LET Aeronautical Works, Kunovice, Czech Republic

Aero Holding Company, Prague, Czech Republic

MANDATORY BULLETIN No. L 33/004a

Sheet: 1
Of: 1
Enclosures: 16

Effectivity: The L33 SÓLO Sailplane Flight Manual (Doc. No. Do-L33.1012.5)

Reason: Small changes of AFM

Description: The Flight Manual holders shall replace old pages by the new ones enclosed to this bulletin:
0-1, 0-2, 2-2, 2-3, 2-9, 2-10, 3-1, 3-2, 3-3, 4-8, 4-9, 6-1, 6-2, 6-3, 6-4, 6-5.

To be accomplished not later than: Immediatelly after receiver this bulletin

To be accomplished by: The Flight Manual holder

Cost covered by: No costs arise

Material availability: Revised pages are enclosed

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Manhours:

95-01-24

Manufacturer

Civil Aviation Inspectorate

G 007004 N

0.1 RECORD OF REVISIONS

Any revision or amendment of the present Manual will be issued in the form of Bulletins, approved by the Civil Aviation Inspectorate of the Czech Republic, supplement of which will contain new (revised) pages. User's duty is to make a note about revisions in the Record of revisions and to replace existing pages with revised and effective ones. Revised or amended parts of the text will be indicated by a vertical line in the left hand margin and the revision No. and the date will be shown on the bottom left hand of the page.

Rev. No.	Affected Section	Affected pages	Date of issue	Bulletin No.	Date of Bulletin approval	Date of insertion and signature
1	0, 2, 3,4,6	0-1, 0-2, 2-2,2-3, 2-9,2-10,3-1, 3-2,3-3,4-8, 4-9, 6-1, 6-2, 6-3, 6-4, 6-5	Jan 20/95	L33/004a	Jan 31/95	

0.2 LIST OF EFFECTIVE PAGES

Pages identified as "Appr." provide information reguired to be furnished by the JAR - 22.

Section	Page	Date	Section	Page	Date
0	1	Jan 20/95	5	Appr. 1	Mar 25/94
	2	Jan 20/95		Appr. 2	Mar 25/94
	3	Mar 25/94		Appr. 3	Mar 25/94
				Appr. 4	Mar 25/94
1	1	Mar 25/94	6	1	Jan 20/95
	2	Mar 25/94		2	Jan 20/95
	3	Mar 25/94		3	Jan 20/95
	4	Mar 25/94		4	Jan 20/95
				5	Jan 20/95
2	Appr. 1	Mar 25/94	7	1	Mar 25/94
	Appr. 2	Jan 20/95		2	Mar 25/94
	Appr. 3	Jan 20/95		3	Mar 25/94
	Appr. 4	Mar 25/94		4	Mar 25/94
	Appr. 5	Mar 25/94		5	Mar 25/94
	Appr. 6	Mar 25/94		6	Mar 25/94
	Appr. 7	Mar 25/94		7	Mar 25/94
	Appr. 8	Mar 25/94		8	Mar 25/94
	Appr. 9	Jan 20/95		9	Mar 25/94
	Appr.10	Jan 20/95			
3	Appr. 1	Jan 20/95	8	1	Mar 25/94
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	Appr. 2	Mar 25/94			
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	Appr. 6	Mar 25/94			
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	Appr.10	Mar 25/94			
	Appr.11	Mar 25/94			
	Appr.12	Mar 25/94			

2.1 INTRODUCTION

Section 2 includes operating limitations,instrument markings, and basic placards necessary for safe operation of the sailplane, its standard systems and standard equipment. The limitations in this section are approved by the CAI, Czech Republic.

2.2 AIRSPEED

Speed		km/h IAS (KIAS)	Remarks
V_{NE}	Never exceed speed	248 (134)	Do not exceed this speed in any operation and do not use more than 1/3 of control deflection
V_{RA}	Rough air speed	158 (85)	Do not exceed this speed except in smooth air, and then only with caution. Examples of rough air are lee-wave rotor thunderclouds etc.
V_A	Manoeuvring speed	158 (85)	Do not make full or abrupt control movement above this speed, because under certain conditions the sailplane may be overstressed by full control movement
V_W	Maximum winch-launching speed	130 (70)	Do not exceed this speed during winch- or autotow-launching
V_T	Maximum aerotowing speed	158 (85)	Do not exceed this speed during aerotowing

V_{NE} airspeed limits above 4200 m(15000 ft) Pressure Altitude are reduced as follows:

Pressure Altitude (m)	5000	6000	7000	8000	9000	10000
V_{NE} km/h IAS	246	243	241	238	235	233

Pressure Altitude(ft)	15 000	20 000	25 000	30 000	35 000
V_{NE} KIAS	134	131	129	127	125

2.3 AIRSPEED INDICATOR MARKINGS

Marking	km/h IAS (KIAS)	Significance
Green arc	85 – 158 (46 - 85)	Normal Operating Range. (Lower limit is maximum weight 1.1 v_{SI} at most forward c.g. Upper limit is rough air speed)
Yellow arc	158 – 248 (85 – 134)	Manoeuvres must be conducted with caution and only in smooth air.
Red line	248 (134)	Maximum speed for all operations
Yellow triangle	90 (49)	Minimum approach speed at maximum weight with retracted air brakes.

2.4 WEIGHT

Maximum take-off and landing weight . . . . . 340 kg (750 lb)

Empty weight with standard equipment . . . . 210 kg (463 lb) ± 3%

Maximum weight of all non lifting part . . . . . 235 kg (518 lb)
(JAR - 22 requirement)

Pilot's weight range . . . . . 55 -110 kg (121 – 243 lb)

It is necessary to use a secured removable cushion with ballast of 7 kg (16 lb) when flown by a pilot (including parachute) weighing less than 62 kg (137 lb) see section 7.8.

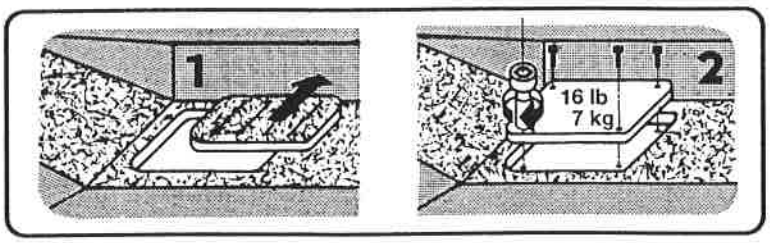
Maximum load in baggage compartment . . . . . 20 kg (44 lb)

WARNING

SUM OF BALLAST WEIGHT, BAGGAGE WEIGHT AND PILOTS WEIGHT (INCLUDING PARACHUTE) MUST NOT EXCEED 130 kg (287 lb).

(Cont.)

RH side cockpit floor



RH side cockpit floor

+	+	=	MAX.	**130 kg**
+		=	MIN.	**62 kg**

LH side cockpit frame

MAX. ALLOWABLE SPEED VS ALTITUDE

PRESSURE ALTITUDE (m) UP TO	5000	6000	7000	8000	9000	10000
SPEED km/h IAS, MAX.	246	243	241	238	235	233

or

MAX. ALLOWABLE SPEED VS ALTITUDE

PRESSURE ALTITUDE (FT) UP TO	15 000	20 000	25 000	30 000	35 000
SPEED KIAS, MAX.	134	131	129	127	125

instrument panel

MAX. WINCH LAUNCHING SPEED	130 km/h IAS
MAX. AEROTOWING SPEED	158 km/h IAS
MAX. MANOEUVRING SPEED	158 km/h IAS

or

MAX. WINCH LAUNCHING SPEED	70 KIAS
MAX. AEROTOWING SPEED	85 KIAS
MAX. MANOEUVRING SPEED	85 KIAS

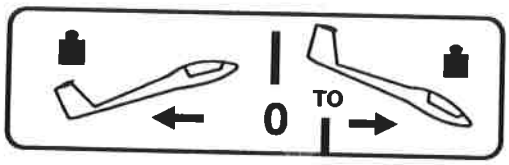
instrument panel

V_{NE} . . **248** km/h IAS
V_{RA} . . **158** km/h IAS

or

V_{NE} . . 134 KIAS
V_{RA} . . 85 KIAS

LH side cockpit floor



TRIMMER

instrument panel

CENTRE OF GRAVITY RANGE
FRONT LIMIT 21 % MAC
REAR LIMIT 39 % MAC

L 33 SÓLO

SAILPLANE FLIGHT MANUAL

SECTION 3

Emergency procedures

Contents

3.1 INTRODUCTION

Section 3 provides checklist and amplified procedures for coping with emergencies that may occur.

3.2 CANOPY JETTISON

- pull both left hand opening handle and right hand emergency jettisoning handle by both hands backward simultaneously
- push the canopy upwards using both hands

3.3 BAILING OUT AFTER CANOPY JETTISON

- undo safety harness
- exit the aircraft over the side of the cockpit

3.4. STALL RECOVERY

Low Speed Stall (One g)

- move control stick forward slightly; check airspeed within normal operation range

Stall at Speed (Accelerated)

- check forward with control stick to reach subcritical angle of attack; ELIMINATE bank by rudder

3.5 SPIN RECOVERY (same as for Normal Procedures)

The sailplane is approved for spins in all configurations.

- check ailerons neutral
- apply rudder opposite to the direction of spin

(Cont.)

- move control stick forward until rotation ceases
- Centralize rudder, and easy out of the ensuing dive

3.6 SPIRAL DIVE RECOVERY

- recover bank by mutually co-ordinated movements of the rudder and aileron
- recover dive

B. Winch - launching

Maximum speed for winch-launch V_w = 130 km/h IAS (70 KIAS).

WARNING

WINCH - LAUNCHING BY THE NOSE HOOK IS PROHIBITED!

Trim in neutral position (0). To keep rope in tension, use wheel brake smoothly to avoid tow-rope overriding. Unstick at a speed of about 78 km/h IAS (42 KIAS) with the control stick pushed almost fully foward in case of aft centre of gravity position, or slightly pulled aft in case of forward centre of gravity position.
Having reached safe altitude increase pitch attitude for climbing by pulling slightly aft on the control stick.
After reaching maximum height the rope will disconnect automatically. If necessary to secure a manual release pull several times tow-rope handle to the stop.

4.5.2 Flight

The sailplane is well manoeuvrable and controllable within whole range of airspeed, configuration and centre of gravity position. During roll from 45° bank to opposite bank the ailerons are effective without noticeable slip tendency.The ailerons and rudder can be fully deflected - at airspeeds below 158 km/h IAS (85 KIAS).

4.5.3 Approach and landing

The recomended approach speed with retracted air brakes is 90 km/h IAS (49 KIAS), with fully extended air brakes is 110 km/h IAS (59 KIAS). Extend the air brakes slowly.
Slip is well controllable and it is possible to use it as an efficient means for landing path shortening when simultaneously extending the air brakes.
The recommended attitude for landing should allow the main gear wheel to touchdown before the tail wheel contacts the ground. To avoid long ground-run after landing touch the ground at the lowest safe speed about 70 km/h IAS (38 KIAS).

NOTE

Due to great effectivity of air brakes it is recommended to handle very carefully at altitudes just above the ground.

4.5.4 High speed features

In flight at a high speed up to 248 km/h IAS (134 KIAS) the sailplane is well controllable. Full deflection of the elevator and rudder are permissible only up to speed V_A = 158 km/h IAS (85 KIAS). One-third deflection is permissible at a speed of V_{NE}. It is necessary to avoid abrupt and violent motions of elevator.
In rough air, i.e. in lee-wave rotor, thunderclouds, visible vortices or during flight across mountain ranges maximum speed V_{RA} = 158 km/h IAS (85 KIAS) must not be exceeded.
Air brakes may be opened up to a speed of V_{NE}. At this speed air brakes should be used only in emergency or at non-intended exceeding of the maximum airspeed. Quick opening results in high loads and abrupt air braking on account of great air brakes efficiency.
A dive should be recovered less abruptly with air brakes extended than with retracted air brakes (see section 2.7 Manoeuvring load factors).
With air brakes extended dive at a speed of 195 km/h IAS (105 KIAS) with the nose attitude near 45° below the horizon. No loose objects should be in the cockpit.

Weight and balance

Contents

6.1 INTRODUCTION

This Section describes the procedures for establishing the basic empty weight and moment of the sailplane. Procedures for calculating the weight and moment are also provided in "Maintenance Manual for the L 33 sailplane".

6.2 WEIGHING AND MOMENT RECORD

Empty weight (standard) . . . . . 210 kg (463 lb) ± 3%
Moment . . . . . 451.3 kg m (39 134 lb in)

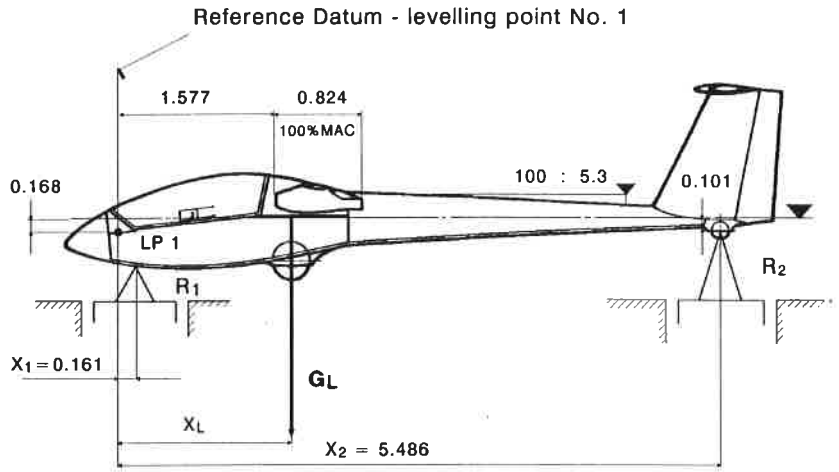


FIG. 6 - 1

The weighing record is on page 6-5 and the calculating procedure of centre of gravity position (moment) is provided in "Maintenance Manual for the L 33 sailplane".

6.3 EQUIPMENT LIST

Standard (S) items must be installed for all operations.Optional (O) items are available for installation. Installed items for each sailplane equipment list will be marked with an "X" and included in the Empty Weight/c.g. pos of the Weight and Balance Record.

	S	O	Subject	Type	Weight kg	Arm from the reference datum (levelling point No. 1) mm	Date of installation
1	X		Airspeed indicator	LUN 1106.21-8	0.40	506	
2	X		Vertical speed indicator ± 5 m/s	LUN 1141	0.48	506	
3	X		Altimeter	LUN 1124.01-8	0.85	506	
4	X		Lower hook	TOST G-88/1-83	0.90	1346	
5	X		Mag. direction indicator	LUN 1225	0.10	468	
6		O	Eletric turn-and-bank/side indicator	LUN 1211.1	0.37	496	
7		O	Vertical speed indicator ± 30 m/s	LUN 1147.10-8	0.5	506	
8		O	Forward hook	TOST E-85/1-85	0.80	256	
9		O	VHF transceiver	AR 3201	4.15	1341	
10		O	Accelerometer	AM-10	0.25	525.0	
11		O	Paint	white			

(cont.)

	S	O	Subject	Type	Weight kg	Arm from the reference datum (levelling point No. 1) mm	Date of installation
12							
13							
14							
15							

6.4 WEIGHT AND BALANCE LOADING FORM

	Weight G (kg)	Arm X (m)	Moment M (kg m)
Empty weight			
Pilot		0.996	
Luggage		1.796	
Totals Σ			

$$\Sigma X = \frac{\Sigma M}{\Sigma G}$$

Totals must be within approved weight and C.G. limits.

Date	Empty weight kg (lb)	c/g Pos. % MAC	Permited pilot weight kg (lb)				Approved	
			Max. baggage 20 kg (44 lb)		No baggage		Date	Signed
			Max.	Min	Max.	Min.		