AIRPLANE FLIGHT MANUAL

Z 242 L

Document No. 003.012.1

Serial No.: .....

Registration Mark: .....

Manufacturer: **ZLIN AIRCRAFT a.s.**
OTROKOVICE 765 81
CZECH REPUBLIC

Category: **ACROBATIC (A)**
UTILITY (U)
NORMAL (N)

Certification Basis: **FAR Part 23** as amended trough **Amendment 23 - 41** inclusive
FAR Part 36 as amended trough **Amendment Amdt. 36 - 20** inclusive
ICAO, Annex 16.

THIS DOCUMENT MUST BE CARRIED IN THE AIRPLANE AT ALL OPERATION TIMES!

THIS AIRPLANE FLIGHT MANUAL IS EASA APPROVED UNDER APPROVAL NO.: 10042932.

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The English version has been translated with care and is accurate to the best of editor's knowledge. However in all official matters the original Czech version is the authoritative document.

THIS AIRPLANE FLIGHT MANUAL SUPERSEDES ALL "AIRPLANE FLIGHT MANUALS OF THE Z 242 L AIRCRAFT" ISSUED IN ENGLISH VERSION, WHICH ARE NOT MARKED ON THE TITTLE PAGE WITH DOCUMENT NUMBER 003.012.1

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0.3.2 Log of revisions

Rev. No.	Description / eligibility	Pages affected:	Date of issue of new page	Date of revision incorporation and signature
1	Implementation of new load spectrum	0-5, 0-7, 2-9	1. 6. 2013	
2	Formal corrections in FM *(correction of values for weight and C/G position calculation, correction of inner dimensions of cockpit and correction of english translation)*	0-5, 0-7, 0-8, 1-12, 4-24, 6-9, 6-10, 6-11, 6-12	8. 6. 2016	

0.4 LIST OF EFFECTIVE PAGES

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1.25 CABIN AND ENTRY DIMENSIONS

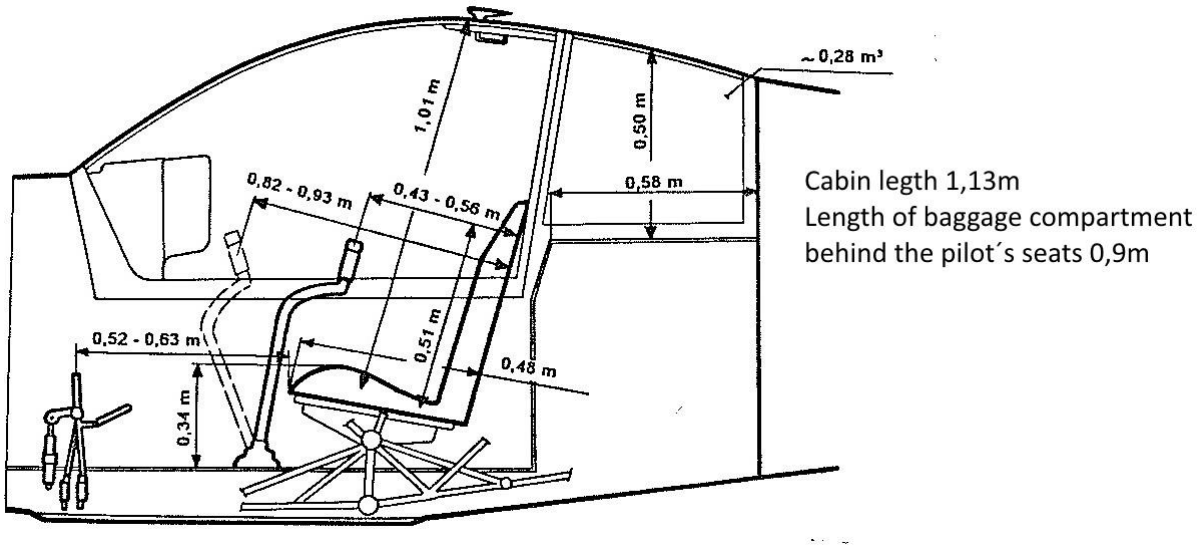

Fig. 1-9

1.27 BAGGAGE SPACE AND ENTRY DIMENSIONS

The dimensions of aircraft baggage compartment are described on Figure 1-9.

1.29 SPECIFIC LOADINGS

Category		Loading			
		Specific wing loading		Specific power loading	
		kg/m2	lb/sq.ft	kg/kW	lb/HP
Acrobatic	(**A**)	70	14.3	6.51	10.7
Utility	(**U**)	73.6	15.1	6.85	11.3
Normal	(**N**)	78.6	16.1	7.32	12.0

Fig. 1-10

WARNING:

(1) DURING SPIN ENTERING AND SPINNING KEEP CONTROL STICK IN FULL PULL POSITION.

(2) THERE IS A RISK OF ENGINE CUT-OFF AT SPINNING WITH LEAN MIXTURE.

(3) DURING ELEVATOR PUSHING AT SPIN RECOVERY THE CONTROL FORCE PEAK MAY REACH THE UPPER LIMIT 250N IF THE ACTION IS MORE "DYNAMIC" THAN RECOMMENDED. IF ELEVATOR PUSHING IS TOO SLOW, MORE ADDITIONAL TURNS MAY BE EXPECTED.

(4) UNLESS THE DESCRIBED RECOVERY PROCEDURE IS FOLLOWED MORE ADDITIONAL TURNS AND INCREASED ALTITUDE LOSS MAY BE EXPECTED.

(5) IF THE PROCEDURE SPECIFIED FOR SPIN RECOVERY IS NOT COMPLIED WITH, THE RECOVERY MAY BE RATHER DELAYED. IN THIS CASE RETURN THE ELEVATOR AND RUDDER CONTROL TO THE POSITION CORRESPONDING TO THE SPIN ENTRY AND REPEAT SPIN RECOVERY.

NOTES:

(1) At correct recovery procedure one or less additional turn after one spin turn and less than one and half additional turn after more spin turns are considered as normal.

(2) During spinning the autorotative motion is characterised by a progressive increase of angular velocity up to 180° per second in the 3rd turn, when the spinning is stabilised.

(3) During spin recovery after two and more turns, it is recommended to use both hands to push the control stick.

(4) Altitude loss in practice of spin, including the recovery of the dive:

1 turn before recovery	approx.	1150 ft (350 m) - category **A**, **U**
3 turn before recovery	approx.	1650 ft (550 m) - category **A**, **U**
6 turn before recovery	approx.	2300 ft (700 m) - category **A**, **U**

C. Inverted spin recovery

(1)	Mixture control	- PUSH MAX. "RICH"
(2)	Throttle control	- PULL IDLING
(3)	Rudder	- FULL DEFLECTION AGAINST TO THE DIRECTION OF ROTATION
(4)	Elevator	- PULL THE CONTROL STICK SIMULTANEOUSLY OR IMMEDIATELY AFTER APPLYING THE RUDDER
(5)	After rotation has stopped:	
	(a) Rudder	- NEUTRAL POSITION
	(b) Elevator	- PULL STEADILY CONTROL STICK TO RECOVER AIRCRAFT FROM DIVING

6.5.2 Weight and balance check procedure

CAUTION:

THE PILOT IS OBLIGED TO CHECK THE TAKE-OFF WEIGHT, THE VARIABLE LOAD AND THE CENTRE OF GRAVITY POSITION BEFORE EACH FLIGHT.

The calculation shall be carried out on the "Weight and Balance Record".

Weight and Balance Record

<table>
<tr><td rowspan="3">No.</td><td colspan="2">Date:</td><td>Type: Z 242L</td><td colspan="4">S/N:</td></tr>
<tr><td colspan="5">Registration Mark:</td></tr>
<tr><td colspan="2" rowspan="2">Description:</td><td rowspan="2">Maximum permissible variable load</td><td colspan="2">Weight</td><td colspan="2">Static moment</td></tr>
<tr><td>kg</td><td>lb</td><td>kgm</td><td>lbinch</td></tr>
<tr><td>1.</td><td colspan="2">Basic Empty Weight</td><td>-</td><td></td><td></td><td></td><td></td></tr>
<tr><td rowspan="2">2.</td><td rowspan="2">Seats</td><td>left</td><td>max. 100 kg* (220 lb)</td><td></td><td></td><td></td><td></td></tr>
<tr><td>right</td><td>max. 100 kg* (220 lb)</td><td></td><td></td><td></td><td></td></tr>
<tr><td>3.</td><td colspan="3">MAIN TANKS……..……litres
(.……...U.S.gal)</td><td></td><td></td><td></td><td></td></tr>
<tr><td>4.</td><td rowspan="2">Category N</td><td colspan="2">AUXILIARY TANKS ...….....litres
(…….....….U.S.gal)</td><td></td><td></td><td></td><td></td></tr>
<tr><td>5.</td><td colspan="2">Baggage – total max. 20 kg (44,10 lb)</td><td></td><td></td><td></td><td></td></tr>
<tr><td>6.</td><td colspan="3">Σ</td><td></td><td></td><td></td><td></td></tr>
<tr><td>7.</td><td colspan="3">Check C/G position :</td><td colspan="4">$\overline{X}_T$ = %b_{MAC}</td></tr>
</table>

** applicable for L 242 and E 242 seats*

Fig. 6-7

Calculating procedure:

(1) The Basic empty weight and Static moment are determined in Section 6.3.

(2) The procedure for calculating the static moments of variable loads is described in Section 6.5.1.

(3) Sum up the Weights and the static moments in the "Weight and balance record" columns.

(4) The loading of the airplane is ACCEPTABLE if the intersection of the "static moment" and "total weight" lines lay within the loading envelope in appropriate category in the "Centre of gravity position check graph" - Section 6.5.3.

Sample problem

Task:

Check the take-off weight and the centre of gravity position for the following flight conditions:

(1) Basic empty weight - 730 kg,
Static moment – 476,7 kgm

(2) Left pilot 73 kg (front position of seat)

(3) Right pilot 96 kg (rear position of seat)

(4) Fuel in the main tanks 2x60 litres

(5) Fuel in the auxiliary tanks 2x20 litres

(6) Total weight of baggage 20 kg

NOTE:

Conversion units of fuel:

1 liters	= 0,72 kg	= 1,587 lb
1 U.S.gal.	= 2,725 kg	= 6,010 lb

Calculation

(1) Enter the basic empty weight/moment values into “Weight and balance record” line (1) (see task - weight 730 kg, static moment 476 kgm).

(2) Determine the values of static moments for the left and right pilots according to Sect. 6.3:
a) Left pilot 73 x 0,856 = 62,5 kgm
b) Right pilot 96 x 0,956 = 91,8 kgm

Enter the weights and static moments of the pilot into line (2).

NOTE:

For determining the static moments of the pilots, the position of the seat must be observed.

(3) Calculate the fuel weight in the main tanks. Conversion coefficient is 0,72 kg = 1 litres of fuel
Fuel weight = 120 x 0,72 = 86,4 kg
According to Sect. 6.3., determine the fuel static moment in the main tanks = 86,4 x 0,750 = 64,8 kgm
The weight and the fuel static moment in the main tanks are entered on line (3).

(4) Calculate the fuel weight in the auxiliary tanks. Conversion coefficient is 0,72 kg = 1 litres of fuel
Fuel weight = 40 x 0,72 = 28,8 kg
According to Sect. 6.3., determine the fuel static moment in the auxiliary tanks = 28,8 x 0,948 = 27,3 kgm
The weight and the fuel static moment in the main tanks are entered on line (4).

(5) According to Sect. 6.3., determine the value of static moment of the baggage = 20 x 1,766 = 35,3 kgm
Enter the weight and the static moment of the baggage on line (5).

(6) Calculate sums of the weights and of the static moments and enter them on line (6).
Σ of weights = 1034,2 kg (point A - graph)
Σ of static moments = 757,7kgm (point B - graph)

(7) The check of the centre of gravity position shows the compliance with the limitation envelope in the “C/G position check” graph, Section 6.5.3.
The resulting centre of gravity position is 24,3 % b_{MAC}.

Filled Weight and Balance Record according to the example

No.	Date:		Type: Z 242L	S/N: example			
				Registration Mark: example			
	Description:		Maximum permissible variable load	Weight		Static moment	
				kg	lb	kgm	lbinch
1.	Basic Empty Weight		-	730		476	
2.	Seats	left	max. 100 kg* (220 lb)	73		62,5	
		right	max. 100 kg* (220 lb)	96		91,8	
3.	MAIN TANKS……..……..litres (……...U.S.gal)			86,4		64,8	
4.	Category **N**	AUXILIARY TANKS ...…....litres (…….....….U.S.gal)		28,8		27,3	
5.		Baggage – total max. 20 kg (44,10 lb)		20		35,3	
6.	Σ			1034,2		757,7	
7.	Check C/G position acc. to graph 6.5.3 / Fig. 6-8 or calculate see 6.1.2 (4)			$\overline{X}_T$ =		24,3	$\%b_{MAC}$

** applicable for L 242 and E 242 seats*

Fig. 6-8

CONCLUSION: The point 3 is situated in diagram the permissible centre of gravity and NORMAL category weight limit range. With regard to weight and centre of gravity the flight may be executed.

6.5.3 Centre of gravity position check diagram

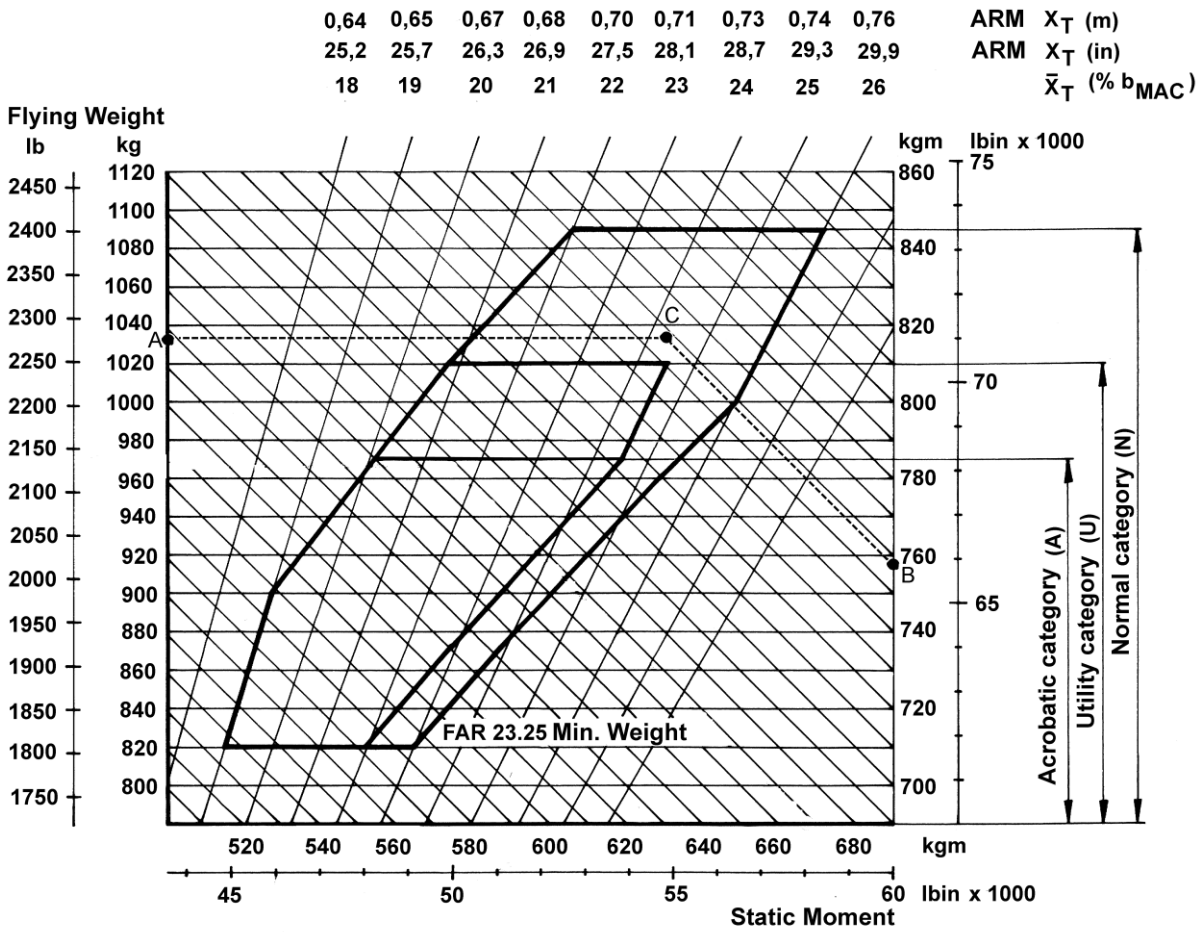

Fig. 6-9