

ROLLADEN-SCHNEIDER Flugzeugbau GmbH LBA-Nr. EB - 4	Technische Mitteilung Nr.: 6010	LS6	Blatt: 1/1 10. Jan. 1987
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Gegenstand: Betriebsgrenzen

Betroffen: Segelflugzeug-Muster LS6, Baureihe LS6 und LS6-a, alle Werknummern.

Dringlichkeit: Aufhebung der Begrenzung der Höchstzulässigen Fluggeschwindigkeit gemäß TM 6009/LTA 86-140 bis spätestens Ende April 1987

Vorgang: 1) Einbau eines hydraulischen Schwingungsdämpfers
Material: entsprechend Zeichnung 3BR-90
Maßnahmen: am Querruder-Wölbklappen-Mischer.

Wahlweise kann anstelle Punkt 1) ein zuschaltbarer Dämpfer gemäß TM 6011 eingebaut werden.

2) Entfernen von Hinweisschild und Farbmarkierung der TM 6009/LTA 86-140

3) Kontrolle der Reibung in der Querruder-Steuerung:
Die Handkraft am Steuerknüppelgriff darf bei eingerastetem Dämpfer und langsamer Betätigung 10 N (1000 gr) nicht überschreiten.

4) Kontrolle der sicheren Funktion des Dämpfers:
Bei allen Wölbklappenstellungen darf bei Querruder-Vollausschlägen kein Dämpfer-Einbauteil zum Anschlag kommen.

5) Ergänzung der Handbücher wie folgt:

LS6 Flughandbuch Revision 2, Ausgabe 11. Dez. 1986
(Blätter 0-5, 2-3, 3-13)

LS6 Wartungshandbuch Revision 3, Ausgabe 11. Dez. 1986
(Blätter 0-3, 1-1, 3-1, 3-2, 6-2, 14-7, 14-10)

LS6-a Flughandbuch Revision 1, Ausgabe 11. Dez. 1986
(Blätter 0-5, 2-3, 3-14)

LS6-a Wartungshandbuch Revision 1, Ausgabe 11. Dez. 1986
(Blätter 0-3, 1-1, 3-1, 3-2, 6-2, 14-7, 14-10)

Gewicht und Schwerpunkt-Lagen: Zusätzliches Gewicht ca. 1.3 kg
Kontrolle der Zuladung entsprechend Wartungshandbuch Kapitel 2. Die Änderung der Schwerpunktlage ist vernachlässigbar.

Hinweise: Durchführung nur durch den Hersteller oder durch einen anerkannten luftfahrttechnischen Betrieb.

Bescheinigung der Durchführung durch Prüfer Klasse 3 im Bordbuch sowie im Wartungshandbuch auf TM-LTA-Durchführungs-Beleg (Blatt 14-1).

LBA-angenommen:



Prüfer
13. Jan. 1987

erstellt: 10. JAN. 1987 <i>Leucke</i>	geprüft: 10. JAN. 1987 <i>Wagner</i>
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ROLLADEN-SCHNEIDER Flugzeugbau GmbH LBA-Nr. EB - 4	Technical Bulletin No. 6010	LS6	Page 1/1
			Edition 10.01.87

SUBJECT : Operating Limit / Vibration Damper

EFFECTIVITY : Sailplane models LS6 and LS6-a, all serial numbers

ACCOMPLISHMENT : Cancellation of VNE-restriction according to TB 6009/
LBA-AD 86-140 until end of April 1987

REASON : 1) Installation of hydraulic vibration damper at the aileron-
MATERIAL : flap-mixer according to drawing 1BR-90.
INSTRUCTIONS :

Optionally a switchable damper according to TB 6011 may be installed.

2) Remove placard and airspeed indicator colour marking according to TB 6009/LBA-AD 86-140

3) Check aileron system friction:
Control stick force during slow aileron motion and damper in operation should not exceed 10 N (1000 grams)

4) Check proper damper operation:
In no case a damper part should limit full aileron deflection.

5) Update Manuals as follows:
LS6 FLIGHT MANUAL Revision 1, (Pages 1-1, 1-2, 4-2, 4-11, 4-12, 7-1, Edition Jan.10,1987)

LS6 INSTRUCTIONS FOR CONTINUED AIRWORTHINESS Revision 1, (Pages 1-1, 1-2, 2-1, 3-8, 8-8, 8-9, 8-11, 8-12, Edition Jan.10,1987). Renumber existing page 8-9 to 8-10 manually.

LS6-a FLIGHT MANUAL Revision 1, (Pages 1-1, 1-2, 4-2, 4-12, 4-13, 7-1, Edition Jan.10,1987)

LS6-a INSTRUCTIONS FOR CONTINUED AIRWORTHINESS
No updating necessary (Edition Jan.10,1987)

WEIGHT AND BALANCE : Additional weight approximately 1.3 kg (2.87 lbs)
Check Maximum Cockpit Load according to Chapter 6 of Flight Manual. Variation of C.G. to be neglected.

REMARKS : Accomplishment by manufacturer or licensed repair station

Accomplishment of TB (LBA-AD 86-140/2) must be checked by Inspector, entered on page 8-1 of Instructions of Continued Airworthiness (TB-AD-Accomplishment List) and in logbook and signed by Inspector

LBA-approved :

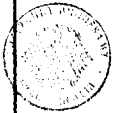



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11. Okt. 1987

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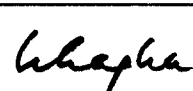
1.1 LOG OF REVISIONS

Revision No.	Pages affected	Description	LBA-approval signature	Date
1	1-1, 1-2, 4-2, 4-11, 4-12, 7-1	Hydraulic damper for aileron system (TB 6010/11, LBA-AD 86-140/2)	 	11 Feb. 1988

LS6 Manuals can be ordered from:
- Rolladen-Schneider Flugzeugbau GmbH
Mühlstrasse 10
D-6073 Egelsbach

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1-3	Nov.20,1985	8-1	Nov.20,1985
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2-3	Nov.20,1985	9-1	Nov.20,1985
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3-1	Nov.20,1985		
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4.2 DAILY INSPECTION continued

5. Tail unit

- Condition, damage or cracks
- Total energy port at upper end of vertical tail fin leading edge free from clogging
- Charged rear battery connected, if used
- Horizontal tail properly installed
- Horizontal tail for damage or pressure marks
- Tail control surfaces movement unobstructed and free from play

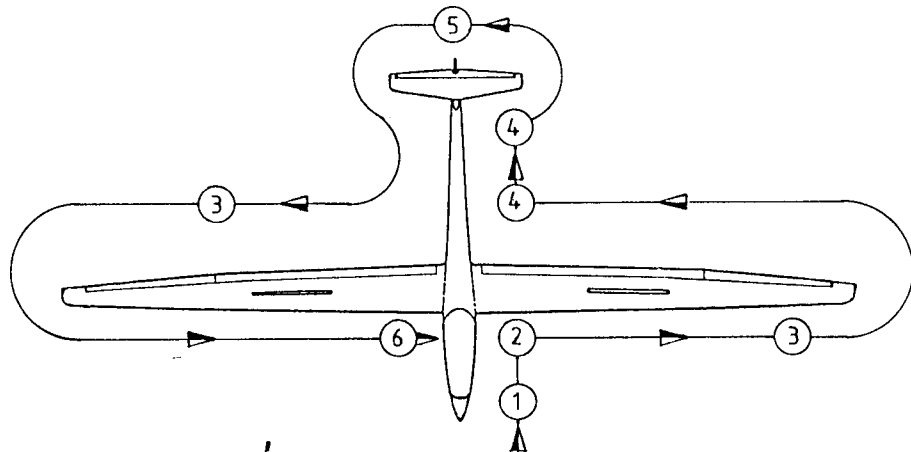
6. Cockpit

- Canopy cleaned, if required
 - Canopy locking and emergency release working properly (Be careful when testing emergency release, the canopy opening system lifts the canopy immediately. Use a helper for reinstallation)
 - Main pins properly secured

 - Secure connections of flaperon and air brake systems using LS-sleeve and colour marking (See page 4-3 for LS-sleeve)

 - Check proper securing of flaperon and air brake systems through baggage compartment rear door by trying to disconnect without opening LS-sleeves, use built in mirrors and colour marking at connectors as an additional visual aid to check positioning of LS-sleeve only
- WARNING:** If there is a bright gap between colour marking and securing sleeve in foremost position, control system is not connected properly
- Check proper function of hydraulic aileron system damper. The switchable aileron system damper is engaged and fully operative at flap positions -5 and 0 degrees, it is disengaged and inoperative at flap positions +5, +10 and +15 ("L") degrees. If aileron positions differ accidentally between disengaging and engaging, then additional short term control stick force (about 10 kg (22 lbs), maximum 20 kg (44 lbs)) is necessary to center the system.
 - Close baggage compartment rear door
 - Water ballast system tubes connected to wing stubs
 - Charged battery fixed in baggage compartment and connected

For assembly and disassembly procedures see Chapter 8



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4.17 SIDESLIP

Sideslip speed range: up to VA= 200 km/h (108 kts, 124 mph)

During sideslip rudder control force decreases to almost zero force.

For a straight and steady sideslip 100% rudder and between 50 to 75% aileron deflection are necessary.

Degradation in airspeed system goes down to zero airspeed indication. Depending on airspeed indicator, negative values may be indicated. (Fuselage nose pitot and forward fuselage side statics used).

4.18 LANDING

- extend landing gear in time (right hand gear handle)
- always extend landing gear, especially in case of an emergency outlanding. Only the sprung landing gear absorbs much landing impact energy.
- water ballast should normally be dumped prior to landing
- recommended minimum approach speed without water ballast and air brakes fully extended: 90 km/h (49 kts, 56 mph)
- air brakes allow control of glide angle within wide limits
- side slipping is not necessary to control glidepath. As extending of air brakes makes the LS6 nose heavy, side slipping with air brakes extended should be avoided, especially at low speeds and with forward C.G. positions, because of limited elevator effectiveness.
- the switchable aileron system damper is engaged and fully operative at flap positions -5 and 0 degrees, it is disengaged and inoperative at flap positions +5, +10 and +15 ("L") degrees. If aileron positions differ accidentally between disengaging and engaging, then additional short term control stick force (about 10 kg (22 lbs), maximum 20 kg (44 lbs)) is necessary to center the system.
- **WARNING: Landing in rain**
 - increase approach speed by at least 10 km/h (5 kts, 6 mph)
 - raindrops change airfoil and reduce performance

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4.19 HIGH ALTITUDE FLIGHTS

Increasing altitude yields higher true airspeed than indicated airspeed and this difference increases with increasing altitude.

This does not influence loads on the structure, which means that colour markings on airspeed indicator are valid unless limited by red lines.

However, as flutter depends on true airspeed, this should never be above 270 km/h IAS (146 kts, 168 mph) up to 2000 m (6500 ft) above MSL.

Using the table on page 2-1, maximum permissible airspeeds depending on altitude, the pilot is able to avoid flying faster than true airspeed of 270 km/h CAS (146 kts, 168 mph).

Example: Indicated airspeed of 219 km/h (118 kts, 136 mph) at 6000 m (19700 ft) altitude correspond to 270 km/h (146 kts, 168 mph) true airspeed.

Due to temperature decreasing with altitude, the viscosity of the aileron vibration damper fluid will increase, thus increasing aileron control forces.

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7.1 DESCRIPTION OF SYSTEMS

AIRFRAME

Fuselage structure is a pure fiberglass shell partly reinforced by stiffening frames, vertical tail fin structure is a fiberglass-foam sandwich. The cockpit portion is a double fiberglass shell.

Wing structure is a fiberglass-foam sandwich, a double-T section carbon fiber spar carrying the bending load.

Flaperon structure is a synthetic fiber-foam sandwich (Kevlar).

Horizontal tail structure is a carbon-foam sandwich, carrying all loads without a spar.

Elevator structure is a synthetic fiber-carbon fiber sandwich (Kevlar).

FLIGHT CONTROLS

Flaperon system activated via pushrods guided in longitudinal motion ball bearings. Connection of system by ball snap joints in fuselage, LS-securing sleeve on wing side pushrod. Mix control system of aileron and flaps inside the fuselage. Hydraulic damper for aileron system, either permanently operating or optionally switchable by flap operation. The switchable version is engaged and fully operative at flap positions -5 and 0 degrees, disengaged and inoperative at flap positions +5, +10 and +15 ("L") degrees.

Elevator system activated via pushrods guided in longitudinal motion ball bearings. Automatic coupling during assembly of horizontal tail unit. 100% mass balance in vertical tail fin pushrod. Longitudinal trim by adjustable spring system, trim wheel and trim position indicator at left side of cockpit.

Rudder system activated via steel cables guided in polyamid tubing, no closed control circuit. 100% mass balance at rudder.

INSTRUMENT PANEL

Panel lifting together with canopy. Depending on version allows for installation of up to 10 instruments including radio.

AIR BRAKES

Activated via pushrods guided partly in longitudinal motion ball bearings, partly in plain bearings. Connection of system by ball snap joints in fuselage, LS-securing sleeve on wing side pushrod. Upper surface double height air brakes with flexible cover blades.

LANDING GEAR

Landing gear is sprung and retractable, housed in a closed box, right hand operation. Tail skid or tail wheel optional.

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1.1 LOG OF REVISIONS

Revision No.	Pages affected	Description	LBA-approval signature	Date
1	1-1, 1-2, 2-1, 3-8, 8-8, 8-9, 8-11, 8-12	Hydraulic damper for aileron system (TB 6010/11, LBA-AD 86-140/2)	 <i>[Signature]</i>	1. Feb. 1988

For revisions of chapter 10, Airworthiness Limitations, see page 10-1.

LS6 Manuals can be ordered from:
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Mühlstrasse 10
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2.1 EXTRAORDINARY INSPECTIONS

Extraordinary inspections should be performed, depending on circumstances (rough landings, ground loops etc.)

1. Landing gear functioning, attachment and drive
2. Landing gear box for damage
3. Tail skid bonding or tail wheel attachment
4. Wings, fuselage and tail for damage (cracks, buckling, compression)
5. Wing's flex number (support fuselage in front of landing gear)
6. Control surfaces function and deflections
7. Tangential tubes across fuselage for straightness

2.2 ANNUAL INSPECTION

1. Lubricate various parts according to plan (Page 2-2)
2. Protect gelcoat with car polish (See also Flight Manual page 8-5, Cleaning and Care). This wax film protects gelcoat against embrittlement and cracking due to ultra violet light. If you use a polishing machine, be careful not to damage anti-collision colour marking or registration signs or sealing.
3. Check anti-friction tape at flaperon metal strip seal and at plastic strip seals. Damaged anti-friction tape will yield damage of gelcoat at control surface very quickly. For installation of sealing see pages 3-5 and 3-6. Remove residual adhesive using lead-free petrol, see also Flight Manual page 8-5, Cleaning and Care.
4. Check colour marking on ball snap joints of flaperon and air brake systems and replace if necessary. See also Flight Manual page 4-3.
5. Check landing gear folding strut for proper overcenter and rubber torsion elements for deformation or separation of rubber from metal. Adjustable overcenter should be 5 mm (0.2 in), landing gear without load, value increases with load. When adjustments are being made, check for identical overcenter at both folding struts and for locking of adjusters.
6. Check hydraulic aileron system damper for damping action and leakage, check mechanism for unobstructed movement and ease of operation. Leakage and resulting damper air can be recognized by an oily damper rod and jerky operation. If you suspect improper damper function contact manufacturer.
7. Perform Annual Inspection according to checklist, chapter 8. The annual inspection checklist contains items (flaperon lateral bearing play, flaperon vent holes), which may only be checked after removing seals. Unless changes are suspected (for instance lateral control surface gaps differing from design values, see also page 4-2), 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.
8. When equipment has been altered compared to valid equipment list, file new equipment list and redetermine C.G. (See Flight Manual chapter 6). With equipment unaltered, C.G. should be redetermined every four years. Appropriate forms see chapter 7.

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3.6 CONTROL SURFACES PLAY AND FRICTION

	Play at inner rear edge	Friction
Aileron	maximum 2.8 mm <0.110 in>	Damper not in operation (TB 6011 only) around 300 grams <0.661 lbs> Damper operating around 600 grams <1.323 lbs>
Elevator	maximum 2.4 mm <0.095 in>	maximum 50 grams <0.110 lbs>
Rudder	not applicable	around 500 grams <1.102 lbs>

Measuring Technique for rear edge play:

Play should be measured with control stick fixed to zero position

Measuring Technique for friction:

Friction should be measured 30 mm <1.2 in> from top end of control stick for elevator and aileron. Values include seals.

Rudder friction should be measured at lower rudder edge.

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SERIAL-No.: _____ Reg.Signs: _____

CONTROL SURFACE DEFLECTIONS

Check control surface deflections annually

Date: _____

AILERON DEFLECTIONS, flap position +10°, measure at inner edge

	Limit (<°>)	Actual (<°>)	Radius mm/in	Limit mm/in	Actual mm/in
LEFT up	13° to 15°				
down	13° to 15°				
RIGHT up	13° to 15°				
down	13° to 15°				

ELEVATOR Measure at outer edge, Radius _____ mm/in

	Limit (<°>)	Actual (<°>)	Limit mm/in	Actual mm/in
up	28° to 30°			
down	22° to 24°			

RUDDER Measure at lower edge, Radius _____ mm/in

	Limit (<°>)	Actual (<°>)	Limit mm/in	Actual mm/in
left	26° to 30°			
right	26° to 30°			

FLAP POSITIONS Radius Left/Right _____ / _____ mm/in, as ailerons

	Limit (<°>)	Actual average (<°>)	Limit mm/in	Actual mm/in
"L"	13° to 15°			
10°	8° to 10°			
5°	3° to 5°			
0°	0° to -2°			
-5°	-3° to -5°			

AIR BRAKES, flap position 0°

Limit 100 to 110 mm average <3.397 to 4.331 in> Actual _____ mm/in

Cross invalid dimensions!

(Stamp) (Signature of Inspector)

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SERIAL-No.: _____ Reg.Signs: _____ CONTROL SURFACE FRICTION/PLAY
Check control surface friction/play annually Date: _____

CONTROL SYSTEM FRICTION

	Limit <grams/lbs>	Actual <g/lbs>	Point of measurement	
Elevator	maximum 50/0.110		30mm/1.2in below stick end	
Aileron	approx.300/0.661		30mm/1.2in below stick end	Damper off
	approx.600/1.322		30mm/1.2in below stick end	Damper on
Rudder	approx.500/1.102		at lower rudder edge	

CONTROL SURFACES REAR EDGE PLAY

Fix control stick at neutral position of control surface

Aileron maximum of 2.8 mm/0.110 in left: _____ mm/in
right: _____ mm/in
Elevator maximum of 2.4 mm/0.095 in _____ mm/in

Cross invalid dimensions!

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SERIAL-No.: _____ Reg.Signs: _____ ANNUAL INSPECTION CHECKLIST 1

Mark as follows: 0 not existing + no faults
/ defective, specify separately

Inspection date: _____

WING UNIT

- () Serial No. _____
- () Finish
- () Spar
- () Root ribs
- () Root rib pins
- () Water tanks
- () Drain holes
- () Flaperons
- () Air brakes
- () Connecting means

- () Flaperon drives
 - () fixed bearing's washer
 - () bearings
 - () lateral bearing play
 - () internal sealing
 - () metal strip sealing
 - () anti-friction tape
 - () stops
 - () ball heads
 - () LS-sleeves
 - () ventilation
- () Flaperon-wing lateral gaps
- () Cracks
- () Compression or buckling
- ()
- () Air brake bearings
 - () cover springing
 - () ball heads
 - () LS-sleeves
- () Main pins

- () Plastic strip gap seal
- () Anti-friction tape

FUSELAGE

- () Serial No. _____
- () Finish
- () Shell
- () Vertical tail fin sandwich
- () Cracks in structure
- () Drain holes
- () Rudder mounting
- () Stabilizer mounting
- () Bushes for wing root pins
- () Tangential tubes
- () Cockpit
- () Seat
- () under seat
- () Control stick
- () Elevator drive under seat
- () Aileron drive under seat
- () Flap drive under seat
- () Landing gear drive under seat
- () Flaperon ball snap joint couplings
- () Air brake ball snap joint couplings
- () Trim wheel and system
- () Trim wheel ratchet
- () Pedals
- () Pedal adjustment
- () Rudder cables
- () Earth connections
- () Water ballast system
- () Air brake system
- () Aileron-flap mixing system
- () Hydraulic damper function
 - () oiltightness
 - () ratchet mechanism
- () Backrest adjustment at both ends
- () Connecting means

HORIZONTAL TAIL UNIT

- () Serial No. _____
- () Finish
- () Sandwich shell
- () Stabilizer ventilation
- () Elevator ventilation
- () Elevator drive
- () Bearings
- () Connection to fuselage
- () Connecting means

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SERIAL-No.: _____ Reg.Signs: _____

ANNUAL INSPECTION CHECKLIST 2

Inspection date: _____

CANOPY

- Locking mechanism
- Emergency release
- Ventilation system
- Window

- Compass deviation list
- Seat belt harness
- Weight and balance plan
- Data placard
- Cockpit placards
- Baggage compartment cover
- Colour marking at ball snap joints

RUDDER

- Finish
- Shell
- Ventilation
- Drive
- Fixed bearing's washer
- Bearings
- Connecting means

ADJUSTMENTS

- Wings and horizontal tail
- Play at root ribs
- Zero setting of control surfaces
- Control surface deflections
- Air brake extension
- Wheel brake
- Trim control operation
- Trim wheel locking and indicator
- C.G. release / automatic release
- Water ballast discharge

LANDING GEAR

- Undercarriage and axle
- Tyre
- Springing
- Drive rod pneumatic spring
- Preset load at folding strut
- Doors
- Bearings and joints
- Connecting means
- Locking
- Overcenter
- Wheel brake system
- C.G.release fitting and drive

GENERAL

- Checklist
- Fireproof type placard
- Minimum Cockpit Load placard
- Registration signs
- Nationality marks
- Anti-collision marking
- Logbook
- Flight Manual
- Instr.f.Continued Airworthiness
- Airworthiness Directives
- Inspection for foreign matter
- Logbook notation
- Flight Manual notation page 9-1
- Min.Cockpit Load placard notation
- Weight and Balance plan notation
- Updating of TB-AD-List in Instr.f.
Cont. Airworthiness
- Control system friction, Form 8-9
- Control surfaces rear edge play
- Measurement of control surface
weight and rear edge weight, 8-8

EQUIPMENT

- Minimum instrumentation
- Additional instrumentation
- Operating range
- Limit marks
- Vacuum flasks
- Function of instrumentation
- Tubing
- Total energy unit
- Pitot system free of leaks
- Static system free of leaks
- T.E. system free of leaks
- Electrical wiring
- Battery and fitting
- Radio
- Antenna system
- Communication check

(Stamp) (Signature of Inspector)


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1.1 LOG OF REVISIONS

Revision No.	Pages affected	Description	LBA-approval signature	Date
1	1-1, 1-2, 4-2, 4-12, 4-13, 7-1	Hydraulic damper for aileron system (TB 6010/11, LBA-AD 86-140/2)	 <i>[Signature]</i>	11. FEB. 1988

LS6-a Manuals can be ordered from:
 Rolladen-Schneider Flugzeugbau GmbH
 Mühlstrasse 10
 D-6073 Egelsbach

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1.2 PAGES INCLUDED

Cover		7-1	Jan.10,1987	
1-1	Jan.10,1987	7-2	Oct.7,1986	
1-2	Jan.10,1987			
1-3	Oct.7,1986	8-1	Oct.7,1986	
1-4	Oct.7,1986	8-2	Oct.7,1986	
1-5	Oct.7,1986	8-3	Oct.7,1986	
1-6	Oct.7,1986	8-4	Oct.7,1986	
1-7	Oct.7,1986	8-5	Oct.7,1986	
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		8-7	Oct.7,1986	
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6-1	Oct.7,1986			
6-2	Oct.7,1986			
6-3	Oct.7,1986			
6-4	Oct.7,1986			
6-5	Oct.7,1986			
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6-7	Oct.7,1986			
6-8	Oct.7,1986			

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4.2 DAILY INSPECTION continued

5. Tail unit

- Condition, damage or cracks
- Total energy port at upper end of vertical tail fin leading edge free from clogging
- Horizontal tail properly installed
- Horizontal tail for damage or pressure marks
- Tail control surfaces movement unobstructed and free from play

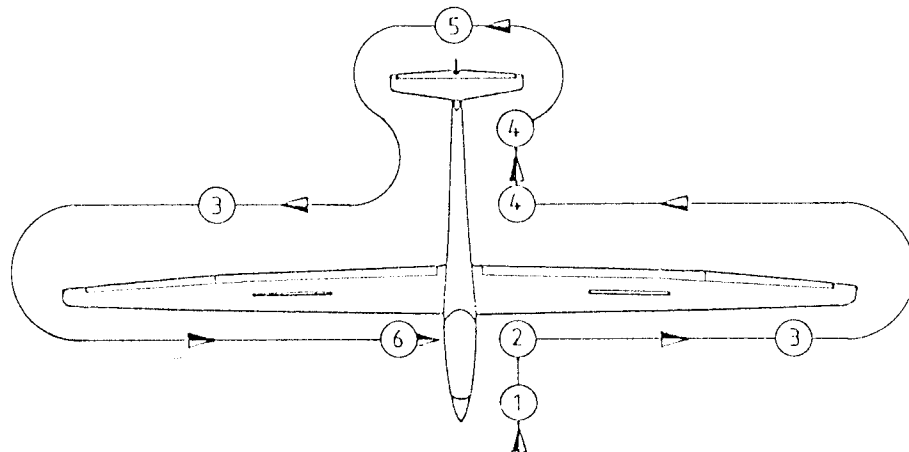
6. Cockpit

- Canopy cleaned, if required
- Canopy locking and emergency release working properly (Be careful when testing emergency release, the canopy opening system lifts the canopy immediately. Use a helper for reinstallation)
- Main pins properly secured
- Secure connections of flaperon and air brake systems using LS-sleeve and colour marking (See page 4-3 for LS-sleeve)
- Check proper securing of flaperon and air brake systems through baggage compartment rear door by trying to disconnect without opening LS-sleeves, use built in mirrors and colour marking at connectors as an additional visual aid to check positioning of LS-sleeve only

WARNING: If there is a bright gap between colour marking and securing sleeve in foremost position, control system is not connected properly

- Check proper function of hydraulic aileron system damper. The switchable aileron system damper is engaged and fully operative at flap positions -5 and 0 degrees, it is disengaged and inoperative at flap positions +5, +10 and +15 ("L") degrees. If aileron positions differ accidentally between disengaging and engaging, then additional short term control stick force (about 10 kg (22 lbs), maximum 20 kg (44 lbs)) is necessary to center the system.
- Close baggage compartment rear door
- Water ballast system tubes connected to wing stubs
- Charged battery fixed in baggage compartment and connected
- Check thermometer near landing gear handle

For assembly and disassembly procedures see Chapter 8



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4.17 SIDESLIP

Sideslip speed range: up to VA= 200 km/h (108 kts, 124 mph)

During sideslip rudder control force decreases to almost zero force.

For a straight and steady sideslip 100% rudder and between 50 to 75% aileron deflection are necessary.

Degradation in airspeed system goes down to zero airspeed indication. Depending on airspeed indicator, negative values may be indicated. (Fuselage nose pitot and forward fuselage side statics used).

4.18 LANDING

- extend landing gear in time (right hand gear handle)
- always extend landing gear, especially in case of an emergency outlanding. Only the sprung landing gear absorbs much landing impact energy.
- water ballast should normally be dumped prior to landing
- recommended minimum approach speed without water ballast and air brakes fully extended: 90 km/h (49 kts, 56 mph)
- air brakes allow control of glide angle within wide limits
- side slipping is not necessary to control glidepath.
As extending of air brakes makes the LS6-a nose heavy, side slipping with air brakes extended should be avoided, especially at low speeds and with forward C.G. positions, because of limited elevator effectiveness.
- the switchable aileron system damper is engaged and fully operative at flap positions -5 and 0 degrees, it is disengaged and inoperative at flap positions +5, +10 and +15 ("L") degrees. If aileron positions differ accidentally between disengaging and engaging, then additional short term control stick force (about 10 kg (22 lbs), maximum 20 kg (44 lbs)) is necessary to center the system.
- **WARNING: Landing in rain**
 - increase approach speed by at least 10 km/h (5 kts, 6 mph)
 - raindrops change airfoil and reduce performance

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4.19 HIGH ALTITUDE FLIGHTS

Increasing altitude yields higher true airspeed than indicated airspeed and this difference increases with increasing altitude.

This does not influence loads on the structure, which means that colour markings on airspeed indicator are valid unless limited by red lines.

However, as flutter depends on true airspeed, this should never be above 270 km/h IAS (146 kts, 168 mph) up to 2000 m (6500 ft) above MSL.

Using the table on page 2-1, maximum permissible airspeeds depending on altitude, the pilot is able to avoid flying faster than true airspeed of 270 km/h CAS (146 kts, 168 mph).

Example: Indicated airspeed of 219 km/h (118 kts, 136 mph) at 6000 m (19700 ft) altitude correspond to 270 km/h (146 kts, 168 mph) true airspeed.

Due to temperature decreasing with altitude, the viscosity of the aileron vibration damper fluid will increase, thus increasing aileron control forces.

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7.1 DESCRIPTION OF SYSTEMS

AIRFRAME

Fuselage structure is a pure fiberglass shell partly reinforced by stiffening frames, vertical tail fin structure is a fiberglass-foam sandwich. The cockpit portion is a double fiberglass shell.

Wing structure is a fiberglass-foam sandwich, a double-T section carbon fiber spar carrying the bending load.

Flaperon structure is a synthetic fiber-foam sandwich (Kevlar).

Horizontal tail structure is a carbon-foam sandwich, carrying all loads without a spar.

Elevator structure is a synthetic fiber-carbon fiber sandwich (Kevlar).

FLIGHT CONTROLS

Flaperon system activated via pushrods guided in longitudinal motion ball bearings. Connection of system by ball snap joints in fuselage, LS-securing sleeve on wing side pushrod. Mix control system of aileron and flaps inside the fuselage. Hydraulic damper for aileron system, either permanently operating or optionally switchable by flap operation. The switchable version is engaged and fully operative at flap positions -5 and 0 degrees, disengaged and inoperative at flap positions +5, +10 and +15 ("L") degrees.

Elevator system activated via pushrods guided in longitudinal motion ball bearings. Automatic coupling during assembly of horizontal tail unit. 100% mass balance in vertical tail fin pushrod. Longitudinal trim by adjustable spring system, trim wheel and trim position indicator at left side of cockpit.

Rudder system activated via steel cables guided in polyamid tubing, no closed control circuit. 100% mass balance at rudder.

INSTRUMENT PANEL

Panel lifting together with canopy. Depending on version allows for installation of up to 10 instruments including radio.

AIR BRAKES

Activated via pushrods guided partly in longitudinal motion ball bearings, partly in plain bearings. Connection of system by ball snap joints in fuselage, LS-securing sleeve on wing side pushrod. Upper surface double height air brakes with flexible cover blades.

LANDING GEAR

Landing gear is sprung and retractable, housed in a closed box, right hand operation. Tail skid or tail wheel optional.

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