

NEW ZEALAND CIVIL AIRWORTHINESS REQUIREMENTS PART II

LEAFLET C.10-1
ISSUE 3 JANUARY 1969

AGRICULTURAL AEROPLANES: GENERAL

1. INTRODUCTION

- 1.1 THIS LEAFLET PRESCRIBES DESIGN REQUIREMENTS FOR AGRICULTURAL AEROPLANES CLASSIFIED IN NORMAL AND/OR SPECIAL CATEGORY.
- 1.2 AGRICULTURAL AEROPLANES ARE DEFINED AS AEROPLANES CLASSIFIED IN SUBDIVISION (E) AERIAL WORK (AGRICULTURAL) IN NZCAR PART I LEAFLET A1.

2. APPLICABILITY

THE REQUIREMENTS OF THIS LEAFLET SHALL APPLY TO ALL AGRICULTURAL AEROPLANES CLASSIFIED IN NORMAL OR SPECIAL CATEGORIES, UNLESS SPECIFICALLY EXEMPTED BY THE DIRECTOR.

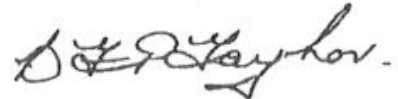
3. BASIC DESIGN REQUIREMENTS

- 3.1 AGRICULTURAL AEROPLANES SHALL COMPLY WITH BASIC DESIGN REQUIREMENTS ACCEPTABLE TO THE DIRECTOR.
- 3.2 BASIC DESIGN REQUIREMENTS ACCEPTABLE TO THE DIRECTOR ARE BRITISH CIVIL AIRWORTHINESS REQUIREMENTS AND U.S. FEDERAL AVIATION REGULATIONS, PARTS 23 AND 25. OTHER DESIGN REQUIREMENTS WHICH PROVIDE AN EQUIVALENT LEVEL OF AIRWORTHINESS MAY ALSO BE ACCEPTABLE SUBJECT TO AGREEMENT IN WRITING FROM THE DIRECTOR.

4. ADDITIONAL DESIGN REQUIREMENTS

- 4.1 AGRICULTURAL AEROPLANES SHALL COMPLY WITH THE REQUIREMENTS OF LEAFLETS C.10-2 TO C.10-9 INCLUSIVE OF THIS PART.
- 4.2 IF THE BASIC AND ADDITIONAL DESIGN REQUIREMENTS CONFLICT, THE ADDITIONAL DESIGN REQUIREMENTS OF SUB-PARAGRAPH 4.1 SHALL OVERRIDE THE BASIC DESIGN REQUIREMENTS OF PARAGRAPH 3.

ISSUED IN PURSUANCE OF THE CIVIL AVIATION REGULATIONS 1953, REGULATIONS 161, 162 AND 163.



DIRECTOR

6/1/28

MINISTRY OF TRANSPORT,
CIVIL AVIATION DIVISION,
WELLINGTON.

NEW ZEALAND CIVIL AIRWORTHINESS REQUIREMENTS PART II

LEAFLET C.10-2
ISSUE 3 JANUARY 1969

AGRICULTURAL AEROPLANES : SPECIAL CATEGORY

1. INTRODUCTION

AGRICULTURAL AEROPLANES MAY BE CLASSIFIED IN THE SPECIAL CATEGORY WITH A HIGHER MAXIMUM WEIGHT THAN THAT PERMITTED IN THE NORMAL CATEGORY, PROVIDED THAT THE PERFORMANCE AND HANDLING REQUIREMENTS OF LEAFLET C10-7 AND THE ENGINE COOLING REQUIREMENT OF LEAFLET C10-9 OF THIS PART ARE MET AT THE HIGHER WEIGHT.

2. MAXIMUM TAKE-OFF WEIGHT

THE MAXIMUM TAKE-OFF WEIGHT IS BASED ON THE DESIGN MAXIMUM WEIGHT OF THE AEROPLANE AND CORRESPONDING MAXIMUM POSITIVE LOAD FACTOR AND IS DETERMINED AS FOLLOWS:

$$W^1 = \frac{2B_1}{n_1 + K} W$$

WHERE W^1 = MAXIMUM TAKE-OFF WEIGHT IN SPECIAL CATEGORY. LB.
 W = DESIGN MAXIMUM WEIGHT. LB.
 n_1 = DESIGN MAXIMUM POSITIVE MANOEUVRING LOAD FACTOR.

$$K = 1.95 + \frac{18,000}{10,000 + W}$$

BUT K NEED NOT BE GREATER THAN 3.0 AND SHALL BE NOT LESS THAN 2.25.

3. MAXIMUM LANDING WEIGHT

THE MAXIMUM LANDING WEIGHT IN SPECIAL CATEGORY SHALL BE CALCULATED IN ACCORDANCE WITH PARAGRAPH 6.1 OF LEAFLET C10-7 OF THIS SECTION EXCEPT THAT IT SHALL NOT IN ANY CASE BE GREATER THAN THE BASIC DESIGN MAXIMUM LANDING WEIGHT.

ISSUED IN PURSUANCE OF THE CIVIL AVIATION REGULATIONS 1953, REGULATIONS 161, 162, 163 AND 166.



DIRECTOR

61/1/28

MINISTRY OF TRANSPORT,
CIVIL AVIATION DIVISION,
WELLINGTON.

NEW ZEALAND CIVIL AIRWORTHINESS REQUIREMENTS

PART II

SECTION C.
SUBSECTION C. 10.

LEAFLET C. 10-3.
ISSUE I—JANUARY 1955.

AGRICULTURAL AEROPLANES: EMERGENCY ALIGHTING CONDITIONS

1. GENERAL

The requirements of this leaflet are intended to ensure that in the event of an aeroplane making an emergency landing involving accelerations up to prescribed maxima, the safety of the occupants has been fully considered. Such consideration extends to the avoidance of injury to the occupants due to the damage which the aeroplane is likely to suffer under the prescribed conditions.

NOTE.—Hazards to occupants in crash conditions can be reduced by designing the aeroplane so that the following occurrences are unlikely to cause either direct physical injury to the occupant or injury as a result of rupture of the tanks:

- Landing gear collapse,
- Landing with a retracted or deranged landing gear, and
- Engines breaking loose.

Serious injury to the occupants can also be reduced by making the interior of the aeroplane free, in so far as is practicable, from projections or hard points so located that the occupants might come into contact with them when making proper use of the seats and safety harnesses provided.

2. ACCELERATIONS

In each emergency alighting condition, all combinations of inertia forces corresponding to the following ranges of ultimate accelerations up to the prescribed resultant shall be considered, taking the direction of the acceleration in each case as relative to the aeroplane:

- 4 g downwards to 4.5 g upwards.
- Zero to 12 g forwards.
- Zero to 1.5 g rearwards.
- Zero to 2.25 g sideways.
- Maximum resultant 12 g.

3. EQUIPMENT

Items of equipment shall, so far as is practicable, be positioned so that if they break loose they are unlikely to cause injury to the occupants or to nullify any of the escape facilities provided for use after an emergency alighting. When such positioning is not practicable the attachments and surrounding structure shall be designed to withstand inertia forces at least equal to those prescribed in paragraph 2.

4. CONDITIONS

4.1. *Crash Landing.*—The design of the aeroplane shall be such that there will be every reasonable probability of the occupants escaping serious injury in the event of a crash landing, including the case of wheels retracted when such contingency is possible.

4.2. *Ditching.*—On aeroplanes for which certification as complying with the requirements for forced alighting on water is desired, it shall be shown that—

The design of the aeroplane is such that, as far as is practicable, its behaviour in a pre-meditated ditching will be unlikely to cause immediate injury to the passengers, or to make their escape impossible (see Leaflet C. 3-3, para. 7); and

The aeroplane would, after such ditching, remain afloat for a period long enough to permit all occupants to leave their normal stations and escape from the aeroplane.

4.3. *Turnover.*—The structure of the aeroplane shall be designed to protect the occupants in the event of a complete turnover, unless the configuration of the aeroplane renders such a contingency extremely improbable.

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NEW ZEALAND CIVIL AIRWORTHINESS REQUIREMENTS

PART II

SECTION C.

LEAFLET C. 10-4.

SUBSECTION C. 10.

ISSUE I—JANUARY 1955.

AGRICULTURAL AEROPLANES: SEATS AND SAFETY HARNESSSES

1. INTRODUCTION

The requirements of this leaflet are intended to ensure that the occupants of an aerial work aeroplane, when engaged on agricultural operations, are provided with reliable and adequate facilities for resisting dangerous movement when subjected to the forces appropriate to normal and emergency conditions.

2. SEATS

2.1. Types :—

2.1.1. This paragraph 2 applies to forward, side, or aft facing seats. Other forms of accommodation shall provide an equal measure of safety, and the Director of Civil Aviation shall be consulted regarding the proposed design at an early stage.

2.1.2. Seats shall be of approved types.

NOTE.—An approved seat is one of a type individually approved by the Director of Civil Aviation or is one certified as suitable for a particular aircraft type by an approved design organization (aircraft). In the former case "an approved organization" supervising the installation is responsible for selecting seats, the forms and certified strengths of which are appropriate to the particular installation.

2.2. Design :—

2.2.1. Seats shall be of a form such as to fulfil the duty for which they are installed and to provide as far as possible the maximum safety in emergency conditions to the occupants and other persons thrown against them. In particular there shall be no hard edges or excrescences in a position likely to cause head injuries to the occupants of the aeroplane in emergency conditions. The design shall be such that they are unlikely to trap the occupants or other persons in a crash, e.g., persons might tend to slide underneath a seat of unsuitable design.

2.2.2. Side-facing seats shall be arranged so that no more than two occupants can lean on any third in emergency conditions.

2.2.3. Seats facing aft shall have suitable backs and headrests to ensure safe restraint to the occupants in emergency conditions.

2.2.4. Seats shall be designed with a view to absorbing as much energy as possible before total failure in a crash.

2.2.5. Adjustable, folding, or rotatable seats shall be designed so that when locked they will not move under loads occurring in the stipulated loading conditions. The locking mechanisms of adjustable and folding seats shall be such as to lock automatically when released.

2.2.6. Any cushions, etc., designed for use with seats occupied by members of the crew on duty shall be suitably secured in position so that it is impossible for them to move and interfere with the normal free movement of the crew or with the full use of the controls. The pilot's seat, together with its upholstery, shall be such as to react the loads applied to it by the pilot without deflecting so as to prejudice his use of the controls.

NOTE.—The pilot's maximum control loads which may be applied simultaneously to both control column and rudder pedal will vary from about 100 lb. each for light aeroplanes to 300 lb. each for aeroplanes with heavy controls.

2.3. Strength :—

2.3.1. The weight of each occupant is assumed to be 170 lb. for design purposes; in addition, allowance shall be made for the weight of the seat including any equipment which will be carried on it.

