CIVIL AVIATION SAFETY AUTHORITY AUSTRALIA

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***This publication is intended to provide guidance and clarification of regulatory requirements and is only advisory.***

***Always read this advice in conjunction with the appropriate legislation.***

**Contents...**


1. Background 2
2. Applicability of CAO 20.7.2 2
3. Aeroplane flight manual 2
4. Take-off distance required 3
5. Landing distance required 4
6. Cancellation 5


**CAAP 235-3(0)**

# RPT OPERATIONS IN MULTI-ENGINE AEROPLANES WITH MTOW NOT ABOVE 5700 KG – AEROPLANE WEIGHT AND PERFORMANCE LIMITATIONS

- References
- subregulation 235 (2) of *Civil Aviation Regulations 1988* (CAR 1988); and
- section 20.7.2 of Civil Aviation Orders (CAO 20.7.2); and
- section 82.3 of Civil Aviation Orders (CAO 82.3); and
- section 101.4 of Civil Aviation Orders (CAO 101.4).

## Who this CAAP applies to

- Owners of aeroplanes with maximum take-off weights not above 5700 kg used in regular public transport operations
- Holders of Air Operator Certificates for regular public transport operations
- Pilots involved in regular public transport operations in aeroplanes with maximum take-off weights not above 5700 kg

## Why this CAAP was written

This Civil Aviation Advisory Publication (CAAP) has been prepared by the Civil Aviation Safety Authority to provide advice relevant to regulation 235 of CAR 1988 and CAO 20.7.2.

New regulations relating to flight manuals (regulations 54 and 55 of CAR 1988) came into force in August 1999. The flight manuals now in use do not contain some of the detailed performance information necessary for the operator to show compliance with CAO 20.7.2. This CAAP provides clarification of the status of performance information in flight manuals which were superseded between August 1999 and August 2002 and advises how an operator can show compliance with CAO 20.7.2.

In RPT operations, take-off and landing distances required must include safety factors but these factors are not specified in CAO 20.7.2. They are not readily found by readers. This CAAP seeks to clarify the safety factors applicable to take-off and landing distances in regular public transport operations in aeroplanes of MTOW not exceeding 5700 kg.

## Status of this CAAP

This CAAP is the first issue of CAAP 235-3(0).

## For further information

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## 1. Background

The maximum weight at which an aeroplane may take-off is often limited by performance considerations. The weight and performance limitations on aeroplanes are specified in section 20.7 of Civil Aviation Orders (CAO). Subregulations 235 (2) to 235 (6) inclusive of CAR 1988 provide the legal head of power for CAO 20.7.

## 2. Applicability of CAO 20.7.2

2.1 CAO 20.7.2 is applicable to regular public transport operations in multi-engine aeroplanes with maximum take-off weight (MTOW) not exceeding 5700 kg.

2.2 A multi-engine aeroplane with a certificate of airworthiness in the normal category may be used in regular public transport operations providing the MTOW of the aeroplane does not exceed 3500 kg. A multi-engine aeroplane with an MTOW exceeding 3500 kg but not exceeding 5700 kg may only be used in regular public transport operations if it has a certificate of airworthiness in the transport or commuter category. This is specified in CAO 82.3, paragraph 6.1 (a).

2.3 An aeroplane with a certificate of airworthiness in the normal category will be granted a certificate of airworthiness in the transport category if the aeroplane is shown to comply with CAO 101.4.

## 3. Aeroplane flight manual

3.1 In August 1999 regulation 54 of CAR 1988 came into force. It specifies that most aircraft must have the flight manual produced by the aircraft manufacturer and approved by the national airworthiness authority in the country in which the aircraft was manufactured. As a result, many operators must change from the Australian flight manual that has been in use for many years to a different flight manual.

3.2 Most flight manuals that meet the specification in regulation 54 do not contain sufficient information to allow the operator to show compliance with CAO 20.7.2. Usually these flight manuals do not contain:

- take-off and landing distance safety factors
- runway performance information that takes account of runway slope
- runway performance information that takes account of runway surfaces other than paved surfaces
- one-engine-inoperative climb gradient information

3.3 In seven places in CAO 20.7.2 the aeroplane flight manual is specified as the source of information related to runway performance and climb gradients. CAO 20.7.2 was written prior to regulation 54 coming into force. The information that is intended to be used to show compliance with CAO 20.7.2 is found in the superseded flight manuals but not in the flight manuals that meet the specification in regulation 54. This performance information has been approved in Australia and has been used in the past to show compliance with CAO 20.7.2. The validity of this performance information has not been reduced. **Operators are encouraged to retain the performance information from their superseded flight manuals, insert it in their Operations Manuals or similar documents carried in the aircraft, and use it in showing compliance with CAO 20.7.2.**

3.4 When CAO 20.7.2 is superseded by Part 121B of the *Civil Aviation Safety Regulations 1998* (CASR) new performance requirements will come into force. It is likely the performance information published in flight manuals that meet the specification in regulation 54 will be sufficient to show compliance with Part 121B.

## 4. Take-off distance requirements

4.1 In regular public transport operations in aeroplanes to which CAO 20.7.2 applies ("applicable aeroplanes"), the take-off distance required is the measured take-off distance multiplied by a safety factor. Relevant safety factors are specified in several sections of CAOs but are not specified in CAO 20.7.2.

4.2 The measured take-off distance is the horizontal distance for the aeroplane to accelerate from stationary, take-off and climb to 50 feet above the runway surface. It has usually been measured by the aeroplane manufacturer. This distance can be adjusted to take account of aeroplane weight, pressure altitude, air temperature and runway wind component. It may also be possible to take account of runway slope and runway surface.

4.3 Take-off distance information published in flight manuals approved in a country other than Australia is usually the measured take-off distance and does not include any safety factor. Take-off distance information approved in Australia is usually the measured take-off distance multiplied by a safety factor. Where a take-off distance chart or table includes a safety factor the magnitude of the safety factor is specified on the chart or table.

4.4 In regular public transport operations in applicable aeroplanes the take-off distance safety factors are:

**A. AEROPLANES OF MTOW NOT EXCEEDING 3500 KG**

- aeroplanes with MTOW equal to or less than 2000 kg .....1.15
- aeroplanes with MTOW equal to 3500 kg.....1.25
- aeroplanes with MTOW greater than 2000 kg but less than 3500 kg ..... a factor derived by linear interpolation between 1.15 and 1.25 according to the maximum take-off weight of the aeroplane.

These safety factors were specified in section 101.22 of Civil Aviation Orders (CAO 101.22), Appendix I, paragraph 2.6(3). CAO 101.22 was cancelled in October 1998 but it remains part of the certification basis for the certificate of airworthiness of most applicable aeroplanes.

These safety factors are also specified in sub-section 20.7.4 of Civil Aviation Orders (CAO 20.7.4), paragraph 6.1.

**B. AEROPLANES WITH MTOW EXCEEDING 3500 KG**

- Aeroplanes with MTOW exceeding 3500 kg but not exceeding 5700 kg.....1.5

This safety factor is specified in CAO 101.4, paragraph 6.20.2(a).

## 5. Landing distance requirements

5.1 In regular public transport operations in applicable aeroplanes the landing distance required is the measured landing distance multiplied by a safety factor. Relevant safety factors are specified in several sections of Civil Aviation Orders but are not specified in CAO 20.7.2.

5.2 The measured landing distance is the horizontal distance for the aeroplane to land and come to a halt from 50 feet above the runway surface. It has usually been measured by the aeroplane manufacturer. This distance can be adjusted to take account of aeroplane weight, pressure altitude and runway wind component. It may also be possible to take account of air temperature, runway slope and runway surface.

5.3 Landing distance information published in flight manuals approved in a country other than Australia is usually the measured landing distance and does not include any safety factor. Landing distance information approved in Australia is usually the measured landing distance multiplied by a safety factor. Where a landing distance chart or table includes a safety factor the magnitude of the safety factor is specified on the chart or table.

5.4 In regular public transport operations in applicable aeroplanes the landing distance safety factors are:

**A. AEROPLANES OF MTOW NOT EXCEEDING 3500 KG**

- aeroplanes with MTOW equal to or less than 2000 kg 1.15
- aeroplanes with MTOW equal to 3500 kg.....1.318
- aeroplanes with MTOW greater than 2000 kg but less than 3500 kg ..... a factor derived by linear interpolation between 1.15 and 1.318 according to the maximum take-off weight of the aeroplane.

These safety factors were specified in section 101.22 of CAO, Appendix I, paragraph 2.6 (4). CAO 101.22 was cancelled in October 1998 but it remains part of the certification basis for the certificate of airworthiness of most applicable aeroplanes.

These safety factors are also specified in CAO 20.7.4, paragraph 10.1.

**B. AEROPLANES WITH MTOW EXCEEDING 3500 KG**

- Aeroplanes with MTOW exceeding 3500 kg but not exceeding 5700 kg.....1.43

This safety factor is specified in CAO 101.4, paragraph 6.20.2(c).

## 5. Cancellation

This CAAP will be superseded when CASR Part 121B comes into force. This CAAP will be cancelled at that time.

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