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## MAINTENANCE MANUAL

FOR THE

SAILPLANES

# **LS8-s** AND **LS8-sb**

Type:	LS8
Versions:	LS8-s LS8-sb (Commercial Designation: LS8-sc from ser.no. 8527 on)
TCDS No.:	EASA TCDS No. A.047
Serial-No.:	_____
Registration Signs:	_____
Edition:	April 2005

**0 Manual Contents****0.1 Log of Revisions**

No.	Page	Description	Date
1	0-1, 0-3, 0-6, 1-1, 1-6, 1-10, 1-11, 8-3	TN8019, wheel brake actuated by airbrake handle.	Feb. 2011
2	Title page, 0-1, 0-3 ÷ 0-6, 0-9, 1-2, 1-6 ÷ 1-8, 1-21, 1-23, 1-28a, 4-1, 4-17, 6-4, 11-11, 9E4	ÄM LS8-1, Miscellaneous improvements from ser. No. 8527 on	December 2011

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## 0.4 LIFE LIMITED PARTS, MAINTENANCE INSTRUCTIONS

### 0.4.1 Repairs

Damaged parts must be repaired or exchanged prior to next flight.

“Major repairs” must be accomplished in accordance with manufacturer repair methods at national authorities-certified repair stations rated for composite aircraft structure work, at FAA Certificated Repair Stations, or by other qualified persons authorised to perform maintenance on composite structures.

Use original spare parts only.

### 0.4.2 Airframe structural Life limit

Maximum FRP structural life limit of sailplanes and powered sailplanes is 12000 hours of flight. To reach this limit, special inspections according to chapter 2.4 of this manual at 3000, 6000, 9000 and beyond that at every 1000 hours of flight must be performed.

### 0.4.3 Life Limits of Equipment Items

- a) **Safety harness webbing** life limited to 12 years after manufacture. Multiple point buckle and brackets on condition (Wear, corrosion etc.).
- b) **Further parts:**  
These parts as for instance wheels, gas struts, control system parts, pins and bushes are not life limited, but may require exchange based on condition (Wear, damage, corrosion).

## 0.4 LIFE LIMITED PARTS, MAINTENANCE INSTRUCTIONS

### 0.4.3 Maintenance Instructions

Latest approved versions each of Operating and Maintenance Manuals of relevant manufacturers are valid:

1. C.G. hook TOST Europa G 88:  
Operating Manual for tow hook version safety hook „Europa G88“.
2. Nose hook TOST E 85:  
Operating Manual for tow hook version nose hook E85.
3. Safety Harness:  
Operating Instructions of Manufacturer.
4. Minimum Instrumentation:  
Operating Instructions of Manufacturers.
5. Structure of the LS8-s and LS8-sb sailplanes:  
**3000** hours total flight time.  
Can be increased stepwise according  
to procedure provided in section 2.4 to: **12000** hours total flight time.

## 1. SYSTEM DESCRIPTION AND ADJUSTMENT DATA

### 1.1 Summary

#### Wings

Wing span variable by exchange of 15m winglets against 18m tips with winglets.

#### Aileron Controls

Aileron system activated via pushrods, connection of system by automatic coupling during rigging. Dynamic aileron mass balance in wing, aileron at 18m wingspan in two parts.

#### Elevator Controls

Elevator system activated via pushrods, automatic coupling of system during rigging. 100% mass balance in vertical tail fin pushrod.

#### Rudder Controls

Rudder system activated via cables, 100% mass balance at rudder.

#### Wheel Brake

Feet operated, activated by Bowden cable from rudder pedals.

**If TN8019 is executed:** The wheel brake Bowden cable is connected to the airbrake drive instead of the rudder pedals.

#### Air Brakes

Activated via pushrods. Automatic connection of system during rigging. Locking mechanism in wings. Upper surface double height air brakes with spring loaded cover blades. Friction damper in box to prevent oscillations during extension.

#### Water Ballast System

Two integral tanks per wing, maximum capacity per wing 95 Litres <25.1 US gallons, 20.9 Imp. gal.>. Two valves at under side of wing for loading and dumping operated by one root rib pin. Automatic connection during rigging. Ventilation of both wing integral tanks at root-rib.

Integral ballast tank in the vertical tail fin for mandatory C.G. movement compensation due to wing water ballast as well as compensation for weight of heavy pilots. Maximum permissible compensation allowed for in tables.

Capacities:

**LS8-s:** 12 Litres <3,17 US gallons, 2,64 Imp. gallons>.

**LS8-sb:** 7.5 Litres <1.98 US gallons, 1.65 Imp. gallons>.

**1. SYSTEM DESCRIPTION AND ADJUSTMENT DATA** (continued)**1.1 Summary** (continued)Cockpit

Double fibreglass shell. Controls for air brakes, longitudinal trim and trim position indicator located on left cockpit side, trim locking lever at control stick. One control for tow cable release on left cockpit frame (operating both hooks), for pedal adjustment on seat, for ventilation on instrument panel cover, for landing gear and water ballast valves on right side of cockpit, for canopy opening on both sides. When operating right canopy lever over full possible travel, the forward canopy mounting becomes unlocked (emergency canopy jettison).

Canopy

One piece hinged up front with instrument panel cover. In case of an emergency exit, a spring loaded latch at the rear canopy edge acts as a temporary hinge for clean separation of the canopy from the fuselage.

Instrument Panel

Panel lifting together with canopy allowing unobstructed entry and exit.

Baggage Compartment

Baggage compartment for light and soft materials only. Permanent installation of batteries or other equipment possible.

Oxygen System

Receptacle for oxygen bottles provided, size of bottles 3 or 4 litres, diameter 100 mm (3.94 in).

Landing Gear

Sprung and retractable, housed in a closed box. Tail skid including cable deflector or tail wheel optional.

Batteries

One battery under front seat is standard equipment.

Optionally an additional baggage compartment battery and/or a tail fin battery are possible. The battery box for the fin battery is installed as standard equipment.

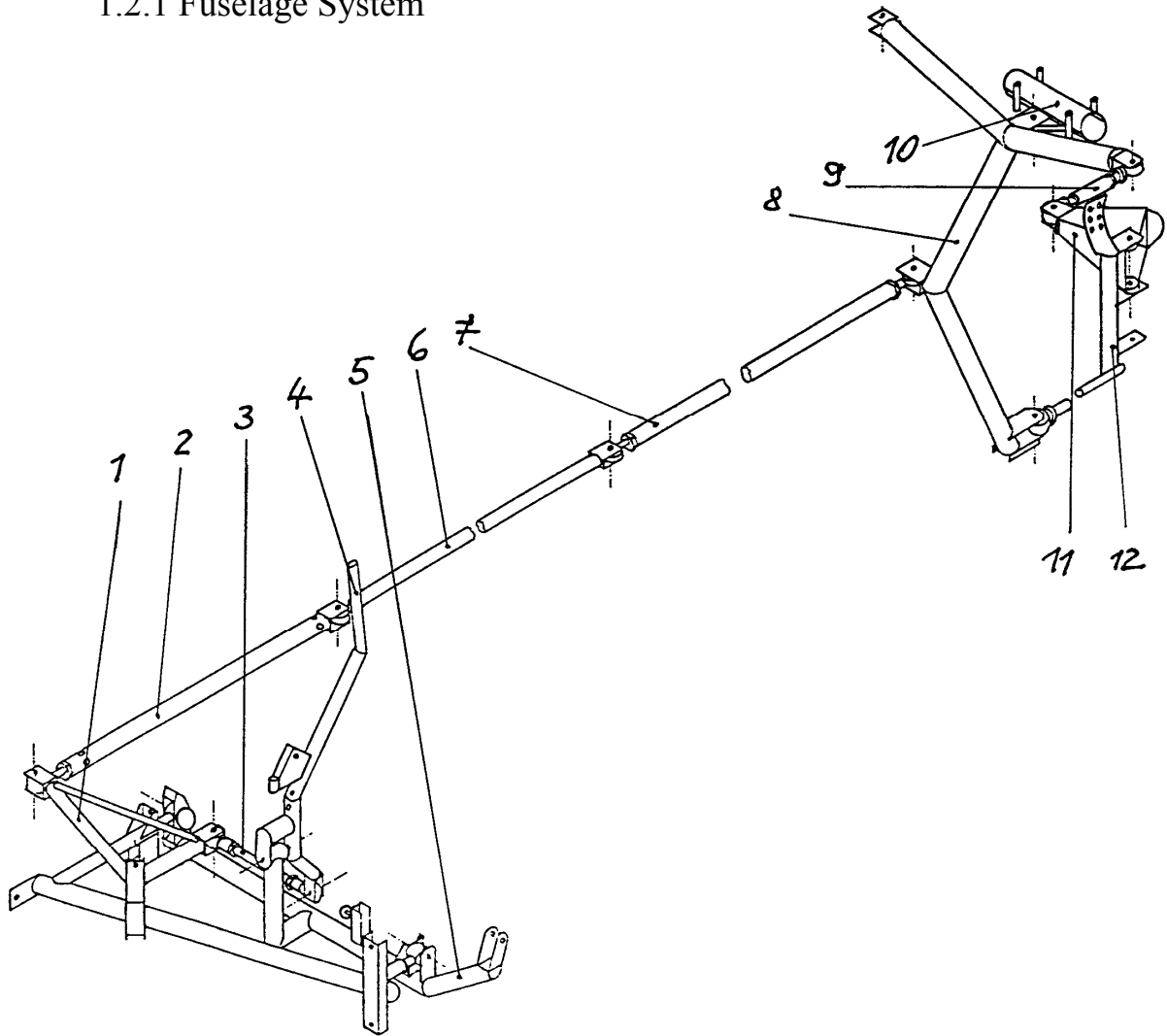
**From ser.no. 8527 on (ÄM LS8-1):** A locking bow (part 10L35 made from piano wire) is installed in the fin battery box. The locking bow prevents the installation of a battery and serves as indicator if a battery is installed, as its ends are visible from the outside.

If a battery will be installed in the fin the locking bow must be removed. After removing the battery reinstall the locking bow.

**1. SYSTEM DESCRIPTION AND ADJUSTMENT DATA (continued)**

**1.2 Aileron Control System**

1.2.1 Fuselage System



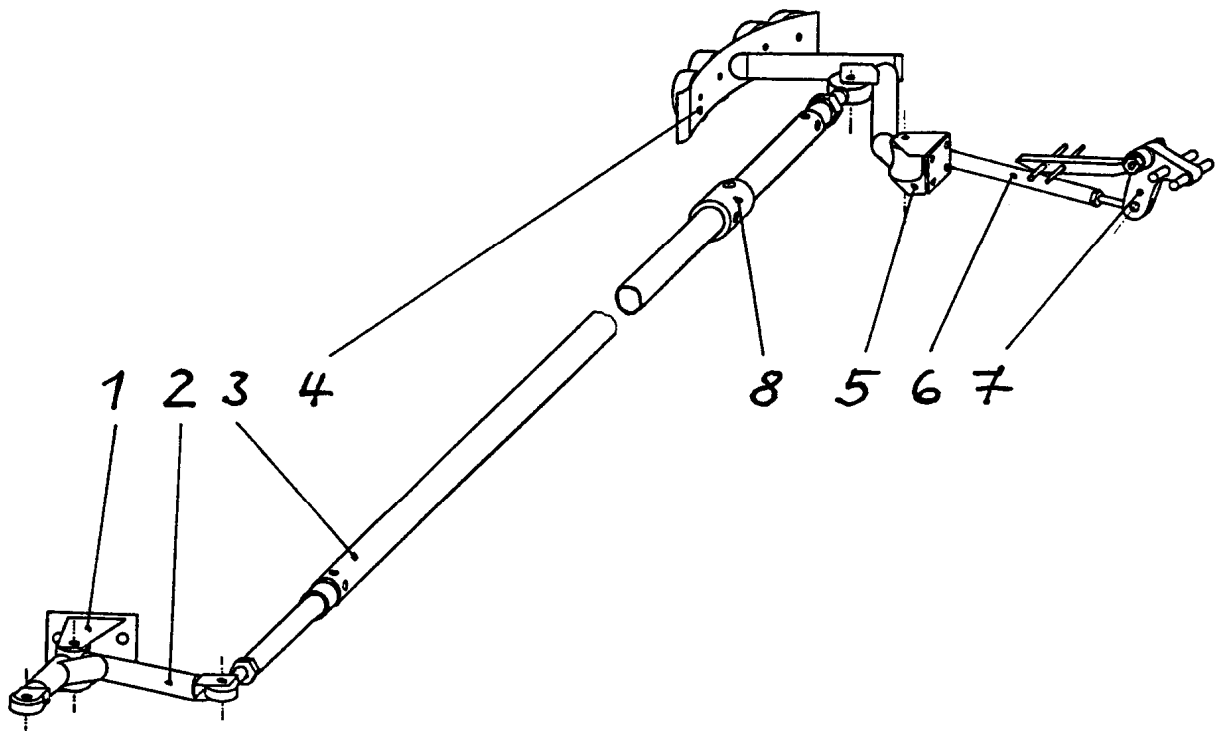
No.	Denomination	Drawing	No.	Denomination	Drawing
1	Forward fuselage aileron lever	3R10-72	9	Parallelogram pushrod	4R10-49d
2	Forward aileron pushrod	4R10-73	10	Aileron lever bearing	3R10-125
3	Stick aileron pushrod with 2 x GISW8 rod end	4R10-175	11	Automatic aileron Connector	3R10-116
4	Control stick	3R3-49	12	Automatic connector bearing	3R10-119
5	Control stick support	1R3-86			
6	Middle aileron pushrod	4R10-74			
7	Rear aileron pushrod	4R10-118			
8	Aileron lever	1R10-178			

**1. SYSTEM DESCRIPTION AND ADJUSTMENT DATA** (continued)

**1.2 Aileron Control System** (continued)

1.2.2 Wing System

No.	Denomination	Drawing
1	Root rib bracket	4F3-76
2	Root rib aileron drive	3F3-78
3	Aileron pushrod	4F3-142
4	Aileron drive lever (right + left)	1F3-133
5	Wing aileron drive bracket	4F3-134
6	Aileron drive rod	4F3-137
7	Drive bracket at aileron (glued-in)	4Q1-40
8	Aileron stop	4F3-136



**1. SYSTEM DESCRIPTION AND ADJUSTMENT DATA** (continued)

**1.2 Aileron Control System** (continued)

1.2.3 Deflections and Tolerances

<u>Aileron</u>	up	-26° to -30°
	down	13° to 15°

For easier checking, measured angles may be converted to mm / in deflection values, using the actual local radius of the defined measuring place. See also table below.

Limit values for aileron deflections in Millimetres/Inches

local radius mm / in	Down 13° to 15°		Up -26° to -30°	
	mm	in	mm	in
75 / 2.953	17 to 20	0.669 to 0.787	34 to 39	1.339 to 1.535
76 / 2.992	17 to 20	0.669 to 0.787	34 to 39	1.339 to 1.535
77 / 3.031	17 to 20	0.669 to 0.787	35 to 40	1.378 to 1.575
78 / 3.071	18 to 20	0.709 to 0.787	35 to 40	1.378 to 1.575
79 / 3.110	18 to 21	0.709 to 0.827	36 to 41	1.417 to 1.614
80 / 3.150	18 to 21	0.709 to 0.827	36 to 41	1.417 to 1.614
81 / 3.189	18 to 21	0.709 to 0.827	36 to 42	1.417 to 1.654
82 / 3.228	19 to 21	0.748 to 0.827	37 to 42	1.457 to 1.654
83 / 3.268	19 to 22	0.748 to 0.866	37 to 43	1.457 to 1.693
84 / 3.307	19 to 22	0.748 to 0.866	38 to 43	1.496 to 1.693
85 / 3.346	19 to 22	0.748 to 0.866	38 to 44	1.496 to 1.732

1.2.4 Stops

Aileron stops at lower control stick end. Adjustment by use of two 10°mm open end wrenches.

1.2.5 Aileron rear edge play

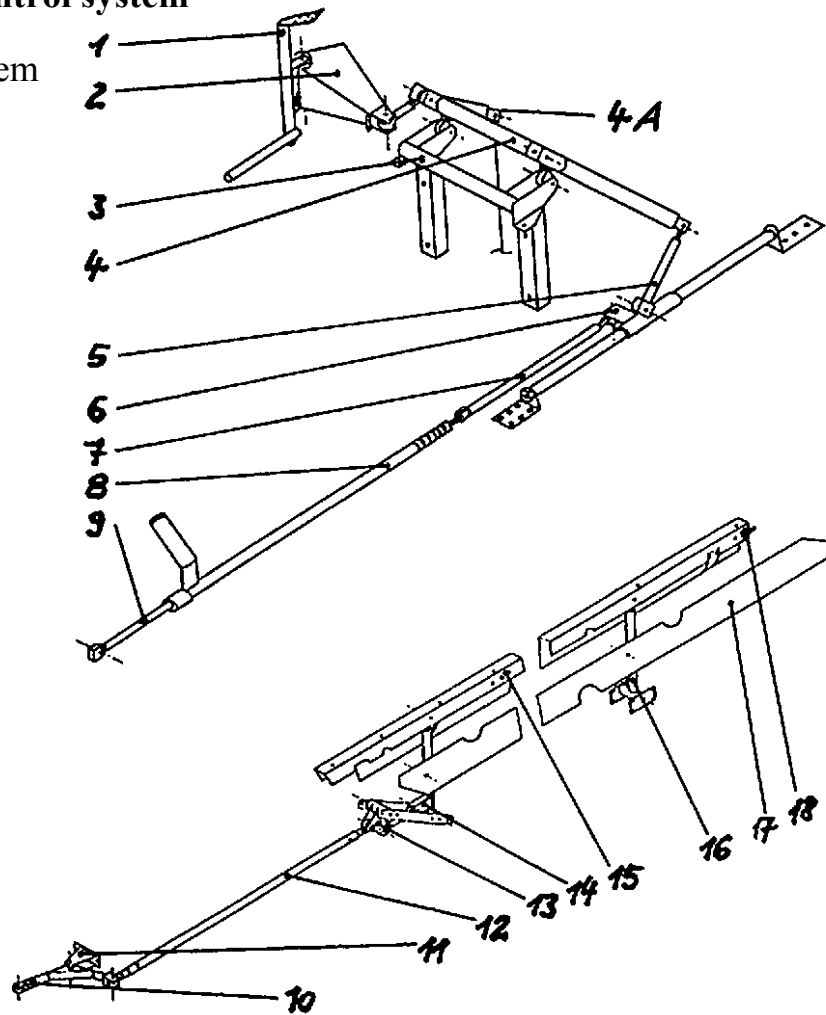
Play should be measured with control stick fixed to neutral position.

Aileron : maximum 2.5 mm <0,1 in> at inner edge

**1. SYSTEM DESCRIPTION AND ADJUSTMENT DATA** (continued)

**1.3 Air Brake Control system**

1.3.1 Control System



<b>Fuselage</b>			<b>Wings</b>		
No.	Denomination	Drawing	No.	Denomination	Drawing
1	Automatic connector bearing	3R10-119	10	Root rib drive lever	3F4-64
				or	3F4-71
2	Automatic air brake connector at fuselage	3R6-44	11	Root rib bracket	4F3-76
3	Air brake drive bracket	3R6-78	12	Wing pushrod	4F4-63
4	Air brake drive shaft	3R6-50	13	Locking lever	4F4-53
4A	<b>With TN8019 executed:</b> shaft with wheel brake cable attachment	9St13	14	Inner lever	3F4-51
			15	Upper blade	3F4-60
5	Intermediate rod	4R10-77	16	Outer lever	3F4-52
6	Sliding connector	4R6-47	17	Lower blade	3F4-54
7	Air brake rod	4R6-59	18	Friction brake	
8	Air brake handle	3R6-74			
	<b>from ser.no. 8527 on</b>	3R08-58			
9	Handle guide tube	4R6-31			

**1. System Description and Adjustment Data** (continued)**1.3 Air Brake Control system** (continued)

## 1.3.2 Adjustment

Fully extended the minimum average height above wing surface is 150 mm <5.906 in>.

**Ser.no. 8474 and from ser.no. 8527 on (ÄM LS8-1:****Wheel brake adjustment:**

There is a notch in the cockpit guide R06-75 for parking brake function. The wheel- brake can be adjusted by a screw on the end of the Bowden cable housing, located on the forward undercarriage fork above the brake actuating lever. Adjust the Bowden cable so that you can just pull the airbrake handle into the parking brake notch. The wheel brake must lock the wheel, if not install new wheel brake pads.

## 1.3.3 Stops

With the plane rigged, air brake stop is the cockpit guide R06-75.

**Caution:** Stops between inner wing air brake levers and blades should be free, when the plane is rigged. They avoid blades cutting into wing structure, when de-rigged.



**1. SYSTEM DESCRIPTION AND ADJUSTMENT DATA** (continued)

**1.4 Elevator Control System** (continued)

1.4.2 Deflections and Tolerances

Elevator:	up	28° - 30°
	down	22° - 26°

For easier checking, measured angles may be converted to mm / in deflection values, using the actual local radius of the defined measuring place. See also table below.

Limit values for aileron deflections in Millimetres/Inches

Elevator		
local radius mm / in	-22°to -26° mm / in	28°to 30° mm / in
67 / 2.638	26 to 30 / 1.024 to 1.181	32 to 35 / 1.260 to 1.378
68 / 2.677	26 to 31 / 1.024 to 1.220	33 to 35 / 1.299 to 1.378
69 / 2.717	26 to 31 / 1.024 to 1.220	33 to 36 / 1.299 to 1.417
70 / 2.756	27 to 31 / 1.063 to 1.220	34 to 36 / 1.339 to 1.417
71 / 2.795	27 to 32 / 1.063 to 1.260	34 to 37 / 1.339 to 1.457
72 / 2.835	27 to 32 / 1.063 to 1.260	35 to 37 / 1.378 to 1.457

1.4.3 Stops

Elevator stops at lower control stick end. Adjustment by use of two 10°mm open end wrenches.

1.4.4 Elevator Rear Edge Play

Play should be measured with control stick fixed to neutral position.

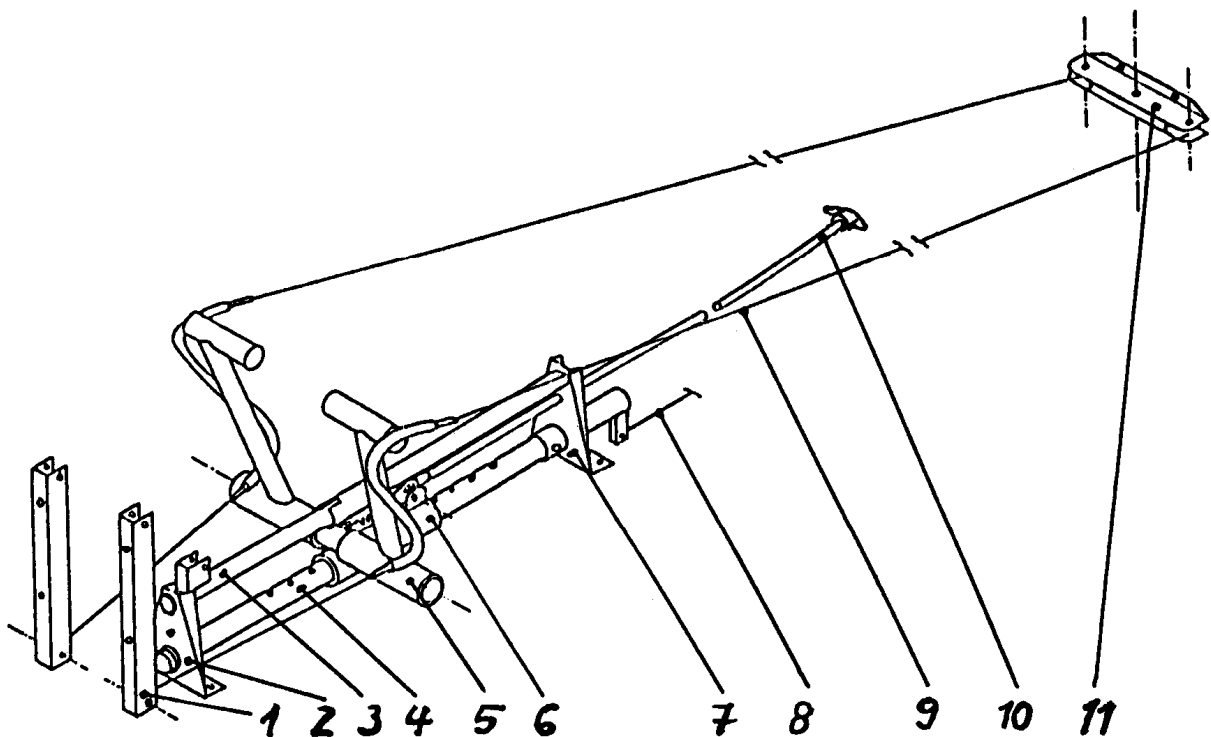
Elevator : maximum 2.5 mm <0.1 in> at inner edge

**1. SYSTEM DESCRIPTION AND ADJUSTMENT DATA** (continued)

**1.5 Rudder Control System, Wheel Brake**

1.5.1 Control System

No.	Denomination	Drawing
1	Canopy opener bracket	4R8-67
2	Forward pedal guide bracket	3R14-14
3	Upper pedal guide tube	4R14-18
4	Lower pedal guide tube	4R14-19
5	Rudder pedal	1R14-21
6	Pedal support	3R14-16
7	Rear pedal guide bracket	3R14-15
8	Wheel brake cable	
8	<b>Not installed with TN8019 executed</b>	
9	Rudder cable	
10	Pedal adjustment cable	4R14-31
11	Rudder drive bracket	4S1-10



**1. SYSTEM DESCRIPTION AND ADJUSTMENT DATA** (continued)**1.5 Rudder Control System, Wheel Brake** (continued)

## 1.5.2 Deflections and Tolerances

<u>Rudder:</u>	To both sides	26° - 30°
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For easier checking, measured angles may be converted to mm / in deflection values, using the actual local radius of the defined measuring place. See also table below.

Limit values for aileron deflections in Millimetres/Inches

<u>Rudder</u>		
Measured value = Distance from lower trailing edge to centre of cable bolt		
Measured Value mm / in	Local Radius mm / in	26° to 30° mm / in
395 / 15.551	390 / 15.354	175 to 202 / 6.890 to 7.953
396 / 15.591	391 / 15.394	176 to 202 / 6.929 to 7.953
397 / 15.630	392 / 15.433	176 to 203 / 6.929 to 7.992
398 / 15.669	393 / 15.472	177 to 203 / 6.969 to 7.992
399 / 15.709	394 / 15.512	177 to 204 / 6.969 to 8.031
400 / 15.748	395 / 15.551	178 to 204 / 7.008 to 8.031

## 1.5.3 Stops

Rudder stops are fibre glass plates at lower rudder end against vertical tail shell.

## 1.5.4 Wheel Brake

Wheel brake adjustment by Bowden cable adjusters at both cable ends – under seat and at landing gear wheel fork.

Stop for wheel brake operation at lower guide tube of pedal support.

**With TN8019 executed:**

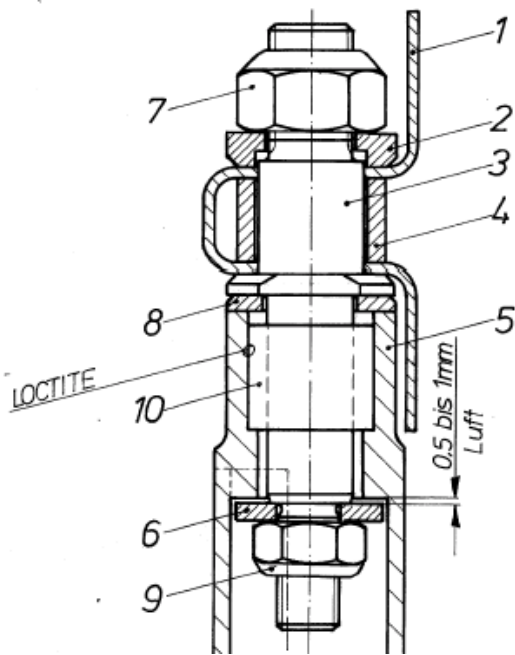
Wheel brake adjustment by Bowden cable adjusters at both cable ends – at the back of the landing gear box and at landing gear wheel fork.

**1. SYSTEM DESCRIPTION AND ADJUSTMENT DATA (continued)**

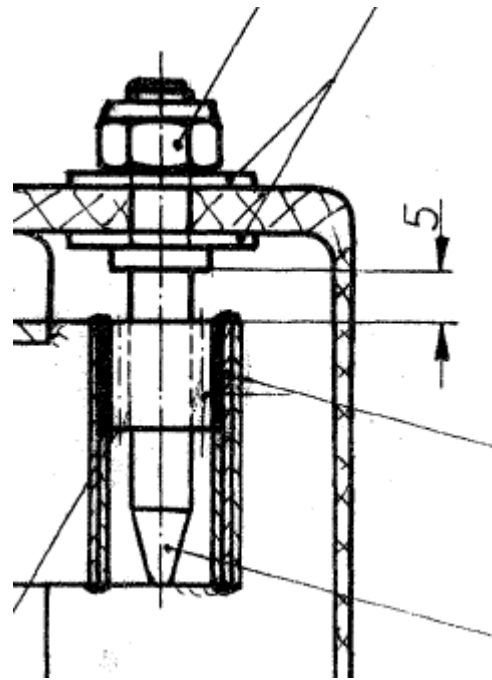
**1.5 Rudder Control System, Wheel Brake (continued)**

1.5.5 Axial play

Maximum permitted axial play at lower rudder bracket: 1mm <0.04 in>.  
 Maximum permitted axial distance at upper rudder bracket: 5mm <0,20 in>.



Lower Rudder Bearing



Upper Rudder Bearing

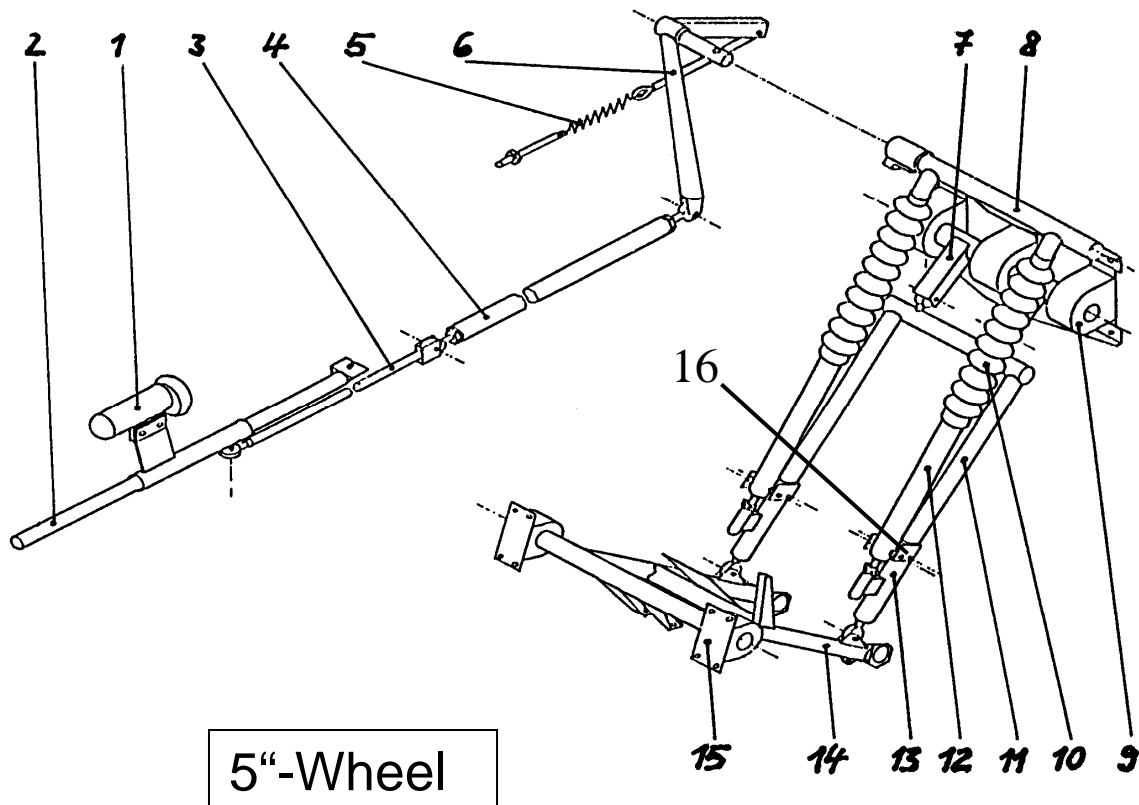
**1. SYSTEM DESCRIPTION AND ADJUSTMENT DATA** (continued)

**1.6 Landing Gear System**

**1.6.1 5" Wheel Landing Gear System**

No.	Denomination	Drawing
1	Gear handle	4R2-87
2	Gear handle guide tube	4R2-89
3	Forward landing gear drive rod	4R2-90
4	Rear landing gear drive rod	4R2-112
5	Compensating spring	4R2-215
6	Outer drive	1R2-84
7	Swinging arm	3R2-83
8	Inner drive	3R2-202
9	Rubber torsion element (large unit)	
10	Rubber bellow	
11	Upper folding strut	3R2-210
12	Inner drive sliding tube	4R2-211
13	Lower folding strut	4R2-207
14	Wheel fork	1R2-200
15	Fork rubber bearing (small unit)	
16	Deflector	4R2-204

**IMPORTANT:**  
 Always exchange parts 6 and 8 together because of close tolerances required.

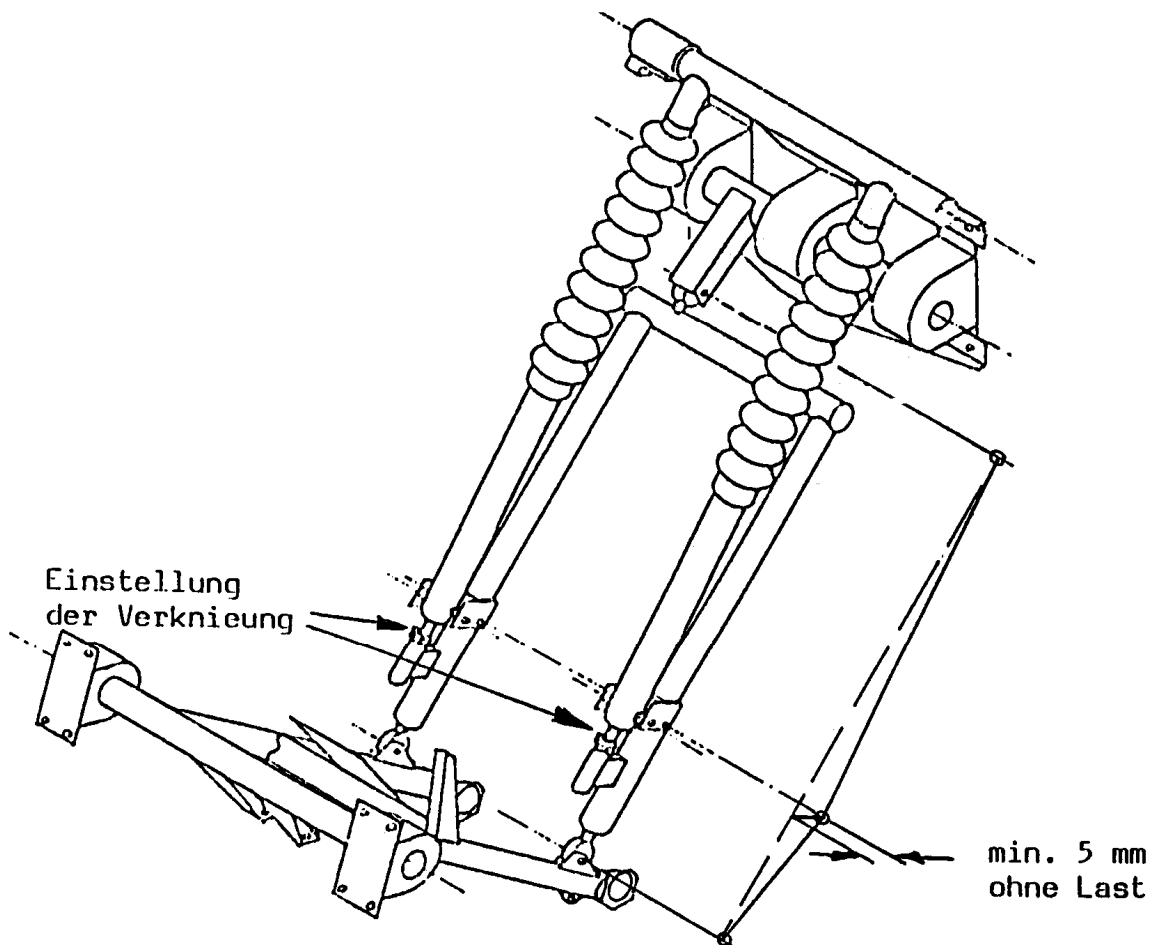


**1. SYSTEM DESCRIPTION AND ADJUSTMENT DATA** (continued)**1.6 Landing Gear System** (continued)

## 1.6.2 Adjustment

## a) Extended

Landing gear overcenter locking with wheel extended, see sketch below. Length of pushrods (3) and (4) must be adjusted such, that landing gear handle (1) can be locked into rear guide detent using force.



## b) Retracted

Landing gear is held in retracted position by handle (1) in forward guide detent.

**1. SYSTEM DESCRIPTION AND ADJUSTMENT DATA** (continued)**1.6 Landing Gear System** (continued)

## 1.6.3 Play

Play between outer drive (6) and inner drive (8) occurs as a result of overload and is not permitted. Deformations in this region can only be verified with items (6) and (8) taken out and cannot be compensated by adjustments. In this case both parts must be exchanged together because of being drilled in a jig as a pair and fitted together.

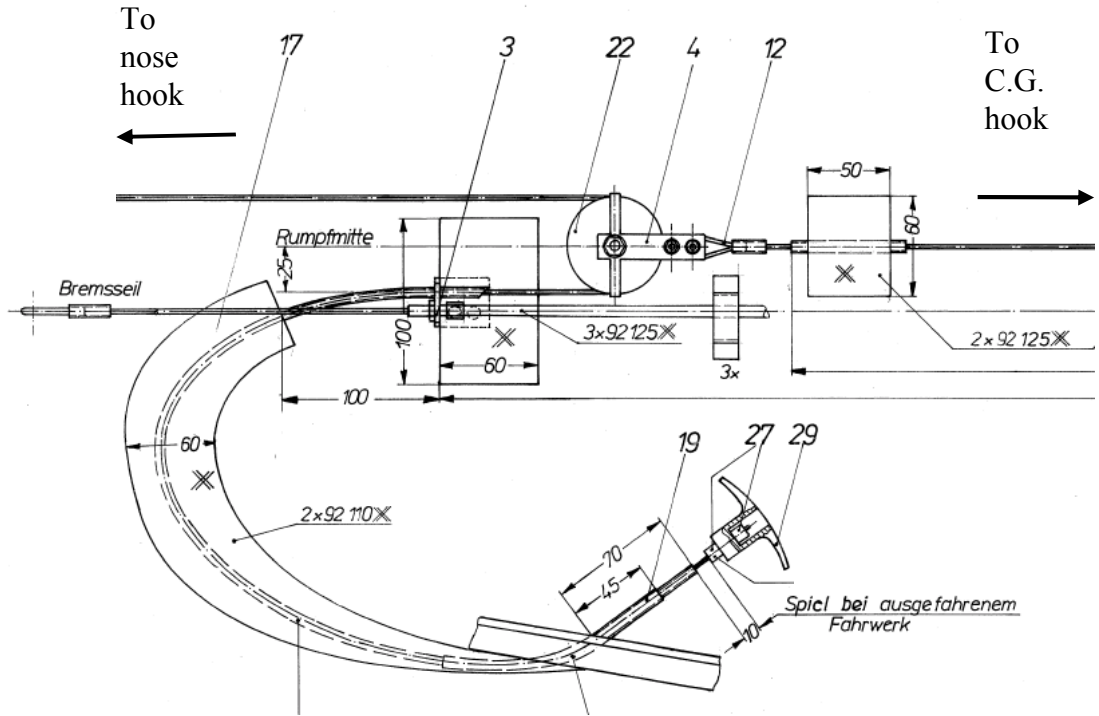
## 1.6.4 Tyre Pressures

Main wheel (5"-wheel)	3,5 bar <51 psi>
Tail wheel (Option)	2,5-3,5 bar <36 – 51 psi>

**1. SYSTEM DESCRIPTION AND ADJUSTMENT DATA** (continued)

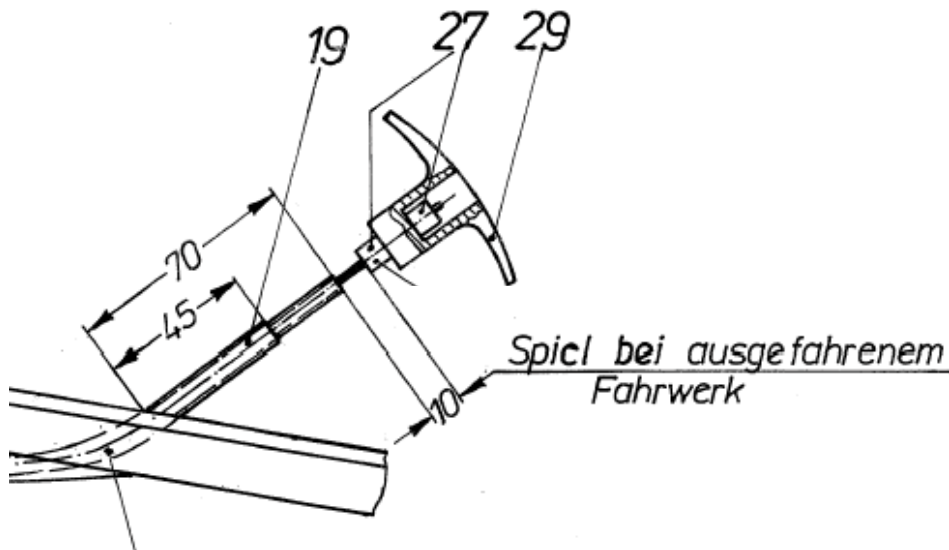
**1.7 Tow Hook System**

**1.7.1 Control System**



**1.7.2 Adjustment**

With the tow release handle fully pulled, both hooks must definitely be fully open, with the handle loose, both hooks must be completely closed. Cable length must be such, that 10 mm <0.4 in> play at tow hook handle is existent with landing gear extended and hooks closed.



**1. SYSTEM DESCRIPTION AND ADJUSTMENT DATA** (continued)

**1.7** Tow Hook System (continued)

**1.7.3 Damage**

Hook and ring of C.G. tow hook must operate easily and must not be bent or abraded. When damaged, hooks must be exchanged or repaired by the manufacturer (Tost).

**1.7.4 Disassembly and Assembly of Tow Hooks**

See Section 4

**1.7.5 Operating and Maintenance Instructions**

For all further details, refer to the Operating and Maintenance Instructions of the tow hook manufacturer

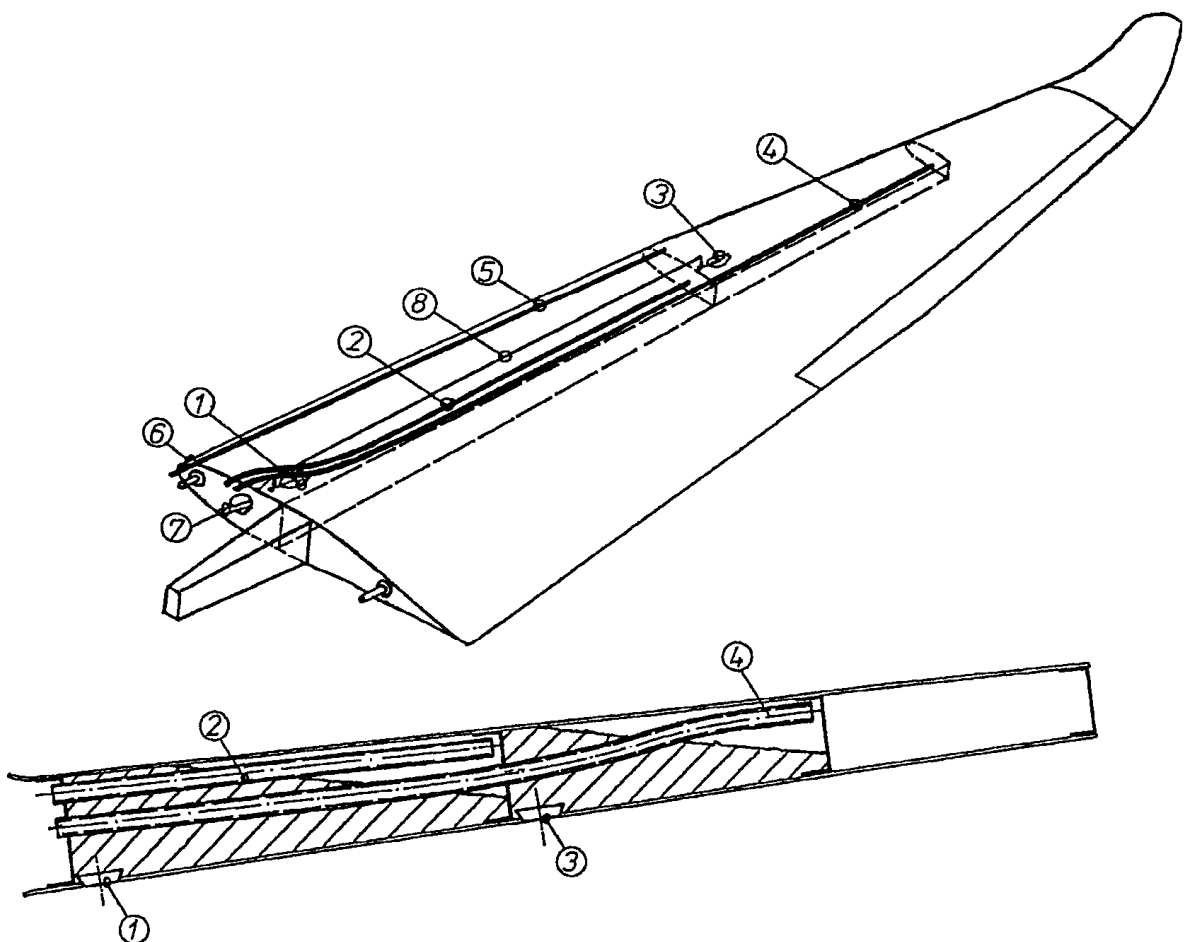
**1. SYSTEM DESCRIPTION AND ADJUSTMENT DATA** (continued)

**1.8. Water Ballast System**

**1.8.1 Wing Water Ballast System**

1.8.1.1 Control System

No.	Denomination
1	Valve of inner tank
2	Ventilation tube of inner tank
3	Valve of outer tank
4	Ventilation tube of outer tank
5	Draining tube of outer tank (only up to S/N 8500)
6	Drain valve for both tanks (only up to S/N 8500)
7	Drive lever
8	Cable to valve of outer tank



**1. SYSTEM DESCRIPTION AND ADJUSTMENT DATA** (continued)

**1.8. Water Ballast System** (continued)

**1.8.1 Wing Water Ballast System** (continued)

1.8.1.2 Adjustment

Water ballast system adjustments of fuselage and wing system must be performed together, see section 4.

1.8.1.3 Maintenance

See section 2.2

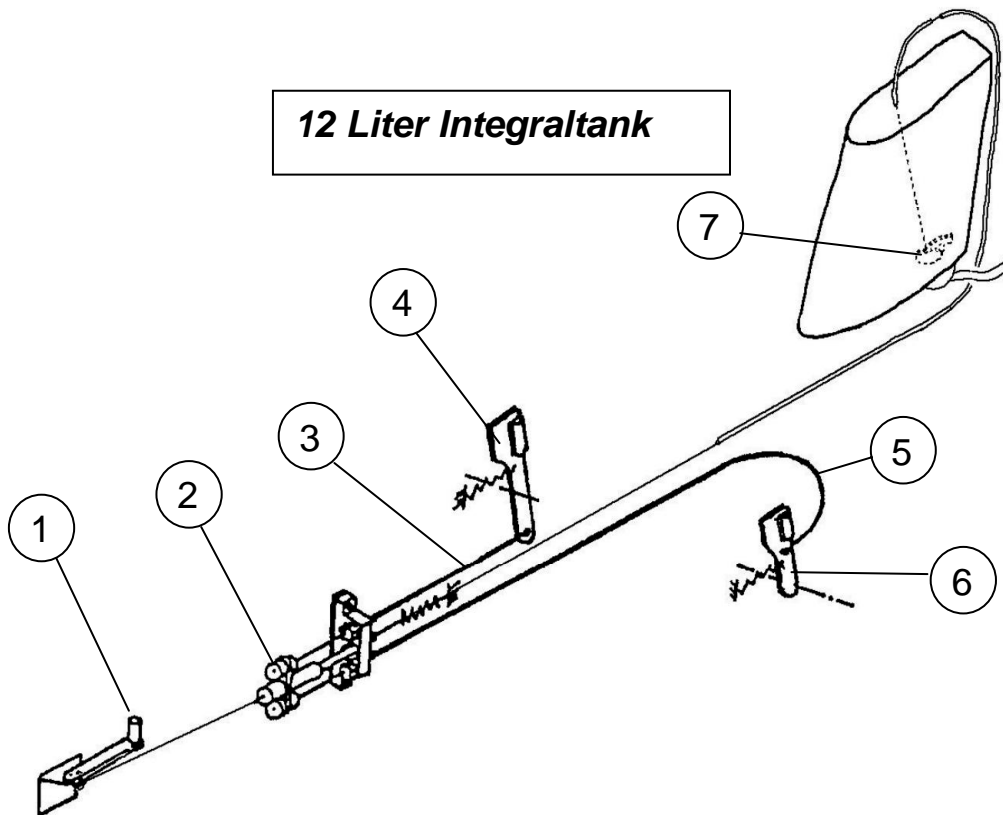
**1. SYSTEM DESCRIPTION AND ADJUSTMENT DATA** (continued)

**1.8. Water Ballast System** (continued)

**1.8.2 Fuselage Water Ballast System**

1.8.2.1.1 Control System LS8-s

No.	Denomination	Drawing
1	Cockpit lever	4R12-141
2	Drive distributor	1BR-215
3	Right side Bowden cable	4R12-129
4	Right side fuselage lever	4R12-113
5	Left side Bowden cable	4R12-130
6	Left side fuselage lever	4R12-114
7	Tail tank valve	1BR-225



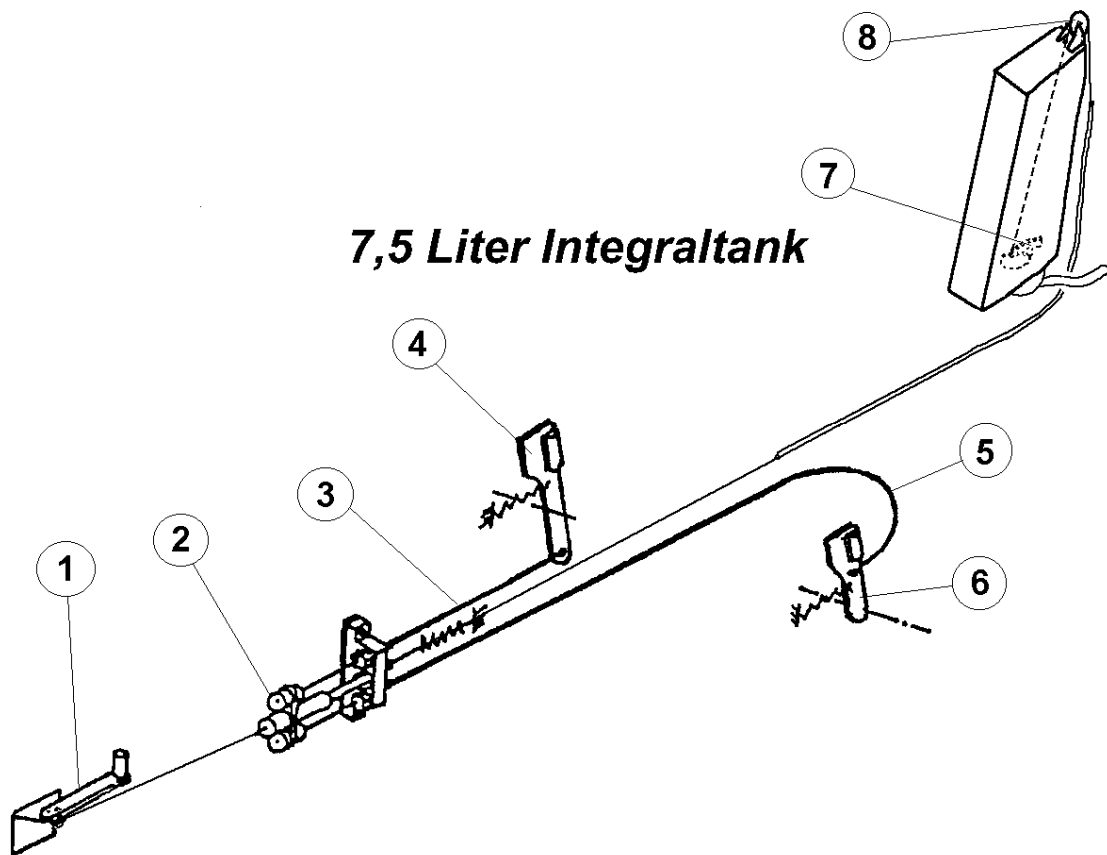
**1. SYSTEM DESCRIPTION AND ADJUSTMENT DATA** (continued)

**1.8. Water Ballast System** (continued)

**1.8.2 Fuselage Water Ballast System**

1.8.2.1.2 Control System LS8-sb

No.	Denomination	Drawing
1	Cockpit handle	4R12-141
	<b>Ser.no. 8474 and from ser.no. 8527 on</b>	9R30
2	Drive distributor	1BR-215
3	Right side Bowden cable	4R12-129
4	Right side fuselage lever	4R12-113
5	Left side Bowden cable	4R12-130
6	Left side fuselage lever	4R12-114
7	Tail tank valve	1BR-225
8	Tail fin pulley	4BR-224



**1. SYSTEM DESCRIPTION AND ADJUSTMENT DATA** (continued)

**1.8. Water Ballast System** (continued)

**1.8.2 Fuselage Water Ballast System** (continued)

1.8.2.2 Adjustment

Water ballast system adjustments of fuselage and wing system must be performed together, see section 4.

1.8.2.3 Maintenance

See section 2.2

**1. SYSTEM DESCRIPTION AND ADJUSTMENT DATA** (continued)**1.9 Electrical System**

**Important Note:** Before commencing work at the electrical system, disconnect power supply by either main switch to „OFF“ position or battery terminal connectors removed.

**1.9.1 Layout**

See diagram section 7.8 of Flight Manual.

**From ser.no. 8527 on (ÄM LS8-1):** In addition please refer to wiring plan 9E4, attached to this MM:

**1.9.2 Battery**

- Battery consists of sealed and maintenance free 12 V / at least 7 Ah lead acid gel batteries with plug-in terminals.

**Warning:** Use controlled chargers only for sealed and maintenance free lead gel batteries. When full capacity is asked for, such a charger should have 14,4 V of final charging voltage (normal controlled chargers have 13,8 V of final charging voltage). An appropriate charger named “Z 08” is available from DG Flugzeugbau.

**Important note:**        **For charging, take care of operating instructions of charger!**

**1. SYSTEM DESCRIPTION AND ADJUSTMENT DATA** (continued)**1.9 Electrical System** (continued)**1.9.3 Cables**

Specification			AWG	mm <sup>2</sup>	
MIL-W_22759/16-	14	-WS	14	2	
MIL-W_22759/16-	16	-WS	16	1,3	
MIL-W_22759/16-	22	-WS	22	0,4	
MIL-C_27500-	22	TG1T14	22	0,4	shielded
MIL-C_27500-	22	TG2T14	2x22	2x0,4	shielded

Instead of specifications named above, other cables approved for use in aircraft according to different specifications or MIL specifications can be used: Operating range min: -55° to 105°C <-67 to 221°F>, operating voltage 600V.

**1. SYSTEM DESCRIPTION AND ADJUSTMENT DATA** (continued)

**1.10 Control Surface Mass and Mass Balance**

(Should be inspected when suspecting changes of mass / weight and after repairs)

Weight and mass balance must be within given limits for safety against flutter:

	Masse / Weight <kg> / <lbs>	Hinge Moment <kg×cm> / <in×oz>	Horizontal reference line
<u>Aileron</u> <b>inner</b>	3.40 to 4.45	2.04 to 3.67	Leading and trailing edges of underside connected
	7.496 to 9.811	28.330 to 50.967	
<b>outer</b>	0.42 to 0.65	0.82 to 1.22	
	0.926 to 1.433	11.388 to 16.943	

<u>Elevator</u> (both halves together)	1.30 to 1.65	3.48 to 4.60	Straight region of upper side
	2.866 to 3.638	48.328 to 63.882	
100% mass balance by weight adaptation of pushrod in vertical tail fin. Total weight of elevator pushrod recorded in section 11.			

<u>Rudder</u>	4.30 to 5.40	-1.02 to 3.36	Centreline
	9.480 to 11.905	-14.165 to 46.662	

**1. SYSTEM DESCRIPTION AND ADJUSTMENT DATA** (continued)**1.10 Control Surface Mass and Mass Balance** (continued)

Measuring Technique for hinge moment: Control surfaces should be attached singly (also each elevator half) at two bearings without any tension or friction. Measure weight at rear edge with reference line level and local radius from hinge, multiply weight and radius to yield hinge moment.

When using identical locations for measuring as used in appendix “Control Surfaces Mass and Moment”, then rear edge weight only must be checked.

**Warning:** Repairs are possible only in exceptional cases, because after changes of local static moment due to repairs, mass balance must be fixed in this region to yield identical static moment values as in the original condition. As this requirement from the flutter investigation may exclude a repair due to low moment tolerances and little room, you should contact the manufacturer beforehand.

**1.11 Control Surfaces Rear Edge Play** (Inspect annually)

Play should be measured with control stick fixed to neutral position.

Elevator : maximum 2.5 mm <0.098 in> at inner edge

Aileron : maximum 2.5 mm <0.098 in> at inner edge

Rudder : not applicable

**1. SYSTEM DESCRIPTION AND ADJUSTMENT DATA** (continued)**1.12 Control System Friction** (Inspect annually)

Values include seals.

Aileron system: 2N to 5N, <0.200 to 0.500 kg; 0.441 to 1.102 lbs>  
measure 30 mm <1.18 in> below stick end.

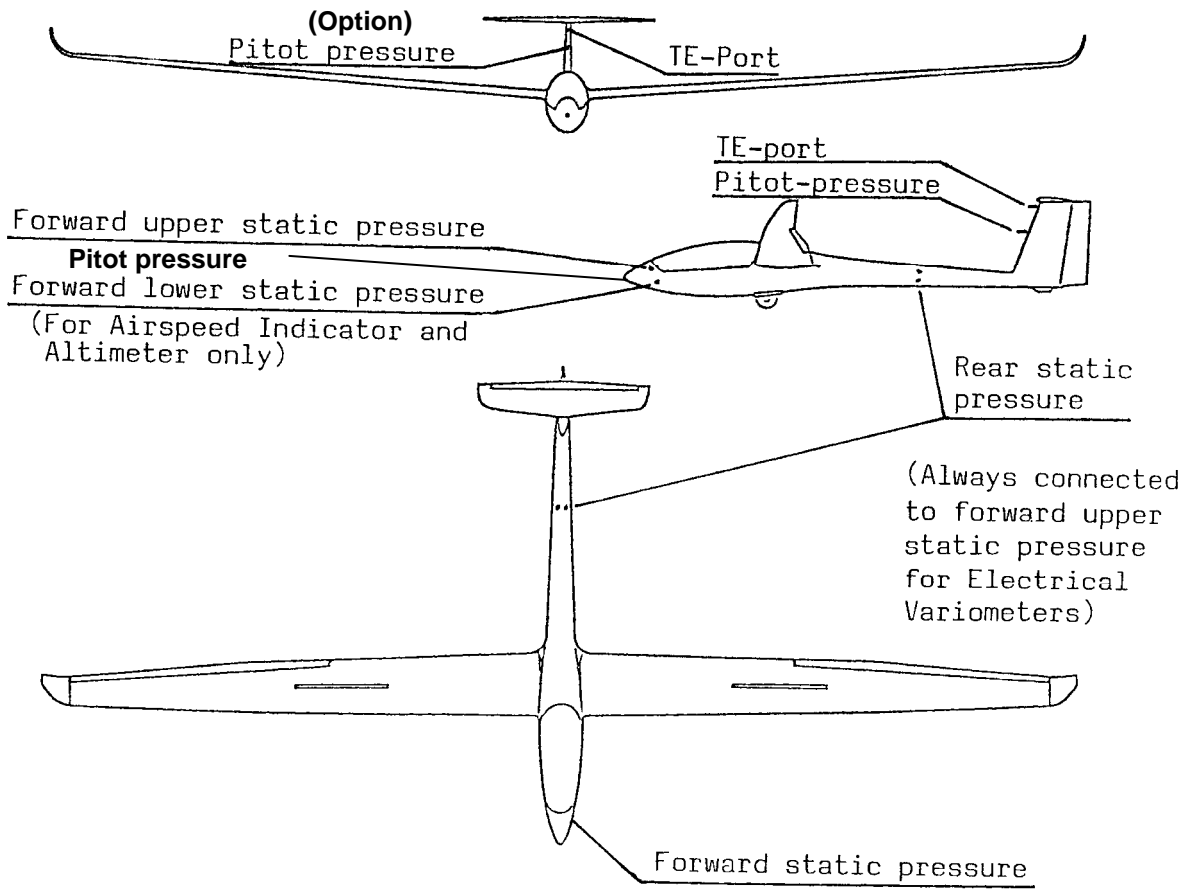
Rudder system: up to about 5N <0.500 kg; 1.102 lbs>,  
measure at lower rudder end.

Elevator system: **Friction travel** max. 50 mm, measure at stick end.

**Friction travel:** Trim stick position to about zero elevator deflection. Apply approximately 1/3 of travel and retard movement towards neutral position by hand. Measure resulting stick position. Repeat procedure for opposite movement, difference of both resulting positions yields **travel due to friction** .

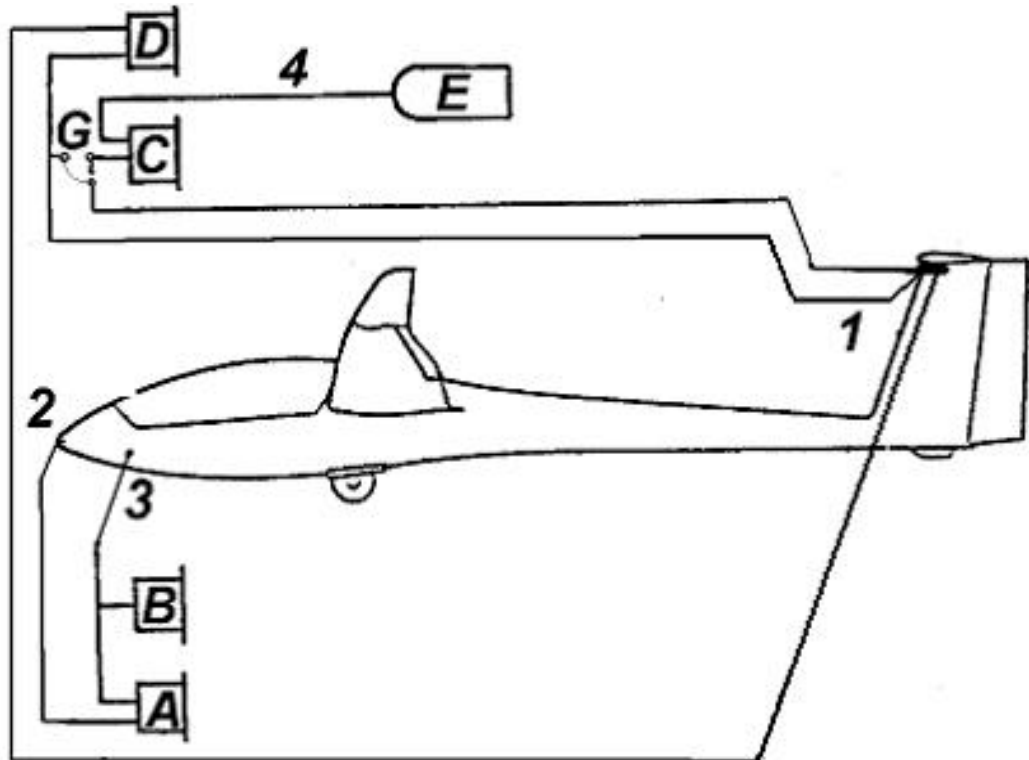
**1. SYSTEM DESCRIPTION AND ADJUSTMENT DATA** (continued)

**1.13 Pressure Ports**



### 1.13 Pressure Ports cont.

In ser.no. 8474 and from ser.no. 8527 on (ÄM LS8-1) the following system is installed:



- 1 Multi Probe : Pitot-/Static-/TE pressure port
- 2 Pitot pressure port at fuselage nose.
- 3 Static pressure port for airspeed indicator and altimeter – forward fuselage sides.
- 4, Vacuum Bottles.
- A ASI
- B Altimeter
- C Variometer
- D Electrical Variometer
- E Capacity bottles for variometers
- G Variometer switch (Option):  
TE (Soaring) / static ( Engine operation)  
(switch shown in „SOARING“ position)

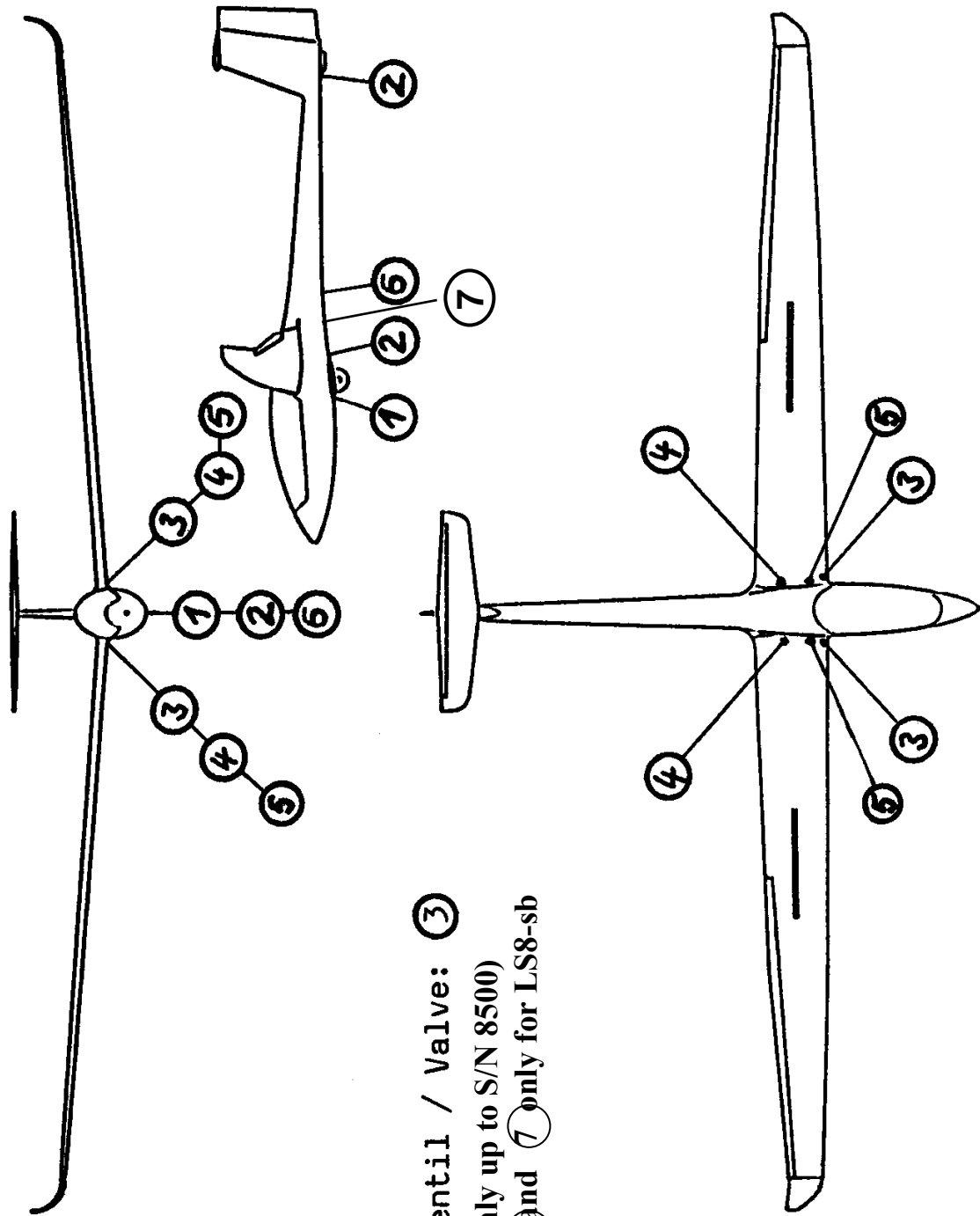
#### Colours of instrument lines:

- 1 Multi Probe:
  - Pitot **clear**
  - Static **red**
  - TE **green**
- 2 Front total pressure **yellow**
- 3 Static pressure front **blue (for ASI and altimeter only!)**
- 4 Variometer capacity bottles **clear dia. 8 mm (0,315 in)**

**Note:** To preserve the sealing-rings inside the holder for the Multi Probe, the end of the probe should be greased with e.g. Vaseline from time to time.

**1. SYSTEM DESCRIPTION AND ADJUSTMENT DATA (continued)**

**1.14 Drain Orifices**



Ventil / Valve: ③  
 (Only up to S/N 8500)  
 ⑥ and ⑦ only for LS8-sb

**1. SYSTEM DESCRIPTION AND ADJUSTMENT DATA** (continued)

**1.15 Primary and Secondary Structure**

No secondary structure available !

## 2. INSPECTIONS

### 2.1 Daily Inspection

2.1.1 **Daily Inspection and Pre-flight Check** see Flight Manual chapter 4.3

2.1.2 **Post flight Check** see Flight Manual chapter 4.9

### 2.2 Inspections at Intervals

#### 2.2.1 Every 200h and during Annual inspection

Inspect rudder cables for wear, especially at S-shaped guides at pedals. Worn cables must be exchanged. For exchange of control cables see section 4.14.

#### 2.2.2 During Annual Inspection (see also Checklist section 11)

1. Wing shell, **especially in main spar cap range**, inspect for:
  - (a) Cracks, scratches, pressure marks ( Shell and spar caps are made from carbon fibre material. This is sensitive against impact and compression, damage is difficult to detect)
    - (1) When suspecting damage, tap region off..
  - (b) When suspecting humidity in the structure in the region of the integral tanks (recognisable for instance at irregular surface mirror finish on the wing under side)
    - (1) Inspect structure through water discharge openings using an endoscope and store units in dry environment according to instructions given in Flight Manual section 4.2. Irregularities will slowly disappear. If need be, contact manufacturer!
2. The aileron sandwich is pressure sensitive.

When pressure marks are present, then the sailplane may be no longer airworthy. Because of resulting possible structural problems or danger of flutter, contact manufacturer for damage classification and repair!
3. Fuselage automatic aileron connectors are equipped with deflectors to avoid incorrect rigging: Check if rigging of the second wing is impossible with intentionally incorrect aileron deflection, namely in neutral position or deflected upward ?

## 2.2 Inspections at Intervals (continued)

### 2.2.2 During Annual Inspection (continued)

4. Lubricate various parts according to plan, see section 3.3.

5. Protect gel coat with suitable polish.

(The wax film protects the gel coat against embrittlement and cracking due to ultra violet light). Suitable polish (e.g. Concord surface sealing) is available from DG-Flugzeugbau.

(a) See also cleaning and care, Flight Manual Section 8.5.

(b) When you use a polishing machine, be careful not to damage:

- (1) Registration signs
- (2) Anti collision colour markings
- (3) Gap seals

These can be damaged by excessive heat.

6. Check anti-friction tape at elevator leading edge under plastic strip sealing.

(a) Damaged anti-friction tape will yield damage of gel coat at control surface very quickly.

(b) For installation of sealing see section 4.6.

7. Inspect air brakes:

(a) Friction damper at outer side of air brake for proper operation of damper rods.

(b) Friction pads free from grease.

(c) Check bearings of air brake levers for corrosion and possible jamming/blocking under load: pull with about 25 kg <55 lbs> force at upper end of each lever in flight direction, simultaneously retract (do not counter hold at cockpit lever!). With too much play or too stiff movement, get bearing(s) repaired according to separately available repair instruction.

## 2.2 Inspections at Intervals (continued)

### 2.2.2 During Annual Inspection (continued)

#### 8. Inspect landing gear for:

- (a) overcenter of folding strut:
  - (1) Adjustable overcenter 5 mm <0.2 in> without load (s. Section 1.6).
  - (2) Value increases with load.
- (b) Preset load at folding strut overcenter.
- (c) Rubber torsion elements for deformation, separation of rubber from metal or cracks.
- (d) When adjustments are being made, check for:
  - (1) identical overcenter at both folding struts.
  - (2) Locking of adjusters.
- (e) Cockpit locking: ***no play*** in direction Extend-Retract allowed (without load on wheel, i.e. on the trailer) because of possible collapsing, resulting in bent inner and outer drive levers.

- 9. Perform Annual Inspection according to checklist in section 11. The annual inspection checklist contains items (e.g. aileron lateral bearing play, aileron vent openings), which may only be checked after removing seals. Unless changes are suspected (for instance lateral control surface gaps differing from design values, see also section 4.5), it is illogical to remove (destroy) seals just for inspection purpose. Existence of washer at fixed bearings can be checked after lifting sealing lids cautiously.

## 2.2 Inspections at Intervals (continued)

### 2.2.2 During Annual Inspection (continued)

10. Check the following items of the water ballast system:
  - (a) Wing and vertical tail fin water tanks for external tightness.
  - (b) Wing tanks and tail fin tank for leaks into structure (irregular surface mirror finish visible).
  - (c) Ventilation and drain tubes for free passage by blowing through, see details section 4.2.
  - (d) Existence of tail fin tank filling markings at vertical tail fin.
  - (e) Wire meshing in filling funnel is mandatory to establish proper function of vertical tail fin valve. Tail tank leaks must be repaired. The vertical tail filling tube adapter is **Minimum equipment**.
  - (f) Tail fin tank discharge time for **7.5 Litres**: Maximum 90 Seconds.
  
11. Check thermometer indication using other thermometer for comparison.

## 2.2 Inspections at Intervals (continued)

### 2.2.2 During Annual Inspection (continued)

#### 12. Check canopy locking and emergency release function:

Measure force required to open canopy emergency release according to following steps (Caution: If this measurement or an operational check is performed without a helper, the spring at the rear end temporary hinge bolt becomes deformed and must be exchanged !):

- (a) "Pilot" in seat with spring gauge.
- (b) Both canopy locking levers opened.
- (c) Helper holding front canopy end must hold canopy on opener to avoid lifting of canopy by gas spring.
- (d) Force required to open right side emergency release max. 15 kg <33°lbs>.
- (e) After force measurement, the pilot pushes the rear end temporary hinge bolt free and lifts the canopy at opening levers, the helper still holds the front end on the opener.

With canopy fully open, the helper pushes the connecting pin upward and engages canopy to opener by turning drive lug anti-clockwise.

When emergency release force is too high, grease all moving parts, contact manufacturer if necessary.

#### 13. Inspect function of canopy rear end temporary hinge:

Measure force required to lift canopy rear edge free from spring:

Reference value 8 to 15 kg <18 to 33 lbs>

If force required is considerably lower, the spring must be exchanged to ensure proper functioning of canopy jettison.

## 2.2 Inspections at Intervals (continued)

### 2.2.2 During Annual Inspection (continued)

14. Inspect function of **tow hooks**:

Refer to operating and maintenance instructions of tow hooks, see section 0.4 of this manual.

15. A **new** C.G. weighing (see section 5) must be performed at least **every 4 years** during the annual inspection, see section 2.2.4.

## 2.2 Inspections at Intervals (continued)

### 2.2.3 Every 3 Months:

Check function of canopy emergency jettison according to instructions provided in Flight manual section 4.3."6 Cockpit".

### 2.2.4 Occasionally

#### **C.G. hook**

After out landings in high grass or on soft ground, check C.G. hook for contamination or damage.

#### **C.G. weighing**

A **new** C.G. determination either by weighing or by calculation (see section 5) must be performed:

- (a) When equipment has been **altered** compared to valid equipment list.
- (b) After all other work influencing weight and balance, a C.G. weighing can be waived, when result can reliably be achieved by calculation. (See Flight Manual section 6.3).

A **new** C.G. weighing (see section 5) must be performed:

- (a) Even with equipment unaltered at least **every 4 years** during the annual inspection.
- (b) After all other work influencing weight and balance, when result can not reliably be achieved by calculation.

## 2.3 Extraordinary Inspections

### 2.3.1 Inspection after rough landings and ground loops

**Complete plane:**

Check angular position of principal axes (Horizontal and vertical tail).  
Check wing flex number.

**Wings:**

Main spar connection: Check main pins and bushes for deformation, hairline cracks and/or delaminated regions around bushes.

**Root ribs:**

Cracks in bonding region between rib and wing shell and spar?  
If need be, remove paint and check if crack continues into FRP structure.  
Bonding of pins, cracks, delamination ?

**Shells:**

Compression, cracks, blisters?

**Note:** Hairline cracks in paint layer originating from air brake cut-out edges are insignificant. Hairline cracks in paint along leading edge stagnation point are without significance as long as they do not “open” with pressure on upper and lower shells.

**Aileron:**

Compression, cracks, blisters ?  
Inspect bearing regions and drive connection region.

**Fuselage:**

Wing-fuselage connection:  
Delaminations, increased play, bent tangential tubes (harsh rigging)?

**Torsion check:**

Hold fuselage, move vertical tail fin laterally. Check for hairline cracks?  
Fuselage shows unusual deformations?  
Fuselage boom-vertical tail fin intersection: cracks?  
If need be, scratch paint and filler off, move tail fin (also front-aft): do cracks continue into FRP structure?  
Remove rudder, inspect bonding of vertical tail fin web.

## 2.3 Extraordinary Inspections (continued)

### 2.3.1 Inspection after rough landings and ground loops (continued)

**Horizontal tail attachment:**

Increased play? Cracks in upper vertical tail fin rib, deformation of brackets, horizontal tail pins loose or deformed?

**Rudder attachment:**

Increased play, delaminations (white FRP regions), bent brackets?

**Fuselage shell:**

Externally: Cracks, kinks, wrinkles?

Internally: Delaminations (white FRP regions), white zigzag lines, cracks?

Stiffeners and frames loose from shell? (Take seat out and check inner cockpit region accordingly).

**Main bulkhead:**

Cracks? Safety harness shoulder strap fixing? Landing gear box bonding/cracks?

**Safety harness lap belt fixing:**

Check seat for cracks/delamination around fixing points. Check safety harness condition, check lap belt fixing at seat.

**Control system:**

Condition and unobstructed movement of all controls.

**Instruments:**

Function? Clogging in pressure pick-ups?

**Engine bay (LS8-b only):**

Cracks or kinks at walls. Engine bay doors close flush?

## 2.3 Extraordinary Inspections (continued)

### 2.3.1 Inspection after rough landings and ground loops (continued)

**Landing gear:**

Inspect for straight axle position, deformation of struts or rubber torsion elements, angular position, unobstructed movement during extend-retract, folding struts proper overcenter, dirt in folding strut forks?

White delamination or cracks in gear box or box bonding regions?

Remove baggage compartment cover also to check from other side.

Condition of drive lever, play in cockpit drive/locking

**Tail skid, tail wheel:**

Cracks and white delaminations at fixing region? Tail wheel: pressure?

## 2.4 Inspection Sequence to Increase Service Life

### 1. General

Results of supplementary serviceability tests at main spar booms for wings proved, that service life of FRP powered sailplanes may be increased to 12.000 hours if airworthiness of each single powered sailplane (in addition to annual inspections) is checked according to a special multi-step inspection programme.

### 2. Schedule

When the powered sailplane has reached 3000 hours service life an inspection according to the programme mentioned under 3. must be carried out. If the result of the inspection is positive or found defects repaired properly, the service life of this powered sailplane will be increased by 3000 hours to 6000 hours (1. Step).

The inspection routine should be repeated when reaching 6000 hours. With a positive result or found defects repaired properly, service life will be increased by another 3000 hours to 9000 hours (2. Step).

The inspection routine should be repeated when reaching 9000 hours. With a positive result or found defects repaired properly, service life will be increased by 1000 hours each to 10000 hours (3. Step), 11000 hours (4. Step) and 12000 hours (5. Step).

3. The valid **Inspection Programme** should be requested from the manufacturer stating serial number and service time.
4. Inspections should be carried out at the manufacturer or an adequately licensed repair shop.
5. Results of inspections must be recorded in an inspection report, commenting to each inspection step. If inspections are not carried out at the manufacturer, a copy of the report must be sent to them for analysis.
6. This inspection does not affect annual inspections.

### **3. Maintenance**

#### **3.1 General Care (see Flight Manual)**

#### **3.2 Maintenance of Airframe**

The airframe needs no maintenance apart from surface care (see above) and greasing of control system and pins (see section 3.3).

After landings on soft ground landing gear and C.G. hook must be cleaned.

#### **3.3 Lubrication Schedule**

<b>Location</b>	<b>Frequency</b>	<b>Lubricant</b>
Main pins and bushes of (1) Wing-fuselage connection (2) Elevator connection (3) Winglet connection Wing side bearings of automatic aileron and air brake system connectors, which are inserted into fuselage couplings	Before each rigging	Water insoluble bearing grease or grease containing molybdenum, for instance: Molykote BR2 (Temperature range from -30° to 130° C <-22° F to 266° F> )
Landing gear: all joints (also at forward rubber bearings)	Once a year	General purpose oil Note: protect rubber parts against oil.
Bearings at control surfaces (needle roller bearings only)	After dis-assembly only	Molykote grease BR2 (-30°- 130°C <-22° F to 266° F >) or Molykote grease 33 (-70°- 180°C <-94° F to 356° F>)

**Tow hooks:** see Operating and maintenance instructions of manufacturer (TOST)

### 3.3 Lubrication Schedule (continued)

**Warning:** Never grease or oil longitudinal motion pushrod bearings. They will soon be destroyed due collection of foreign matter. These ball bearings are used in elevator system, aileron system, air brake system and landing gear drive.

**Warning:** The friction dampers inside the air brake boxes prevent oscillations during extension of air brakes. Therefore, **friction pads should never be greased or oiled !**

### 3.4 Damage of Airframe

Before each take-off, especially after longer parking, a ground check must be performed. Take care of small alterations, for instance small holes, blisters and uneven surfaces.

These may indicate something going wrong.

Contact manufacturer immediately, send perhaps photos of damage and include condition report of an inspector. With these, the manufacturer is able to classify the damage and provide you with repair instructions.

Minor damage, as scratches, small cracks and holes on the surface can be corrected by yourself or a licensed repair shop rated for FRP work.

Further hints as well as a list of materials used can be found in the repair manual LS8-s and LS8-sb.

You should never repair for instance the following:

- Main spar damaged.
- When main brackets at wings, fuselage or tail unit are torn out or in their near vicinity delamination (often “white” FRP) can be detected.
- When parts are damaged such, that correct positioning without jigs or moulds cannot be guaranteed or their structural composition can not longer be verified.
- When cutting open undamaged parts for repair is required.

## **4. Instructions for Assembly- and Maintenance Work**

### **4.1 Seat disassembly and assembly**

#### **4.1.1 Disassembly**

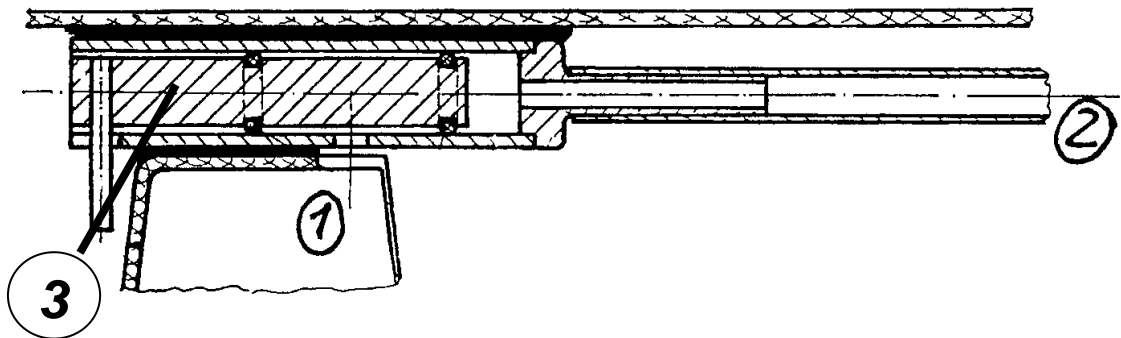
- (1) Remove battery cover from front seat end (2 Camlock fasteners). Batteries fixed to base either by elastic FRP brackets or straps.
- (2) Remove 8 bolts (8 mm thread) hexagon recess No. 5, watch for length and position of bolts, colour mark position of short ones !
- (3) Disconnect backrest base from seat, remove backrest.
- (4) Remove 5 (4 **from ser.no. 8527 on (ÄM LS8-1)**) countersunk screws each (Philips recess, M4 thread) at left side along air brake lever guide and at right side at landing gear lever guide. Remove T-shaped handle from pedal adjuster cable (5 mm thread, nut LN 9348 or DIN 985-8zn, width over flats 8 mm). Use pliers at pressed-on end fitting to avoid cable twisting.
- (5) Loosen control stick opening cover, place air brake lever into forward position.
- (6) Swivel left side of seat upward. Direct left lap belt fixing at seat around longitudinal motion pushrod guide by pulling inward at belt. Take seat out to upper left.

#### **4.1.2 Assembly of seat**

- (1) Inspect under seat region for foreign matter, tools etc.
- (2) Check steel strap in front of control stick existent.
- (3) Connect battery cables to batteries.
- (4) Rest right seat side on support and direct control stick into cut-out.
- (5) Direct pedal adjuster cable below steel strap into guide, place air brake handle into forward position.
- (6) When lowering seat, direct release handle around seat edge and watch especially for left lap belt fixing, this should never be forced over the seat support and elevator pushrod guide, pull seat to cockpit centre.
- (7) If seat fixing bolts are different in length, the short one must be fitted behind trim indicator to avoid chafing at trim system or trim malfunction.
- (8) Fix countersunk screws along left side air brake guide and right side gear handle guide.
- (9) Insert remaining 8 mm thread bolts with hexagon recess No. 5, watch bolt length and positions as noted before.
- (10) Place battery cover to front seat end and close 2 Camlock fasteners.
- (11) Check control system after installation for unobstructed movement.

## 4.2 Adjustment of Water Ballast System

- (1) Before adjusting wing system, check ventilation tubes No. 2 and 4 (see section 1.8) free from clogging. ( Valid only up to S/N 8500: Additionally check draining tube No. 5. free)
  - a) Cleaning of ventilation tubes 2 and 4 possible from root rib end after removing two plugs at root rib (See section 1.8).
  - b) Only up to S/N 8500: Cleaning of tube 5 after removing drain plug No. 3 at root rib (See drawing below).

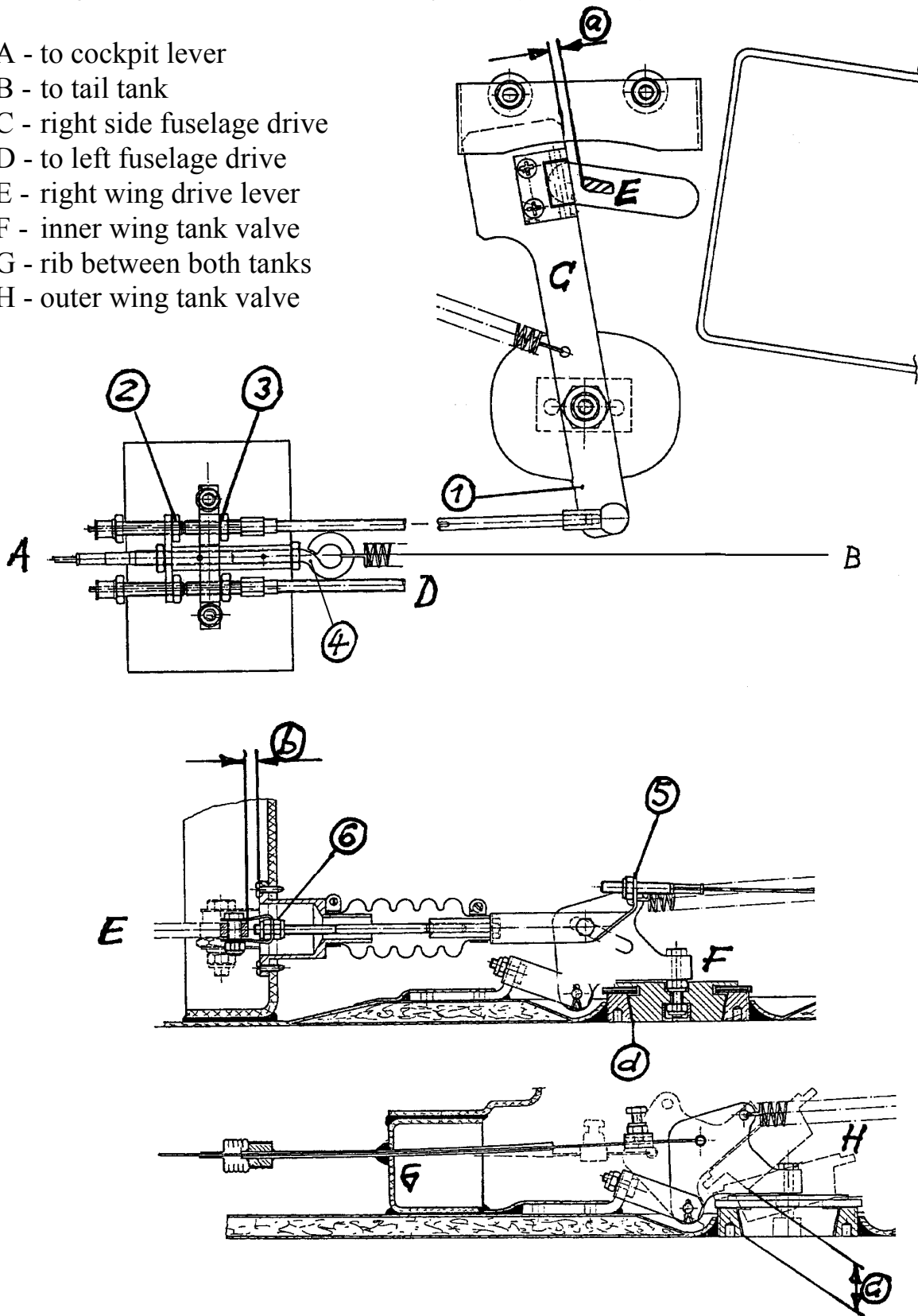


### Drain valve at root rib (valid only up to S/N 8500)

- 1 Opening to inner tank
  - 2 Tube from outer tank: must have free passage
  - 3 Drain valve plug
- (2) Check cockpit operating toggle lever for overcenter in open position.
  - (3) Adjusters at >2< and >3< are used for adjustment of Bowden cable synchronisation and simultaneous opening.
  - (4) Inspect maximum opening of both valves: opening travel of inner valve should be between 19 and 20 mm <0.75 to 0,83 in> (See drawing next page at >d<, method of measurement as indicated under >c<), the one of the outer valve between 13 to 15 mm <0.51 to 0.59 in> (See sketch at >c<). Possible adjustment at >6<.
  - (5) Both wings must be adjusted symmetrically.
  - (6) Play between fuselage and wing drive levers at >a< should be between 0 and maximum 2 mm <0 to 0.08 in>, measure from baggage compartment.
  - (7) Check vertical tail fin tank opening after filling some water: Opening simultaneously with or before **inner** wing tank. Tail fin tank adjustment possible at >4< after wing system adjustment or inspection.
  - (8) Do not forget to lock and colour mark all nuts after adjustments.

4.2 Adjustment of Water Ballast System (continued)

- A - to cockpit lever
- B - to tail tank
- C - right side fuselage drive
- D - to left fuselage drive
- E - right wing drive lever
- F - inner wing tank valve
- G - rib between both tanks
- H - outer wing tank valve



### 4.3 C.G. Hook System Disassembly and Assembly

Tools: 3/8" drive ratchet, 8 and 10 mm sockets, 8 and 10 mm ring- or open end spanners.

General: Note length of bolts and positioning of washers for all assembly positions.  
Keep fixing bolts with plane during hook overhaul.

#### Disassembly of C.G. hook:

- (1) Take canopy off from fuselage according to Flight Manual section 4-3 with a helper after pulling emergency canopy release.
- (2) Disassemble seat according to section 4.1.
- (3) Under seat, disconnect C.G. release cable from pulley, watch for spacer.
- (4) Disassemble C.G. hook from brackets at landing gear fork.
- (5) Pull hook downward.
- (6) Open screwed joints  $\geq 2$  below cable and  $\geq 3$  at lower end of drive lever for about 4 mm  $<0.16$  in>, expand lever arms and remove cable end  $\geq 1$ .

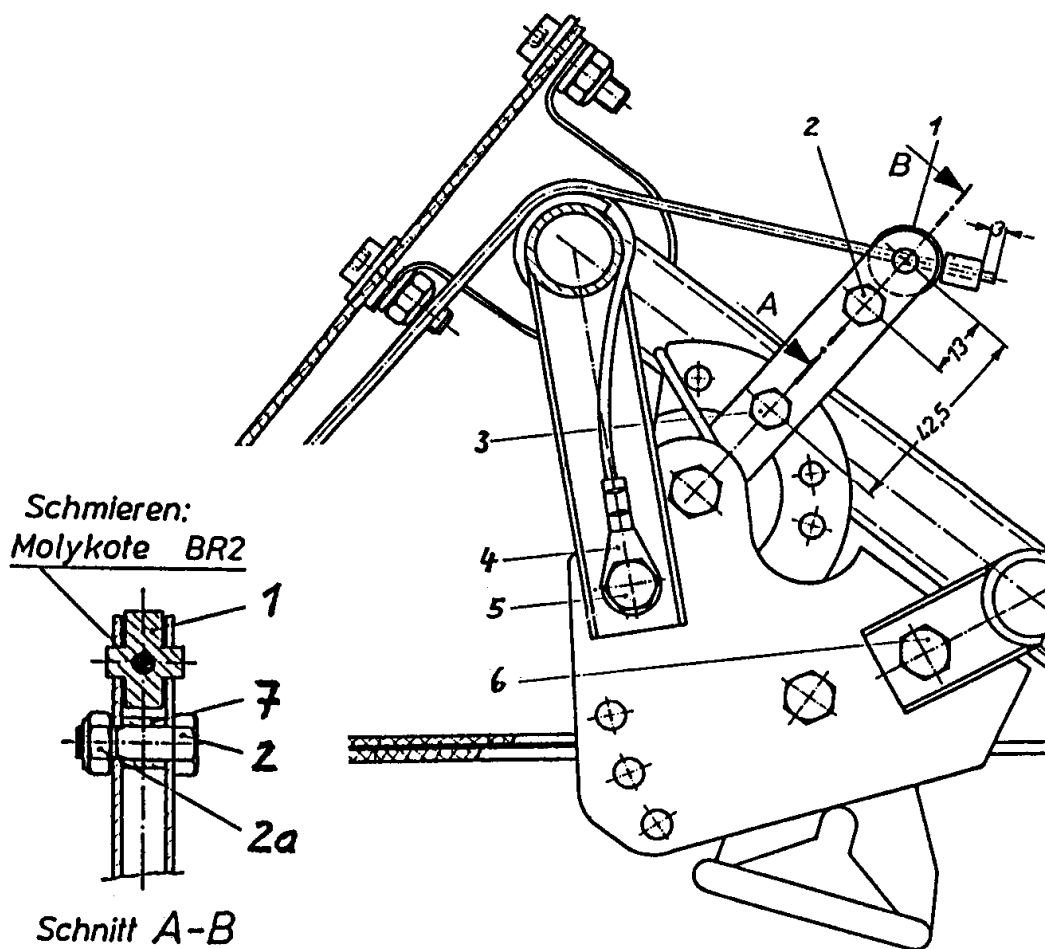
#### Assembly of C.G. hook in reverse order, watch out especially for the following:

- (1) Exchange cable, when wear is considerable in the region sliding over the fork cross member PVC-cover, see also section 4.17 and in FAA "Aircraft Inspection and Repair" Manual.
- (2) Cable must be routed **over** cross member of landing gear fork.
- (3) For position of drive lever at circular segment and fixing bores see sketch below.
- (4) Bushing  $\geq 7$  between lever arms and below cable end avoids clamping of connector.
- (5) Grease cable connector  $\geq 1$ , set into bores at drive lever end and tighten at  $\geq 2$  and  $\geq 3$ .
- (6) Connect ground cable from control stick  $\geq 4$  together with forward fixing bolt  $\geq 5$ .
- (7) Connect cable to pulley under seat (spacer!) and check function of C.G. hook.
- (8) For proper overcenter of hook system, 10 mm  $<0.4$  in> of free cable travel must be available at cockpit T-shaped handle, see section 1.7.
- (9) Before installation of seat, **check for non-existence of foreign matter.**

### 4.3 C.G. Hook System Disassembly and Assembly (continued)

**Warning:** The following items result in improper hook function:

- (b)(a) Missing bushing  $\geq 7$  between drive levers below cable connector  $\geq 1$
- (b) Cable below cross member of landing gear fork.
- (c) Wrong drive lever position at segment.
- (d) Use of other hook fixing positions.



#### 4.4 Nose Hook System Disassembly and Assembly

Tools: 3/8" drive ratchet, 8 and 10 mm sockets, 3 and 4 mm hex head driver sockets, 10 mm ring spanner, 12 mm open end spanner.

General: Note length of bolts and positioning of washers for all assembly positions.

Keep fixing bolts, 5 spacers and lever extension with plane during hook overhaul.

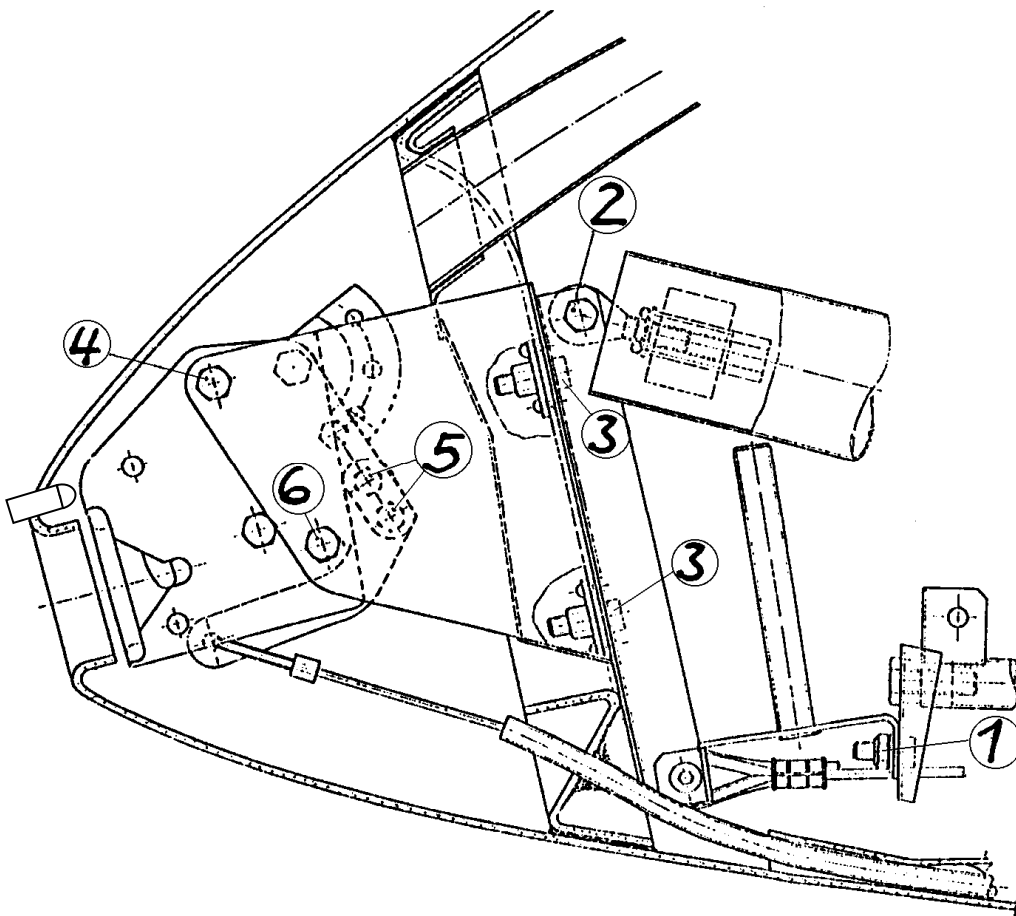
Disassembly of nose hook:

- (1) Take canopy off from fuselage according to Flight Manual section 4 with a helper after pulling emergency canopy release.
- (2) Disassemble seat according to section 4.1.
- (3) Under seat, disconnect C.G. release cable from pulley, watch for spacer.
- (4) Pull pedals to rearmost position.
- (5) Disconnect trim weight holder from pedal guide at >1<.
- (6) Disconnect 2 bolts >2< at front end of canopy support from bracket, move support as far back into cockpit as possible, if need be disconnect gas strut at one end as well.
- (7) Disconnect both canopy support brackets including trim weight holder from nose bulkhead at >3< and move backward too.
- (8) Pull nose hook together with bracket backward from bulkhead.
- (9) Disassemble nose hook from bracket at >4< and >6<, watch for 4 spacers between nose hook body and bracket and for 1 spacer inside nose hook body at position >6<.
- (10) Disassemble drive extension with cable from drive lever at >5<.

#### 4.4 Nose Hook System Disassembly and Assembly (continued)

Assembly of nose hook in reverse order, watch out especially for the following:

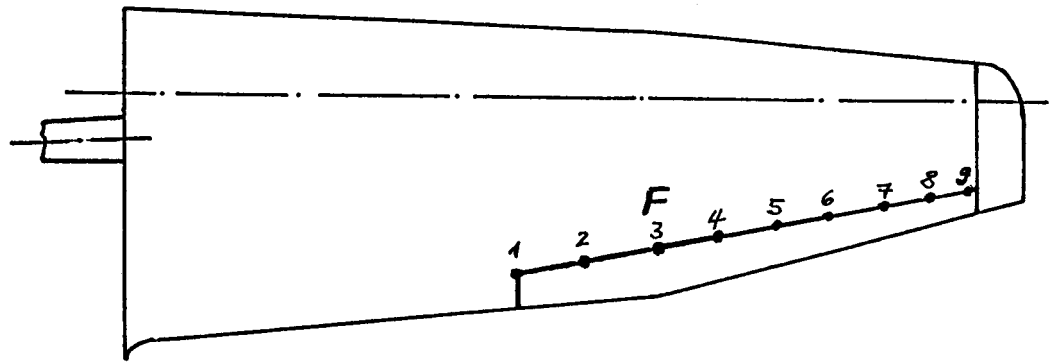
- (1) Insert spacer at position >6< inside hook body before assembly of lever extension.
- (2) When assembling nose hook into bracket, guide outside spacers into position using 12 mm open end spanner.
- (3) After assembly at >3< and connecting C.G. hook cable at pulley (spacer!) – check proper function of both hooks.
- (4) For proper overcenter of hook system, 10 mm <0.4 in> of free cable travel must be available at cockpit T-shaped handle (See section 1.7).
- (5) Before installation of seat, check functions of pedal system and locking of pedal adjustment, function of canopy support, electrical and pneumatic installations of total instrumentation and **check for non-existence of foreign matter.**



## 4.5 Installation of Control Surfaces

Wing scheme with aileron bearings (15 m version shown)

F = laterally fixed bearing



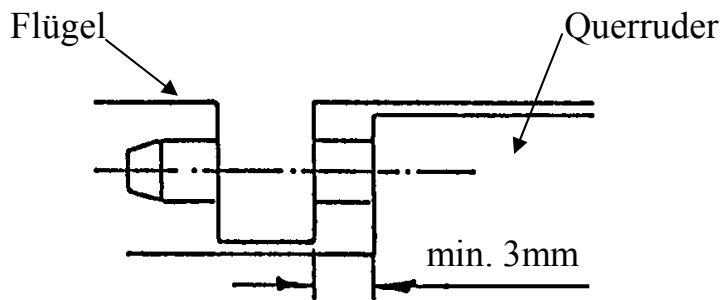
### Aileron – Disassembly

- (1) remove winglet or outer wingtip.
- (2) remove inner sealing tapes (Teflon tape) completely, upper and lower side.
- (3) lift bonded-on drive covers cautiously using knife.
- (4) disconnect drive rods from aileron (6 mm thread, nut M6 LN 9348 or DIN 985-8zn, width over flats 10mm), remember sequence and position of washers, if applicable.
- (5) loosen nut (6 mm thread, M6 LN 9348 or DIN 985-8zn, width over flats 10 mm) from bearing No. 3 (fixed bearing), remember sequence and position of washers.
- (6) deflect aileron fully downward and remove from bearings towards wingtip. Use 2 persons to avoid damage due to low bending stiffness !
- (7) watch washers, if existent, at inner side of bearing pin of fixed bearing No. 3.
- (8) 18 m wingtip aileron may be removed from tip towards fuselage after removing both inner sealing tapes completely (Teflon tape). Inner tip “bearing” intentionally has no bushing pressed in !

4.5 Installation of Control Surfaces (continued)

Assembly of Ailerons

- (1) Install inner sealing tapes on wing according to instructions section 4.6, fix free end on wing outside provisionally using tape.
- (2) grease bearings according to lubrication schedule, see section 3.3.
- (3) make sure that washers, if existent, are on inner side of fixed bearing pin, bearing No. 3.
- (4) align aileron bearing pins with bearings, keep aileron fully deflected downward and push from outside towards wing root.
- (5) use 2 persons, do not use force !
- (6) set up washers at bearing No. 3 as found during disassembly.
- (7) tighten nut (6 mm thread, M6 LN 9348 or DIN 985-8zn, width over flats 10 mm, maximum torque 6.4 Nm (0.65 mkg, 4.623 ft lbs).
- (8) Check lateral bearing play: minimum of 3 mm <0.12 in>



- (9) Check lateral aileron gaps:

18 m wingtip, aileron outer edge	minimum 3 mm <0.12 in>
15 m winglet fitted, aileron outer edge	minimum 2 mm <0.08 in>
aileron inner edge	minimum 1 mm <0.04 in>

- (10) fix drive rods to aileron drive bracket using bolt (LN 9037), nut (6mm thread M6, LN 9348 or DIN 985-8zn, 10 mm width over flats) and washers, maximum torque 6.4 Nm (0.65 mkg, 4.623 ft lbs).
- (11) bond drive covers using polyester filler.
- (12) install internal seals (Teflon tape) at appropriate full deflection, see section 4.6 for details.

## 4.5 Installation of Control Surfaces (continued)

### Disassembly of Elevator

- (1) remove bearings and washers at elevator drive , remember sequence and position of washers, width over flats 10 mm.
- (2) remove elevator halves towards centre. Watch washers, if existent, at inner side of both inner bearing pins.

### Assembly of Elevator

- (1) grease bearings according to lubrication schedule, see section 3.3.
- (2) make sure that washers, if existent, are on inner side of fixed bearing pins.
- (3) match elevator pins of halves with bearings, do not use force !
- (4) with inner bearings just touching shoulders, check outer end lateral gaps for minimum 1 mm <0.04 in>.
- (5) install both drive bearings with washers (0.1 mm <0.004 in> shim between both bearings), screw halves together (6mm thread M6, LN 9348 or DIN 985-8zn, width over flats 10 mm), maximum torque 6.4 Nm (0.65 mkg, 4.623 ft in). Do not brace elevator halves against inner bearings, maximum axial play 0.5 mm <0.02 in>.
- (6) if need be, install new plastic strip gap seals, see section 4.6.

## 4.5 Installation of Control Surfaces (continued)

### Disassembly of Rudder

- (1) disconnect rudder cables.

**Attention:** Don't loose spacing casings.

**Attention:** Rudder cables may be drilled. If this is changed unintentionally, neutral positions of rudder and pedals do no longer correspond and must be realigned as detailed below.

- (2) loosen nut at lower bearing (6mm thread, M6 LN 9348 or DIN 985-8zn, width over flats 10mm) using a socket wrench, remember sequence and position of washers.
- (3) lift rudder upward from bearings.

### Assembly of Rudder

- (1) grease bearings according to lubrication schedule, see section 3.3.
- (2) If need be, install new V-type internal seal, see section 4.6.
- (3) lower rudder into bearings, do not use force !
- (4) check radial play of upper bearing: maximum permissible radial play 0.5 mm <0.02 in>. If necessary renew brass bushing. Make sure, that non-concentric position of bearing keeps relative position to direction of flight. Bond bushing with for instance Loctite 72 b (672).
- (5) connect rudder cables provisionally, do not forget to insert spacing casings into thimbles.
- (6) check pedal-rudder alignment: with rudder neutral check pedals in neutral position.
- (7) With pedals not neutral, twist cable of too much forward pedal **clockwise (maximum 5 turns)** until properly aligned. Should more than 5 turns be necessary for alignment, exchange cables. **Never** turn cables **counter-clockwise** !
- (8) place washers on cable connection bolts and tighten nuts M6 LN 9348 or DIN 985-8zn, width over flats 10 mm, with maximum torque 6.4 Nm (0.65 mkg, 4.623 ft lbs).
- (9) set up washers at lower bearing as found during disassembly (normally: recessed washer first, then large washer). Tighten nut (6 mm thread, LN 9348 or DIN 985-8zn, width over flats 10 mm) with maximum torque 6.4 Nm, (0.64 mkg, 4.623 ft lbs). After assembly the rudder should have audible axial play, maximum axial play 1 mm (0.04 in), see section 1.5.
- (10) if necessary, restore gap seals (convex plastic strip) on both sides, see section 4.6.

## 4.6 Installation of Gap Sealing

### 4.6.1 Installation of gap sealing at ailerons

- (1) Place wing vertically on padded supports with leading edge downward and secure at spar tongue or fork against toppling over.
- (2) Cut Teflon tape to ample aileron length and cover one edge with Tesafix 4965 adhesive strip (9mm wide) without pretension to avoid warping.
- (3) Clean bonding region on wing after aileron disassembly from adhesive residues and paint with primer (Pattex contact adhesive or similar).
- (4) After approximately half an hour of drying, place inner Teflon sealing tapes to wing according to sketch such, that about 2 mm (0.08 in) at the edge are not covered. Remove masking from sealing tape during bonding process.
- (5) Place aileron into bearings provisionally, deflect fully and mark rear wing edge position on aileron using a pencil for both deflections.
- (6) Bond adhesive strip to aileron such that its leading edge is at least 5 mm (0.197 in) in front of marking. Also at bearing cut-outs a minimum of 5°mm (0.197 in) must remain.
- (7) Install aileron completely, see section 4.5. Remove masking tape from aileron bonding strip and press Teflon tape on without undue pulling or warp. Cut surplus Teflon tape along wing rear edge marking (or edge 5mm behind bearing cut-out), but avoid cutting into gel coat.

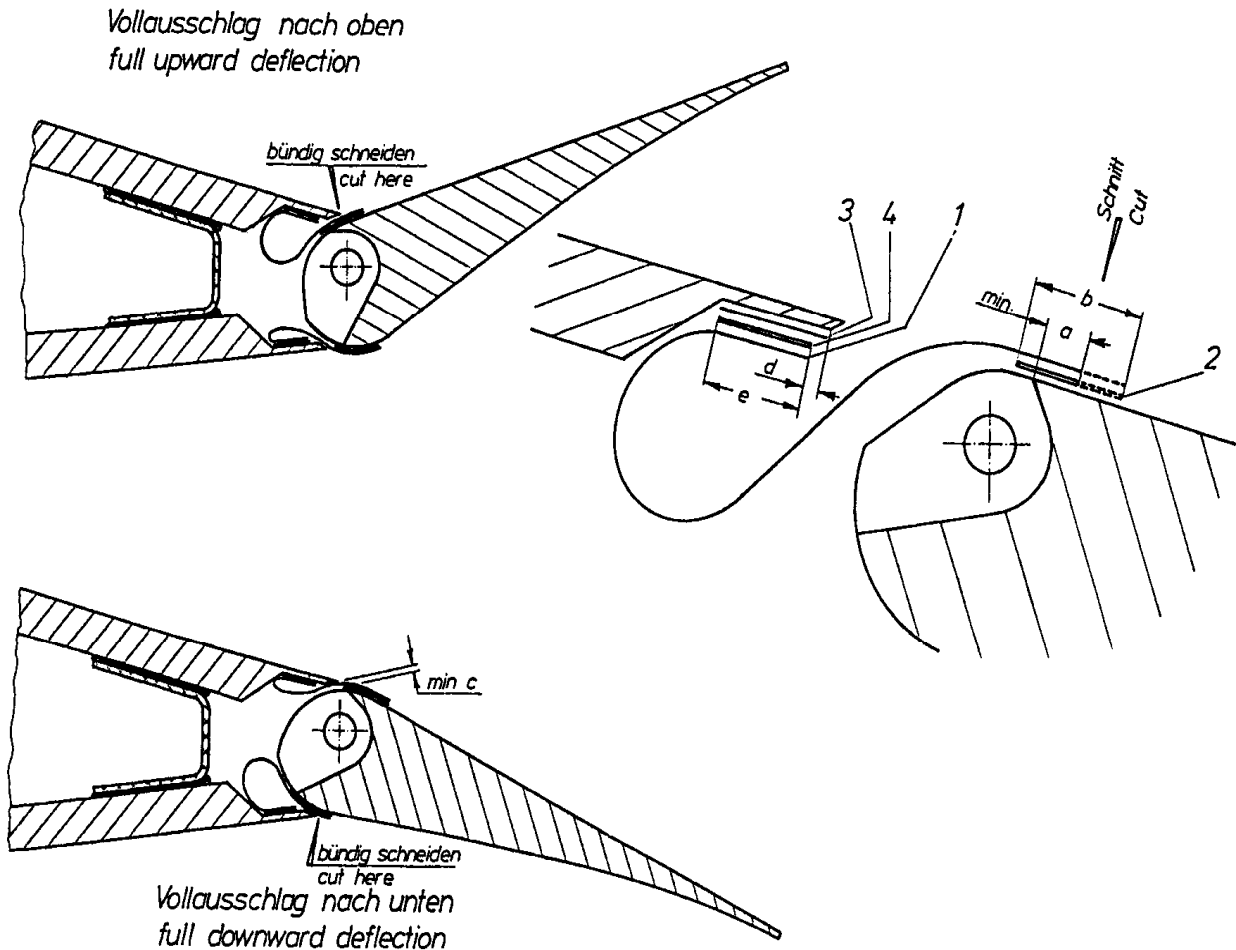
4.6.1 Installation of gap sealing at ailerons (continued)

Material (see parts list section 9):

No.	Denomination	Required
1	Teflon-Glass tape 0.1*50mm <0.004*1.97 in>	15.2m <50 ft>
2	Bonding film Tesafix 4965 translucent 9 mm <0.35 in>	15.2m <50 ft>
3	Primer (Pattex)	
4	Bonding film Tesafix 4965 translucent 9 mm <0.35 in>	15.2m <50 ft>

Measurements:

a	5 mm <0.197 in>
b	12 mm <0.472 in>
c	minimum 1 mm <0.039 in>
d	2 mm <0.079 in>
e	9 mm <0.354 in>



#### 4.6.2 Installation of gap sealing at elevator

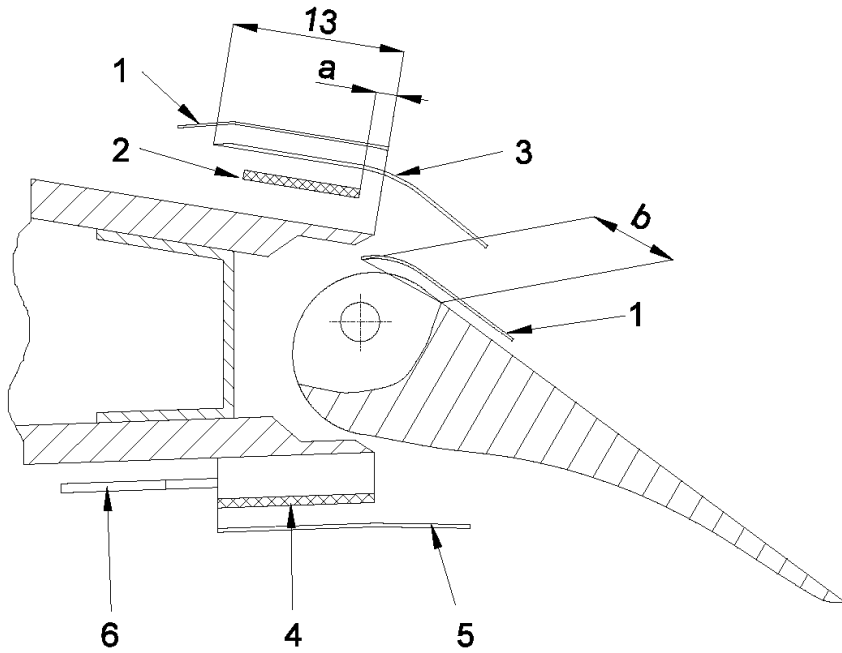
- (1) Apply layer of Tesafilm 4104 to elevator leading edge.
- (2) Bond plastic sealing tape after removing masking tape to elevator upper side. Protect leading edge of sealing tape with Tesafilm 4104 against warping. See drawings on following page.  
Always tighten plastic sealing tape during bonding with 2 persons.
- (3) Bond plastic sealing tape after removing masking tape to elevator under side as given on following page. Thereafter bond 3-D-Zigzag tape flush to leading edge of sealing tape.

Material (see parts list section 9):

No.	Denomination	Required
1	Tesafilm 4104 white 25mm <1 in>	7.0 m <23 ft>
2	Bonding film Tesafix 4965 translucent 9 mm <0.35 in>	2.3 m <7.55 ft>
3	Scarfed convex Mylar tape, 30 mm <1.18 in> wide	2.3 m <7.55 ft>
4	Bonding film Tesafix 4965 translucent 9 mm <0.35 in>	2.3 m <7.55 ft>
5	Straight Mylar tape, 22 mm <0,866 in> wide	2.3 m <7.55 ft>
6	3-D Zigzag tape 0.9 mm, 90°	2.3 m <7.55 ft>

Measurements:

a	2 mm <0.08 in>
b	minimum 7mm <0.28 in>



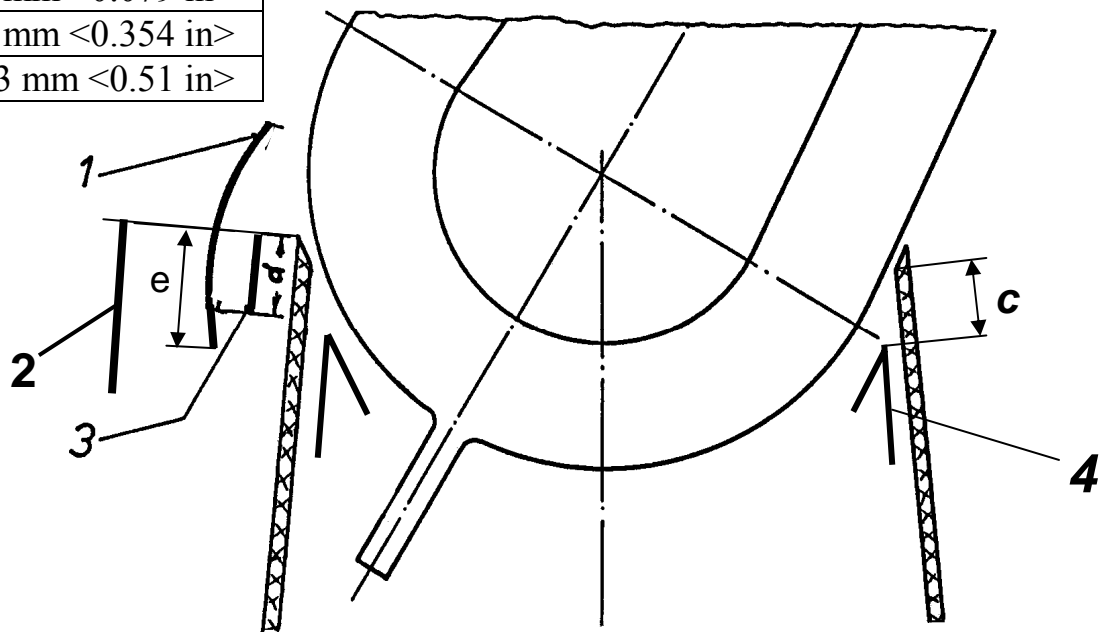
4.6.2 Installation of gap sealing at rudder

Material (see parts list section 9):

No.	Denomination	Required
1	Scarfed convex Mylar tape, 30 mm <1.18 in> wide	2.3 m
2	Tesafilm 4104 white 19 mm <0.75 in>	2.3 m
3	Bonding film Tesafix 4965 translucent 9 mm <0.35 in>	2.3 m
4	V-type seal	2.3 m

Measurements:

c	2 mm <0.079 in>
d	9 mm <0.354 in>
e	13 mm <0.51 in>



#### 4.7 Permanent Installation of fixed Ballast at rear Fuselage

In special cases empty weight C.G. position may be shifted rearward to allow heavy pilots to fly with rearward in-flight C.G. positions.

Therefore it is possible to install a battery (when a battery box is fitted), a heavy tail wheel hub or a trim weight (drawing 4R8-109) at the vertical tail fin web lower end using a holder (according to drawing 4R8-107b) to 4 mounting bolts.

See Sketch (Tail wheel box and lower rudder bearing not drawn).

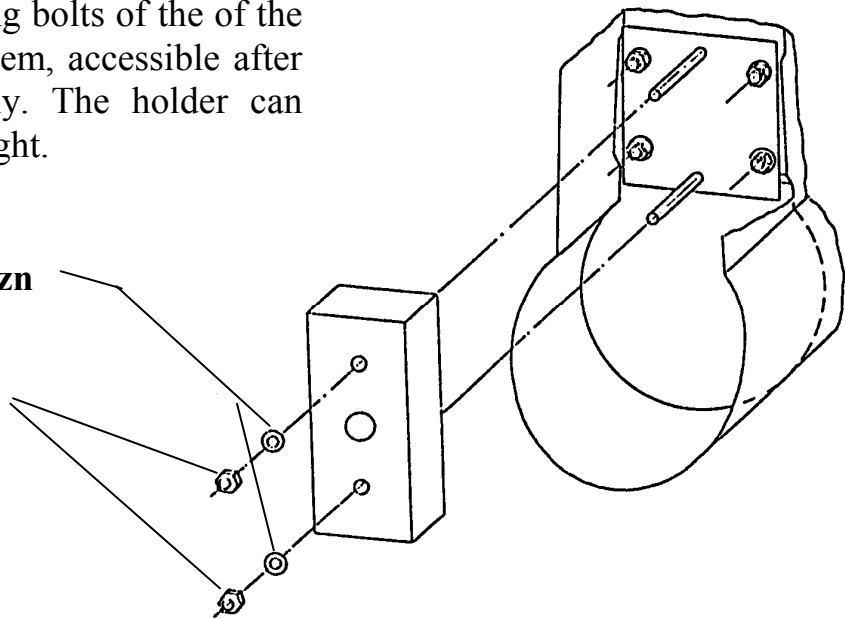
The rear trim weight holder must be fitted to 4 mounting bolts of the of the elevator drive system, accessible after rudder disassembly. The holder can carry one trim weight.

##### Washers

**B6.4 DIN 9021-Stzn**

##### Nuts

**M6 LN 9348 or  
M6 DIN985-8zn**  
(width over flats  
10 mm)



**Warning:** *Never dismount the rear trim weight holder, bolts and nuts are fixing points for the elevator system!*

Disassembly and assembly of rudder see section 1.5. Check for unobstructed movement of rudder and measure rudder deflections after work!

After installation of permanent weight at rear fuselage, a new C.G. weighing must be performed, see section 5!

Maximum weight of rear trim weight: 2.5 kg <5.5 lbs>. (Part 4R8-109)

## 4.8 Permanent Installation of Equipment in Baggage Compartment

Equipment may only be permanently installed using spacers on landing gear box:

- a) Attach to landing gear box >5< (**NOT** on baggage compartment cover >4<) from lower side, using threaded spacers >1<, Loctite and large washers (DIN°9021), three of which are required per unit.  
Baggage compartment cover >4< has to be cut to avoid spacers, see drawing.

1 - Spacer, diameter: 15 mm <0.59 in>

With 5“-wheel: drawing 4R7-96, 45mm <1.77 in >long

2 - Washer 6.4 DIN 9021-Stzn

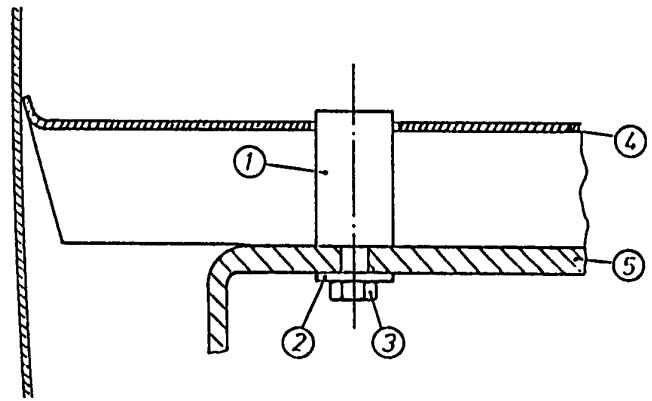
External diameter 18 mm  
<0.7 in>

3 - Bolt M6\*10

DIN 933-8.8 zn or  
DIN 85 A2, (width over  
flats 10 mm)

4 - Baggage compartment  
cover

5 - Landing gear box



**From ser.no. 8527 on (ÄM LS8-1):** The equipment may be permanently installed directly on the baggage compartment floors.

## 4.9 Exchange of Cables

### Control cables and connections

#### 1. Rudder cables and engine retard cable

Cable: B 3.2 MIL-W-83420 I/A resp. ISO 2020  
(former LN 9374) zinc plated

Steel thimbles: A 3.5 DIN 6899

Cable sleeves: Nicopress NT 283M (28-3-M), 3 pressings required, with tool groove Oval M  
(For details see FAA "Aircraft Inspection and Repair")

Stop sleeve: Nicopress NT S117J (871-18-J), use tool groove "J" of tool 51-MJ, 1-press (see note above)

#### 2. Tow hook operation and wheel brake

Cable: A 2.4 MIL-W-83420 I/A resp. ISO 2020  
(former LN 9374)

A 2.4 LN 9389 corrosion resistant (C.G. hook)

2.5 DIN3055 corrosion resistant with steel core  
(C.G. hook)

Steel thimbles: A 2.5 DIN 6899

Cable sleeves: Nicopress NT 282GA (28-2-G), for pressing use tool groove Oval G of tool 64-CGMP. 1 press (see note under 1.)

Stop sleeve: Nicopress NT S117J (871-17-J), use tool groove "J" of tool 51-MJ 1-press (see note under 1.)

#### 1. Tail tank

Cable: 1.2 mm LN 9389 corrosion resistant

Steel thimble: A 1.7 DIN 6899

Stop sleeve: Nicopress NT S117J (871-17-J), for pressing use

**a. groove "J"** of tool 51-MJ, **thereafter**

**b. groove "G"** of tool 64-CGMP, 1 press each in given sequence.

#### 4.10 Processing Instructions for Heat Shrink Sleeves

For isolation of many parts in the electrical system heat shrink tube is being used. During repair- and maintenance work this has often to be removed. This is best done by cautiously cutting open with a sharp knife. For isolation, push the pre-cut shrink sleeve over part to be isolated and heat with hot air gun (at least 200°C <392°F>) until it shrinks and covers the part tight.

#### 4.11 Securing with Loctite

All screwed joints at the control system, which use no self-locking nuts must be secured with Loctite 243. (Alternatively Loctite 72 b (672) can be used).

When a bolt cannot be unscrewed easily, use a hot air gun to heat the region until it can be undone. Before re-inserting the bolt, residual Loctite must be removed from bolt and internal thread (use Loctite 18896 for instance). If need be, re-tap thread.

Before screwing, bolt and internal thread must be degreased: spray Loctite 7063, wipe bolt and blow internal thread with compressed air. Repeat procedure twice for internal thread. Apply one drop of Loctite only to bolt thread. Too much amount of Loctite can result in damage during next removal of bolt. In the case of tapped blind holes apply Loctite to internal thread and not to bolt.

Each Loctite secured bolt should be marked using securing paint, placing a line from bolt head to component. Remove old securing paint beforehand.

**Important Note:** Loctite should never be used, when manufacturing date is more than 2 years past. Manufacturing date is printed to bottom side of bottle: 96A stands for January 1996, 96B for February 1996 etc.

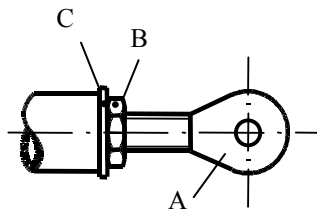
#### 4.12 Adjustments and Installation work at Control Systems

- a) Always use new self-locking nuts according to LN 9348 or DIN985-8zn.
- b) All bolts, not secured by self-locking nuts, must be secured with Loctite 243. Before using bolt, clean off Loctite residue from both bolt and internal thread. Use a drop of Loctite on bolt thread only to avoid damage due to excess Loctite during next bolt removal.
- c) Protection against corrosion (humidity entering pushrods) required formerly used inspection openings to check minimum reach of thread to be discarded. Rod end bearings used may have different thread length with identical heads. Therefore, before adjusting rod end bearings, remaining thread reach must be checked by dismantling.

Thread diameter*pitch	Minimum Reach	Rod end nomination
M8*1,25 (Standard)	17 mm <0.67 in>	Various versions possible
M10*1 (Fine thread)	17 mm <0.67 in>	PM6, various length versions

Watch out during adjustments not to turn rod end bearings too far out.

**Important Note:** All locknuts (B) are either secured by Loctite 243 or by serrated lock washers (C) DIN 6798 I . Do not loose these serrated washers!



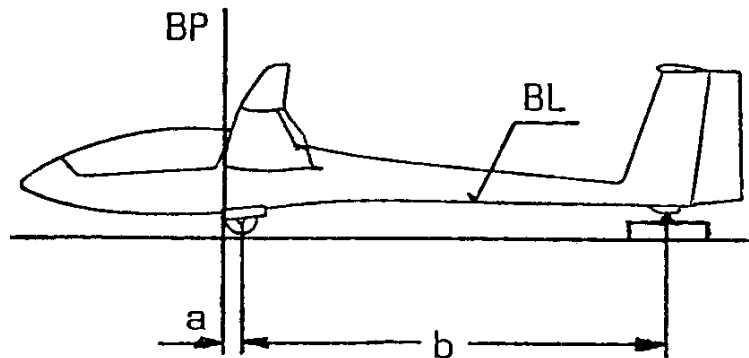
## 5. Weight and Balance

### 5.1 C.G. Weighing

**Datum Line <DL>:** Under side of fuselage boom placed horizontal

**Datum Point <DP>:** Leading edge of wing at root

1. **Determine total weight** (Empty or take-off weight) for both wing span versions, in most cases by weighing all parts and adding together. **When a tail fin battery is being used, weighing must always be done with tail fin battery installed.** Weigh mass of tail fin battery separately (3BR-199, 2.5 to 2.7 kg; <5.5 to 6 lbs>). For details see under Calculation of Loading Limits, section 5.2.
2. **Assemble the glider** in the 15 m version according to instructions in Flight Manual section 4. For in-flight C.G. position, the pilot must be seated in the cockpit.
3. **Raise tail on weighing machine** until datum line is level using wooden blocks or adjustable rack. Check Datum Line horizontal with levelling gauge.
4. **Measure horizontal distance <b>** from tail support to centre of landing gear axis.
5. Using plumb lead, determine points on floor perpendicular to left and right datum points, and points on floor perpendicular to centre of landing gear axis. **Measure distance <a>** from wheel axis to Datum Point.



6. Determine tail weight and deduct weight of auxiliary support used under step 3 to get **net tail weight**.
7. Calculate C.G. position for empty vertical tail fin tank:

$$X_{c.g.} = \frac{Net\_tail\_weight \times b}{Total\_Weight} + a$$

**5.1 C.G. Weighing** (continued)

8. Calculate C.G. position for full vertical tail fin tank:

$$X_{c.g.} = \frac{[Net\_tail\_weight + Water\_weight(Tail\_ballast)] \times b}{Total\_weight + Water\_weight(Tail\_ballast)} + a$$

9. Calculate loading limits according to section 5.2.

Form for **Weighing Report** for copying see section 11.

## 5.2 Calculation of Loading Limits

1. Determine Minimum Cockpit Load for 15 m wingspan and full and empty tail fin tank version following procedure given in section 5.1 from table “Empty Weight C.G. Position”, section 5.4 in <kg/mm> or <in/lbs>. Minimum Cockpit Load for **tail fin battery (3BR-199) removed** (and installed in baggage compartment, when required) decreases **by 10 kg <22°lbs>**.
2. Finally, resulting Minimum Cockpit Load for full tail fin tank and tail fin battery installed should be entered in the following places:
  - a. in weighing report of inspection
  - b. in Flight Manual section 6.2 in **full tail fin tank including tail fin battery** column
  - c. in cockpit under instrument panel cover
  - d. in cockpit on data placard
3. Enter Minimum Cockpit Load for empty tail fin tank without tail fin battery into the following places:
  - a. in Flight Manual section 6.2 in **empty tail fin tank without tail fin battery** column
  - b. in cockpit under instrument panel cover, use smaller font size of this line.
  - c. in cockpit on data placard
4. Enter Minimum Cockpit Load for full tail fin tank without tail fin battery into the following places:
  - a. in Flight Manual section 6.2 in full tail fin tank without tail fin battery column
5. Enter Minimum Cockpit Load for empty tail fin tank with tail fin battery into the following places:
  - a. in Flight Manual section 6.2 in empty tail fin tank with tail fin battery column

## 5.2 Calculation of Loading Limits (continued)

6. Maximum approved Weight of Non-lifting Parts may vary, depending on empty weight and empty weight C.G. position:

LS8-s: between 255 and 263 kg <562 to 580 lbs>

LS8-sb: between 280 and 288 kg <617 to 635 lbs>

In contrast to methods used up to now, maximum weight of non-lifting parts can be determined in relation to empty weight and empty weight C.G. position according to table in section 5.3. See also examples on end of this section.

Maximum weight of Non-lifting Parts should be entered into weighing report.

7. Determine Maximum approved Cockpit Load from table “Empty Weight C.G. Position”, section 5.4 in <kg/mm> or <in/lbs>. Maximum Cockpit Load normally should be 110 kg <242 lbs>, as given in empty weight C.G. table. It may be lower due to trim conditions, excessive equipment or repairs.

Calculate Maximum Cockpit Load on weighing report, see also examples at end of this section.

Resulting Maximum Cockpit Load should be entered in the following places:

- a. in weighing report of inspection
  - b. in Flight Manual, section 6.2
  - c. on Data Placard in cockpit
8. Empty Weight (perhaps increased by weight of permanently fitted trim ballast) should be entered in the following places:
- a. in weighing report of inspection
  - b. in Flight Manual section 6.2 for calculation of maximum permissible water ballast weight
9. Battery position during weighing should be entered in the following places:
- a. in weighing report and equipment list of inspection
  - b. in section 6.2 of Flight Manual

For permanent installation of trim ballast weights, see Maintenance Manual section 4.15.

Form for **Weighing Report**, see Maintenance Manual section 11.

5.2 Calculation of Loading Limits (continued)

Examples for calculation of loading limits:

See also Maintenance Manual section 11, form Weighing Report

- 1) Minimum Cockpit Load (tail fin tank empty, with tail fin battery)  
 For empty weight **273** kg <602 lbs> and empty weight C.G. position  
**665** mm <26.181 in> Minimum Cockpit Load according to table section 5.4 is  
 ..... **80** kg <176 lbs>  
 Limit value **666** mm <26.220 in> greater than calc. value **665** mm <26.181 in>  
 Minimum Cockpit Load (tail fin tank empty, **no tail fin battery**).. **70** kg <154 lbs>
- 2a) Minimum Cockpit Load **LS8-s** (tail fin tank **7.5** kg <16.5 lbs> full, with tail fin battery)  
 For empty weight **280.5** kg <618 lbs>, new empty weight C.G. position  
**767** mm <28.937 in>, Minimum Cockpit Load according to table section 5.4 is  
 ..... **120** kg <265 lbs>  
 Limit value **782** mm <30.787 in> greater than calc. value **767** mm <28.937 in>  
 Minimum Cockpit Load (tail fin tank **7.5** kg <16.5 lbs> full, **no tail fin battery**)  
 ..... **110** kg <242 lbs>
- 2b) Minimum Cockpit Load **LS8-sb** (tail fin tank **12** kg <26.5 lbs> full, with tail fin battery)  
 For empty weight **285** kg <628 lbs>, new empty weight C.G. position  
**825** mm <32.480 in>, Minimum Cockpit Load according to table section 5.4 is  
 ..... **140** kg <309 lbs>  
 Limit value **835** mm <32.874 in> greater than calc. value **825** mm <32.480 in>  
 Minimum Cockpit Load (tail fin tank **12** kg <26.5 lbs> full, **no tail fin battery**)  
 ..... **130** kg <287 lbs>
- 3) Maximum Weight of Non-lifting Parts (**LS8-s / LS8-sb**)  
 Maximum non-lifting parts weight at empty weight **273** kg <602 lbs>  
 and empty weight C.G. position **665** mm <26.181 in> is according to  
 tables section 5.3 ..... **256/281** kg <564/619 lbs>
- 4) Maximum permissible Cockpit Load  
 Fuselage with complete equipment,  
 battery, canopy and main pins ..... **127.4** kg <281 lbs>  
 Horizontal tail ..... **6.8** kg < 15 lbs>  
**Cockpit Load** (maximum 110 kg <242 lbs>) ..... **110** kg <242 lbs>
- 
- Weight of Non-lifting Parts** ..... **244.2** kg <538 lbs>

---

**Maximum Cockpit Load** (max. 110 kg <242 lbs>) ..... **110** kg <242 lbs>

On the following page this example is entered into Flight Manual table section 6.2.

5.2 Calculation of Loading Limits (continued)

Entry in Flight Manual section 6.2, for example above:

			LS8-s		LS8-sb	
	Wing span	[m]	15	18	15	18
	Empty Mass	[kg] / [lbs]	273	282	273	282
	C.G. position	[mm] / [in]	665		665	
	<b>Max. Cockpit Load</b>	[kg] / [lbs]	<b>110</b>		<b>110</b>	
<b>Minimum Cockpit Loadg</b>	<b>with tail-battery</b>	Tail tank full (+)	[kg] / [lbs]	<b>120</b>	<b>140</b>	
		Tail tank empty (+)	[kg] / [lbs]	<b>80</b>	<b>80</b>	
	<b>without tail-battery</b>	Tail tank full (+)	[kg] / [lbs]	<b>110</b>	<b>130</b>	
		Tail tank empty (+)	[kg] / [lbs]	<b>80</b>	<b>80</b>	
	Perm. fixed Trim mass	front	[kg] / [lbs]	---	---	
		rear	[kg] / [lbs]	---	---	
	Batteries installed	Seat	[No.]	<b>1</b>	<b>1</b>	
		Baggage comp.	[No.]	<b>0</b>	<b>0</b>	
		Vert. tail fin	[No.]	<b>1</b>	<b>1</b>	
<b>Date / Inspector</b>			<b>18.08.2005 GS</b>		<b>18.08.2005 GS</b>	

The discrepancy between Maximum Cockpit Load of 110 kg <242 lbs> and Minimum Cockpit Load of 140 kg <309 lbs> (for LS8-sb) with tail fin tank full and tail fin battery indicates, that before each take off the installation position of the tail fin battery must be checked and a functional check for the tail fin tank valve is required. If passage cannot be verified while blowing air through the valve, then perhaps water is still in the tank and therefore the high Minimum Cockpit Load value.

5.3 Calculation of Maximum Weight of Non-Lifting Parts LS8-s

Maximum weight of non-lifting parts of 264 kg <582 lbs> must be reduced in relation to empty weight and empty weight C.G. position **Xs** according to table below (For lbs/in values see following pages after kg/mm tables).

Example: For empty weight C.G. position of **665** mm <26.181 in> and empty weight of **265** kg <584 lbs > the permissible weight of non-lifting parts is **255**°kg <562 lbs>.

Empty weight G <kg>	Empty Weight C.G. position Xs <mm>										
	from 560	from 580	from 600	from 620	from 640	from 660	from 680	from 700	from 720	from 740	from 760
	to 579	to 599	to 619	to 639	to 659	to 679	to 699	to 719	to 739	to 759	to 779
260-261	255	255	255	255	255	255	256	257	259	260	261
261-262	255	255	255	255	255	255	256	257	259	260	261
262-263	255	255	255	255	255	255	256	258	259	260	261
263-264	255	255	255	255	255	255	256	258	259	260	261
264-265	255	255	255	255	255	255	257	258	259	260	262
265-266	255	255	255	255	255	255	257	258	259	260	262
266-267	255	255	255	255	255	256	257	258	259	261	262
267-268	255	255	255	255	255	256	257	258	259	261	262
268-269	255	255	255	255	255	256	257	258	260	261	262
269-270	255	255	255	255	255	256	257	258	260	261	262
270-271	255	255	255	255	255	256	257	259	260	261	262
271-272	255	255	255	255	255	256	257	259	260	261	263
272-273	255	255	255	255	255	256	257	259	260	261	263
273-274	255	255	255	255	255	256	258	259	260	261	263
274-275	255	255	255	255	255	256	258	259	260	262	263
275-276	255	255	255	255	255	257	258	259	260	262	263
276-277	255	255	255	255	255	257	258	259	261	262	263
277-278	255	255	255	255	255	257	258	259	261	262	263
278-279	255	255	255	255	256	257	258	259	261	262	263
279-280	255	255	255	255	256	257	258	260	261	262	264
280-281	255	255	255	255	256	257	258	260	261	262	264
281-282	255	255	255	255	256	257	258	260	261	263	264
282-283	255	255	255	255	256	257	259	260	261	263	264
283-284	255	255	255	255	256	257	259	260	261	263	264
284-285	255	255	255	255	256	257	259	260	262	263	264
285-286	255	255	255	255	256	258	259	260	262	263	264
286-287	255	255	255	255	256	258	259	260	262	263	265
287-288	255	255	255	255	256	258	259	261	262	263	265
288-289	255	255	255	255	257	258	259	261	262	263	265
289-290	255	255	255	255	257	258	259	261	262	264	265
290-291	255	255	255	255	257	258	260	261	262	264	265
291-292	255	255	255	255	257	258	260	261	262	264	265
292-293	255	255	255	256	257	258	260	261	263	264	265
293-294	255	255	255	256	257	258	260	261	263	264	265
294-295	255	255	255	256	257	259	260	261	263	264	266
295-296	255	255	255	256	257	259	260	262	263	264	266
296-297	255	255	255	256	257	259	260	262	263	264	266
297-298	255	255	255	256	258	259	260	262	263	265	266
298-299	255	255	255	256	258	259	260	262	263	265	266
299-300	255	255	255	256	258	259	261	262	263	265	266
300-301	255	255	255	256	258	259	261	262	264	265	266

*continued next page for inch / lbs*

5.3 Calculation of Maximum Weight of Non-Lifting Parts LS8-s (continued)

Maximum weight of non-lifting parts of 580 lbs <263 kg> must be reduced in relation to empty weight and empty weight C.G. position Xs according to table below (For kg/mm values see preceding pages before lbs/in tables).

Example: For empty weight C.G. position of 26.181 in <665 mm > and empty weight of 584 lbs <265 kg > the permissible weight of non-lifting parts is 562 lbs <255 kg >.

Empty Weight G <lbs>	Empty Weight C.G. position Xs <in>										
	from 22,047 to 22,835	from 22,835 to 23,622	from 23,622 to 24,409	from 24,409 to 25,197	from 25,197 to 25,984	from 25,984 to 26,772	from 26,772 to 27,559	from 27,559 to 28,346	from 28,346 to 29,134	from 29,134 to 29,921	from 29,921 to 30,709
	22,835	23,622	24,409	25,197	25,984	26,772	27,559	28,346	29,134	29,921	30,709
573 -575	562	562	562	562	562	562	564	567	569	573	575
575 -578	562	562	562	562	562	562	564	567	569	573	575
578 -580	562	562	562	562	562	562	564	567	571	573	575
580 -582	562	562	562	562	562	562	564	567	571	573	575
582 -584	562	562	562	562	562	562	564	569	571	573	575
584 -586	562	562	562	562	562	562	564	569	571	573	575
586 -589	562	562	562	562	562	562	564	569	571	573	578
589 -591	562	562	562	562	562	562	567	569	571	573	578
591 -593	562	562	562	562	562	562	567	569	571	575	578
593 -595	562	562	562	562	562	564	567	569	571	575	578
595 -597	562	562	562	562	562	564	567	569	573	575	578
597 -600	562	562	562	562	562	564	567	569	573	575	578
600 -602	562	562	562	562	562	564	567	569	573	575	578
602 -604	562	562	562	562	562	564	567	571	573	575	578
604 -606	562	562	562	562	562	564	567	571	573	575	580
606 -608	562	562	562	562	562	564	569	571	573	575	580
608 -611	562	562	562	562	562	564	569	571	573	578	580
611 -613	562	562	562	562	562	564	569	571	573	578	580
613 -615	562	562	562	562	562	567	569	571	575	578	580
615 -617	562	562	562	562	562	567	569	571	575	578	580
617 -619	562	562	562	562	562	567	569	571	575	578	580
619 -622	562	562	562	562	564	567	569	573	575	578	582
622 -624	562	562	562	562	564	567	569	573	575	578	582
624 -626	562	562	562	562	564	567	569	573	575	578	582
626 -628	562	562	562	562	564	567	571	573	575	580	582
628 -631	562	562	562	562	564	567	571	573	575	580	582
631 -633	562	562	562	562	564	567	571	573	575	580	582
633 -635	562	562	562	562	564	569	571	573	578	580	582
635 -637	562	562	562	562	564	569	571	573	578	580	582
637 -639	562	562	562	562	564	569	571	573	578	580	584
639 -642	562	562	562	562	564	569	571	575	578	580	584
642 -644	562	562	562	562	567	569	571	575	578	580	584
644 -646	562	562	562	562	567	569	571	575	578	582	584
646 -648	562	562	562	562	567	569	573	575	578	582	584
648 -650	562	562	562	562	567	569	573	575	578	582	584
650 -653	562	562	562	564	567	569	573	575	580	582	584
653 -655	562	562	562	564	567	571	573	575	580	582	586
655 -657	562	562	562	564	567	571	573	575	580	582	586
657 -659	562	562	562	564	567	571	573	578	580	582	586
659 -661	562	562	562	564	567	571	573	578	580	584	586
661 -664	562	562	562	564	569	571	573	578	580	584	586

next page for LS8-sb

**5.3 Calculation of Maximum Weight of Non-Lifting Parts LS8-sb**

Maximum weight of non-lifting parts of 288 kg <635 lbs> must be reduced in relation to empty weight and empty weight C.G. position Xs according to table below (For lbs/in values see following pages after kg/mm tables).

Example: For empty weight C.G. position of **665** mm <26.181 in> and empty weight of **265** kg <584 lbs > the permissible weight of non-lifting parts is **280**kg <617 lbs>.

Empty Weight G <kg>	Empty Weight C.G. position Xs <mm>										
	from 560 to 579	from 580 to 599	from 600 to 619	from 620 to 639	from 640 to 659	from 660 to 679	from 680 to 699	from 700 to 719	from 720 to 739	from 740 to 759	from 760 to 779
260-261	280	280	280	280	280	280	281	282	283	285	286
261-262	280	280	280	280	280	280	281	282	283	285	286
262-263	280	280	280	280	280	280	281	282	284	285	286
263-264	280	280	280	280	280	280	281	282	284	285	286
264-265	280	280	280	280	280	280	281	283	284	285	286
265-266	280	280	280	280	280	280	281	283	284	285	286
266-267	280	280	280	280	280	280	281	283	284	285	287
267-268	280	280	280	280	280	280	282	283	284	285	287
268-269	280	280	280	280	280	280	282	283	284	286	287
269-270	280	280	280	280	280	281	282	283	284	286	287
270-271	280	280	280	280	280	281	282	283	285	286	287
271-272	280	280	280	280	280	281	282	283	285	286	287
272-273	280	280	280	280	280	281	282	283	285	286	287
273-274	280	280	280	280	280	281	282	284	285	286	287
274-275	280	280	280	280	280	281	282	284	285	286	288
275-276	280	280	280	280	280	281	283	284	285	286	288
276-277	280	280	280	280	280	281	283	284	285	287	288
277-278	280	280	280	280	280	281	283	284	285	287	288
278-279	280	280	280	280	280	282	283	284	286	287	288
279-280	280	280	280	280	280	282	283	284	286	287	288
280-281	280	280	280	280	280	282	283	284	286	287	288
281-282	280	280	280	280	281	282	283	285	286	287	289
282-283	280	280	280	280	281	282	283	285	286	287	289
283-284	280	280	280	280	281	282	283	285	286	287	289
284-285	280	280	280	280	281	282	284	285	286	288	289
285-286	280	280	280	280	281	282	284	285	286	288	289
286-287	280	280	280	280	281	282	284	285	286	288	289
287-288	280	280	280	280	281	283	284	285	287	288	289
288-289	280	280	280	280	281	283	284	285	287	288	289
289-290	280	280	280	280	281	283	284	285	287	288	290
290-291	280	280	280	280	281	283	284	286	287	288	290
291-292	280	280	280	280	282	283	284	286	287	288	290
292-293	280	280	280	280	282	283	284	286	287	289	290
293-294	280	280	280	280	282	283	285	286	287	289	290
294-295	280	280	280	280	282	283	285	286	287	289	290
295-296	280	280	280	281	282	283	285	286	288	289	290
296-297	280	280	280	281	282	284	285	286	288	289	291
297-298	280	280	280	281	282	284	285	286	288	289	291
298-299	280	280	280	281	282	284	285	287	288	289	291
299-300	280	280	280	281	282	284	285	287	288	290	291
300-301	280	280	280	281	283	284	285	287	288	290	291

*continued next page for inch / lbs*

**5.3 Calculation of Maximum Weight of Non-Lifting Parts LS8-sb**

(continued)

Maximum weight of non-lifting parts of 635 lbs <288 kg> must be reduced in relation to empty weight and empty weight C.G. position **Xs** according to table below (For kg/mm values see preceding pages before lbs/in tables).

**Example:** For empty weight C.G. position of 26.181 in <**665** mm > and empty weight of 584 lbs <**265** kg > the permissible weight of non-lifting parts is 617 lbs <**280** kg >.

Empty Weight G <lbs>	Empty Weight C.G. position Xs <in>										
	from 22,047 to 22,835	from 22,835 to 23,622	from 23,622 to 24,409	from 24,409 to 25,197	from 25,197 to 25,984	from 25,984 to 26,772	from 26,772 to 27,559	from 27,559 to 28,346	from 28,346 to 29,134	from 29,134 to 29,921	from 29,921 to 30,709
	573 -575	617	617	617	617	617	617	619	622	624	628
575 -578	617	617	617	617	617	617	619	622	624	628	631
578 -580	617	617	617	617	617	617	619	622	626	628	631
580 -582	617	617	617	617	617	617	619	622	626	628	631
582 -584	617	617	617	617	617	617	619	624	626	628	631
584 -586	617	617	617	617	617	617	619	624	626	628	631
586 -589	617	617	617	617	617	617	619	624	626	628	633
589 -591	617	617	617	617	617	617	622	624	626	628	633
591 -593	617	617	617	617	617	617	622	624	626	631	633
593 -595	617	617	617	617	617	619	622	624	626	631	633
595 -597	617	617	617	617	617	619	622	624	628	631	633
597 -600	617	617	617	617	617	619	622	624	628	631	633
600 -602	617	617	617	617	617	619	622	624	628	631	633
602 -604	617	617	617	617	617	619	622	626	628	631	633
604 -606	617	617	617	617	617	619	622	626	628	631	635
606 -608	617	617	617	617	617	619	624	626	628	631	635
608 -611	617	617	617	617	617	619	624	626	628	633	635
611 -613	617	617	617	617	617	619	624	626	628	633	635
613 -615	617	617	617	617	617	622	624	626	631	633	635
615 -617	617	617	617	617	617	622	624	626	631	633	635
617 -619	617	617	617	617	617	622	624	626	631	633	635
619 -622	617	617	617	617	619	622	624	628	631	633	637
622 -624	617	617	617	617	619	622	624	628	631	633	637
624 -626	617	617	617	617	619	622	624	628	631	633	637
626 -628	617	617	617	617	619	622	626	628	631	635	637
628 -631	617	617	617	617	619	622	626	628	631	635	637
631 -633	617	617	617	617	619	622	626	628	631	635	637
633 -635	617	617	617	617	619	624	626	628	633	635	637
635 -637	617	617	617	617	619	624	626	628	633	635	637
637 -639	617	617	617	617	619	624	626	628	633	635	639
639 -642	617	617	617	617	619	624	626	631	633	635	639
642 -644	617	617	617	617	622	624	626	631	633	635	639
644 -646	617	617	617	617	622	624	626	631	633	637	639
646 -648	617	617	617	617	622	624	628	631	633	637	639
648 -650	617	617	617	617	622	624	628	631	633	637	639
650 -653	617	617	617	619	622	624	628	631	635	637	639
653 -655	617	617	617	619	622	626	628	631	635	637	642
655 -657	617	617	617	619	622	626	628	631	635	637	642
657 -659	617	617	617	619	622	626	628	633	635	637	642
659 -661	617	617	617	619	622	626	628	633	635	639	642
661 -664	617	617	617	619	624	626	628	633	635	639	642

**5.4 Empty Weight C.G. Limits (kg / mm) for *LS8-s and LS8-sb***

Empty-weight <kg>	Empty Weight C.G. Range (mm) at <b>Maximum Cockpit Load of 110 kg</b> and at <b>Minimum Cockpit Load of:</b>						
	70 kg	75 kg	80 kg	85 kg	90 kg	95 kg	100 kg
260	637 -645	637 -662	637 -679	637 -696	637 -713	637 -729	637 -746
261	635 -644	635 -661	635 -678	635 -695	635 -711	635 -728	635 -744
262	634 -643	634 -660	634 -677	634 -694	634 -710	634 -727	634 -743
263	633 -642	633 -659	633 -676	633 -692	633 -709	633 -725	633 -742
264	631 -642	631 -658	631 -675	631 -691	631 -708	631 -724	631 -741
265	630 -641	630 -657	630 -674	630 -690	630 -707	630 -723	630 -739
266	629 -640	629 -656	629 -673	629 -689	629 -706	629 -722	629 -738
267	627 -639	627 -655	627 -672	627 -688	627 -704	627 -721	627 -737
268	626 -638	626 -654	626 -671	626 -687	626 -703	626 -719	626 -735
269	625 -637	625 -653	625 -670	625 -686	625 -702	625 -718	625 -734
270	623 -636	623 -653	623 -669	623 -685	623 -701	623 -717	623 -733
271	622 -635	622 -652	622 -668	622 -684	622 -700	622 -716	622 -732
272	621 -634	621 -651	621 -667	621 -683	621 -699	621 -715	621 -731
273	620 -634	620 -650	620 -666	620 -682	620 -698	620 -714	620 -729
274	618 -633	618 -649	618 -665	618 -681	618 -697	618 -712	618 -728
275	617 -632	617 -648	617 -664	617 -680	617 -696	617 -711	617 -727
276	616 -631	616 -647	616 -663	616 -679	616 -694	616 -710	616 -726
277	615 -630	615 -646	615 -662	615 -678	615 -693	615 -709	615 -725
278	614 -629	614 -645	614 -661	614 -677	614 -692	614 -708	614 -723
279	612 -629	612 -644	612 -660	612 -676	612 -691	612 -707	612 -722
280	611 -628	611 -643	611 -659	611 -675	611 -690	611 -706	611 -721
281	610 -627	610 -643	610 -658	610 -674	610 -689	610 -705	610 -720
282	609 -626	609 -642	609 -657	609 -673	609 -688	609 -704	609 -719
283	608 -625	608 -641	608 -656	608 -672	608 -687	608 -702	608 -718
284	607 -625	607 -640	607 -655	607 -671	607 -686	607 -701	607 -717
285	605 -624	605 -639	605 -655	605 -670	605 -685	605 -700	605 -715
286	604 -623	604 -638	604 -654	604 -669	604 -684	604 -699	604 -714
287	603 -622	603 -638	603 -653	603 -668	603 -683	603 -698	603 -713
288	602 -621	602 -637	602 -652	602 -667	602 -682	602 -697	602 -712
289	601 -621	601 -636	601 -651	601 -666	601 -681	601 -696	601 -711
290	600 -620	600 -635	600 -650	600 -665	600 -680	600 -695	600 -710
291	599 -619	599 -634	599 -649	599 -664	599 -679	599 -694	599 -709
292	598 -618	598 -633	598 -648	598 -663	598 -678	598 -693	598 -708
293	596 -618	596 -633	596 -648	596 -663	596 -677	596 -692	596 -707
294	595 -617	595 -632	595 -647	595 -662	595 -676	595 -691	595 -706
295	594 -616	594 -631	594 -646	594 -661	594 -675	594 -690	594 -705
296	593 -615	593 -630	593 -645	593 -660	593 -675	593 -689	593 -704
297	592 -615	592 -630	592 -644	592 -659	592 -674	592 -688	592 -703
298	591 -614	591 -629	591 -643	591 -658	591 -673	591 -687	591 -702
299	590 -613	590 -628	590 -643	590 -657	590 -672	590 -686	590 -701
300	589 -613	589 -627	589 -642	589 -656	589 -671	589 -685	589 -700

Calculated C.G. position for weighed empty weight must be within limit values. Related cockpit loads are permissible Minimum Cockpit Load and Maximum Cockpit Load.

5.4 Empty Weight C.G. Limits (kg / mm) for LS8-s and LS8-sb (continued)

Empty-weight <kg>	Empty Weight C.G. Range (mm) at <b>Maximum Cockpit Load of 110 kg</b> and at <b>Minimum Cockpit Load of:</b>					
	105 kg	110 kg	120 kg	130 kg	140 kg	150 kg
260	637 -762	637 -779	637 -811	637 -844	637 -876	637 -909
261	635 -761	635 -777	635 -810	635 -842	635 -875	635 -907
262	634 -759	634 -776	634 -808	634 -840	634 -873	634 -905
263	633 -758	633 -774	633 -807	633 -839	633 -871	633 -903
264	631 -757	631 -773	631 -805	631 -837	631 -869	631 -901
265	630 -755	630 -772	630 -803	630 -835	630 -867	630 -899
266	629 -754	629 -770	629 -802	629 -834	629 -866	629 -897
267	627 -753	627 -769	627 -800	627 -832	627 -864	627 -896
268	626 -751	626 -767	626 -799	626 -831	626 -862	626 -894
269	625 -750	625 -766	625 -797	625 -829	625 -860	625 -892
270	623 -749	623 -765	623 -796	623 -827	623 -859	623 -890
271	622 -748	622 -763	622 -795	622 -826	622 -857	622 -888
272	621 -746	621 -762	621 -793	621 -824	621 -855	621 -886
273	620 -745	620 -761	620 -792	620 -823	620 -854	620 -885
274	618 -744	618 -759	618 -790	618 -821	618 -852	618 -883
275	617 -742	617 -758	617 -789	617 -820	617 -850	617 -881
276	616 -741	616 -757	616 -787	616 -818	616 -849	616 -879
277	615 -740	615 -755	615 -786	615 -817	615 -847	615 -878
278	614 -739	614 -754	614 -785	614 -815	614 -846	614 -876
279	612 -738	612 -753	612 -783	612 -814	612 -844	612 -874
280	611 -736	611 -752	611 -782	611 -812	611 -842	611 -873
281	610 -735	610 -750	610 -780	610 -811	610 -841	610 -871
282	609 -734	609 -749	609 -779	609 -809	609 -839	609 -869
283	608 -733	608 -748	608 -778	608 -808	608 -838	608 -867
284	607 -732	607 -747	607 -776	607 -806	607 -836	607 -866
285	605 -730	605 -745	605 -775	605 -805	605 -835	605 -864
286	604 -729	604 -744	604 -774	604 -803	604 -833	604 -863
287	603 -728	603 -743	603 -773	603 -802	603 -832	603 -861
288	602 -727	602 -742	602 -771	602 -801	602 -830	602 -859
289	601 -726	601 -741	601 -770	601 -799	601 -829	601 -858
290	600 -725	600 -739	600 -769	600 -798	600 -827	600 -856
291	599 -724	599 -738	599 -767	599 -797	599 -826	599 -855
292	598 -723	598 -737	598 -766	598 -795	598 -824	598 -853
293	596 -721	596 -736	596 -765	596 -794	596 -823	596 -852
294	595 -720	595 -735	595 -764	595 -792	595 -821	595 -850
295	594 -719	594 -734	594 -762	594 -791	594 -820	594 -848
296	593 -718	593 -733	593 -761	593 -790	593 -818	593 -847
297	592 -717	592 -731	592 -760	592 -789	592 -817	592 -845
298	591 -716	591 -730	591 -759	591 -787	591 -816	591 -844
299	590 -715	590 -729	590 -758	590 -786	590 -814	590 -842
300	589 -714	589 -728	589 -756	589 -785	589 -813	589 -841

Partly, given values for Minimum Cockpit Load exceed permissible Maximum Cockpit Load considerably. These values are required for the use of the vertical tail fin ballast tank as a distinct warning, that its use is limited.

5.4 Empty Weight C.G. Limits (lbs / in) for LS8-s and LS8-sb

Empty-weight <lbs>	Empty Weight C.G. Range (in) at Maximum Cockpit Load of 242 lbs and at Minimum Cockpit Load of:													
	154 lbs		165 lbs		176 lbs		187 lbs		198 lbs		209 lbs		220 lbs	
573	25,08	-25,39	25,08	-26,06	25,08	-26,73	25,08	-27,40	25,08	-28,07	25,08	-28,70	25,08	-29,37
575	25,00	-25,35	25,00	-26,02	25,00	-26,69	25,00	-27,36	25,00	-27,99	25,00	-28,66	25,00	-29,29
578	24,96	-25,32	24,96	-25,98	24,96	-26,65	24,96	-27,32	24,96	-27,95	24,96	-28,62	24,96	-29,25
580	24,92	-25,28	24,92	-25,95	24,92	-26,61	24,92	-27,24	24,92	-27,91	24,92	-28,54	24,92	-29,21
582	24,84	-25,28	24,84	-25,91	24,84	-26,58	24,84	-27,21	24,84	-27,87	24,84	-28,50	24,84	-29,17
584	24,80	-25,24	24,80	-25,87	24,80	-26,54	24,80	-27,17	24,80	-27,84	24,80	-28,47	24,80	-29,09
586	24,76	-25,20	24,76	-25,83	24,76	-26,50	24,76	-27,13	24,76	-27,80	24,76	-28,43	24,76	-29,06
589	24,69	-25,16	24,69	-25,79	24,69	-26,46	24,69	-27,09	24,69	-27,72	24,69	-28,39	24,69	-29,02
591	24,65	-25,12	24,65	-25,75	24,65	-26,42	24,65	-27,05	24,65	-27,68	24,65	-28,31	24,65	-28,94
593	24,61	-25,08	24,61	-25,71	24,61	-26,38	24,61	-27,01	24,61	-27,64	24,61	-28,27	24,61	-28,90
595	24,53	-25,04	24,53	-25,71	24,53	-26,34	24,53	-26,97	24,53	-27,60	24,53	-28,23	24,53	-28,86
597	24,49	-25,00	24,49	-25,67	24,49	-26,30	24,49	-26,93	24,49	-27,56	24,49	-28,19	24,49	-28,82
600	24,45	-24,96	24,45	-25,63	24,45	-26,26	24,45	-26,89	24,45	-27,52	24,45	-28,15	24,45	-28,78
602	24,41	-24,96	24,41	-25,59	24,41	-26,22	24,41	-26,85	24,41	-27,48	24,41	-28,11	24,41	-28,70
604	24,33	-24,92	24,33	-25,55	24,33	-26,18	24,33	-26,81	24,33	-27,44	24,33	-28,03	24,33	-28,66
606	24,29	-24,88	24,29	-25,51	24,29	-26,14	24,29	-26,77	24,29	-27,40	24,29	-27,99	24,29	-28,62
608	24,25	-24,84	24,25	-25,47	24,25	-26,10	24,25	-26,73	24,25	-27,32	24,25	-27,95	24,25	-28,58
611	24,21	-24,80	24,21	-25,43	24,21	-26,06	24,21	-26,69	24,21	-27,28	24,21	-27,91	24,21	-28,54
613	24,17	-24,76	24,17	-25,39	24,17	-26,02	24,17	-26,65	24,17	-27,24	24,17	-27,87	24,17	-28,47
615	24,09	-24,76	24,09	-25,35	24,09	-25,98	24,09	-26,61	24,09	-27,21	24,09	-27,84	24,09	-28,43
617	24,06	-24,72	24,06	-25,32	24,06	-25,95	24,06	-26,58	24,06	-27,17	24,06	-27,80	24,06	-28,39
619	24,02	-24,69	24,02	-25,32	24,02	-25,91	24,02	-26,54	24,02	-27,13	24,02	-27,76	24,02	-28,35
622	23,98	-24,65	23,98	-25,28	23,98	-25,87	23,98	-26,50	23,98	-27,09	23,98	-27,72	23,98	-28,31
624	23,94	-24,61	23,94	-25,24	23,94	-25,83	23,94	-26,46	23,94	-27,05	23,94	-27,64	23,94	-28,27
626	23,90	-24,61	23,90	-25,20	23,90	-25,79	23,90	-26,42	23,90	-27,01	23,90	-27,60	23,90	-28,23
628	23,82	-24,57	23,82	-25,16	23,82	-25,79	23,82	-26,38	23,82	-26,97	23,82	-27,56	23,82	-28,15
631	23,78	-24,53	23,78	-25,12	23,78	-25,75	23,78	-26,34	23,78	-26,93	23,78	-27,52	23,78	-28,11
633	23,74	-24,49	23,74	-25,12	23,74	-25,71	23,74	-26,30	23,74	-26,89	23,74	-27,48	23,74	-28,07
635	23,70	-24,45	23,70	-25,08	23,70	-25,67	23,70	-26,26	23,70	-26,85	23,70	-27,44	23,70	-28,03
637	23,66	-24,45	23,66	-25,04	23,66	-25,63	23,66	-26,22	23,66	-26,81	23,66	-27,40	23,66	-27,99
639	23,62	-24,41	23,62	-25,00	23,62	-25,59	23,62	-26,18	23,62	-26,77	23,62	-27,36	23,62	-27,95
642	23,58	-24,37	23,58	-24,96	23,58	-25,55	23,58	-26,14	23,58	-26,73	23,58	-27,32	23,58	-27,91
644	23,54	-24,33	23,54	-24,92	23,54	-25,51	23,54	-26,10	23,54	-26,69	23,54	-27,28	23,54	-27,87
646	23,47	-24,33	23,47	-24,92	23,47	-25,51	23,47	-26,10	23,47	-26,65	23,47	-27,24	23,47	-27,84
648	23,43	-24,29	23,43	-24,88	23,43	-25,47	23,43	-26,06	23,43	-26,61	23,43	-27,21	23,43	-27,80
650	23,39	-24,25	23,39	-24,84	23,39	-25,43	23,39	-26,02	23,39	-26,58	23,39	-27,17	23,39	-27,76
653	23,35	-24,21	23,35	-24,80	23,35	-25,39	23,35	-25,98	23,35	-26,58	23,35	-27,13	23,35	-27,72
655	23,31	-24,21	23,31	-24,80	23,31	-25,35	23,31	-25,95	23,31	-26,54	23,31	-27,09	23,31	-27,68
657	23,27	-24,17	23,27	-24,76	23,27	-25,32	23,27	-25,91	23,27	-26,50	23,27	-27,05	23,27	-27,64
659	23,23	-24,13	23,23	-24,72	23,23	-25,32	23,23	-25,87	23,23	-26,46	23,23	-27,01	23,23	-27,60
661	23,19	-24,13	23,19	-24,69	23,19	-25,28	23,19	-25,83	23,19	-26,42	23,19	-26,97	23,19	-27,56

Calculated C.G. position for weighed empty weight must be within limit values.  
 Related cockpit loads are permissible Minimum Cockpit Load and Maximum  
 Cockpit Load.

## Maintenance Manual LS8-s and LS8-sb Weight and Balance

### 5.4 Empty Weight C.G. Limits (lbs / in) for LS8-s and LS8-sb (continued)

Empty-weight <lbs>	Empty Weight C.G. Range (in) at <b>Maximum Cockpit Load of 242 lbs</b> and at <b>Minimum Cockpit Load of:</b>											
	231 lbs		242 lbs		265 lbs		287 lbs		309 lbs		331 lbs	
573	25,08	-30,00	25,08	-30,67	25,08	-31,93	25,08	-33,23	25,08	-34,49	25,08	-35,79
575	25,00	-29,96	25,00	-30,59	25,00	-31,89	25,00	-33,15	25,00	-34,45	25,00	-35,71
578	24,96	-29,88	24,96	-30,55	24,96	-31,81	24,96	-33,07	24,96	-34,37	24,96	-35,63
580	24,92	-29,84	24,92	-30,47	24,92	-31,77	24,92	-33,03	24,92	-34,29	24,92	-35,55
582	24,84	-29,80	24,84	-30,43	24,84	-31,69	24,84	-32,95	24,84	-34,21	24,84	-35,47
584	24,80	-29,72	24,80	-30,39	24,80	-31,61	24,80	-32,87	24,80	-34,13	24,80	-35,39
586	24,76	-29,69	24,76	-30,32	24,76	-31,58	24,76	-32,84	24,76	-34,09	24,76	-35,32
589	24,69	-29,65	24,69	-30,28	24,69	-31,50	24,69	-32,76	24,69	-34,02	24,69	-35,28
591	24,65	-29,57	24,65	-30,20	24,65	-31,46	24,65	-32,72	24,65	-33,94	24,65	-35,20
593	24,61	-29,53	24,61	-30,16	24,61	-31,38	24,61	-32,64	24,61	-33,86	24,61	-35,12
595	24,53	-29,49	24,53	-30,12	24,53	-31,34	24,53	-32,56	24,53	-33,82	24,53	-35,04
597	24,49	-29,45	24,49	-30,04	24,49	-31,30	24,49	-32,52	24,49	-33,74	24,49	-34,96
600	24,45	-29,37	24,45	-30,00	24,45	-31,22	24,45	-32,44	24,45	-33,66	24,45	-34,88
602	24,41	-29,33	24,41	-29,96	24,41	-31,18	24,41	-32,40	24,41	-33,62	24,41	-34,84
604	24,33	-29,29	24,33	-29,88	24,33	-31,10	24,33	-32,32	24,33	-33,54	24,33	-34,76
606	24,29	-29,21	24,29	-29,84	24,29	-31,06	24,29	-32,28	24,29	-33,47	24,29	-34,69
608	24,25	-29,17	24,25	-29,80	24,25	-30,98	24,25	-32,21	24,25	-33,43	24,25	-34,61
611	24,21	-29,13	24,21	-29,72	24,21	-30,95	24,21	-32,17	24,21	-33,35	24,21	-34,57
613	24,17	-29,09	24,17	-29,69	24,17	-30,91	24,17	-32,09	24,17	-33,31	24,17	-34,49
615	24,09	-29,06	24,09	-29,65	24,09	-30,83	24,09	-32,05	24,09	-33,23	24,09	-34,41
617	24,06	-28,98	24,06	-29,61	24,06	-30,79	24,06	-31,97	24,06	-33,15	24,06	-34,37
619	24,02	-28,94	24,02	-29,53	24,02	-30,71	24,02	-31,93	24,02	-33,11	24,02	-34,29
622	23,98	-28,90	23,98	-29,49	23,98	-30,67	23,98	-31,85	23,98	-33,03	23,98	-34,21
624	23,94	-28,86	23,94	-29,45	23,94	-30,63	23,94	-31,81	23,94	-32,99	23,94	-34,13
626	23,90	-28,82	23,90	-29,41	23,90	-30,55	23,90	-31,73	23,90	-32,91	23,90	-34,09
628	23,82	-28,74	23,82	-29,33	23,82	-30,51	23,82	-31,69	23,82	-32,87	23,82	-34,02
631	23,78	-28,70	23,78	-29,29	23,78	-30,47	23,78	-31,61	23,78	-32,80	23,78	-33,98
633	23,74	-28,66	23,74	-29,25	23,74	-30,43	23,74	-31,58	23,74	-32,76	23,74	-33,90
635	23,70	-28,62	23,70	-29,21	23,70	-30,35	23,70	-31,54	23,70	-32,68	23,70	-33,82
637	23,66	-28,58	23,66	-29,17	23,66	-30,32	23,66	-31,46	23,66	-32,64	23,66	-33,78
639	23,62	-28,54	23,62	-29,09	23,62	-30,28	23,62	-31,42	23,62	-32,56	23,62	-33,70
642	23,58	-28,50	23,58	-29,06	23,58	-30,20	23,58	-31,38	23,58	-32,52	23,58	-33,66
644	23,54	-28,47	23,54	-29,02	23,54	-30,16	23,54	-31,30	23,54	-32,44	23,54	-33,58
646	23,47	-28,39	23,47	-28,98	23,47	-30,12	23,47	-31,26	23,47	-32,40	23,47	-33,54
648	23,43	-28,35	23,43	-28,94	23,43	-30,08	23,43	-31,18	23,43	-32,32	23,43	-33,47
650	23,39	-28,31	23,39	-28,90	23,39	-30,00	23,39	-31,14	23,39	-32,28	23,39	-33,39
653	23,35	-28,27	23,35	-28,86	23,35	-29,96	23,35	-31,10	23,35	-32,21	23,35	-33,35
655	23,31	-28,23	23,31	-28,78	23,31	-29,92	23,31	-31,06	23,31	-32,17	23,31	-33,27
657	23,27	-28,19	23,27	-28,74	23,27	-29,88	23,27	-30,98	23,27	-32,13	23,27	-33,23
659	23,23	-28,15	23,23	-28,70	23,23	-29,84	23,23	-30,95	23,23	-32,05	23,23	-33,15
661	23,19	-28,11	23,19	-28,66	23,19	-29,76	23,19	-30,91	23,19	-32,01	23,19	-33,11

Partly, given values for Minimum Cockpit Load exceed permissible Maximum Cockpit Load considerably. These values are required for the use of the vertical tail fin ballast tank as a distinct warning, that its use is limited.

**6. Instruments- and Equipment List (Master Equipment List)**

**Maximum mass of all Instrument Panel Installations max. 6.7 kg <14.8 lbs>.**

**6.1 Airspeed Indicator**

<b>Manufacturer</b>	<b>Type</b>	<b>TCDS No.</b>
Winter	<u>6FMS-4</u> (Diameter 80mm) 0-300 km/h Art.No. 6421-499 0-160 kts Art.No. 6423-499 <u>6FMS-5</u> in km/h	TS 10.210/15
Winter	<u>7FMS-4</u> (Diameter 58mm) 0-300 km/h Art.No. 7421-499 0-160 kts Art.No. 7423-499 <u>7FMS-42</u>	TS 10.210/19
Thommen	<u>5A58(Q)</u> range 300 km/h	
PZL	<u>PR-400 S-A</u> in km/h	

or other Airspeed indicators approved according to TSO, JTSO or ETSO for use in aircraft or similar FAA approved airspeed indicators to meet TSO C2 reading to 300 km/h <160 Kt., 180 mph> may be used. Maximum instrument error  $\pm 2\%$ . Colour marking must be according to Flight Manual section 2-3.

**6.2 Altimeter**

<b>Manufacturer</b>	<b>Type</b>	<b>TCDS No.</b>
Winter	<u>4 FGH 10</u> (Diameter 80mm) 1000-10000m Art.No. 4100 3000-30000ft Art.No. 4330	TS 10.220/46
Winter	<u>4 FGH 20</u> (Diameter 58mm) 1000-10000m Art.No. 4220	TS 10.220/47
Winter	<u>4 FGH 20</u> (Diameter 58mm) 1000-20000ft Art.No. 4550	TS 10.220/48
PZL	<u>W-12S</u> in m	

or other Altimeters approved according to TSO, JTSO or ETSO for use in aircraft; one turn of dial max. 1000 m or 3000 ft. A similar FAA approved altimeter to meet TSO C10 with a range of approximately 33000 ft and a mercury or millibar or hektopascal subscale may be used. When an altimeter of up to 20000 ft only is being used, a placard must be near the altimeter stating: Maximum flying altitude 20000 ft. See also Flight Manual section 2.10.

### 6.3 Seat Belt Harness (with multiple point buckles)

Manufacturer	Type	TCDS No.
Schroth	4-01-0.104 (Lap belt and shoulder strap)	40.073/11
Gadringer	Lap belt 5202 Shoulder strap 2700	40.070/32 40.071/05

### 6.4 Compass

Manufacturer	Type	TCDS No.
Ludolph	<u>FK 16</u> , <u>FK 5</u> , <u>FK 10</u>	10.410/3
Airpath	C 2300, C 2400	TS 10.220/47
PZL	BS1, KJ-13A	FD 19/77
Bohli	46 MFK 1	Not approved, only as additional system

### 6.5 UHF – Transmitter and Receiver

Manufacturer	Type	TCDS No.
Dittel	FSG-40 S	10.911/45
	FSG-50	10.911/71
	FSG-60 M	10.911/72
	FSG-70,71 M	10.911/81
	FSG-90	10.911/98JTSO
	FSG 2T	LBA.0.10.911/103JTSO
Becker	AR 3201-(1)	10.911/76
	AR 2008/25 (A)	10.911/48
	AR 4201	JTSO-2C37 D, ED-23A
Avionik Dittel	ATR 720 A	10.911/74
	ATR 720 C	10.911/83
	ATR 600	O.10.911/106JTSO
	ATR 500	LBA.0.10.911/113JTSO

or other radios approved according to TSO, JTSO or ETSO for use in aircraft.

### 6.6 Variometer

Manufacturer	Type	TCDS No.
Winter	5 StVM5 (Diameter 58 mm)	TS 10.230/14
	+ 5 m/s No. 5451	
	+1000 ft/min No. 5452	
	+ 10 kts No. 5453	
Winter	5 STV 5 (Diameter 80 mm)	TS 10.230/13
	+ 5 m/s No. 5251	
	+1000 ft/min No 5252	
	+ 10 kts No. 5253	
Thommen	4A16() or 4A58()	
Bohli	68PVF1 or 68PVF2 in m/s	
PZL	WRS-5D in m/s	

### 6.7 Turn and Bank Indicator

Manufacturer	Type	TCDS No.
Apparatebau Gauting	WZ 402/31 12V	10.241/8
Kelvin & Hughes	<u>KTS 0406</u> or <u>KTS 0406 R</u>	TS 10.210/19
PZL	EZS-3	

### 6.8 Thermometer

Störck	TF-00-59K	
--------	-----------	--

Temperature sensor in ventilation tunnel or landing gear box..

## 6.9 Electrical Supply:

**Battery at seat front:** Only batteries with main fuse according to drawing 4BR-255 approved for use.

Measurements: L 152mm \* B 66mm \* H 100mm <5.98 in \* 2.6 in \* 3.94 in> (over poles), 12V min.7.2 Ah, 2 Batteries required.

2 Battery holders 3BR-253 are fitted as standard.

**From ser.no. 8527 on (ÄM LS8-1):** Battery holders 9R58 instead of 3BR-253.

**Vertical Tail Fin Battery:** The battery box for the fin battery is installed as standard equipment. Optional. Only batteries for the vertical tail fin with main fuse according to drawing 3BR-199 approved for use.

Measurements: L 155mm \* B 35mm \* H 100mm <6.1 in \* 1.38 in \* 3.94 in> (over poles), 6V 7.2 Ah, 2 cells required.

**From ser.no. 8527 on (ÄM LS8-1):** A locking bow (part 10L35 made from piano wire) is installed in the fin battery box. The locking bow prevents the installation of a battery and serves as indicator if a battery is installed, as its ends are visible from the outside.

If a battery will be installed in the fin the locking bow must be removed.

After removing the battery reinstall the locking bow.

**Battery in baggage compartment:** Optional. Mounting see section 4.16.

## 6.11 Equipment, not being part of minimum equipment:

**Transponder:** Units approved according to TSO, JTSO or ETSO for use in airplanes can be installed. For installation of antenna, see details provided in appendix.

**Other equipment as gliding computers or loggers:** These instruments can be installed, as long as it is guaranteed, that they themselves or their effect on the aircraft do not impair safe operation.

**Important Note:** When additional instruments are installed after production, these must be properly secured as long as they are not installed to a manufacturer provided position.

Electrical instruments must be connected via appropriately dimensioned fuses, current for one instrument must not exceed 3A.

After installation a new weighing report must be filed.

**7. List of Special Tools**

## a) Special Equipment

<b>Tool</b>	<b>Drawing</b>	<b>Function</b>
Ratchet key	4F02-15	for assembly / disassembly of elevator and wing tips.
Filling funnel and tube with wire meshing and wing holder	Z66	for filling of water ballast system through discharge openings, use together with adapters.
Inner tank braceable wing adapter	4BF-137	for filling of inner wing tanks through discharge openings together with filling funnel including wire meshing.
Outer tank tapered adapter	4F05-161	for filling of outer wing tanks through discharge openings together with filling funnel including wire meshing.
Tail tank adapter	Z160	for testing of vertical tail fin valve, to avoid take-offs with unintentionally filled vertical tail tank, as well as for filling of tail tank together with filling funnel including wire meshing.

## b) Tools

## 1. Open end wrenches

Width over flats 7, 8, 9, 10, 13mm

Width over flats 14, 17, 19, 22mm

## 2. Sockets for hexagon recess bolts size 5, 6, 8, 10 and 12mm

## 3. Spring scale, max. range 300 N ( 30 kg &lt;67 lbs&gt;)

4. Nicopress tool 64 – CGMP for oval sleeves and 51-MJ for stop sleeves.

## 5. Torque wrench

Torque range up to 50 Nm with sockets for hexagon heads, width over flats 10, 13, 17, 19mm, as well as hexagon recess sockets sizes 3, 4, 5, 10mm.

**8. Markings and Placards**

**LS8-s and LS8-sb Checklist**

This sailplane must be operated in compliance with operating limitations stated in the form of markings, placards and Flight Manual.

1. Main pins secured ?
2. Horizontal tail secured ?
3. Winglets secured ?
4. Test controls ?
5. Tail fin valve operating checked ?
6. When water ballast, then always in wings and tail tank !
7. Check loading conditions
8. Check tail dolly removed
9. Fasten seat belt harness
10. Connect parachute static line
11. Lock air brakes
12. Check trim position
13. Check release system
14. Lock canopy

At underside of instrument panel

Tyre pressure 3.5 bar (51 psi)	on right landing gear door
--------------------------------------	-------------------------------

Tyre pressure 2.5 - 3.5 bar (36 to 51 psi)	above tail wheel, when fitted
--	----------------------------------

at Baggage Compartment

Maximum Baggage weight 5 kg (11 lbs) (For soft items only)
---

<b>MINIMUM COCKPIT LOAD :</b> _____ kg / lbs Minimum Cockpit Load with empty tail tank: _____ kg/lbs Valid for equipment configuration according to Flight Manual chapter 6.
--

Under instrument panel cover

DG-Flugzeugbau GmbH Type: <b>LS8-s / sb</b> Serial Number: <b>8xxx</b>			
<b>Data Placard</b>			
Airspeed Limits (IAS)	km/h	mph	Kt.
Winch Launch / Auto-Tow	140	87	76
Aero tow	195	121	105
In Rough Air	195	121	105
Never exceed (VNE)	280	174	151
Max. Take-off Mass 15m span	525 kg (1157 lbs)		
18m span	575 kg (1268 lbs)		
Aerobatic manoeuvres <b>not</b> approved			
<b>Weight Limitations</b>			
Maximum Cockpit Load	_____ kg	_____ lbs	
<b>Minimum Cockpit Load</b>	_____ kg	_____ lbs	
Minimum Cockpit Load with tail fin tank empty and without tail battery	_____ kg	_____ lbs	
Valid for Equipment Condition according to Flight Manual chapter 6. Lighter pilots must compensate lack of weight			

At right cockpit side

Ball of bearing must be fixed	at forward horizontal tail attachment on vertical tail fin
----------------------------------	---

<b>DG-Flugzeugbau GmbH</b>	
TYPE	LS8-s _____.
TCDS- No.	A.047 _____.
Serial Number	8xxx _____.
Reg. Signs	D-xxxx _____.

<b>DG-Flugzeugbau GmbH</b>	
TYPE	LS8-sb _____.
TCDS- No.	A.047 _____.
Serial Number	8xxx _____.
Reg. Signs	D-xxxx _____.

Type placard at main bulkhead

8. Markings and Placards (continued)

When using a battery in the vertical tail fin. Minimum Cockpit Load must be redetermined by weighing
Use vertical tail fin battery only with main fuse at battery

at vertical tail fin battery cover

<b>Canopy Emergency Release:</b> open left side normally, pull right side with approx.15 kg/33 lbs force to stop
--

at right canopy frame



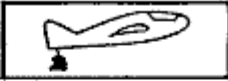



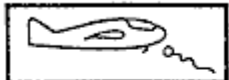
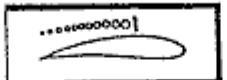

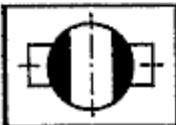
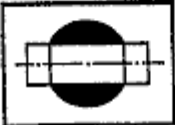
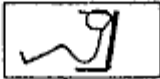


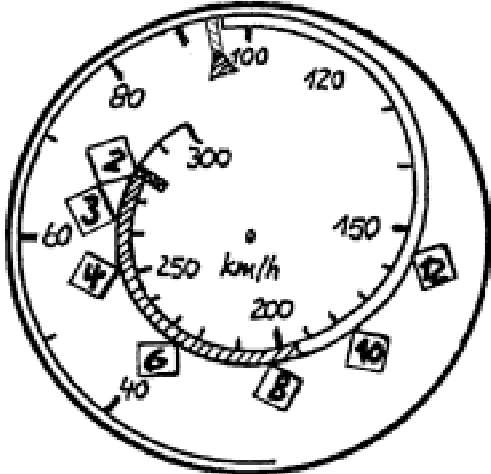
<u>Altitude related</u>	
<u>Never Exceed Speed</u>	km/h
Up to 2000 m MSL	280
Up to 3000 m MSL	266
Up to 4000 m MSL	253
Up to 6000 m MSL	227
Up to 8000 m MSL	202
Up to 10000 m MSL	179
Up to 12000 m MSL	156






On panel near airspeed indicator, for countries operating with metric units only.

<u>Altitude related Never</u>			
<u>Exceed Speed</u>	km/h	Kt.	mph
Up to 6500 ft MSL	280	151	174
Up to 9800 ft MSL	266	144	165
Up to 13100 ft MSL	253	136	157
Up to 19700 ft MSL	227	122	141
Up to 26200 ft MSL	202	109	126
Up to 32800 ft MSL	179	97	111
Up to 39800 ft MSL	156	84	97

On panel near airspeed indicator

8. Markings and Placards (continued)

	Green
	Yellow
	Red
	Blue
	Red VNE

## **9. Parts List**

In this list, the most important parts of electrical system as well as components of control surface sealing and water ballast system are provided.

For drawing numbers of control system parts refer to diagrams section 1.

### **9.1 Parts for electrical system**

45002070	Battery for power supply 12V/min. 7 Ah.
60510385	Protective circuit breaker ETA 2A (automatic cut out)
60510386	Protective circuit breaker ETA 3A (automatic cut out)
60510387	Protective circuit breaker ETA 4A (automatic cut out)
45002072	Flat plug type fuse 15 A (blue) for batteries (main fuse)

## 9.2 Control surface gap sealing and turbulators

### 1. Aileron (Friction surface and internal sealing)

- 30003143 Teflon glass tape 0,1 x 50 mm, 50 m <164°ft> roll
- 70000253 bonding film Tesafix No. 4965, 9 mm <0.35 in>wide, 50 m <164°ft> roll

### 2. Horizontal tail

#### Upper side

- 30003128 Scarfed convex Mylar tape 0,19 x 30 mm <0.0075 x 1.18 in> without adhesive
- 70000253 bonding film Tesafix No. 4965, 9 mm wide, 50 m <164°ft> roll
- 70000232 Tesafilm 4104 white, 25 mm wide, 66 m <216°ft> roll

#### Lower side

- 30003124 straight Mylar tape 0,19 x 22 mm 0.0075 x 0.866 in>, without adhesive
- 70000253 bonding film Tesafix No. 4965, 9 mm wide, 50 m <164°ft> roll
- 30003127 Zigzag tape 90°, 11,5mm wide, 0,5mm thick

### 1. Vertical tail

- 30003128 Scarfed convex Mylar tape 0,19 x 30 mm <0.0075 x 1.18 in> without adhesive
- 70000253 bonding film Tesafix No. 4965, 9 mm wide, 50 m roll
- 70000229 Tesafilm 4104 white, 19 mm, 66 m roll
- 70000295 V - tape white 20 mm, 25m roll

## 9.3 Water Ballast System

- 45001172 rubber bellow at root rib
- 45000125 central plug for valve head
- 40880006 rubber membrane seal for valve head
- 30000340 Sikaflex 252 sealing compound, white, 310 ml cartridge

**10. Diagrams**

reserved

**11. Appendix**

**Equipment List**

Serial No.: \_\_\_\_\_ | Reg. Signs: \_\_\_\_\_ | Year of Manuf.: \_\_\_\_\_

**Minimum Equipment** (check function annually, calibrate every fourth year)

	Type	Manufacturer	Serial No.	Position	Certificate	Function
Airspeed Ind.						
Altimeter						
Radio						
Microphone			---			
Loudspeaker			---			
Battery			---	Seat front		
Batteryholder			---	Seat front		
Lapbelt				Seat		
Shoulder strap				Main Bulkh.		
CG-Hook	G 88	Tost		Land. Gear		
Nose hook	E 85	Tost		Nose		
Thermometer	TF-00-59K	Störck	---	Below Panel	---	
Tail tank-Adapter	Z160	DG	---	Min.Equip-ment	---	

**Additional Equipment**

	Type	Manufacturer	Serial No.	Position	Certificate	Function
TEK-Unit				Vert. Tail		
Variometer						
E- Variometer						
5"-Wheel	Standard 113-20	Tost		Land. Gear		

Place: \_\_\_\_\_ Date: \_\_\_\_\_ Stamp: \_\_\_\_\_ Signature: \_\_\_\_\_

**Weighing Report**

Serial No.: \_\_\_\_\_ | Reg. Signs: \_\_\_\_\_ | Year of Manuf.: \_\_\_\_\_

**Component Mass** (check when equipment altered or every fourth year)

Left wing + 15m WL	kg/lbs	Max. All-up Mass	1157 lbs 15m: 525 kg	1267 lbs 18m: 575 kg
Right wing + 15m WL	kg/lbs	Maximum Weight of Non-Lifting Parts at		
Fuselage + Canopy + Main pins	kg/lbs	W: _____ kg/lbs, Xcg: _____ mm/in	kg/lbs	
Minimum Equipment permanently inst.	kg/lbs	Fuselage (completely equipped)	kg/lbs	
Add. Equipment and Trim ballast	kg/lbs	Horizontal Tail	kg/lbs	
Horizontal Tail	kg/lbs	<b>Cockpit Load (max. 110 kg or 242 lbs)</b>	kg/lbs	
<b>Empty Mass 15 m &lt;G&gt;</b>	kg/lbs	Mass of Non-Lifting Parts	kg/lbs	
Empty Mass 18 m	kg/lbs	Winglet 15 m left	kg/lbs	right kg/lbs
		18 m Tip left	kg/lbs	right kg/lbs
		Wing - WL left	kg/lbs	right kg/lbs

**Weighing Conditions:**

- |   |                          |
|---|--------------------------|
| <input type="checkbox"/> 1 Battery in vertical tail: _____ kg/lbs | <b>Permanent Ballast</b> |
| <input type="checkbox"/> 1 / 2 Batteries at seat front end        |                          |
| <input type="checkbox"/> 1 / 2 Batteries in baggage compartment   |                          |
| <input type="checkbox"/> Tail fin: _____ kg/lbs                   |                          |
| <input type="checkbox"/> _____ kg/lbs                             |                          |

**Weighing and Empty Mass C.G. Determination** (check when equipment altered or every fourth year)

Technical data according to TCDS:	Datum point <DP>: _____	Leading edge of wing at root
	Datum line <DL>: _____	Under side of fuselage boom horizontal
Empty mass <W>	kg/lbs	Distance wheel axis- Datum point <a>
Net tail mass <W2>	kg/lbs	Distance wheel axis- Tail support <b>
Tail fin water <Wa>	kg/lbs	

	<b>with tail tank full and tail battery</b>	<b>with tail tank empty and tail battery</b>
<b>For wing span 15m &lt;49ft&gt;</b>		
<b>(W2+Wa+B)*b</b>	_____ * _____	_____ * _____
----- + a = Xcg	----- + _____ = _____ mm	----- + _____ = _____ mm
<b>W+Wa+B</b>	_____ / in	_____ / in
Empty Mass:	_____ kg/lbs	_____ kg/lbs
Empty Mass C.G. range from:	_____ mm/in to: _____ mm/in	_____ mm/in to: _____ mm/in
Cockpit Load range from:	_____ kg/lbs to: _____ kg/lbs	_____ kg/lbs to: _____ kg/lbs

<b>Minimum Cockpit Loads:</b>	Tail tank _____ Ltr. full	Tail tank empty
<b>With tail battery</b>	_____ kg / lbs	_____ kg / lbs
<b>Without tail battery</b>	_____ kg / lbs	_____ kg / lbs

**Maximum Cockpit Load:**..... \_\_\_\_\_ kg / lbs limited by C.G. Table / Weight of Non-Lifting Parts

Weight and Balance Placard and Minimum Cockpit Load Placard in cockpit as well as entry in Flight Manual page 6-2 have been checked/updated. Equipment during weighing/calculation see equipment list dated: \_\_\_\_\_

Note: See also Maintenance Manual, chapter 5. State dimensions used. Redetermine distances a and b, because of possibly altered suspension level.

**Place:** \_\_\_\_\_ **Date:** \_\_\_\_\_ **Stamp:** \_\_\_\_\_ **Signature:** \_\_\_\_\_

**Control Surface Mass and Moment**

Serial No.: \_\_\_\_\_ | Reg. Signs: \_\_\_\_\_ | Year of Manuf.: \_\_\_\_\_

**Control Surface-Mass** (Check whenever a change is suspected and after repairs)

	Limit	Measured	
<u>Aileron</u> <b><u>inner</u></b>	3,40 to 4,45 kg	left	kg/lbs
	7,496 to 9,811 lbs	right	kg/lbs
<b><u>outer</u></b>	0,42 to 0,65 kg	left	kg/lbs
	0,926 to 1,433 lbs	right	kg/lbs

<u>Elevator</u>	1,30 to 1,65 kg 2,866 to 3,638 lbs	kg/lbs
-----------------	---------------------------------------	--------

<u>Elevator Drive Rod Mass</u>	for 100% Mass Balance	kg/lbs
--------------------------------	-----------------------	--------

<u>Rudder</u>	4,30 to 5,40 kg 9,480 to 11,905 lbs	kg/lbs
---------------	--	--------

**Control Surface-Moment** (Check whenever a change is suspected and after repairs)

	Hinge Moment Limits	Rear Edge-Weight * kg/lbs	Hor. Ref. Line cm/in	= Moment kg cm/in*oz
<u>Aileron</u> <b><u>inner</u></b>	2.04 to 3.67 kg cm	left		
	28.330 to 50.967 in*oz	right		
<b><u>outer</u></b>	0.82 to 1.22 kg cm	left		
	11.388 to 16.943 in*oz	right		

<u>Elevator</u>	3.48 to 4.60 kg cm 48.328 to 63.882 in oz			
-----------------	--	--	--	--

<u>Rudder</u>	-1.02 to 3.36 kg cm -14.165 to 46,660 in oz			
---------------	--	--	--	--

1 kg cm = 13.887 in oz

Cross invalid dimensions

Place: \_\_\_\_\_ Date: \_\_\_\_\_ Stamp: \_\_\_\_\_ Signature: \_\_\_\_\_

**Control Surface Deflections 1 / 2**

Serial No.: \_\_\_\_\_ | Reg. Signs: \_\_\_\_\_ | Year of Manuf.: \_\_\_\_\_

**Ailerons**

Radius Left: \_\_\_\_\_ mm/in Right: \_\_\_\_\_ mm/in  
 Measure between inner aileron and wing trailing edges

	Limit [°]	Actual [°]	Limit [mm/in]	Actual [mm/in]
<b>Left</b> up	-26° to -30°		to	
down	13° to 15°		to	
<b>Right</b> up	-26° to -30°		to	
down	13° to 15°		to	

**Elevator**

Measure at outer edge, radius: \_\_\_\_\_ mm/in

	Limit [°]	Actual [°]	Limit [mm/in]	Actual [mm/in]
<b>Up</b>	-28° to -30°		to	
<b>Down</b>	22° to 26°		to	

**Rudder**

Measure at lower edge, radius: \_\_\_\_\_ mm/in

	Limit [°]	Actual [°]	Limit [mm/in]	Actual [mm/in]
<b>left</b>	26° to 30°		to	
<b>right</b>				

Place: \_\_\_\_\_ Date: \_\_\_\_\_ Stamp: \_\_\_\_\_ Signature: \_\_\_\_\_







**TB-AD-Repetitive Inspections List**

Serial No.: \_\_\_\_\_ | Reg. Signs: \_\_\_\_\_ | Year of Manuf.: \_\_\_\_\_

List opened date: \_\_\_\_\_ Signature: \_\_\_\_\_ Page No. 1

<u>TB</u> LBA- AD	Components concerned	Steps / Modifi- cation	Interval	Date Fl.-hours Stamp Inspector	Date Fl.-hours Stamp Inspector	Date Fl.-hours Stamp Inspector	Date Fl.-hours Stamp Inspector	Date Fl.-hours Stamp Inspector
	<i>C.G. hook</i> <i>G: ____</i> <i>S/N.: _____</i>	<i>Overhaul</i>	<i>2000</i> <i>take-offs</i>					
	<i>Nose hook</i> <i>E: ____</i> <i>S/N.: _____</i>	<i>Overhaul</i>	<i>2000</i> <i>take-offs</i>					
	<i>Seat belt</i> <i>harness</i> <i>Type _____</i> <i>S/N.: _____</i>  <i>Type _____</i> <i>S/N.: _____</i>	<i>Overhaul</i> <i>Exchange</i> <i>Webbing</i>	<i>12 years</i>					
	<u><i>Rudder cables</i></u>	<i>Inspect</i> <i>for wear</i>	<i>Every</i> <i>200 h or</i> <i>Annual</i> <i>Insp.</i>					
	<i>ELT ACK E01</i> <i>Batteries</i> <u><i>Duracell MN 1300</i></u>	<i>Exchange</i>	<i>According</i> <i>to printed</i> <i>Date of</i> <i>expiry</i>	<u><i>until</i></u>				
	<i>ELT-Remote Control</i> <i>Battery</i> <u><i>PX 28 (Alkaline)</i></u> <u><i>PX28L (Lithium)</i></u>  <i>(Cross out non-applicable)</i>	<i>Exchange</i>	<i>max. 4 years</i> <i>max. 8 years</i>  <i>(Cross out non-</i> <i>applicable)</i>	<u><i>until</i></u>				

**Inspection Report**

Serial No.: \_\_\_\_\_ | Reg. Signs: \_\_\_\_\_ | Year of Manuf.: \_\_\_\_\_

Operator:	
-----------	--

Operation Time	(Logbook)	Landings
Total		
Since last Annual Insp.		

<input type="checkbox"/> Final Production Inspection <input type="checkbox"/> Annual Inspection <input type="checkbox"/> Modification Inspection	<input type="checkbox"/> Airworthiness Directive Insp. AD No. _____ <input type="checkbox"/> Repair Inspection _____
--	--

Seq. No.	Report or Findings	Remarks	Signed
1	Check Control Surface Deflections		
2	Check Operating Instructions according to TCDS		
3	Check Placards as given in Flight Manual		
4	Minimum Cockpit Load Tail tank full: _____ kg/lbs Tail tank empty: _____ kg/lbs		
5	Maximum Cockpit Load: _____ kg/lbs		
6	C.G. Hook S/N: _____ operational until:	2000 take-offs	
7	Nose Hook S/N: _____ operational until:	2000 take-offs	
8	AD's performed:		
9	Technical Bulletins performed:		
10	TB-AD-List Maintenance Manual section 11		
11	Repetitive Inspections Checklist MM section 11		
12	Tail fin: Tank 7.5 / 12 Litres with battery box.		
13			
14			

Compass Deviation List:

For:	N	30	60	E	120	150	S	210	240	W	300	330	Signed
Steer:													

The following reports are valid for this inspection report:

Checklist dated:	Equipment List dated:
Inspection Certificate dated:	Control System Deflections 1 / 2 dated:
Flight Test Report 1 / 2 dated:	Control Surface Weight / Moment Report dated:
Findings Report dated:	TB-AD-Checklist dated:
Weighing Report dated:	Repetitive Inspections Checklist dated:

The sailplane corresponds to TCDS and is airworthy.

**Place:** \_\_\_\_\_ **Date:** \_\_\_\_\_ **Stamp:** \_\_\_\_\_ **Signature:** \_\_\_\_\_

**Flight Test Report**

Serial No.: \_\_\_\_\_ | Reg. Signs: \_\_\_\_\_ | Year of Manuf.: \_\_\_\_\_

Operator:	Date:
	Pilot:
	Airfield:
	Take-off Method:
	Take-off: _____   Landing: _____

**Weights:**

Empty Weight <Weighing Report>: \_\_\_\_\_ kg/lbs      Removable Trim Ballast: \_\_\_\_\_ kg/lbs  
 Pilot *with/without* Parachute: \_\_\_\_\_ kg/lbs      Total Flying Weight: \_\_\_\_\_ kg/lbs

**Battery Positions**      Front seat      Baggage Compartment     Tail Fin

**Findings**    (not available = 0    without objections: = +    with objections = - )

1	<b>On Ground</b>	safety harness: _____ pedal adjustment: _____ visibility: _____ handles: _____ seat adjustment: _____ canopy locking: _____ ventilation: _____ control system: _____	_____
2	<b>Take-off</b>	Tow altitude: _____ m, Tow speed (IAS): _____ km/h	_____
3	<b>Tow Release</b>	manual: _____ automatic: _____ (tested on ground)	_____
4	<b>Landing Gear</b>	retract: _____ extend: _____	_____
5	<b>Instrumentation Function</b>		_____
6	<b>Radio Function</b>	on ground: _____ during flight: _____	_____
7	<b>Slow Flight</b>	stalling speed (IAS): _____ km/h	_____
8	<b>Normal Flight</b>	controls free, trim neutral: _____ km/h (Reference 110 – 130 km/h)	_____
9	<b>Trim Range</b>	from (IAS): _____ to: _____ km/h Reference from slow flight to 180- 210 km/h	_____
10	<b>Circling Flight</b>		_____
11	<b>Effectiveness of Controls</b>	elevator: _____, rudder: _____, aileron: _____	_____
12	<b>Straight Flight</b>	trimmed at 80 km/h : _____, at 120 km/h : _____, at 200 km/h : _____ (controls free) resulting middle stick position : _____, _____ : _____, _____ : _____	_____
22	<b>High Speed Flight</b> (be alert to danger of flutter)	up to (IAS): _____ km/h	_____
23	<b>Air Brakes</b>	forces during extending and retracting	_____
24	<b>Side-slip and Landing</b>	(with / without air brakes)	_____

Operating alright.	Alright after accomplishing complaints	New flight test required
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**Remarks:** all speeds: km/h / Kt. / mph all weights: kg / lbs altitudes: m / ft

Reference speed	km/h	80	90	110	120	130	140	150	180	200	210
Value table:	Kt.	43	49	59	65	70	76	81	97	108	113
	mph	50	56	68	75	81	87	93	112	124	130

**Flight with 15 m <49 ft> / 18 m <59 ft>**

Pilot: \_\_\_\_\_  
Signature

**Place:** \_\_\_\_\_ **Date:** \_\_\_\_\_ **Stamp:** \_\_\_\_\_ **Signature:** \_\_\_\_\_

**Annual Inspection Checklist 1/3**

Serial No.: \_\_\_\_\_ | Reg. Signs: \_\_\_\_\_ | Year of Manuf.: \_\_\_\_\_

<p><b><u>Wings</u></b>                  Serial No.: _____                  Finish condition                  Spar stub                  Root ribs and pins                  Sandwich shell condition                  Drain orifices                  Ailerons                  Air brakes                  Connecting means  <b>Aileron</b> pressure marks                  -Drives at ailerons                  -Drives at root ribs                  -fixed bearing + washer                  -Bearings                  -Lateral bearing gaps                  -Lateral gaps to wing                  -Sealing                  -Stops                  -Ventilation                  -Cracks / buckling  <b>Air brake</b> bearings                  -Corrosion at levers                  -Cover springing                  -Drive at root rib                  -locking                  -Friction damper function                  Main pins                  Serial No. _____  <b><u>Wing water system</u></b>                  Drain valve at root rib                  Function + tightness  <b>Tanks</b>-Externally tight                  -Tight between tanks                  -Valve adjustment                  1.Ventilation inner tank                  2.Ventilation inner tank                  Ventilation outer tank                  Discharge time _____                  (min. 180 Seconds)</p>	<p><b><u>Winglets</u></b>                  Winglet shell                  Spar tube                  Pins                  Winglet skids                  Assembly free from play                  Locking of ratchet                  Ventilation openings                  Outer tip aileron  <b><u>Horizontal Tail</u></b>                  Serial No.: _____                  Finish condition                  Sandwich shell condition                  Stabiliser ventilation                  Elevator ventilation                  Elevator drive lever                  drive bearings                  Bearings                  Fuselage connection                  Connecting means                  Sealing  <b><u>Fuselage</u></b>                  Serial No.: _____                  Finish condition                  Shell condition                  Cracks                  Drain orifices                  Rudder mounting                  Stabiliser mounting                  Tangential tubes                  Bushes for wing root pins                  Locking of bushes                  Cockpit                    Seat                  Under seat                  Lap belt fixing at seat                  Control stick                  Elevator drive under seat</p>	<p><b><u>Fuselage continued</u></b>                  Aileron syst. under seat                  Aileron connectors                  -Deflectors straight                  Air brake system                  Air brake connectors                  Trim system                  Trim operation + locking                  Pedals                  -Adjustment + locking                  Rudder cables                  Ground connections                  Backrest locking                  Trim weight holder                  -Upper end stop                  -Lower end pins + bolt                  -Fixing nut                  Nose hook fitting                  -Drive                  Tail skid – cable deflector                  at front end                  -Skid bonding                  Tail wheel                  Connecting means                  Water ballast system  <b><u>Tail fin tank</u></b>                  Volume: _____ Litres                  Tail tank adapter existent                  Cable wear                  -Corrosion                  Valve operating ease                  Functioning                  Funnel filter + level ind.                  Opening before/with wing                  Discharge time for                  (7.5 Ltr.): _____ Sec.                  (max. 90 Sec)                  Tail fin battery box                  -battery box cover  <b>from ser.no. 8527 on</b>                  -locking bow installed?</p>
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Place: \_\_\_\_\_ Date: \_\_\_\_\_ Stamp: \_\_\_\_\_ Signature: \_\_\_\_\_

**Annual Inspection Checklist 2/3**

Serial No.: \_\_\_\_\_ | Reg. Signs: \_\_\_\_\_ | Year of Manuf.: \_\_\_\_\_

<b><u>Canopy</u></b>	<b><u>Equipment</u></b>	<b><u>Adjustments</u></b>
Serial No.: _____	Minimum instrumentation	Wings and horizontal tail
Locking mechanism	Additional Instrumentation	Tangential play
Emergency release funct.	Operating range marks	Zero position of controls
Window	Limit marks	Control surface deflections
Ventilation system	Vacuum flasks	acc. to page 14-7/8
Canopy fixing system	Pneumatic tubing	Max. air brake extension
Gas strut operation	Instruments functioning	Min. 150 mm average
Lift rear edge temporary	Total energy unit	Air brake locked, lateral
Hinge: _____ (8-15 kg)	<u>Systems free from leaks</u>	Gap min. 1 mm inner end
(18-33 lbs)	Total pressure	min.2.5 mm outer end
<b><u>Rudder</u></b>	Static pressure	Air brake locked, cockpit
Finish condition	T.E. system	Lever min. 12mm from stop
Shell	Electrical wiring	Control surface friction
Ventilation openings	Battery + fitting	Control surf. Rear edge play
Drive	Battery main fuse	Landing gear locking
Fixed bearing + washer	Tail fin battery	Trim system function
Bearings	Tail fin battery main fuse	Harness function
Connecting means	Radio	Multiple point buckle funct.
<b><u>Landing gear</u></b>	Antenna system	Op.Limit: _____
Undercarriage + axle	SWR: _____	Ballast system function
Tyre	Communication check	Absolutely tight?
Springing	<b><u>Hooks</u></b>	<b><u>General</u></b>
Bearings + joints	C.G. hook	Registration signs
Folding strut overcenter	-Function + automatic rel.	Nationality marks
Folding strut preset load	-Serial No.: _____	Fireproof type placard
Cockpit locking in flight-direction: no play (1.6.3)	-Op.Limit: _____	External colour marking
Doors	Nose hook function	Checklist
Drive rods + longitudinal	-Serial No.: _____	Minimum cockpit load
Motion bearing	-Op.Limit: _____	Flight Manual
Connecting means	Release cable end play	Maintenance Manual
Wheel brake system	existent w. gear down	AD status
C.G. hook + drive	Data placard	Cert. of Airworthiness
Ground conn. to contr. stick	Placards accord. to Maint. Manual	Logbook notation
Baggage comp. cover	Compass deviation list	Placard notations
Oxygen bottle receptacle		TB-AD-List in MM updated
Fixed ballast at front/rear		Non-exist. of foreign matter

Place: \_\_\_\_\_ Date: \_\_\_\_\_ Stamp: \_\_\_\_\_ Signature: \_\_\_\_\_

**Annual Inspection Checklist 3/3**

Serial No.: \_\_\_\_\_ | Reg. Signs: \_\_\_\_\_ | Year of Manuf.: \_\_\_\_\_

	Check wing air brake levers for corrosion at lower end.				
	Pull with about 25 kg <55 lbs> force at upper end of each lever in flight direction, simultaneously retract without twisting upper member (do not counter hold at cockpit lever!).				
	When under load of last item locking at wing structure results, then bearings at related lever must be exchanged immediately by repair station according to repair instruction "Air Brake Levers".				
	Bearings should be exchanged within 6 months, when corrosion is clearly visible, but no locking or jamming occurs.				
	Valid C.G. weighing dated _____		<b><u>Flight Hours</u></b>		Entry of Cockpit Load in Cockpit + Flight Manual 6.2 checked, unaltered changed to _____ kg/lbs
			Total _____ hr.		
	Valid Equipment List dated _____		Last Ann.. _____ hr.		
			<b><u>Take-offs</u></b>		
			Total _____		
			Last Ann.. _____		

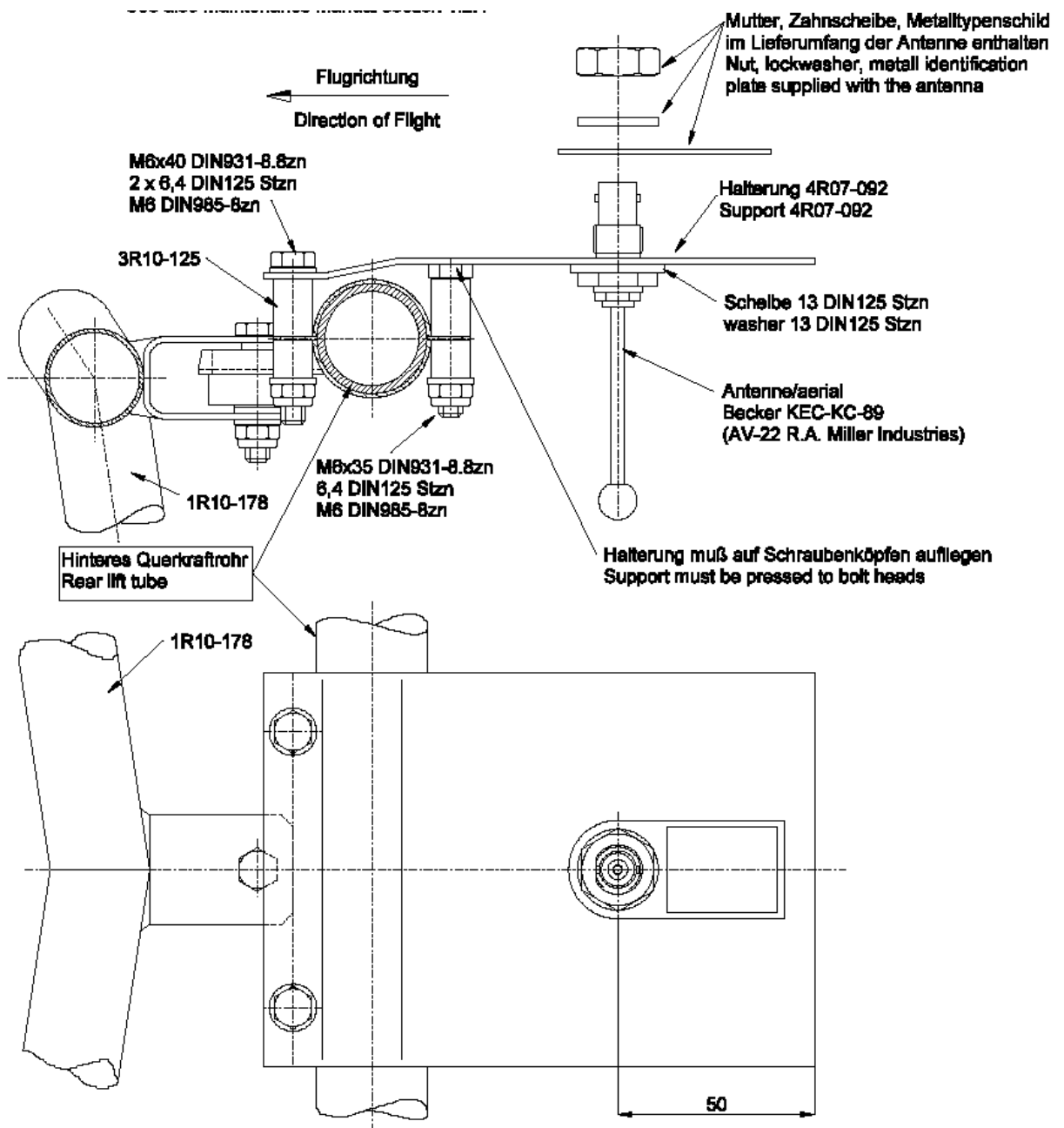
	Inspect automatic couplings for possible wrong rigging
	Permanent installation of equipment in baggage compartment according to chapter 11
	Special inspection hints according to chapter 3 taken care of
	Technical Bulletins performed: _____
	AD's performed: _____
	TB-AD-List page 14-1 updated
	TB-AD Accomplishment List for Repetitive Inspections chapter 11 taken care of
	TB-AD Accomplishment List for Repetitive Inspections chapter 11 updated

**Findings / Complaints / Remedy**

No.	Findings	Remedy / Repair	Inspector

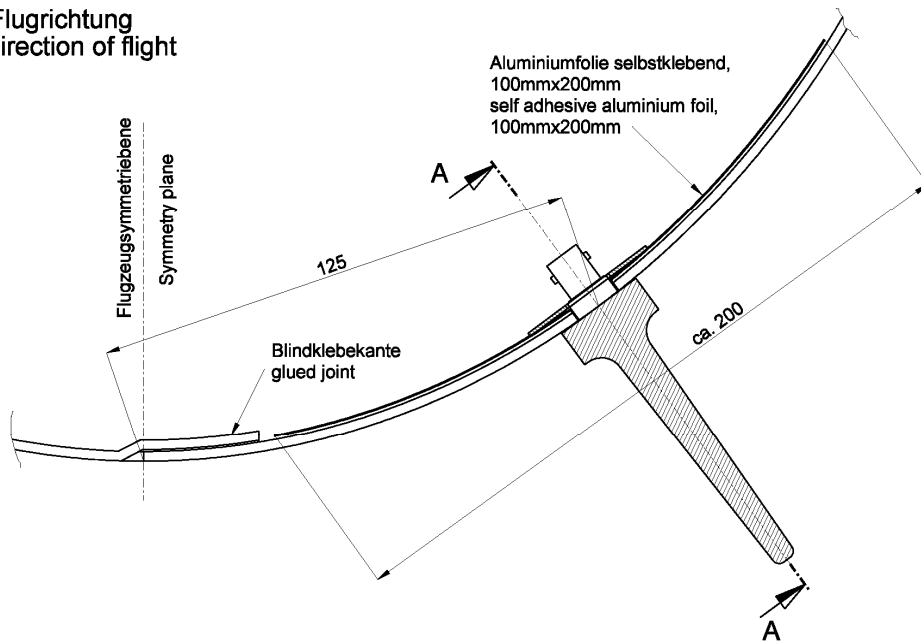
**Place:** \_\_\_\_\_ **Date:** \_\_\_\_\_ **Stamp:** \_\_\_\_\_ **Signature:** \_\_\_\_\_

**Transponder Aerial Installation** for **LS8-s** only



**Transponder Aerial Installation** for **LS8-sb** and **LS8-s**

Blick in Flugrichtung  
view in direction of flight



Schnitt A-A  
Section

alle 3 Bohrungen nach Schablone (Lieferumfang Antenne)  
all 3 openings according to pattern (supplied with antenna)

