

ROLLADEN-SCHNEIDER Flugzeugbau GmbH LBA-Nr. EB - 4	MAINTENANCE MANUAL	LS7-WL	

Title for USA: Instructions for Continued Airworthiness

MAINTENANCE MANUAL FOR THE LS7-WL SAILPLANE

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The translation of this Manual from German has received our most careful attention. However, in any case of doubt or ambiguity, the original German language text must be considered authoritative.

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Technical Bulletins (TB) and Airworthiness Directives (AD) must be entered at end of Instructions for Continued Airworthiness Manual.

Accomplishment of TB and AD should be entered into list page 8-1 and signed by inspector.

DESCRIPTION OF SYSTEMS

AILERON CONTROLS

Aileron system activated via pushrods guided in longitudinal motion ball bearings. Connection of system by automatic coupling during rigging (Hänle system). Ailerons partly mass balanced.

ELEVATOR CONTROLS

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.

RUDDER CONTROLS

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

WHEEL BRAKE

Feet operated, activated by bowden cable from rudder pedals.

AIR BRAKES

Activated via pushrods guided partly in longitudinal motion ball bearings. Automatic connection of system during rigging (Hänle system). Upper surface double height air brakes with flexible cover blades. Friction damper in box to prevent oscillations during extension.

WATER BALLAST SYSTEM

One tank per wing, maximum capacity per wing 75 Liters (19.8 US gallons, 16.5 Imp. gallons), optionally 50 Liter tanks (13.2 US gal., 11.0 Imp. gal.) are available. Valves at wing root, loading and dumping orifice on under side of wings near root. Automatic connection during rigging. In the vertical tail fin either battery receptacle or ballast tank allowing to compensate C.G. movement due to wing water ballast, maximum capacity 5.5 Liters (1.45 US gallons, 1.21 Imp. gallons). When the tail fin tank is combined with a battery receptacle, the maximum capacity is 4.1 Liters (1.08 US gal., 0.9 Imp.gal.)

COCKPIT

Double fiberglass shell. Controls for airbrakes, longitudinal trim (acting as trim position indicator also) located on left cockpit side, trim locking lever at control stick. Control for tow cable release on left cockpit frame (operating C.G. hook and optional nose hook), for pedal adjustment on seat, for ventilation on instrument panel cover, for landing gear and water ballast valve 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 release).

CANOPY

One piece hinged up front with instrument panel. A spring loaded peg at the canopy frame rear edge acts as temporary hinge for clean separation from the fuselage during emergency jettison. Optional camera mounts may be bonded to canopy frame.

INSTRUMENT PANEL

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

BAGGAGE COMPARTMENT

Baggage compartment behind pilot's shoulders is for light and soft materials only. Permanent installation of batteries or other equipment possible.

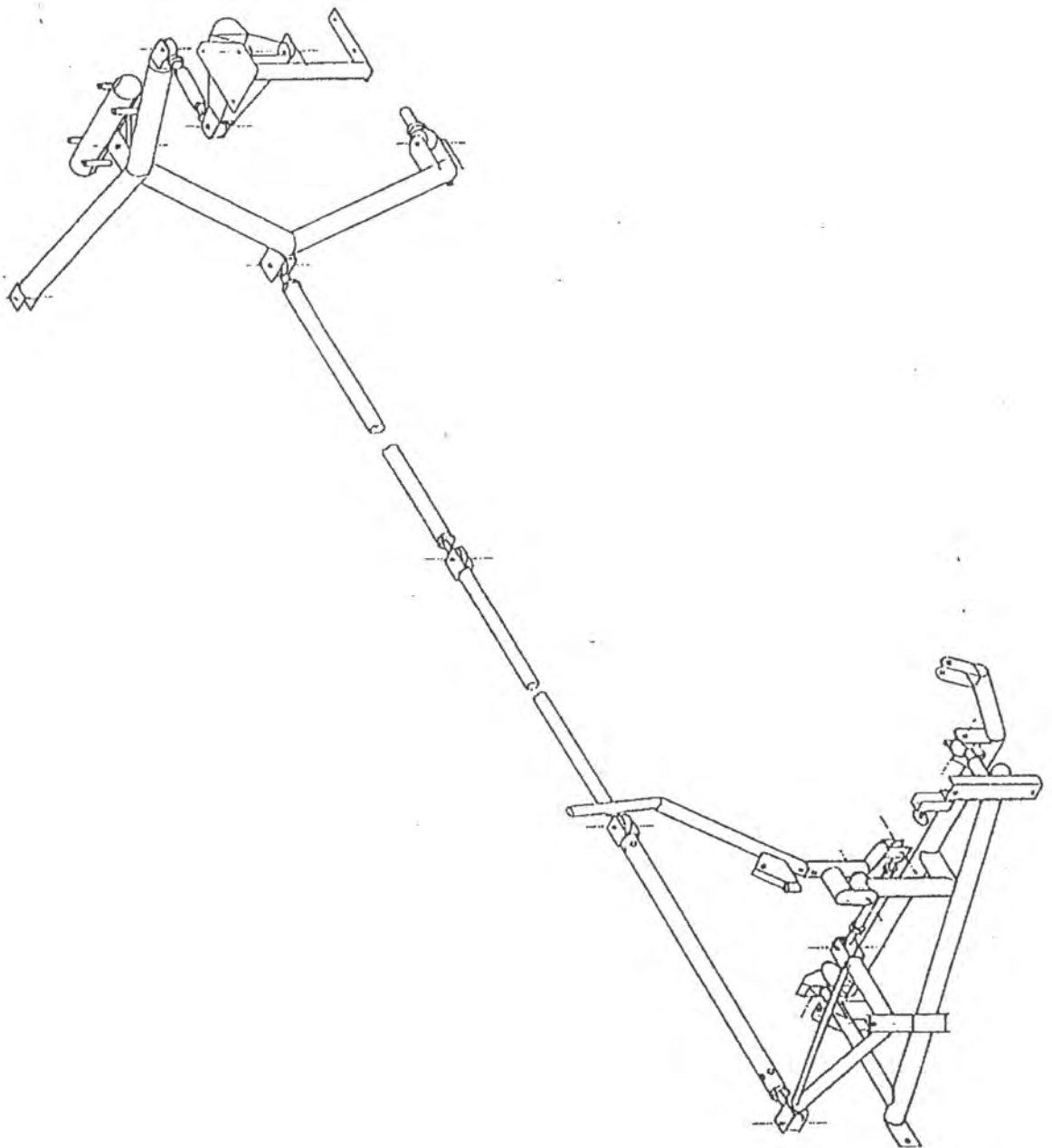
OXYGEN SYSTEM

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

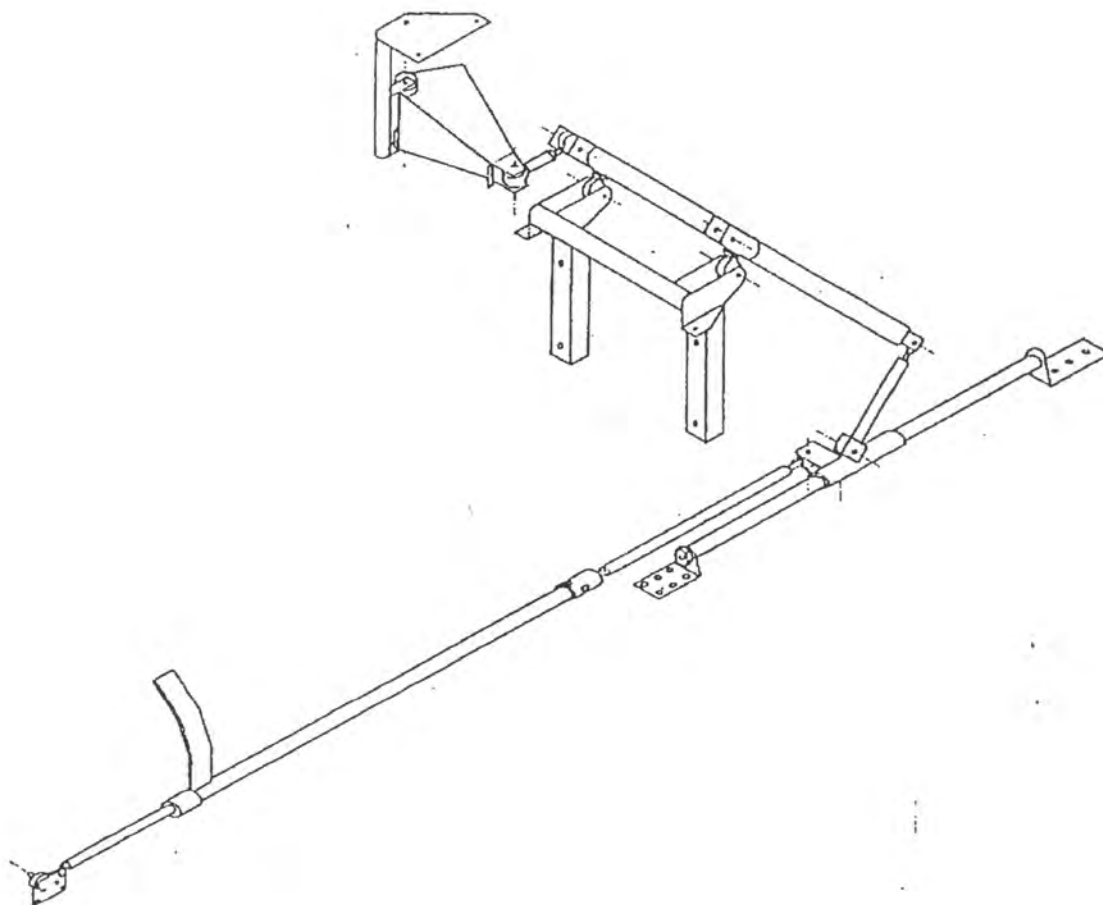
LANDING GEAR

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

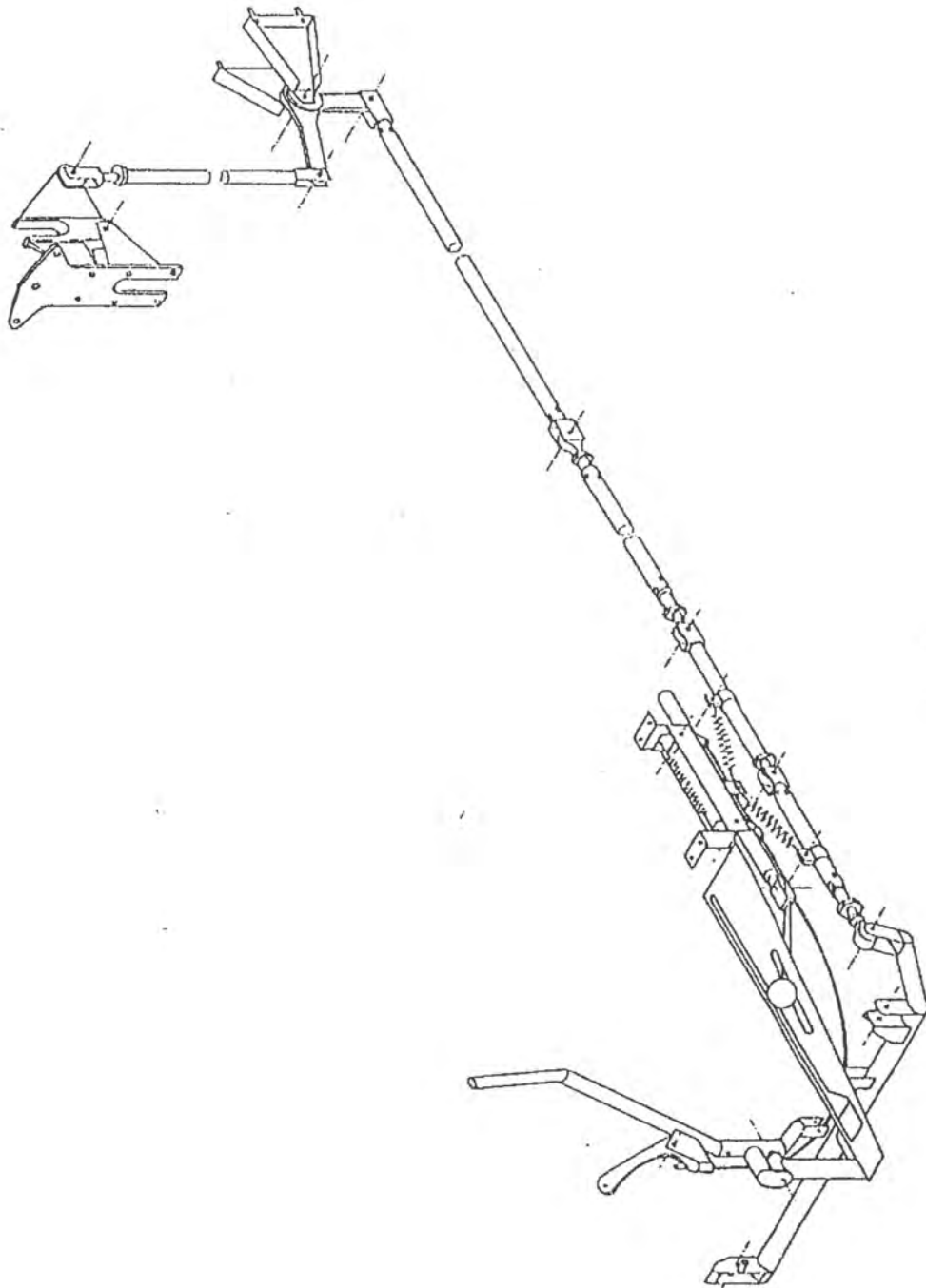
AILERON SYSTEM (Fuselage)



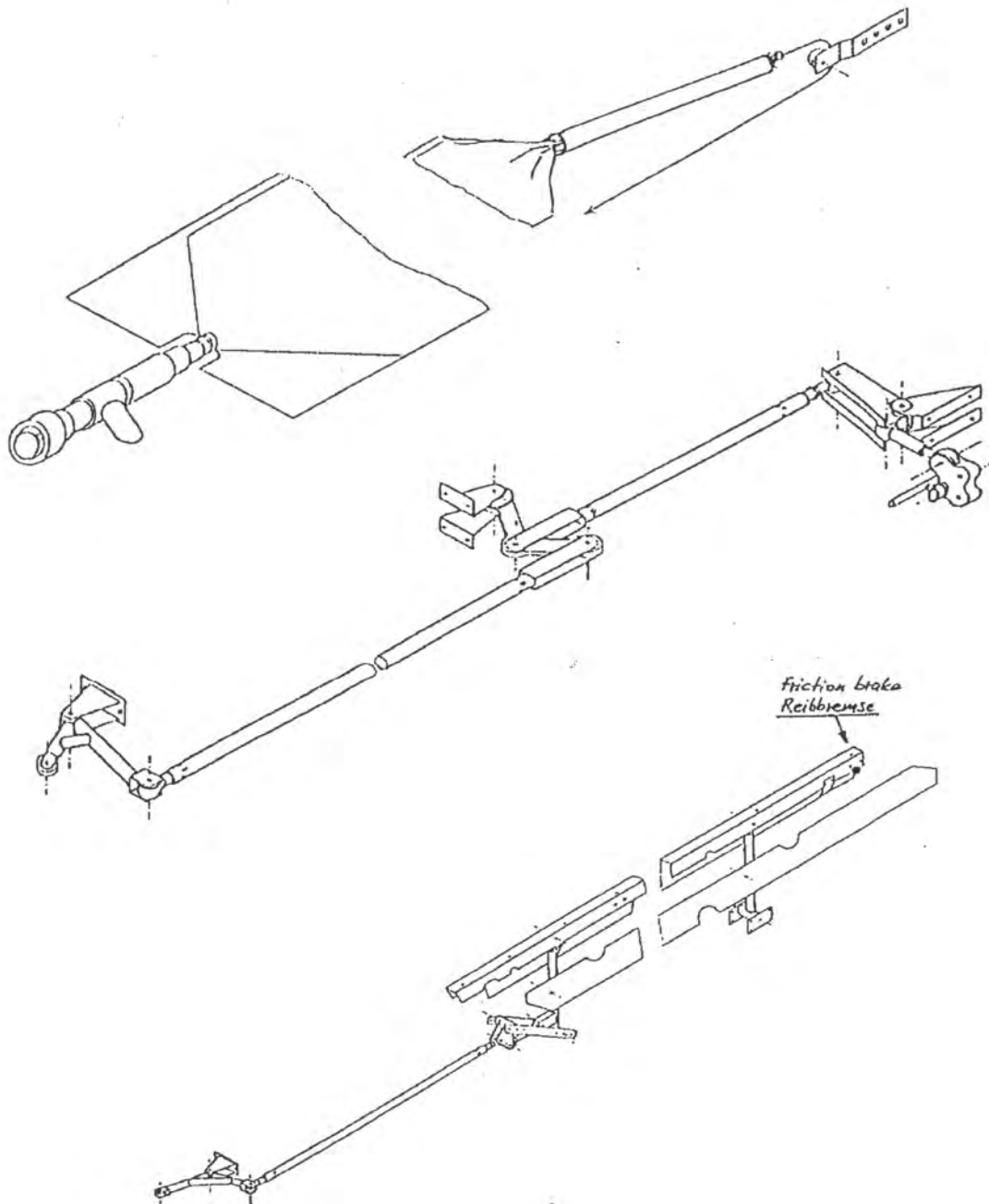
AIR BRAKE SYSTEM (Fuselage)



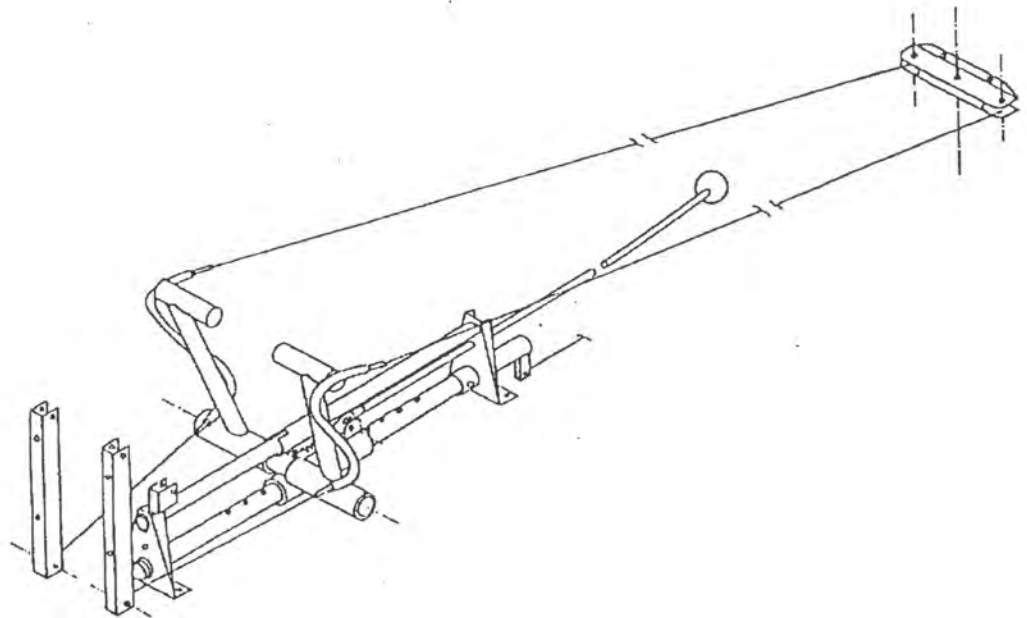
ELEVATOR SYSTEM



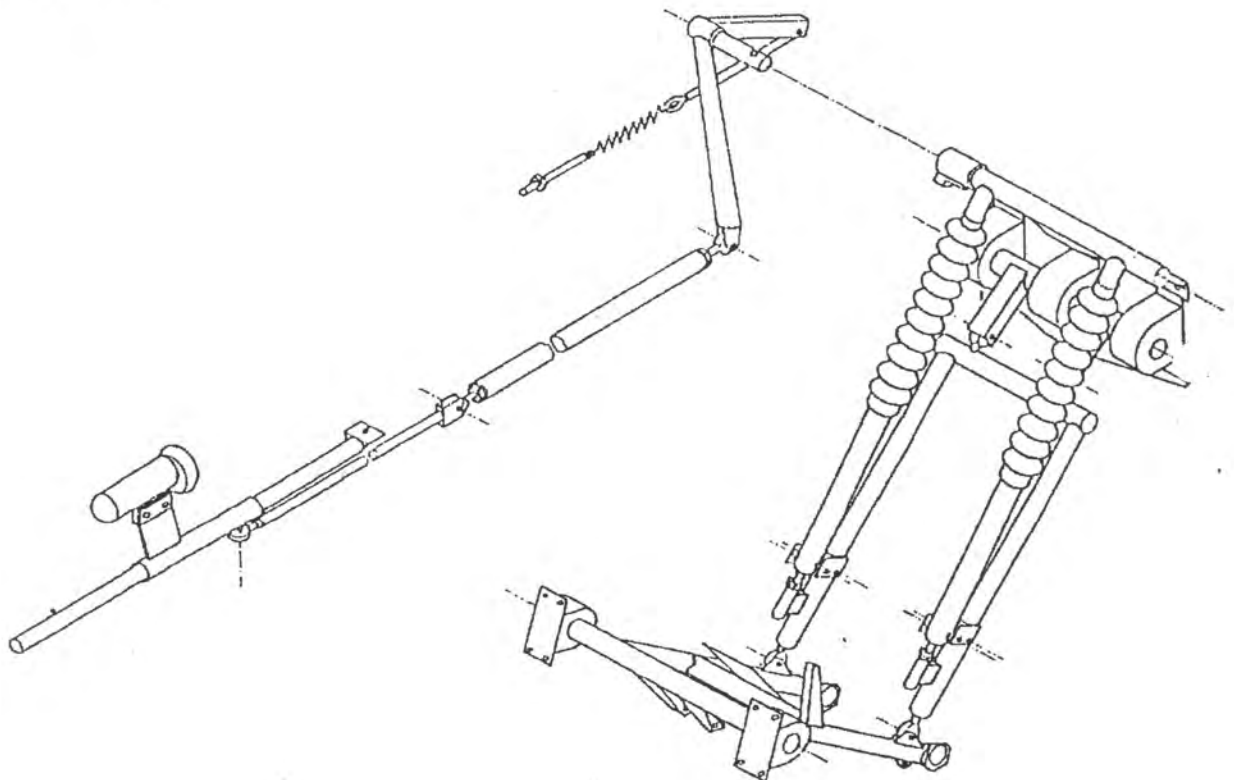
WING CONTROL SYSTEMS AND WATER BALLAST SYSTEM



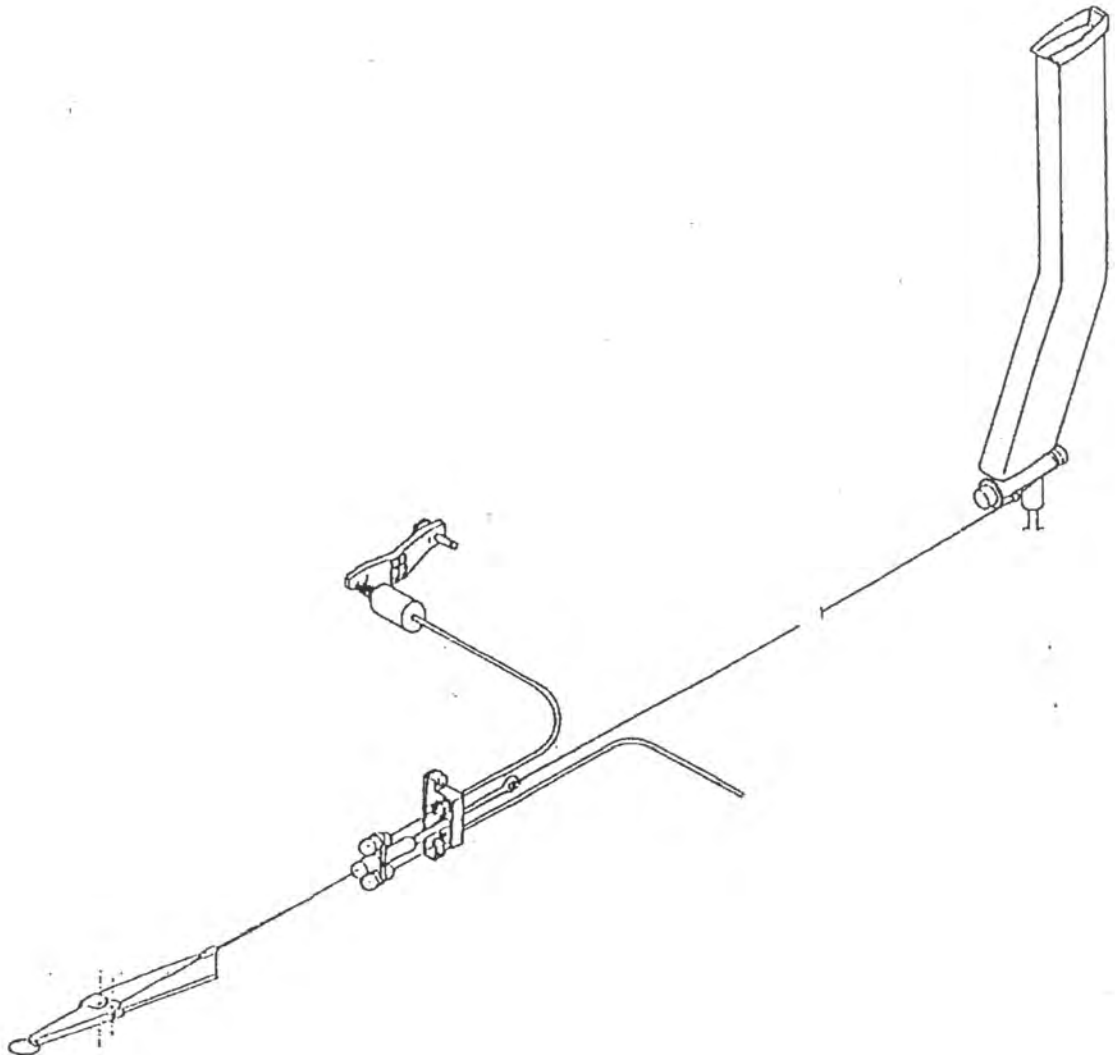
RUDDER CONTROL SYSTEM



LANDING GEAR SYSTEM



WATER BALLAST SYSTEM Fuselage



2.1 INTRODUCTION

This section describes the procedures for establishing the basic empty mass and C.G. position of the sailplane, procedures for determining permissible Cockpit Loading and approved mass limitations.

Complying with these procedures, the pilot is able to load the sailplane properly without any additional calculations due to loading limits placarded in the cockpit and provided in the Flight Manual page 6-2.

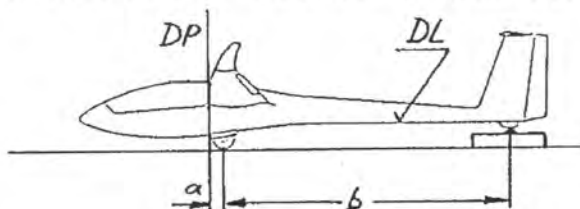
A comprehensive list of all equipment available for this sailplane is included in chapter 12.

2.2 WEIGHING PROCEDURE

DATUM LINE (DL): Under side of fuselage boom placed horizontal

DATUM POINT (DP): Leading edge of wing at root

1. Determine total weight by weighing all parts and adding together. For inflight C.G. position, the pilot's weight must be added too.
2. Assemble sailplane. For inflight C.G., the pilot must be seated in the sailplane.
3. Raise tail on weighing machine until datum line is level using wooden blocks or adjustable jack. (Check with leveling gauge)
4. Measure 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 3) to get net tail weight.
7. Calculate C.G. position for full vertical tail fin tank:

$$X_{cg} = \frac{(\text{net tail weight} + \text{tail fin water weight}) * b}{\text{empty weight} + \text{tail fin water weight}} + a$$

Calculate empty weight C.G. position for empty vertical tail fin tank:

$$X_{cg} = \frac{\text{net tail weight} * b}{\text{empty weight}} + a$$

8. When a battery is fitted in the vertical tail fin, weighing must be done in this configuration. Weigh tail fin battery separately. (Maximum 2.6 kg (5.7 lbs)).
9. Calculate loading limits according to page 2-2.

Form for Weighing Report see Maintenance Manual, page 14-4

2.3 CALCULATION OF LOADING LIMITS

1. Determine Minimum Cockpit Load for full and empty tail fin ballast tank following procedure given on page 2-1 from Table "Empty Weight C.G. Position", page 2-6 <kg/mm> or 2-7 <in/lbs>. When being used in a club, Minimum Cockpit Load should be 70 kg (154 lbs) for empty or non-existent tail fin tank. If it is higher, permanent ballast may be fitted under the forward seat portion, see page 11-1.

Finally, resulting Minimum Cockpit Load for full tail fin tank should be entered in the following places:

- 1) in weighing report of inspection
 - 2) in Flight Manual page 6-2 in full tail fin tank column
 - 3) under instrument panel cover
 - 4) on Data Placard in cockpit
2. For existing tail fin tank, enter Minimum Cockpit Load for empty tail fin tank into Flight Manual page 6-2, column tail fin tank empty.
 3. Maximum approved Weight of Non-lifting Parts may vary between 235 kg and 249 kg <518 lbs to 549 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 on page 2-4 and 2-5. See also examples on page 2-3. Maximum Weight of Non-lifting Parts should be entered into Weighing Report.
 4. Determine Maximum approved Cockpit Load from table "Empty Weight C.G. Position", pages 2-8 or 2-9. Maximum Cockpit Load normally should be 110 kg <242 lbs>, as given in empty weight C.G. table, when being used in a club. The range may be shifted to heavy pilots (for example 80-120 kg, <176-265 lbs>) or to light pilots (for example 60-100 kg <132-220 lbs>) by installation of permanent trim ballast. It may be lower due to trim conditions, excessive equipment or repairs. Calculate Maximum Cockpit Load on weighing report, see also examples on page 2-3. Resulting Maximum Cockpit Load should be entered in the following places:
 - 1) in weighing report of inspection
 - 2) in Flight Manual, page 6-2
 - 3) on Data Placard in cockpit
 5. Empty weight (perhaps increased by weight of permanently fitted trim ballast) should be entered in the following places:
 - 1) in weighing report of inspection
 - 2) in Flight Manual, page 6-2 for calculation of maximum permissible water ballast weight
 6. Battery position during weighing should be entered in the following places:
 - 1) in equipment list and weighing report of inspection
 - 2) on Data Placard in cockpit
 - 3) in Flight Manual, page 6-2, if fitted in tail fin

For permanent installation of trim ballast weights see page 11-1.

2.3 CALCULATION OF LOADING LIMITS continued

EXAMPLE for calculation of loading limits:

See also Maintenance Manual page 14-4, form Weighing Report

Maximum all-up weight 486 kg (1071 lbs)

	Example 1	Example 2	Example 3
1) Minimum Cockpit Load			
For empty weight of	244 kg/538 lbs	244 kg/538 lbs	250 kg/551 lbs
and empty weight C.G. position	677 mm/26.65 in	659 mm/25.94 in	618 mm/24.33 in
the Minimum Cockpit Load according to table pages 2-6/7 is	75 kg/165 lbs	70 kg/154 lbs	60 kg/132 lbs
Limit value greater	..679mm/26.73in	..661mm/26.02in	..620mm/24.41in
than calculated value	677 mm/26.65 in	659 mm/25.94 in	618 mm/24.33 in
2) Maximum Weight of Non-lifting Parts			
Maximum weight of non-lifting parts at empty weight of	244 kg/538 lbs	244 kg/538 lbs	250 kg/551 lbs
and empty weight C.G. position	677 mm/26.65 in	659 mm/25.94 in	618 mm/24.33 in
is according to table pages 2-4/5	241 kg/531 lbs	239 kg/527 lbs	238 kg/525 lbs
3) Maximum permissible Cockpit Load			
For empty weight of	244 kg/538 lbs	244 kg/538 lbs	250 kg/551 lbs
and empty weight C.G. position	677 mm/26.65 in	659 mm/25.94 in	618 mm/24.33 in
maximum permissible cockpit load is according to table pages 2-8/9	120 kg/265 lbs	110 kg/242 lbs	100 kg/220 lbs
Limit value smaller	..675mm/25.57in	..646mm/25.43in	..606mm/23.86in
than calculated value	677 mm/26.65 in	659 mm/25.94 in	618 mm/24.33 in
4) Limitation of maximum permissible Cockpit Load			
FUSELAGE with complete equipment, battery, canopy and main pins	119.9 kg/264lbs	119.9 kg/264lbs	124.9 kg/275 lbs
HORIZONTAL TAIL UNIT	6.3 kg/ 14lbs	6.3 kg/ 14lbs	6.3 kg/ 14 lbs
COCKPIT LOAD (Maximum 120kg/265lbs)	114 kg/251lbs	110 kg/242lbs	100 kg/220 lbs
Weight of Non-lifting Parts	236.2 kg/521lbs	236.2 kg/521lbs	231.2 kg/510 lbs
MAXIMUM COCKPIT LOAD			
(Max. 120 kg/ 265 lbs)	114 kg/251lbs	110 kg/242lbs	100 kg/220 lbs

At example 1 maximum cockpit load is limited by maximum weight of non-lifting parts.

Example 2 results from equipment being shifted forward: Cockpit load range 70-110 kg (154-242 lbs), limitation of maximum cockpit load by C.G. table (with a heavier pilot, the forward inflight C.G. limit would be exceeded).

Installation of further equipment at the forward fuselage (for example: nose hook system and instrumentation) results in example 3: Cockpit load range 60-100 kg (132-220 lbs).

2.4 CALCULATION OF MAXIMUM WEIGHT OF NON-LIFTING PARTS

Maximum weight of non-lifting parts of 249 kg (549 lbs) must be reduced in relation to empty weight and empty weight C.G. position according to table below. (For lbs / inch values see following page)

Example: For empty weight C.G. position of 649 mm (25.55 in) and empty weight of 249 kg (549 lbs) the permissible weight of non-lifting parts is 240 kg (529 lbs).

Empty Weight G (kg) from-to	Empty weight C.G. Position Xs (mm)										
	from 540	from 560	from 580	from 600	from 620	from 640	from 660	from 680	from 700	from 720	from 740
	to 559	to 579	to 599	to 619	to 639	to 659	to 679	to 699	to 719	to 739	to 759
230-231	235	235	235	236	237	238	239	240	241	242	243
231-232	235	235	235	236	237	238	239	240	241	242	244
232-233	235	235	235	236	237	238	239	240	242	243	244
233-234	235	235	235	236	237	238	239	241	242	243	244
234-235	235	235	235	236	237	238	240	241	242	243	244
235-236	235	235	235	236	237	238	240	241	242	243	244
236-237	235	235	235	236	238	239	240	241	242	243	244
237-239	235	235	235	236	238	239	240	241	242	243	244
238-239	235	235	235	237	238	239	240	241	242	243	245
239-240	235	235	235	237	238	239	240	241	242	244	245
240-241	235	235	236	237	238	239	240	241	242	244	245
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244-245	235	235	236	237	238	239	241	242	243	244	245
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247-248	235	235	236	237	239	240	241	242	243	245	246
248-249	235	235	236	238	239	240	241	242	243	245	246
249-250	235	235	236	238	239	240	241	242	244	245	246
250-251	235	235	237	238	239	240	241	243	244	245	246
251-252	235	235	237	238	239	240	241	243	244	245	246
252-253	235	235	237	238	239	240	242	243	244	245	246
253-254	235	236	237	238	239	240	242	243	244	245	247
254-255	235	236	237	238	239	241	242	243	244	245	247
255-256	235	236	237	238	239	241	242	243	244	246	247
256-257	235	236	237	238	240	241	242	243	244	246	247
257-258	235	236	237	238	240	241	242	243	245	246	247
258-259	235	236	237	239	240	241	242	243	245	246	247
259-260	235	236	237	239	240	241	242	244	245	246	247
260-261	235	236	237	239	240	241	242	244	245	246	247
261-262	235	236	238	239	240	241	243	244	245	246	248
262-263	235	236	238	239	240	241	243	244	245	246	248
263-264	235	236	238	239	240	242	243	244	245	247	248
264-265	235	237	238	239	240	242	243	244	245	247	248
265-266	235	237	238	239	240	242	243	244	246	247	248
266-267	235	237	238	239	241	242	243	244	246	247	248
267-268	236	237	238	239	241	242	243	245	246	247	248
268-269	236	237	238	239	241	242	243	245	246	247	249
269-270	236	237	238	240	241	242	243	245	246	247	249
270-271	236	237	238	240	241	242	244	245	246	247	249
271-272	236	237	238	240	241	242	244	245	246	248	249
272-273	236	237	239	240	241	243	244	245	246	248	249

2.4 CALCULATION OF MAXIMUM WEIGHT OF NON-LIFTING PARTS continued

Maximum weight of non-lifting parts of 549 lbs (249 kg) must be reduced in relation to empty weight and empty weight C.G. position according to table below. (For kg / mm values see preceding page)

Example: For empty weight C.G. position of 25.55 in (649 mm) and empty weight of 549 lbs (249 kg) the permissible weight of non-lifting parts is 529 lbs (240 kg).

Empty Weight G (lbs) from-to	Empty weight C.G. Position Xs (inches)										
	from 21.26	from 22.02	from 22.81	from 23.59	from 24.38	from 25.17	from 25.98	from 26.77	from 27.53	from 28.32	from 29.13
	to 22.01	to 22.80	to 23.58	to 24.37	to 25.16	to 25.95	to 26.73	to 27.52	to 28.31	to 29.09	to 29.88
507-509	518	518	518	520	522	525	527	529	531	534	536
509-511	518	518	518	520	522	525	527	529	531	534	538
511-514	518	518	518	520	522	525	527	529	534	536	538
514-516	518	518	518	520	522	525	527	531	534	536	538
516-518	518	518	518	520	522	525	529	531	534	536	538
518-520	518	518	518	520	522	525	529	531	534	536	538
520-522	518	518	518	520	525	527	529	531	534	536	538
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525-527	518	518	518	522	525	527	529	531	534	536	540
527-529	518	518	518	522	525	527	529	531	534	538	540
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564-567	518	520	522	525	529	531	534	536	538	542	545
567-569	518	520	522	525	529	531	534	536	540	542	545
569-571	518	520	522	527	529	531	534	536	540	542	545
571-573	518	520	522	527	529	531	534	538	540	542	545
573-575	518	520	522	527	529	531	534	538	540	542	545
575-578	518	520	525	527	529	531	536	538	540	542	547
578-580	518	520	525	527	529	531	536	538	540	542	547
580-582	518	520	525	527	529	534	536	538	540	545	547
582-584	518	522	525	527	529	534	536	538	540	545	547
584-586	518	522	525	527	529	534	536	538	542	545	547
586-589	518	522	525	527	531	534	536	538	542	545	547
589-591	520	522	525	527	531	534	536	540	542	545	547
591-593	520	522	525	527	531	534	536	540	542	545	549
593-595	520	522	525	529	531	534	536	540	542	545	549
595-597	520	522	525	529	531	534	538	540	542	545	549
597-600	520	522	525	529	531	534	538	540	542	547	549
600-602	520	522	527	529	531	536	538	540	542	547	549

2.5 EMPTY WEIGHT C.G. TABLE (mm, kg) For in, lbs values see page 2-7

Empty Weight (kg)	Minimum Cockpit Load (kg)						
	Rear empty weight C.G. limit value in mm, must be greater than calculated C.G. position						
	60	65	70	75	80	85	90
230	...639	...658	...677	...696	...715	...734	...753
231	...638	...657	...676	...695	...714	...733	...752
232	...637	...656	...675	...694	...713	...732	...750
233	...636	...655	...674	...693	...711	...730	...749
234	...635	...654	...673	...691	...710	...729	...747
235	...634	...653	...671	...690	...709	...727	...746
236	...633	...651	...670	...689	...707	...726	...744
237	...632	...650	...669	...688	...706	...725	...743
238	...631	...649	...668	...686	...705	...723	...741
239	...630	...648	...667	...685	...704	...722	...740
240	...629	...647	...666	...684	...702	...721	...739
241	...628	...646	...665	...683	...701	...719	...737
242	...627	...645	...664	...682	...700	...718	...736
243	...626	...644	...662	...681	...699	...717	...734
244	...625	...643	...661	...679	...697	...715	...733
245	...624	...642	...660	...678	...696	...714	...732
246	...623	...641	...659	...677	...695	...713	...730
247	...622	...640	...658	...676	...694	...711	...729
248	...621	...639	...657	...675	...693	...710	...728
249	...620	...638	...656	...674	...691	...709	...726
250	...620	...637	...655	...673	...690	...708	...725
251	...619	...636	...654	...672	...689	...706	...724
252	...618	...635	...653	...671	...688	...705	...723
253	...617	...635	...652	...669	...687	...704	...721
254	...616	...634	...651	...668	...686	...703	...720
255	...615	...633	...650	...667	...685	...702	...719
256	...614	...632	...649	...666	...683	...700	...717
257	...614	...631	...648	...665	...682	...699	...716
258	...613	...630	...647	...664	...681	...698	...715
259	...612	...629	...646	...663	...680	...697	...714
260	...611	...628	...645	...662	...679	...696	...713
261	...610	...627	...644	...661	...678	...695	...711
262	...610	...627	...643	...660	...677	...694	...710
263	...609	...626	...642	...659	...676	...692	...709
264	...608	...625	...642	...658	...675	...691	...708
265	...607	...624	...641	...657	...674	...690	...707
266	...606	...623	...640	...656	...673	...689	...706
267	...606	...622	...639	...655	...672	...688	...704
268	...605	...621	...638	...654	...671	...687	...703
269	...604	...621	...637	...653	...670	...686	...702
270	...603	...620	...636	...653	...669	...685	...701
271	...603	...619	...635	...652	...668	...684	...700
272	...602	...618	...634	...651	...667	...682	...699

For values beyond the printed table - contact manufacturer

2.5 EMPTY WEIGHT C.G. TABLE (mm, kg) For in, lbs values see page 2-7

Empty Weight (kg)	Minimum Cockpit Load (kg)					
	Rear empty weight C.G. limit value in mm, must be greater than calculated C.G. position					
	95	100	105	110	115	120
230	...772	...791	...810	...828	...847	...865
231	...771	...789	...808	...826	...845	...863
232	...769	...788	...806	...824	...843	...861
233	...767	...786	...804	...823	...841	...859
234	...766	...784	...803	...821	...839	...857
235	...764	...783	...801	...819	...837	...855
236	...763	...781	...799	...817	...835	...853
237	...761	...779	...797	...815	...833	...851
238	...760	...778	...796	...814	...831	...849
239	...758	...776	...794	...812	...830	...847
240	...757	...775	...792	...810	...828	...846
241	...755	...773	...791	...809	...826	...844
242	...754	...771	...789	...807	...824	...842
243	...752	...770	...788	...805	...823	...840
244	...751	...768	...786	...803	...821	...838
245	...749	...767	...784	...802	...819	...836
246	...748	...765	...783	...800	...817	...835
247	...747	...764	...781	...799	...816	...833
248	...745	...763	...780	...797	...814	...831
249	...744	...761	...778	...795	...812	...829
250	...742	...760	...777	...794	...811	...828
251	...741	...758	...775	...792	...809	...826
252	...740	...757	...774	...791	...808	...824
253	...738	...755	...772	...789	...806	...823
254	...737	...754	...771	...788	...804	...821
255	...736	...753	...769	...786	...803	...819
256	...734	...751	...768	...785	...801	...818
257	...733	...750	...766	...783	...800	...816
258	...732	...748	...765	...782	...798	...814
259	...730	...747	...764	...780	...797	...813
260	...729	...746	...762	...779	...795	...811
261	...728	...744	...761	...777	...793	...810
262	...727	...743	...759	...776	...792	...808
263	...725	...742	...758	...774	...790	...807
264	...724	...741	...757	...773	...789	...805
265	...723	...739	...755	...772	...788	...803
266	...722	...738	...754	...770	...786	...802
267	...721	...737	...753	...769	...785	...800
268	...719	...735	...751	...767	...783	...799
269	...718	...734	...750	...766	...782	...797
270	...717	...733	...749	...765	...780	...796
271	...716	...732	...748	...763	...779	...795
272	...715	...731	...746	...762	...778	...793

For values beyond the printed table - contact manufacturer

2.5 EMPTY WEIGHT C.G. TABLE (in, lbs) For mm, kg values see page 2-6

Empty Weight (lbs)	Minimum Cockpit Load (lbs)						
	Rear empty weight C.G. limit value in inches, must be greater than calculated C.G. position						
	132	143	154	165	176	187	198
507	...25.146	...25.906	...26.664	...27.418	...28.168	...28.916	...29.659
509	...25.105	...25.862	...26.617	...27.367	...28.115	...28.859	...29.599
511	...25.064	...25.819	...26.570	...27.317	...28.061	...28.802	...29.539
514	...25.024	...25.776	...26.523	...27.268	...28.009	...28.746	...29.480
516	...24.985	...25.733	...26.477	...27.218	...27.956	...28.691	...29.422
518	...24.946	...25.690	...26.432	...27.170	...27.904	...28.635	...29.363
520	...24.907	...25.648	...26.386	...27.121	...27.853	...28.581	...29.306
522	...24.882	...25.591	...26.399	...27.087	...27.795	...28.543	...29.252
525	...24.843	...25.551	...26.299	...27.008	...27.756	...28.465	...29.173
527	...24.803	...25.512	...26.260	...26.969	...27.717	...28.425	...29.134
529	...24.764	...25.472	...26.220	...26.929	...27.638	...28.386	...29.094
531	...24.724	...25.433	...26.181	...26.890	...27.598	...28.307	...29.016
534	...24.685	...25.394	...26.142	...26.850	...27.559	...28.268	...28.976
536	...24.646	...25.354	...26.063	...26.811	...27.520	...28.228	...28.898
538	...24.606	...25.315	...26.024	...26.732	...27.441	...28.150	...28.858
540	...24.567	...25.276	...25.984	...26.693	...27.402	...28.110	...28.819
542	...24.528	...25.236	...25.945	...26.654	...27.362	...28.071	...28.740
545	...24.488	...25.197	...25.906	...26.614	...27.323	...27.992	...28.701
547	...24.449	...25.157	...25.866	...26.575	...27.283	...27.953	...28.661
549	...24.409	...25.118	...25.827	...26.535	...27.205	...27.913	...28.583
551	...24.409	...25.079	...25.787	...26.496	...27.165	...27.874	...28.543
553	...24.370	...25.039	...25.748	...26.457	...27.126	...27.795	...28.504
556	...24.331	...25.000	...25.709	...26.417	...27.087	...27.756	...28.465
558	...24.291	...25.000	...25.669	...26.339	...27.047	...27.717	...28.386
560	...24.252	...24.961	...25.630	...26.299	...27.008	...27.677	...28.346
562	...24.213	...24.921	...25.591	...26.260	...26.969	...27.638	...28.307
564	...24.173	...24.882	...25.551	...26.220	...26.890	...27.559	...28.228
567	...24.173	...24.843	...25.512	...26.181	...26.850	...27.520	...28.189
569	...24.134	...24.803	...25.472	...26.142	...26.811	...27.520	...28.150
571	...24.094	...24.764	...25.433	...26.102	...26.772	...27.441	...28.110
573	...24.055	...24.724	...25.394	...26.063	...26.732	...27.402	...28.071
575	...24.016	...24.685	...25.354	...26.024	...26.693	...27.362	...27.992
578	...24.016	...24.685	...25.315	...25.984	...26.654	...27.323	...27.953
580	...23.976	...24.646	...25.276	...25.945	...26.614	...27.244	...27.913
582	...23.937	...24.606	...25.276	...25.906	...26.575	...27.205	...27.874
584	...23.898	...24.567	...25.236	...25.866	...26.535	...27.165	...27.835
586	...23.858	...24.528	...25.197	...25.827	...26.496	...27.126	...27.795
589	...23.858	...24.488	...25.157	...25.787	...26.457	...27.087	...27.717
591	...23.819	...24.449	...25.118	...25.748	...26.417	...27.047	...27.677
593	...23.780	...24.449	...25.079	...25.709	...26.378	...27.008	...27.638
595	...23.740	...24.409	...25.039	...25.709	...26.339	...26.969	...27.598
597	...23.740	...24.370	...25.000	...25.669	...26.299	...26.929	...27.559
600	...23.701	...24.331	...24.961	...25.630	...26.260	...26.850	...27.520

For values beyond the printed table - contact manufacturer

2.5 EMPTY WEIGHT C.G. TABLE (in, lbs) For mm, kg values see page 2-6

Empty Weight (lbs)	Minimum Cockpit Load (lbs)					
	Rear empty weight C.G. limit value in inches, must be greater than calculated C.G. position					
	209	220	231	243	254	265
507	...30.394	...31.142	...31.890	...32.598	...33.346	...34.055
509	...30.354	...31.063	...31.811	...32.520	...33.268	...33.976
511	...30.276	...31.024	...31.732	...32.441	...33.189	...33.898
514	...30.197	...30.945	...31.654	...32.402	...33.110	...33.819
516	...30.157	...30.866	...31.614	...32.323	...33.031	...33.740
518	...30.079	...30.827	...31.535	...32.244	...32.953	...33.661
520	...30.039	...30.748	...31.457	...32.165	...32.874	...33.583
522	...29.961	...30.669	...31.378	...32.087	...32.795	...33.504
525	...29.921	...30.630	...31.339	...32.047	...32.717	...33.425
527	...29.843	...30.551	...31.260	...31.969	...32.677	...33.346
529	...29.803	...30.512	...31.181	...31.890	...32.598	...33.307
531	...29.724	...30.433	...31.142	...31.850	...32.520	...33.228
534	...29.685	...30.354	...31.063	...31.772	...32.441	...33.150
536	...29.606	...30.315	...31.024	...31.693	...32.402	...33.071
538	...29.567	...30.236	...30.945	...31.614	...32.323	...32.992
540	...29.488	...30.197	...30.866	...31.575	...32.244	...32.913
542	...29.449	...30.118	...30.827	...31.496	...32.165	...32.874
545	...29.409	...30.079	...30.748	...31.457	...32.126	...32.795
547	...29.331	...30.039	...30.709	...31.378	...32.047	...32.717
549	...29.291	...29.961	...30.630	...31.299	...31.969	...32.638
551	...29.213	...29.921	...30.591	...31.260	...31.929	...32.598
553	...29.173	...29.843	...30.512	...31.181	...31.850	...32.520
556	...29.134	...29.803	...30.472	...31.142	...31.811	...32.441
558	...29.055	...29.724	...30.394	...31.063	...31.732	...32.402
560	...29.016	...29.685	...30.354	...31.024	...31.654	...32.323
562	...28.976	...29.646	...30.276	...30.945	...31.614	...32.244
564	...28.898	...29.567	...30.236	...30.906	...31.535	...32.205
567	...28.858	...29.528	...30.157	...30.827	...31.496	...32.126
569	...28.819	...29.449	...30.118	...30.787	...31.417	...32.047
571	...28.740	...29.409	...30.079	...30.709	...31.378	...32.008
573	...28.701	...29.370	...30.000	...30.669	...31.299	...31.929
575	...28.661	...29.291	...29.961	...30.591	...31.220	...31.890
578	...28.622	...29.252	...29.882	...30.551	...31.181	...31.811
580	...28.543	...29.213	...29.843	...30.472	...31.102	...31.772
582	...28.504	...29.173	...29.803	...30.433	...31.063	...31.693
584	...28.465	...29.094	...29.724	...30.394	...31.024	...31.614
586	...28.425	...29.055	...29.685	...30.315	...30.945	...31.575
589	...28.386	...29.016	...29.646	...30.276	...30.906	...31.496
591	...28.307	...28.937	...29.567	...30.197	...30.827	...31.457
593	...28.268	...28.898	...29.528	...30.157	...30.787	...31.378
595	...28.228	...28.858	...29.488	...30.118	...30.709	...31.339
597	...28.189	...28.819	...29.449	...30.039	...30.669	...31.299
600	...28.150	...28.780	...29.370	...30.000	...30.630	...31.220

For values beyond the printed table - contact manufacturer

2.5 EMPTY WEIGHT C.G. TABLE (mm, kg) For in, lbs values see following page

Empty Weight (kg)	Maximum Cockpit Load (kg)						
	Forward empty weight C.G. limit value in mm, must be smaller than calculated C.G. position						
	120	115	110	105	100	95	90
230	704...	689...	673...	657...	641...	626...	610...
231	702...	686...	671...	655...	640...	624...	608...
232	700...	684...	669...	653...	638...	622...	606...
233	697...	682...	667...	651...	636...	620...	604...
234	695...	680...	665...	649...	634...	618...	603...
235	693...	678...	663...	648...	632...	616...	601...
236	691...	676...	661...	646...	630...	615...	599...
237	689...	674...	659...	644...	628...	613...	597...
238	687...	672...	657...	642...	627...	611...	596...
239	685...	670...	655...	640...	625...	609...	594...
240	683...	668...	653...	638...	623...	608...	592...
241	681...	666...	651...	636...	621...	606...	591...
242	679...	664...	649...	634...	619...	604...	589...
243	677...	662...	648...	633...	618...	603...	587...
244	675...	660...	646...	631...	616...	601...	586...
245	673...	658...	644...	629...	614...	599...	584...
246	671...	657...	642...	627...	613...	598...	583...
247	669...	655...	640...	626...	611...	596...	581...
248	667...	653...	638...	624...	609...	594...	580...
249	665...	651...	637...	622...	608...	593...	578...
250	663...	649...	635...	620...	606...	591...	577...
251	662...	647...	633...	619...	604...	590...	575...
252	660...	646...	631...	617...	603...	588...	574...
253	658...	644...	630...	615...	601...	587...	572...
254	656...	642...	628...	614...	599...	585...	571...
255	654...	640...	626...	612...	598...	583...	569...
256	652...	639...	625...	610...	596...	582...	568...
257	651...	637...	623...	609...	595...	580...	566...
258	649...	635...	621...	607...	593...	579...	565...
259	647...	633...	620...	606...	592...	577...	563...
260	645...	632...	618...	604...	590...	576...	562...
261	644...	630...	616...	603...	589...	575...	560...
262	642...	628...	615...	601...	587...	573...	559...
263	640...	627...	613...	599...	586...	572...	558...
264	639...	625...	612...	598...	584...	570...	556...
265	637...	624...	610...	596...	583...	569...	555...
266	635...	622...	609...	595...	581...	567...	554...
267	634...	620...	607...	593...	580...	566...	552...
268	632...	619...	605...	592...	578...	565...	551...
269	630...	617...	604...	590...	577...	563...	550...
270	629...	616...	602...	589...	575...	562...	548...
271	627...	614...	601...	588...	574...	561...	547...
272	626...	613...	599...	586...	573...	559...	546...

For values beyond the printed table - contact manufacturer

2.5 EMPTY WEIGHT C.G. TABLE (in, lbs) For mm, kg values see preceding page

Empty Weight (lbs)	Maximum Cockpit Load (lbs)						
	Forward empty weight C.G. limit value in inches, must be smaller than calculated C.G. position						
	265	254	243	231	220	209	198
507	27.717...	27.110...	26.500...	25.879...	25.256...	24.629...	24.000...
509	27.631...	27.026...	26.419...	25.801...	25.180...	24.556...	23.930...
511	27.545...	26.943...	26.338...	25.723...	25.105...	24.484...	23.860...
514	27.460...	26.861...	26.258...	25.645...	25.030...	24.412...	23.791...
516	27.375...	26.779...	26.179...	25.569...	24.956...	24.340...	23.722...
518	27.292...	26.698...	26.101...	25.493...	24.883...	24.270...	23.654...
520	27.209...	26.617...	26.023...	25.418...	24.810...	24.199...	23.586...
522	27.126...	26.535...	25.945...	25.354...	24.724...	24.134...	23.504...
525	27.047...	26.457...	25.866...	25.276...	24.685...	24.055...	23.465...
527	26.969...	26.378...	25.787...	25.197...	24.606...	23.976...	23.386...
529	26.890...	26.299...	25.709...	25.118...	24.528...	23.937...	23.307...
531	26.811...	26.220...	25.630...	25.039...	24.449...	23.858...	23.268...
534	26.732...	26.142...	25.551...	24.961...	24.370...	23.780...	23.189...
536	26.654...	26.063...	25.512...	24.921...	24.331...	23.740...	23.110...
538	26.575...	25.984...	25.433...	24.843...	24.252...	23.661...	23.071...
540	26.496...	25.906...	25.354...	24.764...	24.173...	23.583...	22.992...
542	26.417...	25.866...	25.276...	24.685...	24.134...	23.543...	22.953...
545	26.339...	25.787...	25.197...	24.646...	24.055...	23.465...	22.874...
547	26.260...	25.709...	25.118...	24.567...	23.976...	23.386...	22.835...
549	26.181...	25.630...	25.079...	24.488...	23.937...	23.346...	22.756...
551	26.102...	25.551...	25.000...	24.409...	23.858...	23.268...	22.717...
553	26.063...	25.472...	24.921...	24.370...	23.780...	23.228...	22.638...
556	25.984...	25.433...	24.843...	24.291...	23.740...	23.150...	22.598...
558	25.906...	25.354...	24.803...	24.213...	23.661...	23.110...	22.520...
560	25.827...	25.276...	24.724...	24.173...	23.583...	23.031...	22.480...
562	25.748...	25.197...	24.646...	24.094...	23.543...	22.953...	22.402...
564	25.669...	25.157...	24.606...	24.016...	23.465...	22.913...	22.362...
567	25.630...	25.079...	24.528...	23.976...	23.425...	22.835...	22.283...
569	25.551...	25.000...	24.449...	23.898...	23.346...	22.795...	22.244...
571	25.472...	24.921...	24.409...	23.858...	23.307...	22.717...	22.165...
573	25.394...	24.882...	24.331...	23.780...	23.228...	22.677...	22.126...
575	25.354...	24.803...	24.252...	23.740...	23.189...	22.638...	22.047...
578	25.276...	24.724...	24.213...	23.661...	23.110...	22.559...	22.008...
580	25.197...	24.685...	24.134...	23.583...	23.071...	22.520...	21.969...
582	25.157...	24.606...	24.094...	23.543...	22.992...	22.441...	21.890...
584	25.079...	24.567...	24.016...	23.465...	22.953...	22.402...	21.850...
586	25.000...	24.488...	23.976...	23.425...	22.874...	22.323...	21.811...
589	24.961...	24.409...	23.898...	23.346...	22.835...	22.283...	21.731...
591	24.882...	24.370...	23.819...	23.307...	22.756...	22.244...	21.693...
593	24.803...	24.291...	23.780...	23.228...	22.717...	22.165...	21.654...
595	24.764...	24.252...	23.701...	23.189...	22.638...	22.126...	21.575...
597	24.685...	24.173...	23.661...	23.150...	22.598...	22.087...	21.535...
600	24.646...	24.134...	23.583...	23.071...	22.559...	22.008...	21.496...

For values beyond the printed table - contact manufacturer

3.1 ORDINARY INSPECTIONS

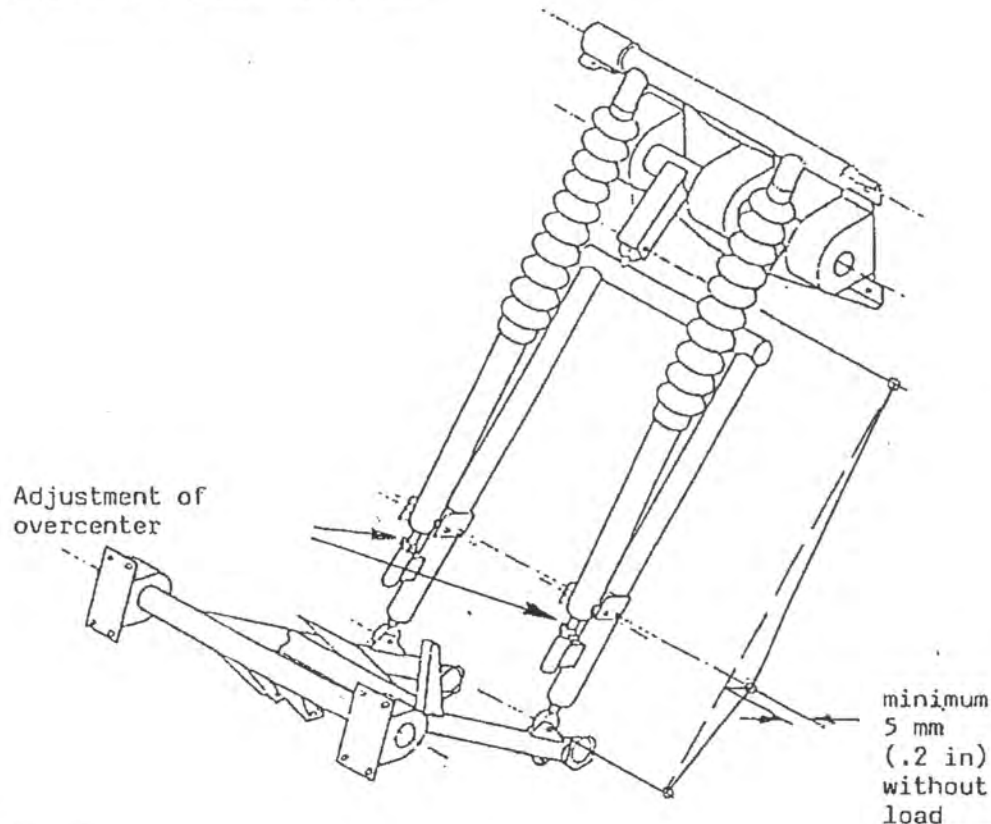
DAILY INSPECTION and PREFLIGHT CHECK see Flight Manual pages 4-3 / 4-4.
POSTFLIGHT CHECK see Flight Manual page 4-16.

ANNUAL INSPECTION

1. Check wing shell, especially in the spar region, for:
 - * cracks, scratches, pressure marks
 - shell and spar caps are made from carbon fiber material. This is sensitive against impact and compression, damage is difficult to detect.
 - * When suspecting damage, tap region off.
 - * Compare wing bending frequency number with earlier measured values or with final production inspection value.
2. The aileron sandwich is pressure sensitive.
 - * When pressure marks are present,
 - then the sailplane may be no longer airworthy.
 - Because of resulting possible 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 (aileron neutral or deflected upward).
4. Lubricate various parts according to plan (see page 3-4)
5. Protect gelcoat with car polish
 - * See also Flight Manual pages 8-4/8-5, 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
 - sealing
 - anti-collision colour markings
 - registration signs (these synthetic resin varnishes are temperature sensitive).
6. Check anti-friction tape at aileron leading edge sealing (normally plastic strip seals, on the underside sometimes metal strip seals).
 - * Damaged anti-friction tape will yield damage of gelcoat at control surface very quickly.
 - * For installation of sealing see pages 4-3 to 4-5.
 - * Remove residual adhesive using lead-free petrol, see also Flight Manual page 8-5, Cleaning and Care.
7. Check air brake friction damper at outer side of air brake box for proper operation of damper rod and pads free from grease.
8. Check landing gear for
 - * overcenter of folding strut:
 - Adjustable overcenter should be 5 mm (0.2 in), gear without load (For adjustments see also sketch on following page)
 - Value increases with load.
 - * preset load at overcenter
 - * rubber torsion elements for deformation or separation of rubber from metal.
 - * When adjustments are being made, check for
 - identical overcenter at both folding struts
 - locking of adjusters.

3.1 ORDINARY INSPECTIONS continued
ANNUAL INSPECTION continued

Landing gear overcenter adjustment



9. Perform Annual Inspection according to checklist, chapter 14.
The annual inspection checklist contains items (aileron lateral bearing play, aileron 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 4-1), 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.
10. Dismantle water ballast bags and vertical tail fin tank (if existent) and check for function (for instance chafe marks, tightness etc.) Wire meshing at tail fin tank upper end and in filling funnel are mandatory to establish proper function of vertical tail fin valve.
11. Check thermometer zero indication using water with ice-water mixture (Existent only when equipped with tail fin tank).
12. When equipment has been altered compared to valid equipment list, file new equipment list and redetermine C.G. (See chapter 2). With equipment unaltered, C.G. should be redetermined every four years. Appropriate forms see chapter 14.

3.1 ORDINARY INSPECTIONS continued
ANNUAL INSPECTION continued

13. Check function of canopy emergency release

Measure force required for canopy emergency release according to following procedure (When this measurement or a release test is being performed without a helper, the spring of the canopy jettison rear edge temporary bolt becomes distorted and must be exchanged):

- "Pilot" with appropriate dynamometer in cockpit
- both canopy openers in open position
- helper at front canopy end to avoid gas spring to lift unit upward
- maximum force for emergency release 15 kg (33 lbs)
- after force measurement: the "pilot" pushes the rear end temporary hinge bolt free and lifts canopy at opening levers, the helper holds the front end on the connector. When in fully open position, the helper pushes the connection pin upward and engages canopy to opener by turning driving lug.
- * If emergency release force is too high, all moving parts should be greased. In doubt contact manufacturer.

14. Check function of canopy jettison rear edge temporary hinge bolt. Measure force required to pull bolt free from spring during opening of canopy at rear canopy edge: force should be between 8 and 15 kg (18 to 33 lbs). When force is clearly lower, the spring must be exchanged to guarantee proper separation of canopy from fuselage during jettison.

3.2 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

3.3 LUBRICATION SCHEDULE

Location	Frequency	Lubricant
Main pins and matching holes Pins and matching holes of elevator connections Wing side bearings at automatic aileron and air brake system connectors, which are inserted into fuselage couplings	Before assembly	Water insoluble bearing grease or grease containing molybdenum, for instance: Molykote BR2 (Temperature range from -30°C to 130°C, -22°F to 266°F)
Landing gear: all joints at rubber bearings Landing gear, all metal parts	Once a year	Oil Spray oil (for instance: Caramba) Note: Protect rubber parts against oil
Bearings of control surfaces	after dis-assembly only	Molykote grease BR2 (Temperature range from -30°C to 130°C, -22°F to 266°F) or Molykote grease 33 (Temperature range from -70°C to 180°C, -94°F to 356°F)

IMPORTANT NOTE: NEVER grease LONGITUDINAL MOTION PUSHROD BEARINGS, they will be destroyed soon due to collection of small foreign matter. These bearings are used in the elevator system, aileron system and air brake system.

WARNING: The friction dampers inside the airbrake boxes prevent oscillations during extension of airbrakes. Therefore, friction pads should never be greased or oiled !

TOW RELEASE: See Maintenance Instructions of manufacturer (Tost)

MULTIPLE POINT BUCKLE

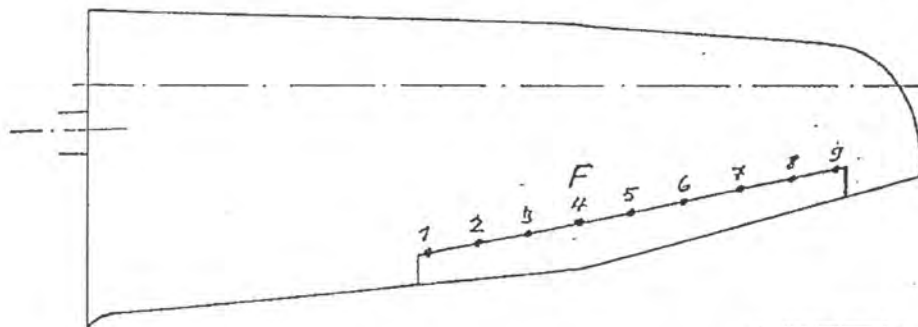
of FAG-7H safety harness: See Maintenance Instructions of manufacturer (Autoflug) (Excerpt see in Appendix)

4.1 INSTALLATION OF CONTROL SURFACES

WARNING: Nuts according to specification LN 9348 may be replaced by nuts according to specification DIN 6924 (985) - M...-8 (the dots represent the nominal thread diameter). The -8 code on each nut indicates the category of strength. If this code is not existent, the nut complies to a lower category of strength and is unsuitable for this use !

DISASSEMBLY OF AILERONS

Wing scheme with aileron bearings, F= laterally fixed bearing



- remove seal (convex plastic strip) from upper aileron side at outer aileron edge
- remove fillet on outside upper edge of aileron near bearing No. 9 .
- turn wing upside down, remove under side gap seal (convex plastic strip) and Teflon strip completely
- disconnect drive rods from aileron (6mm thread, nut LN 9348, bolt LN 9037, width over flats 10 mm), remember sequence and position of washers, if applicable.
- loosen nut (6 mm thread, LN 9348, width over flats 10 mm) from bearing No. 4, (fixed bearing) remember sequence and position of washers.
- deflect aileron fully downward and remove it from bearing pins towards wingtip. Use two persons to avoid damage!
- watch washers, if existent, at inner side of bearing pin No. 4 .

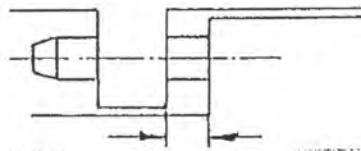
ASSEMBLY OF AILERONS

- grease bearings according to Lubrication Schedule, page 3-4.
- make sure that washers, if existent, are on inner side of fixed bearing pin, No. 4
- match aileron pins with bearings, when aileron fully deflected downward. Use 2 persons. Do not use force. Set up washers at bearing No. 4 as found during disassembly.

4.1 INSTALLATION OF CONTROL SURFACES continued

ASSEMBLY OF AILERONS continued

- tighten nut (6 mm thread, LN 9348, width over flats 10 mm) at bearing No. 2 with maximum torque 6.4 Nm (0.64 mkg, 4.623 ft lbs).
- check lateral bearing play:
minimum of 3 mm (0.12 in)



- check lateral aileron gaps:
at tip minimum of 2 mm (0.08 in)
at inner edge minimum of 1 mm (0.04 in)
- fix drive rod to aileron drive using bolt (LN 9037), nut (LN 9348) and washers, if applicable (6 mm thread, LN 9348, width over flats 10 mm). Maximum torque 6.4 Nm (0.64 mkg, 4.623 ft lbs).
- bond fillet flush into outer edge cutout, check unobstructed movement.
- restore gap seals locally or completely, see page 4-4 for details.

DISASSEMBLY OF ELEVATOR

- remove bearings and washers at elevator drive, remember sequence and position of washers (Width over flats 10 mm).
- remove elevator halves towards center.
- watch washers, if existent, at inner side of both inner bearing pins.

ASSEMBLY OF ELEVATOR

- grease bearings according to Lubrication Schedule, page 3-4.
- make sure that washers, if existent, are on inner side of inner bearing pins.
- match elevator halves pins with bearings, do not use force.
- minimum outer lateral elevator gap 1 mm (0.04 in), when inner bearings just touch shoulders.
- install both drive bearings with washers as found during disassembly (0.1 mm (0.04 in) shim between bearings), bolt (LN 9037) and nut (LN 9348). Maximum torque 6.4 Nm (0.64 mkg, 4.623 ft lbs).
- do not brace elevator halves against inner bearings, maximum axial play 0.5 mm (0.02 in)
- install plastic strip gap seal, see page 4-4 for details.

4.1 INSTALLATION OF CONTROL SURFACES continued

DISASSEMBLY OF RUDDER

- disconnect rudder cables, watch spacing casing.
- loosen nut at lower bearing (6 mm thread, LN 9348, width over flats 10 mm) using a socket wrench, remember sequence and position of washers.
- lift rudder upward from bearings.

ASSEMBLY OF RUDDER

- grease bearings according to Lubrication Schedule, page 3-4.
- set rudder into bearings, do not use force!
- set up washers at lower bearing as found during disassembly (normally: recessed washer first, then large washer). Tighten nut (6 mm thread, LN 9348, width over flats 10 mm) with maximum torque 6.4 Nm (0.64 mkg, 4.623 ft lbs). After assembly the rudder should have slight axial play. Maximum play is 1 mm (0.04 in).
- connect rudder cables, do not forget to insert spacing casings.
- if necessary, restore gap seals (convex plastic strip), see page 4-4 for details.
- check pedal-rudder alignment: with pedals in neutral position and rudder deflected to one side, twist opposite cable clockwise (maximum 5 turns) until properly aligned.
Should more than 5 turns be necessary for alignment, exchange cables. Never turn cables counter clockwise!
- Tighten nuts at rudder cable connection (6 mm thread, LN 9348, width over flats 10 mm) with maximum torque 6.4 Nm (0.64 mkg, 4.623 ft lbs).

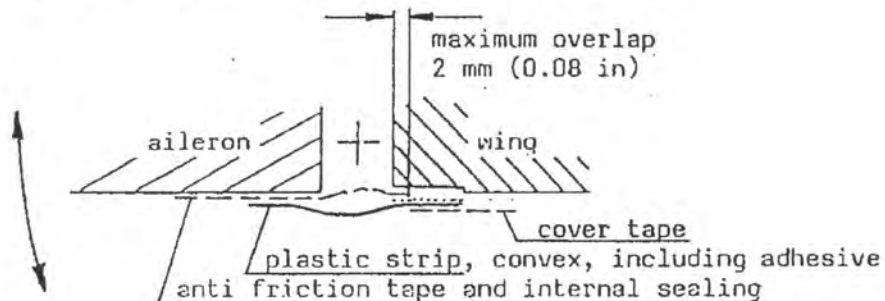
CAUTION:

In case of repairs, never pull longitudinal motion control system pushrods out of their bearings, all balls will leave their cages. Subsequently a hole near each bearing is necessary to reinstall them.

Longitudinal motion ball bearings are used throughout the wing control systems and in the fuselage elevator, aileron and landing gear systems.

4.2 INSTALLATION OF UNDER SIDE GAP SEALING

1. Lay wing upside down on adequately padded supports at root rib and wingtip, outside of aileron, see also sketch below.
Tighten plastic gap seal during bonding always with 2 persons.



2. Clean bonding area from adhesive residues, if bonding area is milled (no or almost no white gelcoat existent) prime with contact adhesive (Example: Pattex).
3. Deflect aileron fully downward, mark rear edge of seal on aileron using a short length of seal and soft pencil.
4. Deflect aileron fully upward, place self-adhesive Teflon tape with its rear edge 2 mm (0.08 in) behind marking of seal's rear edge.
5. Cut Teflon tape leading edge using a sharp knife such, that bonding width on wing is 2 mm (0.08 in). When Teflon tape bonding width on wing is wider, bonding width for convex plastic seal is insufficient because Teflon prevents proper bonding.
6. Remove masking tape from convex plastic seal and position leading edge flush with wing side cutout.
7. Cover leading edge of convex plastic seal with tape against warping (Example: Tescal 4178 white).

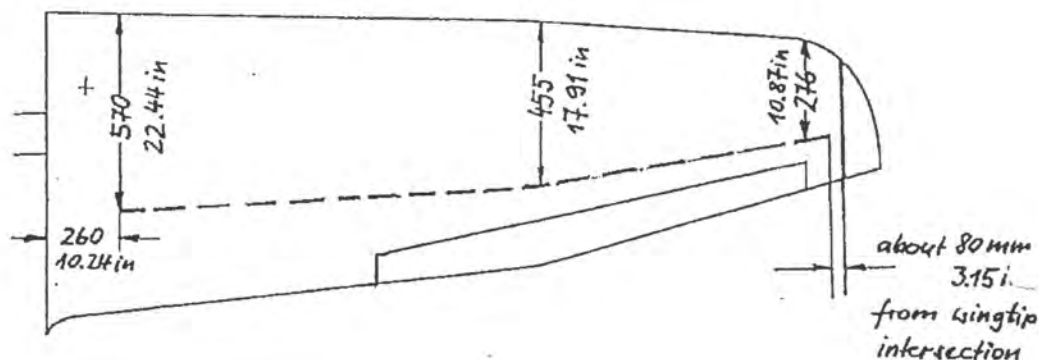
4.3 INSTALLATION OF UPPER SIDE GAP SEALING for aileron, elevator and rudder

1. Clean bonding area from adhesive residues
2. Deflect control surface fully towards sealing, mark rear edge of seal on control surface using a short length of seal and soft pencil.
3. Bond PTFE-anti friction tape (20 mm (0.79 in) wide, translucent) with its rear edge 2 mm (0.08 in) behind marking of seal's rear edge.
4. Remove masking tape from convex plastic seal and position leading edge flush with either wing side cutout or with full bonding width on fin.
5. Cover leading edge of convex plastic seal with tape against warping (Example: Tescal 4178 white).

4.4 INSTALLATION OF TURBULATOR TAPE ON WING UNDER SIDE

Turbulator tape is of 60 Degree Zig Zag Type.

Given measurements are distances from leading edge of turbulator to leading edge of wing, values in mm and inches.



4.5 SEAT

DISASSEMBLY

- remove 4 countersunk screws, Phillips recess, at left side along air brake handles guide
- remove 6 bolts, hexagon recess No.5
- remove backrest cable guide tube from backrest clamps by pulling out and disconnect base from seat
- remove T-shaped handle from pedal adjuster cable (5 mm thread, nut LN 9348, width over flats 8 mm, use 8 mm socket wrench) and pull cable through seat guide tube.
- loosen stick cover, move air brake handle into forward position
- swivel left seat side up and take seat out to upper left, use elasticity of seat to direct left lap fixing bolt around elevator pushrod guide and seat support

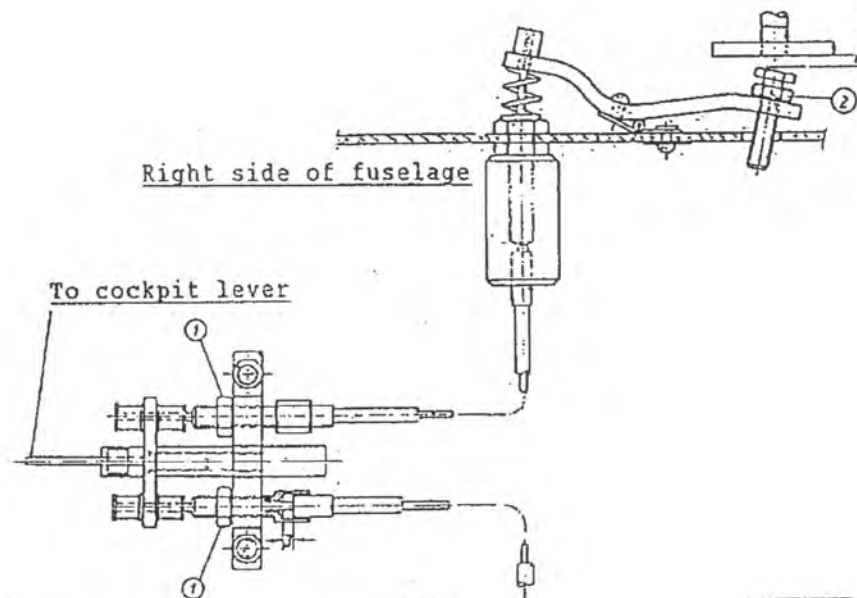
ASSEMBLY

Follow disassembly steps in reverse order, in addition observe the following:

- inspect seat area for foreign matter, tools etc.
- rest seat right side on support, direct control stick into cutout and pedal adjuster cable into guide, place air brake handle into forward position
- when lowering seat, watch especially for nut at left lap belt fixing point, this should never forced over the seat support and elevator pushrod guide
- 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
- screw T-shaped handle to pedal adjuster cable and air brake handle guide into position
- check control system after installation for proper operation

4.6 ADJUSTMENT OF WATER BALLAST VALVES (Vertical tail fin tank fitted)

- check cockpit operating lever for overcenter in open position
- check bowden cable end play >1< at fuselage to wing mechanisms for nominal value of 3 mm (0.118 in), when knurled nuts at drives inside baggage compartment are at clockwise stops
- check vertical tail fin tank opening after filling some water: nominal value 5 to 7 mm (0.197 to 0.276 in) travel at upper end of operating lever. If necessary, adjust at >2<.
- check play at >3< by pressing fuselage to wing mechanisms until touching wing valve stems for nominal value 3 mm (0.118 in). If necessary, adjust at fuselage from outside
- do not forget to lock nuts after adjusting



4.7 WATER BALLAST SYSTEM Disassembly and Assembly

WING WATER BALLAST BAGS

Wing water bags are kept in straight position by nylon rope, running from bag end over a pulley to the root rib, tension approx. 10 kg (45 lbs).

Disassembly

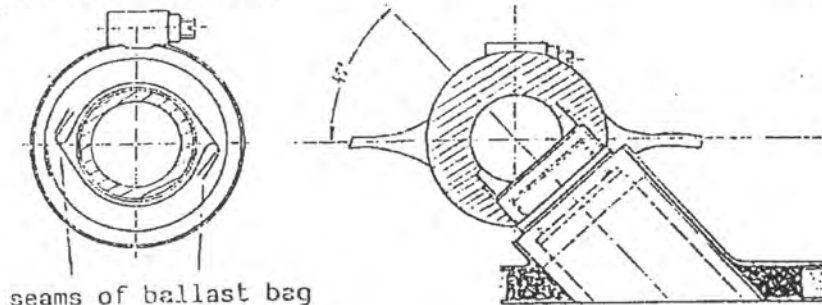
- using water valve key (standard equipment), disconnect screwed joint of valve with release tube from under side through release tube
- unscrew large PVC-nut at root rib
- open knot at rope end and connect approx. 15 m (49 ft) of braided nylon rope (ends heat sealed) by stitching for about 50 mm (2 in). Do not connect by knot, this will not pass through pulley guide
- if water bags are taken out of wings without additional rope, the wing shell must be cut open near the pulley to reinstall the rope !
- pull valve and bag through opening in root rib

Assembly

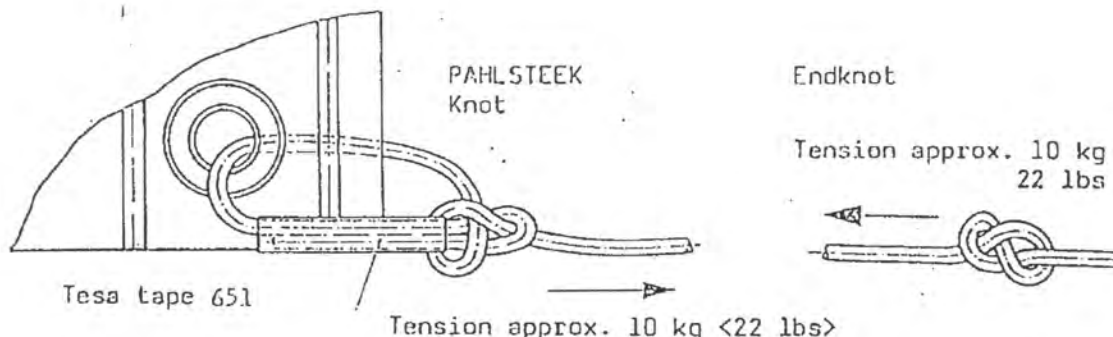
- pull bicycle type tube over valve end, 60 mm (2.4 in) long
- adjust ballast bag with seam to leading edge and to valve as shown below (different adjustment to valve increases discharge time considerably)
- push bag on valve stub, cover bag on stub with tape (example Tesaflex 4163) to protect bag against damage by hose clamps. Turn both seams during taping in the same circumferential direction, otherwise again considerable increase of discharge time.
- tighten hose clamps and check for water tightness before installation into wing
- connect braided nylon rope to brass eye at bag end by special knot ("Pahlsteek") as shown overleaf, cover free rope end by tape
- connect rope to intermediate rope in wing (if no longer connected) by stitching
- check existence of bonded-on gasket at valve discharge orifice

Installation

- Water bags are 75 Liter LS7 bags (according to drawing 1F5-35), reduced in length by 1 m (3.28 ft) according to drawing 1BF-92 by use of PVC tube. Without reduction water pressure during spinning damages wing structure. Installation of bags without length reduction is not approved!
- place bag with seam to leading edge and valve discharge orifice 45° downward to the trailing edge, roll bag and push into root rib cutout, pull cautiously at intermediate rope only
- screw valve to discharge tube from outside through tube using brass nut and water valve key
- screw PVC-nut to valve on outside of root rib by hand, no tools. This nut takes part of the tensional load from the discharge tube.
- pretension rope with about 10 kg (45 lbs), place end knot as shown overleaf. Fix rope end (about 0.5 m (20 in) long) at root rib, do not cut off
- check adjustment of water valves as outlined on preceding page
- fill bags according to instructions given in Flight Manual, check for tightness, proper discharge and discharge time
- when discharge time exceeds 4.5 minutes, the bag may possibly be twisted. When not tight - water dripping from one of the drain holes, the fault must be searched and cleared, this necessitates disassembly !



4.7 WATER BALLAST SYSTEM Disassembly and Assembly continued



TAIL FIN WATER BALLAST TANK

Disassembly

- disconnect operating cable from cockpit distributor at position >2<, see sketch on page 4-2 and extend with approx. 6 m <20 ft> of thin nylon cord
- loosen clamp (or cut bonding) at right lower rudder cutout, holding discharge tube, push stiff tube of approx. 7 to 8 mm <0.28 to 0.32 in> outside diameter and 1.5 m <5 ft> long into discharge tube
- dismount 2 bolts holding upper tank end (and horizontal tail bracket), 8mm thread, LN 9037, width over flats 13 mm.
- cut silicon rubber sealing at upper end cautiously with sharp knife
- pull tank upward, at the same time push auxiliary tube from lower end accordingly

Assembly

- before installation, check valve tightness with water, also tightness with valve fully open, but discharge tube held closed. Valve travel about 9 mm <0.35 in>.
- push auxiliary tube into discharge tube, cover joint with tape to avoid edge catching at ribs or webs
- connect drive cable with auxiliary cord
- insert tank into vertical tail fin upper end, at the same time guide auxiliary tube and pull at cord from cockpit
- valve must be inserted into cutout in lower tail fin rib, use caution to avoid valve damage
- seal upper tank edge with silicon rubber to surrounding structure
- mount 2 bolts holding upper tank end (and horizontal tail bracket), 8mm thread, LN 9037, width over flats 13 mm. When the tank is combined with a battery box, these bolts also hold the battery box cover.
- clamp end of discharge tube (or fix by bonding) in right lower rudder cutout
- adjust valve operation as outlined on page 4-6

Check operation:

- a) watertight with valve closed
- b) opening before wing system opens
- c) tightness during filling (back to front via funnel). With valve open, water level in filling tube must remain constant.

4.8 NOSE HOOK SYSTEM Disassembly and Assembly (Optional equipment)

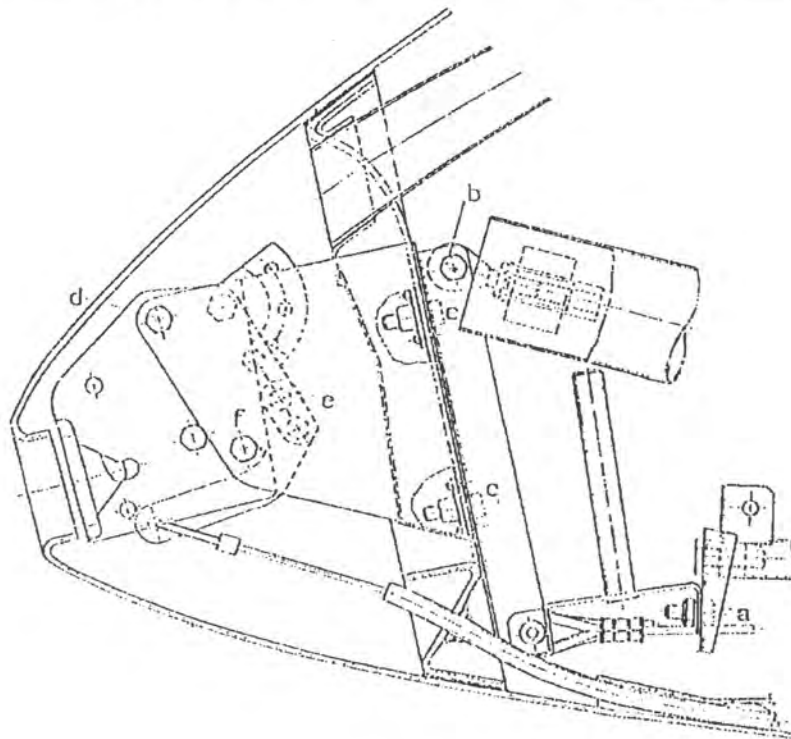
Tools: 3/4" drive ratchet, 8 and 10 mm sockets, 3 and 4 mm hex head driver sockets, 12 mm open end spanner, 10 mm ring spanner

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

- take canopy off fuselage with a helper after pulling emergency canopy release
- disassemble seat according to page 4-5
- under seat, disconnect C.G. release cable from pulley
- pull pedals to rearmost position
- disconnect trim weight holder from pedal guide >a<
- disconnect 2 bolts >b< at front end of canopy support from bracket, move support as far back into cockpit as possible, perhaps disconnect gas strut at one end as well
- disconnect both canopy support brackets from nose bulkhead >c< and move backwards too
- pull nose hook support backward from bulkhead
- disassemble nose hook from support >d<, watch for 4 spacers between nose hook case and support, at >f< 1 spacer inside nose hook case
- disassemble drive extension with cable at >e< from drive lever

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

- insert spacer at >f< before assembly of drive lever extension
- when assembling nose hook into support, direct spacers into position using a 12 mm open ended wrench
- after assembly at >c< and connection of C.G. hook cable to pulley, check function of both hooks
- 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 foreign matter



Airworthiness Limitations

1. Sailplane structural life limit:: **3000 hours** total flying time
The life limit may be increased according to the procedure outlined on page 5-3 stepwise up to **12000 hours** total flying time.

2. Safety harness Autoflug
 FAG-7H lap belt with multiple point buckle
 shoulder strap
 (Lap belt with bracket 4R11-22a sewn in)
 Webbing life limit 12 years from manufacturing date)*

3. Safety harness Gadringer
 Bagu 5303 lap belt with multiple point buckle
 Schugu 2700 shoulder strap
 (Lap belt with bracket 4R11-22a sewn in)
 Webbing life limit 12 years from manufacturing date)*

)* See also Maintenance- and Operating Instructions of manufacturers.

Note: Repair damage prior to next flight.

When in doubt, weather a "small repair" or a "major repair" is necessary, contact the manufacturer.

"Major repairs" must be accomplished in accordance with Rolladen-Schneider 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.

Certain "major repairs" may only performed by the manufacturer due to necessary jigs. This has to be checked with the manufacturer for the case in question.

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 sailplanes may be increased to 12.000 hours if airworthiness of each single sailplane (in addition to annual inspections) is checked according to a special multi-step inspection programme.

2. Schedule

When the 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 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 licences 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.

6.1 FLIGHT CONTROL TRAVEL LIMITS

ELEVATOR: Up 28° to 30°
Down 22° to 24°
RUDDER: To both sides 26° to 30°
AILERON: Up 21° to 25°
Down 10° to 13°

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 page 6-3 or deflections report of final production inspection.

6.2 CONTROL SURFACE WEIGHT AND MASS BALANCE

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

Weight and mass balance should be within given limits for safety against flutter.

	Mass/Weight	Hor. Ref. Line	Hinge Moment
Elevator (*)	1.00 to 1.60 kg 2.21 to 3.53 lbs	Straight region of upper side	
Rudder	3.80 to 4.22 kg 8.38 to 9.30 lbs	Centerline of section	± 1.33 kgcm ± 18.47 in oz
Aileron	2.78 to 3.20 kg 6.13 to 7.06 lbs	Leading and trailing edges of under side connected	1.85 to 3.00 kgcm 25.69 to 41.66 in oz



(*) Elevator hinge moment limits are not absolutely fixed, they are determined during final production inspection and then entered.

Measuring Technique for hinge moment:

Control surface should be attached to 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 final production inspection (see Control Surface Deflections inspection form, page 14-7), then rear edge weight only must be checked.

Warning: When during repairs local static moment is being changed, mass balance must be fixed in this region to yield identical static moment values as in original condition

6.3 CONTROL SURFACES PLAY AND FRICTION

(Should be inspected annually)

	Play at inner rear edge	Friction
Elevator	maximum 2.4 mm (0.094 in)	maximum 100 grams (0.220 lbs)
Aileron (*)	maximum 2.4 mm (0.094 in)	200 to 500 grams (0.441 to 1.102 lbs)
Rudder	not applicable	up to 500 grams (1.102 lbs)

(*) Aileron sealings on both upper and lower sides must be fitted !

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 upper rudder edge.

6.4 LIMIT VALUES FOR CONTROL SURFACE DEFLECTIONS IN MM/IN

Elevator

local radius mm/in	22°to 24°	28°to 30°
66 mm 2.598	25 to 27 mm 0.984 to 1.063	32 to 34 mm 1.260 to 1.339
67 mm 2.638	26 to 28 mm 1.024 to 1.102	32 to 35 mm 1.260 to 1.378
68 mm 2.677	26 to 28 mm 1.024 to 1.102	33 to 35 mm 1.299 to 1.378
69 mm 2.717	26 to 29 mm 1.024 to 1.142	33 to 36 mm 1.299 to 1.417
70 mm 2.756	27 to 29 mm 1.063 to 1.142	34 to 36 mm 1.339 to 1.417
71 mm 2.795	27 to 30 mm 1.063 to 1.181	34 to 37 mm 1.339 to 1.457
72 mm 2.835	27 to 30 mm 1.063 to 1.181	35 to 37 mm 1.378 to 1.457
73 mm 2.874	28 to 30 mm 1.102 to 1.181	35 to 38 mm 1.378 to 1.496

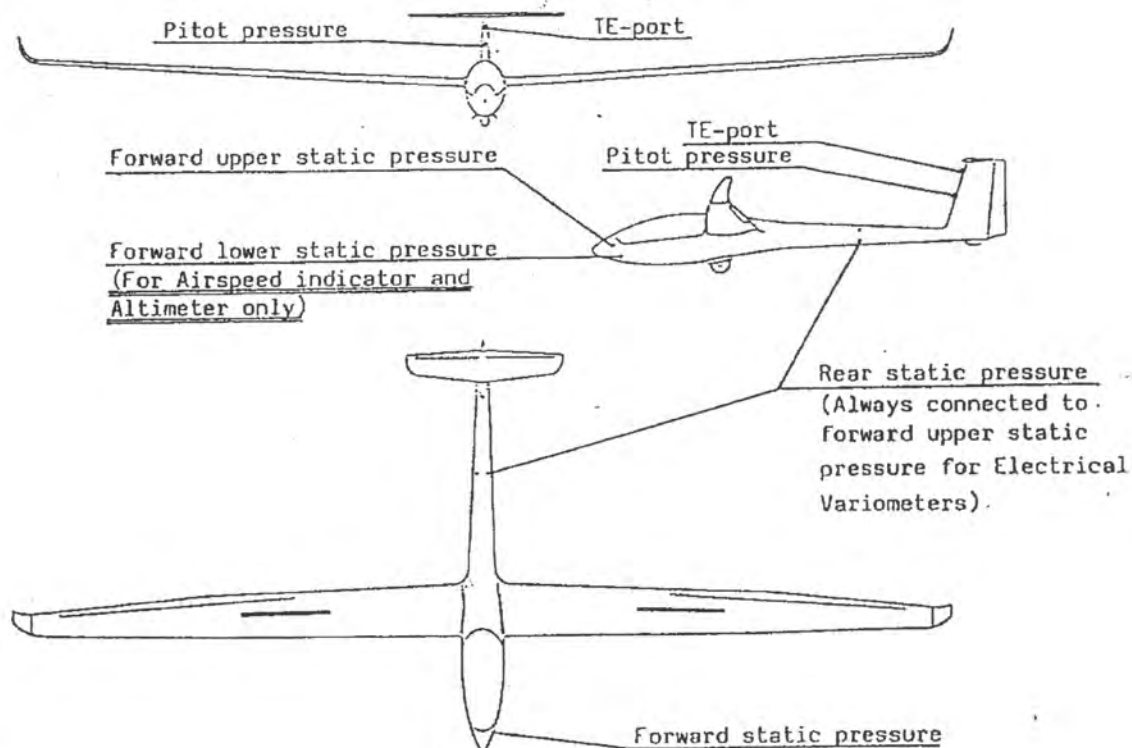
Aileron

local radius mm/in	10°to 13°	21°to 25°
83 mm 3.268	14 to 19 mm 0.551 to 0.748	30 to 36 mm 1.181 to 1.417
84 mm 3.307	15 to 19 mm 0.591 to 0.748	31 to 36 mm 1.220 to 1.417
85 mm 3.346	15 to 19 mm 0.591 to 0.748	31 to 37 mm 1.220 to 1.457
86 mm 3.386	15 to 19 mm 0.591 to 0.748	31 to 37 mm 1.220 to 1.457
87 mm 3.425	15 to 20 mm 0.591 to 0.787	32 to 38 mm 1.260 to 1.496
88 mm 3.465	15 to 20 mm 0.591 to 0.787	32 to 38 mm 1.260 to 1.496
89 mm 3.504	16 to 20 mm 0.630 to 0.787	32 to 39 mm 1.260 to 1.535
90 mm 3.543	16 to 20 mm 0.630 to 0.787	33 to 39 mm 1.299 to 1.535

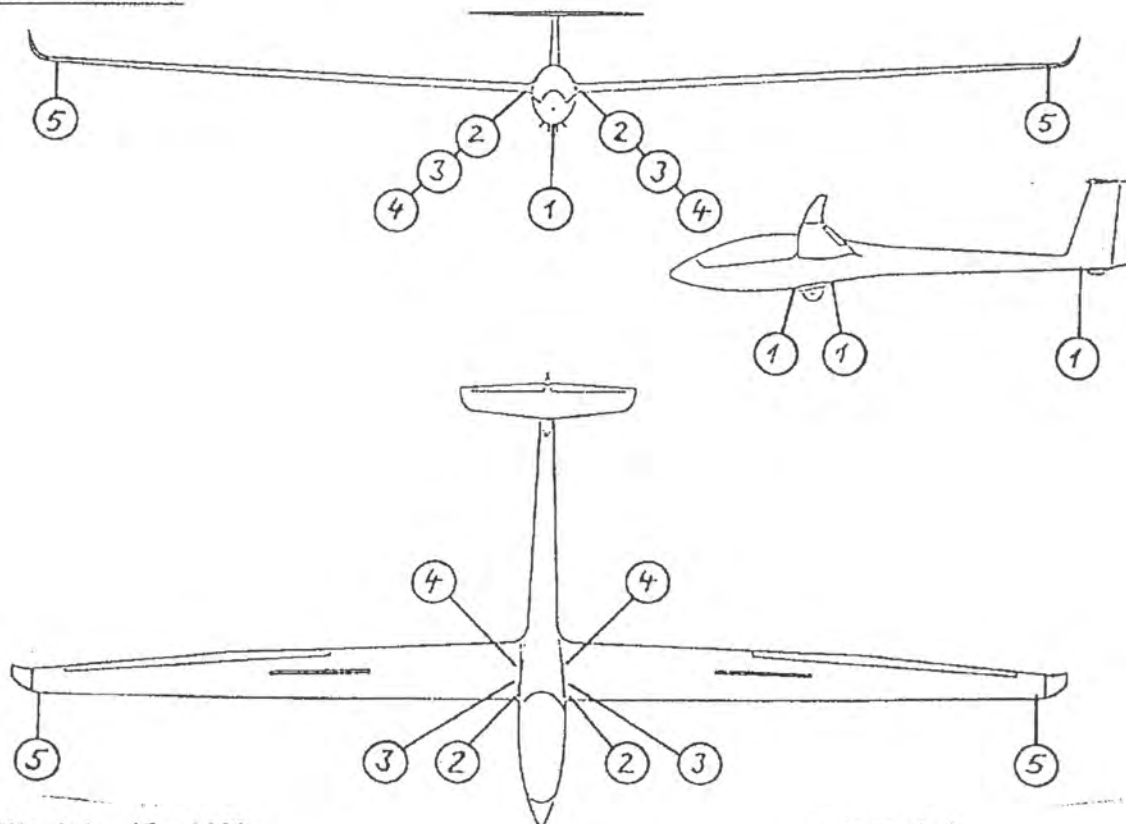
Rudder

local radius mm/in	26°to 30°
311 mm / 12.244 in	140 to 161 mm / 5.512 to 6.339 in
312 mm / 12.283 in	140 to 162 mm / 5.512 to 6.378 in
313 mm / 12.323 in	141 to 162 mm / 5.551 to 6.378 in
314 mm / 12.362 in	141 to 163 mm / 5.551 to 6.417 in
315 mm / 12.402 in	142 to 163 mm / 5.591 to 6.417 in
316 mm / 12.441 in	142 to 164 mm / 5.591 to 6.457 in
317 mm / 12.480 in	143 to 164 mm / 5.630 to 6.457 in
318 mm / 12.520 in	143 to 165 mm / 5.630 to 6.496 in

8.1 PRESSURE PORTS



8.2 DRAIN ORIFICES



8.3 PRIMARY AND SECONDARY STRUCTURE

No secondary structure available !

PLACARDS

For positions of placards see Flight Manual page 7-2.

LS7-WL CHECKLIST

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

1. Main pins secured ?
2. Horizontal tail secured ?
3. Wingtips secured ?
4. Test controls
5. Check loading conditions
6. Fasten seat belt harness
7. Connect parachute static line
8. Lock airbrakes
9. Trim neutral
10. Check release
11. Check tail dolly removed
13. Lock canopy

Tyre Pressure 3 to 3.5 bar on right landing gear door

Tyre Pressure 2.5 - 3.5 bar above tail wheel, if fitted

Maximum Baggage Weight 5 kg/11 lbs (Soft items only)

at main bulkhead

ROLLADEN-SCHNEIDER FLUGZEUGBAU GMBH
TYPE LS7-WL
TCDS No. .
Serial Number 7xxx
Registration .

Type Placard at main bulkhead

>1< at underside of instrument panel

MINIMUM COCKPIT LOAD kg/ lbs
For use of lower Minimum Cockpit Load see Flight Manual pages 2-6 and 6-2

under instrument panel cover >2<

Rolladen-Schneider Flugzeugbau GmbH

Type: LS7-WL Serial Number: xxxx

DATA PLACARD

Airspeed Limits (IAS)	km/h	MPH	kts
Winch launch / Auto tow	140	87	76
Aero Tow	190	118	103
In Rough Air	190	118	103
Never Exceed (VNE)	270	168	146
Maximum Weight	486 kg (1071 lbs)		
including Water Ballast			
Aerobatic manoeuvres not approved			

WEIGHT LIMITATIONS

Maximum Cockpit Load kg. lbs.
Minimum Cockpit Load kg. lbs.
For lower Minimum Cockpit Loads see Flight Manual pages 2-6 and 6-2

Battery in fin / Baggage Compartment
Lighter Pilots must compensate lack of weight as suggested in Flight Manual

on right side of cockpit >3<

Ball of bearing must be fixed

at forward horizontal tail attachment on vertical tail fin

Batt. I

Batt. II

OFF

Electrical switch positions

PLACARDS continued

Numbers relate placards to positions in Flight Manual page 7-2.

Use vertical tail fin battery only
with main fuse at battery

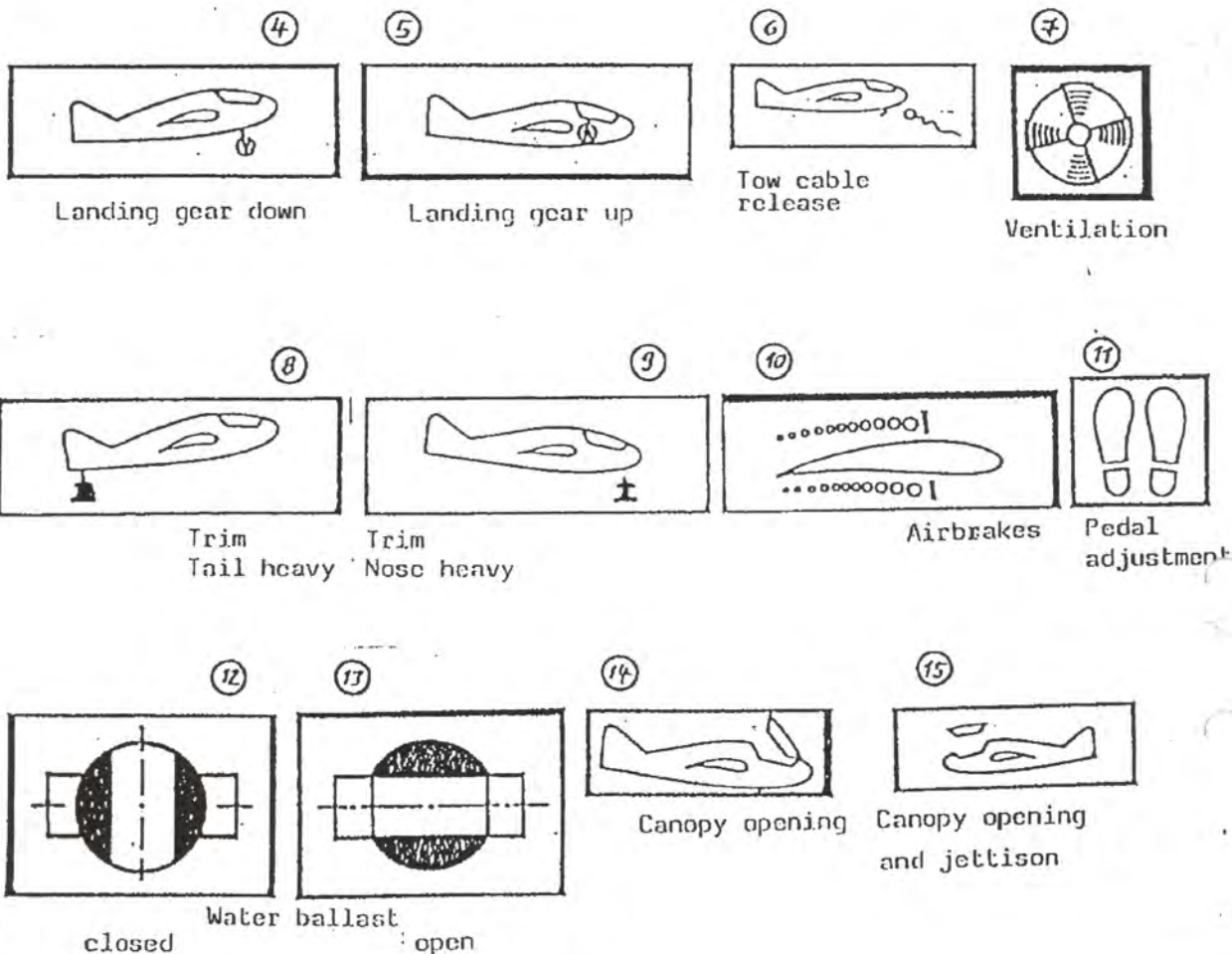
under battery box cover of
vertical tail, if fitted

When using a battery in
the vertical tail fin,
Minimum Cockpit Load must
be redetermined by weighing

under battery box cover of
vertical tail, if fitted

>16< near right canopy opening handle

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



11.1 PERMANENT INSTALLATION OF FIXED BALLAST

If empty weight C.G. position is too far back to allow 70 kg (154 lbs) as Minimum Cockpit Load, permanent installation of ballast (trim weights, 2.5 kg (5.5 lbs) each) under seat in front of control stick is possible.

A trim weight holder can be ordered as optional equipment. Weights should be fixed in flight direction, using large washers and self-locking nuts such that vibration will not allow weights to rotate.

One weight of 2.5 kg (5.5 lbs) shifts empty weight C.G. position approximately 17 mm (0.669 in) forward.

After permanent installation of fixed ballast, empty weight C.G. position should be redetermined by weighing. See Chapter 2.

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

Therefore it is possible to install a battery into the vertical tail fin (if a battery receptacle is fitted there) or a trim weight at the vertical tail fin web lower end using a rear trim weight holder. This holder is fitted to 4 mounting bolts of the elevator drive system and can be accessed after disassembly of the rudder.

WARNING: NEVER dismount the rear trim weight holder, bolts and nuts are fixing points for the elevator system.

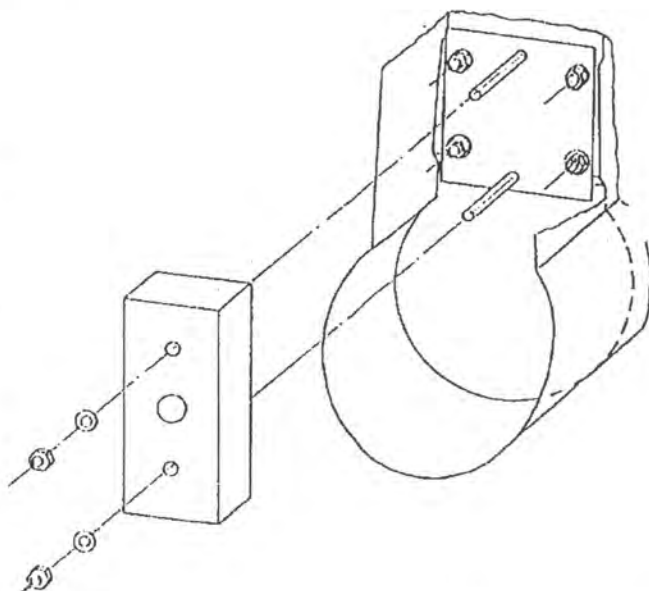
Maximum weight of rear trim weight: 2.45 kg (5.4 lbs), Part No. 4R8-108
Tail fin battery type Dryfit or similar maintenancefree and gastight type, 12V 5.7 Ah, measurements 150* 99* 33 mm (5.9* 3.9* 1.3 in)
weight 2.6 kg (5.7 lbs)

All nuts self-locking M6, LN 9348,
10 mm width over flats, washers
B 6.4, DIN 9021-St

For disassembly and assembly of rudder see Maintenance Manual, chapter 4. Pay special attention to unobstructed movement.

When fitting a trim weight to the vertical tail fin web, C.G. position must be redetermined by weighing according to chapter 2.

Trim weight installation at vertical tail fin web using rear holder (tail wheel box and lower rudder bearing bracket not shown)

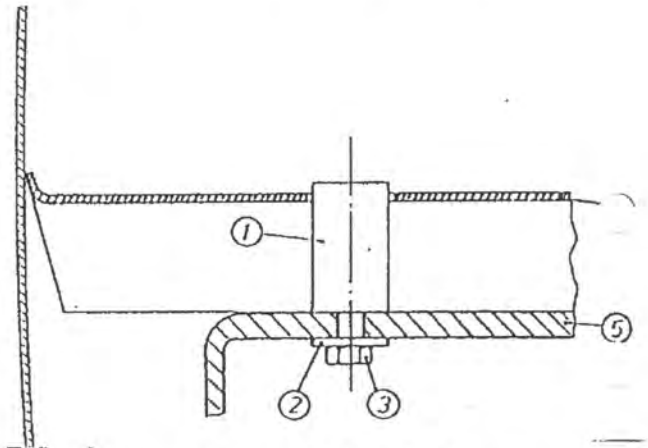


11.2 PERMANENT INSTALLATION OF EQUIPMENT IN BAGGAGE COMPARTMENT

Installation is possible as follows:

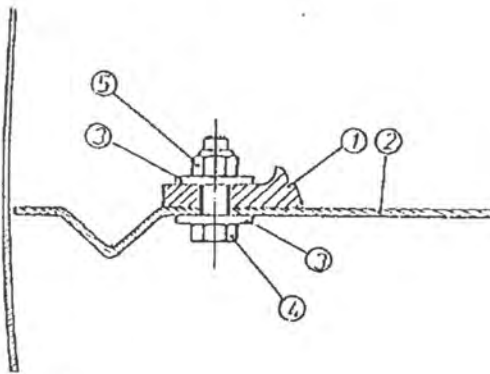
- a) Equipment must be attached to landing gear box using threaded spacers, three of which are necessary per unit. Baggage compartment cover has to be cut to avoid spacers. See sketch.

1. Spacer, diameter 15 mm (0.6 in), length 27 mm (1.1 in).
2. Washer B 5.3 DIN 9021-St outer diameter 15 mm (0.6 in)
3. Screw M5*10 DIN 85-A2
4. Baggage compartment cover
5. Landing gear box



- b) Equipment may be fitted to rear baggage compartment cover >2< behind spar connection (barographs or ELT's only), as near as possible to side stiffening corrugations. Use large washers >3< (DIN 9021, 15 mm (0.6 in) in diameter) and self-locking nuts >5< M5 LN 9348. See sketch below:

- >1< mounting flange of equipment
>4< bolt M5 LN 9037



6) ELECTRICAL INSTALLATION

- a) Battery Only life sealed batteries are recommended (Gel cell or Nickel-Cadmium types).
Battery size must be chosen in relation to power requirements to guarantee 8 hours of continuous service. For "German" type radio plus electrical variometer 12V/5.7 Ah are adequate.
Power requirement for average "German" type radio is 1.5 A for transmitting, 0.4 A for receiving voice and 0.06 A for standby.
Examples: Dittel (Dryfit) 12V/6.5 Ah including battery holder for baggage compartment. Installation according to page 11-2, measurements 170*73*140 mm (length*width*height) <6.69*2.87*5.51 in>, weight 3.1 kg <6.8 lbs>. For tail fin batteries see page 11-1.
- b) Switches Marquardt 2A 250V or other manufacturers
- c) Fuses Microfuse 20*5 mm DIN 41571 or
Circuit Breakers Klixon 7277-2 or 7274-2 or similar ones
Ratings: Master: 3 A (Minimum) quick acting
10 A (Maximum) quick acting
2 A quick acting: Radio Becker/Dittel
1 A quick acting: Electrical variometers
Turn and bank indicator
- d) Radio Walter Dittel FSG series
Avionic Dittel ATR 720 models
Becker AR 2000 and AR 3000 series
Antenna Becker Antenna for vertical tail fin, 118-136 MHz

7) LANDING GEAR

- Main wheel Tost Kobold 103/20, 4 inch in diameter
Tyre Continental 4.00-4 6PR / Tost Aero 61J 4.00-4 6PR
Tube Continental 4.00-4
Tail wheel (opt) Streifeneder 210 * 65
Tyre Continental 210 * 65
Tube Continental 210 * 65

8) RELEASE MECHANISMS

- C.G. hook Tost Europa G88 or G73 or G72
Nose hook Tost E85 or E75 or E72

9) REMOTE INDICATING THERMOMETER (Minimum equipment with vertical tail fin tank)

Störk TF-00-059 K

Feeler gauge in ventilation duct or in landing gear box.

MATERIALS AND SOURCES OF SUPPLY continued

GELCOAT:

PE-Vorgelat white No. 03-69100 Manufacturer: Lesonal-Werke,
Hardener No. 07-20510 Postfach 300709, 7000 Stuttgart 30
Thinner No. 06-30260
Mixture ratio 2% (weight) hardener. For spraying add 30 to 50% thinner.

UP-Vorgelat white T 35 Manufacturer: Martin G. Scheufler
Hardener SF 2 Kunstharzprodukte GmbH, Am Ostkai
Thinner SF 21/22 im Stuttgarter Hafen,
7000 Stuttgart 61 (Obertürkheim)
Mixture ratio 2% (weight) to 100% of hardener for brushing on.
For spraying: 10% (weight) to 100% of T 35, than add 2 to 3% of hardener

WARNING COLOUR:

Nitro Cellulose Kombilack Manufacturer: Lackfabrik Bäder KG,
Reinorange RAL 2004 (orange) or Postfach 25, 7300 Esslingen
Rot RAL 3000 (red)

REPAIRS OF METAL FITTINGS should not be performed before the manufacturer has been consulted. Most fittings are made from 1.7734.4 aircraft material and welded in WIG-process (Shielded arc welding). In no case should they be gas welded, because required properties of the material will disappear.

CABLE SYSTEMS:

Rudder:	cable	B3.2 LN 9374
	cable sleeves	Nicopress 28-3-M, 3 pressings requ, with tool groove Oval M
	steel thimbles	A3.5 DIN 6899
Release mechanism and wheel brake:	cable	A2.4 LN 9374 A2.4 LN 9389 corrosion resistant, (release system under seat)
	cable sleeves	Nicopress 28-2-G, 1 pressing requ. with tool groove J
	stop sleeves	Nicopress 871-17-J, 1 pressing requ. with tool groove 51-MJ
	steel thimbles	A2.5 DIN 6899

LONGITUDINAL MOTION PUSHROD BEARINGS

During repairs, never pull pushrods out of longitudinal motion bearings, because all balls will leave their cages. Consequently, for reinstallation near each bearing a hole must be cut and repaired afterwards. These bearings are being used throughout the wing control systems, in the fuselage for elevator-, aileron- and landing gear drive systems.

WARNING:

Longitudinal motion pushrod bearings should never be greased or oiled, their plastic balls and bearing surfaces will soon be destroyed due to collection of small foreign matter.

Serial Number:

Reg. Signs:

Year of Manuf.:

TB numbers not included are not relevant for this model !

TB LBA-AD	Components concerned	Date	Steps / Modification	I*	Periodical	Time Limit	Accomplishment Inspector
<u>7003</u> 91-110	<i>Pedal adjustment cable guide</i>	<i>Mar. 91</i>	<i>Inspection of lateral play</i>	<i>X</i>	<i>—</i>	<i>Before next Flight</i>	
<u>7004</u> 91-172	<i>Deflector at automatic aileron connector</i>	<i>Sep. 91</i>	<i>Inspection, exchange, if bent</i>		<i>—</i>	<i>Before next flight</i>	
<u>7005</u>	<i>Cockpit modifications</i>	<i>Jan. 92</i>	<i>For S/N 7022 only</i>	<i>X</i>	<i>--</i>		N/A
<u>7006</u>	<i>Type Certification France</i>	<i>Jan. 92</i>	<i>For Export to France only</i>		<i>—</i>		
<u>7007</u>	<i>Removable wingtips</i>	<i>Jun. 92</i>	<i>Modification</i>	<i>I*</i>	<i>--</i>	<i>Opt.</i>	
<u>7008</u>	<i>Winglets</i>	<i>22.12.92</i>	<i>LS7 modification to LS7-WL</i>	<i>X</i>	<i>--</i>	<i>Opt.</i>	
<u>7011</u> 99-267/2	<i>Canopy jettison for 40 cm wide instrument panel</i>	<i>08.06.99</i>	<i>Installation of deflector 3R7-73</i>	<i>X</i>	<i>—</i>	<i>Before next flight</i>	
<u>7012</u>	<i>Nose hook</i>	<i>01.06.99</i>	<i>Additional installation</i>	<i>X</i>	<i>--</i>	<i>Opt.</i>	
<u>7013</u> 00-083	<i>Wing air brake levers</i>	<i>14.Sep.99</i>	<i>Check for corrosion and possible jamming</i>	<i>X</i>	<i>—</i>	<i>Before next flight</i>	
<u>7015</u> 02-043	<i>Increase of Service Life up to 12000 h</i>	<i>15.11.01</i>	<i>Update Maintenance Manual</i>	<i>--</i>	<i>X</i>	<i>Before 3000 h</i>	

Prepared: 05.12.01	Verified:	Complies:
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TB-AD-ACCOMPLISHMENT LIST

Sailplane LS7-WL Serial No. _____ Reg. Signs _____ Year of Manuf. _____

[illegible]

TB-AD-ACCOMPLISHMENT LIST for PERIODICAL INSPECTIONS

Sailplane LS7-WL Serial No. _____ TC-Data Sheet _____
 Year of _____
 Registration _____ Manufact. _____ Page No. _____

Document opened:
Date + Signature
of Inspector

[illegible]

Reifeger Schneider Flugzeugbau GmbH	INSTRUCTIONS FOR CONTINUED AIRWORTHINESS 14 -INSPECTION FORMS	LS7-WL	Page 14-3
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Serial No.:	Reg. Signs:	INSPECTION REPORT
-------------	-------------	-------------------

Operator: _____

Total flying time since manufacture: _____ Hours with _____ landings
 Flying time since last Annual Inspection: _____ Hours with _____ landings

☐ Final Production Inspection	☐ Airworthiness Directive Inspection
☐ Annual Inspection	☐ Repair Inspection
☐ _____	☐ _____

Sequ. No.	Report or Findings	Remarks	Signature
1.	Check Control Surface Deflections		
2.	Check Operating Instructions according to TCDS		
3.	Check Placards as given in Flight Manual		
4.	MINIMUM COCKPIT LOAD is _____ kg/lbs		
5.	TBO-Checklist see Maintenance Manual, page 14-2		
6.	Wings Flex Number _____ cycles per minute (Fuselage supported in front of landing gear and on tail skid/wheel)		
7.	Airworthiness Directives accomplished:		
8.	Technical Bulletins accomplished:		
9.	TB-AD-List updated:		
10.	Del.with: Battery in fin, fin tank 5.5 Ltr.,	fin tank 4.1 Ltr. with battery box	
11.	Del.with wing water bags 100 / 150 Ltr. total		

The following reports are valid for this inspection report:

Checklist dated _____	Equipment List dated _____
Inspection Certificate dated _____	Control System Adjustment Report dated _____
Flight Test Report dated _____	Parts Inspection Certificate _____
Findings Report dated _____	Welding Report _____
Weighing Report dated _____	_____

The sailplane is / is not airworthy.

Place and date of inspection _____	(Stamp) (Signature of inspector) _____
------------------------------------	--

10. NOV. 1992 *Utopia*

Serial No. _____	Reg. Signs _____	Date: _____	WEIGHING REPORT
------------------	------------------	-------------	------------------------

COMPONENT WEIGHTS (Check when equipment altered or every fourth year)

	Dimension		Dimension
Right Wing		Maximum all-up Weight	486 kg/1071 lbs
Left Wing		Maximum Weight of Non-lifting Parts at W=_____kg/lbs and Xcg=_____mm/in according to table pages 2-4/2-5	
Fuselage + Canopy + Main pins		Fuselage (completely equipped)	
Minimum Equipment permanently inst.		Horizontal tail	
Addit. Equipment		Cockpit Load (max.120 kg or 265 lbs)	
Horizontal Tail		Weight of Non-lifting Parts	
Empty Weight (W)			

FIXED BALLAST WEIGHT POSITION

_____kg/lbs in Tail Fin / _____

**BATTERY
POSITION**

None
Baggage Compartment
Tail Fin

WEIGHING AND EMPTY WEIGHT C.G. DETERMINATION

(Check when equipment altered
or every fourth year)

Technical data	Datum Point (DP):	Leading edge of wing at root
according to TCDS:	Datum Line (DL):	Under side of fuselage boom horizontal
	Dimension	Dimension

Empty Weight (W)		Distance Wheel axis - Datum Point (a)	
Nett Tail Weight (W2)		Distance Wheel axis - Tail support (b)	

	with tail fin tank full	with tail tank empty/not existent
$\frac{(W2+Wa) * b}{W+Wa} + a = Xcg$	$\frac{*}{+} = \text{mm/in}$	$\frac{*}{+} = \text{mm/in}$

Empty Weight	_____kg/lb	_____kg/lb
Empty Weight C.G.range	from _____mm/in to _____mm/in	from _____mm/in to _____mm/in
Cockpit load range	from _____kg/lb to _____kg/lb	from _____kg/lb to _____kg/lb

MINIMUM COCKPIT LOAD: _____kg /lbs with tail fin tank (Wa=5.5/4.1 Liters) full
MAXIMUM COCKPIT LOAD: _____kg /lbs limited by: weight of non-lifting parts
C.G. table

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 2

State dimensions used. Redetermine distances
a and b, because of possibly altered
suspension level.

(Stamp)

Signature of Inspector

EDITION: Oct. 15, 1992

Page 14-4

(7WLWE14)

19. NOV. 1992

Whapha

LS7-WL

Serial No. _____ Reg. Signs _____ Date: _____ **FLIGHT TEST REPORT**

Operator _____

PILOT: _____

Airfield: _____

Winch Launch / Aero Tow _____

Take off Time: _____

Landing Time: _____

Empty Weight : _____
Pilot and Parachute Weight: _____
Battery Position : _____
Remov. Trim Ballast Weight: _____
Total Flying Weight : _____

FINDINGS Mark as follows:
Ø = not available
+ = without objections
- = objections, specify at end or overleaf
Mark dimensions used under remarks bel

1. On Safety Harness : () Handles : () Canopy Locking: () Visibility : ()
Ground Seat Adjustment: () Pedal Adjustment: () Control System: () Ventilation: ()

2. Take Off Tow altitude : _____ Tow Speed (IAS): _____ Handling ()

3. Tow Release Function Automatic: () Manual : () 4. Landing Gear Retracting : ()

5. Radio Function On Ground: () During Take Off: () 6. Instrumentation Function : ()

7. Slow Flight Stalling Speed (IAS): _____ ()

8. Normal Flight Controls free, Trim neutral: (IAS): _____ ()
Ref. 100 - 120 km/h

9. Trim Range from (IAS): _____ to: _____ ()
Ref. from slow flight to 200-230 km/h

10. Circling Flight : () 11. Effectiveness of Controls : ()

12. Straight Flight at 80 km/h: () at 120 km/h: () at 200 km/h: ()
Control stick neutral () () ()

13. High Speed Flight up to (IAS): _____ Be alert to danger of flutter ! ()

15. Landing Gear Extending :

16. Air Brakes (Effect./Forces) : () 17. Landing (Sideslip prohibited!) ()

Remarks: All speeds km/h / kts / MPH
All weights kg / lbs
Altitudes m / ft

Sailplane regarding operation alright
Allright after accomplishing complaints
New Flight Test necessary

Cross out
invalid
state-
ments !

Reference Speed Value Table

km/h	kts	MPH
80	43	50
100	54	62
120	65	75
200	108	124
230	124	143

<Signature of Pilot>

Serial No.	Reg. Signs	Date:	EQUIPMENT LIST
--------------------	----------------------	-----------------	----------------

MINIMUM EQUIPMENT: (Check function annually, calibrate every fourth year)

	Type	Manufacturer	Serial-No.	Inst.Pos.	Certif.	Function
Airspeed Ind.) *				I-Panel		
Altimeter) *				I-Panel		
Radio						
Microphone						
Loudspeaker						
Battery						
Lap Belt) *				Seat		
Shoulder Str.) *				Seat		
C.G.Hook) *	G 88	Tost		Landing G.		

Additionally with TAIL FIN TANK:

Thermometer	TF-00-59K	Störck		Seat, right		
Filling tube				Cockp.Pocket		

Additionally for Cloud Flying:

Turn and Bank						
Compaß, compens.						
Variometer						

Additional Equipment: (Check annually, Calibration not required)

Variometer						
Variometer						
Wheel	Kobold 103-20	Tost		Landing Gear		
Waterballast Bags				Wings		
Permanently fixed Ballast				Forward/Aft NONE		

Remark:) * Marked equipment counts for the final production weighing report as permanently installed minimum equipment, the rest as additional equipment

<Stamp> Signature of inspector

SERIAL-No.: _____	Reg.Signs: _____	CONTROL SURFACE WEIGHT / MOMENT
		Date: _____

Check whenever a change is suspected and after repairs

CONTROL SURFACE WEIGHT

	Limit Values	Measured Values	Cross invalid dimensions!
Left Aileron	2.78 - 3.20 kg 6.13 - 7.06 lbs	kg	
		lbs	
Right Aileron		kg	
		lbs	
Elevator	1.00 - 1.60 kg 2.21 - 3.53 lbs	kg	
		lbs	
Rudder	3.80 - 4.22 kg 8.38 - 9.30 lbs	kg	
		lbs	

CONTROL SURFACE MOMENT

Cross invalid dimensions!

	Limit-Moment	Rear Edge Weight	* Radius	= Moment
Left Aileron	1.85 - 3.00 cmkg 25.69 - 41.66 in oz	kg	cm	cmkg
		oz	in	in oz
Right Aileron		kg	cm	cmkg
		oz	in	in oz
Elevator	cmkg	kg	cm	cmkg
		oz	in	in oz
Rudder	± 1.33 cmkg ± 18.47 in oz	kg	cm	cmkg
		oz	in	in oz

(1 cmkg = 13.888 in oz)

<Stamp> _____
 Signature of inspector

SERIAL-No.: _____	Reg.Signs: _____	CONTROL SURFACE DEFLECTIONS
Check control surface deflections annually		Date: _____

AILERON DEFLECTIONS, measure at inner edge

	Limit (°)	Actual (°)	Radius mm/in	Limit mm/in	Actual mm/in
LEFT up	21° to 25°				
down	10° to 13°				
RIGHT up	21° to 25°				
down	10° to 13°				

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°			

CONTROL SYSTEM FRICTION Check control surface friction/play annually

	Limit (grams/lbs)	Actual (g/lbs)	Point of measurement
Elevator	maximum 100 / 0.110		30mm/1.2in below stick end
Aileron	200-500 / 0.22-1.102		30mm/1.2in below stick end
Rudder	maximum 500 / 1.102		at lower rudder edge

CONTROL SURFACES REAR EDGE PLAY

Fix control stick at neutral position of control surface

Aileron maximum of 1.8 mm/0.071 in left: _____ mm/in

right: _____ mm/in

Elevator maximum of 2.4 mm/0.095 in _____ mm/in

Cross invalid dimensions!

(Stamp) (Signature of Inspector)

EDITION: Oct. 15, 1992

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(7WLWE14)

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15. NOV. 1992

Alpha

LS7-WL

SERIAL-No.:	Reg.Signs:	ANNUAL INSPECTION CHECKLIST 1	
Mark as ☐ not existing/not examined + no faults follows: - defective, specify separately		Inspection date:	
See also page 3-1: Annual Inspection			
WING UNIT			
☐ Serial No. _____	☐ Rudder mounting		
☐ Finish	☐ Stabilizer mounting		
☐ Spar	☐ Bushes for wing root pins		
☐ Root ribs	☐ Tangential tubes		
☐ Root rib pins	☐ Tangential tubes, locking of bushes		
☐ Water tanks	☐ Cockpit		
☐ Drain holes	☐ Seat		
☐ Ailerons	☐ under seat		
☐ Air brakes	☐ lap belt fixing at seat		
☐ Connecting means	☐ Control stick		
☐ Aileron pressure marks	☐ Elevator drive under seat		
☐ drive at aileron	☐ Aileron drive under seat		
☐ drive at root rib	☐ Air brake drive under seat		
☐ fixed bearing and washer	☐ Landing gear drive under seat		
☐ bearings	☐ Aileron automatic connectors		
☐ sealing	☐ deflectors not bent		
☐ stops	☐ Air brake automatic connectors		
☐ ventilation	☐ Trim system and locking		
☐ Aileron-wing lateral gaps	☐ Pedals		
☐ Cracks	☐ Pedal adjustment		
☐ Compression or buckling	☐ Rudder cables		
☐ Air brake bearings	☐ Earth connections		
☐ cover springing	☐ Backrest adjustment at both ends		
☐ drive at root rib	☐ Trim weight fixing and nut		
☐ friction brake	☐ Nose hook fixing and drive		
☐ Main pins	☐ Tail skid, cable deflector at front		
☐ Turbulator tape fixing	☐ Tail wheel		
☐ Wing tip skids	☐ Connecting means		
WINGLETS	WATER BALLAST SYSTEM		
☐ Tube and ratchet	☐ Tail fin tank disassembly		
☐ Ribs and pins	☐ operating cable wear		
☐ Shell and finish	☐ corrosion		
☐ Ventilation	☐ valve operating ease		
HORIZONTAL TAIL UNIT	☐ Fin system function after reassembly		
☐ Serial No. _____	☐ Funnel filter, level indicator		
☐ Finish	☐ Opening before wing system		
☐ Sandwich shell	☐ Closing after wing system		
☐ Stabilizer ventilation	☐ Max. 90 seconds discharge time		
☐ Elevator ventilation	☐ Thermometer zero indication		
☐ Elevator drive	☐ function		
☐ Bearings	☐ Tail fin battery box and cover		
☐ Connection to fuselage	CANOPY		
☐ Connecting means	☐ Serial No. _____		
☐ Sealing	☐ Locking mechanism		
FUSELAGE	☐ Emergency release		
☐ Serial No. _____	☐ Ventilation system		
☐ Finish	☐ Window		
☐ Shell	☐ Canopy fixing system		
☐ Cracks in structure	☐ Gas strut operation		
☐ Drain holes			

(Stamp) (Signature of Inspector)

SERIAL-No.:	Reg.Signs:	ANNUAL INSPECTION CHECKLIST 2
RUDDER		Inspection date:
() Finish		() Air brake locked, cockpit lever at least 12mm (0.48 in) away from stop
() Shell		() Control surface friction
() Ventilation		() Control surface rear edge play
() Drive		() Trim system operation
() Fixed bearing and washer		() C.G. hook function / automatic release
() Bearings		() Nose hook function
() Connecting means		() Release cable end play existent with landing gear down?
LANDING GEAR		() Safety harness / multiple point buckle
() Undercarriage and axle		() Water ballast discharge
() Tyre		() Water system absolutely tight ?
() Springing		() Wing flex number _____/Minute
() Bearings and joints		
() Preset load at folding strut		GENERAL
() Doors		() Checklist
() Drive rods and bearings		() Fireproof type placard
() Connecting means		() Minimum Cockpit Load placard
() Locking		() Registration signs / Nationality marks
() Overcenter		() Anti-collision marking
() Wheel brake system		() Logbook
() C.G. hook fitting and drive		() Flight Manual
EQUIPMENT		() Maintenance Manual
() Minimum instrumentation		() Airworthiness Directives
() Additional instrumentation		() <u>Inspection for foreign matter</u>
() Operating range and limit marks		() Logbook notation
() Vacuum flasks		() Flight Manual notation page 9-1
() Function of instrumentation		() Min.Cockpit Load placard notation
() Tubing		() Weight and Balance plan notation
() Total energy unit		() Updating of TB-AD-List in Instr.f. Cont. Airworthiness
() Pitot system free of leaks		() Valid C.G.weighing dated _____
() Static system free of leaks		() Valid Equipm. List dated _____
() T.E. system free of leaks		
() Electrical wiring		() <u>Insp. of automatic couplings for possibly wrong rigging</u>
() Battery and fitting		
() Tail fin battery with main fuse		() Annual inspection hints page 3-1 checked
() Radio		() Faults specified on findings report
() Antenna system		() Permanent installations in baggage compartment according to chapter 11
() Communication check		
() Compass deviation list		
() Seat belt harness		
() Weight and balance plan		
() Data placard		
() Cockpit placards		
() Baggage compartment cover		
ADJUSTMENTS		
() Wings and horizontal tail		
() Play at root ribs		
() Zero setting of control surfaces		
() Control surface deflections according to page 8-6		
() Air brake extension min. 147 mm (5.787 in) at inner edge		
() Air brake locked, lateral gaps of cover: inner edge min. 1 mm (0.04 in) outer edge min. 2.5 mm (0.1 in)		

(Stamp) (Signature of Inspector)

Check air brakes for jamming/locking during retracting under load:

		Inspector
1	Check air brake levers in wing for corrosion at lower end.	
2	Check air brakes for jamming/locking during retracting under load: Simultaneously apply about 25 kg <55 lbs> to the rear at each lever without twisting upper member and retract.	
3	When under the load according to item 2 any kind of jamming on wing occurs, bearings must be replaced according to repair instruction "Air Brake Levers" immediately.	
4	With corrosion existent, but no jamming, bearings must be changed within 6 months.	

In a case of change of ownership please complete this form and send it back to the manufacturer's address below. This is the only practicable way to give you immediate notice of future technical changes, should they become necessary.

Type of sailplane: LS7

Serial Number: _____

Registration Signs: _____

Address of new owner:

Address of former owner:

Send to: Rolladen-Schneider Flugzeugbau GmbH
Mühlstrasse 10
D-6073 Egelsbach
Germany

Telephone: 06103-4126
Teletex: 6103985=LSFLUG
Telex: 176103985=LSFLUG
Fax: 06103-45526