GLIDING FEDERATION OF AUSTRALIA

AIRWORTHINESS DIRECTIVE GLIDERS: Reference No. GFA/AD/162 PILATUS 3

GLIDER TYPE AFFECTED: Pilatus B4-PC11, Pilatus B4-PC11A, all Serial numbers.

SUBJECT: Revision of Flight Manual Documents Nos. 01473 and 01574E

BACKGROUND: The figures for C.G. range and distances, main-tail wheel/ main wheel- wing leading edge as stated in the Approved Flight manual have to be revised.

ACTION: Enclosed are the revised pages which have to be exchanged in the Flight Manual of your B4 glider. (Document No. 01473 for all B4-PC11's and Document No. 01574E for all B4-PC11A's)

The new pages No. 16/17 or 18/19 respectively, giving weight and balance information, have to be filled in as follows:-

1. Under para 4.1(a) "Record of Empty Weight", transfer the figures (unchanged) from the existing page.
2. Insert the actual figures in the formula para 4.1(b) and compute the figure "x" (the figures W_R and W_{Tot} remain unchanged).
3. Fill in the table under para 4.2 "state of Empty Weight and Load", inserting the newly computed figure "x" and using the (revised) formulas given in para 4.5. The sample appended hereto for serial number 193 is included as a guide to how to conduct the revisions. (The figures struck out are the existing data to be changed).

COMPLIANCE: Compliance with this Directive is mandatory and must be carried out immediately on receipt of this A.D.

This Directive is issued pursuant to Air Navigation Regulations under Authority delegated by the Secretary of the Department of Transport.

Douglas Lyon.

DOUGLAS LYON.
CHIEF TECHNICAL OFFICER AIRWORTHINESS
GLIDING FEDERATION OF AUSTRALIA

Date of issue: 20/11/79.

Log of Revision

Any revision of the present manual, except on page 17, must be recorded in the following table, and endorsed by the responsible air authority. The new or amended text in the revised page will be indicated by a black vertical line in the left-hand margin, and the Revision No. will be shown on the bottom left-hand of the page.

Rev. No.	Section	Page	Date	Approval	Date
1	1: 2.5k, 3.2d 2: 4	7, 10 31	7-14-72	SWISS FEDERAL AIR OFFICE Section for Aeronautical Material p.o. G. Dübener	7-18-72
2	1: 1.3,2.3,2.4 2.5,2.6,3.1 3.2,4.1,4.4 5.1,5.4 2: 2, 3.	1,4,5 6,7,8,10 13,15,21 22,23. 29,30.	11-16-72	SWISS FEDERAL AIR OFFICE Section for Aeronautical Material p.o. G. Dübener	11-21-72
3	1: Index 4.2, 4.3 Annex	ii 16/18 24C/D/E	1-23-73	SWISS FEDERAL AIR OFFICE Section for Aeronautical Material p.o. G. Dübener	2-14-73
4	1: 2.5(b) 3.2(a) 4.2, 4.3 Annex	5 9 17/18 24D/E/F	7-8-74	SWISS FEDERAL AIR OFFICE Section for Aeronautical Material p.o. G. Dübener	7-23-74
5	1: 1.4 2.4 4.1, 4.2 Annex	2 5 16/17 24C/D/E	8-20-79	Federal Office for Civil Aviation Section of Aeronautical Material p.o. G. Dübener	10-31-79

- Mean aerodynamic chord 0.979 m
- Aspect ratio 16.0
- Dihedral angle 1^{o}
- Wing profile NACA 64_3 - 618
- Angle of indicence of wing $+1^{o}$ 30'
- Wing area 14.05 m^2
- Wing loading 24.90 kp/m^2

- Angle of incidence of horizontal stabilizer -3^{o}

(see Three View Drawing, page 3)

2.4 Weights and C.G. Limits

- Maximum gross weight	770 lbs
- Gross weight Centre of Gravity location aft Datum	minimum 11.81 in. maximum 17.32 in.
- Datum	Vertical tangent to leading edge of wing
- Levelling means	Slope of rear top surface of fuselage: 1000:80

2.5 Placards

The placards listed under (a) through (l) comply with the requirements of the LFS; for U.S. registered sailplanes, placard items (b) through (r) are required. See FAA Type Certificate Data Sheet G25EU. Placards required by other Air Authorities are listed in Annex page 24 F.

(a) On right-hand cabin wall:

STANDARD CLASS GLIDER

PILATUS B4-PC11

THIS AIRCRAFT COMPLIES WITH CATEGORY "NORMAL" OF THE GERMAN LFS.

LIMITATIONS

MAXIMUM SPEEDS:	mph	kts
- IN CALM WEATHER AND TURBULENCE	149	130
- ON AERO TOW	90	78
- ON WINCH	81	70
STALLING SPEED:	38	33

LOAD: SEE FLIGHT MANUAL

APPROVED AEROBATICS:

SEE FLIGHT MANUAL

(b) On left-hand cabin wall:

PRE-FLIGHT CHECK

- BALLAST ON TAIL REMOVED IF PILOT'S WEIGHT BELOW LIMIT
- PARACHUTE SECURED
- SEAT AND PEDALS ADJUSTED
- SAFETY BELTS SECURED
- CANOPY LOCKED

Serial No.

Distances between Wheels

	L 1	L 2
☐ fixed landing wheel	5.79 in.	132.60 in.
☐ retractable wheel	6.46 in.	131.93 in.

(mark applicable figure with "x")

(a) Record of Empty Weight

- Scale reading forward	W_F	=	lbs
- Scale reading rear	W_R	=	lbs
Empty Weight	$W_{Tot.}$	=	lbs

(b) Empty Weight C. of G.

$$x = \frac{W_R \cdot L_2}{W_{Tot.}} + L\,1 \text{ in.}$$

x = _____ + _____ = _____ in.

4.2 State of Empty Weight and Load

The following list records the up-to-date empty weight and specifies the resultant load limits. Whenever equipment is changed, and following any repair which affects the weight or arm, the new empty weight and resultant loads must be entered in the following list. An instruction how to calculate these figures is given in the Annex (pages 24C/D/E) of this Manual. The entry must be endorsed by the responsible air authority.

Determination of New Empty Weight and Load

1. Empty Weight and Moment

If an additional equipment with known weight and arm has been installed in the sailplane, the new empty weight and moment are determined by addition. For items located aft of the Reference Line, the distance figures are considered to be minus (-) and, vice versa, for items in front of the Reference Line the figures are noted as plus (+).

Example 1

Oxygen equipment installed (located aft of Reference Line)	lbs	in.	in.lbs
- Existing Empty Weight	533	26.4	14,071
- Oxygen equipment	+ 14	+ 8.0	+ 112
- New Empty Weight	W_E = 547		M_E = 14,183

Example 2

Additional instrument installed (located in front of Ref. Line)	lbs	in.	in.lbs
- Existing Empty Weight	533	26.4	14,071
- New instrument	+ 7	- 40.0	- 280
- New Empty Weight	W_E = 540		M_E = 13,791

Example 3

Existing instrument removed (located in front of Ref. Line)	lbs	in.	in.lbs
- Existing Empty Weight	533	26.4	14,071
- Instrument removed	- 7	- 40.0	+ 280
	W_E = 526		M_E = 14,351

Serial No.

4.2 (Continuation)

Date	Subject	lbs	in.	in.lbs	Approval
	Empty Weight as recorded page 16				
	Load:				
	- max. without ballast				
	- max. with ballast of _____ lbs installed				
	- minimum				
	New Empty Weight				
	Resultant load:				
	- max. without ballast				
	- max. with ballast of _____ lbs installed				
	- minimum				

2. Maximum Load without Ballast on Tail

This figure (L_1) is given by the forward C.G. limit (11.81 in.) and the rearmost seat position (20.9 in.).

Based on the new values for Empty Weight (W_E) and Moment (M_E), the maximum load without ballast is calculated as follows:

$$L_1 = \frac{M_E - (11.81 \cdot W_E)}{11.81 + 20.9} \qquad \text{(Formula 1)}$$

3. Maximum Load with Ballast Installed

This figure (L_2) is derived from the max. permissible gross weight (770 lbs) as the difference against the empty weight plus ballast weight (W_B) as follows:

$$L_2 = 770 - (W_E + W_B) \qquad \text{(Formula 2)}$$

4. Minimum Load

This figure (L_3) is given by the rear C.G. limit (17.32 in.) and the most forward seat position (24 in.).

Based on the above values for Empty Weight (W_E) and Moment (M_E), the minimum load is calculated as follows:

$$L_3 = \frac{M_E - (17.32 \cdot W_E)}{17.32 + 24} \qquad \text{(Formula 3)}$$

5. Example with Record

With the values for Empty Weight and Moment given in Example 2 (W_E = 540 lbs, M_E = 13,791 in.lbs), the maximum loads are calculated as follows:

- Max. load without ballast (Formula 1):

$$L_1 = \frac{13{,}791 - (11.81 \cdot 540)}{11.81 + 20.9} = 226.6 \text{ lbs}$$

- Max. load with ballast of 10 lbs installed (Formula 2):

$$L_2 = 770 - (540 + 10) = 220 \text{ lbs}$$

- Minimum load (Formula 3):

$$L_3 = \frac{13{,}791 - (17.32 \cdot 540)}{17.32 + 24} = 107.4 \text{ lbs}$$

The record in page 17 would be as follows:

Date	Subject	lbs	in.	in.lbs	Approval
1.3.73	New Empty Weight (with instrument P/N...)	540		13,791	
	Load:				
	- max. without ballast	226.6			
	- max. with ballast of 10 lbs	220			
	- minimum	107.4			

Log of Revision

Any revision of the present manual, except on page 1 , must be recorded in the following table, and endorsed by the responsible air authority. The new or amended text in the revised page will be indicated by a black vertical line in the left-hand margin, and the Revision No. will be shown on the bottom left-hand of the page.

Rev. No.	Section	Page	Date	Approval	Date
1	3.2(g), 2.5(o) Supplement No. 01580 E	13, 7 1, 2	Feb. 1, 1977	SWISS FEDERAL AIR OFFICE Section for Aeronautical Material p.o. G. Dubacher	March 1, 1977
2	Special Requirements	29A	Jan. 17, 1979	SWISS FEDERAL AIR OFFICE Section for Aeronautical Material p.o. G. Dubacher	January 22 1979
3	1.4, 2.4 4.1, 4.2 4.5	2, 5 18,19 24,25,26	Aug. 20 1979	Federal Office for Civil Aviation Section of Aeronautical Material p.o. G. Dubacher	October 31 1979

1.4 (Cont'd)

- Mean aerodynamic chord 0.979 m
- Aspect ratio 16.0
- Dihedral angle 1°
- Wing profile NACA 64_3 - 618
- Angle of incidence of wing +1° 30'
- Wing area 14.05 m^2
- Wing loading 24.90 kp/m^2

- Angle of incidence of horizontal stabilizer -3°

- Changes against basic model B4-PC11:

  Elevator downward deflection increased; rudder upper end shortened. (Instruction for conversion see PILATUS Document No. 01575)

2.4 Weights and C.G. Limits

- Maximum gross weight	770 lbs
- Gross weight Centre of Gravity location aft Datum	minimum 11.81 in. maximum 17.32 in.
- Datum	Vertical tangent to leading edge of wing
- Levelling means	Slope of rear top surface of fuselage between stations 1512 and 2772 mm: 1000:80

2.5 Placards

The placards listed under (a) through (l) comply with the requirements of the LFS; for U.S. registered sailplanes, placard items (b) through (r) are required. See FAA Type Certificate Data Sheet G25EU. Placards required by other Air Authorities are listed in Annex page 29 A.

(a) On right-hand cabin wall:

STANDARD CLASS GLIDER
PILATUS B4-PC11A

THIS AIRCRAFT COMPLIES WITH CATEGORY "AEROBATIC" OF THE GERMAN LFS.

LIMITATIONS

MAXIMUM SPEEDS:	mph	kts
- IN CALM WEATHER AND TURBULENCE	149	130
- ON AERO TOW	101	88
- ON WINCH	81	70
STALLING SPEED:	38	33

LOAD: SEE FLIGHT MANUAL

APPROVED AEROBATICS:
SEE FLIGHT MANUAL

(b) On left-hand cabin wall:

PRE-FLIGHT CHECK
- BALLAST ON TAIL REMOVED IF PILOT'S WEIGHT BELOW LIMIT
- PARACHUTE SECURED
- SEAT AND PEDALS ADJUSTED
- SAFETY BELTS SECURED
- CANOPY LOCKED
- PEDAL STRAPS ENGAGED

4.1 (Cont'd)

Serial No.

Distances between Wheels

	L 1	L 2
☐ fixed landing wheel	5.79 in	132.60 in
☐ retractable wheel	6.46 in	131.93 in

(mark applicable figure with "x")

(a) Record of Empty Weight

- Scale reading forward W_F = ... lbs
- Scale reading rear W_R = ... lbs

Empty Weight W = ... lbs

(b) Empty Weight C. of G.

$$x = \frac{W_R \cdot L_2}{W} + L\,1 \text{ in.}$$

$$x = \frac{\quad\quad}{\quad\quad} + \quad = \quad \text{in.}$$

4.2 State of Empty Weight and Load

The following list records the up-to-date empty weight and specifies the resultant load limits. Whenever equipment is changed, and following any repair which affects the weight or arm, the new empty weight and resultant loads must be entered in the following list. An instruction how to calculate these figures is given in the Annex (pages 24C/D/E) of this Manual. The entry must be endorsed by the responsible air authority.

4.2 (Cont'd)

Serial No.

Date	Subject	lbs	in.	in.lbs	Approval
	Empty Weight as recorded page 16				
	Load:				
	- max. without ballast				
	- max. with ballast of _____ lbs installed				
	- minimum				
	New Empty Weight				
	Resultant load:				
	- max. without ballast				
	- max. with ballast of _____ lbs installed				
	- minimum				

4.5 Determination of New Empty Weight and Load

(a) Empty Weight and Moment

If an additional equipment with known weight and arm has been installed in the sailplane, the new empty weight and moment are determined by addition. For items located aft of the Reference Line, the distance figures are considered to be minus (-) and, vice versa, for items in front of the Reference Line the figures are noted as plus (+).

Example 1

Oxygen equipment installed (located aft of Reference Line)	lbs	in.	in.lbs
- Existing Empty Weight	533	26.4	14,071
- Oxygen equipment	+ 14	+ 8.0	+ 112
- New Empty Weight	W_E = 547		M_E = 14,183

Example 2

Additional instrument installed (located in front of Ref. Line)	lbs	in.	in.lbs
- Existing Empty Weight	533	26.4	14,071
- New instrument	+ 7	- 40.0	- 280
- New Empty Weight	W_E = 540		M_E = 13,791

Example 3

Existing instrument removed (located in front of Ref. Line)	lbs	in.	in.lbs
- Existing Empty Weight	533	26.4	14,071
- Instrument removed	- 7	- 40.0	+ 280
	W_E = 526		M_E = 14,351

4.5 (Cont'd)

(b) Maximum Load without Ballast on Tail

This figure (L_1) is given by the forward C.G. limit (11.81 in.) and the rearmost seat position (20.9 in.).

Based on the new values for Empty Weight (W_E) and Moment (M_E), the maximum load without ballast is calculated as follows:

$$L_1 = \frac{M_E - (11.81 \cdot W_E)}{11.81 + 20.9} \qquad \text{(Formula 1)}$$

(c) Maximum Load with Ballast Installed

This figure (L_2) is derived from the max. permissible gross weight (770 lbs) as the difference against the empty weight plus ballast weight (W_B) as follows:

$$L_2 = 770 - (W_E + W_B) \qquad \text{(Formula 2)}$$

(d) Minimum Load

This figure (L_3) is given by the rear C.G. limit (17.32 in.) and the most forward seat position (24 in.).

Based on the above values for Empty Weight (W_E) and Moment (M_E), the minimum load is calculated as follows:

$$L_3 = \frac{M_E - (17.32 \cdot W_E)}{17.32 + 24} \qquad \text{(Formula 3)}$$

4.5 (Cont'd)

(e) Example with Record

With the values for Empty Weight and Moment given in Example 2 (W_E = 540 lbs, M_E = 13,791 in.lbs), the maximum loads are calculated as follows:

- Max. load without ballast (Formula 1):

$$L_1 = \frac{13{,}791 - (11.81 \cdot 540)}{11.81 + 20.9} = 226.6 \text{ lbs}$$

- Max. load with ballast of 10 lbs installed (Formula 2)

$$L_2 = 770 - (540 + 10) = 220 \text{ lbs}$$

- Minimum load (Formula 3):

$$L_3 = \frac{13{,}791 - (17.32 \cdot 540)}{17.32 + 24} = 107.4 \text{ lbs}$$

The record in page 19 would be as follows:

Date	Subject	lbs	in.	in.lbs	Approval
1.3.73	New Empty Weight (with instrument P/N...)	540		13,791	
	Load:				
	- max. without ballast	226.6			
	- max. with ballast of 10 lbs	220			
	- minimum	107.4			

Note

Ensure that max. gross weight of 770 lbs is not exceeded.