

**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
3	0-1, 0-3, 0-6, 1-15, 8-1	TN 8021 Small tailwheel	January 2015
4	0-1, 0-3, 0-5, 0-6, 0-10, 1-9, 4-11, 5-3, 5-4, 5-6, 6-1, 6-2, 8-1, 8-2	TN 8024 Manual revision, repair manual	June 2016

**0.2 List of Effective Pages**

Chapter	Page	Edition	Replaced	Replaced	Replaced
0	Title page	April 2005			
	0-1	see log of revisions			
	0-2	see log of revisions			
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	0-4	see log of revisions			
	0-5	see log of revisions			
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	0-7	April 2005			
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1	1-1	April 2005	Feb. 2011		
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	11-15	April 2005			
	9E4	28.11.08			

## 0.4 LIFE LIMITED PARTS, MAINTENANCE INSTRUCTIONS

### 0.4.1 Repairs

Repair or replace damaged parts prior to next flight. Follow the instructions in the Repair Manual LS8.

Major repairs must be accomplished by an approved repair station or by an approved mechanic rated for composite aircraft structure work in accordance with DG repair methods.

Use only genuine spare parts.

For all aircraft under EASA regulations the following applies: According to part 21, subpart M to accomplish major repairs an approved repair instruction is required, see also TN DG-G-01 “Approved repair methods according to EU Commission Regulation 1702/2003 part 21, subpart M”

### 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).

**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 elevator deflections in Millimetres/Inches

local radius		22°to 26°		28°to 30°	
		down		up	
mm	in	mm	in	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

## 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 rudder pedal alignment: with pedals in neutral position check if rudder is neutral.  
If rudder is deflected to one side, twist **opposite** cable **counter-clockwise** (**maximum 5 turns**) until properly aligned.  
Should more than 5 turns be necessary for alignment, exchange cables.

**Caution:** Never turn cables **clockwise** !

- (7) 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).
- (8) 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.
- (9) if necessary, restore gap seals (convex plastic strip) on both sides, see section 4.6.

## 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>**.

**Finally resulting 4 different cockpit loads should be entered in the following places:**

- a. in weighing report of inspection
  - b. in Flight Manual section 6.2
  - c. in cockpit placard under instrument panel cover
  - d. in cockpit on data placard
1. Minimum Cockpit Load for full tail fin tank with tail fin battery
  2. Minimum Cockpit Load for empty tail fin tank with tail fin battery
  3. Minimum Cockpit Load for full tail fin tank without tail fin battery
  4. Minimum Cockpit Load for empty tail fin tank without tail fin battery



## 5.2 Calculation of Loading Limits (continued)

2. 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.

3. 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

4. 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

5. 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)

**Example for entry in Flight Manual section 6.2:**

			LS8-s		LS8-sb	
	Wing span	[m]	15	18	15	18
	Empty Mass	[kg] / <del>[lbs]</del>	273	282	273	282
	C.G. position	[mm] / <del>[in]</del>	665		665	
	<b>Max. Cockpit Load</b>	[kg] / <del>[lbs]</del>	<b>110</b>		<b>110</b>	
<b>Minimum Cockpit Loadg</b>	<b>with tail-battery</b>	Tail tank full (+)	[kg] / <del>[lbs]</del>	<b>120</b>	<b>140</b>	
		Tail tank empty (+)	[kg] / <del>[lbs]</del>	<b>780</b>	<b>80</b>	
	<b>without tail-battery</b>	Tail tank full (+)	[kg] / <del>[lbs]</del>	<b>110</b>	<b>130</b>	
		Tail tank empty (+)	[kg] / <del>[lbs]</del>	<b>70</b>	<b>70</b>	
	Perm. fixed Trim mass	front	[kg] / <del>[lbs]</del>	---	---	
		rear	[kg] / <del>[lbs]</del>	---	---	
	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 to make sure that no unintended amount of water remains in the fin tank.

To check the valve place tail tank filling adapter into the tank outlet and open the cockpit lever. If air cannot be blown into the tank, the valve is not functioning properly (for instance frozen solid or operating cable fractured).

**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 ±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. 4110 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	FK 16, FK 5, FK 10	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
	AR 6201	EASA.210.1249
Avionik Dittel	ATR 720 A	10.911/74
	ATR 720 C	10.911/83
	ATR 600	LBA.0.10.911/106JTSO
	ATR 500	LBA.0.10.911/113JTSO
	ATR 833	EASA.210.0193
Dittel Avionik	KRT2	EASA.210.10038036

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

**8. Markings and Placards**

**LS8-s and -sb Checklist**  
 This sailplane must be operated in compliance with operating limitations stated in the form of markings, placards and EASA approved Flight Manual.

1. Main pins secured?
2. Elevator secured?
3. Winglets secured?
4. Check controls
5. Tail fin valve operation checked?
6. When using water ballast, then always in wing and tail!
7. Check loading conditions
8. Check tail dolly removed?
9. Fasten seat belt harness
10. Fasten parachute and 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

**Tyre Pressure**  
**6,2 bar/90 psi**

above tailwheel  
 small tailwheel according to TN 8021, if installed

at Baggage Compartment

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

**MINIMUM COCKPIT LOAD:** kg / lbs

with tail battery, tail tank full	min.	_____
with tail battery, tail tank empty	min.	_____
without tail battery, tail tank full	min.	_____
without tail battery, tail tank empty	min.	_____

Under instrument panel cover

**DG Flugzeugbau GmbH**  
 Type: LS8-xx      Serial No.: \_\_\_\_\_

**Data Placard**

Airspeed Limits:	km/h	Kt	MPH.	
Winch launch/Auto tow	140	76	87	
Aero tow	195	105	121	
In rough air	195	105	121	
Never exceed (VNE)	280	151	174	
	m	ft	kg	lbs
Max. Take-off Mass *)	15	42	525	1157
Max. Take-off Mass *)	18	59	575	1267

\*) including water ballast  
 Aerobatic manoeuvres **not** approved

**Weight Limitations**

**Maximum Cockpit Load** ....max. \_\_\_\_\_ kg/lbs

**Minimum Cockpit Load**

with tail battery, tail tank full min. \_\_\_\_\_ kg/lbs  
 with tail battery, tail tank empty min. \_\_\_\_\_ kg/lbs  
 without tail battery, tail tank full min. \_\_\_\_\_ kg/lbs  
 without tail battery, tail tank empty min. \_\_\_\_\_ kg/lbs  
 Lighter pilots must compensate lack of weight as suggested in Flight Manual

xx= variant –s or –sb

At right cockpit wall

Ball of bearing  
 must be fixed

at forward horizontal tail  
 attachment on vertical tail fin

**DG-Flugzeugbau GmbH**

TYPE      LS8-s \_\_\_\_\_.

TCDS- No.      A.047 \_\_\_\_\_.

Serial Number      8xxx \_\_\_\_\_.

Reg. Signs      D-xxxx \_\_\_\_\_.

**DG-Flugzeugbau GmbH**

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 39400 ft MSL	156	84	97

On panel near airspeed indicator