dynamic pressure is provided from the pitot tube on the left wing strut. The pitot tube consists of two parts, they are connected by a plastic line which works as bend protection.

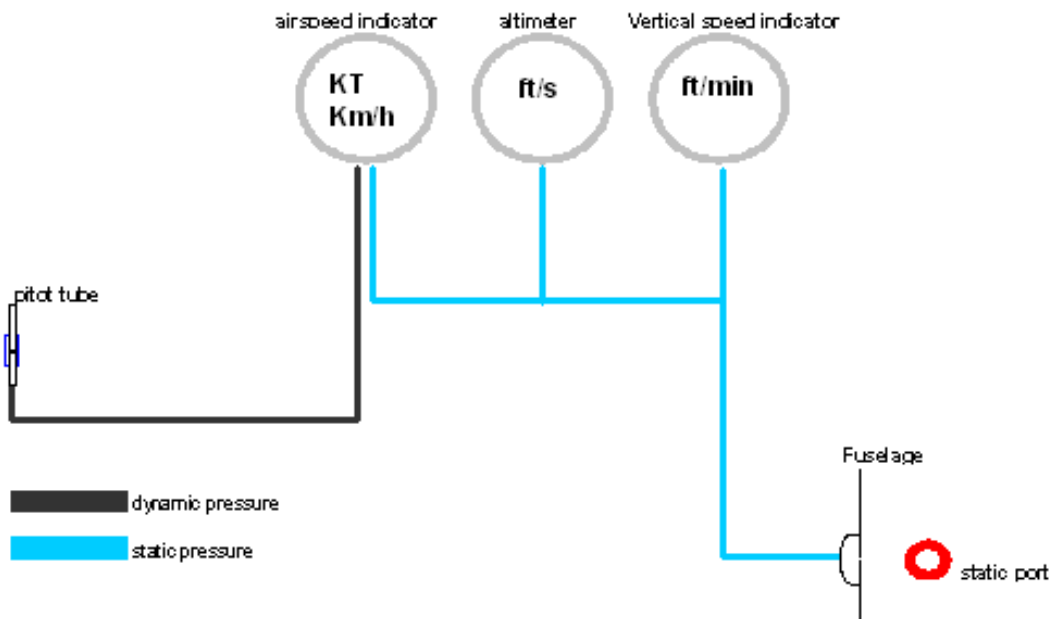
The pressure is distributed by means of transparent plastic lines to the individual instruments. On the back side of each instrument is an indication to which pressure it must be connected. Or refer to the manufacturers installation manual.

### Note:

- Static pressure port has to be checked to ensure its correct function from time to time for water contamination by pulling of the pressure line from instrument panel and blowing carefully towards the pressure port. Same applies for dynamic pressure line.

### CAUTION:

- The speed indicator is especially calibrated to match the characteristics of the aircraft system and marked by aircraft type. So it can only be replaced by same type!





## **9. Electric**

### **9.1. Description**

A 12V engine-driven alternator delivers the electricity required.

If the red generator control light lights up above 1800 RPM, (or SmartMIP gives a warning) shut off all electrical equipment not required for flight as the generator is disconnected and the battery is discharged.

The electrical panel contains most of the switches and fuses.

The electrical system is designed for a maximum load of 12A. Connecting a lot of high-drain components (landing lights etc.) may result in a higher load. This can lead to overheating and/or an electrical smoke/fire condition and must be avoided under all circumstances.

An actual wiring plan is available under [www.fk-servicecenter.com](http://www.fk-servicecenter.com).



#### **9.1.1. Required Tools**

- Standard metric tools

#### **9.1.2. Parts required**

- according to damage

#### **9.1.3. Level of maintenance**

- Heavy; Line; Overhaul; Major repair, alteration or maintenance; Minor repair; Annual Aircraft Inspection; 100 hour inspection

#### **9.1.4. Certification required**

- Owner; A&P Mechanic; LSA Repairman Maintenance

## **10. Structural Repair**

### **10.1. Main Structure**

The main structure contains of:

1. fuselage structure (metal), tail unit structure, engine mount
2. landing gear (metal/carbon fiber composite)
3. control surfaces (metal)
4. main plane (wing & tailplane) structure (metal/carbon fiber composite)

#### **10.1.1. Required Tools**

- Standard metric hardware, TIG welding, fibers and resins according to manufacturer requirements.

#### **10.1.2. Parts required**

- according to damage

#### **10.1.3. Level of maintenance**

- Heavy; Major repair

#### **10.1.4. Certification required**

- A&P Mechanic for metal components, Manufacturer or specialized repair company (e.g. authorized glider repair shop) for composite structures

***Repairs on the main structure must only be performed by authorized persons or companies in accordance with type certificate holder's advice!***

### **10.2. Subsidiary Structure**

The subsidiary structure contains of:

1. front fuselage covers/cowlings (glass fiber composite)
2. wheel pants (glass fiber composite)
3. spinner
4. inside cockpit: covers/consols/floor
5. fabric-skin

#### **10.2.1. Required Tools**

- Standard metric tools

#### **10.2.2. Parts required**

- according to damage

Materials available for fuselage repair:

1. Glass fiber type "Köper" 160g/m<sup>2</sup>
2. 2 component Epoxy-resin
3. Covering Ceconite 102 + adhesives (i.e. Polytak) + common dope
4. 2-component acrylic paint

#### **10.2.3. Level of maintenance**

- Minor repair

#### **10.2.4. Certification required**

- Owner or LSA Repairman

Repairs at the subsidiary structure may be performed by the owner, however it is recommended to consult the manufacturer or a certified repair center before commencing the work.

## **11. Painting and Coatings**

All FK planes are painted on the exterior with a 2-components acrylic paint in an RAL color. The standard factory paint is RAL 9016. For repair and maintenance of painting in details like supplier and processing guidelines, please refer to FK-Lightplanes.

**CAUTION:** Never paint static port, pitot tube, drain valves or antennas

**▲ WARNING:** If covering or painting is changed/modified on ailerons or elevator the mass-balance has to be checked before reinstalling the control surface! Both are fully balanced (means hinge line should be CG position). For more details contact manufacturer! By applying excessive coat the weight and center of gravity might change.

### **11.0.1. Required Tools**

- wet/dry sandpaper different grain sizes
- bucket of water

### **11.0.2. Parts required**

- 2-component filler
- 2-component acrylic primer
- 2-component acrylic final coat

### **11.0.3. Level of maintenance**

- Minor repairs
- Major repairs

### **11.0.4. Certification required**

- Minor repairs: Owner or LSA Repairman
- Major repairs: LSA Repairman, A&P, Repair Station

## **11.1. Preparation Procedures**

- Procedures are similar to those used in car repair shops.

### **11.1.1. Preparation of Metal**

- Remove dust and grease.
- For perfect adhesion of the repair area it is necessary to remove the old paint coat with sandpaper. The sanded surface must be larger/ bigger by 2 inches from the damaged area.
- Sand surfaces with 180-320 sandpaper and fine scuff pads.
- Remove dust and grease

### **11.1.2. Preparation of Composites**

- Remove dust and grease
- For perfect adhesion of the repair area it is necessary to remove the old paint coat with sandpaper. The sanded surface must be larger/ bigger by 2 inches from the damaged area.
- Sand surface with 400 sandpaper.
- Remove dust and grease
- Apply 2-component acrylic fillers per manufacturer's instructions for leveling the sanded area.
- After hardening sand area with 400-600 sandpaper and then with 600-800 wet sandpaper by using many water.

**CAUTION:** Be careful when sanding composites surfaces, especially when dealing with random orbit sander, never remove the Gelcoat and be very careful to avoid sanding into the top layer.

### **11.1.3. Preparation of Fabric**

- Remove dust and grease.
- For perfect adhesion of the repair area it is necessary to remove the old paint coat with sandpaper. The sanded surface must be larger/ bigger by 2 inches from the damaged area.
- Sand surfaces with 400 sandpaper very carefully.

**Note:** We recommend to re-cover damaged fabric sections. Local paint repairs on fabric parts are only transitional solutions.

## **11.2. Painting**

### **Color:**

The surface of the structure (composite structure) must be white or yellow. Local colored decoration is possible. Complete painting in different colors only with agreement of the type certificate holder.

**Note:** Painting with dark colors may cause excessive heating of the surface and can cause serious damage to the structure. All color combinations ex manufacturer are tested.

For a better results we recommend to primer or paint always in a paint cabin. When working with paints follow your national, local environmental regulations and requirements for disposal of waste.

### **CAUTION:**

- No complete painting in different colors, especially dark color. A list of approved color types can be received from type certificate holder.

### **11.2.1. Primer**

Before applying the primer the surface should be prepared as described before. The Primer should be applied with a HVLP gun to reach a corrosion protection and smooth surface. After the primer has dried, sand the area using 600-800 wet sandpaper with many of water till you get a smooth surface. Dry the area and remove dust and grease for final coat application.

### **11.2.2. Final Coat**

Remove dust and grease before applying the final coat. The 2-component acrylic final coat should be applied as per manufacturer's instructions with a HVLP gun to achieve a complete UV protection and smooth surface. Do not cure final coat on composite surfaces at temperatures above 32°C. After the final coat has dried remove paint dust with 1500-2000 wet sandpaper and plenty of water to get a seamless transition. Clean and dry area from sanding water. Polish area with a car polish but do not polish one spot for too long to prevent material overheating.