

# MANDATORY BULLETIN

**MB No: L33/011a**

Concerning: Sailplane Flight Manual for the L 33 SÓLO (Do-L33.1012.3)

Reason: Addition of metric units to the SFM.

Replace old pages by changed and new ones dated Apr 23/99.

Changed and new pages:

0-1, 0-2,

1-4,

2-2, 2-5, 2-8, 2-9, **2-10**,

5-2, 5-3, 5-4, 5-5, **5-6**,

6-2, 6-3, 6-4

To be carried out at the latest by: On receiving this bulletin.

To be carried out by: Holder of SFM.

Costs to be covered by: No costs arise.

Necessary material to be supplied by: Changed and new pages are enclosed.

Bulletin becomes effective: Since the date of receiving.

Manhours required: Ø

Total number of pages: Title sheet of MB and 16 enclosed pages



.....  
Manufacturer

Engineering data contained in this Bulletin is CAA Approved.

Date:



## SAILPLANE FLIGHT MANUAL

### 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, 4, 5, 6	0-1, 0-2, 2-2, 2-3, 2-4, 2-5, 2-6, 2-7, 4-7, 4-8, 4-9, 4-11, 4-12, 5-3, 6-1, 6-2, 6-3, 6-4, 6-5	Oct 31/95	L33/003a	Nov 15/95	
2.	0, 1, 2, 5, 6	0-1, 0-2, 1-4, 2-2, 2-5, 2-8, 2-9, 2-10, 5-2, 5-3, 5-4, 5-5, 5-6, 6-2, 6-3, 6-4	Apr 23/99	L33/011a	Apr 30/99	



## SAILPLANE FLIGHT MANUAL

### 0.2 LIST OF EFFECTIVE PAGES

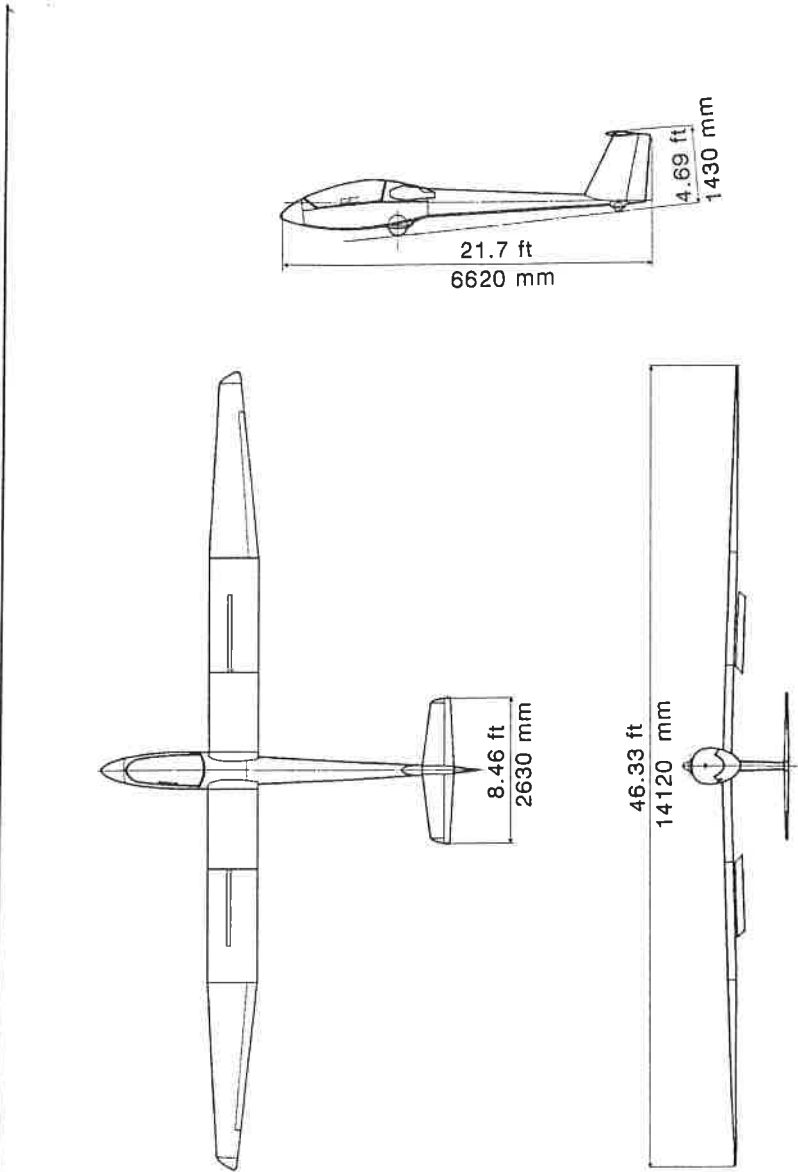
Pages identified as "Appr." provide information required to be furnished by the Federal Aviation Regulations.

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		Appr. 4		Apr 23/99	
				Appr. 5	Apr 23/99
				Appr. 6	Apr 23/99
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## SAILPLANE FLIGHT MANUAL

### 1.5 THREE - VIEW DRAWING (Dimensions in ft/mm)





## SAILPLANE FLIGHT MANUAL

### 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 FAA approved by the CAI, Czech Republic.

### 2.2 AIRSPEED

Speed		CIAS (km/h IAS)	Remarks
V <sub>NE</sub>	Never exceed speed	134 (248)	Do not exceed this speed in any operation and do not use more than 1/3 of control deflection
V <sub>RA</sub>	Rough air speed	85 (158)	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 <sub>A</sub>	Manoeuvring speed	85 (158)	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 <sub>W</sub>	Maximum winch-launching speed	70 (130)	Do not exceed this speed during winch- or autotow-launching
V <sub>T</sub>	Maximum aerotowing speed	85 (158)	Do not exceed this speed during aerotowing

Pay attention to the fact that with increasing altitude the true air speed (TAS) increases as the indicated airspeed (IAS) decreases. This fact does not interfere with the strength and load factor of the sailplane, though to protect from aeroelastic buffeting the following indicated airspeed (IAS) must not be exceeded.

V<sub>NE</sub> airspeed limits above 13,780 ft (4,200 m) Pressure Altitude are reduced as follows: \* Altimeter setting at 29.92 in. Hg (1,013.2 hPa).

Pressure altitude ft*	15,000	20,000	25,000	30,000	35,000
V <sub>NE</sub> KIAS	133	131	129	127	125

Pressure altitude m*	5,000	6,000	7,000	8,000	9,000	10,000
V <sub>NE</sub> km/h IAS	246	243	241	238	235	233

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## SAILPLANE FLIGHT MANUAL

### 2.7 MANOEUVRING LOAD FACTORS

The following load factors must not be exceeded in manoeuvres.

At a speed of  $v_A = 85$  KIAS (158 km/h IAS)  $n = +5.3$   
 $n = -2.65$

At a speed of  $v_{NE} = 134$  KIAS (248 km/h IAS)  $n = +4$   
 $n = -1.5$

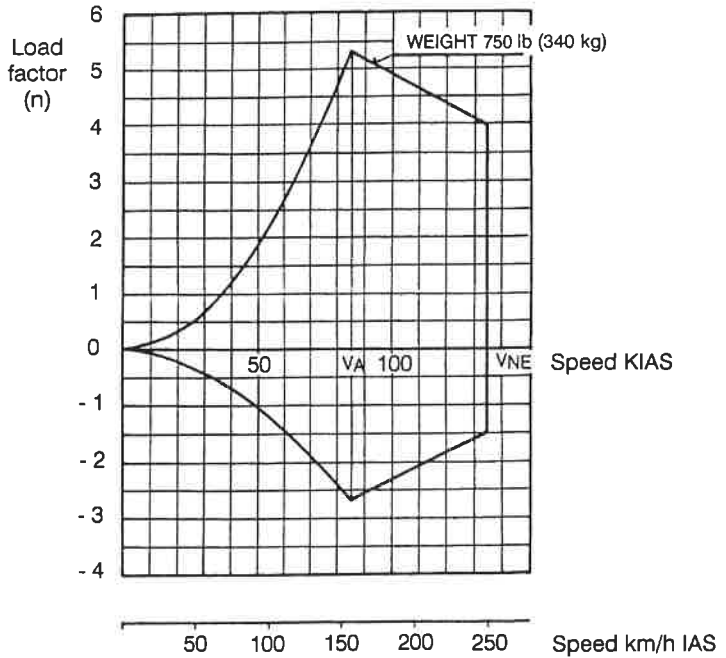


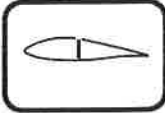
FIG. 2 - 1



## SAILPLANE FLIGHT MANUAL

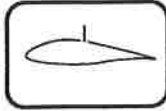
### 2.13 LIMITATION PLACARDS

LH side cockpit frame



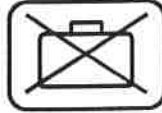
AIR BRAKES RETRACTED

LH side cockpit frame



AIR BRAKES EXTENDED

rear cockpit bulkhead



DO NOT PUT BAGGAGE

control stick



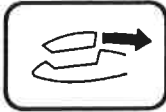
WHEEL BRAKE

release knob



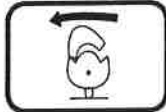
RELEASE

RH side cockpit frame



CANOPY JETTISON

LH side canopy frame



CANOPY OPEN

RH side cockpit frame



SEAT BACK

bottom of instr. panel



PEDAL ADJUSTMENT

RH side cockpit floor

#### OPERATING LIMITATIONS

THE MARKINGS AND PLACARDS INSTALLED IN THIS SAILPLANE CONTAIN OPERATING LIMITATIONS WHICH MUST BE COMPLIED WITH WHEN OPERATING IN UTILITY CATEGORY. OTHER LIMITATIONS ARE CONTAINED IN SAILPLANE FLIGHT MANUAL.

MAX. GROSS WEIGHT  
EMPTY WEIGHT, STANDARD

750 LB  
463 LB

APPROVED MANOEUVRES:

STEEP TURN  
CHANDELLE(CLIMBING)  
LAZY EIGHT

LOOP  
STALL TURN  
SPIN

RH side cockpit frame



AIR VENT

or

#### OPERATING LIMITATIONS

THE MARKINGS AND PLACARDS INSTALLED IN THIS SAILPLANE CONTAIN OPERATING LIMITATIONS WHICH MUST BE COMPLIED WITH WHEN OPERATING IN UTILITY CATEGORY. OTHER LIMITATIONS ARE CONTAINED IN SAILPLANE FLIGHT MANUAL.

MAX. GROSS WEIGHT  
EMPTY WEIGHT, STANDARD

340 kg  
210 kg

APPROVED MANOEUVRES:

STEEP TURN  
CHANDELLE(CLIMBING)  
LAZY EIGHT

LOOP  
STALL TURN  
SPIN

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## SAILPLANE FLIGHT MANUAL

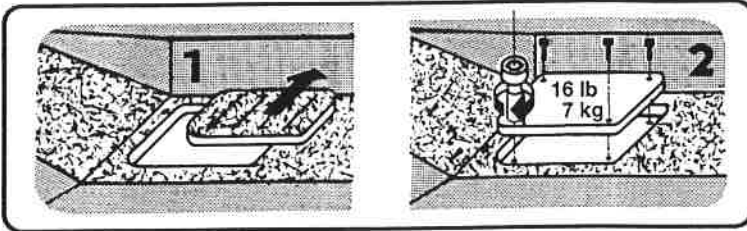
floor behind seat



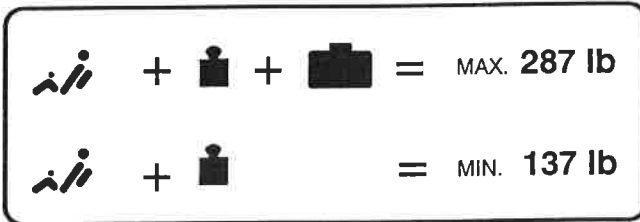
or



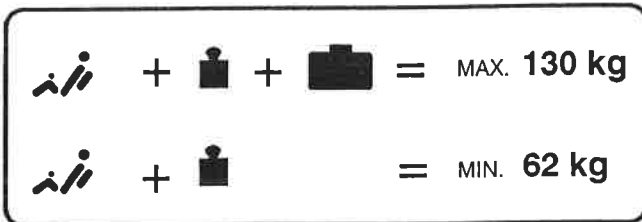
RH side cockpit floor



RH side cockpit floor



or







## SAILPLANE FLIGHT MANUAL

LH side cockpit frame

### 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

or

### MAX. ALLOWABLE SPEED VS ALTITUDE

PRESSURE ALTITUDE (m) UP TO	5 000	6 000	7 000	8 000	9 000	10 000
SPEED km/h IAS, MAX.	246	243	241	238	235	233

instrument panel

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

instrument panel

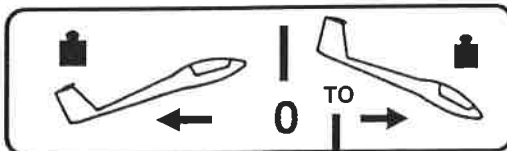
VNE	134 KIAS
VRA	85 KIAS

or

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

VNE	248 km/h IAS
VRA	158 km/h IAS

LH side cockpit floor



TRIMMER

instrument panel

<b>CENTRE OF GRAVITY RANGE</b>	
FRONT LIMIT	21 % MAC
REAR LIMIT	39 % MAC



### 5.1 INTRODUCTION

Section 5 provides approved data for airspeed calibration, stall speeds and non - approved further information. The data in the charts has been computed from actual flight tests with the sailplane in good condition and using average piloting techniques.

### 5.2 APPROVED DATA

#### 5.2.1 Airspeed indicator system calibration

(Assumes zero instrument error)

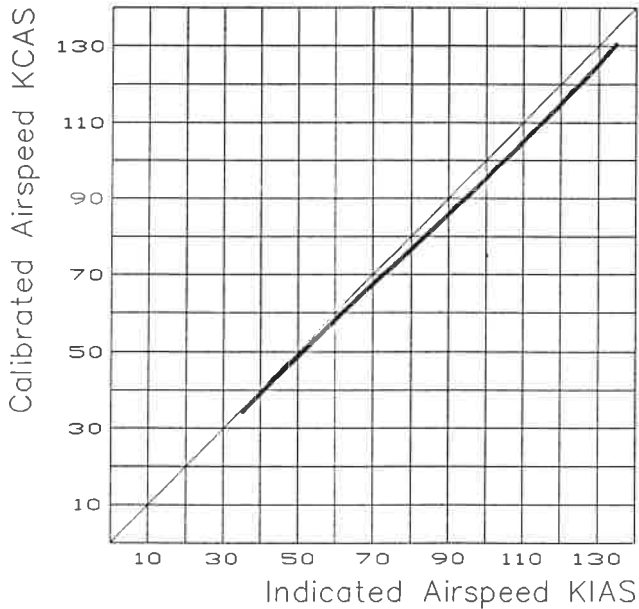


FIG.5 - 1a **Airspeed in KIAS**

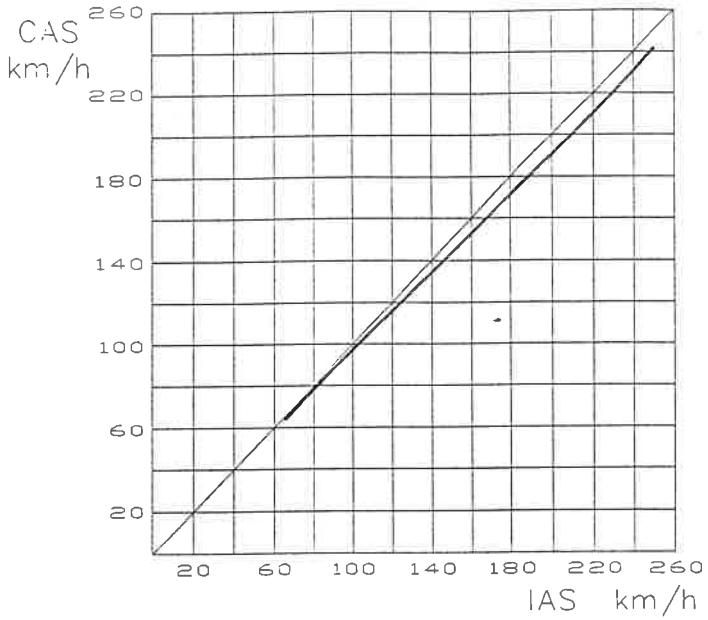


FIG.5 - 1b Airspeed in km/h IAS



## SAILPLANE FLIGHT MANUAL

### 5.2.2 Stall speeds (KIAS)

The effect of weight on stall speed is given in Fig. 5 - 2.

There is a distinctive stall warning at the maximum take-off weight and forward centre of gravity position at a speed of 40 KIAS (75 km/h). At a speed of 38 KIAS (70 km/h) the sailplane begins to lose altitude without downward pitching motion. The full effectivity of control surfaces is maintained during this manoeuvre.

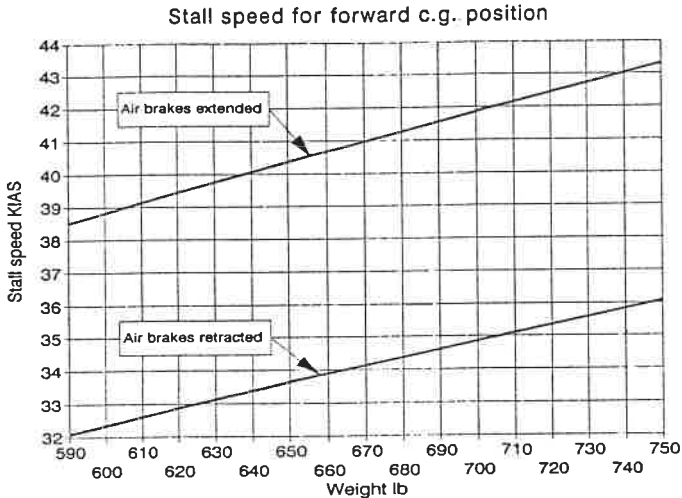


FIG.5 - 2a Airspeed in KIAS, Weight in pounds

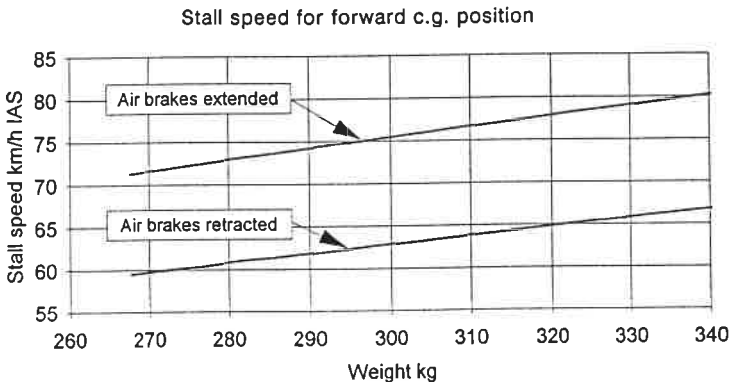


FIG.5 - 2b Airspeed in km/h IAS, Weight in kilograms



## SAILPLANE FLIGHT MANUAL

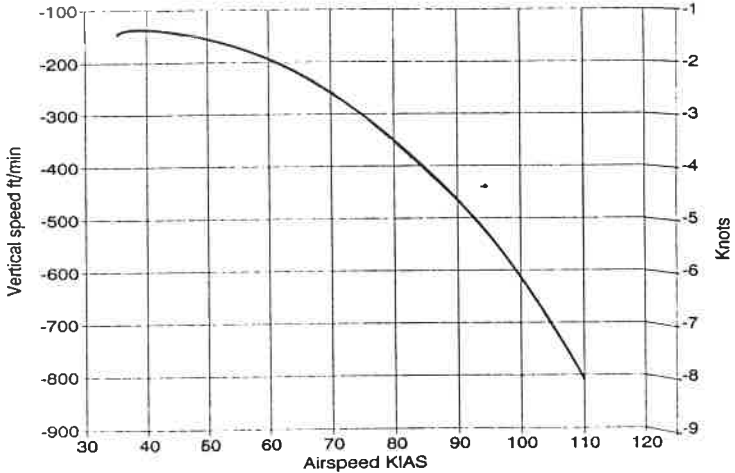
### 5.3 NON - APPROVED FURTHER INFORMATION

Maximum demonstrated operating altitude 18,045 ft (5,500 m).

#### 5.3.1 Flight polar

Flight polar with take off weight 750 lb (340 kg).

Air brakes retracted



Air brakes extended

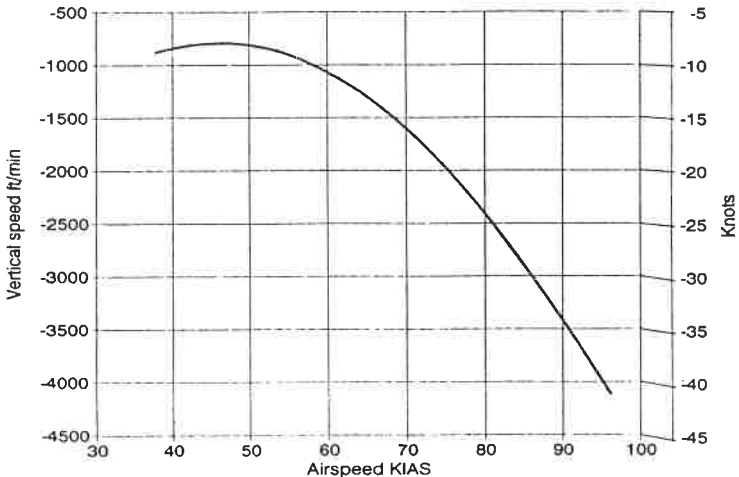


FIG.5 - 3a Airspeed in KIAS, Vertical speed in ft/min

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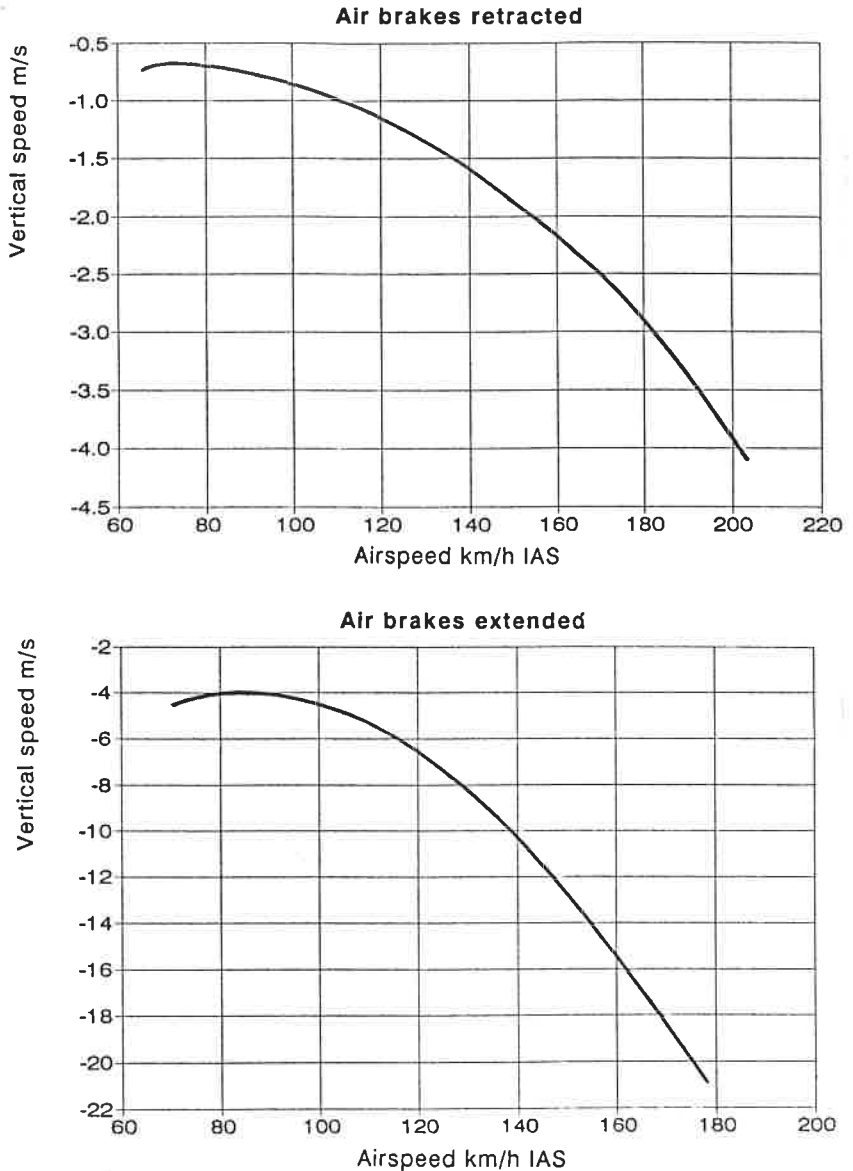


FIG.5 - 3b Airspeed in km/h IAS, Vertical speed in m/s



## SAILPLANE FLIGHT MANUAL

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

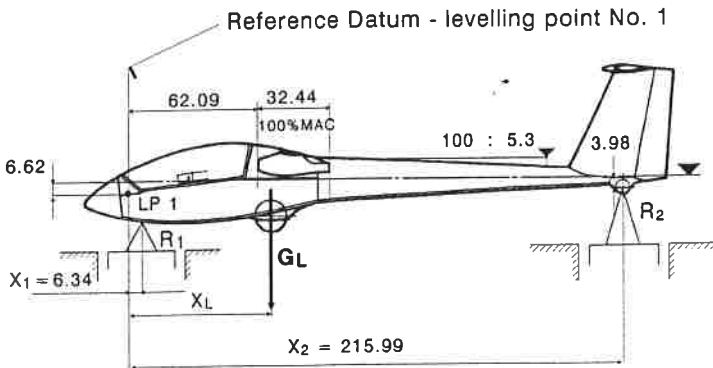


FIG. 6 - 1a Dimensions in inches

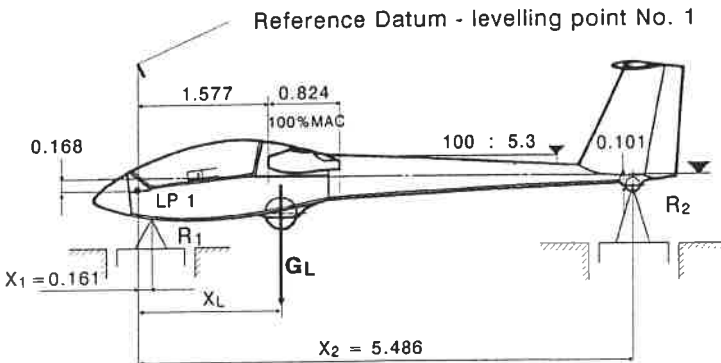


FIG. 6 - 1b Dimensions in metres

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".



## SAILPLANE FLIGHT MANUAL

### 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 lb (kg)	Arm from the reference datum (levlling point No. 1) in (mm)	Date of installation
1	X		Airspeed indicator	LUN 1106.13-8	0.88 (0.40)	19.9 (506)	
2	X		Vertical speed indicator ± 1000 ft/min <b>or</b> Vertical speed indicator ± 10 knots	LUN 1141.02  LUN 1141.04	1.06 (0.48)  1.06 (0.48)	19.9 (506)  19.9 (506)	
3	X		Altimeter			19.9 (506)	
4			Mag. direction indicator	LUN 1225	0.22 (0.10)	18.4 (468)	
5	X		Lower hook	TOST G- 88/1-83	1.98 (0.80)	53.0 (1,346)	
6		O	Eletric turn-and-bank/side indicator	LUN 1211.1	0.81 (0.37)	19.5 (496)	
7		O	Vertical speed indicator ± 6000 ft/min <b>or</b> Vertical speed indicator ± 60 knots	LUN 1147.12-8  LUN 1147.23-8	1.10 (0.50)  1.10 (0.50)	19.9 (506)  19.9 (506)	

(cont.)





## SAILPLANE FLIGHT MANUAL

	S	O	Subject	Type	Weight lb (kg)	Arm from the reference datum (levlling point No. 1) in (mm)	Date of installation
8		O	Forward hook	TOST E- 85/1-85	1.76 (0.80)	10.1 (256)	
9		O	VHF transceiver	AR 3201	9.15 (4.15)	52.8 (1,341)	
10		O	Paint	white			
11							
12							

### 6.4 WEIGHT AND BALANCE LOADING FORM

	Weight G lb (kg)	Arm X in (m)	Moment M lb.in (kg.m)
Empty weight			
Pilot		39.21 (0.996)	
Luggage		70.709 (1.796)	
Totals $\Sigma$			

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

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